Component Procedures: Parking Brake System

Table of Contents

Component Procedures: Parking Brake System

Parking Brake Adjustment (Article 10715)

Special Tools
J-21177-A - Drum To Brake Shoe Clearance Gauge
For equivalent regional tools, refer to Special Tools .
- Adjustments to the park brake shoe are not necessary after replacing the park brake lever or park brake cable s. The park brake is adjusted automatically by cycling the park brake lever 3 times.
- DO not operate the park brake lever with the rear disc brake rotor(s) removed.
- Apply and fully release the parking brake 3 times.
- Verify that the parking brake pedal releases completely.
- Raise and support the vehicle. Lifting and Jacking the Vehicle
- Remove the rear tire and wheel assemblies. Tire and Wheel Removal and Installation
- Remove the rear brake rotor s. Rear Brake Rotor Replacement
- Set the J-21177-A - Drum To Brake Shoe Clearance Gauge inside of the park brake drum at the widest point.
Click for full-size image
- Place the contacts of the tool at the widest point of the drum (1).
- Tighten the set screw on the tool to ensure the proper measurement when removing the tool from the drum.
- Position the J-21177-A - Drum To Brake Shoe Clearance Gauge over the park brake shoe (1) at the widest point. Click for full-size image
- Turn the adjuster on the actuator until the park brake shoe just contacts the J-21177-A - Drum To Brake Shoe Clearance Gauge .
- Repeat steps 8 - 10 for the opposite side.
- Install the rear brake rotors. Rear Brake Rotor Replacement
- Install the rear tire and wheel. Tire and Wheel Removal and Installation
- Lower the vehicle to curb height.
- Set and release the park brake lever 3 times.
- Apply the parking brake. Inspect the rotation of the rear wheels:
- The wheels should not rotate forward.
- The wheels should not rotate rearward.
- Release the parking brake.
- Verify that the wheels rotate freely.
- Lower the vehicle.

Parts and Labor (itype_189)

Labor

Operation	Qualifier Path	Skill	Std Hrs	Wty Hrs
Remove & Replace	Parking Brake > Front Cable, R&R	B	2.1	0.0
Remove & Replace	Parking Brake > Parking Brake Control, R&R	B	2.0	0.0
Remove & Replace	Parking Brake > Rear Cable, R&R > One Side	B	0.5	0.0
Remove & Replace	Parking Brake > Rear Cable, R&R > Both Sides	B	0.7	0.0
Remove & Replace	Parking Brake > Shoes, R&R > Both Sides	B	1.4	1.0
Remove & Replace	Switches > Park Brake Warning Switch, R&R	B	1.8	0.0
Adjust	Parking Brake > Brakes, Adjust	B	1.0	0.8

Park Brake System (Article 10709)

System Component Description
The park brake system consists of the following:
Receives and transfers park brake system apply input force from driver to park brake cable system.
Releases applied park brake system when the lever is returned to the at-rest rest position.
Transfers input force received from park brake lever, through park brake cable equalizer, to park brake apply lever.
Evenly distributes input force to both the left and right park brake unit s.
An auto adjust spring is used to remove the slack in the park brake cables.
Uses multiplied input force from apply lever via the cables to expand park brake shoe toward the friction surface of the drum-in-hat portion of the rear brake rotor .
Threaded park brake actuator s/adjusters are also used to control clearance between the park brake shoe and the friction surface of the drum-in-hat portion of the rear brake rotor.

Applies mechanical output force from park brake actuator/adjuster to friction surface of the drum-in-hat portion of the rear brake rotor.

System Operation

Park brake apply input force is received by the park brake lever assembly being raised, transferred and evenly distributed, through the park brake cables and the park brake cable equalizer, to the left and right park brake apply levers. The park brake apply levers multiply and transfer the apply input force to the park brake actuators/adjusters which expand the park brake shoe toward the friction surface of the drum-in-hat portion of the rear brake rotor in order to prevent the rotation of the rear tire and wheel assemblies. The park brake lever assembly releases an applied park brake system when the lever is returned to the at-rest rest position.

Electronic Park Lock Description and Operation (Article 12882)

If the vehicle is equipped with automatic transmission and a floor mounted console gear shift, it has an electronic park lock system (EPL). The EPL system purpose is to prevent the ignition key from being turned to the OFF position when the transmission is in any position other than PARK and the vehicle may still be moving. The EPL system consists of an ignition lock cylinder solenoid, and a park position switch that is located in the A/T shift lock control switch. The ignition lock cylinder solenoid contains a pin that is spring loaded to mechanically prevent the ignition key cylinder from being turned to the lock position when the vehicle transmission is not in the PARK position. If vehicle power is lost, and/or the transmission is not in the Park position the operator will not be able to turn the ignition key to the lock position and will not be able to remove the ignition key from the column.

Park Brake - Fastener Specifications (Article 10721)

Application Specification

Metric English

Parking Brake Cable Retainer Nut 7 Nm 61 lb in

Parking Brake Indicator Switch Bolt 3 Nm 27 lb in

Parking Brake Lever Nut 22 Nm 16 lb ft

All Technical Service Bulletins (itype_100)

Tsbs

- Normal Characteristic - Instrument Panel Red Brake Light Intermittently Comes On (PI1410B, 2017/05/19)

Park Brake System Diagnosis (Article 10710)

Step Action Yes No

DEFINITION: This diagnostic table is designed to diagnose ONLY the components of the PARK brake system in order to determine if the PARK brake system is operating properly. You will be directed by the appropriate Symptom table to go to other brake system diagnostic tables as appropriate.

1 Were you sent here from a Hydraulic Brake Symptom table? Go to Step 3 Go to Step 2

2 Were you sent here from a Park Brake Symptom table? Go to Step 3 Go to Diagnostic Starting Point - Vehicle

3 Raise and support the vehicle with the rear axle supported by jack stands. Refer to Lifting and Jacking the Vehicle . Shift the transmission into NEUTRAL. With the park brake RELEASED, attempt to rotate the rear wheels to check the rear brakes for a significant amount of drag. Do the rear brakes have a significant amount of drag? Go to Step 8 Go to Step 4

- Raise and support the vehicle with the rear axle supported by jack stands. Refer to Lifting and Jacking the Vehicle .
- Shift the transmission into NEUTRAL.
- With the park brake RELEASED, attempt to rotate the rear wheels to check the rear brakes for a significant amount of drag.

4 Apply the park brake. Attempt to rotate the rear wheels to check the rear brakes for a significant amount of drag. Do the rear brakes have a significant amount of drag? Go to Step 18 Go to Step 5

- Apply the park brake.
- Attempt to rotate the rear wheels to check the rear brakes for a significant amount of drag.

5 Visually inspect the park brake cable connections and the cables that are accessible on the UNDERSIDE of the vehicle for disconnections and/or damage. Were any of the park brake cables disconnected and/or damaged? Go to Step 6 Go to Step 7

6 Reconnect or replace the park brake cables as necessary. Refer to the following procedures as necessary: Parking Brake Lever Replacement Parking Brake Rear Cable Replacement Did you complete the repair and/or replacement? Go to Step 18 —

- Parking Brake Lever Replacement

- Parking Brake Rear Cable Replacement
7 Check the adjustment of the park brake. Refer to Parking Brake Adjustment . Did you find and correct the condition? Go to Step 18 Go to Step 8
8 Caution: Do not depress the brake pedal with the brake rotor s and/or the brake drums removed, or with the brake caliper s repositioned away from the brake rotors, or damage to the brake system may result. Remove the rear brake rotors. Refer to Rear Brake Rotor Replacement . Inspect the park brake shoe hardware for looseness, damaged, broken or missing components. Check the park brake actuator s for a seized condition. Does the park brake hardware and/or the park brake actuator s require replacement? Go to Step 9 Go to Step 10
- Remove the rear brake rotors. Refer to Rear Brake Rotor Replacement .
- Inspect the park brake shoe hardware for looseness, damaged, broken or missing components.
- Check the park brake actuator s for a seized condition.
9 Replace park brake hardware components as necessary. Refer to Parking Brake Shoe Replacement . Replace the park brake actuators as necessary. Refer to Parking Brake Actuator Replacement . Did you find and correct the condition? Go to Step 18 Go to Step 17
- Replace park brake hardware components as necessary. Refer to Parking Brake Shoe Replacement .
- Replace the park brake actuators as necessary. Refer to Parking Brake Actuator Replacement .
10 Have an assistant apply and release the park brake, while you observe the park brake cables for free movement. Did the park brake cables move freely? Go to Step 11 Go to Step 13
11 Check the adjustment of the park brake. Refer to Parking Brake Adjustment . Did you find and correct the condition? Go to Step 18 Go to Step 12
12 With the transmission still in NEUTRAL, apply the park brake. Attempt to rotate the rear wheels to check the rear brakes for a significant amount of drag. Release the park brake. Rotate the rear wheels to check the rear brakes for a significant reduction of drag. Did the park brake apply and release properly? Go to Step 18 Go to Symptoms - Park Brake
- With the transmission still in NEUTRAL, apply the park brake.
- Release the park brake.
- Rotate the rear wheels to check the rear brakes for a significant reduction of drag.
13 Disconnect the park brake cable connections that are accessible on the UNDERSIDE of the vehicle one at a time and check each cable for free movement. Do any of the park brake cables accessible on the underside of the vehicle require replacement? Go to Step 14 Go to Step 15
14 Replace any of the park brake cables that do not have free movement – not releasing properly. Refer to the following procedures as necessary: Parking Brake Lever Replacement Parking Brake Rear Cable Replacement Did you complete the replacement? Go to Step 18 —
15 Disconnect the front park brake cable connection accessible INSIDE the vehicle at the park brake lever assembly and check for free movement. Replace the front park brake cable if it does not have free movement. Refer to Parking Brake Lever Replacement . Did you find and correct a condition? Go to Step 18 Go to Step 16
16 Inspect the park brake lever assembly for proper operation and replace if necessary. Refer to Parking Brake Lever Replacement . Did you find and correct the condition? Go to Step 18 Go to Step 17
17 Replace the component that is used to adjust the park brake system. Refer to Parking Brake Lever Replacement . Adjust the park brake. Refer to Parking Brake Adjustment . Did you complete the replacement and adjustment? Go to Step 18 Go to Symptoms - Park Brake
- Replace the component that is used to adjust the park brake system. Refer to Parking Brake Lever Replacement .
- Adjust the park brake. Refer to Parking Brake Adjustment .
18 Install or connect any components that were removed or disconnected during diagnosis. Verify the operation of the park brake system. Does the park brake operate correctly? System OK Go to Symptoms - Park Brake
- Install or connect any components that were removed or disconnected during diagnosis.
- Verify the operation of the park brake system.

Symptoms - Park Brake (Article 10713)

Refer to Park Brake System Description and Operation .
Visual/Physical Inspection
- Inspect for aftermarket devices which could affect the operation of the park brake system.
- Inspect the easily accessible or visible system components for obvious damage or conditions which could cause the symptom.
Symptom List
Refer to a symptom diagnostic procedure from the following list in order to diagnose the symptom:
Park Brake Will Not Hold or Release

Park Brake Will Not Hold or Release (Article 10711)

Step Action Yes No
1 Were you sent here from the Park Brake Symptom table? Go to Step 2 Go to Diagnostic Starting Point - Vehicle
2 Inspect the park brake system for proper operation. Refer to Park Brake System Diagnosis . Did you find and correct a condition? Go to Step 5 Go to Step 3
3 Inspect the disc brake system for proper operation. Refer to Disc Brake System Diagnosis . Did you find and correct a condition? Go to Step 5 Go to Step 4
4 Inspect the hydraulic brake system for proper operation. Refer to Hydraulic Brake System Diagnosis . Did you find and correct a condition? Go to Step 5 Go to Diagnostic Starting Point - Vehicle
5 Road test the vehicle in order to confirm proper operation. Refer to Brake System Vehicle Road Test . Is the condition still present? Go to Step 2 System OK

Park Brakes - Special Tools (Article 10720)

Illustration Tool Number/ Description
Click for full-size image CH 21177-A J 21177-A Drum to Brake Shoe Clearance Gauge

False instrument warning light/gauges (itype_136)

Tsbs
- Normal Characteristic - Instrument Panel Red Brake Light Intermittently Comes On (PI1410B, 2017/05/19)