IMPORTANT

WARNING/CAUTION/NOTE

Please read this manual and follow its instructions carefully. To emphasize special information, the words **WARNING, CAUTION** and **NOTE** have special meanings. Pay special attention to the messages highlighted by these signal words.

WARNING:

Indicates a potential hazard that could result in death or injury.

CAUTION:

Indicates a potential hazard that could result in vehicle damage.

NOTE:

Indicates special information to make maintenance easier or instructions clearer.

WARNING:

This service manual is intended for authorized Suzuki dealers and qualified service mechanics only. Inexperienced mechanics or mechanics without the proper tools and equipment may not be able to properly perform the services described in this manual.
Improper repair may result in injury to the mechanic and may render the vehicle unsafe for the driver and passengers.

WARNING:

For vehicles equipped with a Supplemental Restraint (Air Bag) System:

- **Service on and around the air bag system components or wiring must be performed only by an authorized SUZUKI dealer. Refer to "Air Bag System Components and Wiring Location View" under "General Description" in air bag system section in order to confirm whether you are performing service on or near the air bag system components or wiring. Please observe all WARNINGS and "Service Precautions" under "On-Vehicle Service" in air bag system section before performing service on or around the air bag system components or wiring. Failure to follow WARNINGS could result in unintentional activation of the system or could render the system inoperative. Either of these two conditions may result in severe injury.**
- **If the air bag system and another vehicle system both need repair, Suzuki recommends that the air bag system be repaired first, to help avoid unintended air bag system activation.**
- **Do not modify the steering wheel, instrument panel or any other air bag system component (on or around air bag system components or wiring). Modifications can adversely affect air bag system performance and lead to injury.**
- **If the vehicle will be exposed to temperatures over 93°C (200°F) (for example, during a paint baking process), remove the air bag system components (air bag (inflator) modules, SDM and/or seat belt with pretensioner) beforehand to avoid component damage or unintended activation.**

Foreword

This SUPPLEMENTARY SERVICE MANUAL is a supplement to RB413 SERVICE MANUAL. It has been prepared exclusively for the following applicable model.

Applicable model: RB310/RB413 of and after the vehicle identification number below.

- ⓧ TSM MMA93S00 210001 ⓧ
- ⓧ TSM MMB53S00 210001 ⓧ
- ⓧ TSM MMA53S00 210001 ⓧ
- ⓧ TSM MMA53S30 210001 ⓧ

If describes only different service information of the above applicable model as compared with RB413 SERVICE MANUAL. Therefore, whenever servicing the above applicable model, consult this supplement first. And for any section, item or description not found in this supplement, refer to the related service manual below.

When replacing parts or servicing by disassembling, it is recommended to use SUZUKI genuine parts, tools and service materials (lubricant, sealants, etc.) as specified in each description.

All information, illustrations and specifications contained in this literature are based on the latest product information available at the time of publication approval. And used as the main subject of description is the vehicle of standard specifications among others. Therefore, note that illustrations may differ from the vehicle being actually serviced.
The right is reserved to make changes at any time without notice.

RELATED MANUAL:

Manual Name	Manual No.
RB413 SERVICE MANUAL	99500-83E00-01E
Wagon R+ (RB413) SUPPLEMENTARY SERVICE MANUAL	99501U83E00-01E
RB310 SERVICE MANUAL	99500U83E10-01E
Wagon R+ (RB310/RB413) SUPPLEMENTARY SERVICE MANUAL	99501U83E10-01E
RB310/413 WIRING DIAGRAM MANUAL	99512U83E20-669

MAGYAR SUZUKI CORPORATION
SERVICE DEPARTMENT

Table of Contents

NOTE:

For the screen toned sections in the above table, refer to the same section of Service Manual mentioned in FOREWORD of this manual.

SECTION 3E

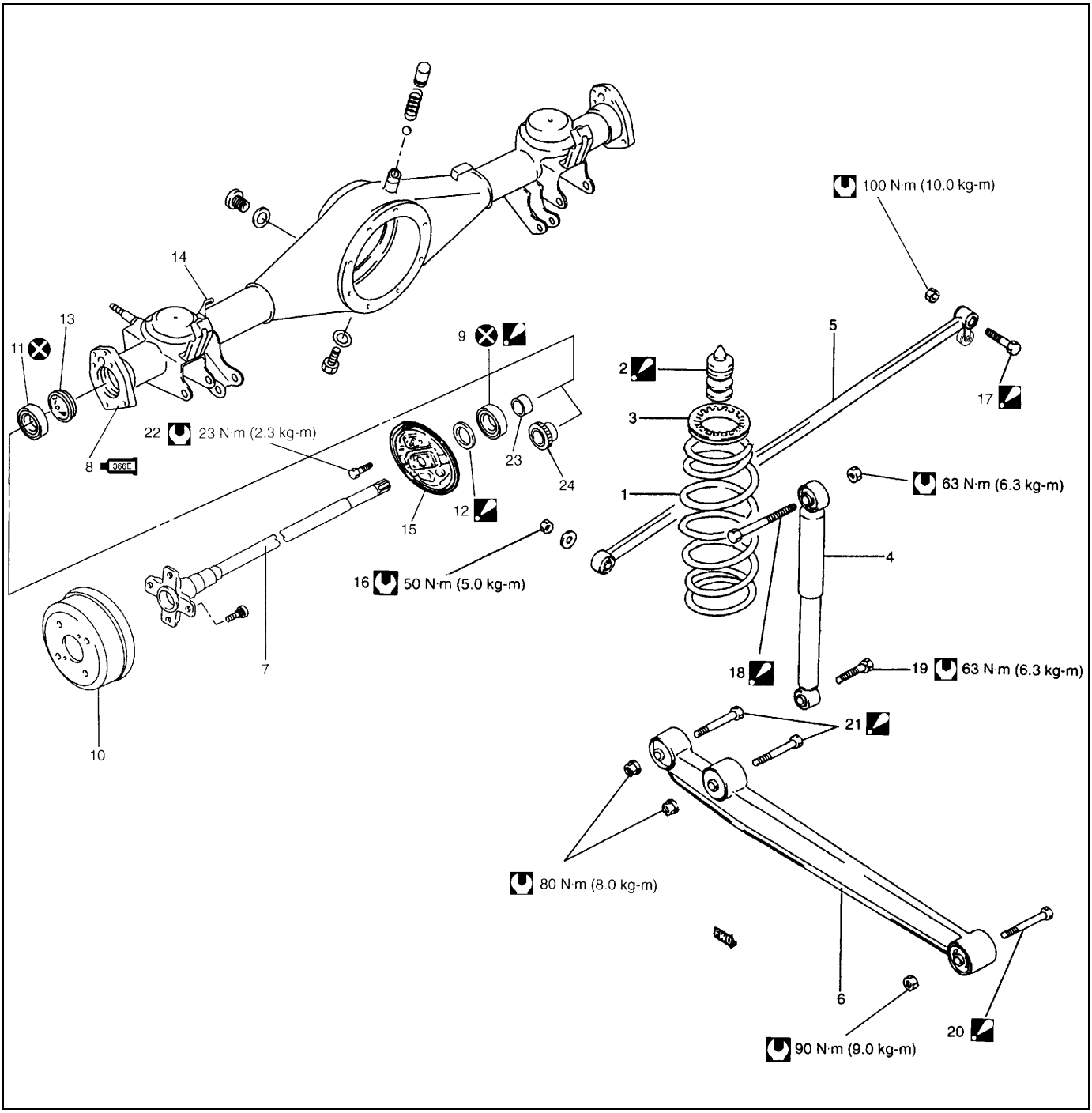
REAR SUSPENSION

NOTE:

- **All suspension fasteners are an important attaching part in that it could affect the performance of vital parts and systems, and/or could result in major repair expense. They must be replaced with one of the same part number or with an equivalent part if replacement becomes necessary. Do not use a replacement part of lesser quality or substitute design. Torque values must be used as specified during reassembly to assure proper retention of this part.**
- **Never attempt to heat, quench or straighten any suspension part. Replace it with a new part, or damage to the part may result.**
- **For the item with asterisk (*) in the "CONTENTS" below, refer to the same section of the Service Manual mentioned in "FOREWORD" of this manual.**

CONTENTS

On-Vehicle Service

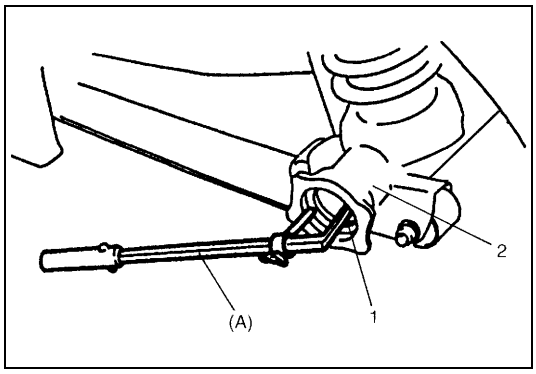


	1. Rear coil spring		10. Brake drum		19. Shock absorber lower bolt
	2. Rear bump stopper : Apply soap water, when installing.		11. Oil seal		20. Trailing arm front bolt : Insert from vehicle inside.
	3. Rear spring upper seat		12. Spacer : The tapered side of spacer inner diameter directed toward outside (brake drum side).		21. Trailing arm rear bolt : Insert from vehicle inside.
	4. Rear shock absorber		13. Oil seal protector		22. Brake back plate bolt
	5. Lateral rod		14. LSPV bracket (only vehicle with LSPV)		23. Bearing retainer ring (without ABS)
	6. Trailing arm		15. Brake back plate		24. Bearing retainer ring (with ABS)
	7. Rear axle shaft		16. Lateral rod axle housing side nut		Tightening torque
366E	8. Rear axle housing : Apply water tight sealant 99000-31090 to joint of plate and axle housing.		17. Lateral rod body side bolt : Insert from the direction as shown.		Do not reuse
	9. Bearing : Seal side of bearing comes inside of brake drum.		18. Shock absorber upper bolt : Insert from vehicle outside.		

Rear Axle Shaft Oil Seal

REMOVAL

1) Remove rear axle shaft. For details, refer to steps 1) to 8) of "REAR AXLE SHAFT AND WHEEL BEARING" in this section.

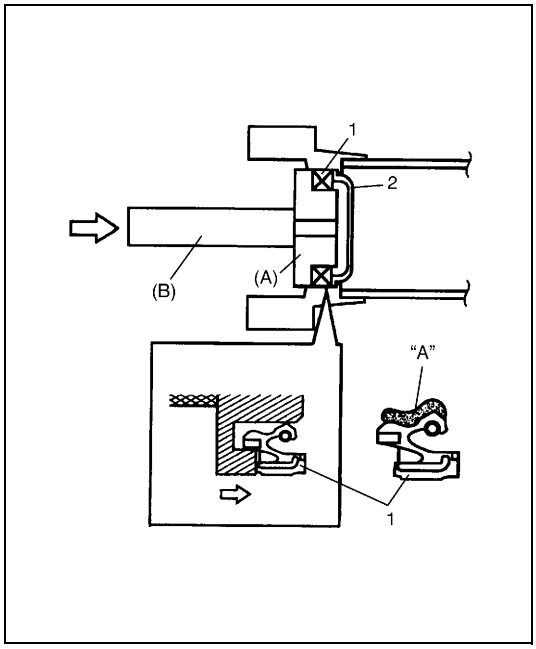


2) Remove rear axle shaft oil seal (1) by using special tool.

Special tool
(A) : 09913-50121

2. Axle housing

INSTALLATION



1) Using special tool, drive in new oil seal (1) until it contacts oil seal protector (2) in axle housing.

NOTE:

- **Make sure that oil seal is free from inclination as it is installed.**
- **Refer to figure so that oil seal is installed in proper direction.**

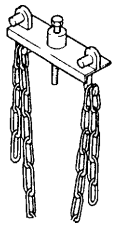
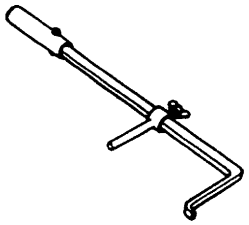
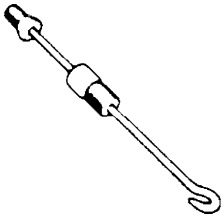
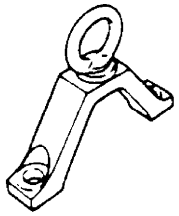
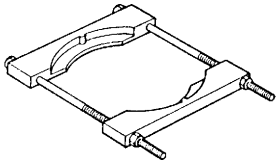
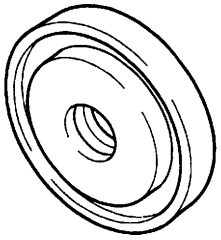
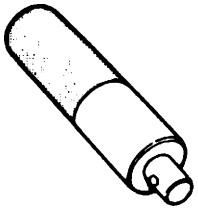
Special tool
(A) : 09944-67010
(B) : 09924-74510

"A" : Grease 99000-25010

A : Differential side

2) For procedure hereafter, refer to steps 4) to 16) of "REAR AXLE SHAFT AND WHEEL BEARING" in this section.

Special Tool

 09927-18411 Universal puller	 09913-50121 Oil seal remover	 09942-15511 Sliding hammer	 09943-17912 Brake drum remover
 09921-57810 Bearing remover	 09944-67010 Oil seal installer	 09924-74510 Bearing and oil seal handle	

SECTION 5A

BRAKES PIPE/HOSE/MASTER CYLINDER

WARNING:

For vehicles equipped with Supplemental Restraint (Air Bag) System:

- **Service on and around the air bag system components or wiring must be performed only by an authorized SUZUKI dealer. Refer to "Air Bag System Components and Wiring Location View" under "General Description" in air bag system section in order to confirm whether you are performing service on or near the air bag system components or wiring. Please observe all WARNINGS and "Service Precautions" under "On-Vehicle Service" in air bag system section before performing service on or around the air bag system components or wiring. Failure to follow WARNINGS could result in unintentional activation of the system or could render the system inoperative. Either of these two conditions may result in severe injury.**
- **Technical service work must be started at least 90 seconds after the ignition switch is turned to the "LOCK" position and the negative cable is disconnected from the battery. Otherwise, the system may be activated by reserve energy in the Sensing and Diagnostic Module (SDM).**

NOTE:

All brake fasteners are important attaching parts in that they could affect the performance of vital parts and systems, and/or could result in major repair expense. They must be replaced with one of same part number or with an equivalent part if replacement becomes necessary. Do not use a replacement part of lesser quality or substitute design. Torque values must be used as specified during reassembly to assure proper retention of all parts. There is to be no welding as it may result in extensive damage and weakening of the metal.

For the items with asterisk (*) in the "CONTENTS" below, refer to the same section of the Service Manual mentioned in FOREWORD of this manual.

CONTENTS

On-Vehicle Service

CAUTION:
- **Lubricate rubber parts with clean, fresh brake fluid to ease assembly.**
- **Do not use lubricated shop air on brake parts as damage to rubber components may result.**
- **If any hydraulic component is removed or brake line disconnected, bleed the brake system.**
- **The torque values specified are for dry, unlubricated fasteners.**
- **Do not allow brake fluid to get on painted surfaces. Painted surfaces will be damaged by brake fluid.**

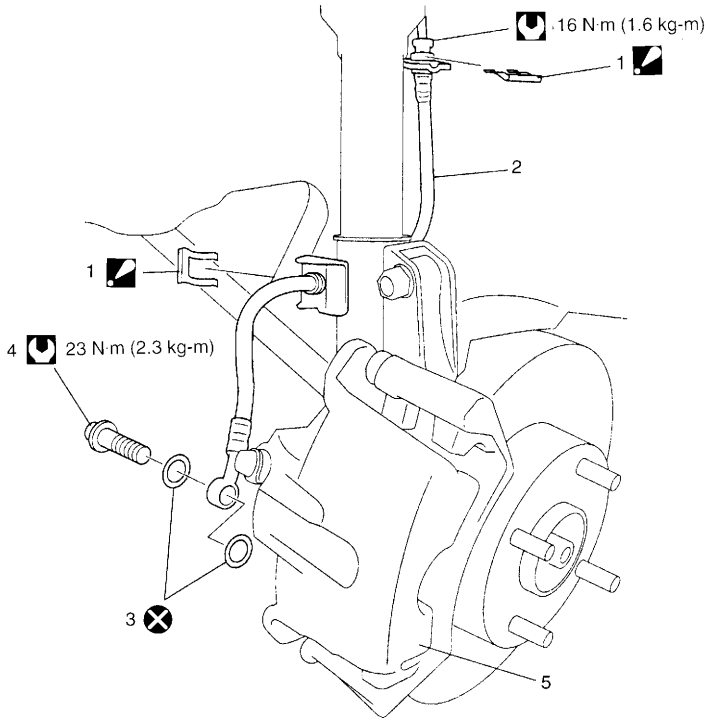
Front Brake Hose/Pipe

REMOVAL

1) Raise and suitably support vehicle. Remove tire and wheel.
   This operation is not necessary when removing pipes connecting master cylinder and flexible hose.
2) Clean dirt and foreign material from both hose end or pipe end fittings. Remove brake hose or pipe.

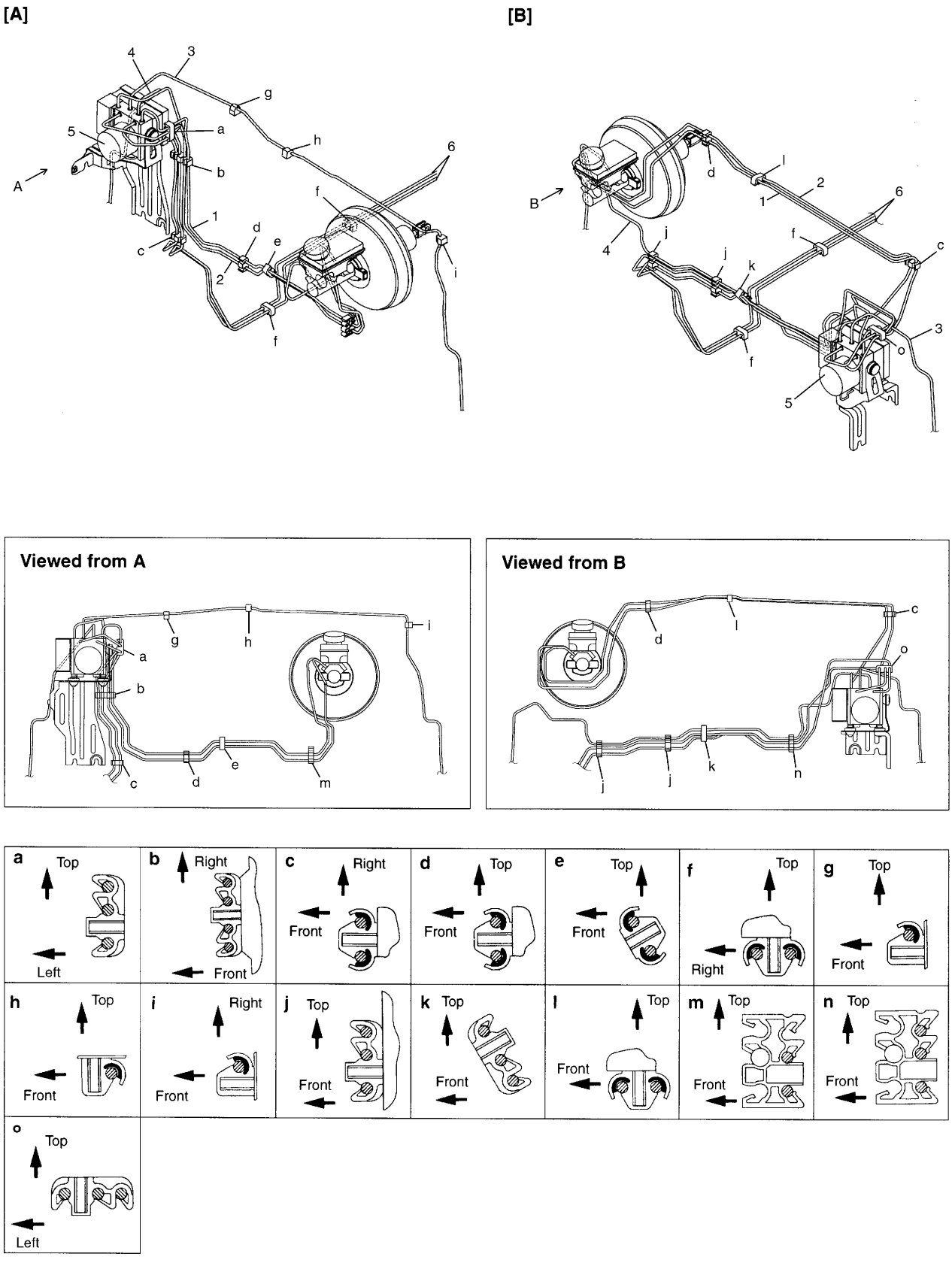
INSTALLATION

1) Reverse removal procedure for brake hose and pipe installation procedure.
   For installation, make sure that steering wheel is in straightforward position and hose has no twist or kink. Check to make sure that hose doesn't contact any part of suspension, both in extreme right and extreme left turn conditions. If it does at any point, remove and correct. Fill and maintain brake fluid level in reservoir. Bleed brake system.
2) Perform brake test and check installed part for fluid leakage.



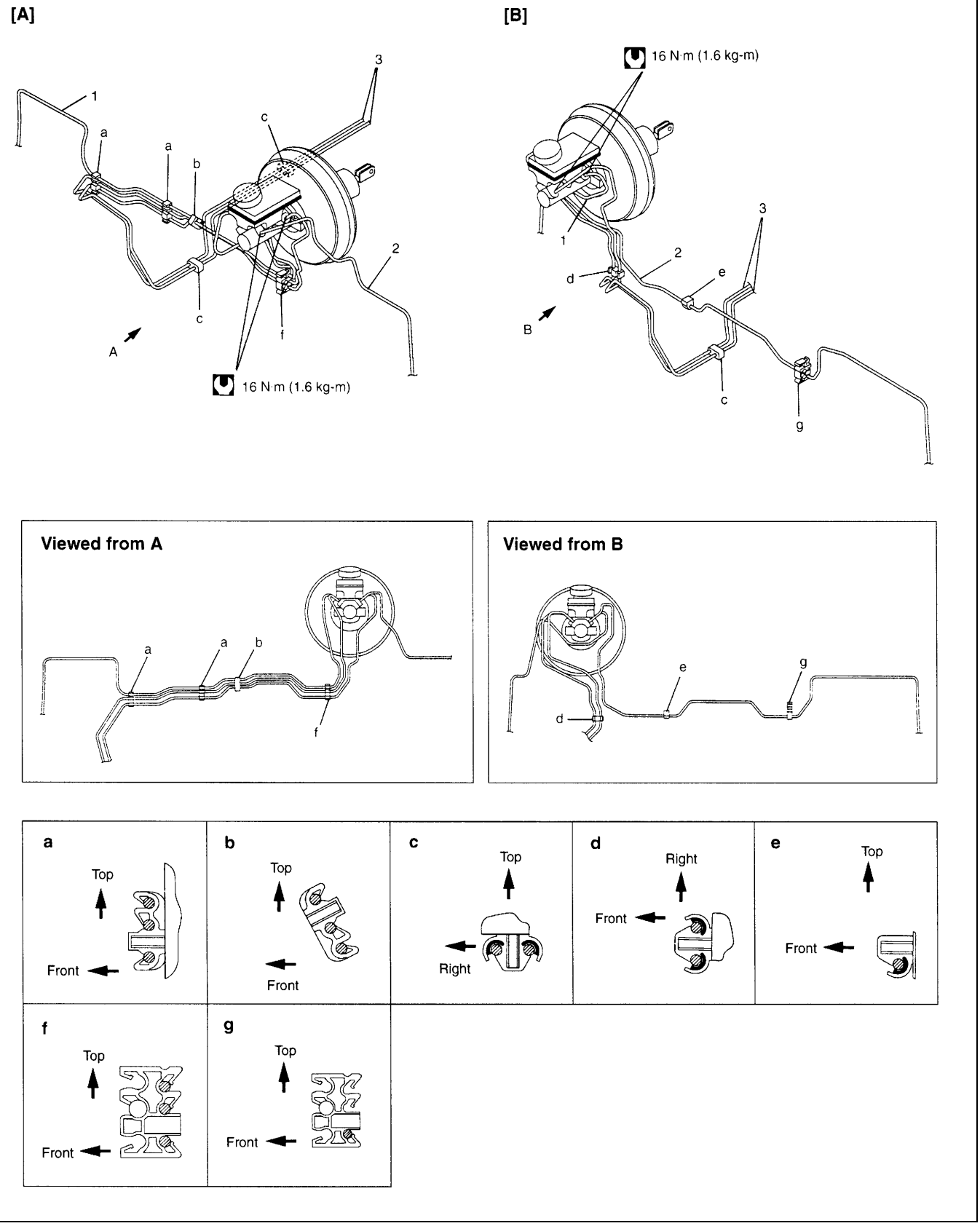
◪	1. E-ring: Insert E-ring till its end surface is flush with or deeper than bracket end surface.	5. Brake caliper	
	2. Flexible hose	◪	Tightening Torque
	3. Hose washer	⊗	Do not reuse
	4. Hose bolt		

For vehicle with ABS



[A] : For left-hand steering vehicle	2. From master cylinder secondary to ABS hydraulic unit	6. To rear brakes
[B] : For right-hand steering vehicle	3. From ABS hydraulic unit to left front brake	Tightening Torque
a – n : Clamp	4. From ABS hydraulic unit to right front brake	
1. From master cylinder primary to ABS hydraulic unit	5. ABS hydraulic unit	

For vehicle without ABS



[A] : For left-hand steering vehicle	2. From master cylinder secondary to left front brake
[B] : For right-hand steering vehicle	3. To rear brakes
a – g : Clamp	Tightening Torque
1. From master cylinder primary to right front brake	

SECTION 5B

FRONT BRAKE

NOTE:

All brake fasteners are important attaching parts in that they could affect the performance of vital parts and systems, and/or could result in major repair expense. They must be replaced with one of same part number or with an equivalent part if replacement becomes necessary. Do not use a replacement part of lesser quality or substitute design. Torque values must be used as specified during reassembly to assure proper retention of all parts. There is to be no welding as it may result in extensive damage and weakening of the metal.

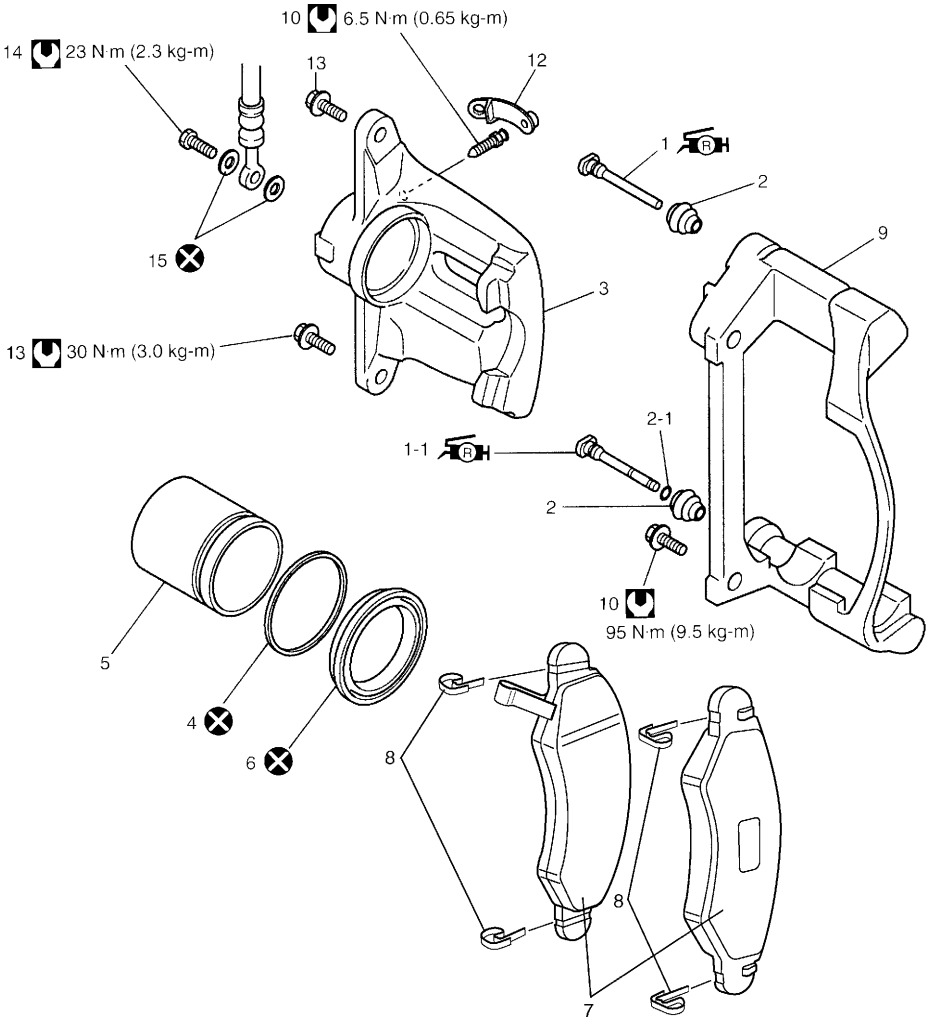
For the items with asterisk (*) in the "CONTENTS" below, refer to the same section of the Service Manual mentioned in FOREWORD of this manual.

CONTENTS

On-Vehicle Service

CAUTION:

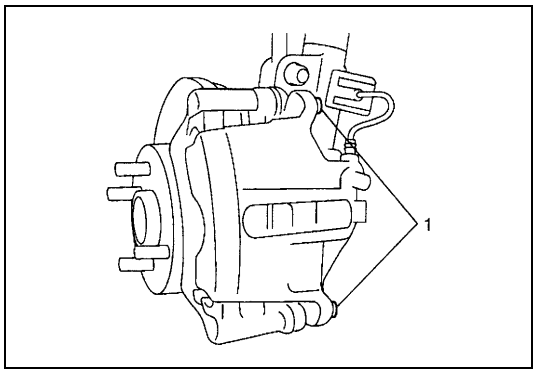
Lubricate parts as specified. Do not use lubricated shop air on brake parts as damage to rubber components may result. If any component is removed or line disconnected, bleed the brake system. Replace pads in axle sets only. The torque values specified are for dry, unlubricated fasteners.



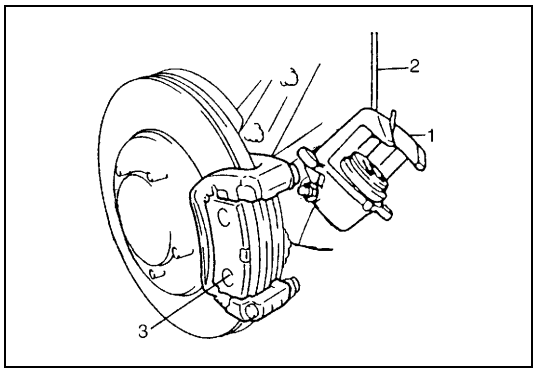
R H	1. Guiding pin :	6. Piston boot	13. Caliper pin bolt
R H	1-1. Locking pin : Apply specified rubber grease to guiding and locking pins surfaces for smooth movement.	7. Disc brake pad	14. Flexible hose bolt
	2. Pin boot	8. Pad spring	15. Gasket
	2-1. O-ring	9. Brake caliper carrier	Tightening Torque
	3. Disc brake caliper (disc brake cylinder)	10. Caliper bolt	Do not reuse
	4. Piston seal	11. Bleeder plug	
	5. Disc brake piston	12. Bleeder plug cap	

Front Disc Brake Pad

REMOVAL



1) Hoist vehicle and remove wheel.
2) Remove caliper pin bolts (1).



3) Remove E-ring from strut and then remove caliper (1) from caliper carrier.

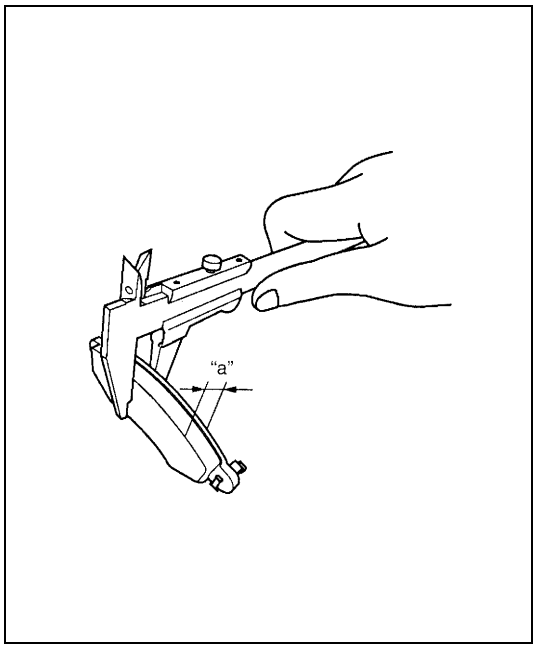
NOTE:

Hang removed caliper with a wire hook (2) or the like so as to prevent brake hose from bending and twisting excessively or being pulled. Don't operate brake pedal with pads removed.

4) Remove pads (3).

INSPECTION

Brake Pad



Check pad lining for wear. When wear exceeds limit, replace with new one.

CAUTION:

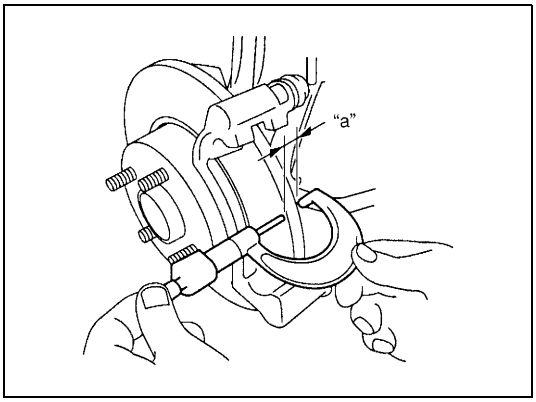
Never polish pad lining with sandpaper. If lining is polished with sandpaper, hard particles of sandpaper will be deposited in lining and may damage disc. When pad lining requires correction, replace it with a new one.

Pad thickness (lining + rim) "a"
Standard : 15.3 mm (0.60 in.)
Service limit : 8.2 mm (0.32 in.)

NOTE:

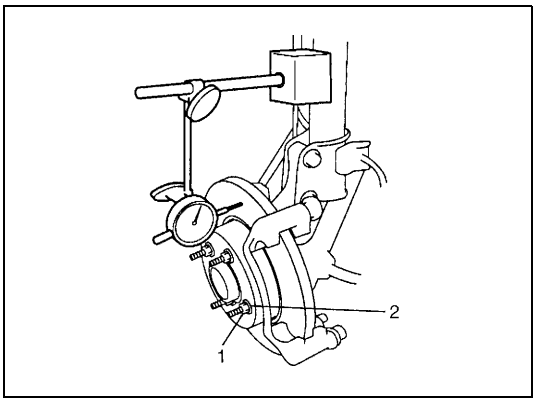
When pads are removed, visually inspect caliper for brake fluid leak. Correct leaky point, if any.

Brake Disc



Check disc surface for scratches in wearing parts. Scratches on disc surface noticed at the time of specified inspection or replacement are normal and disc is not defective unless they are serious. But when there are deep scratches or scratches all over disc surface, replace it. When only one side is scratched, polish and correct that side.

Disc thickness "a"
Standard : 17.0 mm (0.67 in.)
Service limit : 15.0 mm (0.59 in.)

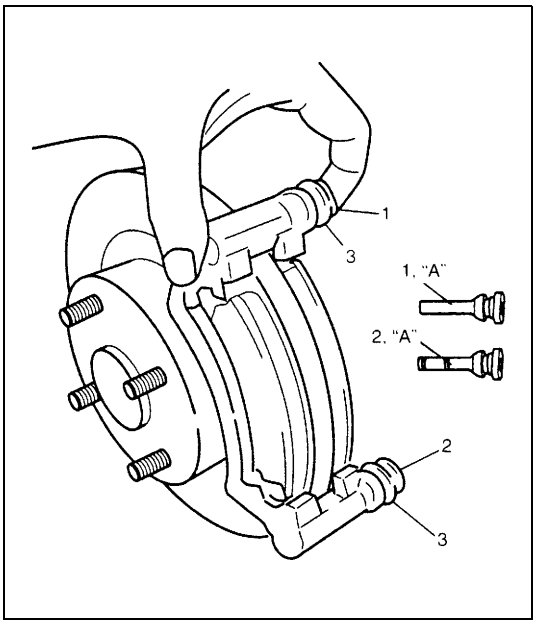


Use wheel nuts (1) and suitable plain washers (2) to hold the disc securely against the hub, then mount a dial indicator as shown and measure the runout at 20 mm (0.79 in.) from the outer edge of the disc.

Limit on disc deflection : 0.15 mm (0.006 in.)

NOTE:

Check front wheel bearing for looseness before measurement.



Cylinder Slide Guiding and Locking Pins

Check guiding pin (1) and locking pin (2) for smooth movement as shown.
If it is found faulty, correct or replace. Apply rubber grease to guiding and locking pins outer surface. Rubber grease should be the on whose viscosity is less affected by such low temperature a –40°C (–40°F).

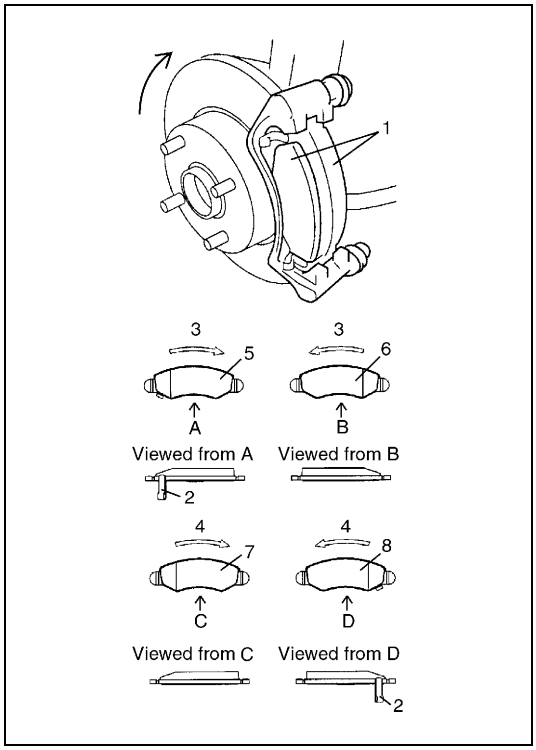
"A" : Rubber grease

Locking pin (2) has grooves and O-ring but guiding pin (1) has no groove. Install guiding pin into pin hole of carrier upper side.

Dust Boot

Check boot (3) for breakage, crack and damage. If defective, replace.

INSTALLATION

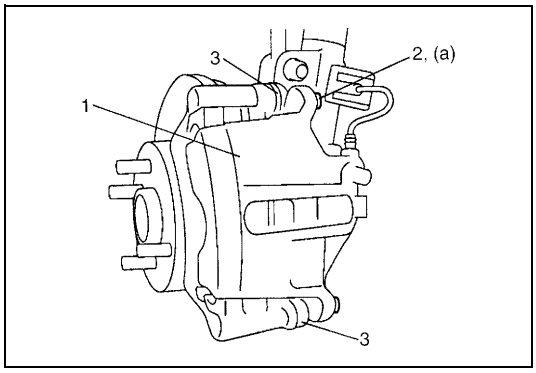


CAUTION:
Observe CAUTION at the beginning of ON-VEHICLE SERVICE.

1) Install pads (1).

NOTE:
Install pad with sensor (2) to vehicle center side.
Note the direction of each pad as shown in the figure.

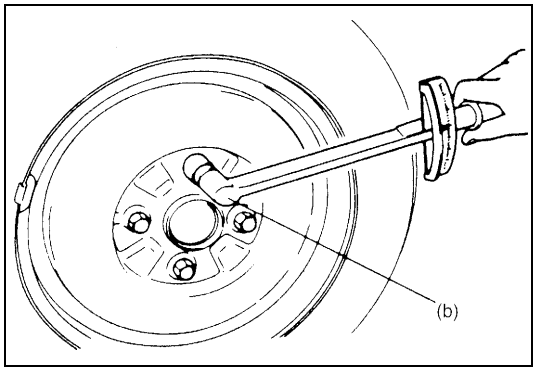
3.	Front right disc forward rotation
4.	Front left disc forward rotation
5.	Disc side of right inner pad
6.	Disc side of right outer pad
7.	Disc side of left outer pad
8.	Disc side of left inner pad



2) Install caliper (1) and torque caliper pin bolts (2) to specification.

Tightening torque
(a) : 30 N·m (3.0 kg-m, 22.0 lb-ft)

NOTE:
Make sure that boots (3) are fit into groove securely.



3) Torque front wheel nuts to specification.

Tightening torque
(b) : 85 N·m (8.5 kg-m, 61.5 lb-ft)

4) Upon completion of installation, perform brake test.

Required Service Material

Material	Recommended SUZUKI product (Part Number)	Use
Brake fluid	DOT4	• To fill master cylinder reservoir. • To clean and apply to inner parts of caliper and wheel cylinder when they are disassembled.
Rubber grease	Molykote G807 or equivalent	To caliper guide pin.

SECTION 5C

PARKING AND REAR BRAKE

WARNING:

For vehicles equipped with Supplemental Restraint (Air Bag) System:

- **Service on and around the air bag system components or wiring must be performed only by an authorized SUZUKI dealer. Refer to "Air Bag System Components and Wiring Location View" under "General Description" in air bag system section in order to confirm whether you are performing service on or near the air bag system components or wiring. Please observe all WARNINGS and "Service Precautions" under "On-Vehicle Service" in air bag system section before performing service on or around the air bag system components or wiring. Failure to follow WARNINGS could result in unintentional activation of the system or could render the system inoperative. Either of these two conditions may result in severe injury.**
- **Technical service work must be started at least 90 seconds after the ignition switch is turned to the "LOCK" position and the negative cable is disconnected from the battery. Otherwise, the system may be activated by reserve energy in the Sensing and Diagnostic Module (SDM).**

NOTE:

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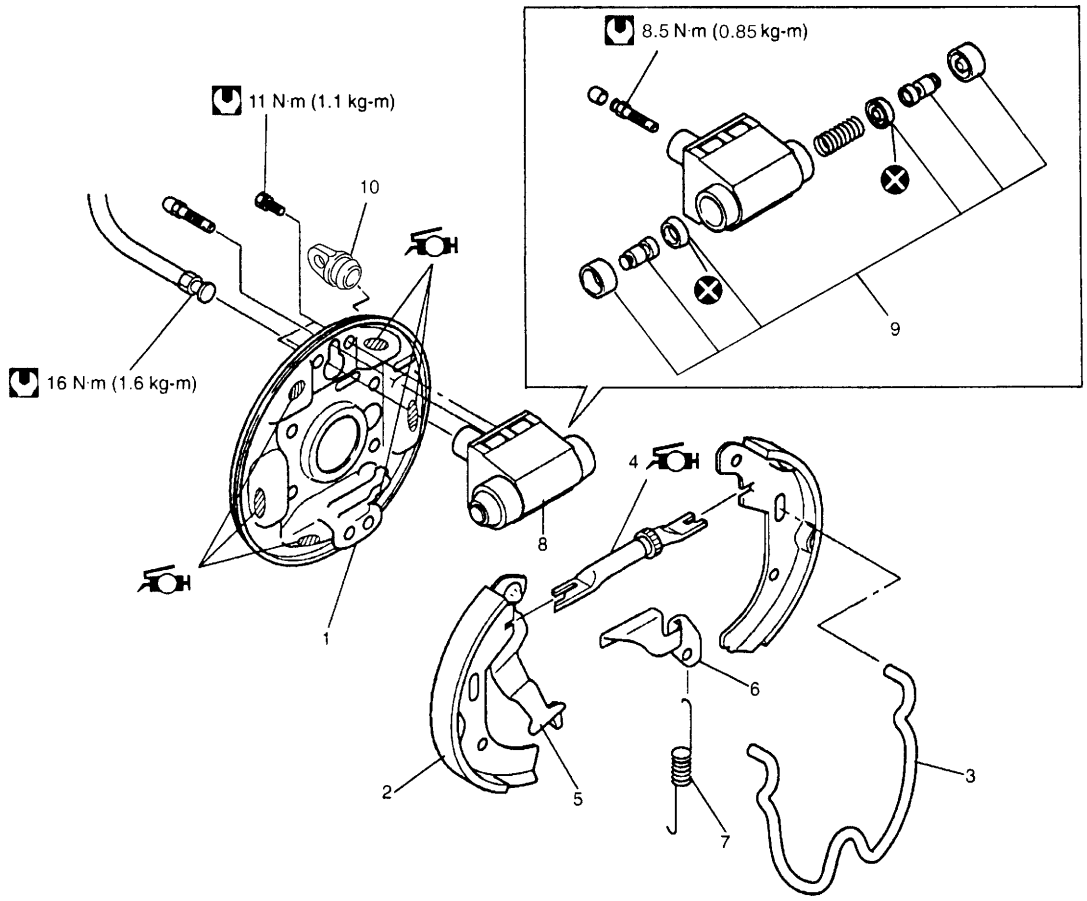
For the items with asterisk (*) in the "CONTENTS" below, refer to the same section of the Service Manual mentioned in FOREWORD of this manual.

CONTENTS

On-Vehicle Service

CAUTION:

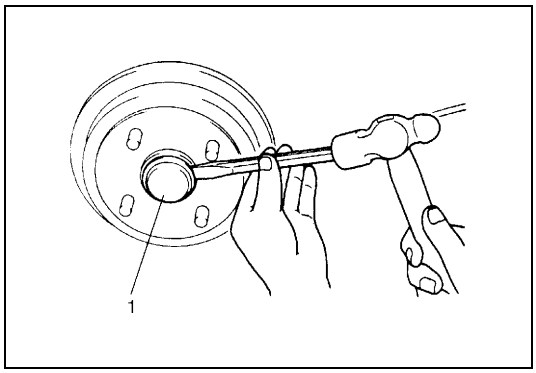
- **Replace all components included in repair kits to service this drum brake. Lubricate parts as specified.**
- **If any hydraulic component is removed or brake line disconnected, bleed the brake system.**
- **The torque values specified are for dry, unlubricated fasteners.**



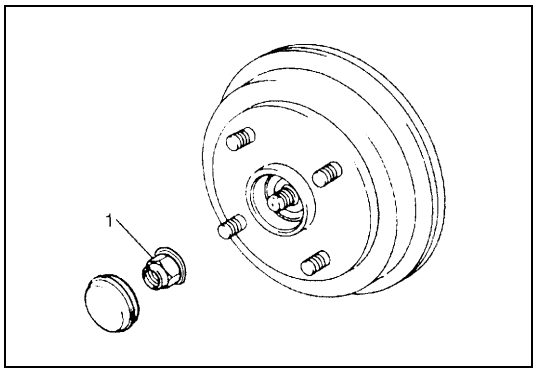
⚙	1. Brake back plate : Clean back plate and apply thin coat of Bentonite base brake grease (anti-squeal agent) to six surfaces on which shoe rims rest.	7. Adjuster spring	
	2. Brake shoe	8. Wheel cylinder	
	3. Retractor spring	9. Piston assembly	
⚙	4. Brake adjuster (strut) : Apply Bentonite base brake grease between actuator and shoe rim and at actuator pivot points.	10. Cover	
	5. Parking brake shoe lever	Tightening Torque	
	6. Adjuster actuator	Do not reuse	

Brake Drum

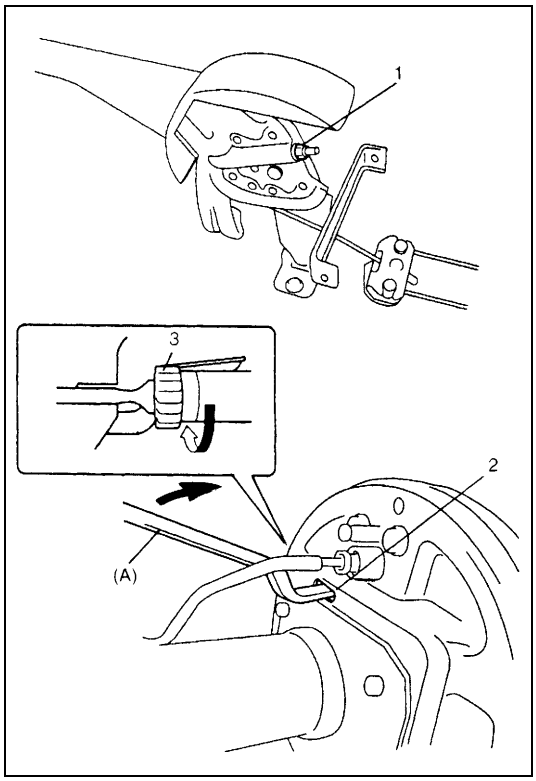
REMOVAL



1) Hoist vehicle and remove wheel.
2) Remove spindle cap (1) as shown (by hammering lightly at 3 locations around it so as not to deform or cause damage to seating part of cap).



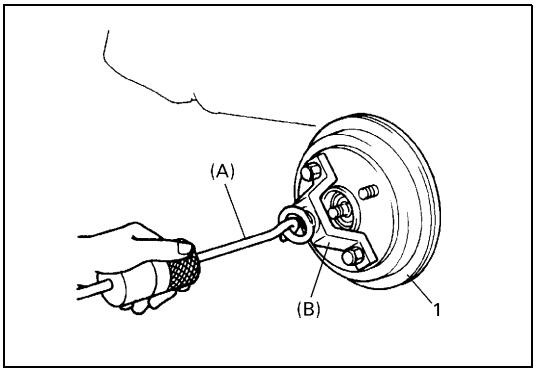
3) Uncalk spindle nut, remove spindle nut (1).



4) Release parking brake lever.
5) Remove brake drum.
   If brake drum can not be removed easily, increase clearance between brake shoes and drum as follows.
   a) Remove console box and loosen parking brake cable adjusting nut (1).
   b) Remove adjuster cover on back plate.
   c) Insert special tool through hole (2) in back plate.

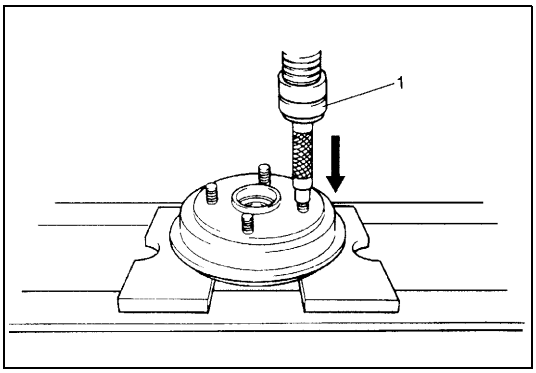
   Special tool
   (A) : Snap-on Part No. B3404B or equivalent

   d) Turn adjuster (3) with special tool in such direction as indicated in figure so as to obtain larger clearance.

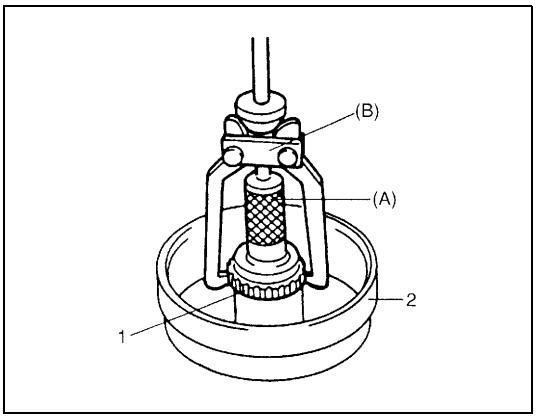


e) Pull brake drum (1) off by hand.
If it is hard to remove, use special tools.

Special tool
(A) : 09942-15510
(B) : 09943-17912



6) Remove wheel stud bolt by using hydraulic press (1).



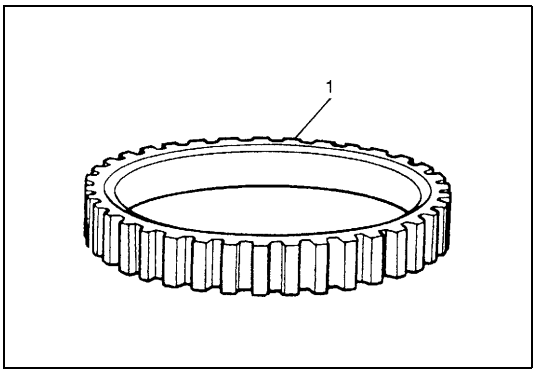
7) Remove sensor ring (1) from brake drum (2) using special tool (if equipped with ABS).

CAUTION:
Pull out sensor ring from brake drum gradually and evenly. Attempt to pull it out partially may cause it to be deformed.

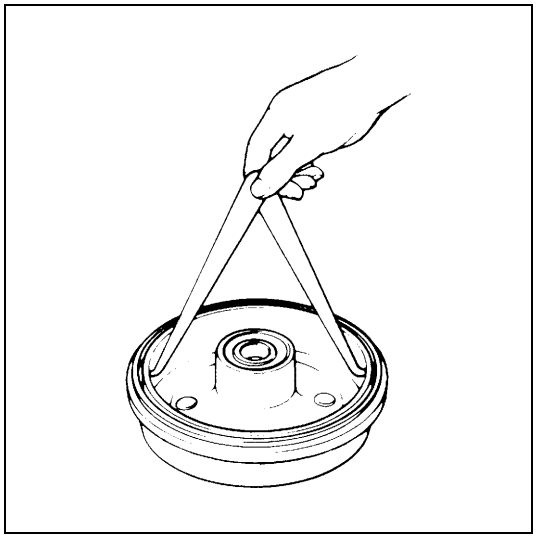
Special tool
(A) : 09913-75520
(B) : 09913-65135

INSPECTION

Sensor Ring



- Check ring serration (teeth) for being missing, damaged or deformed.
- Check sensor ring for being deformed (warped).
- Check that no foreign material is attached.
  If any malcondition is found, repair or replace.



Brake Drum

Inspect drum for cleanliness. Check wear of its braking surface by measuring its inside diameter.

Inside diameter
Standard : 200 mm (7.87 in.)
Service Limit : 202 mm (7.95 in.)

Whenever brake drums are removed, they should be thoroughly cleaned and inspected for cracks, scores, deep grooves.

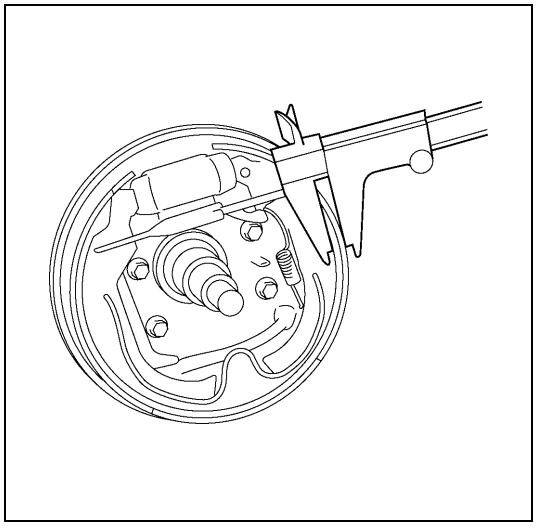
Cracked, Scored, or Grooved Drum

A cracked, drum is unsafe for further service and must be replaced. Do not attempt to weld a cracked drum.
Smooth up any slight scores. Heavy or extensive scoring will cause excessive brake lining wear and it will probably be necessary to resurface drum braking surface.
If brake linings are slightly worn and drum is grooved, drum should be polished with fine emery cloth but should no be turned.

NOTE:

When drum is removed, visually inspect wheel cylinder for brake fluid leakage. Correct leaky point, if any.

Brake Shoe



Where lining is worn out beyond service limit, replace shoe.

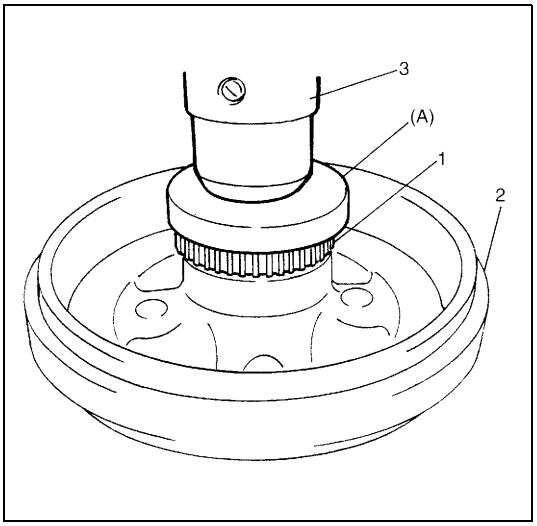
Thickness (lining + shoe rim)
Standard : 6.4 mm (0.25 in.)
Service limit : 3.6 mm (0.14 in.)

If one of brake linings is to service limit, all linings must be replaced at the same time.

CAUTION:

Never polish lining with sandpaper. If lining is polished with sandpaper, hard particles of sandpaper will be deposited in lining and may damage drum. When it is required to correct lining, replace it with a new one.

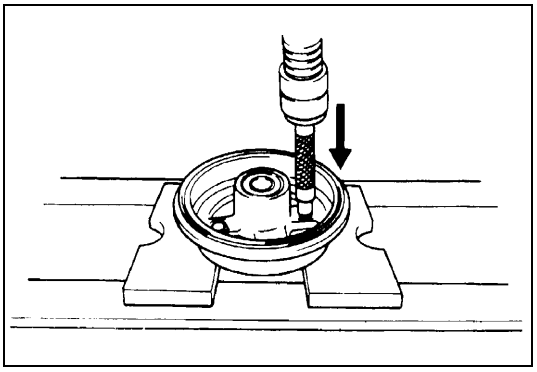
INSTALLATION



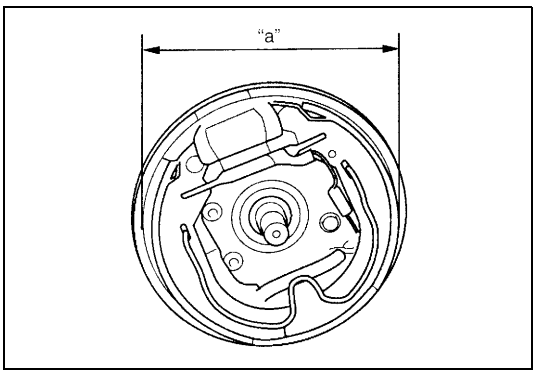
1) Install new sensor ring (1) to brake drum (2) by using special tool and hydraulic press (3) (if equipped with ABS).

CAUTION:
Do not reuse (reinstall) removed sensor ring.
Used sensor ring can not be press-fitted securely.

Special tool
(A) : 09926-68310

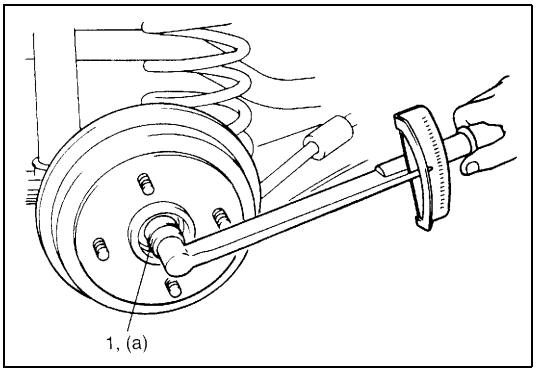


2) Insert new stud in drum hole and rotate it slowly to assure serrations are aligned with those made by replaced bolt.



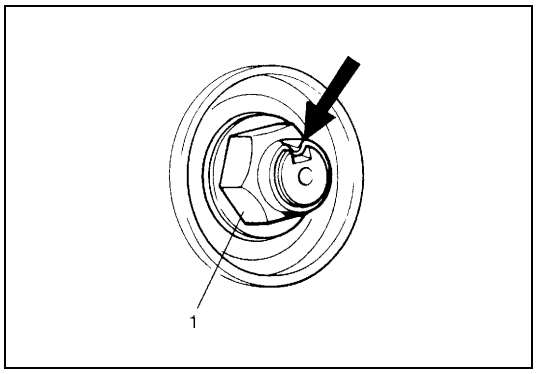
3) Before installing brake drum, check outer diameter "a" of brake shoes. If it is not within value as specified below, adjust it to specification by turning adjuster.

Brake shoes outer diameter "a"	=	Measured brake drum inside diameter	–	0.5 to 1.0 mm (0.02 to 0.04 in.)



4) Install brake drum after making sure that inside of brake drum and brake shoes are free from dirt and oil.
5) Install new spindle nut (1).
6) Tighten spindle nut (1) to specified torque.

Tightening torque
(a) : 175 N·m (17.5 kg-m, 126.5 lb-ft)

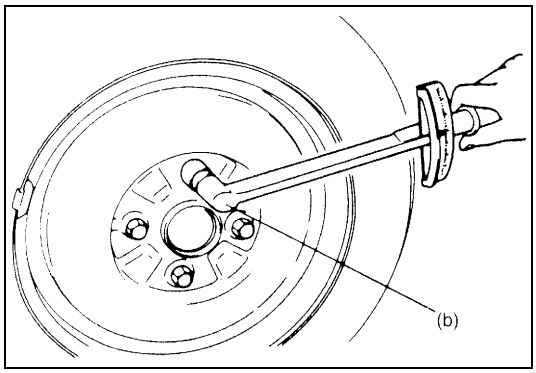


7) Calk spindle nut (1).
8) Install spindle cap.

NOTE:

- **When installing spindle cap, hammer lightly several locations on the collar of cap until collar comes closely into contact with brake drum.**
- **If fitting part of cap is deformed or damaged or if it is fitted loosely, replace with new one.**

9) Upon completion of all jobs, depress brake pedal with about 30 kg (66 lbs) load at least 15 – 20 times until adjuster actuator clicking sound from drum brake can not be heard so as to obtain proper drum-to-shoe clearance.
   Adjust parking brake cable. (For adjustment, see PARKING BRAKE INSPECTION AND ADJUSTMENT in SECTION 5.)
10) Install console box if removed.



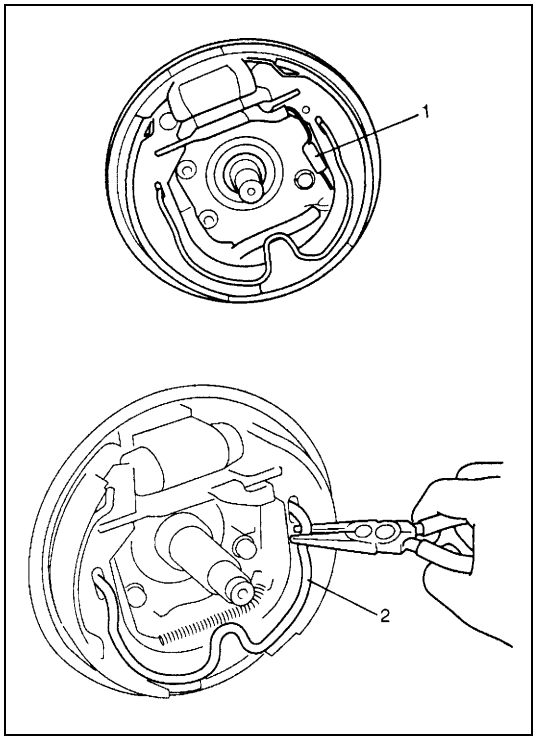
11) Install wheel and tighten wheel nuts so specified torque.

Tightening torque
(b) : 85 N·m (8.5 kg-m, 61.5 lb-ft)

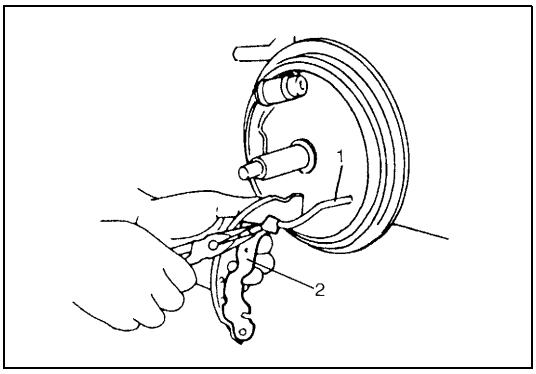
12) Check to ensure that brake drum is free from dragging and proper braking is obtained. Then remove vehicle from hoist and perform brake test (foot brake and parking brake).

Brake Shoe

REMOVAL



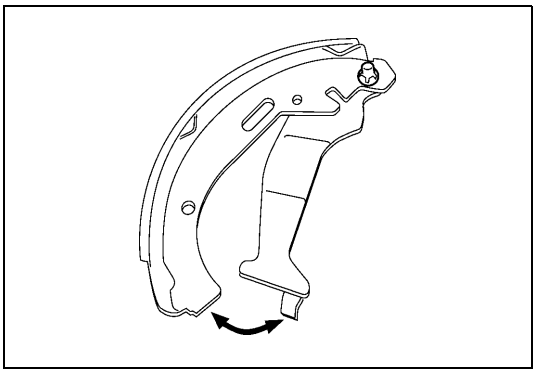
1) Perform steps 1) to 5) of BRAKE DRUM REMOVAL.
2) Remove adjuster spring (1).
3) Remove retractor spring (2) as shown.



4) Remove brake shoes and disconnect parking brake cable (1) from parking brake shoe lever (2).

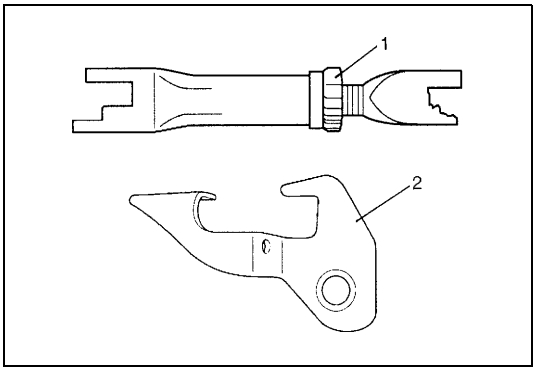
INSPECTION

Parking Shoe Lever



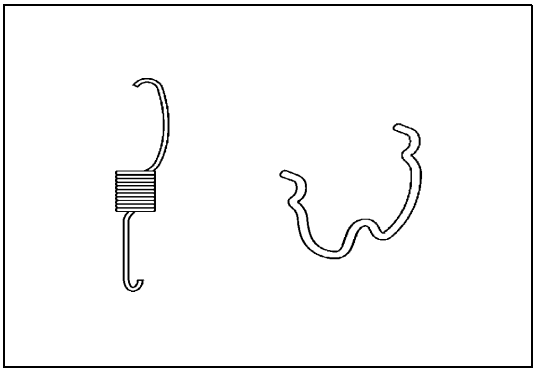
Inspect brake shoe lever for smooth movement along shoe rim. If defective, correct or replace.

Brake Adjuster (Strut) and Adjuster Actuator



Check ratchet (1) of adjuster and adjuster actuator (2) for operation, wear or damage.

Springs

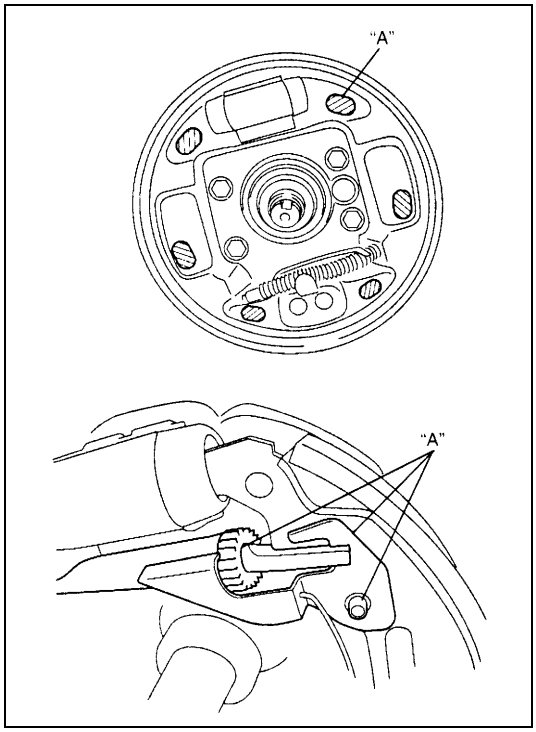


Inspect for damage or weakening.
Inspect each part with arrow for rust. If found defective, replace.

Brake Shoe

Refer to BRAKE DRUM INSPECTION of this section.

INSTALLATION

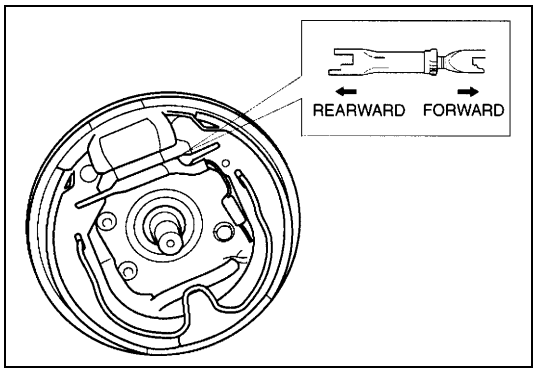


1) When reinstalling brake adjuster, disassemble and thoroughly clean screw threads with a wire brush and apply grease to screw threads.
   Clean brake back plate and apply thin coat of grease to six surfaces on which shoe rims rest.

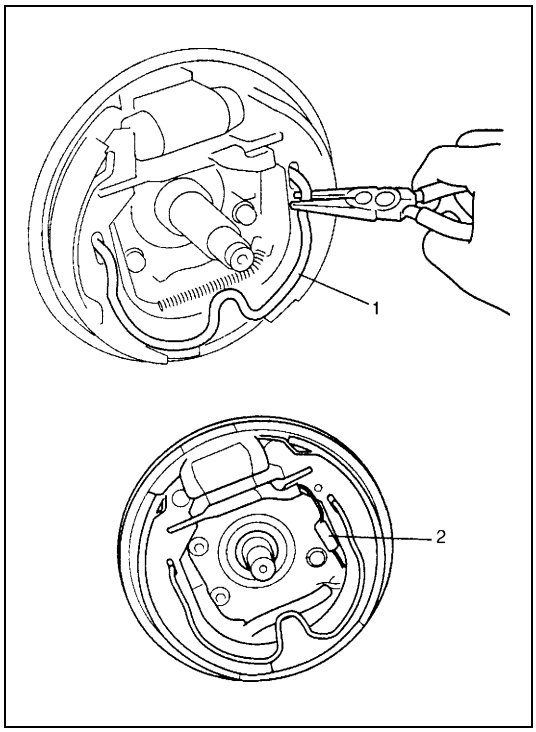
"A" : Bentonite base brake grease (Anti-squeal agent)

2) Apply thinly grease between actuator and shoe rim, and at actuator pivot point.

"A" : Bentonite base brake grease (Anti-squeal agent)



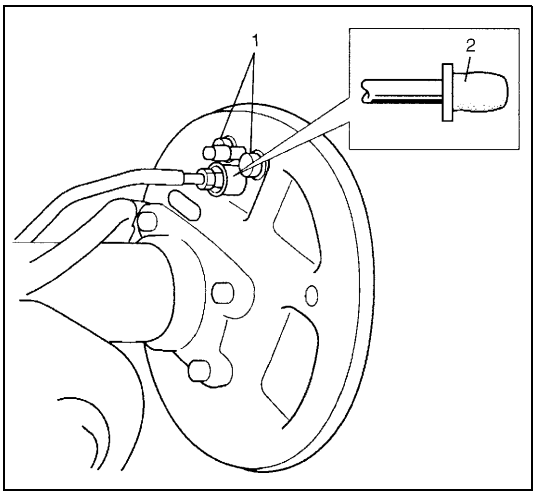
3) Assemble parts as shown in reverse order of REMOVAL.



4) Install retractor spring (1) as shown.
5) Install adjuster spring (2) as shown, with loop facing outward.
6) For procedure hereafter, refer to steps 3) to 12) of BRAKE DRUM INSTALLATION in this section.

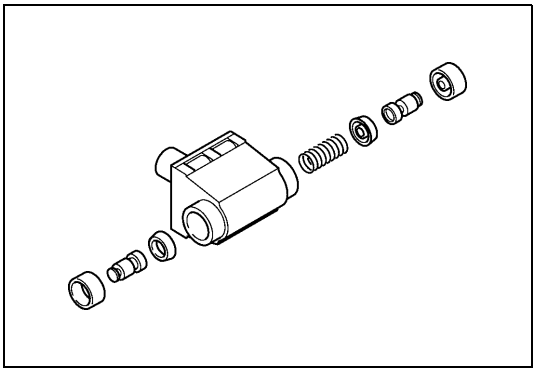
Wheel Cylinder

REMOVAL



1) Perform steps 1) to 5) of BRAKE DRUM REMOVAL.
2) Perform steps 2) to 4) of BRAKE SHOE REMOVAL.
3) Loosen brake pipe flare nut but only within the extent that fluid does not leak.
4) Remove wheel cylinder mounting bolts (1). Disconnect brake pipe from wheel cylinder and put wheel cylinder bleeder plug cap (2) onto pipe to prevent fluid from spilling.

INSPECTION



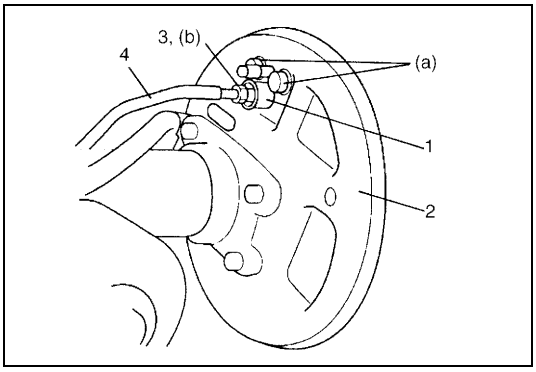
Inspect wheel cylinder disassembled parts for wear, cracks, corrosion or damage.

NOTE:

Clean wheel cylinder components with brake fluid.

INSTALLATION

1) Take off bleeder plug cap from brake pipe and connect pipe (for pipes) to wheel cylinder just enough to prevent fluid from leaking.



2) Tighten wheel cylinder (1) to brake back plate (2) to specified torque.
3) Torque flare nut (3) of brake pipe (4) which was connected in step 1) to specification.

Tightening torque
(a) : 11 N·m (1.1 kg-m, 8.0 lb-ft)
(b) : 16 N·m (1.6 kg-m, 12.0 lb-ft)

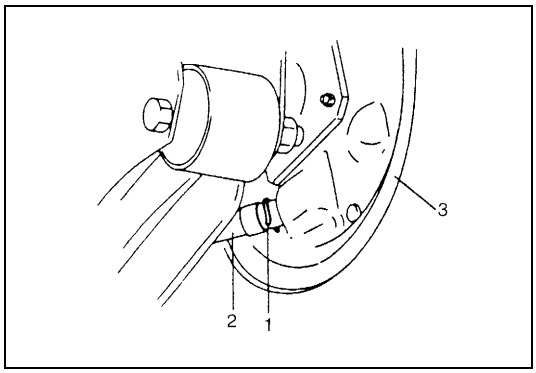
4) Install bleeder plug cap taken off from pipe back to bleeder plug.
5) For procedure hereafter, refer to steps 1) to 6) of BRAKE SHOE INSTALLATION.

NOTE:

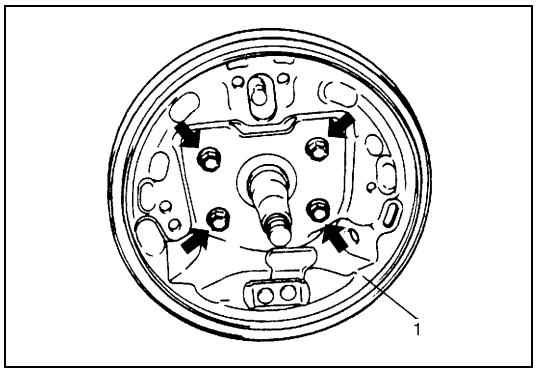
Be sure to bleed brake system. (for bleeding operation, see BLEEDING BRAKES in SECTION 5.)

Brake Back Plate

REMOVAL

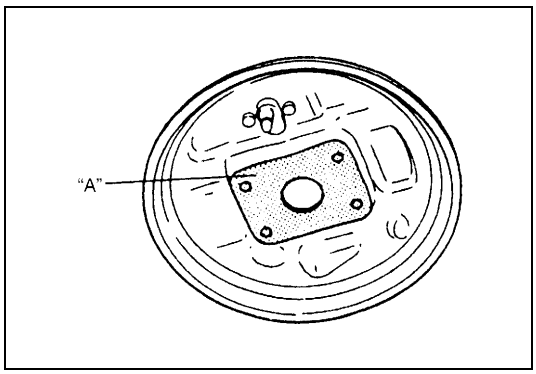


1) Perform steps 1) to 5) of BRAKE DRUM REMOVAL in this section.
2) Perform steps 2) to 4) of BRAKE SHOE REMOVAL in this section.
3) Perform steps 3) and 4) of WHEEL CYLINDER REMOVAL in this section.
4) Remove parking brake cable securing clip (1) and disconnect brake cable (2) from brake back plate (3).



5) Remove brake back plate (1) from rear axle.

INSTALLATION

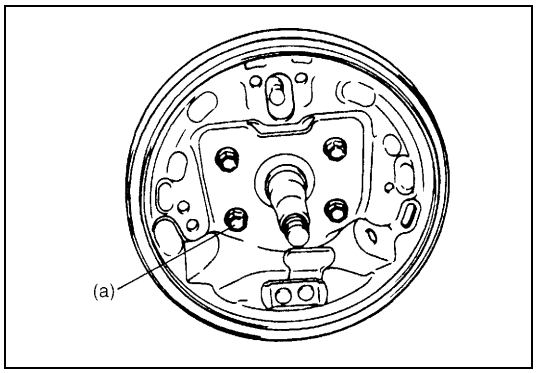


1) Apply water tight sealant to mating surfaces of brake back plate and rear axle.

"A" : Sealant 366E, 99000-31090

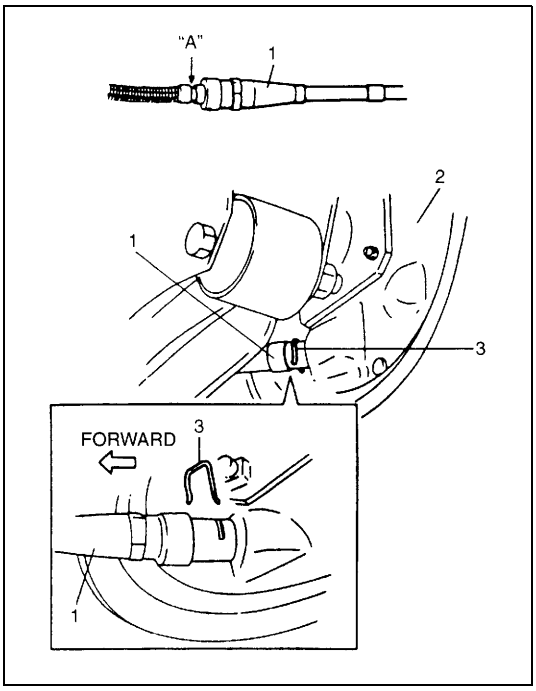
NOTE:

In case of vehicle equipped with ABS, do not apply sealant around hole for wheel speed sensor.



2) Install brake back plate and tighten back plate bolts to specified torque.

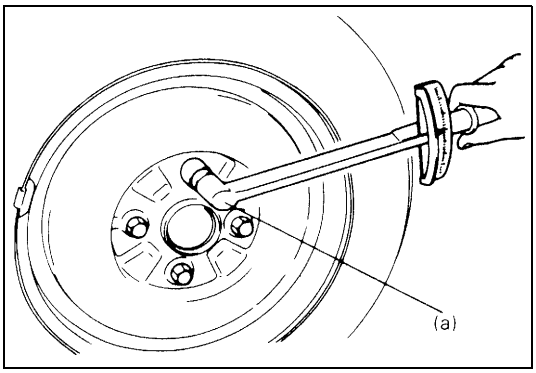
Tightening torque
(a) : 24 N·m (2.4 kg-m, 17.5 lb-ft)



3) Apply water tight sealant where plate and cable contact, and run parking brake cable (1) through brake back plate (2) and secure it with clip (3).

"A" : Sealant 366E, 99000-31090

4) Install wheel cylinder, and tighten wheel cylinder bolts and brake pipe flare nut to specified torque. (Refer to steps 1) to 4) of WHEEL CYLINDER INSTALLATION in this section.)
5) Install brake shoes, referring to steps 1) to 5) of BRAKE SHOE INSTALLATION in this section.
6) Install brake drum. Refer to steps 3) to 8) of its INSTALLATION in this section.
7) Fill reservoir with brake fluid and bleed brake system. (For bleeding operation, see BLEEDING BRAKES in SECTION 5.)



8) Install wheel and tighten wheel nuts to specified torque.

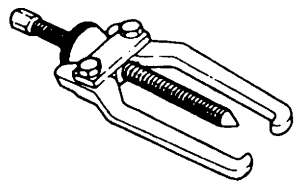
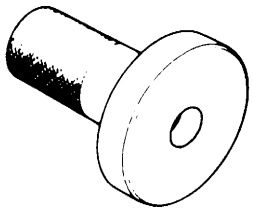
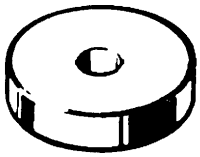
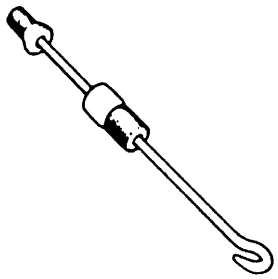
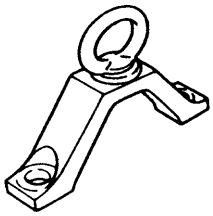
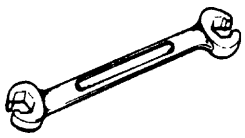
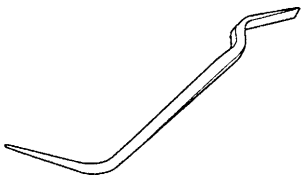
Tightening torque
(a) : 85 N·m (8.5 kg-m, 61.5 lb-ft)

9) Upon completion of all jobs, depress brake pedal with about 30 kg (66 lbs) load at least 10 – 15 times until adjuster actuator clicking sound from drum brake can not be heard so as to obtain proper drum-to-shoe clearance.
   Adjust parking brake cable. (For adjustment, see PARKING BRAKE INSPECTION and ADJUSTMENT in SECTION 5.)
10) Install console box.
11) Check to ensure that brake drum is free from dragging and proper braking is obtained. Then remove vehicle from hoist and perform brake test (foot brake and parking brake).
12) Check each installed part for oil leakage.

Required Service Materials

Material	Recommended SUZUKI product (Part Number)	Use
Brake fluid	DOT 4	• To fill master cylinder reservoir. • To clean and apply to inner parts of caliper and wheel cylinder when they are disassembled.
Water tight sealant	SEALING COMPOUND 366E 99000-31090	• To apply to mating surfaces of brake back plate and rear wheel cylinder. • To apply to contact position of parking brake cable and back plate. • To apply to mating surfaces of brake back plate and rear axle.
Bentonite base brake grease (Anti-squeal agent)	—	• To coat thinly to surface on which shoe rims rest. • To coat thinly between actuator and shoe rim, and at actuator pivot points.

Special Tools

 09913-65135 Bearing puller	 09913-75520 Bearing installer	 09926-68310 Bearing installer	 09942-15510 Sliding hammer
 09943-17912 Brake drum remover (Front wheel hub remover)	 09950-78230 Flare nut wrench (10 – 11 mm)	 Snap-on Part NO. B3404B or equivalent	

SECTION 5E

ANTILOCK BRAKE SYSTEM (ABS)

WARNING:

For vehicles equipped with Supplemental Restraint (Air Bag) System :

- **Service on and around the air bag system components or wiring must be performed only by an authorized SUZUKI dealer. Refer to "Air Bag System Components and Wiring Location View" under "General Description" in air bag system section in order to confirm whether you are performing service on or near the air bag system components or wiring. Please observe all WARNINGS and "Service Precautions" under "On-Vehicle Service" in air bag system section before performing service on or around the air bag system components or wiring. Failure to follow WARNINGS could result in unintentional activation of the system or could render the system inoperative. Either of these two conditions may result in severe injury.**
- **Technical service work must be started at least 90 seconds after the ignition switch is turned to the "LOCK" position and the negative cable is disconnected from the battery. Otherwise, the system may be activated by reserve energy in the Sensing and Diagnostic Module (SDM).**

NOTE:

All brake fasteners are important attaching parts in that they could affect the performance of vital parts and systems, and/or could result in major repair expense. They must be replaced with one of same part number or with an equivalent part if replacement becomes necessary. Do not use a replacement part of lesser quality or substitute design. Torque values must be used as specified during reassembly to assure proper retention of all parts. There is to be no welding as it may result in extensive damage and weakening of the metal.

For the items with asterisk (*) in the "CONTENTS" below, refer to the same section of the Service Manual mentioned in FOREWORD of this manual.

CONTENTS

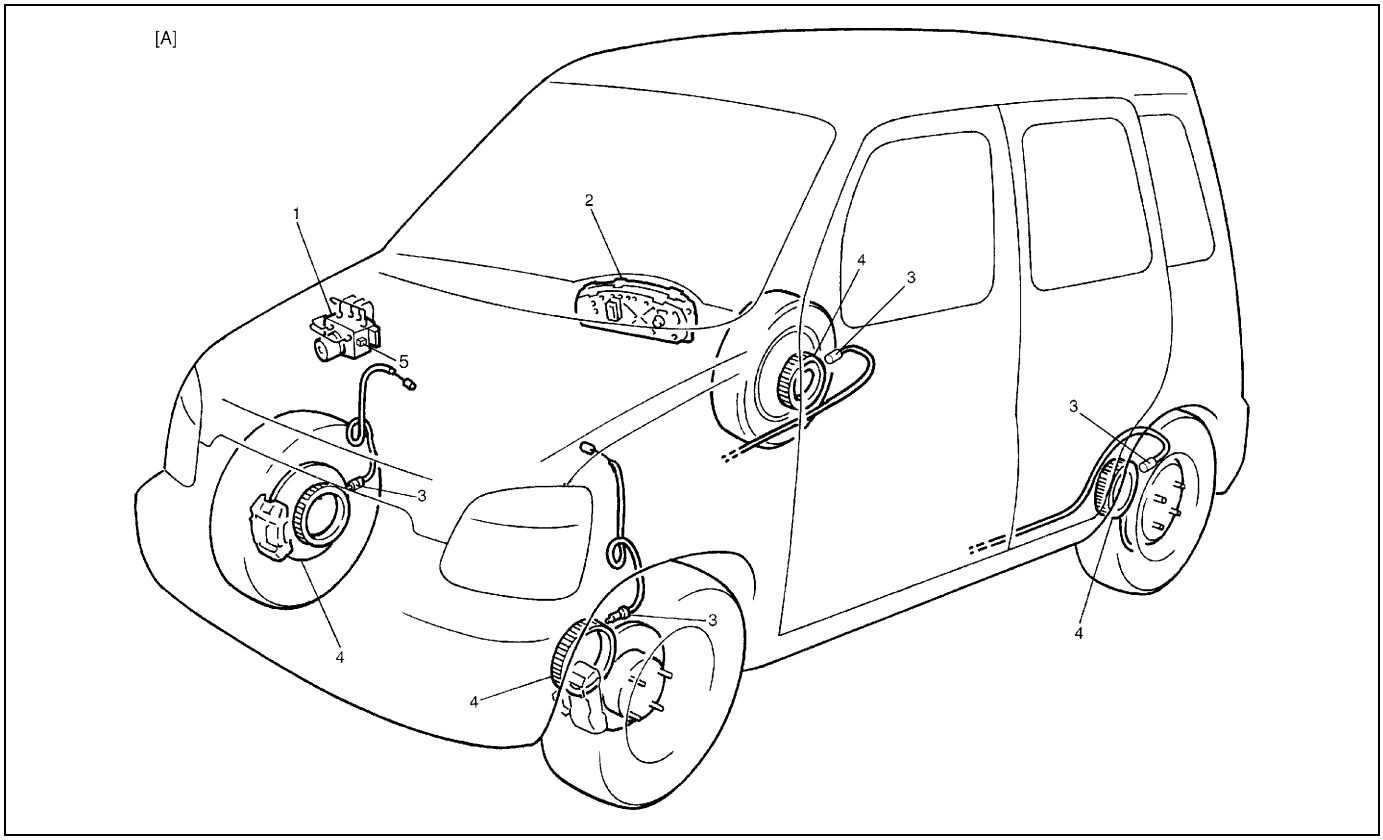
General Description

Components and Parts Location

The ABS (Antilock Brake System) controls the fluid pressure applied to the Wheel cylinder of each brake from the master cylinder so that each wheel is not locked even when hard braking is applied.
This ABS has also the following function.
While braking is applied, but before ABS control becomes effective, braking force is distributed between the front and rear so as to prevent the rear wheels from being locked too early for better stability of the vehicle.
The main component parts of this ABS include the following parts in addition to those of the conventional brake system.

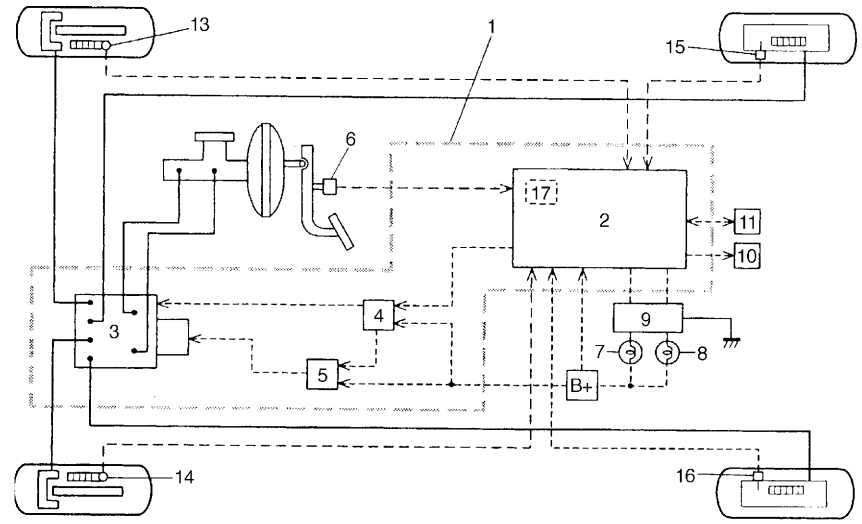
- Wheel speed sensor which senses revolution speed of each wheel and outputs its signal.
- "ABS" warning lamp which lights to inform abnormality when system fails to operate properly.
- ABS hydraulic unit/control module assembly is incorporated ABS control module, ABS hydraulic unit (actuator assembly), fail-safe relay and pump motor relay.
  - ABS control module which sends operation signal to ABS hydraulic unit to control fluid pressure applied to each wheel cylinder based on signal from each wheel speed sensor so as to prevent wheel from locking.
  - ABS hydraulic unit which operates according to signal from ABS control module to control fluid pressure applied to wheel cylinder of each 4 wheels.
  - Fail-safe relay (solenoid valve relay) which supplies power to solenoid valve in ABS hydraulic unit.
  - Pump motor relay which supplies power to pump motor in ABS hydraulic unit.
- G sensor (built in ABS hydraulic unit/control module assembly) which detects vehicle deceleration. (For 4WD model only)

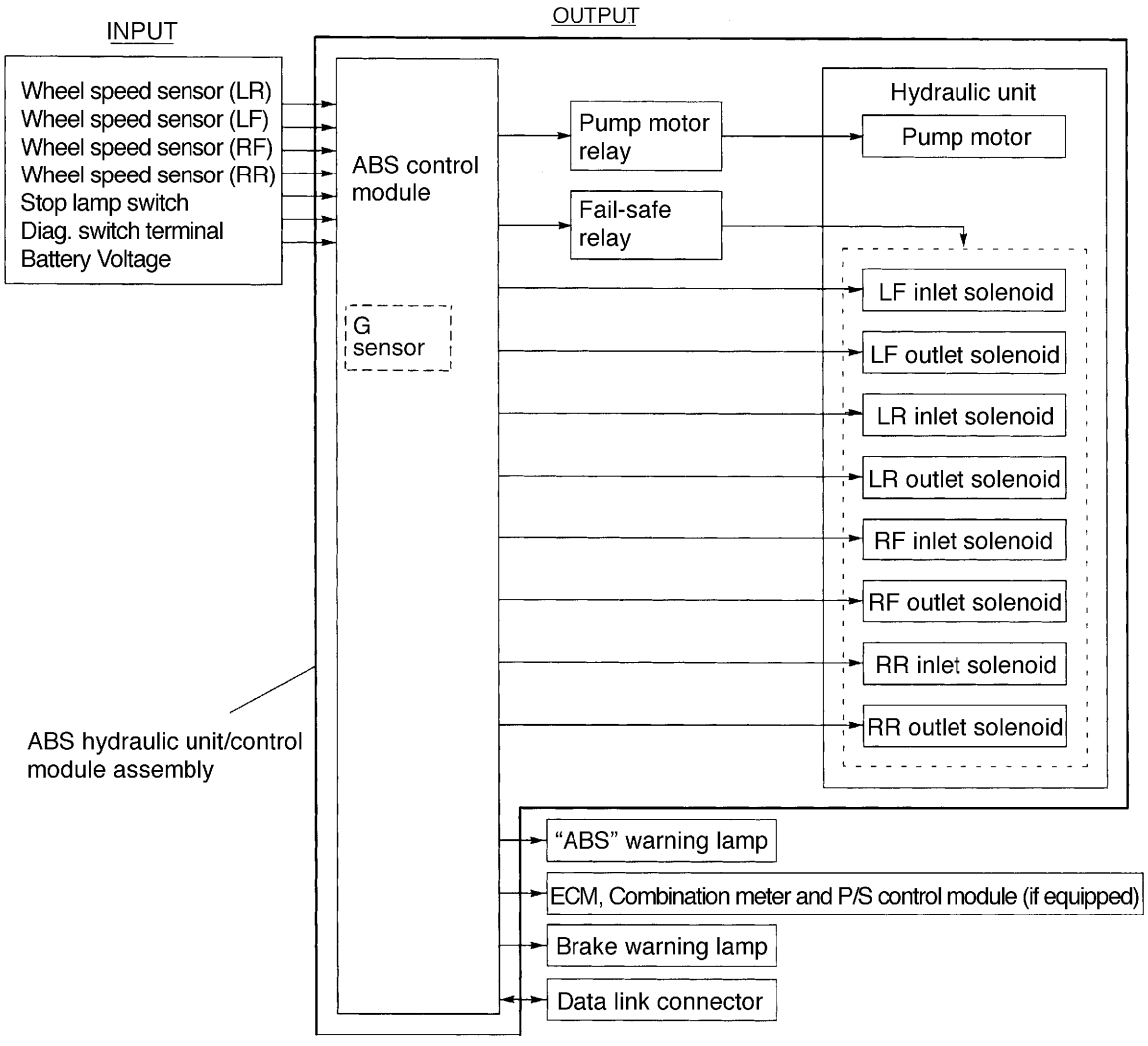
This ABS is equipped with Electronic Brake force Distribution (EBD) system that controls a fluid pressure of rear wheels to best condition, which is the same function as that of proportioning valve, by the signal from wheel sensor independently of change of load due to load capacity and so on. And if the EBD system fails to operate properly, the brake warning lamp lights to inform abnormality.



[A] : LH steering vehicle shown	2. Combination meter	4. Wheel speed sensor ring
1. ABS hydraulic unit/control module assembly	3. Wheel speed sensor	5. G sensor (For 4WD model only)

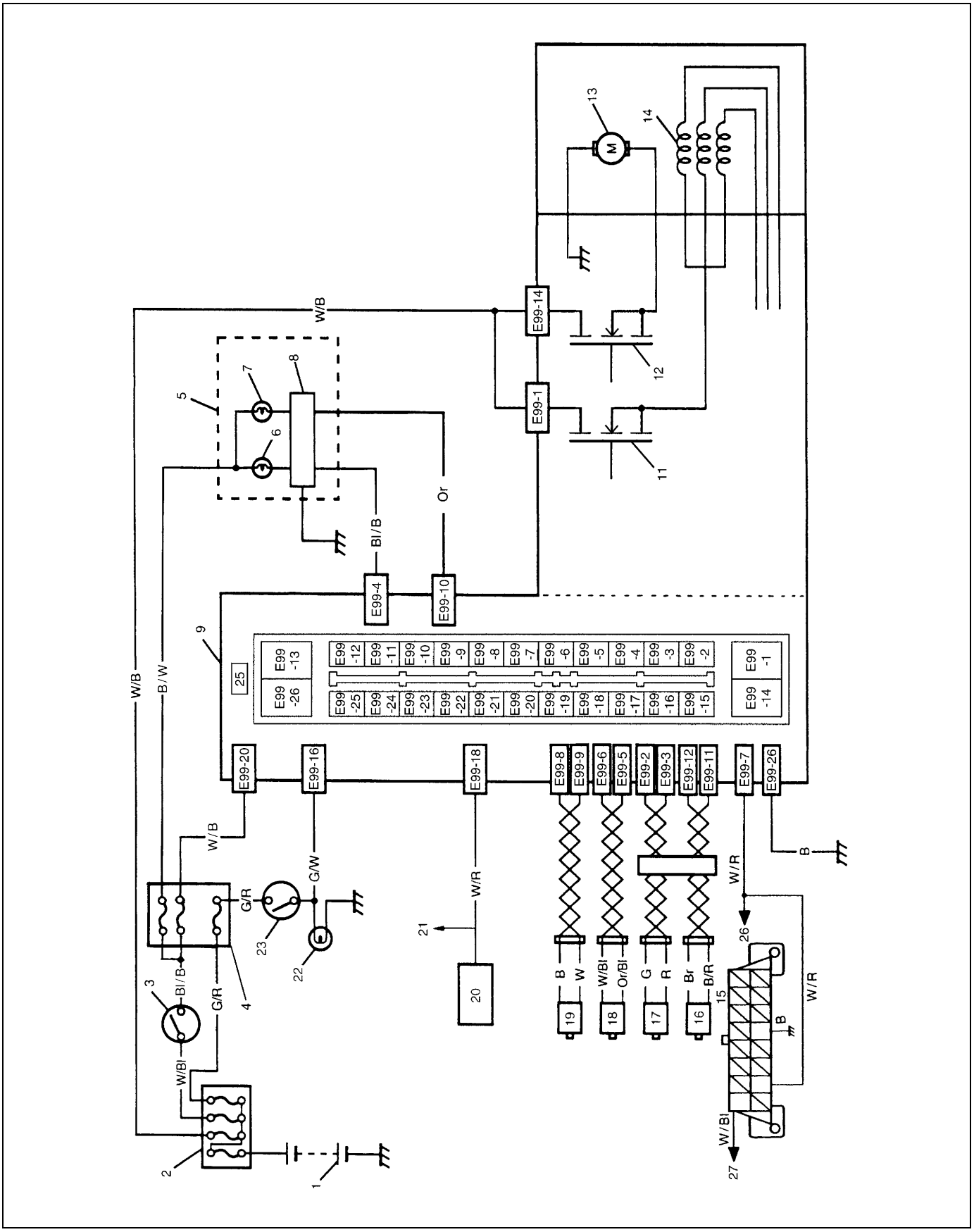
System Schematic





1. ABS hydraulic unit/control module assembly	7. “ABS” warning lamp	13. Wheel speed sensor (Right -front)
2. ABS control module	8. Brake warning lamp	14. Wheel speed sensor (Left-front)
3. ABS hydraulic unit	9. Lamp driver module	15. Wheel speed sensor (Right-rear)
4. Fail safe relay	10. ECM, Combination meter and P/S control module (if equipped)	16. Wheel speed sensor (Left-rear)
5. Pump motor relay	11. Data link connector	17. G sensor (For 4WD model only)
6. Stop lamp switch	12. Blank	

System Circuit



1. Battery	10. Terminal arrangement of ABS hydraulic unit/control module assembly	19. Left-front wheel speed sensor
2. Main fuses	11. ABS fail-safe FET (Solenoid valve FET)	20. ECM
3. Ignition switch	12. ABS pump motor FET	21. K-line tester
4. Circuit fuses	13. Pump motor	22. To ECM, SDM and P/S control module (if equipped)
5. Combination meter	14. Solenoid valves	23. Stop lamp
6. "ABS" warning lamp	15. Data link connector (DLC)	24. Stop lamp switch
7. Brake warning lamp	16. Right-rear wheel speed sensor	25. G sensor
8. Warning lamp driver module (for ABS)	17. Left-rear wheel speed sensor	26. To ECM, TCM, P/S control module and SDM
9. ABS hydraulic unit/control module assembly	18. Right-front wheel speed sensor	27. To main fuse box

Wire color					
B :	Black	Br :	Brown	R/Y :	Red/Yellow
B/G :	Black/Green	G :	Green	V :	Violet
B/R :	Black/Red	G/R :	Green/Red	V/Y :	Violet/Yellow
B/W :	Black/White	G/W :	Green/White	W :	White
B/Y :	Black/Yellow	Or/Bl :	Orange/Blue	W/B :	White/Black
Bl :	Blue	R :	Red	W/Bl :	White/Blue
Bl/B :	Blue/Black	R/B :	Red/Black	W/G :	White/Green
Bl/Y :	Blue/Yellow	R/Bl :	Red/Blue	W/R :	White/Red
Bl/W :	Blue/White	R/W :	Red/White	W/Y :	White/Yellow

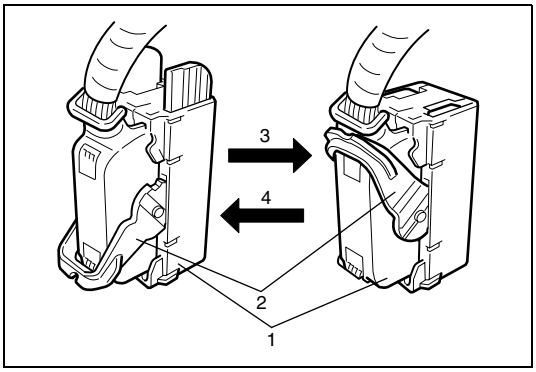
TERMINAL		CIRCUIT
E99	1	ABS fail-safe FET
	2	Left-rear wheel speed sensor (+)
	3	Left-rear wheel speed sensor (–)
	4	"ABS" warning lamp
	5	Right-front wheel speed sensor (–)
	6	Right-front wheel speed sensor (+)
	7	Serial data link terminal
	8	Left-front wheel speed sensor (+)
	9	Left-front wheel speed sensor (–)
	10	Brake warning lamp
	11	Right-rear wheel speed sensor (+)
	12	Right-rear wheel speed sensor (–)
	13	–
	14	ABS pump motor FET
	15	–
	16	Stop lamp switch
	17	–
	18	Vehicle speed signal
	19	–
	20	Ignition switch
	21	–
	22	–
	23	–
	24	–
	25	Data link connector
	26	Ground

Diagnosis

To ensure that the trouble diagnosis is done accurately and smoothly, observe “PRECAUTIONS IN DIAGNOSING TROUBLES” and follow “ABS DIAGNOSTIC FLOW TABLE”.

Precaution in Diagnosing Troubles

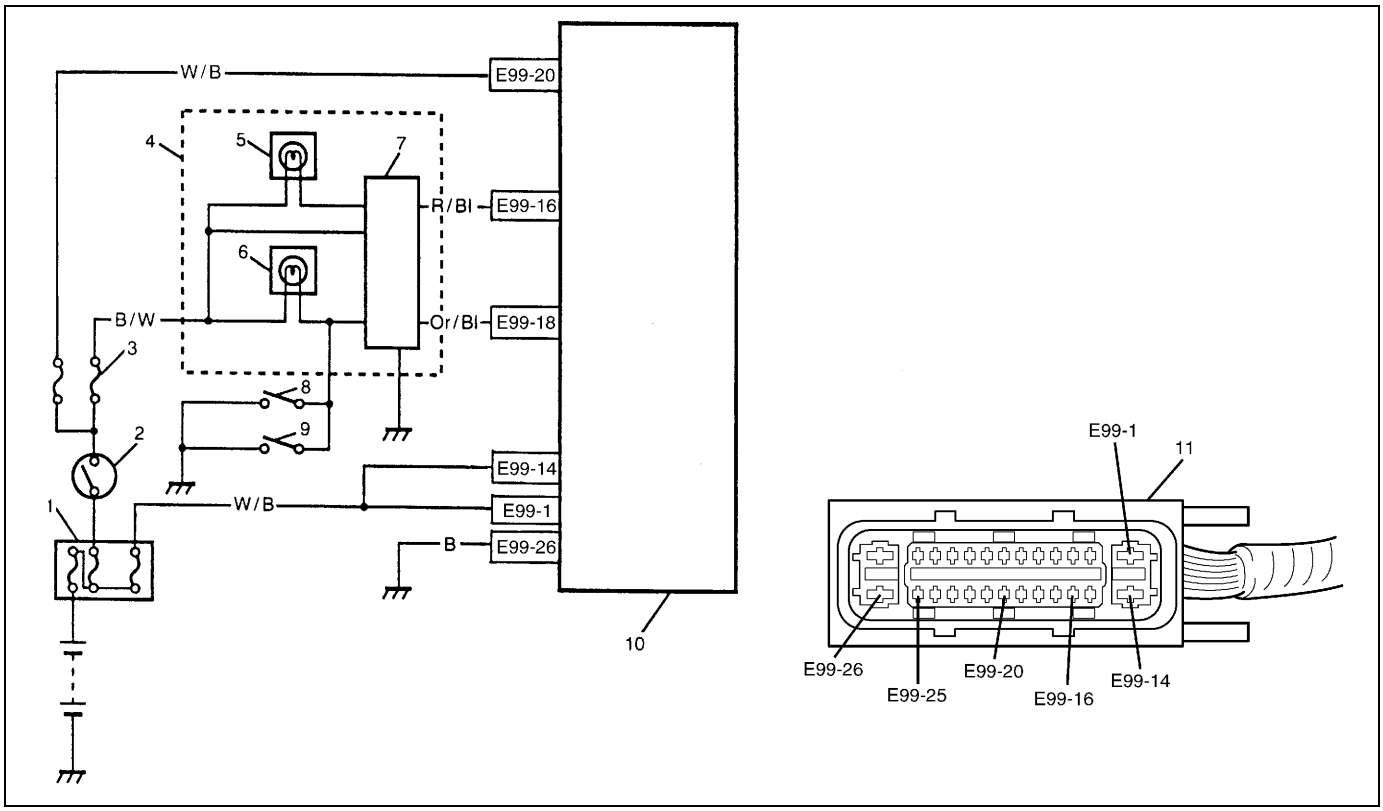
- If the vehicles was operated in any of the following ways, ABS warning lamp may light momentarily but this does not indicate anything abnormal in ABS.
  – The vehicle was driven with parking brake pulled.
  – The vehicle was driven with brake dragging.
  – The vehicle was stuck in mud, sand, etc.
  – Wheel spin occurred while driving.
  – Wheel(s) was rotated while the vehicle was jacked up.
- Be sure to read “PRECAUTIONS FOR ELECTRONIC CIRCUIT SERVICE” in Section 0A before inspection and observe what is written there.
- Be sure to use the trouble diagnosis procedure as described in the flow table. Failure to follow the flow table may result in incorrect diagnosis. (Some other diagnosis trouble code may be stored by mistake in the memory of ABS control module during inspection.)



- When disconnecting ABS hydraulic unit/control module connector (1), turn down lock (2) of connector.
  When connecting, set the connector on ABS hydraulic unit/control module assembly and push the lock (2) down.

3.	Connect
4.	Disconnect

Table – A ABS Warning Lamp Circuit Check – Lamp Does Not Come "ON" at Ignition Switch ON



1. Main fuse	5. ABS warning lamp	9. Brake fluid level switch
2. Ignition switch	6. Brake warning lamp	10. ABS hydraulic unit/control module assembly
3. Circuit fuse	7. Lamp driver module	11. ABS hydraulic unit/control module connector
4. Combination meter	8. Parking brake switch	

CIRCUIT DESCRIPTION

Operation (ON/OFF) of ABS warning lamp is controlled by ABS control module through lamp driver module in combination meter.

If the Antilock brake system is in good condition, ABS control module turns ABS warning lamp ON at the ignition switch ON, keeps it ON for 2 seconds and then turns it OFF. If an abnormality in the system is detected, ABS warning lamp is turned ON continuously by ABS control module. Also, it is turned ON continuously by lamp driver module when the connector of ABS control module is disconnected.

INSPECTION

Step	Action	Yes	No
1	1) Turn ignition switch ON. Do other warning lamp come ON?	Go to Step 2.	Go to Step 4.
2	1) Disconnect ABS hydraulic unit/control module connector. Does ABS warning lamp light with ignition switch ON?	Substitute a known-good ABS hydraulic unit/control module assembly and recheck.	Go to Step 3.
3	1) Remove combination meter. Is bulb of ABS warning lamp in good condition?	"R/Bl" circuit shorted to ground. If OK, replace combination meter (lamp driver module).	Replace bulb.
4	Is IG fuse in good condition?	Open in "B/W" wire to combination meter or poor connection.	Repair and replace.

Table – B ABS Warning Lamp Circuit Check – Lamp Comes "ON" Steady

Refer to TABLE – A for System Circuit Diagram and Circuit Description.

INSPECTION

Step	Action	Yes	No
1	Perform diagnostic trouble code check. Is there any DTC (NO CODES on SUZUKI scan tool) exists?	Go to Step 2.	Go to Step 3.
2	Does malfunction DTC exist at Step 1?	Go to Step 7 of "ABS DIAGNOSTIC FLOW TABLE" in this section.	Go to Step 3.
3	1) Disconnect ABS hydraulic unit/control module connector. 2) Check for proper connection to ABS hydraulic unit/control module connector at terminals "E99-4", "E99-20" and "E99-26". 3) If OK then ignition switch ON and measure voltage at terminal "E99-20" of connector. Is it 10 – 14 V?	Go to Step 4.	"W/B" circuit open.
4	1) With ABS hydraulic unit/control module connector disconnected, turn ignition switch ON and light ABS warning lamp. 2) Connect terminal "E99-4" of disconnected connector to ground using service wire. Does ABS warning lamp turn off?	Go to Step 5.	"R/Bl" circuit open. If wire and connection are OK, replace combination meter (lamp driver module).
5	1) Measure resistance from connector terminal "E99-26" to body ground. Is continuity indicated?	Substitute a known-good ABS hydraulic unit/control module assembly and recheck.	"B" circuit open.

Table – C EBD Warning Lamp (Brake Warning Lamp) Check – Lamp Comes "ON" Steady

CIRCUIT DESCRIPTION

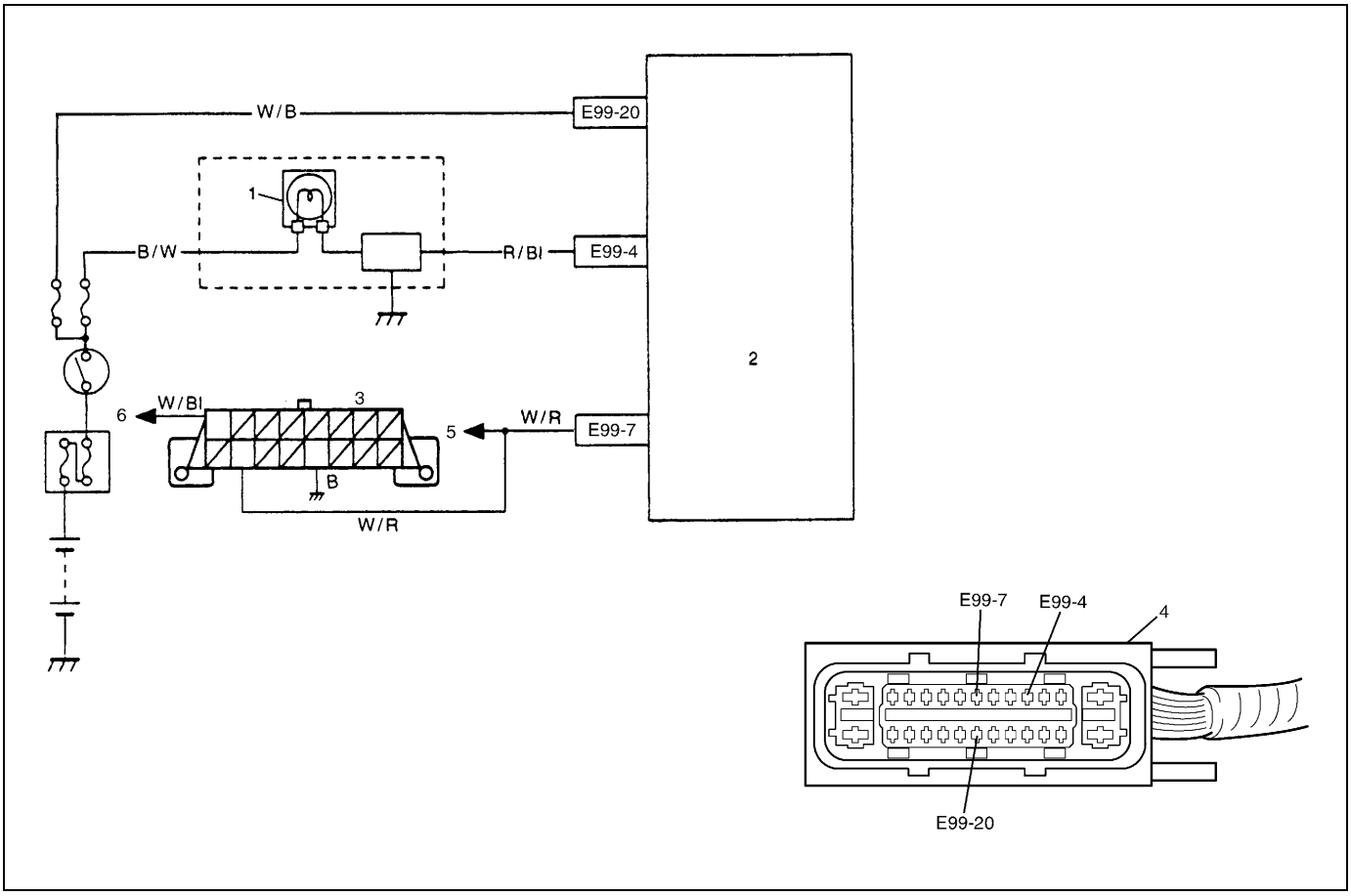
EBD warning lamp (Brake warning lamp) is controlled by parking brake switch, brake fluid level switch and ABS control module/hydraulic unit assembly through lamp driver module in combination meter. Refer to "TABLE – A" for circuit diagram.

INSPECTION

Step	Action	Yes	No
1	1) Make sure that : • Parking brake is completely released. • Brake fluid level is upper than the minimum level. Are the check results OK?	Go to Step 2.	Release parking brake completely and/or replenish brake fluid.
2	Does "ABS" warning lamp come on?	Perform "TABLE – B" previously outlined.	Go to Step 3.
3	1) Disconnect ABS hydraulic unit/control module connector. 2) Check for proper connection to ABS hydraulic unit/control module connector at terminals "E99-10". 3) If OK, apply chocks to wheels and select gear in neutral position (P range for A/T). 4) Keep brake pedal depressed and start engine. Release parking brake. 5) Connect terminal "E99-10" of disconnected connector to ground using service wire. Does brake warning lamp turn off?	Substitute a known-good ABS hydraulic unit/control module assembly and recheck.	"Or/Bl" circuit open. If wire and connection are OK, replace combination meter.

Serial Data Link Circuit Check

CAUTION:
Be sure to perform "SYSTEM CHECK FLOW TABLE" before starting diagnosis according to flow table.

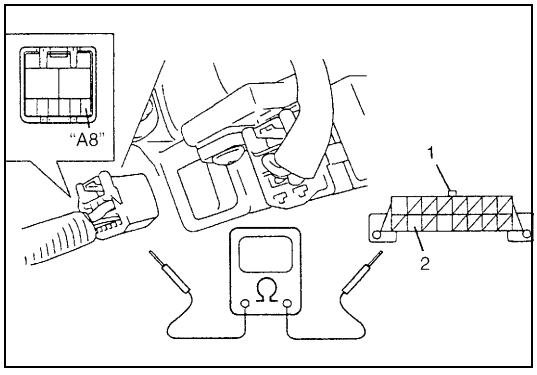


1. "ABS" warning lamp in combination meter	3. Data link connector (DLC)	5. To ECM, TCM, P/S control module and SDM
2. ABS hydraulic unit/control module assembly	4. ABS hydraulic unit/control module connector	6. To main fuse box

INSPECTION

Step	Action	Yes	No
1	Was “ABS DIAGNOSTIC CHECK FLOW TABLE” performed?	Go to Step 2.	Go to “ABS DIAGNOSTIC CHECK FLOW TABLE” in this section.
2	1) Make sure that SUZUKI scan tool is free from malfunction and correct cartridge for ABS is used. 2) Turn ignition switch to OFF position. 3) Check proper connection of SUZUKI scan tool to DLC. Is connection in good condition?	Go to Step 3.	Properly connect SUZUKI scan tool to DLC.
3	1) Check if communication is possible by trying communication with other controller (ECM, TCM, P/S control module or SDM). Is it possible to communicate with other controller?	Go to Step 4.	Repair open in common section of serial data circuit (“W/R” wire circuit) used by all controllers or short to ground or power circuit which has occurred somewhere in serial data circuit (“W/R” wire circuit).
4	1) With ignition switch OFF position, disconnect ABS hydraulic unit/control module connector from ABS hydraulic unit/control module. 2) Check proper connection at “E99-25” (“W/R” wire) terminal for serial data circuit. 3) If OK, then check resistance between “E99-25” (“W/R” wire) terminal and “W/R” wire terminal for serial data circuit in DLC. Is resistance 1 Ω or less?	Substitute a known-good P/S control module and recheck.	Repair high resistance or open in “W/R” wire circuit for ANTI LOCK BRAKE system.

Fig. for Step 4



1. DLC
2. “W/R” wire terminal

Diagnostic Trouble Code (DTC) Table

CAUTION:
Be sure to perform "ABS DIAGNOSTIC FLOW TABLE" before starting diagnosis.

DTC (displayed on SUZUKI scan tool)	DIAGNOSTIC ITEMS	
NO DTC	Normal	
C1015	G sensor circuit	
C1021	RF	Wheel speed sensor circuit
C1025	LF	
C1031	RR	
C1035	LR	
C1022	RF	Wheel speed sensor circuit or sensor ring
C1026	LF	
C1032	RR	
C1036	LR	
C1041	RF	Inlet solenoid valve circuit
C1042		Outlet solenoid valve circuit
C1045	LF	Inlet solenoid valve circuit
C1046		Outlet solenoid valve circuit
C1051	RR	Inlet solenoid valve circuit
C1052		Outlet solenoid valve circuit
C1055	LR	Inlet solenoid valve circuit
C1056		Outlet solenoid valve circuit
C1057	Power source	
C1061	ABS pump motor and/or motor relay circuit	
C1063	Fail safe-relay	
C1071	ABS control module	

DTC C1015 – G Sensor Circuit

DESCRIPTION

If the signal voltage of G sensor while at a stop does not vary from that while running, this DTC is set.
Therefore, this DTC may be set when a vehicle is lifted up and its wheel(s) is turned. In such case, clear the DTC and check again.

INSPECTION

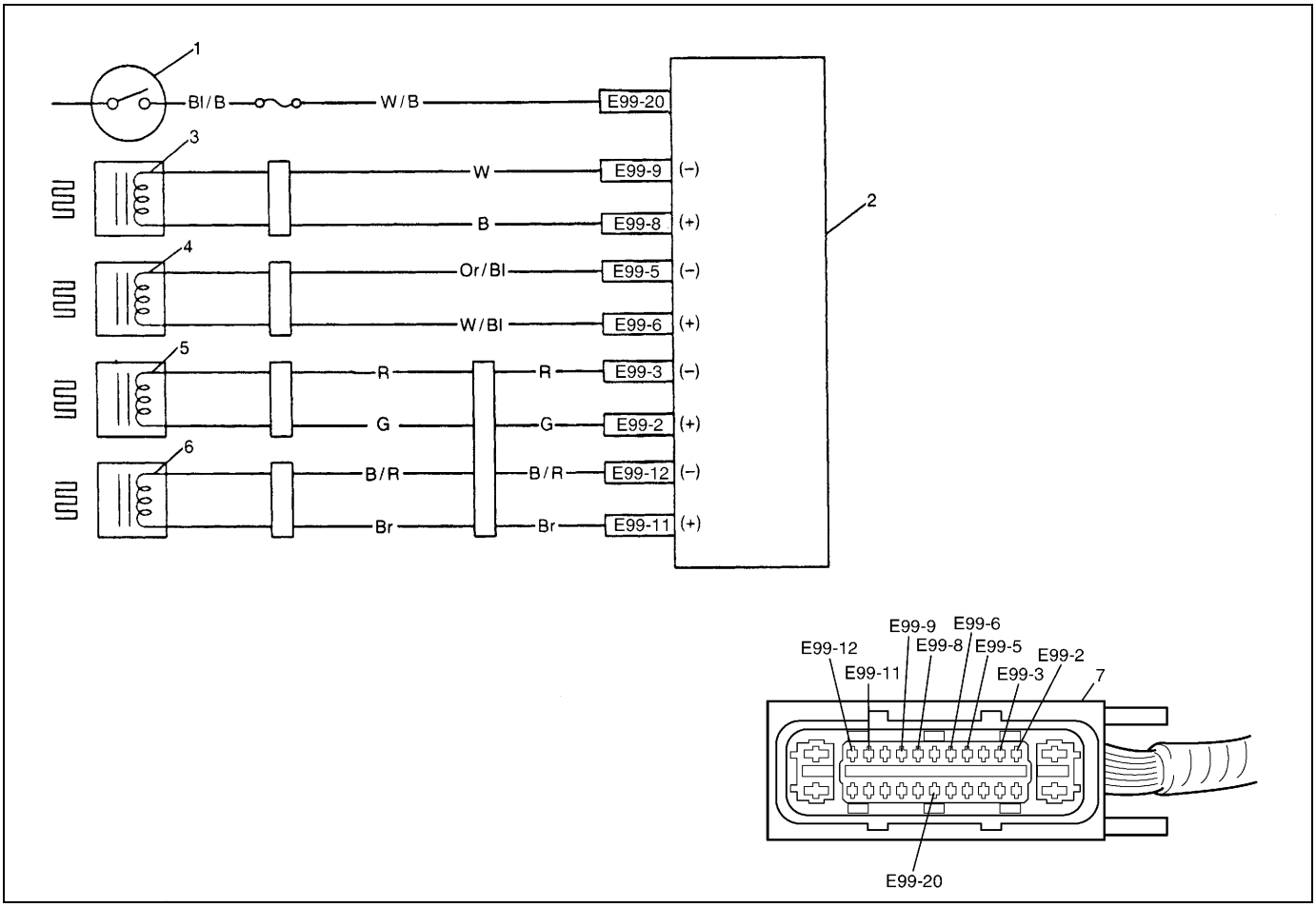
1) Ignition switch OFF.
2) Check for proper connection from harness to control module.
3) If OK, substitute an ABS hydraulic unit/control module assembly with correct part number.
4) Recheck system.

DTC C1021, DTC C1022 – Right-Front Wheel Speed Sensor Circuit or Sensor Ring

DTC C1025, DTC C1026 – Left-Front Wheel Speed Sensor Circuit or Sensor Ring

DTC C1031, DTC C1032 – Right-Rear Wheel Speed Sensor Circuit or Sensor Ring

DTC C1035, DTC C1036 – Left-Rear Wheel Speed Sensor Circuit or Sensor Ring



1. Ignition switch	4. Right-front wheel speed sensor	7. ABS hydraulic unit/control module connector
2. ABS control module/hydraulic unit assembly	5. Left-rear wheel speed sensor	
3. Left-front wheel speed sensor	6. Right-rear wheel speed sensor	

DESCRIPTION

The ABS control module monitors the voltage at the terminal of each sensor while the ignition switch is ON. When the voltage is not within the specified range, an applicable DTC will be set. Also, when no sensor signal is inputted at starting or while running, an applicable DTC will be set.

NOTE:

When the vehicle was operated in any of the following ways, one of these DTCs may be set even when the sensor is in good condition. If such possibility is suspected, repair the trouble (dragging of brake, etc.) of the vehicle, clear DTC once and then after performing the driving test as described in Step 2 of "ABS DIAGNOSIS FLOW TABLE", check whether or not any abnormality exists.

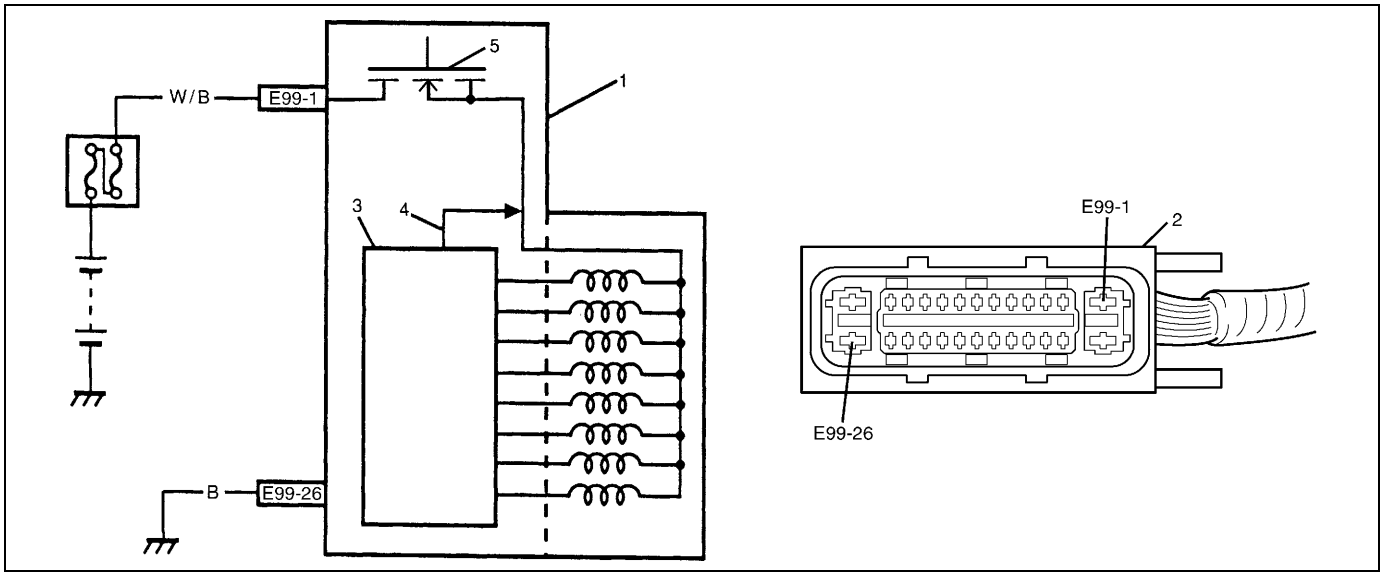
- **The vehicle was driven with parking brake pulled.**
- **The vehicle was driven with brake dragging.**
- **Wheel spin occurred while driving.**
- **Wheel(s) was turned while the vehicle was jacked up.**
- **The vehicle was stuck.**

INSPECTION

Step	Action	Yes	No
1	1) Disconnect applicable ABS wheel speed sensor coupler with ignition switch OFF. 2) Measure resistance between terminals of ABS wheel speed sensor. Refer to "FRONT WHEEL SPEED SENSOR" and/or "REAR WHEEL SPEED SENSOR" in this section. Is measured resistance value as specified?	Go to Step 2.	Replace ABS wheel speed sensor assembly.
2	1) Turn ignition switch OFF. 2) Disconnect ABS hydraulic unit/control module connector. 3) Check for proper connection to ABS control module at each sensor terminal. 4) If OK, then turn ignition switch ON and measure voltage between sensor terminal of module connector and body ground. Is it 0V?	Go to Step 3.	ABS wheel speed sensor circuit shorted to power.
3	1) Turn ignition switch OFF. 2) Connect ABS wheel speed sensor coupler. 3) Measure resistance between the following points. • Both ABS hydraulic unit/control module connector terminals of the corresponding sensor. This check result should be the same as above Step 1. • Either terminal of wheel speed sensor coupler and body ground. This check result should be no continuity. Are both check results OK?	Go to Step 4.	Circuit open or shorted to ground.
4	1) Remove applicable ABS wheel speed sensor. 2) Check sensor for damage or foreign material attached. Is it in good condition?	Go to Step 5.	Clean, repair or replace.
5	Check front and/or rear sensor ring for the following (remove rear drum as necessary) : • Rotor serration (teeth) neither missing nor damaged. • No foreign material being attached. • Rotor not being eccentric. • Wheel bearing free from excessive play. Are they in good condition?	Go to Step 6.	Clean, repair or replace.

Step	Action	Yes	No
6	1) Install ABS wheel speed sensor to knuckle. 2) Tighten sensor bolt to specified torque and check that there is no clearance between sensor and knuckle. Is it OK?	Go to Step 7.	Replace ABS wheel speed sensor.
7	Referring to “Reference” of “FRONT WHEEL SPEED SENSOR” and/or “Reference” of “REAR WHEEL SPEED SENSOR” in this section, check output voltage or waveform. Is specified voltage and/or waveform obtained?	Substitute a known-good ABS hydraulic unit/control module assembly and recheck.	Replace sensor and recheck.

DTC C1041 – Right-Front Inlet Solenoid Circuit
DTC C1045 – Left-Front Inlet Solenoid Circuit
DTC C1051 – Right-Rear Inlet Solenoid Circuit
DTC C1055 – Left-Rear Inlet Solenoid Circuit
DTC C1042 – Right-Front Outlet Solenoid Circuit
DTC C1046 – Left-Front Outlet Solenoid Circuit
DTC C1052 – Right-Rear Outlet Solenoid Circuit
DTC C1056 – Left-Rear Outlet Solenoid Circuit



1. ABS hydraulic unit/control module assembly	3. ABS control module	5. Fail-safe relay
2. ABS hydraulic unit/control module assembly connector	4. Signal	

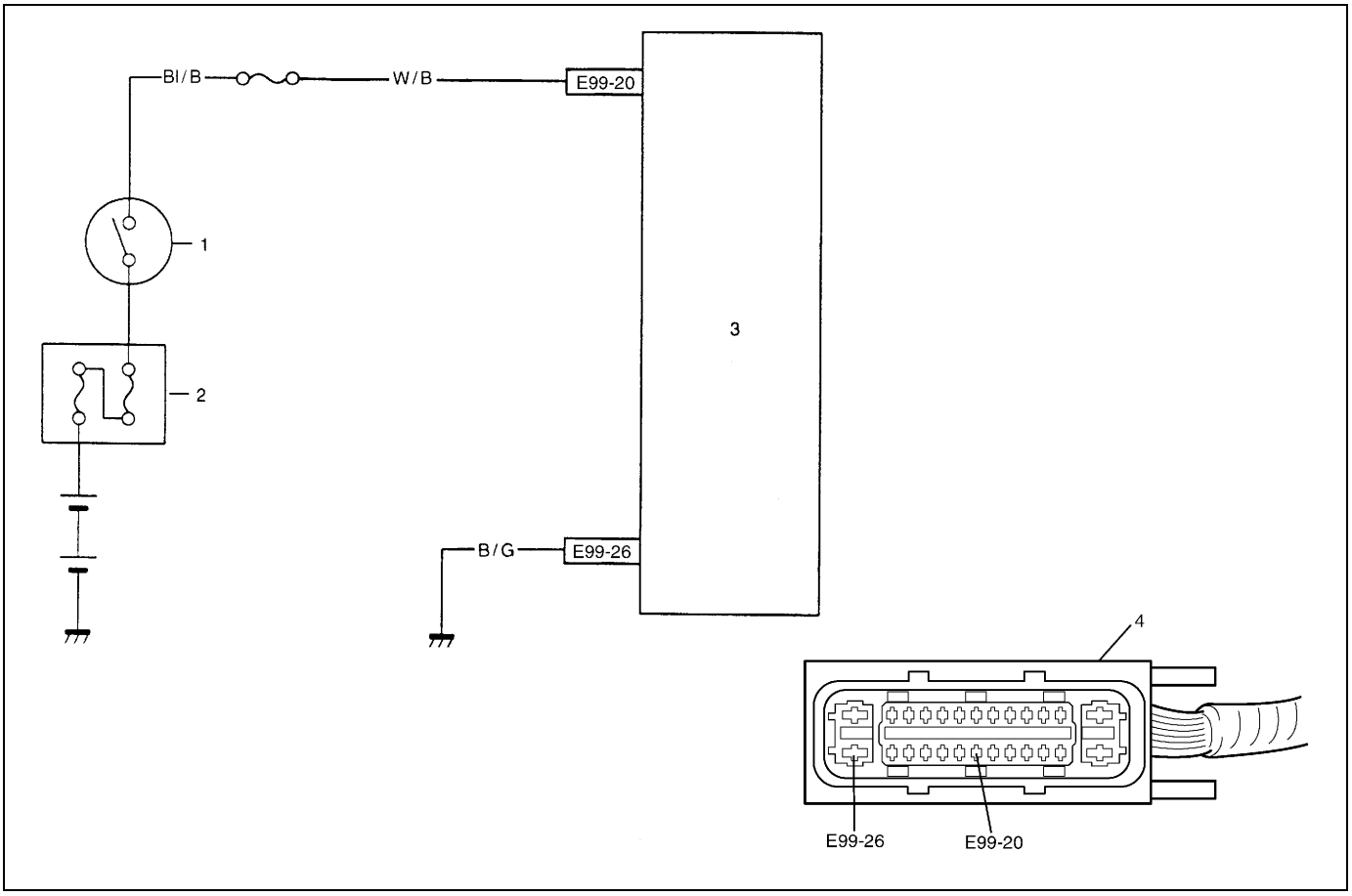
DESCRIPTION

The ABS control module monitors the output from the valve.
When the output of each valve exceeds the specified value compared with the signal sent from ABS control module, this DTC is set.

INSPECTION

Step	Action	Yes	No
1	1) Check solenoid operation referring to item “ABS HYDRAULIC UNIT OPERATION CHECK” in this section. Is it in good condition?	Check terminal “E99-1” connection. If connection is OK, substitute a known-good ABS hydraulic unit/control module assembly and recheck.	Go to Step 2.
2	1) Turn ignition switch to OFF position. 2) Disconnect ABS hydraulic unit/control module connector. 3) Check for proper connection to ABS hydraulic unit/control module connector at terminal “E99-1”. 4) If OK, then measure voltage between terminal “E99-1” of module connector and “E99-26”. Is it 10 – 14 V?	Substitute a known-good ABS hydraulic unit/control module assembly and recheck.	“WHT/BLU” or “BLK” circuit open.

DTC C1057 – Power Source Circuit



1. Ignition switch	3. ABS hydraulic unit/control module assembly
2. Main fuse	4. ABS hydraulic unit/control module connector

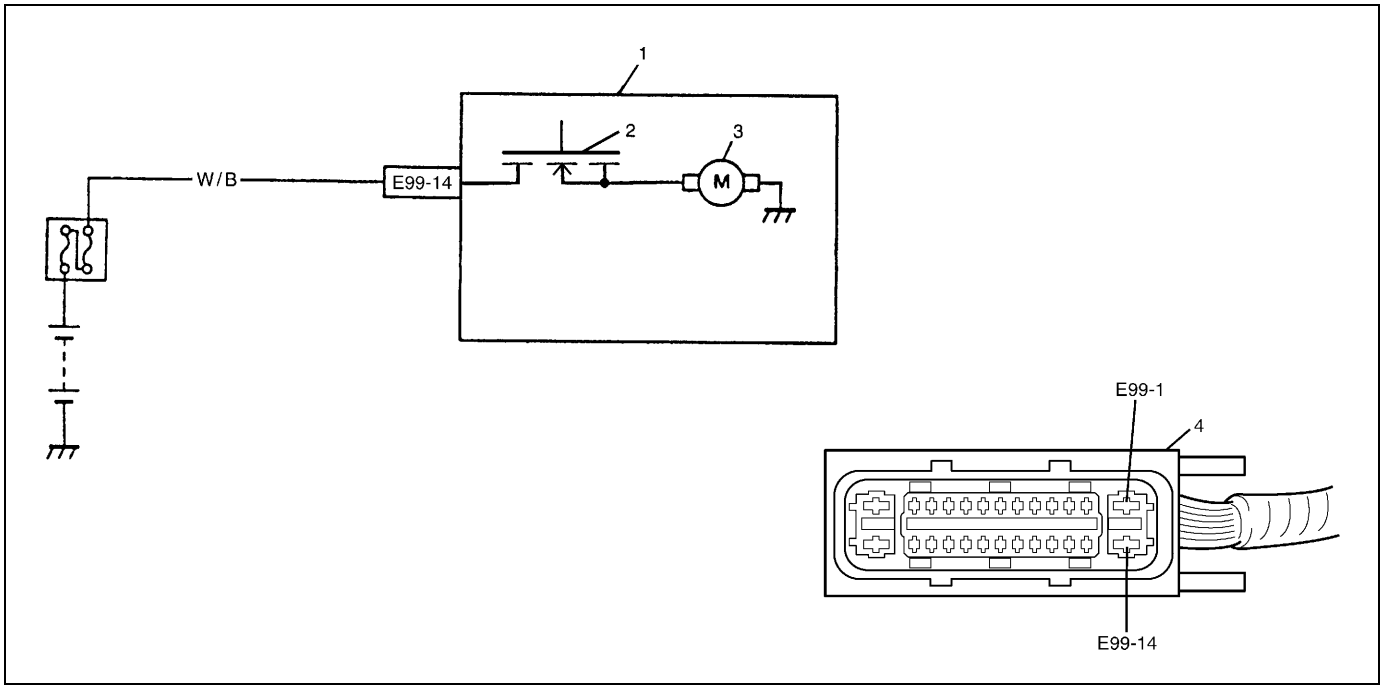
DESCRIPTION

The ABS control module monitors the power source voltage at terminal “E20-18”. When the power source voltage becomes extremely high or low, this DTC will be set. As soon as the voltage rises or lowers to the specified level, the set DTC will be cleared.

INSPECTION

Step	Action	Yes	No
1	1) Connect a voltmeter between battery positive (+) terminal and body ground. 2) Start the engine and measure the maximum voltage when racing the engine. Is it over 18 V?	Check charging system referring to “CHARGING SYSTEM” section.	Go to Step 2.
2	1) Disconnect ABS hydraulic unit/control module connector. 2) Keep the engine idling, measure the voltage between terminal “E99-20” of ABS control module and body ground. Is it always under 9 V?	Check charging system referring to “CHARGING SYSTEM” section. Imperfect short between wire “W/B” and ground.	Poor connection of terminal “E99-20” or “E99-26” of the ABS control module. If the above are in good condition, substitute a known-good ABS hydraulic unit/control module and recheck.

DTC C1061 – ABS Pump Motor Circuit



1. ABS hydraulic unit/control module assembly	3. ABS pump motor
2. ABS pump motor FET	4. ABS hydraulic unit/control module connector

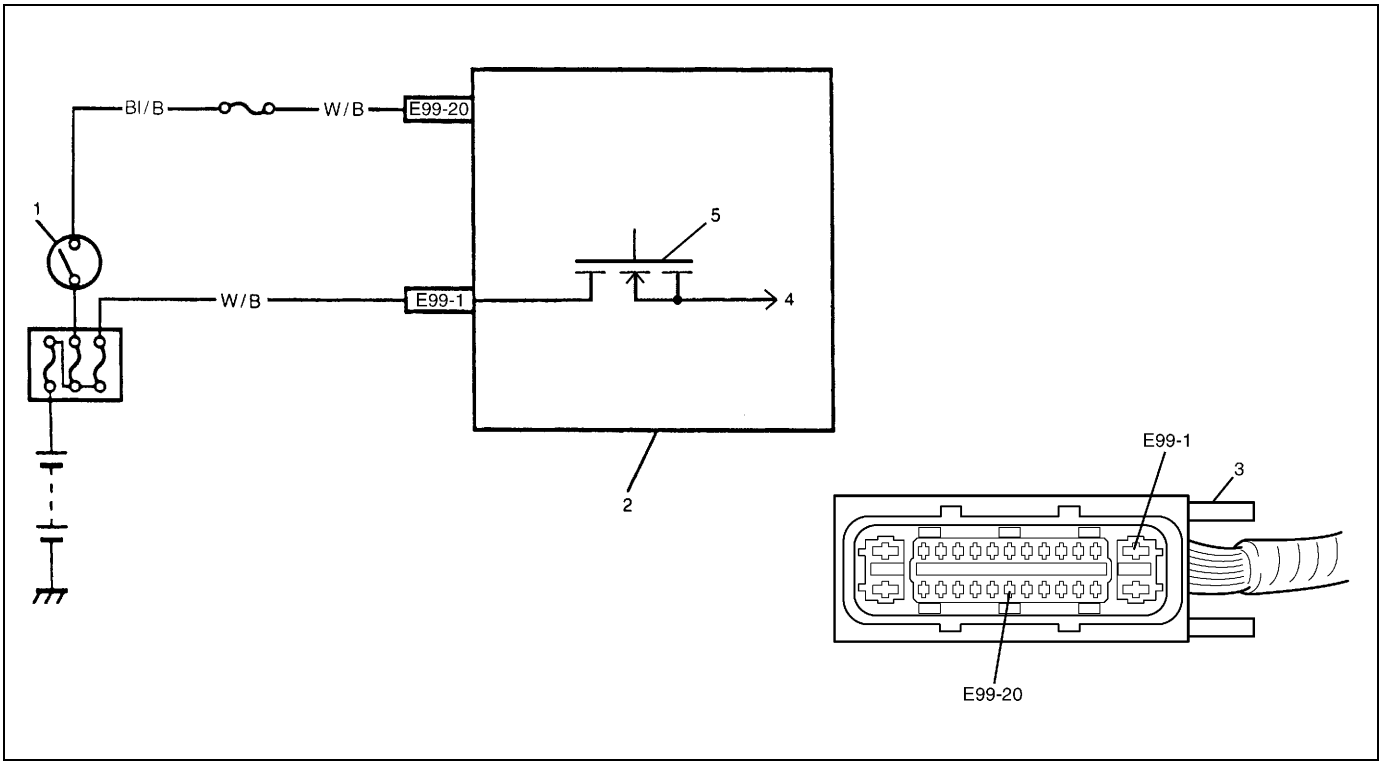
DESCRIPTION

The ABS control module monitors the voltage at monitor terminal of pump motor circuit constantly with the ignition switch turned ON. It sets this DTC when the voltage at the monitor terminal does not become high/low according to ON/OFF commands to the motor relay of the module (does not follow these commands).

INSPECTION

Step	Action	Yes	No
1	1) Check pump motor referring to "ABS HYDRAULIC UNIT OPERATION CHECK" in this section. Is it in good condition?	Check terminal "E99-14" connection. If connections OK, substitute a known-good ABS hydraulic unit/control module assembly and recheck.	Go to Step 2.
2	1) Turn Ignition switch to OFF position. 2) Disconnect ABS hydraulic unit/control module connector. 3) Check for proper connection to ABS hydraulic unit/control module connector at terminal "E99-14". 4) If OK, then measure voltage between terminal "E99-14" of module connector and body ground. Is it 10 – 14 V?	Substitute a known-good ABS hydraulic unit/control module assembly and recheck.	"W/B" circuit open.

DTC C1063 – ABS Fail-Safe FET Circuit



1. Ignition switch	3. ABS hydraulic unit/control module connector	5. Fail-safe FET
2. ABS hydraulic unit/control module assembly	4. To solenoid valves	

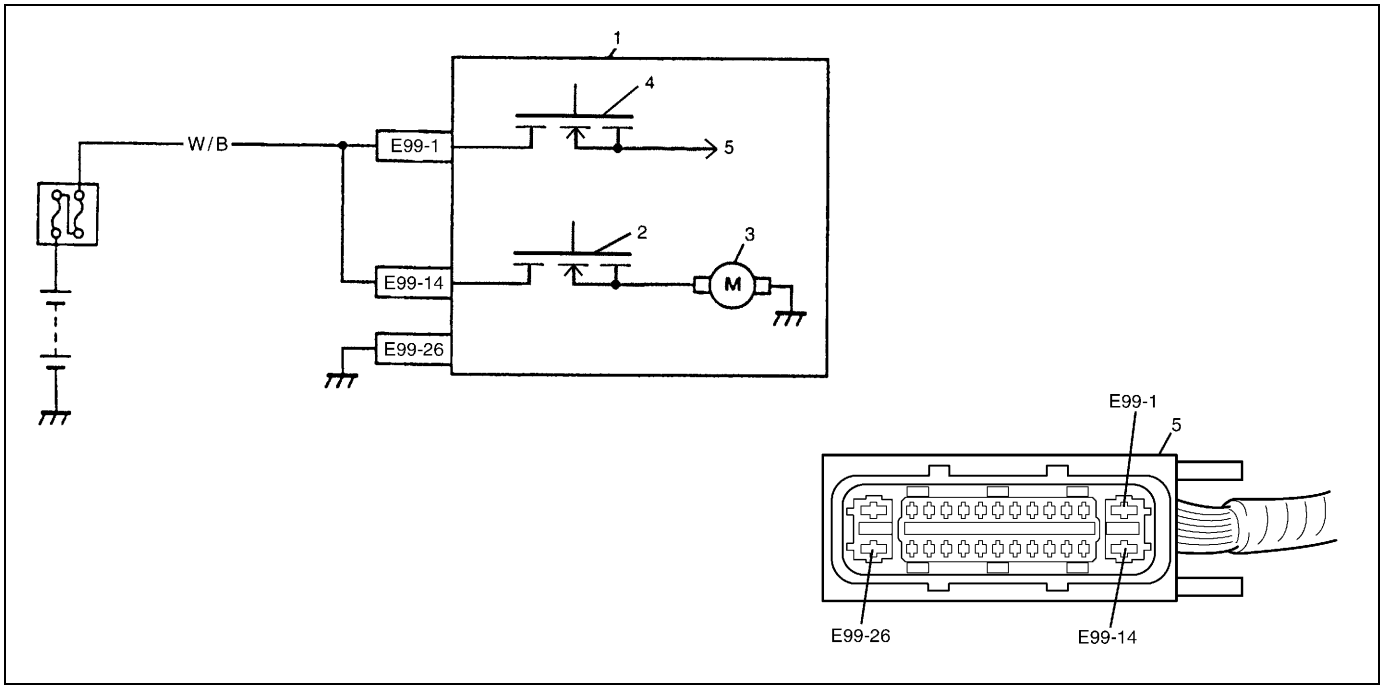
DESCRIPTION

ABS control module monitors the voltage at the terminal of solenoid circuit constantly with ignition switch turned ON. Also, immediately after ignition switch is turned ON, perform initial check as follows.
Switch fail-safe relay in the order of OFF → ON and check if voltage changes to Low → High. If anything faulty is found in the initial check and when the voltage is low with ignition switch turned ON, this DTC will be set.

INSPECTION

Step	Action	Yes	No
1	Check battery voltage. Is it about 11 V or higher?	Go to Step 2.	Check charging system referring to “CHARGING SYSTEM” section.
2	Check ABS main fuse and connection. Is it in good condition?	Go to Step 3.	Repair and/or replace fuse.
3	1) Turn ignition switch to OFF position. 2) Disconnect ABS hydraulic unit/control module connector. 3) Check proper connection to ABS hydraulic unit/control module at terminal “E99-1”. 4) If OK, then measure voltage between connector terminal “E99-1” and body ground. Is it 10 – 14 V?	Substitute a known-good ABS hydraulic unit/control module assembly and recheck.	“W/B” circuit open or short to ground.

DTC C1071 – ABS Control Module



1. ABS hydraulic unit/control module assembly	3. ABS pump motor	5. ABS hydraulic unit/control module connector
2. ABS pump motor FET	4. ABS fail safe FET	

DESCRIPTION

This DTC will be set when an internal malfunction is detected in the ABS control module.

INSPECTION

Step	Action	Yes	No
1	Clear all DTCs and check DTC. Is it DTC C1071?	Go to Step 2.	Could be a temporary malfunction of the ABS control module.
2	1) Check proper connection of ABS hydraulic unit/control module connector. 2) If OK, disconnect ABS hydraulic unit/control module connector and check the followings. • Voltage “E99-1” terminal : 10 – 14 V • Resistance between “E99-26” and body ground : Continuity Are the check result as specified above?	Replace ABS hydraulic unit/control module assembly.	Repair and recheck.

On-Vehicle Service

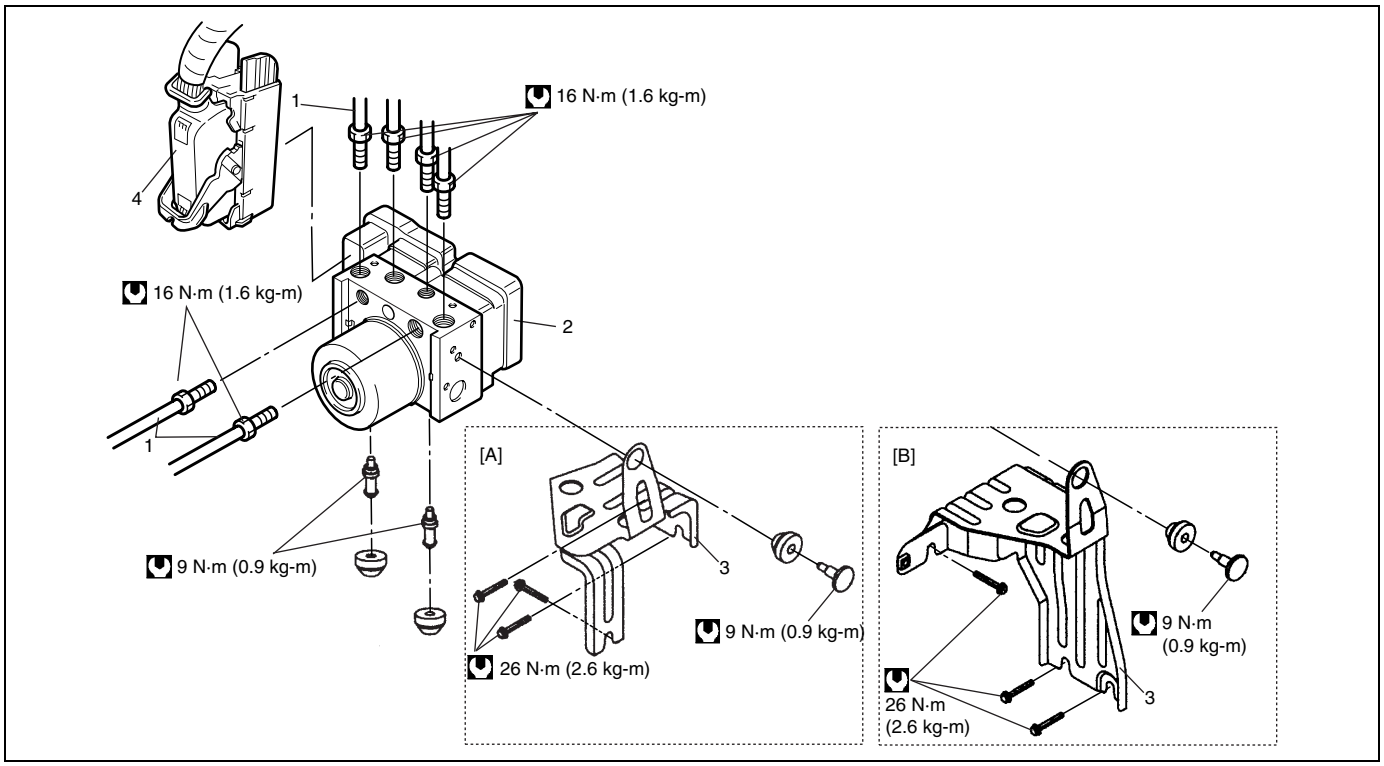
Precautions

When connector is connected to ABS hydraulic unit/control module assembly, do not disconnect connectors of sensors with ignition switch ON. Then DTC will be set in ABS control module.

ABS Hydraulic Unit/Control Module Assembly

CAUTION:

Never disassemble ABS hydraulic unit/control module assembly, loosen blind plug or remove motor. Performing any of these prohibited services will affect original performance of ABS hydraulic unit/ control module assembly.

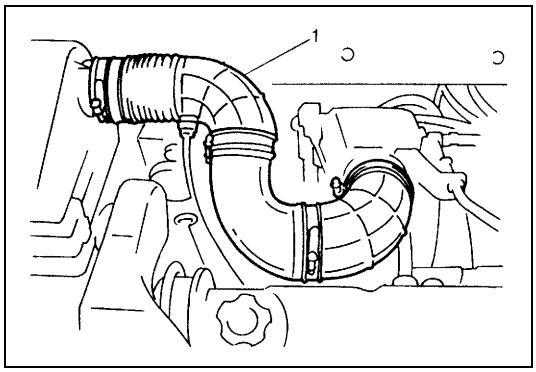


[A] : RH	1. Brake pipe	3. Bracket
[B] : LH	2. ABS hydraulic unit/control module assembly	4. Connector

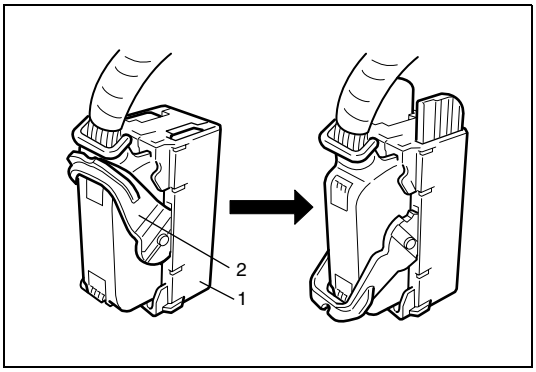
HYDRAULIC UNIT INSPECTION

Check hydraulic unit for fluid leakage.
If any, repair or replace.

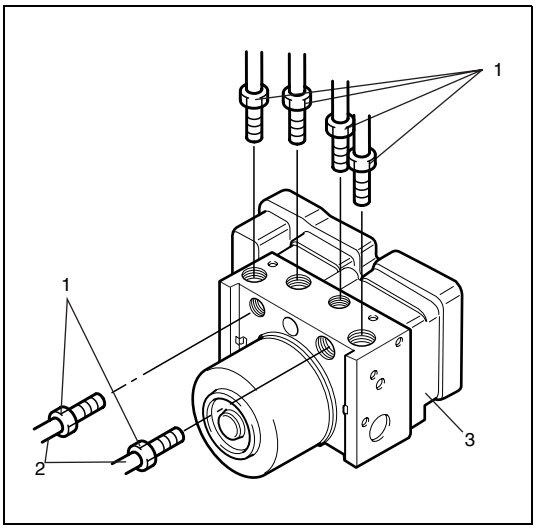
REMOVAL



1) Disconnect negative cable from battery.
2) For LH vehicle, remove air cleaner outlet pipe (1) referring to "Engine Mechanical" section.



3) Disconnect ABS hydraulic unit/control module assembly connector (1) by turning down lock (2).

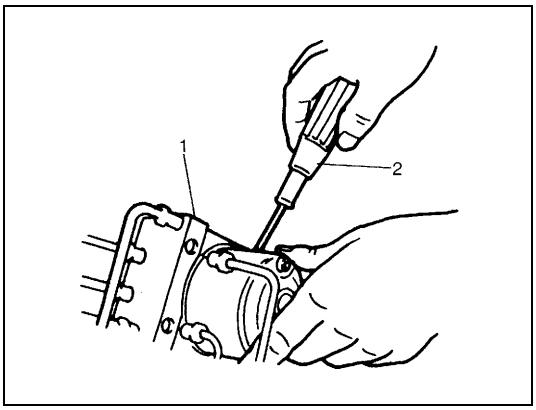


4) Using special tool, loosen flare nuts (1) and disconnect brake pipes (2) from ABS hydraulic unit/control module assembly (3).

Special tool
: 09950-78220

NOTE:

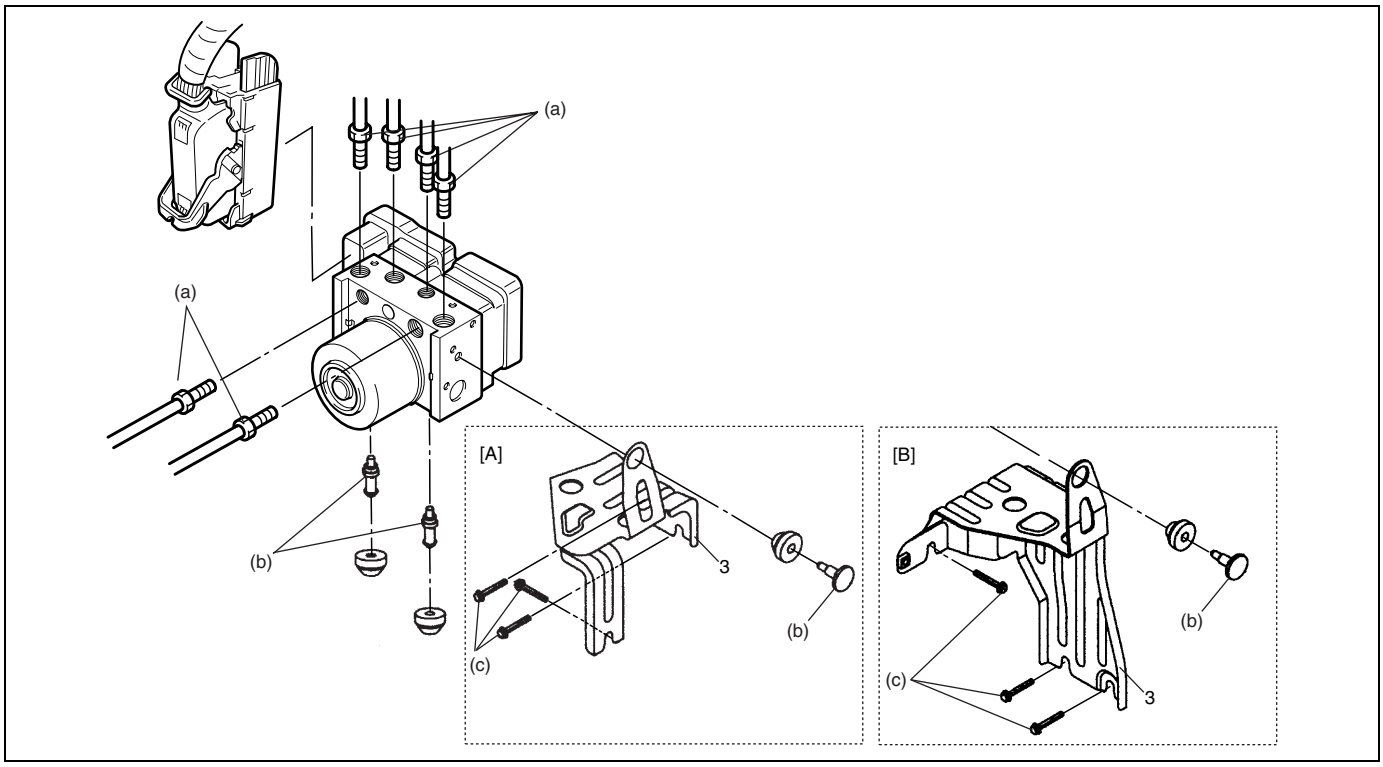
Put bleeder plug cap onto pipe to prevent fluid from spilling. Do not allow brake fluid to get on painted surfaces.



5) Remove one screw and disconnect take out ABS hydraulic unit/control module assembly (1) from bracket using screwdriver (2).

CAUTION:

- **Do not give an impact to hydraulic unit.**
- **Use care not to allow dust to enter hydraulic unit.**
- **Do not place hydraulic unit on its side or upside down. Handling it in inappropriate way will affect its original performance.**



[A] : RH
[B] : LH

INSTALLATION

1) Install hydraulic unit by reversing removal procedure.

Tightening torque

(a) : 16 N·m (1.6 kg-m, 11.5 lb-ft)
(b) : 9 N·m (0.9 kg-m, 6.5 lb-ft)
(c) : 26 N·m (2.6 kg-m, 18.0 lb-ft)

2) Bleed air from brake system referring to "BRAKE" section.
3) Check each installed part for fluid leakage and perform "ABS Hydraulic Unit Operation Check" in this section.

NOTE:

For new ABS hydraulic unit/control module assembly, if "ABS Hydraulic Unit Operation Check" procedure has not been performed, "ABS" warning lamp may flash when ignition switch is turned ON position.

SECTION 6F1

IGNITION SYSTEM (ELECTRONIC IGNITION SYSTEM)

WARNING:

For vehicles equipped with Supplemental Restraint (Air Bag) System:

- **Service on and around the air bag system components or wiring must be performed only by an authorized SUZUKI dealer. Refer to "Air Bag System Components and Wiring Location View" under "General Description" in air bag system section in order to confirm whether you are performing service on or near the air bag system components or wiring. Please observe all WARNINGS and "Service Precautions" under "On-Vehicle Service" in air bag system section before performing service on or around the air bag system components or wiring. Failure to follow WARNINGS could result in unintentional activation of the system or could render the system inoperative. Either of these two conditions may result in severe injury.**
- **Technical service work must be started at least 90 seconds after the ignition switch is turned to the "LOCK" position and the negative cable is disconnected from the battery. Otherwise, the system may be activated by reserve energy in the Sensing and Diagnostic Module (SDM).**

NOTE:

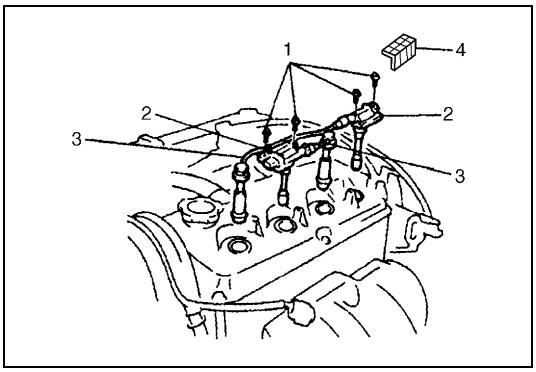
For the items with asterisk (*) in the "CONTENTS" below, refer to the same section of the Service Manual mentioned in FOREWORD of this manual.

CONTENTS

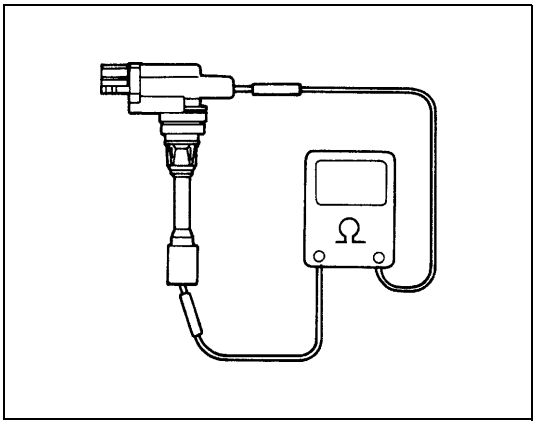
On-Vehicle Service

Ignition Coil Assembly (Including Ignitor)

Inspection



1) Disconnect negative cable at battery.
2) Pull out ignition coil cover (4).
3) Disconnect ignition coil coupler.
4) Disconnect high-tension cord (3) from ignition coil assembly (2).
5) Remove ignition coil bolts (1) and then pull out ignition coil assembly.



6) Measure secondary coil for resistance.

Secondary coil resistance
: 7.1 – 9.5 kΩ at 20°C, 68°F

If resistance is out of specification, replace ignition coil assembly.

7) Install ignition coil assembly.
8) Tighten ignition coil bolts, and then connect ignition coil coupler.
9) Install high-tension cord to ignition coil assembly while gripping its cap.
10) Install ignition coil cover certainly to ignition coil assembly.

SECTION 8D

WINDOWS, MIRRORS, SECURITY AND LOCKS

WARNING:

For vehicles equipped with a Supplement Restraint (Air Bag) System

- **Service on and around the air bag system components or wiring must be performed only by an authorized SUZUKI dealer. Refer to "Air Bag System Components and Wiring Location View" under "General Description" in air bag system section in order to confirm whether you are performing service on or near the air bag system components or wiring. Please observe all WARNINGS and "Service Precautions" under "On-Vehicle Service" in air bag system section before performing service on or around the air bag system components or wiring. Failure to follow WARNINGS could result in unintentional activation of the system or could render the system inoperative. Either of these two conditions may result in severe injury.**
- **Technical service work must be started at least 90 seconds after the ignition switch is turned to the "LOCK" position and the negative cable is disconnected from the battery. Otherwise, the system may be activated by reserve energy in the Sensing and Diagnostic Module (SDM).**

NOTE:

For the items with asterisk (*) in the "CONTENTS" below, refer to the same section of the Service Manual mentioned in "FOREWORD" of this manual.

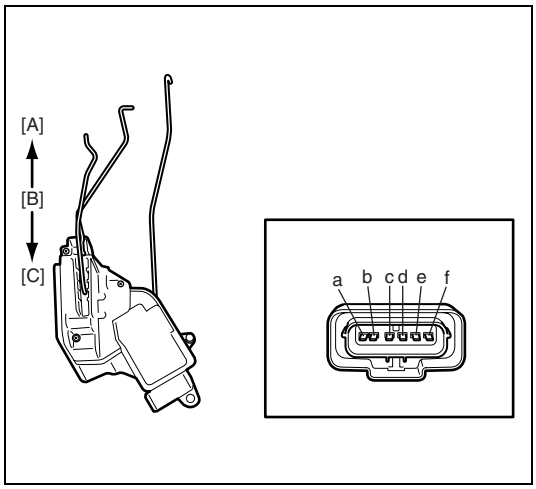
CONTENTS

On-Vehicle Service

Power Door Lock System (If Equipped)

Key cylinder switch

INSPECTION



Inspect continuity between terminals under the following key positions.

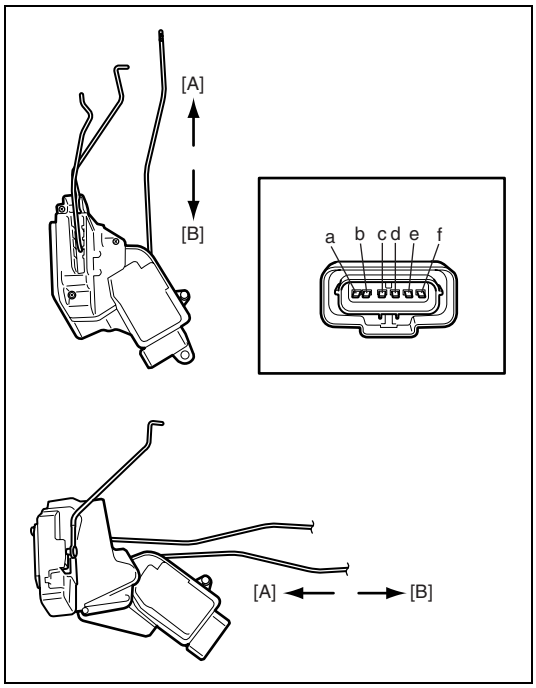
For right side switch terminals		a	b	c
For left side switch terminals		f	e	d
Key position	Neutral			
	Unlock	○	○	
	Lock	○		○

[A] : Lock
[B] : Neutral
[C] : Lock

Power door lock actuator

INSPECTION

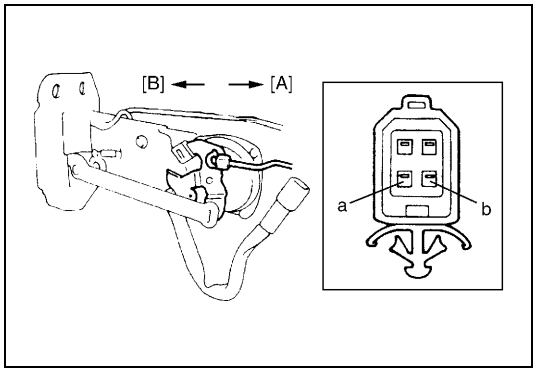
1) Disconnect power door lock actuator coupler.
2) Connect 12 V battery positive and negative terminals to the door lock actuator terminals shown below.
   If it does not operate as specified in table below, replace door lock actuator.



For Front & Rear Door

For right side switch terminals		f	e	d
For left side switch terminals		a	b	c
Unlock	⇒ Lock	⊖	⊖	⊕
Lock	⇒ Dead lock	⊖	⊕	⊕
Lock	⇒ Unlock	⊕	⊖	⊖
Dead lock	⇒ Unlock			

[A] : Unlock
[B] : Lock



For Back Door

		a	b
Unlock	⇒ Lock	⊕	⊖
Lock	⇒ Unlock	⊖	⊕

[A] : Unlock
[B] : Lock

SECTION 9

BODY SERVICE

WARNING:

For vehicles equipped with Supplemental Restraint (Air Bag) System:

- **Service on and around the air bag system components or wiring must be performed only by an authorized SUZUKI dealer. Refer to "Air Bag System Components and Wiring Location View" under "General Description" in air bag system section in order to confirm whether you are performing service on or near the air bag system components or wiring. Please observe all WARNINGS and "Service Precautions" under "On-Vehicle Service" in air bag system section before performing service on or around the air bag system components or wiring. Failure to follow WARNINGS could result in unintentional activation of the system or could render the system inoperative. Either of these two conditions may result in severe injury.**
- **Technical service work must be started at least 90 seconds after the ignition switch is turned to the "LOCK" position and the negative cable is disconnected from the battery. Otherwise, the system may be activated by reserve energy in the Sensing and Diagnostic Module (SDM).**
- **When body servicing, if shock may be applied to air bag system component parts, remove those parts beforehand. (Refer to Section 10B.)**

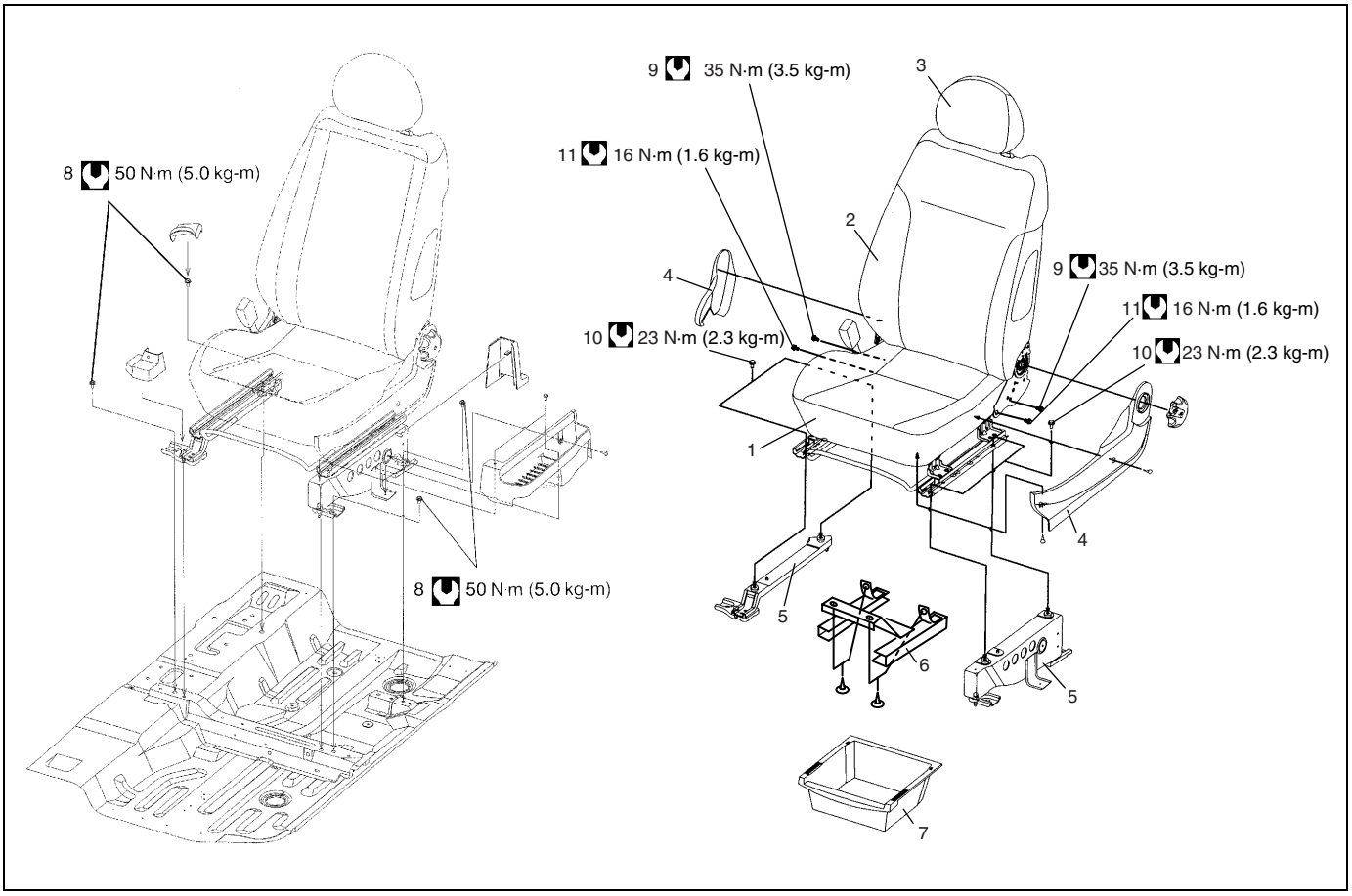
NOTE:

Fasteners are important attaching parts in that they could affect the performance of vital components and systems, and/or could result in major repair expense. They must be replaced with one of the same part number or with an equivalent part if replacement becomes necessary.
Do not use a replacement part of lesser quality or substitute a design. Torque values must be used as specified during reassembly to assure proper retention of these parts.
For the items with asterisk (*) in the "CONTENTS" below, refer to the same section of the Service Manual mentioned in FOREWORD of this manual.

CONTENTS

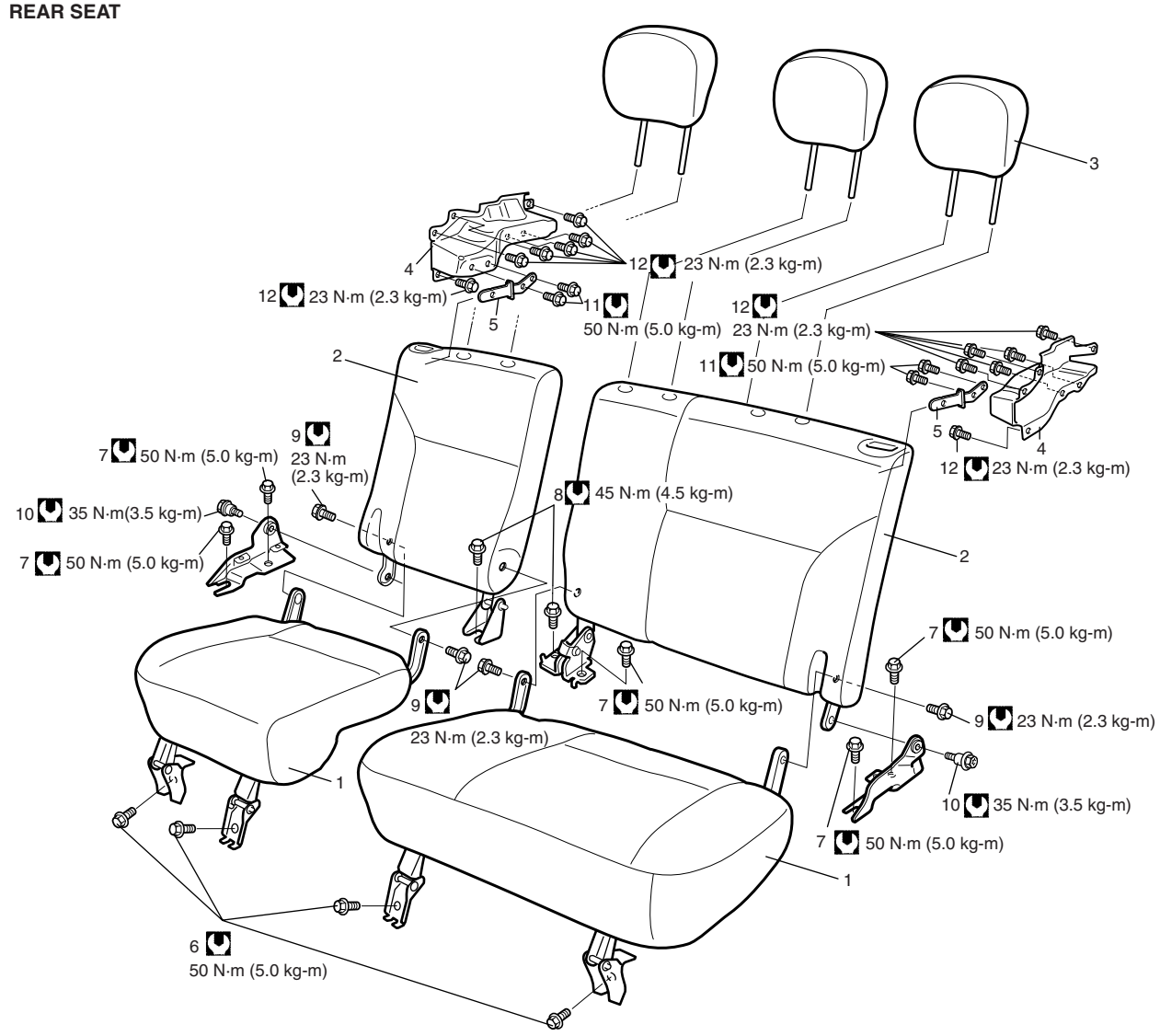
Seats

Front Seat and Rear Seat



1. Seat cushion	5. Bracket	9. Reclining bolt
2. Seat back	6. Tray bracket	10. Bracket bolt
3. Head rest	7. Tray	11. Reclining bolt
4. Cover	8. Seat adjuster bolt	Tightening Torque

REAR SEAT



1. Seat cushion	6. Seat cushion bolt	11. Rear seat striker bolt
2. Seat back	7. Seat back bolt	12. Rear seat striker bracket bolt
3. Head restraint	8. Seat back bolt	Tightening Torque
4. Rear seat striker bracket	9. Folding bolt	
5. rear seat striker	10. Folding bolt	

REMOVAL

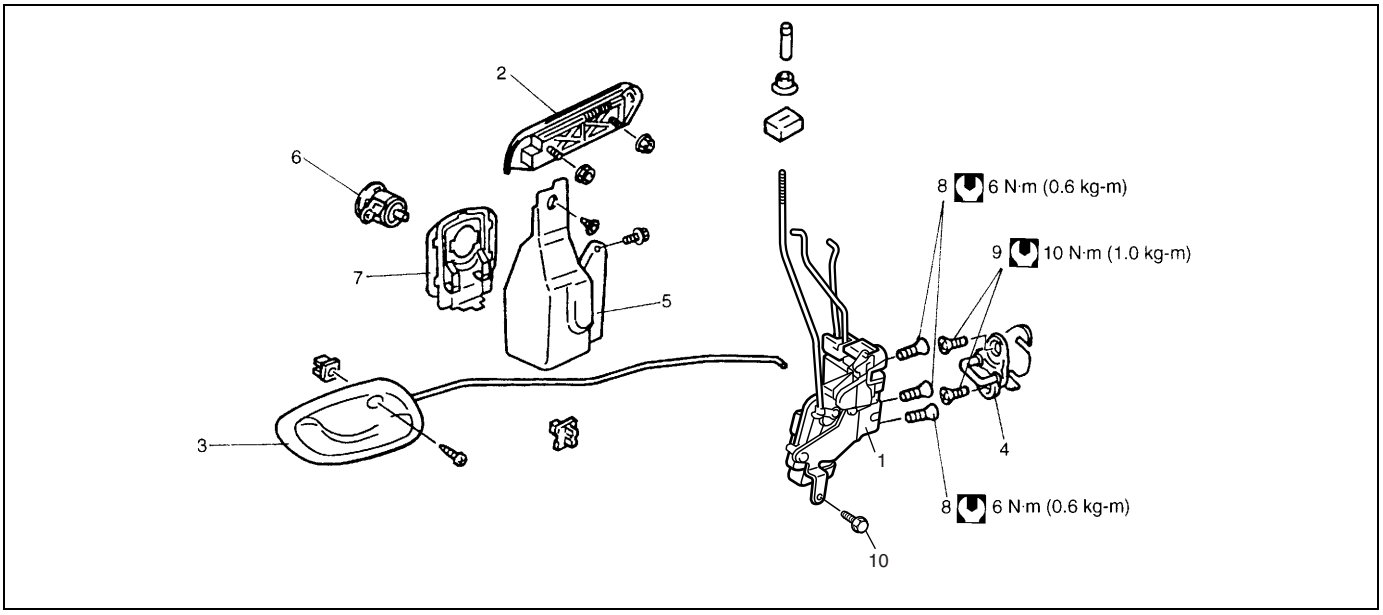
1) Remove seat cushion bolts and seat back bolts.
2) Fold seat back to remove it from rear seat striker.
3) Disassemble and repair seat as necessary.

INSTALLATION

Reverse removal procedure to install front seat.
Torque to specifications, as shown.

Security and Locks

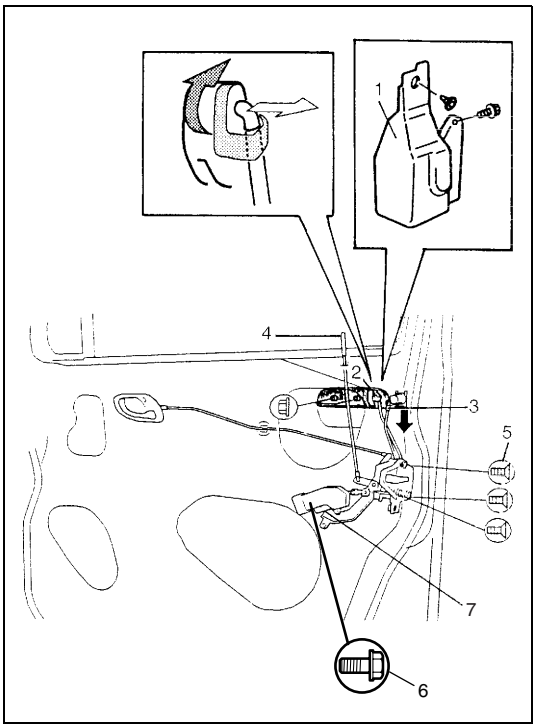
Front Door Lock Assembly



1. Door latch	6. Key cylinder
2. Outside handle	7. Key cylinder retainer
3. Inside handle bezel	8. Door lock screw
4. Latch striker	9. Door latch striker screw
5. Cover	10. Door lock bolt (vehicle with power door lock system)

REMOVAL

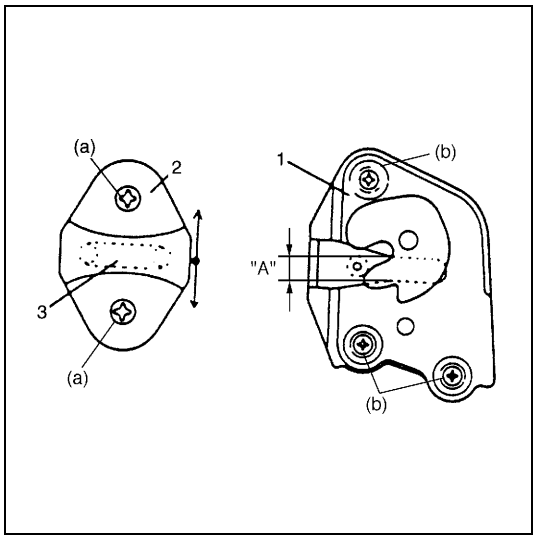
1) Remove door trim and door sealing cover, refer to steps 1) to 9) of FRONT DOOR GLASS REMOVAL in this section.
2) Raise window all the way up.
3) Remove door sash.



4) Remove door lock cover (1).
5) Disconnect door opening control rod (2) from outside handle.
6) Disconnect door lock control rod (3).
7) Disconnect door lock motor lead wire (if equipped).
8) Remove door lock nob (4).
9) Loosen door lock mounting screw (5), door lock mounting bolt (6) (vehicle with power door lock system) and remove door lock assembly (7).

INSTALLATION

To install front door lock, reverse removal procedure, noting the following.



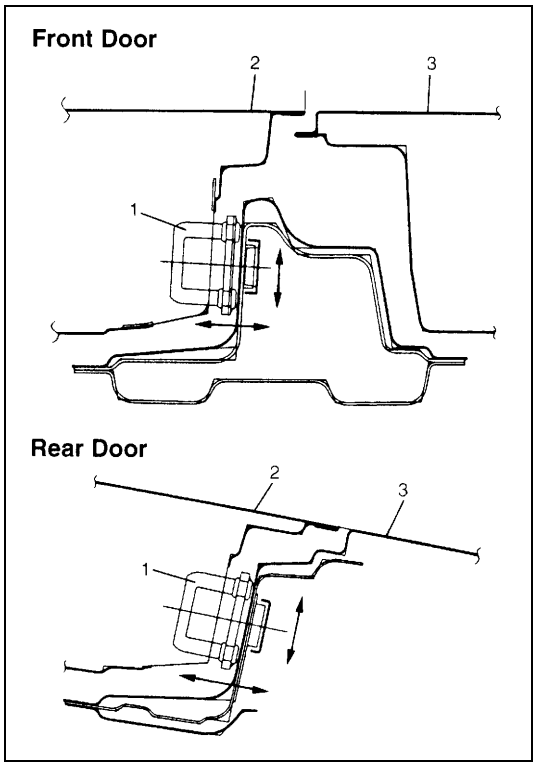
- Door latch striker.
  Move door latch striker (2) up or down so its center aligns with the center of groove “A” on the door lock assembly (1), as shown.

NOTE:

Striker should be moved vertically and placed level. Do not adjust door lock.

Tightening torque
(a) : 10 N·m (1.0 kg-m, 7.2 lb-ft)
(b) : 6 N·m (0.6 kg-m, 4.3 lb-ft)

3. Shaft



- Move door latch striker (1) sideways to adjust door outer panel surface (2) flush with rear door outer panel or body outer panel surface (3), as shown.
  In order to correctly obtain door lock operates, increase or decrease number of shims inserted between body and striker (1) to adjust it.

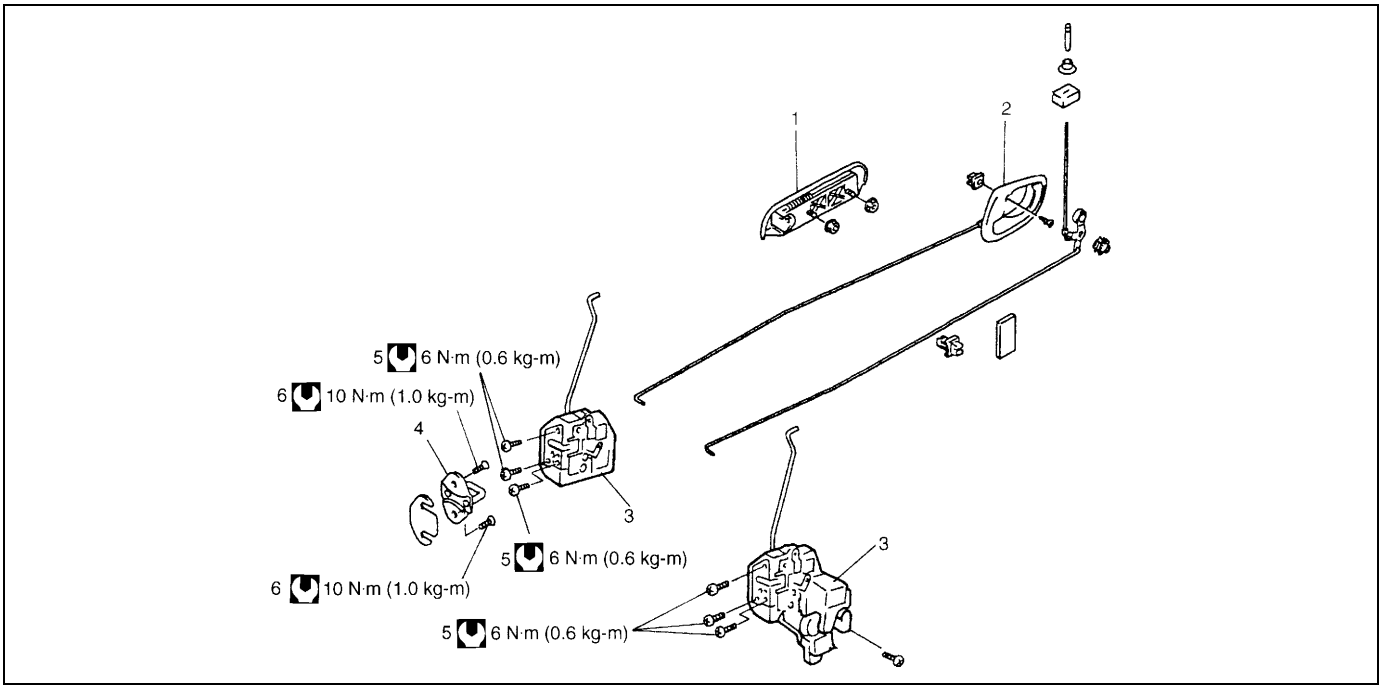
NOTE:

Apply grease to striker contact parts periodically.

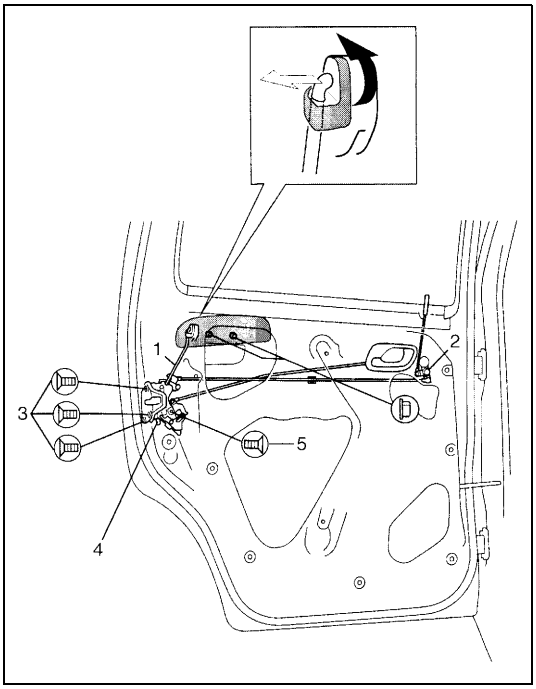
INSPECTION

Check that door open and closes smoothly and properly.
Also check that door latch half look operates properly (check that door latch half lock keeps door from opening all the way) and door latch full locks securely when closed.
Adjust door latch striker position if necessary.

Rear Door Lock Assembly



1. Outside handle	4. Latch striker
2. Inside handle bezel	5. Door lock screw
3. Door lock assembly	6. Door latch striker screw



REMOVAL

1) Remove door trim and door sealing cover, refer to steps 1) to 4) of REAR DOOR GLASS REMOVAL in this section.
2) Disconnect door opening control rod (1) and door lock control rod (2).
3) Loosen door lock mounting screw (3), door lock actuator screw (5) (if equipped power door lock) and remove door lock assembly (4).

INSTALLATION

Reverse removal sequence to install rear door lock, noting points mentioned in “FRONT DOOR LOCK ASSEMBLY”.

SECTION 10

RESTRAINT SYSTEM

WARNING:

For vehicles equipped with a Supplemental Restraint (Air Bag) System:

- **Service on and around the air bag system components or wiring must be performed only by an authorized SUZUKI dealer. Please observe all WARNINGS and "Service Precautions" under "On-Vehicle Service" in air bag system section before performing service on or around the air bag system components or wiring. Failure to follow WARNINGS could result in unintentional activation of the system or could render the system inoperative. Either of these two conditions may result in severe injury.**
- **The procedures in this section must be followed in the order listed to temporarily disable the air bag system and prevent false diagnostic codes from setting. Failure to follow procedures could result in possible air bag system activation, personal injury or otherwise unneeded air bag system repairs.**

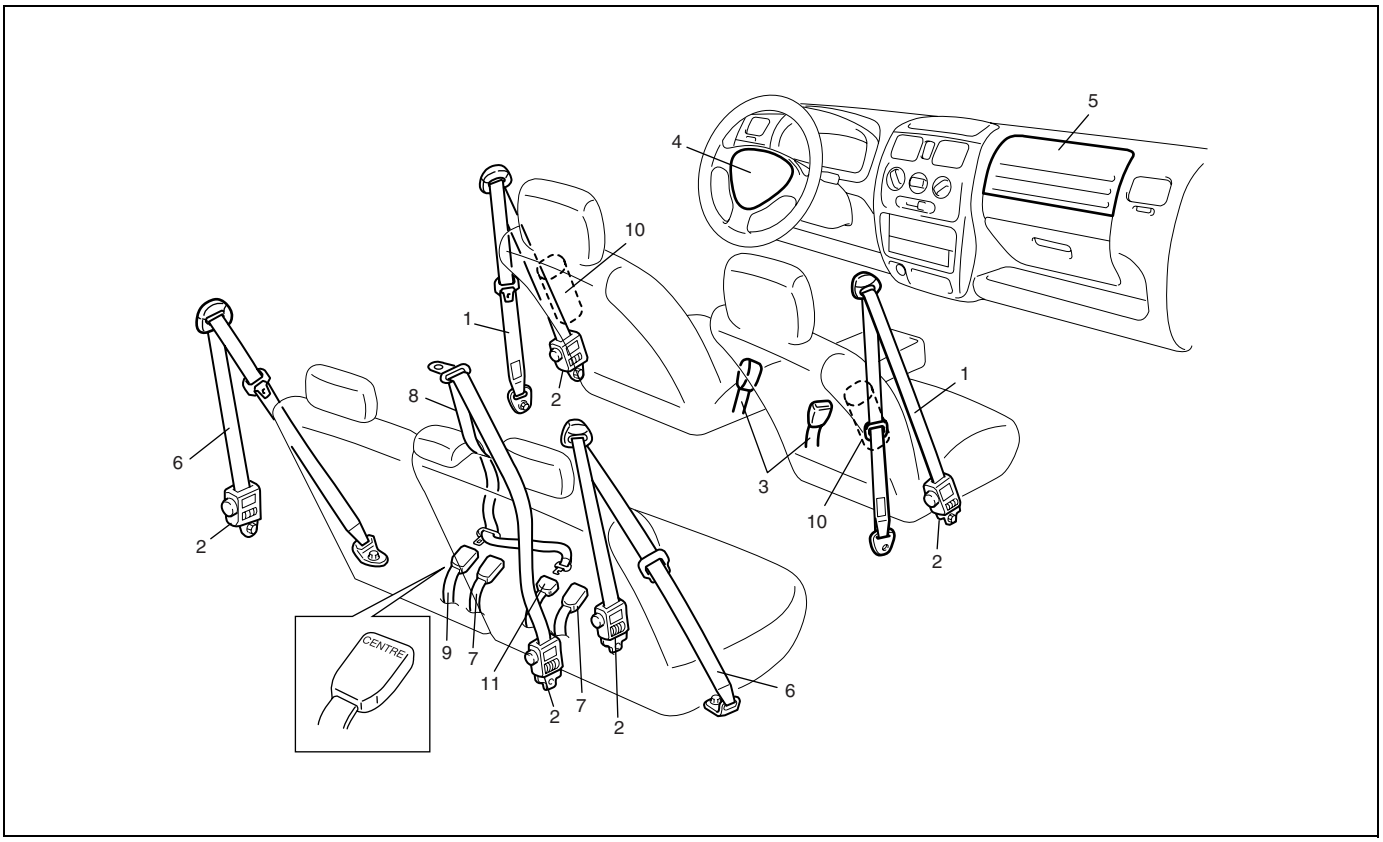
CONTENTS

General Description

System Specification

There are three types of restraint system for this vehicle.

	Type 1	Type 2	
Front seat belt	• Seat belt with ELR	• Seat belt with ELR	• Seat belt with ELR
Rear seat belt	• Seat belt with A-ELR • Center seat belt with ELR	• Seat belt with A-ELR • Center seat belt with ELR	• Seat belt with A-ELR • Center seat belt with ELR
Supplemental restraint system	• Driver air bag (inflator) module	• Driver and front passenger air bag (inflator) modules	• Driver and front passenger air bag (inflator) modules
	• Driver and front passenger pretensioners	• Driver and front passenger pretensioners	• Driver and front passenger pretensioners • Driver and front passenger side air bag (inflator) modules



1. Front seat belt	5. Passenger air bag (inflator) module (if equipped)	9. Buckle for rear center seat belt
2. Retractor assembly	6. Rear seat belt	10. Side air bag (inflator) module (if equipped)
3. Buckle for front seat belt	7. Buckle for rear seat belt	11. Connector for rear center seat belt
4. Driver air bag (inflator) module	8. Rear center seat belt	

Seat belt with ELR

The seat belt with emergency locking retractor (ELR) is designed so that it locks immediately (to prevent the webbing from being pulled out of the retractor any further) when any of the following items is detected as exceeding each set value;

- Speed at which the webbing is pulled out of the retractor.
- Acceleration or deceleration of the vehicle speed.
- Inclination.

Seat belt with A-ELR

The automatic and emergency locking retractor (A-ELR) works as an Emergency Locking Retractor (ELR) till its webbing is pulled all the way out and then on as an Automatic Locking Retractor (ALR) till it is retracted fully.
ALR: Automatically locks when the webbing is pulled out from the retractor and allowed to retract even a little. Then the webbing can not be pulled out any further, unless it is wound all the way back into the retractor, which releases the lock and allows the webbing to be pulled out.

Seat belt with ELR and pretensioner

The seat belt with ELR and a pretensioner has a pretensioner mechanism which operates in linkage with the air bag in addition to the above described ELR. The pretensioner takes up the sag of the seat belt in occurrence of a front collision with an impact larger than a certain set value, thereby enhancing restraint performance.

SECTION 10A

SEAT BELT

WARNING:

For vehicles equipped with a Supplemental Restraint (Air Bag) System:

- **Service on or around the air bag system components or wiring must be performed only by an authorized SUZUKI dealer. Please observe all WARNINGS and "Service Precautions" under "On-Vehicle Service" in air bag system section before performing service on or around the air bag system components or wiring. Failure to follow WARNINGS could result in unintentional activation of the system or could render the system inoperative. Either of these two conditions may result in severe injury.**
- **The procedures in this section must be followed in the order listed to disable the air bag system temporarily and prevent false diagnostic trouble codes from setting. Failure to follow procedures could result in possible activation of the air bag system, personal injury or otherwise unneeded air bag system repairs.**

CAUTION:

When fasteners are removed, always reinstall them at the same location from which they were removed. If a fastener needs to be replaced, use the correct part number fastener for that application. If the correct part number fastener is not available, a fastener of equal size and strength (or stronger) may be used. Fasteners that are not reused, and those requiring thread-locking compound, will be called out. The correct torque value must be used when installing fasteners that require it. If the above procedures are not followed, parts or system damage could result.

NOTE:

For the items with asterisk (*) in the "CONTENTS" below, refer to the same section of the Service Manual mentioned in "FOREWORD" of this manual.

CONTENTS

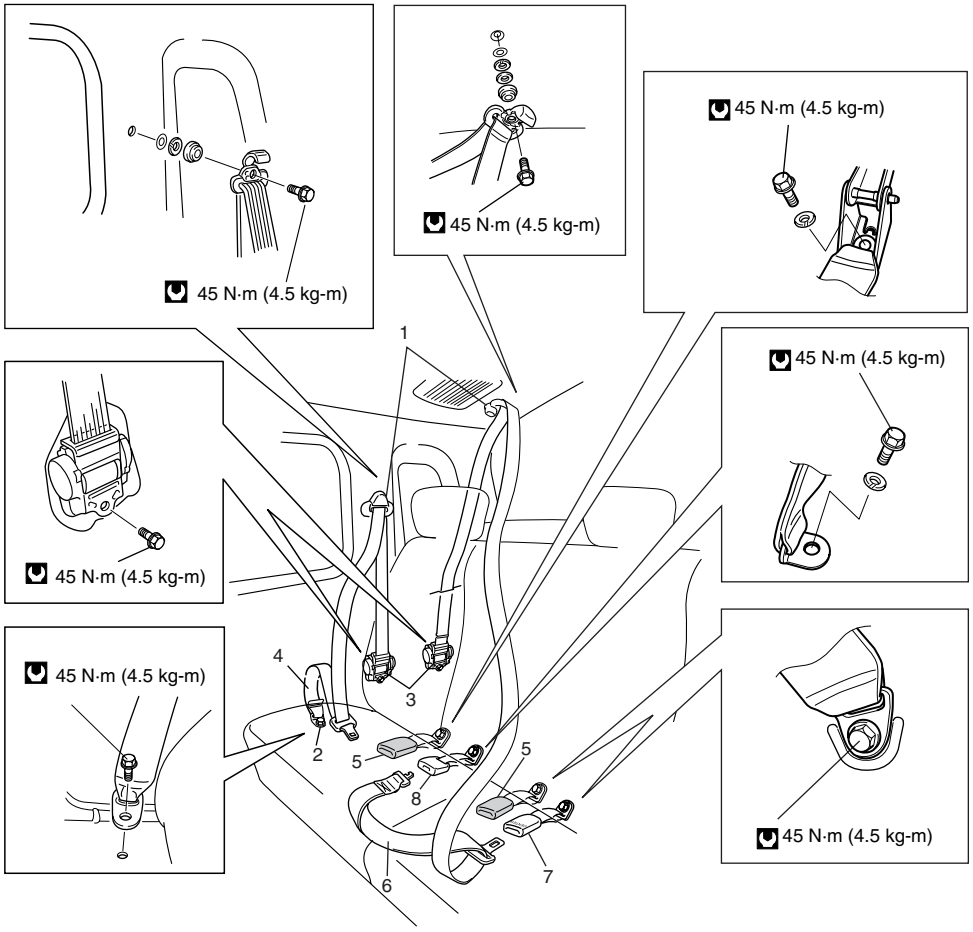
On-Vehicle Service

Rear Seat Belt

WARNING:

Be sure to read "SERVICE PRECAUTIONS" before starting to work and observe every precaution during work.

COMPONENT



1. Upper anchor	4. Rear seat belt with A-ELR	7. Buckle for rear center seat belt
2. Lower anchor	5. Buckle for rear seat belt	8. Connector for rear center seat belt
3. Retractor assembly	6. Rear center seat belt with ELR	Tightening torque

REMOVAL

Remove rear seat belts referring “Component” under “Rear Seat Belt” in this section.

INSPECTION

- Check the rear seat belt in the same way as “INSPECTION” of “FRONT SEAT BELT”, in this section.
- As to seat belts with A-ELR, check them as follows in addition to above check.
  – With vehicle at stop, pull seat belt all the way out, let it retract a little and try to pull it. It should not be pulled out, that is, it should be locked where retracted.
  – Let seat belt retract to its original state. Next, pull it half way out, let it retract a little and try to pull it again. It should be pulled out smoothly, that is it should not be locked at this time.

INSTALLATION

Install in reverse order of removal, noting the following.

- Seat belt anchor bolts should have an unified fine thread (7/16-20 UNF). Under no circumstances should any different sized or metric screw threads be used.

Tightening Torque Specification

Fastening part	Tightening torque		
	N•m	kg-m	lb-ft
Upper and lower anchor bolt	45	4.5	32.5
Retractor assembly bolt	45	4.5	32.5
Retractor assembly screw	3.5	0.35	2.55
Front seat belt buckle mounting bolt	35	3.5	25.5
Rear seat belt, rear center seat belt buckle mounting bolts	45	4.5	32.5
Rear center seat belt connector mounting bolt	45	4.5	32.5

Prepared by
MAGYAR SUZUKI CORPORATION
Service Department

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