

2. CHASSIS

204 : Suspension

204-00 : Suspension System – General Information

Specifications

Specifications

Wheel Alignment Specification - Front

All Right-Hand Drive and Japan				
Item		LH	RH	Split LH-RH
Castor	Decimal degrees	$7.57^{\circ} \pm 0.75^{\circ}$	$7.04^{\circ} \pm 0.75^{\circ}$	$0.54^{\circ} \pm 0.75^{\circ}$
	Degrees/minutes	$7^{\circ} 34' \pm 45'$	$7^{\circ} 2' \pm 45'$	$0^{\circ} 32' \pm 45'$
Camber	Decimal degrees	$-0.7^{\circ} \pm 0.75^{\circ}$	$-0.3^{\circ} \pm 0.75^{\circ}$	$-0.4^{\circ} \pm 0.75^{\circ}$
	Degrees/minutes	$-0^{\circ} 42' \pm 45'$	$-0^{\circ} 18' \pm 45'$	$-0^{\circ} 24' \pm 45'$
Total toe	Decimal degrees	$0.1^{\circ} \pm 0.2^{\circ}$		
	Degrees/minutes	$0^{\circ} 6' \pm 12'$		

USA, Canada, Mexico and Dominican Republic				
Item		LH	RH	Split LH-RH
Castor	Decimal degrees	$7.48^{\circ} \pm 0.75^{\circ}$	$7.48^{\circ} \pm 0.75^{\circ}$	$0^{\circ} \pm 0.75^{\circ}$
	Degrees/minutes	$7^{\circ} 29' \pm 45'$	$7^{\circ} 29' \pm 45'$	$0^{\circ} \pm 45'$
Camber	Decimal degrees	$-0.25^{\circ} \pm 0.75^{\circ}$	$-0.75^{\circ} \pm 0.75^{\circ}$	$0.5^{\circ} \pm 0.75^{\circ}$
	Degrees/minutes	$-0^{\circ} 15' \pm 45'$	$-0^{\circ} 45' \pm 45'$	$0^{\circ} 30' \pm 45'$
Total toe	Decimal degrees	$0.1^{\circ} \pm 0.2^{\circ}$		
	Degrees/minutes	$0^{\circ} 6' \pm 12'$		

Rest of the World				
Item		LH	RH	Split LH-RH

Castor	Decimal degrees	$7.48^{\circ} \pm 0.75^{\circ}$	$7.48^{\circ} \pm 0.75^{\circ}$	$0^{\circ} \pm 0.75^{\circ}$
	Degrees/minutes	$7^{\circ} 29' \pm 45'$	$7^{\circ} 29' \pm 45'$	$0^{\circ} \pm 45'$
Camber	Decimal degrees	$-0.4^{\circ} \pm 0.75^{\circ}$	$-0.6^{\circ} \pm 0.75^{\circ}$	$0.2^{\circ} \pm 0.75^{\circ}$
	Degrees/minutes	$-0^{\circ} 24' \pm 45'$	$-0^{\circ} 36' \pm 45'$	$0^{\circ} 12' \pm 45'$
Total toe	Decimal degrees	$0.1^{\circ} \pm 0.2^{\circ}$		
	Degrees/minutes	$0^{\circ} 6' \pm 12'$		

Wheel Alignment Specification - Rear

All Vehicles			
Item		LH	RH
Camber	Decimal degrees	$-0.89^{\circ} \pm 0.75^{\circ}$	$-0.89^{\circ} \pm 0.75^{\circ}$
	Degrees/minutes	$-0^{\circ} 53' \pm 45'$	$-0^{\circ} 53' \pm 45'$
Toe	Decimal degrees	$0.083^{\circ} \pm 0.14^{\circ}$	$0.083^{\circ} \pm 0.14^{\circ}$
	Degrees/minutes	$0^{\circ} 5' \pm 8'$	$0^{\circ} 5' \pm 8'$
Total toe	Decimal degrees	$0.167^{\circ} \pm 0.20^{\circ}$	
	Degrees/minutes	$0^{\circ} 10' \pm 12'$	
Rear thrust angle	Decimal degrees	$0^{\circ} \pm 0.14^{\circ}$	
	Degrees/minutes	$0^{\circ} \pm 8'$	

General Specifications

Item	Specification
Clear Vision	
Clear vision (negative value is counterclockwise)	$0^{\circ} \pm 3^{\circ}$
Ride Height	
Front	386 ± 15 mm
Rear	373 ± 15 mm
Ball Joint Radial Play	
Lower ball joint — maximum	0.8 mm
Upper ball joint — maximum	0.8 mm

- All the above figures are measured at "kerb" height -all fluids at full and a full fuel tank.
- Tires must be inflated to normal pressure
- Rear thrust angle = $(\text{LH toe} - \text{RH toe}) \div 2$
- Ride height is measured from the centre of the wheel to the apex of the wheel arch, through the wheel centre line.

Camber and Caster Adjustment

NOTE:

The camber and caster adjustment for the left-hand side is shown, the procedure for adjusting the right-hand side is similar.

NOTE:

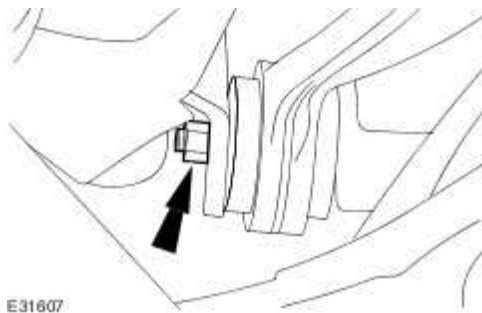
This procedure must be carried out using a 4-post ramp.

1. Check the camber and caster settings. Follow the equipment manufacturers instructions.

2. **NOTE:**

Left-hand shown, right-hand similar.

Loosen the front lower arm lock nut.



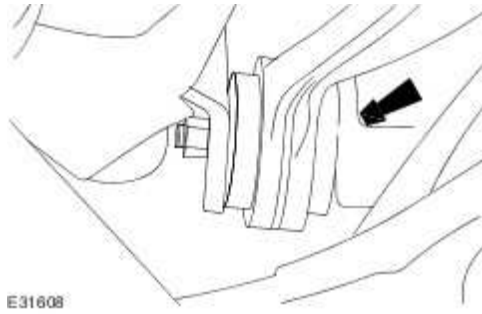
3. **NOTE:**

Adjustments to the caster will affect the toe settings. Therefore, the caster and toe may need to be adjusted at the same time to achieve the correct settings.

NOTE:

Left-hand shown, right-hand similar.

Rotate the caster adjustment cam bolt to adjust the caster.



4. Check the caster settings. Follow the equipment manufacturers instructions. Adjust as necessary.

5. NOTE:

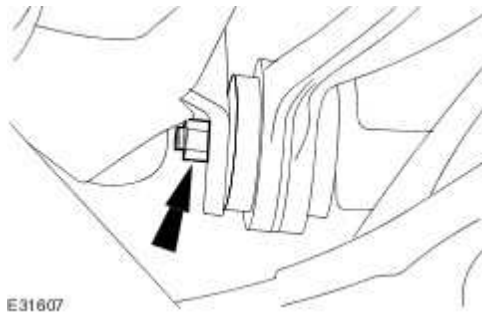
Make sure the caster adjustment cam bolt does not rotate.

NOTE:

Left-hand shown, right-hand similar.

Tighten the caster adjustment cam bolt lock nut.

- Tighten to 175 Nm.



6. NOTE:

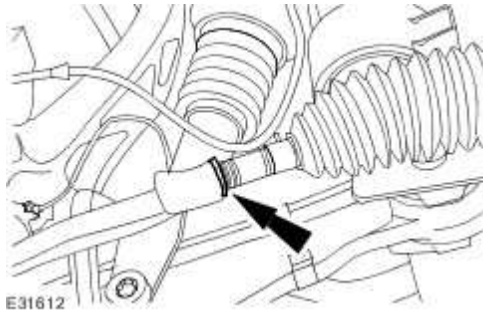
Adjustments to the camber will affect the toe settings. Therefore, the camber and toe may need to be adjusted at the same time to achieve the correct settings.

NOTE:

Left-hand shown, right-hand similar.

Loosen the tie-rod end lock nut.

- Clean and lubricate the lock nut and tie-rod threads.



7.

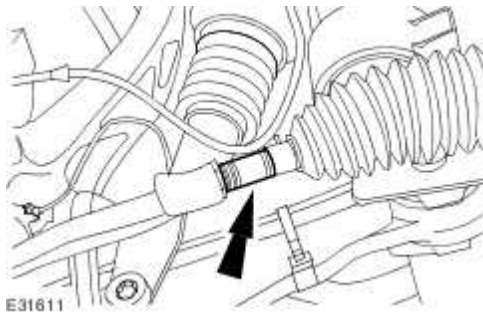


CAUTION: Do not allow the tie-rod end or steering gear boot to twist when the tie-rod is rotated. Failure to follow this instruction may result in damage to the vehicle.

NOTE:

Left-hand, shown right-hand similar.

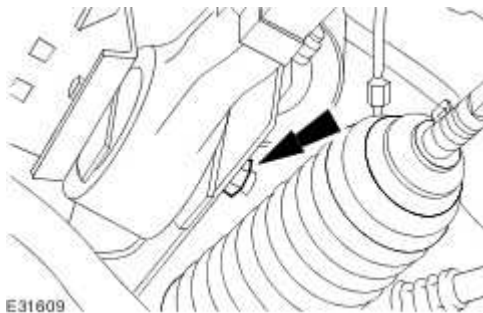
Rotate the tie-rod to adjust the toe.



8. **NOTE:**

Left-hand shown, right-hand similar.

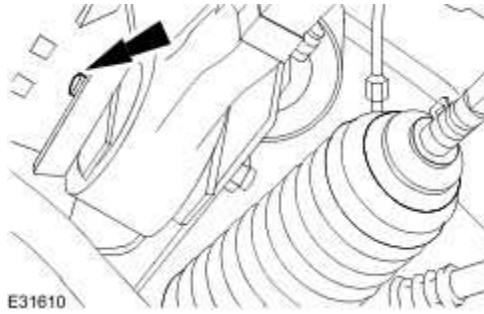
Loosen the rear lower arm lock nut.



9. **NOTE:**

Left-hand shown, right-hand similar.

Rotate the camber adjustment cam bolt to adjust the camber.



10. Check the camber and toe settings. Follow the equipment manufacturers instructions. Adjust as necessary.

11. NOTE:

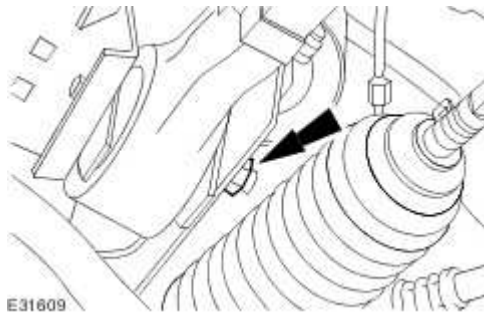
Make sure the camber adjustment cam bolt does not rotate.

NOTE:

Left-hand shown, right-hand similar.

Tighten the rear lower arm lock nut.

- Tighten to 175 Nm.



12. NOTE:

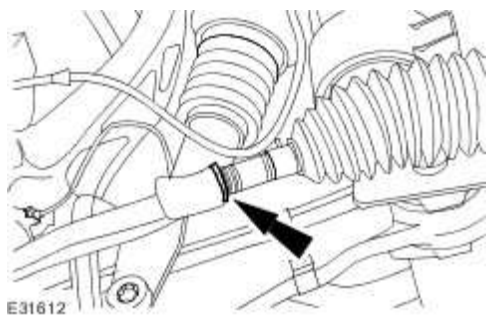
Make sure the tie-rod or tie-rod end does not rotate.

NOTE:

Left-hand shown, right-hand similar.

Tighten the tie-rod end lock nut.

- Tighten to 100 Nm.



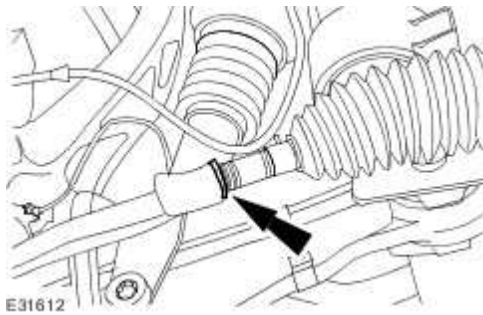
E31612

Front Toe Adjustment (57.65.01)

1. Start the engine and center the steering wheel.
2. Turn the engine off, and hold the steering wheel in the 'straight ahead' position by attaching a rigid link from the steering wheel to the brake pedal.
3. Check the toe settings. Follow the equipment manufacturers instructions.
4. **NOTE:**
Left-hand shown, right-hand similar.

Loosen the tie-rod end lock nut.

- Clean and lubricate the lock nut and tie-rod threads.



5.

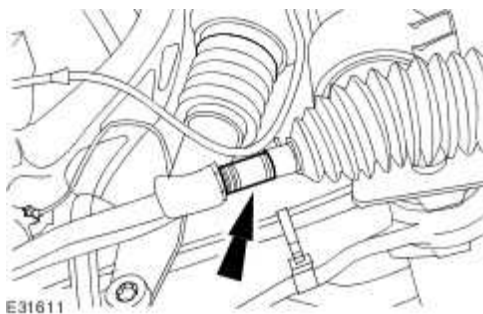


CAUTION: Do not allow the tie-rod end or steering gear boot to twist when the tie-rod is rotated. Failure to follow this instruction may result in damage to the vehicle.

NOTE:

Left-hand shown, right-hand similar.

Rotate the tie-rod to adjust the toe setting.



6. **NOTE:**

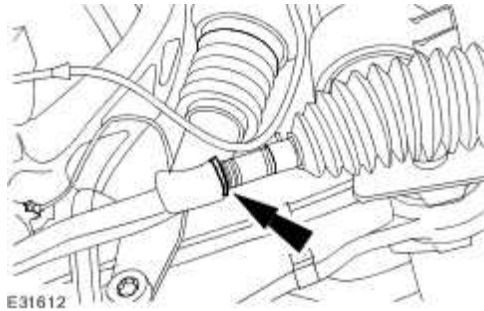
Make sure the tie-rod or tie-rod end does not rotate.

NOTE:

Left-hand shown, right-hand similar.

Tighten the tie-rod end lock nut.

- Tighten to 100 Nm.



7. Recheck the toe settings. Follow the equipment manufacturers instructions.

Rear Toe Adjustment (57.65.08)

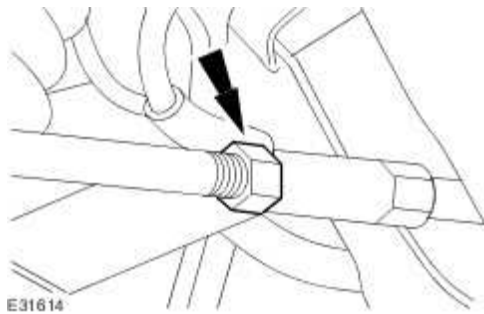
1. Check the toe settings. Follow the equipment manufacturers instructions.

2. **NOTE:**

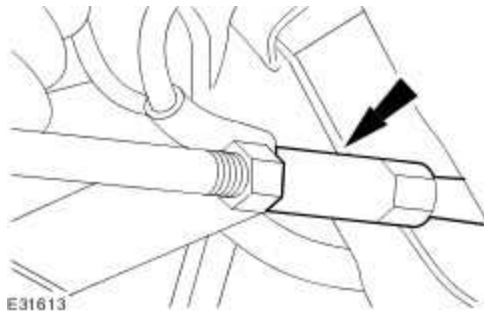
Left-hand, shown right-hand similar.

Loosen the toe link lock nut.

- Clean and lubricate the lock nut and toe link threads.

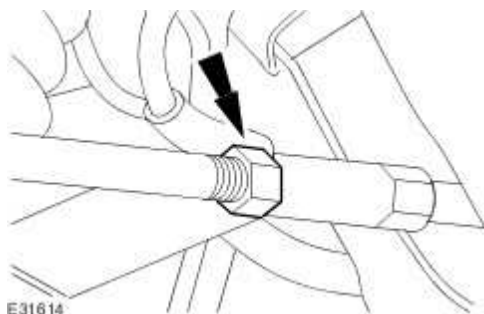


3. Rotate the toe link to adjust the toe settings.



4. Tighten the toe link lock nut.

- Tighten to 55 Nm.



5. Check the toe settings. Follow the equipment manufacturers instructions.

Wheel Bearing Inspection

1. Raise and support the vehicle. For additional information, refer to [100-02](#)

2. **NOTE:**

Make sure the wheel rotates freely and the brake pads are retracted sufficiently to allow movement of the tire and wheel assembly.

Firmly grasp the tire at the top and bottom and move the wheel inward and outward while lifting the weight of the tire off the wheel bearing.

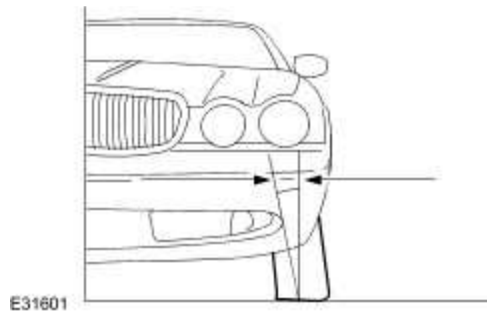
3. If the tire and wheel is loose on the wheel hub assembly or does not rotate freely, install a new front wheel hub or rear hub as necessary. For additional information, refer to [204-01](#) or [204-02](#)

Wheel Alignment Angles

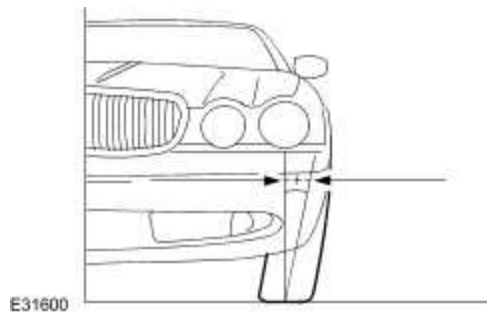
Camber, caster and toe are adjustable on the front suspension system. Only the toe is adjustable on the rear suspension system. Camber and caster are adjusted by means of eccentric cams on the lower arm mounting bolts. The front toe is adjusted by use of the front tie-rod. The rear toe is adjusted by the use of toe link assemblies connecting the knuckles to the rear sub-frame.

Camber

Negative Camber

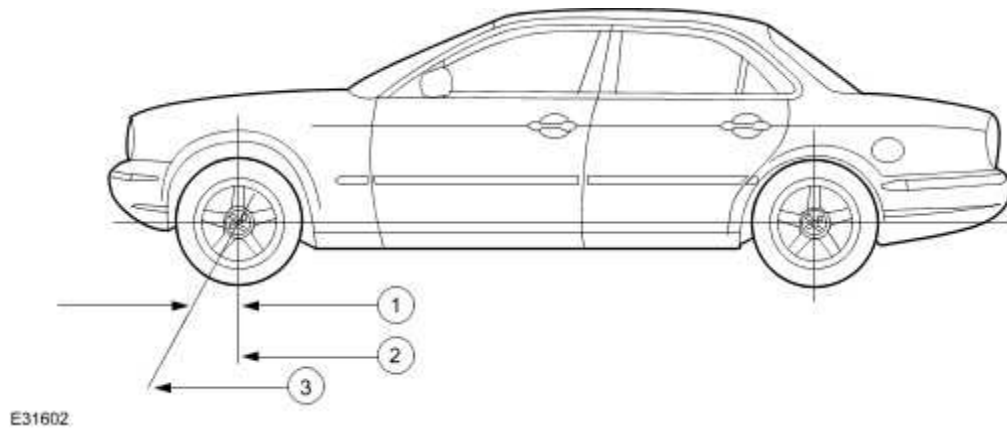


Positive Camber



Camber is the vertical tilt of the wheel when viewed from the front. Camber can be positive or negative and has a direct effect on tire wear.

Caster



Item	Description
1	Positive caster
2	True vertical
3	Steering axis

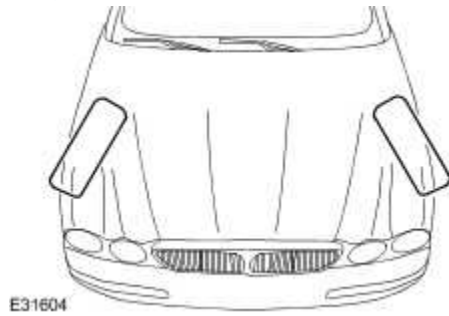
Caster is the deviation from vertical of an imaginary line drawn through the ball joints when viewed from the side. The caster specifications in this section will give the vehicle the best directional stability characteristics when loaded and driven. The caster setting is not related to tire wear.

Toe

Positive Toe (Toe-In)



Negative Toe (Toe-Out)



The vehicle toe setting:

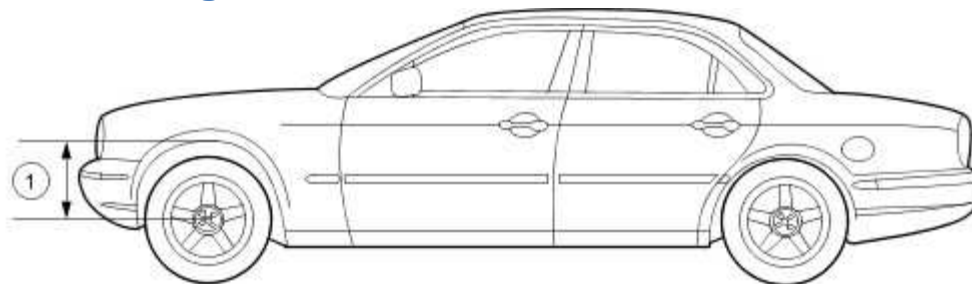
- affects tire wear and directional stability.

Ride Height

NOTE:

All ride height measurements are carried out with vehicle empty and 9 liters of fuel in the tank (showroom condition). The vehicle must be driven above 40 km/h (25 miles/hour) for a minimum of five minutes to make sure that the reservoir is full.

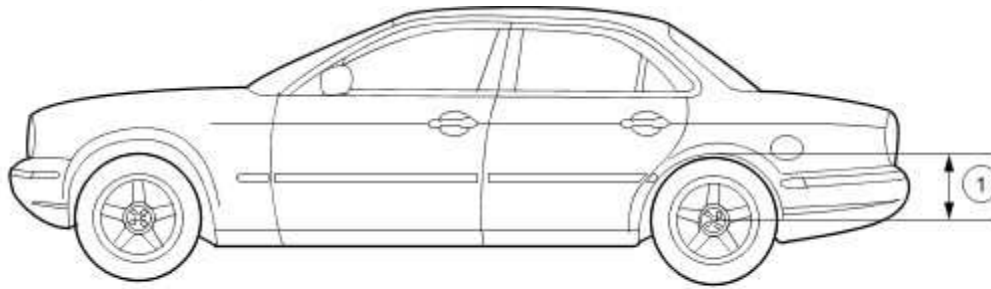
Front Ride Height Measurement



E31605

Item	Description
1	Ride height

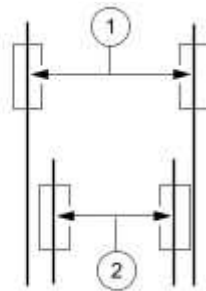
Rear Ride Height Measurement



E31606

Item	Description
1	Ride height

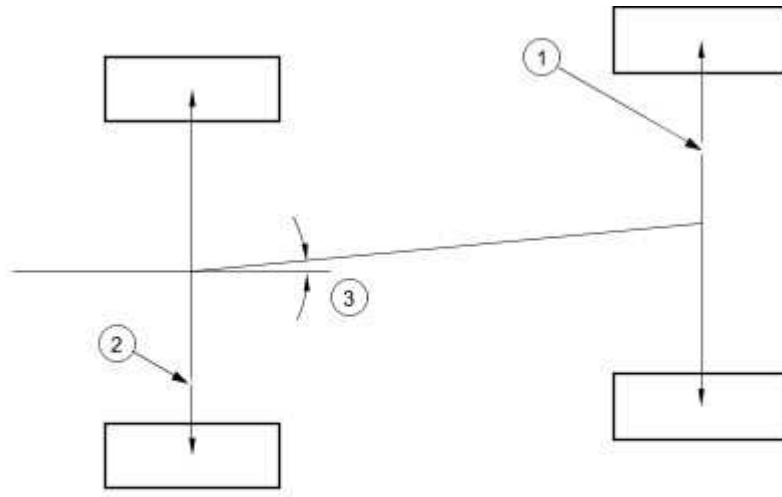
Wheel Track



A0001102

Item	Description
1	Front track
2	Rear track

Crabbing



E31475

Item	Description
1	Front track
2	Rear track
3	Crabbing angle

Crabbing is the condition in which the independent rear suspension (IRS) system is not square to the chassis. Heavily crowned roads can give the illusion of crabbing.

Wander

Wander is the tendency of the vehicle to require frequent, random left and right steering wheel corrections to maintain a straight path down a level road.

Shimmy

Shimmy, as observed by the driver, is rotational oscillations of the steering wheel which may come and go over time, generally resulting from wheel and tire imbalances.

Shimmy can be experienced at any speed but generally between 80 to 145 km/h (50 to 90 miles/hour) and is most often experienced on smooth roads at steady speeds.

Nibble

Sometimes confused with shimmy, nibble is a condition resulting from tire interaction with various road surfaces or brake disc irregularity and observed by the driver as small rotational oscillations of the steering wheel.

Poor Returnability of the Steering

Poor returnability of the steering is used to describe the poor return of the steering wheel to center after a turn or the steering correction is completed.

Drift/Pull

Pull is a tugging sensation, felt by the hands on the steering wheel, that must be overcome to keep the vehicle going straight.

Drift describes what a vehicle with this condition does with hands off the steering wheel.

- A vehicle-related drift/pull, on a flat road, will cause a consistent deviation from the straight-ahead path and require constant steering input in the opposite direction to counteract the effect.
- Drift/pull may be induced by conditions external to the vehicle (i.e., wind, road crown).

Vague On-Center Feel

Vague on-center feel is characterized by little or no buildup of turning effort felt in the steering wheel as the wheel is rocked slowly left and right within very small turns around center or straight-ahead (under 20 degrees of steering wheel turn). Efforts may be said to be "flat on center".

- In the diagnosis of a roadability problem, it is important to understand the difference between wander and vague on-center feel.

Suspension System

Inspection and Verification



WARNING: Before carrying out a road test, make sure the vehicle is safe to do so. Failure to follow this instruction may result in personal injury.

1 . Gather as much information from the driver as possible and verify the customer concern by carrying out a road test, as closely as possible reproducing the conditions under which the fault occurs.



If the customer complaint is of vibration.

[Noise, Vibration and Harshness \(NVH\)](#)

2 . Visually inspect for obvious signs of mechanical damage.

Mechanical
<ul style="list-style-type: none">• Tire pressures• Damaged tires• Wheel bearing(s)• Loose or damaged front or rear suspension components• Loose, damaged or missing suspension fastener(s)• Damaged or leaking air suspension components• Worn or damaged suspension bushing(s)• Loose, worn or damaged steering system components• Damaged axle components

3 . If an obvious cause for an observed or reported condition is found, correct the cause (if possible) before proceeding to the symptom chart.

Symptom chart

Symptom	Possible causes	Action
Crabbing	<ul style="list-style-type: none">• Incorrect rear thrust angle• Front or rear	Check the rear alignment. Rear Toe Adjustment (57.65.08) Check the front and rear suspension for signs of damage

	suspension components	or wear.
Drift/Pull/Wander	<ul style="list-style-type: none"> • Tire pressures • Uneven tire wear • Damaged steering components • Wheel alignment • Brake drag • Unevenly loaded or overloaded vehicle 	Check and adjust the tire pressures (see visual inspection). Check for uneven tire wear, investigate the cause and rectify as necessary. Check the steering for wear/damage. Check and adjust the wheel alignment as necessary. Check for binding brakes, rectify as necessary. Advise the driver of the load issues.
Front bottoming or riding low	<ul style="list-style-type: none"> • Damaged suspension components • Air spring fault 	Check the suspension components for damage. Check the dynamic suspension. Vehicle Dynamic Suspension
Uneven tire wear	<ul style="list-style-type: none"> • Incorrect tire pressure (rapid center rib or inner and outer edge wear) • Incorrect front or rear toe (rapid inner or outer edge wear) • Incorrect camber (rapid inner or outer edge wear) • Tires out of balance (tires cupped or dished) 	Check and adjust the tire pressures (see visual inspection). Check and adjust the wheel alignment as necessary. Balance the tires as necessary.
Harsh ride	<ul style="list-style-type: none"> • Damaged suspension components • Air spring fault 	Check the suspension components for damage. Check the dynamic suspension. Vehicle Dynamic Suspension
Shimmy or wheel tramp	<ul style="list-style-type: none"> • Wheels/tires • Loose wheel nut(s) • Loose front suspension fasteners • Front wheel bearing(s) fault • Worn or damaged suspension component bushing • Loose, worn or damaged ball joint(s) • Loose, worn or damaged steering components 	Check the wheels and tires for condition and balance. Check and tighten the wheel nuts and suspension fasteners to specification. Check the front wheel bearings, suspension bushings, ball joints and steering components for wear or damage. Check and adjust the wheel alignment as necessary.

	<ul style="list-style-type: none"> • Front wheel alignment 	
Poor returnability of the steering (self-centering)	<ul style="list-style-type: none"> • Steering column • Ball joints • Steering components 	Check the steering column universal joints, etc. Check the ball joints and other steering components.
Sway or roll	<ul style="list-style-type: none"> • Loose front or rear stabilizer bar • Worn lower suspension arm stabilizer bar insulators • Air spring fault 	Check the stabilizer bar security and condition. Rectify as necessary. Check the air springs. Vehicle Dynamic Suspension
Vehicle leans to one side	<ul style="list-style-type: none"> • Front or rear suspension components • Air spring fault 	Check the front and rear suspension. Check the air springs. Vehicle Dynamic Suspension

Component tests

Ball Joint Inspection

NOTE:

The front suspension is shown in the following procedures. The inspection of the rear suspension upper ball joint is similar.

1 . Raise and support the vehicle.

2 . Prior to carrying out any inspection of the ball joints, inspect the front wheel bearings.

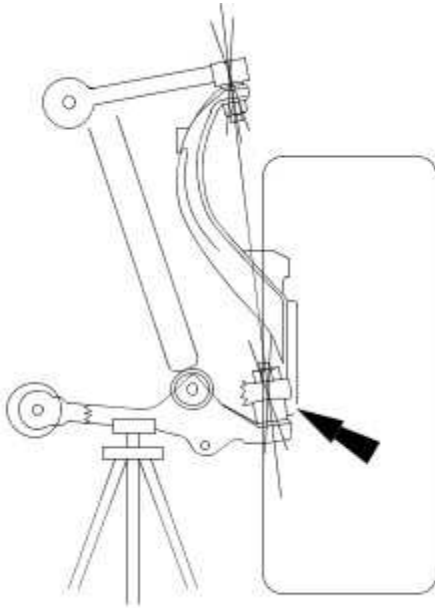
[Wheel Bearing Inspection](#)

3 .



CAUTION: The safety stand beneath the suspension lower lower arm must only support the weight of the suspension and not the full weight of the vehicle. Failure to follow this instruction may result in damage to the components.

Position a safety stand beneath the front suspension lower arm or rear suspension lower arm to be tested.



VUJ0005101

4 . While an assistant pulls and pushes the top and bottom of the tire, observe the relative movement between the ball joint and the front suspension lower arm. Any movement at or exceeding the specification indicates a worn or damaged ball joint. Install a new wheel knuckle as necessary.

[Wheel Knuckle \(60.25.23\)](#)

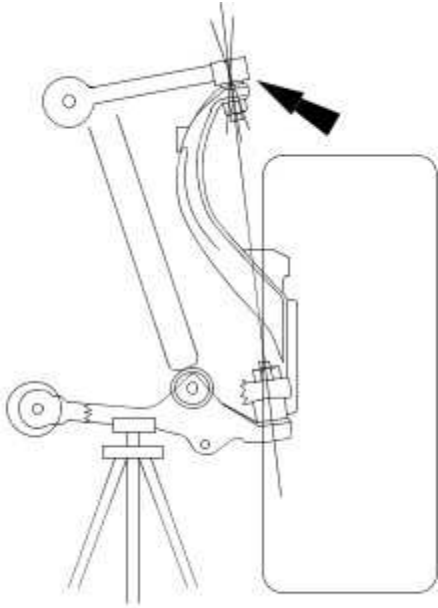
5 . While an assistant pulls and pushes the top and bottom of the tire, observe the relative movement between the ball joint and the front suspension upper arm or rear suspension upper arm. Any movement at or exceeding the specification indicates a worn or damaged ball joint. Install a new upper arm as necessary. Refer to

[Upper Arm LH \(60.35.41\)](#)

[Upper Arm RH \(60.35.42\)](#) or

[Upper Arm \(64.25.31\)](#) .

6 . Remove the safety stand.



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7 . Lower the vehicle.

204-01 : Front Suspension

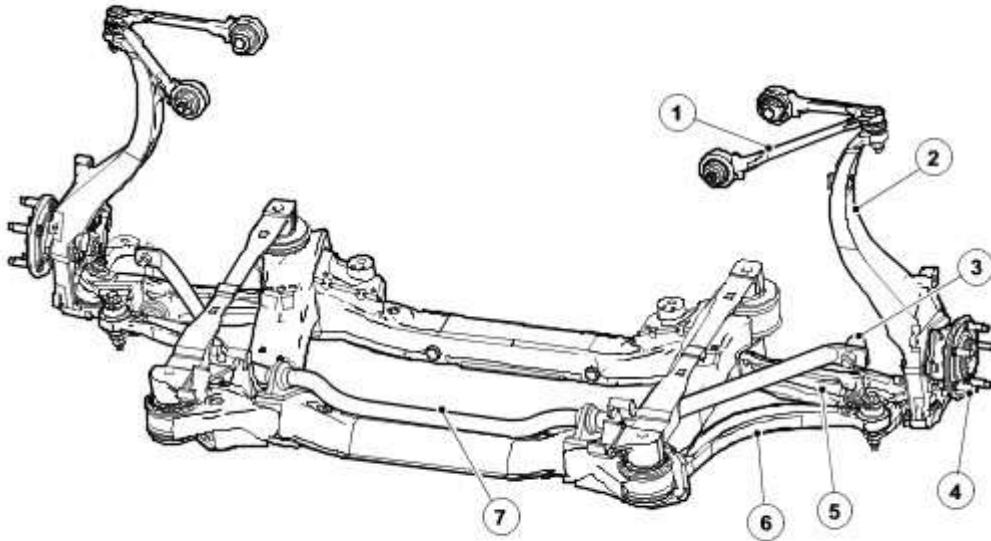
Specification

Specifications

Torque Specifications

Description	Nm	lb-ft	lb-in
Steering gear to subframe retaining bolts	100	74	-
Stabilizer bar link retaining nut	43	32	-
Stabilizer bar link retaining nut and bolt	70	52	-
Stabilizer bar clamp retaining bolts	55	41	-
Rear lower arm ball joint retaining nut	92	68	-
Front and rear lower arm to subframe retaining nut and bolt	175	129	-
Front lower arm to rear lower arm retaining nut and bolt	A	A	A
Upper arm ball joint retaining nut	90	66	-
Upper arm to body retaining nuts and bolts	47	35	-
Air spring assembly to lower arm retaining bolt	175	129	-
Tie-rod end to wheel knuckle retaining nut	75	55	-
Wheel hub and bearing to wheel knuckle retaining bolts	90	66	-
Exhaust manifold to cylinder head retaining nuts (3.0l only)	20	15	-
Dipstick tube retaining bolt	10	7	-
Engine mount lower retaining nut	55	41	-
Front subframe front retaining bolt	200	148	-
Front subframe rear retaining bolt	115	85	-
Wheel and tire retaining nuts	125	92	-
Hydraulic control unit retaining bolts	9	-	80
A = refer to the procedure for the correct torque sequence	-	-	-

Front Suspension



E36781

Item	Part Number	Description
1	—	Upper arm
2	—	Wheel knuckle
3	—	Stabilizer bar link
4	—	Wheel bearing and hub
5	—	Rear lower arm
6	—	Front lower arm
7	—	Stabilizer bar



WARNING: No attempt must be made to weld or repair the front subframe. If it is damaged a new one must be installed. Failure to follow this instruction may result in personal injury.

The independent front suspension is of the double wishbone type and is mounted on the front subframe, the front subframe consisting of a pressed steel fabrication.

The rear of the front subframe provides the mounting points for the power assisted steering gear and the engine mounts.

A vertical knuckle arm is installed between the lower and upper suspension arms. This wheel knuckle carries the lower arm swivel joint, front hub, ABS rotor, ABS sensor, wheel bearing and brake assembly.

A stabilizer bar is mounted via clamps and bushes to the front subframe and is linked via connecting links to each of the lower arms.

When cornering, weight is naturally transferred to the outer wheel and there is a natural tendency for the inner wheel to lift. The stabilizer bar helps to reduce the vehicle roll.

Front Suspension

For additional information, refer to [<<204-00>>](#)

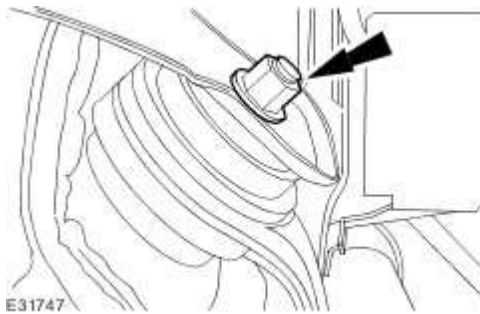
Front Lower Arm (60.35.53)

Removal

- 1 . Remove the air deflector. <<501-02>>
- 2 . Remove the wheel and tire assembly. <<204-04>>



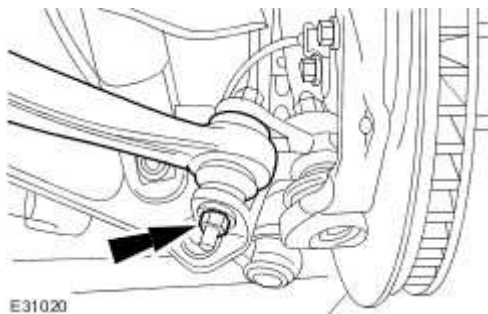
- 3 . Remove the front lower arm retaining nut and bolt.



- 4 . **NOTE:**

Remove the front lower arm.

➤ Remove and discard the nut and bolt.



Installation

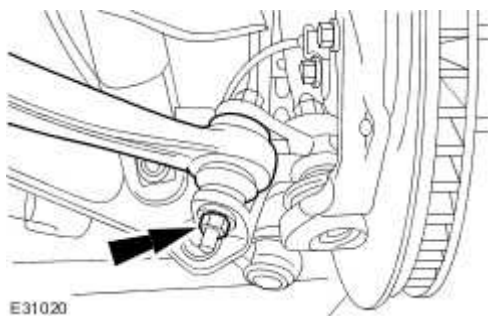
1 . NOTE:

Install a new nut and bolt.

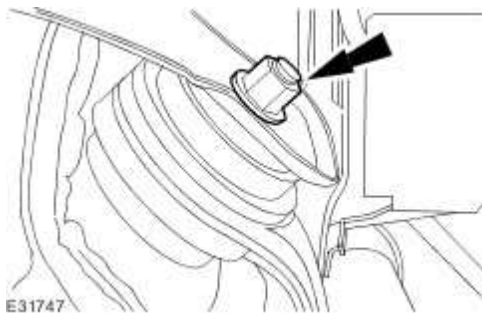
Install the front lower arm.

► Stage 1: Tighten to 60 Nm.

► Stage 2: Tighten 135°.




2 . Install the front lower arm inner retaining nut and bolt.



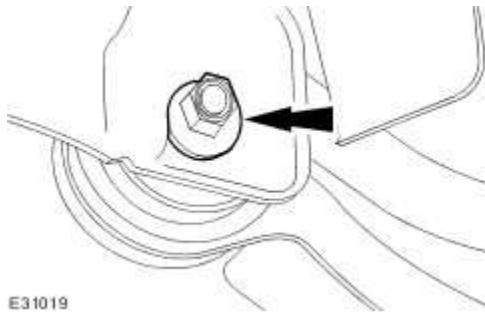
3 . Install the wheel and tire assembly. <<204-04>>



4 . Install the air deflector. <<501-02>>

- 5 .  **CAUTION:** The final tightening of the front lower arm inner retaining nut and bolt must be carried out with the vehicle on its wheels. Failure to follow this instruction may result in damage to the component.

Tighten to 175 Nm.



6 . Carry out the camber and caster adjustment. <<204-00>>

Rear Lower Arm (60.35.54)

Special Service Tools

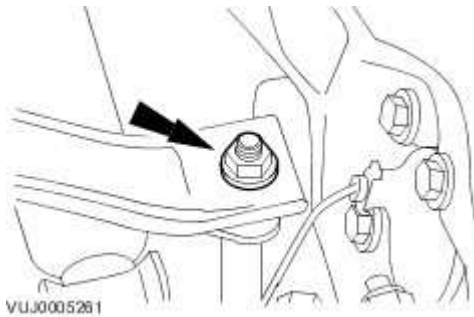


Ball Joint Splitter
204-327

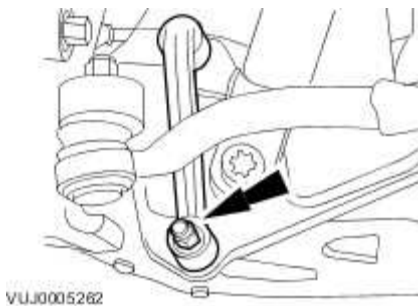
Removal

- 1 . Remove the wheel and tire assembly.
For additional information, refer to [Wheel and Tire \(74.20.05\)](#)
For additional information, refer to

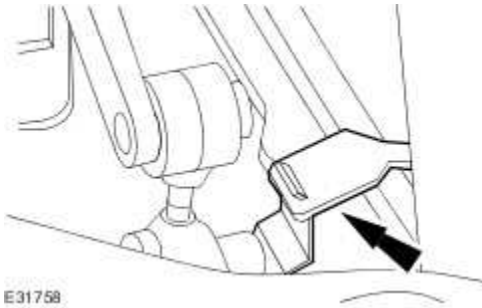
- 2 . Remove the stabilizer bar link retaining nut.



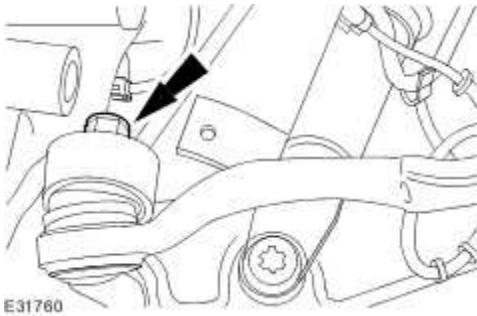
- 3 . Remove the stabilizer bar link.



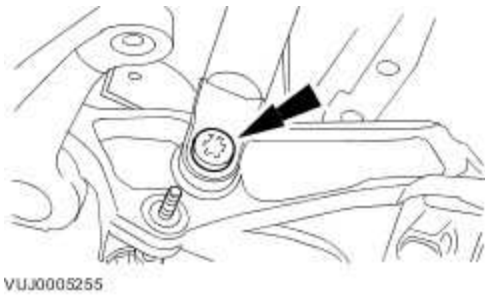
- 4 . Detach the headlamp leveling sensor retaining clip.



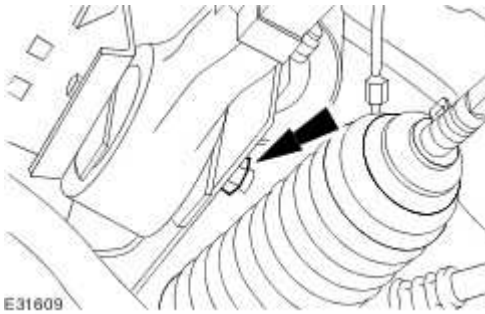
5 . Detach the tie rod end.



6 . Detach the air spring assembly.

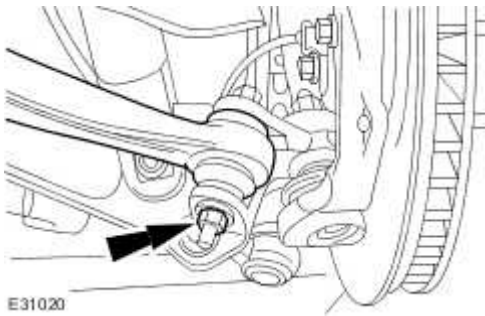



7 . Detach the rear lower arm.



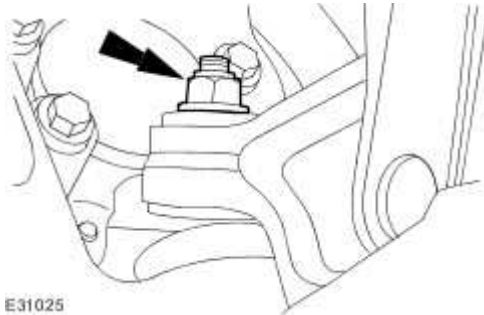
8 . Detach the front lower arm.


➤ Remove and discard the retaining nut and bolt.



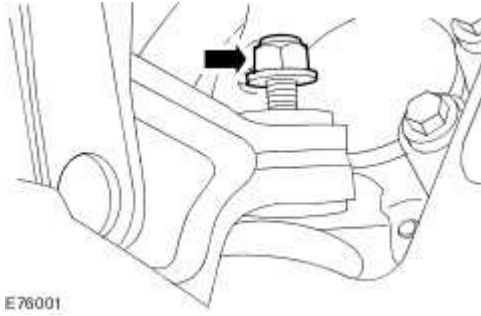
9  **CAUTION: Prevent the rear lower arm ball joint ball pin hexagon from rotating. Failure to follow this instruction may result in damage to the lower ball joint boot.**

Loosen the rear lower arm ball joint retaining nut.



10  **CAUTION: Prevent the rear lower arm ball joint ball pin hexagon from rotating. Failure to follow this instruction may result in damage to the lower ball joint boot.**

Adjust the rear lower arm ball joint retaining nut until the ball joint thread cannot be seen.



11



WARNING: Make sure the special tool is supported while carrying out the operation. Failure to follow this instruction may result in personal injury.



CAUTION: Make sure the special tool is supported while carrying out the operation. Failure to follow this instruction may result in damage to the special tool.



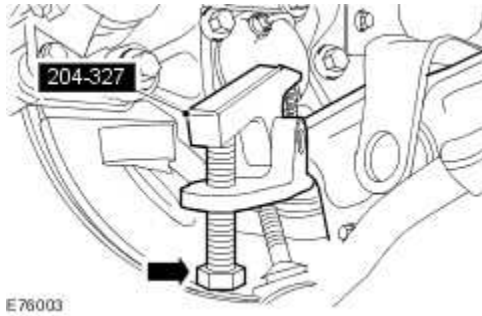
CAUTION: Make sure the special tool is correctly located and the lower ball joint boot is not damaged while carrying out the operation. Failure to follow this instruction may result in damage to the component.

Using the special tool, release the rear lower arm ball joint from the wheel knuckle lower pivot.

► Tighten the special tool adjusting bolt to a maximum of 60 Nm.

If the rear lower arm ball joint releases from the wheel knuckle lower pivot
► using no more than 60 Nm on the special tool adjusting bolt, proceed to step 13.

If the rear lower arm ball joint does not release from the wheel knuckle
► lower pivot using no more than 60 Nm on the special tool adjusting bolt, proceed to step 12.



12



WARNING: Make sure the special tool is supported while carrying out the operation. Failure to follow this instruction may result in personal injury.



CAUTION: Make sure the special tool is supported while carrying out the operation. Failure to follow this instruction may result in damage to the special tool.



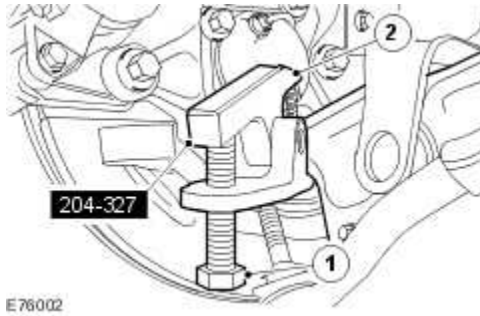
CAUTION: Make sure the special tool is correctly located and the lower ball joint boot is not damaged while carrying out the operation. Failure to follow this instruction may result in damage to the component.

NOTE:

Do not carry out this step if the rear lower arm ball joint released from the wheel knuckle lower pivot in step 11.

Using the special tool, release the rear lower arm ball joint from the wheel knuckle lower pivot.

- 1) Tighten the special tool adjusting bolt to a maximum of 60 Nm.
- 2) Strike the top surface of the special tool directly above the rear lower arm ball joint at the point indicated using a copper and hide mallet.



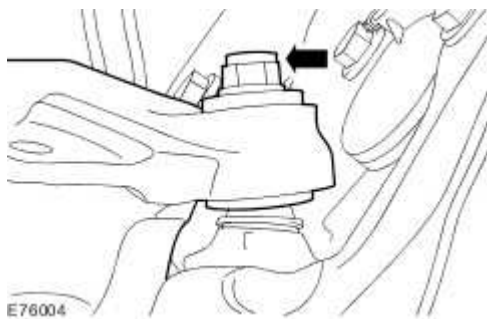
13



- CAUTION: Prevent the rear lower arm ball joint ball pin hexagon from rotating. Failure to follow this instruction may result in damage to the lower ball joint boot.

Remove the rear lower arm.

- Remove and discard the retaining nut.



Installation

1



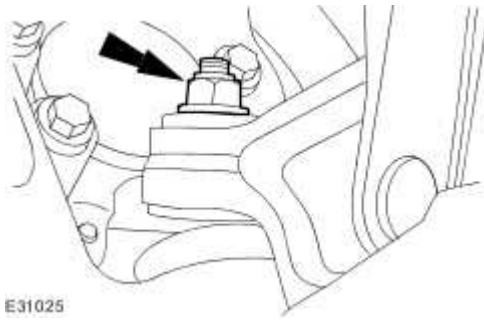
- CAUTION: Prevent the rear lower arm ball joint ball pin hexagon from rotating. Failure to follow this instruction may result in damage to the lower ball joint boot.

NOTE:

Install a new retaining nut.

Install the rear lower arm.

► Tighten to 92 Nm.



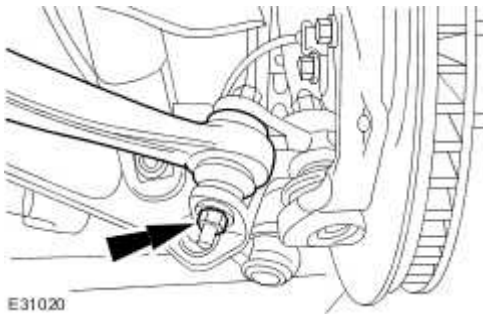
2 . NOTE:

Install a new retaining nut and bolt.

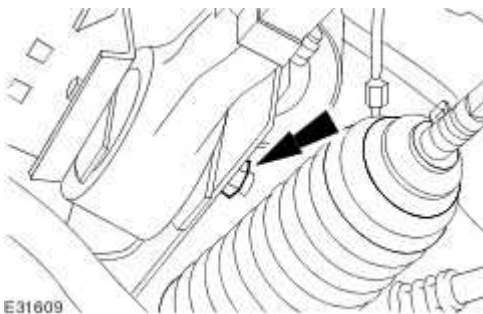
Attach the front lower arm.

► Stage 1: Tighten to 60 Nm.

► Stage 2: Tighten 135°.

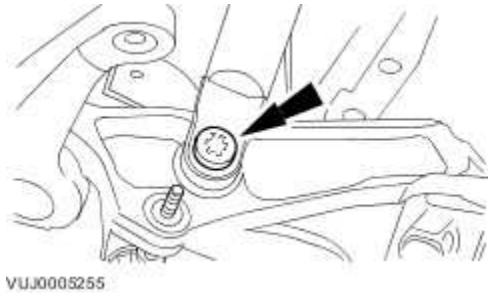


3 . Attach the rear lower arm.



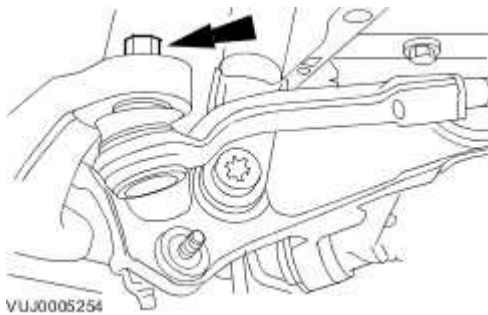
4 . Attach the air spring assembly.

▶ Tighten to 175 Nm.

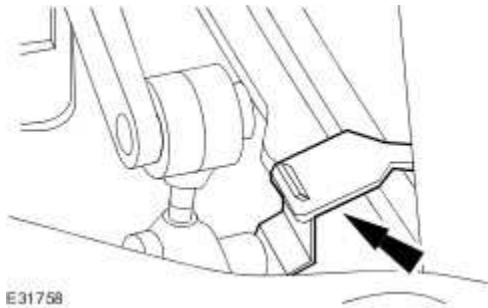


5 . Attach the tie rod end.

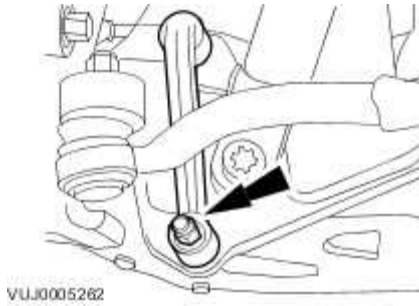
▶ Tighten to 75 Nm.



6 . Attach the head lamp leveling sensor retaining clip.

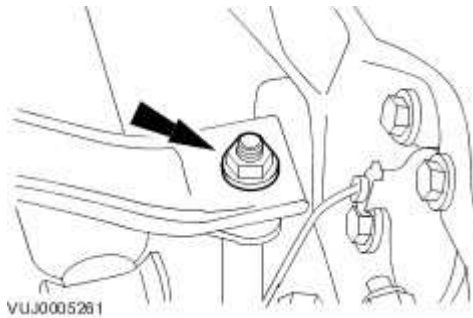


7 . Install the stabilizer bar link.



8 . Attach the stabilizer bar link.

► Tighten to 43 Nm.



9 . Install the wheel and tire assembly.

For additional information, refer to [Wheel and Tire \(74.20.05\)](#)

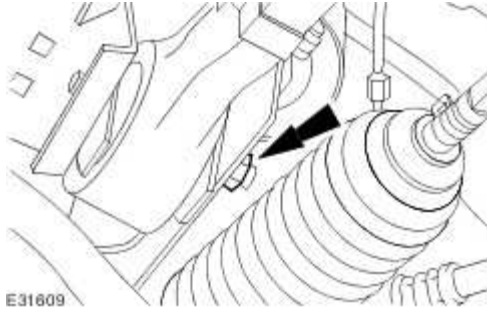
For additional information, refer to

10

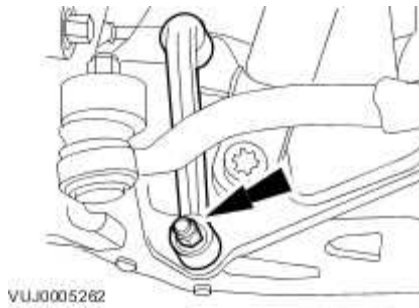


· **CAUTION: The final tightening of the rear lower arm inner retaining nut and bolt must be carried out with the vehicle on its wheels.**

Tighten to 175 Nm.



11 . Tighten to 70 Nm.

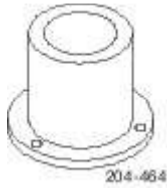


12 . Carry out the camber and caster adjustment.

For additional information, refer to [Camber and Caster Adjustment](#)

Rear Lower Arm Bushing (60.35.56)

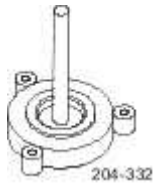
Special Service Tools



Guide Bush Installer
204-464



Remover Bush
204-333



Base Guide - Bush Installer
204-332



Installer Bush
204-465



Replacer bush
204-334

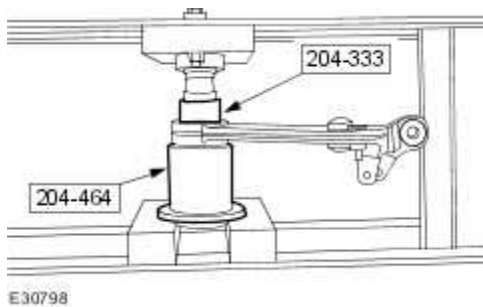
Removal

- 1 . Remove the rear lower arm.
For additional information, refer to

2 . NOTE:

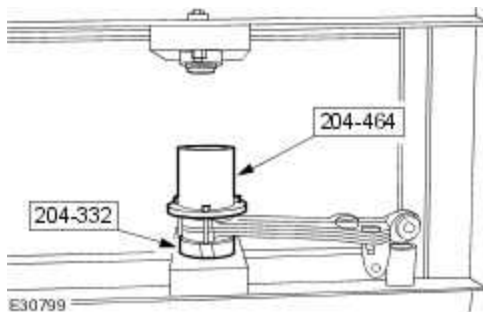
Note the orientation of the bushing before removal.

Using the special tools remove the rear lower arm bushing.



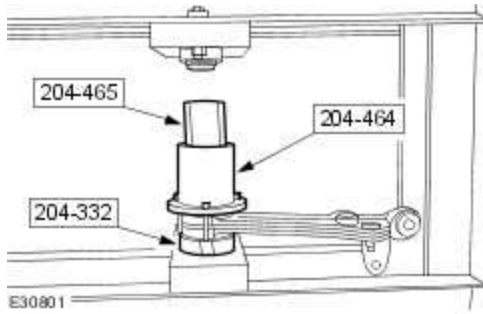
Installation

- 1 . Install the special tools to the rear lower arm.



- 2 . Use the installer, align the special tools to the rear lower arm.

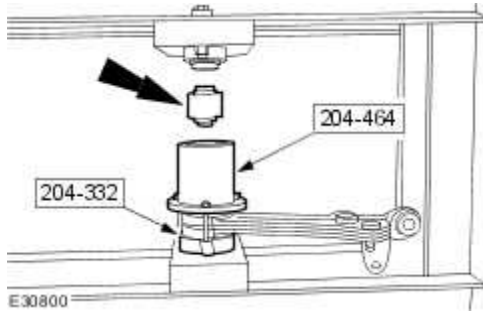
► Tighten the retaining bolts



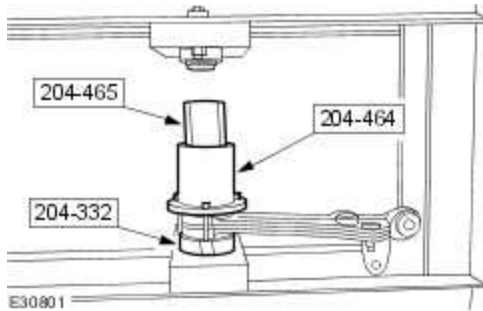
3 . NOTE:

Make sure the bushing is correctly orientated.

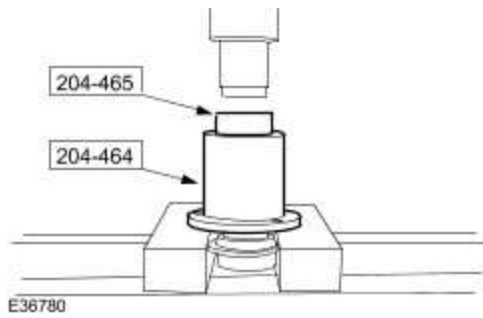
Install the rear lower arm bushing to the special tool.



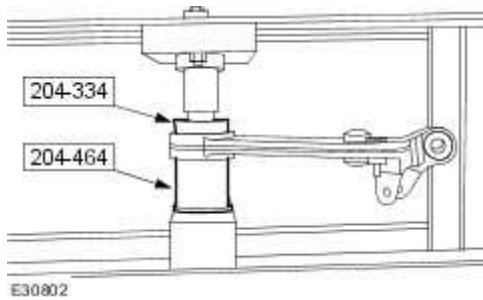
4 . Using the special tools, partially install the rear lower arm bushing.



5 . Remove the special tool from the rear lower arm bushing.



6 . Using the special tool, completely install the rear lower arm bushing.



7 . Install the rear lower arm.

For additional information, refer to

Shock Absorber Bushing (60.30.16)

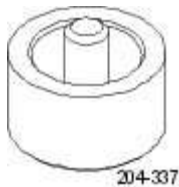
Special Service Tools



Remover Support Bush
204-335



Remover Bush
204-336



Replacer Support - Bush
204-337



Replacer - Bush
204-338

Removal

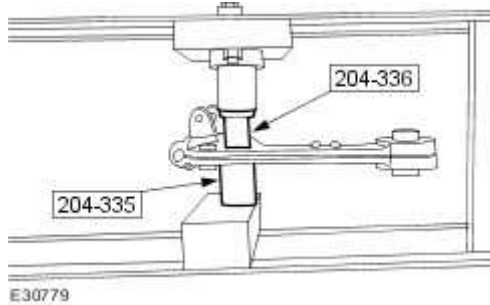
- 1 . Remove the rear lower arm.
For additional information, refer to

2



- **CAUTION:** Make sure the supporting tools are orientated correctly to the rear lower arm. Failure to follow this instruction may cause damage to the component.

Using the special tools remove the shock absorber bushing.

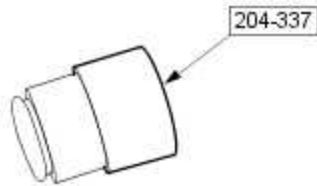


Installation

1 . NOTE:

Make sure the shock absorber bushing boot is correctly located into the special tool.

Install the shock absorber bushing to the special tool.

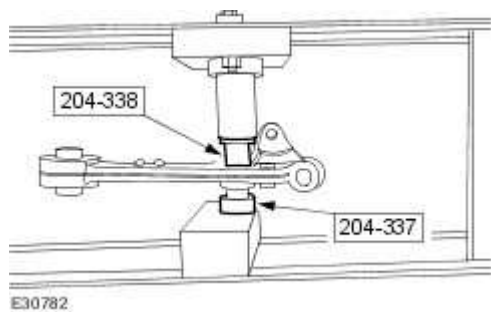


2



- **CAUTION:** Make sure the supporting tools are orientated correctly to the rear lower arm. Failure to follow this instruction may cause damage to the component.

Using the special tools install the shock absorber bushing.



- 3 . Install the rear lower arm.
For additional information, refer to

Front Stabilizer Bar - 3.0L (60.10.01)

Special Service Tools



Powertrain Assembly Jack
HTJ1200-02



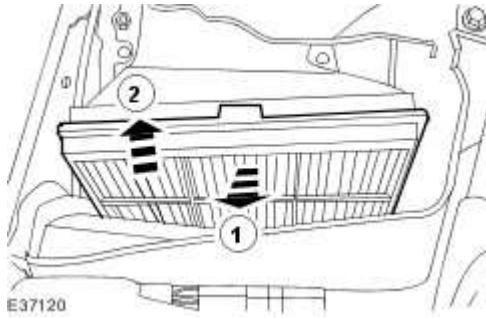
Engine Lifting Bracket
303-661



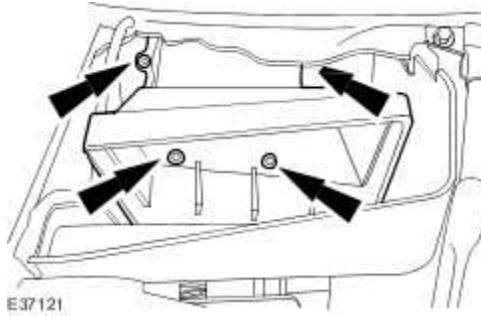
Engine Support Bracket
303-021

Removal

- 1 . Remove the cowl vent screen. [<<501-02>>](#)
- 2 . Remove the cabin air filter.
 - 1) Detach the cabin air filter.
 - 2) Remove the cabin air filter.



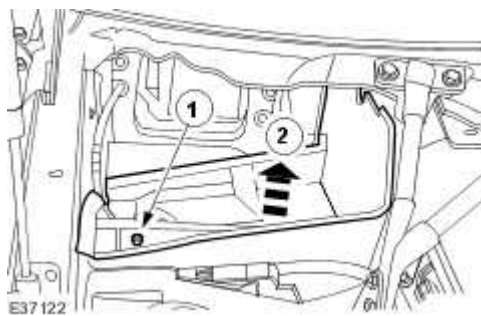
3 . Remove the cabin air filter housing.



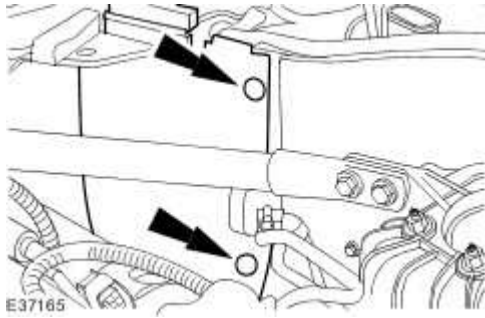
4 . Remove the right-hand engine compartment panel.

1) Remove the retaining bolt.

2) Remove the right-hand engine compartment panel.

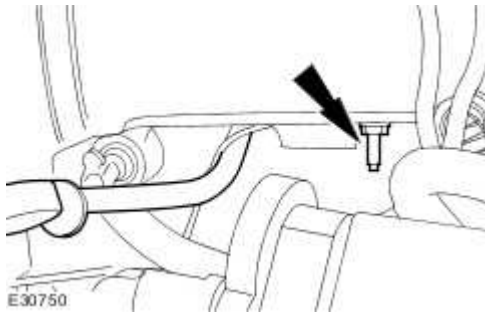


5 . Remove the left-hand engine compartment access panel.



6 . Detach the dipstick tube.

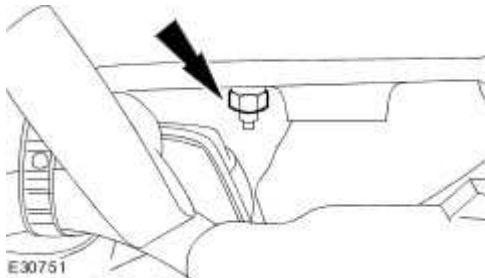
▶ Remove the dipstick tube retaining bolt.



7 . **NOTE:**

Left-hand shown, right-hand similar.

Loosen the exhaust manifold retaining nut.

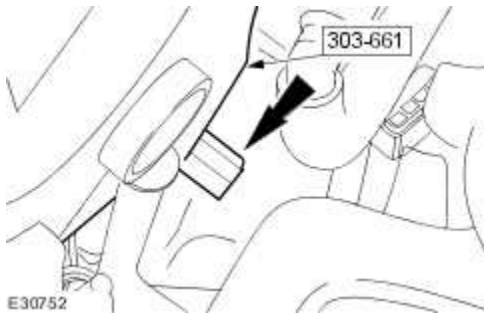


8 . **NOTE:**

Left-hand shown, right-hand similar.

Install the special tool to the exhaust manifold.

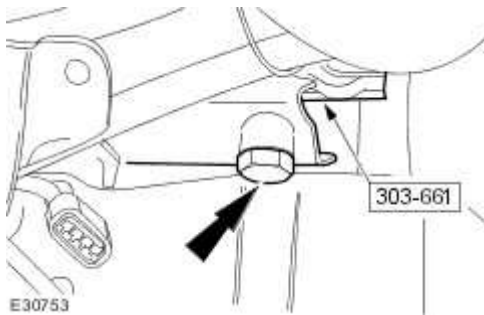
▶ Install the retaining bolt.



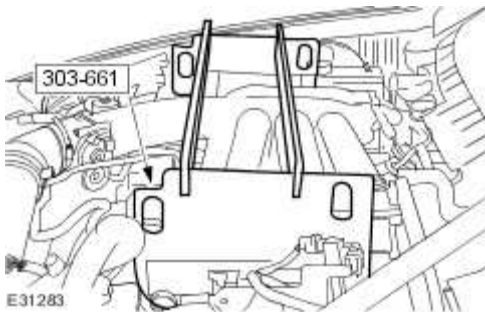
9 . NOTE:

Left-hand shown, right-hand similar.

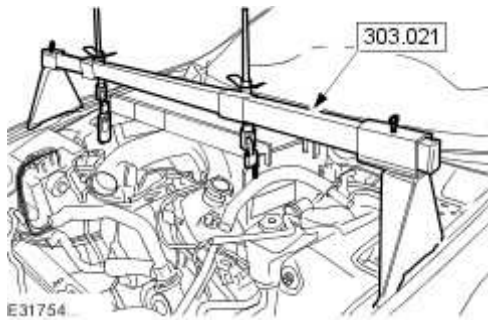
Install the retaining bolt.



10 . Install the special tool support bars to the special tool.



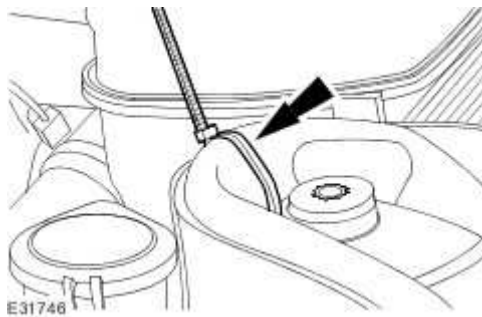
11 . Install the special tool.



12 . **NOTE:**

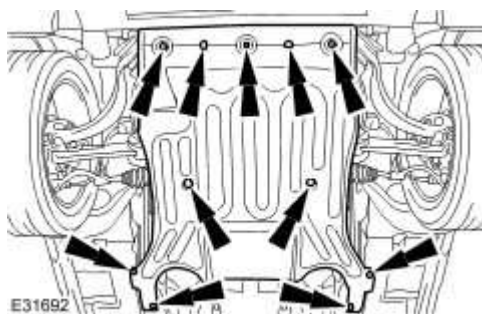
Right-hand shown, left-hand similar.

Support the radiator.



13 . Remove the radiator splash shield. [.<<501-02>>](#)

14 . Remove the air deflector.



15 . **NOTE:**

Left-hand shown, right-hand similar.

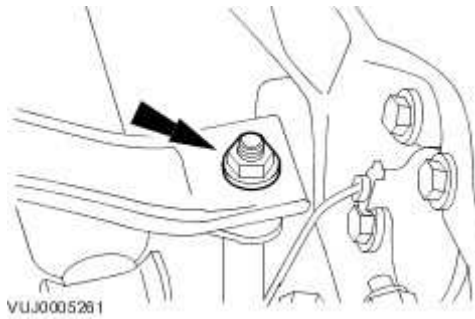
Remove the front wheel and tire assembly.



16 . **NOTE:**

Left-hand shown, right-hand similar.

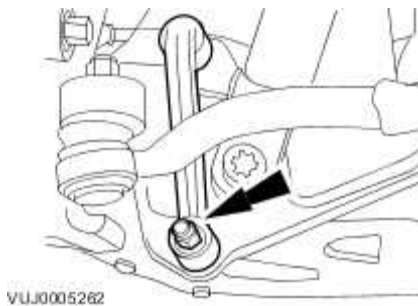
Remove the stabilizer bar link retaining nut.



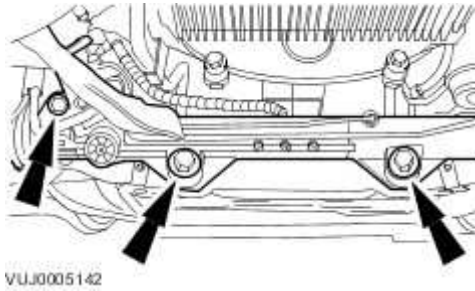
17 . **NOTE:**

Left-hand shown, right-hand similar.

Remove the stabilizer bar link.



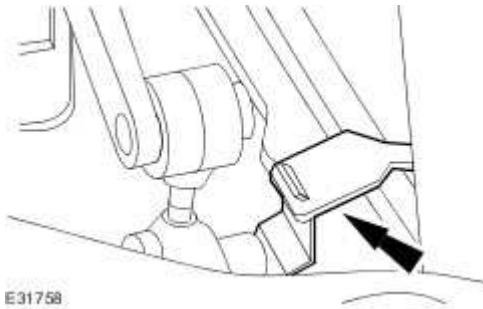
18 . Detach the steering gear.



19 . **NOTE:**

Left-hand shown, right-hand similar.

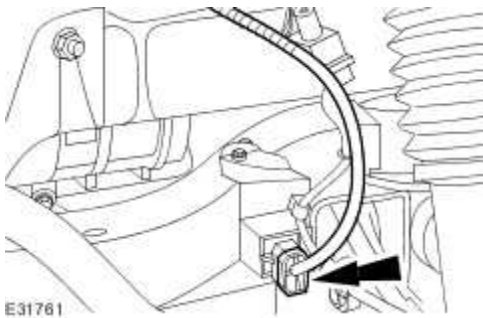
Detach the headlamp leveling sensor retaining clip.



20 . **NOTE:**

Left-hand shown, right-hand similar.

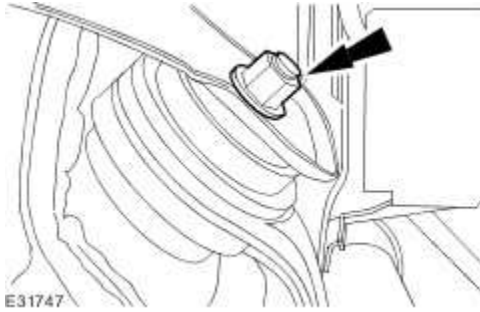
Disconnect the headlamp leveling sensor electrical connector.



21 . **NOTE:**

Left-hand shown, right-hand similar.

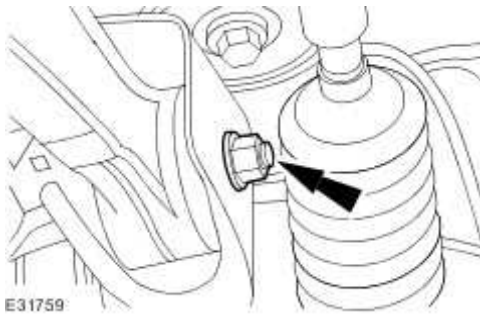
Loosen the front lower arm retaining nut and bolt.



22 . **NOTE:**

Left-hand shown, right-hand similar.

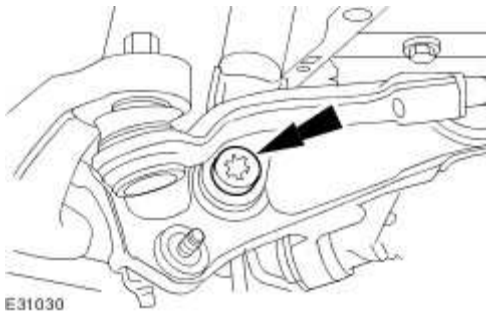
Loosen the rear lower arm retaining nut and bolt.



23 . **NOTE:**

Left-hand shown, right-hand similar.

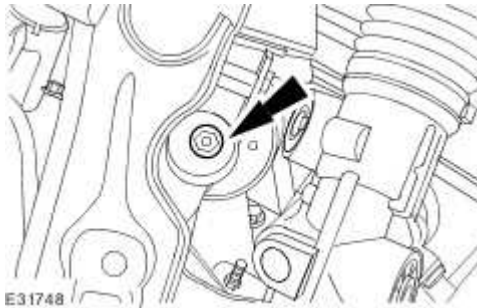
Detach the air spring assembly.



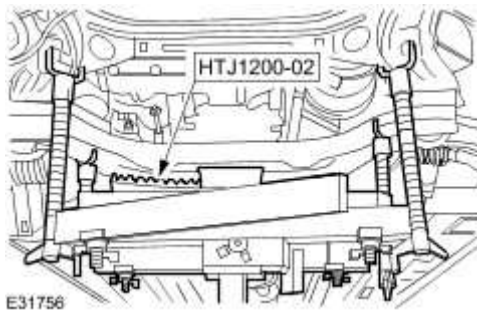
24 . **NOTE:**

Left-hand shown, right-hand similar.

Detach the engine mount.



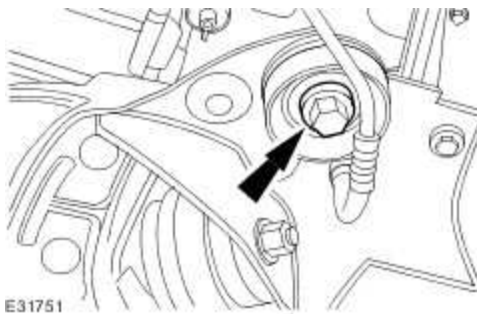
25 . Install the special tool.



26 . **NOTE:**

Left-hand shown, right-hand similar.

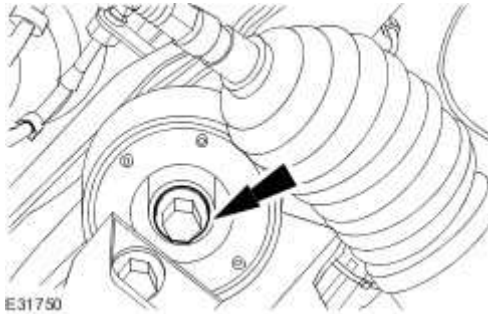
Remove the front subframe front retaining bolt.



27 . **NOTE:**

Left-hand shown, right-hand similar.

Remove the front subframe rear retaining bolt.

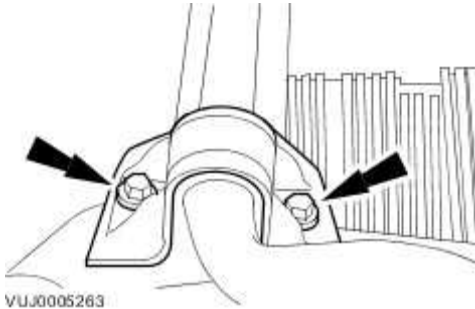


28 . Lower the special tool by approximately 200 mm (7.9 in).

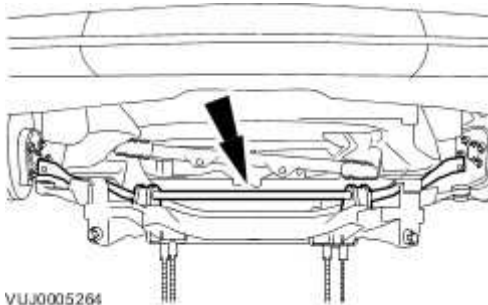
29 . **NOTE:**

Left-hand shown, right-hand similar.

Remove the stabilizer bar clamp.

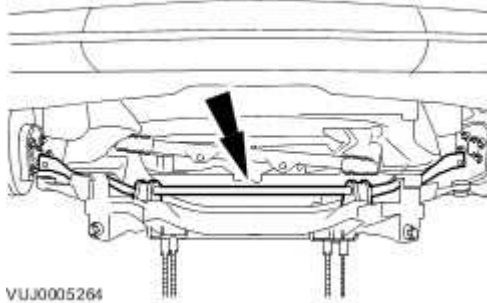


30 . Remove the stabilizer bar.



Installation

- 1 . Install the stabilizer bar

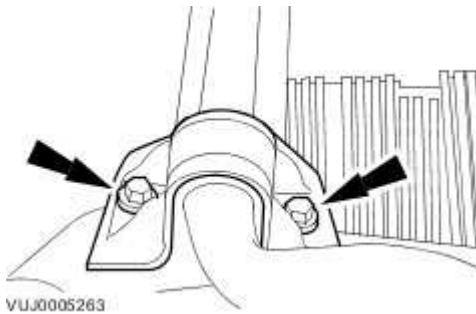


- 2 . **NOTE:**

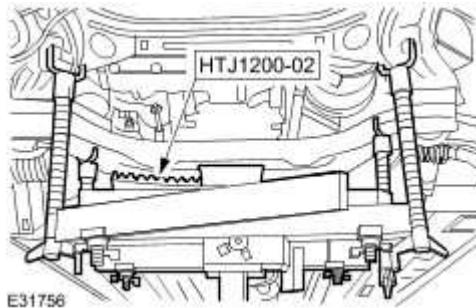
Left-hand shown, right-hand similar.

Install the stabilizer bar clamp.

▶ Tighten to 55 Nm.



- 3 . Using the special tool, install the front subframe.



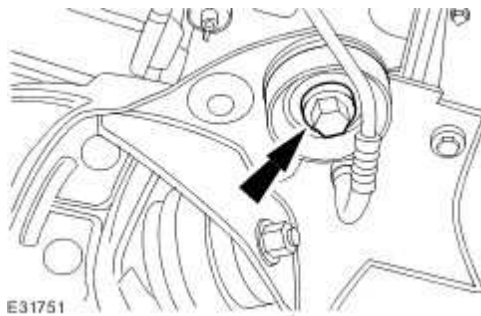
4 . Check the front subframe alignment. <<502-00>>

5 . **NOTE:**

Left-hand shown, right-hand similar.

Install the front subframe front retaining bolt.

▶ Tighten to 200 Nm.

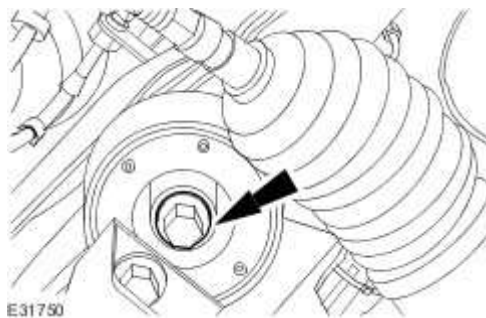


6 . **NOTE:**

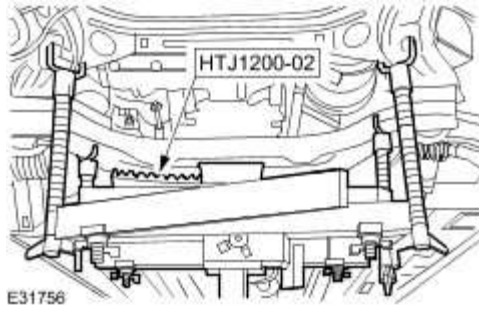
Left-hand shown, right-hand similar.

Install the front subframe rear retaining bolt.

▶ Tighten to 115 Nm.



7 . Remove the special tool.

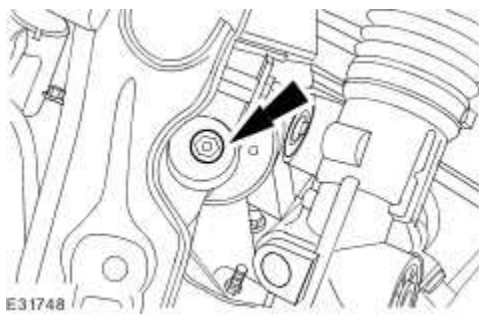


8 . NOTE:

Left-hand shown, right-hand similar.

Attach the engine mount.

▶ Tighten to 55 Nm.

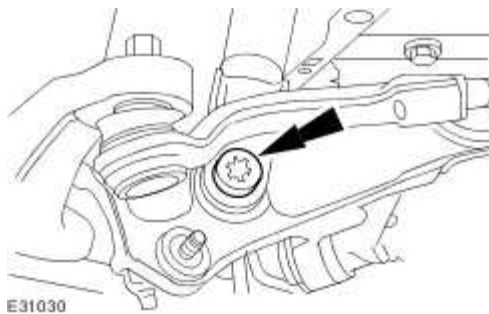


9 . NOTE:

Left-hand shown, right-hand similar.

Attach the air spring assembly.

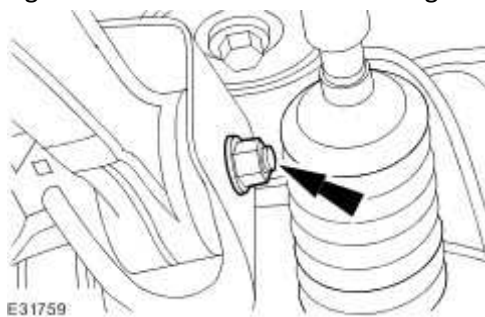
▶ Tighten to 175 Nm.



10 . **NOTE:**

Left-hand shown, right-hand similar.

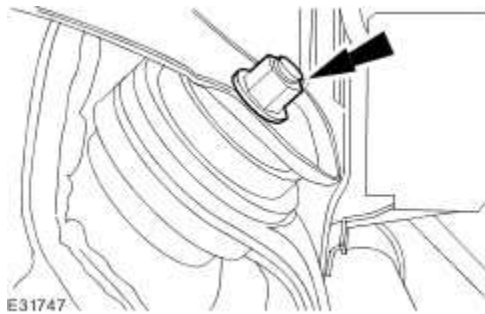
Tighten the rear lower arm retaining nut and bolt.




11 . **NOTE:**

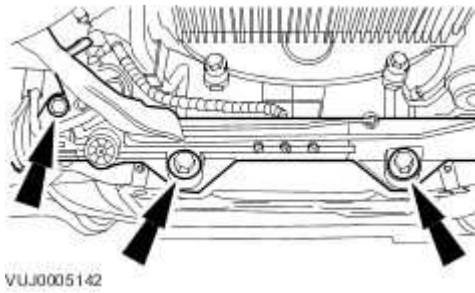
Left-hand shown, right-hand similar.

Tighten the front lower arm retaining nut and bolt.



12 . Install the steering gear.

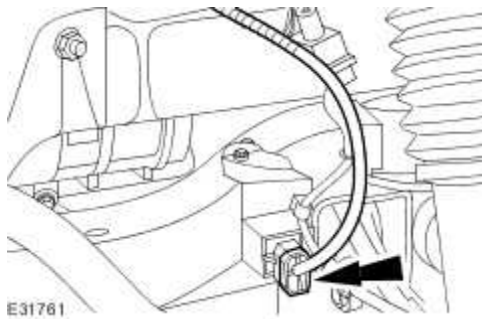
 Tighten to 100 Nm.



13 . NOTE:

Left-hand shown, right-hand similar.

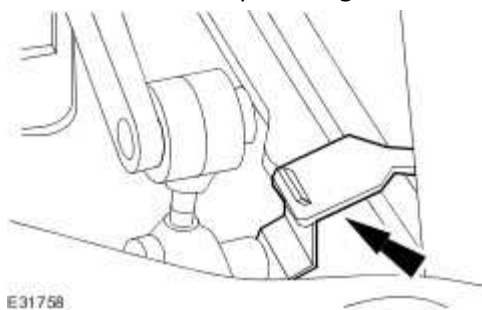
Connect the headlamp leveling sensor electrical connector.



14 . NOTE:

Left-hand shown, right-hand similar.

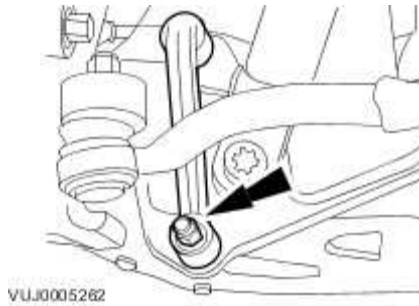
Attach the headlamp leveling sensor retaining clip.



15 . **NOTE:**

Left-hand shown, right-hand similar.

Install the stabilizer bar link.

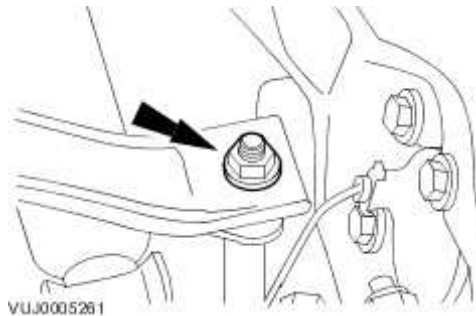


16 . **NOTE:**

Left-hand shown, right-hand similar.

Attach the stabilizer bar link.

▶ Tighten to 43 Nm.



17 . **NOTE:**

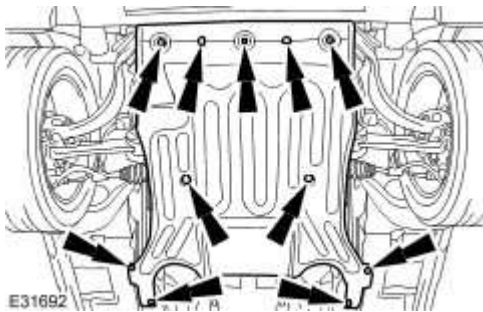
Left-hand shown, right-hand similar.

Install the front wheel and tire assembly.

▶ Tighten to 125 Nm.



18 . Install the air deflector.



19 . Install the radiator splash shield. [<<501-02>>](#)

20

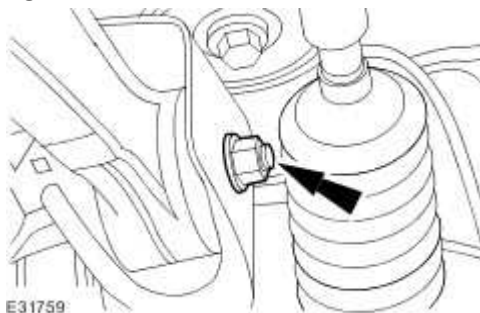


CAUTION: The final tightening of the rear lower arm inner retaining nut and bolt must be carried out with the vehicle on its wheels. Failure to follow this instruction may result in damage to the component.

NOTE:

Left-hand shown, right-hand similar.

Tighten to 175 Nm.



21

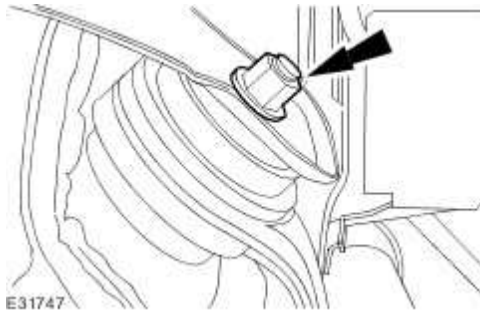


CAUTION: The final tightening of the rear lower arm inner retaining nut and bolt must be carried out with the vehicle on its wheels. Failure to follow this instruction may result in damage to the component.

NOTE:

Left-hand shown, right-hand similar.

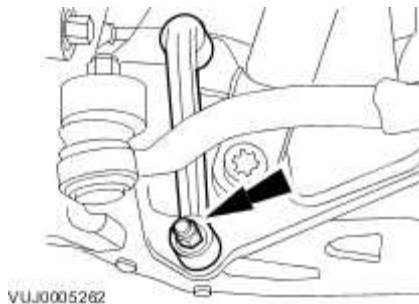
Tighten to 175 Nm.



22 . **NOTE:**

Left-hand shown, right-hand similar.

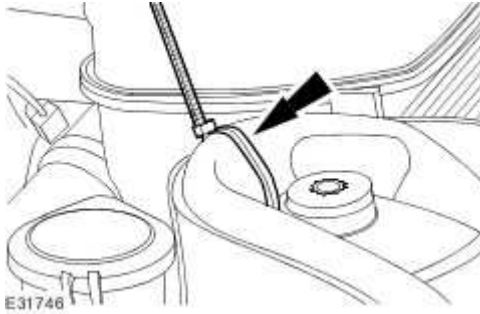
Tighten to 70 Nm.



23 . **NOTE:**

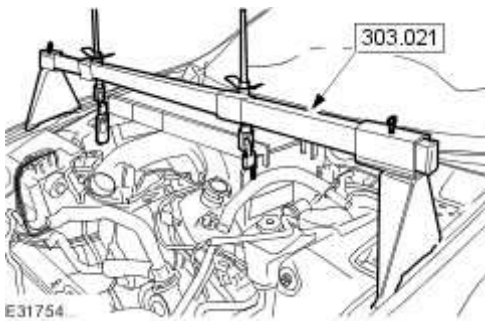
Right-hand shown, left-hand similar.

Remove the radiator support.

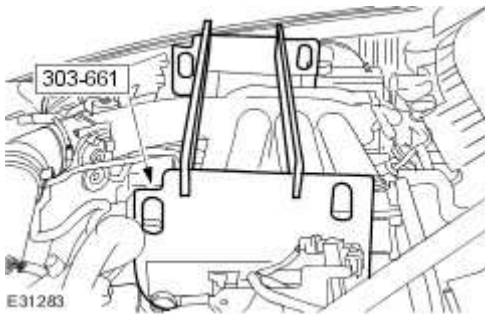


24 . Remove the special tool.

▶ Loosen the special tool adjustment bolts.



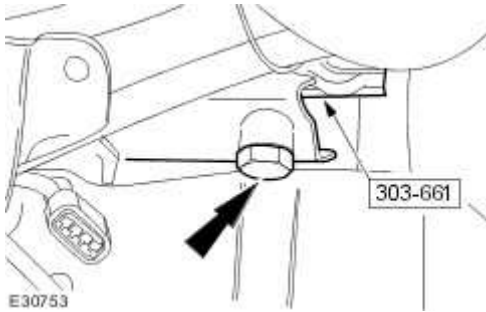
25 . Remove the special tool support bars from the special tool.



26 . **NOTE:**

Left-hand shown, right-hand similar.

Remove the retaining bolt.

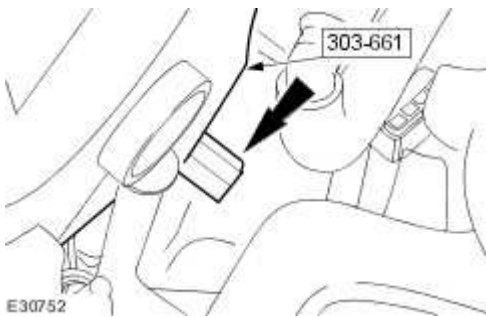


27 . NOTE:

Left-hand shown, right-hand similar.

Remove the special tool from the exhaust manifold.

▶ Remove the retaining bolt.



28 . NOTE:

Left-hand shown, right-hand similar.

Install the exhaust manifold retaining nut.

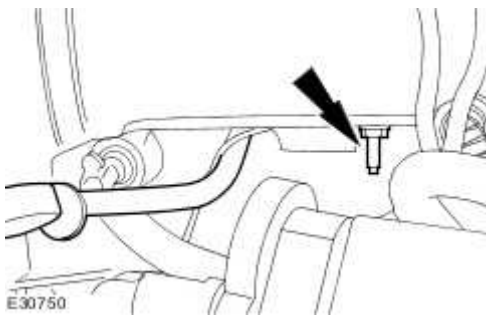
▶ Tighten to 20 Nm.



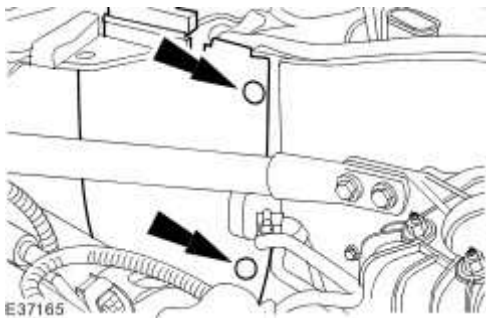
29 . Attach the dipstick tube.

▶ Install the dipstick tube retaining bolt.

▶ Tighten to 10 Nm.



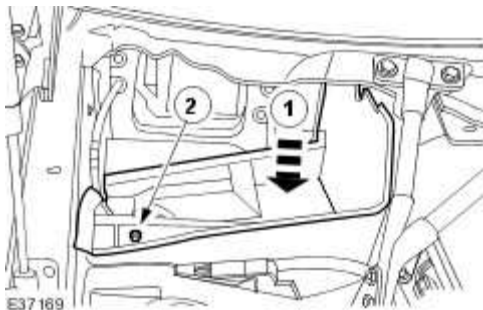
30 . Install the left-hand engine compartment access panel.



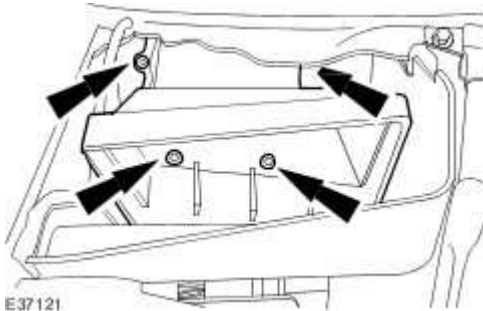
31 . Install the right-hand engine compartment panel.

1) Install the right-hand engine compartment panel.

2) Install the retaining bolt.



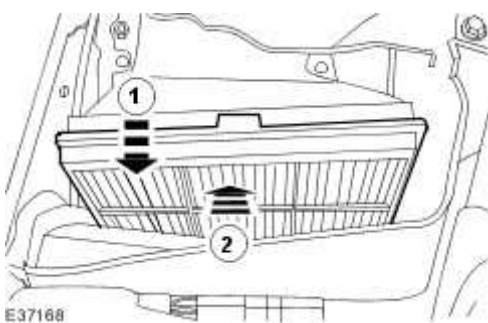
32 . Install the cabin air filter housing.



33 . Attach the cabin air filter.

1) Install the cabin air filter.

2) Attach the cabin air filter.



34 . Install the cowl vent screen. [<<501-02>>](#)

35 . Check the caster and camber adjustment. [<<204-00>>](#)

Front Stabilizer Bar - 3.5L/4.2L (60.10.01)

Special Service Tools



Powertrain Assembly Jack
HTJ1200-02



Engine Lifting Brackets
303-749



Engine Support Bracket
303-021



Subframe Alignment Bolt
502-007

Removal

Vehicles with 3.5L or 4.2L engine without supercharger

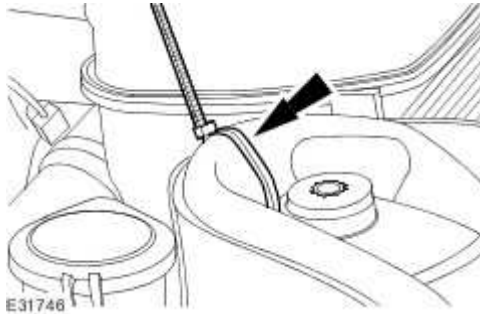
- 1 Remove the throttle body.
 - For additional information, refer to [Throttle Body - Vehicles Without: Supercharger, VIN Range: G00442->G45703 \(19.70.04\)](#)
 - For additional information, refer to [Throttle Body - Vehicles Without: Supercharger, VIN Range: G45704->G99999 \(19.70.04\)](#)

All vehicles

2 . NOTE:

Right-hand shown, left-hand similar.

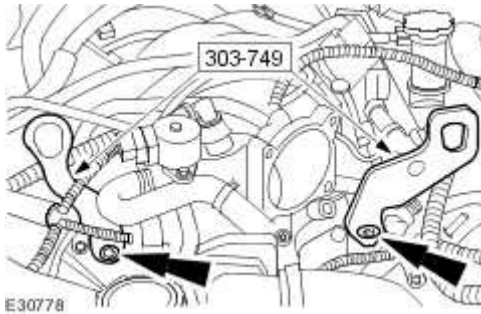
Support the radiator.



3 NOTE:

Vehicles with 3.5L or 4.2L engine without supercharger shown, vehicles with 4.2L engine with supercharger similar.

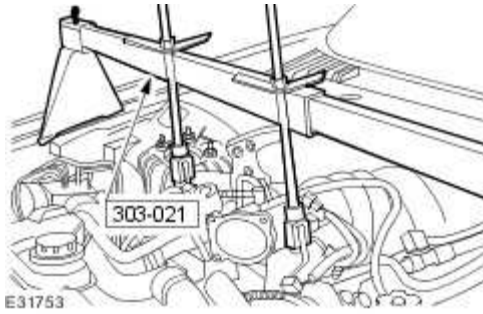
Install the special tools.



4 NOTE:

Vehicles with 3.5L or 4.2L engine without supercharger shown, vehicles with 4.2L engine with supercharger similar.

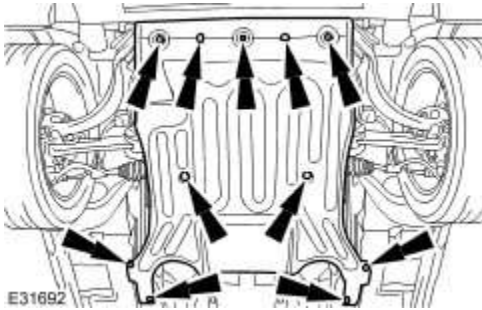
Install the special tool.



5 . Remove the radiator splash shield.

For additional information, refer to [Radiator Splash Shield \(76.22.90\)](#)

6 . Remove the air deflector.



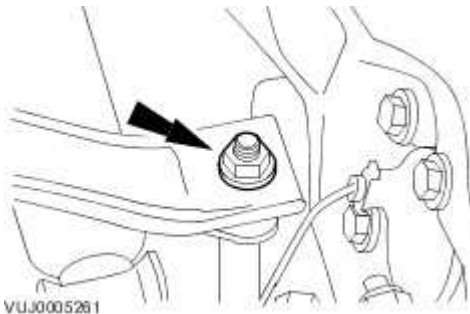
7 . Remove the front wheels and tires.

For additional information, refer to [Wheel and Tire \(74.20.05\)](#)

8 . **NOTE:**

Left-hand shown, right-hand similar.

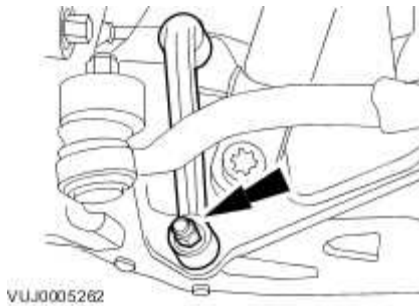
Remove the stabilizer bar link retaining nut.



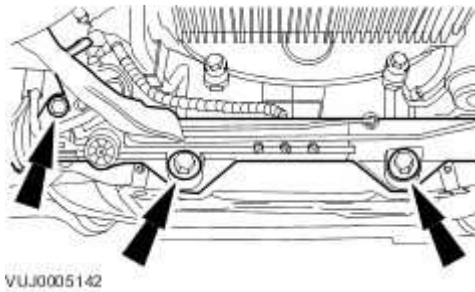
9 . **NOTE:**

Left-hand shown, right-hand similar.

Remove the stabilizer bar link.



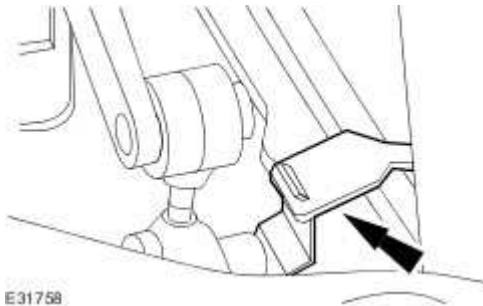
10 . Detach the steering gear.



11 . **NOTE:**

Left-hand shown, right-hand similar.

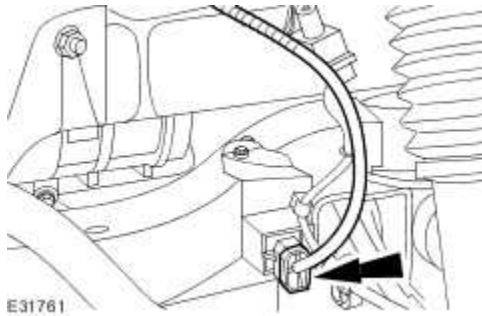
Detach the headlamp leveling sensor retaining clip.



12 . NOTE:

Left-hand shown, right-hand similar.

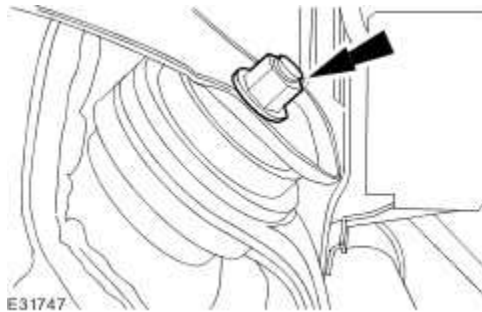
Disconnect the headlamp leveling sensor electrical connector.



13 . NOTE:

Left-hand shown, right-hand similar.

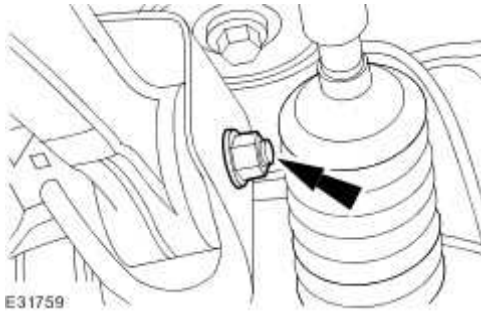
Loosen the front lower arm retaining nut and bolt.



14 . NOTE:

Left-hand shown, right-hand similar.

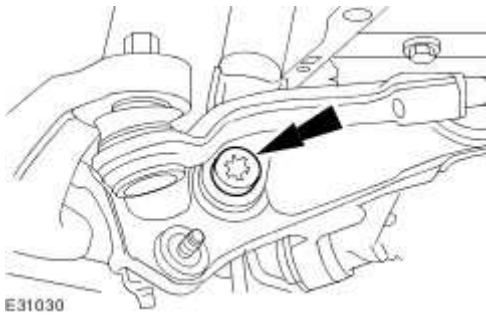
Loosen the rear lower arm retaining nut and bolt.



15 . **NOTE:**

Left-hand shown, right-hand similar.

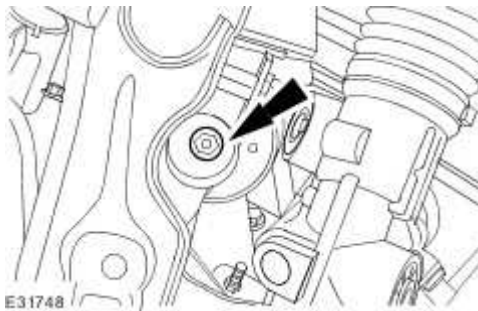
Detach the air spring assembly.



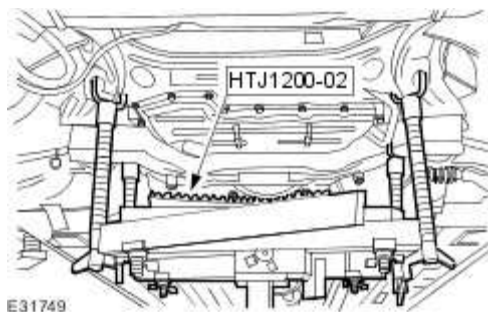
16 . **NOTE:**

Left-hand shown, right-hand similar.

Detach the engine mount.



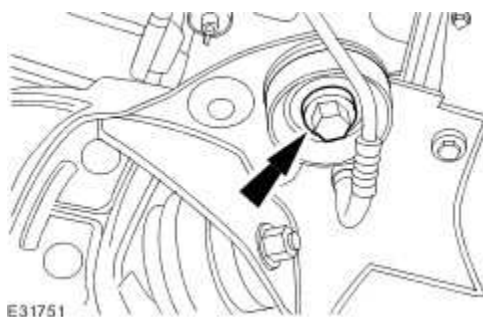
17 . Install the special tool.



18 . NOTE:

Left-hand shown, right-hand similar.

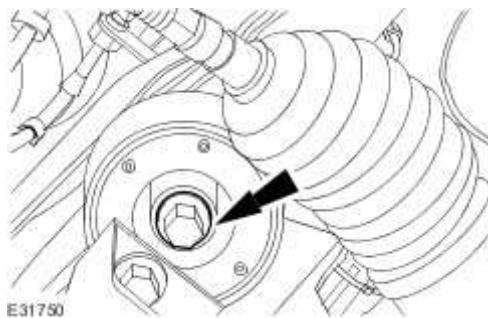
Remove the front subframe front retaining bolts.



19 . NOTE:

Left-hand shown, right-hand similar.

Remove the front subframe rear retaining bolts.

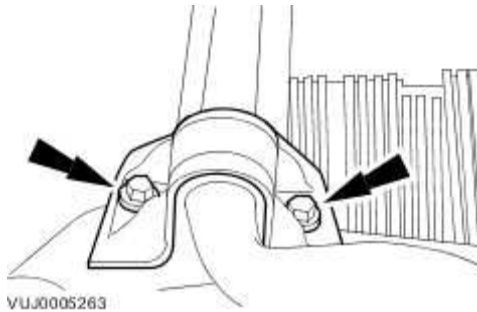


20 . Lower the special tool by approximately 200 mm (7.9 in).

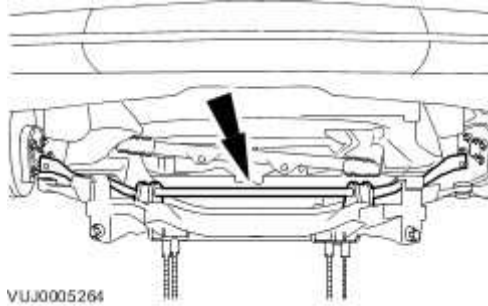
21 . NOTE:

Left-hand shown, right-hand similar.

Remove the stabilizer bar clamp.



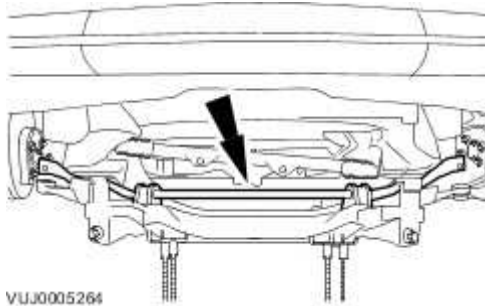
22 . Remove the stabilizer bar.



Installation

All vehicles

1 . Install the stabilizer bar

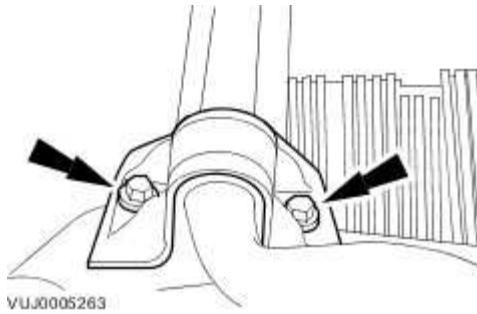


2 . NOTE:

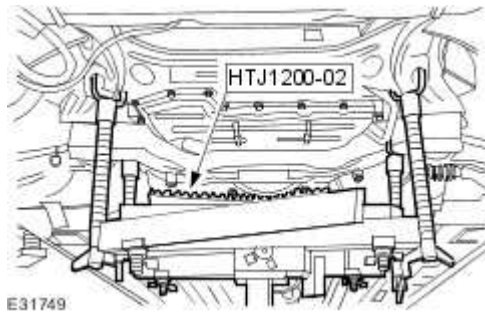
Left-hand shown, right-hand similar.

Install the stabilizer bar clamp.

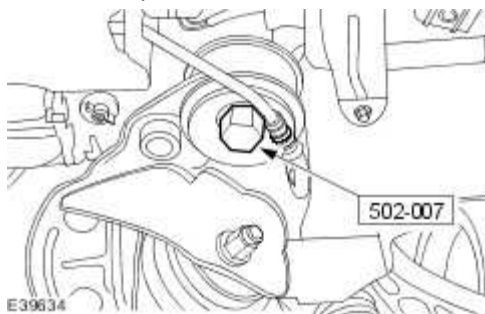
▶ Tighten to 55 Nm.



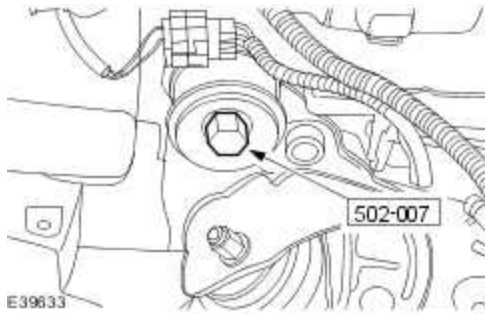
3 . Using the special tool, install the front subframe.



4 . Install the special tool.



5 . Install the special tool.

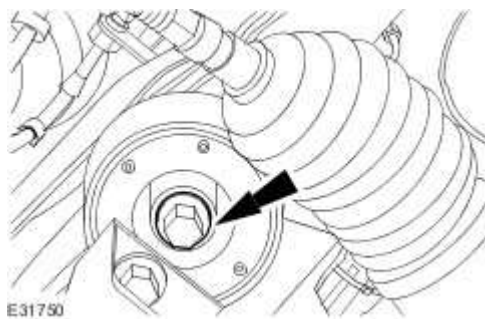


6 . NOTE:

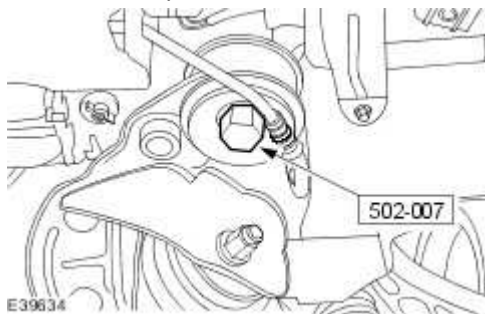
Left-hand shown, right-hand similar.

Install the front subframe rear retaining bolts.

► Tighten to 115 Nm.



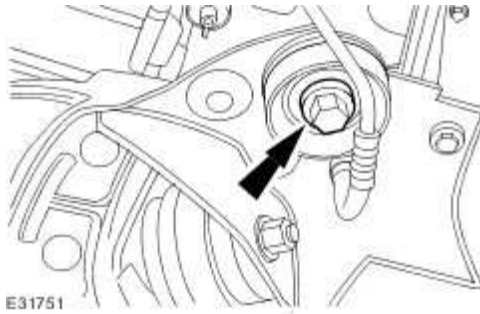
7 . Remove the special tool.



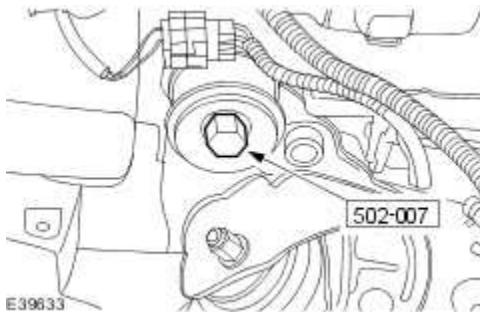
8 . Install the front subframe front retaining bolt.

► Stage 1: Tighten to 100 Nm.

► Stage 2: Tighten to 270°.



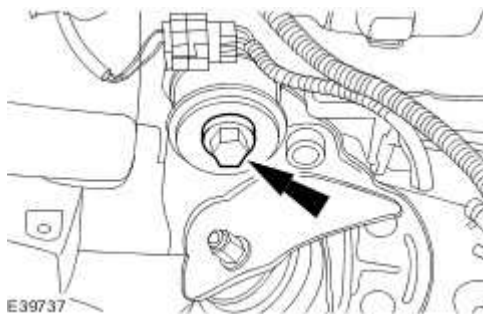
9 . Remove the special tool.



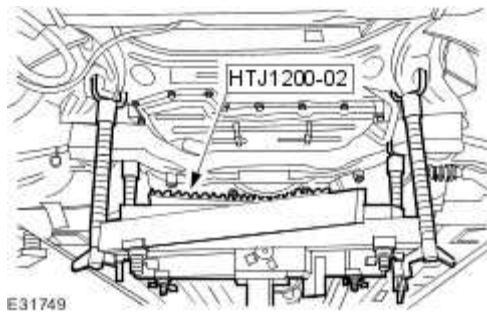
10 . Install the front subframe front retaining bolt.

► Stage 1: Tighten to 100 Nm.

► Stage 2: Tighten to 270°.



11 . Remove the special tool.

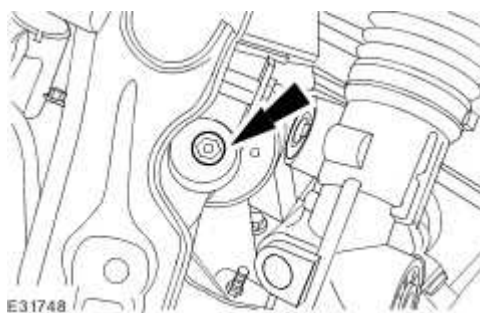


12 . NOTE:

Left-hand shown, right-hand similar.

Attach the engine mount.

▶ Tighten to 55 Nm.

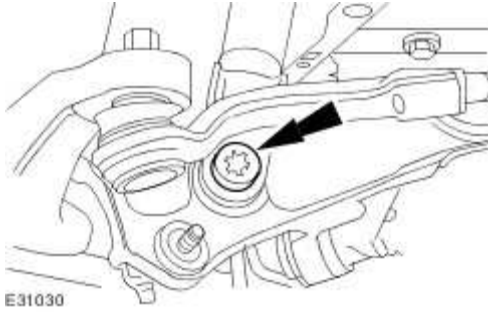


13 . NOTE:

Left-hand shown, right-hand similar.

Attach the air spring assembly.

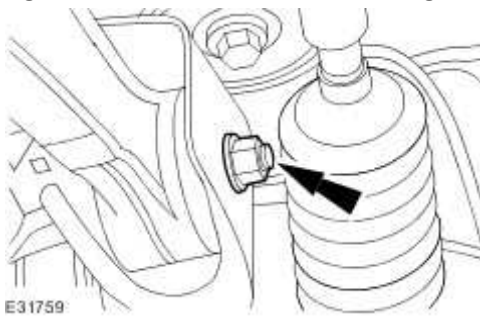
▶ Tighten to 175 Nm.



14 . NOTE:

Left-hand shown, right-hand similar.

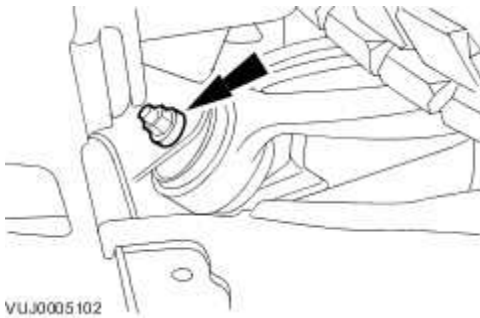
Tighten the rear lower arm retaining nut and bolt.




15 . NOTE:

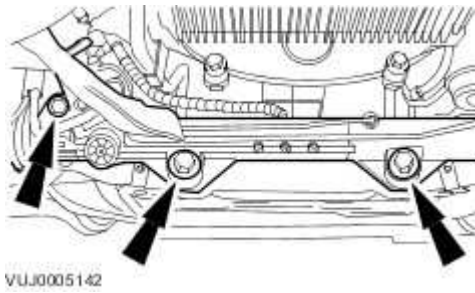
Left-hand shown, right-hand similar.

Tighten the front lower arm retaining nut and bolt.



16 . Install the steering gear.

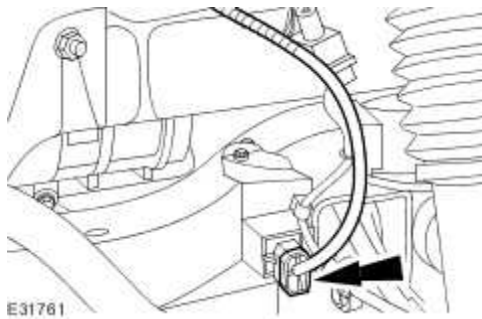
 Tighten to 100 Nm.



17 . NOTE:

Left-hand shown, right-hand similar.

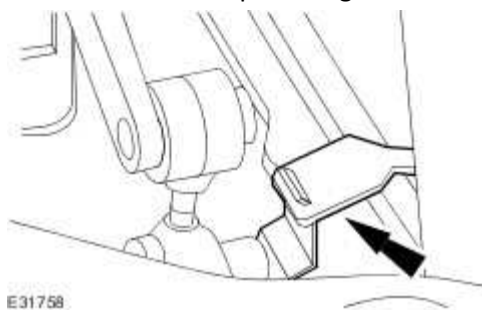
Connect the headlamp leveling sensor electrical connector.



18 . NOTE:

Left-hand shown, right-hand similar.

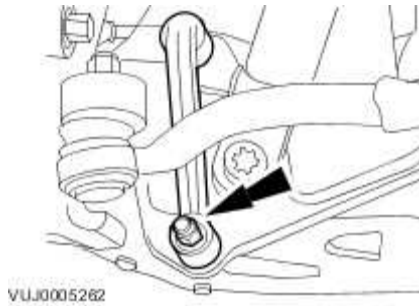
Attach the headlamp leveling sensor retaining clip.



19 . **NOTE:**

Left-hand shown, right-hand similar.

Install the stabilizer bar link.

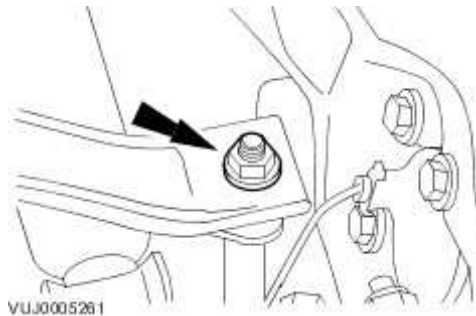


20 . **NOTE:**

Left-hand shown, right-hand similar.

Attach the stabilizer bar link.

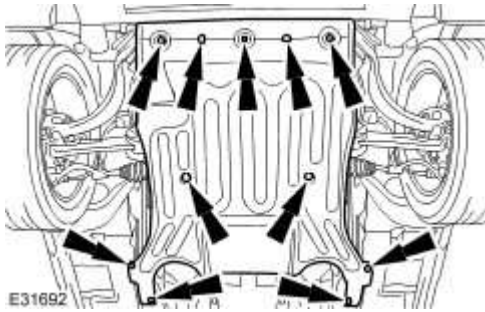
▶ Tighten to 43 Nm.



21 . Install the front wheels and tires.

For additional information, refer to [Wheel and Tire \(74.20.05\)](#).

22 . Install the air deflector.



23 . Install the radiator splash shield.

For additional information, refer to [Radiator Splash Shield \(76.22.90\)](#)

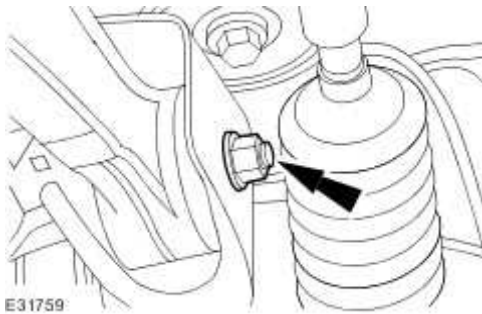
24 **NOTE:**

The final tightening of the rear lower arm inner retaining nut and bolt must be carried out with the vehicle on its wheels.

NOTE:

Left-hand shown, right-hand similar.

Tighten to 175 Nm.



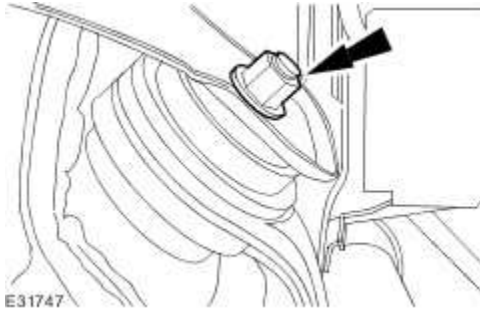
25 **NOTE:**

The final tightening of the front lower arm inner retaining nut and bolt must be carried out with the vehicle on its wheels.

NOTE:

Left-hand shown, right-hand similar.

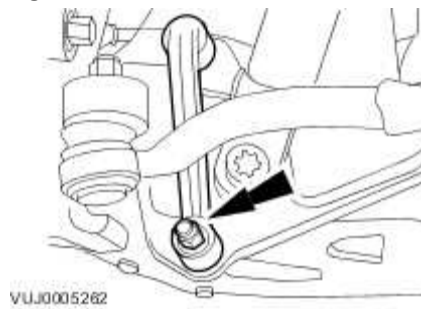
Tighten to 175 Nm.



26 . **NOTE:**

Left-hand shown, right-hand similar.

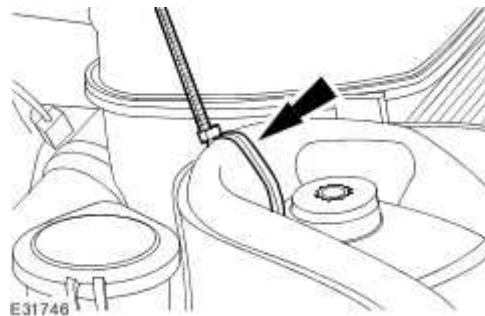
Tighten to 70 Nm.



27 . **NOTE:**

Right-hand shown, left-hand similar.

Remove the radiator support.

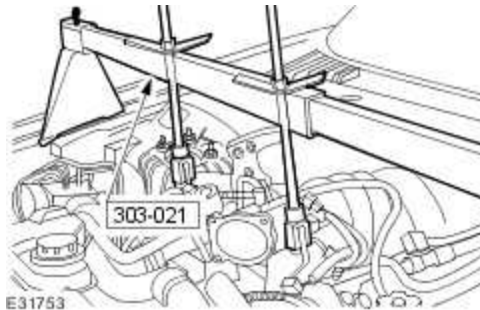


28 NOTE:

Vehicles with 3.5L or 4.2L engine without supercharger shown, vehicles with 4.2L engine with supercharger similar.

Remove the special tool.

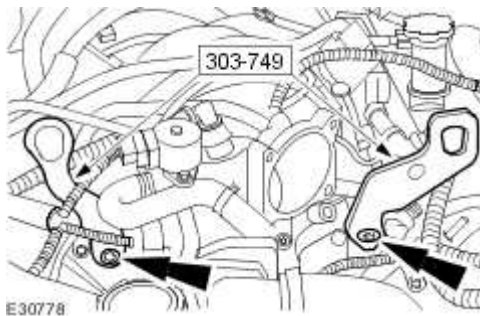
► Loosen the special tool adjustment bolts.



29 NOTE:

Vehicles with 3.5L or 4.2L engine without supercharger shown, vehicles with 4.2L engine with supercharger similar.

Remove the special tools.



Vehicles with 3.5L or 4.2L engine without supercharger

30 Install the throttle body.

For additional information, refer to [Throttle Body - Vehicles Without: Supercharger, VIN Range: G00442->G45703 \(19.70.04\)](#)

For additional information, refer to [Throttle Body - Vehicles Without: Supercharger, VIN Range: G45704->G99999 \(19.70.04\)](#)

All vehicles

31 . Check the caster and camber adjustment.

For additional information, refer to [Camber and Caster Adjustment](#)

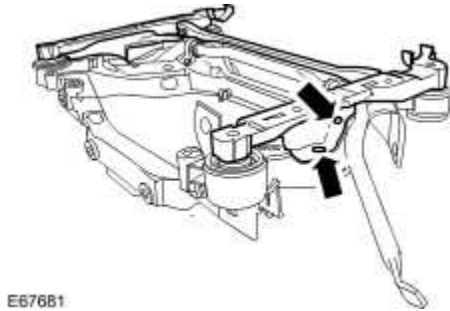
Front Stabilizer Bar - 2.7L Diesel (60.10.01)

Removal

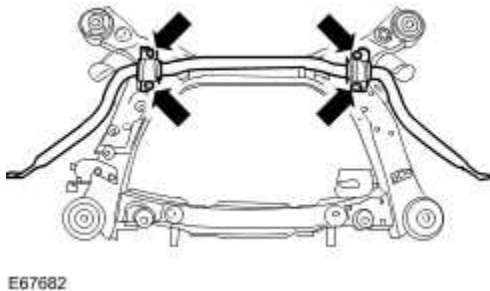
- 1 . Remove the front subframe.

For additional information, refer to [Front Subframe - 2.7L Diesel \(76.10.05\)](#)

- 2 . Remove the front subframe spacer.



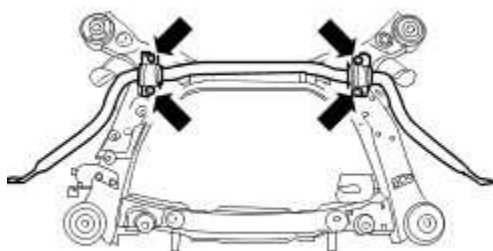
- 3 . Remove the stabilizer bar.



Installation

- 1 . To install, reverse the removal procedure.

► Tighten to 55 Nm.

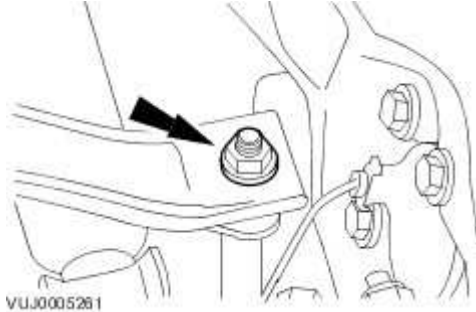


E67682

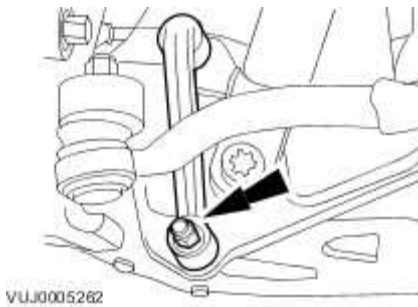
Front Stabilizer Bar Link (60.10.02)

Removal

- 1 . Raise and support the vehicle. <<100-02>>
- 2 . Remove the stabilizer bar link retaining nut.

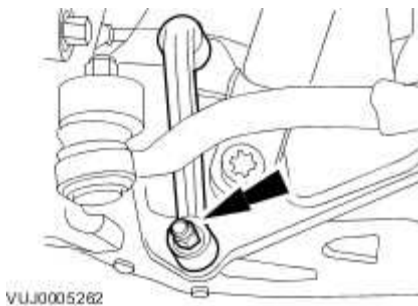


- 3 . Remove the stabilizer bar link.



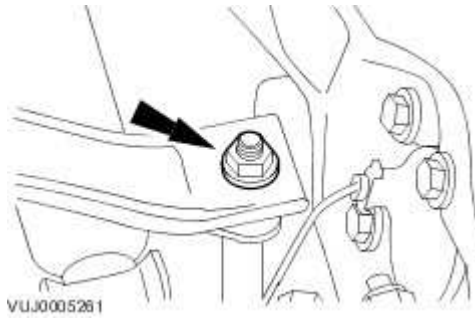
Installation

- 1 . Install the stabilizer bar link.



- 2 . Install the stabilizer bar link retaining nut.

► Tighten to 43 Nm.

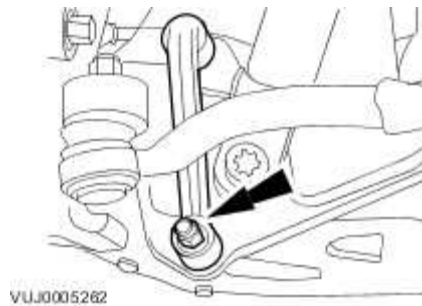


3 . Lower the vehicle.

4 **NOTE:**

The final tightening of the stabilizer bar retaining nut and bolt must be carried out with the vehicle on its wheels.

Tighten to 70 Nm.



Stabilizer Bar Link Bushing (60.10.03)

Special Service Tools



Support
204-339



Bush Installer
204-340



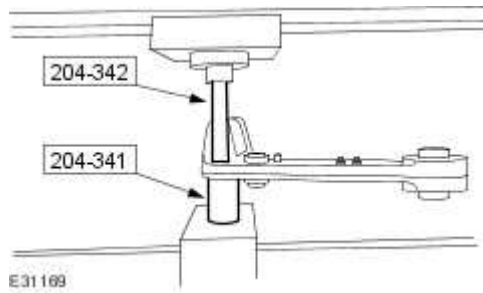
Support
204-341



Bush Remove
204-342

Removal

- 1 . Remove the rear lower arm.
For additional information, refer to
- 2 . Using the special tools remove the stabilizer bar link bushing.

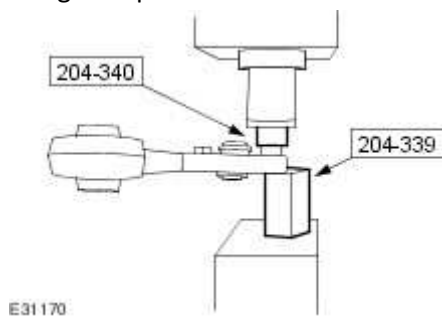


Installation

1 . NOTE:

Apply water to lubricate the bushing.

Using the special tools install the stabilizer bar link bushing.



2 . Install the rear lower arm.

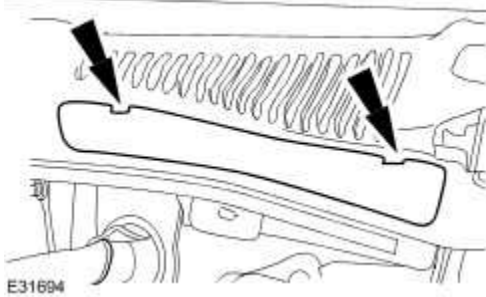
For additional information, refer to

Upper Arm LH (60.35.41)

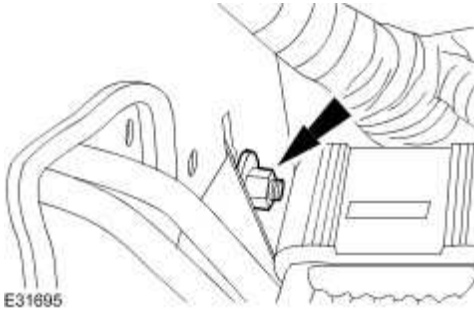
Removal

1 . Remove the air spring assembly. [<<204-05>>](#)

2 . Remove the cowl vent screen access panel.

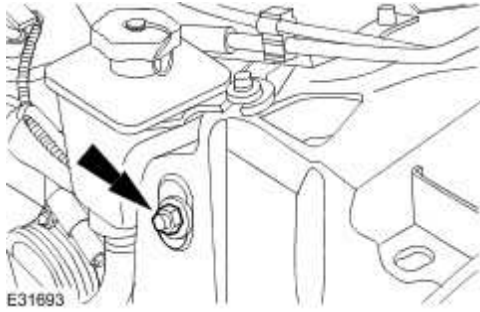


3 . Remove the upper arm rear retaining nut.



4 . Remove the air cleaner assembly. For additional information, refer to [<<303-12A>>](#) or [<<303-12B>>](#)

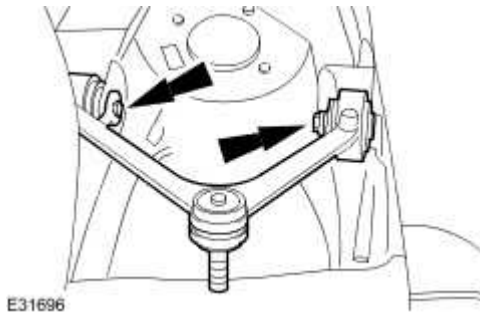
5 . Remove the upper arm front retaining nut.



6 . NOTE:

Note the position of the upper arm retaining bolt locating tangs to aid installation.

Remove the upper arm.



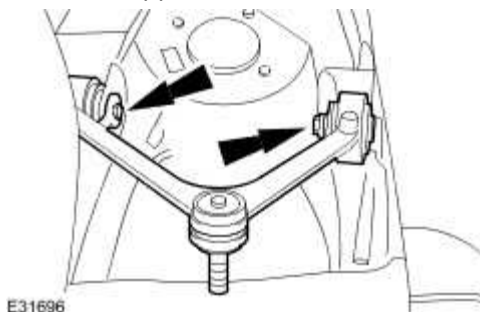
Installation

1

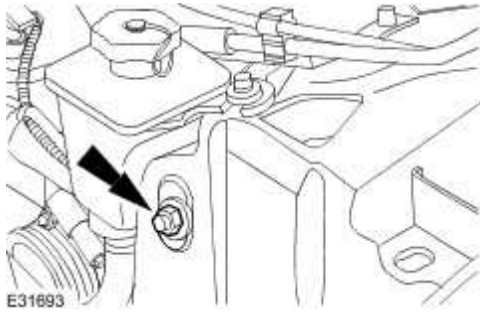


CAUTION: Make sure the upper arm retaining bolt locating tangs are correctly located. Failure to follow this instruction may result in damage to the vehicle.

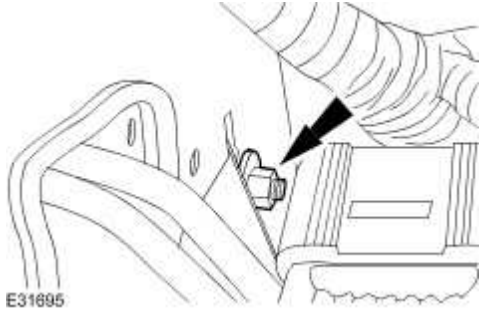
Install the upper arm.



2 . Install the upper arm front retaining nut.



3 . Install the upper arm rear retaining nut.

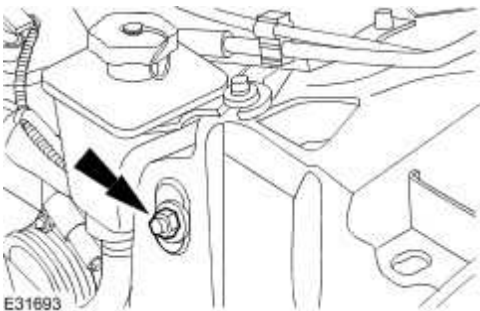


4 . Install the air spring assembly. [.<<204-05>>](#)

5 **NOTE:**

The final tightening of the Upper arm retaining nut must be carried out with the vehicle on its wheels.

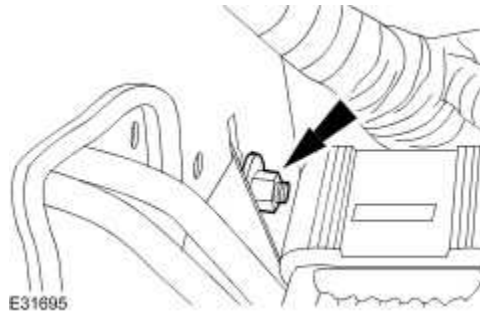
Tighten to 47 Nm.



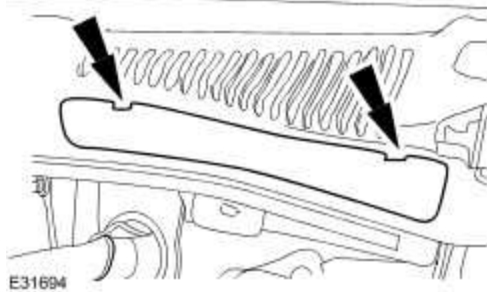
6 **NOTE:**

- The final tightening of the Upper arm retaining nut must be carried out with the vehicle on its wheels.

Tighten to 47 Nm.



- 7 . Install the cowl vent screen access panel.



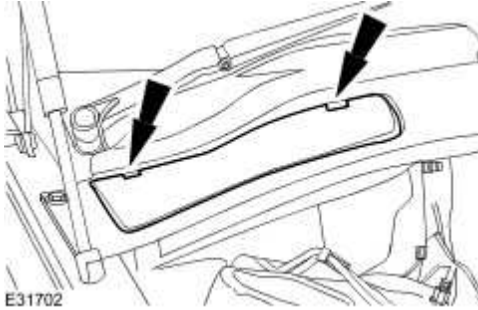
- 8 Install the air cleaner assembly. For additional information, refer to [<<303-12A>>](#) or [<<303-12B>>](#).

Upper Arm RH (60.35.42)

Removal

1 . Remove the air spring assembly. [<<204-05>>](#)

2 . Remove the cowl vent screen access panel.



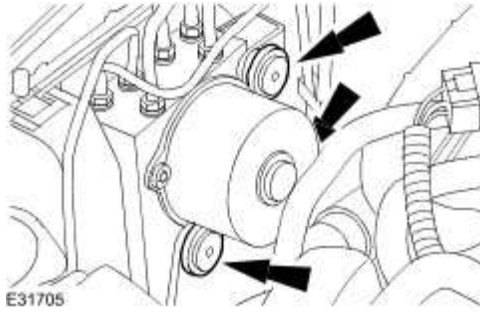
3 . Remove the upper arm rear retaining nut.



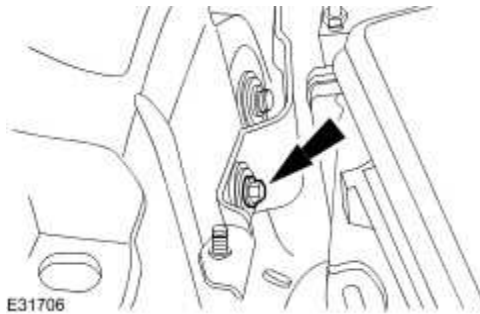
4 . Detach the engine compartment battery junction box.



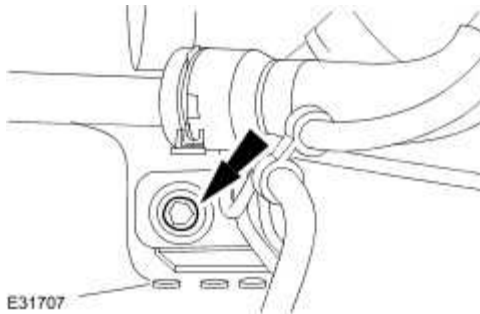
5 . Detach the hydraulic control unit.



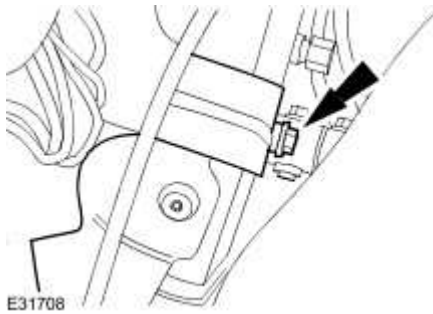
6 . Remove the hydraulic control unit mounting bracket upper retaining bolt.



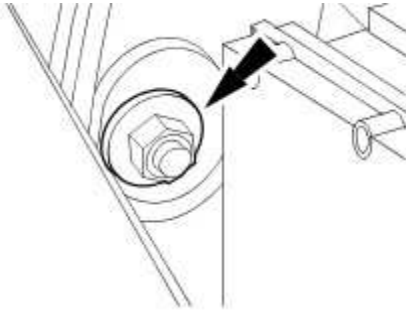
7 . Remove the hydraulic control unit mounting bracket retaining bolt.



8 . Detach the hydraulic control unit mounting bracket.



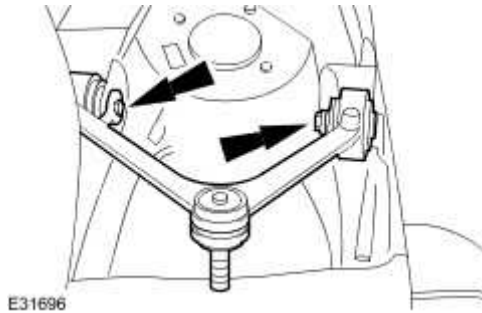
9 . Remove the upper arm front retaining nut.



10 . **NOTE:**

Note the position of the upper arm retaining bolt locating tangs to aid installation.

Remove the upper arm.



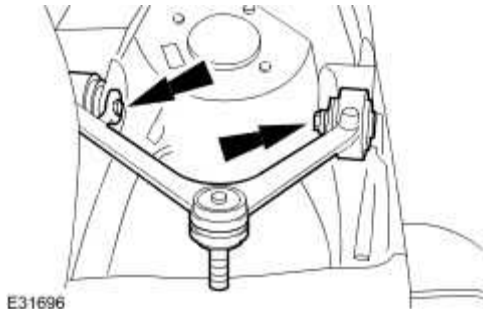
Installation

1

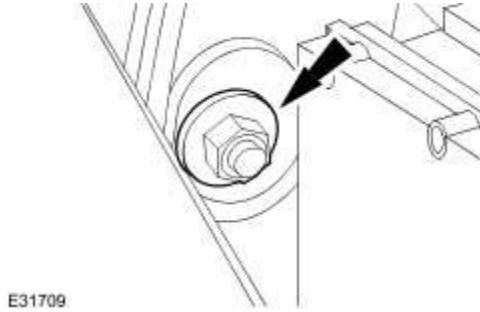


- CAUTION: Make sure the upper arm retaining bolt locating tangs are correctly located. Failure to follow this instruction may result in damage to the component.

Install the upper arm.



2 . Install the upper arm front retaining nut.



3 . Install the upper arm rear retaining nut.

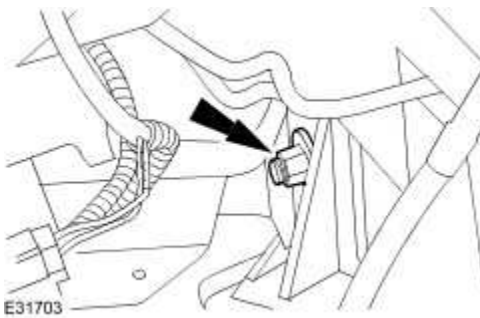


4 . Install the air spring assembly. [<<204-05>>](#)

5 **NOTE:**

The final tightening of the Upper arm retaining nut must be carried out with the vehicle on its wheels.

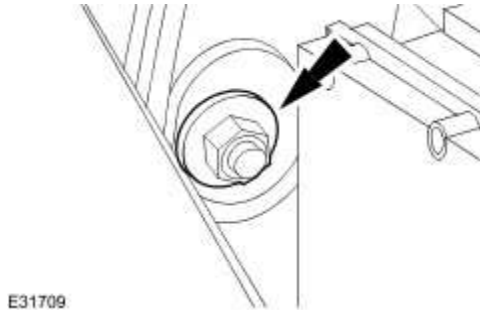
Tighten to 47 Nm.



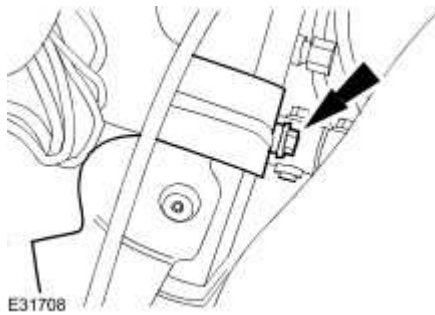
6 NOTE:

The final tightening of the Upper arm retaining nut must be carried out with the vehicle on its wheels.

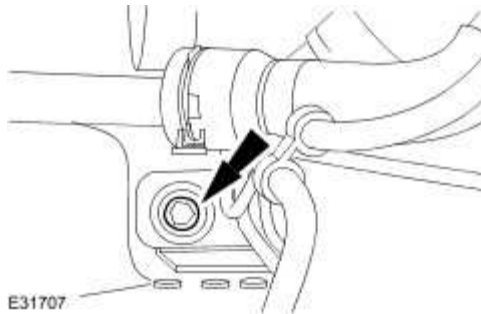
Tighten to 47 Nm.



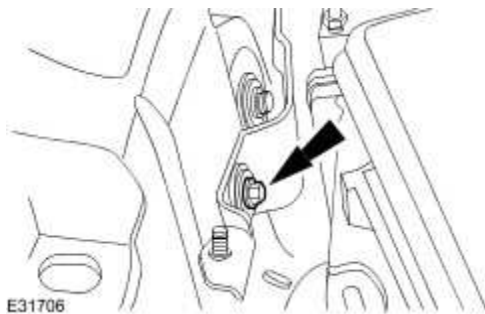
7 . Attach the hydraulic control unit mounting bracket.



8 . Install the hydraulic control unit mounting bracket retaining bolt.

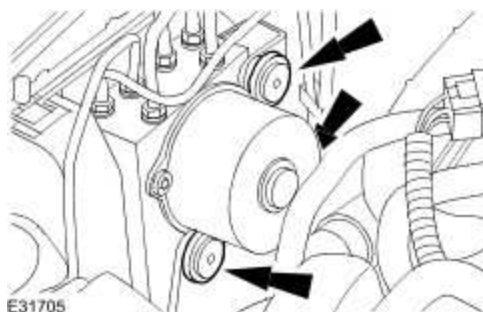


9 . Install the hydraulic control unit mounting bracket upper retaining bolt.



10 . Attach the hydraulic control unit.

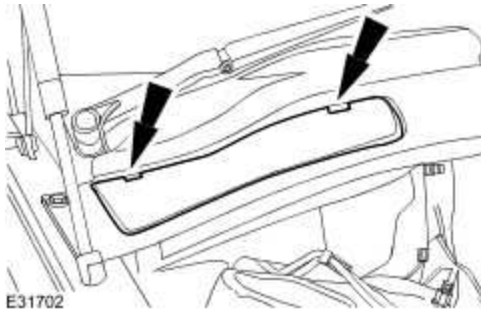
1) Tighten to 9 Nm.



11 . Attach the engine compartment battery junction box.



12 . Install the cowl vent screen access panel.



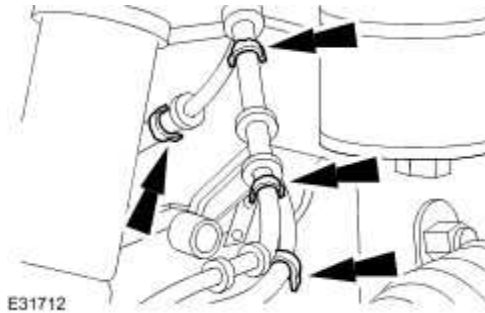
E31702

Front Wheel Bearing and Wheel Hub (60.25.03)

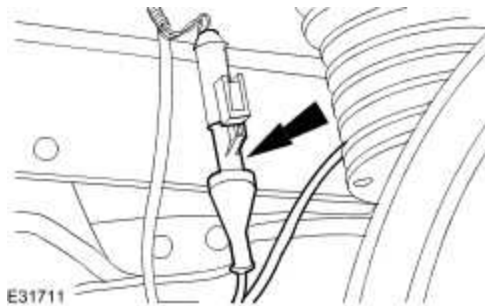
Removal

- 1 Remove the brake disc.
 - For additional information, refer to [Brake Disc - Vehicles With: Standard Brakes, VIN Range: G00442->G45703 \(70.10.10\)](#)
 - For additional information, refer to [Brake Disc - Vehicles With: Standard Brakes, VIN Range: G45704->G99999 \(70.10.10\)](#)
 - For additional information, refer to [Brake Disc - Vehicles With: High Performance Brakes, VIN Range: G00442->G45703 \(70.10.10\)](#)
 - For additional information, refer to [Brake Disc - Vehicles With: High Performance Brakes, VIN Range: G45704->G99999 \(70.10.10\)](#)

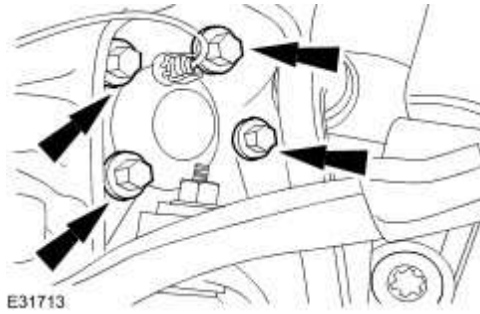
- 2 . Detach the front wheel speed sensor harness.



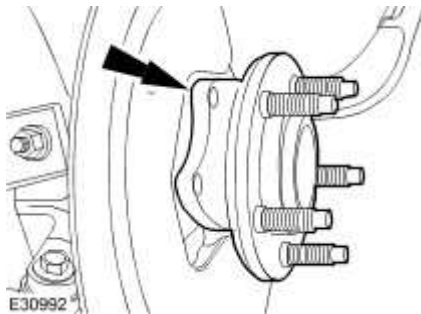
- 3 . Disconnect the front wheel speed sensor electrical connector.



- 4 . Remove the wheel bearing and wheel hub retaining bolts.



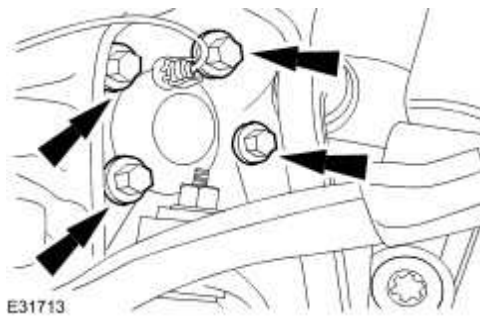
5 . Remove the wheel bearing and wheel hub.



Installation

1 . To install, reverse the removal procedure.

► Tighten to 90 Nm.



Wheel Knuckle (60.25.23)

Special Service Tools

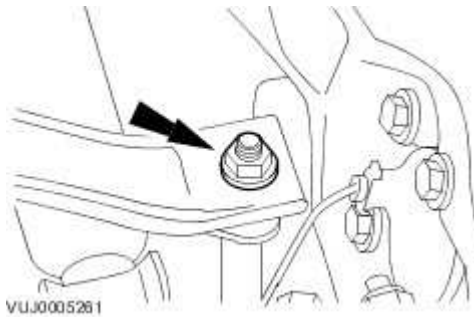


Ball Joint Splitter
204-327

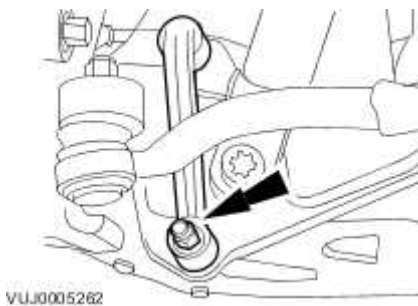
Removal

- 1 Remove the brake disc shield.
 - For additional information, refer to [Brake Disc Shield - Vehicles With: Standard Brakes \(70.10.18\)](#)
 - For additional information, refer to [Brake Disc Shield - Vehicles With: High Performance Brakes \(70.10.18\)](#)

- 2 . Remove the stabilizer bar link retaining nut.



- 3 . Remove the stabilizer bar link.

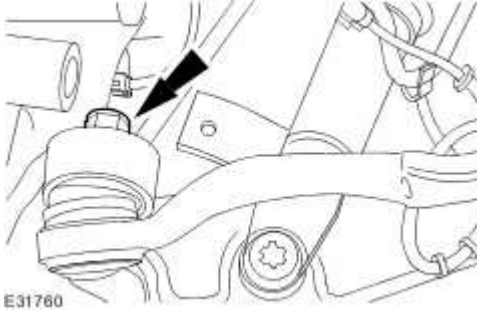


4



- CAUTION: Prevent the tie-rod end ball joint ball pin hexagon from rotating. Failure to do so may result in damage to the tie-rod end ball joint boot.

Detach the tie-rod end.



5

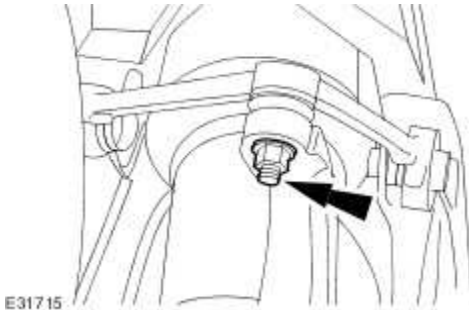


- CAUTION: Prevent the upper ball joint ball pin hexagon from rotating. Failure to do so may result in damage to the upper ball joint boot.



CAUTION: Make sure the wheel knuckle is supported. Failure to follow these instructions may result in damage to the component.

Detach the upper arm.

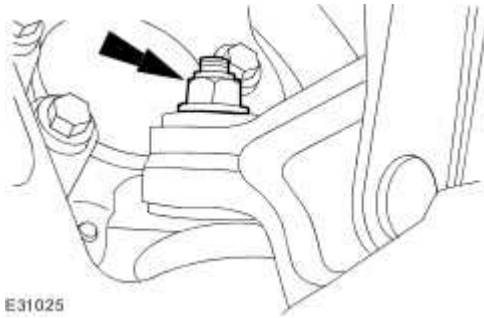


6



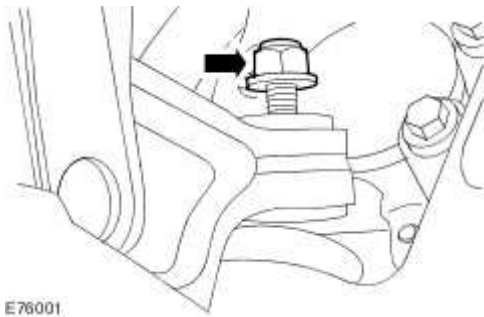
- CAUTION: Prevent the rear lower arm ball joint ball pin hexagon from rotating. Failure to follow this instruction may result in damage to the lower ball joint boot.

Loosen the rear lower arm ball joint retaining nut.



- 7
- ⚠ **CAUTION:** Prevent the rear lower arm ball joint ball pin hexagon from rotating. Failure to follow this instruction may result in damage to the lower ball joint boot.

Adjust the rear lower arm ball joint retaining nut until the ball joint thread cannot be seen.



- 8
- ⚠ **WARNING:** Make sure the special tool is supported while carrying out the operation. Failure to follow this instruction may result in personal injury.

⚠ **CAUTION:** Make sure the special tool is supported while carrying out the operation. Failure to follow this instruction may result in damage to the special tool.

⚠ **CAUTION:** Make sure the special tool is correctly located and the lower ball joint boot is not damaged while carrying out the operation. Failure to follow this instruction may result in damage to the component.

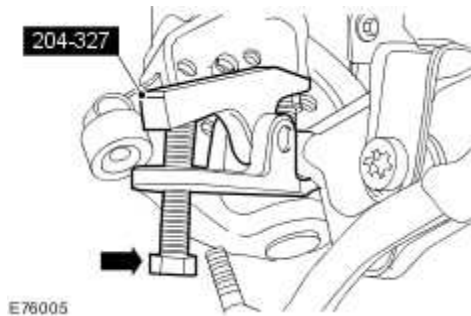
Using the special tool, release the rear lower arm ball joint from the wheel knuckle lower

pivot.

- ▶ Tighten the special tool adjusting bolt to a maximum of 60 Nm.

- If the rear lower arm ball joint releases from the wheel knuckle lower pivot
- ▶ using no more than 60 Nm on the special tool adjusting bolt, proceed to step 10.

- If the rear lower arm ball joint does not release from the wheel knuckle
- ▶ lower pivot using no more than 60 Nm on the special tool adjusting bolt, proceed to step 9.



9



WARNING: Make sure the special tool is supported while carrying out the operation. Failure to follow this instruction may result in personal injury.



CAUTION: Make sure the special tool is supported while carrying out the operation. Failure to follow this instruction may result in damage to the special tool.



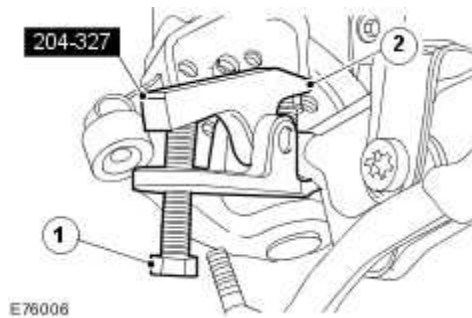
CAUTION: Make sure the special tool is correctly located and the lower ball joint boot is not damaged while carrying out the operation. Failure to follow this instruction may result in damage to the component.

NOTE:

Do not carry out this step if the rear lower arm ball joint released from the wheel knuckle lower pivot in step 8.

Using the special tool, release the rear lower arm ball joint from the wheel knuckle lower pivot.

- 1) Tighten the special tool adjusting bolt to a maximum of 60 Nm.
- 2) Strike the top surface of the special tool directly above the rear lower arm ball joint at the point indicated using a copper and hide mallet.



10



WARNING: Make sure the wheel knuckle is supported while carrying out the operation. Failure to follow this instruction may result in personal injury.



CAUTION: Make sure the wheel knuckle is supported while carrying out the operation. Failure to follow this instruction may result in damage to the component.

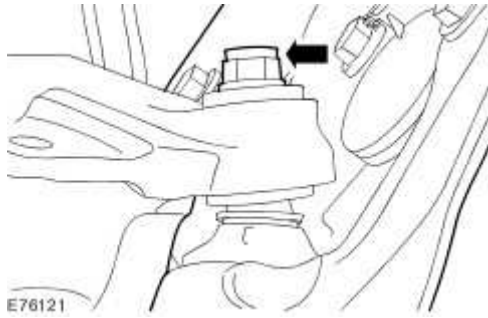


CAUTION: Prevent the rear lower arm ball joint ball pin hexagon from rotating. Failure to follow this instruction may result in damage to the lower ball joint boot.


Remove the wheel knuckle.



Remove and discard the retaining nut.




Installation

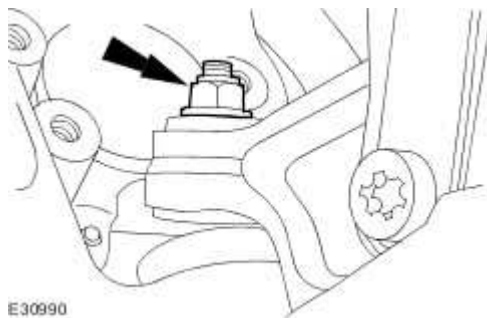
- 1  **CAUTION:** Prevent the rear lower arm ball joint ball pin hexagon from rotating. Failure to follow this instruction may result in damage to the lower ball joint boot.

NOTE:

Install a new retaining nut.

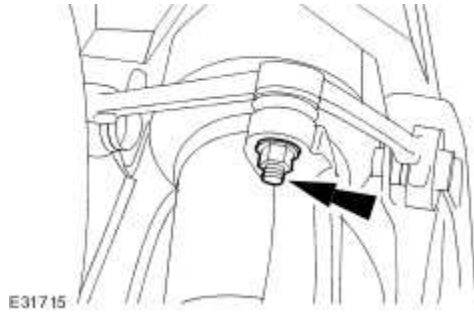
Install the wheel knuckle

 Tighten to 92 Nm.



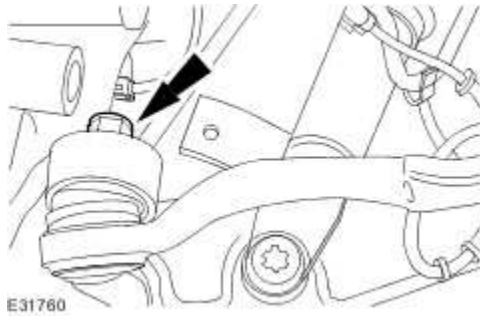
- 2 . Attach the upper arm.

 Tighten to 90 Nm

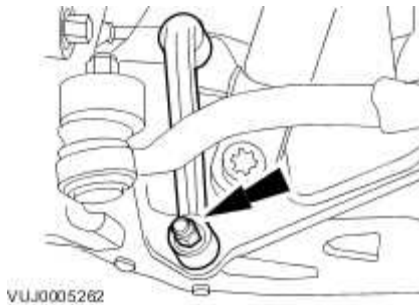


3 . Attach the tie rod end.

▶ Tighten to 75 Nm.

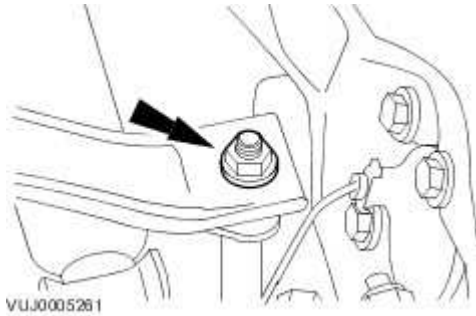


4 . Install the stabilizer bar link.



5 . Attach the stabilizer bar link.

▶ Tighten to 43 Nm.



6 Install the brake disc shield.

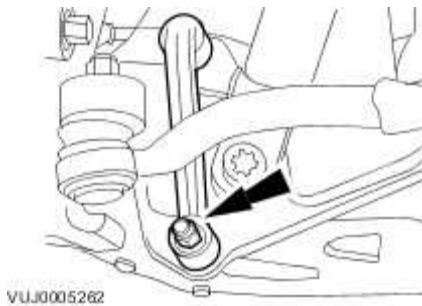
- For additional information, refer to [Brake Disc Shield - Vehicles With: Standard Brakes \(70.10.18\)](#)

For additional information, refer to [Brake Disc Shield - Vehicles With: High Performance Brakes \(70.10.18\)](#)

7 **NOTE:**

The final tightening of the stabilizer bar link retaining nut and bolt must be carried out with the vehicle on its wheels.

Tighten to 70 Nm.



204-02 : Rear Suspension

Specifications

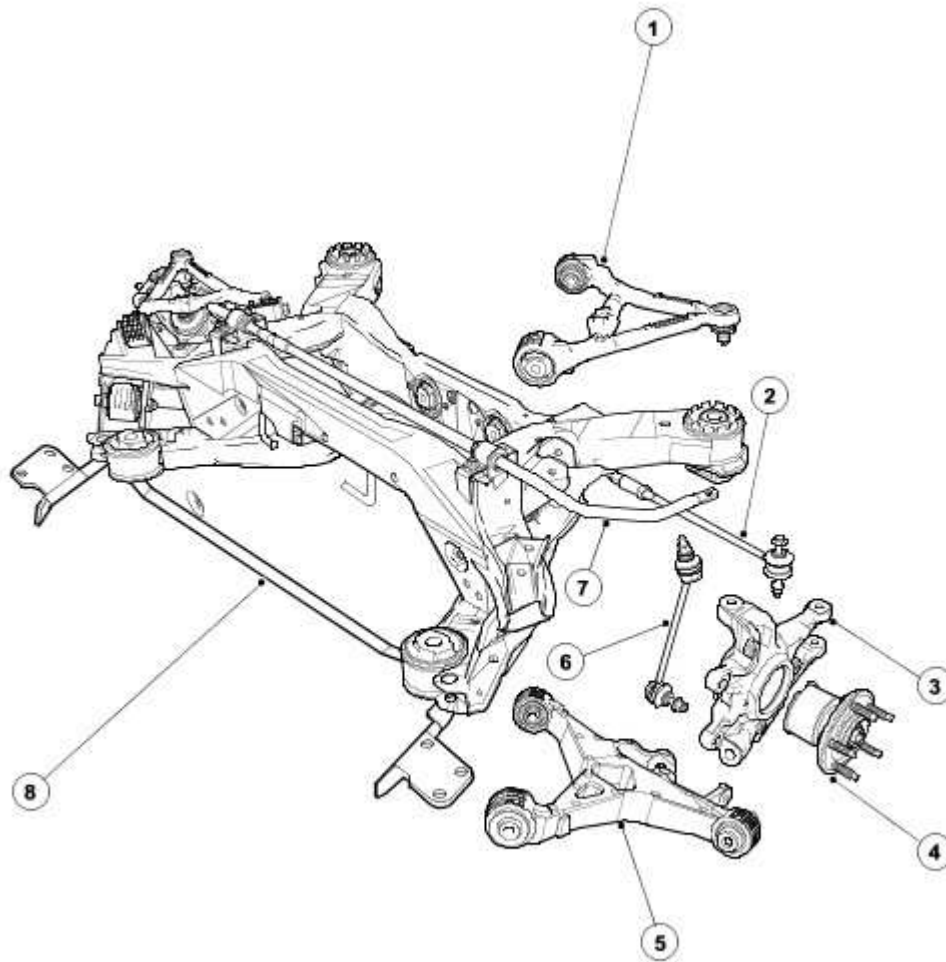
Specifications

Torque Specifications

Description	Nm	lb-ft	lb-in
Tie rod outer bolt	55	41	-
Lower arm inner bolts	163	120	-
Lower arm outer bolt	175*	129	-
Upper arm ball joint nut	90	66	-
Upper arm inner bolts	98	72	-
Shock absorber upper fixing nuts	28	21	-
Lower shock absorber bolt	133	98	-
Shock absorber top mounting nut without adaptive damping	50	37	-
Shock absorber top mounting nut with adaptive damping	27	20	-
Stabilizer bar	55	41	-
Stabilizer link mounting nuts	48	35	-
Wheel hub nut	300	221	-

*If you are re-using this fixing on a vehicle built prior to VIN H16808, then tighten to 150 Nm. If you are replacing a fixing, then you must replace both nut and bolt and tighten to 175 Nm.

Rear Suspension



E31619

Item	Part Number	Description
1	—	Upper arm
2	—	Tie rod
3	—	Wheel knuckle
4	—	Wheel hub

5	—	Lower arm
6	—	Stabilizer bar drop link
7	—	Stabilizer bar
8	—	NVH brace

The independent rear suspension features aluminium upper and lower control arms which carry the hub assemblies and air springs.

Components

The wheel knuckle:

- carries the wheel hub.
- carries the brake caliper assembly.
- carries the Anti-lock brake (ABS) sensor.
- carries the wheel hub bearing and bearing seals.
- is of a unique design for vehicles with supercharger.

The stabilizer link:

- is of a steel construction with a ball joint at each end.
- transmits vertical movements of the rear suspension to the stabilizer bar.

The stabilizer bar:

- is mounted on the subframe.
- is connected to the left and right hand lower wishbones by the stabilizer bar drop links.
- is fitted to all models with or without sports suspension.

The upper arm:

- is a one piece aluminium casting and incorporates a built in ball joint.
- is the upper support for the wheel knuckle.
- is fitted with height sensors which are part of the high intensity discharge (HID) lights feature and the air suspension.

The tie rod:

- is of a two piece steel construction with a ball joint at both ends.
- is utilized to adjust rear wheel alignment.

The lower arm:

- is a one piece aluminium casting, with integral mounting points for the shock absorber and spring assembly and the stabilizer bar link.
- is the lower support for the wheel knuckle.

Rear Suspension

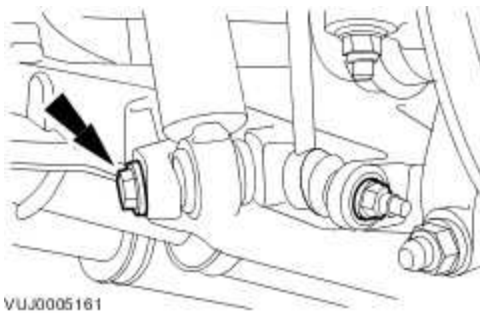
For additional information, refer to [<<204-00>>](#).

Lower Arm (64.35.43)

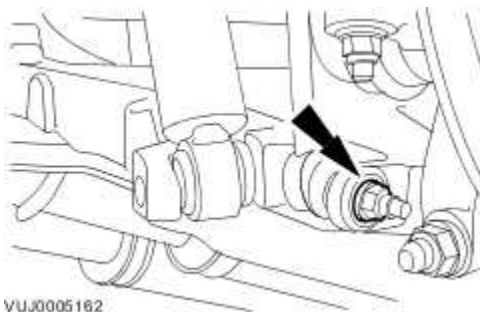
Removal

All vehicles

- 1 . Make sure the park brake is in the off position.
- 2 . Remove the wheel and tire.
For additional information, refer to [Wheel and Tire \(74.20.05\)](#)
- 3 . Detach the shock absorber assembly from the lower arm.



- 4 . Detach the stabilizer bar link.

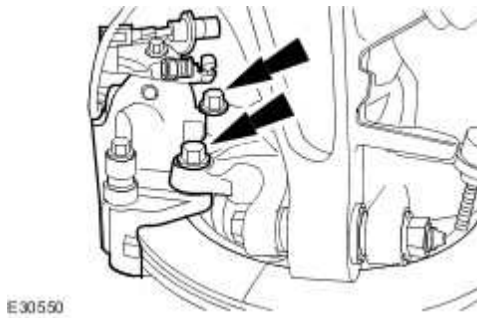


Vehicles without Brembo brakes

- 5 .  **CAUTION:** The brake caliper must be supported at all times.

Detach the brake caliper and secure to one side.

- ▶ Remove and discard the brake caliper retaining bolts.

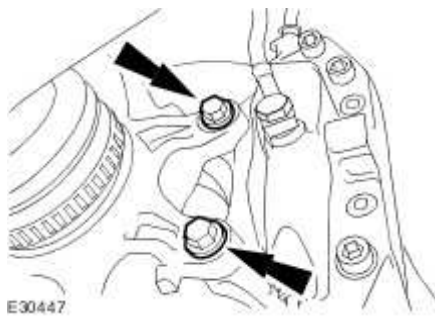


Vehicles with Brembo brakes

6.  **CAUTION: The brake caliper must be supported at all times.**

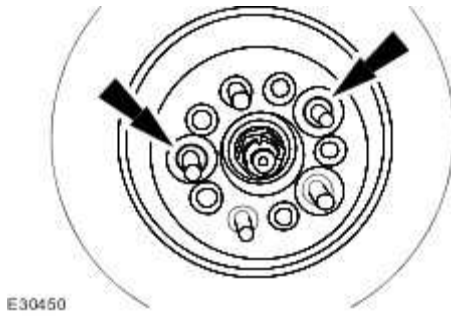
Detach the brake caliper and secure to one side.

- ▶ Remove and discard the brake caliper retaining bolts.

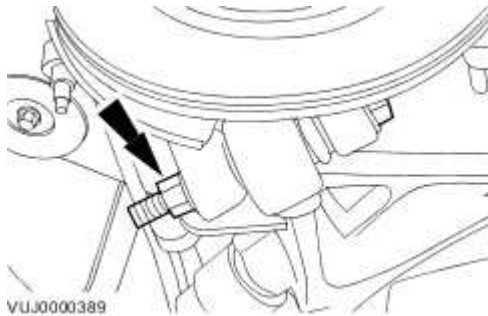


All vehicles

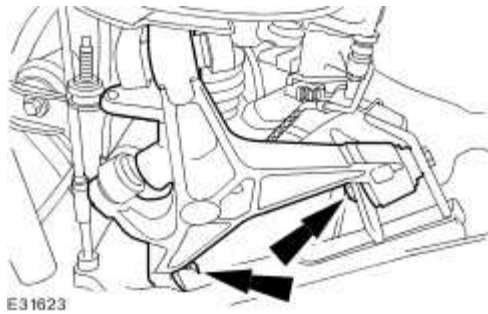
7. Remove and discard the retaining clips and reposition the brake disc.



8 . Detach the lower arm from the wheel hub assembly.



9 . Remove the lower arm.



Installation

All vehicles

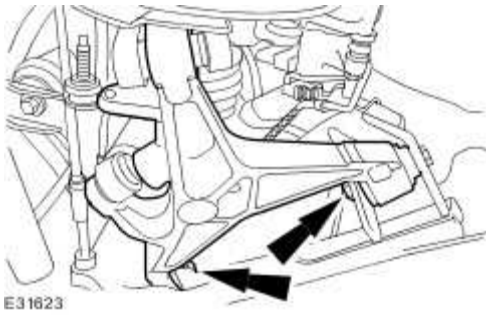
1




- **CAUTION:** The final tightening of the rear suspension components must be carried out with the vehicle on its wheels.

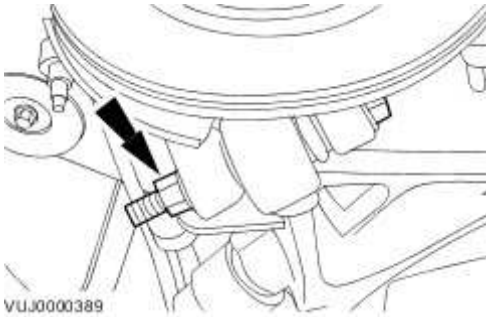
Install the lower arm.

- ▶ Install the retaining bolts.



- 2  **CAUTION:** The final tightening of the rear suspension components must be carried out with the vehicle on its wheels.

Install the retaining nut and bolt.

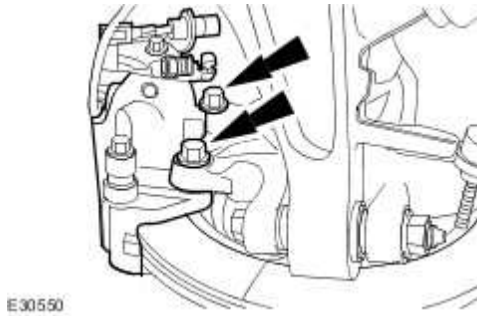


Vehicles without Brembo brakes

- 3 . Attach the brake caliper.

- ▶ Install new brake caliper retaining bolts.

- ▶ Tighten to 103 Nm.

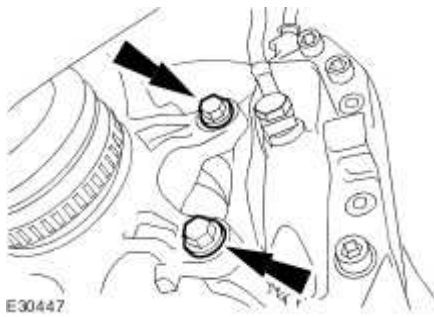


Vehicles with Brembo brakes

4 . Attach the brake caliper.

➤ Install new brake caliper retaining bolts.

➤ Tighten to 70 Nm.



All vehicles

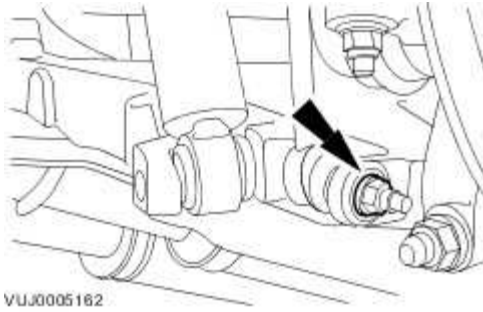
5




· **CAUTION: The final tightening of the rear suspension components must be carried out with the vehicle on its wheels.**

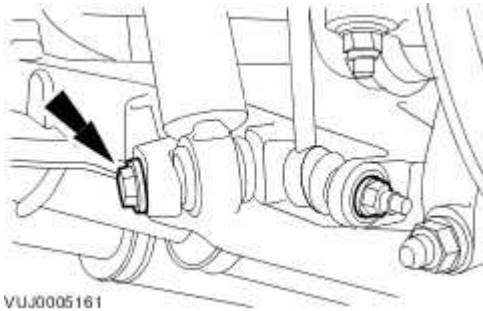
Attach the stabilizer bar link.

➤ Tighten to 48 Nm.




- 6 .  **CAUTION: The final tightening of the rear suspension components must be carried out with the vehicle on its wheels.**

Install the the shock absorber retaining bolt.

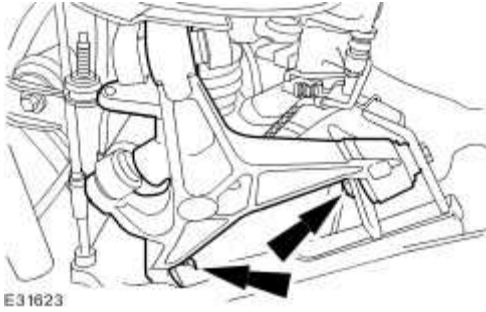


- 7 . Install the wheel and tire.
For additional information, refer to [Wheel and Tire \(74.20.05\)](#)

- 8 . Lower the vehicle.

- 9 .  **CAUTION: The final tightening of the rear suspension components must be carried out with the vehicle on its wheels.**

Tighten to 163 Nm.

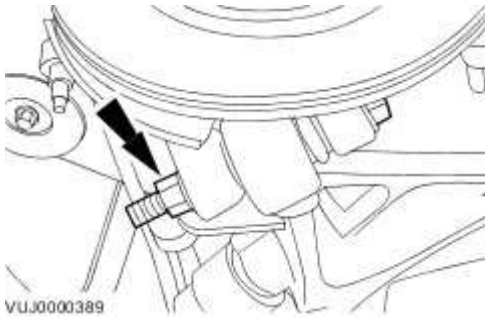


10



CAUTION: The final tightening of the rear suspension components must be carried out with the vehicle on its wheels.

Tighten to 175 Nm.



NOTE:

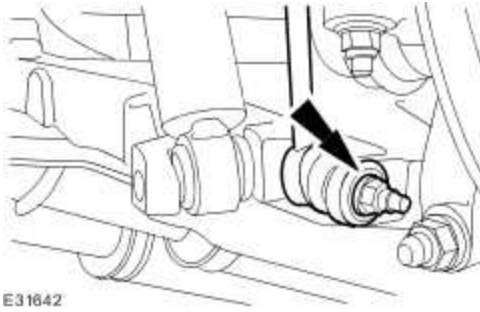
If you are re-using this fixing on a vehicle built prior to VIN H16808, then tighten old fixing to 150 Nm. If you are replacing a fixing, then you must replace both nut and bolt and tighten to 175 Nm.

11



CAUTION: The final tightening of the rear suspension components must be carried out with the vehicle on its wheels.

Tighten to 48 Nm.

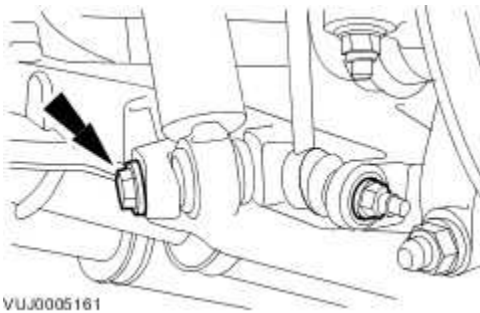


12



CAUTION: The final tightening of the rear suspension components must be carried out with the vehicle on its wheels.

Tighten to 133 Nm.



13 . Check the wheel alignment and adjust as necessary.

For additional information, refer to [Wheel Alignment Angles](#)

Rear Stabilizer Bar (64.35.08)

Special Service Tools



Powertrain assembly jack
HTJ1200-2

Removal


All vehicles

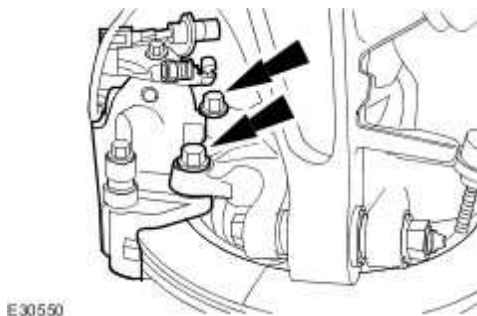
- 1 . Drain the right-hand fuel tank saddle. [<<310-00>>](#)
- 2 . Remove both the upper arms.
For additional information, refer to
- 3 . Remove the front muffler. [<<309-00>>](#)

Vehicles without Brembo brakes

- 4 .  **CAUTION: The brake caliper must be supported at all times.**

Detach the brake caliper and brake caliper anchor plate and secure to one side.

 Remove and discard the brake caliper retaining bolts.



Vehicles with Brembo brakes

5 .

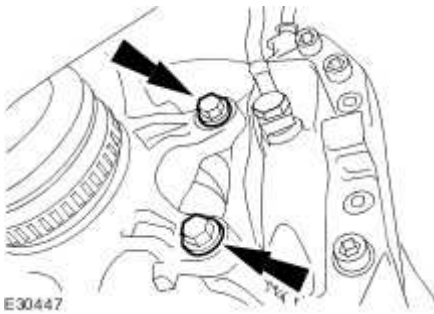


CAUTION: The brake caliper must be supported at all times.

Detach the brake caliper and secure to one side.



Remove and discard the brake caliper retaining bolts.

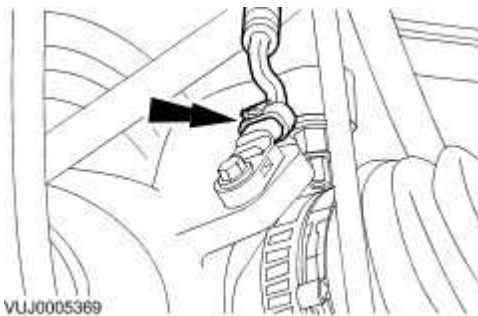


All vehicles

6 . **NOTE:**

Left-hand shown right-hand similar.

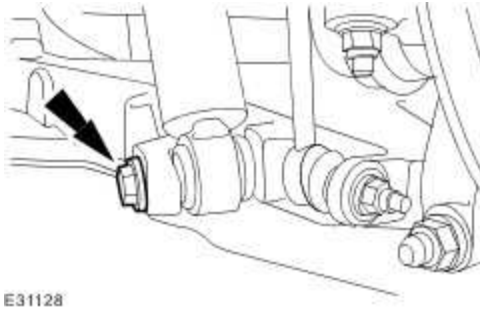
Disconnect the anti-lock brake system (ABS) sensor electrical connector.



7 . **NOTE:**

Right-hand shown left-hand similar.

Detach the shock absorber and spring assembly from the lower arm.



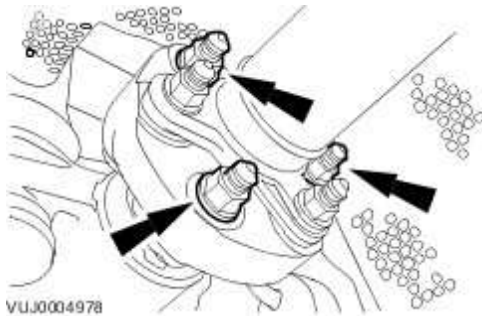
8



CAUTION: Under no circumstances must the flexible coupling (or its fixings) be loosened or removed from the driveshaft

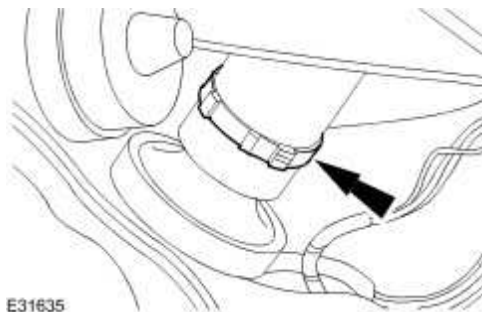
Detach the driveshaft from the rear drive axle flange.

- Mark the position of the driveshaft in relation to the rear drive axle flange.
- Mark the position of the balance nut in relation to the rear drive axle flange (if fitted).
- Mark the position of each nut and bolt in relation to the rear drive axle flexible joint.

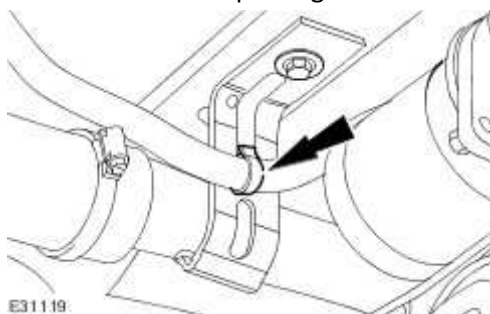


9 . Detach the fuel filler pipe.

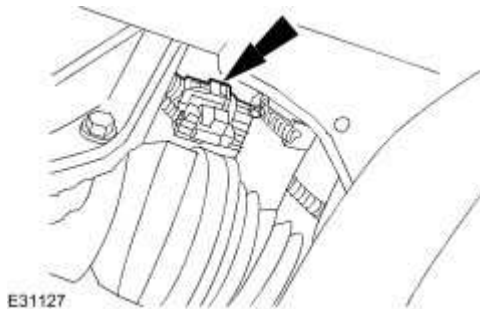
- Remove and discard the hose clip.



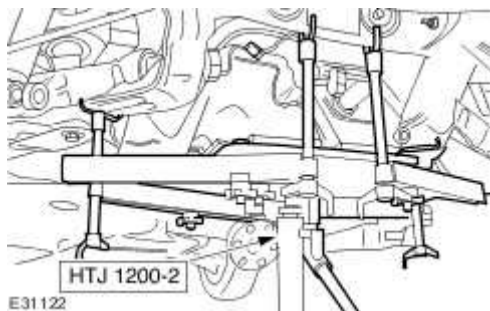
10 . Detach the electric parking brake motor harness.



11 . Disconnect the electric parking brake motor electrical connector.



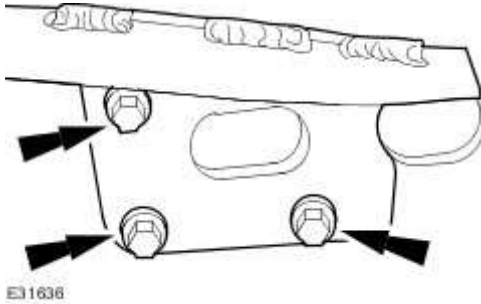
12 . Install the special tool to support the rear subframe.



13 . **NOTE:**

Left-hand shown right-hand similar.

Remove the Noise,Vibration and Harshness brace retaining bolts.

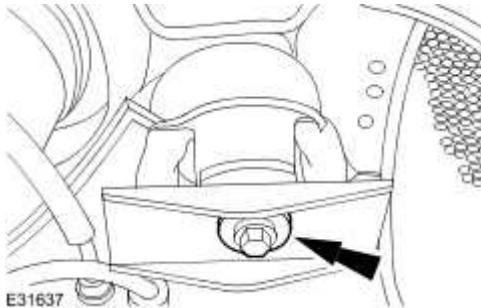


14 . Using the special tool, support the subframe.

15 . **NOTE:**

Left-hand shown right-hand similar.

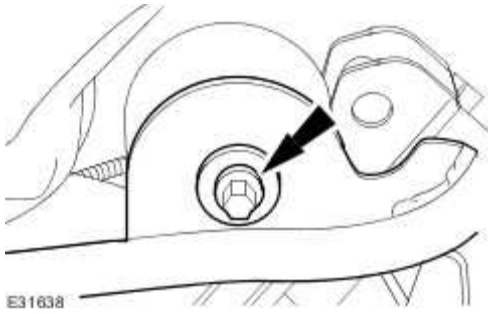
Remove the subframe rear mount retaining bolt.



16 . **NOTE:**

Left-hand shown right-hand similar.

Remove the subframe front mount retaining bolt.

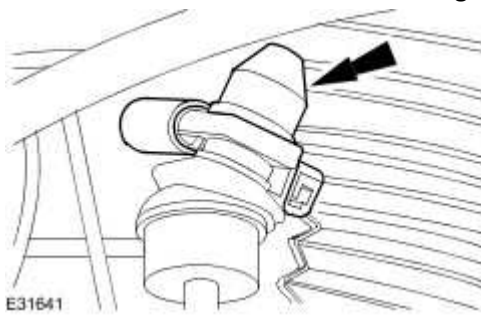


17 . Lower the subframe.

18 . **NOTE:**

Left-hand shown right-hand similar.

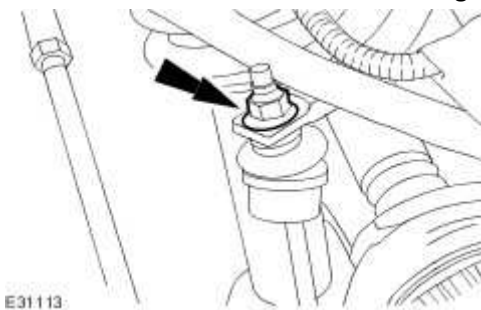
Remove the stabilizer bar link retaining nut dust cover.



19 . **NOTE:**

Right-hand shown left-hand similar.

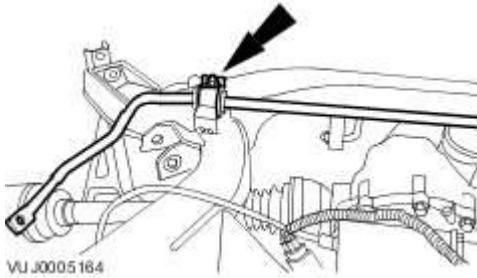
Remove the stabilizer bar link retaining nut.



20 . **NOTE:**

Left-hand shown right-hand similar.

Remove the stabilizer bar.



Installation

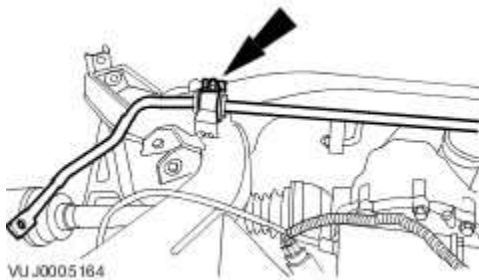
All vehicles

1 . **NOTE:**

Left-hand shown right-hand similar.

Install the stabilizer bar.

► Tighten to 55 Nm.



2 . **NOTE:**

Right-hand shown left-hand similar.

Install the stabilizer bar link retaining nut.

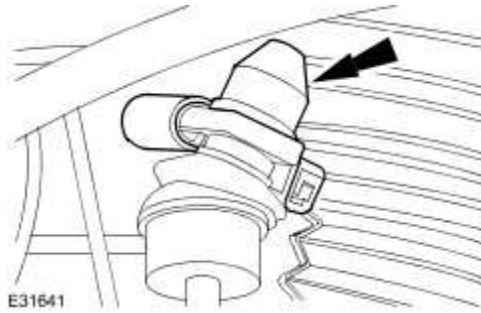
▶ Tighten to 48 Nm.



3 . NOTE:

Left-hand shown right-hand similar.

Install the stabilizer bar link retaining nut dust cover.



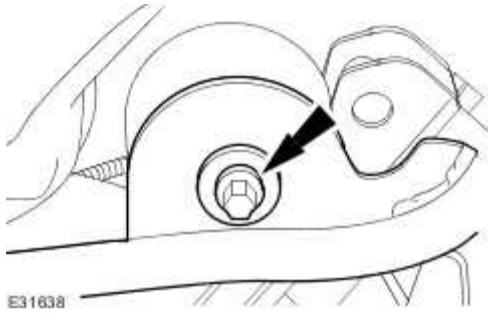
4 . Reposition the subframe.

5 . NOTE:

Left-hand shown right-hand similar.

Install the subframe front mount retaining bolt.

▶ Tighten to 125 Nm.

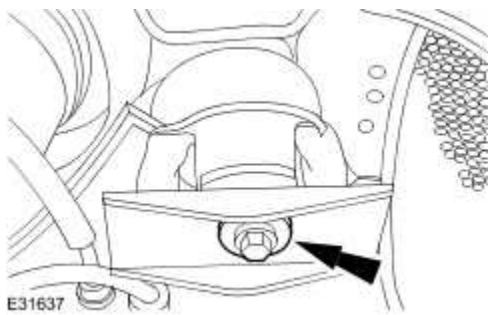


6 . NOTE:

Left-hand shown right-hand similar.

Install the subframe rear mount retaining bolt.

▶ Tighten to 125 Nm.

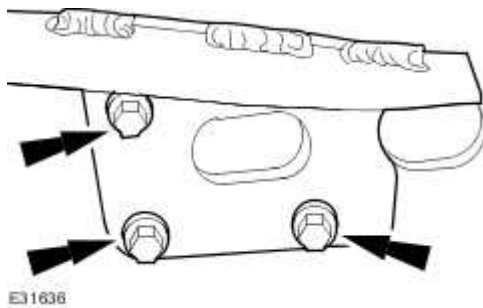


7 . NOTE:

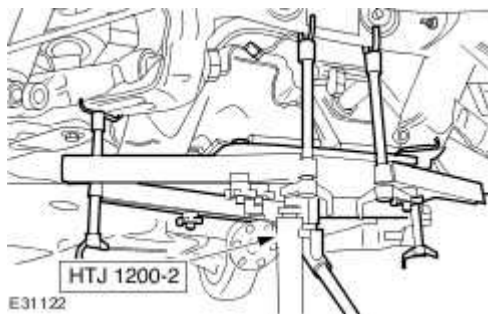
Left-hand shown right-hand similar.

Install the Noise, Vibration and Harshness brace retaining bolts.

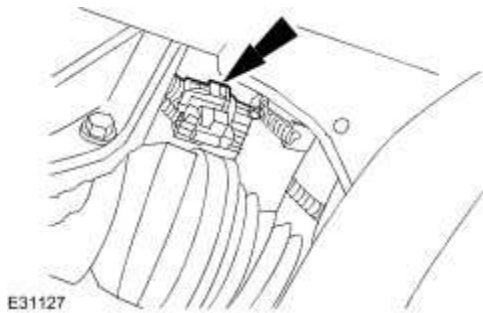
▶ Tighten to 48 Nm.



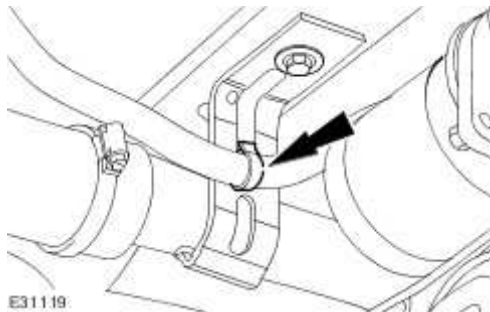
8 . Remove the special tool from the rear subframe.



9 . Connect the electric parking brake motor electrical connector.

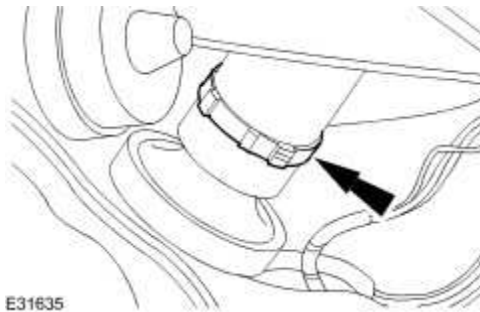


10 . Attach the electric parking brake motor harness.



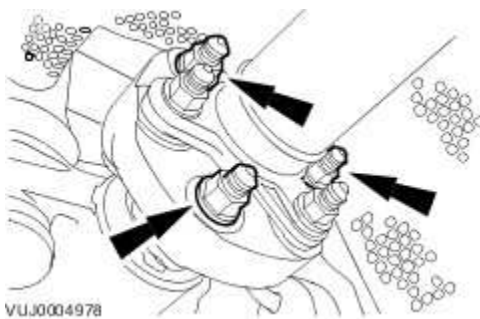
11 . Attach the fuel filler pipe.

▶ Fit and tighten new hose clip.



12 . Attach the driveshaft to the rear drive axle flange.

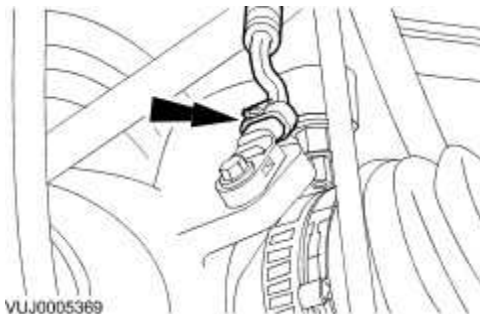
▶ Tighten to 88 Nm.



13 . **NOTE:**

Left-hand shown right-hand similar.

Connect the ABS sensor electrical connector.

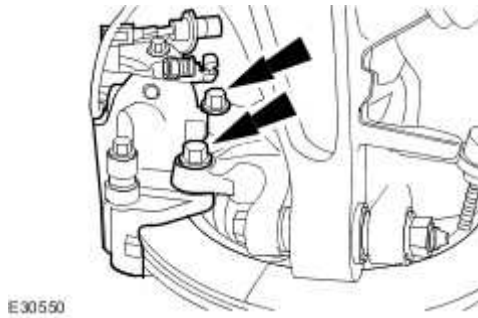


Vehicles without Brembo brakes

14 . Attach the brake caliper.

▶ Install new brake caliper retaining bolts.

▶ Tighten to 103 Nm.



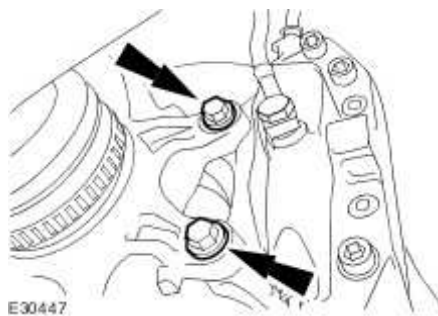
15 . Install the brake pads. <<206-04>>

Vehicles with Brembo brakes

16 . Attach the brake caliper.

▶ Install new brake caliper retaining bolts.

▶ Tighten to 70 Nm.




All vehicles

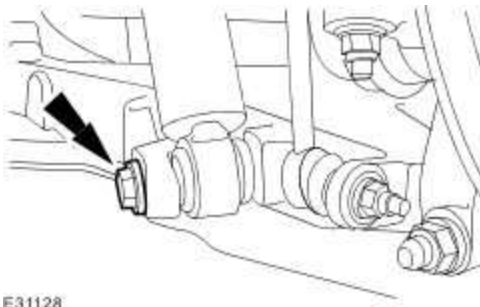
17 . Install the front muffler. <<309-00>>

- 18 . Install both the upper arms.
For additional information, refer to

- 19 . Fill the right-hand fuel tank saddle. [.<<310-00>>](#)

- 20  **CAUTION: The final tightening of the rear suspension components must be carried out with the vehicle on its wheels.**

Tighten to 133 Nm.



- 21 . Check the wheel alignment and adjust as necessary. [.<<204-00>>](#)

- 22 . Carry out the rear subframe alignment procedure. [.<<502-00>>](#)

Rear Stabilizer Bar Link (64.35.24)

Removal

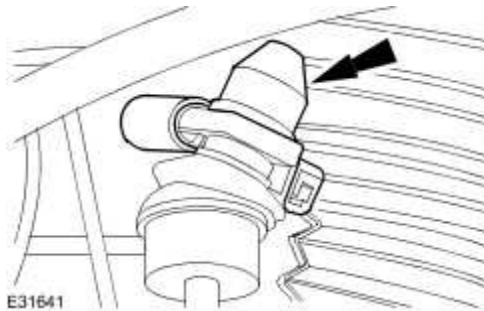
- 1 . Remove the wheel and tire.

For additional information, refer to [Wheel and Tire \(74.20.05\)](#)

- 2 . **NOTE:**

Left-hand shown, right-hand similar.

Remove the stabilizer bar link retaining nut dust cover.



- 3 . **NOTE:**

Right-hand shown, left-hand similar.

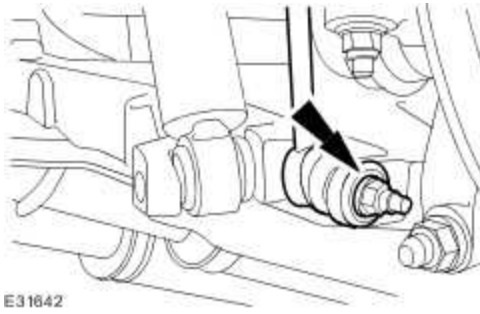
Detach the stabilizer bar link.



- 4 . **NOTE:**

Right-hand shown, left-hand similar.

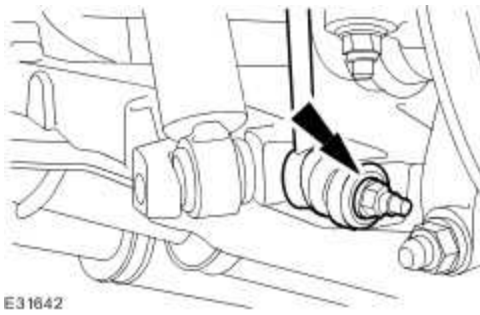
Remove the stabilizer bar link.



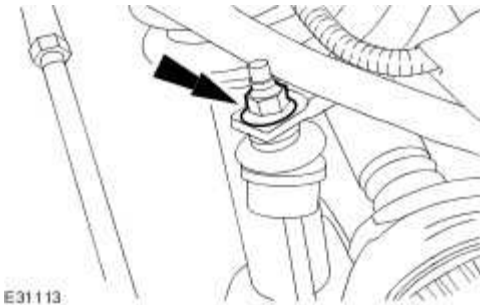
Installation

1 . To install, reverse the removal procedure.

▶ Tighten to 48 Nm.



2 . Tighten to 48 Nm.

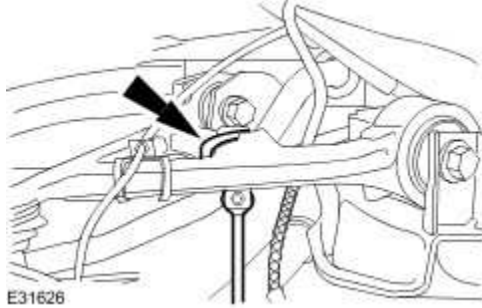


Upper Arm (64.25.31)

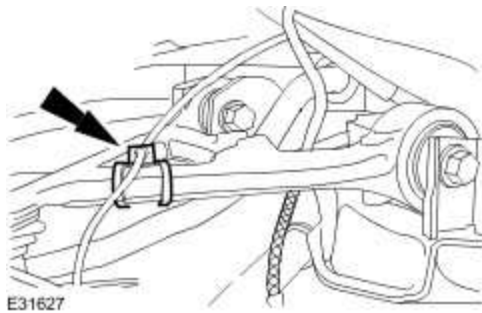
Removal

1 . Remove the wheel and tire. <<204-04>>

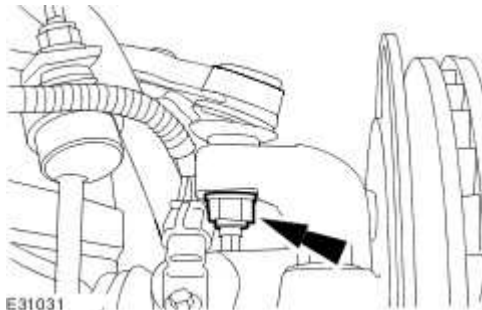
2 . Detach the high intensity discharge (HID) sensor link rod.



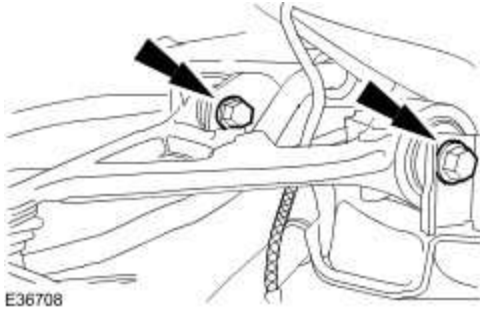
3 . Detach the anti-lock brake system (ABS) sensor wiring harness.




4 . Detach the upper arm from the wheel knuckle.



5 . Remove the upper arm.

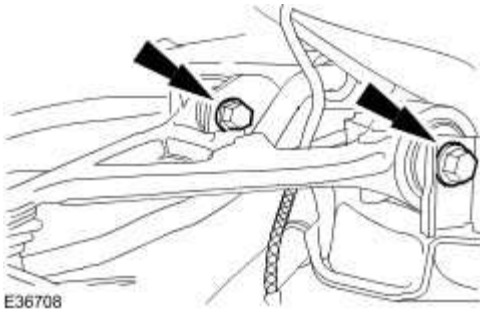



Installation

- 1  **CAUTION:** The final tightening of the rear suspension components must be carried out with the vehicle on its wheels.

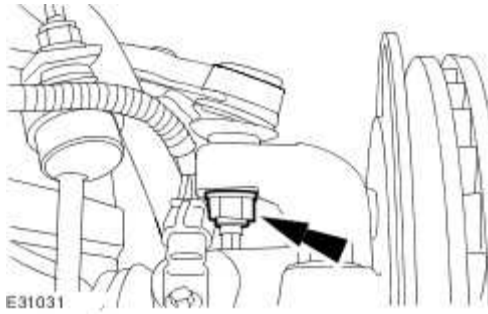
 **CAUTION:**

Install the upper arm.

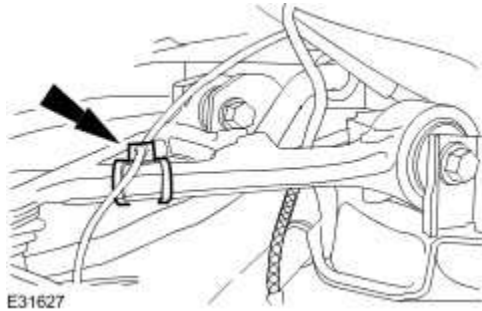


- 2  **CAUTION:** The final tightening of the rear suspension components must be carried out with the vehicle on its wheels.

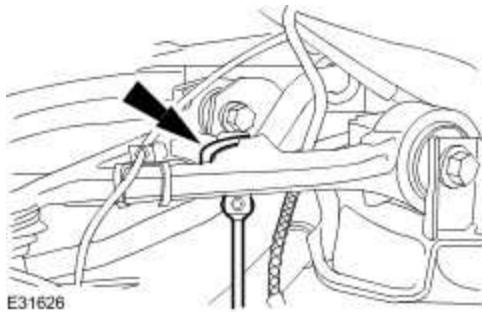
Attach the upper arm to the wheel knuckle.



3 . Attach the anti-lock brake system (ABS) sensor wiring harness.




4 . Attach the high intensity discharge (HID) sensor link rod.

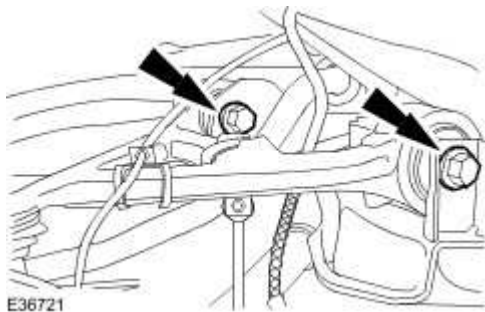


5 . Install the wheel and tire. [<<204-04>>](#)

6 . Lower the vehicle.

7 .  **CAUTION:** The final tightening of the rear suspension components must be carried out with the vehicle on its wheels.

Tighten to 98 Nm.

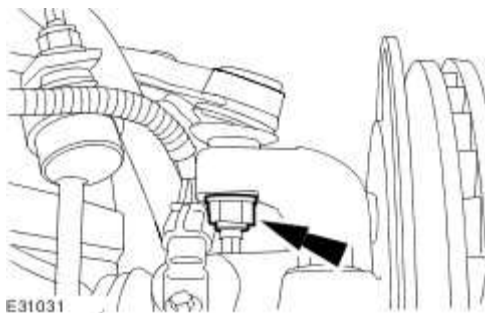


8



- **CAUTION:** The final tightening of the rear suspension components must be carried out with the vehicle on its wheels.

Tighten to 90 Nm.



- 9 . Check and adjust the wheel alignment as necessary. [.<<204-00>>](#)

Rear Wheel Bearing (64.15.14)

Special Service Tools



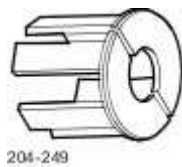
Hub puller
205-491



Adaptor nuts
205-491-01



Flange remover forcing screw
204-269



Rear hub support tool
204-249



Rear hub bearing removal tool
204-250



204193

Front hub remover

204-193



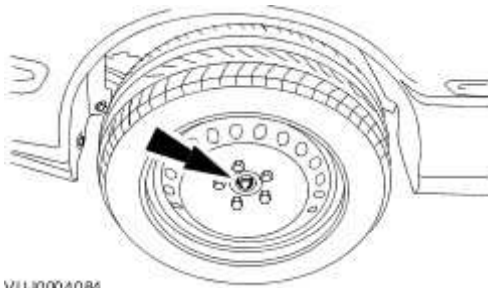
204-252

Bearing support

204-252

Removal

- 1 . Loosen the wheel hub nut.



VUJ0004084

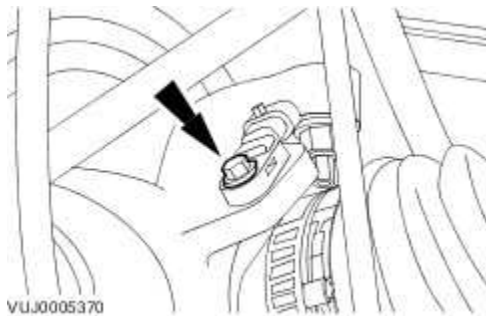
- 2 Remove the brake disc.

- . For additional information, refer to [Brake Disc - Vehicles With: Standard Brakes, VIN Range: G00442->G45703 \(70.10.11\)](#)

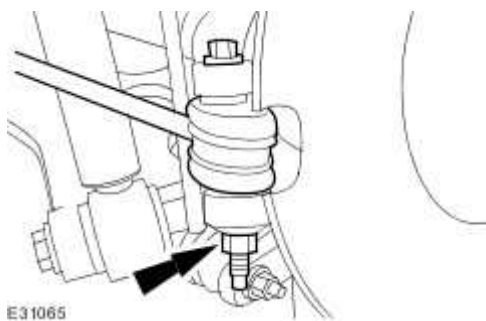
For additional information, refer to [Brake Disc - Vehicles With: High Performance Brakes, VIN Range: G00442->G45703 \(70.10.11\)](#)

For additional information, refer to [Brake Disc - VIN Range: G45704->G99999 \(70.10.11\)](#)

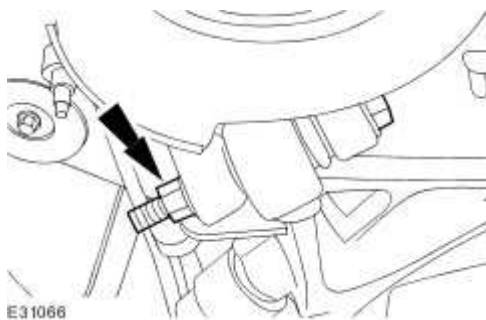
- 3 . Detach the anti-lock brake system (ABS) sensor.



4 . Detach the outer tie rod.

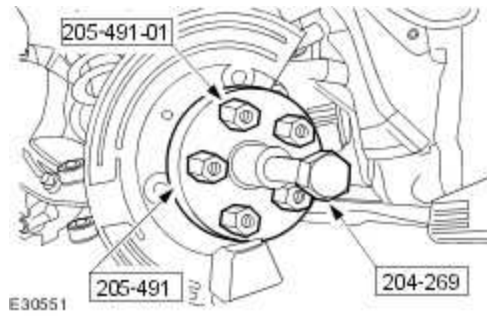


5 . Detach the lower arm from the wheel knuckle.

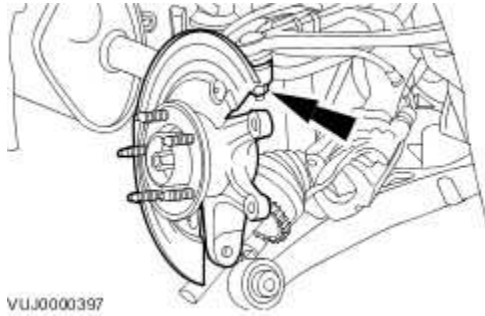


6 . Remove the wheel hub nut.

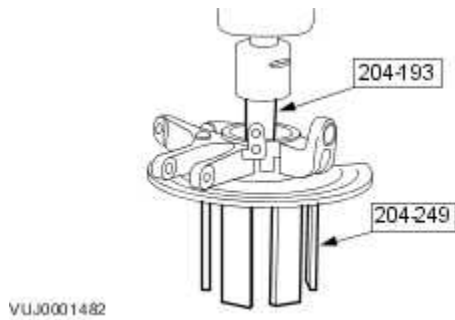
7 . Using the special tools, detach the halfshaft.



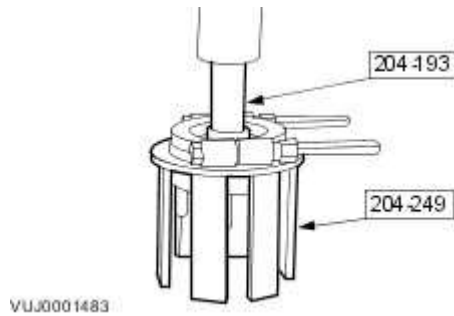
8 . Remove the wheel knuckle assembly.



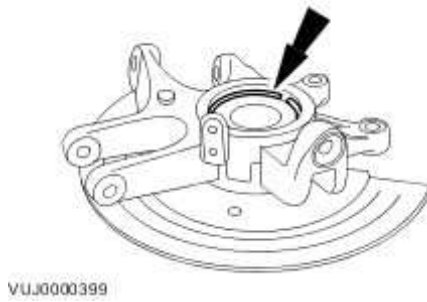
9 . Using the special tools, remove the wheel hub from the bearing.



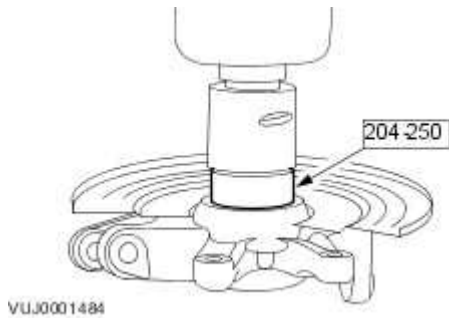
10 . Using the special tools, remove the inner bearing race from the hub.



11 . Remove the circlip.



12 . Using the special tools, remove the bearing from the wheel knuckle.



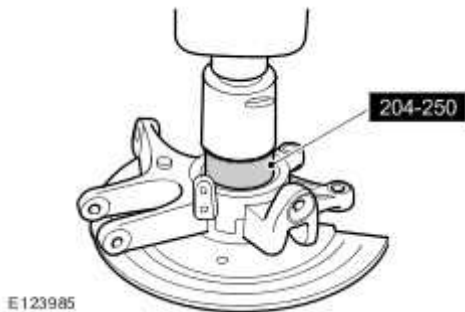
Installation

1

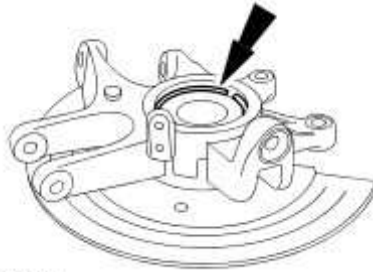


- CAUTION: The final tightening of the rear suspension components must be carried out with the vehicle on its wheels.

Using the special tools, install the bearing to the wheel knuckle.

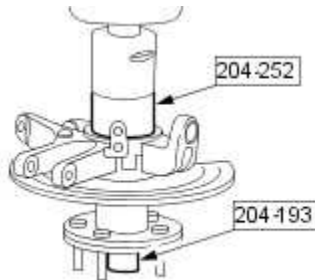


2 . Install the circlip.



VUJ0000399

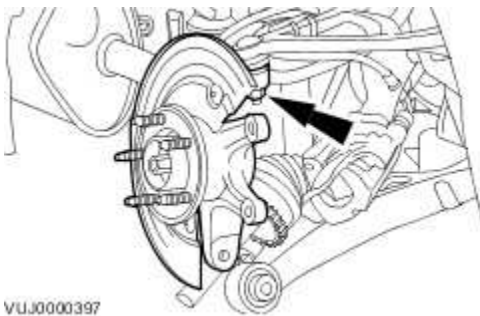
3 . Using the special tools, install the wheel hub to the bearing.



VUJ0001486

4 . Install the wheel knuckle assembly.

► Tighten to 90 Nm.



VUJ0000397

5 **NOTE:**

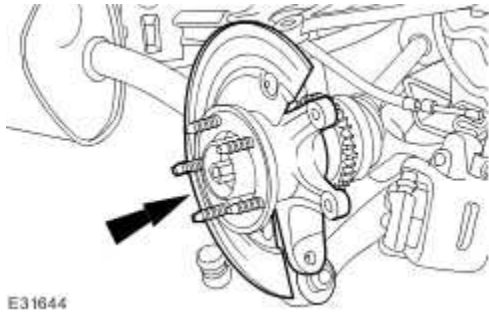
Using the old wheel hub nut tighten to 150 Nm.

NOTE:

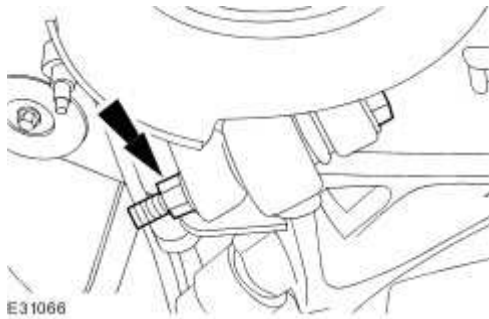
Remove and discard the old wheel hub nut, install a new wheel hub nut tighten to 150

Nm.

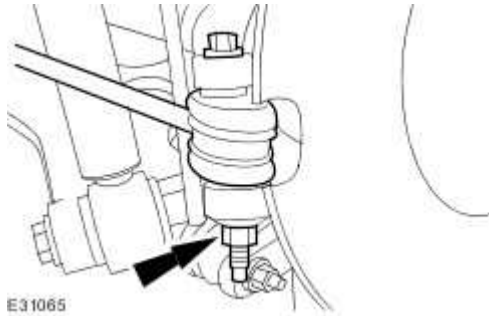
Attach the wheel knuckle to the halfshaft.



6 . Install the lower arm to the wheel knuckle.

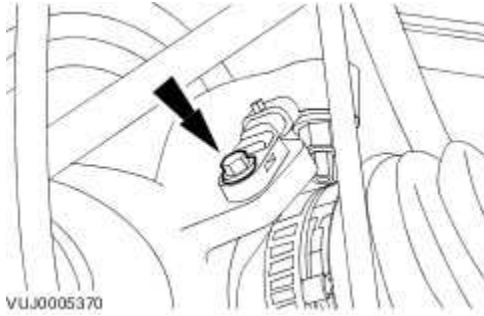


7 . Install the outer tie rod retaining bolt.



8 . Install the ABS sensor.

► Tighten to 10 Nm.



9 Install the brake disc.

. For additional information, refer to

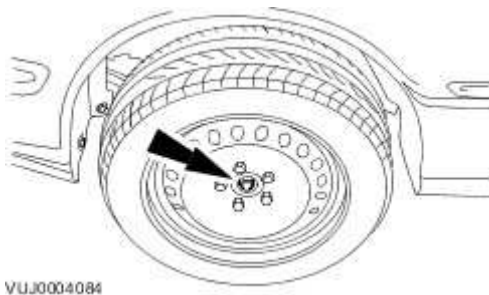
For additional information, refer to

For additional information, refer to [Brake Disc - Vehicles With: High Performance Brakes, VIN Range: G00442->G45703 \(70.10.10\)](#)

For additional information, refer to [Brake Disc - Vehicles With: High Performance Brakes, VIN Range: G45704->G99999 \(70.10.10\)](#)

10 . Tighten the wheel hub nut.

▶ Tighten to 300 Nm.

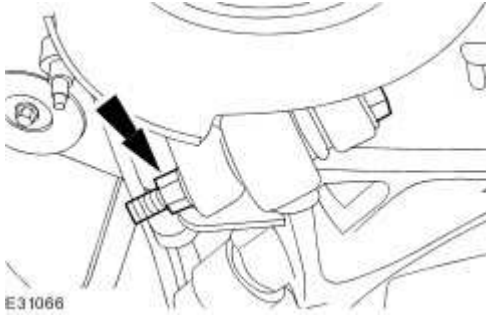


11



. **CAUTION:** The final tightening of the rear suspension components must be carried out with the vehicle on its wheels.

Tighten to 150 Nm.

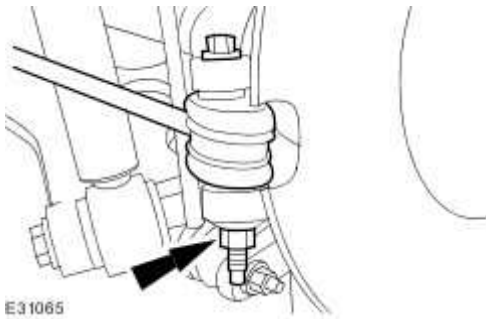


12



CAUTION: The final tightening of the rear suspension components must be carried out with the vehicle on its wheels.

Tighten to 55 Nm.



204-04 : Wheels and Tires

Specifications

Specifications

US/Canada Tire Pressures

Wheel Size	Tire Size & Type	For Speeds up to 160 Km/h (100 miles/h) All Load Conditions		For Speeds over 160 Km/h (100 miles/h) All Load Conditions	
		Front	Rear	Front	Rear
17 inch	235/55R17 99H Continental	1.90 bar (28 lbf/in ²)	2.10 bar (30 lbf/in ²)	2.10 bar (30 lbf/in ²)	2.20 bar (32 lbf/in ²)
18 inch	235/50R18 97H Continental Conti Touring Contact CH95 or Michelin Pilot HX MXM4	1.90 bar (28 lbf/in ²)	2.10 bar (30 lbf/in ²)	2.10 bar (30 lbf/in ²)	2.20 bar (32 lbf/in ²)
19 inch	255/40R19 96 or 100Y Pirelli P-Zero	1.90 bar (28 lbf/in ²)	2.10 bar (30 lbf/in ²)	2.20 bar (32 lbf/in ²)	2.30 bar (34 lbf/in ²)
20 inch	255/35R20 97Y Michelin Pilot Sport	2.20 bar (32 lbf/in ²)	2.30 bar (34 lbf/in ²)	2.30 bar (34 lbf/in ²)	2.50 bar (36 lbf/in ²)
18 inch (temporary use spare wheel) Up to 80 km/h (50 mph)	135/80R 18	4.2 bar (60lbf/in ²)		—	

Out-Side North America (OSNA) Tire Pressures

NOTE:

Not including other markets.

Wheel Size	Tire Size & Type	For Speeds up to 160 Km/h (100 miles/h) All Load Conditions		For Speeds over 160 Km/h (100 miles/h) All Load Conditions	
		Front	Rear	Front	Rear
17 inch	235/55R17 99W Continental	1.90 bar (28 lbf/in ²)	2.10 bar (30 lbf/in ²)	2.20 bar (32 lbf/in ²)	2.30 bar (34 lbf/in ²)
18 inch	235/50R18 97W Pirelli P6000	1.90 bar (28 lbf/in ²)	2.10 bar (30 lbf/in ²)	2.50 bar (36 lbf/in ²)	2.60 bar (38 lbf/in ²)

19 inch	255/40R19 96 or 100Y Pirelli P-Zero	1.90 bar (28 lbf/in ²)	2.10 bar (30 lbf/in ²)	2.20 bar (32 lbf/in ²)	2.30 bar (34 lbf/in ²)
20 inch	255/35R20 97Y Michelin Pilot Sport	2.20 bar (32 lbf/in ²)	2.30 bar (34 lbf/in ²)	2.30 bar (34 lbf/in ²)	2.50 bar (36 lbf/in ²)
18 inch (temporary use spare wheel) Up to 80 km/h (50 mph)	135/80R 18	4.2 bar (60lbf/in ²)		—	

Other Markets Tire Pressures

NOTE:

Other markets includes: Russia, Estonia, Argentina, Brazil, Chile, Dominican Republic, Panama, Morroco, Phillippines and Sri Lanka.

Wheel Size	Tire Size & Type	Front at all Speeds	Rear at all Speeds
18 inch	235/50R18 97W Pirelli P6000	2.50 bar (36 lbf/in ²)	2.60 bar (38 lbf/in ²)
19 inch	255/40R19 96 or 100Y Pirelli P-Zero	2.20 bar (32 lbf/in ²)	2.30 bar (34 lbf/in ²)
20 inch	255/35R20 97Y Michelin Pilot Sport	2.30 bar (34 lbf/in ²)	2.50 bar (36 lbf/in ²)
18 inch (temporary use spare wheel) Up to 80 km/h (50 mph)	135/80R 18	4.2 bar (60lbf/in ²)	

Torque Specifications

Description	Nm	lb/ft	lb/in
Wheel nuts	125	92	-

Wheel Specification

Wheel Type	Wheel Size
Ten spoke alloy	7.5 x 17
Eleven spoke alloy	7.5 x 17
Nineteen spoke alloy	8 x 18
Eight spoke alloy	8 x 18
Double seven spoke alloy	8 x 18
Twenty spoke alloy	8 x 18

Double five spoke alloy	8.5 x 19
Sport five spoke alloy	8.5 x 19

Tire Specification (winter)

Tire Manufacturer	Tire Size
Continental	235/55R17 103 V
Continental	235/50R18 101 V
Pirelli	235/50R18 101 V

Tire Specification (all seasons)

Tire Manufacturer	Tire Size
Continental	235/55R17 99 H
Continental or Michelin	235/50R18 97 H

Tire Specification (summer)

Tire Manufacturer	Tire Size
Continental	235/55R17 99 W
Pirelli	235/50R18 97 W
Pirelli	255/40R19 96 or 100 Y

Specifications

US/Canada Tire Pressures

Wheel Size	Tire Size & Type	For Speeds up to 160 Km/h (100 miles/h) All Load Conditions		For Speeds over 160 Km/h (100 miles/h) All Load Conditions	
		Front	Rear	Front	Rear
18 inch	235/50R18 97 H Continental Conti Touring Contact CH95 or Michelin Pilot HX MXM4	1.90 bar (28 lbf/in ²)	2.10 bar (30 lbf/in ²)	2.10 bar (30 lbf/in ²)	2.20 bar (32 lbf/in ²)
19 inch	255/40R19 96 Y Pirelli P-Zero	1.90 bar (28 lbf/in ²)	2.10 bar (30 lbf/in ²)	2.20 bar (32 lbf/in ²)	2.30 bar (34 lbf/in ²)
20 inch	255/35R20 97 Y Michelin Pilot Sport	2.20 bar (32 lbf/in ²)	2.30 bar (34 lbf/in ²)	2.30 bar (34 lbf/in ²)	2.50 bar (36 lbf/in ²)
20 inch	255/35ZR20 97 Y Dunlop SP Sport 01	2.20 bar (32 lbf/in ²)	2.30 bar (34 lbf/in ²)	2.30 bar (34 lbf/in ²)	2.50 bar (36 lbf/in ²)
18 inch (temporary use spare wheel) Up to 80 km/h (50 mph)	135/80R18	4.2 bar (60 lbf/in ²)		—	

Out-Side North America (OSNA) Tire Pressures

NOTE:

OSNA markets includes: Russia, Estonia, Argentina, Brazil, Chile, Dominican Republic, Panama, Morocco, Philippines and Sri Lanka.

Wheel Size	Tire Size & Type	Front at all Speeds	Rear at all Speeds
18 inch	235/50R18 97 W Pirelli P6000	2.50 bar (36 lbf/in ²)	2.60 bar (38 lbf/in ²)
19 inch	255/40R19 96 Y Pirelli P-Zero	2.20 bar (32 lbf/in ²)	2.30 bar (34 lbf/in ²)
20 inch	255/35R20 97 Y Michelin Pilot Sport	2.30 bar (34 lbf/in ²)	2.50 bar (36 lbf/in ²)
20 inch	255/35ZR20 97 Y Dunlop SP Sport 01	2.30 bar (34 lbf/in ²)	2.50 bar (36 lbf/in ²)
18 inch (temporary use spare wheel) Up to 80 km/h (50 mph)	135/80R18	4.2 bar (60 lbf/in ²)	

All Other Markets Tire Pressures

Wheel Size	Tire Size & Type	For Speeds up to 160 Km/h (100 miles/h) All Load Conditions		For Speeds over 160 Km/h (100 miles/h) All Load Conditions	
		Front	Rear	Front	Rear
18 inch	235/50R18 97 W Pirelli P6000	1.90 bar (28 lbf/in ²)	2.10 bar (30 lbf/in ²)	2.50 bar (36 lbf/in ²)	2.60 bar (38 lbf/in ²)
19 inch	255/40R19 96 Y Pirelli P-Zero	1.90 bar (28 lbf/in ²)	2.10 bar (30 lbf/in ²)	2.20 bar (32 lbf/in ²)	2.30 bar (34 lbf/in ²)
20 inch	255/35R20 97 Y Michelin Pilot Sport	2.20 bar (32 lbf/in ²)	2.30 bar (34 lbf/in ²)	2.30 bar (34 lbf/in ²)	2.50 bar (36 lbf/in ²)
20 inch	255/35ZR20 97 Y Dunlop SP Sport 01	2.20 bar (32 lbf/in ²)	2.30 bar (34 lbf/in ²)	2.30 bar (34 lbf/in ²)	2.50 bar (36 lbf/in ²)
18 inch (temporary use spare wheel) Up to 80 km/h (50 mph)	135/80R18	4.2 bar (60 lbf/in ²)		—	

Torque Specifications

Description	Nm	lb/ft	lb/in
Wheel nuts	125	92	-

Wheel Specification

Wheel Type	Wheel Size
Luxury alloy	8 x 18
Dynamic alloy	8 x 18
Rapier alloy	8 x 18
Tucana alloy	8 x 18
Custom alloy	8.5 x 19
Sabre alloy	8.5 x 19
Sepang alloy	9 x 20
Callisto alloy	9 x 20

Tire Specification (winter)

Tire Manufacturer	Tire Size
Continental	235/50R18 101 V
Pirelli	235/50R18 101 V

Tire Specification (all seasons)

Tire Manufacturer	Tire Size
Continental or Michelin	235/50R18 97 H

Tire Specification (summer)

Tire Manufacturer	Tire Size
Pirelli	235/50R18 97 W
Pirelli	255/40R19 96 Y
Michelin or Dunlop	255/35ZR20 97 Y

Specifications

US/Canada Tire Pressures

Wheel Size	Tire Size & Type	Front at all Speeds	Rear at all Speeds
18 inch	235/50R18 97 H Continental Conti Touring Contact CH95 or Michelin Pilot HX MXM4	2.10 bar (30 lbf/in ²)	2.20 bar (32 lbf/in ²)
19 inch	255/40R19 96 Y Pirelli P-Zero	2.20 bar (32 lbf/in ²)	2.30 bar (34 lbf/in ²)
19 inch	255/40 R19 100V Pirelli P6 4 Seasons	2.20 bar (32 lbf/in ²)	2.30 bar (34 lbf/in ²)
20 inch	255/35R20 97 Y Michelin Pilot Sport	2.30 bar (34 lbf/in ²)	2.50 bar (36 lbf/in ²)
20 inch	255/35ZR20 97 Y Dunlop SP Sport 01	2.30 bar (34 lbf/in ²)	2.50 bar (36 lbf/in ²)
18 inch (temporary use spare wheel) Up to 80 km/h (50 mph)	135/80R18	4.2 bar (60 lbf/in ²)	

Out-Side North America (OSNA) Tire Pressures

NOTE:

OSNA markets includes: Russia, Estonia, Argentina, Brazil, Chile, Dominican Republic, Panama, Morocco, Philippines and Sri Lanka.

Wheel Size	Tire Size & Type	Front at all Speeds	Rear at all Speeds
18 inch	235/50R18 97 W Pirelli P6000	2.50 bar (36 lbf/in ²)	2.60 bar (38 lbf/in ²)
19 inch	255/40R19 96 Y Pirelli P-Zero	2.20 bar (32 lbf/in ²)	2.30 bar (34 lbf/in ²)
20 inch	255/35R20 97 Y Michelin Pilot Sport	2.30 bar (34 lbf/in ²)	2.50 bar (36 lbf/in ²)
20 inch	255/35ZR20 97 Y Dunlop SP Sport 01	2.30 bar (34 lbf/in ²)	2.50 bar (36 lbf/in ²)
18 inch (temporary use spare wheel) Up to 80 km/h (50 mph)	135/80R18	4.2 bar (60 lbf/in ²)	

All Other Markets Tire Pressures

Wheel Size	Tire Size & Type	For Speeds up to 160 Km/h (100 miles/h) All Load Conditions		For Speeds over 160 Km/h (100 miles/h) All Load Conditions	
		Front	Rear	Front	Rear
18 inch (Petrol)	235/50R18 97 W Pirelli P6000	1.90 bar (28 lbf/in ²)	2.10 bar (30 lbf/in ²)	2.50 bar (36 lbf/in ²)	2.60 bar (38 lbf/in ²)
18 inch (Diesel)	235/50R18 97 W Pirelli P6000	2.10 bar (30 lbf/in ²)	2.10 bar (30 lbf/in ²)	2.50 bar (36 lbf/in ²)	2.60 bar (38 lbf/in ²)
19 inch	255/40R19 96 Y Pirelli P-Zero	1.90 bar (28 lbf/in ²)	2.10 bar (30 lbf/in ²)	2.20 bar (32 lbf/in ²)	2.30 bar (34 lbf/in ²)
20 inch	255/35R20 97 Y Michelin Pilot Sport	2.20 bar (32 lbf/in ²)	2.30 bar (34 lbf/in ²)	2.30 bar (34 lbf/in ²)	2.50 bar (36 lbf/in ²)
20 inch	255/35ZR20 97 Y Dunlop SP Sport 01	2.20 bar (32 lbf/in ²)	2.30 bar (34 lbf/in ²)	2.30 bar (34 lbf/in ²)	2.50 bar (36 lbf/in ²)
18 inch (temporary use spare wheel) Up to 80 km/h (50 mph)	135/80R18	4.2 bar (60 lbf/in ²)		—	

Torque Specifications

Description	Nm	lb/ft	lb/in
Wheel nuts	125	92	-

Wheel Specification

Wheel Type	Wheel Size
Tucana	8 x 18
Carelia	8.5 x 19
Polaris	8.5 x 19
Sabre	8.5 x 19
Sabre chrome	8.5 x 19
Vela	8.5 x 19
Sepang	9 x 20
Concept 8 (Callisto)	9 x 20
Cremona	9 x 20
Callisto	9 x 20

Tire Specification (all seasons)

Tire Manufacturer	Tire Size
Continental Pro Contact	235/50 R18 97H
Michelin Pilot HX MXM4	235/50 R18 97H
Pirelli P6 4 Seasons	255/40 R19 100V
Dunlop SP Sport 01	255/35 ZR20 97Y

Tire Specification (summer)

Tire Manufacturer	Tire Size
Pirelli P6000 Powergy	235/50 R18 97W
Continental Premium Contact 2	235/50 R18 97W
Pirelli P-Zero	255/40 R19 100V

Tire Specification (spare)

Tire Manufacturer	Tire Size
Pirelli Temp Spare	135/80 R18 104M

Wheels and Tires - VIN Range: G00442- >G45703



WARNING: Do not mix different types of tires on the same vehicle such as radial, bias or bias belted tires except in emergencies (temporary spare usage). Failure to follow these instructions may result in personal injury.



WARNING: Never run the engine with one wheel off the ground, for example when changing a wheel. The wheel resting on the ground may cause the vehicle to move. Failure to follow these instructions may result in personal injury.



WARNING: Aftermarket aerosol tire sealants are extremely flammable. Always question the customer to make sure these products have not been used. Failure to follow these instructions may result in personal injury.



WARNING: Always wear safety goggles or a face shield when performing any work with wheel and tire assemblies. Failure to follow these instructions may result in personal injury.



WARNING: Retighten the wheel nuts at 800 km (500 miles) after any wheel change or anytime the wheel nuts are loosened. Failure to follow these instructions may result in personal injury.



WARNING: Failure to retighten the wheel nuts at the specified mileage could cause the wheels to become detached while the vehicle is in motion. Failure to follow these instructions may result in personal injury.



WARNING: Each individual axle, wheel and tire has its own maximum weight or tire inflation rating. Do not overload or over-inflate beyond the capacity of the lowest rated components of the system. Failure to follow these instructions may result in personal injury.



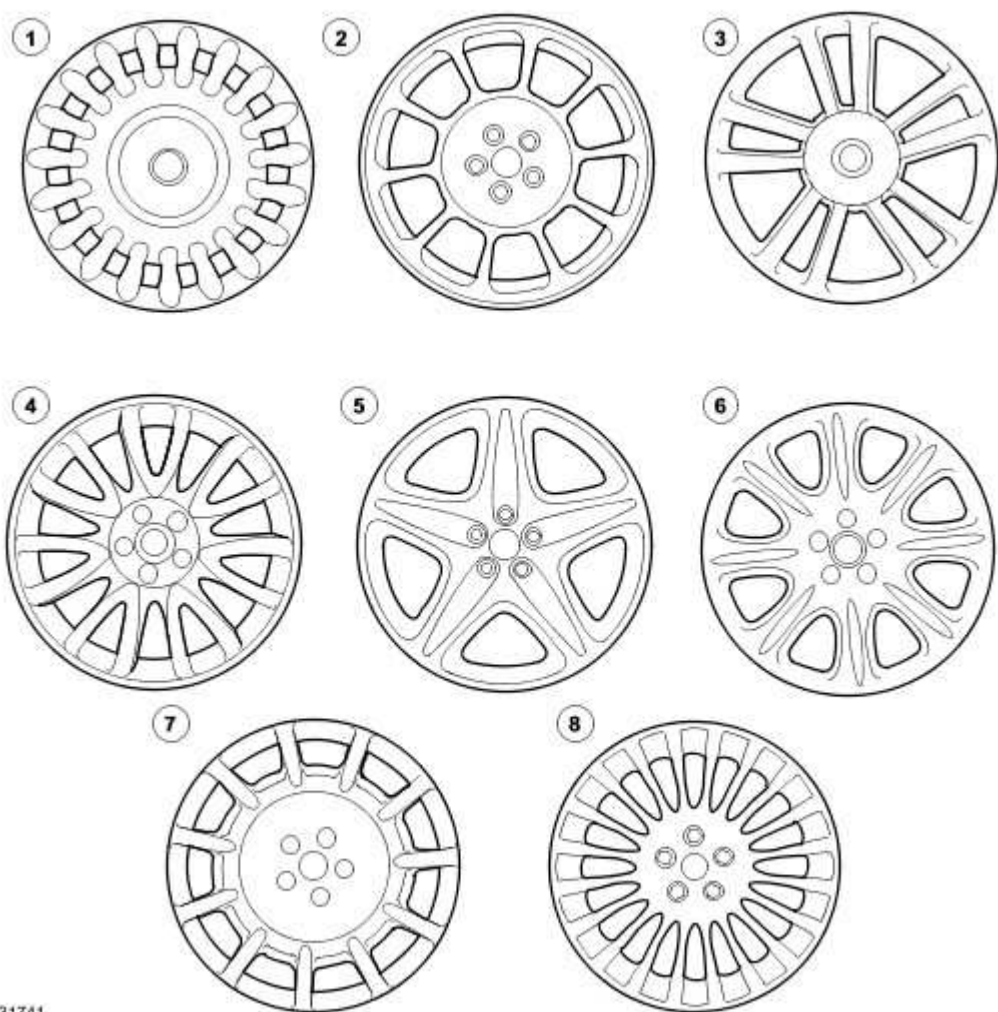
WARNING: When changing a wheel, make sure that the vehicle cannot move. Always apply the parking brake and select the transmission park position. Failure to follow these instructions may result in personal injury.



WARNING: Reduce air pressure as much as possible by pushing the valve core plunger in before removing the valve core. Failure to follow these instructions may result in personal injury.

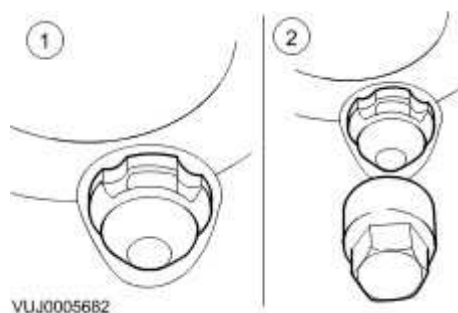


CAUTION: Do not clean aluminium wheels with steel wool, abrasive type cleaners or detergents. Failure to follow these instructions may result in damage to the vehicle.



E31741

Item	Part Number	Description
1	-	Nineteen spoke alloy
2	-	Ten spoke alloy
3	-	Double five spoke alloy
4	-	Double seven spoke alloy
5	-	Sport five spoke alloy
6	-	Eight spoke alloy
7	-	Eleven spoke alloy
8		Twenty spoke alloy



Item	Part Number	Description
1	-	Locking wheel nut
2	-	Locking wheel nut socket

Locking Wheel Nuts

Locking wheel nuts are fitted to certain markets and are available as an accessory in other markets.

One locking wheel nut is fitted to each road wheel and may only be removed by using the correctly coded socket.

Locking wheel nuts are available in one length. The correct socket is supplied with the vehicle tool kit. Sets of sockets are available to Jaguar dealers.

Recommended Tires

The radial ply tires recommended by Jaguar meet the high speed performance of the vehicle. Only tires of identical specification may be fitted as replacements. Under no circumstances must cross-ply tires be fitted.

Tire Inflation Pressures

All recommended tires, including winter tires, must be inflated to the pressures shown in the Specifications sub-section. Inflation pressures must only be checked when the tires are cold.

Tire Replacement and Wheel-Interchanging

When the replacement of a tire is necessary, it is preferable to fit a complete set. If two replacement tires are fitted (to one axle), they must be of the same manufacturer and type as those on the other axle.

New tires must be balanced before fitting to the vehicle.

Winter (Snow) Tires

Winter tires must only be fitted in complete four-wheel sets of the same type and size. The maximum speed with winter tires fitted (without snow chains) is 210 km/h (131 mile/h) for H rated tires or 240

km/h (149 mile/h) for V rated tires.

When using snow chains, note that:

- Snow chains must only be fitted to the rear wheels.
- Only Jaguar snow chains should be used.
- Snow chains must not be used on roads which are clear of snow.
- The maximum speed with winter tires and snow chains fitted is 48 km/h (30 mile/h).
- Traction control (where fitted) must be switched OFF when using snow chains.

Rotational Indicators

Some recommended winter tires may have an arrow moulded in the sidewall to indicate the correct direction of rotation. It is essential tires are fitted so that the arrow is pointing in the direction of rotation.

Some of the recommended tires for normal and winter use have an asymmetric tread pattern. These tires have inside and outside markers which should be fitted appropriately to the wheel.

Temporary-Use Spare Wheel

In certain markets, the spare wheel supplied with the vehicle is of the temporary-use type. It is narrower than the normal road wheel and takes up less room in the wheel luggage compartment.

When using this type of spare wheel note that:

- Maximum speed must not exceed 80 km/h (50 mile/h).
- The normal road wheel must be replaced as soon as possible.
- Only one temporary-use wheel may be fitted to the vehicle at any time.
- Traction control (where fitted) must be switched OFF.

Tread Wear Indicator

Tread wear indicators are molded into the bottom of the tread grooves across the width of the tire. The tire must be renewed when tread wear indicators become visible at the surface of the tread, in two or more adjacent tread grooves.

Note that tire tread depth and condition must comply with prevailing local legislation.

Wheels and Tires - VIN Range: G45704- >H18679



WARNING: Do not mix different types of tires on the same vehicle such as radial, bias or bias belted tires except in emergencies (temporary spare usage). Failure to follow these instructions may result in personal injury.



WARNING: Never run the engine with one wheel off the ground, for example when changing a wheel. The wheel resting on the ground may cause the vehicle to move. Failure to follow these instructions may result in personal injury.



WARNING: Aftermarket aerosol tire sealants are extremely flammable. Always question the customer to make sure these products have not been used. Failure to follow these instructions may result in personal injury.



WARNING: Always wear safety goggles or a face shield when performing any work with wheel and tire assemblies. Failure to follow these instructions may result in personal injury.



WARNING: Tighten the wheel nuts at 800 km (500 miles) after any wheel change or anytime the wheel nuts are loosened. Failure to follow these instructions may result in personal injury.



WARNING: Failure to tighten the wheel nuts at the specified mileage could cause the wheels to become detached while the vehicle is in motion. Failure to follow these instructions may result in personal injury.



WARNING: Each individual axle, wheel and tire has its own maximum weight or tire inflation rating. Do not overload or over-inflate beyond the capacity of the lowest rated

components of the system. Failure to follow these instructions may result in personal injury.



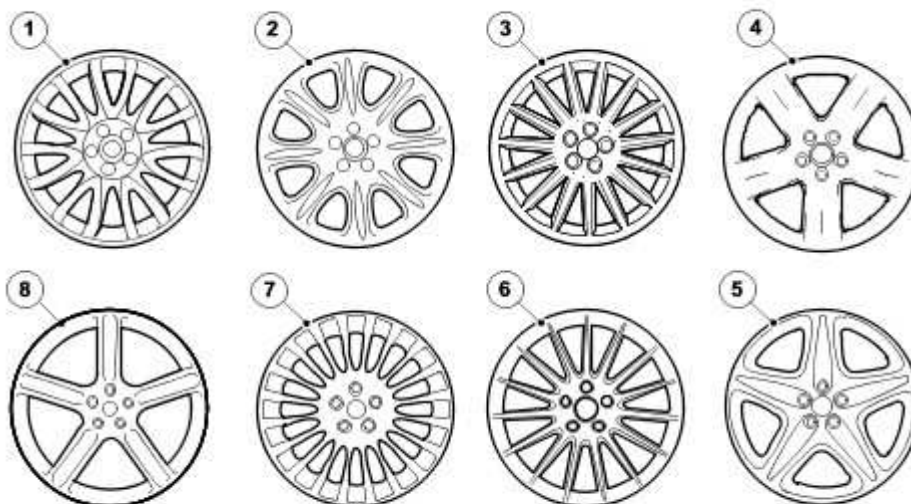
WARNING: When changing a wheel, make sure that the vehicle cannot move. Always apply the parking brake and select the transmission park position. Failure to follow these instructions may result in personal injury.



WARNING: Reduce air pressure as much as possible by pushing the valve core plunger in before removing the valve core. Failure to follow these instructions may result in personal injury.



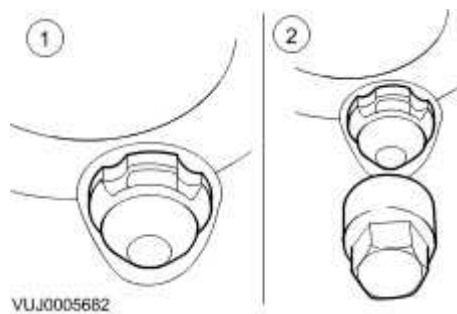
CAUTION: Do not clean aluminium wheels with steel wool, abrasive type cleaners or detergents. Failure to follow these instructions may result in damage to the vehicle.



E74104

Item	Part Number	Description
1	-	Luxury
2	-	Dynamic

3	-	Sepang
4	-	Rapier
5	-	Tucana
6	-	Custom (Crome option available in the US)
7	-	Sabre (Crome option available in the US)
8		Callisto



Item	Part Number	Description
1	-	Locking wheel nut
2	-	Locking wheel nut socket

Locking Wheel Nuts

Locking wheel nuts are fitted to certain markets and are available as an accessory in other markets.

One locking wheel nut is fitted to each road wheel and may only be removed by using the correctly coded socket.

Locking wheel nuts are available in one length. The correct socket is supplied with the vehicle tool kit. Sets of sockets are available to Jaguar dealers.

Recommended Tires

The radial ply tires recommended by Jaguar meet the high speed performance of the vehicle. Only tires of identical specification may be fitted as replacements. Under no circumstances must cross-ply tires be fitted.

Tire Inflation Pressures

All recommended tires, including winter tires, must be inflated to the pressures shown in the specifications. For additional information, refer to [Specifications - VIN Range: G45704->G99999](#) (204-04 Wheels and Tires)

Tire Replacement and Wheel-Interchanging

When the replacement of a tire is necessary, it is preferable to fit an axle set. If two replacement tires are fitted (to one axle), they must be of the same manufacturer and type as those on the other axle.

New tires must be balanced before fitting to the vehicle.

Winter (Snow) Tires

Winter tires must only be fitted in complete four-wheel sets of the same type and size. The maximum speed with winter tires fitted (without snow chains) is 210 km/h (131 miles/h) for H rated tires or 240 km/h (149 miles/h) for V rated tires.

When using snow chains, note that:

- Snow chains must only be fitted to the rear wheels
- Only Jaguar snow chains should be used
- Snow chains must not be used on roads which are clear of snow
- The maximum speed with winter tires and snow chains fitted is 48 km/h (30 miles/h)
- Traction control (where fitted) must be switched OFF when using snow chains.

Rotational Indicators

Some recommended winter tires may have an arrow moulded in the sidewall to indicate the correct direction of rotation. It is essential tires are fitted so that the arrow is pointing in the direction of rotation.

Some of the recommended tires for normal and winter use have an asymmetric tread pattern. These tires have inside and outside markers which should be fitted correctly to the wheel.

Temporary-Use Spare Wheel

In certain markets, the spare wheel supplied with the vehicle is of the temporary-use type. It is narrower than the normal road wheel and takes up less room in the luggage compartment.

When using this type of spare wheel note that:

- Maximum speed must not exceed 80 km/h (50 miles/h)
- The normal road wheel must be replaced as soon as possible
- Only one temporary-use wheel may be fitted to the vehicle at any time
- Traction control (where fitted) must be switched OFF.

Tread Wear Indicator

Tread wear indicators are molded into the bottom of the tread grooves across the width of the tire. The tire must be renewed when tread wear indicators become visible at the surface of the tread, in two or more adjacent tread grooves.

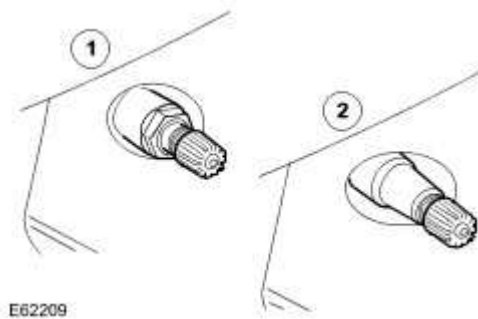
Note that tire tread depth and condition must comply with specific market legislations.

Tire Changing

Caution: When removing or installing a new tire care must be taken to make sure that the tire low pressure sensor is not damaged. Make sure the tire bead is broken from the wheel rim 180 degrees from the tire low pressure sensor. Failure to follow this instruction may cause damage to the tire low pressure sensor.

Tire Pressure Monitoring

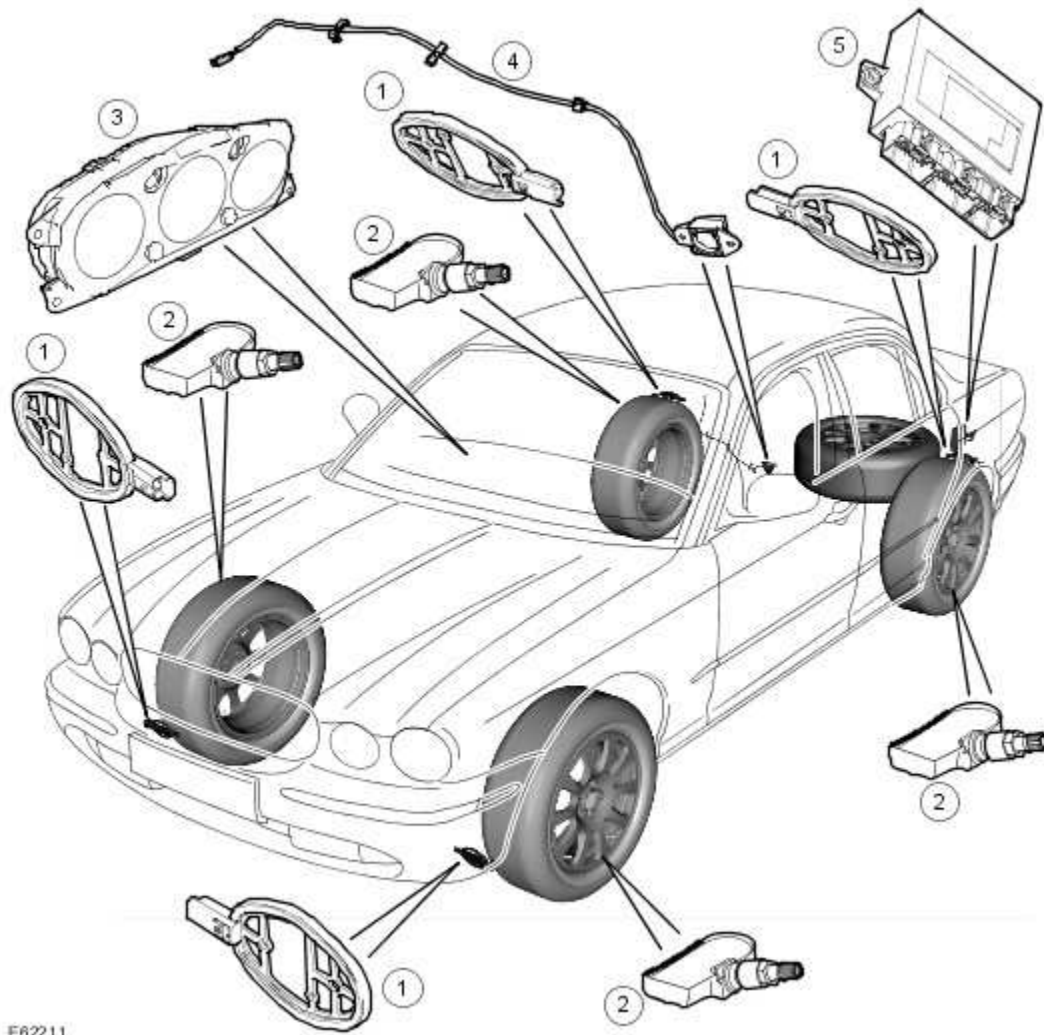
Visual Identification



Wheels fitted with the tire low pressure sensor can be visually identified by the external metal lock nut and valve (1). All Jaguar non-tire pressure monitoring system wheels have a rubber valve fitted (2).

The tire pressure monitoring system monitors pressure in each tire including the full size spare tire (temporary-use spare wheels are not fitted with tire low pressure sensors and are consequently not monitored).

Tire Pressure Monitoring System - Component Location



E62211

Item	Part Number	Description
1		Tire pressure monitoring system antenna
2		Tire low pressure sensor
3		Instrument cluster
4		External antenna
5		Tire pressure monitoring system module

The purpose of the tire pressure monitoring system is to assist the driver in maintaining the vehicle's tire pressures at the optimum level in order to:

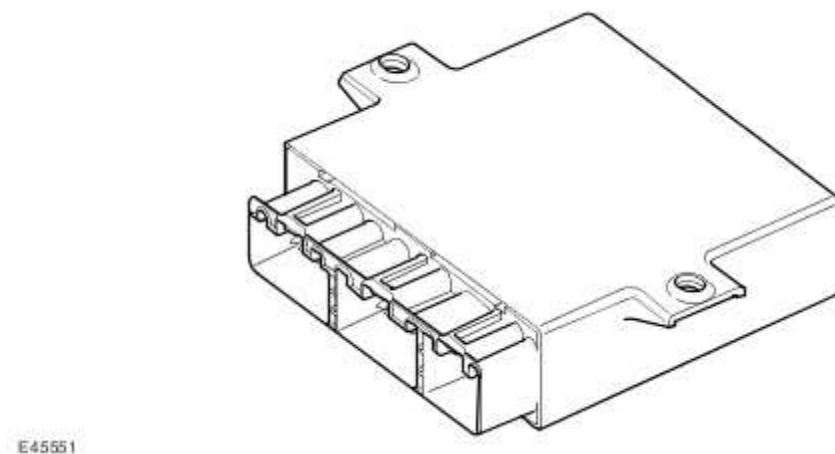
- improve fuel consumption

- maintain ride and handling characteristics
- reduce the risk of rapid tire deflation – which may be caused by under inflated tires
- comply with legislation in specific markets.

The tire pressure monitoring system measures the pressure in each of the tires on the vehicle and issues warnings to the driver if any of the pressures deviate from a defined tolerance, which is dependant on the vehicle market and the size and type of tire fitted.

Note: During a **blow out** a very rapid reduction in tire pressure is experienced. The system is not intended to warn the driver of a **blow out**, since it is not possible to give the driver sufficient warning that such an event is occurring, due to its short duration. The design of the tire pressure monitoring system is to assist the driver in keeping the tires at the correct pressure, which may to reduce the likelihood of a tire **blow out** occurring.

Tire Pressure Monitoring System Module



The tire pressure monitoring system module is located with the parking aid module in the luggage compartment of the vehicle.

The tire pressure monitoring system module's main function is to detect the following:

- the tire pressure is below the recommended low tolerance value – under inflated tire
- the position of the tire on the vehicle.

The tire pressure monitoring system module communicates with the vehicle instrument cluster to provide the driver with appropriate warnings and also indicates the status/failure of tire pressure monitoring system components.

Tire Location

Because of the requirement for different pressure targets and thresholds for the front and rear tires, the tire pressure monitoring system module can identify the position of the tires on the vehicle, and assign a received tire pressure sensor identification to a specific position on the vehicle (i.e. FL (front left), FR (front right), RL (rear left) or RR (rear right)).

Tire location is performed automatically by the module using an auto-location function. This function requires no manual intervention by the driver. The tire pressure monitoring system module can automatically learn the position of tires on the vehicle if the tire pressure sensors or their positions are changed on the vehicle.

The tire pressure monitoring system module can automatically detect, under normal conditions, the following:

- one or more tire pressure sensors have been replaced
- one or more tire pressure sensor identifications are missing
- one or more 'alien' identifications are being received, i.e. the module can reject identifications from tire pressure sensors that do not belong to the vehicle
- the spare tire and one of the tires in use on the vehicle have exchanged position on the vehicle.

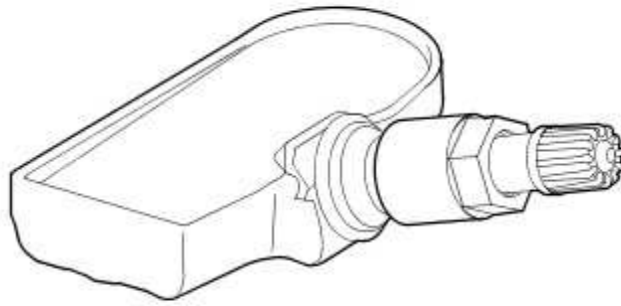
Spare Tire Identification

Depending on the vehicle specification, the spare tire may or may not be fitted with a tire pressure sensor. Temporary-use spare wheels are not fitted with sensors and are consequently not monitored.

If the spare tire is fitted with a tire pressure sensor, the tire pressure monitoring system module can detect it, determine that it is the spare tire and monitor its pressure and issue warnings to the driver accordingly. If the tire pressure monitoring system module does not detect a spare tire pressure sensor, the tire pressure monitoring system module will not show a fault to the driver, however a fault code will be stored in the tire pressure monitoring system module.

If the spare tire is being monitored and the driver replaces a flat road tire with the spare tire, the tire pressure monitoring system module will not continually warn the driver that the original flat tire (now in the spare position) is flat. This prevents distraction of the driver by constant pressure warnings being issued. Warnings will only be displayed for 20 seconds after the ignition is switched on.

Tire Low Pressure Sensor



E45553

The tire pressure monitoring system uses 'active' tire low pressure sensors which are mounted on each wheel, inside the tire cavity. The sensor is retained in position by the valve attachment to the wheel. The tire low pressure sensors transmit their Radio Frequency (RF) signals at either 315 MHz or 433 MHz dependent on market requirements.

The tire low pressure sensor periodically measure the pressure and temperature of the air inside the tire. Pressure and temperature measurements are transmitted periodically to the external RF antenna on the vehicle.

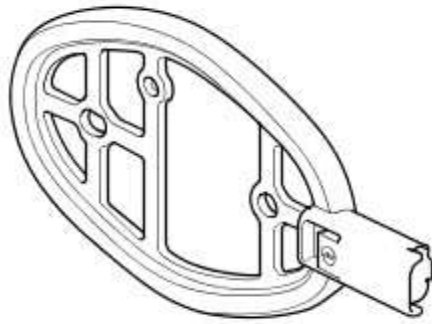
The tire low pressure sensors are self-contained units which have no electrical connections into or out of the tire low pressure sensor.

The care points detailed in 'Tire Changing' must be followed to avoid damage to the tire low pressure sensor. If the tire low pressure sensor is removed, the nut, valve core, cap, seal and washer must also be replaced and the tire low pressure sensor tightened to the correct torque value. It is also recommended that the nut, valve core, cap, seal and washer are replaced at every tire change.

The RF transmission from the tire low pressure sensor contains a unique identification code in its transmission data, so that the tire pressure monitoring system module can identify the tire on the vehicle. If the tire low pressure sensor is replaced on a road wheel, the new sensor identification will be learnt when the vehicle is first driven at a speed of more than 20 km/h (12.5 miles/h) for 15 minutes. If a new tire low pressure sensor is fitted to the spare wheel, the identification for that tire low pressure sensor must be programmed into the tire pressure monitoring system module using a Jaguar approved diagnostic tool or that wheel will not be monitored. The code is provided on a label with the complete wheel and tire assembly when new and is also printed on the casing of each tire low pressure sensor.

In order to conserve battery power, the tire pressure monitoring system module uses different transmission rates when the wheel is stationary or moving. The wheel speed required to change between the stationary and moving transmission rates is approximately 20 kph (12.5 mile/h).

Antenna



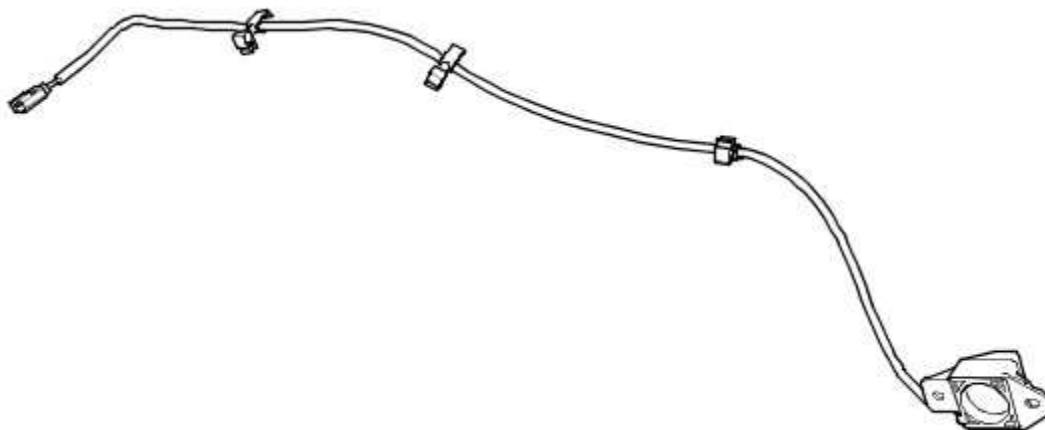
E45552

The antennas are located near the front of the front wheel arches, and the rear of the rear wheel arches. The tire pressure monitoring system has four antennas. Each antenna has a connector which connects with the body wiring harness.

The antenna is a passive, Low Frequency (LF) transmitter. Each antenna is controlled by the tire pressure monitoring system module and provides an auto-location feature to identify tire positions on the vehicle.

The tire pressure monitoring system module energizes each antenna in turn using LF drivers. The corresponding tire low pressure sensor detects the resulting LF transmission and modifies the mode status within the RF transmission. This data is received by the tire pressure monitoring system module through the external RF antenna. The tire pressure monitoring system module can then determine which sensor is transmitting and its location on the vehicle.

External Antenna



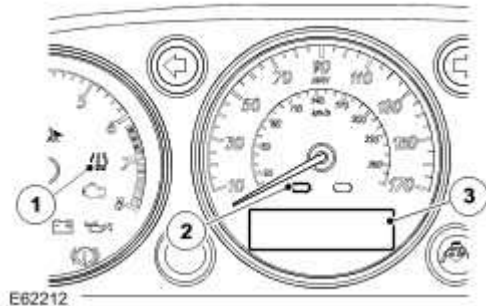
E62213

The tire pressure monitoring system external antenna is located at the rear of the vehicle and is mounted between the spare wheel well and rear subframe.

The unit receives tire pressure, temperature and acceleration readings from each tire and interfaces with the tire pressure monitoring system module. The tire pressure monitoring system module then transmits the appropriate messages to the instrument cluster.

The unit also receives further information from each tire pressure sensor concerning wheel identification, mode status and the condition of the tire pressure sensor battery.

Instrument Cluster Indications



Item	Part Number	Description
1		Low tire pressure warning indicator
2		Secondary amber warning indicator
3		Message center

Warnings are displayed by the low tire pressure warning indicator, the secondary amber warning indicator and a text message displayed in the message center.

The warning indicators are driven by controller area network (CAN) messages from the tire pressure monitoring system module. The warning indicators are illuminated by the instrument cluster software for three seconds when the ignition is switched to position II for a bulb check.

Note: If the vehicle is not fitted with the tire pressure monitoring system, the warning indicators will not illuminate at any time.

System Operation

The tire low pressure sensor transmits by RF (315 MHz or 433 MHz depending on market) signal. These signals contains data which corresponds to tire low pressure sensor identification, tire pressure, tire temperature, acceleration and tire low pressure sensor mode.

Each time the vehicle is driven, the tire pressure monitoring system module activates each LF antenna in turn. The corresponding tire low pressure sensor detects the LF signal and responds by modifying the mode status within the RF transmission.

The system enters 'parking mode' after the vehicle speed has been less than 20 km/h (12.5 miles/h) for 12 minutes. In parking mode the tire low pressure sensors transmit a coded signal to the tire pressure monitoring system module once every 13 hours. If the tire pressure decreases by more than 0.06 bar (1 lbf/in²) the tire low pressure sensor will transmit more often as pressure is lost.

The spare tire sensor transmits a signal every 13 hours in the same manner as the road wheels when in parking mode. If the tire pressure decreases by more than 0.06 bar (1 lbf/in²) the tire low pressure sensor will transmit more often as pressure is lost.

As each wheel responds to the LF signal from the tire pressure monitoring system module, it is assigned a position on the vehicle and is monitored for the remainder of that drive cycle in that position.

When the vehicle has been parked for more than 15 minutes and then driven at a speed of more than 20 km/h (12.5 miles/h), the antennas fire in turn for 6 seconds on all except North American specification vehicles or for 18 seconds on North American specification only vehicles in the following order:

- Front left
- Six second pause (for the tire pressure monitoring system module to detect a response from the tire low pressure sensor)
- Front right
- Six second pause
- Rear right
- Six second pause
- Rear left
- Six second pause

Each tire low pressure sensor responds in turn so the tire pressure monitoring system module can establish the tire low pressure sensor positions at the start of the drive cycle. This process is repeated up to three times but less if the tire low pressure sensor positions are already known in the tire pressure monitoring system module. This process is known as 'Auto Location' and takes three to four minutes on all except North American specification vehicles and seven to eight minutes on North American specification vehicles to complete. During this period the tire low pressure sensors transmit at regular intervals, once every 5 seconds on all except North American specification vehicles and once every 15 seconds on North American specification vehicles. For the remainder of the drive cycle the tire low pressure sensors transmit once every 60 seconds or if a change in tire pressure is sensed until the vehicle stops and the tire pressure monitoring system returns to parking mode.

Once the wheel position is established, the antennas stop firing and do not fire again until the vehicle has been parked for more than 15 minutes. The signal transmissions from each tire low pressure sensor continue at one minute intervals whilst the vehicle is being driven. This transmission is to monitor the tire pressure. The warning occurs at 25% deflation and comprises of message center amber secondary warning light, the low tire pressure warning indicator and an appropriate message

displayed in the instrument cluster message center. The message center will also display additional information about the position of the affected wheel(s).

Wheels and Tires - VIN Range: H18680- >H99999

OVERVIEW

A number of wheel and tire size combinations are available. A Tire Pressure Monitoring System (TPMS) is also available. The system monitors the pressure in each tire and informs the driver if the pressure falls below predetermined thresholds.

TIRES

Tires are available in a number of different sizes and tread patterns dependent on vehicle specification. Tire sizes are as follows:

- T135/80R18 (space saver wheel)
- 235/50R18 Front / Rear
- 255/40R19 Front / Rear
- 255/35R20 Front / Rear.

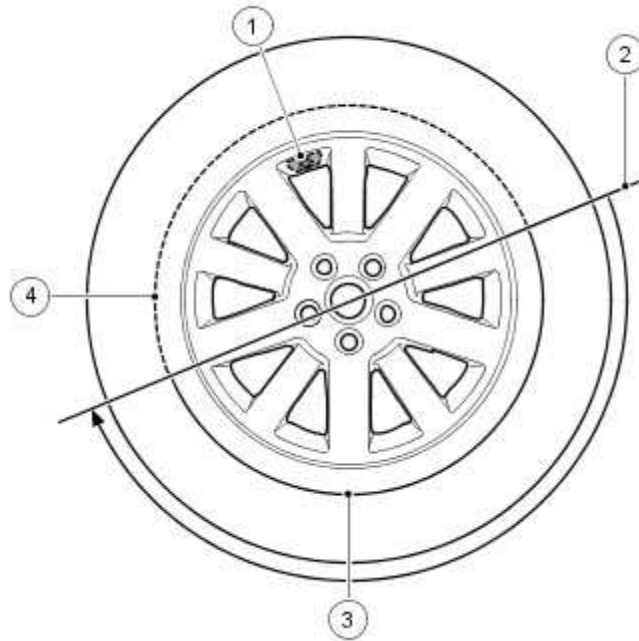


WARNING: Tires should be inflated to the recommended pressures (as given in the Owners Handbook) only when the tires are cold (ambient temperature). If the tires have been subjected to use or exposed to direct sunlight, move the vehicle into a shaded position and allow the tires to cool before checking/adjusting the pressures.

Tire Changing

On vehicles fitted with TPMS, care must be taken when removing and refitting tires to ensure that the tire pressure sensor is not damaged.

Vehicles fitted with TPMS can be visually identified by an external metal locknut and valve of the tire pressure sensor on the road wheels. Vehicles without TPMS will have rubber tire valve.



E45549

Item	Part Number	Description
1		Tire valve and pressure sensor
2		Tire fitting/removal tool initial start position
3		High tire and bead tension area
4		Low tire and bead tension area

When removing the tire, the bead breaker must not be used within 90° of the tire valve in each direction on each side of the tire.

When using the tire removal machine, the fitting arm start position must be positioned as shown in the tire changing illustration for each side of the tire. The wheel can then be rotated through 180 degrees in a clockwise direction. This will relieve tension from the tire bead allowing the remaining 180 degrees of the tire to be manually pulled from the rim.

When refitting the tire, position the fitting arm as shown. Rotate the tire and take care that the bead on the low tension side of the tire does not damage the sensor.

TREAD Act - North America Only

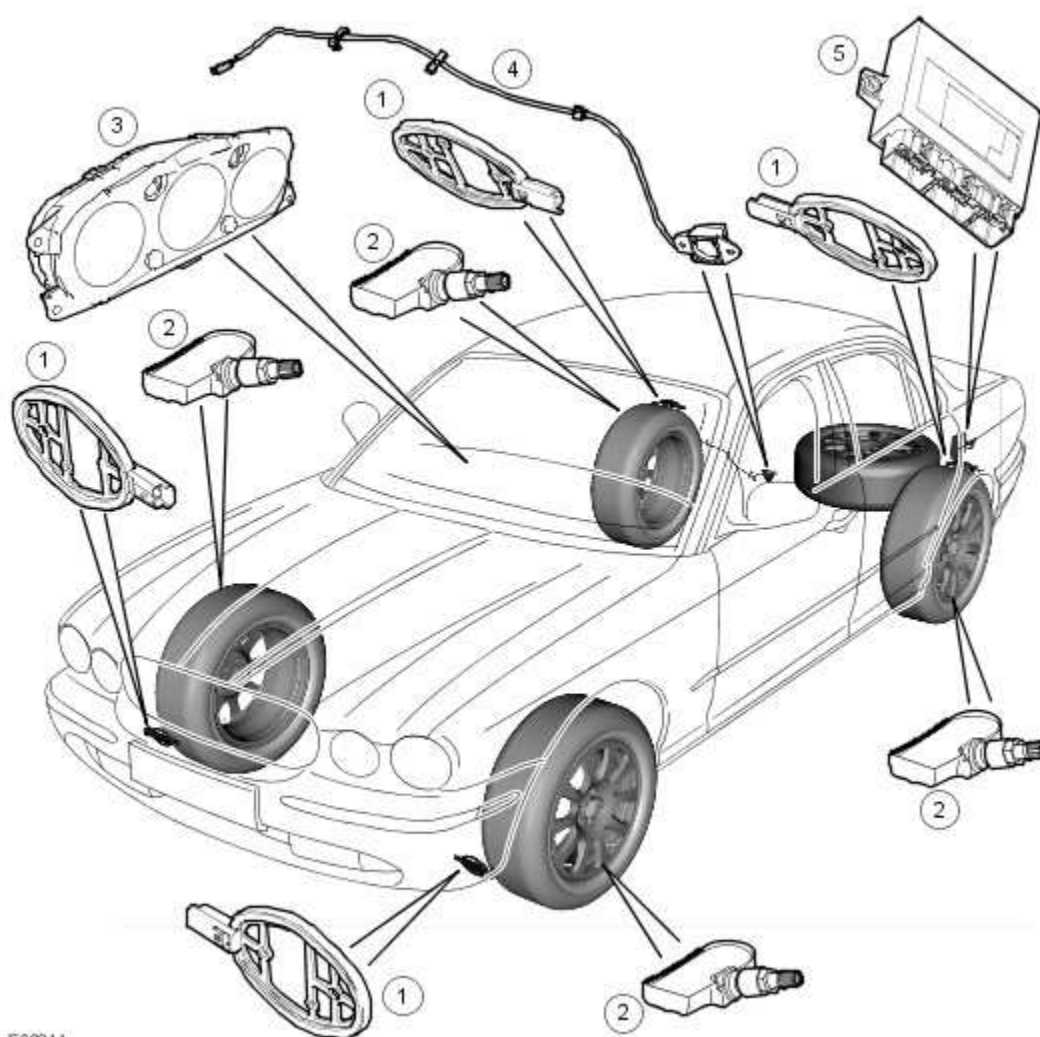
Vehicles supplied to the North American markets must comply with the legislation of the Transport Recall Enhancement, Accountability and Documentation (TREAD) act. Part of the requirement of the TREAD act is for the vehicle to display a label, positioned on the driver's side 'B' pillar, which defines

the recommended tire inflation pressure, load limits and maximum load of passengers and luggage weight the vehicle can safely carry. This label will be specific to each individual vehicle and will be installed on the production line.

This label must not be removed from the vehicle. The label information will only define the specification of the vehicle as it came off the production line. It will not include dealer or owner fitted accessory wheels and tires of differing size from the original fitment.

If the label is damaged or removed for body repair, it must be replaced with a new label specific to that vehicle. A new label is requested from Jaguar parts and will be printed specifically for the supplied VIN (vehicle identification number) of the vehicle.

TIRE PRESSURE MONITORING SYSTEM COMPONENT LOCATION



E62211

Item	Part Number	Description
1		Initiator (4 off)

2		Tire pressure sensor (5 off)
3		Instrument cluster
4		Radio Frequency (RF) antenna
5		TPMS module

NOTE:

A tire pressure sensor is not fitted to a temporary spare wheel.

OVERVIEW

The TPMS is a driver assistance system which assists the driver to maintain the tire pressures at the optimum level. The TPMS is a standard fitment on NAS vehicles and an optional fitment in other markets. The TPMS system has the following benefits:

- Improve fuel consumption
- Maintain ride and handling characteristics
- Reduce the risk of rapid tire deflation - which may be caused by under inflated tires
- Comply with legislation requirements in relevant markets.



CAUTION: The TPMS is not intended as a replacement for regular tire pressure and tire condition checks and should be considered as additional to good tire maintenance practices.

The TPMS measures the pressure in each of the tires on the vehicle and issues warnings to the driver if any of the pressures deviate from defined tolerances.

NOTE:

During a 'blow-out' a very rapid reduction in pressure is experienced. The system is not intended to warn the driver of a 'blow-out', since it is not possible to give the driver sufficient warning that such an event is occurring, due to its short duration. The design of the TPMS is to assist the driver in keeping the tires at the correct pressure, which will tend to reduce the likelihood of a tire 'blow-out' occurring.

The controlling software for the TPMS is located within a TPMS module. The software detects the following:

- the tire pressure is below the recommended low pressure value - under inflated tire
- the position of the tire on the vehicle.

The system comprises a TPMS module, a RF antenna, 4 initiators and 4 or 5 tire pressure sensors, depending on the type of spare wheel fitted.

The TPMS module is located on the LH (left-hand) side of the trunk. The RF antenna is located beneath the rear of the vehicle. The front initiators are positioned at the front of the wheel arches, behind the fender splash shields. The rear initiators are positioned at the rear of the rear wheel arches, behind the fender splash shields.

The 4 initiators are hardwired to the TPMS module. The initiators transmit 125 KHz Low Frequency (LF) signals to the tire pressure sensors which respond by modifying the mode status within the RF transmission. The 315 or 433 MHz RF signals are detected by the RF antenna which is connected directly to the TPMS module. The received RF signals from the tire pressure sensors are passed to the TPMS module and contain identification, pressure, temperature and acceleration information for each wheel and tire.

The TPMS module communicates with the instrument cluster via the high speed CAN (controller area network) bus to provide the driver with appropriate warnings. The TPMS module also indicates status or failure of the TPMS or components.

Tire Location and Identification

The TPMS can identify the position of the wheels on the vehicle and assign a received tire pressure sensor identification to a specific position on the vehicle, for example FL (front left), FR (front right), RL (rear left) and RR (rear right). This feature is required because of the different pressure targets and threshold between the front and rear tires.

The wheel location is performed automatically by the TPMS module using an 'auto-location' function. This function is fully automatic and requires no input from the driver. The TPMS module automatically re-learns the position of the wheels on the vehicle if the tire pressure sensors are replaced or the wheel positions on the vehicle are changed.

The TPMS software can automatically detect, under all operating conditions, the following:

- one or more new tire pressure sensors have been fitted
- one or more tire pressure sensors have stopped transmitting
- reject identifications from tire pressure sensors which do not belong to the vehicle
- two 'running' wheels on the vehicle have changed positions.

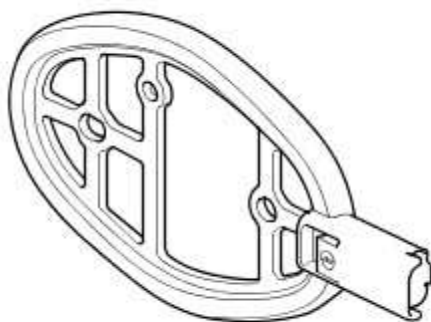
If a new tire pressure sensor is fitted on any 'running' wheel, the module can learn the new sensor identification automatically when the vehicle is driven for more than 15 minutes at a speed of more than 20 km/h (12.5 mph).

The tire learn and location process is ready to commence when the vehicle has been stationary or traveling at less than 12 mph (20 km/h) for 15 minutes. This is known as 'parking mode'. The learn/locate process requires the vehicle to be driven at speeds of more than 20 km/h (12.5 mph) for 15 minutes. If the vehicle speed reduces to below 20 km/h (12.5 mph), the learn process timer is suspended until the vehicle speed increases to more than 20 km/h (12.5 mph), after which time the

timer is resumed. If the vehicle speed remains below 20 km/h (12.5 mph) for more than 15 minutes, the timer is set to zero and process starts again.

If the tire pressure sensors fitted to the running wheels vehicle are changed, the module can learn the new sensor identifications automatically. The learn function requires no manual intervention by the driver.

INITIATOR



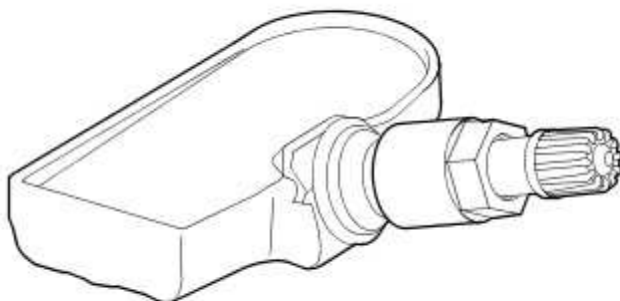
E45552

The front initiators are located near the front of the front wheel arches, behind the fender splash shields. The rear initiators are located at the rear of the rear wheel arches, behind the fender splash shields. Each initiator has a connector which connects to the vehicle body harness.

The initiator is a passive LF transmitter. It transmits signals which are received by the tire pressure sensors prompting them to modify their mode status.

The TPMS module energizes each initiator in turn using LF drivers. The corresponding tire pressure sensor detects the LF signal and responds by modifying the mode status within the RF transmission.

TIRE PRESSURE SENSOR



E45553

The TPMS uses active tire pressure sensors which are located on each wheel, inside the tire cavity. The sensor incorporates the tire valve and is secured by a nut on the outside of the wheel. The sensor contains a Printed Circuit Board (PCB) which houses a PTC (positive temperature coefficient) sensor, a Piezo pressure sensor, a radio receiver and transmitter and a lithium battery.

The tire pressure sensors use the PTC (positive temperature coefficient) sensor and the Piezo sensor to periodically measure the pressure and temperature of the air inside the tire. The data is transmitted by RF data signals at either 315 MHz or 433 MHz dependant on market requirements.

The RF transmission from the sensor contains a unique identification code in its transmission data. This allows the TPMS to identify the wheel on the vehicle. The tire pressure sensor can also detect when the wheel is rotating. In order to preserve battery power, the sensor uses different transmission rates when the wheel is stationary or moving.

If a sensor is replaced on a 'running wheel', the vehicle must remain stationary for 15 minutes before being driven. This allows the system to detect the new sensor. To initiate full TPMS operation, the vehicle must then be driven at a speed of more than 20 km/h (12.5 mph) for 15 minutes, then remain stationary for a further 15 minutes.

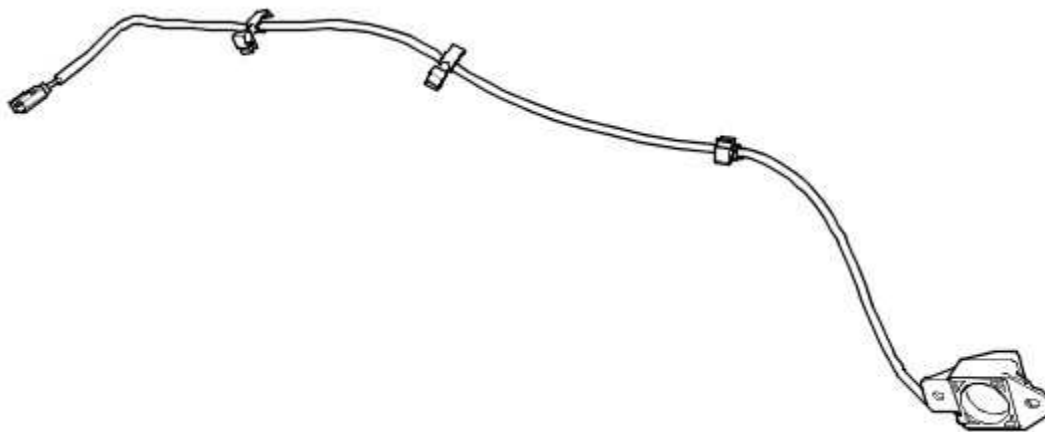
Care Points

The care points detailed in 'Tire Changing' earlier in this section must be followed to avoid damage to the sensor.

If a new sensor or tire is fitted, a new nut, seal and washer must also be fitted and the sensor nut tightened to the correct torque as given in the Removal and Installation section of this manual.

If the valve nut is loosened, the seal, washer and nut must be replaced.

RF ANTENNA

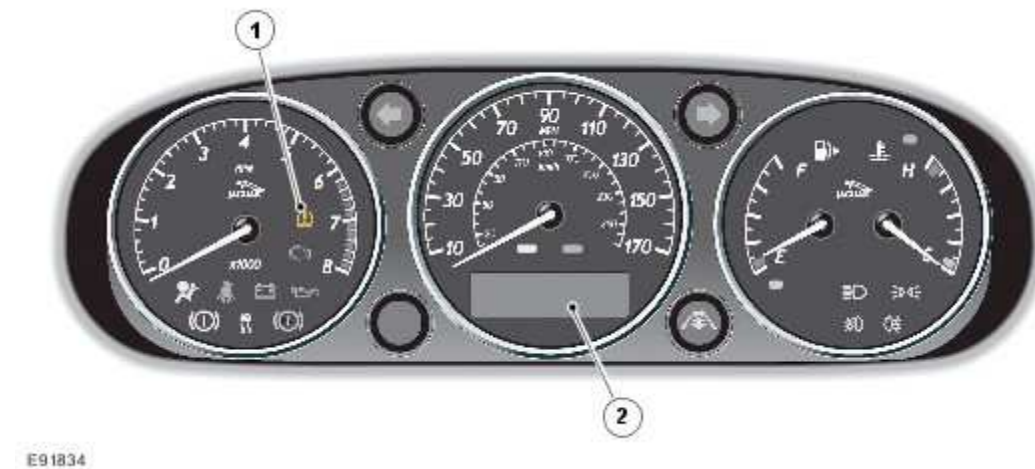


E62213

The TPMS RF antenna is located at the rear of the vehicle and is mounted between the spare wheel well and rear subframe. The unit receives tire pressure, temperature and acceleration readings from each tire and interfaces with the TPMS module. The TPMS module then transmits the appropriate

messages to the instrument cluster. The unit also receives further information from each tire pressure sensor concerning wheel identification, mode status and the condition of the tire pressure sensor battery.

INSTRUMENT CLUSTER AND MESSAGE CENTER



Item	Part Number	Description
1		Low tire pressure warning indicator
2		Message Center

The warning indications to the driver are common on all vehicles fitted with TPMS. The driver is alerted to system warnings by a low tire pressure warning indicator in the instrument cluster and an applicable text message in the message center.

The TPMS module passes system status information to the instrument cluster on the high speed CAN (controller area network) bus. The instrument cluster then converts this data into illumination of the warning indicator and display of an appropriate message.

When the ignition is switched on, the warning indicator is illuminated for 3 seconds for a bulb check.

NOTE:

If the vehicle is not fitted with the TPMS, the warning indicator will not illuminate.

The instrument cluster checks, within the 3 second bulb check period, for a CAN (controller area network) bus message from the TPMS. During this time the TPMS performs internal tests and CAN (controller area network) bus initialization. The warning indicator will be extinguished if the TPMS module does not issue a fault message or tire pressure warning message.

If a TPMS fault warning message is detected by the instrument cluster at ignition on, the warning

indicator will flash for 72 seconds after the 3 second bulb check period and then remain permanently illuminated.

If a tire pressure warning message is detected by the instrument cluster at ignition on, the warning indicator will extinguish briefly after the 3 second bulb check period, before re-illuminating to indicate a tire pressure warning.

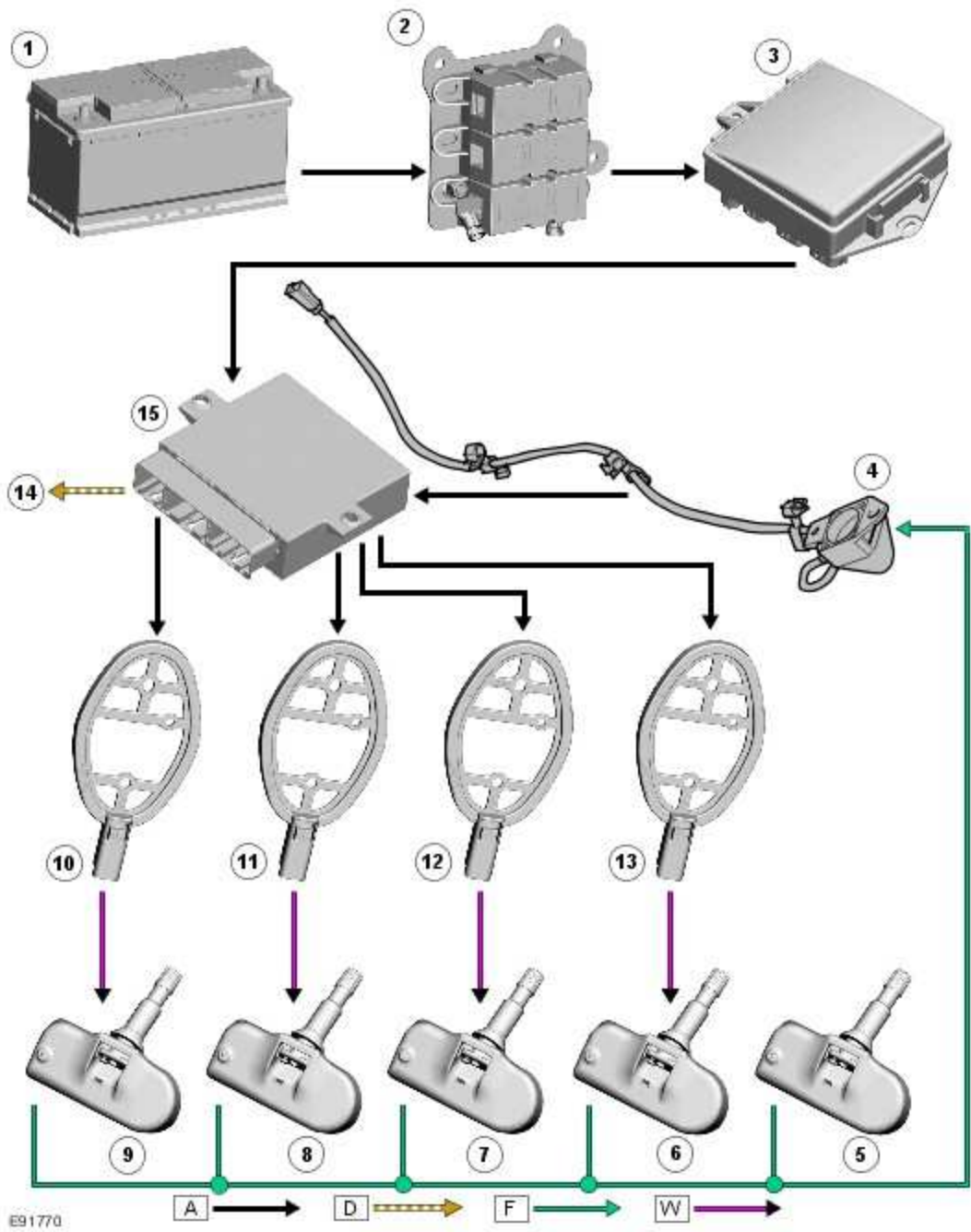
The following table shows the warning indicator functionality for given events:

Message	Reason	Action
CHECK PRESSURE RH FRONT TYRE	RH (right-hand) front tire pressure has fallen to 25% of recommended pressure.	Stop the vehicle as soon as safely possible. Check all tire pressures and inflate to recommended pressure.
CHECK PRESSURE LH FRONT TYRE	LH (left-hand) front tire pressure has fallen to 25% of recommended pressure.	Stop the vehicle as soon as safely possible. Check all tire pressures and inflate to recommended pressure.
CHECK PRESSURE RH REAR TYRE	RH (right-hand) rear tire pressure has fallen to 25% of recommended pressure.	Stop the vehicle as soon as safely possible. Check all tire pressures and inflate to recommended pressure.
CHECK PRESSURE LH REAR TYRE	LH (left-hand) rear tire pressure has fallen to 25% of recommended pressure.	Stop the vehicle as soon as safely possible. Check all tire pressures and inflate to recommended pressure.
TYRE PRESSURE SENSOR FAULT	Pressure sensor failure, a wheel has been fitted to the vehicle that does not contain a pressure sensor, or interference from an unapproved accessory.	A fault has occurred in the TPMS. Interrogate the TPMS module for faults and diagnose using the Jaguar approved diagnostic system.
TYRE PRESSURE SYSTEM FAULT	No transmission from more than one pressure sensor, more than one pressure sensor fault, or CAN (controller area network) bus signal missing.	A fault has occurred in the TPMS. Interrogate the TPMS module for faults and diagnose using the Jaguar approved diagnostic system.
TYRE PRESSURES LOW FOR SPEED	Tire pressures are not suitable for high speed driving.	Stop the vehicle as soon as safely possible. Check all tire pressures and inflate to recommended pressure.

CONTROL DIAGRAM

NOTE:

A = Hardwired; **D** = High Speed CAN (controller area network) bus; **F** = RF Transmission; **W** = LF Transmission



Item	Part Number	Description
1		Battery
2		Battery fuse box

3		Rear power distribution box
4		RF antenna
5		Spare wheel pressure sensor (if fitted)
6		LH (left-hand) rear pressure sensor
7		RH (right-hand) rear pressure sensor
8		LH (left-hand) front pressure sensor
9		RH (right-hand) front pressure sensor
10		RH (right-hand) front initiator
11		LH (left-hand) front initiator
12		RH (right-hand) rear initiator
13		LH (left-hand) rear initiator
14		High speed CAN (controller area network) bus to other vehicle systems
15		TPMS module

PRINCIPLES OF OPERATION

Each time the vehicle is driven the TPMS module activates each initiator in turn to transmit a LF 125 KHz signal to each tire pressure sensor. The LF signal is received by the tire pressure sensor which responds by transmitting a signal which is received by the RF antenna. The signal contains coded data which corresponds to sensor identification, air pressure, air temperature and acceleration data and is passed to the TPMS module.

When the vehicle has been parked for more than 15 minutes and then driven at a speed of more than 12.5 mph (20 km/h), the initiators fire in turn for 6 seconds on all 433 MHz vehicles or for 18 seconds on 315 MHz vehicles in the following order:

- Front left
- 6 second pause (for the TPMS module to detect a response from the tire pressure sensor)
- Front right
- 6 second pause
- Rear right
- 6 second pause
- Rear left
- 6 second pause.

Each tire pressure sensor responds in turn which allows the TPMS module to establish the sensor positions at the start of the drive cycle. This process is repeated up to 3 times but less if the sensor positions are already known. The process is known as 'Auto Location' and takes 2 to 4 minutes to complete.

During this period the tire pressure sensors transmit at regular intervals, once every 5 seconds (once every 15 seconds on 315 MHz vehicles). For the remainder of the drive cycle the tire pressure sensors transmit once every 60 seconds or more often if a change of tire pressure is sensed until the vehicle stops and the TPMS returns to the parking mode.

Once the wheel positions have been established, the initiators stop transmitting the LF signal and do not transmit again until the vehicle has been parked for more than 15 minutes.

The TPMS enters 'Parking Mode' after the vehicle speed has been less than 20 km/h (12.5 mph) for 15 minutes. In parking mode the tire pressure sensors transmit a coded RF signal once every 13 hours. If the tire pressure decreases by more than 0.06 bar (1 lbf/in²), the sensor will transmit more often if pressure in the tire is being lost.

Wheels and Tires - VIN Range: G00442- >G45703

General notes

Factory installed tires and wheels are designed to operate satisfactory when inflated to the recommended inflation pressures; refer to the Specifications sub-section. The recommended pressures apply to vehicle loads up to and including full-rated load capacity.

Correct tire pressures and driving technique have an important influence on tire life. Heavy cornering, excessively rapid acceleration and unnecessary sharp braking increase tire wear.

Replacement tires should follow the recommended:

- size.
- speed rating.
- load range.
- radial construction type.

The use of any other size or type may seriously affect:

- safety.
- ride.
- handling.
- speedometer and odometer calibration.
- vehicle ground clearance.
- tire clearance between body and chassis.
- wheel bearing life.
- brake cooling.

Wheels need to be renewed when:

- impact damaged.
- heavily corroded.
- porous.
- wheel stud holes or seats become damaged.
- they have excessive radial or lateral runout.

Safety notes



WARNING: Do not mix different types of tires on the same vehicle. Handling may be seriously affected resulting in loss of control. Failure to follow these instructions may result in

personal injury.



WARNING: When using winter tires, observe the direction of the sidewall moulded indicators; correct tire rotational direction is critical. Failure to follow these instructions may result in personal injury.



WARNING: A tire and wheel must always be correctly matched. Wider or narrower tires than recommended could cause danger through sudden deflation. Failure to follow these instructions may result in personal injury.



WARNING: When using the temporary spare wheel, maximum speed must not exceed 80 km/h (50 mile/h). Drive with caution and replace with the specified wheel and tire assembly as soon as possible. Failure to follow these instructions may result in personal injury.



WARNING: Traction control (if available) must not be engaged with a temporary spare wheel fitted. Failure to follow these instructions may result in personal injury.



WARNING: When changing a wheel, make sure that the vehicle cannot move. Always apply the parking brake and select the transmission park position. Failure to follow these instructions may result in personal injury.



WARNING: Never run the engine with one wheel off the ground, for example, when changing the wheel. The wheel resting on the ground may cause the vehicle to move. Failure to follow these instructions may result in personal injury.



WARNING: Tighten the wheel nuts to specification. Too tight may cause damage, too loose may allow the wheel to become detached. Failure to follow these instructions may result in

personal injury.



WARNING: Use only wheels and wheel nuts supplied by Jaguar. Aftermarket wheels or wheel nuts may not fit or function correctly and could cause injury or damage. Failure to follow these instructions may result in personal injury.

Inspection and Verification

- 1 . Verify the customer's concern by driving the vehicle.
- 2 . Visually inspect for obvious signs of damage:

Visual Inspection Chart

Mechanical
Incorrect tire pressure
Wheel imbalance
Tires worn beyond tread wear indicators
Cuts
Abrasions
Bulges (blister)
Ply separation
Embedded objects
Impact damage
Incorrect speed rating
Incorrect load rating
Incorrect rotational direction

- 1 . If an obvious cause for an observed or reported concern is found, correct the cause (if possible) before proceeding to the next step.

2 . If the concern is not visually evident, verify the symptom and refer to Symptom Chart.

Tire Wear Inspection

To maximize tire performance, inspect the tires for signs of incorrect inflation and uneven wear which may indicate a need for balancing, rotation or front suspension alignment. Tires should also be checked frequently for cuts, stone bruises, abrasions, blisters, and for objects that may have become embedded in the tread. More frequent inspections are recommended when rapid or extreme temperature changes occur or when road surfaces are rough or occasionally littered with debris.

Tire Wear Diagnosis

New tires should be installed if the wear indicators are exposed or if there is severe shoulder wear. Shoulder wear is usually caused by either excessive camber or excessive toe on radial tires.

Sometimes incorrect rear toe settings or damaged struts will cause severe cupping' or scalloped' tire wear on non-drive wheels.

Incorrect rear toe alignment will also cause other unusual wear patterns.

Road Test

A tire vibration diagnostic procedure always begins with a road test. The road test and customer interview (if available) will provide much of the information needed to find the source of a vibration.

During the road test, drive the vehicle on a road that is smooth and free of undulations. If vibration is apparent, note and record the following:

- The speed at which the vibration occurs.
- What type of vibration occurs in each speed range. Mechanical or audible.
- How the vibration is affected by changes in the following: Engine torque. Vehicle speed. Engine speed.
- Type of vibration-sensitivity: torque sensitive, vehicle speed sensitive or engine speed sensitive.

The following explanations help isolate the source of the vibration.

Torque Sensitive

This means that the condition may be improved or made worse by accelerating, decelerating, coasting, maintaining a steady vehicle speed or applying engine torque.

Vehicle Speed Sensitive

This means that the vibration always occurs at the same vehicle speed and is not affected by engine torque, engine speed or the transmission gear selected.

Engine Speed Sensitive

This means that the vibration occurs at varying vehicle speeds when a different transmission gear is selected. It may sometimes be isolated by increasing or decreasing engine speed with the

transmission in NEUTRAL or by stall testing with the transmission in gear. If the condition is engine speed sensitive, the cause is probably not related to the tires.

If the road test indicates that there is tire whine, but no shake or vibration, the noise originates with the contact between the tire and the road surface.

A thumping noise usually means that the tire has a flat or soft spot making a noise as they slap the roadway. Tire whine may be distinguished from axle noise. Tire whine remains the same over a range of speeds.

Tires show excess wear on edge of treads

Possible Source(s):

- Tires under-inflated.

Action(s) to take:

- Correct pressure to specification.

Possible Source(s):

- Vehicle overloaded.

Action(s) to take:

- Correct as required.

Tires show excess wear on edge of treads (having the correct tire pressures)

Possible Source(s):

- Incorrect toe setting.

Action(s) to take:

- Set to specification. For additional information, [<<204-00>>](#)

Tires show excess wear in center of tread

Possible Source(s):

- Tires over-inflated.

Action(s) to take:

- Correct pressure to specification.

Other excessive tire wear problems

Possible Source(s):

- Incorrect tire pressure.

Action(s) to take:

- Correct pressure to specification.

Possible Source(s):

- Incorrect tire and wheel usage.

Action(s) to take:

- Install correct tire and wheel combination.

Possible Source(s):

- Loose or leaking air springs.

Action(s) to take:

- Tighten or install new air springs as necessary. For additional information, [<<204-05>>](#)

Possible Source(s):

- Geometry out of alignment.

Action(s) to take:

- Check and adjust. For additional information, [<<204-00>>](#)

Possible Source(s):

- Loose, worn or damaged suspension components.

Action(s) to take:

- Inspect, repair or install new suspension components as necessary.

Possible Source(s):

- Wheel and tire assembly out of balance.

Action(s) to take:

- Balance wheel and tire assembly.

Possible Source(s):

- Excessive lateral or radial runout of wheel or tire.

Action(s) to take:

- Check, repair or install a new wheel or tire as necessary. Refer to the procedure in this section.

Wheel mounting is difficult

Possible Source(s):

- Incorrect application or mismatched parts, including wheel studs and wheel nuts. Corroded, worn or damaged parts.

Action(s) to take:

- Clean or install a new part.

Wobble or shimmy affecting wheel runout

Possible Source(s):

- Damaged wheel (eventually damaging wheel bearings and causing uneven tire wear).

Action(s) to take:

- Inspect wheel rims for damage and runout. Install a new wheel rim as necessary.

Excessive vibration, rough steering or severe tire wear

Possible Source(s):

- Loose or incorrect attaching parts.

Action(s) to take:

- Tighten or install new parts.

Vehicle vibrations

Possible Source(s):

- Tires and wheels mismatched.

Action(s) to take:

- Install correct tire and wheel combination.

Possible Source(s):

- Inflation pressure too high or too low.

Action(s) to take:

- Correct pressure to specification.

Possible Source(s):

- Uneven tire wear.

Action(s) to take:

- Refer to Diagnosis and Testing in this section.

Possible Source(s):

- Out-of-balance wheel, tire, wheel hub or disc assembly.

Action(s) to take:

- Determine the out-of-balance component and balance or install a new part.

Possible Source(s):

- Damaged or distorted wheel from road impact hazard or incorrect handling.

Action(s) to take:

- Install a new wheel.

Possible Source(s):

- Excessive radial runout.

Action(s) to take:

- Install a new wheel or tire. Check for incorrect wheel and tire specifications.

Possible Source(s):

- Excessive lateral runout.

Action(s) to take:

- Install a new wheel or tire.

Possible Source(s):

- Incorrectly seated tire.

Action(s) to take:

- Remount the tire.

Possible Source(s):

- Loose wheel mountings - damaged wheel studs, wheel nuts, worn or broken wheel hub face or foreign material on mounting faces.

Action(s) to take:

- Tighten or install new parts. Clean mounting surfaces.

Possible Source(s):

- Defective wheel bearings.

Action(s) to take:

- Install a new bearing set. For additional information refer to [<<204-01>>](#) or [<<204-02>>](#)

Possible Source(s):

- Brake disc imbalance.

Action(s) to take:

- For additional information refer to [<<206-00>>](#)

Possible Source(s):

- Water in tires.

Action(s) to take:

- Remove water.

Possible Source(s):

- Loose engine or transmission mounts.

Action(s) to take:

- Tighten or install a new mount.

Possible Source(s):

- Incorrect front end alignment.

Action(s) to take:

- Align front end. For additional information, [<<204-01>>](#)

Possible Source(s):

- Loose or worn driveline or suspension parts.

Action(s) to take:

- Repair or install new parts.

Possible Source(s):

- Excessive driveshaft runout or imbalance.

Action(s) to take:

- Install a new driveshaft. For additional information, [<<205-01>>](#)

Possible Source(s):

- Worn or damaged flexible drive joint.

Action(s) to take:

- Install a new driveshaft. For additional information, [<<205-01>>](#)

Damaged wheel hub stud threads

Possible Source(s):

- Sliding wheel across the wheel studs during installation. Loose wheel nuts.

Action(s) to take:

- Install new wheel studs.

Broken wheel studs

Possible Source(s):

- Loose or overtightened wheel nuts.

Action(s) to take:

- Install new wheel studs.

Corrosion and contamination streaks from the wheel hub wheel stud holes

Possible Source(s):

- Loose wheel nuts.

Action(s) to take:

- Check complete assembly. Install new parts. Follow correct torque procedure.

Damaged wheel nuts

Possible Source(s):

- Loose wheel assembly.

Action(s) to take:

- Install new wheel nuts. Follow correct torque procedure.

Possible Source(s):

- Over-tightened wheel nuts.

Action(s) to take:

- Install new wheel nuts. Follow correct torque procedure.

Frozen wheel nuts

Possible Source(s):

- Corrosion or galling.

Action(s) to take:

- If corrosion is light, wire brush away corrosion. If corrosion is excessive install new wheel studs and wheel nuts.

Wheels and Tires - VIN Range: G45704->G99999

Overview

This section will provide basic information to assist in the diagnosis of tire-related faults.

Tire pressure monitoring systems (TPMS) have been introduced on 2006 my vehicles and this section will also provide information to assist in the diagnosis of the system fitted to Jaguar vehicles.

Tire pressure monitoring system

Principle of operation

Each road wheel has a sensor which feeds information to the control module which will then interpret the information and display a message on the driver message center, along with a warning light and an amber lozenge if appropriate.

The messages are self-explanatory, but full descriptions can be found in the owner guide.

For additional information on the description and operation of the TPMS.

[Wheels and Tires - VIN Range: G45704->H18679](#)

TPMS inspection and verification

1 . Verify the customer complaint.

NOTE:

Record any messages displayed by the system.

2 . Visually inspect for obvious signs of mechanical or electrical damage.

Mechanical	Electrical
<ul style="list-style-type: none">• Tire pressures• Tire/Wheel damage• Tire low pressure sensor fitment/damage• Front antenna fitment/damage• Rear antenna fitment/damage• External antenna fitment/damage	<ul style="list-style-type: none">• Fuses (FPDB, RPDB, PJB)• Front antenna fitment/damage• Rear antenna fitment/damage• External antenna fitment/damage• TPMS module• Connectors/Harnesses

3 . If an obvious cause for an observed or reported concern is found, correct the cause (if possible) before proceeding to the next step.

4 . If the cause is not visually evident use the Jaguar approved diagnostic system or a scan tool to retrieve the fault codes before proceeding to the diagnostic trouble code (DTC) index.

DTC Index

NOTE:

Generic scan tools may not read the codes listed, or may read only 5-digit codes. Match the 5 digits from the scan tool to the first 5 digits of the 7-digit code listed to identify the fault (the last 2 digits give extra information read by the manufacturer-approved diagnostic system).

DTC	Description	Possible causes	Action
B1A5611	External antenna	<ul style="list-style-type: none">Antenna: short circuit to ground	GO to Pinpoint Test G528618p1 .
B1A5612	External antenna	<ul style="list-style-type: none">Antenna: high resistanceAntenna: short circuit to battery	GO to Pinpoint Test G528618p1 .
B1A5638	External antenna	<ul style="list-style-type: none">Antenna: signal frequency incorrect	Replace the external antenna.
B247700	Module configuration failure	<ul style="list-style-type: none">TPMS module not configured at end of line or at PDI	Configure the module using the Jaguar approved diagnostic system
C1A5616	Left hand front tire low pressure sensor	<ul style="list-style-type: none">Low battery detected	Replace the tire low pressure sensor. Tire Low Pressure Sensor
C1A5631	Left hand front tire low pressure sensor	<ul style="list-style-type: none">No signal detected	Check for stored DTCs B1A5611, B1A5612 or B1A5638 and follow the actions indicated. If none of these DTCs are stored replace the tire low pressure sensor. Tire Low Pressure Sensor
C1A5691	Left hand front tire low pressure sensor	<ul style="list-style-type: none">Data out of range	Replace the tire low pressure sensor. Tire Low Pressure Sensor
C1A5693	Left hand front tire low	<ul style="list-style-type: none">No sensor can be found at this location	Check for stored DTCs C1A5711, C1A5712, C1A5713 or C1A5631 and

	pressure sensor		follow the actions indicated.
C1A5711	Left hand front antenna	<ul style="list-style-type: none"> Output circuit: short circuit to ground 	GO to Pinpoint Test G528618p2 .
C1A5712	Left hand front antenna	<ul style="list-style-type: none"> Output circuit: short circuit to battery 	GO to Pinpoint Test G528618p2 .
C1A5713	Left hand front antenna	<ul style="list-style-type: none"> Output circuit: high resistance 	GO to Pinpoint Test G528618p2 .
C1A5816	Right hand front tire low pressure sensor	<ul style="list-style-type: none"> Low battery detected 	Replace the tire low pressure sensor. Tire Low Pressure Sensor
C1A5831	Right hand front tire low pressure sensor	<ul style="list-style-type: none"> No signal detected 	Check for stored DTCs B1A5611, B1A5612 or B1A5638 and follow the actions indicated. If none of these DTCs are stored replace the tire low pressure sensor. Tire Low Pressure Sensor
C1A5891	Right hand front tire low pressure sensor	<ul style="list-style-type: none"> Data out of range 	Replace the tire low pressure sensor. Tire Low Pressure Sensor
C1A5893	Right hand front tire low pressure sensor	<ul style="list-style-type: none"> No sensor can be found at this location 	Check for stored DTCs C1A5911, C1A5912, C1A5913 or C1A5831 and follow the actions indicated.
C1A5911	Right hand front antenna	<ul style="list-style-type: none"> Output circuit: short circuit to ground 	GO to Pinpoint Test G528618p3 .
C1A5912	Right hand front antenna	<ul style="list-style-type: none"> Output circuit: short circuit to battery 	GO to Pinpoint Test G528618p3 .
C1A5913	Right hand front antenna	<ul style="list-style-type: none"> Output circuit: high resistance 	GO to Pinpoint Test G528618p3 .
C1A6016	Left hand rear tire low pressure sensor	<ul style="list-style-type: none"> Low battery detected 	Replace the tire low pressure sensor. Tire Low Pressure Sensor
C1A6031	Left hand rear tire low	<ul style="list-style-type: none"> No signal detected 	Check for stored DTCs B1A5611, B1A5612 or B1A5638 and follow the

	pressure sensor		actions indicated. If none of these DTCs are stored replace the tire low pressure sensor. Tire Low Pressure Sensor
C1A6091	Left hand rear tire low pressure sensor	<ul style="list-style-type: none"> Data out of range 	Replace the tire low pressure sensor. Tire Low Pressure Sensor
C1A6093	Left hand rear tire low pressure sensor	<ul style="list-style-type: none"> No sensor can be found at this location 	Check for stored DTCs C1A6111, C1A6112, C1A6113 or C1A60 31 and follow the actions indicated.
C1A6111	Left hand rear antenna	<ul style="list-style-type: none"> Output circuit: short circuit to ground 	GO to Pinpoint Test G528618p4 .
C1A6112	Left hand rear antenna	<ul style="list-style-type: none"> Output circuit: short circuit to battery 	GO to Pinpoint Test G528618p4 .
C1A6113	Left hand rear antenna	<ul style="list-style-type: none"> Output circuit: high resistance 	GO to Pinpoint Test G528618p4 .
C1A6216	Right hand rear tire low pressure sensor	<ul style="list-style-type: none"> Low battery detected 	Replace the tire low pressure sensor. Tire Low Pressure Sensor
C1A6231	Right hand rear tire low pressure sensor	<ul style="list-style-type: none"> No signal detected 	Check for stored DTCs B1A5611, B1A5612 or B1A5638 and follow the actions indicated. If none of these DTCs are stored replace the tire low pressure sensor. Tire Low Pressure Sensor
C1A6291	Right hand rear tire low pressure sensor	<ul style="list-style-type: none"> Data out of range 	Replace the tire low pressure sensor. Tire Low Pressure Sensor
C1A6293	Right hand rear tire low pressure sensor	<ul style="list-style-type: none"> No sensor can be found at this location 	Check for stored DTCs C1A6311, C1A6312, C1A6313 or C1A6231 and follow the actions indicated.
C1A6311	Right hand rear antenna	<ul style="list-style-type: none"> Output circuit: short circuit to ground 	GO to Pinpoint Test G528618p5 .

C1A6312	Right hand rear antenna	<ul style="list-style-type: none"> Output circuit: short circuit to battery 	GO to Pinpoint Test G528618p5 .
C1A6313	Right hand rear antenna	<ul style="list-style-type: none"> Output circuit: high resistance 	GO to Pinpoint Test G528618p5 .
C1A6416	Spare tire low pressure sensor	<ul style="list-style-type: none"> Low battery detected 	Replace the tire low pressure sensor. Tire Low Pressure Sensor
C1A6491	Spare tire low pressure sensor	<ul style="list-style-type: none"> Data out of range 	Replace the tire low pressure sensor. Tire Low Pressure Sensor
C1A6493	Spare tire low pressure sensor	<ul style="list-style-type: none"> No sensor can be found at this location 	If the vehicle is fitted with a temporary spare wheel and tyre take no action. Check for stored DTCs B1A5611, B1A5612 or B1A5638 and follow the actions indicated. If none of these DTCs are stored replace the tire low pressure sensor. Tire Low Pressure Sensor
C1D1800	Location failure	<ul style="list-style-type: none"> The control module cannot locate the sensor 	Check for DTCs indicating a component fault.
U007300	CAN BUS off	<ul style="list-style-type: none"> CAN communication error 	For network tests, Communications Network
U1A1449	CAN error	<ul style="list-style-type: none"> CAN failed to initialise 	For network tests, Communications Network
U251800	CAN error	<ul style="list-style-type: none"> CAN signal fault: DATC, ambient temperature/barometric pressure 	For network tests, Communications Network
U252100	CAN error	<ul style="list-style-type: none"> CAN signal fault: ABS, vehicle reference speed 	For network tests, Communications Network
U252300	CAN error	<ul style="list-style-type: none"> CAN signal fault: ECM, engine speed 	For network tests, Communications Network

Wheels and tires inspection and verification

Basic information on the wheels and tires available for this model year can be found at.

[Wheels and Tires - VIN Range: G45704->H18679](#)

Specifications for the wheels and tires (pressures, torques, etc) can be found at the same link.

When replacing wheels or tires you must comply with local legislation regarding health and safety and correct fitment.

If the vehicle is fitted with TPMS, only Jaguar approved wheels and tyres should be used. If the wheel and tyre size is changed (for example from R18 to R20) the TPMS module should be updated with the correct pressure information appropriate to the new wheel and tyre set. Update the TPMS module using the Jaguar approved diagnostic system.

As a general guideline, only replace tires in pairs or as a set, and only with tires of equivalent size and specification.

Confirm the symptoms of the customer complaint.

As much information as possible should be gathered from the driver to assist in diagnosing the cause(s).

1 . Before a road test, carry out a basic inspection to make sure the vehicle is safe and legal to drive.

Basic inspection

- Correct tire inflation.
[Specifications](#)
- Legal tire tread depth.
- Cuts/Bulges in tire sidewall(s).
- Tire ply separation.
- Embedded objects.
- Wheel rim damage.
- Correct tire fitment (specification, direction of rotation, etc).
- Any obvious distortion of the tire (flat/high spots).
- Worn/Damaged steering or suspension components.

[Front Suspension](#)

[Rear Suspension](#)

Road test

If the results of the basic inspection are acceptable, carry out a road test to confirm the symptoms.

To reproduce the symptoms, test the vehicle on similar roads to those on which the fault occurs and at similar speeds (provided it is legal to do so).

If the vibration or noise can be reproduced, note the speed at which it occurs and see if it is possible to drive through the symptom, meaning, is it possible to alter the fault by driving faster or slower than the speed at which it occurs?

If it is possible, it is likely that the fault is caused by an imbalance in the wheel or tire.

If the vibration or noise gets worse as the vehicle speed increases, it is likely that the fault is caused by distortion in the wheel or tire, or worn or damaged components.

Distortion checks

Check for distortion by raising the vehicle so that the wheels are free and placing an axle stand or similar fixed object next to each wheel in turn.

If the stand is placed at the tread of the tire, the tire can be checked for ovality by turning the wheel by hand and checking for high or low spots where the gap between the tread and the stand increases or reduces.

If the stand is placed next to the wheel rim or tire sidewall, the wheel and tire can be checked for run-out in a similar way.

Pinpoint tests

NOTE:

When performing voltage or resistance tests, always use a digital multimeter (DMM) accurate to 3 decimal places, and with an up-to-date calibration certificate. When testing resistance, always take the resistance of the DMM leads into account.

NOTE:

Check and rectify basic faults before beginning diagnostic routines involving pinpoint tests.

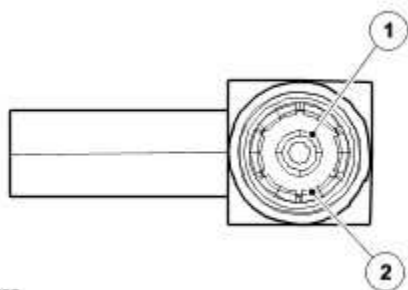
NOTE:

If DTCs are recorded and a fault is not present when performing the pinpoint tests, an intermittent concern may be the cause. Always check for loose connections and corroded terminals.

PINPOINT TEST G528618p1 : EXTERNAL ANTENNA NO CONNECTION

G528618t1 : Check the external antenna signal circuit for short circuit to ground

1. Key off. 2. Disconnect the TPMS external antenna electrical connector, CR99. 3.



E63853

Measure the resistance between:

CR99, harness side	Battery
Pin 01, signal	Negative terminal

- Is the resistance less than 10,000 ohms?

-> Yes

GO to Pinpoint Test [G528618t44](#).

-> No

GO to Pinpoint Test [G528618t2](#).

G528618t2 : Check the external antenna signal circuit for short circuit to power

1. Measure the resistance between:

CR99, harness side	Battery
Pin 01, signal	Positive terminal

- Is the resistance less than 10,000 ohms?

-> Yes

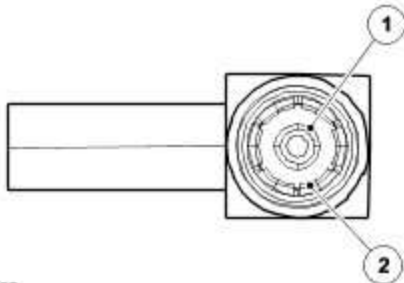
GO to Pinpoint Test [G528618t45](#).

-> No

GO to Pinpoint Test [G528618t3](#).

G528618t44 : Check whether the short circuit is in the harness or the module

1. Disconnect the TPMS module connector, CR96. 2.



E63653

Measure the resistance between:

CR99, harness side	Battery
Pin 01, signal	Negative terminal

- Is the resistance less than 10,000 ohms?

-> **Yes**

REPAIR the short circuit. For additional information, refer to the wiring diagram. Clear the DTC and test the system for normal operation.

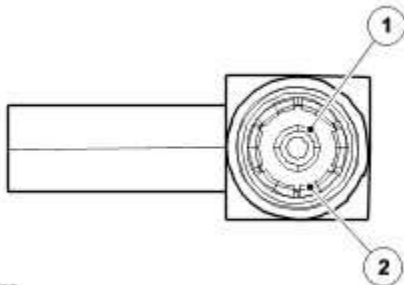
-> **No**

INSTALL a new TPMS control module.

[Tire Pressure Monitoring System \(TPMS\) Module](#)

G528618t45 : Check whether the short circuit is in the harness or the module

1. Disconnect the TPMS module connector, CR96. 2.



E63653

Measure the resistance between:

CR99, harness side	Battery

Pin 01, signal	Positive terminal
----------------	-------------------

- **Is the resistance less than 10,000 ohms?**

-> **Yes**

REPAIR the short circuit. For additional information, refer to the wiring diagram. Clear the DTC and test the system for normal operation.

-> **No**

INSTALL a new TPMS control module.

[Tire Pressure Monitoring System \(TPMS\) Module](#)

G528618t3 : Check the external antenna signal circuit for high resistance

1. Measure the resistance between:

CR96, harness side	CR99, harness side
Pin 01, signal	Pin 01, signal

- **Is the resistance greater than 5 ohms?**

-> **Yes**

REPAIR the high resistance. For additional information, refer to the wiring diagram. Clear the DTC and test the system for normal operation.

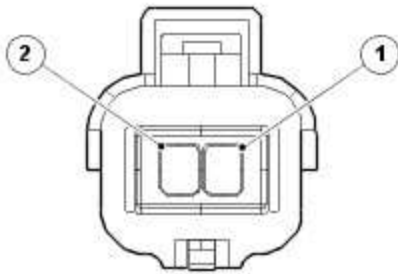
-> **No**

INSTALL a new external antenna.

PINPOINT TEST G528618p2 : LEFT HAND FRONT LOW-FREQUENCY ANTENNA CIRCUIT

G528618t7 : Check the antenna negative circuit for short circuit to ground

1. Key off. 2. Disconnect the left hand front low-frequency antenna electrical connector, EC83. 3.



E63857

4. Measure the resistance between:

EC83, harness side	Battery
Pin 02, negative	Negative terminal

- Is the resistance less than 10,000 ohms?

-> Yes

GO to Pinpoint Test [G528618t28](#).

-> No

GO to Pinpoint Test [G528618t4](#).

G528618t4 : Check the antenna negative circuit for short circuit to power

1. Measure the resistance between:

EC83, harness side	Battery
Pin 02, negative	Positive terminal

- Is the resistance less than 10,000 ohms?

-> Yes

GO to Pinpoint Test [G528618t30](#).

-> No

GO to Pinpoint Test [G528618t29](#).

G528618t29 : Check the antenna positive circuit for short circuit to ground

1. Measure the resistance between:

EC83, harness side	Battery
Pin 01, positive	Negative terminal

- **Is the resistance less than 10,000 ohms?**

-> **Yes**

GO to Pinpoint Test [G528618t32](#).

-> **No**

GO to Pinpoint Test [G528618t31](#).

G528618t31 : Check the antenna positive circuit for short circuit to power

1. Measure the resistance between:

EC83, harness side	Battery
Pin 01, positive	Positive terminal

- **Is the resistance less than 10,000 ohms?**

-> **Yes**

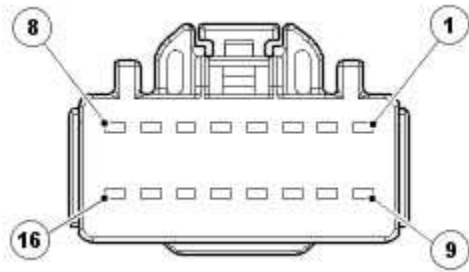
GO to Pinpoint Test [G528618t33](#).

-> **No**

GO to Pinpoint Test [G528618t9](#).

G528618t28 : Check whether the short circuit is in the harness or the module

1. Disconnect the TPMS module connector, CR94. 2.



3. Measure the resistance between:

EC83, harness side	Battery
Pin 02, negative	Negative terminal

- Is the resistance less than 10,000 ohms?

-> Yes

REPAIR the short circuit. This circuit contains intermediate connector, EC17. For additional information, refer to the wiring diagram. Clear the DTC and test the system for normal operation.

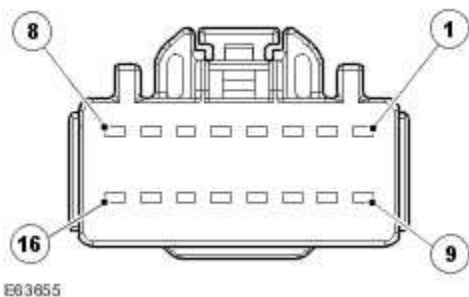
-> No

INSTALL a new TPMS control module.

[Tire Pressure Monitoring System \(TPMS\) Module](#)

G528618t30 : Check whether the short circuit is in the harness or the module

1. Disconnect the TPMS module connector, CR94. 2.



3. Measure the resistance between:

EC83, harness side	Battery
Pin 02, negative	Positive terminal

- Is the resistance less than 10,000 ohms?

-> Yes

REPAIR the short circuit. This circuit contains intermediate connector, EC17. For additional information, refer to the wiring diagram. Clear the DTC and test the system for normal operation.

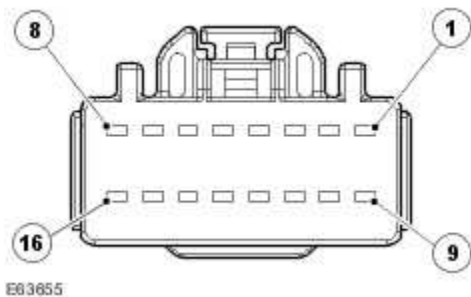
-> No

INSTALL a new TPMS control module.

[Tire Pressure Monitoring System \(TPMS\) Module](#)

G528618t32 : Check whether the short circuit is in the harness or the module

1. Disconnect the TPMS module connector, CR94. 2.



3. Measure the resistance between:

EC83, harness side	Battery
Pin 01, positive	Negative terminal

- Is the resistance less than 10,000 ohms?

-> Yes

REPAIR the short circuit. This circuit contains intermediate connector, EC17. For additional information, refer to the wiring diagram. Clear the DTC and test the system for normal operation.

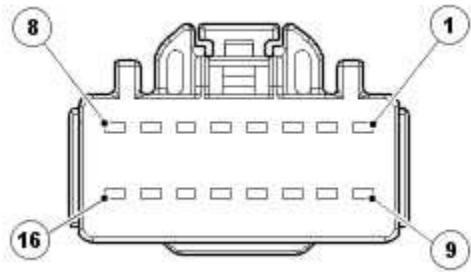
-> No

INSTALL a new TPMS control module.

[Tire Pressure Monitoring System \(TPMS\) Module](#)

G528618t33 : Check whether the short circuit is in the harness or the module

1. Disconnect the TPMS module connector, CR94. 2.



3. Measure the resistance between:

EC83, harness side	Battery
Pin 01, positive	Positive terminal

- Is the resistance less than 10,000 ohms?

-> Yes

REPAIR the short circuit. This circuit contains intermediate connector, EC17. For additional information, refer to the wiring diagram. Clear the DTC and test the system for normal operation.

-> No

INSTALL a new TPMS control module.

[Tire Pressure Monitoring System \(TPMS\) Module](#)

G528618t9 : Check the antenna negative circuit for high resistance

1. Measure the resistance between:

CR94, harness side	EC83, harness side
Pin 14, negative	Pin 02, negative

- Is the resistance greater than 5 ohms?

-> Yes

REPAIR the high resistance circuit. This circuit contains intermediate connector, EC17. For additional information, refer to the wiring diagram. Clear the DTC and test the system for normal operation.

-> No

GO to Pinpoint Test [G528618t8](#).

G528618t8 : Check the antenna positive circuit for high resistance

1. Measure the resistance between:

CR94, harness side	EC83, harness side
Pin 13, positive	Pin 01, positive

- **Is the resistance greater than 5 ohms?**

-> **Yes**

REPAIR the high resistance circuit. This circuit contains intermediate connector, EC17. For additional information, refer to the wiring diagram. Clear the DTC and test the system for normal operation.

-> **No**

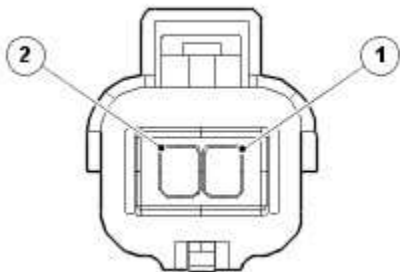
INSTALL a new left hand front low-frequency antenna.

[Tire Pressure Monitoring System \(TPMS\) Front Antenna](#)

PINPOINT TEST G528618p3 : RIGHT HAND FRONT LOW-FREQUENCY ANTENNA CIRCUIT

G528618t5 : Check the antenna negative circuit for short circuit to ground

1. Key off. 2. Disconnect the right hand front low-frequency antenna electrical connector, EC84. 3.



E63657

Measure the resistance between:

EC84, harness side	Battery
Pin 02, negative	Negative terminal

- Is the resistance less than 10,000 ohms?

-> Yes

GO to Pinpoint Test [G528618t12](#).

-> No

GO to Pinpoint Test [G528618t6](#).

G528618t6 : Check the antenna negative circuit for short circuit to power

1. Measure the resistance between:

EC84, harness side	Battery
Pin 02, negative	Positive terminal

- Is the resistance less than 10,000 ohms?

-> Yes

GO to Pinpoint Test [G528618t13](#).

-> No

GO to Pinpoint Test [G528618t10](#).

G528618t10 : Check the antenna positive circuit for short circuit to ground

1. Measure the resistance between:

EC84, harness side	Battery
Pin 01, positive	Negative terminal

- Is the resistance less than 10,000 ohms?

-> Yes

GO to Pinpoint Test [G528618t14](#).

-> No

GO to Pinpoint Test [G528618t11](#).

G528618t11 : Check the antenna positive circuit for short circuit to power

1. Measure the resistance between:

EC84, harness side	Battery
Pin 01, positive	Positive terminal

- Is the resistance less than 10,000 ohms?

-> Yes

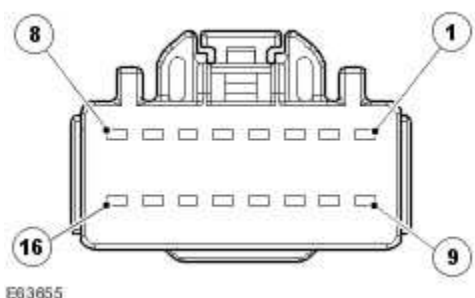
GO to Pinpoint Test [G528618t15](#).

-> No

GO to Pinpoint Test [G528618t16](#).

G528618t12 : Check whether the short circuit is in the harness or the module

1. Disconnect the TPMS module connector, CR94. 2.



Measure the resistance between:

EC84, harness side	Battery
Pin 02, negative	Negative terminal

- Is the resistance less than 10,000 ohms?

-> Yes

REPAIR the short circuit. This circuit contains intermediate connector, EC17. For additional information, refer to the wiring diagram. Clear the DTC and test the system for normal operation.

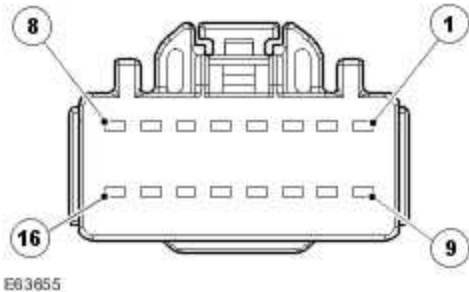
-> No

INSTALL a new TPMS control module.

[Tire Pressure Monitoring System \(TPMS\) Module](#)

G528618t13 : Check whether the short circuit is in the harness or the module

1. Disconnect the TPMS module connector, CR94. 2.



Measure the resistance between:

EC84, harness side	Battery
Pin 02, negative	Positive terminal

- Is the resistance less than 10,000 ohms?

-> Yes

REPAIR the short circuit. This circuit contains intermediate connector, EC17. For additional information, refer to the wiring diagram. Clear the DTC and test the system for normal operation.

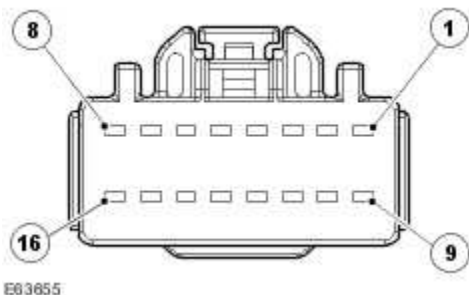
-> No

INSTALL a new TPMS control module.

[Tire Pressure Monitoring System \(TPMS\) Module](#)

G528618t14 : Check whether the short circuit is in the harness or the module

1. Disconnect the TPMS module connector, CR94. 2.



Measure the resistance between:

EC84, harness side	Battery

Pin 01, positive	Negative terminal
------------------	-------------------

- **Is the resistance less than 10,000 ohms?**

-> **Yes**

REPAIR the short circuit. This circuit contains intermediate connector, EC17. For additional information, refer to the wiring diagram. Clear the DTC and test the system for normal operation.

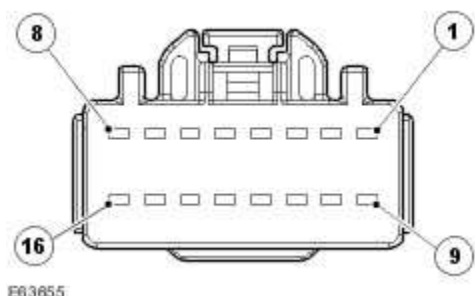
-> **No**

INSTALL a new TPMS control module.

[Tire Pressure Monitoring System \(TPMS\) Module](#)

G528618t15 : Check whether the short circuit is in the harness or the module

1. Disconnect the TPMS module connector, CR94. 2.



Measure the resistance between:

EC84, harness side	Battery
Pin 01, positive	Positive terminal

- **Is the resistance less than 10,000 ohms?**

-> **Yes**

REPAIR the short circuit. This circuit contains intermediate connector, EC17. For additional information, refer to the wiring diagram. Clear the DTC and test the system for normal operation.

-> **No**

INSTALL a new TPMS control module.

[Tire Pressure Monitoring System \(TPMS\) Module](#)

G528618t16 : Check the antenna negative circuit for high resistance

1. Measure the resistance between:

CR94, harness side	EC84, harness side
Pin 16, negative	Pin 02, negative

- **Is the resistance greater than 5 ohms?**

-> **Yes**

REPAIR the high resistance circuit. This circuit contains intermediate connector, EC17. For additional information, refer to the wiring diagram. Clear the DTC and test the system for normal operation.

-> **No**

GO to Pinpoint Test [G528618t17](#).

G528618t17 : Check the antenna positive circuit for high resistance

1. Measure the resistance between:

CR94, harness side	EC84, harness side
Pin 15, positive	Pin 01, positive

- **Is the resistance greater than 5 ohms?**

-> **Yes**

REPAIR the high resistance circuit. This circuit contains intermediate connector, EC17. For additional information, refer to the wiring diagram. Clear the DTC and test the system for normal operation.

-> **No**

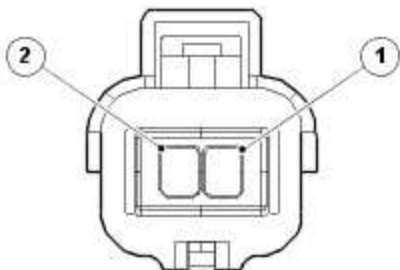
INSTALL a new right hand front low-frequency antenna.

[Tire Pressure Monitoring System \(TPMS\) Front Antenna](#)

PINPOINT TEST G528618p4 : LEFT HAND REAR LOW-FREQUENCY ANTENNA CIRCUIT

G528618t18 : Check the antenna negative circuit for short circuit to ground

1. Key off. 2. Disconnect the left hand rear low-frequency antenna electrical connector, BR08. 3.



E63857

Measure the resistance between:

BR08, harness side	Battery
Pin 02, negative	Negative terminal

- Is the resistance less than 10,000 ohms?

-> Yes

GO to Pinpoint Test [G528618t22](#).

-> No

GO to Pinpoint Test [G528618t19](#).

G528618t19 : Check the antenna negative circuit for short circuit to power

1. Measure the resistance between:

BR08, harness side	Battery
Pin 02, negative	Positive terminal

- Is the resistance less than 10,000 ohms?

-> Yes

GO to Pinpoint Test [G528618t23](#).

-> No

GO to Pinpoint Test [G528618t20](#).

G528618t20 : Check the antenna positive circuit for short circuit to ground

1. Measure the resistance between:

BR08, harness side	Battery
Pin 01, positive	Negative terminal

- **Is the resistance less than 10,000 ohms?**

-> **Yes**

GO to Pinpoint Test [G528618t24](#).

-> **No**

GO to Pinpoint Test [G528618t21](#).

G528618t21 : Check the antenna positive circuit for short circuit to power

1. Measure the resistance between:

BR08, harness side	Battery
Pin 01, positive	Positive terminal

- **Is the resistance less than 10,000 ohms?**

-> **Yes**

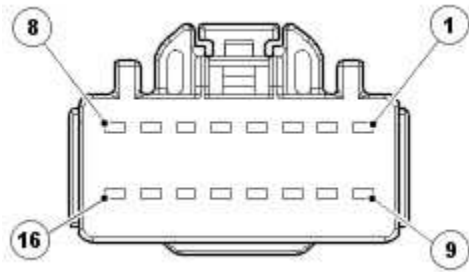
GO to Pinpoint Test [G528618t25](#).

-> **No**

GO to Pinpoint Test [G528618t26](#).

G528618t22 : Check whether the short circuit is in the harness or the module

1. Disconnect the TPMS module connector, CR94. 2.



E63655

Measure the resistance between:

BR08, harness side	Battery
Pin 02, negative	Negative terminal

- Is the resistance less than 10,000 ohms?

-> Yes

REPAIR the short circuit. This circuit contains intermediate connector, BR01. For additional information, refer to the wiring diagram. Clear the DTC and test the system for normal operation.

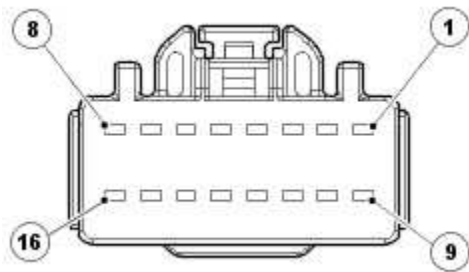
-> No

INSTALL a new TPMS control module.

[Tire Pressure Monitoring System \(TPMS\) Module](#)

G528618t23 : Check whether the short circuit is in the harness or the module

1. Disconnect the TPMS module connector, CR94. 2.



E63655

Measure the resistance between:

BR08, harness side	Battery
Pin 02, negative	Positive terminal

- Is the resistance less than 10,000 ohms?

-> Yes

REPAIR the short circuit. This circuit contains intermediate connector, BR01. For additional information, refer to the wiring diagram. Clear the DTC and test the system for normal operation.

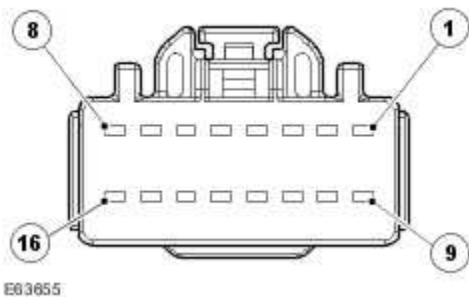
-> No

INSTALL a new TPMS control module.

[Tire Pressure Monitoring System \(TPMS\) Module](#)

G528618t24 : Check whether the short circuit is in the harness or the module

1. Disconnect the TPMS module connector, CR94. 2.



Measure the resistance between:

BR08, harness side	Battery
Pin 01, positive	Negative terminal

- Is the resistance less than 10,000 ohms?

-> Yes

REPAIR the short circuit. This circuit contains intermediate connector, BR01. For additional information, refer to the wiring diagram. Clear the DTC and test the system for normal operation.

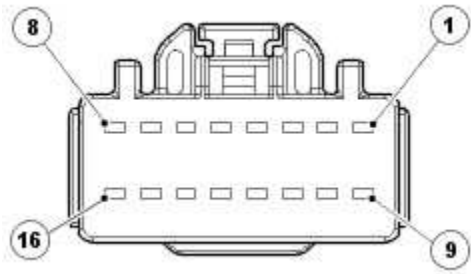
-> No

INSTALL a new TPMS control module.

[Tire Pressure Monitoring System \(TPMS\) Module](#)

G528618t25 : Check whether the short circuit is in the harness or the module

1. Disconnect the TPMS module connector, CR94. 2.



E63855

Measure the resistance between:

BR08, harness side	Battery
Pin 01, positive	Positive terminal

- Is the resistance less than 10,000 ohms?

-> Yes

REPAIR the short circuit. This circuit contains intermediate connector, BR01. For additional information, refer to the wiring diagram. Clear the DTC and test the system for normal operation.

-> No

INSTALL a new TPMS control module.

[Tire Pressure Monitoring System \(TPMS\) Module](#)

G528618t26 : Check whether the short circuit is in the harness or the module

1. Measure the resistance between:

CR94, harness side	BR08, harness side
Pin 06, negative	Pin 02, ground

- Is the resistance greater than 5 ohms?

-> Yes

REPAIR the high resistance circuit. This circuit contains intermediate connector, BR01. For additional information, refer to the wiring diagram. Clear the DTC and test the system for normal operation.

-> No

GO to Pinpoint Test [G528618t27](#).

G528618t27 : Check the antenna positive circuit for high resistance

1. Measure the resistance between:

CR94, harness side	BR08, harness side
Pin 05, positive	Pin 01, positive

- **Is the resistance greater than 5 ohms?**

-> **Yes**

REPAIR the high resistance circuit. This circuit contains intermediate connector, BR01. For additional information, refer to the wiring diagram. Clear the DTC and test the system for normal operation.

-> **No**

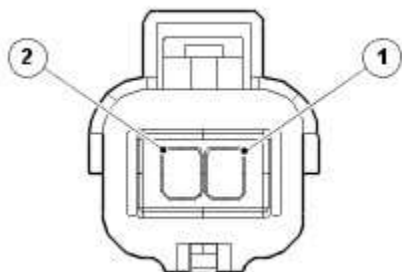
INSTALL a new rear left hand low-frequency antenna.

[Tire Pressure Monitoring System \(TPMS\) Rear Antenna](#)

PINPOINT TEST G528618p5 : RIGHT HAND REAR LOW-FREQUENCY ANTENNA CIRCUIT

G528618t34 : Check the antenna negative circuit for short circuit to ground

1. Key off. 2. Disconnect the right hand rear low-frequency antenna electrical connector, BR09. 3.



E63657

Measure the resistance between:

BR09, harness side	Battery
Pin 02, negative	Negative terminal

- Is the resistance less than 10,000 ohms?

-> Yes

GO to Pinpoint Test [G528618t38](#).

-> No

GO to Pinpoint Test [G528618t35](#).

G528618t35 : Check the antenna negative circuit for short circuit to power

1. Measure the resistance between:

BR09, harness side	Battery
Pin 02, negative	Positive terminal

- Is the resistance less than 10,000 ohms?

-> Yes

GO to Pinpoint Test [G528618t39](#).

-> No

GO to Pinpoint Test [G528618t36](#).

G528618t36 : Check the antenna positive circuit for short circuit to ground

1. Measure the resistance between:

BR09, harness side	Battery
Pin 01, positive	Negative terminal

- Is the resistance less than 10,000 ohms?

-> Yes

GO to Pinpoint Test [G528618t40](#).

-> No

GO to Pinpoint Test [G528618t37](#).

G528618t37 : Check the antenna positive circuit for short circuit to power

1. Measure the resistance between:

BR09, harness side	Battery
Pin 01, positive	Positive terminal

- Is the resistance less than 10,000 ohms?

-> Yes

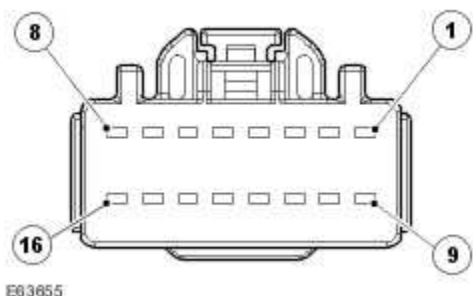
GO to Pinpoint Test [G528618t41](#).

-> No

GO to Pinpoint Test [G528618t42](#).

G528618t38 : Check whether the short circuit is in the harness or the module

1. Disconnect the TPMS module connector, CR94. 2.



Measure the resistance between:

BR09, harness side	Battery
Pin 02, negative	Negative terminal

- Is the resistance less than 10,000 ohms?

-> Yes

REPAIR the short circuit. This circuit contains intermediate connector, BR01. For additional information, refer to the wiring diagram. Clear the DTC and test the system for normal operation.

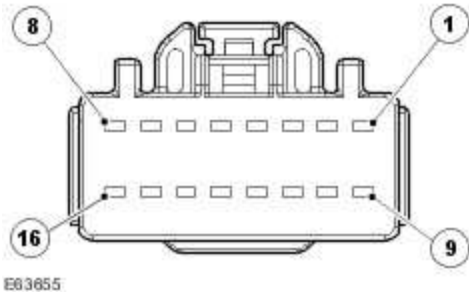
-> No

INSTALL a new TPMS control module.

[Tire Pressure Monitoring System \(TPMS\) Module](#)

G528618t39 : Check whether the short circuit is in the harness or the module

1. Disconnect the TPMS module connector, CR94. 2.



Measure the resistance between:

BR09, harness side	Battery
Pin 02, negative	Positive terminal

- Is the resistance less than 10,000 ohms?

-> Yes

REPAIR the short circuit. This circuit contains intermediate connector, BR01. For additional information, refer to the wiring diagram. Clear the DTC and test the system for normal operation.

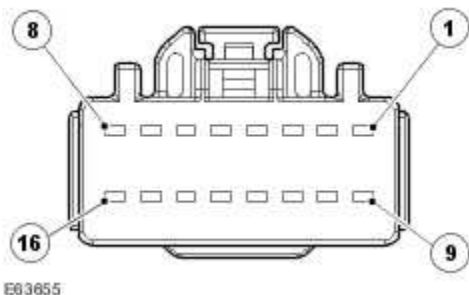
-> No

INSTALL a new TPMS control module.

[Tire Pressure Monitoring System \(TPMS\) Module](#)

G528618t40 : Check whether the short circuit is in the harness or the module

1. Disconnect the TPMS module connector, CR94. 2.



Measure the resistance between:

BR09, harness side	Battery

Pin 01, positive	Negative terminal
------------------	-------------------

- Is the resistance less than 10,000 ohms?

-> **Yes**

REPAIR the short circuit. This circuit contains intermediate connector, BR01. For additional information, refer to the wiring diagram. Clear the DTC and test the system for normal operation.

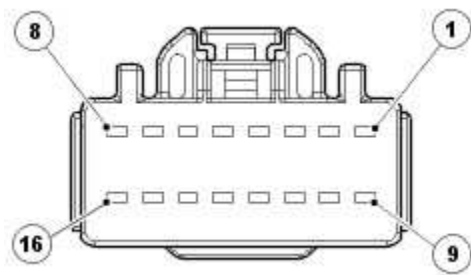
-> **No**

INSTALL a new TPMS control module.

[Tire Pressure Monitoring System \(TPMS\) Module](#)

G528618t41 : Check whether the short circuit is in the harness or the module

1. Disconnect the TPMS module connector, CR94. 2.



Measure the resistance between:

BR09, harness side	Battery
Pin 01, positive	Positive terminal

- Is the resistance less than 10,000 ohms?

-> **Yes**

REPAIR the short circuit. This circuit contains intermediate connector, BR01. For additional information, refer to the wiring diagram. Clear the DTC and test the system for normal operation.

-> **No**

INSTALL a new TPMS control module.

[Tire Pressure Monitoring System \(TPMS\) Module](#)

G528618t42 : Check whether the short circuit is in the harness or the module

1. Measure the resistance between:

CR94, harness side	BR09, harness side
Pin 08, negative	Pin 02, negative

- **Is the resistance greater than 5 ohms?**

-> **Yes**

REPAIR the high resistance circuit. This circuit contains intermediate connector, BR01. For additional information, refer to the wiring diagram. Clear the DTC and test the system for normal operation.

-> **No**

GO to Pinpoint Test [G528618t43](#).

G528618t43 : Check whether the short circuit is in the harness or the module

1. Measure the resistance between:

CR94, harness side	BR09, harness side
Pin 07, positive	Pin 01, positive

- **Is the resistance greater than 5 ohms?**

-> **Yes**

REPAIR the high resistance circuit. This circuit contains intermediate connector, BR001. For additional information, refer to the wiring diagram. Clear the DTC and test the system for normal operation.

-> **No**

INSTALL a new rear right hand low-frequency antenna.

[Tire Pressure Monitoring System \(TPMS\) Rear Antenna](#)

Tire Low Pressure Sensor

Removal

NOTE:

It is strongly recommended that a new tire low pressure sensor O-ring seal, washer, nut, valve core and cap are installed each time a tire is removed and installed. The O-ring seal, washer, nut, valve core and cap must be replaced if the tire low pressure sensor is removed. Removal of the tire low pressure sensor retaining nut must be regarded as tire low pressure sensor removal. The tire low pressure sensor valve cap must always be in place except when inflating, releasing pressure or checking pressure.

1. Remove the wheel and tire.

For additional information, refer to [Wheel and Tire \(74.20.05\)](#)

2



- **CAUTION: Make sure the tire bead is broken from the wheel rim 180 degrees from the tire low pressure sensor. Failure to follow this instruction may result in damage to the tire low pressure sensor.**

Remove the tire.

For additional information, refer to [Wheels and Tires - VIN Range: G45704->H18679](#)

3

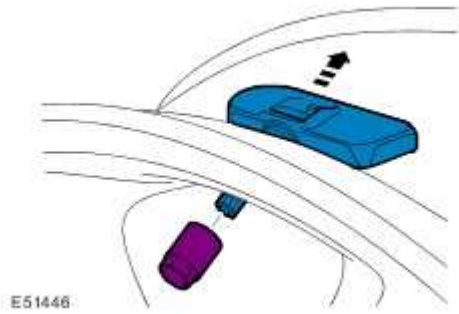


- **CAUTION: Make sure you do not push on the tire low pressure sensor valve. Failure to follow this instruction may result in damage to the valve.**

Remove the tire low pressure sensor.



Remove and discard the tire low pressure sensor retaining nut, valve core, valve cap, O-ring seal and washer.



Installation

1



- CAUTION: The base of the valve stem must be held whilst pushing on the new seal and washer. Failure to follow this instruction may result in damage to the tire low pressure sensor.

NOTE:

Make sure that the washer and O-ring seal are installed correctly. The flat face of washer must be seated against the sensor housing. The taper of O-ring seal points towards the wheel.

Install a new washer and O-ring seal.



Install a new valve core and valve cap.



2



- CAUTION: Make sure solvents or cleaning agents of any type are not used to clean the tire low pressure sensor. Failure to follow this instruction may result in damage to the

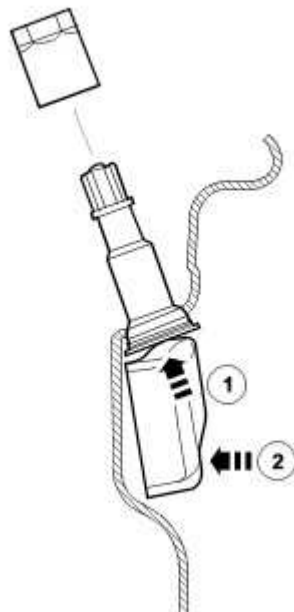
tire low pressure sensor.

NOTE:

If the tire low pressure sensor is replaced on a road wheel, the new tire low pressure sensor identification code will be learnt when the vehicle is first driven. If a new tire low pressure sensor is fitted to the spare wheel the identification code for that tire low pressure sensor must be programmed into the tire pressure monitoring system module. The identification code is printed on the casing of each tire low pressure sensor and is prefixed with ID.

Install the tire low pressure sensor.

- 1) Support the base of the valve stem when installing the tire low pressure sensor.
 - 2) Hold the tire low pressure sensor against the wheel rim when tightening the retaining nut.
- ▶ Install a new tire low pressure sensor retaining nut.
 - ▶ Tighten the nut to 8 Nm.



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3 .



CAUTION: Make sure no damage occurs to the tire low pressure sensor.

Install the tire and balance the wheel.

For additional information, refer to [Wheels and Tires - VIN Range: G45704->H18679](#)

4 . Install the wheel and tire.

For additional information, refer to [Wheel and Tire \(74.20.05\)](#)

Tire Pressure Monitoring System (TPMS)

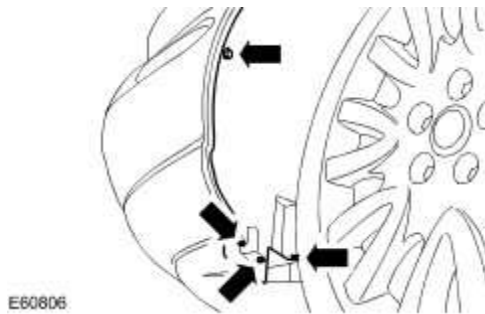
Front Antenna

Removal

1 . NOTE:

Left-hand shown, right-hand similar.

Detach the fender splash shield.

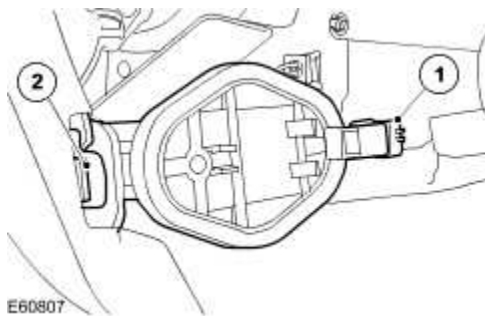


2 . NOTE:

Left-hand shown, right-hand similar.

Remove the tire pressure monitoring system front antenna.

- 1) Disconnect the electrical connector.
- 2) Remove the tire pressure monitoring system front antenna.



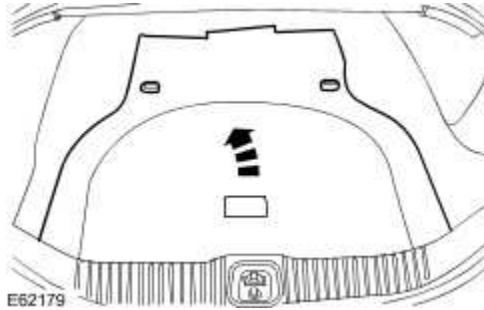
Installation

- 1 . To install, reverse the removal procedure.

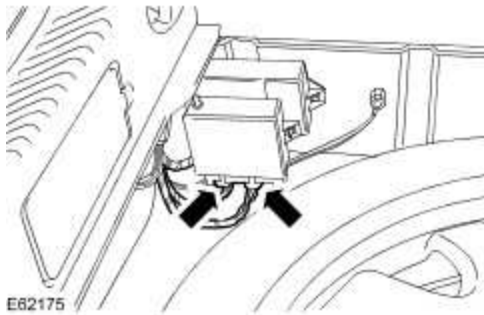
Tire Pressure Monitoring System (TPMS) Module

Removal

- 1 . Reposition the luggage compartment floor covering.

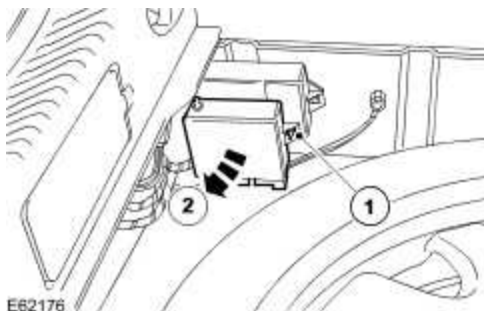


- 2 . Disconnect the tire pressure monitoring system module electrical connectors.



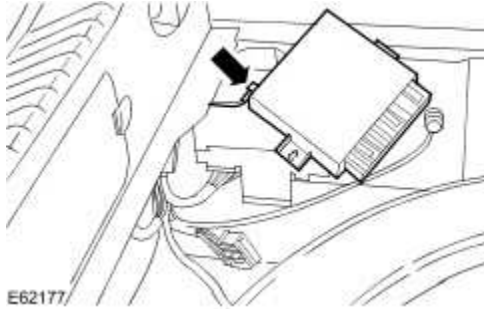
- 3 . Reposition the tire pressure monitoring system module.

- 1) Remove the retaining nut.
- 2) Reposition the tire pressure monitoring system module.



4 . Remove the tire pressure monitoring system module.

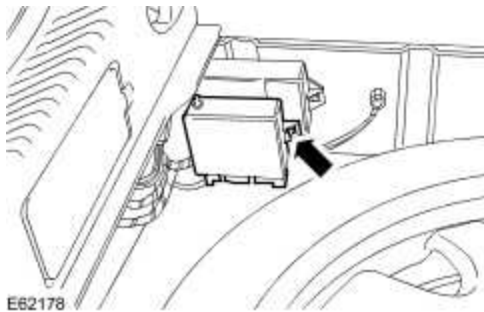
▶ Disconnect the external antenna.



Installation

1 . To install, reverse the removal procedure.

▶ Tighten to 5 Nm.



Tire Pressure Monitoring System (TPMS)

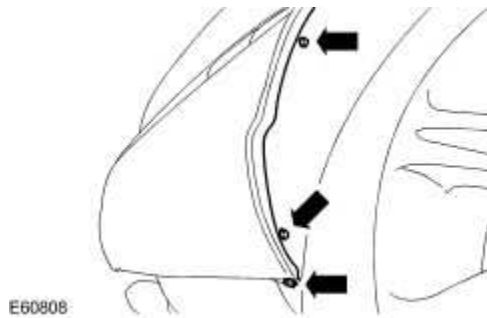
Rear Antenna

Removal

1 . NOTE:

Right-hand shown, left-hand similar.

Detach the fender splash shield.

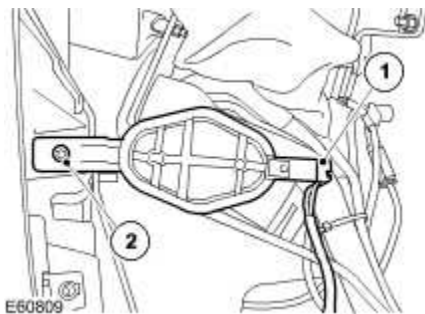


2 . NOTE:

Right-hand shown, left-hand similar.

Remove the tire pressure monitoring system rear antenna.

- 1) Disconnect the electrical connector.
- 2) Remove the tire pressure monitoring system rear antenna.



Installation

- 1 . To install, reverse the removal procedure.

Wheel and Tire (74.20.05)

Removal

1



- CAUTION: Do not use heat to loosen a seized wheel nut. Excessive heat may cause damage to the wheel and wheel bearings.

Loosen the wheel nuts.



2 . Raise and support the vehicle. <<100-02>>

3 . Remove the wheel and tire assembly.



Installation

1



- WARNING: Make sure there is no contamination of the wheel, hub or brake disc contact surfaces. Installation without metal to metal contact at the mounting surfaces may cause the wheel nuts to loosen and allow the wheel to detach with the vehicle in motion. Failure to follow these instructions may result in personal injury.



WARNING: Apply a small amount of grease to the hub and wheel mating surfaces before installation. Make sure the grease does not come into contact with the vehicles braking components and the wheel stud threads. Failure to follow these instructions may result in personal injury.

To install, reverse the removal procedure.

▶ Tighten to 125 Nm.



204-05 : Vehicle Dynamic Suspension

Specifications

Specifications

Torque Specifications

Description	Nm	lb-ft	lb-in
Compressor to body retaining nuts	20	15	-
Reservoir to body retaining nuts	7	-	62
Solenoid valve block to reservoir retaining nuts	5	-	44
Air pipes	5	-	44
Air suspension module to body retaining nuts	4	-	35
Front height sensors retaining bolts	20	15	-
Front height sensor to bracket retaining bolts	5	-	44
Rear height sensors retaining bolts	20	15	-
Front vertical accelerometer to body retaining nuts	4	-	35
Rear vertical accelerometer to body retaining nuts	4	-	35
Front air spring to body upper retaining nuts	25	18	-
Front suspension upper arm retaining nut	90	66	-
Front air spring assembly to lower arm retaining bolt	175	129	-
Rear air spring to body upper retaining nuts	25	18	-
Rear air spring assembly to lower arm retaining bolt	133	98	-
Compressor air pipe retaining nut	2	-	18

Air Leaks

1.



CAUTION: Any spray used must have a corrosion inhibitor, and must not cause damage to paintwork, plastics, metals or plastic pipes.

NOTE:

The recommended leak detection spray is GOTECH LDS, Jaguar part number C2C 22398.

The recommended leak detection spray should be used to identify any suspected leaks. This procedure should also be used where any of the air suspension components have been disturbed.

2. Clean around the area of the suspected air leak.

3. Using the recommended leak detection spray, spray around all of the air suspension components, working systematically until the source of the air leak has been found.

4. **NOTE:**

If a new air suspension component is to be fitted, and no air leak has been detected at the pipe connectors, remove and discard the new air pipe connections supplied with the component.

If any of the air suspension components are found to be leaking e.g. air spring, compressor, reservoir or the solenoid valve block repair is effected by replacement only. If an air leak from the pipe connector has also been identified, a new air pipe connector, supplied with the air suspension component, must be installed.

5. **NOTE:**

Only Jaguar approved connectors have been tested to the correct pressure and temperature specifications.

NOTE:

Air pipes must only be cut using either Hose cutter 204-494, available from SPX LTD or Hose cutter YA1000A, available from Snap-On Tools.

NOTE:

If the color coded markings adjacent to the pipe connections are removed when cutting air pipes, the cut end of the air pipe must be clearly marked with a suitable colored tape or

paint mark.

If the source of the air leak is found to be a pipe connection cut 5 mm (0.2 in) off the end of the air pipe and fit a new connector.

6. NOTE:

Air pipes must only be cut using either Hose cutter 204-494, available from SPX LTD or Hose cutter YA1000A, available from Snap-On Tools.

NOTE:

Only Jaguar approved air pipes have been tested to the correct pressure and temperature specifications.

If the source of the air leak is found to be in a section of pipe cut out the damaged section of air pipe and replace with new air pipe and air pipe connectors as required.

7. NOTE:

If the repair has been unsuccessful repeat the above steps until the air leak is rectified.

Using the Jaguar approved diagnostic system ensure that the system is fully pressurized.

8. Using the recommended leak detection spray, spray around all of the air suspension components, working systematically to make sure that the source of the air leak has been found.

Ride Height Adjustments

Special Service Tools



Ride height gauge.

204-484

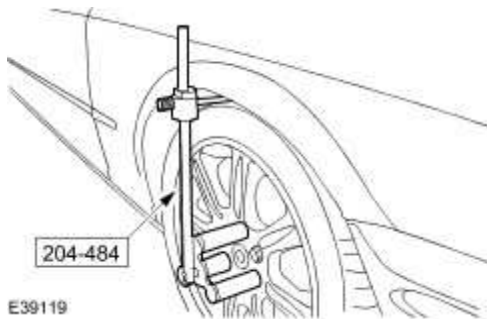
1. **NOTE:**

Fit special tool 204-484 as illustrated.

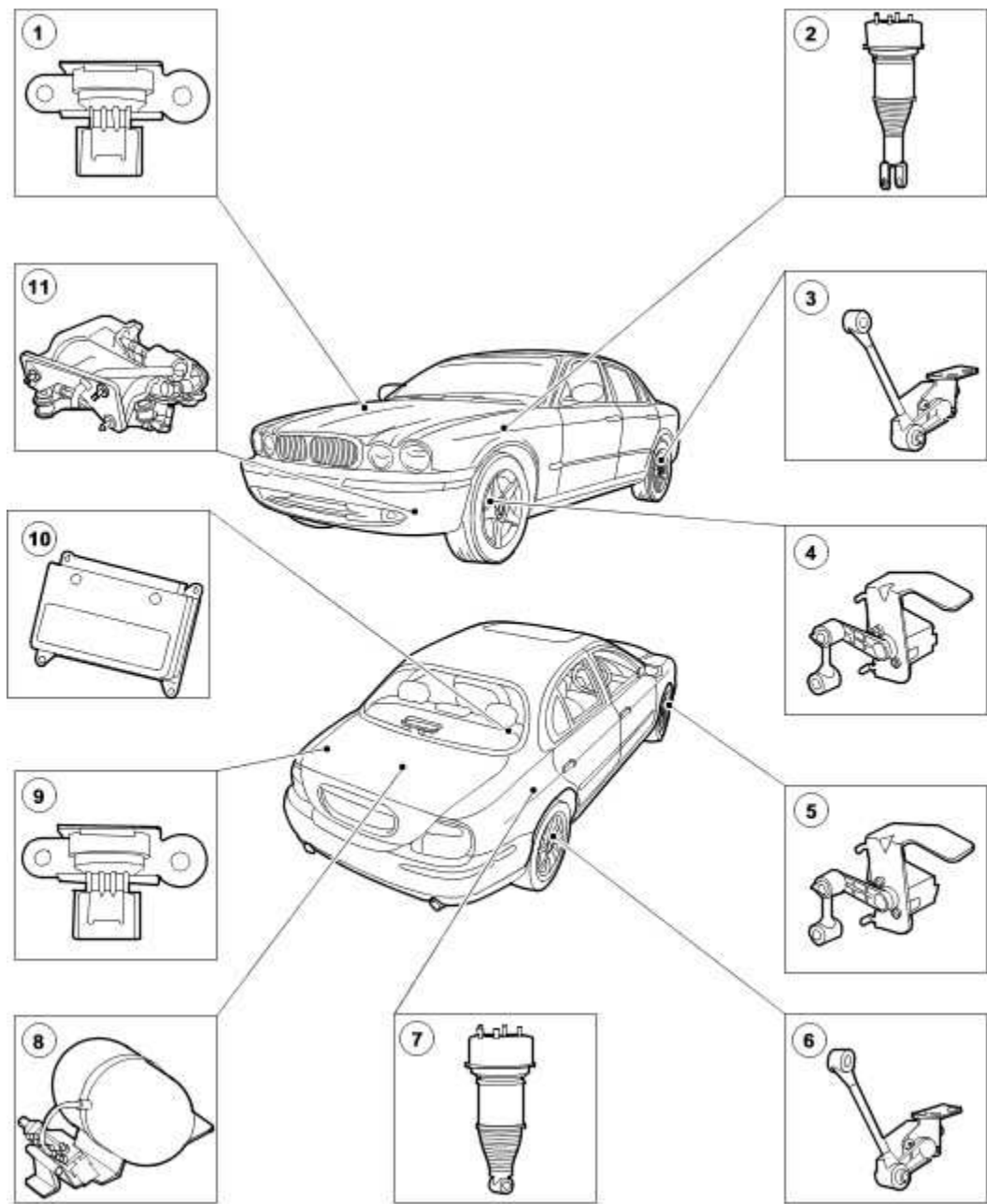
NOTE:

Make sure that the ride height gauge is vertical as shown.

Using the Jaguar approved diagnostic system carry out the ride height adjustments.



Vehicle Dynamic Suspension



E37421

Item	Part Number	Description
1	—	Front vertical accelerometer

2	—	Front air spring
3	—	Left-hand rear suspension height sensor
4	—	Left-hand front suspension height sensor
5	—	Right-hand front suspension height sensor (not used on vehicles built after December 2003)
6	—	Right-hand rear suspension height sensor
7	—	Rear air spring
8	—	Solenoid valve block and air reservoir
9	—	Rear vertical accelerometer
10	—	Air suspension control module
11	—	Compressor

The vehicle dynamic suspension is a passive air suspension system providing vehicle levelling independent of load. The system also improves the drag coefficient by automatically lowering the vehicle for high speed driving.

When driving at high speeds, the air suspension system will lower the vehicle to improve aerodynamics and vehicle stability. The suspension will automatically return the vehicle to the normal ride height when the vehicle slows.

NOTE:

Speed lowering is disabled when towing. Only Jaguar approved towing equipment will inhibit this feature.

The air suspension system ensures that the vehicle is always at the correct ride height for varying load conditions.

The air suspension system automatically adjusts the amount of air in the air springs to level the vehicle. Air is supplied either from an air reservoir or a compressor. The compressor will run periodically to fill the air reservoir.

The air suspension module (ASM) controls the operation of the solenoids in the valve block. The front air springs are operated as a pair, the rear air springs are operated independently of each other. The ASM adjusts one axle at a time, for example, when lifting the vehicle the rear axle is controlled first;

when lowering the vehicle the front axle is controlled first. This reduces headlamp glare during leveling operations.

The ASM uses two different filter rates. When stationary, a 'fast' filter allows the system to react quickly to payload changes. Whilst driving a 'slow' filter allows for compensation of the fuel level change but does not react to road inputs for example pot holes and speed bumps.

Suspension Height Sensors

Vehicles built before December 2003 have four suspension height sensors which are mounted on the front and rear subframe assemblies, two front and two rear. Vehicles built after December 2003 have only three (the right front sensor being deleted), although the functionality of the system remains the same. The suspension height sensors are linked to the suspension arms by drop link connections and secured by means of a spring clip.

NOTE:

There may be some early vehicles which will have four sensors fitted, but which have the three-sensor module, making the right front sensor redundant. To confirm the level of equipment, read the module part number from the **special applications** menu in **configuration** on the Jaguar approved diagnostic system. Part numbers before 'BJ' are four sensor, while 'BJ' and after are three sensor. If the Jaguar approved diagnostic system is not available, remove the rear seat and sound deadening and read the part number from the module.

NOTE:

Suspension height sensors require calibration if removed/refitted or replaced.

Air Springs

Two derivatives of the air spring are available, comfort and sport, the sport having slightly smaller working volumes for higher spring rates.

The air springs are complemented by two versions of damper assembly, passive and active.



CAUTION: When removing and refitting the air spring and damper assemblies, care must be taken to avoid damage to the internal seal assembly.



CAUTION: When working on the air spring and damper assembly, ensure that no twisting occurs between the air spring top mounting and damper body. Twisting may result in damage to the air spring inner components.

A pressure retaining valve (PRV) is located in each air spring which retains sufficient pressure to protect the air spring membrane during service and handling.

NOTE:

De-pressurization and re-pressurization of the air suspension system should be performed using the Jaguar approved diagnostic system prior to, and after, any work being carried out.

Solenoid Valve Block

The solenoid valve block contains five individual solenoid valves (one per air spring and one for the vehicle reservoir). A pressure sensor is incorporated into the solenoid valve block and monitors air spring and reservoir pressure. The solenoid valve block is mounted on isolators to reduce valve operation noise. Pipe connections are provided for the front and rear air spring assemblies and also the reservoir and compressor. The compressor to valve block port and the rear air spring ports are 4 mm in diameter with the front air spring ports being 6 mm in diameter. Each of the solenoid valve block ports and air pipes are color coded (pink, blue, white, yellow, red and brown) for correct connection.

Reservoir

The reservoir has a volume of 4.5 liters with a maximum design pressure of 15 bar (218 psi). Dependent on load conditions, this store of reserve air is sufficient for two full lifts. The system automatically replenishes the reservoir by way of the compressor.

Air Suspension Module

The air suspension module (ASM) is accessed from the right-hand side of the vehicle, behind the back of the rear seat. The ASM can be recognized by the 4 individually colored connectors (gold, grey, yellow and pink) and the 'WABCO' logo on the front of the module. ASM calibration is required when either a replacement module is fitted, or if any height sensors have been removed/refitted or replaced.

NOTE:

When installing a new air suspension module it will be necessary to configure the module into the customer mode using the Jaguar approved diagnostic system.

Compressor

The air compressor is located in the left-hand front wheel arch behind the bumper beam assembly. It contains an air filter, an integral regenerative air drier element plus an air exhaust solenoid valve. The compressor is isolated from the main body structure by 3 mounts, each incorporating a rubber bush and metal spring. The maximum pressure developed by the system is 15 bar (218 psi) with a compressor pressure relief valve fitted, set to relieve pressures above 17 Bar (247 psi). The

compressor only operates whilst the engine is running. To guard against the compressor overheating the ASM may shut down the compressor to allow cooling to take place. Re-activation of the compressor depends on vehicle activity and is generally no longer than 120 seconds.

Vehicle Dynamic Suspension

Operating modes

Before it will be possible to verify the customer concern, it will be necessary to understand the modes of the system to establish what the system should and should not do in each mode. The table below should help in understanding the operating modes.

Vehicle operating condition	Air suspension operating mode	Levelling status
Static, parked. No occupant or loading activity for 30 minutes	Sleep mode	<ul style="list-style-type: none"> Compressor unpowered Only lowering allowed
Static, parked. Occupant entry and/or loading activity within past 30 minutes	Preliminary mode	<ul style="list-style-type: none"> Lifting with reservoir Lowering permitted Compressor unpowered
Static, parked with engine running	Stance mode	<ul style="list-style-type: none"> Lifting with reservoir Lowering permitted Compressor unpowered unless reservoir pressure is below a preset minimum and the vehicle is below the compressor activation height
Driving	Drive mode	<ul style="list-style-type: none"> Lowering permitted at all speeds
		When vehicle speed is below 40 km/h (25 mph): <ul style="list-style-type: none"> Lifting with reservoir Compressor unpowered unless reservoir pressure is below a preset minimum and the vehicle is below the compressor activation height
		When vehicle speed is above 40 km/h (25 mph): <ul style="list-style-type: none"> Compressor powered to lift vehicle and refill reservoir

TRANSPORTATION MODE

The vehicle will arrive at the dealership in transportation mode, and will need to be reset to customer mode at PDI (this will be carried out by a Jaguar dealer).

Transportation mode keeps the vehicle in a raised condition to allow adequate clearance for transporter loading and unloading. If the vehicle has lowered, the compressor is used to lift the vehicle. Until a suitable height is reached, the message center will display **Vehicle too low**. The message, **Air Suspension Fault** will be displayed on the message center at all times whilst the vehicle is in transportation mode.

CUSTOMER MODE

The modes below are all enabled in this mode.

SLEEP MODE

The system shuts down into sleep mode 30 minutes after the vehicle is left, and "wakes up" to check the ride height every 24 hours. If the vehicle is not level, the system lowers until the vehicle attitude is correct. The system will **not** lift the vehicle while in sleep mode to conserve reservoir pressure and battery power.

PRELIMINARY MODE

When a door or luggage compartment is opened, or the engine is switched off from a standstill condition, (see below) this mode is enabled.

In Preliminary mode, the reservoir is used to lift the vehicle to level it to within a greater tolerance than in stance or drive modes (see below).

STANCE MODE

When the vehicle is stationary with the engine running, (standstill condition) the vehicle will be levelled to within a closer tolerance than in preliminary mode to ensure that the trim heights are correct before moving off.

Any lifting necessary will be done from the reservoir, unless the vehicle is below a preset minimum height and the reservoir pressure is below a preset minimum, in which case, the compressor will be used to lift the vehicle.

DRIVE MODE

When the vehicle speed is above the preset threshold, the compressor is always used to lift the vehicle. This threshold is also used to initiate recharging of the reservoir. The following functions are enabled in drive mode;

Speed Lowering Function

To reduce aerodynamic drag and enhance vehicle stability, the system lowers the vehicle at high road speeds.

Levelling Inhibit Function

When the system detects significant cornering, braking and acceleration, it inhibits levelling such that it will not attempt to compensate for vehicle attitude changes.

Inclination Function

The system enables this function when parking on an uneven surface, (or with a wheel on a kerb, for example) to ensure the vehicle attitude remains correct when driving off.

Rough Road Detection

When the system detects a rough road surface, the speed lowering function is inhibited, or cancelled, bringing the vehicle back up to standard ride height to aid passenger comfort.

Trailer Towing Function

When the system detects that the vehicle is towing, (via the connection of the trailer socket) the speed lowering function is inhibited.

NOTE:

This function will only be enabled by the Jaguar approved towing equipment.

Jacking Function

When the system detects that the vehicle is being jacked, or raised on a wheel-free lift, the vehicle enters jacking mode, which inhibits lowering to prevent air loss.

Jacking mode is exited when the vehicle is driven, or the ride height passes below a threshold value.

Inspection and Verification

1 . Verify the customer concern.

2 . Confirm which, if any, warning lights and/or messages were displayed on the instrument cluster.

The following messages can be displayed:

- **vehicle too low**
- **air suspension fault**

3 . Visually inspect for obvious signs of mechanical or electrical damage.

Mechanical	Electrical
<ul style="list-style-type: none">• Tire pressures• Suspension components (wear/damage/security)• Air springs (leakage/damage/tampering)• Reservoir• Compressor	<ul style="list-style-type: none">• Fuse(s)• Wiring harness/electrical connectors• Controller area network circuits. For additional information,• Sensors

<ul style="list-style-type: none"> • Pipework and unions • Sensor fitment • Valve block 	<ul style="list-style-type: none"> • Valve block • Air suspension control module (ASU)
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4 . If an obvious cause for an observed or reported concern is found, correct the cause (if possible) before proceeding to the next step.

5 . Check the vehicle ride height.

[Ride Height Adjustments](#)

6 . If the cause is not visually evident use the Jaguar approved diagnostic system or a scan tool to retrieve the fault codes before proceeding to the diagnostic trouble code (DTC) index chart, or the symptom chart if no DTCs are set.

Symptom Chart

Symptom	Message	Possible Source	Action
Vehicle sits too high and does not lower	<ul style="list-style-type: none"> • Air suspension fault (permanent) • Vehicle too low (occasional) 	<ul style="list-style-type: none"> • Vehicle is in Transportation mode 	<ul style="list-style-type: none"> • Check for DTC C2780 • The Jaguar approved diagnostic system is required to reconfigure the vehicle into customer mode
	None	<ul style="list-style-type: none"> • Vehicle is in Jacking mode (this does NOT indicate a fault) 	To verify, drive the vehicle to above 3 km/h (1.8 mph) to exit jacking mode and check for lowering. If the vehicle does not lower, the system must be tested using the Jaguar approved diagnostic system
Vehicle sits too low	Vehicle too low (flagged when any corner is more than 60 mm too low)	<ul style="list-style-type: none"> • Low spring pressure following chassis rework • Spring airline failure • Spring leakage 	<p>Run the engine and listen for the compressor operating:</p> <ul style="list-style-type: none"> • If the vehicle attempts to lift for 45 seconds, then flags C2302, check that air is being delivered to the air springs by disconnecting the Voss fittings at the springs • If air is being delivered to the springs, check the springs for leakage • If air is not being

			<p>delivered to the springs, verify where air flow is restricted or lost in the air harness</p> <ul style="list-style-type: none"> If the vehicle does not attempt to lift, the system must be tested using the Jaguar approved diagnostic system
	None	The reservoir is depleted, and the vehicle is not below the compressor activation height (this does NOT indicate a fault)	<ul style="list-style-type: none"> If safe, drive the vehicle steadily to above 40 km/h (25 mph) for a minimum 5 minutes. Bring the vehicle to a halt and check if the vehicle has lifted If the vehicle does not lift, the system must be tested using the Jaguar approved diagnostic system
Vehicle gradually lowers while stationary	None	<ul style="list-style-type: none"> Air spring leak Air harness leak Voss fitting leak 	Check the air harness, springs and fittings for leakage. Rectify as necessary
Vehicle attitude is not flat after levelling	None	<ul style="list-style-type: none"> Height sensor linkage/clip displaced Water ingress into the height sensor connector 	<ul style="list-style-type: none"> Visually inspect the height sensor linkage/clip. Rectify as necessary Check the connectors. Rectify as necessary
Hard ride	None	<ul style="list-style-type: none"> Tire pressures incorrect Non-standard wheels/tires Ride height incorrect Harness fault Air spring fault 	<p>Check/adjust the tire pressures. Make sure that the wheels and tires are to specification. Check the ride height.</p> <p>Ride Height Adjustments Check for DTCs indicating a harness or system fault, refer to the DTC index. Check the air springs (see visual inspection).</p>
Soft ride	None	<ul style="list-style-type: none"> Tire pressures incorrect 	Check/adjust the tire pressures.

		<ul style="list-style-type: none"> • Ride height incorrect • Air spring fault 	<p>Check the ride height.</p> <p>Ride Height Adjustments</p> <p>Disconnect the electrical connector from the suspect air spring and recheck. If the ride is still soft, install a new air spring.</p> <p>Front Air Spring (60.32.08)</p> <p>Rear Air Spring - VIN Range: G00442->G45703 (60.32.10)</p> <p>Rear Air Spring - VIN Range: G45704->G99999 (60.32.10)</p>
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Diagnostic Trouble Code (DTC) index



CAUTION: When probing connectors to take measurements in the course of the pinpoint tests, use the adaptor kit, part number 3548-1358-00.

NOTE:

When performing electrical voltage or resistance tests, always use a digital multimeter (DMM) accurate to 3 decimal places, and with an up-to-date calibration certificate. When testing resistance, always take the resistance of the DMM leads into account.

NOTE:

Check and rectify basic faults before beginning diagnostic routines involving pinpoint tests.

DTC	Description	Possible Source	Action
B1312	Head lamp circuit malfunction	<ul style="list-style-type: none"> • Head lamp circuit; short circuit to B+ 	For headlamp circuit tests, GO to Pinpoint Test G256924p2 .
B1342	Control module failure	<ul style="list-style-type: none"> • Control module failure 	Contact dealer technical support for confirmation of control module failure, and/or raise an EPQR.
B1471	Head lamp circuit	<ul style="list-style-type: none"> • Head lamp circuit; open 	For headlamp circuit tests, GO to Pinpoint Test

	malfunction	circuit, short to ground	G256924p2.
B1671	Control module circuit malfunction (high/low voltage)	<ul style="list-style-type: none"> Control module power supply circuit; short to high voltage Control module power supply circuit; open circuit, high resistance, short to ground Charging system fault 	For control module supply circuit tests, GO to Pinpoint Test G256924p3.
B2477	Module configuration failure	<ul style="list-style-type: none"> Control module incorrectly configured to vehicle specification 	Reconfigure the control module using the Jaguar approved diagnostic system.
B2804	Reservoir solenoid signal circuit malfunction	<ul style="list-style-type: none"> Reservoir solenoid signal circuit; short to B+ Reservoir solenoid failure 	For solenoid circuit tests, GO to Pinpoint Test G256924p4.
B2807	Pressure sensor signal circuit malfunction	<ul style="list-style-type: none"> Pressure sensor signal circuit; short to B+ Pressure sensor failure 	For pressure sensor signal circuit tests, GO to Pinpoint Test G256924p5.
B2808	Pressure sensor supply circuit malfunction	<ul style="list-style-type: none"> Pressure sensor supply circuit; short to B+ 	For pressure sensor supply short circuit to B+ tests, GO to Pinpoint Test G256924p6.
B2809	Pressure sensor supply circuit malfunction	<ul style="list-style-type: none"> Pressure sensor supply circuit; short to ground 	For pressure sensor supply short circuit to ground tests, GO to Pinpoint Test G256924p7.
B2810	Air suspension vent solenoid circuit malfunction	<ul style="list-style-type: none"> Vent solenoid circuit; open circuit, short to ground, short to B+ Vent solenoid failure 	For vent solenoid circuit tests, GO to Pinpoint Test G256924p8.
C1416	Right-hand front air spring solenoid circuit malfunction	<ul style="list-style-type: none"> Air spring solenoid circuit; short to B+ 	For right-hand front air spring solenoid circuit tests, GO to Pinpoint Test G256924p9.
C1417	Right-hand front air spring	<ul style="list-style-type: none"> Air spring solenoid circuit; 	For right-hand front air spring solenoid circuit

	solenoid circuit malfunction	short to ground	tests, GO to Pinpoint Test G256924p9 .
C1419	Right-hand front air spring solenoid circuit malfunction	<ul style="list-style-type: none"> Air spring solenoid circuit; open circuit 	For right-hand front air spring solenoid circuit tests, GO to Pinpoint Test G256924p9 .
C1421	Left-hand front air spring solenoid circuit malfunction	<ul style="list-style-type: none"> Air spring solenoid circuit; short to B+ 	For left-hand front air spring solenoid circuit tests, GO to Pinpoint Test G256924p10 .
C1422	Left-hand front air spring solenoid circuit malfunction	<ul style="list-style-type: none"> Air spring solenoid circuit; short to ground 	For left-hand front air spring solenoid circuit tests, GO to Pinpoint Test G256924p10 .
C1424	Left-hand front air spring solenoid circuit malfunction	<ul style="list-style-type: none"> Air spring solenoid circuit; open circuit 	For left-hand front air spring solenoid circuit tests, GO to Pinpoint Test G256924p10 .
C1425	Right-hand rear air spring solenoid circuit malfunction	<ul style="list-style-type: none"> Air spring solenoid circuit; short to ground 	For right-hand rear air spring solenoid circuit tests, GO to Pinpoint Test G256924p11 .
C1426	Right-hand rear air spring solenoid circuit malfunction	<ul style="list-style-type: none"> Air spring solenoid circuit; short to B+ 	For right-hand rear air spring solenoid circuit tests, GO to Pinpoint Test G256924p11 .
C1427	Right-hand rear air spring solenoid circuit malfunction	<ul style="list-style-type: none"> Air spring solenoid circuit; open circuit 	For right-hand rear air spring solenoid circuit tests, GO to Pinpoint Test G256924p11 .
C1430	Left-hand rear air spring solenoid circuit malfunction	<ul style="list-style-type: none"> Air spring solenoid circuit; open circuit 	For left-hand rear air spring solenoid circuit tests, GO to Pinpoint Test G256924p12 .
C1431	Left-hand rear air spring	<ul style="list-style-type: none"> Air spring solenoid circuit; 	For left-hand rear air spring solenoid circuit

	solenoid circuit malfunction	short to B+	tests, GO to Pinpoint Test G256924p12 .
C1432	Left-hand rear air spring solenoid circuit malfunction	<ul style="list-style-type: none"> Air spring solenoid circuit; short to ground 	For left-hand rear air spring solenoid circuit tests, GO to Pinpoint Test G256924p12 .
C1437	Rear vertical accelerometer signal circuit malfunction	<ul style="list-style-type: none"> Rear vertical accelerometer signal circuit; short to ground 	For rear vertical accelerometer signal circuit tests, GO to Pinpoint Test G256924p13 .
C1438	Rear vertical accelerometer signal circuit malfunction	<ul style="list-style-type: none"> Rear vertical accelerometer signal circuit; short to B+ 	For rear vertical accelerometer signal circuit tests, GO to Pinpoint Test G256924p13 .
C1457	Front vertical accelerometer signal circuit malfunction	<ul style="list-style-type: none"> Front vertical accelerometer signal circuit; short to ground 	For front vertical accelerometer signal circuit tests, GO to Pinpoint Test G256924p14 .
C1458	Front vertical accelerometer signal circuit malfunction	<ul style="list-style-type: none"> Front vertical accelerometer signal circuit; short to B+ 	For front vertical accelerometer signal circuit tests, GO to Pinpoint Test G256924p14 .
C1460	Acceleration sensor supply circuit malfunction	<ul style="list-style-type: none"> Acceleration sensor supply circuit; open circuit, high resistance, short to ground, short to B+ 	For acceleration sensor supply circuit tests, GO to Pinpoint Test G256924p15 .
C1723	Height sensor supply circuit malfunction	<ul style="list-style-type: none"> Left-hand front height sensor supply circuit; open circuit, short to ground, short to B+ Right-hand front height sensor supply circuit; open circuit, short to ground, short to B+ Left-hand rear height 	For height sensor supply circuit tests, GO to Pinpoint Test G256924p16 .

		<p>sensor supply circuit; short to ground, open circuit, short to B+</p> <ul style="list-style-type: none"> Right-hand rear height sensor supply circuit; open circuit, short to ground, short to B+ 	
C1800	Air suspension reservoir solenoid drive circuit failure	<ul style="list-style-type: none"> Reservoir solenoid drive circuit; open circuit, short to ground Reservoir solenoid failure 	For reservoir solenoid drive circuit tests, GO to Pinpoint Test G256924p4 .
C1830	Air suspension compressor relay circuit malfunction	<ul style="list-style-type: none"> Compressor relay drive circuit; open circuit, short to ground, short to B+ 	For suspension relay drive circuit tests, GO to Pinpoint Test G256924p17 .
C1881	Right-hand front height sensor signal circuit malfunction (only on vehicles built before December 2003)	<ul style="list-style-type: none"> Sensor signal circuit; open circuit, short to ground Sensor failure 	For right-hand front height sensor signal circuit tests, GO to Pinpoint Test G256924p18 .
C1883	Right-hand front height sensor signal circuit malfunction (only on vehicles built before December 2003)	<ul style="list-style-type: none"> Sensor signal circuit; short to B+ Sensor failure 	For right-hand front height sensor signal circuit tests, GO to Pinpoint Test G256924p18 .
C1885	Right-hand rear height sensor signal circuit malfunction	<ul style="list-style-type: none"> Sensor signal circuit; open circuit, short to ground Sensor failure 	For right-hand rear height sensor signal circuit tests, GO to Pinpoint Test G256924p19 .
C1887	Right-hand rear height sensor signal circuit malfunction	<ul style="list-style-type: none"> Sensor signal circuit; short to B+ Sensor failure 	For right-hand rear height sensor signal circuit tests, GO to Pinpoint Test G256924p19 .
C1889	Left-hand front height sensor signal circuit malfunction	<ul style="list-style-type: none"> Sensor signal circuit; open circuit, short to ground Sensor failure 	For left-hand front height sensor signal circuit tests, GO to Pinpoint Test G256924p20 .

C1891	Left-hand front height sensor signal circuit malfunction	<ul style="list-style-type: none"> • Sensor signal circuit; short to B+ • Sensor failure 	For left-hand front height sensor signal circuit tests, GO to Pinpoint Test G256924p20 .
C1893	Left-hand rear height sensor signal circuit malfunction	<ul style="list-style-type: none"> • Sensor signal circuit; open circuit, short to ground • Sensor failure 	For left-hand rear height sensor signal circuit tests, GO to Pinpoint Test G256924p21 .
C1895	Left-hand rear height sensor signal circuit malfunction	<ul style="list-style-type: none"> • Sensor signal circuit; short to B+ • Sensor failure 	For left-hand rear height sensor signal circuit tests, GO to Pinpoint Test G256924p21 .
C1991	Module calibration failure	<ul style="list-style-type: none"> • Module calibration failure 	Calibrate the control module using the Jaguar approved diagnostic system.
C1993	Pressure sensor signal circuit malfunction	<ul style="list-style-type: none"> • Pressure sensor signal circuit; open circuit, short to ground • Pressure sensor failure 	For pressure sensor signal circuit tests, GO to Pinpoint Test G256924p22 .
C2302	Levelling plausibility error	<ul style="list-style-type: none"> • Levelling plausibility error 	Carry out mechanical checks (air leaks, etc). Refer to the service bulletins.
C2303	Reservoir plausibility error	<ul style="list-style-type: none"> • Reservoir plausibility error 	Carry out mechanical checks (air leaks, etc). Refer to the service bulletins.
C2304	Air spring supply circuit malfunction	<ul style="list-style-type: none"> • Air spring supply circuit; short to ground 	For air spring supply circuit tests, GO to Pinpoint Test G256924p23 .
C2305	Air spring supply circuit malfunction	<ul style="list-style-type: none"> • Air spring supply circuit; short to B+ 	For air spring supply circuit tests, GO to Pinpoint Test G256924p23 .

C2779	Air spring solenoid supply/drive circuit malfunction	<ul style="list-style-type: none"> • Air spring solenoid supply circuit; short to ground, short to B+ • Left-hand front air spring solenoid drive circuit; open circuit, short to ground, short to B+ • Right-hand front air spring solenoid drive circuit; open circuit, short to ground, short to B+ • Left-hand rear air spring solenoid drive circuit; open circuit, short to ground, short to B+ • Right-hand rear air spring solenoid drive circuit; open circuit, short to ground, short to B+ 	For air spring solenoid supply/drive circuit tests, GO to Pinpoint Test G256924p24 .
C2780	Control module in manufacturer sub-state	<ul style="list-style-type: none"> • Control module programming 	Programme the control module using the Jaguar approved diagnostic system.
U1900	CAN communication bus fault	<ul style="list-style-type: none"> • CAN communication error 	For CAN circuit tests,
U2516	Air suspension module bus off	<ul style="list-style-type: none"> • CAN communication error 	For CAN circuit tests,
U2518	RCCM CAN message missing	<ul style="list-style-type: none"> • CAN communication error 	For CAN circuit tests,
U2521	ABS CAN message missing	<ul style="list-style-type: none"> • CAN communication error 	For CAN circuit tests,
U2523	ECM CAN message missing	<ul style="list-style-type: none"> • CAN communication error 	For CAN circuit tests,

Pinpoint tests



CAUTION: When probing connectors to take measurements in the course of the pinpoint tests, use the adaptor kit, part number 3548-1358-00.

NOTE:

When performing electrical voltage or resistance tests, always use a digital multimeter (DMM) accurate to 3 decimal places, and with an up-to-date calibration certificate. When testing resistance, always take the resistance of the DMM leads into account.

NOTE:

Vehicles built before December 2003 have four suspension height sensors which are mounted on the front and rear subframe assemblies, two front and two rear. Vehicles built after December 2003 have only three (the right front sensor being deleted), although the functionality of the system remains the same. There may be some early vehicles which will have four sensors fitted, but which have the three-sensor module, making the right front sensor redundant. To confirm the level of equipment, read the module part number from the **special applications** menu in **configuration** on the Jaguar approved diagnostic system. Part numbers before 'BJ' are four sensor, while 'BJ' and after are three sensor. If the Jaguar approved diagnostic system is not available, remove the rear seat and sound deadening and read the part number from the module.

NOTE:

Check and rectify basic faults before beginning diagnostic routines involving pinpoint tests.

PINPOINT TEST G256924p1 : CHECK FOR LEAKS FROM AIR HARNESS

G256924t1 : VISUALLY INSPECT THE AIR HARNESS CONNECTIONS

1. Make sure the system is pressurized, either from the reservoir, or by activating the compressor. 2. Clean around the area of the suspected leak. 3. Using GOTECH LDS, spray around the air suspension components until the source of the leak is found.

- **Was a leak found?**

-> **Yes**

REPAIR the leak as necessary. For additional information, [Air Leaks](#). Test the system for normal operation.

-> **No**

Recheck system operation. Check for DTCs.

PINPOINT TEST G256924p2 : B1312, B1471; HEADLAMP CIRCUIT MALFUNCTION

G256924t2 : CHECK THE HEADLAMP TO ASU PWM SIGNAL CIRCUIT FOR HIGH RESISTANCE

1. Disconnect the battery negative terminal. 2. Disconnect the ASU electrical connector, CR89. 3. Disconnect the right-hand headlamp electrical connector, EC06. 4. Disconnect the left-hand headlamp electrical connector, EC57. 5. Measure the resistance between CR89, pin 03 (Y) and EC06, pin 02 (Y). 6. Measure the resistance between CR89, pin 03 (Y) and EC57, pin 02 (YB).

- Is either resistance greater than 5 ohms?

-> Yes

REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC. TEST the system for normal operation.

-> No

GO to Pinpoint Test [G256924t3](#).

G256924t3 : CHECK THE HEADLAMP TO ASU PWM SIGNAL CIRCUIT FOR SHORT TO GROUND

1. Reconnect the battery negative terminal. 2. Measure the resistance between CR89, pin 03 (Y) and GROUND.

- Is the resistance less than 10,000 ohms?

-> Yes

REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC. TEST the system for normal operation.

-> No

GO to Pinpoint Test [G256924t4](#).

G256924t4 : CHECK THE HEADLAMP TO ASU PWM SIGNAL CIRCUIT FOR SHORT TO B+

1. Measure the voltage between CR89, pin 03 (Y) and GROUND.

- Is the voltage greater than 3 volts?

-> **Yes**

REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC. TEST the system for normal operation.

-> **No**

CONTACT dealer technical support for confirmation of possible control module failure, and/or raise an EPQR.

PINPOINT TEST G256924p3 : B1671; BATTERY VOLTAGE OUT OF RANGE

G256924t5 : CHECK THE POWER SUPPLY TO THE ASU

1. Disconnect the ASU electrical connector, CR88. 2. Measure the voltage between CR88, pin 01 (NW) and GROUND.

- **Is the voltage approximately 10 volts?**

-> **Yes**

RECHECK DTCs.

-> **No**

GO to Pinpoint Test [G256924t6](#).

G256924t6 : CHECK THE ASU POWER SUPPLY CIRCUIT FOR HIGH RESISTANCE

1. Disconnect the battery negative terminal. 2. Remove fuse 52 of the rear power distribution box. 3. Measure the resistance between CR88, pin 01 (NW) and the output terminal of fuse 52.

- **Is the resistance greater than 5 ohms?**

-> **Yes**

REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC. TEST the system for normal operation.

-> **No**

RECHECK the voltage to the ASU. If the voltage is high, check the charging system, [Charging System - 2.7L Diesel](#)

PINPOINT TEST G256924p4 : B2804, C1800; RESERVOIR SOLENOID DRIVE CIRCUIT FAULT

G256924t7 : CHECK THE SOLENOID DRIVE CIRCUIT FOR SHORT TO B+

1. Disconnect the ASU electrical connector, CR91. 2. Disconnect the valve block electrical connector, CR22. 3. Measure the voltage between CR22, pin 05 (BO) and GROUND.

- **Is the voltage greater than 3 volts?**

-> **Yes**

REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC. TEST the system for normal operation.

-> **No**

GO to Pinpoint Test [G256924t49](#).

G256924t49 : CHECK THE SOLENOID DRIVE CIRCUIT FOR SHORT TO GROUND

1. Measure the resistance between CR22, pin 05 (BO) and GROUND.

- **Is the resistance less than 10,000 ohms?**

-> **Yes**

REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC. TEST the system for normal operation.

-> **No**

GO to Pinpoint Test [G256924t50](#).

G256924t50 : CHECK THE SOLENOID DRIVE CIRCUIT FOR HIGH RESISTANCE

1. Measure the resistance between CR22, pin 05 (BO) and CR91, pin 08 (BO).

- **Is the resistance greater than 5 ohms?**

-> **Yes**

REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC. TEST the system for normal operation.

-> **No**

INSTALL a new valve block.

[Air Suspension Solenoid Valve Block](#)

PINPOINT TEST G256924p5 : B2807; PRESSURE SENSOR SIGNAL CIRCUIT FAULT

G256924t8 : CHECK THE PRESSURE SENSOR SIGNAL CIRCUIT FOR SHORT TO B+

1. Disconnect the ASU electrical connector, CR88. 2. Disconnect the valve block electrical connector, CR92. 3. Measure the voltage between CR92, pin 02 (G) and GROUND.

- Is the voltage greater than 3 volts?

-> Yes

REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC. TEST the system for normal operation.

-> No

INSTALL a new valve block.

[Air Suspension Solenoid Valve Block](#)

PINPOINT TEST G256924p6 : B2808; PRESSURE SENSOR SUPPLY CIRCUIT FAULT

G256924t9 : CHECK THE PRESSURE SENSOR SUPPLY CIRCUIT FOR SHORT TO B+

1. Disconnect the ASU electrical connector, CR88. 2. Disconnect the valve block electrical connector, CR92. 3. Measure the voltage between CR92, pin 03 (GY) and GROUND.

- Is the voltage greater than 3 volts?

-> Yes

REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC. TEST the system for normal operation.

-> No

INSTALL a new valve block.

[Air Suspension Solenoid Valve Block](#)

PINPOINT TEST G256924p7 : B2809; PRESSURE SENSOR SUPPLY CIRCUIT FAULT

G256924t10 : CHECK THE PRESSURE SENSOR SUPPLY CIRCUIT FOR SHORT TO GROUND

1. Disconnect the ASU electrical connector, CR88. 2. Disconnect the valve block electrical connector, CR92. 3. Measure the resistance between CR92, pin 03 (GY) and GROUND.

- Is the resistance less than 10,000 ohms?

-> Yes

REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC. TEST the system for normal operation.

-> No

INSTALL a new valve block.

[Air Suspension Solenoid Valve Block](#)

PINPOINT TEST G256924p8 : B2810; VENT SOLENOID CIRCUIT FAULT

G256924t11 : CHECK THE VENT SOLENOID SUPPLY CIRCUIT FOR HIGH RESISTANCE

1. Disconnect the battery negative terminal. 2. Disconnect the ASU electrical connector, CR91. 3. Disconnect the vent solenoid electrical connector, EC62. 4. Measure the resistance between CR91, pin 10 (YU) and EC62, pin 02 (YU).

- Is the resistance greater than 5 ohms?

-> Yes

REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC. TEST the system for normal operation.

-> No

GO to Pinpoint Test [G256924t12](#).

G256924t12 : CHECK THE VENT SOLENOID SUPPLY CIRCUIT FOR SHORT TO GROUND

1. Reconnect the battery negative terminal. 2. Measure the resistance between CR91, pin 10 (YU) and GROUND.

- **Is the resistance less than 10,000 ohms?**

-> **Yes**

REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC. TEST the system for normal operation.

-> **No**

GO to Pinpoint Test [G256924t13](#).

G256924t13 : CHECK THE VENT SOLENOID SUPPLY CIRCUIT FOR SHORT TO B+

1. Measure the voltage between CR91, pin 10 (YU) and GROUND.

- **Is the voltage greater than 3 volts?**

-> **Yes**

REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC. TEST the system for normal operation.

-> **No**

GO to Pinpoint Test [G256924t14](#).

G256924t14 : CHECK THE VENT SOLENOID SIGNAL CIRCUIT FOR HIGH RESISTANCE

1. Measure the resistance between CR91, pin 11 (U) and EC62, pin 01 (U).

- **Is the resistance greater than 5 ohms?**

-> **Yes**

REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC. TEST the system for normal operation.

-> **No**

GO to Pinpoint Test [G256924t15](#).

G256924t15 : CHECK THE VENT SOLENOID SIGNAL CIRCUIT FOR SHORT TO GROUND

1. Measure the resistance between CR91, pin 11 (U) and GROUND.

- **Is the resistance less than 10,000 ohms?**

-> **Yes**

REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC.
TEST the system for normal operation.

-> **No**

GO to Pinpoint Test [G256924t16](#).

G256924t16 : CHECK THE VENT SOLENOID SIGNAL CIRCUIT FOR SHORT TO B+

1. Measure the voltage between CR91, pin 11 (U) and GROUND.

- **Is the voltage greater than 3 volts?**

-> **Yes**

REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC.
TEST the system for normal operation.

-> **No**

INSTALL a new compressor,
[Air Suspension Compressor](#)

PINPOINT TEST G256924p9 : C1416, C1417, C1419; RIGHT-HAND FRONT AIR SPRING DRIVE CIRCUIT MALFUNCTION

G256924t17 : CHECK THE RIGHT-HAND FRONT AIR SPRING DRIVE CIRCUIT FOR SHORT TO B+

1. Disconnect the right-hand front air spring electrical connector, EC12. 2. Measure the voltage between EC12, pin 02 (BG) and GROUND.

- **Is the voltage greater than 3 volts?**

-> **Yes**

REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC.
TEST the system for normal operation.

-> **No**

GO to Pinpoint Test [G256924t18](#).

G256924t18 : CHECK THE RIGHT-HAND FRONT AIR SPRING DRIVE CIRCUIT FOR SHORT TO GROUND

1. Measure the resistance between EC12, pin 02 (BG) and GROUND.

- **Is the resistance less than 10,000 ohms?**

-> **Yes**

REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC. TEST the system for normal operation.

-> **No**

GO to Pinpoint Test [G256924t19](#).

G256924t19 : CHECK THE RIGHT-HAND FRONT AIR SPRING DRIVE CIRCUIT FOR HIGH RESISTANCE

1. Disconnect the battery negative terminal. 2. Disconnect the ASU electrical connector, CR89. 3. Measure the resistance between EC12, pin 02 (BG) and CR89, pin 10 (BG).

- **Is the resistance greater than 5 ohms?**

-> **Yes**

REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC. TEST the system for normal operation.

-> **No**

INSTALL a new air spring solenoid, CLEAR the DTC. TEST the system for normal operation.

PINPOINT TEST G256924p10 : C1421, C1422, C1424; LEFT-HAND FRONT AIR SPRING DRIVE CIRCUIT MALFUNCTION

G256924t20 : CHECK THE LEFT-HAND FRONT AIR SPRING DRIVE CIRCUIT FOR SHORT TO B+

1. Disconnect the left-hand front air spring electrical connector, EC47. 2. Measure the voltage between EC47, pin 02 (BO) and GROUND.

- **Is the voltage greater than 3 volts?**

-> **Yes**

REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC.

TEST the system for normal operation.

-> **No**

GO to Pinpoint Test [G256924t21](#).

G256924t21 : CHECK THE LEFT-HAND FRONT AIR SPRING DRIVE CIRCUIT FOR SHORT TO GROUND

1. Measure the resistance between EC47, pin 02 (BO) and GROUND.

- **Is the resistance less than 10,000 ohms?**

-> **Yes**

REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC. TEST the system for normal operation.

-> **No**

GO to Pinpoint Test [G256924t22](#).

G256924t22 : CHECK THE LEFT-HAND FRONT AIR SPRING DRIVE CIRCUIT FOR HIGH RESISTANCE

1. Disconnect the battery negative terminal. 2. Disconnect the ASU electrical connector, CR89. 3. Measure the resistance between EC47, pin 02 (BO) and CR89, pin 01 (BO).

- **Is the resistance greater than 5 ohms?**

-> **Yes**

REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC. TEST the system for normal operation.

-> **No**

INSTALL a new air spring solenoid, CLEAR the DTC. TEST the system for normal operation.

PINPOINT TEST G256924p11 : C1425, C1426, C1427; RIGHT-HAND REAR AIR SPRING DRIVE CIRCUIT MALFUNCTION

G256924t23 : CHECK THE RIGHT-HAND REAR AIR SPRING DRIVE CIRCUIT FOR SHORT TO B+

1. Disconnect the right-hand rear air spring electrical connector, CR23. 2. Measure the voltage between CR23, pin 02 (BG) and GROUND.

- **Is the voltage greater than 3 volts?**

-> **Yes**

REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC. TEST the system for normal operation.

-> **No**

GO to Pinpoint Test [G256924t24](#).

G256924t24 : CHECK THE RIGHT-HAND REAR AIR SPRING DRIVE CIRCUIT FOR SHORT TO GROUND

1. Measure the resistance between CR23, pin 02 (BG) and GROUND.

- **Is the resistance less than 10,000 ohms?**

-> **Yes**

REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC. TEST the system for normal operation.

-> **No**

GO to Pinpoint Test [G256924t25](#).

G256924t25 : CHECK THE RIGHT-HAND REAR AIR SPRING DRIVE CIRCUIT FOR HIGH RESISTANCE

1. Disconnect the battery negative terminal. 2. Disconnect the ASU electrical connector, CR89. 3. Measure the resistance between CR23, pin 02 (BG) and CR89, pin 11 (BG).

- **Is the resistance greater than 5 ohms?**

-> **Yes**

REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC. TEST the system for normal operation.

-> **No**

INSTALL a new air spring solenoid, CLEAR the DTC. TEST the system for normal operation.

PINPOINT TEST G256924p12 : C1430, C1431, C1432; LEFT-HAND REAR AIR SPRING DRIVE CIRCUIT MALFUNCTION

G256924t26 : CHECK THE LEFT-HAND REAR AIR SPRING DRIVE CIRCUIT FOR SHORT TO B+

1. Disconnect the left-hand rear air spring electrical connector, TL33. 2. Measure the voltage between TL33, pin 02 (BK) and GROUND.

- Is the voltage greater than 3 volts?

-> Yes

REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC. TEST the system for normal operation.

-> No

GO to Pinpoint Test [G256924t27](#).

G256924t27 : CHECK THE LEFT-HAND REAR AIR SPRING DRIVE CIRCUIT FOR SHORT TO GROUND

1. Measure the resistance between TL33, pin 02 (BK) and GROUND.

- Is the resistance less than 10,000 ohms?

-> Yes

REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC. TEST the system for normal operation.

-> No

GO to Pinpoint Test [G256924t28](#).

G256924t28 : CHECK THE LEFT-HAND REAR AIR SPRING DRIVE CIRCUIT FOR HIGH RESISTANCE

1. Disconnect the battery negative terminal. 2. Disconnect the ASU electrical connector, CR89. 3. Measure the resistance between TL33, pin 02 (BK) and CR89, pin 02 (BK).

- Is the resistance greater than 5 ohms?

-> Yes

REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. CLEAR the

DTC. TEST the system for normal operation.

-> **No**

INSTALL a new air spring solenoid, CLEAR the DTC. TEST the system for normal operation.

PINPOINT TEST G256924p13 : C1437, C1438; REAR VERTICAL ACCELEROMETER SIGNAL CIRCUIT

G256924t29 : CHECK THE REAR ACCELEROMETER SIGNAL CIRCUIT FOR SHORT TO GROUND

1. Disconnect the ASU electrical connector, CR89. 2. Disconnect the rear accelerometer electrical connector, TL34. 3. Measure the resistance between TL34, pin 02 (GO) and GROUND.

- **Is the resistance less than 10,000 ohms?**

-> **Yes**

REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC. TEST the system for normal operation.

-> **No**

GO to Pinpoint Test [G256924t30](#).

G256924t30 : CHECK THE REAR ACCELEROMETER SIGNAL CIRCUIT FOR SHORT TO B+

1. Measure the voltage between TL34, pin 02 (GO) and GROUND.

- **Is the voltage greater than 3 volts?**

-> **Yes**

REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC. TEST the system for normal operation.

-> **No**

INSTALL a new rear vertical accelerometer,
[Rear Vertical Accelerometer \(86.56.55\)](#) CLEAR the DTC. TEST the system for normal operation.

PINPOINT TEST G256924p14 : C1457, C1458; FRONT VERTICAL ACCELEROMETER SIGNAL CIRCUIT

G256924t31 : CHECK THE FRONT ACCELEROMETER SIGNAL CIRCUIT FOR SHORT TO GROUND

1. Disconnect the ASU electrical connector, CR89. 2. Disconnect the accelerometer electrical connector, EC13. 3. Measure the resistance between EC13, pin 02 (G) and GROUND.

- **Is the resistance less than 10,000 ohms?**

-> **Yes**

REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC. TEST the system for normal operation.

-> **No**

GO to Pinpoint Test [G256924t32](#).

G256924t32 : CHECK THE FRONT ACCELEROMETER SIGNAL CIRCUIT FOR SHORT TO B+

1. Measure the voltage between EC13, pin 02 (G) and GROUND.

- **Is the voltage greater than 3 volts?**

-> **Yes**

REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC. TEST the system for normal operation.

-> **No**

INSTALL a new front vertical accelerometer,
[Rear Vertical Accelerometer \(86.56.55\)](#) CLEAR the DTC. TEST the system for normal operation.

PINPOINT TEST G256924p15 : C1460; ACCELEROMETER SENSOR SUPPLY CIRCUIT FAULT

G256924t33 : CHECK THE ACCELEROMETER SENSOR SUPPLY CIRCUIT FOR SHORT TO GROUND

1. Disconnect the ASU electrical connector, CR91. 2. Measure the resistance between CR91, pin 16 (Y) and GROUND.

- **Is the resistance less than 10,000 ohms?**

-> **Yes**

REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC. TEST the system for normal operation.

-> **No**

GO to Pinpoint Test [G256924t34](#).

G256924t34 : CHECK THE ACCELEROMETER SENSOR SUPPLY CIRCUIT FOR SHORT TO B+

1. Measure the voltage between CR91, pin 16 (Y) and GROUND.

- **Is the voltage greater than 3 volts?**

-> **Yes**

REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC. TEST the system for normal operation.

-> **No**

GO to Pinpoint Test [G256924t35](#).

G256924t35 : CHECK THE ACCELEROMETER SENSOR SUPPLY CIRCUIT FOR HIGH RESISTANCE

1. Disconnect the front accelerometer electrical connector, EC13. 2. Disconnect the rear accelerometer electrical connector, TL34. 3. Measure the resistance between CR91, pin 16 (Y) and EC13, pin 03 (Y). 4. Measure the resistance between CR91, pin 16 (Y) and TL34, pin 03 (Y).

- **Is either resistance greater than 5 ohms?**

-> **Yes**

REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC. TEST the system for normal operation.

-> **No**

CHECK for DTCs indicating a sensor fault. Contact dealer technical support for confirmation of possible module failure, and/or raise an EPQR.

PINPOINT TEST G256924p16 : C1723; HEIGHT SENSOR(S) SUPPLY CIRCUIT(S) FAULT

G256924t36 : CHECK THE LEFT-HAND FRONT HEIGHT SENSOR SUPPLY CIRCUIT FOR SHORT TO GROUND

1. Disconnect the ASU electrical connector, CR90. 2. Measure the resistance between CR90, pin 01 (G) and GROUND.

- **Is the resistance less than 10,000 ohms?**

-> **Yes**

REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC.
TEST the system for normal operation.

-> **No**

GO to Pinpoint Test [G256924t37](#).

G256924t37 : CHECK THE LEFT-HAND FRONT HEIGHT SENSOR SUPPLY CIRCUIT FOR SHORT TO B+

1. Measure the voltage between CR90, pin 01 (G) and GROUND.

- **Is the voltage greater than 3 volts?**

-> **Yes**

REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC.
TEST the system for normal operation.

-> **No**

GO to Pinpoint Test [G256924t38](#).

G256924t38 : CHECK THE LEFT-HAND FRONT HEIGHT SENSOR SUPPLY CIRCUIT FOR HIGH RESISTANCE

1. Disconnect the left-hand front height sensor electrical connector, EC45. 2. Measure the resistance between CR90, pin 01 (G) and EC45, pin 05 (G).

- **Is the resistance greater than 5 ohms?**

-> **Yes**

REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC. TEST the system for normal operation.

-> **No**

GO to Pinpoint Test [G256924t39](#).

G256924t39 : CHECK THE RIGHT-HAND FRONT HEIGHT SENSOR SUPPLY CIRCUIT FOR SHORT TO GROUND

1. Measure the resistance between CR90, pin 04 (GO) and GROUND.

- **Is the resistance less than 10,000 ohms?**

-> **Yes**

REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC.
TEST the system for normal operation.

-> **No**

GO to Pinpoint Test [G256924t40](#).

G256924t40 : CHECK THE RIGHT-HAND FRONT HEIGHT SENSOR SUPPLY CIRCUIT FOR SHORT TO B+

1. Measure the voltage between CR90, pin 04 (GO) and GROUND.

- **Is the voltage greater than 3 volts?**

-> **Yes**

REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC.
TEST the system for normal operation.

-> **No**

GO to Pinpoint Test [G256924t41](#).

G256924t41 : CHECK THE RIGHT-HAND FRONT HEIGHT SENSOR SUPPLY CIRCUIT FOR HIGH RESISTANCE

1. Disconnect the right-hand front height sensor electrical connector, EC18. 2. Measure the resistance between CR90, pin 01 (G) and EC18, pin 05 (GO).

- **Is the resistance greater than 5 ohms?**

-> **Yes**

REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC. TEST the system for normal operation.

-> **No**

GO to Pinpoint Test [G256924t42](#).

G256924t42 : CHECK THE LEFT-HAND REAR HEIGHT SENSOR SUPPLY CIRCUIT FOR SHORT TO GROUND

1. Measure the resistance between CR90, pin 07 (BW) and GROUND.

- **Is the resistance less than 10,000 ohms?**

-> **Yes**

REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC.
TEST the system for normal operation.

-> **No**

GO to Pinpoint Test [G256924t43](#).

G256924t43 : CHECK THE LEFT-HAND REAR HEIGHT SENSOR SUPPLY CIRCUIT FOR SHORT TO B+

1. Measure the voltage between CR90, pin 07 (BW) and GROUND.

- **Is the voltage greater than 3 volts?**

-> **Yes**

REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC. TEST the system for normal operation.

-> **No**

GO to Pinpoint Test [G256924t44](#).

G256924t44 : CHECK THE LEFT-HAND REAR HEIGHT SENSOR SUPPLY CIRCUIT FOR HIGH RESISTANCE

1. Disconnect the left-hand rear height sensor electrical connector, CV03. 2. Measure the resistance between CR90, pin 07 (BW) and CV03, pin 05 (BW).

- **Is the resistance greater than 5 ohms?**

-> **Yes**

REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC. TEST the system for normal operation.

-> **No**

GO to Pinpoint Test [G256924t45](#).

G256924t45 : CHECK THE RIGHT-HAND REAR HEIGHT SENSOR SUPPLY CIRCUIT FOR SHORT TO GROUND

1. Measure the resistance between CR90, pin 10 (YR) and GROUND.

- **Is the resistance less than 10,000 ohms?**

-> **Yes**

REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC. TEST the system for normal operation.

-> **No**

GO to Pinpoint Test [G256924t46](#).

G256924t46 : CHECK THE RIGHT-HAND REAR HEIGHT SENSOR SUPPLY CIRCUIT FOR SHORT TO B+

1. Measure the voltage between CR90, pin 10 (YR) and GROUND.

- **Is the voltage greater than 3 volts?**

-> **Yes**

REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC. TEST the system for normal operation.

-> **No**

GO to Pinpoint Test [G256924t47](#).

G256924t47 : CHECK THE RIGHT-HAND REAR HEIGHT SENSOR SUPPLY CIRCUIT FOR HIGH RESISTANCE

1. Disconnect the right-hand rear height sensor electrical connector, CV04. 2. Measure the resistance between CR90, pin 10 (YR) and CV04, pin 05 (YR).

- **Is the resistance greater than 5 ohms?**

-> **Yes**

REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC. TEST the system for normal operation.

-> **No**

CHECK for DTCs indicating a sensor fault. Contact dealer technical support for confirmation of possible module failure, and/or raise an EPQR.

PINPOINT TEST G256924p17 : C1830; RELAY DRIVE CIRCUIT FAULT

G256924t51 : CHECK THE RELAY DRIVE CIRCUIT FOR SHORT TO B+

1. Remove the air suspension relay. 2. Measure the voltage between the relay base, pin 02, and GROUND.

- **Is the voltage greater than 3 volts?**

-> **Yes**

REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC. TEST the system for normal operation.

-> **No**

GO to Pinpoint Test [G256924t48](#).

G256924t48 : CHECK THE RELAY DRIVE CIRCUIT FOR SHORT TO GROUND

1. Measure the resistance between the relay base, pin 02, and GROUND.

- **Is the resistance less than 10,000 ohms?**

-> **Yes**

REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC. TEST the system for normal operation.

-> **No**

GO to Pinpoint Test [G256924t52](#).

G256924t52 : CHECK THE RELAY DRIVE CIRCUIT FOR HIGH RESISTANCE

1. Disconnect the battery negative terminal. 2. Disconnect the ASU electrical connector, CR91. 3. Measure the resistance between CR91, pin 12 (NR).

- **Is the resistance greater than 5 ohms?**

-> **Yes**

REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC. TEST the system for normal operation.

-> **No**

INSTALL a new air suspension relay. CLEAR the DTC. TEST the system for normal operation. If the DTC is repeated, contact dealer technical support for confirmation of possible module failure, and/or raise an EPQR.

PINPOINT TEST G256924p18 : C1881, C1883; RIGHT-HAND FRONT HEIGHT SENSOR SIGNAL CIRCUIT FAULT

G256924t53 : CHECK THE RIGHT-HAND FRONT SIGNAL CIRCUIT FOR SHORT TO B+

1. Disconnect the right-hand front height sensor electrical connector, EC18. 2. Measure the voltage between EC18, pin 04 (GW) and GROUND.

- **Is the voltage greater than 3 volts?**

-> **Yes**

REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC.
TEST the system for normal operation.

-> **No**

GO to Pinpoint Test [G256924t54](#).

G256924t54 : CHECK THE RIGHT-HAND FRONT SIGNAL CIRCUIT FOR SHORT TO GROUND

1. Measure the resistance between EC18, pin 04 (GW) and GROUND.

- **Is the resistance less than 10,000 ohms?**

-> **Yes**

REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC.
TEST the system for normal operation.

-> **No**

GO to Pinpoint Test [G256924t55](#).

G256924t55 : CHECK THE RIGHT-HAND FRONT SIGNAL CIRCUIT FOR HIGH RESISTANCE

1. Disconnect the battery negative terminal. 2. Disconnect the ASU electrical connector, CR90. 3. Measure the resistance between CR90, pin 05 (GW) and EC18, pin 04 (GW).

- **Is the resistance greater than 5 ohms?**

-> **Yes**

REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC. TEST the system for normal operation.

-> **No**

CHECK for DTCs indicating a sensor fault. Contact dealer technical support for confirmation of possible module failure, and/or raise an EPQR.

PINPOINT TEST G256924p19 : C1885, C1887; RIGHT-HAND REAR HEIGHT SENSOR SIGNAL CIRCUIT FAULT

G256924t56 : CHECK THE RIGHT-HAND REAR SIGNAL CIRCUIT FOR SHORT TO B+

1. Disconnect the right-hand rear height sensor electrical connector, CV04. 2. Measure the voltage between CV04, pin 04 (YG) and GROUND.

- **Is the voltage greater than 3 volts?**

-> **Yes**

REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC. TEST the system for normal operation.

-> **No**

GO to Pinpoint Test [G256924t57](#).

G256924t57 : CHECK THE RIGHT-HAND REAR SIGNAL CIRCUIT FOR SHORT TO GROUND

1. Measure the resistance between CV04, pin 04 (YG) and GROUND.

- **Is the resistance less than 10,000 ohms?**

-> **Yes**

REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC. TEST the system for normal operation.

-> **No**

GO to Pinpoint Test [G256924t58](#).

G256924t58 : CHECK THE RIGHT-HAND REAR SIGNAL CIRCUIT FOR HIGH RESISTANCE

1. Disconnect the battery negative terminal. 2. Disconnect the ASU electrical connector, CR90. 3. Measure the resistance between CR90, pin 11 (YG) and CV04, pin 04 (YG).

- **Is the resistance greater than 5 ohms?**

-> **Yes**

REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC. TEST the system for normal operation.

-> **No**

CHECK for DTCs indicating a sensor fault. Contact dealer technical support for confirmation of possible module failure, and/or raise an EPQR.

PINPOINT TEST G256924p20 : C1889, C1891; LEFT-HAND FRONT HEIGHT SENSOR SIGNAL CIRCUIT FAULT

G256924t59 : CHECK THE LEFT-HAND FRONT SIGNAL CIRCUIT FOR SHORT TO B+

1. Disconnect the left-hand front height sensor electrical connector, EC45. 2. Measure the voltage between EC45, pin 04 (GU) and GROUND.

- Is the voltage greater than 3 volts?

-> Yes

REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC. TEST the system for normal operation.

-> No

GO to Pinpoint Test [G256924t60](#).

G256924t60 : CHECK THE LEFT-HAND FRONT SIGNAL CIRCUIT FOR SHORT TO GROUND

1. Measure the resistance between EC45, pin 04 (GU) and GROUND.

- Is the resistance less than 10,000 ohms?

-> Yes

REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC. TEST the system for normal operation.

-> No

GO to Pinpoint Test [G256924t61](#).

G256924t61 : CHECK THE LEFT-HAND FRONT SIGNAL CIRCUIT FOR HIGH RESISTANCE

1. Disconnect the battery negative terminal. 2. Disconnect the ASU electrical connector, CR90. 3. Measure the resistance between CR90, pin 02 (GU) and EC45, pin 04 (GU).

- Is the resistance greater than 5 ohms?

-> Yes

REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC. TEST the system for normal operation.

-> **No**

CHECK for DTCs indicating a sensor fault. Contact dealer technical support for confirmation of possible module failure, and/or raise an EPQR.

PINPOINT TEST G256924p21 : C1893, C1895; LEFT-HAND REAR HEIGHT SENSOR SIGNAL CIRCUIT FAULT

G256924t62 : CHECK THE LEFT-HAND REAR SIGNAL CIRCUIT FOR SHORT TO B+

1. Disconnect the left-hand rear height sensor electrical connector, CV03. 2. Measure the voltage between CV03, pin 04 (BR) and GROUND.

- **Is the voltage greater than 3 volts?**

-> **Yes**

REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC. TEST the system for normal operation.

-> **No**

GO to Pinpoint Test [G256924t63](#).

G256924t63 : CHECK THE LEFT-HAND REAR SIGNAL CIRCUIT FOR SHORT TO GROUND

1. Measure the resistance between CV03, pin 04 (BR) and GROUND.

- **Is the resistance less than 10,000 ohms?**

-> **Yes**

REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC. TEST the system for normal operation.

-> **No**

GO to Pinpoint Test [G256924t64](#).

G256924t64 : CHECK THE LEFT-HAND REAR SIGNAL CIRCUIT FOR HIGH RESISTANCE

1. Disconnect the battery negative terminal. 2. Disconnect the ASU electrical connector, CR90. 3. Measure the resistance between CR90, pin 08 (BR) and CV03, pin 04 (BR).

- **Is the resistance greater than 5 ohms?**

-> **Yes**

REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC. TEST the system for normal operation.

-> **No**

CHECK for DTCs indicating a sensor fault. Contact dealer technical support for confirmation of possible module failure, and/or raise an EPQR.

PINPOINT TEST G256924p22 : C1993; PRESSURE SENSOR SIGNAL CIRCUIT FAULT

G256924t65 : CHECK THE PRESSURE SENSOR SIGNAL CIRCUIT FOR SHORT TO GROUND

1. Disconnect the pressure sensor electrical connector, CR92. 2. Measure the resistance between CR92, pin 02 (G) and GROUND.

- **Is the resistance less than 10,000 ohms?**

-> **Yes**

REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC. TEST the system for normal operation.

-> **No**

GO to Pinpoint Test [G256924t66](#).

G256924t66 : CHECK THE PRESSURE SENSOR SIGNAL CIRCUIT FOR HIGH RESISTANCE

1. Disconnect the battery negative terminal. 2. Disconnect the ASU electrical connector, CR90. 3. Measure the resistance between CR92, pin 02 (G) and CR90, pin 14 (G).

- **Is the resistance greater than 5 ohms?**

-> **Yes**

REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC. TEST the system for normal operation.

-> **No**

INSTALL a new valve block,

[Air Suspension Solenoid Valve Block](#) CLEAR the DTC. TEST the system for normal operation.

PINPOINT TEST G256924p23 : C2304, C2305; AIR SPRING SUPPLY CIRCUIT FAULT

G256924t67 : CHECK THE LEFT-HAND FRONT AIR SPRING SUPPLY CIRCUIT FOR SHORT TO GROUND

1. Disconnect the left-hand front air spring electrical connector, EC47. 2. Measure the resistance between EC47, pin 01 (WR) and GROUND.

- Is the resistance less than 10,000 ohms?

-> Yes

REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC. TEST the system for normal operation.

-> No

GO to Pinpoint Test [G256924t68](#).

G256924t68 : CHECK THE LEFT-HAND FRONT AIR SPRING SUPPLY CIRCUIT FOR SHORT TO B+

1. Measure the voltage between EC47, pin 01 (WR) and GROUND.

- Is the voltage greater than 3 volts?

-> Yes

REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC. TEST the system for normal operation.

-> No

GO to Pinpoint Test [G256924t69](#).

G256924t69 : CHECK THE RIGHT-HAND FRONT AIR SPRING SUPPLY CIRCUIT FOR SHORT TO GROUND

1. Disconnect the right-hand front air spring electrical connector, EC12. 2. Measure the resistance between EC12, pin 01 (WU) and GROUND.

- Is the resistance less than 10,000 ohms?

-> Yes

REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC. TEST the system for normal operation.

-> **No**

GO to Pinpoint Test [G256924t70](#).

G256924t70 : CHECK THE RIGHT-HAND FRONT AIR SPRING SUPPLY CIRCUIT FOR SHORT TO B+

1. Measure the voltage between EC12, pin 01 (WU) and GROUND.

- **Is the voltage greater than 3 volts?**

-> **Yes**

REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC.
TEST the system for normal operation.

-> **No**

GO to Pinpoint Test [G256924t71](#).

G256924t71 : CHECK THE LEFT-HAND REAR AIR SPRING SUPPLY CIRCUIT FOR SHORT TO GROUND

1. Disconnect the left-hand rear air spring electrical connector, TL33. 2. Measure the resistance between TL33, pin 01 (WG) and GROUND.

- **Is the resistance less than 10,000 ohms?**

-> **Yes**

REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC.
TEST the system for normal operation.

-> **No**

GO to Pinpoint Test [G256924t72](#).

G256924t72 : CHECK THE LEFT-HAND REAR AIR SPRING SUPPLY CIRCUIT FOR SHORT TO B+

1. Measure the voltage between TL33, pin 01 (WG) and GROUND.

- **Is the voltage greater than 3 volts?**

-> **Yes**

REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC.
TEST the system for normal operation.

-> **No**

GO to Pinpoint Test [G256924t73](#).

G256924t73 : CHECK THE RIGHT-HAND REAR AIR SPRING SUPPLY CIRCUIT FOR SHORT TO GROUND

1. Disconnect the right-hand rear air spring electrical connector, CR23. 2. Measure the resistance between CR23, pin 01 (WB) and GROUND.

- **Is the resistance less than 10,000 ohms?**

-> **Yes**

REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC. TEST the system for normal operation.

-> **No**

GO to Pinpoint Test [G256924t74](#).

G256924t74 : CHECK THE RIGHT-HAND REAR AIR SPRING SUPPLY CIRCUIT FOR SHORT TO B+

1. Measure the voltage between CR23, pin 01 (WB) and GROUND.

- **Is the voltage greater than 3 volts?**

-> **Yes**

REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC. TEST the system for normal operation.

-> **No**

CHECK for DTCs indicating a air spring fault. Contact dealer technical support for confirmation of possible module failure, and/or raise an EPQR.

PINPOINT TEST G256924p24 : C2779; AIR SPRING SOLENOID SUPPLY/DRIVE CIRCUIT FAULT

G256924t75 : CHECK THE AIR SPRING SOLENOID SUPPLY CIRCUIT FOR SHORT TO GROUND

1. Disconnect the ASU electrical connector, CR91. 2. Measure the resistance between CR91, pin 01 (YG) and GROUND.

- **Is the resistance less than 10,000 ohms?**

-> **Yes**

REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC.
TEST the system for normal operation.

-> **No**

GO to Pinpoint Test [G256924t76](#).

G256924t76 : CHECK THE AIR SPRING SOLENOID SUPPLY CIRCUIT FOR SHORT TO B+

1. Measure the voltage between CR91, pin 01 (YG) and GROUND.

- **Is the voltage greater than 3 volts?**

-> **Yes**

REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC.
TEST the system for normal operation.

-> **No**

GO to Pinpoint Test [G256924t77](#).

G256924t77 : CHECK THE AIR SPRING SOLENOID SUPPLY CIRCUIT FOR HIGH RESISTANCE

1. Disconnect the air spring solenoid electrical connector, CR22. 2. Measure the resistance between CR91, pin 01 (YG) and CR22, pin 06 (YG).

- **Is the resistance greater than 5 ohms?**

-> **Yes**

REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC. TEST the system for normal operation.

-> **No**

GO to Pinpoint Test [G256924t78](#).

G256924t78 : CHECK THE LEFT-HAND FRONT AIR SPRING SOLENOID DRIVE CIRCUIT FOR SHORT TO GROUND

1. Measure the resistance between CR22, pin 01 (WR) and GROUND.

- **Is the resistance less than 10,000 ohms?**

-> **Yes**

REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC.
TEST the system for normal operation.

-> **No**

GO to Pinpoint Test [G256924t79](#).

G256924t79 : CHECK THE LEFT-HAND FRONT AIR SPRING SOLENOID DRIVE CIRCUIT FOR SHORT TO B+

1. Measure the voltage between CR22, pin 01 (WR) and GROUND.

- **Is the voltage greater than 3 volts?**

-> **Yes**

REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC.
TEST the system for normal operation.

-> **No**

GO to Pinpoint Test [G256924t80](#).

G256924t80 : CHECK THE LEFT-HAND FRONT AIR SPRING SOLENOID DRIVE CIRCUIT FOR HIGH RESISTANCE

1. Measure the resistance between CR22, pin 01 (WR) and CR91, pin 02 (WR).

- **Is the resistance greater than 5 ohms?**

-> **Yes**

REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC. TEST the system for normal operation.

-> **No**

GO to Pinpoint Test [G256924t81](#).

G256924t81 : CHECK THE RIGHT-HAND FRONT AIR SPRING SOLENOID DRIVE CIRCUIT FOR SHORT TO GROUND

1. Measure the resistance between CR22, pin 02 (WB) and GROUND.

- **Is the resistance less than 10,000 ohms?**

-> **Yes**

REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC.
TEST the system for normal operation.

-> **No**

GO to Pinpoint Test [G256924t82](#).

G256924t82 : CHECK THE RIGHT-HAND FRONT AIR SPRING SOLENOID DRIVE CIRCUIT FOR SHORT TO B+

1. Measure the voltage between CR22, pin 02 (WB) and GROUND.

- **Is the voltage greater than 3 volts?**

-> **Yes**

REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC.
TEST the system for normal operation.

-> **No**

GO to Pinpoint Test [G256924t83](#).

G256924t83 : CHECK THE RIGHT-HAND FRONT AIR SPRING SOLENOID DRIVE CIRCUIT FOR HIGH RESISTANCE

1. Measure the resistance between CR22, pin 02 (WB) and CR91, pin 03 (WB).

- **Is the resistance greater than 5 ohms?**

-> **Yes**

REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC. TEST the system for normal operation.

-> **No**

GO to Pinpoint Test [G256924t84](#).

G256924t84 : CHECK THE LEFT-HAND REAR AIR SPRING SOLENOID DRIVE CIRCUIT FOR SHORT TO GROUND

1. Measure the resistance between CR22, pin 03 (WU) and GROUND.

- **Is the resistance less than 10,000 ohms?**

-> **Yes**

REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC.
TEST the system for normal operation.

-> **No**

GO to Pinpoint Test [G256924t85](#).

G256924t85 : CHECK THE LEFT-HAND REAR AIR SPRING SOLENOID DRIVE CIRCUIT FOR SHORT TO B+

1. Measure the voltage between CR22, pin 03 (WU) and GROUND.

- **Is the voltage greater than 3 volts?**

-> **Yes**

REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC.
TEST the system for normal operation.

-> **No**

GO to Pinpoint Test [G256924t86](#).

G256924t86 : CHECK THE LEFT-HAND REAR AIR SPRING SOLENOID DRIVE CIRCUIT FOR HIGH RESISTANCE

1. Measure the resistance between CR22, pin 03 (WU) and CR91, pin 05 (WU).

- **Is the resistance greater than 5 ohms?**

-> **Yes**

REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC. TEST the system for normal operation.

-> **No**

GO to Pinpoint Test [G256924t87](#).

G256924t87 : CHECK THE RIGHT-HAND REAR AIR SPRING SOLENOID DRIVE CIRCUIT FOR SHORT TO GROUND

1. Measure the resistance between CR22, pin 04 (WG) and GROUND.

- **Is the resistance less than 10,000 ohms?**

-> **Yes**

REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC.
TEST the system for normal operation.

-> **No**

GO to Pinpoint Test [G256924t85](#).

G256924t88 : CHECK THE RIGHT-HAND REAR AIR SPRING SOLENOID DRIVE CIRCUIT FOR SHORT TO B+

1. Measure the voltage between CR22, pin 04 (WG) and GROUND.

- **Is the voltage greater than 3 volts?**

-> **Yes**

REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC.

TEST the system for normal operation.

-> **No**

GO to Pinpoint Test [G256924t86](#).

G256924t89 : CHECK THE RIGHT-HAND REAR AIR SPRING SOLENOID DRIVE CIRCUIT FOR HIGH RESISTANCE

1. Measure the resistance between CR22, pin 04 (WG) and CR91, pin 06 (WG).

- **Is the resistance greater than 5 ohms?**

-> **Yes**

REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC. TEST the system for normal operation.

-> **No**

INSTALL a new valve block,

[Air Suspension Solenoid Valve Block](#) CLEAR the DTC. TEST the system for normal operation.

Air Suspension Compressor

Removal

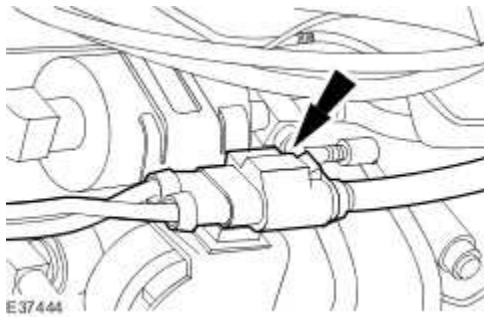
- 1 . Disconnect the battery ground cable.

For additional information, refer to [Battery Disconnect and Connect](#)

- 2 . Remove the radiator splash shield.

For additional information, refer to [Radiator Splash Shield \(76.22.90\)](#)

- 3 . Disconnect the electrical connector.



- 4



WARNING: Loosen the pipes no more than one full turn to allow the stored air pressure to vent for a minimum of three seconds.



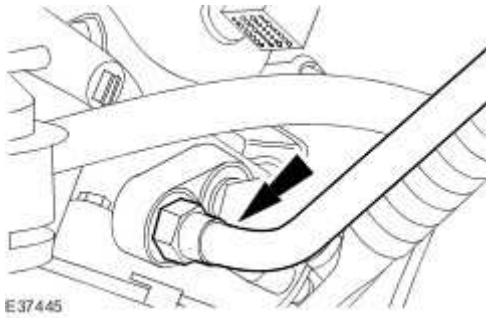
CAUTION: Using a suitable blanking plug, blank off the end of the air pipe to prevent dirt ingress.

NOTE:

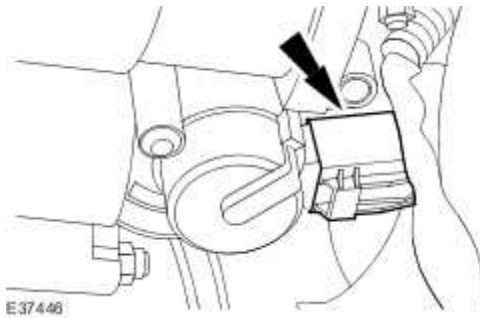
Make a note of the correct routing of the air pipe.

Release the air pipe.

▶ Remove the nut.



5 . Disconnect the electrical connector.



6 .  **CAUTION: Make sure air feed pipe does not come detached from air compressor mounting bracket.**

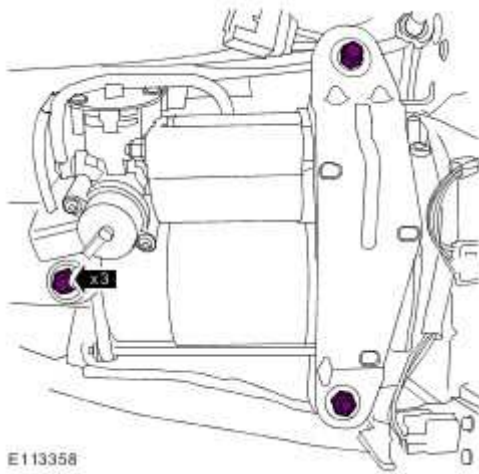
Remove air feed pipe.



7 .  **CAUTION: Mounting bushes may fall out on removal of the compressor.**

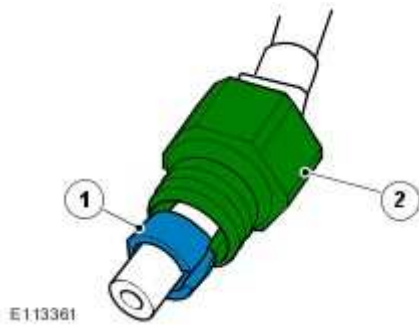
Remove the compressor.

- Remove the 3 nuts.
- Remove the compressor support brace.
- Collect the 6 bushes.



8 . Remove air pipe union.

- 1) Split, remove and discard olive.
- 2) Remove and discard brass nut.



Installation

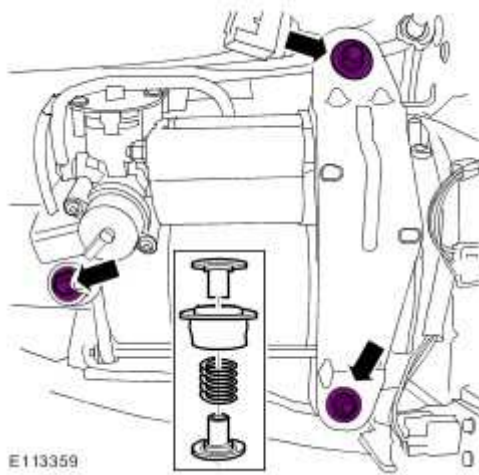
1



- CAUTION: Make sure mounting bushes and springs are in the correct orientation. Failure to follow this instruction will cause the compressor to become noisy and may cause damage to the vehicle.

Locate compressor to mounting bracket.

- ▶ Install compressor support brace.
- ▶ Install the 3 nuts and tighten to 20 Nm.



2



- CAUTION: Make sure the air feed pipe is not restricted and is in the correct orientation. Failure to carry out this instruction may cause damage to the vehicle.

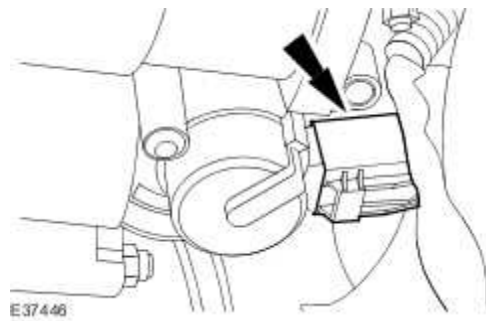


CAUTION: Failure to check pipe can result in pipe being trapped and restricting air flow to air suspension system.

Install air feed pipe to compressor filter.



3 . Connect the electrical connector.

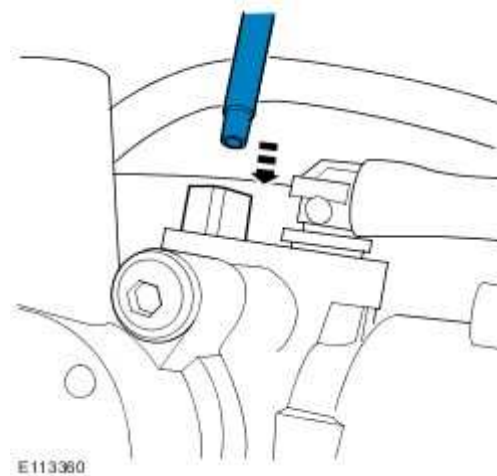


4 . **NOTE:**

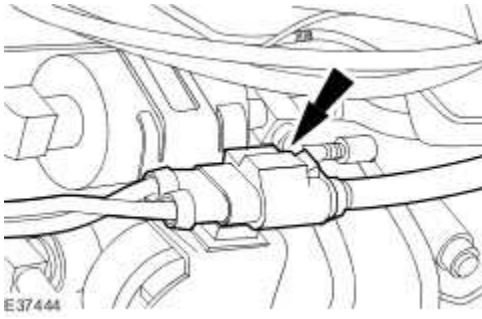
Make sure the pipe is routed correctly.

Remove blanking plug from compressor.

► Push air pipe firmly into union.



- 5 . Connect the electrical connector.



- 6 . Install the radiator splash shield.

For additional information, refer to [Radiator Splash Shield \(76.22.90\)](#)

- 7 . Connect the battery ground cable.

For additional information, refer to [Battery Disconnect and Connect](#)

Air Suspension Control Module (60.32.03)

Removal

NOTE:

Vehicles built before December 2003 have four suspension height sensors which are mounted on the front and rear subframe assemblies, two front and two rear. Vehicles built after December 2003 have only three (the right front sensor being deleted), although the functionality of the system remains the same.

NOTE:

The later module can be fitted in place of the four sensor module, but the right front sensor must be left in place, even though the system will not use it.

1



CAUTION: Electronic modules are sensitive to static electrical charges. If exposed to these charges, damage may result.

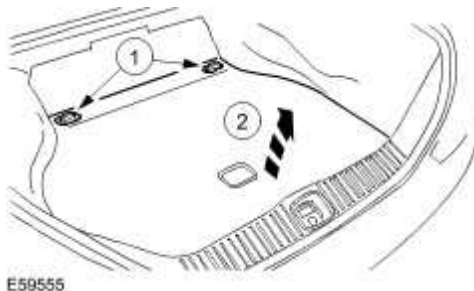
Disconnect the battery ground cable.

For additional information, refer to [Battery Disconnect and Connect](#).

2 . Remove the luggage compartment floor covering.

1) Remove the luggage compartment floor covering securing screws.

2) Remove the luggage compartment floor covering.



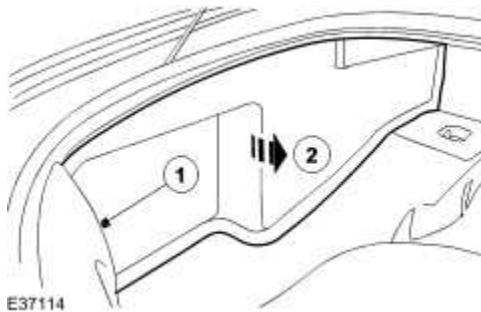
3 . NOTE:

Left-hand shown, right-hand similar.

Remove the luggage compartment side trim panel.

1) Remove the luggage compartment side trim retaining clip.

2) Remove the luggage compartment side trim panel.

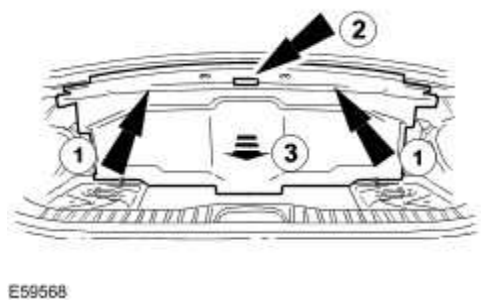


4 . Remove the luggage compartment front carpet.

1) Remove the fir tree clips

2) Disconnect the interior light electrical connector.

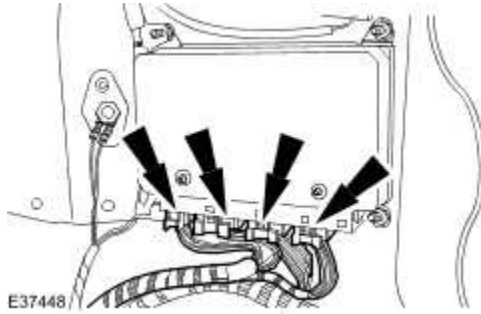
3) Remove the luggage compartment front carpet.



5 . Remove the rear seat backrest.

For additional information, refer to [Rear Seat Backrest \(76.70.38\)](#)

6 . Disconnect the air suspension control module electrical connectors.

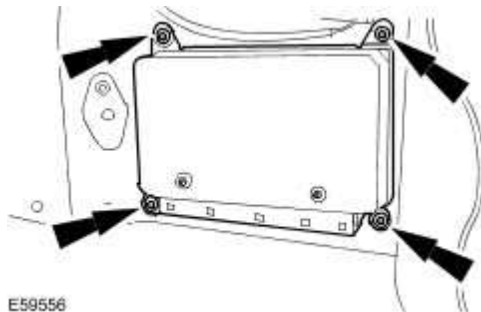


7 . **NOTE:**

Clean the vehicle of any debris after the rivets have been removed.

Remove the air suspension control module.

➤ Using a suitable tool, remove the four rivets.



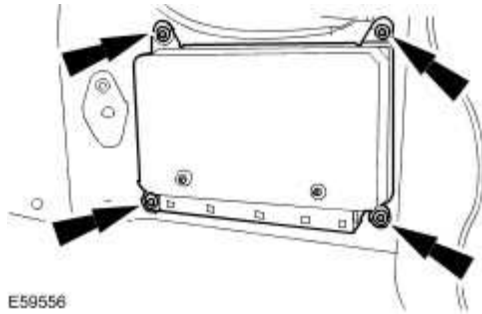
Installation

1



CAUTION: Make sure the rivets are correctly seated and the riveting device is positioned squarely onto the rivets before the rivets are secured. Failure to follow this instruction may result in damage to the vehicle.

To install, reverse the removal procedure.



2 . Connect the battery ground cable.

For additional information, refer to [Battery Connect \(86.15.15\)](#)

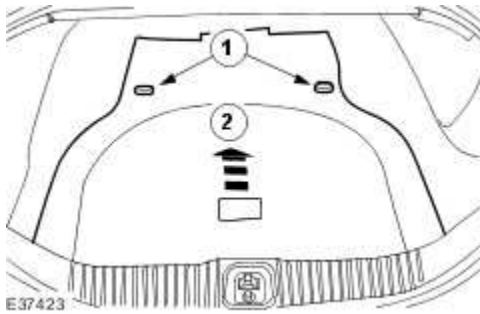
3 . Re-calibrate the air suspension control module using the Jaguar approved diagnostic system.

For additional information, refer to [Ride Height Adjustments](#)

Air Suspension Reservoir

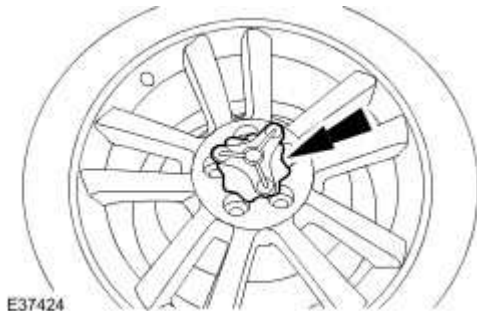
Removal

- 1 . Using the Jaguar approved diagnostic system depressurize the air suspension system.
- 2 . Disconnect the battery ground cable. [<<414-01>>](#)
- 3 . Remove the luggage compartment floor covering.
 - 1) Remove the luggage compartment floor covering securing screws.
 - 2) Remove the luggage compartment floor covering.

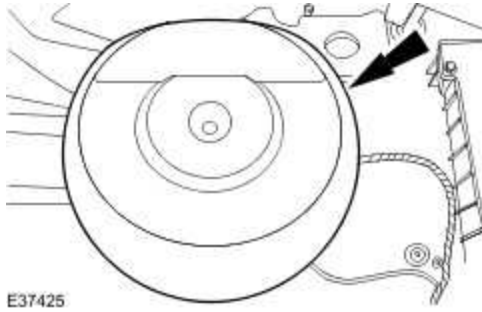


- 4  **CAUTION:** Before the spare wheel retainer is removed the lower locking nut should be loosened.

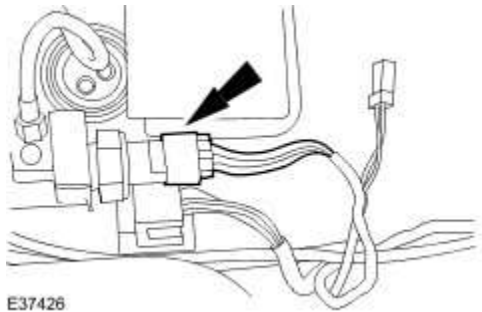
Remove the spare wheel.



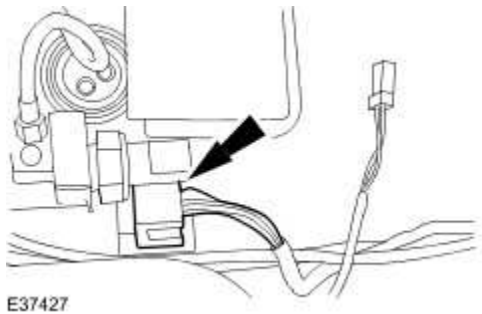
5 . Remove the reservoir insulator.




6 . Disconnect the electrical connector.



7 . Disconnect the electrical connector.



8  **WARNING: Loosen the pipes no more than one full turn to allow the stored air pressure to vent for a minimum of three seconds.**

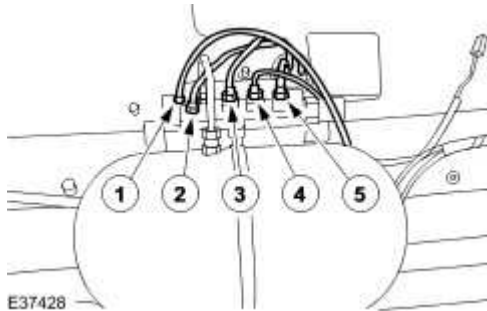
Remove the air pipes.

- 1) Detach the blue air pipe.
- 2) Detach the white air pipe.

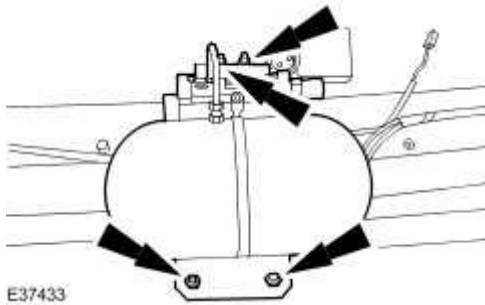
3) Detach the yellow air pipe.

4) Detach the red air pipe.

5) Detach the brown air pipe.



9 . Remove the reservoir.

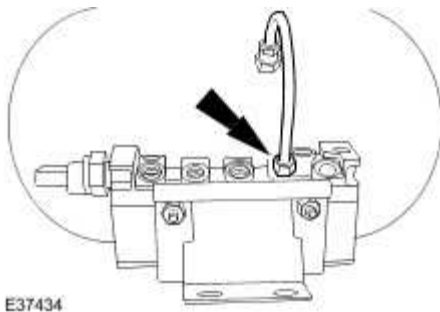


10

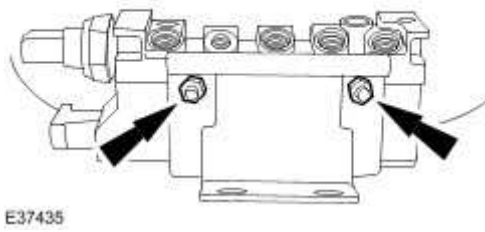


WARNING: Loosen the pipe no more than one full turn to allow the stored air pressure to vent for a minimum of one minute.

Detach the pink air pipe.



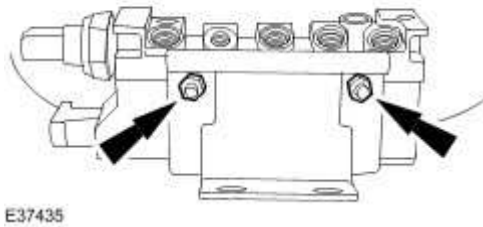
11 . Remove the securing nuts.



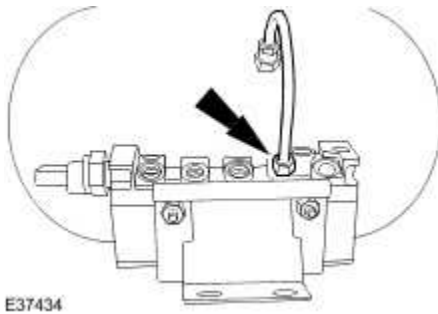
Installation

1 . To install, reverse the removal procedure.

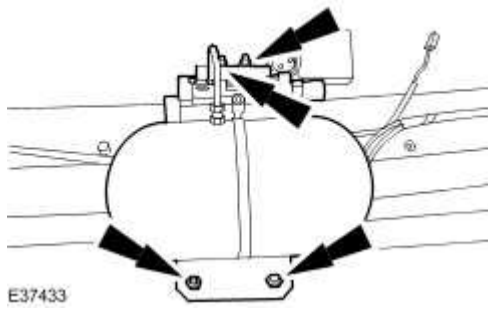
▶ Tighten to 5 Nm.



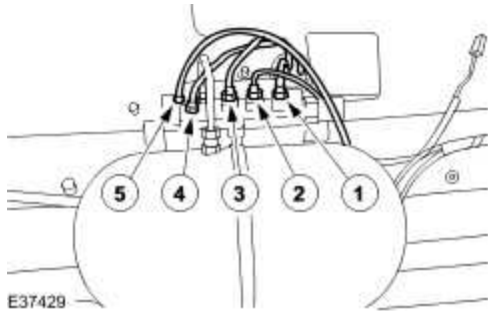
2 . Tighten to 5 Nm.



3 . Tighten to 7 Nm.



4 . Tighten to 5 Nm.



5 . Connect the battery ground cable. [<<414-01>>](#)

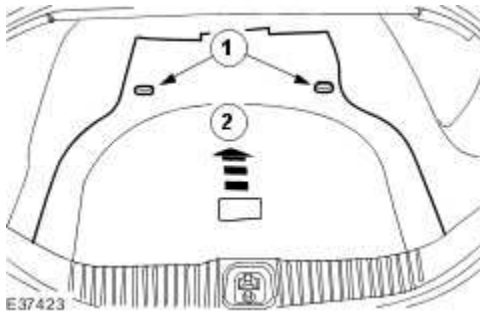
6 Where required. Using the Jaguar approved diagnostic system pressurize the air suspension . system.

7 . Start and run the engine for 2 minutes to make sure the vehicle has leveled.

Air Suspension Solenoid Valve Block

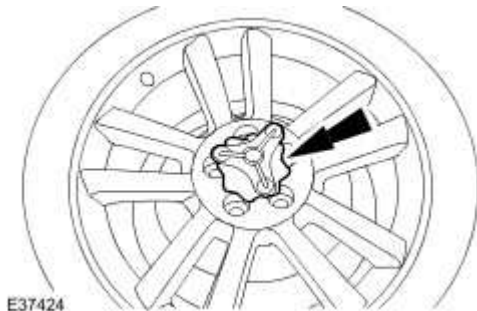
Removal

- 1 . Using the Jaguar approved diagnostic system depressurize the air suspension system.
- 2 . Disconnect the battery ground cable. [<<414-01>>](#)
- 3 . Remove the luggage compartment floor covering.
 - 1) Remove the luggage compartment floor covering securing screws.
 - 2) Remove the luggage compartment floor covering.

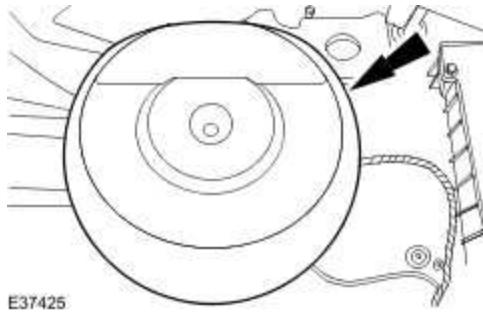


- 4  **CAUTION:** Before the spare wheel retainer is removed the lower locking nut should be loosened.

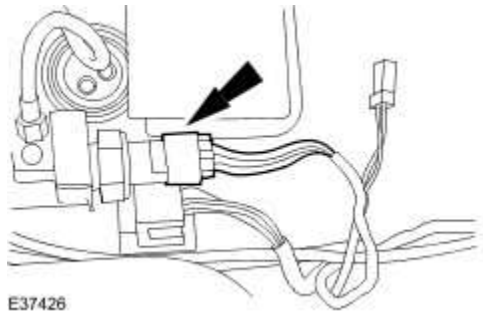
Remove the spare wheel.



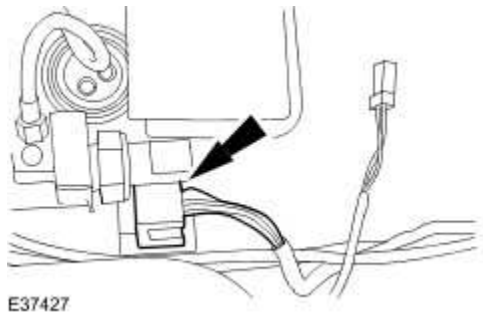
5 . Remove the reservoir insulator.



6 . Disconnect the electrical connector.



7 . Disconnect the electrical connector.



8



WARNING: Loosen the pipes no more than one full turn to allow the stored air pressure to vent for a minimum of three seconds.

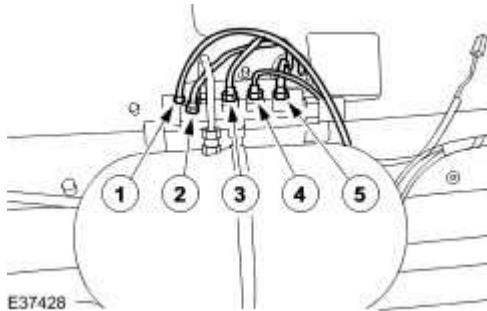
Remove the air pipes.

- 1) Detach the blue air pipe.
- 2) Detach the white air pipe.

3) Detach the yellow air pipe.

4) Detach the red air pipe.

5) Detach the brown air pipe.

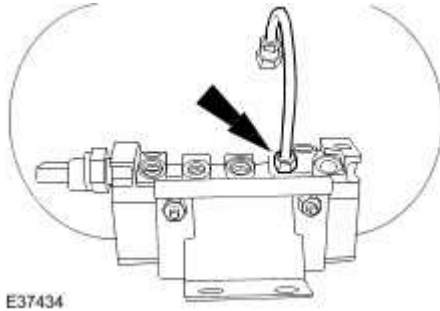


9

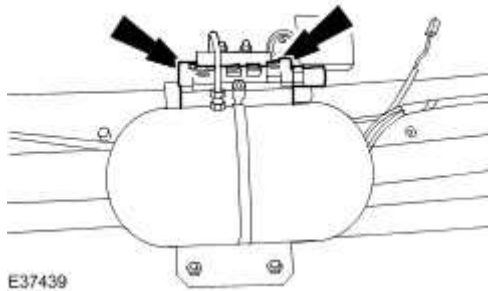


WARNING: Loosen the pipe no more than one full turn to allow the stored air pressure to vent for a minimum of one minute.

Detach the pink air pipe.



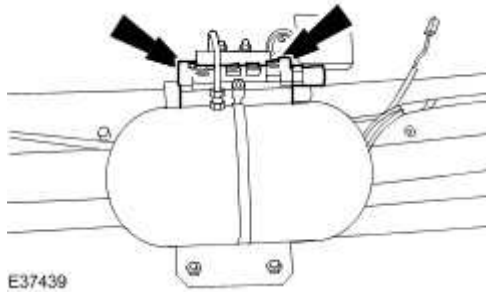
10 . Remove the solenoid valve block.



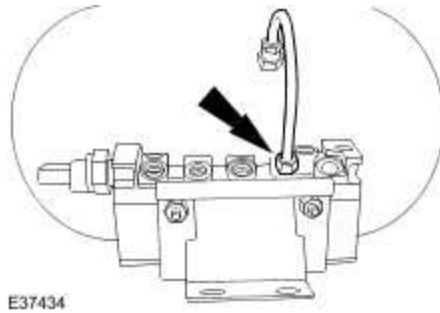
Installation

- 1 . To install, reverse the removal procedure.

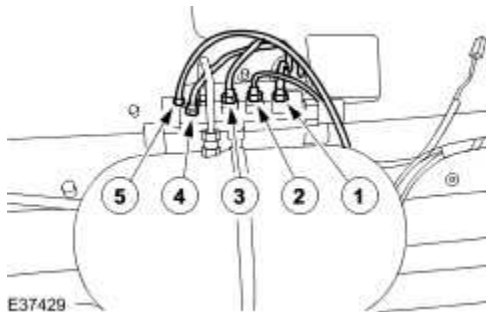
▶ Tighten to 5 Nm.



- 2 . Tighten to 5 Nm.



- 3 . Tighten to 5 Nm.



- 4 . Connect the battery ground cable. [<<414-01>>](#)

- 5 Where required. Using the Jaguar approved diagnostic system pressurize the air suspension

. system.

6 . Start and run the engine for 2 minutes to make sure the vehicle has leveled.

Front Air Spring (60.32.08)

Removal

1 . Using the Jaguar approved diagnostic system depressurize the air suspension system.

2 . Remove the wheel and tire assembly.

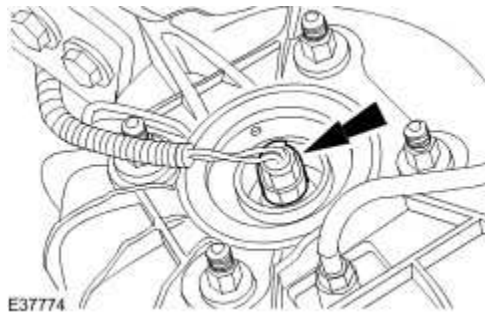
For additional information, refer to [Wheel and Tire \(74.20.05\)](#)



3 . **NOTE:**

Left-hand shown, right-hand similar.

Disconnect the air spring electrical connector if fitted.



4

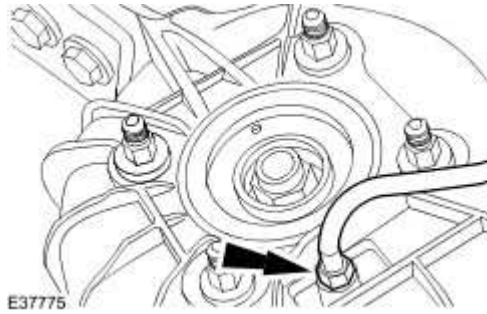


- **WARNING:** Loosen the air pipe until the stored air pressure starts to vent. Wait for at least one minute for the air pressure to escape completely before fully removing the air pipe connector.

NOTE:

Left-hand shown, right-hand similar.

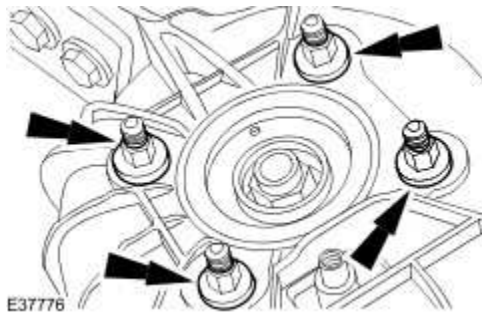
Detach the air pipe.



5 . **NOTE:**

Left-hand shown, right-hand similar.

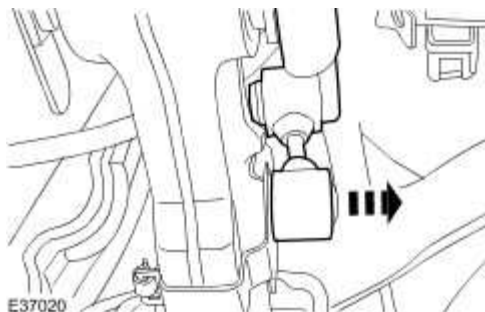
Remove the air spring retaining nuts.



6 . Remove the stabilizer bar link.

For additional information, refer to [Front Stabilizer Bar Link \(60.10.02\)](#)

7 . Detach the front air suspension height sensor link rod.



8 . Detach the brake line from the inner fender securing clips

9

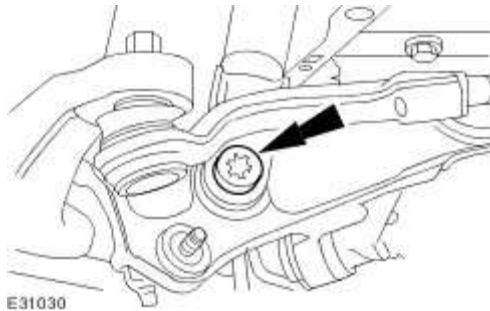


CAUTION: Prevent the air spring from rotating. Do not use extension bars when removing the air spring securing bolt. Failure to follow these instructions may result in damage to the air spring.

NOTE:

Left-hand shown, right-hand similar.

Detach the air spring assembly.



10



CAUTION: Prevent the upper ball joint ball pin hexagon from rotating. Failure to do so may result in damage to the upper ball joint boot.

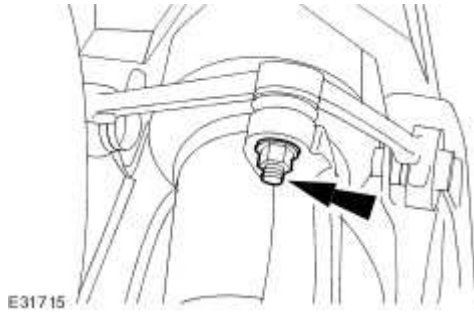


CAUTION: Make sure the wheel knuckle is supported. Failure to follow these instructions may result in damage to the vehicle.

NOTE:

Left-hand shown, right-hand similar.

Detach the upper arm.



11 . Remove the air spring.

Installation



WARNING: Do not install an air spring if the pressure retaining valve has been removed or has become loose. Failure to follow this instruction may result in personal injury.



CAUTION: Do not install an air spring if the pressure retaining valve has been removed or has become loose. Failure to follow this instruction may result in damage to the vehicle.

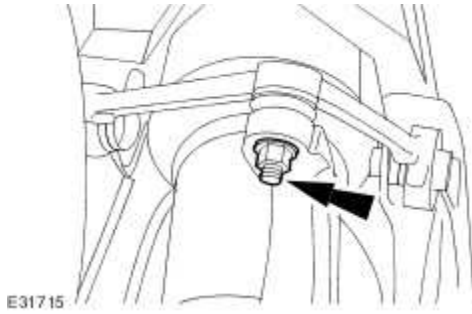
NOTE:


New air springs have a shelf life of seven months from the date of manufacture. Do not install the air spring if the date marking exceeds this date.

1 . To install, reverse the removal procedure.



Tighten to 90 Nm.

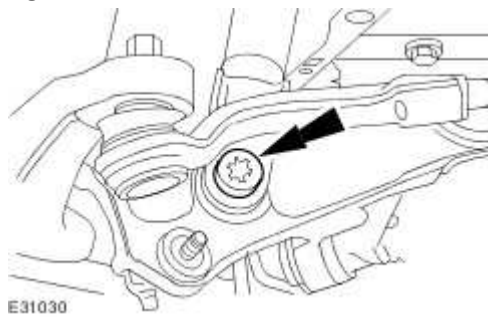


- 2  **CAUTION:** Prevent the air spring from rotating. Do not use extension bars when tightening the air spring securing bolt. Failure to follow these instructions may result in damage to the air spring.

NOTE:

Left-hand shown, right-hand similar.

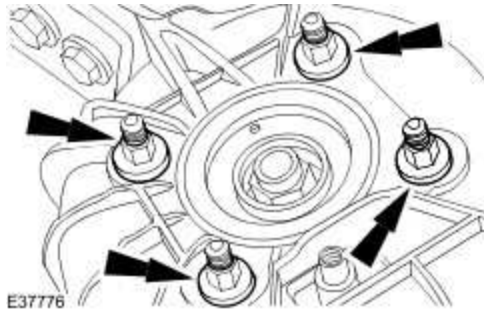
Tighten to 175 Nm.




3 . **NOTE:**

Left-hand shown, right-hand similar.

Tighten to 25 Nm.

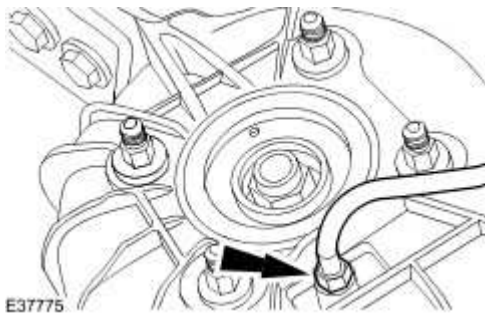


- 4  **CAUTION:** Do not over tighten the air pipe union as it may result in the pressure retaining valve coming loose if removed again.

NOTE:

Left-hand shown, right-hand similar.

Tighten to 5 Nm.



5 **NOTE:**

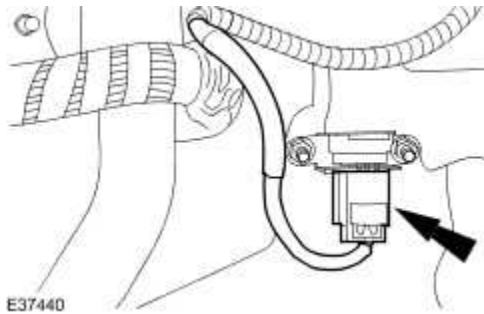
Make sure the air suspension system is repressurized using the Jaguar approved diagnostic system before lowering the vehicle to the ground.

Repressurize the air suspension system. For further information, refer to the Jaguar approved diagnostic system.

Front Vertical Accelerometer (86.56.53)

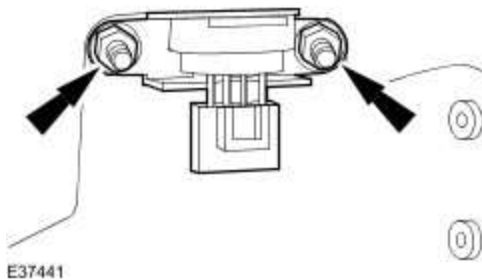
Removal

- 1 . Remove the wheel and tire assemble. [<<204-04>>](#)
- 2 . Remove the right-hand side front fender splash shield. [<<501-02>>](#)
- 3 . Disconnect the front vertical accelerometer electrical connector.



- 4 .  **CAUTION:** Make sure the vertical accelerometer is not dropped in transit as damage will be caused to internal components.

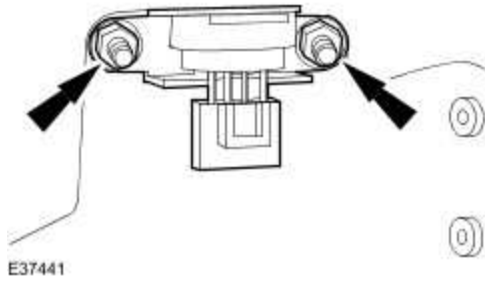
Remove the front vertical accelerometer.



Installation

- 1 . To install, reverse the removal procedure.

 Tighten to 4 Nm.



Rear Air Spring - VIN Range: G00442- >G45703 (60.32.10)

Removal

1 . Using the Jaguar approved diagnostic system depressurize the air suspension.

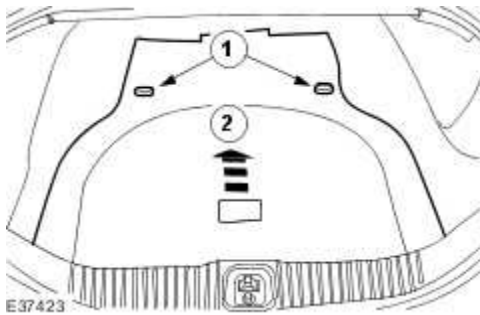
2 . Disconnect the battery ground cable.

For additional information, refer to [Battery Disconnect and Connect](#)

3 . Remove the luggage compartment floor covering.

1) Remove the luggage compartment floor covering securing screws.

2) Remove the luggage compartment floor covering.



4 . **NOTE:**

Left-hand shown, right-hand similar.

Remove the luggage compartment side trim panel.



5 . NOTE:

Left-hand shown, right-hand similar.

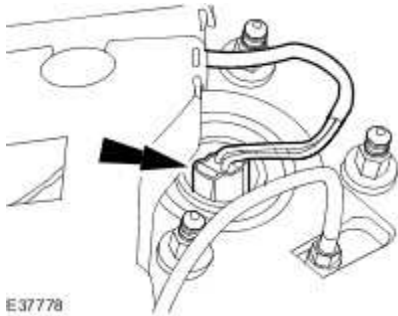
Remove the air spring trim panel.



6 . NOTE:

Left-hand shown, right-hand similar.

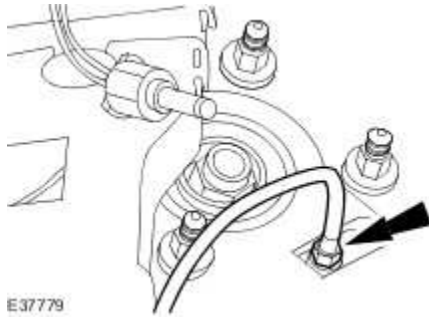
Disconnect the air spring electrical connector.



7 . NOTE:

Left-hand shown, right-hand similar.

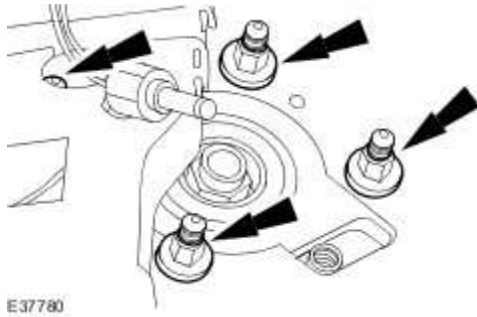
Detach the air pipe.



8 . NOTE:

Left-hand shown, right-hand similar.

Remove the air spring retaining nuts.

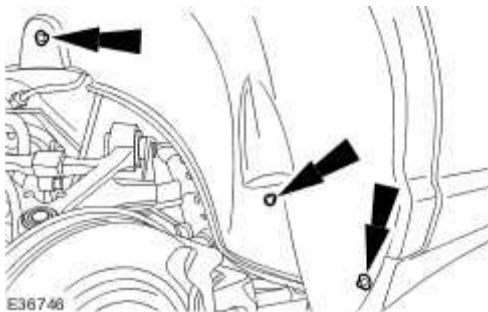


- 9 . Remove the rear wheel and tire assembly.
For additional information, refer to

10 . NOTE:

Left-hand shown, right-hand similar.

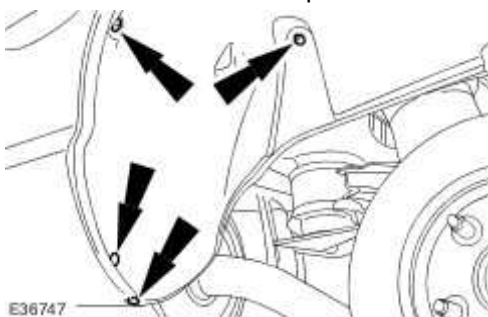
Detach the rear fender splash shield.



11 . NOTE:

Left-hand shown, right-hand similar.

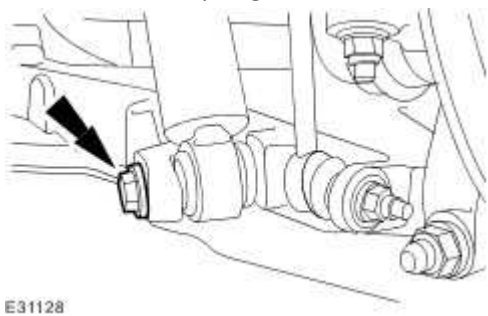
Remove the rear fender splash shield.



12 . NOTE:

Left-hand shown, right-hand similar.

Remove the air spring bolt.

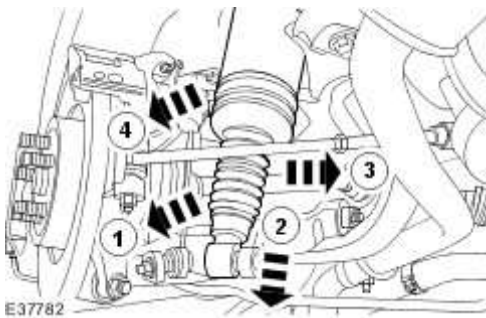


13 . NOTE:

Left-hand shown, right-hand similar.

Remove the air spring.

- 1) Displace the air spring lower mounting from the lower arm.
- 2) Displace the air spring from the upper mounting.
- 3) Position the air spring to the outside of the lower arm.
- 4) Remove the air spring.



Installation



WARNING: Do not install an air spring if the pressure retaining valve has been removed or has become loose. Failure to follow this instruction may result in personal injury.



CAUTION: Do not install an air spring if the pressure retaining valve has been removed or has become loose. Failure to follow this instruction may result in damage to the vehicle.

NOTE:

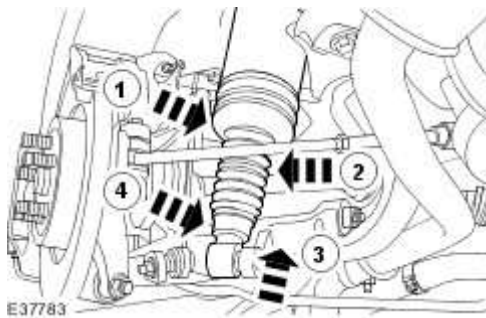
New air springs have a shelf life of seven months from the date of manufacture. Do not install the air spring if the date marking exceeds this date.

1 . NOTE:

Left-hand shown, right-hand similar.

Install the air spring.

- 1) Install the air spring.
- 2) Position the air spring to the front of the lower arm.
- 3) Locate the air spring into the upper mount.
- 4) Locate the lower air spring mounting into the lower arm.

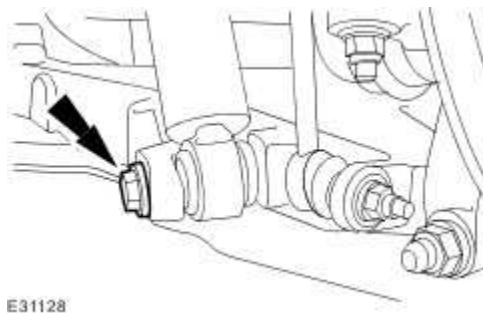


2 . NOTE:

Left-hand shown, right-hand similar.

Install the air spring bolt.

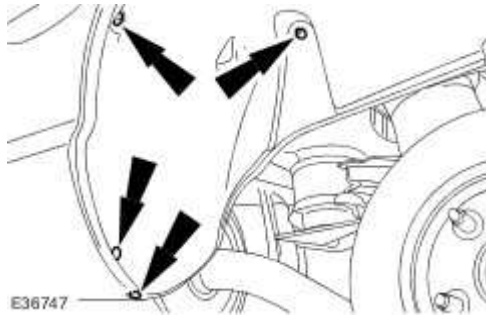
► Tighten to 133 Nm.



3 . NOTE:

Left-hand shown, right-hand similar.

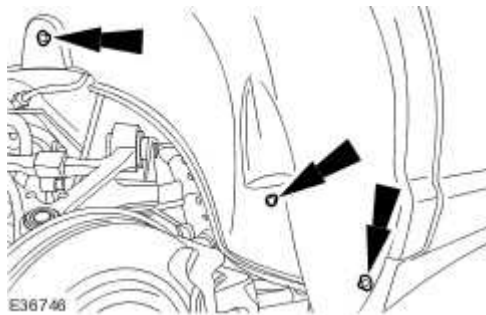
Attach the rear fender splash shield.



4 . NOTE:

Left-hand shown, right-hand similar.


Install the rear fender splash shield.

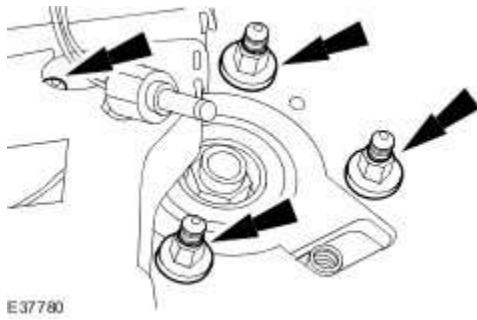


5 . NOTE:

Left-hand shown, right-hand similar.

Install the rear air spring retaining nuts.

 Tighten to 25 Nm.

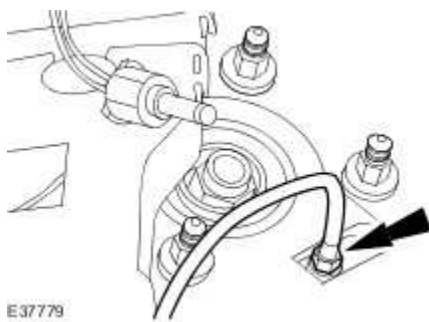


6 . NOTE:

Left-hand shown, right-hand similar.

Attach the air pipe.

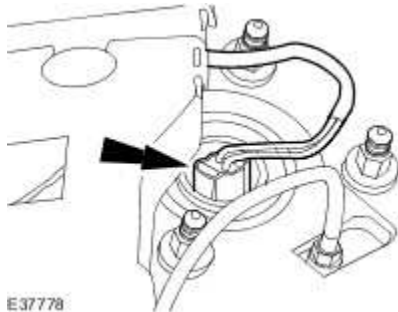
▶ Tighten to 5 Nm.



7 . NOTE:

Left-hand shown, right-hand similar.

Connect the air spring electrical connector.



8 . NOTE:

Left-hand shown, right-hand similar.

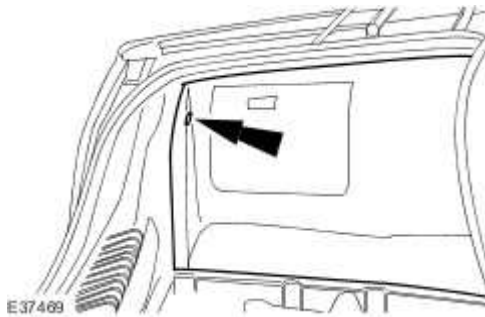
Install the air spring trim panel.



9 . NOTE:

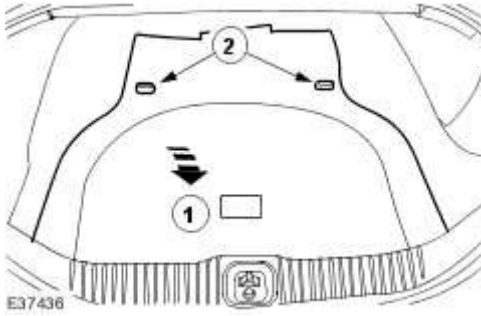
Left-hand shown, right-hand similar.

Install the luggage compartment side trim panel.



10 . Install the luggage compartment floor covering.

- 1) Install the luggage compartment floor covering.
- 2) Install the luggage compartment floor covering securing screws.



- 11 . Connect the battery ground cable.

For additional information, refer to [Battery Connect \(86.15.15\)](#)

12 **NOTE:**

Make sure that the air suspension system is repressurized using the Jaguar approved diagnostic system before lowering the vehicle to the ground.

Repressurize the air suspension system. For further information, refer to the Jaguar approved diagnostic system.

- 13 . Install the rear wheel and tire assembly.

For additional information, refer to

Rear Air Spring - VIN Range: G45704- >G99999 (60.32.10)

Removal

1 . Using the Jaguar approved diagnostic system depressurize the air suspension system.

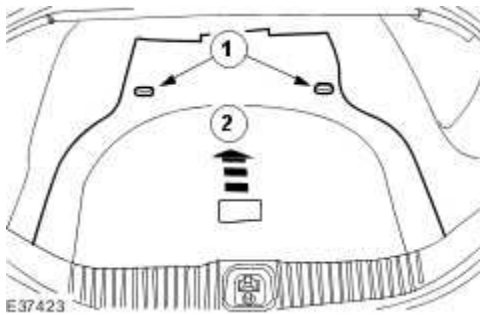
2 . Disconnect the battery ground cable.

For additional information, refer to [Battery Disconnect and Connect](#)

3 . Remove the luggage compartment floor covering.

1) Remove the luggage compartment floor covering securing screws.

2) Remove the luggage compartment floor covering.



4 . **NOTE:**

Left-hand shown, right-hand similar.

Remove the luggage compartment side trim panel.



5 . NOTE:

Left-hand shown, right-hand similar.

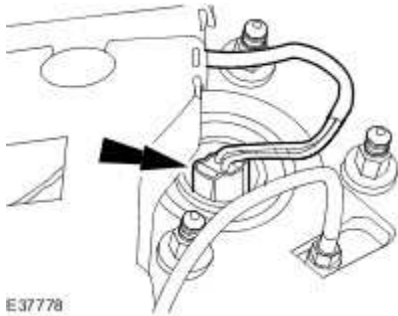
Remove the air spring trim panel.



6 . NOTE:

Left-hand shown, right-hand similar.

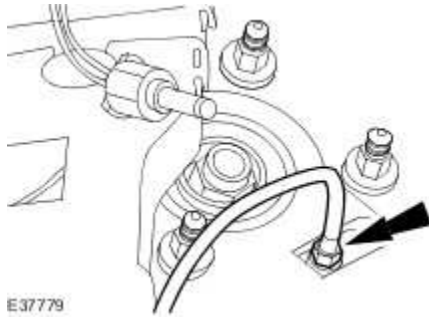
Disconnect the air spring electrical connector.



7 . NOTE:

Left-hand shown, right-hand similar.

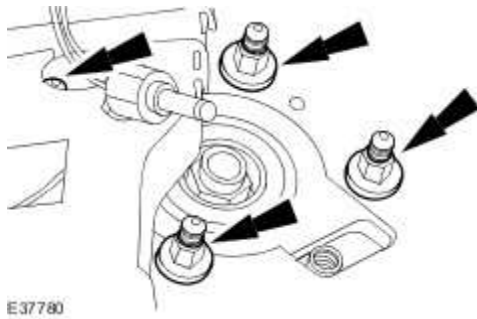
Detach the air pipe.



8 . NOTE:

Left-hand shown, right-hand similar.

Remove the air spring retaining nuts.



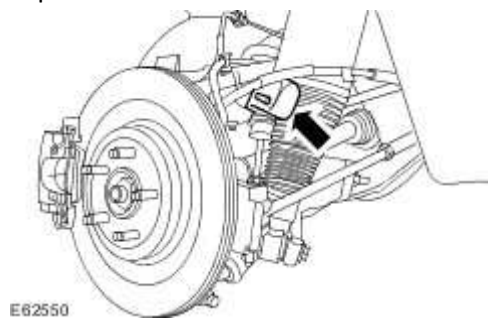
9 . Remove the rear wheel and tire assembly.

For additional information, refer to

10 . NOTE:

Left hand shown, right-hand similar.

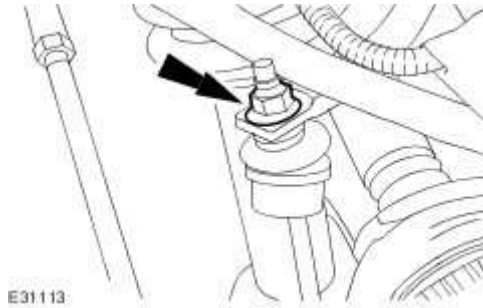
Reposition the stabilizer bar link cover.



11 . **NOTE:**

Left hand shown, right-hand similar.

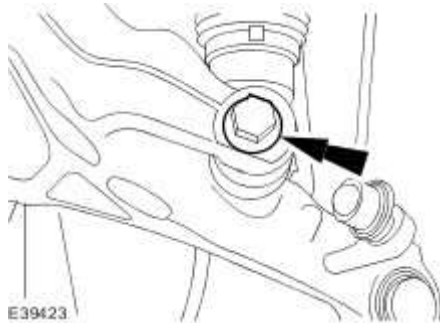
Detach the stabilizer bar link.



12 . **NOTE:**

Left hand shown, right-hand similar.

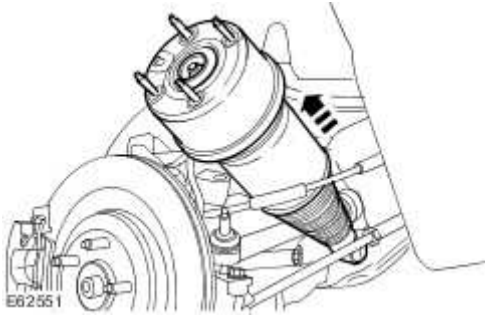
Remove the air spring retaining bolt.



13 . **NOTE:**

Left hand shown, right-hand similar.

Remove the air spring.



Installation



WARNING: Do not install an air spring if the pressure retaining valve has been removed or has become loose. Failure to follow this instruction may result in personal injury.



CAUTION: Do not install an air spring if the pressure retaining valve has been removed or has become loose. Failure to follow this instruction may result in damage to the vehicle.

NOTE:

New air springs have a shelf life of seven months from the date of manufacture. Do not install the air spring if the date marking exceeds this date.

1 . NOTE:

Left hand shown, right-hand similar.

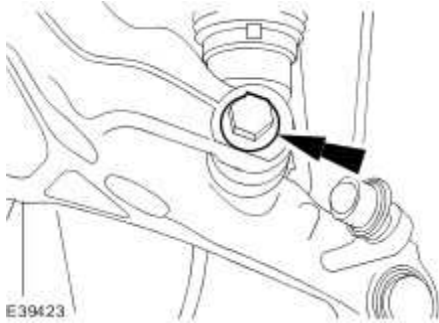
Install the air spring.



2 . NOTE:

Left hand shown, right-hand similar.

Tighten to 133 Nm.



3 . NOTE:

Left hand shown, right-hand similar.

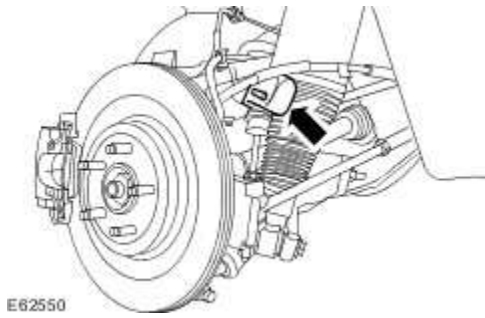
Tighten to 48 Nm.



4 . NOTE:

Left hand shown, right-hand similar.

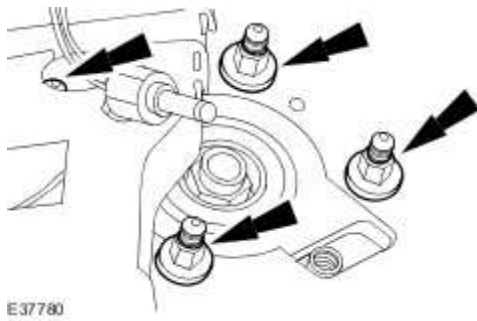
Reposition the stabilizer bar link cover.



5 . NOTE:

Left-hand shown, right-hand similar.

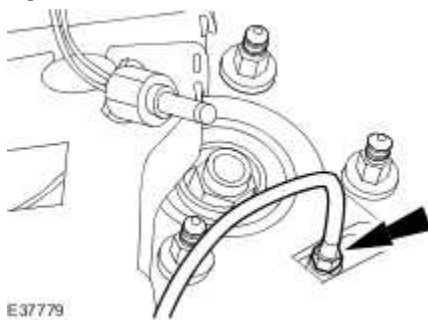
Tighten to 25 Nm..



6 . NOTE:

Left-hand shown, right-hand similar.

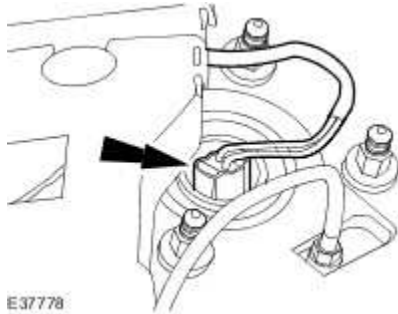
Tighten to 5 Nm.



7 . NOTE:

Left-hand shown, right-hand similar.

Connect the air spring electrical connector.



8 . NOTE:

Left-hand shown, right-hand similar.

Install the air spring trim panel.



9 . NOTE:

Left-hand shown, right-hand similar.

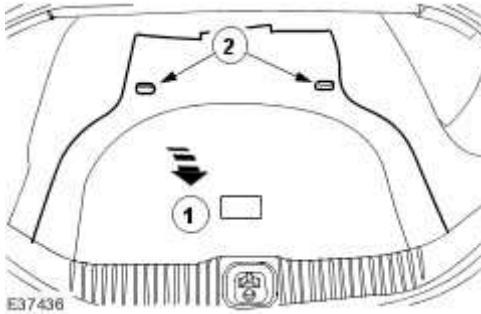
Install the luggage compartment side trim panel.



10 . Install the luggage compartment floor covering.

1) Install the luggage compartment floor covering.

2) Install the luggage compartment floor covering securing screws.



11 . Connect the battery ground cable.

For additional information, refer to [Battery Connect \(86.15.15\)](#)

12 **NOTE:**

Make sure that the air suspension system is repressurized using the Jaguar approved diagnostic system before lowering the vehicle to the ground.

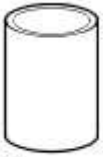
Repressurize the air suspension system. For further information, refer to the Jaguar approved diagnostic system.

13 . Install the rear wheel and tire assembly.

For additional information, refer to

Rear Air Spring Lower Bushing (64.32.03)

Special Service Tools



E52622

Bushing Remover / installer
205-335



E52621

Bushing remover
204-533



E52620

Bushing installer
204-534

Removal

- 1 . Remove the rear air spring.

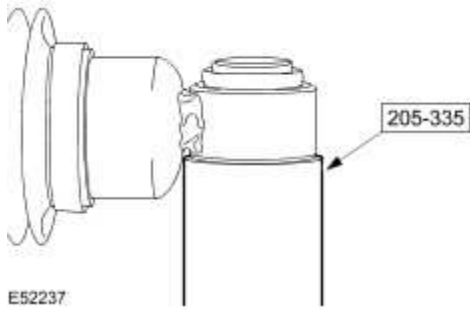
For additional information, refer to [Rear Air Spring - VIN Range: G00442->G45703 \(60.32.10\)](#)

For additional information, refer to [Rear Air Spring - VIN Range: G45704->G99999 \(60.32.10\)](#)

- 2 . **NOTE:**

With assistance make sure the tool is aligned.

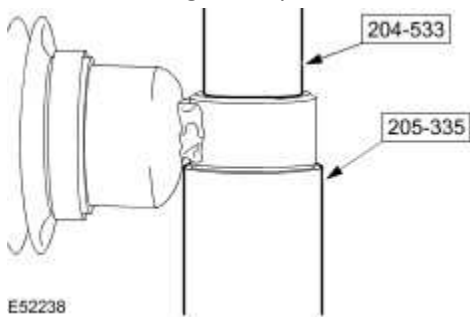
Using the special tool, support the air spring.



3 . NOTE:

With assistance make sure the tool is aligned.

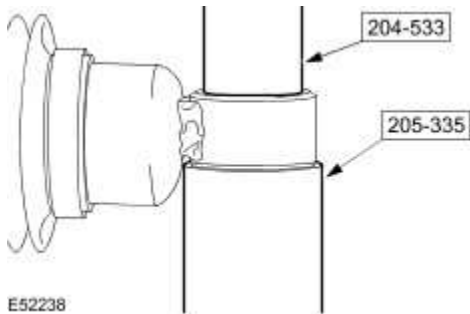
Position and align the special tool to the air spring bush.



4 . NOTE:

With assistance make sure the tool is aligned.

Using special tools slowly push the bush from the air spring.



Installation

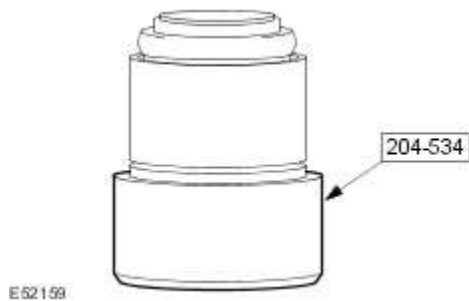
1 . NOTE:

Make sure the bush is clean and free from oil or grease.

NOTE:

Use a suitable lubricant to allow the bush to locate into the special tool.

Locate the new bush in the special tool.



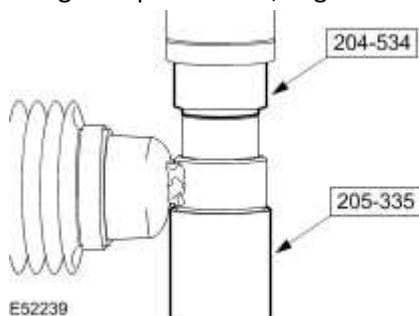
2 NOTE:

Make sure the damper is clean and free from grease or oil and is not damaged prior to pushing in the new bush.

NOTE:

Make sure the air spring and bush are placed in the correct orientation.

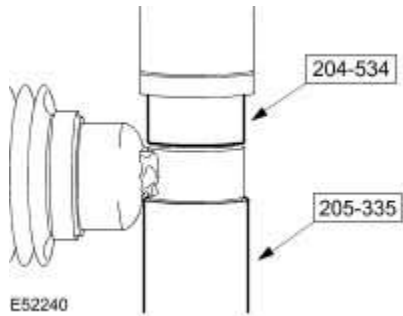
Using the special tools, align the bush to the air spring.



3 . NOTE:

Make sure correct alignment is maintained.

Slowly push the bush into the air spring until the tool reaches the stop.



4 . Install the rear air spring.

For additional information, refer to [Rear Air Spring - VIN Range: G00442->G45703 \(60.32.10\)](#)

For additional information, refer to [Rear Air Spring - VIN Range: G45704->G99999 \(60.32.10\)](#)

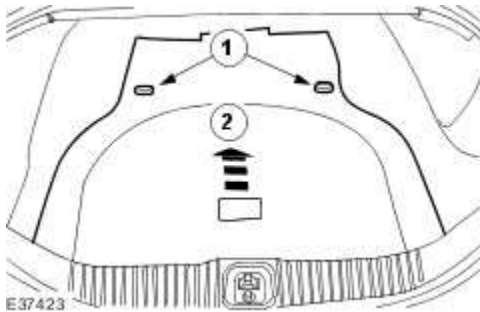
Rear Vertical Accelerometer (86.56.55)

Removal

1 . Remove the luggage compartment floor covering.

1) Remove the luggage compartment floor covering securing screws.

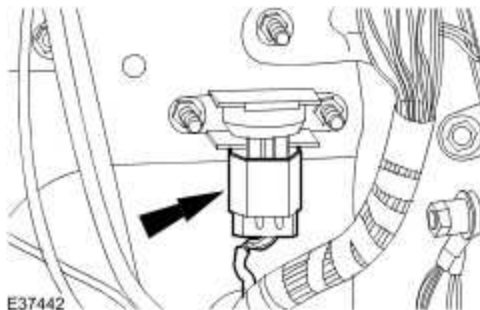
2) Remove the luggage compartment floor covering.



2 . Remove the luggage compartment side trim panel.



3 . Disconnect the rear vertical accelerometer electrical connector.

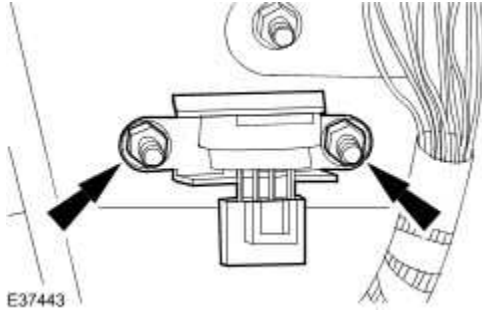


4



- **CAUTION:** Make sure the vertical accelerometer is not dropped in transit as damage will be caused to internal components.

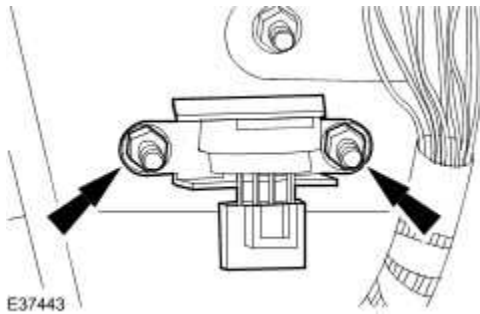
Remove the rear vertical accelerometer.



Installation

- 1 . To install, reverse the removal procedure.

▶ Tighten to 4 Nm.



Suspension Height Sensor (60.32.05)

Removal

NOTE:

Vehicles built before December 2003 have four suspension height sensors which are mounted on the front and rear subframe assemblies, two front and two rear. Vehicles built after December 2003 have only three (the right front sensor being deleted), although the functionality of the system remains the same. There may be some early vehicles which will have four sensors fitted, but which have the three-sensor module, making the right front sensor redundant. To confirm the level of equipment, read the module part number from the special applications menu in configuration on the Jaguar approved diagnostic system. Part numbers before 'BJ' are four sensor, while 'BJ' and after are three sensor. If the Jaguar approved diagnostic system is not available, remove the rear seat and sound deadening and read the part number from the module.

NOTE:

The later module can be fitted in place of the four sensor module, but the right front sensor must be left in place, even though the system will not use it.

1. Remove the wheel and tire assemblies.

For additional information, refer to [Wheel and Tire \(74.20.05\)](#)

2



- **CAUTION:** Do not spray solvents or cleaning agents inside the height sensor. Failure to follow this instruction may result in damage to the vehicle.

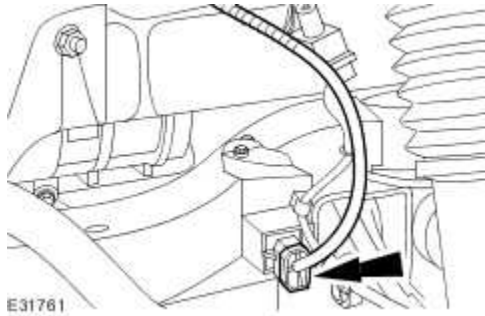


CAUTION: Make sure the height sensor is thoroughly cleaned prior to disassembly.
For additional information, refer to [General Service Information](#)

NOTE:

Front shown, rear similar.

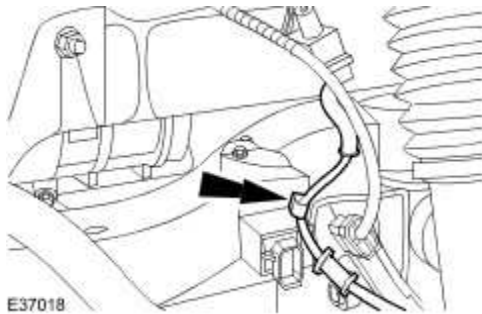
Disconnect the front air suspension height sensor electrical connector.



3 . NOTE:

This step is for front air suspension height sensors only.

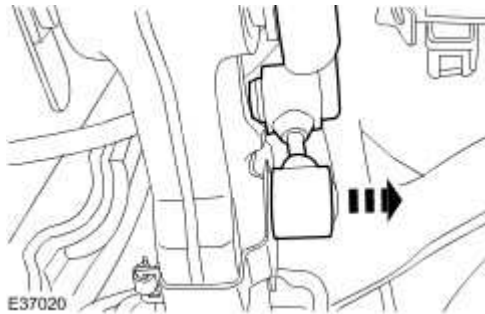
Detach the wheel speed sensor harness.



4 . NOTE:

Front shown, rear similar.

Detach the front air suspension height sensor link rod.

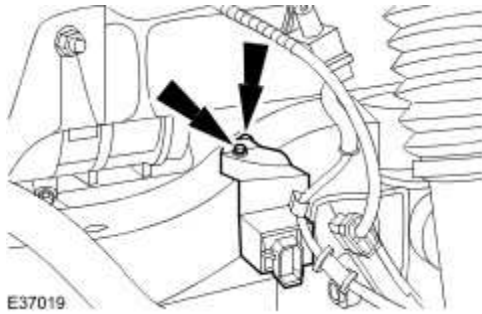


5 . NOTE:

Front shown, rear similar.

Remove the front air suspension height sensor.

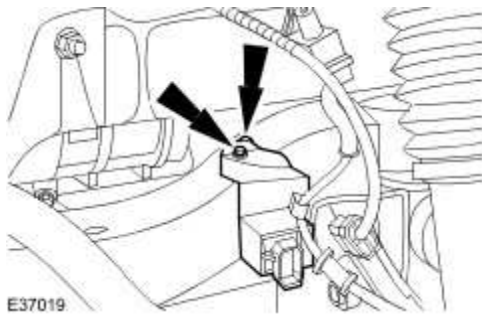
▶ Remove the front air suspension height sensor retaining bolts.



Installation

1 . To install, reverse the removal procedure.

▶ Tighten to 20 Nm.



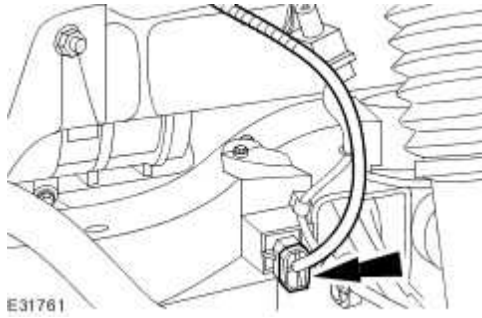
2 NOTE:

To aid installation of the electrical connector, apply a small amount of silicone based oil or grease to the connector seal.

NOTE:

Make sure the electrical connector latch is fully secured to the sensor.

Connect the front air suspension height sensor electrical connector.



- 3 . Re-calibrate the suspension height sensor using the Jaguar approved diagnostic system.
For additional information, refer to [Ride Height Adjustments](#)

205 : Driveline

205-00 : Driveline System – General Information

General procedures

Driveline Angle Inspection

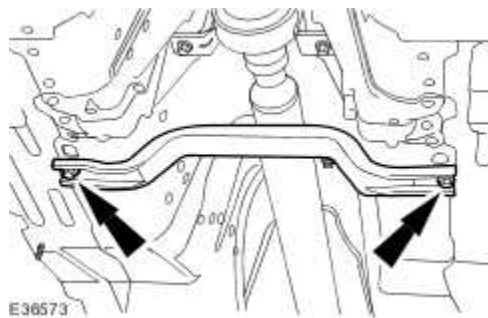
Special Service Tools



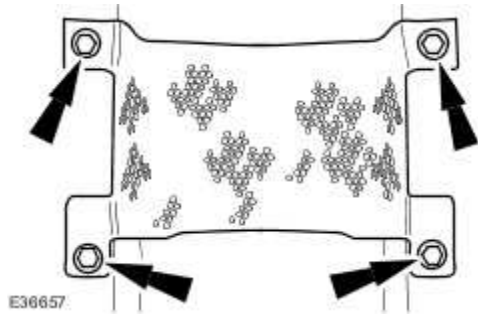
Alignment Tool

205-535

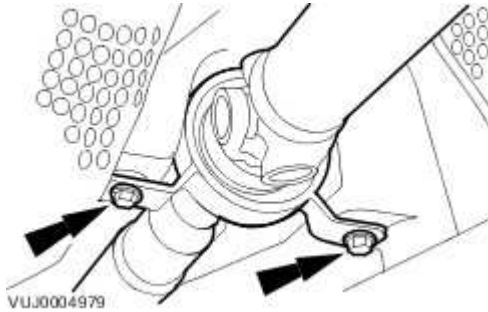
1. Raise and support the vehicle. [<<100-02>>](#)
2. Remove the exhaust system. [<<309-00>>](#)
3. Remove the support bracket.



4. Remove the driveshaft heat shield.



5. Loosen the driveshaft centre bearing retaining bolts two complete turns.



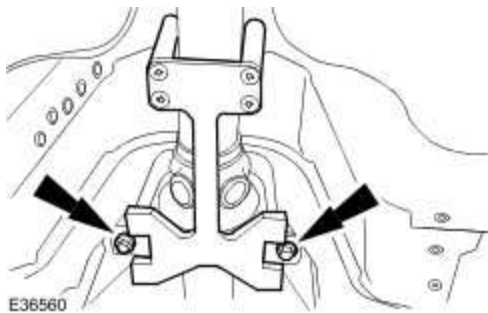
6.



CAUTION: Make sure the driveshaft centre bearing is correctly aligned to the driveshaft. Failure to follow these instructions may result in damage to the vehicle.

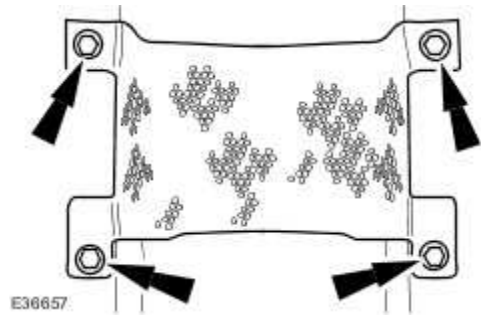
Using the special tool, align the driveshaft centre bearing.

- Tighten to 40 Nm.



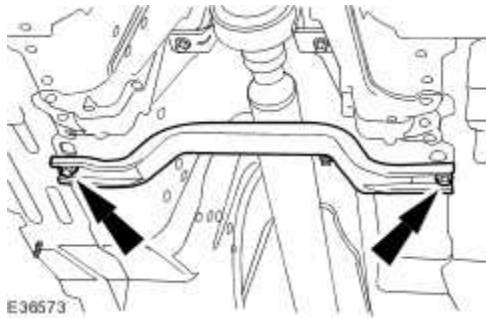
7. Install the driveshaft heat shield retaining bolts.

- Tighten to 7 Nm.



8. Install the support bracket.

- Tighten to 9 Nm.



9. Install the exhaust system. [<<309-00>>](#)

Driveline System

The driveline transfers engine torque to the drive wheels. Power is transmitted through the transmission to the driveshaft and then to the rear drive axle which is connected to the rear drive halfshaft.

For additional information, refer to [Halfshaft](#) (205-05 Rear Drive Halfshafts)

For additional information, refer to [Driveshaft](#) (205-01 Driveshaft)

For additional information, refer to [Axle Assembly](#) (205-02 Rear Drive Axle/Differential)

The engine angle is built into the engine mounts. If the engine angle is out of specification, the engine mounts must be inspected for damage.

Driveline Vibration

Driveline vibration exhibits a higher frequency and lower amplitude than high-speed shake. Driveline vibration is directly related to the speed of the vehicle and is usually noticed at various speed ranges. Driveline vibration can be felt as a tremor in the floorpan or is heard as a rumble, hum, or boom. Driveline vibration can exist in all drive modes, but may exhibit different symptoms depending upon whether the vehicle is accelerating, decelerating, cruising, or coasting. Check the driveline angles if the vibration is particularly noticeable during acceleration or deceleration, especially at lower speeds. Check that the centre bearing washers between the body and bearing housing are 3mm minimum and 8mm maximum thickness.

In order to diagnose vibrations in the driveshaft, refer to the Jaguar approved diagnostic system for analysis/rectification.

Driveline Angle

Driveline angularity is the angular relationship between the engine crankshaft, the driveshaft, and the rear drive axle pinion. Factors determining driveline angularity include ride height, rear springs and engine mounts.

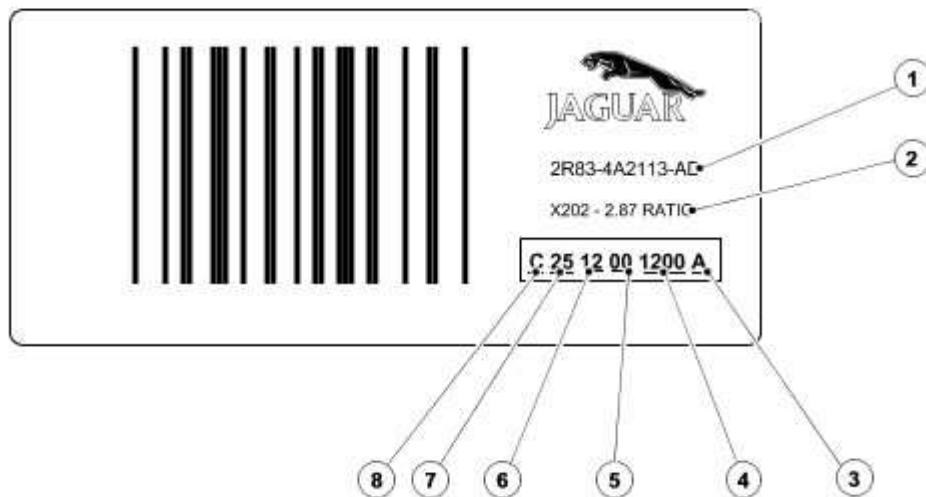
An incorrect driveline (pinion) angle can often be detected by the driving condition in which the vibration occurs.

- A vibration during coasting from 72 to 56 km/h (45 to 35 mph) is often caused by a high pinion angle.
- A vibration during acceleration from 56 to 72 km/h (35 to 45 mph) may indicate a low pinion angle.

When these conditions exist, check the driveline angles.

If the tires and driveline angle are not the cause, carry out the Noise, Vibration and Harshness (NVH) tests to determine whether the concern is caused by a condition in the driveline. For additional information, refer to [Noise, Vibration and Harshness \(NVH\)](#) (100-04 Noise, Vibration and Harshness)

Rear Drive Axle Identification Tag



E49637

Item	Description
1	Part Number
2	Ratio and Vehicle Line
3	Rear Drive Axle Ratio <ul style="list-style-type: none"> • A and E = 2.87 Ratio • B and F = 3.07 Ratio • C and G = 3.31 Ratio • D = 2.69 Ratio
4	Time Built

5	Year Built
6	Month Built
7	Day Built
8	Plant Built <ul style="list-style-type: none"> • C = Castle Bromwich • B = Browns Lane • G = German Specification

Engine capacity	Transmission	Axle Ratio
4.2L V8 Supercharger	Automatic	2:87
4.2L V8	Automatic	2:87
3.5 V8	Automatic	3.07
3.0 V6	Automatic	3.31

The plant code denotes a particular rear drive axle design and specific ratio. In addition, the plant code will not change as long as that particular rear drive axle never undergoes an external design change. If, however, an internal design change takes place during the production life of the rear drive axle and that internal change affects parts interchangeability, a dash and numerical suffix is added to the plant code. This means that as an assembly both rear drive axles are interchangeable; however, internally they are different. Therefore, each requires different internal parts at the time of repair.

Driveline System

Inspection and Verification



CAUTION: Only serviceable items can be renewed or adjusted. Failure to follow this instruction may result in the warranty of the component being rejected.

Certain driveline trouble symptoms are also common to the engine, transmission, wheel bearings, tires, and other parts of the vehicle. For this reason, make sure that the cause of the trouble is in the driveline before adjusting, repairing, or installing any new components. For additional information, [Noise, Vibration and Harshness \(NVH\)](#)

- 1 . Verify the customer concern by carrying out a road test of the vehicle.
- 2 . Visually inspect for obvious signs of mechanical damage.
- 3 . If an obvious cause for an observed or reported concern is found, correct the cause (if possible) before proceeding to the next step.
- 4 . If the concern is not visually evident, verify the symptom and refer to the Symptom Chart.

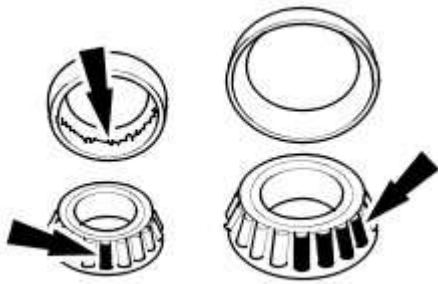
Rear Drive Axle Noise

Gear Howl and Whine

Howling or whining of the ring gear and pinion is due to an incorrect gear pattern, gear damage or incorrect bearing preload.

Bearing Whine

Bearing whine is a high-pitched sound similar to a whistle. It is usually caused by worn/damaged pinion bearings, which are operating at driveshaft speed. Bearing noise occurs at all driving speeds. This distinguishes it from gear whine which is speed dependent.



ELE0012864

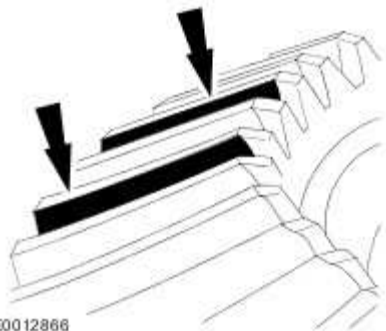
As noted, pinion bearings make a high-pitched, whistling noise, usually at all speeds. If however there is only one pinion bearing that is worn/damaged, the noise may vary in different driving phases.

A wheel bearing noise can be mistaken for a pinion bearing noise.

Chuckle

Chuckle that occurs on the coast driving phase is usually caused by excessive clearance between the differential gear hub and the differential case bore.

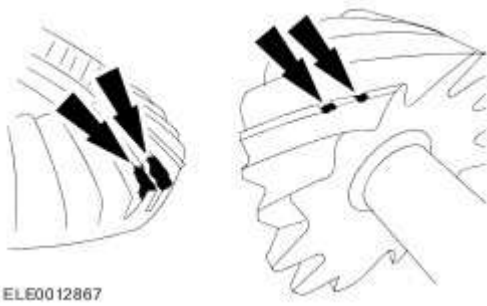
Damage to a gear tooth on the coast side can cause a noise identical to a chuckle. A very small tooth nick or ridge on the edge of a tooth can cause the noise.



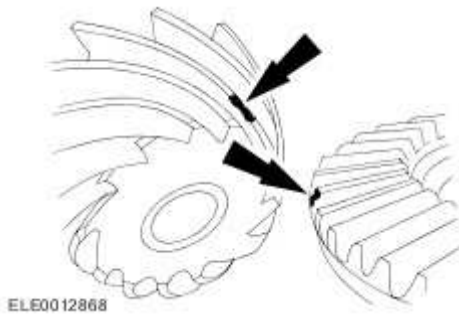
ELE0012866

Knock

Knock, which can occur on all driving phases, has several causes including damaged teeth or gearset.



A gear tooth damaged on the drive side is a common cause of the knock.



Clunk

Clunk is a metallic noise heard when the automatic transmission is engaged in REVERSE or DRIVE. The noise may also occur when the throttle is applied or released. Clunk is caused by transmission calibration, backlash in the driveline or loose suspension components and is felt or heard in the vicinity of the rear drive axle.

Bearing Rumble

Bearing rumble sounds like marbles being tumbled. This condition is usually caused by a worn/damaged wheel bearing. The lower pitch is because the wheel bearing turns at only about one-third of the driveshaft speed. Wheel bearing noise also may be high-pitched, similar to gear noise, but will be evident in all four driving modes.

Symptom Chart

Noise is at constant tone over a narrow vehicle speed range. Usually heard on light drive and coast conditions.

Possible Source(s):

- Rear drive axle.

Action(s) to take:

- For additional information, GO to Pinpoint Test [G215971p1](#).

Noise is the same on drive or coast

Possible Source(s):

- Road.
- Wheel bearing.

Action(s) to take:

- Normal conditions.
- CHECK and INSTALL a new wheel bearing as necessary. For additional information, [Rear Wheel Bearing \(64.15.14\)](#)

Possible Source(s):

- Worn or damaged driveshaft joint.

Action(s) to take:

- INSTALL new components as necessary.

Possible Source(s):

- Driveshaft center bearing.

Action(s) to take:

- INSTALL new components as necessary.

Noise is produced with the vehicle standing and driving

Possible Source(s):

- Engine.

Action(s) to take:

- For additional information, [Engine - 3.0L/3.5L/4.2L](#)

Possible Source(s):

- Transmission.

Action(s) to take:

- For additional information,

Noise is more pronounced while turning

Possible Source(s):

- Differential side gears and pinion gears.

Action(s) to take:

- For additional information,
[Rear Drive Axle and Differential](#)

Loud clunk in the driveline when shifting from reverse to forward

Possible Source(s):

- Transmission out of calibration.
- Engine idle speed set too high.
- Engine mount.

Action(s) to take:

- Using the Jaguar approved diagnostic system, calibrate the transmission control module (TCM).
- Check and adjust the idle speed as necessary. For additional information,
[Electronic Engine Controls - VIN Range: G00442->G45703](#) or
[Electronic Engine Controls - VIN Range: G00442->G45703](#)
- INSPECT and INSTALL new engine mounts as necessary.

Possible Source(s):

- Transmission Mount.

Action(s) to take:

- INSPECT and INSTALL new transmission mounts as necessary.

Possible Source(s):

- Transmission.

Action(s) to take:

- For additional information,

Possible Source(s):

- Suspension components.

Action(s) to take:

- INSPECT and INSTALL new suspension components as necessary.

Possible Source(s):

- Backlash in the driveline.

Action(s) to take:

- INSPECT and INSTALL new suspension components as necessary.

Clicking, popping, or grinding noises

Possible Source(s):

- Inadequate or contaminated lubrication in the rear drive halfshaft constant velocity (CV) joint.
- Another component contacting the rear drive halfshaft.
- Wheel bearings, brakes or suspension components.

Action(s) to take:

- INSPECT, CLEAN and LUBRICATE with new grease as necessary.
- INSPECT and REPAIR as necessary.
- INSPECT and INSTALL new components as necessary.

Vibration at highway speeds

Possible Source(s):

- Out-of-balance wheels or tires.

Action(s) to take:

- INSTALL new tire(s) as necessary.
[Wheel and Tire \(74.20.05\)](#)

Possible Source(s):

- Driveline out of balance/misalignment.

Action(s) to take:

- For additional information, refer to the Jaguar approved diagnostic system.

Possible Source(s):

- Propshaft centre bearing touching body mounting point.

Action(s) to take:

- Check for correct spacer washer thickness. INSPECT and INSTALL new washers as necessary.

Shudder, Vibration During Acceleration

Possible Source(s):

- Powertrain/driveline misalignment.

Action(s) to take:

- CHECK for misalignment. INSTALL new components as necessary.

Possible Source(s):

- High constant velocity (CV) joint operating angles caused by incorrect ride height.

Action(s) to take:

- CHECK the ride height and VERIFY the correct spring rate. INSTALL new components as necessary.

Lubricant Leak

Possible Source(s):

- Vent.

Action(s) to take:

- Check oil level and correct as necessary.

Possible Source(s):

- Damaged seal.

Action(s) to take:

- INSTALL new components as necessary.

Possible Source(s):

- Rear drive axle filler plug.

Action(s) to take:

- INSTALL new components as necessary.

Possible Source(s):

- Rear drive axle rear cover joint.

Action(s) to take:

- INSTALL new components as necessary.

PINPOINT TEST G215971p1 : EXCESSIVE DRIVELINE NOISE

G215971t1 : CHECK NOISE FROM VEHICLE ON ROAD TEST

1. Road test vehicle to determine load and speed conditions when noise occurs. 2. Assess the noise with different gears selected.

- **Does the noise occur at the same vehicle speed?**

-> Yes

INSTALL a new final drive. TEST the system for normal operation.

-> No

REFER to

[Engine - 3.0L/3.5L/4.2L](#) and

205-01 : Driveshaft

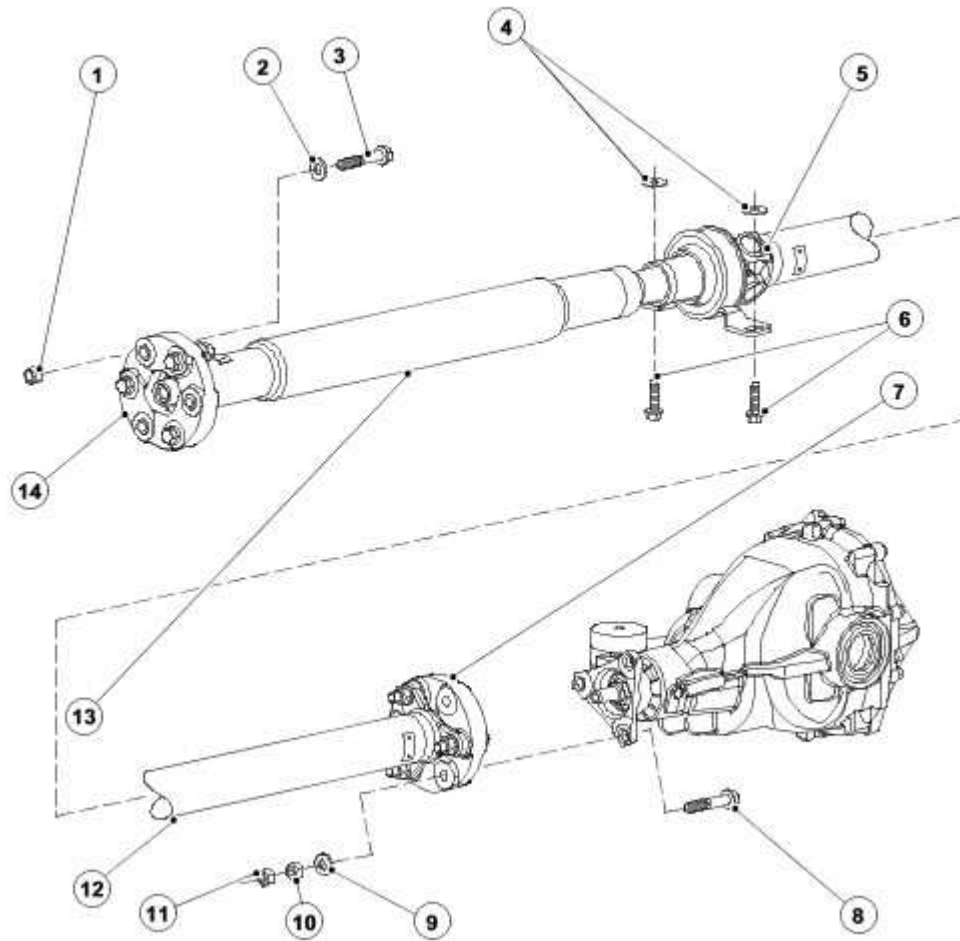
Specifications

Specifications

Torque Specifications

Description	Nm	lb-ft	lb-in
Centre bearing retaining bolts	48	36	-
Transmission flexible joint retaining bolts	108	80	-
Rear drive axle CV joint retaining bolts	73	54	-
Driveshaft heat shield retaining bolts	7	-	62

Driveshaft



E36956

Item	Part Number	Description
1	—	Transmission flexible joint retaining nut
2	—	Transmission flexible joint washer
3	—	Transmission flexible joint retaining bolt
4	—	Centre bearing spacers
5	—	Universal joint

6	—	Centre bearing retaining bolts
7	—	Rear drive axle flexible joint
8	—	Rear drive axle flexible joint retaining bolt
9	—	Rear drive axle flexible joint washer
10	—	Rear drive axle flexible joint retaining nut
11	—	Rear drive axle flexible joint balance nut
12	—	Rear driveshaft tube
13	—	Collapsible front driveshaft tube
14	—	Transmission flexible joint



CAUTION: To preserve 'drive line' refinement, individual parts, other than fixings, **MUST NOT** be renewed. In the event of any balance or driveshaft component related concern, the complete assembly must be renewed. Under no circumstances may the flexible coupling be removed from the driveshaft (or its fixings be loosened). Do not drop or subject the driveshaft to damage.

NOTE:

All driveshaft assemblies are balanced. If undercoating the vehicle, protect the driveshaft, universal joints and the rear drive axle shafts to prevent over-spray of the undercoating material.

The driveshaft consists of the following:

- A two piece welded steel tube with a splined center slip joint.
- A universal joint.
- A center bearing.
- Two flexible joints.

Universal Joint

The universal joint is:

- a lubed-for-life design and requires no lubrication in service.

Driveshaft

For additional information, refer to [205-00](#).

Driveshaft (47.15.01)

Removal

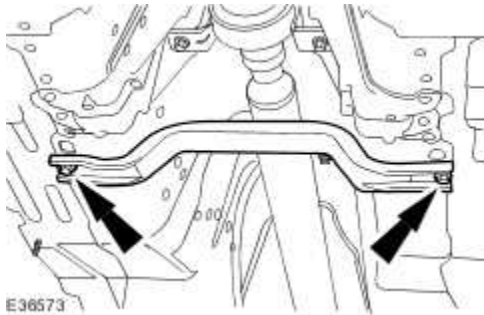
- 1 . Raise and support the vehicle.

For additional information, refer to [Lifting](#)

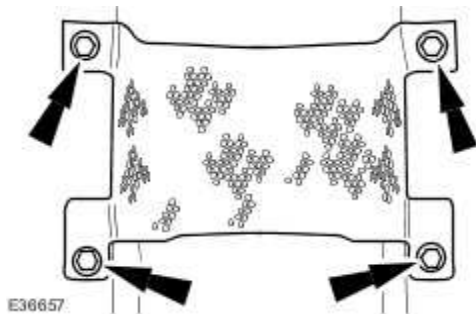
- 2 . Remove the exhaust system.

For additional information, refer to [Exhaust System - 3.0L/3.5L/4.2L](#)

- 3 . Remove the support bracket.



- 4 . Remove the driveshaft heat shield.



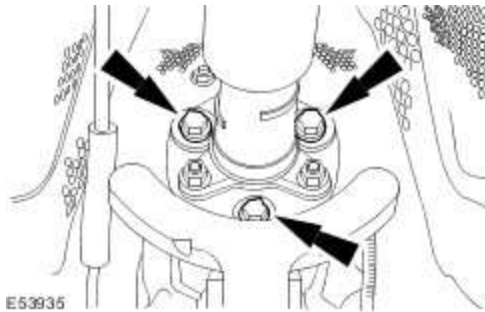
- 5




CAUTION: Under no circumstances must the flexible coupling (or its fixings) be loosened or removed from the driveshaft.

Detach the driveshaft from the transmission flange.

- Mark the position of the driveshaft in relation to the transmission flange.
- Mark the position of each nut and bolt in relation to the transmission flexible joint.



- 6  **CAUTION: Under no circumstances must the flexible coupling (or its fixings) be loosened or removed from the driveshaft.**

Detach the driveshaft from the rear drive axle flange.

- Mark the position of the driveshaft in relation to the rear drive axle flange.
- Mark the position of the balance nut in relation to the rear drive axle flange (if fitted).
- Mark the position of each nut and bolt in relation to the rear drive axle flexible joint.



7.



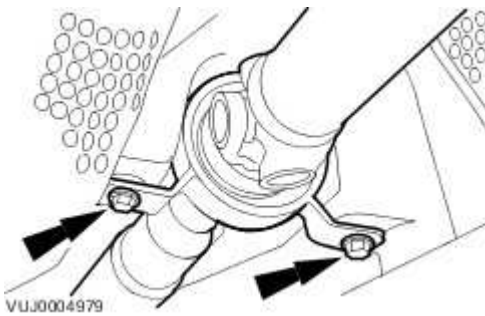
CAUTION: Support the driveshaft front and rear sections.

NOTE:

Note the position of the driveshaft centre bearing spacers.

Remove the driveshaft.

▶ Remove the driveshaft centre bearing spacers.



Installation

1 NOTE:

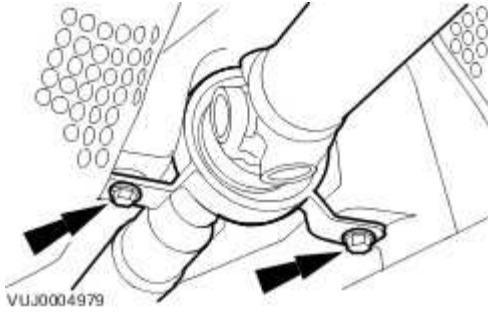
If a new driveshaft is installed, refer to Jaguar approved diagnostic system to establish the correct location for the balance nut if required.

NOTE:

Do not fully tighten the driveshaft centre bearing retaining bolts.

Tighten to 40 Nm.

▶ Install the driveshaft centre bearing spacers.



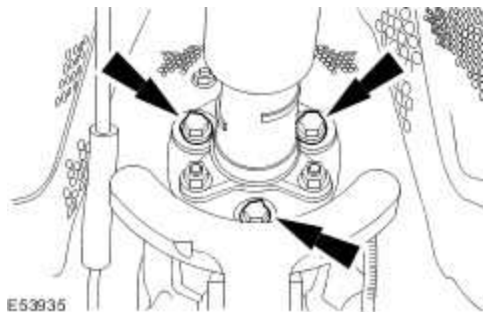
2 . Attach the driveshaft to the rear drive axle flange.

- ▶ Tighten to 88 Nm.
- ▶ If a balance nut is fitted, install onto the original bolt position.
- ▶ Tighten to 12 Nm.



3 . Attach the driveshaft to the transmission flange.

- ▶ Tighten to 108 Nm.



4



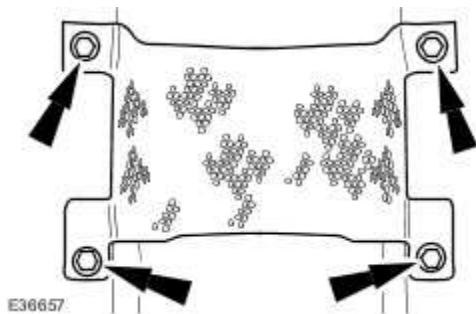
- **CAUTION:** Make sure the driveshaft centre bearing is correctly aligned to the driveshaft. Failure to follow these instructions may result in damage to the vehicle.

Carry out the Driveline Angle Inspection.

For additional information, refer to [Driveline Angle Inspection](#)

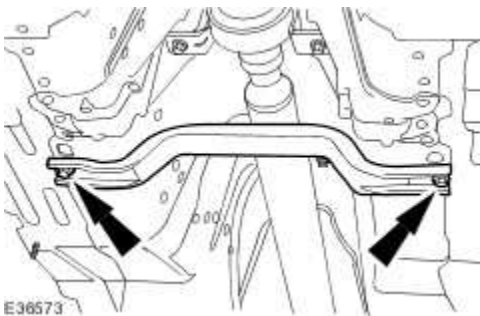
- 5 . Install the driveshaft heat shield retaining bolts.

▶ Tighten to 7 Nm.



- 6 . Install the support bracket.

▶ Tighten to 9 Nm.



- 7 . Install the exhaust system.

For additional information, refer to [Exhaust System - 3.0L/3.5L/4.2L](#)

8 . Lower the vehicle.

205-02 : Rear Drive Axle / Differential

Specifications

Specifications

General Specifications

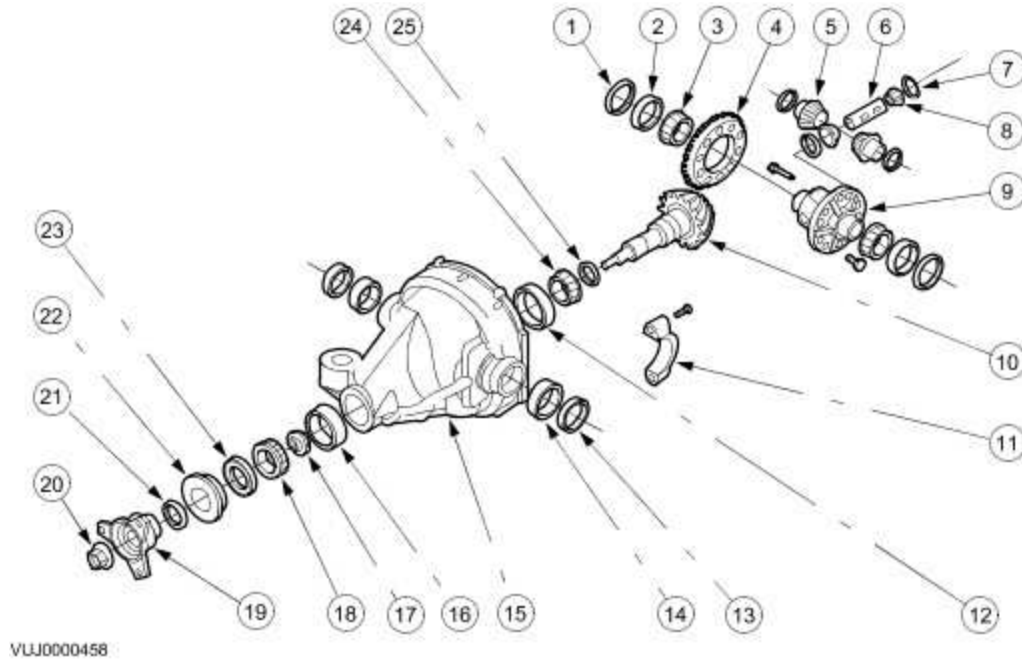
Item	Specification
Differential fluid type	M2C192A synthetic
Differential fluid capacity	1.3 liters

Torque Specifications

Description	Nm	lb-ft	lb-in
Axle front retaining bolt	90	55	—
Axle rear retaining bolts	A	—	—
Driveshaft flexible joint	88	65	—

A = refer to the procedure for correct torque sequence.

Rear Drive Axle and Differential



Item	Part Number	Description
1	—	Differential bearing shim
2	—	Differential bearing cup
3	—	Differential bearing
4	—	Ring gear
5	—	Differential side gear
6	—	Differential pinion shaft
7	—	Differential pinion thrust washer
8	—	Differential pinion gear
9	—	Differential gear case
10	—	Pinion
11	—	Differential bearing cap
12	—	Rear axle pinion bearing cup
13	—	Output shaft oil seals
14	—	Differential pilot bearing
15	—	Differential housing
16	—	Differential drive pinion cup
17	—	Differential drive pinion collapsible spacer

18	—	Pinion bearing
19	—	Pinion flange
20	—	Pinion nut
21	—	Dust shield
22	—	Rear axle drive pinion seal
23	—	Rear axle pinion shaft oil slinger
24	—	Pinion Bearing
25	—	Drive pinion bearing adjustment shim

The rear axle drive pinion receives power from the engine through the transmission and driveshaft. The drive pinion gear rotates the differential drive gear which is bolted to the differential housing outer flange. Inside the differential housing, two differential pinion gears are mounted on a differential shaft which is pinned to the differential housing. These differential pinion gears are engaged with the differential side gears to which the halfshafts are splined. As the differential gear turns, it rotates the halfshafts and rear wheels.

When it is necessary for one wheel and halfshaft to rotate faster than the other, the faster turning differential side gear causes the differential pinion gears to roll on the slower turning differential side gear. This allows differential action between the two halfshafts.

Rear Drive Axle and Differential

For additional information, refer to [<<205-00>>](#)

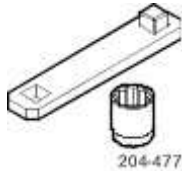
Axle Assembly - Vehicles Without: Differential Drain Plug (51.25.13)

Special Service Tools



Powertrain Assembly Jack.

HTJ1200-2



Replacer - Mounting Bolts Final Drive To Subframe.

204-477

Removal

- 1 . Remove both halfshafts.

For additional information, refer to [Rear Halfshaft \(47.10.13\)](#)

- 2 . Remove the exhaust system.

For additional information, refer to [Front Muffler - 3.0L/3.5L/4.2L \(30.10.18\)](#)

3



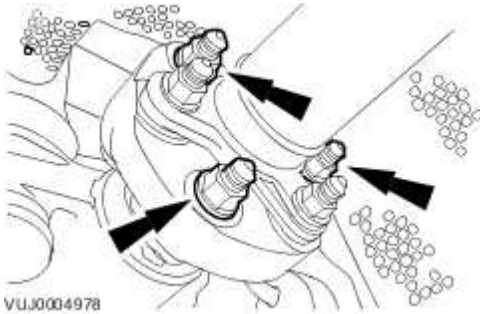
- **CAUTION: Under no circumstances must the flexible coupling (or its fixings) be loosened or removed from the driveshaft.**


Detach the driveshaft from the differential flange.



Mark the position of the driveshaft in relation to the differential flange.

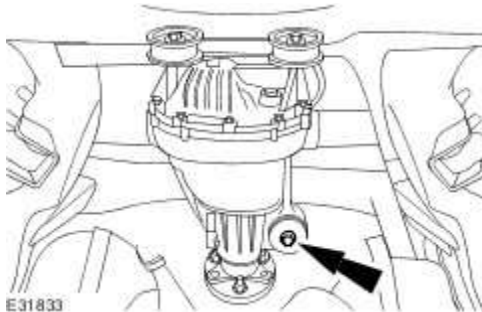
- Mark the position of the balance nut in relation to the differential flange (if fitted).
- Mark the position of each nut and bolt in relation to the driveshaft flexible joint.



- 4  **CAUTION:** When supporting the axle assembly, use a suitable packing material to prevent damage to the axle assembly.

Using the special tool HTJ1200-02, support the axle assembly.

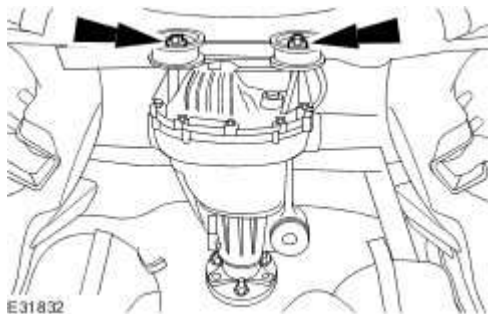
- 5 . Remove the axle assembly front retaining bolt.



6 **NOTE:**

The axle assembly rear retaining bolts do not have to be fully removed for the axle assembly to be removed, slacken the rear retaining bolts alternately until the rear axle assembly is released.

Remove the axle assembly.

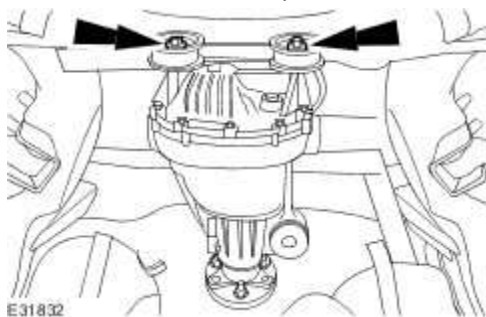


Installation

1 . NOTE:

Loosely tighten the axle assembly rear retaining bolts.

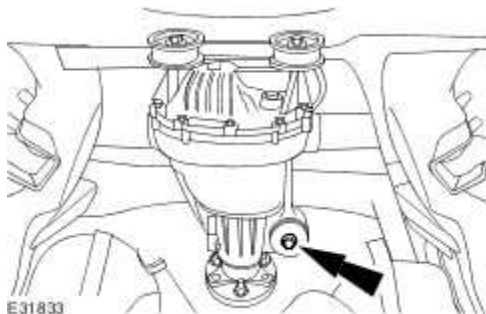
Install the axle assembly.



2 . NOTE:

Make sure the axle front retaining bolt washer and spacer are correctly installed.

Install the axle assembly front retaining bolt.



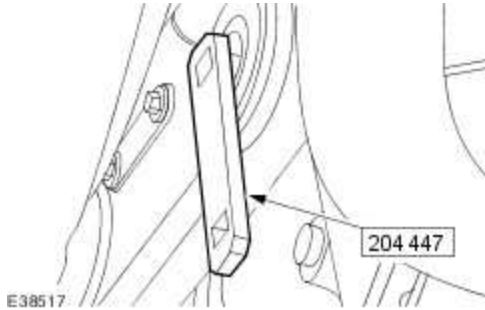
3



CAUTION: When supporting the axle assembly, use a suitable packing material to prevent damage to the axle assembly.

Remove the special tool HTJ1200-02, supporting the axle assembly.

4 . Install the special tool.



5



CAUTION: Make sure the axle rear retaining bolts are tightened to the correct torque specification. Failure to follow this instruction may result in damage to the vehicle.

Using the special tool and a torque wrench, tighten the axle rear retaining bolts.

▶ Tighten to 200 Nm.

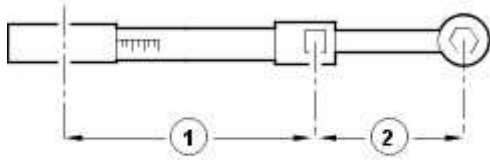
▶ To make sure the axle rear retaining bolts are torqued to the correct specification, using the special tool and a torque wrench the following calculation steps must be followed.

▶ Step 1. Multiply 200 Nm by the effective length of the torque wrench (1).

▶ Step 2. Add the effective length of the special tool (2) to the effective length of the torque wrench (1).

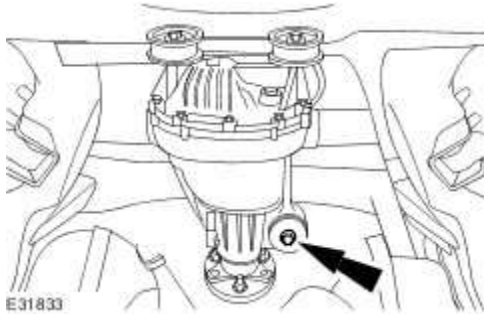
▶ Step 3. Divide the total of step 1 by the total of step 2.

▶ Step 4. Set the torque wrench to the figure arrived at in step 3.



E37107

6 . Tighten to 90 Nm.

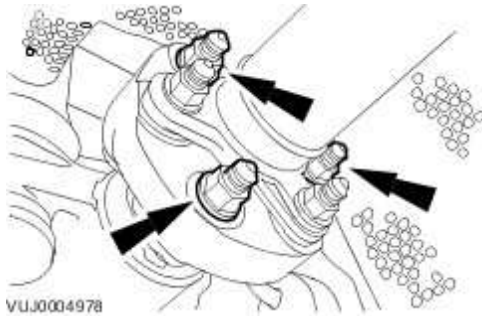


E31833

7 . **NOTE:**

Make sure the driveshaft nuts and bolts are correctly installed.

Tighten to 88 Nm.



VUJ0004978

8 . Install the exhaust system.

For additional information, refer to [Front Muffler - 3.0L/3.5L/4.2L \(30.10.18\)](#)

9 . Install both halfshafts.

For additional information, refer to [Rear Halfshaft \(47.10.13\)](#)

Axle Assembly - Vehicles With: Differential Drain Plug (51.25.13)

No data

Axle Housing Bushing (64.25.30)

Special Service Tools



204-275

Forcing screw remover and installer
204-274



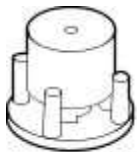
204-274

Forcing screw remover and installer
204-274



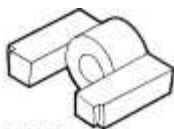
JAG-061

Bearing kit
JAG-061



205-534

Receiving Cup and mount plate
205-534



205-533

Remover Front Mount Bush
205-533



204-245

Installer front mount bush

204-245



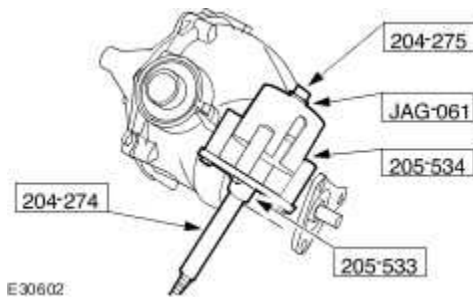
204-243

Installer Front Mount Bush

204-243

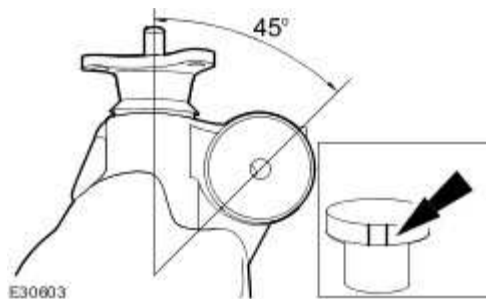
Removal

- 1 . Remove the axle assembly.
For additional information, refer to
- 2 . Using the special tools, remove the axle housing bushing.

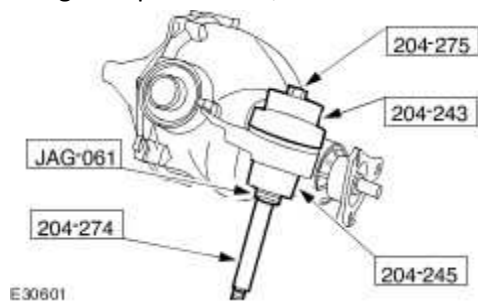


Installation

- 1 The bushing should be installed with the raised molding at 45 degrees to the centre line of the pinion shaft.



2 . Using the special tools, install the axle housing bushing.



3 . Install the axle assembly.

For additional information, refer to

Drive Pinion Seal (51.20.01)

Special Service Tools



205053

Flange holding tool

205-053



204-264

Pinion seal installer

204-264



204-265

Flange remover/replacer plate

204-265



204-266

Flange remover/replacer boss

204-266



204-267

Flange remover/replacer shaft center

204-267



Flange remover/replacer forcing screw
204-269

Removal

1. Remove the driveshaft.

For additional information, refer to [Driveshaft \(47.15.01\)](#)

2



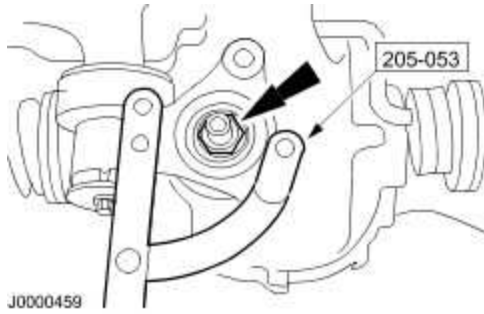
CAUTION: The following step must be carried out to make sure the correct drive pinion flange retaining nut torque is achieved.



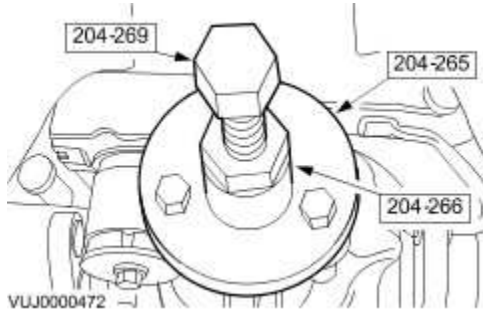
CAUTION: Only use a paint mark to match mark the drive pinion and flange.

Remove the drive pinion flange nut.

- ▶ Match mark the drive pinion nut to the drive pinion flange.
- ▶ Match mark the drive pinion flange to the drive pinion shaft.
- ▶ Loosen the drive pinion flange nut 180°.
- ▶ Tighten the drive pinion flange nut to the match mark.
- ▶ Note the force required to tighten to the match mark.
- ▶ Remove the drive pinion flange nut.

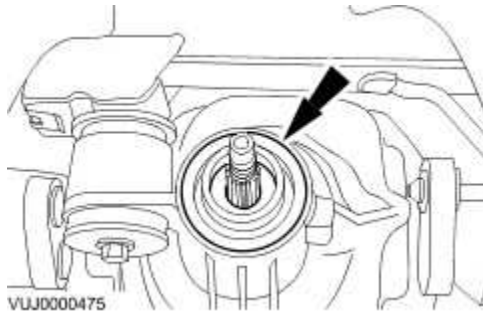


3 . Using the special tools, remove the drive pinion flange.



4 . Remove the drive pinion seal dust cover.

5 . Using a suitable tool, remove the drive pinion seal.



Installation

1

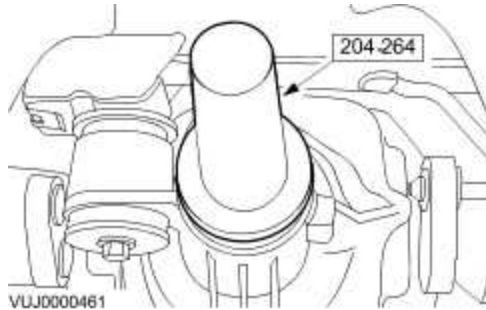


- **CAUTION:** If the drive pinion seal becomes misaligned during installation, remove it and install a new one.

NOTE:

Check the rear drive axle pinion flange, rear axle housing and drive pinion splines for damage.

Using the special tool, install the drive pinion seal.



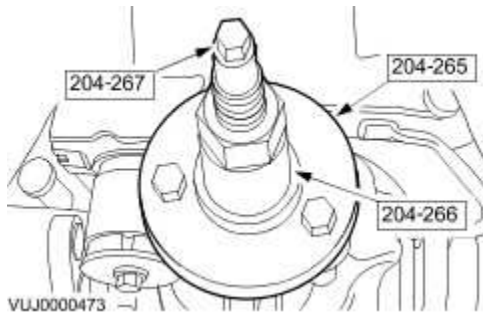
2 . Install the drive pinion seal dust cover.

3 .



CAUTION: Only use the correct special tools to install the drive pinion flange.

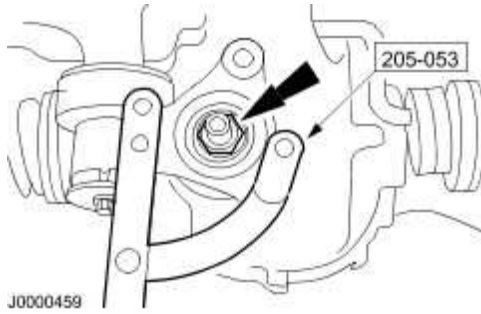
Using the special tools, install the drive pinion flange.



4 . Install a new drive pinion flange nut.

➤ Tighten the drive pinion flange nut to the force noted on removal.

➤ Tighten the drive pinion flange nut to a further 10%.



5



- **CAUTION: Axle fluid should flow from the filler plug threaded hole when full. Failure to follow this instruction may result in damage to the axle.**

Check and top up the axle assembly fluid level as required.

➤ Tighten to 34 Nm.

6 . Install the driveshaft.

For additional information, refer to [Driveshaft \(47.15.01\)](#)

205-05 : Rear Drive Halfshaft

Specifications

Specifications

Lubricants, Fluids, Sealers and Adhesives

Item	Specification
Constant velocity (CV) grease	Olistamoly LN 584 LO

Torque Specification

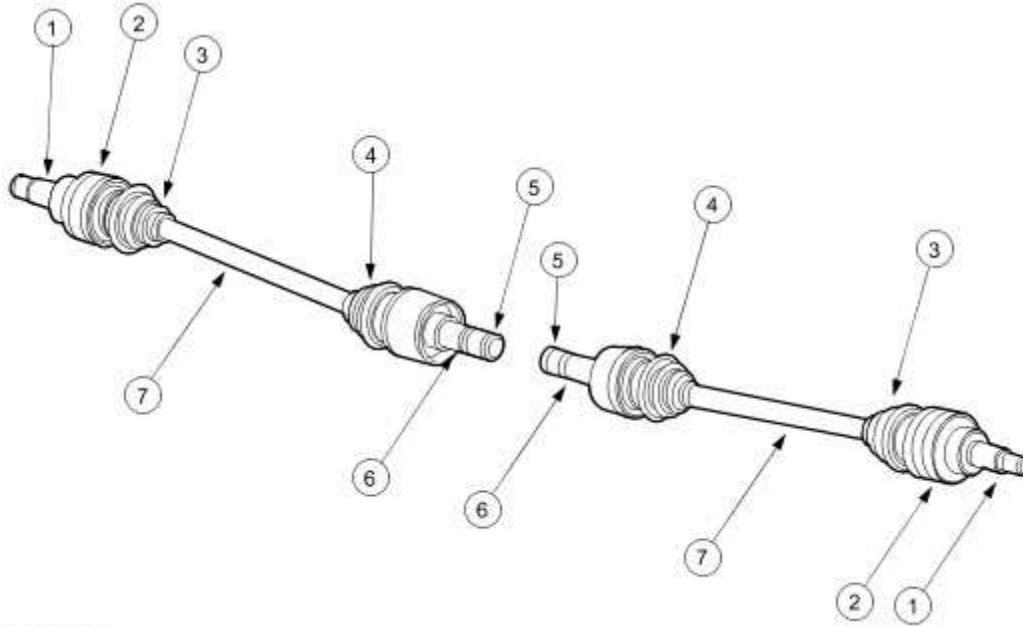
Description	Nm	lb-ft	lb-in
Anti-lock brake sensor retaining nut	9	—	80
Lower arm to wheel knuckle retaining nut	150	111	—
Outer tie rod ball joint retaining nut	55	41	—
Upper wish bone ball joint retaining nut	90	66	—
Wheel hub nut	300	221	—

Fill Capacities

Description	Vehicle	Grams
Grease for inner CV joint boot	Vehicles without supercharger	100
	Vehicles with supercharger	-
Grease for inner CV joint	Vehicles without supercharger	40
	Vehicles with supercharger	100
Grease for outer CV joint boot	Vehicles without supercharger	55
	Vehicles with supercharger	-
Grease for outer CV joint	Vehicles without supercharger	65
	Vehicles with supercharger	100

Rear Drive Halfshafts

Rear Drive Halfshafts



VUU0005655

Item	Part Number	Description
1	—	Outer constant velocity (CV) joint
2	—	Anti-lock brake system (ABS) ring
3	—	Outer CV joint boot
4	—	Inner CV joint boot
5	—	Spring clip
6	—	Inner CV joint
7	—	Halfshaft

The rear drive halfshafts are of unequal lengths and both inner and outer joints are of the CV type.

The outer CV joints are fitted with an ABS ring which is continuously monitored by the wheel speed

sensor.

The inner and outer CV joints are linked by a solid halfshaft. The inner CV joints are retained in the rear drive axle with the aid of a spring clip.

Handling Rear Drive Halfshafts

The following points should be observed when handling rear drive halfshafts:

- Do not pull on the CV joints or the bar shaft.
- Do not allow the CV joints to exceed 18 degrees of travel.
- Check polished surfaces and splines for damage.
- Do not allow the CV joint boots to come into contact with sharp edges, hot vehicle components or the exhaust system.
- Do not drop the rear drive halfshafts, this may cause damage to the splined sections of the CV joints, the threaded sections of the CV joints or the interior of the boots which may not be visible.
- Do not support the rear drive halfshaft by holding the CV joint alone.

Underbody Protection and Corrosion Prevention

The CV joint boots should be covered during application of underbody protection or corrosion prevention. Foreign matter on the CV boots may cause premature ageing of the material. Foreign material on the rear drive halfshafts may cause imbalance.

Rear Drive Halfshafts

For additional information, refer to [<<205-00>>](#).

Rear Halfshaft (47.10.13)

Special Service Tools



Halfshaft splitter handle
307-443



Halfshaft splitter
307-442



Halfshaft oil seal installer
205-532



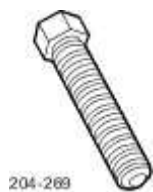
Halfshaft seal protector
205-461



Hub puller
205-491



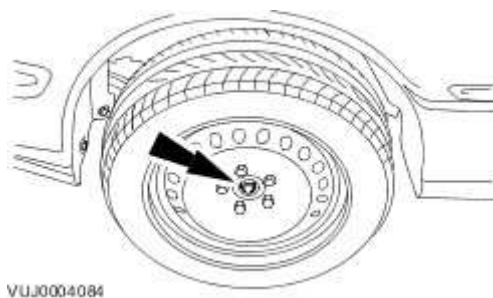
Adaptor nuts
205-491-01



Flange remover forcing screw
204-269

Removal

- 1 . Loosen the wheel hub nut.



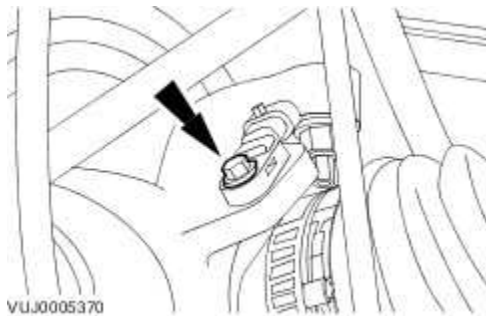
- 2 Remove the brake disc.

- . For additional information, refer to [Brake Disc - Vehicles With: Standard Brakes, VIN Range: G00442->G45703 \(70.10.11\)](#)

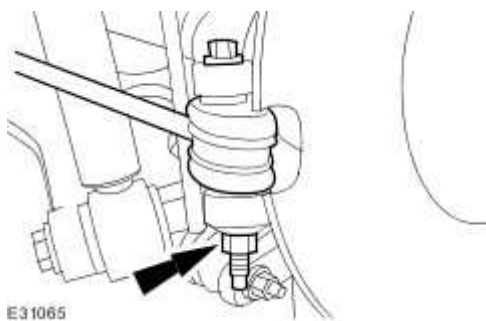
For additional information, refer to [Brake Disc - Vehicles With: High Performance Brakes, VIN Range: G00442->G45703 \(70.10.11\)](#)

For additional information, refer to [Brake Disc - VIN Range: G45704->G99999 \(70.10.11\)](#)

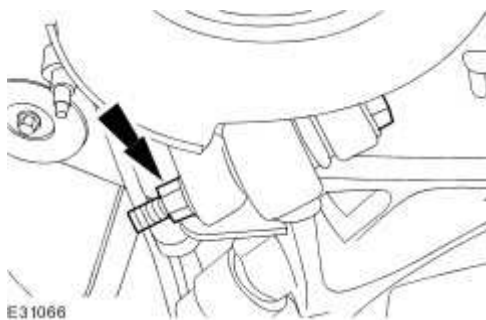
- 3 . Detach the anti-lock brake system (ABS) sensor.



4 . Detach the outer tie rod.

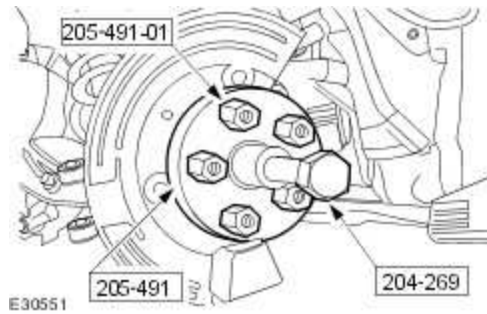


5 . Detach the lower arm from the wheel knuckle.

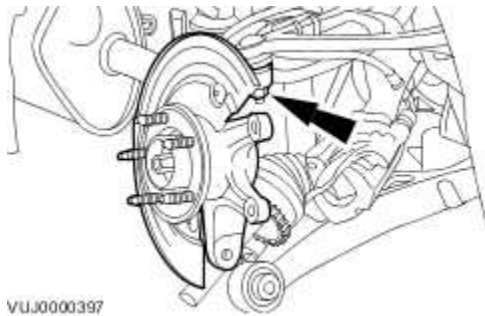


6 . Remove the wheel hub nut.

7 . Using the special tools, detach the halfshaft.



8 . Remove the wheel knuckle assembly.



9



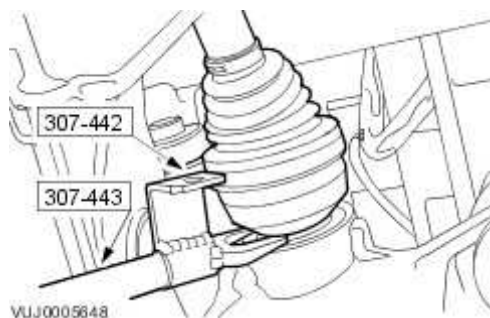
CAUTION: To avoid damage to the halfshaft constant velocity (CV) joints and boots, do not allow the CV joints to exceed 18 degrees of travel.

NOTE:

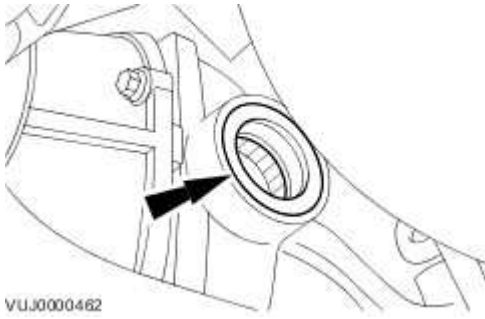
The halfshaft is retained in the axle assembly by a retaining clip.

Using the special tools, remove the halfshaft.

▶ Remove and discard the retaining clip.



10 . Remove the halfshaft seal.

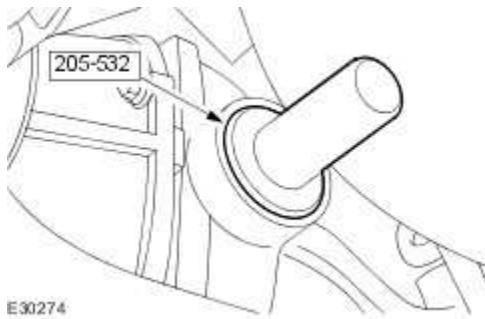


Installation

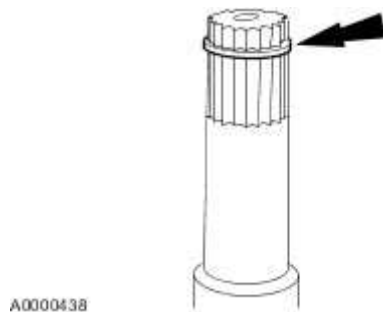


CAUTION: The final tightening of the rear suspension components must be carried out with the vehicle on its wheels.

1 . Using the special tool, install the halfshaft seal.



2 . Install a new retaining clip.



3

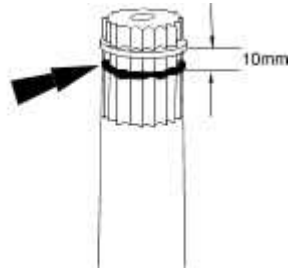


CAUTION: The next four steps must be carried out within 5 minutes of applying the sealant.



CAUTION: Install the halfshaft within 5 minutes of applying the sealant.

Apply a 3mm diameter bead of Loctite WSK-M2G349-A4 or equivalent meeting Jaguar specification to the halfshaft splines.



4



CAUTION: Do not damage the axle shaft seal.



CAUTION: To avoid damage to the halfshaft CV joints and boots, do not allow the CV joints to exceed 18 degrees of travel.



CAUTION: Make sure no damage occurs to the halfshaft seal when installing the halfshaft.

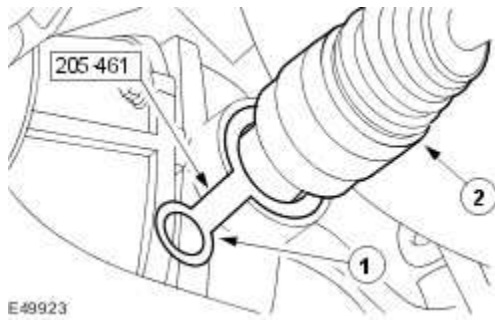
NOTE:

Do not fully engage the halfshaft into the axle assembly.

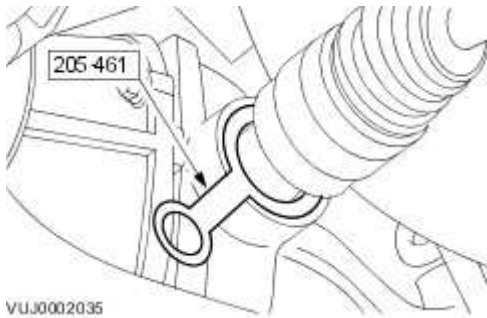
Install the halfshaft.


1) Install the special tool to the halfshaft seal.


2) Install the halfshaft.



5 . Remove the special tool.



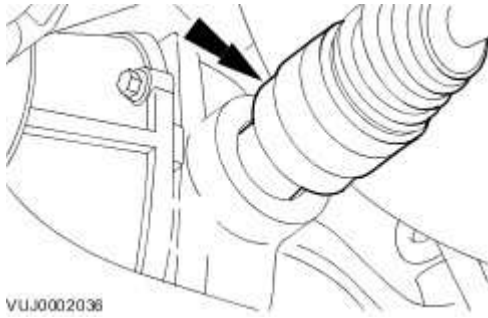
6  **CAUTION:** To avoid damage to the halfshaft CV joints and boots, do not allow the CV joints to exceed 18 degrees of travel.


 **CAUTION:** Make sure no damage occurs to the halfshaft seal when installing the halfshaft.

NOTE:


Make sure the retaining clip is correctly seated.

Attach the halfshaft.

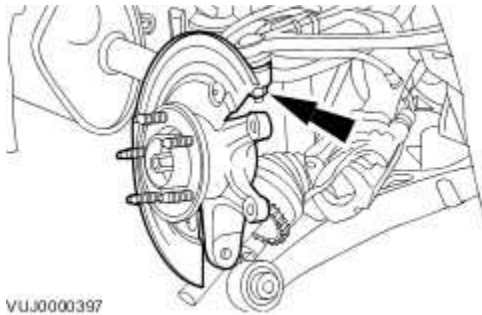


- 7 .  **CAUTION:** Axle fluid should flow from the filler plug threaded hole when full. Failure to follow this instruction may result in damage to the axle.

Check and top up the axle assembly fluid level as required.

 Tighten to 34 Nm.

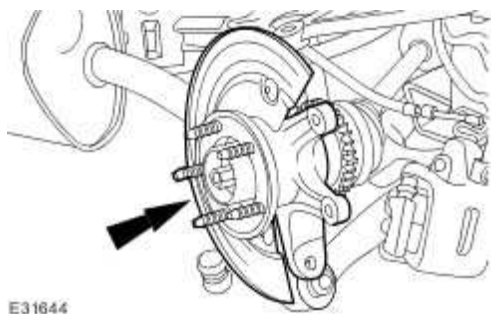
- 8 . Install the wheel knuckle assembly.



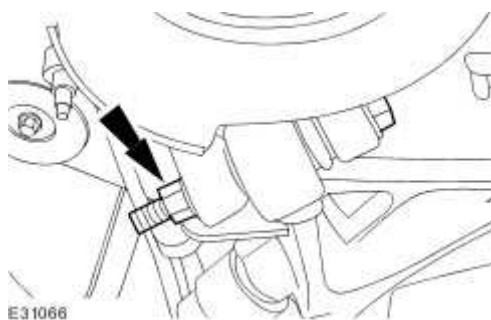
- 9 . **NOTE:**

Using the old wheel hub nut, tighten to 150 Nm.

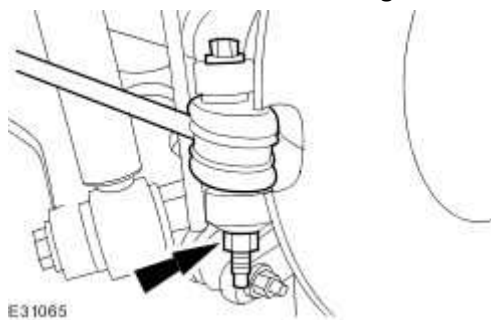
Attach the wheel knuckle to the halfshaft.



10 . Install the lower arm to the wheel knuckle.

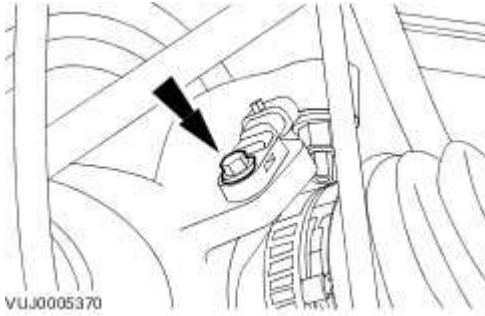


11 . Install the outer tie rod retaining nut.



12 . Install the ABS sensor.

▶ Tighten to 9 Nm.



13 Install the brake disc.


- For additional information, refer to [Brake Disc - Vehicles With: Standard Brakes, VIN Range: G00442->G45703 \(70.10.11\)](#)

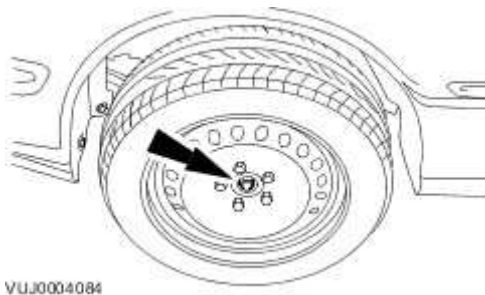
For additional information, refer to [Brake Disc - Vehicles With: High Performance Brakes, VIN Range: G00442->G45703 \(70.10.11\)](#)

For additional information, refer to [Brake Disc - VIN Range: G45704->G99999 \(70.10.11\)](#) or

For additional information, refer to [Brake Disc - VIN Range: G45704->G99999 \(70.10.11\)](#)

14 . Remove and discard the old wheel hub nut, install a new wheel hub nut.

 Tighten to 300 Nm.

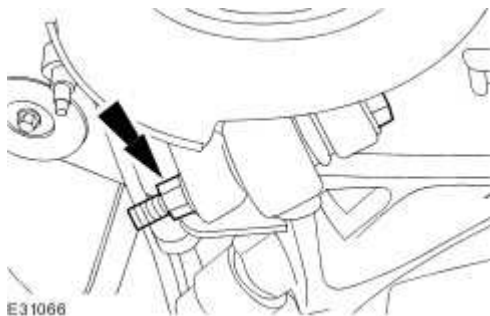


15



- CAUTION:** The final tightening of the rear suspension components must be carried out with the vehicle on its wheels.

Tighten to 150 Nm.

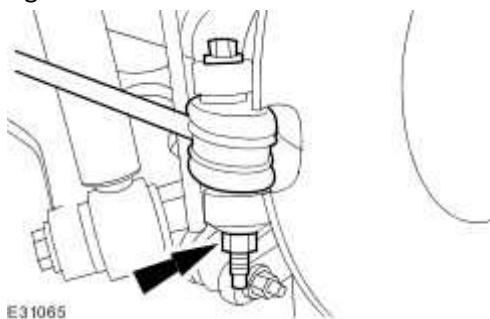


16



- CAUTION: The final tightening of the rear suspension components must be carried out with the vehicle on its wheels.

Tighten to 55 Nm.



Inner Constant Velocity (CV) Joint Boot (47.10.33)


Removal

1. Remove the halfshaft.

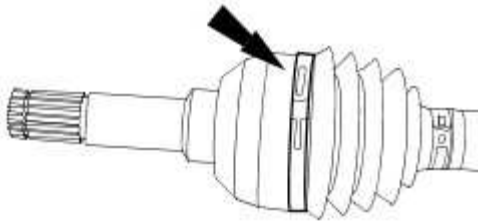
For additional information, refer to [Rear Halfshaft \(47.10.13\)](#)

2.  **CAUTION:** Use suitable protective covers to protect the halfshaft.


Using a suitable clamp, secure the halfshaft.

3.  **CAUTION:** Make sure the inner constant velocity (CV) joint is not separated from the halfshaft.

Remove and discard the inner CV joint boot retaining clip.



VUJ0005653

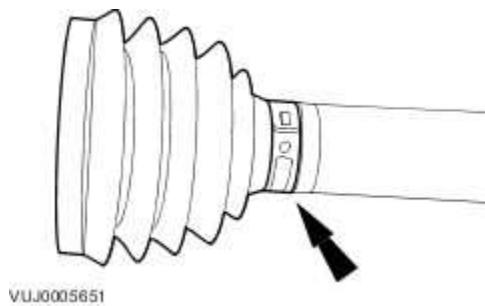
4.  **CAUTION:** Make sure the CV joint ball bearings do not drop out of the CV joint.

Using a suitable tool, remove the inner CV joint.



5 . Remove the inner CV joint boot.

▶ Remove and discard the retaining clip.



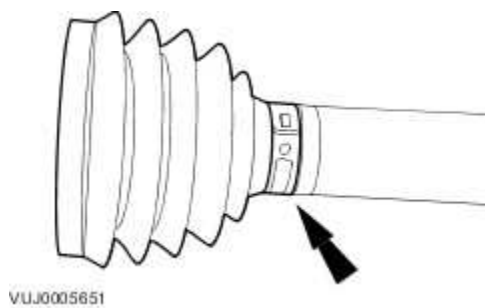
Installation

All vehicles

1 . Install the inner CV joint boot.

▶ Install a new retaining clip.

▶ Using a suitable tool, install the retaining clip.



Vehicles without supercharger

2 .



CAUTION: Make sure the CV joint ball bearings do not drop out of the CV joint.

NOTE:

Use a CV grease meeting Jaguar specification.

Fit the inner CV joint.

▶ Fill the CV joint with 40 grams of grease.

▶ Fill the CV joint boot with 100 grams of grease.



VUJ0005654

Vehicles with supercharger

3 .



CAUTION: Make sure the CV joint ball bearings do not drop out of the CV joint.

NOTE:

Use a CV grease meeting Jaguar specification.

Fit the inner CV joint.

▶ Fill the CV joint with 100 grams of grease.



All vehicles

4 .



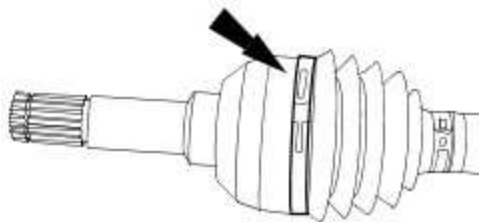
CAUTION: Make sure the CV joint is not separated from the halfshaft.

NOTE:

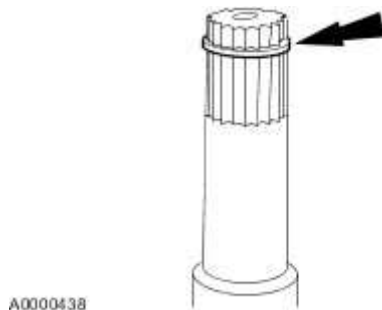
Make sure enough air is present in the CV boot.

Install a new retaining clip.

➤ Using a suitable tool, install the retaining clip.



5 . Install a new retaining clip.



6 . Remove the halfshaft from the clamp.

7 . Install the halfshaft.

For additional information, refer to [Rear Halfshaft \(47.10.13\)](#)

Outer Constant Velocity (CV) Joint Boot (47.10.32)

Removal


- 1 . Remove the Halfshaft.

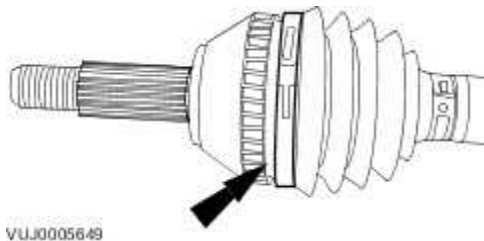
For additional information, refer to [Rear Halfshaft \(47.10.13\)](#)

- 2 .  **CAUTION:** Use suitable protective covers to protect the halfshaft.

Using a suitable clamp, secure the halfshaft.

- 3 . Remove the outer constant velocity (CV) joint boot retaining clip.

 Remove and discard the retaining clip.



- 4 .  **CAUTION:** Do not damage the bearing retainer.

NOTE:

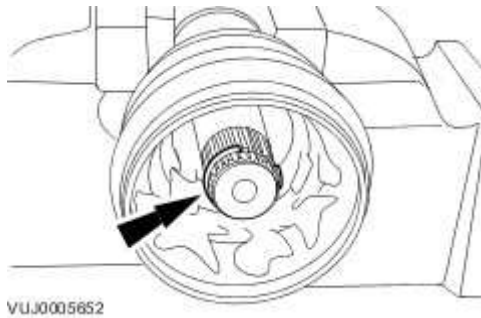
The outer CV joint is retained to the shaft by a spring clip.

Using a suitable brass drift, remove the outer CV joint.



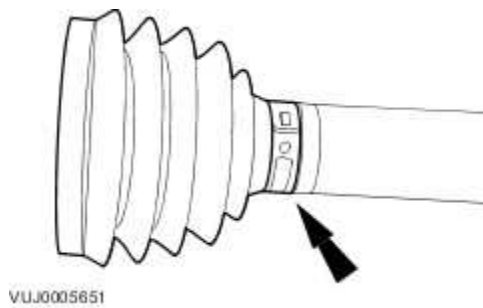
5 . Remove the retaining clip.

▶ Remove and discard the retaining clip.



6 . Remove the outer CV joint boot.

▶ Remove and discard the retaining clip.



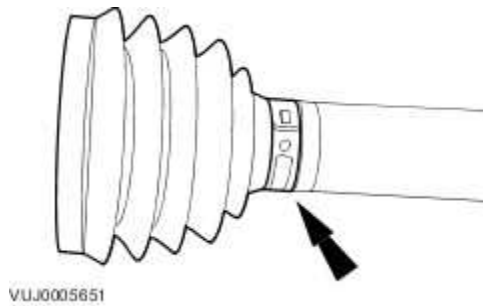
Installation

All vehicles

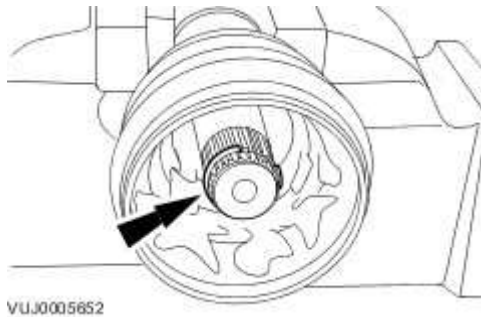
- 1 . Install the outer CV joint boot.

▶ Install the new retaining clip.


▶ Using a suitable tool, install the retaining clip.



- 2 . Install the new retaining clip.



Vehicles without supercharger

- 3 .  **CAUTION:** Make sure the CV joint ball bearings do not drop out of the CV joint.

NOTE:

Use a CV grease meeting Jaguar specification.

Fit the outer CV joint.

▶ Fill the CV joint with 55 grams of grease.

- Fill the CV joint boot with 65 grams of grease.



Vehicles with supercharger

4.  **CAUTION:** Make sure the CV joint ball bearings do not drop out of the CV joint.

NOTE:

Use a CV grease meeting Jaguar specification.

Fit the outer CV joint.

- Fill the CV joint with 100 grams of grease.



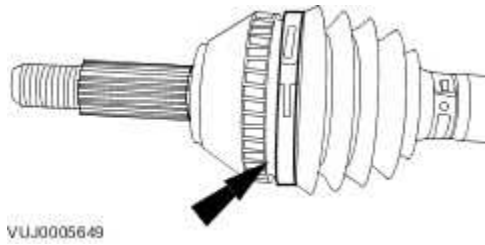
All vehicles

5. **NOTE:**

Make sure enough air is present in the CV boot.

Install the new retaining clip.

► Using a suitable tool, install the retaining clip.



6 . Remove the halfshaft from the clamp.

7 . Install the halfshaft.

For additional information, refer to [Rear Halfshaft \(47.10.13\)](#)

206 : Brake System

206-00 : Brake System – General Information

Specifications

Specifications

Lubricants, Fluids, Sealers and Adhesives



CAUTION: Do not use brake fluid ITT Super Dot 4 on 2006my vehicles onwards. Failure to follow this instruction may result in damage to the vehicle.

NOTE:

Brake fluid ITT Super Dot 4 has now been superseded by Shell ESL Super Dot 4 which is the Jaguar recommended brake fluid. Shell ESL Super Dot 4 can be used on all model years.

Item	Specification
Brake fluid	ITT Super Dot 4
Brake fluid	Shell ESL Super Dot 4

Brake Lining and Disc Specifications

Item	Specification
Front brake disc diameter - Vehicles with 4.2L engine	320 mm (12.8 in)
Front brake disc diameter - Vehicles with Brembo brakes	365 mm (14.6 in)
New front brake disc nominal thickness - Vehicles with 3.0L, 3.5L or 4.2L engine	30 mm (1.2 in)
New front brake disc nominal thickness - Vehicles with Brembo brakes	32 mm (1.28 in)
Worn brake disc discard thickness - Vehicles with 3.0L, 3.5L or 4.2L engine	28 mm (1.14 in)
Worn front brake disc discard thickness - Vehicles with Brembo brakes	30 mm (1.2 in)
Rear brake disc diameter - Vehicles with 3.0L, 3.5L or 4.2L engine	288 mm (11.52 in)

Rear brake disc diameter - Vehicles with Brembo brakes	330 mm (13.2 in)
New rear brake disc nominal thickness - Vehicles with 3.0L, 3.5L or 4.2L engine	20 mm (0.8 in)
New rear brake disc nominal thickness - Vehicles with Brembo brakes	15 mm (0.6 in)
Worn rear brake disc minimum thickness - Vehicles with 3.0L, 3.5L or 4.2L engine	18 mm (0.72 in)
Worn rear brake disc minimum thickness - Vehicles with Brembo brakes	13 mm (0.52 in)
Maximum front and rear brake disc runout (installed) - Vehicles with 3.0L, 3.5L or 4.2L engine	0.076 mm (0.003 in)
Maximum front brake disc runout (installed) - Vehicles with Brembo brakes	0.070 mm (0.002 in)
Maximum rear brake disc runout (installed) - Vehicles with Brembo brakes	0.070 mm (0.002 in)
Maximum new front and rear brake disc thickness variation - Vehicles with 3.0L, 3.5L or 4.2L engine	0.005 mm (0.0002 in) in 360°
Maximum new front brake disc thickness variation - Vehicles with Brembo brakes	0.010 mm (0.0003 in) in 360°
Maximum new rear brake disc thickness variation - Vehicles with Brembo brakes	0.010 mm (0.0003 in) in 360°
Maximum used front and rear brake disc thickness variation - Vehicles with 3.0L, 3.5L or 4.2L engine	0.009 mm (0.0004 in) in 360°
Maximum front and rear hub face runout (installed) - Vehicles with 3.0L, 3.5L or 4.2L engine	0.05 mm (0.002 in)
Maximum front hub face runout (installed) - Vehicles with Brembo brakes	0.05 mm (0.002 in)
Maximum rear hub face runout (installed) - Vehicles with Brembo brakes	0.05 mm (0.002 in)
Front brake caliper piston diameter - twin piston - Vehicles with 3.0L, 3.5L or 4.2L engine	38 mm (1.52 in) and 45 mm (1.8 in)
Rear brake caliper piston diameter - Vehicles with 3.0L, 3.5L or 4.2L engine	43 mm (1.72 in)
Front brake caliper piston diameter - twin piston - Vehicles with Brembo brakes	38 mm (1.52 in) and 44 mm (1.8 in)
Rear brake caliper piston diameter - twin piston - Vehicles with Brembo brakes	28 mm (1.12 in) and 30 mm (1.2 in)

Specifications

Lubricants, Fluids, Sealers and Adhesives



CAUTION: Do not use brake fluid ITT Super Dot 4 on 2006MY vehicles onwards. Failure to follow this instruction may result in damage to the vehicle.

NOTE:

Brake fluid ITT Super Dot 4 has now been superseded by Shell ESL Super Dot 4 which is the Jaguar recommended brake fluid. Shell ESL Super Dot 4 can be used on all model years.

Item	Specification
Brake fluid	Shell ESL

Brake Lining and Disc Specifications

Item	Specification
Front brake disc diameter - Vehicles with standard brakes	326 mm (12.8 in)
Front brake disc diameter - Vehicles with high performance brakes	355 mm (14.0 in)
New front brake disc nominal thickness - Vehicles with standard brakes	30 mm (1.18 in)
New front brake disc nominal thickness - Vehicles with high performance brakes	32 mm (1.28 in)
Worn brake disc discard thickness - Vehicles with standard brakes	28 mm (1.14 in)
Worn front brake disc discard thickness - Vehicles with high performance brakes	30 mm (1.18 in)
Rear brake disc diameter	326 mm (12.8 in)
New rear brake disc nominal thickness	20 mm (0.79 in)
Worn rear brake disc minimum thickness	18 mm (0.72 in)
Maximum front brake disc runout (installed) - Vehicles with standard brakes	0.090 mm (0.004 in)
Maximum front brake disc runout (installed) - Vehicles with high performance brakes	0.090 mm (0.004 in)
Maximum rear brake disc runout (installed)	0.075 mm (0.003 in)
Maximum front hub face runout (installed)	0.015 mm (0.0006 in)
Maximum rear hub face runout (installed)	0.05 mm (0.002 in)
Front brake caliper piston diameter	60 mm (2.36 in)
Rear brake caliper piston diameter	45 mm (1.77 in)

Brake Disc Runout Check

Check

1. Remove the wheel and tire. For additional information, refer to [<<204-04>>](#).

2. **NOTE:**

For vehicles with Brembo brakes, detach the parking brake caliper.

Detach the front or rear brake caliper.

3. Install all wheel nuts and tighten equally to 20 Nm.

- Make sure that the brake disc is fully seated against the hub face.

4. Install a dial test indicator gauge and holding fixture to a suitable mounting point.

5. **NOTE:**

If the runout is outside specification, check the hub face runout.

Using the dial test indicator, measure the inner and outer faces of the brake disc.

1. Position the gauge so that it contacts the disc 10 mm (0.4 in) from the outer edge.
2. Slowly rotate the hub/disc assembly. Note the reading.

6. If a front hub runout check is required, remove the front brake disc. For additional information, refer to [<<206-03>>](#). If a rear hub runout check is required, remove the rear brake disc. For additional information, refer to [<<206-04>>](#).

7. **NOTE:**

The hub surface should be free from dirt and corrosion. Do not use abrasive cloths to clean hub faces.

Using the dial test indicator, measure the hub face runout.

1. Position the gauge so that it contacts the mounting tube between the stud and the chamfer.
2. Slowly rotate the hub and note the runout. For additional information, refer to the specification chart.

- If the front hub runout exceeds the specifications, install a new hub, brake disc and recheck. For additional information, refer to [<<204-01>>](#). If the rear hub runout exceeds the specifications, install a new hub, brake disc and recheck. For additional information, refer to [<<204-02>>](#).

8. If the front hub face is within specification, install a new brake disc. For additional information, refer to [<<206-03>>](#). If the rear hub face is within specification, install a new disc. For additional information, refer to [<<206-04>>](#).

9. Install the wheel and tire. For additional information, refer to [<<204-04>>](#).

Brake System Bleeding - VIN Range: G00442->G45703 (70.25.03)



WARNING: Brake Fluid contains polyglycol ethers and polyglycols. Avoid contact with the eyes. Wash hands thoroughly after handling, as prolonged contact may cause irritation and dermatitis. If brake fluid contacts the eyes, flush the eyes with cold water or eyewash solution and seek medical attention. If taken internally do not induce vomiting, seek immediate medical attention. Failure to follow these instructions may result in personal injury.



CAUTION: Make sure that the vehicle is standing on a level surface or supported on a wheel free lift.



CAUTION: If brake fluid comes into contact with the paintwork, the affected area must be immediately washed down with cold water.

NOTE:

The system consists of separate circuits for each front and diagonally opposite rear wheel. Each front to rear circuit and each wheel circuit can be bled individually of each other.

NOTE:

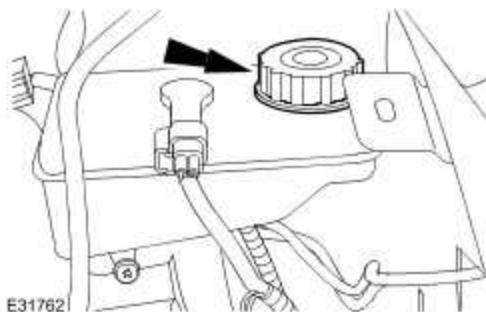
The service ABS hydraulic control unit is supplied pre-filled with brake fluid. Therefore, a conventional bleed procedure should be adequate to remove all the air from the brake system.

1.



CAUTION: Make sure that the brake master cylinder reservoir filler cap does not become contaminated.

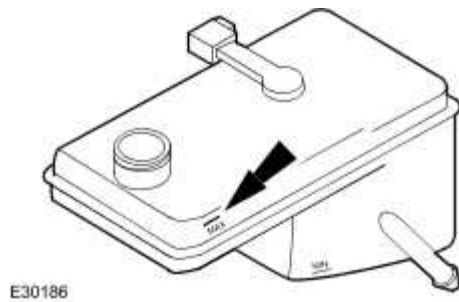
Remove the brake master cylinder reservoir filler cap.



2. NOTE:

Always use fluid from a sealed container and dispose of used fluid safely.

Fill up the brake master cylinder reservoir to the MAX mark as necessary.



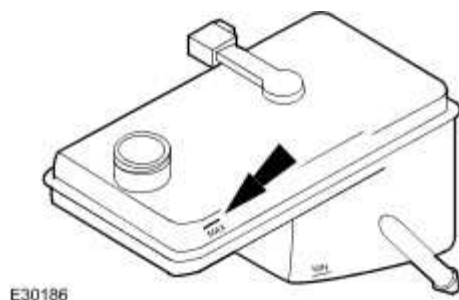
3. Install a bleed tube to the rear right-hand brake caliper bleed nipple.

4. Bleed the circuit.

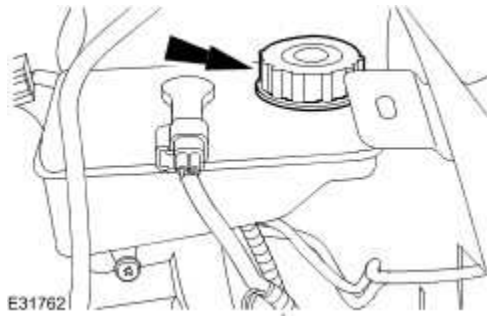
- Make sure the bleed tube is firmly attached to the bleed nipple.
- Submerge the end of the bleed tube in a bleed jar containing a small quantity of approved brake fluid.
- Position the bleed jar base at least 300 mm (12 in) above the bleed nipple to maintain fluid pressure and prevent air leaking past the bleed nipple threads.
- Open the bleed nipple half a turn.
- Slowly apply the brake pedal to its maximum travel (this forces brake fluid into the bleed jar).
- Close the bleed nipple.
- Return the brake pedal to the rest position.
- Wait 2 seconds to allow the brake fluid to replenish the system.
- Fill up the brake master cylinder reservoir to the MAX mark as necessary.
- Continue to bleed the circuit until air-free brake fluid is pumped into the jar.
- Fully tighten the bleed nipple.

5. Repeat the procedure for the rear left, front right and front left-hand brake circuits.

6. Fill up the brake master cylinder reservoir to the MAX mark.



7. Install the brake master cylinder reservoir filler cap.

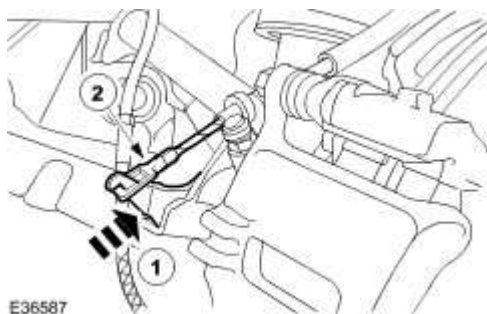


Additional Procedure to Bleed New Calipers with Integral Park Brake Mechanism

NOTE:

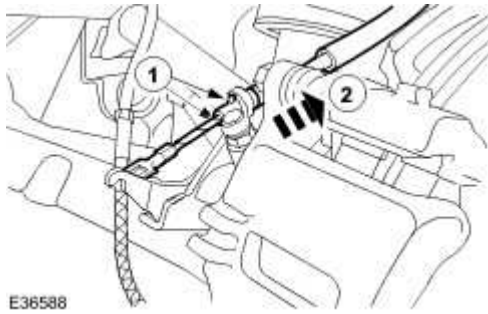
Due to the complexity of the fluid path within the integral park brake calipers, it may be difficult to achieve a satisfactory result using the procedure above when new calipers have been installed.

1. Using the Jaguar approved diagnostic system, put the park brake system into service mode.
2. Remove both rear wheels and tires. [<<204-04>>](#)
3. Bleed the braking system.
4. Disconnect the parking brake cable.
 - Release the tension.
 - Disconnect the park brake cable.

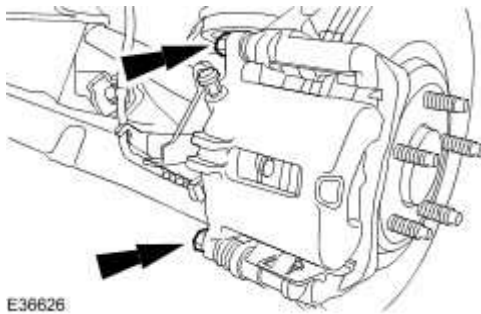


5. Detach the park brake cable.

1. Release the retaining tangs.
2. Detach the park brake cable.



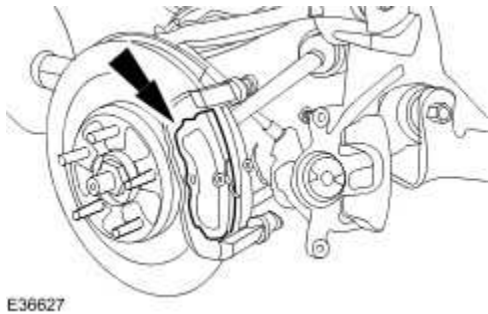
6. Detach the brake caliper from the anchor bracket.



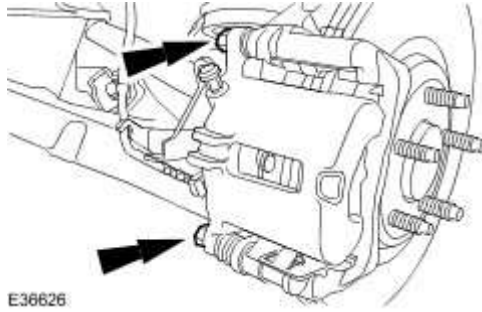
7. **NOTE:**

The inner brake pad must have at least 7mm of friction material. If there is less than 7mm a new pad must be used.

Remove the outer brake pad.

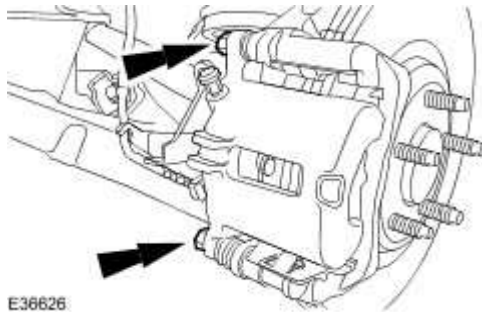


8. Attach the brake caliper with a protective cloth placed between the caliper fingers and the disc.



9. Slowly apply the brake pedal until the piston is extended to the brake disc.

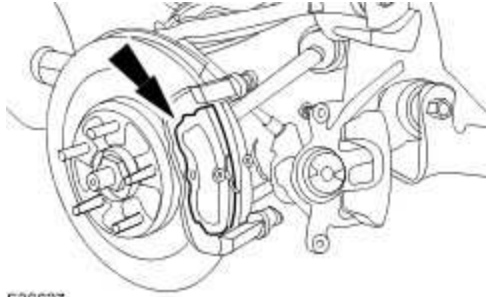
10. Detach the brake caliper from the anchor bracket.



11. Bleed the caliper.

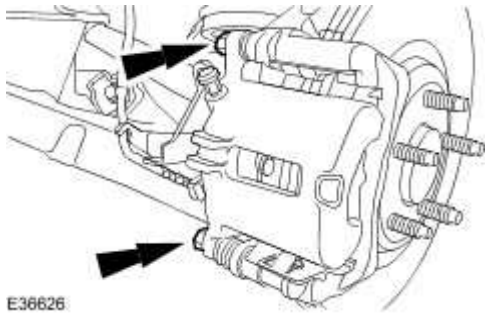
- Make sure the bleed tube is firmly attached to the bleed nipple.
- Submerge the end of the bleed tube in a bleed jar containing a small quantity of approved brake fluid.
- Position the bleed jar base at least 300 mm (12 in) above the bleed nipple to maintain fluid pressure and prevent air leaking past the bleed nipple threads.
- Position the brake caliper with the piston facing down and the bleed nipple at the top.
- Open the bleed nipple half a turn.
- Using the special tool, fully retract the caliper piston.
- Close the bleed nipple.
- Repeat the above procedure twice.
- Fill up the brake master cylinder reservoir to the MAX mark as necessary.
- Continue to bleed the caliper using the above procedure until air-free brake fluid is pumped into the jar.
- Fully tighten the bleed nipple.
- Make sure the piston grooves are aligned to fit the brake pad peg when the caliper is assembled.

12. Install the outer brake pad.



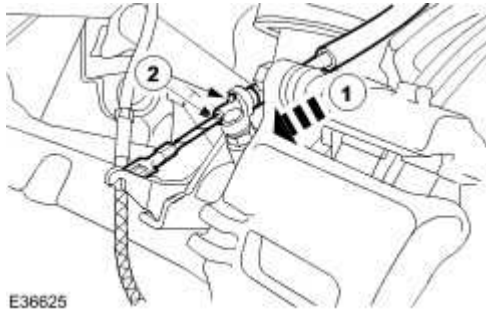
13. Install the brake caliper.

- Install new brake caliper guide pin retaining bolts.
- Tighten to 34 Nm.



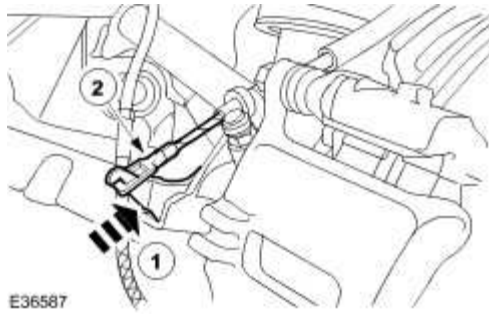
14. Attach the park brake cable.

- Attach the park brake cable.
- Fully seat the retaining tangs.



15. Connect the park brake cable.

- Release the tension.
- Connect the park brake cable.



16. Bleed the braking system.

17. Install the wheels and tires. [<<204-04>>](#)

Brake System Bleeding - VIN Range: G45704->H99999 (70.25.03)



WARNING: Brake fluid contains polyglycol ethers and polyglycols. Avoid contact with the eyes. Wash hands thoroughly after handling, as prolonged contact may cause irritation and dermatitis. If brake fluid contacts the eyes, flush the eyes with cold water or eyewash solution and seek medical attention. If taken internally do not induce vomiting, seek immediate medical attention. Failure to follow these instructions may result in personal injury.



CAUTION: Make sure that the vehicle is standing on a level surface or supported on a wheel free lift.



CAUTION: If brake fluid comes into contact with the paintwork, the affected area must be immediately washed down with cold water.

NOTE:

The system consists of separate circuits for each front and diagonally opposite rear wheel. Each front to rear circuit and each wheel circuit can be bled individually of each other.

NOTE:

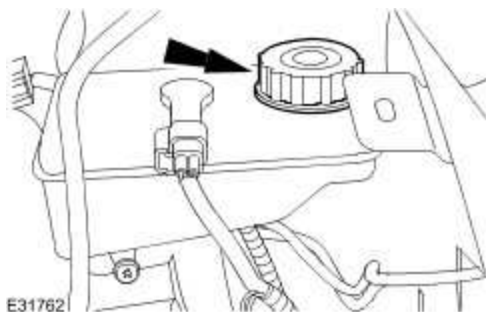
The service anti-lock braking system (ABS) hydraulic control unit is supplied pre-filled with brake fluid. Therefore, a conventional bleed procedure should be adequate to remove all the air from the brake system.

1.



CAUTION: Make sure that the brake master cylinder reservoir filler cap does not become contaminated.

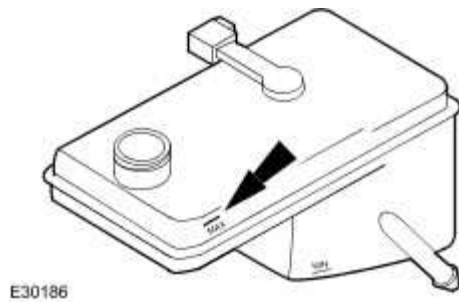
Remove the brake master cylinder reservoir filler cap.



2. NOTE:

Always use fluid from a sealed container and dispose of used fluid safely.

Fill up the brake master cylinder reservoir to the MAX mark as necessary.



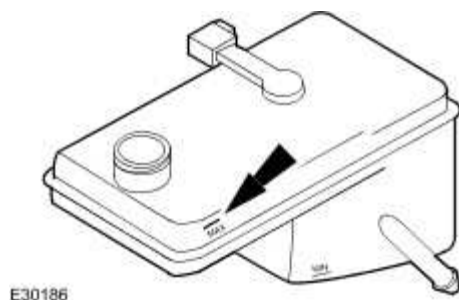
3. Install a bleed tube to the rear right-hand brake caliper bleed nipple.

4. Bleed the circuit.

- Make sure the bleed tube is firmly attached to the bleed nipple.
- Submerge the end of the bleed tube in a bleed jar containing a small quantity of approved brake fluid.
- Position the bleed jar base at least 300 mm (12 in) above the bleed nipple to maintain fluid pressure and prevent air leaking past the bleed nipple threads.
- Open the bleed nipple half a turn.
- Slowly apply the brake pedal to its maximum travel (this forces brake fluid into the bleed jar).
- Close the bleed nipple.
- Return the brake pedal to the rest position.
- Wait 2 seconds to allow the brake fluid to replenish the system.
- Fill up the brake master cylinder reservoir to the MAX mark as necessary.
- Continue to bleed the circuit until air-free brake fluid is pumped into the jar.
- Fully tighten the bleed nipple.

5. Repeat the procedure for the rear left, front right and front left-hand brake circuits.

6. Fill up the brake master cylinder reservoir to the MAX mark.



NOTE:

Due to the complexity of the fluid path within the integral park brake calipers, it may be difficult to achieve a satisfactory result using the procedure above when new calipers have been installed. Therefore carry out the following steps to make sure that the system is properly bled.

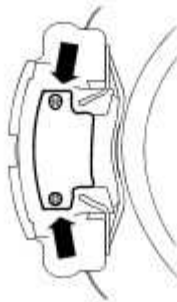
7. Remove both rear wheels and tires.

[Wheel and Tire \(74.20.05\)](#)

8. NOTE:

Left-hand shown, right-hand similar.

Remove the logo badge.

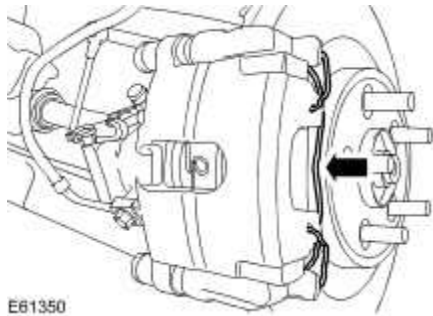


E61746

9. NOTE:

Left-hand shown, right-hand similar.

Remove the anti-rattle spring.

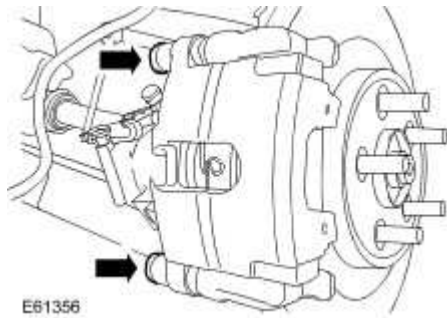


E61350

10. NOTE:

Left-hand shown, right-hand similar.

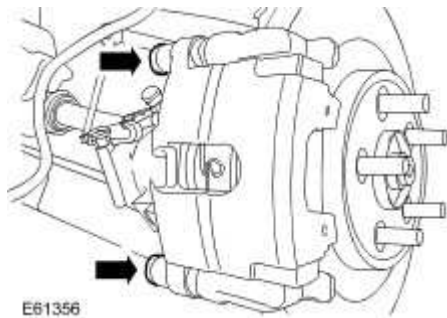
Remove the brake caliper retaining bolt dust covers.



11. NOTE:

Left-hand shown, right-hand similar.

Detach the brake caliper.



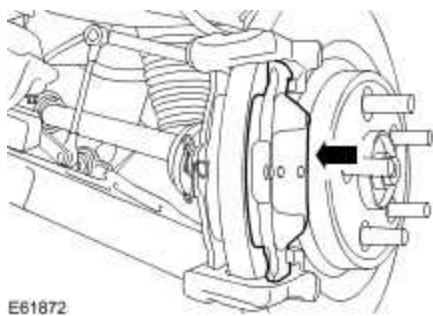
12. NOTE:

The inner brake pad must have at least 7mm of friction material. If there is less than 7mm a new pad must be used.

NOTE:

Left-hand shown, right-hand similar.

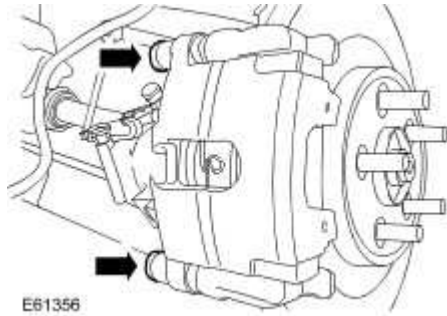
Remove the outer brake pad.



13. NOTE:

Left-hand shown, right-hand similar.

Attach the brake caliper with a protective cloth placed between the caliper fingers and the disc.

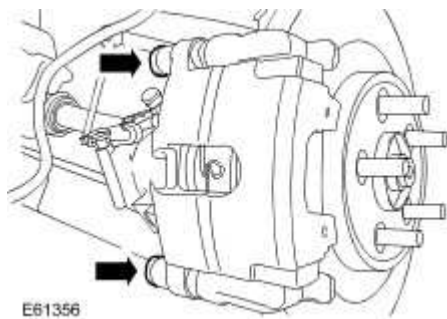


14. Slowly apply the brake pedal until the piston is extended to the brake disc.

15. NOTE:

Left-hand shown, right-hand similar.

Detach the brake caliper.



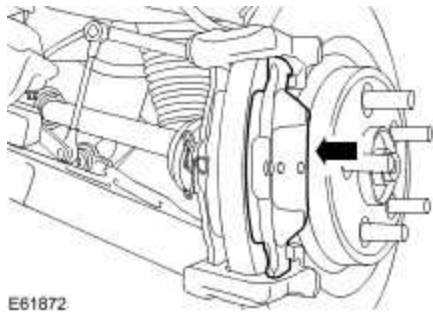
16. Bleed the caliper.

- Make sure the bleed tube is firmly attached to the bleed nipple.
- Submerge the end of the bleed tube in a bleed jar containing a small quantity of approved brake fluid.
- Position the bleed jar base at least 300 mm (12 in) above the bleed nipple to maintain fluid pressure and prevent air leaking past the bleed nipple threads.
- Position the brake caliper with the piston facing down and the bleed nipple at the top.
- Open the bleed nipple half a turn.
- Using a suitable tool, fully retract the caliper piston.
- Close the bleed nipple.
- Repeat the above procedure twice.
- Fill up the brake master cylinder reservoir to the MAX mark as necessary.
- Continue to bleed the caliper using the above procedure until air-free brake fluid is pumped into the jar.
- Fully tighten the bleed nipple.

17. NOTE:

Left-hand shown, right-hand similar.

Install the outer brake pad.

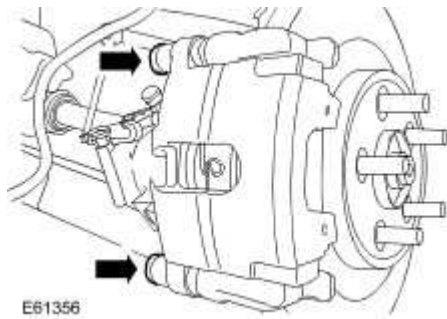


18. NOTE:

Left-hand shown, right-hand similar.

Install the brake caliper.

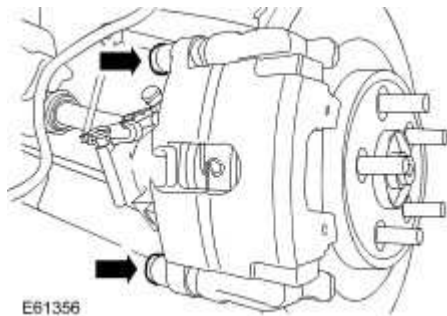
- Tighten to 28 Nm.



19. NOTE:

Left-hand shown, right-hand similar.

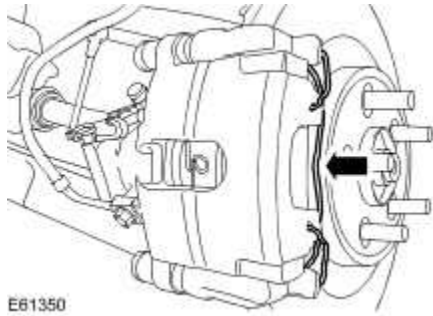
Install the brake caliper retaining bolt dust covers.



20. NOTE:

Left-hand shown, right-hand similar.

Install the anti-rattle spring.

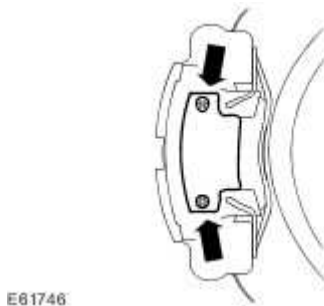


21. **NOTE:**

Left-hand shown, right-hand similar.

Install the logo badge.

- Tighten to 5 Nm.



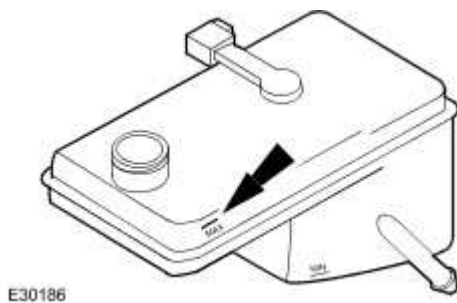
22. Install the wheels and tires.

[Wheel and Tire \(74.20.05\)](#)

23. **NOTE:**

Always use fluid from a sealed container and dispose of used fluid safely.

Fill up the brake master cylinder reservoir to the MAX mark as necessary.

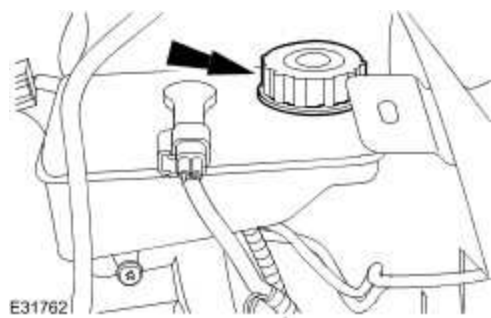


24.



CAUTION: Make sure that the brake master cylinder reservoir filler cap does not become contaminated.

Install the brake master cylinder reservoir filler cap.



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Brake System - VIN Range: G00442- >G45703



WARNING: Brake fluid contains polyglycol ethers and polyglycols. Avoid contact with the eyes. Wash hands thoroughly after handling, as prolonged contact may cause irritation and dermatitis. If brake fluid contacts the eyes, flush the eyes with cold water or eyewash solution and seek medical attention. If taken internally do not induce vomiting, seek immediate medical attention. Failure to follow these instructions may result in personal injury.

The braking system is a diagonally split, dual circuit design featuring front and rear disc brakes.

The hydraulic system provides separate circuits for each pair of diagonally opposed wheels (left front, right rear and right front, left rear).

The standard front brake caliper has two retaining bolts that attach the brake caliper to the anchor plate. These are of double, sliding piston type which makes sure equal effort is applied through both brake pads. The anchor plate is attached to the wheel knuckle with two bolts. The standard rear brake calipers are single pistoned floating caliper type, which also incorporates the park brake mechanism. The standard brake disc is manufactured from cast iron and is of the vented type. It is retained on the hub by two retaining clips and the wheel studs.

The Brembo front and rear brake calipers have two retaining bolts that attach the brake caliper to the wheel knuckle. These are four piston fixed type which makes sure that equal effort is applied through both brake pads. The Brembo rear brakes have separate brake calipers for the parking brake. The Brembo brake disc is manufactured from cast iron and is of the vented type. It is retained on the hub by two retaining clips and the wheel studs. The brake pads in all cases are asbestos free.

Braided steel brake hoses are now fitted to reduce expansion under braking pressure and are of a light weight design.

The brake master cylinder is of a tandem design and is linked to a brake booster to reduce the brake pedal effort. The tandem design will make sure that in the event of one brake circuit failure the other will remain fully operational. The brake booster operating rod is connected directly to the brake pedal.

The parking brake module is located in the luggage compartment behind the right-hand rear luggage compartment trim panel and operates the rear brakes through a motor and cable system.

Brake System - VIN Range: G45704- >G99999



WARNING: Brake fluid contains polyglycol ethers and polyglycols. Avoid contact with the eyes. Wash hands thoroughly after handling, as prolonged contact may cause irritation and dermatitis. If brake fluid contacts the eyes, flush the eyes with cold water or eyewash solution and seek medical attention. If taken internally do not induce vomiting, seek immediate medical attention. Failure to follow these instructions may result in personal injury.

The braking system is a diagonally split, dual circuit design featuring front and rear disc brakes.

The hydraulic system provides separate circuits for each pair of diagonally opposed wheels (left front, right rear and right front, left rear).

The standard front brake caliper has two retaining bolts that attach the brake caliper to the anchor plate. These are of single, sliding piston type. The anchor plate is attached to the wheel knuckle with two bolts. The standard brake disc is manufactured from cast iron and is of the vented type. It is retained on the hub by two retaining clips and the wheel studs.

The high performance front brake caliper has two retaining bolts that attach the brake caliper to the anchor plate. These are of single, sliding piston type. The anchor plate is attached to the wheel knuckle with two bolts. The high performance brake disc is manufactured from cast iron and is of the vented type. It is retained on the hub by two retaining clips and the wheel studs.

The rear brake calipers are single pistoned floating caliper type, which also incorporates the park brake mechanism. In addition, the high performance caliper has a logo badge which has to be removed when changing the brake pads. The brake disc is manufactured from cast iron and is of the vented type. It is retained on the hub by two retaining clips and the wheel studs.

The brake pads in all cases are asbestos free.

Braided steel brake hoses are fitted to reduce expansion under braking pressure and are of a light weight design.

The brake master cylinder is of a tandem design and is linked to a brake booster to reduce the brake pedal effort. The tandem design will make sure that in the event of one brake circuit failure the other will remain fully operational. The brake booster operating rod is connected directly to the brake pedal.

The parking brake module is located in the luggage compartment behind the right-hand rear luggage compartment trim panel and operates the rear brakes through a motor and cable system.

Brake System

Principles of Operations

The brake system operates by transferring effort applied to the brake pedal, by the driver to the brakes at each wheel.

The braking effort is distributed to each wheel, using a hydraulic system. The system is assisted using a vacuum brake booster that reduces pedal effort for a given hydraulic pressure. The parking brake operates on the rear wheels and is applied using a pull/push switch mounted on the floor console. The adjustable pedal system allows adjustment of the throttle, brake and clutch pedals by a switch fitted on the steering column shroud.

Inspection and Verification

NOTE:

Prior to carrying out any diagnosis, make sure that the brake system warning indicator is functional.

Visually examine the front and rear wheel and tire assemblies for damage such as uneven wear patterns, tread worn out or sidewall damage. Verify the tires are the same size, type and, where possible, same manufacture. Replace the damaged wheel or excessively worn tire. For additional information, refer to [<<204-04>>](#).

Wheels and tires must be cleared of any foreign matter and tire pressures adjusted to the correct specification.

If the tires exhibit uneven wear or feathering, the cause must be corrected. Check the steering and suspension components for damage or wear and, if necessary, check and adjust front wheel alignment. For additional information, refer to [<<204-00>>](#).

Road Test

Visual Inspection Chart

Mechanical	Electrical
Brake master cylinder	Parking brake actuator

Brake caliper piston(s)	Parking brake module
Parking brake caliper piston(s)	Parking brake switch
Brake discs	Damaged or corroded wiring harness
Wheel bearings	Brake master cylinder fluid level switch
Brake pads	Adjustable pedal motor
Power brake booster	Adjustable pedal switch
Brake pedal linkage	
Brake booster vacuum hose	
Tires	
Debris	
Adjustable pedal drive cables	

Carry out a road test to compare actual vehicle braking performance with the performance standards expected by the driver. The ability of the test driver to make valid comparisons and detect performance deficiencies will depend on experience.

The driver should have a thorough knowledge of brake system operation and accepted general performance guidelines to make good comparisons and detect performance concerns.

An experienced brake technician will always establish a route that will be used for all brake diagnosis road tests. The roads selected will be reasonably smooth and level. Gravel or bumpy roads are not suitable because the surface does not allow the tires to grip the road equally. Crowned roads should be avoided because of the large amount of weight shifted to the low set of wheels on this type of road. Once the route is established and consistently used, the road surface variable can be eliminated from the test results.

Before a road test, obtain a complete description of the customer concerns or suspected condition. From the description, the technician's experience will allow the technician to match possible causes with symptoms. Certain components will be tagged as possible suspects while others will be eliminated by the evidence. More importantly, the customer description can reveal unsafe conditions which should be checked or corrected before the road test. The description will also help form the basic approach to the road test by narrowing the concern to specific components, vehicle speed or conditions.

Begin the road test with a general brake performance check. Keeping the description of the concern in mind, test the brakes at different vehicle speeds using both light and heavy pedal pressure. To determine if the concern is in the front or rear braking system, use the brake pedal and then use the parking brake control. If the condition (pull, vibration, pulsation) occurs only with the parking brake, the concern is in the rear brake system.

If the concern becomes evident during this check, verify it fits the description given before the road test. If the concern is not evident, attempt to duplicate the condition using the information from the description.

If a concern exists, use the Symptom Chart in order to isolate it to a specific sub-system and condition description. From this description, a list of possible sources can be used to further narrow the cause to a specific component or condition.

Brakes noisy

Possible Source(s):

- Brake pads.
- Brake discs.

Action(s) to take:

- GO to Pinpoint Test A.

Vibration when brakes are applied

Possible Source(s):

- Wheels require balancing.
- Wheel hub nuts.
- Brake caliper mounting bolts.
- Brake pads.
- Foreign material/scratches/corrosion on brake disc contact surfaces.
- Excessive brake disc thickness variation.
- Excessive brake disc runout.
- Wheel bearing wear or failure.

- Suspension bush wear or failure.
- Steering bush wear or failure.

Action(s) to take:

- Go to Pinpoint Test B.

The brakes pull or drift

Possible Source(s):

- Tire pressures/wear.
- Brake calipers.
- Brake pads.
- Brake discs.
- Wheel alignment adjustment.
- Wheel bearing.
- Suspension bushes and ball joints.

Action(s) to take:

- GO to Pinpoint Test C.

The pedal feels spongy

Possible Source(s):

- Air in brake system.
- Leak in hydraulic system.
- Brake booster/master cylinder.
- Brake pads.

Action(s) to take:

- GO to Pinpoint Test D.

The pedal goes down fast

Possible Source(s):

- Air in brake system.
- Leak in hydraulic system.
- Brake booster/master cylinder.
- Brake pads.

Action(s) to take:

- GO to Pinpoint Test E.

The pedal goes down slowly

Possible Source(s):

- Air in brake system.
- Brake booster/master cylinder.

Action(s) to take:

- Go to Pinpoint Test F.

Excessive brake pedal effort

Possible Source(s):

- Brake pads.
- Brake booster.

Action(s) to take:

- GO to Pinpoint Test G.

Brake lockup during light brake pedal force

Possible Source(s):

- Brake pads.

- Brake calipers.

Action(s) to take:

- GO to Pinpoint Test H.

Brakes drag

Possible Source(s):

- Parking brake control applied/malfunction.
- Seized parking brake cables.
- Seized caliper slide pins.
- Seized brake caliper.
- Brake booster.
- Pedal gear.

Action(s) to take:

- GO to Pinpoint Test I.

Excessive/Erratic brake pedal travel

Possible Source(s):

- Hydraulic system.
- Brake pads.
- Brake discs.
- Hub and bearing assembly.

Action(s) to take:

- GO to Pinpoint Test J.

The red brake warning indicator is always on

Possible Source(s):

- Fluid level.

Action(s) to take:

- FILL the system to specification. CHECK for leaks.

Possible Source(s):

- Brake fluid level sensor.

Action(s) to take:

- INSTALL a new brake master cylinder fluid reservoir. For additional information, refer to [<<206-06>>](#).

Possible Source(s):

- Parking brake control.

Action(s) to take:

- For additional information, [<<206-05>>](#)

Possible Source(s):

- Electrical circuit.

Action(s) to take:

- For additional information, [<<206-05>>](#)

Slow or incomplete brake pedal return

Possible Source(s):

- Brake pedal binding.
- Brake booster/master cylinder.

Action(s) to take:

- GO to Pinpoint Test K.

PINPOINT TEST G189234p1 : BRAKES NOISY

G189234t1 : INSPECT BRAKE PADS

1. Inspect the condition of the front and rear brake pads. Check for damage to any anti-squeal shims.

- **Are the brake pads OK?**

-> **Yes**

GO to Pinpoint Test [G189234t2](#).

-> **No**

CLEAN the front brake pads or INSTALL new front brake pads if necessary. For additional information, refer to [<<206-03>>](#). CLEAN the rear brake pads or INSTALL new rear brake pads if necessary. For additional information, refer to [<<206-04>>](#). Test vehicle for presence of brake squeal.

G189234t2 : INSPECT BRAKE DISCS

1. Inspect the brake discs for excessive corrosion, wear or disc thickness variation.

- **Does excessive corrosion, wear or disc thickness variation exist?**

-> **Yes**

INSTALL new front brake discs and brake pads. For additional information, refer to [<<206-03>>](#).

INSTALL new rear brake discs and brake pads. For additional information, refer to [<<206-04>>](#). TEST the system for normal operation.

-> **No**

Vehicle is OK.

PINPOINT TEST G189234p2 : VIBRATION WHEN BRAKES ARE APPLIED

G189234t3 : ROAD TEST VEHICLE

1. Road test the vehicle between 40-80 km/h (25-50 mph) without applying brakes.

- **Is the vibration present?**

-> **Yes**

TEST for noise vibration and harshness. For additional information, refer to [<<100-04>>](#). REPEAT road test if necessary.

-> **No**

GO to Pinpoint Test [G189234t4](#).

G189234t4 : CHECK FOR BRAKE VIBRATION

1. Road test the vehicle between 40-80 km/h (25-50 mph) with light and medium application on the brake pedal.

- **Is a vibration present?**

-> **Yes**

CHECK the brake caliper mounting bolts and wheel hub nuts and TIGHTEN as necessary. CHECK the balance of all road wheels and REPAIR as necessary. CHECK the brake discs for excessive wear, runout, thickness variation or cracks.

INSTALL new brake discs and brake pads as necessary. GO to Pinpoint Test [G189234t5](#).

-> **No**

Vehicle is OK.

G189234t5 : IS VIBRATION STILL PRESENT UNDER BRAKE APPLICATION?

1. Road test the vehicle between 40-80 km/h (25-50 mph) with light and medium application on the brake pedal.

- **Is a vibration present?**

-> **Yes**

CHECK for wear or failure of steering bushes. For additional information, refer to [<<211-02>>](#). CHECK for wear or failure of steering ball joints. For additional information, refer to [<<211-03>>](#). CHECK for wear or failure of front wheel bearings, suspension bushes and ball joints. For additional information, refer to [<<204-01>>](#). CHECK for wear or failure of rear wheel bearings, suspension bushes and ball joints. For additional information, refer to [<<204-02>>](#).

-> **No**

Vehicle is OK.

PINPOINT TEST G189234p3 : THE BRAKES PULL OR DRIFT

G189234t6 : ROAD TEST VEHICLE

1. Road test the vehicle and apply the brake pedal.

- **Does the vehicle pull or drift?**

-> **Yes**

GO to Pinpoint Test [G189234t7](#).

-> **No**

Vehicle is OK.

G189234t7 : INSPECT TIRE PRESSURE

1. Check for excessive tire wear or incorrect pressures.

- **Are the tires at the correct pressure and in good condition?**

-> **Yes**

GO to Pinpoint Test [G189234t8](#).

-> **No**

ADJUST the tire pressures or INSTALL new tires if excessively worn. TEST the system for normal operation.

G189234t8 : CHECK CALIPERS

1. Check the front brake caliper pistons for binding, leaking or sticking. For additional information, refer to [<<206-03>>](#). Check the rear brake caliper pistons for binding, leaking or sticking. For additional information, refer to [<<206-04>>](#).

- **Do the disc brake caliper pistons and pins bind, leak or stick?**

-> **Yes**

INSTALL new brake calipers as necessary. TEST the system for normal operation.

-> **No**

GO to Pinpoint Test [G189234t9](#).

G189234t9 : INSPECT BRAKE DISCS

1. Check the brake discs for excessive damage, thickness variation or runout. For additional information, refer to General Procedures.

- **Does excessive damage or runout exist?**

-> **Yes**

INSTALL new brake discs and brake pads as necessary. TEST the system for normal operation.

-> **No**

GO to Pinpoint Test [G189234t10](#).

G189234t10 : INSPECT THE FRONT HUB AND WHEEL BEARING ASSEMBLY

1. Check the front hub and wheel bearing assembly. For additional information, refer to [<<204-00>>](#).

- **Are the wheel bearings OK?**

-> **Yes**

GO to Pinpoint Test [G189234t11](#).

-> **No**

INSTALL new wheel bearings. For additional information, refer to [<<204-01>>](#). TEST the system for normal operation.

G189234t11 : CHECK SUSPENSION BUSHES AND BALL JOINTS.

1. Check all suspension bushes and ball joints.

- **Are the suspension bushes and ball joints OK?**

-> **Yes**

GO to Pinpoint Test [G189234t12](#).

-> **No**

INSTALL new front suspension bushes and ball joints as required. For additional information, refer to [<<204-01>>](#). INSTALL new rear suspension bushes and ball joints as required. For additional information, refer to [<<204-02>>](#).

G189234t12 : CHECK VEHICLE ALIGNMENT

1. Check the vehicle alignment. For additional information, refer to [<<502-00>>](#).

- **Is the alignment within specification?**

-> **Yes**

Vehicle is OK.

-> **No**

Adjust the alignment as necessary. For additional information, refer to [<<502-00>>](#).

PINPOINT TEST G189234p4 : THE PEDAL FEELS SPONGY

G189234t13 : CHECK FOR SPONGY PEDAL (ENGINE OFF)

1. Check for a firm brake pedal.

- **Is the brake pedal effort and brake pedal travel normal?**

-> **Yes**

Vehicle is OK.

-> **No**

GO to Pinpoint Test [G189234t14](#).

G189234t14 : CHECK BRAKE PEDAL RESERVE (ENGINE OFF)

1. Pump the brake pedal 10 times and hold on the final application.

- **Does the brake pedal feel firm on final application?**

-> **Yes**

GO to Pinpoint Test [G189234t15](#).

-> **No**

BLEED the brake system. For additional information, refer to General Procedures. TEST the system for normal operation.

G189234t15 : CHECK BRAKE PEDAL RESERVE (ENGINE ON)

1. Engine is idle. 2. Apply the brake pedal lightly three or four times. 3. Wait 15 seconds for the vacuum to recover. 4. Push down on the brake pedal until it stops moving downward or an increased resistance to the brake pedal travel occurs. 5. Hold the brake pedal in the applied position while increasing the engine speed to 2000 revs/min. 6. Release the accelerator pedal.

- **Does the brake pedal move downward as the engine speed returns to idle?**

-> **Yes**

GO to Pinpoint Test [G189234t16](#).

-> **No**

CHECK the vacuum to brake booster. For additional information, refer to [<<206-07>>](#).

G189234t16 : CHECK BRAKE FLUID LEVEL

1. Check the brake master cylinder reservoir fluid level.

- **Is the fluid level OK?**

-> **Yes**

BLEED the brake system. For additional information, refer to General Procedures. TEST the system for normal operation.

-> **No**

CHECK brake master cylinder reservoir sealing points. For additional information, refer to Brake

Master Cylinder in this section. ADD fluid and BLEED the brake system. For additional information, refer to General Procedures. TEST the system for normal operation. REPEAT road test if necessary.

PINPOINT TEST G189234p5 : THE PEDAL GOES DOWN FAST

G189234t17 : ROAD TEST VEHICLE

1. Road test and apply the brake pedal.

- Is the brake pedal effort and brake pedal travel normal?

-> Yes

Vehicle is OK.

-> No

GO to Pinpoint Test [G189234t18](#).

G189234t18 : CHECK BRAKE FLUID LEVEL

1. Check the brake master cylinder reservoir fluid level.

- Is the fluid level within specification?

-> Yes

GO to Pinpoint Test [G189234t19](#).

-> No

CHECK the brake master cylinder reservoir sealing points. For additional information, refer to Brake Master Cylinder Component Test in this section. ADD fluid and BLEED brake system. For additional information, refer to General Procedures. TEST the system for normal operation. REPEAT road test if necessary.

G189234t19 : CHECK BRAKE PEDAL TRAVEL-PRESSURIZE SYSTEM

1. Pump the brake pedal rapidly (five times).

- Does the brake pedal travel build up and then hold?

-> Yes

BLEED the brake system. Refer to the General Procedures. TEST the system for normal operation. REPEAT road test. For additional information, refer to [<<206-06>>](#)

-> No

GO to Pinpoint Test [G189234t20](#).

G189234t20 : CHECK FOR BRAKE SYSTEM LEAKS

1. Check for external brake system leaks. For additional information, refer to Brake master cylinder in this section.

- **Are leaks found?**

-> **Yes**

REPAIR as necessary, ADD fluid and BLEED brake system. For additional information, refer to General Procedures. TEST the system for normal operation. REPEAT road test.

-> **No**

System is OK.

PINPOINT TEST G189234p6 : THE PEDAL GOES DOWN SLOWLY

G189234t21 : ROAD TEST VEHICLE - CHECK BRAKE PEDAL OPERATION

1. Check if the condition occurs during actual stopping application by applying the brake pedal while the vehicle is moving.

- **Does the condition occur when the vehicle is moving?**

-> **Yes**

GO to Pinpoint Test [G189234t22](#).

-> **No**

GO to Pinpoint Test [G189234t23](#).

G189234t22 : CHECK FOR BRAKE SYSTEM LEAKS

1. Check for external brake system leaks. For additional information, refer to Brake master cylinder in this section.

- **Are there any external brake system leaks?**

-> **Yes**

REPAIR as necessary. ADD fluid and BLEED the brake system. For additional information, refer to General Procedures. TEST the system for normal operation.

-> **No**

GO to Pinpoint Test [G189234t23](#).

G189234t23 : CARRY OUT A BRAKE MASTER CYLINDER BYPASS TEST

1. Test for brake master cylinder bypass condition. Refer to Brake master cylinder component test in this section.

- **Are any concerns found?**

-> **Yes**

INSTALL a new brake master cylinder, ADD fluid and BLEED the brake system. For additional information, refer to General Procedures. TEST the system for normal operation.

-> **No**

System is OK.

PINPOINT TEST G189234p7 : EXCESSIVE BRAKE PEDAL EFFORT

G189234t24 : CHECK BRAKE PADS

1. Check the brake pads for wear, contamination, correct installation, damage and type.

- **Are any concerns found?**

-> **Yes**

INSTALL the front brake pads correctly or INSTALL new front brake pads if necessary. For additional information, refer to [<<206-03>>](#). INSTALL the rear brake pads correctly or INSTALL new rear brake pads if necessary. For additional information, refer to [<<206-04>>](#). REPEAT road test.

-> **No**

GO to Pinpoint Test [G189234t25](#).

G189234t25 : CHECK VACUUM

1. Disconnect the vacuum booster hose from the brake booster. 2. Connect a vacuum/pressure tester to the vacuum hose. 3. Run the engine at normal operating temperature. 4. Record the vacuum reading.

- **Is the reading 40.5kPa (12 in-Hg) or greater?**

-> **Yes**

GO to Pinpoint Test [G189234t26](#).

-> **No**

LOCATE and REPAIR the source of low vacuum. TEST the system for normal operation.

G189234t26 : INSPECT SYSTEM

1. Switch the engine off. 2. Reconnect the vacuum hose. 3. Inspect the brake booster, rubber grommet, and all vacuum plumbing for cracks, holes, damaged connections, or missing clamps. 4. Pump the brake pedal several times to exhaust the vacuum. Push down on the brake pedal and hold.

- **Does the brake pedal move down when the engine is started?**

-> **Yes**

Vacuum system is OK.

-> **No**

GO to Pinpoint Test [G189234t27](#).

G189234t27 : CHECK POWER BRAKE BOOSTER VALVE

1. Check the brake booster valve. For additional information, refer to Brake Booster in this section.

- **Is the power brake booster valve OK?**

-> **Yes**

CHECK the brake booster. For additional information, refer to Brake Booster in this section. INSTALL a new brake booster if necessary. TEST the system for normal operation.

-> **No**

INSTALL a new brake booster valve. TEST the system for normal operation.

PINPOINT TEST G189234p8 : BRAKE LOCKUP DURING LIGHT BRAKE PEDAL FORCE

G189234t28 : TEST BRAKE LOCKUP

1. Road test the vehicle and apply the brake pedal lightly.

- **Do the brakes lockup?**

-> **Yes**

GO to Pinpoint Test [G189234t29](#).

-> **No**

Vehicle is OK.

G189234t29 : INSPECT BRAKE PADS

1. Inspect brake pads for contamination, correct installation, damage and type.

- **Are any concerns found?**

-> **Yes**

CHECK the front brake pads. For additional information, refer to [<<206-03>>](#). CHECK the rear brake pads. For additional information, refer to [<<206-04>>](#). INSTALL new brake pads as necessary. REPEAT road test.

-> **No**

GO to Pinpoint Test [G189234t30](#).

G189234t30 : INSPECT BRAKE CALIPERS

1. Inspect brake calipers for binding, leaking or sticking.

- **Are any concerns found?**

-> **Yes**

CHECK the front brake calipers. For additional information, refer to [<<206-03>>](#). CHECK the rear brake calipers. For additional information, refer to [<<206-04>>](#). INSTALL the brake calipers correctly or INSTALL new brake calipers as necessary. TEST the system for normal operation. REPEAT road test if necessary.

-> **No**

Vehicle is OK.

PINPOINT TEST G189234p9 : BRAKES DRAG

G189234t31 : ROAD TEST VEHICLE

1. Road test the vehicle and apply the brakes.

- **Are the brakes functioning correctly?**

-> **Yes**

Vehicle is OK.

-> **No**

GO to Pinpoint Test [G189234t32](#).

G189234t32 : CHECK BRAKE CALIPERS

1. Check the front caliper pistons for binding, leaking or sticking. For additional information, refer to [<<206-03>>](#). Check the rear caliper pistons for binding, leaking or sticking. For additional information, refer to [<<206-04>>](#).

- **Do the disc brake caliper pistons and pins bind, leak or stick?**

-> **Yes**

INSPECT the brake calipers and parking brake cables. INSTALL new components as necessary. Road test vehicle.

-> **No**

GO to Pinpoint Test [G189234t33](#).

G189234t33 : CHECK BRAKE BOOSTER

1. Check the brake booster connecting rod alignment and travel. For additional information, refer to [<<206-07>>](#).

- **Is the connecting rod OK?**

-> **Yes**

Vehicle is OK.

-> **No**

INSTALL a new brake booster. For additional information, refer to [<<206-07>>](#). TEST the system for normal operation.

PINPOINT TEST G189234p10 : EXCESSIVE/ERRATIC BRAKE PEDAL TRAVEL

G189234t34 : TEST ON ROUGH ROAD

1. Road test the vehicle on rough road conditions. 2. Apply the brakes slowly.

- **Is the brake pedal effort and brake pedal travel normal?**

-> **Yes**

Vehicle is OK.

-> **No**

GO to Pinpoint Test [G189234t35](#).

G189234t35 : CHECK BRAKE FLUID LEVEL

1. Check the brake master cylinder reservoir fluid level.

- **Is the fluid level OK?**

-> **Yes**

GO to Pinpoint Test [G189234t36](#).

-> **No**

CHECK brake master cylinder reservoir sealing points. For additional information, refer to Brake master cylinder in this section. ADD brake fluid and BLEED the brake system. For additional information, refer to General Procedures. TEST the system for normal operation. REPEAT road test if necessary.

G189234t36 : CHECK BRAKE PEDAL RESERVE

1. Engine is idle. 2. Apply the brake pedal lightly three or four times. 3. Wait 15 seconds for the vacuum to replenish. 4. Push down on the brake pedal until it stops moving downward or an increased resistance to the brake pedal travel occurs. 5. Hold the brake pedal in the applied position while increasing the engine speed to 2000 revs/min. 6. Release the accelerator pedal.

- **Does the brake pedal move downward as the engine speed returns to idle?**

-> **Yes**

GO to Pinpoint Test [G189234t37](#).

-> **No**

CHECK the vacuum to the brake booster. For additional information, refer to [<<206-07>>](#).

G189234t37 : CHECK THE FRONT HUB AND BEARING ASSEMBLY

1. Check the front hub and bearing assembly. For additional information, refer to [<<204-00>>](#)

- **Are the front wheel bearings loose?**

-> **Yes**

INSTALL a new front wheel bearing if damaged. For additional information, refer to [<<204-00>>](#) TEST the system for normal operation.

-> **No**

CHECK the front brake discs for thickness variances. For additional information, refer to General Procedures.

PINPOINT TEST G189234p11 : SLOW OR INCOMPLETE BRAKE PEDAL RETURN

G189234t38 : CHECK FOR BRAKE PEDAL RETURN

1. Run the engine at fast idle while making several brake applications. 2. Pull the brake pedal rearward with approximately 44.5 N (10lb) force. 3. Release the brake pedal and measure the distance to the toe board. 4. Make a hard brake application. 5. Release the brake pedal and measure the brake pedal to toe board distance. The brake pedal should return to its original position.

- **Does the brake pedal return to its original position?**

-> **Yes**

Vehicle is OK.

-> **No**

GO to Pinpoint Test [G189234t39](#).

G189234t39 : CHECK FOR BRAKE PEDAL BINDING

1. Check the brake pedal to make sure it is operating freely.

- **Is the brake pedal operating freely?**

-> **Yes**

INSTALL a new brake booster. For additional information, refer to [<<206-07>>](#). TEST the system for normal operation.

-> **No**

REPAIR or INSTALL new brake pedal. TEST the system for normal operation.

Component Tests

Brake Booster

1 . Check all hoses and connections. All unused vacuum connectors should be capped. Hoses and their connections should be correctly secured and in good condition with no holes and no collapsed areas. Inspect the valve on the brake booster for damage.

2 . Check the hydraulic brake system for leaks or low fluid.

3 . With the transmission in PARK (automatic transmissions) or in NEUTRAL (manual transmissions), stop the engine and apply the parking brake. Pump the brake pedal several times to exhaust all vacuum in the system.

4 . With the engine switched off and all vacuum in the system exhausted, apply the brake pedal and hold it down. Start the engine. If the vacuum system is operating, the brake pedal will tend to move downward under constant foot pressure. If no motion is felt, the vacuum booster system is not functioning.

5 . Remove the vacuum hose from the brake booster. Manifold vacuum should be available at the

brake booster end of the hose with the engine at idle speed and the transmission in PARK or NEUTRAL. Make sure that all unused vacuum outlets are correctly capped, hose connectors are correctly secured and vacuum hoses are in good condition. When it is established that manifold vacuum is available to the brake booster, connect the vacuum hose to the brake booster and repeat Step 3. If no downward movement of the brake pedal is felt, install a new brake booster.

6 . Operate the engine for a minimum of 10 seconds at a fast idle. Stop the engine and allow the vehicle to stand for 10 minutes. Then, apply the brake pedal with approximately 89 N (20lb) of force. The pedal feel (brake application) should be the same as that noted with the engine running. If the brake pedal feels hard (no power assist), install a new valve and then repeat the test. If the brake pedal still feels hard, install a new brake booster. If the brake pedal movement feels spongy, bleed the brake system.

Brake Master Cylinder

Usually, the first and strongest indicator of anything wrong in the brake system is a feeling through the brake pedal. In diagnosing the condition of the brake master cylinder, check pedal feel as evidence of a brake concern. Check for brake warning lamp illumination and the brake fluid level in the brake master cylinder reservoir.

Normal Conditions

The following conditions are considered normal and are not indications that the brake master cylinder is in need of repair.

- New brake systems are designed to produce a pedal effort that is not as hard as in the past. Complaints of light pedal efforts should be compared to the pedal efforts of another vehicle of the same model and year.
- The fluid level will fall with brake pad wear.

Abnormal Conditions

NOTE:

Prior to carrying out any diagnosis, make sure the brake system warning indicator is functional.

Changes in the brake pedal feel or brake pedal travel are indicators that something could be wrong in the brake system. The diagnostic procedure and techniques use brake pedal feel, warning indicator illumination and low brake fluid level as indicators to diagnosing brake system concerns. The following conditions are considered abnormal and indicate that the brake master cylinder is in need of repair:

- Brake pedal goes down fast. This could be caused by an external or internal leak.
- Brake pedal goes down slowly. This could be caused by an internal or external leak.

- Brake pedal is low or feels spongy. This condition may be caused by no fluid in the brake master cylinder, reservoir cap vent holes clogged or air in the hydraulic system.
- Brake pedal effort is excessive. This may be caused by a bind or obstruction in the pedal/linkage, a faulty non return valve, booster or insufficient booster vacuum.
- Rear brakes lock up during light pedal force. This may be caused by damaged brake pads, a partially applied parking brake, a damaged ABS sensor or bearing failure.
- Brake pedal effort erratic. This condition could be caused by the brake booster or incorrectly installed brake pads.
- Brake warning indicator is on. This may be caused by low fluid level or float assembly damaged.

Non Pressure Leaks

Any reduced fluid volume in the brake master cylinder reservoir condition may be caused by two types of none pressure external leaks.

Type 1: An external leak may be occur at the brake master cylinder reservoir cap because of incorrect positioning of gasket and cap. Reposition cap and gasket.

Type 2: An external leak may occur at the brake master reservoir mounting seals. Repair such a leak by installing new seals and make sure that the brake master reservoir retaining bolt is correctly installed.

Type 3: An external leak may occur in the manual transmission clutch operating system. For additional information, refer to [<<308-00>>](#).

206-03 : Front Disc Brake

Specifications

Specifications

Lubricants, Fluids, sealers and Adhesives



CAUTION: Do not use brake fluid ITT Super Dot 4 on 2006my vehicles onwards. Failure to follow this instruction may result in damage to the vehicle.

NOTE:

Brake fluid ITT Super Dot 4 has now been superseded by Shell ESL Super Dot 4 which is the Jaguar recommended brake fluid. Shell ESL Super Dot 4 can be used on all model years.

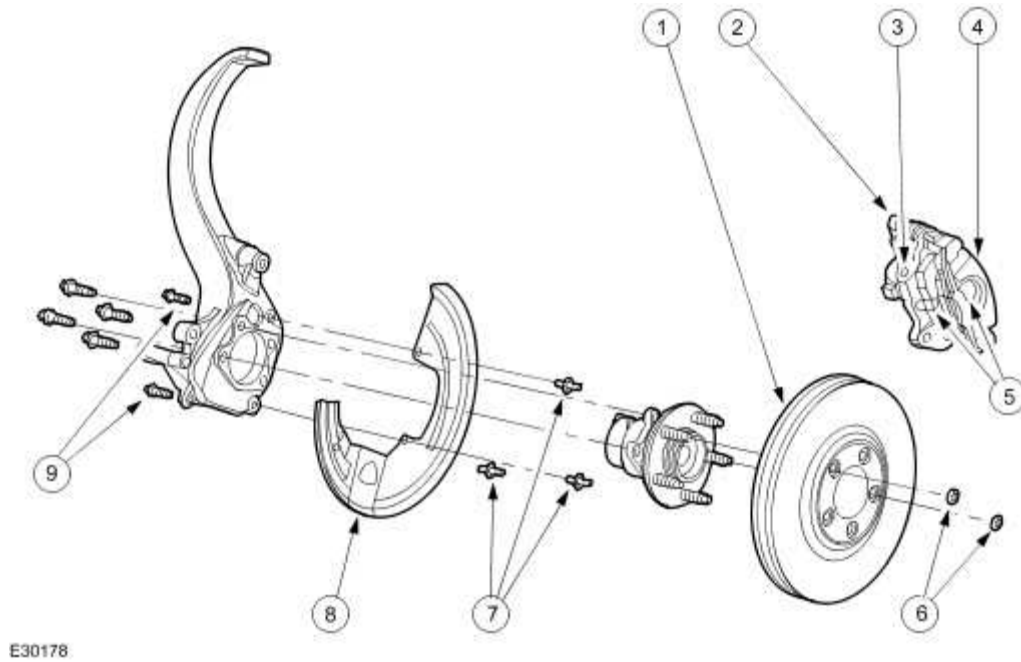
Item	Specification
Brake fluid	ITT Super Dot 4
Brake fluid	Shell ESL Super Dot 4
Brake caliper slide pin grease	Klueber GLK1

Torque Specifications

Description	Nm	lb-ft	lb-in
Brake caliper anchor plate - Vehicles with 3.0L, 3.5L or 4.2L engine	103	76	-
Brake caliper retaining bolts - Vehicles with Brembo brakes	212	156	-
Brake caliper retaining bolts - Vehicles with 3.0L, 3.5L or 4.2L engine	34	25	-
Brake hose retaining bolt	35	26	-

Front Disc Brake - VIN Range: G00442- >G45703

Vehicles without Brembo brakes



E30178

Item	Part Number	Description
1	—	Brake disc
2	—	Brake caliper guide pin retaining bolt
3	—	Brake caliper anchor plate
4	—	Brake caliper
5	—	Brake pads
6	—	Brake disc retaining clips
7	—	Brake disc shield retaining rivets
8	—	Brake disc shield

9	—	Brake caliper anchor plate retaining bolts
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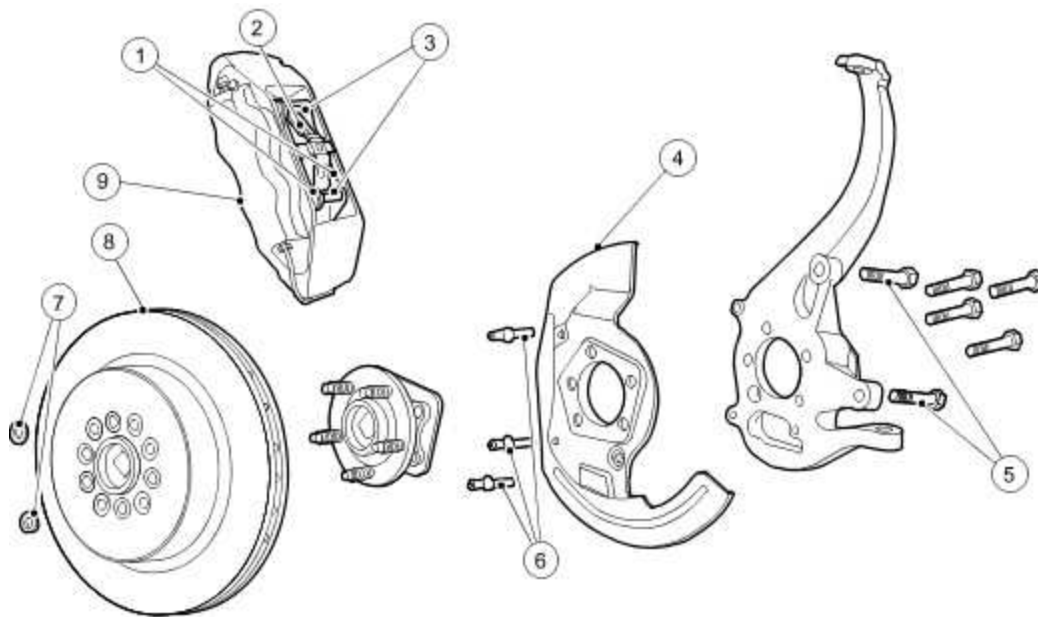
For vehicles without Brembo brakes, the brake system consists of the following components:

- Brake pads
- Double piston, floating calipers
- Brake discs
- Brake caliper anchor plates
- Steel braided brake hoses

The brake caliper has two retaining bolts that attach the brake caliper to the anchor plate. These are of double, sliding piston type which makes sure equal effort is applied through both brake pads. The anchor plate is attached to the wheel knuckle with two bolts. The hydraulic system provides separate circuits for each pair of diagonally opposed wheels (i.e. left front, right rear and right front, left rear).

The brake disc is manufactured from cast iron and is of the vented type. It is retained on the hub by two retaining clips and the wheel studs.

Vehicles with Brembo brakes



E30067

Item	Part Number	Description
1	—	Brake pads
2	—	Brake pad anti-rattle spring
3	—	Brake pad retaining pins

4	—	Brake disc shield
5	—	Brake caliper retaining bolts
6	—	Brake disc shield retaining rivets
7	—	Brake disc retaining clips
8	—	Brake disc
9	—	Brake caliper

For vehicles with Brembo brakes, the brake system consists of the following components:

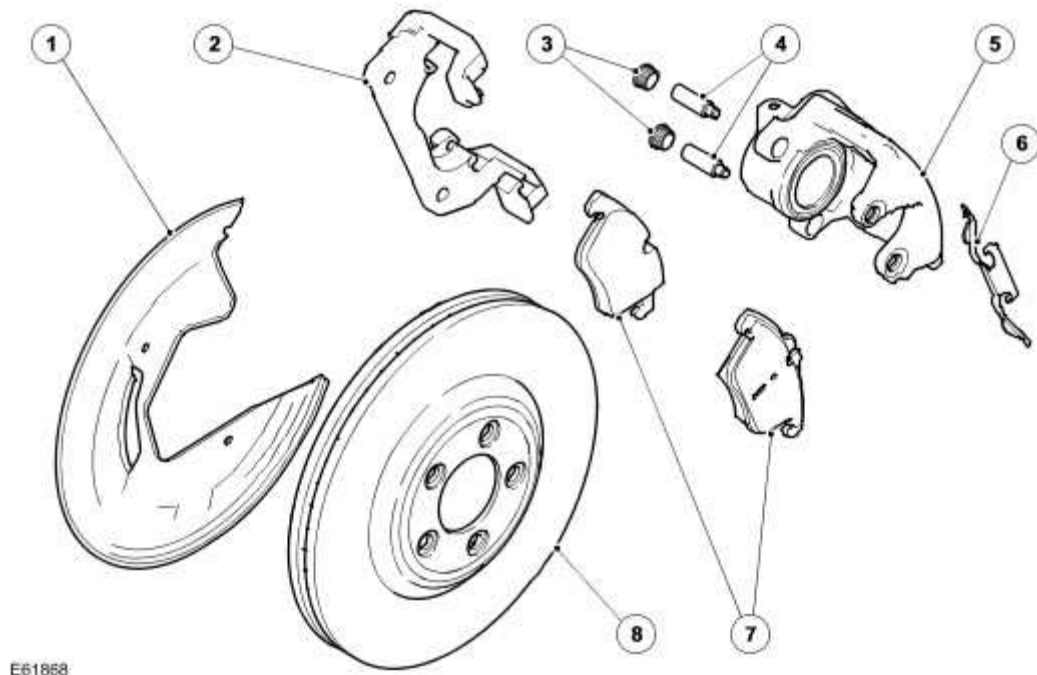
- Brake pads
- Four piston, fixed calipers
- Drilled brake discs
- Steel braided brake hoses

The brake caliper has two retaining bolts that attach the brake caliper to the wheel knuckle. These are of four piston fixed type which makes sure that equal effort is applied through both brake pads. The hydraulic system provides separate circuits for each pair of diagonally opposed wheels (i.e. left front, right rear and right front, left rear).

The brake disc is manufactured from cast iron and is of the vented type. It is retained on the hub by two retaining clips and the wheel studs.

Front Disc Brake - VIN Range: G45704- >G99999

Vehicles with standard brakes



Item	Part Number	Description
1	—	Brake disc shield
2	—	Brake caliper anchor plate
3	—	Brake caliper retaining bolt dust covers
4	—	Brake caliper retaining bolts
5	—	Brake caliper
6	—	Anti-rattle spring
7	—	Brake pads
8	—	Brake disc

For vehicles with standard brakes, the brake system consists of the following components:

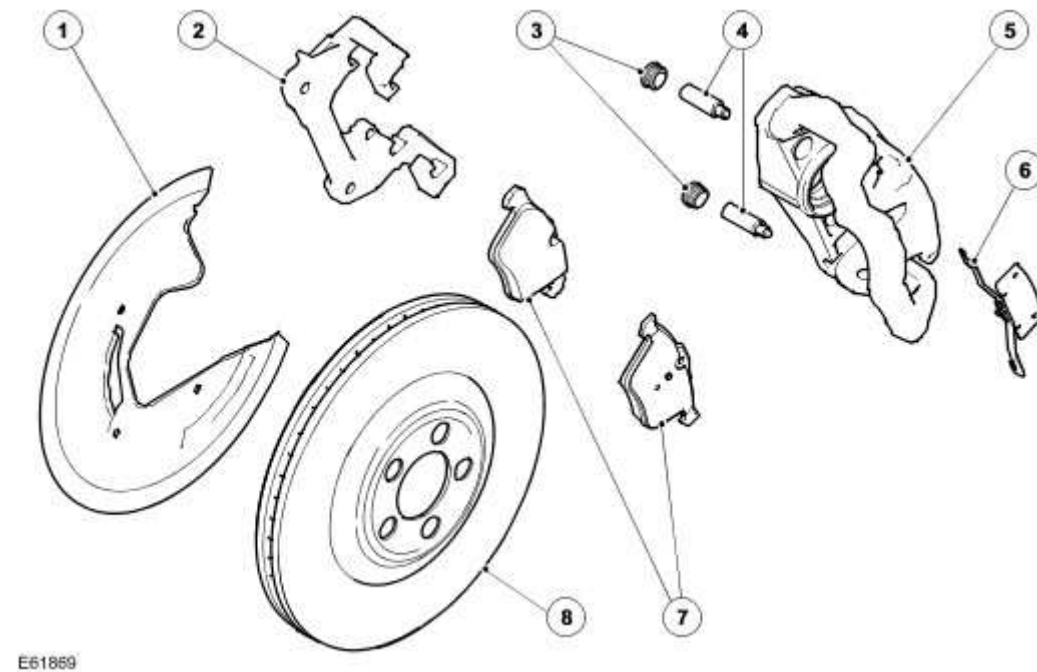
- Brake pads
- Single piston, floating calipers

- Brake discs
- Brake caliper anchor plates
- Steel braided brake hoses

The brake caliper has two retaining bolts that attach the brake caliper to the anchor plate. These are of single, sliding piston type. The anchor plate is attached to the wheel knuckle with two bolts. The hydraulic system provides separate circuits for each pair of diagonally opposed wheels (i.e. left front, right rear and right front, left rear).

The brake disc is manufactured from cast iron and is of the vented type. It is retained on the hub by two retaining clips and the wheel studs.

Vehicles with high performance brakes



Item	Part Number	Description
1	—	Brake disc shield
2	—	Brake caliper anchor plate
3	—	Brake caliper retaining bolt dust covers
4	—	Brake caliper retaining bolts
5	—	Brake caliper
6	—	Anti-rattle spring

7	—	Brake pads
8	—	Brake disc

For vehicles with high performance brakes, the brake system consists of the following components:

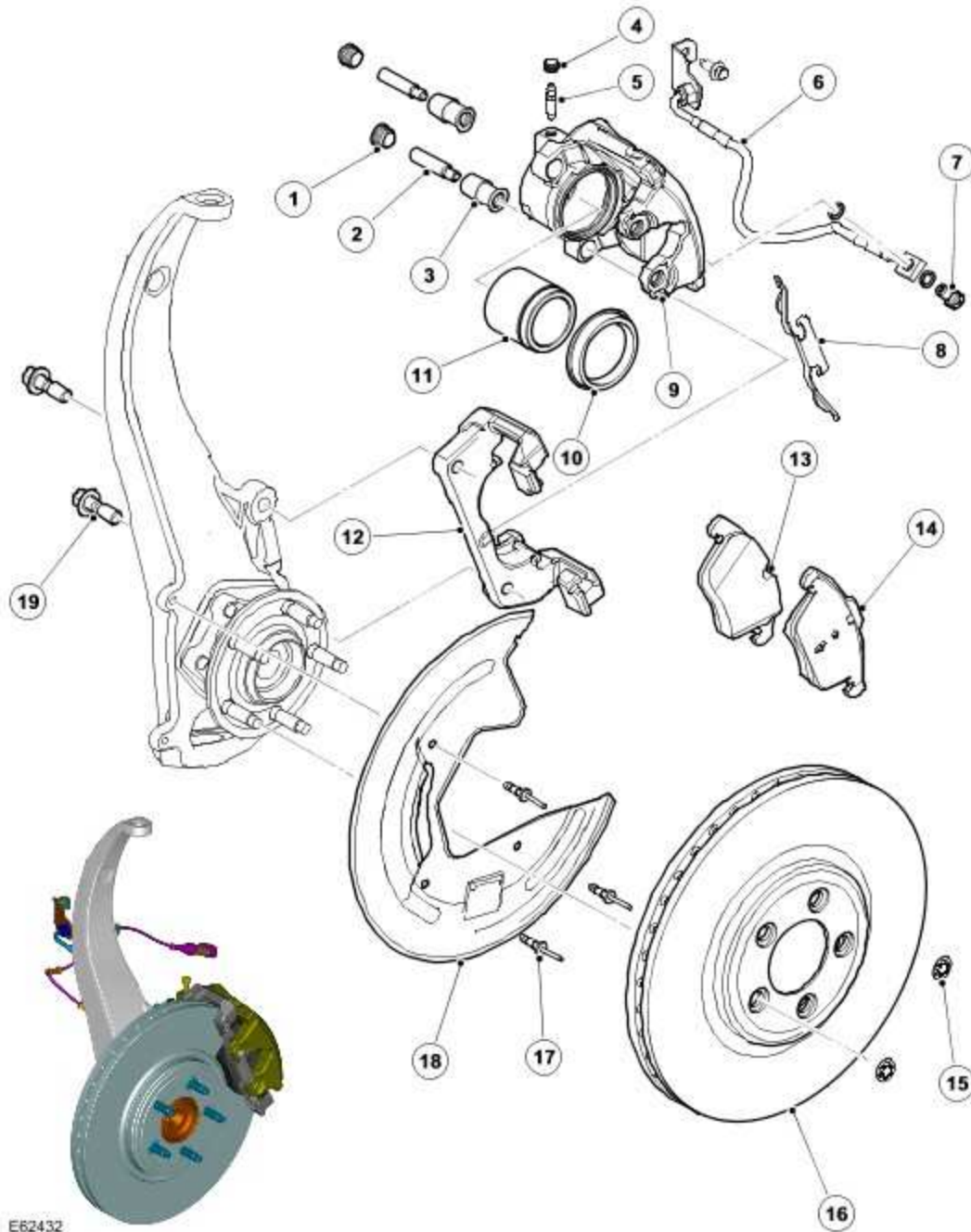
- Brake pads
- Single piston, fixed calipers
- Brake discs
- Steel braided brake hoses

The brake caliper has two retaining bolts that attach the brake caliper to the anchor plate. These are of single, sliding piston type. The anchor plate is attached to the wheel knuckle with two bolts. The hydraulic system provides separate circuits for each pair of diagonally opposed wheels (i.e. left front, right rear and right front, left rear).

The brake disc is manufactured from cast iron and is of the vented type. It is retained on the hub by two retaining clips and the wheel studs.

Front Disc Brake

STANDARD BRAKES - COMPONENT LOCATION



Item	Part Number	Description
1		Guide pin dust cover (2 off)
2		Guide pin (2 off)

3		Guide pin bush (2 off)
4		Bleed screw dust cap
5		Bleed screw
6		Brake hose
7		Bolt - brake hose to caliper
8		Anti-rattle spring
9		Brake caliper housing
10		Piston dust cover
11		Piston
12		Caliper carrier
13		Inboard brake pad
14		Outboard brake pad
15		Retaining washers (2 off)
16		Brake disc
17		Rivets (3 off)
18		Brake dust shield
19		Caliper carrier bolts (2 off)

INTRODUCTION

The front standard type braking system used on the naturally aspirated vehicles features 326 x 20 mm (12.83 x 0.79 in) diameter ventilated brake discs and cast iron, single piston, sliding calipers.

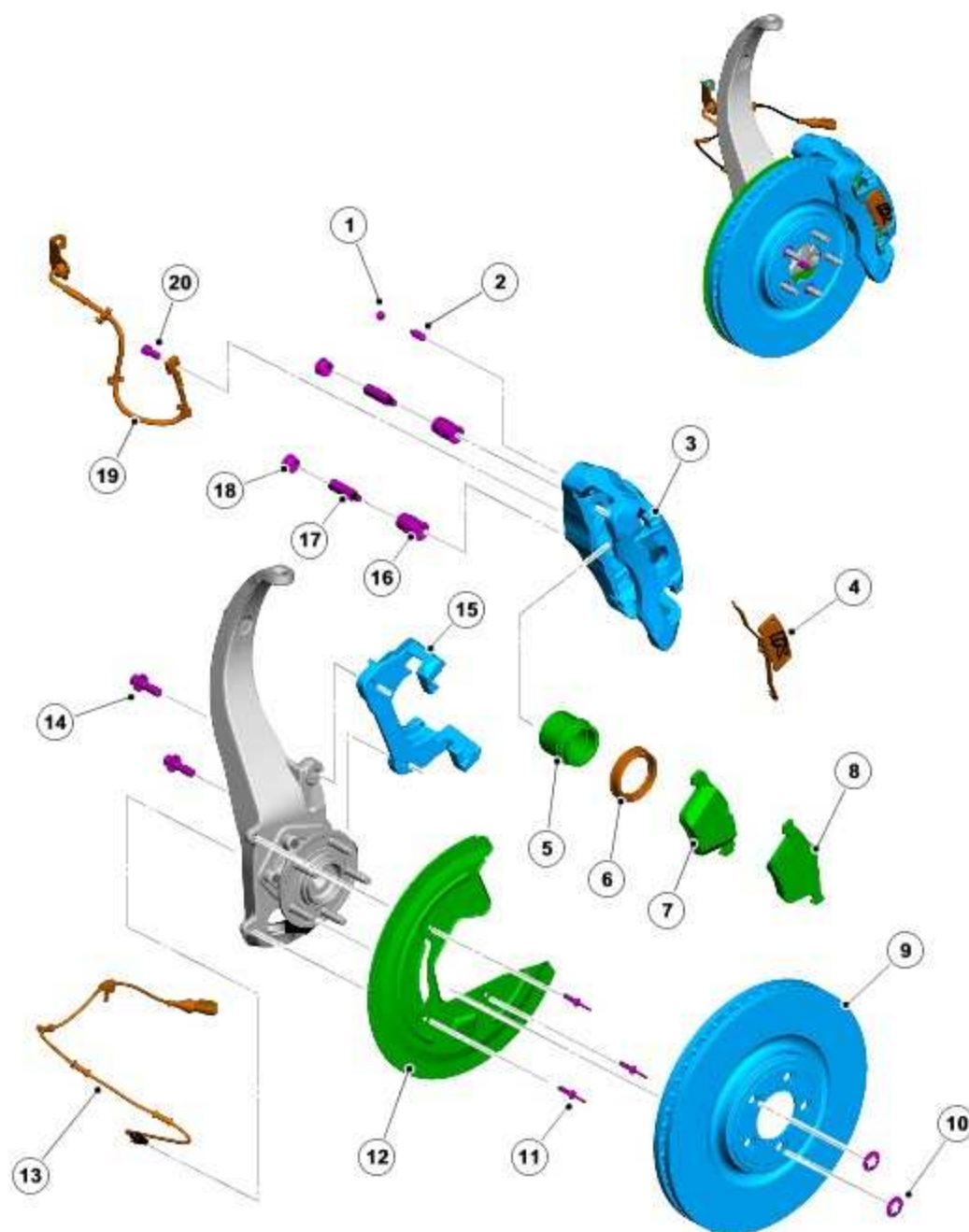
The caliper is mounted within a fixed carrier that is secured to the front wheel knuckle with 2 bolts. When hydraulic pressure is supplied to the caliper, the piston extends to force the inner pad against the brake disc. The caliper reacts and slides along 2 guide pins to bring the outer pad into contact with the brake disc.

Each inboard brake pad is installed with a pressed steel anti-rattle spring.

NOTE:

There is no wear indicator installed to the front brake pads.

The brake disc is manufactured from cast iron and is of the vented type. The disc is retained on the wheel hub by 2 retaining washers and the wheel nuts.

PERFORMANCE BRAKES - COMPONENT LOCATION

Item	Part Number	Description
1		Bleed screw dust cap
2		Bleed screw
3		Brake caliper housing
4		Anti-rattle spring (with 'R' type badge)
5		Piston
6		Piston dust cover
7		Inboard brake pad
8		Outboard brake pad
9		Brake disc
10		Retaining washers (2 off)
11		Rivets (3 off)
12		Brake dust shield
13		Anti-lock Brake System (ABS) sensor cable
14		Caliper carrier bolts (2 off)
15		Caliper carrier
16		Guide pin bush (2 off)
17		Guide pin (2 off)
18		Guide pin dust cover (2 off)
19		Brake hose
20		Bolt - brake hose to caliper

INTRODUCTION

The front performance type braking system used on the supercharged vehicle features 355 x 32 mm (13.98 x 1.26 in) diameter ventilated brake discs, and composite aluminum and cast iron, single piston, sliding calipers.

In addition, the brake calipers on the supercharged vehicle are painted and a logo badge is formed on the anti-rattle spring.

The caliper is mounted within a fixed carrier that is secured to the front wheel knuckle with 2 bolts. When hydraulic pressure is supplied to the caliper, the piston extends to force the inner pad against the brake disc. The caliper reacts and slides along 2 guide pins to bring the outer pad into contact with the brake disc.

Each inboard brake pad is installed with a pressed steel anti-rattle spring.

NOTE:

There is no wear indicator installed to the front brake pads.

The brake disc is manufactured from cast iron and is of the vented type. The disc is retained on the wheel hub by 2 retaining washers and the wheel nuts.

Front Disc Brake

For additional information, refer to [<<206-00>>](#).

Brake Caliper - Vehicles With: Standard Brakes, VIN Range: G00442->G45703 (70.55.02)

Special Service Tools



Brake pedal hold-down tool

JDS 9013

Removal

- 1 . Remove the brake pads.

For additional information, refer to

2



- **CAUTION:** Brake fluid contains polyglycol ethers and polyglycols. Avoid contact with the eyes. Wash hands thoroughly after handling, as prolonged contact may cause irritation and dermatitis. If brake fluid contacts the eyes, flush the eyes with cold water or eyewash solution and seek medical attention. If taken internally do not induce vomiting, seek immediate medical attention. Failure to follow these instructions may result in personal injury.



CAUTION: If brake fluid comes into contact with the paintwork, the affected area must be immediately washed down with cold water.



CAUTION: The brake caliper must be supported at all times.



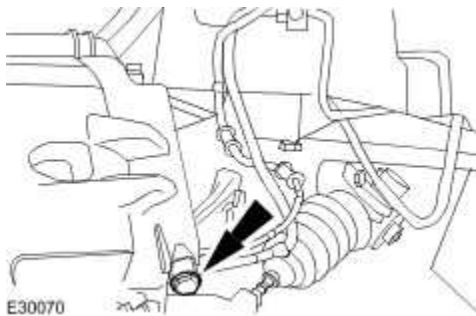
CAUTION: Cap the brake hose to prevent loss of fluid and dirt ingress.

NOTE:

To prevent the loss of brake fluid, apply the brake pedal hold-down tool and adjust to hold the brake pedal down 40 mm (1.6 in).

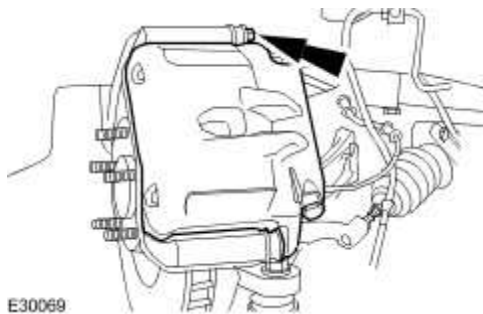
Detach the brake hose.

- ▶ Remove and discard the sealing washers.



3 . Remove the brake caliper.

- ▶ Remove and discard the brake caliper upper retaining bolt.



Installation

1



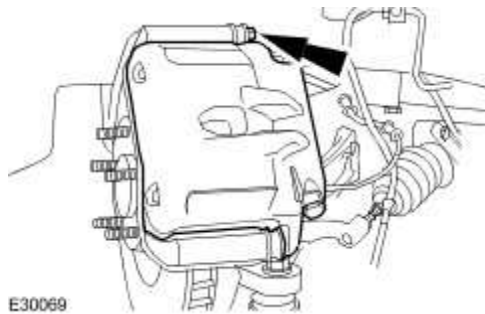
CAUTION: If brake fluid comes into contact with the paintwork, the affected area

must be immediately washed down with cold water.

Install the brake caliper.

▶ Install a new brake caliper upper retaining bolt.

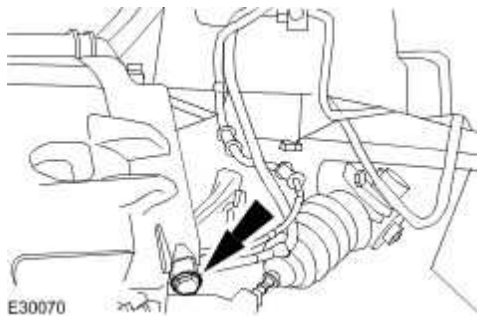
▶ Tighten to 34 Nm.



2 . Attach the brake hose.

▶ Install new sealing washers.

▶ Tighten to 35 Nm.



3 . Remove the brake pedal hold-down tool.

4 . Install the brake pads.

For additional information, refer to

5 . Bleed the brake system.

For additional information, refer to

Brake Caliper - Vehicles With: Standard Brakes, VIN Range: G45704->G99999 (70.55.02)

Special Service Tools



Brake pedal hold-down tool
JDS 9013

Removal

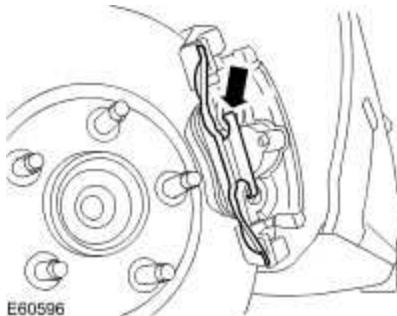
- 1 . Remove both front wheels and tires.

For additional information, refer to [Wheel and Tire \(74.20.05\)](#)

- 2 . **NOTE:**

Left-hand shown, right-hand similar.

Remove the anti-rattle spring.



- 3



WARNING: Brake fluid contains polyglycol ethers and polyglycols. Avoid contact with the eyes. Wash hands thoroughly after handling, as prolonged contact may cause irritation and dermatitis. If brake fluid contacts the eyes, flush the eyes with cold water or eyewash solution and seek medical attention. If taken internally do not induce vomiting, seek immediate medical attention. Failure to follow these instructions may result in

personal injury.



CAUTION: If brake fluid comes into contact with the paintwork, the affected area must be immediately washed down with cold water.



CAUTION: Cap the brake hose to prevent loss of fluid and dirt ingress.

NOTE:

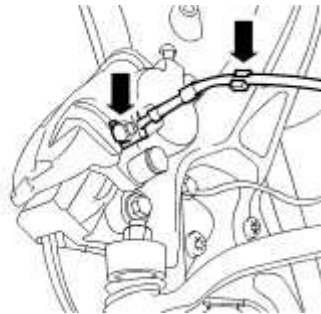
To prevent the loss of brake fluid, apply the brake pedal hold-down tool and adjust to hold the brake pedal down 40 mm (1.6 in).

NOTE:

Left-hand shown, right-hand similar.

Detach the brake hose.

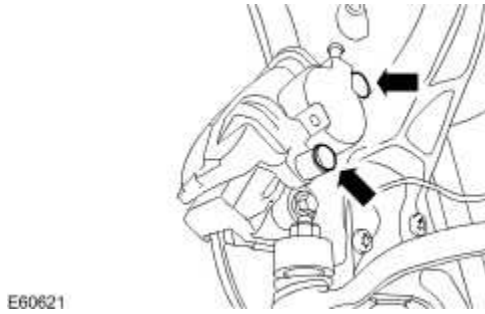
▶ Remove and discard the sealing washers.



4 . NOTE:

Left-hand shown, right-hand similar.

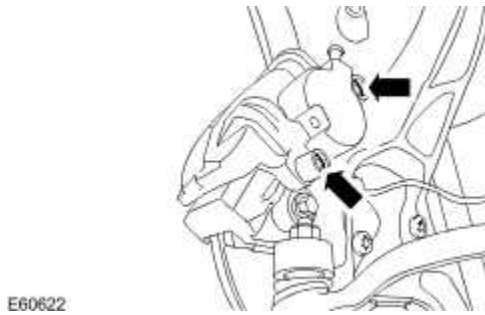
Remove the brake caliper retaining bolt dust covers.



5 . NOTE:

Left-hand shown, right-hand similar.

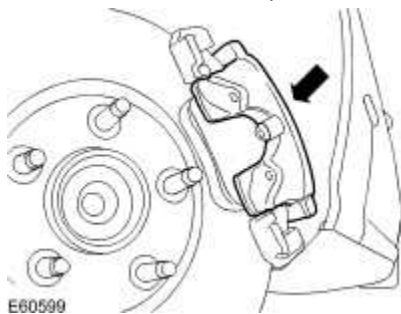
Remove the brake caliper retaining bolts.



6 . NOTE:

Left-hand shown, right-hand similar.

Remove the brake caliper.



7



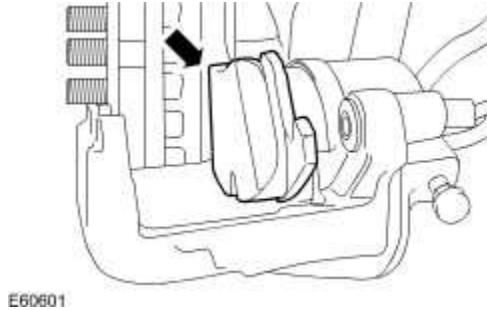
CAUTION: Do not allow the brake caliper to hang on the hydraulic hose, as this will

damage the hose. Failure to follow this instruction will result in damage to the hose.

NOTE:

Left-hand shown, right-hand similar.

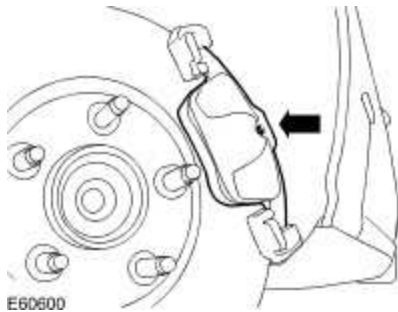
Remove the brake pad from the caliper piston.



8 . NOTE:

Left-hand shown, right-hand similar.

Remove the brake pad.



Installation

1 .



WARNING: Do not use compressed air to disperse brake dust into the atmosphere.



CAUTION: Brake pads must always be replaced in axle sets.



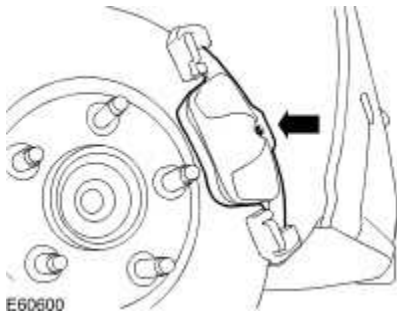
CAUTION: Make sure the brake disc faces are clean before installation.

NOTE:

Left-hand shown, right-hand similar.

Install the brake pad.

➤ Using a suitable tool, fully retract the brake caliper piston.



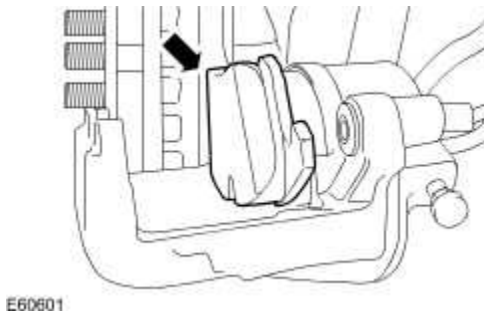
2 . NOTE:

Make sure the brake pad is correctly installed to the caliper piston.

NOTE:

Left-hand shown, right-hand similar.

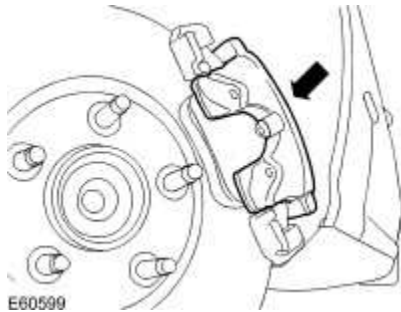
Install the brake pad to the caliper piston.



3 . NOTE:

Left-hand shown, right-hand similar.

Install the brake caliper.

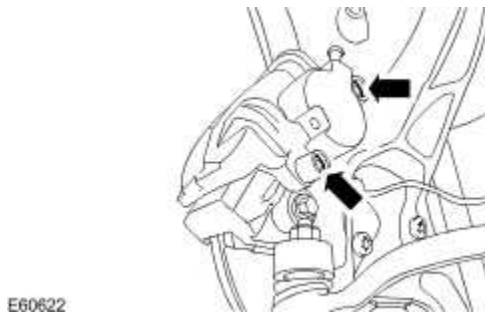


4 . NOTE:

Left-hand shown, right-hand similar.

Install the brake caliper retaining bolts.

► Tighten to 28 Nm.

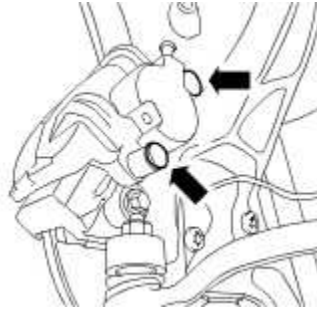


5 . NOTE:

Left-hand shown, right-hand similar.

Install the brake caliper retaining bolt dust covers.

E60621



6 . NOTE:

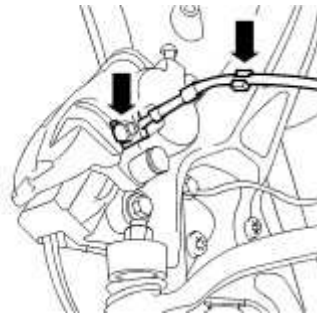
Left-hand shown, right-hand similar.

Attach the brake hose.

▶ Install new sealing washers.

▶ Tighten to 35 Nm.

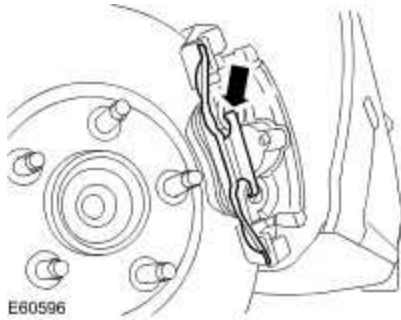
E60620



7 . NOTE:

Left-hand shown, right-hand similar.

Install the anti-rattle spring.



- 8 . Remove the brake pedal hold-down tool.
- 9 Bleed the brake system.
 - . For additional information, refer to [Brake System Bleeding - VIN Range: G45704->H99999 \(70.25.03\)](#)
- 10 . Install both front wheels and tires.
 - For additional information, refer to [Wheel and Tire \(74.20.05\)](#)

Brake Caliper - Vehicles With: High Performance Brakes, VIN Range: G00442->G45704 (70.55.02)

Special Service Tools



Brake pedal hold-down tool
JDS 9013

Removal

- 1 Remove the brake pads.
 - For additional information, refer to [Brake Pads - Vehicles With: High Performance Brakes, VIN Range: G00442->G45703 \(70.40.02\)](#)

2



- **CAUTION:** Brake fluid contains polyglycol ethers and polyglycols. Avoid contact with the eyes. Wash hands thoroughly after handling, as prolonged contact may cause irritation and dermatitis. If brake fluid contacts the eyes, flush the eyes with cold water or eyewash solution and seek medical attention. If taken internally do not induce vomiting, seek immediate medical attention. Failure to follow these instructions may result in personal injury.



CAUTION: If brake fluid comes into contact with the paintwork, the affected area must be immediately washed down with cold water.

NOTE:

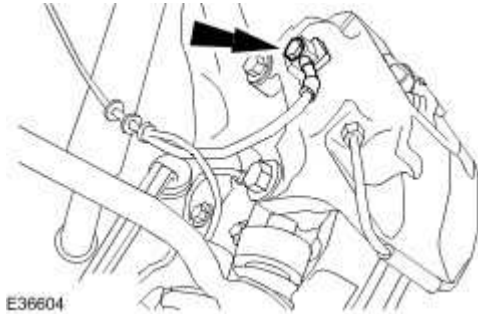
To prevent the loss of brake fluid, apply the brake pedal hold-down tool and adjust to hold the brake pedal down 40 mm (1.6 in).

NOTE:

Cap the brake hose to prevent loss of fluid and prevent dirt ingress.

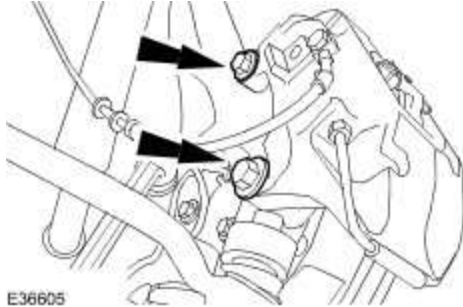
Detach the brake hose.

- ▶ Remove and discard the sealing washers.



3 . Remove the brake caliper.

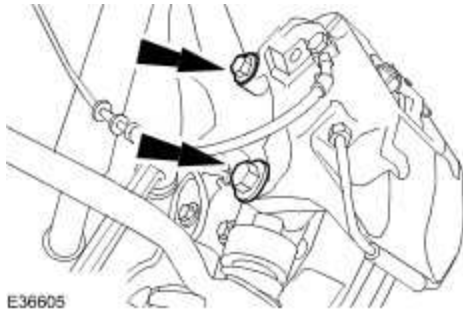
- ▶ Remove and discard the brake caliper retaining bolts.



Installation

1 . Install the brake caliper.

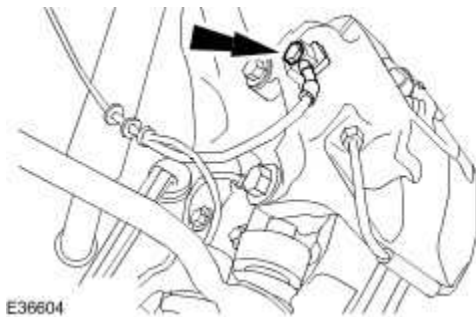
- ▶ Install new brake caliper retaining bolts.
- ▶ Tighten to 212 Nm.



2 . Attach the brake hose.

▶ Install new sealing washers.

▶ Tighten to 35 Nm.



3 . Remove the brake pedal hold-down tool.

4 Install the brake pads.

. For additional information, refer to [Brake Pads - Vehicles With: High Performance Brakes, VIN Range: G00442->G45703 \(70.40.02\)](#)

5 Bleed the brake system.

. For additional information, refer to [Brake System Bleeding - VIN Range: G00442->G45703 \(70.25.03\)](#)

Brake Caliper - Vehicles With: High Performance Brakes, VIN Range: G45704->G99999 (70.55.02)

Special Service Tools



Brake pedal hold-down tool
JDS 9013

Removal

- 1 . Remove both front wheels and tires.

For additional information, refer to [Wheel and Tire \(74.20.05\)](#)

- 2 . **NOTE:**

Left-hand shown, right-hand similar.

Remove the anti-rattle spring.

3



WARNING: Brake fluid contains polyglycol ethers and polyglycols. Avoid contact with the eyes. Wash hands thoroughly after handling, as prolonged contact may cause irritation and dermatitis. If brake fluid contacts the eyes, flush the eyes with cold water or eyewash solution and seek medical attention. If taken internally do not induce vomiting, seek immediate medical attention. Failure to follow these instructions may result in personal injury.



CAUTION: If brake fluid comes into contact with the paintwork, the affected area must be immediately washed down with cold water.



CAUTION: Cap the brake hose to prevent loss of fluid and dirt ingress.

NOTE:

To prevent the loss of brake fluid, apply the brake pedal hold-down tool and adjust to hold the brake pedal down 40 mm (1.6 in).

NOTE:

Left-hand shown, right-hand similar.

Detach the brake hose.



Remove and discard the sealing washers.

4 . NOTE:

Left-hand shown, right-hand similar.

Remove the brake caliper retaining bolt dust covers.

5 . NOTE:

Left-hand shown, right-hand similar.

Remove the brake caliper retaining bolts.

6 . **NOTE:**

Left-hand shown, right-hand similar.

Remove the brake caliper.

7

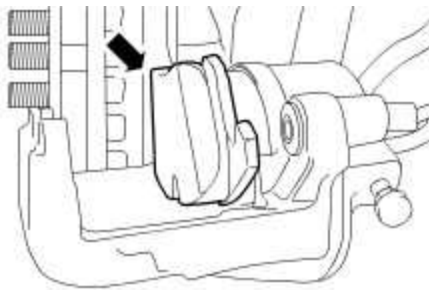


CAUTION: Do not allow the brake caliper to hang on the hydraulic hose, as this will damage the hose. Failure to follow this instruction will result in damage to the hose.

NOTE:

Left-hand shown, right-hand similar.

Remove the brake pad from the caliper piston.

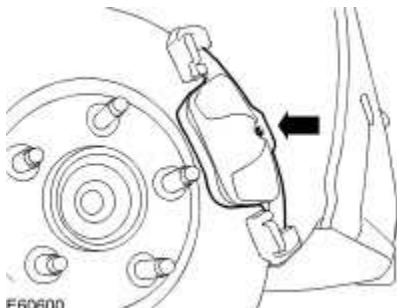


E60601

8 . **NOTE:**


Left-hand shown, right-hand similar.

Remove the brake pad.



E60600

Installation

1.  **WARNING:** Do not use compressed air to disperse brake dust into the atmosphere.


 **CAUTION:** Brake pads must always be replaced in axle sets.

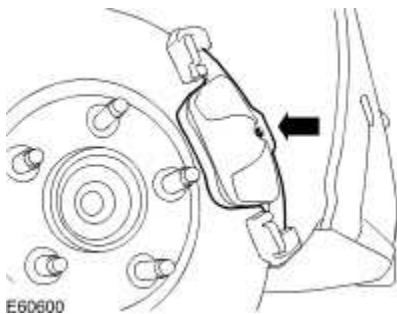
 **CAUTION:** Make sure the brake disc faces are clean before installation.

NOTE:

Left-hand shown, right-hand similar.

Install the brake pad.

 Using a suitable tool, fully retract the brake caliper piston.



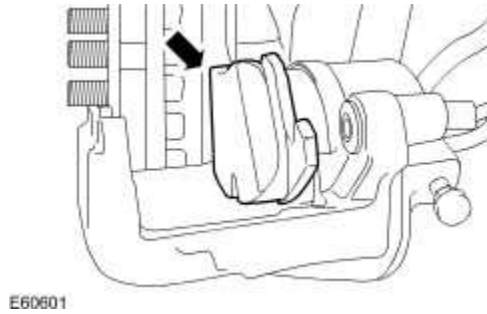
2 . NOTE:

Make sure the brake pad is correctly installed to the caliper piston.

NOTE:

Left-hand shown, right-hand similar.

Install the brake pad to the caliper piston.



3 . NOTE:


Left-hand shown, right-hand similar.

Install the brake caliper.

4 . NOTE:

Left-hand shown, right-hand similar.

Install the brake caliper retaining bolts.

 Tighten to 58 Nm.

5 . NOTE:


Left-hand shown, right-hand similar.


Install the brake caliper retaining bolt dust covers.

6 . NOTE:

Left-hand shown, right-hand similar.

Attach the brake hose.

 Install new sealing washers.

 Tighten to 35 Nm.

7 . NOTE:

Left-hand shown, right-hand similar.

Install the anti-rattle spring.

8 . Remove the brake pedal hold-down tool.

9 Bleed the brake system.

. For additional information, refer to [Brake System Bleeding - VIN Range: G45704->H99999 \(70.25.03\)](#)

10 . Install both front wheels and tires.

For additional information, refer to [Wheel and Tire \(74.20.05\)](#)

Brake Disc - Vehicles With: Standard Brakes, VIN Range: G00442->G45703 (70.10.10)

Removal

1. Remove the brake pads.

For additional information, refer to

- 2.

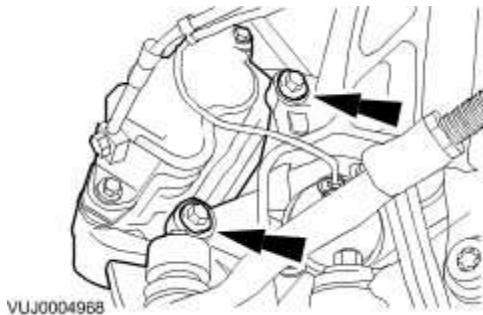


CAUTION: The brake caliper must be supported at all times.

Detach the brake caliper and brake caliper anchor plate and secure to one side.



Remove and discard the brake caliper retaining bolts.



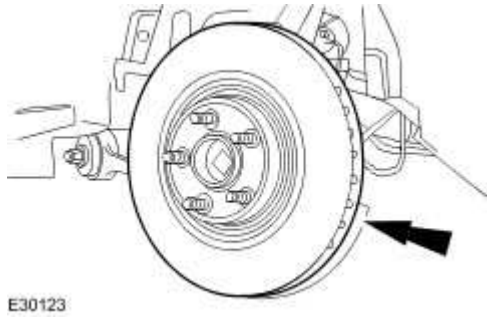
- 3 **NOTE:**

If the same brake disc is to be installed, the tip of a hub must be marked with a corresponding part of the brake disc for alignment.

Remove the brake disc.



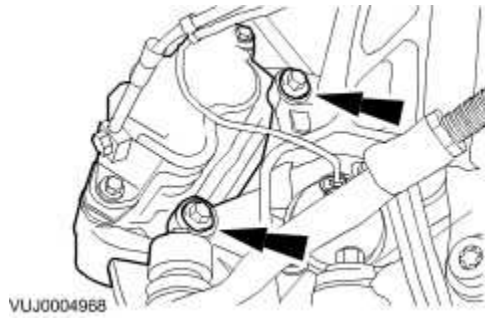
Remove and discard the brake disc retaining clips.



Installation

1 . To install, reverse the removal procedure.

► Tighten to 103 Nm.



Brake Disc - Vehicles With: Standard Brakes, VIN Range: G45704->G99999 (70.10.10)

Removal

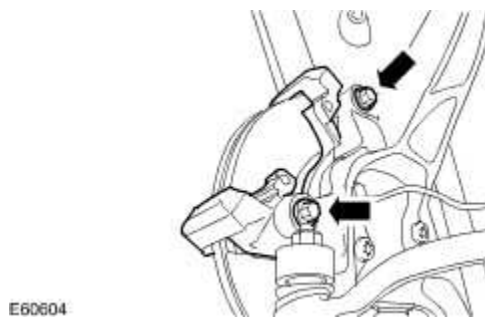
- 1 Remove the brake pads.
 - . For additional information, refer to [Brake Pads - Vehicles With: Standard Brakes, VIN Range: G45704->G99999 \(70.40.02\)](#)

2 . NOTE:

Left-hand shown, right-hand similar.

Remove the brake caliper anchor plate.

- ▶ Remove and discard the brake caliper anchor plate retaining bolts.



3 NOTE:

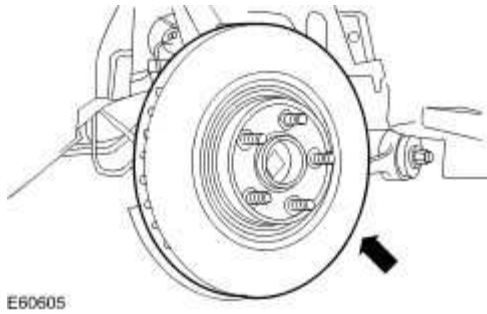
If the same brake disc is to be installed, the tip of a hub must be marked with a corresponding part of the brake disc for alignment.

NOTE:

Left-hand shown, right-hand similar.

Remove the brake disc.

- Remove and discard the brake disc retaining clips.



Installation

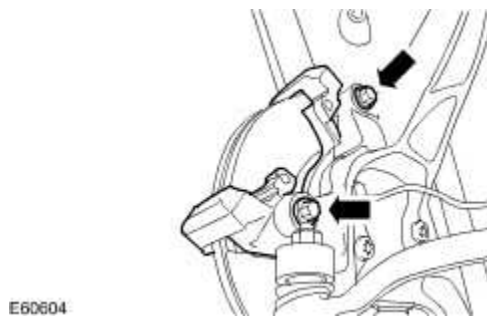
1.  **CAUTION:** Brake discs must always be replaced in axle sets.

NOTE:

Left-hand shown, right-hand similar.

To install, reverse the removal procedure.

- Tighten to 115 Nm.



Brake Disc - Vehicles With: High Performance Brakes, VIN Range: G00442->G45703 (70.10.10)

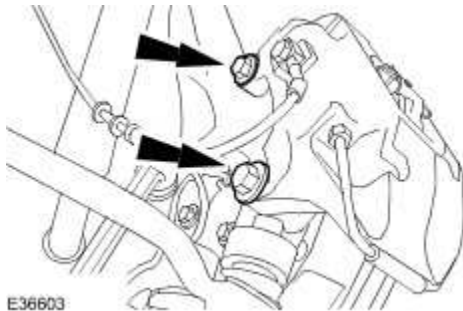
Removal

- 1 Remove the brake pads.
 - . For additional information, refer to [Brake Pads - Vehicles With: High Performance Brakes, VIN Range: G00442->G45703 \(70.40.02\)](#)

2.  **CAUTION: The brake caliper must be supported at all times.**

Detach the brake caliper and secure to one side.

- ▶ Remove and discard the brake caliper retaining bolts.

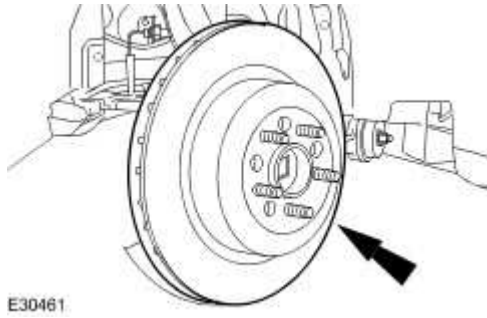


3 NOTE:

. If the same brake disc is to be installed, the tip of a hub must be marked with a corresponding part of the brake disc for alignment.

Remove the brake disc.

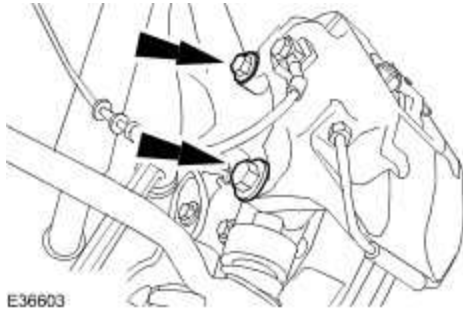
- ▶ Remove and discard the brake disc retaining clips.



Installation

1 . To install, reverse the removal procedure.

► Tighten to 212 Nm.



Brake Disc - Vehicles With: High Performance Brakes, VIN Range: G45704->G99999 (70.10.10)

Removal

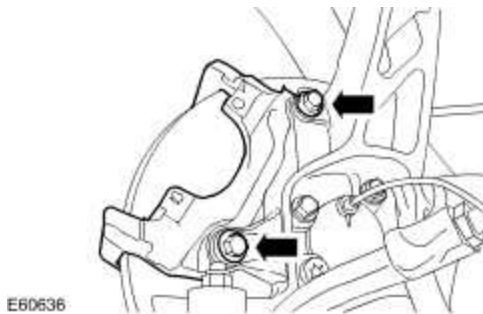
- 1 Remove the brake pads.
 - For additional information, refer to [Brake Pads - Vehicles With: High Performance Brakes, VIN Range: G45704->G99999 \(70.40.02\)](#)

2 . NOTE:

Left-hand shown, right-hand similar.

Remove the brake caliper anchor plate.

- ▶ Remove and discard the brake caliper anchor plate retaining bolts.



3 NOTE:

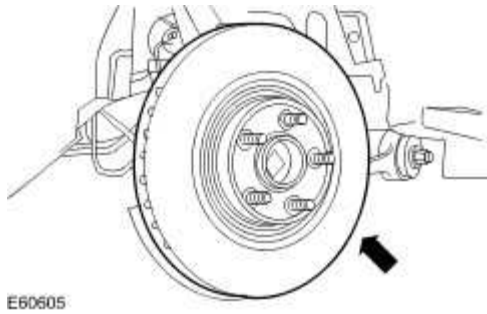
If the same brake disc is to be installed, the tip of a hub must be marked with a corresponding part of the brake disc for alignment.

NOTE:

Left-hand shown, right-hand similar.

Remove the brake disc.

- Remove and discard the brake disc retaining clips.



Installation

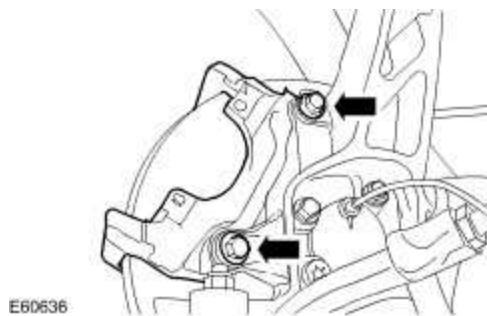
1.  **CAUTION:** Brake discs must always be replaced in axle sets.

NOTE:

Left-hand shown, right-hand similar.

To install, reverse the removal procedure.

- Tighten to 115 Nm.



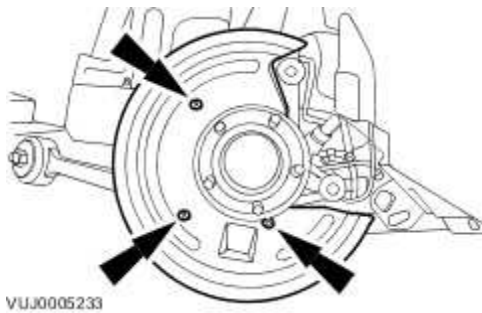
Brake Disc Shield - Vehicles With: Standard Brakes (70.10.18)

Removal

- 1 Remove the front brake disc.
 - For additional information, refer to [Brake Disc - Vehicles With: Standard Brakes, VIN Range: G00442->G45703 \(70.10.10\)](#)
 - For additional information, refer to [Brake Disc - Vehicles With: Standard Brakes, VIN Range: G45704->G99999 \(70.10.10\)](#)

- 2 . Remove the brake disc shield.

▶ Remove and discard the brake disc shield retaining rivets.



Installation

- 1 . To install, reverse the removal procedure.

▶ Install new brake disc shield retaining rivets.

Brake Disc Shield - Vehicles With: High Performance Brakes (70.10.18)

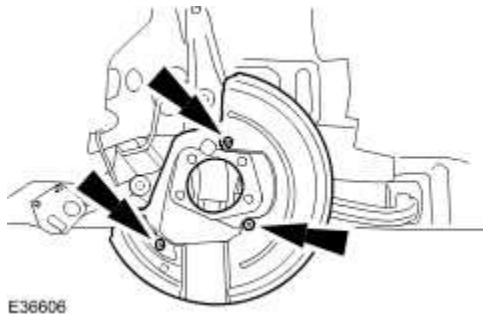
Removal

- 1 . Remove the wheel bearing and wheel hub.

For additional information, refer to [Front Wheel Bearing and Wheel Hub \(60.25.03\)](#)

- 2 . Remove the brake disc shield.

▶ Remove and discard the brake disc shield retaining rivets.



Installation

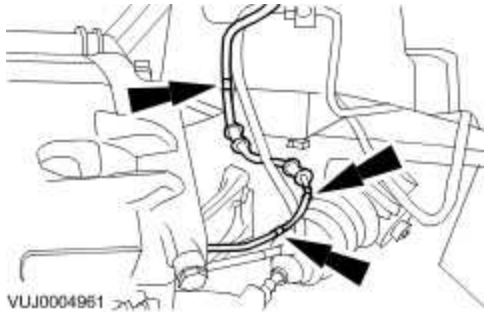
- 1 . To install, reverse the removal procedure.

▶ Install new brake disc shield retaining rivets.

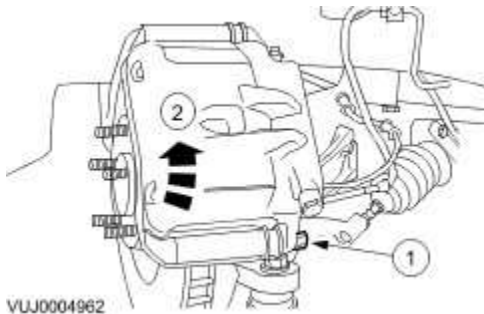
Brake Pads - Vehicles With: Standard Brakes, VIN Range: G00442->G45703 (70.40.02)

Removal

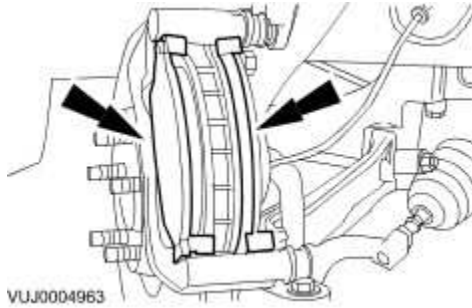
- 1 . Remove both front wheels and tires. [<<204-04>>](#)
- 2 . Detach the anti-lock brake (ABS) sensor wiring harness from the retaining clips.




- 3 . Rotate the brake caliper upwards.
 - 1) Remove and discard the brake caliper lower retaining bolt.
 - 2) Rotate the brake caliper upwards.




- 4 . Remove the brake pads.



Installation




- 1  **WARNING:** Do not use compressed air to disperse brake dust into the atmosphere.

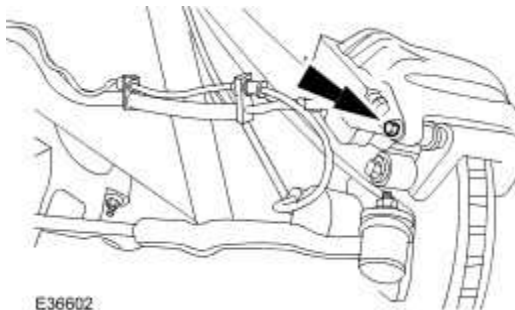
 **CAUTION:** If the pistons are pushed back into the housing, brake fluid will be forced back into the brake fluid reservoir.

 **CAUTION:** Make sure the brake disc faces are clean before installation.

 **CAUTION:** Brake pads must always be replaced in axle sets.

To install, reverse the removal procedure.

-  Using a suitable tool, fully retract the brake caliper pistons.
-  Install a new brake caliper lower retaining bolt.
-  Tighten to 34 Nm.



E36602

Brake Pads - Vehicles With: Standard Brakes, VIN Range: G45704->G99999 (70.40.02)

Removal

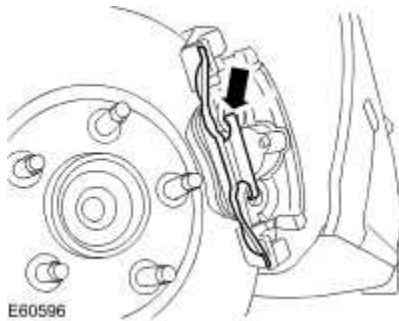
- 1 . Remove both front wheels and tires.

For additional information, refer to [Wheel and Tire \(74.20.05\)](#)

2 . NOTE:

Left-hand shown, right-hand similar.

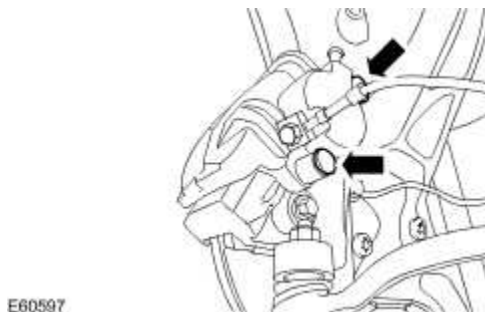
Remove the anti-rattle spring.



3 . NOTE:

Left-hand shown, right-hand similar.

Remove the brake caliper retaining bolt dust covers.



4

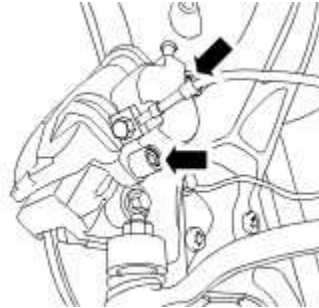


- CAUTION: Do not allow the brake caliper to hang on the hydraulic hose, as this will damage the hose. Failure to follow this instruction will result in damage to the hose.

NOTE:

Left-hand shown, right-hand similar.

Remove the brake caliper retaining bolts.



E60598

5

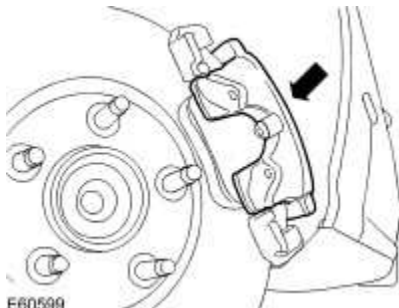


- CAUTION: Do not allow the brake caliper to hang on the hydraulic hose, as this will damage the hose. Failure to follow this instruction will result in damage to the hose.

NOTE:

Left-hand shown, right-hand similar.

Detach the brake caliper.



E60599

6



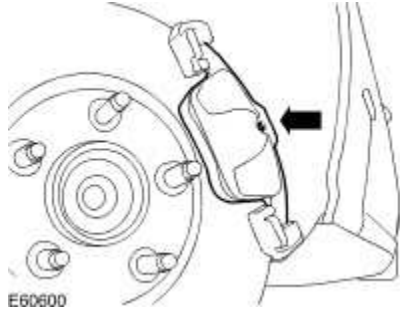
- CAUTION: Do not allow the brake caliper to hang on the hydraulic hose, as this will

damage the hose. Failure to follow this instruction will result in damage to the hose.

NOTE:

Left-hand shown, right-hand similar.

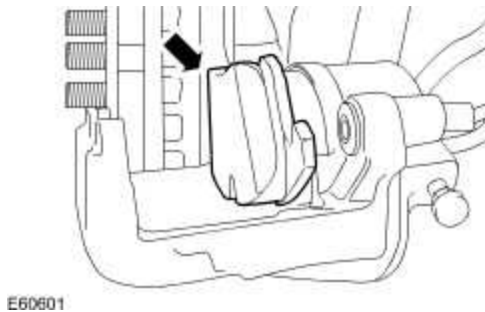
Remove the brake pad.



7 . NOTE:

Left-hand shown, right-hand similar.

Remove the brake pad from the caliper piston.



Installation

1



· **WARNING:** Do not use compressed air to disperse brake dust into the atmosphere.



· **CAUTION:** If the pistons are pushed back into the housing, brake fluid will be forced

back into the brake fluid reservoir.



CAUTION: Make sure the brake disc faces are clean before installation.



CAUTION: Brake pads must always be replaced in axle sets.

NOTE:

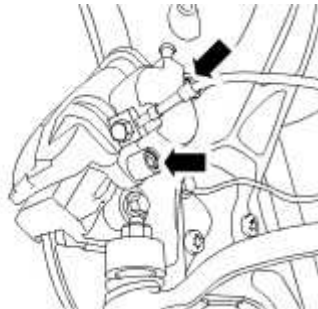
Make sure that the inboard brake pad is correctly installed to the caliper piston.

NOTE:

Left-hand shown, right-hand similar.

To install, reverse the removal procedure.

- Using a suitable tool, fully retract the brake caliper pistons.
- Tighten to 28 Nm.



E60598

Brake Pads - Vehicles With: High Performance Brakes, VIN Range: G00442->G45703 (70.40.02)

Removal

- 1 . Raise front of vehicle and support on stands.

For additional information, refer to [Jacking](#)

- 2 . Remove front wheels.

For additional information, refer to [Wheel and Tire \(74.20.05\)](#)

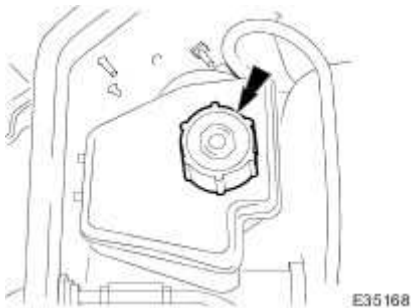
3



- **CAUTION:** Remove brake fluid spillage immediately from paint work, with clean water.

Loosen brake fluid reservoir-cap.

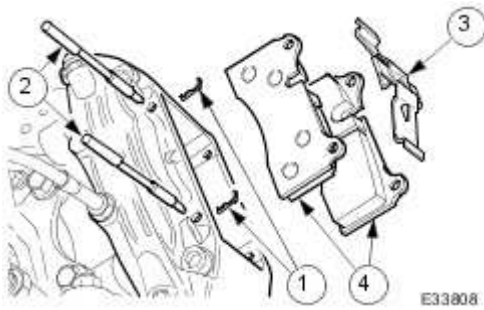
▶ Position a cloth around the reservoir to collect any fluid spillage.



- 4 . Remove brake pads from caliper.

- 1) Remove 'R' clips.
- 2) Withdraw pins from caliper.
- 3) Remove anti-rattle spring.

4) Discard brake pads.



5 . Clean all mating surfaces and remove brake dust, see WARNING above.


6 . Repeat above procedure to remove opposite side brake pads.

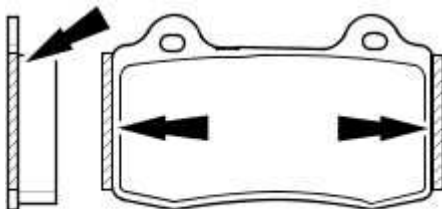
Installation

- 1  **CAUTION: Make sure grease does not contact brake-pad friction surface or brake disc.**

To prevent brake squeal apply grease to the shoulders of the brake-pad backplate.

For additional information, refer to [Specifications](#)

-  Apply a uniform layer of grease to backplate shoulders, making sure the whole shoulder is covered.

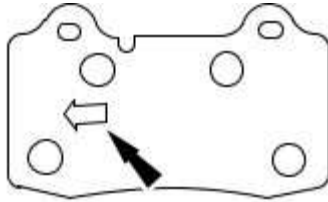


2



- **CAUTION: Make sure the brake pads are fitted with the direction arrow following the direction of wheel rotation.**

Make sure the brake pads are fitted with the direction arrow following the direction of wheel rotation.



E52793

3



- **CAUTION: Retracting the caliper piston may cause the fluid reservoir to over-flow. Remove brake fluid spillage immediately from paint work, with clean water.**



CAUTION: Make sure the brake pads are installed to the correct orientation.



CAUTION: Make sure the brake pads are fitted with the direction arrow following the direction of wheel rotation.



CAUTION: Note condition of pins and 'R' clips and replace if necessary.

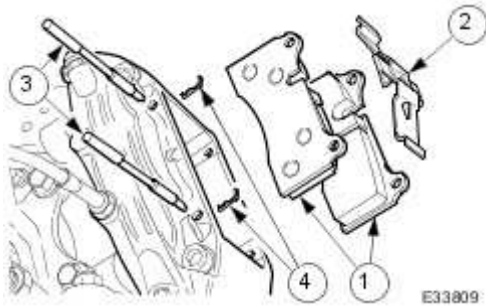
Install brake pads into caliper.



Slowly retract caliper pistons into caliper.

- 2) Install pads.
- 3) Position anti-rattle spring.
- 4) Install pins.

5) Install 'R' clips.



4 . Repeat above procedure to install opposite side brake pads.

5 . Fit wheels.

For additional information, refer to [Wheel and Tire \(74.20.05\)](#)

6 . Remove stands and lower vehicle.

For additional information, refer to [Jacking](#)

7



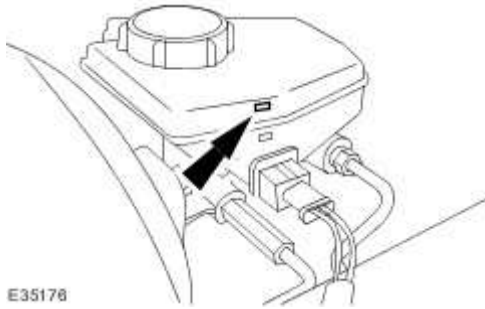
· **CAUTION: Remove brake fluid spillage immediately from paint work, with clean water.**

Check brake fluid level.

▶ Check brake fluid level is at the maximum mark.

▶ Remove cloth.

▶ Fit cap.



- 8 . Remove paint work protection covers, and close engine compartment.
- 9 . Start the engine and repeatedly press the brake pedal until brake pressure is evident.

Brake Pads - Vehicles With: High Performance Brakes, VIN Range: G45704->G99999 (70.40.02)

Removal

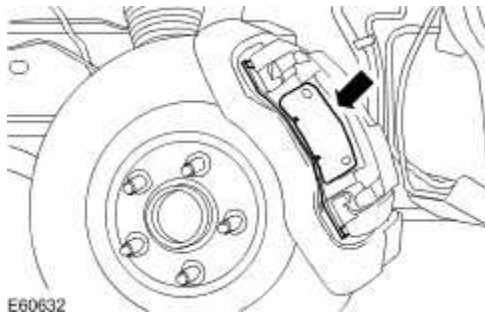
- 1 . Remove both front wheels and tires.

For additional information, refer to [Wheel and Tire \(74.20.05\)](#).

2 . NOTE:

Left-hand shown, right-hand similar.

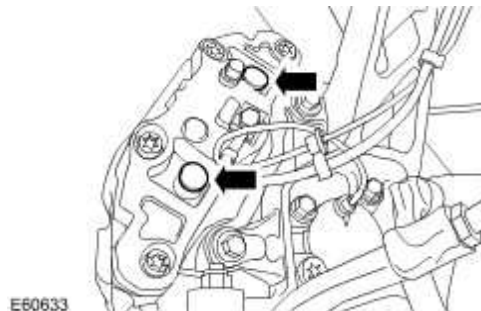
Remove the anti-rattle spring.



3 . NOTE:

Left-hand shown, right-hand similar.

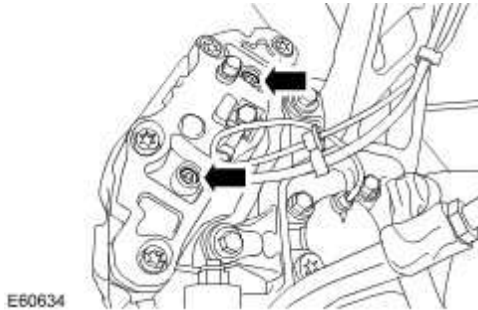
Remove the brake caliper retaining bolt dust covers.



4 . **NOTE:**

Left-hand shown, right-hand similar.

Remove the brake caliper retaining bolts.



5

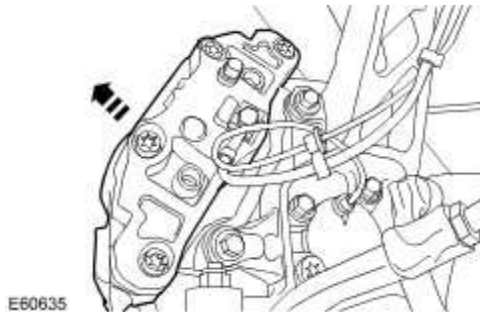


CAUTION: Do not allow the brake caliper to hang on the hydraulic hose, as this will damage the hose. Failure to follow this instruction will result in damage to the hose.

NOTE:

Left-hand shown, right-hand similar.

Detach the brake caliper.



6

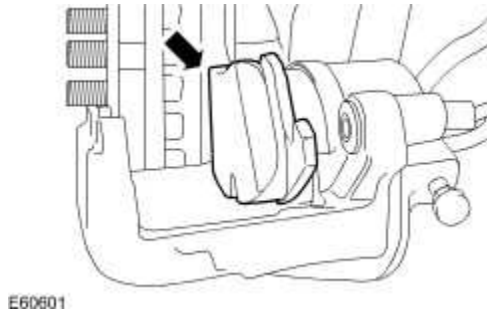


CAUTION: Do not allow the brake caliper to hang on the hydraulic hose, as this will damage the hose. Failure to follow this instruction will result in damage to the hose.

NOTE:

Left-hand shown, right-hand similar.

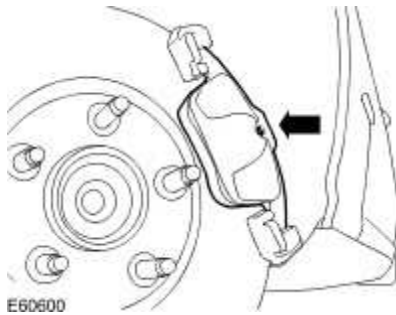
Remove the brake pad from the caliper piston.



7 . NOTE:

Left-hand shown, right-hand similar.

Remove the brake pad.



Installation

1



· **WARNING:** Do not use compressed air to disperse brake dust into the atmosphere.



CAUTION: If the pistons are pushed back into the housing, brake fluid will be forced back into the brake fluid reservoir.



CAUTION: Make sure the brake disc faces are clean before installation.



CAUTION: Brake pads must always be replaced in axle sets.

NOTE:

Make sure that the inboard brake pad is correctly installed to the caliper piston.

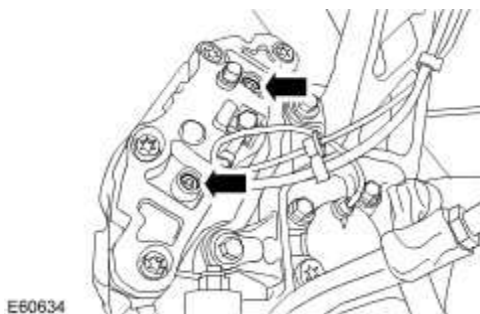
NOTE:

Left-hand shown, right-hand similar.

To install, reverse the removal procedure.

➤ Using a suitable tool, fully retract the brake caliper pistons.

➤ Tighten to 58 Nm.



206-04 : Rear Disc Brake

Specifications

Specifications

Lubricants, Fluids, sealers and Adhesives



CAUTION: Do not use brake fluid ITT Super Dot 4 on 2006my vehicles onwards. Failure to follow this instruction may result in damage to the vehicle.

NOTE:

Brake fluid ITT Super Dot 4 has now been superseded by Shell ESL Super Dot 4 which is the Jaguar recommended brake fluid. Shell ESL Super Dot 4 can be used on all model years.

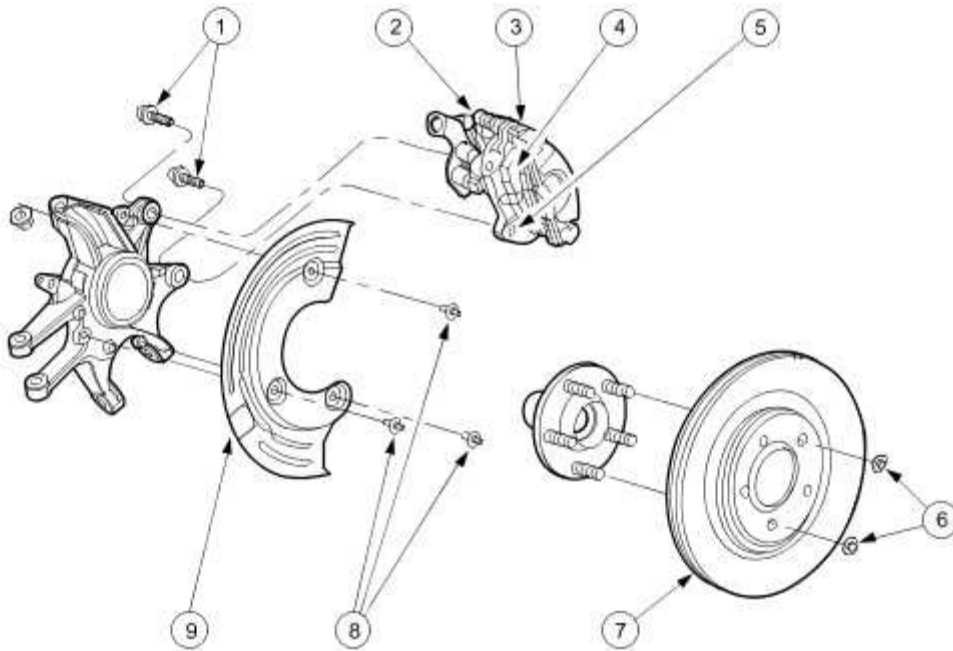
Item	Specification
Brake fluid	ITT Super Dot 4
Brake fluid	Shell ESL Super Dot 4
Brake caliper slide pin grease	Klueber GLK1

Torque Specifications

Description	Nm	lb-ft	lb-in
Brake hose to brake caliper - Vehicles with 3.0L, 3.5L or 4.2L engine	35	26	-
Brake hose to brake caliper - Vehicles with Brembo brakes	35	26	-
Brake caliper anchor plate - Vehicles with 3.0L, 3.5L or 4.2L engine	103	76	-
Brake caliper retaining bolts - Vehicles with Brembo brakes	70	51	-
Brake caliper retaining bolts - Vehicles with 3.0L, 3.5L or 4.2L engine	34	25	-

Rear Disc Brake - VIN Range: G00442- >G45703

Vehicles without Brembo brakes



E30174

Item	Part Number	Description
1	—	Brake caliper anchor plate retaining bolts
2	—	Brake caliper guide pin retaining bolt
3	—	Brake caliper
4	—	Brake pads
5	—	Brake caliper anchor plate
6	—	Brake disc retaining clips
7	—	Brake disc
8	—	Brake disc shield retaining rivets

9	—	Brake disc shield
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For vehicles without Brembo brakes, the brake system consists of the following components:

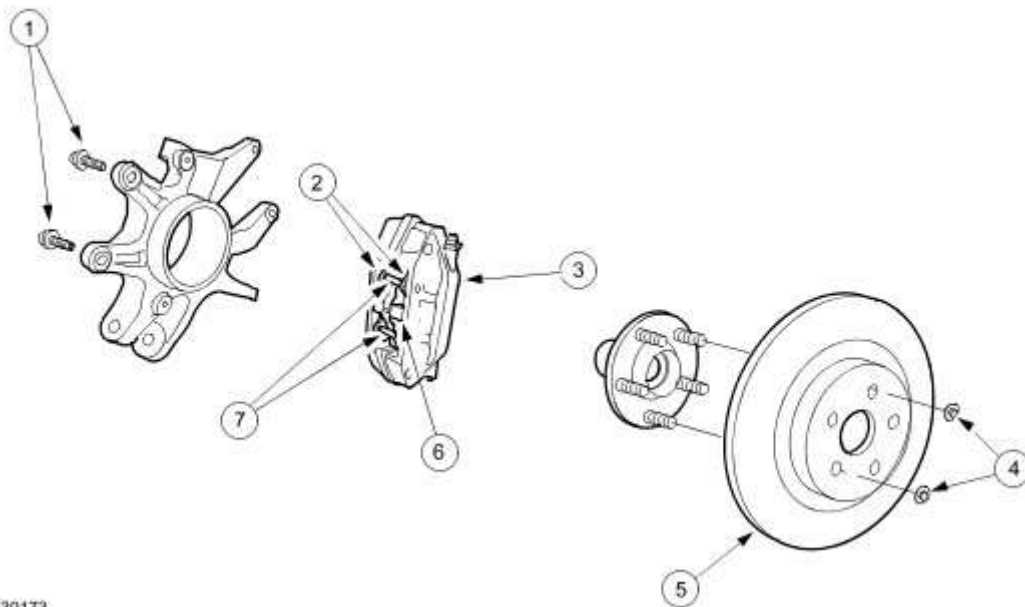
- Brake pads
- Single piston, floating calipers
- Brake discs
- Brake caliper anchor plates
- Steel braided brake hoses

The brake caliper has two retaining bolts that attach the brake caliper to the anchor plate. These are of single, sliding piston type which makes sure equal effort is applied through both brake pads. The anchor plate is attached to the wheel knuckle with two bolts. The hydraulic system provides separate circuits for each pair of diagonally opposed wheels (i.e. left front, right rear and right front, left rear).

The brake disc is manufactured from cast iron and is of the vented type. It is retained on the hub by two retaining clips and the wheel studs.

The rear brake caliper incorporates the parking brake of which is self adjusting according to brake pad wear.

Vehicles with Brembo brakes



E30173

Item	Part Number	Description
1	—	Brake caliper retaining bolts
2	—	Brake pads

3	—	Brake caliper
4	—	Brake disc retaining clips
5	—	Brake disc
6	—	Brake pad anti-rattle spring
7	—	Brake pad retaining pins

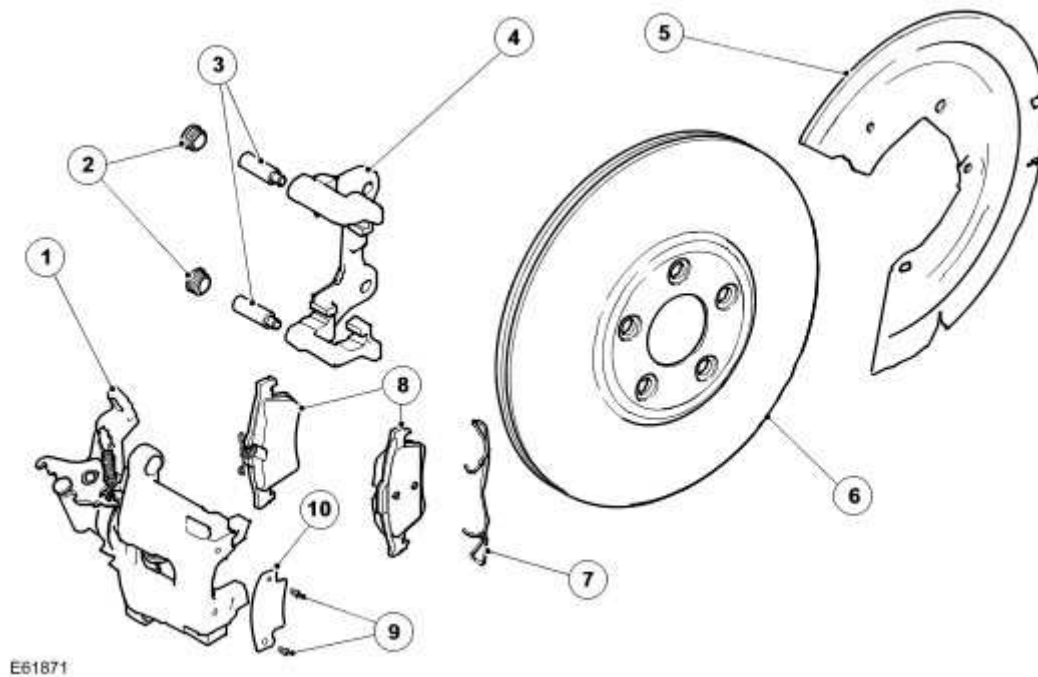
For vehicles with Brembo brakes, the brake system consists of the following components:

- Brake pads
- Four piston, fixed calipers
- Brake discs
- Steel braided brake hoses

The brake caliper has two retaining bolts that attach the brake caliper to the wheel knuckle. These are of four piston fixed type which makes sure that equal effort is applied through both brake pads. The hydraulic system provides separate circuits for each pair of diagonally opposed wheels (i.e. left front, right rear and right front, left rear).

The brake disc is manufactured from cast iron and is of the solid type. It is retained on the hub by two retaining clips and the wheel studs.

Rear Disc Brake - VIN Range: G45704- >G99999



Item	Part Number	Description
1	—	Brake caliper
2	—	Brake caliper retaining bolt dust covers
3	—	Brake caliper retaining bolts
4	—	Brake caliper anchor plate
5	—	Brake disc shield
6	—	Brake disc
7	—	Anti-rattle spring
8	—	Brake pads
9	—	Logo badge retaining screws (if equipped)
10	—	Logo badge (if equipped)

The brake system consists of the following components:

- Brake pads
- Single piston, floating calipers
- Brake discs
- Brake caliper anchor plates
- Steel braided brake hoses

The brake caliper has two retaining bolts that attach the brake caliper to the anchor plate. These are of single, sliding piston type. In addition, the high performance caliper has a logo

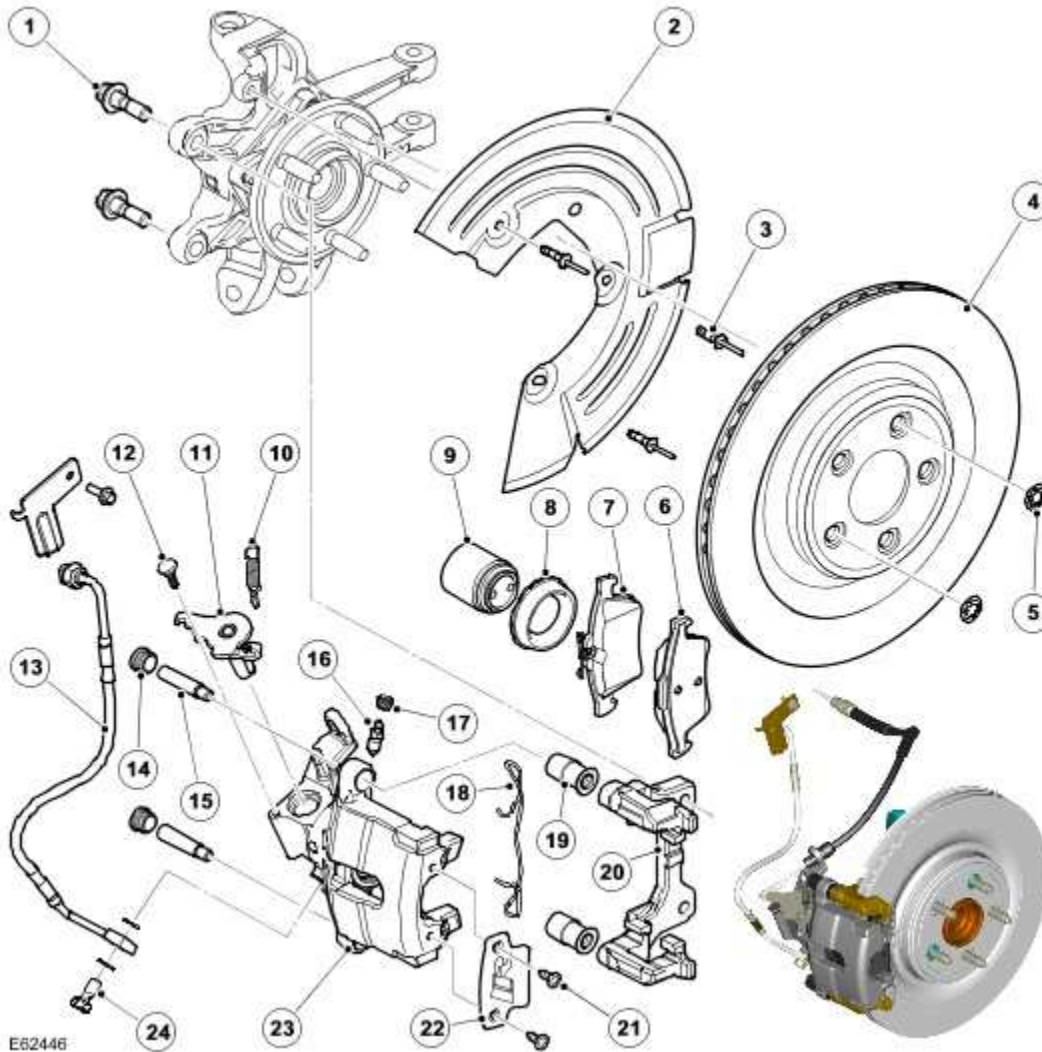
bagde which has to be removed when changing the brake pads. The anchor plate is attached to the wheel knuckle with two bolts. The hydraulic system provides separate circuits for each pair of diagonally opposed wheels (i.e. left front, right rear and right front, left rear).

The brake disc is manufactured from cast iron and is of the vented type. It is retained on the hub by two retaining clips and the wheel studs.

The rear brake caliper incorporates the parking brake of which is self adjusting according to brake pad wear.

Rear Disc Brake

COMPONENT LOCATION



Item	Part Number	Description
1		Caliper carrier bolts (2 off)
2		Brake dust shield
3		Rivets (3 off)
4		Brake disc
5		Retaining washers (2 off)
6		Outboard brake pad

7		Inboard brake pad
8		Piston dust cover
9		Piston
10		Parking brake return spring
11		Parking brake lever
12		Parking brake lever stop
13		Brake hose
14		Guide pin dust cover (2 off)
15		Guide pins (2 off)
16		Bleed screw
17		Bleed screw dust cap
18		Anti-rattle spring
19		Guide pin bush (2 off)
20		Caliper carrier
21		Screw (2 off) - (supercharged model)
22		'R' type logo badge (supercharged model)
23		Brake caliper housing
24		Bolt - brake hose to caliper

INTRODUCTION

The rear braking system on both the naturally aspirated and supercharged vehicles features 326 x 20 mm (12.83 x 0.79 in) diameter ventilated brake discs with aluminum, single acting piston, sliding calipers.

The brake calipers on the supercharged vehicle are painted and also include a logo badge. The logo badge must be removed in order to renew the brake pads.

The caliper is mounted within a fixed carrier that is secured to the rear wheel knuckle with 2 bolts. When hydraulic pressure is supplied to the caliper, the piston extends to force the inner pad against the brake disc. The caliper reacts and slides along 2 guide pins to bring the outer pad into contact with the brake disc.

Each inboard brake pad is installed with a wire type anti-rattle spring.

NOTE:

There is no wear indicator installed to the rear brake pads.

The brake disc is manufactured from cast iron and is of the vented type. The disc is retained on the wheel hub by 2 retaining washers and the wheel nuts.

Also incorporated into each rear brake caliper carrier is the parking brake mechanism. For additional information, refer to [Parking Brake](#) (206-05)

Repairs



CAUTION: Whilst carrying out rear parking brake related service procedures, the tension on the rear parking brake release actuator will need to be released. Failure to follow this instruction may result in the parking brake functioning incorrectly or becoming inoperative.

Before carrying out any work on the rear brakes, the Jaguar approved diagnostic system must be connected and the 'parking brake un-jam' routine run.

When all work is carried out on the rear brakes, the parking brake system will require resetting. For additional information, refer to [Parking Brake](#) (206-05)

Rear Disc Brake

For additional information, refer to [206-00](#).

Brake Caliper - Vehicles With: Standard Brakes, VIN Range: G00442->G45703 (70.55.03)

Special Service Tools

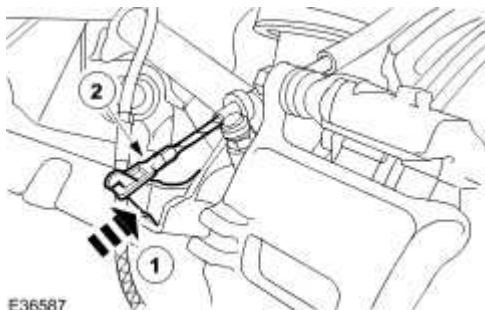


Brake pedal hold-down tool

JDS 9013

Removal

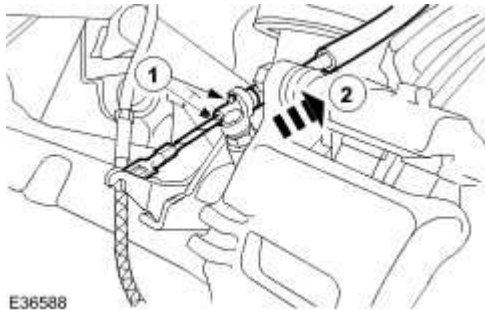
- 1 Carry out the parking brake cable tension release procedure.
 - For additional information, refer to [Parking Brake Cable Tension Release - VIN Range: G00442->G45703](#)
- 2 . Remove both rear wheels and tires.
For additional information, refer to [Wheel and Tire \(74.20.05\)](#)
- 3 . Detach the parking brake cable.
 - 1) Reposition the brake caliper lever.
 - 2) Detach the parking brake cable.



4 . Detach the parking brake cable.

1) Release the retaining tangs.

2) Detach the parking brake cable.



5



CAUTION: Brake fluid contains polyglycol ethers and polyglycols. Avoid contact with the eyes. Wash hands thoroughly after handling, as prolonged contact may cause irritation and dermatitis. If brake fluid contacts the eyes, flush the eyes with cold water or eyewash solution and seek medical attention. If taken internally do not induce vomiting, seek immediate medical attention. Failure to follow these instructions may result in personal injury.



CAUTION: If brake fluid comes into contact with the paintwork, the affected area must be immediately washed down with cold water.



CAUTION: The brake caliper must be supported at all times.



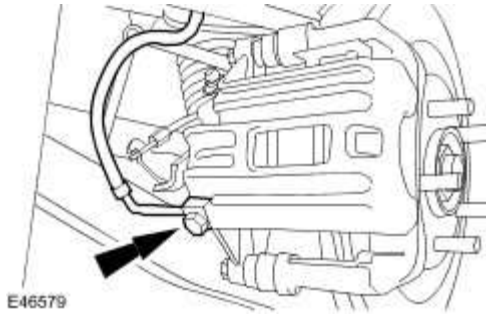
CAUTION: Cap the brake hose to prevent loss of fluid and prevent dirt ingress.

NOTE:

To prevent the loss of brake fluid, apply the brake pedal hold-down tool and adjust to hold the brake pedal down 40 mm (1.6 in).

Detach the brake hose.

▶ Remove and discard the sealing washers.



6 . NOTE:

Left-hand shown, right-hand similar.

Remove the brake caliper.

1) Remove and discard the brake caliper retaining bolts.

2) Remove the brake caliper.



Installation

1



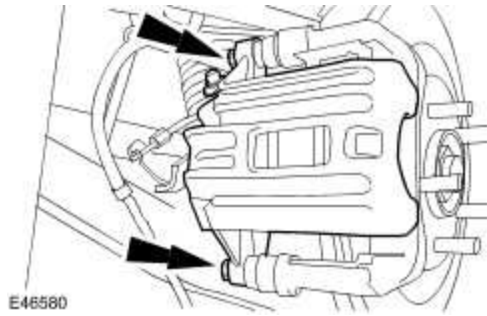
CAUTION: If brake fluid comes into contact with the paintwork, the affected area

must be immediately washed down with cold water.

Install the brake caliper.

▶ Install new brake caliper upper retaining bolts.

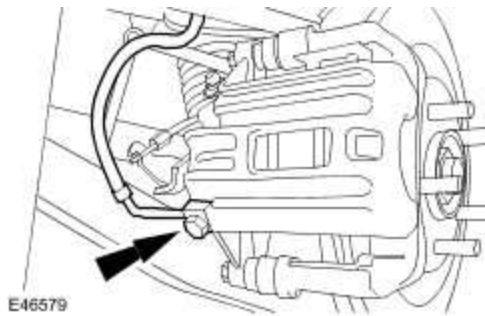
▶ Tighten to 34 Nm.



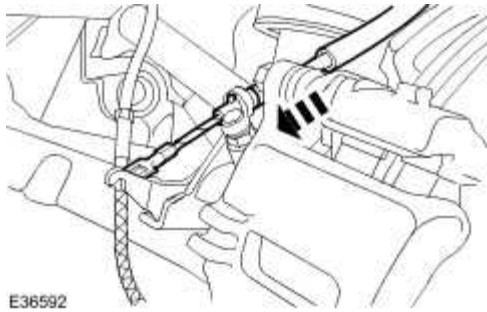
2 . Attach the brake hose.

▶ Install new sealing washers.

▶ Tighten to 35 Nm.



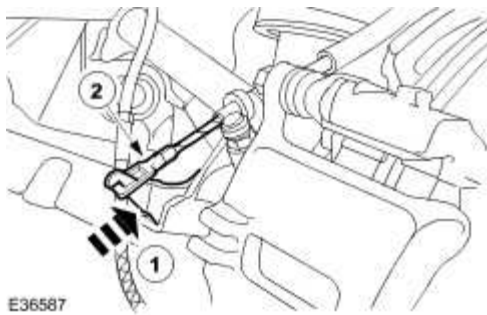
3 . Attach the parking brake cable.



4 . Attach the parking brake cable.

1) Reposition the brake caliper lever.

2) Attach the parking brake cable.



5 . Remove the brake pedal hold-down tool.

6 Bleed the brake system.

. For additional information, refer to [Brake System Bleeding - VIN Range: G00442->G45703 \(70.25.03\)](#)

7 . Install both rear wheels and tires.

For additional information, refer to [Wheel and Tire \(74.20.05\)](#)

Brake Caliper - Vehicles With: High Performance Brakes, VIN Range: G00442->G45703 (70.55.03)

Special Service Tools



Brake pedal hold-down tool
JDS 9013

Removal

- 1 Remove the brake pads.
 - For additional information, refer to [Brake Pads - Vehicles With: High Performance Brakes, VIN Range: G00442->G45703 \(70.40.03\)](#)

2



- **CAUTION:** Brake fluid contains polyglycol ethers and polyglycols. Avoid contact with the eyes. Wash hands thoroughly after handling, as prolonged contact may cause irritation and dermatitis. If brake fluid contacts the eyes, flush the eyes with cold water or eyewash solution and seek medical attention. If taken internally do not induce vomiting, seek immediate medical attention. Failure to follow these instructions may result in personal injury.



CAUTION: If brake fluid comes into contact with the paintwork, the affected area must be immediately washed down with cold water.

NOTE:

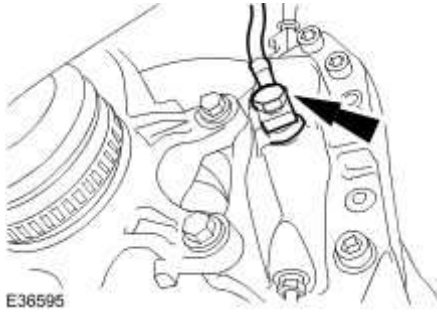
To prevent the loss of brake fluid, apply the brake pedal hold-down tool and adjust to hold the brake pedal down 40 mm (1.6 in).

NOTE:

Cap the brake hose to prevent loss of fluid and prevent dirt ingress.

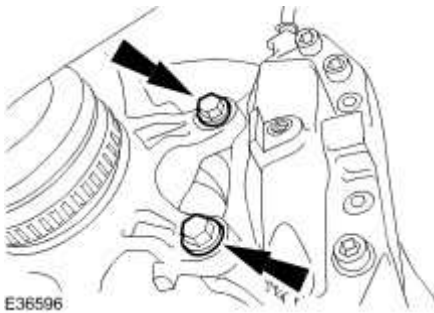
Detach the brake hose.

- ▶ Remove and discard the sealing washers.



3 . Remove the brake caliper.

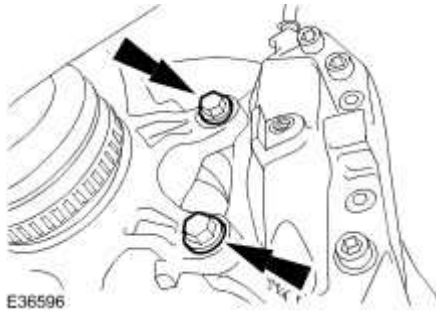
- ▶ Remove and discard the brake caliper retaining bolts.



Installation

1 . Install the brake caliper.

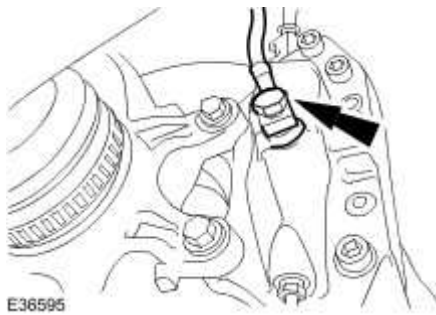
- ▶ Install new brake caliper retaining bolts.
- ▶ Tighten to 70 Nm.



2 . Attach the brake hose.

▶ Install new sealing washers.

▶ Tighten to 35 Nm.



3 . Remove the brake pedal hold-down tool.

4 Install the brake pads.

. For additional information, refer to [Brake Pads - Vehicles With: High Performance Brakes, VIN Range: G00442->G45703 \(70.40.03\)](#)

5 Bleed the brake system.

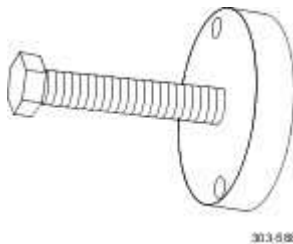
. For additional information, refer to [Brake System Bleeding - VIN Range: G00442->G45703 \(70.25.03\)](#)

Brake Caliper - VIN Range: G45704- >G99999 (70.55.03)

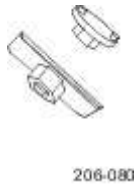
Special Service Tools



Brake pedal hold-down tool
JDS 9013



Crankshaft pulley/damper remover
303-588



Brake caliper piston retractor tool
206-080



Brake caliper piston retractor tool
206-081

Removal

All vehicles

- 1 Carry out the parking brake cable tension release procedure.

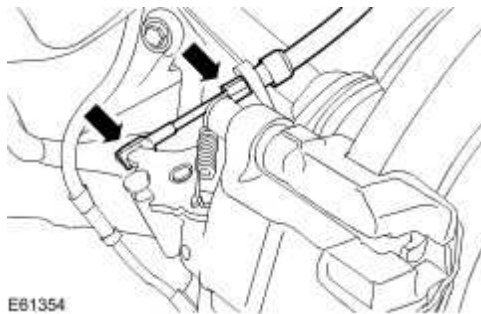
- 1 . For additional information, refer to [Parking Brake Cable Tension Release - VIN Range: G45704->G99999](#)

- 2 . Remove both rear wheels and tires.
For additional information, refer to

- 3 . **NOTE:**

Left-hand shown, right-hand similar.

Detach the parking brake cable.

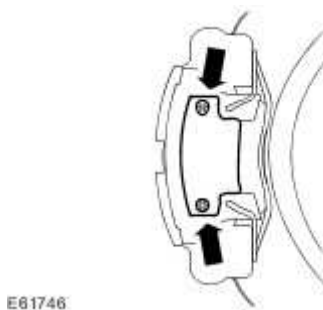


Vehicles with high performance brakes

- 4 . **NOTE:**

Left-hand shown, right-hand similar.

Remove the logo badge.

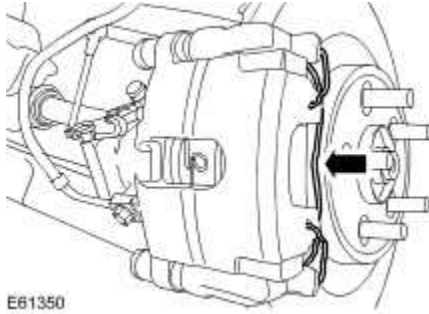


All vehicles

- 5 . **NOTE:**

Left-hand shown, right-hand similar.

Remove the anti-rattle spring.



6



CAUTION: Brake fluid contains polyglycol ethers and polyglycols. Avoid contact with the eyes. Wash hands thoroughly after handling, as prolonged contact may cause irritation and dermatitis. If brake fluid contacts the eyes, flush the eyes with cold water or eyewash solution and seek medical attention. If taken internally do not induce vomiting, seek immediate medical attention. Failure to follow these instructions may result in personal injury.



CAUTION: If brake fluid comes into contact with the paintwork, the affected area must be immediately washed down with cold water.



CAUTION: Cap the brake hose to prevent loss of fluid and prevent dirt ingress.

NOTE:

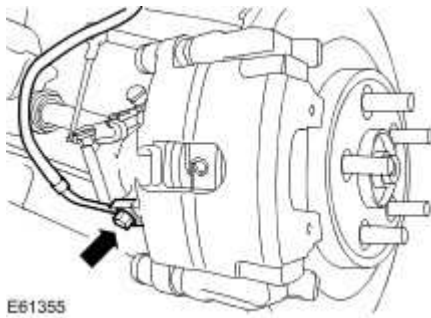
To prevent the loss of brake fluid, apply the brake pedal hold-down tool and adjust to hold the brake pedal down 40 mm (1.6 in).

NOTE:

Left-hand shown, right-hand similar.

Detach the brake hose.

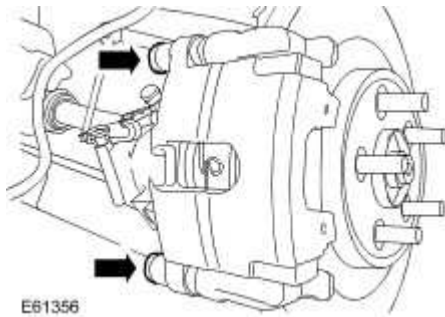
▶ Remove and discard the sealing washers.



7 . NOTE:

Left-hand shown, right-hand similar.

Remove the brake caliper retaining bolt dust covers.

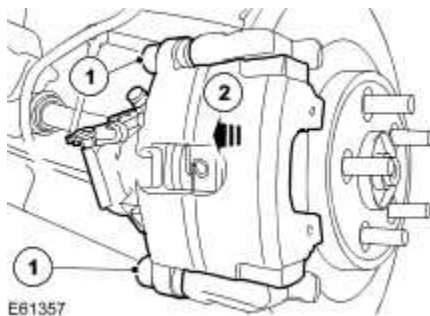


8 . NOTE:

Left-hand shown, right-hand similar.

Remove the brake caliper.

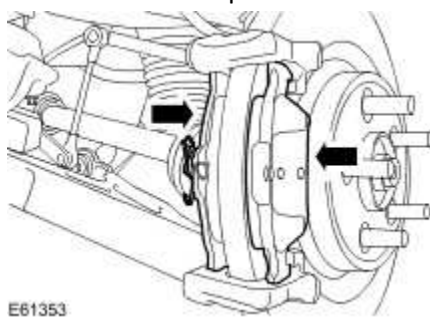
- 1) Remove the brake caliper retaining bolts.
- 2) Remove the brake caliper.



9 . NOTE:

Left-hand shown, right-hand similar.

Remove the brake pads.



Installation

All vehicles

1



· **WARNING:** Do not use compressed air to disperse brake dust into the atmosphere.



· **CAUTION:** Brake pads must always be replaced in axle sets.



· **CAUTION:** Make sure the brake disc faces are clean before installation.

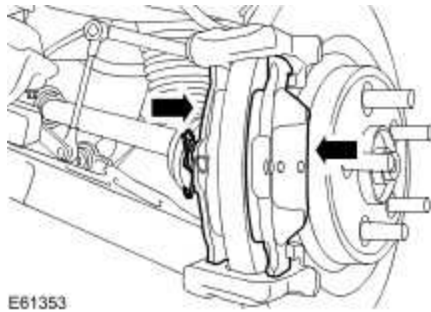
NOTE:

Make sure that the brake pad with the anti-rattle spring is installed to the inboard side of the brake disc.

NOTE:

Left-hand shown, right-hand similar.

Install the brake pads.



2



CAUTION: As the piston is pushed back into the caliper housing, the brake fluid level in the reservoir will rise. Do not allow the reservoir to overflow.



CAUTION: If brake fluid comes into contact with the paintwork, the affected area must be immediately washed down with cold water.

NOTE:

Only the extraction bolt from special tool 303-588 is used.

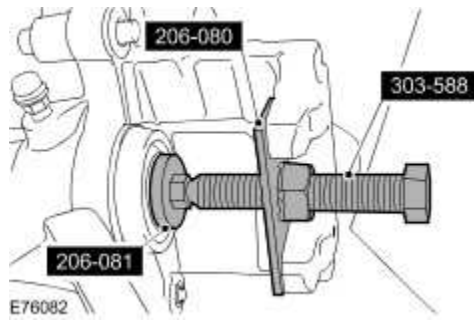
NOTE:

Only the forcing plate from special tool 206-080 is used.

NOTE:

Right-hand shown, left-hand similar.

Using the special tools, fully retract the brake caliper piston.



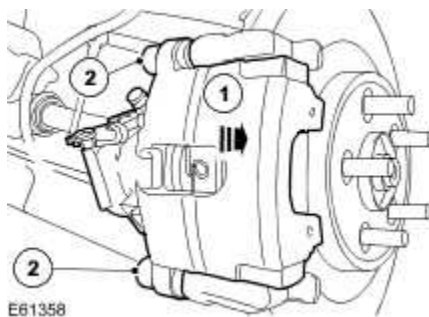
3 . NOTE:

Left-hand shown, right-hand similar.

Install the brake caliper retaining bolts.

1) Install the brake caliper.

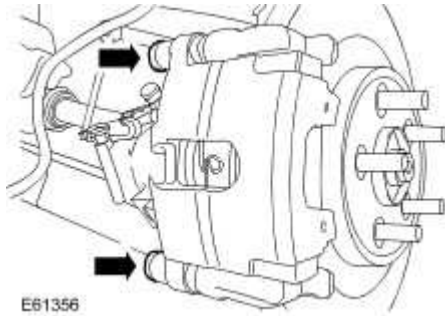
2) Tighten to 28 Nm.



4 . NOTE:

Left-hand shown, right-hand similar.

Install the brake caliper retaining bolt dust covers.



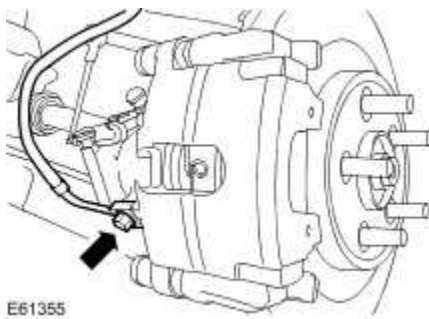
5 . NOTE:

Left-hand shown, right-hand similar.

Attach the brake hose.

▶ Install new sealing washers.

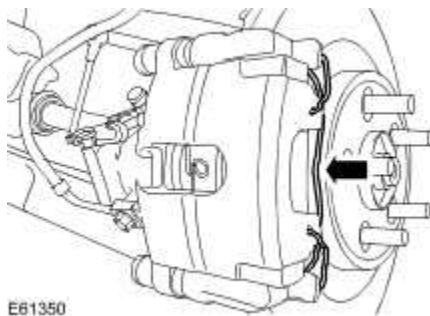
▶ Tighten to 35 Nm.



6 . NOTE:

Left-hand shown, right-hand similar.

Install the anti-rattle spring.



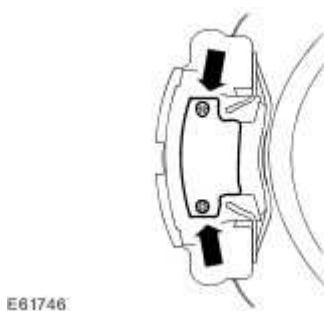
Vehicles with high performance brakes

7 . NOTE:

Left-hand shown, right-hand similar.

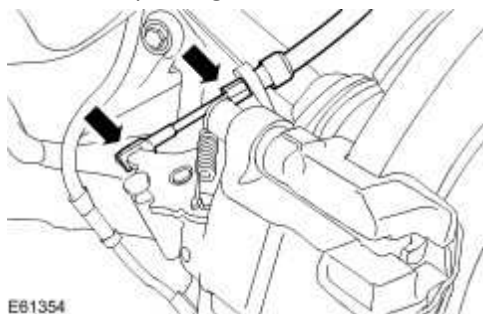
Install the logo badge.

▶ Tighten to 5 Nm.



All vehicles

8 . Attach the parking brake cable.



9 . Remove the brake pedal hold-down tool.

10 . Bleed the brake system.

For additional information, refer to

11 . Install both rear wheels and tires.

For additional information, refer to

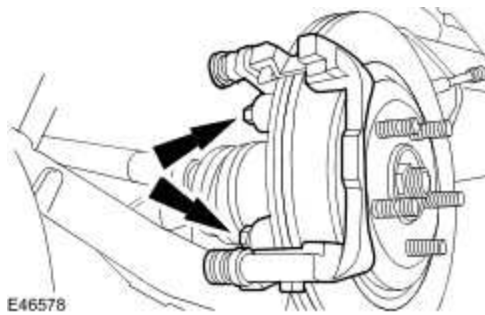
Brake Disc - Vehicles With: Standard Brakes, VIN Range: G00442->G45703 (70.10.11)

Removal

- 1 Remove the brake pads.
 - . For additional information, refer to [Brake Pads - Vehicles With: Standard Brakes, VIN Range: G00442->G45703 \(70.40.03\)](#)

2.  **CAUTION:** The brake caliper must be supported at all times.


Detach brake caliper anchor plate.

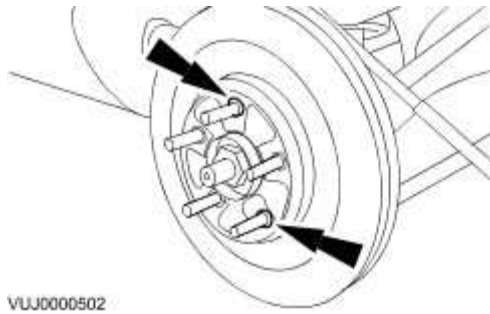


3 **NOTE:**

. If the same brake disc is to be installed, the tip of a hub must be marked with a corresponding part of the brake disc for alignment.

Remove the brake disc.

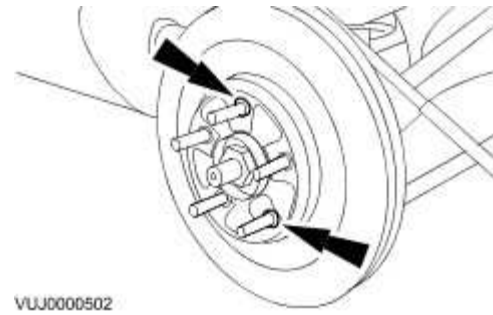
-  Remove and discard the brake disc retaining clips.



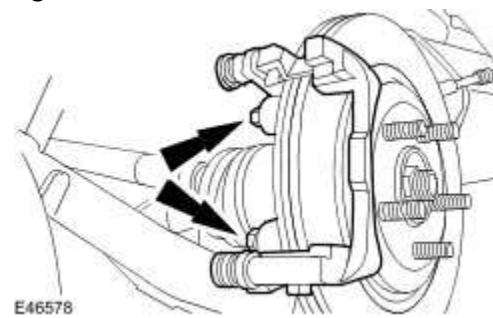
Installation

1 . To install, reverse the removal procedure.

▶ Install new brake disc retaining clips.



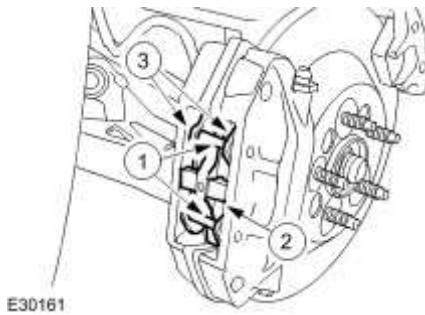
2 . Tighten to 103 Nm.



Brake Disc - Vehicles With: High Performance Brakes, VIN Range: G00442->G45703 (70.10.11)


Removal

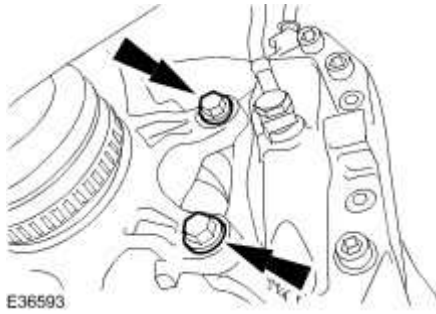
- 1 . Remove the parking brake pads. [<<206-05>>](#)
- 2 . Remove the brake pads.
 - 1) Remove the brake pad retaining pins.
 - 2) Remove the brake pad anti-rattle spring plate.
 - 3) Remove the brake pads.



- 3 .  **CAUTION: The brake caliper must be supported at all times.**

Detach the brake caliper and secure to one side.

-  Remove and discard the brake caliper retaining bolts.

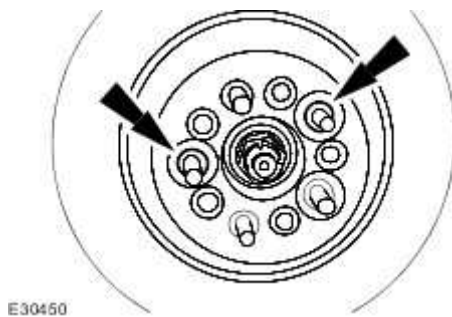


4 NOTE:

If the same brake disc is to be installed, the tip of a hub must be marked with a corresponding part of the brake disc for alignment.

Remove the brake disc.

➤ Remove and discard the brake disc retaining clips.



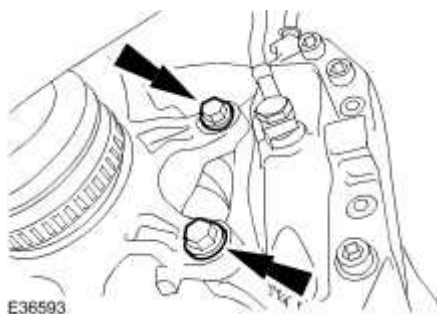
Installation

1 . NOTE:

Install new brake caliper retaining bolts.

To install, reverse the removal procedure.

➤ Tighten to 103 Nm.



Brake Disc - VIN Range: G45704->G999999 (70.10.11)

Removal

- 1 . Remove the brake pads.

For additional information, refer to [Brake Pads - VIN Range: G45704->G999999 \(70.40.03\)](#)

- 2 .




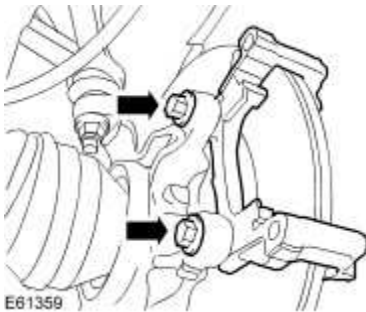
CAUTION: The brake caliper must be supported at all times.

NOTE:

Left-hand shown, right-hand similar.

Remove the brake caliper anchor plate.

 Remove and discard the brake caliper anchor plate retaining bolts.



- 3 **NOTE:**

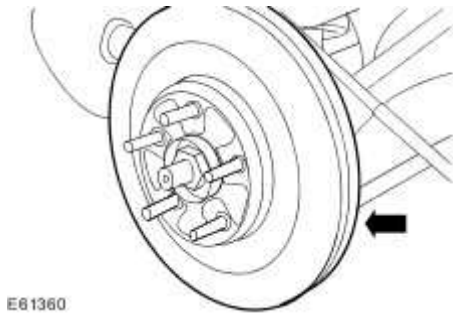
If the same brake disc is to be installed, the tip of a hub must be marked with a corresponding part of the brake disc for alignment.

NOTE:


Left-hand shown, right-hand similar.

Remove the brake disc.

- Remove and discard the brake disc retaining clips.



Installation

1.  **WARNING:** Do not use compressed air to disperse brake dust into the atmosphere.

 **CAUTION:** Brake discs must always be replaced in axle sets.

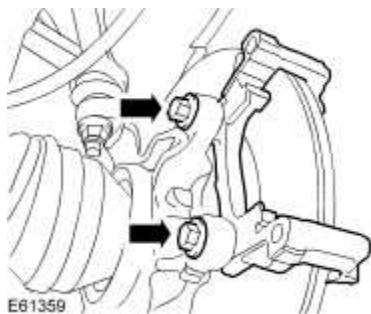
 **CAUTION:** Make sure the brake disc faces are clean before installation.

NOTE:

Left-hand shown, right-hand similar.

To install, reverse the removal procedure.

- Tighten to 103 Nm.



E61359

Brake Pads - Vehicles With: Standard Brakes, VIN Range: G00442->G45703 (70.40.03)

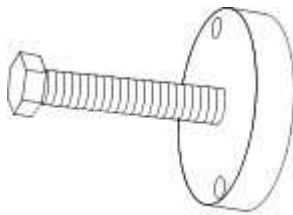
Special Service Tools



206-080

Brake caliper piston retractor tool

206-080



303-588

Crankshaft pulley/damper remover

303-588

Removal

1



- CAUTION: Whilst carrying out rear parking brake related service procedures, the tension on the rear parking brake release actuator will need to be released. Failure to follow this instruction may result in the parking brake to function incorrectly or become inoperative.

Carry out the parking brake cable tension release.

For additional information, refer to [Parking Brake - VIN Range: G00442->G45170](#)

2 . Remove both rear wheels and tires.

For additional information, refer to

3 . NOTE:

Left-hand shown, right-hand similar.

Detach the brake caliper.

1) Remove and discard the brake caliper retaining bolts.

2) Detach the brake caliper.

4 .



CAUTION: The brake caliper must be supported at all times.

NOTE:

Left-hand shown, right-hand similar.

Using a suitable tie strap, secure the caliper to one side.

5 . NOTE:

Left-hand shown, right-hand similar.

Remove the brake pads.



Remove the brake pad anti-rattle spring plates.

Installation

1



- **WARNING:** Do not use compressed air to disperse brake dust into the atmosphere.



CAUTION: If the pistons are pushed back into the housing, brake fluid will be forced back into the brake fluid reservoir.



CAUTION: Make sure that the brake disc faces are clean before installation.



CAUTION: Brake pads must always be replaced in axle sets.

NOTE:

Remove the forcing screw from the crankshaft pulley/damper remover and install to the brake caliper piston retractor tool.

NOTE:

Left-hand shown, right-hand similar.

Using the special tools, fully retract the brake caliper piston.

2 **NOTE:**

- Left-hand shown, right-hand similar.

Make sure the brake caliper piston location mark is in the correct position so that the locator pin on the brake pad locates correctly into the brake caliper piston.

3 NOTE:

Remove the forcing screw from the brake caliper piston retractor tool and install to the crankshaft pulley/damper remover.

NOTE:

Left-hand shown, right-hand similar.

Install new brake pads.

▶ Install the brake pad anti-rattle spring plates.

4 .



CAUTION: The brake caliper must be supported at all times.

NOTE:

Left-hand shown, right-hand similar.

Remove the tie strap.

5 . NOTE:

Left-hand shown, right-hand similar.

Attach the caliper.

▶ Install new brake caliper lower retaining bolts.

▶ Tighten to 34 Nm.

- 6 . Install both rear wheels and tires.
For additional information, refer to

7



- **CAUTION:** Calibrate the electric park brake using Jaguar approved diagnostic system.
If the Jaguar approved diagnostic system is not available disconnect the battery for approximately 30 seconds, the vehicle will then prompt the driver to carry out the calibration procedure as per the vehicle hand book on re-connection.

Calibrate the electric parking brake module using the Jaguar approved diagnostic system.


8 **NOTE:**

- Do not start the engine or operate the electronic park brake before depressing the brake pedal.


Repeatedly depress the brake pedal until brake pressure is evident.

Brake Pads - Vehicles With: High Performance Brakes, VIN Range: G00442->G45703 (70.40.03)


Removal

- 1  **CAUTION:** Whilst carrying out rear parking brake related service procedures, the tension on the rear parking brake release actuator will need to be released. Failure to follow this instruction may result in the parking brake to function incorrectly or become inoperative.


Carry out the parking brake cable tension release.
For additional information, refer to

- 2  **WARNING:** BRAKE DUST, IF INHALED CAN DAMAGE YOUR HEALTH. ALWAYS REMOVE BRAKE DUST USING A VACUUM BRUSH. DO NOT USE A COMPRESSED-AIR LINE TO DISPERSE BRAKE DUST INTO THE ATMOSPHERE. Failure to follow this instruction may result in personal injury.

 **CAUTION:** Brake pads must always be replaced in axle sets.

 **CAUTION:** Replacement of nuts and bolts: Various thread-locking devices are used on nuts and bolts throughout the vehicle. These devices restrict the number of times a nut or bolt can be used.

For additional information, refer to [General Service Information](#)

 **CAUTION:** The High performance brake caliper is aligned to the brake disc when it is first installed to the vehicle, therefore, care must be taken not to disturb this alignment. When removing the caliper; remove the bolts that secure the anchor bracket to the vertical link only. DO NOT loosen any other caliper bolts.

Open engine compartment and fit paint work protection covers to fenders.

3 . Raise rear of vehicle and support on stands.

For additional information, refer to [Jacking](#)

4 . Remove rear wheels.

For additional information, refer to

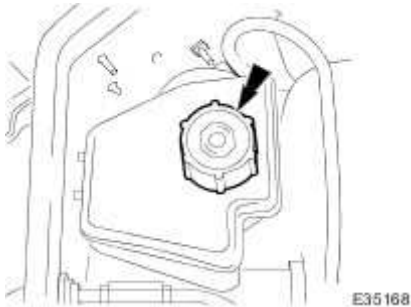
5



CAUTION: Remove brake fluid spillage immediately from paint work, with clean water.

Loosen brake fluid reservoir-cap.

▶ Position a cloth around the reservoir to collect any fluid spillage.

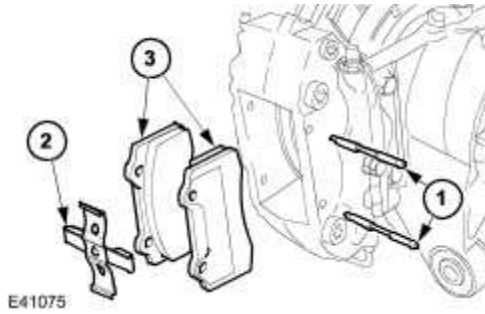


6 . Remove brake pads from caliper.

1) Withdraw pins from caliper.

2) Remove anti-rattle spring.

3) Remove brake pads.



7 . Clean all mating surfaces and remove brake dust, see WARNING above.

8 . Repeat above procedure to remove opposite side brake pads.

Installation

1

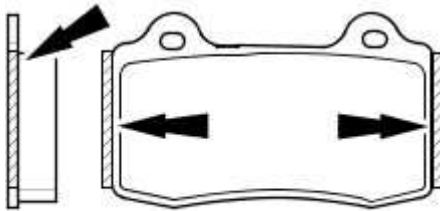


- CAUTION: Make sure grease does not contact brake-pad friction surface or brake disc.

To prevent brake squeal apply grease to the shoulders of the brake-pad backplate.

For additional information, refer to

- Apply a uniform layer of grease to backplate shoulders, making sure the whole shoulder is covered.



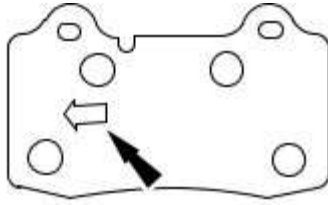
E41081

2



- CAUTION: Make sure the brake pads are fitted with the direction arrow following the direction of wheel rotation.

Make sure the brake pads are fitted with the direction arrow following the direction of wheel rotation.



E52793

3



CAUTION: Retracting the caliper piston may cause the fluid reservoir to over-flow. Remove brake fluid spillage immediately from paint work with clean water.



CAUTION: Make sure the brake pads are installed to the correct orientation.



CAUTION: Make sure the brake pads are fitted with the direction arrow following the direction of wheel rotation.



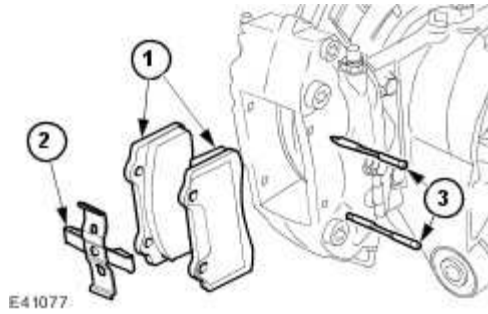
CAUTION: Note the condition of pins and replace if necessary.

NOTE:

Slowly retract caliper pistons.

Install brake pads.

- 1) Install pads.
- 2) Position anti-rattle spring.
- 3) Install pins - make sure pin collets are fully engaged into caliper.



4 . Repeat above procedure to install opposite side brake pads.

5 . Fit wheels.

For additional information, refer to

6 . Remove stands and lower vehicle.

For additional information, refer to [Jacking](#)

7



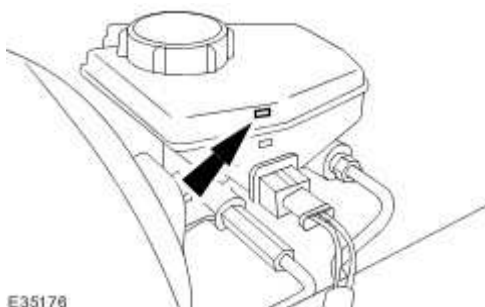
· **CAUTION: Remove brake fluid spillage immediately from paint work, with clean water.**

Check brake fluid level.

▶ Check brake fluid level is at the maximum mark.

▶ Remove cloth.

▶ Fit cap.



8 . Remove paint work protection covers, and close engine compartment.

9



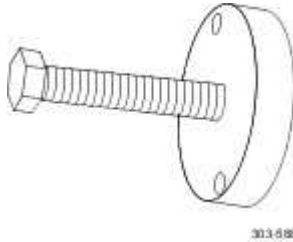
- **CAUTION: Calibrate the electric park brake using Jaguar approved diagnostic system.**
If the Jaguar approved diagnostic system is not available disconnect the battery for approximately 30 seconds, the vehicle will then prompt the driver to carry out the calibration procedure as per the vehicle hand book on re-connection.

Calibrate the electric parking brake module using the Jaguar approved diagnostic system.

10 . Start the engine and repeatedly press the brake pedal until brake pressure is evident.

Brake Pads - VIN Range: G45704->G99999 (70.40.03)

Special Service Tools



Crankshaft pulley/damper remover
303-588



Brake caliper piston retractor tool
206-080



Brake caliper piston retractor tool
206-081

Removal

All vehicles

1



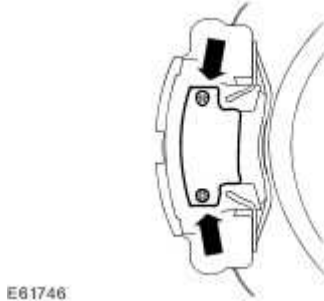
CAUTION: Whilst carrying out rear parking brake related service procedures, the tension on the rear parking brake release actuator will need to be released. Failure to follow this instruction may result in the parking brake to function incorrectly or become inoperative.

Carry out the parking brake cable tension release.
For additional information, refer to

- 2 . Remove both rear wheels and tires.
For additional information, refer to

Vehicles with high performance brakes

- 3 . Remove the logo badge.

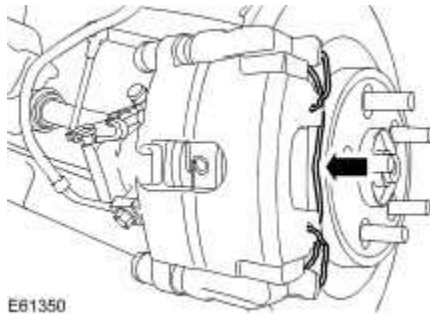


All vehicles

- 4 . **NOTE:**

Left-hand shown, right-hand similar.

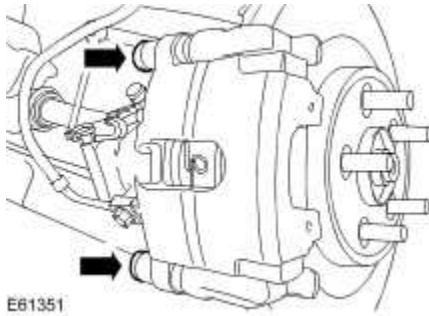
Remove the anti-rattle spring.



- 5 . **NOTE:**

Left-hand shown, right-hand similar.

Remove the brake caliper retaining bolt dust covers.



6 .



CAUTION: The brake caliper must be supported at all times.

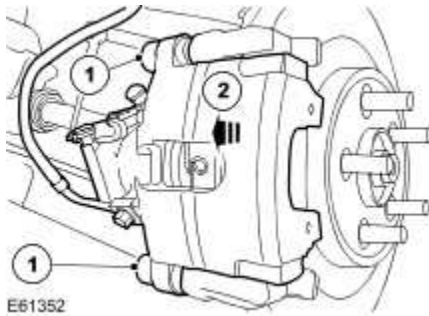
NOTE:

Left-hand shown, right-hand similar.

Detach the brake caliper.

1) Remove the brake caliper retaining bolts.

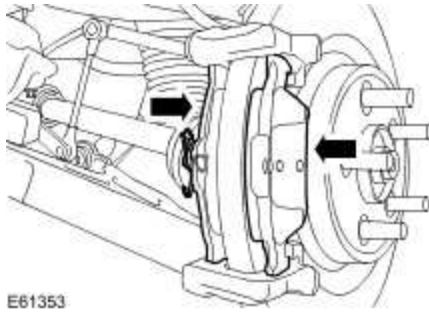
2) Detach the brake caliper.



7 . **NOTE:**

Left-hand shown, right-hand similar.

Remove the brake pads.



Installation

1



CAUTION: As the piston is pushed back into the caliper housing, the brake fluid level in the reservoir will rise. Do not allow the reservoir to overflow.



CAUTION: If brake fluid comes into contact with the paintwork, the affected area must be immediately washed down with cold water.

NOTE:

Only the extraction bolt from special tool 303-588 is used.

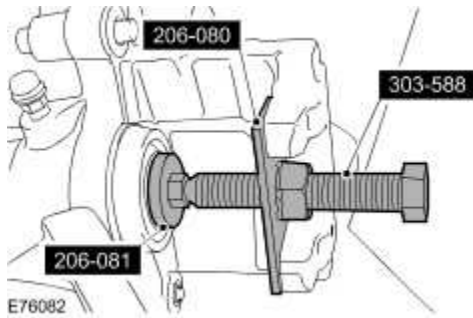
NOTE:

Only the forcing plate from special tool 206-080 is used.

NOTE:

Right-hand shown, left-hand similar.

Using the special tools, fully retract the brake caliper piston.



2



WARNING: Do not use compressed air to disperse brake dust into the atmosphere.



CAUTION: Make sure the brake disc faces are clean before installation.



CAUTION: Brake pads must always be replaced in axle sets.

NOTE:

Make sure that the brake pad with the anti-rattle spring is installed to the inboard side of the brake disc.

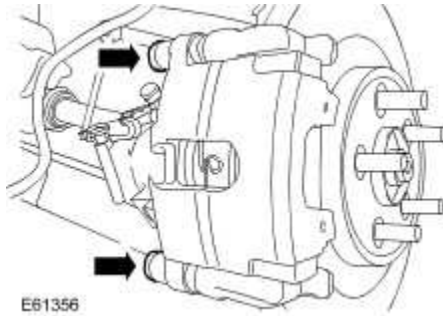
NOTE:

Left-hand shown, right-hand similar.

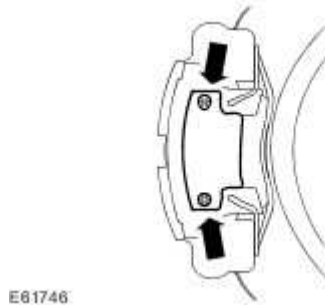
To install, reverse the removal procedure.



Tighten to 28 Nm.



3 . Tighten to 5 Nm.



4



- **CAUTION:** Calibrate the electric park brake using Jaguar approved diagnostic system. If the Jaguar approved diagnostic system is not available disconnect the battery for approximately 30 seconds, the vehicle will then prompt the driver to carry out the calibration procedure as per the vehicle hand book on re-connection.

Calibrate the electric parking brake module using the Jaguar approved diagnostic system.

5 **NOTE:**

- Do not start the engine or operate the electronic park brake before depressing the brake pedal.

Repeatedly depress the brake pedal until brake pressure is evident.

206-05 : Parking brake and Actuation

Specifications

Specifications

Description	Nm	lb-ft	lb-in
Parking brake caliper retaining bolts - vehicles with Brembo brakes	70	52	-
Parking brake module retaining nuts	4	-	35
Parking brake release actuator retaining bolts	20	15	-

Parking Brake Cable Tension Release - VIN Range: G00442->G45703

Special Service Tools



Electric parking brake release tool
206-082



CAUTION: The warranty of the electric parking brake release tool will be invalidated if the casing has been removed.

1.



WARNING: Always use the Jaguar Approved Diagnostic System to release the parking brake cable tension, when carrying out repair operations on the electric park brake which require the cable tension to be released.

Connect the Jaguar approved diagnostic system to release the parking brake cable tension.



WARNING: The procedure below should only be used in emergency situations, to release the electric parking brake. All calibration of the parking brake system will be lost, and the parking brake will need to be re-calibrated to function correctly.

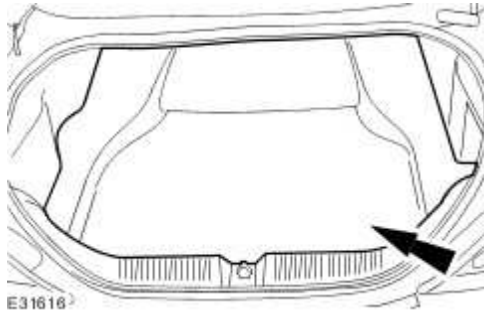
NOTE:

The tool shown must only be used in the event of an emergency.

2. Move the selector lever to the ' P ' position.

3. Release the parking brake.

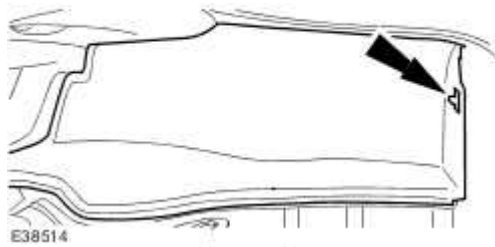
4. Remove the luggage compartment floor covering.



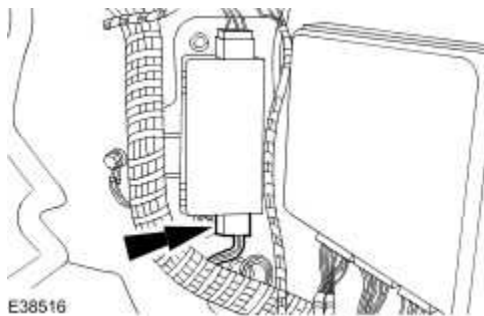
5. **NOTE:**

Left-hand shown, right-hand similar.

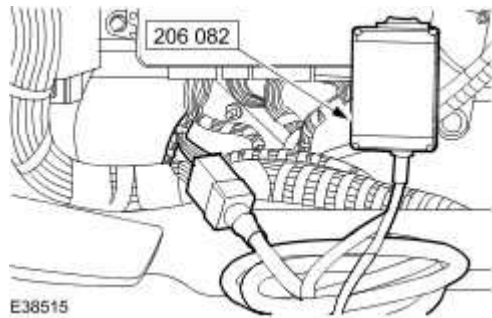
Remove the luggage compartment side trim panel.



6. Disconnect the parking brake module electrical connector



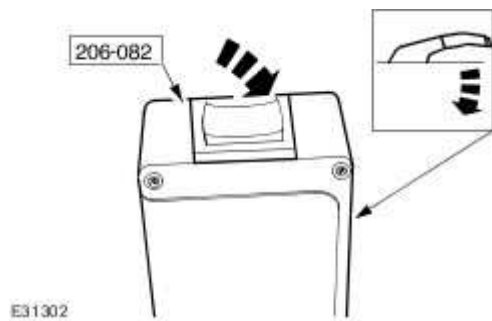
7. Connect the special tool to the parking brake module wiring harness electrical connector.



8. NOTE:

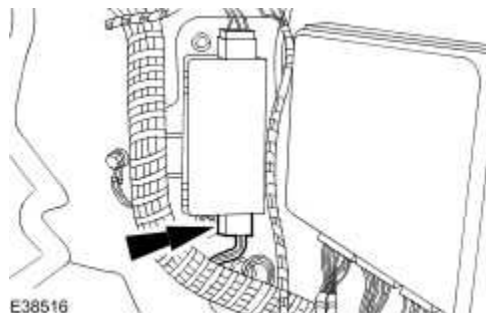
Operate the parking brake release tool until an audible noise is heard from the parking brake release actuator.

Release the parking brake cable tension.



9. Remove the special tool and carry out any necessary repair to the system.

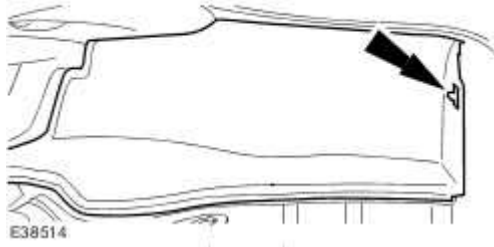
10. Connect the parking brake module electrical connector.



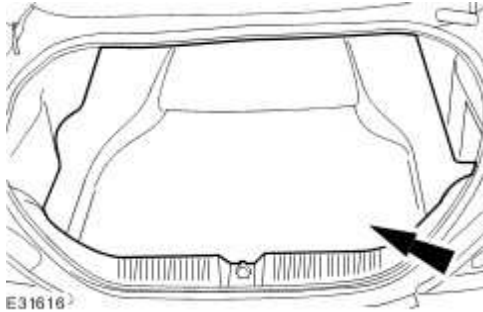
11. NOTE:

Left-hand shown, right-hand similar.

Install the luggage compartment side trim panel.



12. Remove the luggage compartment floor covering.



13. **NOTE:**

The brake pedal must be applied when calibrating the parking brake switch.

Apply the parking brake.

14.



CAUTION: Calibrate the electric park brake using Jaguar approved diagnostic system. If the Jaguar approved diagnostic system is not available disconnect the battery for approximately 30 seconds, the vehicle will then prompt the driver to carry out the calibration procedure as per the vehicle hand book on re-connection.

Calibrate the electric parking brake module using the Jaguar approved diagnostic system.

Parking Brake Cable Tension Release - VIN Range: G45704->G99999

Special Service Tools



Electric parking brake release tool
206-082



Electric parking brake release tool
206-082-01



CAUTION: The warranty of the electric parking brake release tool will be invalidated if the casing has been removed.

1.



WARNING: Always use the Jaguar Approved Diagnostic System to release the parking brake cable tension, when carrying out repair operations on the electric park brake which require the cable tension to be released.

Connect the Jaguar approved diagnostic system to release the parking brake cable tension.

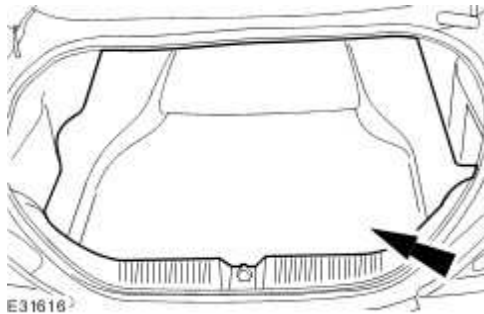


WARNING: The procedure below should only be used in emergency situations, to release the electric parking brake. All calibration of the parking brake system will be lost, and the parking brake will need to be re-calibrated to function correctly.

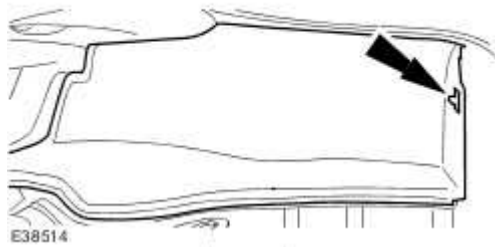
NOTE:

The tool shown must only be used in the event of an emergency.

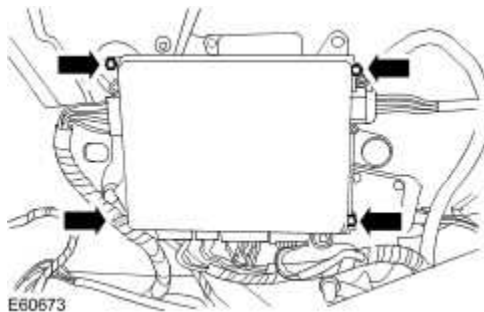
2. Move the selector lever to the ' P ' position.
3. Release the parking brake.
4. Remove the luggage compartment floor covering.



5. Remove the luggage compartment side trim panel.



6. Detach the rear electronic module (REM).



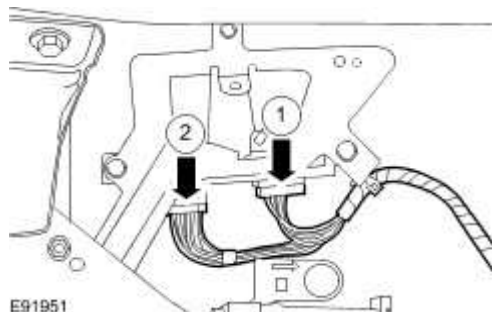
- 7.



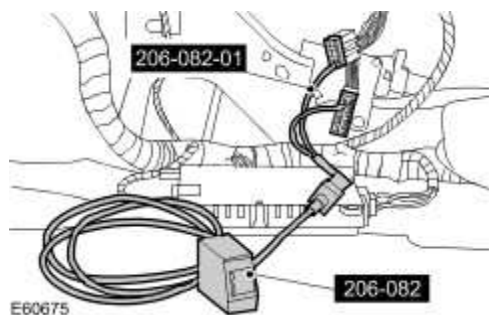
CAUTION: Disconnect the parking brake module electrical connectors in the sequence

shown. Failure to follow this instruction may result in diagnostic trouble codes being stored in the module.

Disconnect the parking brake module electrical connectors.



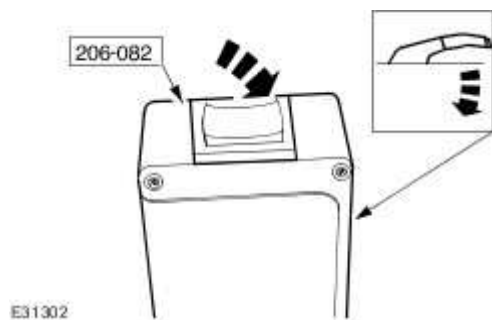
8. Connect the special tools to the parking brake module wiring harness electrical connectors.



9. **NOTE:**

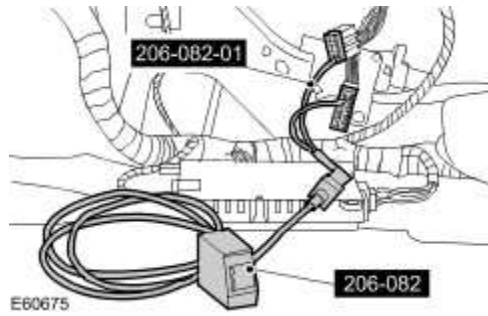
Operate the parking brake release tool until an audible noise is heard from the parking brake release actuator.

Release the parking brake cable tension.



10. Remove the special tool and carry out any necessary repair to the system.

11. Disconnect the special tools from the parking brake module wiring harness electrical connectors.

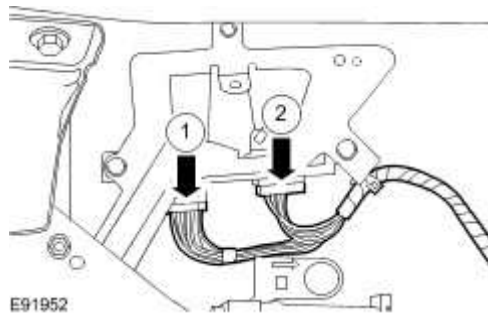


12.



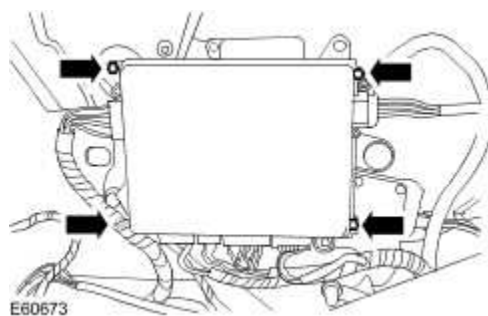
CAUTION: Connect the parking brake module electrical connectors in the sequence shown. Failure to follow this instruction may result in diagnostic trouble codes being stored in the module.

Connect the parking brake module electrical connectors.

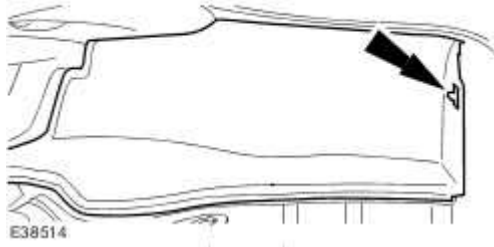


13. Attach the REM.

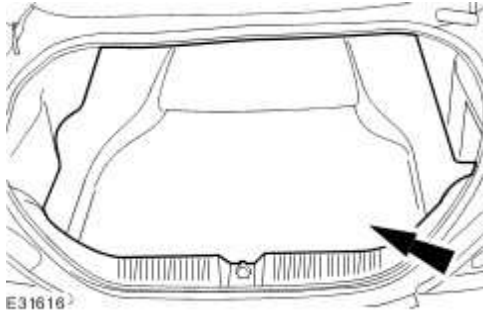
- Tighten to 6 Nm.



14. Install the luggage compartment side trim panel.



15. Install the luggage compartment floor covering.



16. **NOTE:**

The brake pedal must be applied when calibrating the parking brake switch.

Apply the parking brake.

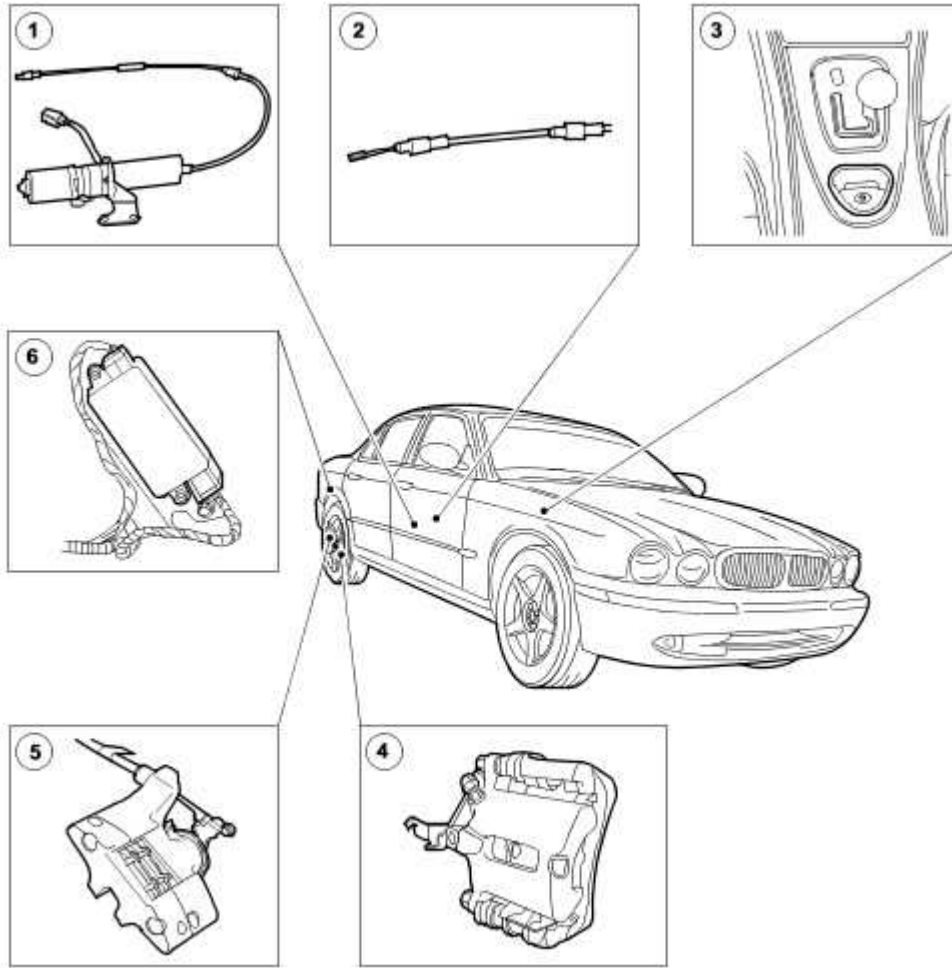
17.



CAUTION: Calibrate the electric park brake using Jaguar approved diagnostic system. If the Jaguar approved diagnostic system is not available disconnect the battery for approximately 30 seconds, the vehicle will then prompt the driver to carry out the calibration procedure as per the vehicle hand book on re-connection.

Calibrate the electric parking brake module using the Jaguar approved diagnostic system.

Parking Brake - VIN Range: G00442- >G45703



E38590

Item	Part Number	Description
1	—	Parking brake actuator
2	—	Parking brake cable
3	—	Parking brake switch
4	—	Parking brake caliper (vehicles without Brembo brakes)

5	—	Parking brake caliper (vehicles with Brembo brakes)
6	—	Parking brake module

Electric Park Brake

The electric park brake (EPB) system is operated by a floor console mounted switch. The rear calipers are activated by cables from an electric motor and actuator unit which is mounted on the rear subframe. Overall control of the EPB is from a control module which is located in the luggage compartment behind the right-hand rear luggage compartment trim panel. On vehicles with Brembo brakes separate parking brake calipers are fitted.

EPB Operation

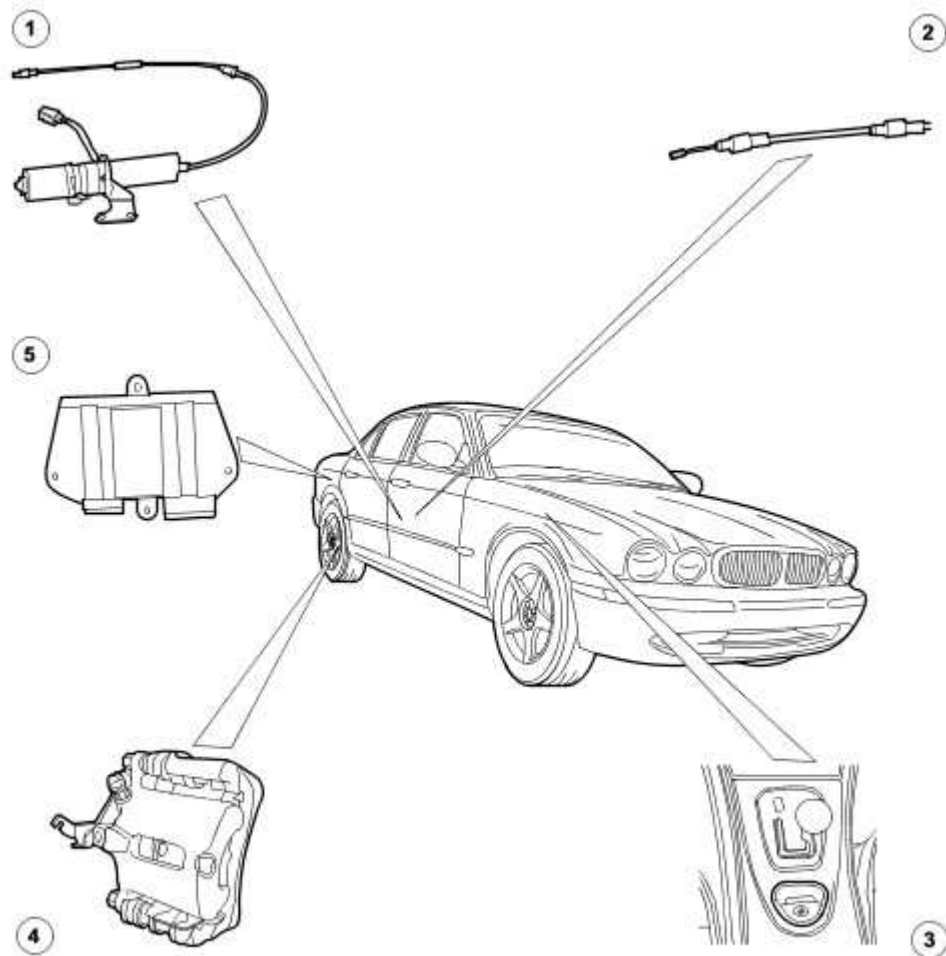
To apply the parking brake, pull the parking brake switch upwards and release. The switch will then return to the neutral position and the parking brake low fluid warning light will illuminate on the instrument cluster. To release the parking brake set the ignition switch to position 2 or with the engine running, apply the footbrake and press the parking brake switch down. The parking brake is automatically released when the selector is moved from the 'P' position.

If the vehicle is stationary and the gear selector is in 'D' or 'R' and the parking brake is applied, then the parking brake will automatically release when the accelerator pedal is depressed.

The parking brake is automatically applied when the key is removed from the ignition switch. If the parking brake is required to be permanently released press and hold the parking brake switch down and at the same time remove the key. If the parking brake is operated while the vehicle is in motion the message 'PARKBRAKE ON' will be displayed on the message centre. The warning lamp in the instrument cluster will be illuminated and a warning chime will sound.

If the battery has been discharged or disconnected a message 'APPLY PARKBRAKE' will be displayed when the ignition is next switched on. Apply the footbrake and pull the parking brake switch up to apply the parking brake. This is required to reset the parking brake system which will now function correctly.

Parking Brake - VIN Range: G45704- >G99999



E60940

Item	Part Number	Description
1	—	Parking brake actuator
2	—	Parking brake cable
3	—	Parking brake switch
4	—	Brake caliper
5	—	Parking brake module

Electric Park Brake

The electric park brake (EPB) system is operated by a floor console mounted switch. The rear calipers are activated by cables from an electric motor and actuator unit which is mounted on the rear subframe. Overall control of the EPB is from a control module which is located in the luggage compartment behind the right-hand rear luggage compartment trim panel and above and behind the rear electronic module (REM).

EPB Operation

To apply the parking brake, pull the parking brake switch upwards and release. The switch will then return to the neutral position and the parking brake low fluid warning light will illuminate on the instrument cluster. To release the parking brake set the ignition switch to position 2 or with the engine running, apply the footbrake and press the parking brake switch down. The parking brake is automatically released when the selector is moved from the 'P' position.

If the vehicle is stationary and the gear selector is in 'D' or 'R' and the parking brake is applied, then the parking brake will automatically release when the accelerator pedal is depressed.

The parking brake is automatically applied when the key is removed from the ignition switch. If the parking brake is required to be permanently released press and hold the parking brake switch down and at the same time remove the key. If the parking brake is operated while the vehicle is in motion the message 'PARKBRAKE ON' will be displayed on the message centre. The warning lamp in the instrument cluster will be illuminated and a warning chime will sound.

If the battery has been discharged or disconnected a message 'APPLY PARKBRAKE' will be displayed when the ignition is next switched on. Apply the footbrake and pull the parking brake switch up to apply the parking brake. This is required to reset the parking brake system which will now function correctly.

Parking Brake - VIN Range: G00442- >G45170

Inspection and Verification

- 1 . Verify the customer concern.
- 2 . Visually inspect for obvious signs of mechanical or electrical damage.

Mechanical	Electrical
Parking brake cable	Fuse(s)
Parking brake actuator	Wiring harness/electrical connectors
Parking brake caliper	Check for bent/corroded pins
Parking brake pads	Parking brake switch
Drop link caps	Parking brake module

3 . If an obvious cause for an observed or reported concern is found, correct the cause (if possible) before proceeding to the next step.

4 . If the cause is not visually evident and the Jaguar approved diagnostic system is not available, use a suitable code reader to retrieve any fault codes before proceeding to the Diagnostic Trouble Code (DTC) Index Chart (or the Symptom Chart if no DTCs are set), for actions to take.

Symptom Chart

Symptom	Possible Sources	Action
The parking brake will not engage or release	<ul style="list-style-type: none"> • Cables fouled, trapped or damaged • Cables incorrectly routed or fixed • Rear lining wear • Service brake incorrectly adjusted following lining change • Caliper malfunction 	<ul style="list-style-type: none"> • Check the rear and primary cables for fouling, trapping or damage • Check the cable routing between caliper and subframe mountings. Make sure the cables sit above the rear anti-roll bar drop link caps, and that the drop link caps are not damaged • Check that the rear cable end fitting connector is correctly fitted into the caliper bracket, and is not damaged

	<ul style="list-style-type: none"> • Actuator malfunction 	<ul style="list-style-type: none"> • Check that the rear cable end fitting connector is correctly fitted into the subframe bracket and is not damaged • Check the 'C' clip between the cable and the subframe for fit/damage • Check that the cable is correctly located into the reaction and connector brackets • Inspect the rear brake linings (parkbrake caliper linings for vehicles with supercharger) for wear • Check the parkbrake cable for correct adjustment • Fully retract the cables. Pump the brake pedal hard five times • Check the condition of the rear caliper (parkbrake caliper for vehicles with supercharger). Make sure the caliper return spring is correctly fitted • Check the actuator for damage and/or excessive noise in normal operation • For additional information, Parking Brake Cable Tension Release - VIN Range: G00442->G45703 Parking Brake Pads - Vehicles With: High Performance Brakes (70.40.04) Parking Brake Rear Cables Parking Brake Module - VIN Range: G00442->G45703 (70.35.47) Parking Brake Release Actuator - VIN Range: G00001->G03445 (70.35.45)
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Driver Information Chart

Warning	Message	Possible Source	Action
Yellow priority light	Apply parkbrake	Parkbrake not calibrated	Depress footbrake and apply parkbrake at the same time (the parkbrake should now be correctly calibrated. Check for correct function)
Yellow priority light/Red, flashing priority light	Parkbrake fault	<ul style="list-style-type: none"> • Parkbrake Apply switch circuit failure • Parkbrake Apply switch circuit short to ground • Parkbrake Release switch circuit failure • Parkbrake Release switch 	Check DTCs. Refer to the DTC index for relevant pinpoint test

		circuit short to ground <ul style="list-style-type: none"> • Parkbrake Apply and Release switch contacts energized simultaneously • Parkbrake motor output short to ground • Parkbrake motor output open circuit • Parkbrake motor output battery short to ground 	
Warning chime	Parkbrake on	Parkbrake applied with vehicle in motion	Release parkbrake

Diagnostic Trouble Code (DTC) index

DTC	Description	Possible Source	Action
B1342	Control module failure	<ul style="list-style-type: none"> • Power supply to module failure • Ground to module failure • Control module failure 	For EPB control module power and ground tests, GO to Pinpoint Test G295394p1 .
C1094	Parkbrake Apply switch circuit failure	<ul style="list-style-type: none"> • Connector pin(s) bent • Connector loose or corroded • Harness fault 	For EPB switch circuit tests, GO to Pinpoint Test G295394p2 .
C1769	Parkbrake Apply switch circuit short to ground	<ul style="list-style-type: none"> • Connector pin(s) bent • Connector loose or corroded • Harness fault 	For EPB switch circuit tests, GO to Pinpoint Test G295394p2 .
C1782	Parkbrake Release switch circuit failure	<ul style="list-style-type: none"> • Connector pin(s) bent • Connector loose or corroded • Harness fault 	For EPB switch circuit tests, GO to Pinpoint Test G295394p2 .
C1783	Parkbrake Release switch circuit short to ground	<ul style="list-style-type: none"> • Connector pin(s) bent • Connector loose or corroded • Harness fault 	For EPB switch circuit tests, GO to Pinpoint Test G295394p2 .
C1989	Parkbrake Apply and Release switch contacts energized simultaneously	<ul style="list-style-type: none"> • Connector pin(s) bent • Connector loose or corroded 	For EPB switch tests, GO to Pinpoint Test

		<ul style="list-style-type: none"> • Harness fault 	G295394p3.
C1784	Parkbrake motor output short to ground	<ul style="list-style-type: none"> • Fuse failure • Connector pin(s) bent • Connector loose or corroded • Harness fault 	For EPB motor circuit tests, GO to Pinpoint Test G295394p4.
C1785	Parkbrake motor output open circuit	<ul style="list-style-type: none"> • Fuse failure • Connector pin(s) bent • Connector loose or corroded • Harness fault 	For EPB motor circuit tests, GO to Pinpoint Test G295394p4.
C1786	Parkbrake motor output battery short to ground	<ul style="list-style-type: none"> • Fuse failure • Connector pin(s) bent • Connector loose or corroded • Harness fault 	For EPB motor circuit tests, GO to Pinpoint Test G295394p4.
C1799	Hall effect sensor circuit failure	<ul style="list-style-type: none"> • Hall effect circuit open circuit • Hall effect circuit short circuit to ground 	For hall effect sensor circuit tests, GO to Pinpoint Test G295394p5.
C1801	Greater than expected motor current draw reached before expected travel (motor current draw compared to expected number of turns)	<ul style="list-style-type: none"> • Cables fouled, trapped or damaged • Cables incorrectly routed or fixed • Rear lining wear • Service brake not correctly adjusted following lining change • Caliper malfunction • Actuator malfunction 	Refer to the symptom chart for actions regarding mechanical operation
C1802	Greater than expected travel for measured current draw (motor current draw compared to expected number of turns)	<ul style="list-style-type: none"> • Cables incorrectly routed or fixed • Rear lining wear • Service brake not correctly adjusted following lining change • Caliper malfunction • Actuator malfunction 	Refer to the symptom chart for actions regarding mechanical operation
C1803	Less than expected travel for parkbrake release	<ul style="list-style-type: none"> • Cables fouled, trapped or damaged • Cables incorrectly 	Refer to the symptom chart for actions regarding mechanical

		routed or fixed <ul style="list-style-type: none"> • Rear lining wear • Service brake not correctly adjusted following lining change • Caliper malfunction • Actuator malfunction 	operation
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Pinpoint Tests



CAUTION: When probing connectors to take measurements in the course of the pinpoint tests, use the adaptor kit, part number 3548-1358-00.

NOTE:

Inspect connectors for signs of water ingress, and pins for damage and/or corrosion.

NOTE:

When performing electrical voltage or resistance tests, always use a digital multimeter (DMM) accurate to 3 decimal places, and with an up-to-date calibration certificate. When testing resistance, always take the resistance of the DMM leads into account.

NOTE:

Check and rectify basic faults before beginning diagnostic routines involving pinpoint tests.

PINPOINT TEST G295394p1 : DTC B1342; CONTROL MODULE FAILURE

G295394t1 : CHECK THE POWER SUPPLY TO THE EPB CONTROL MODULE

1. Disconnect the EPB control module electrical connector, CR50. 2. Measure the voltage between CR50, pin 01 (NW) and GROUND.

- Is the voltage less than 10 volts?

-> Yes

REPAIR the circuit between the EPB control module and battery. This circuit includes the battery junction box (fuse 32). For additional information, refer to the wiring diagrams. CLEAR the DTC. TEST

the system for normal operation.

-> **No**

GO to Pinpoint Test [G295394t2](#).

G295394t2 : CHECK THE GROUND TO THE EPB CONTROL MODULE

1. Measure the resistance between CR50, pin 04 (B) and GROUND.

- **Is the resistance greater than 5 ohms?**

-> **Yes**

REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC. TEST the system for normal operation.

-> **No**

Contact dealer technical support for advice on possible EPB control module failure.

PINPOINT TEST G295394p2 : DTC C1094, C1769, C1782, C1783; PARK BRAKE APPLY SWITCH CIRCUIT FAILURE/SHORT TO GROUND, PARK BRAKE RELEASE SWITCH CIRCUIT FAILURE/SHORT TO GROUND

G295394t3 : CHECK THE SIGNAL GROUND TO THE EPB SWITCHPACK

1. Measure the resistance between TL82, pin 02 (BK) and GROUND.

- **Is the resistance greater than 5 ohms?**

-> **Yes**

GO to Pinpoint Test [G295394t4](#).

-> **No**

GO to Pinpoint Test [G295394t5](#).

G295394t4 : CHECK THE SIGNAL GROUND CIRCUIT TO THE EPB SWITCHPACK FOR HIGH RESISTANCE

1. Disconnect the battery negative terminal. 2. Disconnect the EPB control module electrical connector, CR32. 3. Measure the resistance between TL82, pin 06 (WU) and CR32, pin 12 (WU).

- **Is the resistance greater than 5 ohms?**

-> **Yes**

REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC. TEST the system for normal operation.

-> **No**

GO to Pinpoint Test [G295394t5](#).

G295394t5 : CHECK THE VOLTAGE FROM THE EPB CONTROL MODULE TO THE SWITCHPACK

1. Reconnect the battery negative terminal. 2. Reconnect the EPB control module electrical connector, CR32. 3. Turn the ignition switch to the **ON** position. 4. Measure the voltage between TL82, pin 08 (WU) and GROUND. 5. Measure the voltage between TL82, pin 04 (RW) and GROUND.

- **Is either voltage less than 3 volts?**

-> **Yes**

GO to Pinpoint Test [G295394t6](#).

-> **No**

Check the EPB switch function. CLEAR the DTC. TEST the system for normal operation.

G295394t6 : CHECK THE EPB CONTROL MODULE TO SWITCHPACK CIRCUITS FOR HIGH RESISTANCE

1. Disconnect the battery negative terminal. 2. Disconnect the EPB control module electrical connector, CR32. 3. Measure the resistance between TL82, pin 08 (WU) and CR32, pin 05 (WU). 4. Measure the resistance between TL82, pin 04 (RW) and CR32, pin 06 (RW).

- **Is either resistance greater than 5 ohms?**

-> **Yes**

REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC. TEST the system for normal operation.

-> **No**

GO to Pinpoint Test [G295394t7](#).

G295394t7 : CHECK THE EPB CONTROL MODULE TO SWITCHPACK CIRCUITS FOR SHORT TO GROUND

1. Reconnect the battery negative terminal. 2. Measure the resistance between TL82, pin 08 (WU) and GROUND. 3. Measure the resistance between TL82, pin 04 (RW) and GROUND.

- **Is either resistance less than 10,000 ohms?**

-> **Yes**

REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC. TEST the system for normal operation.

-> **No**

Contact dealer technical support for advice on possible EPB control module failure.

PINPOINT TEST G295394p3 : DTC C1989; PARK BRAKE APPLY AND RELEASE SWITCH CONTACTS ENERGIZED SIMULTANEOUSLY

G295394t8 : CHECK PARK BRAKE APPLY SWITCH FUNCTION

1. Disconnect the EPB switchpack electrical connector, TL82. 2. Connect an ohmmeter between pins 06 and 08 of the switch. 3. Operate the switch to the **Apply** position.

- **Does the ohmmeter switch between open and closed circuit as the switch is operated?**

-> **Yes**

GO to Pinpoint Test [G295394t9](#).

-> **No**

INSTALL a new switchpack.

[Parking Brake Switch \(70.35.46\)](#) CLEAR the DTC. TEST the system for normal operation.

G295394t9 : CHECK PARK BRAKE RELEASE SWITCH FUNCTION

1. Connect an ohmmeter between pins 04 and 06 of the switch. 2. Operate the switch to the **Release** position.

- **Does the ohmmeter switch between open and closed circuit as the switch is operated?**

-> **Yes**

GO to Pinpoint Test [G295394t10](#).

-> **No**

INSTALL a new switchpack.

[Parking Brake Switch \(70.35.46\)](#) CLEAR the DTC. TEST the system for normal operation.

G295394t10 : CHECK THE PARK BRAKE SWITCH FOR SHORT CIRCUIT

1. Connect an ohmmeter between pins 04 and 08 of the switch.

- **Is the resistance less than 10,000 ohms?**

-> **Yes**

INSTALL a new switchpack.

[Parking Brake Switch \(70.35.46\)](#) CLEAR the DTC. TEST the system for normal operation.

-> **No**

Recheck DTCs. Contact dealer technical support for advice on possible EPB control module failure.

PINPOINT TEST G295394p4 : DTC C1784, C1785, C1786; EPB MOTOR OUTPUT OPEN/SHORT CIRCUIT

G295394t11 : CHECK THE EPB MOTOR + CIRCUIT FOR OPEN CIRCUIT

1. Disconnect the battery negative terminal. 2. Disconnect the EPB motor electrical connector, CV07. 3. Disconnect the EPB control module electrical connector, CR50. 4. Measure the resistance between CV07, pin 01 (RW) and CR50, pin 03 (RW).

- **Is the resistance greater than 5 ohms?**

-> **Yes**

REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC. TEST the system for normal operation.

-> **No**

GO to Pinpoint Test [G295394t12](#).

G295394t12 : CHECK THE EPB MOTOR - CIRCUIT FOR OPEN CIRCUIT

1. Measure the resistance between CV07, pin 06 (GW) and CR50, pin 02 (GW).

- **Is the resistance greater than 5 ohms?**

-> **Yes**

REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC. TEST the system for normal operation.

-> **No**

GO to Pinpoint Test [G295394t13](#).

G295394t13 : CHECK THE EPB MOTOR + CIRCUIT FOR SHORT TO GROUND

1. Reconnect the battery negative terminal. 2. Measure the resistance between CV07, pin 01 (RW) and GROUND.

- **Is the resistance less than 10,000 ohms?**

-> **Yes**

REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC. TEST the system for normal operation.

-> **No**

GO to Pinpoint Test [G295394t14](#).

G295394t14 : CHECK THE EPB MOTOR - CIRCUIT FOR SHORT TO GROUND

1. Measure the resistance between CV07, pin 06 (GW) and GROUND.

- **Is the resistance less than 10,000 ohms?**

-> **Yes**

REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC. TEST the system for normal operation.

-> **No**

GO to Pinpoint Test [G295394t15](#).

G295394t15 : CHECK THE EPB MOTOR + AND - FOR SHORT CIRCUIT TO EACH OTHER

1. Measure the resistance between CV07, pins 06 (GW) and 01 (RW).

- **Is the resistance less than 10,000 ohms?**

-> **Yes**

REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC. TEST the system for normal operation.

-> **No**

GO to Pinpoint Test [G295394t16](#).

G295394t16 : CHECK THE EPB MOTOR FOR OPEN CIRCUIT

1. Check for continuity between pins 01 and 06 of the motor.

- **Is the circuit continuous?**

-> **Yes**

Contact dealer technical support for advice on possible EPB control module failure.

-> **No**

INSTALL a new EPB motor.

[Parking Brake Release Actuator - VIN Range: G00001->G03445 \(70.35.45\)](#) CLEAR the DTC. TEST the system for normal operation.

PINPOINT TEST G295394p5 : DTC C1799; HALL EFFECT SENSOR FAILURE

G295394t17 : CHECK THE HALL EFFECT SENSOR POWER SUPPLY

1. Disconnect the EPB motor electrical connector, CV07. 2. Measure the voltage between CV07, pin 03 (Y) and GROUND.

- **Is the voltage less than 3 volts?**

-> **Yes**

GO to Pinpoint Test [G295394t18](#).

-> **No**

GO to Pinpoint Test [G295394t19](#).

G295394t18 : CHECK THE HALL EFFECT SENSOR POWER SUPPLY CIRCUIT FOR HIGH RESISTANCE

1. Disconnect the battery negative terminal. 2. Disconnect the EPB control module electrical connector, CR32. 3. Measure the resistance between CV07, pin 03 (Y) and CR32, pin 10 (Y).

- **Is the resistance greater than 5 ohms?**

-> **Yes**

REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC. TEST the system for normal operation.

-> **No**

GO to Pinpoint Test [G295394t19](#).

G295394t19 : CHECK THE HALL EFFECT SENSOR SIGNAL GROUND

1. Reconnect the battery negative terminal. 2. Measure the resistance between CV07, pin 05 (WU) and GROUND.

- **Is the resistance greater than 5 ohms?**

-> **Yes**

GO to Pinpoint Test [G295394t20](#).

-> **No**

GO to Pinpoint Test [G295394t21](#).

G295394t20 : CHECK THE HALL EFFECT SENSOR SIGNAL GROUND CIRCUIT FOR HIGH RESISTANCE

1. Measure the resistance between CV07, pin 05 (WU) and CR32, pin 12 (WU).

- **Is the resistance greater than 5 ohms?**

-> **Yes**

REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC. TEST the system for normal operation.

-> **No**

GO to Pinpoint Test [G295394t21](#).

G295394t21 : CHECK THE HALL EFFECT SENSOR INPUT CIRCUIT FOR HIGH RESISTANCE

1. Measure the resistance between CV07, pin 04 (YB) and CR32, pin 04 (YB).

- **Is the resistance greater than 5 ohms?**

-> **Yes**

REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC. TEST the system for normal operation.

-> **No**

INSTALL a new hall effect sensor. (The hall effect sensor is not available separately).

[Parking Brake Release Actuator - VIN Range: G00001->G03445 \(70.35.45\)](#) CLEAR the DTC. TEST the system for normal operation. If the DTC is repeated, contact dealer technical support for advice on possible EPB module failure.

Parking Brake - VIN Range: G45171- >G99999

Principles of Operation

For a detailed description of the Parking Brake and Actuation, refer to the relevant Description and Operation sections in the workshop manual.

[Parking Brake - VIN Range: G45704->G99999](#)

Inspection and Verification

1 . Verify the customer concern.

2 . Visually inspect for obvious signs of mechanical or electrical damage.

Mechanical	Electrical
<ul style="list-style-type: none">• Parking brake cable• Parking brake actuator• Parking brake caliper• Parking brake pads• Drop link caps	<ul style="list-style-type: none">• Fuses/Relays• Damaged, Loose or Corroded Connector(s)• Damage to Wiring Loom/Incorrect Location, Stretched or Taught

3 . If an obvious cause for an observed or reported concern is found, correct the cause (if possible) before proceeding to the next step.

4 . If the cause is not visually evident use the Jaguar approved diagnostic system or a scan tool to retrieve the fault codes before proceeding to the diagnostic trouble code (DTC) Index.

Symptom Chart

Symptom	Possible Sources	Action
The parking brake will not engage or release	<ul style="list-style-type: none">• Cables fouled, trapped or damaged• Cables incorrectly routed or fixed• Rear lining wear• Service brake incorrectly adjusted following lining change• Caliper malfunction• Actuator malfunction	<ul style="list-style-type: none">• Check the rear and primary cables for fouling, trapping or damage• Check the cable routing between caliper and subframe mountings. Make sure the cables sit above the rear anti-roll bar drop link caps, and that the drop link caps are not damaged• Check that the rear cable end fitting connector is correctly fitted into the caliper bracket, and is not damaged• Check that the rear cable end fitting connector is correctly fitted into the subframe bracket and is not damaged• Check the 'C' clip between the cable and the

		<p>subframe for fit/damage</p> <ul style="list-style-type: none"> • Check that the cable is correctly located into the reaction and connector brackets • Inspect the rear brake linings (parking brake caliper linings for vehicles with supercharger) for wear • Check the parking brake cable for correct adjustment • Fully retract the cables. Pump the brake pedal hard five times • Check the condition of the rear caliper (parking brake caliper for vehicles with supercharger). Make sure the caliper return spring is correctly fitted • Check the actuator for damage and/or excessive noise in normal operation • For additional information, Parking Brake Cable Tension Release - VIN Range: G45704->G99999 Parking Brake Pads - Vehicles With: High Performance Brakes (70.40.04) Parking Brake Rear Cables Parking Brake Module - VIN Range: G45704->G99999 (70.35.47) Parking Brake Release Actuator - VIN Range: G03446->H99999 (70.35.45)
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DTC index



CAUTION: When probing connectors to take measurements in the course of the pinpoint tests, use the adaptor kit, part number 3548-1358-00

NOTE:

If the control module/component is suspect and the vehicle remains under manufacturer warranty, refer to the Warranty Policy and Procedures manual (section B1.2), or determine if any prior approval program is in operation, prior to the installation of a new module.

NOTE:

Generic scan tools may not read the codes listed, or may read only 5 digit codes. Match the five digits from the scan tool to the first five digits of the seven digit code listed to identify the fault (the last two digits give additional information read by the manufacturer approved diagnostic system).

NOTE:

When performing voltage or resistance tests, always use a digital multimeter (DMM) accurate to three decimal places and with a current calibration certificate. When testing resistance, always take the resistance of the DMM leads into account.

NOTE:

Check and rectify basic faults before beginning diagnostic routines that involve pinpoint tests.

NOTE:

Inspect connectors for signs of water ingress, and pins for damage and/or corrosion.

NOTE:

If DTCs are recorded and, after performing the pinpoint tests, a fault is not present, an intermittent concern may be the cause. Always check for loose connections and corroded terminals.

DTC	Description	Possible cause	Action
B131700	Battery Voltage High	<ul style="list-style-type: none">Parking brake module - supply voltage high (above 18 volts) Generator voltage is regulated by the engine control module	Refer to electrical circuit diagrams and check parking brake module power circuit for fault
B131800	Battery Voltage Low	<ul style="list-style-type: none">Parking brake module - supply voltage low (below 8 volts) Generator voltage is regulated by the engine control module	Refer to electrical circuit diagrams and check parking brake module power and ground circuit for fault
B134200	ECU is defective	<ul style="list-style-type: none">Parking brake module - internal fault	Suspect the module, check and install a parking brake module as required, refer to the new module installation note at the top of the DTC Index

B135264	Ignition Key-In Circuit Failure	<ul style="list-style-type: none"> Parking brake module, ignition key-in circuit fault (Failed plausibility check with CAN data) 	Refer to electrical circuit diagrams and check parking brake module, ignition key-in circuit for fault
B247700	Module Configuration Failure	<ul style="list-style-type: none"> Parking brake module - configuration failure 	The module can be configured using the new module configuration procedure
C109400	Park Brake Apply Switch Circuit Failure	<ul style="list-style-type: none"> Parking brake module, primary park brake apply switch - short to power or open circuit 	Carry out any pinpoint tests associated with this DTC using the manufacturer approved diagnostic system. Refer to electrical circuit diagrams and check, parking brake module, primary park brake apply switch for short to power or open circuit
C140800	Park Brake Release Switch Circuit Out of Range	<ul style="list-style-type: none"> Parking brake module, park brake release switch - voltage out of range 	Carry out any pinpoint tests associated with this DTC using the manufacturer approved diagnostic system. Refer to electrical circuit diagrams and check park brake release switch circuit, for primary release switch circuit tests, GO to Pinpoint Test G531320p8 .
C140900	Park Brake Apply Switch Circuit Out of Range	<ul style="list-style-type: none"> Primary apply switch circuit - short to power or high resistance 	Carry out any pinpoint tests associated with this DTC using the manufacturer approved diagnostic system. Refer to electrical circuit diagrams and check primary apply switch circuit for short to power or high resistance, for primary apply switch circuit tests, GO to Pinpoint Test G531320p9 .
C176900	Park Brake Apply Switch Circuit Short to Ground	<ul style="list-style-type: none"> Primary apply switch circuit - short to ground 	Carry out any pinpoint tests associated with this DTC using the manufacturer approved diagnostic system. Refer to electrical circuit diagrams and check primary apply switch circuit for short to ground, for primary apply switch circuit tests, GO to Pinpoint Test

			G531320p10.
C178200	Park Brake Release Switch Circuit Failure	<ul style="list-style-type: none"> Primary release switch circuit - short circuit to power or open circuit 	<p>Carry out any pinpoint tests associated with this DTC using the manufacturer approved diagnostic system. Refer to electrical circuit diagrams and check primary release switch circuit for short circuit to power or open circuit, for primary release switch circuit tests, GO to Pinpoint Test G531320p29.</p>
C178300	Park Brake Release Switch Short to Ground	<ul style="list-style-type: none"> Primary release switch circuit - short to ground 	<p>Carry out any pinpoint tests associated with this DTC using the manufacturer approved diagnostic system. Refer to electrical circuit diagrams and check primary release switch circuit for short circuit to ground, for primary release switch circuit tests, GO to Pinpoint Test G531320p12.</p>
C178400	Electric Park Brake Motor Output Short to Ground	<ul style="list-style-type: none"> Park brake motor output circuit - short to ground 	<p>Carry out any pinpoint tests associated with this DTC using the manufacturer approved diagnostic system. Refer to electrical circuit diagrams and check park brake motor output for short circuit to ground, GO to Pinpoint Test G531320p13.</p>
C178500	Electric Park Brake Motor Output Open Circuit	<ul style="list-style-type: none"> Park brake motor output circuit - open circuit 	<p>Carry out any pinpoint tests associated with this DTC using the manufacturer approved diagnostic system. Refer to electrical circuit diagrams and check park brake motor output for open circuit, GO to Pinpoint Test G531320p24.</p>
C178600	Electric Park Brake Motor Output Power Short to Ground	<ul style="list-style-type: none"> Park brake motor output - short circuit to power 	<p>Carry out any pinpoint tests associated with this DTC using the manufacturer approved diagnostic system. Refer to electrical circuit diagrams and check park brake</p>

			motor output for short circuit to power, GO to Pinpoint Test G531320p16 .
C179900	Hall Effect Circuit Failure	<ul style="list-style-type: none"> • Hall effect sensor - circuit fault • Hall effect sensor - mechanical fault 	<p>Carry out any pinpoint tests associated with this DTC using the manufacturer approved diagnostic system. Refer to electrical circuit diagrams and check hall effect sensor for circuit fault, for hall effect sensor tests, GO to Pinpoint Test G531320p17.</p> <p>Refer to the symptom chart for actions regarding mechanical operation faults.</p>
C180100	Motor Engage Current Reached Before Full Apply Travel Distance	<ul style="list-style-type: none"> • Cables fouled, trapped or damaged • Cables incorrectly routed or fixed • Rear lining wear • Service brake not correctly adjusted following lining change • Caliper malfunction • Actuator malfunction 	Refer to the symptom chart for actions regarding mechanical operation faults.
C180200	Motor Engage Current Not Reached or Travelled Too Far Apply	<ul style="list-style-type: none"> • Cables incorrectly routed or fixed • Rear lining wear • Service brake not correctly adjusted following lining change • Caliper malfunction • Actuator malfunction 	Refer to the symptom chart for actions regarding mechanical operation faults.
C180300	Less than expected travel for parking brake release	<ul style="list-style-type: none"> • Cables fouled, trapped or damaged • Cables incorrectly routed or fixed • Rear lining wear • Service brake not correctly adjusted following lining change • Caliper malfunction • Actuator malfunction 	<p>Carry out any pinpoint tests associated with this DTC using the manufacturer approved diagnostic system. For motor release tests, GO to Pinpoint Test G531320p19.</p> <p>Refer to the symptom chart for actions regarding mechanical operation faults.</p>

C198900	Park Brake Apply and Release Switch Contacts Energized Simultaneously	<ul style="list-style-type: none"> Park brake apply and release switch contacts energized simultaneously 	Carry out any pinpoint tests associated with this DTC using the manufacturer approved diagnostic system. Refer to electrical circuit diagrams and check park brake apply and release switch circuits for fault GO to Pinpoint Test G531320p21 .
C1D0062	Park Brake Apply Switch	<ul style="list-style-type: none"> Park brake switch - fault 	Suspect park brake switch mechanism fault, check operation, replace as required
C1D0064	Park Brake Apply Switch	<ul style="list-style-type: none"> Park brake switch - fault 	Suspect park brake switch mechanism fault, check operation, replace as required
C1D0066	Park Brake Apply Switch	<ul style="list-style-type: none"> Park brake switch - fault (More then 30 Applies and 30 Releases initiated in a 60 second time period while in static mode) 	Refer to electrical circuit diagrams and check park brake apply and release switch circuits for fault. suspect park brake switch mechanism fault, check operation, replace as required.(Park Brake Switch Fault, will be entered to lock out further abuse of the system. Full functionality will be restored upon ignition reset)
C1D0711	Secondary Park Brake Apply Switch	<ul style="list-style-type: none"> Parking brake module secondary apply switch circuit - short to ground 	Carry out any pinpoint tests associated with this DTC using the manufacturer approved diagnostic system. Refer to electrical circuit diagrams and check, secondary apply switch circuit for short to ground, for secondary apply switch tests, GO to Pinpoint Test G531320p5 .
C1D0715	Secondary Park Brake Apply Switch	<ul style="list-style-type: none"> Parking brake module secondary apply switch circuit - short to power or open circuit 	Carry out any pinpoint tests associated with this DTC using the manufacturer approved diagnostic system. Refer to electrical circuit diagrams and check, secondary apply switch circuit for short to power or open circuit, for

			secondary apply switch tests, GO to Pinpoint Test G531320p7 .
C1D071C	Secondary Park Brake Apply Switch	<ul style="list-style-type: none"> Parking brake module secondary apply switch circuit - voltage out of range 	Carry out any pinpoint tests associated with this DTC using the manufacturer approved diagnostic system. Refer to electrical circuit diagrams and check, secondary apply switch circuit for fault, for secondary apply switch tests, GO to Pinpoint Test G531320p2 .
C1D0811	Secondary Park Brake Release Switch	<ul style="list-style-type: none"> Parking brake module secondary release switch circuit - short circuit to ground 	Carry out any pinpoint tests associated with this DTC using the manufacturer approved diagnostic system. Refer to electrical circuit diagrams and check, secondary release switch circuit for short circuit to ground, for secondary release switch tests, GO to Pinpoint Test G531320p20 .
C1D0815	Secondary Park Brake Release Switch	<ul style="list-style-type: none"> Parking brake module secondary release switch circuit - short circuit to power or open circuit 	Carry out any pinpoint tests associated with this DTC using the manufacturer approved diagnostic system. Refer to electrical circuit diagrams and check, secondary release switch circuit for short to power or open circuit For secondary release switch tests, GO to Pinpoint Test G531320p18 .
C1D081C	Secondary Park Brake Release Switch	<ul style="list-style-type: none"> Parking brake module secondary release switch circuit - voltage out of range 	Carry out any pinpoint tests associated with this DTC using the manufacturer approved diagnostic system. Refer to electrical circuit diagrams and check, secondary release switch circuit for short circuit to power or high resistance, for secondary release switch tests, GO to Pinpoint Test G531320p4 .
C1D1000	FET Over Current/Over	<ul style="list-style-type: none"> Parking brake module - 	Suspect the module, check and install a parking brake module as

	Temperature	internal fault	required, refer to the new module installation note at the top of the DTC Index
C1D1162	Park Brake Release Switch	<ul style="list-style-type: none"> Parking brake switch - internal fault 	Suspect parking brake switch mechanical fault, check and install a parking brake switch as required
C1D1164	Park Brake Release Switch	<ul style="list-style-type: none"> Parking brake switch - internal fault 	Suspect parking brake switch mechanical failure, check and install a parking brake switch as required
C1D1464	Ignition Status	<ul style="list-style-type: none"> Parking brake module - ignition status circuit fault 	Refer to electrical circuit diagrams and check, parking brake module ignition status circuit for fault
C1D1564	Brake Switch Status	<ul style="list-style-type: none"> Parking brake module, brake switch circuit fault (Failed plausibility check with CAN data) 	Carry out any pinpoint tests associated with this DTC using the manufacturer approved diagnostic system. Refer to electrical circuit diagrams and check footbrake switch circuit for fault, for footbrake switch tests, GO to Pinpoint Test G531320p22 .
C1D1614	High Power Battery Feed	<ul style="list-style-type: none"> High power feed circuit - short to ground or high resistance 	Refer to electrical circuit diagrams and check parking brake module high power feed circuit for short circuit to ground or high resistance, for power feed tests, GO to Pinpoint Test G531320p11 .
C1D2092	Vehicle Deceleration	<ul style="list-style-type: none"> Key-Out-Applied after implausible vehicle speed (Implausible vehicle speed is defined as a change from High Speed Dynamic Mode to Static Mode without passing through Low Speed Dynamic Mode) 	Check DSC (ABS) module for stored fault codes
U000100	High Speed CAN Communication Bus - Can	<ul style="list-style-type: none"> Parking brake module - CAN Bus circuit fault 	Refer to electrical circuit diagrams and check parking brake module

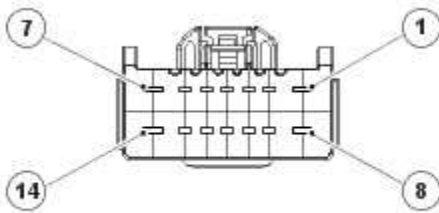
	Transmit/Receive Error		CAN Bus circuit fault
U000188	High Speed CAN Communication Bus - CAN Bus off	<ul style="list-style-type: none"> Parking brake module - CAN Bus circuit fault 	Refer to electrical circuit diagrams and check parking brake module CAN Bus circuit fault
U010000	Lost Communication With ECM/PCM	<ul style="list-style-type: none"> Parking brake module - CAN Bus circuit fault 	Refer to electrical circuit diagrams and check parking brake module CAN Bus circuit to engine control module for fault
U010100	Lost Communication with TCM	<ul style="list-style-type: none"> Parking brake module - CAN Bus circuit fault 	Refer to electrical circuit diagrams and check parking brake module CAN Bus circuit to transmission control module for fault
U012100	Lost Communication With Anti-Lock Brake System (ABS) Control Module	<ul style="list-style-type: none"> Parking brake module - CAN Bus circuit fault 	Refer to electrical circuit diagrams and check parking brake module CAN Bus circuit to (DSC) anti-lock brake system control module for fault
U015500	Lost Communication With Instrument Panel Cluster (IPC) Control Module	<ul style="list-style-type: none"> Parking brake module - CAN Bus circuit fault 	Refer to electrical circuit diagrams and check parking brake module CAN Bus circuit to instrument panel cluster for fault
U040100	Invalid Data Received From ECM/PCM	<ul style="list-style-type: none"> Parking brake module - CAN Bus circuit fault (At least one message from the ECM/PCM was invalid for 250 ms or longer) 	Refer to electrical circuit diagrams and check parking brake module CAN Bus circuit to engine control module for fault
U040200	Invalid Data Received From Transmission Control Module	<ul style="list-style-type: none"> Parking brake module - CAN Bus circuit fault (At least one message from the TCM was invalid for 250 ms or longer) 	Refer to electrical circuit diagrams and check parking brake module CAN Bus circuit to transmission control module for fault
U041500	Invalid Data Received From Anti-Lock Brake System Control Module	<ul style="list-style-type: none"> Parking brake module - CAN Bus circuit fault (At least one message from the ABS was invalid for 250 ms or longer) 	Refer to electrical circuit diagrams and check parking brake module CAN Bus circuit to anti-lock brake system control module for fault

Pinpoint Tests

PINPOINT TEST G531320p1 : PRIMARY PARKING BRAKE APPLY SWITCH CIRCUIT FAILURE

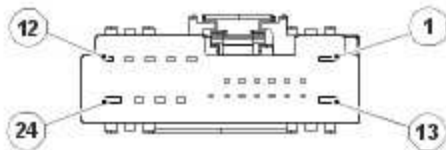
G531320t1 : CHECK THE PRIMARY APPLY SIGNAL CIRCUIT FOR SHORT CIRCUIT TO POWER

1. Key off. 2.



E55103

Electric parking brake module connector 1 (CR50) disconnected. 3.



E55104

Electric parking brake module connector 2 (CR32) connector disconnected. 4. Key on, engine off. 5. Measure the resistance between:

CR50, harness side	Vehicle battery
Electric parking brake switch apply 1 - signal - Pin 10	Positive terminal

- Is the resistance greater than 100 Kohms?

-> Yes

GO to Pinpoint Test [G531320t2](#).

-> No

GO to Pinpoint Test [G531320t8](#).

G531320t2 : CHECK THE PRIMARY RELEASE SIGNAL CIRCUIT FOR SHORT CIRCUIT TO POWER

1. Measure the resistance between:

CR50 connector, harness side	Vehicle battery
Electric parking brake switch apply 1 - signal - Pin 11	Positive terminal

- Is the resistance greater than 100 Kohms?

-> Yes

GO to Pinpoint Test [G531320t3](#).

-> No

GO to Pinpoint Test [G531320t9](#).

G531320t3 : CHECK THE SECONDARY APPLY SIGNAL CIRCUIT FOR SHORT CIRCUIT TO POWER

1. Measure the resistance between:

CR32 connector, harness side	Vehicle battery
Electric parking brake switch apply 2 - signal - Pin 02	Positive terminal

- Is the resistance greater than 100 Kohms?

-> Yes

GO to Pinpoint Test [G531320t4](#).

-> No

GO to Pinpoint Test [G531320t10](#).

G531320t4 : CHECK THE SECONDARY RELEASE SIGNAL CIRCUIT FOR SHORT CIRCUIT TO POWER

1. Measure the resistance between:

CR32 connector, harness side	Vehicle battery
Electric parking brake switch release 2 - signal - Pin 14	Positive terminal

- **Is the resistance greater than 100 Kohms?**

-> **Yes**

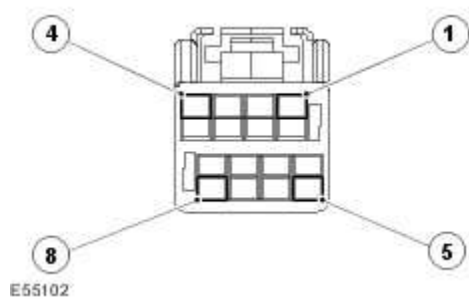
GO to Pinpoint Test [G531320t5](#).

-> **No**

GO to Pinpoint Test [G531320t11](#).

G531320t5 : CHECK THE PRIMARY APPLY SIGNAL CIRCUIT FOR OPEN CIRCUIT

1.



Electric parking brake switch (TL82) connector disconnected. 2. Measure the resistance between:

CR50 connector, harness side	TL82 connector, harness side
Electric parking brake switch apply 1 - signal - Pin 10	Electric parking brake switch apply 1 - signal - Pin 08

- **Is the resistance less than 10 ohms?**

-> **Yes**

GO to Pinpoint Test [G531320t6](#).

-> **No**

REPAIR the open circuit. For additional information, refer to the wiring diagrams.

G531320t6 : CHECK THE SWITCH RETURN CIRCUIT FOR OPEN CIRCUIT

1. Measure the resistance between:

CR32 connector, harness side	TL82 connector, harness side
Electric parking brake switch - switch return - Pin 06	Electric parking brake switch - switch return - Pin 06

- Is the resistance less than 10 ohms?

-> Yes

GO to Pinpoint Test [G531320t7](#).

-> No

REPAIR the open circuit. For additional information, refer to the wiring diagrams.

G531320t7 : CHECK THE ELECTRIC PARKING BRAKE SWITCH

1. Measure the resistance between:

TL82 connector, component side	TL82 connector, component side
Electric parking brake switch apply 1 - signal - Pin 08	Electric parking brake switch - switch return - Pin 06

- Is the resistance between 595 ohms - 611 ohms?

-> Yes

An intermittent fault may be present in the wiring harness. Visually check for chaffed wires or other physical damage to the harness. If no fault is found in the circuit, suspect the following component(s): - EPB Module - EPB module connector, CR50 - EPB module connector, CR32

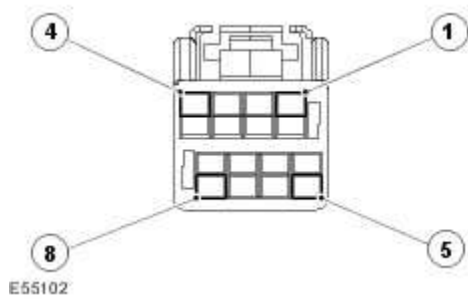
-> No

INSTALL a new EPB switch.

[Parking Brake Switch \(70.35.46\)](#)

G531320t8 : CHECK IF THE SHORT CIRCUIT IS IN THE HARNESS OR THE SWITCH

1.



Electric parking brake switch (TL82) connector disconnected. 2. Measure the resistance between:

CR50 connector, harness side	Vehicle battery
Electric parking brake switch apply 1 - signal - Pin 10	Positive terminal

- Is the resistance greater than 100 Kohms?

-> Yes

INSTALL a new EPB switch.

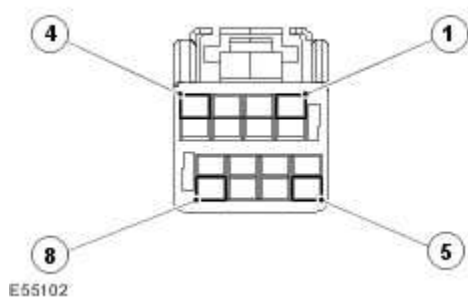
[Parking Brake Switch \(70.35.46\)](#)

-> No

REPAIR the short circuit. For additional information, refer to the wiring diagrams.

G531320t9 : CHECK IF THE SHORT CIRCUIT IS IN THE HARNESS OR THE SWITCH

1.



Electric parking brake switch (TL82) connector disconnected. 2. Measure the resistance between:

CR50 connector, harness side	Vehicle battery
Electric parking brake switch release 1 - signal - Pin 11	Positive terminal

- Is the resistance greater than 100 Kohms?

-> **Yes**

INSTALL a new EPB switch.

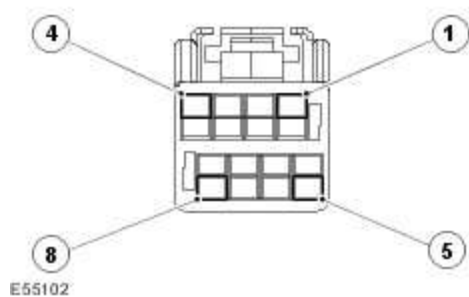
[Parking Brake Switch \(70.35.46\)](#)

-> **No**

REPAIR the short circuit. For additional information, refer to the wiring diagrams.

G531320t10 : CHECK IF THE SHORT CIRCUIT IS IN THE HARNESS OR THE SWITCH

1.



Electric parking brake switch (TL82) connector disconnected. 2. Measure the resistance between:

CR32 connector, harness side	Vehicle battery
Electric parking brake switch apply 2 - signal - Pin 02	Positive terminal

- Is the resistance greater than 100 Kohms?

-> **Yes**

INSTALL a new EPB switch.

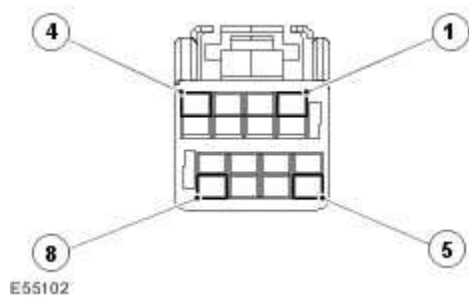
[Parking Brake Switch \(70.35.46\)](#)

-> **No**

REPAIR the short circuit. For additional information, refer to the wiring diagrams.

G531320t11 : CHECK IF THE SHORT CIRCUIT IS IN THE HARNESS OR THE SWITCH

1.



Electric parking brake switch (TL82) connector disconnected. 2. Measure the resistance between:

CR32 connector, harness side	Vehicle battery
Electric parking brake switch release 2 - signal - Pin 14	Positive terminal

- Is the resistance greater than 100 Kohms?

-> Yes

INSTALL a new EPB switch.

[Parking Brake Switch \(70.35.46\)](#)

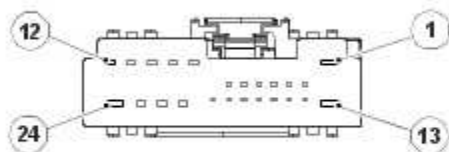
-> No

REPAIR the short circuit. For additional information, refer to the wiring diagrams.

PINPOINT TEST G531320p2 : SECONDARY APPLY SWITCH CIRCUIT VOLTAGE OUT OF RANGE

G531320t12 : CHECK THE SECONDARY SWITCH CIRCUIT RESISTANCE

1. Key off. 2.



E55104

Electric parking brake module connector 2 (CR32) disconnected. 3. Key on, engine off. 4. Measure the resistance between:

CR32 connector, harness side	CR32 connector, harness side
Electric parking brake switch apply 2 - signal - Pin 02	Electric parking brake switch - switch return - Pin 06

- Is the resistance between 595 ohms - 611 ohms?

-> Yes

An intermittent fault may be present in the wiring harness. Visually check for chaffed wires or other physical damage to the harness. If no fault is found in the circuit, suspect the following component(s): - EPB fault - EPB module connector, CR32

-> No

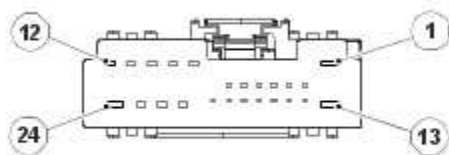
INSTALL a new EPB switch.

[Parking Brake Switch \(70.35.46\)](#)

PINPOINT TEST G531320p4 : SECONDARY RELEASE SWITCH CIRCUIT VOLTAGE OUT OF RANGE

G531320t21 : CHECK THE SECONDARY SWITCH CIRCUIT RESISTANCE

1. Key off. 2.



E55104

Electric parking brake connector 2 (CR32) disconnected. 3. Key on, engine off. 4. Measure the resistance between:

CR32 connector, harness side	CR32 connector, harness side
Electric parking brake switch release 2 - signal - Pin 14	Electric parking brake switch - switch return - Pin 06

- Is the resistance between 595 ohms - 611 ohms?

-> **Yes**

An intermittent fault may be present in the wiring harness. Visually check for chaffed wires or other physical damage to the harness. If no fault is found in the circuit, suspect the following component(s): - EPB module - EPB module connector, CR32

-> **No**

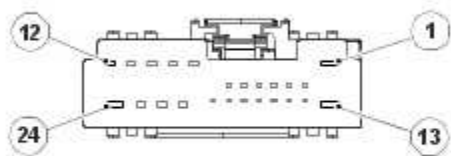
INSTALL a new EPB switch.

[Parking Brake Switch \(70.35.46\)](#)

PINPOINT TEST G531320p5 : SECONDARY APPLY SWITCH CIRCUIT SHORT CIRCUIT TO GROUND

G531320t22 : CHECK THE SECONDARY APPLY SIGNAL CIRCUIT FOR SHORT CIRCUIT TO GROUND

1. Key off. 2.



E55104

Electric parking brake connector 2 (CR32) disconnected. 3. Key on, engine off. 4. Measure the resistance between:

CR32 connector, harness side	Vehicle battery
Electric parking brake switch apply 2 - signal - Pin 02	Negative terminal

- **Is the resistance greater than 100 Kohms?**

-> **Yes**

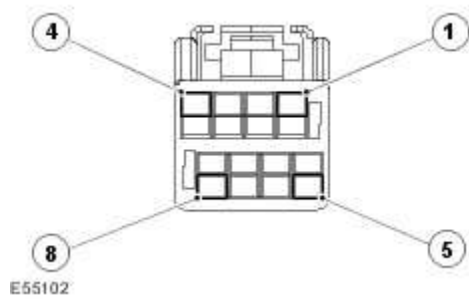
An intermittent fault may be present in the wiring harness. Visually check for chaffed wires or other physical damage to the harness. If no fault is found in the circuit, suspect the following component(s): - EPB module - EPB module connector, CR32

-> **No**

GO to Pinpoint Test [G531320t23](#).

G531320t23 : CHECK IF THE SHORT CIRCUIT IS IN THE HARNESS OR THE SWITCH

1.



Electric parking brake switch (TL82) connector disconnected. 2. Measure the resistance between:

CR32 connector, harness side	Vehicle battery
Electric parking brake switch apply 2 - signal - Pin 02	Negative terminal

- Is the resistance greater than 100 Kohms?

-> Yes

INSTALL a new EPB switch.

[Parking Brake Switch \(70.35.46\)](#)

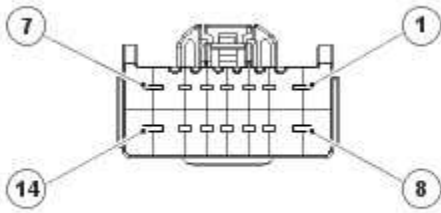
-> No

REPAIR the short circuit. For additional information, refer to the wiring diagrams.

PINPOINT TEST G531320p7 : SECONDARY APPLY HARNESS SHORT CIRCUIT TO BATTERY OR OPEN CIRCUIT

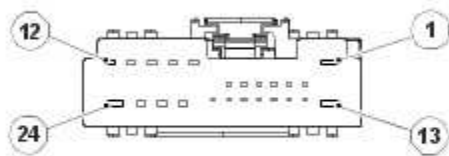
G531320t31 : CHECK THE PRIMARY APPLY SIGNAL CIRCUIT FOR SHORT CIRCUIT TO POWER

1. Key off. 2.



E55103

Electric parking brake module connector 1 (CR50) disconnected. 3.



E55104

Electric parking brake module connector 2 (CR32) disconnected. 4. Key on, engine off. 5. Measure the resistance between:

CR50 connector, harness side	Vehicle battery
Electric parking brake switch apply 1 - signal - Pin 10	Positive terminal

- Is the resistance greater than 100 Kohms?

-> Yes

GO to Pinpoint Test [G531320t32](#).

-> No

GO to Pinpoint Test [G531320t38](#).

G531320t32 : CHECK THE PRIMARY RELEASE SIGNAL CIRCUIT FOR SHORT CIRCUIT TO POWER

1. Measure the resistance between:

CR50 connector, harness side	Vehicle battery
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Electric parking brake switch release 1 - signal - Pin 11	Positive terminal
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- Is the resistance greater than 100 Kohms?

-> Yes

GO to Pinpoint Test [G531320t33](#).

-> No

GO to Pinpoint Test [G531320t39](#).

G531320t33 : CHECK THE SECONDARY APPLY SIGNAL CIRCUIT FOR SHORT CIRCUIT TO POWER

1. Measure the resistance between:

CR32 connector, harness side	Vehicle battery
Electric parking brake switch apply 2 - signal - Pin 02	Positive terminal

- Is the resistance greater than 100 Kohms?

-> Yes

GO to Pinpoint Test [G531320t34](#).

-> No

GO to Pinpoint Test [G531320t40](#).

G531320t34 : CHECK THE SECONDARY RELEASE SIGNAL CIRCUIT FOR SHORT CIRCUIT TO POWER

1. Measure the resistance between:

CR32 connector, harness side	Vehicle battery
Electric parking brake switch release 2 - signal - Pin 14	Positive terminal

- Is the resistance greater than 100 Kohms?

-> **Yes**

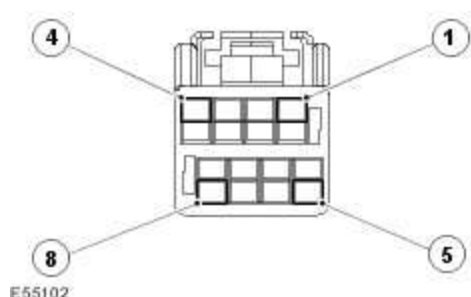
GO to Pinpoint Test [G531320t35](#).

-> **No**

GO to Pinpoint Test [G531320t41](#).

G531320t35 : CHECK THE SECONDARY APPLY SIGNAL CIRCUIT FOR OPEN CIRCUIT

1.



Electric parking brake switch (TL82) connector disconnected. 2. Measure the resistance between:

CR32 connector, harness side	TL82 connector, harness side
Electric parking brake switch apply 2 - signal - Pin 02	Electric parking brake switch apply 2 - signal - Pin 07

- **Is the resistance less than 10 ohms?**

-> **Yes**

GO to Pinpoint Test [G531320t36](#).

-> **No**

REPAIR the open circuit. For additional information, refer to the wiring diagrams.

G531320t36 : CHECK THE SWITCH RETURN SIGNAL CIRCUIT FOR OPEN CIRCUIT

1. Measure the resistance between:

CR32 connector, harness side	TL82 connector, harness side
Electric parking brake switch - switch return - Pin 06	Electric parking brake switch - switch return - Pin 06

- Is the resistance less than 10 ohms?

-> Yes

GO to Pinpoint Test [G531320t37](#).

-> No

REPAIR the open circuit. For additional information, refer to the wiring diagrams.

G531320t37 : CHECK THE ELECTRIC PARKING BRAKE SWITCH

1. Measure the resistance between:

TL82 connector, component side	TL82 connector, component side
Electric parking brake switch apply 2 - signal - Pin 07	Electric parking brake switch - switch return - Pin 06

- Is the resistance between 595 ohms - 611 ohms?

-> Yes

An intermittent fault may be present in the wiring harness. Visually check for chaffed wires or other physical damage to the harness. If no fault is found in the circuit, suspect the following component(s): - EPB module - EPB module connector, CR50 - EPB module connector, CR32

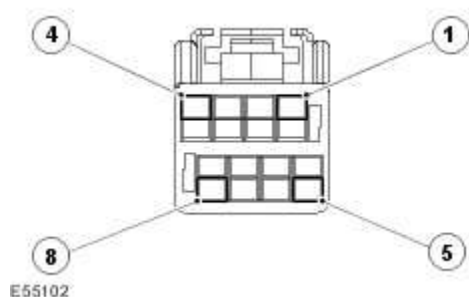
-> No

INSTALL a new EPB switch.

[Parking Brake Switch \(70.35.46\)](#)

G531320t38 : CHECK IF THE SHORT CIRCUIT IS IN THE HARNESS OR THE SWITCH

1.



Electric parking brake switch (TL82) connector disconnected. 2. Measure the resistance between:

CR50 connector, harness side	Vehicle battery
Electric parking brake switch apply 1 - signal - Pin 10	Positive terminal

- Is the resistance greater than 100 Kohms?

-> Yes

INSTALL a new EPB switch.

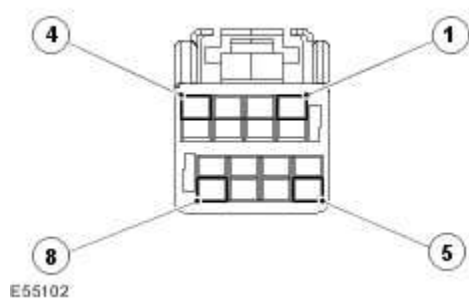
[Parking Brake Switch \(70.35.46\)](#)

-> No

REPAIR the short circuit. For additional information, refer to the wiring diagrams.

G531320t39 : CHECK IF THE SHORT CIRCUIT IS IN THE HARNESS OR THE SWITCH

1.



Electric parking brake switch (TL82) connector disconnected. 2. Measure the resistance between:

CR50 connector, harness side	Vehicle battery
Electric parking brake switch release 1 - signal - Pin 11	Positive terminal

- Is the resistance greater than 100 Kohms?

-> Yes

INSTALL a new EPB switch.

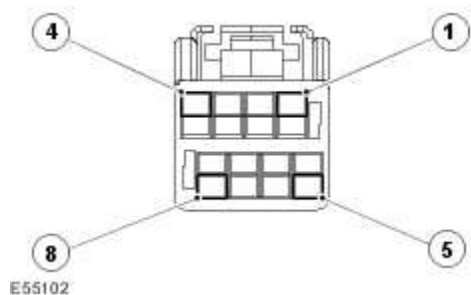
[Parking Brake Switch \(70.35.46\)](#)

-> No

REPAIR the short circuit. For additional information, refer to the wiring diagrams.

G531320t40 : CHECK IF THE SHORT CIRCUIT IS IN THE HARNESS OR THE SWITCH

1.



Electric parking brake switch (TL82) connector disconnected. 2. Measure the resistance between:

CR32 connector, harness side	Vehicle battery
Electric parking brake switch apply 2 - signal - Pin 02	Positive terminal

- Is the resistance greater than 100 Kohms?

-> Yes

INSTALL a new EPB switch.

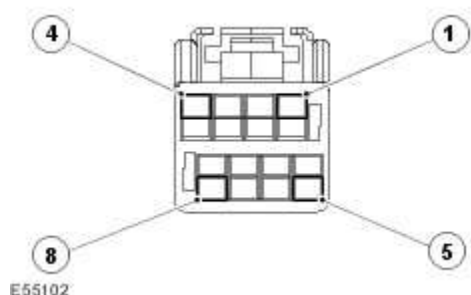
[Parking Brake Switch \(70.35.46\)](#)

-> No

REPAIR the short circuit. For additional information, refer to the wiring diagrams.

G531320t41 : CHECK IF THE SHORT CIRCUIT IS IN THE HARNESS OR THE SWITCH

1.



Electric parking brake switch (TL82) connector disconnected. 2. Measure the resistance between:

CR32 connector, harness side	Vehicle battery
Electric parking brake switch release 2 - signal - Pin 14	Positive terminal

- Is the resistance greater than 100 Kohms?

-> Yes

INSTALL a new EPB switch.

[Parking Brake Switch \(70.35.46\)](#)

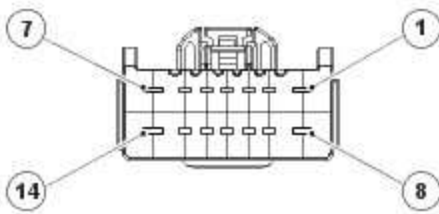
-> No

REPAIR the short circuit. For additional information, refer to the wiring diagrams.

PINPOINT TEST G531320p8 : PRIMARY RELEASE SWITCH CIRCUIT OUT OF RANGE

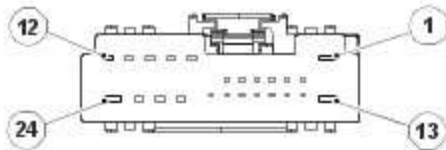
G531320t42 : CHECK THE PRIMARY RELEASE SWITCH CIRCUIT RESISTANCE

1. Key off. 2.



E55103

Electric parking brake module connector 1 (CR50) disconnected. 3.



E55104

Electric parking brake module connector 2 (CR32) disconnected. 4. Key on, engine off. 5. Measure the resistance between:

CR50 connector, harness side	CR32 connector, harness side
Electric parking brake switch release 1 - signal - Pin 11	Electric parking brake switch - switch return - Pin 06

- Is the resistance between 595 ohms - 611 ohms?

-> **Yes**

An intermittent fault may be present in the wiring harness. Visually check for chaffed wires or other physical damage to the harness. If no fault is found in the circuit, suspect the following component(s): - EPB module - EPB module connector, CR50

-> **No**

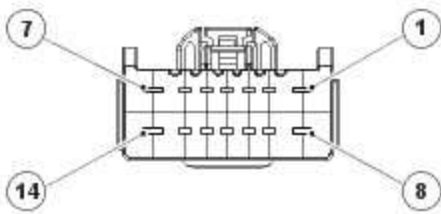
INSTALL a new EPB switch.

[Parking Brake Switch \(70.35.46\)](#)

PINPOINT TEST G531320p9 : PRIMARY APPLY SWITCH CIRCUIT OUT OF RANGE

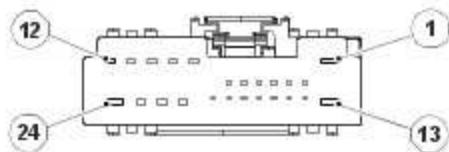
G531320t43 : CHECK THE PRIMARY APPLY SWITCH CIRCUIT RESISTANCE

1. Key off. 2.



E55103

Electric parking brake module connector 1 (CR50) disconnected. 3.



E55104

Electric parking brake module connector 2 (CR32) disconnected. 4. Key on, engine off. 5. Measure the resistance between:

CR50 connector, harness side	CR32 connector, harness side
Electric parking brake switch apply 1 - signal - Pin 10	Electric parking brake switch - switch return - Pin 06

- Is the resistance between 595 ohms - 611 ohms?

-> **Yes**

An intermittent fault may be present in the wiring harness. Visually check for chaffed wires or other physical damage to the harness. If no fault is found in the circuit, suspect the following component(s): - EPB module - EPB module connector, CR50

-> **No**

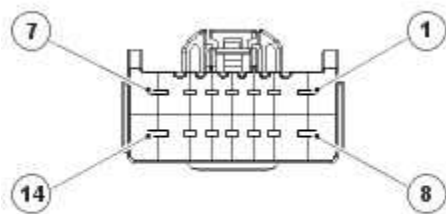
INSTALL a new EPB switch.

[Parking Brake Switch \(70.35.46\)](#)

PINPOINT TEST G531320p10 : PRIMARY APPLY SWITCH CIRCUIT SHORT CIRCUIT TO GROUND

G531320t44 : CHECK THE PRIMARY APPLY SIGNAL CIRCUIT FOR SHORT CIRCUIT TO GROUND

1. Key off. 2.



E55103

Electric parking brake module connector 1 (CR50) disconnected. 3. Key on, engine off. 4. Measure the resistance between:

CR50 connector, harness side	Vehicle battery
Electric parking brake switch apply 1 - signal - Pin 10	Negative terminal

- **Is the resistance greater than 100 Kohms?**

-> **Yes**

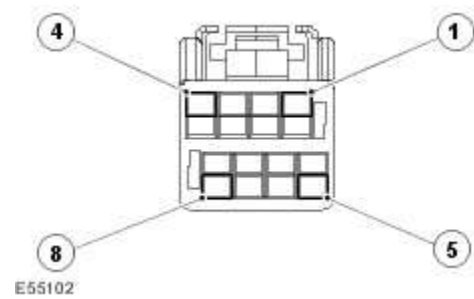
An intermittent fault may be present in the wiring harness. Visually check for chaffed wires or other physical damage to the harness. If no fault is found in the circuit, suspect the following component(s): - EPB module - EPB module connector, CR50

-> **No**

GO to Pinpoint Test [G531320t45](#).

G531320t45 : CHECK IF THE SHORT CIRCUIT IS IN THE HARNESS OR THE SWITCH

1.



Electric parking brake switch (TL82) connector disconnected. 2. Measure the resistance between:

CR50 connector, harness side	Vehicle battery
Electric parking brake switch apply 1 - signal - Pin 10	Negative terminal

- Is the resistance greater than 100 Kohms?

-> Yes

INSTALL a new EPB switch.

[Parking Brake Switch \(70.35.46\)](#)

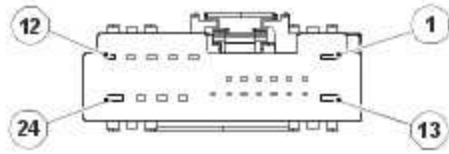
-> No

REPAIR the short circuit. For additional information, refer to the wiring diagrams.

PINPOINT TEST G531320p11 : HIGH POWER BATTERY FEED CIRCUIT SHORT CIRCUIT TO GROUND OR OPEN CIRCUIT

G531320t46 : CHECK THE HIGH POWER SUPPLY CIRCUIT

1.



E55104

Electric parking brake module connector 2 (CR32) disconnected. 2. Measure the voltage between:

CR32 connector, harness side	Vehicle battery
Electric parking brake module - battery supply - Pin 01	Negative terminal

- Is the voltage between 9 volts - 15 volts?

-> Yes

An intermittent fault may be present in the wiring harness. Visually check for chaffed wires or other physical damage to the harness. If no fault is found in the circuit, suspect the following component(s): - EPB module

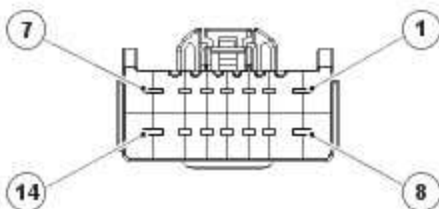
-> No

No supply to the EPB circuit. check and repair the circuit as necessary. For additional information, refer to the wiring diagrams.

PINPOINT TEST G531320p12 : PRIMARY RELEASE SWITCH CIRCUIT SHORT CIRCUIT TO GROUND

G531320t47 : CHECK THE PRIMARY RELEASE SIGNAL CIRCUIT FOR SHORT TO GROUND

1. Key off. 2.



E55103

Electric parking brake module connector 1 (CR50) disconnected. 3. Key on, engine off. 4. Measure the resistance between:

CR50 connector, harness side	Vehicle battery
Electric parking brake switch release 1 - signal - Pin 11	Negative terminal

- Is the resistance greater than 100 Kohms?

-> Yes

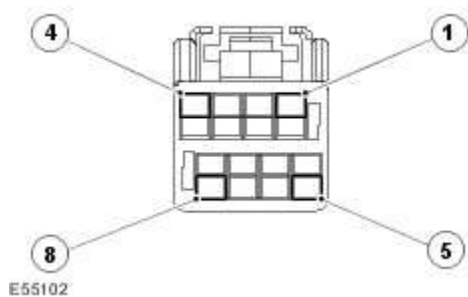
An intermittent fault may be present in the wiring harness. Visually check for chaffed wires or other physical damage to the harness. If no fault is found in the circuit, suspect the following component(s): - EPB module - EPB module connector, CR50

-> No

GO to Pinpoint Test [G531320t48](#).

G531320t48 : CHECK IF THE SHORT CIRCUIT IS IN THE HARNESS OR THE SWITCH

1.



Electric parking brake switch (TL82) connector disconnected. 2. Measure the resistance between:

CR50 connector, harness side	Vehicle battery
Electric parking brake switch release 1 - signal - Pin 11	Negative terminal

- Is the resistance greater than 100 Kohms?

-> Yes

INSTALL a new EPB switch.

[Parking Brake Switch \(70.35.46\)](#)

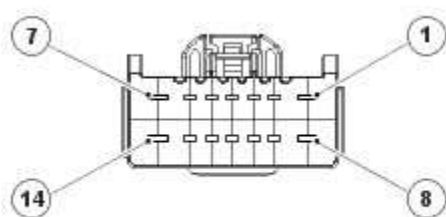
-> No

REPAIR the short circuit. For additional information, refer to the wiring diagrams.

PINPOINT TEST G531320p13 : PARKING BRAKE ACTUATOR OUTPUT SHORT CIRCUIT TO GROUND

G531320t49 : CHECK THE ACTUATOR NEGATIVE SIGNAL CIRCUIT FOR SHORT CIRCUIT TO GROUND

1. Key off. 2.



E55103

Electric parking brake switch (TL82) connector disconnected. 3. Key on, engine off. 4. Measure the resistance between:

CR50 connector, harness side	Vehicle battery
Electric parking brake actuator - negative - Pin 07	Negative terminal

- Is the resistance greater than 100 Kohms?

-> Yes

GO to Pinpoint Test [G531320t50](#).

-> No

GO to Pinpoint Test [G531320t51](#).

G531320t50 : CHECK THE ACTUATOR POSITIVE SIGNAL CIRCUIT FOR SHORT CIRCUIT TO GROUND

1. Measure the resistance between:

CR50 connector, harness side	Vehicle battery
------------------------------	-----------------

Electric parking brake actuator - positive - Pin 14	Negative terminal
---	-------------------

- Is the resistance greater than 100 Kohms?

-> **Yes**

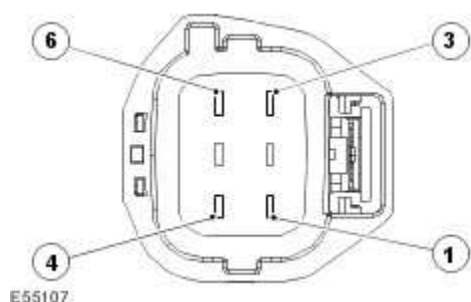
An intermittent fault may be present in the wiring harness. Visually check for chaffed wires or other physical damage to the harness. If no fault is found in the circuit, suspect the following component(s): - EPB module - EPB module connector, CR50

-> **No**

GO to Pinpoint Test [G531320t52](#).

G531320t51 : CHECK IF THE SHORT CIRCUIT IS IN THE HARNESS OR THE ACTUATOR

1.



EPB actuator connector disconnected. 2. Measure the resistance between:

CR50 connector, harness side	Vehicle battery
Electric parking brake actuator - negative - Pin 07	Negative terminal

- Is the resistance greater than 100 Kohms?

-> **Yes**

INSTALL a new EPB actuator.

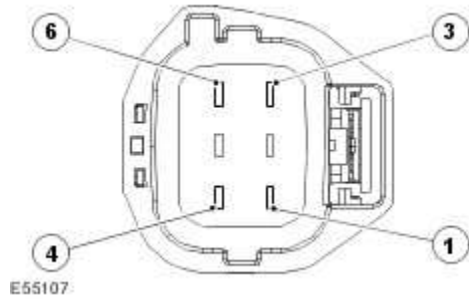
[Parking Brake Release Actuator - VIN Range: G03446->H99999 \(70.35.45\)](#)

-> **No**

REPAIR the short circuit. For additional information, refer to the wiring diagrams.

G531320t52 : CHECK IF THE SHORT CIRCUIT IS IN THE HARNESS OR THE ACTUATOR

1.



E55107

EPB actuator connector disconnected. 2. Measure the resistance between:

CR50 connector, harness side	Vehicle battery
Electric parking brake actuator - positive - Pin 14	Negative terminal

- Is the resistance greater than 100 Kohms?

-> Yes

INSTALL a new EPB actuator.

[Parking Brake Release Actuator - VIN Range: G03446->H99999 \(70.35.45\)](#)

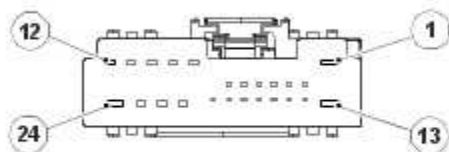
-> No

REPAIR the short circuit. For additional information, refer to the wiring diagrams.

PINPOINT TEST G531320p15 : HIGH POWER GROUND FEED OPEN CIRCUIT

G531320t61 : CHECK THE MODULE GROUND CIRCUIT FOR CONTINUITY

1.



E55104

Electric parking brake module connector 2 (CR32) disconnected. 2. Measure the resistance between:

CR32 connector, harness side	Vehicle battery
Electric parking brake module - ground - Pin 13	Negative terminal

- **Is the resistance less than 10 ohms?**

-> **Yes**

An intermittent fault may be present in the wiring harness. Visually check for chaffed wires or other physical damage to the harness. If no fault is found in the circuit, suspect the following component(s): - EPB Module

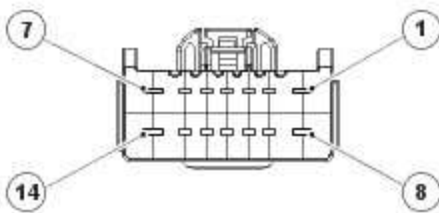
-> **No**

REPAIR the open circuit. For additional information, refer to the wiring diagrams.

PINPOINT TEST G531320p16 : ACTUATOR OUTPUT SHORT CIRCUIT TO BATTERY

G531320t62 : CHECK THE ACTUATOR NEGATIVE SIGNAL CIRCUIT FOR SHORT CIRCUIT TO POWER

1. Key off. 2.



E55103

Electric parking brake module connector 1 (CR50) disconnected. 3. Key on, engine off. 4. Measure the resistance between:

CR50 connector, harness side	Vehicle battery
Electric parking brake actuator - negative - Pin 07	Positive terminal

- **Is the resistance greater than 100 Kohms?**

-> **Yes**

GO to Pinpoint Test [G531320t63](#).

-> **No**

GO to Pinpoint Test [G531320t64](#).

G531320t63 : CHECK THE ACTUATOR POSITIVE SIGNAL CIRCUIT FOR SHORT CIRCUIT TO POWER

1. Measure the resistance between:

CR50 connector, harness side	Vehicle battery
Electric parking brake actuator - positive - Pin 14	Positive terminal

- **Is the resistance greater than 100 Kohms?**

-> **Yes**

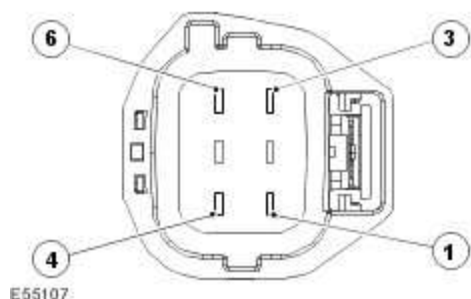
An intermittent fault may be present in the wiring harness. Visually check for chaffed wires or other physical damage to the harness. If no fault is found in the circuit, suspect the following component(s): - EPB module - EPB module connector, CR50

-> **No**

GO to Pinpoint Test [G531320t65](#).

G531320t64 : CHECK IF THE SHORT CIRCUIT IS IN THE HARNESS OR THE ACTUATOR

1.



EPB actuator connector disconnected. 2. Measure the resistance between:

CR50 connector, harness side	Vehicle battery
Electric parking brake actuator - negative - Pin 07	Positive terminal

- Is the resistance greater than 100 Kohms?

-> Yes

INSTALL a new EPB actuator.

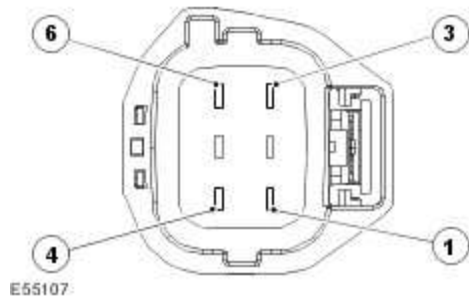
[Parking Brake Release Actuator - VIN Range: G03446->H99999 \(70.35.45\)](#)

-> No

REPAIR the short circuit. For additional information, refer to the wiring diagrams.

G531320t65 : CHECK IF THE SHORT CIRCUIT IS IN THE HARNESS OR THE ACTUATOR

1.



EPB actuator connector disconnected. 2. Measure the resistance between:

CR50 connector, harness side	Vehicle battery
Electric parking brake actuator - positive - Pin 14	Positive terminal

- Is the resistance greater than 100 Kohms?

-> Yes

INSTALL a new EPB actuator.

[Parking Brake Release Actuator - VIN Range: G03446->H99999 \(70.35.45\)](#)

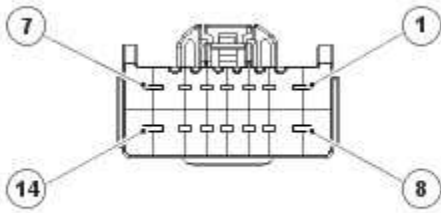
-> No

REPAIR the short circuit. For additional information, refer to the wiring diagrams.

PINPOINT TEST G531320p17 : ACTUATOR HALL EFFECT SENSOR CIRCUIT FAILURE

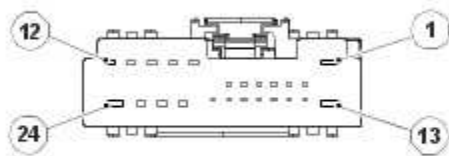
G531320t66 : CHECK THE HALL EFFECT 5 VOLT SUPPLY CIRCUIT FOR SHORT CIRCUIT TO GROUND

1. Key off. 2.



E55103

Electric parking brake module connector 1 (CR50) disconnected. 3.



E55104

Electric parking brake module connector 2 (CR32) disconnected. 4. Key on, engine off. 5. Measure the resistance between:

CR50 connector, harness side	Vehicle battery
Electric parking brake hall effect - signal - Pin 12	Negative terminal

- Is the resistance greater than 100 Kohms?

-> Yes

GO to Pinpoint Test [G531320t67](#).

-> No

GO to Pinpoint Test [G531320t74](#).

G531320t67 : CHECK THE HALL EFFECT 5 VOLT SUPPLY CIRCUIT FOR SHORT CIRCUIT TO POWER

1. Measure the resistance between:

CR50 connector, harness side	Vehicle battery
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Electric parking brake hall effect - signal - Pin 12	Positive terminal
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- Is the resistance greater than 100 Kohms?

-> Yes

GO to Pinpoint Test [G531320t68](#).

-> No

GO to Pinpoint Test [G531320t75](#).

G531320t68 : CHECK THE ACTUATOR SIGNAL CIRCUIT FOR SHORT CIRCUIT TO GROUND

1. Measure the resistance between:

CR32 connector, harness side	Vehicle battery
Electric parking brake actuator - signal - Pin 10	Negative terminal

- Is the resistance greater than 100 Kohms?

-> Yes

GO to Pinpoint Test [G531320t69](#).

-> No

GO to Pinpoint Test [G531320t76](#).

G531320t69 : CHECK THE ACTUATOR SIGNAL CIRCUIT FOR SHORT CIRCUIT TO POWER

1. Measure the resistance between:

CR32 connector, harness side	Vehicle battery
Electric parking brake actuator - signal - Pin 10	Negative terminal

- Is the resistance greater than 100 Kohms?

-> **Yes**

GO to Pinpoint Test [G531320t70](#).

-> **No**

GO to Pinpoint Test [G531320t77](#).

G531320t70 : CHECK THE SENSOR RETURN CIRCUIT FOR SHORT CIRCUIT TO BATTERY

1. Measure the resistance between:

CR50 connector, harness side	Vehicle battery
Electric parking brake hall effect - ground - Pin 13	Positive terminal

- Is the resistance greater than 100 Kohms?

-> **Yes**

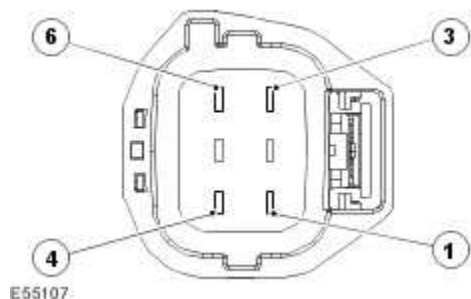
GO to Pinpoint Test [G531320t71](#).

-> **No**

GO to Pinpoint Test [G531320t78](#).

G531320t71 : CHECK THE SENSOR RETURN CIRCUIT FOR OPEN CIRCUIT

1.



EPB actuator connector disconnected. 2. Measure the resistance between:

CR50 connector, harness side	EPB actuator connector, harness side
Electric parking brake hall effect - ground - Pin 13	Electric parking brake hall effect - ground - Pin 05

- Is the resistance less than 10 ohms?

-> Yes

GO to Pinpoint Test [G531320t72](#).

-> No

REPAIR the open circuit. For additional information, refer to the wiring diagrams.

G531320t72 : CHECK THE HALL EFFECT 5 VOLT SUPPLY CIRCUIT FOR OPEN CIRCUIT

1. Measure the resistance between:

CR50 connector, harness side	EPB actuator connector, harness side
Electric parking brake hall effect - signal - Pin 12	Electric parking brake hall effect - signal - Pin 03

- Is the resistance less than 10 ohms?

-> Yes

GO to Pinpoint Test [G531320t73](#).

-> No

REPAIR the open circuit. For additional information, refer to the wiring diagrams.

G531320t73 : CHECK THE ACTUATOR SIGNAL CIRCUIT FOR OPEN CIRCUIT

1. Measure the resistance between:

CR32 connector, harness side	EPB actuator connector, harness side
Electric parking brake actuator - signal - Pin 10	Electric parking brake actuator - signal - Pin 04

- Is the resistance less than 10 ohms?

-> Yes

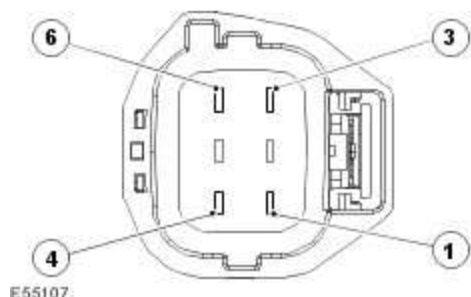
An intermittent fault may be present in the wiring harness. Visually check for chaffed wires or other physical damage to the harness. If no fault is found in the circuit, suspect the following component(s): - EPB module - EPB actuator - EPB module connector, CR50 - EPB module connector, CR32 - EPB actuator connector

-> **No**

REPAIR the open circuit. For additional information, refer to the wiring diagrams.

G531320t74 : CHECK IF THE SHORT CIRCUIT IS IN THE HARNESS OR THE ACTUATOR

1.



EPB actuator connector disconnected. 2. Measure the resistance between:

CR50 connector, harness side	Vehicle battery
Electric parking brake hall effect - signal - Pin 12	Negative terminal

- **Is the resistance greater than 100 Kohms?**

-> **Yes**

INSTALL a new EPB actuator.

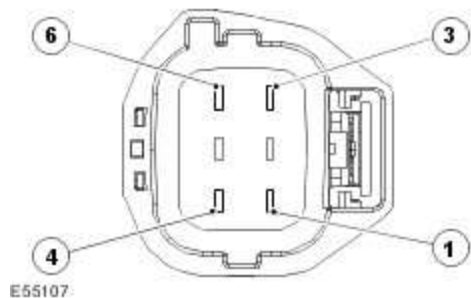
[Parking Brake Release Actuator - VIN Range: G03446->H99999 \(70.35.45\)](#)

-> **No**

REPAIR the short circuit. For additional information, refer to the wiring diagrams.

G531320t75 : CHECK IF THE SHORT CIRCUIT IS IN THE HARNESS OR THE ACTUATOR

1.



EPB actuator connector disconnected. 2. Measure the resistance between:

CR50 connector, harness side	Vehicle battery
------------------------------	-----------------

Electric parking brake hall effect - signal - Pin 12	Positive terminal
--	-------------------

- Is the resistance greater than 100 Kohms?

-> **Yes**

INSTALL a new EPB actuator.

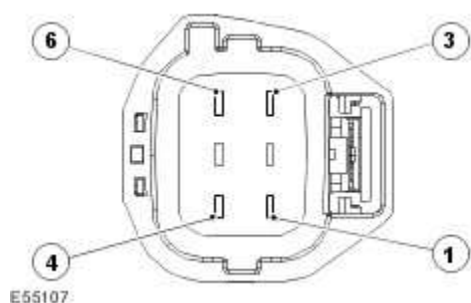
[Parking Brake Release Actuator - VIN Range: G03446->H99999 \(70.35.45\)](#)

-> **No**

REPAIR the short circuit. For additional information, refer to the wiring diagrams.

G531320t76 : CHECK IF THE SHORT CIRCUIT IS IN THE HARNESS OR THE ACTUATOR

1.



EPB actuator connector disconnected. 2. Measure the resistance between:

CR32 connector, harness side	Vehicle battery
Electric parking brake actuator - signal - Pin 10	Negative terminal

- Is the resistance greater than 100 Kohms?

-> **Yes**

INSTALL a new EPB actuator.

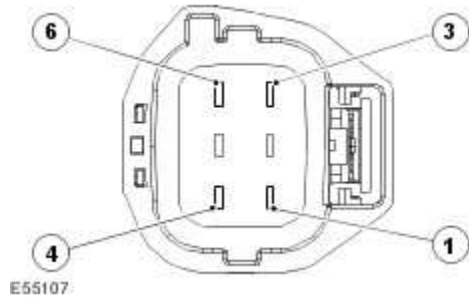
[Parking Brake Release Actuator - VIN Range: G03446->H99999 \(70.35.45\)](#)

-> **No**

REPAIR the short circuit. For additional information, refer to the wiring diagrams.

G531320t77 : CHECK IF THE SHORT CIRCUIT IS IN THE HARNESS OR THE ACTUATOR

1.



EPB actuator connector disconnected. 2. Measure the resistance between:

CR32 connector, harness side	Vehicle battery
Electric parking brake actuator - signal - Pin 10	Positive terminal

- Is the resistance greater than 100 Kohms?

-> Yes

INSTALL a new EPB actuator.

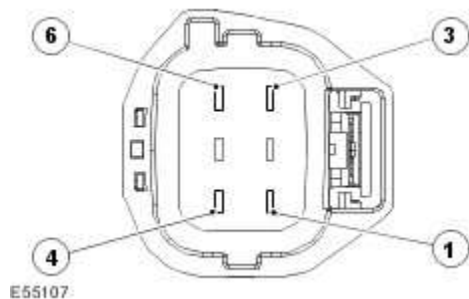
[Parking Brake Release Actuator - VIN Range: G03446->H999999 \(70.35.45\)](#)

-> No

REPAIR the short circuit. For additional information, refer to the wiring diagrams.

G531320t78 : CHECK IF THE SHORT CIRCUIT IS IN THE HARNESS OR THE ACTUATOR

1.



EPB actuator connector disconnected. 2. Measure the resistance between:

CR50 connector, harness side	Vehicle battery
Electric parking brake hall effect - ground - Pin 13	Positive terminal

- Is the resistance greater than 100 Kohms?

-> Yes

INSTALL a new EPB actuator.

[Parking Brake Release Actuator - VIN Range: G03446->H99999 \(70.35.45\)](#)

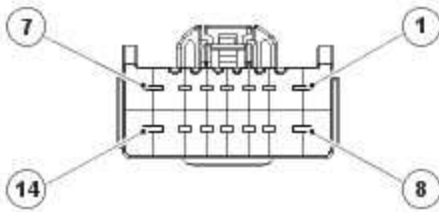
-> No

REPAIR the short circuit. For additional information, refer to the wiring diagrams.

PINPOINT TEST G531320p18 : SECONDARY RELEASE HARNESS SHORT CIRCUIT TO BATTERY OR OPEN CIRCUIT

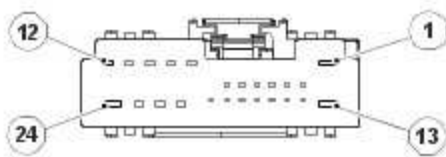
G531320t79 : CHECK THE PRIMARY APPLY SIGNAL CIRCUIT FOR SHORT CIRCUIT TO POWER

1. Key off. 2.



E55103

Electric parking brake module connector 1 (CR50) disconnected. 3.



E55104

Electric parking brake module connector 2 (CR32) disconnected. 4. Key on, engine off. 5. Measure the resistance between:

CR50 connector, harness side	Vehicle battery
Electric parking brake switch apply 1 - signal - Pin 10	Positive terminal

- Is the resistance greater than 100 Kohms?

-> Yes

GO to Pinpoint Test [G531320t80](#).

-> No

GO to Pinpoint Test [G531320t86](#).

G531320t80 : CHECK THE PRIMARY RELEASE SIGNAL CIRCUIT FOR SHORT CIRCUIT TO POWER

1. Measure the resistance between:

CR50 connector, harness side	Vehicle battery
Electric parking brake switch release 1 - signal - Pin 11	Positive terminal

- Is the resistance greater than 100 Kohms?

-> Yes

GO to Pinpoint Test [G531320t81](#).

-> No

GO to Pinpoint Test [G531320t87](#).

G531320t81 : CHECK THE SECONDARY APPLY SIGNAL CIRCUIT FOR SHORT CIRCUIT TO POWER

1. Measure the resistance between:

CR32 connector, harness side	Vehicle battery
Electric parking brake switch apply 2 - signal - Pin 02	Positive terminal

- Is the resistance greater than 100 Kohms?

-> Yes

GO to Pinpoint Test [G531320t82](#).

-> **No**

GO to Pinpoint Test [G531320t88](#).

G531320t82 : CHECK THE SECONDARY RELEASE SIGNAL CIRCUIT FOR SHORT CIRCUIT TO POWER

1. Measure the resistance between:

CR32 connector, harness side	Vehicle battery
Electric parking brake switch release 2 - signal - Pin 14	Positive terminal

- Is the resistance greater than 100 Kohms?

-> **Yes**

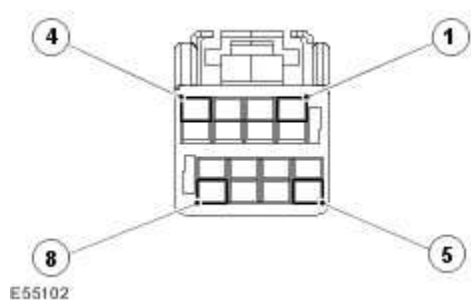
GO to Pinpoint Test [G531320t83](#).

-> **No**

GO to Pinpoint Test [G531320t89](#).

G531320t83 : CHECK THE SECONDARY RELEASE SIGNAL CIRCUIT FOR OPEN CIRCUIT

1.



Electric parking brake switch (TL82) connector disconnected. 2. Measure the resistance between:

CR32 connector, harness side	TL82 connector, harness side
Electric parking brake switch release 2 - signal - Pin 14	Electric parking brake switch release 2 - signal - Pin 05

- Is the resistance less than 10 ohms?

-> **Yes**

GO to Pinpoint Test [G531320t84](#).

-> **No**

REPAIR the open circuit. For additional information, refer to the wiring diagrams.

G531320t84 : CHECK THE SWITCH RETURN SIGNAL CIRCUIT FOR OPEN CIRCUIT

1. Measure the resistance between:

CR32 connector, harness side	TL82 connector, harness side
Electric parking brake switch - switch return - Pin 06	Electric parking brake switch - switch return - Pin 06

- **Is the resistance less than 10 ohms?**

-> **Yes**

GO to Pinpoint Test [G531320t85](#).

-> **No**

REPAIR the open circuit. For additional information, refer to the wiring diagrams.

G531320t85 : CHECK THE ELECTRIC PARKING BRAKE SWITCH

1. Measure the resistance between:

TL82 connector, component side	TL82 connector, component side
Electric parking brake switch release 2 - signal - Pin 05	Electric parking brake switch - switch return - Pin 06

- **Is the resistance between 595 ohms - 611 ohms?**

-> **Yes**

An intermittent fault may be present in the wiring harness. Visually check for chaffed wires or other physical damage to the harness. If no fault is found in the circuit, suspect the following component(s): - EPB module - EPB module connector, CR50 - EPB module connector, CR32

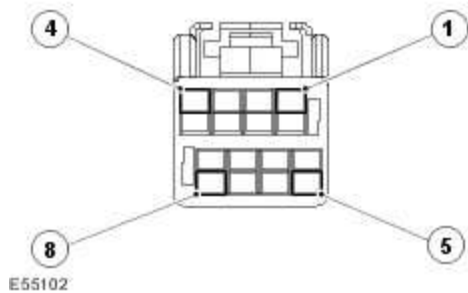
-> **No**

INSTALL a new EPB switch.

[Parking Brake Switch \(70.35.46\)](#)

G531320t86 : CHECK IF THE SHORT CIRCUIT IS IN THE HARNESS OR THE SWITCH

1.



Electric parking brake switch (TL82) connector disconnected. 2. Measure the resistance between:

CR50 connector, harness side	Vehicle battery
Electric parking brake switch apply 1 - signal - Pin 10	Positive terminal

- Is the resistance greater than 100 Kohms?

-> Yes

INSTALL a new EPB switch.

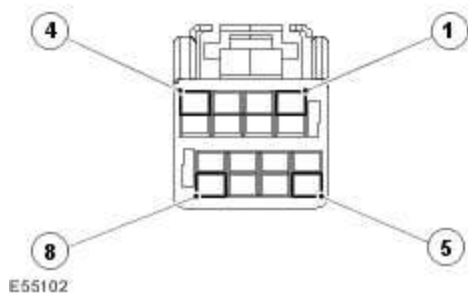
[Parking Brake Switch \(70.35.46\)](#)

-> No

REPAIR the short circuit. For additional information, refer to the wiring diagrams.

G531320t87 : CHECK IF THE SHORT CIRCUIT IS IN THE HARNESS OR THE SWITCH

1.



Electric parking brake switch (TL82) connector disconnected. 2. Measure the resistance between:

CR50 connector, harness side	Vehicle battery
------------------------------	-----------------

Electric parking brake switch release 1 - signal - Pin 11	Positive terminal
---	-------------------

- Is the resistance greater than 100 Kohms?

-> **Yes**

INSTALL a new EPB switch.

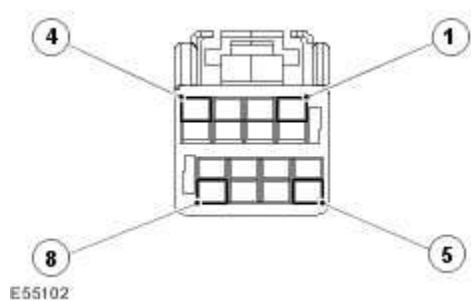
[Parking Brake Switch \(70.35.46\)](#)

-> **No**

REPAIR the short circuit. For additional information, refer to the wiring diagrams.

G531320t88 : CHECK IF THE SHORT CIRCUIT IS IN THE HARNESS OR THE SWITCH

1.



Electric parking brake switch (TL82) connector disconnected. 2. Measure the resistance between:

CR32 connector, harness side	Vehicle battery
Electric parking brake switch apply 2 - signal - Pin 02	Positive terminal

- Is the resistance greater than 100 Kohms?

-> **Yes**

INSTALL a new EPB switch.

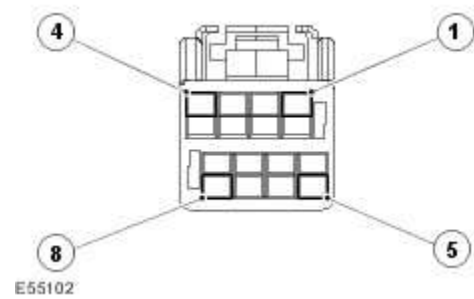
[Parking Brake Switch \(70.35.46\)](#)

-> **No**

REPAIR the short circuit. For additional information, refer to the wiring diagrams.

G531320t89 : CHECK IF THE SHORT CIRCUIT IS IN THE HARNESS OR THE SWITCH

1.



Electric parking brake switch (TL82) connector disconnected. 2. Measure the resistance between:

CR32 connector, harness side	Vehicle battery
Electric parking brake switch release 2 - signal - Pin 14	Positive terminal

- Is the resistance greater than 100 Kohms?

-> Yes

INSTALL a new EPB switch.

[Parking Brake Switch \(70.35.46\)](#)

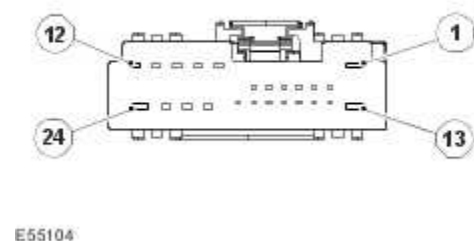
-> No

REPAIR the short circuit. For additional information, refer to the wiring diagrams.

PINPOINT TEST G531320p19 : ACTUATOR DOES NOT FULLY RELEASE

G531320t90 : CHECK THE HIGH CURRENT GROUND CIRCUIT FOR AN OPEN CIRCUIT IN THE HARNESS

1. Key off. 2.



Electric parking brake connector 2 (CR32) disconnected. 3. Measure the resistance between:

CR32 connector, harness side	Vehicle battery
Electric parking brake module - ground - Pin 13	Negative terminal

- **Is the resistance less than 10 ohms?**

-> **Yes**

An intermittent fault may be present in the wiring harness. Visually check for chaffed wires or other physical damage to the harness. If no fault is found in the circuit, suspect the following component(s): - EPB module - EPB module connector, CR32

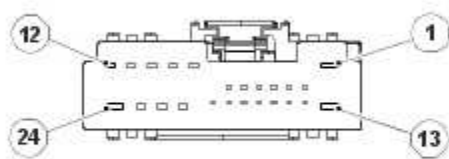
-> **No**

REPAIR the open circuit. For additional information, refer to the wiring diagrams.

PINPOINT TEST G531320p20 : SECONDARY RELEASE SWITCH CIRCUIT SHORT CIRCUIT TO GROUND

G531320t91 : CHECK THE SECONDARY RELEASE SIGNAL CIRCUIT FOR SHORT CIRCUIT TO GROUND

1. Key off. 2.



E55104

Electric parking brake connector 1 (CR50) disconnected. 3. Key on, engine off. 4. Measure the resistance between:

CR32 connector, harness side	Vehicle battery
Electric parking brake switch release 2 - signal - Pin 14	Negative terminal

- **Is the resistance greater than 100 Kohms?**

-> **Yes**

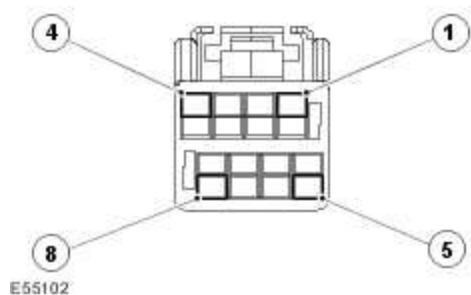
An intermittent fault may be present in the wiring harness. Visually check for chaffed wires or other physical damage to the harness. If no fault is found in the circuit, suspect the following component(s): - EPB module - EPB module connector, CR32

-> **No**

GO to Pinpoint Test [G531320t92](#).

G531320t92 : CHECK IF THE SHORT CIRCUIT IS IN THE HARNESS OR THE SWITCH

1.



Electric parking brake switch connector (TL82) disconnected. 2. Measure the resistance between:

CR32 connector, harness side	Vehicle battery
Electric parking brake switch release 2 - signal - Pin 14	Negative terminal

- Is the resistance greater than 100 Kohms?

-> **Yes**

INSTALL a new EPB switch.

[Parking Brake Switch \(70.35.46\)](#)

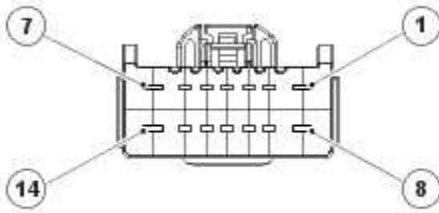
-> **No**

REPAIR the short circuit. For additional information, refer to the wiring diagrams.

PINPOINT TEST G531320p21 : APPLY AND RELEASE SWITCH CONTACTS ENERGIZED SIMULTANEOUSLY

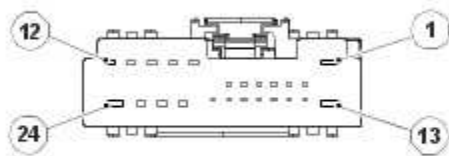
G531320t93 : CHECK THE PRIMARY EPB APPLY AND RELEASE CIRCUIT FOR SHORT CIRCUIT FAULTS

1. Key off. 2.



E55103

Electric parking brake connector 1 (CR50) disconnected. 3.



E55104

Electric parking brake connector 2 (CR32) disconnected. 4. Make sure the parking brake switch is not in the apply or release position. 5. Measure the resistance between:

CR50 connector, harness side	CR50 connector, harness side
Electric parking brake switch apply 1 - signal - Pin 10	Electric parking brake switch release 1 - signal - Pin 11

- Is the resistance between 1.19 Kohms - 1.222 Kohms?

-> Yes

GO to Pinpoint Test [G531320t94](#).

-> No

GO to Pinpoint Test [G531320t95](#).

G531320t94 : CHECK THE SECONDARY EPB APPLY AND RELEASE CIRCUIT FOR SHORT CIRCUIT FAULTS

1. Make sure the parking brake switch is not in the apply or release position. 2. Measure the resistance between:

CR32 connector, harness side	CR32 connector, harness side
Electric parking brake switch apply 2 - signal - Pin 02	Electric parking brake switch release 2 - signal - Pin 14

- Is the resistance between 1.19 Kohms - 1.222 Kohms?

-> Yes

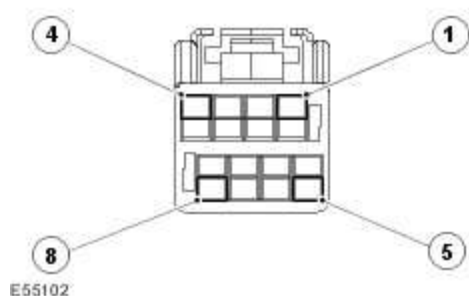
An intermittent fault may be present in the wiring harness. Visually check for chaffed wires or other physical damage to the harness. If no fault is found in the circuit, suspect the following component(s): - EPB module - EPB module connector, CR50 - EPB module connector, CR32

-> No

GO to Pinpoint Test [G531320t96](#).

G531320t95 : CHECK IF THE SHORT CIRCUIT IS IN THE HARNESS OR THE SWITCH

1.



Electric parking brake switch (TL82) connector disconnected. 2. Measure the resistance between:

CR50 connector, harness side	CR50 connector, harness side
Electric parking brake switch apply 1 - signal - Pin 10	Electric parking brake switch release 1 - signal - Pin 11

- Is the resistance greater than 100 Kohms?

-> Yes

INSTALL a new EPB switch.

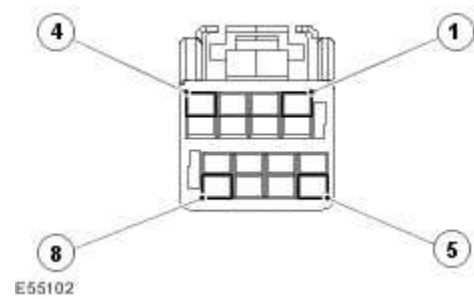
[Parking Brake Switch \(70.35.46\)](#)

-> No

REPAIR the short circuit. For additional information, refer to the wiring diagrams.

G531320t96 : CHECK IF THE SHORT CIRCUIT IS IN THE HARNESS OR THE SWITCH

1.



Electric parking brake switch (TL82) connector disconnected. 2. Measure the resistance between:

CR32 connector, harness side	CR32 connector, harness side
Electric parking brake switch apply 2 - signal - Pin 02	Electric parking brake switch release 2 - signal - Pin 14

- Is the resistance greater than 100 Kohms?

-> Yes

INSTALL a new EPB switch.

[Parking Brake Switch \(70.35.46\)](#)

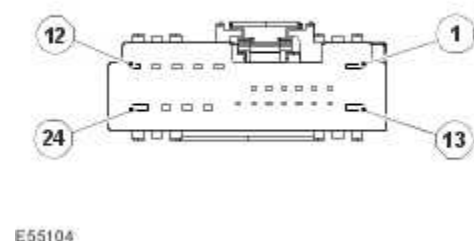
-> No

REPAIR the short circuit. For additional information, refer to the wiring diagrams.

PINPOINT TEST G531320p22 : BRAKE SWITCH INPUT STATUS PLAUSIBILITY FAILURE

G531320t97 : CHECK THE BRAKE SWITCH CIRCUIT FOR SHORT CIRCUIT TO POWER IN HARNESS

1. Key off. 2.



Electric parking brake module connector 2 (CR32) disconnected. 3. Key on, engine off. 4. Make sure the brake pedal is not pressed. 5. Measure the resistance between:

CR32 connector, harness side	Vehicle battery
Brake switch - signal - Pin 07	Positive terminal

- **Is the resistance greater than 100 Kohms?**

-> **Yes**

GO to Pinpoint Test [G531320t98](#).

-> **No**

GO to Pinpoint Test [G531320t99](#).

G531320t98 : CHECK THE BRAKE SWITCH CIRCUIT FOR SHORT CIRCUIT TO GROUND IN THE HARNESS

1. Measure the resistance between:

CR32 connector, harness side	Vehicle battery
Brake switch - signal - Pin 07	Negative terminal

- **Is the resistance greater than 100 Kohms?**

-> **Yes**

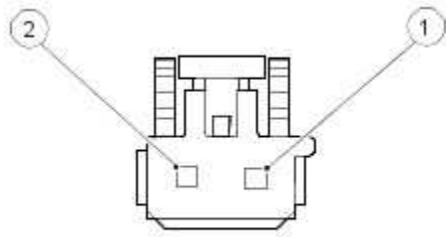
The following items have not been fully tested : - EPB module - Brake switch - ECM

-> **No**

REPAIR the short circuit. For additional information, refer to the wiring diagrams.

G531320t99 : CHECK THE BRAKE SWITCH CIRCUIT FOR SHORT CIRCUIT TO POWER IN THE HARNESS

1.



E55108

Brake pressure sensor (BPS) connector disconnected. 2. Measure the resistance between:

CR32 connector, harness side	Vehicle battery
Brake switch - signal - Pin 07	Positive terminal

- Is the resistance greater than 100 Kohms?

-> Yes

INSTALL a new BPS.

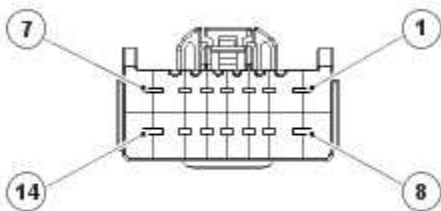
-> No

REPAIR the short circuit. For additional information, refer to the wiring diagrams.

PINPOINT TEST G531320p24 : ACTUATOR OUTPUT OPEN CIRCUIT

G531320t102 : CHECK THE ACTUATOR CIRCUIT RESISTANCE

1. Key off. 2.



E55103

Electric parking brake module connector 1 (CR50) disconnected. 3. Key on, engine off. 4. Measure the resistance between:

CR50 connector, harness side	CR50 connector, harness side
-------------------------------------	-------------------------------------

Electric parking brake actuator - positive - Pin 14	Electric parking brake actuator - negative - Pin 07
---	---

- Is the resistance between 0.5 ohms - 1 ohms?

-> **Yes**

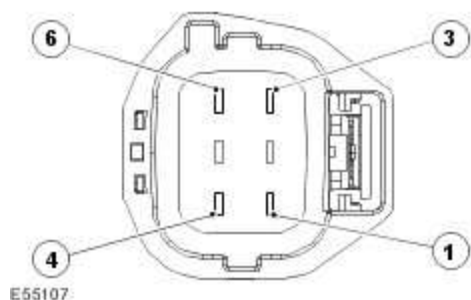
An intermittent fault may be present in the wiring harness. Visually check for chaffed wires or other physical damage to the harness. If no fault is found in the circuit, suspect the following component(s): - EPB module - EPB module connector, CR50

-> **No**

GO to Pinpoint Test [G531320t103](#).

G531320t103 : CHECK THE ACTUATOR SIGNAL CIRCUIT FOR OPEN CIRCUIT

1.



EPB actuator connector disconnected. 2. Measure the resistance between:

CR50 connector, harness side	EPB actuator connector, harness side
Electric parking brake actuator - positive - Pin 14	Electric parking brake actuator - positive - Pin 01

- Is the resistance less than 10 ohms?

-> **Yes**

GO to Pinpoint Test [G531320t104](#).

-> **No**

REPAIR the open circuit. For additional information, refer to the wiring diagrams.

G531320t104 : CHECK THE ACTUATOR RETURN CIRCUIT FOR OPEN CIRCUIT

1. Measure the resistance between:

CR50 connector, harness side	EPB actuator connector, harness side
Electric parking brake actuator - negative - Pin 07	Electric parking brake actuator - negative - Pin 06

- Is the resistance less than 10 ohms?

-> Yes

GO to Pinpoint Test [G531320t105](#).

-> No

REPAIR the open circuit. For additional information, refer to the wiring diagrams.

G531320t105 : CHECK THE ACTUATOR CIRCUIT RESISTANCE

1. Measure the resistance between:

EPB actuator connector, component side	EPB actuator connector, component side
Electric parking brake actuator - positive - Pin 01	Electric parking brake actuator - negative - Pin 06

- Is the resistance between 0.5 ohms - 1 ohm?

-> Yes

REPAIR the open circuit. For additional information, refer to the wiring diagrams.

-> No

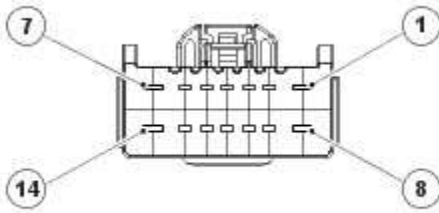
INSTALL a new EPB actuator.

[Parking Brake Release Actuator - VIN Range: G03446->H99999 \(70.35.45\)](#)

PINPOINT TEST G531320p29 : PRIMARY PARKING BRAKE RELEASE SWITCH CIRCUIT FAULT

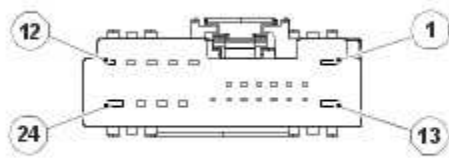
G531320t134 : CHECK THE PRIMARY RELEASE SWITCH SIGNAL CIRCUIT FOR SHORT CIRCUIT TO POWER

1. Key off. 2.



E55103

Electric parking brake module connector 1 (CR50) disconnected. 3.



E55104

Electric parking brake module connector 2 (CR32) disconnected. 4. Key on, engine off. 5. Measure the resistance between:

CR50 connector, harness side	Vehicle battery
Primary release switch signal 1 - pin 11	Positive terminal

- Is the resistance greater than 100 Kohms?

-> Yes

GO to Pinpoint Test [G531320t135](#).

-> No

GO to Pinpoint Test [G531320t141](#).

G531320t135 : CHECK THE PRIMARY APPLY SWITCH SIGNAL CIRCUIT FOR SHORT CIRCUIT TO POWER

1. Measure the resistance between:

CR50 connector, harness side	Vehicle battery
------------------------------	-----------------

Primary apply switch signal 1 - pin 10	Positive terminal
--	-------------------

- Is the resistance greater than 100 Kohms?

-> Yes

GO to Pinpoint Test [G531320t136](#).

-> No

GO to Pinpoint Test [G531320t142](#).

G531320t136 : CHECK THE SECONDARY APPLY SWITCH SIGNAL CIRCUIT FOR SHORT CIRCUIT TO POWER

1. Measure the resistance between:

CR32 connector, harness side	Vehicle battery
Secondary apply switch signal 2 - pin 02	Positive terminal

- Is the resistance greater than 100 Kohms?

-> Yes

GO to Pinpoint Test [G531320t137](#).

-> No

GO to Pinpoint Test [G531320t143](#).

G531320t137 : CHECK THE SECONDARY RELEASE SWITCH SIGNAL CIRCUIT FOR SHORT CIRCUIT TO POWER

1. Measure the resistance between:

CR32 connector, harness side	Vehicle battery
Secondary release switch signal 2 - pin 14	Positive terminal

- Is the resistance greater than 100 Kohms?

-> **Yes**

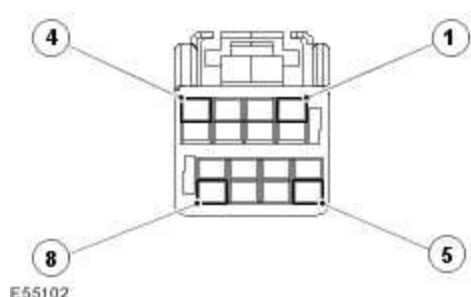
GO to Pinpoint Test [G531320t138](#).

-> **No**

GO to Pinpoint Test [G531320t144](#).

G531320t138 : CHECK THE PRIMARY RELEASE SWITCH SIGNAL CIRCUIT FOR HIGH RESISTANCE

1.



Electric parking brake switch (TL82) connector disconnected. 2. Measure the resistance between:

CR50 connector, harness side	TL82 connector, harness side
Primary release switch signal 1 - pin 11	Primary release switch signal 1 - pin 04

- **Is the resistance less than 10 ohms?**

-> **Yes**

GO to Pinpoint Test [G531320t139](#).

-> **No**

REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams.

G531320t139 : CHECK THE APPLY SWITCH RETURN CIRCUIT FOR HIGH RESISTANCE

1. Measure the resistance between:

CR32 connector, harness side	TL82 connector, harness side
Switch return - pin 06	Switch return - pin 06

- Is the resistance less than 10 ohms?

-> Yes

GO to Pinpoint Test [G531320t140](#).

-> No

INSTALL a new parking brake switch.

[Parking Brake Switch \(70.35.46\)](#)

G531320t140 : CHECK THE SWITCH RESISTANCE

1. Measure the resistance between:

TL82 connector, component side	TL82 connector, component side
Switch release signal 1 - pin 04	Switch return - pin 06

- Is the resistance between 595 and 611 ohms?

-> Yes

An intermittent fault may be present in the wiring harness. Visually check for chaffed wires or other physical damage to the harness. If no fault is found in the circuit, suspect the following component(s): - CR50 - CR32 - EPB module

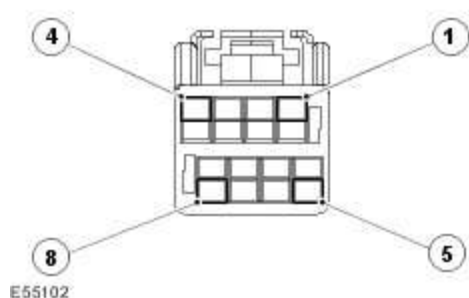
-> No

INSTALL a new parking brake switch.

[Parking Brake Switch \(70.35.46\)](#)

G531320t141 : CHECK IF THE SHORT CIRCUIT IS IN THE HARNESS OR THE SWITCH

1.



Electric parking brake switch (TL82) connector disconnected. 2. Measure the resistance between:

CR50 connector, component side	Vehicle battery
--------------------------------	-----------------

Release switch signal 1 - pin 11	Positive terminal
----------------------------------	-------------------

- Is the resistance greater than 100 Kohms?

-> **Yes**

INSTALL a new parking brake switch.

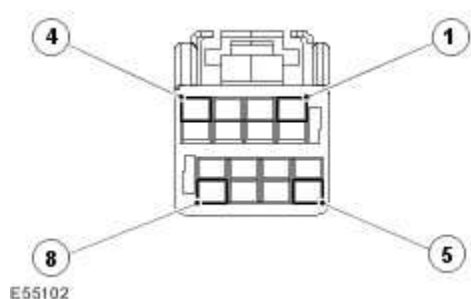
[Parking Brake Switch \(70.35.46\)](#)

-> **No**

REPAIR the short circuit. For additional information, refer to the wiring diagrams.

G531320t142 : CHECK IF THE SHORT CIRCUIT IS IN THE HARNESS OR THE SWITCH

1.



Electric parking brake switch (TL82) connector disconnected. 2. Measure the resistance between:

CR50 connector, component side	Vehicle battery
Apply switch signal 1 - pin 10	Positive terminal

- Is the resistance greater than 100 Kohms?

-> **Yes**

INSTALL a new parking brake switch.

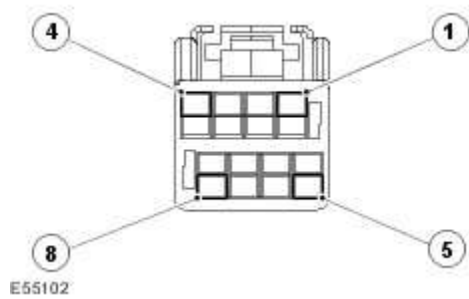
[Parking Brake Switch \(70.35.46\)](#)

-> **No**

REPAIR the short circuit. For additional information, refer to the wiring diagrams.

G531320t143 : CHECK IF THE SHORT CIRCUIT IS IN THE HARNESS OR THE SWITCH

1.



Electric parking brake switch (TL82) connector disconnected. 2. Measure the resistance between:

CR32 connector, component side	Vehicle battery
Apply switch signal 2 - pin 02	Positive terminal

- Is the resistance greater than 100 Kohms?

-> Yes

INSTALL a new parking brake switch.

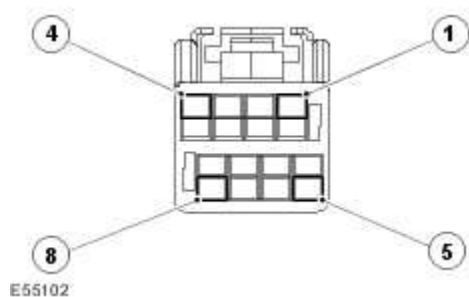
[Parking Brake Switch \(70.35.46\)](#)

-> No

REPAIR the short circuit. For additional information, refer to the wiring diagrams.

G531320t144 : CHECK IF THE SHORT CIRCUIT IS IN THE HARNESS OR THE SWITCH

1.



Electric parking brake switch (TL82) connector disconnected. 2. Measure the resistance between:

CR32 connector, component side	Vehicle battery
Release switch signal 2 - pin 14	Positive terminal

- **Is the resistance greater than 100 Kohms?**

-> Yes

INSTALL a new parking brake switch.

[Parking Brake Switch \(70.35.46\)](#)

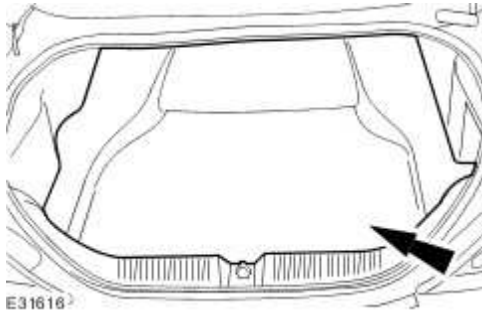
-> No

REPAIR the short circuit. For additional information, refer to the wiring diagrams.

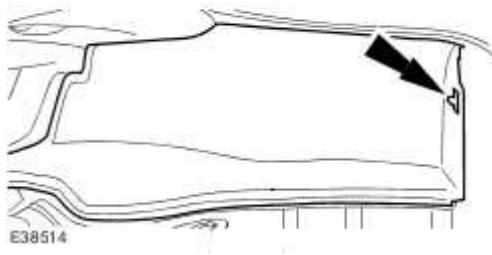
Parking Brake Module - VIN Range: G00442->G45703 (70.35.47)

Removal

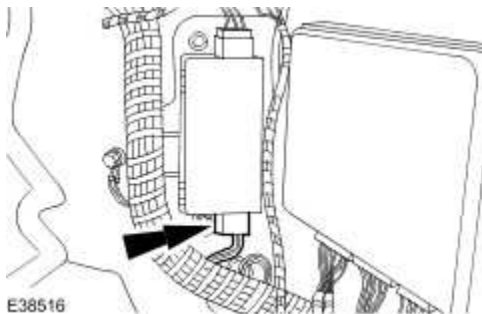
- 1 . Remove the luggage compartment floor covering.



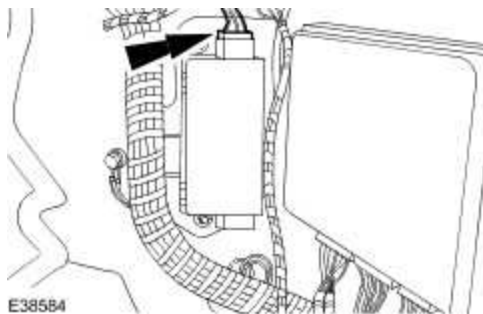
- 2 . Remove the luggage compartment side trim panel.



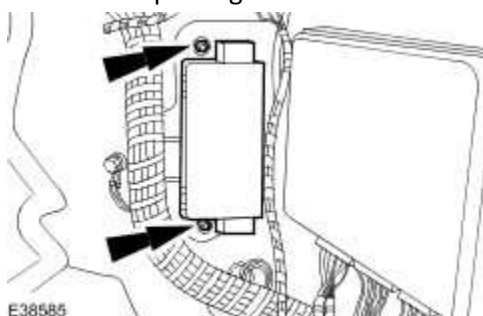
- 3 . Disconnect the parking brake module electrical connector.



- 4 . Disconnect the parking brake module electrical connector.



5 . Remove the parking brake module.



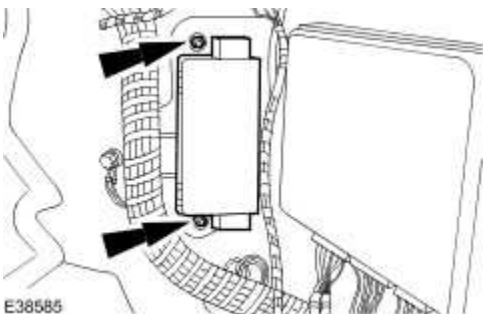
Installation

1 NOTE:

If a new parking brake module is installed it must be configured using the Jaguar approved diagnostic system.

To install, reverse the removal procedure.

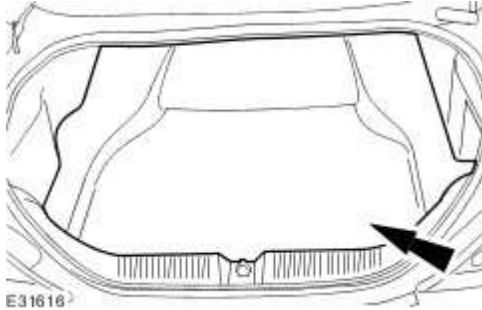
► Tighten to 4 Nm.



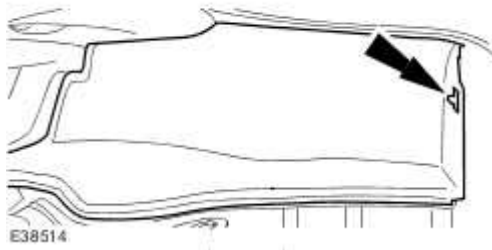
Parking Brake Module - VIN Range: G45704->G99999 (70.35.47)

Removal

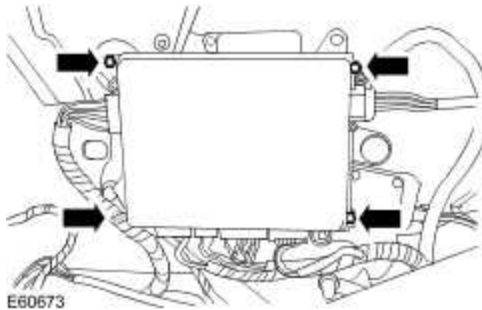
- 1 . Remove the luggage compartment floor covering.



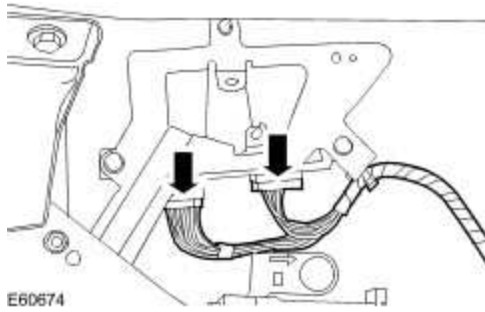
- 2 . Remove the luggage compartment side trim panel.



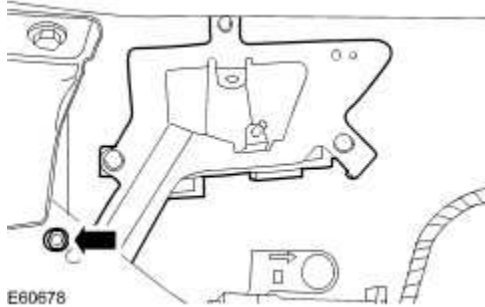
- 3 . Detach the rear electronic module (REM).



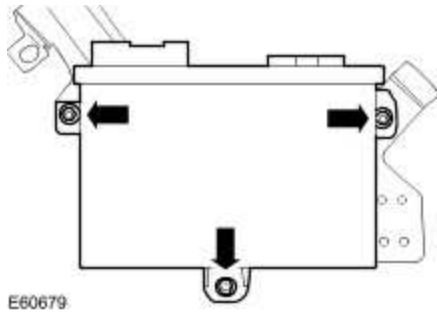
- 4 . Disconnect the parking brake module electrical connectors.



5 . Detach the parking brake module.



6 . Remove the parking brake module.



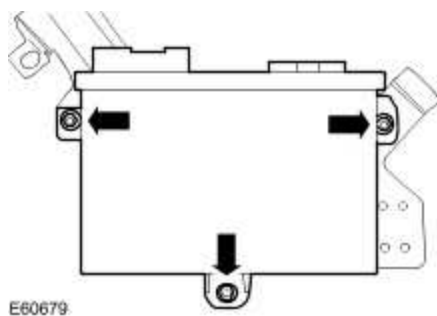
Installation

1 NOTE:

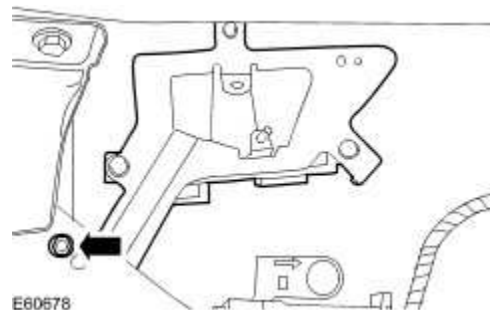
If a new parking brake module is installed it must be configured using the Jaguar approved diagnostic system.

To install, reverse the removal procedure.

► Tighten to 4 Nm.



2 . Tighten to 10 Nm.



Parking Brake Pads - Vehicles With: High Performance Brakes (70.40.04)

Special Service Tools



Brake caliper piston retractor.

206-081

Removal

- 1 . Carry out the parking brake cable tension release.

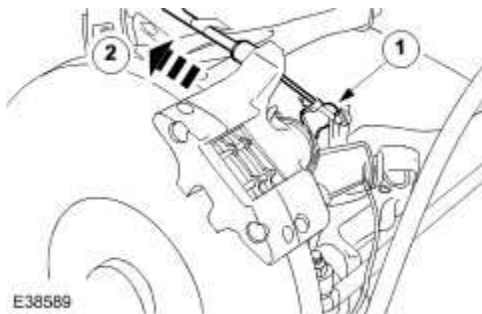
For additional information, refer to

- 2 . Remove both rear wheels and tires. [<<204-04>>](#)

- 3 . Detach the parking brake cable.

1) Reposition the parking brake caliper lever.

2) Detach the parking brake cable.

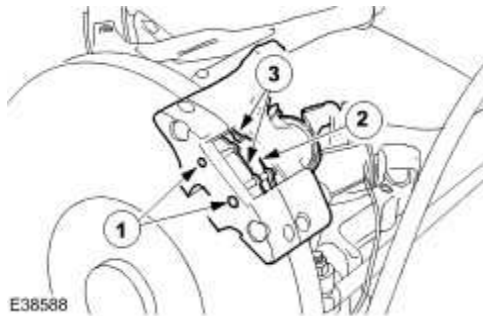


- 4 . Remove the parking brake pads.

1) Remove the parking brake pad retaining pins.

2) Remove the parking brake pad anti-rattle spring plate.

3) Remove the parking brake pads.

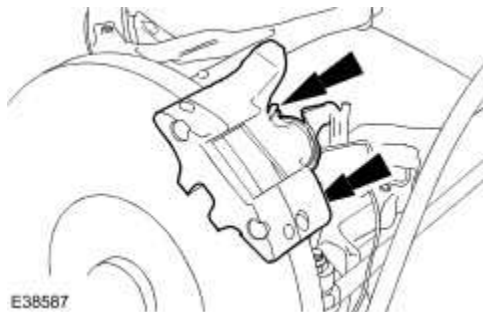


5 . NOTE:

Note using special tool 206-081 retract the parking brake caliper piston.

Remove the parking brake caliper.

➤ Remove and discard the parking brake caliper retaining bolts.



Installation

1



CAUTION: Make sure the brake disc faces are clean before installation.



CAUTION: Brake pads must always be replaced in axle sets.



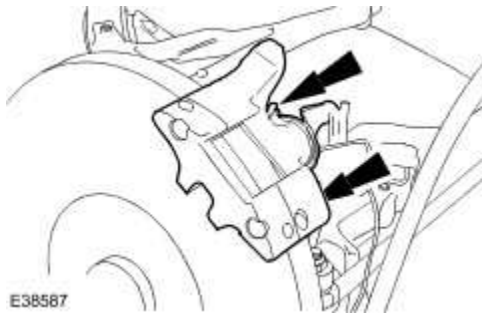
CAUTION: Install new parking brake caliper retaining bolts.



CAUTION: After installing the parking brake caliper, manually operate the parking brake caliper lever until the parking brake caliper piston is set to the correct position and the clearances between the pads, discs and parking brake caliper piston have been removed.

To install, reverse the removal procedure.

2 . Tighten to 70 Nm.

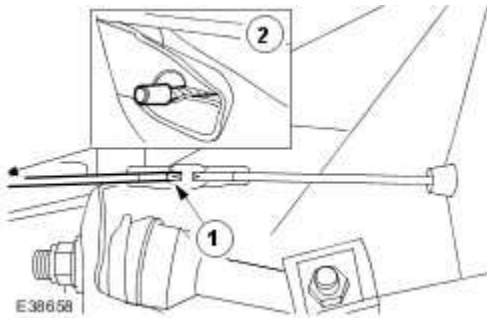


Parking Brake Rear Cables

Removal

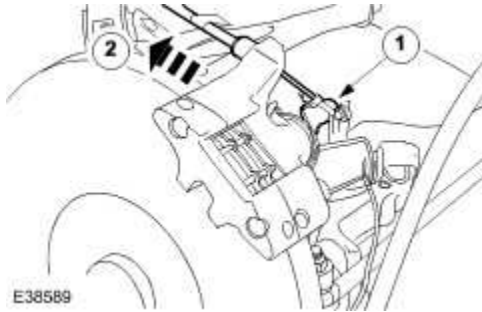
All vehicles

- 1 . Carry out the parking brake cable release.
For additional information, refer to
- 2 . Remove both rear wheels and tires. [<<204-04>>](#)
- 3 . Detach the parking brake cable.
 - 1) For right-hand side connector bracket:
 - reposition the retaining tang.
 - detach the parking brake cable.
 - 2) For left-hand side reaction bracket, detach the parking brake cable.

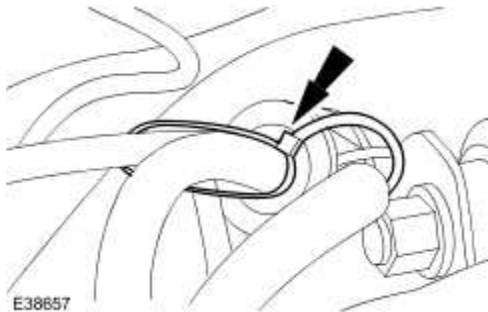


Vehicles with supercharger

- 4 . Detach the parking brake cable.
 - 1) Reposition the parking brake caliper lever.
 - 2) Detach the parking brake cable.



5 . Remove the parking brake cable retaining tie strap.

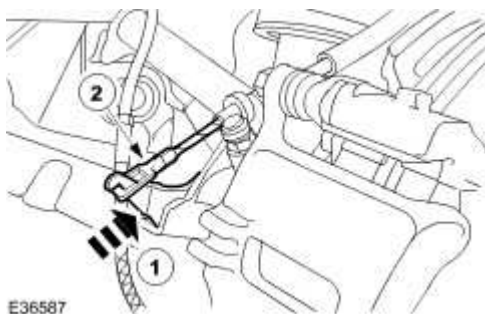


Vehicles without supercharger

6 . Detach the parking brake cable.

1) Reposition the parking brake caliper lever.

2) Detach the parking brake cable.

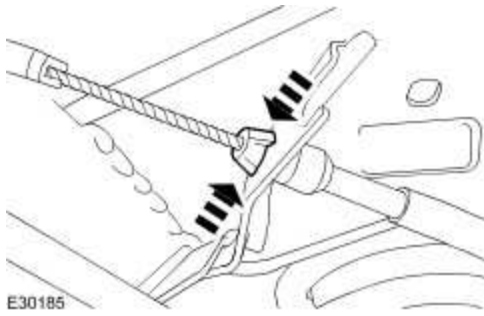


All vehicles

7 . Remove the parking brake cable.

▶ Detach the parking brake cable retaining tangs.

▶ Remove the parking brake cable.



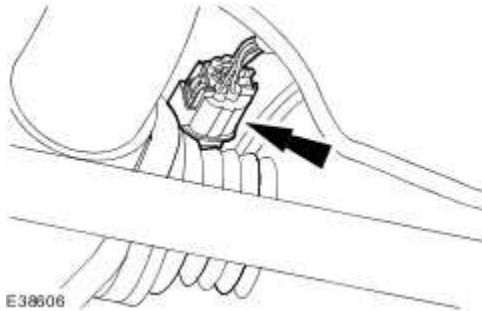
Installation

- 1 . To install, reverse the removal procedure.

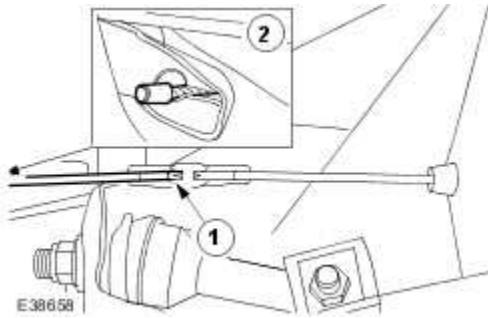
Parking Brake Release Actuator - VIN Range: G00001->G03445 (70.35.45)

Removal

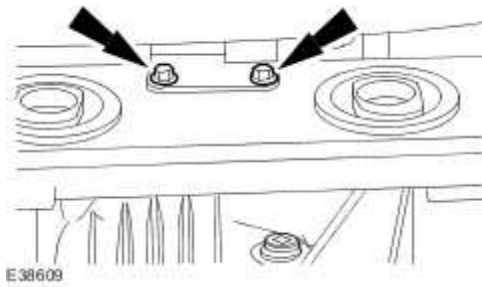
- 1 Carry out the parking brake cable tension release.
 - . For additional information, refer to [Parking Brake Cable Tension Release - VIN Range: G00442->G45703](#)
- 2 . Raise and support the vehicle.
For additional information, refer to
- 3 . Disconnect the parking brake release actuator electrical connector.



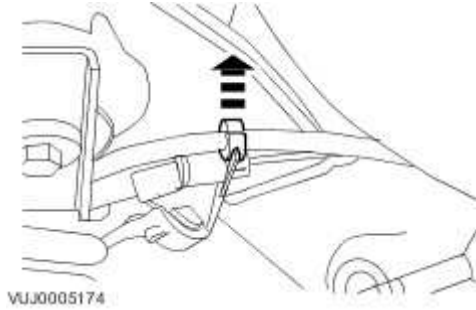
- 4 . Detach the parking brake cable.
 - 1) For right-hand side connector bracket:
 - reposition the retaining tang.
 - detach the parking brake cable.
 - 4) For left-hand side reaction bracket, detach the parking brake cable.



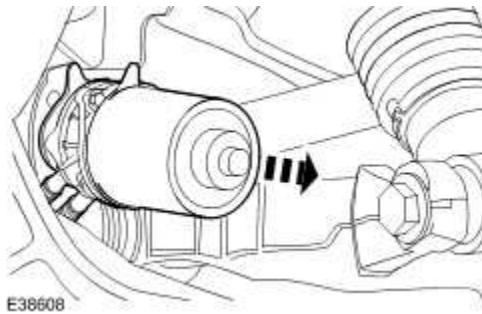
5 . Remove the parking brake release actuator retaining bolts.



6 . Detach the parking brake release actuator cable.



7 . Remove the parking brake release actuator.



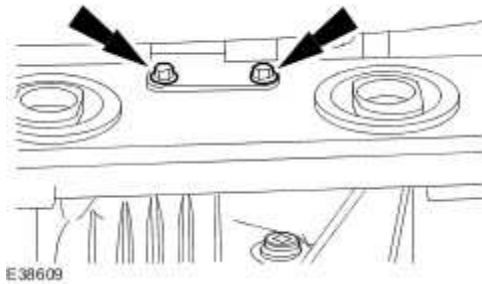
Installation

1 . NOTE:

Make sure the parking brake cable is correctly routed.

To install, reverse the removal procedure.

▶ Tighten to 20 Nm.



2



- **CAUTION:** Calibrate the electric park brake using Jaguar approved diagnostic system. If the Jaguar approved diagnostic system is not available disconnect the battery for approximately 30 seconds, the vehicle will then prompt the driver to carry out the calibration procedure as per the vehicle hand book on re-connection.

Calibrate the electric parking brake module using the Jaguar approved diagnostic system.

Parking Brake Release Actuator - VIN Range: G03446->H99999 (70.35.45)

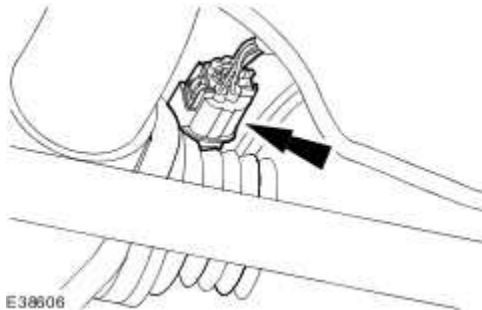
Special Service Tools



Powertrain assembly jack
HTJ1200-02

Removal

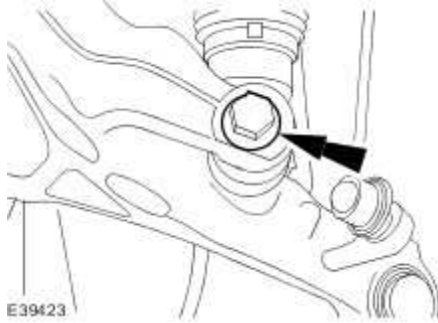
- 1 Carry out the parking brake cable tension release.
 - . For additional information, refer to [Parking Brake Cable Tension Release - VIN Range: G45704->G99999](#)
- 2 . Drain the fuel tank.
 - For additional information, refer to [Fuel Tank Draining - VIN Range: G45704->G99999](#)
- 3 . Raise and support the vehicle.
 - For additional information, refer to
- 4 . Disconnect the parking brake release actuator electrical connector.



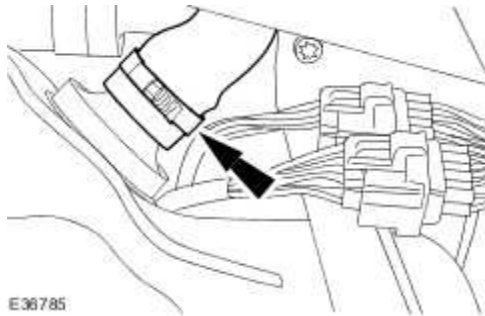
5 . NOTE:

Left-hand shown, right-hand similar.

Detach the air springs.



6 . Detach the fuel tank filler pipe.



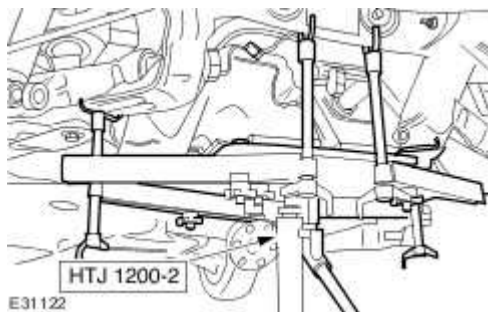
7 . **NOTE:**

Right-hand shown, left-hand similar.

Detach the muffler and tail pipe from the hanger insulator.



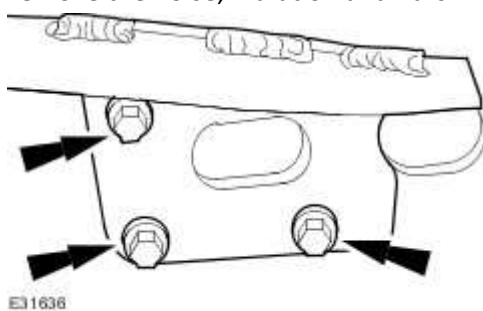
8 . Install the special tool to support the rear subframe.



9 . NOTE:

Left-hand shown, right-hand similar.

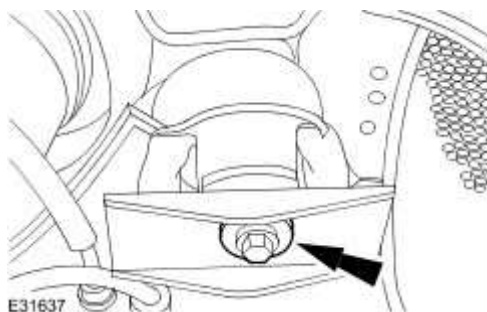
Remove the noise, vibration and harshness brace retaining bolts.



10 . NOTE:

Left-hand shown, right-hand similar.

Remove and discard the rear subframe rear retaining bolts.

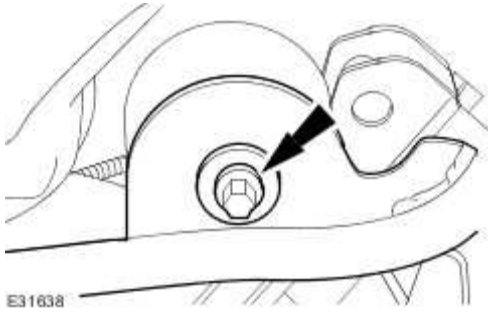


11 . NOTE:

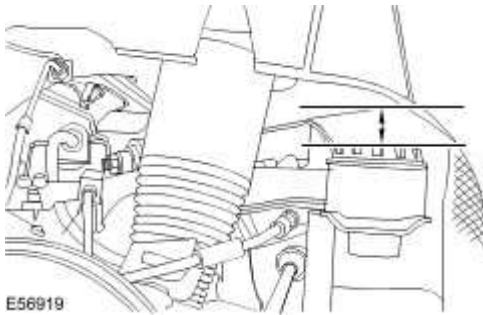
Left-hand shown, right-hand similar.

Remove the noise, vibration and harshness brace.

▶ Remove and discard the rear subframe front retaining bolts.

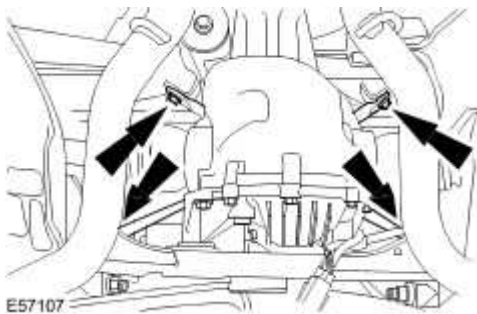


12 . Lower the subframe to a maximum of 60 mm.

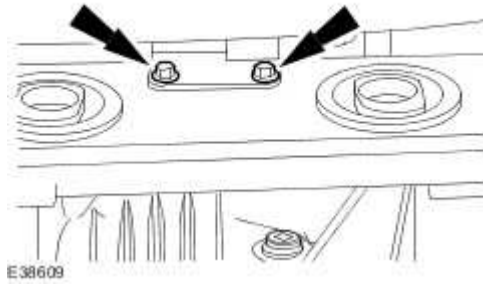


13 . Remove and discard the cross brace retaining bolts.

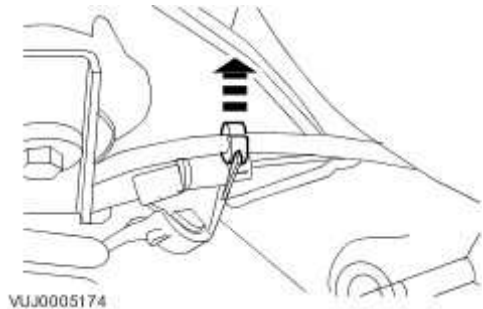
▶ Reposition the cross brace.



14 . Remove the parking brake release actuator retaining bolts.



15 . Detach the parking brake release actuator cable.



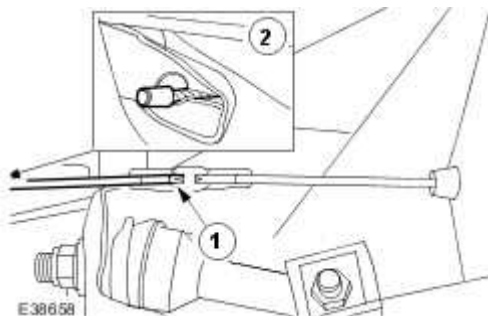
16 . Detach the parking brake release actuator cable.

1) For right-hand side connector bracket:

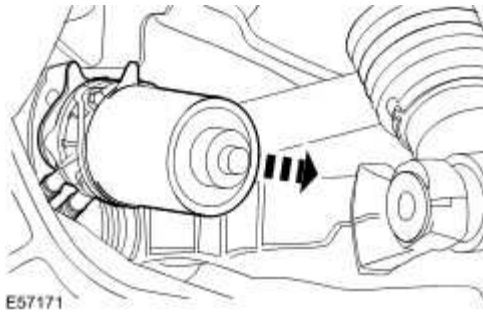
▶ Reposition the retaining tang.

▶ Detach the parking brake cable.

4) For left-hand side reaction bracket, detach the parking brake cable.



17 . Remove the parking brake release actuator.



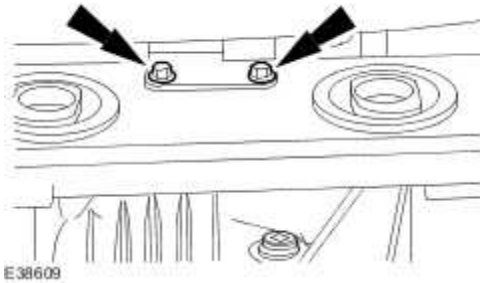
Installation

1 . NOTE:

Make sure the parking brake cable is correctly routed.

Install the parking brake release actuator.

▶ Tighten to 20 Nm .



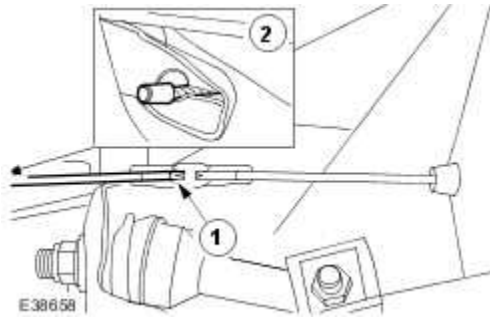
2 . Attach the parking brake release actuator cable.

1) For right-hand side connector bracket:

▶ Reposition the retaining tang.

▶ Detach the parking brake cable.

4) For left-hand side reaction bracket, detach the parking brake cable.

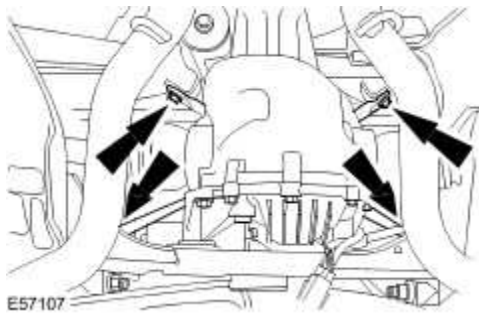


3 . Reposition the cross brace.

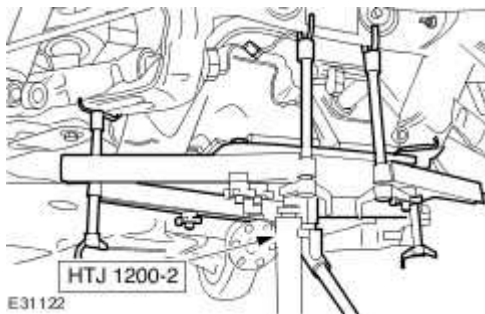
▶ Install new cross brace retaining bolts.

▶ Tighten rear M8 to 35 Nm.

▶ Tighten front M10 to 70 Nm.



4 . Raise special tool and align subframe.

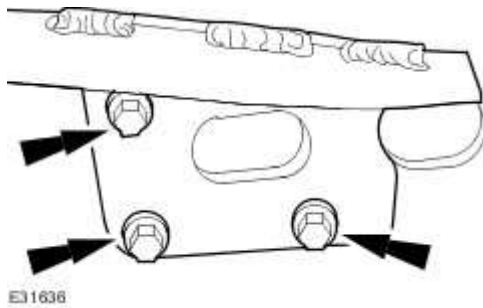


5 . **NOTE:**

Left-hand shown, right-hand similar.

Install the noise, vibration and harshness brace.

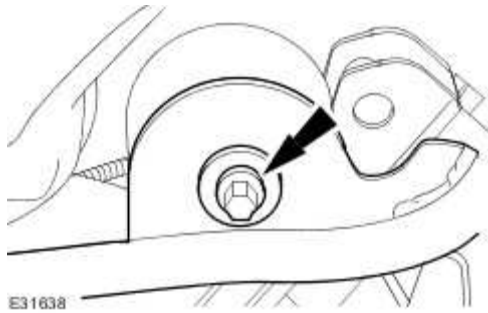
▶ Tighten to 47 Nm



6 . NOTE:

Left-hand shown, right-hand similar.

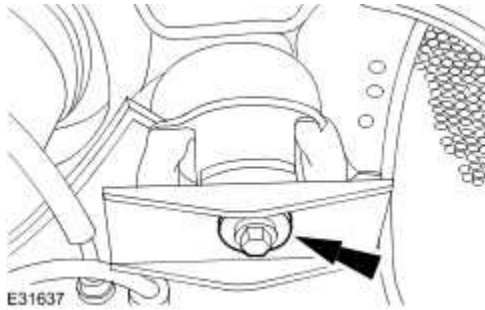
Install, but do not fully tighten the new rear subframe front retaining bolts.



7 . NOTE:

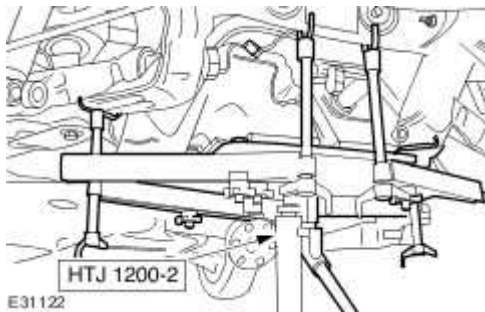
Left-hand shown, right-hand similar.

Install and fully tighten the new rear subframe retaining bolts.



8 . Tighten rear subframe retaining bolts to 125 Nm.

9 . Remove the special tool supporting the rear subframe.



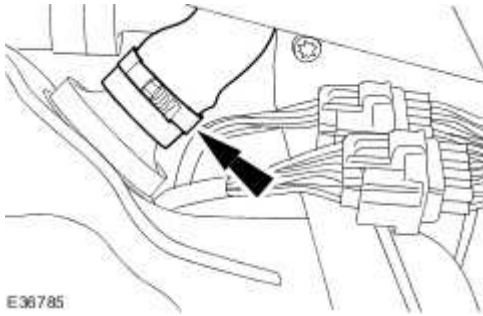
10 . **NOTE:**

Right-hand shown, left-hand similar.

Attach the muffler and tailpipe to the hanger insulator.



11 . Attach the fuel tank filler pipe.

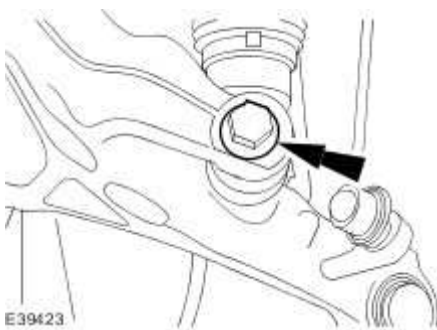


12 . **NOTE:**

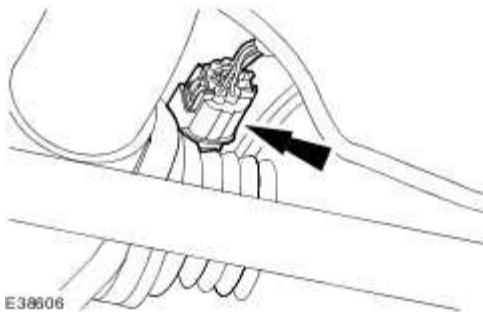
Right-hand shown, left-hand similar.

Attach the rear air springs.

▶ Tighten to 133 Nm.



13 . Connect the parking brake release actuator electrical connector.



14 . Lower the vehicle.

15



- **CAUTION:** Calibrate the electric park brake using Jaguar approved diagnostic system. If the Jaguar approved diagnostic system is not available disconnect the battery for approximately 30 seconds, the vehicle will then prompt the driver to carry out the calibration procedure as per the vehicle hand book on re-connection.

Calibrate the electric parking brake module using the Jaguar approved diagnostic system.

16 . Refill the fuel tank.

Parking Brake Switch (70.35.46)

Installation

- 1 . To install, reverse the removal procedure.

206-06 : Hydraulic Brake Actuation

Specifications

Specifications

Lubricants, Fluids, Sealers and Adhesives



CAUTION: Do not use brake fluid ITT Super Dot 4 on 2006my vehicles onwards. Failure to follow this instruction may result in damage to the vehicle.

NOTE:

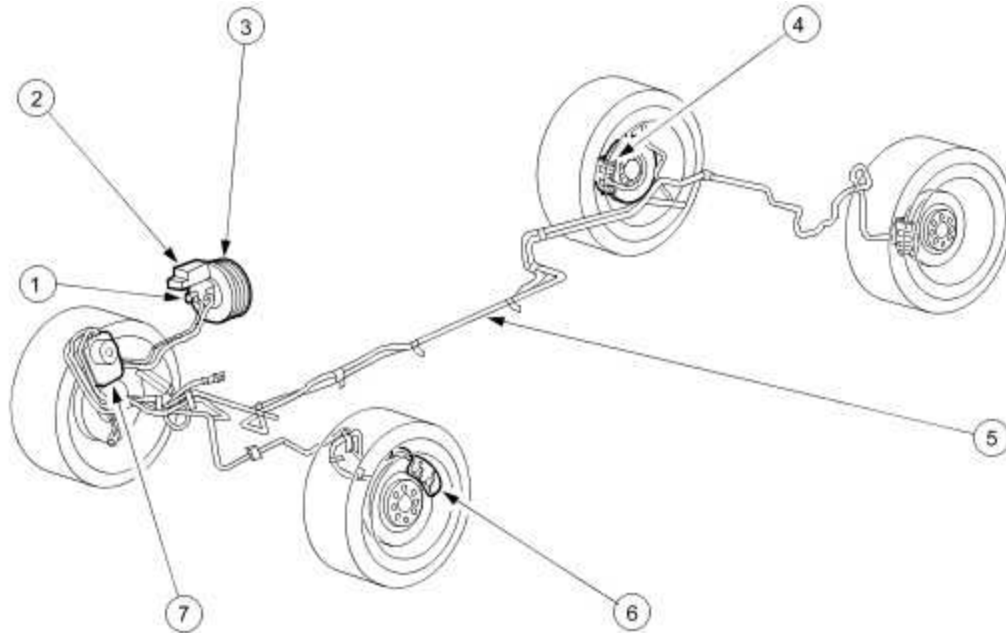
Brake fluid ITT Super Dot 4 has now been superseded by Shell ESL Super Dot 4 which is the Jaguar recommended brake fluid. Shell ESL Super Dot 4 can be used on all model years.

Item	Specification
Brake fluid	ITT Super Dot 4
Brake fluid	Shell ESL Super Dot 4

Torque Specifications

Description	Nm	lb-ft	lb-in
Brake master cylinder to brake booster retaining nuts.	25	18	-
HCU to brake master cylinder brake tubes	17	13	-
Brake master cylinder reservoir retaining bolts	8	-	71

Hydraulic Brake Actuation



VUJ0000453

Item	Part Number	Description
1	—	Brake master cylinder
2	—	Brake fluid reservoir
3	—	Brake booster
4	—	Rear brake caliper
5	—	Brake lines
6	—	Front brake caliper
7	—	Hydraulic control unit



WARNING: Brake fluid contains polyglycol ethers and polyglycols. Avoid contact with the eyes. Wash hands thoroughly after handling, as prolonged contact may cause irritation and dermatitis. If brake fluid contacts the eyes, flush the eyes with cold water or eyewash solution and seek medical attention. If taken internally, do not induce vomiting, seek immediate medical

attention. Failure to follow these instructions may result in personal injury.

The hydraulic brake system is of a pedal operated, diagonally split dual line brake system that consists of the following components:

- A brake booster.
- A brake master cylinder.
- Front brake discs.
- Front brake disc calipers.
- Rear brake discs.
- Rear brake disc calipers.
- Brake tubes and hoses.
- Anti-lock brake system (ABS).

Brake Master Cylinder

The brake master cylinder is a dual piston type. The master cylinder operates as follows:

- When the brake pedal is applied, pressure is applied by mechanical linkage to the primary and secondary systems.
- Brake master cylinder pistons apply hydraulic pressure to the two circuits.

The master cylinder consists of the following components:

- Primary and secondary pistons.
- Brake master cylinder fluid reservoir with integral fluid level warning indicator.

Adjustable Pedals

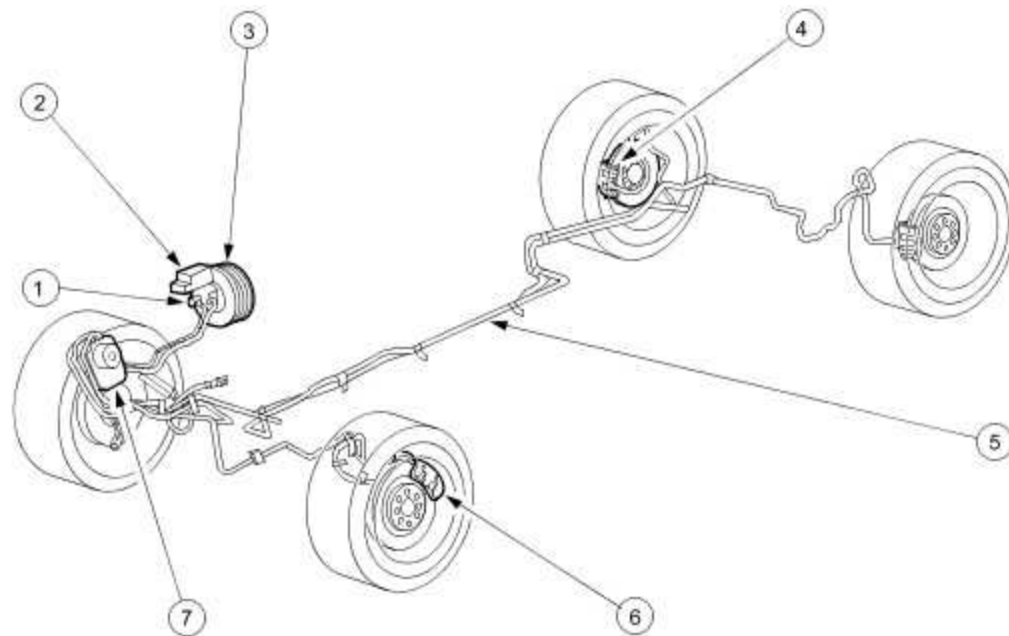
The adjustable pedal system comprises of a throttle pedal assembly with an adjustment motor and drive cables. The drive cables are attached to the brake and clutch adjustment mechanisms. The pedals move forward and rearward together. Two separate pedal positions can be set and stored in the memory for driver recall. The pedal position adjustment is by a switch fitted on the steering column shroud.

Hydraulic Brake Actuation

COMPONENT LOCATION



WARNING: Brake fluid contains polyglycol ethers and polyglycols. Avoid contact with the eyes. Wash hands thoroughly after handling, as prolonged contact may cause irritation and dermatitis. If brake fluid contacts the eyes, flush the eyes with cold water or eyewash solution and seek medical attention. If taken internally, do not induce vomiting, seek immediate medical attention. Failure to follow these instructions may result in personal injury.



VUJ0000453

Item	Part Number	Description
1		Brake master cylinder
2		Brake fluid reservoir
3		Brake booster
4		Rear brake caliper
5		Brake lines
6		Front brake caliper
7		Hydraulic control unit

OVERVIEW

The hydraulic brake system is of a pedal-operated, diagonally split dual line brake system that consists of the following components:

- A brake booster
- A brake master cylinder
- Front brake discs
- Front brake disc calipers
- Rear brake discs
- Rear brake disc calipers
- Brake tubes and hoses
- Anti-lock brake system (ABS)

BRAKE MASTER CYLINDER

The brake master cylinder is a dual piston type. The master cylinder operates as follows:

- When the brake pedal is applied, pressure is applied by mechanical linkage to the primary and secondary systems
- Brake master cylinder pistons apply hydraulic pressure to the two circuits

The master cylinder consists of the following components:

- Primary and secondary pistons
- Brake master cylinder fluid reservoir with integral fluid level warning indicator

ADJUSTABLE PEDALS


The adjustable pedal system comprises of a throttle pedal assembly with an adjustment motor and drive cables. The drive cables are attached to the brake adjustment mechanisms. The pedals move forward and rearward together. Two separate pedal positions can be set and stored in the memory for driver recall. The pedal position adjustment is by a switch fitted on the steering column shroud.

Hydraulic Brake Actuation

For additional information, refer to [<<206-00>>](#).

Brake Fluid Reservoir (70.30.16)

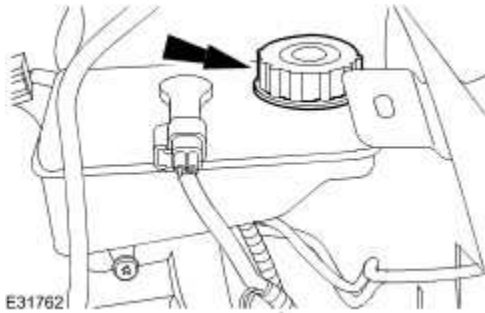
Removal

- 1  **CAUTION:** If brake fluid comes into contact with the paintwork, the affected area must be immediately washed down with cold water.

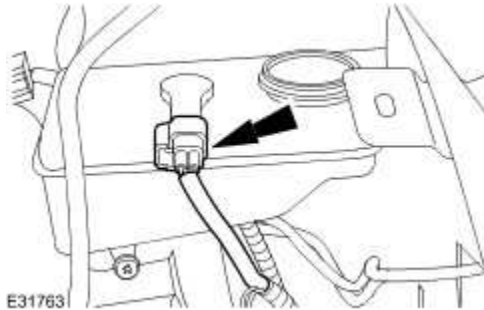
NOTE:

Make sure the brake fluid reservoir filler cap does not become contaminated.

Remove the brake fluid reservoir filler cap.



- 2 . Disconnect the brake fluid level sensor electrical connector.



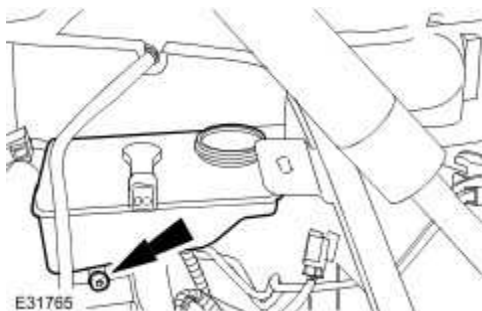
- 3 . Using a suitable suction device drain the brake fluid reservoir.



4 . NOTE:

Remove and discard the O-ring seals.

Remove the brake fluid reservoir from the master cylinder.

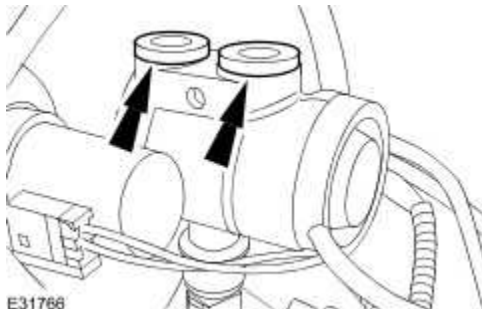


Installation

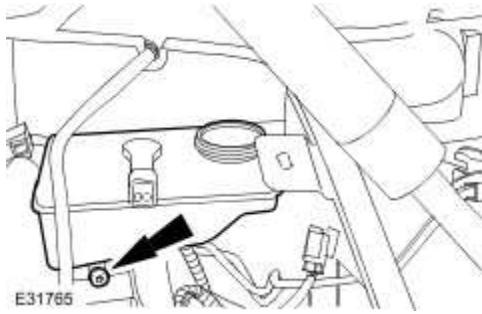
1 . NOTE:

Install new O-ring seals.

To install, reverse the removal procedure.




2 . Tighten to 8 Nm.



3 . After installation, bleed the brake system. [<<206-00>>](#)

Brake Master Cylinder - 3.0L/3.5L/4.2L (70.30.08)

Removal

- 1  **CAUTION:** If brake fluid comes into contact with the paintwork, the affected area must be immediately washed down with cold water.

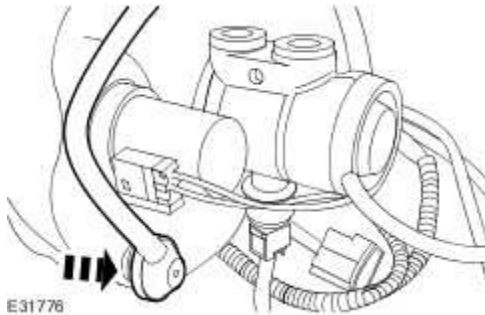
NOTE:

Make sure that the brake fluid reservoir filler cap does not become contaminated.

Remove the brake fluid reservoir.

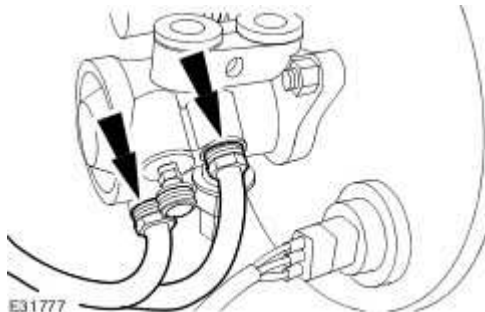
For additional information, refer to [Brake Fluid Reservoir \(70.30.16\)](#)

- 2 . Remove the brake booster/vacuum pipe.

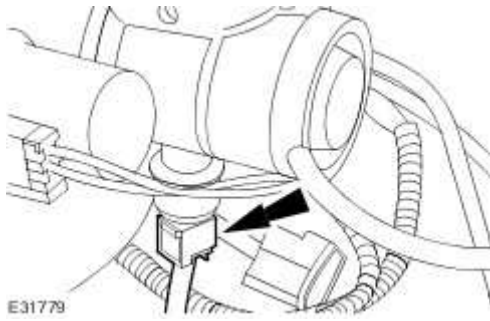


- 3 .  **CAUTION:** Cap the brake hose to prevent loss of fluid and dirt ingress.

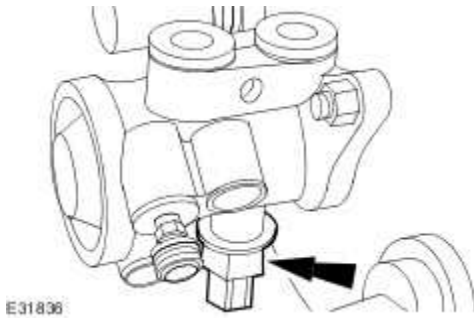
Disconnect the master cylinder brake pipes.



- 4 . Remove the dynamic stability control sensor electrical connector.

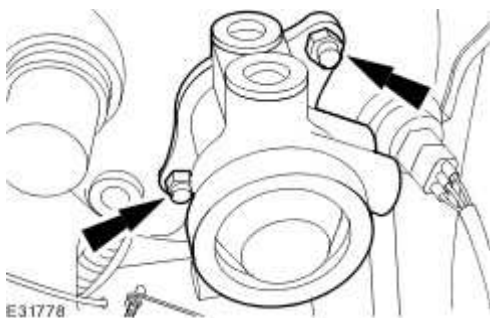


- 5 . Remove the dynamic stability control sensor.



- 6 . Remove the brake master cylinder.

► Remove and discard the O-ring seal.

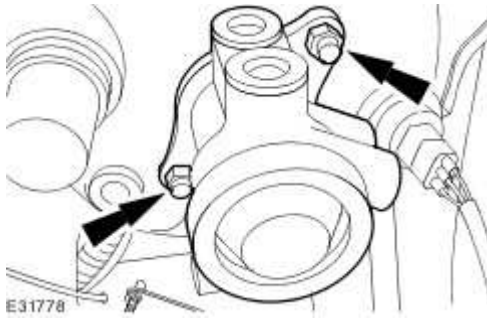


Installation

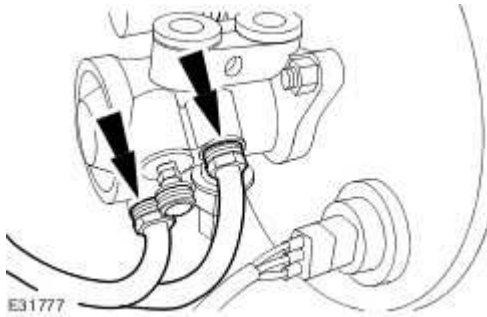
- 1 . To install, reverse the removal procedure.

▶ Install a new O-ring seal.

▶ Tighten to 25 Nm.



2 . Tighten to 17 Nm.



3 After installation, bleed the brake system.

. For additional information, refer to [Brake System Bleeding - VIN Range: G00442->G45703 \(70.25.03\)](#)

For additional information, refer to [Brake System Bleeding - VIN Range: G45704->H99999 \(70.25.03\)](#)

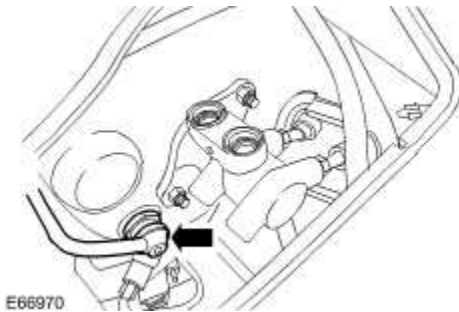
Brake Master Cylinder - 2.7L Diesel (70.30.08)


Removal

- 1 . Remove the brake fluid reservoir.

For additional information, refer to [Brake Fluid Reservoir \(70.30.16\)](#).

- 2 . Disconnect the brake booster vacuum pipe.



- 3  **CAUTION:** If brake fluid comes into contact with the paintwork, the affected area must be immediately washed down with cold water.

NOTE:

Cap the exposed ports to prevent dirt ingress and loss of fluid.

Disconnect the brake master cylinder brake pipes.



4 . Remove the brake master cylinder.

▶ Remove and discard the O-ring seal.



Installation

1 . To install, reverse the removal procedure.

▶ Install a new O-ring seal.

▶ Tighten to 25 Nm.



2 . Tighten to 17 Nm.



206-07 : Power Brake Actuation

Specifications

Specifications

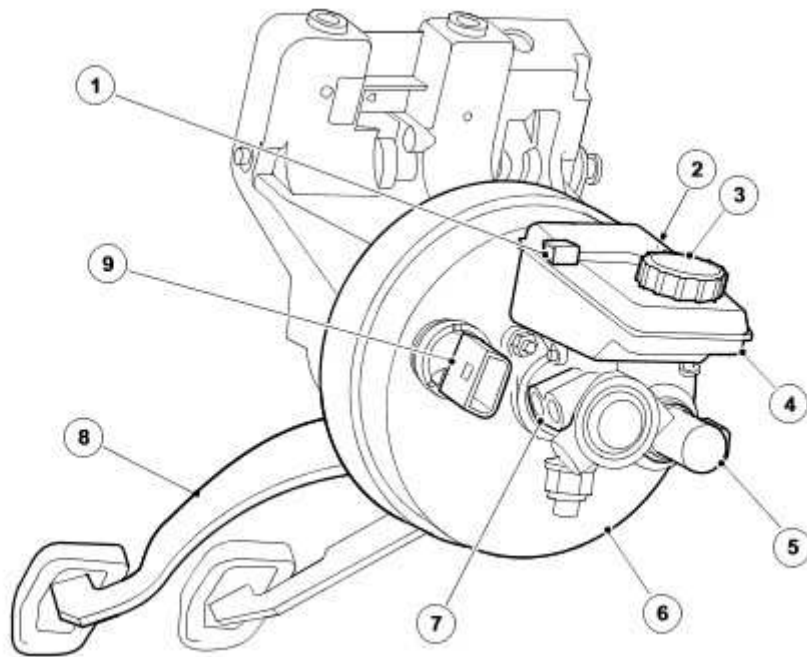
Torque Specifications

Description	Nm	lb-ft	lb-in
Brake booster retaining nuts	25	18	-
Brake vacuum pump retaining bolts	23	17	-
Brake vacuum pump retaining stud	13	10	-
Brake vacuum pump retaining nut	13	10	-

Brake Booster



WARNING: Brake fluid contains polyglycol ethers and polyglycols. Avoid contact with the eyes. Wash hands thoroughly after handling, as prolonged contact may cause irritation and dermatitis. If brake fluid contacts the eyes, flush the eyes with cold water or eyewash solution and seek medical attention. If taken internally, do not induce vomiting, seek immediate medical attention. Failure to follow these instructions may result in personal injury.



E64135

Item	Part Number	Description
1	—	Brake fluid level sensor
2	—	Non return valve/vacuum supply
3	—	Brake fluid reservoir cap
4	—	Brake fluid reservoir
5	—	Brake master cylinder active booster solenoid (Vehicles built up to VIN:G45703)
5	—	Brake vacuum sensor (3.0L and 3.5L Vehicles built after VIN:G45704)
6	—	Brake booster
7	—	Brake master cylinder
8	—	Brake pedal

9	—	Brake pedal travel sensor
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The diaphragm-type power brake booster:

- Is self contained.
- Is mounted on the engine side of the bulkhead.
- Uses engine intake manifold vacuum and atmospheric pressure for its assistance.
- Utilizes a non-return valve to preserve vacuum.

Brake Booster

COMPONENT LOCATION



WARNING: Brake fluid contains polyglycol ethers and polyglycols. Avoid contact with the eyes. Wash hands thoroughly after handling, as prolonged contact may cause irritation and dermatitis. If brake fluid contacts the eyes, flush the eyes with cold water or eyewash solution and seek medical attention. If taken internally, do not induce vomiting, seek immediate medical attention. Failure to follow these instructions may result in personal injury.

Item	Part Number	Description
1		Brake fluid reservoir cap
2		Brake fluid level sensor
3		Brake fluid reservoir
4		Brake booster
5		Brake pedal
6		Brake vacuum sensor (3.0L and 3.5L)
7		Non return valve/vacuum supply
8		Brake master cylinder

OVERVIEW

The diaphragm-type power brake booster is self contained and is mounted on the engine side of the bulkhead. It uses engine intake manifold vacuum and atmospheric pressure for its assistance and utilizes a non-return valve to preserve vacuum.

Power Brake System

For additional information, refer to [<<206-00>>](#).

Brake Booster (70.50.17)

Removal

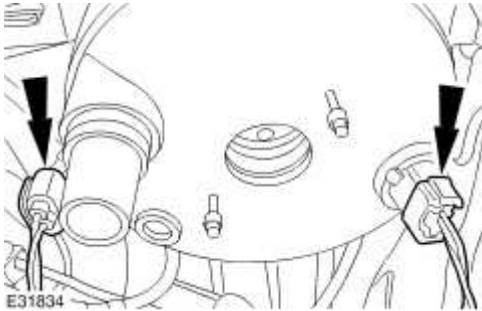
All vehicles

- 1 . Remove the brake master cylinder.

For additional information, refer to [Brake Master Cylinder - 3.0L/3.5L/4.2L \(70.30.08\)](#)

Vehicles built up to VIN:G45703

- 2 Disconnect the brake booster pedal travel sensor and brake booster solenoid electrical connectors.

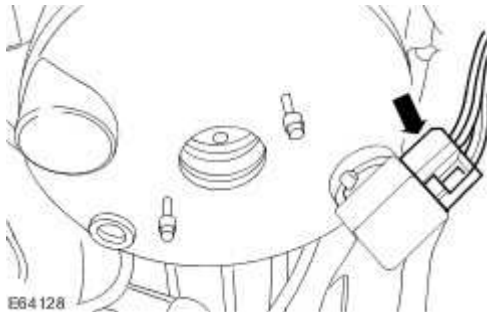


Vehicles built from VIN:G45704

NOTE:

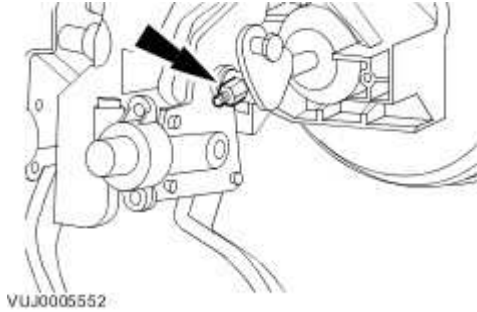
Vehicles with 3.0L and 3.5L engines.

- 3 . Disconnect the brake booster vacuum sensor electrical connector.



All vehicles

- 4 . Remove the brake booster retaining nut.



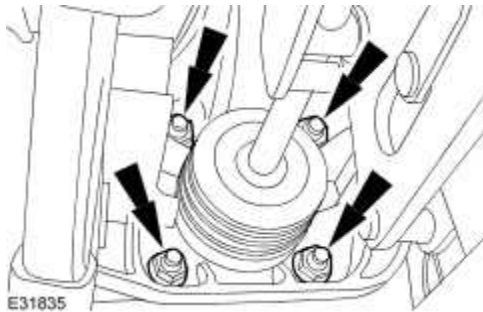
- 5 **NOTE:**

The non-return valve and vacuum pipe assembly should be removed with the brake booster.

NOTE:

Remove and discard the brake booster/pedal box gasket.

Remove the brake booster.



Installation

- 1 **NOTE:**

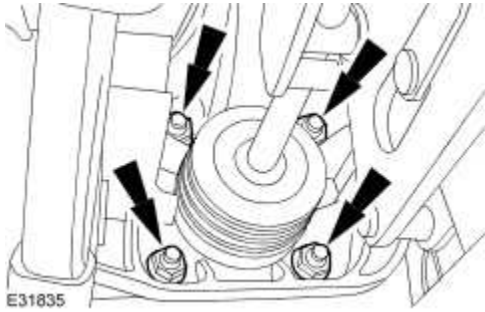
When renewing the brake booster, the non-return valve and vacuum pipe assembly should be installed prior to the brake booster installation.

NOTE:

Replace the brake booster/pedal box gasket.

To install, reverse the removal procedure.

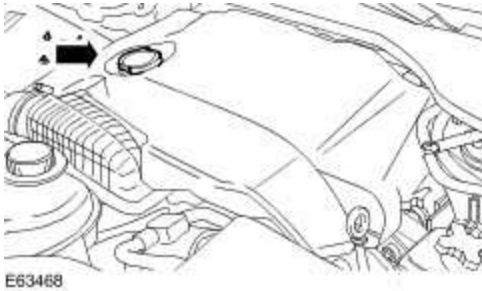
▶ Tighten to 25 Nm.



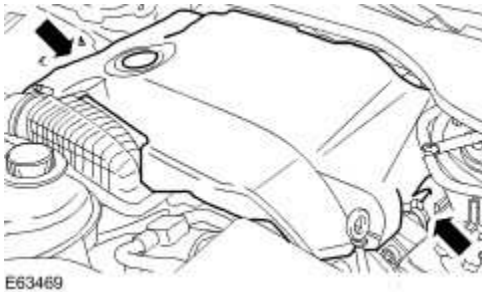
Brake Vacuum Pump

Removal

- 1 . Remove the oil filler cap.

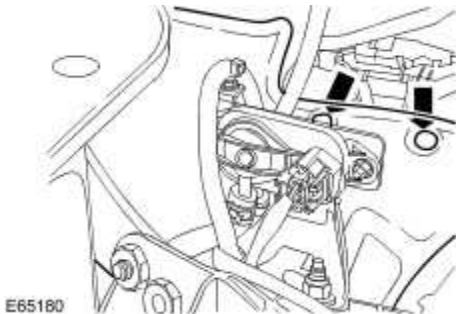



- 2 . Remove the engine cover.



- 3 . Install the engine oil filler cap to prevent foreign material entering the valve cover.

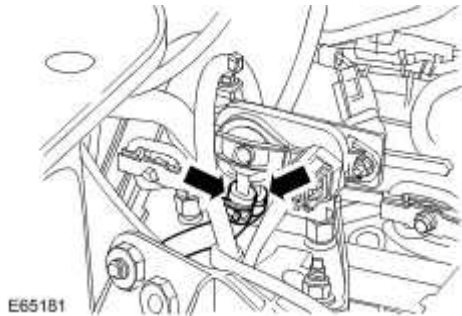
- 4 . Remove the injector sound proofing.



- 5  **CAUTION:** Make a note of the connection orientation of the high and low pressure hoses to the sensor ports. Make sure the hoses are located to the correct sensor port when

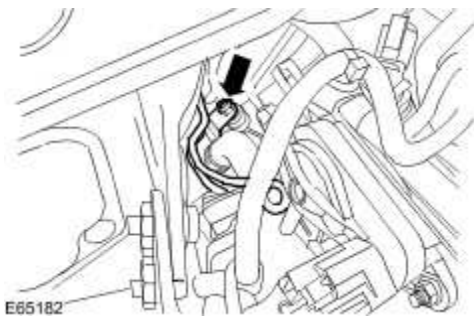
installed. Failure to follow these instructions may result in damage to the vehicle.

Detach the diesel particulate filter differential pressure sensor high-pressure and low-pressure hoses.

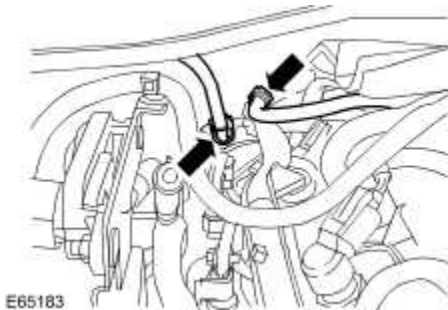


6 . Detach the diesel particulate filter high-pressure and low-pressure pipes.

▶ Remove the retaining nut.



7 . Disconnect the pipes from the brake vacuum pump.



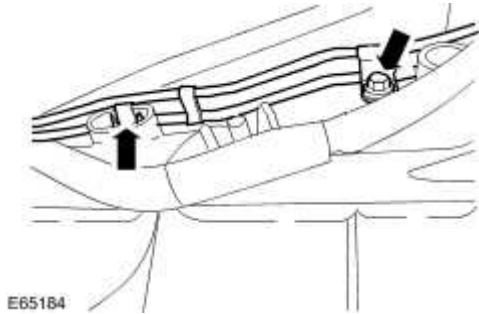
8 . Remove the right-hand catalytic converter.

For additional information, refer to [Catalytic Converter - 2.7L Diesel \(17.50.05\)](#)

- 9 Detach the diesel particulate filter high-pressure and low-pressure pipes from the
transmission housing.

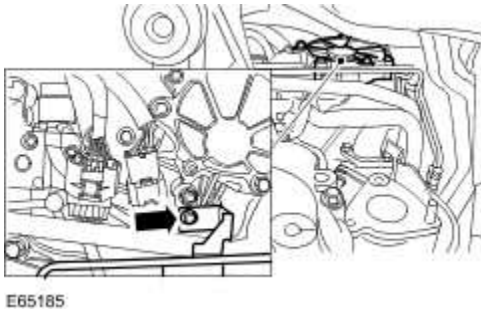
➤ Remove the retaining bolt.

➤ Detach the retaining clip.

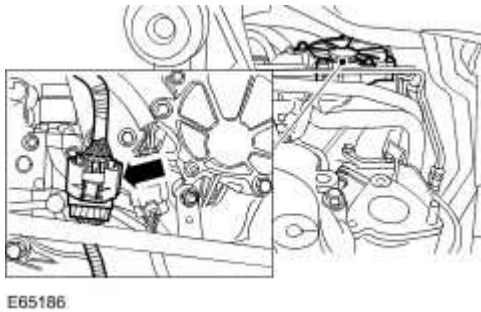


- 10 Detach the diesel particulate filter high-pressure and low-pressure pipes from the retaining
bracket.

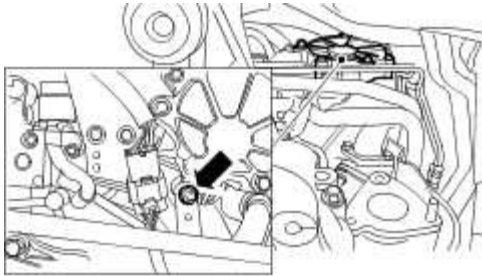
➤ Remove the retaining bolt.



- 11 . Detach the transmission harness connector from the mounting bracket.

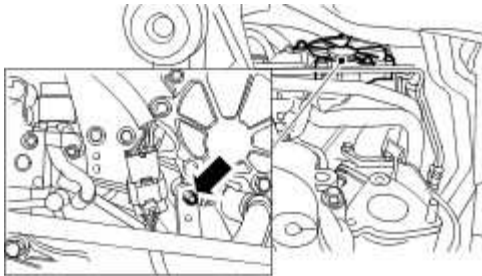


12 . Remove the crankcase vent oil separator pipe retaining nut.



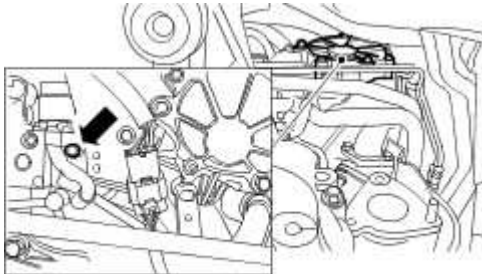
E65187

13 . Remove the brake vacuum pump retaining stud.



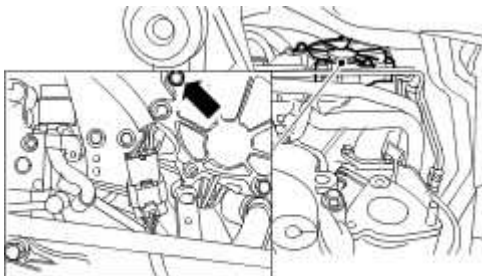
E65188

14 . Remove the crankcase vent oil separator pipe retaining bolt.



E65189

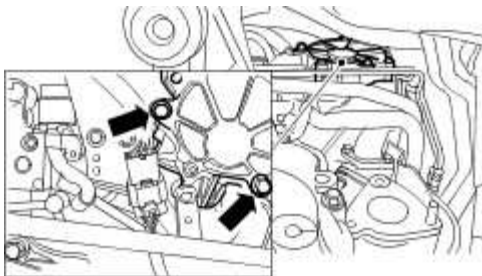
15 . Remove the right-hand high pressure fuel pipe bracket retaining bolt.



E65190

16 . Remove the brake vacuum pump.

▶ Remove the retaining bolts.



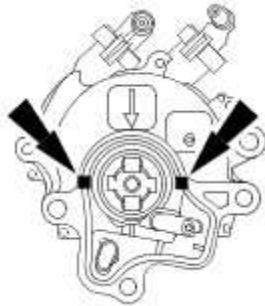
E65191

Installation

1 Apply silicone gasket sealant or equivalent meeting Jaguar specification.

▶ The application of sealant must be 10mm square in the two places shown.
Install the brake vacuum pump immediately after applying the sealant.

▶ The brake vacuum pump should be fitted directly to the engine without smearing the sealant.



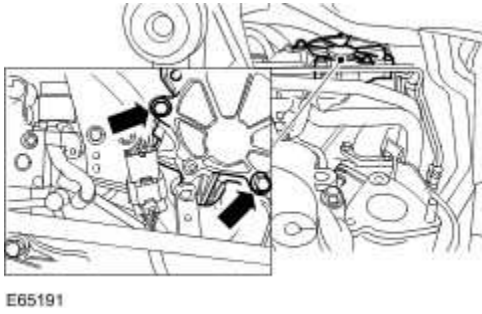
E53361

2 .  **CAUTION: Make sure the drive coupling is aligned with the camshaft coupling.**

Install the brake vacuum pump.

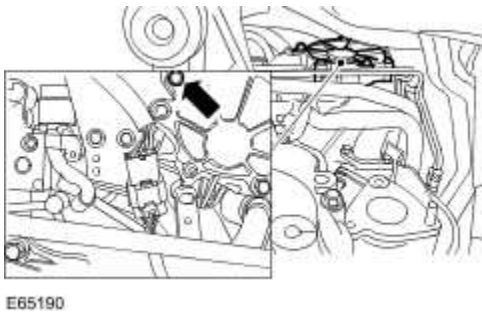
▶ Install the retaining bolts.

► Tighten to 23 Nm.



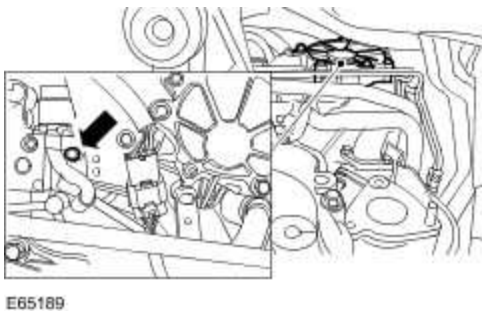
3 . Install the right-hand high pressure fuel pipe bracket retaining bolt.

► Tighten to 10 Nm.



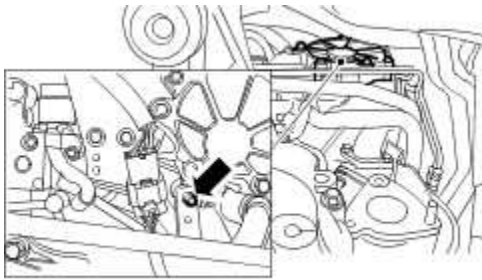
4 . Install the crankcase vent oil separator pipe retaining bolt.

► Tighten to 10 Nm.



5 . Install the brake vacuum pump retaining stud.

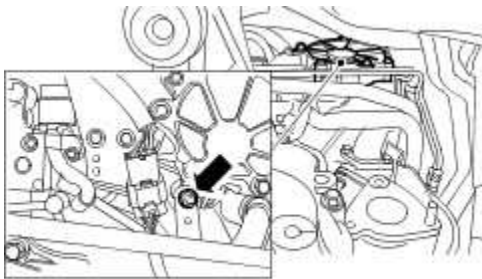
► Tighten to 13 Nm.



E65188

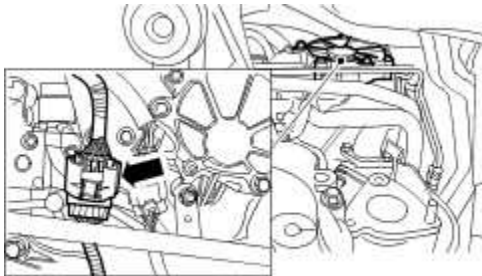
6 . Install the crankcase vent oil separator pipe retaining nut.

► Tighten to 13 Nm.



E65187

7 . Attach the transmission harness connector to the mounting bracket.

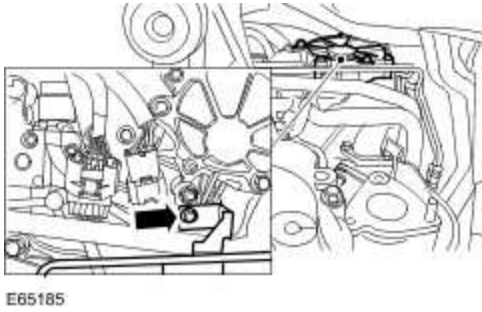


E65186

8 . Attach the diesel particulate filter pressure pipes to the retaining bracket.

► Install the retaining bolt.

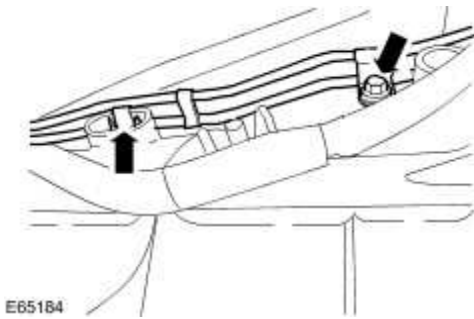
► Tighten to 10 Nm.



9 . Attach the diesel particulate filter pressure pipes to the transmission housing.

▶ Install the retaining bolt.

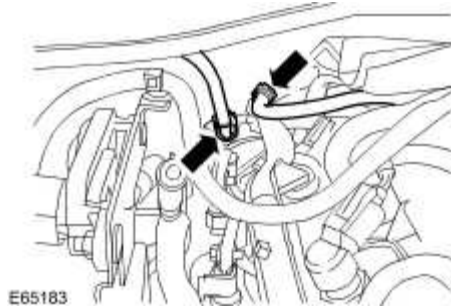
▶ Tighten to 10 Nm.



10 . Install the right-hand catalytic converter.

For additional information, refer to [Catalytic Converter - 2.7L Diesel \(17.50.05\)](#)

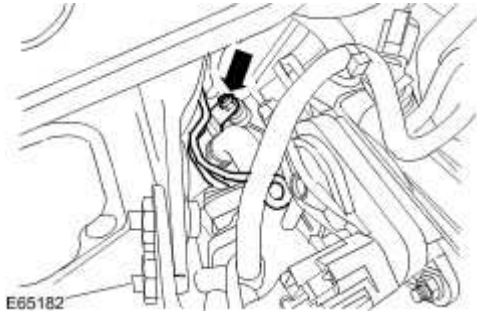
11 . Connect the pipes to the brake vacuum pump.



12 . Attach the diesel particulate filter pressure pipes.

▶ Install the retaining nut.

▶ Tighten to 10 Nm.

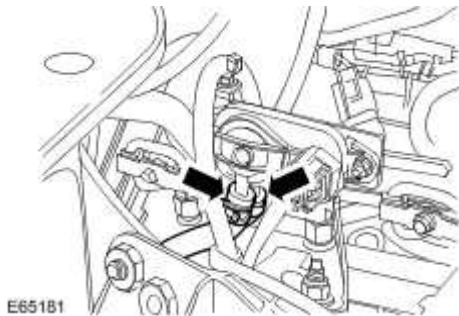


13

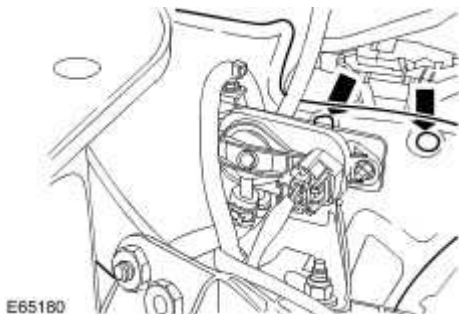


CAUTION: Make sure the high and low pressure hoses are fully installed and the retaining clips are positioned in their original position.

Attach the diesel particulate filter differential pressure sensor high-pressure and low-pressure hoses.

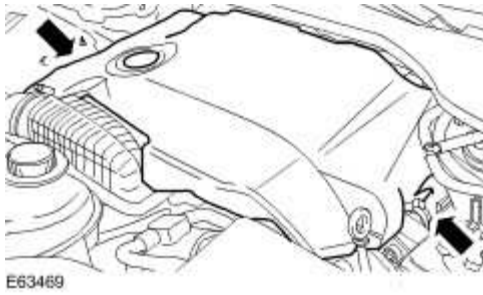


14 . Install the injector sound proofing.

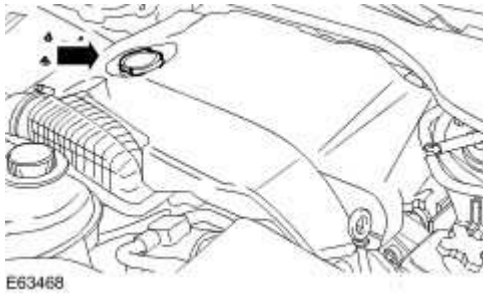


15 . Remove the engine oil filler cap.

16 . Install the engine cover.



17 . Install the oil filler cap.



206-09 : Anti-Lock Control – Stability Assist

Specifications

Specifications

Lubricants, Fluids, Sealers and Adhesives



CAUTION: Do not use brake fluid ITT Super Dot 4 on 2006my vehicles onwards. Failure to follow this instruction may result in damage to the vehicle.

NOTE:

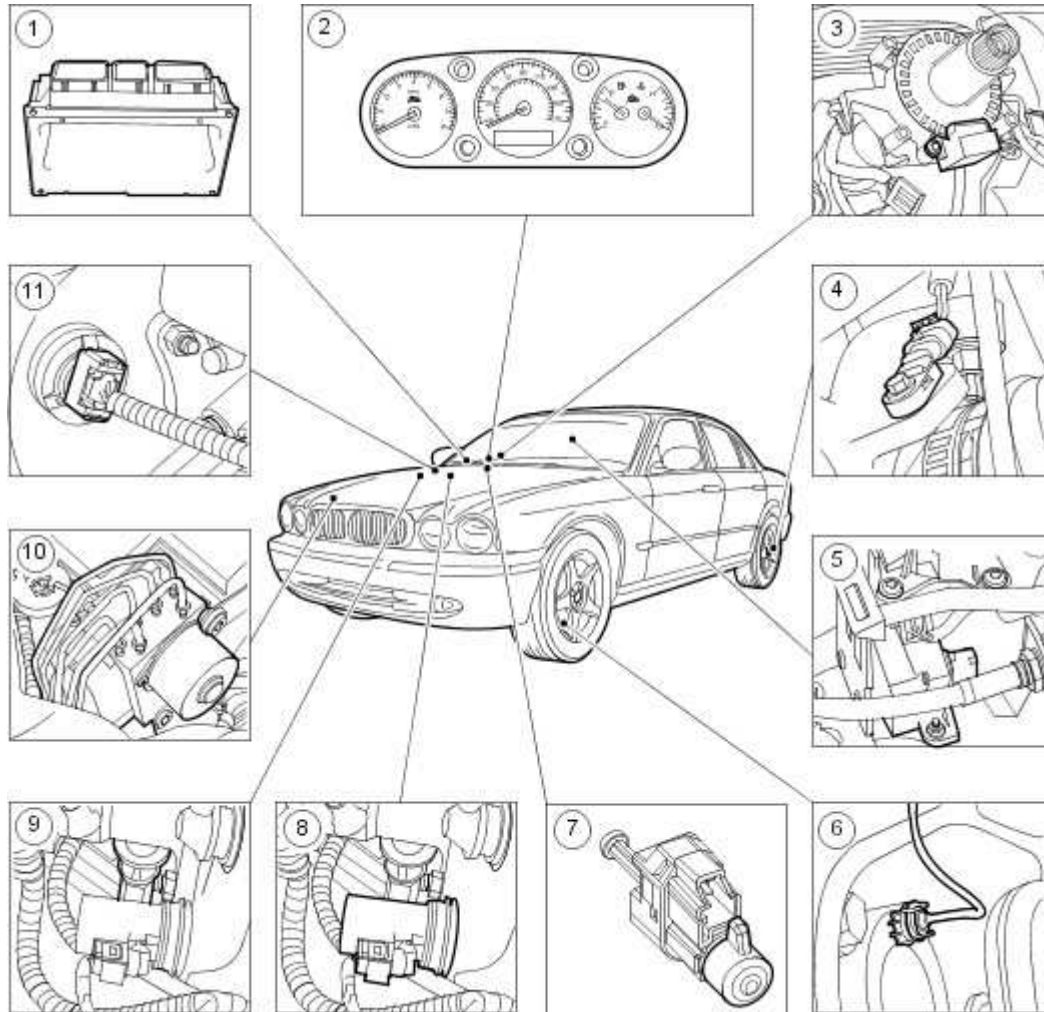
Brake fluid ITT Super Dot 4 has now been superseded by Shell ESL Super Dot 4 which is the Jaguar recommended brake fluid. Shell ESL Super Dot 4 can be used on all model years.

Item	Specification
Brake fluid	ITT Super Dot 4
Brake fluid	Shell ESL Super Dot 4

Torque Specifications

Description	Nm	lb-ft	lb-in
Brake master cylinder pressure transducer	30	22	–
Brake line connections to brake pressure control valve block	17	13	–
Yaw rate sensor retaining nuts	7	–	62
Hydraulic control unit (HCU) mounting bolts	9	–	80
Rear wheel speed sensor retaining bolt	9	–	80

Anti-Lock Control - Stability Assist - VIN Range: G00442->G45703



E31827

Item	Part Number	Description
1	—	Engine control module
2	—	Instrument cluster
3	—	Steering wheel angle sensor
4	—	Wheel speed sensor - rear

5	—	Yaw/lateral rate sensor
6	—	Wheel speed sensor - front
7	—	Brake pedal switch
8	—	Brake pedal travel sensor
9	—	Brake master cylinder primary pressure transducer
10	—	ABS/DSC hydraulic control modulator
11	—	Master cylinder active booster solenoid

The anti-lock brake system (ABS) modulates brake pressure on each wheel independently to maintain vehicle stability during braking. The ABS continually monitors the rotational velocity of each wheel anytime the ignition switch is in the run position and determines if a tire is skidding when the brakes are applied. Only then does the ABS intervene to modulate the brake pressure to the skidding wheel. The modulation continues until the wheel rotates freely. The brake pressure is then restored and the modulate/restore cycle is repeated whenever skidding is detected. This cycle occurs at a rate of several times per second.

The ABS module is capable of detecting the following system conditions:

- hydraulic valve failure
- wheel speed sensor failure
- ABS power relay short circuit
- interconnect failures to the ABS sensors, power and ground to the ABS module
- over/under voltage conditions

The ABS provides self-diagnostics and displays failure messages via the ABS indicator in the instrument cluster. Failure of the ABS module, for whatever reason, will not compromise the normal operation of the brake system.

The Dynamic Stability Control (DSC) system includes the:

- anti-lock brake system.
- yaw/lateral control.
- full speed traction control.

The DSC system manages the braking system to enhance the driver control of the vehicle.

The DSC system continually monitors the steering wheel angle, master cylinder brake pressure, front and rear wheel speeds, vehicle yaw and lateral rate acceleration.

The yaw/lateral rate sensor supplies a signal to the DSC module, via a serial link, which monitors the

vehicles rate of acceleration from its central axis in a sideways direction, and also the vehicles angular rotation around it's central axis.

The driver input parameters are continually monitored via the brake master cylinder dynamic stability control sensor, the brake pedal travel sensor and the steering wheel angle sensor.

DSC is enabled/disabled via the traction control ON/OFF switch.

Self-diagnosis of the DSC system is provided via the instrument cluster message centre.

Traction control is an additional function added to the ABS/DSC system. The vehicles driven wheels are continually monitored for wheel spin relative to the calculated reference speed and to each other. If wheel spin is detected, the traction control function intervenes independently of the driver, applying brake pressure to the slipping wheel and reducing the engine drive torque supply. Meanwhile, brake pressure is modulated by the traction control until traction is re-established. Traction control brake actuation is diminished above 40 km/h (25 mph). Above this speed traction control relies primarily on engine torque reduction.

Traction control is enabled/disabled via the traction control ON/OFF switch. When the switch is in the (OFF) position, the amber traction control warning lamp solidly illuminates within the instrument cluster message centre. The traction control is automatically activated when the ignition is switched on. Self-diagnosis of the traction control system is also provided via the instrument cluster message centre.

The traction control brake intervention is automatically disabled whenever the brakes exceed a temperature limit. The traction brake intervention will remain disabled until the brakes have cooled, irrespective of ignition switch position or ignition switch cycling.

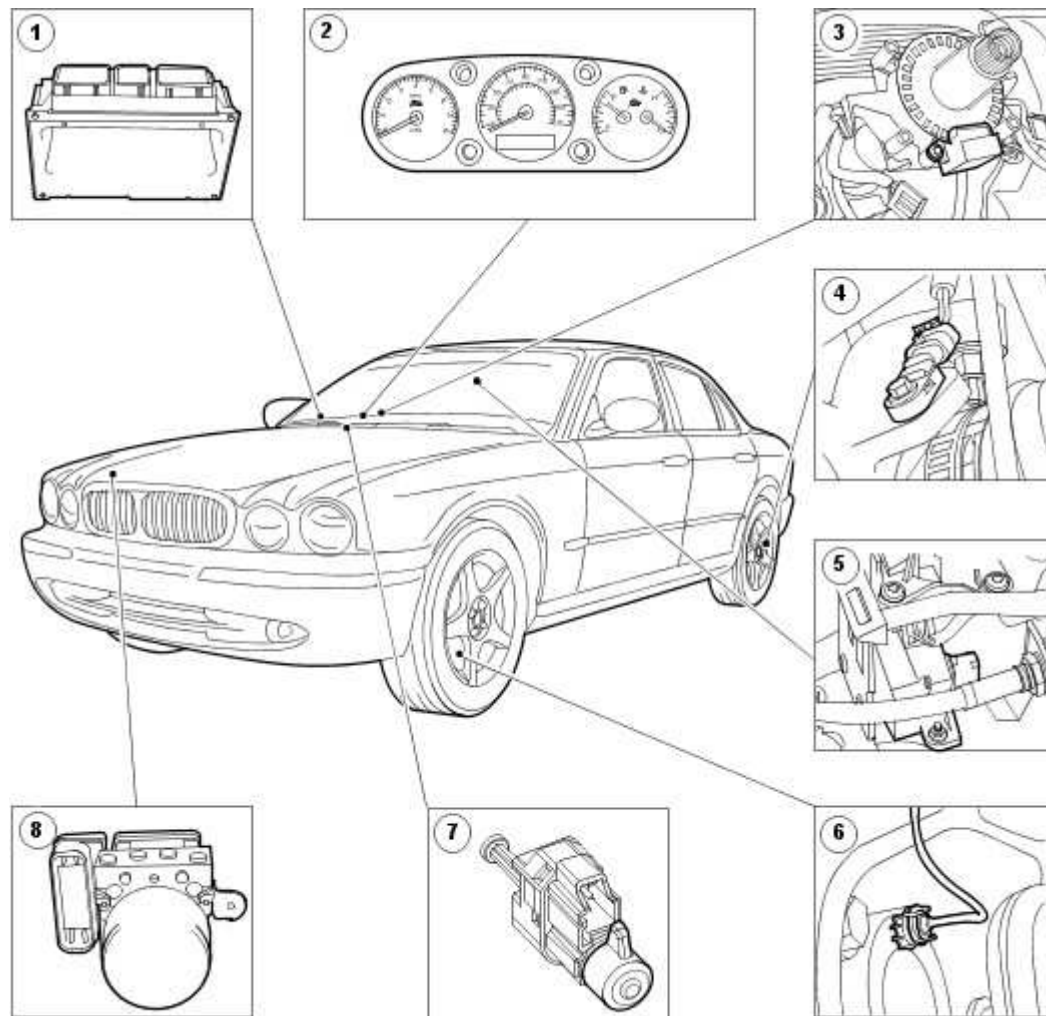
Brake Vacuum Assist (3.0L V6 and 3.5L V8 Vehicles Only)

Operation of Brake Vacuum Assist is possible at the start of an ignition cycle when the engine is cold and low vacuum levels are generated by the engine. Its operation will result in vibrating pedal and some modulator noise. This may appear to be similar to unexpected ABS (anti-lock brake system) function, at lower than expected speed or light braking effort. As the engine warms up, Brake Vacuum Assist operation should become less frequent, though it can be active in other circumstances where vacuum levels are lower than required; for example, at higher altitudes or during frequent, heavy braking.

Additionally, noise levels during Brake Vacuum Assist may be variable, with initial system activity louder than normal activity. In some circumstances initial activity louder than normal may be interpreted as a 'thump' noise, particularly if there is no significant Brake Vacuum Assist functionality that immediately follows.

In these cases, this system behaviour is not unexpected, and should not be a cause for fault investigation.

Anti-Lock Control - Stability Assist - VIN Range: G45704->G99999



E63857

Item	Part Number	Description
1	—	Engine control module (ECM)
2	—	Instrument cluster and message centre
3	—	Steering wheel rotation sensor
4	—	Wheel speed sensor - rear
5	—	Lateral/yaw rate sensor

6	—	Wheel speed sensor - front
7	—	Brake pedal switch
8	—	Anti-lock brake system (ABS)/Dynamic stability control hydraulic control modulator (HCU)

The ABS modulates brake pressure on each wheel independently to maintain vehicle stability during braking. The ABS continually monitors the rotational velocity of each wheel during driving and determines if a tire is skidding when the brakes are applied. Only then does the ABS intervene to modulate the brake pressure to the skidding wheel. The modulation continues until the wheel rotates freely. The brake pressure is then restored and the modulate/restore cycle is repeated whenever skidding is detected. This cycle occurs at a rate of several times per second.

The ABS/dynamic stability control module is capable of detecting the following system conditions:

- hydraulic valve failure
- wheel speed sensor failure
- ABS power relay short circuit
- interconnect failures to the ABS sensors, power and ground to the ABS module
- over/under voltage conditions.

The ABS provides self-diagnostics and displays failure messages through the ABS warning indicator in the instrument cluster. Failure of the ABS module, for whatever reason, will not compromise the normal operation of the brake system.

The dynamic stability control system includes the:

- anti-lock brake system
- lateral/yaw control
- full speed traction control.

The dynamic stability control system manages the braking system to enhance the driver control of the vehicle.

The dynamic stability control system continually monitors the steering wheel angle, master cylinder brake pressure, front and rear wheel speeds and vehicle lateral/yaw rate acceleration.

The dynamic stability control module supports speed control and stability assist functions.

The lateral/yaw rate sensor supplies a signal to the dynamic stability control module, via a serial link, which monitors the vehicles rate of acceleration from its central axis in a sideways direction, and also the vehicles angular rotation around it's central axis.

The driver input parameters are continually monitored by the steering wheel rotation sensor and the

HCU master cylinder pressure sensor.

Dynamic stability control is enabled/disabled through the traction control ON/OFF switch.

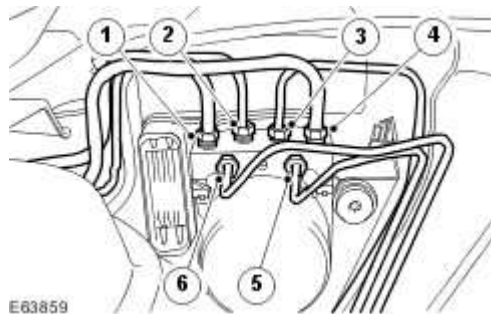
Self-diagnosis of the dynamic stability control system is provided through the instrument cluster and message center.

Traction control is an additional function added to the ABS/dynamic stability control system. The vehicles driven wheels are continually monitored for wheel spin relative to the calculated reference speed and to each other. If wheel spin is detected, the traction control function intervenes independently of the driver, applying brake pressure to the spinning wheel and reducing the engine drive torque supply. Meanwhile, brake pressure is modulated by the traction control until traction is re-established. Traction control brake actuation is diminished above 40 kph (25 mile/h). Above this speed, traction control relies primarily on engine torque reduction.

Traction control is enabled/disabled through the traction control ON/OFF switch. When the switch is in the OFF position, the amber traction control warning lamp solidly illuminates within the instrument cluster message center. The traction control is automatically activated when the ignition is switched on. Self-diagnosis of the traction control system is also provided through the instrument cluster and message center.

The traction control brake intervention is automatically disabled whenever the brakes exceed a temperature limit. The traction brake intervention will remain disabled until the brakes have cooled.

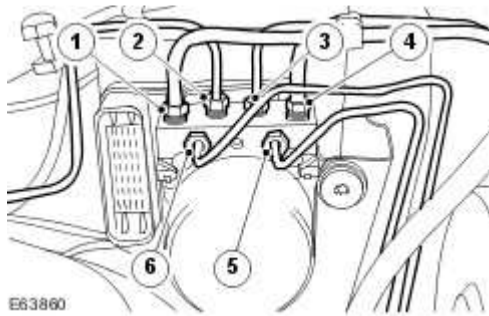
Hydraulic Control Modulator Brake Tube Location - Left-hand Drive



Item	Part Number	Description
1	—	Secondary circuit
2	—	Front left-hand
3	—	Front right-hand
4	—	Primary circuit
5	—	Rear left-hand

6	—	Rear right-hand
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Hydraulic control Modulator Brake Tube Location - Right-hand Drive



Item	Part Number	Description
1	—	Secondary circuit
2	—	Front left-hand
3	—	Front right-hand
4	—	Primary circuit
5	—	Rear left-hand
6	—	Rear right-hand

Brake Vacuum Assist (3.0L V6 and 3.5L V8 Vehicles Only)

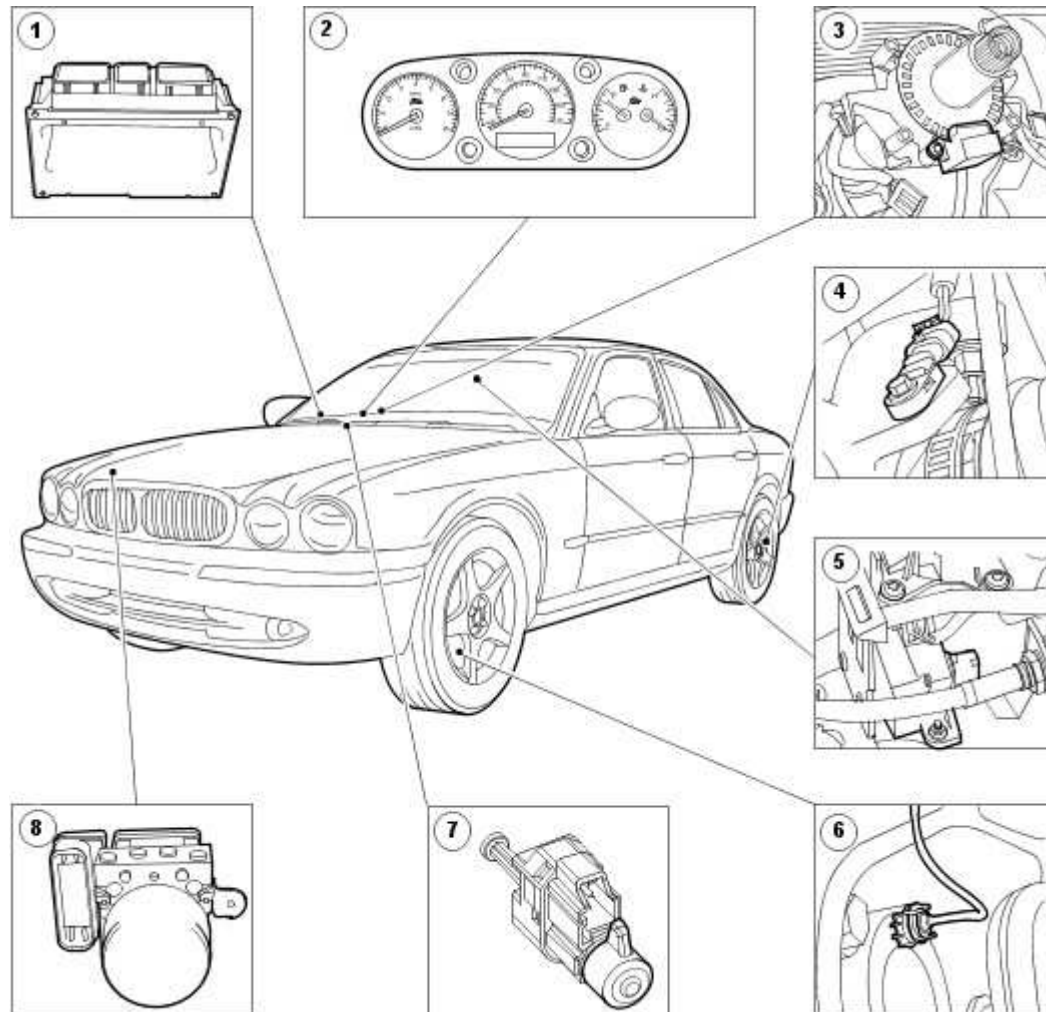
Operation of Brake Vacuum Assist is possible at the start of an ignition cycle when the engine is cold and low vacuum levels are generated by the engine. Its operation will result in vibrating pedal and some modulator noise. This may appear to be similar to unexpected ABS (anti-lock brake system) function, at lower than expected speed or light braking effort. As the engine warms up, Brake Vacuum Assist operation should become less frequent, though it can be active in other circumstances where vacuum levels are lower than required; for example, at higher altitudes or during frequent, heavy braking.

Additionally, noise levels during Brake Vacuum Assist may be variable, with initial system activity louder than normal activity. In some circumstances initial activity louder than normal may be interpreted as a 'thump' noise, particularly if there is no significant Brake Vacuum Assist functionality that immediately follows.

In these cases, this system behaviour is not unexpected, and should not be a cause for fault investigation.

Anti-Lock Control - Stability Assist

COMPONENT LOCATION



E63857

Item	Part Number	Description
1		Engine Control Module (ECM)
2		Instrument cluster and message centre
3		Steering angle sensor
4		Wheel speed sensor - rear
5		Lateral/yaw rate sensor
6		Wheel speed sensor - front

7		Brake pedal switch
8		Anti-lock Brake System (ABS)/Dynamic Stability Control (DSC) module

INTRODUCTION

The ABS modulates brake pressure on each wheel independently to maintain vehicle stability during braking. The ABS continually monitors the rotational velocity of each wheel during driving and determines if a tire is skidding when the brakes are applied. Only then does the ABS intervene to modulate the brake pressure to the skidding wheel. The modulation continues until the wheel rotates freely. The brake pressure is then restored and the modulate/restore cycle is repeated whenever skidding is detected. This cycle occurs at a rate of several times per second.

The ABS control module is capable of detecting the following system conditions:

- Hydraulic valve failure
- Wheel speed sensor failure
- ABS power relay short circuit
- Interconnect failures to the ABS sensors, power and ground to the ABS module
- Over/under voltage conditions

The ABS provides self-diagnostics and displays failure messages through the ABS warning indicator in the instrument cluster. Failure of the ABS module, for whatever reason, will not compromise the normal operation of the brake system.

The DSC system includes the:

- anti-lock brake system
- lateral/yaw control
- full speed traction control

The DSC system manages the braking system to enhance the driver control of the vehicle.

The DSC system continually monitors the steering wheel angle, master cylinder brake pressure, front and rear wheel speeds and vehicle lateral/yaw rate acceleration.

The lateral/yaw rate sensor supplies a signal to the DSC module, via a serial link, which monitors the vehicles rate of acceleration from its central axis in a sideways direction, and also the vehicles angular rotation around its central axis.

The driver input parameters are continually monitored by the steering wheel rotation sensor and the hydraulic control unit master cylinder pressure sensor.

The DSC is enabled/disabled through the traction control ON/OFF switch.

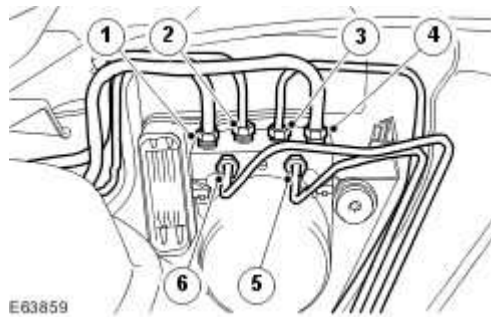
Self-diagnosis of the DSC system is provided through the instrument cluster and message center.

Traction control is an additional function added to the ABS/DSC system. The vehicles driven wheels are continually monitored for wheel spin relative to the calculated reference speed and to each other. If wheel spin is detected, the traction control function intervenes independently of the driver, applying brake pressure to the spinning wheel and reducing the engine drive torque supply. Meanwhile, brake pressure is modulated by the traction control until traction is re-established. Traction control brake actuation is diminished above 40 kph (25 mile/h). Above this speed, traction control relies primarily on engine torque reduction.

Traction control is enabled/disabled through the traction control ON/OFF switch. When the switch is in the OFF position, the amber traction control warning lamp solidly illuminates within the instrument cluster message center. The traction control is automatically activated when the ignition is switched on. Self-diagnosis of the traction control system is also provided through the instrument cluster and message center.

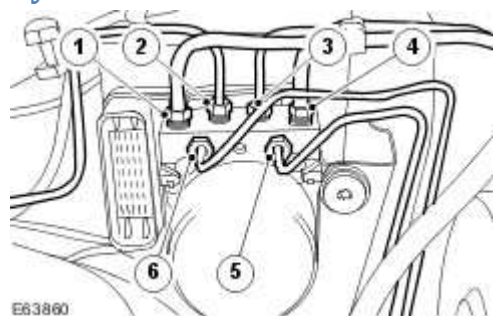
The traction control brake intervention is automatically disabled whenever the brakes exceed a temperature limit. The traction brake intervention will remain disabled until the brakes have cooled.

Hydraulic Control Modulator Brake Tube Location - Left-hand Drive



Item	Part Number	Description
1		Secondary circuit
2		Front left-hand
3		Front right-hand
4		Primary circuit
5		Rear left-hand
6		Rear right-hand

Hydraulic control Modulator Brake Tube Location - Right-hand Drive



Item	Part Number	Description
1		Secondary circuit
2		Front left-hand
3		Front right-hand
4		Primary circuit
5		Rear left-hand
6		Rear right-hand

Brake Vacuum Assist (3.0L V6 and 3.5L V8 Vehicles Only)

Operation of Brake Vacuum Assist is possible at the start of an ignition cycle when the engine is cold and low vacuum levels are generated by the engine. Its operation will result in vibrating pedal and some modulator noise. This may appear to be similar to unexpected ABS (anti-lock brake system) function, at lower than expected speed or light braking effort. As the engine warms up, Brake Vacuum Assist operation should become less frequent, though it can be active in other circumstances where vacuum levels are lower than required; for example, at higher altitudes or during frequent, heavy braking.

Additionally, noise levels during Brake Vacuum Assist may be variable, with initial system activity louder than normal activity. In some circumstances initial activity louder than normal may be interpreted as a 'thump' noise, particularly if there is no significant Brake Vacuum Assist functionality that immediately follows.

In these cases, this system behaviour is not unexpected, and should not be a cause for fault investigation.

Anti-Lock Control - Stability Assist - VIN Range: G00442->G45703

Principle of operation

The anti-lock control - stability assist system includes the:

- anti-lock brake system (ABS)
- yaw/acceleration control
- emergency brake assist
- traction control

Anti-lock Brake System (ABS)

The anti-lock brake system (ABS) modulates brake pressure on each wheel independently to maintain vehicle stability during braking. The ABS continually monitors the rotational velocity of each wheel anytime the ignition switch is in the run position and determines if a tire is skidding when the brakes are applied. Only then does the ABS intervene to modulate the brake pressure to the skidding wheel. The modulation continues until the wheel rotates freely. The brake pressure is then restored and the modulate/restore cycle is repeated whenever skidding is detected. This cycle occurs at a rate of several times per second.

The ABS module is capable of detecting the following system conditions:

- hydraulic valve failure
- wheel speed sensor failure
- ABS power relay short circuit
- interconnect failures to the ABS sensors, power and ground to the ABS module
- over/under voltage conditions

The ABS provides self-diagnostics and displays failure messages via the ABS indicator in the instrument cluster. Failure of the ABS module, for whatever reason, will not compromise the normal operation of the brake system.

Traction Control

Traction control is an additional function added to the anti-lock control - stability assist system. The vehicles driven wheels are continually monitored for wheel spin relative to the calculated reference speed and to each other. If wheel spin is detected, the traction control function intervenes, applying brake pressure to the slipping wheel and reducing the engine drive torque supply. Meanwhile, brake pressure is modulated by the traction control until traction is re-established. Traction control brake actuation is diminished above 40 km/h (25 mph). Above this speed traction control relies primarily on engine torque reduction.

The traction control brake intervention is automatically disabled whenever the brakes exceed a

temperature limit. The traction control brake intervention will remain disabled until the brakes have cooled, irrespective of ignition switch position or ignition switch cycling.

Stability Assist

Dynamic stability control (DSC) maximizes vehicle stability under all conditions. The DSC system compares actual vehicle course to that intended by the driver. If the intended course differs from the actual course due to over steer or under steer conditions, the DSC system will brake individual wheels and reduce engine torque to bring the vehicle back to the driver's intended direction. By using a combined yaw rate sensor and lateral accelerometer, the vehicles rotational motion around its vertical axis and centrifugal forces generated while cornering are calculated to determine the vehicle's actual behavior. Using additional sensors for detecting steering wheel position and road wheel speed enables the system to recognize the driver's intentions.

Dynamic stability control is enabled/disabled via the DSC **ON/OFF** switch. When the switch is in the **OFF** position, the amber DSC warning lamp solidly illuminates within the instrument cluster message center. The DSC is automatically activated when the ignition is switched on. The DSC also provides failure messages via the instrument cluster message center.

Emergency Brake Assist

The emergency brake assist function allows the driver to enter ABS with greater speed and efficiency so that maximum braking is achieved sooner. Using the information received from the wheel speed sensors, brake pedal travel switch, master cylinder pressure transducer, master cylinder active booster solenoid and the yaw rate sensor and accelerometer, the ABS module detects whether more braking pressure can be applied in relation to how much braking pressure the driver is applying in an emergency braking situation.

Inspection and Verification

- 1 . Verify the customer concern.
- 2 . Confirm if the ABS warning light was illuminated, or still is.

NOTE:

An intermittent fault may allow the warning light to go off. This does not necessarily mean the fault is not present. Some warnings will appear to clear when the ignition is cycled. This is often because the warning has flagged as a result of one of the vehicle's on-board diagnostic routines having run to detect the fault. If the same routine is not run when the ignition is switched **ON**, the warning will not reflag until the routine does run.

- 3 . Visually inspect for obvious signs of mechanical or electrical damage.

Mechanical	Electrical
<ul style="list-style-type: none">• Brake fluid level• Vacuum system	<ul style="list-style-type: none">• Warning light operation• Fuses (see table)

- Wheel speed sensor fitment
- Wheel speed sensor air gap
- Wheel speed sensor tone ring(s) (missing or damaged teeth/contamination)
- Yaw rate/lateral accelerometer sensor cluster fitment
- Incorrect wheel or tire size

- Wheel speed sensors
- Connectors/Pins
- Harnesses
- Steering wheel angle sensor
- Yaw/lateral rate sensor cluster
- ABS/DSC module

4 . If an obvious cause for an observed or reported concern is found, correct the cause (if possible) before proceeding to the next step.

5 . If the cause is not visually evident and the Jaguar approved diagnostic system is not available, use a fault code reader to retrieve the fault codes before proceeding to the diagnostic trouble code (DTC) index chart.

Fuse Identification Table

Location	Fuse Number	Rating	Circuit
Engine bay fuse box	20	30 Amp	ABS/Stability assist control pump battery supply
Engine bay fuse box	22	30 Amp	ABS/Stability assist control module battery supply
Cabin fuse box	17	5 Amp	ABS/Stability assist control module ignition supply
Primary junction box	44	5 Amp	Brake light switch battery supply

Brake Pedal Position Switch Calibration

The brake pedal position switch procedure is under review. For further information, contact dealer technical support.

Diagnostic Trouble Code (DTC) Index

DTC	Description	Possible Source	Action
C1093	Traction control disable CAN failure	<ul style="list-style-type: none"> • Traction control disable CAN message failure 	For CAN module circuit tests, <<418-00>>
C1095	Pump motor circuit failure	<ul style="list-style-type: none"> • Pump motor B+ power supply circuit; high resistance, open circuit, short circuit to GROUND, short circuit to B+ • Pump motor failure 	For ABS/DSC module circuit tests, GO to Pinpoint Test G307559p1 .

C1141	Left-hand front wheel speed sensor tone ring damaged/missing tooth	<ul style="list-style-type: none"> Damaged/ missing tooth on tone ring 	Refer to visual inspection chart. Inspect tone ring for damage.
C1142	Right-hand front wheel speed sensor tone ring damaged/missing tooth	<ul style="list-style-type: none"> Damaged/ missing tooth on tone ring 	Refer to visual inspection chart. Inspect tone ring for damage.
C1143	Left-hand rear wheel speed sensor tone ring damaged/missing tooth	<ul style="list-style-type: none"> Damaged/ missing tooth on tone ring 	Refer to visual inspection chart. Inspect tone ring for damage.
C1144	Right-hand rear wheel speed sensor tone ring damaged/missing tooth	<ul style="list-style-type: none"> Damaged/ missing tooth on tone ring 	Refer to visual inspection chart. Inspect tone ring for damage.
C1145	Right-hand front wheel speed sensor (WSS) circuit failure	<ul style="list-style-type: none"> Wheel speed sensor circuit; open circuit, short circuit Wheel speed sensor to control module circuit; high resistance, open circuit, short circuit to GROUND Wheel speed sensor failure 	For right hand front WSS circuit tests, GO to Pinpoint Test G307559p2 .
C1155	Left-hand front wheel speed sensor (WSS) circuit failure	<ul style="list-style-type: none"> Wheel speed sensor circuit; open circuit, short circuit Wheel speed sensor to control module circuit; high resistance, open circuit, short circuit to GROUND Wheel speed sensor failure 	For left hand front WSS circuit tests, GO to Pinpoint Test G307559p3 .
C1165	Right-hand rear wheel speed sensor (WSS) circuit failure	<ul style="list-style-type: none"> Wheel speed sensor circuit; open circuit, short circuit Wheel speed sensor to control module circuit; high resistance, open circuit, short circuit to GROUND Wheel speed sensor failure 	For right hand rear WSS circuit tests, GO to Pinpoint Test G307559p4 .
C1175	Left-hand rear wheel speed sensor (WSS)	<ul style="list-style-type: none"> Wheel speed sensor circuit; open circuit, short circuit Wheel speed sensor to 	For left -hand rear WSS circuit tests, GO to Pinpoint Test

	circuit failure	control module circuit; high resistance, open circuit, short circuit to GROUND <ul style="list-style-type: none"> Wheel speed sensor failure 	G307559p5.
C1233	Left-hand front wheel speed sensor (WSS) signal failure	<ul style="list-style-type: none"> Wheel speed sensor gap too large Missing tone ring or sensor Incorrect tone ring Incorrect wheel size 	Check the wheel speed sensor for correct fitment. Front Wheel Speed Sensor (70.60.03)
C1234	Right-hand front wheel speed sensor (WSS) signal failure	<ul style="list-style-type: none"> Wheel speed sensor gap too large Missing tone ring or sensor Incorrect tone ring Incorrect wheel size 	Check the wheel speed sensor for correct fitment. Front Wheel Speed Sensor (70.60.03)
C1235	Right-hand rear wheel speed sensor (WSS) signal failure	<ul style="list-style-type: none"> Wheel speed sensor gap too large Missing tone ring or sensor Incorrect tone ring Incorrect wheel size 	Check the wheel speed sensor for correct fitment. Rear Wheel Speed Sensor (70.60.04)
C1236	Left-hand rear wheel speed sensor (WSS) signal failure	<ul style="list-style-type: none"> Wheel speed sensor gap too large Missing tone ring or sensor Incorrect tone ring Incorrect wheel size 	Check the wheel speed sensor for correct fitment. Rear Wheel Speed Sensor (70.60.04)
C1267	ABS/DSC function temporarily disabled	<ul style="list-style-type: none"> HF interference Supply voltages to valve solenoids or sensors out of range EEPROM read/write failure ABS/DSC module failure 	Contact dealer technical support for advice on possible ABS/DSC module failure. Refer to inspection and verification for information on warning light behavior
C1277	Steering angle sensor (SA sensor) circuit A/B failure	<ul style="list-style-type: none"> SA sensor circuit(s) open circuit, short circuit, short circuit to GROUND or B+ SA sensor damaged Sensor wiring damaged Sensor loose, not mounted correctly 	For SA sensor circuit tests, GO to Pinpoint Test G307559p6.
C1279	Yaw rate sensor circuit failure	<ul style="list-style-type: none"> Yaw rate/lateral accelerometer sensor cluster circuit(s) open/short circuit, short circuit to 	For lateral/yaw rate sensor circuit tests, GO to Pinpoint Test G307559p7.

		<p>GROUND or B+</p> <ul style="list-style-type: none"> Yaw rate/lateral accelerometer sensor cluster failure 	
C1280	Yaw rate sensor signal failure	<ul style="list-style-type: none"> Sensor loose, not mounted correctly Yaw rate/lateral accelerometer sensor cluster failure 	Refer to visual inspection chart. Check sensor fitment. Refer to dealer technical support for advice on possible sensor failure.
C1281	Lateral accelerometer sensor circuit failure	<ul style="list-style-type: none"> Connector pins bent or corroded Sensor wiring damaged Yaw rate/lateral accelerometer sensor cluster failure 	For lateral/yaw rate sensor circuit tests, GO to Pinpoint Test G307559p7 .
C1282	Lateral accelerometer sensor signal failure	<ul style="list-style-type: none"> Sensor loose, not mounted correctly Yaw rate/lateral accelerometer sensor cluster failure 	Refer to visual inspection chart. Check sensor fitment. Refer to dealer technical support for advice on possible sensor failure.
C1285	Booster solenoid circuit failure	<ul style="list-style-type: none"> Booster solenoid circuit open circuit, short circuit to GROUND Booster solenoid failure 	For booster solenoid circuit tests, GO to Pinpoint Test G307559p8 .
C1286	Booster mechanical failure	<ul style="list-style-type: none"> Brake light switch incorrectly calibrated Pedal force switch open circuit, short circuit to GROUND Pedal force switch failure Active brake booster mechanical failure ABS/DSC module failure 	Contact dealer technical support for advice on brake pedal position switch calibration procedure. For pedal force switch tests, GO to Pinpoint Test G307559p10 . Contact dealer technical support for advice on possible active brake booster or ABS/DSC module failure.
C1287	Booster pedal force switch circuit failure	<ul style="list-style-type: none"> Booster pedal force switch open circuit, short circuit to GROUND or B+ Booster pedal force switch failure 	For pedal force switch tests, GO to Pinpoint Test G307559p10 .

C1288	Pressure sensor main/primary input circuit failure	<ul style="list-style-type: none"> • Brake pressure circuit open circuit, short circuit to GROUND or B+ • Connector pins bent or corroded • Damaged harness/wiring • Sensor failure • ABS/DSC module failure 	For pressure sensor circuit tests, GO to Pinpoint Test G307559p11 .
C1295	Steering angle sensor internal failure	<ul style="list-style-type: none"> • Steering angle signal open circuit, short circuit to GROUND or B+, high resistance • Sensor loose • Encoder ring contaminated • Sensor failure 	For SA sensor circuit tests, GO to Pinpoint Test G307559p6 . Check sensor fitment, check encoder ring for debris.
C1306	Steering angle sensor—no center found during initialization	<ul style="list-style-type: none"> • Steering angle sensor — no center found within time limits 	Check for associated DTCs. Reinitialize the sensor by turning the ignition to the OFF position, then back ON without turning the steering wheel.
C1307	Steering wheel angle sensor encoder ring failure	<ul style="list-style-type: none"> • Loose or damaged encoder ring • Steering angle sensor failure • Signal wires shorted together 	Check the security and condition of the steering angle sensor encoder ring. Check encoder ring for debris. For SA sensor circuit tests, GO to Pinpoint Test G307559p6 .
C1440	Brake pressure sensor signal fault	<ul style="list-style-type: none"> • Pressure sensor signal circuit open circuit, short circuit to GROUND or B+ • Brake pressure sensor failure 	For pressure sensor circuit tests, GO to Pinpoint Test G307559p11 .
C1446	Brake switch circuit failure	<ul style="list-style-type: none"> • Brake light switch signal failure • Mechanical switch failure 	For brake light switch circuit tests, GO to Pinpoint Test G307559p12 .
C1730	Sensor supply voltage out of range (+5 volt)	<ul style="list-style-type: none"> • Sensor supply voltage circuit short circuit to GROUND or B+ • Defective sensor • ABS/DSC module failure 	For sensor power and GROUND circuit tests, <<418-00>> Contact dealer technical support for advice on possible ABS/DSC module failure.

C1777	Vacuum pressure circuit failure	<ul style="list-style-type: none"> • Mechanical failure in active booster unit • ABS/DSC module failure 	CLEAR the DTC. TEST the system for normal operation. If the DTC is repeated, contact dealer technical support for advice on possible active booster or ABS/DSC module failure.
C1994	DSC continuous operation fault	<ul style="list-style-type: none"> • Yaw rate sensor cluster failure 	Contact dealer technical support for advice on possible yaw rate sensor cluster failure.
C1997	Pressure controller failure	<ul style="list-style-type: none"> • Booster solenoid open/short circuit, short circuit to GROUND or B+, high resistance • Booster solenoid failure • Pressure sensor signal open/short circuit, short circuit to GROUND or B+, high resistance • Pressure sensor failure 	For booster solenoid circuit tests, GO to Pinpoint Test G307559p8 . For pressure sensor circuit tests, GO to Pinpoint Test G307559p11 .
C2778	Yaw rate/Lateral accelerometer sensor cluster power supply failure	<ul style="list-style-type: none"> • Sensor power supply voltage open circuit, short circuit to GROUND or B+ • ABS/DSC module failure 	For lateral/yaw rate sensor circuit tests, GO to Pinpoint Test G307559p7 . Contact dealer technical support for advice on possible ABS/DSC module failure.
C2783	Sensor cluster incorrect	<ul style="list-style-type: none"> • Incorrect yaw rate/lateral accelerometer sensor cluster fitted 	Contact dealer technical support for advice on possible yaw rate sensor cluster failure.
C2785	Yaw rate/Lateral accelerometer sensor(s) out of calibration	<ul style="list-style-type: none"> • Yaw rate/Lateral accelerometer sensor cluster not calibrated 	Contact dealer technical support for advice on recalibration of the yaw rate sensor cluster.
B1231	Longitudinal acceleration threshold exceeded	<ul style="list-style-type: none"> • Check brake hydraulic/mechanical function/condition • Pressure sensor failure • ACC failure • Hydraulic unit failure • Mechanical failure in booster actuation unit 	Carry out a full vehicle DTC check. Check for DTC P1696 as an indication of an ACC system fault. For pressure sensor circuit tests, GO to Pinpoint Test G307559p11 . For vacuum circuit tests refer

		<ul style="list-style-type: none"> Brake booster vacuum low Brake booster failure 	to inspection and verification. Contact dealer technical support for further advice.
B1317	Supply voltage out of range (HIGH)	<ul style="list-style-type: none"> Charging system failure ABS/DSC module GROUND fault 	Check the battery condition and charging system, <<414-00>> <<414-01>>
B1318	Supply voltage out of range (LOW)	<ul style="list-style-type: none"> Battery failure, loose connections Charging system failure ABS/DSC module positive supply fault 	Check the battery condition and charging system, <<414-00>> <<414-01>>
B1342	ABC/DSC module failure	<ul style="list-style-type: none"> ABS/DSC module failure 	Contact dealer technical support for advice on possible ABS/DSC module failure
B2141	NVM configuration failure	<ul style="list-style-type: none"> No or invalid vehicle configuration information received from the ECM and stored in EEPROM 	Reconfigure the ECM <<418-00>>
B2736	Pedal travel sensor circuit failure	<ul style="list-style-type: none"> Pedal travel sensor circuit: open circuit, short circuit to GROUND or B+, high resistance, signal wires short circuit to each other 	For pedal travel sensor tests, GO to Pinpoint Test G307559p9 .
B2739	Pedal travel sensor signal circuit failure	<ul style="list-style-type: none"> Connector pins bent or corroded Pedal travel sensor signal failure; open circuit, short circuit to GROUND or B+, high resistance Pedal travel sensor failure ABS/DSC module failure 	For pedal travel sensor tests, GO to Pinpoint Test G307559p9 .
B2741	Yaw rate/Lateral accelerometer sensor cluster fault	<ul style="list-style-type: none"> Yaw rate/Lateral accelerometer sensor cluster failure 	Contact dealer technical support for advice on possible yaw rate sensor failure.
U1901	Local CAN yaw rate/lateral accelerometer sensor cluster communication	<ul style="list-style-type: none"> Local CAN fault Control module internal local CAN failure Yaw rate/Lateral accelerometer sensor 	For CAN module circuit tests, <<418-00>> Contact dealer technical support for advice on possible yaw rate sensor

	fault	cluster failure	failure.
U2012	Communication bus error	<ul style="list-style-type: none"> CAN failure Control module internal CAN failure 	For CAN circuit tests, <<418-00>>
U2202	Invalid configuration data received	<ul style="list-style-type: none"> ABS/DSC incorrectly configured to VID block 	Contact dealer technical support for advice on reconfiguration of modules.
U2515	Missing message for adaptive cruise control ACC	<ul style="list-style-type: none"> CAN message is not received at specified rate or is missing 	For CAN module circuit tests, <<418-00>>
U2522	CAN message timeout from TCM	<ul style="list-style-type: none"> CAN message is not received at specified rate or is missing 	For CAN module circuit tests, <<418-00>>
U2523	CAN message timeout from ECM	<ul style="list-style-type: none"> CAN message is not received at specified rate or is missing 	For CAN module circuit tests, <<418-00>>
U2527	Local CAN transmit error	<ul style="list-style-type: none"> Local CAN failure 	For CAN module circuit tests, <<418-00>>

Pinpoint Tests



CAUTION: When probing connectors to take measurements in the course of the pinpoint tests, use the adaptor kit, part number 3548-1358-00.

NOTE:

When performing electrical voltage or resistance tests, always use a digital multimeter (DMM) accurate to 3 decimal places, and with an up-to-date calibration certificate. When testing resistance, always take the resistance of the DMM leads into account.

NOTE:

Check and rectify basic faults before beginning diagnostic routines involving pinpoint tests.

PINPOINT TEST G307559p1 : C1095; PUMP MOTOR FAULT

G307559t1 : CHECK THE BATTERY POWER SUPPLY (1) TO THE ABS/DSC MODULE

1. Turn the ignition switch to the **OFF** position. 2. Disconnect the ABS/DSC module electrical connector EC30. 3. Measure the voltage between EC30, pin 01 (NR) and GROUND.

- **Is the voltage less than 10 volts?**

-> **Yes**

REPAIR the circuit. This circuit includes the engine compartment fuse box (fuse 20). For additional information, refer to the wiring diagrams. CLEAR the DTC. TEST the system for normal operation.

-> **No**

GO to Pinpoint Test [G307559t3](#).

G307559t3 : CHECK THE BATTERY POWER SUPPLY (2) TO THE ABS/DSC MODULE

1. Measure the voltage between EC30, pin 32 (NW) and GROUND.

- **Is the voltage less than 10 volts?**

-> **Yes**

REPAIR the circuit. This circuit includes the engine compartment fuse box (fuse 22). For additional information, refer to the wiring diagrams. CLEAR the DTC. TEST the system for normal operation.

-> **No**

GO to Pinpoint Test [G307559t7](#).

G307559t7 : CHECK THE GROUND TO THE ABS/DSC MODULE

1. Measure the resistance between EC30, pins 16 and 47 (B) and GROUND.

- **Is the resistance greater than 5 ohms?**

-> **Yes**

REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC. TEST the system for normal operation.

-> **No**

Contact dealer technical support for advice on possible ABS/DSC module failure.

PINPOINT TEST G307559p2 : C1145; RIGHT HAND FRONT WHEEL SPEED SENSOR (WSS) ELECTRICAL FAILURE

G307559t8 : CHECK THE WSS TO ABS/DSC MODULE SIGNAL CIRCUIT FOR HIGH RESISTANCE

1. Turn the ignition switch to the **OFF** position. 2. Disconnect the ABS/DSC module electrical connector EC30. 3. Disconnect the WSS electrical connector EC15. 4. Measure the resistance between EC30, pin 34 (WU) and EC15, pin 02 (WU).

- **Is the resistance greater than 5 ohms?**

-> **Yes**

REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC. TEST the system for normal operation.

-> **No**

GO to Pinpoint Test [G307559t9](#).

G307559t9 : CHECK THE WSS TO ABS/DSC MODULE SIGNAL CIRCUIT FOR SHORT TO GROUND

1. Measure the resistance between EC30, pin 34 (WU) and GROUND.

- **Is the resistance less than 10,000 ohms?**

-> **Yes**

REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC. TEST the system for normal operation.

-> **No**

GO to Pinpoint Test [G307559t10](#).

G307559t10 : CHECK THE WSS TO ABS/DSC MODULE SUPPLY CIRCUIT FOR HIGH RESISTANCE

1. Measure the resistance between EC30, pin 33 (NG) and EC15, pin 01 (NG).

- **Is the resistance greater than 5 ohms?**

-> **Yes**

REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC. TEST the system for normal operation.

-> **No**

GO to Pinpoint Test [G307559t2](#).

G307559t2 : CHECK THE WSS TO ABS/DSC MODULE SUPPLY CIRCUIT FOR SHORT TO GROUND

1. Measure the resistance between EC30, pin 33 (NG) and GROUND.

- **Is the resistance less than 10,000 ohms?**

-> **Yes**

REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC. TEST the system for normal operation.

-> **No**

INSTALL a new right-hand front wheel speed sensor.

[Front Wheel Speed Sensor \(70.60.03\)](#) CLEAR the DTC. TEST the system for normal operation. If the DTC is repeated, contact dealer technical support for advice on possible ABS/DSC module failure.

PINPOINT TEST G307559p3 : C1155; LEFT HAND FRONT WHEEL SPEED SENSOR (WSS) ELECTRICAL FAILURE

G307559t11 : CHECK THE WSS TO ABS/DSC MODULE SIGNAL CIRCUIT FOR HIGH RESISTANCE

1. Turn the ignition switch to the **OFF** position. 2. Disconnect the ABS/DSC module electrical connector EC30. 3. Disconnect the WSS electrical connector EC44. 4. Measure the resistance between EC30, pin 45 (WG) and EC44, pin 2 (WG).

- **Is the resistance greater than 5 ohms?**

-> **Yes**

REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC. TEST the system for normal operation.

-> **No**

GO to Pinpoint Test [G307559t12](#).

G307559t12 : CHECK THE WSS TO ABS/DSC MODULE SIGNAL CIRCUIT FOR SHORT TO GROUND

1. Measure the resistance between EC30, pin 46 (NG) and GROUND.

- **Is the resistance less than 10,000 ohms?**

-> **Yes**

REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC. TEST the system for normal operation.

-> **No**

GO to Pinpoint Test [G307559t13](#).

G307559t13 : CHECK THE WSS TO ABS/DSC MODULE SUPPLY CIRCUIT FOR HIGH RESISTANCE

1. Measure the resistance between EC30, pin 46 (NG) and EC44, pin 01 (NG).

- **Is the resistance greater than 5 ohms?**

-> **Yes**

REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC. TEST the system for normal operation.

-> **No**

GO to Pinpoint Test [G307559t5](#).

G307559t5 : CHECK THE WSS TO ABS/DSC MODULE SUPPLY CIRCUIT FOR SHORT TO GROUND

1. Measure the resistance between EC30, pin 46 (NG) and GROUND.

- **Is the resistance less than 10,000 ohms?**

-> **Yes**

REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC. TEST the system for normal operation.

-> **No**

INSTALL a new left-hand front wheel speed sensor.

[Front Wheel Speed Sensor \(70.60.03\)](#) CLEAR the DTC. TEST the system for normal operation. If the DTC is repeated, contact dealer technical support for advice on possible ABS/DSC module failure.

PINPOINT TEST G307559p4 : C1165; RIGHT HAND REAR WHEEL SPEED SENSOR (WSS) ELECTRICAL FAILURE

G307559t14 : CHECK THE WSS TO ABS/DSC MODULE SIGNAL CIRCUIT FOR HIGH RESISTANCE

1. Turn the ignition switch to the **OFF** position. 2. Disconnect the ABS/DSC module electrical connector EC30. 3. Disconnect the WSS electrical connector CV08. 4. Measure the resistance between EC30, pin 43 (W) and CV08, pin 02 (W).

- **Is the resistance greater than 5 ohms?**

-> **Yes**

REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC. TEST the system for normal operation.

-> **No**

GO to Pinpoint Test [G307559t15](#).

G307559t15 : CHECK THE WSS TO ABS/DSC MODULE SIGNAL CIRCUIT FOR SHORT TO GROUND

1. Measure the resistance between EC30, pin 43 (W) and GROUND.

- **Is the resistance less than 10,000 ohms?**

-> **Yes**

REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC. TEST the system for normal operation.

-> **No**

GO to Pinpoint Test [G307559t16](#).

G307559t16 : CHECK THE WSS TO ABS/DSC MODULE SUPPLY CIRCUIT FOR HIGH RESISTANCE

1. Measure the resistance between EC30, pin 42 (N) and CV08, pin 01 (R).

- **Is the resistance greater than 5 ohms?**

-> **Yes**

REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC. TEST the system for normal operation.

-> **No**

GO to Pinpoint Test [G307559t65](#).

G307559t65 : CHECK THE WSS TO ABS/DSC MODULE SUPPLY CIRCUIT FOR SHORT TO GROUND

1. Measure the resistance between EC30, pin 42 (N) and GROUND.

- **Is the resistance less than 10,000 ohms?**

-> **Yes**

REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC. TEST the system for normal operation.

-> **No**

INSTALL a new right-hand rear wheel speed sensor.

[Rear Wheel Speed Sensor \(70.60.04\)](#) CLEAR the DTC. TEST the system for normal operation. If the DTC is repeated, contact dealer technical support for advice on possible ABS/DSC module failure.

PINPOINT TEST G307559p5 : C1175; LEFT HAND REAR WHEEL SPEED SENSOR (WSS) ELECTRICAL FAILURE

G307559t17 : CHECK THE WSS TO ABS/DSC MODULE SIGNAL CIRCUIT FOR HIGH RESISTANCE

1. Turn the ignition switch to the **OFF** position. 2. Disconnect the ABS/DSC module electrical connector EC30. 3. Disconnect the WSS electrical connector CV06. 4. Measure the resistance between EC30, pin 36 (WR) and CV06, pin 02 (W).

- **Is the resistance greater than 5 ohms?**

-> **Yes**

REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC. TEST the system for normal operation.

-> **No**

GO to Pinpoint Test [G307559t18](#).

G307559t18 : CHECK THE WSS TO ABS/DSC MODULE SIGNAL CIRCUIT FOR SHORT TO GROUND

1. Measure the resistance between EC30, pin 36 (WR) and GROUND.

- **Is the resistance less than 10,000 ohms?**

-> **Yes**

REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC.

TEST the system for normal operation.

-> **No**

GO to Pinpoint Test [G307559t19](#).

G307559t19 : CHECK THE WSS TO ABS/DSC MODULE SUPPLY CIRCUIT FOR HIGH RESISTANCE

1. Measure the resistance between EC30, pin 37 (NR) and CV06, pin 01 (R).

- **Is the resistance greater than 5 ohms?**

-> **Yes**

REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC. TEST the system for normal operation.

-> **No**

GO to Pinpoint Test [G307559t66](#).

G307559t66 : CHECK THE WSS TO ABS/DSC MODULE SUPPLY CIRCUIT FOR SHORT TO GROUND

1. Measure the resistance between EC30, pin 37 (NR) and GROUND.

- **Is the resistance less than 10,000 ohms?**

-> **Yes**

REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC. TEST the system for normal operation.

-> **No**

INSTALL a new left-hand rear wheel speed sensor.

[Rear Wheel Speed Sensor \(70.60.04\)](#) CLEAR the DTC. TEST the system for normal operation. If the DTC is repeated, contact dealer technical support for advice on possible ABS/DSC module failure.

PINPOINT TEST G307559p6 : C1277, C1295; STEERING ANGLE SENSOR (SA SENSOR) 'A' AND 'B' CIRCUIT FAILURE

G307559t20 : CHECK THE VOLTAGE SUPPLY TO THE STEERING ANGLE SENSOR

1. Disconnect the steering angle sensor electrical connector IP37. 2. Turn the ignition switch to the **ON** position. 3. Measure the voltage between IP37, pin 04 (R) and GROUND.

- **Is the voltage less than 10 volts?**

-> **Yes**

GO to Pinpoint Test [G307559t21](#).

-> **No**

GO to Pinpoint Test [G307559t22](#).

G307559t21 : CHECK THE STEERING ANGLE SENSOR VOLTAGE SUPPLY CIRCUIT FOR HIGH RESISTANCE

1. Turn the ignition switch to the **OFF** position. 2. Disconnect the ABS/DSC module electrical connector EC30. 3. Measure the continuity between EC30, pin 07 (R) and IP37, pin 04 (R).

- **Is the resistance greater than 5 ohms?**

-> **Yes**

REPAIR the high resistance circuit. This circuit includes the splice IPS14. For additional information, refer to the wiring diagrams. CLEAR the DTC. TEST the system for normal operation.

-> **No**

Contact dealer technical support for advice on possible ABS/DSC module failure.

G307559t22 : CHECK THE STEERING ANGLE SENSOR GROUND SUPPLY CIRCUIT

1. Turn the ignition switch to the **OFF** position. 2. Reconnect the ABS/DSC module electrical connector EC30. 3. Disconnect the yaw/lateral rate sensor electrical connector IP23. 4. Turn the ignition switch to the **ON** position. 5. Measure the resistance between IP37, pin 01 (B) and GROUND.

- **Is the resistance greater than 5 ohms?**

-> **Yes**

REPAIR the high resistance circuit. This circuit includes the splice IPS10. For additional information, refer to the wiring diagrams. CLEAR the DTC. TEST the system for normal operation.

-> **No**

GO to Pinpoint Test [G307559t23](#).

G307559t23 : CHECK THE STEERING ANGLE SENSOR SIGNAL CIRCUIT 'A' FOR HIGH RESISTANCE

1. Turn the ignition switch to the **OFF** position. 2. Disconnect the ABS/DSC module electrical connector EC30. 3. Measure the resistance between EC30, pin 03 (Y) and IP37 pin 02 (Y).

- **Is the resistance greater than 5 ohms?**

-> **Yes**

GO to Pinpoint Test [G307559t24](#).

-> **No**

REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC. TEST the system for normal operation.

G307559t24 : CHECK THE STEERING ANGLE SENSOR SIGNAL CIRCUIT 'B' FOR HIGH RESISTANCE

1. Measure the resistance between EC30, pin 06 (U) and IP37, pin 03 (U).

- **Is the resistance greater than 5 ohms?**

-> **Yes**

GO to Pinpoint Test [G307559t25](#).

-> **No**

REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC. TEST the system for normal operation.

G307559t25 : CHECK THE STEERING ANGLE SENSOR SIGNAL CIRCUIT 'A' FOR SHORT TO GROUND

1. Measure the resistance between IP37, pin 02 (Y) and GROUND.

- **Is the resistance less than 10,000 ohms?**

-> **Yes**

REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC. TEST the system for normal operation.

-> **No**

GO to Pinpoint Test [G307559t26](#).

G307559t26 : CHECK THE STEERING ANGLE SENSOR SIGNAL CIRCUIT 'B' FOR SHORT TO GROUND

1. Measure the resistance between IP37, pin 03 (B) and GROUND.

- **Is the resistance less than 10,000 ohms?**

-> **Yes**

REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC. TEST the system for normal operation.

-> **No**

GO to Pinpoint Test [G307559t27](#).

G307559t27 : CHECK THE STEERING ANGLE SENSOR SIGNAL CIRCUITS 'A' AND 'B' FOR SHORT TO EACH OTHER

1. Measure the resistance between IP37, pin 03 (B) IP37, pin 02 (Y).

- **Is the resistance less than 5 ohms?**

-> **Yes**

REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC. TEST the system for normal operation.

-> **No**

INSTALL a new steering angle sensor. CLEAR the DTC. TEST the system for normal operation. If the DTC is repeated, contact dealer technical support for advice on possible ABS/DSC module failure.

PINPOINT TEST G307559p7 : C1279, C1281, C2778, C2785, B2741; LATERAL/YAW RATE CIRCUIT FAILURE

G307559t28 : CHECK THE VOLTAGE SUPPLY TO THE LATERAL/YAW RATE SENSOR

1. Disconnect the yaw/lateral rate sensor electrical connector IP23. 2. Turn the ignition switch to the **ON** position. 3. Measure the voltage between IP23, pin 03 (R) and GROUND.

- **Is the voltage less than 10 volts?**

-> **Yes**

GO to Pinpoint Test [G307559t29](#).

-> **No**

GO to Pinpoint Test [G307559t4](#).

G307559t29 : CHECK THE YAW/LATERAL RATE SENSOR VOLTAGE SUPPLY CIRCUIT FOR HIGH RESISTANCE

1. Turn the ignition switch to the **OFF** position. 2. Disconnect the ABS/DSC module electrical connector EC30. 3. Measure the resistance between IP23, pin 03 (R) and EC30, pin 07 (R).

- **Is the resistance greater than 5 ohms?**

-> **Yes**

REPAIR the high resistance circuit. This circuit includes the splice IPS14. For additional information, refer to the wiring diagrams. CLEAR the DTC. TEST the system for normal operation.

-> **No**

GO to Pinpoint Test [G307559t30](#).

G307559t30 : CHECK THE YAW/LATERAL RATE SENSOR VOLTAGE SUPPLY CIRCUIT FOR SHORT TO GROUND

1. Measure the resistance between IP23, pin 03 (R) and GROUND.

- **Is the resistance less than 10,000 ohms?**

-> **Yes**

REPAIR the short circuit. This circuit includes the splice IPS14. For additional information, refer to the wiring diagrams. CLEAR the DTC. TEST the system for normal operation.

-> **No**

Contact dealer technical support for advice on possible ABS/DSC module failure.

G307559t4 : CHECK THE GROUND TO THE YAW/LATERAL RATE SENSOR

1. Measure the resistance between IP23, pin 05 (BK) and GROUND.

- **Is the resistance greater than 5 ohms?**

-> **Yes**

GO to Pinpoint Test [G307559t67](#).

-> **No**

GO to Pinpoint Test [G307559t32](#).

G307559t67 : CHECK THE YAW/LATERAL RATE SENSOR GROUND CIRCUIT FOR HIGH RESISTANCE

1. Turn the ignition switch to the **OFF** position. 2. Disconnect the ABS/DSC module electrical connector EC30. 3. Measure the resistance between IP23, pin 05 (BK) and EC30, pin 05 (BK).

- **Is the resistance greater than 5 ohms?**

-> **Yes**

REPAIR the high resistance circuit. This circuit includes the splice IPS10. For additional information, refer to the wiring diagrams. CLEAR the DTC. TEST the system for normal operation.

-> **No**

GO to Pinpoint Test [G307559t32](#).

G307559t32 : CHECK THE YAW/LATERAL RATE SENSOR GROUND CIRCUIT FOR SHORT TO B+

1. Measure the voltage between IP23, pin 05 (BK) and GROUND.

- **Is the voltage greater than 3 volts?**

-> **Yes**

REPAIR the short circuit. This circuit includes the splice IPS10. For additional information, refer to the wiring diagrams. CLEAR the DTC. TEST the system for normal operation.

-> **No**

Contact dealer technical support for advice on possible ABS/DSC module failure.

PINPOINT TEST G307559p8 : C1285; ACTIVE BOOSTER SOLENOID CIRCUIT FAILURE

G307559t33 : CHECK THE ACTIVE BOOSTER SOLENOID SUPPLY VOLTAGE

1. Disconnect the booster solenoid electrical connector, EC03. 2. Turn the ignition switch to the **ON** position. 3. Measure the voltage between EC03, pin 04 (RW) and GROUND.

- **Is the voltage less than 10 volts?**

-> **Yes**

GO to Pinpoint Test [G307559t34](#).

-> **No**

GO to Pinpoint Test [G307559t36](#).

G307559t34 : CHECK THE ACTIVE BOOSTER SOLENOID SUPPLY CIRCUIT FOR HIGH RESISTANCE

1. Turn the ignition switch to the **OFF** position. 2. Disconnect the ABS/DSC module electrical connector EC30. 3. Measure the resistance between EC03, pin 04 (RW) and EC30, pin 17 (RW).

- **Is the resistance greater than 5 ohms?**

-> **Yes**

REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC. TEST the system for normal operation.

-> **No**

GO to Pinpoint Test [G307559t35](#).

G307559t35 : CHECK THE ACTIVE BOOSTER SOLENOID SUPPLY CIRCUIT FOR SHORT TO GROUND

1. Measure the resistance between EC03 pin 04 (RW) and GROUND.

- **Is the resistance less than 10,000 ohms?**

-> **Yes**

REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC. TEST the system for normal operation.

-> **No**

Contact dealer technical support for advice on possible ABS/DSC module failure.

G307559t36 : CHECK THE ACTIVE BOOSTER SOLENOID SIGNAL CIRCUIT FOR HIGH RESISTANCE

1. Disconnect the ABS/DSC module electrical connector EC30. 2. Measure the resistance between EC03, pin 03 (BW) and EC30, pin 31 (BW).

- **Is the resistance greater than 5 ohms?**

-> **Yes**

REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC. TEST the system for normal operation.

-> **No**

GO to Pinpoint Test [G307559t37](#).

G307559t37 : CHECK THE ACTIVE BOOSTER SOLENOID SIGNAL CIRCUIT FOR SHORT TO GROUND

1. Measure the resistance between EC03, pin 03 (BW) and GROUND.

- **Is the resistance less than 10,000 ohms?**

-> **Yes**

REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC. TEST the system for normal operation.

-> **No**

Contact dealer technical support for advice on possible active booster failure. CLEAR the DTC. TEST the system for normal operation. If the DTC is repeated, contact dealer technical support for advice on possible ABS/DSC module failure.

PINPOINT TEST G307559p10 : C1286,C1287; PEDAL FORCE SWITCH CIRCUIT FAILURE

G307559t31 : CHECK THE PEDAL FORCE SWITCH FUNCTION NORMALLY CLOSED

1. Disconnect the brake pedal force switch electrical connector EC03. 2. With the brake pedal in the rest position, measure the resistance between pins 02 and 05 of the switch.

- **Is the resistance greater than 5 ohms?**

-> **Yes**

Contact dealer technical support for advice on possible active booster failure. CLEAR the DTC. TEST the system for normal operation.

-> **No**

GO to Pinpoint Test [G307559t68](#).

G307559t68 : CHECK THE PEDAL FORCE SWITCH FUNCTION NORMALLY OPEN

1. With the brake pedal depressed, measure the resistance between pins 03 and 05 of the switch.

- **Is the resistance greater than 5 ohms?**

-> **Yes**

Contact dealer technical support for advice on possible active booster failure. CLEAR the DTC. TEST the system for normal operation.

-> **No**

GO to Pinpoint Test [G307559t38](#).

G307559t38 : CHECK THE PEDAL FORCE SWITCH SUPPLY VOLTAGE

1. Turn the ignition switch to the **ON** position. 2. Measure the voltage between EC03, pin 05 (WG) and GROUND.

- **Is the voltage less than 10 volts?**

-> **Yes**

GO to Pinpoint Test [G307559t39](#).

-> **No**

GO to Pinpoint Test [G307559t41](#).

G307559t39 : CHECK THE PEDAL FORCE SWITCH SUPPLY CIRCUIT FOR HIGH RESISTANCE

1. Turn the ignition switch to the **OFF** position. 2. Disconnect the ABS/DSC module electrical connector EC30. 3. Measure the resistance between EC03, pin 05 (WG) and EC30, pin 28 (wG).

- **Is the resistance greater than 5 ohms?**

-> **Yes**

GO to Pinpoint Test [G307559t40](#).

-> **No**

REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC. TEST the system for normal operation.

G307559t40 : CHECK THE PEDAL FORCE SWITCH SUPPLY CIRCUIT FOR SHORT TO GROUND

1. Measure the resistance between EC03, pin 5 (WG) and GROUND.

- **Is the resistance less than 10,000 ohms?**

-> **Yes**

REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC. TEST the system for normal operation.

-> **No**

Contact dealer technical support for advice on possible ABS/DSC module failure.

G307559t41 : CHECK THE BRAKE PEDAL FORCE SWITCH SIGNAL (NC) CIRCUIT FOR HIGH RESISTANCE

1. Measure the resistance between EC03, pin 02 (YR) and EC30, pin 30 (YR).

- **Is the resistance greater than 5 ohms?**

-> **Yes**

REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC. TEST the system for normal operation.

-> **No**

GO to Pinpoint Test [G307559t42](#).

G307559t42 : CHECK THE BRAKE PEDAL FORCE SWITCH SIGNAL CIRCUIT (NC) FOR SHORT TO GROUND

1. Measure the resistance between EC03, pin 02 (YR) and GROUND.

- **Is the resistance less than 10,000 ohms?**

-> **Yes**

REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC. TEST the system for normal operation.

-> **No**

GO to Pinpoint Test [G307559t43](#).

G307559t43 : CHECK THE BRAKE PEDAL FORCE SWITCH SIGNAL CIRCUIT (NO) FOR HIGH RESISTANCE

1. Measure the resistance between EC03, pin 01 (YU) and EC30, pin 31 (YU).

- **Is the resistance greater than 5 ohms?**

-> **Yes**

REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC. TEST the system for normal operation.

-> **No**

GO to Pinpoint Test [G307559t44](#).

G307559t44 : CHECK THE BRAKE PEDAL FORCE SWITCH SIGNAL CIRCUIT (NO) FOR SHORT TO GROUND

1. Measure the resistance between EC03, pin 02 (YR) and GROUND.

- **Is the resistance less than 10,000 ohms?**

-> **Yes**

REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC.

TEST the system for normal operation.

-> **No**

Contact dealer technical support for advice on possible active booster failure. CLEAR the DTC. TEST the system for normal operation. If the DTC is repeated, contact dealer technical support for advice on possible ABS/DSC module failure.

PINPOINT TEST G307559p11 : B1231, C1288, C1440, C1997; PRESSURE SENSOR MAIN/PRIMARY 5 VOLT SUPPLY CIRCUIT FAILURE

G307559t45 : CHECK THE PRESSURE SENSOR 5 VOLT SUPPLY

1. Turn the ignition switch to the **OFF** position. 2. Disconnect the pressure sensor electrical connector EC34. 3. Turn the ignition switch to the **ON** position. 4. Measure the voltage between EC34, pin 01 (BG) and GROUND. 5. Measure the voltage between EC34, pin 03 (YU) and GROUND.

- **Is either voltage less than 5 volts?**

-> **Yes**

GO to Pinpoint Test [G307559t46](#).

-> **No**

GO to Pinpoint Test [G307559t6](#).

G307559t46 : CHECK THE PRESSURE SENSOR 5 VOLT SUPPLY CIRCUIT FOR HIGH RESISTANCE

1. Turn the ignition switch to the **OFF** position. 2. Disconnect the ABS/DSC module electrical connector EC30. 3. Measure the resistance between the EC34, pin 03 (YU) and EC30, pin 18 (GU).

- **Is the resistance greater than 5 ohms?**

-> **Yes**

REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC. TEST the system for normal operation.

-> **No**

GO to Pinpoint Test [G307559t48](#).

G307559t48 : CHECK THE PRESSURE SENSOR 5 VOLT SUPPLY CIRCUIT FOR SHORT TO GROUND

1. Measure the resistance between EC34, pin 03 (YU) and GROUND.

- **Is the resistance less than 10,000 ohms?**

-> **Yes**

REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC.
TEST the system for normal operation.

-> **No**

GO to Pinpoint Test [G307559t49](#).

G307559t6 : CHECK THE GROUND TO THE PRESSURE SENSOR

1. Measure the resistance between EC34, pin 01 (BG) and GROUND.

- **Is the resistance greater than 5 ohms?**

-> **Yes**

GO to Pinpoint Test [G307559t47](#).

-> **No**

Contact dealer technical support for advice on possible ABS/DSC module failure.

G307559t47 : CHECK THE PRESSURE SENSOR GROUND CIRCUIT FOR HIGH RESISTANCE

1. Measure the resistance between EC34, pin 01 (BG) and EC30, pin 19 (BG).

- **Is the resistance greater than 5 ohms?**

-> **Yes**

REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC. TEST the system for normal operation.

-> **No**

Contact dealer technical support for advice on possible ABS/DSC module failure.

G307559t49 : CHECK THE PRESSURE SENSOR GROUND CIRCUIT FOR SHORT TO B+

1. Measure the voltage between the pressure sensor electrical connector EC34, pin 01 (BG) and GROUND.

- **Is the voltage greater than 3 volts?**

-> **Yes**

REPAIR the circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC. TEST the system for normal operation.

-> **No**

GO to Pinpoint Test [G307559t50](#).

G307559t50 : CHECK THE PRESSURE SENSOR SIGNAL CIRCUIT FOR HIGH RESISTANCE

1. Measure the resistance between EC34, pin 02 (GU) and EC30, pin 20 (GU).

- **Is the resistance greater than 5 ohms?**

-> **Yes**

REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC. TEST the system for normal operation.

-> **No**

GO to Pinpoint Test [G307559t51](#).

G307559t51 : CHECK THE PRESSURE SENSOR SIGNAL CIRCUIT FOR SHORT TO GROUND

1. Measure the resistance between EC34, pin 02 (GU) and GROUND.

- **Is the resistance less than 10,000 ohms?**

-> **Yes**

REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC. TEST the system for normal operation.

-> **No**

GO to Pinpoint Test [G307559t52](#).

G307559t52 : CHECK THE PRESSURE SENSOR SIGNAL CIRCUIT FOR SHORT TO B+

1. Measure the voltage between EC34, pin 02 (GU) and GROUND.

- **Is the voltage greater than 5 volts?**

-> **Yes**

REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC. TEST the system for normal operation.

-> **No**

INSTALL a new pressure sensor. CLEAR the DTC. TEST the system for normal operation. If the DTC is repeated, contact dealer technical support for advice on possible ABS/DSC module failure.

PINPOINT TEST G307559p9 : C2736, B2736, B2739; PEDAL TRAVEL SENSOR CIRCUIT FAILURE

G307559t53 : CHECK THE PEDAL TRAVEL SENSOR SUPPLY VOLTAGE

1. Disconnect the brake pedal travel sensor electrical connector EC10. 2. Turn the ignition switch to the **ON** position. 3. Measure the voltage between EC10, pin 01 (G) and GROUND.

- **Is the voltage less than 10 volts?**

-> **Yes**

GO to Pinpoint Test [G307559t54](#).

-> **No**

GO to Pinpoint Test [G307559t56](#).

G307559t54 : CHECK THE PEDAL TRAVEL SENSOR SUPPLY CIRCUIT FOR HIGH RESISTANCE

1. Turn the ignition switch to the **OFF** position. 2. Disconnect the ABS/DSC module electrical connector EC30. 3. Measure the resistance between EC10, pin 01 (G) and EC30, pin 26 (G).

- **Is the resistance greater than 5 ohms?**

-> **Yes**

REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC. TEST the system for normal operation.

-> **No**

GO to Pinpoint Test [G307559t55](#).

G307559t55 : CHECK THE PEDAL TRAVEL SENSOR SUPPLY CIRCUIT FOR SHORT TO GROUND

1. Measure the resistance between EC10, pin 01 (G) and GROUND.

- **Is the resistance less than 10,000 ohms?**

-> **Yes**

REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC.
TEST the system for normal operation.

-> **No**

Contact dealer technical support for advice on possible ABS/DSC module failure.

G307559t56 : CHECK THE PEDAL TRAVEL SENSOR GROUND CIRCUIT FOR HIGH RESISTANCE

1. Measure the resistance between EC10, pin 02 (B) and EC30, pin 24 (B).

- **Is the resistance greater than 5 ohms?**

-> **Yes**

REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC. TEST the system for normal operation.

-> **No**

GO to Pinpoint Test [G307559t57](#).

G307559t57 : CHECK THE PEDAL TRAVEL SENSOR GROUND SUPPLY CIRCUIT

1. Turn the ignition switch to the **OFF** position. 2. Reconnect the ABS/DSC module electrical connector EC30. 3. Turn the ignition switch to the **ON** position. 4. Measure the resistance between EC10, pin 02 (B) and GROUND.

- **Is the resistance greater than 5 ohms?**

-> **Yes**

Contact dealer technical support for advice on possible ABS/DSC module failure.

-> **No**

GO to Pinpoint Test [G307559t58](#).

G307559t58 : CHECK THE PEDAL TRAVEL SENSOR GROUND CIRCUIT FOR SHORT TO B+

1. Measure the voltage between EC10, pin 02 (B) and GROUND.

- **Is the voltage greater than 3 volts?**

-> **Yes**

REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC.
TEST the system for normal operation.

-> **No**

GO to Pinpoint Test [G307559t59](#).

G307559t59 : CHECK THE PEDAL TRAVEL SENSOR SIGNAL CIRCUIT FOR HIGH RESISTANCE

1. Turn the ignition switch to the **OFF** position. 2. Disconnect the ABS/DSC module electrical connector EC30. 3. Measure the resistance between EC10, pin 03 (U) and EC30, pin 40 (U).

- **Is the resistance greater than 5 ohms?**

-> **Yes**

REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC. TEST the system for normal operation.

-> **No**

GO to Pinpoint Test [G307559t60](#).

G307559t60 : CHECK THE PEDAL TRAVEL SENSOR SIGNAL CIRCUIT FOR SHORT TO GROUND

1. Measure the resistance between EC10, pin 03 (U) and GROUND.

- **Is the resistance less than 10,000 ohms?**

-> **Yes**

REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC. TEST the system for normal operation.

-> **No**

GO to Pinpoint Test [G307559t61](#).

G307559t61 : CHECK THE PEDAL TRAVEL SENSOR SIGNAL CIRCUIT FOR SHORT TO B+

1. Measure the voltage between EC10, pin 03 (U) and GROUND.

- **Is the voltage greater than 3 volts?**

-> **Yes**

REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC. TEST the system for normal operation.

-> **No**

Contact dealer technical support for advice on possible active booster failure. [<<206-07>>](#)CLEAR the

DTC. TEST the system for normal operation. If the DTC is repeated, contact dealer technical support for advice on possible ABS/DSC module failure.

PINPOINT TEST G307559p12 : C1446; BRAKE LIGHT SWITCH CIRCUIT FAILURE

G307559t62 : CHECK THE BRAKE LIGHT SWITCH OUTPUT VOLTAGE

1. Turn the ignition switch to the **OFF** position. 2. Disconnect the rear electronic module (REM) electrical connector CR13. 3. Turn the ignition switch to the **ON** position. 4. Depress the brake pedal. 5. Measure the voltage between CR13, pin 13 (GO) and GROUND.

- **Is the voltage less than 10 volts?**

-> **Yes**

GO to Pinpoint Test [G307559t63](#).

-> **No**

INSTALL a new rear electronic module (REM). CLEAR the DTC. TEST the system for normal operation.

G307559t63 : CHECK THE BRAKE LIGHT SWITCH SUPPLY VOLTAGE

1. Disconnect the brake light switch electrical connector CR78. 2. Measure the voltage between CR78, pin 01 (NG) and GROUND.

- **Is the voltage less than 10 volts?**

-> **Yes**

REPAIR the circuit between the battery and the brake light switch electrical connector CR78, pin 01 (NG). This circuit includes the primary junction box (fuse 44). For additional information, refer to the wiring diagrams. CLEAR the DTC. TEST the system for normal operation.

-> **No**

GO to Pinpoint Test [G307559t64](#).

G307559t64 : CHECK THE CONTINUITY OF THE BRAKE LIGHT SWITCH OUTPUT CIRCUIT

1. Measure the resistance between CR78, pin 02 (GO), and CR13, pin 13 (GO).

- **Is the resistance greater than 5 ohms?**

-> **Yes**

REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. CLEAR the

DTC. TEST the system for normal operation.

-> **No**

INSTALL a new brake light switch. CLEAR the DTC. TEST the system for normal operation.

Anti-Lock Control - Stability Assist - VIN Range: G45704->G99999

Overview

There are some changes for 2006 my, the most obvious of which when diagnosing the system is the change to 7-digit diagnostic trouble codes (DTCs) from the familiar 5-digit.

Refer to the DTC index in this section for guidance on how to use these codes with the Jaguar approved diagnostic system or a scan tool.

For information on the operation of the system,

[Anti-Lock Control - Stability Assist - VIN Range: G45704->G99999](#)

Inspection and Verification

- 1 . Verify the customer concern.
- 2 . Confirm if the ABS warning light was illuminated, or still is.

NOTE:

An intermittent fault may allow the warning light to go off. This does not necessarily mean the fault is not present. Some warnings will appear to clear when the ignition is cycled. This is often because the warning has flagged as a result of one of the vehicle's on-board diagnostic routines having run to detect the fault. If the same routine is not run when the ignition is switched **ON**, the warning will not reflag until the routine does run.

- 3 . Visually inspect for obvious signs of mechanical or electrical damage.

Mechanical	Electrical
<ul style="list-style-type: none">• Brake fluid level• Vacuum system• Wheel speed sensor (WSS) fitment• WSS air gap• WSS ring(s) (missing or damaged teeth/contamination)• Steering wheel rotation sensor• Yaw rate sensor and accelerometer cluster fitment• Incorrect wheel or tire size	<ul style="list-style-type: none">• Warning light operation• Fuses (see table)• Wheel speed sensors• Connectors/Pins• Harnesses• Steering wheel rotation sensor• Yaw rate sensor and accelerometer cluster• Booster pressure sensor• Hydraulic control module (HCU)

- 4 . If an obvious cause for an observed or reported concern is found, correct the cause (if possible) before proceeding to the next step.

5 . If the cause is not visually evident use the Jaguar approved diagnostic system or a scan tool to retrieve the fault codes before proceeding to the DTC index chart.

Fuse Identification Table

Location	Fuse Number	Rating	Circuit
Front power distribution fuse box	20	30 Amp	HCU pump battery supply
Front power distribution fuse box	03	5 Amp	HCU module battery supply
Front power distribution fuse box	22	15 Amp	HCU valve battery supply
Primary junction fuse box	17	5 Amp	HCU module ignition supply

DTC Index

NOTE:

Generic scan tools may not read the codes listed, or may read only 5-digit codes. Match the 5 digits from the scan tool to the first 5 digits of the 7-digit code listed to identify the fault (the last 2 digits give extra information read by the manufacturer-approved diagnostic system).

DTC	Description	Possible cause	Action
C000101	Traction control switch (TCS) control channel A valve 1	<ul style="list-style-type: none">Internal HCU fault	Refer to the warranty policy and procedures manual if a module is suspect.
C000201	Traction control switch (TCS) control channel A valve 2	<ul style="list-style-type: none">Internal HCU fault	Refer to the warranty policy and procedures manual if a module is suspect.
C000301	Traction control switch (TCS) control channel B valve 1	<ul style="list-style-type: none">Internal HCU fault	Refer to the warranty policy and procedures manual if a module is suspect.
C000401	Traction control switch (TCS) control channel B	<ul style="list-style-type: none">Internal HCU fault	Refer to the warranty policy and procedures manual if a module is

	valve 2		suspect.
C001001	Left hand front outlet control	<ul style="list-style-type: none"> Internal HCU fault 	Refer to the warranty policy and procedures manual if a module is suspect.
C001101	Left hand front outlet control	<ul style="list-style-type: none"> Internal HCU fault 	Refer to the warranty policy and procedures manual if a module is suspect.
C00117A	Left hand front outlet control	<ul style="list-style-type: none"> Fluid leak Seal failure 	Check the brake fluid condition. Check the hydraulic system for leaks.
C001401	Right hand front inlet control	<ul style="list-style-type: none"> Internal HCU fault 	Refer to the warranty policy and procedures manual if a module is suspect.
C001501	Right hand front outlet control	<ul style="list-style-type: none"> Internal HCU fault 	Refer to the warranty policy and procedures manual if a module is suspect.
C00157A	Right hand front outlet control	<ul style="list-style-type: none"> Internal HCU fault 	Check the brake fluid condition. Check the hydraulic system for leaks.
C001801	Left hand rear inlet control	<ul style="list-style-type: none"> Internal HCU fault 	Refer to the warranty policy and procedures manual if a module is suspect.
C001901	Left hand rear outlet control	<ul style="list-style-type: none"> Internal HCU fault 	Refer to the warranty policy and procedures manual if a module is suspect.
C001C01	Right hand rear inlet control	<ul style="list-style-type: none"> Internal HCU fault 	Refer to the warranty policy and procedures manual if a module is suspect.
C001D01	Right hand rear outlet control	<ul style="list-style-type: none"> Internal HCU fault 	Refer to the warranty policy and procedures manual if a module is suspect.
C002001	ABS pump motor control - excessive	<ul style="list-style-type: none"> Power supply to pump motor: short circuit Power supply to pump motor: incorrect voltage 	Refer to the warranty policy and procedures manual if a module is suspect.

	volt drop	<ul style="list-style-type: none"> • Pump ground circuit fault • Mechanical pump fault 	suspect.
C00201C	ABS pump motor control - voltage out of range	<ul style="list-style-type: none"> • Power supply to pump motor: high resistance • Power supply to pump motor: short circuit • Pump ground circuit fault • Internal solid-state fault caused by ground circuit fault 	Refer to the warranty policy and procedures manual if a module is suspect.
C002071	ABS pump motor control - actuator stuck	<ul style="list-style-type: none"> • Power supply to pump motor: high resistance • Power supply to pump motor: short circuit • Mechanical pump fault 	For power supply circuit tests, GO to Pinpoint Test G531322p3 . If the power and ground circuits are OK, refer to the warranty policy and procedures manual if a module is suspect. No physical test of the pump is possible.
C002201	Brake booster fault	<ul style="list-style-type: none"> • Vacuum circuit fault • Booster fault 	For a mechanical check of the vacuum booster function. GO to Pinpoint Test G531322p1 .
C003007	Left hand front wheel speed sensor (WSS) ring	<ul style="list-style-type: none"> • Contamination or debris on the WSS ring • WSS ring distorted • Excessive vibration 	Check the WSS ring for damage/contamination (the sensor ring is part of the hub and can only be inspected by removing the sensor). Front Wheel Speed Sensor (70.60.03) Check the steering and suspension for excessive play which could cause vibration.
C003101	Left hand front wheel speed sensor (WSS) - signal current out of range	<ul style="list-style-type: none"> • WSS signal circuit: short circuit to ground • WSS signal circuit: short circuit to power • WSS signal circuit: high resistance 	For left hand front WSS tests, GO to Pinpoint Test G531322p4 .
C003107	Left hand front wheel speed sensor (WSS) - mechanical fault	<ul style="list-style-type: none"> • WSS faulty/incorrectly installed • WSS or ring missing/damaged • Excessive gap between sensor and ring 	Check the condition and fitment of the WSS. Front Wheel Speed Sensor (70.60.03) Check the WSS ring for damage/contamination. Check the

		<ul style="list-style-type: none"> Incorrect ring (number of teeth) 	steering and suspension for excessive play. Check the WSS ring for correct specification.
C003307	Right hand front wheel speed sensor ring	<ul style="list-style-type: none"> Contamination or debris on the WSS ring WSS ring distorted Excessive vibration 	<p>Check the WSS ring for damage/contamination (the sensor ring is part of the hub and can only be inspected by removing the sensor).</p> <p>Front Wheel Speed Sensor (70.60.03) Check the steering and suspension for excessive play which could cause vibration.</p>
C003401	Right hand front wheel speed sensor (WSS) - signal current out of range	<ul style="list-style-type: none"> WSS signal circuit: short circuit to ground WSS signal circuit: short circuit to power WSS signal circuit: high resistance 	For right hand front WSS tests, GO to Pinpoint Test G531322p5 .
C003407	Right hand front wheel speed sensor (WSS) - mechanical fault	<ul style="list-style-type: none"> WSS faulty/incorrectly installed WSS or ring missing/damaged Excessive gap between sensor and ring Incorrect ring (number of teeth) 	<p>Check the condition and fitment of the WSS.</p> <p>Front Wheel Speed Sensor (70.60.03) Check the WSS ring for damage/contamination. Check the steering and suspension for excessive play. Check the WSS ring for correct specification.</p>
C003607	Left hand rear wheel speed sensor (WSS) ring	<ul style="list-style-type: none"> Contamination or debris on the WSS ring WSS ring distorted Excessive vibration 	Check the WSS ring for damage/contamination. Check the suspension for excessive play which could cause vibration.
C003701	Left hand rear wheel speed sensor (WSS) - signal current out of range	<ul style="list-style-type: none"> WSS signal circuit: short circuit to ground WSS signal circuit: short circuit to power WSS signal circuit: high resistance 	For left hand rear WSS tests, GO to Pinpoint Test G531322p6 .
C003707	Left hand rear wheel speed sensor (WSS) -	<ul style="list-style-type: none"> WSS faulty/incorrectly installed WSS or ring missing/damaged Excessive gap between 	<p>Check the condition and fitment of the WSS.</p> <p>Rear Wheel Speed Sensor (70.60.04) Check the WSS ring for</p>

	mechanical fault	<ul style="list-style-type: none"> sensor and ring Incorrect ring (number of teeth) 	damage/contamination. Check the suspension for excessive play. Check the WSS ring for correct specification.
C003907	Right hand rear wheel speed sensor (WSS) ring	<ul style="list-style-type: none"> Contamination or debris on the WSS ring WSS ring distorted Excessive vibration 	Check the WSS ring for damage/contamination. Check the suspension for excessive play which could cause vibration.
C003A01	Right hand rear wheel speed sensor (WSS) - signal current out of range	<ul style="list-style-type: none"> WSS signal circuit: short circuit to ground WSS signal circuit: short circuit to power WSS signal circuit: high resistance 	For right hand rear WSS tests, GO to Pinpoint Test G531322p7 .
C003A07	Right hand rear wheel speed sensor (WSS) - mechanical fault	<ul style="list-style-type: none"> WSS faulty/incorrectly installed WSS or ring missing/damaged Excessive gap between sensor and ring Incorrect ring (number of teeth) 	Check the condition and fitment of the WSS. Rear Wheel Speed Sensor (70.60.04) Check the WSS ring for damage/contamination. Check the suspension for excessive play. Check the WSS ring for correct specification.
C004064	Brake pedal switch	<ul style="list-style-type: none"> Brake pedal switch circuit: short circuit to ground Brake pedal switch circuit: short circuit to power Brake pedal switch circuit: high resistance Brake pedal switch failure 	For brake switch circuit tests, GO to Pinpoint Test G531322p2 .
C004401	Brake pressure sensor A	<ul style="list-style-type: none"> Sensor failure The sensor is internal to the control module 	Refer to the warranty policy and procedures manual if a module is suspect.
C004428	Brake pressure sensor	<ul style="list-style-type: none"> Sensor failure The sensor is internal to the control module 	Refer to the warranty policy and procedures manual if a module is suspect.
C004464	Brake pressure	<ul style="list-style-type: none"> Sensor failure The sensor is internal to the control 	Refer to the warranty policy and

	sensor	module	procedures manual if a module is suspect.
C00447A	Brake pressure sensor - cross check failure	<ul style="list-style-type: none"> Internal hydraulic leak/seal failure 	Refer to the warranty policy and procedures manual if a module is suspect.
C004701	Booster pressure sensor	<ul style="list-style-type: none"> Booster pressure sensor circuit: short circuit to ground Booster pressure sensor circuit: short circuit to power Booster pressure sensor circuit: high resistance Booster pressure sensor failure 	For booster pressure sensor tests, GO to Pinpoint Test G531322p8 .
C004728	Booster pressure sensor	<ul style="list-style-type: none"> Booster pressure sensor circuit: short circuit to ground Booster pressure sensor circuit: short circuit to power Booster pressure sensor circuit: high resistance Booster pressure sensor failure 	For booster pressure sensor tests, GO to Pinpoint Test G531322p8 .
C004762	Booster pressure sensor	<ul style="list-style-type: none"> Brake hydraulic circuit failure Booster pressure sensor failure 	Check the brake hydraulic circuits. Check the master cylinder, etc. Brake System
C004764	Booster pressure sensor	<ul style="list-style-type: none"> Booster pressure sensor circuit: short circuit to ground Booster pressure sensor circuit: short circuit to power Booster pressure sensor circuit: high resistance Booster pressure sensor failure 	For booster pressure sensor tests, GO to Pinpoint Test G531322p8 .
C005101	Steering wheel rotation sensor	<ul style="list-style-type: none"> Sensor power circuit fault Sensor ground circuit fault Sensor signal circuit fault 	For steering wheel rotation sensor tests, GO to Pinpoint Test G531322p9 .

		<ul style="list-style-type: none"> Steering wheel rotation sensor fault 	
C005102	Steering wheel rotation sensor	<ul style="list-style-type: none"> Sensor power circuit fault Sensor ground circuit fault Sensor signal circuit fault Sensor loose/incorrectly installed Encoder wheel misaligned or faulty Steering wheel rotation sensor fault 	<p>Check the sensor and encoder wheel for correct fitment/alignment.</p> <p>Steering Wheel Rotation Sensor (86.56.58) For steering wheel rotation sensor tests, GO to Pinpoint Test G531322p9.</p>
C005128	Steering wheel rotation sensor - offset monitoring	<ul style="list-style-type: none"> Sensor loose/incorrectly installed Vehicle track incorrectly adjusted 	<p>Check the sensor and encoder wheel for correct fitment/alignment.</p> <p>Steering Wheel Rotation Sensor (86.56.58) Check the steering and suspension for damage/wear which would affect the track.</p>
C005167	Steering wheel rotation sensor	<ul style="list-style-type: none"> Center position not learnt/lost Implausible signals from other sensors (yaw rate, lateral acceleration, wheel speed sensors) 	<p>Cycle the ignition off and on, drive the vehicle in a straight line for three seconds at a speed higher than 50 Km/h (31 Mph) to learn the center position. Check the sensors listed for correct fitment/damage. Check for DTCs indicating a sensor fault.</p>
C005192	Steering wheel rotation sensor	<ul style="list-style-type: none"> Sensor apertures blocked Encoder wheel misaligned or faulty Sensor fault 	<p>Check the sensor and encoder wheel for correct fitment/alignment and condition.</p> <p>Steering Wheel Rotation Sensor (86.56.58)</p>
C005195	Steering wheel rotation sensor	<ul style="list-style-type: none"> Sensor incorrectly assembled Circuit incorrectly connected 	<p>For steering wheel rotation sensor tests, GO to Pinpoint Test G531322p9.</p>
C005196	Steering wheel rotation sensor	<ul style="list-style-type: none"> Sensor circuit(s): short circuit to each other Sensor fault 	<p>For steering wheel rotation sensor tests, GO to Pinpoint Test G531322p9.</p>
C006101	Yaw rate sensor and	<ul style="list-style-type: none"> Sensor fault 	<p>Install a new sensor.</p> <p>Yaw Rate Sensor and Accelerometer</p>

	accelerometer		(86.56.64)
C006128	Yaw rate sensor and accelerometer	<ul style="list-style-type: none"> • Sensor incorrectly calibrated • Sensor fault 	Carry out the yaw rate sensor reset special application using the Jaguar approved diagnostic system. Clear the DTC and drive the vehicle to a speed greater than 20 kmh (12.5 mph) for more than 3 seconds to confirm the fix.
C006164	Yaw rate sensor and accelerometer	<ul style="list-style-type: none"> • Sensor loose/incorrectly installed • Sensor ground circuit: high resistance • Sensor fault 	Check the sensor for correct installation. Yaw Rate Sensor and Accelerometer (86.56.64) For yaw rate sensor and accelerometer tests, GO to Pinpoint Test G531322p10 .
C006301	Yaw rate sensor and accelerometer	<ul style="list-style-type: none"> • Sensor fault 	Install a new sensor. Yaw Rate Sensor and Accelerometer (86.56.64)
C006328	Yaw rate sensor and accelerometer	<ul style="list-style-type: none"> • Sensor incorrectly calibrated • Sensor fault 	Carry out the yaw rate sensor reset special application using the Jaguar approved diagnostic system. Clear the DTC and drive the vehicle to a speed greater than 20 kmh (12.5 mph) for more than 3 seconds to confirm the fix.
C006364	Yaw rate sensor and accelerometer	<ul style="list-style-type: none"> • Sensor loose/incorrectly installed • Sensor ground circuit: high resistance • Sensor fault 	Check the sensor for correct installation. Yaw Rate Sensor and Accelerometer (86.56.64) For yaw rate sensor and accelerometer tests, GO to Pinpoint Test G531322p10 .
C006A01	Yaw rate sensor and accelerometer	<ul style="list-style-type: none"> • Sensor supply circuit: high resistance • Sensor fault 	For yaw rate sensor and accelerometer tests, GO to Pinpoint Test G531322p10 .
C006A04	Yaw rate sensor and accelerometer	<ul style="list-style-type: none"> • Sensor supply circuit: short circuit to power • Sensor supply circuit: short circuit to ground • Sensor supply circuit: high resistance 	For yaw rate sensor and accelerometer tests, GO to Pinpoint Test G531322p10 .

		<ul style="list-style-type: none"> • Sensor failure 	
C006A16	Yaw rate sensor and accelerometer - low voltage detected	<ul style="list-style-type: none"> • Sensor supply circuit: short circuit to power • Sensor supply circuit: short circuit to ground • Sensor supply circuit: high resistance • Sensor failure 	For yaw rate sensor and accelerometer tests, GO to Pinpoint Test G531322p10 .
C006A17	Yaw rate sensor and accelerometer - high voltage detected	<ul style="list-style-type: none"> • Sensor supply circuit: short circuit to power • Sensor failure 	For yaw rate sensor and accelerometer tests, GO to Pinpoint Test G531322p10 .
C006A47	Yaw rate sensor and accelerometer	<ul style="list-style-type: none"> • Watchdog/Safety failure 	Install a new sensor. Yaw Rate Sensor and Accelerometer (86.56.64)
C006A95	Yaw rate sensor and accelerometer	<ul style="list-style-type: none"> • Incorrect part fitted 	Install a new sensor. Yaw Rate Sensor and Accelerometer (86.56.64)
C006B00	Yaw rate sensor and accelerometer	<ul style="list-style-type: none"> • Sensor failure 	Install a new sensor. Yaw Rate Sensor and Accelerometer (86.56.64)
C008247	Hydraulic control module fault	<ul style="list-style-type: none"> • Internal HCU failure 	Refer to the warranty policy and procedures manual if a module is suspect.
C008248	Hydraulic control module fault	<ul style="list-style-type: none"> • Internal HCU failure 	Refer to the warranty policy and procedures manual if a module is suspect.
C008249	Hydraulic control module fault	<ul style="list-style-type: none"> • Internal HCU failure 	Refer to the warranty policy and procedures manual if a module is suspect.
C008254	Yaw rate sensor and accelerometer	<ul style="list-style-type: none"> • Calibration failure 	Carry out the yaw rate sensor reset special application using the Jaguar approved diagnostic system. Clear the DTC and retest.

C110801	Internal pressure sensor fault	<ul style="list-style-type: none"> Internal HCU failure 	Refer to the warranty policy and procedures manual if a module is suspect.
C110964	Traction control switch (TCS) error	<ul style="list-style-type: none"> J-Gate module error 	Check for transmission DTCs.
C113301	Internal pressure sensor fault	<ul style="list-style-type: none"> Internal HCU failure 	Refer to the warranty policy and procedures manual if a module is suspect.
C113328	Left hand front brake pressure sensor	<ul style="list-style-type: none"> Internal HCU failure 	Refer to the warranty policy and procedures manual if a module is suspect.
C113364	Left hand front brake pressure sensor	<ul style="list-style-type: none"> Internal HCU failure 	Refer to the warranty policy and procedures manual if a module is suspect.
C113401	Right hand front brake pressure sensor	<ul style="list-style-type: none"> Internal HCU failure 	Refer to the warranty policy and procedures manual if a module is suspect.
C113428	Right hand front brake pressure sensor	<ul style="list-style-type: none"> Internal HCU failure 	Refer to the warranty policy and procedures manual if a module is suspect.
C113464	Right hand front brake pressure sensor	<ul style="list-style-type: none"> Internal HCU failure 	Refer to the warranty policy and procedures manual if a module is suspect.
B10DF46	Master cylinder isolation valve	<ul style="list-style-type: none"> Valve not calibrated Internal HCU fault 	The valve values cannot be calibrated in service. Refer to the warranty policy and procedures manual if a module is suspect.
U000100	CAN communication bus	<ul style="list-style-type: none"> Isolated CAN communication error CAN circuit fault Internal HCU failure 	Clear the DTCs, retest. If CAN fault codes reset,
U000168	CAN communication software error	<ul style="list-style-type: none"> Isolated CAN communication error Internal HCU failure 	Clear the DTCs, retest. If CAN fault codes reset,

U010000	Lost communication with ECM	<ul style="list-style-type: none"> Isolated CAN communication error CAN circuit fault 	Clear the DTCs, retest. If CAN fault codes reset,
U010400	Lost communication with speed control module	<ul style="list-style-type: none"> Isolated CAN communication error CAN circuit fault 	Clear the DTCs, retest. If CAN fault codes reset,
U012500	Lost communication with yaw rate sensor and accelerometer	<ul style="list-style-type: none"> Isolated CAN communication error Local CAN circuit fault Sensor failure 	Clear the DTCs, retest. If CAN fault codes reset,
U012588	Lost communication with yaw rate sensor and accelerometer	<ul style="list-style-type: none"> Isolated CAN communication error Local CAN circuit fault Sensor failure 	Clear the DTCs, retest. If CAN fault codes reset,
U01550	Lost communication with instrument pack module	<ul style="list-style-type: none"> Isolated CAN communication error CAN circuit fault 	Clear the DTCs, retest. If CAN fault codes reset,
U030000	Control module software incompatibility	<ul style="list-style-type: none"> Configuration data not received from EMS Configuration data received is not compatible with the DSC module 	Confirm that the configuration data for the EMS is correct. Confirm that the correct DSC module is installed.
U030005	Control module software error	<ul style="list-style-type: none"> Internal HCU software error 	Refer to the warranty policy and procedures manual if a module is suspect.
U030055	Stored vehicle configuration data does not match	<ul style="list-style-type: none"> Configuration data received is different from the previous key cycle Control module swapped from another vehicle 	Confirm the vehicle configuration. Reconfigure the module using the Jaguar approved diagnostic system
U030087	Received vehicle configuration data	<ul style="list-style-type: none"> Configuration data received is different from the modules seen on the 	Confirm the vehicle configuration. Reconfigure the module using the

	does not match	<ul style="list-style-type: none"> network Control module swapped from another vehicle 	Jaguar approved diagnostic system
U040164	Invalid data received from the ECM	<ul style="list-style-type: none"> Invalid data 	<p>Check for engine management DTCs.</p> <p>Electronic Engine Controls - VIN Range: G45704->G99999 or Electronic Engine Controls - VIN Range: G45704->G99999</p>
U040192	Torque request denied by the ECM	<ul style="list-style-type: none"> Engine management fault detected 	<p>Check for engine management DTCs.</p> <p>Electronic Engine Controls - VIN Range: G45704->G99999 or Electronic Engine Controls - VIN Range: G45704->G99999</p>
U040200	TCM messages not received in the specified time	<ul style="list-style-type: none"> Isolated CAN communication error CAN circuit fault 	Clear the DTCs, retest. If CAN fault codes reset,
U040264	Invalid data received from the TCM	<ul style="list-style-type: none"> Invalid data received from the TCM 	Check for transmission DTCs.
U040592	Fault declared by the speed control module	<ul style="list-style-type: none"> ACC fault detected by the speed control module 	<p>Check for speed control DTCs.</p> <p>Speed Control - VIN Range: G45704->G99999</p>
U042300	Missing reverse gear signal	<ul style="list-style-type: none"> Isolated CAN communication error CAN circuit fault 	Clear the DTCs, retest. If CAN fault codes reset,
U210868	Speed control vehicle deceleration implausible	<ul style="list-style-type: none"> Braking requested by speed control exceeds allowed threshold 	<p>Check for speed control DTCs.</p> <p>Speed Control - VIN Range: G45704->G99999</p>
U300316	Battery voltage low	<ul style="list-style-type: none"> HCU supply circuit fault(s) Internal HCU failure 	For module supply and ground tests, GO to Pinpoint Test G531322p3 .
U300317	Battery voltage	<ul style="list-style-type: none"> HCU supply circuit fault(s) 	For module supply and ground tests,

	high	<ul style="list-style-type: none"> Charging system fault(s) 	GO to Pinpoint Test G531322p3 .
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Pinpoint tests

PINPOINT TEST G531322p1 : BRAKE VACUUM ASSIST FUNCTION

G531322t1 : CHECK THE BRAKE PEDAL TRAVEL WITH THE ENGINE OFF

1. Key off. 2. Pump the brake pedal six times and hold firm pressure on the pedal.

- Did the pedal travel decrease and the pedal go hard as it was pumped?

-> Yes

GO to Pinpoint Test [G531322t2](#).

-> No

CHECK the vacuum circuit to the brake booster. Start the engine and idle for three minutes, switch off then repeat the test. If the pedal travel does not decrease, suspect the brake booster.

G531322t2 : CHECK THE BRAKE PEDAL TRAVEL WITH THE ENGINE RUNNING

1. With firm pressure still held on the brake pedal, start the engine.

- Did the pedal travel increase as the engine started?

-> Yes

The vacuum function of the brake booster is operating normally. Check for DTCs indicating a fault elsewhere in the system.

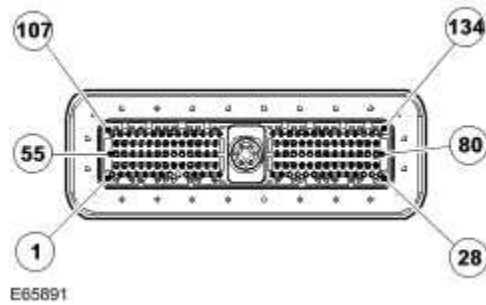
-> No

CHECK the vacuum circuit to the brake booster.

PINPOINT TEST G531322p2 : BRAKE SWITCH

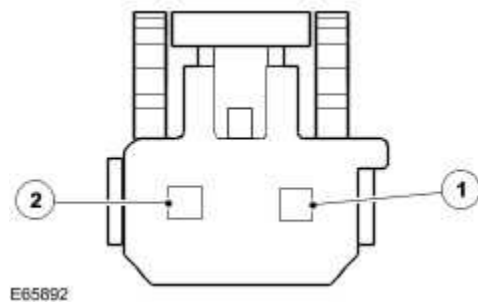
G531322t3 : CHECK THE OPERATION OF THE BRAKE SWITCH (PEDAL RELEASED)

1.



Circuit	Pin
Brake light switch	41

2.



Circuit	Pin
Power supply	01
Signal	02

3. Key off. 4. Disconnect the brake switch electrical connector, CR078. 5. Make sure the brake pedal is not pressed. 6. Measure the resistance between:

Brake switch connector CR078, component side	Brake switch connector CR078, component side
Pin 01	Pin 02

- Is the resistance greater than 10 ohms?

-> Yes

GO to Pinpoint Test [G531322t4](#).

-> **No**

INSTALL a new brake switch. CLEAR the DTC, test the system for normal operation.

G531322t4 : CHECK THE OPERATION OF THE BRAKE SWITCH (PEDAL PRESSED)

1. Press the brake pedal. 2. Measure the resistance between:

Brake switch connector CR078, component side	Brake switch connector CR078, component side
Pin 01	Pin 02

- **Is the resistance greater than 10 ohms?**

-> **Yes**

INSTALL a new brake switch. CLEAR the DTC, test the system for normal operation.

-> **No**

GO to Pinpoint Test [G531322t5](#).

G531322t5 : CHECK THE POWER SUPPLY TO THE BRAKE PEDAL SWITCH

1. Key on, engine off. 2. Measure the voltage between:

Brake switch connector CR078, harness side	Battery
Pin 01	Negative terminal

- **Is the voltage less than 10 volts?**

-> **Yes**

REPAIR the circuit between the brake switch and battery. This circuit includes fuse 35 of the primary junction box. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation.

-> **No**

GO to Pinpoint Test [G531322t6](#).

G531322t6 : CHECK THE BRAKE SWITCH SIGNAL CIRCUIT FOR SHORT CIRCUIT TO GROUND

1. Key off. 2. Measure the resistance between:

Brake switch connector CR078, harness side	Battery
Pin 02	Negative terminal

- Is the resistance less than 100 Kohms?

-> Yes

REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation.

-> No

GO to Pinpoint Test [G531322t7](#).

G531322t7 : CHECK THE BRAKE SWITCH SIGNAL CIRCUIT FOR SHORT CIRCUIT TO POWER

1. Measure the resistance between:

Brake switch connector CR078, harness side	Battery
Pin 02	Positive terminal

- Is the resistance less than 100 Kohms?

-> Yes

REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation.

-> No

GO to Pinpoint Test [G531322t8](#).

G531322t8 : CHECK THE BRAKE SWITCH SIGNAL CIRCUIT FOR HIGH RESISTANCE

1. Disconnect the ECM electrical connector, EC300. 2. Measure the resistance between:

Brake switch connector CR078, harness side	ECM connector EC300, harness side
--	-----------------------------------

Pin 02	Pin 41
--------	--------

- Is the resistance less than 10 ohms?

-> Yes

CHECK for CAN DTCs indicating a network fault.

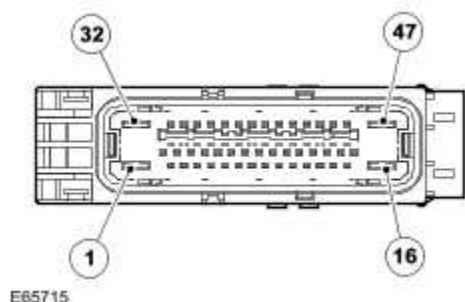
-> No

REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC. TEST the system for normal operation.

PINPOINT TEST G531322p3 : MODULE SUPPLIES AND GROUNDS

G531322t9 : CHECK THE MODULE PUMP SUPPLY

1.



Circuit	Pin
Pump supply	01
Valves supply	32
Batt supply	02
Ignition supply	08
Pump ground	47
Valve ground	16

2. Key off. 3. Disconnect the ABS module connector, EC030. 4. Measure the voltage between:

EC030, harness side	Battery
Pump supply, pin 01	Negative terminal

- **Is the voltage between 9 and 15 volts?**

-> **Yes**

GO to Pinpoint Test [G531322t10](#).

-> **No**

REPAIR the supply circuit as necessary. This circuit includes fuse 20 of the front power distribution box. For additional information, refer to the wiring diagrams. Clear the DTC, test the system for normal operation.

G531322t10 : CHECK THE MODULE VALVES SUPPLY

1. Measure the voltage between:

EC030, harness side	Battery
Valves supply, pin 32	Negative terminal

- **Is the voltage between 9 and 15 volts?**

-> **Yes**

GO to Pinpoint Test [G531322t11](#).

-> **No**

REPAIR the supply circuit as necessary. This circuit includes fuse 04 of the front power distribution box. For additional information, refer to the wiring diagrams. Clear the DTC, test the system for normal operation.

G531322t11 : CHECK THE MODULE BATT SUPPLY

1. Measure the voltage between:

EC030, harness side	Battery
Batt supply, pin 02	Negative terminal

- Is the voltage between 9 and 15 volts?

-> Yes

GO to Pinpoint Test [G531322t12](#).

-> No

REPAIR the supply circuit as necessary. This circuit includes fuse 01 of the front power distribution box. For additional information, refer to the wiring diagrams. Clear the DTC, test the system for normal operation.

G531322t12 : CHECK THE MODULE IGNITION SUPPLY

1. Key on, engine off. 2. Measure the voltage between:

EC030, harness side	Battery
Ignition supply, pin 08	Negative terminal

- Is the voltage between 9 and 15 volts?

-> Yes

GO to Pinpoint Test [G531322t13](#).

-> No

REPAIR the supply circuit as necessary. This circuit includes fuse 03 of the primary junction box. For additional information, refer to the wiring diagrams. Clear the DTC, test the system for normal operation.

G531322t13 : CHECK THE PUMP GROUND

1. Key off. 2. Measure the resistance between:

EC030, harness side	Battery
Pump ground, pin 47	Negative terminal

- Is the resistance less than 10 ohms?

-> Yes

GO to Pinpoint Test [G531322t14](#).

-> No

REPAIR the ground circuit as necessary. For additional information, refer to the wiring diagrams.
Clear the DTC, test the system for normal operation.

G531322t14 : CHECK THE VALVE GROUND

1. Measure the resistance between:

EC030, harness side	Battery
Valve ground, pin 16	Negative terminal

- Is the resistance less than 10 ohms?

-> Yes

Refer to the warranty policy and procedures manual if a module is suspect.

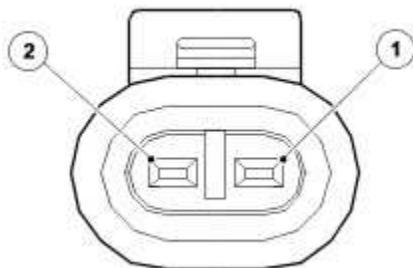
-> No

REPAIR the ground circuit as necessary. For additional information, refer to the wiring diagrams.
Clear the DTC, test the system for normal operation.

PINPOINT TEST G531322p4 : LEFT HAND FRONT WHEEL SPEED SENSOR (WSS)

G531322t15 : CHECK THE WSS RETURN CIRCUIT FOR SHORT CIRCUIT TO GROUND

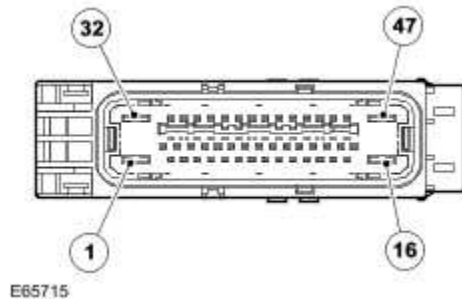
1.



E65719

Circuit	Pin
WSS signal	01
WSS return	02

2.



Circuit	Pin
Left hand front WSS signal	46
Left hand front WSS return	45

3. Key off. 4. Disconnect the WSS connector, EC044. 5. Disconnect the ABS module connector, EC030. 6. Key on, engine off. 7. Measure the resistance between:

EC044, harness side	Battery
Pin 02	Negative terminal

- Is the resistance greater than 100 Kohms?

-> Yes

GO to Pinpoint Test [G531322t16](#).

-> No

REPAIR the short circuit. For additional information, refer to the wiring diagrams. Clear the DTC, test the system for normal operation by driving the vehicle at more than 20 kph (12.5 mph) for more than 3 minutes.

G531322t16 : CHECK THE WSS RETURN CIRCUIT FOR SHORT CIRCUIT TO POWER

1. Measure the resistance between:

EC044, harness side	Battery
Pin 02	Positive terminal

- Is the resistance greater than 100 Kohms?

-> Yes

GO to Pinpoint Test [G531322t17](#).

-> No

REPAIR the short circuit. For additional information, refer to the wiring diagrams. Clear the DTC, test the system for normal operation by driving the vehicle at more than 20 kph (12.5 mph) for more than 3 minutes.

G531322t17 : CHECK THE WSS RETURN CIRCUIT FOR HIGH RESISTANCE

1. Measure the resistance between:

EC044, harness side	EC030, harness side
Pin 02	Pin 45

- Is the resistance less than 10 ohms?

-> Yes

GO to Pinpoint Test [G531322t18](#).

-> No

REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. Clear the DTC, test the system for normal operation by driving the vehicle at more than 20 kph (12.5 mph) for more than 3 minutes.

G531322t18 : CHECK THE WSS SIGNAL CIRCUIT FOR SHORT CIRCUIT TO POWER

1. Measure the resistance between:

EC044, harness side	Battery
Pin 01	Positive terminal

- Is the resistance greater than 100 Kohms?

-> Yes

GO to Pinpoint Test [G531322t19](#).

-> **No**

REPAIR the short circuit. For additional information, refer to the wiring diagrams. Clear the DTC, test the system for normal operation by driving the vehicle at more than 20 kph (12.5 mph) for more than 3 minutes.

G531322t19 : CHECK THE WSS SIGNAL CIRCUIT FOR SHORT CIRCUIT TO GROUND

1. Measure the resistance between:

EC044, harness side	Battery
Pin 01	Negative terminal

- **Is the resistance greater than 100 Kohms?**

-> **Yes**

GO to Pinpoint Test [G531322t20](#).

-> **No**

REPAIR the short circuit. For additional information, refer to the wiring diagrams. Clear the DTC, test the system for normal operation by driving the vehicle at more than 20 kph (12.5 mph) for more than 3 minutes.

G531322t20 : CHECK THE WSS SIGNAL CIRCUIT FOR HIGH RESISTANCE

1. Measure the resistance between:

EC044, harness side	EC030, harness side
Pin 01	Pin 46

- **Is the resistance less than 10 ohms?**

-> **Yes**

GO to Pinpoint Test [G531322t21](#).

-> **No**

REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. Clear the DTC, test the system for normal operation by driving the vehicle at more than 20 kph (12.5 mph) for more than 3 minutes.

G531322t21 : CHECK THE WSS SIGNAL AND RETURN CIRCUITS FOR SHORT CIRCUIT TO EACH OTHER

1. Measure the resistance between:

EC044, harness side	EC044, harness side
Pin 01	Pin 02

- Is the resistance greater than 100 Kohms?

-> Yes

An intermittent fault may be present in the wiring harness. Visually check for chaffed wires or other physical damage to the harness. If no fault is found in the harness, suspect the following components: - WSS connector - WSS - ABS module connector - ABS module

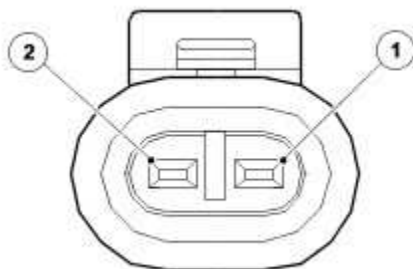
-> No

REPAIR the short circuit. For additional information, refer to the wiring diagrams. Clear the DTC, test the system for normal operation by driving the vehicle at more than 20 kph (12.5 mph) for more than 3 minutes.

PINPOINT TEST G531322p5 : RIGHT HAND FRONT WHEEL SPEED SENSOR (WSS)

G531322t22 : CHECK THE WSS RETURN CIRCUIT FOR SHORT CIRCUIT TO GROUND

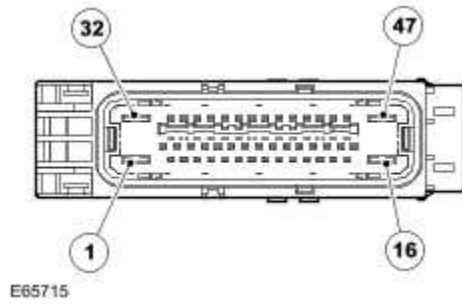
1.



E65719

Circuit	Pin
WSS signal	01
WSS return	02

2.



Circuit	Pin
Right hand front WSS signal	33
Right hand front WSS return	34

3. Key off. 4. Disconnect the WSS connector, EC015. 5. Disconnect the ABS module connector, EC030. 6. Key on, engine off. 7. Measure the resistance between:

EC015, harness side	Battery
Pin 02	Negative terminal

- Is the resistance greater than 100 Kohms?

-> Yes

GO to Pinpoint Test [G531322t88](#).

-> No

REPAIR the short circuit. For additional information, refer to the wiring diagrams. Clear the DTC, test the system for normal operation by driving the vehicle at more than 20 kph (12.5 mph) for more than 3 minutes.

G531322t88 : CHECK THE WSS RETURN CIRCUIT FOR SHORT CIRCUIT TO POWER

1. Measure the resistance between:

EC015, harness side	Battery
Pin 02	Positive terminal

- Is the resistance greater than 100 Kohms?

-> Yes

GO to Pinpoint Test [G531322t89](#).

-> No

REPAIR the short circuit. For additional information, refer to the wiring diagrams. Clear the DTC, test the system for normal operation by driving the vehicle at more than 20 kph (12.5 mph) for more than 3 minutes.

G531322t89 : CHECK THE WSS RETURN CIRCUIT FOR HIGH RESISTANCE

1. Measure the resistance between:

EC015, harness side	EC030, harness side
Pin 02	Pin 34

- Is the resistance less than 10 ohms?

-> Yes

GO to Pinpoint Test [G531322t90](#).

-> No

REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. Clear the DTC, test the system for normal operation by driving the vehicle at more than 20 kph (12.5 mph) for more than 3 minutes.

G531322t90 : CHECK THE WSS SIGNAL CIRCUIT FOR SHORT CIRCUIT TO POWER

1. Measure the resistance between:

EC015, harness side	Battery
Pin 01	Positive terminal

- Is the resistance greater than 100 Kohms?

-> Yes

GO to Pinpoint Test [G531322t91](#).

-> **No**

REPAIR the short circuit. For additional information, refer to the wiring diagrams. Clear the DTC, test the system for normal operation by driving the vehicle at more than 20 kph (12.5 mph) for more than 3 minutes.

G531322t91 : CHECK THE WSS SIGNAL CIRCUIT FOR SHORT CIRCUIT TO GROUND

1. Measure the resistance between:

EC015, harness side	Battery
Pin 01	Negative terminal

- **Is the resistance greater than 100 Kohms?**

-> **Yes**

GO to Pinpoint Test [G531322t92](#).

-> **No**

REPAIR the short circuit. For additional information, refer to the wiring diagrams. Clear the DTC, test the system for normal operation by driving the vehicle at more than 20 kph (12.5 mph) for more than 3 minutes.

G531322t92 : CHECK THE WSS SIGNAL CIRCUIT FOR HIGH RESISTANCE

1. Measure the resistance between:

EC015, harness side	EC030, harness side
Pin 01	Pin 33

- **Is the resistance less than 10 ohms?**

-> **Yes**

GO to Pinpoint Test [G531322t93](#).

-> **No**

REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. Clear the DTC, test the system for normal operation by driving the vehicle at more than 20 kph (12.5 mph) for more than 3 minutes.

G531322t93 : CHECK THE WSS SIGNAL AND RETURN CIRCUITS FOR SHORT CIRCUIT TO EACH OTHER

1. Measure the resistance between:

EC015, harness side	EC015, harness side
Pin 01	Pin 02

- Is the resistance greater than 100 Kohms?

-> Yes

An intermittent fault may be present in the wiring harness. Visually check for chaffed wires or other physical damage to the harness. If no fault is found in the harness, suspect the following components: - WSS connector - WSS - ABS module connector - ABS module

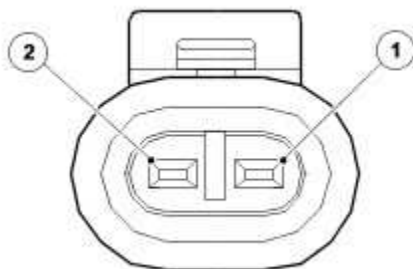
-> No

REPAIR the short circuit. For additional information, refer to the wiring diagrams. Clear the DTC, test the system for normal operation by driving the vehicle at more than 20 kph (12.5 mph) for more than 3 minutes.

PINPOINT TEST G531322p6 : LEFT HAND REAR WHEEL SPEED SENSOR (WSS)

G531322t23 : CHECK THE WSS RETURN CIRCUIT FOR SHORT CIRCUIT TO GROUND

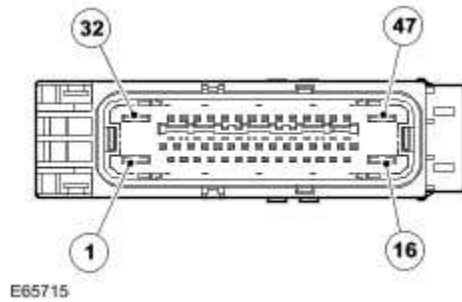
1.



E65719

Circuit	Pin
WSS return	01
WSS signal	02

2.



Circuit	Pin
Left hand rear WSS signal	36
Left hand rear WSS return	37

3. Key off. 4. Disconnect the WSS connector, CV006. 5. Disconnect the ABS module connector, EC030. 6. Key on, engine off. 7. Measure the resistance between:

CV006, harness side	Battery
Pin 01	Negative terminal

- Is the resistance greater than 100 Kohms?

-> Yes

GO to Pinpoint Test [G531322t94](#).

-> No

REPAIR the short circuit. For additional information, refer to the wiring diagrams. Clear the DTC, test the system for normal operation by driving the vehicle at more than 20 kph (12.5 mph) for more than 3 minutes.

G531322t94 : CHECK THE WSS RETURN CIRCUIT FOR SHORT CIRCUIT TO POWER

1. Measure the resistance between:

CV006, harness side	Battery
Pin 01	Positive terminal

- Is the resistance greater than 100 Kohms?

-> Yes

GO to Pinpoint Test [G531322t95](#).

-> No

REPAIR the short circuit. For additional information, refer to the wiring diagrams. Clear the DTC, test the system for normal operation by driving the vehicle at more than 20 kph (12.5 mph) for more than 3 minutes.

G531322t95 : CHECK THE WSS RETURN CIRCUIT FOR HIGH RESISTANCE

1. Measure the resistance between:

CV006, harness side	EC030, harness side
Pin 01	Pin 37

- Is the resistance less than 10 ohms?

-> Yes

GO to Pinpoint Test [G531322t96](#).

-> No

REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. Clear the DTC, test the system for normal operation by driving the vehicle at more than 20 kph (12.5 mph) for more than 3 minutes.

G531322t96 : CHECK THE WSS SIGNAL CIRCUIT FOR SHORT CIRCUIT TO POWER

1. Measure the resistance between:

CV006, harness side	Battery
Pin 02	Positive terminal

- Is the resistance greater than 100 Kohms?

-> Yes

GO to Pinpoint Test [G531322t97](#).

-> **No**

REPAIR the short circuit. For additional information, refer to the wiring diagrams. Clear the DTC, test the system for normal operation by driving the vehicle at more than 20 kph (12.5 mph) for more than 3 minutes.

G531322t97 : CHECK THE WSS SIGNAL CIRCUIT FOR SHORT CIRCUIT TO GROUND

1. Measure the resistance between:

CV006, harness side	Battery
Pin 02	Negative terminal

- **Is the resistance greater than 100 Kohms?**

-> **Yes**

GO to Pinpoint Test [G531322t98](#).

-> **No**

REPAIR the short circuit. For additional information, refer to the wiring diagrams. Clear the DTC, test the system for normal operation by driving the vehicle at more than 20 kph (12.5 mph) for more than 3 minutes.

G531322t98 : CHECK THE WSS SIGNAL CIRCUIT FOR HIGH RESISTANCE

1. Measure the resistance between:

CV006, harness side	EC030, harness side
Pin 02	Pin 36

- **Is the resistance less than 10 ohms?**

-> **Yes**

GO to Pinpoint Test [G531322t99](#).

-> **No**

REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. Clear the DTC, test the system for normal operation by driving the vehicle at more than 20 kph (12.5 mph) for more than 3 minutes.

G531322t99 : CHECK THE WSS SIGNAL AND RETURN CIRCUITS FOR SHORT CIRCUIT TO EACH OTHER

1. Measure the resistance between:

CV006, harness side	CV006, harness side
Pin 01	Pin 02

- Is the resistance greater than 100 Kohms?

-> Yes

An intermittent fault may be present in the wiring harness. Visually check for chaffed wires or other physical damage to the harness. If no fault is found in the harness, suspect the following components: - WSS connector - WSS - ABS module connector - ABS module

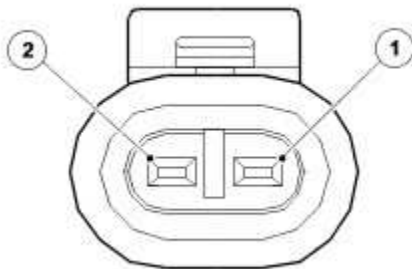
-> No

REPAIR the short circuit. For additional information, refer to the wiring diagrams. Clear the DTC, test the system for normal operation by driving the vehicle at more than 20 kph (12.5 mph) for more than 3 minutes.

PINPOINT TEST G531322p7 : RIGHT HAND REAR WHEEL SPEED SENSOR (WSS)

G531322t24 : CHECK THE WSS RETURN CIRCUIT FOR SHORT CIRCUIT TO GROUND

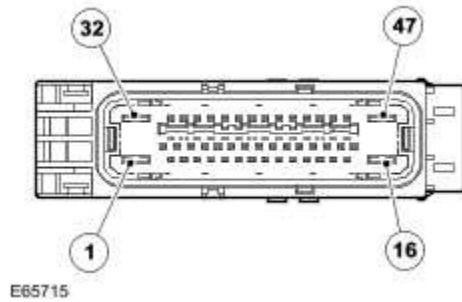
1.



E65719

Circuit	Pin
WSS return	01
WSS signal	02

2.



Circuit	Pin
Right hand rear WSS return	42
Right hand rear WSS signal	43

3. Key off. 4. Disconnect the WSS connector, CV008. 5. Disconnect the ABS module connector, EC030. 6. Key on engine off. 7. Measure the resistance between:

CV008, harness side	Battery
Pin 01	Negative terminal

- Is the resistance greater than 100 Kohms?

-> Yes

GO to Pinpoint Test [G531322t100](#).

-> No

REPAIR the short circuit. For additional information, refer to the wiring diagrams. Clear the DTC, test the system for normal operation by driving the vehicle at more than 20 kph (12.5 mph) for more than 3 minutes.

G531322t100 : CHECK THE WSS RETURN CIRCUIT FOR SHORT CIRCUIT TO POWER

1. Measure the resistance between:

CV008, harness side	Battery
Pin 01	Positive terminal

- Is the resistance greater than 100 Kohms?

-> Yes

GO to Pinpoint Test [G531322t101](#).

-> No

REPAIR the short circuit. For additional information, refer to the wiring diagrams. Clear the DTC, test the system for normal operation by driving the vehicle at more than 20 kph (12.5 mph) for more than 3 minutes.

G531322t101 : CHECK THE WSS RETURN CIRCUIT FOR HIGH RESISTANCE

1. Measure the resistance between:

CV008, harness side	EC030, harness side
Pin 01	Pin 42

- Is the resistance less than 10 ohms?

-> Yes

GO to Pinpoint Test [G531322t102](#).

-> No

REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. Clear the DTC, test the system for normal operation by driving the vehicle at more than 20 kph (12.5 mph) for more than 3 minutes.

G531322t102 : CHECK THE WSS SIGNAL CIRCUIT FOR SHORT CIRCUIT TO POWER

1. Measure the resistance between:

CV008, harness side	Battery
Pin 02	Positive terminal

- Is the resistance greater than 100 Kohms?

-> Yes

GO to Pinpoint Test [G531322t103](#).

-> **No**

REPAIR the short circuit. For additional information, refer to the wiring diagrams. Clear the DTC, test the system for normal operation by driving the vehicle at more than 20 kph (12.5 mph) for more than 3 minutes.

G531322t103 : CHECK THE WSS SIGNAL CIRCUIT FOR SHORT CIRCUIT TO GROUND

1. Measure the resistance between:

CV008, harness side	Battery
Pin 02	Negative terminal

- **Is the resistance greater than 100 Kohms?**

-> **Yes**

GO to Pinpoint Test [G531322t104](#).

-> **No**

REPAIR the short circuit. For additional information, refer to the wiring diagrams. Clear the DTC, test the system for normal operation by driving the vehicle at more than 20 kph (12.5 mph) for more than 3 minutes.

G531322t104 : CHECK THE WSS SIGNAL CIRCUIT FOR HIGH RESISTANCE

1. Measure the resistance between:

CV008, harness side	EC030, harness side
Pin 02	Pin 43

- **Is the resistance less than 10 ohms?**

-> **Yes**

GO to Pinpoint Test [G531322t105](#).

-> **No**

REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. Clear the DTC, test the system for normal operation by driving the vehicle at more than 20 kph (12.5 mph) for more than 3 minutes.

G531322t105 : CHECK THE WSS SIGNAL AND RETURN CIRCUITS FOR SHORT CIRCUIT TO EACH OTHER

1. Measure the resistance between:

CV008, harness side	CV008, harness side
Pin 01	Pin 02

- Is the resistance greater than 100 Kohms?

-> Yes

An intermittent fault may be present in the wiring harness. Visually check for chaffed wires or other physical damage to the harness. If no fault is found in the harness, suspect the following components: - WSS connector - WSS - ABS module connector - ABS module

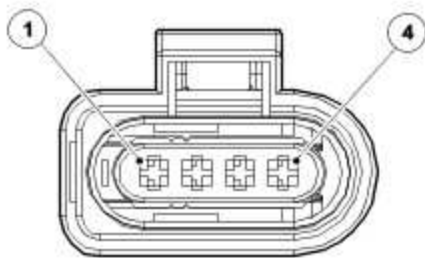
-> No

REPAIR the short circuit. For additional information, refer to the wiring diagrams. Clear the DTC, test the system for normal operation by driving the vehicle at more than 20 kph (12.5 mph) for more than 3 minutes.

PINPOINT TEST G531322p8 : BOOSTER PRESSURE SENSOR

G531322t25 : CHECK THE POWER SUPPLY TO THE BOOSTER PRESSURE SENSOR

1.

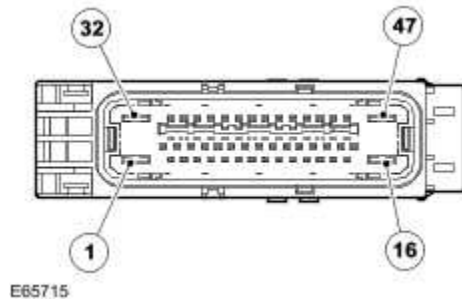


E65716

Circuit	Pin
Power supply	03
Signal A	04

Signal B	01
Ground	02

2.



Circuit	Pin
Power supply	26
Signal A	38
Signal B	30
Ground	27

3. Key off. 4. Disconnect the booster pressure sensor connector, EC095. 5. Key on, engine off. 6. Measure the voltage between:

EC095, harness side	Battery
Pin 03	Negative terminal

- Is the voltage greater than 4 volts?

-> Yes

GO to Pinpoint Test [G531322t28](#).

-> No

GO to Pinpoint Test [G531322t26](#).

G531322t26 : CHECK THE BOOSTER PRESSURE SENSOR POWER SUPPLY CIRCUIT FOR SHORT CIRCUIT TO GROUND

1. Measure the resistance between:

EC095, harness side	Battery
Pin 03	Negative terminal

- **Is the resistance greater than 10 Kohms?**

-> **Yes**

GO to Pinpoint Test [G531322t27](#).

-> **No**

REPAIR the short circuit. For additional information, refer to the wiring diagrams. Clear the DTC, test the system for normal operation by applying and releasing the brake pedal firmly three times with the engine running.

G531322t27 : CHECK THE BOOSTER PRESSURE SENSOR POWER SUPPLY CIRCUIT FOR HIGH RESISTANCE

1. Key off. 2. Disconnect the ABS module connector, EC030. 3. Measure the resistance between:

EC095, harness side	EC030, harness side
Pin 03	Pin 26

- **Is the resistance less than 10 ohms?**

-> **Yes**

An intermittent fault may be present in the wiring harness. Visually check for chaffed wires or other physical damage to the harness.

-> **No**

REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. Clear the DTC, test the system for normal operation by applying and releasing the brake pedal firmly three times with the engine running.

G531322t28 : CHECK THE GROUND CIRCUIT TO THE BOOSTER PRESSURE SENSOR

1. Measure the resistance between:

EC095, harness side	Battery
Pin 02	Negative terminal

- Is the resistance less than 10 ohms?

-> Yes

GO to Pinpoint Test [G531322t32](#).

-> No

GO to Pinpoint Test [G531322t29](#).

G531322t29 : CHECK THE BOOSTER PRESSURE SENSOR GROUND CIRCUIT FOR SHORT CIRCUIT TO POWER

1. Measure the resistance between:

EC095, harness side	Battery
Pin 02	Positive terminal

- Is the resistance greater than 10 Kohms?

-> Yes

GO to Pinpoint Test [G531322t31](#).

-> No

GO to Pinpoint Test [G531322t30](#).

G531322t30 : CHECK WHETHER THE SHORT CIRCUIT IS IN THE HARNESS OR THE MODULE

1. Key off. 2. Disconnect the ABS module connector, EC030. 3. Key on, engine off. 4. Measure the resistance between:

EC095, harness side	Battery
Pin 02	Positive terminal

- **Is the resistance greater than 10 Kohms?**

-> **Yes**

Refer to the warranty policy and procedures manual if a module is suspect.

-> **No**

REPAIR the short circuit. For additional information, refer to the wiring diagrams. Clear the DTC, test the system for normal operation by applying and releasing the brake pedal firmly three times with the engine running.

G531322t31 : CHECK THE BOOSTER PRESSURE SENSOR GROUND CIRCUIT FOR HIGH RESISTANCE

1. Key off. 2. Disconnect the ABS module connector, EC030. 3. Key on, engine off. 4. Measure the resistance between:

EC095, harness side	EC030, harness side
Pin 02	Pin 27

- **Is the resistance less than 10 ohms?**

-> **Yes**

An intermittent fault may be present in the wiring harness. Visually check for chaffed wires or other physical damage to the harness. If no fault is found in the harness, suspect the following components: - Booster pressure sensor connector - ABS module connector - ABS module

-> **No**

REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. Clear the DTC, test the system for normal operation by applying and releasing the brake pedal firmly three times with the engine running.

G531322t32 : CHECK THE BOOSTER PRESSURE SENSOR SIGNAL A CIRCUIT FOR SHORT CIRCUIT TO GROUND

1. Measure the resistance between:

EC095, harness side	Battery
Pin 04	Negative terminal

- **Is the resistance greater than 10 Kohms?**

-> **Yes**

GO to Pinpoint Test [G531322t34](#).

-> **No**

GO to Pinpoint Test [G531322t33](#).

G531322t33 : CHECK WHETHER THE SHORT CIRCUIT IS IN THE HARNESS OR THE MODULE

1. Key off. 2. Disconnect the ABS module connector, EC030. 3. Key on, engine off. 4. Measure the resistance between:

EC095, harness side	Battery
Pin 04	Negative terminal

- **Is the resistance greater than 10 Kohms?**

-> **Yes**

Refer to the warranty policy and procedures manual if a module is suspect.

-> **No**

REPAIR the short circuit. For additional information, refer to the wiring diagrams. Clear the DTC, test the system for normal operation by applying and releasing the brake pedal firmly three times with the engine running.

G531322t34 : CHECK THE BOOSTER PRESSURE SENSOR SIGNAL A CIRCUIT FOR SHORT CIRCUIT TO POWER

1. Measure the resistance between:

EC095, harness side	Battery
Pin 04	Positive terminal

- **Is the resistance greater than 10 Kohms?**

-> **Yes**

GO to Pinpoint Test [G531322t36](#).

-> **No**

GO to Pinpoint Test [G531322t35](#).

G531322t35 : CHECK WHETHER THE SHORT CIRCUIT IS IN THE HARNESS OR THE MODULE

1. Key off. 2. Disconnect the ABS module connector, EC030. 3. Key on, engine off. 4. Measure the resistance between:

EC095, harness side	Battery
Pin 04	Positive terminal

- **Is the resistance greater than 10 Kohms?**

-> **Yes**

Refer to the warranty policy and procedures manual if a module is suspect.

-> **No**

REPAIR the short circuit. For additional information, refer to the wiring diagrams. Clear the DTC, test the system for normal operation by applying and releasing the brake pedal firmly three times with the engine running.

G531322t36 : CHECK THE BOOSTER PRESSURE SENSOR SIGNAL B CIRCUIT FOR SHORT CIRCUIT TO GROUND

1. Measure the resistance between:

EC095, harness side	Battery
Pin 01	Negative terminal

- **Is the resistance greater than 10 Kohms?**

-> **Yes**

GO to Pinpoint Test [G531322t38](#).

-> **No**

GO to Pinpoint Test [G531322t37](#).

G531322t37 : CHECK WHETHER THE SHORT CIRCUIT IS IN THE HARNESS OR THE MODULE

1. Key off. 2. Disconnect the ABS module connector, EC030. 3. Key on, engine off. 4. Measure the resistance between:

EC095, harness side	Battery
Pin 01	Negative terminal

- **Is the resistance greater than 10 Kohms?**

-> **Yes**

Refer to the warranty policy and procedures manual if a module is suspect.

-> **No**

REPAIR the short circuit. For additional information, refer to the wiring diagrams. Clear the DTC, test the system for normal operation by applying and releasing the brake pedal firmly three times with the engine running.

G531322t38 : CHECK THE BOOSTER PRESSURE SENSOR SIGNAL B CIRCUIT FOR SHORT CIRCUIT TO POWER

1. Measure the resistance between:

EC095, harness side	Battery
Pin 01	Positive terminal

- **Is the resistance greater than 10 Kohms?**

-> **Yes**

GO to Pinpoint Test [G531322t40](#).

-> **No**

GO to Pinpoint Test [G531322t39](#).

G531322t39 : CHECK WHETHER THE SHORT CIRCUIT IS IN THE HARNESS OR THE MODULE

1. Key off. 2. Disconnect the ABS module connector, EC030. 3. Key on, engine off. 4. Measure the resistance between:

EC095, harness side	Battery
Pin 01	Positive terminal

- **Is the resistance greater than 10 Kohms?**

-> **Yes**

Refer to the warranty policy and procedures manual if a module is suspect.

-> **No**

REPAIR the short circuit. For additional information, refer to the wiring diagrams. Clear the DTC, test the system for normal operation by applying and releasing the brake pedal firmly three times with the engine running.

G531322t40 : CHECK THE BOOSTER PRESSURE SENSOR SIGNAL A CIRCUIT FOR HIGH RESISTANCE

1. Key off. 2. Disconnect the ABS module connector, EC030. 3. Key on, engine off. 4. Measure the resistance between:

EC095, harness side	EC030, harness side
Pin 04	Pin 38

- **Is the resistance less than 10 ohms?**

-> **Yes**

GO to Pinpoint Test [G531322t41](#).

-> **No**

REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. Clear the DTC, test the system for normal operation by applying and releasing the brake pedal firmly three times with the engine running.

G531322t41 : CHECK THE BOOSTER PRESSURE SENSOR SIGNAL B CIRCUIT FOR HIGH RESISTANCE

1. Measure the resistance between:

EC095, harness side	EC030, harness side
Pin 01	Pin 30

- Is the resistance less than 10 ohms?

-> Yes

GO to Pinpoint Test [G531322t42](#).

-> No

REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. Clear the DTC, test the system for normal operation by applying and releasing the brake pedal firmly three times with the engine running.

G531322t42 : CHECK THE BOOSTER PRESSURE SENSOR SIGNAL A AND B CIRCUITS FOR SHORT CIRCUIT TO EACH OTHER

1. Measure the resistance between:

EC095, harness side	EC095, harness side
Pin 01	Pin 04

- Is the resistance greater than 10 Kohms?

-> Yes

An intermittent fault may be present in the wiring harness. Visually check for chaffed wires or other physical damage to the harness.

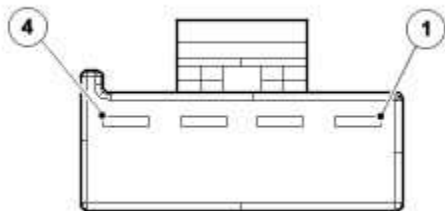
-> No

REPAIR the short circuit. For additional information, refer to the wiring diagrams. Clear the DTC, test the system for normal operation by applying and releasing the brake pedal firmly three times with the engine running.

PINPOINT TEST G531322p9 : STEERING WHEEL ROTATION SENSOR

G531322t43 : CHECK THE POWER SUPPLY TO THE STEERING WHEEL ROTATION SENSOR

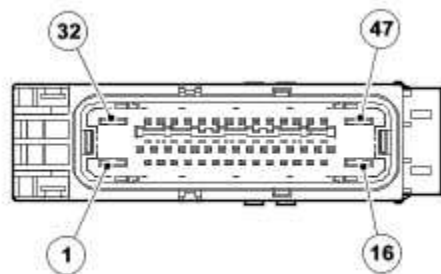
1.



E65720

Circuit	Pin
Sensor power	01
Signal B	02
Signal A	03
Sensor return	04

2.



E65715

Circuit	Pin
Sensor power	05
Signal B	09
Signal A	41
Sensor return	40

3. Key off. 4. Disconnect the steering wheel rotation sensor connector, IP037. 5. Key on, engine off. 6. Measure the voltage between:

IP037, harness side	Battery
01	Negative terminal

- **Is the voltage greater than 4 volts?**

-> **Yes**

GO to Pinpoint Test [G531322t46](#).

-> **No**

GO to Pinpoint Test [G531322t44](#).

G531322t44 : CHECK THE STEERING WHEEL ROTATION SENSOR POWER SUPPLY CIRCUIT FOR SHORT CIRCUIT TO GROUND

1. Measure the resistance between:

IP037, harness side	Battery
01	Positive terminal

- **Is the resistance greater than 10 Kohms?**

-> **Yes**

GO to Pinpoint Test [G531322t45](#).

-> **No**

REPAIR the short circuit. For additional information, refer to the wiring diagrams. Clear the DTC, test the system for normal operation by turning the steering from the center position to full right hand lock, to full left hand lock and back to the center position before road testing the vehicle on roads requiring steering input.

G531322t45 : CHECK THE STEERING WHEEL ROTATION SENSOR POWER SUPPLY CIRCUIT FOR HIGH RESISTANCE

1. Key off. 2. Disconnect the ABS module connector, EC030. 3. Measure the resistance between:

FH110, harness side	EC030, harness side
Pin 01	Pin 05

- Is the resistance less than 10 ohms?

-> **Yes**

An intermittent fault may be present in the wiring harness. Visually check for chaffed wires or other physical damage to the harness.

-> **No**

REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. Clear the DTC, test the system for normal operation by turning the steering from the center position to full right hand lock, to full left hand lock and back to the center position before road testing the vehicle on roads requiring steering input.

G531322t46 : CHECK THE GROUND CIRCUIT TO THE STEERING WHEEL ROTATION SENSOR

1. Measure the resistance between:

FH110, harness side	Battery
Pin 04	Negative terminal

- Is the resistance less than 10 ohms?

-> **Yes**

GO to Pinpoint Test [G531322t50](#).

-> **No**

GO to Pinpoint Test [G531322t47](#).

G531322t47 : CHECK THE STEERING WHEEL ROTATION SENSOR GROUND CIRCUIT FOR SHORT CIRCUIT TO POWER

1. Measure the resistance between:

FH110, harness side	Battery
Pin 04	Positive terminal

- Is the resistance greater than 10 Kohms?

-> **Yes**

GO to Pinpoint Test [G531322t49](#).

-> **No**

GO to Pinpoint Test [G531322t48](#).

G531322t48 : CHECK WHETHER THE SHORT CIRCUIT IS IN THE HARNESS OR THE MODULE

1. Key off. 2. Disconnect the ABS module connector, EC030. 3. Key on, engine off. 4. Measure the resistance between:

FH110, harness side	Battery
Pin 04	Positive terminal

- **Is the resistance greater than 10 Kohms?**

-> **Yes**

Refer to the warranty policy and procedures manual if a module is suspect.

-> **No**

REPAIR the short circuit. For additional information, refer to the wiring diagrams. Clear the DTC, test the system for normal operation by turning the steering from the center position to full right hand lock, to full left hand lock and back to the center position before road testing the vehicle on roads requiring steering input.

G531322t49 : CHECK THE STEERING WHEEL ROTATION SENSOR GROUND CIRCUIT FOR HIGH RESISTANCE

1. Key off. 2. Disconnect the ABS module connector, EC030. 3. Measure the resistance between:

FH110, harness side	EC030, harness side
Pin 04	Pin 40

- **Is the resistance less than 10 ohms?**

-> **Yes**

An intermittent fault may be present in the wiring harness. Visually check for chaffed wires or other physical damage to the harness.

-> **No**

REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. Clear the DTC, test the system for normal operation by turning the steering from the center position to full right hand lock, to full left hand lock and back to the center position before road testing the vehicle on roads requiring steering input.

G531322t50 : CHECK THE STEERING WHEEL ROTATION SENSOR SIGNAL A CIRCUIT FOR SHORT CIRCUIT TO GROUND

1. Measure the resistance between:

FH110, harness side	Battery
Pin 03	Negative terminal

- **Is the resistance greater than 10 Kohms?**

-> **Yes**

GO to Pinpoint Test [G531322t52](#).

-> **No**

GO to Pinpoint Test [G531322t51](#).

G531322t51 : CHECK WHETHER THE SHORT CIRCUIT IS IN THE HARNESS OR THE MODULE

1. Key off. 2. Disconnect the ABS module connector, EC030. 3. Key on, engine off. 4. Measure the resistance between:

FH110, harness side	Battery
Pin 03	Negative terminal

- **Is the resistance greater than 10 Kohms?**

-> **Yes**

Refer to the warranty policy and procedures manual if a module is suspect.

-> **No**

REPAIR the short circuit. For additional information, refer to the wiring diagrams. Clear the DTC, test the system for normal operation by turning the steering from the center position to full right hand

lock, to full left hand lock and back to the center position before road testing the vehicle on roads requiring steering input.

G531322t52 : CHECK THE STEERING WHEEL ROTATION SENSOR SIGNAL A CIRCUIT FOR SHORT CIRCUIT TO POWER

1. Measure the resistance between:

FH110, harness side	Battery
Pin 03	Positive terminal

- **Is the resistance greater than 10 Kohms?**

-> **Yes**

GO to Pinpoint Test [G531322t54](#).

-> **No**

GO to Pinpoint Test [G531322t53](#).

G531322t53 : CHECK WHETHER THE SHORT CIRCUIT IS IN THE HARNESS OR THE MODULE

1. Key off. 2. Disconnect the ABS module connector, EC030. 3. Key on, engine off. 4. Measure the resistance between:

FH110, harness side	Battery
Pin 03	Positive terminal

- **Is the resistance greater than 10 Kohms?**

-> **Yes**

Refer to the warranty policy and procedures manual if a module is suspect.

-> **No**

REPAIR the short circuit. For additional information, refer to the wiring diagrams. Clear the DTC, test the system for normal operation by turning the steering from the center position to full right hand lock, to full left hand lock and back to the center position before road testing the vehicle on roads requiring steering input.

G531322t54 : CHECK THE STEERING WHEEL ROTATION SENSOR SIGNAL B CIRCUIT FOR SHORT CIRCUIT TO GROUND

1. Measure the resistance between:

FH110, harness side	Battery
Pin 02	Negative terminal

- **Is the resistance greater than 10 Kohms?**

-> **Yes**

GO to Pinpoint Test [G531322t56](#).

-> **No**

GO to Pinpoint Test [G531322t55](#).

G531322t55 : CHECK WHETHER THE SHORT CIRCUIT IS IN THE HARNESS OR THE MODULE

1. Key off. 2. Disconnect the ABS module connector, EC030. 3. Key on, engine off. 4. Measure the resistance between:

FH110, harness side	Battery
Pin 02	Negative terminal

- **Is the resistance greater than 10 Kohms?**

-> **Yes**

Refer to the warranty policy and procedures manual if a module is suspect.

-> **No**

REPAIR the short circuit. For additional information, refer to the wiring diagrams. Clear the DTC, test the system for normal operation by turning the steering from the center position to full right hand lock, to full left hand lock and back to the center position before road testing the vehicle on roads requiring steering input.

G531322t56 : CHECK THE STEERING WHEEL ROTATION SENSOR SIGNAL B CIRCUIT FOR SHORT CIRCUIT TO POWER

1. Measure the resistance between:

FH110, harness side	Battery
Pin 02	Positive terminal

- **Is the resistance greater than 10 Kohms?**

-> **Yes**

GO to Pinpoint Test [G531322t58](#).

-> **No**

GO to Pinpoint Test [G531322t57](#).

G531322t57 : CHECK WHETHER THE SHORT CIRCUIT IS IN THE HARNESS OR THE MODULE

1. Key off. 2. Disconnect the ABS module connector, EC030. 3. Key on, engine off. 4. Measure the resistance between:

FH110, harness side	Battery
Pin 02	Positive terminal

- **Is the resistance greater than 10 Kohms?**

-> **Yes**

Refer to the warranty policy and procedures manual if a module is suspect.

-> **No**

REPAIR the short circuit. For additional information, refer to the wiring diagrams. Clear the DTC, test the system for normal operation by turning the steering from the center position to full right hand lock, to full left hand lock and back to the center position before road testing the vehicle on roads requiring steering input.

G531322t58 : CHECK THE STEERING WHEEL ROTATION SENSOR SIGNAL A CIRCUIT FOR HIGH RESISTANCE

1. Key off. 2. Disconnect the ABS module connector, EC030. 3. Key on, engine off. 4. Measure the resistance between:

FH110, harness side	EC030, harness side

Pin 03	Pin 41
--------	--------

- Is the resistance less than 10 ohms?

-> Yes

GO to Pinpoint Test [G531322t59](#).

-> No

REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. Clear the DTC, test the system for normal operation by turning the steering from the center position to full right hand lock, to full left hand lock and back to the center position before road testing the vehicle on roads requiring steering input.

G531322t59 : CHECK THE STEERING WHEEL ROTATION SENSOR SIGNAL B CIRCUIT FOR HIGH RESISTANCE

1. Measure the resistance between:

FH110, harness side	EC030, harness side
Pin 02	Pin 41

- Is the resistance less than 10 ohms?

-> Yes

GO to Pinpoint Test [G531322t60](#).

-> No

REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. Clear the DTC, test the system for normal operation by turning the steering from the center position to full right hand lock, to full left hand lock and back to the center position before road testing the vehicle on roads requiring steering input.

G531322t60 : CHECK THE STEERING WHEEL ROTATION SENSOR SIGNAL A AND B CIRCUITS FOR SHORT CIRCUIT TO EACH OTHER

1. Measure the resistance between:

FH110, harness side	FH110, harness side
Pin 02	Pin 03

- Is the resistance greater than 100 Kohms?

-> **Yes**

An intermittent fault may be present in the wiring harness. Visually check for chaffed wires or other physical damage to the harness.

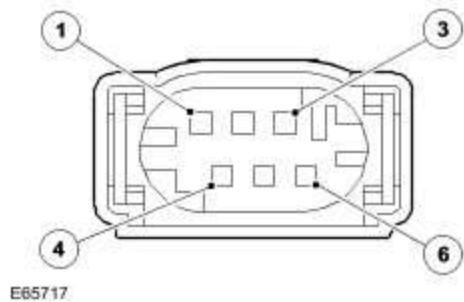
-> **No**

REPAIR the short circuit. For additional information, refer to the wiring diagrams. Clear the DTC, test the system for normal operation by turning the steering from the center position to full right hand lock, to full left hand lock and back to the center position before road testing the vehicle on roads requiring steering input.

PINPOINT TEST G531322p10 : YAW RATE SENSOR AND ACCELEROMETER

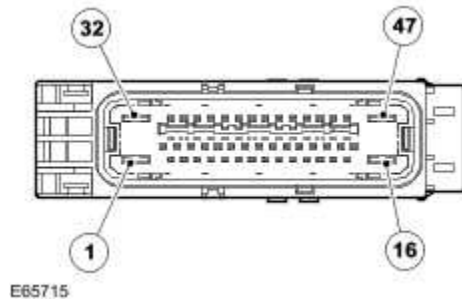
G531322t61 : CHECK THE POWER SUPPLY TO THE YAW RATE SENSOR AND ACCELEROMETER

1.



Circuit	Pin
CAN negative	01
CAN positive	02
Sensor power	03
Sensor ground	05

2.



Circuit	Pin
CAN negative	19
CAN positive	18
Sensor power	22
Sensor ground	29

3. Key off. 4. Disconnect the yaw rate sensor and accelerometer connector, IP023 5. Key on, engine off. 6. Measure the resistance between:

IP023, harness side	Battery
Pin 03	Negative terminal

- Is the voltage greater than 4 volts?

-> Yes

GO to Pinpoint Test [G531322t64](#).

-> No

GO to Pinpoint Test [G531322t62](#).

G531322t62 : CHECK THE YAW RATE SENSOR AND ACCELEROMETER POWER SUPPLY CIRCUIT FOR SHORT CIRCUIT TO GROUND

1. Measure the resistance between:

IP023, harness side	Battery
---------------------	---------

Pin 03	Negative terminal
--------	-------------------

- **Is the resistance greater than 10 Kohms?**

-> **Yes**

GO to Pinpoint Test [G531322t63](#).

-> **No**

REPAIR the short circuit. For additional information, refer to the wiring diagrams. Clear the DTC, test the system for normal operation by driving the vehicle to a speed greater than 20 Kph (12.5 mph) for more than 3 seconds.

G531322t63 : CHECK THE YAW RATE SENSOR AND ACCELEROMETER POWER SUPPLY CIRCUIT FOR HIGH RESISTANCE

1. Key off. 2. Disconnect the ABS module connector, EC030. 3. Measure the resistance between:

IP023, harness side	EC030, harness side
Pin 03	Pin 22

- **Is the resistance less than 10 ohms?**

-> **Yes**

An intermittent fault may be present in the wiring harness. Visually check for chaffed wires or other physical damage to the harness.

-> **No**

REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. Clear the DTC, test the system for normal operation by driving the vehicle to a speed greater than 20 Kph (12.5 mph) for more than 3 seconds.

G531322t64 : CHECK THE GROUND CIRCUIT TO THE YAW RATE SENSOR AND ACCELEROMETER

1. Measure the resistance between:

IP023, harness side	Battery
Pin 05	Negative terminal

- Is the resistance less than 10 ohms?

-> Yes

GO to Pinpoint Test [G531322t68](#).

-> No

GO to Pinpoint Test [G531322t65](#).

G531322t65 : CHECK THE YAW RATE SENSOR AND ACCELEROMETER GROUND CIRCUIT FOR SHORT CIRCUIT TO POWER

1. Measure the resistance between:

IP023, harness side	Battery
Pin 05	Positive terminal

- Is the resistance greater than 10 Kohms?

-> Yes

GO to Pinpoint Test [G531322t67](#).

-> No

GO to Pinpoint Test [G531322t66](#).

G531322t66 : CHECK WHETHER THE SHORT CIRCUIT IS IN THE HARNESS OR THE MODULE

1. Key off. 2. Disconnect the ABS module connector, EC030. 3. Key on, engine off. 4. Measure the resistance between:

IP023, harness side	Battery
Pin 05	Positive terminal

- Is the resistance greater than 10 Kohms?

-> Yes

Refer to the warranty policy and procedures manual if a module is suspect.

-> **No**

REPAIR the short circuit. For additional information, refer to the wiring diagrams. Clear the DTC, test the system for normal operation by driving the vehicle to a speed greater than 20 Kph (12.5 mph) for more than 3 seconds.

G531322t67 : CHECK THE YAW RATE SENSOR AND ACCELEROMETER GROUND CIRCUIT FOR HIGH RESISTANCE

1. Key off. 2. Disconnect the ABS module connector, EC030. 3. Key on, engine off. 4. Measure the resistance between:

IP023, harness side	EC030, harness side
Pin 05	Pin 29

- **Is the resistance less than 10 ohms?**

-> **Yes**

An intermittent fault may be present in the wiring harness. Visually check for chaffed wires or other physical damage to the harness.

-> **No**

REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. Clear the DTC, test the system for normal operation by driving the vehicle to a speed greater than 20 Kph (12.5 mph) for more than 3 seconds.

G531322t68 : CHECK THE YAW RATE SENSOR AND ACCELEROMETER CAN - CIRCUIT FOR SHORT CIRCUIT TO GROUND

1. Measure the resistance between:

IP023, harness side	Battery
Pin 01	Negative terminal

- **Is the resistance greater than 10 Kohms?**

-> **Yes**

GO to Pinpoint Test [G531322t70](#).

-> **No**

GO to Pinpoint Test [G531322t69](#).

G531322t69 : CHECK WHETHER THE SHORT CIRCUIT IS IN THE HARNESS OR THE MODULE

1. Key off. 2. Disconnect the ABS module connector, EC030. 3. Key on, engine off. 4. Measure the resistance between:

IP023, harness side	Battery
Pin 01	Negative terminal

- **Is the resistance greater than 10 Kohms?**

-> **Yes**

Refer to the warranty policy and procedures manual if a module is suspect.

-> **No**

REPAIR the short circuit. For additional information, refer to the wiring diagrams. Clear the DTC, test the system for normal operation by driving the vehicle to a speed greater than 20 Kph (12.5 mph) for more than 3 seconds.

G531322t70 : CHECK THE YAW RATE SENSOR AND ACCELEROMETER CAN - CIRCUIT FOR SHORT CIRCUIT TO POWER

1. Measure the resistance between:

IP023, harness side	Battery
Pin 01	Positive terminal

- **Is the resistance greater than 10 Kohms?**

-> **Yes**

GO to Pinpoint Test [G531322t72](#).

-> **No**

GO to Pinpoint Test [G531322t71](#).

G531322t71 : CHECK WHETHER THE SHORT CIRCUIT IS IN THE HARNESS OR THE MODULE

1. Key off. 2. Disconnect the ABS module connector, EC030. 3. Key on, engine off. 4. Measure the resistance between:

IP023, harness side	Battery
Pin 01	Positive terminal

- Is the resistance greater than 10 Kohms?

-> Yes

Refer to the warranty policy and procedures manual if a module is suspect.

-> No

REPAIR the short circuit. For additional information, refer to the wiring diagrams. Clear the DTC, test the system for normal operation by driving the vehicle to a speed greater than 20 Kph (12.5 mph) for more than 3 seconds.

G531322t72 : CHECK THE YAW RATE SENSOR AND ACCELEROMETER CAN + CIRCUIT FOR SHORT CIRCUIT TO GROUND

1. Measure the resistance between:

IP023, harness side	Battery
Pin 02	Negative terminal

- Is the resistance greater than 10 Kohms?

-> Yes

GO to Pinpoint Test [G531322t74](#).

-> No

GO to Pinpoint Test [G531322t73](#).

G531322t73 : CHECK WHETHER THE SHORT CIRCUIT IS IN THE HARNESS OR THE MODULE

1. Key off. 2. Disconnect the ABS module connector, EC030. 3. Key on, engine off. 4. Measure the resistance between:

IP023, harness side	Battery
Pin 02	Negative terminal

- Is the resistance greater than 10 Kohms?

-> Yes

Refer to the warranty policy and procedures manual if a module is suspect.

-> No

REPAIR the short circuit. For additional information, refer to the wiring diagrams. Clear the DTC, test the system for normal operation by driving the vehicle to a speed greater than 20 Kph (12.5 mph) for more than 3 seconds.

G531322t74 : CHECK THE YAW RATE SENSOR AND ACCELEROMETER CAN + CIRCUIT FOR SHORT CIRCUIT TO POWER

1. Measure the resistance between:

IP023, harness side	Battery
Pin 02	Positive terminal

- Is the resistance greater than 10 Kohms?

-> Yes

GO to Pinpoint Test [G531322t76](#).

-> No

GO to Pinpoint Test [G531322t75](#).

G531322t75 : CHECK WHETHER THE SHORT CIRCUIT IS IN THE HARNESS OR THE MODULE

1. Key off. 2. Disconnect the ABS module connector, EC030. 3. Key on, engine off. 4. Measure the resistance between:

IP023, harness side	Battery
Pin 02	Positive terminal

- Is the resistance greater than 10 Kohms?

-> Yes

Refer to the warranty policy and procedures manual if a module is suspect.

-> **No**

REPAIR the short circuit. For additional information, refer to the wiring diagrams. Clear the DTC, test the system for normal operation by driving the vehicle to a speed greater than 20 Kph (12.5 mph) for more than 3 seconds.

G531322t76 : CHECK THE YAW RATE SENSOR AND ACCELEROMETER CAN - CIRCUIT FOR HIGH RESISTANCE

1. Key off. 2. Disconnect the ABS module connector, EC030. 3. Key on, engine off. 4. Measure the resistance between:

IP023, harness side	EC030, harness side
Pin 01	Pin 19

- **Is the resistance less than 10 ohms?**

-> **Yes**

GO to Pinpoint Test [G531322t77](#).

-> **No**

REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. Clear the DTC, test the system for normal operation by driving the vehicle to a speed greater than 20 Kph (12.5 mph) for more than 3 seconds.

G531322t77 : CHECK THE YAW RATE SENSOR AND ACCELEROMETER CAN + CIRCUIT FOR HIGH RESISTANCE

1. Measure the resistance between:

IP023, harness side	EC030, harness side
Pin 02	Pin 18

- **Is the resistance less than 10 ohms?**

-> **Yes**

GO to Pinpoint Test [G531322t78](#).

-> **No**

REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. Clear the

DTC, test the system for normal operation by driving the vehicle to a speed greater than 20 Kph (12.5 mph) for more than 3 seconds.

G531322t78 : CHECK THE YAW RATE SENSOR AND ACCELEROMETER CAN + AND - CIRCUITS FOR SHORT CIRCUIT TO EACH OTHER

1. Measure the resistance between:

IP023, harness side	IP023, harness side
Pin 02	Pin 01

- **Is the resistance greater than 10 Kohms?**

-> Yes

An intermittent fault may be present in the wiring harness. Visually check for chaffed wires or other physical damage to the harness.

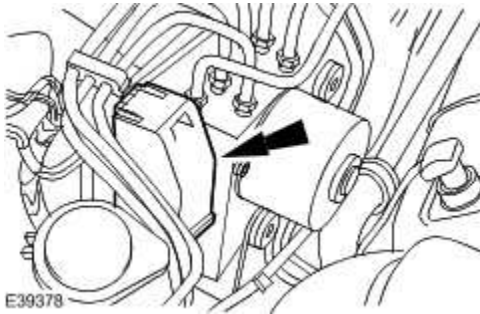
-> No

REPAIR the short circuit. For additional information, refer to the wiring diagrams. Clear the DTC, test the system for normal operation by driving the vehicle to a speed greater than 20 Kph (12.5 mph) for more than 3 seconds.

Anti-Lock Brake System (ABS) Module (70.60.02)

Removal

- 1 . Disconnect the battery ground cable. [<<414-01>>](#)
- 2 . Disconnect the hydraulic control unit electrical connector.



- 3 . Detach the engine compartment battery junction box.



- 4 . Remove the ABS module.




Installation

- 1 . To install, reverse the removal procedure.

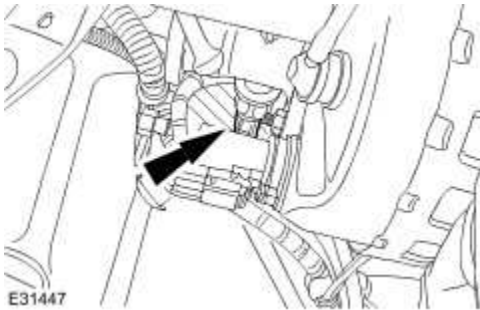
Brake Master Cylinder Pressure Transducer


Removal

- 1  **WARNING:** Brake fluid contains polyglycol ethers and polyglycols. Avoid contact with the eyes. Wash hands thoroughly after handling, as prolonged contact may cause irritation and dermatitis. If brake fluid contacts the eyes, flush the eyes with cold water or eyewash solution and seek medical attention. If taken internally do not induce vomiting, seek immediate medical attention. Failure to follow these instructions may result in personal injury.

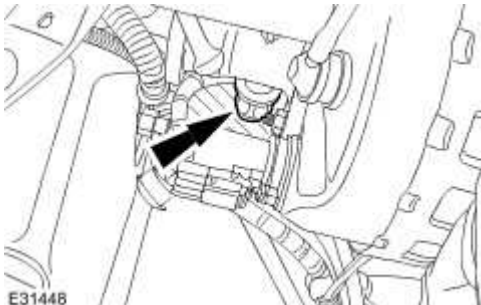
Disconnect the battery ground cable. [<<414-01>>](#)

- 2 . Disconnect the brake master cylinder primary pressure transducer electrical connector.



- 3  **CAUTION:** If brake fluid is spilt on the paintwork, the effected area must be immediately washed down with cold water.

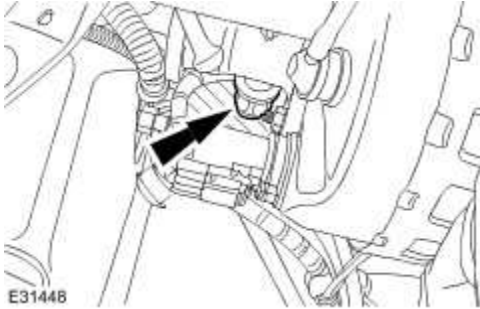
Remove the brake master cylinder primary pressure transducer.



Installation

1 . To install, reverse the removal procedure.

► Tighten 30 Nm.



2 . Bleed the ABS brake system. [<<206-00>>](#)

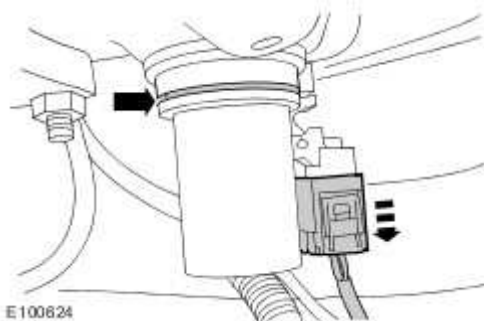
Brake Pedal Travel Sensor - VIN Range: G00442->G49700

Removal



WARNING: Failure to carry out procedure may result in damage to the vehicle.

- 1 . Depress brake pedal 20 times to remove vacuum from brake booster.
- 2 . Remove the brake pedal travel sensor.
 - Disconnect the brake pedal travel sensor electrical connector.
 - Using a suitable pick, remove the spring clip.



Installation

- 1 . Fit new spring clip to sensor housing, ensuring correct alignment.
- 2 . Lubricate new seal with water and fit seal to the sensor.
- 3 . Fit and fully seat new brake pedal travel sensor.
 - Connect the brake pedal travel sensor electrical connector.

Front Wheel Speed Sensor (70.60.03)

Removal

1 . Raise and support the vehicle. <<100-02>>

2

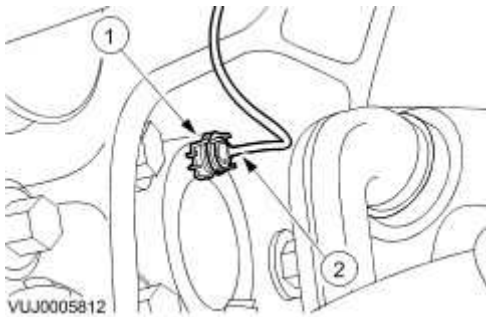


CAUTION: Make sure the ignition is in the 'OFF' position before disconnecting the front wheel speed sensor electrical connector.

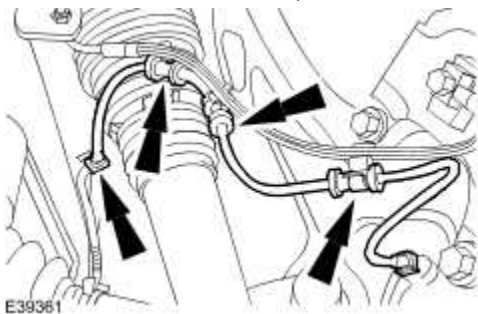
Detach the front wheel speed sensor.

1) Remove the front wheel speed sensor retaining clip.


2) Detach the front wheel speed sensor.

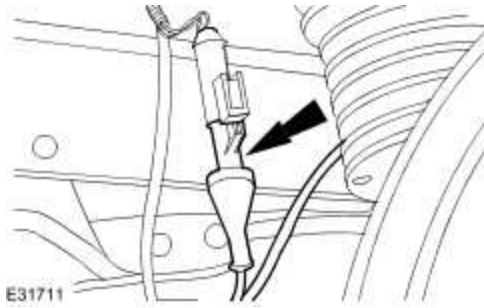


3 . Detach the front wheel speed sensor harness.




4 . Remove the front wheel speed sensor.

 Disconnect the electrical connector.



Installation

- 1  **CAUTION:** Make sure the wheel speed sensor locating tang is correctly seated in the hub assembly.

 **CAUTION:** Make sure the front wheel speed sensor harness is correctly routed around the front suspension components.

To install, reverse the removal procedure.

Hydraulic Control Unit (HCU) - VIN Range: G00442->G45703 (70.60.18)

Special Service Tools



Brake pedal hold-down tool

JDS 9013

Removal

1



- **WARNING:** Brake fluid contains polyglycol ethers and polyglycols. Avoid contact with the eyes. Wash hands thoroughly after handling, as prolonged contact may cause irritation and dermatitis. If brake fluid contacts the eyes, flush the eyes with cold water or eyewash solution and seek medical attention. If taken internally do not induce vomiting, seek immediate medical attention. Failure to follow these instructions may result in personal injury.

NOTE:

To prevent the loss of brake fluid, apply the brake pedal hold-down tool and adjust to hold the brake pedal down 60 mm (2.4 in).

Disconnect the battery ground cable. [.<<414-01>>](#)

2 . Raise and support the vehicle. [.<<100-02>>](#)

3 . Connect a bleed pipe bottle to the caliper bleed nipple and loosen the caliper bleed nipple.

4 Install pedal hold-down tool.




Install the tool between the pedal and the seat frame.

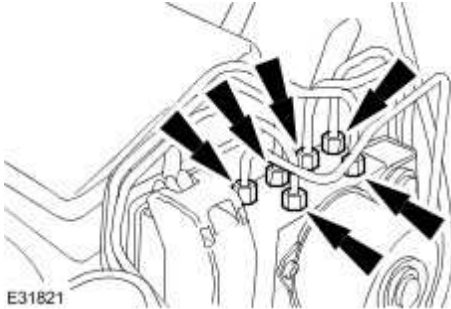
- ▶ Turn the tool hand-wheel to depress and hold the pedal 60 mm (2.4 in) from the 'Off' position
- ▶ This will prevent loss of fluid from the reservoir through disconnected brake pipes.

5 . Remove the bleed pipe and bottle.

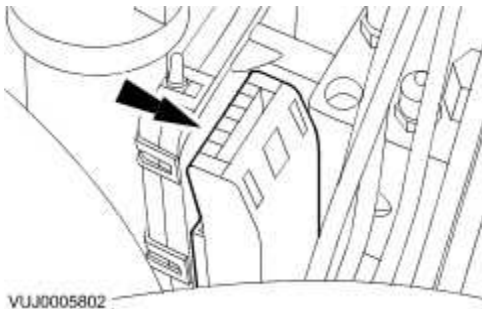
- ▶ Tighten the caliper bleed nipple.
- ▶ Disconnect and remove the bleed pipe and bottle.
- ▶ Install the bleed nipple dust cap.

6  **CAUTION: If brake fluid is spilt on the paintwork, the effected area must be immediately washed down with cold water.**

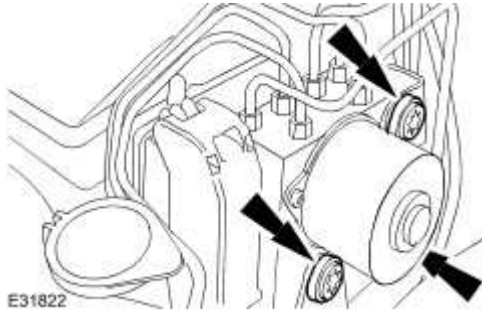
Disconnect the hydraulic control unit brake tubes.



7 . Disconnect the hydraulic control unit electrical connector.



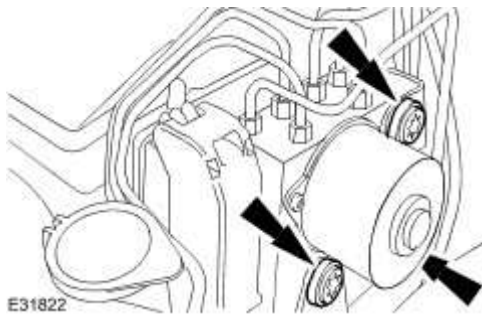
8 . Remove the hydraulic control unit.



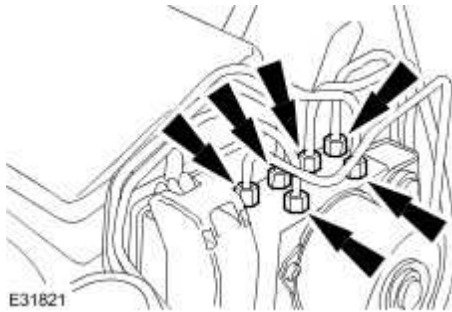
Installation

1 . To install, reverse the removal procedure.

► Tighten to 9 Nm.



2 . Tighten to 17 Nm.



3 . Bleed the ABS brake system. [<<206-00>>](#)

Hydraulic Control Unit (HCU) - VIN Range: G45704->G99999 (70.60.18)

Special Service Tools



Brake pedal hold-down tool

JDS 9013

Removal

All vehicles

1



- **WARNING:** Brake fluid contains polyglycol ethers and polyglycols. Avoid contact with the eyes. Wash hands thoroughly after handling, as prolonged contact may cause irritation and dermatitis. If brake fluid contacts the eyes, flush the eyes with cold water or eyewash solution and seek medical attention. If taken internally do not induce vomiting, seek immediate medical attention. Failure to follow these instructions may result in personal injury.

NOTE:

To prevent the loss of brake fluid, apply the brake pedal hold-down tool and adjust to hold the brake pedal down 60 mm (2.4 inch).

Disconnect the battery ground cable.

For additional information, refer to [Battery Disconnect and Connect](#)

2 . Raise and support the vehicle.

For additional information, refer to [Lifting](#)

3 Connect brake bleed pipes and bottles to the left-hand front and the left-hand rear brake
· caliper bleed nipples and loosen the brake caliper bleed nipples.

4 Install pedal hold-down tool.

- ▶ Install the tool between the brake pedal and the seat frame.
- ▶ Turn the tool hand-wheel to press and hold the brake pedal 60 mm (2.4 inch) from the 'Off' position
- ▶ This will prevent loss of fluid from the reservoir through disconnected brake tubes.

Vehicles with standard brakes

5 . Remove the bleed pipes and bottles.

- ▶ Tighten the left-hand front caliper bleed nipple.
- ▶ Tighten to 8 Nm.
- ▶ Tighten the left-hand rear brake caliper bleed nipple.
- ▶ Tighten to 14 Nm.
- ▶ Disconnect and remove the brake bleed pipes and bottles.
- ▶ Install the bleed nipple dust caps.

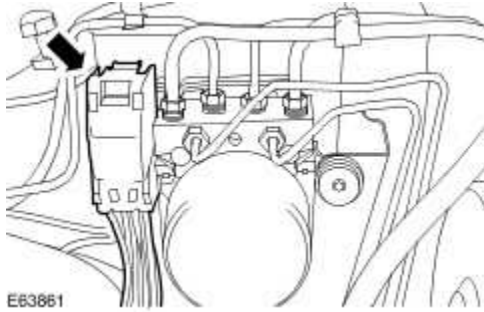
Vehicles with high performance brakes

6 . Remove the bleed pipes and bottles.

- ▶ Tighten the left-hand front caliper bleed nipple.
- ▶ Tighten to 14 Nm.
- ▶ Tighten the left-hand rear brake caliper bleed nipple.
- ▶ Tighten to 14 Nm.
- ▶ Disconnect and remove the brake bleed pipes and bottles.
- ▶ Install the bleed nipple dust caps.

All vehicles

- 7 . Disconnect the hydraulic control unit (HCU) electrical connector.



Right-hand drive vehicles

8



CAUTION: If brake fluid is spilt on the paintwork, the effected area must be immediately washed down with cold water. Failure to follow this instruction may result in damage to the vehicle.



CAUTION: To minimise brake fluid loss the brake tubes must be disconnected in the order shown. Failure to follow this instruction may result in damage to the vehicle.



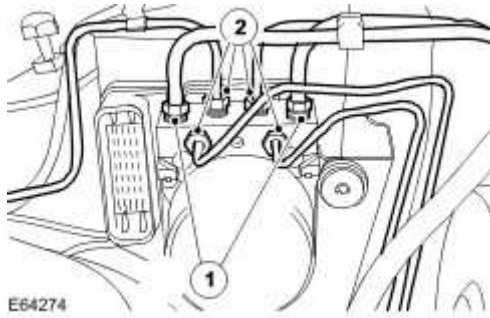
CAUTION: Cap the exposed brake tubes and ports to prevent loss of fluid and dirt ingress. Failure to follow this instruction may result in damage to the vehicle.

NOTE:

Using a suitable tool mark the position of the brake tubes to the HCU.

Disconnect the HCU brake tubes.

- 1) Disconnect the HCU primary and secondary circuit brake tubes.
- 2) Disconnect the HCU outlet brake tubes.



Left-hand drive vehicles

9



CAUTION: If brake fluid is spilt on the paintwork, the effected area must be immediately washed down with cold water. Failure to follow this instruction may result in damage to the vehicle.



CAUTION: To minimise brake fluid loss the brake tubes must be disconnected in the order shown. Failure to follow this instruction may result in damage to the vehicle.



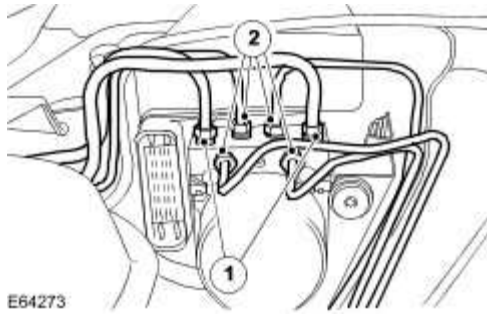
CAUTION: Cap the exposed brake tubes and ports to prevent loss of fluid and dirt ingress. Failure to follow this instruction may result in damage to the vehicle.

NOTE:

Using a suitable tool mark the position of the brake tubes to the HCU.

Disconnect the HCU brake tubes.

- 1) Disconnect the HCU primary and secondary circuit brake tubes.
- 2) Disconnect the HCU outlet brake tubes.



All vehicles

10 . Remove the HCU.



Installation

1 NOTE:


A new HCU does not come supplied with the HCU base bracket. The HCU base bracket should be removed and installed to the new HCU. The HCU base bracket securing bolts must be torqued if a new HCU is being installed to the vehicle.

- Tighten the three HCU base bracket securing bolts to 9 Nm.

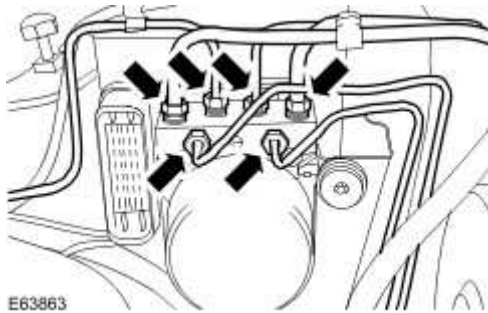
To install, reverse the removal procedure.

2 . Tighten to 9 Nm.



- 3  **CAUTION:** Make sure the brake tubes are installed to the correct ports. Failure to follow this instruction may result in damage to the vehicle.

Tighten to 17 Nm.



- 4 Bleed the anti-lock brake system (ABS).
- For additional information, refer to [Brake System Bleeding - VIN Range: G45704->H99999 \(70.25.03\)](#)

Rear Wheel Speed Sensor (70.60.04)

Removal

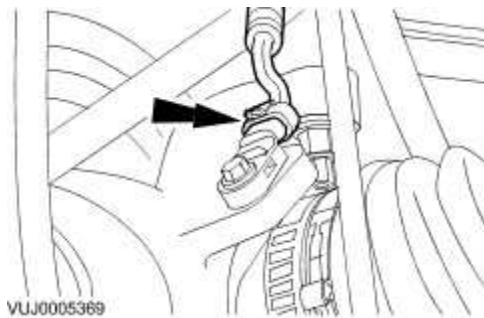
1 . Raise and support the vehicle. <<100-02>>

2



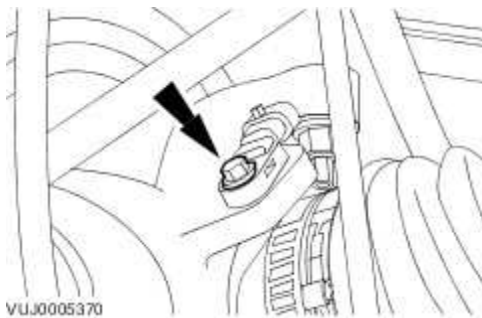
· **CAUTION: Make sure the ignition is in the 'OFF' position before disconnecting the rear wheel speed sensor electrical connector.**

Disconnect the rear wheel speed sensor electrical connector.



3 . Remove the rear wheel speed sensor.

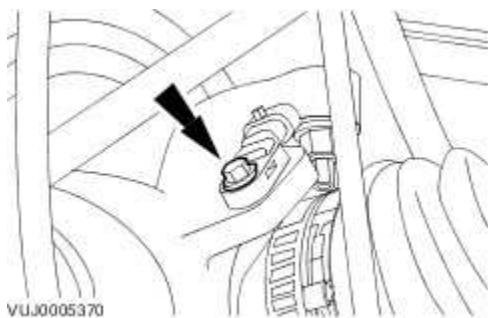
➤ Remove the securing bolt.



Installation

1 . To install, reverse the removal procedure.

➤ Tighten to 9 Nm.

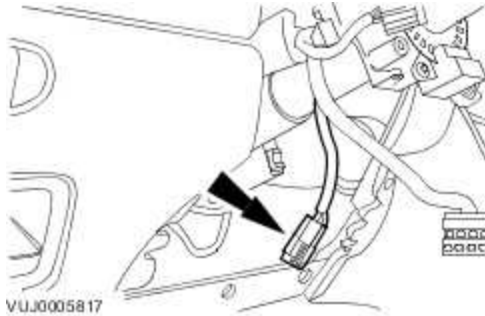


VUJ0005370

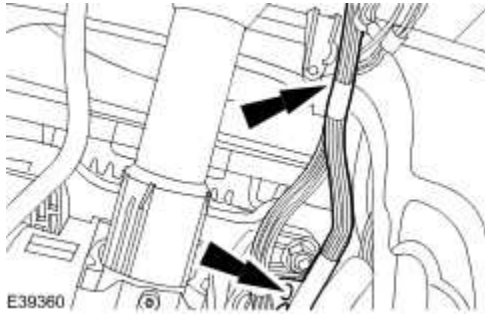
Steering Wheel Rotation Sensor (86.56.58)

Removal

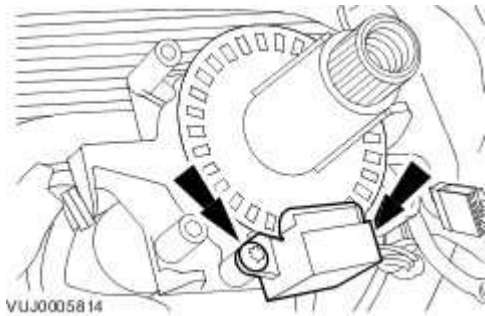
- 1 . Disconnect the battery ground cable. [<<414-01>>](#)
- 2 . Remove the steering wheel. [<<211-04>>](#)
- 3 . Disconnect the steering wheel rotation sensor electrical connector.



- 4 . Disconnect the steering wheel rotation sensor electrical wiring harness from steering column.



- 5 . Remove the steering wheel rotation sensor.



Installation

1 . NOTE:

Note the correct routing of the steering wheel rotation sensor electrical wiring harness.

To install, reverse the removal procedure.

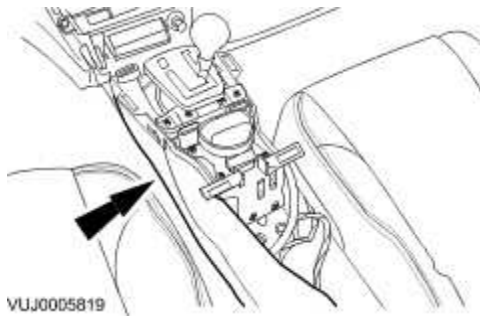
Yaw Rate Sensor and Accelerometer (86.56.64)

Removal

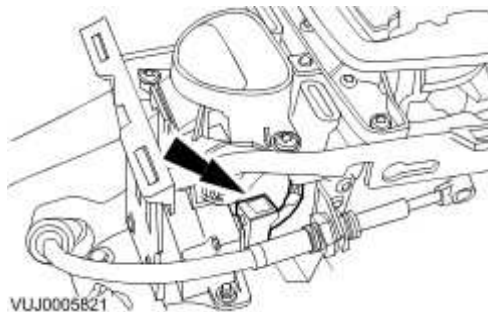
1 . Disconnect the battery ground cable. [<<414-01>>](#)

2 . Remove the floor console. [<<501-12>>](#)

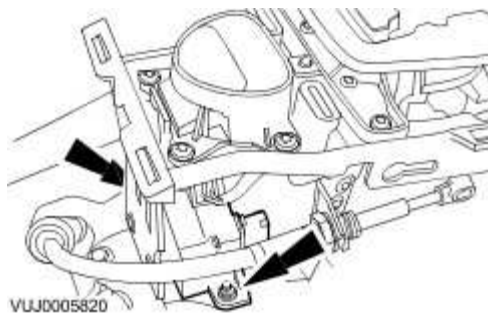
3 . Remove the air duct.



4 . Disconnect the lateral/yaw rate sensor electrical connector.



5 . Remove the lateral/yaw rate sensor.



Installation

1 . NOTE:

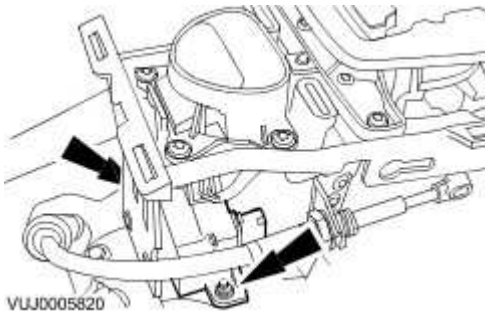
If sensor appears damaged or is dropped during installation do not fit to vehicle.

NOTE:

Make sure the lateral/yaw rate sensor is fitted the correct way around.

To install, reverse the removal procedure.

▶ Tighten to 7 Nm.



211 : Steering System

211-00 : Steering System – General Information

Specifications

Specifications

Steering Linkage Specifications

Steering Linkage Free Play	Measurement (mm)	Measurement (in)
Free play (measured at the steering wheel rim)	0-6	0-0.24

Power Steering Pump Specifications

Item	Specification
Power steering pump relief pressure	106-114 bar

Lubricants, Fluids, Sealers and Adhesives

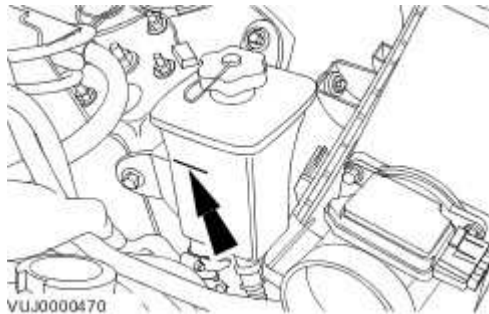
Item	Specification
Power steering fluid	Dextron 3

Power Steering System Bleeding (57.15.02)

1. NOTE:

When filling the reservoir, make sure that the fluid is clean and not agitated prior to use. The fluid should be poured slowly into the reservoir to minimize the possibility of aeration.

Fill the reservoir to the MAX mark.



2. NOTE:

Do not start the engine.

Turn the steering from lock to lock.

3. Check the fluid level. Fill the reservoir to the MAX mark if necessary.

4. Start the engine and turn the steering from lock to lock.

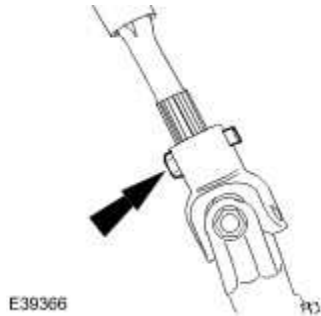
5. Switch the engine off.

6. Check the fluid level. Fill the reservoir to the MAX mark if necessary.

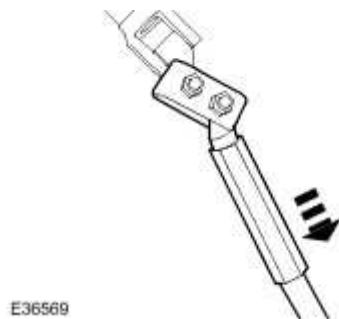
7. Start the engine, turn the steering wheel from lock to lock. If excessive noise is apparent or shudder is evident through the steering wheel, repeat the bleed procedure.

Steering Column Lower Shaft Setting

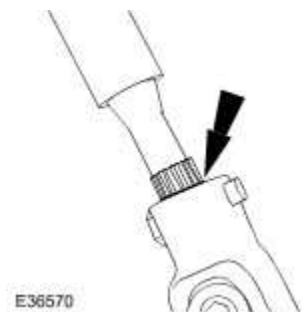
1. Centralize the steering wheel.
2. Loosen the steering column lower shaft pinch bolt.



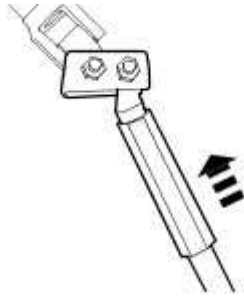
3. Fully extend the steering column lower shaft swinging link.



4. Mark the position of the steering column lower shaft relative to the universal joint.

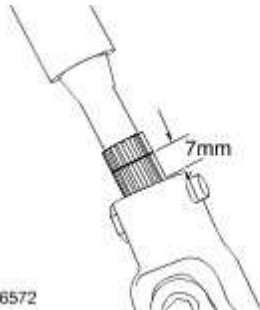


5. Fully retract the steering column lower shaft swinging link.



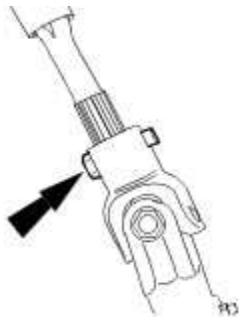
E36571

6. Move the steering column lower shaft until the measurement between the mark on the steering column lower shaft and the top of the universal joint is 7mm.



E36572

7. Tighten to 35 Nm.



E39366

Power Steering System Flushing (57.15.08)

NOTE:

If heavy steering or contamination within the power steering system is found, it is necessary to carry out the system flush procedure as detailed below. If any components have been replaced in the power steering system the procedure below must be carried out in full.

NOTE:

Some variation in the illustrations may occur, but the essential information is always correct.

1. Remove the power steering fluid reservoir cap.
2. Using a suitable syringe, remove the power steering fluid from the power steering fluid reservoir.

3.



CAUTION: Be prepared to collect escaping fluids.

NOTE:

Note the orientation of the clip.

Detach the power steering fluid reservoir.

- Detach but do not remove the power steering fluid reservoir.
- Release the power steering fluid return hose from the power steering fluid reservoir.
- If a quick release coupling is fitted to the power steering return hose, release the power steering fluid return hose from the coupling by removing the clip.



4.



CAUTION: Be prepared to collect escaping fluids.

NOTE:

Make sure that all openings are sealed. Use new blanking caps.

Using a suitable blanking cap, cap the power steering reservoir return pipe.



5.

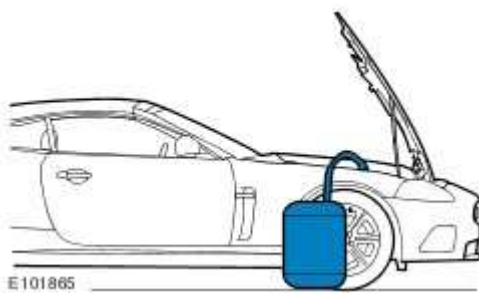


CAUTION: Be prepared to collect escaping fluids.

NOTE:

Make sure the extended pipe is not kinked or twisted and is correctly secured with hose clips.

Attach a suitable pipe to the power steering return hose to allow the fluid to drain.



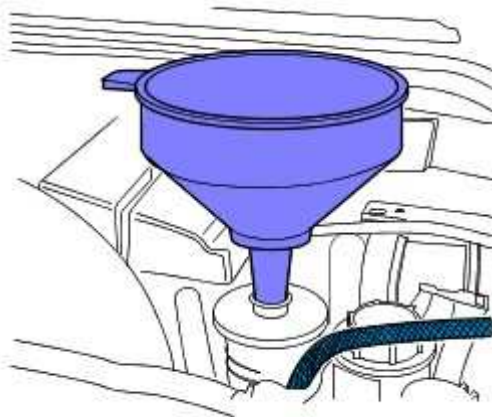
6. **NOTE:**

The suitable funnel should have the a capacity of 4 litres and O-ring seal

NOTE:

The suitable funnel must be tightly sealed to the power steering fluid reservoir to avoid fluid leakage.

Install a suitable funnel onto the power steering fluid reservoir.



E94372

7.



WARNING: Do not work on or under a vehicle supported only by a jack. Always support the vehicle on safety stands.

Raise and support the vehicle with the wheels just clear of the ground.

8.



CAUTION: Steps 8 and 9 must be carried out within 2 - 3 seconds of each other. Failure to follow this instruction may result in damage to the power steering system.



CAUTION: Be prepared to collect escaping fluids.

Using the suitable funnel, top up the power steering system with the specified fluid. Make sure the fluid level is maintained at two thirds full in the funnel.

9.



CAUTION: Be prepared to collect escaping fluids.



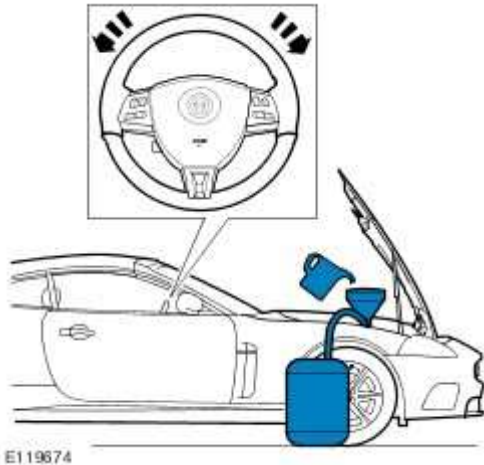
CAUTION: Do not allow the power steering fluid level in the power steering fluid reservoir to fall below the minimum power steering fluid level. Failure to follow this instruction may result in damage to the power steering system.



CAUTION: Make sure the engine is switched off as soon as the full 4 litres of power steering fluid has entered the power steering fluid reservoir.

Flush the power steering system.

- Start the engine
- With assistance turn the steering slowly lock to lock 3 times at approximately 1 revolution every 5 seconds.
- Continue to flush the power steering system until 4 litres of power steering fluid has been added to the power steering reservoir. This should take approximately 30 seconds.

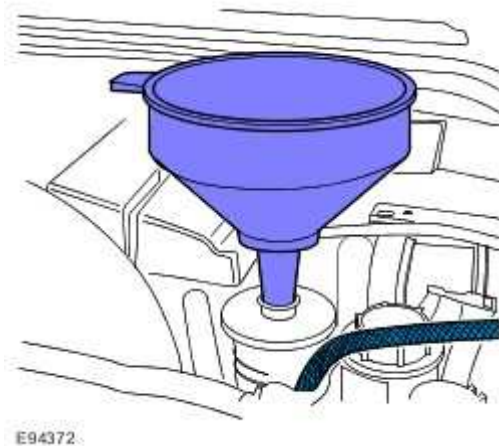


10.



CAUTION: Be prepared to collect escaping fluids.

Remove the suitable funnel.

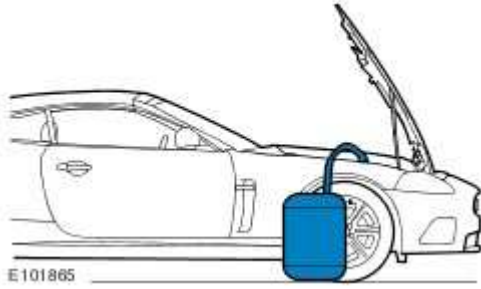


11.



CAUTION: Be prepared to collect escaping fluids.

Remove the suitable pipe to the power steering return hose.



12.



CAUTION: Be prepared to collect escaping fluids.

NOTE:

Note the orientation of the clip.

If a quick release coupling is fitted to the power steering return hose, connect the power steering fluid return hose to the coupling by installing the clip.

13. Install a new power steering fluid reservoir.

Steering System

The power steering system is a rack and pinion design, with an engine-driven pump providing the steering assistance. The system features variable steering assistance with vehicle speed and a variable ratio steering rack.

Absolute cleanliness must be observed when replenishing the fluid or dismantling any part of the system. New fluid from a sealed container must be used.

NOTE:

If the steering gear, pump or cooler are being replaced for leakage or noise related issues and there is no evidence of fluid contamination, there is no need to replace the reservoir.

In some cases where the fluid clearly contains particulate matter, and the system continues to function, flush the system with fresh fluid and replace the reservoir, as there is the possibility that the reservoir internal filter may be damaged or faulty.

Steering System

Inspection and Verification

- 1 . Verify the customer concern by driving the vehicle.
- 2 . Visually inspect for obvious signs of mechanical or electrical damage.

Mechanical Checks

- Incorrect tire pressure, loose wheel nuts, incorrect wheel alignment
- Loose tie-rods
- Loose damper and spring assemblies or ball joint
- Loose steering column shaft universal joints
- Loose pinch bolts on steering column shaft
- Loose steering gear assembly
- Check for external damage to the steering gear. Damaged tie-rods



CAUTION: If a steering gear assembly is returned under warranty with leaking seals, there is also damage to the steering gear boot/boots the steering gear warranty will be invalid. This is due to the steering gear seals being damaged due to foreign materials entering the steering gear boot and damaging the steering gear seals thereafter.

- Damaged steering gear boot
- Damaged accessory drive belt
- Binding or misaligned steering column, pump or steering gear
- Incorrect fluid level
- Hose leaks or line restrictions
- Hose fouling bodywork

Electrical Checks/Tests

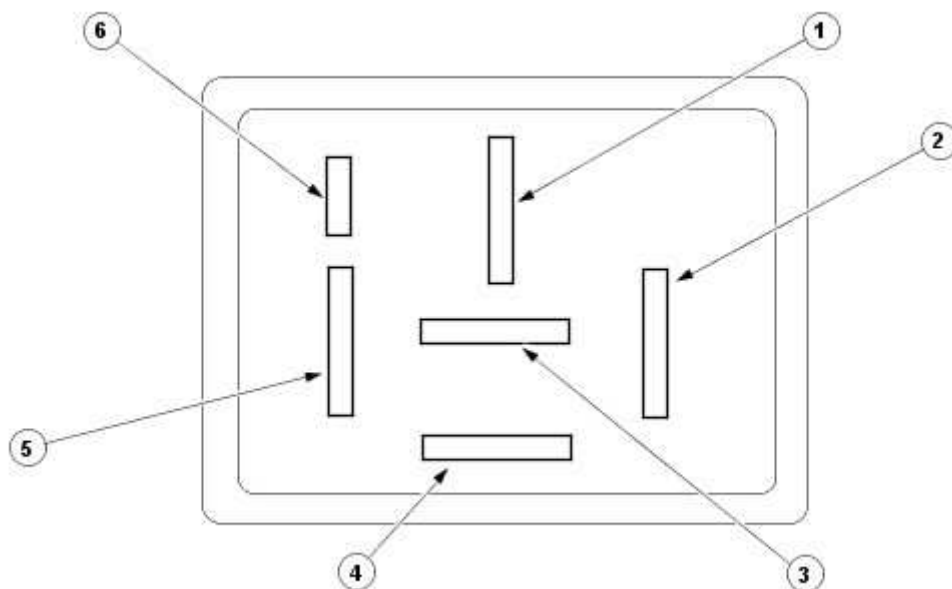
- Make sure all connectors are in place (steering gear Servotronic solenoid and steering control module (SCM) - if applicable)
- Make sure all the fuses are in place and not blown
- DISCONNECT the steering gear transducer and the steering should become heavy
- TEST electrical values: Power Supply to the SCM = 12 Volts Steering gear transducer resistance 7.0 to 7.5 Ohms is normal Steering gear transducer voltage = 6 Volts Steering gear transducer current = 840 mA at 0 mph reducing to 0 mA at maximum speed
- RECONNECT all electrical items disturbed during testing

3 . If an obvious cause for an observed or reported concern is found, correct the cause (if possible) before proceeding to the next step.

4 . Check the power steering fluid condition. For additional information, REFER to Power Steering Fluid Condition Check in this section.

5 . If the concern is not visually evident, verify the symptom and REFER to Steering Fault Diagnosis by Symptom Charts in this section.

Steering Relay Harness Connector



E39815

Item	Description

1	Steering transducer ground
2	Ignition feed
3	Steering transducer feed
4	Ground
5	Speed sensor signal
6	Serial interface

Steering Linkage Inspection and Backlash (Freeplay) Check



CAUTION: Steering gear boots must be handled carefully to avoid damage. Use new clamps when installing steering gear boots.

Inspect the boots for cuts, deterioration, twisting or distortion. Check the steering gear boots to make sure they are tight. Install new boots or clamps as necessary.

NOTE:

The following steps must be carried out with assistance.

- 1 . With the wheels in the straight ahead position, gently turn the steering wheel to the left and the right to check for free play.
- 2 . Free play should be between 0 and 6 mm (0 and 0.24 in) at the steering wheel rim. If the free play exceeds this limit, either the ball joints are worn, the lower steering column joints are worn or the backlash of the steering gear is excessive.



CAUTION: DO NOT attempt to adjust the steering gear yoke. Failure to follow this instruction will result in the steering gear warranty to become invalid.

- 3 . The backlash of the steering gear cannot be adjusted, install a new steering gear. For additional information, [<<211-02>>](#)

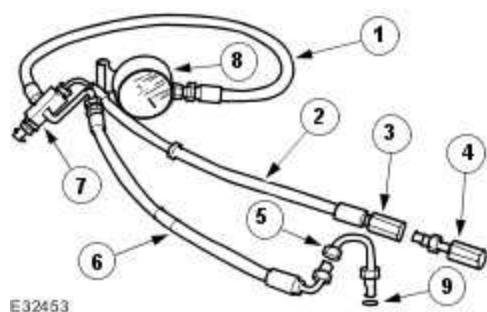
- 4 . Grasp the steering wheel firmly and move it up and down and to the left and right without turning the wheel to check for column bearing wear, steering wheel or steering column. For additional information, [<<211-04>>](#)

Power Steering Fluid Condition Check

- 1 . Run the engine for 2 minutes.
- 2 . Check the power steering fluid system level.
- 3 . Observe the color and the odor. The color under normal circumstances should be dark reddish, not brown or black.
- 4 . Allow the fluid to drip onto a facial tissue and examine the stain.
- 5 . If evidence of solid material is found, the power steering fluid system should be drained for further inspection.
- 6 . If fluid contamination or steering component failure is confirmed by the sediment in the power steering fluid system, REFER to Steering Fault Diagnosis by Symptom Charts in this section.

Power Steering Pressure Test

Test Equipment



Item	Special Tool Number	Description
1	211-011	Pressure Gauge Hose
2	211-011-08	Pump Return Hose
3	211-011-07	Pump Return Hose Connector
4	211-011-03/2	Test Equipment to High Pressure Hose Adaptor
5	211-011-03/1	Pump High Pressure Outlet to Hose Adaptor
6	211-011-02	Pump Adaptor to Control Valve Hose
7	211-011-01	Control Valve

8	211-011	Pressure Gauge
9	-	'O' Ring Seal

The measurement of the maximum system pressure, (which is governed by the pressure relief valve) is achieved by inserting the Service Tool (pressure gauge and adaptors) into the fluid circuit of the power steering system. Run the engine at idle speed, turn the steering from lock to lock and read the maximum pressure recorded on the gauge.

Installing Test Equipment

To install the pressure test equipment:

- Place a suitable drain tray below the power steering pump.
- Install a hose clamp on the reservoir to pump hose prior to disconnecting any hoses, to avoid unnecessary loss of fluid.
- Disconnect the hose from the power steering pump high pressure outlet.
- Install the pump outlet to hose adaptor (5). Do not omit the 'O' ring seal (9).
- Connect the power steering pump adaptor to control valve hose (6) of the test equipment.
- Install the adaptor (4) in the high pressure hose previously removed from the power steering pump outlet.
- Connect the connector (3) of the test equipment hose (2) to the adaptor (4).
- Remove the hose clamp from the reservoir hose.
- Start the engine.

With the control valve (7) OPEN and the engine idling, the following system pressures may be checked:

- During turning.
- When the steering is held on full lock.
- With the steering at rest.



CAUTION: To avoid excessive heating of the power steering pump, do not close the valve for longer than 5 seconds maximum.



CAUTION: Do not drive the vehicle with the test equipment installed.

With the control valve (7) CLOSED the power steering pump maximum output pressure can be checked.

Removing Test Equipment

To remove the test equipment:

- Install a hose clamp on the reservoir to power steering pump hose.

- Removing the test equipment is a reversal of the installation instructions.
- Install a new 'O' ring seal (9) to the power steering pump high pressure outlet to hose connection.
- Install the original hose to the power steering pump.
- Remove the clamp from the reservoir to the power steering pump hose.
- Top-up the reservoir fluid.
- Bleed the power steering system. For additional information, [Power Steering System Bleeding \(57.15.02 \)](#)

Steering Fault Diagnosis by Symptom Charts


Leakage

Condition	Possible Sources	Action
<ul style="list-style-type: none"> • Fluid leakage 	Confirm the position of the fluid leak.	<ul style="list-style-type: none"> • CLEAN the area of the leak. • Inspect the area and confirm the exact position of leak. • Make sure the fluid is not from another system on the vehicle.
	<ul style="list-style-type: none"> • Overfilled system. 	<ul style="list-style-type: none"> • CORRECT the fluid level as necessary.
	<ul style="list-style-type: none"> • Component leak. 	<p>NOTE:</p> <p>Record the position of the leak and some indication of the rate of the leak on the Warranty Return Record Sheet.</p> <ul style="list-style-type: none"> • LOCATE the suspect component or CHECK hose connections and repair as necessary.
	<ul style="list-style-type: none"> • Damaged fluid cap. 	<ul style="list-style-type: none"> • INSTALL a new fluid cap.
	<ul style="list-style-type: none"> • Loose or damaged hose fittings. 	<ul style="list-style-type: none"> • TIGHTEN or INSTALL a new hose as necessary.
	<ul style="list-style-type: none"> • Leakage at power steering pump. 	<ul style="list-style-type: none"> • INSTALL a new power steering pump as necessary. For additional information, <<211-02>>
<ul style="list-style-type: none"> • Fluid leakage 	<ul style="list-style-type: none"> • Leakage at steering hose to steering gear connection. 	<ul style="list-style-type: none"> • CHECK steering hose to steering gear connection for leakage. CHECK and TIGHTEN the steering hose to steering gear connection retaining bolts/bolts as

		necessary.
	<ul style="list-style-type: none"> Power steering fluid leakage at O-ring seals. 	<ul style="list-style-type: none"> CHECK the power steering system for signs of steering fluid loss from O-ring seals. INSTALL new O-ring seals as necessary. BLEED the power steering system. For additional information, <<211-00>>
	<ul style="list-style-type: none"> Power steering fluid leakage from transfer pipes. 	<ul style="list-style-type: none"> CHECK the power steering system for signs of steering fluid loss from the transfer pipes. CHECK and TIGHTEN the transfer pipes if required, INSTALL new transfer pipes as necessary. BLEED the power steering system. For additional information, <<211-00>>
	<ul style="list-style-type: none"> Power steering fluid leakage from the steering gear. 	<ul style="list-style-type: none"> CHECK the power steering gear for signs of fluid loss. INSTALL a new steering gear as necessary. For additional information, <<211-02>>
	<ul style="list-style-type: none"> Power steering fluid leakage from steering gear boot. 	<ul style="list-style-type: none"> CHECK the power steering gear for signs of fluid loss. INSTALL a new steering gear as necessary. For additional information, <<211-02>>

Functional

Condition	Possible Sources	Action
<ul style="list-style-type: none"> Free play at steering wheel 	<ul style="list-style-type: none"> Excess play in the steering linkage. 	<ul style="list-style-type: none"> CHECK the steering linkage for excess play. For additional information, REFER to the Steering Linkage Inspection and Backlash (Freeplay) Check in this section.
	<ul style="list-style-type: none"> Steering wheel loose. 	<ul style="list-style-type: none"> CHECK and TIGHTEN the steering wheel retaining bolt/bolts as necessary. For additional information, <<211-04>>

	<ul style="list-style-type: none"> Lower steering column pinch bolt loose. 	<ul style="list-style-type: none"> CHECK and TIGHTEN the lower steering column pinch bolts as necessary. For additional information, <<211-04>>
	<ul style="list-style-type: none"> Excessive wear in lower steering column. 	<ul style="list-style-type: none"> CHECK for lower steering column for wear in the universal joints. If wear is present, INSTALL a new lower steering column as necessary.
	<ul style="list-style-type: none"> Wear in suspension joints. 	<div>  CAUTION: DO NOT attempt to adjust the steering gear yoke. Failure to follow this instruction will result in the steering gear warranty to become invalid. </div> <ul style="list-style-type: none"> CHECK for excess wear in the front suspension joints. For additional information, <<204-00>>
<ul style="list-style-type: none"> Vehicle wanders from side to side on the road, when the vehicle is driven straight ahead and the steering wheel is held in a firm position 	<ul style="list-style-type: none"> Incorrect tire pressure or tire size. 	<ul style="list-style-type: none"> CHECK and ADJUST the tire pressure. For additional information, <<204-04>> INSTALL a new tire as necessary. For additional information, <<204-04>>
	<ul style="list-style-type: none"> Vehicle is unevenly or excessively loaded. 	<ul style="list-style-type: none"> ADJUST the load evenly.
	<ul style="list-style-type: none"> Loose/worn tie-rods. 	<ul style="list-style-type: none"> INSTALL a new tie-rod end. For additional information, <<211-03>>
	<ul style="list-style-type: none"> Steering gear bolts loose or damaged. 	<ul style="list-style-type: none"> TIGHTEN or INSTALL new bolts.
	<ul style="list-style-type: none"> Loose or worn suspension ball joint(s). 	<ul style="list-style-type: none"> INSTALL a new suspension ball joint assembly. For additional information, <<204-01>>
	<ul style="list-style-type: none"> Steering column 	<ul style="list-style-type: none"> TIGHTEN the steering column

	universal joint pinch bolt loose.	universal joint pinch bolt. For additional information, <<211-04>>
	<ul style="list-style-type: none"> Incorrect toe adjustment. 	<ul style="list-style-type: none"> ADJUST as necessary. For additional information, <<204-00>>
	<ul style="list-style-type: none"> Loose or worn rear suspension. 	<ul style="list-style-type: none"> TIGHTEN loose, or INSTALL new rear suspension components. For additional information, <<204-02>>
<ul style="list-style-type: none"> Vehicle tends to pull to one side when driven on a level surface 	<ul style="list-style-type: none"> Incorrect tire pressure. Incorrect tire size or different tire/tread type. Uneven tire wear 	<ul style="list-style-type: none"> CHECK and ADJUST the tire pressure. For additional information, <<204-04>> INSTALL a new tire as necessary. For additional information, <<204-04>>
	<ul style="list-style-type: none"> Vehicle is unevenly loaded or overloaded. 	<ul style="list-style-type: none"> Adjust the load.
	<ul style="list-style-type: none"> Incorrect toe adjustment. 	<ul style="list-style-type: none"> ADJUST as necessary. For additional information, <<204-00>>
	<ul style="list-style-type: none"> Damaged front suspension components. 	<ul style="list-style-type: none"> INSTALL new front suspension components as necessary. For additional information, <<204-01>>
	<ul style="list-style-type: none"> Damaged rear suspension components. 	<ul style="list-style-type: none"> INSTALL new rear suspension components as necessary. For additional information, <<204-02>>
	<ul style="list-style-type: none"> Steering gear valve effort out of balance. 	<ul style="list-style-type: none"> SHIFT the transmission into NEUTRAL while driving at no more than 30 miles/hour (50 km/h) and turn the ignition to position I (engine OFF-coasting). If the vehicle does not pull with the engine off, INSTALL a new steering gear. For additional information, <<211-02>>

		<ul style="list-style-type: none"> If the vehicle does drift with the engine off, CROSS SWITCH front wheel assemblies. If the vehicle pulls to the opposite side, SWITCH wheels that were on the rear to the same side on the front. If the vehicle pull direction is not changed, CHECK the front suspension components and toe adjustments. For additional information, <<204-01>>
	<ul style="list-style-type: none"> Check the front and rear brakes for correct operation. 	<ul style="list-style-type: none"> ADJUST as necessary. For additional information, <<206-00>>
	<ul style="list-style-type: none"> Check for bent rear suspension components and for damaged coil springs in the front suspension. 	<ul style="list-style-type: none"> INSTALL new rear suspension components as necessary. For additional information, <<204-02>> INSTALL new front suspension components as necessary. For additional information, <<204-01>>
	<ul style="list-style-type: none"> Check the rear suspension for loose or worn suspension components. 	<ul style="list-style-type: none"> TIGHTEN or INSTALL new components as necessary. For additional information, <<204-02>>
	<ul style="list-style-type: none"> Incorrect underbody alignment. 	<ul style="list-style-type: none"> CHECK underbody alignment. For additional information, <<502-00>>
<ul style="list-style-type: none"> Poor returnability of the steering 	<ul style="list-style-type: none"> Lower steering column interference. 	<ul style="list-style-type: none"> CHECK the steering column is free from interference from the engine harness, sound proofing or the floor covering.
	<ul style="list-style-type: none"> Incorrect tire pressure. 	<ul style="list-style-type: none"> CHECK and ADJUST the tire pressure. For additional information, <<204-04>>
	<ul style="list-style-type: none"> Incorrect tire size or type. 	<ul style="list-style-type: none"> INSTALL a new tire as necessary. For additional information, <<204-04>>

	<ul style="list-style-type: none"> Steering column upper shroud fouling on the steering wheel. 	<ul style="list-style-type: none"> CHECK steering column upper shroud for fouling. ADJUST as necessary.
	<ul style="list-style-type: none"> Steering column universal joints binding. 	<ul style="list-style-type: none"> INSTALL a new steering column. For additional information, <<211-04>>
	<ul style="list-style-type: none"> Steering column shaft floor seal binding. 	<ul style="list-style-type: none"> CHECK the steering column shaft floor seal for correct fitment and REFIT as necessary.
	<ul style="list-style-type: none"> Steering column shaft floor seal may be torn. 	<ul style="list-style-type: none"> INSTALL a new steering column shaft floor seal as necessary.
	<ul style="list-style-type: none"> Binding or damaged tie-rods. 	<ul style="list-style-type: none"> CHECK tie-rod end for excessive wear or tightness in ball joint. INSTALL a new tie-rod end. For additional information, <<211-03>>
	<ul style="list-style-type: none"> Damaged or worn front suspension components. 	<ul style="list-style-type: none"> INSTALL new front suspension components as necessary. For additional information, <<204-01>>
	<ul style="list-style-type: none"> Incorrect toe adjustment. 	<ul style="list-style-type: none"> ADJUST as necessary. For additional information, <<204-00>>
<ul style="list-style-type: none"> Excessive steering efforts required during low speed manoeuvring and/or during parking manoeuvres 	<ul style="list-style-type: none"> Low power steering fluid. 	<ul style="list-style-type: none"> CHECK steering system for signs of steering fluid loss. BLEED the power steering system. For additional information, <<211-00>>
	<ul style="list-style-type: none"> Damaged accessory drive belt tensioner. 	<ul style="list-style-type: none"> INSTALL a new accessory drive belt tensioner.
	<ul style="list-style-type: none"> Hose or cooler line restriction. 	<ul style="list-style-type: none"> CHECK hose or cooler lines for correct routing. INSTALL a new hose as necessary.

	<ul style="list-style-type: none"> Fluid aeration. 	<ul style="list-style-type: none"> BLEED the system. For additional information,
	<ul style="list-style-type: none"> Steering transducer not closed - no feed voltage. 	<ul style="list-style-type: none"> CHECK the steering transducer circuit. For additional information, REFER to the wiring diagrams. Carry out the electrical checks and tests. For additional information, REFER to the Electrical Checks and Tests in this section.
	<ul style="list-style-type: none"> Steering transducer not closed - cable fault. 	<ul style="list-style-type: none"> CHECK the steering transducer circuit. For additional information, REFER to the wiring diagrams. Carry out the electrical checks and tests. For additional information, REFER to the Electrical Checks and Tests in this section.
	<ul style="list-style-type: none"> Steering control module (SCM) defective. 	<ul style="list-style-type: none"> CHECK the SCM and INSTALL a new SCM as necessary.
	<ul style="list-style-type: none"> Power steering fluid delivery pressure or flow too low. 	<ul style="list-style-type: none"> CHECK the power steering pressure. For additional information, REFER to the Power Steering Pressure Test in this section. INSTALL a new power steering pump as necessary. For additional information, <<211-02>>
	<ul style="list-style-type: none"> Internal steering gear leakage. 	<ul style="list-style-type: none"> CHECK the power steering pressure. For additional information, REFER to the Power Steering Pressure Test in this section. INSTALL a new steering gear as necessary. For additional information, <<211-02>>
<ul style="list-style-type: none"> Steering operation is very heavy when 	<ul style="list-style-type: none"> Steering transducer 	<ul style="list-style-type: none"> CHECK steering transducer and INSTALL a new steering

driving, but when stationary manoeuvring is good	open early.	transducer as necessary. <ul style="list-style-type: none"> Carry out the electrical checks and tests. For additional information, REFER to the Electrical Checks and Tests in this section.
	<ul style="list-style-type: none"> Steering transducer open early, steering control module (SCM) fault. 	<ul style="list-style-type: none"> CHECK SCM and INSTALL a new SCM as necessary.
	<ul style="list-style-type: none"> Steering transducer open early, speedo signal error. 	<ul style="list-style-type: none"> CHECK speedo circuit. For additional information, REFER to the wiring diagrams.
<ul style="list-style-type: none"> Steering operation is very light when driving, but when stationary manoeuvring is good 	<ul style="list-style-type: none"> Steering transducer not open, (no power steering fluid flow). 	<ul style="list-style-type: none"> CHECK the power steering fluid condition. For additional information, REFER to the Power Steering Fluid condition check in this section.
	<ul style="list-style-type: none"> Steering transducer not open, steering control module (SCM) fault. 	<ul style="list-style-type: none"> CHECK the SCM and INSTALL a new SCM as necessary. Carry out the electrical checks and tests. For additional information, REFER to the Electrical Checks and Tests in this section.
	<ul style="list-style-type: none"> Steering transducer not open, speedo signal error. 	<ul style="list-style-type: none"> CHECK the speedo circuit. For additional information, REFER to the wiring diagrams.
	<ul style="list-style-type: none"> CHECK the power steering fluid low pressure pipe for restricted flow. 	<ul style="list-style-type: none"> INSTALL a new power steering fluid low pressure pipe.
<ul style="list-style-type: none"> Steering heavy operation during rapid manoeuvring 	<ul style="list-style-type: none"> Air in power steering system. 	<ul style="list-style-type: none"> CHECK for an air leak into the power steering system and repair as necessary. BLEED the power steering system. For additional information, Power Steering System Bleeding (57.15.02)

	<ul style="list-style-type: none"> Fluid loss at the power steering pump shaft seal. 	<ul style="list-style-type: none"> CHECK the power steering pump for signs of steering fluid loss. INSTALL a new power steering pump as necessary. For additional information, <<211-02>>
	<ul style="list-style-type: none"> Power steering fluid delivery pressure or flow too low. 	<ul style="list-style-type: none"> CHECK the power steering pump for signs of steering fluid loss. CHECK the power steering pressure. For additional information, REFER to the Power Steering Pressure Test in this section. INSTALL a new power steering pump as necessary. For additional information, <<211-02>>
<ul style="list-style-type: none"> Steering heavy operation in one direction 	<ul style="list-style-type: none"> Lower steering column interference. 	<ul style="list-style-type: none"> CHECK the steering column is free from interference from the engine harness, sound proofing or the floor covering.
	<ul style="list-style-type: none"> Incorrect steering geometry. 	<ul style="list-style-type: none"> CHECK the front wheel alignment. For additional information, <<204-00>>
	<ul style="list-style-type: none"> Faulty rotary valve/seal. 	<ul style="list-style-type: none"> CHECK the power steering pressure. For additional information, REFER to the Power Steering Pressure Test in this section. INSTALL a new steering gear as necessary. For additional information, <<211-02>>
	<ul style="list-style-type: none"> Tire fouling on the wheel arch liner. 	<ul style="list-style-type: none"> CHECK for clearance between the tire and the wheel arch liner. Remove and refit the wheel arch liner or INSTALL a new wheel arch liner as necessary.
<ul style="list-style-type: none"> Steering heavy operation in both 	<ul style="list-style-type: none"> Low power steering fluid. 	<ul style="list-style-type: none"> CHECK steering system for signs of steering fluid loss. BLEED the power steering

directions		system. For additional information, <<211-00>>
	<ul style="list-style-type: none"> Air in power steering system. 	<ul style="list-style-type: none"> CHECK the power steering pump for signs of steering fluid loss. INSTALL a new power steering pump as necessary. For additional information, <<211-02>>
	<ul style="list-style-type: none"> Fluid loss at the power steering pump shaft seal. 	<ul style="list-style-type: none"> CHECK the power steering pump for signs of steering fluid loss. INSTALL a new power steering pump as necessary. For additional information, <<211-02>>
	<ul style="list-style-type: none"> Power steering fluid delivery pressure or flow too low. 	<ul style="list-style-type: none"> CHECK the power steering pump for signs of steering fluid loss. CHECK the power steering pressure. For additional information, REFER to the Power Steering Pressure Test in this section. INSTALL a new power steering pump as necessary. For additional information, <<211-02>>
<ul style="list-style-type: none"> Steering operation varies from heavy to light when driving at constant speed 	<ul style="list-style-type: none"> Lower steering column interference. 	<ul style="list-style-type: none"> CHECK the steering column is free from interference from the engine harness, sound proofing or the floor covering.
	<ul style="list-style-type: none"> Incorrect speedometer signal. 	<ul style="list-style-type: none"> CHECK the speedo circuit. For additional information, refer to the wiring diagrams.
	<ul style="list-style-type: none"> Steering transducer cable/connection faulty or grounded. 	<ul style="list-style-type: none"> CHECK the steering transducer circuit. For additional information, refer to the wiring diagrams. Carry out the electrical checks and tests. For additional information, REFER to the Electrical Checks and Tests in

		this section.
<ul style="list-style-type: none"> Steering wheel varies from light to heavy two times per revolution 	<ul style="list-style-type: none"> Lower steering column interference. 	<ul style="list-style-type: none"> CHECK the steering column is free from interference from the engine harness, sound proofing or the floor covering.
	<ul style="list-style-type: none"> Steering column universal joints binding. 	<ul style="list-style-type: none"> INSTALL a new steering column. For additional information, <<211-04>>
	<ul style="list-style-type: none"> Seized or damaged steering components. 	<ul style="list-style-type: none"> CHECK for wear or failure of suspension bushes and ball joints. For additional information, <<204-00>>


Noise


Condition	Possible Sources	Action
<ul style="list-style-type: none"> Accessory drive belt squeal 	<ul style="list-style-type: none"> Incorrect accessory drive belt tension or accessory drive belt glazed. 	<ul style="list-style-type: none"> CHECK accessory drive belt condition and INSTALL a new accessory drive belt as necessary. For additional information, <<303-05>>
<ul style="list-style-type: none"> Chirp noise in the steering pump 	<ul style="list-style-type: none"> Loose or worn accessory drive belt. 	<ul style="list-style-type: none"> CHECK accessory drive belt condition and INSTALL a new accessory drive belt as necessary. For additional information, <<303-05>>
<ul style="list-style-type: none"> Power steering pump noisy 	<ul style="list-style-type: none"> Low power steering fluid. 	<ul style="list-style-type: none"> CHECK steering system for signs of steering fluid loss. BLEED the power steering system. For additional information, <<211-00>>
	<ul style="list-style-type: none"> Power steering pump worn or otherwise defective. 	<ul style="list-style-type: none"> CHECK for leaks. REPAIR as necessary. CHECK the power steering pressure. For additional information, REFER to the Power Steering Pressure Test in this section. INSTALL a new power steering pump as necessary. For

		additional information, <<211-02>>
<ul style="list-style-type: none"> Whine type noise 	<ul style="list-style-type: none"> Aerated fluid. 	<ul style="list-style-type: none"> BLEED the power steering system. For additional information, Power Steering System Bleeding (57.15.02)
	<ul style="list-style-type: none"> Power steering pump. 	<ul style="list-style-type: none"> CHECK for leaks. REPAIR as necessary. INSTALL a new power steering pump as necessary. For additional information, <<211-02>>
<ul style="list-style-type: none"> Noise during steering gear movement 	<ul style="list-style-type: none"> Low power steering fluid. 	<ul style="list-style-type: none"> CHECK steering system for signs of steering fluid loss. BLEED the power steering system. For additional information, <<211-00>>
	<ul style="list-style-type: none"> Water contamination to the power steering fluid. 	<ul style="list-style-type: none"> DRAIN the power steering system. BLEED the power steering system. For additional information, <<211-00>>
	<ul style="list-style-type: none"> Cavitation due to restricted power steering feed hose. 	<ul style="list-style-type: none"> CHECK and reposition power steering feed hoses and INSTALL new hoses as necessary.
<ul style="list-style-type: none"> Continuous noise 	<ul style="list-style-type: none"> Low power steering fluid. 	<ul style="list-style-type: none"> CHECK steering system for signs of steering fluid loss. BLEED the power steering system. For additional information, <<211-00>>
	<ul style="list-style-type: none"> Power steering pump drive loose. 	<ul style="list-style-type: none"> CHECK power steering coupling and power steering pump. INSTALL a new power steering coupling or power steering pump as necessary. For additional information, <<211-02>>
	<ul style="list-style-type: none"> Incorrect accessory 	<ul style="list-style-type: none"> CHECK accessory drive belt

	drive belt tension or accessory drive belt glazed.	condition and INSTALL a new accessory drive belt as necessary. For additional information, <<303-05>>
	<ul style="list-style-type: none"> Power steering pump drive pulley loose. 	<ul style="list-style-type: none"> CHECK and TIGHTEN the power steering pump drive pulley retaining bolts as necessary. For additional information, <<303-03>>
	<ul style="list-style-type: none"> Power steering pump retaining bolts loose. 	<ul style="list-style-type: none"> CHECK the power steering pump retaining bolts and TIGHTEN as necessary.
	<ul style="list-style-type: none"> Power steering hose/pipe in contact with the vehicles body. 	<ul style="list-style-type: none"> CHECK and reposition power steering hoses/pipes, INSTALL new hoses/pipes as necessary.
	<ul style="list-style-type: none"> Power steering hose restricted/twisted. 	<ul style="list-style-type: none"> CHECK and reposition power steering hose, replace hose as necessary.

Vibration

Condition	Possible Sources	Action
<ul style="list-style-type: none"> Feedback (knocking noises in the steering gear) - condition where roughness is felt in the steering wheel by the driver when the vehicle is driven over rough surfaces 	<ul style="list-style-type: none"> Loose/worn tie-rods. 	<ul style="list-style-type: none"> INSTALL a new tie-rod end. For additional information, <<211-03>>
	<ul style="list-style-type: none"> Steering gear retaining bolts loose or damaged. 	<p> CAUTION: DO NOT attempt to adjust the steering gear yoke. Failure to follow this instruction will result in the steering gear warranty to become invalid.</p> <ul style="list-style-type: none"> CHECK and TIGHTEN the steering gear retaining bolts. INSTALL new retaining bolts as necessary. For additional information, <<211-02>>

	<ul style="list-style-type: none"> Loose suspension bushing, bolts or ball joints. 	<ul style="list-style-type: none"> TIGHTEN or INSTALL new components as necessary. For additional information, <<204-01>>
	<ul style="list-style-type: none"> Steering column retaining bolts loose. 	 <p>CAUTION: DO NOT attempt to adjust the steering gear yoke. Failure to follow this instruction will result in the steering gear warranty to become invalid.</p> <ul style="list-style-type: none"> CHECK and TIGHTEN the steering column retaining bolts/nuts and pinch bolts if required. For additional information, <<211-04>>
	<ul style="list-style-type: none"> Excessive wear in steering column assembly. 	<ul style="list-style-type: none"> CHECK for steering column for wear in the universal joints and bearings. If wear is present, INSTALL a new steering column as necessary. For additional information, <<211-04>>
<ul style="list-style-type: none"> Nibble (Shimmy) Oscillation of the steering wheel (not vertical which is SHAKE). This is driven by road wheel imbalance. 	<ul style="list-style-type: none"> Road wheel imbalance. 	<ul style="list-style-type: none"> CHECK for road wheel imbalance. CHECK for relevant SERVICE BULLETINS/SERVICE ACTIONS for the vehicle on Jaguar Communications Online (JCOL) or in hard copy form.
	<ul style="list-style-type: none"> Steering wheel replacement. 	<ul style="list-style-type: none"> CHECK for relevant SERVICE BULLETINS/SERVICE ACTIONS for the vehicle on Jaguar Communications Online (JCOL) or in hard copy form.
	<ul style="list-style-type: none"> Rack replacement. 	<ul style="list-style-type: none"> CHECK for relevant SERVICE BULLETINS/SERVICE ACTIONS for the vehicle on Jaguar Communications Online (JCOL) or in hard copy form.

Description of General Steering System Noises

Boom

Rhythmic sound like a drum roll or distant thunder. May cause pressure on the ear drum.

Buzz

Low-pitched sound, like a bee. Usually associated with vibrations.

Chatter

Rapidly repeating metallic sound.

Chuckle

Rapid noise that sounds like a stick against the spokes of a spinning bicycle wheel.

Chirp

High pitched rapidly repeating sound, like chirping birds.

Click

Light sound, like a ball point pen being clicked.

Click/Thump

Heavy metal-to-metal sound, like a hammer striking steel.

Grind

Abrasive sound, like a grinding wheel or sandpaper rubbing against wood.

Groan/Moan

Continuous, low-pitched humming sound.

Groan/Howl

Low, guttural sound, like an angry dog.

Hiss

Continuous sound like air escaping from a tire valve.

Hum

Continuous sound of varying frequencies, like a wire humming in the wind.

Knock

Heavy, loud repeating sound like a knock on a door.

Ping

Similar to knock, except at higher frequency.

Rattle

A sound suggesting looseness, such as marbles rolling around in a can.

Roar

Deep, long, prolonged sound like an animal, or winds and ocean waves.

Rumble

Low, heavy continuous sound like that made by wagons or thunder.

Scrape

Grating noise like one hard plastic rubbing part rubbing against another.

Squeak

High-pitched sound like rubbing a clean window.

Squeal

Continuous, high-pitched sound like running finger nails across a chalkboard.

Tap

Light, hammering sound like tapping pencil on edge of table. May be rhythmic or intermittent.

Weep

Continuous mid-range sound (lower frequency than squeal, higher frequency than groan).

Whir/Whine

High-pitched buzzing sound, like an electric motor or drill.

Whistle

Sharp, shrill sound, like wind passing a small opening.

Description of Specific Steering System Noise Types

Belt Squeal

Belt squeal is a high frequency air-borne noise generated by slippage of the ribbed Vee belt on the power steering pump pulley. Squeal increases with system loading and at the end of lock.

Clonk

Clonk is a structure-borne noise heard as a loose-sounding rattle or vibration coming from the steering column. Clonk can be identified by driving and turning over cobblestones, rough roads, or high frequency bumps such as 25-50 mm tall tar strips. Clonk requires a tie-rod load impact.

Column Knock

Column knock is a loose-sounding rattle or vibration generated by the steering column shaft contacting other portions of the column assembly. The noise is both audible and tactile. Column knock is generated by driving over cobblestones or rough pavement. It is not necessary to turn the steering wheel to create this noise.

Column Rattle

Column rattle is a metallic sounding noise created when applying a highly impulsive force to the steering wheel. Column rattle is often used to combine the more general group of column noises including clonk and column knock. Column rattle noises can be caused by clonk, knock, loose column components, bonus parts etc. A series of parked, straight-line driving, and cornering test should be carried out to isolate the source/sources.

Grinding/Scrape

Grinding is a low frequency noise in the column when the steering wheel is turned. Is generally caused by interference between moving components such as the steering wheel to steering column shroud.

Grunt (Squawk)

Grunt is a "honking" sound elicited when coming off one of the steering stops. Grunt is generally excited during parking manoeuvres with a low to medium speed steering input.

Hiss (Swish)

Hiss or Valve Hiss is a high-frequency sound coming from the steering gear when the system is loaded. It is a rushing or "swish" noise that doesn't change frequency with RPM. Hiss is the general noise generated by the flow of hydraulic fluid through restrictions in the steering system. Restrictions include the rotary steering valve, power steering tubes, connectors, tuning orifices, etc. Hiss can be air-borne and structure-borne, but the structure-borne path through the steering intermediate shaft is usually dominant.

Moan (Groan)

Moan is the general structure-borne noise of the steering system. Moan is primarily transmitted to the driver via the body structure through the pump mount, engine mounts, power steering lines and power steering brackets. On some vehicles, moan is a load humming noise, often present when the wheel is turned and the system is loaded. It may change frequency with engine RPM and if the system is loaded or unloaded.

Rack Knock (Rack Slap)



CAUTION: DO NOT attempt to adjust the steering gear yoke. Failure to follow this instruction will result in the steering gear warranty to become invalid.

Rack Knock is a rattle sound and steering wheel vibration caused by separation of the steering gear and pinion while driving over bumps. It is a structure-borne noise transmitted through the intermediate shaft and column. Rack knock can also be heard as a "thump" or impact noise that occurs with the vehicle stationary when the steering wheel is released from a loaded position and allowed to return to rest. Noise occurs with the engine on or off.

Rattles

Rattles are noises caused by knocking or hitting with components in the steering system. Steering rattles can occur in the engine compartment, the suspension, or the passenger compartment. Rattles can be caused by loose parts, movable and flexible parts, and improper clearances.

Squeaks/Scrapes

Squeaks/Scrapes are noises due to friction or component rubbing anywhere in the steering system. Squeaks/Scrapes have appeared in steering linkages and joints, in column components and in column and steering wheel trim parts.

Weep

Weep is an air-borne noise, occasionally generated when turning the steering across lock at a constant rate. When present on a vehicle the noise, once initiated can often be maintained across a large proportion of the available steering movement.

Whistle

Whistle is similar to hiss but is louder and of a higher frequency. It is also more of a pure tone noise than hiss. Whistle is air-borne and is generated by a high flow rate of hydraulic fluid through a small restriction.

Zip

Zip noise is the air-borne noise generated by power steering pump cavitation when power steering fluid does not flow freely through the suction hose from the reservoir to the pump. Zip primarily occurs during cold weather at start-up.

Steering System Vibrations and Harshness

Buzz

Buzz is a tactile rotary vibration felt in the steering wheel for slow steering inputs. Buzz can also be called a grinding feel and it is closely related to grunt and is caused by high system gain with low damping. Buzz is generally excited during parking manoeuvres with low to medium speed steering input.

Buzz (Electrical)

A different steering buzz can be caused by pulse width modulated (PWM) electric actuators used in variable assist steering systems. This buzz is felt by turning the ignition key to run without starting the engine and holding onto the steering wheel. In extreme cases, the buzz can be felt with the engine running also.

Column/Steering Wheel Shake

Column shake is a low frequency vertical vibration excited by primary engine vibrations.

Nibble (Shimmy)

Steering nibble is a rotary oscillation or vibration of the steering wheel, which can be excited at a specific vehicle speed. Nibble is driven by wheel and tire imbalance exciting a suspension recession mode, which then translates into steering gear travel and finally steering wheel nibble.

Shudder (Judder)

Shudder is a low frequency oscillation of the entire steering system (tire, wheels, steering gear and linkage, etc.) when the vehicle is steered during static-park or at low speeds. Shudder is very dependent on road surface.

Torque Ripple

Torque ripple is a concern with Electric Power Steering (EPS) systems. Torque ripple is most evident at static-park steering the wheel very slowly from lock to lock. Torque ripple is primarily caused by motor commutation.

Torque/Velocity Variation (Phasing/Effort Cycling)

Steering wheel torque variation occurring twice in one revolution is normally as a result of problems with the lower steering column (intermediate shaft), but foul conditions generally result in either constant stiffness or single point stiffness. Depending upon the orientation of the joints, the steering can feel asymmetric (torque falling off in one direction and rising in the other) or else it can simply have pronounced peaks and troughs as the steering moves from lock to lock.

Wheel Fight (Kick Back)

Wheel fight is excess feedback of sudden road forces through the steering system and back to the driver. It is evaluated at all vehicle speeds over cobblestones, rough roads, and potholes. The tires, wheels, and suspension generate forces into the steering systems. Steering friction, hydraulic damping, hydraulic compliance, mechanical compliance, steering ratio, and assist gain all affect how much is transmitted to the driver.

Steering Linkage



CAUTION: Steering gear boots must be handled carefully to avoid damage. Use new clamps when installing steering gear boots.

Inspect the boots for cuts, deterioration, twisting or distortion. Check the steering gear boots to make sure they are tight. Install new boots or clamps as necessary.

NOTE:

The following steps must be carried out with assistance.

- 1 . With the wheels in the straight ahead position, gently turn the steering wheel to the left and the right to check for free play.
- 2 . Free play should be between 0 and 6 mm (0 and 0.24 in) at the steering wheel rim. If the free play exceeds this limit, either the ball joints are worn, the lower steering column joints are worn or the backlash of the steering gear is excessive.
- 3 .



CAUTION: DO NOT attempt to adjust the steering gear yoke. Failure to follow this instruction will result in the steering gear warranty to become invalid.

The backlash of the steering gear cannot be adjusted, install a new steering gear. For additional information, [<<211-02>>](#)

4 . Grasp the steering wheel firmly and move it up and down and to the left and right without turning the wheel to check for column bearing wear, steering wheel or steering column. For additional information, [<<211-04>>](#)

211-02 : Power Steering

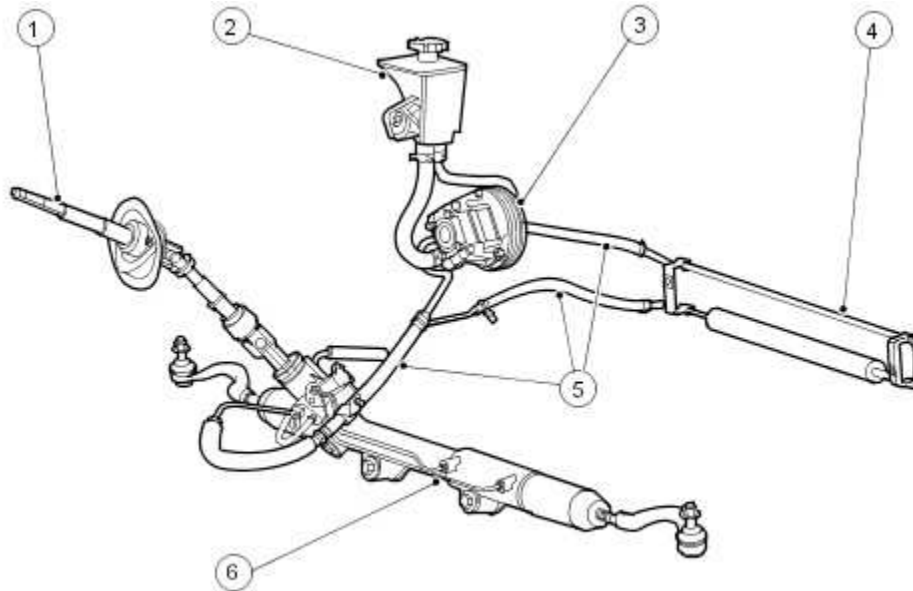
Specifications

Specifications

Torque Specifications

Description	Nm	lb-ft	lb-in
Power steering fluid cooler retaining bolts	7	-	62
Power steering pump retaining bolts	25	18	-
Lower steering column slider pinch bolt	30	22	-
Lower steering column to steering gear pinch bolt	30	22	-
Steering gear retaining bolts	100	74	-
Power steering pump supply line - vehicles with petrol engines	15	11	-
Power steering pump supply line - vehicles with 2.7L diesel engine	22	16	-
Power steering control valve actuator retaining bolt	2	-	18
Steering gear supply and return lines retaining bolt	10	7	-
Power steering fluid reservoir retaining bolts	10	7	-

Power Steering



E30165

Item	Part Number	Description
1	—	Lower steering column
2	—	Power steering fluid reservoir
3	—	Power steering pump
4	—	Power steering fluid cooler
5	—	Power steering lines
6	—	Steering gear

The vehicle uses a rack and pinion type, variable ratio steering gear with speed proportional servotronic. The power steering pump is belt driven on all model variants and the power steering oil cooler is of a tube and fin type and is mounted to the front of the cooling pack.

A variable steering rack ratio reduces the amount of turns from lock to lock to improve parking maneuvers without losing any steering feel at higher speeds.

The steering assistance decreases smoothly at a calibrated rate to increase the steering efforts required as vehicle speed increases. The steering efforts are controlled by the actuator position, which in turn is controlled electronically by the speed proportional servotronic curve which is incorporated within the Generic Electronic Module (GEM).

Absolute cleanliness must be observed when replenishing the fluid or dismantling any part of the system. New fluid from a sealed container must be used.

NOTE:

If the steering gear, pump or cooler are being replaced for leakage or noise related issues and there is no evidence of fluid contamination, there is no need to replace the reservoir.

In some cases where the fluid clearly contains particulate matter, and the system continues to function, flush the system with fresh fluid and replace the reservoir, as there is the possibility that the reservoir internal filter may be damaged or faulty.

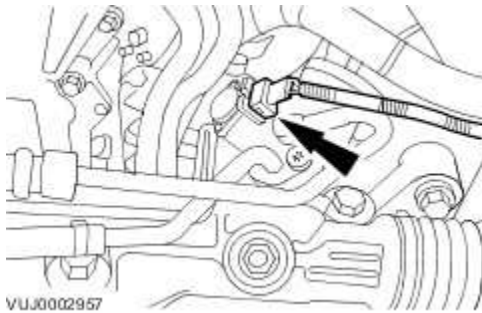
Power Steering

For additional information, refer to [211-00](#).

Power Steering Control Valve Actuator (57.10.32)

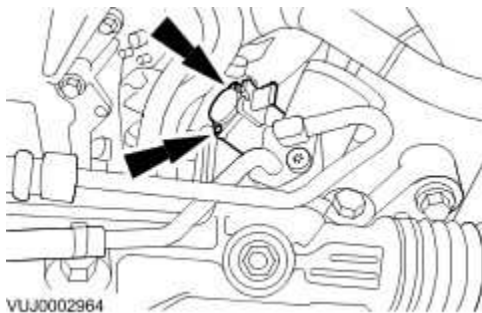
Removal

- 1 . Remove the air deflector. [.<<501-02>>](#)
- 2 . Disconnect the actuator electrical connector.



- 3 . Remove the actuator.

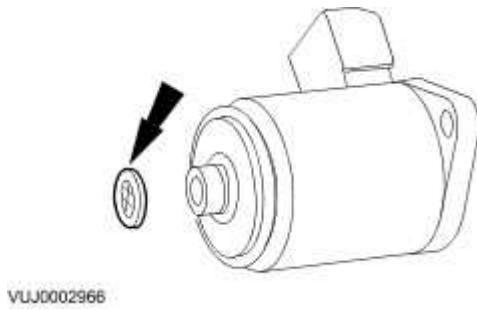
- ▶ Drain the fluid into a suitable container.
- ▶ Remove and discard the O-ring seals and filter.




Installation

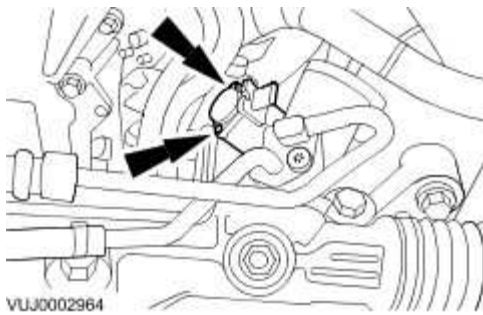
- 1 . To install, reverse the removal procedure.

▶ Install new O-ring seals and filter.



- 2 .  **CAUTION:** Make sure both the retaining bolts are tightened an even number of turns.

Tighten to 3 Nm.



- 3 . Install the air deflector. [.<<501-02>>](#)
- 4 . Bleed the power steering system. [.<<211-00>>](#)

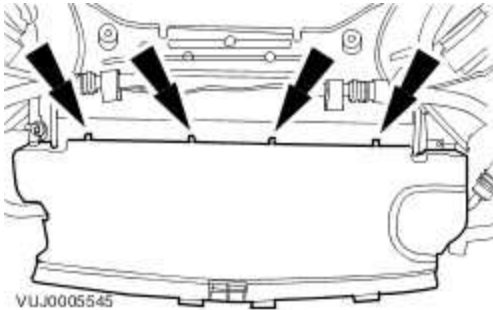
Power Steering Fluid Cooler (57.15.11)


Removal


All vehicles

- 1 Remove the Front Bumper Cover.
 - For additional information, refer to [Front Bumper Cover - VIN Range: G00442->H18679 \(76.22.78\)](#)

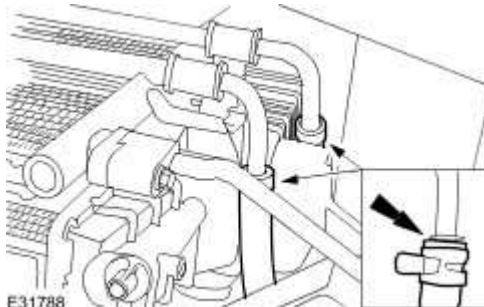
- 2 . Remove the lower cowl.



- 3  **CAUTION:** If power steering fluid comes into contact with the paintwork, the affected area must be immediately washed down with cold water.

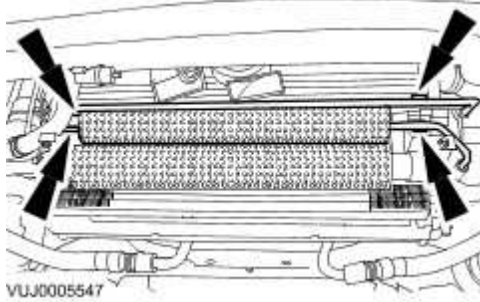
 **CAUTION:** Cap the power steering line to prevent loss of fluid and prevent dirt ingress.

Disconnect the power steering fluid cooler lines.



Vehicles with supercharger

4 . Remove the power steering fluid cooler.

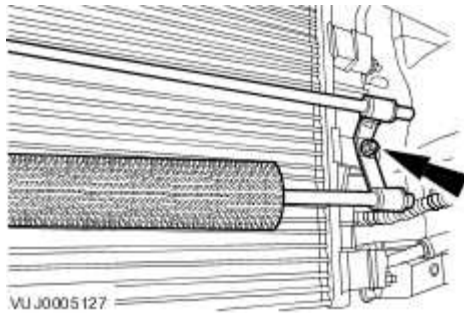


Vehicles without supercharger

5 . **NOTE:**

Left-hand shown, right-hand similar.

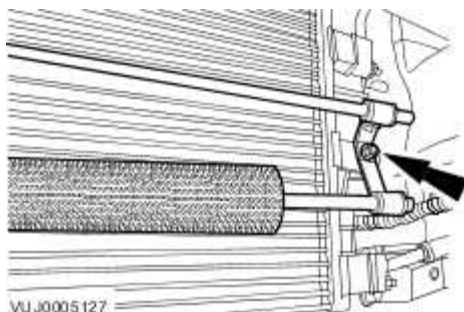
Remove the power steering fluid cooler.



Installation

1 . To install, reverse the removal procedure.

 Tighten to 7 Nm.




2 NOTE:

If the cooler is being replaced for leakage or noise related issues and there is no evidence of fluid contamination, there is no need to replace the reservoir.

In some cases where the fluid clearly contains particulate matter, and the system continues to function, flush the system with fresh fluid and replace the reservoir, as there is the possibility that the reservoir internal filter may be damaged or faulty.

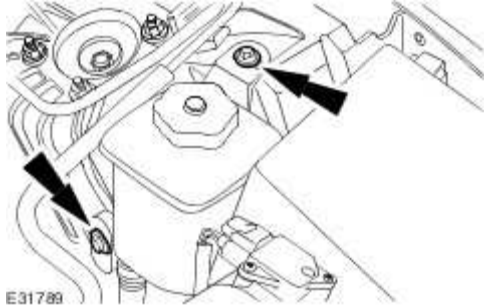
Power Steering Fluid Reservoir - 3.0L/3.5L/4.2L (57.15.08)


Removal


- 1  **CAUTION:** If power steering fluid comes into contact with the paintwork, the affected area must be immediately washed down with cold water.

 **CAUTION:** Cap the power steering lines to prevent loss of fluid and dirt ingress.

Detach the power steering fluid reservoir.



- 2  **CAUTION:** If power steering fluid comes into contact with the paintwork, the affected area must be immediately washed down with cold water.

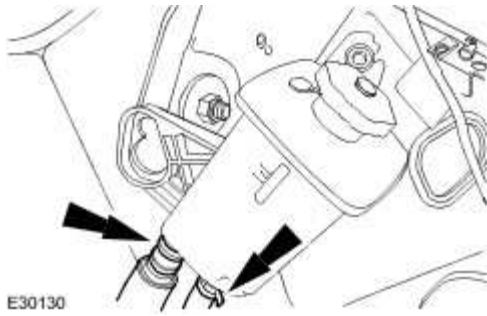
 **CAUTION:** Cap the power steering lines to prevent loss of fluid and prevent dirt ingress.

NOTE:

Drain fluid into a suitable container.

Remove the power steering fluid reservoir.

- ▶ Detach the power steering fluid reservoir lines.



Installation

- 1 . To install, reverse the removal procedure.
- 2 . Bleed the power steering system. [<<211-00>>](#)

Power Steering Fluid Reservoir - 2.7L Diesel (57.15.08)

Removal

- 1 . Remove the air cleaner.

For additional information, refer to [Air Cleaner \(19.10.05\)](#)

2



- **CAUTION:** If power steering fluid comes into contact with the paintwork, the affected area must be immediately washed down with cold water.

NOTE:

Clamp the power steering lines to prevent loss of fluid and dirt ingress.

NOTE:

Drain the fluid into a suitable container.

Detach the power steering fluid reservoir lines.

- 3 . Detach the air pipe from the reservoir.

- 4 . Remove the power steering fluid reservoir.



Remove the power steering fluid reservoir retaining bolt.

Installation

1



- CAUTION: If power steering fluid comes into contact with the paintwork, the affected area must be immediately washed down with cold water.

To install, reverse the removal procedure.



Tighten to 10 Nm.

- 2 . Bleed the power steering system.

For additional information, refer to [Power Steering System Bleeding \(57.15.02 \)](#)

Power Steering Pump - 3.0L (57.20.14)

Removal

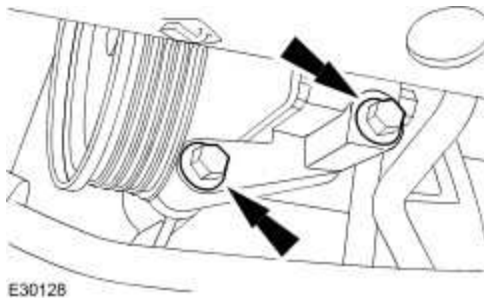
- 1 Remove the accessory drive belt.
 - For additional information, refer to [Accessory Drive Belt - 3.0L, VIN Range: G00442->G45703 \(12.10.40\)](#)
 - For additional information, refer to [Accessory Drive Belt - 3.0L, VIN Range: G45704->G99999 \(12.10.40\)](#)

- 2 . Remove the air cleaner.
 - For additional information, refer to [Air Cleaner \(19.10.05\)](#)


- 3 . Remove the left-hand front wheel and tire.
 - For additional information, refer to [Wheel and Tire \(74.20.05\)](#)

- 4 . Remove the air deflector.
 - For additional information, refer to [Air Deflector \(76.11.41\)](#)

- 5 . Remove the power steering pump lower retaining bolts.



- 6 . Lower the vehicle.

- 7  **CAUTION:** Cap the power steering line to prevent loses of fluid and prevent dirt ingress.

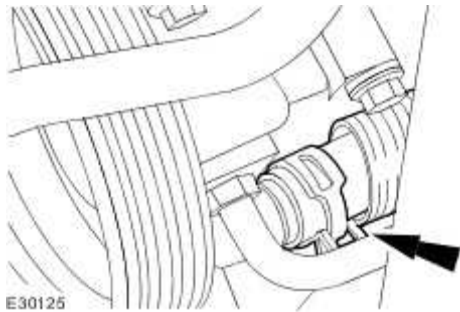


CAUTION: If power steering fluid comes into contact with the paintwork, the affected area must be immediately washed down with cold water.

NOTE:

Drain the fluid into a suitable container.

Disconnect the power steering reservoir to power steering pump supply line.



8



CAUTION: Cap the power steering lines to prevent losses of fluid and prevent dirt ingress.



CAUTION: If power steering fluid comes into contact with the paintwork, the affected area must be immediately washed down with cold water.

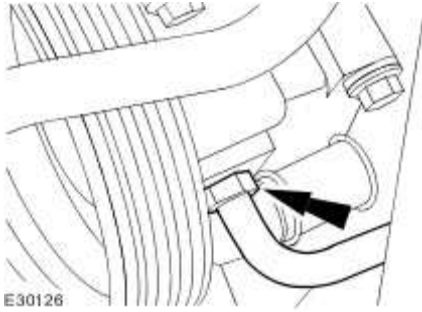
NOTE:

Drain the fluid into a suitable container.

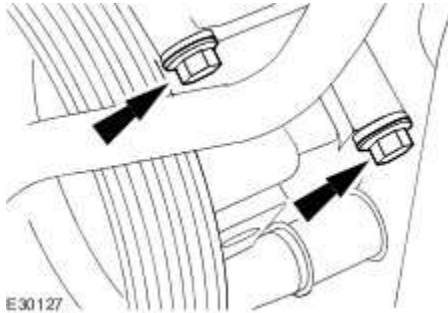
Disconnect the power steering pump to steering gear supply line.



Remove and discard the O-ring seal.



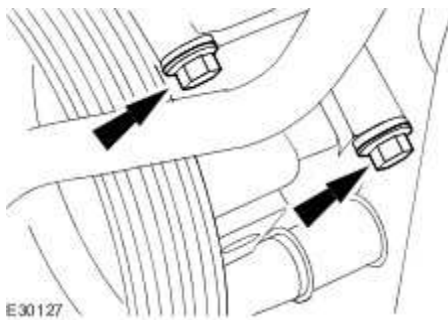
9 . Remove the power steering pump.



Installation

1 . To install, reverse the removal procedure.

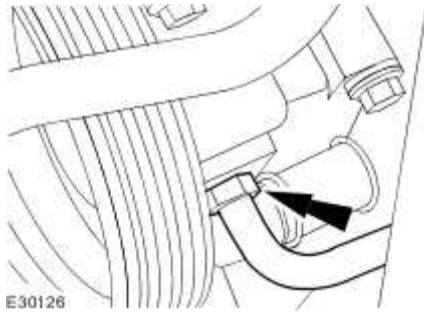
► Tighten to 25 Nm.



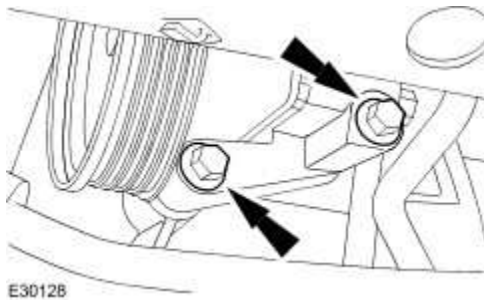
2 . **NOTE:**

Install a new O-ring seal.

Tighten to 15 Nm.



3 . Tighten to 25 Nm.



4 NOTE:

If the pump is being replaced for leakage or noise related issues and there is no evidence of fluid contamination, there is no need to replace the reservoir.

In some cases where the fluid clearly contains particulate matter, and the system continues to function, flush the system with fresh fluid and replace the reservoir, as there is the possibility that the reservoir internal filter may be damaged or faulty.

Power Steering Pump - 3.5L/4.2L (57.20.14)

Special Service Tools



303-021

Engine support beam.

303-021

Engine lifting brackets

303-749

Removal

All vehicles

- 1 . Remove the air cleaner assembly.

For additional information, refer to [Air Cleaner \(19.10.05\)](#)

- 2 . Detach the accessory drive belt.

For additional information, refer to [Accessory Drive Belt - 3.5L/4.2L \(12.10.40\)](#)

- 3 . Remove the left-hand front wheel and tire.

For additional information, refer to [Wheel and Tire \(74.20.05\)](#)

- 4 . Remove the air deflector.

For additional information, refer to [Air Deflector \(76.11.41\)](#)

- 5 . Remove the left-hand engine mount nut.

6



- **CAUTION:** Cap the power steering line to prevent loss of fluid and prevent dirt ingress.



CAUTION: If power steering fluid comes into contact with the paintwork, the affected area must be immediately washed down with cold water.

NOTE:

Drain the fluid into a suitable container.

Disconnect the power steering reservoir to power steering pump supply line.

- 7 . Remove the air conditioning (A/C) compressor upper bolt.

- 8 . Lower the vehicle.

Vehicles without supercharger

- 9 Remove the throttle body.
- For additional information, refer to [Throttle Body - Vehicles Without: Supercharger, VIN Range: G00442->G45703 \(19.70.04\)](#)
- For additional information, refer to [Throttle Body - Vehicles Without: Supercharger, VIN Range: G45704->G99999 \(19.70.04\)](#)

All vehicles

- 10 . Install the left-hand engine lifting eye.

11 . Using the special tools, raise the engine to a suitable height.

12 . Raise the vehicle.

13 . Detach the A/C compressor.



Remove the 2 A/C compressor lower bolts.

14 . Remove the 2 power steering pump lower bolts.

15 . Lower the vehicle.

16



CAUTION: Cap the power steering lines to prevent loss of fluid and prevent dirt ingress.



CAUTION: If power steering fluid comes into contact with the paintwork, the affected area must be immediately washed down with cold water.

NOTE:

Drain the fluid into a suitable container.

Disconnect the power steering pump to steering gear pressure line.

 Remove and discard the O-ring seal.

17



- **CAUTION:** Care must be taken to make sure that the coolant hoses and A/C pipes are not damaged during the removal of the power steering pump.

NOTE:

The power steering pump rear upper bolt cannot be removed with the power steering pump located on the dowels. The power steering pump must be detached and rotated to allow the bolt to be removed.

Remove the power steering pump.

Installation

1



- **CAUTION:** Care must be taken to make sure that the coolant hoses and A/C pipes are not damaged during the installation of the power steering pump.


NOTE:

The power steering pump rear upper bolt must be installed before the power steering pump is located on the dowels.

To install, reverse the removal procedure.

2 . Tighten to 25 Nm.

3 . Install a new O-ring seal.

 Tighten to 15 Nm.

4 . Tighten to 25 Nm.

5 . Tighten to 25 Nm.

6 . Tighten to 25 Nm.

7 . Tighten to 63 Nm.

8 NOTE:

. If the pump is being replaced for leakage or noise related issues and there is no evidence of fluid contamination, there is no need to replace the reservoir.

In some cases where the fluid clearly contains particulate matter, and the system continues to function, flush the system with fresh fluid and replace the reservoir, as there is the possibility that the reservoir internal filter may be damaged or faulty.

9 . Bleed the power steering system.

For additional information, refer to [Power Steering System Bleeding \(57.15.02 \)](#)

Power Steering Pump - 2.7L Diesel (57.20.14)

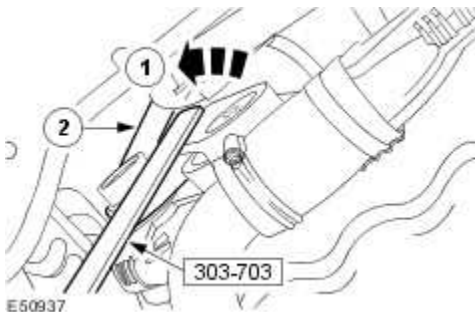
Special Service Tools



Accessory Belt Detensioner
303-703

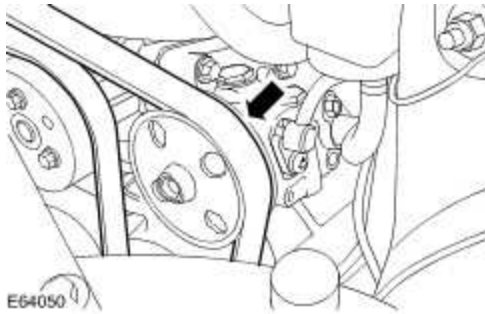
Removal

- 1 . Remove the air cleaner assembly.
For additional information, refer to
- 2 . Remove the air deflector.
For additional information, refer to
- 3 Detach the accessory drive belt.
 - 1) Using the special tool, rotate the accessory drive belt tensioner counter clockwise.
 - 2) Detach the accessory drive belt.




4 . Lower the vehicle.

5 . Detach the accessory drive belt from the power steering pump pulley.

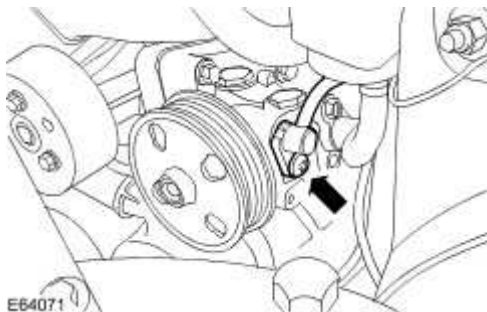


6  **CAUTION:** Cap the power steering lines to prevent loss of fluid and dirt ingress.

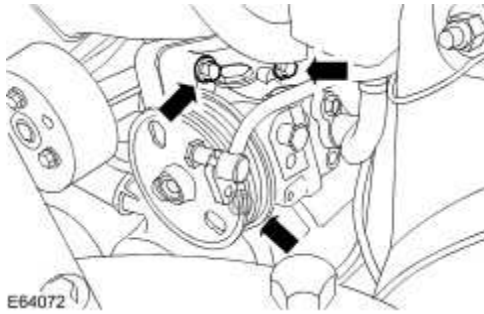
 **CAUTION:** If power steering fluid comes into contact with the paintwork, the affected area must be immediately washed down with cold water.

Disconnect the power steering pump to steering gear pressure line.

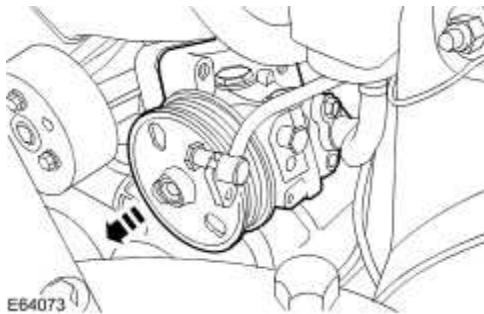
 Remove and discard the O-ring seal.



7 . Remove the power steering pump retaining bolts.



8 . Reposition the power steering pump forwards.



9



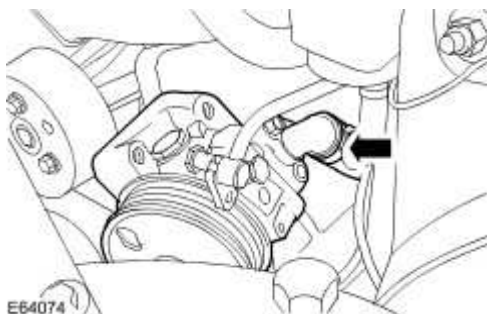
CAUTION: Cap the power steering lines to prevent loss of fluid and dirt ingress.



CAUTION: If power steering fluid comes into contact with the paintwork, the affected area must be immediately washed down with cold water.

Remove the power steering pump.

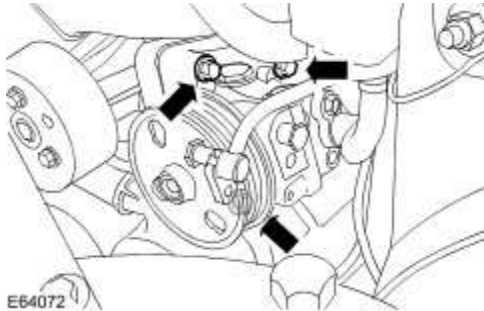
▶ Detach the hose.



Installation

1 . To install, reverse the removal procedure.

▶ Tighten to 22 Nm.



2 . Tighten to 22 Nm.

▶ Install new O-ring seal.

▶ Lubricate the new O-ring seal with power steering fluid.



3 NOTE:

If the pump is being replaced for leakage or noise related issues and there is no evidence of fluid contamination, there is no need to replace the reservoir.

In some cases where the fluid clearly contains particulate matter, and the system continues to function, flush the system with fresh fluid and replace the reservoir, as there is the possibility that the reservoir internal filter may be damaged or faulty.

Steering Gear Bushing (57.10.30)

Special Service Tools



Steering gear lower bush remover and installer.
204-273



Steering gear upper bush remover and installer.
211-271



Steering gear bush remover and installer (Nut)
204-274



Bearings
JAG-061



Steering gear bush remover and installer (Bolt)
204-275

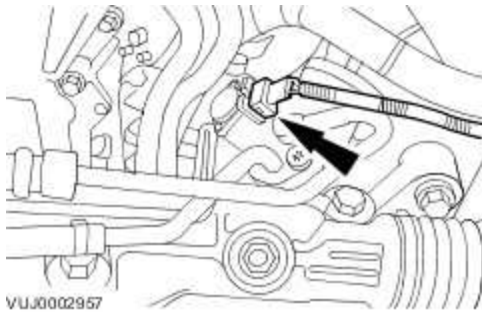
Removal

- 1 . Center the steering wheel.

▶ Lock in position and remove the ignition key.

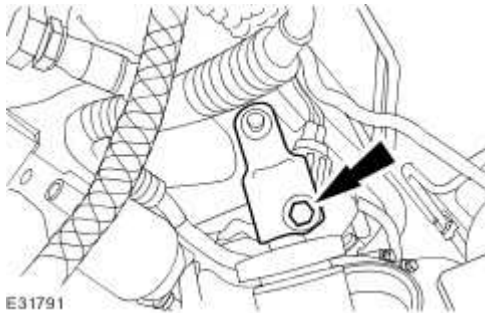
- 2 . Remove the air deflector. [<<501-02>>](#)

- 3 . Disconnect the power steering control valve actuator electrical connector.

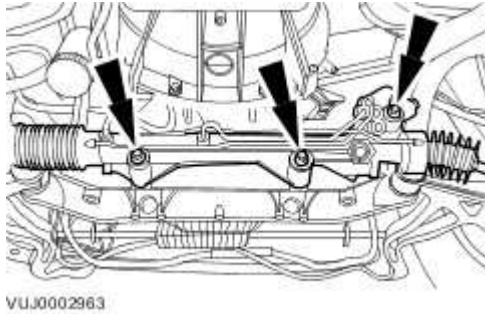


- 4 . Detach the lower steering column.

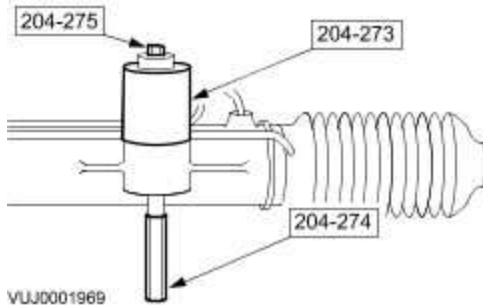
▶ Remove the steering gear shaft pinch bolt.



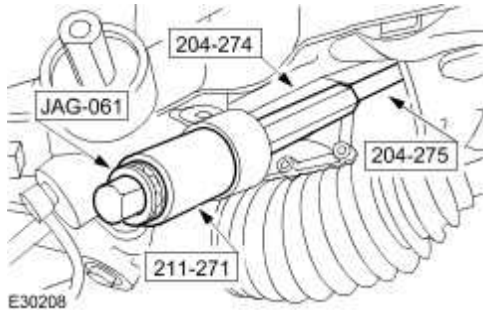
- 5 . Detach the steering gear.



6 . Using the special tools, remove the steering gear lower bushes.



7 . Using the special tools, remove the steering gear upper bush.

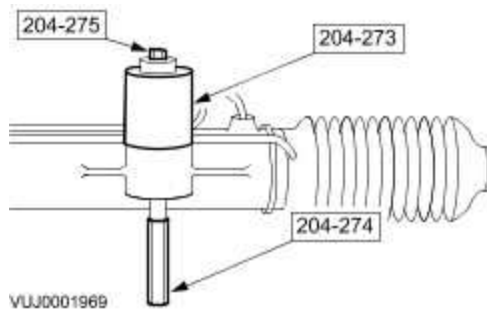


Installation

1 . **NOTE:**

Apply a thin film of lubricant to the steering gear bushes.

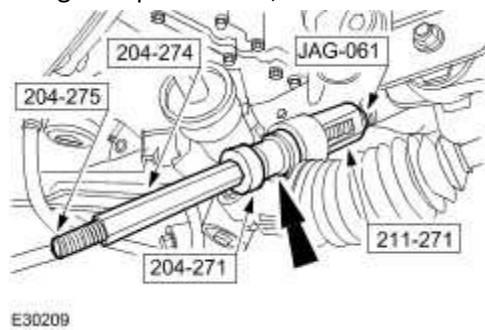
Using the special tools, install the steering gear lower bushes.



2 . NOTE:

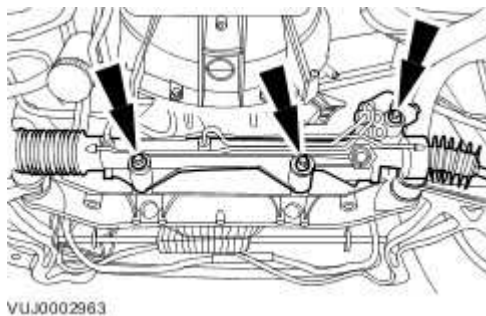
Apply a thin film of lubricant to the steering gear bush.

Using the special tools, install the steering gear upper bush.



3 . Install the steering gear.

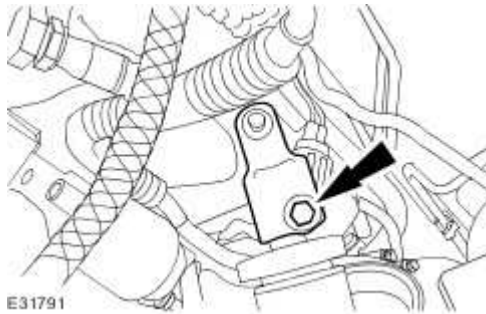
▶ Tighten to 100 Nm.



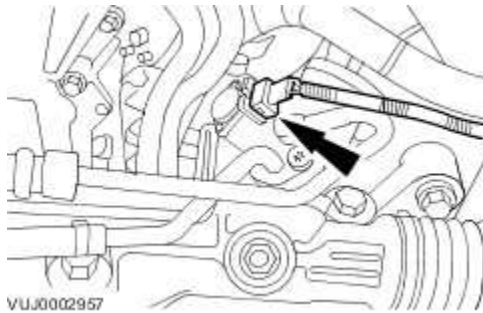
4 . Attach the lower steering column.

▶ Install the steering gear shaft pinch bolt.

▶ Tighten to 35 Nm.



5 . Connect the power steering control valve actuator electrical connector.



6 . Install the air deflector. <<501-02>>

211-03 : Steering linkage

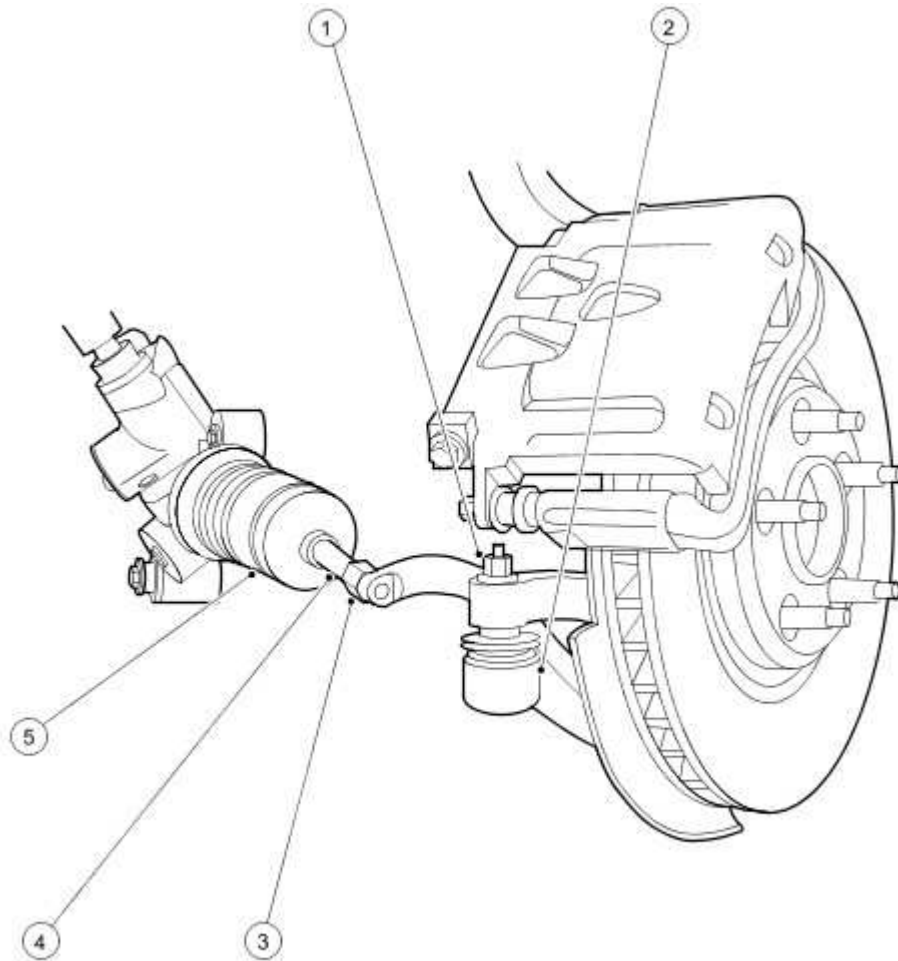
Specifications

Specifications

Torque Specifications

Description	Nm	lb-ft	lb-in
Tie-rod end retaining nut	75	55	-
Tie-rod end lock nut	55	41	-

Steering Linkage



E30455

Item	Part Number	Description
1	—	Tie-rod end retaining nut
2	—	Tie-rod end
3	—	Tie-rod end lock nut
4	—	Tie-rod
5	—	Tie-rod end boot

The left and right-hand tie-rod assemblies:

- Transmit steering forces from the steering gear to the wheel knuckles.
- Provide front road wheel toe setting by adjustment of the threaded outer tie-rod ends.

NOTE:

Steering geometry adjustments must only be carried out with the vehicle on turn plates to allow the wheels to move during adjustment.

The left and right-hand steering rack boots:

- Are installed between the steering rack and the tie-rod ends.
- Are of the concertina type.
- Are to prevent the ingress of foreign matter.

Steering Linkage

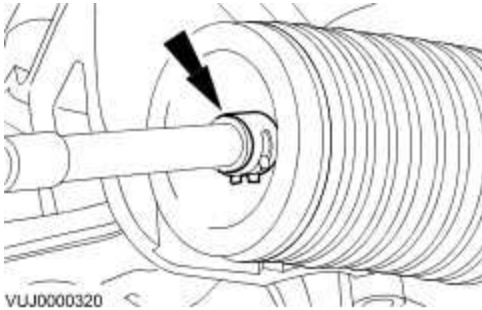
For additional information, refer to [211-00](#)

Steering Gear Boot (57.10.29)

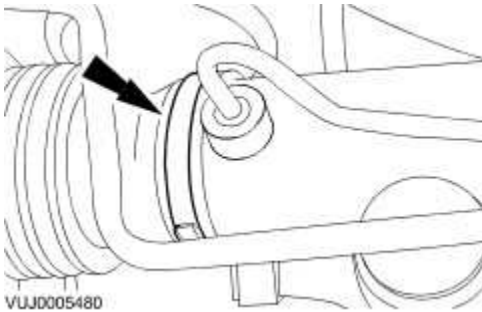
Removal


- 1 . Remove the tie rod end.
For additional information, refer to

- 2 . Remove and discard the tie-rod boot outer retaining clamp.

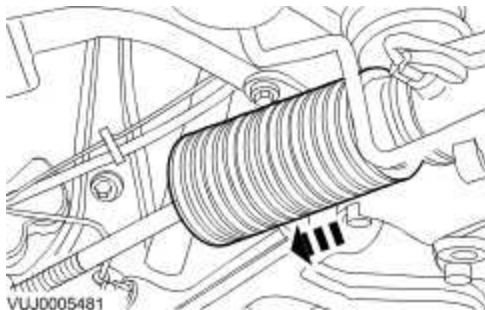


- 3 . Remove and discard the tie-rod boot inner retaining clamp.




- 4  **CAUTION:** Make sure the area is washed down thoroughly before removing the steering gear boot.

Remove the tie-rod boot.



Installation

1.  **CAUTION:** Make sure the tie-rod is clean before installing the steering gear boot.

NOTE:

Install new retaining clamps.

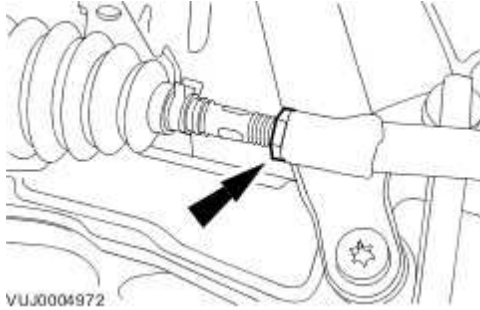
To install, reverse the removal procedure.

Tie Rod End (57.55.02)

Removal

1 . Remove the front wheel and tire. [<<204-04>>](#)

2 . Loosen the tie-rod end lock nut.

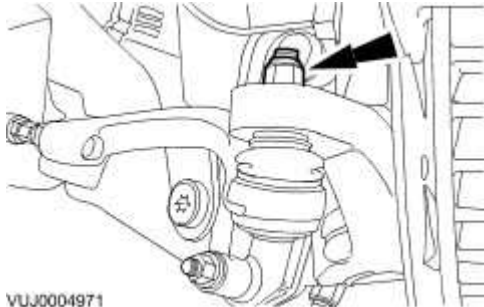


3



· **CAUTION:** Prevent the tie-rod end ball joint ball pin from rotating. Failure to do so may result in damage to the tie-rod end ball joint boot.

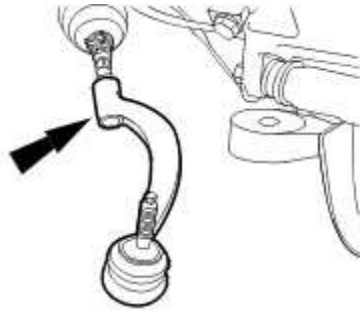
Remove the tie-rod end retaining nut.



4 . **NOTE:**

Make a note of the number of turns required to remove the tie-rod end.

Remove the tie-rod end.

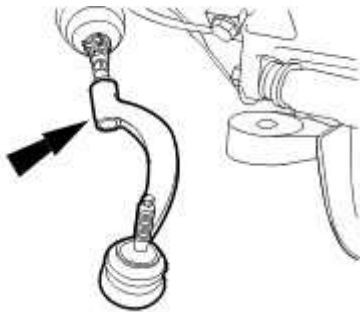


Installation

1 NOTE:

Make sure the tie-rod end is installed on the tie-rod by the same amount of turns used to remove it.

Install the tie-rod end.



2



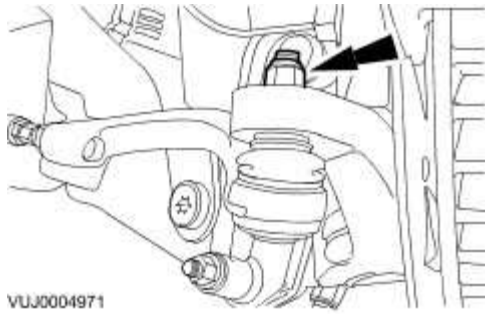
CAUTION: Prevent the tie-rod end ball joint ball pin from rotating. Failure to do so may result in damage to the tie-rod end ball joint boot.



CAUTION: Make sure the mating surfaces are free from dirt and lubricant.

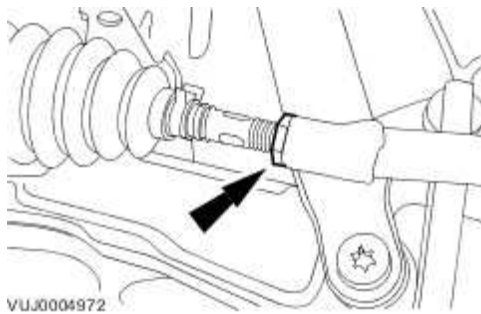
Install the tie-rod end retaining nut.

► Tighten to 75 Nm.



3 . Tighten the tie-rod end lock nut.

▶ Tighten to 55 Nm.



4 . Check the front toe adjustment. [<<204-00>>](#)

211-04 : Steering Column

Specifications

Specifications

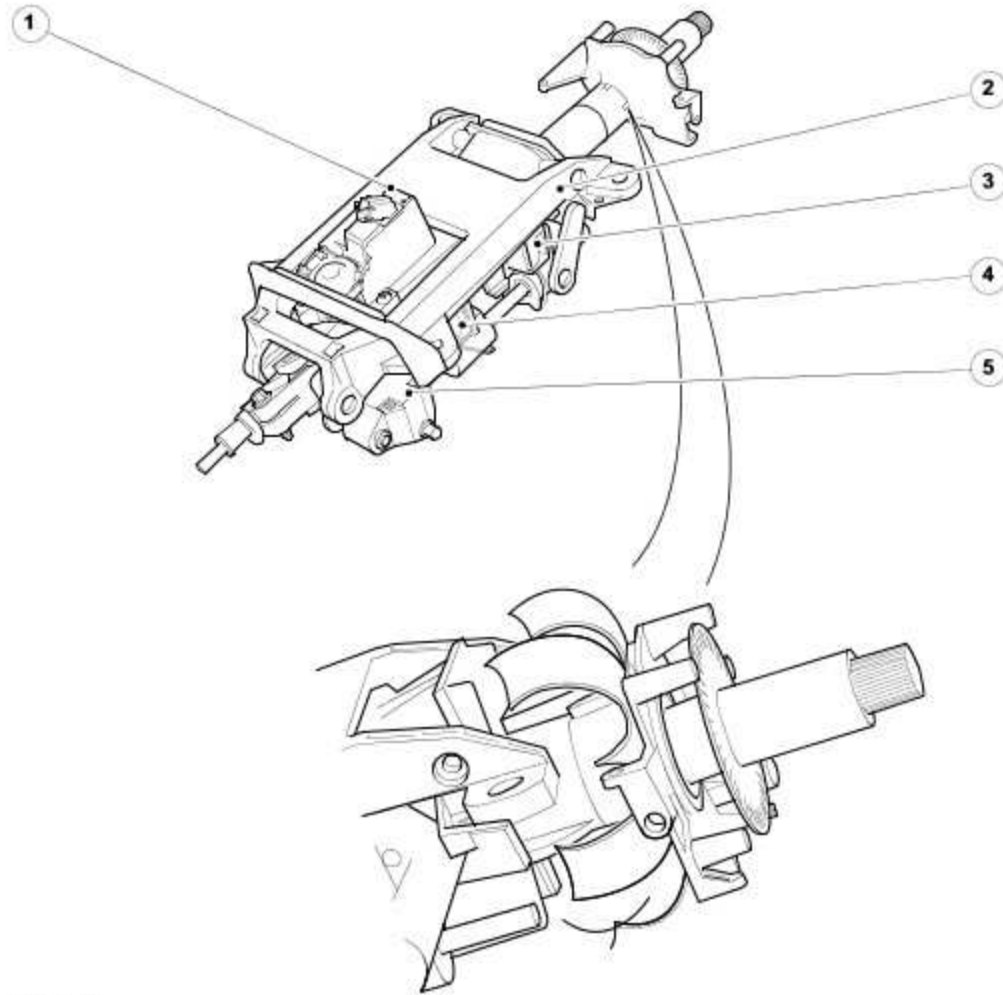
Torque Specifications

Description	Nm	lb-ft	lb-in
Steering wheel retaining bolt	65	48	-
Upper steering column pinch bolt	35	26	-
Lower steering column pinch bolt	35	26	-
Upper steering column retaining nuts	30*	22	-
Lower steering column retaining nuts	9	-	80
Tilt solenoid retaining bolts	1	-	9
Telescopic solenoid retaining bolts	1	-	9
Telescopic housing retaining bolts	8	-	71
Steering column lower shroud retaining screws	3	-	27

*If you are re-using this fixing on a vehicle built prior to VIN H16709, then tighten to 25 Nm.
If you are replacing a fixing, then you must tighten to 30 Nm.

Steering Column

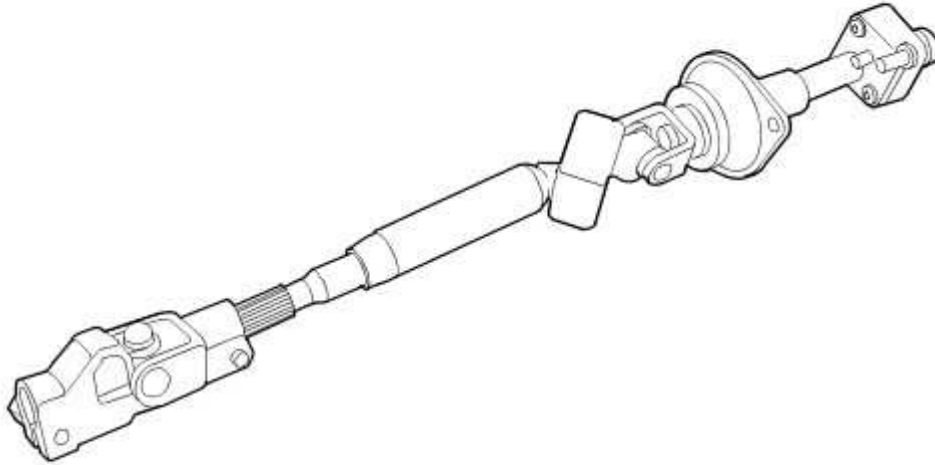
Upper column



E31012

Item	Part Number	Description
1	—	Steering column lock actuator
2	—	Steering column
3	—	Telescope solenoid
4	—	Tilt solenoid
5	—	Tilt/Telescopic motor

Lower column



E31786

The steering lock actuator is secured to the lower part of the adjustable steering column and consists of a locking pin and an electric motor. The electric motor has a hall effect sensor which detects lock and unlock states, this makes the lock actuator more sensitive for the time taken to lock and unlock. A bus controller chip has also been added to cope with the high integrity bus traffic. The column is locked and unlocked by inserting and removing the ignition key respectively. The instrument cluster provides control for the column adjustment by means of a power tilt/telescope switch on the side of the steering column lower shroud, memory recall and easy entry or exit.

The upper column is a tilt and telescopic type consisting of one electric motor to tilt and telescope the steering column. The steering column has 50 mm of telescopic movement and 5 degrees of tilt adjust. The power tilt and telescope function allows the driver to manually set the steering column position by using the power tilt/telescope switch, regardless of the ignition switch position. When moving the column, the switch will only allow one directional movement at a time.

Crash load absorption is provided by a unique peeling tube mechanism. If an accident occurs and the driver is not wearing a safety belt the steering column must be replaced. The steering column must also be replaced if the air bag is deployed.

The upper steering column will need to be calibrated if the column or the instrument cluster is renewed. Calibration is carried out using the Jaguar approved diagnostic system. No routine maintenance of the steering wheel and driver airbag is required. Any setting of steering wheel for misalignment must be achieved by adjusting the tie rods.

The lower steering column has the advantage of having a swing link mechanism, this is fitted to provide movement to occur in the steering system when travelling over bumps and obstacles. This

system improves the driver feel of the steering system as vibrations through the suspension assembly are greatly decreased.

The lower steering column swing link will need to be calibrated if the lower slider pinch bolt has been released or removed and if the lower column is replaced. No routine maintenance of the swing link or lower universal joint is required as these components are sealed with a special lubricant and high temperature resistant seals.


Steering Column

For additional information, refer to [<<211-00>>](#).

Ignition Switch Lock Cylinder (57.40.29)

Removal

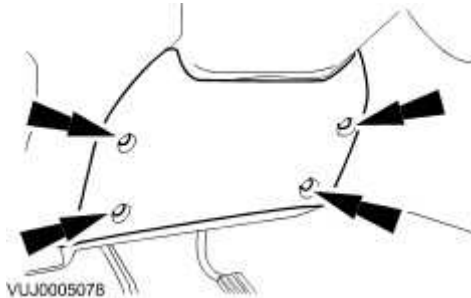
Vehicles with ignition switch lock cylinder interlock cable

- 1  **CAUTION:** When disconnecting the 'J' gate make sure that no damage occurs to the interlock cable.

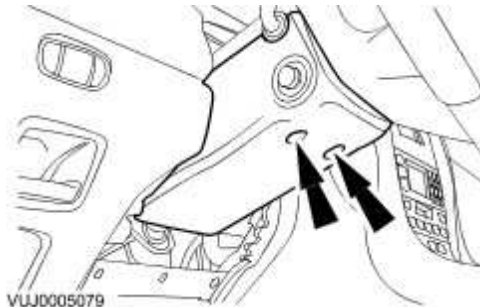
Remove the transmission selector lever. [<<307-05>>](#)

All vehicles

- 2 . Remove the instrument panel lower trim.



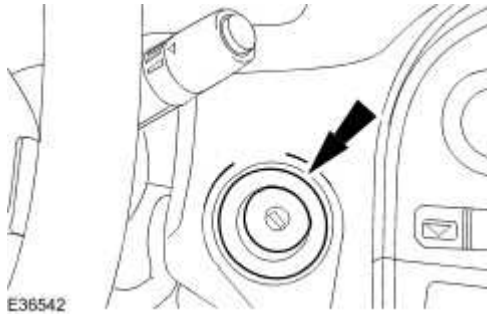
- 3 . Remove the steering column lower shroud.




- 4  **CAUTION:** If excessive force is used to remove the ignition switch lock cylinder

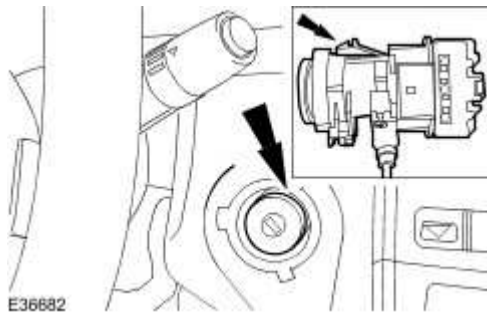
shroud damage may occur to the instrument panel.

Remove the ignition switch lock cylinder shroud.

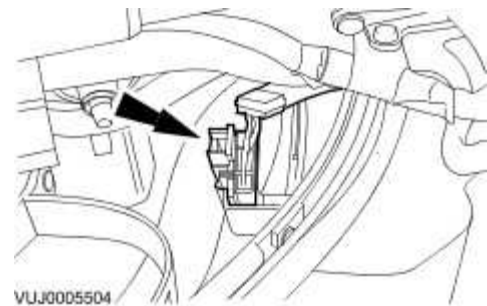


- 5  **CAUTION:** If excessive force is used to remove the ignition switch lock cylinder housing damage may occur to the instrument panel.

Using a suitable tool, detach the ignition switch lock cylinder housing.



- 6 . Disconnect the electrical connector.



Vehicles with ignition switch lock cylinder interlock cable

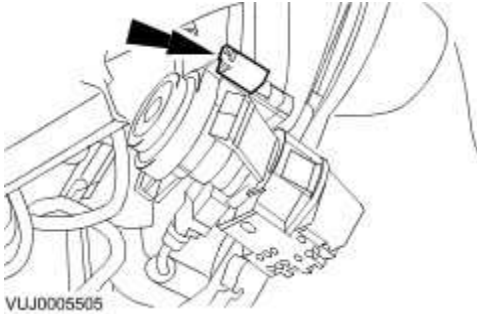
7 .



CAUTION: Make sure the ignition switch lock cylinder interlock cable is not crimped.

Remove the ignition switch lock cylinder housing.

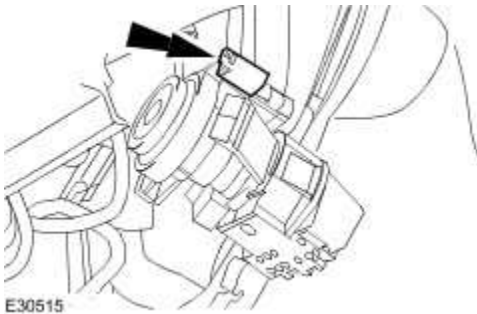
▶ Disconnect the electrical connector.



All vehicles

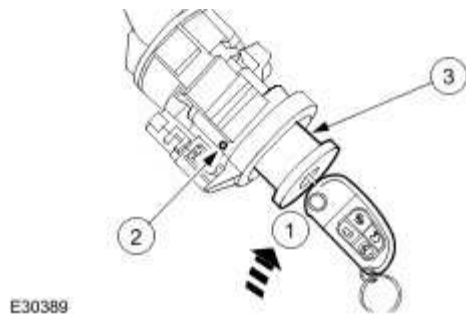
8 . Remove the ignition switch lock cylinder housing.

▶ Disconnect the electrical connector.



9 . Remove the ignition switch lock cylinder.

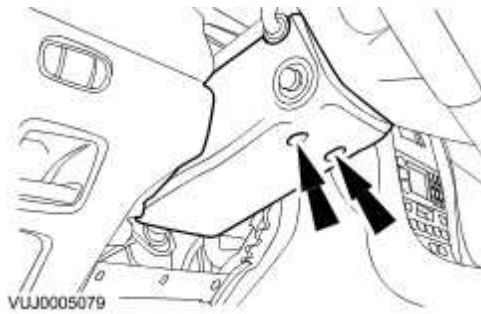
- 1) Turn ignition key to position one.
- 2) Release the retaining plunger.
- 3) Remove the ignition switch lock cylinder.



Installation

1 . To install, reverse the removal procedure.

► Tighten to 3 Nm.



Steering Column (57.40.01)

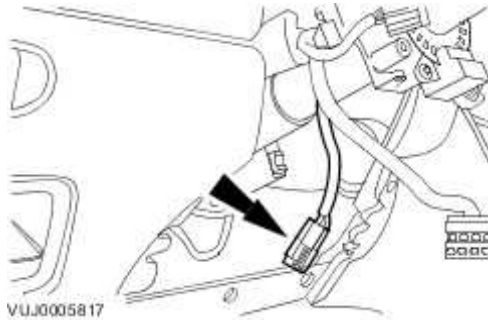
Removal

1 . If possible make sure that the steering column is fully lowered and fully extended.

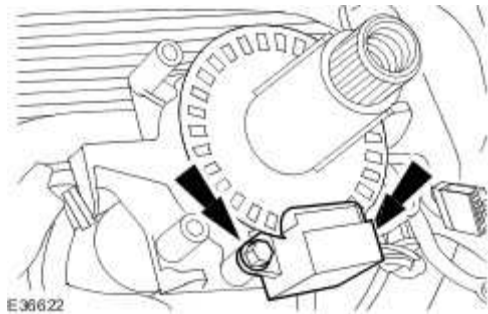
2 . Remove the clockspring.

For additional information, refer to [Clockspring \(86.65.92\)](#)

3 . Disconnect the steering wheel rotation sensor electrical connector.



4 . Remove the steering wheel rotation sensor.



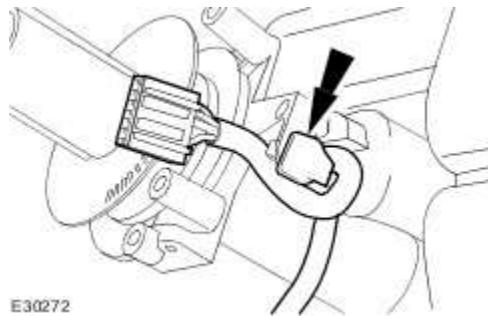
5 . Detach the left-hand multifunction switch wiring harness.



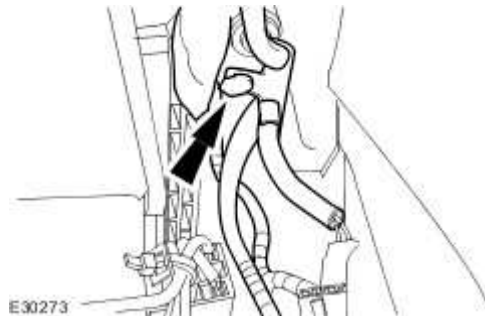
6 . Detach the left-hand multifunction switch wiring harness.



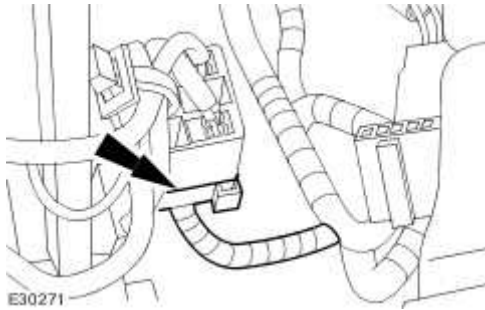
7 . Detach the right-hand multifunction switch wiring harness.



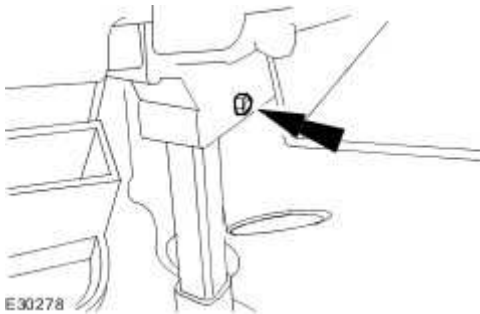
8 . Detach the right-hand multifunction switch wiring harness.



9 . Disconnect the steering column electrical connector.

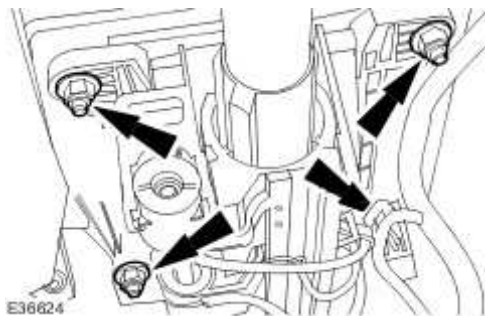


10 . Remove the steering column pinch bolt.



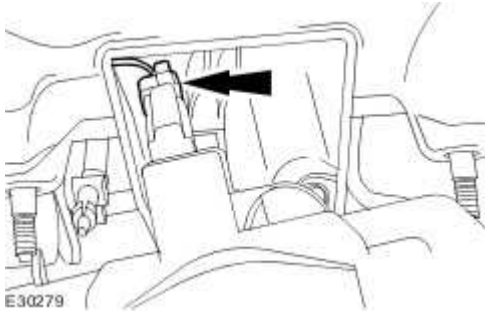
11 . Detach the steering column.

► Support the weight of the steering column.



12 . Remove the steering column.

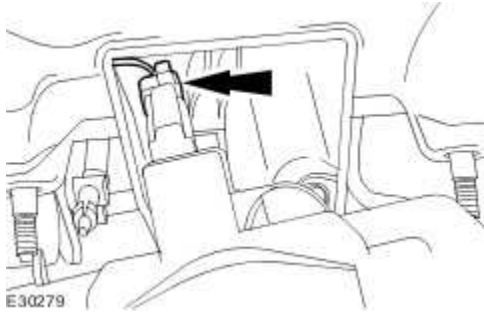
► Disconnect the steering column lock actuator electrical connector.



Installation

1 . Install the steering column.

▶ Connect the steering column lock actuator electrical connector.

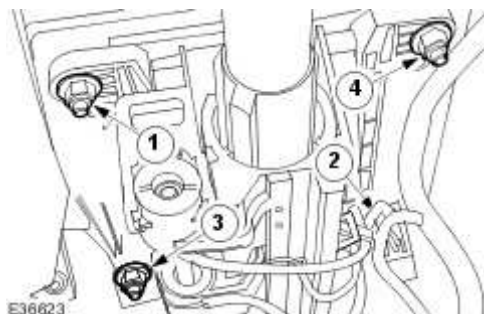


2 . **NOTE:**

Tighten the retaining nuts in the sequence shown.


Attach the steering column.

▶ Tighten to 30 Nm.

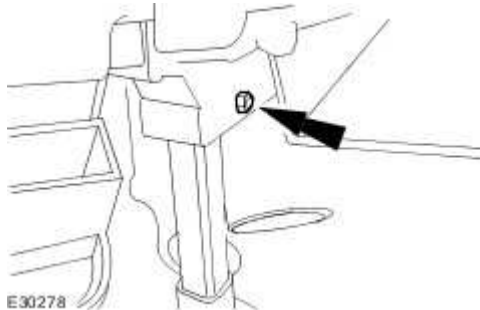


NOTE:

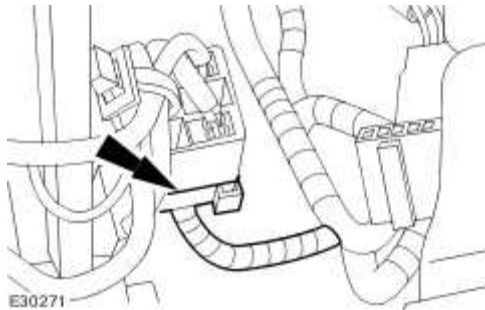
If you are re-using this fixing on a vehicle built prior to VIN H16708, then tighten to 25 Nm. If you are replacing a fixing, then you must tighten to 30 Nm.

- 3 .  **CAUTION: Make sure the pinch bolt is correctly installed.**

Tighten to 35 Nm.



- 4 . Connect the steering column electrical connector.



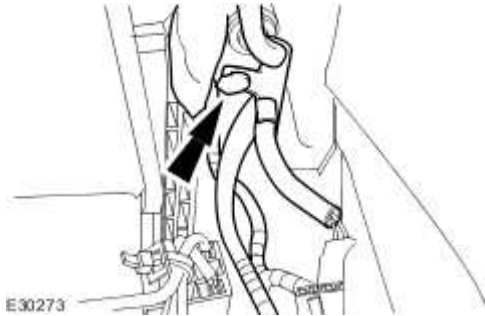
- 5 . Attach the left-hand multifunction switch wiring harness.



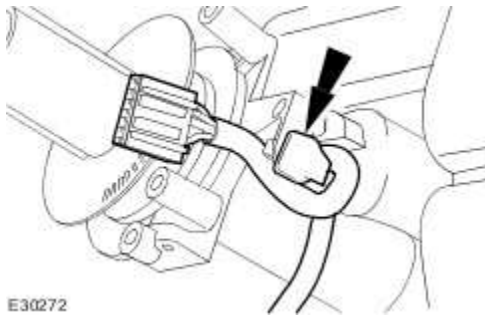
6 . Attach the left-hand multifunction switch wiring harness.



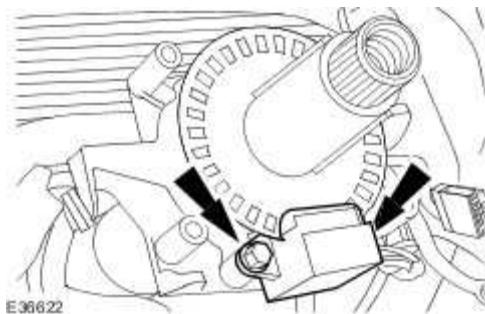
7 . Attach the right-hand multifunction switch wiring harness.



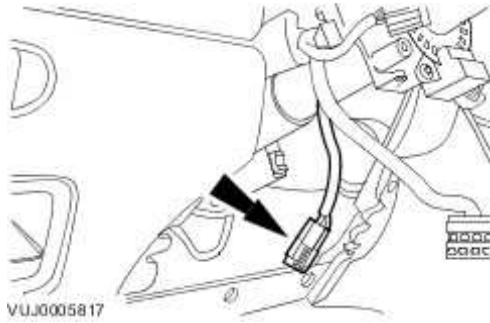
8 . Attach the right-hand multifunction switch wiring harness.



9 . Install the steering wheel rotation sensor.



10 . Connect the steering wheel rotation sensor electrical connector.



11 . Install the clockspring.

For additional information, refer to [Clockspring \(86.65.92\)](#)

12 . Reposition the steering column back to its original position.

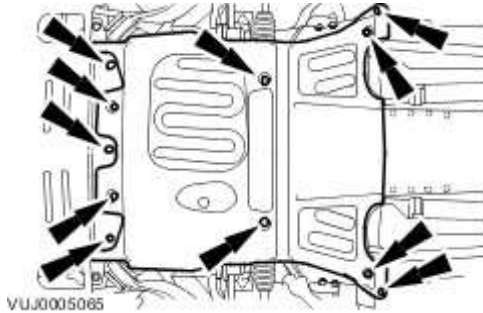
Steering Column Lower Shaft (57.40.05)

Removal

1 . Centralize the steering wheel.

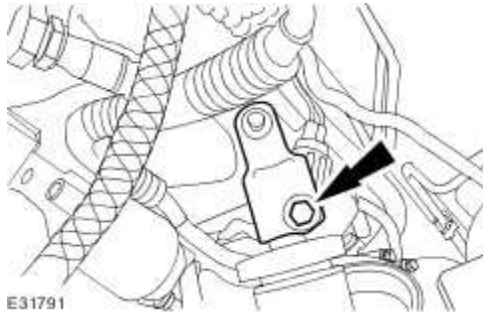
▶ Lock in position and remove the ignition key.

2 . Remove the air deflector.

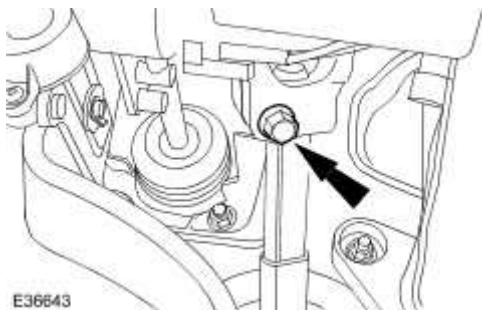


3 . Detach the lower steering column universal joint from the steering gear.

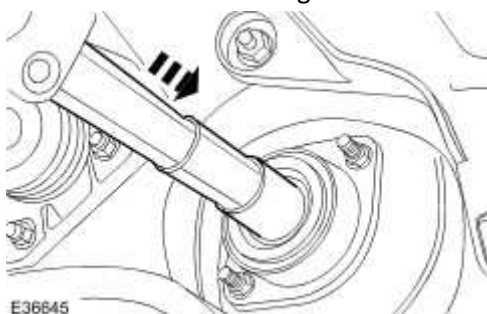
▶ Remove the retaining bolt.



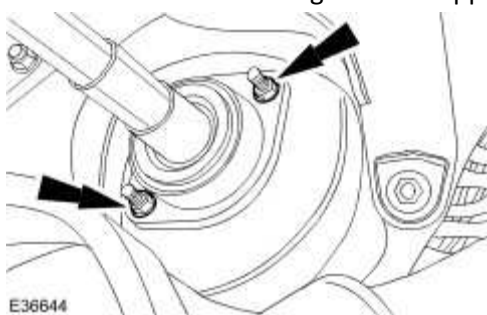
4 . Remove the upper steering column pinch bolt.



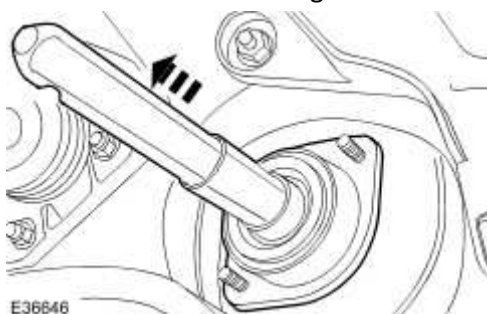
5 . Detach the lower steering column shaft from the upper steering column.



6 . Remove the lower steering column support bearing retaining nuts.



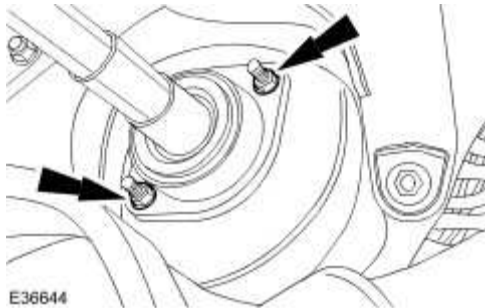
7 . Remove the lower steering column.



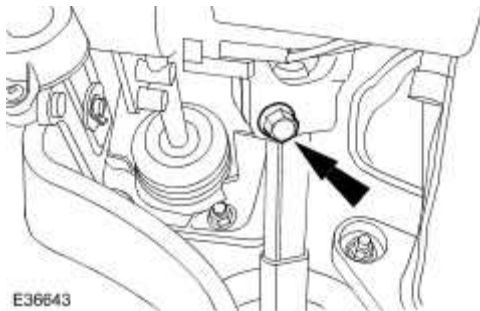
Installation

- 1 . To install, reverse the removal procedure.

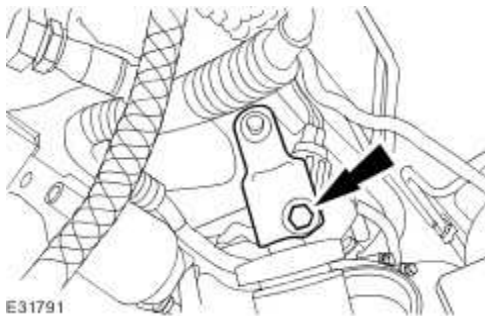
▶ Tighten to 9 Nm.



- 2 . Tighten to 35 Nm.



- 3 . Tighten to 35 Nm.



- 4 . Carry out the lower steering column setting procedure. [.<<211-00>>](#)

Steering Wheel (57.60.01)

Special Service Tools



E43628

Locking Tool

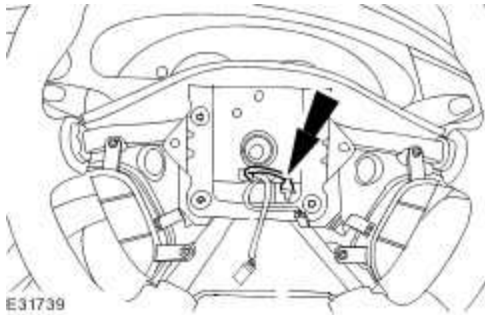
211-326

Removal

- 1 . Remove the driver air bag module.

For additional information, refer to [Driver Air Bag Module \(76.73.39\)](#)

- 2 . Disconnect the electrical connector.



E31739

3

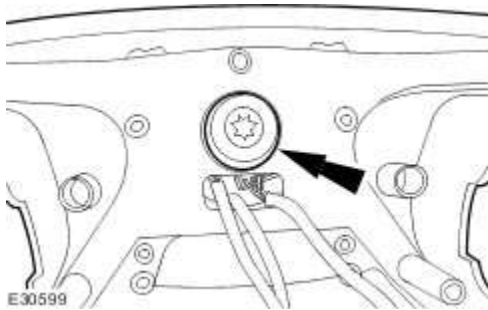



CAUTION: Position the front wheels in a straight ahead position and centralize steering wheel. Failure to follow this instruction may result in damage to the clockspring.



CAUTION: Make sure no damage is occurred to the electrical connectors. Failure to follow this instruction may result in damage to the vehicle.

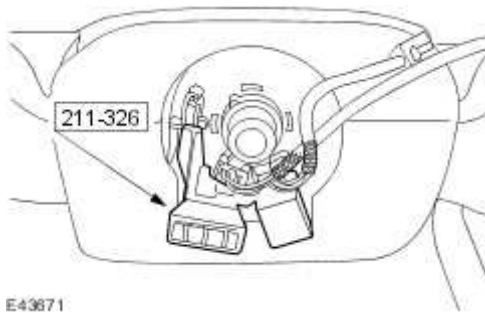
Remove the steering wheel.




- 4
-  **CAUTION:** Failing to install the special tool to the clockspring may result in damage to the vehicle.

 **CAUTION:** Do not allow the clockspring to unwind.

Install the special tool to the clockspring.



Installation

- To install, reverse the removal procedure.
-  **CAUTION:** Make sure that the arrow on the cassette is centered and pointing vertically prior to the steering wheel installation. On removal of the special tool, keep the clockspring cables taught to prevent the cassette moving from the set position. Do not allow the clockspring to unwind. Failure to follow this instruction may result in damage to the component.

Install the steering wheel.

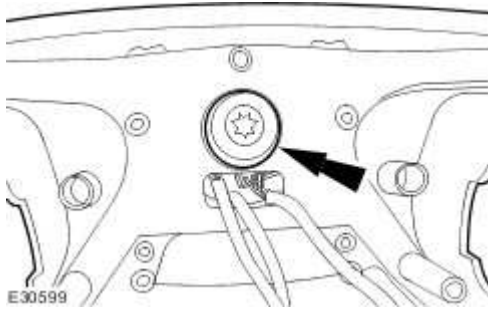


3



CAUTION: Check the alignment arrow is still in the vertical position with the wheels straight ahead to make sure that the directional indicator cancellation is central.

Tighten to 65 Nm.

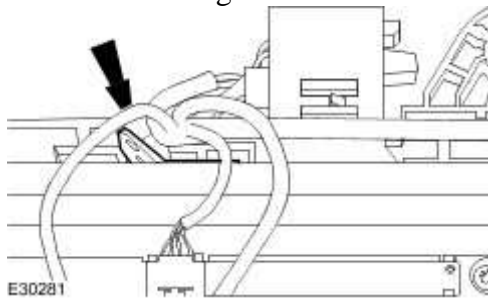


Steering Column

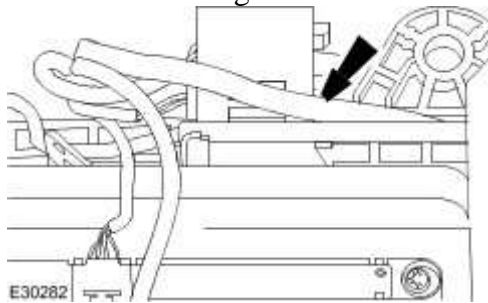
Disassembly

1 . Remove the Steering Column Lock Actuator. <<211-05>>

2 . Detach the wiring harness .

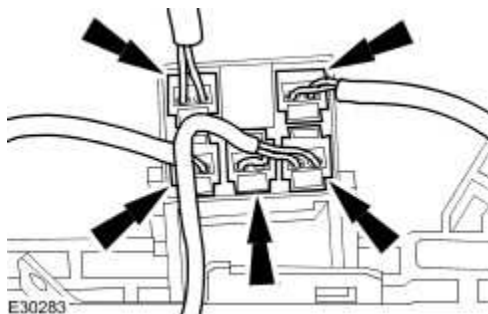


3 . Detach the steering column electrical connector housing.



4 . Remove the steering column electrical connector housing.

- Disconnect the electrical connectors.

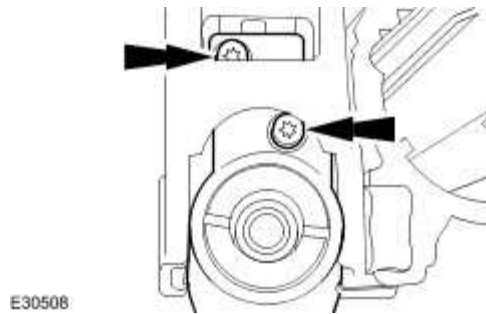


5 . **NOTE:**

Remove and discard the tilt solenoid retaining bolts.

Remove the tilt solenoid.

- Detach the tilt solenoid wiring harness.

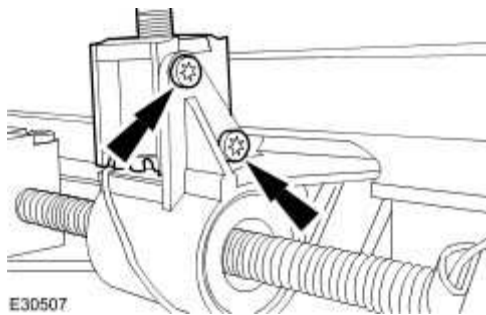


6 . NOTE:

Remove and discard the telescopic solenoid retaining bolts.

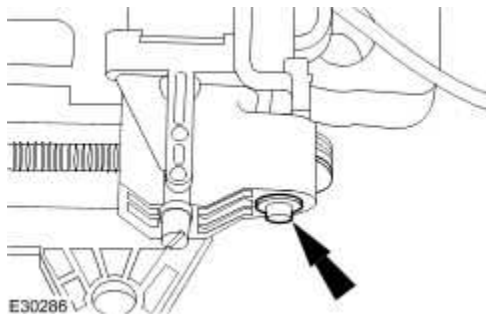
Remove the telescopic solenoid.

- Remove and discard the retaining strap.

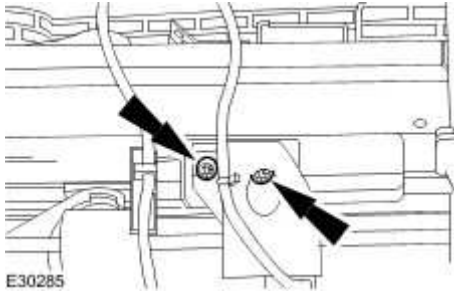



7 . Remove the tilt/telescopic motor retaining pin.

- Remove and discard the retaining pin and washers.

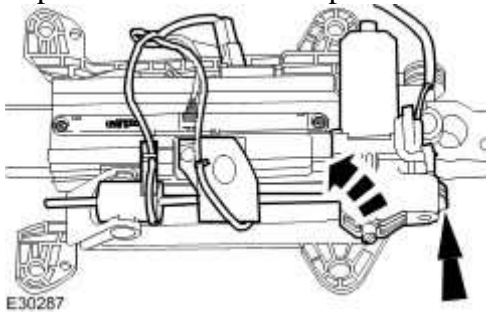


8 . Remove and discard the telescopic housing retaining bolts.



- 9 .  **CAUTION:** Make sure the potentiometer sliders are fully disconnected.
Failure to follow this instruction may result in component damage.

Reposition the tilt/telescopic motor.

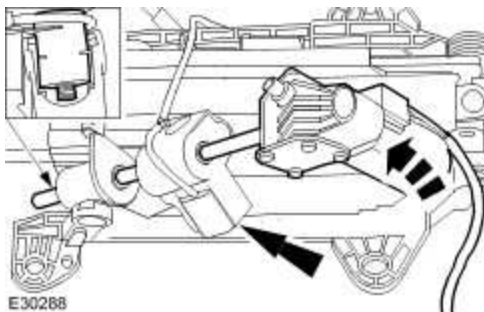


10 . **NOTE:**

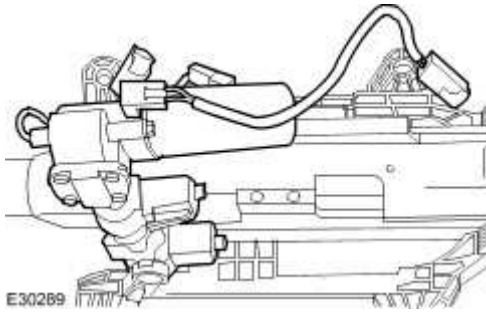
The tilt/telescopic motor will only need to be rotated if the motor is inoperative.

Rotate the tilt/telescopic motor as shown.


- Press the telescopic solenoid engagement pin.



11 . Remove the tilt/telescopic motor.

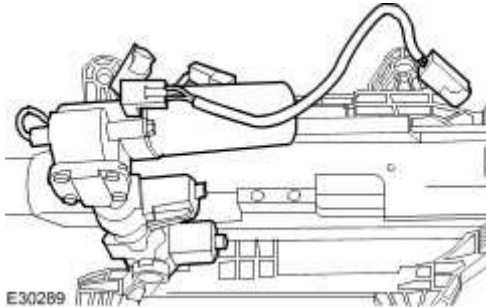


Assembly

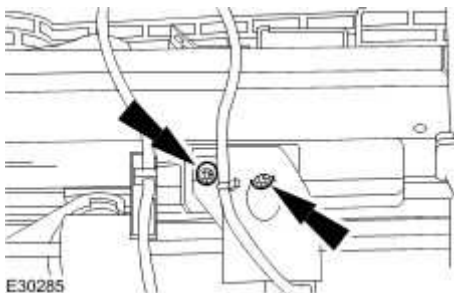
- 1  **CAUTION: Make sure the potentiometer sliders are correctly located. Failure to follow this instruction may result in component damage.**

Install the tilt/telescopic motor.

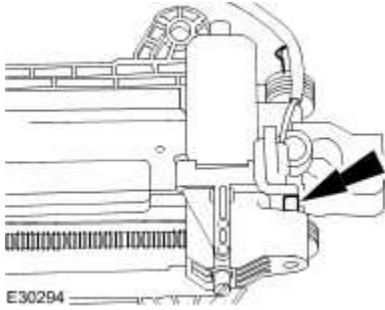
- Reposition the tilt/telescopic motor to the steering column.



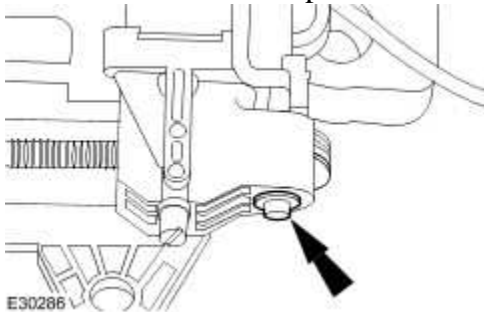
- 2 . Install new telescopic housing retaining bolts.
 - Tighten to 8 Nm.



- 3 . Install the supplied spacer between the tilt/telescopic motor and steering column.



- 4 . Install a new tilt/telescopic motor retaining pin and washers.

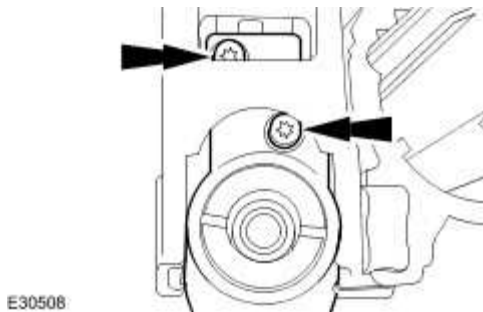


5 . **NOTE:**

Install new tilt solenoid retaining bolts.

Install the tilt solenoid.

- Tighten to 1 Nm.
- Attach the tilt solenoid wiring harness.

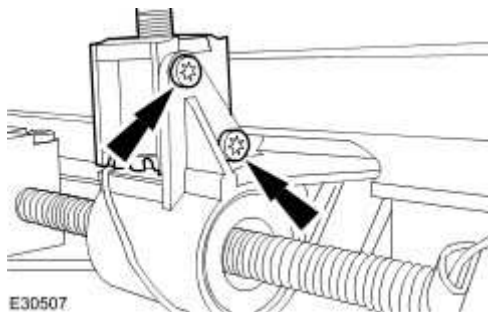


6 . **NOTE:**

Install new telescopic solenoid retaining bolts.

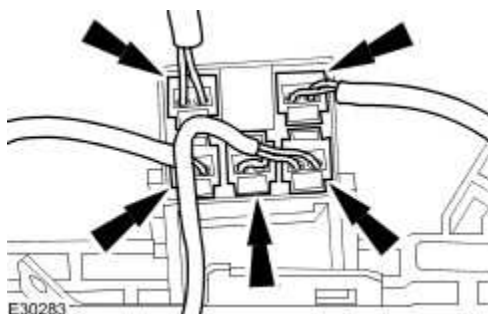
Install the telescopic solenoid.

- Tighten to 1 Nm.
- Install a new retaining strap.

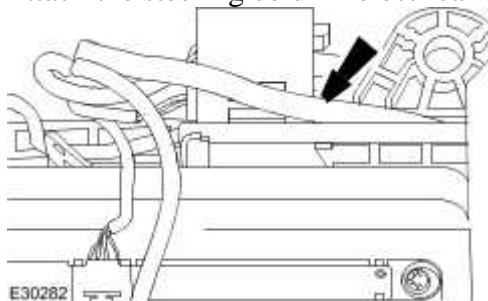


7 . Install the steering column electrical connector housing.

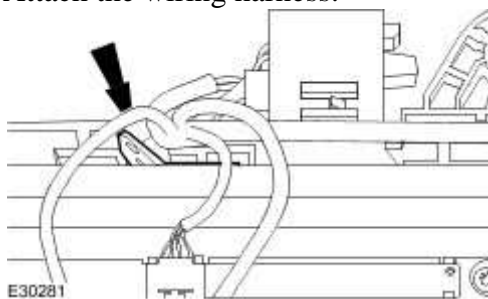
- Connect the electrical connectors.



8 . Attach the steering column electrical connector housing.



9 . Attach the wiring harness.

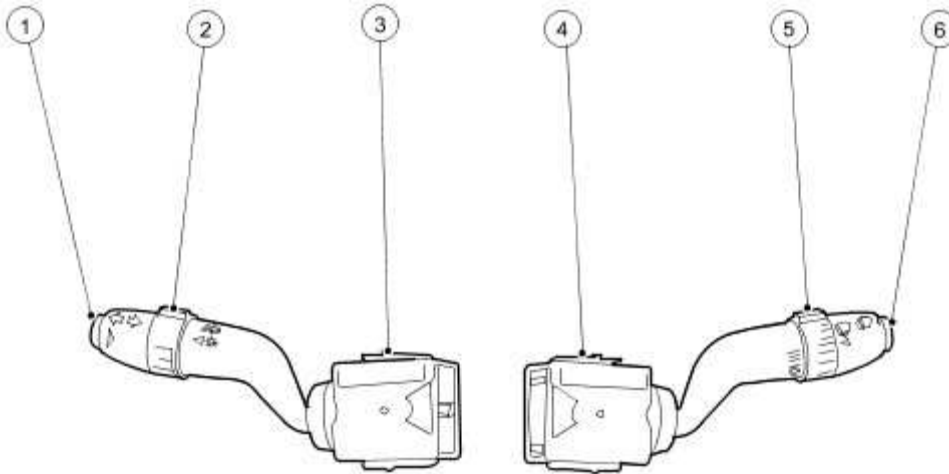


10 . Install the Steering Column Lock Actuator. [<<211-05>>](#)

211-05 :Steering Column Switches

Description and operation

Steering Column Switches



VUJ0005378

Item	Part Number	Description
1		Trip Button
2		Side Lamps/Head Lamps/Auto Lamps and Exit Delay Collar
3		Direction Indicator/Main Beam Switch
4		Wiper Switch
5		Intermittent Wipe Time Delay Collar
6		Wash/Wipe Button

The multifunction switch is situated on the steering column and consists of the wiper switch and the direction indicator/main beam switch.

Multifunction switch left-hand

The Multifunction switch left-hand is on the left-hand side of the steering column and controls the following functions.

Direction Indicators

The direction indicators:

- operate when the ignition switch is in position II.
- are operated by moving the multifunction switch up or down until it latches in position, to indicate a right or left turn respectively.
- can be operated while the multifunction switch is held against spring pressure before reaching the latch position.
- cancel automatically upon completion of a turn. The multifunction switch then returns to the center position.

An audible ticking and a flashing green warning lamp on the instrument cluster indicate that the direction indicators are operating. If an indicator bulb fails, the warning lamp and ticking operate at twice the normal rate and a message will appear on the instrument cluster message center.

Side Lamps

The Side Lamp function is operated by rotating the multifunction switch collar one position counter clockwise this will then activate the side lamps.

Head Lamps

The Head Lamp function is operated by rotating the multifunction switch collar two positions counter clockwise this will then activate the head lamps.

Main Beam

The Main Beam multifunction switch has one pull and one push position. Pulling the main beam multifunction switch toward the driver will cause the main beam lamps to flash. The main beam lamps can be flashed with the ignition on or off and will remain activated as long as the multifunction switch is held.

Pushing the multifunction switch away from the driver to the latch position will operate main beam lamps continuously if the head lamps are on.

Auto Lamps

The Auto Lamp function is operated by rotating the multifunction switch collar to the auto position. The head lamps will then operate automatically when the sunload sensor detects low light levels.

Exit Delay

The Exit Delay time can be varied by rotating the multifunction switch collar. Turning the collar clockwise will decrease the exit delay time and turning the collar counter clockwise will increase the exit delay time. The head lamps will stay for a set period of time ranging from 10 seconds to 2 minutes.

Trip Function

If the Trip Function switch is pressed once, a menu in the instrument cluster message center will be displayed and cycle through an option menu. Pushing and holding the switch resets the mileage calculated in a trip cycle. The trip mileage is displayed in the instrument cluster message center.

Multifunction switch right-hand

The Multifunction switch right-hand is on the right-hand side of the steering column and controls the following functions.

Flick Wipe

Flick wipe operation:

- is obtained by pulling the multifunction switch towards the driver.
- features a single wipe at normal speed if the multifunction switch is released immediately.
- features continuous wipe action at fast speed while the multifunction switch position is held.

Intermittent Wipe

In the intermittent wipe position:

- the wiper operates intermittently, with a variable time delay between wipes.
- the time delay can be varied by rotating the multifunction switch collar, turning the collar clockwise will increase the wiper time delay and turning the collar counter clockwise will decrease the wiper time delay. The switch has 7 positions and wiper delay varies between 2-20 seconds wiper delay.

Slow Speed Wiper

In the slow speed position:

- the wiper operates continuously at slow speed.

High Speed Wiper

In the high speed position:

- the wiper operates continuously at high speed.

Windscreen Wash/Wipe

The wash/wipe function:

- is operated by the button at the end of the multifunction switch.
- operates the washers and wiper, while the button is pressed, for up to 20 seconds.
- provides an additional three sweeps of the wiper after the button is released.
- wash function is disabled if the Washer Fluid Low message is displayed, but wipe operation is still available.

Head lamp Power Wash (if equipped)

The headlamp power wash function:

- operates only when the head lamps are on and the windscreen wash/wipe button is pressed.
- provides two short bursts of approximately 3 seconds apart to the head lamps.
- the powerwash cycle will continue for up to 20 seconds if the wash/wipe button is held.

The headlamp powerwash will operate the first time the wash/wipe button is pressed and thereafter every sixth succeeding wash/wipe operation.

Moisture Sensitive Wiping

The moisture sensitive wiping function:

- operates if the collar on the multifunction is set to the auto position.
- operates if moisture on the windscreen is detected.
- operates the wipers at varied speeds depending on the amount of moisture detected on the windscreen.
- operates the wipers at varied speeds depending on the speed of the vehicle.

Steering Column Switches

Principles of Operation

For a detailed description of the Steering Column Switches, refer to the relevant Description and Operation sections in the workshop manual.

[Steering Column Switches](#)

Inspection and Verification

- 1 . Verify the customer concern.
- 2 . Visually inspect for obvious signs of electrical damage.

Visual Inspection Chart

Electrical
<ul style="list-style-type: none">• Fuses/Relays• Damaged, Loose or Corroded Connector(s)• Damage to Wiring Loom/Incorrect Location, Stretched or Taught

- 1 . If an obvious cause for an observed or reported concern is found, correct the cause (if possible) before proceeding to the next step.
- 2 . If the cause is not visually evident, verify the symptom and refer to the Jaguar approved diagnostic system.

DTC Index

Steering Column Lock Module



CAUTION: When probing connectors to take measurements in the course of the pinpoint tests, use the adaptor kit, part number 3548-1358-00.

NOTE:

If the control module/component is suspect and the vehicle remains under manufacturer warranty, refer to the Warranty Policy and Procedures manual (section B1.2), or determine if any prior approval program is in operation, prior to the installation of a new module/component.

NOTE:

When performing voltage or resistance tests, always use a digital multimeter (DMM) accurate to three decimal places and with a current calibration certificate. When testing resistance, always take the resistance of the DMM leads into account.

NOTE:

Check and rectify basic faults before beginning diagnostic routines that involve pinpoint tests.

NOTE:

Inspect connectors for signs of water ingress, and pins for damage and/or corrosion.

NOTE:

If DTCs are recorded and, after performing the pinpoint tests, a fault is not present, an intermittent concern may be the cause. Always check for loose connections and corroded terminals.

DTC	Description	Possible Causes	Action
B1342	ECU is defective	<ul style="list-style-type: none">Steering column lock module - failure	Steering column lock module electronic failure. Suspect faulty module, check and install as required, refer to the new module installation note at the top of the DTC Index
B2162	Instrument Cluster ID does not match	<ul style="list-style-type: none">Stored vehicle identification details incorrect	Steering column lock module electronic failure. Configure steering column lock module (Must enable SCLM and instrument cluster to transfer ID) i.e. Configure as for replacement new module
B2168	Unable to confirm unlocked condition	<ul style="list-style-type: none">Steering column lock module - failure (cannot complete unlock command)	Steering column lock module mechanical failure. Suspect faulty module, check and install as required, refer to the new module installation note at the top of the DTC Index

B2169	Unable to confirm locked condition	<ul style="list-style-type: none"> Steering column lock module - failure (cannot complete lock command) 	Steering column lock module mechanical failure. Suspect faulty module, check and install as required, refer to the new module installation note at the top of the DTC Index
B2375	Hall Sensor Failed in Unlocking Direction	<ul style="list-style-type: none"> Steering column lock module - hall sensor failure 	Steering column lock module failure. Suspect faulty module, check and install as required, refer to the new module installation note at the top of the DTC Index
B2376	Lock Cycle - Timing Invalid	<ul style="list-style-type: none"> Steering column lock module - failure (Lock : Time between Unlock Edge to Lock edge is too short) 	Steering column lock module failure. Suspect faulty module, check and install as required, refer to the new module installation note at the top of the DTC Index
B2377	Unlock Cycle - Timing Invalid	<ul style="list-style-type: none"> Steering column lock module - failure (Unlock : Time between Lock Edge to Unlock edge is too short) 	Steering column lock module failure. Suspect faulty module, check and install as required, refer to the new module installation note at the top of the DTC Index
B2378	Hall Sensor Failed in Locking Direction	<ul style="list-style-type: none"> Steering column lock module - hall sensor failure 	Steering column lock module failure. Suspect faulty module, check and install as required, refer to the new module installation note at the top of the DTC Index
B2379	SCLM not configured (inhibited mode)	<ul style="list-style-type: none"> Steering column lock module is not configured (set after first unlock command) 	Configure steering column lock module (Must enable SCLM and instrument cluster to transfer ID)

Steering Column Lock Actuator (57.40.41)

Special Service Tools

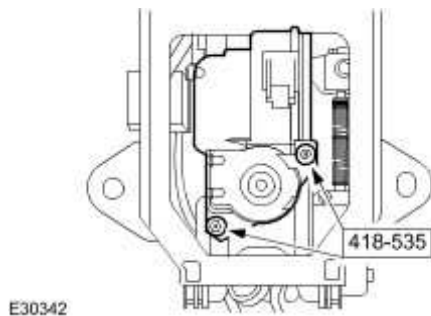


5 point security torx bit
418-535

Removal

- 1 . Remove the steering column. [<<211-04>>](#)
- 2 Remove the steering column lock actuator.

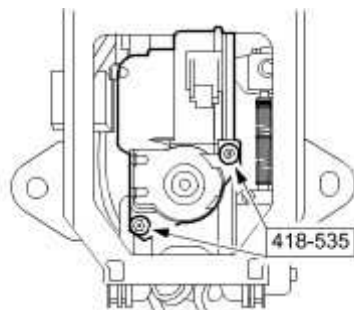
► Using the special tool, remove the steering column lock actuator retaining bolts.



Installation

- 1 . To install, reverse the removal procedure.

► Tighten to 9 Nm.



E30342

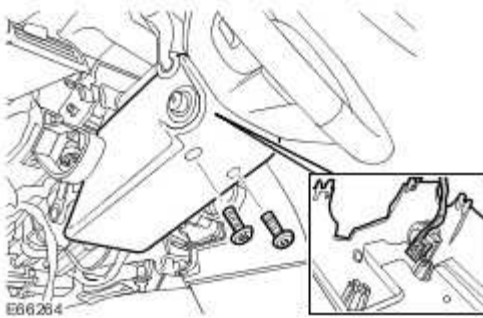
Steering Column Multifunction Switch LH (86.65.78)

Removal

- 1 Remove the steering column lower cowl.

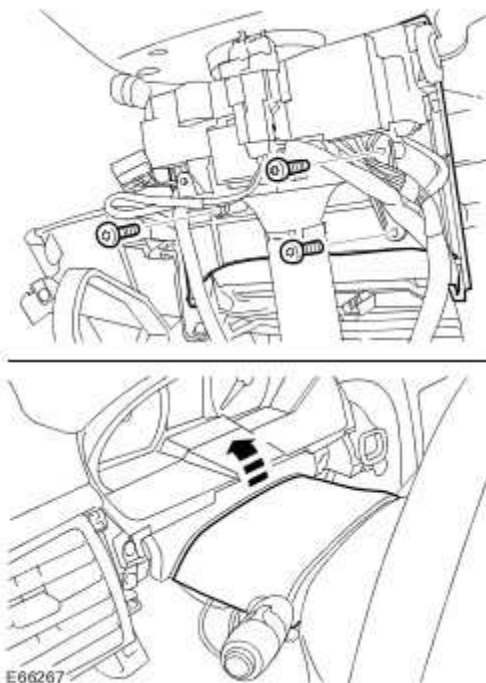
▶ Remove the 2 screws.

▶ If installed, disconnect the steering column and foot pedal control switch electrical connector.



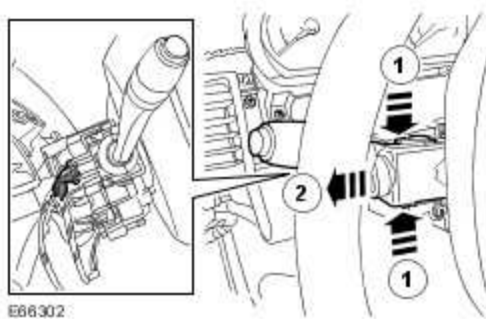
- 2 . Remove the steering column upper cowl.

▶ Remove the 3 screws.



3 . Remove the steering column multifunction switch.

- ▶ Depress the 2 clips.
- ▶ Disconnect the electrical connector.



Installation

1 .



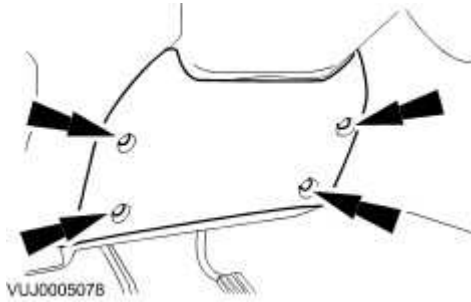
CAUTION: Make sure the electrical harness is not trapped during the installation.

To install, reverse the removal procedure.

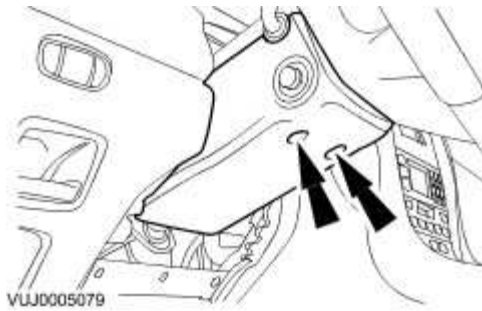
Steering Column Multifunction Switch RH (86.65.41)

Removal

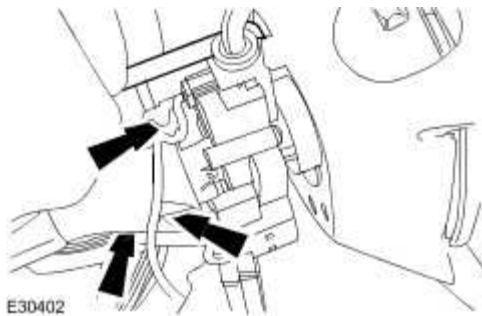
- 1 . Remove the instrument panel lower trim.



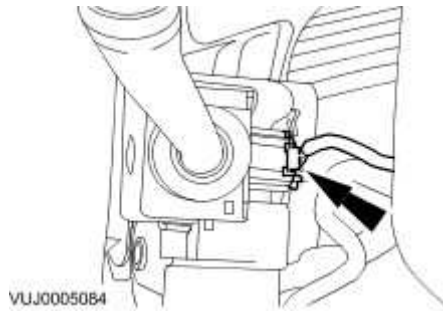
- 2 . Detach the steering column lower shroud.



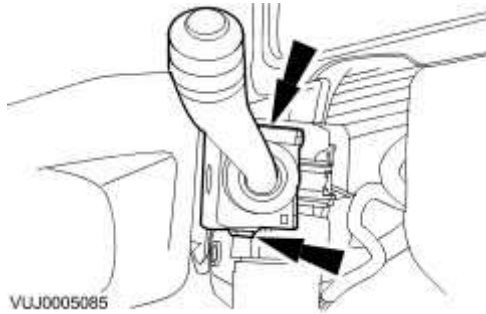
- 3 . Remove the steering column upper shroud.



- 4 . Disconnect the steering column multifunction switch RH electrical connector.



5 . Remove the steering column multifunction switch RH switch.



Installation

1 . To install, reverse the removal procedure.

2 . Tighten to 3 Nm.

