

BRAKE SYSTEM

SECTION **BR**

CONTENTS

PRECAUTIONS	3	Inspection.....	18
Supplemental Restraint System (SRS) "AIR BAG" and "SEAT BELT PRE-TENSIONER"	3	Assembly	18
Precautions for Brake System.....	3	Installation.....	19
Precautions When Working On ABS.....	4	BRAKE BOOSTER	20
Wiring Diagrams and Trouble Diagnosis.....	4	On-vehicle Service.....	20
PREPARATION	5	OPERATING CHECK	20
Commercial Service Tools	5	AIRTIGHT CHECK	20
NOISE, VIBRATION AND HARSHNESS (NVH)		Removal.....	20
TROUBLESHOOTING	6	Inspection.....	20
NVH Troubleshooting Chart.....	6	OUTPUT ROD LENGTH CHECK	20
ON-VEHICLE SERVICE	7	Installation.....	21
Checking Brake Fluid Level.....	7	VACUUM HOSE	22
Checking Brake Line	7	Removal and Installation	22
Changing Brake Fluid.....	7	Inspection.....	22
Brake Burnishing Procedure.....	7	HOSES AND CONNECTORS	22
Bleeding Brake System	8	CHECK VALVE	22
BRAKE HYDRAULIC LINE	9	VACUUM PUMP	23
Hydraulic Circuit.....	9	Removal.....	23
Removal.....	9	Installation.....	24
Inspection.....	10	Inspection.....	24
Installation.....	10	Component	25
DUAL PROPORTIONING VALVE	11	Disassembly.....	25
Dual Proportioning Valve	11	Assembly	25
INSPECTION.....	11	FRONT DISC BRAKE	27
REMOVAL AND INSTALLATION (BUILT-IN TYPE)	11	Component	27
BRAKE PEDAL AND BRACKET	12	Pad Replacement	27
Removal and Installation	12	Removal.....	28
Inspection.....	12	Disassembly.....	28
Adjustment.....	12	Inspection.....	28
MASTER CYLINDER (NABCO)	14	CALIPER.....	28
Removal.....	14	ROTOR.....	29
Disassembly.....	15	Assembly	30
Inspection.....	15	Installation.....	30
Assembly	15	REAR DRUM BRAKE	31
Installation.....	16	Components.....	31
MASTER CYLINDER [BOSCH (NABCO)]	17	Removal.....	31
Removal.....	17	Inspection - Wheel Cylinder	32
Disassembly.....	17	Wheel Cylinder Overhaul.....	33
		Inspection - Drum	33

CONTENTS (Cont'd)

Inspection - Lining	33	DATA MONITOR PROCEDURE	61
Installation	33	ACTIVE TEST PROCEDURE	62
REAR DISC BRAKE (CAM & STRUT TYPE)	35	DATA MONITOR MODE	63
Component	35	ACTIVE TEST MODE	63
Pad Replacement	35	TROUBLE DIAGNOSIS - INTRODUCTION	64
Removal	37	How to Perform Trouble Diagnoses for Quick and Accurate Repair	64
Disassembly	37	INTRODUCTION	64
Inspection	38	TROUBLE DIAGNOSIS - BASIC INSPECTION	65
CALIPER	38	Preliminary Check	65
ROTOR	39	Ground Circuit Check	68
Assembly	39	ABS ACTUATOR AND ELECTRIC UNIT GROUND	68
Installation	42	TROUBLE DIAGNOSES FOR SELF-DIAGNOSTIC ITEMS	69
REAR DISC BRAKE (BALL & RAMP TYPE)	43	Wheel Sensor or Rotor	69
Component	43	DIAGNOSTIC PROCEDURE	69
Pad Replacement	43	ABS Actuator Solenoid Valve or Solenoid Valve Relay	72
Removal	45	DIAGNOSTIC PROCEDURE	72
Disassembly	45	Motor Relay or Motor	75
Inspection	45	DIAGNOSTIC PROCEDURE	75
CALIPER	45	Low Voltage	77
ROTOR	46	DIAGNOSTIC PROCEDURE	77
Installation	46	Control Unit	79
PARKING BRAKE CONTROL	47	DIAGNOSTIC PROCEDURE	79
Components	47	TROUBLE DIAGNOSES FOR SYMPTOMS	80
Removal and Installation	47	1. ABS Works Frequently	80
Inspection	47	2. Unexpected Pedal Action	80
Adjustment	48	3. Long Stopping Distance	81
		4. ABS Does Not Work	82
		5. Pedal Vibration and Noise	83
		6. ABS Warning Lamp Does Not Come On When Ignition Switch Is Turned On	84
		7. ABS Warning Lamp Stays On When Ignition Switch Is Turned On	86
		REMOVAL AND INSTALLATION	88
		Wheel Sensors	88
		ABS Actuator and Electric Unit	89
		REMOVAL	89
		INSTALLATION	89
		Sensor Rotor	90
		REMOVAL	90
		INSTALLATION	90
		SERVICE DATA AND SPECIFICATIONS (SDS)	91
		General Specifications	91
		Disc Brake	91
		Drum Brake	91
		Brake Pedal	92
		Parking Brake	92

PRECAUTIONS

Supplemental Restraint System (SRS) "AIR BAG" and "SEAT BELT PRE-TENSIONER"

Supplemental Restraint System (SRS) "AIR BAG" and "SEAT BELT PRE-TENSIONER"

NJBR0139

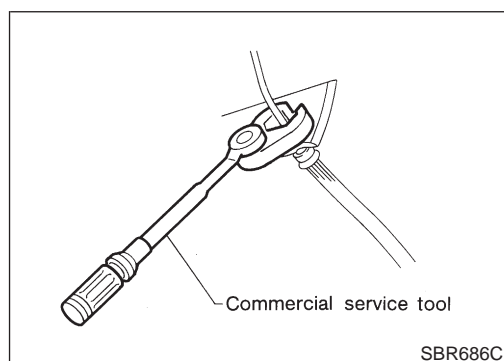
The Supplemental Restraint System such as "AIR BAG" and "SEAT BELT PRE-TENSIONER" used along with a seat belt, helps to reduce the risk or severity of injury to the driver and front passenger for certain types of collision. The SRS system composition which is available to NISSAN MODEL N16 is as follows (The composition varies according to the destination and optional equipment.):

- For a frontal collision
The Supplemental Restraint System consists of driver air bag module (located in the center of the steering wheel), front passenger air bag module (located on the instrument panel on passenger side), front seat belt pre-tensioners, a diagnosis sensor unit, warning lamp, wiring harness and spiral cable.
- For a side collision
The Supplemental Restraint System consists of front side air bag module (located in the outer side of front seat), side air bag (satellite) sensor, diagnosis sensor unit (one of components of air bags for a frontal collision), wiring harness, warning lamp (one of components of air bags for a frontal collision).

Information necessary to service the system safely is included in the **RS section** of this Service Manual.

WARNING:

- To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision which would result in air bag inflation, all maintenance should be performed by an authorized NISSAN dealer.
- Improper maintenance, including incorrect removal and installation of the SRS, can lead to personal injury caused by unintentional activation of the system. For removal of Spiral Cable and Air Bag Module, see the RS section.
- Do not use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual. SRS wiring harnesses can be identified by yellow harness connector.



Precautions for Brake System

NJBR0002

- Recommended fluid is brake fluid "DOT 4".
- Never reuse drained brake fluid.
- Be careful not to splash brake fluid on painted areas.
- To clean or wash all parts of master cylinder, disc brake caliper and wheel cylinder, use clean brake fluid.
- Never use mineral oils such as gasoline or kerosene. They will ruin rubber parts of the hydraulic system.
- Use flare nut wrench when removing and installing brake tube.
- Always torque brake lines when installing.
- Burnish the brake contact surfaces after refinishing or replacing drums or rotors, after replacing pads or linings, or if a soft pedal occurs at very low mileage. Refer to "Brake Burnishing Procedure", "ON-VEHICLE SERVICE", BR-7.

WARNING:

- Clean brake pads and shoes with a waste cloth, then wipe with a dust collector.

PRECAUTIONS

Precautions When Working On ABS

NJBR0140

- Use recommended tyres in combination with ABS.
- Please fit tyres or studded tyres, etc. with the same size.
- If different sizes of tyres, or tyres other than the ones recommended for use with the ABS, are fitted, stopping distance will increase and control and stability could deteriorate.
- When changing brake pads, please use Nissan genuine parts.
- When fitting radios etc, do not position the radio itself, antenna, or antenna cables within an area of about 100 mm (3.94 in) of the control unit.
- When doing any work that requires electro-welding, first remove the control unit.
- Please take care when taking a power supply for the audio, lamps etc., not to take this from any ABS-related harness. (Please refer to the electrical wiring diagrams for ABS-related harnesses)

Wiring Diagrams and Trouble Diagnosis

NJBR0003

When you read wiring diagrams, refer to the following:

- GI-12, "HOW TO READ WIRING DIAGRAMS"
- EL-10, "POWER SUPPLY ROUTING"

When you perform trouble diagnosis, refer to the following:

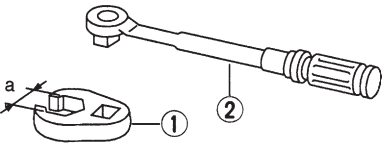
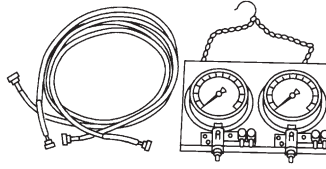
- GI-31, "HOW TO FOLLOW TEST GROUPS IN TROUBLE DIAGNOSES"
- GI-21, "HOW TO PERFORM EFFICIENT DIAGNOSIS FOR AN ELECTRICAL INCIDENT"
- On board self-diagnosis is available everywhere except for Europe.

PREPARATION

Commercial Service Tools

Commercial Service Tools

NJBR0004

Tool name	Description
1 Flare nut crowfoot 2 Torque wrench	 <p>Removing and installing each brake piping a: 10 mm (0.39 in)</p> <p>NT360</p>
Brake fluid pressure gauge	 <p>Measuring brake fluid pressure</p> <p>NT151</p>

NOISE, VIBRATION AND HARSHNESS (NVH) TROUBLESHOOTING

NVH Troubleshooting Chart

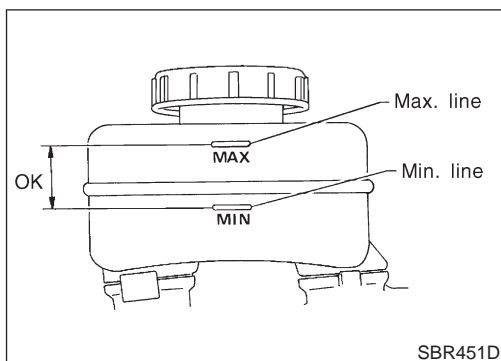
NVH Troubleshooting Chart

NJBR0005S01

Use the table below to help you find the cause of the symptom. If necessary, repair or replace these parts.

Symptom	BRAKE	Noise		SUSPECTED PARTS (Possible cause)	Reference page
		Shake	Shimmy, Judder		
		X		Linings or pads - damaged	BR-27, 33, 35
		X		Linings or pads - uneven wear	BR-27, 33, 35
		X		Return springs damaged	BR-31
		X		Shims damaged	BR-27, 35
	X	X		Rotor or drum imbalance	—
	X			Rotor or drum damage	—
	X			Rotor runout	BR-29, 39
	X			Rotor or drum deformation	—
	X			Rotor or drum deflection	—
	X			Rotor or drum rust	—
	X			Rotor thickness variation	BR-29, 39
	X			Drum out of round	BR-33
		X	X	DRIVE SHAFT	NVH in FA section
	X	X	X	AXLE AND SUSPENSION	NVH in FA section
	X	X	X	TIRES	NVH in FA, RA section
	X	X	X	ROAD WHEEL	NVH in FA section
	X	X	X	STEERING	NVH in ST section

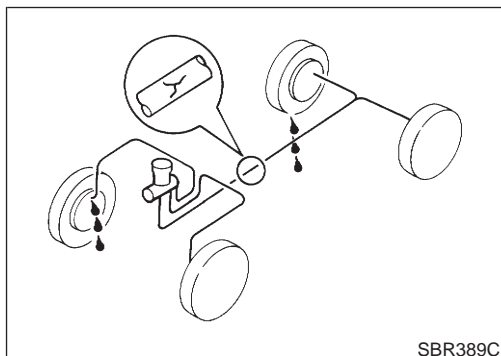
X: Applicable



Checking Brake Fluid Level

NJBR0006

- Check fluid level in reservoir tank. It should be between Max and Min lines on reservoir tank.
- If fluid level is extremely low, check brake system for leaks.
- Release parking brake lever and see if brake warning lamp goes off. If not, check brake system for leaks.



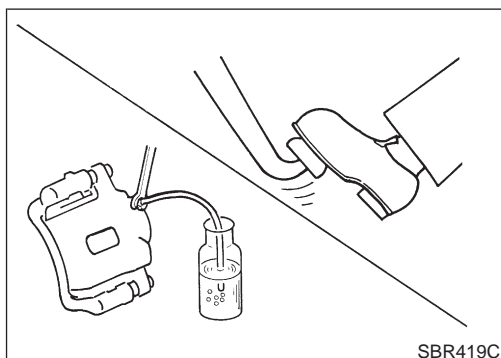
Checking Brake Line

NJBR0007

CAUTION:

If leakage occurs around joints, retighten or, if necessary, replace damaged parts.

1. Check brake lines (tubes and hoses) for cracks, deterioration or other damage. Replace any damaged parts.
2. Check for oil leakage by fully depressing brake pedal while engine is running.



Changing Brake Fluid

NJBR0008

CAUTION:

- Refill with new brake fluid "DOT 4".
- Always keep fluid level higher than minimum line on reservoir tank.
- Never reuse drained brake fluid.
- Be careful not to splash brake fluid on painted areas; it may cause paint damage. If brake fluid is splashed on painted areas, wash it away with water immediately.

1. Clean inside of reservoir tank, and refill with new brake fluid.
2. Connect a vinyl tube to each air bleeder valve.
3. Drain brake fluid from each air bleeder valve by depressing brake pedal while keeping reservoir level higher than minimum line by adding new brake fluid.
4. Repeat until new brake fluid comes out of each air bleeder valve.
Use same procedure as in bleeding hydraulic system to refill brake fluid. Refer to "Bleeding Brake System", BR-8.

Brake Burnishing Procedure

NJBR0036

Burnish the brake contact surfaces according to the following procedure after refinishing or replacing drums or rotors, after replacing pads or linings, or if a soft pedal occurs at very low mileage.

CAUTION:

Only perform this procedure under safe road and traffic conditions. Use extreme caution.

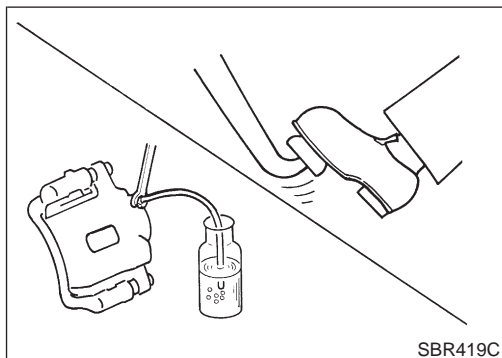
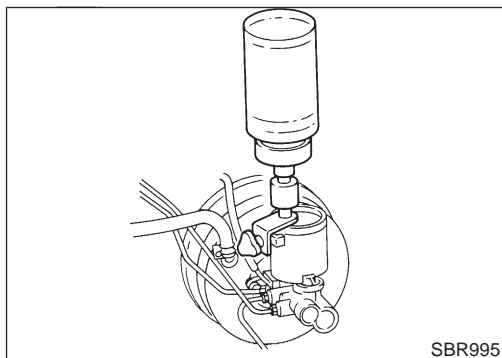
1. Drive the vehicle on a straight smooth road at 50 km/h (31 MPH).
2. Use medium brake pedal/foot effort to bring the vehicle to a complete stop from 50 km/h (31 MPH). Adjust brake pedal/foot

ON-VEHICLE SERVICE

Brake Burnishing Procedure (Cont'd)

pressure such that vehicle stopping time equals 3 to 5 seconds.

3. To cool the brake system, drive the vehicle at 50 km/h (31 MPH) for 1 minute without stopping.
4. Repeat steps 1 to 3, 10 times or more to complete the burnishing procedure.



Bleeding Brake System

NJBR0009

CAUTION:

- Carefully monitor brake fluid level at master cylinder during bleeding operation.
 - Fill reservoir with new brake fluid "DOT 4". Make sure it is full at all times while bleeding air out of system.
 - Place a container under master cylinder to avoid spillage of brake fluid.
 - For models with ABS, turn ignition switch OFF and disconnect ABS actuator connectors or battery ground cable.
- Bleed air in the following order.
Right rear brake → Left front brake → Left rear brake → Right front brake
1. Connect a transparent vinyl tube to air bleeder valve.
 2. Fully depress brake pedal several times.
 3. With brake pedal depressed, open air bleeder valve to release air.
 4. Close air bleeder valve.
 5. Release brake pedal slowly.
 6. Repeat steps 2. through 5. until clear brake fluid comes out of air bleeder valve.

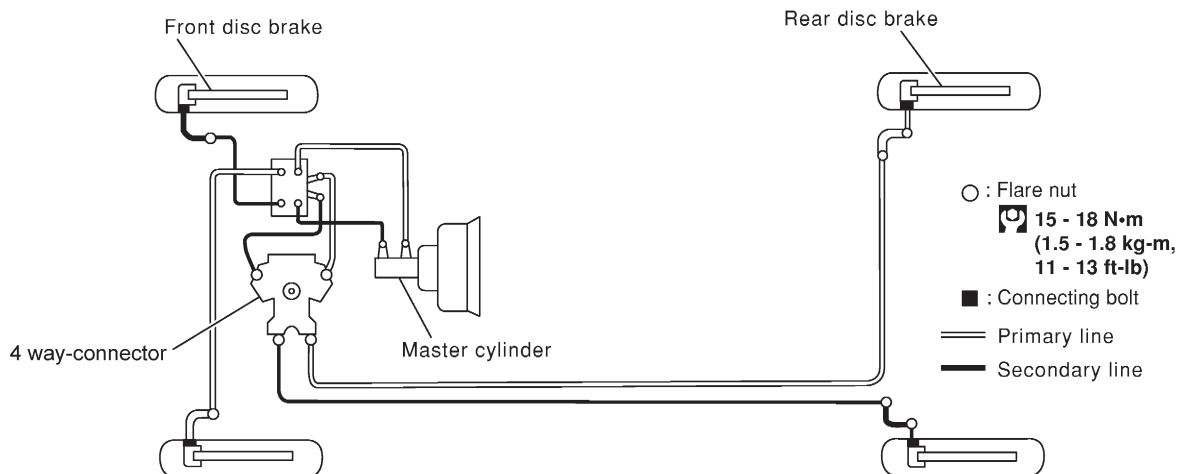
BRAKE HYDRAULIC LINE

Hydraulic Circuit

Hydraulic Circuit

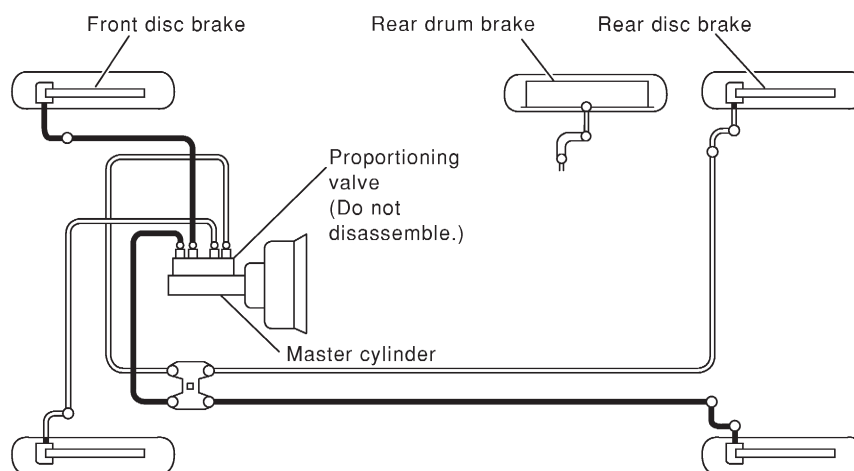
NJBR0010

With ABS models



Without ABS models

(Models with dual proportioning valve built into master cylinder) (built-in type)



NBR430

Removal

NJBR0011

CAUTION:

- Be careful not to splash brake fluid on painted areas; it may cause paint damage. If brake fluid is splashed on painted areas, wash it away with water immediately.
 - All hoses must be free from excessive bending, twisting and pulling.
 - For ball & ramp type rear caliper, care should be taken as not to let air enter the body.
1. Remove flare nut connecting brake tube and hose, then withdraw lock spring.

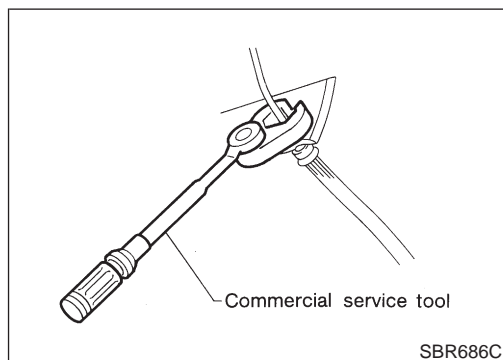
BRAKE HYDRAULIC LINE

Inspection

2. Cover openings to prevent entrance of air and dirt whenever disconnecting brake line.

Inspection

Check brake lines (tubes and hoses) for cracks, deterioration or other damage. Replace any damaged parts. NJBR0012



Installation

CAUTION:

- Refill with new brake fluid "DOT 4".
 - Never reuse drained brake fluid.
1. Tighten all flare nuts and connecting bolts.

Specification:

Flare nut

15 - 18 N·m (1.5 - 1.8 kg-m, 11 - 13 ft-lb)

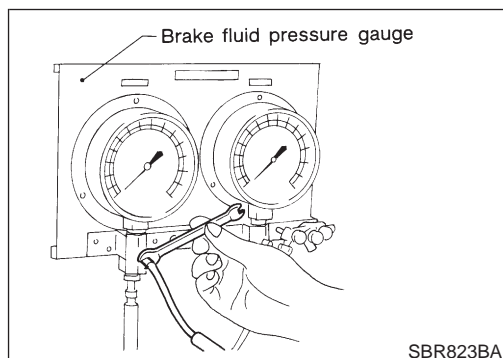
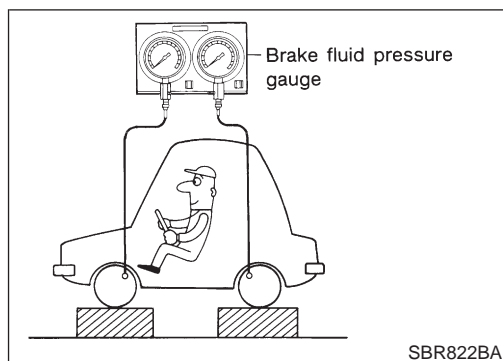
Connecting bolt

17 - 20 N·m (1.7 - 2.0 kg-m, 12 - 14 ft-lb)

2. Refill until new brake fluid comes out of each air bleeder valve.
3. Bleed air. Refer to "Bleeding Brake System", BR-8.

DUAL PROPORTIONING VALVE

Dual Proportioning Valve



Dual Proportioning Valve

INSPECTION

CAUTION:

- Carefully monitor brake fluid level at master cylinder.
- Use new brake fluid "DOT 4".
- Be careful not to splash brake fluid on painted areas; it may cause paint damage. If brake fluid is splashed on paint areas, wash it away with water immediately.
- Depress pedal slowly when raising front brake pressure.
- Check rear brake pressure at least 2 seconds after front brake pressure reaches specified value.

1. Connect brake fluid pressure gauge to air bleeders of front and rear brakes on either LH or RH side.
2. Bleed air from the Tool.
3. Check fluid pressure by depressing brake pedal.

Unit: kPa (bar, kg/cm², psi)

Applied pressure (Front brake)	5,884 (58.8, 60, 853.2)
Output pressure (Rear brake)	3,430 - 4,800 (34.3 - 45, 35 - 45.70, 497 - 649.5)

If output pressure is out of specifications, replace the master assembly (built-in type).

4. Bleed air after disconnecting the Tool. Refer to "Bleeding Brake System", BR-8.

REMOVAL AND INSTALLATION (BUILT-IN TYPE)

Always replace together with master cylinder as an assembly.

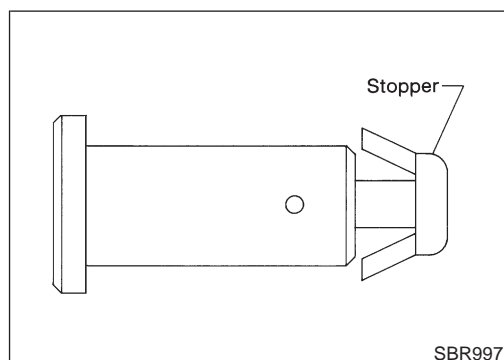
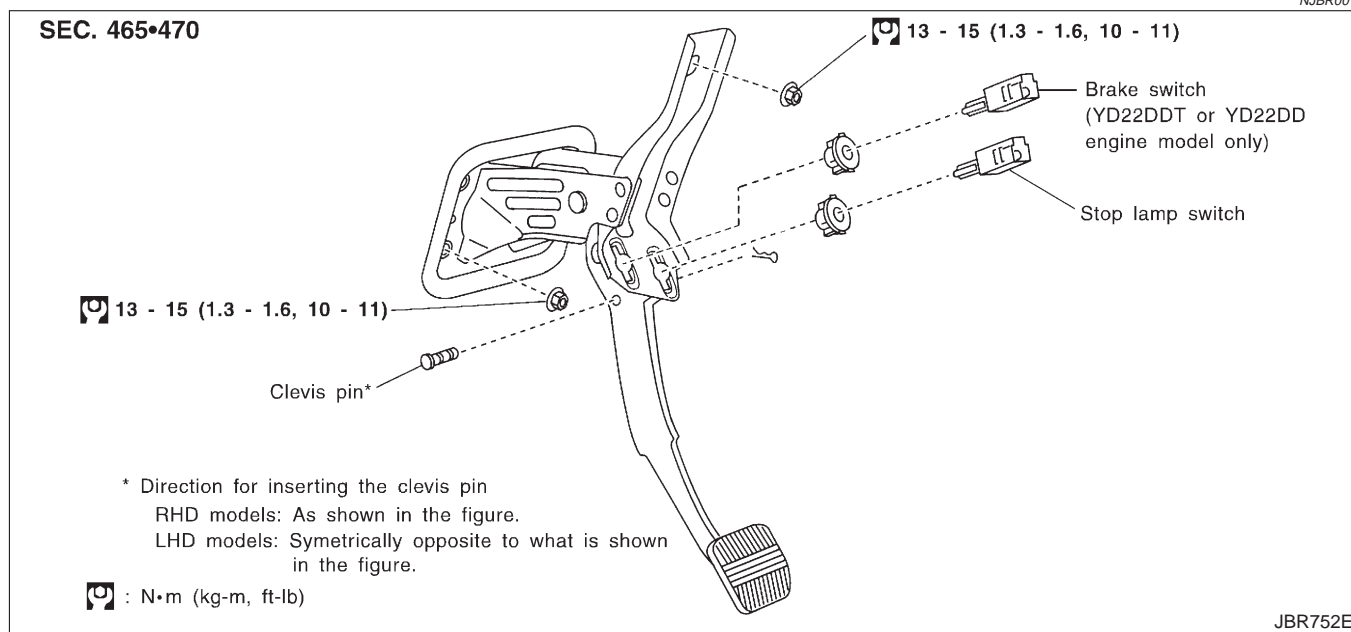
- Refer to "MASTER CYLINDER (NABCO)", BR-14.

BRAKE PEDAL AND BRACKET

Removal and Installation

Removal and Installation

NJBR0015

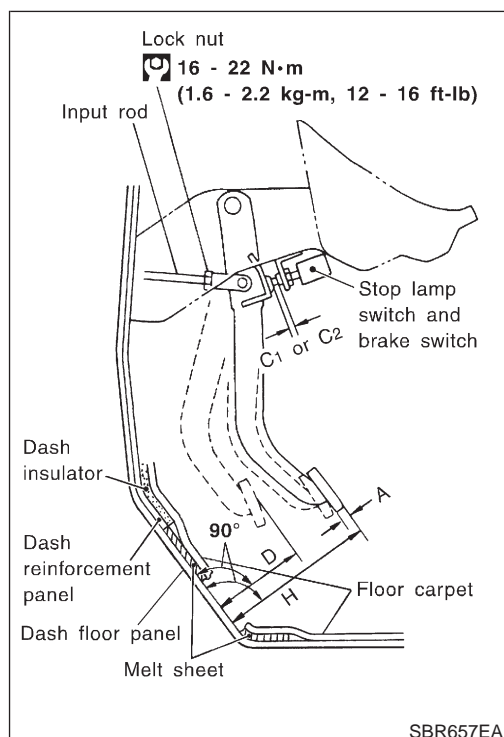


Inspection

NJBR0016

Check brake pedal for following items.

- Brake pedal bend
- Clevis pin deformation
- Crack of any welded portion
- Crack or deformation of clevis pin stopper



Adjustment

NJBR0017

Check brake pedal free height from metal panel. Adjust if necessary.

H: Free height

Refer to SDS, BR-92.

C₁, C₂: Clearance between pedal stopper and threaded end of stop lamp switch and brake switch

0.74 - 1.96 mm (0.0291 - 0.0772 in)

D: Depressed height

LHD (M/T): More than 90 mm (3.54 in)

LHD (A/T): More than 95 mm (3.74 in)

RHD (M/T): More than 90 mm (3.54 in)

RHD (A/T): More than 95 mm (3.74 in)

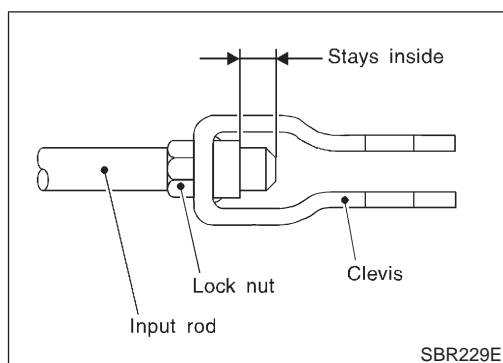
Under force of 490 N (50 kg, 110 lb) with engine running

A: Pedal free play at pedal pad

1.0 - 3.0 mm (0.039 - 0.118 in)

BRAKE PEDAL AND BRACKET

Adjustment (Cont'd)



1. Loosen lock nut and adjust pedal free height by turning brake booster input rod. Then tighten lock nut.
2. Check pedal free play.
Make sure that stop lamps go off when pedal is released.
3. Check brake pedal's depressed height while engine is running. If lower than specification, check brake system for leaks, accumulation of air or any damage to components (master cylinder, wheel cylinder, etc.); then make necessary repairs.

MASTER CYLINDER (NABCO)

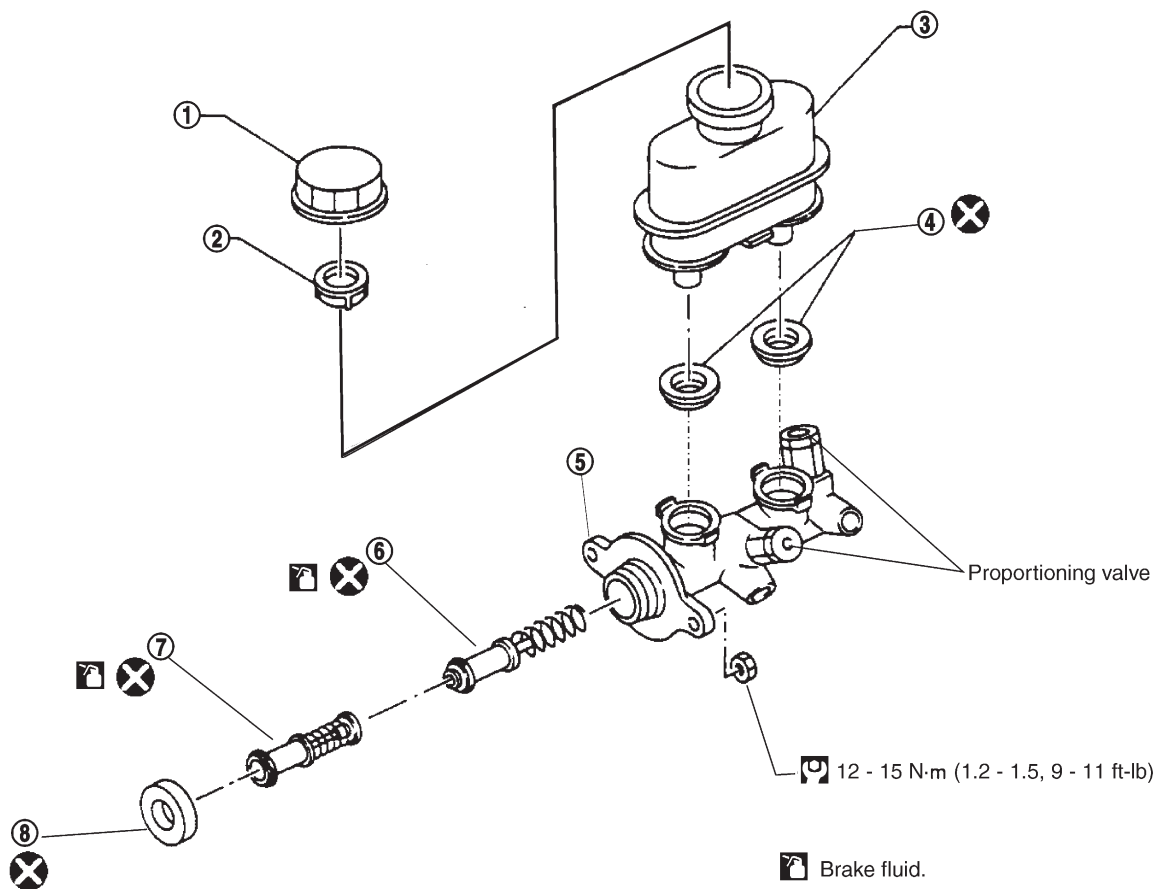
Removal

Removal

NJBR0139

NABCO make

sec. 460



NBR351

- | | | |
|-------------------|------------------------------|----------------------------|
| 1. Reservoir cap | 4. Seal | 7. Primary piston assembly |
| 2. Oil filter | 5. Cylinder body | 8. Stopper cap |
| 3. Reservoir tank | 6. Secondary piston assembly | |

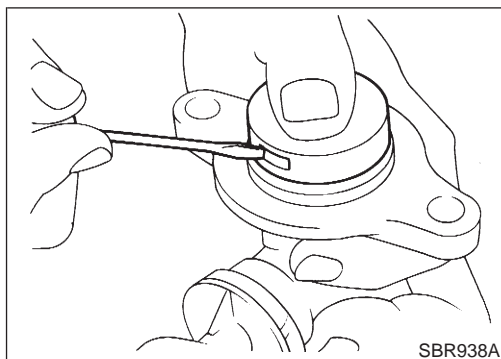
CAUTION:

Be careful not to splash brake fluid on painted areas; it may cause paint damage. If brake fluid is splashed on painted areas, wash it away with water immediately.

1. Connect a vinyl tube to air bleeder valve.
2. Drain brake fluid from each air bleeder valve, depressing brake pedal to empty fluid from master cylinder.
3. Remove brake pipe flare nuts.
4. Remove master cylinder mounting nuts.

MASTER CYLINDER (NABCO)

Disassembly

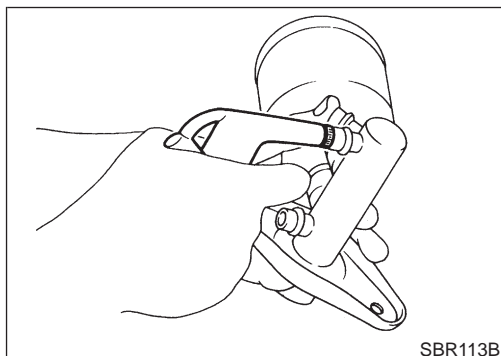


SBR938A

Disassembly

NJBR0152

1. Bend claws of stopper cap outward and remove stopper cap.



SBR113B

2. Remove valve stopper while piston is pushed into cylinder.
3. Remove piston assemblies.
If it is difficult to remove secondary piston assembly, gradually apply compressed air through fluid outlet.
4. Draw out reservoir tank.

Inspection

NJBR0153

Check for the following items.

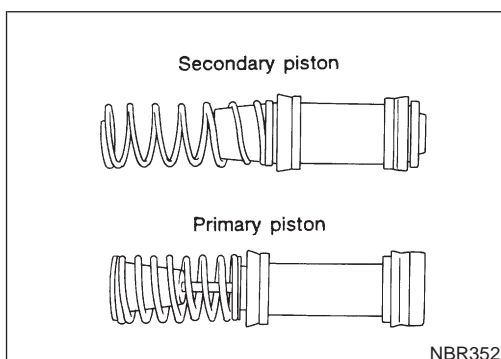
Replace any part if damaged.

Master cylinder:

- Pin holes or scratches on inner wall.

Piston:

- Deformation of or scratches on piston cups.

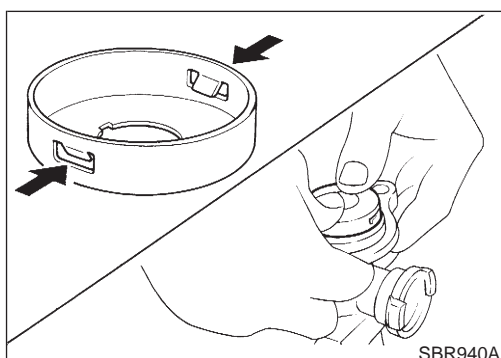


NBR352

Assembly

NJBR0154

1. Insert secondary piston assembly. Then insert primary piston assembly.
 - Pay attention to alignment of secondary piston slit with valve stopper mounting hole of cylinder body.

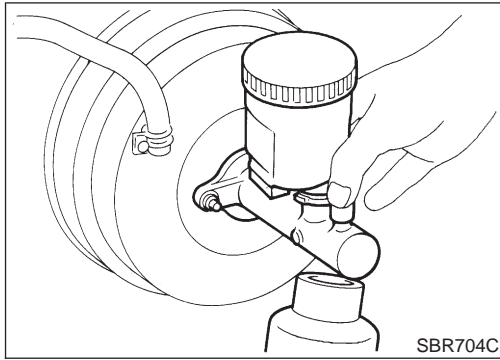


SBR940A

2. Install stopper cap.
Before installing stopper cap, ensure that claws are bent inward.
3. Push reservoir tank seals into cylinder body.
4. Push reservoir tank into cylinder body.

MASTER CYLINDER (NABCO)

Installation



Installation

NJBR0155

CAUTION:

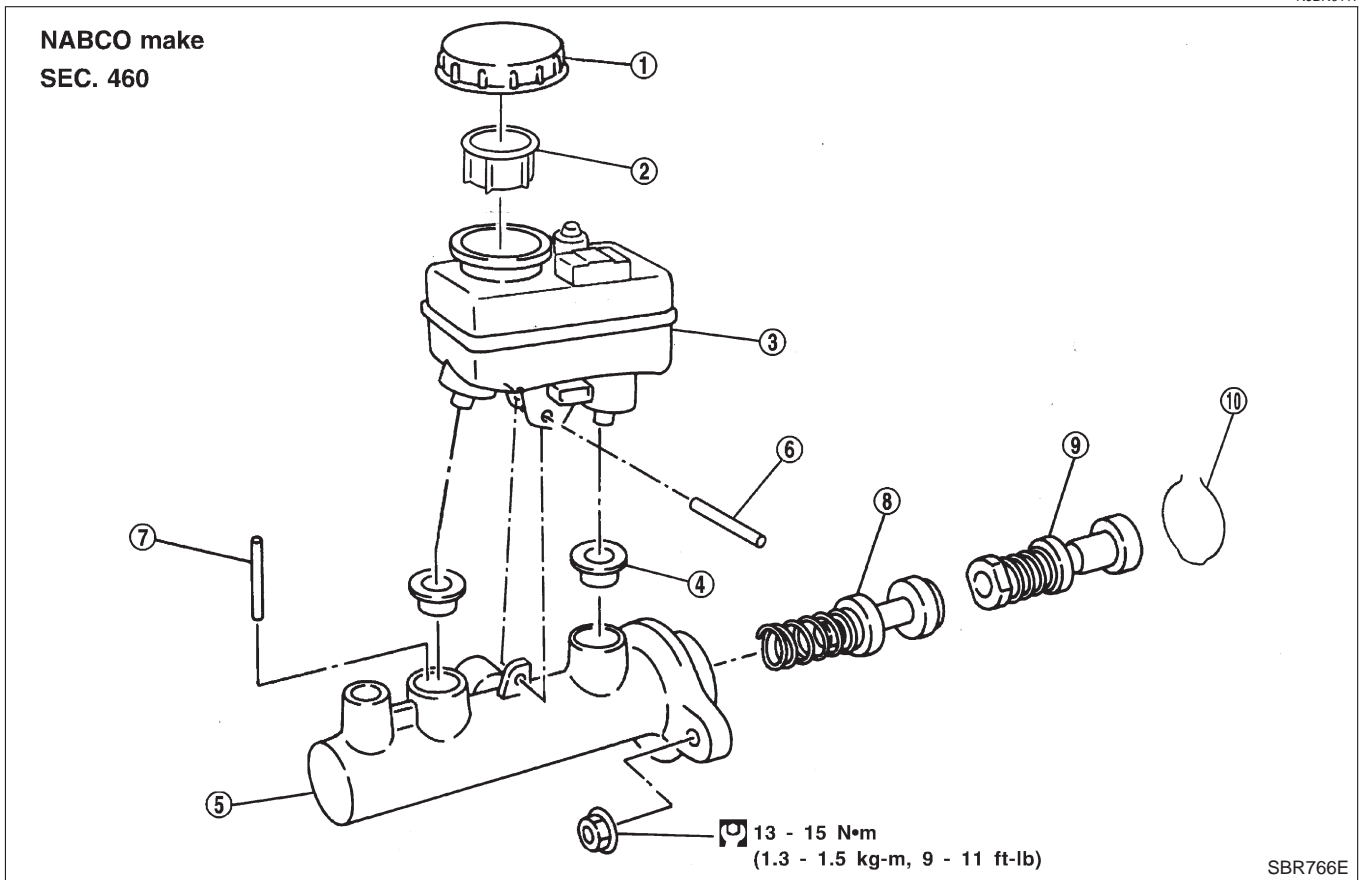
- Refill with new brake fluid "DOT 4".
 - Never reuse drained brake fluid.
1. Place master cylinder onto brake booster and secure mounting nuts lightly.
 2. Torque mounting nuts.
🔧 : 12 - 15 N·m (1.2 - 1.5 kg-m, 9 - 11 ft-lb)
 3. Fill up reservoir tank with new brake fluid.
 4. Plug all ports on master cylinder with fingers to prevent air suction while releasing brake pedal.
 5. Have driver depress brake pedal slowly several times until no air comes out of master cylinder.
 6. Fit brake lines to master cylinder.
 7. Tighten flare nuts.
🔧 : 15 - 18 N·m (1.5 - 1.8 kg-m, 11 - 13 ft-lb)
 8. Bleed air from brake system. Refer to "Bleeding Brake System", BR-8.

MASTER CYLINDER [BOSCH (NABCO)]

Removal

Removal

NJBR0117



- | | | |
|---------------------------------|-----------------------|------------------------------|
| 1. Reservoir cap | 5. Cylinder body | 8. Secondary piston assembly |
| 2. Oil filter (ABS models only) | 6. Elastic pin | 9. Primary piston assembly |
| 3. Reservoir tank | 7. Piston stopper pin | 10. Circlip |
| 4. Seal | | |

CAUTION:

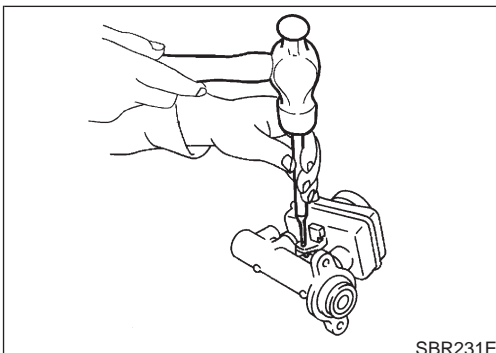
Be careful not to splash brake fluid on painted areas; it may cause paint damage. If brake fluid is splashed on painted areas, wash it away with water immediately.

1. Connect a vinyl tube to front caliper air bleeder valve.
2. Drain brake fluid from each front caliper air bleeder valve, depressing brake pedal to empty fluid from master cylinder.
3. Remove brake pipe flare nuts.
4. Remove master cylinder mounting nuts.

Disassembly

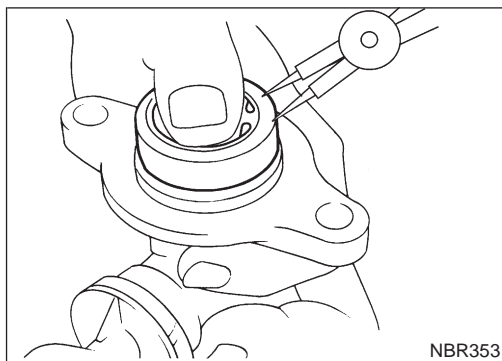
1. Drive out elastic pin from cylinder body.
2. Remove reservoir tank and seals.

NJBR0118

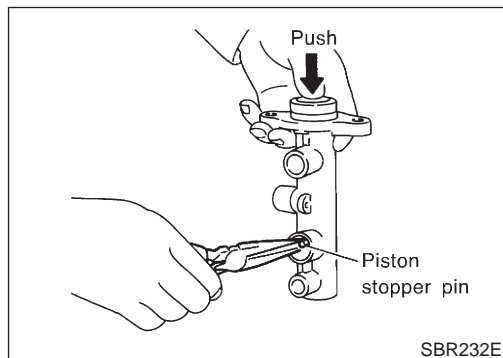


MASTER CYLINDER [BOSCH (NABCO)]

Disassembly (Cont'd)



3. Remove the circlip with suitable pliers while piston is pushed into cylinder.



4. Remove piston stopper pin while piston is pushed into cylinder.
5. Remove piston assemblies.
If it is difficult to remove secondary piston assembly, gradually apply compressed air through fluid outlet.

Inspection

NJBR0119

Check for the following items.

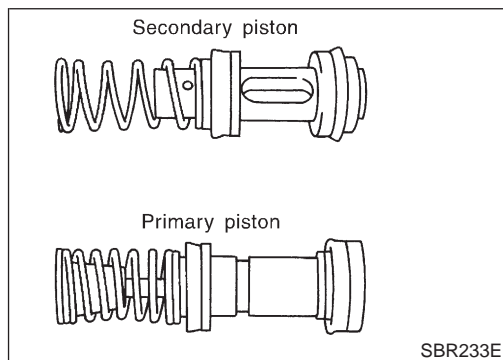
Replace any part if damaged.

Master cylinder:

- Pin holes or scratches on inner wall.

Piston:

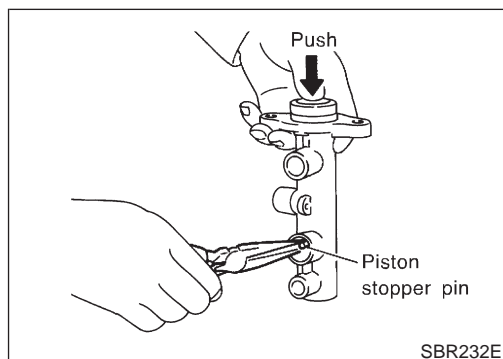
- Deformation of or scratches on piston cups.



Assembly

NJBR0120

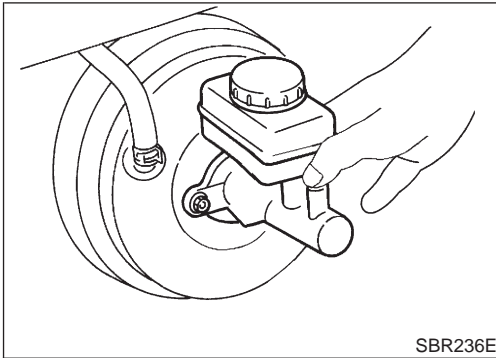
1. Insert secondary piston assembly. Then insert primary piston assembly.
 - **Pay attention to alignment of secondary piston slit with valve stopper mounting hole of cylinder body.**



2. Install piston stopper pin while piston is pushed into cylinder. Then secure the primary and secondary piston assemblies with circlip.
3. Push reservoir tank seals and reservoir tank into cylinder body.
4. Install elastic pin.

MASTER CYLINDER [BOSCH (NABCO)]

Installation



Installation

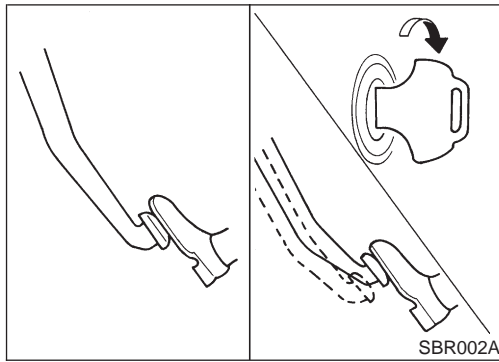
NJBR0121

CAUTION:

- Refill with new brake fluid "DOT 4".
 - Never reuse drained brake fluid.
1. Place master cylinder onto brake booster and secure mounting nuts lightly.
 2. Torque mounting nuts.
🔧 : 13 - 15 N·m (1.3 - 1.5 kg-m, 9 - 11 ft-lb)
 3. Fill up reservoir tank with new brake fluid.
 4. Plug all ports on master cylinder with fingers to prevent air suction while releasing brake pedal.
 5. Have driver depress brake pedal slowly several times until no air comes out of master cylinder.
 6. Fit brake lines to master cylinder.
 7. Tighten flare nuts.
🔧 : 15 - 18 N·m (1.5 - 1.8 kg-m, 11 - 13 ft-lb)
 8. Bleed air from brake system.

BRAKE BOOSTER

On-vehicle Service



On-vehicle Service

NJBR0023

OPERATING CHECK

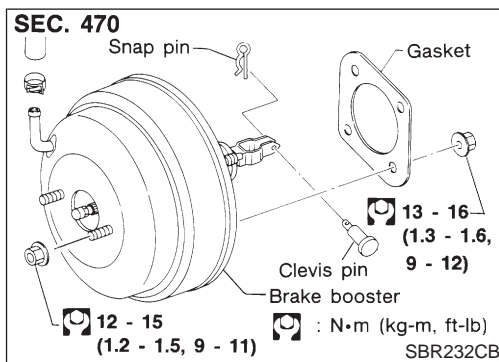
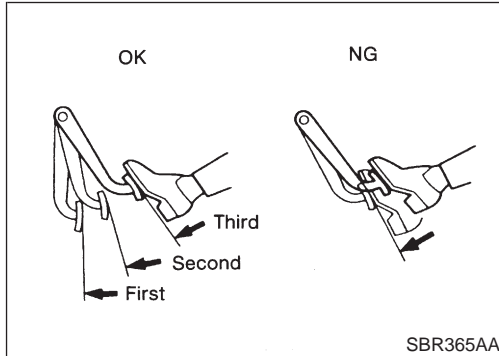
NJBR0023S01

1. Stop engine and depress brake pedal several times. Check that pedal stroke does not change.
2. Depress brake pedal, then start engine. If pedal goes down slightly, operation is normal.

AIRTIGHT CHECK

NJBR0023S02

1. Start engine, and stop it after one or two minutes. Depress brake pedal several times slowly. The pedal should go further down the first time, and then it should gradually rise thereafter.
2. Depress brake pedal while engine is running, and stop engine with pedal depressed. The pedal stroke should not change after holding pedal down for **30 seconds**.

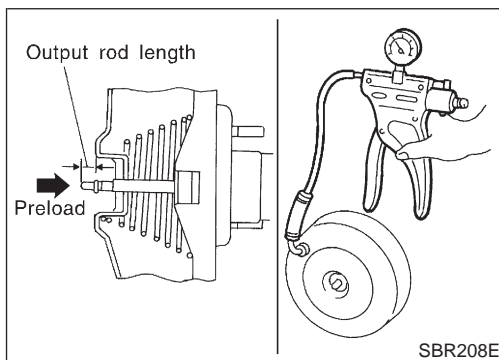


Removal

NJBR0024

CAUTION:

- Be careful not to splash brake fluid on painted areas; it may cause paint damage. If brake fluid is splashed on painted areas, wash it away with water immediately.
- Be careful not to deform or bend brake pipes, during removal of booster.



Inspection

NJBR0025

OUTPUT ROD LENGTH CHECK

NJBR0025S01

1. Apply vacuum of -66.7 kPa (-667 mbar, -500 mmHg, -19.69 inHg) to brake booster with a handy vacuum pump.
2. Add preload of 19.6 N (2 kg, 4.4 lb) to output rod.
3. Check output rod length.

Specified length:

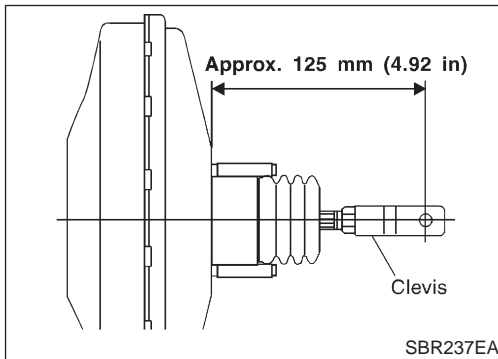
10.275 - 10.525 mm (0.4045 - 0.4144 in)

Installation

NJBR0026

CAUTION:

- Be careful not to deform or bend brake pipes, during installation of booster.
- Replace clevis pin if damaged.
- Refill with new brake fluid "DOT 4".
- Never reuse drained brake fluid.
- Take care not to damage brake booster mounting bolt thread when installing. Due to the acute angle of installation, the threads can be damaged with the dash panel.



1. Before fitting booster, temporarily adjust clevis to dimension shown.
2. Fit booster, then secure mounting nuts (brake pedal bracket to master cylinder) lightly.
3. Connect brake pedal and booster input rod with clevis pin.
4. Secure mounting nuts.

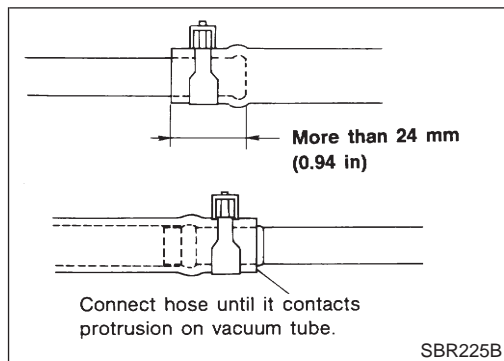
Specification:

13 - 16 N·m (1.3 - 1.6 kg·m, 9 - 12 ft·lb)

5. Install master cylinder. Refer to "Installation" in "MASTER CYLINDER", BR-19.
6. Bleed air. Refer to "Bleeding Brake System", BR-8.

VACUUM HOSE

Removal and Installation



Removal and Installation

NJBR0027

CAUTION:

When installing vacuum hoses, pay attention to the following points.

- Do not apply any oil or lubricants to vacuum hose and check valve.
- Insert vacuum tube into vacuum hose as shown.
- Install check valve, paying attention to its direction.

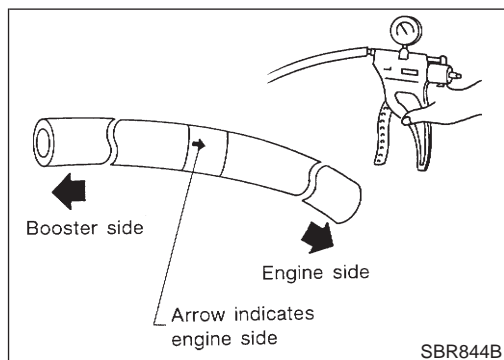
Inspection

NJBR0028

HOSES AND CONNECTORS

NJBR0028S01

Check vacuum lines, connections and check valve for airtightness, improper attachment chafing and deterioration.



CHECK VALVE

NJBR0028S02

Check vacuum with a vacuum pump.

Connect to booster side	Vacuum should exist.
Connect to engine side	Vacuum should not exist.

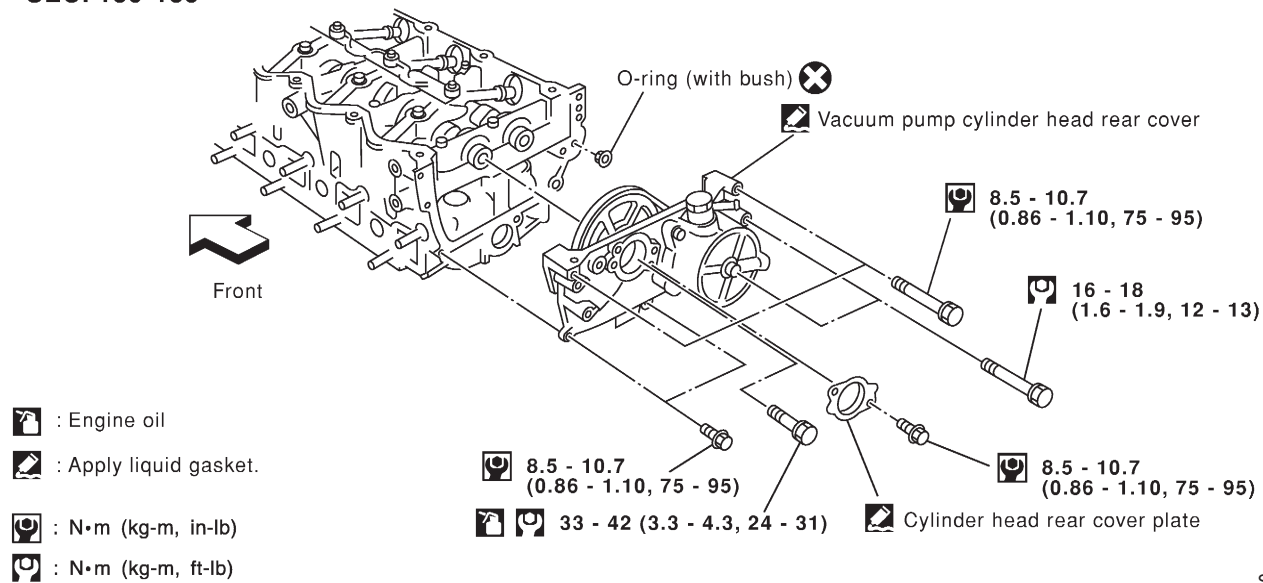
VACUUM PUMP

Removal

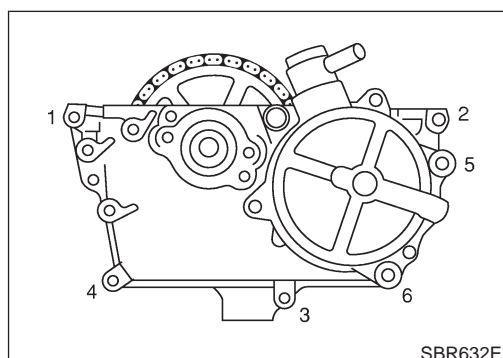
Removal

NJBR0123

SEC. 130•135



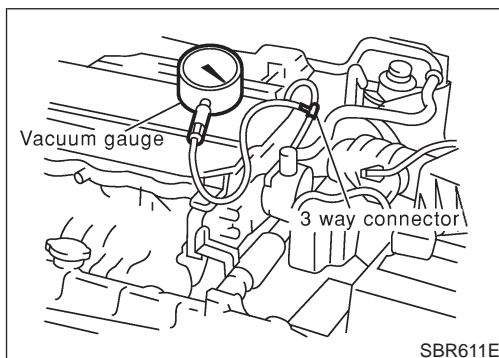
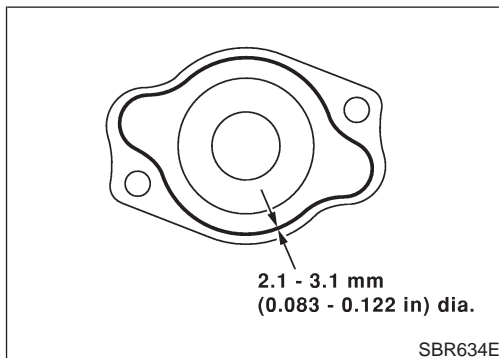
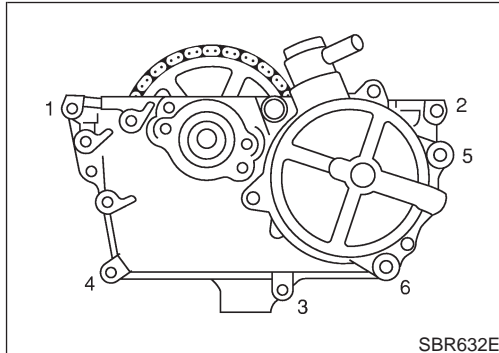
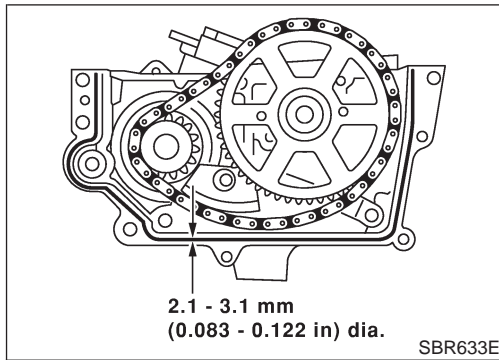
- Remove parts shown below.
 - Air duct, air cleaner case (upper)
 - Engine cover
 - Rocker cover
 - Exhaust manifold cover
 - EGR tube
- Disconnect vacuum hose from vacuum pump.
- Remove cylinder head rear cover plate.
 - Use a tool such as seal cutter (SST) to remove.
- Loosen and remove rear cam sprocket installation bolts.
 - Camshaft should not be attached. Using engine inner resistance, loosen installation bolts.



- Remove vacuum pump and cylinder head rear cover assembly.
 - Remove and install vacuum pump, sprocket, drive chain, and chain guide as an assembly.
 - Loosen mounting bolts in the reverse order of the numbers shown in the figure to the left.
 - Remove only bolts that are shown in the figure. (Be especially careful not to remove M6 bolts on the vacuum pump.)
 - Use a tool such as a seal cutter (SST).

VACUUM PUMP

Installation



Installation

NJBR0124

1. Assemble vacuum pump and cylinder head rear cover assembly, referring to "Component" in the next page.
2. Install vacuum pump and cylinder head rear cover assembly to cylinder head.
 - a. Apply ThreeBond 1207C (KP510 00150) without breaks to the location shown in the figure to the left.
- b. Tighten the mounting bolts in the numerical order shown by the figure to the left.
3. Install rear cam sprocket installation bolts.
4. Remove sprocket retaining two M6 bolts.
 - M6 bolts will be used for installation.
5. Tighten rear cam sprocket installation bolts.
 - Camshaft should not be fixed. Using engine inner resistance, tighten installation bolts.
6. Install cylinder head rear cover plate.
 - Apply ThreeBond 1207C (KP510 00150) without breaks to the location shown by the figure to the left.
7. Install parts in the reverse order of removal.

CAUTION:

If the engine is started with vacuum pump released (vacuum hose disconnected), it causes increase of blowby gas amount, and engine damage may result. When starting the engine, be sure to close vacuum circuit.

Inspection

NJBR0125

- Remove vacuum hose. Then, connect vacuum gauge with three-way connector.
- Install three-way connector to the area where vacuum pump negative pressure can be directly measured. (The figure shown an example.)
- Start the engine, then measure negative pressure.

Standard: -86.6 to -101.3 kPa (-866 to -1,013 mbar, -650 to -760 mmHg, -25.59 to -29.92 inHg)
- If it is not within standard, inspect for suction of air in the middle of route and measure it again.
- If it is still not within standard value, replace the vacuum pump.

VACUUM PUMP

Assembly (Cont'd)

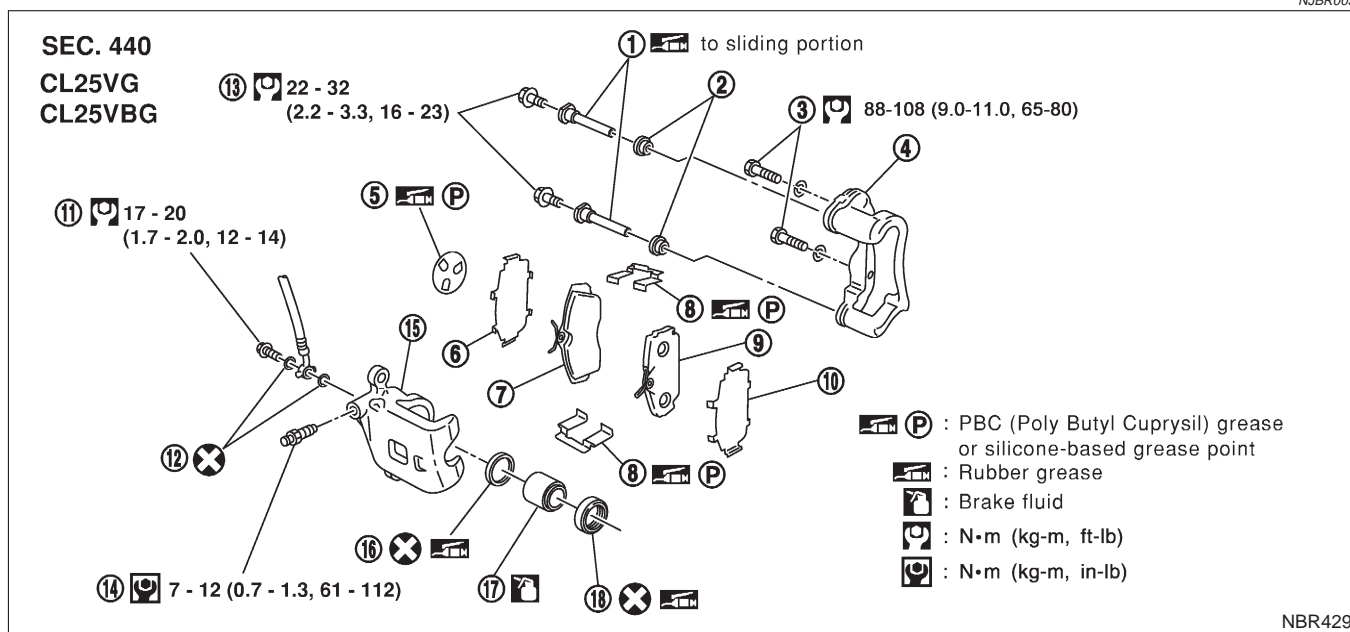
- lightly [approximately 9.8 N (1.0 kg, 2.2 lb)].
- 6. Remove thickness gauges (2).
 - Leave sprocket retaining bolts (M6) until installation.

FRONT DISC BRAKE

Component

Component

NJBR0030



- | | | |
|------------------------------|---------------------|-------------------|
| 1. Main pin | 7. Inner pad | 13. Main pin bolt |
| 2. Pin boot | 8. Pad retainer | 14. Bleed valve |
| 3. Torque member fixing bolt | 9. Outer pad | 15. Cylinder body |
| 4. Torque member | 10. Outer shim | 16. Piston seal |
| 5. Shim cover | 11. Connecting bolt | 17. Piston |
| 6. Inner shim | 12. Copper washer | 18. Piston boot |

Pad Replacement

NJBR0029

WARNING:

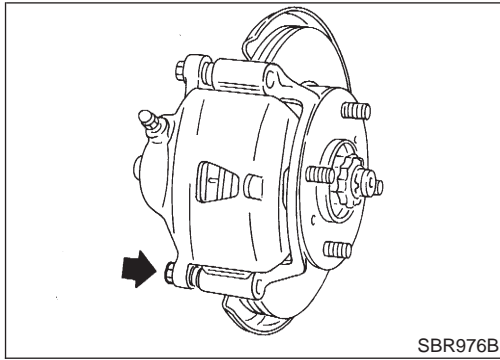
Clean brake pads with a vacuum dust collector to minimize the hazard of airborne particles or other materials.

CAUTION:

- When cylinder body is open, do not depress brake pedal because piston will pop out.
- Be careful not to damage piston boot or get oil on rotor. Always replace shims when replacing pads.
- If shims are rusted or show peeling of the rubber coat, replace them with new shims.
- It is not necessary to remove connecting bolt except for disassembly or replacement of caliper assembly. In this case, suspend cylinder body with wire so as not to stretch brake hose.
- Burnish the brake contact surfaces after refinishing or replacing drums or rotors, after replacing pads or linings, or if a soft pedal occurs at very low mileage. Refer to "Brake Burnishing Procedure", "ON-VEHICLE SERVICE", BR-7.

FRONT DISC BRAKE

Pad Replacement (Cont'd)



1. Remove master cylinder reservoir cap.
2. Remove pin bolt.
3. Open cylinder body upward. Then remove pad with retainers, inner and outer shims.

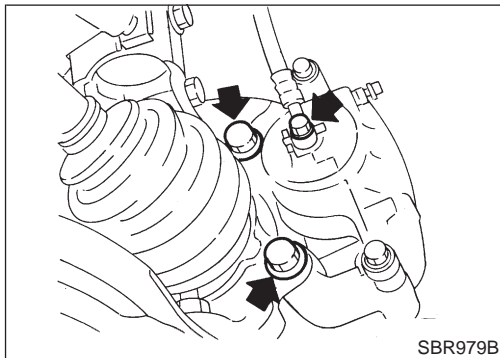
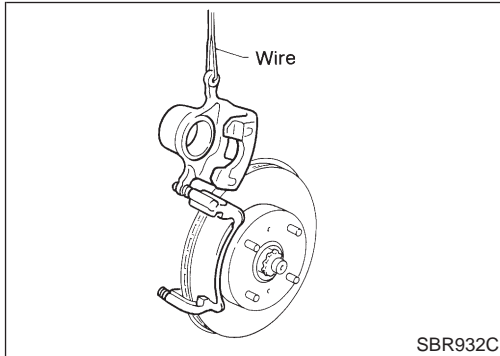
Standard pad thickness:

11 mm (0.43 in)

Pad wear limit:

2.0 mm (0.079 in)

Carefully monitor brake fluid level because brake fluid will return to reservoir when pushing back piston.



Removal

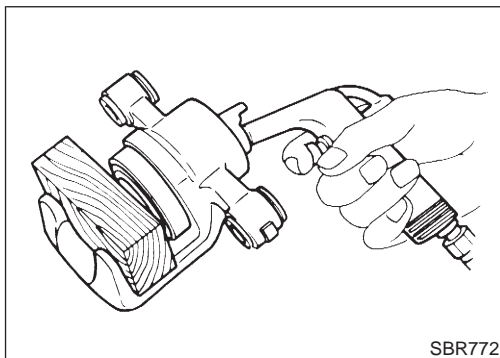
NJBR0031

WARNING:

Clean brake pads with a vacuum dust collector to minimize the hazard of airborne particles or other materials.

Remove torque member fixing bolts and connecting bolt.

It is not necessary to remove connecting bolt except for disassembly or replacement of caliper assembly. In this case, suspend caliper assembly with wire so as not to stretch brake hose.



Disassembly

NJBR0032

WARNING:

Do not place your fingers in front of piston.

CAUTION:

Do not scratch or score cylinder wall.

1. Push out piston with piston boot with compressed air.
2. Remove piston seal with a suitable tool.

Inspection

NJBR0033

CALIPER

NJBR0033S01

Cylinder Body

NJBR0033S0101

- Check inside surface of cylinder for score, rust, wear, damage or presence of foreign materials. If any of the above conditions are observed, replace cylinder body.
- Minor damage from rust or foreign materials may be eliminated by polishing surface with a fine emery paper. Replace cylinder body if necessary.

CAUTION:

Use brake fluid to clean. Never use mineral oil.

FRONT DISC BRAKE

Inspection (Cont'd)

Piston

NJBR0033S0102

CAUTION:

Piston sliding surface is plated. Do not polish with emery paper even if rust or foreign materials are stuck to sliding surface.

Check piston for score, rust, wear, damage or presence of foreign materials. Replace if any of the above conditions are observed.

Slide Pin, Pin Bolt and Pin Boot

NJBR0033S0103

Check for wear, cracks or other damage. Replace if any of the above conditions are observed.

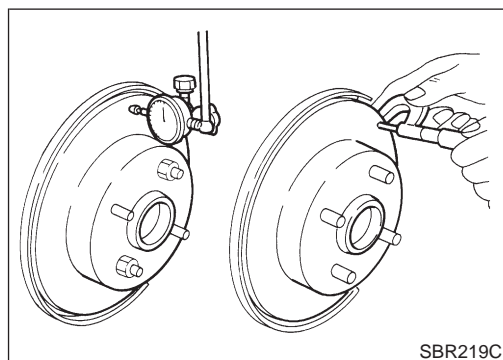
ROTOR

NJBR0033S02

Rubbing Surface

NJBR0033S0201

Check rotor for roughness, cracks or chips.



Runout

NJBR0033S0202

1. Secure rotor to wheel hub with at least two nuts (M12 x 1.25).
2. Check runout using a dial indicator.

Make sure that wheel bearing axial end play is within the specifications before measuring. Refer to AX section ("Front Wheel Bearing", "ON-VEHICLE SERVICE").

Maximum runout:

0.07 mm (0.0028 in)

3. If the runout is out of specification, find minimum runout position as follows:
 - a. Remove nuts and rotor from wheel hub.
 - b. Shift the rotor one hole and secure rotor to wheel hub with nuts.
 - c. Measure runout.
 - d. Repeat steps a. to c. so that minimum runout position can be found.
4. If the runout is still out of specification, turn rotor with on-car brake lathe ("MAD, DL-8700", "AMMCO 700 and 705" or equivalent).

Thickness

NJBR0033S0203

Thickness variation (At least 8 positions):

Maximum 0.01 mm (0.0004 in)

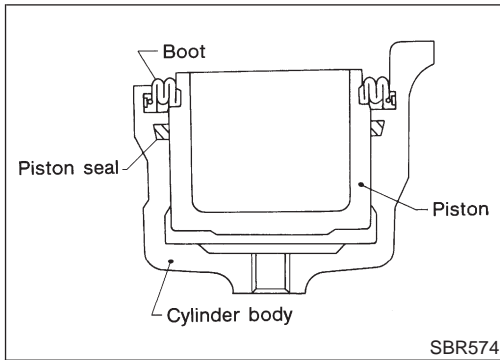
If thickness variation exceeds the specification, turn rotor with on-car brake lathe.

Rotor repair limit:

20.0 mm (0.787 in)

FRONT DISC BRAKE

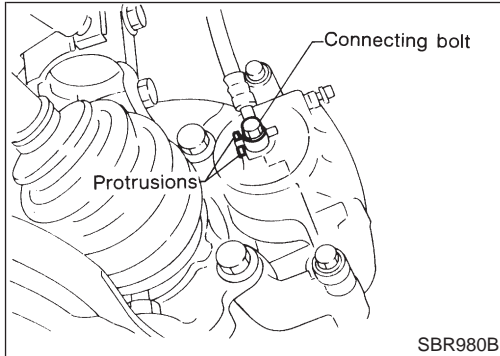
Assembly



Assembly

NJBR0034

1. Insert piston seal into groove on cylinder body.
2. With piston boot fitted to piston, insert piston boot into groove on cylinder body and install piston.
3. Properly secure piston boot.



Installation

NJBR0035

CAUTION:

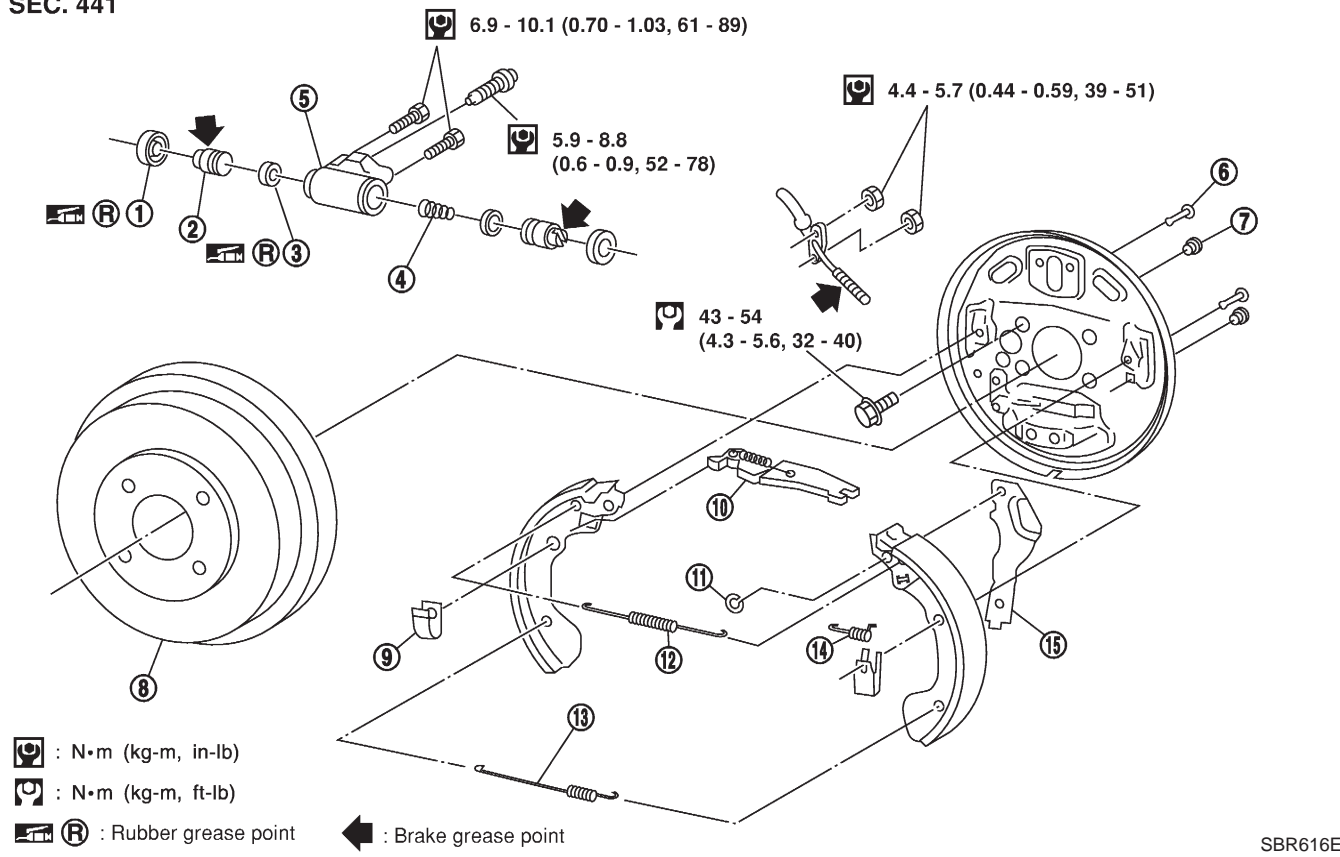
- Refill with new brake fluid "DOT 4".
 - Never reuse drained brake fluid.
1. Install brake hose to caliper securely.
 2. Install all parts and secure all bolts.
 3. Bleed air. Refer to "Bleeding Brake System", BR-8.

REAR DRUM BRAKE

Components

NJBR0128

SEC. 441



- | | | |
|-------------------|--------------------------|---------------------------|
| 1. Boot | 6. Shoe hold-down pin | 11. Retainer ring |
| 2. Piston | 7. Plug | 12. Return spring (Upper) |
| 3. Piston cap | 8. Brake drum | 13. Return spring (Lower) |
| 4. Spring | 9. Shoe hold-down spring | 14. Spring |
| 5. Wheel cylinder | 10. Adjuster | 15. Toggle lever |

Removal

WARNING:

Clean brake lining with a vacuum dust collector to minimize the hazard of airborne materials.

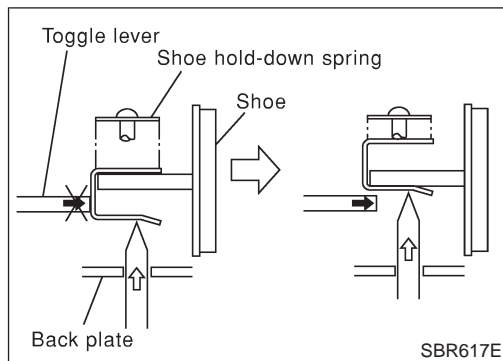
CAUTION:

Make sure parking brake lever is completely released.

NJBR0129

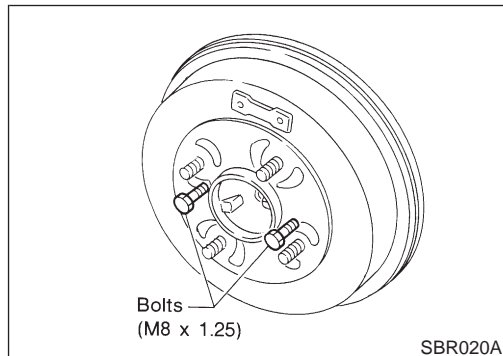
REAR DRUM BRAKE

Removal (Cont'd)

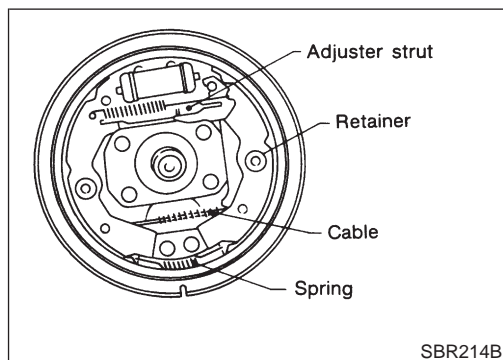


1. Release parking brake lever fully, then remove drum. **If drum is hard to remove, the following procedures should be carried out.**

a. **Remove plug. To make shoe clearance, push shoe hold-down spring to free toggle lever.**



b. **Install two bolts as shown. Tighten the two bolts gradually.**



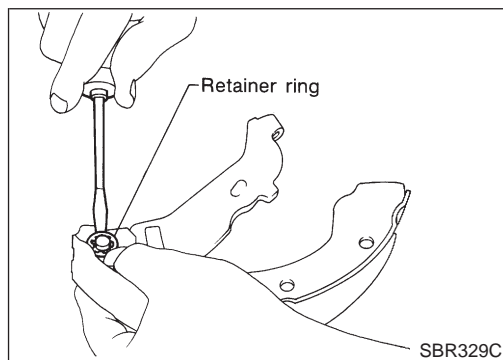
2. After removing retainer, remove spring by rotating shoes.

● **Be careful not to damage wheel cylinder piston boots.**

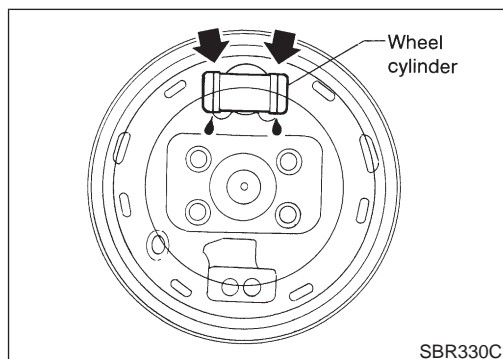
● **Be careful not to damage parking brake cable when separating it.**

3. Remove adjuster.

4. Disconnect parking brake cable from toggle lever.



5. Remove retainer ring with a suitable tool. Then separate toggle lever and brake shoe.



Inspection — Wheel Cylinder

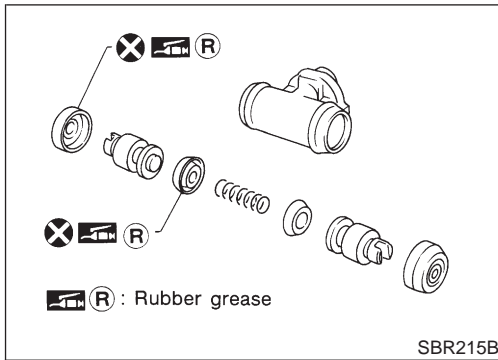
NJBR0130

● Check wheel cylinder for leakage.

● Check for wear, damage and loose conditions. Replace if any such condition exists.

REAR DRUM BRAKE

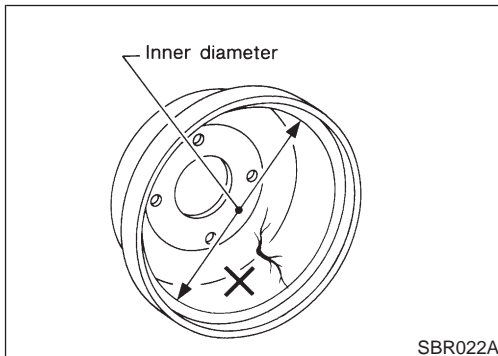
Wheel Cylinder Overhaul



Wheel Cylinder Overhaul

NJBR0131

- Check all internal parts for wear, rust and damage. Replace if necessary.
- Pay attention so as not to scratch cylinder when installing pistons.



Inspection — Drum

NJBR0132

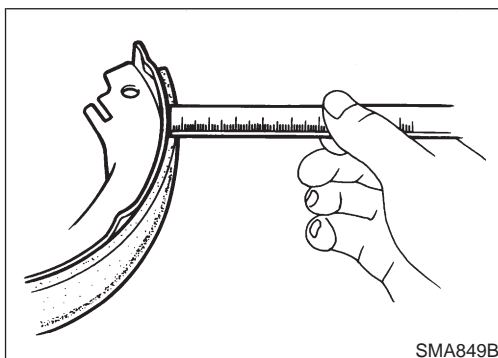
Maximum inner diameter:

204.5 mm (8.05 in)

Maximum out-of-round:

0.03 mm (0.0012 in)

- Contact surface should be fine finished with No. 120 to 150 emery paper.
- Using a drum lathe, resurface brake drum if it shows scoring, partial wear or stepped wear.
- After brake drum has been completely reconditioned or replaced, check drum and shoes for proper contact pattern.



Inspection — Lining

NJBR0133

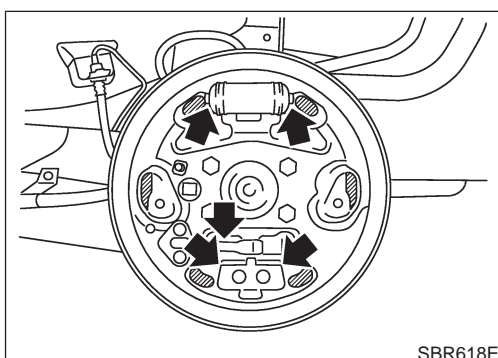
Check lining thickness.

Standard lining thickness:

4.5 mm (0.177 in)

Lining wear limit:

1.5 mm (0.059 in)



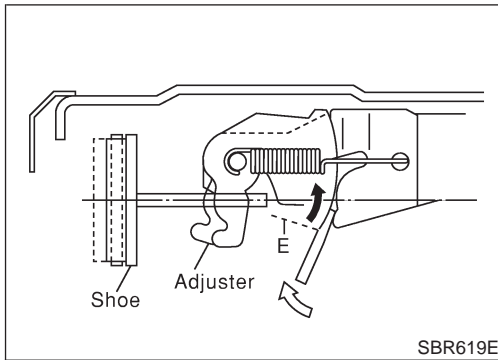
Installation

NJBR0134

- Always perform shoe clearance adjustment. Refer to BR-48.
 - Burnish the brake contact surfaces after refinishing or replacing drums or rotors, after replacing pads or linings, or if a soft pedal occurs at very low mileage. Refer to "Brake Burnishing Procedure", "ON-VEHICLE SERVICE", BR-7.
1. Fit toggle lever to brake shoe with retainer ring.
 2. Apply brake grease to the contact areas shown at left.

REAR DRUM BRAKE

Installation (Cont'd)



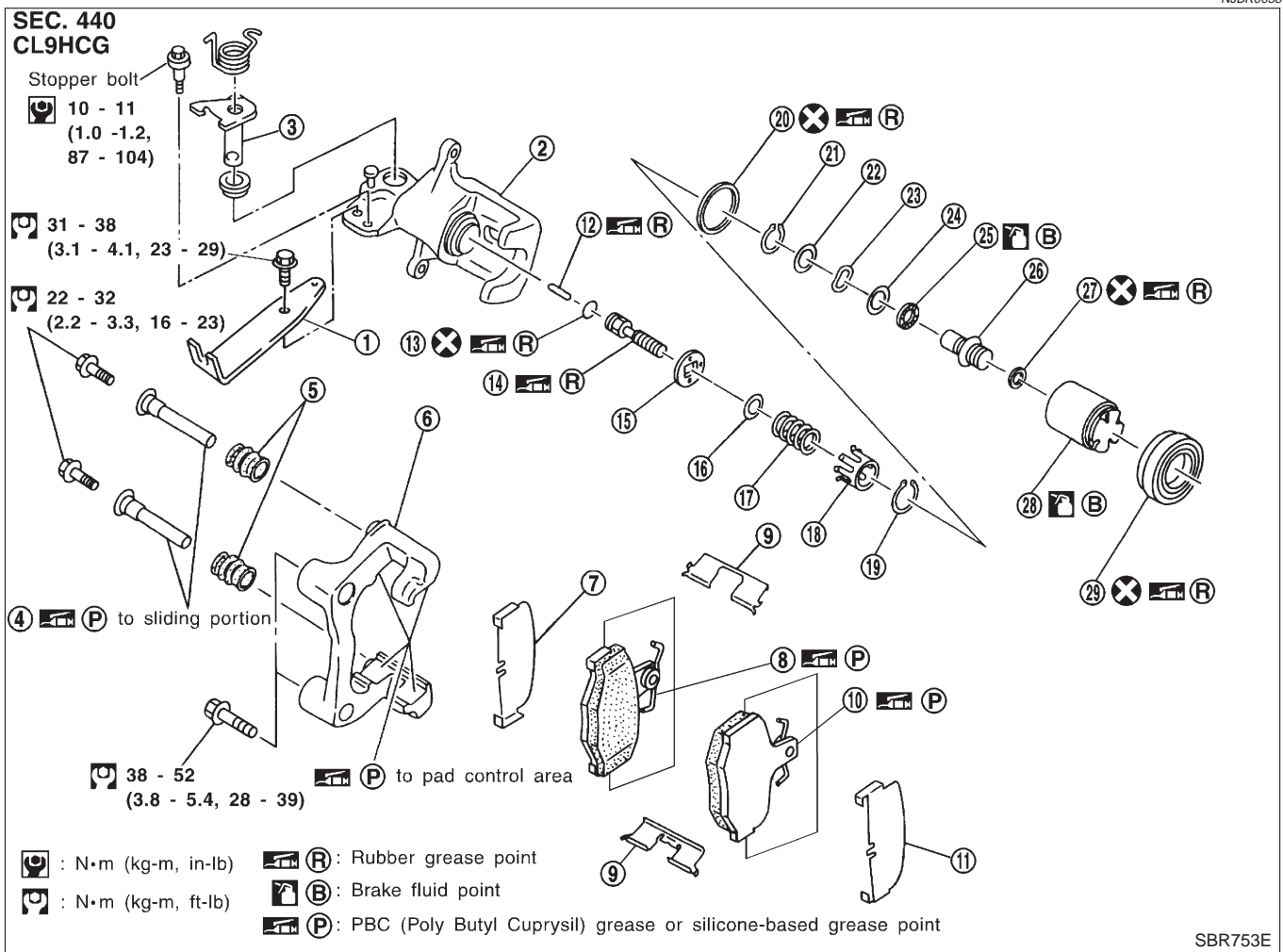
3. Shorten adjuster by rotating it.
 - To tighten loosened brake shoes, first, insert a screw driver in the direction shown in the left. Then, move the adjuster in the direction shown by the arrow while disengaging the tooth contact. Never tap the area E.
4. Connect parking brake cable to toggle lever.
5. Install all parts.
Be careful not to damage wheel cylinder piston boots.
6. Check all parts are installed properly.
Pay attention to direction of adjuster assembly.
7. Install brake drum.
8. When installing new wheel cylinder or overhauling wheel cylinder, bleed air. Refer to "Bleeding Brake System", BR-8.
9. Adjust parking brake. Refer to BR-48.

REAR DISC BRAKE (CAM & STRUT TYPE)

Component

Component

NJBR0038



SBR753E

- | | | |
|------------------|----------------------|-----------------|
| 1. Cable guide | 11. Outer shim | 21. Snap ring A |
| 2. Cylinder | 12. Strut | 22. Washer |
| 3. Toggle lever | 13. O-ring | 23. Wave washer |
| 4. Pin | 14. Push rod | 24. Washer |
| 5. Pin boot | 15. Key plate | 25. Bearing |
| 6. Torque member | 16. Retaining washer | 26. Adjuster |
| 7. Inner shim | 17. Spring | 27. Cup |
| 8. Inner pad | 18. Spring cover | 28. Piston |
| 9. Pad retainer | 19. Snap ring B | 29. Piston boot |
| 10. Outer pad | 20. Piston seal | |

Pad Replacement

NJBR0037

WARNING:

Clean brake pads with a vacuum dust collector to minimize the hazard of airborne particles or other materials.

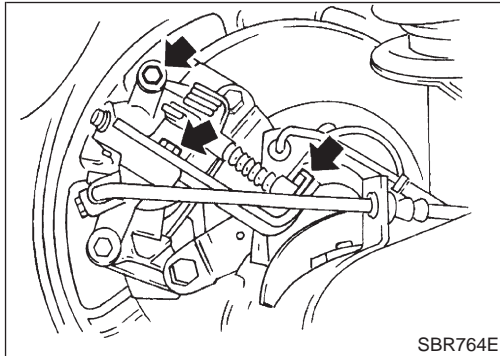
CAUTION:

- When cylinder body is open, do not depress brake pedal because piston will pop out.
- Be careful not to damage piston boot or get oil on rotor. Always replace shims in replacing pads.
- If shims are rusted or show peeling of rubber coat, replace them with new shims.

REAR DISC BRAKE (CAM & STRUT TYPE)

Pad Replacement (Cont'd)

- It is not necessary to remove connecting bolt except for disassembly or replacement of caliper assembly. In this case, suspend cylinder body with wire so as not to stretch brake hose.
- Burnish the brake contact surfaces after refinishing or replacing drums or rotors, after replacing pads or linings, or if a soft pedal occurs at very low mileage. Refer to "Brake Burnishing Procedure", "ON-VEHICLE SERVICE", BR-7.



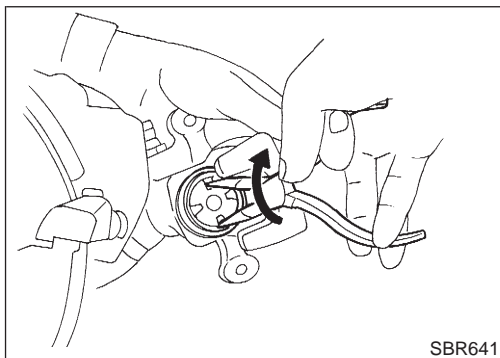
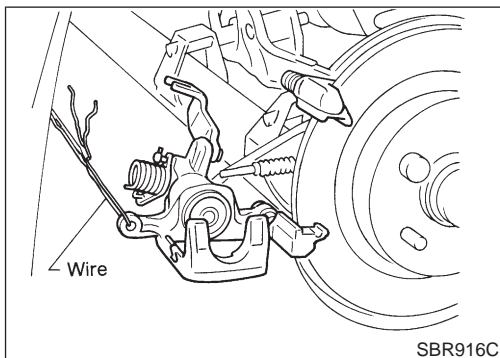
1. Remove master cylinder reservoir cap.
2. Remove brake cable mounting bolt and lock spring.
3. Release parking brake control lever, then disconnect cable from the caliper.
4. Remove upper pin bolt.
5. Open cylinder body downward. Then remove pad retainers, and inner and outer shims.

Standard pad thickness:

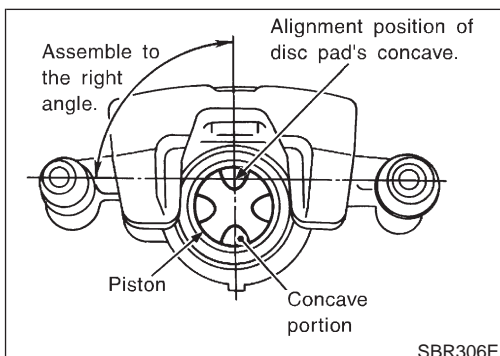
9.3 mm (0.366 in)

Pad wear limit:

2.0 mm (0.079 in)



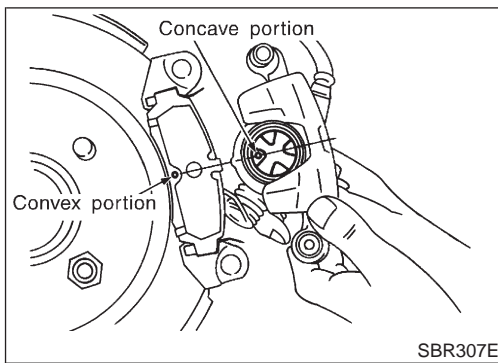
6. When installing new pads, push piston into cylinder body by gently turning piston clockwise, as shown. **Carefully monitor brake fluid level because brake fluid will return to reservoir when pushing back piston.**



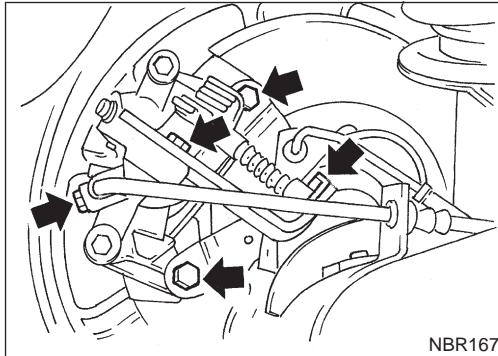
7. Adjust the piston to the right angle as shown in the figure.

REAR DISC BRAKE (CAM & STRUT TYPE)

Pad Replacement (Cont'd)



8. As shown in the figure, align the piston's concave to the pad's convex, then install the cylinder body to the torque member.
9. Install brake cable, brake cable mounting bolt, lock spring and master cylinder reservoir cap.



Removal

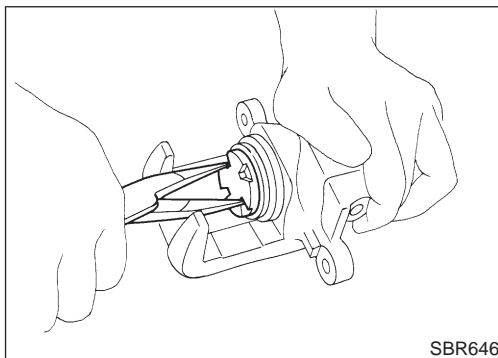
NJBR0039

WARNING:

Clean brake pads with a vacuum dust collector to minimize the hazard of airborne particles or other materials.

1. Remove brake cable mounting bolt and lock spring.
2. Release parking brake control lever, then disconnect cable from the caliper.
3. Remove torque member fixing bolts and connecting bolt.

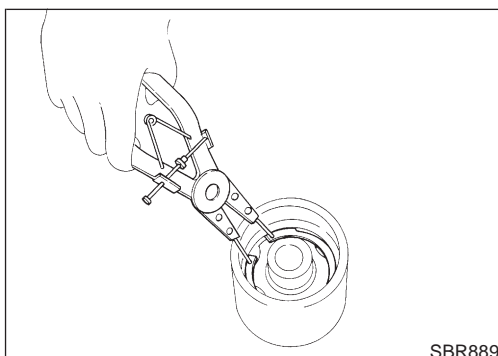
It is not necessary to remove connecting bolt except for disassembly or replacement of caliper assembly. In this case, suspend caliper assembly with wire so as not to stretch brake hose.



Disassembly

NJBR0040

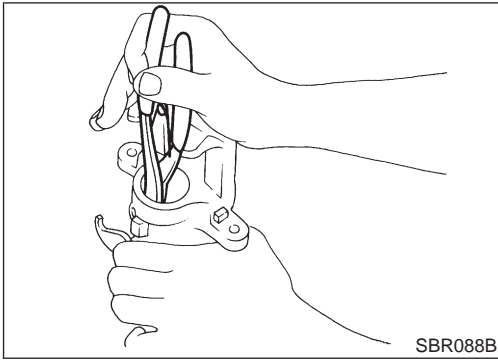
1. Remove piston by turning it counterclockwise with long nose pliers or suitable tool.



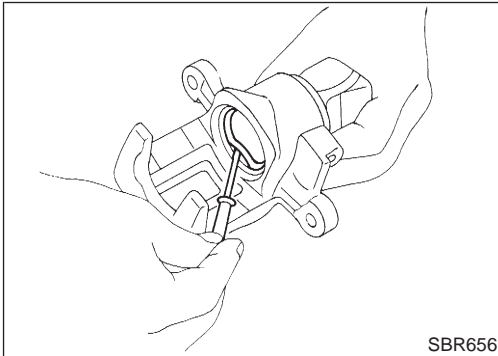
2. Pry off ring A from piston with suitable pliers and remove adjusting nut.

REAR DISC BRAKE (CAM & STRUT TYPE)

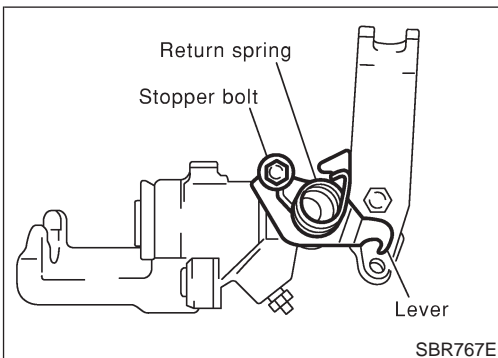
Disassembly (Cont'd)



3. Disassemble cylinder body.
 - a. Pry off ring B with suitable pliers, then remove spring cover, spring and seat.
 - b. Remove washer, key plate, push rod, O-ring and strut.



- c. Remove piston seal.
Be careful not to damage cylinder body.



4. Remove return spring, toggle lever and cable guide.

Inspection

CALIPER

NJBR0041

CAUTION:

NJBR0041S01

Use brake fluid to clean cylinder. Never use mineral oil.

Cylinder Body

NJBR0041S0101

- Check inside surface of cylinder for score, rust, wear, damage or presence of foreign materials. If any of the above conditions are observed, replace cylinder body.
- Minor damage from rust or foreign materials may be eliminated by polishing surface with a fine emery paper. Replace cylinder body if necessary.

Torque Member

NJBR0041S0102

Check for wear, cracks or other damage. Replace if necessary.

Piston

NJBR0041S0103

CAUTION:

Piston sliding surface is plated. Do not polish with emery paper even if rust or foreign matter is stuck to sliding surface.

Check piston for score, rust, wear, damage or presence of foreign materials.

Replace if any of the above conditions are observed.

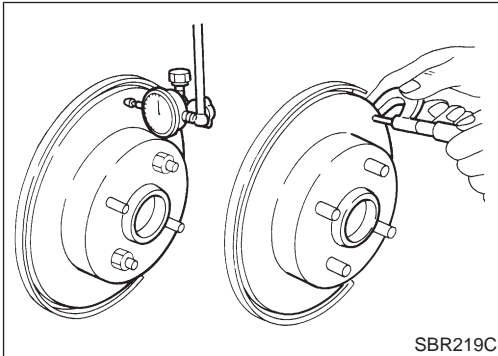
REAR DISC BRAKE (CAM & STRUT TYPE)

Inspection (Cont'd)

Pin and Pin Boot

Check for wear, cracks or other damage.
Replace if any of the above conditions are observed.

NJBR0041S0104



ROTOR

Rubbing Surface

Check rotor for roughness, cracks or chips.

NJBR0041S02

NJBR0041S0201

Runout

1. Secure rotor to wheel hub with two nuts (M12 x 1.25).
2. Check runout using a dial indicator.

NJBR0041S0202

Make sure that axial end play is within the specifications before measuring. Refer to AX section ("REAR WHEEL BEARING", "On-vehicle Service").

3. Change relative positions of rotor and wheel hub so that runout is minimized.

**Maximum runout:
0.07 mm (0.0028 in)**

Thickness

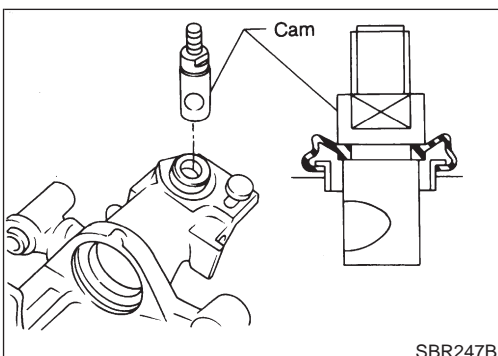
Rotor repair limit:

**Standard thickness
10 mm (0.39 in)**

**Minimum thickness
9 mm (0.35 in)**

**Thickness variation (At least 8 portions)
Maximum 0.02 mm (0.0008 in)**

NJBR0041S0203



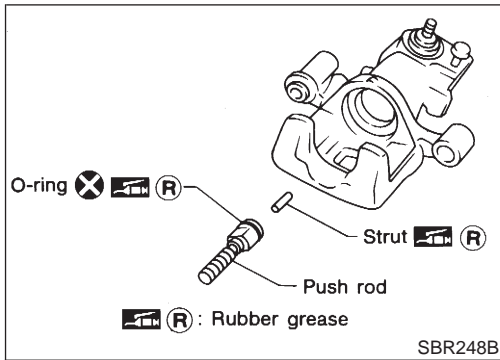
Assembly

1. Insert cam with depression facing towards open end of cylinder.

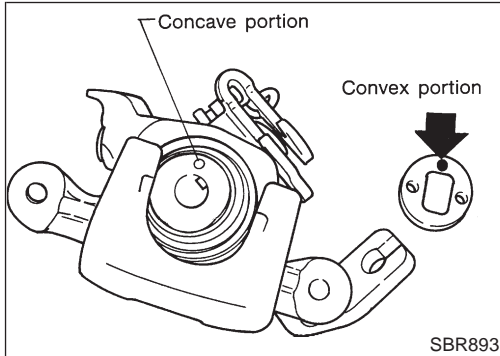
NJBR0042

REAR DISC BRAKE (CAM & STRUT TYPE)

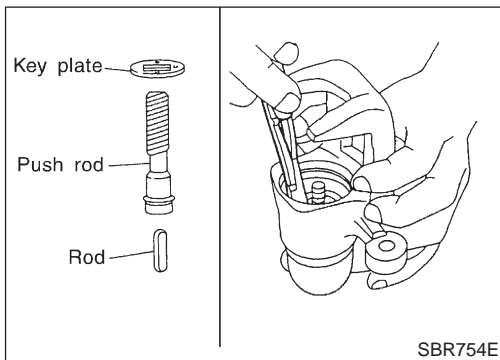
Assembly (Cont'd)



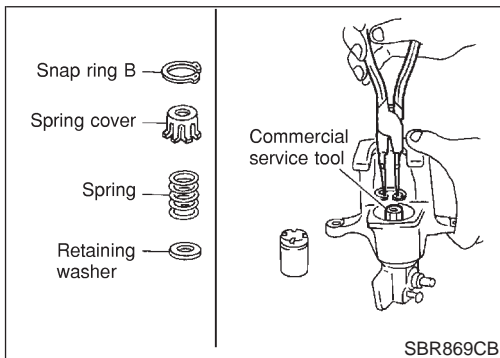
2. Generously apply rubber grease to strut and push rod to make insertion easy.



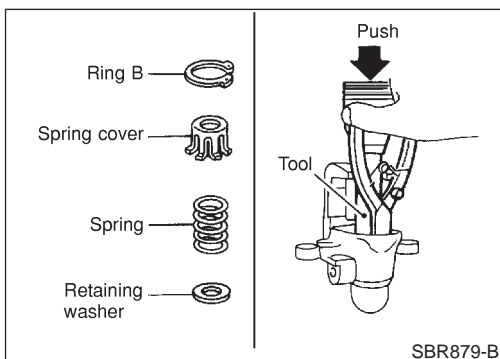
3. Fit push rod into square hole in key plate. Also match convex portion of key plate with concave portion of cylinder.



4. Install rod, push rod and key plate.

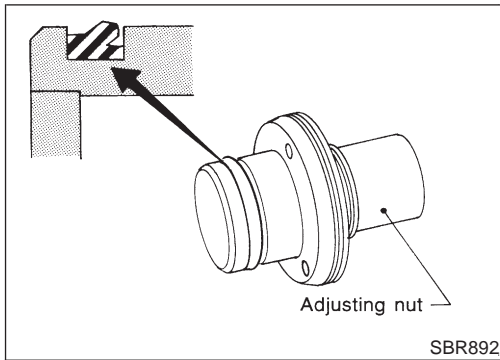


5. Install seat, spring, spring cover and ring B with suitable press and drift.

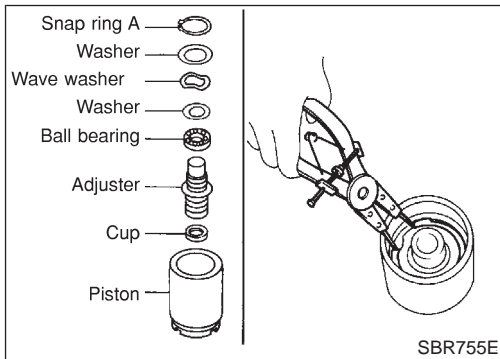


REAR DISC BRAKE (CAM & STRUT TYPE)

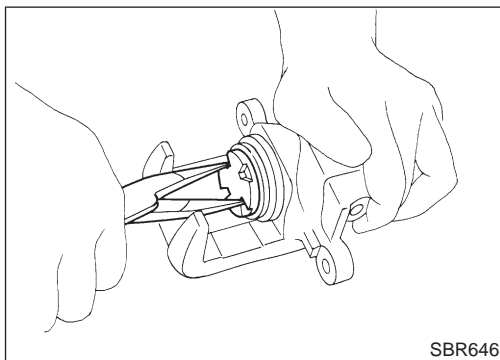
Assembly (Cont'd)



6. Install cup in the specified direction.

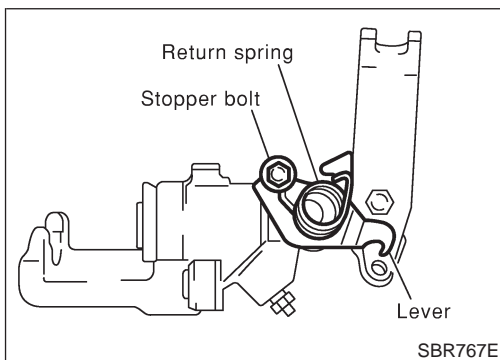


7. Install adjuster, bearing, washers and ring A with a suitable tool.

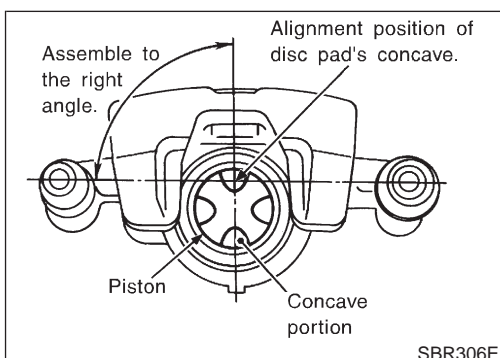


8. Insert piston seal into groove on cylinder body.

9. With piston boot fitted to piston, insert piston boot into groove on cylinder body and fit piston by turning it clockwise with long nose pliers, or suitable tool.



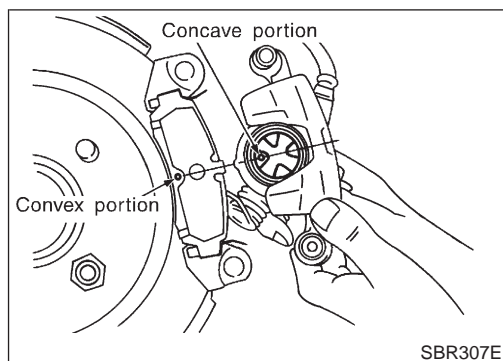
10. Fit toggle lever, return spring and cable guide.



11. Adjust the piston to the right angle as shown in the figure.

REAR DISC BRAKE (CAM & STRUT TYPE)

Installation



Installation

NJBR0043

CAUTION:

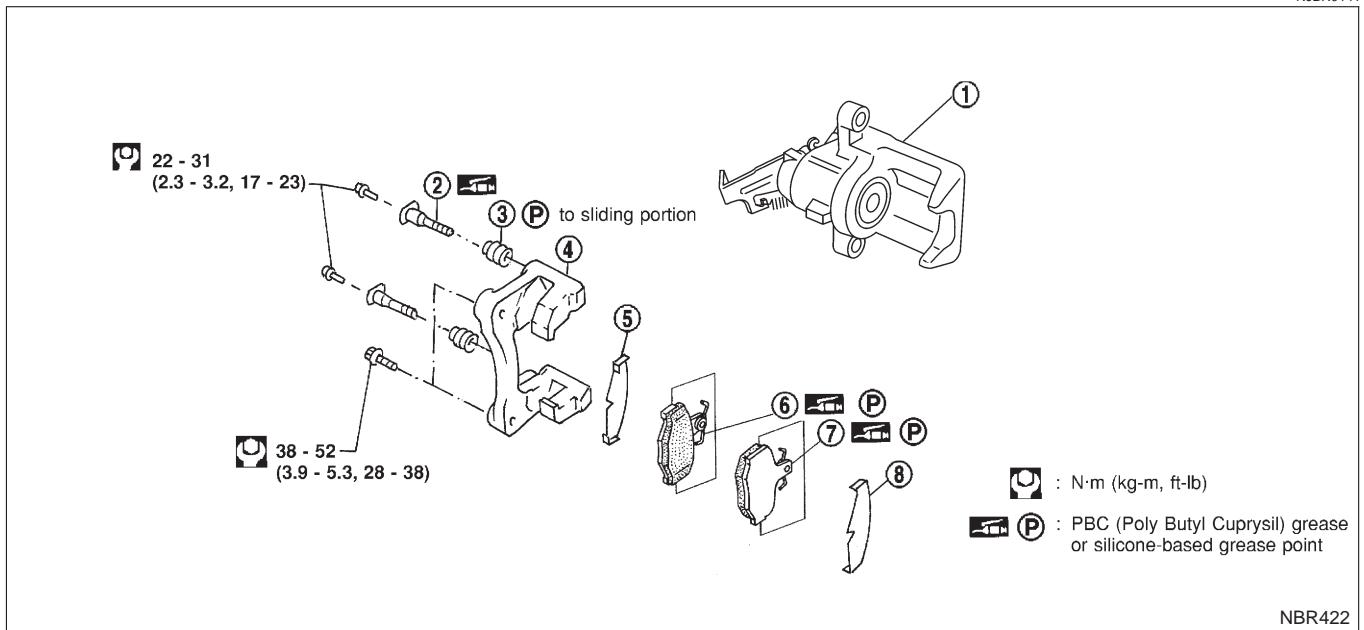
- Refill with new brake fluid "DOT 4".
 - Never reuse drained brake fluid.
1. Install caliper assembly.
 - As shown in the figure, align the piston's concave to the pad's convex, then install the cylinder body to the torque member.
 2. Install brake hose to caliper securely.
 3. Install all parts and secure all bolts.
 4. Bleed air. Refer to "Bleeding Brake System", BR-8.

REAR DISC BRAKE (BALL & RAMP TYPE)

Component

Component

NJBR0141



1. Cylinder body
2. Pin
3. Pin boot

4. Torque member
5. Inner shim
6. Inner pad

7. Outer pad
8. Outer shim

NOTE:

The cylinder body cannot be disassembled.

Pad Replacement

NJBR0142

WARNING:

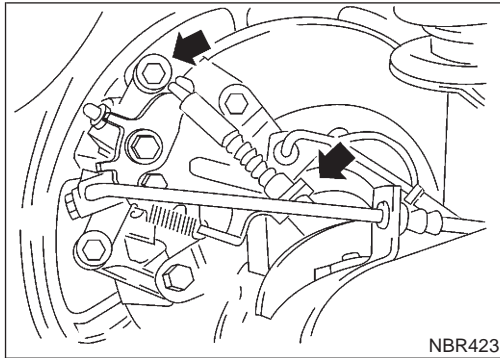
Clean brake pads with a vacuum dust collector to minimize the hazard of airborne particles or other materials.

CAUTION:

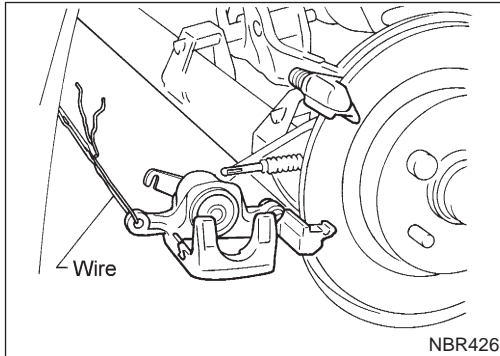
- When cylinder body is open, do not depress brake pedal because piston will pop out.
- Be careful not to damage piston boot or get oil on rotor. Always replace shims in replacing pads.
- If shims are rusted or show peeling of rubber coat, replace them with new shims.
- It is not necessary to remove connecting bolt except for replacement of caliper assembly. In this case, suspend cylinder body with wire so as not to stretch brake hose.
- Burnish the brake contact surfaces after refinishing or replacing rotors, after replacing pads, or if a soft pedal occurs at very low mileage. Refer to "Brake Burnishing Procedure", "ON-VEHICLE SERVICE", BR-7.

REAR DISC BRAKE (BALL & RAMP TYPE)

Pad Replacement (Cont'd)



1. Remove master cylinder reservoir cap.
2. Remove brake cable lock spring.
3. Release parking brake control lever, then disconnect cable from the caliper.
4. Remove upper pin bolt.



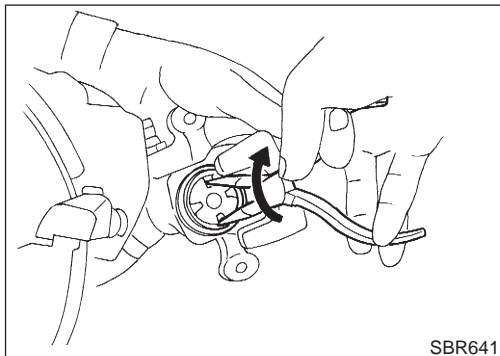
5. Open cylinder body downward. Then remove pads inner and outer shims.

Standard pad thickness:

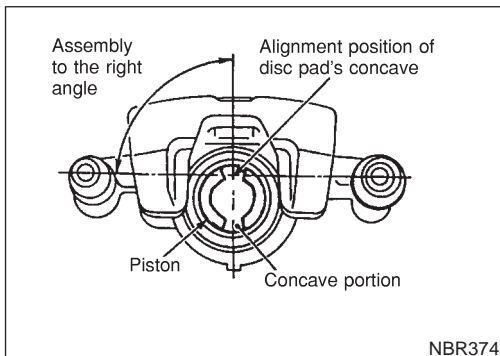
9.3 mm (0.366 in)

Pad wear limit:

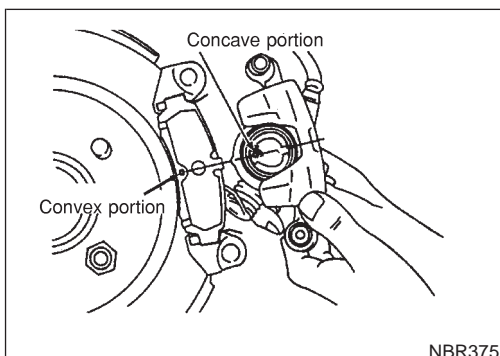
2.0 mm (0.079 in)



6. When installing new pads, push piston into cylinder body by gently turning piston clockwise, as shown. **Carefully monitor brake fluid level because brake fluid will return to reservoir when pushing back piston.**



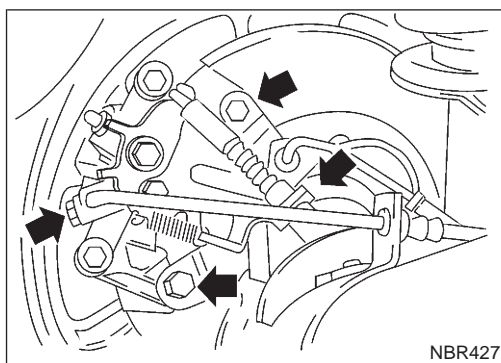
7. Adjust the piston to the right angle as shown in the figure.



8. As shown in the figure, align the piston's concave to the pad's convex, then install the cylinder body to the torque member.
9. Install brake cable, brake cable mounting bolt, lock spring and master cylinder reservoir cap.

REAR DISC BRAKE (BALL & RAMP TYPE)

Removal



Removal

NJBR0143

WARNING:

Clean brake pads with a vacuum dust collector to minimize the hazard of airborne particles or other materials.

1. Remove brake cable lock spring.
2. Release parking brake control lever, then disconnect cable from the caliper.
3. Remove torque member fixing bolts and connecting bolt.
4. Remove brake hose connecting bolt.
5. Plug off the brake hose and cylinder body to prevent air entering the system.

CAUTION:

Care should be taken as not to let:

- Air enter the cylinder body and brake hose.
- Brake fluid spill from the cylinder body and brake hose.

Disassembly

NJBR0144

Remove pin bolts and pins.

NOTE:

Cylinder body can not be disassembled.

Inspection

NJBR0145

CALIPER

NJBR0145S01

CAUTION:

Do not drain any brake fluid from cylinder body. Cylinder body can not be disassembled.

Cylinder Body

NJBR0145S0101

Check cylinder body for score, rust, wear, damage or presence of foreign materials. If any of the above conditions are observed, replace cylinder body.

Torque Member

NJBR0145S0102

Check for wear, cracks or other damage. Replace if necessary.

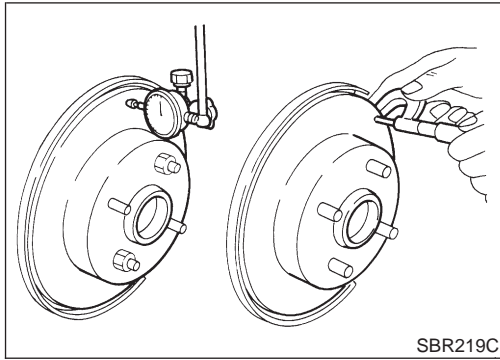
Pin and Pin Boot

NJBR0145S0104

Check for wear, cracks or other damage. Replace if any of the above conditions are observed.

REAR DISC BRAKE (BALL & RAMP TYPE)

Inspection (Cont'd)



ROTOR

Rubbing Surface

NJBR0145S02

Check rotor for roughness, cracks or chips.

NJBR0145S0201

Runout

NJBR0145S0202

1. Secure rotor to wheel hub with two nuts (M12 x 1.25).
2. Check runout using a dial indicator.

Make sure that axial end play is within the specifications before measuring. Refer to AX section ("REAR WHEEL BEARING", "On-vehicle Service").

3. Change relative positions of rotor and wheel hub so that runout is minimized.

**Maximum runout:
0.07 mm (0.0028 in)**

Thickness

NJBR0145S0203

Rotor repair limit:

Standard thickness

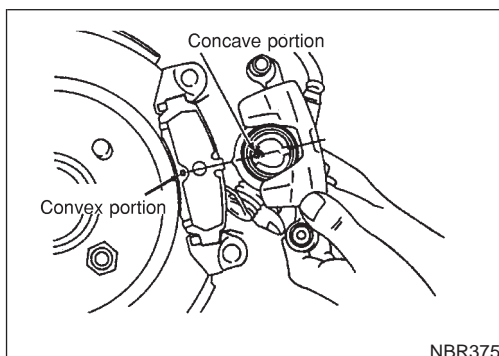
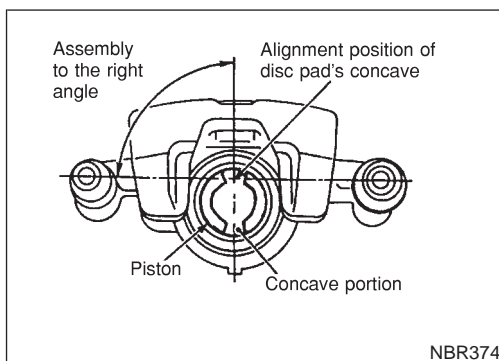
10 mm (0.39 in)

Minimum thickness

9 mm (0.35 in)

Thickness variation (At least 8 portions)

Maximum 0.02 mm (0.0008 in)



Installation

NJBR0146

CAUTION:

- Refill with new brake fluid "DOT 4".
- Never reuse drained brake fluid.
- Do not drain (factory) filled brake fluid from (new) caliper assemblies.

1. Install caliper assembly.
- As shown in the figure, align the piston's concave to the pad's convex, then install the cylinder body to the torque member.
2. Remove the plug from the cylinder body and brake hose.

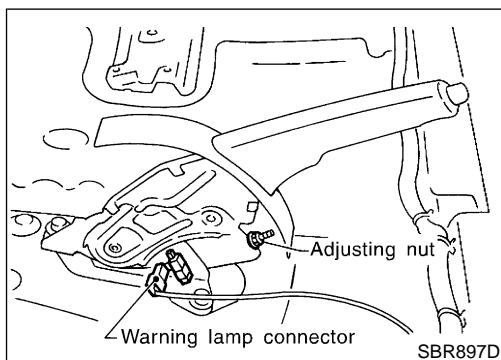
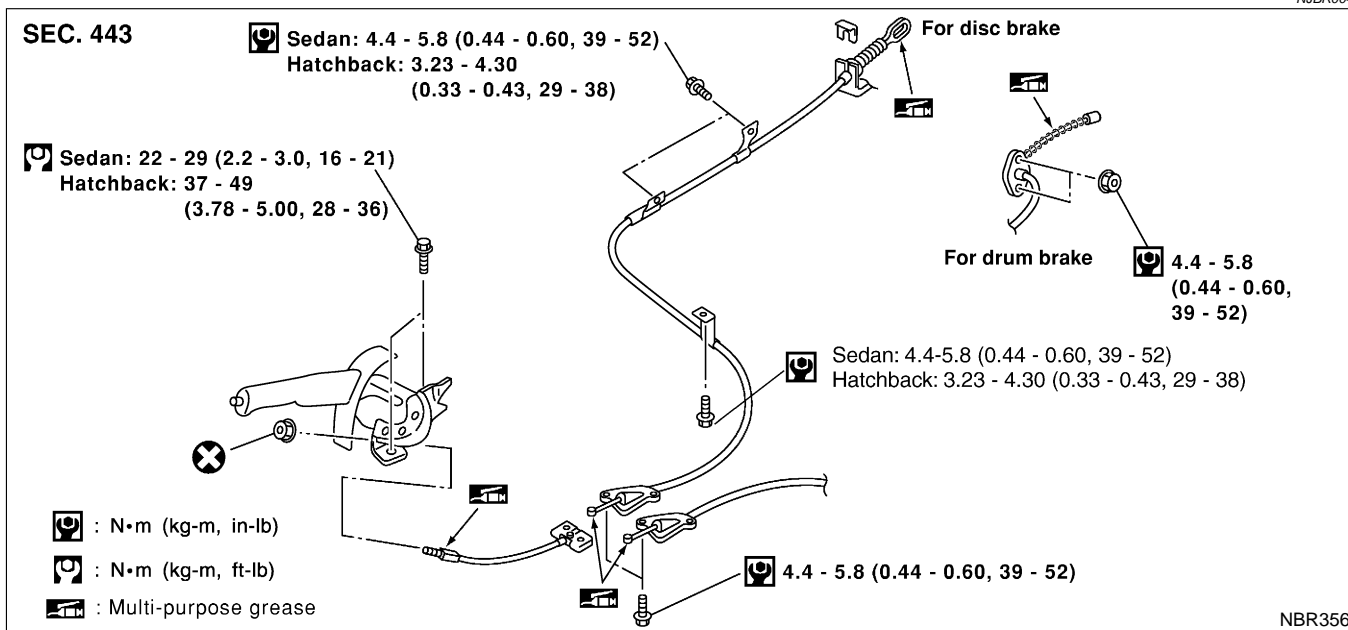
CAUTION:

Care should be taken as not to let:

- Air enter the cylinder body and brake hose.
 - Brake fluid spill from the cylinder body and brake hose.
3. Install brake hose to caliper securely.
 4. Install all parts and secure all bolts.
 5. Bleed air. Refer to "Bleeding Brake System", BR-8.

Components

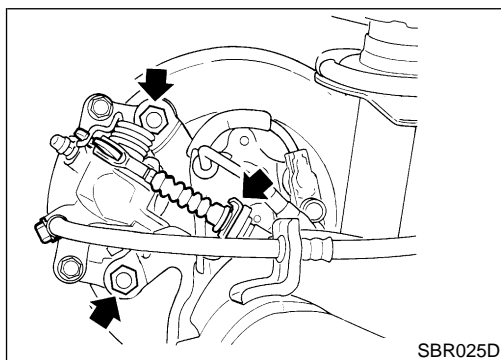
NJBR0044



Removal and Installation

NJBR0045

1. To remove parking brake cable, first remove center console.
2. Disconnect warning lamp switch connector.
3. Remove adjusting nut.
4. Remove bolts and nuts securing parking brake cable.
5. Remove parking brake device.
6. Remove lock plate and disconnect cable (disc brake only).
For drum brake models, refer to "Removal", "REAR DRUM BRAKE", BR-31.



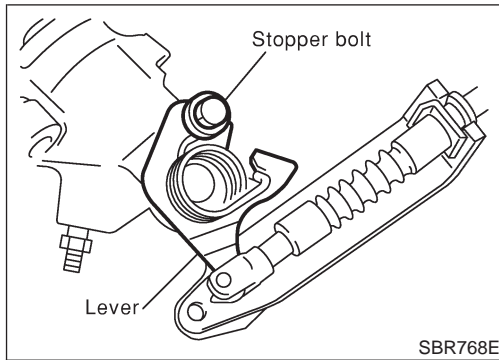
Inspection

NJBR0046

1. Check control lever for wear or other damage. Replace if necessary.
2. Check wires for discontinuity or deterioration. Replace if necessary.
3. Check warning lamp and switch. Replace if necessary.
4. Check parts at each connecting portion and, if found deformed or damaged, replace.

PARKING BRAKE CONTROL

Adjustment

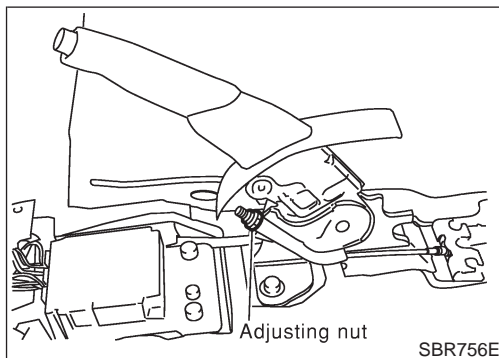


Adjustment

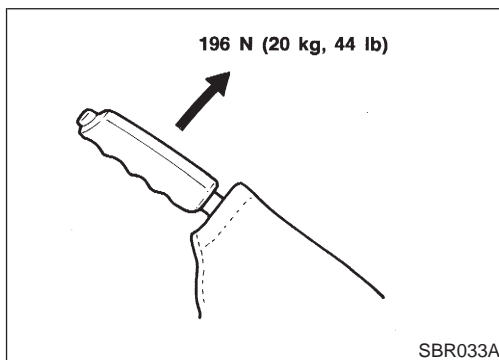
Before or after adjustment, pay attention to the following points. NJBR0047

- For rear disc brake be sure that toggle lever returns to stopper when parking brake lever is released.
- There is no drag when parking brake lever is released.
- Vehicle is unladen.

1. Adjust clearance between shoe and drum or pad and rotor as follows:
 - a. Release parking brake lever and loosen adjusting nut.
 - b. Depress brake pedal fully at least 10 times with engine running.



2. Pull control lever 10 times or more to make a (full) lever stroke of 195 mm (7.68 in). At 4 to 6 notches, adjust the parking brake cable by turning the adjusting nut.



3. Pull control lever with specified amount of force. Check lever stroke and ensure smooth operation.

Number of notches

5 - 6

4. Bend warning lamp switch plate to ensure:
 - Warning lamp comes on when lever is lifted "A" notches.
 - Warning lamp goes out when lever is fully released.

Number of "A" notches: 1

Purpose

The ABS consists of electronic and hydraulic components. It allows for control of braking force so that locking of the wheels can be avoided.

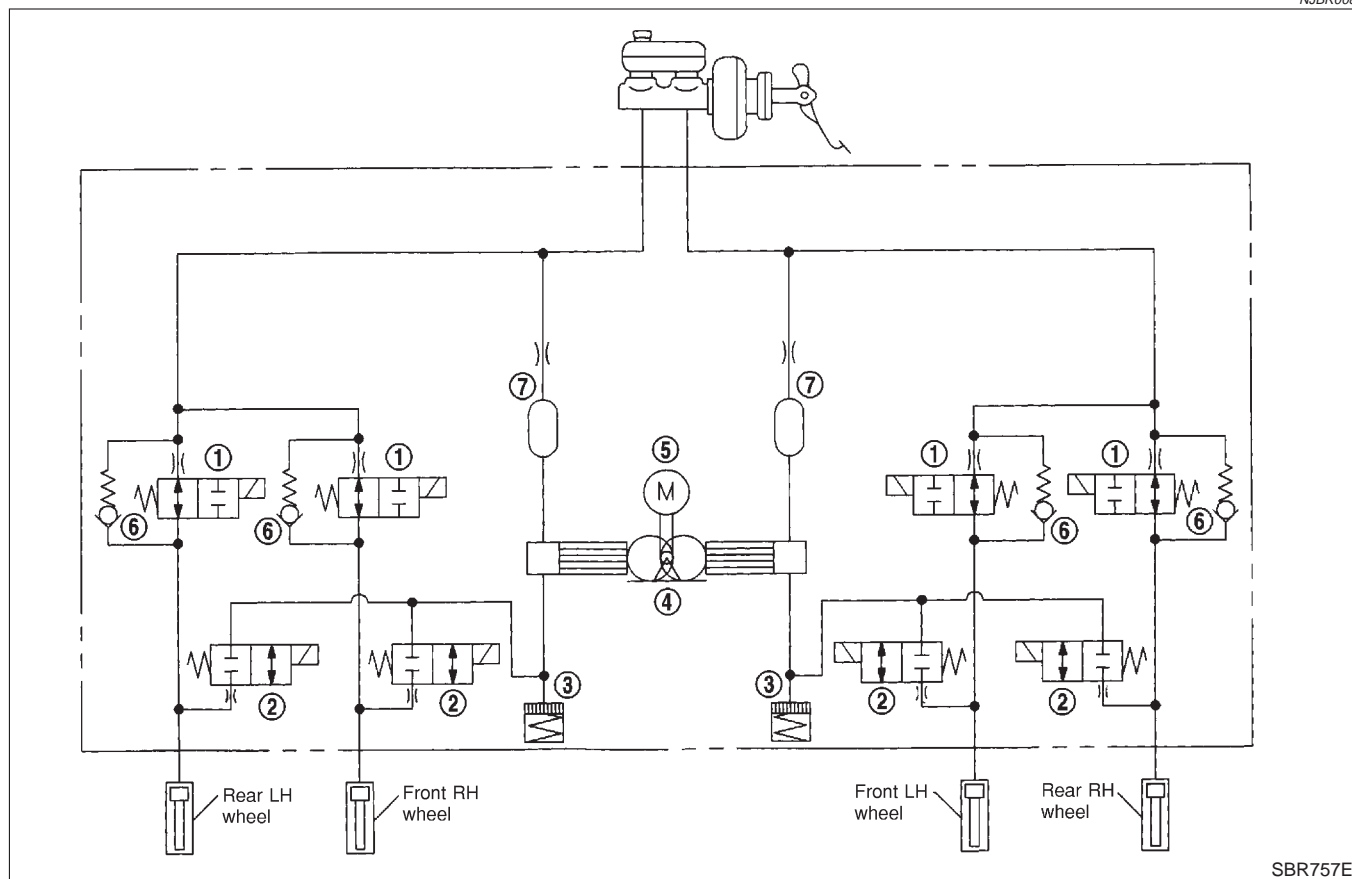
The ABS:

- 1) Ensures proper tracking performance through steering wheel operation.
- 2) Enables obstacles to be avoided through steering wheel operation.
- 3) Ensures vehicle stability by preventing flat spins.

ABS (Anti-Lock Brake System) Operation

- When the vehicle speed is less than 10 km/h (6 MPH) this system does not work.
- The Anti-Lock Brake System (ABS) has self-test capabilities. The system turns on the ABS warning lamp for 1 second after turning the ignition switch ON. The system performs another test the first time the vehicle reaches 6 km/h (4 MPH). A mechanical noise may be heard as the ABS performs a self-test. This is a normal part of the self-test feature. If a malfunction is found during this check, the ABS warning lamp will come on.
- During ABS operation, a mechanical noise may be heard. This is a normal condition.

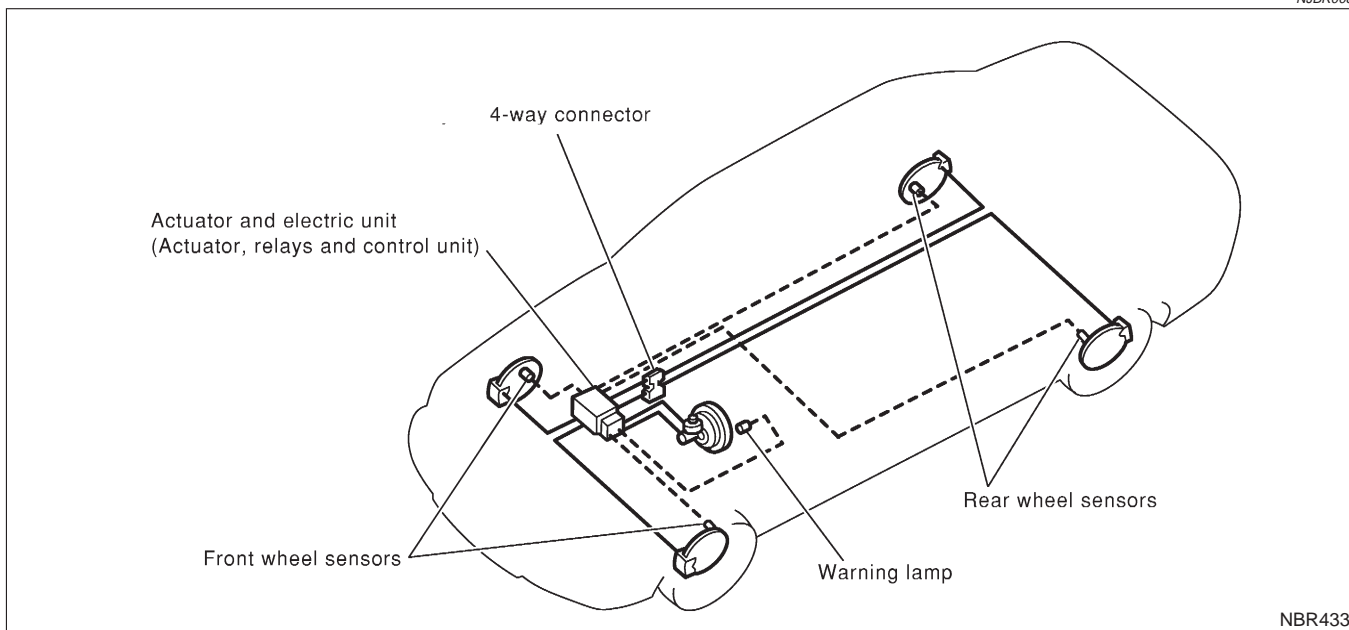
ABS Hydraulic Circuit



- | | | |
|--------------------------|----------|-----------------------|
| 1. Inlet solenoid valve | 4. Pump | 6. Bypass check valve |
| 2. Outlet solenoid valve | 5. Motor | 7. Damper |
| 3. Reservoir | | |

System Components

NJBR0086



NBR433

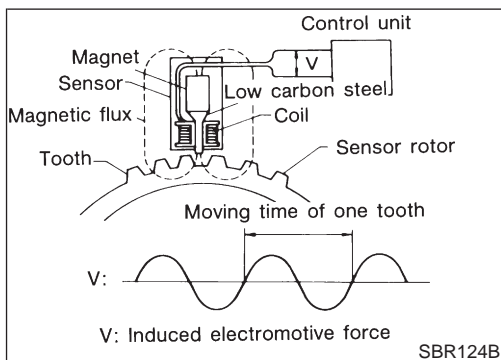
System Description

NJBR0087

SENSOR

NJBR0087S01

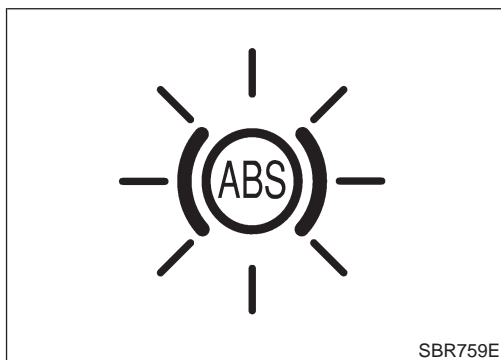
The sensor unit consists of a gear-shaped sensor rotor and a sensor element. The element contains a bar magnet around which a coil is wound. The sensor is installed on the back side of the brake rotor. Sine-wave current is generated by the sensor as the wheel rotates. The frequency and voltage increase(s) as the rotating speed increases.



CONTROL UNIT

NJBR0087S02

The control unit computes the wheel rotating speed by the signal current sent from the sensor. Then it supplies a DC current to the actuator solenoid valve. It also controls ON-OFF operation of the valve relay and motor relay. If any electrical malfunction should be detected in the system, the control unit causes the warning lamp to light up. In this condition, the ABS will be deactivated by the control unit, and the vehicle's brake system reverts to normal operation.



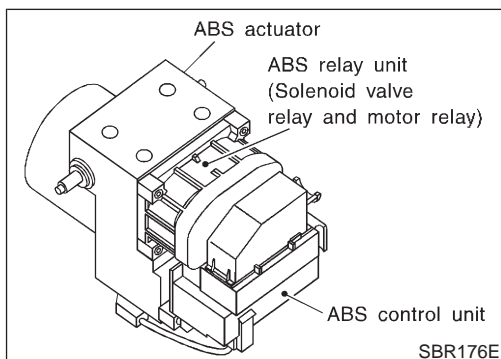
SBR759E

ABS ACTUATOR AND ELECTRIC UNIT

NJBR0087S03

The ABS actuator and electric unit contains:

- An electric motor and pump
- Two relays
- Eight solenoid valves, each inlet and outlet for
 - LH front
 - RH front
 - LH rear
 - RH rear
- ABS control unit



SBR176E

DESCRIPTION

ABS

System Description (Cont'd)

This components controls the hydraulic circuit and increases, holds or decreases hydraulic pressure to all or individual wheels. The ABS actuator and electric unit can not be disassembled and can be only serviced as an assembly.

ABS Actuator Operation

NJBR0087S0301

		Inlet solenoid valve	Outlet solenoid valve	
Normal brake operation		OFF (Open)	OFF (Closed)	Master cylinder brake fluid pressure is directly transmitted to caliper via the inlet solenoid valve.
ABS operation	Pressure hold	ON (Closed)	OFF (Closed)	Hydraulic circuit is shut off to hold the caliper brake fluid pressure.
	Pressure decrease	ON (Closed)	ON (Open)	Caliper brake fluid is sent to reservoir via the outlet solenoid valve. Then it is pushed up to the master cylinder by pump.
	Pressure increase	OFF (Open)	OFF (Closed)	Master cylinder brake fluid pressure is transmitted to caliper.

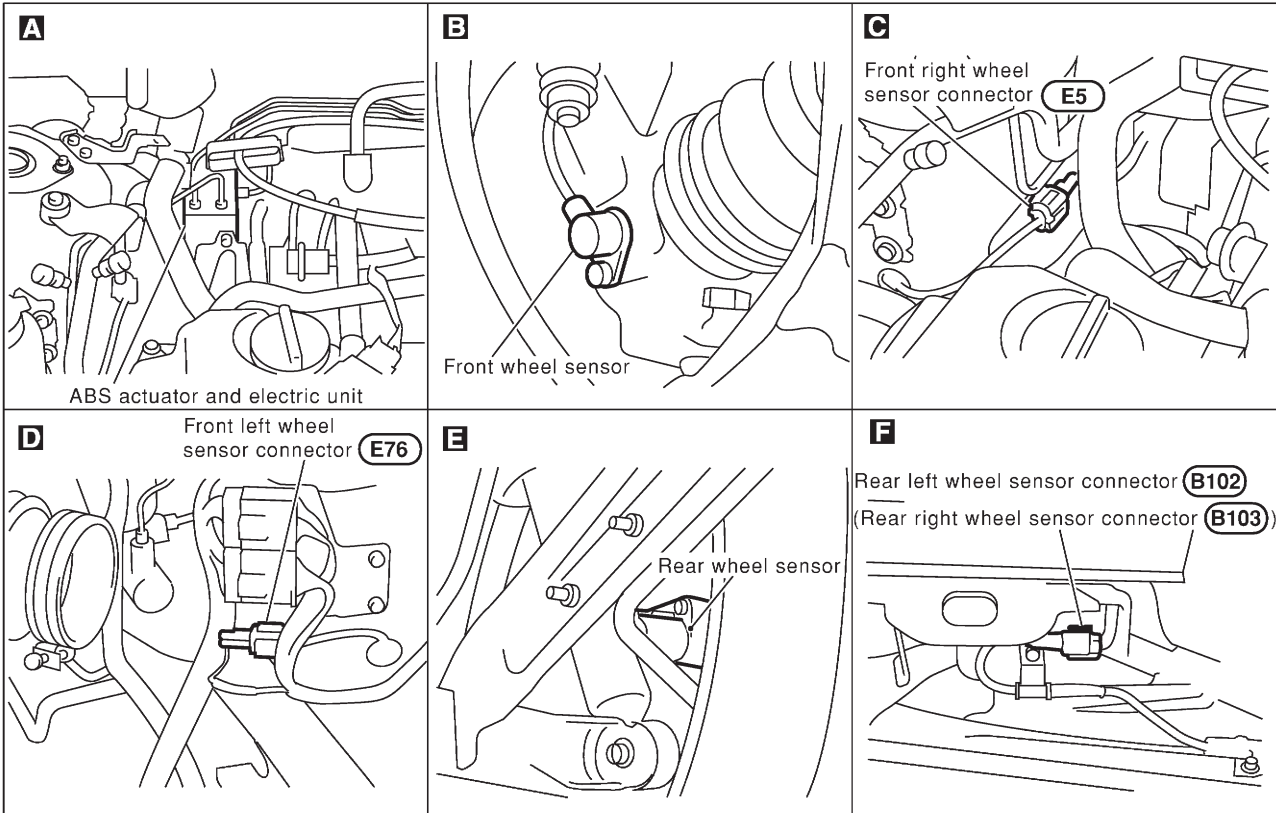
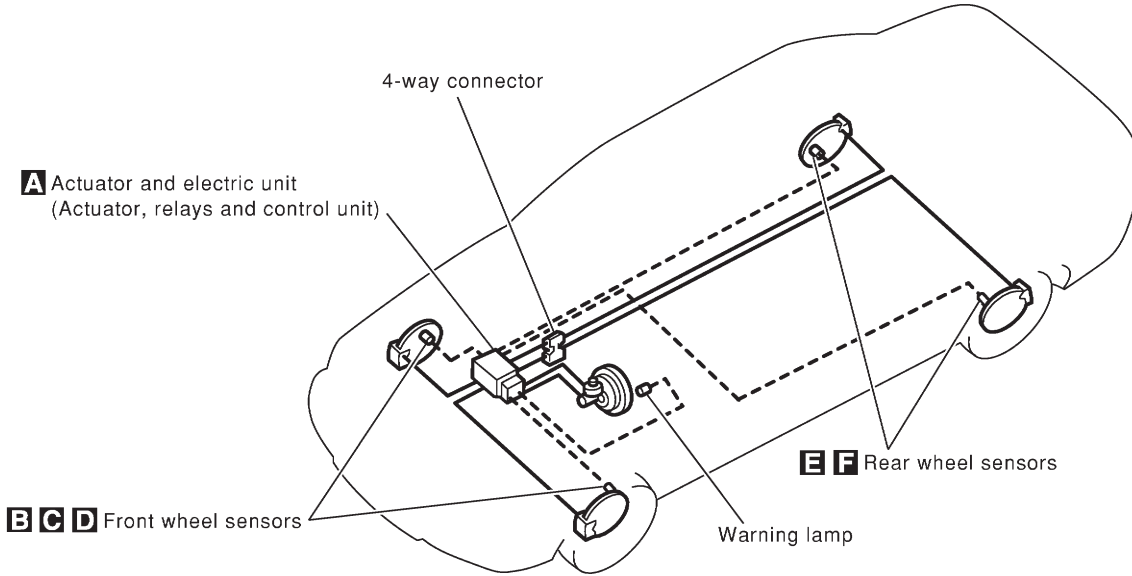
DESCRIPTION

ABS

Component Parts and Harness Connector Location

Component Parts and Harness Connector Location

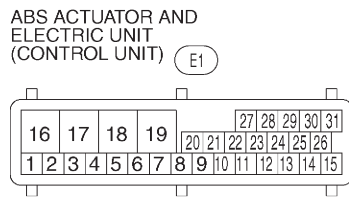
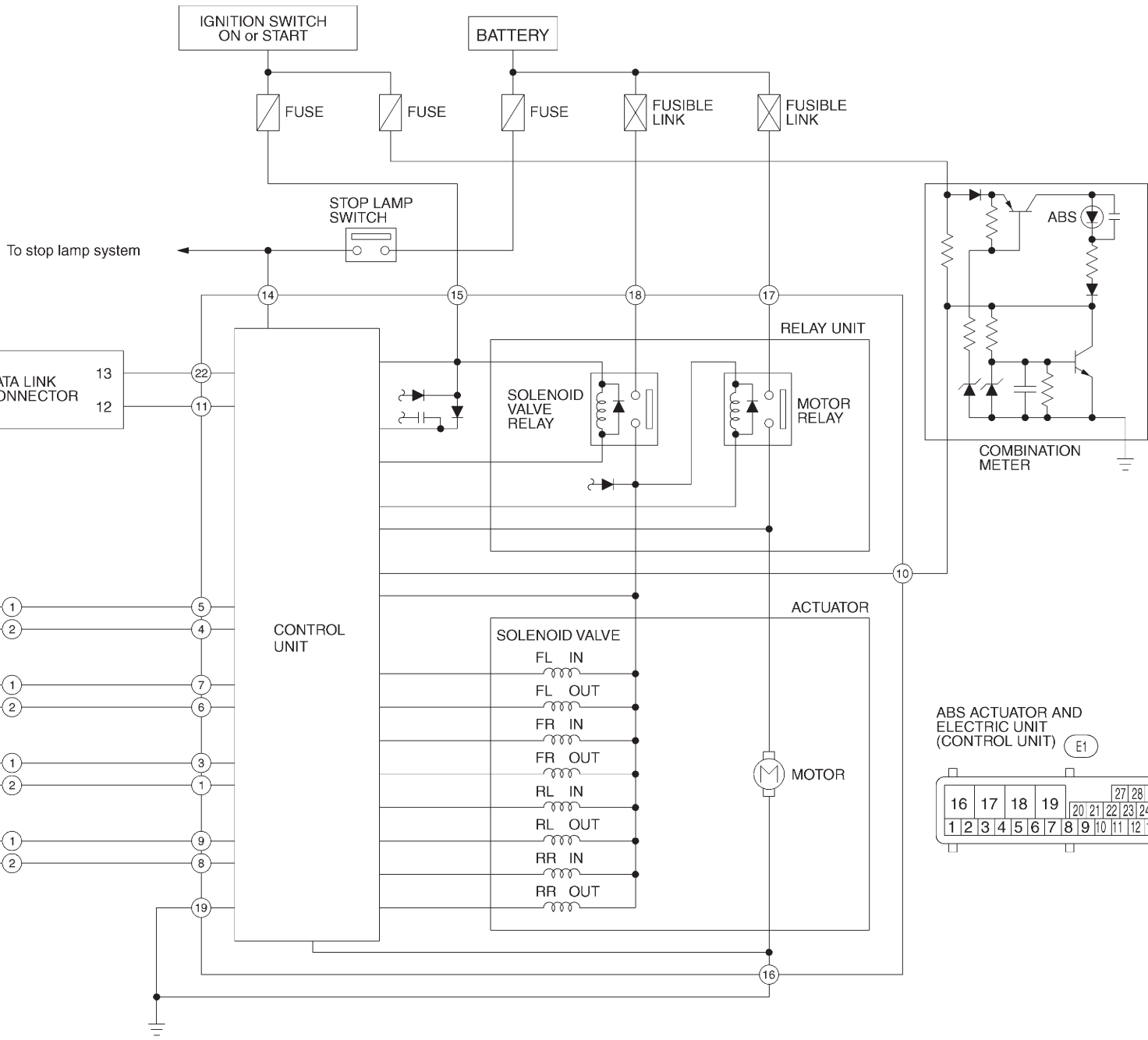
NJBR0088



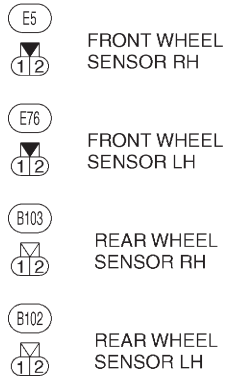
NBR432

DESCRIPTION

Schematic



BR-53



YBR223

DESCRIPTION

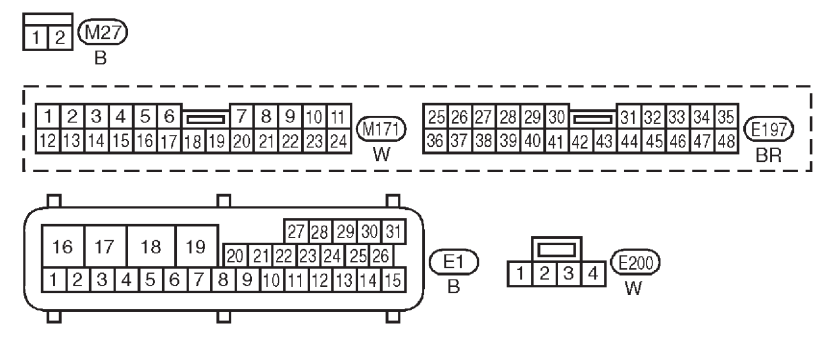
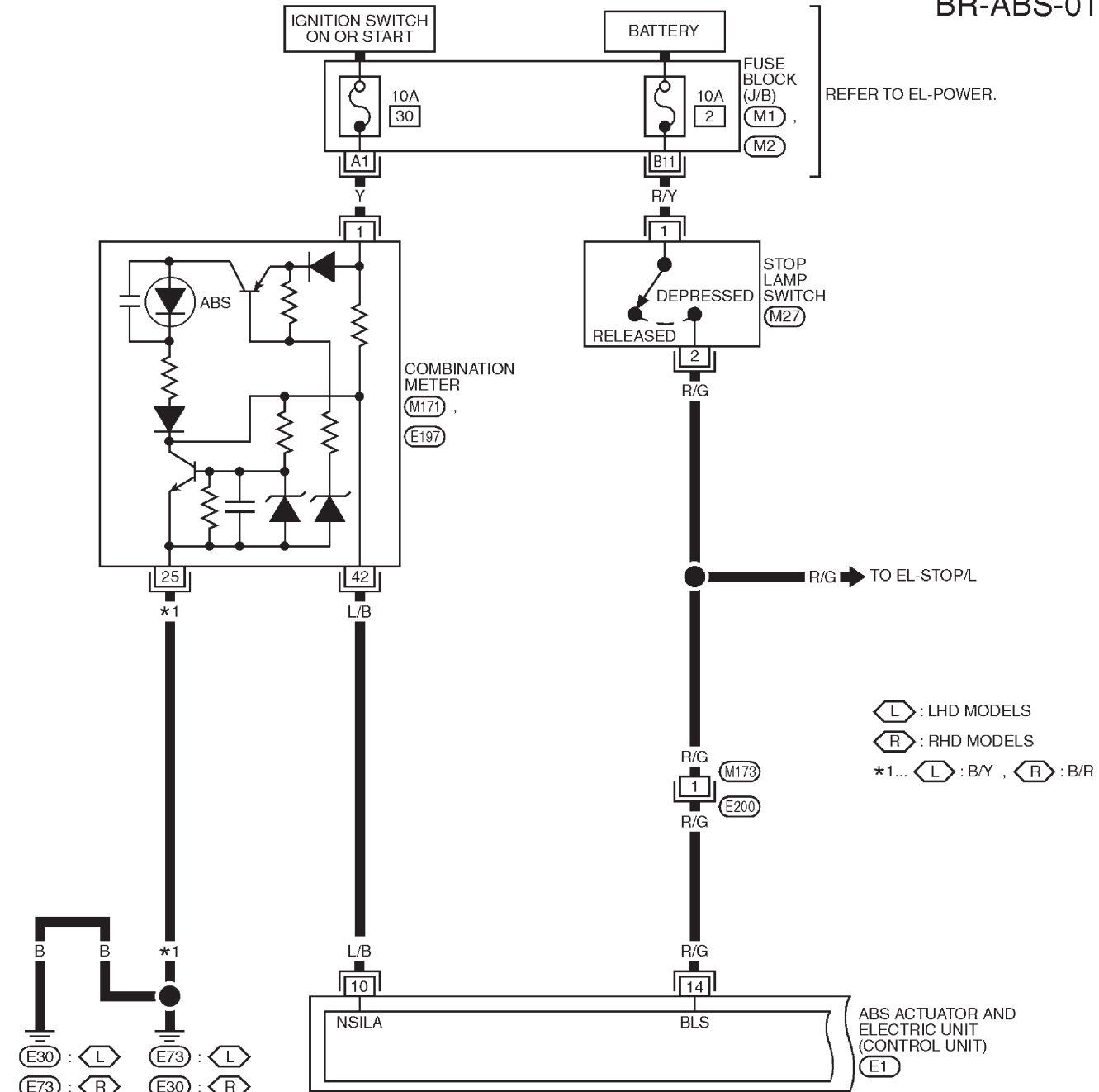
ABS

Wiring Diagram — ABS —

Wiring Diagram — ABS —

NJBRO090

BR-ABS-01



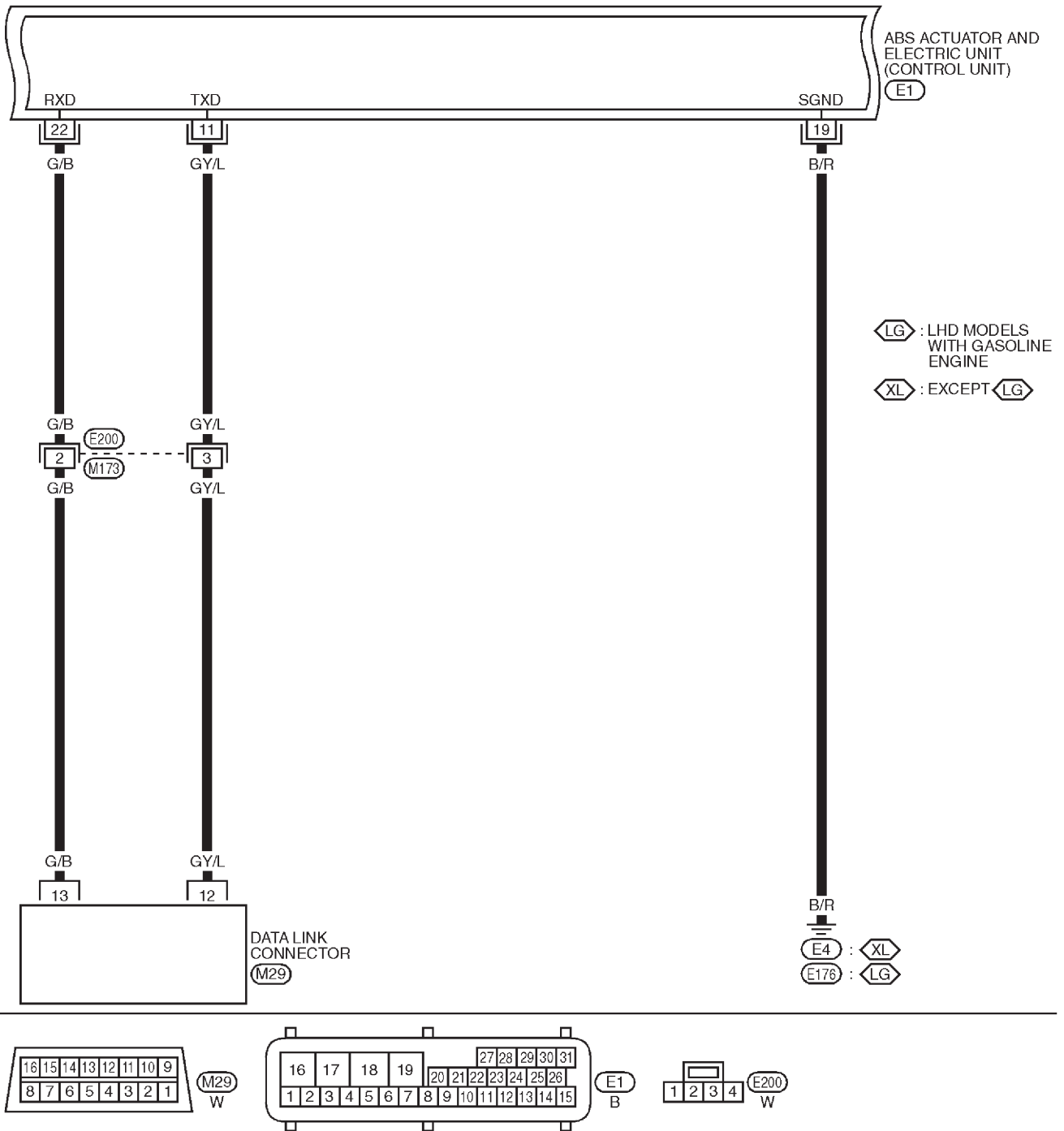
YBR224

DESCRIPTION

ABS

Wiring Diagram — ABS — (Cont'd)

BR-ABS-02



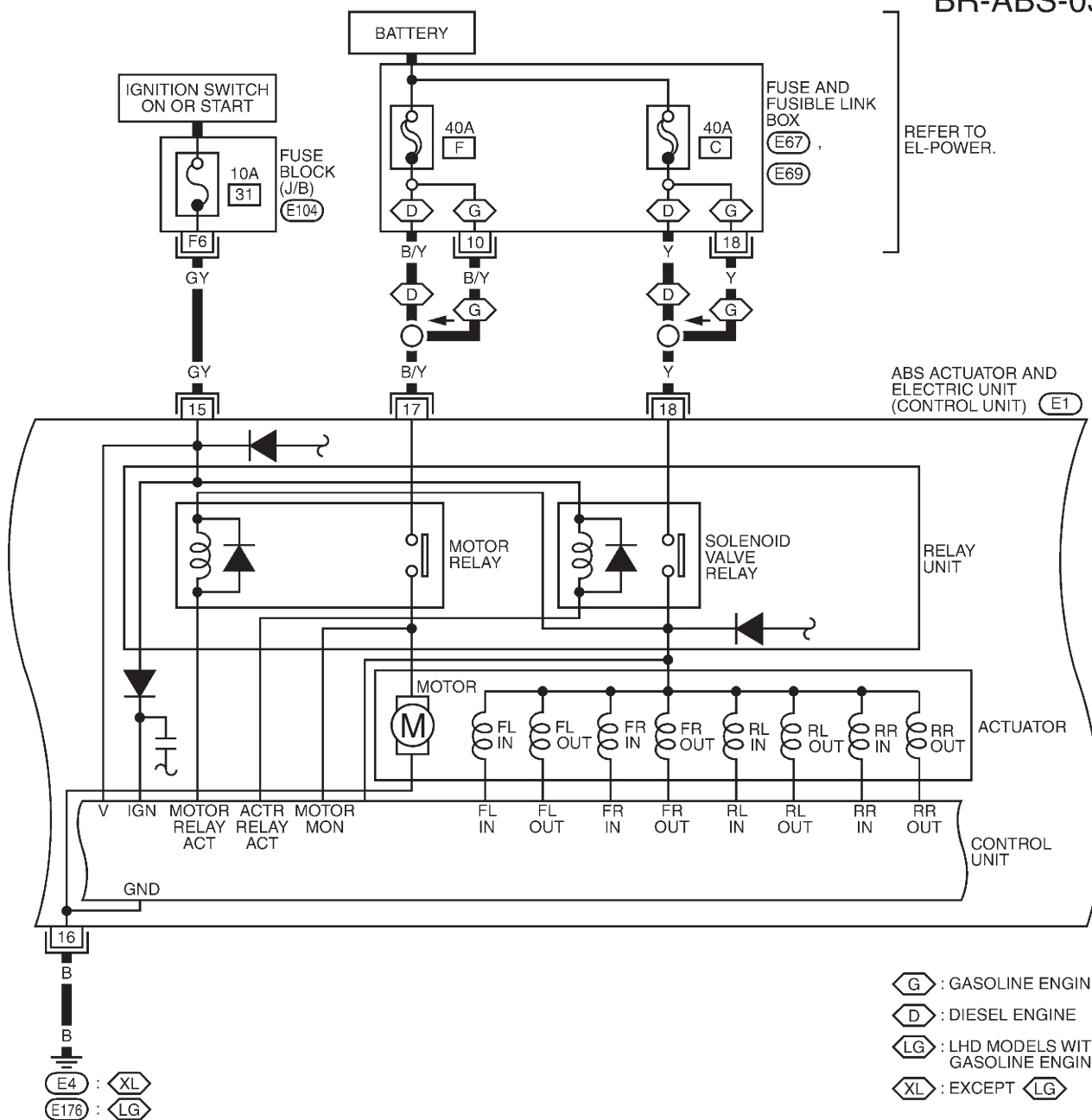
YBR225

DESCRIPTION

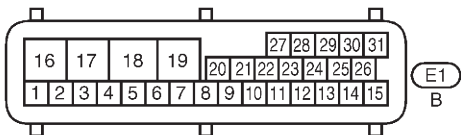
ABS

Wiring Diagram — ABS — (Cont'd)

BR-ABS-03



REFER TO THE FOLLOWING.
 (E104) - FUSE BLOCK-JUNCTION BOX (J/B)
 (E67), (E69) - FUSE AND FUSIBLE LINK BOX



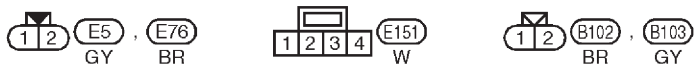
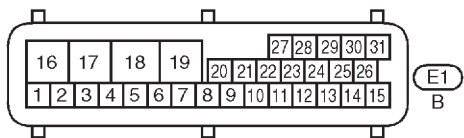
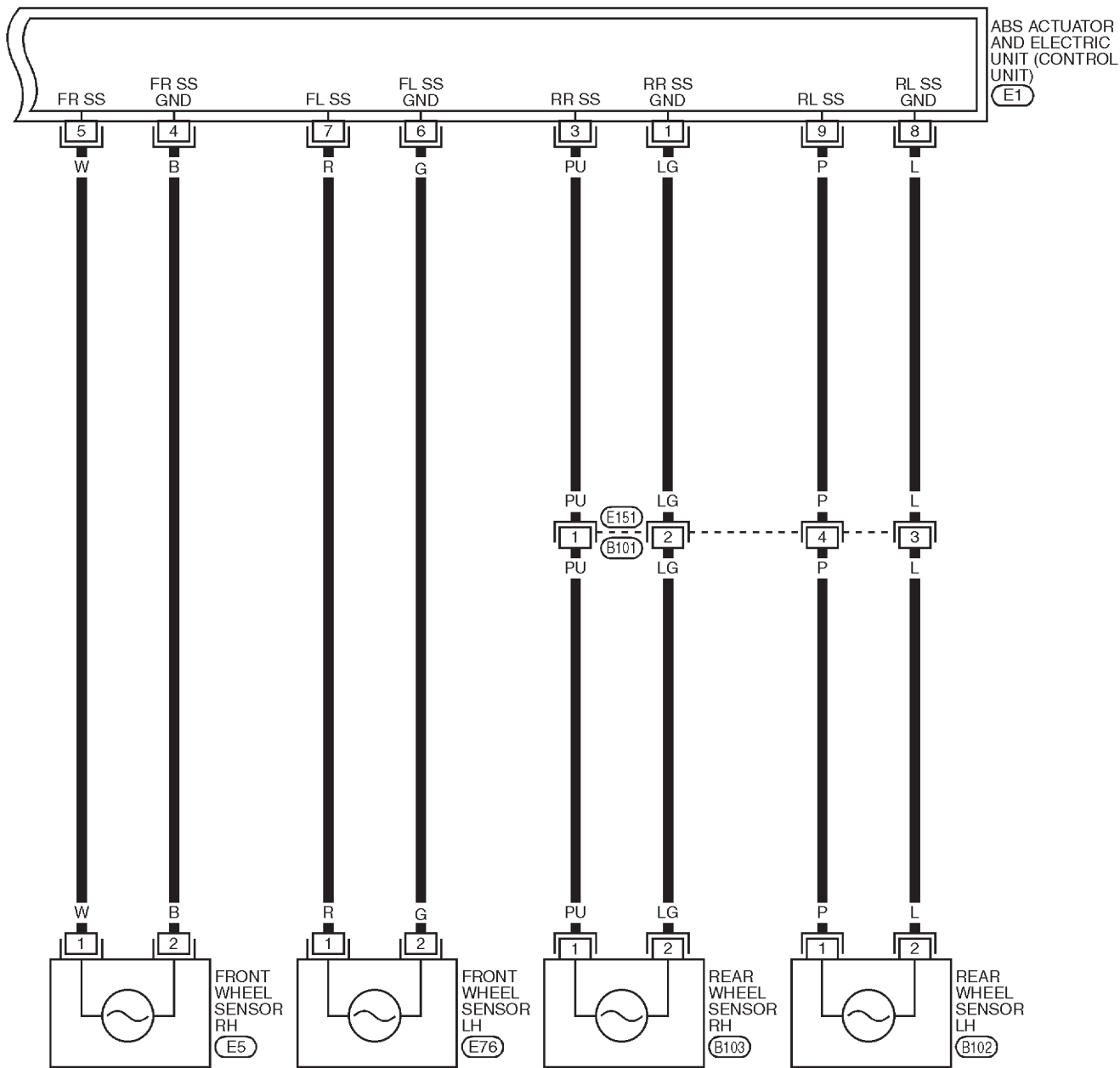
YBR226

DESCRIPTION

ABS

Wiring Diagram — ABS — (Cont'd)

BR-ABS-04



YBR227

CONSULT-II

NJBR0092

CONSULT-II APPLICATION TO ABS

NJBR0092S01

ITEM	DATA MONITOR	ACTIVE TEST
Front right wheel sensor	X	—
Front left wheel sensor	X	—
Rear right wheel sensor	X	—
Rear left wheel sensor	X	—
Stop lamp switch	X	—
Front right inlet solenoid valve	X	X
Front right outlet solenoid valve	X	X
Front left inlet solenoid valve	X	X
Front left outlet solenoid valve	X	X
Rear right inlet solenoid valve	X	X
Rear right outlet solenoid valve	X	X
Rear left inlet solenoid valve	X	X
Rear left outlet solenoid valve	X	X
Actuator solenoid valve relay	X	—
Actuator motor relay (ABS MOTOR is shown on the ACTIVE TEST screen.)	X	X
ABS warning lamp	X	—
Battery voltage	X	—
Control unit	—	—

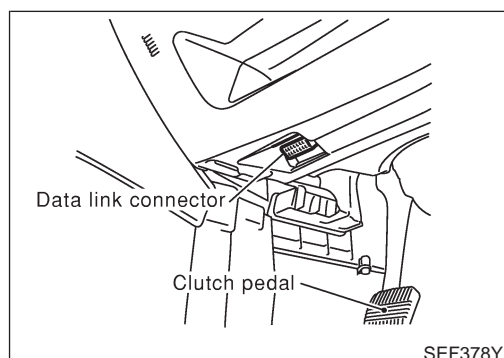
X: Applicable

—: Not applicable

ECU (ABS CONTROL UNIT) PART NUMBER MODE

NJBR0092S02

Ignore the ECU part number displayed in the ECU PART NUMBER MODE. Refer to parts catalog to order the ABS actuator and electric unit.



CONSULT-II Inspection Procedure SELF-DIAGNOSIS PROCEDURE

NJBR0093

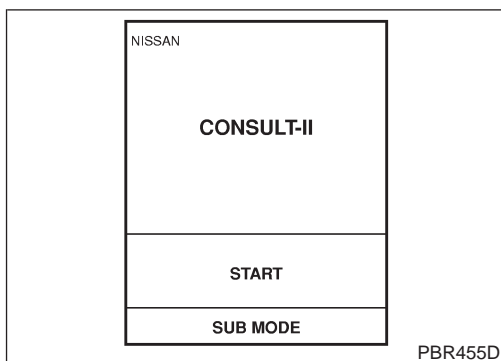
NJBR0093S01

1. Turn ignition switch OFF.
2. Connect CONSULT-II to data link connector.
3. Start engine.
4. Drive vehicle over 30 km/h (19 MPH) for at least one minute.

ON BOARD DIAGNOSTIC SYSTEM DESCRIPTION

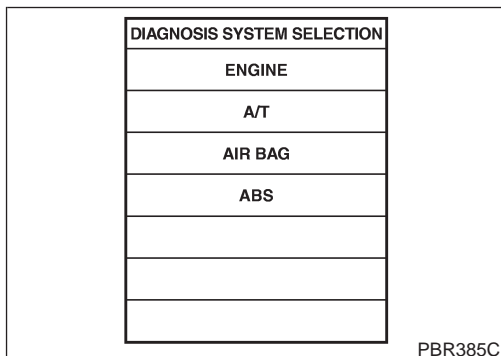
ABS

CONSULT-II Inspection Procedure (Cont'd)



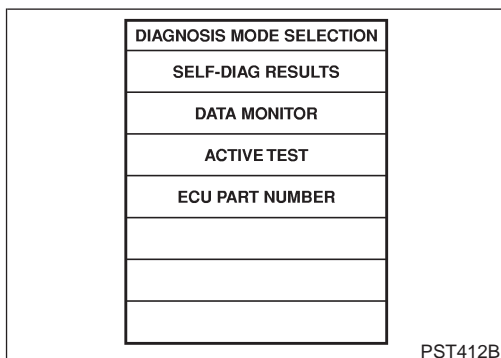
PBR455D

5. Stop vehicle with engine running and touch "START" on CONSULT-II screen.



PBR385C

6. Touch "ABS".

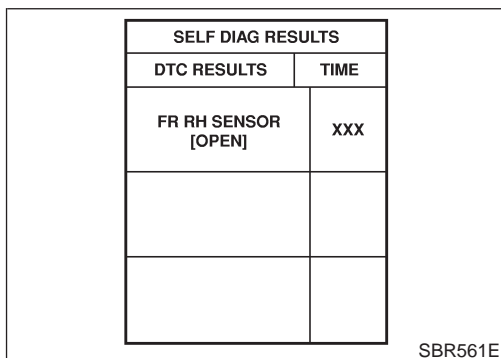


PST412B

7. Touch "SELF-DIAG RESULTS".

- The screen shows the detected malfunction and how many times the ignition switch has been turned since the malfunction.

8. Make the necessary repairs following the diagnostic procedures.



SBR561E

9. After the malfunctions are repaired, erase the self-diagnostic results stored in the control unit by touching "ERASE".

10. Check ABS warning lamp for deactivation after driving vehicle over 30 km/h (19 MPH) for at least one minute.

NOTE:
"SELF-DIAG RESULTS" screen shows the detected malfunction and how many times the ignition switch has been turned since the malfunction.

ON BOARD DIAGNOSTIC SYSTEM DESCRIPTION

ABS

CONSULT-II Inspection Procedure (Cont'd)

SELF-DIAGNOSTIC RESULTS MODE

=NJBRO093S02

Diagnostic item	Diagnostic item is detected when ...	Reference Page
FR RH SENSOR [OPEN]*1	<ul style="list-style-type: none"> ● Circuit for front right wheel sensor is open. (An abnormally high input voltage is entered.) 	BR-69
FR LH SENSOR [OPEN]*1	<ul style="list-style-type: none"> ● Circuit for front left wheel sensor is open. (An abnormally high input voltage is entered.) 	BR-69
RR RH SENSOR [OPEN]*1	<ul style="list-style-type: none"> ● Circuit for rear right sensor is open. (An abnormally high input voltage is entered.) 	BR-69
RR LH SENSOR [OPEN]*1	<ul style="list-style-type: none"> ● Circuit for rear left sensor is open. (An abnormally high input voltage is entered.) 	BR-69
FR RH SENSOR [SHORT]*1	<ul style="list-style-type: none"> ● Circuit for front right wheel sensor is shorted. (An abnormally low input voltage is entered.) 	BR-69
FR LH SENSOR [SHORT]*1	<ul style="list-style-type: none"> ● Circuit for front left wheel sensor is shorted. (An abnormally low input voltage is entered.) 	BR-69
RR RH SENSOR [SHORT]*1	<ul style="list-style-type: none"> ● Circuit for rear right sensor is shorted. (An abnormally low input voltage is entered.) 	BR-69
RR LH SENSOR [SHORT]*1	<ul style="list-style-type: none"> ● Circuit for rear left sensor is shorted. (An abnormally low input voltage is entered.) 	BR-69
ABS SENSOR [ABNORMAL SIGNAL]	<ul style="list-style-type: none"> ● Teeth damage on sensor rotor or improper installation of wheel sensor. (Abnormal wheel sensor signal is entered.) 	BR-69
FR RH IN ABS SOL [OPEN]	<ul style="list-style-type: none"> ● Circuit for front right inlet solenoid valve is open. (An abnormally low output voltage is entered.) 	BR-72
FR LH IN ABS SOL [OPEN]	<ul style="list-style-type: none"> ● Circuit for front left inlet solenoid valve is open. (An abnormally low output voltage is entered.) 	BR-72
RR RH IN ABS SOL [OPEN]	<ul style="list-style-type: none"> ● Circuit for rear right inlet solenoid valve is open. (An abnormally low output voltage is entered.) 	BR-72
RR LH IN ABS SOL [OPEN]	<ul style="list-style-type: none"> ● Circuit for rear left inlet solenoid valve is open. (An abnormally low output voltage is entered.) 	BR-72
FR RH IN ABS SOL [SHORT]	<ul style="list-style-type: none"> ● Circuit for front right inlet solenoid valve is shorted. (An abnormally high output voltage is entered.) 	BR-72
FR LH IN ABS SOL [SHORT]	<ul style="list-style-type: none"> ● Circuit for front left inlet solenoid valve is shorted. (An abnormally high output voltage is entered.) 	BR-72
RR RH IN ABS SOL [SHORT]	<ul style="list-style-type: none"> ● Circuit for rear right inlet solenoid valve is shorted. (An abnormally high output voltage is entered.) 	BR-72
RR LH IN ABS SOL [SHORT]	<ul style="list-style-type: none"> ● Circuit for rear left inlet solenoid valve is shorted. (An abnormally high output voltage is entered.) 	BR-72
FR RH OUT ABS SOL [OPEN]	<ul style="list-style-type: none"> ● Circuit for front right outlet solenoid valve is open. (An abnormally low output voltage is entered.) 	BR-72
FR LH OUT ABS SOL [OPEN]	<ul style="list-style-type: none"> ● Circuit for front left outlet solenoid valve is open. (An abnormally low output voltage is entered.) 	BR-72
RR RH OUT ABS SOL [OPEN]	<ul style="list-style-type: none"> ● Circuit for rear right outlet solenoid valve is open. (An abnormally low output voltage is entered.) 	BR-72
RR LH OUT ABS SOL [OPEN]	<ul style="list-style-type: none"> ● Circuit for rear left outlet solenoid valve is open. (An abnormally low output voltage is entered.) 	BR-72
FR RH OUT ABS SOL [SHORT]	<ul style="list-style-type: none"> ● Circuit for front right outlet solenoid valve is shorted. (An abnormally high output voltage is entered.) 	BR-72
FR LH OUT ABS SOL [SHORT]	<ul style="list-style-type: none"> ● Circuit for front left outlet solenoid valve is shorted. (An abnormally high output voltage is entered.) 	BR-72

ON BOARD DIAGNOSTIC SYSTEM DESCRIPTION

ABS

CONSULT-II Inspection Procedure (Cont'd)

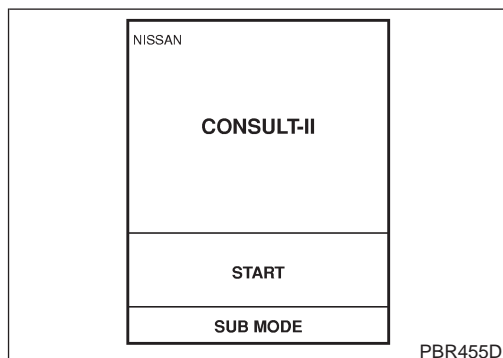
Diagnostic item	Diagnostic item is detected when ...	Reference Page
RR RH OUT ABS SOL [SHORT]	<ul style="list-style-type: none"> ● Circuit for rear right outlet solenoid valve is shorted. (An abnormally high output voltage is entered.) 	BR-72
RR LH OUT ABS SOL [SHORT]	<ul style="list-style-type: none"> ● Circuit for rear left outlet solenoid valve is shorted. (An abnormally high output voltage is entered.) 	BR-72
ABS ACTUATOR RELAY [ABNORMAL]	<ul style="list-style-type: none"> ● Actuator solenoid valve relay is ON, even control unit sends off signal. ● Actuator solenoid valve relay is OFF, even control unit sends on signal. 	BR-72
ABS MOTOR RELAY [ABNORMAL]	<ul style="list-style-type: none"> ● Circuit for actuator motor is open or shorted. ● Actuator motor relay is stuck. 	BR-75
BATTERY VOLT [ABNORMAL]	<ul style="list-style-type: none"> ● Power source voltage supplied to ABS control unit is abnormally low. 	BR-77
CONTROL UNIT	<ul style="list-style-type: none"> ● Function of calculation in ABS control unit has failed. 	BR-79

*1: Be sure to confirm the ABS warning lamp illuminates when the ignition switch is turned ON after repairing the shorted sensor circuit, but the lamp goes out when driving the vehicle over 30 km/h (19 MPH) for one minute in accordance with SELF-DIAGNOSIS PROCEDURE.

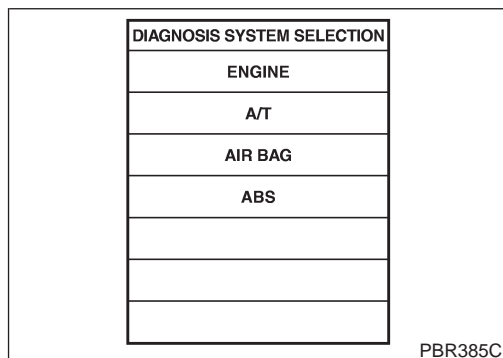
DATA MONITOR PROCEDURE

NJBR0093S03

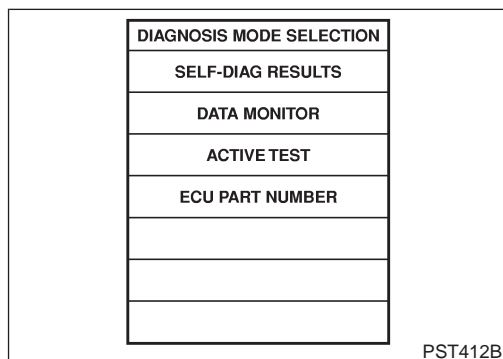
1. Turn ignition switch OFF.
2. Connect CONSULT-II to data link connector.
3. Turn ignition switch ON.
4. Touch "START" on CONSULT-II screen.

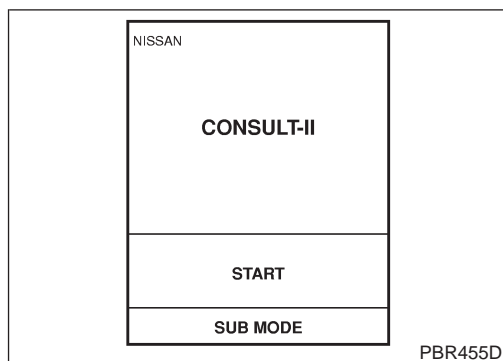


5. Touch "ABS".



6. Touch "DATA MONITOR".
7. Touch "SETTING" on "SELECT MONITOR ITEM" screen.
8. Touch "LONG TIME" on "SET RECORDING COND" screen.
9. Touch "START" on "SELECT MONITOR ITEM".

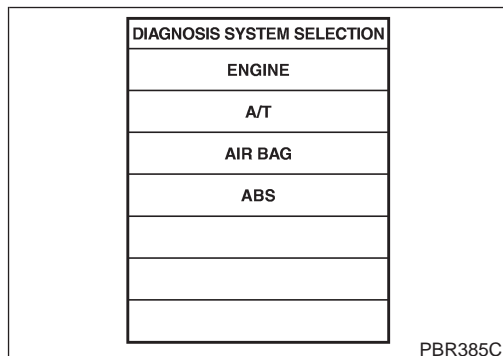




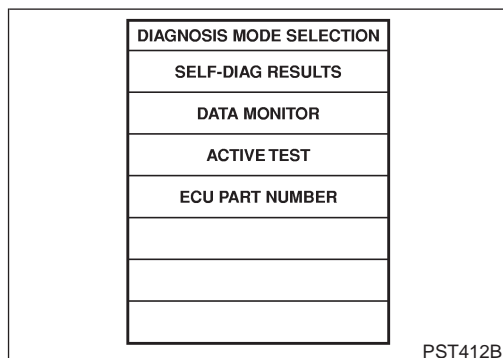
ACTIVE TEST PROCEDURE

NJB0093S04

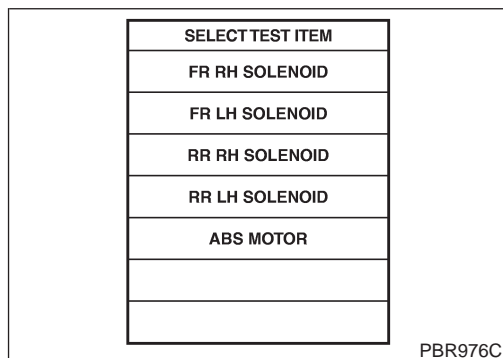
- When conducting Active test, vehicle must be stationary.
 - When ABS warning lamp stays on, never conduct Active test.
1. Turn ignition switch OFF.
 2. Connect CONSULT-II to data link connector.
 3. Start engine.
 4. Touch "START" on CONSULT-II screen.



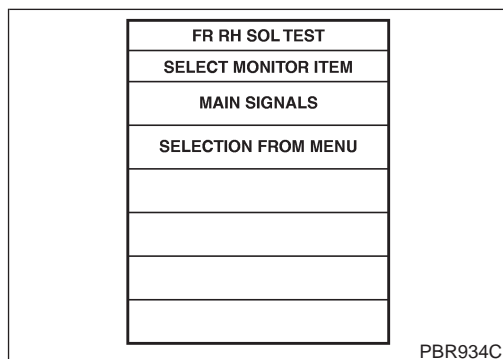
5. Touch "ABS".



6. Touch "ACTIVE TEST".



7. Select active test item by touching screen.



8. Touch "START".

9. Carry out the active test by touching screen key.

ON BOARD DIAGNOSTIC SYSTEM DESCRIPTION

ABS

CONSULT-II Inspection Procedure (Cont'd)

DATA MONITOR MODE

NJBR0093S05

MONITOR ITEM	CONDITION	SPECIFICATION
FR RH SENSOR FR LH SENSOR RR RH SENSOR RR LH SENSOR	Drive vehicle. (Each wheel is rotating.)	Displays computed vehicle speed from wheel sensor signal. Almost the same speed as speedometer.
STOP LAMP SW	Turn ignition switch ON and depress brake pedal.	Depress the pedal: ON Release the pedal: OFF
FR RH IN SOL FR RH OUT SOL FR LH IN SOL FR LH OUT SOL RR IN SOL RR OUT SOL RL IN SOL RL OUT SOL	Ignition switch is turned ON or engine is running.	Operating conditions for each solenoid valve are indicated. ABS is not operating: OFF
ACTUATOR RLY	Ignition switch is turned ON or engine is running.	Displays ON/OFF condition of ABS actuator relay. When turning ignition switch ON, ABS actuator relay is operated.
MOTOR RELAY		ABS is not operating: OFF ABS is operating: ON
WARNING LAMP		Warning lamp is turned on: ON Warning lamp is turned off: OFF
BATTERY VOLT		Power supply voltage for control unit

ACTIVE TEST MODE

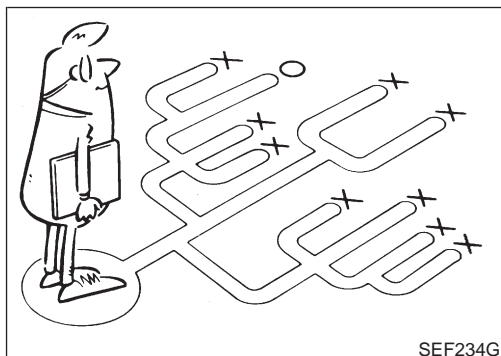
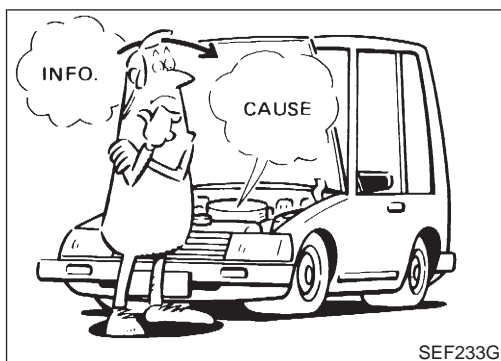
NJBR0093S06

TEST ITEM	CONDITION	JUDGEMENT		
FR RH SOLENOID FR LH SOLENOID RR RH SOLENOID RR LH SOLENOID	Ignition switch is turned ON.	Brake fluid pressure control operation		
			IN SOL	OUT SOL
		UP (Increase):	OFF	OFF
		KEEP (Hold):	ON	OFF
		DOWN (Decrease):	ON	ON
ABS MOTOR		ABS actuator motor ON: Motor runs OFF: Motor stops		

NOTE:

Active test will automatically stop ten seconds after the test starts. (TEST IS STOPPED monitor shows ON.)

How to Perform Trouble Diagnoses for Quick and Accurate Repair



How to Perform Trouble Diagnoses for Quick and Accurate Repair

INTRODUCTION

NJBR0094

NJBR0094S01

The ABS system has an electronic control unit to control major functions. The control unit accepts input signals from sensors and instantly drives actuator. It is essential that both kinds of signals are proper and stable. It is also important to check for conventional problems: such as air leaks in the booster or lines, lack of brake fluid, or other problems with the brake system.

It is much more difficult to diagnose a problem that occurs intermittently rather than continuously. Most intermittent problems are caused by poor electric connections or faulty wiring. In this case, careful checking of suspicious circuits may help prevent the replacement of good parts.

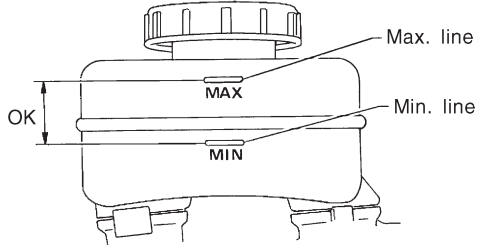
A visual check only may not find the cause of the problems, so a road test should be performed.

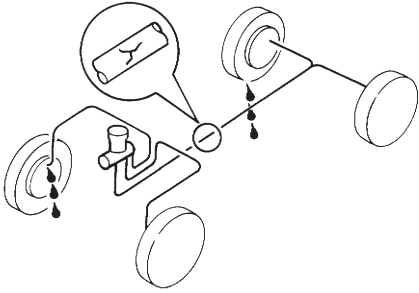
Before undertaking actual checks, take just a few minutes to talk with a customer who approaches with a ABS complaint. The customer is a very good source of information on such problems; especially intermittent ones. Through the talks with the customer, find out what symptoms are present and under what conditions they occur.

Start your diagnosis by looking for “conventional” problems first. This is one of the best ways to troubleshoot brake problems on an ABS controlled vehicle. Also check related Service Bulletins for information.

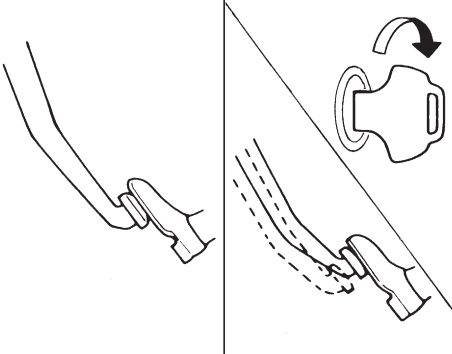
Preliminary Check

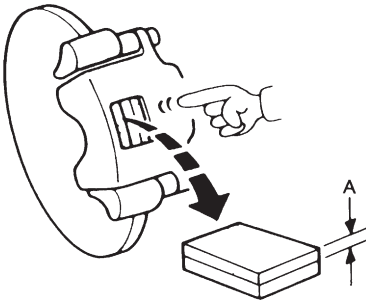
NJBR0095

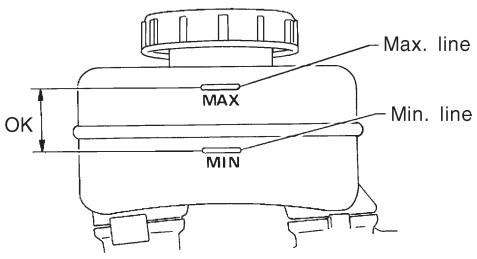
1	CHECK BRAKE FLUID LEVEL		
<p>Check brake fluid level in reservoir tank. Low fluid level may indicate brake pad wear or leakage from brake line.</p>			
			
<small>SBR451D</small>			
<p>Is brake fluid filled between MAX and MIN lines on reservoir tank and/or has brake fluid been contaminated?</p>			
Yes	▶	GO TO 2.	
No	▶	Repair. GO TO 2.	

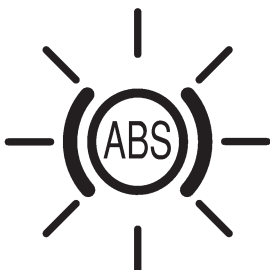
2	CHECK BRAKE LINE		
<p>Check brake line for leakage.</p>			
			
<small>SBR389C</small>			
<p>Is leakage present at or around brake lines, tubes or hoses or are any of these parts cracked or damaged?</p>			
Yes	▶	GO TO 3.	
No	▶	Repair. GO TO 3.	

Preliminary Check (Cont'd)

3	CHECK BRAKE BOOSTER OPERATION	
<p>Check brake booster for operation and air tightness. Refer to BR-20.</p> <div style="text-align: center;">  </div> <p style="text-align: right;">SBR058C</p>		
Is brake booster airtight and functioning properly?		
Yes	▶	GO TO 4.
No	▶	Replace. GO TO 4.

4	CHECK BRAKE PAD AND ROTOR	
<p>Check brake pad or lining and rotor or drum. Refer to BR-27, 29, 33, 33, 35, 39.</p> <div style="text-align: center;">  </div> <p style="text-align: right;">SBR059C</p>		
Are brake pads and rotors functioning properly?		
Yes	▶	GO TO 5.
No	▶	Replace.

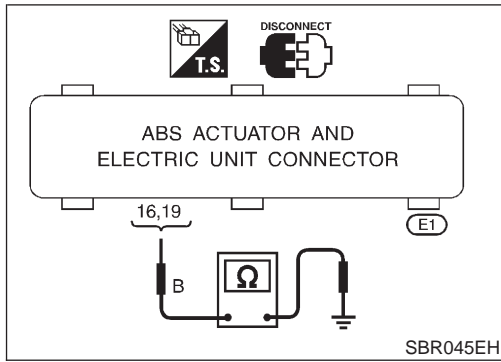
5	RECHECK BRAKE FLUID LEVEL	
Check brake fluid level in reservoir tank again.		
		
SBR451D		
Is brake fluid filled between MAX and MIN lines on reservoir tank and/or has brake fluid been contaminated?		
Yes	▶	GO TO 6.
No	▶	Fill up brake fluid.

6	CHECK WARNING LAMP ACTIVATION	
Check warning lamp activation.		
		
SBR759E		
Does warning lamp turn on when ignition switch is turned "ON"?		
Yes	▶	GO TO 7.
No	▶	Check fuse, warning lamp bulb and warning lamp circuit.

7	CHECK WARNING LAMP DEACTIVATION	
Check warning lamp for deactivation after engine is started.		
Does warning lamp turn off when engine is started?		
Yes	▶	GO TO 8.
No	▶	Go to Self-diagnosis. Refer to BR-58.

8	DRIVE VEHICLE	
Drive vehicle at speeds over 30 km/h (19 MPH) for at least one minute.		
Does warning lamp remain off after vehicle has been driven at 30 km/h (19 MPH) for at least one minute?		
Yes	▶	END
No	▶	Go to Self-diagnosis. Refer to BR-58.

Ground Circuit Check



Ground Circuit Check

ABS ACTUATOR AND ELECTRIC UNIT GROUND

NJBR0096

NJBR0096S04

- Check continuity between ABS actuator and electric unit connector terminals and ground.

Continuity should exist.

Wheel Sensor or Rotor DIAGNOSTIC PROCEDURE

NJBR0098

NJBR0098S01

1	INSPECTION START
<p>Wheel sensor inspection</p> <div style="text-align: center;"> <p style="text-align: center;">Wheel sensor connectors (sensor side)</p> <p style="text-align: center;">Front RH Front LH Rear RH Rear LH</p> </div>	
SBR476EB	
▶	GO TO 2.

2	CHECK CONNECTOR
<ol style="list-style-type: none"> 1. Disconnect connectors from control unit and wheel sensor according to the self-diagnostic results. Check terminals for damage or loose connections. Then reconnect connectors. 2. Carry out self-diagnosis again. <p style="text-align: center;">Does warning lamp activate again?</p>	
Yes	▶ GO TO 3.
No	▶ INSPECTION END

3	CHECK WHEEL SENSOR CIRCUIT
<ol style="list-style-type: none"> 1. Disconnect control unit connector. 2. Check resistance between control unit connector terminals. Code No. 21 or 22 (Front RH wheel) Terminals 4 and 5 Code No. 25 or 26 (Front LH wheel) Terminals 6 and 7 Code No. 31 or 32 (Rear RH wheel) Terminals 1 and 3 Code No. 35 or 36 (Rear LH wheel) Terminals 8 and 9 Resistance: 1.44 - 1.76 kΩ <div style="text-align: center; margin: 10px 0;"> <p style="text-align: center;">Is resistance 1.44 - 1.76 kΩ?</p> </div>	
Yes	▶ GO TO 5.
No	▶ GO TO 4.

SBR477EC

TROUBLE DIAGNOSES FOR SELF-DIAGNOSTIC ITEMS

ABS

Wheel Sensor or Rotor (Cont'd)

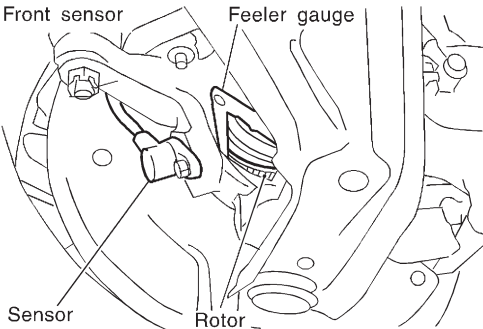
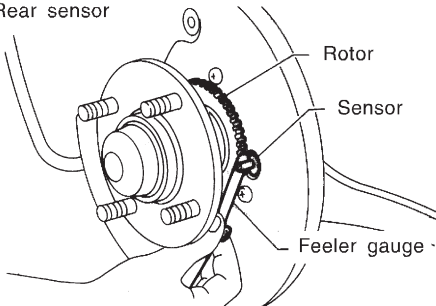
4	CHECK WHEEL SENSOR	
<p>Check resistance of each sensor. (See NOTE.) Resistance: 1.44 - 1.76 kΩ</p> <div style="text-align: center;"> <p>Front RH sensor (E5) Front LH sensor (E76) Rear RH sensor (B103) Rear LH sensor (B102)</p> </div> <p style="text-align: right;">SBR478EC</p> <p style="text-align: center;">Is resistance 1.44 - 1.76 kΩ?</p>		
Yes	▶	Repair harness and connectors between control unit connector and wheel sensor connector.
No	▶	Replace wheel sensor.

5	CHECK TIRE	
<p>Check for inflation pressure, wear and size of each tire.</p> <p style="text-align: center;">Are tire pressure and size correct and is tire wear within specifications?</p>		
Yes	▶	GO TO 6.
No	▶	Adjust tire pressure or replace tire(s).

TROUBLE DIAGNOSES FOR SELF-DIAGNOSTIC ITEMS

ABS

Wheel Sensor or Rotor (Cont'd)

6	CHECK WHEEL BEARING	
<p>Check wheel bearing axial end play. Check clearance between sensor and rotor.</p> <p>Clearance: Front 0.7 - 1.8 mm (0.028 - 0.071 in) Rear 0.4 - 1.5 mm (0.016 - 0.059 in)</p>		
		
SBR333E		
		
SBR069CA		
Is axial end play and clearance within specifications?		
Yes	▶	GO TO 7.
No	▶	Clean sensor fixing portion, or replace sensor.

7	CHECK SENSOR ROTOR	
Check sensor rotor for teeth damage.		
Is sensor rotor free from damage?		
Yes	▶	Check control unit pin terminals for damage or the connection of control unit harness connector. Reconnect control unit harness connector. Then retest.
No	▶	Replace sensor rotor.

ABS Actuator Solenoid Valve or Solenoid Valve Relay DIAGNOSTIC PROCEDURE

=NJBR0100

NJBR0100S01

1	INSPECTION START
<p>Solenoid valve relay inspection</p> <div style="text-align: center;"> </div> <p style="text-align: right;">SBR761E</p>	
▶	GO TO 2.

2	CHECK SOLENOID VALVE POWER SUPPLY CIRCUIT
<p>Check 40A [c] fusible link (ABS ACTR) for ABS solenoid valve relay. For fusible link layout, refer to POWER SUPPLY ROUTING in EL section.</p> <p style="text-align: center;">Is fusible link OK?</p>	
Yes	▶ GO TO 3.
No	▶ GO TO 7.

3	CHECK FUSE
<p>Check 10A fuse No. 31. For fuse layout, refer to "POWER SUPPLY ROUTING" in EL section.</p> <p style="text-align: center;">Is fuse OK?</p>	
Yes	▶ GO TO 4.
No	▶ GO TO 9.

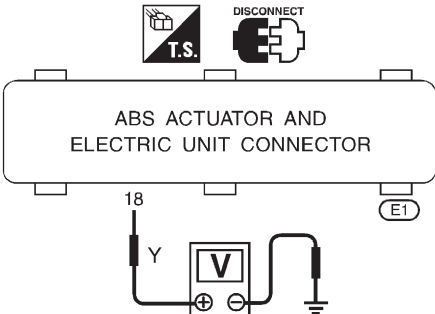
TROUBLE DIAGNOSES FOR SELF-DIAGNOSTIC ITEMS

ABS

ABS Actuator Solenoid Valve or Solenoid Valve Relay (Cont'd)

4	CHECK CONNECTOR	
1. Disconnect ABS actuator and electric unit connector. Check terminals for damage or loose connection. Then reconnect connector. 2. Carry out self-diagnosis again.		
Does warning lamp activate again?		
Yes	▶	GO TO 5.
No	▶	INSPECTION END

5	CHECK GROUND CIRCUIT	
Refer to ABS ACTUATOR AND ELECTRIC UNIT in Ground Circuit Check, BR-68.		
Is ground circuit OK?		
Yes	▶	GO TO 6.
No	▶	Repair harness and connectors.

6	CHECK SOLENOID VALVE POWER SUPPLY CIRCUIT	
1. Disconnect ABS actuator and electric unit connector. 2. Check voltage between ABS actuator and electric unit connector terminal 18 and ground.		
		
NBR431		
Does battery voltage exist?		
Yes	▶	Replace ABS actuator and electric unit.
No	▶	Check the following. <ul style="list-style-type: none"> ● Harness connector E1 ● Harness for open or short between ABS actuator and electric unit and fusible link If NG, repair harness or connectors.

7	REPLACE FUSIBLE LINK	
Replace fusible link.		
Does the fusible link blow out when ignition switch is turned "ON"?		
Yes	▶	GO TO 8.
No	▶	INSPECTION END

TROUBLE DIAGNOSES FOR SELF-DIAGNOSTIC ITEMS

ABS

ABS Actuator Solenoid Valve or Solenoid Valve Relay (Cont'd)

8	CHECK RELAY UNIT POWER SUPPLY CIRCUIT	
<p>1. Disconnect ABS actuator and electric unit connector. 2. Check continuity between ABS actuator and electric unit connector terminal 18 and ground.</p> <div style="text-align: center;"> <p style="text-align: right;">NBR372</p> </div> <p style="text-align: center;">Does continuity exist?</p>		
Yes	▶	Replace ABS actuator and electric unit.
No	▶	<p>Check the following.</p> <ul style="list-style-type: none"> ● Harness connector E1 ● Harness for open or short between ABS actuator and electric unit and fusible link <p>If NG, repair harness or connectors.</p>

9	REPLACE FUSE	
<p>Replace fuse.</p> <p style="text-align: center;">Does the fuse blow out when ignition switch is turned "ON"?</p>		
Yes	▶	<p>Check the following.</p> <ul style="list-style-type: none"> ● Harness connector E1 ● Harness for open or short between ABS actuator and electric unit and fuse <p>If NG, repair harness or connectors.</p>
No	▶	INSPECTION END

Motor Relay or Motor DIAGNOSTIC PROCEDURE

=NJBRO101

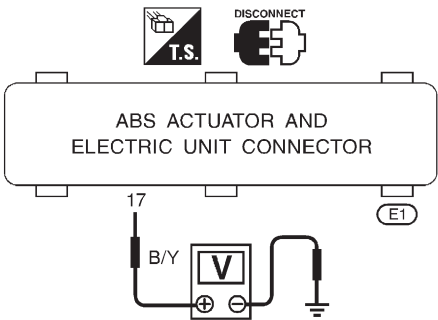
NJBRO101S01

1	INSPECTION START																																													
<p>ABS motor relay inspection</p> <div style="text-align: center; margin: 10px 0;"> </div> <p style="text-align: center; margin-top: 10px;"> ABS actuator and electric unit connector (E1) <table border="1" style="display: inline-table; border-collapse: collapse; text-align: center; font-size: small;"> <tr><td>15</td><td>14</td><td>13</td><td>12</td><td>11</td><td>10</td><td>9</td><td>8</td><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td></tr> <tr><td>26</td><td>25</td><td>24</td><td>23</td><td>22</td><td>21</td><td>20</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>31</td><td>30</td><td>29</td><td>28</td><td>27</td><td></td><td></td><td></td><td>19</td><td>18</td><td>17</td><td>16</td><td></td><td></td><td></td></tr> </table> </p>		15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	26	25	24	23	22	21	20									31	30	29	28	27				19	18	17	16			
15	14	13	12	11	10	9	8	7	6	5	4	3	2	1																																
26	25	24	23	22	21	20																																								
31	30	29	28	27				19	18	17	16																																			
SBR760E																																														
▶	GO TO 2.																																													

2	CHECK MOTOR POWER SUPPLY CIRCUIT	
<p>Check 40A [F] fusible link (ABS MTR) for ABS motor relay. For fusible link layout, refer to POWER SUPPLY ROUTING in EL section.</p> <p style="text-align: center;">Is fusible link OK?</p>		
Yes	▶	GO TO 3.
No	▶	GO TO 6.

3	CHECK CONNECTOR	
<p>1. Disconnect ABS actuator and electric unit connector. Check terminals for damage or loose connection. Then reconnect connectors.</p> <p>2. Carry out self-diagnosis again.</p> <p style="text-align: center;">Does warning lamp activate again?</p>		
Yes	▶	GO TO 4.
No	▶	INSPECTION END

Motor Relay or Motor (Cont'd)

4	CHECK MOTOR RELAY POWER SUPPLY CIRCUIT	
<p>1. Disconnect ABS actuator and electric unit connector. 2. Check voltage between ABS actuator and electric unit connector terminal 17 and ground.</p>		
		
SBR055EF		
Does battery voltage exist?		
Yes	▶	GO TO 5.
No	▶	Check the following. <ul style="list-style-type: none"> ● Harness connector E1 ● Harness for open or short between ABS actuator and electric unit and fusible link If NG, repair harness or connectors.

5	CHECK ABS ACTUATOR AND ELECTRIC UNIT GROUND CIRCUIT	
Refer to ABS ACTUATOR AND ELECTRIC UNIT GROUND in Ground Circuit Check, BR-68.		
Is ground circuit OK?		
Yes	▶	Replace ABS actuator and electric unit.
No	▶	Check the following. <ul style="list-style-type: none"> ● Harness connector E1 ● Harness for open or short between ABS actuator and electric unit and ground If NG, repair harness or connectors.

6	REPLACE FUSIBLE LINK	
Replace fusible link.		
Does the fusible link blow out when ignition switch is turned "ON"?		
Yes	▶	GO TO 7.
No	▶	INSPECTION END

7	CHECK ABS ACTUATOR MOTOR POWER SUPPLY CIRCUIT	
<p>1. Disconnect battery cable and ABS actuator and electric unit connector. 2. Check continuity between ABS actuator and electric unit connector terminal 17 and ground.</p> <div style="text-align: center;"> </div> <p style="text-align: right;">NBR373</p> <p style="text-align: center;">Does continuity exist?</p>		
Yes	▶	Check ABS actuator and electric unit pin terminals for damage or the connection of ABS actuator and electric unit harness connector. Reconnect ABS actuator and electric unit harness connector. Then retest.
No	▶	<p>Check the following.</p> <ul style="list-style-type: none"> ● Harness connector E1 ● Harness for open or short between ABS actuator and electric unit and fusible link <p>If NG, repair harness or connectors.</p>

Low Voltage DIAGNOSTIC PROCEDURE

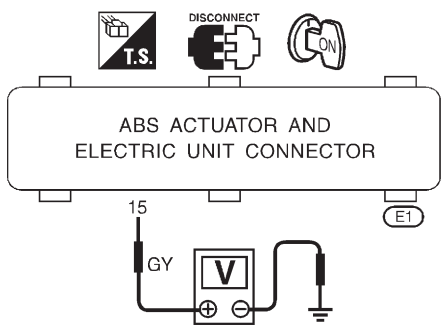
NJBR0102

NJBR0102S01

1	INSPECTION START	
<p>ABS actuator and electric unit power supply and ground circuit inspection</p> <div style="text-align: center;"> </div> <p style="text-align: right;">SBR625E</p>		
▶		GO TO 2.

Low Voltage (Cont'd)

2	CHECK CONNECTOR	
1. Disconnect ABS actuator and electric unit connector. Check terminals for damage or loose connections. Then reconnect connector. 2. Carry out self-diagnosis again.		
Does warning lamp activate again?		
Yes	▶▶	GO TO 3.
No	▶▶	INSPECTION END

3	CHECK ABS ACTUATOR AND ELECTRIC UNIT POWER SUPPLY CIRCUIT	
1. Disconnect ABS actuator and electric unit connector. 2. Check voltage between ABS actuator and electric unit connector terminal 15 and ground.		
		
SBR058EH		
Does battery voltage exist when ignition switch is turned ON?		
Yes	▶▶	GO TO 4.
No	▶▶	GO TO 5.

4	CHECK ABS ACTUATOR AND ELECTRIC UNIT GROUND	
Refer to ABS ACTUATOR AND ELECTRIC UNIT GROUND in Ground Circuit Check, BR-68.		
Is ground circuit OK?		
OK	▶▶	Check ABS actuator and electric unit pin terminals for damage or the connection of ABS actuator and electric unit harness connector. Reconnect ABS actuator and electric unit harness connector. Then retest.
NG	▶▶	Check the following. <ul style="list-style-type: none"> ● Harness connector E1 ● Harness for open or short between ABS actuator and electric unit and ground If NG, repair harness or connectors.

5	CHECK FUSE	
Check 10A fuse 31 (Engine control) for control unit. Refer to POWER SUPPLY ROUTING in EL section.		
Is fuse OK?		
Yes	▶▶	GO TO 6.
No	▶▶	Replace fuse.

6	CHECK ABS ACTUATOR AND ELECTRIC UNIT POWER SUPPLY CIRCUIT	
Check continuity between battery and ABS actuator and electric unit connector terminal 15.		
Does continuity exist?		
Yes	▶	Check battery. Refer to BATTERY in EL section.
No	▶	Check the following. <ul style="list-style-type: none"> ● Harness connector E1 ● Harness for open or short between ABS actuator and electric unit and fuse If NG, repair harness or connectors.

Control Unit DIAGNOSTIC PROCEDURE

NJBR0103

NJBR0103S01

1	INSPECTION START	
ABS actuator and electric unit power supply and ground circuit inspection		
<p style="text-align: center;">SBR626E</p>		
▶		GO TO 2.

2	CHECK CONNECTOR	
1. Disconnect ABS actuator and electric unit connector. Check terminals for damage or loose connections and replace. Then reconnect connector. 2. Carry out self-diagnosis again.		
Does warning lamp activate again?		
Yes	▶	GO TO 3.
No	▶	INSPECTION END

3	CHECK ABS ACTUATOR AND ELECTRIC UNIT POWER SUPPLY CIRCUIT	
Check voltage. Refer to "3. CHECK ABS ACTUATOR AND ELECTRIC UNIT POWER SUPPLY CIRCUIT" in "Low Voltage", BR-77.		
Does battery voltage exist when ignition switch is turned ON?		
Yes	▶	GO TO 4.
No	▶	Repair.

4	CHECK WARNING LAMP INDICATION	
Does warning lamp activate again?		
Yes	▶	Replace ABS actuator and electric unit.
No	▶	Inspect the system according to the CONSULT-II result.

TROUBLE DIAGNOSES FOR SYMPTOMS

ABS

1. ABS Works Frequently

1. ABS Works Frequently

NJBR0104

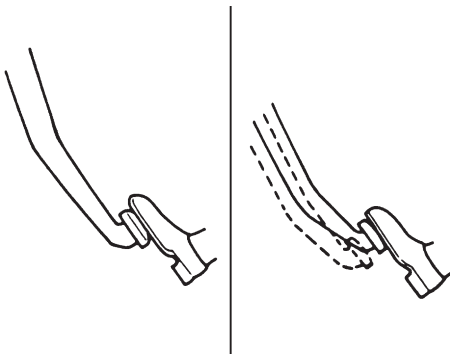
1	CHECK BRAKE FLUID PRESSURE	
Check brake fluid pressure distribution.		
Is brake fluid pressure distribution normal?		
Yes	▶	GO TO 2.
No	▶	Perform Preliminary Check. Refer to BR-65.

2	CHECK WHEEL SENSOR	
1. Check wheel sensor connector for terminal damage or loose connections. 2. Perform wheel sensor mechanical check. Refer to "Wheel Sensor or Rotor", BR-69.		
Are wheel sensors functioning properly?		
Yes	▶	GO TO 3.
No	▶	Repair.

3	CHECK FRONT AXLE	
Check front and rear axles for excessive looseness. Refer to AX section, "Front Wheel Bearing", "ON-VEHICLE SERVICE" and "Rear Wheel Bearing", "ON-VEHICLE SERVICE".		
Is front axle installed properly?		
Yes	▶	Go to "3. CHECK WARNING LAMP INDICATION" in "2. Unexpected Pedal Action", BR-81.
No	▶	Repair.

2. Unexpected Pedal Action

NJBR0105

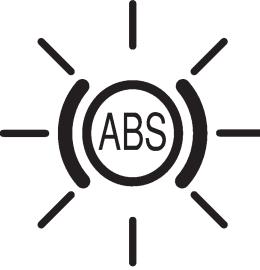
1	CHECK BRAKE PEDAL STROKE	
Check brake pedal stroke. Is stroke excessively large?		
		
SBR540A		
Yes	▶	Perform Preliminary Check. Refer to BR-65.
No	▶	GO TO 2.

TROUBLE DIAGNOSES FOR SYMPTOMS

ABS

2. Unexpected Pedal Action (Cont'd)

2	CHECK CONNECTOR AND PERFORMANCE	
1. Disconnect ABS actuator and electric unit connector. 2. Check whether brake is effective.		
OK or NG		
Yes	▶	GO TO 3.
No	▶	Perform Preliminary Check. Refer to BR-65.

3	CHECK WARNING LAMP INDICATION	
Ensure warning lamp remains off while driving.		
		
SBR759E		
Is warning lamp turned off?		
Yes	▶	GO TO 4.
No	▶	Carry out self-diagnosis. Refer to BR-58.

4	CHECK WHEEL SENSOR	
1. Check wheel sensor connector for terminal damage or loose connection. 2. Perform wheel sensor mechanical check.		
Is wheel sensor mechanism OK?		
Yes	▶	Check ABS actuator and electric unit pin terminals for damage or the connection of ABS actuator and electric unit harness connector. Reconnect ABS actuator and electric unit harness connector. Then retest.
No	▶	Repair.

3. Long Stopping Distance

NJBR0106

1	CHECK CONNECTOR AND PERFORMANCE	
1. Cancel ABS by disconnecting ABS actuator and electric unit connector. 2. Check whether stopping distance is still long.		
OK or NG		
OK	▶	Perform Preliminary Check and air bleeding.
NG	▶	Go to "3. CHECK WARNING LAMP INDICATION" in "2. Unexpected Pedal Action", BR-80.

NOTE:
Stopping distance may be longer than vehicles without ABS when road condition is slippery.

4. ABS Does Not Work


NJBR0107

1	CHECK WARNING LAMP INDICATION	
Does the ABS warning lamp activate?		
Yes	▶	Carry out self-diagnosis. Refer to BR-58.
No	▶	Go to "3. CHECK WARNING LAMP INDICATION" in "2. Unexpected Pedal Action", BR-80.

NOTE:
ABS does not work when vehicle speed is under 10 km/h (6 MPH).

5. Pedal Vibration and Noise

=NJB0108

1	INSPECTION START
Pedal vibration and noise inspection	
	
SAT797A	
▶ GO TO 2.	

2	CHECK SYMPTOM
1. Apply brake. 2. Start engine.	
Does the symptom appear only when engine is started?	
Yes	▶ Carry out self-diagnosis. Refer to BR-58.
No	▶ GO TO 3.

3	RECHECK SYMPTOM
Does the symptom appear when electrical equipment switches (such as headlamp) are operated?	
Yes	▶ GO TO 4.
No	▶ Go to "3. CHECK WARNING LAMP INDICATION" in "2. Unexpected Pedal Action", BR-80.

4	CHECK WHEEL SENSOR
Check wheel sensor shield ground. For location of shield ground, refer to wiring diagram and "HARNES LAYOUT" in EL section.	
Is wheel sensor shield grounded properly?	
Yes	▶ Check ABS actuator and electric unit pin terminals for damage or the connection of ABS actuator and electric unit harness connector. Reconnect ABS actuator and electric unit harness connector. Then retest.
No	▶ Repair.

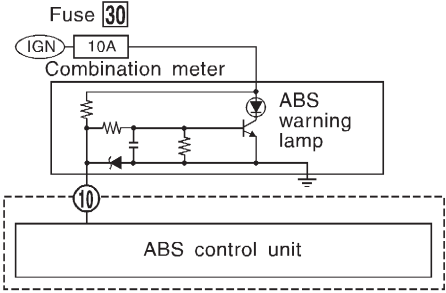
NOTE:

ABS may operate and cause vibration under any of the following conditions.

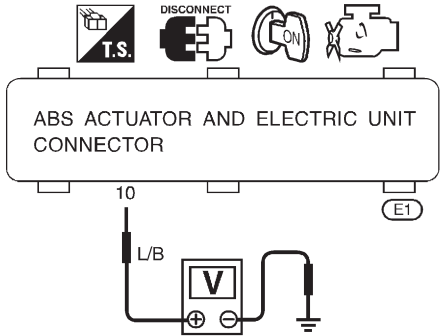
- Applying brake gradually when shifting or operating clutch.
- Low friction (slippery) road.
- High speed cornering.
- Driving over bumps and pot holes.
- Engine speed is over 5,000 rpm with vehicle stopped.

6. ABS Warning Lamp Does Not Come On When Ignition Switch Is Turned On

=NJBRO109

1	INSPECTION START
Warning lamp circuit inspection	
	
SBR762E	
▶	GO TO 2.

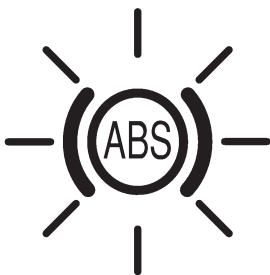
2	CHECK FUSE
Check 10A fuse No. 30 for warning lamp. For fuse layout, refer to "POWER SUPPLY ROUTING" in EL section.	
Is fuse OK?	
Yes	▶ GO TO 3.
No	▶ Replace fuse.

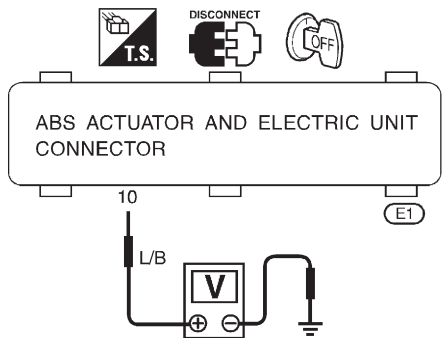
3	CHECK ABS CONTROL UNIT POWER SUPPLY CIRCUIT
<ol style="list-style-type: none"> 1. Install 10A fuse. 2. Disconnect ABS actuator and electric unit connector. 3. Check voltage between control unit connector terminal 10 and ground after turning ignition switch "ON". 	
	
SBR628E	
Does battery voltage exist after turning ignition switch "ON"?	
Yes	▶ GO TO 5.
No	▶ GO TO 4.

TROUBLE DIAGNOSES FOR SYMPTOMS

ABS

6. ABS Warning Lamp Does Not Come On When Ignition Switch Is Turned On (Cont'd)

4	CHECK WARNING LAMP INDICATION	
Disconnect ABS actuator and electric unit connector.		
		
SBR759E		
Does the ABS warning lamp activate?		
Yes	▶	GO TO 6.
No	▶	GO TO 5.

5	CHECK HARNESS FOR SHORT	
1. Disconnect ABS actuator and electric unit connector. 2. Check voltage between ABS actuator and electric unit connector terminal 10 and ground.		
		
SBR144EF		
Does battery voltage exist?		
Yes	▶	Check combination meter. Refer to WARNING LAMPS in EL section.
No	▶	Repair harness and connectors between fuse and ABS actuator and electric unit connector terminal 10.

6	CHECK HARNESS CONNECTOR	
Check ABS actuator and electric unit pin terminals for damage or connection of ABS actuator and electric unit harness connector. Reconnect ABS actuator and electric unit harness connector. Then reset.		
OK	▶	INSPECTION END
NG	▶	Replace ABS actuator and electric unit.

TROUBLE DIAGNOSES FOR SYMPTOMS

ABS

7. ABS Warning Lamp Stays On When Ignition Switch Is Turned On

=NJBR0110

7. ABS Warning Lamp Stays On When Ignition Switch Is Turned On

1	INSPECTION START
<p>ABS control unit inspection</p> <div style="text-align: center;"> </div> <p style="text-align: right;">SBR763E</p>	
▶	GO TO 2.

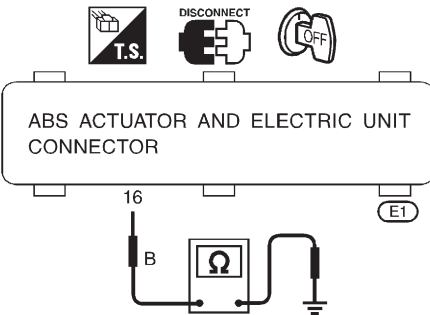
2	CHECK WARNING LAMP
<p>1. Disconnect ABS actuator and electric unit connector. 2. Connect suitable wire between ABS actuator and electric unit connector terminal 10 and ground.</p> <div style="text-align: center;"> </div> <p style="text-align: center;">Does warning lamp activate?</p>	
Yes	▶ GO TO 3.
No	▶ Repair combination meter. Check the following. <ul style="list-style-type: none"> ● Harness connector E1 ● Harness for open or short between ABS actuator and electric unit and fuse ● If NG, repair harness or connector.

3	CHECK HARNESS CONNECTOR
<p>Check ABS actuator and electric unit pin terminals for damage or the connection of ABS actuator and electric unit harness connector. Reconnect ABS actuator and electric unit harness connector. Then retest.</p>	
OK	▶ INSPECTION END
NG	▶ GO TO 4.

TROUBLE DIAGNOSES FOR SYMPTOMS

ABS

7. ABS Warning Lamp Stays On When Ignition Switch Is Turned On (Cont'd)

4	CHECK ABS MOTOR GROUND	
<p>1. Turn ignition switch "OFF". 2. Disconnect ABS actuator and electric unit connector. 3. Check continuity between ABS actuator and electric unit connector terminal 16 and ground.</p> <div style="text-align: center;">  </div> <p style="text-align: right;">SBR147EC</p>		
Does continuity exist?		
Yes	▶▶	Replace ABS actuator and electric unit.
No	▶▶	<p>Check the following.</p> <ul style="list-style-type: none"> ● Harness connector E1 ● Harness for open or short between ABS actuator and electric unit and ground <p>If NG, repair harness or connector.</p>

REMOVAL AND INSTALLATION

NJBR0111

ABS

CAUTION:

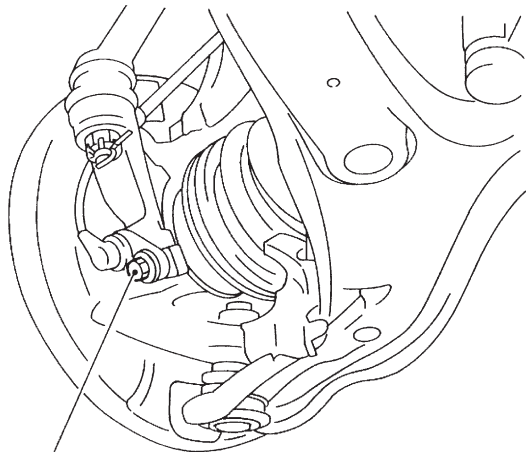
Be careful not to damage sensor edge and sensor rotor teeth. When removing the front or rear wheel hub assembly, first remove the ABS wheel sensor from the assembly. Failure to do so may result in damage to the sensor wires making the sensor inoperative.


Wheel Sensors

NJBR0111S01

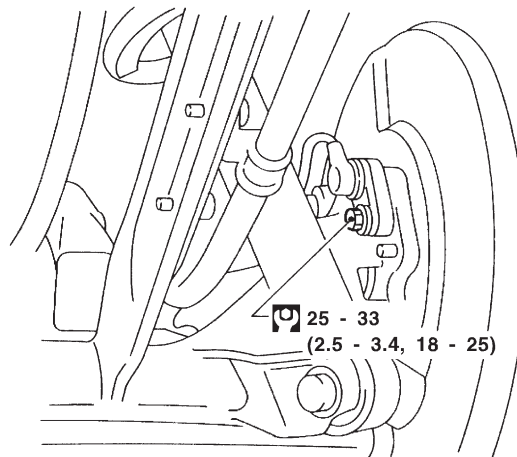
SEC. 476


Front wheel sensor




 18 - 24 (1.8 - 2.4, 13 - 17)

Rear wheel sensor



 25 - 33
(2.5 - 3.4, 18 - 25)

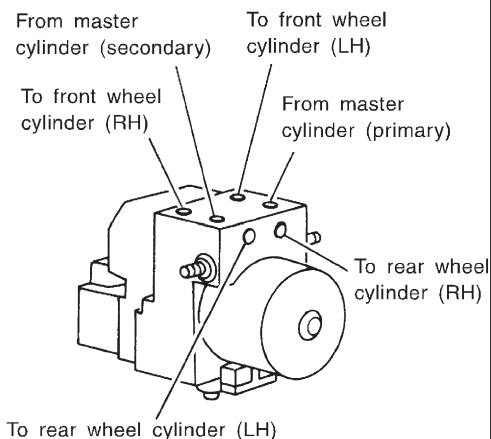
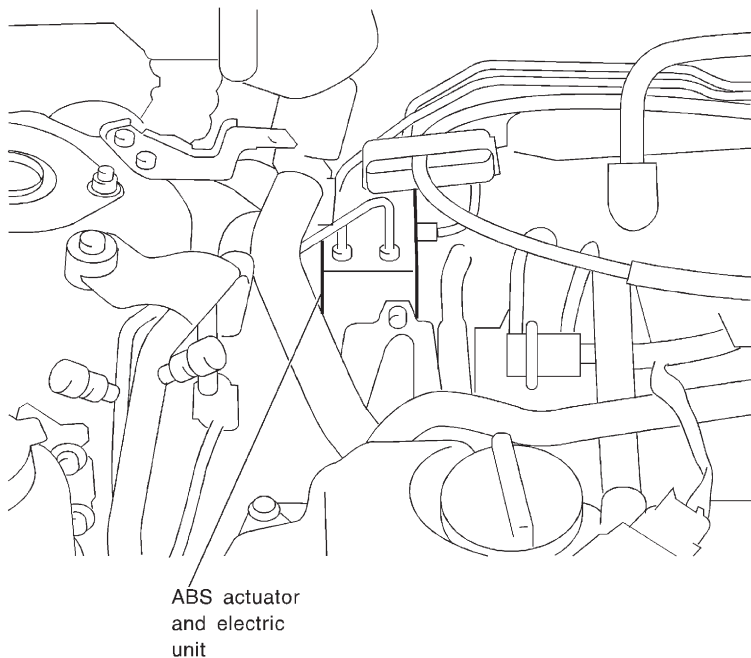
 : N·m (kg-m, ft-lb)

SBR902D

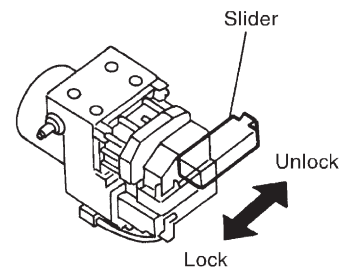
ABS Actuator and Electric Unit

NJBR0111S10

SEC. 476



The way of connector lock



SBR630E

REMOVAL

NJBR0111S1001

1. Disconnect battery cable.
2. Drain brake fluid.
3. Remove mounting bracket fixing bolts and nuts.
4. Disconnect connector, brake pipes and remove fixing nuts.

INSTALLATION

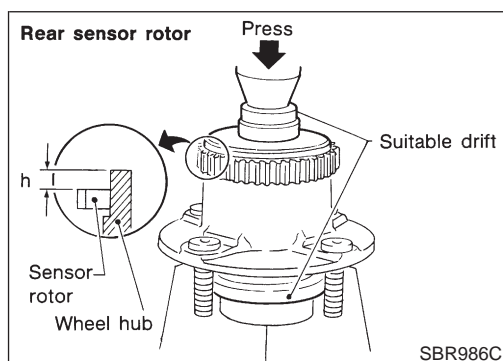
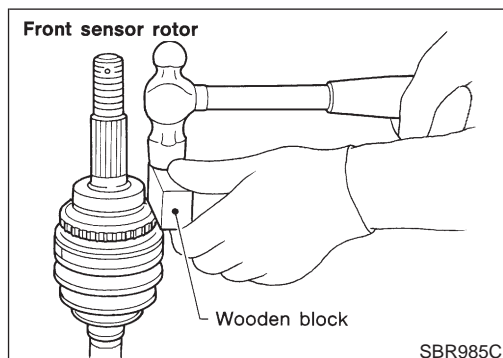
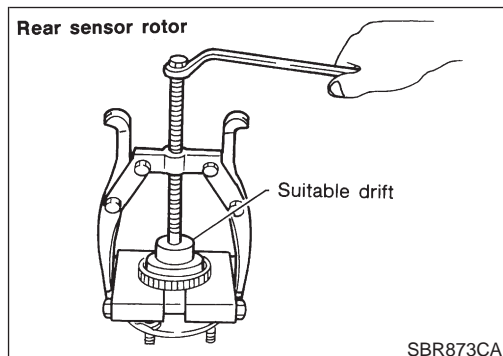
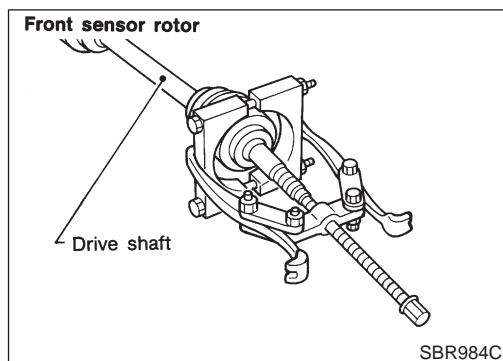
NJBR0111S1002

CAUTION:

After installation, refill brake fluid. Then bleed air.

1. Connect brake pipes temporarily.
2. Tighten fixing bolts and nuts.
3. Tighten brake pipes.
4. Connect connector and battery cable.

Sensor Rotor



Sensor Rotor

NJBR0111S02

REMOVAL

NJBR0111S0201

1. Remove the drive shaft and rear wheel hub. Refer to "Drive Shaft" and "Wheel Hub" in AX section.
2. Remove the sensor rotor using suitable puller, drift and bearing replacer.

INSTALLATION

NJBR0111S0202

Install the sensor rotor. For front sensor rotor, use hammer and wooden block. For rear sensor rotor, use suitable drift and press.

- Always replace sensor rotor with new one.
- Pay attention to the dimension of rear sensor rotor as show in figure.

h: 24.8 - 25.8 mm (0.976 - 1.016 in)

SERVICE DATA AND SPECIFICATIONS (SDS)

General Specifications

General Specifications

Unit: mm (in)
NJBR0077

Engine		QG15DE		Except QG15DE	
ABS		Without	With		Without
Front brake	Brake model	CL25VG	CL25VBG		
	Cylinder bore diameter	57.2 (2.252)			
	Pad Length × width × thickness	113.1 × 45.5 × 11.0 (4.45 × 1.791 × 0.433)	108.8 × 47.7 × 11.0 (4.28 × 1.878 × 0.433)		
	Rotor outer diameter × thickness	257 × 22 (10.12 × 0.87)	280 × 22 (11.02 × 0.87)		
ABS		Without	With		Without
Rear brake	Brake model	LT20N	CL11HEG (Ball & Ramp type)		CL9HCG
	Cylinder bore diameter	17.46 (0.6874)	38.2 (1.504)		33.96 (1.3370)
	Lining or pad Length × width × thickness	195 × 35 × 4.5 (7.68 × 1.38 × 0.18)	79.8 × 38.5 × 9.3 (3.142 × 1.516 × 0.37)		
	Drum inner diameter or rotor outer diameter × thickness	203.2 (8.00)	258 × 10 (10.16 × 0.39)		
Master cylinder	Cylinder bore diameter	23.81 (15/16)			
Control valve	Valve model	Dual proportioning valve [without ABS]			
	Split point kPa (bar, kg/cm ² , psi) × reducing ratio	3.43 (34.3 × 35 × 497) × 0.4			
Brake booster	Booster model	V255	S255		V255
	Diaphragm diameter	Primary	255 (10.04)		
		Secondary	—		
Specified brake fluid		DOT 4			

Disc Brake

Unit: mm (in)
NJBR0078

Brake model		CL25VG, CL25VBG		CL9HCG, CL11HEG	
Pad wear limit	Minimum thickness	2.0 (0.078)		2.0 (0.079)	
	Maximum runout	0.07 (0.0028)		0.07 (0.0028)	
Rotor repair limit	Minimum thickness	20.0 (0.787)		9 (0.35)	

Drum Brake

Unit: mm (in)
NJBR0135

Brake model		LT20N	
Lining wear limit	Minimum thickness	1.5 (0.059)	
	Maximum inner diameter	204.5 (8.051)	
Drum repair limit	Maximum out-of-round	0.03 (0.0012)	

SERVICE DATA AND SPECIFICATIONS (SDS)

Brake Pedal

Brake Pedal

NJBR0079
Unit: mm (in)

Free height "H"	LHD	M/T	156.0 - 166.0 (6.14 - 6.54)
		A/T	165.0 - 175.0 (6.54 - 6.89)
	RHD	M/T	155.0 - 165.0 (6.10 - 6.50)
		A/T	164.0 - 174.0 (6.46 - 6.85)
Clearance "C" between pedal stopper and threaded end of stop lamp switch or brake switch			0.74 - 1.96 (0.0291 - 0.0772)

*: Measured from surface of dash panel to surface of pedal pad

Parking Brake

NJBR0080

Type	Center lever
Number of notches [under force of 196 N (20 kg, 44 lb)]	5 - 6
Number of notches when warning lamp switch comes on	1