

SECTION 206-00 Brake System - General Information

VEHICLE APPLICATION: 2011.50 Ranger

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SPECIFICATIONS**BRAKE TECHNICAL DATA**

ITEM	SPECIFICATION
Brake fluid type	WSS-M6C65-A2 Super Dot4-14M
Brake pedal height	214—219 mm
Standard pedal play	3.0—8.0 mm
Standard pedal-to-floor clearance	105 mm or more
Power brake unit fluid pressure when pedal depressed at 200 N {20 kgf}	At 0 kPa {0 mmHg}: 237 kPa or more
Power brake unit fluid pressure when pedal depressed at 200 N {20 kgf}	At 67 kPa {500 mmHg}:8.75 kpa or more
Minimum front disc pad thickness	1.5 mm min
Minimum front disc plate thickness	30 mm
Minimum front disc plate thickness after machining using a brake lathe on-vehicle	30.8 mm
Front disc plate runout limit	0.05 mm max
Minimum rear brake lining thickness	1.0 mm
Maximum rear brake drum diameter - 4x2 (except vehicles with increased ride height)	271.5 mm
Maximum rear brake drum diameter - 4x2 vehicles with increased ride height and 4x4	296.5 mm
Parking brake lever stroke when pulled at 98 N {10 kgf}	3—6 notches

Load sensing proportioning valve (LSPV) fluid pressure

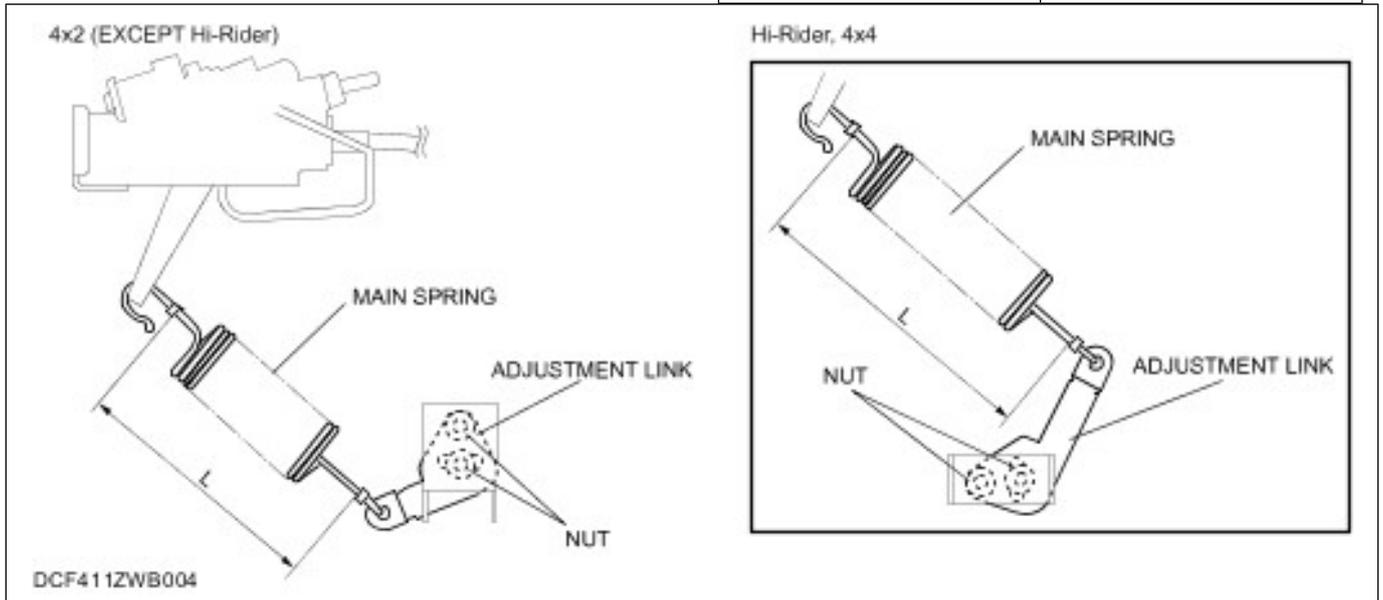
Type	Front wheel cylinder fluid pressure (kPa)	Rear wheel cylinder (kPa)
4x2 (except vehicles with increased ride height)	4,900	1,950-2,470
	9,800	3,070-3,910
4x2 vehicles with increased ride height and 4x4	4,900	1,820-2,320
	9,800	2,950-3,750

GENERAL PROCEDURES

Brake Load Sensor Proportioning Valve Adjustment(12 136 0)

1. Place the unloaded vehicle on level ground. Unloaded: Fuel tank is full. Jack and tools are in designated position.
2. A change of 5 mm (0.20 in) in dimension L results in a change of the following.

Type	Change (kPa {kgf/cm ² , psi})
4x2 (except Hi-Rider) Without 4W-ABS	625 (8.7, 123)
Hi-Rider, 4x4 Without 4W-ABS	510 (11, 154)



3. Adjust main spring dimension L between the LSPV and the adjustment link loosening and repositioning the LSPV.
 - Decrease dimension L if the fluid pressure is low.
 - Increase dimension L if the fluid pressure is high.

If not as specified, replace the LSPV as a component.

4.

Specification Dimension L

Type	Dimension x (mm {in})
4x2 (except Hi-Rider) Without 4W-ABS	166.0—173.0 (5.808—6.082)
Hi-Rider, 4x4 Without 4W-ABS	184.5—191.5 (6.910—7.185)

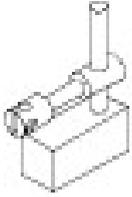
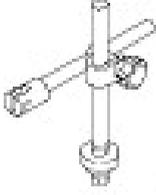
5. Tightening the nut.

Specification 11.4—15.6 Nm (1.90—2.59 kgfm, 13.8—18.7 ftlbf).
6. After adjustment, recheck the fluid pressure.

GENERAL PROCEDURES

Front Brake Disc Runout Check

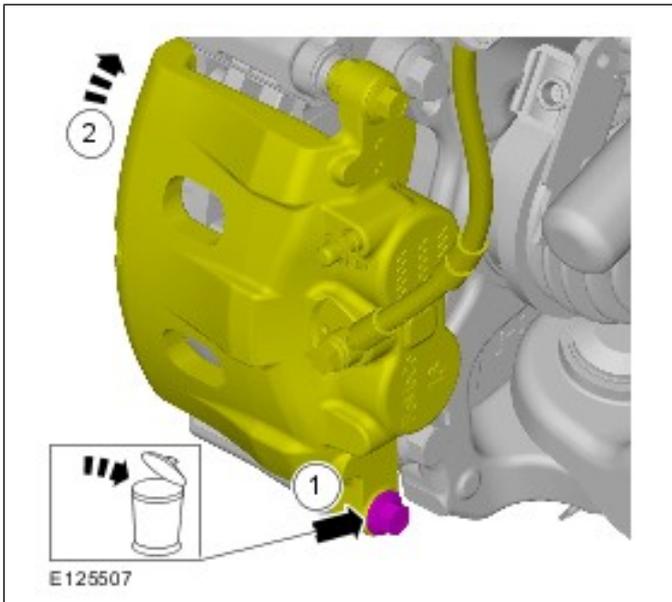
Special Tool(s) / General Equipment

 <p>13008</p>	<p>205-044 Holding Fixture, Dial Indicator Gauge</p>
 <p>13046</p>	<p>205-069 Dial Indicator Gauge (Metric)</p>
 <p>15022A</p>	<p>205-070 Holding Fixture, Dial Indicator Gauge</p>
<p>Calliper Gauge</p>	

Activation

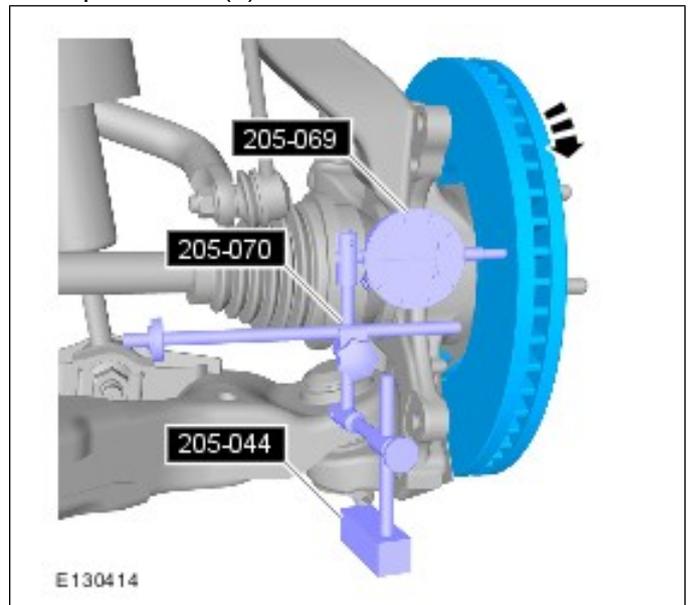
1. Refer to: [Wheel and Tire \(204-04 Wheels and Tires, Removal and Installation\)](#).

2.



3. **NOTE:** The total dial indicator gauge reading should not exceed specification.

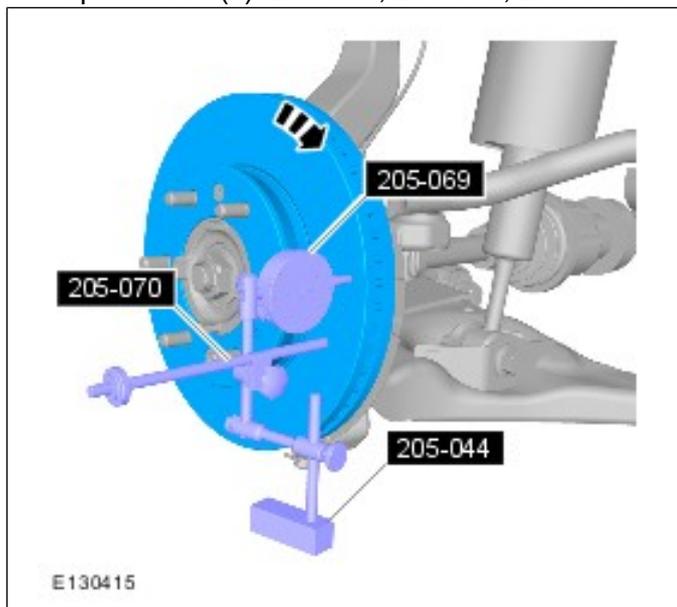
Special Tool(s): 205-069, 205-070, 205-044



4. **NOTE:** The total dial indicator gauge reading should not exceed specification.

GENERAL PROCEDURES

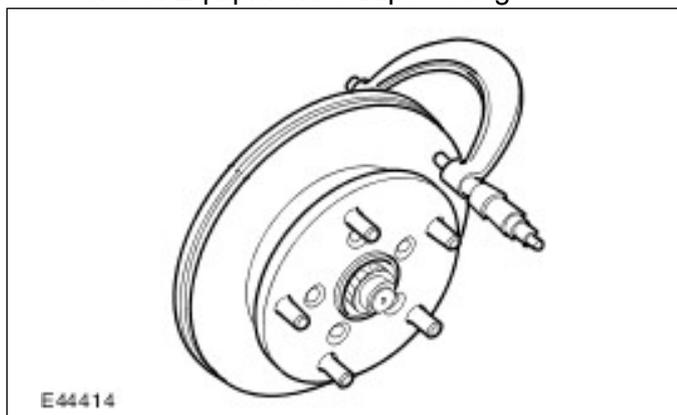
Special Tool(s): 205-069, 205-070, 205-044



- 5. NOTE:** If any of the measurements exceed the run out specification of 0.05 mm or the brake disc thickness variation is more than 0.018 mm, a new brake disc must be installed and the brake disc runout re-checked.

Using a suitable micrometer, measure the brake disc thickness at eight positions, 45 degrees apart and approximately 10 mm from the outer edge of the brake disc.

General Equipment: Calliper Gauge



GENERAL PROCEDURES**Brake System Leak Check****Check**

1. **NOTE:** Brake fluid is water soluble and it is possible that all evidence of fluid leakage has been washed off if the vehicle has been operated in rain or snow.

Check the brake fluid level. Add brake fluid as necessary.

2. Apply the brakes several times and make sure the pedal feel is not spongy. If necessary, bleed the brake system.

For additional information, refer to **Brake System Bleeding** in this section.

3. Check the brake fluid level and verify that the fluid level is actually dropping.
4. **NOTE:** If the brake fluid level drops and no external leak is evident, check for a brake master cylinder bore end seal leak.

Locate and correct the external leak.

GENERAL PROCEDURES

Brake System Bleeding(12 141 0)

General Equipment

Ford diagnostic equipment

Bleeding

All Vehicles

⚠ WARNING: Brake fluid contains polyglycol ethers and polyglycols. Avoid contact with the eyes. Wash hands thoroughly after handling. If brake fluid contacts the eyes, flush the eyes for 15 minutes with cold running water. Get medical attention if irritation persists. If taken internally, drink water and induce vomiting. Get medical attention immediately. Failure to follow these instructions may result in personal injury.

⚠ CAUTION: If brake fluid is spilled on the paintwork, the affected area must be immediately washed down with cold water.

NOTE: Make sure that the vehicle is standing on a level surface.

NOTE: The system consists of separate circuits for each front and diagonally opposite rear wheel. Each circuit can be bled independently.

1. **⚠ CAUTION:** The brake fluid reservoir must remain full with new, clean brake fluid at all times during bleeding.

Install the bleed tube to the bleed nipple.

2. Immerse the end of the bleed tube in a bleed jar containing a small quantity of approved brake fluid.

3. Position the bleed jar base at least 300 mm above the bleed nipple to maintain fluid pressure and prevent air leaking past the threads of the bleed nipple.

4. Loosen the rear left bleed nipple by one-half turn.

5. Operate the brake pedal fully (pumping brake fluid and air into the bleed jar) and allow the brake pedal to return to the rest position.

6. **NOTE:** Rear brakes only.

Rapidly operate the parking brake control several times.

7. Fill the brake fluid reservoir to the MAX mark.

8. Continue operating the brake pedal until air-free fluid is being pumped into the bleed jar.

9. With the brake pedal fully depressed tighten the bleed nipple.

10. **⚠ CAUTION:** Make sure that the bleed nipple cap is installed after bleeding the brake line(s). This will prevent corrosion to the bleed nipple. Failure to follow this instruction may result in the bleed nipple becoming seized.

Repeat the procedure for the remaining brake lines in the following order:

1. Front left.
2. Front right.
3. Rear right.

Vehicles with anti-lock brakes

11. **NOTE:** This step is only necessary when changing the brake fluid to remove the used brake fluid from the hydraulic control unit (HCU).

Using **Ford diagnostic equipment**, bleed the brake system.

GENERAL PROCEDURES

Brake System Pressure Bleeding(12 141 0)

General Equipment

Ford diagnostic equipment
Brake/clutch system pressure bleeder/filler

Bleeding

All vehicles

 **WARNING:** Brake fluid contains polyglycol ethers and polyglycols. Avoid contact with the eyes. Wash hands thoroughly after handling. If brake fluid contacts the eyes, flush the eyes for 15 minutes with cold running water. Get medical attention if irritation persists. If taken internally, drink water and induce vomiting. Get medical attention immediately. Failure to follow these instructions may result in personal injury.

 **CAUTION:** If brake fluid is spilt on the paintwork, the affected area must be immediately washed down with cold water.

NOTE: Make sure that the vehicle is standing on a level surface.

NOTE: The system consists of separate circuits for each front and diagonally opposite rear wheel. Each circuit can be bled independently.

1. Fill the brake fluid reservoir to the MAX mark.

2. CAUTIONS:

 Make sure that the pressure within the brake system does not exceed 1 bar.

 Make sure that the pressure bleeding equipment is filled with new brake fluid to the correct specification.

Using the **brake/clutch system pressure bleeder/filler**, pressure bleed the system in accordance with the manufacturer's instructions in the following order:

1. Rear left.
 - Rapidly operate the parking brake control several times.
2. Front left.
3. Front right.
4. Rear right.
 - Rapidly operate the parking brake control several times.

 **CAUTION:** Make sure that the bleed nipple cap is installed after bleeding the brake line(s). This will prevent corrosion to the bleed nipple. Failure to follow this instruction may result in the bleed nipple becoming seized.

3. Fill the brake fluid reservoir to the MAX mark as necessary.

Vehicles with anti-lock brakes

4. **NOTE:** This step is only necessary when changing the brake fluid to remove the used brake fluid from the hydraulic control unit (HCU).

Using **Ford diagnostic equipment**, bleed the brake system.