

Install the brake caliper.

- Tighten the brake caliper upper bolt to 35 Nm (26 lb.ft).

4. Install the brake pads.

- Install the two clips.

5. NOTE: Use an additional wrench to prevent the component from rotating.

Secure the brake caliper.

- Rotate the brake caliper downwards.
- Tighten the brake caliper lower bolt to 35 Nm (26 lb.ft).

6. Connect the brake hose to the brake caliper.

- Clean the component mating faces.
- Remove the blanking caps from the ports.
- Install new sealing washers.
- Tighten the brake hose union to 32 Nm (24 lb.ft).

7. LH side only: Connect the brake pad wear indicator sensor.

- Secure in the clip.

8. Bleed the brake system.

For additional information, refer to: [Component Bleeding - Vehicles With: Standard Brakes](#) (206-00 Brake System - General Information, General Procedures).

9. Install the wheel and tire.

- Tighten the wheel nuts to 140 Nm (103 lb.ft).

## Parking Brake and Actuation -

### General Specification

Item	Specification
Operation	Twin shoe (leading/trailing) operating on rear wheels, controlled from a floor console EPB switch via an actuator and twin cables.
Minimum brake lining material thickness	2.0 mm (0.078 in)

### Torque Specifications

Description	Nm	lb-ft
* Rear brake disc retaining bolt	16	12
* Brake caliper anchor plate to wheel knuckle bolts:		
Stage 1	15	11

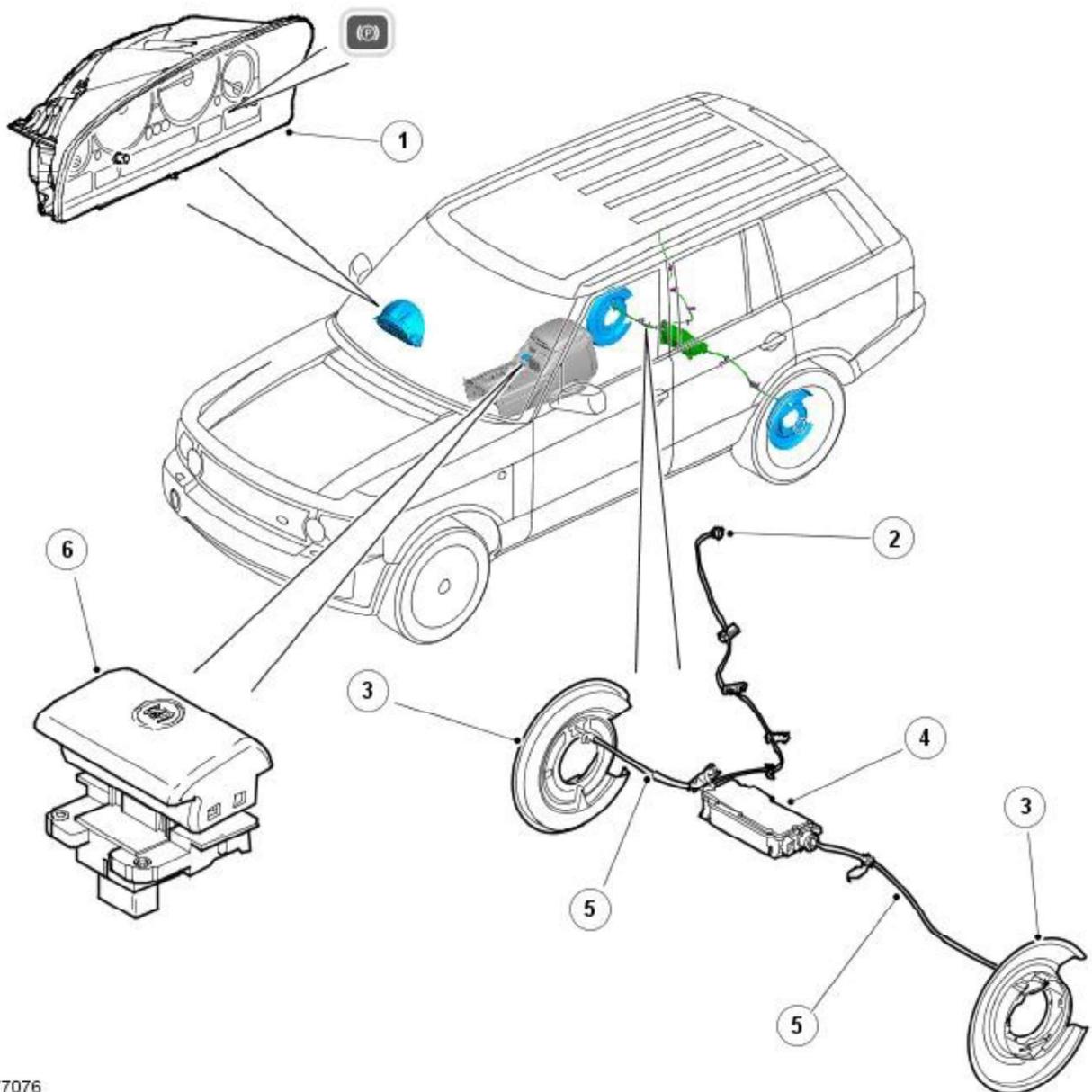
Description	Nm	lb-ft
Stage 2	Further 60°	Further 60°
* Brake caliper to anchor plate bolts	35	26
Parking brake cable to wheel knuckle bolt	8	6
Parking brake cable to upper arm support clip bolt	5	4
Parking brake actuator bolts	9	7
Parking brake cable to actuator nut	6	4

\* **New nuts/bolts must be installed**

## Parking Brake and Actuation - Parking Brake

Description and Operation

### COMPONENT LOCATION



Item	Part Number	Description
1	-	Parking brake indicators
2	-	Emergency release cable
3	-	Drum brake (2 off)
4	-	Parking brake module
5	-	Parking brake cable
6	-	Parking brake switch

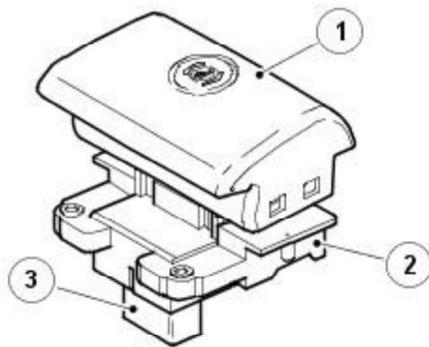
## OVERVIEW

The parking brake is an electrically actuated system that operates drum brakes integrated into the rear brake discs. The parking brake system consists of:

- A parking brake switch.
- Left and right drum brakes.
- Left and right brake cables.
- An emergency release cable.
- Two parking brake indicators.
- A parking brake module.

The parking brake is operated by the parking brake module, which adjusts the tension of the brake cables to apply and release the drum brakes. Operation of the parking brake module is initiated by the parking brake switch.

## PARKING BRAKE SWITCH



E77077

Item	Part Number	Description
1	-	Operating handle
2	-	Switch body
3	-	Electrical connector

The parking brake switch is used by the driver to apply and release the parking brake, and is installed in the center console adjacent to the gear shift lever. An electrical connector on the back of the switch provides the interface with the vehicle wiring. A brake symbol on the switch illuminates when the exterior lamps are selected on.

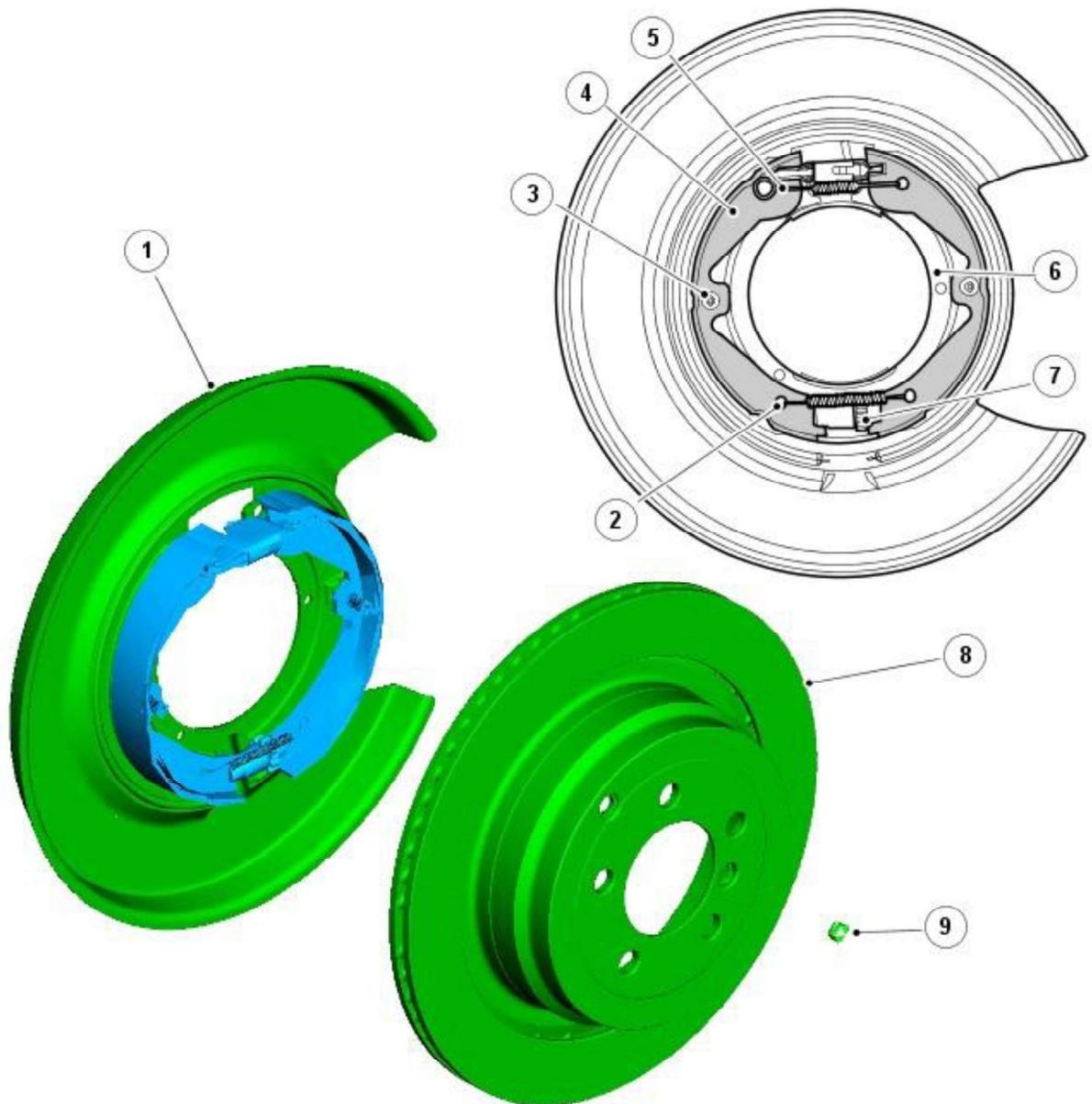
There are 3 states for the parking brake switch:

- Apply request, when the handle of the parking brake switch is pulled up.
- Release request, when the handle of the parking brake switch is pushed down.
- Idle, when the handle of the parking brake switch is in the central or rest position.

Microswitches, incorporated into the parking brake switch, are activated by the handle of the parking brake switch. To determine the operating state of the parking brake switch, the parking brake module monitors the activity of the microswitches.

## DRUM BRAKES

- NOTE: right-hand (RH) brake shown, left-hand (LH) brake similar



E81491

Item	Part Number	Description
1	-	Dust shield
2	-	Adjuster spring
3	-	Shoe locating pin and clip
4	-	Brake shoe
5	-	Return spring
6	-	Backplate
7	-	Toothed wheel adjuster
8	-	Rear brake disc
9	-	Adjuster access plug



**WARNING:** The parking brake may not switch off until 20 minutes after the ignition is switched off. Automatic re-apply of the parking brake is possible and is not eliminated until this period has expired.



**CAUTION:** The parking brake module must be isolated from electrical power before attempting to remove a brake disc from the vehicle. Operation of the parking brake switch while a brake disc is removed may cause the actuating mechanism in the parking brake module to seize.

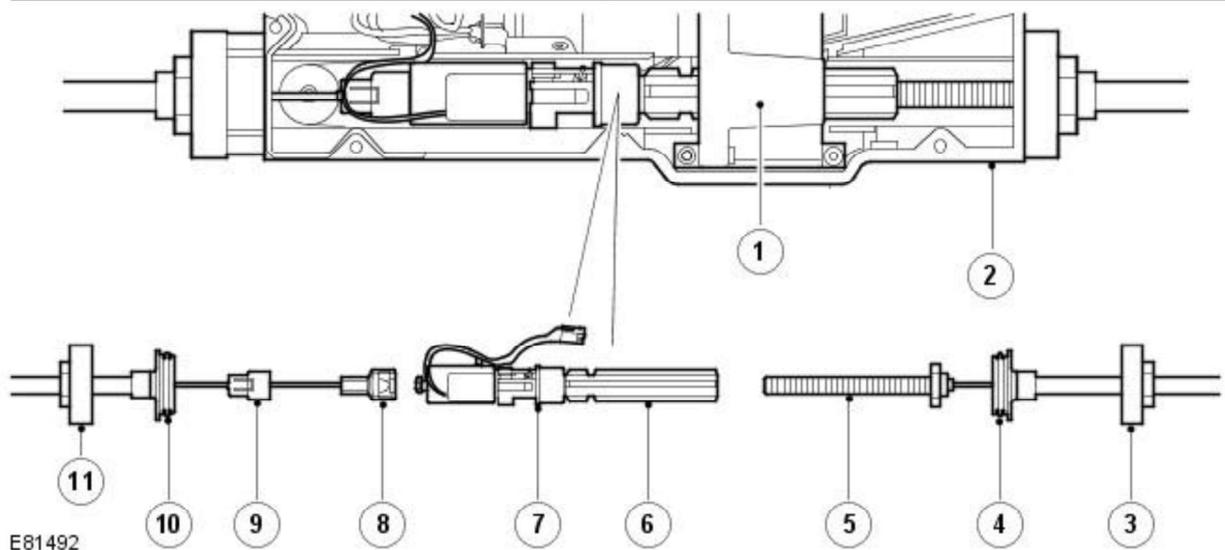
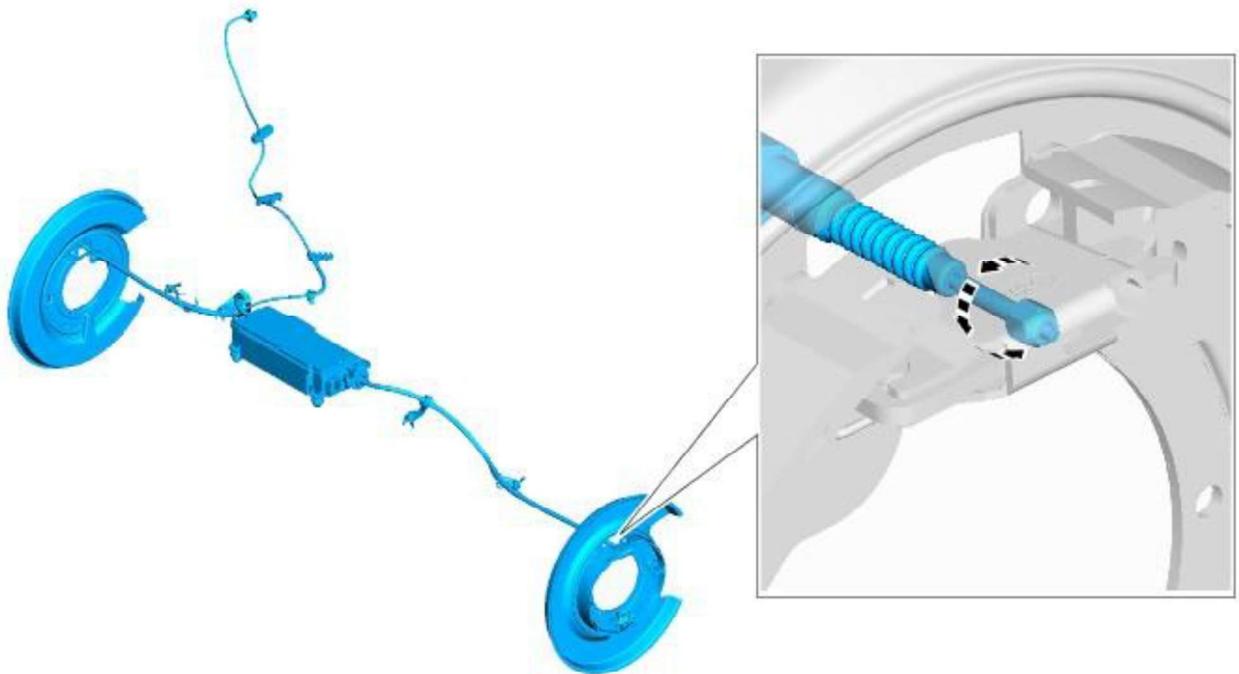
Each drum brake consists of a pair of brake shoes installed on a backplate attached to the rear hub carrier.

When the parking brake module tensions the brake cables, the movement is transmitted to an expander, which acts on both brake shoes. Brake shoe to drum clearance is set with a manual adjuster, which is accessed through a hole in the brake disc. The adjuster is a conventional toothed wheel adjuster.

After replacement of the brake shoes or brake discs, a bedding in procedure must be performed to ensure the drum brakes operate satisfactorily.

For additional information, refer to: [Parking Brake Shoes Bedding-In](#) (206-05 Parking Brake and Actuation, General Procedures).

## BRAKE CABLES



E81492

Item	Part Number	Description
1	-	Gearbox
2	-	Parking brake module housing
3	-	Cable nut
4	-	Sealing collar
5	-	Threaded connector
6	-	Spline shaft
7	-	Force sensor
8	-	Shoe
9	-	Locking cover
10	-	Sealing collar
11	-	Cable nut



**WARNING:** The parking brake may not switch off until 20 minutes after the ignition is switched off. Automatic re-apply of the parking brake is possible and is not eliminated until this period has expired.



**CAUTION:** The parking brake module must be isolated from electrical power before attempting to remove a brake disc from the vehicle. Operation of the parking brake switch while a brake disc is removed may cause the actuating mechanism in the parking brake module to seize.

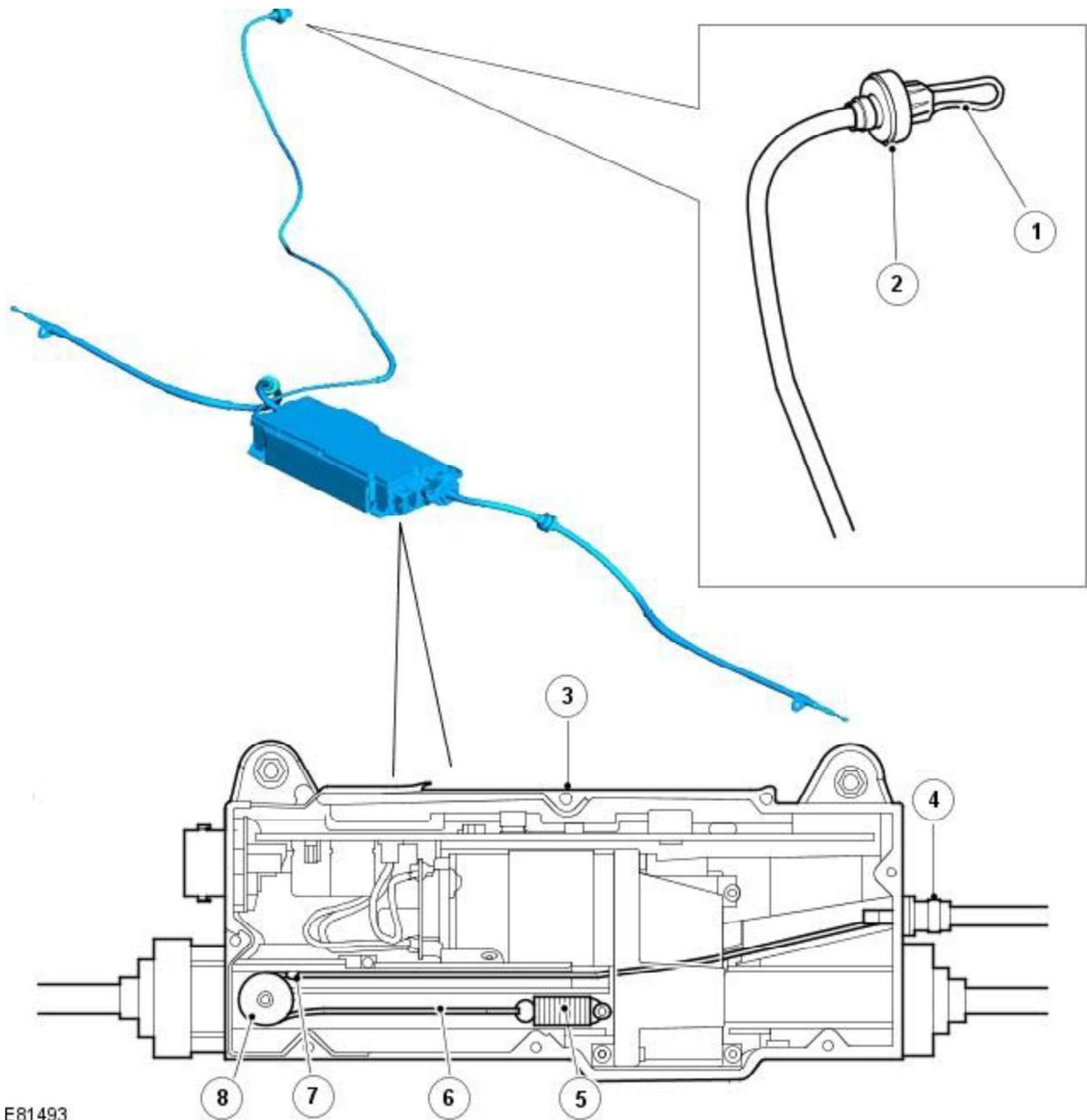
The brake cables consist of Bowden cables installed between the parking brake module and the drum brakes. The outer cable is attached to the respective wheel knuckle with a screw. The inner cable attaches to the expander and is secured in position with a nipple. In the parking brake module, the two inner cables are joined together via the force sensor and the spline shaft.

The inner cable of the RH brake cable is connected to a nipple on the force sensor by a 'shoe' on the end of the cable; a locking cover keeps the shoe engaged with the nipple.

The inner cable of the LH brake cable is connected to the spline shaft by a threaded connector (LH thread); a squared flange at the end of the threaded connector locates in the housing of the parking brake module, to prevent the threaded connector from turning with the spline shaft.

When the spline shaft turns, the threaded connector of the LH brake cable is screwed into or out of the spline shaft, which changes the effective length of the inner cables and operates the drum brakes. The ability of the spline shaft to move axially in the gearbox equalizes the load applied by the inner cables to the two drum brakes.

## EMERGENCY RELEASE CABLE



E81493

Item	Part Number	Description
1	-	Pull ring
2	-	Quick release fitting
3	-	Parking brake module
4	-	Sealing collar
5	-	Spring
6	-	Inner cable
7	-	Nipple
8	-	Pulley wheel

The emergency release cable allows the parking brake to be mechanically released in the event that:

- The parking brake is not able to be electrically released due to a system fault.
- The battery is disconnected or battery voltage decreases below 7.5 volts while the parking brake is applied, preventing electrical release of the parking brake.

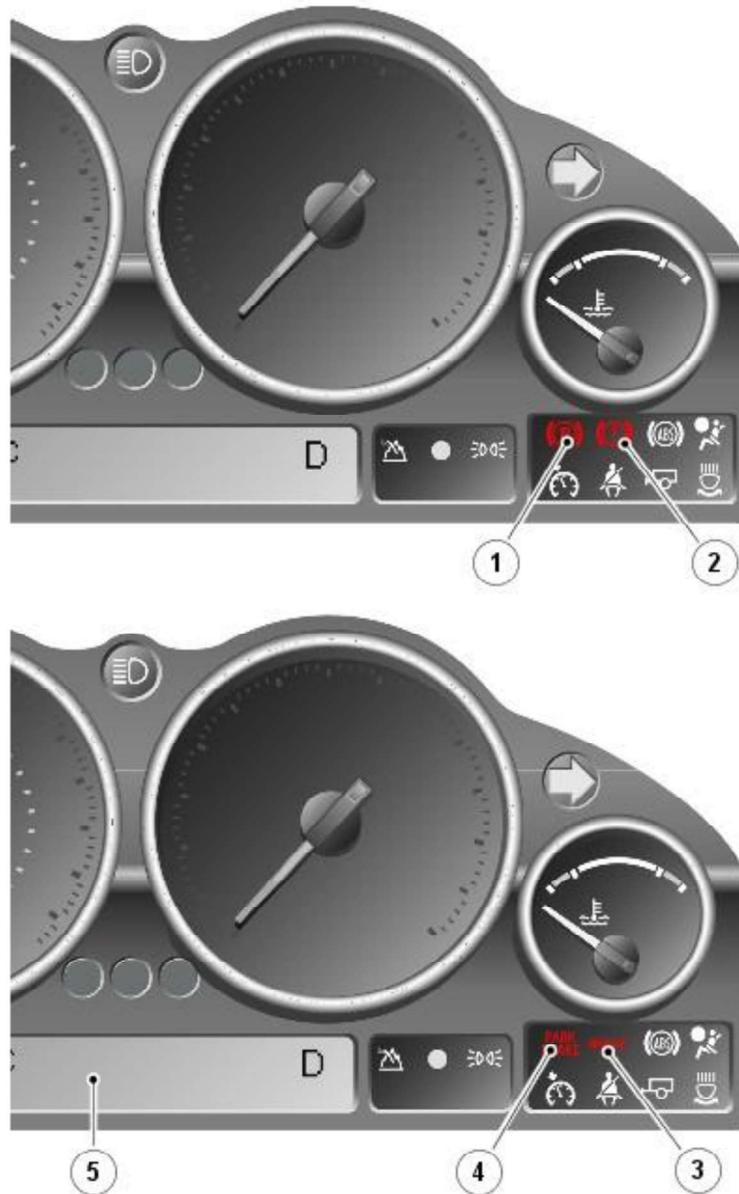
The parking brake is mechanically released by disconnecting the force sensor from the spline shaft in the parking brake module. During normal operation, the force sensor and the spline shaft are locked together by a lever operated pawl on the end of the spline shaft, which engages with a spigot on the force sensor.

The emergency release cable is a Bowden cable installed between the parking brake module and the luggage compartment. In the luggage compartment, a pull ring is installed on the end of the inner cable. The pull ring is designed to fit the hook on the end of the jack handle, and when used in combination with a screwdriver shaft, can be used to pull on the cable.

The pull required to release the latch is approximately 200 N (45 lbf). When the pull ring of the emergency release cable is released, the spring in the parking brake module retracts the inner cable and the nipple moves away from the pawl operating lever.

After the emergency release cable has been used to release the parking brake, the next time an apply selection is made with the parking brake switch, the parking brake module automatically runs through a latching procedure to reconnect the spline shaft with the force sensor. The parking brake module turns the spline shaft so that it moves towards the force sensor. The pawl of the spline shaft then re-engages with the spigot of the force sensor. A second apply selection with the parking brake switch is required to apply the parking brake.

## PARKING BRAKE INDICATORS



E89531

Item	Part Number	Description
1	-	Red warning indicator (all except NAS)
2	-	Amber warning indicator (all except NAS)
3	-	Red warning indicator (NAS only)
4	-	Amber warning indicator (NAS only)
5	-	Message center display

The parking brake has 2 warning indicator lamps and displayed messages in the instrument cluster message center to alert the driver to the operational condition of the parking brake. For additional information, refer to:

[Instrument Cluster](#) (413-01 Instrument Cluster, Description and Operation),  
[Information and Message Center](#) (413-08 Information and Message Center, Description and Operation).

## PARKING BRAKE MODULE

The parking brake module monitors external and internal inputs and adjusts the tension of the brake cables to operate the drum brakes.

The parking brake module is installed directly on the rear subframe. Two rubber mounts, installed on lugs on the underside of the parking brake module, locate in holes in the subframe. The remaining corners of the parking brake module are secured to the subframe with shoulder bolts.

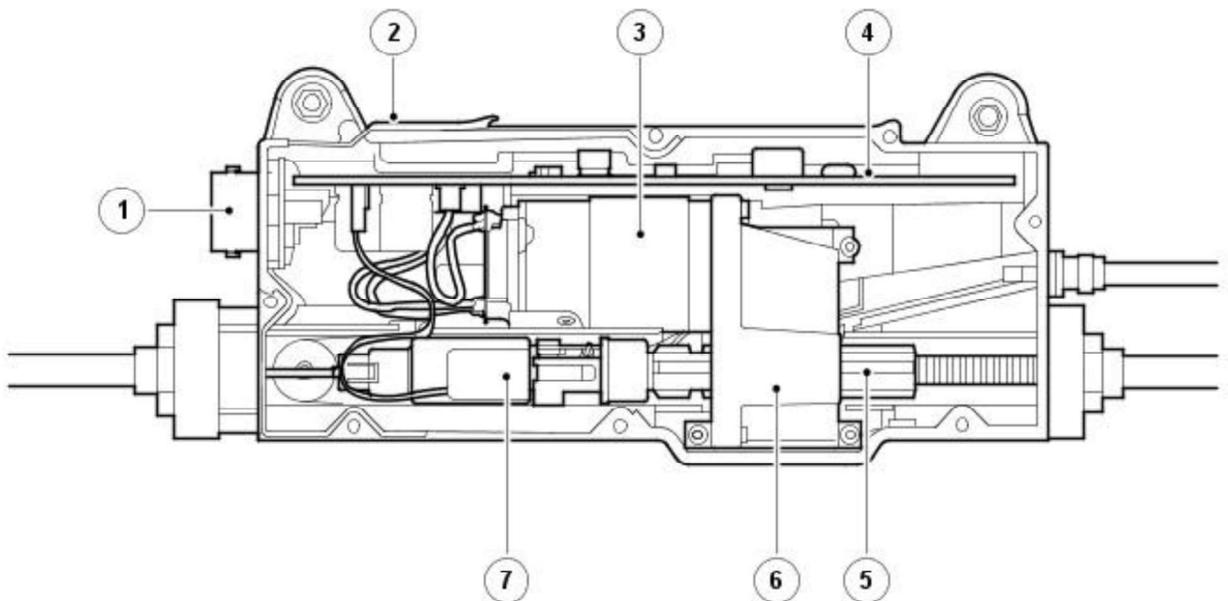
The main components of the parking brake module are:

- A PCB (printed circuit board) incorporating the ASIC (application specific integrated circuit) for control of the parking brake.
- An electric motor.
- A gearbox.
- A splined shaft.
- A force sensor.

The splined shaft and the force sensor are connected together by a latch on the end of the splined shaft. The splined shaft rotates on the latch and moves axially in the gearbox. The latch and the force sensor slide in a channel in the body of the parking brake module.

To apply or release the drum brakes, the parking brake module controls the operation of the electric motor to drive the gearbox. The gearbox rotates the splined shaft to increase or decrease the tension in the brake cables. The parking brake module monitors the load exerted by the brake cables using the input from the force sensor.

Interior of Parking Brake Module



E81494

Item	Part Number	Description
------	-------------	-------------

1	-	Electrical connector
2	-	Housing
3	-	Electric motor
4	-	PCB
5	-	Splined shaft
6	-	Gearbox
7	-	Force sensor

### **Inputs and Outputs**

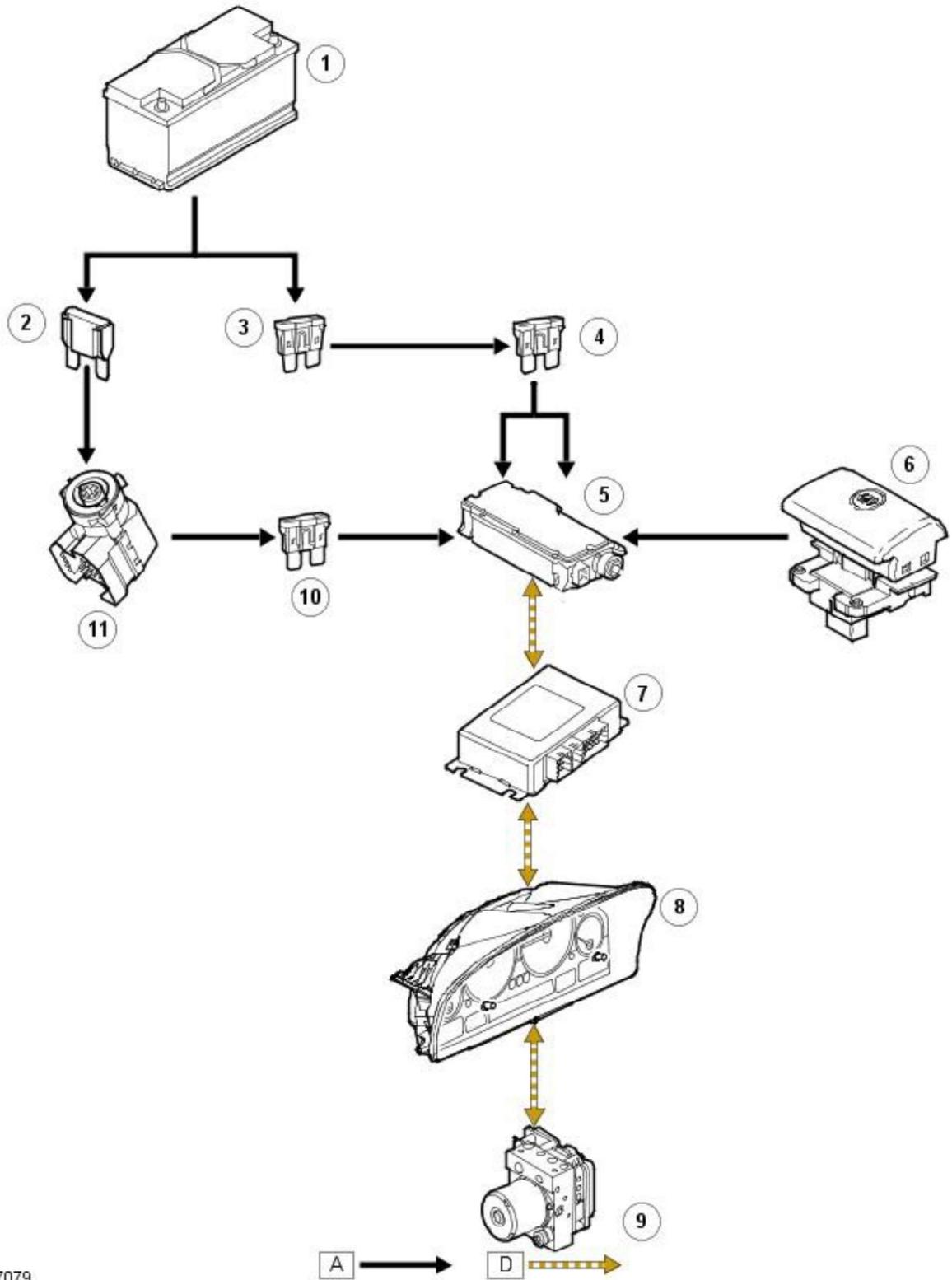
A 32 pin electrical connector on the RH side of the parking brake module provides the interface between the PCB and the vehicle wiring.

The parking brake module is powered by two permanent battery power feeds from the auxiliary junction box (AJB). A third connection with the central junction box (CJB) provides a battery voltage signal when the ignition switch is in position II (ignition). Other hardwired inputs include those from the parking brake switch.

In addition to the hardwired connections, the parking brake module is connected to the high speed controller area network (CAN) bus to enable communication with other vehicle systems.

# CONTROL DIAGRAM

• NOTE: **A** = Hardwired connection; **D** = High speed CAN bus



Item	Part Number	Description
1	-	Battery
2	-	Maxi fuse 62P, CJB
3	-	Fuse 5P, CJB
4	-	Fuse 6R, AJB
5	-	Parking brake module
6	-	Parking brake switch
7	-	transmission control module (TCM)
8	-	Instrument cluster
9	-	anti-lock brake system (ABS) module
10	-	Fuse 36P, CJB
11	-	Ignition switch

## PRINCIPLES OF OPERATION

The parking brake can be applied at any time provided sufficient battery power is available. For the parking brake to be released, various pre-conditions are required. The parking brake has manual and automatic actuating modes, to cater for different operating circumstances, as detailed in the following table:

### Actuating Modes

Mode	Pre-Conditions	Driver Action
Static apply	Vehicle speed less than 2.5 km/h (1.6 mph).	Pull up parking brake switch.
Static release	1. Vehicle speed less than 2.5 km/h (1.6 mph). 2. Engine running. <b>OR</b> Ignition switch in position II and brake pedal or accelerator pedal pressed.	Press down parking brake switch.
Dynamic apply	Vehicle speed more than 2.5 km/h (1.6 mph).	Pull up parking brake switch as required.
Dynamic release	Vehicle speed more than 2.5 km/h (1.6 mph).	Release (to neutral position) or press down parking brake switch.
DAR (drive away release)	1. Ignition switch in position II. 2. Transmission in gear 1, 2 or R (with high range selected) or 1, 2, 3 or R (with low range selected). 3. Accelerator pedal pressed more than 5%.	None. Parking brake released automatically on drive away.

### Operating Voltages

Actuation of the parking brake (apply or release) is only started if the power supply to the parking brake module is within 9 to 18 volts. At any voltage in this range, the parking brake module is able to tighten the brake cables to the maximum, to fully apply the parking brake, although at voltages between 9 and 10.5 volts the actuation time may exceed 1.0 second.

During a parking brake actuation:

- If the power supply to the parking brake module decreases to less than 8.3 volts, the parking brake module continues the actuation, but stores a related diagnostic trouble code (DTC). If the ignition is on, the parking brake module also signals the instrument cluster to illuminate the amber parking brake warning indicator and flash the red parking brake warning indicator. On the instrument cluster, a message advising there is a parking brake fault is shown in the message center. The warning indications are discontinued if the power supply voltage increases to 8.3 volts or more.
- If the power supply voltage decreases to less than 7.5 volts, the parking brake module discontinues the actuation. Actuation is automatically resumed if the power supply voltage subsequently increases to 7.5 volts or more and the parking brake switch request is still valid.
- If the power supply voltage decreases below 6.5 volts, the parking brake function is disabled for the remainder of the ignition cycle.
- If the power supply voltage increases to more than 18.0 volts, the parking brake module immediately disables the parking brake function and stores a related DTC. If the ignition is on, the parking brake module also signals the instrument cluster to illuminate the amber parking brake warning indicator and flash the red parking brake warning indicator. On the instrument cluster, a message advising that the parking brake has a fault and is not functioning is shown in the message center. The parking brake function remains disabled until the power supply voltage is within 9 to 18 volts again. When the power supply voltage is within 9 to 18 volts again, the warning indications are cancelled and actuation is automatically resumed if the parking brake module is in a dynamic mode of operation with a valid parking brake switch request.

- NOTE: The instrument cluster shuts down below 8 volts, so warning indications and messages are not displayed below 8 volts. CAN transmission stops if battery voltage drops below 7.0 volts and re-starts when voltage goes above 7.5 volts.

## Sleep Mode

To reduce quiescent drain on the vehicle battery, the parking brake module incorporates a sleep mode. The parking brake module enters the sleep mode, provided the ignition is off and there are no signals from the wheel speed sensors, when one of the following occurs:

- 20 minutes elapse after the last actuation of the parking brake.
- If no actuation occurred, 20 minutes elapse after the ignition is switched off.

The parking brake module wakes up from the sleep mode when one of the following occurs:

- An apply or release request is made with the parking brake switch.
- The ignition is turned on.

The parking brake module wakes up within 500 ms. The high speed CAN bus is activated within 200 ms maximum.

When the parking brake module is woken with a release request from the parking brake switch, the parking brake module ignores the request but illuminates the red brake warning indicator. The parking brake module extinguishes the red brake warning indicator and goes back to sleep immediately the switch is released to the neutral position.

When the parking brake module is woken with an apply request from the parking brake switch, if the parking brake is already applied the parking brake module ignores the request but illuminates the red brake warning indicator. The parking brake module extinguishes the red brake warning indicator and goes back to sleep immediately the switch is released to the neutral position. If the parking brake is in the released condition when the apply request is made, the parking brake module illuminates the red brake warning indicator and applies the parking brake. The parking brake module extinguishes the red brake warning indicator and goes back to sleep 3 minutes after the apply activation, or immediately after the switch is released to the neutral position, whichever occurs first.

## Dynamic Apply

In the dynamic apply mode, if the vehicle speed is more than 10 km/h (6.25 mph) when the parking brake switch is selected to apply, the parking brake module requests the ABS module to activate the disc brakes on all four wheels. When the vehicle comes to a standstill, the parking brake module statically applies the parking brake. Once the static load is achieved, the hydraulic pressure is removed. If the parking brake switch is released to the neutral position, or pressed down to the release position, during dynamic apply, braking is cancelled.

The ABS module monitors the deceleration rate using the wheel speed sensor signals, and adjusts the hydraulic pressure to the disc brakes as required to achieve the required rate. All of the anti-lock control - traction control system brake functions remain enabled in the dynamic apply mode.

The parking brake module incorporates two fallback functions for the dynamic apply mode:

- Fallback 1 is invoked if vehicle speed is between 2.5 km/h (1.25 mph) and  $V_{max}$  when the parking brake switch is selected to apply and the ABS module is unable to fulfil a hydraulic request. When fallback 1 is invoked, the parking brake module decelerates the vehicle using only the parking brake. The parking brake module monitors the deceleration rate using the wheel speed information from the ABS module, and adjusts the tension of the brake cables to achieve the required rate. During deceleration the parking brake module also uses the wheel speed inputs from the ABS module to operate an anti-lock function for the rear wheels. When vehicle speed decreases to 2.5 km/h (1.25 mph) the parking brake module changes to the static apply mode.
- Fallback 2 is invoked if the ABS module fails. In this instance the parking brake module monitors the output shaft speed sensor on the transmission to determine if a static or dynamic condition exists.
- Fallback 3 is invoked if there is a loss of communication between the parking brake module and the CAN bus has failed. When fallback 3 is invoked, the parking brake module decelerates the vehicle using only the parking brake. The parking brake module tightens the brake cables under the control of the driver, no anti-lock function is available.

While dynamic apply is active, including fallback 1, 2 and fallback 3, the parking brake module also outputs high speed CAN bus signals to:

- The ABS module, to apply the stop lamps.
- The instrument cluster, to sound an intermittent warning buzzer, at 0.5 second on, 1.0 second off.
- The instrument cluster, to illuminate the red parking brake warning indicator. The indicator is permanently illuminated except in fallback 3, when it flashes.

### **DAR Pre-arming**

The DAR pre-arming function operates when the transfer box is in high range to reduce the parking brake release time during DAR and to provide a smooth take-off. DAR pre-arming is invoked when:

- The ignition switch is in position II.
- The transmission is in gear 1, 2 or R.
- The vehicle is stationary.
- No failsafe tighten actuation has occurred.

### **Automatic Load Adjustment**

While the ignition is on, the parking brake module constantly monitors the input from the force sensor. If the tension of the brake cables goes outside the limits for a given operating mode, the parking brake module automatically restores the tension within limits.

**Failsafe Tighten.** If, during DAR pre-arming, the vehicle moves, then the maximum cable force is reinstated for the remainder of that ignition cycle.

**Automatic Apply.** While the parking brake is applied, if the tension of the brake cables decreases by a prescribed amount from the initial setting, the parking brake module automatically restores the tension to the initial setting.

**Automatic Release.** While the parking brake is released, if the tension of the brake cables increase to a prescribed amount, the parking brake module automatically reduces the tension to zero.

### **Parking Brake Switch Monitoring**

The parking brake module monitors for the following types of fault in the parking brake switch system:

- Short circuits between a pull-down transistor in the parking brake module and battery voltage.
- Broken wires and microswitches.
- Plausibility.

If a fault is detected, the parking brake module stores a related fault code.

The parking brake switch has a degree of in-built redundancy. If a single microswitch fault is detected the parking brake module can still determine the operating state of the parking brake switch. Short circuits or multiple failures cause the parking brake module to disable the parking brake switch for the remainder of the ignition cycle. The parking brake module also disables the parking brake switch if a plausibility fault occurs. However, since plausibility faults are usually caused by incomplete operation of the parking brake switch, the parking brake switch is re-enabled if the parking brake module subsequently establishes a plausible operating state.

If a single microswitch fault is detected, the parking brake module signals the instrument cluster to illuminate the amber parking brake warning indicator. The parking brake module also signals the instrument cluster to display a message advising there is a parking brake fault. During an apply actuation, the parking brake module also signals the instrument cluster to flash the red parking brake warning indicator.

For all other fault types, the parking brake module signals the instrument cluster to illuminate the amber parking brake warning indicator and to display a message advising the parking brake has a fault and is not functioning. If it makes an apply actuation, the parking brake module signals the instrument cluster to flash the red parking brake warning indicator for the remainder of the ignition cycle.

On the next ignition cycle, the warning indicators and the messages are only activated if the fault is still present, although the DTC is retained by the parking brake module until cleared by the Land Rover approved diagnostic system.

## Parking Brake and Actuation - Parking Brake Shoe and Lining Adjustment

### General Procedures

1. Check operation of the electronic parking brake.
2. Release the electronic parking brake.
  - Press the brake pedal and press the parking brake switch down to release the parking brake. Check that the warning light goes out.
  - Turn the ignition key to position '0' and remove the key.

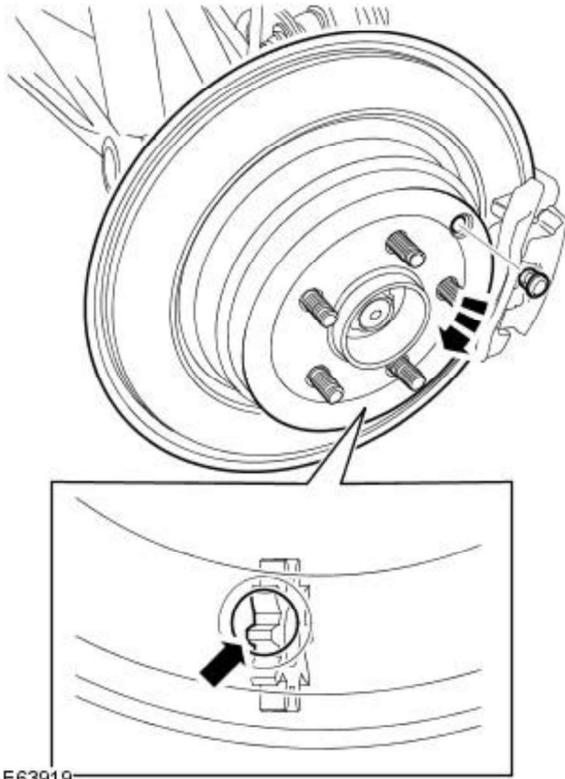
**3.**  **WARNING:** Do not work on or under a vehicle supported only by a jack. Always support the vehicle on safety stands.

Raise and support the vehicle.

4. Remove the rear wheels and tires.
5. Remove the parking brake shoe adjuster access plugs.
6. **NOTE:** Rotate the rear brake disc to locate the parking brake shoe adjuster.

Rotate the parking brake shoe adjuster until resistance is felt and the rear brake disc will not rotate.

- Apply and release the parking brake several times to centralize the parking brake shoes, re-adjust if required.



**7. NOTE:** Rotating the parking brake shoe adjuster backwards will move the parking brake shoes away from the parking brake drum.

Rotate the parking brake shoe adjuster back 8 clicks.

- 8.** Repeat the above procedure for the other side.
- 9.** Install the parking brake shoe adjuster access plugs.
- 10.** Install the rear wheels and tires.

- Tighten the wheel nuts to 140 Nm (103 lb.ft).

**11.**  **CAUTION:** The parking brake shoe bedding-in procedure must be carried out if new parking brake shoes or new rear brake discs are installed.

- **NOTE:** It is not necessary to carry out the parking brake shoe bedding-in procedure if the parking brake shoes have been removed for access to other components.

If necessary, carry out the parking brake shoe bedding-in procedure.

For additional information, refer to: [Parking Brake Shoes Bedding-In](#) (206-05 Parking Brake and Actuation, General Procedures).

# Parking Brake and Actuation - Parking Brake Shoes Bedding-In

## General Procedures

- NOTE: This procedure must be carried out if, new parking brake shoes are fitted, new rear brake discs are fitted or if the vehicle has been mud wading (not water) for more than 50 miles.

1. Carry out the parking brake shoe bedding-in procedure.

2. NOTE: The parking brake shoes 'bedding-in procedure' mode will remain active for the remainder of the ignition cycle, or until the vehicle speed exceeds 31 mph (50 kph). If the procedure needs to be re-entered, the entry actions must be repeated.

To enter the parking brake shoes 'bedding-in procedure' mode.

- Start and run the engine.
- Apply the brake pedal 3 times within 10 seconds and hold applied after the 3rd application.
- Apply the electronic parking brake switch 4 times, followed by 3 release applications within 10 seconds.

3. Once the parking brake shoes 'bedding-in procedure' mode has been entered, the parking brake warning lamp will flash and the parking brake shoes can be bedded-in. Conduct 10 repeated stops from 30 - 35 kph (19 - 22 mph), followed by a 500 metre (547 yard) interval between each stop to allow the parking brake actuator and rear brakes to cool.

- The electronic parking brake brake force will be increased up to the dynamic maximum so long as the switch is held in the applied position.
- If the switch is released to either the NEUTRAL or OFF positions, the electronic parking brake will be released.
- The parking brake actuator and rear brakes MUST be allowed to cool between applications, either by driving at 19 mph (30 kph) for 500 metres (547 yards) or remaining stationary for 1 minute between each application.

# Parking Brake and Actuation - Parking Brake Actuator

Removal and Installation

## Removal



**CAUTION:** It is essential that absolute cleanliness is observed when working on the parking brake actuator. Always cover any open orifices using lint free non-flocking material to prevent the ingress of foreign matter. Failure to follow this instruction may result damage to the components.

- **NOTE:** It is not necessary to carry out the parking brake shoe 'bedding-in procedure' if the rear brake discs or parking brake shoes have been removed for access to other components.

1. Release the electronic parking brake.
2. Using the Land Rover approved diagnostic system, drive the parking brake to the mounting position.
3. Using the Land Rover approved diagnostic system, depressurize the air suspension.  
For additional information, refer to: [Air Suspension System Depressurize and Pressurize](#) (204-05 Vehicle Dynamic Suspension, General Procedures).
4. Disconnect the battery ground cable.  
For additional information, refer to: Specifications (414-00 Charging System - General Information, Specifications).

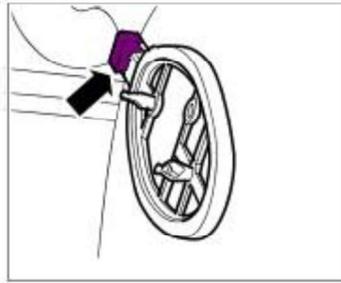


5. **WARNING:** Do not work on or under a vehicle supported only by a jack. Always support the vehicle on safety stands.

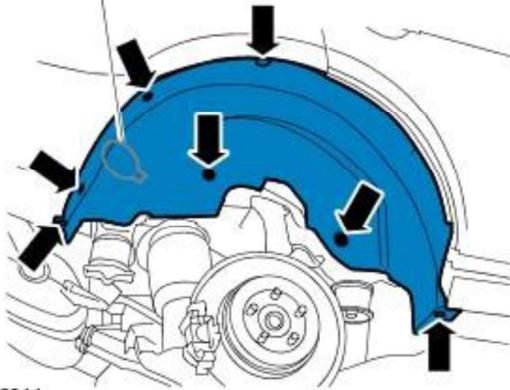
Raise and support the vehicle.

6. Remove the rear wheels and tires.  
For additional information, refer to: [Wheel and Tire](#) (204-04 Wheels and Tires, Removal and Installation).

**7. Remove the RH rear fender splash shield.**

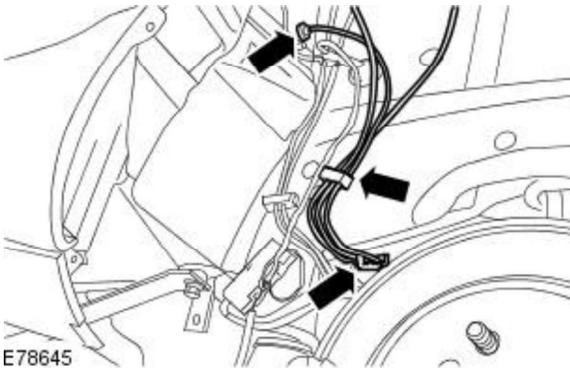


- Remove the 4 screws.
- Remove the nut.
- Remove the scrivet.
- Remove the clip.
- Disconnect the tire pressure antenna electrical connector.



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**8. NOTE: Note the routing of the parking brake emergency release cable.**



Release the parking brake emergency release cable and rear suspension spring air lines.

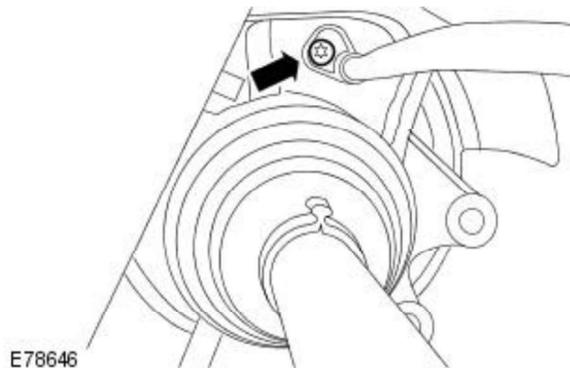
- Release the parking brake emergency release cable.
- Release from the 2 clips.

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**9. Remove the rear brake discs.**

For additional information, refer to: [Brake Disc](#) (206-04 Rear Disc Brake, Removal and Installation).

**10. NOTE: Right-hand shown, left-hand similar.**



Remove the parking brake cable bolt from the rear wheel knuckle.

E78646

**11. NOTE:** Left-hand shown, right-hand similar.

Release the parking brake cables.

1. Pull the parking brake cable sleeve away from the parking brake shoe expander.
2. Pull the parking brake cable towards the parking brake shoe expander.
3. Release the parking brake cable from the parking brake shoe expander.

**12.** Remove the exhaust system. For additional information, refer to:

[Exhaust System](#) (309-00A Exhaust System - 4.2L SC V8 - AJV8, Removal and Installation),  
[Exhaust System](#) (309-00B Exhaust System - 4.4L NA V8 - AJ41, Removal and Installation),  
[Exhaust System - Vehicles Without: Diesel Particulate Filter \(DPF\)](#) (309-00C Exhaust System - 3.6L V8 - TdV8, Removal and Installation),  
[Exhaust System - Vehicles With: Diesel Particulate Filter \(DPF\)](#) (309-00C Exhaust System - 3.6L V8 - TdV8, Removal and Installation).

**13.** Remove the fuel tank heat shield.

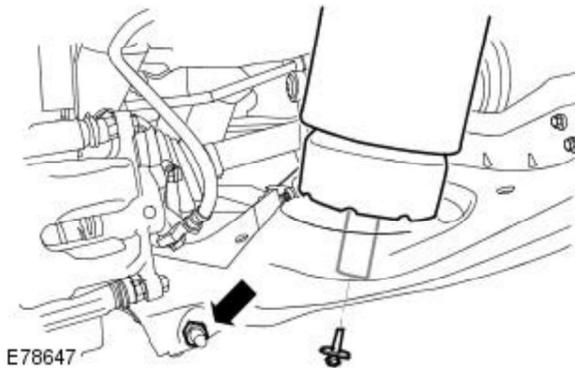
- Remove the 8 screws.

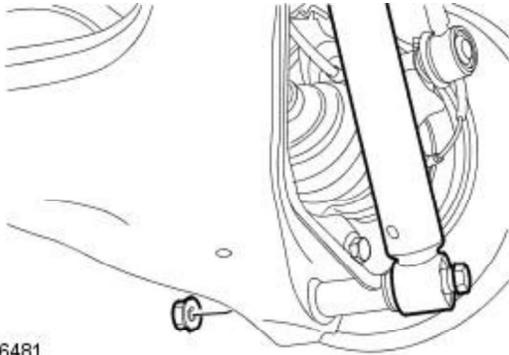


**14. NOTE:** Left-hand shown, right-hand similar.

Release the rear air spring from the lower suspension arm.

- Remove the screw.



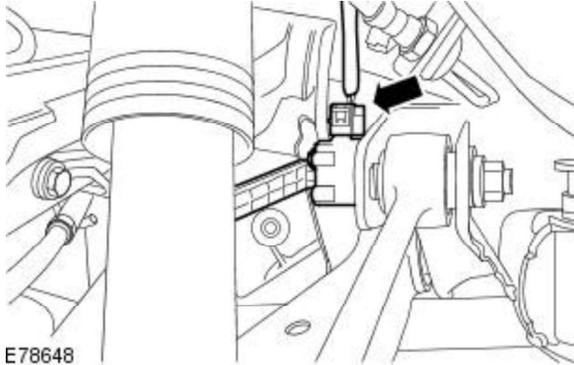


E86481

**15. NOTE:** Left-hand shown, right-hand similar.

Release the rear shock absorber from the lower suspension arm.

- Remove the bolt and discard the nut.

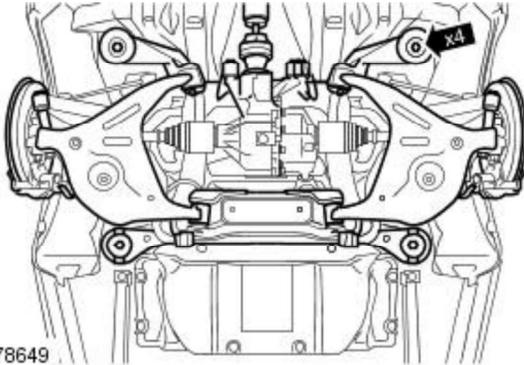


E78648

**16. NOTE:** Right-hand shown, left-hand similar.

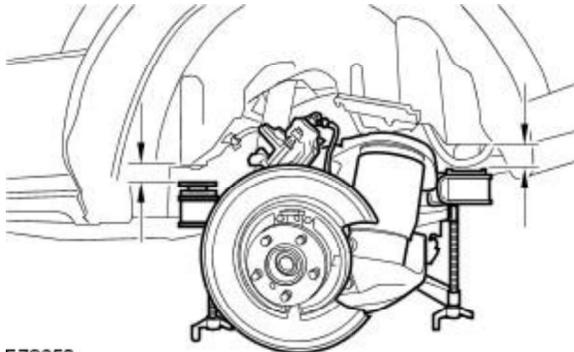
Disconnect both rear suspension height sensor electrical connectors.

**17.** Using a suitable hydraulic jack, support the rear subframe.



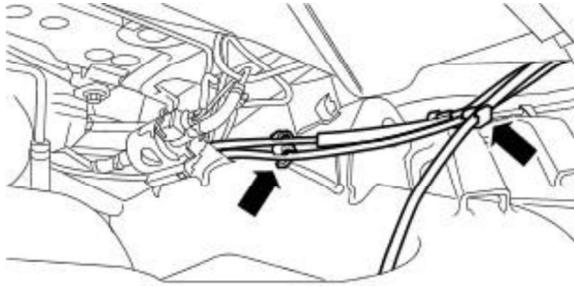
E78649

**18.** Remove the 4 rear subframe mounting bolts.



E78650

**19.** Lower the rear subframe to a maximum of 20 mm (0.78 inches).

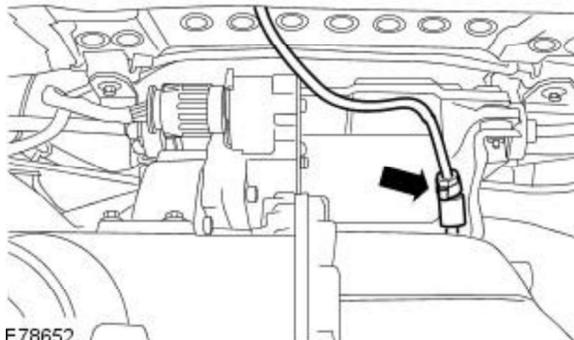


**20. NOTE:** Note the routing of the parking brake emergency release cable.

Release the parking brake emergency release cable and rear suspension spring air lines.

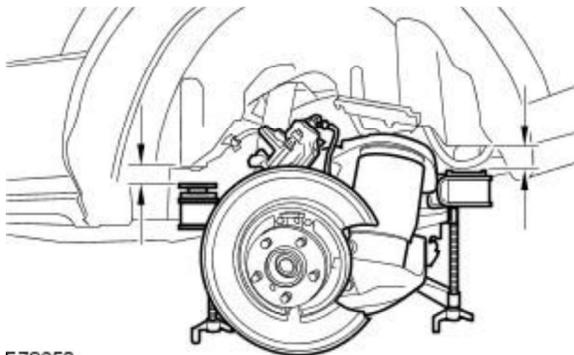
- Release from the 2 clips.

E78651



**21.** Disconnect the differential case breather line.

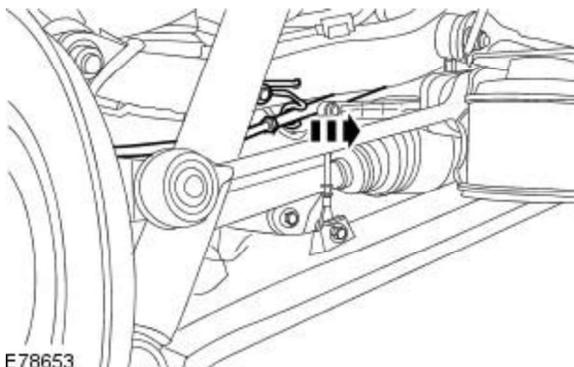
E78652



**22.** Lower the rear subframe to a maximum of 40 mm (1.57 inches).

- Collect the spacers from the mountings.

E78650

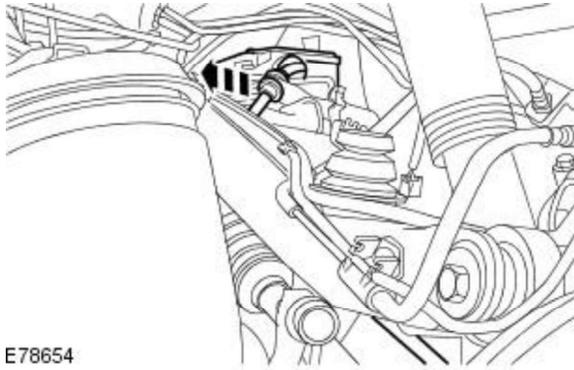


**23. NOTE:** Right-hand shown, left-hand similar.

Release the parking brake cable clip from the upper suspension arm.

- Remove the bolt.

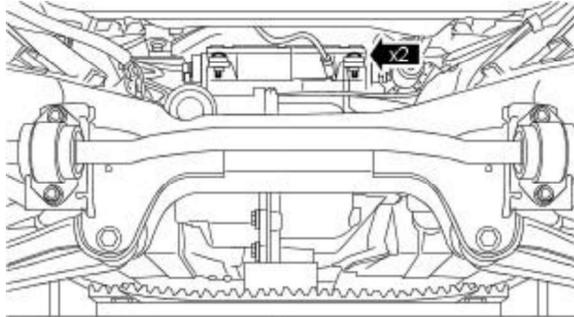
E78653



E78654

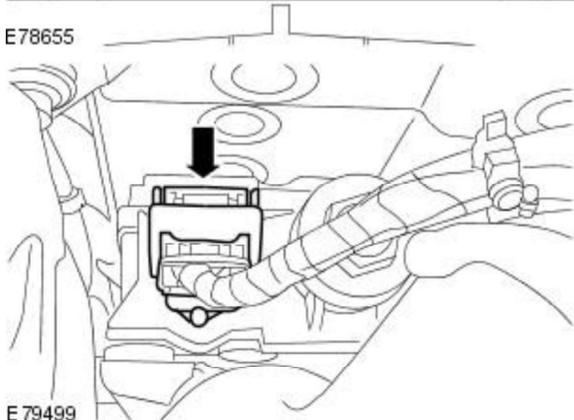
**24. NOTE:** Right-hand shown, left-hand similar.

Release the parking brake cable from the rear subframe clip.



E78655

**25.** Remove the 2 parking brake actuator bolts.



E 79499

**26. CAUTIONS:**

 Make sure that the area around the component is clean and free of foreign material.

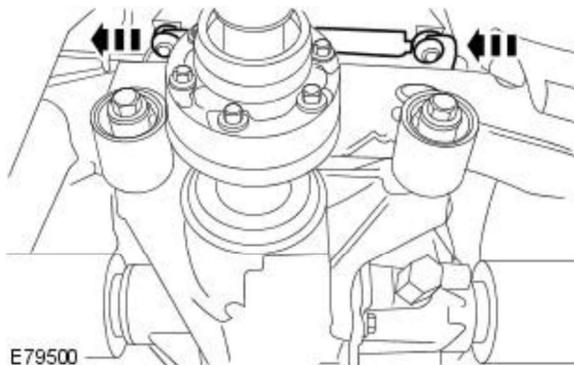
 It is imperative that no damage is caused to the electrical connector or the module.

 Do not touch the electrical connections.

Disconnect the parking brake actuator electrical connector.

**27.** Remove the parking brake actuator and cable assembly.

- Release the 2 front rubber mounts.



E79500

## Installation

**1.** Install the parking brake actuator and cable assembly.

- Attach the 2 front rubber mounts.

**2.**  **CAUTION:** Do not touch the electrical connections.

Connect the parking brake actuator electrical connector.

**3.** Install the parking brake actuator bolts and tighten to 9 Nm (7 lb.ft)

**4. NOTE:** Right-hand shown, left-hand similar.

Install the parking brake cable to the rear subframe clip.

**5. NOTE:** Right-hand shown, left-hand similar.

Install the parking brake cable clip to the upper suspension arm.

- Install the bolt.

**6.** Connect the differential case breather line.

**7.** Attach the parking brake emergency release cable and rear suspension spring air lines.

- Secure in the 2 clips.

**8.** Raise the rear subframe and locate on the dowels.

- Install the spacers to the rear subframe mountings.

**9.**  **CAUTION:** Make sure that the spacers are correctly located to the bushes prior to tightening.

Install the 4 rear subframe mounting bolts and tighten to 165 Nm (122 lb.ft)

**10.** Connect both rear suspension height sensor electrical connectors.

**11. NOTE:** Left-hand shown, right-hand similar.

Attach the rear shock absorber to the lower suspension arm.

- Install the screw, but do not fully tighten at this stage.

**12. NOTE:** Left-hand shown, right-hand similar.

Attach the rear air spring to the suspension lower arm.

- Tighten the screw to 7 Nm. (5 lb.ft).

**13.** Install the fuel tank heat shield.

- Install the 8 screws.

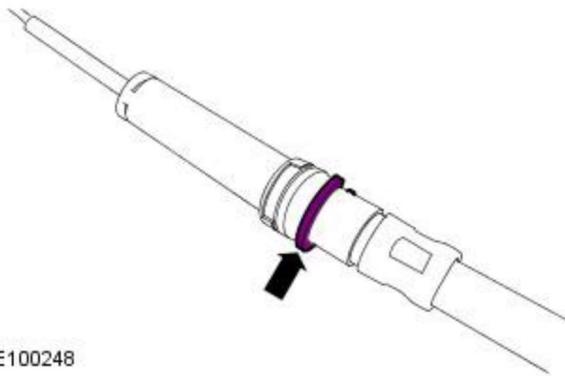
**14.** Install the exhaust system. For additional information, refer to:

[Exhaust System](#) (309-00A Exhaust System - 4.2L SC V8 - AJV8, Removal and Installation),

[Exhaust System](#) (309-00B Exhaust System - 4.4L NA V8 - AJ41, Removal and Installation),

[Exhaust System - Vehicles Without: Diesel Particulate Filter \(DPF\)](#) (309-00C Exhaust System - 3.6L V8 - TdV8, Removal and Installation),

[Exhaust System - Vehicles With: Diesel Particulate Filter \(DPF\)](#) (309-00C Exhaust System - 3.6L V8 - TdV8, Removal and Installation).



E100248

**15.**  **CAUTION:** Make sure that the parking brake cable latches correctly into the parking brake shoe expander.

- **NOTE:** Make sure that the brake cable circlip is positioned as shown.

Attach the parking brake cables.

- Push the parking brake cable through the wheel knuckle into the parking brake shoe expander.

**16.** **NOTE:** Right-hand shown, left-hand similar.

Install the parking brake cable bolt to the rear wheel knuckle and tighten to 8 Nm (6 lb.ft).

**17.** Install the rear brake discs.

For additional information, refer to: [Brake Disc](#) (206-04 Rear Disc Brake, Removal and Installation).

**18.** Attach the parking brake emergency release cable and rear suspension spring air lines.

- Secure the 2 clips.
- Install the parking brake emergency release cable.

**19.** Install the RH rear fender splash shield.

- Install the clip.
- Install the scrivet.
- Install the nut.
- Install the 4 screws.

**20.** Install the rear wheels and tires.

For additional information, refer to: [Wheel and Tire](#) (204-04 Wheels and Tires, Removal and Installation).

-  **21. CAUTION:** Nuts and bolts must be tightened with the weight of the vehicle on the suspension.

Tighten the rear shock absorber lower nuts and bolts to 110 Nm (81 lb.ft).

- 22.** Connect the battery ground cable.  
For additional information, refer to: Specifications (414-00 Charging System - General Information, Specifications).
- 23.** Using the Land Rover approved diagnostic system, read, evaluate and clear any fault codes from the parking brake actuator memory.
- 24.** Using the Land Rover approved diagnostic system, calibrate the parking brake actuator on an even surface.
- 25.** Test the parking brake for correct operation.

## Parking Brake and Actuation - Parking Brake Cable LH

Removal and Installation

### Removal

- CAUTIONS:



It is essential that absolute cleanliness is observed when working on the parking brake actuator. Always cover any open orifices using lint free non-flocking material to prevent the ingress of foreign matter. Failure to follow this instruction may result damage to the components.



The parking brake actuator fault memory must not be erased.

- NOTE: If the parking brake system has completed less than 50,000 cycles it is permissible to replace the parking brake cables. If over 50,000 cycles have been completed, then the parking brake cables can only replaced as part of the parking brake actuator and cable assembly. The parking brake cycle count can be checked using the Land Rover approved diagnostic system, (ON/OFF = 1 cycle). If a parking brake cable becomes detached whilst the vehicle is being driven, a 'parking brake actuator unblocking procedure' may be required using the Land Rover approved diagnostic system. If a parking brake cable breaks then the complete parking brake actuator and cable assembly should be replaced.

- NOTE: It is not necessary to carry out the parking brake shoe 'bedding-in procedure' if the rear brake discs or parking brake shoes have been removed for access to other components.

1. Using the Land Rover approved diagnostic system, drive the parking brake to the mounting position.

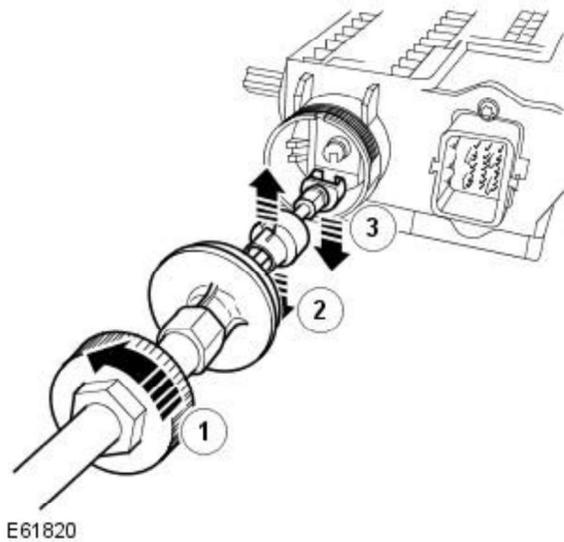
-  **2. WARNING:** Do not work on or under a vehicle supported only by a jack. Always support the vehicle on safety stands.

Raise and support the vehicle.

3. Disconnect the battery ground cable.  
For additional information, refer to: Specifications (414-00, Specifications).
4. Remove the rear wheels and tires.
5. NOTE: The thread is left handed.

Remove the RH parking brake cable.

For additional information, refer to: [Parking Brake Cable RH](#) (206-05 Parking Brake and Actuation, Removal and Installation).



## 6. CAUTIONS:

 Make sure that the area around the component is clean and free of foreign material.

 Make sure that no dirt or moisture enters the parking brake actuator during parking brake cable replacement.

 It is imperative that no damage is caused to the electrical connector or the module.

 Do not touch the electrical connections.

Remove the LH parking brake cable.

- Release the nut.
- Release the parking brake cable clip.
- Release and remove the parking brake cable.

## Installation

### 1. Install the LH parking brake cable.

- Attach the parking brake cable.
- Install the parking brake cable clip.
- Tighten the nut to 6 Nm (4 lb.ft).

### 2. Install the RH parking brake cable.

For additional information, refer to: [Parking Brake Cable RH](#) (206-05 Parking Brake and Actuation, Removal and Installation).

### 3. Install the rear wheels and tires.

- Tighten nuts to 140 Nm (103 lb.ft).

### 4. Connect the battery ground cable.

For additional information, refer to: Specifications (414-00, Specifications).

 **CAUTION:** The parking brake actuator fault memory must not be erased.

Test the parking brake for correct operation.

Published: 11-May-2011

# Parking Brake and Actuation - Parking Brake Cable RH

Removal and Installation

## Removal

### • CAUTIONS:



It is essential that absolute cleanliness is observed when working on the parking brake actuator. Always cover any open orifices using lint free non-flocking material to prevent the ingress of foreign matter. Failure to follow this instruction may result damage to the components.



The parking brake actuator fault memory must not be erased.

• NOTE: If the parking brake system has completed less than 50,000 cycles it is permissible to replace the parking brake cables. If over 50,000 cycles have been completed, then the parking brake cables can only be replaced as part of the parking brake actuator and cable assembly. The parking brake cycle count can be checked using the Land Rover approved diagnostic system, (ON/OFF = 1 cycle). If a parking brake cable becomes detached whilst the vehicle is being driven, a 'parking brake actuator unblocking procedure' may be required using the Land Rover approved diagnostic system. If a parking brake cable breaks then the complete parking brake actuator and cable assembly should be replaced.

• NOTE: It is not necessary to carry out the parking brake shoe 'bedding-in procedure' if the rear brake discs or parking brake shoes have been removed for access to other components.

1. Using the Land Rover approved diagnostic system, drive the parking brake to the mounting position.



**2. 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.

3. Disconnect the battery ground cable.  
For additional information, refer to: Specifications (414-00, Specifications).

4. Remove the rear wheels and tires.

5. Remove the parking brake actuator and cable assembly.  
For additional information, refer to: [Parking Brake Actuator](#) (206-05 Parking Brake and Actuation, Removal and Installation).

### 6. CAUTIONS:



Make sure that the area around the component is clean and free of foreign material.



Make sure that no dirt or moisture enters the parking brake actuator during parking brake cable replacement.

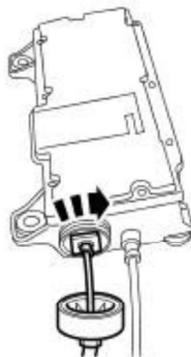


It is imperative that no damage is caused to the electrical connector or the module.



Do not touch the electrical connections.

• NOTE: The thread is left handed.



E 78690

Remove the RH parking brake cable.

- Release the nut.
- Release and remove the parking brake cable.

### Installation

**1.** NOTE: Apply a suitable amount of the supplied grease to the RH parking brake cable threads.

Install the RH parking brake cable.

- Screw the parking brake cable in 5 complete turns.
  - Tighten the nut to 6 Nm (4 lb.ft).
- 2.** Install the parking brake actuator and cable assembly.  
For additional information, refer to: [Parking Brake Actuator](#) (206-05 Parking Brake and Actuation, Removal and Installation).
- 3.** Install the rear wheels and tires.
- Tighten nuts to 140 Nm (103 lb.ft).
- 4.** Connect the battery ground cable.  
For additional information, refer to: Specifications (414-00, Specifications).
- 5.**  CAUTION: The parking brake actuator fault memory must not be erased.

Test the parking brake for correct operation.

## Parking Brake and Actuation - Parking Brake Shoes

Removal and Installation

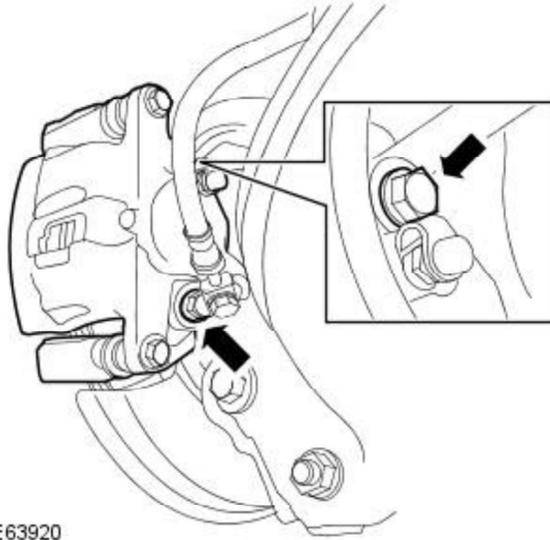
### Removal

• NOTE: If the parking brake shoes or the brake discs have been removed for access to other components then DO NOT carry out the bedding in procedure.

- 1.** Using the Land Rover approved diagnostic system, drive the parking brake to the mounting position.
- 2.** Disconnect the battery ground cable.  
For additional information, refer to: Specifications (414-00, Specifications).
- 3.**  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.

- 4.** Remove the rear wheels and tires

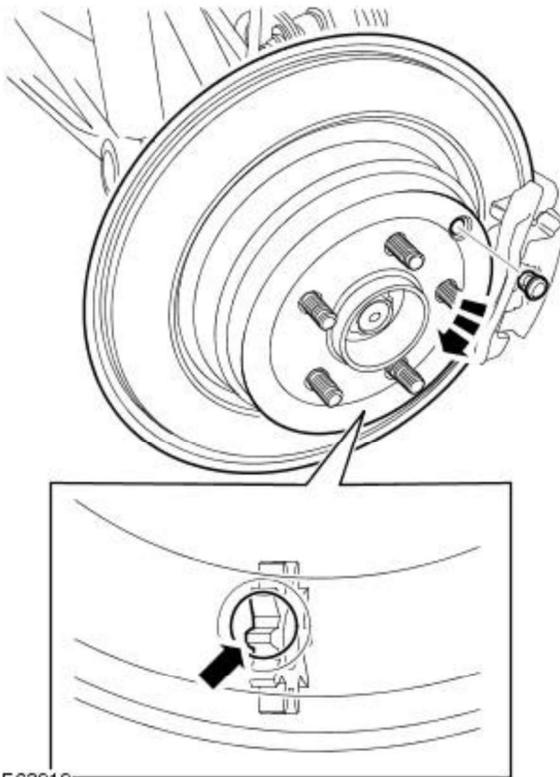


E63920

5.  CAUTION: Do not allow the brake caliper to hang on the brake hose.

Tie the brake caliper aside.

- Remove and discard the 2 bolts.

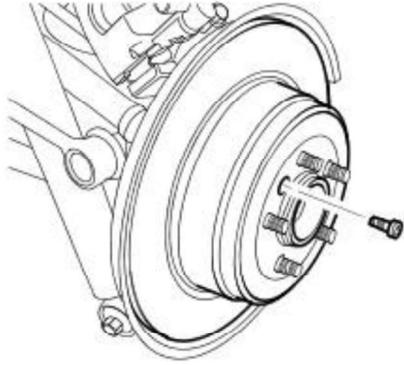


E63919

6. NOTE: Rotate the rear brake disc to locate the parking brake shoe adjuster.

Release the parking brake shoe adjustment.

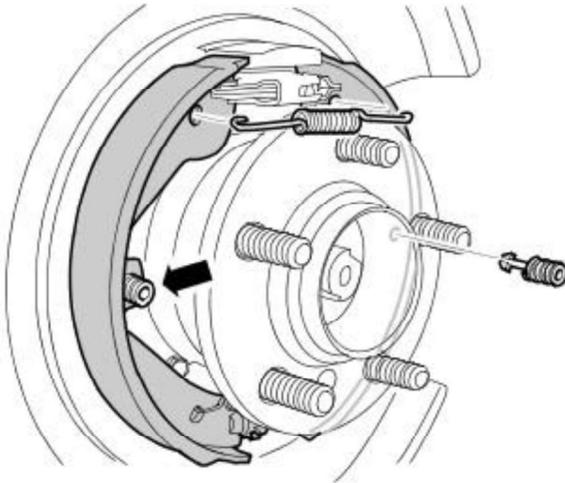
- Remove the parking brake shoe adjuster access plug.
- Rotate the parking brake shoe adjuster.



E63921

**7. Remove the rear brake disc.**

- Remove the Allen screw.



E63924

**8. NOTE:** Rotate the parking brake shoe retainers through 90 degrees to release them from the back plate.

Remove the parking brake shoes as an assembly with the parking brake shoe lower spring and the parking brake shoe adjuster.

- Remove both parking brake shoe retainers.
- Remove the parking brake shoe upper return spring.

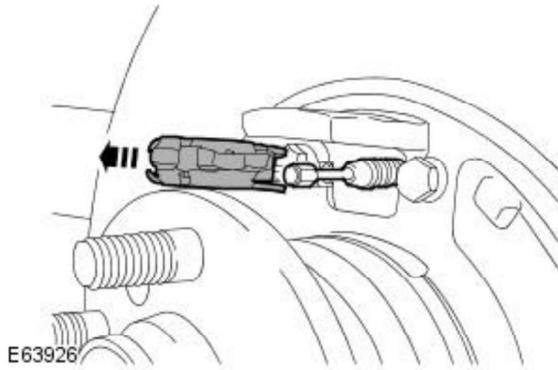


E68677

**9. Remove the parking brake shoe adjuster.**

- Remove the parking brake shoe lower return spring.
- Remove the parking brake shoes.

10. Remove the parking brake shoe expander.



11. Repeat the above procedure for the other side.

## Installation

1.  **WARNING:** Do not use compressed air to clean brake components. Dust from friction materials can be harmful if inhaled.

Install the parking brake shoe expander.

- Clean the component mating faces.

2. **NOTE:** Apply grease of the correct specification sparingly to the adjuster threads.

Install the parking brake shoe adjuster.

- Clean the adjuster and set it to its minimum extension.
- Install the parking brake shoe lower return spring.
- Assemble the parking brake shoes.

3. Install the parking brake shoes.

- Clean the component mating faces.
- Install both parking brake shoe retainers.
- Install the parking brake shoe upper return spring.

4.  **CAUTION:** Brake discs must be renewed in pairs.

Install the rear brake disc.

- Make sure that the rear brake disc and hub mating surfaces are clean.
- Tighten the Allen screw to 16 Nm (12 lb.ft).

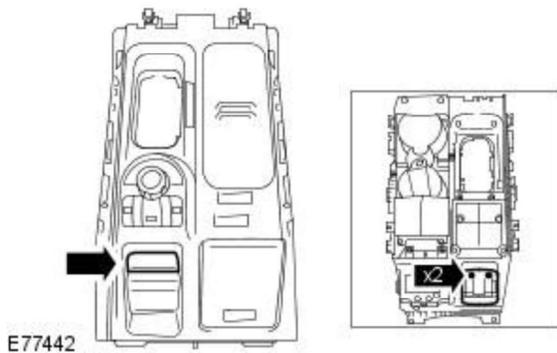
5. Install the brake caliper.
  - Clean the component mating faces.
  - Tighten the new bolts to 15 Nm (11 lb.ft), plus a further 60 degrees.
6. Repeat the above procedure for the other side.
7. Adjust the parking brake shoes.  
For additional information, refer to: [Parking Brake Shoe and Lining Adjustment](#) (206-05 Parking Brake and Actuation, General Procedures).
8. Install the rear wheels and tires.
  - Tighten the wheel nuts to 140 Nm (103 lb.ft).
9. Connect the battery ground cable.  
For additional information, refer to: Specifications (414-00, Specifications).

## Parking Brake and Actuation - Parking Brake Switch

Removal and Installation

### Removal

1. Disconnect the battery ground cable.  
For additional information, refer to: Specifications (414-00, Specifications).
2. Remove the floor console upper panel.  
For additional information, refer to: [Floor Console Upper Panel](#) (501-12 Instrument Panel and Console, Removal and Installation).
3. Remove the parking brake switch.
  - Remove the parking brake switch trim panel.
  - Remove the 2 screws.



### Installation

1. Install the parking brake switch.
  - Install the 2 screws.
  - Install the parking brake switch trim panel.
2. Install the floor console upper panel.  
For additional information, refer to: [Floor Console Upper Panel](#) (501-12 Instrument Panel and Console, Removal and Installation).
3. Connect the battery ground cable.  
For additional information, refer to: Specifications (414-