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: RB413 4WD model

If describes only different service information of RB413 4WD model as compared with RB413 SERVICE MANUAL. Therefore, whenever servicing RB413 4WD 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
RB310/413 WIRING DIAGRAM MANUAL	99512U83E10-669

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 0A

GENERAL INFORMATION

NOTE:

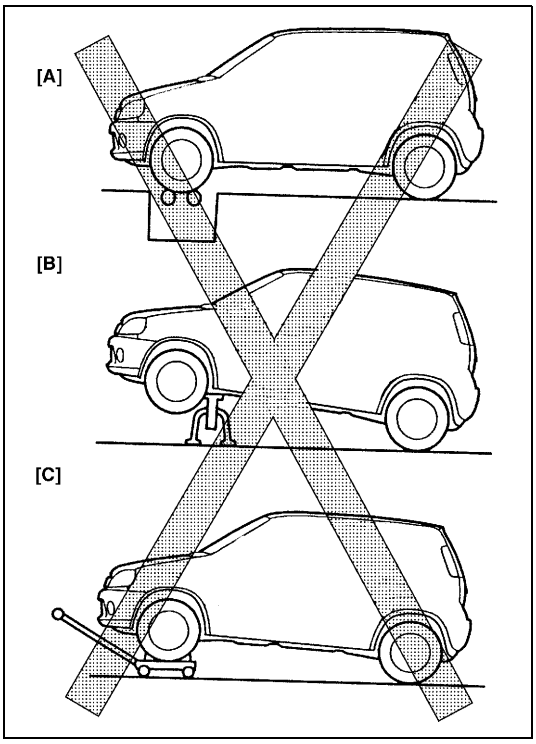
For descriptions (items) not found in this section, refer to the same section of the Service Manual mentioned in FOREWORD of this manual.

CONTENTS

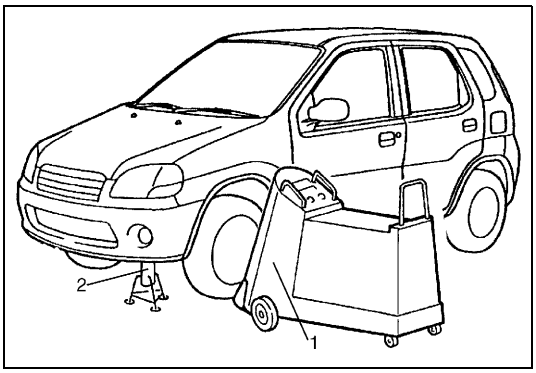
Precautions

Precaution in Servicing Full-Time 4WD Vehicle

This full-time 4WD vehicle can not be converted to 2WD manually.
Observe the following caution in servicing. Otherwise, front wheels drive rear wheels or vise-versa and vehicle accidents, drivetrain damage and personal injury may result.



- **Never perform any of the following types of service work.**
  [A] : Testing with 2-wheel chassis dynamometer, speedometer tester or brake tester.
  [B] : Driving front wheels, which are jacked up.
  [C] : Towing under the condition where either front or rear wheels can not rotate.
- **When testing with 2-wheel chassis dynamometer, speedometer tester or brake tester, be sure to make the vehicle as front wheel drive by removing propeller shaft assembly.**



- **When using On-vehicle type wheel balancing equipment (1), be sure to jack up all four wheels, off the ground completely and support vehicle with safety stands (2).**
  Be careful of the other wheels, which will rotate at the same time.

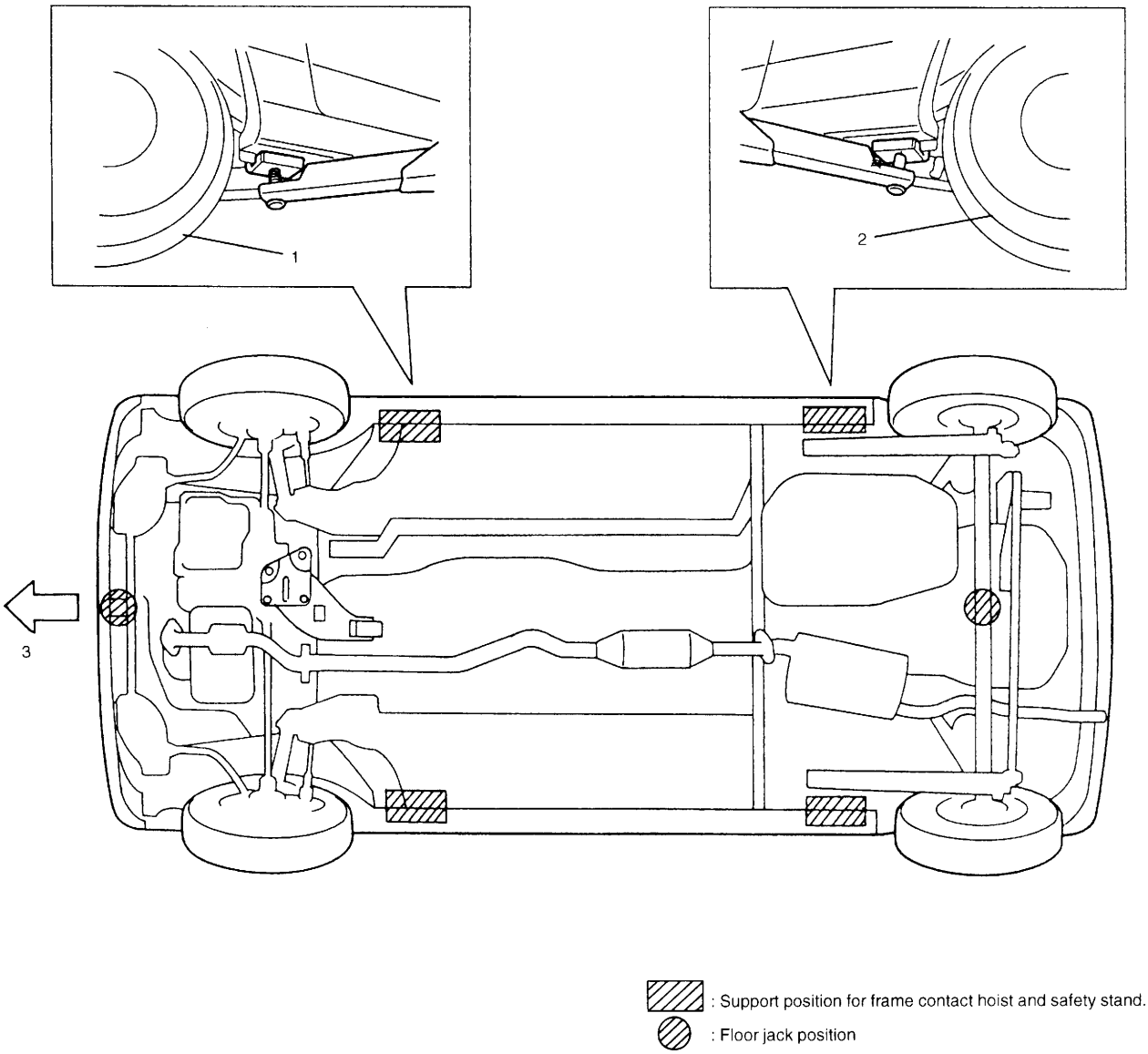
- **This vehicle should be towed under one of the following conditions :**
  - **With all wheels on a flatbed truck.**
  - **With front or rear wheels lifted and a dolly under the other wheels.**

Vehicle Lifting Points

WARNING:

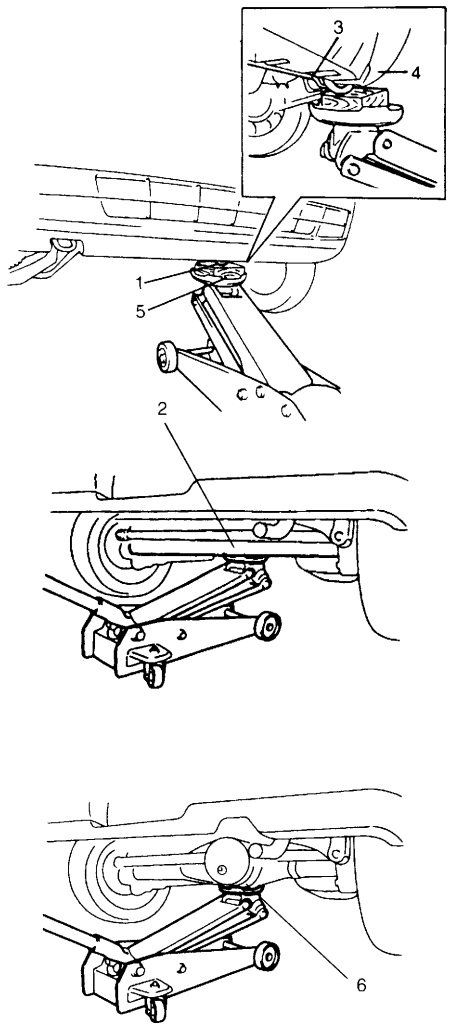
- **Before applying hoist to underbody, always take vehicle balance throughout service into consideration. Vehicle balance on hoist may change depending on what part to be removed.**
- **Before lifting up the vehicle, check to be sure that end of hoist arm is not in contact with brake pipe, fuel pipe, bracket or any other part.**
- **When using frame contact hoist, apply hoist as shown (right and left at the same position). Lift up the vehicle till 4 tires are a little off the ground and make sure that the vehicle will not fall off by trying to move vehicle body in both ways. Work can be started only after this confirmation.**
- **Make absolutely sure to lock hoist after vehicle is hoisted up.**

When using frame contact hoist:



1.	Front left tire
2.	Rear left tire
3.	Front

When using floor jack:



WARNING:

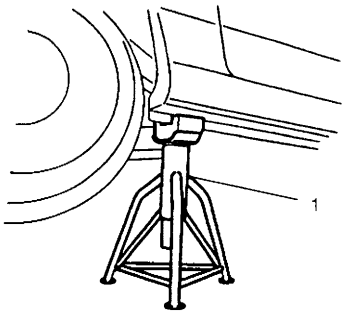
- **If the vehicle to be jacked up only at the front or rear end, be sure to block the wheels on ground in order to ensure safety.**
  After the vehicle is jacked up, be sure to support it on stands. It is extremely dangerous to do any work on the vehicle raised on jack alone.

CAUTION:

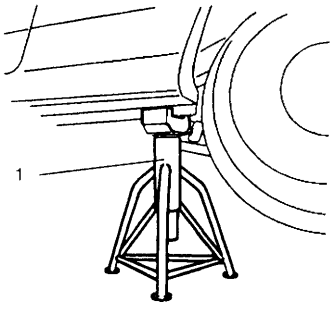
- **Never apply jack against suspension parts (i.e., stabilizer (3), etc.), front bumper (4) or vehicle floor, otherwise it may get deformed.**

When lifting front vehicle end with floor jack, be sure to put the wooden block (5) on the jack against front jacking bracket (1). When lifting rear vehicle end with floor jack, be sure to put the jack against the center portion of rear axle (2) (2WD vehicle) or rear axle housing (6) (4WD vehicle).

Front



Rear



To perform service with either front or rear vehicle end jacked up, be sure to place safety stands (1) under vehicle body so that vehicle body is securely supported. And then check to ensure that vehicle body does not slide on safety stands and the vehicle is held stable for safety's sake

SECTION 0B

MAINTENANCE AND LUBRICATION

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 descriptions (items) not found in this section, refer to the same section of the Service Manual mentioned in FOREWORD of this manual.

CONTENTS

Maintenance Schedule

Normal Condition Schedule

Interval: This interval should be judged by odometer reading or months, whichever comes first.		This table includes services as scheduled up to 90,000 km (54,000 miles) mileage. Beyond 90,000 km (54,000 miles), carry out the same services at the same intervals respectively.						
		km (x 1,000)	15	30	45	60	75	90
		Miles (x 1,000)	9	18	27	36	45	54
		Months	12	24	36	48	60	72
1. ENGINE								
1-1. Drive belt (tension, damage)		V-rib belt	–	–	I	–	–	R
1-2. Camshaft timing belt			Replace every 100,000 km (60,000 miles)					
1-3. Valve lash (clearance)			–	I	–	I	–	I
1-4. Engine oil and Engine oil filter	When SG, SH or SJ grade oil is used.		R	R	R	R	R	R
	When SE or SF grade oil is used.		Replace every 10,000 km (6,000 miles) or 8 months					
1-5. Engine coolant			–	R	–	R	–	R
1-6. Exhaust system (leakage, damage, tightness)			–	I	–	I	–	I
2. IGNITION SYSTEM								
2-1. Spark plugs	When unleaded fuel is used		–	–	R	–	–	R
3. FUEL SYSTEM								
3-1. Air cleaner filter		Paved-road	I	I	R	I	I	R
		Dusty condition	Refer to “Severe Driving Condition” schedule					
3-2. Fuel lines (deterioration, leakage, damage)			–	I	–	I	–	I
3-3. Fuel tank			–	–	I	–	–	I
4. EMISSION CONTROL SYSTEM								
4-1. PCV (Positive Crankcase Ventilation) valve			–	–	–	–	–	I
4-2. Fuel evaporative emission control system			–	–	–	–	–	I
5. BRAKE								
5-1. Brake discs and pads (thickness, wear, damage)			I	I	I	I	I	I
Brake drums and shoes (wear, damage)			–	I	–	I	–	I
5-2. Brake hoses and pipes (leakage, damage, clamp)			–	I	–	I	–	I
5-3. Brake fluid			–	R	–	R	–	R
5-4. Brake lever and cable (damage, stroke, operation)			Inspect at first 15,000 km (9,000 miles) only					

Interval: This interval should be judged by odometer reading or months, whichever comes first.		This table includes services as scheduled up to 90,000 km (54,000 miles) mileage. Beyond 90,000 km (54,000 miles), carry out the same services at the same intervals respectively.					
		km (x 1,000)	15	30	45	60	75	90
		Miles (x 1,000)	9	18	27	36	45	54
		Months	12	24	36	48	60	72
6. CHASSIS AND BODY								
6-1.	Clutch pedal (For manual transmission)		–	I	–	I	–	I
6-2.	Tires/wheel discs (wear, damage, rotation)		I	I	I	I	I	I
6-3.	Drive shaft boots (breakage, damage) / Propeller shaft (4WD)		–	–	I	–	–	I
6-4.	Suspension system (tightness, damage, rattle, breakage)		–	I	–	I	–	I
6-5.	Steering system (tightness, damage, breakage, rattle)		–	I	–	I	–	I
6-6.	Manual transmission oil (leakage, level) ("I": 1st 15,000 km only)		I	–	R	–	–	R
6-7.	Automatic transmission	Fluid level	–	I	–	I	–	I
		Fluid change	Replace every 165,000 km (99,000 miles)					
6-7-1.	Transfer oil (4WD) (leakage, level)		I	–	I	–	I	–
6-7-2.	Rear differential oil (4WD) (level) ("R": 15,000 km only)		R or I	–	I	–	I	–
6-8.	All latches, hinges and locks		–	I	–	I	–	I
6-9.	Ventilator air filter (if equipped)		–	I	R	–	I	R

NOTE:

- **"R": Replace or change**
- **"I": Inspect and correct or replace if necessary**
- **For Sweden, item 2-1, 4-1 and 4-2 should be performed by odometer reading only.**
- **For Item 1-2. Camshaft timing belt: This belt may be replaced every 90,000 km (54,000 miles) according to customer's maintenance convenience.**

Maintenance Recommended under Severe Driving Conditions

If the vehicle is usually used under the conditions corresponding to any severe condition code given below, it is recommended that applicable maintenance operation be performed at the particular interval as given in the chart below.

Severe condition code
A – Repeated short trips
B – Driving on rough and/or muddy roads
C – Driving on dusty roads
D – Driving in extremely cold weather and/or salted roads
E – Repeated short trips in extremely cold weather
H – Trailer towing (if admitted)

Severe Condition Code	Maintenance	Maintenance Operation	Maintenance Interval
– B C D – – – –	ITEM 1-1 Drive belt (V-rib belt)	I	Every 15,000 km (9,000 miles) or 12 months
		R	Every 45,000 km (27,000 miles) or 36 months
A – C D E – – H	ITEM 1-4 Engine oil and oil filter	R	Every 5,000 km (3,000 miles) or 4 months
A B C – E – – H	ITEM 2-1 Spark plugs	R	Every 10,000 km (6,000 miles) or 8 months
– – C – – – – –	ITEM 3-1 Air cleaner filter *1	I	Every 2,500 km (1,500 miles)
		R	Every 30,000 km (18,000 miles) or 24 months
– B – D E – – H	ITEM 6-3 Drive shafts and propeller shafts (4WD)	I	Every 15,000 km (9,000 miles) or 12 months
– B – – E – – H	ITEM 6-6, 6-7-1, 6-7-2 Manual transmission oil, transfer oil (4WD) and differential oil (4WD)	R	Every 30,000 km (18,000 miles) or 24 months
– B – – E – – H	ITEM 6-7 Automatic transmission fluid	R	Every 30,000 km (18,000 miles) or 24 months
– B C D – – – H	ITEM 6-2 Wheel bearings	I	Every 15,000 km (9,000 miles) or 12 months
– – C D – – – –	ITEM 6-9 Ventilator air filter *2 (if equipped)	I	Every 15,000 km (9,000 miles) or 12 months
		R	Every 45,000 km (27,000 miles) or 36 months

NOTE:

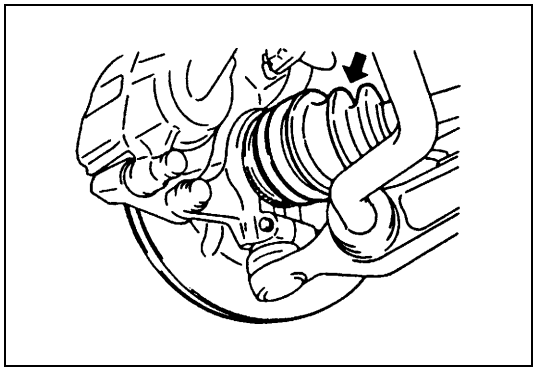
- **"R" : Replace or change**
- **"I" : Inspect and correct or replace if necessary**
- ***1 : Inspect or replace more frequently if necessary.**
- ***2 : Clean or replace more frequently if the air from the ventilator decreases.**

Maintenance Service

Chassis and Body

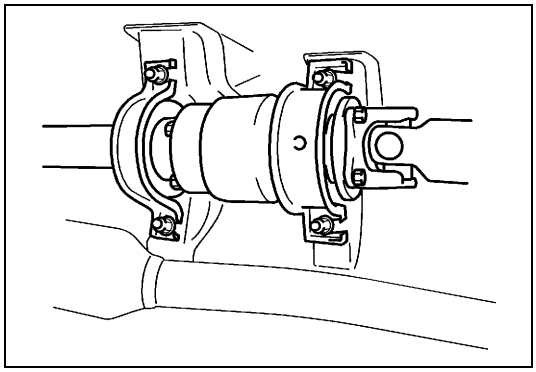
Drive Shaft (Axle) Boots / Propeller Shafts (4WD) (ITEM 6-3)

DRIVE SHAFT (AXLE) BOOTS INSPECTION



Check drive shaft boots (wheel side and differential side) for leaks, detachment, tear or other damage.
Replace boot as necessary.

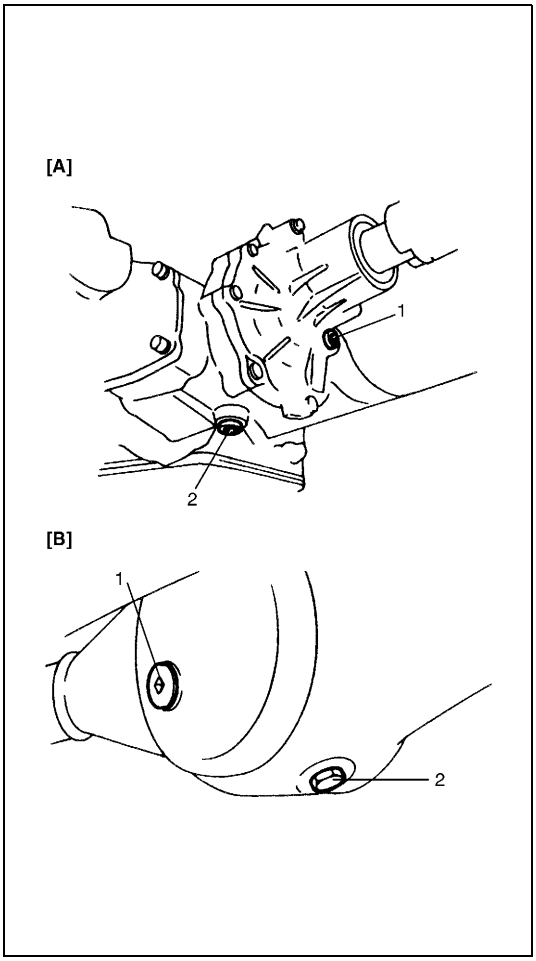
PROPELLER SHAFTS (4WD) INSPECTION



1) Check propeller shaft connecting bolts for looseness. If looseness is found, tighten to specified torque.
2) Check propeller shaft joints for wear, play and damage. If any defect is found, replace.
3) Check propeller shaft center support for biting of foreign matter, crack, abnormal noise and damage. If any defect is found, replace.

Transfer Oil (4WD) and Rear Differential Oil (4WD) (ITEM 6-7-1 and -2)

INSPECTION



1) Check transfer case or differential for evidence of oil leakage. Repair leaky point if any.
2) Make sure that vehicle is placed level for oil level check.
3) Remove level plug of transfer or differential and check oil level.
   Oil level can be checked roughly by means of level plug hole. That is, if oil flows out of level plug hole or if oil level is found up to hole when level plug is removed, oil is properly filled.
   If oil is found insufficient, pour specified amount of specified oil referring to "TRANSFER OIL CHANGE" in Section 7D or "DIFFERENTIAL OIL CHANGE" in Section 7F.

[A] :	Transfer
[B] :	Rear differential
1.	Oil level/filler plug
2.	Drain plug

4) Tighten level plug to specified torque referring to "TRANSFER OIL CHANGE" in Section 7D or "CHANGING DIFFERENTIAL OIL" in Section 7F.

REPLACEMENT

Change transfer oil and differential oil with new specified oil referring to "TRANSFER OIL CHANGE" in Section 7D or "DIFFERENTIAL OIL CHANGE" in Section 7F.

Recommended Fluids and Lubricants

Engine oil	SE, SF, SG, SH or SJ (Refer to engine oil viscosity chart in item 1-4.)
Engine coolant (Ethylene glycol base coolant)	"Anti-freeze / Anti-corrosion coolant"
Brake fluid	DOT4 or SAE J1704
Manual transmission oil	API GL-4, SAE75W-90 (Refer to Section 7A for detail)
Transfer oil (4WD)	Refer to "OIL CHANGE" in Section 7D
Differential oil (4WD)	Refer to "OIL CHANGE" in Section 7F
Automatic transmission fluid	An equivalent of DEXRON®-III
Door hinges	Engine oil or water resistance chassis grease
Hood latch assembly	
Key lock cylinder	Spray lubricant

SECTION 3E

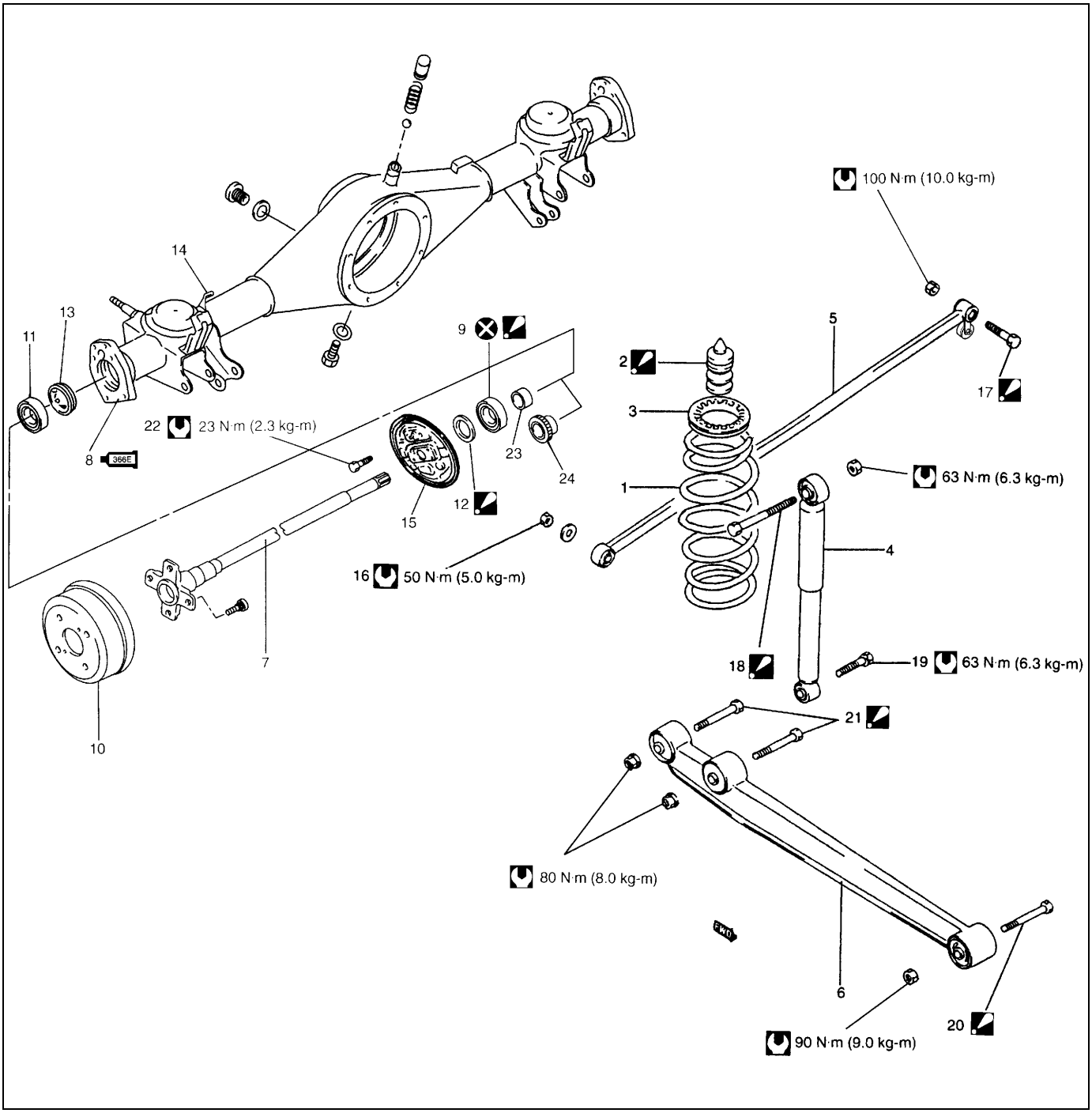
REAR SUSPENSION

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 descriptions (items) not found in this section, refer to the same section of the Service Manual mentioned in FOREWORD of this manual.**

CONTENTS

On-Vehicle Service

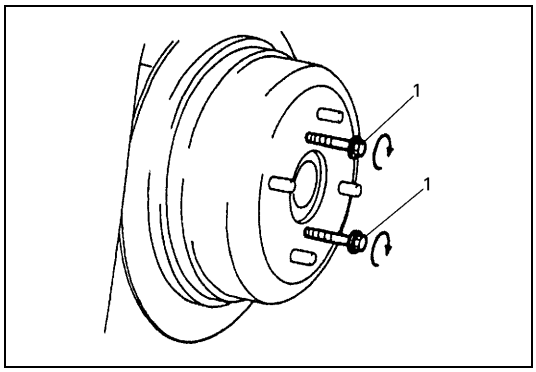


	1. Rear coil spring		10. Brake drum		19. Shock absorber lower bolt
	2. Rear bump stopper : Apply soap water, when installing.		11. Oil seal		20. Trailing arm front bolt : Insert from vehicle inside.
	3. Rear spring upper seat		12. Spacer : The tapered side of spacer inner diameter directed toward outside (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 and Wheel Bearing

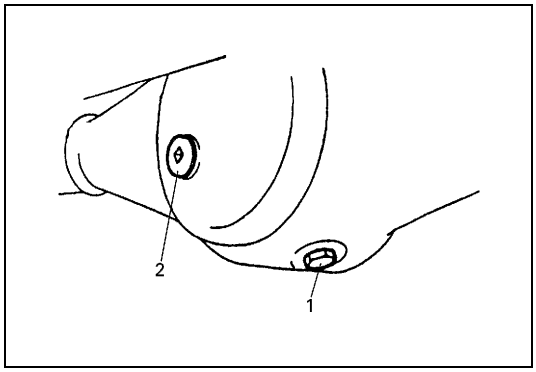
REMOVAL

1) Hoist vehicle and remove rear wheels.



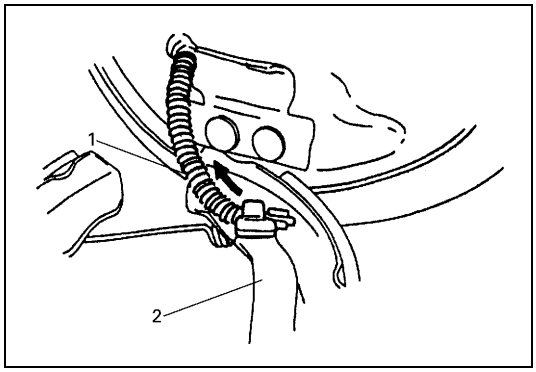
2) Remove rear brake drum by using 8 mm bolts. For details referring to Section 5C.

1. 8 mm bolt

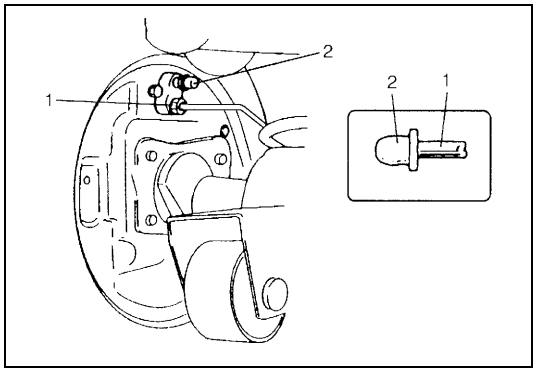


3) Drain gear oil from rear axle housing by loosening drain plug (1).

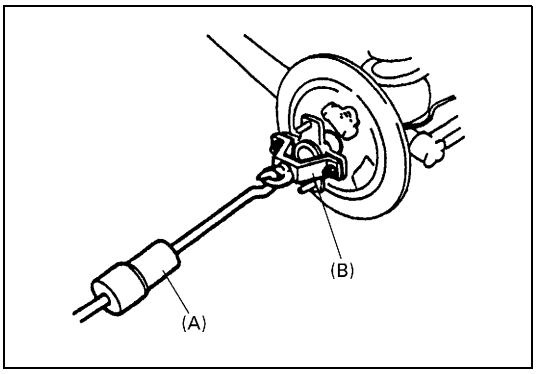
2. Level plug



4) Disconnect parking brake cable from parking brake shoe lever (2) and remove parking brake cable (1) from brake back plate.

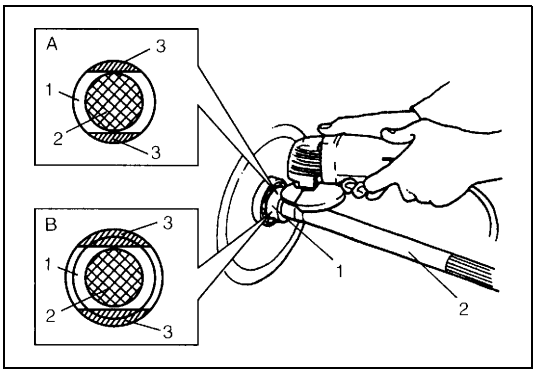


5) Disconnect brake pipe (1) from wheel cylinder and put wheel cylinder bleeder plug cap (2) onto pipe to prevent fluid from spilling.
6) Remove wheel speed sensor from axle housing (if equipped with ABS).
7) Remove brake back plate bolts from axle housing.



8) Using special tools indicated, draw out axle shaft with brake back plate.

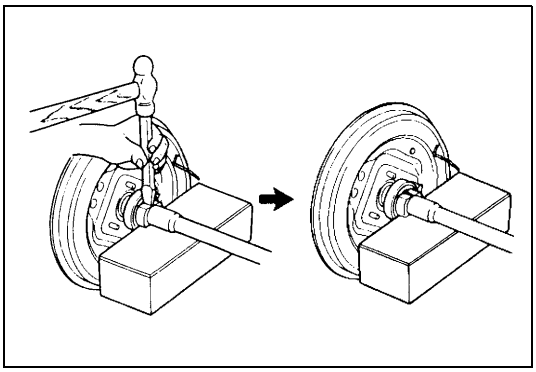
Special tool
(A) : 09942-15511
(B) : 09943-17912



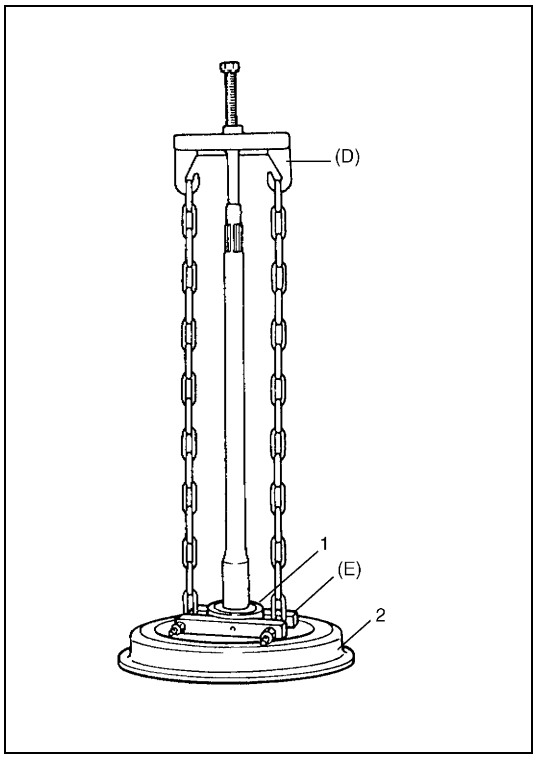
9) In order to remove the retainer ring (1) from the axle shaft (2), grind (3) with a grinder two parts of the bearing retainer ring as illustrated till it becomes thin.

CAUTION:
Be careful not to go so far as to grind the shaft.

A : Without ABS
B : With ABS

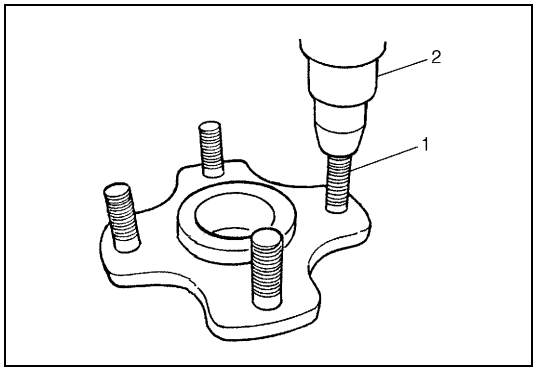


10) Break with a chisel the thin ground retainer ring, and it can be removed.



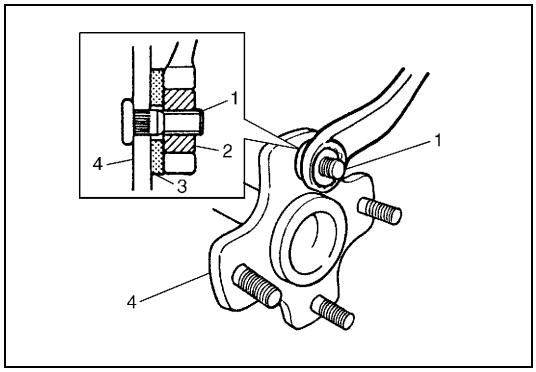
11) Using special tools, remove bearing (1) from shaft and then remove brake back plate (2).

Special tool
(D) : 09927-18411
(E) : 09921-57810



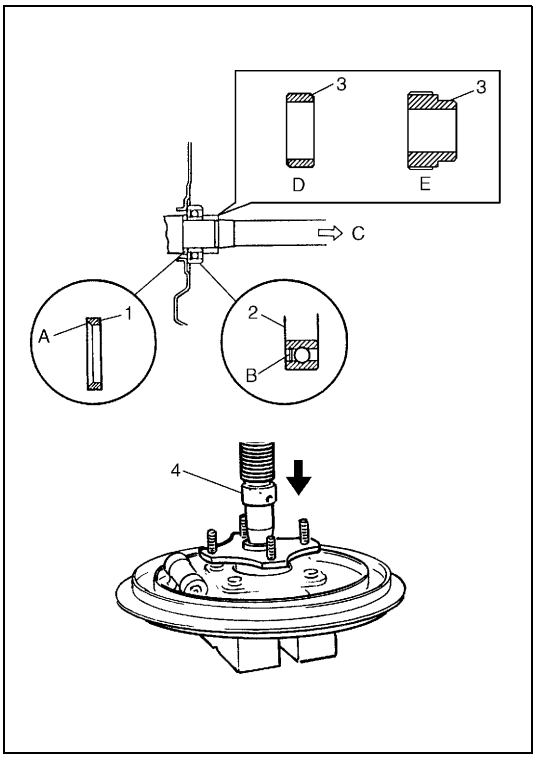
12) Remove stud bolts (1) by using hydraulic press (2).

INSTALLATION



1) Aligning serrations between new stud bolts (1) and flange (4), install new stud bolts by tightening nut as shown.

2. Nut
3. Washer

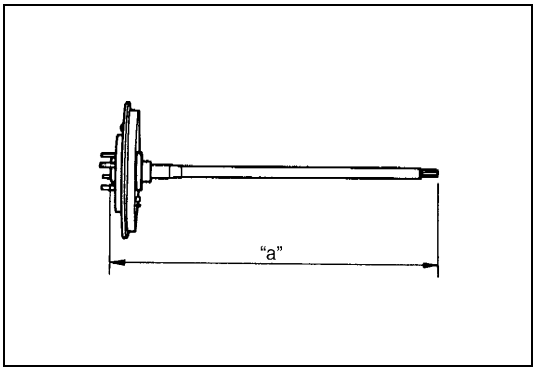


2) Press in a new bearing (2) and retainer ring (3) in order by using an hydraulic press (4).

NOTE:

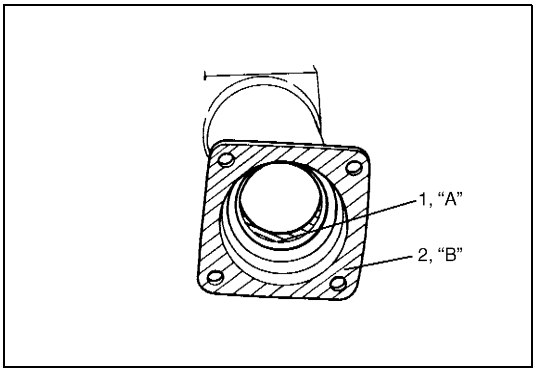
- **Install wheel bearing spacer (1) with the tapered side of its inner diameter directed toward outside (axle shaft flange side).**
- **Install wheel bearing with its sealed side directed toward outside (axle shaft flange side).**
- **Use care not to cause any damage to outside of retainer ring and wheels sensor ring (if equipped with ABS).**

A :	Tapered side
B :	Sealed side
C :	Differential side
D :	Without ABS
E :	With ABS



3) Inspect axle shaft length.

Rear axle shaft length "a"
Right side : 657.5 mm (25.9 in.)
Left side : 785.5 mm (30.9 in.)



4) Apply grease to axle shaft oil seal (1) lip as shown.

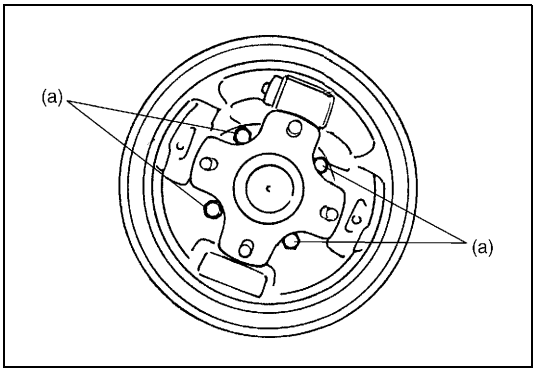
"A" : Grease 99000-25010

5) Apply sealant to mating surface (2) of axle housing and brake back plate.

NOTE:

Make sure to remove old sealant before applying it anew.

"B" : Sealant 99000-31090

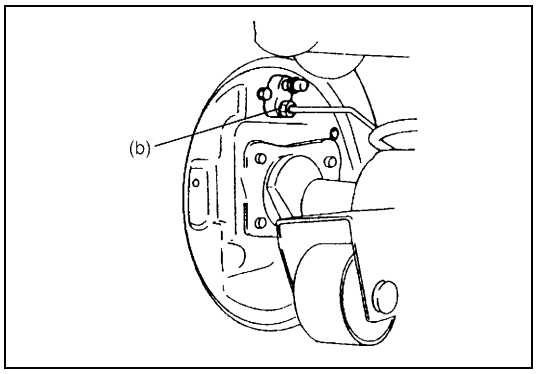


6) Install rear axle shaft to rear axle housing and tighten brake back plate bolts to specified torque.

NOTE:

When installing rear axle shaft, be careful not to cause damage to oil seal lip in axle housing.

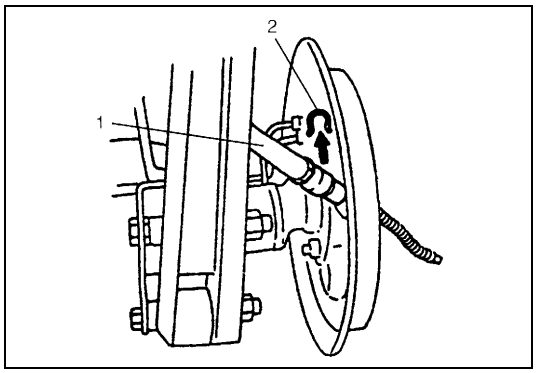
Tightening torque
Brake back plate bolts (a) : 23 N·m (2.3 kg-m, 17.0 lb-ft)



7) Connect brake pipe to wheel cylinder and tighten brake pipe flare nut to specified torque.

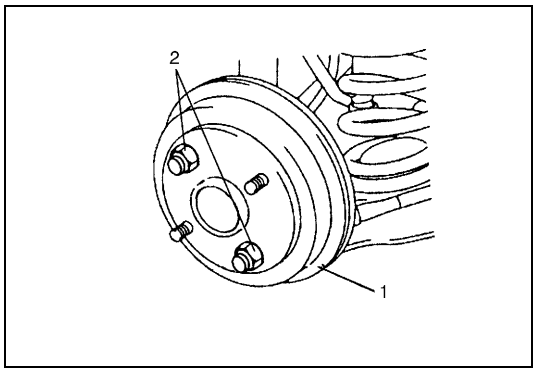
Tightening torque
Brake pipe flare nut (b) : 16 N·m (1.6 kg-m, 11.5 lb-ft)

8) Tighten oil drain plug to specified torque and refill rear axle (differential) housing with new specified gear oil and tighten oil filler plug to specified torque. Refer to Section 7F for tightening torque data and refill.



9) Connect parking brake cable (1) to parking brake shoe lever. Install brake shoes and secure parking brake cable to brake back plate with clip (2).
Install wheel speed sensor (if equipped with ABS).

CAUTION:
Check to ensure that clip is in good condition before installing it. If deformed or broken, replace.

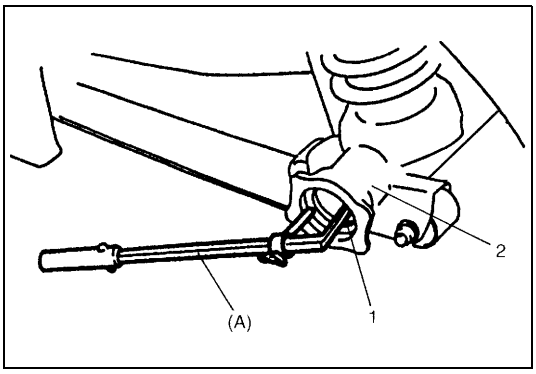


10) Install brake drum (1) (right & left) after marking sure that inside of brake drum and brake shoes are free from dirt and oil. Then tighten wheel nuts (2) temporarily by hand.
11) Fill reservoir with brake fluid and bleed brake system. (For bleeding operation, refer to “BLEEDING BRAKES” in Section 5.)
12) Install wheel and tighten wheel nuts to specified torque.
13) Upon completion of all jobs, pull parking brake lever with about 20 kg, (44 lbs) load three to five times so as to obtain proper drum-to-shoe clearance.
Adjust parking brake cable (for adjustment, refer to “PARKING BRAKE INSPECTION AND ADJUSTMENT” in Section 5).
14) Check to ensure that brake drum is free from dragging and proper braking is obtained.
15) Perform brake test (foot brake and parking brake).
(For brake test, see Section 5.)
16) Check each installed part for oil leakage.

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.

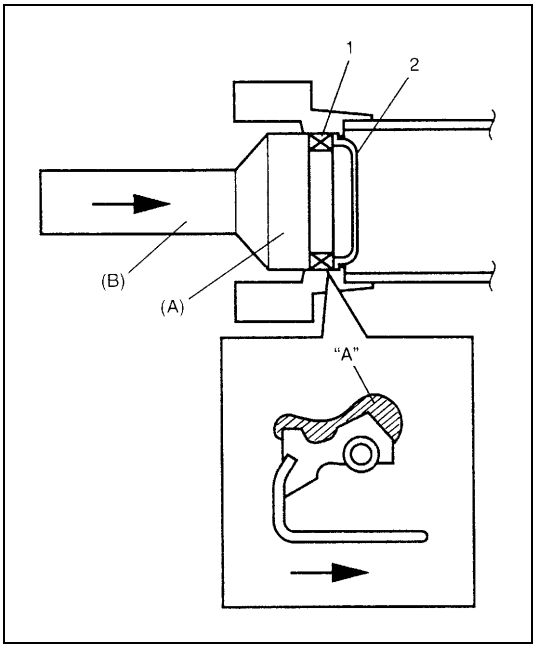


2) Remove rear axle shaft oil seal (1) by using special tool.

Special tool
(A) : 09913-50121

2. Axle housing

INSTALLATION



1) Using special tool, drive in 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) : 09924-84510-004
(B) : 09913-75821

"A" : Grease 99000-25010

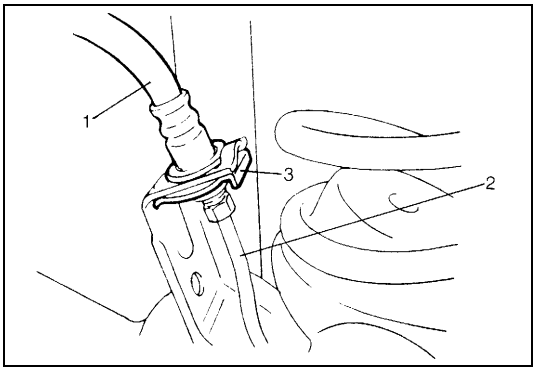
A : Differential side

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

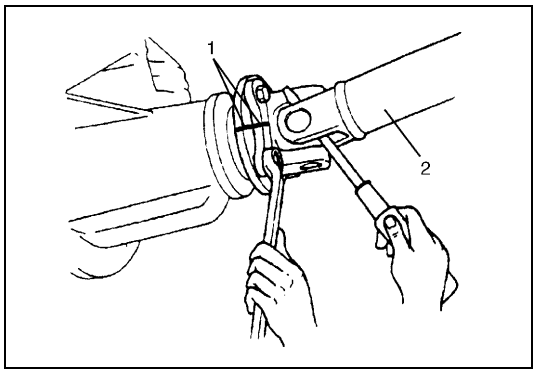
Rear Axle Housing

REMOVAL

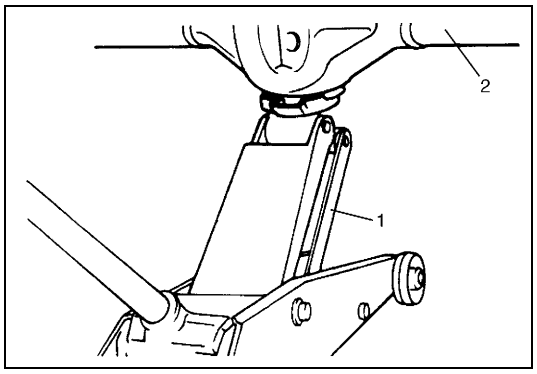
1) Remove rear axle shaft referring to item 1) to 8) of "REAR AXLE SHAFT AND WHEEL BEARING" in this section.



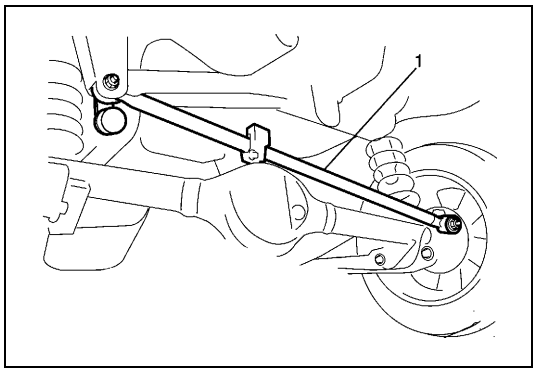
2) Disconnect brake pipes (2) (right & left) from flexible hoses (1) and remove E-rings (3).
3) Remove brake pipes from wheel cylinders (right & left).
4) Remove wheel speed sensors (right & left) and release clamps from axle housing (if equipped with ABS).
5) Remove LSPV adjust nut and detach spring end from rear axle housing (if equipped with LSPV).



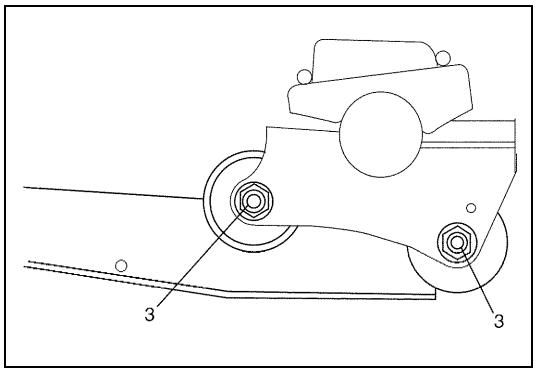
6) Before removing propeller shaft, give match marks (1) on joint flange and propeller shaft (2) as shown.
7) Remove propeller shaft.



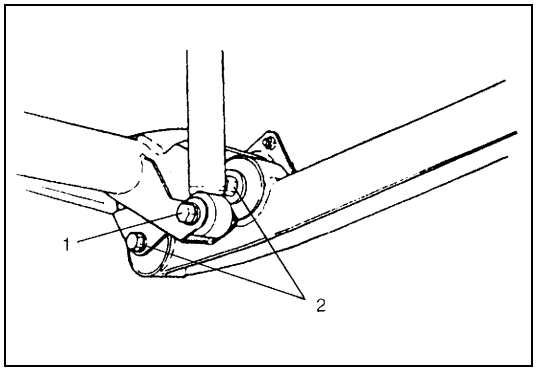
8) For jobs hereafter, support rear axle housing by using floor jack (1) under axle housing (2) and remove differential carrier assembly.



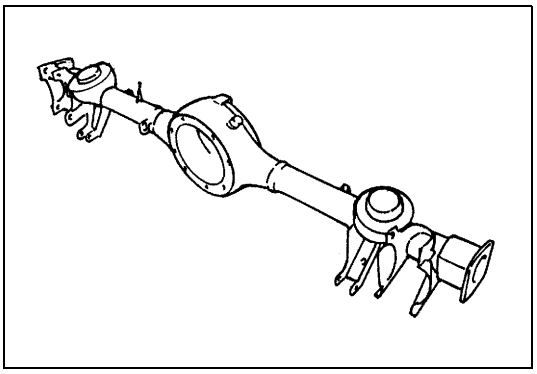
9) Remove lateral rod (1).



10) Loosen trailing arm rear mounting nuts (3) (right & left) from axle housing, but don't remove bolts.



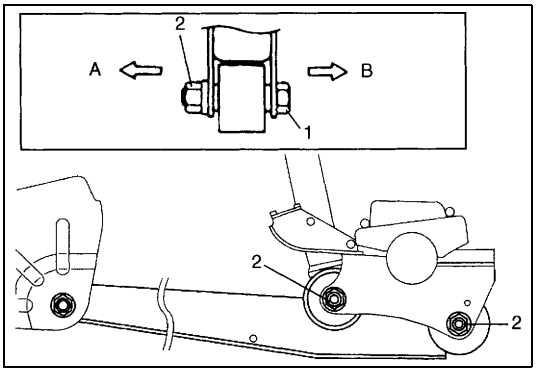
11) Remove shock absorber lower mounting bolts (1).
12) Lower floor jack until tension of suspension coil spring becomes a little loose and remove trailing arm rear mounting bolts (2) (right & left).
13) Lower rear axle housing gradually and remove coil springs.



14) Remove axle housing.

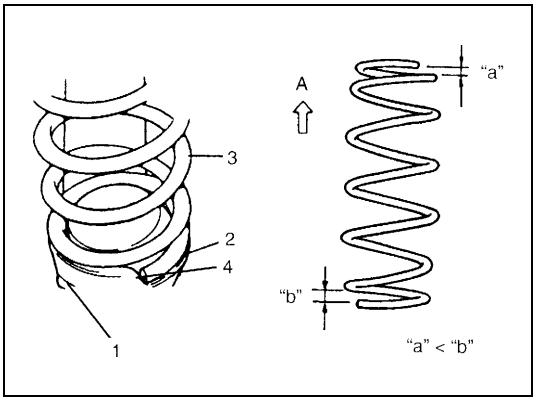
INSTALLATION

Install removed parts in reverse order of removal, noting the following.



1) Place rear axle housing on floor jack. Then install rear trailing arm bolts (1) (right & left) in proper direction as shown. Then tighten nuts (2) temporarily by hand.

A :	Vehicle out side
B :	Vehicle center side

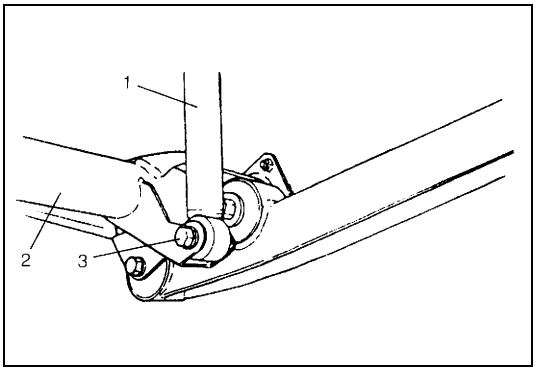


2) Install coil springs (3) (right & left) on spring seat (2) of axle housing (1) and raise axle housing.

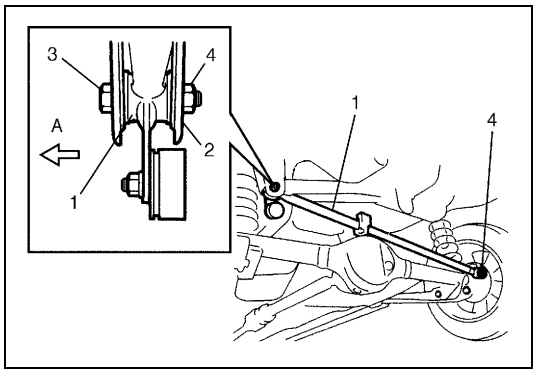
NOTE:

When seating coil spring (3), mate spring end with stepped part (4) of rear axle spring seat as shown.

A :	Upper side
"a" :	Small
"b" :	Large

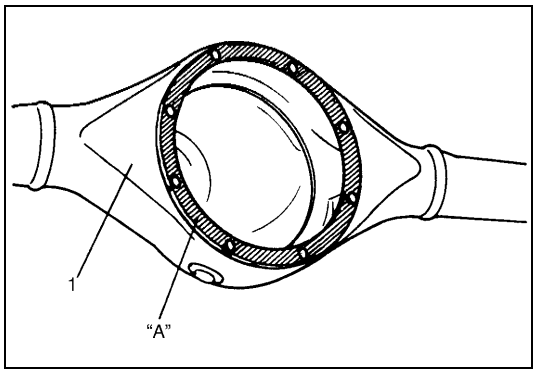


3) Install shock absorber (1) (right and left) to axle housing (2) and install bolts in proper direction as shown. Then tighten bolts (3) (right & left) temporarily by hand.



4) Install lateral rod (1) and bolt (3) in proper direction as shown. Then tighten nuts (4) temporarily by hand.

2.	Vehicle body
A :	Forward

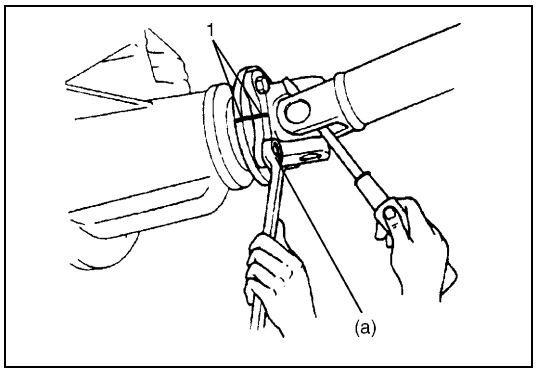


5) Clean mating surfaces of axle housing (1) and differential carrier and apply sealant to housing side.

"A" : Sealant 99000-31110

6) Install differential carrier assembly to axle housing and tighten carrier bolts to specified torque.

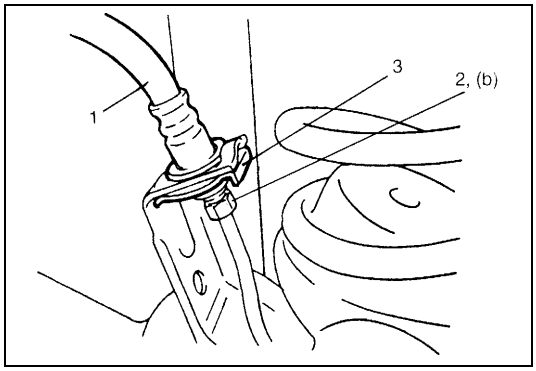
Tightening torque
Rear differential carrier bolts : 23 N·m (2.3 kg-m, 17.0 lb-ft)



7) Install propeller shaft to joint flange aligning match marks (1) and tighten flange bolts to specified torque.

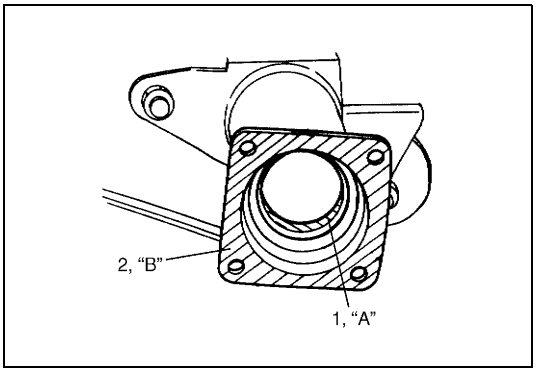
Tightening torque
Companion flange bolts (a) : 23 N·m (2.3 kg-m, 17.0 lb-ft)

8) Install LSPV spring to rear axle.
Tighten LSPV adjust nut temporarily at this step. (if equipped with LSPV).
9) Install wheel speed sensor and clamp wire securely (right & left) (if equipped with ABS).
10) Remove floor jack from axle housing.



11) Connect brake flexible hoses (1) (right & left) to bracket on rear axle and secure it with E-rings (3) (right & left).
12) Connect brake pipes to brake flexible hoses (1) and tighten brake pipe flare nuts (2) to specified torque.

Tightening torque
Brake pipe flare nut (b) : 16 N·m (1.6 kg-m, 11.5 lb-ft)

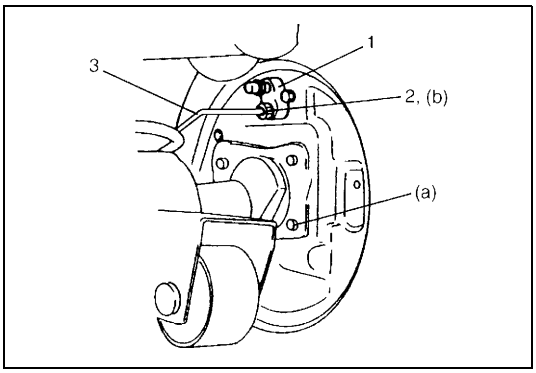


13) Apply grease to axle shaft oil seals (1) lip (right & left).

"A" : Grease 99000-25010

14) Clean mating surfaces (2) (right & left) of axle housing and brake back plate and apply water tight sealant as shown in figure.

"B" : Sealant 99000-31090

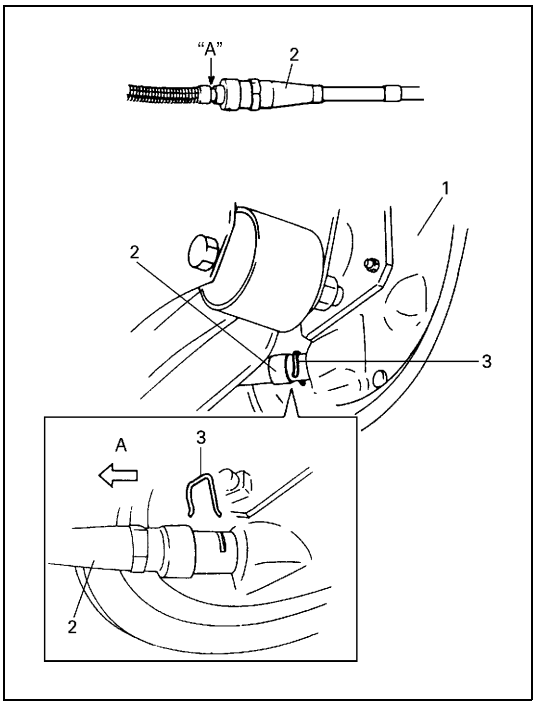


15) Install rear axle shaft (right & left) to rear axle housing and tighten brake back plate bolts to specified torque.

Tightening torque
Brake back plate bolts (a) : 23 N·m (2.3 kg-m, 17.0 lb-ft)

16) Connect brake pipes (3) to wheel cylinders (1) (right & left) and tighten brake pipe flare nuts (2) to specified torque.

Tightening torque
Brake pipe flare nuts (b) : 16 N·m (1.6 kg-m, 11.5 lb-ft)



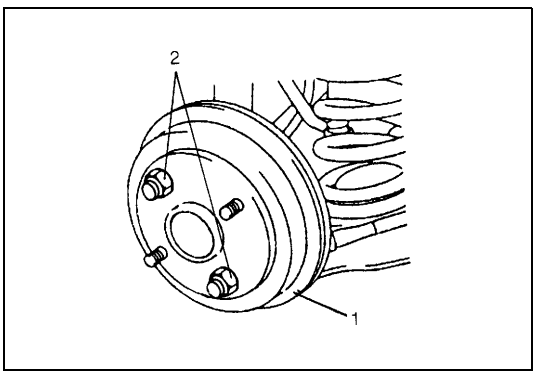
17) Apply water tight sealant where brake back plate (1) and parking brake cable contact.
Connect parking brake cable (2) to brake back plate (right & left) and secure it with clip (3).

"A" : Sealant 99000-31090

NOTE:

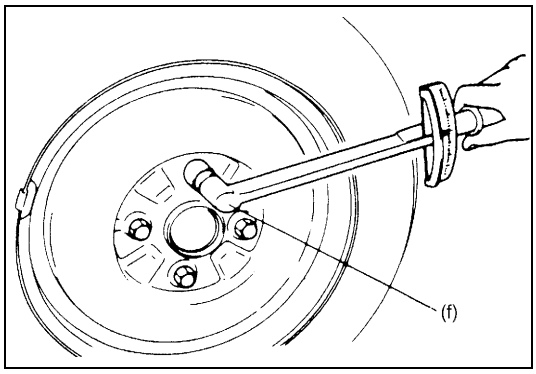
Check to ensure that clip is in good condition before installing it. If deformed or broken, replace.

18) Install brake shoes (right & left) referring to "BRAKE SHOE" in Section 5C.



19) Install brake drums (1) (right & left) after making sure that inside of brake drum and brake shoes are free from dirt and oil. Then tighten wheel nuts (2) temporarily by hand.
20) Fill reservoir with brake fluid and bleed brake system. (For bleeding operation, refer to Section 5.)
21) Refill differential gear housing with new specified gear oil. Refer to Section 7F.

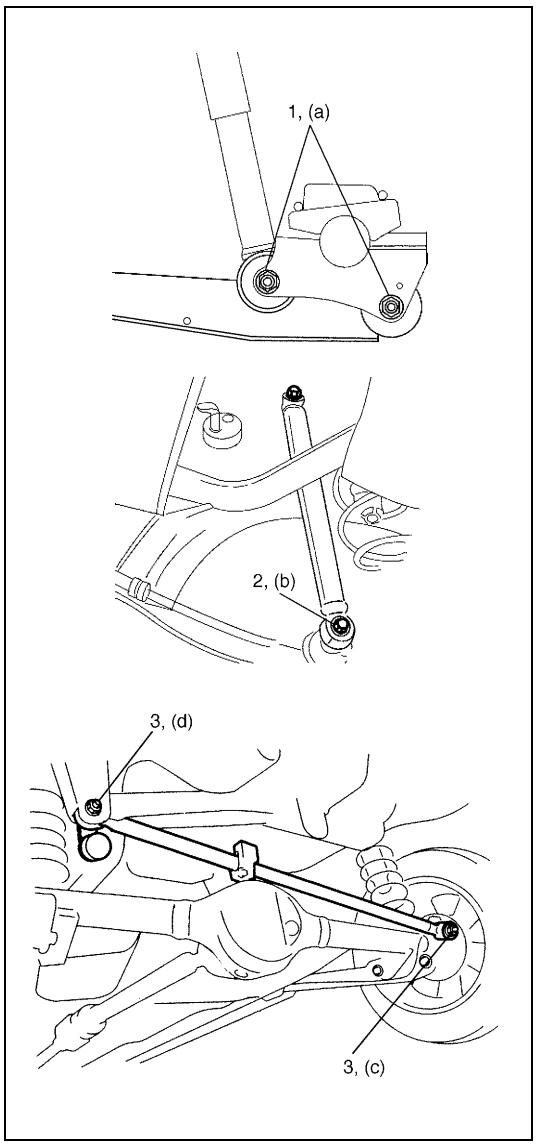
A : Forward



22) Install wheels and tighten wheel nuts to specified torque.

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

23) Upon completion of all jobs, pull parking brake lever with about 20 kg, (44 lbs) load three to five times so as to obtain proper drum-to-shoe clearance.
Adjust parking brake cable referring to “PARKING BRAKE” in Section 5C.
24) Lower hoist.



25) Tighten right and left trailing arm nuts (1) and shock absorber lower bolts (2) to specified torque.
Tighten lateral rod nuts (3) to specified torque.

NOTE:

When tightening these bolts and nuts, be sure that vehicle is off hoist and in non loaded condition.

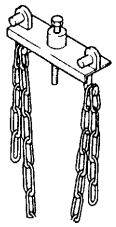
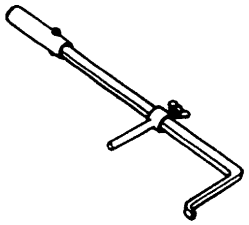
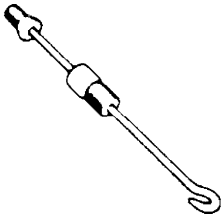
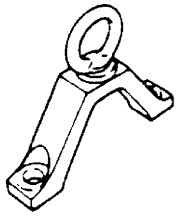
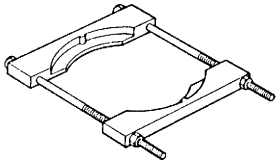
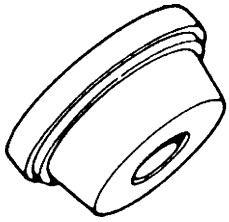
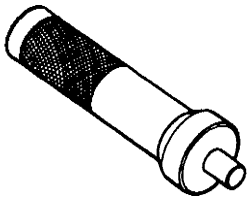
Tightening torque
Rear trailing arm nuts (a) : 80 N·m (8.0 kg-m, 58.0 lb-ft)
Rear shock absorber lower bolts
(b) : 63 N·m (6.3 kg-m, 45.5 lb-ft)
Lateral rod axle housing side nut
(c) : 50 N·m (5.0 kg-m, 36.5 lb-ft)
Lateral rod body side nut (d) :
100 N·m (10.0 kg-m, 72.5 lb-ft)

26) Check to ensure that brake drum is free from dragging and proper braking is obtained.
27) Perform brake test (foot brake and parking brake).
28) If equipped with LSPV, check and adjust LSPV spring referring to “LSPV INSPECTION AND ADJUSTMENT” in Section 5A and perform “FLUID PRESSURE TEST” in Section 5.
29) Check each installed part for oil leakage.

Required Service Material

Material	Recommended SUZUKI product (Part Number)	Use
Lithium grease	SUZUKI SUPER GREASE (A) (99000-25010)	• Axle shaft oil seal • Wheel bearing
Sealant	SUZUKI BOND NO. 1215 (99000-31110)	• Joint seam of differential carrier and axle housing
Gear oil	For gear oil information, refer to Section 7F.	• Differential gear (Rear axle housing)
Water tight sealant	SUZUKI SEALING COMPOUND 366E (99000-31090)	• Joint seam of axle housing and brake back plate

Special Tool

 09927-18411 Universal puller	 09913-50121 Oil seal remover	 09942-15511 Sliding hammer	 09943-17912 Brake drum remover
 09921-57810 Bearing remover	 09924-84510-004 Oil seal installer	 09913-75821 Installer attachment	

SECTION 4B

PROPELLER SHAFTS

CONTENTS

General Description

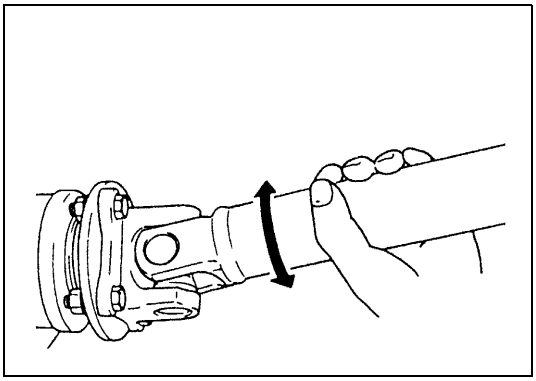
Most universal and constant velocity joints require no maintenance. They are lubricated for life and can not be lubricated on the vehicle. If universal and constant velocity joints becomes noisy or worn, it must be replaced.
The propeller shaft is a balanced unit. Handle it carefully so that balance can be maintained.
A viscous coupling is used for the coupling system which distributes an optimum driving force to the front and rear wheels according to the driving conditions. It is located at the center of the propeller shaft.

Diagnosis

Diagnosis Table

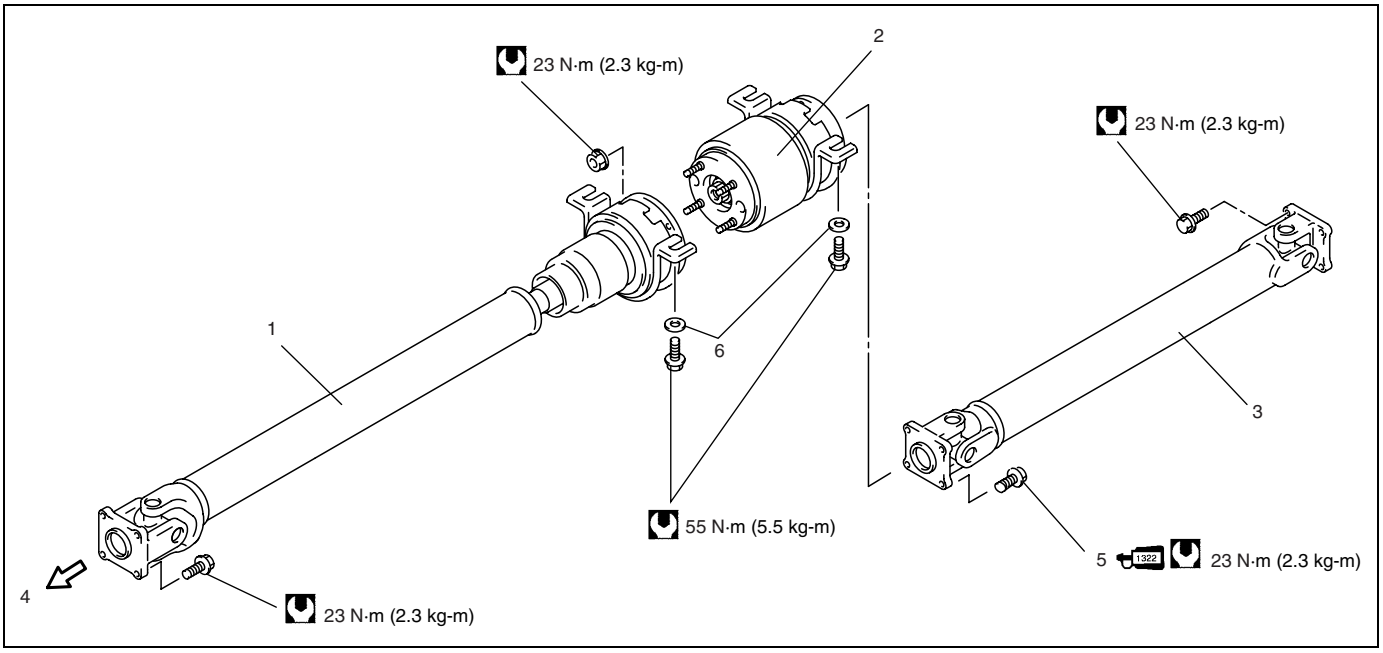
Condition	Possible Cause	Correction
Abnormal noise	• Loose universal joint bolt	Tighten universal joint bolt.
	• Spider bearing worn out or stuck	Replace.
	• Worn or broken constant velocity joint	Replace.
	• Worn or broken center support bearing	Replace.
	• Broken center support rubber	Replace.
	• Wear spider	Replace propeller shaft.
Vibration	• Performed propeller shaft	Replace.

Propeller Shaft Joint Check



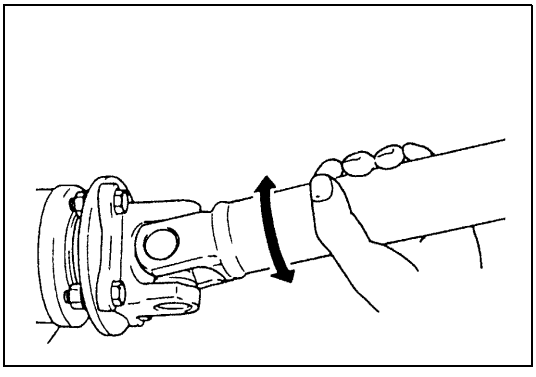
If universal joints are suspected of producing chattering or rattling noise, inspect them for wear. Check to see if cross spider rattles in yokes and replace defective propeller shaft with new one.
Noise coming from universal joint can be easily distinguished from other noises because rhythm of chattering or rattling is in step with cruising speed. Noise is pronounced particularly on standing start or in coasting condition (when braking effect of engine is showing in the drive line).

On-Vehicle Service



	1. Propeller shaft No.1 with center support
	2. Viscous coupling with center support
	3. Propeller shaft No.2
	4. Forward
1322	5. Propeller shaft No.2 bolt : Apply thread lock 99000-32110 to thread.
	6. Washer (if equipped)
	Tightening torque

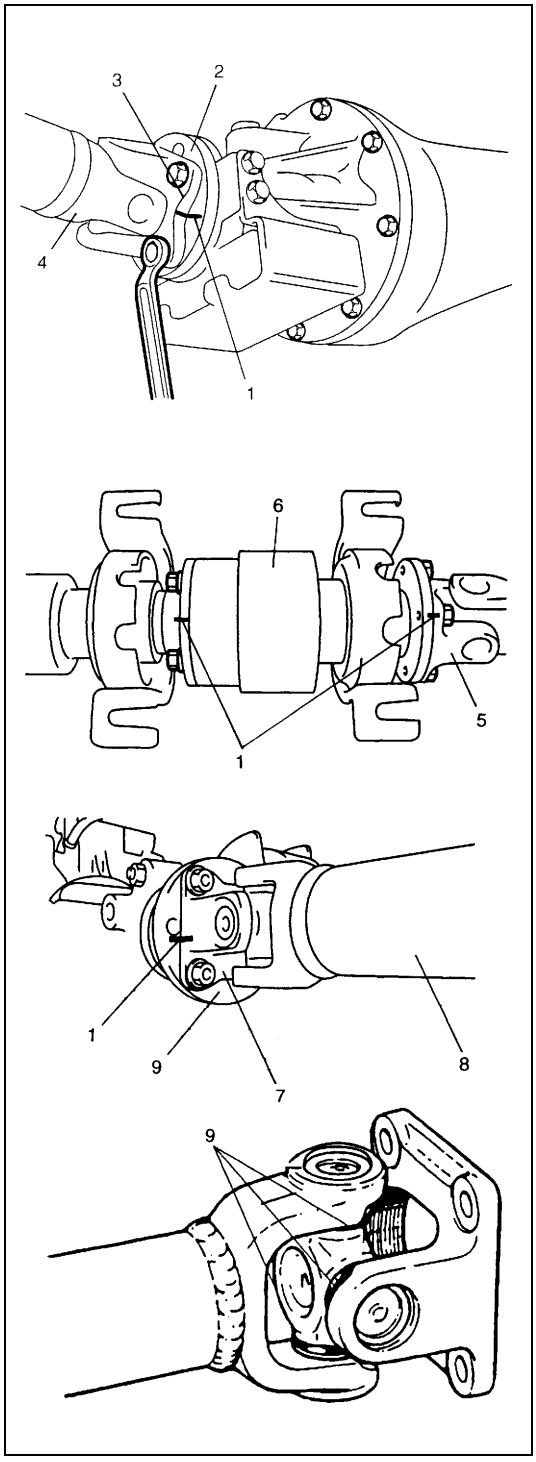
PRECEDENTIAL INSPECTION



- Check propeller shaft connecting bolts for looseness. If looseness is found, tighten to specified torque.
- Check propeller shaft joints for wear, rattle and damage. If any defect is found, replace.
- Check propeller shaft center support for biting of foreign matter, crack, abnormal noise and damage. If any defect is found, replace.

REMOVAL

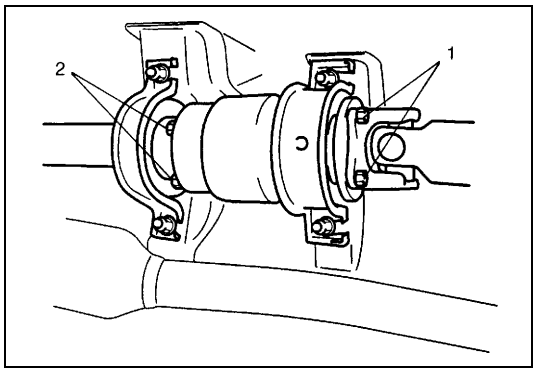
1) Hoist vehicle.



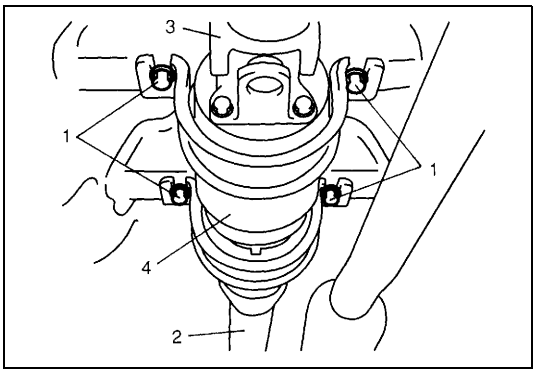
2) Before removing propeller shafts, give match marks (1) on yoke (3) of propeller shaft No.2 (4) and companion flange (2) of differential as shown. Also give match marks (1) on propeller shaft No.2 yoke (5), viscous coupling with center support (6), yoke (7) of propeller shaft No.1 with center support (8) and transfer output flange (9).

CAUTION:
Don't damage joint seal (10) to prevent lubrication defect of joint.

3) Loosen propeller shaft bolt at front and rear end, and separate propeller shafts from transfer and rear differential.



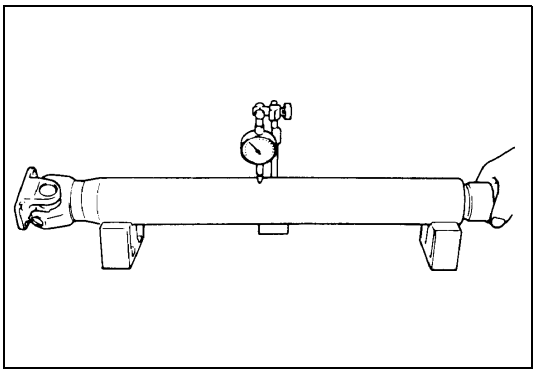
4) If disassembling propeller shaft assembly is necessary, loosen propeller shaft No.2 bolts (1) and viscous coupling nuts (2) to facilitate subsequent disassembling, but keeping each connection provisionally.



5) Loosen center support bolts (1), then remove propeller shaft No.1 with center support (2), propeller shaft No.2 (3) and viscous coupling with center support (4) all together.

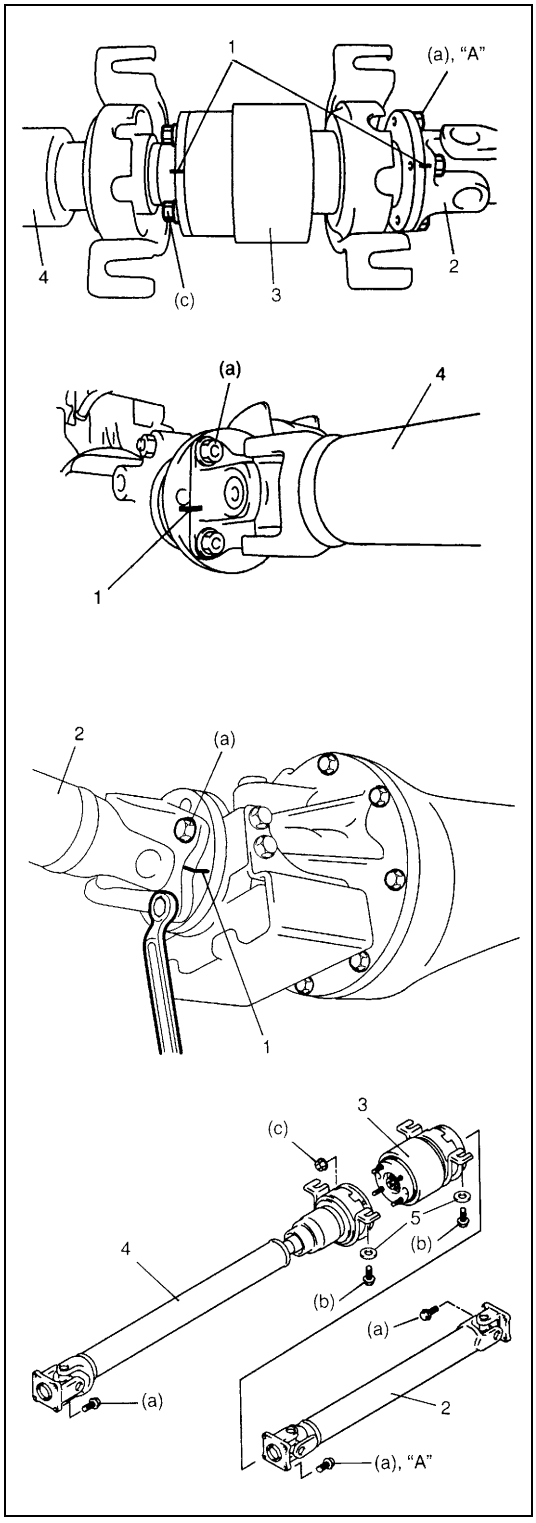
6) Disconnect propeller shaft No.1 with center support and propeller shaft No.2 from viscous coupling with center support.

INSPECTION



- Inspect propeller shaft and flange yoke for damage.
- Inspect propeller shaft for runout.
  If damage is found or shaft runout exceeds its limit, replace.

Propeller shaft runout
Limit : 0.7 mm (0.028 in.)



INSTALLATION

Reverse removal procedure to install propeller shafts noting following point.

- When installing propeller shafts and viscous coupling with center support, align the match marks (1).
  Otherwise, vibration may occur during driving.
- Apply thread lock cement to thread of propeller shaft No.2 bolts.

"A" : Cement 99000-32110

- Use following specification to torque bolts.

Tightening torque
Propeller shaft bolts (a) : 23 N·m (2.3 kg-m, 17.0 lb-ft)
Center support bolts (b) : 55 N·m (5.5 kg-m, 40.0 lb-ft)
Viscous coupling nuts (c) : 23 N·m (2.3 kg-m, 17.0 lb-ft)

2. Propeller shaft No.2
3. Viscous coupling with center support
4. Propeller shaft No.1 with center support
5. Washer (if equipped)

Tightening Torque Specification

Fastening portion	Tightening torque		
	N•m	kg-m	lb-ft
Propeller shaft bolts	23	2.3	17.0
Center support bolts	55	5.5	40.0
Viscous coupling nuts	23	2.3	17.0

Required Service Material

Material	Recommended SUZUKI Material (Part Number)	Use
Thread lock cement	THREAD LOCK CEMENT 1322 (99000-32110)	• Propeller shaft No.2 bolt

SECTION 5

BRAKES

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 replace with one of same part number or with an equivalent part if replacement becomes necessary. D 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 descriptions (items) not found in this section, refer to the same section of the Service Manual mentioned in FOREWORD of this manual.**

CONTENTS

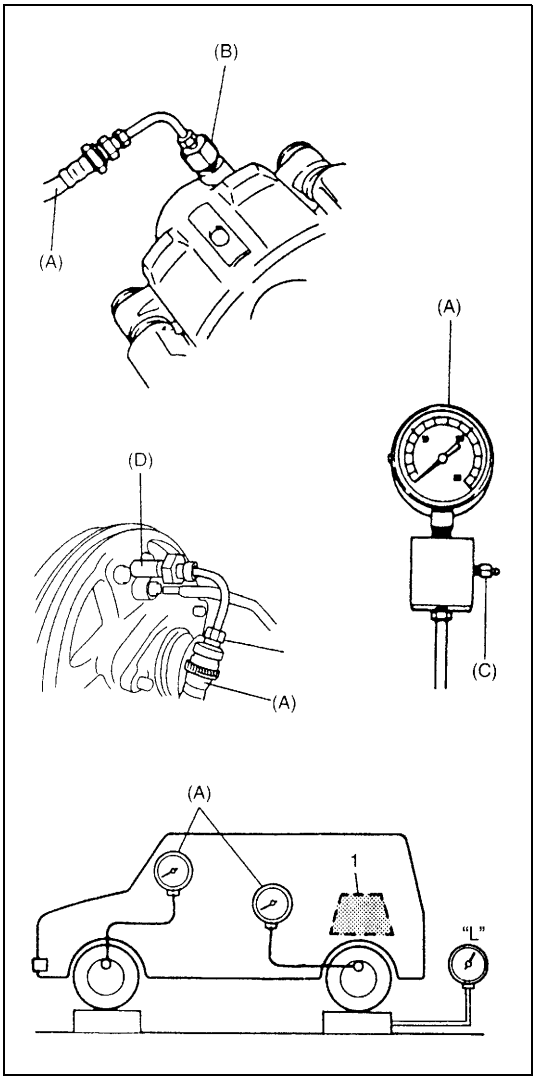
Check and Adjustment

Fluid Pressure Test (If Equipped with LSPV)

Test procedure for LSPV assembly is as follows.

Before testing, confirm the following.

- Fuel tank is filled with fuel fully.
- Vehicle is equipped with spare tire, tools, jack and jack handle.



1) Place vehicle on level floor and set approximately about 1,000 N (100 kg, 220 lbs) weight (1) on rear housing center so that rear axle weighs 4,500 N (450 kg, 992 lbs).

Rear axle weight "L" : 4,500 N (450 kg, 992 lbs)

2) Install special tool to front and rear brake.

NOTE:

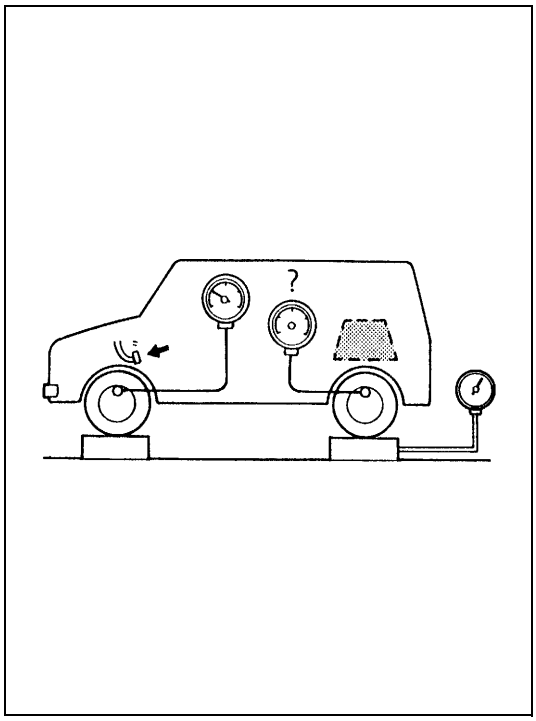
Pressure gauge should be connected to bleeder plug hole of front (left side brake) and rear (right side brake). After testing front left side and rear right side, test front right side and rear left side in the same way.

Special tool
Front brake
(A) : 09956-02310
(B) : 09952-36310
(C) : 55473-82030 (Air bleeder plug as a spare part)

NOTE:

For front brake, use special tool (B) instead of thread diameter 10 mm attachment included in special tool (A).

Rear brake
(A) : 09956-02310
(C) : 55473-82030 (Air bleeder plug as a spare part)
(D) : 09952-48320

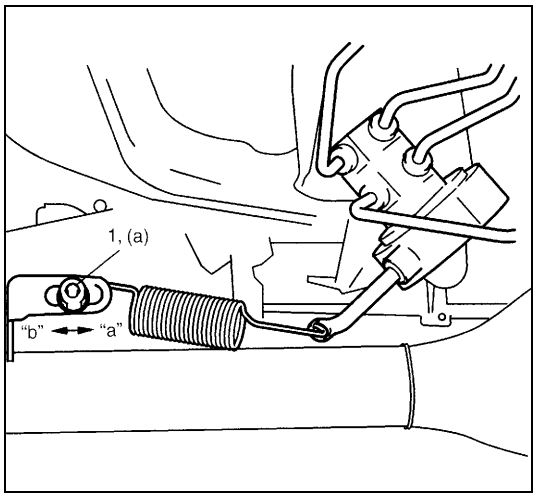


3) Depress brake pedal gradually till fluid pressure of front brake becomes as specified below and check corresponding pressure of rear brake then. It should be within specification given below.

Front brake	Rear brake
7,500 kPa 75 kg/cm^2 1,067 psi	4,000 – 5,500 kPa 40 – 55 kg/cm^2 569 – 782 psi

4) As done above, apply 100 kg/cm^2 pressure to front brake and check that rear brake pressure then is within specification as given below.

Front brake	Rear brake
10,000 kPa 100 kg/cm^2 1,422 psi	4,700 – 6,200 kPa 47 – 62 kg/cm^2 668 – 882 psi



5) If rear brake pressure is not within specification, adjust it by changing bolt (2) position as follows.
- If rear brake pressure is higher than specification, move bolt and nut (1) center side "a" and if it is lower, out side "b".
- Repeat steps 3) and 4) until rear brake pressure is within specification.
- After adjustment, be sure to torque nut (1) to specification.

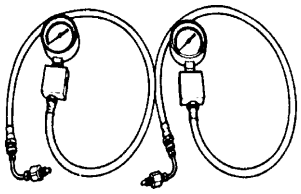
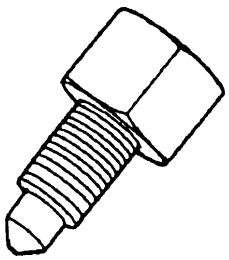
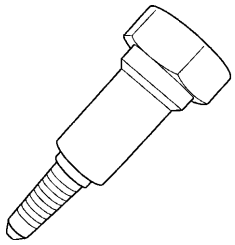
Tightening torque
LSPV nut (a) : 25 N·m (2.5 kg-m, 18.0 lb-ft)

6) Upon completion of fluid pressure test, bleed brake system and perform brake test.

Tightening Torque Specification

Fastening part	Tightening torque		
	N•m	kg-m	lb-ft
Brake pipe flare nut	16	1.6	11.5
Brake bleeder plug (Front caliper)	6.5	0.65	5.0
Brake bleeder plug (Wheel cylinder)	8.5	0.85	6.5
LSPV spring adjust nut	25	2.5	18.0

Special Tool

		
09956-02310 Fluid pressure gauge	09952-36310 Pressure gauge attachment	09952-48320 Pressure gauge attachment

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 descriptions (items) not found in this section, refer to the same section of the Service Manual mentioned in FOREWORD of this manual.**

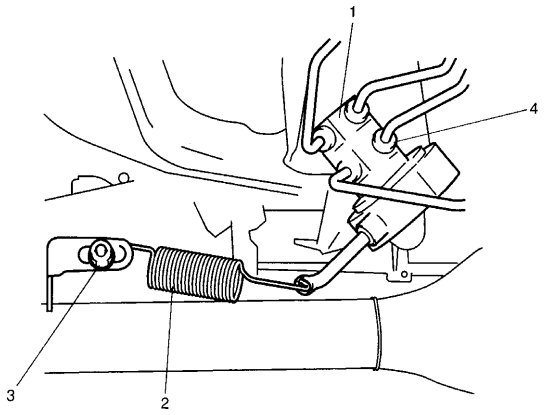
5A

CONTENTS

General Description

LSPV (Load Sensing Proportioning Valve) Assembly (if equipped)

As shown in figure below, LSPV is included within the brake circuit which connects the master cylinder and the rear wheel brake. It controls the hydraulic pressure applied to the rear wheel brake according to the loaded state of the vehicle (or weight of the load), whereby preventing the rear wheels from getting locked prematurely.



1.	LSPV assembly
2.	Spring
3.	Adjust nut
4.	Brake pipe flare nut

On-Vehicle Service

CAUTION:

- **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.**

Rear Brake Hose/Pipe (For Vehicle with LSPV)

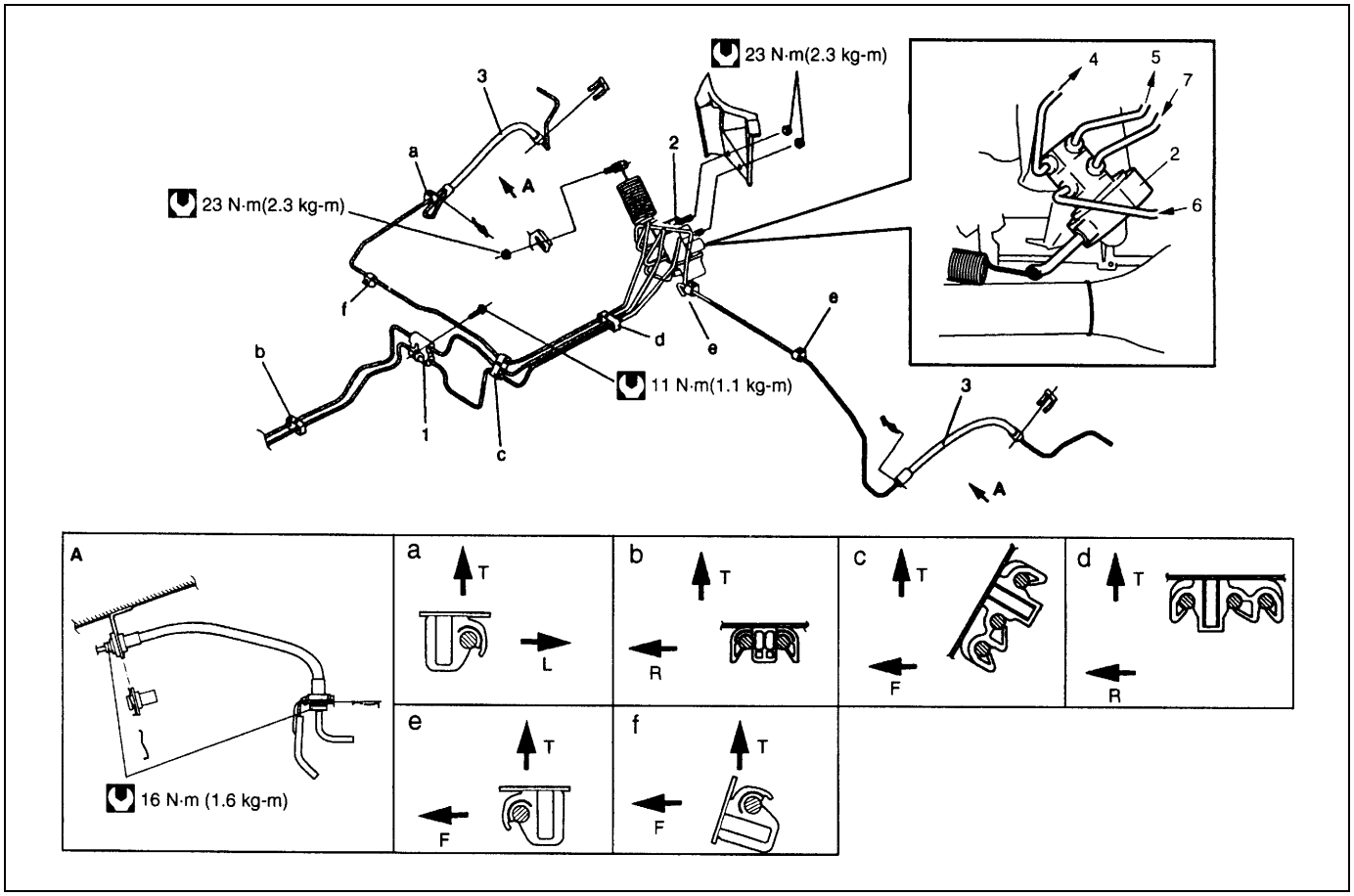
REMOVAL

1) Raise and suitably support vehicle. Remove tire and wheel.
2) Clean dirt and foreign material from both hose end or pipe end fittings. Remove brake hose or pipe.

INSTALLATION

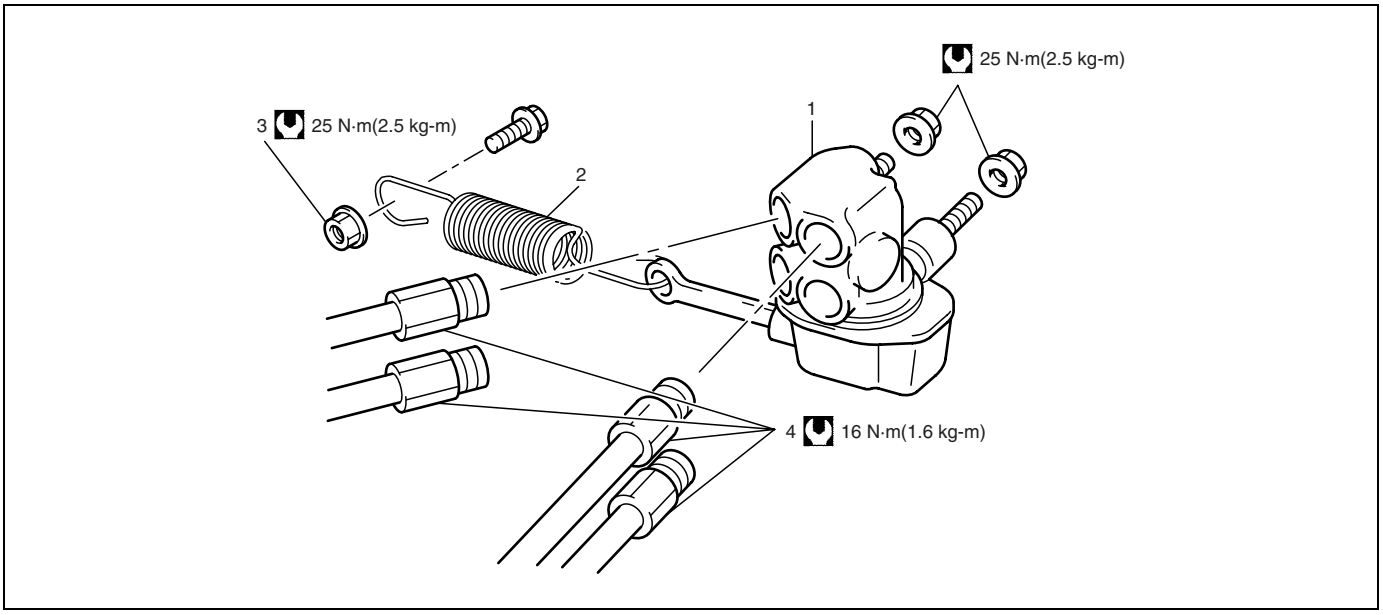
Reverse removal procedure for brake hose or pipe installation procedure.

- Install clamps properly referring to figure below.
- When installing hose, make sure that it has no twist or kink.
- Fill and maintain brake fluid level in reservoir. Bleed brake system.
- Perform brake test and check each installed part for fluid leakage.



1. 4 way joint	A : Viewed from A
2. LSPV assembly	F : Front side
3. Rear brake hose	L : Left side
4. To left rear wheel cylinder	R : Right side
5. To right rear wheel cylinder	T : Top side
6. From master cylinder (Primary)	a – f : Clamp
7. From master cylinder (Secondary)	Tightening Torque

LSPV (Load Sensing Proportioning Valve) Assembly (if equipped)

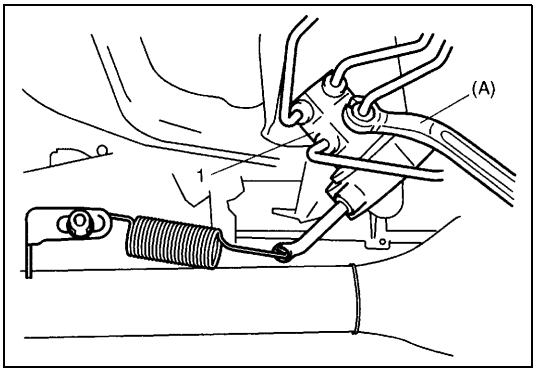


1.	LSPV assembly
2.	Spring
3.	Adjust nut
4.	Brake pipe
⬇	Tightening Torque

CAUTION:
- **Never disassemble LSPV assembly. Disassembly will spoil its original performance. Replace with new one if defective.**
- **Observe CAUTION at the beginning of ON-VEHICLE SERVICE.**

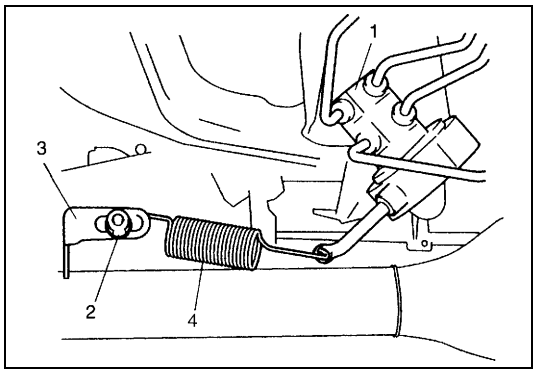
REMOVAL

1) Clean around reservoir cap and take out fluid with syringe or such.
2) Hoist vehicle.



3) Disconnect brake pipes from LSPV assembly (1).

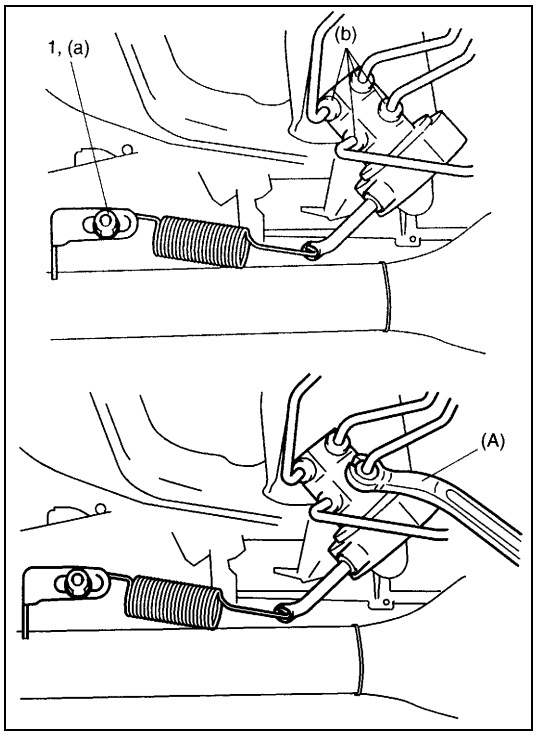
Special tool
(A) : 09950-78230 (10 x 11 mm)



4) Remove nut (2) and detach spring end from bracket (3).
5) Remove LSPV assembly (1) with spring (4) from vehicle body.

INSTALLATION

1) Install LSPV assembly with spring to vehicle body.



2) Tighten brake pipe flare nuts and LSPV adjusting nut (1) to specified torque.

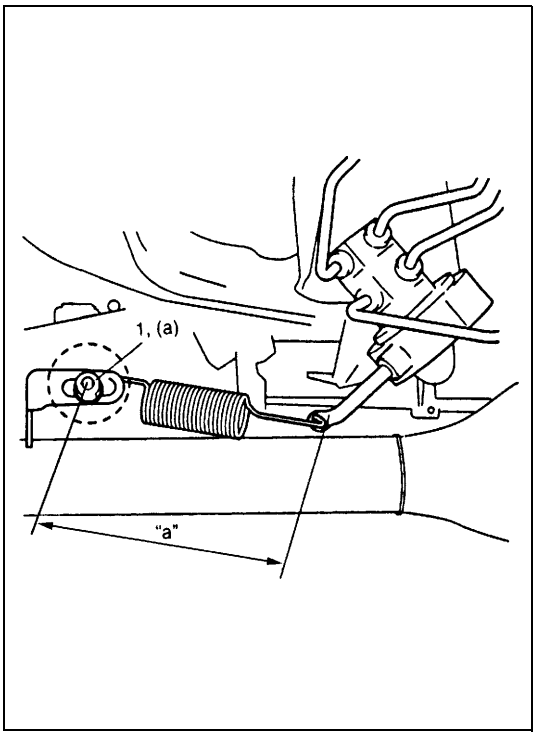
Special tool
(A) : 09950-78230 (10 x 11 mm)

Tightening torque
LSPV adjust nut (a) : 25 N·m (2.5 kg-m, 18.0 lb-ft)
Brake pipe flare nut (b) : 16 N·m (1.6 kg-m, 11.5 lb-ft)

3) Fill reservoir with specified fluid and bleed air from brake system.
4) After bleeding air, check that LSPV is installed properly referring to following “INSPECTION & ADJUSTMENT”.

INSPECTION & ADJUSTMENT

1) Confirm the following before inspection and adjustment.
   - Fuel tank is filled with fuel fully.
   - Vehicle is equipped with spare tire, tools, jack and jack handle.
   - Vehicle is free from any other load.
   - Vehicle is placed on level floor.



2) Push up LSPV lever with finger till it stops and measure length of coil spring ("a" in figure).
3) Spring length "a" should be as specified.

Spring length "a" :
4WD : 148 mm (5.83 in.)

4) If it isn't, adjust it to specification by changing LSPV adjusting bolt and nut position as shown in figure. After adjustment, tighten nut (1) to specified torque.

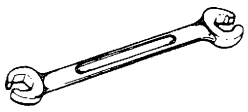
Tightening torque
LSPV adjust nut (a) : 25 N·m (2.5 kg-m, 18.0 lb-ft)

NOTE:

Check to make sure that LSPV body and brake pipe joints are free from fluid leakage. Replace defective parts, if any.

5) Confirm fluid pressure referring to "Fluid Pressure Test" in Section 5.

Special Tool



09950-78230
Flare nut wrench (10 x 11 mm)

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:

- **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 descriptions (items) not found in this section, refer to the same section of the Service Manual mentioned in FOREWORD of this manual.**

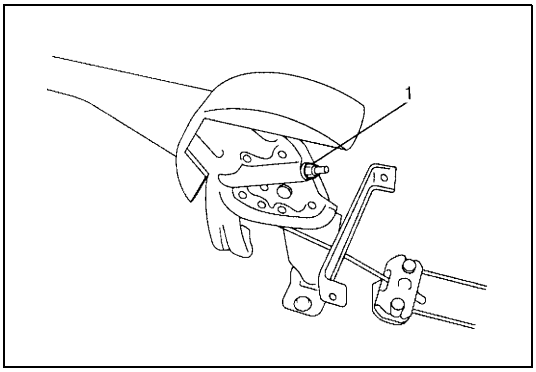
CONTENTS

On-Vehicle Service

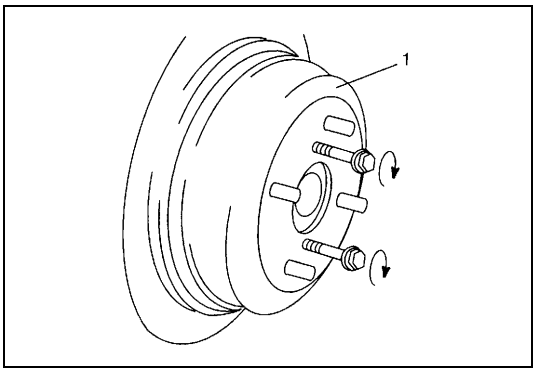
Brake Drum

REMOVAL

1) Hoist vehicle and remove wheel.
2) Release parking brake lever.

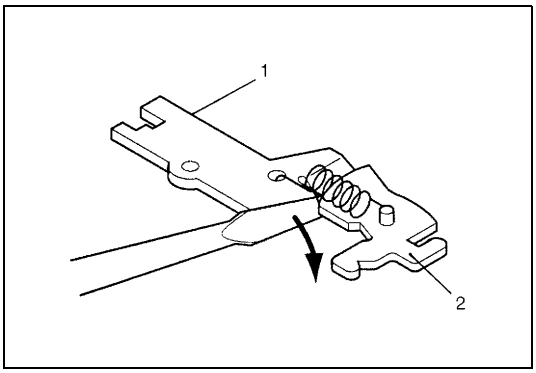


3) Remove brake drum.
   If brake drum can not be removed easily, increase clearance between brake shoes and drum as follows.
   a) Remove console box and loosen parking brake cable adjusting nut (1).

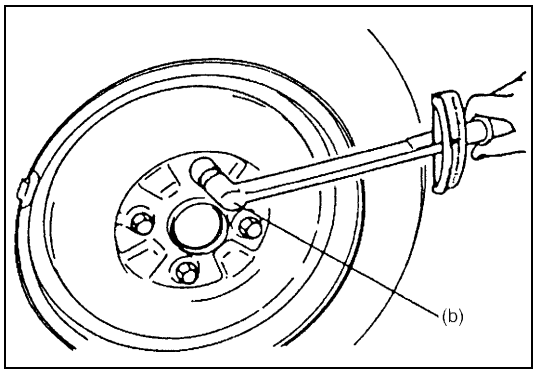


   b) Pull brake drum (1) off by using 8 mm bolts.

INSTALLATION



1) Put flat head rod or the like between rod (1) and ratchet (2) and pull ratchet as shown to maximize clearance between shoe and drum.
2) Install brake drum after making sure that inside of brake drum and brake shoes are free from dirt and oil.
3) Upon completion of all jobs, depress brake pedal with about 30 kg (66 lbs) load three to five times so as to obtain proper drum-to-shoe clearance.
   Adjust parking brake cable. (For adjustment, see PARKING BRAKE INSPECTION AND ADJUSTMENT in Section 5.)
4) Install console box if removed.



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

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

6) 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 Back Plate

REMOVAL AND INSTALLATION

Refer to “REAR AXLE SHAFT AND WHEEL BEARING (4WD VEHICLE)” in Section 3E.

SECTION 5E1

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 descriptions (items) not found in this section, refer to the same section of the Service Manual mentioned in the FOREWORD of this manual.**

CONTENTS

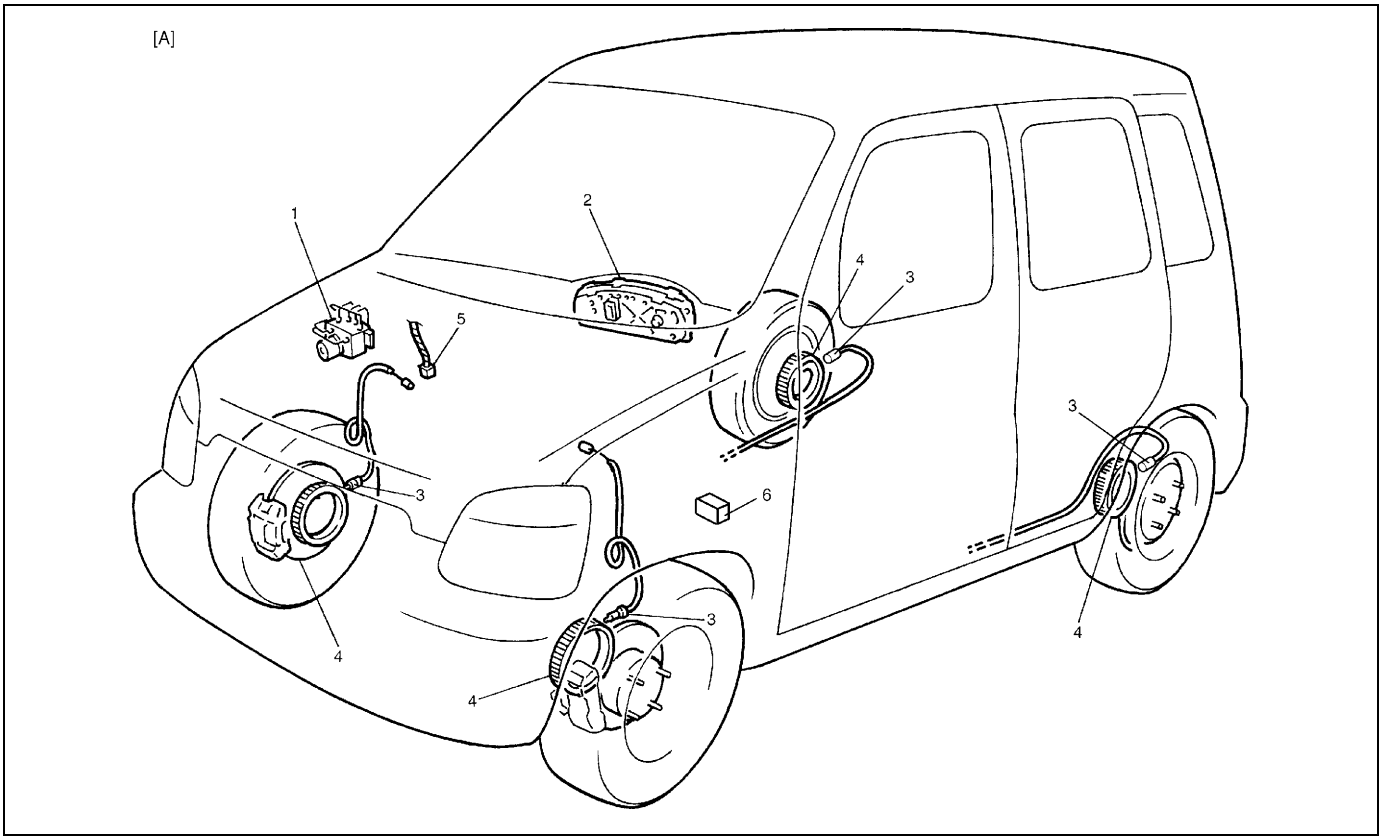
General Description

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.

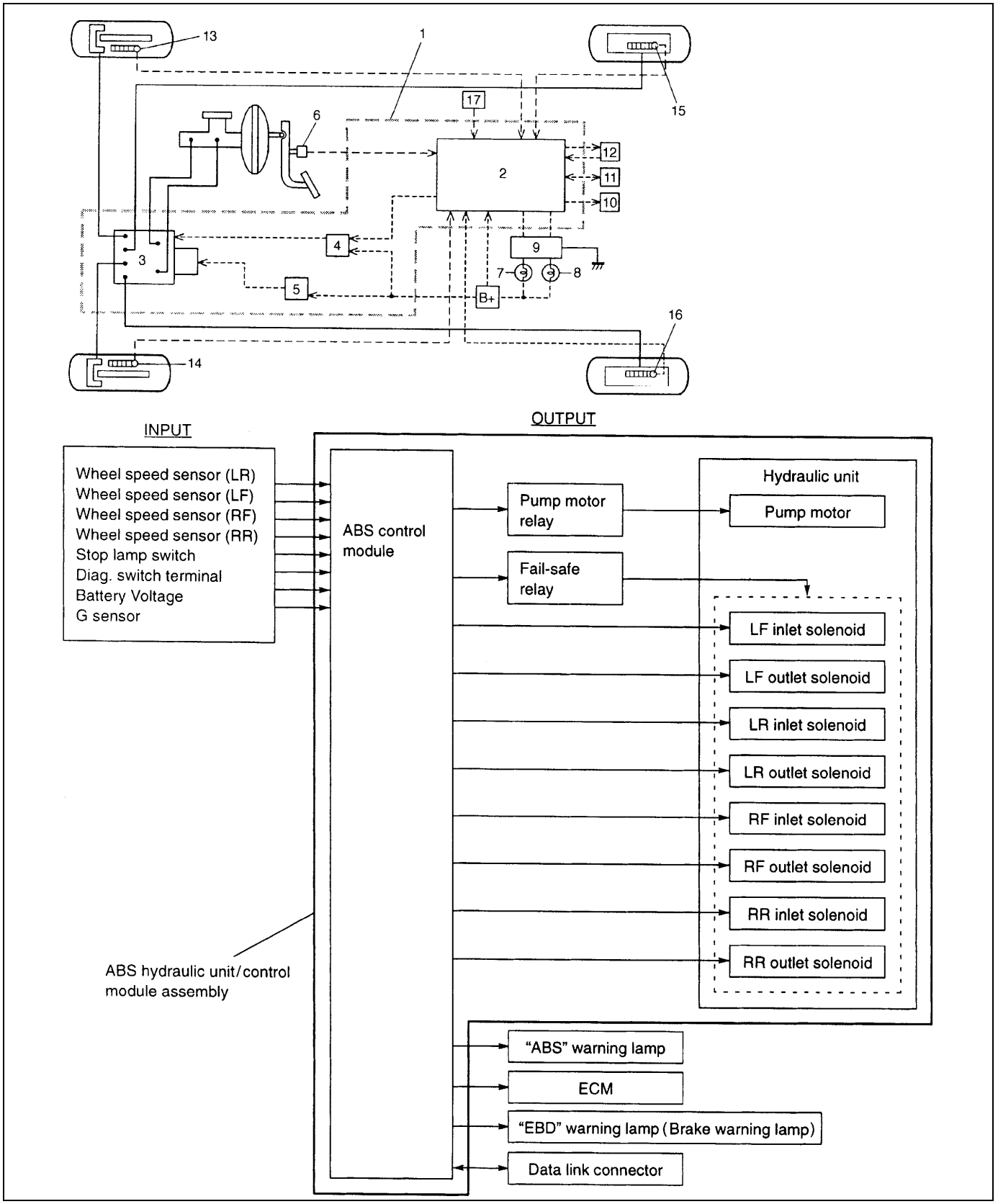
- Wheel speed sensor which senses revolution speed of each wheel and outputs its signal.
- "ABS" warning lamp which lights to inform abnormality when system fails to operate properly.
- ABS hydraulic unit/control module assembly is incorporated ABS control module, ABS hydraulic unit (actuator assembly), 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 which detects vehicle deceleration speed. (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.



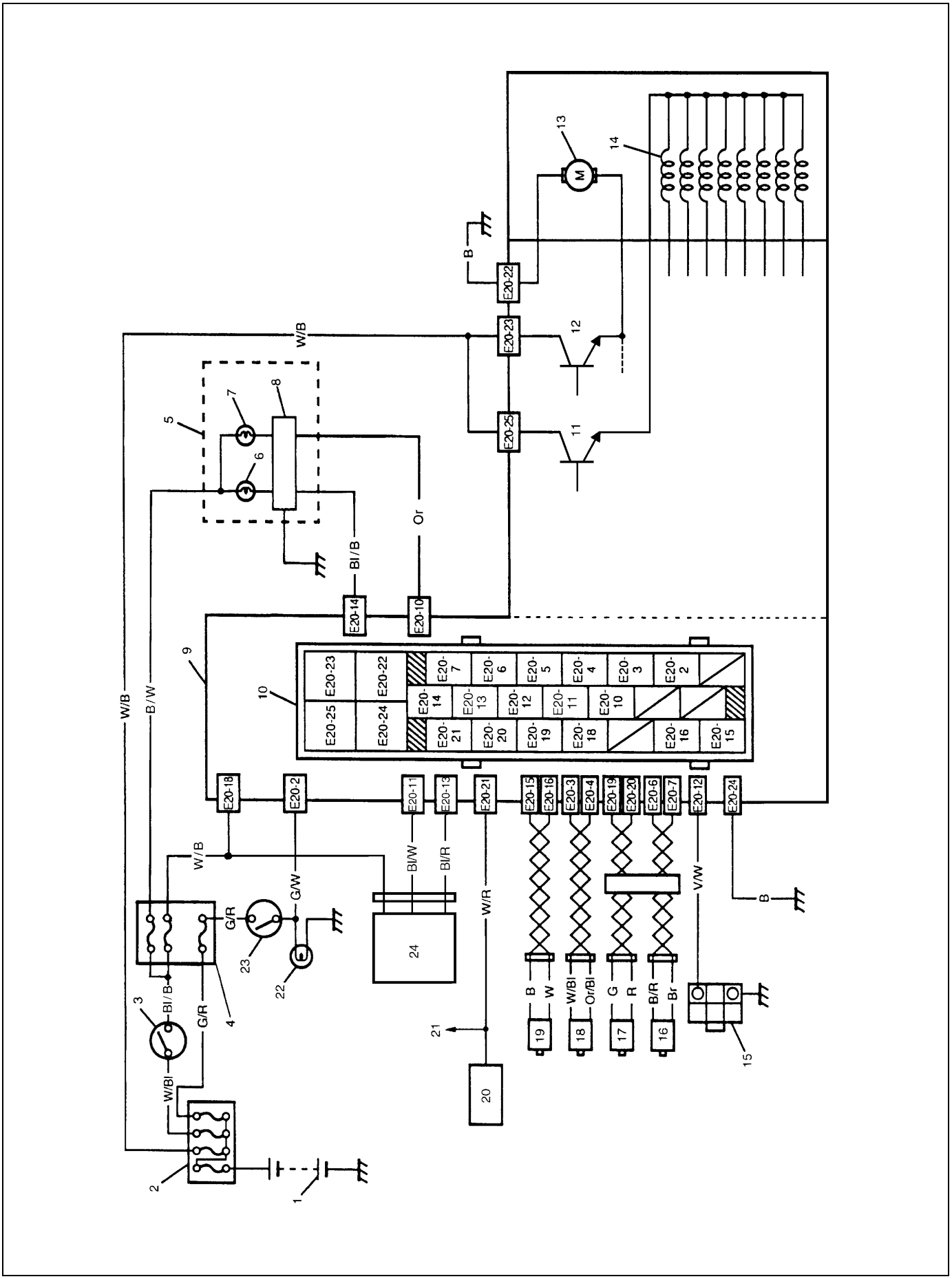
[A] : LH steering vehicle shown	2. Combination meter	4. Wheel speed sensor ring	6. G sensor
1. ABS hydraulic unit/control module assembly	3. Wheel speed sensor	5. Monitor coupler	

System Schematic



1. ABS hydraulic unit/control module assembly	7. "ABS" warning lamp	13. Wheel speed sensor (Right-front)
2. ABS control module	8. "EBD" warning lamp (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	16. Wheel speed sensor (Left-rear)
5. Pump motor relay	11. Data link connector	17. G sensor
6. Stop lamp switch	12. Monitor coupler	

System Circuit



1. Battery	9. ABS hydraulic unit/control module assembly	17. Left-rear wheel speed sensor
2. Main fuses	10. Terminal arrangement of ABS hydraulic unit/control module assembly	18. Right-front wheel speed sensor
3. Ignition switch	11. ABS fail-safe relay (Solenoid valve relay)	19. Left-front wheel speed sensor
4. Circuit fuses	12. ABS pump motor relay	20. Data link connector
5. Combination meter	13. Pump motor	21. To ECM, SDM and EPS controller (if equipped)
6. “ABS” warning lamp	14. Solenoid valves	22. Stop lamp
7. “EBD” warning lamp (Brake warning lamp)	15. Diagnosis monitor coupler	23. Stop lamp switch
8. Warning lamp driver module (for ABS)	16. Right-rear wheel speed sensor	24. G sensor

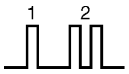
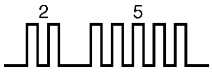
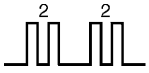
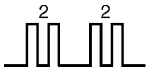
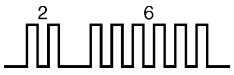
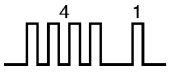
Wire color					
B :	Black	Br :	Brown	R :	Red
B/R :	Black/Red	G :	Green	V/W :	Violet/White
B/W :	Black/White	G/R :	Green/Red	W/B :	White/Black
Bl/B :	Blue/Black	G/W :	Green/White	W/Bl :	White/Blue
Bl/R :	Blue/Red	Or :	Orange	W/R :	White/Red
Bl/W :	Blue/White	Or/Bl :	Orange/Blue		

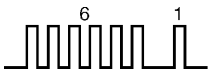
TERMINAL	CIRCUIT
E20-1	——
E20-2	Stop lamp switch
E20-3	Right-front wheel speed sensor (+)
E20-4	Right-front wheel speed sensor (–)
E20-5	——
E20-6	Right-rear wheel speed sensor (–)
E20-7	Right-rear wheel speed sensor (+)
E20-8	——
E20-9	——
E20-10	“EBD” warning lamp (Brake warning lamp)
E20-11	G sensor
E20-12	Diagnosis switch terminal
E20-13	Ground (for G sensor)
E20-14	“ABS” warning lamp
E20-15	Left-front wheel speed sensor (+)
E20-16	Left-front wheel speed sensor (–)
E20-17	——
E20-18	Ignition switch
E20-19	Left-rear wheel speed sensor (+)
E20-20	Left-rear wheel speed sensor (–)
E20-21	Data link connector
E20-22	Ground (for ABS pump motor)
E20-23	ABS pump motor relay
E20-24	Ground (for ABS control module)
E20-25	ABS fail-safe relay

Diagnosis

Diagnostic Trouble Code (DTC) Table

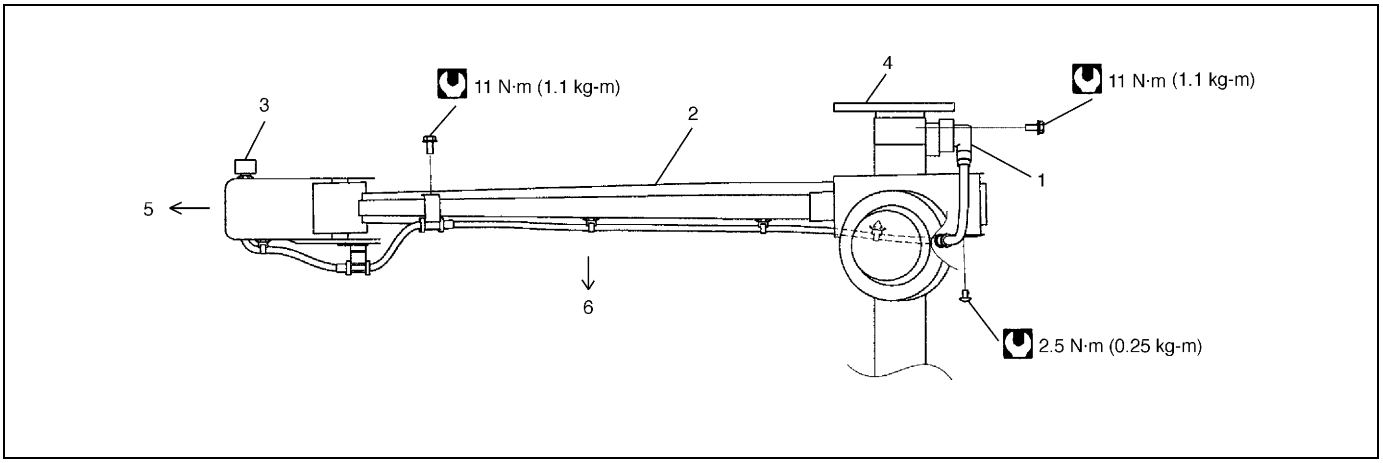
CAUTION:
Be sure to perform "ABS DIAGNOSTIC FLOW TABLE" referring to Section 5E1 of the Service Manual mentioned in FOREWORD of this manual before starting diagnosis.

DTC (displayed on SUZUKI scan tool)	DTC (indicated by "ABS" warning lamp)	ABS warning lamp flashing pattern	DIAGNOSTIC ITEMS	
NO DTC	12		Normal	
C1013	13		ABS control module	
C1015	15		G sensor circuit	
C1021	21		RF	Wheel speed sensor circuit
C1025	25		LF	
C1031	31		RR	
C1035	35		LR	
C1022	22		RF	Wheel speed sensor circuit or sensor ring
C1026	26		LF	
C1032	32		RR	
C1036	36		LR	
C1041	41		RF	Inlet solenoid valve circuit
C1042	42			Outlet solenoid valve circuit
C1045	45		LF	Inlet solenoid valve circuit
C1046	46			Outlet solenoid valve circuit

DTC (displayed on SUZUKI scan tool)	DTC (indicated by "ABS" warning lamp)	ABS warning lamp flashing pattern	DIAGNOSTIC ITEMS	
C1051	51		RR	Inlet solenoid valve circuit
C1052	52			Outlet solenoid valve circuit
C1055	55		LR	Inlet solenoid valve circuit
C1056	56			Outlet solenoid valve circuit
C1057	57		Power source	
C1061	61		ABS pump motor and/or motor relay circuit	
C1063	63		Fail safe-relay	
C1071	71		ABS control module	

On-Vehicle Service

Rear Wheel Speed Sensor

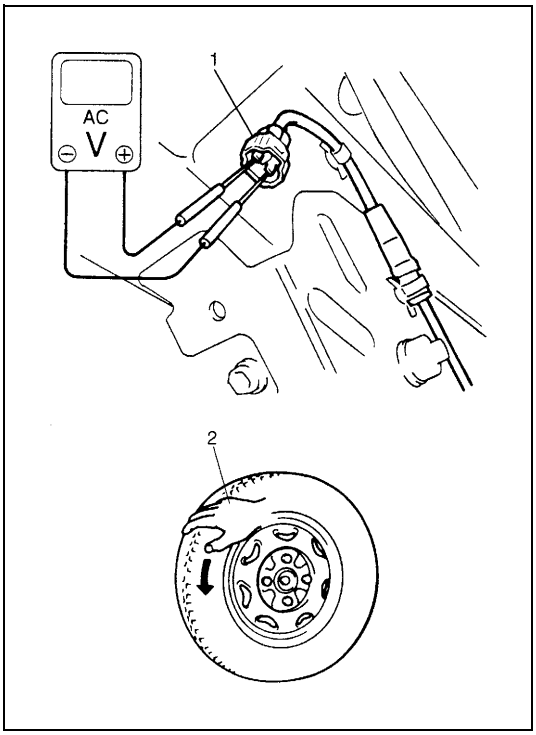


1. Rear wheel speed sensor (right side)	4. Rear axle housing	Tightening torque
2. Trailing arm	5. Forward	
3. Sensor coupler	6. Vehicle inside	

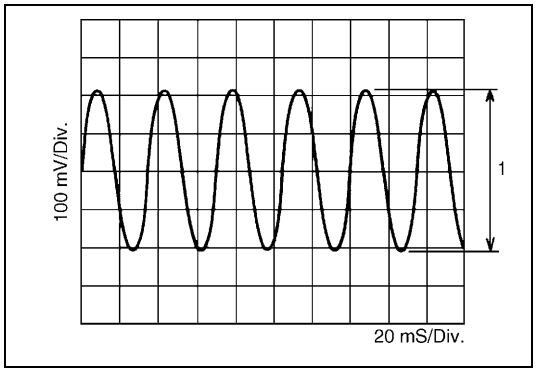
OUTPUT VOLTAGE INSPECTION

1) Turn ignition switch “OFF”.
2) Hoist vehicle.
3) Disconnect connector of wheel speed sensor.
4) Connect voltmeter between connector (1) terminals.
5) While turning wheel at a speed of approximately 1/2 to 1 rotation per second, check AC voltage of sensor.
   If measured voltage is not as specified, check sensor, rotor and their installation conditions.

Output AC voltage at 1/2 to 1 rotation per second
106 mV or more



2. Rotate by hand

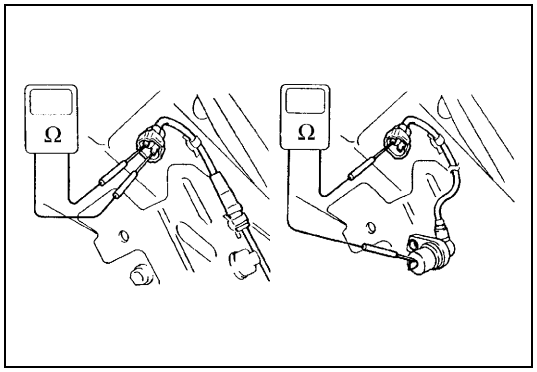


Reference

When using oscilloscope for this check, check if peak-to-peak voltage (1) meets specification and waveform is complete.

Peak-to-peak voltage at 1/2 to 1 rotation per second
150 mV or more at 20 Hz

SENSOR INSPECTION



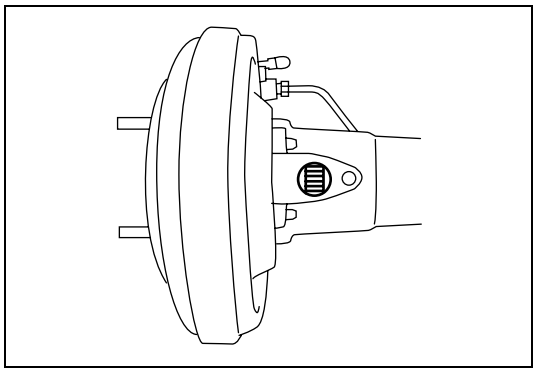
- Check sensor for damage.
- Check sensor for resistance and continuity.
  If the check result is not as specified and any malcondition is found, replace.

Between both terminals of sensor
1.2 – 1.6 kΩ at 20°C (68°F)

Between sensor terminal and sensor body
No continuity

Rear Wheel Speed Sensor Ring

INSPECTION



- Check rotor serration (teeth) for being missing damaged or deformed.
- Turn wheel and check if rotor rotation is free from eccentricity and looseness.
- Check that no foreign material is attached.
- If any faulty is found, repair or replace.

REMOVAL/ INSTALLATION

NOTE:

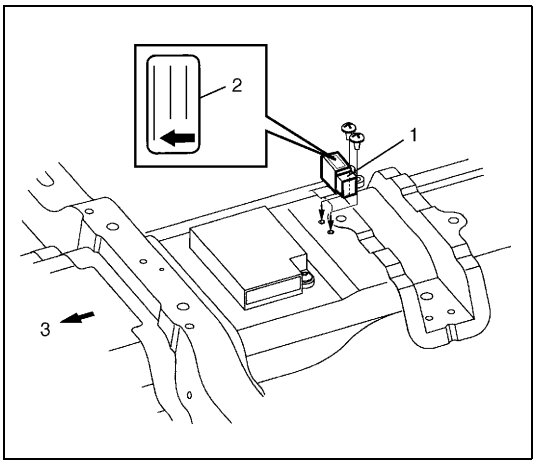
The rear wheel speed sensor ring can not be removed or replaced alone. If rear wheel speed sensor ring needs to be replaced, replace it as a retainer ring of rear axle shaft.

For removal and installation of retainer ring of rear axle shaft, refer to “REAR AXLE SHAFT AND WHEEL BEARING” in Section 3E.

G Sensor (For 4WD Vehicle Only)

REMOVAL

1) Turn ignition switch OFF and disconnect battery negative cable.
2) Remove center console box.

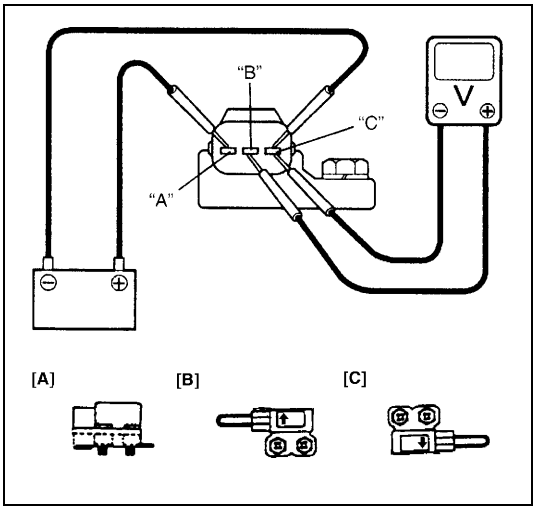


3) Remove G sensor (1) from floor.
4) Disconnect connector from sensor.

CAUTION:
Sensor must not be dropped or shocked. It will affect its original performance.

2.	Label
3.	Forward

INSPECTION



Connect positive cable of 12 volt battery to "A" terminal of sensor and ground cable to "C" terminal. Then using voltmeter, check voltage between "B" terminal and "C" terminal.

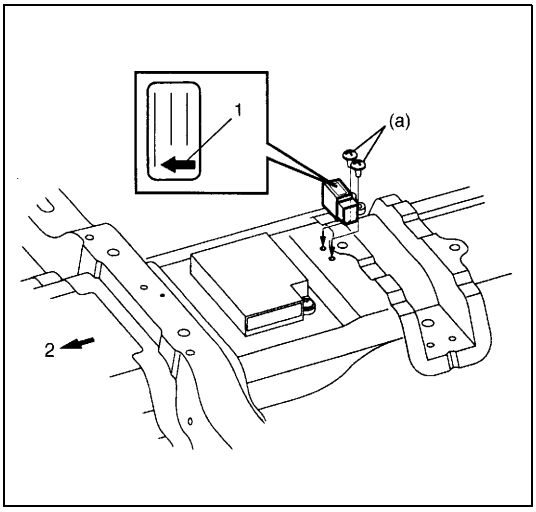
G sensor specification
When placed horizontally : 2 – 3 V
When placed upright with arrow upward : 3 – 4 V
When placed upright with arrow downward : 1 – 2 V

If measured voltage is not as specified, replace sensor.

[A] :	Horizontal
[B] :	Upright with arrow upward
[C] :	Upright with arrow downward

INSTALLATION

1) Connect connector to sensor securely.



2) Install sensor onto floor so that arrow mark (1) directs vehicle forward (2). Tighten bolts to specified torque.

Tightening torque
G sensor bolt (a) : 3.0 N·m (0.3 kg-m, 2.2 lb-ft)

3) Install rear console box.
4) Connect negative cable at battery.

Tightening Torque Specification

Fastening part	Tightening torque		
	N•m	kg-m	lb-ft
G sensor bolt	3.0	0.3	2.2

SECTION 6A1

ENGINE MECHANICAL

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).**

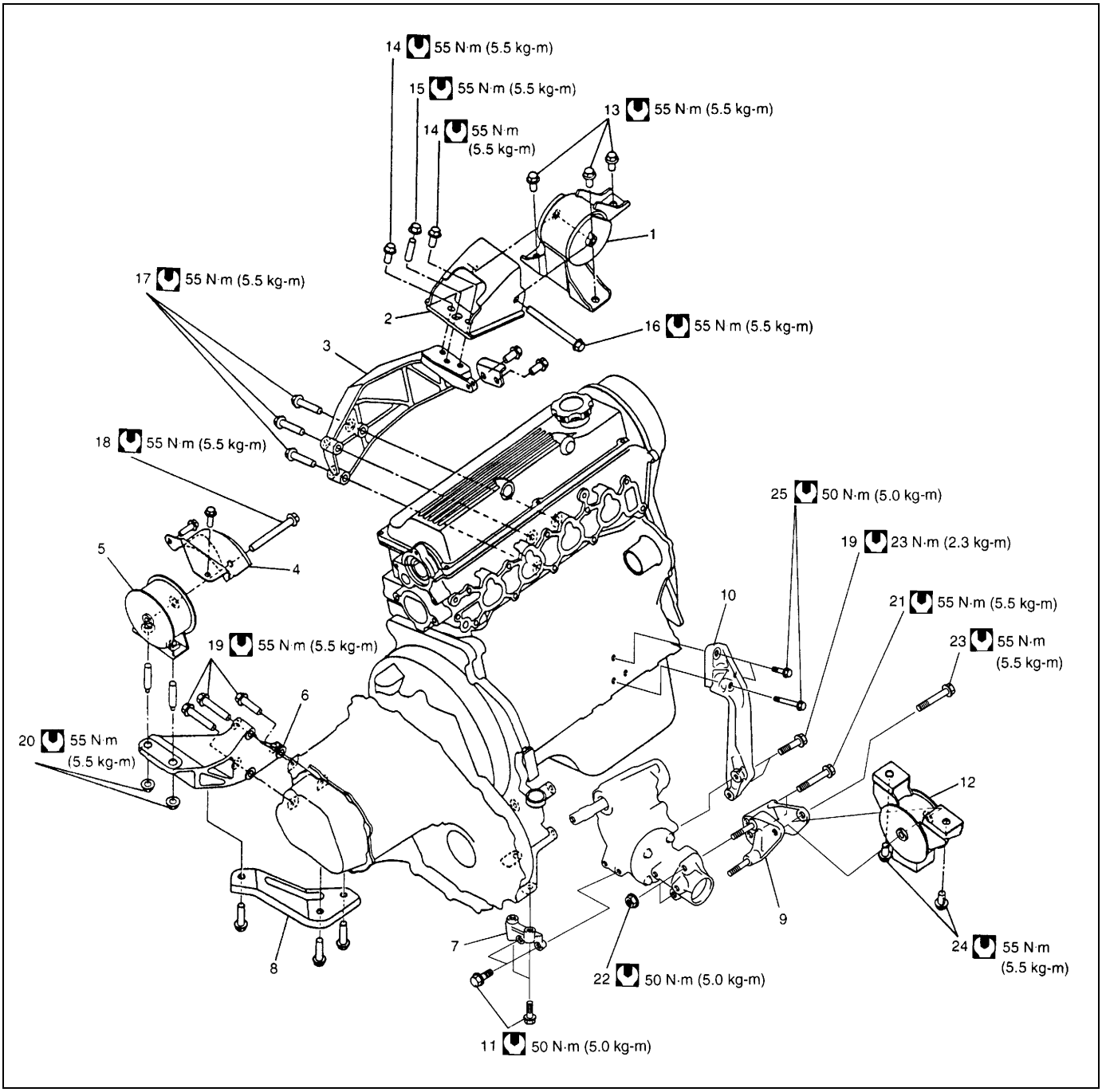
NOTE:

For the descriptions (items) not found in this section, refer to the same section of the Service Manual mentioned in the FOREWORD of this manual.

CONTENTS

Unit Repair Overhaul

Engine Mounting

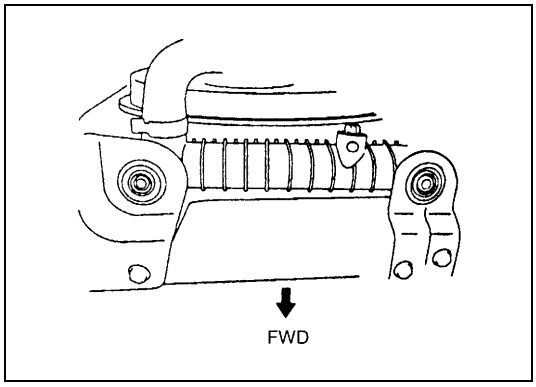


1. Right mounting	10. Transfer to engine stiffener (if equipped)	19. Transfer to engine stiffener No.1 bolt (if equipped)
2. Right mounting swing bracket	11. Transfer stiffener bolt	20. Left mounting nut
3. Right mounting bracket	12. Rear mounting	21. Rear mounting bracket bolt
4. Left mounting body bracket	13. Right mounting body bolt	22. Rear mounting bracket nut
5. Left mounting	14. Right mounting bracket & swing bolt	23. Rear mounting bush bolt
6. Left mounting bracket	15. Right mounting bracket & swing nut	24. Rear mounting body bolt
7. Transfer stiffener	16. Right mounting bush bolt	25. Transfer to engine stiffener No.2 bolt (if equipped)
8. Left mounting bracket stiffener	17. Right mounting bracket bolt	Tightening Torque
9. Rear mounting bracket	18. Left mounting bush bolt	

Engine Assembly

REMOVAL

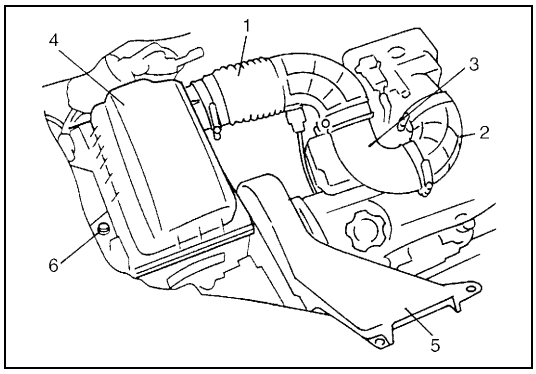
1) Release fuel pressure in fuel feed line by referring to Section 6 of the Service Manual mentioned in the FOREWORD of this manual.
2) After disconnect negative and positive cables at battery, remove battery and battery tray.
3) Remove engine hood after disconnecting windshield washer hose.



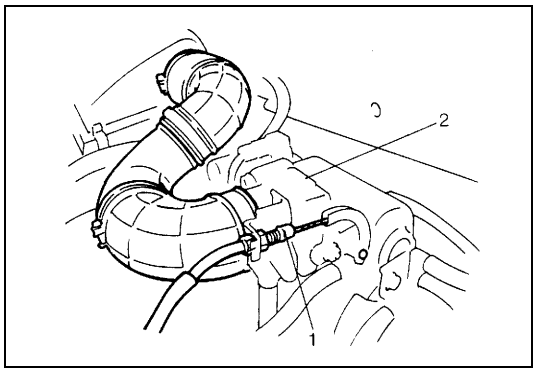
4) Drain cooling system.

WARNING:
To help avoid danger of being burned, do not remove drain plug and radiator cap while engine and radiator are still hot. Scalding fluid and steam can be blown out under pressure if plug and cap are taken off too soon.

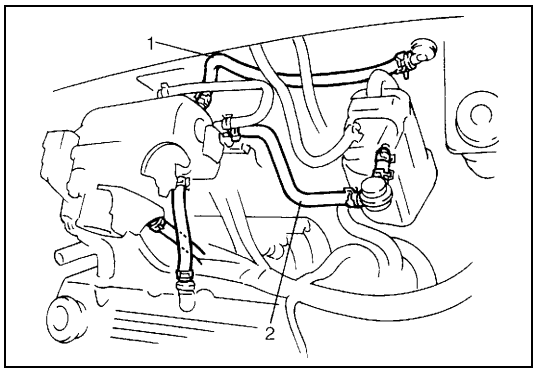
5) Disconnect radiator inlet hose from thermostat case and outlet hose from water inlet pipe.



6) Remove air cleaner outlet No.1 hose (1) and No.2 hose (2) with air intake joint (3).
7) Remove suction pipe (5) and remove air cleaner assembly (4) by removing its fastening bolt (6).



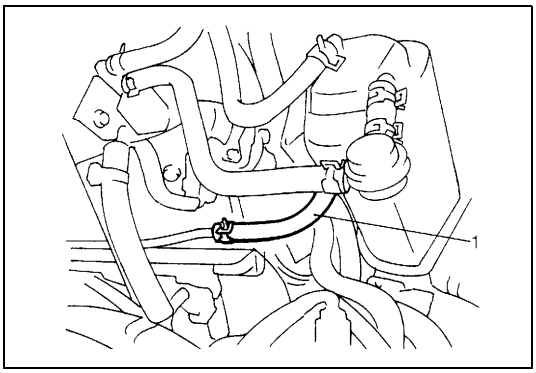
8) Disconnect the following cables.
   - Accelerator cable (1) from throttle body (2).
   - Clutch cable from transmission.
   - Gear shift and select control cables from transmission.



9) Disconnect the following vacuum hose.
   - Brake booster hose (1) from intake manifold.
   - Canister purge hose (2) from EVAP canister purge valve.

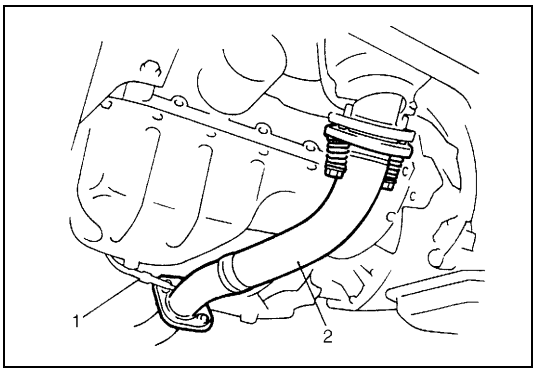
10) Disconnect the following electric wires:
- Back-up light switch
- Battery negative cable from transmission
- Vehicle speed sensor
- e.t.c.

and release above wire harness from clamps.



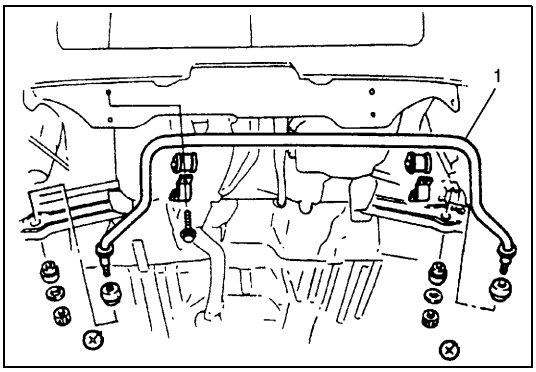
11) Disconnect fuel feed hose (1) from fuel delivery pipe.
12) Disconnect heater inlet and outlet hoses.

13) Remove right and left engine under covers.



14) Disconnect oxygen sensor No.2 (1) coupler and remove exhaust No.1 pipe (2).

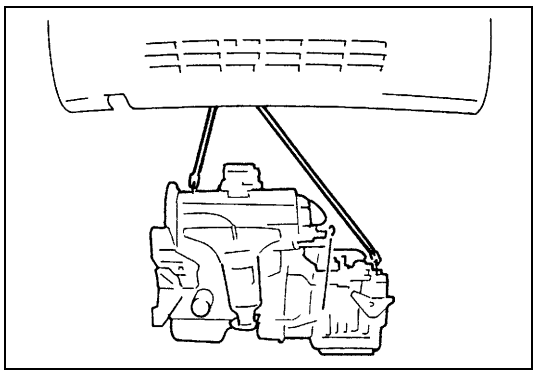
15) Drain engine oil, transmission oil and transfer oil.
16) Remove propeller shafts referring to Section 4B.



17) Remove stabilizer bar (1) referring to Section 3D of the Service Manual mentioned in the FOREWORD of this manual.

18) Remove drive shaft joints from differential gear of transmission and intermediate shaft of transfer.
Refer to Section 4 of the Service Manual mentioned in the FOREWORD of this manual for procedure to disconnect drive shaft joint.
For engine and transmission removal, it is not necessary to remove drive shafts from steering knuckle.

19) Disconnect A/C suction and discharge hoses and then remove A/C compressor and its bracket (if equipped), refer to Section 1B of the Service Manual mentioned in the FOREWORD of this manual.
20) Install support device.
21) Remove the following bolts and nuts referring to the figure of "Engine Mounting" in this section.
    a) Remove engine rear mounting bush bolt.
    b) Remove engine left mounting nuts.
    c) Remove engine right mounting bracket bolts and nut.
22) Before removing engine with transmission and transfer from body, recheck to make sure all hoses, electric wires and cables are disconnected from engine and transmission.



23) Lower engine with transmission and transfer from body.

INSTALLATION

1) Lift engine with transmission and transfer into engine compartment, but do not remove support device.
2) Install engine right mounting bracket bolts and nut.
3) Install engine left mounting nuts.
4) Install engine rear mounting bush bolt.
5) Tighten bolts and nuts to specified torque referring to the figure of “Engine Mounting” in this section.
6) Remove support device.
7) Reverse removal procedures for installation of remainder.
   - Install A/C compressor bracket and A/C compressor and connect A/C suction and discharge hoses, refer to Section 1B of the Service Manual mentioned in the FOREWORD of this manual.
   - Push in each drive shaft joint fully so that snap ring engages with differential gear and intermediate shaft of transfer.
     Use care not to damage oil seal lip when inserting.
   - Install stabilizer bar, refer to Section 3D of the Service Manual mentioned in the FOREWORD of this manual.
   - Install exhaust No.1 pipe.
   - Install right and left engine under covers.
   - Connect each hoses securely.
   - Clamp electric wire securely.
8) Adjust clutch pedal free travel, referring to Section 7C of the Service Manual mentioned in the FOREWORD of this manual.
   Connect gear shift and select control cables referring to Section 7A.
9) Refill transmission with gear oil referring to Section 7A of the Service Manual mentioned in the FOREWORD of this manual.
10) Refill engine with engine oil, referring to Section 0B of the Service Manual mentioned in the FOREWORD of this manual.
11) Refill cooling system, referring to Section 6B of the Service Manual mentioned in the FOREWORD of this manual.
12) Adjust A/C compressor belt (if equipped), referring to Section 1B of the Service Manual mentioned in the FOREWORD of this manual.
13) Upon completion of installation, verify that there is no fuel leakage, coolant leakage, transmission oil leakage or exhaust gas leakage at each connection.
14) Adjust accelerator cable play, referring to Section 6E of the Service Manual mentioned in the FOREWORD of this manual.

SECTION 7A

MANUAL TRANSMISSION

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 descriptions (items) not found in this section, refer to the same section of the Service Manual mentioned in the FOREWORD of this manual.

CONTENTS

General Description

Construction and Servicing

The transmission provides five forward speeds and one reverse speed by means of three synchronizer mesh devices and three shafts-input shaft, countershaft and reverse gear shaft. All forward gears are in constant mesh, and reverse uses a sliding idler gear arrangement.

The low speed synchronizer mesh device is mounted on counter shaft and engaged with counter shaft first gear or second gear, while the high speed synchronizer mesh device is done on input shaft and engaged with input shaft third gear or fourth gear. The fifth speed synchronizer mesh device on input shaft is engaged with input shaft fifth gear mounted on the input shaft.

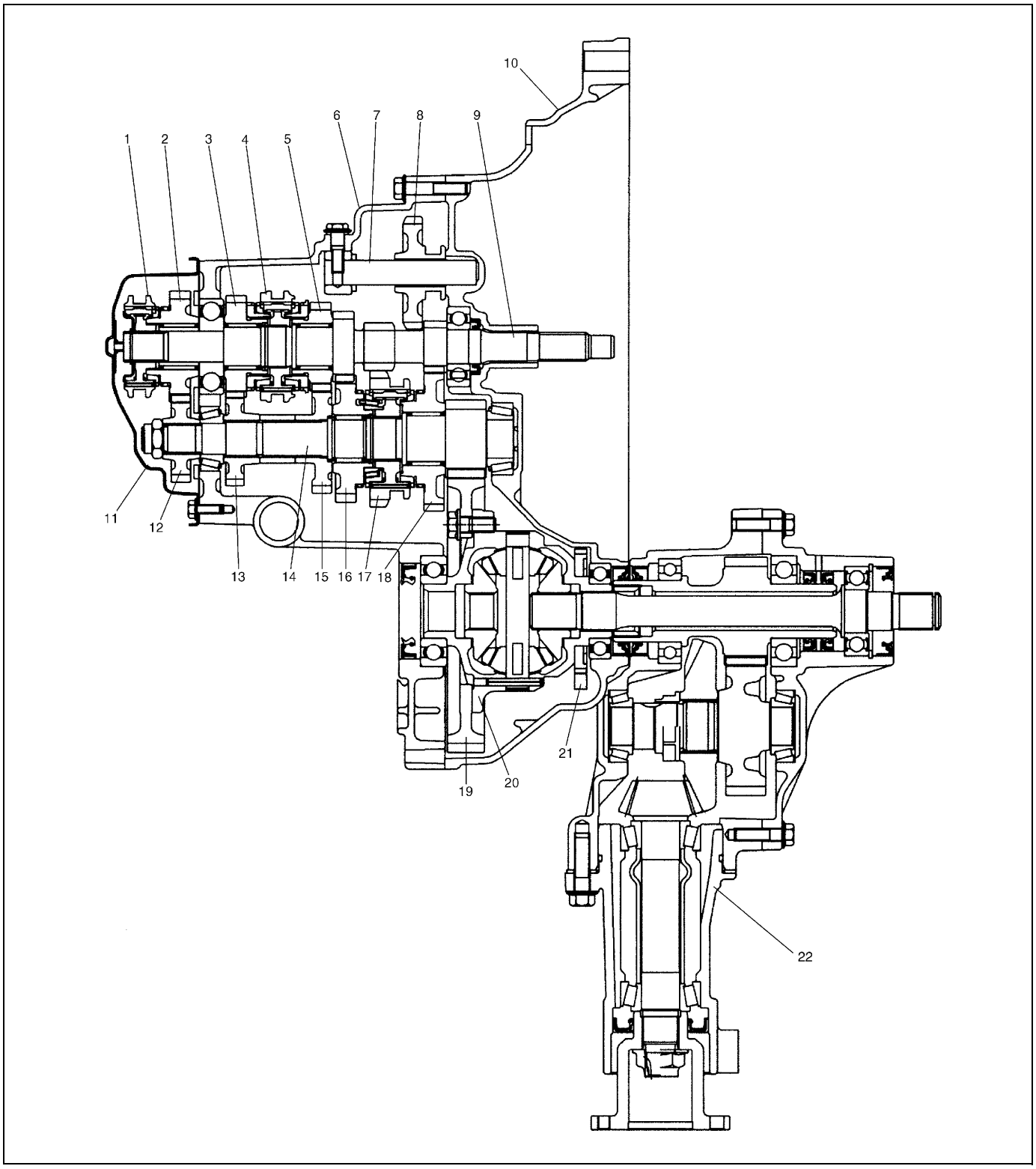
The double cone synchronizing mechanism is provided to 2nd gear synchromesh device for high performance of shifting to 2nd gear.

The countershaft turns the final gear and differential assembly, thereby turning the front drive shafts which are attached to the front wheels.

4WD model is equipped with transfer assembly on transmission being mated to right side of differential output in transmission.

For servicing, it is necessary to use genuine sealant or its equivalent on mating surfaces of transmission case which is made of aluminum. The case fastening bolts must be tightened to specified torque by means of torque wrench. It is also important that all parts are thoroughly cleaned with cleaning fluid and air dried before reassembling.

Further, care must be taken to adjust preload of counter shaft taper roller bearings. New synchronizer rings are prohibited from being lapped with respective gear cones by using lapping compound before they are assembled.



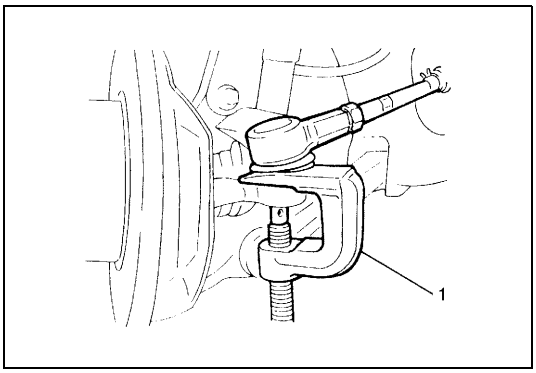
1. 5th speed sleeve & hub	7. Reverse gear shaft	13. Countershaft 4th gear	19. Final gear
2. Input shaft 5th gear	8. Reverse idler gear	14. Countershaft	20. Differential case
3. Input shaft 4th gear	9. Input shaft	15. Countershaft 3rd gear	21. Vehicle speed sensor
4. High speed sleeve & hub	10. Right case	16. Countershaft 2nd gear	22. Transfer assembly
5. Input shaft 3rd gear	11. Side cover	17. Low speed sleeve & hub	
6. Left case	12. Countershaft 5th gear	18. Countershaft 1st gear	

On-Vehicle Service

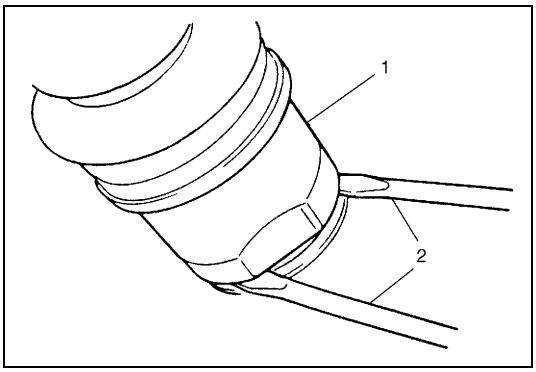
Differential Side Oil Seal

REPLACEMENT

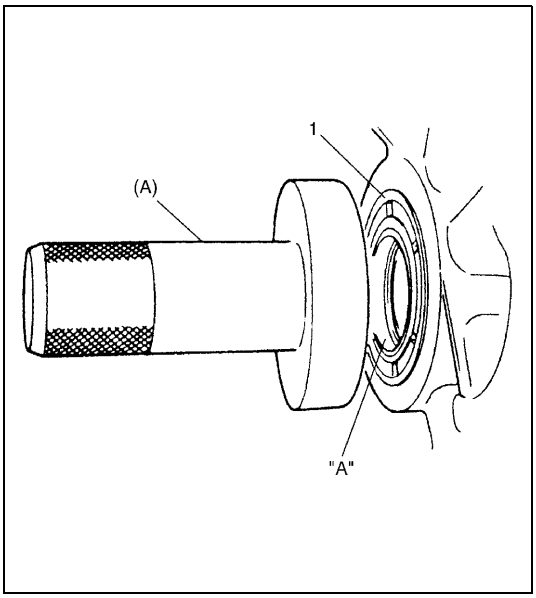
1) Lift up vehicle and drain transmission and transfer oil.
2) Remove wheel, and then remove tie-rod end nut.



3) Disconnect tie-rod end from knuckle by using puller (1).
4) Remove two stabilizer mount brackets from vehicle body.
5) Remove ball stud bolt and then separate suspension arm from knuckle.
6) Separate transfer from transmission assembly.
   For detail, refer to Section 7D.



7) By using large size screwdrivers (2), pull out drive shaft joint (1) so as to release snap ring fitting of joint spline at differential side.
   Pushing knuckle portion outward, detach drive shaft at differential side.



8) Remove oil seal (1) and install a new one until it becomes flush with case surface by using special tool and hammer.

NOTE:

When installing oil seal, face its spring side inward.

Special tool
(A) : 09913-75510 (LH)
(A) : 09951-46010 (RH)

9) Apply grease to oil seal lip and at the same time check drive shaft where oil seal contacts and make sure of its smoothness.

"A" : Grease 99000-25010

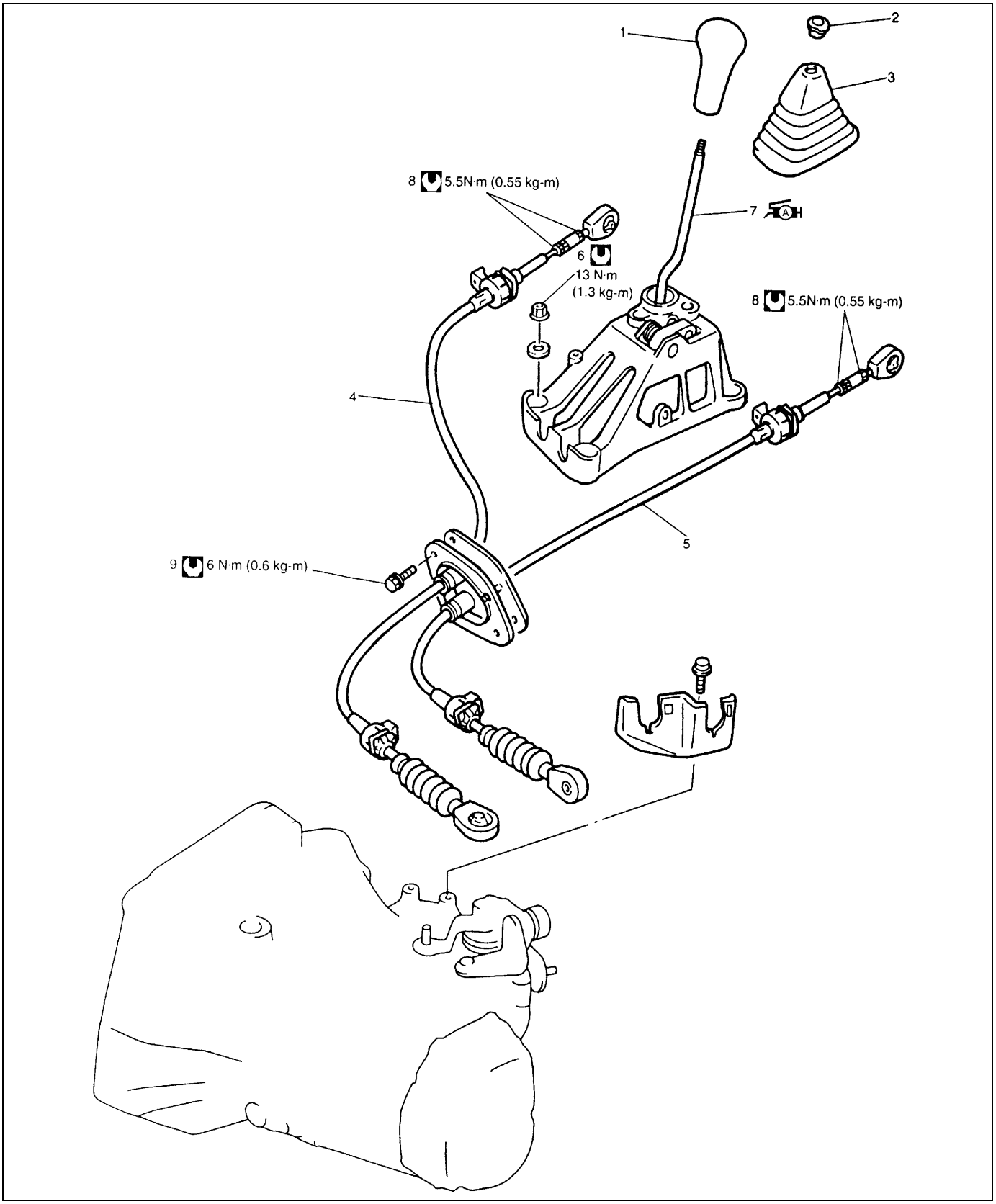
10) Install transfer to transmission referring to Section 7D.

11) Insert drive shaft joint to differential gear.

CAUTION:
- **Be careful not to scratch oil seal lip with drive shaft joint while inserting.**
- **Make sure to insert drive shaft joint fully and seat its snap ring as it was.**
- **Do not hit joint boot with hammer or the like. Nothing but hands is allowed to use when inserting joint.**

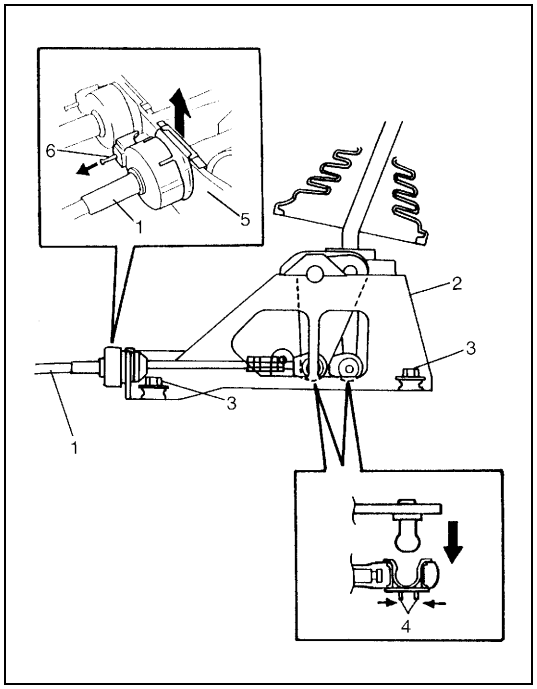
12) Connect ball stud with knuckle and fasten with bolt to specification referring to Section 3D of the Service Manual mentioned in the FOREWORD of this manual.
13) Connect tie-rod end with knuckle and fasten new nut to specified torque referring to Section 3D of the Service Manual mentioned in the FOREWORD of this manual.
14) Install stabilizer mount brackets, fasten bolts to specified torque referring to Section 3D of the Service Manual mentioned in the FOREWORD of this manual.
15) Pour transmission oil and transfer oil as specified and make sure that oil has been sealed with oil seal.

Gear Shift Control Lever and Cable



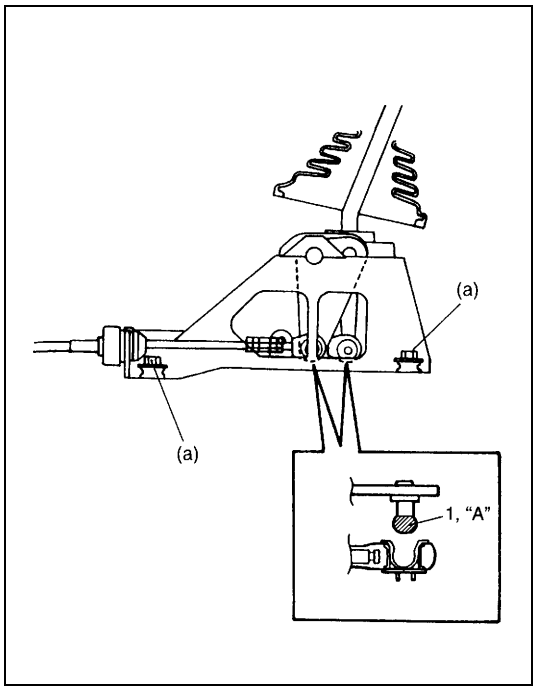
1. Gear shift control lever knob	5. Gear select control cable	8. Cable nut
2. Lever boot holder	6. Gear shift control cable guide nut	9. Cable mounting bolt
3. Gear shift lever boot	7. Gear shift control lever assembly : Apply grease 99000-25010 to pin ends to which shift and select cables are connected.	Tightening Torque
4. Gear shift control cable		

REMOVAL



1) Remove console box.
2) Disconnect gear shift and select control cables (1) from gear shift control lever assembly (2).
   a) Disconnect cable end from pivot while pushing cable end bush (4).
   b) Detach cable from bracket (5) while pulling pin (6).
3) Remove gear shift control lever assembly mounting nuts (3) and gear shift lever assembly from body.
4) Disconnect shift and select cables from transmission in the same manner as step 2).
5) Remove cable grommet and cable clamp, and then remove shift and select cables from body.

INSTALLATION



Reverse removal procedure for installation and note as follows.

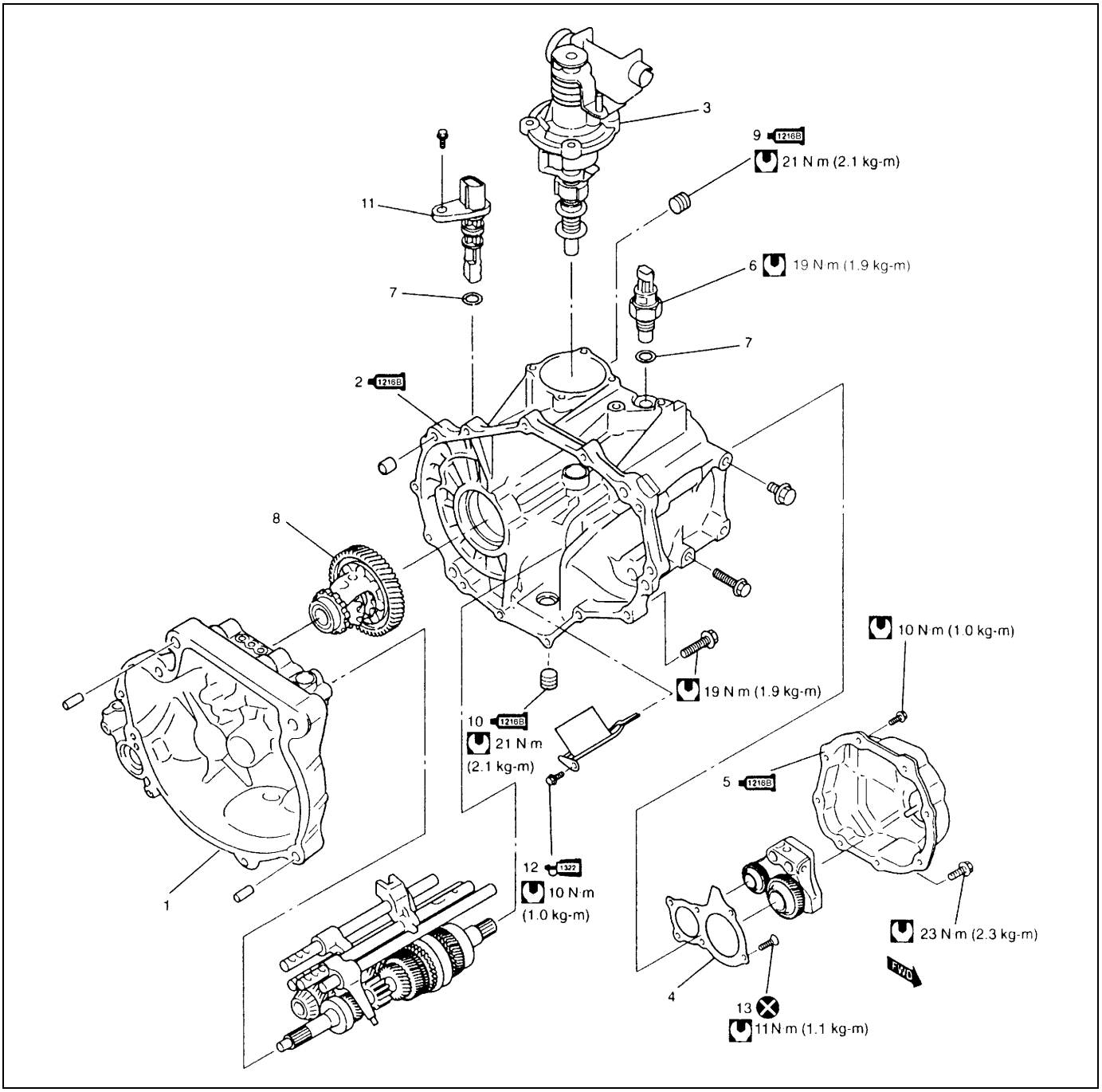
- Apply grease to pin ends (1) before installing shift and select cable ends to pin ends.

"A" : Grease 99000-25010

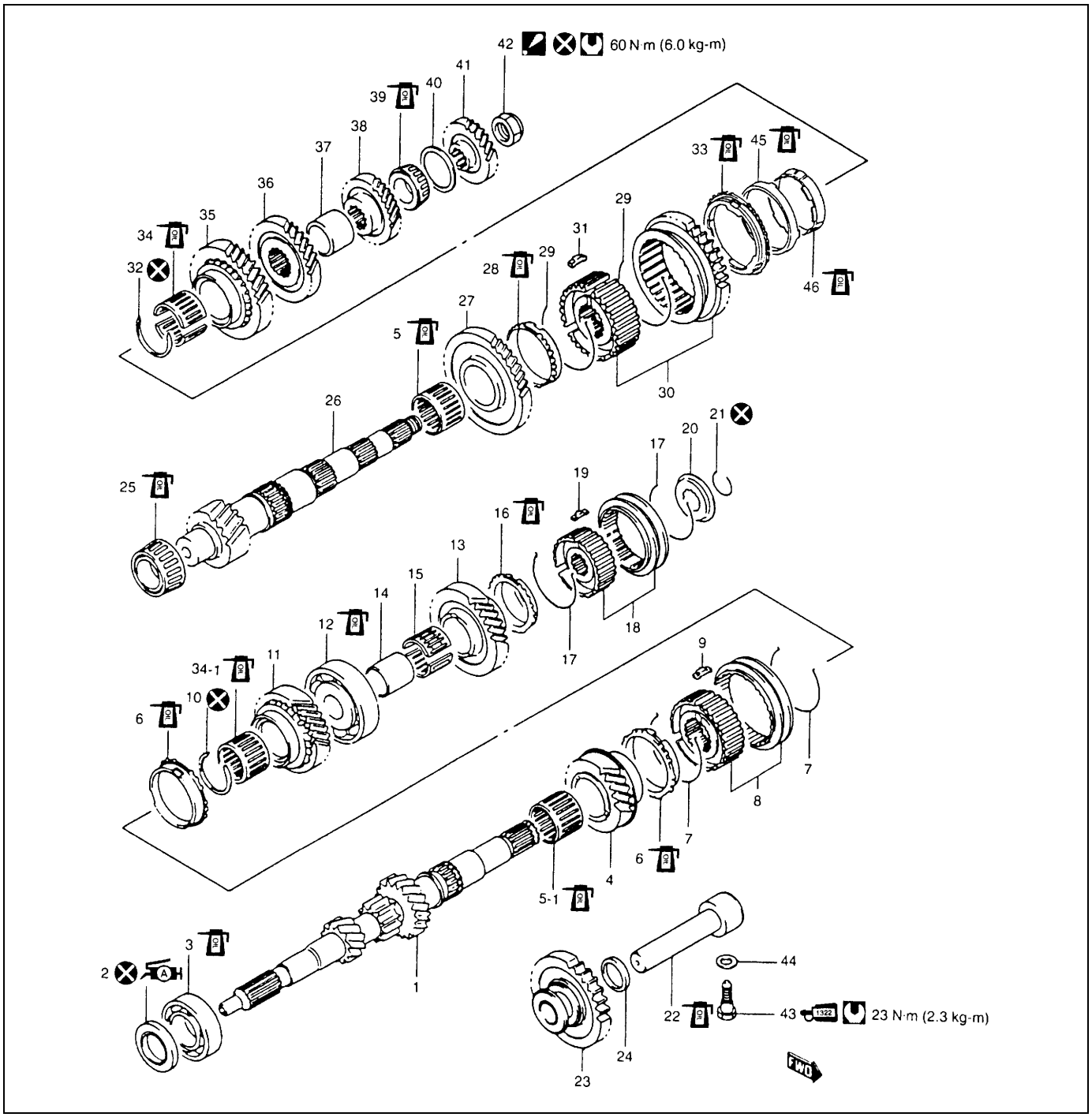
- Tighten gear shift control lever assembly mounting nuts to specified torque.

Tightening torque
Gear shift control lever assembly nuts
(a) : 13 N·m (1.3 kg-m, 9.5 lb-ft)

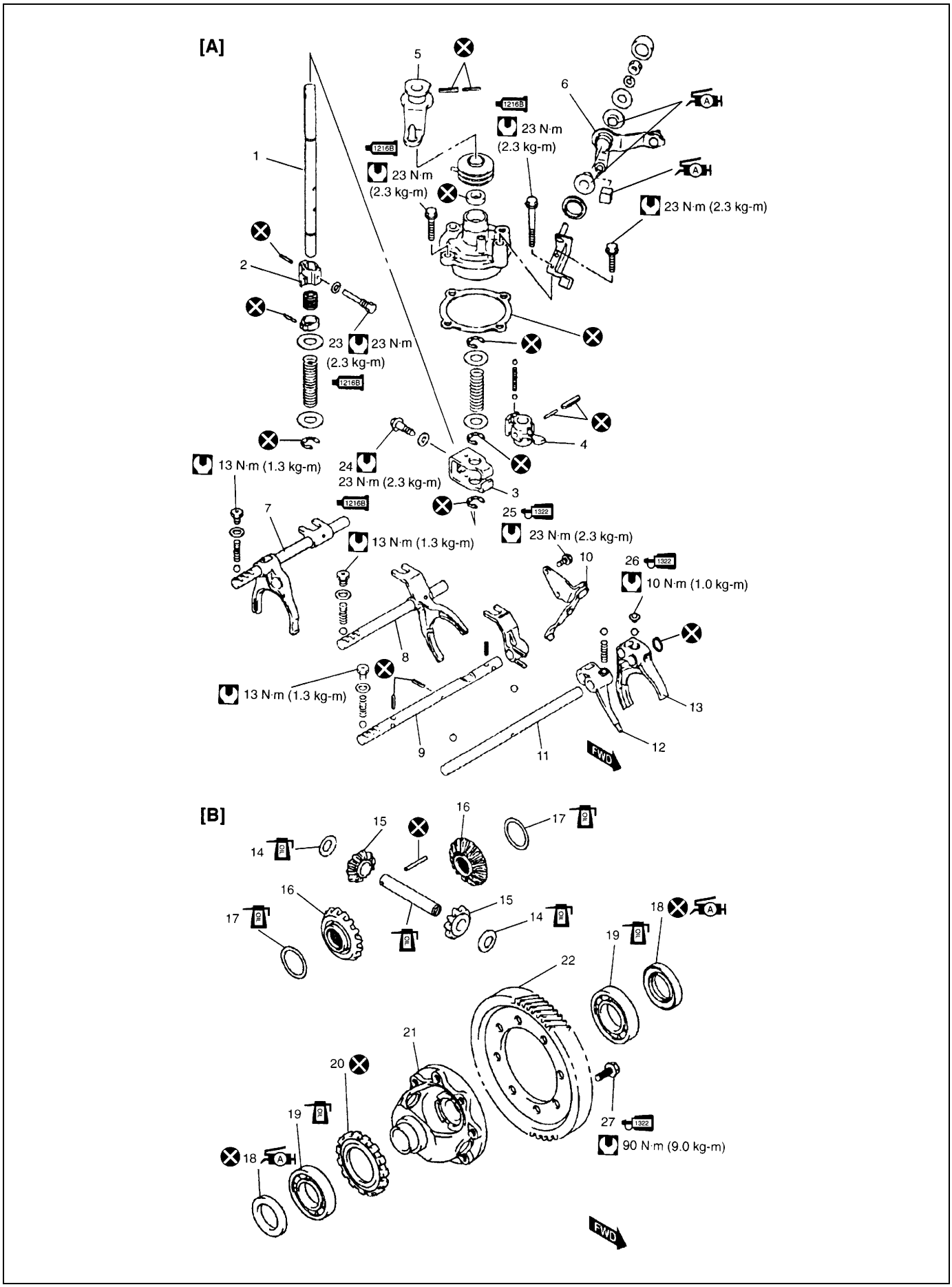
Unit Repair Overhaul



[A] : TRANSMISSION CASE	6. Back up light switch	11. VSS
1. Transmission right case	7. O-ring	1322 12. Oil gutter bolt : Apply thread lock 99000-32110 to all around thread part of bolt.
1216B 2. Transmission left case : Apply sealant 99000-31230 to mating surface of left case and right case.	8. Differential assembly	13. Left case plate bolts and screw
3. Gear shifter assembly	1216B 9. Oil level/filler plug : Apply sealant 99000-31230 to all around thread part of plug.	Tightening Torque
4. Transmission left case plate	1216B 10. Oil drain plug : Apply sealant 99000-31230 to all around thread part of plug.	Do not reuse.
1216B 5. Transmission side cover : Apply sealant 99000-31230 to mating surface of side cover and left case.		


42
60 N·m (6.0 kg-m)
41
40
39
38
37
36
35
34
32
33
45
46
31
29
28
29
27
5
26
30
25
21
20
17
19
16
13
15
14
12
18
17
34-1
11
10
6
9
7
8
7
6
4
5-1
3
2
1
44
22
43
1322
23 N·m (2.3 kg·m)
24
23
FWD

1. Input shaft	17. 5th synchronizer spring	34. Needle bearing (separated steel cage type)
2. Oil seal : Apply grease 99000-25010 to oil seal lip.	18. 5th speed sleeve & hub	34-1. Needle bearing (steel cage type)
3. Input shaft right bearing	19. 5th synchronizer key	35. Countershaft 2nd gear
4. Input shaft 3rd gear	20. 5th synchronizer hub plate	36. Countershaft 3rd gear
5. Needle bearing (resin cage type)	21. Circlip	37. 3rd & 4th gear spacer
5-1. Needle bearing (resin cage type)	22. Reverse gear shaft	38. Countershaft 4th gear
6. High speed synchronizer ring	23. Reverse idler gear	39. Countershaft left bearing
7. High speed synchronizer spring	24. Reverse shaft washer	40. Bearing set shim
8. High speed sleeve & hub	25. Countershaft right bearing	41. Countershaft 5th gear
9. High speed synchronizer key	26. Countershaft	42. Countershaft nut : After tightening nut to specified torque, caulk nut securely.
10. Circlip	27. Countershaft 1st gear	43. Reverse shaft bolt : Apply thread lock cement 99000-32110 to thread.
11. Input shaft 4th gear	28. 1st gear synchronizer ring	44. Washer
12. Input shaft left bearing	29. Low speed synchronizer spring	45. Center cone
13. Input shaft 5th gear	30. Low speed sleeve & hub	46. 2nd gear synchronizer inner ring
14. 5th gear spacer	31. Low speed synchronizer key	Apply transmission oil.
15. 5th gear needle bearing (separated steel cage type)	32. Circlip	Tightening Torque
16. 5th speed synchronizer ring	33. 2nd gear synchronizer outer ring	Do not reuse.

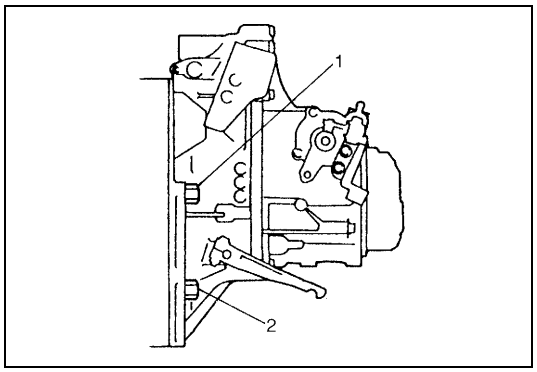

[A]
5
6
1216B
23 N·m
(2.3 kg-m)
1
1216B
23 N·m
(2.3 kg-m)
23 N·m (2.3 kg-m)
2
23
23 N·m
(2.3 kg-m)
1216B
4
13 N·m (1.3 kg-m)
24
23 N·m (2.3 kg-m)
3
1216B
25
1322
23 N·m (2.3 kg-m)
7
13 N·m (1.3 kg-m)
10
26
1322
10 N·m (1.0 kg-m)
8
13 N·m (1.3 kg-m)
13
9
11
12
FWD
[B]
16
17
15
14
16
17
15
14
18
19
22
21
20
19
18
27
1322
90 N·m (9.0 kg-m)
FWD

[A] : GEAR SHIFTER	10. Reverse gear shift lever		21. Differential case
[B] : DIFFERENTIAL	11. 5th & reverse gear shift guide shaft		22. Final gear
1. Gear shift & select shaft	12. Reverse gear shift arm		23. 5th to reverse interlock guide bolt : Apply sealant 99000-31230 to bolt thread.
2. 5th & reverse gear shift cam	13. 5th gear shift fork		24. Gear shift interlock bolt : Apply sealant 99000-31230 to bolt thread.
3. Gear shift interlock plate	14. Side gear washer		25. Reverse gear shift lever bolt : Apply thread lock 99000-32110 to all around thread part of bolt.
4. Gear shift & select lever	15. Differential side pinion gear		26. 5th gear shift fork plug : Apply thread lock 99000-32110 to all around thread part of plug.
5. Shift cable lever	16. Differential side gear		27. Final gear bolt : Apply thread lock 99000-32110 to all around thread part of bolt.
6. Select cable lever	17. Side gear washer		 Apply transmission oil.
7. Low speed gear shift shaft	 18. Differential side oil seal : Apply grease 99000-25010 to oil seal lip.		 Tightening Torque
8. High speed gear shift shaft	19. Differential side bearing		 Do not reuse.
9. 5th & reverse gear shift shaft	20. Speed sensor ring		

DISMOUNTING

Under hood

1) Disconnect negative cable at battery.
2) Undo wiring harness clamps, disconnect back up light switch coupler, VSS coupler and ground cable.
3) Disconnect clutch cable from clutch release lever and bracket.
4) Disconnect gear shift and select control cables.

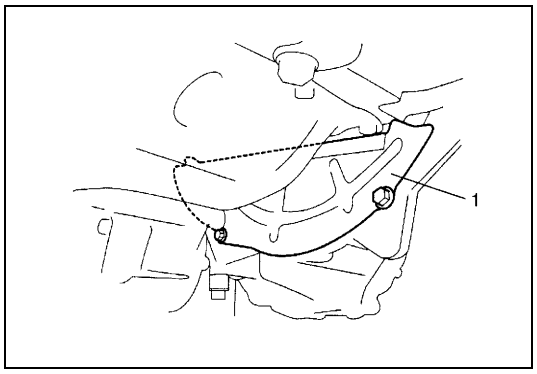


5) Remove bolt (2), and loosen bolt (1) which is unable to be removed due to interference of water pipe.

6) Remove starting motor taking out its bolts. Starting motor plate should also come down.
7) Support engine by using lifting device.

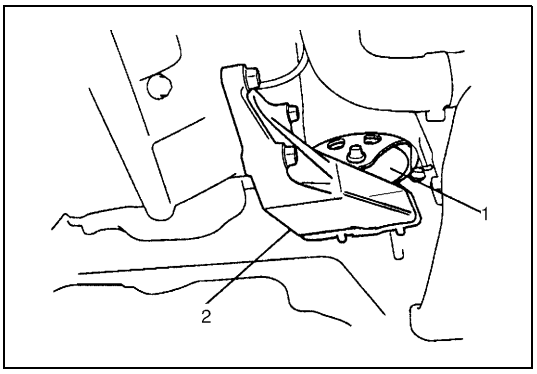
On lift

8) Drain transmission oil referring to Section 7A of the Service Manual mentioned in the FOREWORD of this manual.
9) Drain transfer oil referring to Section 7D.
10) Remove left and right drive shaft referring to Section 4 of the Service Manual mentioned in the FOREWORD of this manual.
11) Remove left side of engine under cover.
12) Remove transfer referring to Section 7D.



13) Remove clutch housing lower plate (1).

14) Remove transfer referring to Section 7D.
15) Remove transmission to engine bolt and nut.
16) Lower vehicle and support transmission with transmission jack.



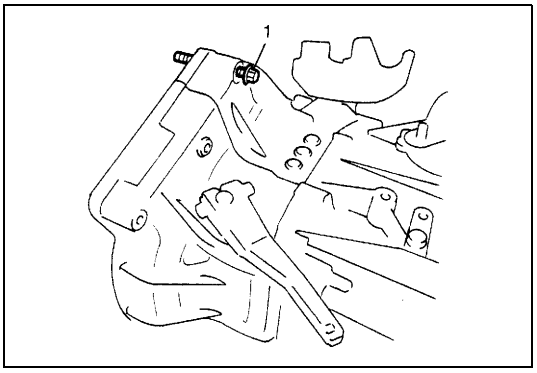
17) Remove engine left mounting (1) with bracket (2).

18) Remove other attached parts from transmission, if any.
19) Pull transmission out so as to disconnect input shaft from clutch disc and then lower it.

REMOUNTING

CAUTION:
Care should be taken not to scratch oil seal lip with drive shaft while raising transmission.
Do not hit drive shaft joint with hammer when installing it into differential gear.

Remount transmission in reverse order of dismounting procedure noting the following.



- Set bolt (1) to the original position of transmission before mounting transmission assembly to engine assembly.
- Refer to the first figure of “UNIT REPAIR OVERHAUL” in Section 7A of the Service Manual mentioned in the FOREWORD of this manual for fastener specified torque.
- Refer to Section 7D for installing transfer.
- Push in drive shaft joints (right & left) fully so as to snap ring of shaft engages with differential gear.
- Set each clamp for wiring securely.
- After connecting clutch cable, be sure to adjust its play properly.
  Refer to Section 7C of the Service Manual mentioned in the FOREWORD of this manual.
- Fill transmission and transfer with oil as specified.
- Connect battery and check function of engine, clutch and transmission.

Sub Assembly Service

Differential assembly

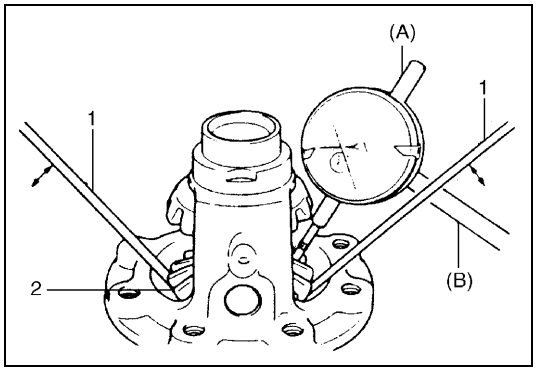
ADJUSTMENT AND REASSEMBLY

Judging from abnormality noted before disassembly and what is found through visual check of component parts after disassembly, prepare replacing parts and proceed to reassembly. Make sure that all parts are clean.

1) Assemble differential gear and measure thrust play of differential gear as follows.

Differential gear thrust play
0.03 – 0.31 mm (0.001 – 0.012 in.)

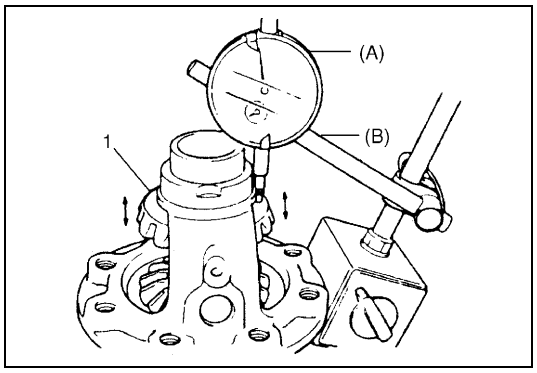
Left side



- Hold differential assembly with soft jawed vise and apply measuring tip of dial gauge to top surface of gear.
- Using 2 screwdrivers (1), move gear (2) up and down and read movement of dial gauge pointer.

Special tool
(A) : 09900-20607
(B) : 09900-20701

Right side

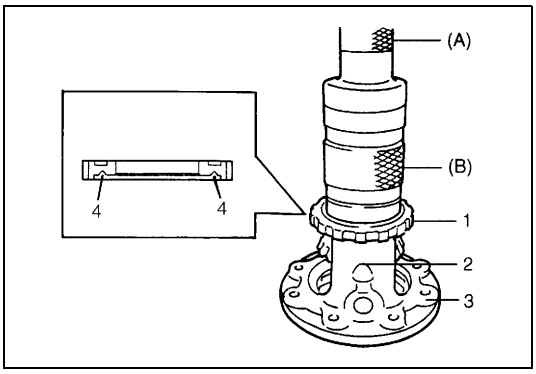


- Using similar procedure to the above, set dial gauge tip to gear (1) shoulder.
- Move gear up and down by hand and read dial gauge.

Special tool
(A) : 09900-20607
(B) : 09900-20701

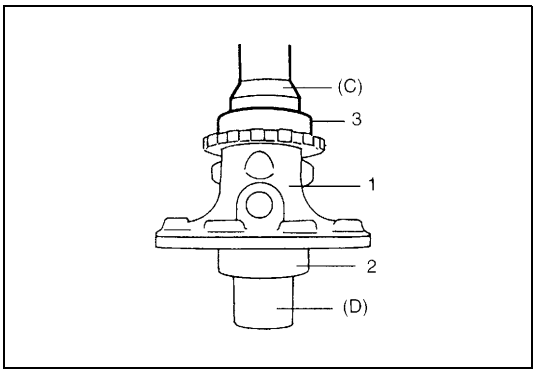
2) If thrust play is out of specification, select suitable thrust washer from among the following available size, install it and check again that specified gear play is obtained.

Available thrust washer thickness
0.9, 0.95, 1.0, 1.05, 1.1, 1.15 and 1.2 mm
(0.035, 0.037, 0.039, 0.041, 0.043, 0.045, and 0.047 in.)



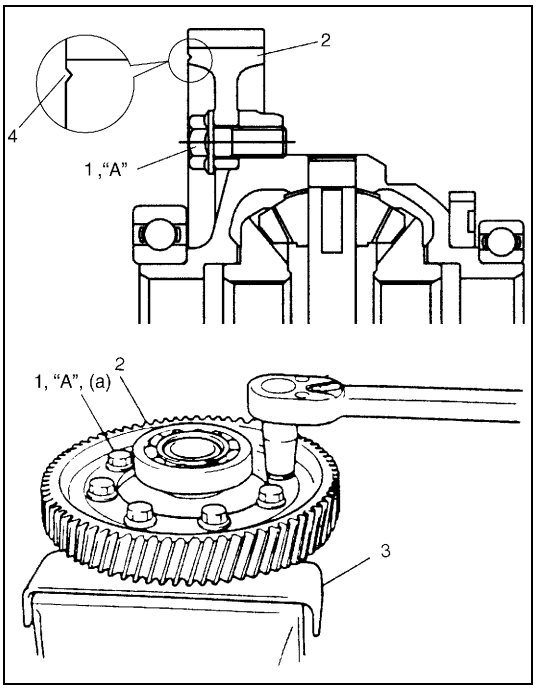
3) Drive in new differential side pinion shaft pin (2) till the depth from differential case (3) surface is about 1 mm (0.04 in.).
4) Press-fit new sensor rotor (1) with groove (4) side downward as shown by using special tools and copper hammer.

Special tool
(A) : 09913-75510
(B) : 09940-54910



5) Press-fit left bearing by using special tools and copper hammer.
6) Support differential assembly (1) as illustrated so as to left bearing (2) is floating, and then press-fit right bearing (3) like left bearing in Step 5).

Special tool
(C) : 09951-76010
(D) : 09951-16060



7) Hold differential assembly with soft jawed vise (3), install final gear (2) as shown in figure and then tighten bolts (1) with thread lock cement applied to specified torque.

NOTE:
Make sure to install final gear in correct installing direction.

CAUTION:
Use of any other bolts than specified ones is prohibited.

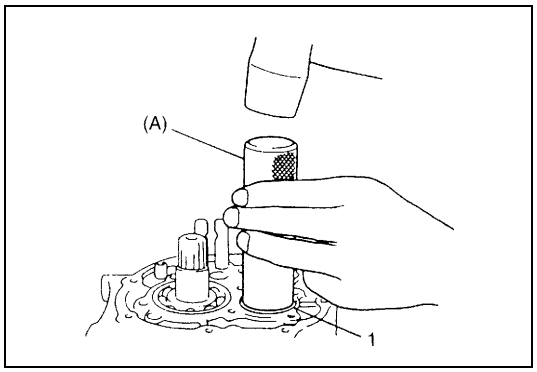
"A" : Thread lock cement 99000-32110

Tightening torque
Final gear bolts (a) : 90 N·m (9.0 kg-m, 65.0 lb-ft)

4. Groove

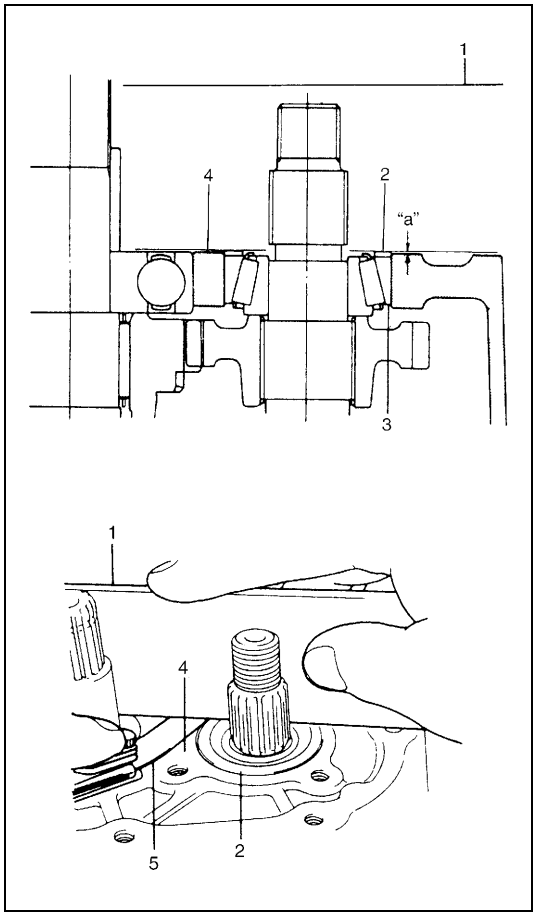
Assembling Unit

Fifth gears



1) To seat countershaft left bearing cup (1) to bearing cone, tap cup by using special tool and plastic hammer.

Special tool
(A) : 09913-84510



2) Put a shim (2) on bearing cup (3) provisionally, place straight edge (1) over it and compress it by hand through straight edge, and then measure "a" (Clearance between case surface (4) and straight edge) by using feeler gauge (5).

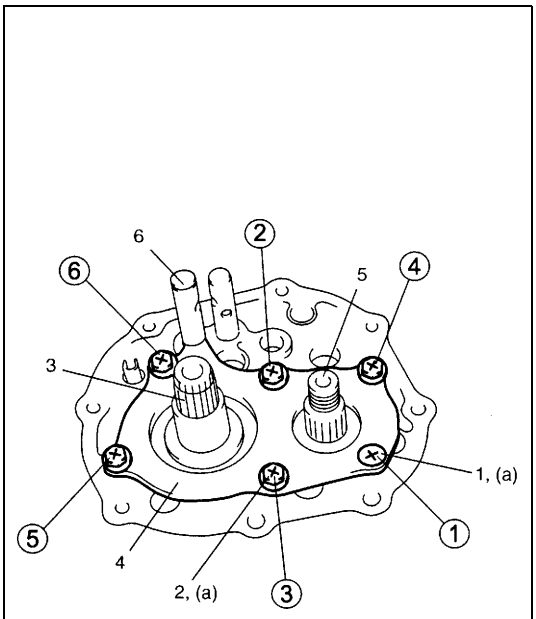
Clearance between case surface and straight edge
"a" : 0.13 – 0.17 mm (0.0051 – 0.0067 in.)
(Shim protrusion)

3) By repeating above step, select a suitable shim which adjusts clearance "a" to specification and put it on bearing cup.

NOTE:

Insert 0.15 mm (0.0059 in.) feeler to know whether or not a shim fulfills specification quickly.

Available shim thickness
0.40, 0.45, 0.50, 0.55, 0.6, 0.65,0.7, 0.75, 0.8, 0.85, 0.9, 0.95, 1.0, 1.05, 1.1 and 1.15 mm
(0.015, 0.017, 0.019, 0.021, 0.023, 0.025, 0.027, 0.029, 0.031, 0.033, 0.035, 0.037, 0.039, 0.041, 0.043 and 0.045 in.)



4) Place left case plate (4) inserting its end in groove of shift guide shaft (6) and then tighten it with new screw (1) and bolts (2) with adhesive pre-coated temporarily with less than specified torque.

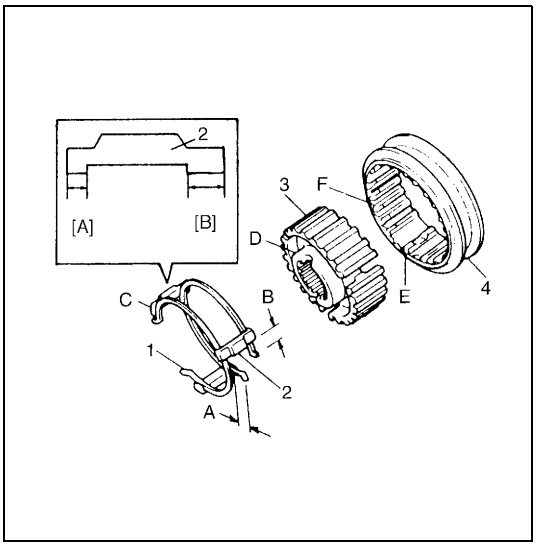
CAUTION:
Do not reuse left case plate screw and bolts. Be sure to use new screw and bolts with adhesive pre-coated. Otherwise, they may loosen.

5) Tighten new screw and bolts to specified torque finally in the order of circled numbers shown in figure.

NOTE:
After tightening screw and bolts, make sure that countershaft can be rotated by hand feeling certain load.

Tightening torque
Left case plate screw and bolts
(a) : 11 N·m (1.1 kg-m, 8.0 lb-ft)

3.	Input shaft
5.	Countershaft

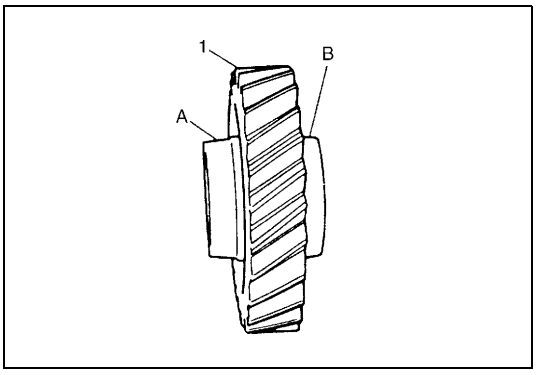


6) Assemble 5th speed synchronizer sleeve (4) and hub (3) with keys (2) and springs (1).

NOTE:
Short side C in keys, long boss D in hub and chamfered spline F in sleeve should face inward (5th gear side).

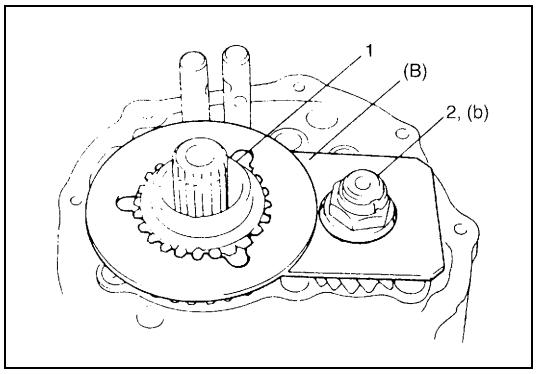
Synchronizer key installation position
A = B

[A] :	Short side C
[B] :	Long side
C :	Short side (Inward)
D :	Long boss (Inward)
E :	Key way
F :	Chamfered spline (Inward)



7) Install 5th gear (1) to counter shaft facing machined boss A inward.

A :	Machined boss (Inside)
B :	No machining (Outside)

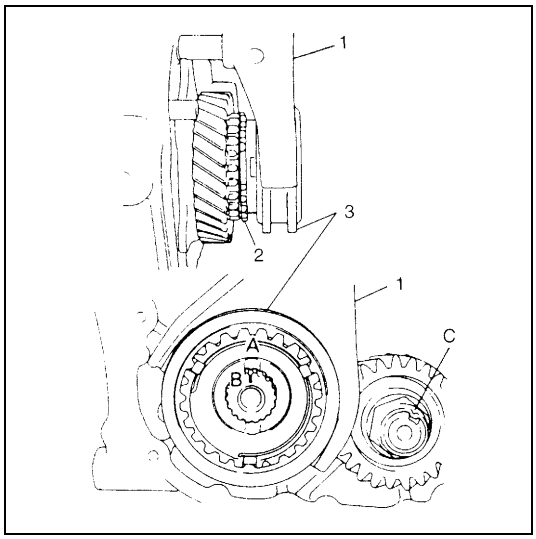


8) Install needle bearing of separated steel cage type to input shaft, apply oil then install 5th gear (1) and special tool to stop shaft rotation.

Special tool
(B) : 09927-76010

9) Install new countershaft nut (2) and tighten it to specification.

Tightening torque
Countershaft nut (b) : 60 N·m (6.0 kg-m, 43.5 lb-ft)

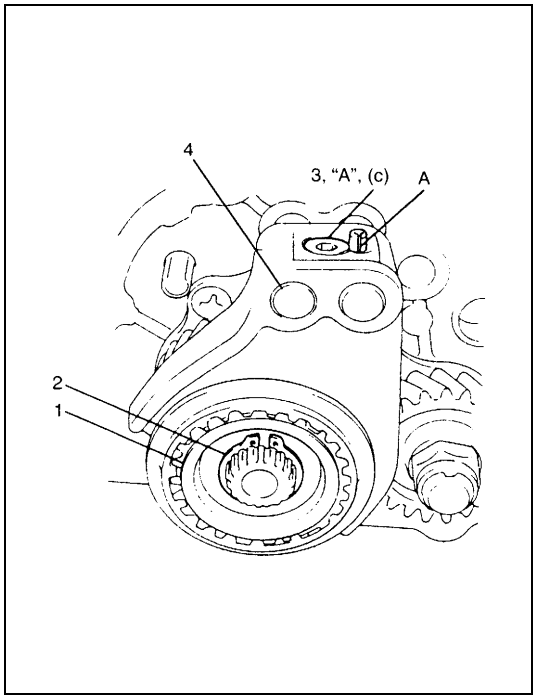


10) Remove special tool, then caulk nut at C with caulking tool and hammer.
11) Install synchronizer ring (2).
12) Fit 5th gear shift fork (1) to sleeve & hub assembly (3) and install them into input shaft, shift shaft and shift guide shaft at once aligning hub oil groove A with shaft mark B.

NOTE:

Long flange of hub faces inward (gear side).

A :	Oil groove (Align with B)
B :	Punch mark
C :	Caulking



13) Drive in spring pin facing its slit A outward.

A :	Pin slit (Face outward)

14) Install steel ball, tighten shift fork plug (3) to which thread lock cement has been applied.

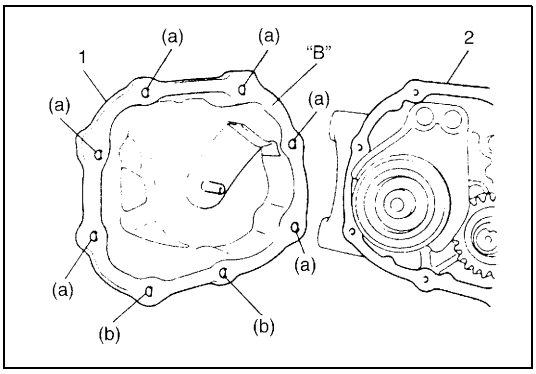
"A" : Cement 99000-32110

Tightening torque
5th shift fork plug (c) : 10 N·m (1.0 kg-m, 7.5 lb-ft)

15) Fit hub plate (1) and fix it with new circlip (2).
16) Install new circlip (4) to the end of 5th & reverse gear shift guide shaft.

CAUTION:

- **Coat shift fork plug with thread lock cement reasonably. If it is done to much, excess may interfere in ball movement and cause hard shift to 5th speed.**
- **Make sure circlip is installed in shaft groove securely.**



17) Clean mating surface of both left case (2) and side cover (1), coat mating surface with sealant evenly, mate it with left case and then tighten bolts.

"B" : Sealant 99000-31230

Tightening torque
Side cover No. 1 bolts (a) : 10 N·m (1.0 kg-m, 7.5 lb-ft)
Side cover No. 2 bolts (b) : 23 N·m (2.3 kg-m, 17.0 lb-ft)

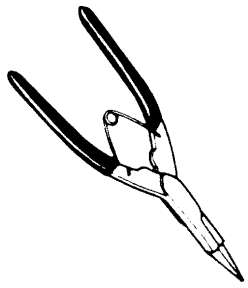
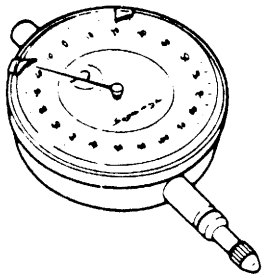
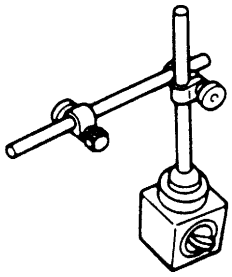
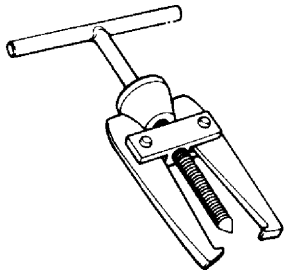
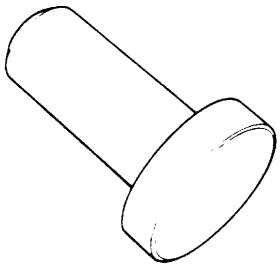
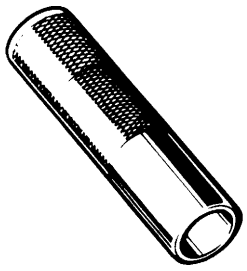
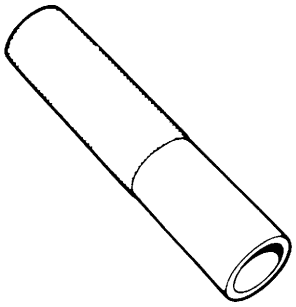
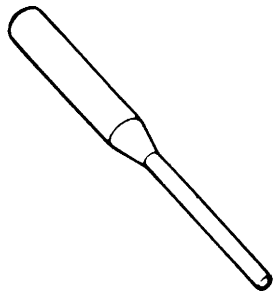
Tightening Torque Specification

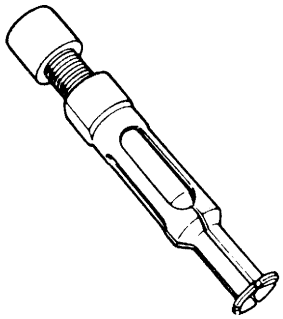
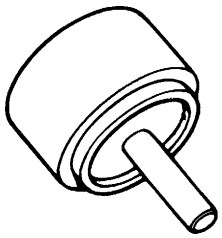
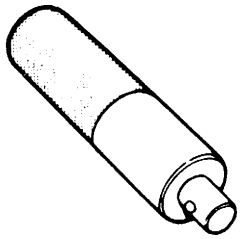
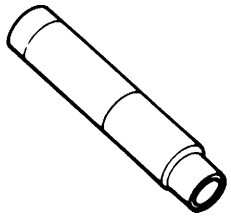
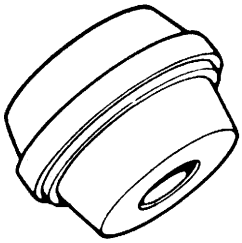
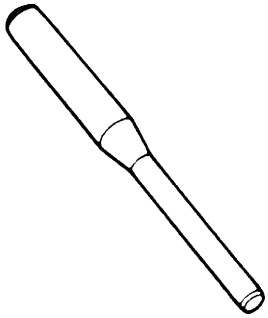
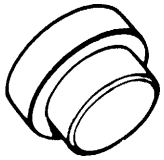
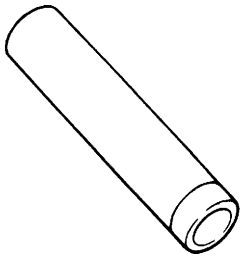
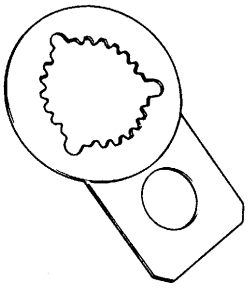
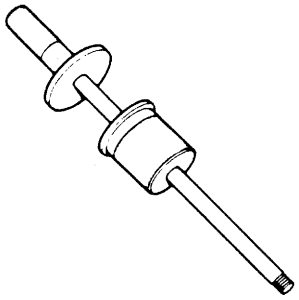
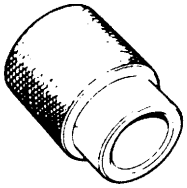
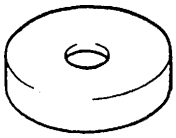
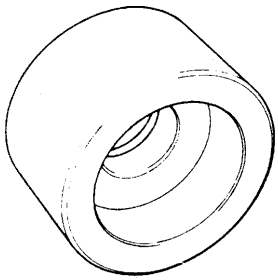
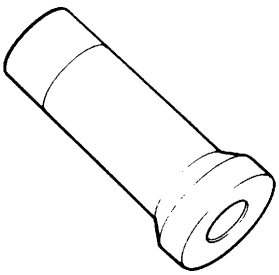
Fastening portion	Tightening torque		
	N•m	kg-m	lb-ft
Transmission oil level/filler and drain plugs	21	2.1	15.5
Gear shift control lever assembly nut	13	1.3	9.5
Final gear bolts	90	9.0	65.0
Reverse gear shift lever bolts	23	2.3	17.0
Transmission case bolts	19	1.9	14.0
Reverse shaft bolt	23	2.3	17.0
Locating spring bolts	13	1.3	9.5
Left case plate bolts and screw	11	1.1	8.0
Countershaft nut	60	6.0	43.5
5th shift fork plug	10	1.0	7.5
Side cover No.1 bolts	10	1.0	7.5
Side cover No.2 bolts	23	2.3	17.0
Guide case bolts	23	2.3	17.0
Gear shift interlock bolt	23	2.3	17.0
5th to reverse interlock guide bolt	23	2.3	17.0
Backup lamp switch	19	1.9	14.0

Required Service Materials

Material	Recommended SUZUKI Material	Use
Lithium grease	SUZUKI SUPER GREASE A (99000-25010)	• Oil seal lips
Sealant	SUZUKI BOND NO.1216B (99000-31230)	• Oil drain plug and filler / level plug • Gear shift shaft bolt • Mating surface of transmission case • Mating surface of side cover • Gear shift interlock bolt • 5th to reverse interlock guide bolt
Thread lock cement	THREAD LOCK 1322 (99000-32110)	• Reverse gear shift lever bolts • Oil gutter bolt • Left case plate screws • Shift fork plug • Reverse shaft bolt

Special Tools

 09900-06107 Snap ring pliers (Opening type)	 09900-20607 Dial gauge	 09900-20701 Magnetic stand	 09913-60910 Bearing puller
 09913-75510 Bearing installer	 09913-80113 Bearing installer	 09913-84510 Bearing installer	 09922-85811 Spring pin remover 4.5 mm

 09923-74510 Bearing remover	 09923-78210 Bearing installer	 09924-74510 Installer attachment	 09925-18011 Bearing installer
 09925-68210 Bearing outer race installer	 09925-78210 Spring pin remover 6 mm	 09925-88210 Bearing puller attachment	 09925-98221 Bearing installer
 09927-76010 Gear holder	 09930-30104 Sliding shaft	 09940-53111 Bearing installer	 09940-54910 Sensor rotor installer
 09951-46010 Oil seal installer	 09951-16060 Bush remover	 09951-76010 Bearing installer	

SECTION 7C

CLUTCH

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:

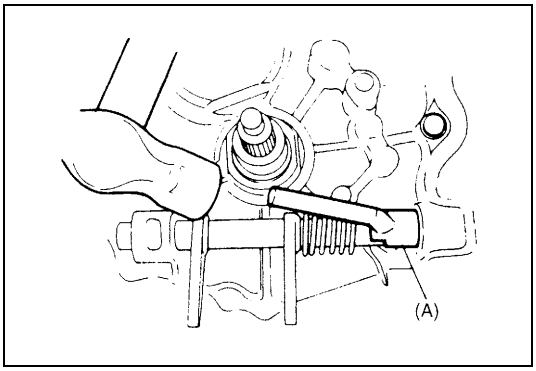
For the descriptions (items) not found in this section, refer to the same section of the Service Manual mentioned in the FOREWORD of this manual.

CONTENTS

Unit Repair Overhaul

Clutch Release System

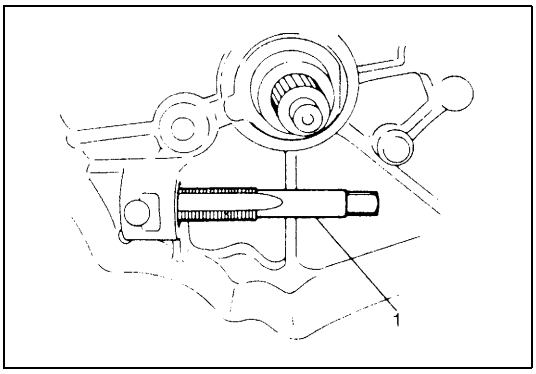
REMOVAL



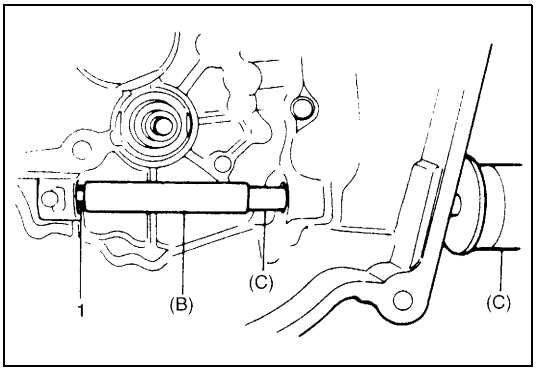
1) Remove ß-pin from release shaft.
2) Remove release lever by loosening its nut.
3) Take out release bearing by turning release shaft (1).
4) Unhook return spring by using pliers.
5) Drive out No.2 bush by using special tool and hammer.
   Release shaft seal will also be pushed out.

Special tool
(A) : 09922-46010

6) Remove release shaft and return spring.



7) Install tap (M16 X 1.5) (1) to clutch release shaft No.1 bush.

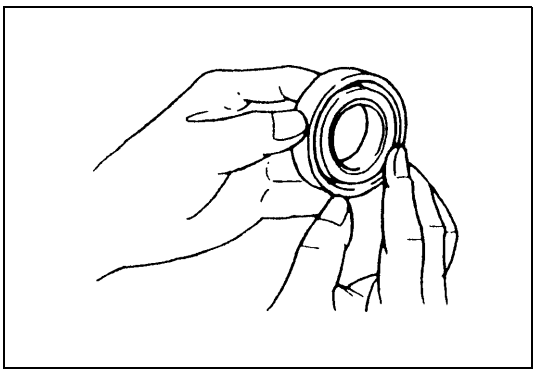


8) Pull out No.1 bush by using tap (1) and special tools.

Special tool
(B) : 09923-46020
(C) : 09930-30104

INSPECTION

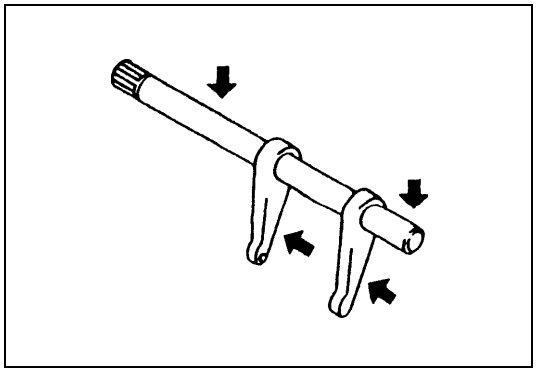
Clutch release bearing



Check clutch release bearing for smooth rotation.
If abnormality is found, replace it.

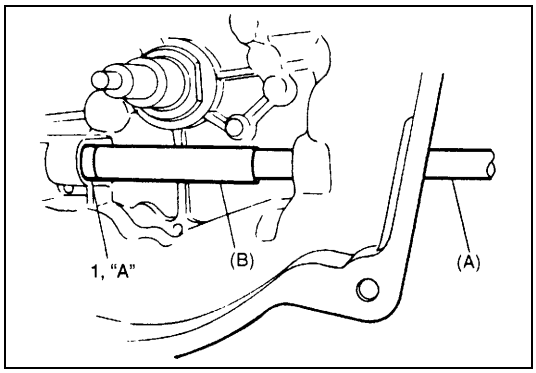
CAUTION:
Do not wash release bearing. Washing may cause grease leakage and consequential bearing damage.

Clutch release shaft



Check clutch release shaft and its pin for deflection or damage. If abnormality is found, replace it.

INSTALLATION

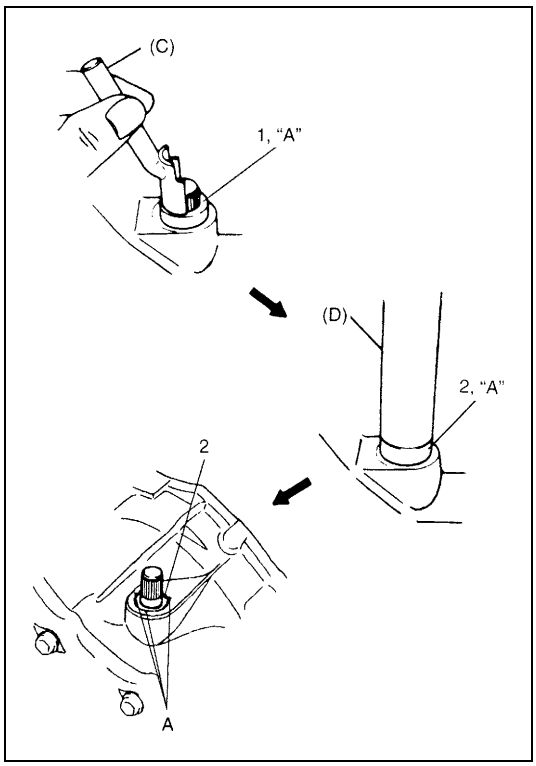


1) Drive in a new No.1 bush (1) by using special tools and then apply grease to bush inside.

Special tool
(A) : 09930-30104
(B) : 09923-46030

"A" : Grease 99000-25010

2) Install release shaft with return spring applied to it.



3) Apply grease to No.2 bush (1) inside and press-fit it by using the same special tool as in removal.

"A" : Grease 99000-25010

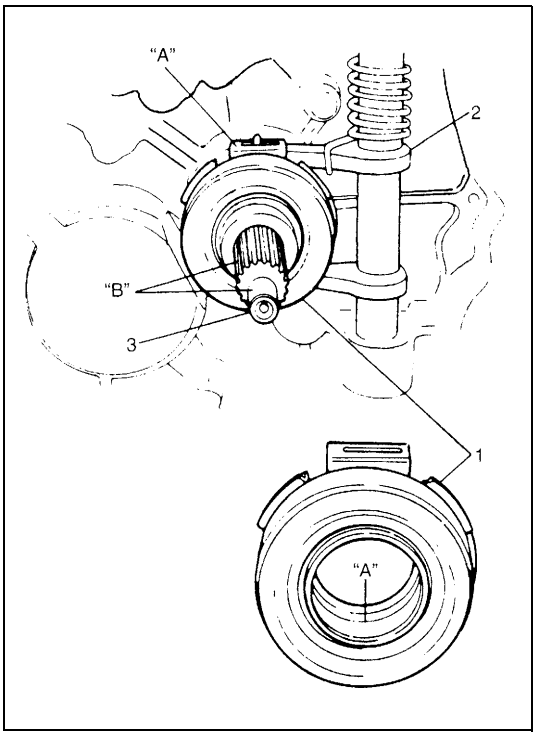
Special tool
(C) : 09922-46010

4) Coat grease to shaft seal (2) lip and then install it till it is flush with case surface. Use special tool for this installation and face seal lip downward (inside).

"A" : Grease 99000-25010

Special tool
(D) : 09925-98221

5) Caulk seal at A by using caulking tool and hammer.

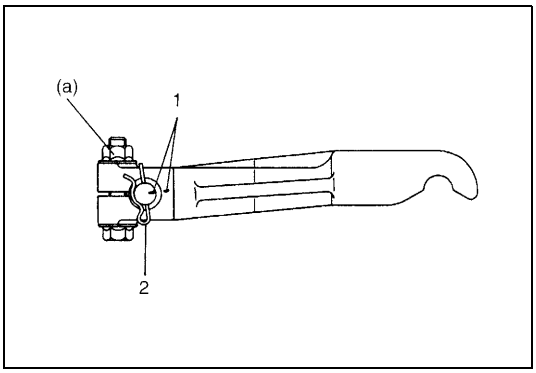


6) Hook return spring.
7) Apply grease to release bearing (1) inside and release shaft arm (2), then set bearing.

"A" : Grease 99000-25010

8) Apply small amount of grease to input shaft (3) spline and front end as well.

"B" : Grease 99000-25210



9) Set release lever to release shaft aligning their punch marks (1), then tighten nut.

Tightening torque
Release lever nut (a) : 23 N·m (2.3 kg-m, 17.0 lb-ft)

10) Install ß-pin (2) to release shaft.

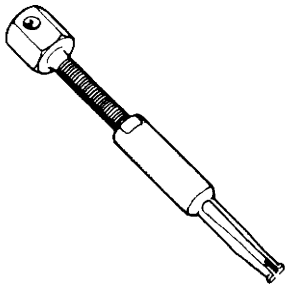
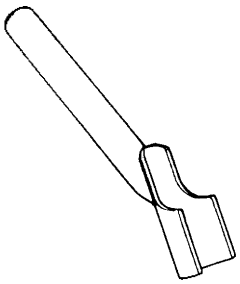
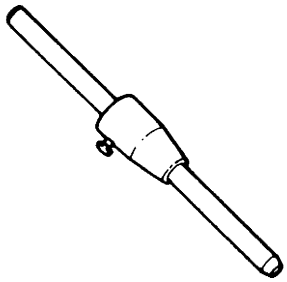
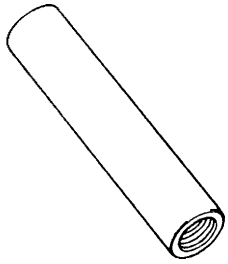
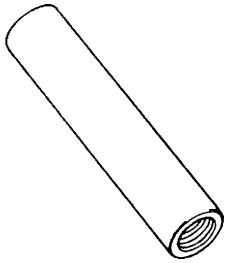
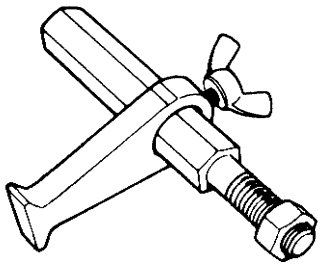
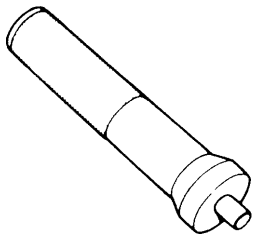
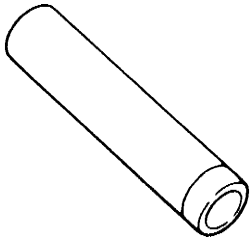
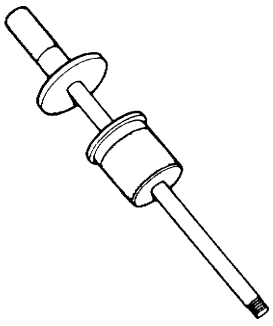
Tightening Torque Specification

Fastening portion	Tightening torque		
	N•m	kg-m	lb-ft
Clutch cable bolts	11	1.1	8.0
Flywheel bolts	76	7.6	55.0
Clutch cover bolts	23	2.3	16.5
Release lever nut	23	2.3	16.5

Required Service Materials

Material	Recommended SUZUKI product (Part Number)	Use
Lithium grease	SUZUKI SUPER GREASE A (99000-25010)	• Cable end hook and joint pin. • Release shaft bushes and seal. • Release shaft arm. • Release bearing inside.
	SUZUKI SUPER GREASE I (99000-25210)	Input shaft spline and front end.

Special Tool

 09917-58010 Bearing remover	 09922-46010 Bush remover	 09923-36330 Clutch center guide	 09923-46020 Joint pipe
 09923-46030 Joint pipe	 09924-17811 Flywheel holder	 09925-98210 Input shaft bearing installer	 09925-98221 Bearing installer
 09930-30104 Sliding shaft			

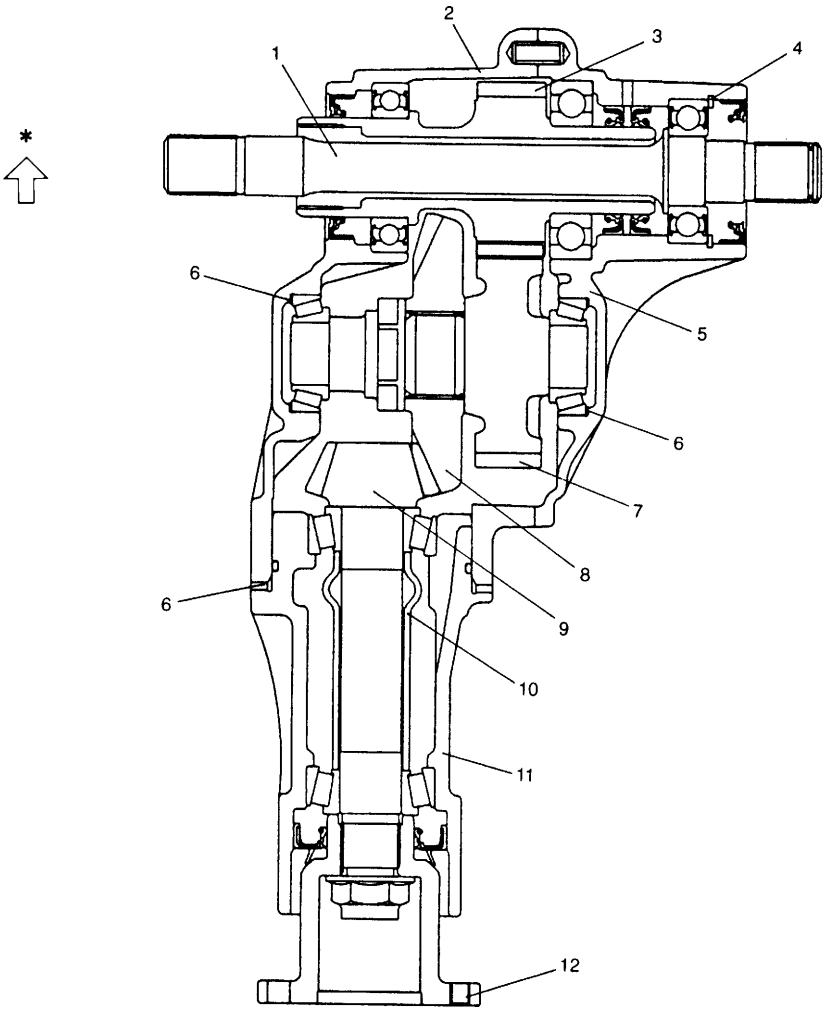
SECTION 7D

TRANSFER

CONTENTS

General Description

The transfer is mounted on transmission case by fastening bolts with reduction drive gear in transfer and differential case in transmission coupled by involute spline. Driving force from transmission is transmitted to propeller shaft through reduction drive gear, reduction driven gear and bevel gears in transfer. As bevel gears, which change the direction of driving torque axis to the direction of the angle with 90 degrees, hypoid gears are provided. Hypoid gears have an advantage of preventing gear noise, at the same time, they require accurate adjustment of tooth contact and backlash.



1. Intermediate shaft	6. Shim	11. Transfer output retainer
2. Left case	7. Reduction driven gear	12. Flange
3. Reduction drive gear	8. Bevel gear (hypoid gear)	✱: Forward
4. Circlip	9. Bevel pinion shaft (hypoid gear)	
5. Right case	10. Pinion shaft spacer	

Diagnosis

Condition	Possible Cause	Correction
Noise	Inadequate or insufficient lubricant	Replenish.
	Damaged or worn bearing(s)	Replace.
	Damaged or worn gear(s)	Replace.
	Damaged or worn chamfered tooth on sleeve or gear	Replace.
	Preload of taper roller bearing is reduced	Adjust.

On-Vehicle Service

Oil Change

1) Before changing or inspecting oil, be sure to stop engine and lift vehicle horizontally.
2) With vehicle lifted up, check oil level and leakage. If leakage exists, correct or repair it.
3) Drain old oil, tighten drain plug (2) after applying sealant to its thread and pour new specified oil as shown below by specified amount (roughly up to level hole).

"A" : Sealant 99000-31230

Tightening torque
Transfer oil drain plug (a) : 21 N·m (2.1 kg-m, 15.5 lb-ft)

NOTE:

- **It is highly recommended to use SAE 80W-90 Hypoid gear oil API GL-5.**
- **Whenever vehicle is hoisted for any other service work than oil change, also be sure to check for oil leakage.**

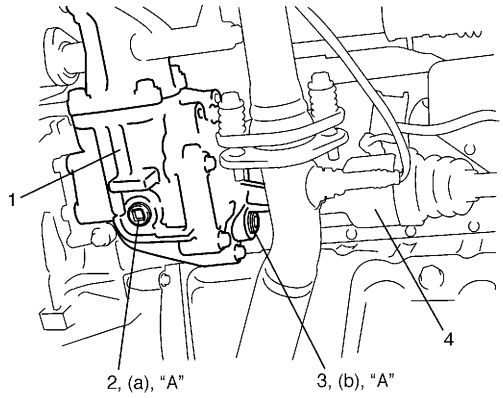
Transfer gear oil
: Hypoid gear oil API GL-5
For oil viscosity, refer to the chart.

Oil Capacity
: 0.5 liters (1.1/0.9 US/Imp. pt)

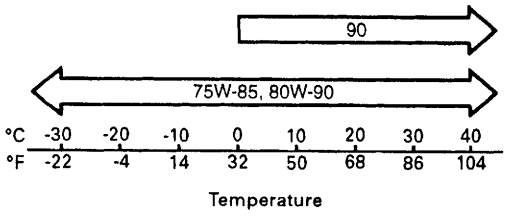
4) Torque level/filler plug (3) as specified below after applying sealant to its thread.

"A" : Sealant 99000-31230

Tightening torque
Transfer oil level / filler plug
(b) : 21 N·m (2.1 kg-m, 15.5 lb-ft)

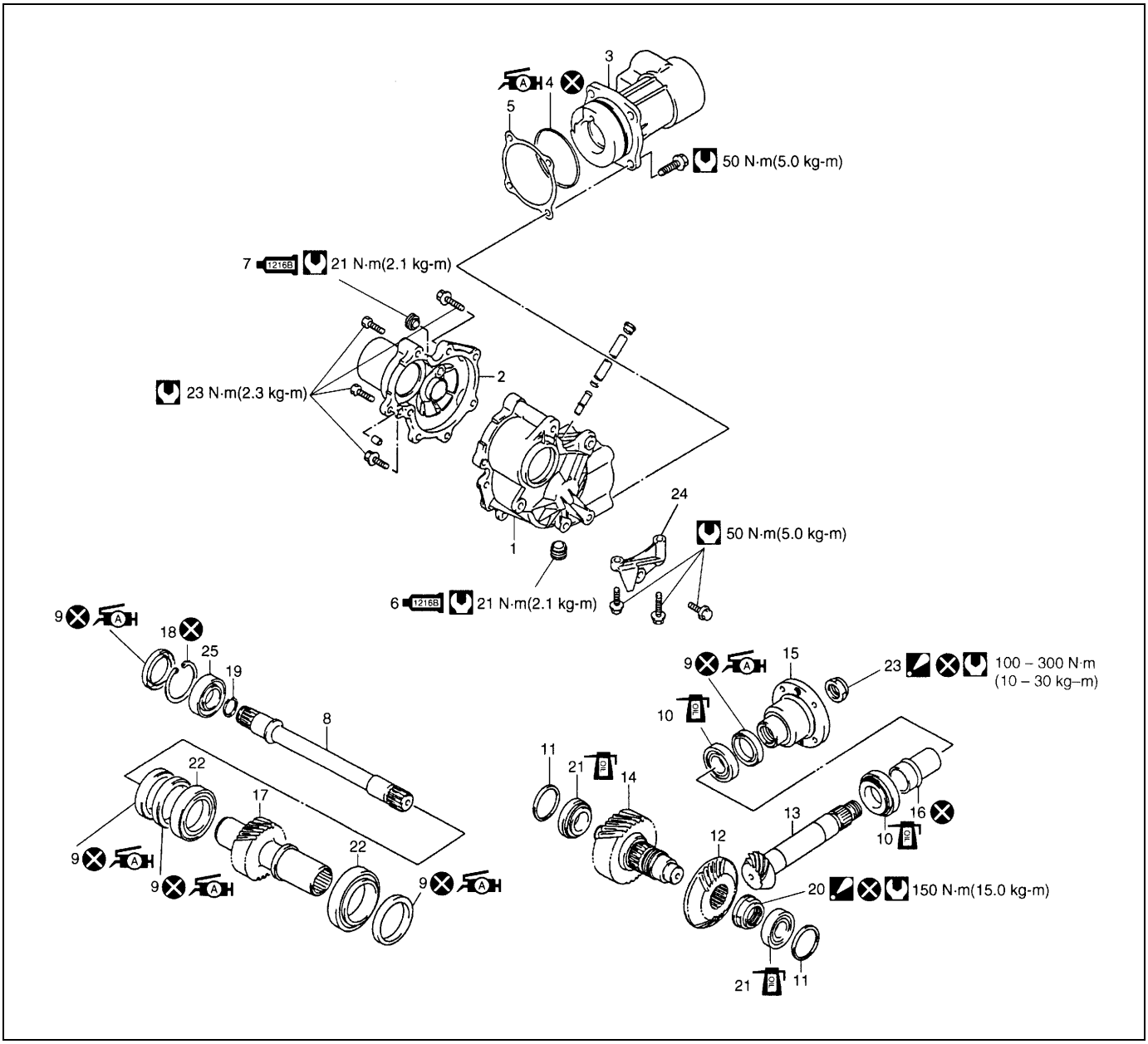


Viscosity chart SAE



1.	Transfer
4.	Drive shaft

Unit Repair Overhaul

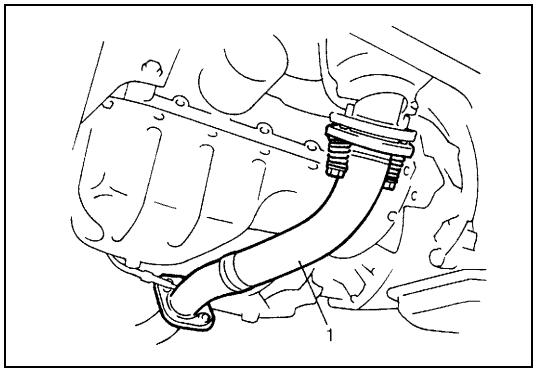


	1.	Transfer left case	11.	Bevel gear shim	21. Driven gear bearing
	2.	Transfer right case	12.	Bevel gear (Hypoid gear)	22. Reduction drive gear bearing
	3.	Transfer output retainer	13.	Bevel pinion shaft (Hypoid gear)	23. Flange nut : After tightening nut so as rotation torque of bevel pinion shaft to be in specified value, caulk nut securely.
A H	4.	O-ring : Apply grease 99000-25010 to all around surface.	14.	Reduction driven gear	24. Transfer stiffener
	5.	Bevel pinion shim	15.	Flange	25. Intermediate shaft right bearing
1216B	6.	Drain plug : Apply sealant 99000-31230 to all around thread part of drain plug.	16.	Pinion shaft spacer	Do not reuse.
1216B	7.	Level/filler plug : Apply sealant 99000-31230 to all around thread part of level plug.	17.	Reduction drive gear	Tightening torque
	8.	Intermediate shaft	18.	Circlip	Apply transfer oil.
A H	9.	Oil seal : Apply grease 99000-25010 to oil seal lip.	19.	Snap ring	
	10.	Pinion shaft bearing	20.	Bevel gear nut : After tightening nut to specified torque, caulk nut securely.	

Unit Dismounting

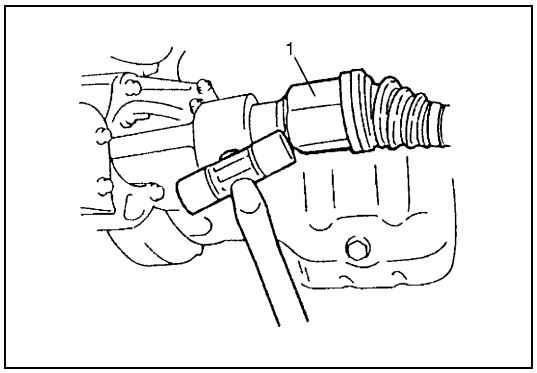
DISMOUNTING

1) Disconnect negative cable at battery.
2) Hoist vehicle and remove wheels.
3) Drain transaxle oil and transfer oil



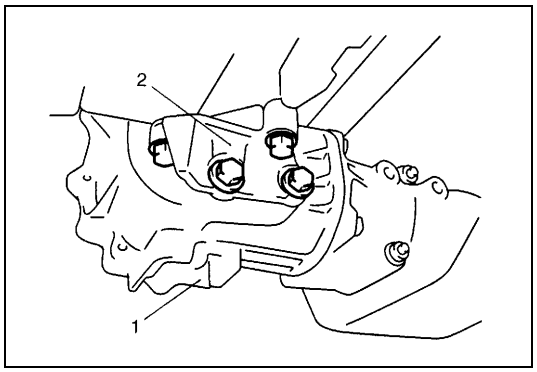
4) Remove exhaust pipe (1).

5) Remove propeller shaft referring to Section 4B.



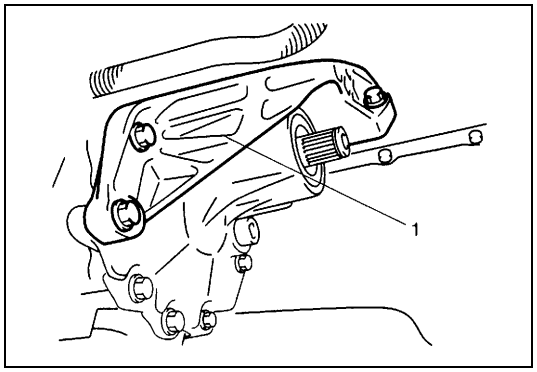
6) Remove right side drive shaft (1) referring to Section 4A.

7) Disconnect breather hose from transfer assembly.

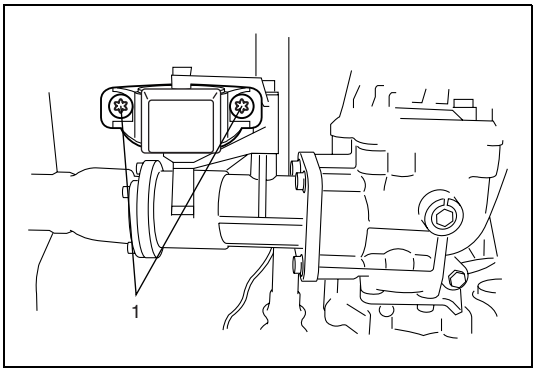


8) Remove transfer stiffener (2).

1. Transfer

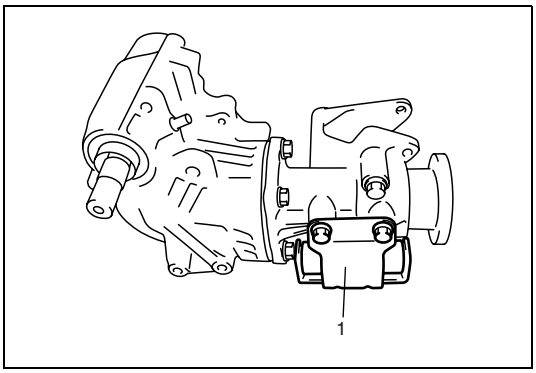


9) Remove transfer to engine stiffener (1) by removing its 5 bolts, if equipped.

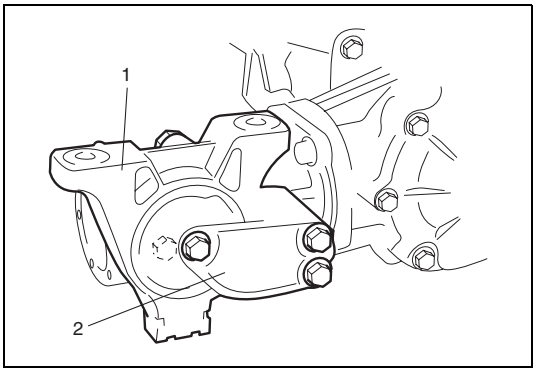


10) With transaxle assembly held on jack, remove rear mounting bracket bolts (1).

11) Remove transfer to transmission bolts and draw out transfer assembly from transmission assembly.



12) Remove dynamic damper (1) from transfer assembly, if equipped.



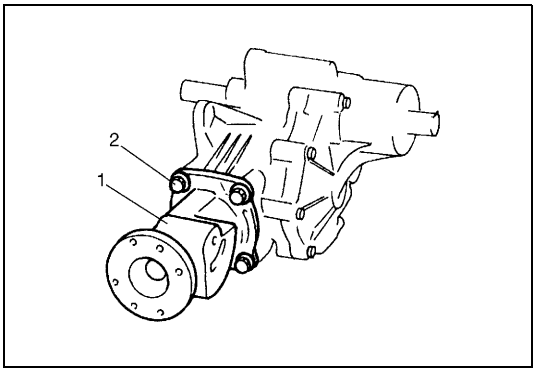
13) Remove rear mounting (1) and rear mounting bracket (2) from transfer assembly.

14) Remove breather hose from transfer assembly.

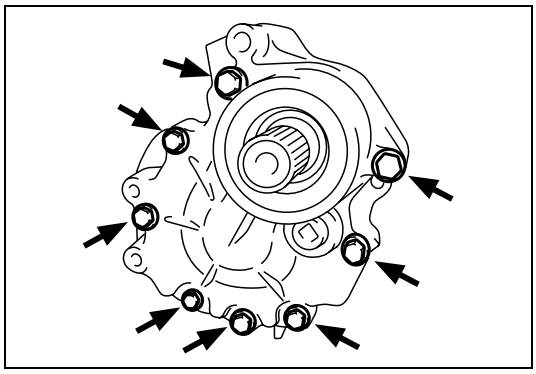
Unit Disassembly

Transfer assembly

DISASSEMBLY

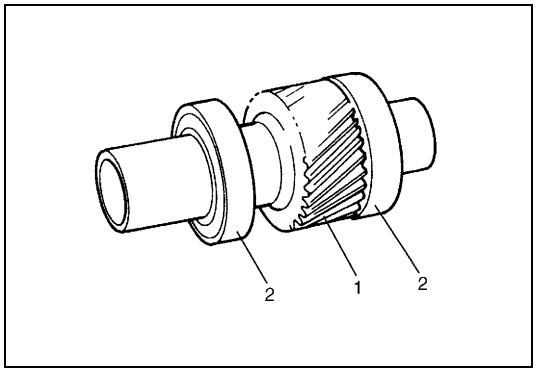


1) Remove retainer bolts (2) and remove transfer output retainer assembly (1).



2) Remove transfer case bolts.

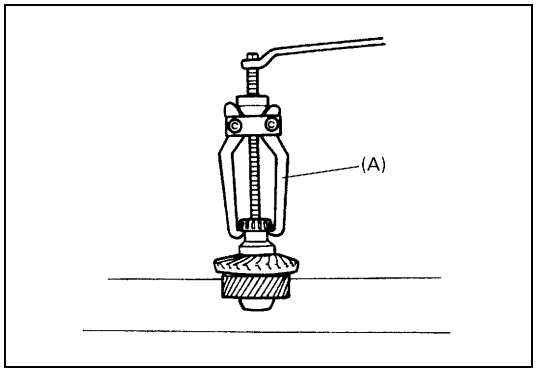
3) Separate right case with intermediate shaft from left case by tapping with plastic hammer.



4) Remove reduction drive gear assembly (1) from left case by tapping with plastic hammer.
5) Remove reduction drive gear bearings (2) (right and left) from reduction drive gear by using bearing puller and hydraulic press.

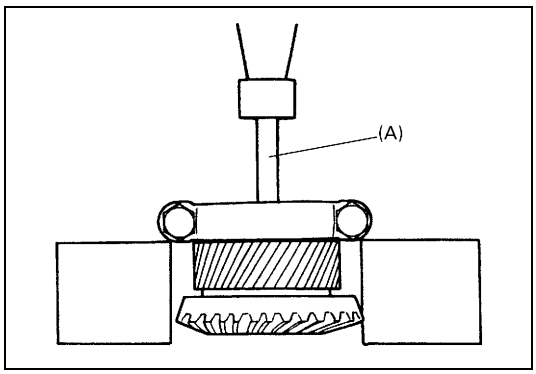
Reduction driven gear assembly

DISASSEMBLY



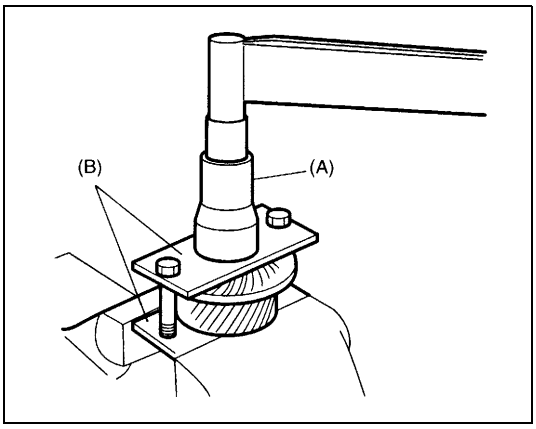
1) Drive out left side driven gear bearing by using special tool.

Special tool
(A) : 09913-65135



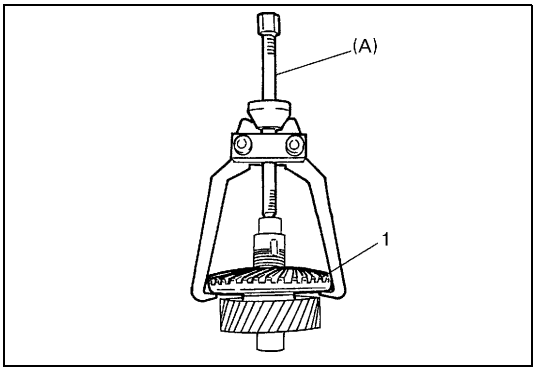
2) Drive out right side driven gear bearing by using bearing puller, hydraulic press and special tool.

Special tool
(A) : 09925-58210



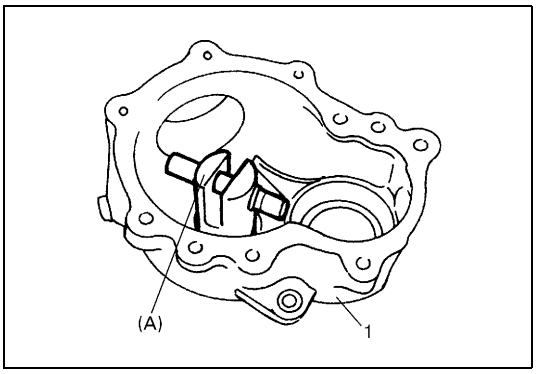
3) Uncaulk bevel gear nut, remove bevel gear nut while holding bevel gear with special tool and vise.

Special tool
(A) : 09941-58020
(B) : 09924-57610



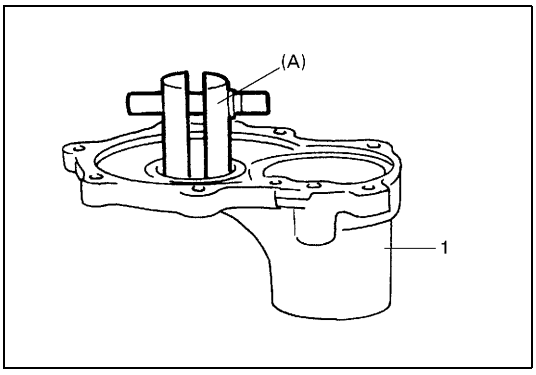
4) Drive out bevel gear (1) by using special tool.

Special tool
(A) : 09913-65135



5) Remove driven gear bearing outer race from left case (1) by using special tool.

Special tool
(A) : 09941-54911



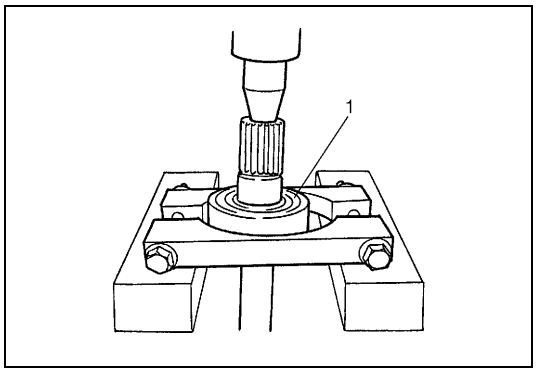
6) Remove driven gear bearing outer race from right case (1) by using special tool.

Special tool
(A) : 09941-54911

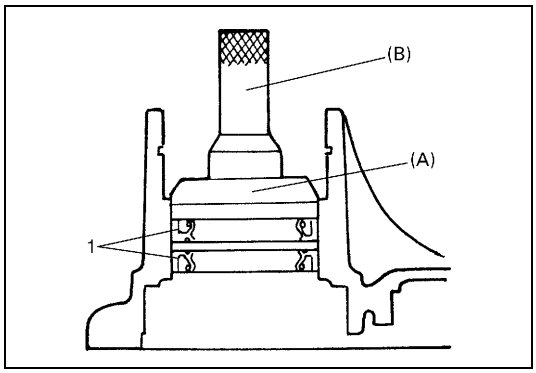
Intermediate shaft

DISASSEMBLY

1) Remove reduction drive oil seal and snap ring, and then drive out intermediate shaft.



2) Drive out intermediate shaft right bearing (1) from intermediate shaft by using bearing puller and hydraulic press.



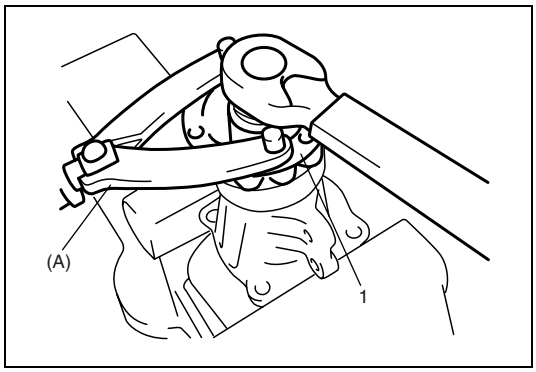
3) Remove reduction drive gear oil seals (1) by using hydraulic press and special tools.

Special tool
(A) : 09924-84510-005
(B) : 09913-75821

Transfer output retainer assembly

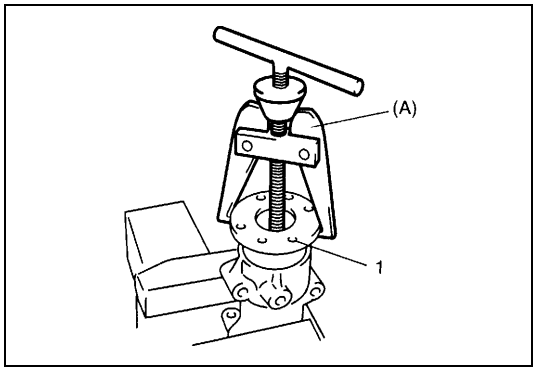
DISASSEMBLY

1) Uncaulk flange nut.



2) Remove flange nut while holding flange (1) by using special tool.

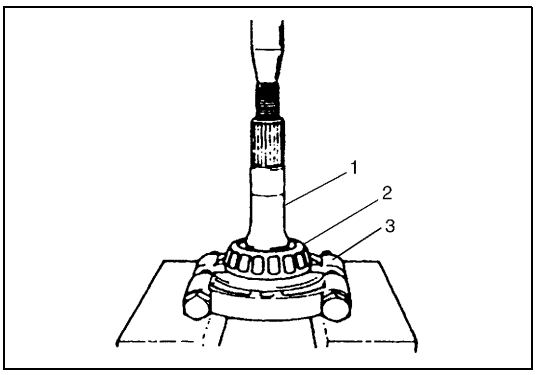
Special tool
(A) : 09930-40113



3) Remove flange (1) by special tool.

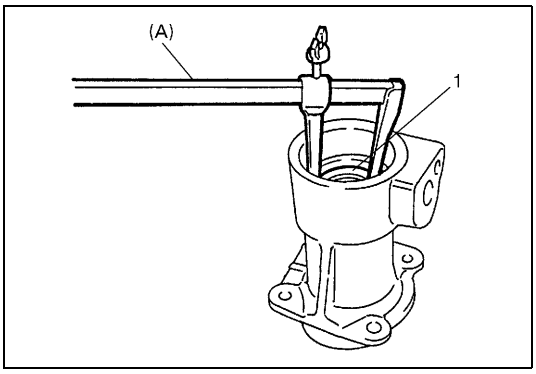
Special tool
(A) : 09913-60910

4) Drive out bevel pinion shaft from transfer output retainer by tapping with plastic hammer.
5) Drive out pinion spacer from bevel pinion shaft.



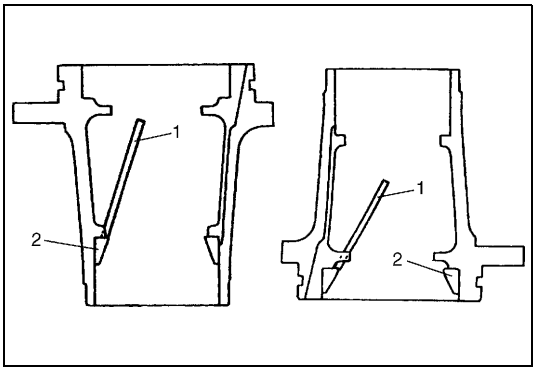
6) Drive out pinion shaft bearing (2) from bevel pinion shaft (1) by using hydraulic press.

3. Bearing puller



7) Remove pinion shaft oil seal (1) by using special tool.

Special tool
(A) : 09913-50121



8) Drive out pinion shaft bearing outer races (2) (front and rear) by using brass bar (1).

Component Inspection

- Check each bearing for smooth rotation, wear or discoloration.
  If found abnormal, replace.
- Check oil seal for leakage and its lip for excessive hardness.
  If either is found, replace.
- Check transfer case for cracks.
- Check bevel pinion and bevel gear for wear or cracks.
- Check pinion gear and pinion shaft for wear or damage.

Unit Assembly

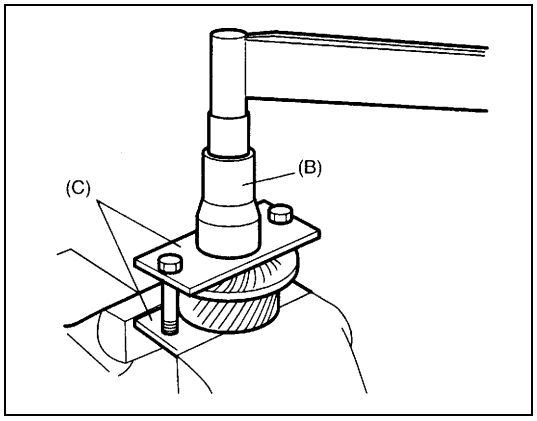
CAUTION:
- **Bevel gear and pinion must be replaced as a set when either replacement becomes necessary.**
- **When replacing taper roller bearing, replace as inner race & outer race assembly.**

Judging from faulty conditions noted before disassembly and what is found through visual check of bearing and gear tooth etc. after disassembly, prepare replacing parts and proceed to reassembly according to procedures as described below.

Reduction driven gear assembly

ASSEMBLY

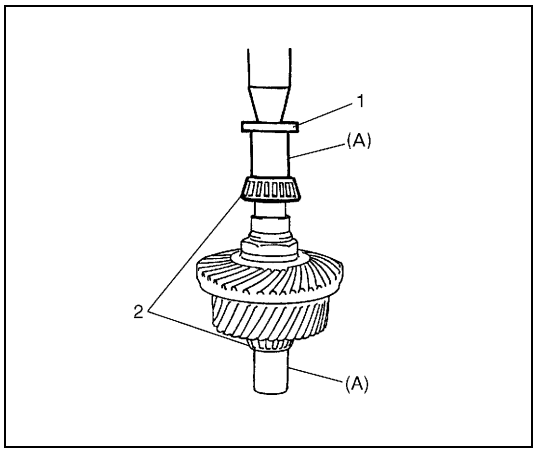
1) Drive in bevel gear to reduction driven gear.



2) Tighten bevel gear nut to specified torque while holding bevel gear with special tool and vise, and then caulk nut.

Tightening torque
Transfer bevel gear nut
: 150 N·m (15.0 kg-m, 108.5 lb-ft)

Special tool
(B) : 09941-58020
(C) : 09924-57610



NOTE:

Support shaft with special tool as illustrated in the figure so that retainer of bearing cone will be free from compression.

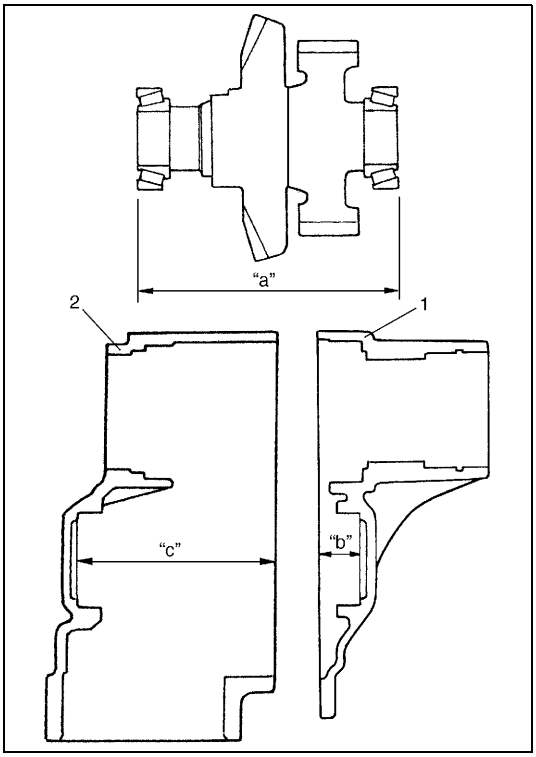
3) Press-fit driven gear bearings (2) (right and left) to driven gear by using special tools.

Special tool
(A) : 09945-16070

1. Plate

Bevel gear shim

ADJUSTMENT



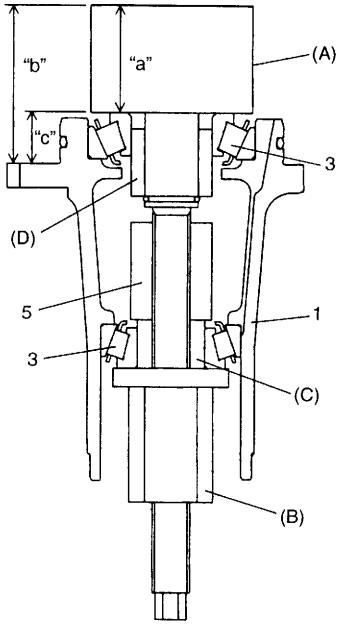
1) Install driven gear bearing outer races, take measurement of distance "a" between end faces of driven gear bearing outer races.
2) Measure depth "b" and "c" from mating face of right (left) case to face processed for installation of driven gear bearing.
3) Calculate shim thickness to be inserted.
   Shim thickness = {"b" + "c" – "a" + 0.1 mm (0.004 in.)}/2
4) Select shim(s) closest to calculated value.

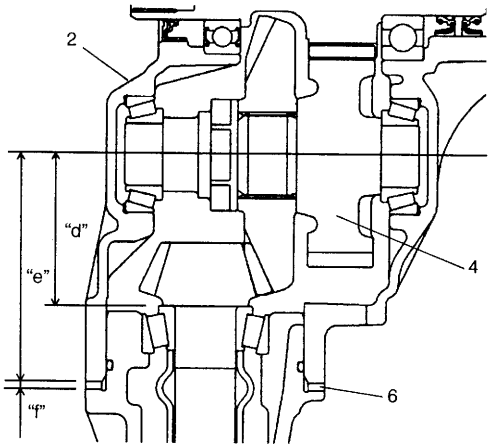
Available shim thickness
: 0.60, 0.65, 0.70, 0.75, 0.80, 0.85, 0.90, 0.95, 1.00 and 1.05 mm (0.024, 0.026, 0.028, 0.030, 0.031, 0.033, 0.035, 0.037, 0.040, and 0.041 in.)

1. Right case
2. Left case

Transfer output retainer assembly

ASSEMBLY AND ADJUSTMENT





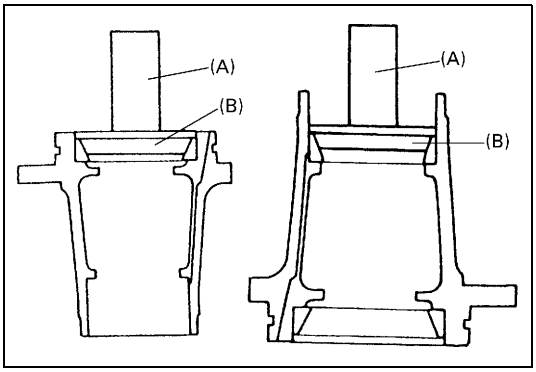
"a": Pinion dummy (special tool) height 40 mm (1.575 in.)	1. Transfer output retainer
"b": Height from retainer installation face to pinion dummy top face	2. Left case
"c": Distance from retainer installation face to end face of bearing race ("b" – "a")	3. Pinion shaft bearing
"d": Pinion shaft mounting distance 61.5 mm (2.421 in.)	4. Reduction driven gear
"e": Distance from end face of left case to axis of reduction driven gear 93.4 mm (3.677 in.)	5. Spacer Length : 82 mm – 84 mm (3.228 – 3.307 in.) Inside diameter : 14 mm (0.551 in.) Outside diameter : 30 mm – 35 mm (1.181 – 1.378 in.)
"f": Necessary shim thickness	6. Shim

Special tool

(A) : 09922-76140
(B) : 09922-76150
(C) : 09922-76340
(D) : 09922-76430

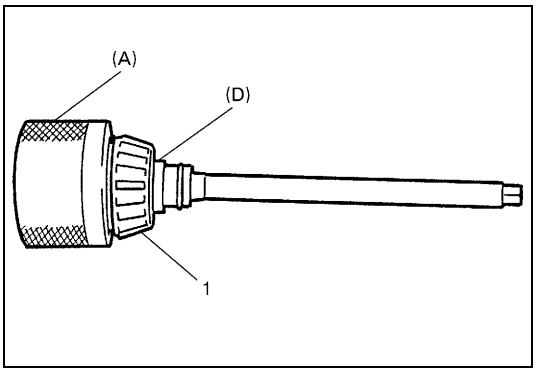
To engage bevel pinion and gear correctly, it is prerequired to install bevel pinion to transfer output retainer properly by using adjusting shim (bevel pinion shim) as selected below

.



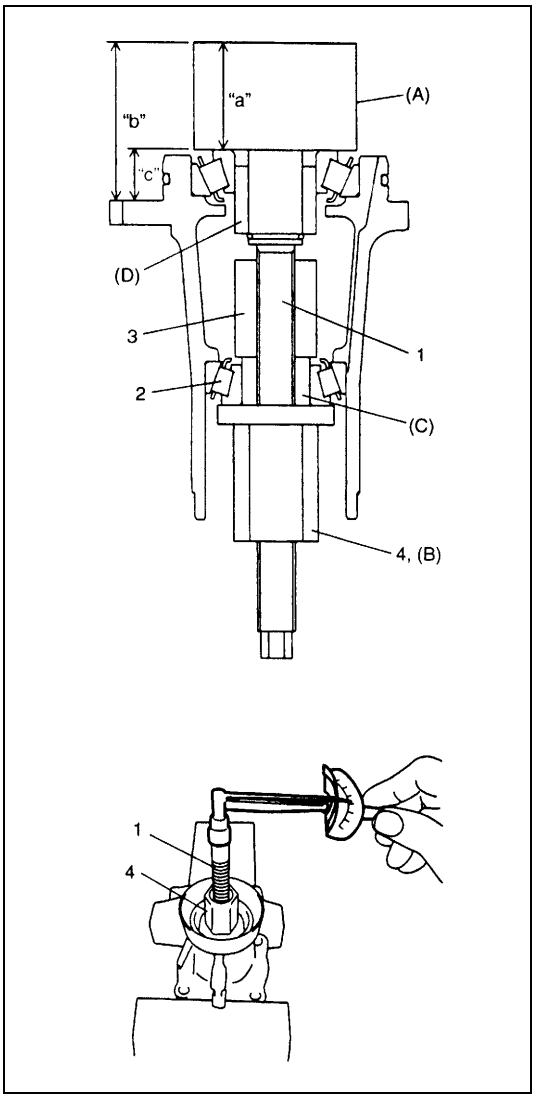
1) Press-fit pinion shaft bearing outer races (front and rear) by using special tools.

Special tool
(A) : 09913-75821
(B) : 09924-84510-005



2) Install pinion shaft bearing (1) (front side) to bevel pinion dummy with front collar (special tools).

Special tool
(A) : 09922-76140
(D) : 09922-76430



NOTE:

This installation requires no spacer or oil seal.

3) Install bevel pinion dummy (1), spacer (3), pinion shaft bearing (2) (rear side) and special tool (C) by using special tool (B) to transfer output retainer.

Special tool
(A) : 09922-76140
(B) : 09922-76150
(C) : 09922-76340
(D) : 09922-76430

4) Tighten bevel pinion nut (special tool) (4) so that specified bearing preload is obtained.

NOTE:

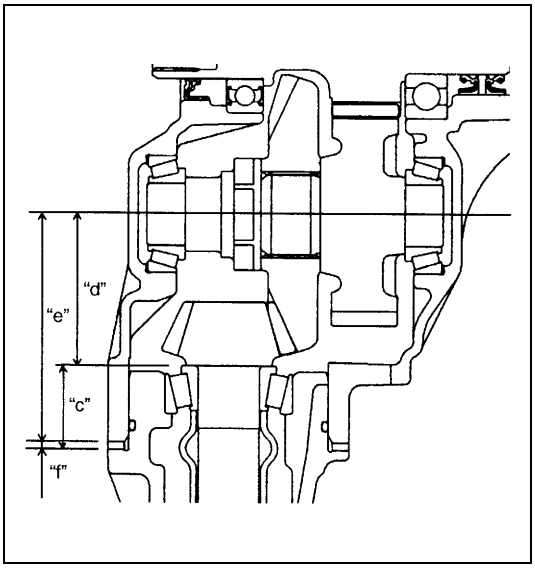
Before taking measurement, check for rotation by hand more than 15 revolutions.

Pinion shaft bearing preload
: 0.5 – 1.3 N·m (5.0 – 13.0 kg-cm, 0.35 – 0.90 lb-ft)

5) Measure height "b" in figure by using vernier caliper. Calculate "c" by using measured value.

Distance "c"	=	Height "b"	–	Height "a" 40 mm (1.575 in.)

"a":	Pinion dummy height
"b":	Height from retainer installation face to pinion dummy top face
"c":	Distance from retainer installation face to end face of bearing race



6) Obtain adjusting shim thickness by using calculated value in following equation.

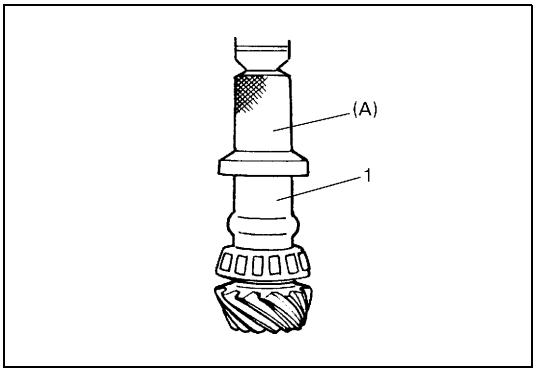
Necessary shim thickness "f"	=	Distance "c"	–	Distance "e" 93.4 mm (3.677 in.)	+	Distance "d" 61.5 mm (2.421 in.)

"c" :	Distance from retainer installation face to end face of bearing race
"d" :	Pinion shaft mounting distance 61.5 mm (2.421 in.)
"e" :	Distance from end face of left case to axis of reduction driven gear 93.4 mm (3.677 in.)
"f" :	Necessary shim thickness

7) Select adjusting shim closest to calculated value from among the following available sizes.

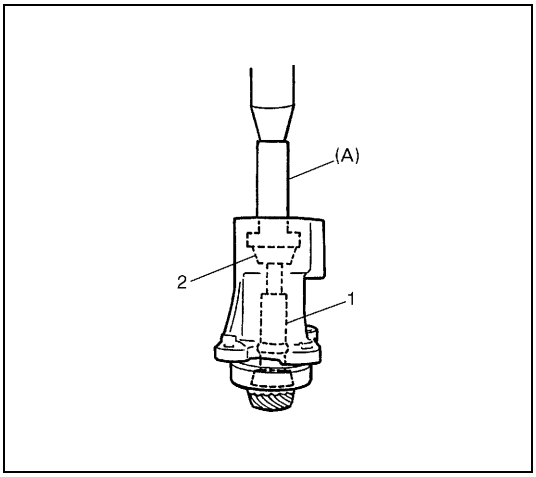
Available shims thickness
: 0.30, 2.00, 2.03, 2.06, 2.09, 2.12, 2.15, 2.18, 2.21, 2.24 and 2.27 mm (0.012, 0.079, 0.080, 0.081, 0.082, 0.083, 0.085, 0.086, 0.087, 0.088 and 0.089 in.)

8) Disassemble bevel pinion dummy and special tools.



9) Press-fit pinion shaft bearing (front side) by using special tool, hydraulic press and pinion shaft spacer (1) removed in procedure "Unit Disassembly Transfer Output Retainer Assembly" in this section.

Special tool
(A) : 09913-75810

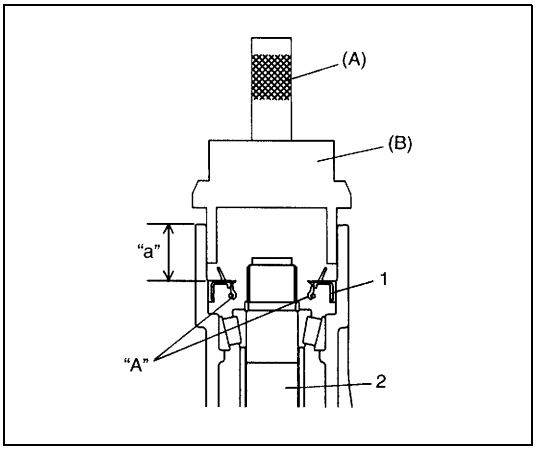


10) Install bevel pinion shaft with new pinion shaft spacer (1) to transfer output retainer.

CAUTION:
Press-fit bearing to such an extent that spacer is not compressed. Excessive compression may cause a failure in bearing preload adjustment.

11) Press-fit pinion shaft bearing (rear side) (2) by using special tool and hydraulic press.

Special tool
(A) : 09913-75810



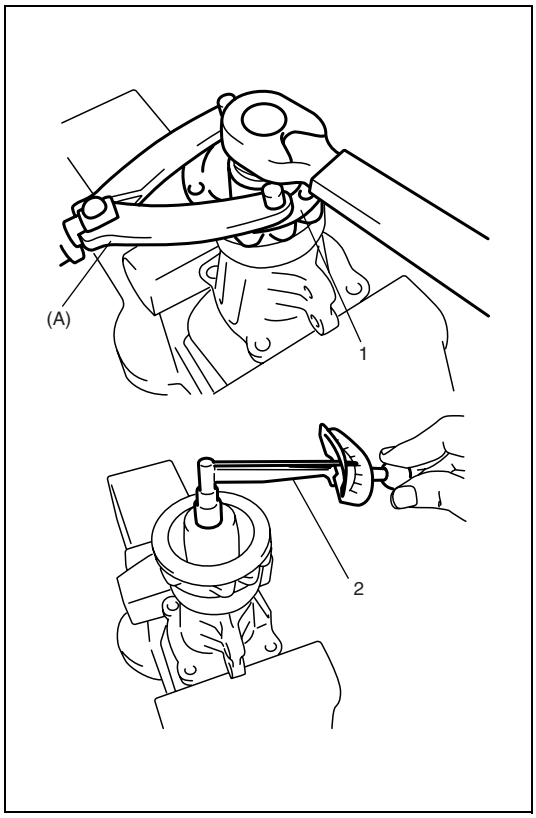
12) Drive in new oil seal (1) by using special tools and apply grease to oil seal lip.

Special tool
(A) : 09924-74510
(B) : 09926-27610

"A" : Grease 99000-25010

Transfer bevel pinion shaft oil seal installing depth
"a" : 27.0 – 27.5 mm (1.063 – 1.083 in.)

2. Bevel pinion shaft



13) Install flange (1) and tighten flange nut gradually so as rotational torque of bevel pinion shaft to be in specified value.

NOTE:

- **If rotational torque of bevel pinion shaft exceeds specification given below, replace pinion shaft spacer and tighten flange nut.**
- **Before taking measurement of rotational torque, rotate pinion shaft over ten rounds in advance.**
- **For measuring bevel pinion shaft rotational torque, turning bevel pinion at about 50 rpm is required.**

Special tool
(A) : 09930-40113

Tightening torque
Transfer output flange nut (reference)
: 100 – 300 N·m (10.0 – 30.0 kg-m, 72.5 – 217.0 lb-ft)

Rotational torque for bevel pinion shaft (Bearing preload)
: 0.5 – 1.3 N·m (5.0 – 13.0 kg-cm, 0.35 – 0.90 lb-ft)

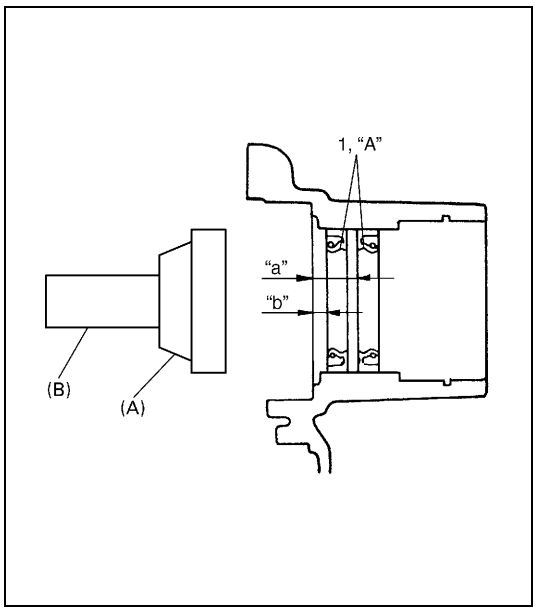
2. Torque wrench

14) Caulk flange nut.

Right case

ASSEMBLY

1) Press-fit intermediate shaft right bearing to intermediate shaft.



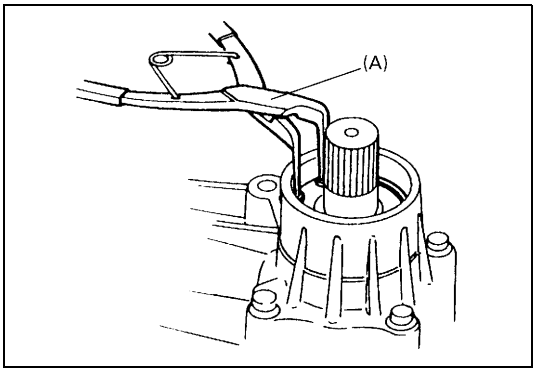
CAUTION:
Use care the installation direction and depth of oil seals for correct installation. Failure to install them may cause oil leakage.

2) Install new reduction drive gear oil seals (1) to case by using special tool and apply grease to oil seal lips.

Special tool
(A) : 09924-84510-005
(B) : 09913-75821

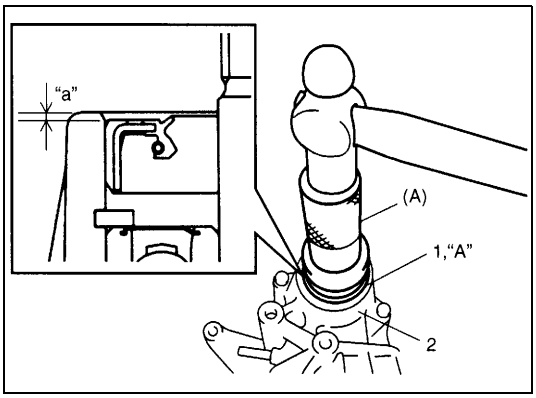
"A" : Grease 99000-25010

Transfer reduction drive gear oil seal installing depth
"a" : 16.0 – 16.5 mm (0.630 – 0.650 in.)
"b" : 4.0 – 4.5 mm (0.157 – 0.177 in.)



3) Install intermediate shaft to right case, and install snap ring.

Special tool
(A) : 09952-76011



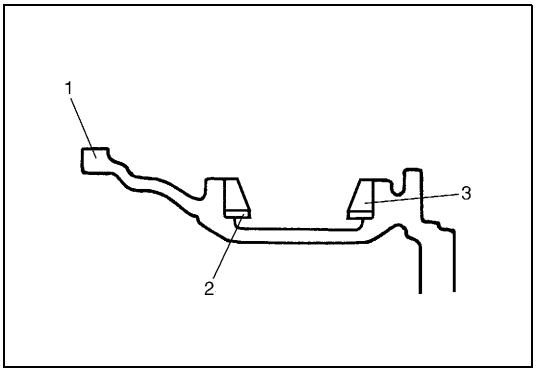
4) Install new right case oil seal (1) to right case (2).

Special tool
(A) : 09925-15410

Transfer right case oil seal installing depth
"a" : 1.0 – 1.5 mm (0.039 – 0.059 in.)

5) Fill inside of oil seal with about 3 g (0.11 oz) grease, and apply grease to oil seal lip.

"A" : Grease 99000-25010

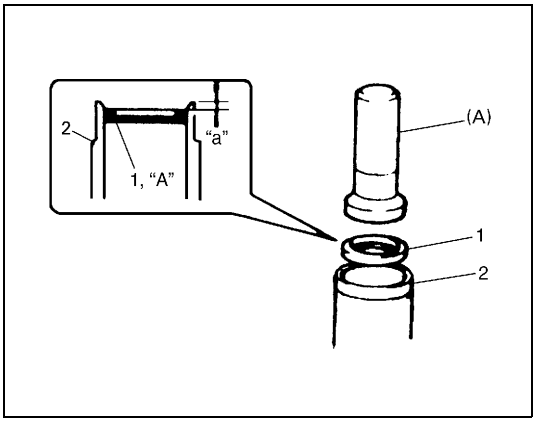


6) Install bevel gear shim(s) (2) selected in item "Bevel Gear Shim Adjustment" and driven gear bearing outer race (3) to right case (1).

Left case

ASSEMBLY

1) Install the bevel gear shim(s) selected in item "Bevel Gear Shim Adjustment" and driven gear bearing outer race to left case.



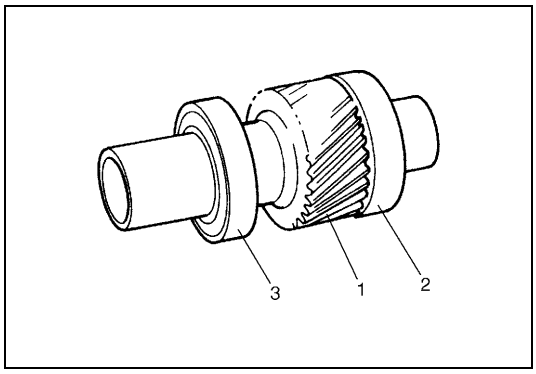
2) Install new left case oil seal (1) to left case (2) by using special tool.

Special tool
(A) : 09925-15410

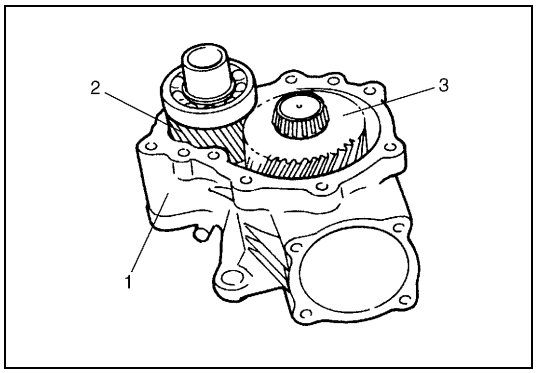
Transfer left case oil seal installing depth
"a" : 1.5 – 2.0 mm (0.059 – 0.078 in.)

3) Fill inside of oil seal with about 3 g (0.11 oz) grease, and apply grease to oil seal lip.

"A" : Grease 99000-25010



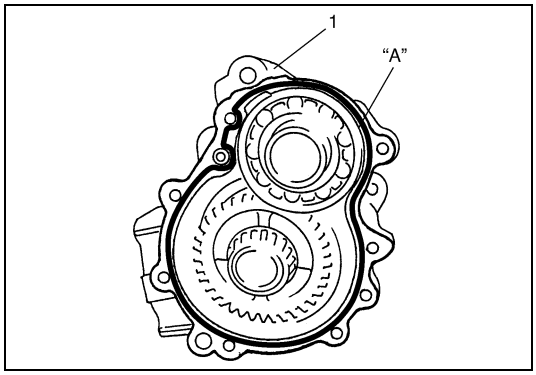
4) Press-fit drive gear bearings (right (2) and left (3)) to reduction drive gear (1).
Apply gear oil to ball of bearing.



5) Install reduction drive gear assembly (2) and reduction driven gear assembly (3) to left case (1).

Transfer assembly

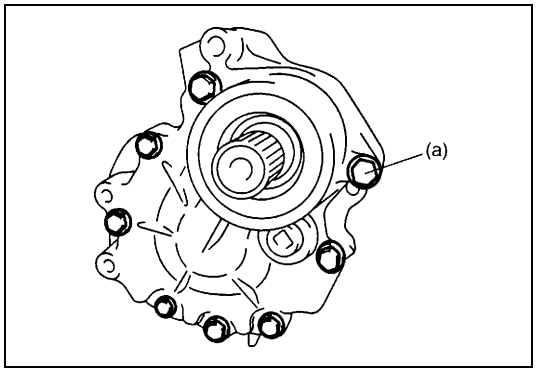
ASSEMBLY



CAUTION:
Clean mating surfaces of cases with solvent completely, otherwise oil leakage might take place.

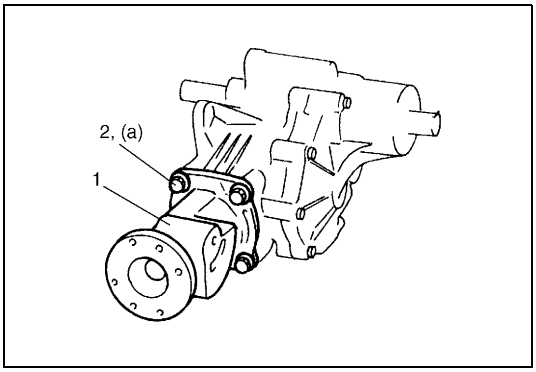
1) Clean mating surface of right case and left case (1), and apply sealant to left case (1) by using a nozzle as shown in figure by such amount that its section is 1.5 mm (0.059 in.) in diameter.

"A" : Sealant 99000-31230



2) Tighten transfer case bolts to specified torque.

Tightening torque
Transfer case bolts (a) : 23 N·m (2.3 kg-m, 17.0 lb-ft)

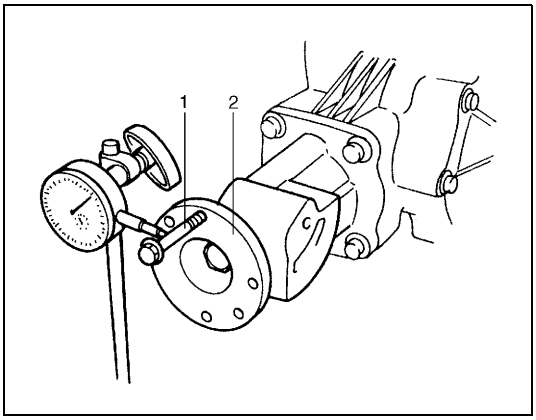


3) Install the bevel pinion shim(s) selected in preceding procedure ("Transfer Output Retainer Assembly, Assembly and Adjustment"), install transfer output retainer assembly (1) to transfer case and then tighten retainer bolts (2) to specified torque.

Tightening torque
Transfer output retainer bolts
(a) : 50 N·m (5.0 kg-m, 36.5 lb-ft)

Bevel gear back lash

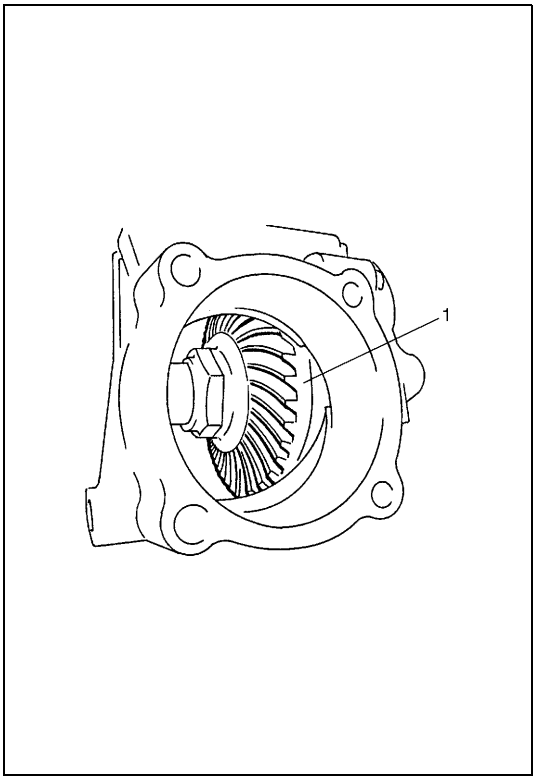
MEASUREMENT



1) Install bolt to bolt hole of flange (2), set dial gauge measuring tip at right angles to bolt (1) as shown in figure.
Take measurement backlash of pinion and bevel gear.

NOTE:
If backlash exceeds specification given below, replace bevel pinion shim (between transfer case and transfer output retainer) and measure backlash again.

Transfer pinion & bevel gear backlash
: 0.1 – 0.2 mm (0.0039 – 0.0078 in.)



2) As final step, check gear tooth contact as follows.

NOTE:
When applying red lead paste to teeth, be sure to paint tooth surfaces uniformly. The paste must not be too dry or too fluid.

a) After cleaning tooth surface of bevel gear (1), paint them with gear marking compound evenly by using brush or sponge etc.

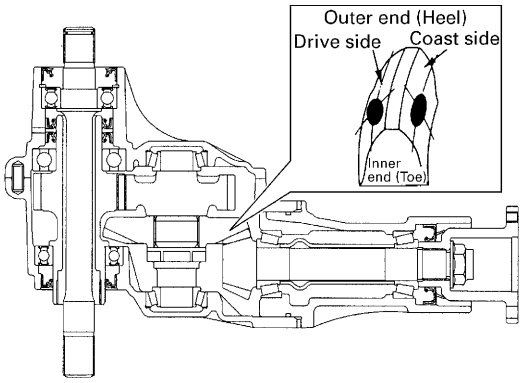
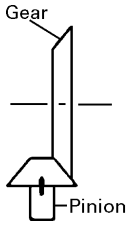
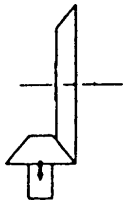
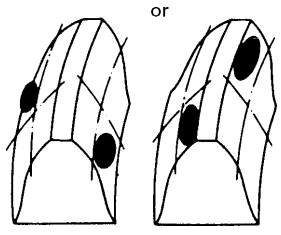
NOTE:
Be careful not to turn bevel gear more than one full revolution, for it will hinder accurate check.

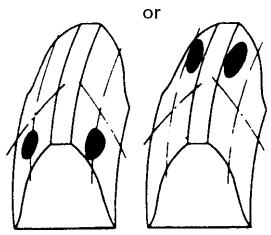
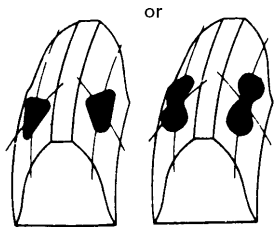
b) Turn gear to bring its painted part in mesh with bevel pinion and turn it back and forth by hand to repeat their contact.
c) Bring painted part up and check contact pattern, referring to following chart.
If contact pattern is not normal, readjust or replace as necessary according to instruction in chart.

NOTE:

If bevel gear back lash and bevel pinion shims are adjusted properly, correct tooth contact should be provided.

If correct tooth contact is not provided even when they are adjusted properly, however, there may be an abnormal condition in worn tooth, transfer case or retainer. Check each component and replace as necessary.

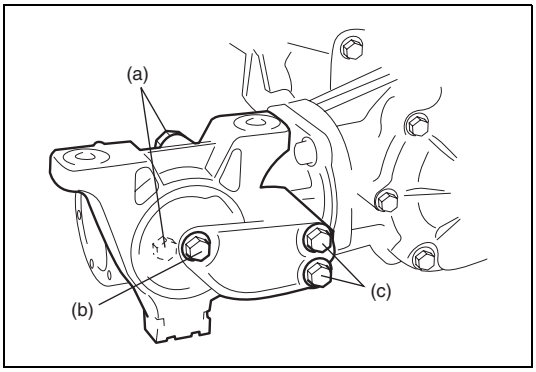
TOOTH CONTACT PATTERN	DIAGNOSIS AND REMEDY
	NORMAL
	HIGH CONTACT Pinion is positioned too fat from the center of drive bevel gear. 1) Decrease thickness of bevel pinion shim and position pinion closer to gear center. 2) Adjust drive bevel gear backlash to specification. 
	LOW CONTACT Pinion is positioned too close to the center of drive bevel gear. 1) Increase thickness of bevel pinion shim and position pinion farther from gear center. 2) Adjust drive bevel gear backlash to specification. 
	These contact patterns indicate that the “offset” of reduction driven gear is too much or too little. The remedy is to change the division of the bevel gear shim(s).

TOOTH CONTACT PATTERN	DIAGNOSIS AND REMEDY
	These contact patterns, located on toe or heel on both drive and coast sides, mean that 1) both pinion and gear are defective, 2) retainer is not true, or 3) gear is not properly seated on transfer case. The remedy is to replace the defective member.
	Irregular patterns: If the pattern is not oval, it means that bevel gear is defective. High or low spots on tooth surfaces or on the seat of bevel gear are the cause of irregular patterns appearing on some teeth. The remedy is to replace the pinion and gear set and, if the seat is defective, so is transfer case.

Unit Installation

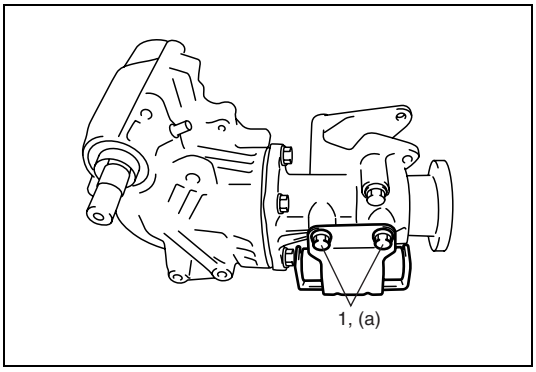
INSTALLATION

Install transfer assembly by reversing removal procedure and noting the following points.



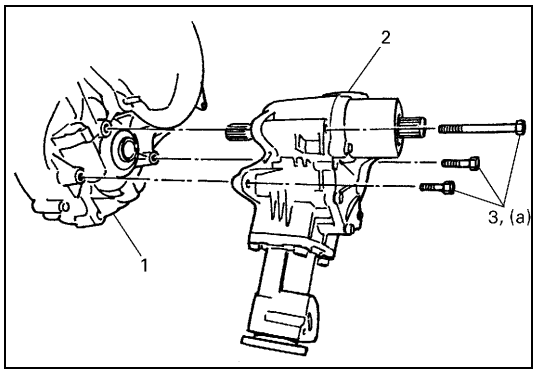
- Tighten mounting bolt and mounting bracket bolts and nuts to specified torque.

Tightening torque
Transfer rear mounting bracket nuts
(a) : 50 N·m (5.0 kg-m, 36.5 lb-ft)
Transfer mounting bolt
(b) : 55 N·m (5.5 kg-m, 40.0 lb-ft)
Transfer rear mounting bracket No.2 bolts
(c) : 55 N·m (5.5 kg-m, 40.0 lb-ft)



- Tighten dynamic damper bolts (1) to specified torque, if equipped.

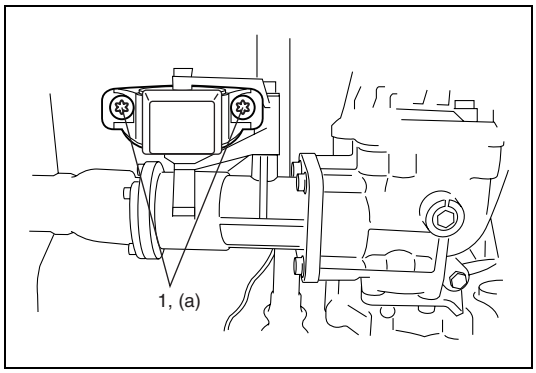
Tightening torque
Dynamic damper bolts
(a) : 50 N·m (5.0 kg-m, 36.5 lb-ft)



- Tighten transfer to transmission bolts (3) to specified torque.

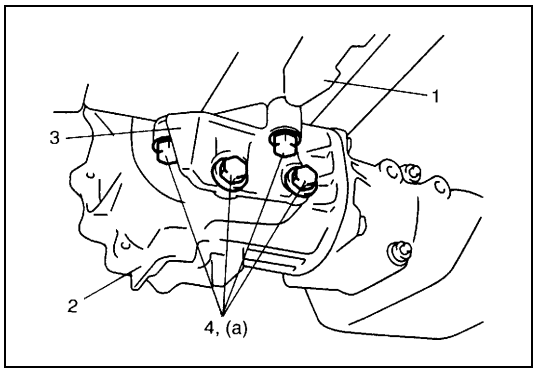
Tightening torque
Transfer to transmission bolts
(a) : 50 N·m (5.0 kg-m, 36.5 lb-ft)

1.	Transmission
2.	Transfer assembly



- Tighten rear mounting bracket bolts (1) to specified torque.

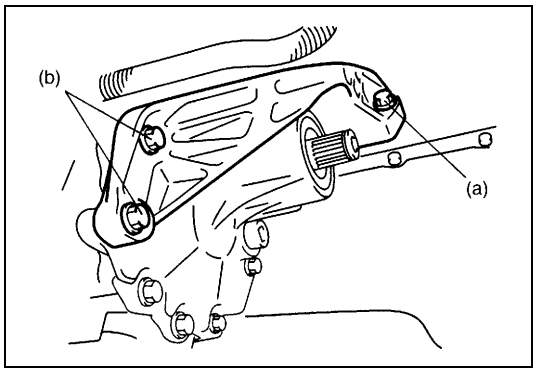
Tightening torque
Transfer rear mounting bracket bolts
(a) : 55 N·m (5.5 kg-m, 40.0 lb-ft)



- Tighten transfer stiffener bolts (4) to specified torque.

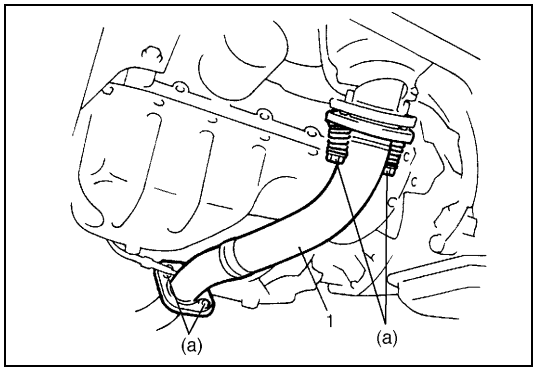
Tightening torque
Transfer stiffener bolts (a) : 50 N·m (5.0 kg-m, 36.5 lb-ft)

1.	Transmission
2.	Transfer
3.	Stiffener



- Tighten transfer to engine stiffener bolts to specified torque, if equipped.

Tightening torque
Transfer to engine stiffener No.1 bolts
(a) : 50 N·m (5.0 kg-m, 36.5 lb-ft)
Transfer to engine stiffener No.2 bolts
(b) : 23 N·m (2.3 kg-m, 17.0 lb-ft)



- Tighten exhaust pipe bolts.

Tightening torque
Exhaust pipe bolts
(a) : 50 N·m (5.0 kg-m, 36.5 lb-ft)

1.	Exhaust No.1 pipe

- Install right side drive shaft, referring to Section 4A of the service manual mentioned in the “Forword” of this manual.
- Install propeller shaft and tighten propeller shaft bolts and center support bolts to specified torque (refer to Section 4B).
- Pour gear oil to transfer as specified, refer to “Oil Change” in this section.
  Check oil level and leakage.

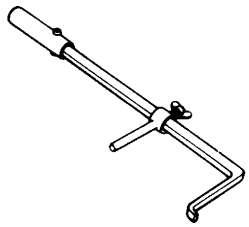
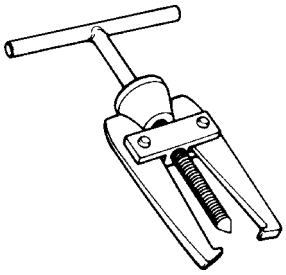
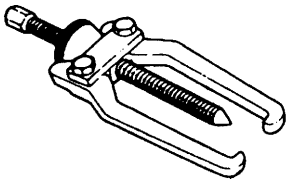
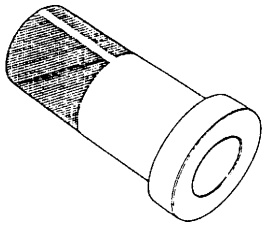
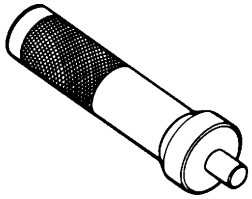
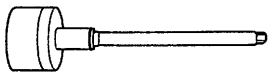
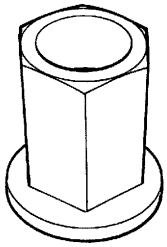
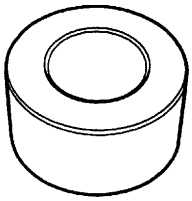
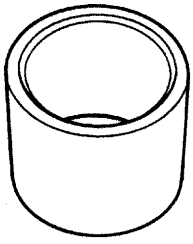
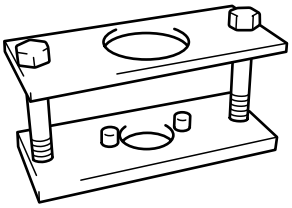
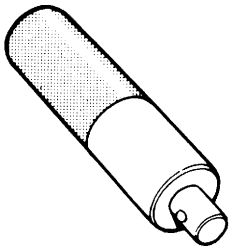
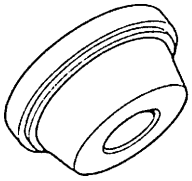
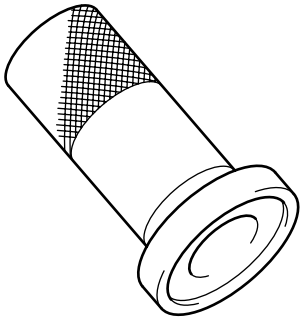
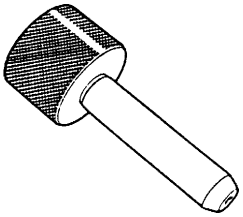
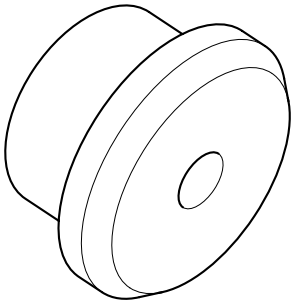
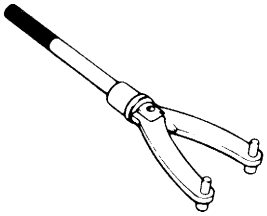
Tightening Torque Specification

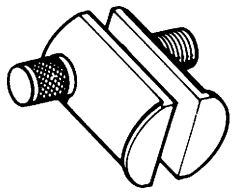
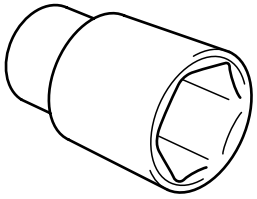
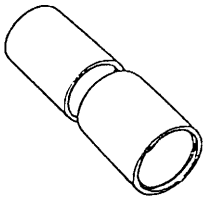
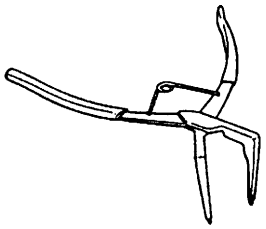
Fastening part	Tightening torque		
	N•m	kg-m	lb-ft
Transfer oil level/filler and drain plugs	21	2.1	15.5
Transfer bevel gear nut	150	15.0	108.5
Transfer case bolts	23	2.3	17.0
Transfer output retainer bolts	50	5.0	36.5
Transfer to transmission bolts	50	5.0	36.5
Transfer rear mounting bracket bolts	55	5.5	40.0
Transfer rear mounting bracket nuts	50	5.0	36.5
Transfer mounting bolt	55	5.5	40.0
Transfer rear mounting bracket No.2 bolts	55	5.5	40.0
Transfer stiffener bolts	50	5.0	36.5
Exhaust pipe bolts	50	5.0	36.5
Dynamic damper bolts (if equipped)	50	5.0	36.5
Transfer output flange nut (reference)	100 – 300	10.0 – 30.0	72.5 – 217.0
Transfer to engine stiffener No.1 bolts (if equipped)	50	5.0	36.5
Transfer to engine stiffener No.2 bolts (if equipped)	23	2.3	17.0

Required Service Material

Material	Recommended SUZUKI products (Part Number)	Use
Lithium grease	SUZUKI SUPER GREASE A (99000-25010)	• Oil seal lips
Sealant	SUZUKI BOND NO. 1216B (99000-31230)	• Oil drain plug • Oil level plug • Mating surface of transfer case

Special Tool

 09913-50121 Oil seal remover	 09913-60910 Bearing/Gear puller	 09913-65135 Bearing puller	 09913-75810 Bearing installer
 09913-75821 Bearing installer attachment	 09922-76140 Bevel pinion shaft	 09922-76150 Bevel pinion nut	 09922-76340 Rear collar
 09922-76430 Front collar	 09924-57610 Gear holder	 09924-74510 Installer handle	 09924-84510-005 Bearing installer attachment
 09925-15410 Oil seal installer	 09925-58210 Oil seal installer	 09926-27610 Oil seal installer	 09930-40113 Rotor holder

			
09941-54911 Bearing outer race remover	09941-58020 Socket wrench (40 mm)	09945-16070 Retainer ring installer set	09952-76011 Snap ring pliers (closing type)

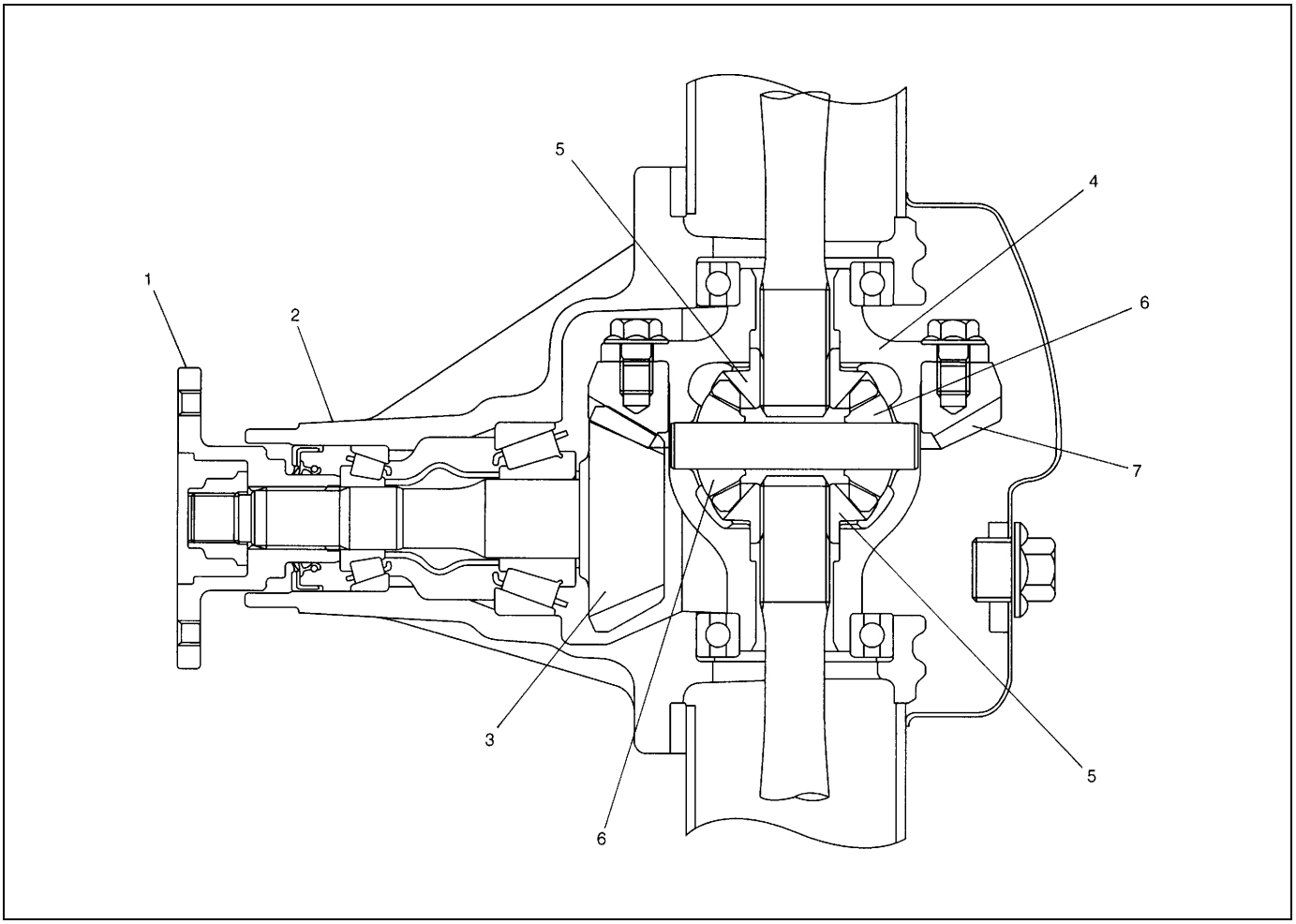
SECTION 7F

REAR DIFFERENTIAL

CONTENTS

General Description

The differential assembly uses a hypoid drive bevel pinion and gear.
The differential assembly is decisive in that the drive power is concentrated there. Therefore, use of genuine parts and specified torque is compulsory. Further, because of sliding tooth meshing with high pressure between drive bevel pinion and gear, it is mandatory to lubricate them by hypoid gear oil.
The hypoid gears have an advantage of preventing gear noise, at the same time, they require accurate adjustment of tooth contact and backlash.



1. Companion flange	4. Differential case	7. Drive bevel gear (hypoid gear)
2. Differential carrier	5. Differential side gear	
3. Drive bevel pinion (hypoid gear)	6. Differential pinion	

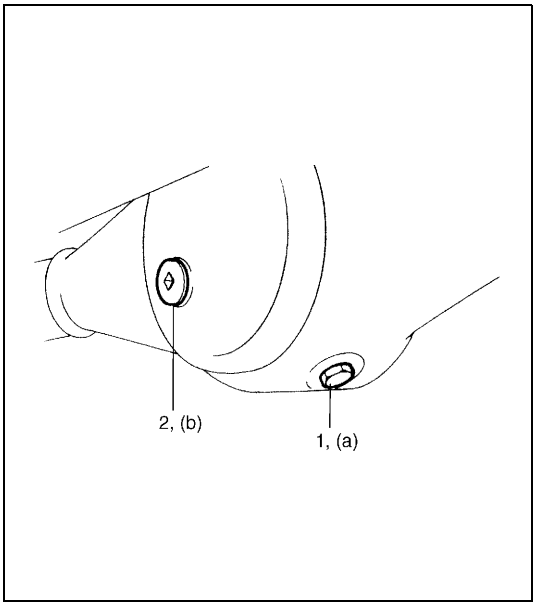
Diagnosis

Condition	Possible Cause	Correction
Gear noise	Deteriorated or water mixed lubricant	Repair and replenish.
	Inadequate or insufficient lubricant	Repair and replenish.
	Maladjusted backlash between drive bevel pinion and gear	Adjust and prescribed.
	Improper tooth contact in the mesh between drive bevel pinion and gear	Adjust or replace.
	Loose drive bevel gear securing bolts	Replace or retighten.
	Damaged side gear(s) or side pinion(s)	Replace.
Bearing noise	(Constant noise) Deteriorated or water mixed lubricant	Repair or replenish.
	(Constant noise) Inadequate or insufficient lubricant	Repair or replenish.
	(Noise while coasting) Damaged bearing(s) of drive bevel pinion	Replace.
	(Noise while turning) Damaged differential side bearing(s)	Replace.
Oil leakage	Clogged breather plug	Clean.
	Worn or damaged oil seal	Replace.
	Excessive oil	Adjust oil level.

On-Vehicle Service

Oil Change

1) Before oil change or inspection, be sure to stop engine and set vehicle horizontally.
2) Check oil level and existence of leakage. For checking oil level roughly, lower point of level hole can be assumed to be standard point of level. If leakage is found, correct its cause.

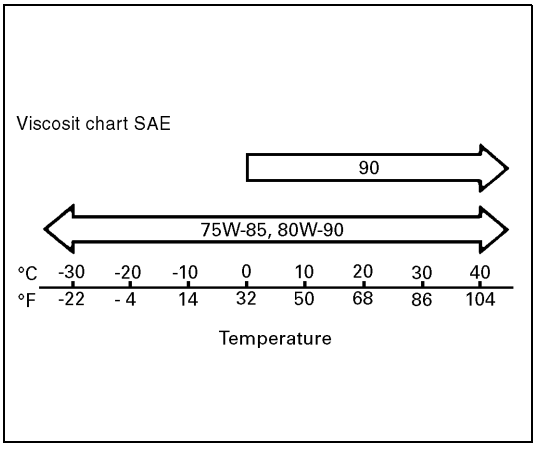


3) Remove level/filler plug (2) and drain plug (1), then drain old oil.
4) Install new gasket to drain plug and tighten drain plug to specified torque.

Tightening torque
Rear differential oil drain plug
(a) : 55 N·m (5.5 kg-m, 40.0 lb-ft)

5) Pour proper amount of new hypoid gear oil as specified below (roughly up to level hole).
6) Install new gasket to level/filler plug and tighten level/filler plug to specified torque.

Tightening torque
Rear differential oil level/filler plug
(b) : 50 N·m (5.0 kg-m, 36.5 lb-ft)



NOTE:

- **It is highly recommended to use SAE 80W-90 viscosity.**
- **Whenever vehicle is hoisted for any other service work than oil change, also be sure to check for oil leakage.**

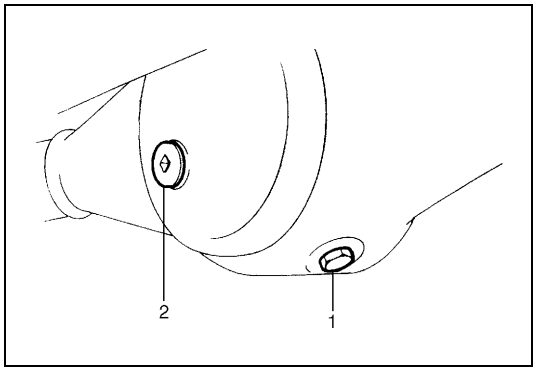
Differential oil
Hypoid gear oil API GL-5
For oil viscosity, refer to the chart.

Differential oil capacity
1.0 liters (2.1/1.8 US/Imp. pt)

Differential Unit

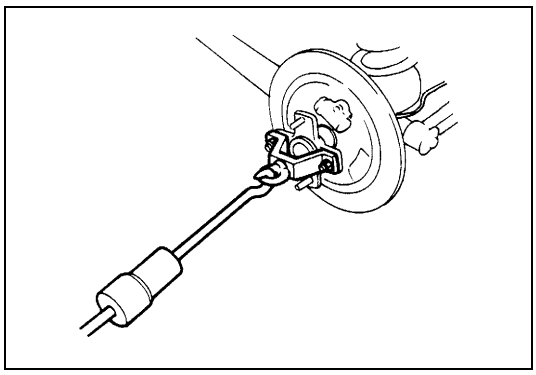
DISMOUNTING

1) Hoist vehicle and remove wheels.

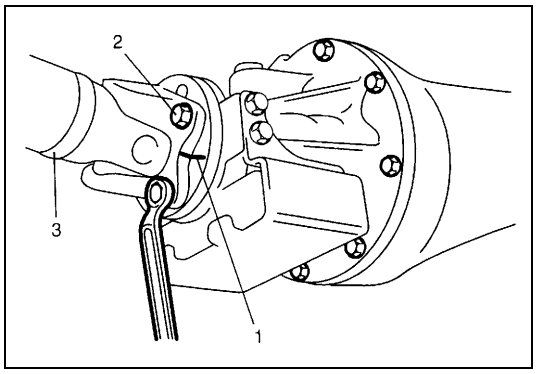


2) Drain oil from rear differential. (Refer to “Oil Change” in this section.)

1. Drain plug
2. Level/filler plug

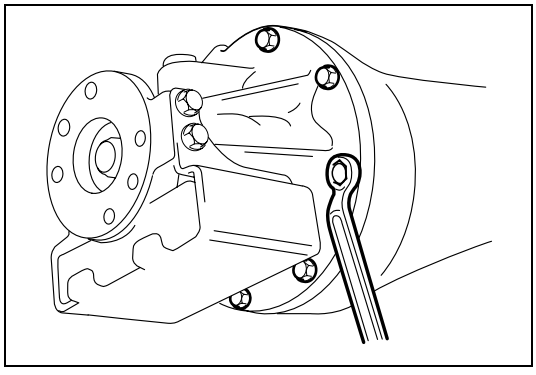


3) Remove brake drum and disconnect parking brake cable from brake back plate.
4) Remove axle shafts, referring to “Rear Axle Shaft and Wheel Bearing Removal” in Section 3E.



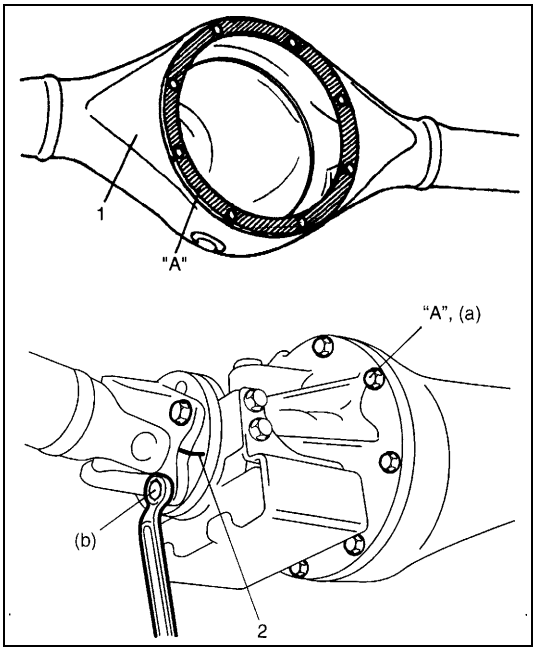
5) Before removing propeller shaft, give match marks (1) on companion flange and propeller shaft as shown.
6) Remove 4 propeller shaft flange bolts (2) from rear differential, and then pull out propeller shaft (3) from rear differential.

7) Support rear differential using jack.



8) Remove differential carrier bolts.

9) Lower jack with rear differential assembly.



REMOUNTING

Reverse removal procedure for installation, noting the following.

Rear differential

- Clean mating surfaces of axle housing (1) and differential carrier and apply sealant to housing side.

"A" : Sealant 99000-31110

- Apply sealant to carrier bolts and tighten carrier bolts to specified torque.

"A" : Sealant 99000-31110

Tightening torque
Differential carrier bolts
(a) : 23 N·m (2.3 kg-m, 17.0 lb-ft)

- Install propeller shaft to joint flange aligning match marks (2) and tighten propeller shaft bolts to specified torque.

Tightening torque
Propeller shaft bolts
(b) : 23 N·m (2.3 kg-m, 17.0 lb-ft)

Rear axle shaft

For installation of rear axle shaft, refer to "Rear Axle Shaft and Wheel Bearing Installation" in Section 3E.

Rear brake drum

For installation of rear brake drum, refer to "Brake Drum Installation" in Section 5C.

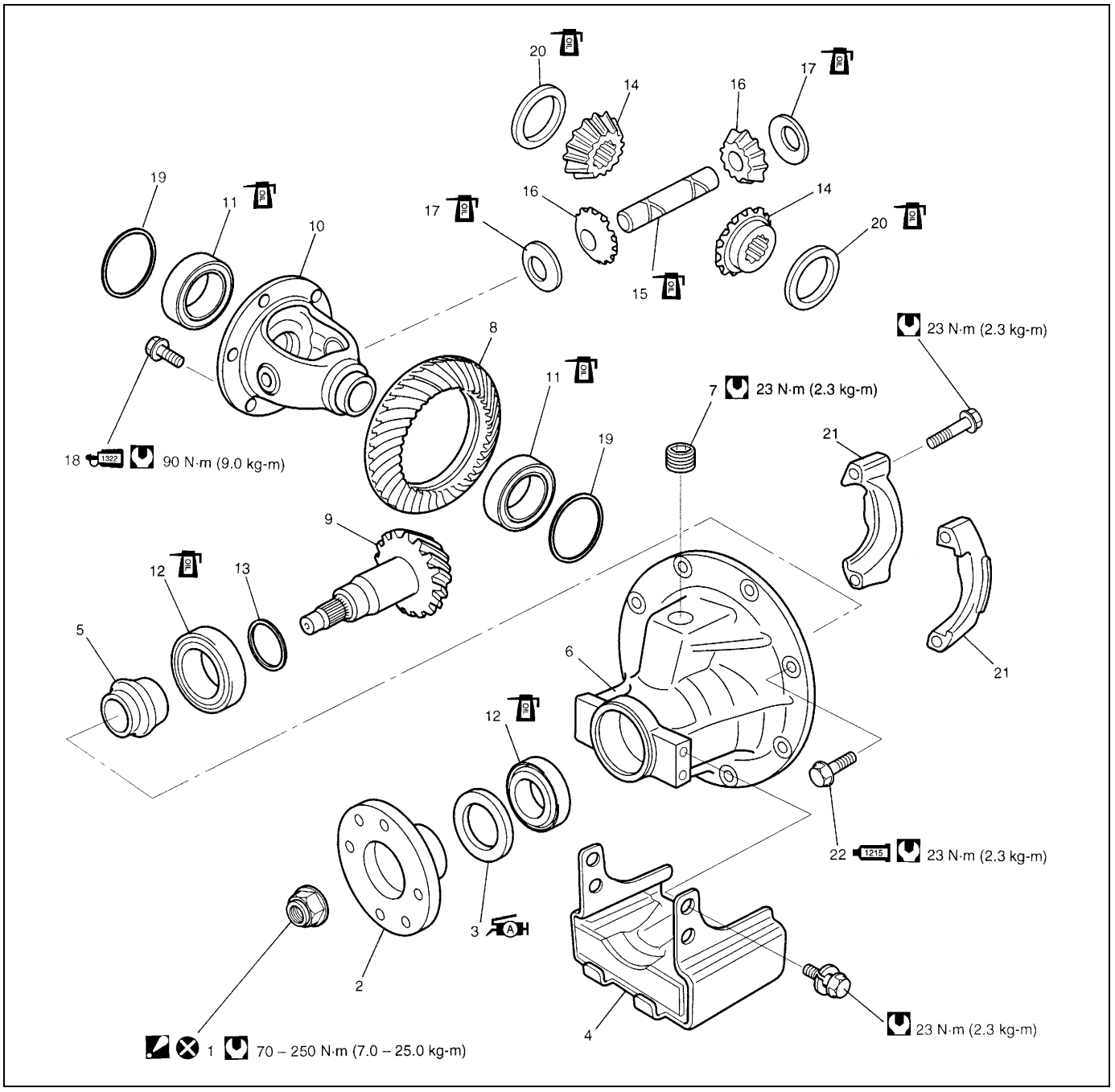
Differential gear oil

Refill differential housing with new specified oil. Refer to "Oil Change" in this section for refill.

Brake circuit air purging

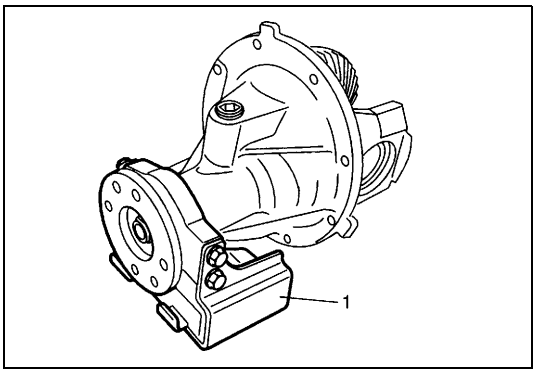
Make sure to purge air out of brake circuit. Refer to "Bleeding Brakes" in Section 5 of the Service Manual mentioned in the FOREWORD of this manual.
Then check that joint seam of pipe is free from oil leak.

Unit Repair Overhaul

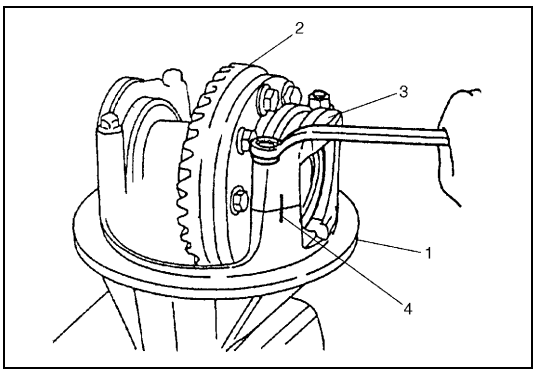


1. Companion flange nut : After tightening nut so as drive bevel pinion bearing preload to be in specified value, caulk nut securely.	10. Differential case	19. Side bearing shim
2. Companion flange	11. Differential side bearing	20. Differential gear washer
3. Oil seal : Apply grease 99000-25010 to oil seal lip.	12. Drive bevel pinion bearing	21. Differential side bearing cap
4. Dynamic damper	13. Drive bevel pinion shim	1215 22. Differential carrier bolt : Apply sealant 99000-31110 to thread part.
5. Spacer	14. Differential gear	Do not reuse.
6. Differential carrier	15. Differential pinion shaft	Tightening torque
7. Plug	16. Differential pinion	Apply differential oil.
8. Drive bevel gear (hypoid gear)	17. Differential pinion washer	
9. Drive bevel pinion (hypoid gear)	1322 18. Drive bevel gear bolt : Apply thread lock cement 99000-32110 to thread part of bolt.	

DISASSEMBLY



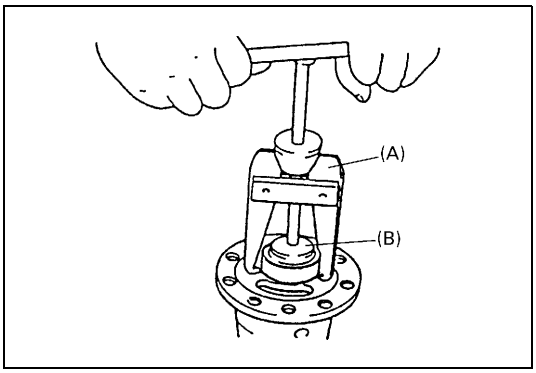
1) Remove dynamic damper (1).



2) Put match marks (4) on differential side bearing caps (3) and differential carrier (1).
3) Take off differential side bearing caps by removing their bolts and remove differential gear assembly (2).

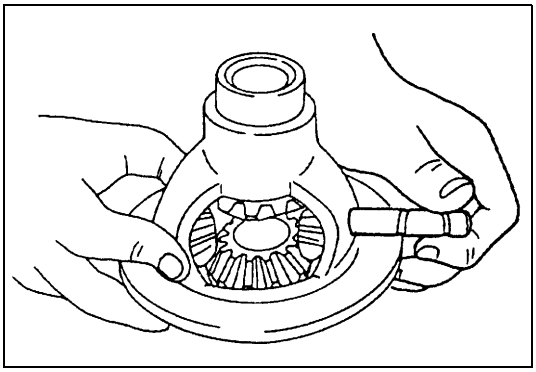
NOTE:
Check number of shims and thickness of each shim in advance.

4) With aluminum plates placed on vise first, grip differential case with it and remove drive bevel gear by removing its bolts.

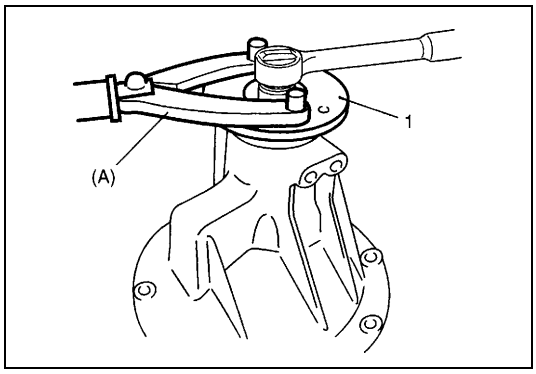


5) Using special tools, pull out differential side bearings.

Special tool
(A) : 09913-60910
(B) : 09925-88210

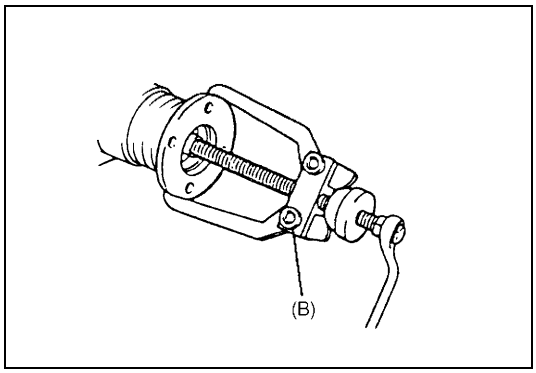


6) Remove differential pinion shaft.
7) Remove differential gears, pinions and washers.



8) Uncaulk companion flange nut.
9) Hold companion flange (1) with special tool and then remove companion flange nut.

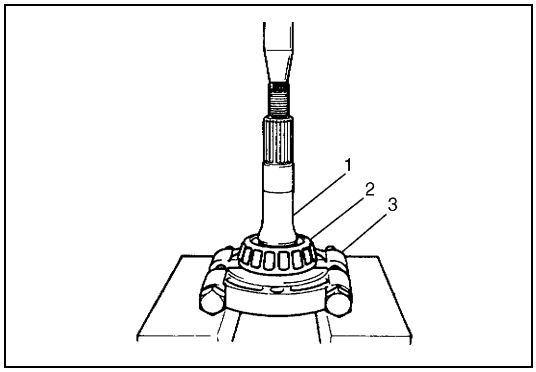
Special tool
(A) : 09930-40113



10) Remove companion flange from pinion.
Use special tool if it is hard to remove.

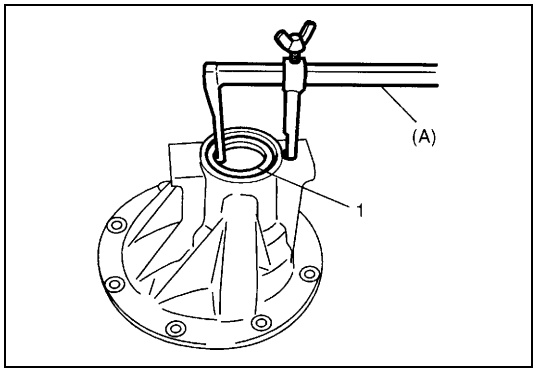
Special tool
(B) : 09913-65135

11) Remove drive bevel pinion (1) with rear bearing and spacer from carrier.



12) Remove drive bevel pinion rear bearing (2) by using bearing puller (3) and hydraulic press.

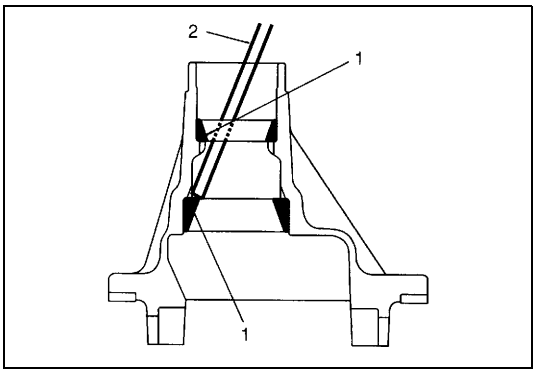
1. Drive bevel pinion



13) Remove oil seal (1) by using special tool.

Special tool
(A) : 09913-50121

14) Remove drive bevel pinion front bearing from differential carrier.



15) Drive out drive bevel pinion bearing outer races (1) by using metallic stick (2).

INSPECTION

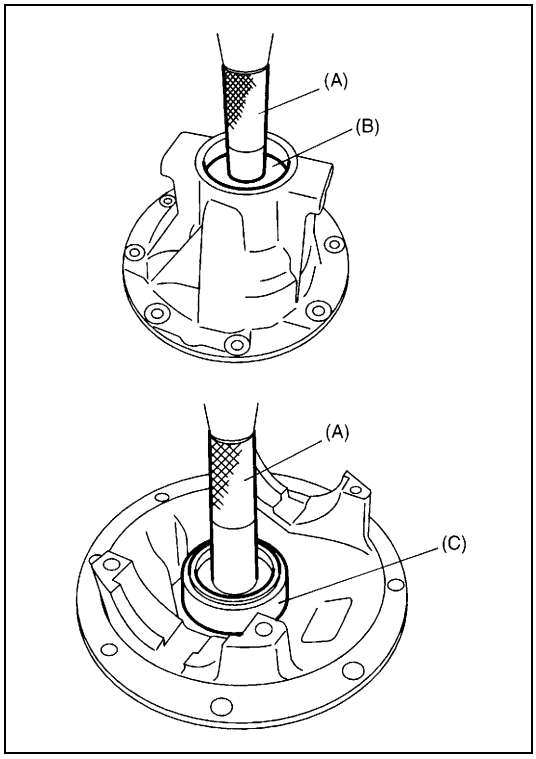
- Check companion flange for wear or damage.
- Check bearings for wear or discoloration.
- Check differential carrier for cracks.
- Check drive bevel pinion and bevel gear for wear or cracks.
- Check differential gears, pinion gears and pinion shaft for wear or damage.
- Check differential gear spline for wear or damage.

ADJUSTMENT AND ASSEMBLY

Judging from faulty conditions noted before disassembly and what is found through visual check of bearing and gear tooth etc. after disassembly, prepare replacing parts and proceed to reassembly according to procedures as described below. Make sure that all parts are clean.

CAUTION:

- **Drive bevel gear and pinion must be replaced as a set when either replacement becomes necessary.**
- **When replacing taper roller bearing, replace as inner race & outer race assembly.**

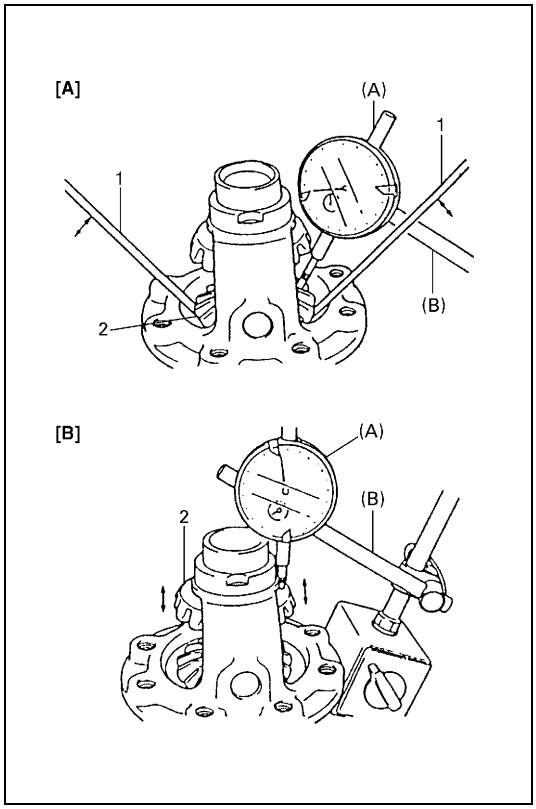


Drive bevel pinion bearing outer race

For press-fitting drive bevel pinion bearing outer races, use special tools as shown.

CAUTION:
Perform press-fitting carefully so as not to tilt outer race.

Special tool
(A) : 09924-74510
(B) : 09925-68210
(C) : 09951-16090



Differential case assembly

1) Assemble differential gears and measure thrust play of differential gear (2) as follows.

Special tool
(A) : 09900-20607
(B) : 09900-20701

Differential gear thrust play
0 – 0.37 mm (0 – 0.014 in.)

[A] : Right side
[B] : Left side

Right side

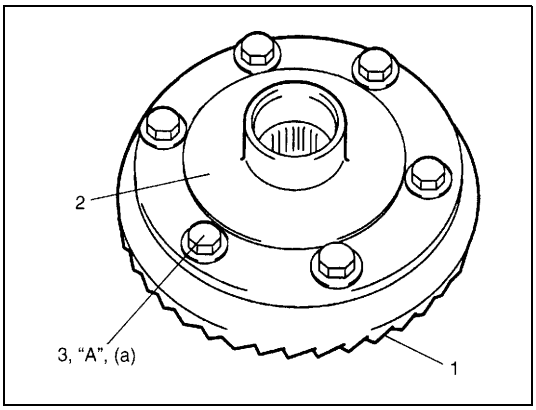
- Hold differential assembly with soft jawed vise and apply measuring tip of dial gauge to top surface of gear (2).
- Using 2 screwdrivers (1), move gear (2) up and down and read movement of dial gauge pointer.

Left side

- Using similar procedure to the above, set dial gauge tip to gear shoulder.
- Move gear (2) up and down by hand and read dial gauge.

2) If thrust play is out of specification, select suitable differential gear washer from among following available size, install it and check again that specified gear play is obtained.

Available differential gear washer thickness
0.90, 1.00 and 1.10 mm (0.035, 0.039 and 0.043 in.)

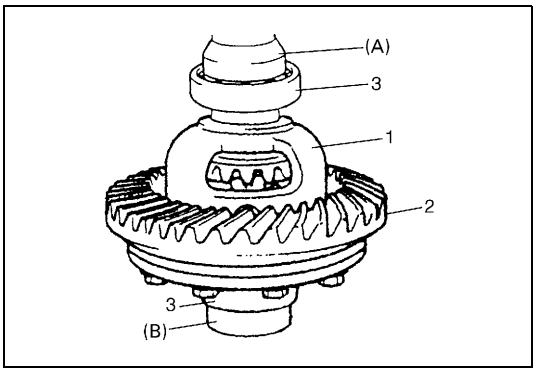


3) Put drive bevel gear (1) on differential case (2) and fasten them with bolts (3) by tightening them to specified torque. Use thread lock cement for bolts (3).

CAUTION:
Use of any other bolts than that specified is prohibited.

"A" : Thread lock cement 99000-32110

Tightening torque
Drive bevel gear bolts (a) : 90 N·m (9.0 kg-m, 65.0 lb-ft)

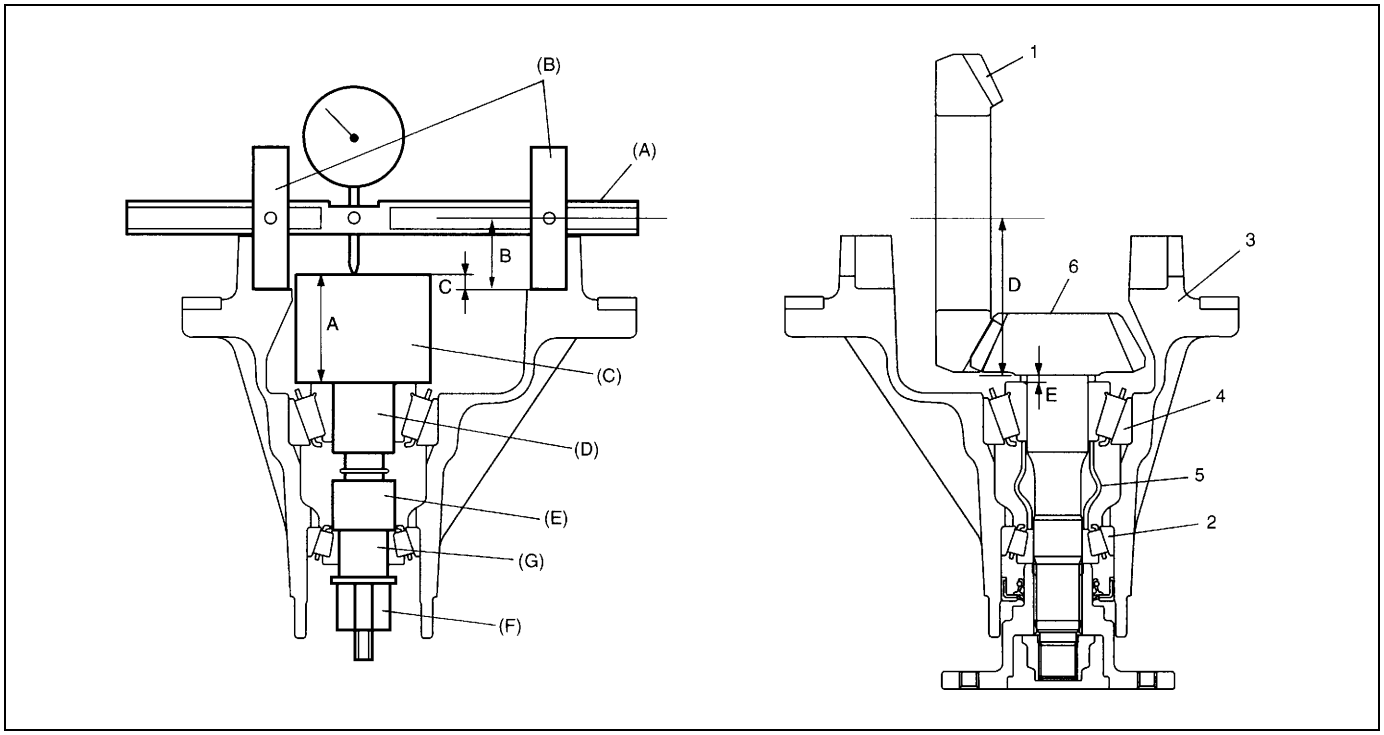


4) Press-fit differential side bearings (3) to differential case (1) by using special tools.

Special tool
(A) : 09951-76010
(B) : 09951-16060

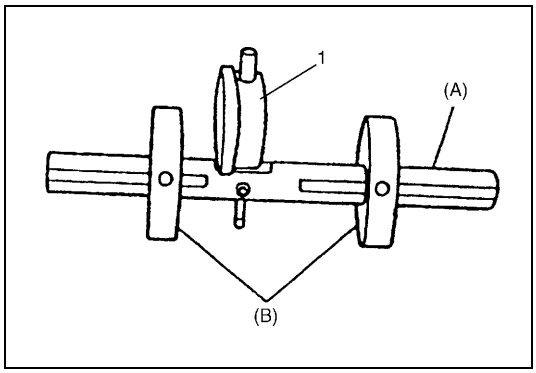
2. Drive bevel gear

Differential carrier and drive bevel pinion



A: Dummy height of pinion form dummy 40 mm/1.757 in.	D: Drive bevel pinion mounting distance 68.00 mm/2.677 in.	3. Differential carrier
B: Radius of bearing form dummy with dummy shaft 31 mm/ 1.220 in.	E: Shim thickness for mounting distance adjustment (E = 3 mm (0.118 in.) – C)	4. Rear bearing
A+B: Mounting distance adjusting dummy total size 71.00 mm/ 2.795 in.	1. Drive bevel gear	5. Spacer
C: Measured dimension	2. Front bearing	6. Drive bevel pinion

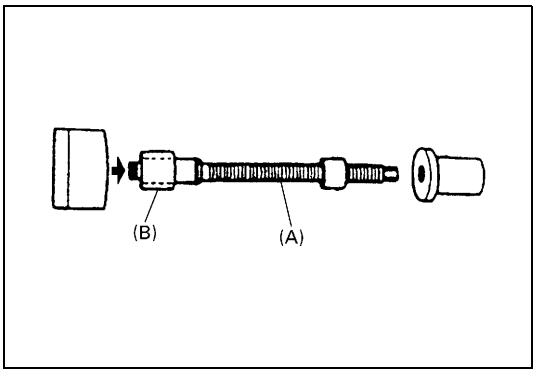
Special tool
(A) : 09922-76120
(B) : 09922-76250
(C) : 09922-76140
(D) : 09922-76430
(E) : 09922-76340
(F) : 09922-76150
(G) : 09922-76350



1) Assemble bearing form dummy with dummy shaft using special tools.

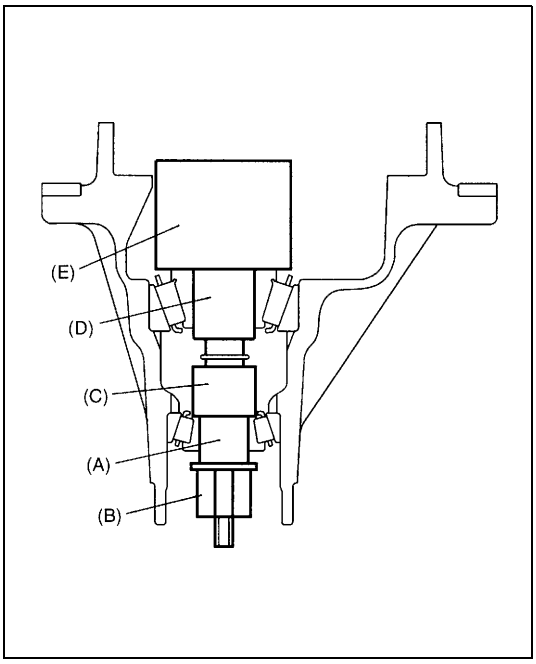
Special tool
(A) : 09922-76120
(B) : 09922-76250

2) Install dial gauge (1) to bearing form dummy with dammy shaft.



3) Assemble pinion form dummy by using special tools.

Special tool
(A) : 09922-76140
(B) : 09922-76430

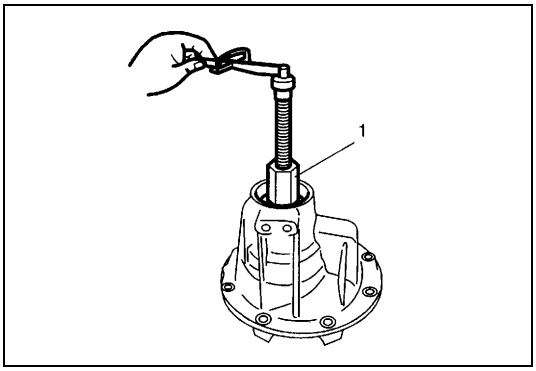


4) Apply gear oil to drive bevel pinion rear bearing, install bearing to pinion form dummy and then install pinion form dummy to differential carrier.
5) Apply gear oil to drive bevel pinion front bearing and install bearing to pinion form dummy with other special tools as shown in figure.

Special tool
(A) : 09922-76350
(B) : 09922-76150
(C) : 09922-76340
(D) : 09922-76430
(E) : 09922-76140

NOTE:

This installation requires no spacer or oil seal.

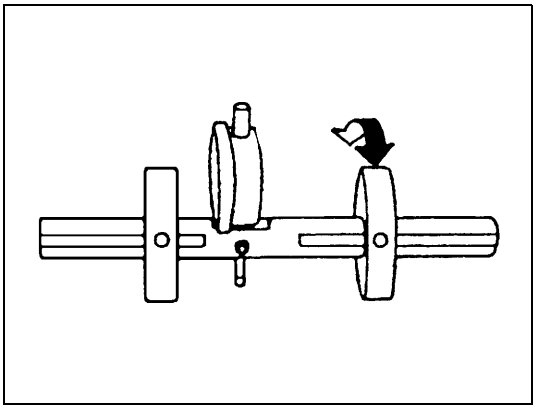


6) Tighten pinion form dummy nut (special tool) (1) so that specified bearing preload is obtained.

NOTE:

Before taking measurement, check for rotation by hand more than 15 revolutions.

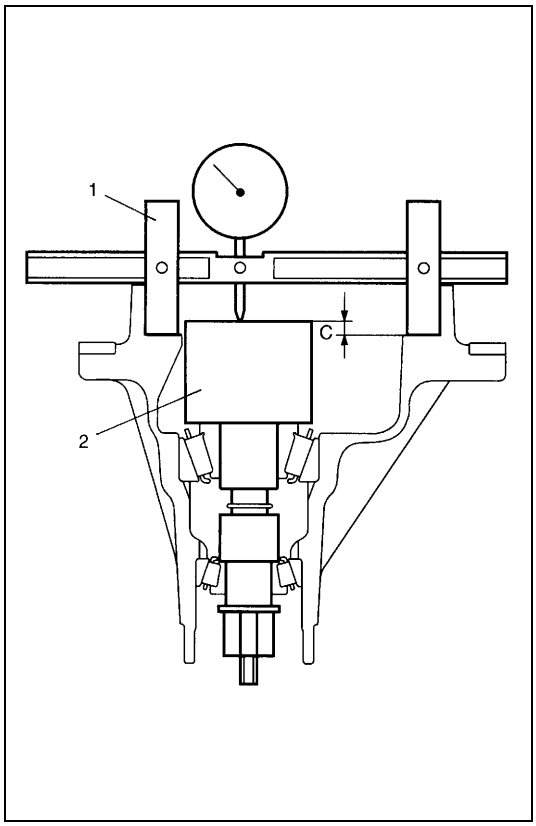
Drive bevel pinion bearing preload (at 50 rpm)
0.5 – 1.3 N·m (5.0 – 13.0 kg-cm, 0.35 – 0.90 lb-ft)



7) Set dial gauge to bearing form dummy with dummy shaft and make 0 (zero) adjustment on surface plate.

NOTE:

- **When setting dial gauge to bearing form dummy with dummy shaft, tighten screw lightly. Be careful not to overtighten it, which will cause damage to dial gauge.**
- **With dial gauge set, turn dummy back and forth by hand a couple of times and attain accurate 0 (zero) adjustment.**



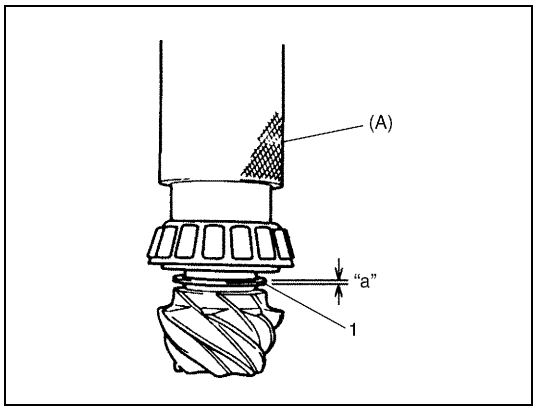
8) Place zero-adjusted bearing form dummy with dummy shaft (1) and dial gauge set on pinion form dummy (2) and take measurement between zero position and contracted dial gauge measuring tip.

NOTE:

- **Repeat turning back and forth of dummy and measure distance as far as top surface of pinion form dummy from 0 (zero) position accurately.**
- **When dial gauge measuring tip contracts from 0 (zero) position, pointer turns clockwise.**
- **Measured value may exceed 1 mm. Therefore, it is also necessary to know reading of short pointer.**

9) Obtain adjusting shim thickness by using measured value by dial gauge in the following equation.

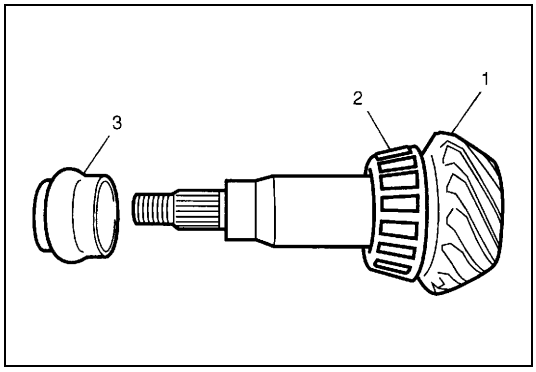
Necessary shim thickness	=	3 mm/0.118 in. (Adjusting dummy total size – Drive bevel pinion mounting distance)	–	Dial gauge measured value C



10) Select adjusting shim(s) (1) closest to calculated value from among following available sizes and put it in place and then press-fit rear bearing.

Special tool
(A) : 09913-80113

Available shim thickness
"a" : 0.30, 1.00, 1.03, 1.06, 1.09, 1.12, 1.15, 1.18, 1.21, 1.24, 1.27, and 1.30 mm (0.012, 0.039, 0.041, 0.042, 0.043, 0.044, 0.045, 0.046, 0.048, 0.049, 0.050 and 0.051 in.)

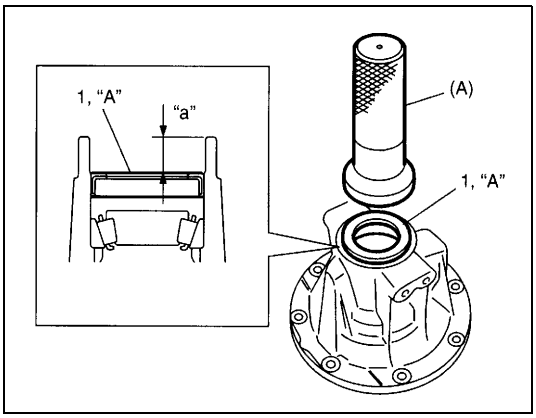


11) With new pinion spacer (3) inserted as shown, install front bearing to differential carrier.

NOTE:

- **Make sure to use new spacer for reinstallation.**
- **Apply oil to bearings.**

1. Drive bevel pinion
2. Rear bearing

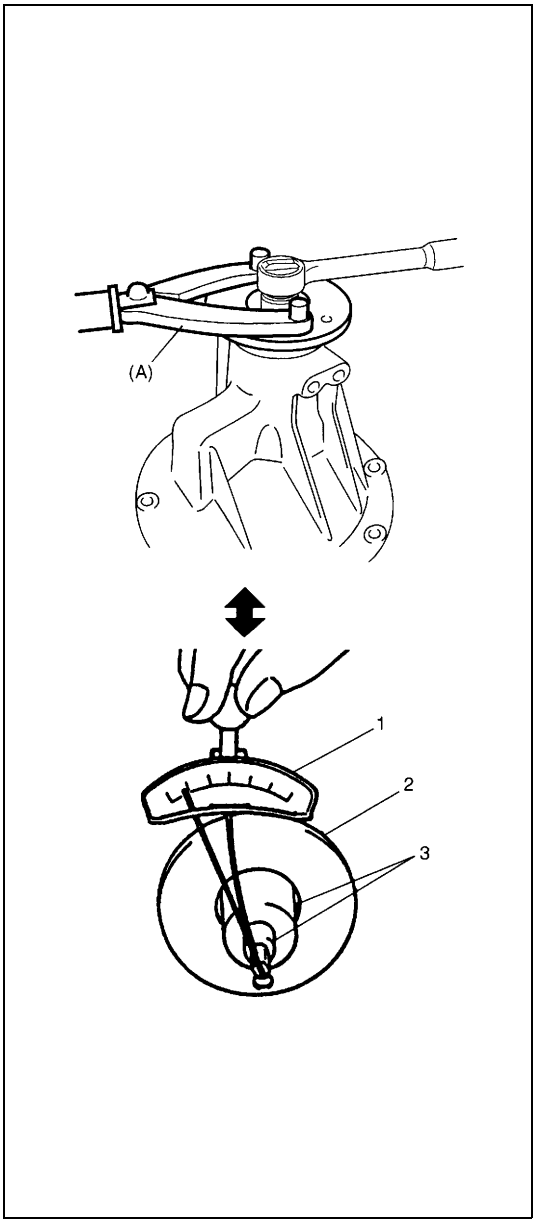


12) Using special tool and hammer, drive new oil seal (1) into differential carrier. Then apply grease to oil seal lip.

Special tool
(A) : 09913-76010

Differential carrier oil seal installing depth
"a" : 14.5 – 15.5 mm (0.57 – 0.61 in.)

"A" : Grease 99000-25010



13) While tightening companion flange nut gradually with special tool and wrench, set preload of drive bevel pinion bearing to specification.

NOTE:

- **Before taking measurement, check for smooth rotation with turning drive bevel pinion 15 revolutions or more by hand.**
- **Drive bevel pinion bearing preload is adjusted by tightening companion flange nut to deform spacer.**
  Therefore, be sure to use a new spacer for adjustment and tighten companion flange nut step by step and check for starting torque (preload) as often as tightening to prevent over crushing of spacer.
  If exceeds specification given below during adjustment, replace spacer and repeat preload adjustment procedure. Attempt to decrease starting torque (preload) by loosening companion flange nut will not do.
- **Measure drive bevel pinion bearing preload while turning drive bevel pinion about 50 rpm.**

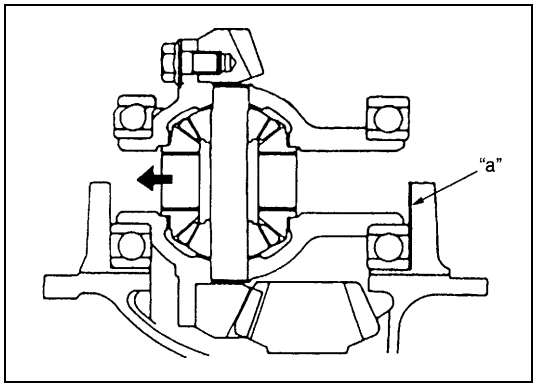
Tightening torque
Companion flange nut : Reference 70 – 250 N·m (7.0 – 25.0 kg-m, 51.0 – 181.0 lb-ft)

Drive bevel pinion bearing preload
0.5 – 1.3 N·m (5.0 – 13.0 kg-cm, 0.35 – 0.90 lb-ft)

Special tool
(A) : 09930-40113

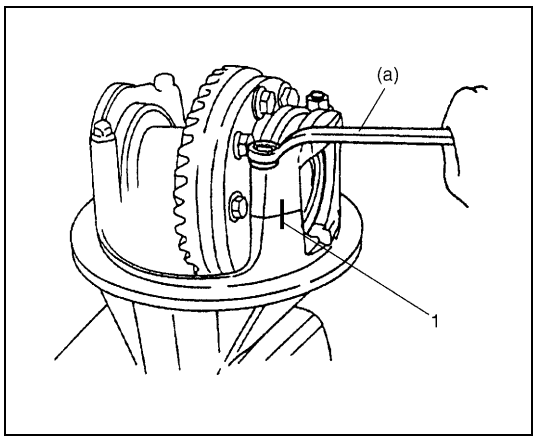
1.	Torque wrench
2.	Companion flange
3.	Socket with adapter

Differential assembly



1) Place differential case assembly to differential carrier, push differential case to left side as shown in figure.
   Then measure clearance "a" between side bearing and differential carrier by using thickness gauge.
   Select shims closest to measured value.

Available shim thickness
: 1.35,1.40,1.45, 1.50, 1.55, 1.60, 1.65, 1.70 and 1.75 mm (0.0531, 0.0551, 0.0571, 0.0591, 0.0610, 0.0630, 0.0650, 0.669 and 0.0689 in.)

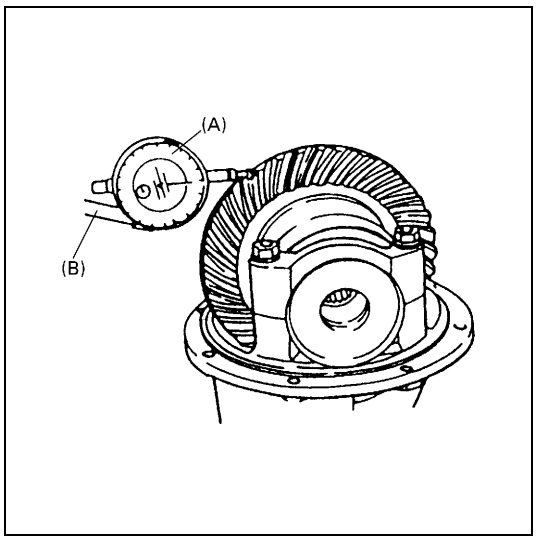


2) Divide selected shim(s) between both sides (right and left) and install them to differential carrier. Then install differential side bearing cap.

Tightening torque
Differential side bearing cap bolts
(a) : 23 N·m (2.3 kg-m, 17.0 lb-ft)

NOTE:

- **Align match marks (1) on cap and carrier.**
- **Apply gear oil to bearing.**



3) Measure backlash by using dial gauge.

Drive bevel gear backlash
0.10 – 0.20 mm (0.0039 – 0.0078 in.)

NOTE:

- **Be sure to apply measuring tip of dial gauge at right angles to convex side (drive side) of tooth.**
- **If backlash is out of specification, change division of shims so that backlash is within specification.**

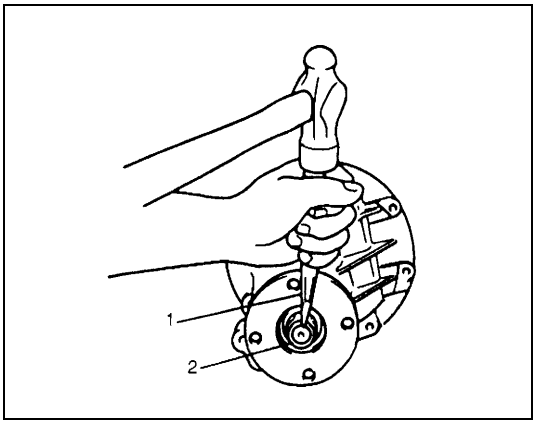
Special tool
(A) : 09900-20607
(B) : 09900-20701

4) Check gear tooth contact as follows.
   a) After cleaning tooth surface of drive bevel gears, paint them with gear marking compound evenly by using brush or sponge etc.

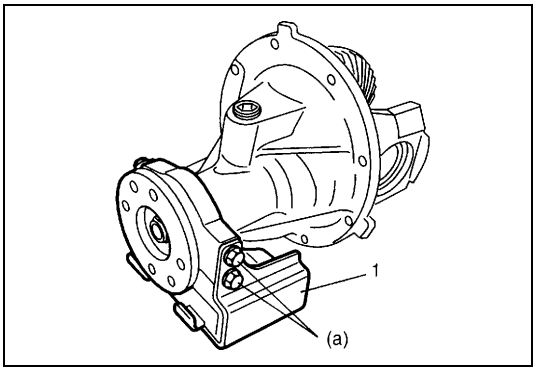
CAUTION:
When applying red lead paste to teeth, be sure to paint tooth surfaces uniformly. The paste must not be too dry or too fluid.

   b) Turn gear to bring its painted part in mesh with bevel pinion and turn it back and forth by hand to repeat their contact.
   c) Bring painted part up and check contact pattern, referring to the following chart. If contact pattern is not normal, readjust or replace as necessary according to instruction in chart.

NOTE:
Be careful not to turn bevel gear more than one full revolution, or it will hinder accurate check.

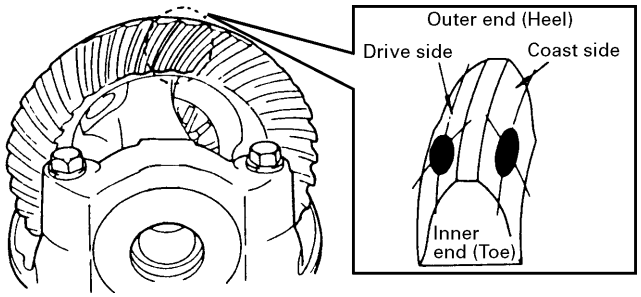
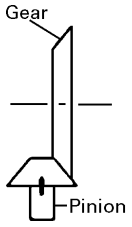
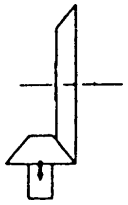
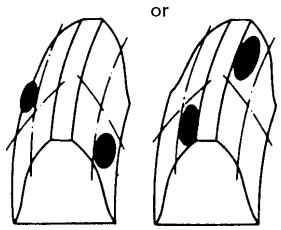
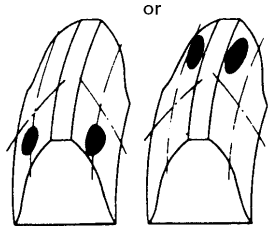


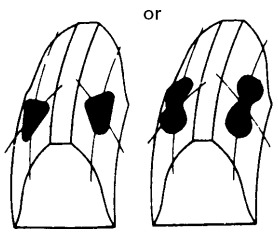
5) After completing of gear tooth contact check caulk companion flange nut (2) with caulking tool (1) and hammer.



6) Install dynamic damper (1).
   Tighten bolts to specified torque.

Dynamic damper bolt
(a) : 23 N·m (2.3 kg-m, 17.0 lb-ft)

TOOTH CONTACT PATTERN	DIAGNOSIS AND REMEDY
	NORMAL
	HIGH CONTACT Pinion is positioned too far from the center of drive bevel gear. 3) Increase thickness of pinion height adjusting shim and position pinion closer to gear center. 4) Adjust drive bevel gear backlash to specification. 
	LOW CONTACT Pinion is positioned too close to the center of drive bevel gear. 1) Decrease thickness of pinion height adjusting shim and position pinion farther from gear center. 2) Adjust drive bevel gear backlash to specification. 
	These contact patterns indicate that the “offset” of differential is too much or too little. The remedy is to replace the carrier with a new one.
	These contact patterns, located on toe or heel on both drive and coast sides, mean that 1) both pinion and gear are defective, 2) carrier is not true and square, or 3) gear is not properly seated on differential case. The remedy is to replace the defective member.

TOOTH CONTACT PATTERN	DIAGNOSIS AND REMEDY
	Irregular patterns: If the pattern is not oval, it means that bevel gear is defective. High or low spots on tooth surfaces or on the seat of bevel gear are the cause of irregular patterns appearing on some teeth. The remedy is to replace the pinion and-gear set and, if the seat is defective, so is transfer case.

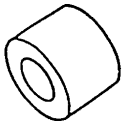
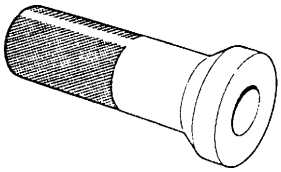
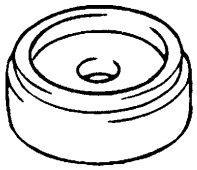
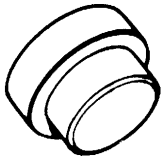
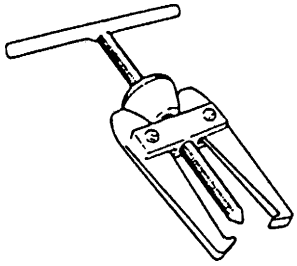
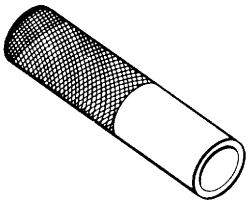
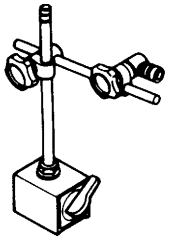
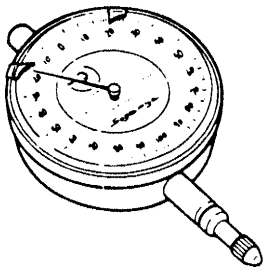
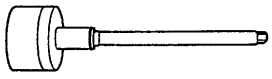
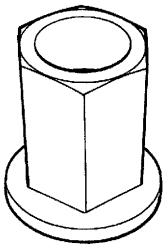
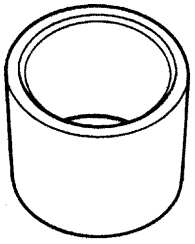
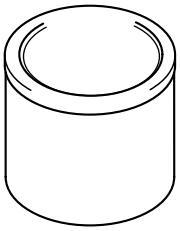
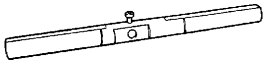
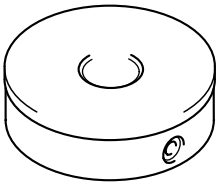
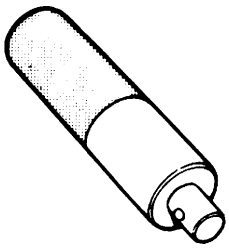
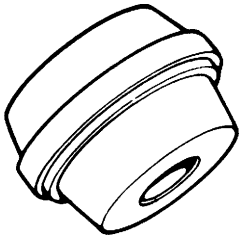
Tightening Torque Specification

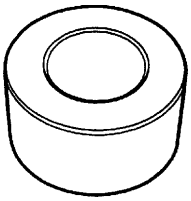
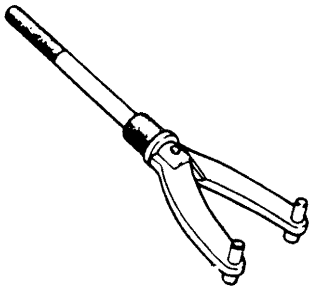
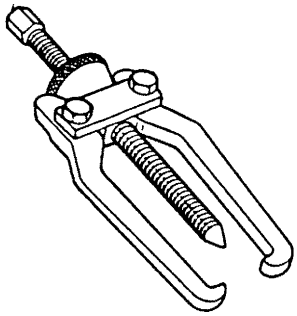
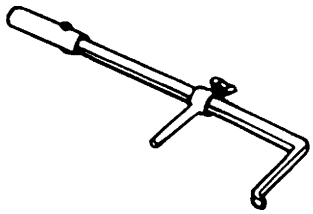
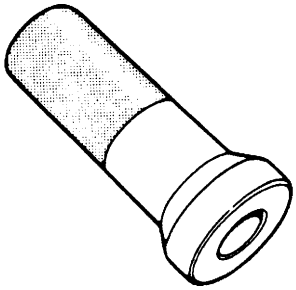
Fastening part	Tightening torque		
	N•m	kg-m	lb-ft
Rear differential oil drain plug	55	5.5	40.0
Rear differential oil level/filler plug	50	5.0	36.5
Companion flange nut (reference)	70 – 250	7.0 – 25.0	51.0 – 181.0
Dynamic damper bolts	23	2.3	17.0
Drive bevel gear bolts	90	9.0	65.0
Differential side bearing cap bolts	23	2.3	17.0
Rear differential plug	23	2.3	17.0
Differential carrier bolts	23	2.3	17.0
Propeller shaft bolts	23	2.3	17.0

Required Service Material

Material	Recommended SUZUKI product (Part Number)	Use
Thread lock cement	THREAD LOCK CEMENT 1322 (99000-32110)	Bevel gear bolts
Lithium grease	SUZUKI SUPER GREASE A (99000-25010)	Oil seal lips
Sealant	SUZUKI BOND NO. 1215 (99000-31110)	• Thread part of differential carrier bolt • Mating surface of differential carrier • Mating surface of rear axle housing

Special Tool

 09951-16060 Lower arm bush remover	 09951-76010 Bearing installer	 09951-16090 Oil seal installer	 09925-88210 Bearing puller attachment
 09913-60910 Bearing puller	 09913-80113 Bearing installer	 09900-20701 Magnetic stand	 09900-20607 Dial gauge
 09922-76140 Bevel pinion shaft	 09922-76150 Bevel pinion nut	 09922-76430 Front collar	 09922-76350 Gauge block
 09922-76120 Dummy shaft	 09922-76250 Bevel gear dummy	 09924-74510 Bearing installer handle	 09925-68210 Bearing installer

 09922-76340 Rear collar	 09930-40113 Flange holder	 09913-65135 Bearing puller	 09913-50121 Oil seal remover
 09913-76010 Bearing installer			

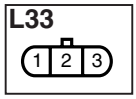
SECTION 8A-8

Note:
For descriptions (items) not found in this section, refer to the same section of Wiring Diagram Manual mentioned in FOREWORD of this manual.

LIST OF CONNECTORS

Note:
For the connectors not found in this section, refer to the same section of Wiring Diagram Manual 8A-8 mentioned in FOREWORD of this manual.

The connector below shows the modified connector for 4WD vehicle.



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