

Rear Disc Brake -

General Specification

Item	Specification
Rear disc:	
3.2 Petrol engine	Ventilated
2.2 Diesel engine	Solid
Rear disc diameter:	
Ventilated	302 mm (11.9 in)
Solid	302 mm (11.9 in)
Rear disc thickness new:	
Ventilated	20 mm (0.79 in)
Solid	12 mm (0.47 in)
Service limit:	
Ventilated	18 mm
Solid	10 mm
Pad minimum thickness	2 mm
Maximum disc run out - Disc installed	0.080 mm

Torque Specifications

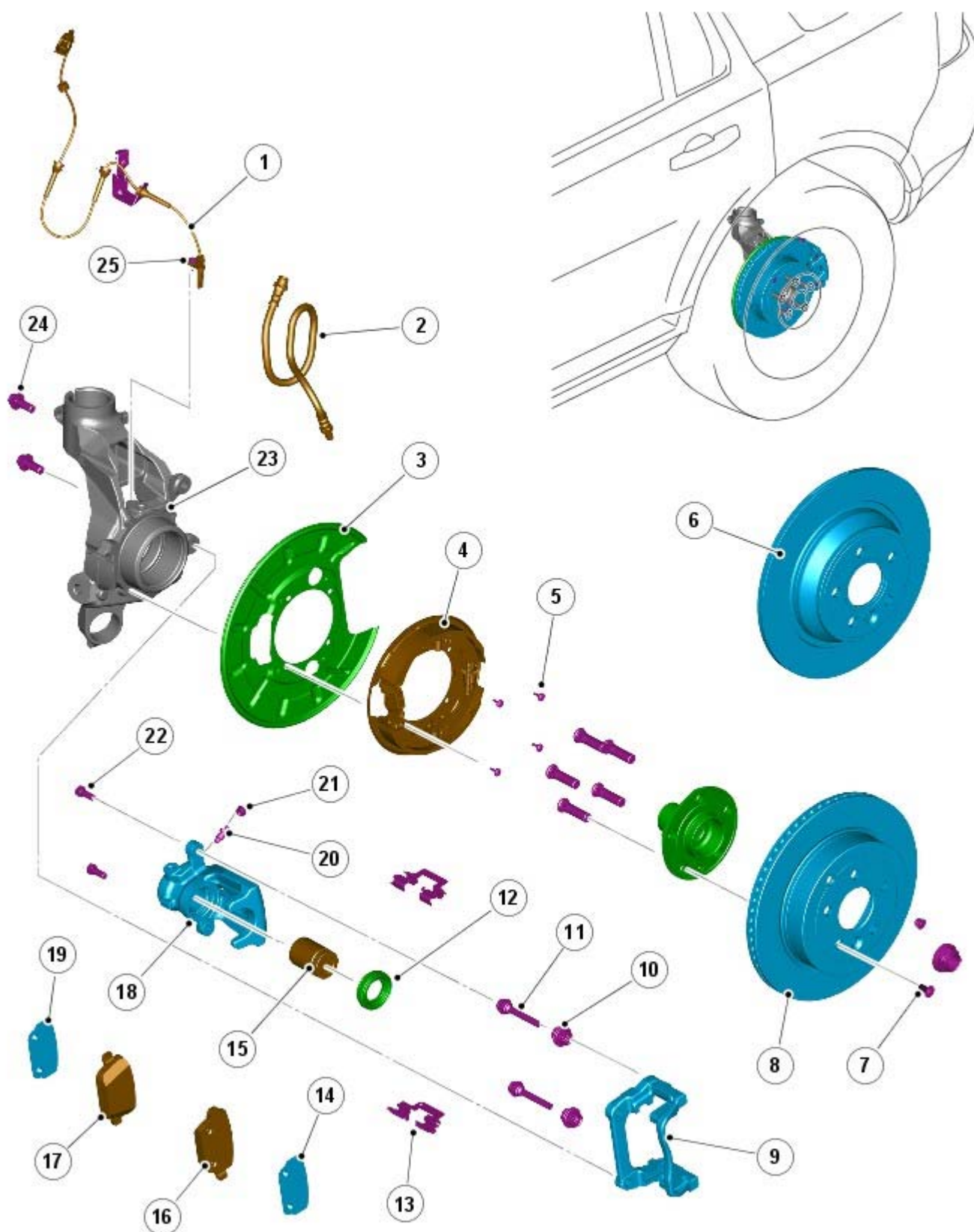
Description	Nm	lb-ft
Brake caliper bleed screw	10	7
Brake caliper fixed carrier to wheel knuckle bolts*	110	81
Brake caliper guide pin bolts	30	22
Brake disc dust shield bolts	13	10
Brake disc Torx screw	35	26
Brake flexi hose unions to caliper	15	11
Brake hose retaining bracket to wheel knuckle bolt	22	16

* New nuts/bolts must be installed

Part Number
Rear Disc Brake - Rear Disc Brake
 Description and Operation

Published: 11-May-2011

COMPONENT LOCATION



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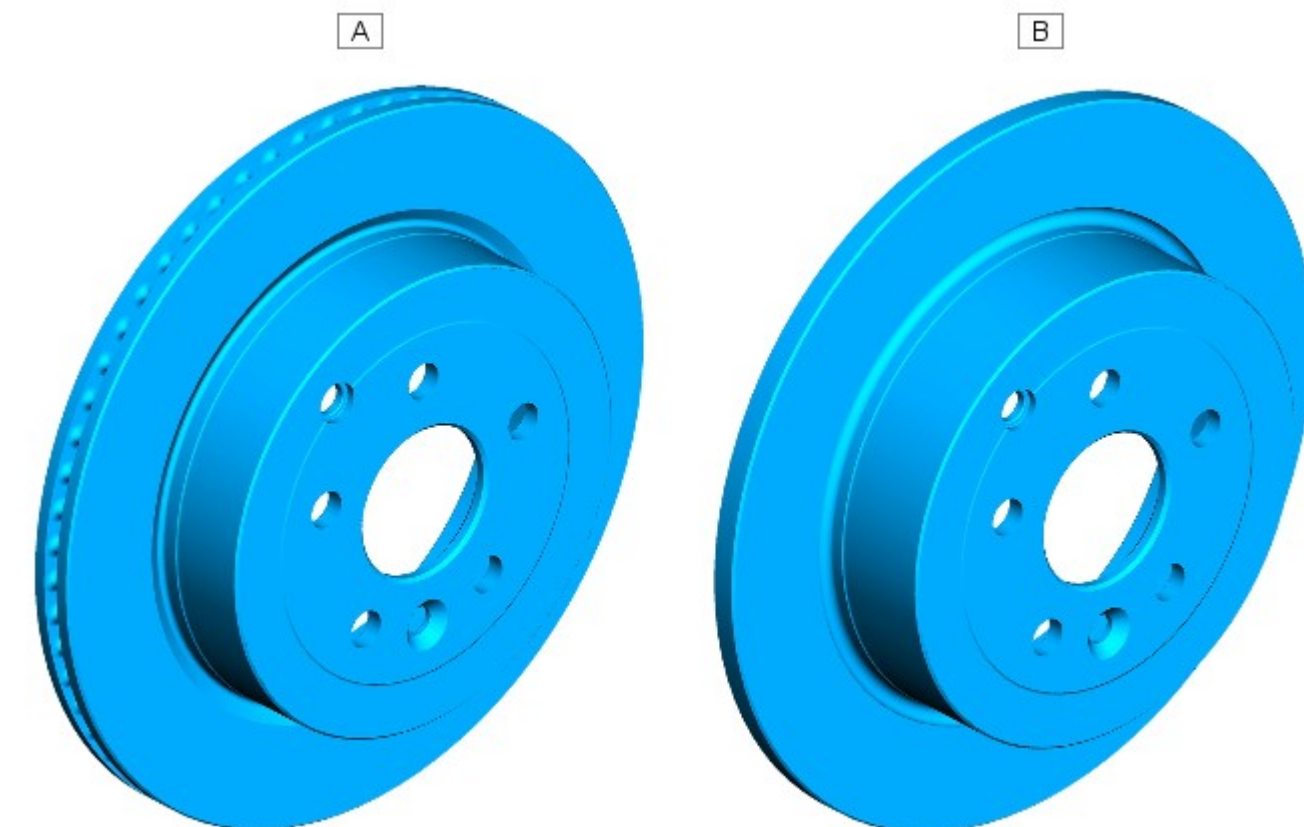
Item	Part Number	Description
1	-	Anti-lock Brake System (ABS) sensor cable
2	-	Flexible hose

3	Dust shield
4	Parking brake assembly
5	Dust shield retaining screw (4 off)
6	Brake disc – solid (TD4 diesel vehicle)
7	Brake disc retaining screw
8	Brake disc – ventilated (i6 gasoline vehicle)
9	Fixed carrier
10	Bushed bolt rubber boot (2 off)
11	Bushed bolt
12	Caliper piston seal
13	Brake pad retaining spring (2 off)
14	Outer anti-squeal shim
15	Caliper piston
16	Outer brake pad
17	Inner brake pad
18	Sliding caliper
19	Inner anti-squeal shim
20	Caliper bleed screw
21	Bleed screw cap
22	Bushed bolt retaining screw (2 off)
23	Rear Left-Hand (LH) wheel knuckle
24	Fixed carrier retaining bolt (2 off)
25	Anti-lock Brake System (ABS) sensor retaining screw

OVERVIEW

The rear brake assembly features either a conventional ventilated or a solid type brake disc, and cast-iron sliding caliper with single acting piston.

BRAKE DISC



E83312

Item		Description
A		Rear brake disc - i6 gasoline vehicle
B		Rear brake disc - TD4 diesel vehicle

The ventilated type brake disc is 302 x 20 mm (11.89 x 0.79 in) in diameter and installed to the 3.2 liter i6 gasoline vehicle. The solid type brake disc is 302 x 12 mm (11.89 x 0.47 in) in diameter and installed to the 2.2 liter TD4 diesel vehicle. The brake disc is secured to the wheel knuckle hub with a single screw and is also retained by the 5 wheel securing nuts.

Both sizes of rear brake disc are sufficiently cooled to achieve high levels of thermal stability, even during severe braking.

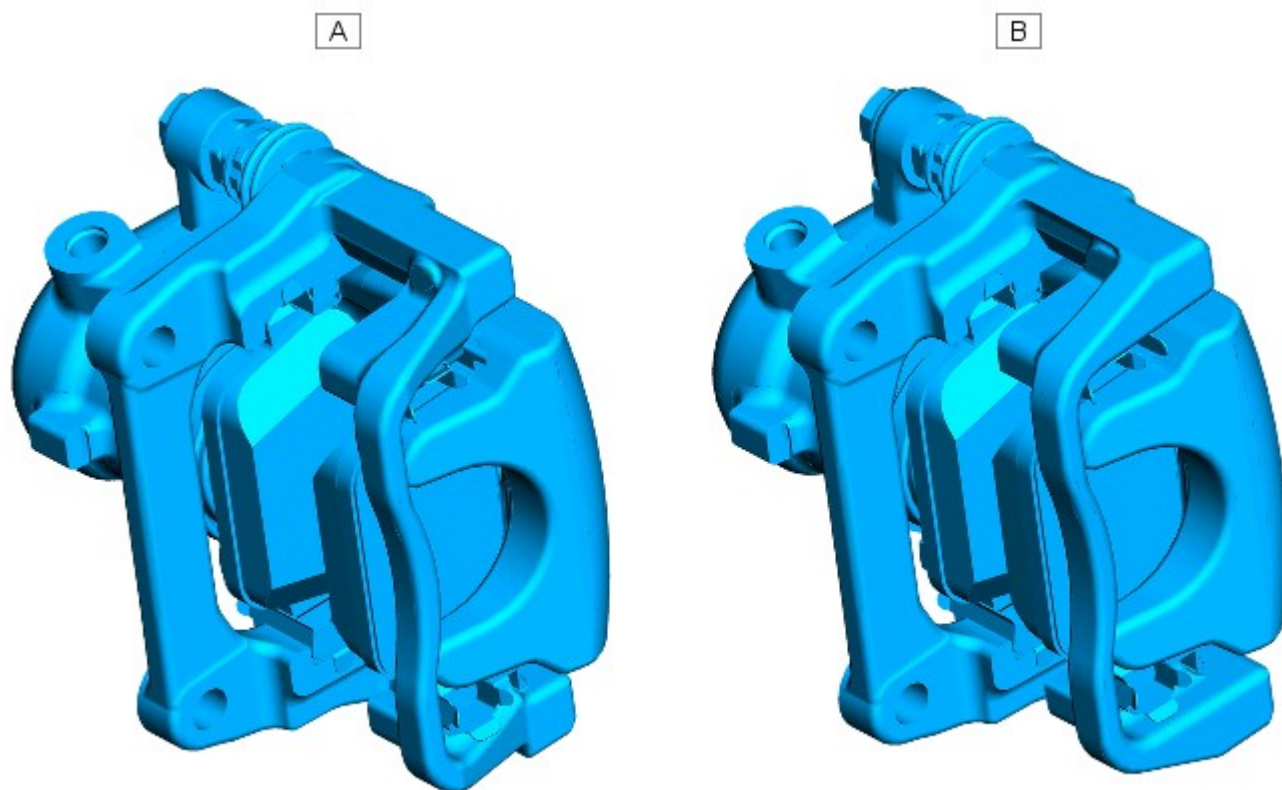
The solid type brake disc is cooled as the vehicles forward motion directs air over the disc surfaces. The conventional ventilated disc is cooled by the forward motion of the vehicle drawing air through radial slots formed on the disc outer rim. The air cools the disc from the inside edge to the disc center, before venting out through slots formed around the disc central bell.

The brake disc also forms the location for the parking brake components. The brake disc internal diameter is 185 mm (7.28 in) and is machined with a smooth surface to form the brake drum. An integral backplate and brake dust shield is mounted to the rear of the brake disc. The backplate encloses the brake disc and also provides the mounting location for the 2 parking brake shoes and operating components.

An aperture is formed in the dust shield and backplate that allows the parking brake cable to protrude through to the inner side of the brake disc, and connect to the parking brake expander unit. A hole machined in the brake disc outer hub provides access to the parking brake manual adjuster.

For additional information, refer to: [Parking Brake](#) (206-05 Parking Brake and Actuation, Description and Operation).

CALIPER ASSEMBLY



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Item		Description
A		Rear brake caliper - i6 gasoline vehicle
B		Rear brake caliper - TD4 diesel vehicle

The caliper assembly comprises a fixed carrier and sliding caliper. The fixed carrier is mounted to straddle the brake disc and is attached to the wheel knuckle with 2 bolts. The fixed carrier provides the location for 2 brake pads that are mounted on either side of the brake disc, and is formed with guide channels that allow the brake pads to slide toward the disc surface.

NOTE: The 2 fixed carrier retaining bolts are pre-applied with a thread locking adhesive and must not be re-used during maintenance. New fixed carrier retaining bolts must be used and the original bolts discarded.

The sliding caliper is mounted over the fixed carrier and retains the 2 brake pads within the caliper assembly. The sliding caliper is secured to the fixed carrier with 2 bushed bolts, and is formed with a hydraulic chamber containing a piston and annular seal.

The sliding caliper is connected via a flexible hose to the brake system hydraulic circuit, and also incorporates a bleed screw for maintenance purposes.

The 2 bushed bolts are machined with a smooth surface and are protected from dirt and moisture ingress with a collapsible rubber boot. The bushed bolts allow the sliding caliper limited lateral movement along the fixed carrier.

An anti-squeal shim is installed on the outside edge of each brake pad and reduces Noise, Vibration and Harshness (NVH) from the brake components during operation.

An upper and lower brake pad retaining spring are mounted between the fixed carrier and sliding caliper. The retaining springs are held in position by the 2 bushed bolts, and maintain pressure on the brake pads to prevent radial movement of the pads away from the brake disc.

The brake pads are not installed with pad wear sensors.

BRAKE DUST SHIELD

A formed brake dust shield and integral parking brake backplate is located between the wheel knuckle and brake disc, and is secured to the knuckle with 4 screws.

The brake dust shield is handed to the relevant side of the vehicle and protects the brake components from cross axle stone throws. The brake dust shield also prevents debris and brake dust from spreading to other parts of the vehicle.

PRINCIPLES OF OPERATION

Brake Application

As the brake pedal is applied, initial hydraulic pressure is felt in the sliding caliper chamber causing the piston to extend toward the brake disc. The moving piston contacts the inner brake pad, forcing the pad along the fixed carrier guide channels and into contact with the inner side of the brake disc.

As the piston extends from the caliper chamber, it passes through an internal annular seal located within the caliper chamber. The movement of the piston distorts the shape of the seal and consequently, the seal applies pressure on the piston outer surface.

The sliding caliper now reacts and commences to slide along the 2 bushed bolts, in the opposite direction to the extending piston. The sliding caliper contacts the outer brake pad, forcing the pad along the fixed carrier guide channels and into contact with the outer side of the brake disc.

With both brake pads now in full contact with the brake disc and hydraulic pressure acting on the piston, no further movement of the piston and sliding caliper is possible. The force created by the piston and caliper acting against the brake pads increases rapidly, trapping the brake disc and slowing the vehicle.

Brake Release

As the brake pedal is released, hydraulic pressure in the caliper chamber collapses and force is no longer applied to the brake pads. The brake pads are moved slightly outwards by the action of the rotating brake disc, and the caliper internal annular seal returns to the normal shape. As the seal moves it grips on the piston outer surface and withdraws the piston into the chamber, sufficiently to provide the necessary pad to disc clearance.

This action prevents the piston from holding the inner brake pad against the disc, and also enables the piston to protrude further from the caliper chamber to compensate for brake pad wear.

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Rear Disc Brake - Rear Disc Brake

Diagnosis and Testing


For additional information.

REFER to: [Brake System](#) (206-00 Brake System - General Information, Diagnosis and Testing).

Rear Disc Brake - Brake Pads

Removal and Installation

Removal

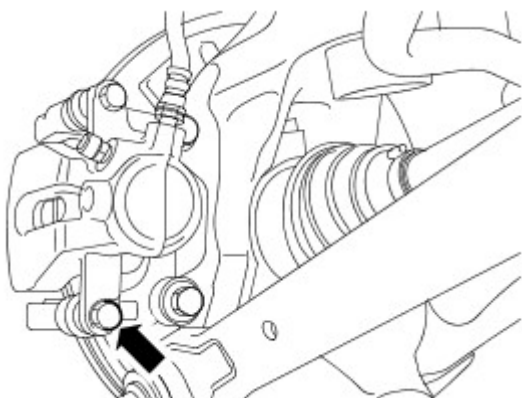
1.  **WARNING:** Do not work on or under a vehicle supported only by a jack. Always support the vehicle on safety stands.

Raise and support the vehicle.

2. Remove the wheel and tire.

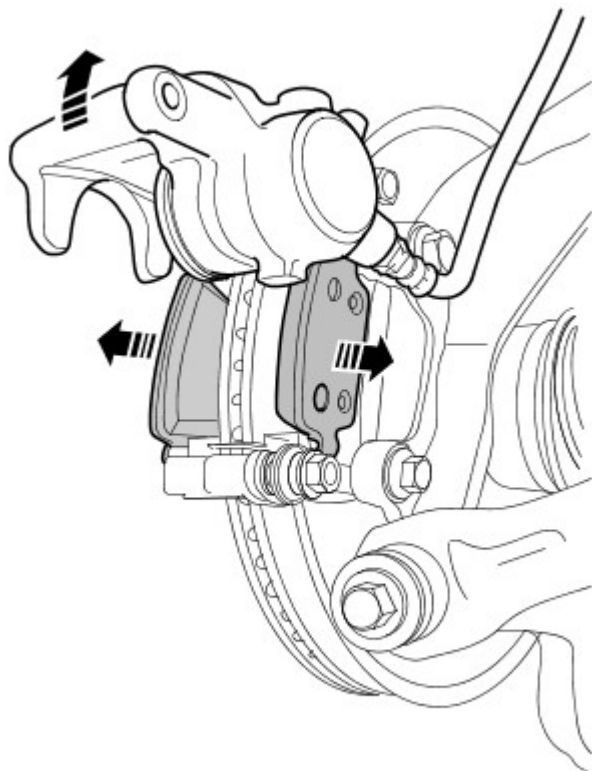
Refer to: [Wheel and Tire](#) (204-04 Wheels and Tires, Removal and Installation).

3. Remove the brake caliper lower bolt.



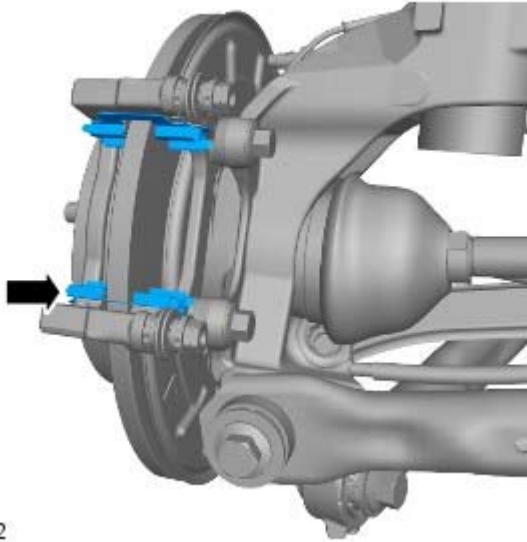
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4. Remove the brake pads.




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5. Remove the brake pad clips.

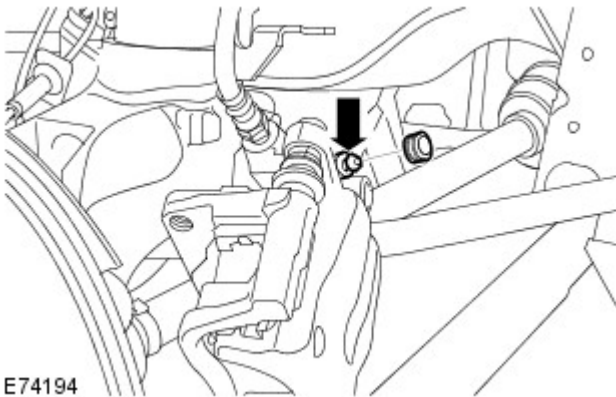


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Installation

1.  **WARNING:** Do not use compressed air to clean brake components. Dust from friction materials can be harmful if inhaled.
Clean the brake caliper housing and anchor plate using brake cleaning fluid.

2. Inspect the caliper piston and slide pin seals for damage.



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3. Position a bleed jar containing a small quantity of approved brake fluid. Connect the bleed tube to the bleed screw and loosen the screw.

4. Press the piston into the caliper housing and tighten the bleed screw.

Torque: 10 Nm

5. Disconnect the bleed tube and remove the jar.

6. **CAUTIONS:**



If new brake pads are installed, a new gold coloured brake pad clip must be fitted in the lower position. The clip with one hole must be fitted to petrol vehicles. The clip with two holes must be fitted to diesel vehicles. Failure to follow this instruction may result in damage to the vehicle.



If new brake pads are installed, a new black coloured brake pad clip must be fitted in the upper position. Failure to follow this instruction may result in damage to the vehicle.

Install the brake pad clips.

7. Install the brake pads.

8. Secure the brake caliper.

Torque: 35 Nm

9. Repeat the above procedure for the other side.

10. Install the wheels and tires.

Refer to: [Wheel and Tire](#) (204-04 Wheels and Tires, Removal and Installation).

11. Depress the brake pedal several times, check the fluid level in the brake fluid reservoir and top-up with brake fluid if necessary.

Rear Disc Brake - Brake Disc

Removal and Installation

Removal

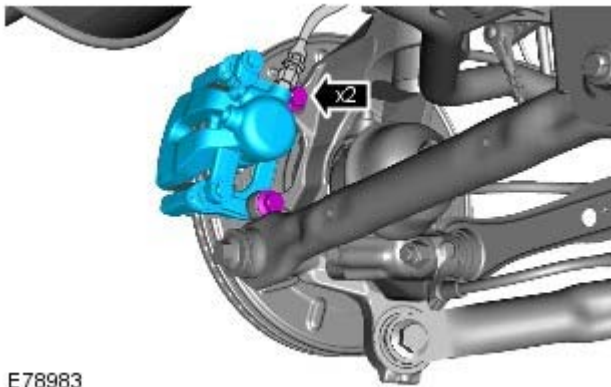
NOTE: If the parking brake shoes or the brake discs have been removed for access to other components then DO NOT carry out the bedding in procedure.

1.  **WARNING:** Make sure to support the vehicle with axle stands.


Raise and support the vehicle.

2. Remove the wheels and tires.

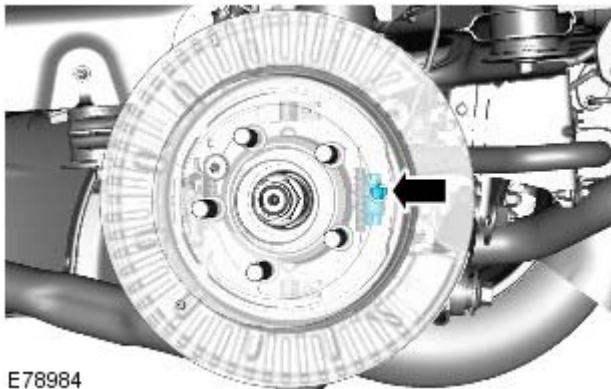
Refer to: [Wheel and Tire](#) (204-04 Wheels and Tires, Removal and Installation).



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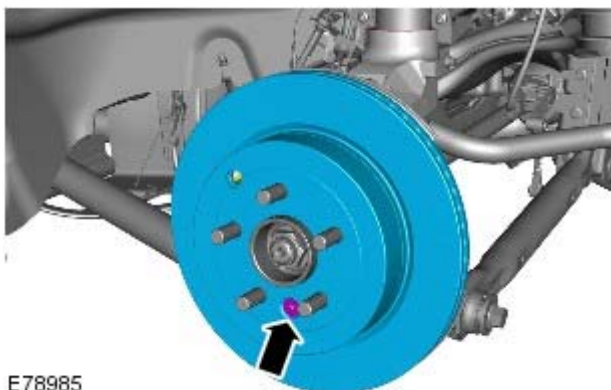
3.  **CAUTION:** Make sure that no load is placed on the brake hose.

- Tie the brake caliper and anchor aside.



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4.
 - Release the park brake shoe adjustment.




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- 5.

6. Repeat the above procedure for the other side.

Installation

1.  **CAUTION:** Make sure that the mating faces are clean and free of foreign material.

Install the brake disc.

Torque: 35 Nm

2. **CAUTIONS:**



Make sure that the mating faces are clean and free of foreign material.



Make sure that the brake hose is not twisted and is correctly located.

Secure the brake caliper and anchor plate to the wheel knuckle.

Torque: 110 Nm

3. Repeat the above procedure for the other side.
4. Adjust the parking brake.

Refer to: [Parking Brake Cable Adjustment](#) (206-05 Parking Brake and Actuation, General Procedures).
5. Install the wheels and tires.
6. If necessary, carry out the parking brake shoe bedding-in procedure.

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

Rear Disc Brake - Brake Caliper

Removal and Installation

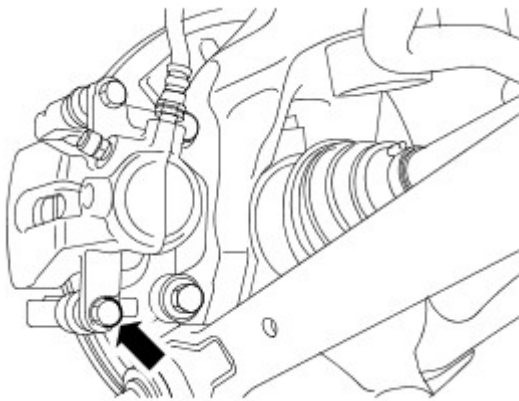
Removal

1.  **WARNING:** Make sure to support the vehicle with axle stands.


Raise and support the vehicle.

2. Remove the wheel and tire.

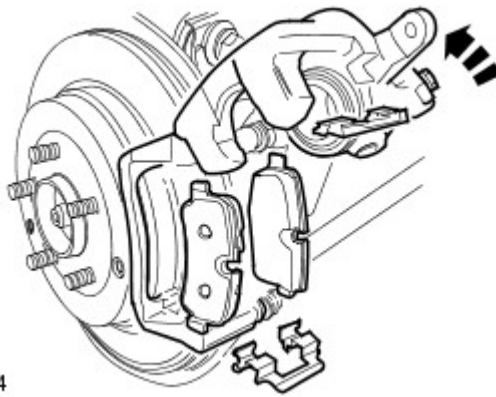
Refer to: [Wheel and Tire](#) (204-04 Wheels and Tires, Removal and Installation).



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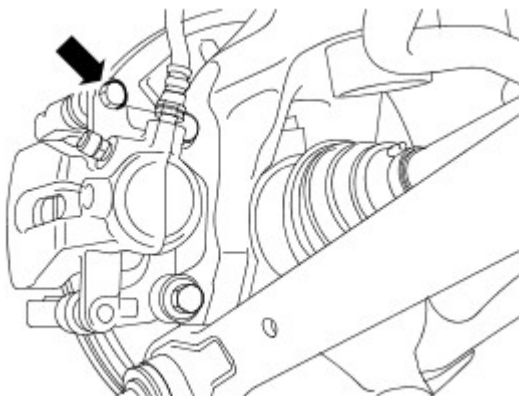
3.  **CAUTION:** Make sure that new bolts are installed.

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



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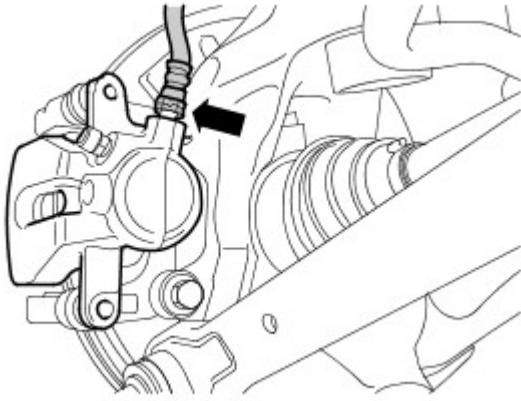
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5.  **CAUTION:** Make sure that new bolts are installed.

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




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6.  **CAUTION:** Make sure that all openings are sealed. Use new blanking caps.

7. Remove the brake caliper housing.

Installation

1.  **WARNING:** Do not use compressed air to clean brake components. Dust from friction materials can be harmful if inhaled.
Clean the brake caliper housing and anchor plate using brake cleaning fluid.

2. Install the brake caliper.


3. Connect the brake tube to the brake caliper.

Torque: 30 Nm

4. Install the brake caliper upper bolt.

Torque: 30 Nm

5.
 - Install the two clips.
 - Install the brake pads.

6.  **CAUTION:** Make sure that the brake hose is not twisted and is correctly located.

Install the brake caliper lower bolt.

Torque: 30 Nm

7. Install the wheel and tire.

Refer to: [Wheel and Tire](#) (204-04 Wheels and Tires, Removal and Installation).

8. Bleed the brake system.

Refer to: [Brake System Bleeding](#) (206-00 Brake System - General Information, General Procedures).

Rear Disc Brake - Brake Caliper Anchor Plate

Removal and Installation

Removal

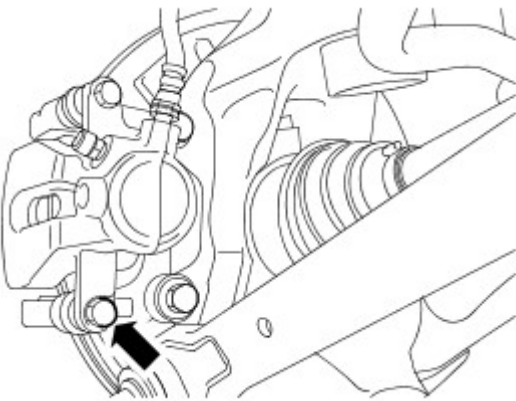
1.  **WARNING:** Make sure to support the vehicle with axle stands.

Raise and support the vehicle.

2. Remove the wheel and tire.

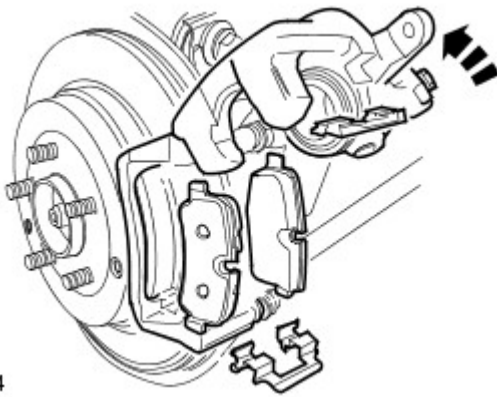
Refer to: [Wheel and Tire](#) (204-04 Wheels and Tires, Removal and Installation).

3.



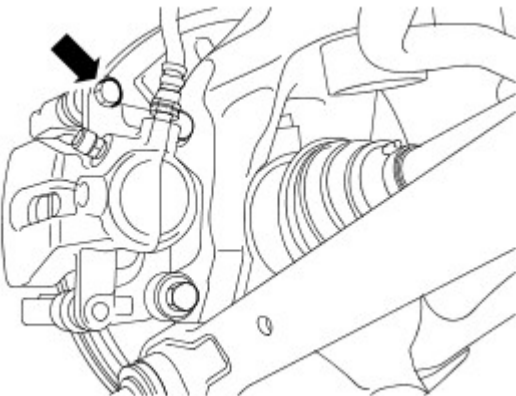
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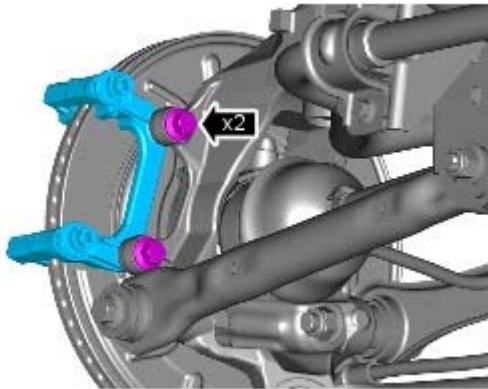


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6.  **CAUTION:** Do not allow the brake caliper to hang on the brake hose.

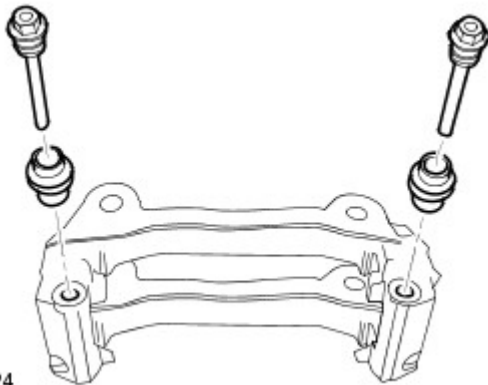
Tie the brake caliper housing aside.

7.




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8.



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Installation

1.  **WARNING:** Do not use compressed air to clean brake components. Dust from friction materials can be harmful if inhaled.
Clean the brake caliper housing and anchor plate using brake cleaning fluid.


2. Clean and lubricate the guide pins.

3. Install the guide pins.

4.  **CAUTION:** Make sure that new bolts are installed.

Install the brake caliper anchor plate.

Torque: 110 Nm

6. Install the clips and brake pads.
5.  **CAUTION:** Make sure that new bolts are installed.
7. Install the brake caliper housing and install the top bolt.

Torque: 35 Nm



Make sure that new bolts are installed.



Make sure that the brake hose is not twisted and is correctly located.

Align the brake caliper to the anchor plate.

Torque: 30 Nm

8. Install the wheel and tire.

Refer to: [Wheel and Tire](#) (204-04 Wheels and Tires, Removal and Installation).