DAIHATSU

TERIOS

J100

TO INDEX

BRAKES

JBR00001-00000

BR

NO. 9710-JE

BASIC CHECK

BRAKE PEDAL

1. Ensure that the brake pedal height is with in specified valve by measuring the brake pedal height.
   Specified Value: 162.8 mm (*155.8 mm)

   CAUTION:
   - "*" Mark denote brake pedal height between upper surface of brake pedal pad and upper surface of protrude section of floor panel.

2. Pedal height adjustment
   (1) Disconnect the connector from the stop lamp switch.
   (2) Slacken the nut of the stop lamp switch and screw out the stop lamp switch, until the brake pedal has a free travel.
   (3) Slacken the lock nut of the brake pedal clevis. Turn the push rod so as to adjust the pedal height to the specified value.
   (4) Tighten the lock nut of the brake pedal clevis to the specified tightening torque.
   Tightening Torque: 25.5 ± 2.9 N·m (2.6 ± 0.3 kgf-m)

   (5) Screw in the stop lamp switch, until the clearance between the brake pedal cushion and the edge of the threaded portion of the stop lamp switch becomes 1.5 mm.
   (6) Tighten the lock nut of the stop lamp switch to the specified tightening torque.
   Tightening Torque: 19.6 ± 7.8 N·m (2.0 ± 0.8 kgf-m)

   (7) Connect the connector of the stop lamp switch.Then, proceed to the brake pedal free play check.

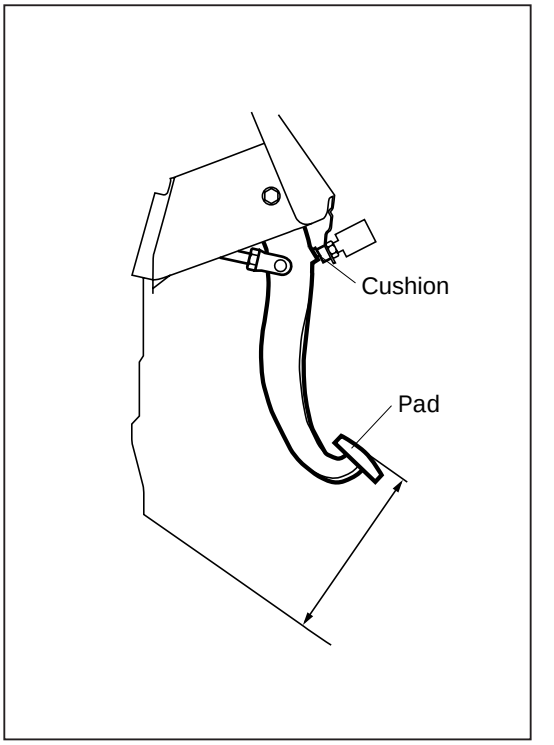
3. Pedal free play check
   (1) After turning off the engine, depress the brake pedal several times so that no vacuum may remain in the brake booster.
   (2) Measure the brake pedal free play by pushing the brake pedal lightly by hand. Here, the brake pedal free play means the distance from a point where the brake pedal is free to a point where you begin to feel a resistance.
   Specified Value: 0.5 - 2 mm

   (3) Ensure that the free play is within the specified value.
   If the brake pedal free play fails to meet the specified value, adjust the brake pedal free play to the specified value.

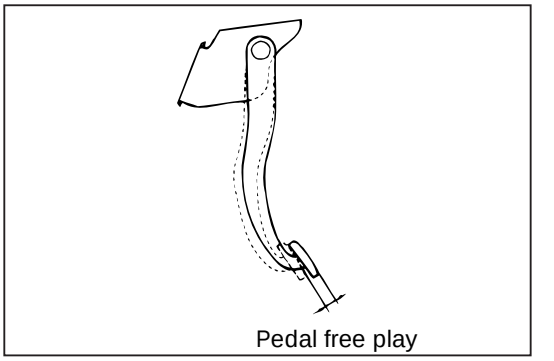
4. Pedal free play adjustment
   (1) Slacken the nut of the brake pedal clevis.
   (2) Turn the push rod so as to adjust the pedal free play to the specified value.
   Specified Value: 0.5 - 2 mm

   (3) Tighten the lock nut of the brake pedal clevis.
   Tightening Torque: 25.5 ± 2.9 N·m (2.6 ± 0.3 kgf-m)

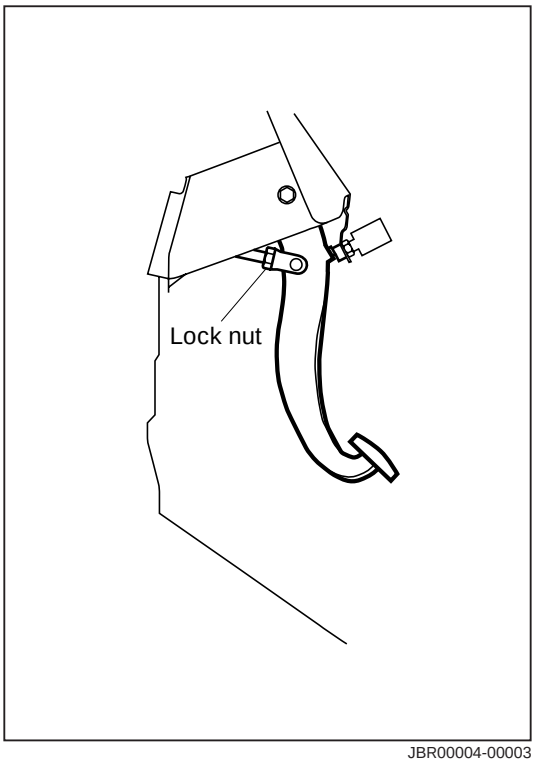
   (4) Ensure that the brake pedal height is within the specified value and the stop lamp functions properly.



JBR00002-00001

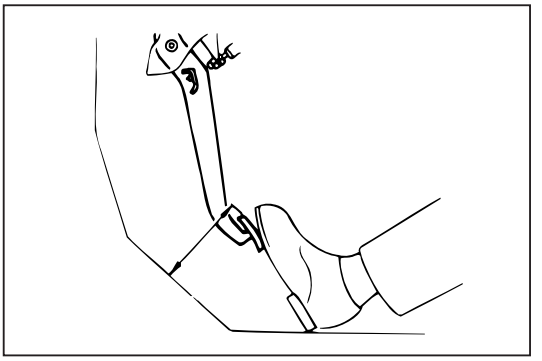


JBR00003-00002



JBR00004-00003

5. Pedal reserve travel check
   (1) Start the engine and run the engine at idling.
   (2) Depress the brake pedal with a pedal applying force of 300 N (30kgf) with the parking brake lever returned.
   (3) Measure the distance between the upper surface of brake pedal pad center and the upper surface of protrude section of floor panel.
   Specified Value: 85 mm or more



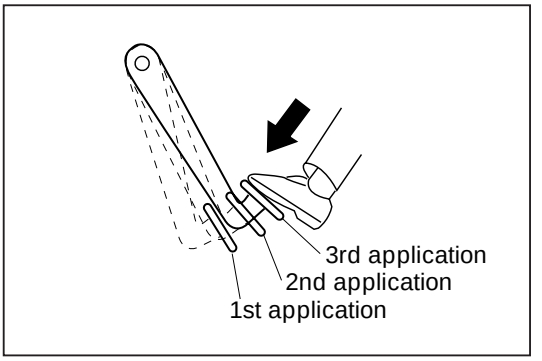
JBR00005-00004

BOOSTER

IN-VEHICLE CHECK

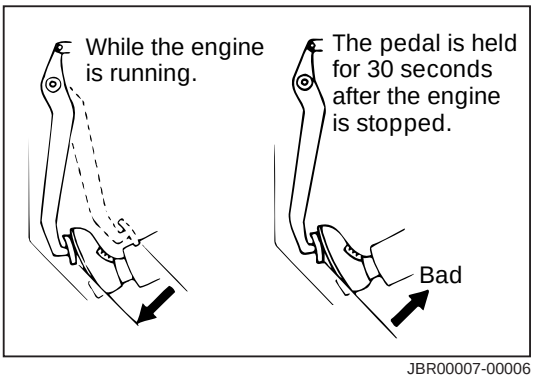
1. Booster air-tight performance check
   (1) Start the engine.
   (2) Turn off the engine after a few minutes.
   (3) Ensure that the position of the brake pedal height progressively rises every time the brake pedal is depressed.
   If the position of the brake pedal rises progressively at the second and third applications, it indicates the brake booster is functioning properly.

   CAUTION:
   - Be sure to keep intervals of each application of the brake pedal at least five seconds or more between the first and second applications as well as the second and third applications.



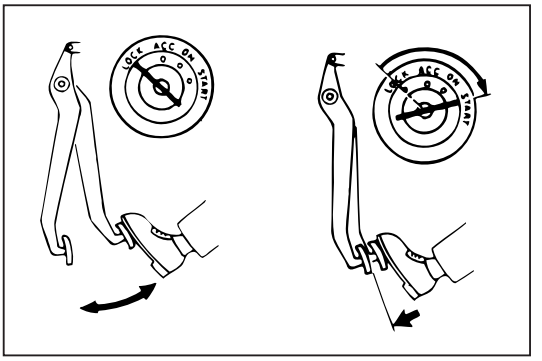
JBR00006-00005

2. Booster air-tight performance check under loaded condition
   (1) Start the engine.
   (2) Depress the brake pedal fully.
   (3) Turn off the engine while depressing the brake pedal.
   (4) Ensure that the brake pedal height remains unchanged for more than 30 seconds. It indicates that the booster is functioning properly.



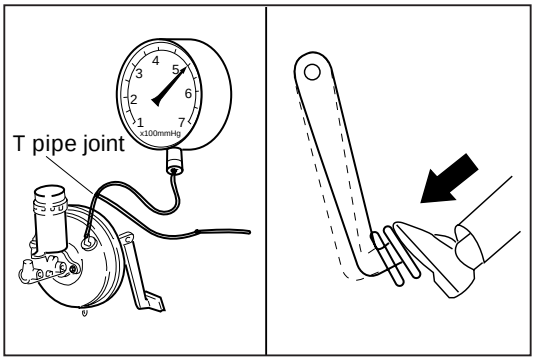
JBR00007-00006

3. Booster operation check
   (1) Depress the brake pedal several times under the engine stopped state, until the brake pedal height will no longer change (to release the vacuum pressure retained in the brake booster).
   (2) Ensure that the height of the brake pedal will go down when the engine is started while keeping the depressing force of the brake pedal unchanged.
   It indicates that the booster is functioning properly.



JBR00008-00007

4. Booster air-tight performance check under loaded condition
   (1) Connect a negative pressure gauge to the booster, using a “T or Y” pipe joint.
   (2) Start the engine with the brake pedal depressed with a force of 200 N.
   (3) Stop the engine when the negative pressure exceeds 500 mmHg.
   (4) Ensure that the negative pressure retained in the brake booster will not drop 25 mmHg or more for 15 seconds since the engine is stopped.
   It means that the air tightness is proper. If not, check air leakage of the check valve in the brake booster hose.



JBR00009-00008

AIR BLEEDING

1. Fill and maintain the brake fluid level in the reservoir tank at the upper level during the operation.
   NOTE:
   • If the brake fluid is spilled inadvertently over the paint-finish surface of the vehicle or resin-made parts, immediately wipe off the brake fluid and flush with fresh water.
   • When drain the brake fluid, do not fill brake fluid into the reservoir tank.


JBR00010-00009

2. Connection of vinyl hose to bleeder plug of wheel cylinder
   Connect a suitable vinyl or rubber hose to the bleeder plug of the wheel cylinder and submerge one end of the vinyl or rubber hose in a container filled with the brake fluid. Connect the other end of the vinyl hose to the wheel cylinder bleeder plug of the vehicle.
   NOTE:
   • Start the air bleeding operation at the wheel cylinder which is located at the furthermost point from the master cylinder.

JBR00011-000010

3. Air bleeding
   (1) Perform the operation by two persons. One person should depress the brake pedal slowly and hold it in a depressed state.
   (2) While depressing the brake pedal, the other person slackens the bleeder plug 1/3 through 1/2 turn to drain the brake fluid. Then, tighten the bleeder plug temporarily.
   (3) Repeat the steps (1) and (2) above, until bubbles are no longer observed in the fluid.
   NOTE:
   • It may require more time than the ordinary brake system if the vehicle is equipped with ABS.

JBR00012-00011

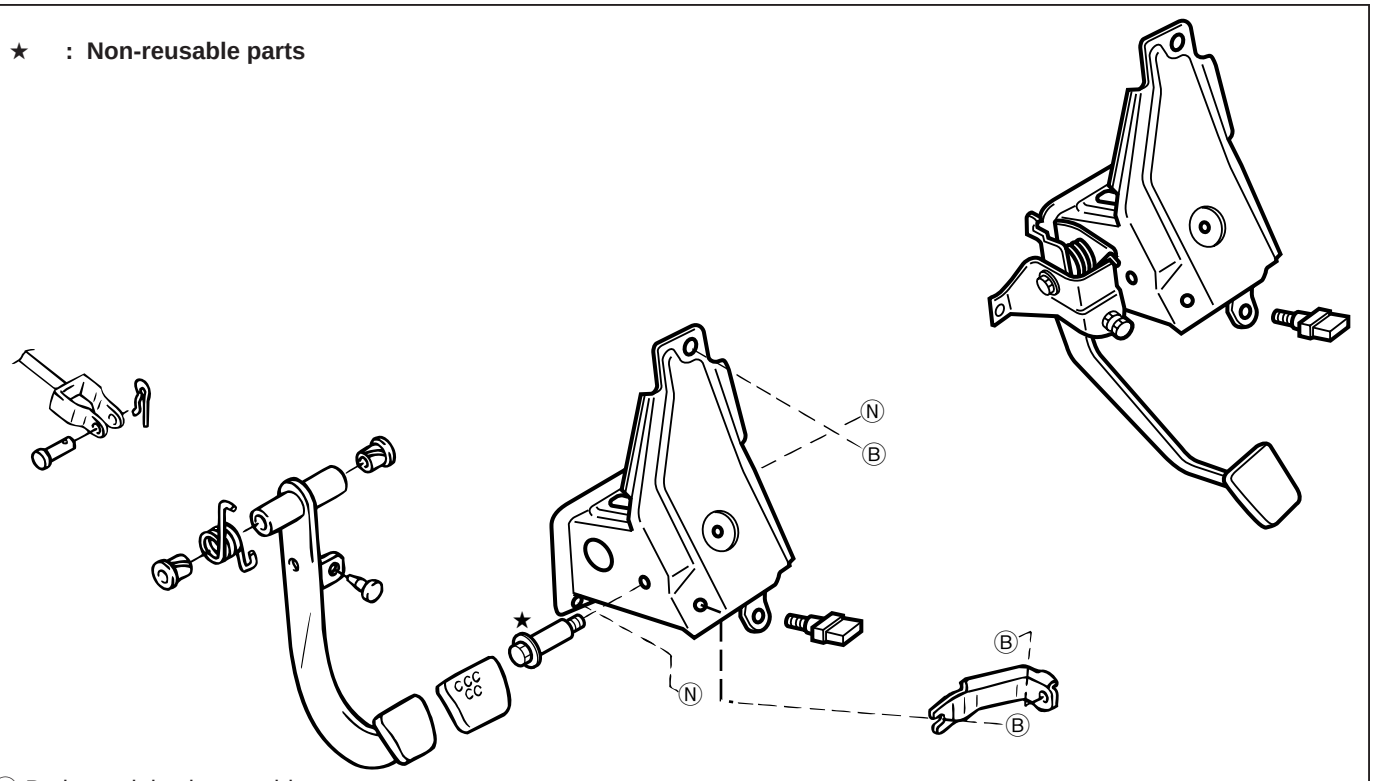
(4) Tighten the bleeder plug securely to the specified tightening torque.
   Tightening Torque: 6.9 - 9.8 N·m (0.7 - 1.0 kgf-m)

4. Checking of brake fluid leakage
   Ensure that no brake fluid leakage exists on the brake line when the brake pedal is depressed fully.

BRAKE PEDAL

COMPONENTS

★ : **Non-reusable parts**



① Brake pedal subassembly
② Brake pedal pad
③ Cushion
④ Brake pedal bracket
⑤ Brake pedal shaft
⑥ Pedal bracket stay
⑦ Bush
⑧ Spring

NOTE:
★: The brake pedal shaft installed from right side when model with left hand drive. Contrary, the brake pedal shaft installed from left side when model with right hand drive.

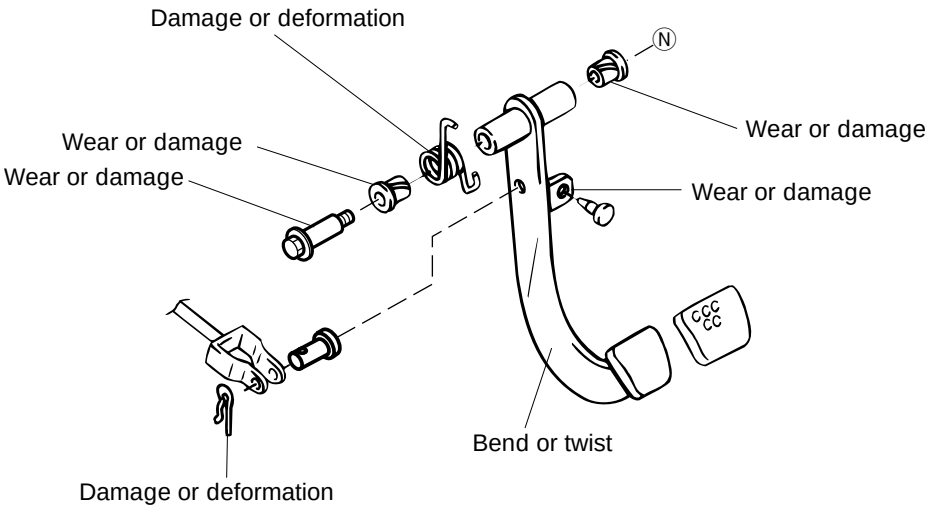
JBR00013-00012

REMOVAL

1. Remove the instrument panel. (Only when the brake pedal bracket removal is required) (Refer to the BO section.)
2. Disconnect the connector from the stop lamp switch while unlocking its lock.
3. Remove the stop lamp switch by screwing it out.
4. Disengage the clutch cable from the clutch pedal. (Only for models with manual transmission.) (Refer to the CL section.)
5. Remove the clip and pin from the brake pedal clevis.
6. Disconnect the wire harness clamp from the brake pedal bracket.
7. Remove the brake pedal bracket by removing the attaching bolts and nuts.
8. Remove the brake pedal by removing its attaching bolts and nuts.
7. Remove the spring from the brake pedal.
8. Remove the bushes from the brake pedal.
9. Remove the brake pedal pad and cushion from the brake pedal.

JBR00014-00000

10. Inspect the following parts.

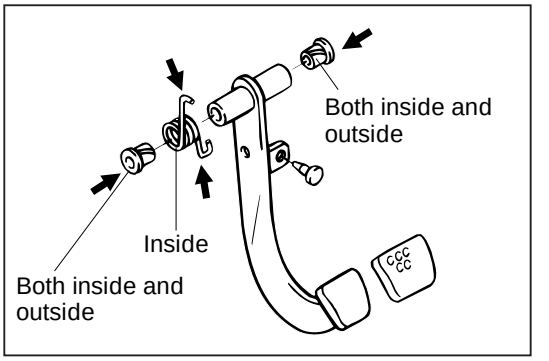


JBR00015-00013

INSTALLATION

1. Apply the specified grease to those points indicated in the right figure.
   Specified Grease:
   Lithium soap base multi-purpose grease

2. Install the cushion, brake pedal pad, bushes and spring to the brake pedal.



JBR00016-00014

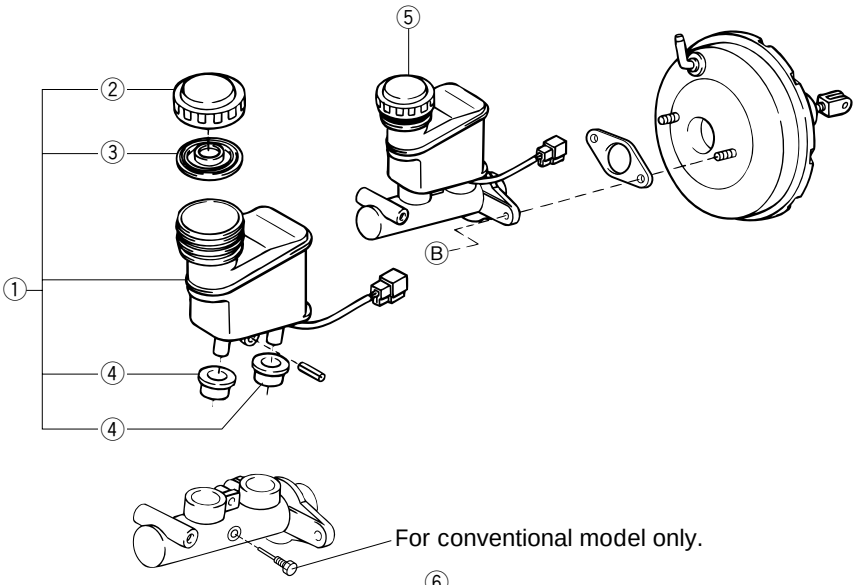
3. Install the brake pedal on the brake pedal bracket.
4. Install the brake pedal to the brake pedal bracket while connecting the spring end to the brake pedal bracket with the brake pedal shaft and nut. Then, tighten the nut to the specified tightening torque.
   Tightening Torque: 15.2 - 23.0 N·m (1.55 - 2.35 kgf-m)

5. Apply the lithium soap base multi-purpose grease to the clevis pin contacting surface of the brake pedal.
6. Connect the clevis to the brake pedal with the pin and install the clip to the pin securely.
7. Install the brake pedal bracket to the body with the pedal bracket stay, attaching bolts and nuts.
8. Screw in the stop lamp switch to the brake pedal bracket. (Refer to the “Brake pedal” section.)
9. Perform the check and adjustment of the brake pedal. (Refer to the “Brake pedal” section.)
10. Install the instrument panel. (Refer to BO section.)
11. Check that no abnormal noise is emitted when the brake papal is depressed.

JBR00017-00000

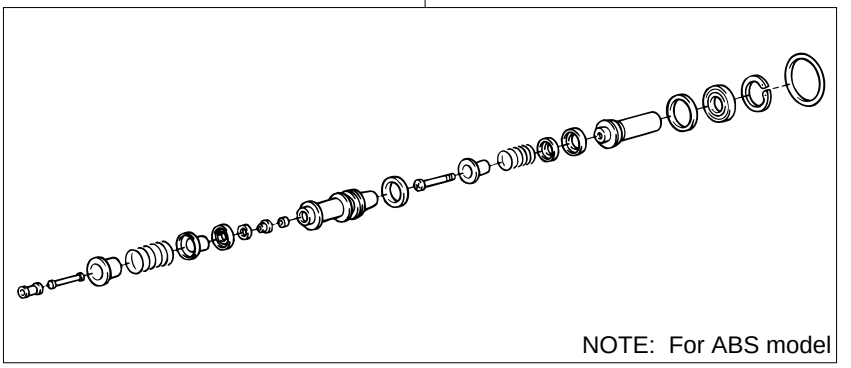
BRAKE MASTER CYLINDER

COMPONENTS



For conventional model only.

⑥



NOTE: For ABS model

① Brake master cylinder reservoir tank
② Reservoir filler cap
③ Reservoir diaphragm
④ Grommet
⑤ Brake master cylinder assembly
⑥ Tandem master cylinder repair kit

JBR00018-00015

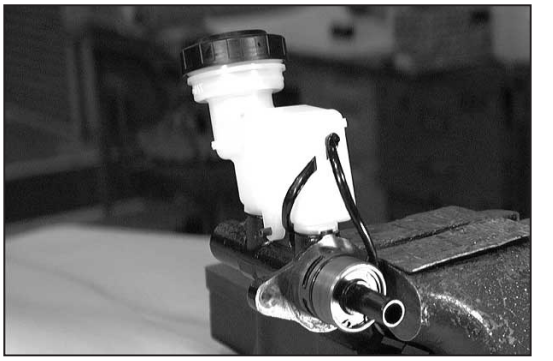
REMOVAL

1. Disconnect the connector of the brake fluid level switch.
2. Drain the brake fluid from the master cylinder.
   (Refer to the “Air bleeding” section for procedure.)
3. Disconnect the brake pipes from the master cylinder.
   CAUTION:
   - If the brake fluid is spilled inadvertently over the paint-finish surface of the vehicle or resin-made parts, immediately wipe off the brake fluid and wash with fresh water.

JBR00019-00016

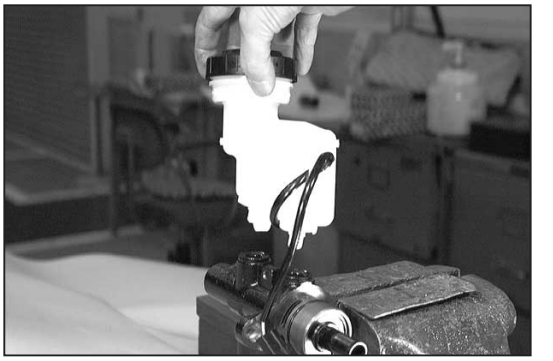
4. Remove the master cylinder from the brake booster.
   NOTE:
   - The O-ring is installed on the master cylinder.
     It may be hard to remove the master cylinder from the brake booster.

5. Secure the master cylinder to a vise.



JBR00020-00017

6. Remove the slotted pin of the master cylinder reservoir tank, using a suitable knock pin punch.
7. Pull out the brake master cylinder reservoir tank from the master cylinder.

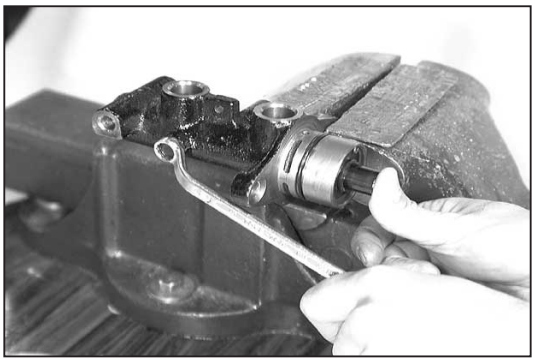


JBR00021-00018

8. Remove the grommets from the master cylinder or reservoir tank.

JBR00022-00019

9. Remove the set bolt and gasket while the pistons are being pushed fully by means of a suitable bar.
   (Only when equipped)
   NOTE:
   - Do not push the piston rapidly in order to prevent the brake fluid from splashing.

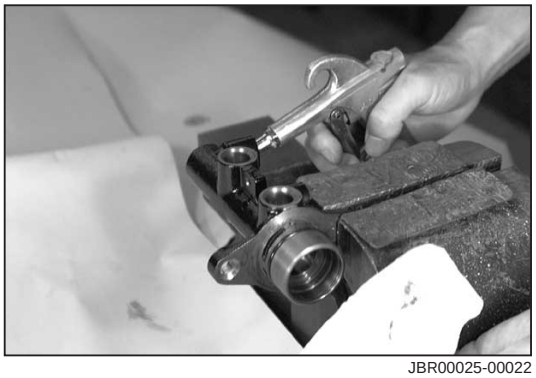


JBR00023-00020

10. Using snap ring pliers, detach the snap ring while the pistons are being pushed by means of a suitable bar.

JBR00024-00021

11. Remove the piston No. 1 from the master cylinder.
    CAUTION:
    - Remove the piston straight, being very careful not to scratch the cylinder bore.



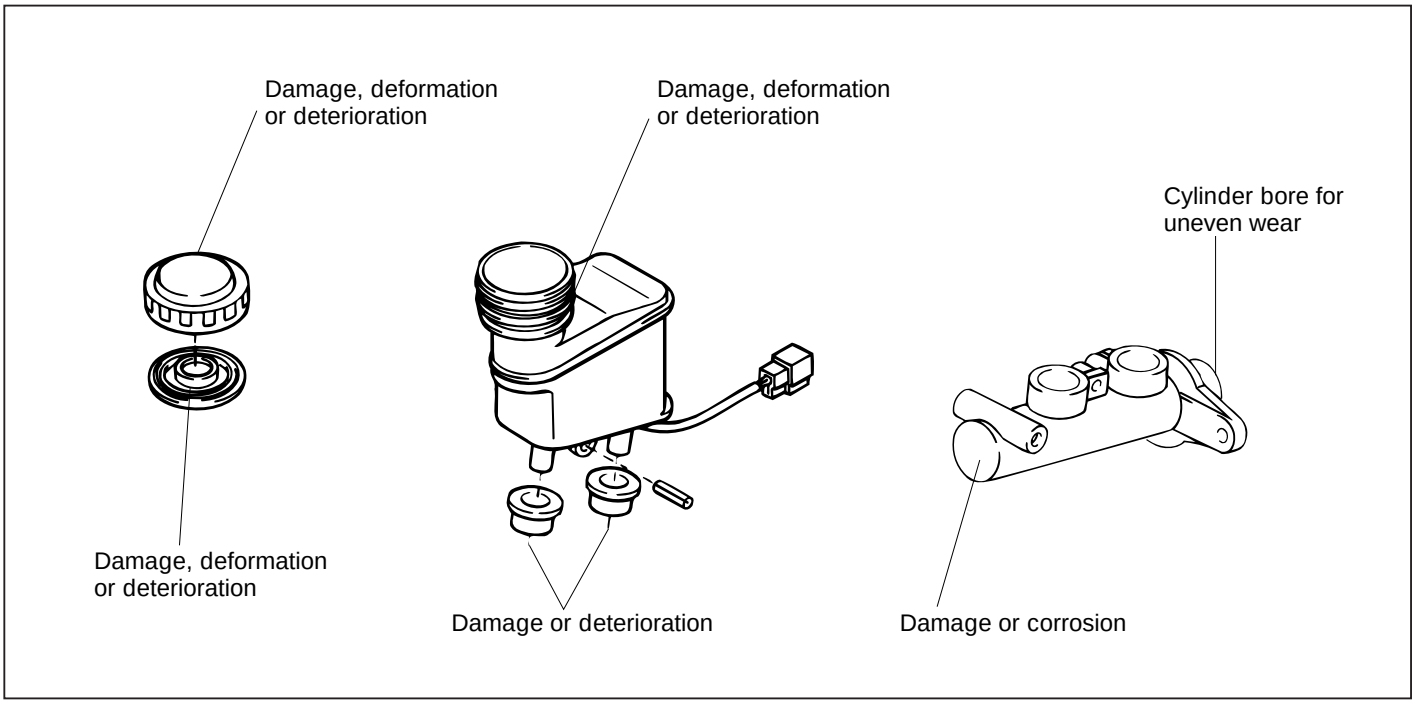
JBR00025-00022

12. Remove the piston No. 2 by lightly applying compressed air at the brake pipe hole.
    WARNING:
    - Be sure to protect your eyes by wearing safety goggles, when using compressed air.

    CAUTION:
    - Never score the cylinder bore during the removal of the piston No. 2.
      Remove the piston in a straight direction.

    NOTE:
    - Be sure to prevent the brake fluid from splashing, using a piece of cloth or the like.

13. Inspect the following parts. If any problem is found, repair them, as required.



JBR00026-00023

ASSEMBLY

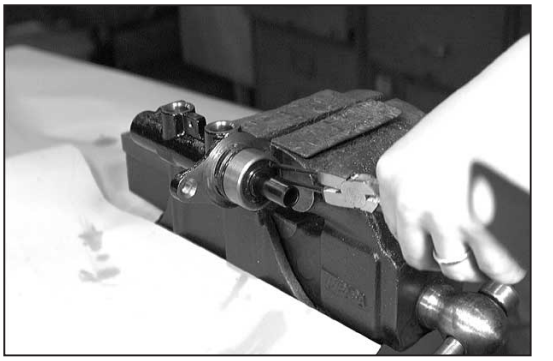
1. Wash the master cylinder and components with washing solvent and dry them with compressed air.
   WARNING:
   - Be sure to protect your eyes by wearing safety goggles, when using compressed air.

JBR00027-00024

2. Thinly apply brake rubber grease to the lip section of the cups of the piston No. 2 assembly.
3. Install the piston No. 2 into the master cylinder.


JBR00028-00025

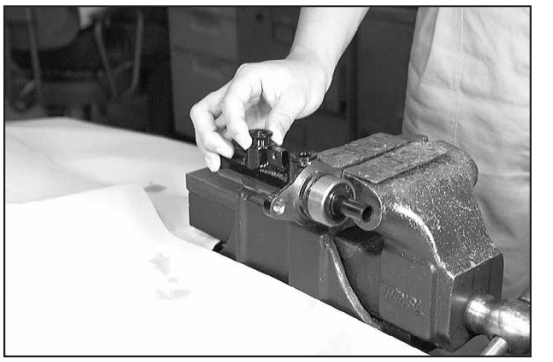
4. Thinly apply brake rubber grease to the lip section of the cups and O-ring on the piston No. 1 assembly.
5. Install the piston No. 1 assembly into the master cylinder.
6. Install a new snap ring while pushing the piston No. 1 into the master cylinder, using snap ring pliers.
   WARNING:
   - Never reuse the removed snap ring.


JBR00029-00026

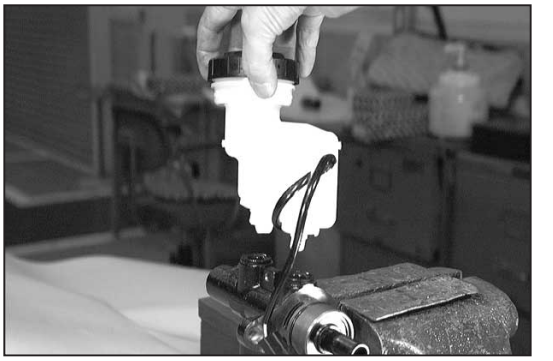
7. Install the set bolt of the piston No. 2 assembly to the master cylinder with a new gasket interposed while pushing the piston No. 2.
   Tightening Torque: 7.9 - 11.7 N·m (0.8 - 1.2 kgf-m)


JBR00030-00027

8. Thinly apply brake rubber grease to the grommets.
9. Install the grommets to the master cylinder.


JBR00031-00028

10. Install the brake master cylinder reservoir tank to the master cylinder.
11. Secure the master cylinder reservoir tank to the master cylinder by installing a new slotted pin.
    CAUTION:
    - Never reuse the used slotted pin.

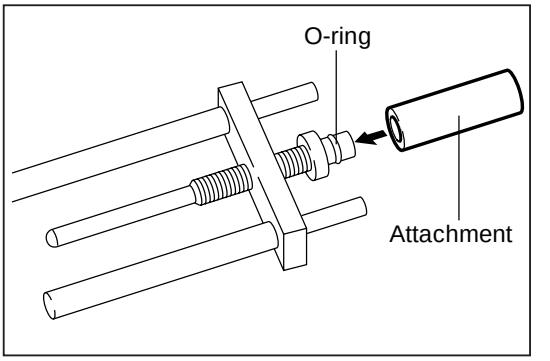

JBR00032-00029

INSTALLATION

1. Check the clearance between the master cylinder and the brake booster push rod.
   (1) Prepare the following SSTs.
   SST: 09730-87401-000
   09737-87003-000①
   09733-87401-000②
   09731-87401-000③
   09732-87401-000④
   09734-87401-000⑤
   09735-87401-000⑥

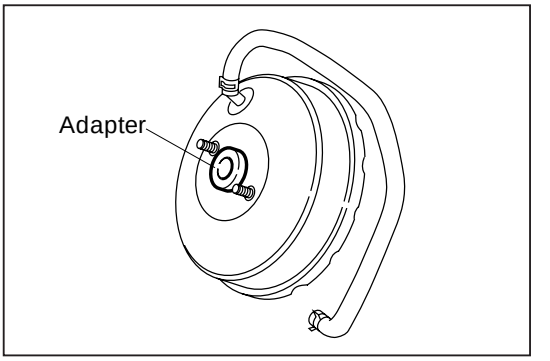
JBR00033-00000

   (2) Assemble the components of the above SSTs as follows.
   ① Install the O-ring (②) to the O-ring groove of the adjusting rod(①).
   ② Install the attachment (③) on the adjusting rod (①).
   ③ Thinly apply the brake rubber grease to the outer surface of the attachment (③).



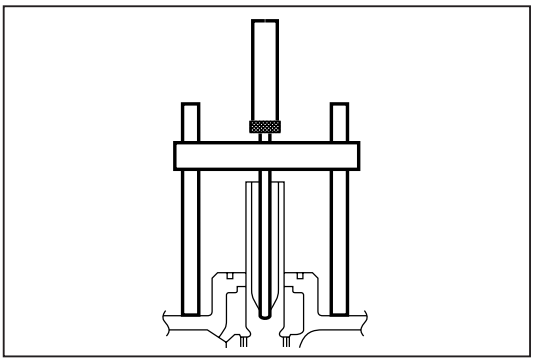
JBR00034-00030

   (3) Install the O-ring (⑤) and O-ring (⑥) to the adapter (④) and apply the brake rubber grease to the O-rings.
   (4) Install the adapter (④) to the brake booster.



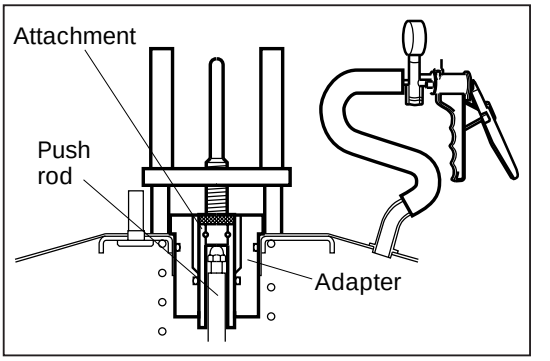
JBR00035-00031

   (5) Attach the SST assembled in step (2) on the master cylinder.
   (6) Turn the adjusting rod to adjust the clearance between the SST and the piston rod end to zero.



JBR00036-00032

   (7) Set the SST on the brake booster as shown.
   NOTE:
   • Apply brake rubber grease to the attaching section of the SST.



JBR00037-00033

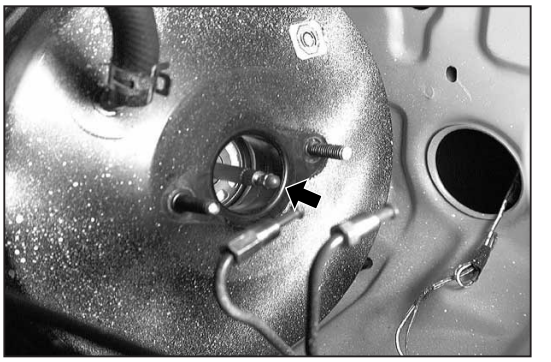
   (8) Connect a Mity Vac to the brake booster.
   (9) Apply a vacuum of 500 mmHg to the booster housing, using the Mity Vac.
   (10) Ensure that the clearance between the SST and the piston rod is zero by turning the adjusting rod lightly.

WARNING:
- Be sure to adjust the clearance properly. Failure to observe this warning may lead to brake system problem.

NOTE:
- If the clearance fails to meet the specified value, adjust the clearance between the SST and the push rod of the brake booster to zero, by turning the adjusting tip provided at the top of the push rod of the brake booster.

JBR00038-00000

(11) Adjustment of brake booster push rod height
Adjust the brake booster push rod height while depressing the brake pedal fully.
(12) Ensure that the clearance between the push rod and the SST is zero.



JBR00039-00034

WARNING:
- Be sure to adjust the clearance properly. Failure to observe this warning may lead to brake system problem.

(13) Remove the SST from the brake booster.
(14) Remove the Mity Vac from the brake booster.
(15) Connect the vacuum hose to the brake booster.

2. Thinly apply brake rubber grease to the oil seal on the master cylinder piston shaft.
3. Install the master cylinder to the brake booster with attaching nuts. Tighten the attaching nuts evenly to the specified tightening torque.
   Tightening Torque: 12.7 ± 2.5 N·m (1.3 ± 0.3 kgf-m)

WARNING:
- Be sure to perform the adjustment of the brake booster push rod height, if any inner part of the master cylinder has been replaced.
  Failure to observe this warning may lead to damage or malfunction of the brake system.

JBR00040-00000

JBR00041-00035

4. Temporarily connect the brake pipes to the master cylinder and tighten the flare nuts to the specified tightening torque.
   Tightening Torque: 12.7 - 17.7 N·m (1.3 - 1.8 kgf-m)

5. Connect the brake fluid level switch connector.
6. Perform air bleeding for the brake system.
7. Ensure that no fluid leakage exists on the brake system.
8. Perform the checks and adjustments of the brake pedal height. (Refer to the brake papal section.)
9. Check the brake fluid leakage on the brake system.

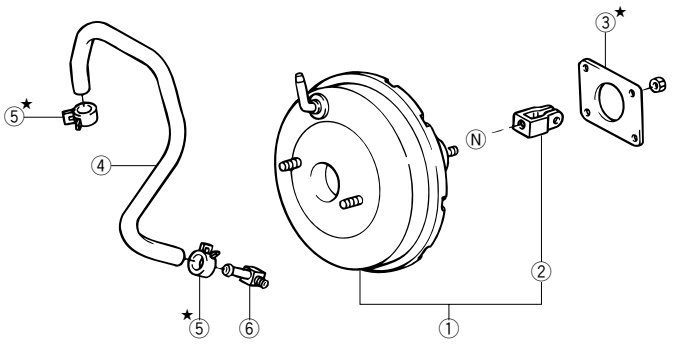
JBR00042-00036

BRAKE BOOSTER

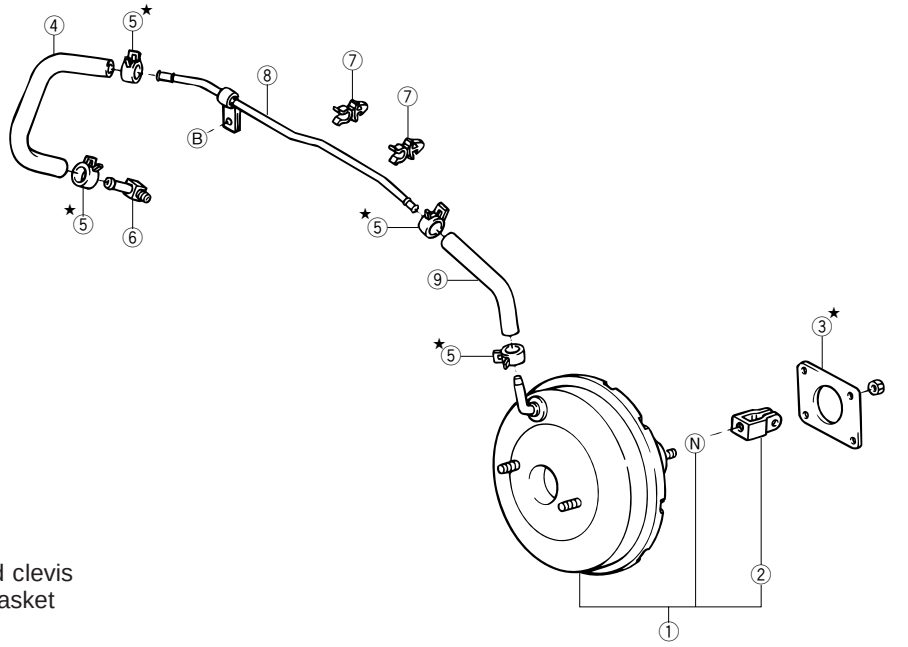
COMPONENTS

★ : Non-reusable parts

RHD



LHD



① Brake booster assembly
② Master cylinder push rod clevis
③ Brake booster bracket gasket
④ Union to connector tube
⑤ Clip
⑥ Union
⑦ Intake manifold tube clamp
⑧ Intake manifold to connector tube
⑨ Union to check valve hose

JBR00043-00037

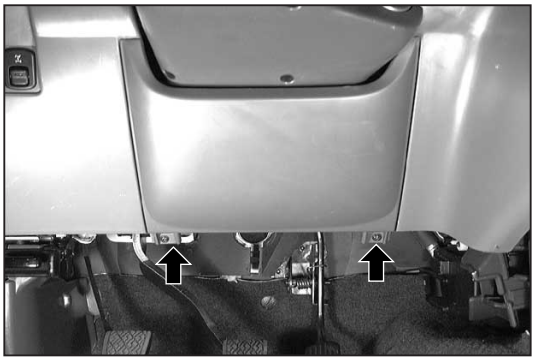
REMOVAL

1. Remove the brake master cylinder.
   (Refer to the “Brake master cylinder” section for removal.)
   CAUTION:
   - If the brake fluid is spilled inadvertently over the paint finish surface of the vehicle or resin part, immediately wipe off the brake fluid and wash with fresh water.

2. Remove the vacuum hose from the vehicle.

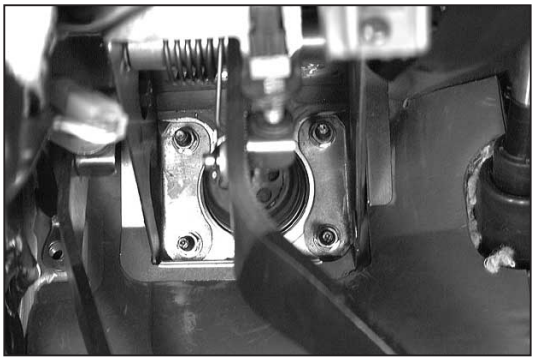
JBR00044-00038

3. Remove the instrument finish lower panel by removing the two attaching bolts.



JBR00045-00039

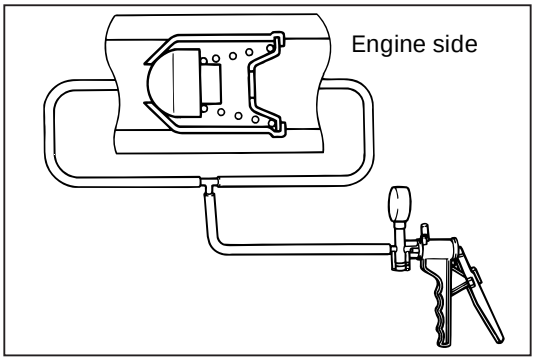
4. Remove the clip of the push rod clevis pin.
5. Remove the push rod clevis pin.
6. Loosen the brake booster attaching nuts evenly.
7. Remove the brake booster attaching nuts.
8. Remove the brake booster from the dash panel.
   CAUTION:
   - Be very careful not to deform the brake tubes during the removal of the brake booster.



JBR00046-00040

INSPECTION

1. Inspection of check valve (vacuum hose)
   Check that continuity exists from the booster side to the engine side. Also, check that no continuity exists from the engine side to the booster side.
   If the inspection results are not satisfactory, replace the vacuum hose.
2. Inspection of booster push rod-to-master cylinder clearance
   Check the clearance of the brake booster push rod.
   (Refer to the “Brake master cylinder” section.)



JBR00047-00041

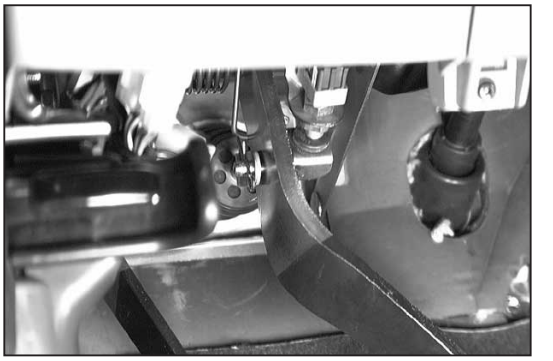
INSTALLATION

1. Install the brake booster to the dash panel with a new brake booster bracket gasket interposed.
2. Install the attaching nuts and tighten them to the specified tightening torque.
   Tightening Torque: 9.8 - 15.7 N·m (1.0 - 1.6 kgf-m)

   CAUTION:
   - Care must be exercised so that the brake tubes may not be interfered with the brake pedal during the installation.

JBR00048-00000

3. Connect the clevis and brake pedal with the clevis pin.
   If any difficulty is encountered in installing the clevis pin, loosen the lock nut of the clevis and adjust the length of the push rod of the brake booster by turning the brake booster push rod or clevis.
4. Apply chassis grease to the sliding surface of the components.
5. Install a new clip to the clevis pin.
6. Perform the check and adjustment of the brake pedal.
   (Refer to the “Brake pedal” section.)



JBR00049-00042

6. Install the instrument finish lower panel and install two attaching screws.
7. Install the brake master cylinder.
   (Refer to the brake master cylinder section for installation.)
   CAUTION:
   - Be sure to follow the installation procedure for the brake master cylinder described in the above mentioned section. Failure to observe this caution may lead to serious accidents or problems.

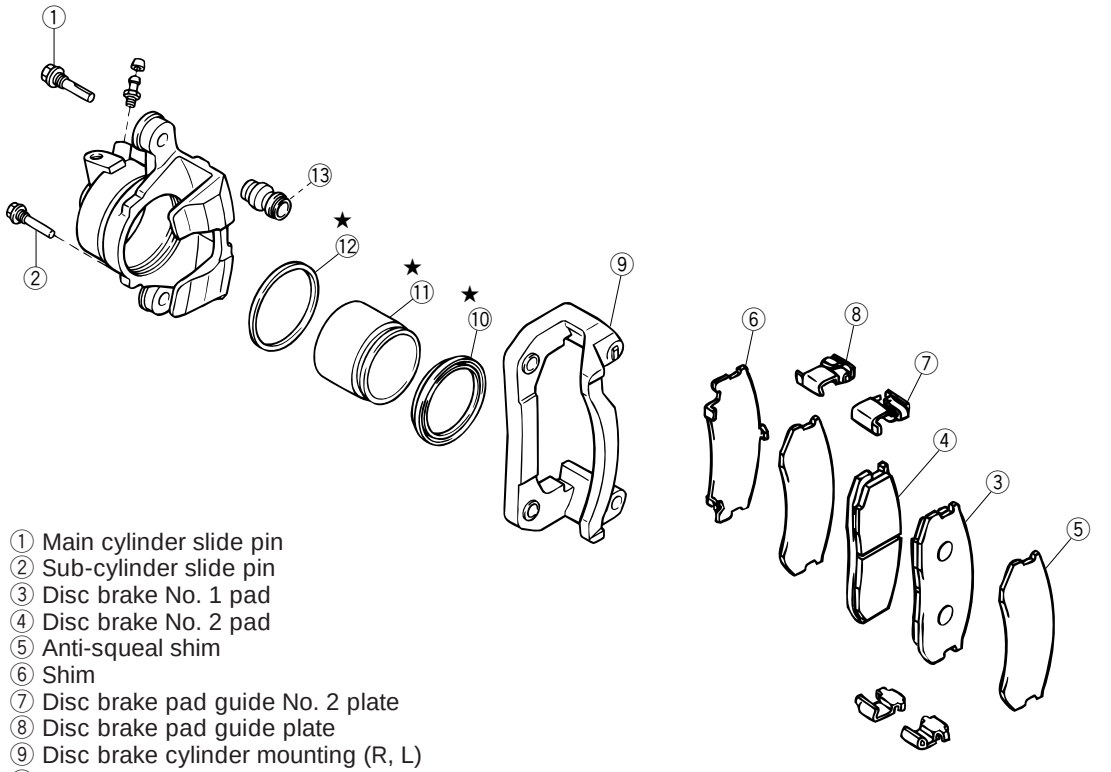
8. Perform the air bleeding.
   (Refer to BR–4.)
9. Check the brake performance with a four-wheel brake tester.

JBR00050-00000

FRONT BRAKE

COMPONENTS

★ : Non-reusable parts



① Main cylinder slide pin
② Sub-cylinder slide pin
③ Disc brake No. 1 pad
④ Disc brake No. 2 pad
⑤ Anti-squeal shim
⑥ Shim
⑦ Disc brake pad guide No. 2 plate
⑧ Disc brake pad guide plate
⑨ Disc brake cylinder mounting (R, L)
⑩ Cylinder boot
⑪ Front disc brake piston
⑫ Piston seal
⑬ Pin boot

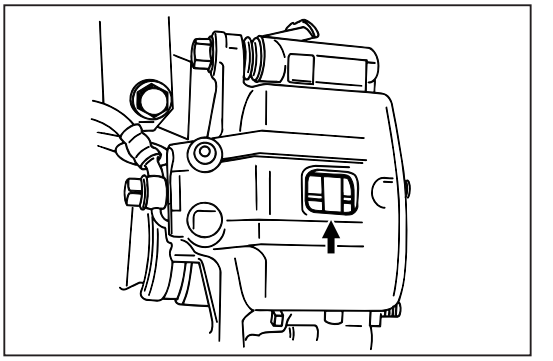
JBR00051-00043

INSPECTION

1. Jack up the vehicle and support the vehicle with safety stands. (Refer to the GI section.)
2. Remove the front wheels.
3. Check the pad thickness through the inspection hole provided at the disc brake caliper as shown.

   Specified Thickness: 10 mm
   Minimum Thickness: 1 mm

   If the brake pad thickness is less than the specified value or the wear indicator emits a warning sound, replace the brake pad with a new one.
   CAUTION:
   - Be sure to replace the right and left side brake pads as a set. Failure to observe this caution may lead to side pull of the brake function.



JBR00052-00044

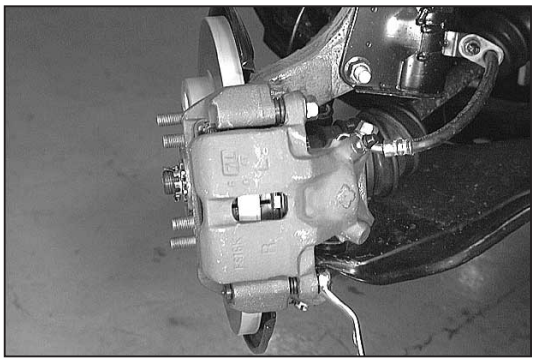
4. Install the front wheels.

REMOVAL

NOTE:
- The replacement procedure of the brake pads is not mentioned in this service manual. Refer to the procedure which is necessary to replace the brake pads.

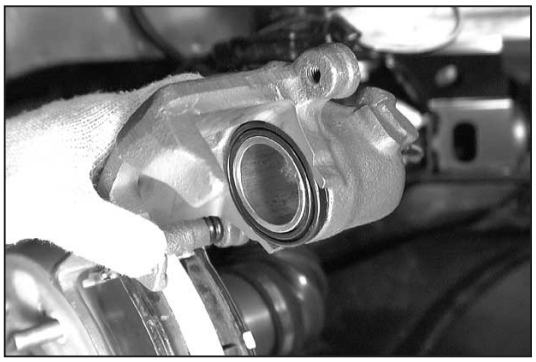
1. Jack up the vehicle and support the vehicle with safety stands. (Refer to the GI section.)
2. Remove the front wheels.
3. Drain the brake fluid from the front brake line.
   (When only necessary. Refer to the “Air bleeding” section.)

JBR00053-00000



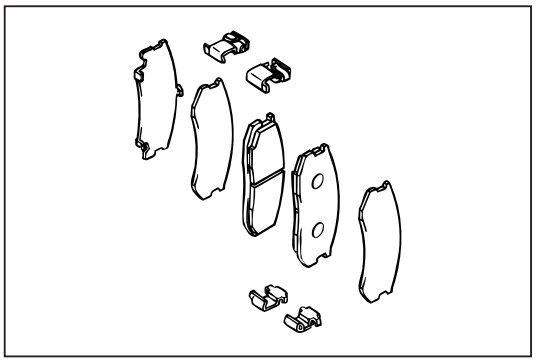
4. Disconnect the brake hose from the disc brake cylinder by removing the union bolt and gasket. (When necessary)
5. Loosen the cylinder slide pins.
6. Remove the cylinder slide sub pin.

JBR00054-00045



7. Turn up the disc brake assembly as shown.
   CAUTION:
   - Be very careful not to pull the brake hoses more than necessary.
8. Remove the disc brake cylinder assembly from the disc brake cylinder mounting.

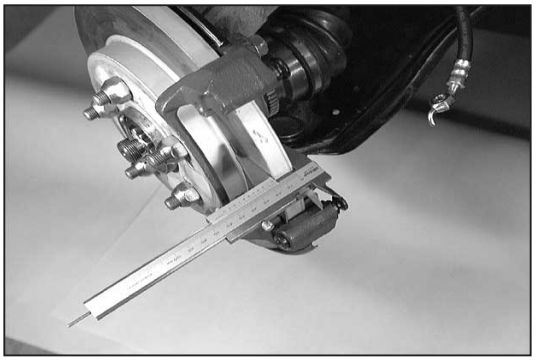
JBR00055-00046



9. Detach the following parts from the disc brake cylinder mounting.
   (1) Disc brake pad
   (2) Anti-squeal shims No. 1 and No. 2
   (3) Brake pad guide plates No. 1 and No. 2
10. Inspection of brake pad-related parts
    Ensure that the disc brake pad-related parts are free from damage, deformation, deterioration or corrosion.
    If any damage is found, replace the damaged part with a new one.
    CAUTION:
    - Replace the brake pad when damage or uneven wear exists.
    - Replace the right and left side brake pads as a set when replacing the brake pads. Failure to observe this caution may lead to side pull of the brake function.
    - Be sure to perform the brake pad replacement one side by one side. Failure to observe this caution may cause the piston to jump out.

JBR00056-00047

11. Ensure that the disc rotor thickness is more than that specified value by means of vernier calipers.
    Inspect the disc rotor thickness.
    Specified Thickness: 16 mm
    Minimum Thickness: 15 mm

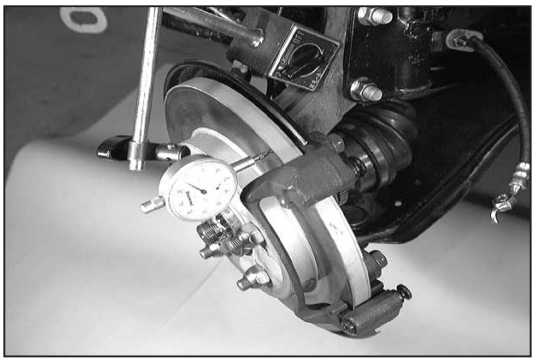

JBR00057-00048

12. Inspection of disc rotor runout
    (1) Secure the disc rotor with hub nuts properly.
    CAUTION:
    • Be sure to use suitable hub nuts if the hub is of a decorated type.

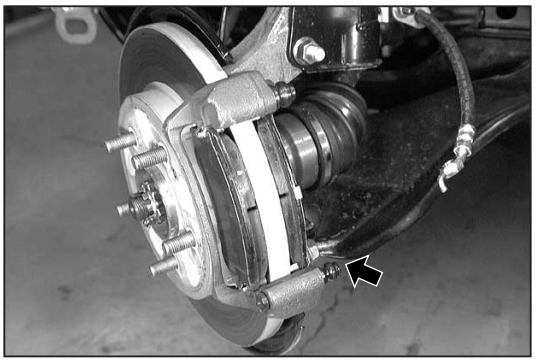
    (2) Ensure that the wheel bearings exhibit no looseness.
    If an excessive play is found, replace the wheel bearings.
    (3) Ensure that the disc rotor runout is within the specified value, using a dial gauge.
    Maximum disc runout: 0.10 mm

    CAUTION:
    • Be sure to check the runout at a point 10 mm inward from the outer edge of the disc rotor.

    If the measured runout exceeds the allowable limit, replace the disc with a new one.

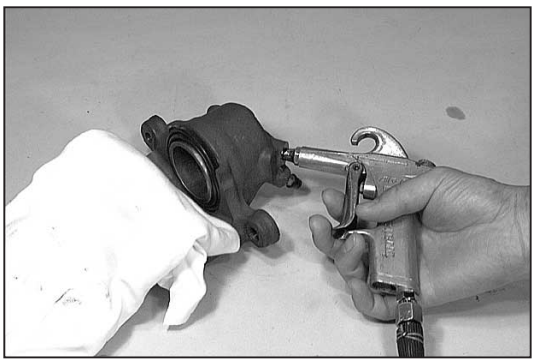

JBR00058-00049

13. Remove the pin boots from the disc brake cylinder mounting.
14. Remove the disc brake cylinder mounting by removing the attaching bolts.
15. Remove the disc rotor.

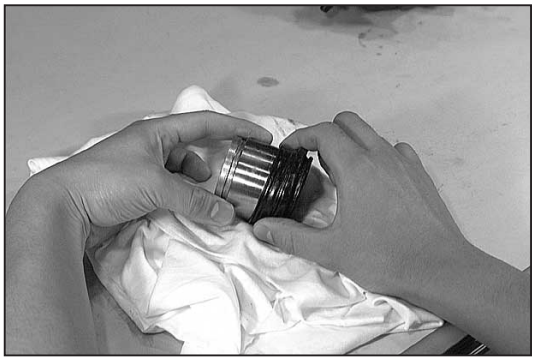

JBR00059-00050

Disassembly of front disc brake cylinder assembly

1. Removal of brake piston
   Apply compressed air gradually to the brake hose connecting hole of the disc brake cylinder assembly while a piece of cloth is placed at the piston end side, in order to prevent the piston from getting damaged and to prevent the brake fluid from splashing.
   WARNING:
   • Utmost care must be exercised so that your fingers or hands may not be pinched by the piston end.
   • Be sure to protect your eyes by wearing safety goggles when using compressed air.

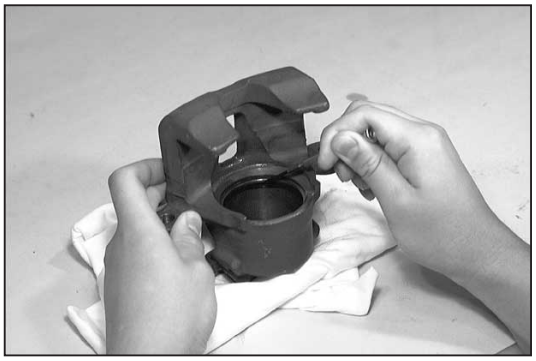

JBR00060-00051

2. Remove the cylinder boot from the cylinder.



JBR00061-00052

3 Detach the piston seal from the cylinder, using a suitable minor screwdriver or the like.
CAUTION:
- Be very careful not to score the cylinder bore wall, etc. during the removal.



JBR00062-00053

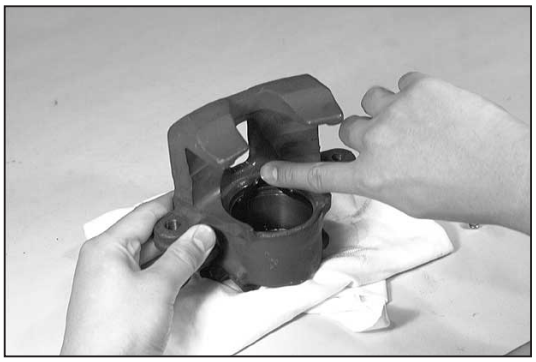
Assembly of front disc brake cylinder assembly

NOTE:
- The assembly procedure is basically reverse to the disassembly procedure. Therefore, some illustrations are not mentioned in this installation procedure.
- Please refer to the illustration mentioned in the disassembly procedure if any difficulty is encountered.

JBR00063-00000

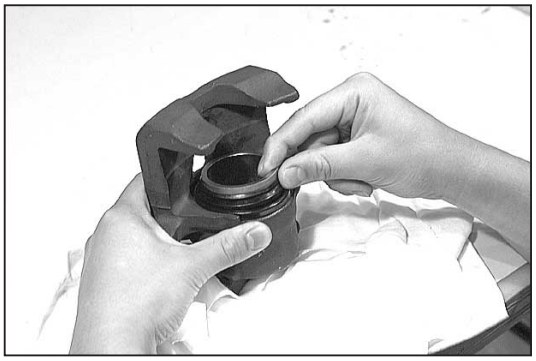
1. Assembly of front brake cylinder assembly
(1) Wash the disc brake cylinder and related parts, except rubber parts, with washing solvent and dry them with compressed air.
WARNING:
- Be sure to protect your eyes by wearing safety goggles, when using compressed air.
- If any damage, deformation, deterioration or wear exists on the components, replace the parts with new ones.

CAUTION:
- Replace the rubber parts with new ones.



JBR00064-00054

(2) Thinly apply brake rubber grease to the cylinder wall and the piston seal.
(3) Insert the piston seal to the groove in the disc brake cylinder.
(4) Thinly apply brake rubber grease to the piston and boot.
(5) Install the outer end of the boot to the groove in the cylinder.
(6) Insert the piston into cylinder through the boot, making sure that the piston is not tilted during the installation.
WARNING:
- Never score or damage the piston seal, boots, piston and cylinder during the installation.



JBR00065-00055

(7) Insert the outer end of the boot to the groove provided on the piston properly.
CAUTION:
- Never score or damage the boots.

(8) Install the cylinder main pin to the disc brake cylinder assembly by hand.

JBR00066-00056

INSTALLATION

NOTE:
- The installation procedure is basically reverse to the removal procedure. Therefore, some illustrations are not mentioned in this installation procedure.
- Please refer to the illustration mentioned in the disassembly procedure if any difficulty is encountered.

JBR00067-00000

1. Install the disc rotor on the front hub.
   CAUTION:
   - Be sure to clean the disc rotor attaching surface of the front hub and disc rotor before assembly.

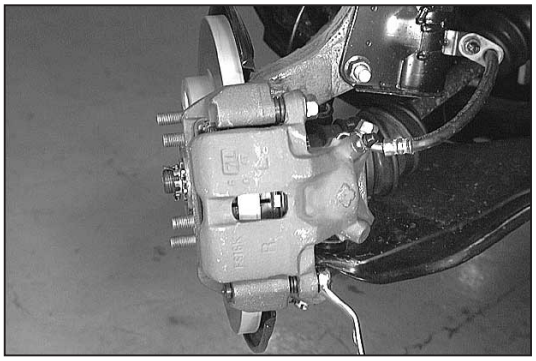
2. Install the disc brake cylinder mounting with the attaching bolts and tighten the attaching bolts to the specified tightening torque.
   Tightening Torque: 90.2 -135.3 N·m (9.2 - 13.8 kgf-m)

3. Thinly apply the brake rubber grease to the pin boots.
4. Install the pin boots to the disc brake cylinder mounting.
   NOTE:
   - Install the sub-cylinder slide pin boot, using the sub-cylinder slide pin.

5. Install the disc brake pad guide plates on the disc brake cylinder mounting.
6. Install the brake pads, anti-squeal shims and shims to the disc brake cylinder mounting.
7. Thinly apply the brake rubber grease to the sliding surface of the cylinder slide main pin.
8. Install the disc brake cylinder assembly to the disc brake cylinder mounting.
9. Turn over the disc brake assembly onto the disc brake pads, anti-squeal shims and shim while the pin boots of the sub-cylinder slide pin are being pushed by fingers.
   CAUTION:
   - Be very careful not to pull the brake hoses more than necessary. (When the brake hose is not disconnected)
   - Be very careful not to damage the pin boots during the assembly.
   - Care must be exercised so that the brake cylinder may not be interfered with the disc brake pads, anti-squeal shims and shim during the installation.

JBR00068-00000

10. Thinly apply the brake rubber grease to the sliding surface of the sub-cylinder slide pin.
11. Install the sub-cylinder slide pin of the disc brake cylinder assembly to the disc brake mounting.
    CAUTION:
    - Be very careful not to damage the pin boot during the assembly.



JBR00069-00057

12. Tighten the main and sub cylinder slide pins to the specified tightening torque.
    Tightening Torque:
    Main: 78.5 - 88.3 N·m (8.0 - 9.0 kgf-m)
    Sub: 44.1 - 53.9 N·m (4.5 - 5.5 kgf-m)

13. Connect the brake hose to the disc brake cylinder assembly by the union bolt with new gaskets interposed.
14. Tighten the union bolt to the specified tightening torque.
    Tightening Torque: 26.5 - 34.3 N·m (2.7 - 3.5 kgf-m)

    NOTE:
    - Make sure that the brake hose is not twisted or stretched.
    - After completion of the installation, turn the steering wheel from lock to lock position. Make sure that the brake hose is not interfered with other parts.

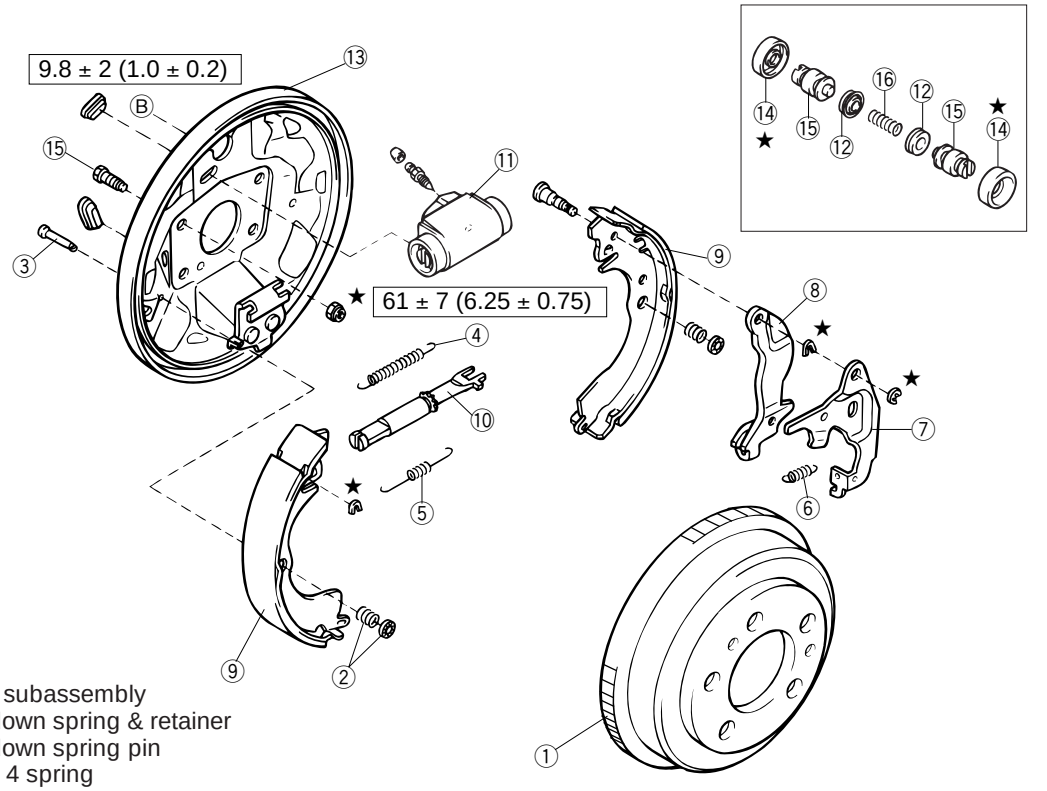
15. Perform the air bleeding for the brake line.
    (Refer to the “Air bleeding” section.)
16. Ensure that no fluid leakage is present on the brake hose connected section and parts between the disc brake cylinder and the disc brake piston.
17. Install the front wheels.
18. Depress the brake pedal more than 10 times.
19. Check to see if the brake disc can rotate smoothly.
20. Ensure that no abnormal sound is emitted or no drag exists when the wheel is rotated.
21. Check the brake performance with a brake tester.

JBR00070-00000

REAR BRAKE

COMPONENTS

□ : Tightening torque
Unit : N·m (kgf-m)
★ : Non-reusable parts



① Brake drum subassembly
② Shoe hold-down spring & retainer
③ Shoe hold-down spring pin
④ Tension No. 4 spring
⑤ Tension No. 3 spring
⑥ Tension spring
⑦ Automatic adjust lever (R, L)
⑧ Parking brake shoe lever (R, L)
⑨ Brake shoe assembly
⑩ Parking brake shoe strut
⑪ Cylinder assembly
⑫ Cylinder cap
⑬ Brake backing plate subassembly
⑭ Wheel cylinder boot
⑮ Wheel brake cylinder piston
⑯ Compression spring
⑰ Cylinder cup

JBR00071-00058

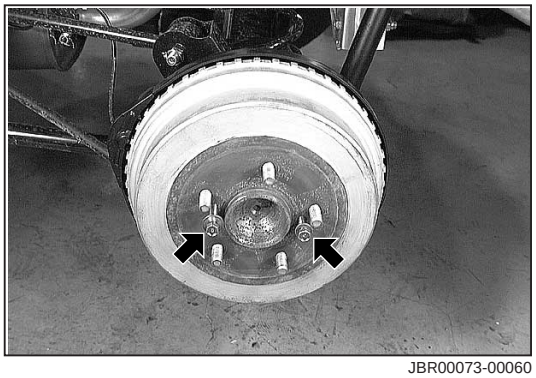
REMOVAL

1. Remove the hole plug at the inspection hole provided on the backing plate.
2. Inspect that the thickness of the brake shoe lining is more than the specified value, through the inspection hole.
   Standard thickness: 5.0 mm
   Minimum thickness: 1.0 mm

JBR00072-00059

DISASSEMBLY

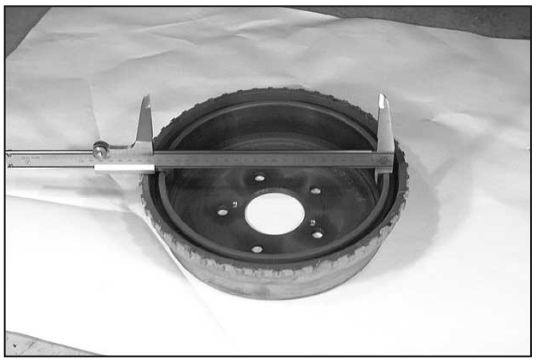
1. Jack up the vehicle and support it with safety stands.
   (Refer to the GI section.)
2. Drain the brake fluid from the rear brake line.
   (Refer to the Air breeding section.)
3. Remove the rear wheels.
4. Release the parking brake fully.
5. Remove the rear brake drum from the rear axle hub by pulling it out.
   NOTE:
   - If any difficulty is encountered in removing the brake drum, screw in the 8mm bolts to the brake drum evenly.
   - The bolt hole is offset. Therefore, after tightening the bolt to a certain extent, lightly tap the brake drum, using a plastic hammer or the like, so that the brake drum may be lifted up evenly.



JBR00073-00060

6. Check the brake drum inner diameter, using suitable vernier calipers.
   Specified Diameter: 228.6 mm
   Allowable Limit: 229.6 mm

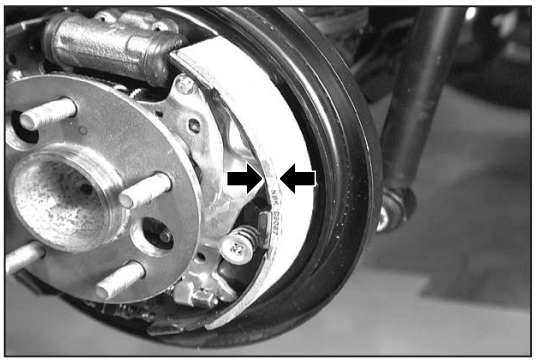
   If the diameter exceeds the specified value, replace the brake drum with a new one.



JBR00074-00061

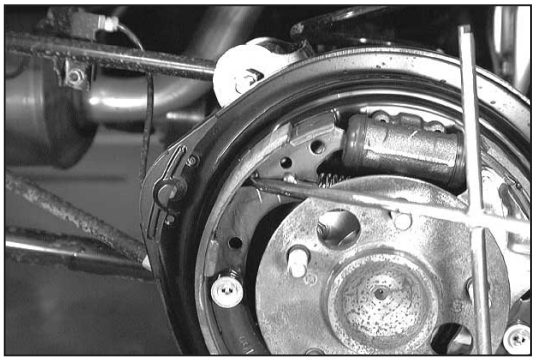
7. Check the brake shoe thickness, using suitable vernier calipers or ruler.
   Specified Thickness: 5.0 mm
   Allowable Limit: 1.0 mm

   If the diameter exceeds the specified value, replace the brake drum with a new one.
8. Check the brake shoe for seizure or abnormal wear, etc.
   If any damage exists, replace the brake shoe with a new one.



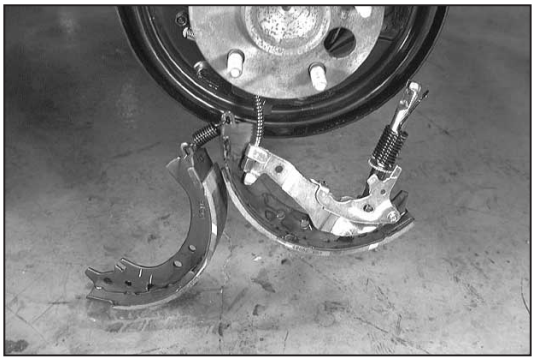
JBR00075-00062

9. Remove the tension No. 4 spring, using the following SST.
   SST: 09703-30010-000



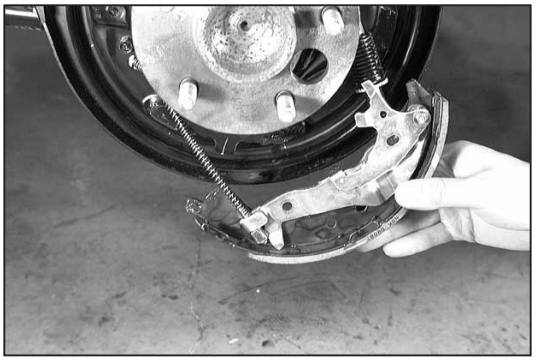
JBR00076-00063

10. Remove the shoe hold-down spring pin retainers and springs from the shoe hold-down spring pins.
11. Remove the shoe hold-down spring pins.
12. Detach the brake shoes from the backing plate.
13. Remove the leading side brake shoe from the tension No. 3 spring.
14 Remove the tension No. 3 spring.
15. Remove the parking brake shoe strut from the brake shoe.



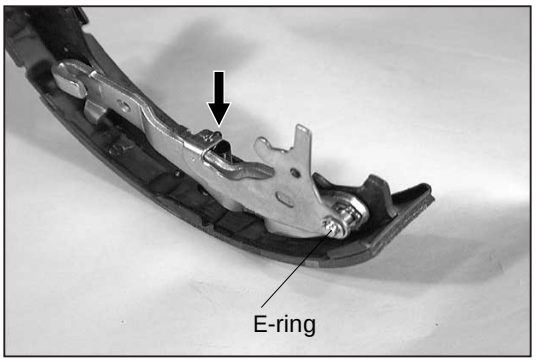
JBR00077-00064

16. Disconnect the parking brake cable from the parking brake shoe lever.
    NOTE:
    - If any difficulty is encountered in disconnecting the parking brake cable from the parking brake shoe lever, loosen the parking brake lever adjusting nut fully.



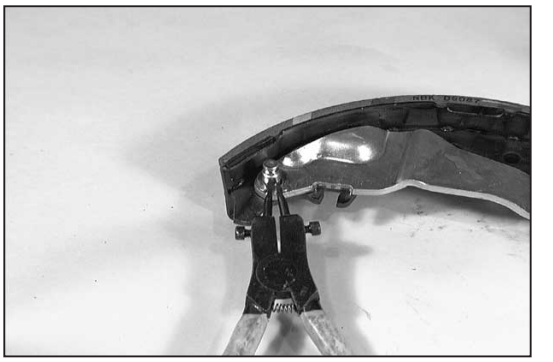
JBR00078-00065

17 Remove the tension spring.
18. Remove the automatic adjuster lever from the brake shoe by removing the E-ring.
    CAUTION:
    - Never reuse the removed E-ring.



JBR00079-00066

19. Remove the parking brake shoe lever and parking brake lever pin from the brake shoe by extracting the C-ring, using outside nose pliers or the like.
    CAUTION:
    - Never reuse the removed C-ring.

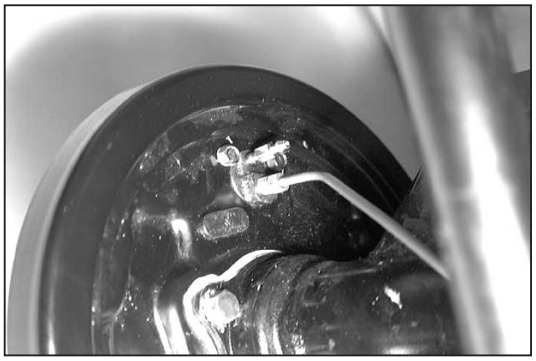


JBR00080-00067

20. Remove the wheel cylinder boots, wheel cylinder pistons with the cup and compression spring from the wheel cylinder.
21. Remove the piston cup and boots from the wheel cylinder pistons.

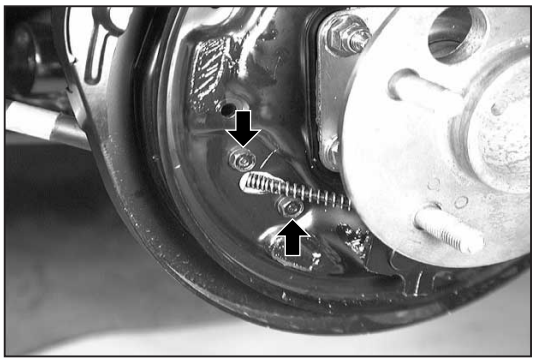
JBR00081-00068

22. Disconnect the brake pipe from the wheel cylinder by disconnecting the flare nut, using a flare nut wrench.
23. Remove the wheel cylinder by removing the attaching bolts.



JBR00082-00069

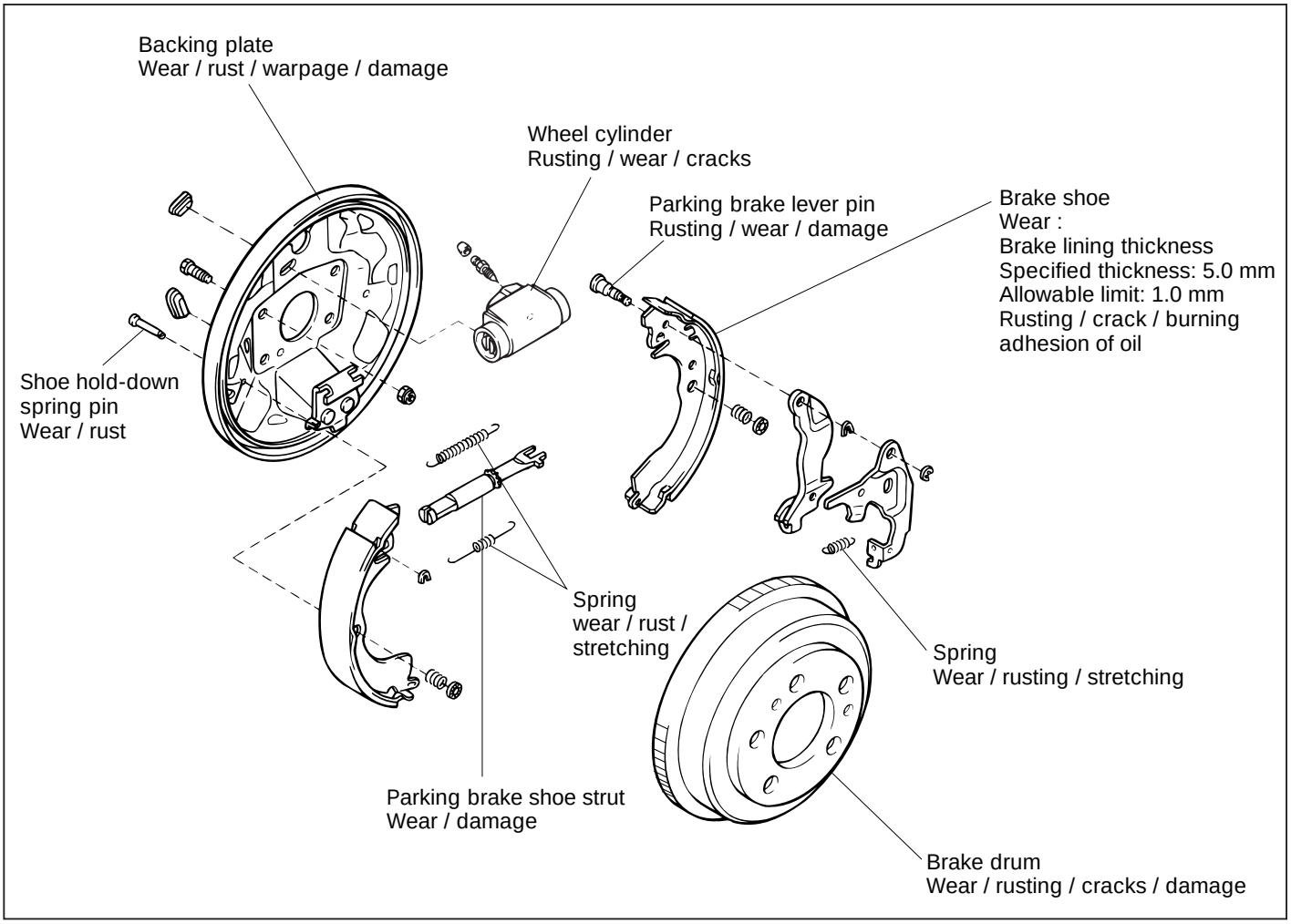
24. Disconnect the parking brake cable from the backing plate by removing the two attaching bolts.
25. Remove the wheel speed sensor by removing the attaching bolt. (Only when equipped)
26. Remove the backing plate.
(Refer to the RS section.)



JBR00083-00070

INSPECTION

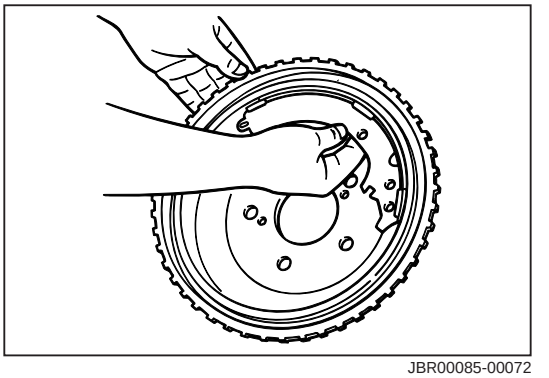
1. Inspect the components with point mentioned in figure.
If any damage is found, replace the damaged parts with new ones.



JBR00084-00071

2. Checking of brake lining contacting condition with brake drum
   (1) Apply powder of chalk to the brake drum. Then, check the brake lining surface contacting condition with the brake drum by rubbing the brake lining in the brake drum.
   If the contacting condition of the brake lining with brake drum is poor, grind the brake lining surface with abrasive paper or the like.
   CAUTION:
   - Replace the brake lining with a new one if an excessive uneven contact exists.
   - Ensure that the brake lining thickness is within the specified value after grinding.

   (2) Make sure that the contacting condition of the brake lining is sufficient after grinding the brake lining.
   (3) Clean the brake lining and brake drum after performing the checking of the brake lining contacting condition.



JBR00085-00072

INSTALLATION

CAUTION:
- Be sure to apply brake grease to the metal and metal sliding surfaces, unless otherwise specified.

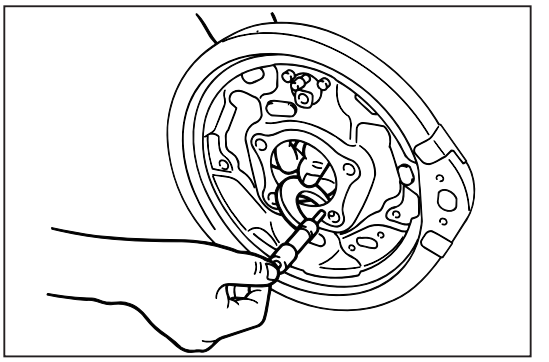
NOTE:
- The installation procedure is basically reverse to the removal procedure. Therefore, some illustrations are not mentioned in this installation procedure.
- Please refer to the illustration mentioned in the removal procedure if any difficulty is encountered.

JBR00086-00000

1. Installation of backing plate
   Refer to the RS section for installation of the backing plate. Be sure to select the correct shim when the backing plate is replaced with a new one in the manner described as follows.
   Selection of shim
   (1) Measure the thickness of the new backing plate.
   (2) Select the shim from the following table which corresponds to the thickness of the new backing plate.

   Rear axle bearing retainer gasket (shim)

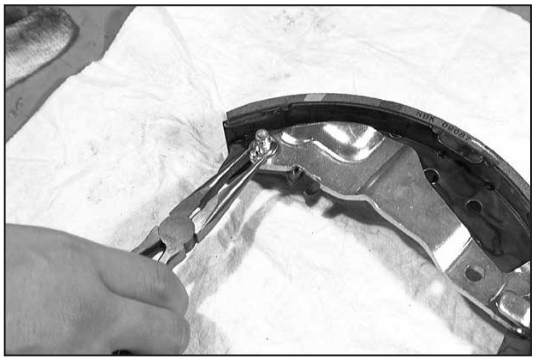
Thickness of backing plate	Thickness of shim
2.650 - 2.790	0.15
2.505 - 2.650	0.30
2.410 - 2.505	0.40



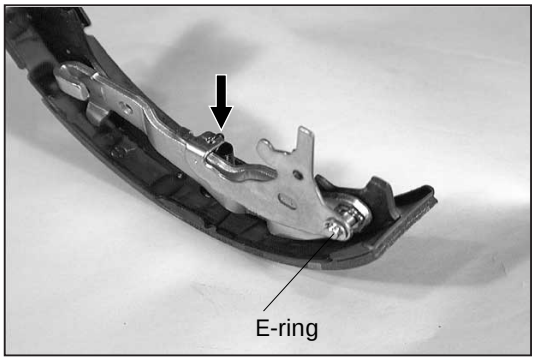
JBR00087-00073

2. Install the backing plate with the selected shim.
   (Refer to the RS section for installation.)
3. Connect the parking brake cable to the brake backing plate with two attaching bolts and tighten them to the specified tightening torque.
   Tightening torque: 6.0 - 9.0 N·m (0.64 - 0.96 kgf-m)

4. Thinly apply brake grease to the sliding portions of the parking brake shoe lever.
5. Install the parking brake shoe lever to the trailing side brake shoe with the parking brake lever pin together with a new C-ring. Then, retract the C-ring with pliers or the like.
   WARNING:
   - Never reuse the removed C-ring.

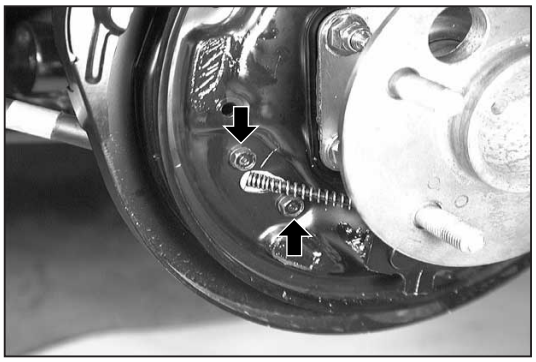

JBR00088-00074

6. Connect the automatic adjuster lever to the parking brake lever pin. Then, install the new E-ring.
7. Install the tension spring to the brake shoe and automatic adjuster lever.



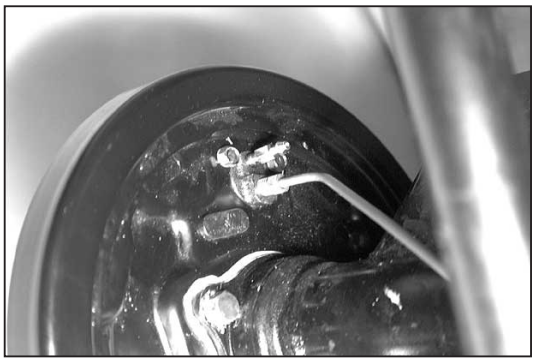
JBR00089-00075

8. Clean the backing plate thoroughly.
9. Connect the parking brake cable to the backing prate with two attaching bolts and tighten them to the specified tightening torque.


JBR00090-00076

10. Install the wheel cylinder to the backing plate with attaching bolts and tighten the attaching bolts to the specified tightening torque.
    Tightening Torque: 7.5 - 11.5 N·m (0.8 - 1.2 kgf-m)

11. Connect the flare nut of the brake tube to the wheel cylinder fully by hand and tighten the flare nut to the specified tightening torque.
    Tightening Torque: 12.7 - 17.6 N·m (1.3 - 1.8 kgf-m)

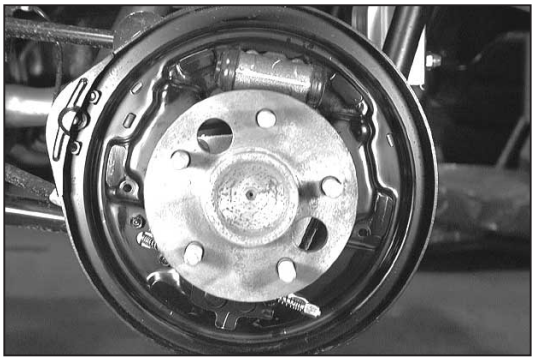

JBR00091-00077

12. Assemble new piston cups and rubber boots to the pistons.
13. Thinly apply brake rubber grease to the lip section of the piston cup.
    WARNING:
    - Never install the piston cups in a wrong direction. Failure to observe this warning may lead to brake fluid leakage or serious brake malfunction.

14. Install the compression spring and wheel cylinder pistons with the wheel cylinder boots to the wheel cylinder.
    NOTE:
    - Loosen the bleeder plug fully before installing the wheel pistons.

JBR00092-00078

15. Apply brake grease to the six brake shoe contacting points on the backing plate, one point each on the wheel cylinder pistons and two points on the brake lining anchor.
    WARNING:
    - Be careful not to allow lubricants, such as grease or oil etc., to get to the wheel cylinder boot or brake shoe lining.



JBR00093-00079

16. Connect the parking brake cable to the parking brake shoe lever.
17. Install the rear side brake shoes on the backing plate with the shoe hold-down pin, spring and retainer.
18. Connect the tension spring to the back side of the brake shoe.
19. Connect the other side of the brake shoe to the tension spring.
20. Thinly apply brake grease to the sliding section of the parking brake shoe strut.

JBR00094-00000

21. Install the other side of the brake shoe to the backing plate with the shoe hold-down pin, spring and retainer while placing the parking brake shoe strut in position.
22. Install the tension No. 4 spring to the brake shoes, using the following SST.
    SST: 09921-00010-000

23. Clean the brake drum contacting surface of the rear axle hub and axle hub contacting surface of the brake drum properly.
24. Install the brake drum to the rear axle hub.
    CAUTION:
    - Never allow the brake drum to interfere with the brake shoe during the installation.
    - Make sure that the parking brake lever strut is retracted fully before the installation.

25. Install the rear wheels.
    Tighten the attaching hub nuts to the specified tightening torque.
    Tightening Torque: 103.0 ± 14.7 N·m (10.5 ± 1.5 kgf-m.)

26. Perform air bleeding. (Refer to the “Air bleeding” section.)
27. Apply the parking lever several times, until the clicking sounds emitted from the rear brake will stops.

JBR00095-00000

Reference:

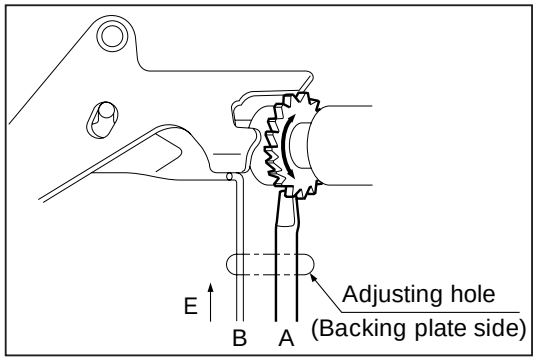
Manual adjusting method of brake shoe-to-drum clearance

NOTE:

- The illustration shows the brake at the right hand side. The brake at the left hand side is symmetric to the brake at the right hand side.

(1) Remove the adjusting hole plug provided on the backing plate.
(2) Turn the adjusting wheel by a flat screwdriver (A) inserted from the adjusting hole in the direction (C) as shown in the figure, until the brake shoe comes in contact with the brake drum.
(3) Turn back the adjusting wheel in the direction (D) by the screwdriver (A) while pushing up the adjusting lever with the L-shaped head bar (E), until the brake drum turns without dragging.
(4) Install the adjusting hole plug to the backing plate.

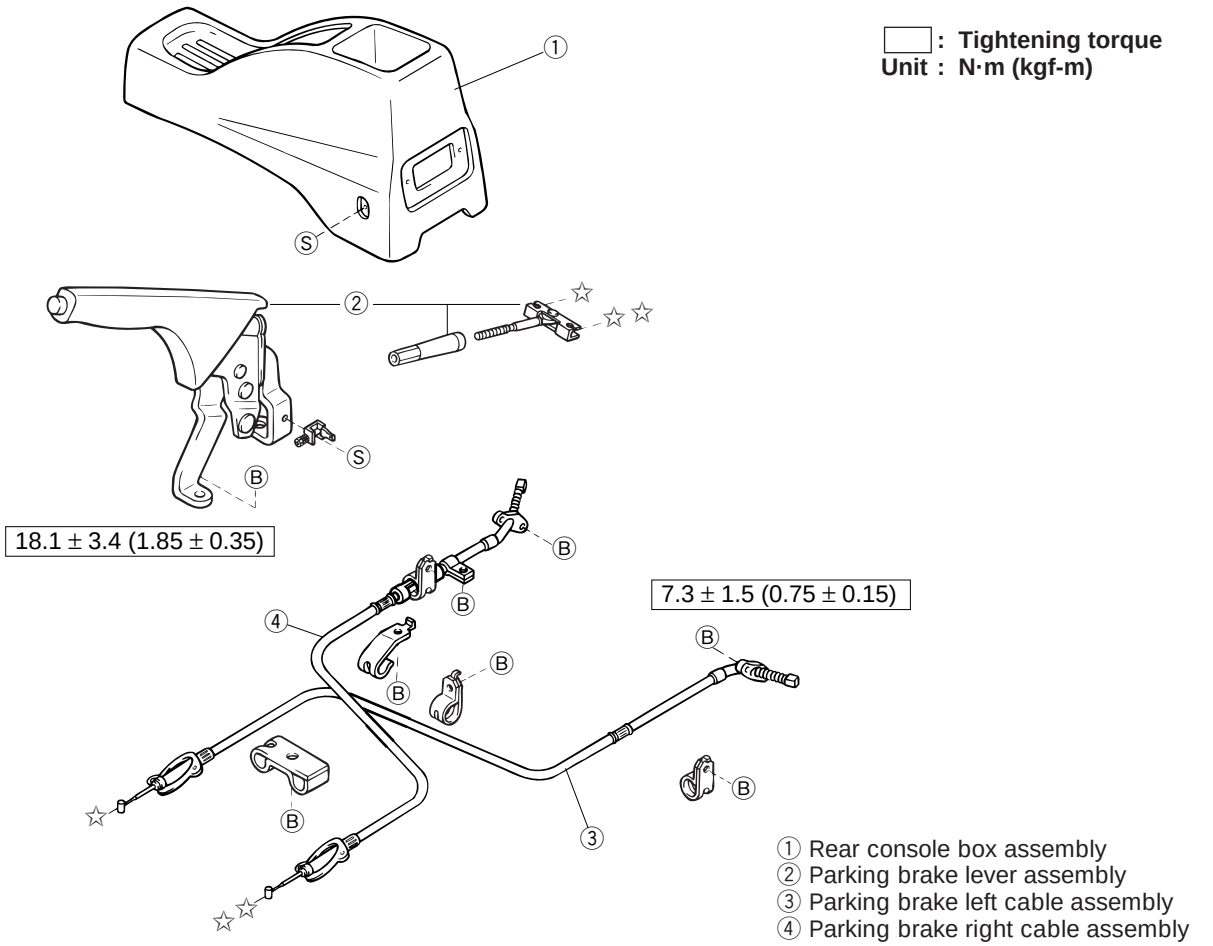
28. Adjust the working travel of the parking brake lever.
(Refer to the “Parking brake” section for adjustment.)
29. Check the brake performance with a four-wheel brake tester.



JBR00096-00080

PARKING BRAKE

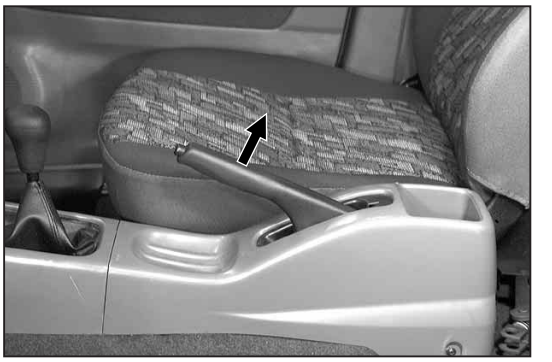
COMPONENTS



JBR00097-00081

INSPECTION

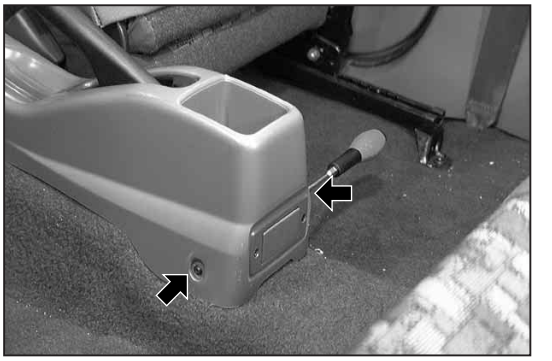
1. Pull up the parking brake control handle several times and place it to fully-returned position.
2. Ensure that the parking brake control handle travel is 5 to 7 notches when the parking brake control handle in pulled up with a force of 196 N (20 kgf).
   If the number of the notches fails to meet the specified numbers, adjust the parking brake control handle travel to the specified value.



JBR00098-00082

ADJUSTMENT

1. Depress the brake pedal fully several times and ensure that the parking control lever travel fails to meet the specified notches.
2. Remove the rear console box by removing the two attaching screws.

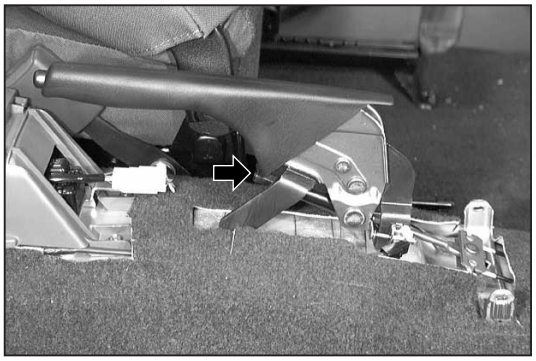


JBR00099-00083

3. Adjust the parking brake control handle travel to the specified number of notches by turning the adjusting nut of the parking brake pull rod.
   Specified Value: 5 - 7 notches

   CAUTION:
   - Be sure to use a hexagon socket (box) wrench for adjustment to prevent the adjusting nut from being damaged.

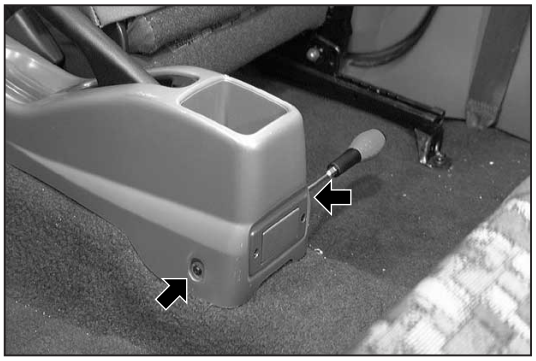
4. Install the rear console box with the two attaching screws.



JBR00100-00084

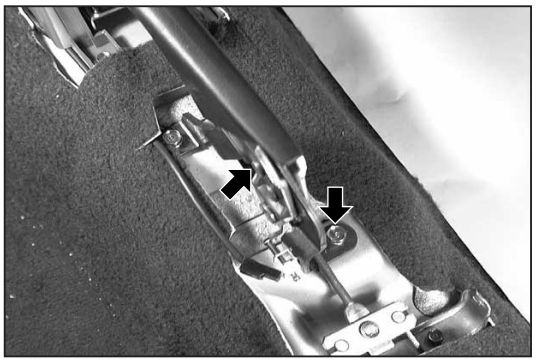
REMOVAL

1. Remove the rear console box by removing the two attaching screws. (Refer to the BO section.)



JBR00101-00085

2. Remove the adjusting nut from the parking brake pull rod.
3. Disconnect the connector from the parking brake switch.
4. Remove the parking brake control handle by removing the two attaching bolts.



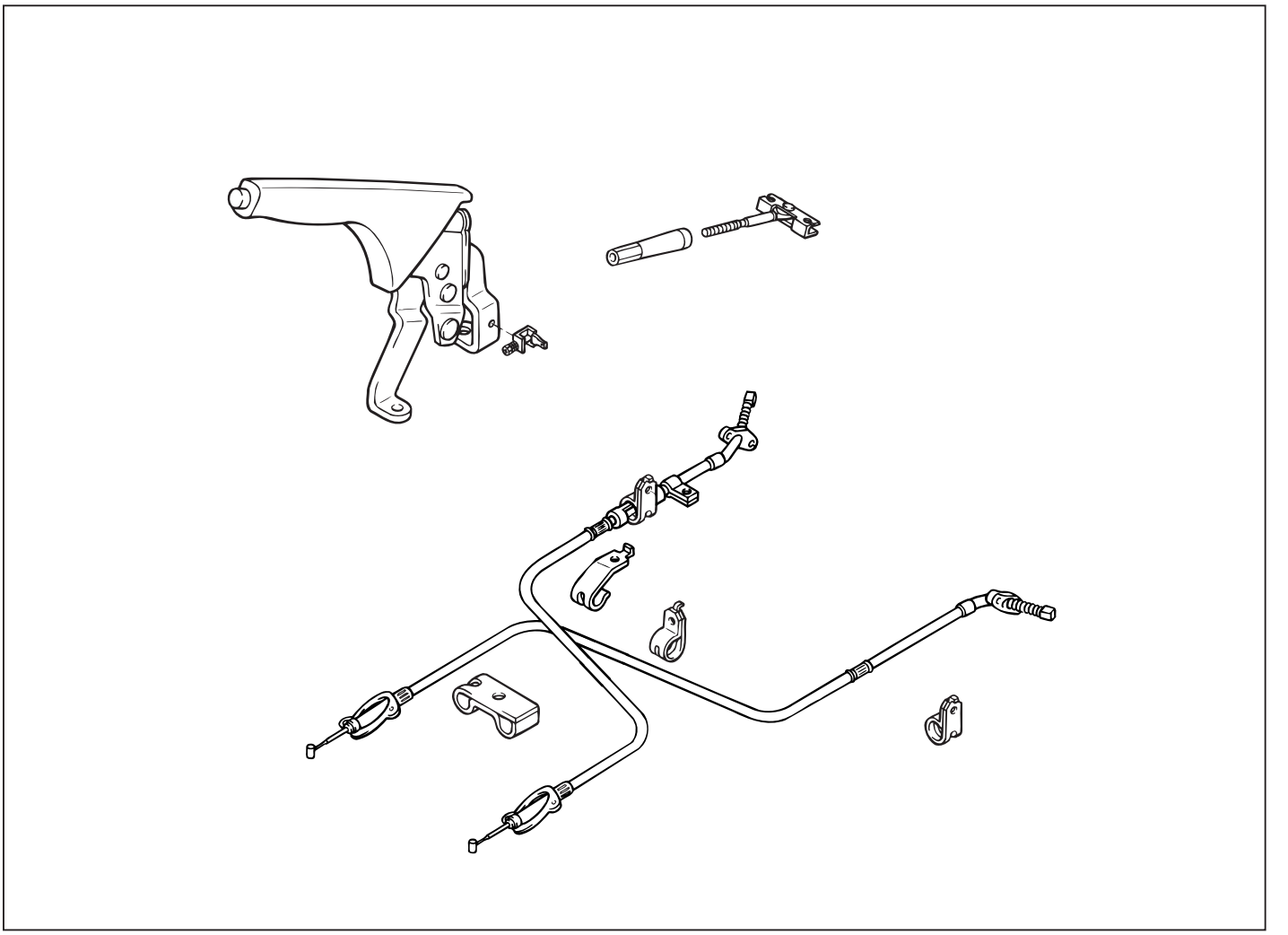
JBR00102-00086

5. Remove the parking brake pull rod by disconnecting the parking brake cables from the parking brake pull rod.
6. Lift up the vehicle and support the vehicle with safety stands.
   (Refer to the GI section for supporting section of the safety stands.)
7. Disconnect the parking brake cable assembly from the brake backing plate.
   (Refer to the rear brake section.)
8. Remove the parking brake cable by removing the attaching bolts of the parking brake cable and its clamps.
9. Remove the clamps from the parking brake cable assembly.

JBR00103-00000

INSPECTION

Inspect the components with the following point. Replace any damaged parts.



JBR00104-00087

INSTALLATION

NOTE:
- The installation procedure is basically reverse to the removal procedure. Therefore, some illustrations are not mentioned in this installation procedure.
- Please refer to the illustration mentioned in the removal procedure, if any difficulty is encountered.

1. Install the parking brake cable to the vehicle with the attaching bolts of the parking brake cable and its clamps.
   Tightening Torque: 5.8 - 8.8 N·m (0.6 - 0.9 kgf-m)

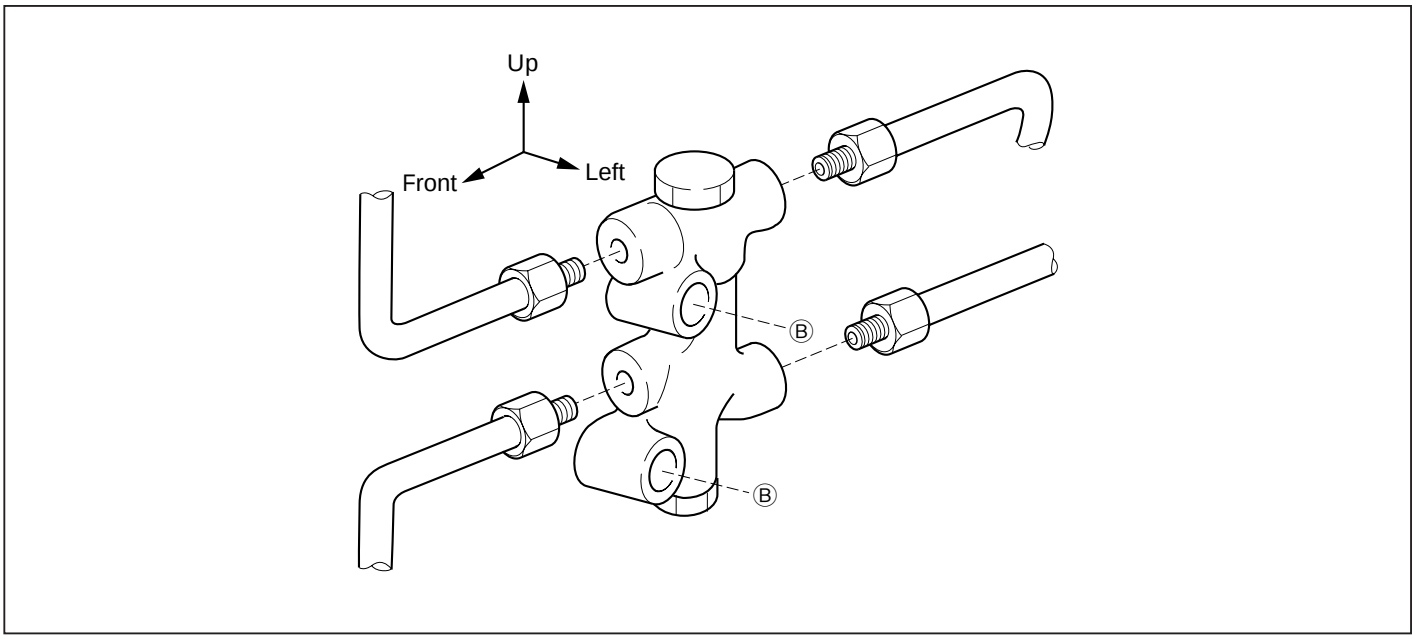
2. Connect the parking brake cable assembly to the brake backing plate. (Refer to the rear brake section.)
3. Lift down the vehicle.
4. Connect the parking brake cables to the parking brake pull rod.
5. Install the parking brake handle assembly to the floor panel while connecting the parking brake pull rod to the parking brake handle assembly and tighten the attaching bolts to the specified tightening torque.
   Tightening Torque: 14.7 - 21.6 N·m (1.5 - 2.0 kgf-m)

6. Install the adjusting nut.
7. Connect the connector of the parking brake switch.
8. Perform the adjustment of the parking brake lever. (Refer to the adjustment section.)
9. Install the rear console box with the two attaching screws.

JBR00105-00000

PROPORTIONING VALVE

COMPONENTS



JBR00106-00088

INSPECTION

Inspect the proportioning valve function with a four-wheel brake tester.

1. Place the vehicle on the four-wheel brake tester.
2. Ensure that the rear wheels will not be locked before the front wheels are locked.
   If the rear wheel will be locked simultaneously or before the front wheels are locked, replace the proportioning valve with a new one.

JBR00107-00000

REPLACEMENT

1. Open the engine hood.
2. Drain the brake fluid from the brake line.
   (Refer to the “Air bleeding” section.)
3. Remove the battery and battery carrier. (For RHD vehicle)
4. Disconnect the brake tubes from the proportioning valve.
5. Remove the proportioning valve by removing the attaching bolts.

JBR00108-00000

INSTALLATION

1. Install a new proportioning valve with the bolts and tighten them to the specified tightening torque.
   Tightening Torque: 13 - 15 N·m (1.3 - 1.5 kgf-m)

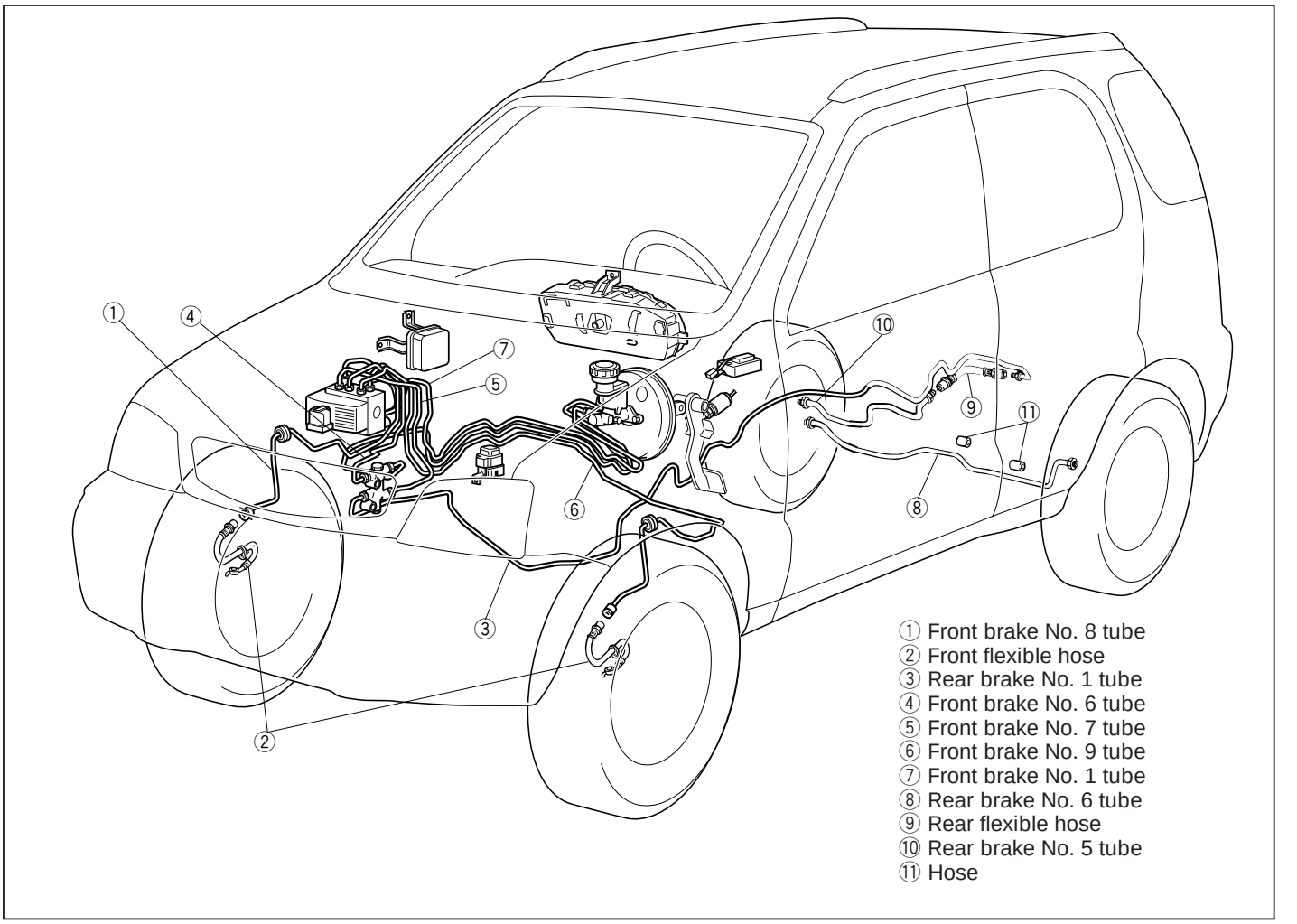
2. Connect the brake tubes to the proportioning valve fully by hand.
3. Tighten the flare nut to the specified tightening torque.
   Tightening Torque: 12.7 - 17.6 N·m (1.3 - 1.8 kgf-m)

4. Perform the air bleeding for the brake system.
   (Refer to the “Air bleeding” section.)
5. Perform the brake performance test with a four-wheel brake tester.

JBR00109-00000

BRAKE HOSE

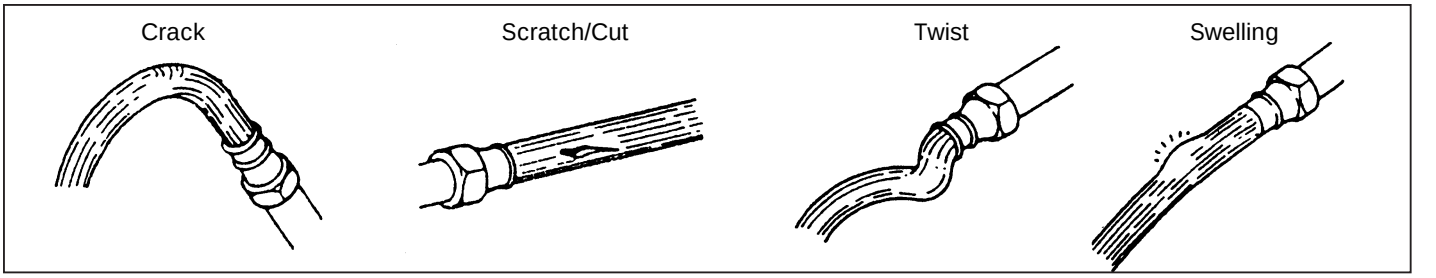
COMPONENTS



JBR00110-00089

INSPECTION

Inspect the brake hose for following points and replace it with a new one if any damage exists.

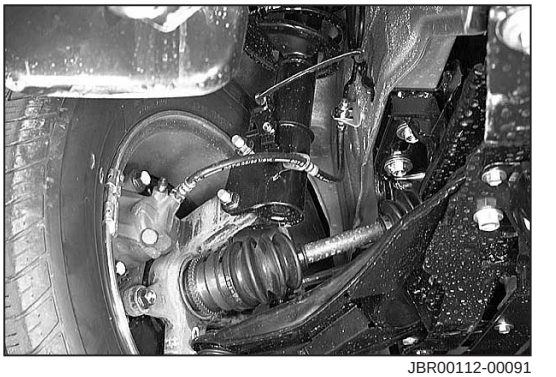


JBR00111-00090

REPLACEMENT

Front brake hose

1. Drain the brake fluid from the brake system.
   (Refer to the “Air bleeding” section.)
2. Disconnect the flare nut of the brake pipe from the brake hose, using a flare nut wrench.
3. Disconnect the brake hose from the clamp by removing the E-ring.
   NOTE:
   - Never reuse the used E-ring.



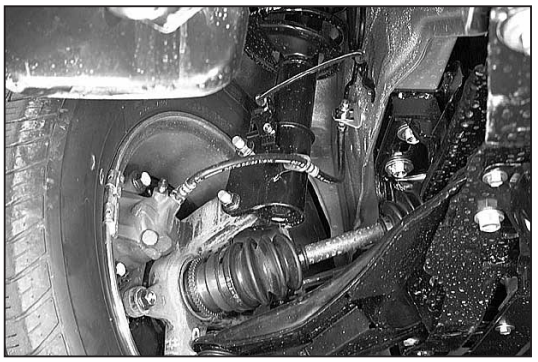
JBR00112-00091

4. Disconnect the brake hose from the disc brake cylinder assembly by removing the union bolts and washers.
   CAUTION:
   • Do not reuse the used washers.

5. Remove the brake hose by removing the attaching bolt of the clamp bolts.
6. Install the brake hose with the clamp bolt and tighten the clamp bolt to the specified tightening torque.
   Tightening Torque: 6.9 - 15.7 N·m (0.7 - 1.6 kgf-m)

7. Connect the brake hose to the disc brake cylinder assembly with the union bolt with a new gasket interposed.

JBR00113-00000



JBR00114-00092

8. Tighten the union bolt to the specified tightening torque.
   Tightening Torque: 26.5 - 34.3 N·m (2.7 - 3.5 kgf-m)

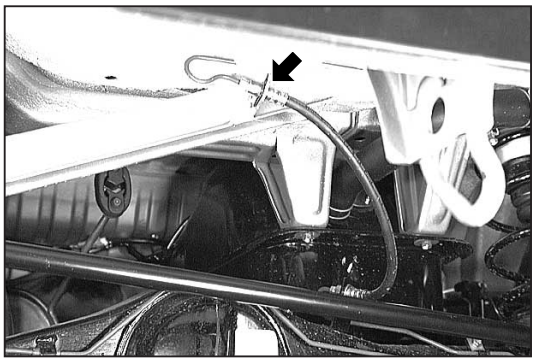
9. Connect the brake hose to the bracket and secure it by installing a new E-ring.
   CAUTION:
   • Be sure to connect the E-ring in such a manner that the E-ring is securely inserted in the groove provided on the brake hose end properly.

10. Connect the flare nut of the brake pipe to the brake hose fully by hand.
11. Tighten the flare nut to the specified tightening torque.
    Tightening Torque: 12.7 - 17.6 N·m (1.3 - 1.8 kgf-m)

12. Perform the air bleeding.
    (Refer to the “Air bleeding” section.)
13. Ensure that no brake fluid leakage exists.

Rear brake hose

1. Drain the brake fluid from the brake system.
   (Refer to the “Air bleeding” section.)
2. Disconnect the flare nut of the brake pipes from the brake hose, using a flare nut wrench.
3. Remove the brake hose from the clamps by removing the E-rings.
   WARNING:
   • Never reuse the used E-rings.



JBR00115-00093

4. Connect the brake hose to the brackets and secure it by installing new E-rings.
   WARNING:
   • Never reuse the used E-ring.
   • Be sure to connect the E-ring in such a manner that the E-ring is securely inserted in the groove provided on the brake hose end properly.

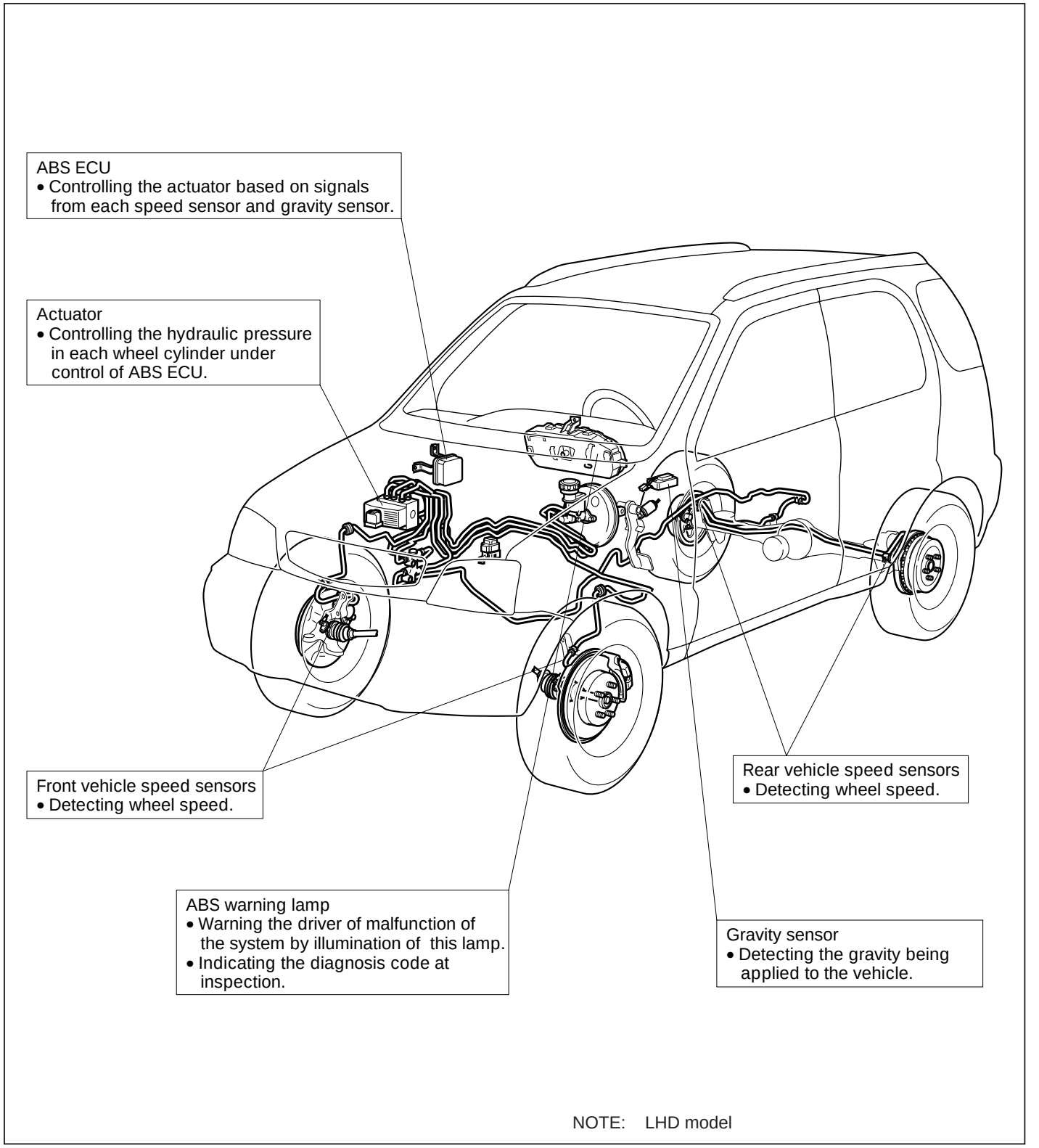
5. Connect the flare nuts of the brake pipes to the brake hose fully by hand.
6. Tighten the flare nuts to the specified tightening torque.
   Tightening Torque: 12.7 - 17.6 N·m (1.3 - 1.8 kgf-m)

7. Perform the air bleeding.
   (Refer to the “Air bleeding” section.)
8. Ensure that no brake fluid leakage exists.

ANTI-LOCK BRAKE SYSTEM

SYSTEM OUTLINE

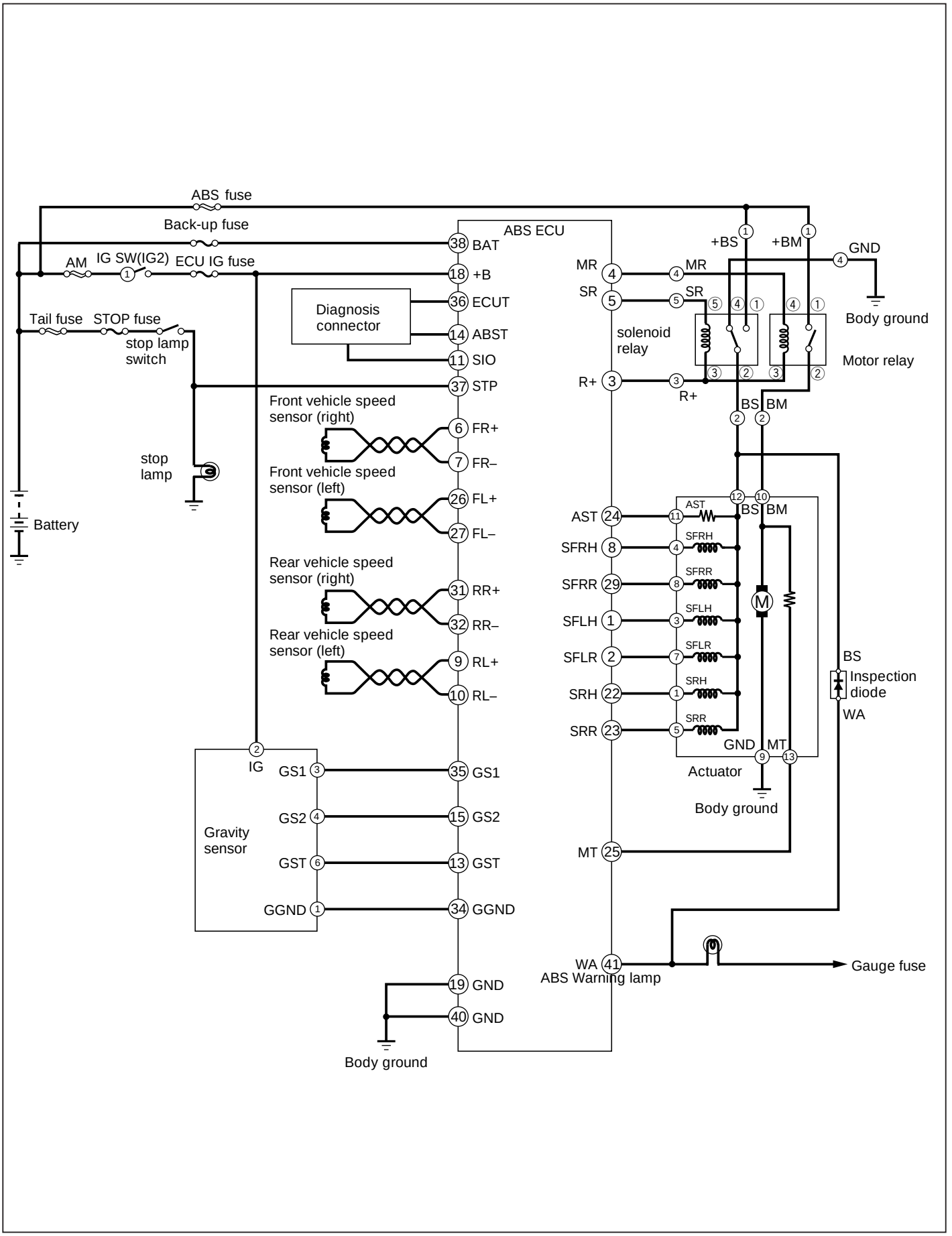
The ABS is a brake system to prevent the wheels from locking which may cause the vehicle to slip. For this purpose, the ABS assures proper braking forces at all times by maintaining the coefficient of friction between the tires and the road surface to an optimum level through controlling the hydraulic pressure of each of the front right, front left and rear wheels. In this way, the controllability or steerability of the steering wheel is assured even under sudden braking/hard braking, except for the case of over-speeding or sharp turning in a corner.



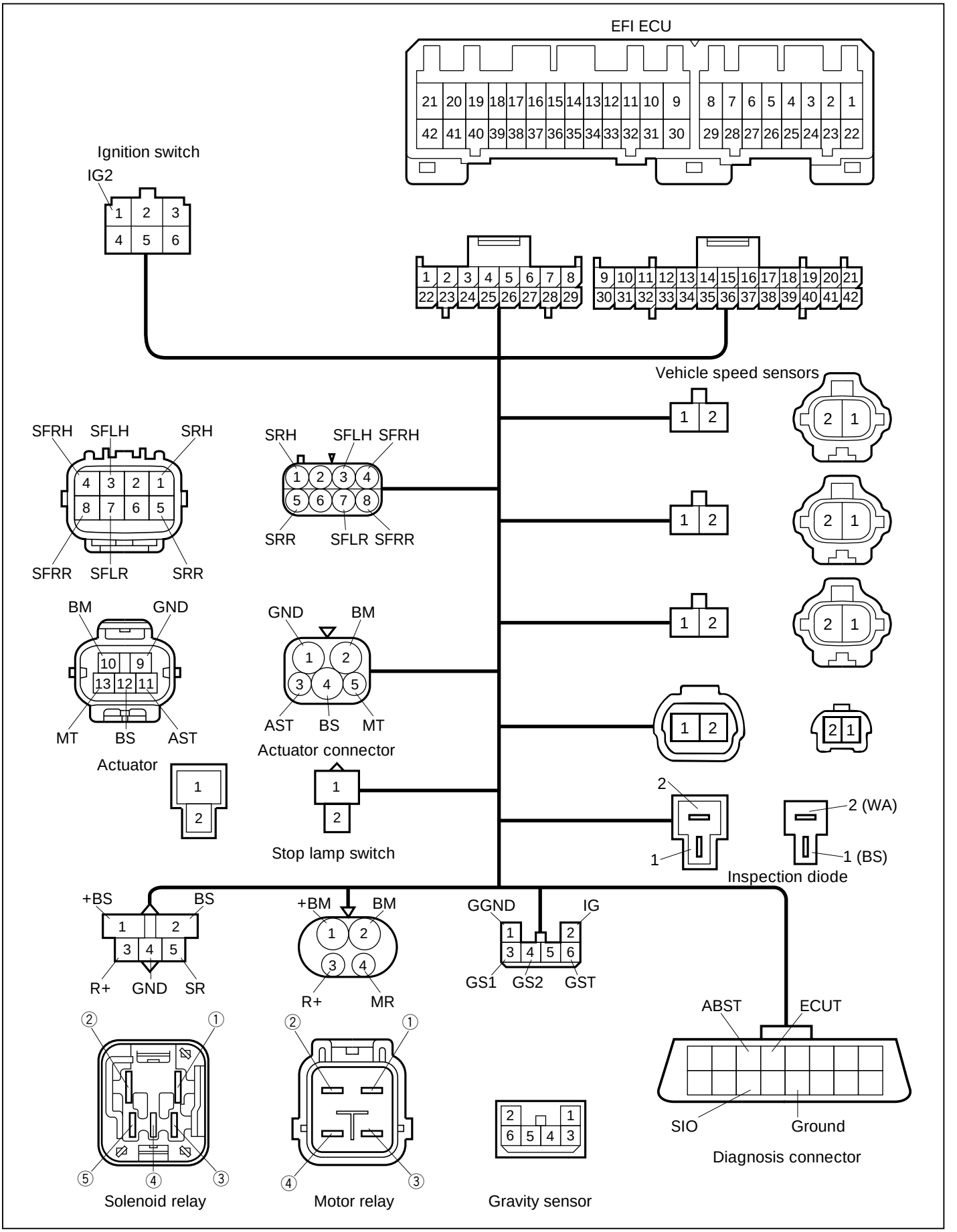
NOTE: LHD model

JABS00002-00001

JABS CIRCUIT DIAGNOSIS

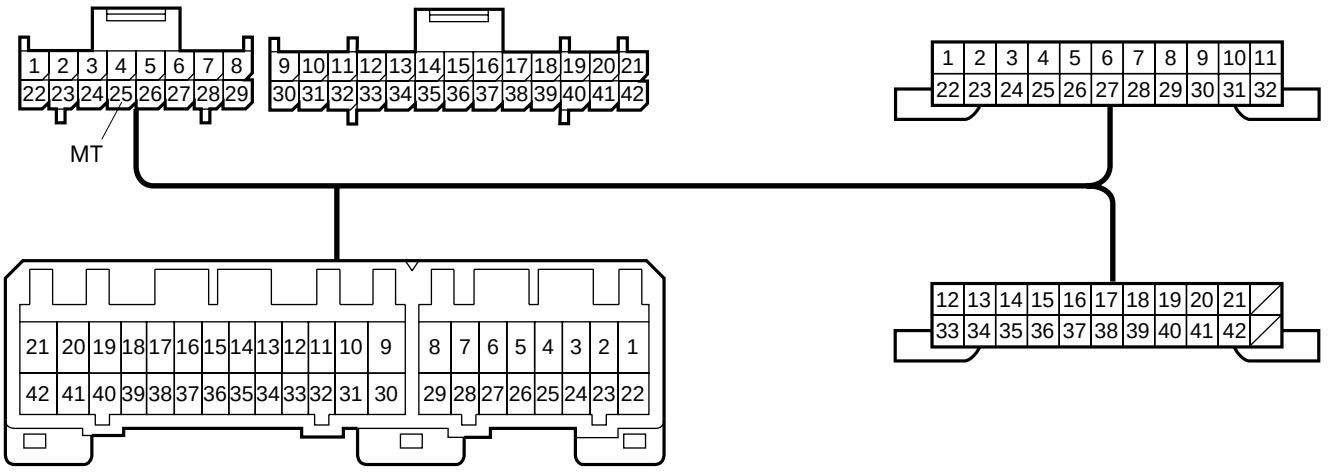


ABS RELATED CONNECTORS

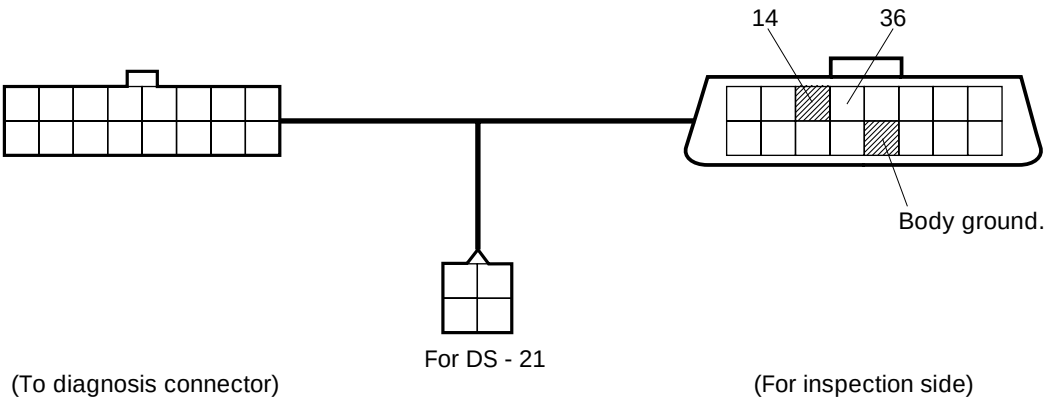


ABS00004-00003

SST (Sub - harness)



SST (Diagnosis connector)



ABS00000-00004

ABS CIRCUIT CONNECTION TABLE

ABS ECU SST (Sub-harness) No.	ABS ECU SST (Sub-harness) Terminal connected to	Terminal name	Terminal No. ABS actuator	Gravity sensor	Solenoid relay	Motor relay	Speed sensor Front RH	Speed sensor Front LH	Speed sensor Rear RH	Speed sensor Rear LH	Others
1	SFLH terminal of actuator	SFLH	③								
2	SFLR terminal of actuator	SFLR	⑦								
3	R+ terminal of motor and solenoid relay	R+			③	③					
4	MR terminal of motor relay	MR				④					
5	SR terminal of solenoid relay	SR			⑤						
6	Front right speed sensor (+)	FR+					②				
7	Front right speed sensor (–)	FR–					①				
8	SFRH terminal of actuator	SFRH	④								
9	Rear left speed sensor (+)	RL+								①	
10	Rear left speed sensor (–)	RL–								②	
11	SIO terminal diagnosis connector	SIO									Diagnosis connector *1
12		NIL									
13	GST terminal of gravity sensor	GST		⑥							
14	ABST terminal of diagnosis connector	ABST									Diagnosis connector *1
15	GS2 terminal of gravity sensor	GS2		④							
16		NIL									
17		NIL									
18	Ignition switch (IG 2)	+B									Ignition switch (IG 2) *2
19	Body ground	GND									Body ground *3
20	*Internal check use only	D/G									Never touch !! *4
21		NIL									
22	SRH terminal of actuator	SRH	①								
23	SRR terminal of actuator	SRR	⑤								
24	AST terminal of actuator	AST	⑪								
25	MT terminal of actuator	MT	⑬								
26	Front left speed sensor (+)	FL+						②			
27	Front left speed sensor (–)	FL–						①			
28		NIL									
29	SFRR terminal of actuator	SFRR	⑧								
30		NIL									
31	Rear right speed sensor (+)	RR+							①		
32	Rear right speed sensor (–)	RR–							②		
33		NIL									
34	GGND terminal of gravity sensor	GGND		①							
35	GS1 terminal of gravity sensor	GS1		③							
36	ECUT terminal of diagnosis connector	ECUT									Diagnosis connector *1
37	Stop lamp switch	STP									Stop lamp switch *2

ABS ECU SST (Sub-harness)		Terminal name	Terminal No.								
			ABS actuator								
				Gravity sensor							
					Solenoid relay						
						Motor relay					
							Speed sensor				
							Front		Rear		
No.	Terminal connected to						RH	LH	RH	LH	Others
38	Back-up fuse	BAT									Back-up fuse *3
39		NIL									
40	Body ground	GND									Body ground *3
41	ABS warning lamp	WA									Combination meter *2 Inspection diode
42		NIL									
–		BS	⑫		②						Inspection diode
–		BM	⑩			②					
–		GND	⑨								Body ground *3
–		+BS, +BM			①						ABS fuse *3
–		+B		②							ECU IG fuse *3
–		GND			④						Body ground *3

*1 : Refer to page ABS–3 and 4.

*2 : Refer to BE section.

*3 : Refer to HW section.

*4 : CAUTION:

- Never touch and connect anything to this terminal. Failure to observe this caution may lead to ABS ECU malfunction.

ABS00005-00000

PRECAUTIONS

1. The ABS system has a self-diagnosis function. The ECU memorizes abnormality as diagnosis codes which are occurring at present or occurred in the past.
   Memorized diagnosis codes are erased when the power supply is disconnected. Therefore, be sure to read out diagnosis codes before starting any operations.
   CAUTION:
   - Be sure to read out diagnosis codes of the EFI system before disconnecting the power supply. Failure to observe this caution will erase memorized diagnosis codes.

2. The components of the ABS system are precise and delicate. Therefore, never apply any excessive impact during the removal, inspection and installation.
   CAUTION:
   - Never use components to which an impact is applied by dropping or hitting with other objects.

3. Never perform the inspection of the ABS system when the vehicle is wet, such as after running in rain or snow and after washing, in order to prevent water or dust, etc. from being admitted into the ABS and related connectors.
4. Never allow water and dust, etc. to enter into the ABS and related connectors.
5. Never allow water, etc. to come in contact with the ABS components installed in the cabin and their connectors.
6. Prevent water from coming in contact with the ABS related parts and connectors during washing.
7. Prior to replacing the ABS ECU, thoroughly perform the trouble shooting for possible items other than the ABS ECU. The ABS ECU is a reliable, but an expensive part.
   Even when the ABS ECU is replaced according to the check results of the trouble shooting and the relevant trouble has been remedied, be sure to reinstall the old ABS ECU so as to confirm that the malfunction was obviously caused by the faulty ABS ECU.
8. Never try to remove the ABS ECU cover and touch the screws on the ABS ECU proper.
9. Ensure that the components of the brake system are installed properly and so that no brake fluid leakage exists before performing the trouble shooting of the ABS.
10. Ensure that no excessive rattle exists on each of the wheel bearings before performing the trouble shooting of the ABS.
11. When installing a wireless installation (HAM, CB, Telephone, etc.) :
    The ABS ECU has been so designed that it is resistant to external influence.
    However, if a vehicle is equipped with a wireless installation, such as CB, HAM, telephone and so forth, (even if its output is only 10 W) it may affect the ABS ECU adversely. Therefore, observe the following precautions.
    - Install the antenna at a place as far away as possible from the ABS ECU and related harnesses.
    - The antenna cord should be kept at least 30 cm from the ABS ECU and its related harnesses.
    - The antenna cord should not be routed in parallel to ABS related harnesses.
    - Adjust the antenna output correctly.
    - Never install a wireless installation with a high output into the vehicle.
    - Never use or place a handy telephone near the components of the ABS and its related harnesses.
12. When disconnecting or connecting connectors:
    - Prevent dust, water and foreign material, etc. from being admitted into the ABS related connectors when disconnecting or connecting the connectors. Failure to observe this caution may cause serious malfunction, due to lowering the insulation of each terminal.
    - Never damage or lose the gasket or seal of connectors during disconnection or connection.
    - Be sure to confirm the shape of the lock and release the lock properly before disconnecting the connectors.
    - Never damage the rubber protector of connectors during disconnection or connection.

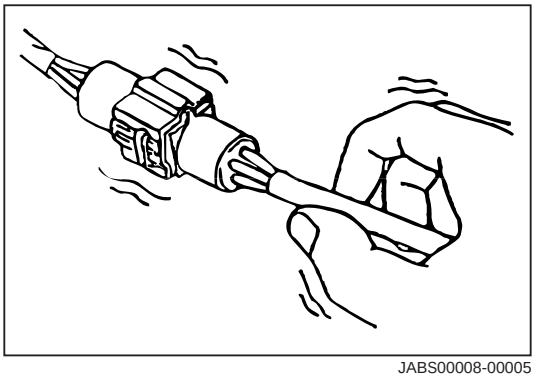
JABS00006-00000

13. Circuit tester
    - For trouble shooting, use a volt/ohmmeter whose internal resistance is more than 10 k ohm, whose resolution is 0.1 V or more and 0.5 ohm or more, and whose accuracy is 0 ± 2 % or more.
      Use of a volt/ohmmeter which has lower specifications than those described above for trouble shooting may lead to wrong diagnosis or mis-judgement.
14. Never deform the terminals of connectors by applying an excessive force when checks are performed by attaching the probe electrodes of the volt/ohmmeter to the terminals.
    Prevent such damage by utilizing SSTs effectively.
15. Be sure to disconnect the ground cable from the negative terminal of the battery before disconnecting the connector of the wire harness from the ABS ECU. Failure to observe this caution may lead to ABS ECU damage.

JABS00007-00000

TROUBLE SHOOTING HINTS

1. Most of troubles related to the electrical system of the ABS are merely caused by poor connections.
   Ensure the following points carefully before and during the inspection.
   (1) Visually inspect that the terminals are not damaged or bent.
   (2) Ensure that connectors are securely connected and locked.
   (3) Ensure that the measured continuity or resistance will not be changed when light vibration is applied to the connector or the wire harness connected to the related circuit of presumable parts of trouble.



JABS00008-00005

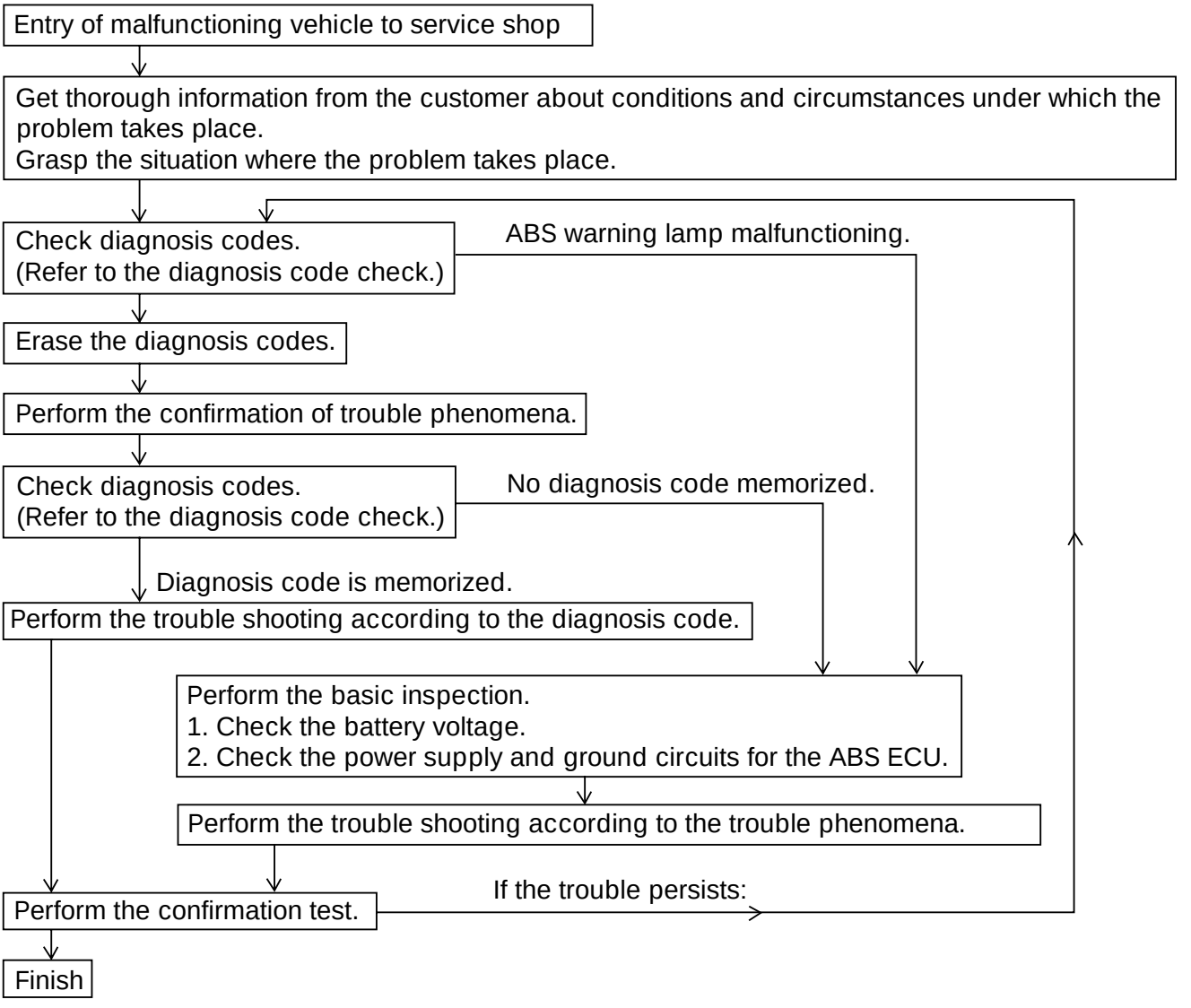
HOW TO PROCEED TROUBLE SHOOTING

The trouble or malfunction of the brake system mainly originates in the mechanical systems, such as the brake pedal, brake booster, brake master cylinder, P valve, wheel cylinders and brake fluid line, or electrical systems, such as the ABS actuator, wheel speed sensors, gravity sensor, ABS ECU and ABS related wiring harness.
This manual describes mainly trouble shooting of the electrical system of the ABS control systems on the premise that the brake mechanical systems are functioning normally.
Hence, when the brake system is encountered with any trouble, make sure that the trouble does not originate in the mechanical systems of the brake systems.

To proceed the trouble shooting, first perform the diagnosis check. Then, if any of the diagnosis codes other than the normal codes is outputted, perform the trouble shooting according to the diagnosis codes.
When no diagnosis code is outputted even if malfunction phenomena exists, perform the trouble shooting according to the malfunction phenomena.

The following diagram shows the basic procedure for the trouble shooting.
Actual approach may differ if you have much experience on this system. However, it is recommended to perform the trouble shooting according to this procedure.

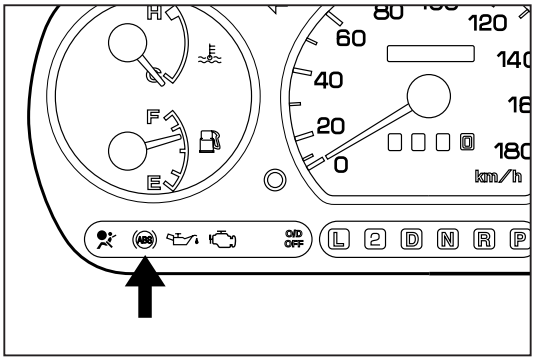
JABS00009-00000



JABS00010-00000

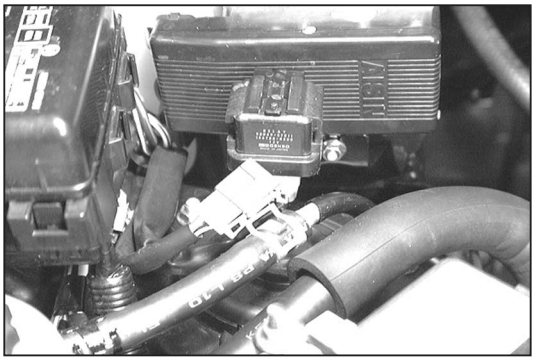
DIAGNOSIS CODE CHECK

1. Checking of ABS warning lamp
   (1) Ensure that the ABS warning lamp will glow for about three seconds after the ignition switch is turned ON, and, then, the warning lamp goes out.
   NOTE:
   • Proceed to trouble shooting according to the trouble phenomenon if the ABS warning lamp fails to meet the condition above.



JABS00011-00006

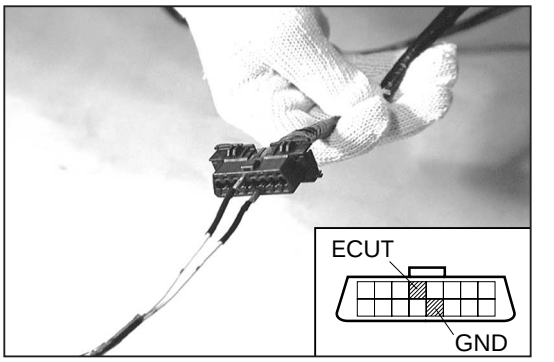
2. Output of diagnosis codes
   (1) Remove the inspection diode from the connector.


JABS00012-00007

   (2) Connect the following SST to the diagnosis connector.
   SST: 09991-87401-000

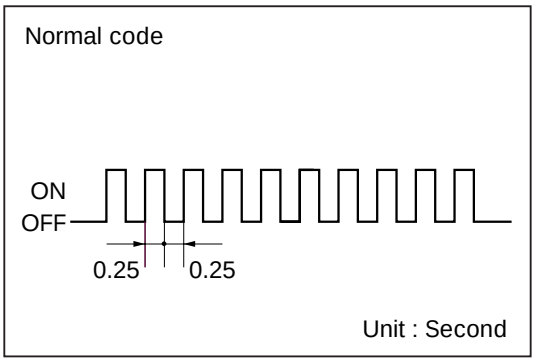
   (3) Connect the ECUT and GND terminals in the SST with the following SST.
   SST: 09991-87403-000

   CAUTION:
   • Never connect the terminal other than that specified. Even slight contact of the other terminals causes serius malfunction.

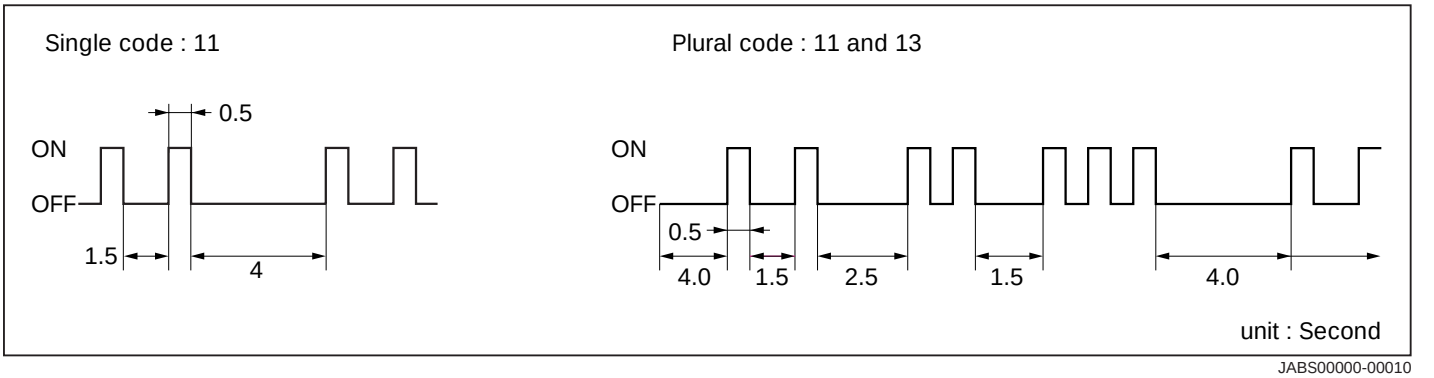


JABS00013-00008

   (4) Turn ON the ignition switch.
   (5) Read out the diagnosis code(s) by observing the number of blinking of the ABS waning lamp.
   NOTE:
   • When plural malfunctions codes are memorized, the code will be outputted starting from a smaller code number at intervals of 2.5 seconds.
   • After completion of one cycle, the same codes will be outputted again at intervals of 4 seconds.



JABS00014-00009



JABS00000-00010

DIAGNOSIS CODE TABLE

CODE NO.	Diagnosis items	Diagnosis contents	Timing of diagnosis	Presumable causes of trouble
11	Solenoid relay	Open wire	All time	• Solenoid relay • Solenoid relay-related harness
12	Solenoid relay	Short circuit	Immediately after ignition switch is turned ON.	
13	Motor relay	Open wire	Immediately after ignition switch is turned ON.	• Motor relay • Motor relay-related harness
14	Motor relay	Short circuit	All time	
21	Right front solenoid valve	Open wire or short circuit	All time	• Solenoid valve in actuator • Solenoid valve-related harness
22	Left front solenoid valve			
23	Rear solenoid valve			
31	Right front vehicle speed sensor	• Open wire or short circuit • speed sensor signal	All time	• Vehicle speed sensors • Vehicle speed sensor-related harness
32	Left front vehicle speed sensor			
33	Right rear vehicle speed sensor			
34	Left rear vehicle speed sensor			
37	Front vehicle speed sensor	Speed sensor signal	When running at 20 km/h or more after ignition switch is turned ON.	• Front vehicle speed sensors and related harness
41	Power supply voltage (Low)	When running	Low voltage (10 V or less)	• Battery • Alternator • Power supply-related harness
42	Power supply voltage (High)	All time	High voltage (18 V or less)	
43	Gravity sensor	When repeating stop and start.	Function	• Gravity sensor
44	Gravity sensor	All time	Open wire or short circuit	• Gravity sensor • Gravity sensor-related harness
49	Stop lamp switch	All time	Open wire	• Stop lamp • Stop lamp-related harness
51	Motor	Immediately after ignition switch is turned ON.	Function in voltage	• Motor in actuator • Motor-related harness

JABS00015-00000

Erasing procedure for diagnosis codes

CAUTION:

- There are four methods to erase diagnosis codes, as mentioned below. However, if the diagnosis codes are erased by the brake pedal method, normally diagnosis codes of the EFI system also will be erased when the power supply of the vehicle is shut off.
- Therefore, be sure to read out the diagnosis codes of the EFI system before disconnecting the power supply.
- Disconnection of the power supply is required when disconnecting the connector of the wire harness from the ABS ECU.

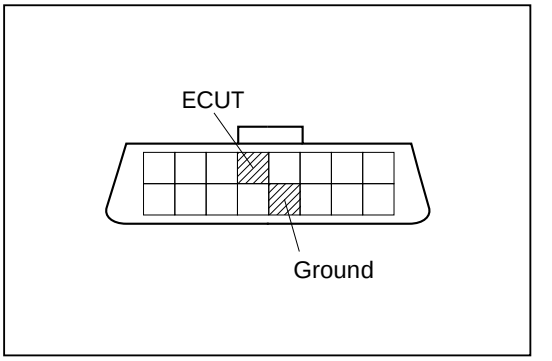
JABS00016-00000

1. Erasing procedure by brake pedal
   (1) Connect the following SST to the diagnosis connector.
   SST: 09991-87401-000

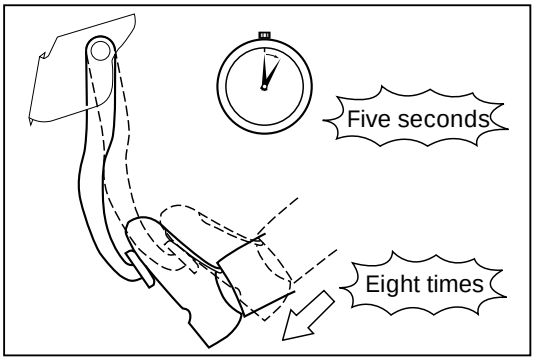
   (2) Connect the ECUT and GND terminals in the SST terminal with the following SST.
   SST: 09991-87403-000

   CAUTION:
   - Never connect the terminals other than that specified, for even slight contact of other terminals may lead to serius malfunction or damage.

   (3) Turn ON the ignition switch.(Never start the engine.)
   (4) Depress the brake pedal more than 8 times within 5 seconds.
   (5) Ensure that the normal code is indicated by the ABS warning lamp.
   (6) Turn off the ignition switch.
   (7) Remove the SST (jump wire) from the SST(sub harness).
   (8) Turn on the ignition switch.
   (9) Ensure that the ABS warning lamp remains extinguished after a lapse of three seconds.
   If the ABS warning lamp remains illuminated, repeat the operation above again.
   (10) Turn off the ignition switch.
   (11) Remove the SST from the diagnosis connector.



JABS00017-00011



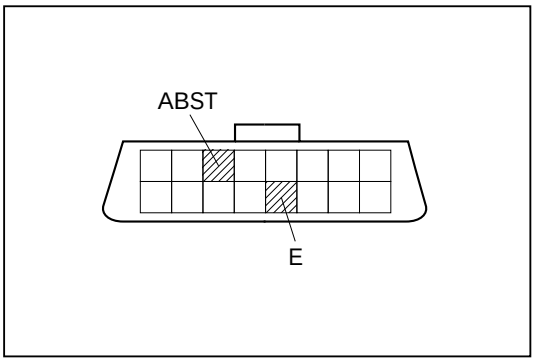
JABS00018-00012

2. Erasing diagnosis codes by utilizing the ABST terminal
   (1) Connect the following SST to the diagnosis connector.
   SST: 09991-87401-000

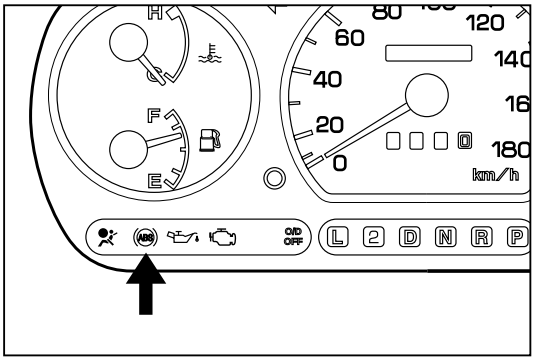
   (2) Turn ON the ignition switch.(Never start the engine.)
   (3) Repeat the connection and disconnection of ABST and GND terminals in the SST four times within eight seconds, using the following SST.
   SST: 09991-87403-000

   CAUTION:
   - Never connect the terminals other than that specified, for even slight contact of other terminals may lead to serius malfunction or damage.

   (4) Ensure that the ABS warning lamp remains extinguished.
   If the ABS warning lamp remains illuminated, repeat the operation above again.
   (5) Turn off the ignition switch.
   (6) Remove the SST (sub harness) from the diagnosis connector.



JABS00019-00013

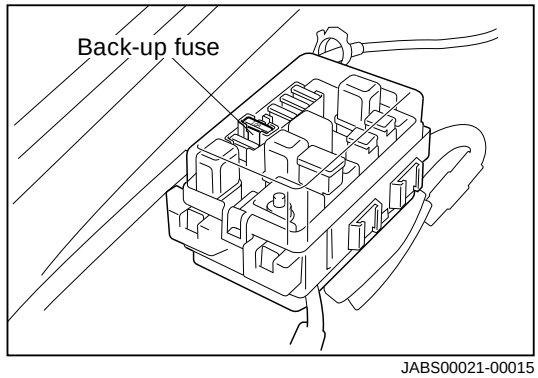


JABS00020-00014

3. Erasing diagnosis codes by removing back-up fuse
   (1) Ensure that the ignition switch is turned OFF.
   (2) Remove the back-up fuse from the relay block, using the fuse puller, and install it again after a lapse of more than 10 seconds.

   CAUTION:
   - Be sure to read out diagnosis codes of the EFI system before disconnecting the back-up fuse.
   - When a radio, a cassette stereo, etc. are installed, it should be noted that it may take more than ten seconds to delete the diagnosis codes.

   (3) Turn on the ignition switch.
   (4) Ensure that the ABS warning lamp remains extinguished after a lapse of three seconds.
   If the ABS warning lamp remains illuminated, repeat the operation above again.
   (5) Turn off the ignition switch.



JABS00021-00015

4. Erasing diagnosis codes by disconnecting the negative terminal of battery ground cable from the battery negative terminal.
   (1) Ensure that the ignition switch is turned OFF.
   (2) Disconnect the negative terminal of the battery ground cable from the battery negative terminal for more than 10 seconds. Then, connect the negative terminal of the battery ground cable to the negative terminal.

   CAUTION:
   - Be sure to read out diagnosis codes of the EFI system before disconnecting the negative terminal of the ground cable from the battery negative terminal.

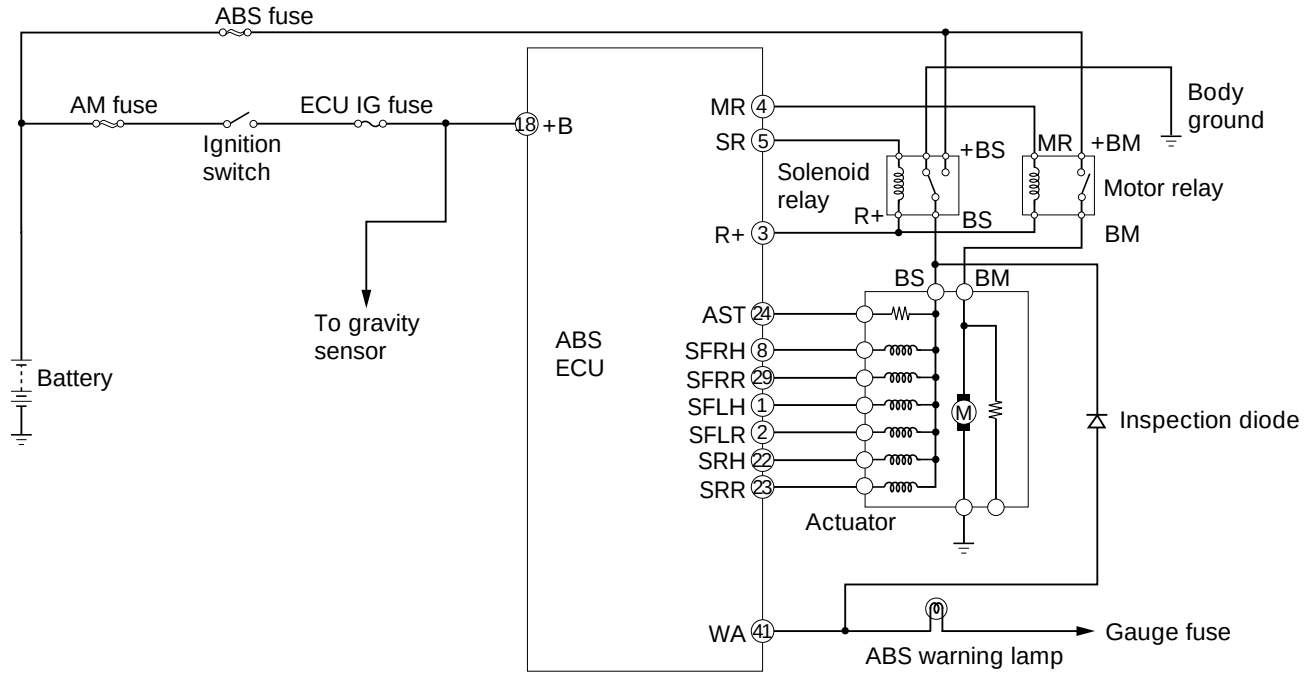
   (3) Turn on the ignition switch.
   (4) Ensure that the ABS warning lamp remains extinguished after a lapse of three seconds.
   If the ABS warning lamp remains illuminated, repeat the operation above again.
   (5) Turn off the ignition switch.

JABS00022-00000

TROUBLE SHOOTING ACCORDING TO DIAGNOSIS CODES

TROUBLE SHOOTING ACCORDING TO DIAGNOSIS CODE

DIAGNOSIS CODE No.	11	JUDGMENT SOURCE: Comparing voltage being applied to across terminals +B and AST of ABS ECU between the ON condition and the OFF condition of solenoid relay
DIAGNOSIS ITEM	Solenoid relay	
DIAGNOSIS CONTENTS	Open wire	



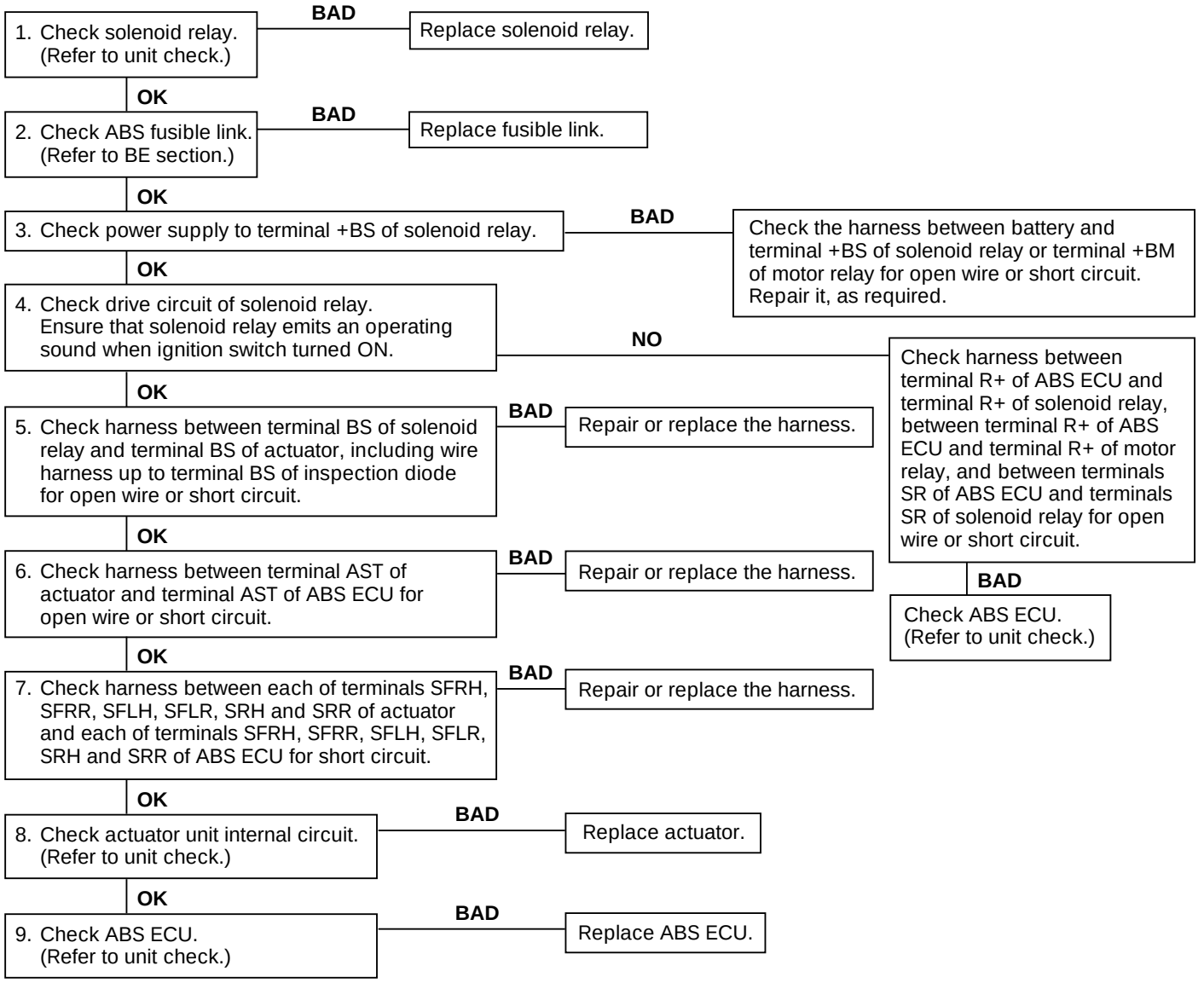
JABS00023-00016

Checking points

1. Solenoid relay
2. ABS fusible link for open wire.
3. Wire harness between battery and terminal +BS of solenoid relay for open wire or short circuit.
4. Wire harness between battery and terminal +BM of motor relay for short circuit.
5. Wire harness between terminal BS of solenoid relay and terminal BS of actuator, including wire harness up to terminal BS of diode for open wire or short circuit.
6. Circuits in actuator for open wire or short circuit.
7. Wire harness between terminal AST of actuator and terminal AST of ABS ECU for open wire or short circuit.
8. Wire harness between SFRH, SFRR, SFLH, SFLR, SRH and SRR terminals of actuator and the same terminals of ABS ECU for short circuit.
9. Wire harness between terminal R+ of ABS ECU and terminal R+ of solenoid relay, between terminal SR of ABS ECU and terminal SR of solenoid relay, and between terminal R+ of ABS ECU and terminal R+ of motor relay for open wire or short circuit.
10. ABS ECU

JABS00024-00000

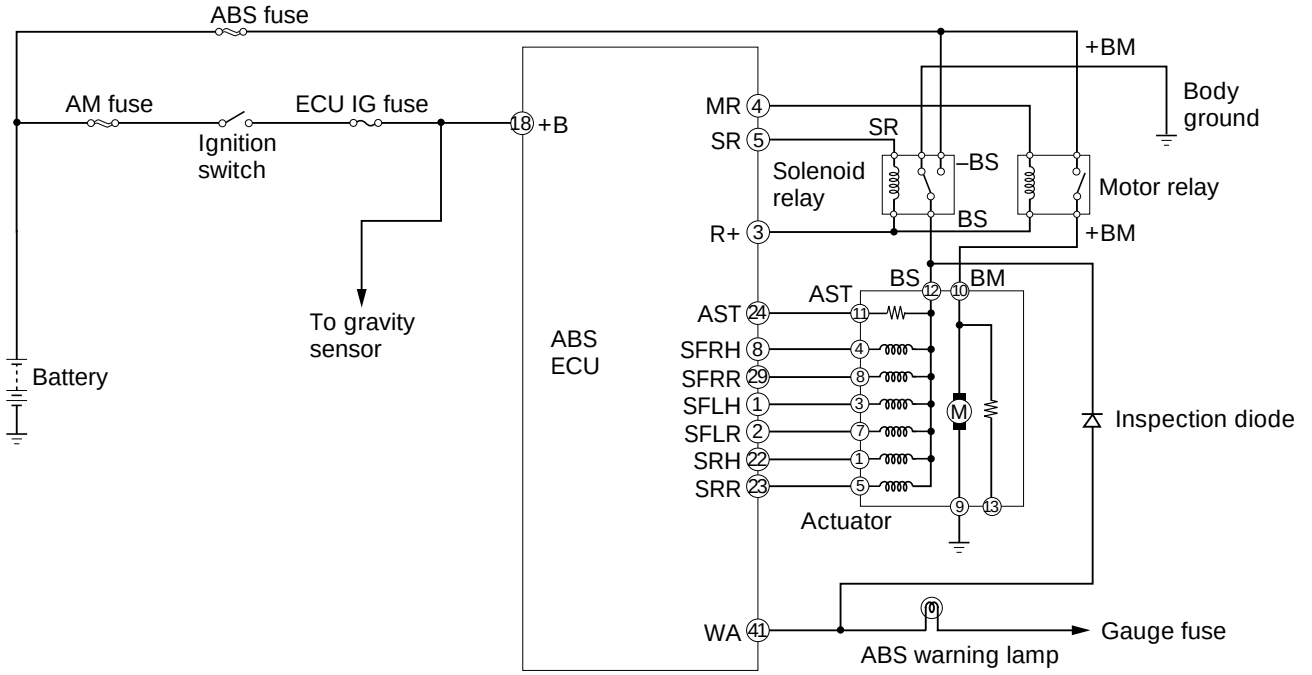
Checking procedure



JABS00025-00000

TROUBLE SHOOTING ACCORDING TO DIAGNOSIS CODE

DIAGNOSIS CODE No.	12	JUDGMENT SOURCE: Monitoring the voltage being applied to terminal AST of the ABS ECU when solenoid relay is turned off.
DIAGNOSIS ITEM	Solenoid relay	
DIAGNOSIS CONTENTS	Short circuit	



JABS00026-00017

Checking points

1. Solenoid relay
2. Wire harness between terminal GND of solenoid relay and body ground for open wire.
3. Wire harness between terminal AST of actuator and terminal AST of ABS ECU for short circuit with positive circuit.
4. Wire harness between terminal SR of solenoid relay and terminal SR of ABS ECU for short circuit with ground circuit.
5. ABS ECU

JABS00027-00000

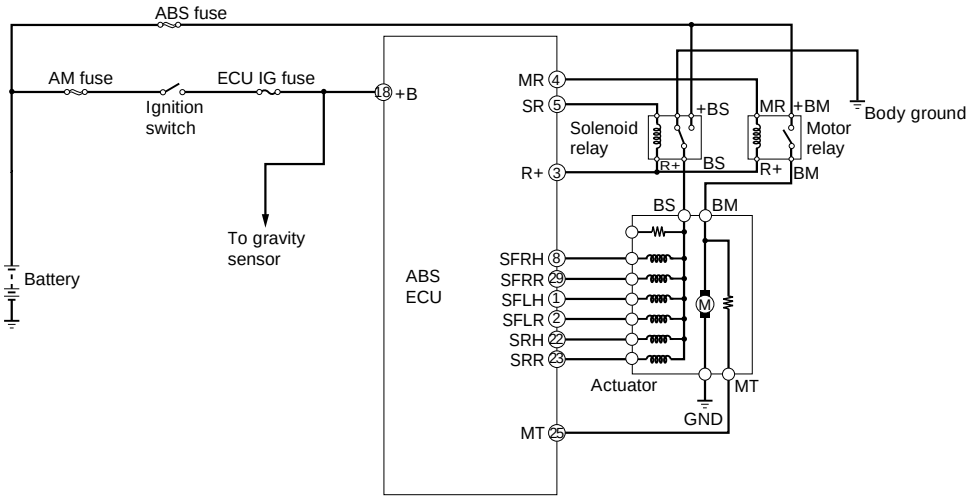
Checking procedure

1. Check solenoid relay. (Refer to unit check.)
   - **BAD** → Replace solenoid relay.
   - **OK** ↓
2. Check circuit between terminal GND of solenoid relay and body ground for open wire.
   - **BAD** → Repair or replace the wire harness.
   - **OK** ↓
3. Check wire harness between terminal SR of solenoid relay and terminal SR of ABS ECU for short circuit with body ground.
   - **BAD** → Repair or replace the wire.
   - **OK** ↓
4. Check circuit between terminal AST of actuator and terminal AST of ABS ECU for short circuit with positive circuit.
   - **BAD** → Repair or replace the wire.
   - **OK** ↓
5. Check ABS ECU. (Refer to unit check.)
   - **BAD** → Replace ABS ECU.

JABS00028-00000

TROUBLE SHOOTING ACCORDING TO DIAGNOSIS CODE

DIAGNOSIS CODE No.	13	JUDGMENT SOURCE: Monitoring voltage being applied to across terminals +B and MT of ABS ECU with motor relay turned ON.
DIAGNOSIS ITEM	Motor relay	
DIAGNOSIS CONTENTS	Open wire	



JABS00029-00018

Checking points

1. Motor relay
2. ABS fusible link
3. Wire harness between battery and terminal +BM of motor relay for open wire or short circuit.
4. Wire harness between battery and terminal +BS of solenoid relay for short circuit with body ground.
5. Wire harness between terminal BM of motor relay and terminal BM of actuator for open wire or short circuit.
6. Circuits in actuator between terminal BM and terminal MT, and between terminal BM and terminal GND for open wire or short circuit.
7. Wire harness between terminal MT of actuator and terminal MT of ABS ECU for open wire or short circuit.
8. ABS ECU

JABS00030-00000

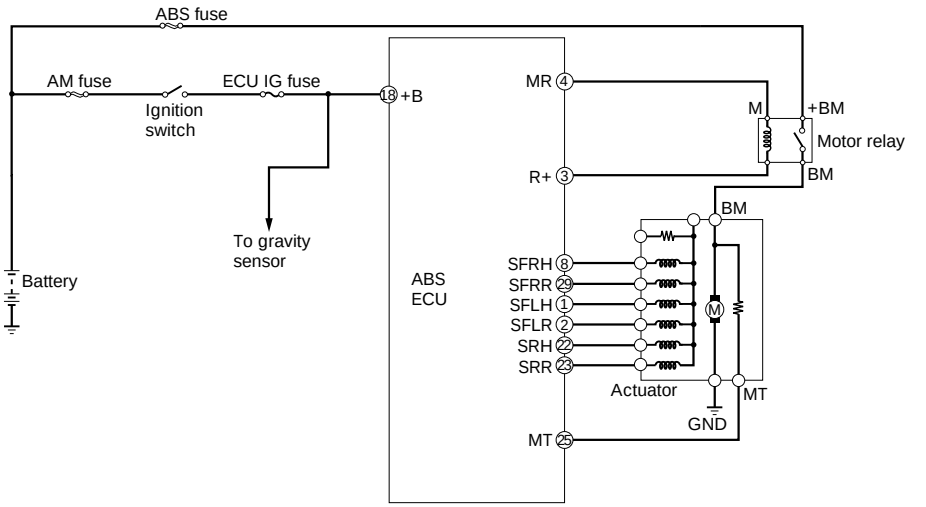
Checking procedure

1. Check motor relay. (Refer to unit check.)
   - BAD → Replace solenoid relay.
   - OK ↓
2. Check ABS fusible link.
   - BAD → Replace fusible link.
   - OK ↓
3. Check power supply to terminal +BM of motor relay.
   - BAD → Check the harness between battery and terminal +BM of motor relay or terminal +BS of solenoid relay for open wire or short circuit. Repair it, as required.
   - OK ↓
4. Check drive circuit of solenoid relay. Ensure that the motor relay emits an operating sound when ignition switch is turned ON.
   - NO → Check harness between terminal R+ of ABS ECU and terminal R+ of motor relay, and between terminal MR of motor relay and terminal MR of ABS ECU for open wire or short circuit.
     - OK → Check ABS ECU. (Refer to unit check.)
   - OK ↓
5. Check harness between terminal BM of motor relay and terminal BM of actuator for open wire or short circuit.
   - BAD → Repair or replace the harness.
   - OK ↓
6. Check harness between terminal MT of actuator and terminal MT of ABS ECU for open wire or short circuit.
   - BAD → Repair or replace the harness.
   - OK ↓
7. Check actuator unit. (Refer to unit check.)
   - BAD → Replace actuator.
   - OK ↓
8. Check ABS ECU. (Refer to unit check.)
   - BAD → Replace ABS ECU.

JABS00031-00000

TROUBLE SHOOTING ACCORDING TO DIAGNOSIS CODE

DIAGNOSIS CODE No.	14	JUDGMENT SOURCE: Comparing voltage being applied to across +B and MT terminals of ABS ECU with motor relay turned OFF.
DIAGNOSIS ITEM	Motor relay	
DIAGNOSIS CONTENTS	Short circuit	



JABS00032-00019

Checking points

1. Motor relay
2. Wire harness between terminal MR of motor relay and terminal MR of ABS ECU for short circuit with body ground.
3. Wire harness between terminal BM of motor relay and terminal BM of motor for short circuit with positive circuit.
4. Wire harness between terminal MT of actuator and terminal MT of ABS ECU for short circuit with positive circuit.
5. Circuits in actuator between terminal BM and terminal MT or between terminal BM and terminal GND for short circuit with positive circuit.
6. ABS ECU

JABS00033-00000

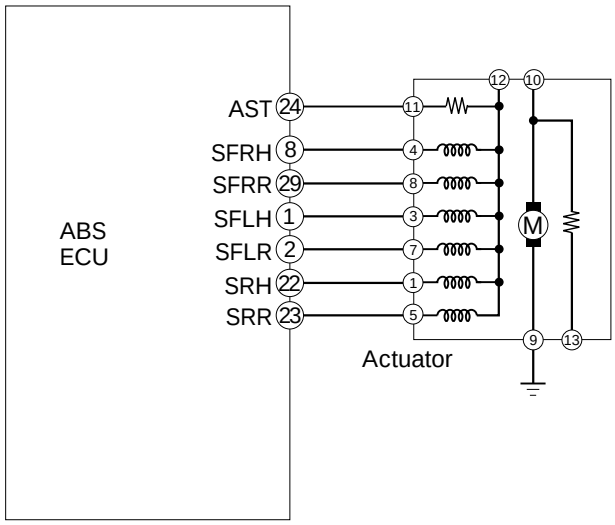
Checking procedure

1. Check motor relay. (Refer to unit check.)
   - BAD → Replace solenoid relay.
   - OK ↓
2. Check wire harness between terminal MR of ABS ECU and terminal MR of motor relay for short circuit with body ground.
   - BAD → Check the harness between battery and terminal +BM of motor relay or terminal +BS of solenoid relay for open wire or short circuit. Repair it, as required.
   - OK ↓
3. Check drive circuit of solenoid relay. Ensure that the motor relay emits an operating sound when ignition switch is turned ON.
   - NO → Check harness between terminal MR of ABS ECU and terminal MR of motor relay for short circuit.
     - OK → Check ABS ECU. (Refer to unit check.)
   - OK ↓
4. Check harness between terminal BM of motor relay and terminal BM of actuator for short circuit with positive circuit.
   - BAD → Repair or replace the harness.
   - OK ↓
5. Check harness between terminal MT of actuator and terminal MT of ABS ECU for short circuit with positive terminal.
   - BAD → Repair or replace the harness.
   - OK ↓
6. Check actuator unit. (Refer to unit check.)
   - BAD → Replace actuator.
   - OK ↓
7. Check ABS ECU. (Refer to unit check.)
   - BAD → Replace ABS ECU

JABS00034-00000

TROUBLE SHOOTING ACCORDING TO DIAGNOSIS CODE

DIAGNOSIS CODE No.	21, 22 and 23	JUDGMENT SOURCE: Monitoring the voltage being applied to ABS ECU through each of solenoid valves and standard resistance are identified with the prememorized value in the CPU of ABS ECU.
DIAGNOSIS ITEM	Solenoid valve	
DIAGNOSIS CONTENTS	Open wire or short circuit	



JABS00035-00020

Checking points

1. Solenoid valve circuit in actuator.
2. Wire harness between respective terminals AST, SFRH, SFRR, SFLH, SFLR, SRH and SRR of actuator ABS ECU for open wire or short circuit.
3. ABS ECU

JABS00036-00000

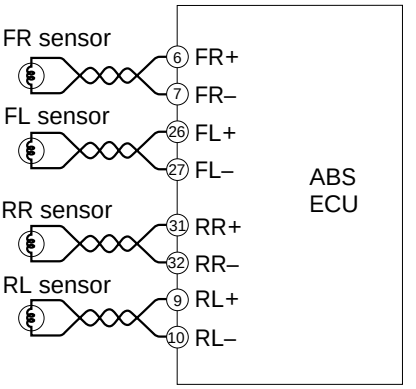
Checking procedure

1. Check actuator circuit. (Refer to unit check.) — **BAD** → Replace actuator.
   OK
2. Check wire harness between respective terminals AST, SFRH, SFRR, SFLH, SFLR, SRH and SRR for open wire or short circuit. — **BAD** → Repair the wire harness.
   OK
3. Check ABS ECU. (Refer to unit check.) — **BAD** → Replace ABS ECU.

JABS00037-00000

TROUBLE SHOOTING ACCORDING TO DIAGNOSIS CODE

DIAGNOSIS CODE No.	31	32	33	34	37	JUDGMENT SOURCE:
DIAGNOSIS ITEM	R	L	R	L	Both sides	• Monitoring sensor circuit voltage. • Monitoring difference of input signal from each sensor. • Monitoring missing of input signal from each sensor.
	Front		Rear		Front	
	Vehicle speed sensor					
DIAGNOSIS CONTENTS	• Open wire or short circuit • Abnormal input signal					



NOTE:
R: Right side
L: Left side

JABS00038-00021

Checking points

1. Speed sensors
2. Speed sensor rotor for damage
3. Wire harness of each speed sensor for open wire or short circuit with body ground.
4. Clearance between speed sensor and sensor rotor.
5. Excessive rattle of wheel bearings.
6. ABS ECU

JABS00039-00000

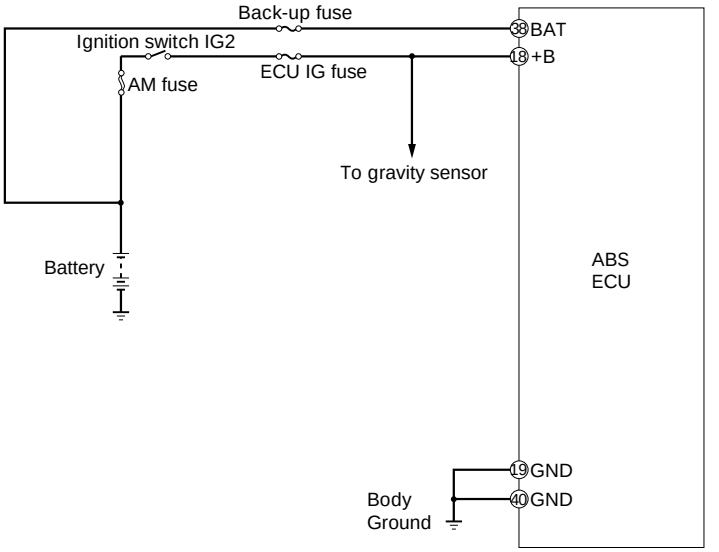
Checking procedure

1. Check speed sensor. (Refer to unit check.)
   - **BAD** → Clear or replace speed sensor.
   - **OK** ↓
2. Check speed sensor rotor. (Refer to unit check.)
   - **BAD** → Clear or replace speed sensor rotor.
   - **OK** ↓
3. Check wire harness between terminals FR + and -, between terminals FL + and -, between terminals RR + and -, and between terminals RL + and - of ABS ECU and each sensors for open or short circuit with body ground.
   - **BAD** → Replace wire harness.
   - **OK** ↓
4. Check clearance between speed sensor and sensor rotor. (Refer to unit check.)
   - **BAD** → Adjust clearance.
   - **OK** ↓
5. Check wheel bearing for excessive rattle.
   - **BAD** → Replace wheel bearing.
   - **OK** ↓
6. Check ABS ECU. (Refer to unit check.)
   - **BAD** → Replace ABS ECU.

JABS00040-00000

TROUBLE SHOOTING ACCORDING TO DIAGNOSIS CODE

DIAGNOSIS CODE No.	41 or 42	JUDGMENT SOURCE: When power supply voltage to terminal +B of the ABS ECU becomes 10 volts or less or 18 volts or more.
DIAGNOSIS ITEM	Power supply voltage	
DIAGNOSIS CONTENTS	Abnormal power supply voltage	



JABS00041-00022

Checking points

1. Battery
2. Charging system (Alternator with IC regulator)
3. AM fusible link
4. Ignition switch
5. ECU IG fuse
6. Following circuits
   - Battery to fusible link
   - Fusible link to ignition switch
   - Ignition switch to ECU IG fuse
   - ECU IG fuse to terminal +B of the ABS ECU
   - ECU IG fuse to terminal IG of the Gravity sensor
   - Battery to terminal +BS of solenoid relay and terminal +BM motor relay
7. ABS ECU

JABS00042-00000

Checking procedure

1. Check battery voltage. (Refer CH section in this service manual.)
   - BAD → Charge or replace the battery.
   - OK ↓
2. Check charging system. (Refer to CH section.)
   - BAD → Repair charging system.
   - OK ↓
3. Check the following parts or wire harnesses for open wire or short circuit.
   - Battery to fusible link
   - Fusible link to ignition switch
   - Ignition switch to ECU IG fuse
   - ECU IG fuse to terminal +B of the ABS ECU
   - ECU IG fuse to terminal IG of the Gravity sensor
   - Battery to terminal +BS of solenoid relay and terminal +BM of motor relay

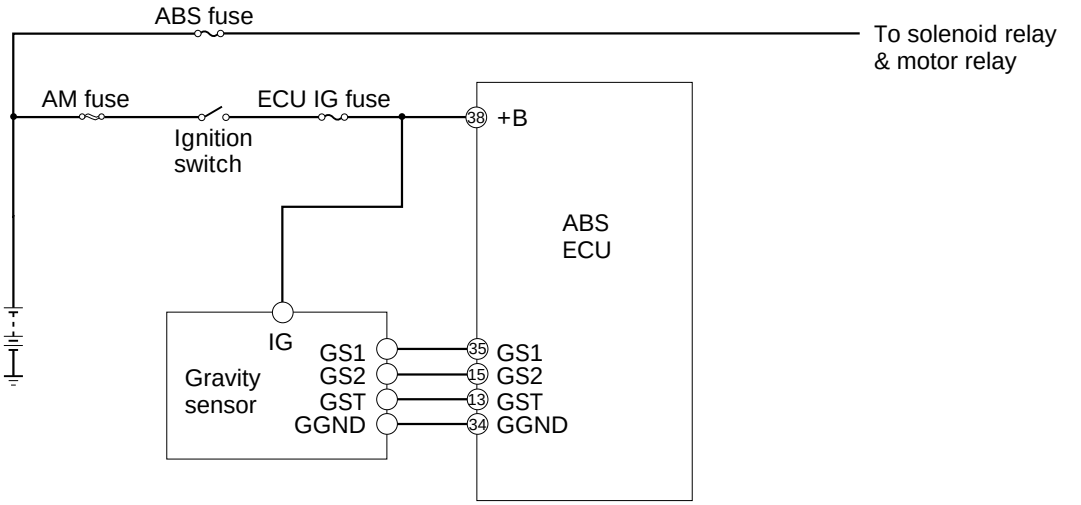
   BAD → Repair or replace the wire harness

   OK ↓
4. Check ABS ECU. (Refer to unit check.)
   - BAD → Replace ABS ECU.

JABS00043-00000

TROUBLE SHOOTING ACCORDING TO DIAGNOSIS CODE

DIAGNOSIS CODE No.	43	JUDGMENT SOURCE: • Monitoring if output signal of gravity sensor meets predetermined output form.
DIAGNOSIS ITEM	Gravity sensor	
DIAGNOSIS CONTENTS	Abnormal output signal	
DIAGNOSIS CODE No.	44	JUDGMENT SOURCE: • Monitoring if output signal of gravity sensor meets predetermined output form. • When wire harness between each of terminals GS1, GS2, GST and GGND of gravity sensor and ABS ECU becomes open of shorted.
DIAGNOSIS ITEM	Gravity sensor	
DIAGNOSIS CONTENTS	Open wire or short circuit	



JABS00044-00023

Checking points

1. Gravity sensor
2. Power supply to terminal IG of gravity sensor.
3. Wire harness between respective terminals GS1, GS2, GST and GGND terminals of gravity sensor and the same terminal of ABS ECU for short circuit or open wire.
4. ABS ECU

JABS00045-00000

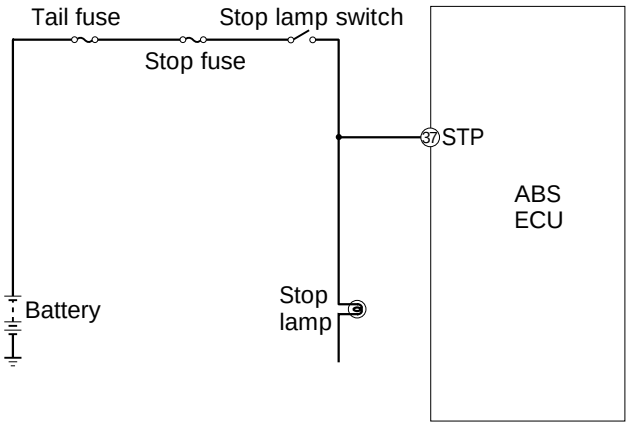
Checking procedure

1. Check power supply to IG terminal of gravity sensor from ignition switch.
   - **BAD** → Check and repair the related part(s).
   - **OK**
2. Check wire harness between each of terminals GS1, GS2, GST and GGND of gravity sensor and ABS ECU for open wire or short circuit.
   - **BAD** → Replace the wire harness.
   - **OK**
3. Check gravity sensor function. (Refer to unit inspection.)
   - **BAD** → Replace gravity sensor.
   - **OK**
4. Check ABS ECU. (Refer to unit check.)
   - **BAD** → Replace ABS ECU.

JABS00046-00000

TROUBLE SHOOTING ACCORDING TO DIAGNOSIS CODE

DIAGNOSIS CODE No.	49	JUDGMENT SOURCE: • Monitoring brake lamp circuit
DIAGNOSIS ITEM	Stop lamp switch	
DIAGNOSIS CONTENTS	Open wire	



JABS00047-00024

Checking points

1. Stop lamp
2. Stop lamp circuit
3. ABS ECU

JABS00048-00000

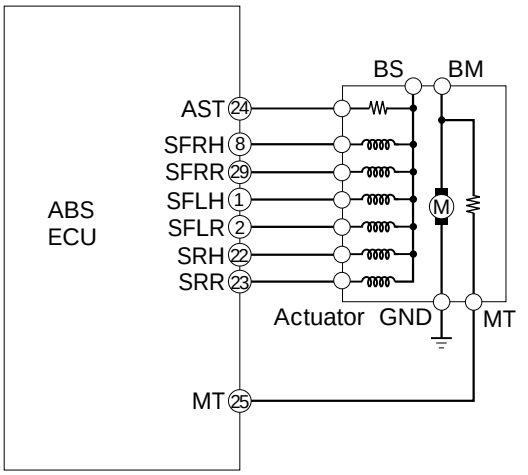
Checking procedure

1. Check of stop lamp circuit
   Ensure that the stop lamp glows when brake pedal is depressed.
   - **NO** → Repair brake lamp circuit.
   - **OK** ↓
2. Check wire harness between stop lamp switch and terminal STP of ABS ECU for open wire or short circuit.
   - **BAD** → Repair or replace the wire harness.
   - **OK** ↓
3. Check ABS ECU.
   (Refer to unit check.)
   - **BAD** → Replace ABS ECU.

JABS00049-00000

TROUBLE SHOOTING ACCORDING TO DIAGNOSIS CODE

DIAGNOSIS CODE No.	51	JUDGMENT SOURCE: • Monitoring voltage at terminal MT of actuator when actuator pump motor is turned OFF.
DIAGNOSIS ITEM	Actuator pump motor	
DIAGNOSIS CONTENTS	Operation	



JABS00050-00025

Checking points

1. Actuator pump motor circuit
2. Wire harness between terminal GND of actuator and body ground for open wire.
3. ABS ECU
4. Wire harness between terminal MT of actuator and terminal MT of ABS ECU.

JABS00051-00000

Checking procedure

1. Check wire harness between terminal GND of actuator and body ground for open wire.
   - BAD → Repair circuit or replace wire harness.
   - OK ↓
2. Check wire harness between terminal MT of actuator and terminal MT of ABS ECU for open wire or short circuit.
   - BAD → Repair circuit or replace wire harness.
   - OK ↓
3. Check resistance between terminal BM and terminal MT of actuator. Specified resistance 33 Ω (at 20 °C)
   - BAD → Replace actuator.
   - OK ↓
4. Check ABS ECU. (Refer to unit check.)
   - BAD → Replace ABS ECU.
   - OK ↓
5. Replace actuator.

JABS00052-00000

TROUBLE SHOOTING ACCORDING TO TROUBLE PHENOMENA

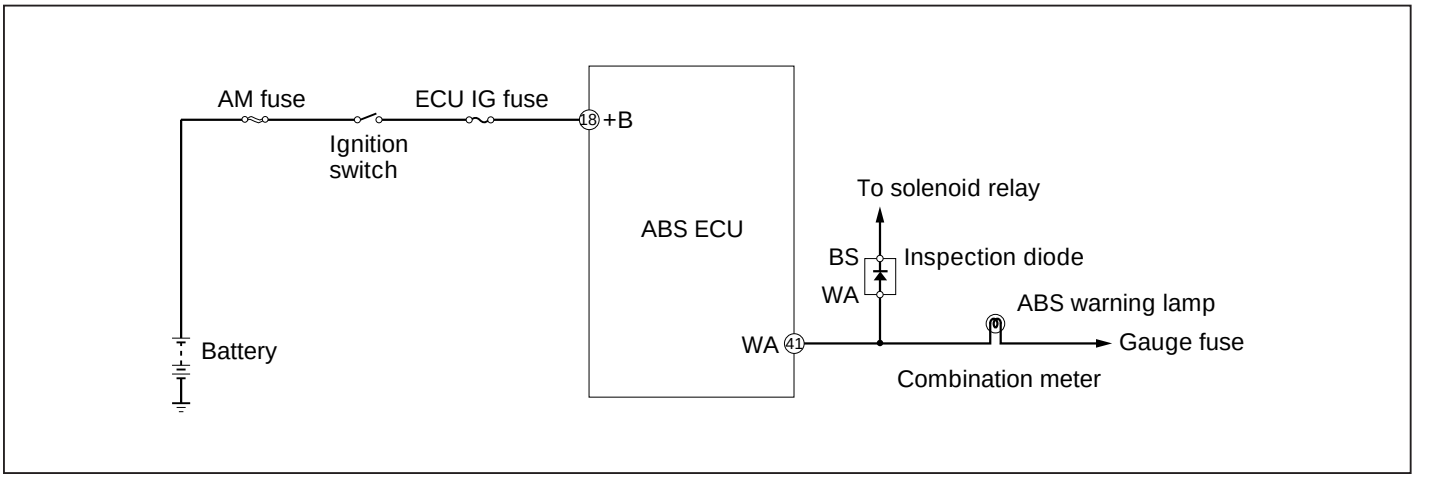
TROUBLE SHOOTING ACCORDING TO TROUBLE PHENOMENON

TROUBLE PHENOMENA	Flow chart number
1. ABS warning lamp remains illuminated immediately after ignition switch is turned ON.	1
2. ABS warning lamp will not glow immediately after ignition switch is turned ON.	2
3. ABS warning lamp will start blinking immediately after ignition switch is turned ON.	3
4. ABS warning lamp is illuminated while driving.	4
5. Side pull of brake	4
6. Poor effectiveness	4
7. ABS operates under normal braking.	4
8. ABS operates just before vehicle stops under normal braking.	4
9. Brake pedal vibrates excessively.	4
10. Wheel locks frequently under ABS operation.	4
11. Starting of ABS operation is late.	5
12. Brake pedal working travel is too small.	6
13. Brake pedal working travel is too large. (Reserve travel is too small.)	7

JABS00053-00000

TROUBLE SHOOTING PROCEDURE FLOW CHART NUMBER 1

PHENOMENA: ABS warning lamp remains illuminated.



JABS00054-00026

Checking point

1. Abnormal input voltage to ABS ECU.
2. Wire harness between terminal WA of ABS ECU and ABS warning lamp for short circuit with body ground.
3. Wire harness between terminal WA of ABS ECU and diode for short circuit with body ground.
4. Solenoid relay
5. ABS ECU

1. Remove the inspection diode from inspection connector. (Refer to unit inspection.)

2. Ensure that the ABS warning lamp remains illuminated even three seconds after ignition switch is turned ON.
   - **NO** → Check solenoid relay and related circuit. (Refer to unit inspection.)
   - **Remain illuminated**

3. Check diagnosis code. (Refer to diagnosis code check.)
   - **Malfunction code** → Perform trouble shooting according to diagnosis code.
   - **Lamp remains illuminated.**

4. Connect the following SST between ABS ECU and connectors connected to ABS ECU. (Refer to unit check of ABS ECU section.)
   SST: 09842-87401-000

5. Start the engine.

6. Ensure that the voltage at terminal ⑱+B of the SST is within specified value when engine is started.
   Specified value: 10 - 17 volts
   - **BAD** → Check power supply to terminal +B of ABS ECU for following points.
     1. EFI IG fuse for burn-out
     2. Ignition switch
     3. Wire harness of related circuit for open wire or short circuit.
     4. Charging system.
   - **OK**

7. Turn Off the ignition switch.

8. Disconnect the SST connectors from the ABS ECU.

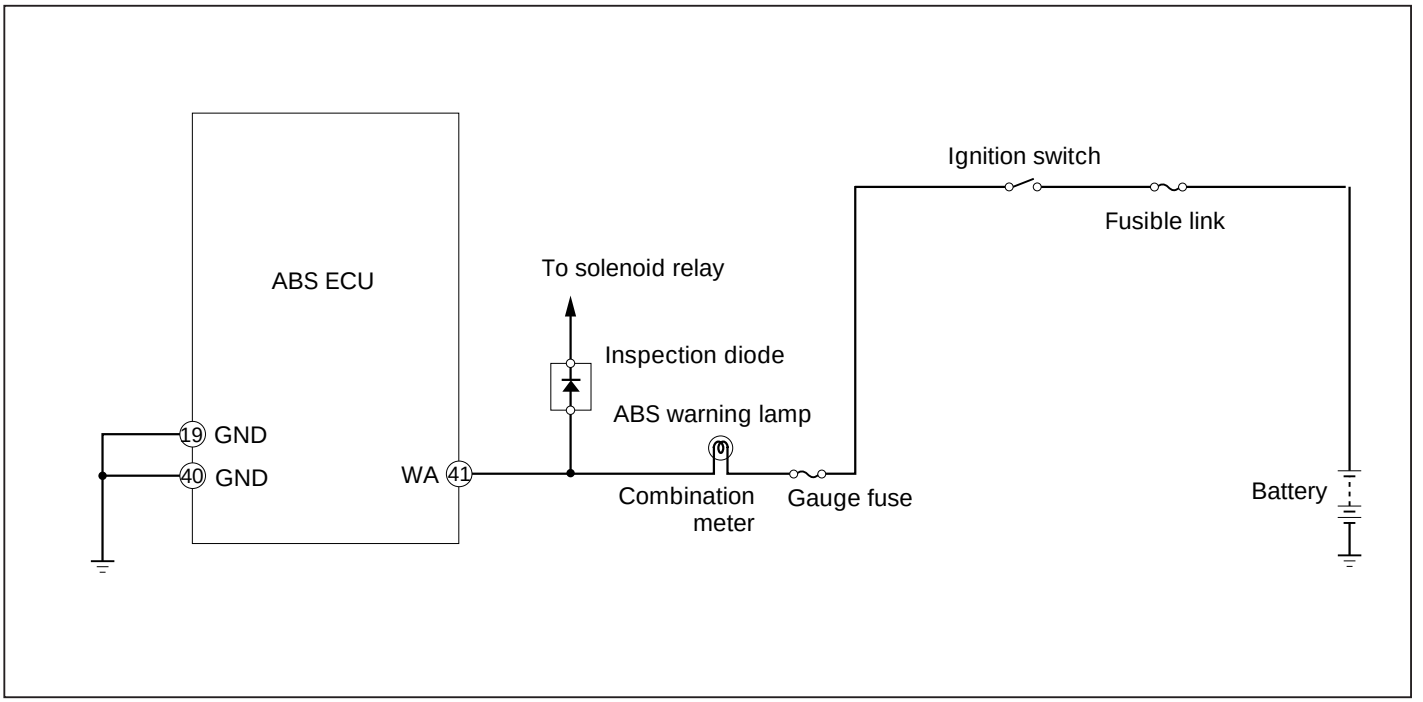
9. Check to see if ABS warning lamp goes on when ignition switch is turned ON.
   - **NO** → Check EFI ECU. (Refer to unit check.)
   - **Lamp remains illuminated.**

10. Check wire harness between ABS warning lamp and terminal WA of the ABS ECU or inspection diode connector for short circuit with body ground.
    - **BAD** → Repair or replace wire harness.

JABS00055-00000

TROUBLE SHOOTING PROCEDURE FLOW CHART NUMBER 2

PHENOMENA: ABS warning lamp will not glow after ignition switch is turned ON.



JABS00056-00027

Presumable causes for trouble

1. ABS warning lamp bulb for burnout.
2. Gauge fuse burnout.
3. Circuit between battery and combination meter for open wire.
4. Circuit between combination meter and terminal WA of ABS ECU or inspection diode for open wire.
5. Warning lamp circuit in the combination meter for open for open wire.
6. Diode rapture

1. Remove the inspection diode.
2. Disconnect the connector of wire harness from the ABS ECU. (Refer to the unit inspection of the ABS ECU.)
3. Connect the following SST to disconnected connector of the ABS ECU. (Refer to the unit inspection of the ABS ECU.)
   SST: 09842-87401-000

   CAUTION:
   - Never connect the connector of SST to the ABS ECU.

4. Connect the terminals WA and GND of the SST.

5. Ensure that the ABS warning lamp is illuminated when the ignition switch is turned ON.

NO → Check and repair the following points.
1. Power supply to combination meter.
2. ABS warning lamp for burnout.
3. ABS warning lamp circuit in combination meter for open wire.
4. Wire harness between combination lamp and terminal WA of ABS ECU for open wire.

YES

6. Check inspection diode. (Refer to unit inspection.)

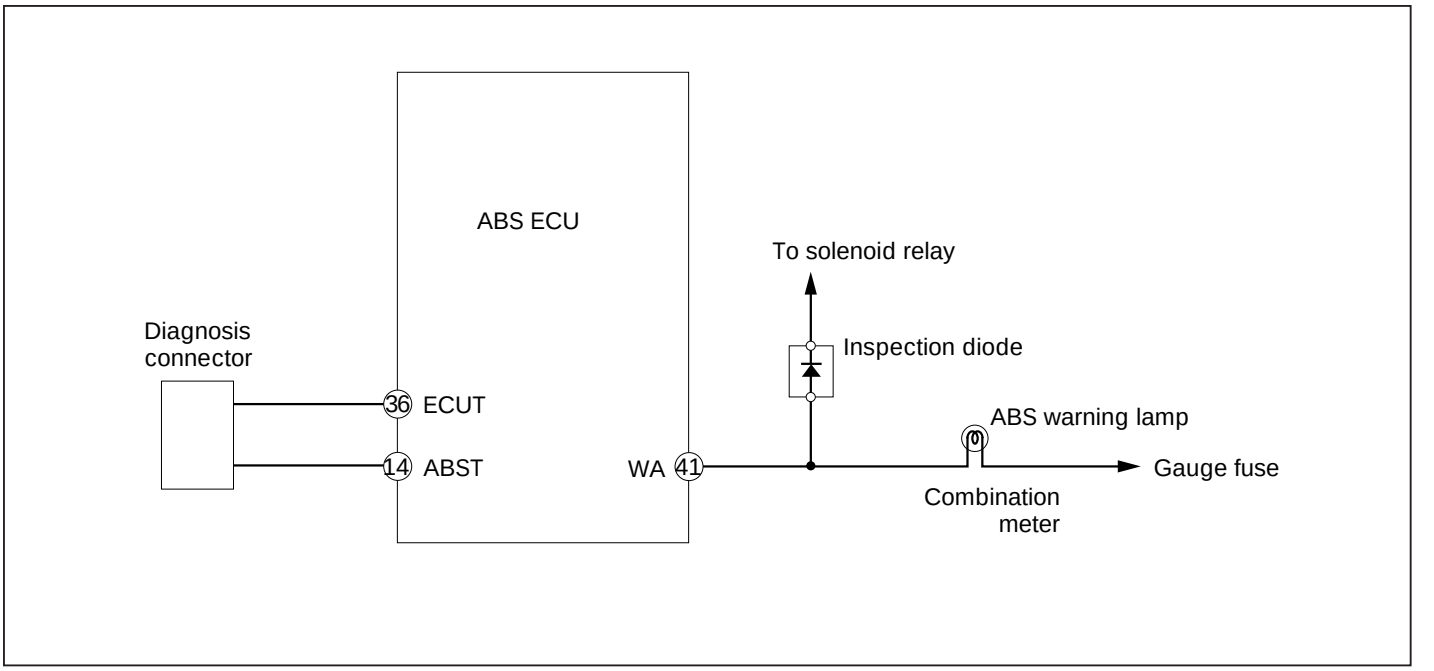
BAD → Replace check diode.

6. Check ABS ECU. (Refer to unit inspection.)

JABS00057-00000

TROUBLE SHOOTING PROCEDURE FLOW CHART NUMBER 3

PHENOMENA: ABS warning lamp blinks immediately after ignition switch is turned ON.



JABS00058-00028

Checking point

- Wire harness between each of terminals ECUT ㊱ and ABST ⑭ of ABS ECU and diagnosis connector for short circuit with body ground.
- ABS ECU

1. Disconnect the connector of wire harness from the ABS ECU. (Refer to the unit inspection of the ABS ECU.)
2. Ensure that no continuity exists between terminals ECUT and ABST of diagnosis connector with body ground.
   - **NO** → Repair or replace wire harness.
   - **YES**
3. Check ABS ECU. (Refer to unit inspection.)

JABS00059-00000

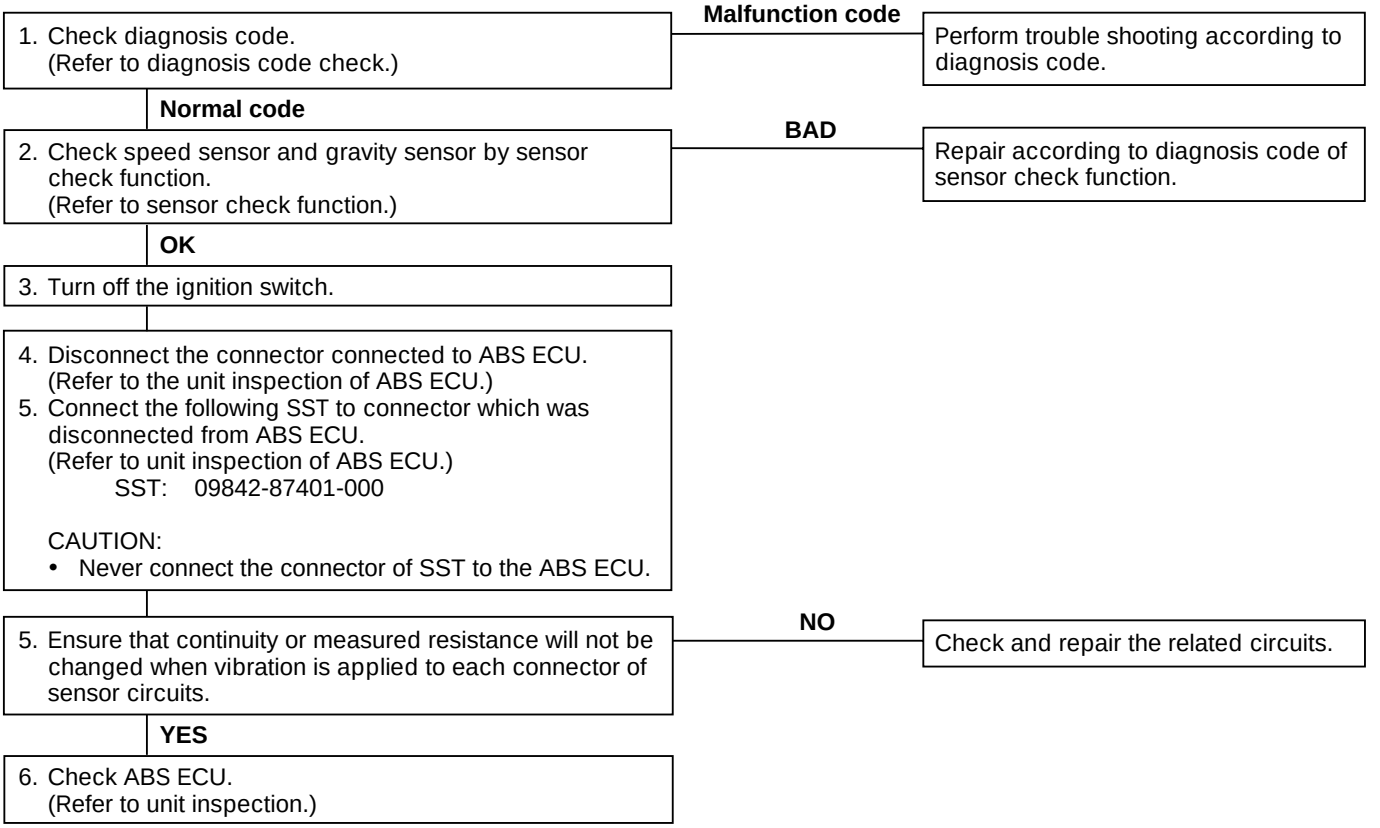
TROUBLE SHOOTING PROCEDURE FLOW CHART NUMBER 4

PHENOMENA: ABS warning lamp remains illuminated while driving.
Side pull of brake
Poor effectiveness
ABS operates under normal braking.
ABS operates just before vehicle stops under normal braking.
Brake pedal vibrates excessively.
Wheel locks frequently under ABS operation.

JABS00060-00000

Checking points

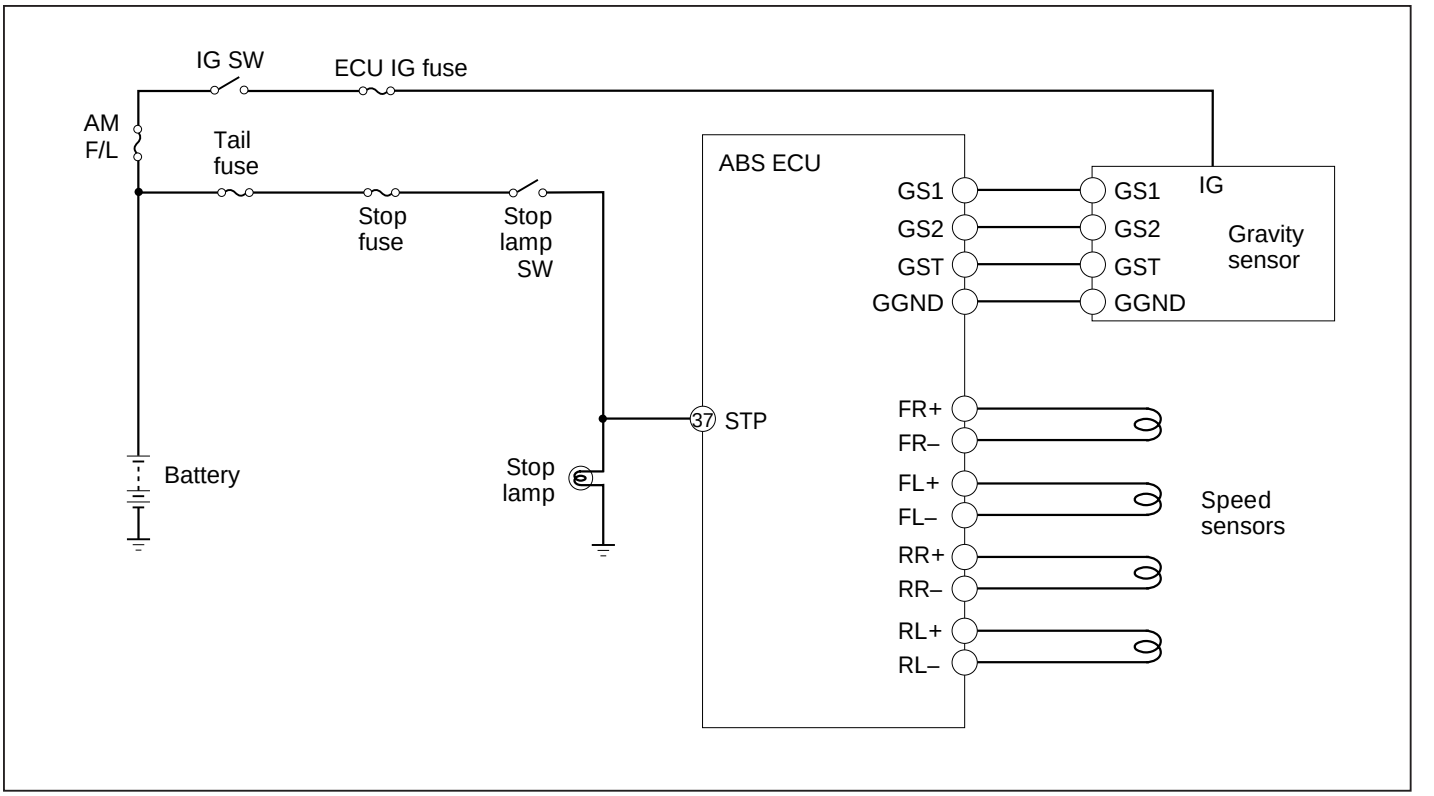
- Wheel speed sensors and related wire harness
- Gravity sensor and related wire harness
- ABS ECU



JABS00061-00000

TROUBLE SHOOTING PROCEDURE FLOW CHART NUMBER 5

PHENOMENA: Starting of ABS operation is late.



JABS00062-00029

1. Check diagnosis code.
   (Refer to diagnosis code check.)

Malfunction code → Perform trouble shooting according to diagnosis code.

Normal code

2. Disconnect the connector connected to ABS ECU.
   (Refer to the unit inspection of ABS ECU.)
3. Connect the following SST to connector which was disconnected from ABS ECU.
   (Refer to unit inspection of ABS ECU.)
   SST: 09842-87401-000

   CAUTION:
   • Never connect the connector of SST to the ABS ECU.

4. Ensure that a voltage of 8 volts or more is applied to terminal STP of the ABS ECU when brake pedal is depressed.

NO → Check and repair the circuits between terminal STP and stop lamp switch.

OK

5. Check speed sensor by sensor check function.
   (Refer to sensor check function.)

BAD → Repair according to diagnosis code of sensor check function.

OK

5. Check ABS ECU.
   (Refer to unit inspection.)

JABS00063-00000

TROUBLE SHOOTING PROCEDURE FLOW CHART NUMBER 6

PHENOMENA: Brake pedal working travel is too small

NOTE:

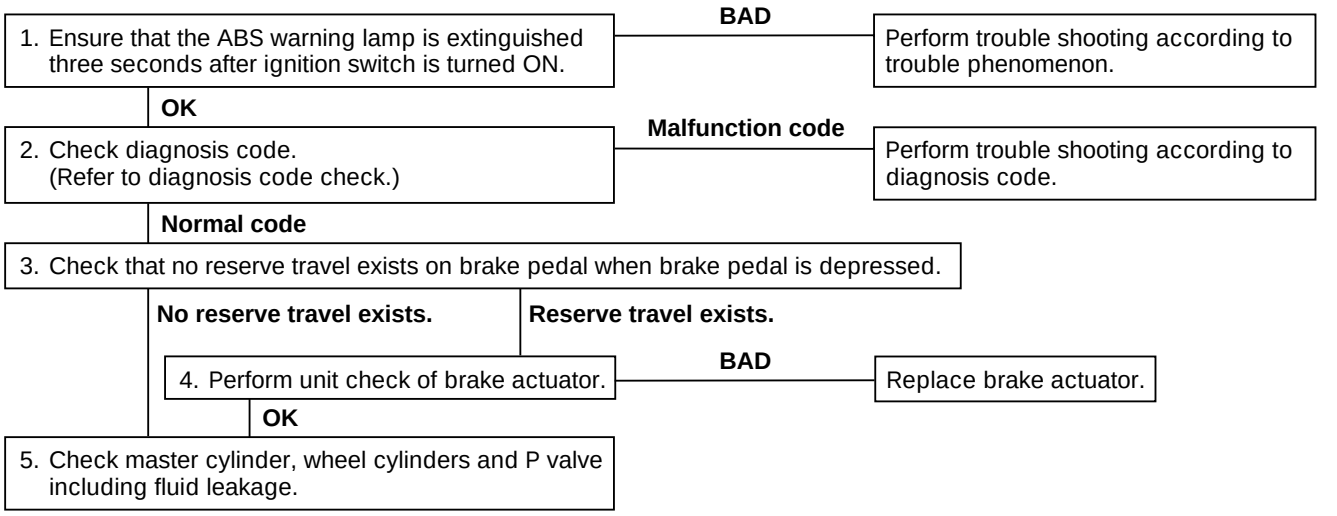
- No consideration has been taken for function of each wheel cylinder in this procedure.

1. Ensure that the ABS warning lamp is extinguished three seconds after ignition switch is turned ON.
   - **BAD** → Perform trouble shooting according to trouble phenomenon.
   - **YES**
2. Check diagnosis code. (Refer to diagnosis code check.)
   - **Malfunction code** → Perform trouble shooting according to diagnosis code.
   - **Normal code**
3. Ensure that the brake fluid will flow out from each wheel cylinder when the same operation as the air bleeding is performed. (Refer to air bleeding section.)
   - **OK** → Check abnormality in each wheel cylinder system.
   - **BAD**
4. Loosen the flare nuts of brake fluid inlet pipes of actuator connected to the master cylinder. (Refer to unit inspection.)
5. Ensure that the brake fluid will flow out when brake pedal is depressed. (Refer to unit inspection.)
   CAUTION:
   - Depress the brake pedal gradually, otherwise quite a large amount of the brake fluid will flow out. (Refer to caution in air bleeding section.)
   - **NO** → Check abnormality in brake pedal and master cylinder.
   - **OK**
6. Tighten the loosened brake fluid inlet pipes. (Refer to unit inspection.)
7. Loosen the flare nut of brake fluid pipes on actuator connected to each wheel cylinder. (Refer to unit inspection.)
   - **OK** → Check brake pipes and hoses between actuator and wheel cylinder, including P valve.
8. Ensure that the brake fluid will flow out flow each outlet pipe when brake pedal is depressed. (Refer to unit inspection.)
   CAUTION:
   - Depress the brake pedal gradually, otherwise quite a large amount of the brake fluid will flow out. (Refer to caution in air breeding section.)
   - **NO**
9. Replace the actuator with a new one.

JABS00064-00000

TROUBLE SHOOTING PROCEDURE FLOW CHART NUMBER 7

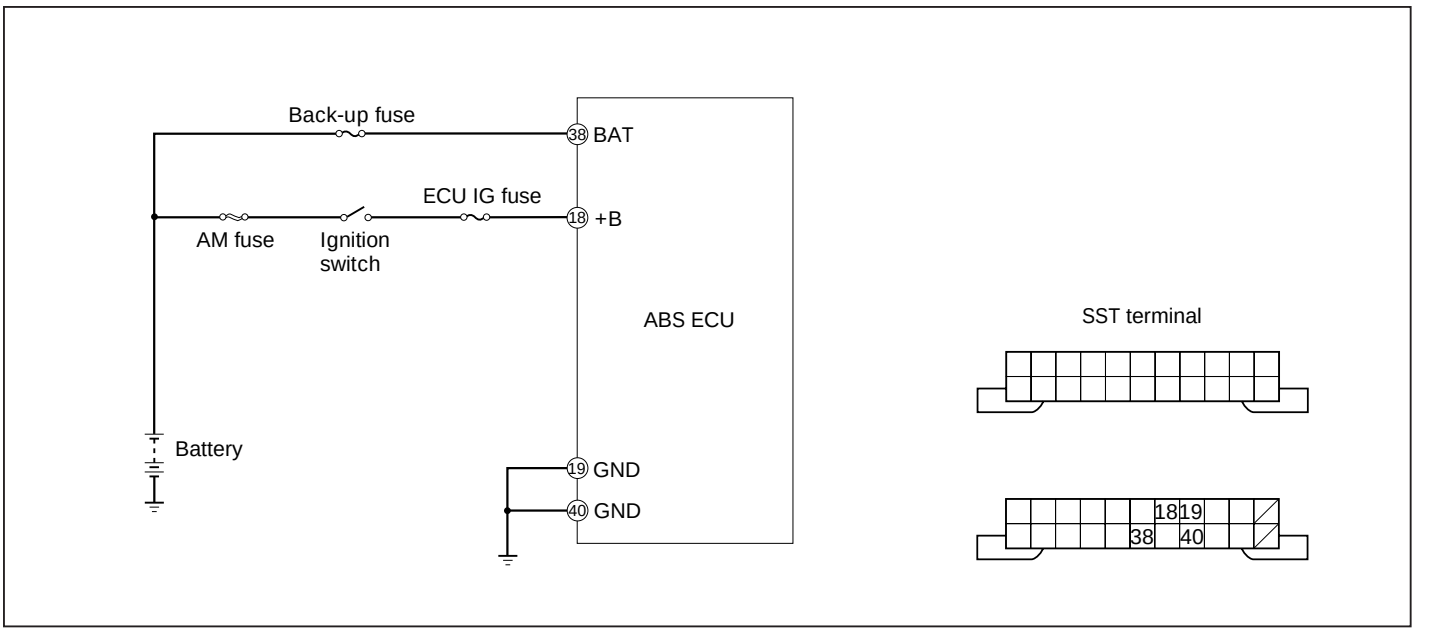
PHENOMENA: Brake pedal working travel is too large. (Reserve travel is too small.)



JABS00065-00000

BASIC CHECK

To perform the diagnosis properly, be sure to perform the basic check before carrying out the specified inspection to ensure whether the power supply circuit and ground circuit of the ABS ECU are proper or not.



JABS00066-00030

1. Ensure that the voltage applying to the ABS ECU is within the specified value, using a volt meter.
   Specified voltage: 10 - 18 volts

2. Connection of the SST
   (1) Disconnect the negative terminal of the ground cable from the battery negative terminal.
   CAUTION:
   - Be sure to read out the diagnosis code of the EFI system before disconnecting the negative terminal of the ground cable from the battery negative terminal.

JABS00067-00000

(2) Remove the glove compartment box by removing the glove compartment hinge. (Refer to the BO section.)
(3) Disconnect the connector of the wire harness which is connected to the ABS ECU.
(4) Connect the following SST to the connectors of the wire harness disconnected from the ABS ECU.(Refer to the unit inspection of ABS ECU.)
SST: 09842-87401-000

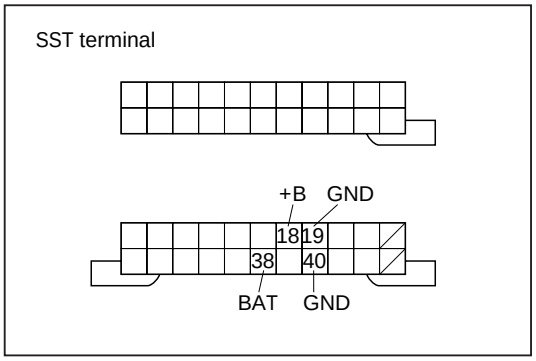
JABS00068-00031

CAUTION:
- Never connect the connectors of the SST to the ABS ECU proper.

3. Connect the negative terminal of the ground cable to the battery negative terminal.
4. Turn on the ignition switch.
NOTE:
- Never start the engine.

JABS00069-00032

5. Ensure that the battery voltage is applied between the terminal +B and the body ground, and between the terminal BAT and the body ground, using a specified circuit tester.
If the battery voltage is not applied, check the power supply circuit for open wire or short circuit.
6. Turn off the ignition switch.
7. Ensure that the battery voltage is applied between the terminal BAT of the SST and the body ground.
If no battery voltage applied, check the back-up power supply circuit for open wire or short circuit.
8. Ensure that continuity exists between each of the terminals GND of the SST and the body ground.
If no continuity exists, repair or replace the wire harness.
9. Disconnect the negative terminal of the ground cable from the battery negative terminal.
10. Disconnect the connector of the wire harness from the connector of the SST.
11. Connect the connector of the wire harness to the ABS ECU.
12. Connect the negative terminal of the ground cable to the battery negative terminal.



JABS00070-00033

UNIT INSPECTION & REPLACEMENT

NOTE:
- The inspection of each sensor circuit should be performed by reoffering to the ABS RELATED CONNECTORS and ABS CIRCUIT CONNECTION TABLE.
- Utilize the following SST effectively by reoffering to the unit inspection of the ABS ECU.
  SST: 09842-87401-000

- Never connect the connector of the SST to the ABS ECU during the inspection of continuity. Failure to observe this note may lead to wrong diagnosis results.

JABS00071-00000

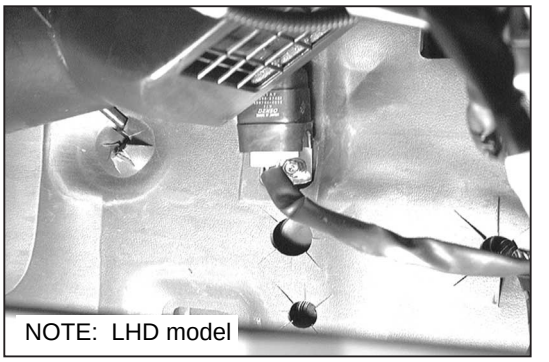
SOLENOID RELAY

1. Turn off the ignition switch.
2. Remove the solenoid relay from the dash panel by removing the attaching bolt.
3. Disconnect the connector of the wire harness connected to the solenoid relay.
   NOTE:
   - The solenoid relay is installed on the dash panel around the front center side of the front right seat.

JABS00072-00000

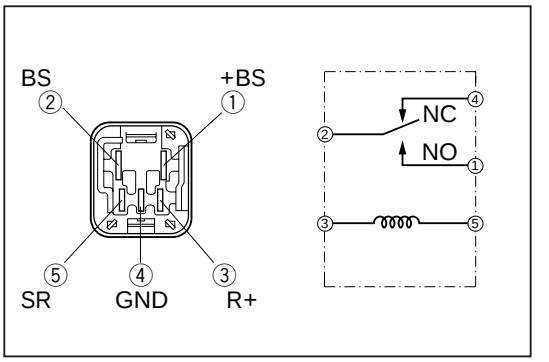
4. Ensure that continuity exists between the terminals BS and GND of the solenoid relay.
   If no continuity exists, replace the solenoid relay with a new one.
5. Ensure that the resistance between the terminals R+ and SR within the specified value.
   Specified resistance: 80 Ω (at 20 °C)

   If the measured resistance fails to meet the specified value, replace the solenoid relay with a new one.



JABS00073-00034

6. Ensure that continuity exists between the terminals +BS and BS when the battery voltage is applied across the terminals R+ and SR.
   If no continuity exists, replace the solenoid relay with a new one.
7. Install the solenoid relay to the dash panel with the attaching bolt.
8. Connect the connector of the wire harness to the solenoid relay.



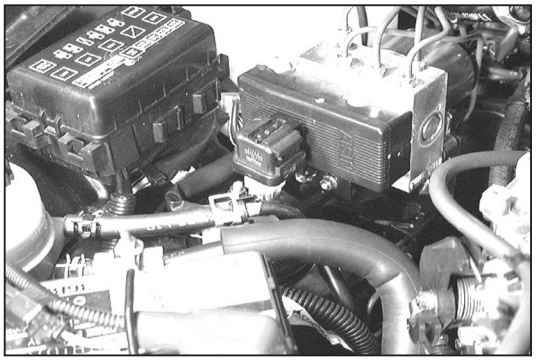
JABS00074-00035

MOTOR RELAY

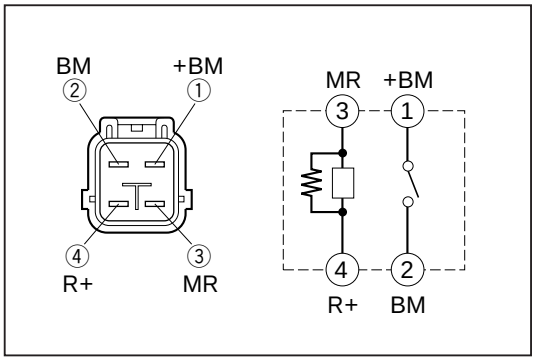
1. Turn off the ignition switch.
2. Remove the motor relay from its bracket while unlocking the lock provided on its bracket.
3. Disconnect the connector of the wire harness connected to the motor relay.
4. Ensure that the resistance between the terminals R+ and MR is within the specified value.
   Specified resistance: 62 ohm (at 20 °C)

   If the measured resistance fails to meet the specified value, replace the motor relay with a new one.

5. Ensure that continuity exists between the terminals +BM and BM of the motor relay when the battery voltage is applied across the terminals R+ and MR.
   If no continuity exists, replace the motor relay with a new one.
6. Connect the connector of the wire harness to the motor relay.
7. Install the motor relay to its bracket.



JABS00075-00036



JABS00076-00037

SENSOR CHECK BY SENSOR CHECK FUNCTION OF THE ABS ECU

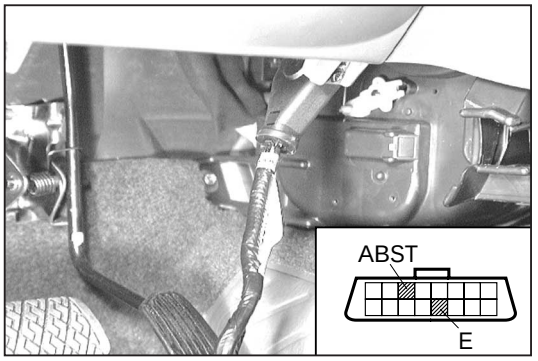
NOTE:
- The sensor check function of the ABS ECU checks the output signal (voltage) and its conditions of each speed sensor and gravity sensor.
- Therefore, you may judge whether sensors are proper or not by this function when the ABS ECU is functioning properly.
- Carefully follow the instructions mentioned below, in particular, the instructions regarding the operation of the ignition switch. Failure to observe this NOTE may lead to wrong diagnosis results.

JABS00077-00000

1. Ensure that the ignition switch is turned off.
2. Connect the following SST to the diagnosis connecter.
   SST: 09991-87401-000

3. Connect the terminal ABST with the ground terminal in the inspection connector of the SST, using the following SST.
   SST: 09991-87403-000

   CAUTION:
   - Never connect the connector other than that specified. Even slight contact of terminals other than that specified will lead to malfunction of the ABS, EFI and/or other systems.

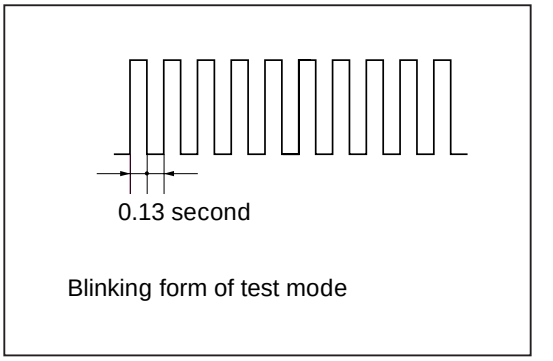


JABS00078-00038

4. Turn ON the ignition switch.
   CAUTION:
   - Never turn off the ignition switch until the sensor check by the sensor function is completed.

5. Ensure that the ABS warning lamp will indicate the ABS ECU code number once immediately after the ignition switch is turned on.
   NOTE:
   - There is no problem even if the ABS ECU code is not outputted.

JABS00079-00000



JABS00080-00039

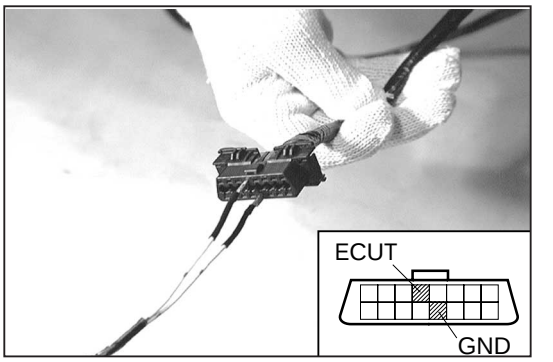
6. Ensure that the ABS warning lamp blinks at intervals of 0.13 second.
   <Reference>
   This shows that the ABS ECU is in the test mode.

7. Drive the vehicle at a speed between 45 km/h and 80 km/h. Then, maintain the driving speed for one second or more.
   WARNING:
   - Be sure to perform the test driving in a safe place.

   CAUTION:
   - Keep the steering wheel in a straight-ahead direction at the time of starting and stopping.
   - Never made tire slipping during the test driving.
   - If phenomenon appears under the high speed driving, drive the vehicle at a speed of 80 km/h or more and keep the driving speed for one second or more after performing the test driving above.

8. Stop the vehicle.
   NOTE:
   - Never turn off the ignition switch.

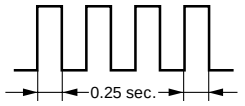
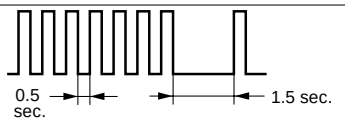
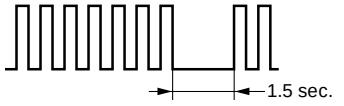
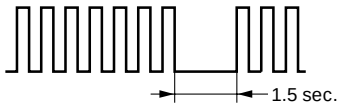
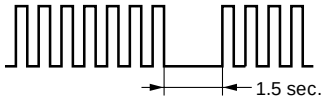
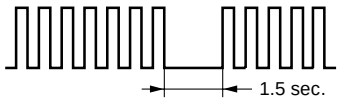
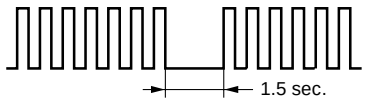
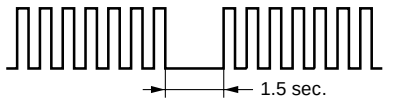
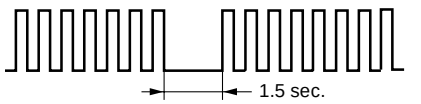
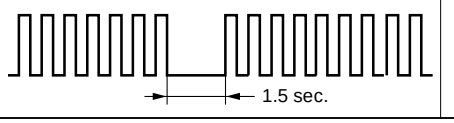
9. Connect the terminals ECUT and GND of the SST.
10. Read out the diagnosis code indicated by the blinking of the ABS warning lamp.
    NOTE:
    - The ABS warning lamp blinks at intervals of 0.25 second when the malfunction code is not memorized.
    - The ABS warning lamp indicates the malfunction code by blinking at intervals of 0.5 second. There is an interval of 1.5 seconds between the first digit and the second digit.
    - The ABS warning lamp blinks at intervals of the 2.5 seconds between codes when plural codes are memorized.
    - The ABS warning lamp repeats blinking at intervals of 4 seconds after all memorized malfunction codes are outputted.
    - When plural codes are memorized, the ABS warning lamp indicates diagnosis codes, starting from a smaller number.



JABS00081-00067

Diagnosis code table

NOTE:
- Be sure to perform trouble shooting including its related wire harness hand and connectors of presumable parts mentioned in the table above.

Code No.	Output from of diagnosis code	Diagnosis contents	Presumable causes
Nil		Normal	No trouble on sensor systems
71		Lack of output voltage of front right side speed sensor	Speed sensor Sensor rotor Clearance between sensor and sensor rotor Wheel bearing
72		Lack of output voltage of front left side speed sensor	Speed sensor Sensor rotor Clearance between sensor and sensor rotor Wheel bearing
73		Lack of output voltage of rear right side speed sensor	Speed sensor Sensor rotor Clearance between sensor and sensor rotor Wheel bearing
74		Lack of output voltage of rear left side speed sensor	Speed sensor Sensor rotor Clearance between sensor and sensor rotor Wheel bearing
75		Excessive variation of output voltage of front right side speed sensor	Speed sensor Sensor rotor Clearance between sensor and sensor rotor Deterioration of sensor tip and/or sensor rotor
76		Excessive variation of output voltage of front left side speed sensor	Speed sensor Sensor rotor Clearance between sensor and sensor rotor Deterioration of sensor tip and/or sensor rotor
77		Excessive variation of output voltage of rear right side speed sensor	Speed sensor Sensor rotor Clearance between sensor and sensor rotor Deterioration of sensor tip and/or sensor rotor
78		Excessive variation of output voltage of rear left side speed sensor	Speed sensor Sensor rotor Clearance between sensor and sensor rotor Deterioration of sensor tip and/or sensor rotor
79		Gravity sensor function	Gravity sensor

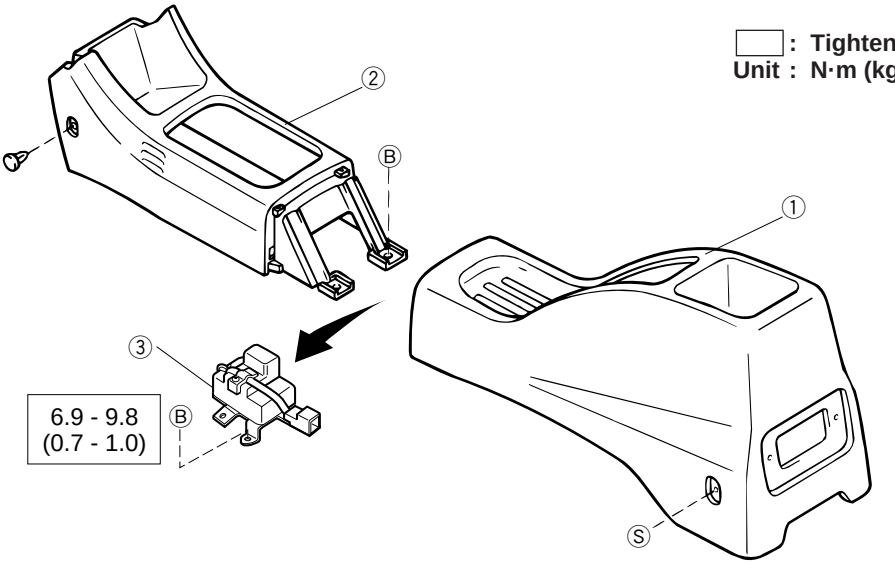
JABS00082-00000

11. Turn off the ignition switch.
12. Remove the SST (jump wire) from the SST (sub-harness.)
    NOTE:
    - All memorized codes will be erased when the ignition switch is turned off or the jump wire between the terminals ABST and the ground terminal is removed.

13. Remove the SST from the diagnosis connector.
14. Perform the unit inspection for parts mentioned in the table above as presumable cause and their related harnesses.

JABS00083-00000

GRAVITY SENSOR



① Rear console box assembly
② Console panel
③ Gravity sensor

JABS00084-00040

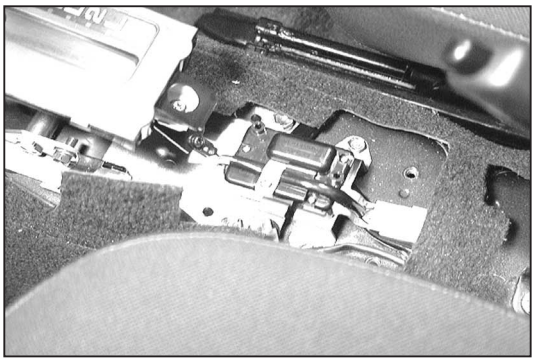
NOTE:
- The function check of the gravity sensor should be performed by the sensor check function. The following procedure applies only to the inspection of attaching conditions, removal and installation.

1. Removal of rear console box
   (1) Turn off the ignition switch.
   (2) Remove the console box by removing the two attaching bolts and screw grommets. (Refer to BO section.)

   NOTE:
   - Change the shift lever position while removing the center console box in the case of automatic transmission-equipped model.

JABS00085-00000

2. Inspection of gravity sensor for installation condition
   Check the gravity sensor for the following points.
   - Connector connecting condition.
   - Gravity sensor installing condition.
   - Ensure that the gravity sensor attaching bolts are tightened properly and the gravity sensor is seated on the floor panel properly.
     Also, check that the wire harness for the gravity sensor is not interfered with the gravity sensor.
     If any trouble exists, repair or replace the gravity sensor or the wire harness.



JABS00086-00041

3. Removal of gravity sensor
   (1) Remove the gravity sensor attaching bolts.
   (2) Disconnect the two wire harness clamps from the bracket of the gravity sensor.
   (3) Disconnect the connector from the gravity sensor.
4. Installation of gravity sensor
   (1) Connect the connector of the wire harness to the gravity sensor.
   (2) Connect the two wire harness clamps to the bracket of the gravity sensor.

JABS00087-00000

(3) Install the gravity sensor to the floor panel with two attaching bolts in such a direction that the connector provided on the gravity sensor faces toward backward.

CAUTION:

- Never install the gravity sensor in a reverse direction. The gravity sensor can be installed in both directions. Failure to observe this caution may make the gravity sensor inoperative.
- Never pinch the wire harness of the gravity sensor at the front side of the gravity sensor during the installation.
- Be sure to clean the contacting surfaces of the gravity sensor and floor panel before installing the gravity sensor.

(2) Tighten the attaching bolts evenly in two or three stages to the specified tightening torque.
Tightening torque: 6.9 - 9.8 N·m (0.7 - 1.0 kgf-m)

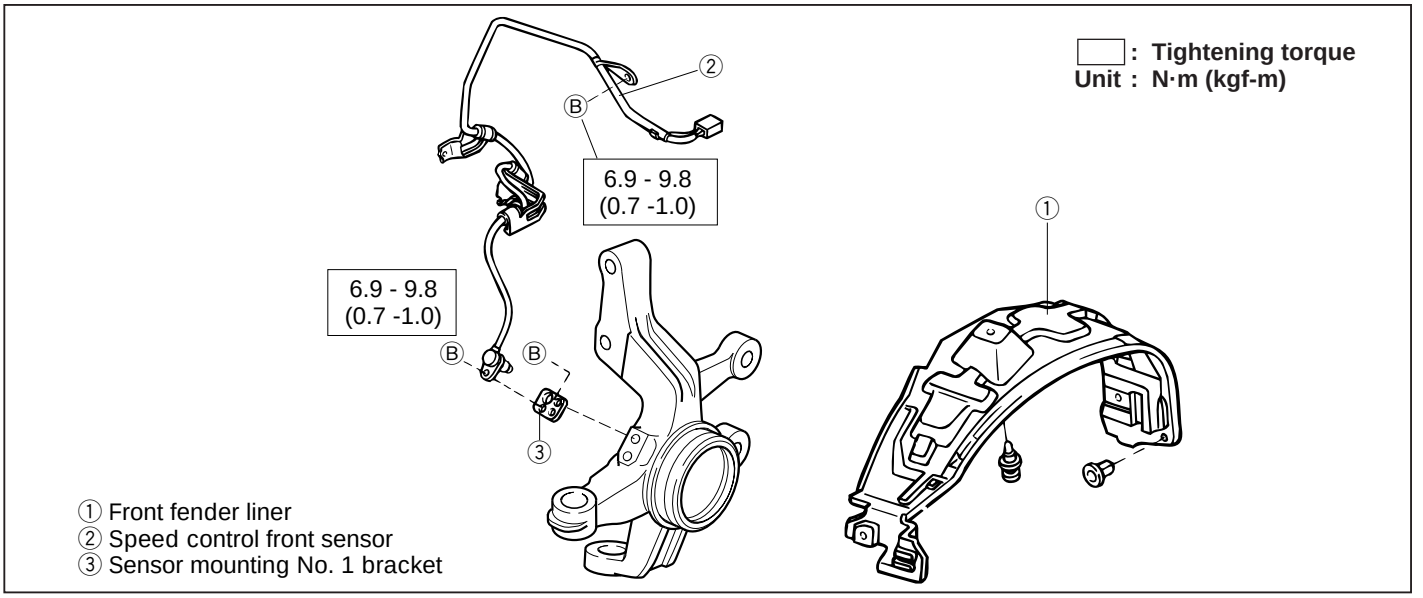
5 Install the center console boxes with two attaching bolts and screw grommets. (Refer to BO section.)

JABS00088-00000

FRONT SPEED SENSOR

NOTE:

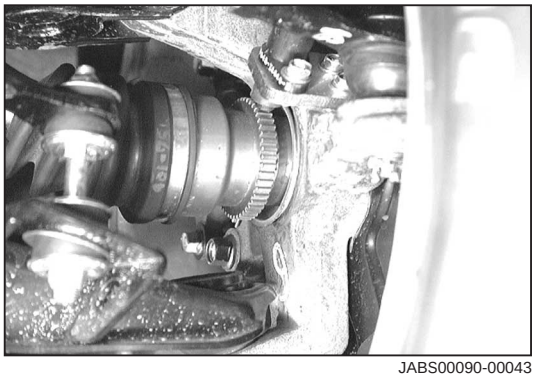
- The check of the speed sensor is basically carried out by the sensor check function.



JABS00089-00042

1. Checking of air gap
Ensure that the air gap between the sensor tip and the sensor rotor is within the specified value.
Air gap: 0.7 ± 0.5 mm

If the air gap fails to meet the specified air gap, replace the speed sensor, knuckle or sensor rotor(drive shaft), as required. (Refer to FS section.)



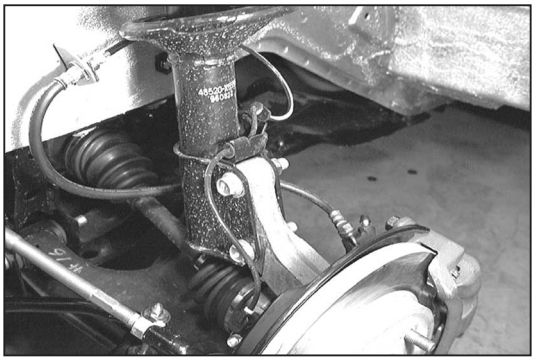
JABS00090-00043

2. Checking of sensor rotor
   Inspect the sensor rotor for the following points.
   - Ensure that the sensor rotor is pressed in on the drive shaft properly, is free from damage and is not contaminated by foreign materials.
   - Ensure that the wheel bearing has no excessive play.

   If any trouble exists, clean, repair or replace the sensor rotor (drive shaft) or wheel bearing, as required. (Refer to FS section.)

3. Removal of front speed sensor
   (1) Remove the fender liner. (Refer to BO section.)
   (2) Disconnect the wire harness side connector from the sensor connector.
   (3) Remove the front speed sensor by removing the attaching bolts.

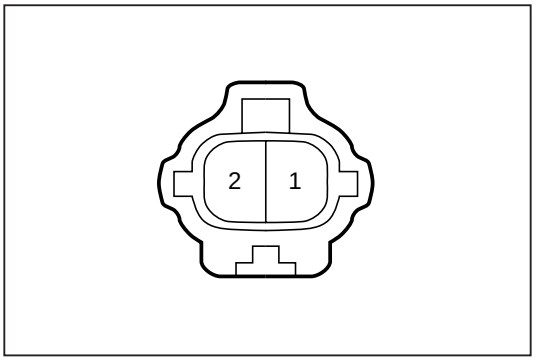
JABS00091-00000



JABS00092-00044

4. Inspection of speed sensor
   (1) Ensure that the front speed sensor resistance is within the specified value, using an ohmmeter.
   Specified resistance: 1.1 ± 0.2 k Ω (at 20°C)

   (2) Ensure that the tips of the speed sensors are free from damage or contamination with foreign materials.
   Clean the tips of the speed sensors, if they are contaminated.



JABS00093-00045

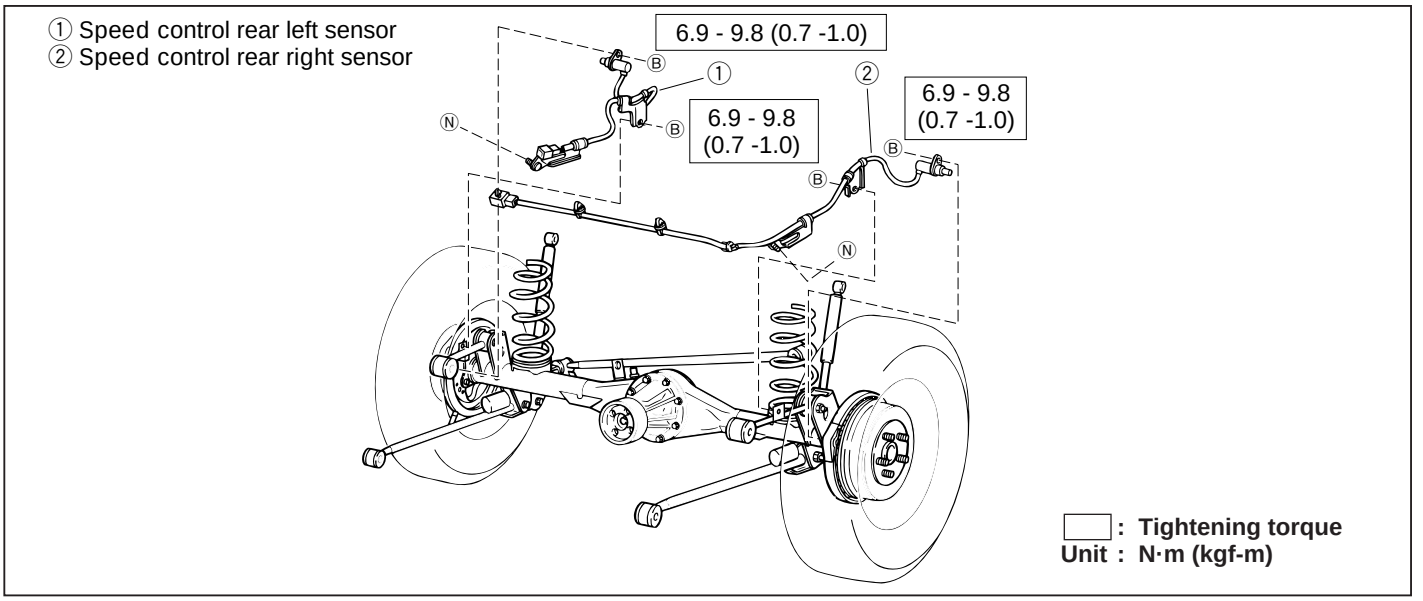
5. Installation of front speed sensor
   CAUTION:
   - Be sure to clean the contacting surfaces of the speed sensors and speed sensor before the installation.
   - Never twist the speed sensor harness during the installation and check that the checked line has not been twisted.

6. Install the speed sensor to the vehicle with the attaching bolts and tighten them to the specified tightening torque.
   Tightening torque:
   Speed sensor harness clamp to inner fender:
   6.9 - 9.8 N·m (0.7 - 1.0 kgf-m)
   Speed sensor to knuckle:
   6.9 - 9.8 N·m (0.7 - 1.0 kgf-m)

7. Install the fender liner. (Refer to BO section.)

REAR SPEED SENSOR

NOTE:
- The check of the speed sensor is basically carried out by the sensor check function.



JABS00094-00046

1. Remove the rear wheels. (Refer to RS section.)
2. Checking of air gap.
   (1) Remove the rear wheel. (Refer to RS section)
   (2) Ensure that the air gap between the sensor tip and the sensor rotor (brake drum) is within the specified value.
   Air gap: 1.8 ± 1.0 mm

   If the air gap fails to meet the specified air gap, replace the speed sensor, brake backing plate (refer to RS section.) or sensor rotor (brake drum), as required.
   (3) Install the rear wheel. (Refer to RS section.)

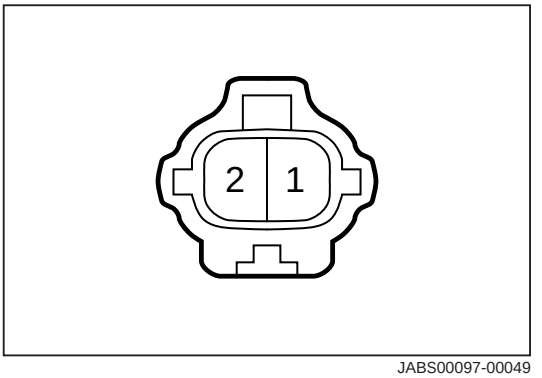
JABS00095-00047

3. Checking of sensor rotor (brake drum.)
   (1) Remove the rear wheel. (Refer to RS section.)
   (2) Ensure that the sensor rotor is free from damage and contamination with foreign materials. Also, check that no excessive free play exists on the wheel bearings.
   If any trouble exists, clean, repair or replace the sensor rotor(brake drum) or wheel bearing, as required.
   (3) Install the rear wheel. (Refer to RS section.)

JABS00096-00048

4. Inspection of speed sensor
   CAUTION:
   - Never remove the rear speed sensor from the vehicle, unless its replacement is required.
   - No spare part of the sensor wire clamp is available.

   (1) Disconnect the connector of the rear speed sensor from the connector of the wire harness.
   (2) Ensure that the rear speed sensor resistance is within the specified value, using an ohmmeter.
   Specified resistance: 1.1 ± 0.2 k Ω (at 20°C)



JABS00097-00049

(3) Ensure that the tips of the speed sensors are free from damage or contamination with foreign materials.
Clean the tips of the speed sensors, if they are contaminated.
(4) Connect the connector of the rear speed sensor to the connector of the wire harness.

5. Removal of speed sensor
NOTE:
• Refer to the illustration shown in page BR–77.

(1) Turn off the ignition switch.
(2) Disconnect the connector of the speed sensor from the connector of the wire harness.
(3) Disconnect the sensor harness clamp by removing the attaching bolts.
(4) Disconnect the sensor harness clamp form the floor panel by retracting its lock sections, using a minor screwdriver or the like.
(5) Remove the speed sensor by removing the attaching bolt.

6. Installation of speed sensor
(1) Clean the attaching surface of the speed sensor and backing plate.
(2) Install the speed sensor with the attaching bolt and tightening it to the specified tightening torque.
Tightening torque: 6.9 - 9.8 N·m (0.7 - 1.0 kgf-m)

(3) Connect the sensor harness clamp to the floor panel and ensure that the locking section is properly engaged by pulling it lightly.
(4) Connect the sensor harness clamp with the attaching bolts and tighten them to the specified tightening torque.
Tightening torque: 6.9 - 9.8 N·m (0.7 - 1.0 kgf-m)

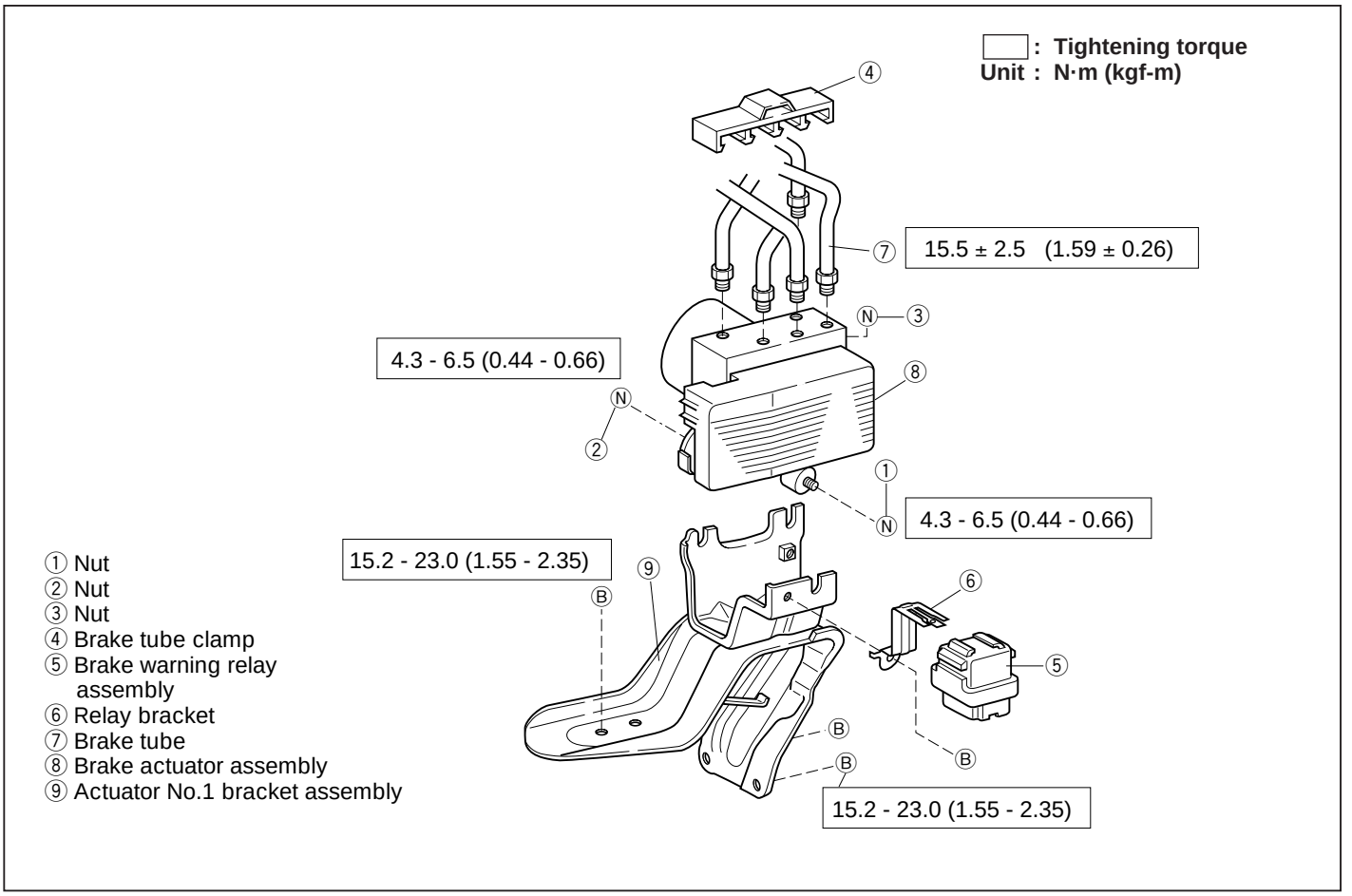
(5) Connect the connector of the speed sensor to the connector to the wire harness.
(6) Check the speed sensor by performing the sensor check function of the ABS.

JABS00098-00000

ABS ACTUATOR

WARNING:

- Be sure to prevent foreign substances from being admitted into the brake actuator. Failure to observe this warning may lead to serius brake malfunction.



JABS00099-00050

1. Check of continuity and resistance
   (1) Disconnect the negative terminal of the ground cable from the negative terminal of the battery.

   NOTE:
   - Be sure to read out the diagnosis code of the ABS and EFI before disconnecting the battery power supply.

   (2) Remove the glove compartment box by removing the glove compartment door hinge. (Refer to BO section.)
   (3) Disconnect the connector of the wire harness from the ABS ECU.
   (4) Connect the following SST to the connector of the wire harness which was connected to the ABS ECU.
   SST: 09842-87401-000

   NOTE:
   - Never connect the connector of the SST to the ABS ECU.

JABS00100-00051

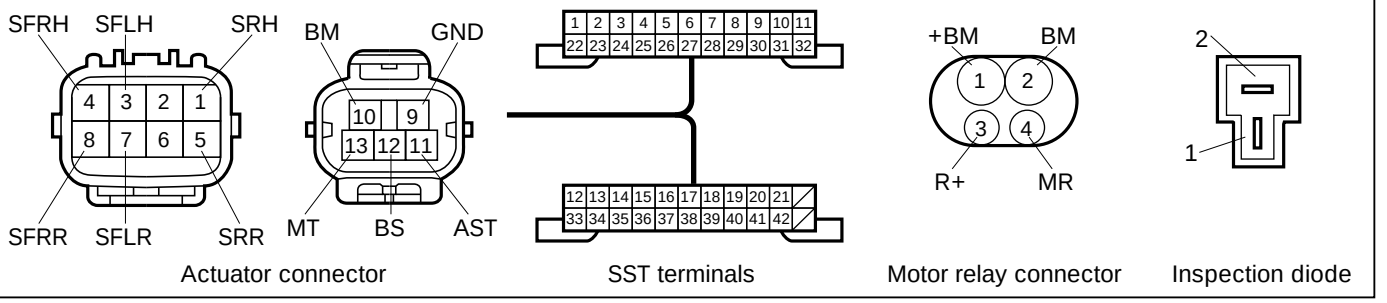
(5) Remove the inspection diode. (Refer to the inspection diode section)
(6) Remove the motor relay. (Refer to the motor relay section.)
(7) Ensure that the resistance or continuity between the respective terminals is within the specified value, as shown in the table below.

NOTE:

- Resistance values in the following table below denote values at an ambient temperature of 20°C.
  If any one of resistance or continuity fails to meet the specification in the following table, replace the actuator with a new one.

JABS00101-00000

Terminal table of SST and connector terminals



JABS00000-00052

	Terminal to be checked or measured											Resistance
Terminal No. (Actuator)	1	3	4	5	7	8	9	10	11	12	13	
Terminal to be checked	○									○		5 ± 0.25 Ω plus wiring resistance
		○								○		
			○							○		
				○						○		2.2 ± 0.2 Ω plus wiring resistance
					○					○		
						○				○		
									○	○		33 ± 0.2 Ω plus wiring resistance
								○			○	
							○	○				wiring resistance
SST terminal	22	1	8	23	2	29	19		24			
Motor relay								2				
Inspection diode										2		

If the measured resistance or continuity fails to meet the specified value, perform the unit inspection after the actuator is removed by referring to the table above, in order to clarify that the trouble originated in the wire harness or the actuator unit.

JABS00102-00000

(8) Install the motor relay. (Refer to the motor relay section.)
(9) Install the inspection diode. (Refer to the inspection diode section.)
(10) Remove the following SST from the connector of the wire harness which was connected to the ABS ECU.

NOTE:

- Never connect the connector of the SST to the ABS ECU.

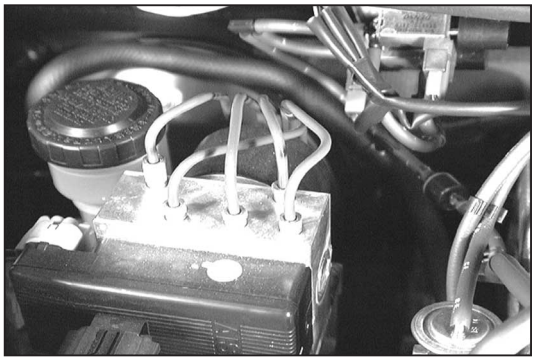
(11) Connect the connector of the wire harness to the ABS ECU.
(12) Install the glove compartment box by installing the glove compartment box retainer. (Refer to BO section.)
(13) Connect the negative terminal of the ground cable from the negative terminal of the battery.

JABS00103-00000

2. Check of fluid lines in actuator

CAUTION:

- Be sure to prevent the brake fluid from coming in contact with the painted surface and resin parts, using a piece of cloth or the like. If the brake fluid comes in contact with the painted surface and resin parts, immediately wipe off the brake fluid and wash with fresh water.

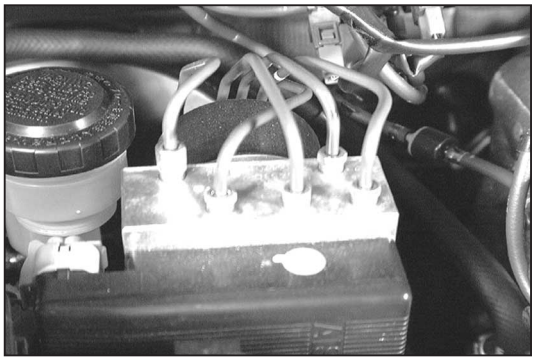


JABS00104-00053

(1) Loosen the brake pipes connected to the actuator from the master cylinder.
(2) Ensure that the brake fluid will flow out without resistance when the brake pedal is depressed.

CAUTION:

- Be sure to depress the brake pedal gradually, otherwise a quite large amount of brake fluid will splash out.
- If no brake fluid flows out, check the fluid leakage or internal leakage in the master cylinder.



JABS00105-00054

(3) Tighten the flare nuts to the specified tightening torque.
Tightening torque: 15.5 ± 2.5 N·m (1.59 ± 0.26 kgf-m)

(4) Loosen the brake pipes connected to the actuator from the wheel cylinders.
(5) Ensure that the brake fluid will flow out without resistance when the brake pedal is depressed.

CAUTION:

- Be sure to depress the brake pedal gradually, otherwise a quite large amount of brake fluid will splash out.

If no brake fluid flows out, replace the actuator with a new one, after inspecting the P valve for fluid continuity.

(6) Tighten the flare nuts to the specified tightening torque.
Tightening torque: 15.5 ± 2.5 N·m (1.59 ± 0.26 kgf-m)

JABS00106-00000

3. Function check of actuator

(1) Preparation before inspection
   ① Check the brake system, using a brake tester.
   If any trouble exists, repair it, as required.
   ② Jack up the vehicle and support it with safety stands.
   (Refer to GI section for supporting position of the safety stand.)
   ③ Release the parking brake.
   ④ Place the shift lever in the neutral position.
   ⑤ Ensure that the wheels turn properly.

LABS00107-00055

⑥ Disconnect the negative terminal of the ground cable from the negative terminal of the battery.

NOTE:
- Be sure to read out the diagnosis code of the EFI system before disconnecting the power supply to the vehicle.

⑦ Disconnect the connector of the wire harness connected to the ABS ECU.
⑧ Connect the following SST to the connector of the wire harness disconnected from the ABS ECU.
SST: 09842-87401-000

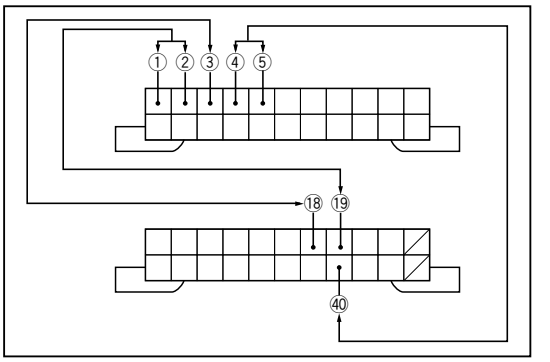

LABS000108-00056

NOTE:
- Never connect the connector of the SST to the ABS ECU.

⑨ Connect the negative terminal of the ground cable to the negative terminal of the battery.

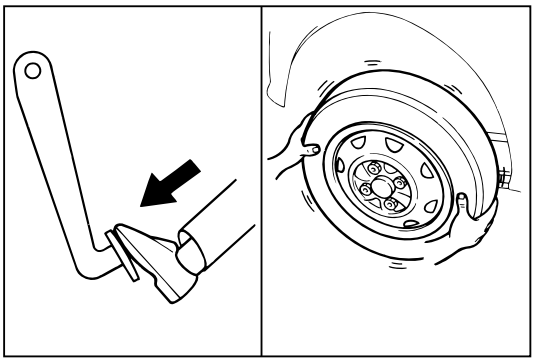
(2) Inspection of left side front wheel
CAUTION:
- Never connect the terminal to other terminals than that specified. Failure to observe this caution may lead to serius trouble including fire.

① Connect the terminals No. 1 and 2 to terminal No. 19.
② Connect the terminals No. 4 and 5 to terminals No. 40.
③ Connect the terminals No. 3 to terminals No. 18.



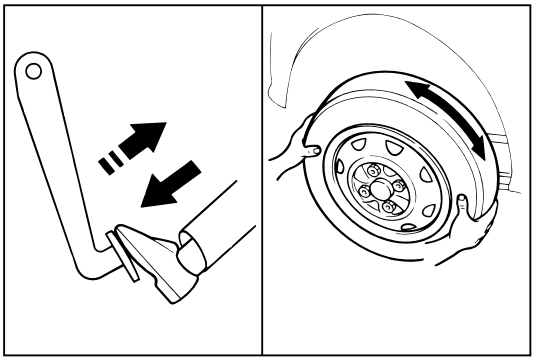
LABS00109-00057

④ Ensure that the front side left wheel will be locked when the brake pedal is depressed.


LABS00110-00058

⑤ Ensure that the locked state of the front side left wheel will be released and the wheel turns freely, also, ensure that the brake pedal will rise up slightly when the ignition switch is turned ON while depressing the brake pedal.

CAUTION:
- Never leave the ignition switch in the ON state for 15 seconds or more.
- Failure to observe this caution will make the actuator inoperative.


LABS00111-00059

⑥ Turn off the ignition switch immediately after the inspection.
If the actuator is not functioning as specified above, replace the actuator with a new one.

⑥ Remove the jump wire in the SST terminals.

NOTE:

- Proceed to check the remaining right and rear wheels as mentioned in step (3).

⑦ Disconnect the negative terminal of the ground cable from the negative terminal of the battery.
⑧ Remove the SST from the connector of the wire harness.
⑨ Connect the connector of the wire harness to the ABS ECU.

10. Connect the negative terminal of the ground cable to the negative terminal of the battery.

LABS00112-00000

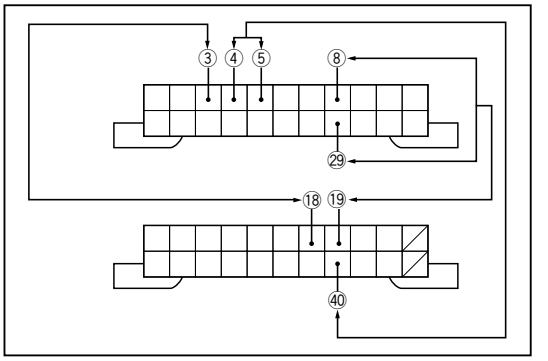
(3) Inspection of right side front wheel and rear wheels

CAUTION:

- The terminals of the SST shown in this step are to be connected for each inspection.
- However, the step-by-step procedure is not given in this step. The inspection procedure of the right side front wheel and rear wheels is the same as the left side front wheel, except terminals to be connected in the SST. Therefore, follow the procedure mentioned in “Inspection of left side front wheel”, except terminals in the SST to be connected.

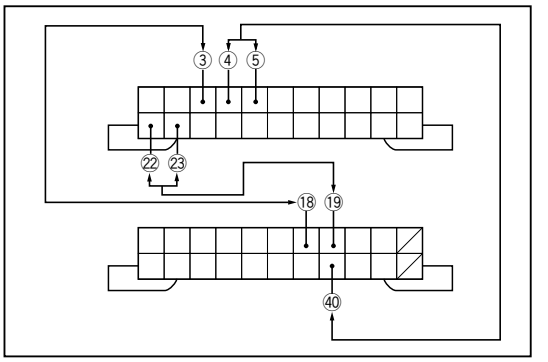
LABS00113-00000

① Right side front wheel
- Connect the terminals No. 8 and 29 to terminal 19.
- Connect the terminals No. 4 and 5 to terminal No. 40.
- Connect the terminals No. 3 and 18.



LABS00114-00060

② Rear wheels
- Connect the terminals No. 22 and 23 to terminal 19.
- Connect the terminals No. 4 and 5 to terminal No. 40.
- Connect the terminals No. 3 and 18.



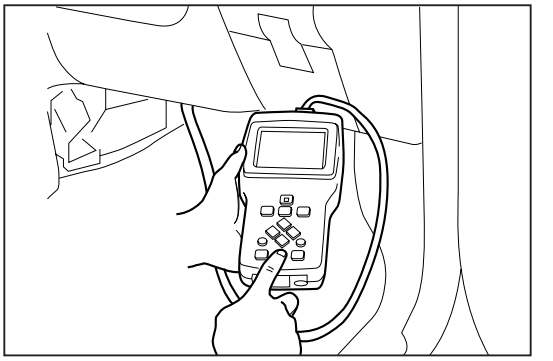
LABS00115-00061

4. Function check of actuator using DS-21

(1) Preparation before inspection
① Check the brake system, using a brake tester.
② Jack up the vehicle and support it with safety stands.
(Refer to GI section for supporting position of the safety stand.)
③ Release the parking brake.
④ Place the shift lever to the neutral position.
⑤ Ensure that the wheels turn properly.

LABS00116-00000

(2) Inspection
(Refer to the service manual of DS-21 for more details.)
① Connect the DS-21 to the diagnosis connector, using the following SST.
SST: 09991-87401-000



JABS00117-00062

② Select the function of the actuator drive.

NOTE:
- When selecting of the actuator drive, release the security function of DS-21.

③ Ensure that the wheels turn properly.
④ Ensure that the wheels will be locked when the brake pedal is depressed.
⑤ Ensure that the locked state of the front side left wheel will the released and the wheel turns freely. Also, ensure that the brake pedal will rise up slightly when the function of the front side left wheel actuator is performed by DS-21.
⑥ Perform the remaining inspection of the front side right wheel and rear wheels one by one, following the steps ① to ⑤ mentioned above.

JABS00118-00000

5. Removal of ABS actuator
NOTE:
- Refer to the illustration in page BR–79

(1) Removal of motor relay
① Disconnect the connectors of the wire harness from the motor relay.
② Remove the motor relay by unlocking the lock on its bracket.
③ Remove the motor relay bracket.
(2) Drain the brake fluid from the brake system.
(3) Remove the brake tube clamp.
(4) Disconnect the brake pipes from the actuator.
CAUTION:
- Prevent dust or other foreign substances from being admitted into the actuator and brake line.
- Failure to observe this caution may lead to serius brake problem.

(5) Remove the actuator by removing the attaching nuts.
CAUTION:
- Never deform the brake pipes during the removal of the actuator.

(6) Removal of ABS actuator bracket
① Disconnect the brake pipe from the brake pipe clamp.
② Disconnect the brake pipe (connected from the front inlet P valve to the actuator) from the P valve.
CAUTION:
- Prevent dust or other foreign substances from being admitted into the brake line.
- Failure to observe this caution may lead to serius brake problem.

③ Remove the ABS actuator bracket with the brake pipe by removing the attaching bolts.

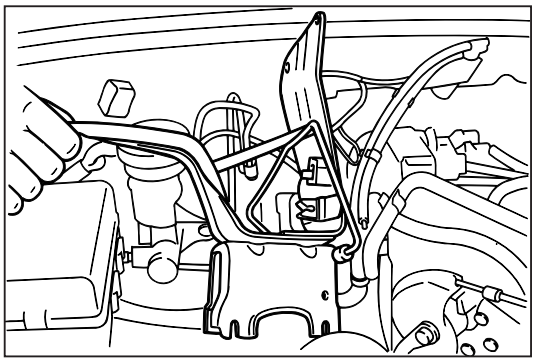
JABS00119-00000

6. Installation of ABS actuator
   NOTE:
   • The installation procedure is basically procedure in the reverse order of the removal procedure. Therefore, some illustrations are omitted from the installation procedure. Refer to the illustration in the removal procedure if any difficulty is encountered.

JABS00120-00000

(1) Installation of ABS actuator bracket
   ① Insert the brake pipe (connected from the P valve to the front inlet of the actuator) in the brake actuator bracket as shown.
   ② Install the ABS actuator bracket by installing the attaching bolts and tighten the attaching bolts to the specified tightening torque evenly.
   Tightening torque: 15.2 - 23.0 N·m (1.55 - 2.35 kgf-m)

   ③ Connect the brake pipe to the P valve temporarily by your hand.



JABS00121-00063

(2) Install the actuator with the attaching nuts and tighten them to the specified tightening torque.
   Tightening torque: 4.3 - 6.5 N·m (0.44 - 0.66 kgf-m)

CAUTION:
• Never deform the brake pipes during the removal of the actuator.

(3) Connect the brake pipes to the actuator and tighten the flare nuts of the brake pipes which are connected to the actuator and P valve to the specified tightening torque.
   Tightening torque: 15.5 ± 2.5 N·m (1.59 ± 0.26 kgf-m)

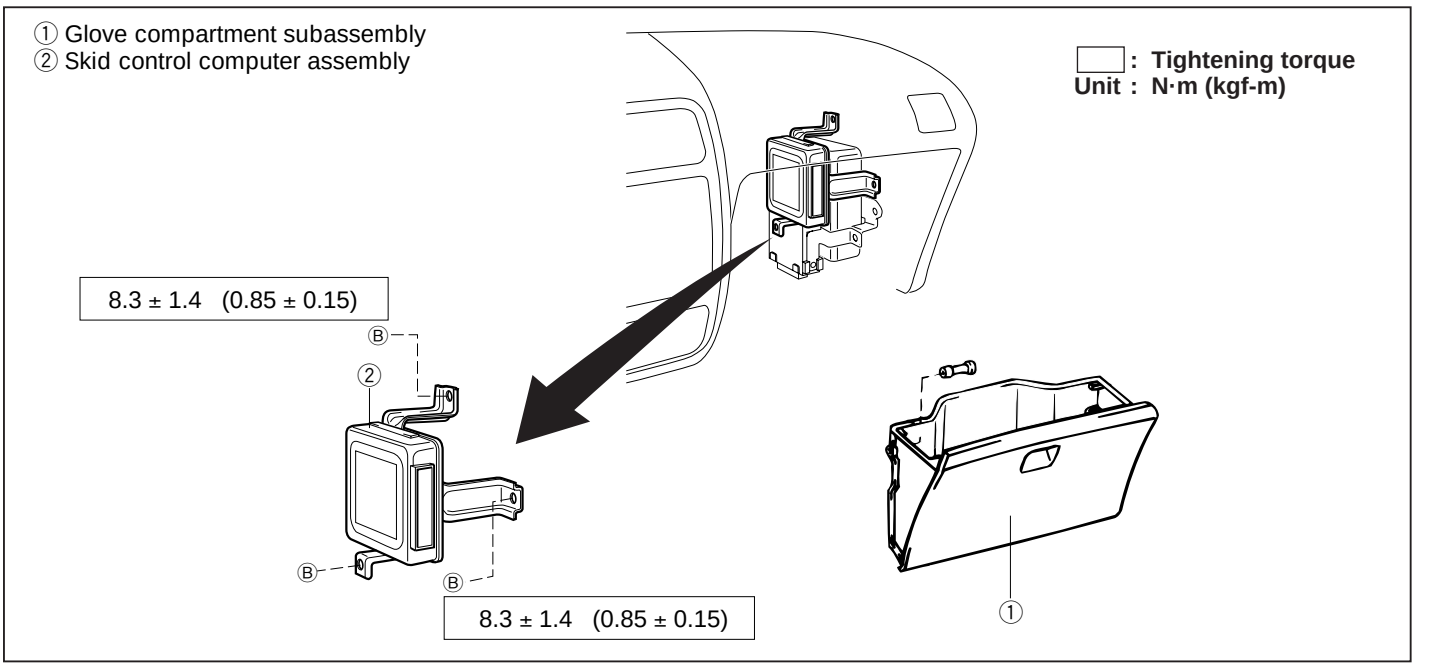
CAUTION:
• Prevent dust or other foreign substances from being admitted into the actuator and brake line.
• Failure to observe this caution may lead to serius brake problem.

(4) Fill the brake fluid to the brake system.
(5) Ensure that no brake fluid leakage exists.
(6) Installation of motor relay
   ① Install the motor relay bracket with the attaching bolts.
   ② Connect the motor relay to the motor relay bracket and ensure that the lock is properly engaged.
   ③ Connect the connectors of the wire harness to the motor relay.

JABS00122-00000

ABS ECU

COMPONENTS



JABS00123-00064

CAUTION:

- Be sure to read out the diagnosis code of the ABS and EFI systems before disconnecting the battery power supply. Failure to observe this caution will erase the memorized diagnosis codes.
- Be sure to perform the unit inspection of the ABS ECU at the battery voltage between 10 to 14 volts when the ignition switch is turned ON.
- Use correct measuring instrument for inspection. (Refer to BR–42.)

1. Disconnect the negative terminal of the ground cable from the negative terminal of the battery.
2. Remove the glove compartment box by removing the retainer. (Refer to BO section.)
3. Disconnect the connector of the wire harness from the ABS ECU.
4. Connect the following SST between the ABS ECU and the connector of the wire harness.
   SST: 09842-87401-000
5. Connect the negative terminal of the ground cable to the negative terminal of the battery.
6. Measure the voltages under the condition specified in the table below and perform the trouble shooting of the part(s) related to the wire harness and connection as mentioned in the table below.
   NOTE:
   - All specifications mentioned in the following table denote values at a temperature under 20-25 °C.
   - Be sure to perform the trouble shooting including its related wire harness and connectors of presumable parts mentioned in the following table.

JABS00124-00000

JABS00125-00065

Terminal to be connected	Specified value	Measuring condition		Presumable cause
1 (SFLH) - 40 (GND)	Zero volt	Ignition switch OFF		Actuator Solenoid relay
	Battery voltage	Ignition switch ON	After ABS warning lamp is extinguished.	
2 (SFLR) - 40 (GND)	Zero volt	Ignition switch OFF		Actuator Solenoid relay
	Battery voltage	Ignition switch ON	After ABS warning lamp is extinguished.	
3 (R+) - 40 (GND)	Zero volt	Ignition switch OFF		Solenoid relay Motor relay
	Battery voltage	Ignition switch ON		
4 (MR) - 40 (GND)	Zero volt	Ignition switch OFF		Motor relay
	Battery voltage	Ignition switch ON	When motor relay is turned ON	
	Battery voltage	Ignition switch ON	When motor is operating, for example, short duration immediately after ignition switch is turned ON.	
5 (SR) - 40 (GND)	Zero volt	Ignition switch OFF		Solenoid relay
	Zero volt	Ignition switch ON	When solenoid relay is turned ON	
6 (FR+) - 40 (GND)	Zero volt	Ignition switch OFF		Front right speed sensor
	1.0 - 3.0 volts	Ignition switch ON		
7 (FR–) - 40 (GND)	Zero volt	Ignition switch OFF		
	1.0 - 3.0 volts	Ignition switch ON		
8 (SFRH) - 40 (GND)	Zero volt	Ignition switch OFF		Actuator Solenoid relay
	Battery voltage	Ignition switch ON	After ABS warning lamp is extinguished.	
8 (RL+) - 40 (GND)	Zero volt	Ignition switch OFF		Front left speed sensor
	1.0 - 3.0 volts	Ignition switch ON		
10 (RL–) - 40 (GND)	Zero volt	Ignition switch OFF		
	1.0 - 3.0 volts	Ignition switch ON		
13 (GST) - 40 (GND)	Zero volt	Ignition switch OFF		Gravity sensor
	Zero volt	Ignition switch ON		
14 (ABST) - 40 (GND)	Zero volt	Ignition switch OFF		Diagnosis connector
	Battery voltage	Ignition switch ON		
15 (GS2) - 40 (GND)	Zero volt	Ignition switch OFF		Gravity sensor
	1.0 - 3.0 volts	Ignition switch ON		
18 (IG2) - 40 (GND)	Zero volt	Ignition switch OFF		Ignition switch
	Battery voltage	Ignition switch ON		
19 (GND) - 40 (GND)	Zero volt	Ignition switch OFF		Body ground
	Zero volt	Ignition switch ON		
19 (GND) - Body ground	Continuity	Ignition switch OFF		
22 (SRH) - 40 (GND)	Zero volt	Ignition switch OFF		Actuator Solenoid relay
	Battery voltage	Ignition switch ON	After ABS warning lamp is extinguished.	
23 (SRR) - 40 (GND)	Zero volt	Ignition switch OFF		Actuator Solenoid relay
	Battery voltage	Ignition switch ON	After ABS warning lamp is extinguished.	
24 (AST) - 40 (GND)	Zero volt	Ignition switch OFF		Actuator Solenoid relay
	Battery voltage	Ignition switch ON		
25 (MT) - 40 (GND)	Zero volt	Ignition switch OFF		Actuator Motor relay
	Zero volt	Ignition switch ON		
	Battery voltage	Ignition switch ON	During motor relay is ON	

Terminal to be connected	Specified value	Measuring condition		Presumable cause
26 (FL+) - 40 (GND)	Zero volt	Ignition switch OFF		Front left speed sensor
	1.0 - 3.0 volts	Ignition switch ON		
27 (FL–) - 40 (GND)	Zero volt	Ignition switch OFF		
	1.0 - 3.0 volts	Ignition switch ON		
29 (SFRR) - 40 (GND)	Zero volt	Ignition switch OFF		Actuator Motor relay
	Battery voltage	Ignition switch ON	After ABS warning lamp is extinguished.	
31 (RR+) - 40 (GND)	Zero volt	Ignition switch OFF		Rear right speed sensor
	1.0 - 3.0 volts	Ignition switch ON		
32 (RR–) - 40 (GND)	Zero volt	Ignition switch OFF		
	1.0 - 3.0 volts	Ignition switch ON		
34 (GGND) - 40 (GND)	Zero volt	Ignition switch OFF		Gravity sensor
	Zero volt	Ignition switch ON		
35 (GS1) - 40 (GND)	Zero volt	Ignition switch OFF		
	1.0 - 3.0 volts	Ignition switch ON		
36 (ECUT) - 40 (GND)	3.0 - 6.0 volts	Ignition switch OFF		Diagnosis connector
	Battery voltage	Ignition switch ON		
37 (STP) - 40 (GND)	Zero volt	Ignition switch OFF		Stop lamp switch Stop lamp
	Zero volt	Ignition switch ON		
	Battery voltage	When brake pedal is depressed		
38 (BAT) - 40 (GND)	Battery voltage	Ignition switch OFF		Back-up fuse
	Battery voltage	Ignition switch ON		
40 (GND) - Body ground	Zero volt	Ignition switch OFF		Body ground
	Zero volt	Ignition switch ON		
	Continuity	Ignition switch OFF		ABS warning lamp (Combination lamp)
41 (WA) - 40 (GND)	Zero volt	Ignition switch OFF		
	Battery voltage	Ignition switch ON	After ABS warning lamp is extinguished.	

JABS00126-00000

7. Turn off the ignition switch.
8. Disconnect the negative terminal of the ground cable from the negative terminal of the battery.
9. Disconnect the SST connectors from the ABS ECU.
10. Measure resistance or continuity between the SST terminals specified in the table below and perform the trouble shooting for the part(s) related to the wire harness including the connectors mentioned in the table below.
    NOTE:
    - All specifications mentioned above denote values at a temperature of under 20 - 25°C.

Terminal to be connected	Specified value	Measuring condition	Presumable cause
㉖ (FL+) - ㉗ (FL–)	1.0 - 1.4 kΩ ± 20%	Ignition switch turned OFF.	Front left speed sensor
⑥ (FR+) - ⑦ (FR–)	1.0 - 1.4 kΩ ± 20%		Front right speed sensor
⑨ (RL+) - ⑩ (RL–)	1.0 - 1.4 kΩ ± 20%		Rear left speed sensor
㉛ (RR+) - ㉜ (RR–)	1.0 - 1.4 kΩ ± 20%		Rear right speed sensor
② (SFLR) - ㊵ (GND)	2.0 - 2.4 kΩ ± 20%		Front left fluid pressure retaining solenoid valve
㉙ (SFRR) - ㊵ (GND)	2.0 - 2.4 kΩ ± 20%		Front right fluid pressure retaining solenoid valve
㉓ (SRR) - ㊵ (GND)	2.0 - 2.4 kΩ ± 20%		Rear fluid pressure retaining solenoid valve
㉒ (SRH) - ㊵ (GND)	4.75 - 5.25 Ω ± 20%		Rear fluid pressure reducing solenoid valve
① (SFLH) - ㊵ (GND)	4.75 - 5.25 Ω ± 20%		Front left fluid pressure reducing solenoid valve
⑧ (SFRH) - ㊵ (GND)	4.75 - 5.25 Ω ± 20%		Front right fluid pressure reducing solenoid valve
⑤ (SR) - ③ (R+)	80 Ω ± 20%		Solenoid relay
④ (MR) - ③ (R+)	62 Ω ± 20%		Motor relay
㉔ (AST) - ㊵ (GND)	33 Ω ± 20%		Monitor resistance
㉕ (MT) - ㊵ (GND)	32 Ω ± 20%		Motor

JABS00127-00000

11. Disconnect the connectors of the wire harness from the SST.
12. Connect the connectors of the wire harness to the ABS ECU.
13. Install the glove compartment box. (Refer to BO section.)
14. Connect the negative terminal of the ground cable to the negative terminal of the battery.
15. Perform the final check, using a four-wheel brake tester or on the road test.
    WARNING:
    - The road test should be carried out at a safe place.

JABS00128-00000

Replacement of ABS ECU

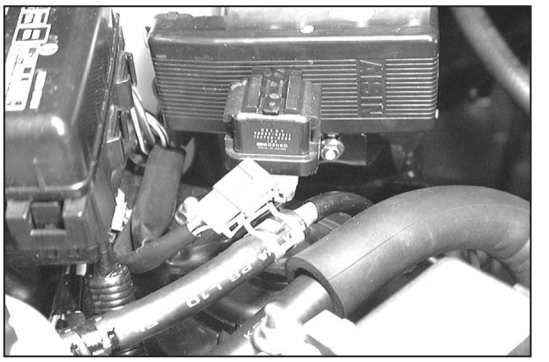
(Refer to the illustration in page BR–86.)

1. Disconnect the negative terminal of the ground cable from the negative terminal of the battery.
   CAUTION:
   - Be sure to read out the diagnosis code of the ABS and EFI systems before disconnecting the battery power supply.
2. Remove the glove compartment box by removing its retainer. (Refer to BO section.)
3. Disconnect the connector of the wire harness from the ABS ECU.
4. Disconnect the wire harness clamp from the ABS ECU bracket by retracting the mushroom section of the clamp.
5. Remove the ABS ECU by removing the two attaching bolts.
6. Install the ABS ECU with two attaching bolts.
7. Connect the wire harness clamp to the ABS ECU connector.
8. Connect the connectors of the wire harness to the ABS ECU.
9. Install the glove compartment box by installing its retainer. (Refer to BO section.)
10. Connect the negative terminal of the ground cable to the negative terminal of the battery.

JABS00129-00000

INSPECTION DIODE

1. Remove the check diode from the connector of the wire harness.



JABS00130-00066

2. Ensure that continuity exists between the terminals of the inspection diode. Also, ensure that no continuity exists between the terminals when the attaching order of the tester probes is reversed, using an ohmmeter. (Refer to the BR–38.)
   Replace the inspection diode if it fails to meet the specification.
   NOTE:
   - The current flow direction of the ohmmeter differs, depending on its design.
3. Install the inspection diode to the connector of the wire harness.

JABS00131-00000

STOP LAMP SWITCH

Check the stop lamp switch function.
(Refer to the BE section for inspection.)

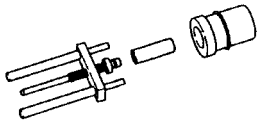
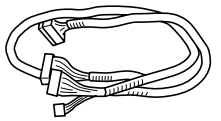
JABS00132-00000

TIGHTENING TORQUE

Tightening components	N·m	kgf-m
Brake pedal clevis	25.5 ± 2.9	2.6 ± 0.3
Bleeder plug	6.9 - 9.8	0.7 - 1.0
Piston stopper bolt × master cylinder	7.9 - 11.7	0.8 - 1.2
Master cylinder × brake booster	12.7 ± 2.5	1.3 ± 0.3
Brake pipe × master cylinder	12.7 - 17.7	1.3 - 1.8
Brake booster × dash panel	9.8 - 15.7	1.0 - 1.6
Disc brake cylinder mounting × disc rotor	90.2 - 135.3	9.2 - 13.8
Main and sub cylinder slide pins	19.6 - 29.4	2.0 - 3.0
Wheel cylinder × backing plate	7.5 - 11.5	0.8 - 1.2
Flare nut × wheel cylinder	12.7 - 17.6	1.3 - 1.8
Rear wheel hub nut	103.0 ± 14.7	10.5 ± 1.5
Parking brake cable clamp	5.8 - 8.8	0.6 - 0.9
Parking brake handle assembly × floor panel	14.7 - 21.6	0.15 - 0.2
Proportioning valve × body	5.9 - 9.8	0.6 - 1.0
Flare nut	12.7 - 17.6	1.3 - 1.8
Brake hose clamp bolt	6.9 - 15.7	0.7 - 1.6
Brake hose × disc brake cylinder assembly	26.5 - 34.3	2.7 - 3.5
Gravity sensor × floor panel	6.9 - 9.8	0.7- 1.0
Speed sensor harness clamp × inner fender	6.9 - 9.8	0.7 - 1.0
Speed sensor × knuckle	6.9 - 9.8	0.7 - 1.0
Speed sensor × fender epron	6.9 - 9.8	0.7 - 1.0
ABS actuator × ABS actuator bracket	4.3 - 6.5	0.44 - 0.66
Brake pipe × ABS actuator	15.5 ± 2.5	1.59 ± 0.26
ABS actuator bracket × fender epron	15.2 - 23.0	1.55 - 2.35
Flare nut	15.5 ± 2.5	1.59 ± 0.26
Skid control computer assembly × body	8.3 ± 1.4	0.85 ± 0.15

JABS00133-00000

SSTs

Shape	Part name	Part name	Remarks
	09730-87401-000	Brake booster gauge set	
	09737-87003-000	(Gauge)	
	09733-87401-000	(O-ring)	
	09731-87401-000	(Attachment)	
	09732-87401-000	(Adapter)	
	09734-87401-000	(O-ring)	
	09735-87401-000	(O-ring)	
	09703-30010-000	Brake shoe return spring tool	
	09921-00010-000	Spring tension tool	
	09991-87401-000	Engine control system inspection wire	
	09842-87401-000	ABS computer check sub-harness	
	09991-87403-000	Diagnosis check wire	

JABS00134-00068

TO INDEX TO NEXT SECTION