

SUZUKI

SF416

SUPPLEMENTARY SERVICE MANUAL FOR FOUR-WHEEL DRIVE MODEL

USE THIS MANUAL WITH:
SF416 SERVICE MANUAL (99500-71C00-01E)

SUZUKI
Caring for Customers

99501-71C00-01E
(英)

Prepared by

SUZUKI MOTOR CORPORATION

**TECHNICAL DEPARTMENT
AUTOMOBILE SERVICE DIVISION**

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FOREWORD

This SUPPLEMENTARY SERVICE MANUAL is a supplement to SF416 SERVICE MANUAL (99500-71C00-01E) and has prepared for four-wheel drive (4WD) model.

When servicing 4WD model, consult this manual first. And for any item or description not contained in this manual, refer to the above mentioned SERVICE MANUAL.

When replacing parts or servicing by disassembling, it is recommended to use SUZUKI genuine parts, tools and service materials (lubricants, 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. The right is reserved to make changes at any time without notice.

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SUZUKI MOTOR CORPORATION

*TECHNICAL DEPARTMENT
AUTOMOBILE SERVICE DIVISION*

SECTION 0B

MAINTENANCE AND LUBRICATION

CONTENTS

MAINTENANCE SCHEDULE	0B-1
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NOTE:
Following items are added to 2WD maintenance schedule.

MAINTENANCE SCHEDULE

NORMAL CONDITION SCHEDULE

NOTE:
This schedule applies to carburetor equipped cars.

Interval: This interval should be judged by odometer reading or months, whichever comes first.	This table includes services as scheduled up to 48,000 miles (80,000 km) mileage. Beyond 48,000 miles (80,000 km), carry out the same services at the same intervals respectively.								
	km (x 1,000)	10	20	30	40	50	60	70	80
	miles (x 1,000)	6	12	18	24	30	36	42	48
	months	6	12	18	24	30	36	42	48
CHASSIS AND BODY									
1. Transmission oil	I	R	I	R	I	R	I	R	
2. Rear differential oil	I	R	I	R	I	R	I	R	

NOTES:
"R" : Replace or change
"I" : Inspect and correct or replace if necessary

MAINTENANCE RECOMMENDED UNDER SEVERE DRIVING CONDITIONS

If the car 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 below chart.

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

Severe Condition Code	Maintenance	Maintenance Operation	Maintenance Interval
— B C D — —	Propeller shafts	I	Every 6000 miles (10000 km) or 6 months

NOTES:
"R": Replace or change "I": Inspect and correct or replace if necessary

MAINTENANCE SERVICE

CHASSIS AND BODY

1. Transmission Oil Inspection and Change

[Inspection]

- 1) Inspect transmission and transfer cases for evidence of oil leakage.
Repair leaky point if any.
- 2) Make sure that car is placed level for oil level check.
- 3) Remove level plug of transmission.
- 4) Check oil level.
Oil level can be checked roughly by means of filler/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 oil up to level hole.
For specified oil, refer to description of oil change (p. 7A-4) under ON-CAR SERVICE in SECTION 7A.

[Change]

- 1) Place the car level and drain oil by removing drain plug.
- 2) Apply sealant to drain plug and tighten drain plug to specified torque.
- 3) Pour specified oil up to level hole.

- 4) Tighten filler plug to specified torque.
For recommended oil, its amount and tightening torque data, refer to ON-CAR SERVICE (p. 7A-4) of SECTION 7A.

2. Differential Oil Inspection and Change

[Inspection]

- 1) Inspect rear differential case for evidence of oil leakage.
Repair leaky point, if any.
- 2) Make sure that the vehicle is placed level for oil level check.
- 3) Remove level plug of differential. 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 as given in SECTION 7E.

[Change]

Place the vehicle level and drain oil by removing drain plug. Pour specified amount of specified oil as shown in p. 7E-2 and tighten drain plug and filler plug to specified torque.

For location of oil drain plug and level plug of differential and their tightening torque, refer to ON-CAR SERVICE in SECTION 7E.

Propeller Shaft Inspection (severe conditions)

- Check propeller shaft joints for wear, play 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.

SECTION 4

FRONT DRIVE SHAFT

NOTE:

For the items not found in this section, refer to the same section of the SF416 Service Manual.

CONTENTS

GENERAL DESCRIPTION	4-1
REASSEMBLY (Drive Shaft)	4-1

GENERAL DESCRIPTION

A constant velocity ball joint is used on the wheel side of front drive shaft and a constant velocity double offset joint (DOJ) on the differential side.

REASSEMBLY (Drive Shaft)

When fixing boot to outer race with boot band, adjust so that measurement (A) becomes as indicated in figure below.

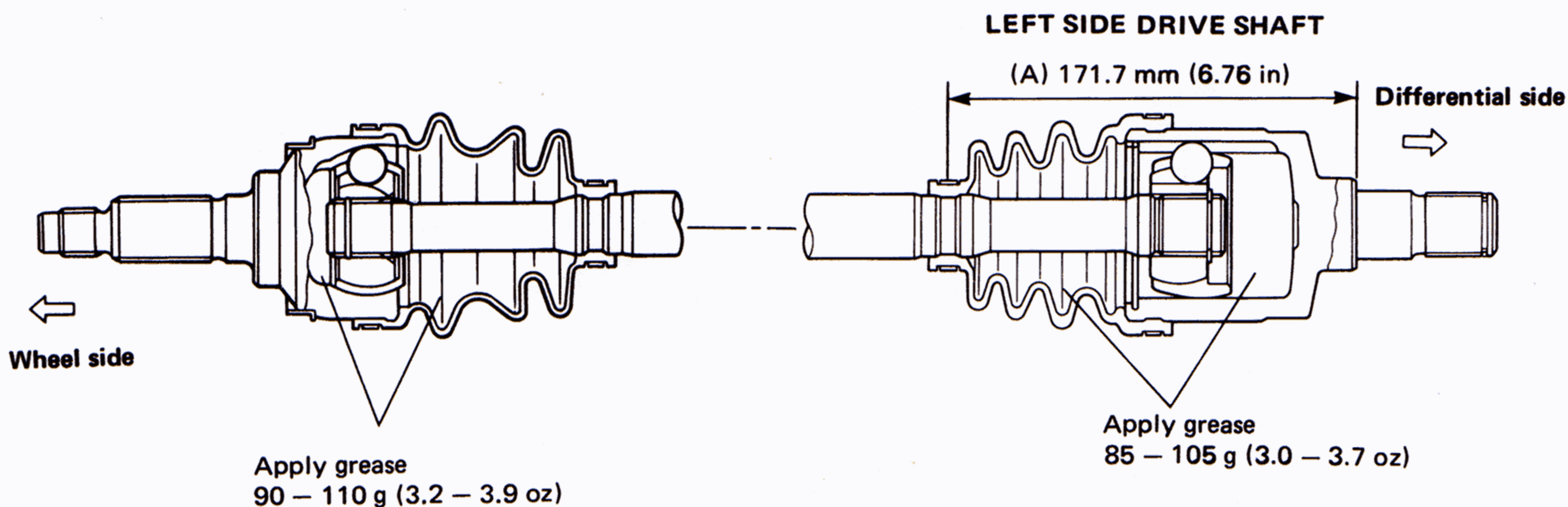


Fig. 4-1

SECTION 4B

PROPELLER SHAFTS

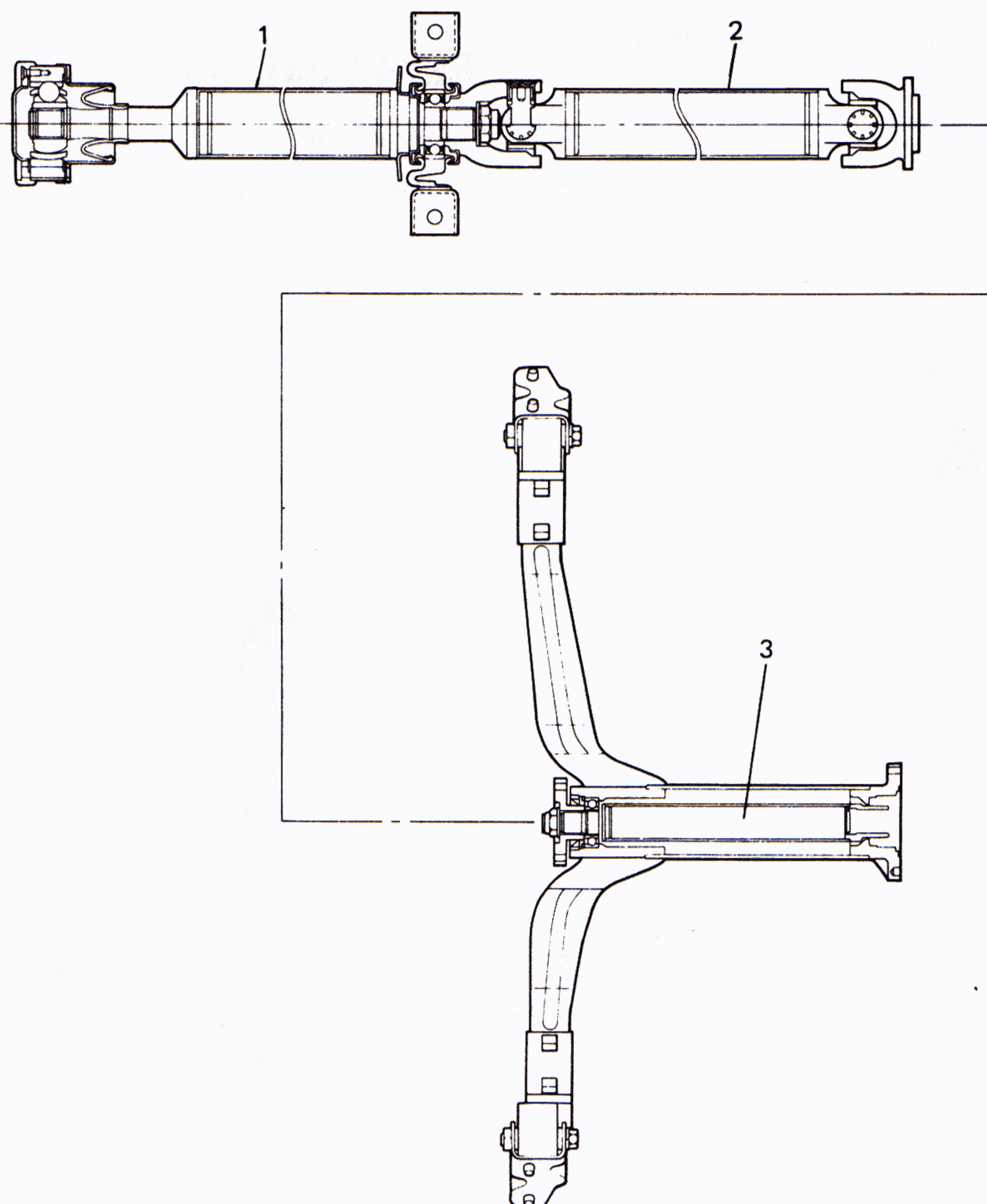
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GENERAL DESCRIPTION	4B-1
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Removal	4B-2
Installation	4B-3
Inspection	4B-3
TORQUE SPECIFICATIONS	4B-4
REQUIRED SERVICE MATERIAL	4B-4

GENERAL DESCRIPTION

Most universal joints require no maintenance. They are lubricated for life and can not be lubricated on the vehicle. If a universal joint becomes noisy or worn, it must be replaced.

The propeller shaft is a balanced unit. Handle it carefully so that balance can be maintained.



1. Propeller shaft No. 1
2. Propeller shaft No. 2
3. Propeller shaft No. 3

Fig. 4B-1

ON CAR SERVICE

REMOVAL (No. 1 & No. 2 Shaft)

- 1) Hoist car.
- 2) Separate No. 2 propeller shaft No. 3 propeller shaft.

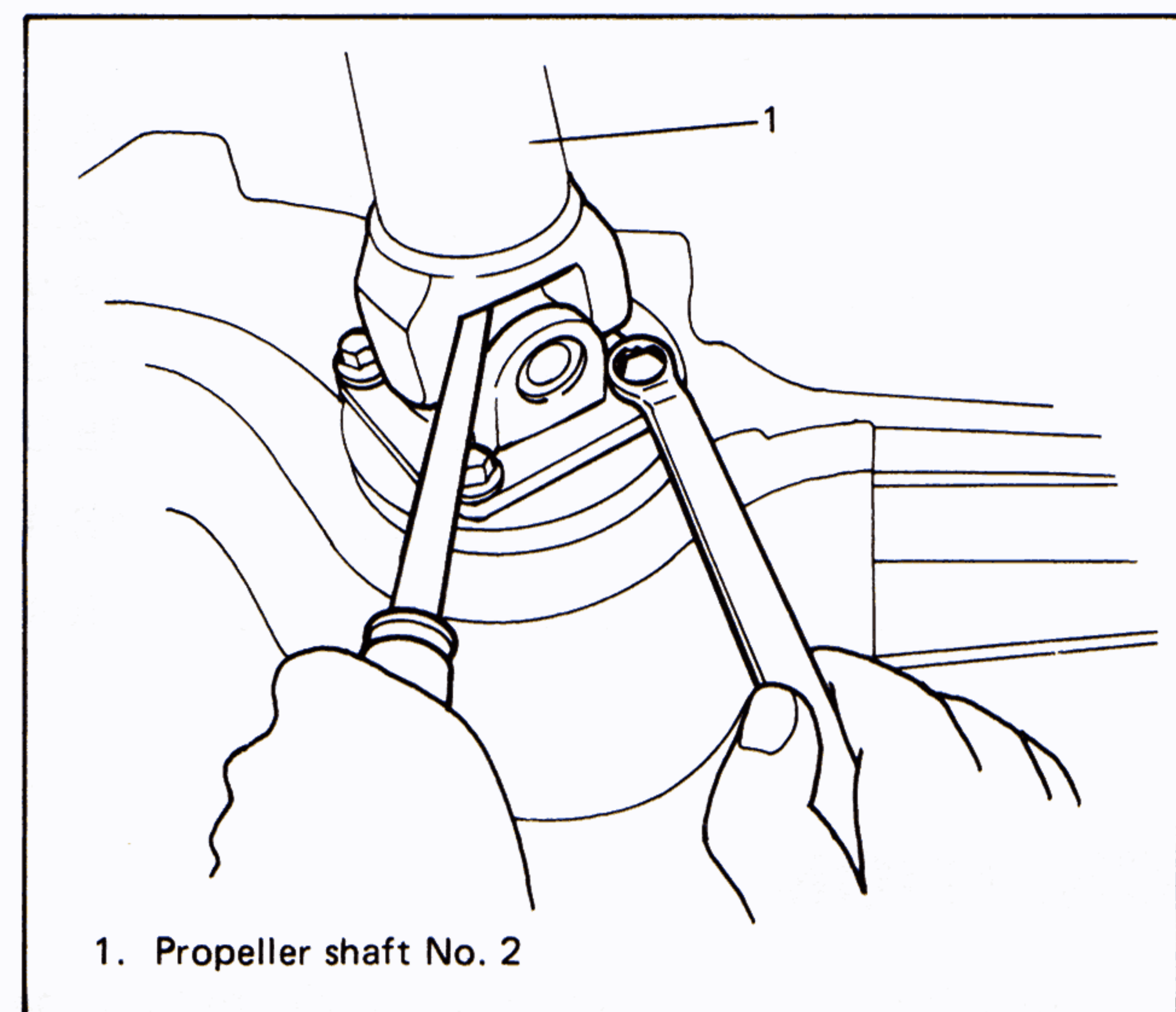


Fig. 4B-2

- 3) Remove No. 1 propeller shaft from transmission case flange.

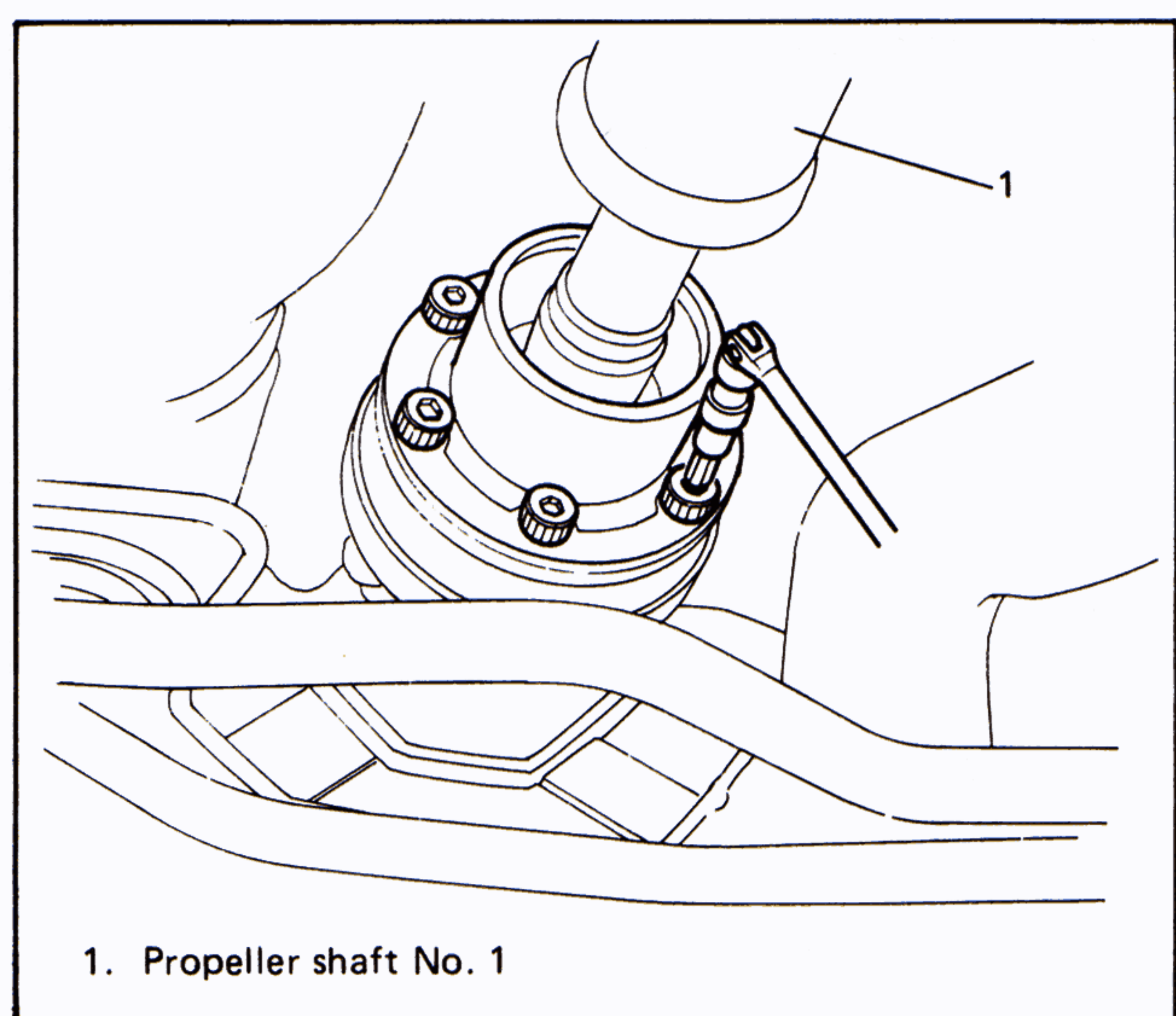


Fig. 4B-3

- 4) Remove propeller shaft center support bracket from car body. (Bracket and No. 1 & No. 2 shaft are removed in one without separation.) Use care not to drop it.

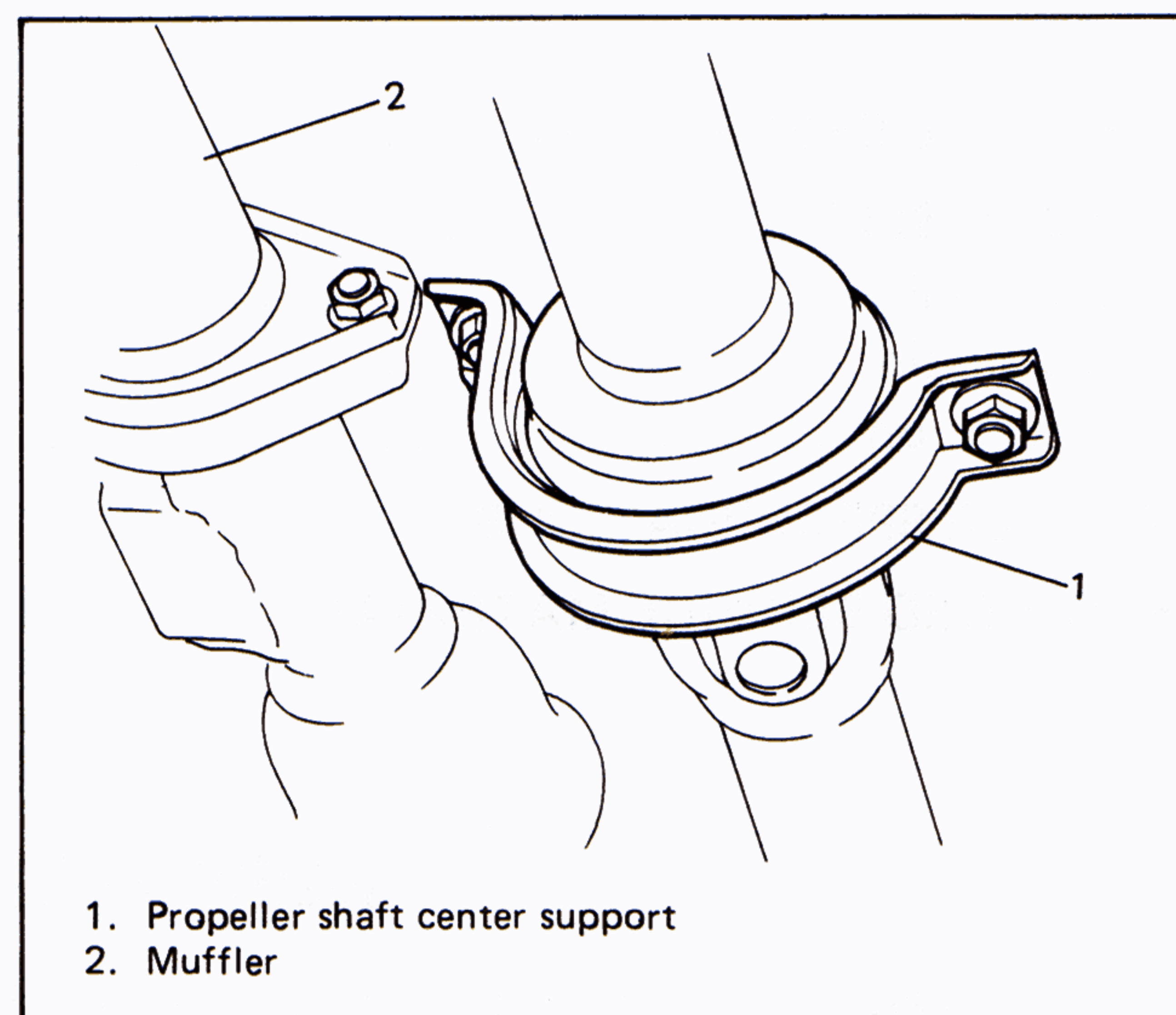


Fig. 4B-4

REMOVAL (No. 3 Shaft)

- 1) Hoist car.
- 2) Remove muffler and then separate No. 2 propeller shaft from No. 3 propeller shaft.
- 3) Remove No. 3 propeller shaft outer tube from viscous coupling case.

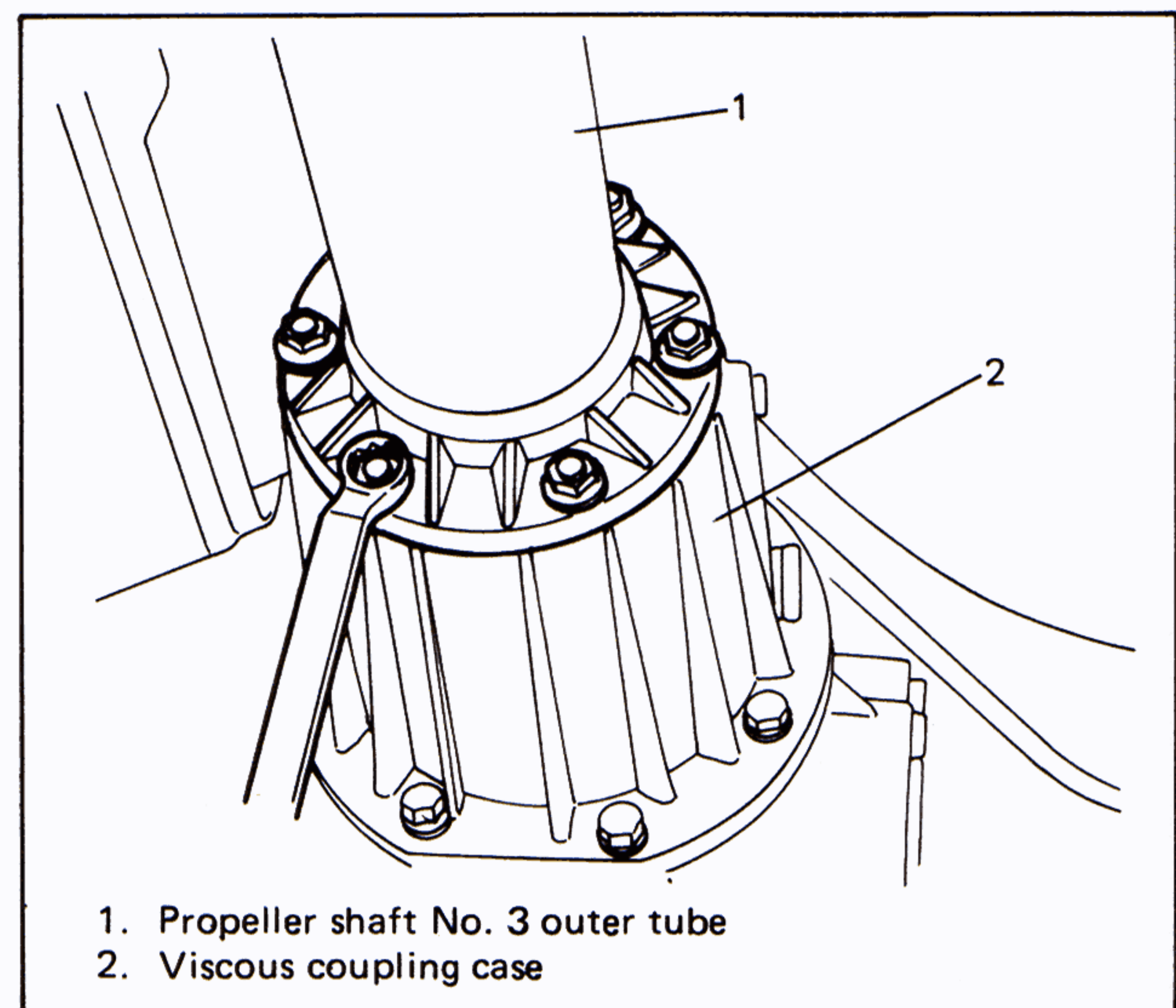


Fig. 4B-5

TORQUE SPECIFICATIONS

Fastening parts	Tightening torque		
	N·m	kg-m	lb-ft
1. Center bracket nuts	44 – 66	4.4 – 6.6	32.0 – 47.5
2. Propeller shaft No. 1 bolts	18 – 28	1.8 – 2.8	13.5 – 20.0
3. Propeller shaft No. 2 bolts	27 – 37	2.7 – 3.7	20.0 – 26.5
4. Propeller shaft No. 3 front member nuts	44 – 66	4.4 – 6.6	32.0 – 47.5
5. Propeller shaft No. 3 to viscous case bolts	20 – 31	2.0 – 3.1	14.5 – 22.0

REQUIRED SERVICE MATERIAL

MATERIAL	RECOMMENDED SUZUKI PRODUCT	USE
Sealant	SUZUKI BOND NO. 1215 (99000-31110)	Matching surfaces of propeller shaft No. 3 and viscous case

SECTION 4C

REAR DRIVE SHAFT

CONTENTS

GENERAL DESCRIPTION	4C-1
ON CAR SERVICE	4C-2
Drive Shaft Assembly	4C-2
RECOMMENDED TORQUE SPECIFICATIONS	4C-5

GENERAL DESCRIPTION

This drive shaft uses equal velocity ball joints which transmit the driving force smoothly even at an angle change.

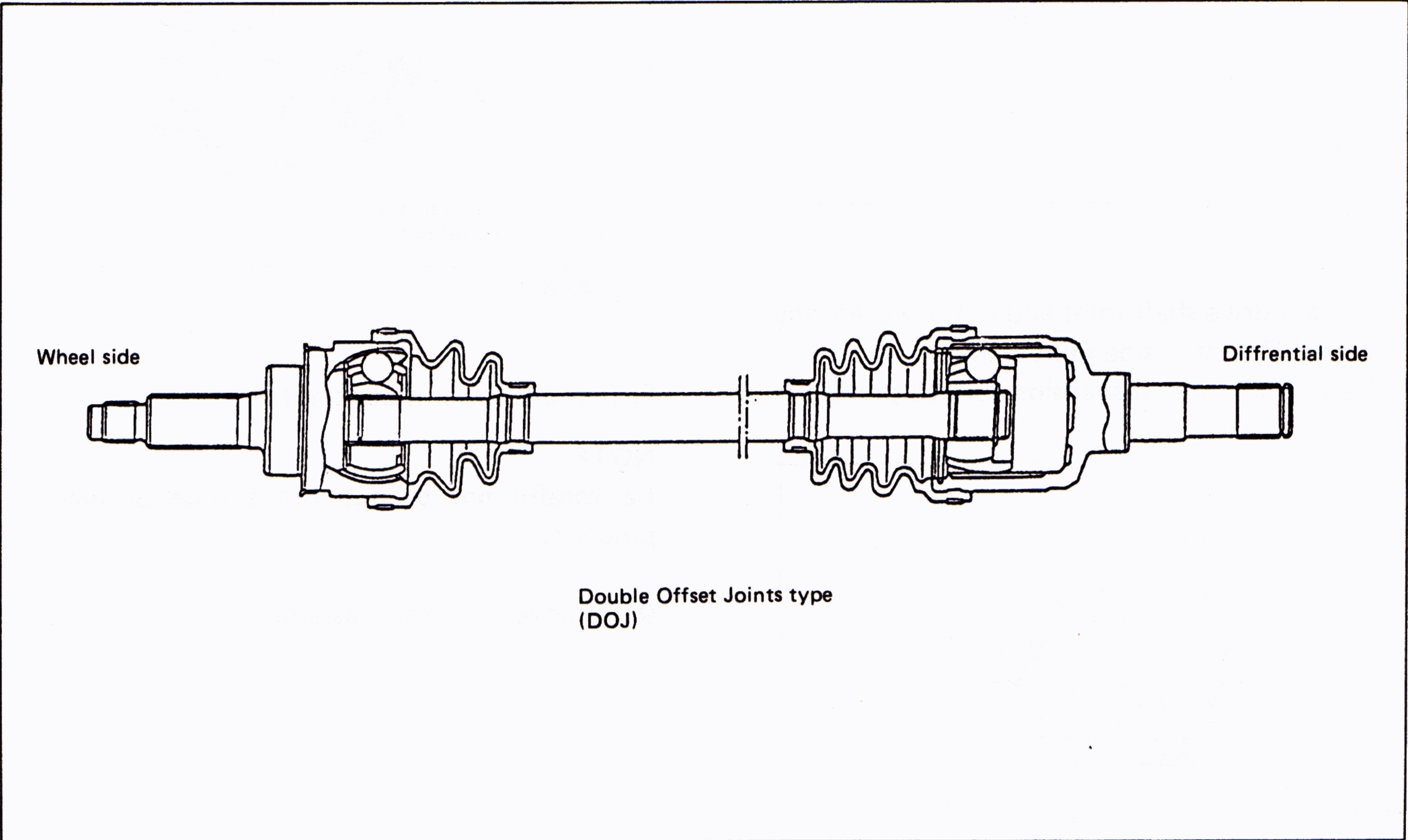


Fig. 4C-1

ON CAR SERVICE

DRIVE SHAFT ASSEMBLY

REMOVAL

1. Remove caulking of spindle nut and then remove spindle nut (30 mm) and washer.

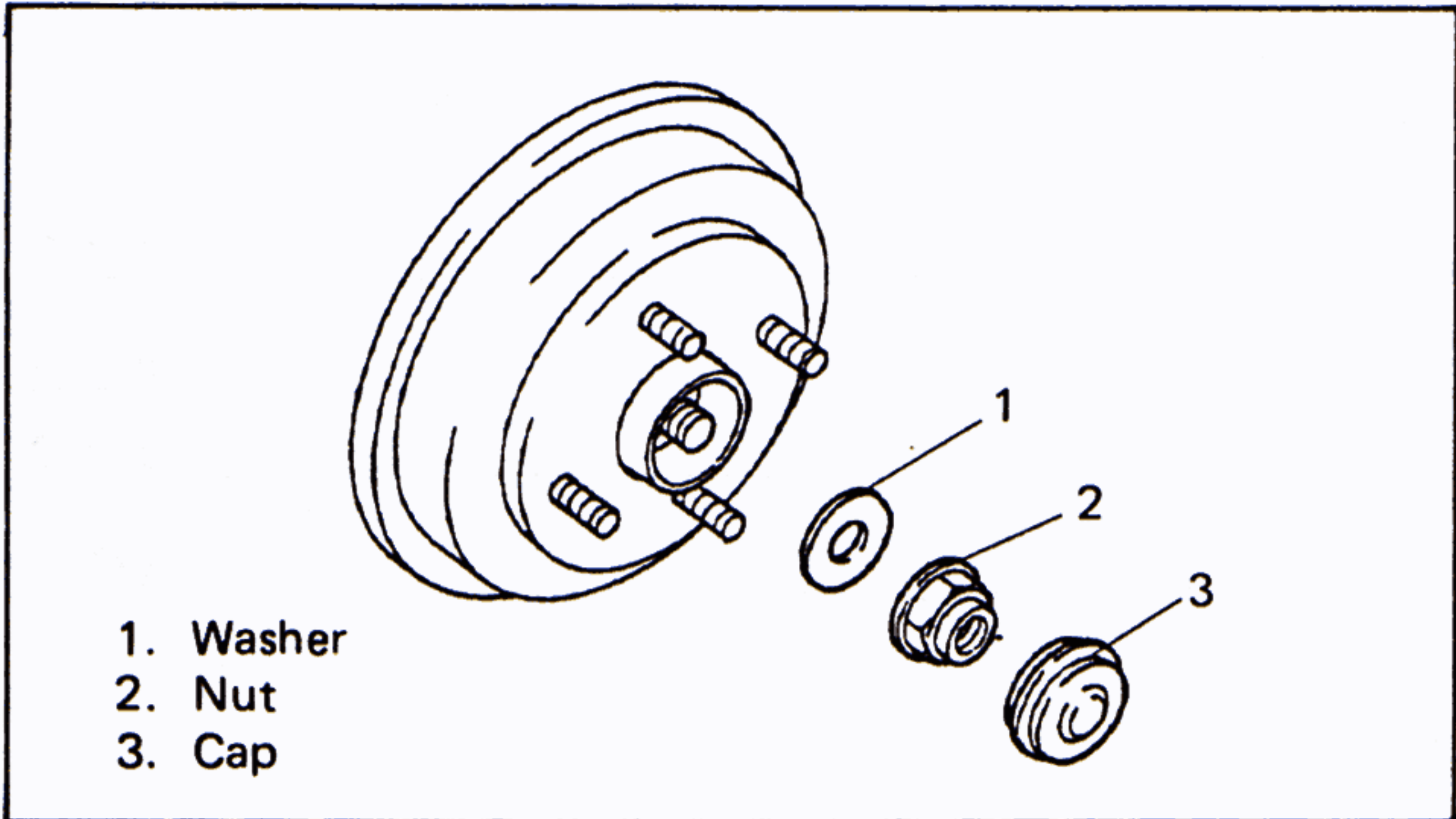


Fig. 4C-2

2. Dismount tire and drain differential oil.

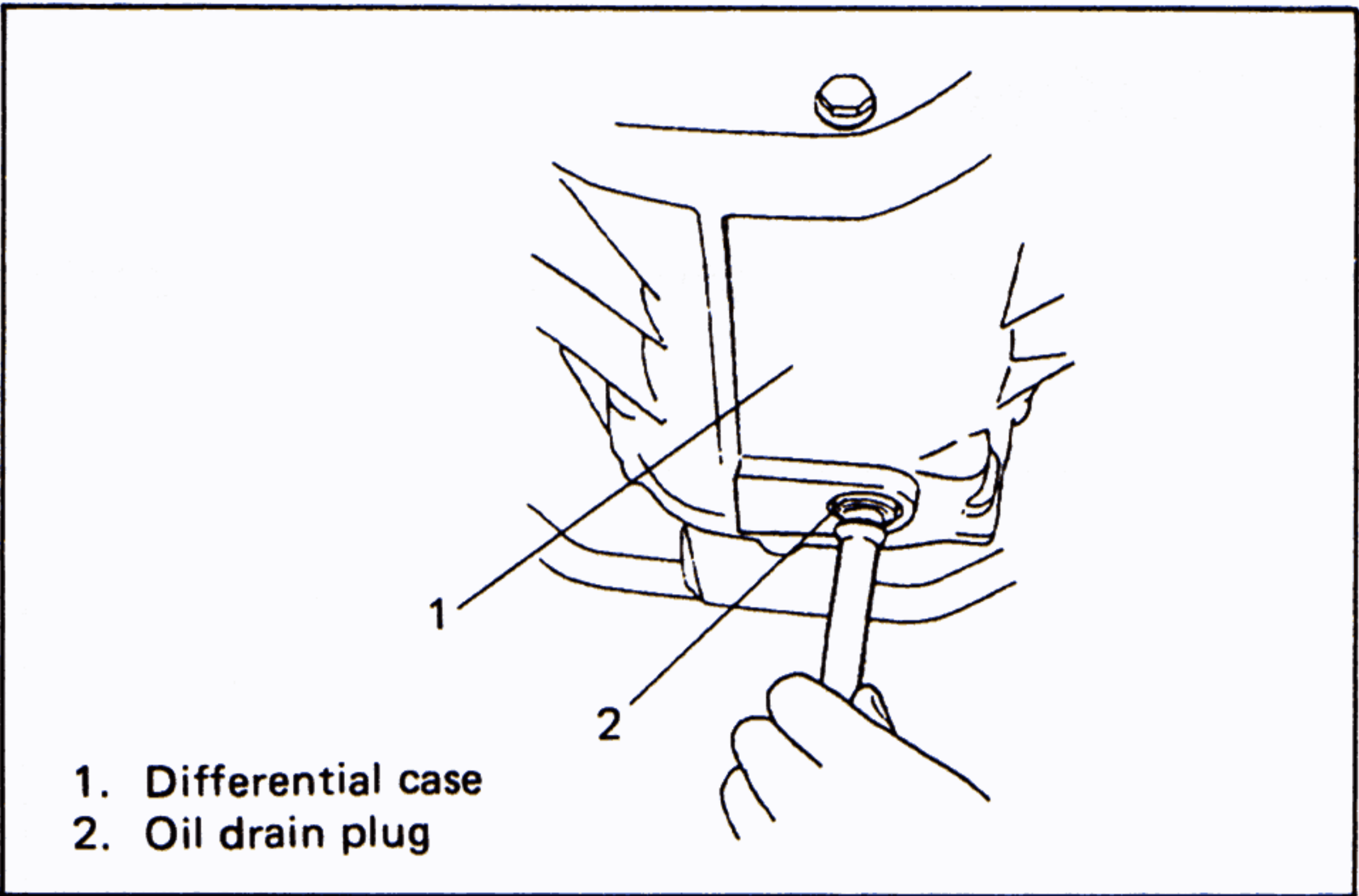


Fig. 4C-3

3. Pull out drive shaft joint and remove snap ring from differential side joint spline.

4. Place jack under suspension arm to prevent it from lowering.

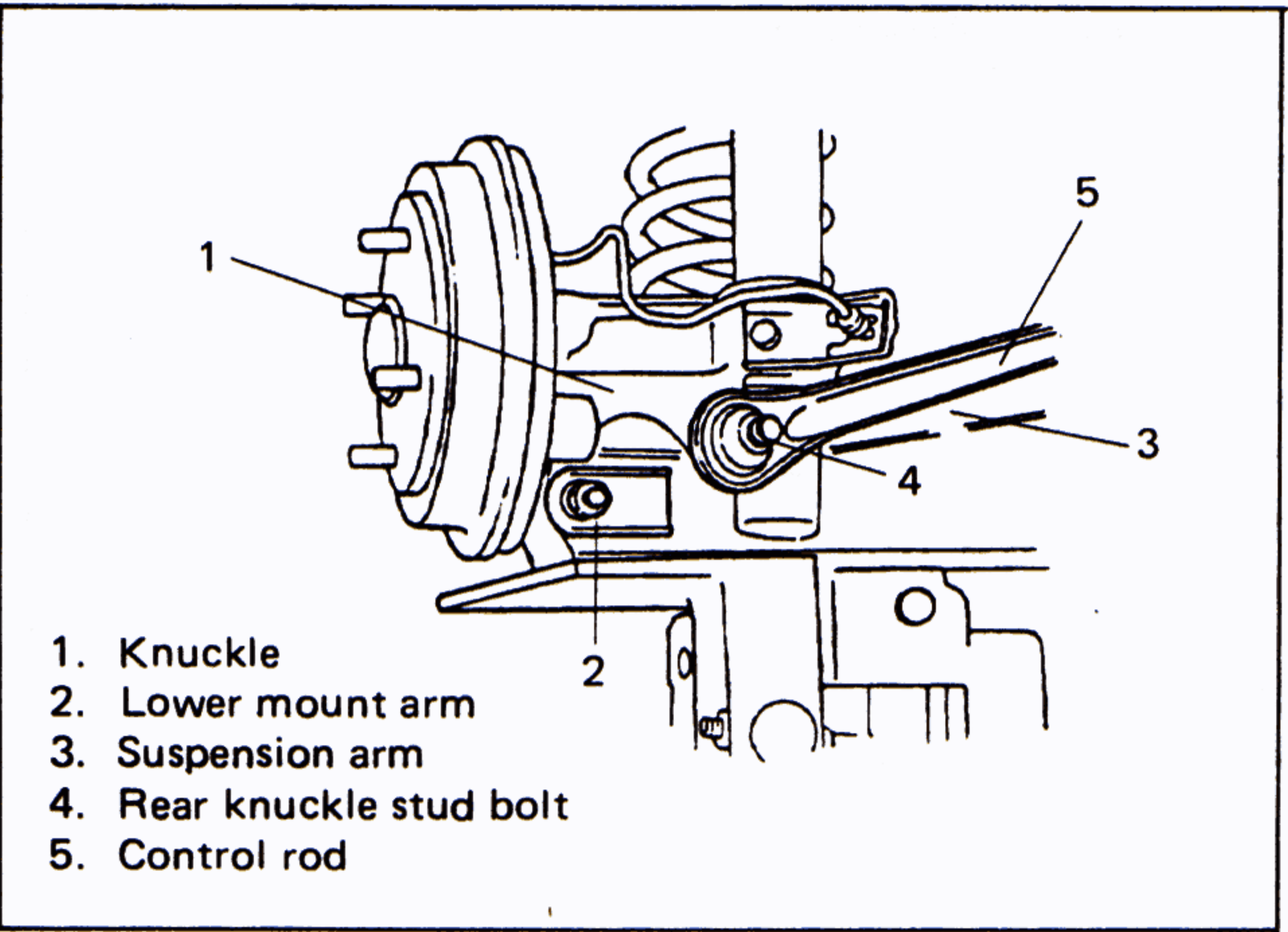


Fig. 4C-4

5. Disconnect brake hose from control rod.

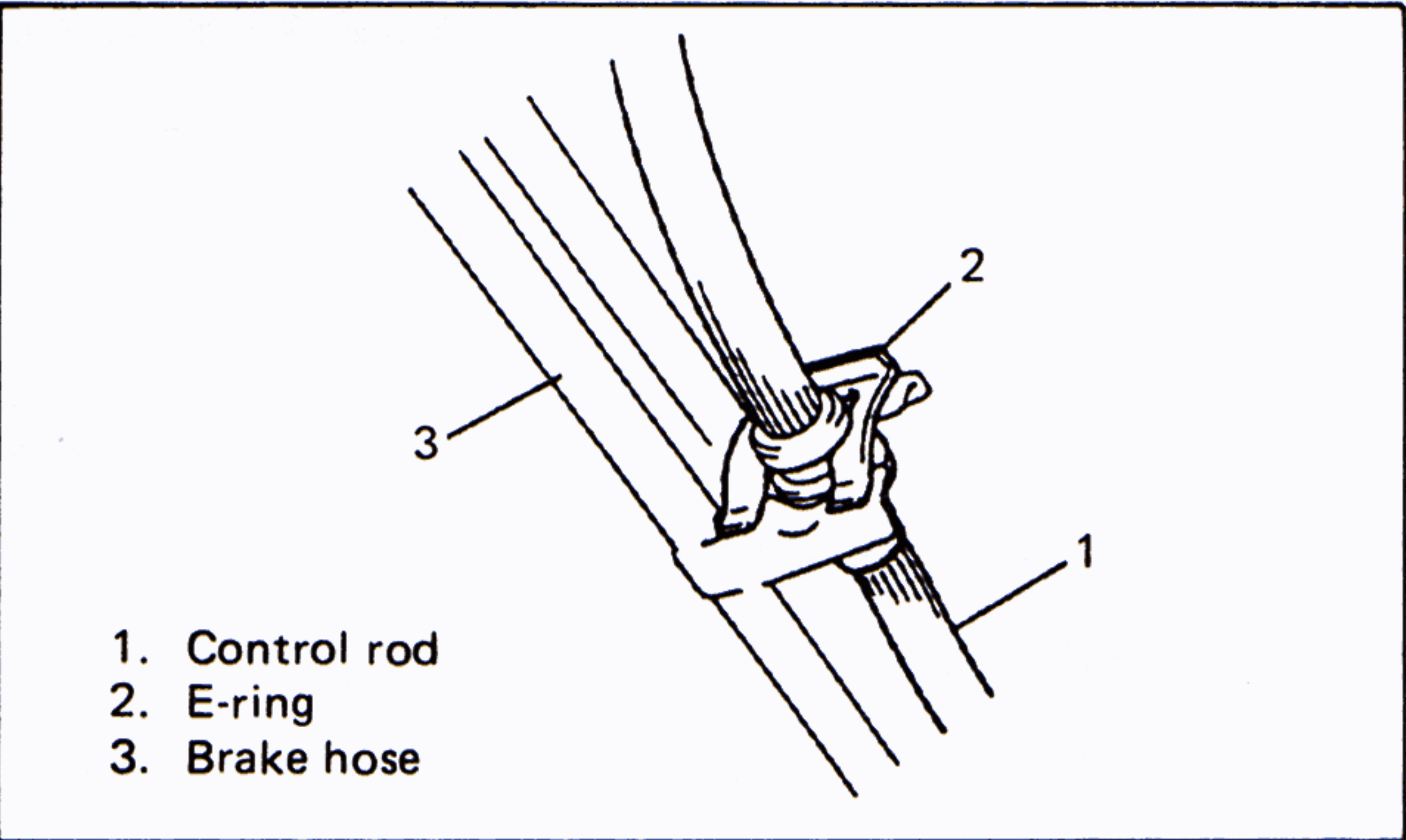


Fig. 4C-5

6. Remove control rod from rear knuckle stud bolt.

7. After removing strut lower mount bolt, pull strut out of rear knuckle by pulling it from above.

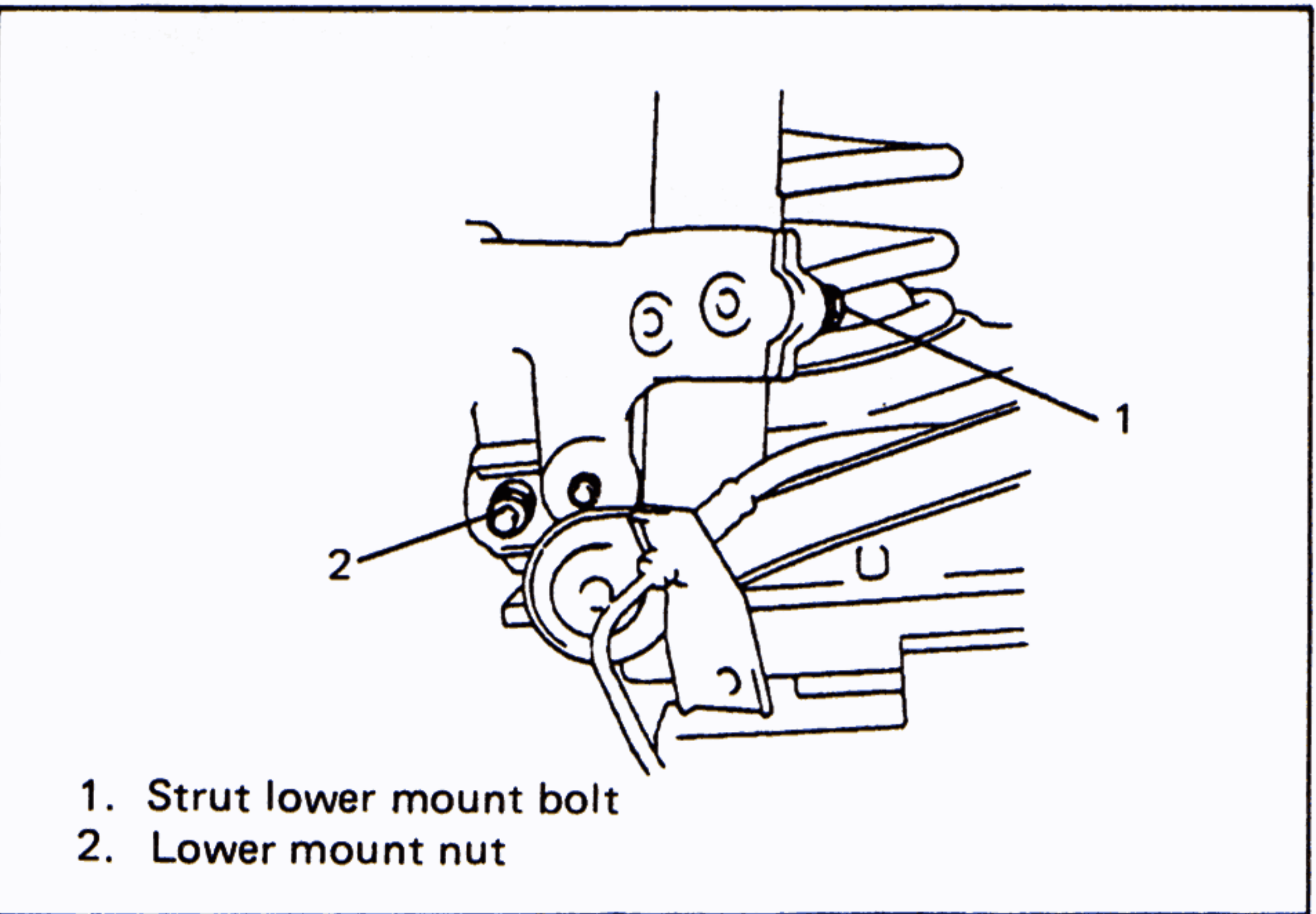


Fig. 4C-6

8. Remove lower mount nut.

NOTE:
Be careful not to pull brake hose or have it pinched.

9. Remove drive shaft assembly.

DISASSEMBLY

NOTE:

- Wheel side joint can't be disassembled.
Disassemble differential side joint when replacing wheel side boot.
- When replacing boot, use care not to damage it.

1. Remove differential side boot band and then remove joint housing.

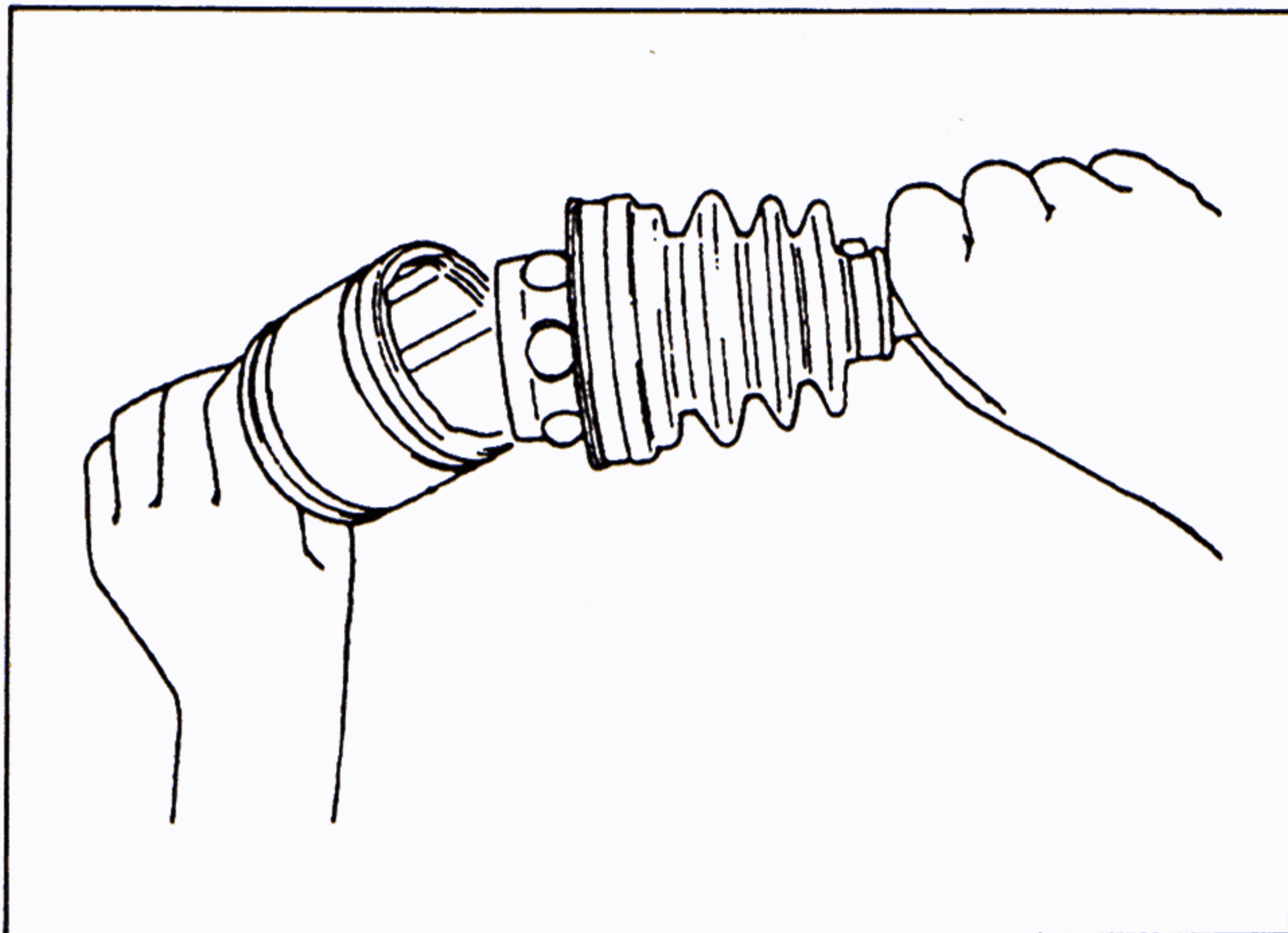


Fig. 4C-7

2. Using snap ring pliers, remove circlip and then take out ball joint.

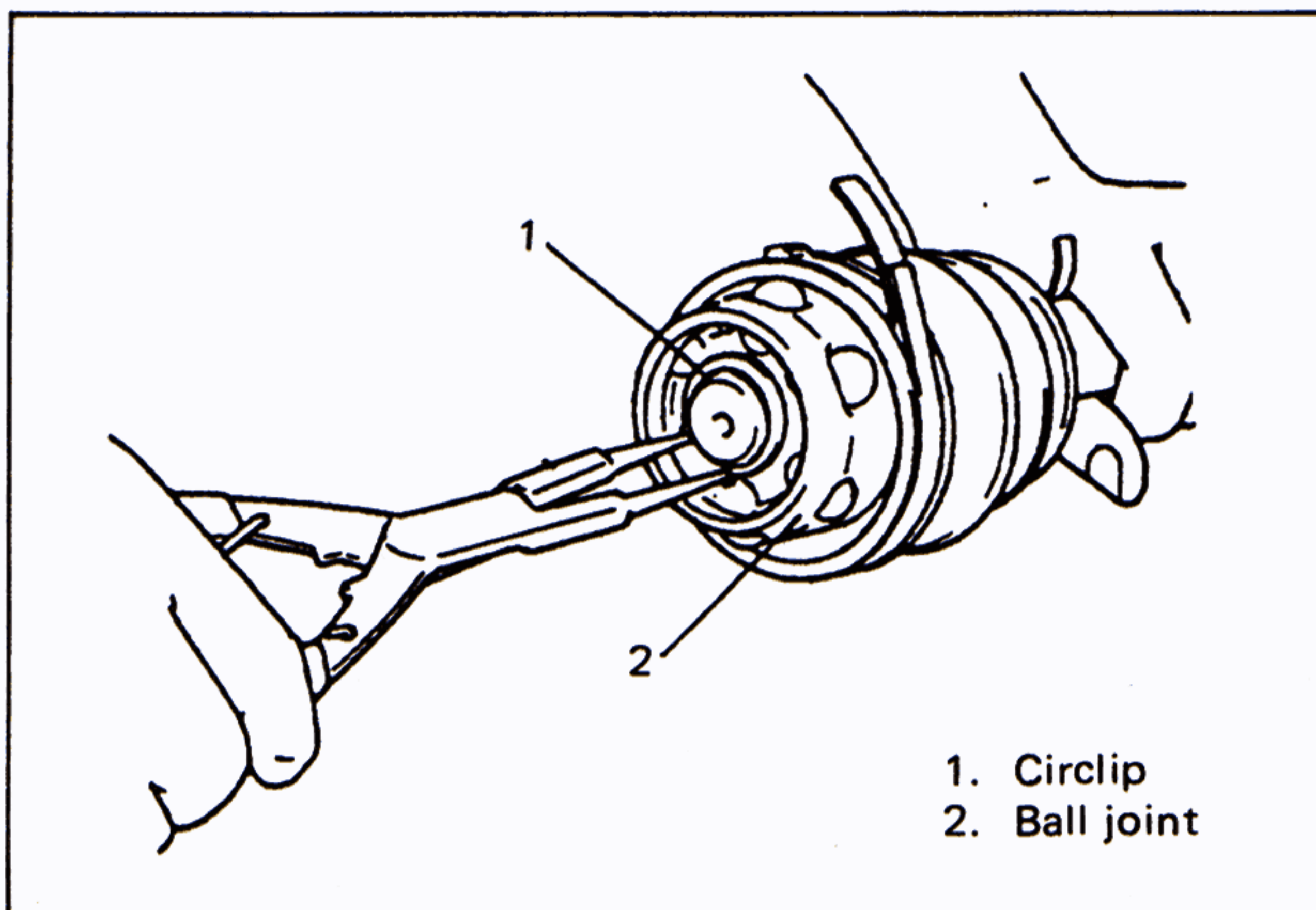


Fig. 4C-8

3. Remove differential side and shaft side boots from shaft.

INSPECTION

1. Check boots for damage and deterioration.
2. Check circlip, snap ring and boot band for breakage, deformation and any faulty condition and replace, if any.

ASSEMBLY

For assembly, reverse disassembly procedure, noting following points.

- Before reassembly, check that necessary parts have been replaced. For that, check where defect exists before disassembly and visually inspect disassembled parts carefully. Also, after washing disassembled joint housing in kerosene or the like, dry it completely by blowing air and clean boot with cloth.
- Apply ample amount of joint grease to wheel side joint and inside of boot.
- Install wheel side boot to shaft.
- Fill inside of boot with joint grease and then fix it with boot band.
- Install differential side boot to shaft and apply ample amount of grease to joint and inside of boot.
- After installing double offset joint to shaft, fix it with circlip.
- With differential side boot silled with grease, install joint assembly.
- Fix boot to joint assembly with boot band.

INSTALLATION

For installation, reverse removal procedure noting following points.

- Connect brake hose to control rod properly.

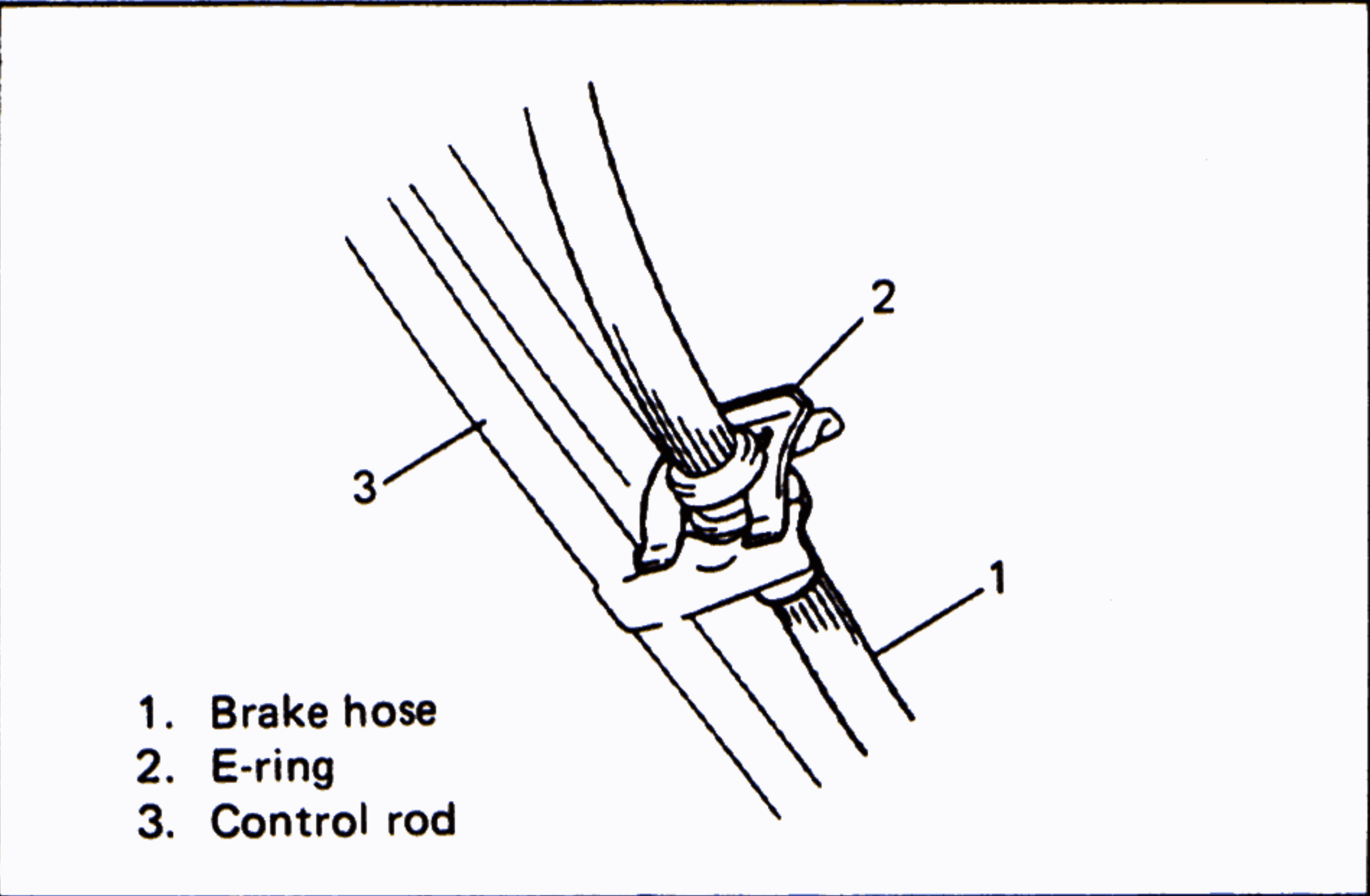


Fig. 4C-9

- Install strut to knuckle.
Fit lug "A" on strut into opening in knuckle and push down strut till "B" marked parts of strut contact upper end of knuckle as shown below.

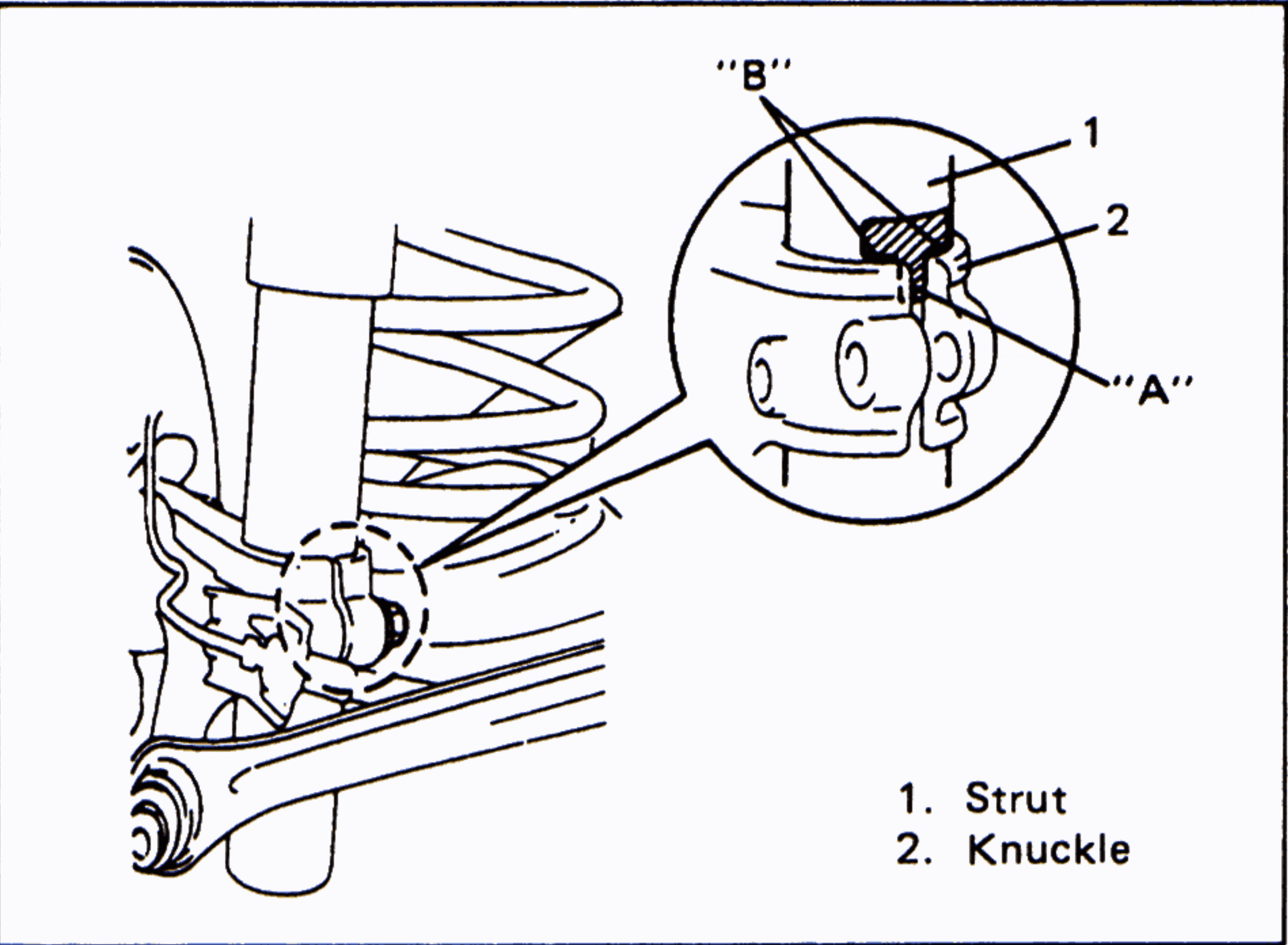


Fig. 4C-10

- Caulk spindle nut as shown below.

NOTE:
Replace spindle nut with a new one.

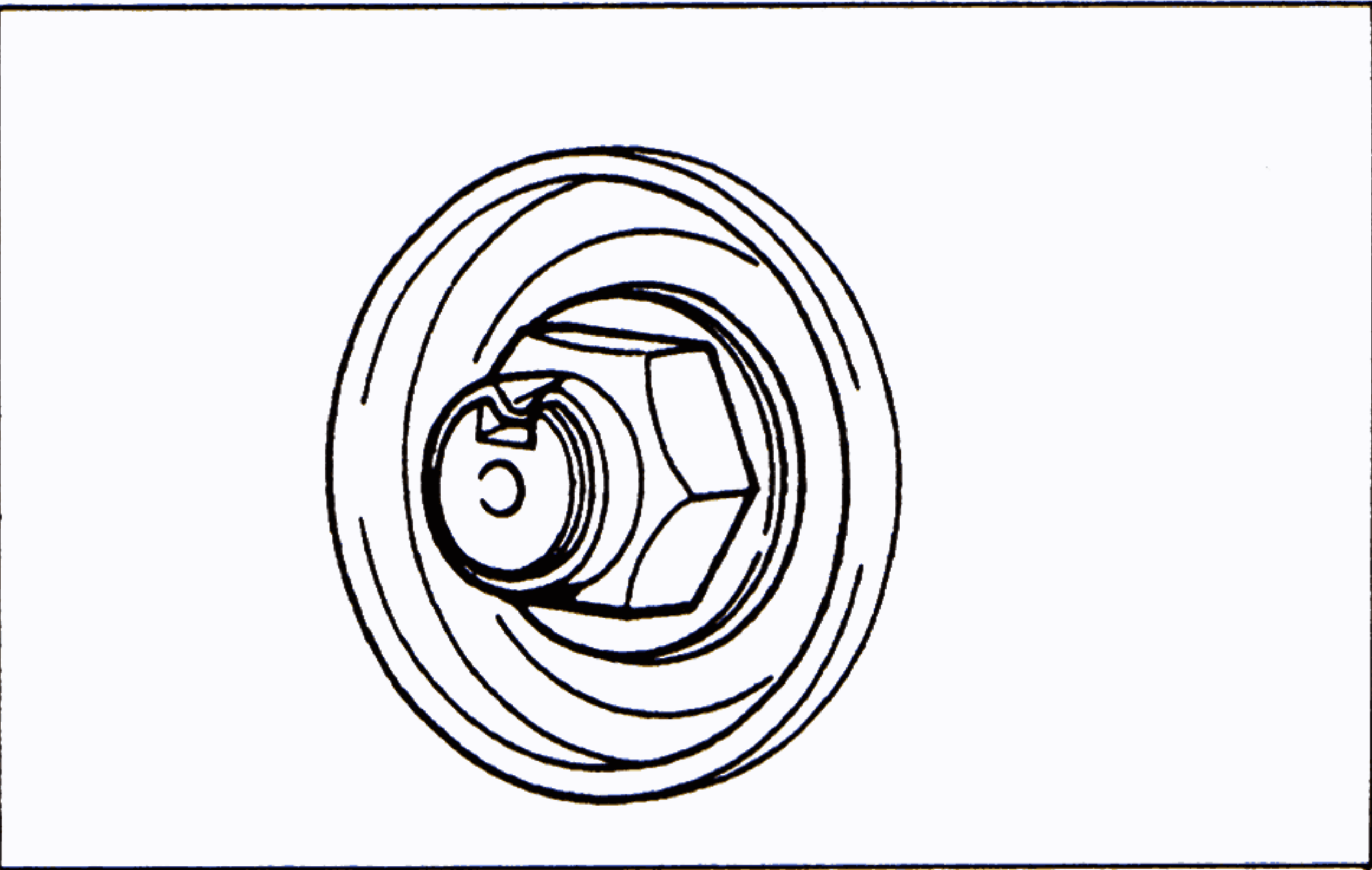
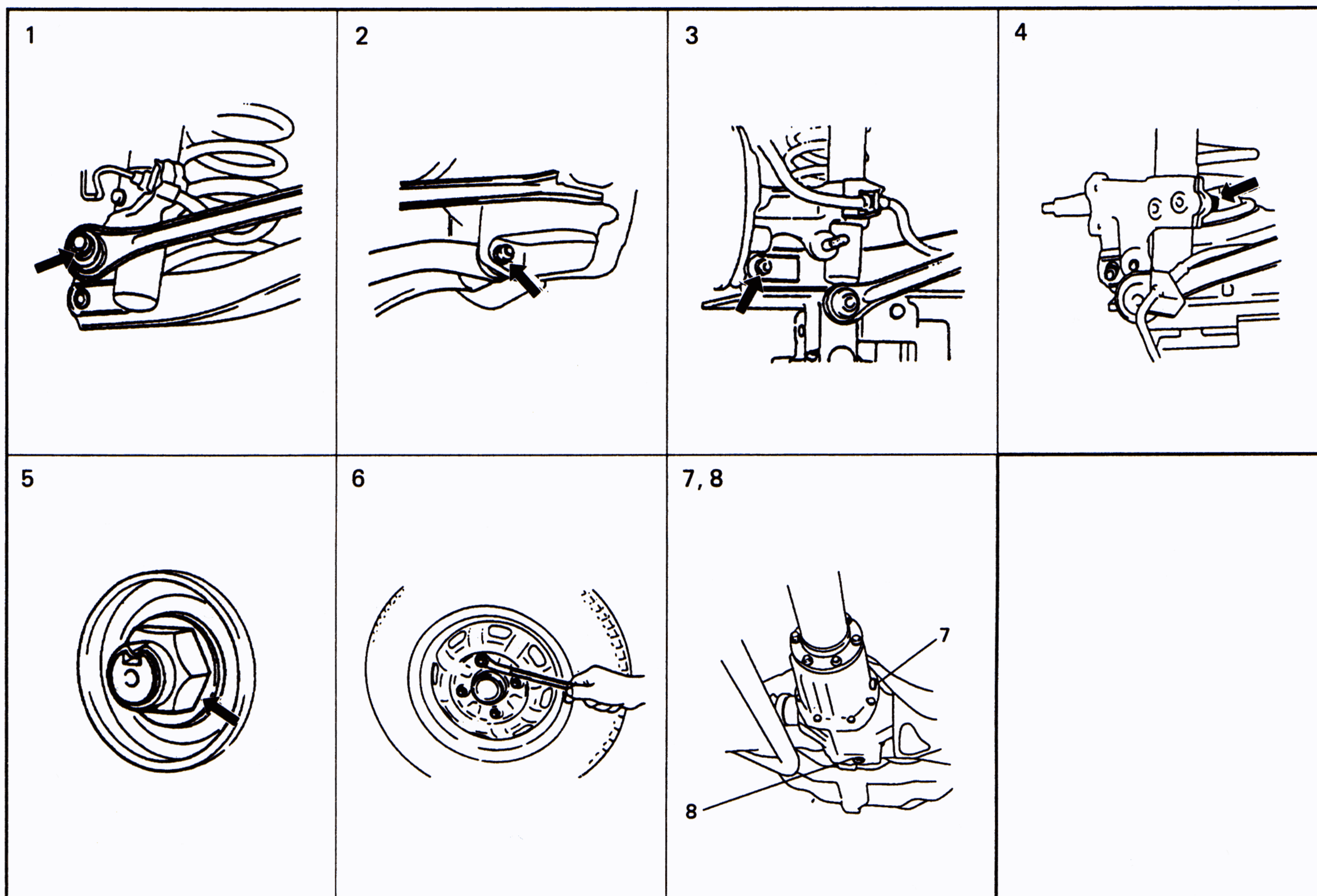


Fig. 4C-11

- Fill differential oil. (Refer to Section 7E.)

RECOMMENDED TORQUE SPECIFICATIONS

Fastener	Tightening torque		
	N·m	kg-m	lb-ft
1. Control rod nut (wheel nut)	70 – 90	7.0 – 9.0	51.0 – 65.0
2. Suspension arm rear nut	40 – 60	4.0 – 6.0	29.0 – 43.0
3. Knuckle arm lower mount nut	40 – 60	4.0 – 6.0	29.0 – 43.0
4. Strut lower mount bolt	50 – 70	5.0 – 7.0	36.5 – 50.5
5. Rear spindle nut	150 – 200	15.0 – 20.0	108.5 – 144.5
6. Wheel nut	50 – 70	5.0 – 7.0	36.5 – 50.5
7. Oil level plug	18 – 28	1.8 – 2.8	13.5 – 20.0
8. Oil drain plug	18 – 28	1.8 – 2.8	13.5 – 20.0



SECTION 6A

ENGINE MECHANICAL

CONTENTS

UNIT REPAIR OVERHAUL	6A-1
Engine Assembly	6A-1

UNIT REPAIR OVERHAUL

ENGINE ASSEMBLY

DISMOUNTING

1. Relieve fuel pressure according to procedure described in p. 6-3 SERVICE MANUAL 99500-71C00-01E.
2. Remove battery cables at battery.
3. Remove engine hood panel.
4. Drain cooling system.
5. Remove battery and battery tray.
6. Remove air cleaner assembly.
7. Remove radiator with cooling fan.
8. Remove accelerator cable.
9. Remove electronic wire harness.
10. Disconnect clutch cable from transmission.
11. Disconnect shift and select cables from transmission.
12. Disconnect heater hoses.
13. Disconnect vacuum hoses.
14. Disconnect fuel hoses.
15. Remove exhaust pipe.
16. Remove front wheels.
17. Remove splash cover.
18. Remove stabilizer.
19. By using large size screwdrivers, pull out left drive shaft joint at differential side and right drive shaft joint at drive intermediate shaft so as to release snap ring fitting.
Refer to SECTION 4.
20. Remove ball stud bolts and nuts from both side knuckles and detach suspension arms and then pull out both drive shaft joints from differential.
21. Separate propeller shaft No. 1 from transfer.

22. Support engine and remove engine mounting bolts and nuts.
23. Lower engine with transmission.

REMOUNTING

Reverse dismounting procedure for remounting and note follows.

- Tighten bolts and nuts to specified torque.

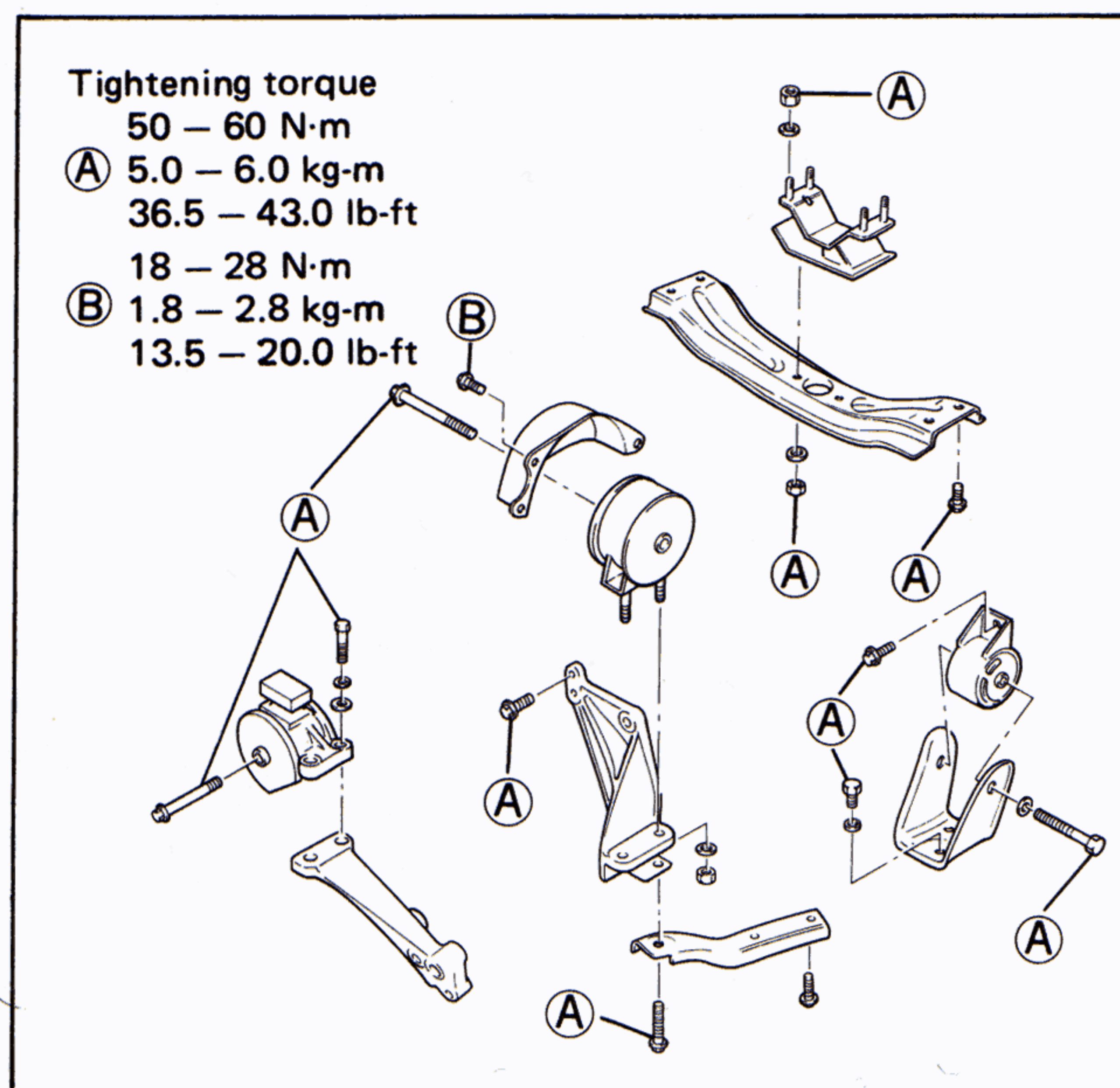


Fig. 6A-1

- Upon completion of installation, verify that there is no fuel leakage, water leakage or exhaust gas leakage at each connection.

SECTION 6C

ENGINE FUEL

CONTENTS

GENERAL DESCRIPTION	6C-1
Fuel System	6C-1
Fuel Pump	6C-2
Fuel Level Gauge	6C-2
ON CAR SERVICE	6C-3
Fuel Tank	6C-3

GENERAL DESCRIPTION

FUEL SYSTEM

The main components of the fuel system are fuel tank, fuel pump, circulation pump, fuel filter and main fuel level gauge, sub fuel level gauge and it includes three lines; fuel feed line, fuel return line and fuel vapor line.

Whether equipped with a canister in the fuel vapor line or not depends on the vehicle specifications. Because the fuel tank of a four-wheel drive vehicle is configured in two sections, a circulation pump is provided inside the sub-tank so that fuel can be transferred from the sub-tank to the main tank. This prevents fuel from being left in one tank.

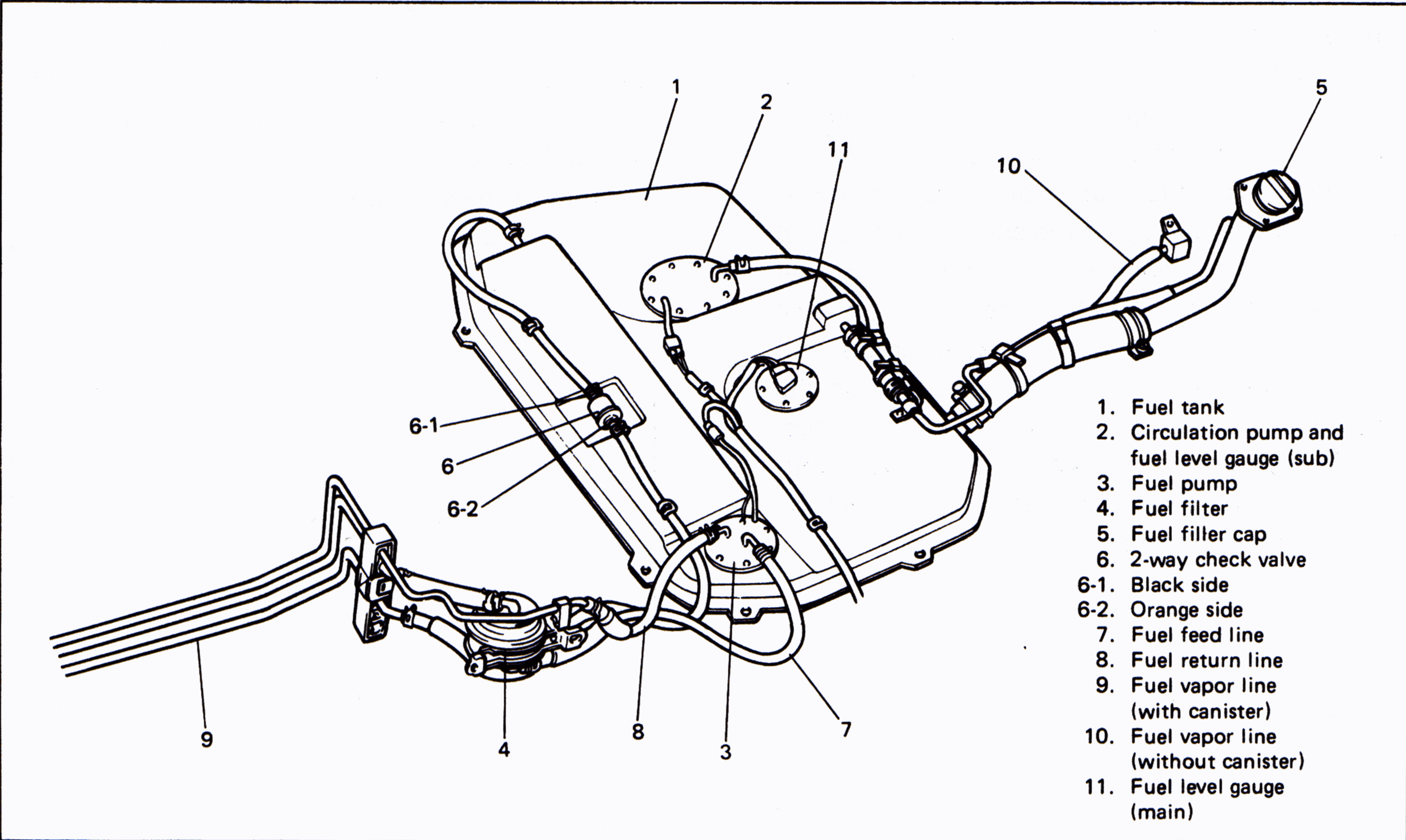


Fig. 6C-1 Fuel System

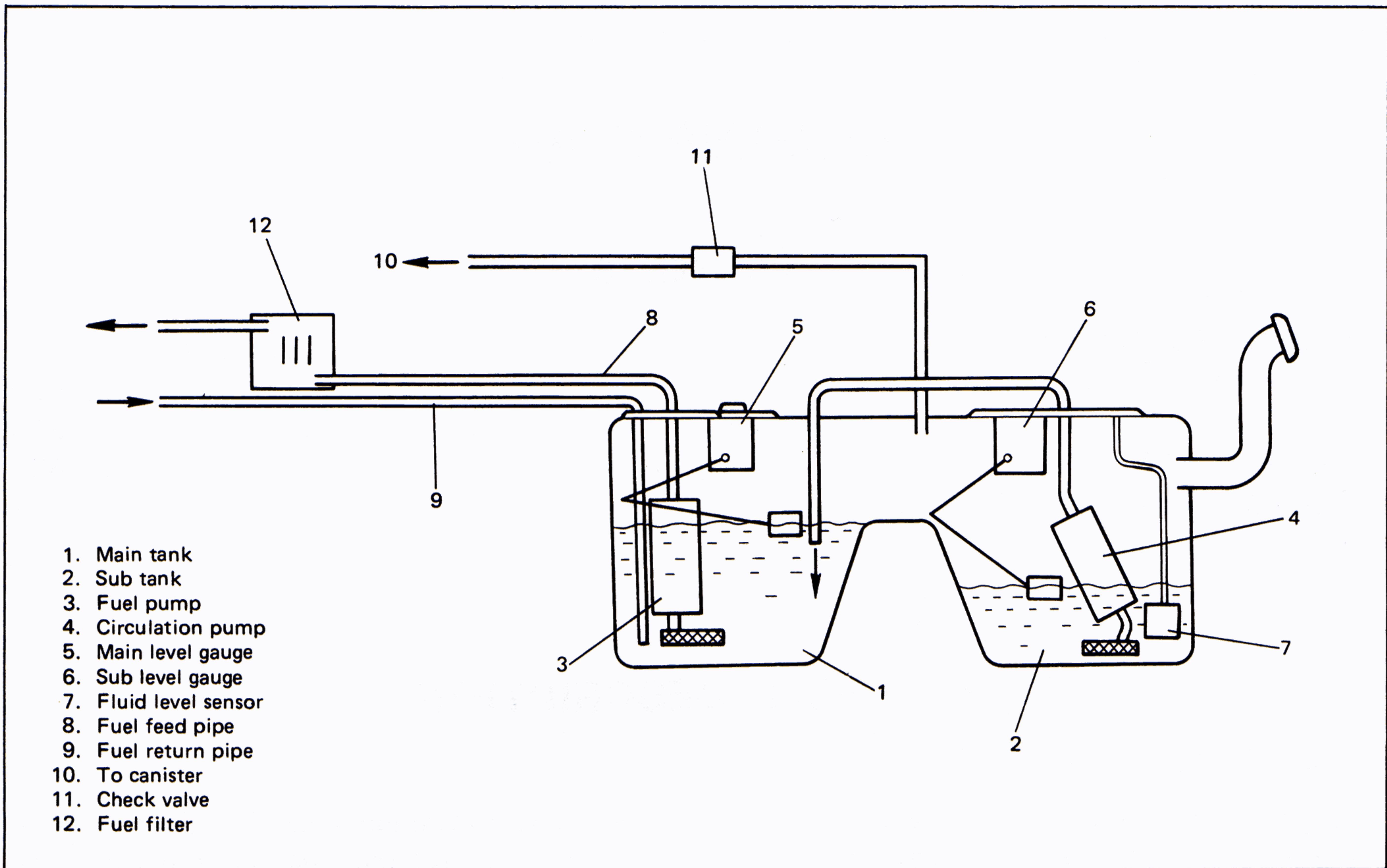


Fig. 6C-2 Fuel Lines

FUEL PUMP

The fuel pump and circulation pump are both housed inside the tank. When the fuel level rises above the fluid level sensor, the circulation pump operates when the ignition switch is turned on, and the fuel in the sub-tank is supplied to the main tank. The fuel pump operates simultaneously with the startup of the engine, so that fuel is supplied to the engine. When the level of fuel in the sub-tank drops below the operation level of the fluid level sensor, the relay operates, and the circulation pump stops. If, because of the swaying of the car or for other reasons, fuel spills from the main tank back into the sub-tank, raising the level there above the sensor level the circulation pump begins to operate again.

FUEL LEVEL GAUGE

The fuel meter indication is displayed by means of compound resistance value deriving from two fuel level gauges connected in series. In other words, the value indicated on the meter is the averaged value of the fuel level in the main tank and that in the sub-tank.

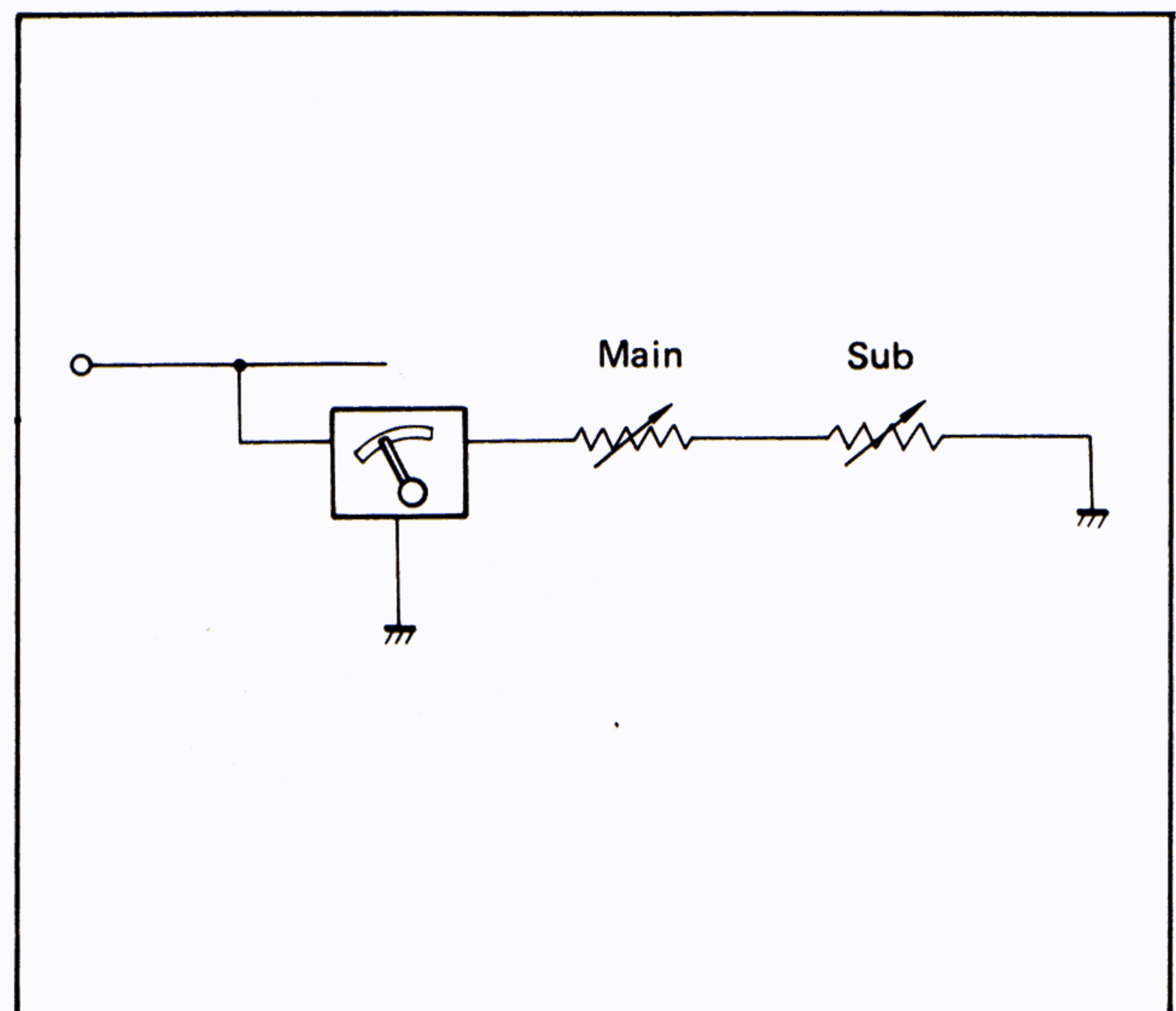


Fig. 6C-3

ON CAR SERVICE

FUEL TANK

REMOVE OR DISCONNECT

1. Relieve fuel pressure in fuel feed line according to procedure described on p. 6-3 of SF413 Supplementary Service Manual (for Electronic Fuel Injection model).
2. Negative cable at battery.
3. Rear seat cushion referring to SECTION 9.
4. Fuel level gauge (main & sub), fuel pump and circulation pump lead wire couplers, and detach wire tape.

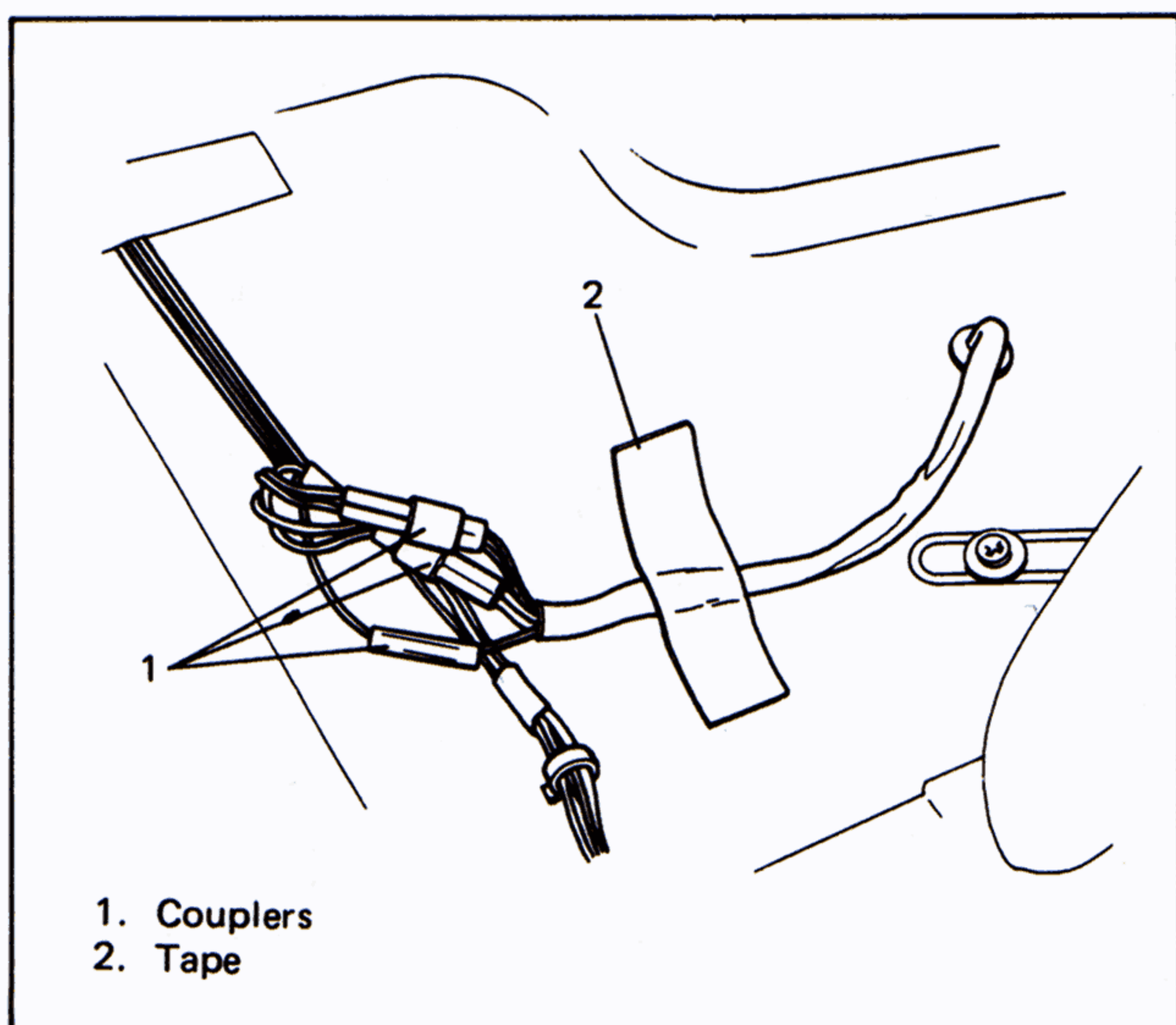


Fig. 6C-4 Disconnecting Couplers

5. Hoist car.
6. Fuel filler hose and breather hose from filler neck.

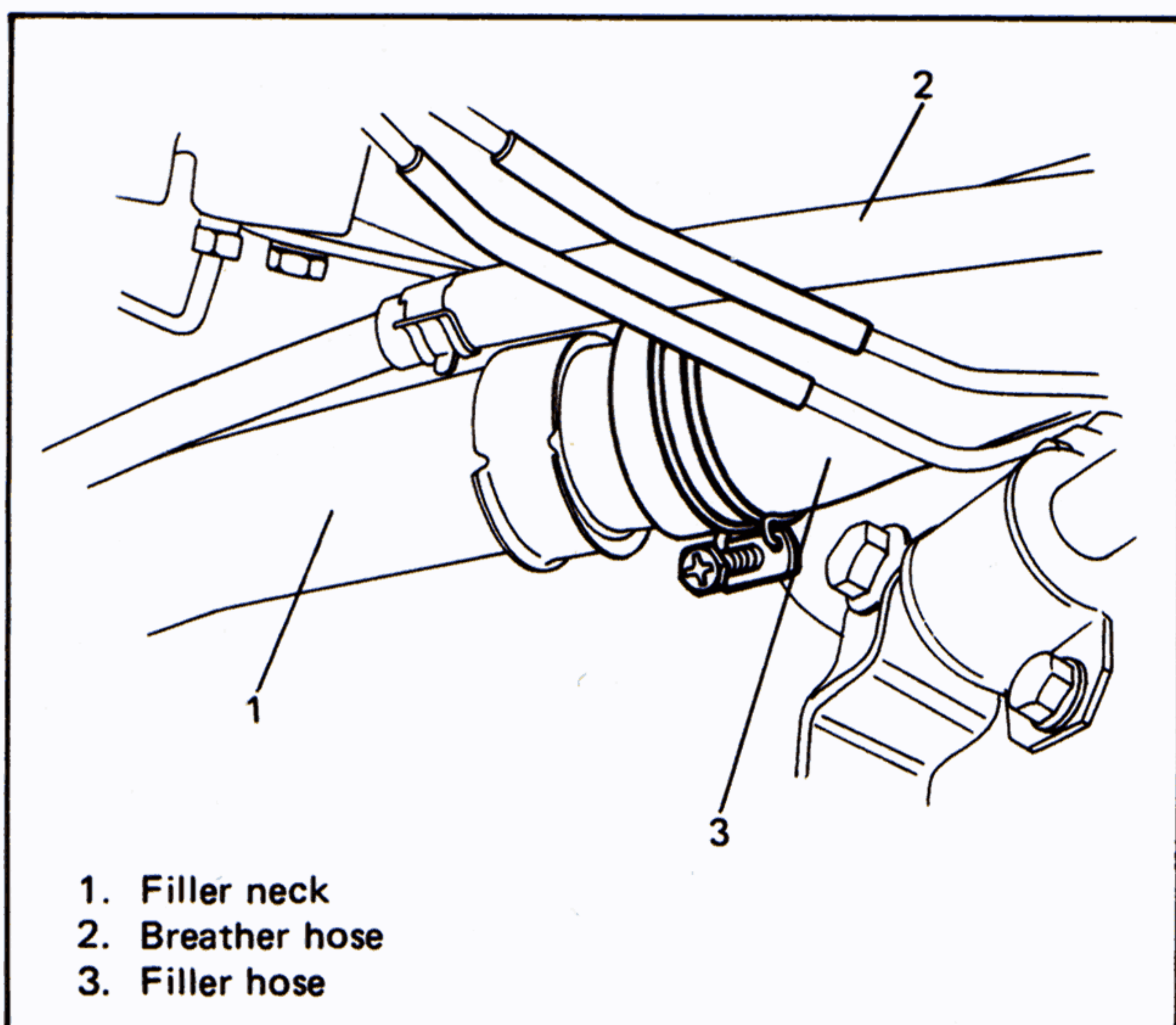


Fig. 6C-5 Breather and Filler Hoses

7. As fuel tank has no drain plug, drain fuel tank by pumping fuel out through fuel tank filler.

Use hand operated pump device to drain fuel tank.

CAUTION:

Never drain or store fuel in an open container to avoid possibility of fire or explosion.

8. Fuel hoses from filter and pipes.

WARNING:

A small amount of fuel may be released after the fuel hose is disconnected. In order reduce the chance of personal injury, cover the hose and pipe to be disconnected with a shop cloth. Be sure to put that cloth in an approved container when disconnection is completed.

9. Propeller shaft No. 3, refer to Section 4B.
10. After draining rear differential oil, viscous coupling case from rear differential case.
11. Fuel tank heat protector from body.

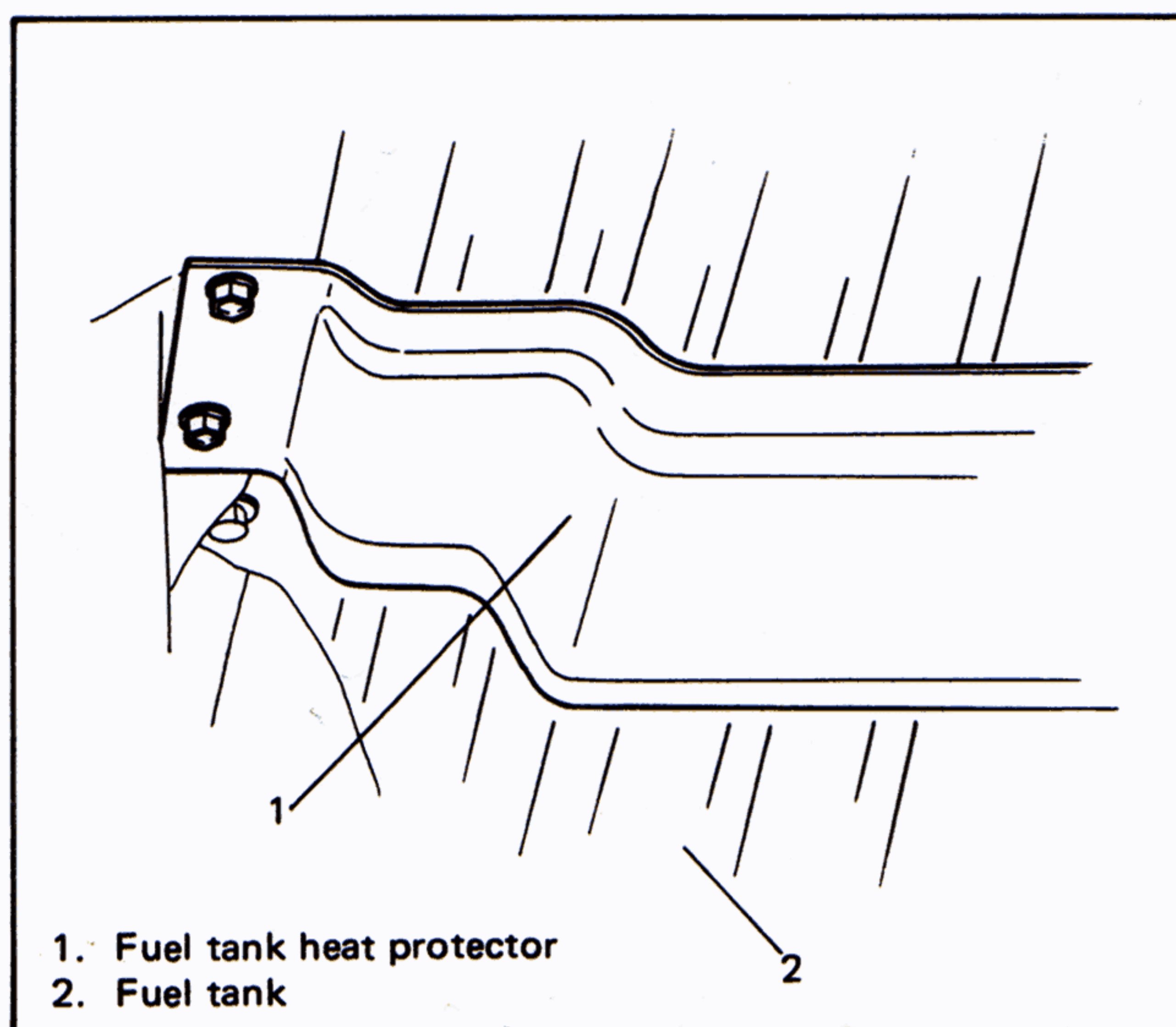


Fig. 6C-6

12. Fuel tank from car.

INSTALLATION

Reverse removal procedure for installation.

SECTION 6K

EXHAUST SYSTEM

CONTENTS

GENERAL DESCRIPTION 6K-1

MAINTENANCE 6K-2

ON CAR SERVICE 6K-2

NOTE:

The catalytic converter is provided or not depending on specification.

GENERAL DESCRIPTION

The exhaust system consists of an exhaust manifold, an exhaust center pipe, a muffler, and seals and gaskets etc., and the exhaust center pipe has the catalytic converter.

The catalytic converter is an emission control device added to the exhaust system to lower the

levels of Hydrocarbon (HC), Carbon Monoxide (CO), (and Oxides of Nitrogen (NOx)) pollutants in the exhaust gas.

THE CATALYTIC CONVERTER REQUIRES USE OF UNLEADED FUEL ONLY.

NOTE:

Shape of exhaust center pipe varies depending on specifications.

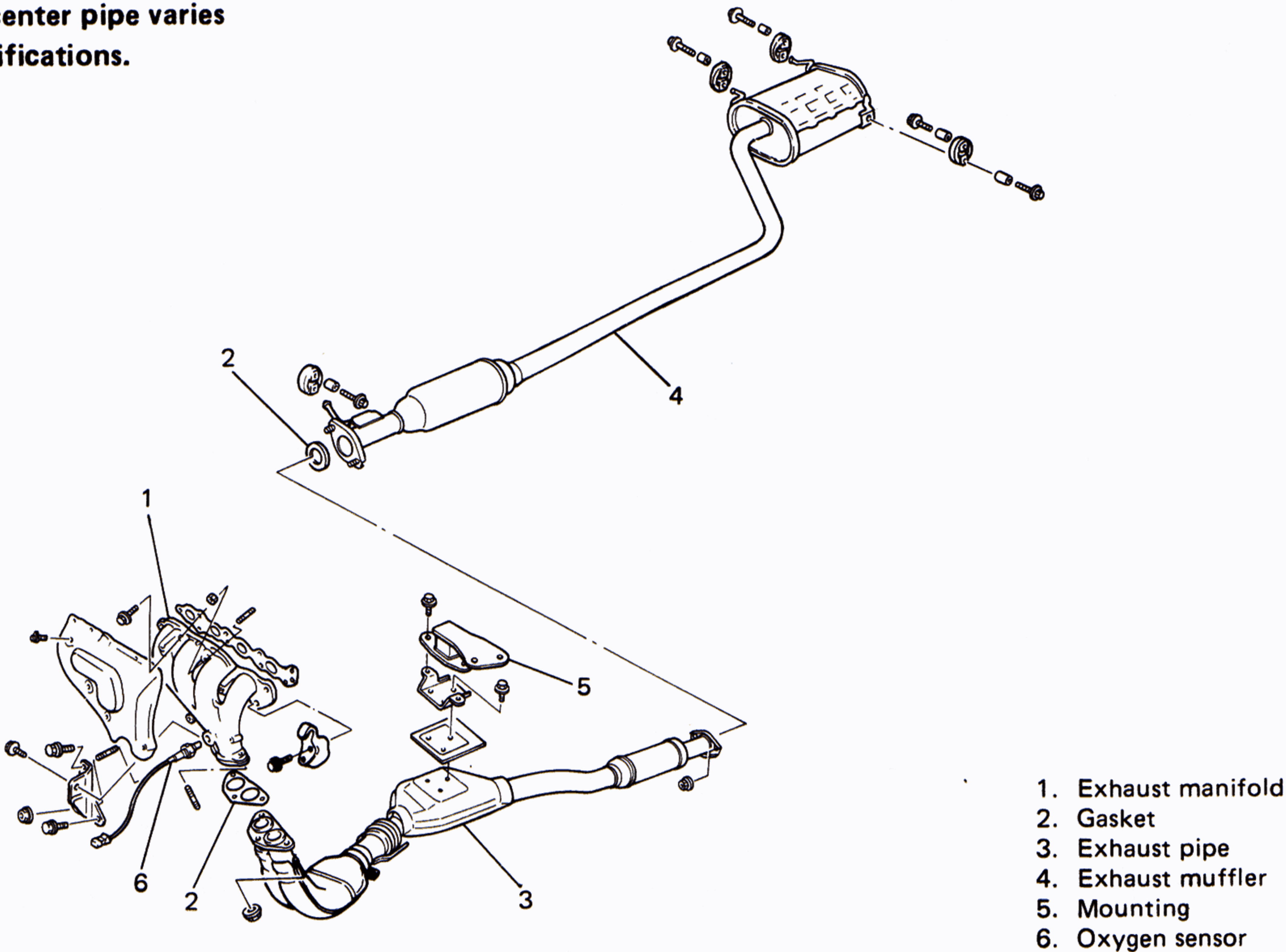


Fig. 6K-1 Exhaust System

MAINTENANCE

WARNING:

To avoid the danger of being burned, do not touch the exhaust system when the system is hot. Any service on the exhaust system should be performed when the system is cool.

At every interval of periodic maintenance service, and when car is raised for other service, check exhaust system as follows:

- Check rubber mountings for damage, deterioration, and out of position.
- Check exhaust system for leakage, loose connection, dent and damage.
If bolts or nuts are loosened, tighten them to specified torque. Refer to "ON CAR SERVICE" for torque data.
- Check nearby body areas for damaged, missing, or mispositioned part, open seam, hole, loose connection or any other defect which could permit exhaust fumes to seep into car.
- Make sure that exhaust system components have enough clearance from underbody to avoid overheating and possible damage to passenger compartment carpet.
- Any defect should be fixed at once.

ON CAR SERVICE

- Refer to Section 6A of SF416 SERVICE MANUAL for removal and installation procedures of exhaust manifold.
- For replacement of center pipe, muffler, tail pipe or any part used to mount or connect them, be sure to hoist car and observe WARNING given at the left of this page.

CAUTION:

As muffler center pipe has catalytic converter in it, it should not be exposed to any impulse. Be careful not to drop it or hit it against something.

- When exhaust manifold is removed, check gaskets and seal for deterioration or damage. Replace them as necessary.
- Tighten bolts and nuts to specified torques when reassembling.
Refer to Fig. 6K-2 for location of bolts and nuts.

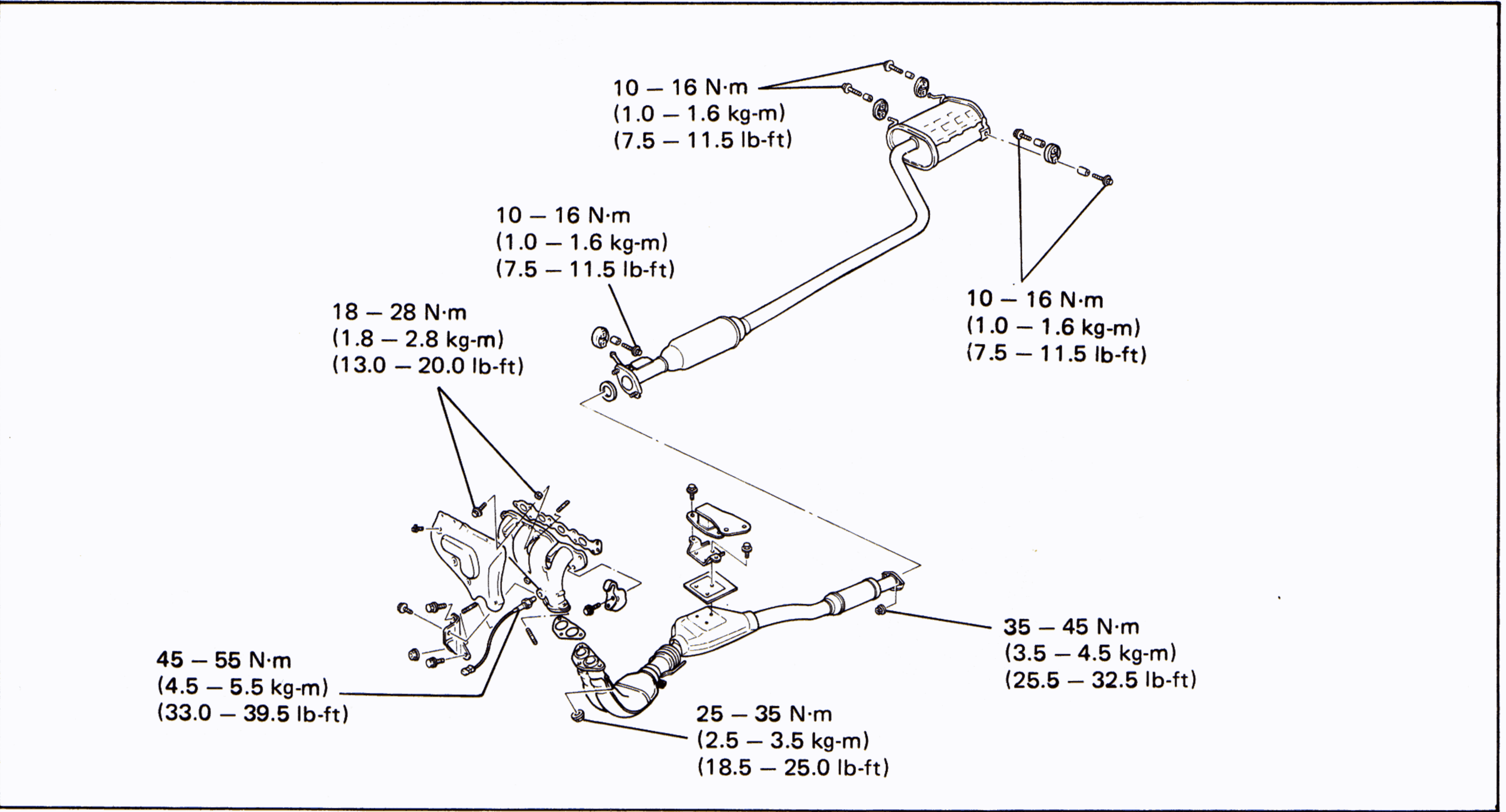


Fig. 6K-2 Recommended Torque Specification

SECTION 7A

MANUAL TRANSMISSION

CONTENTS

GENERAL DESCRIPTION 7A-1

ON-CAR SERVICE 7A-4

Oil Change 7A-4

UNIT REPAIR OVERHAUL 7A-5

Dismounting of Transmission 7A-5

Remounting 7A-6

Removal of Transfer Ass'y & Differential 7A-6

GENERAL DESCRIPTION

CONSTRUCTION AND SERVICING

The transmission provides five forward speeds and one reverse speed by means of three synchronizers 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 is mounted on counter shaft and engaged with counter shaft first gear or second gear, while the high speed synchronizer is done on input shaft and engaged with input shaft third gear or fourth gear.

The fifth speed synchronizer on input shaft is engaged with input shaft fifth gear mounted on the input shaft.

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

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.

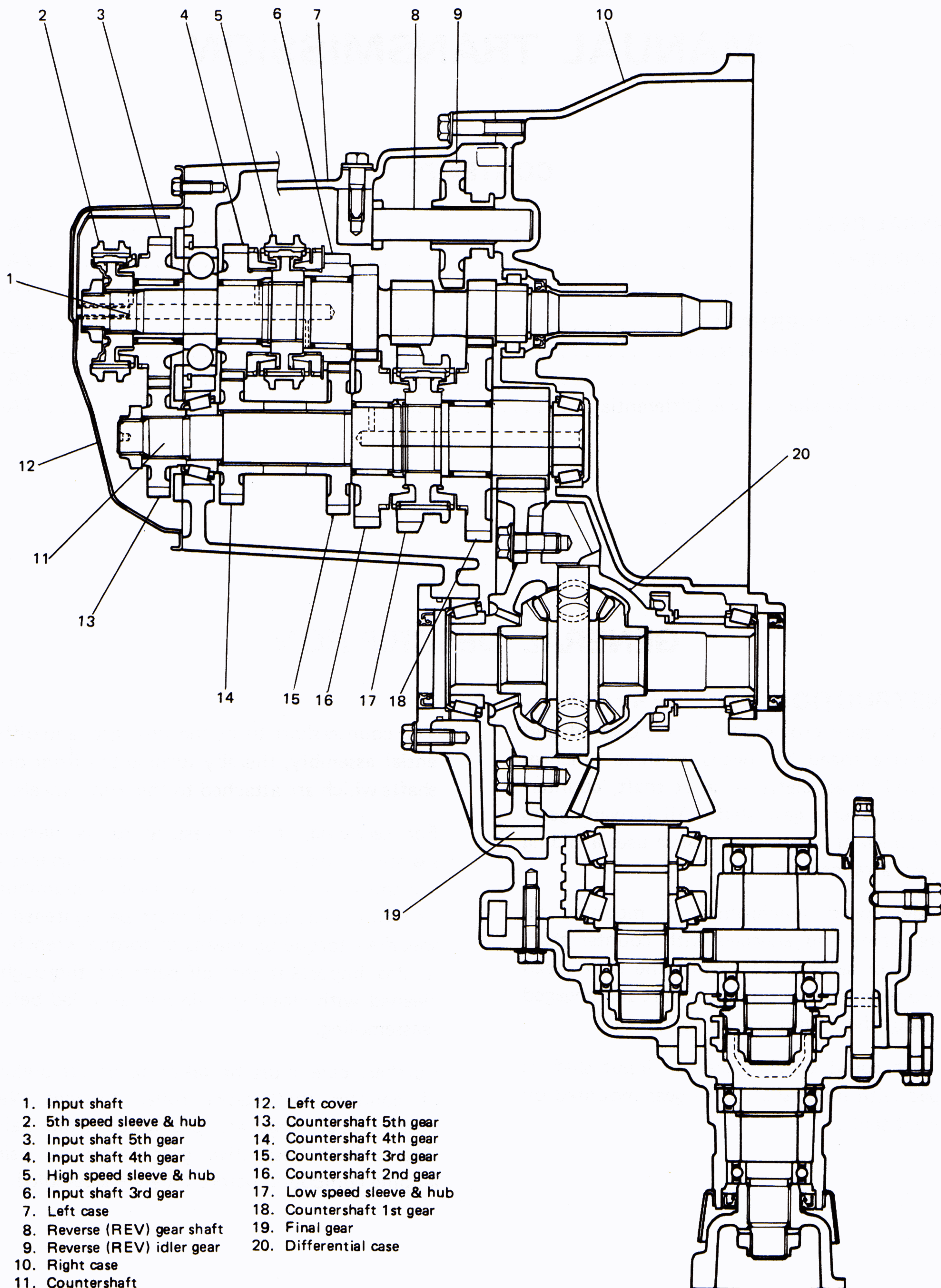
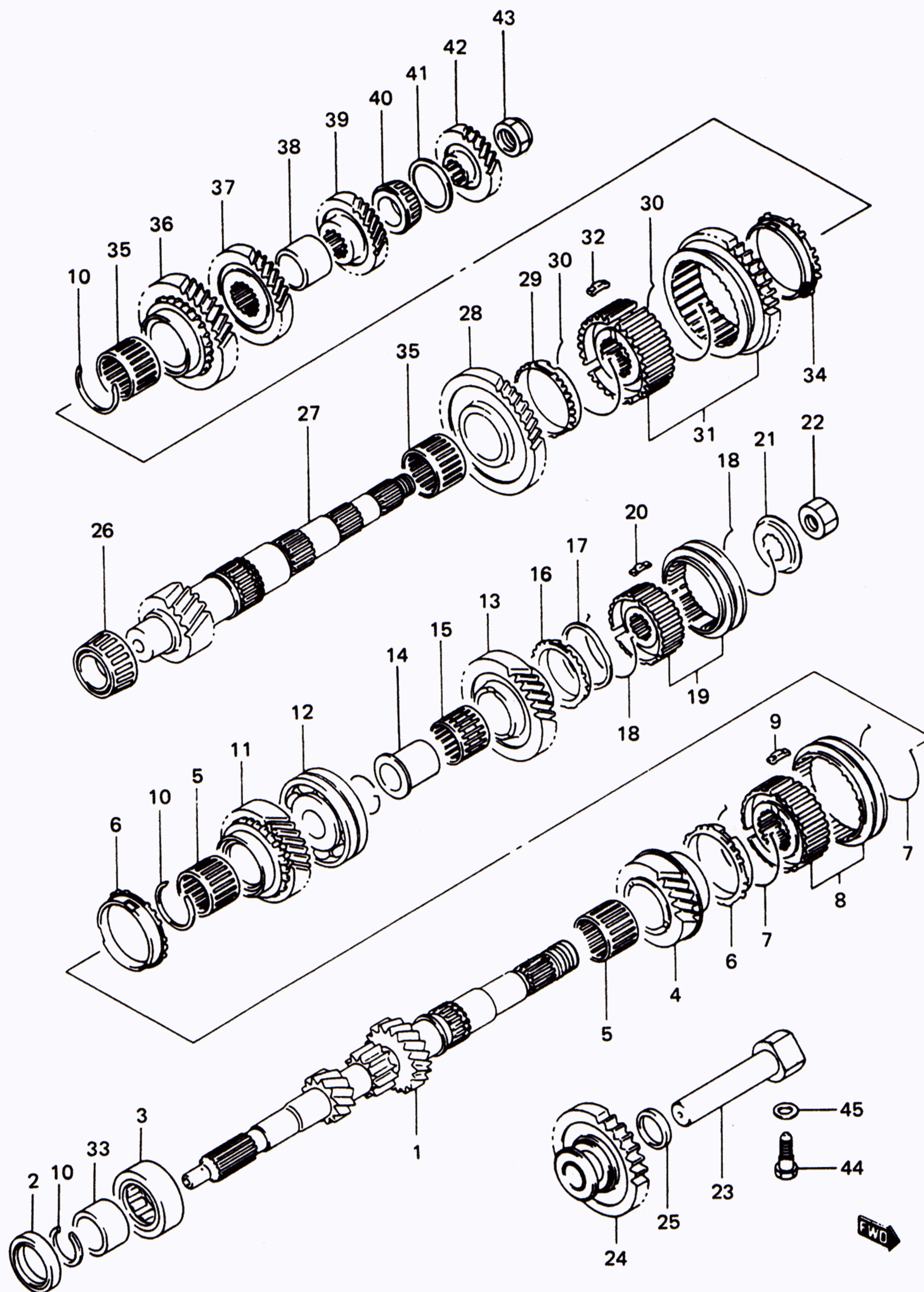


Fig. 7A-1 Manual Transmission Cutaway



1. Input shaft
2. Oil seal
3. Input shaft R bearing
4. Input shaft 3rd gear
5. 3rd & 4th gear bearing
6. High speed synchronizer ring
7. High speed synchronizer spring
8. High speed sleeve & hub
9. High speed synchronizer key
10. Circlip
11. Input shaft 4th gear
12. Input shaft L bearing
13. Input shaft 5th gear
14. 5th gear spacer
15. 5th gear bearing

16. 5th speed synchronizer ring
17. Synchronizer ring spring
18. 5th synchronizer spring
19. 5th speed sleeve & hub
20. 5th synchronizer key
21. 5th synchronizer hub plate
22. Nut
23. Reverse (REV) gear shaft
24. Reverse (REV) idler gear
25. Reverse (REV) shaft washer
26. Countershaft R bearing
27. Countershaft
28. Countershaft 1st gear
29. 1st gear synchronizer ring
30. Low speed synchronizer spring

31. Low speed sleeve & hub
32. Low speed synchronizer key
33. Spacer
34. 2nd gear synchronizer ring
35. 1st & 2nd gear bearing
36. Countershaft 2nd gear
37. Countershaft 3rd gear
38. 3rd & 4th gear spacer
39. Countershaft 4th gear
40. Countershaft L bearing
41. Bearing set shim
42. Countershaft 5th gear
43. Countershaft nut
44. Reverse shaft bolt
45. Washer

Fig. 7A-2 Manual Transmission Exploded View

ON-CAR SERVICE

OIL CHANGE

1. Before changing or inspecting oil, be sure to stop engine and lift car horizontally.
2. With car lifted up, check oil level and leakage. If leakage exists, correct it.
3. Drain old oil and fill new specified oil as in the following table by specified amount (up to level hole).
4. Torque drain and level/filler plugs as specified below. Apply sealant to drain plug before installation.

NOTE:

- It is recommended to use API GL-4 SAE 75W-90 gear oil.
- Whenever car is hoisted for any other service work than oil change, also be sure to check for oil leakage.

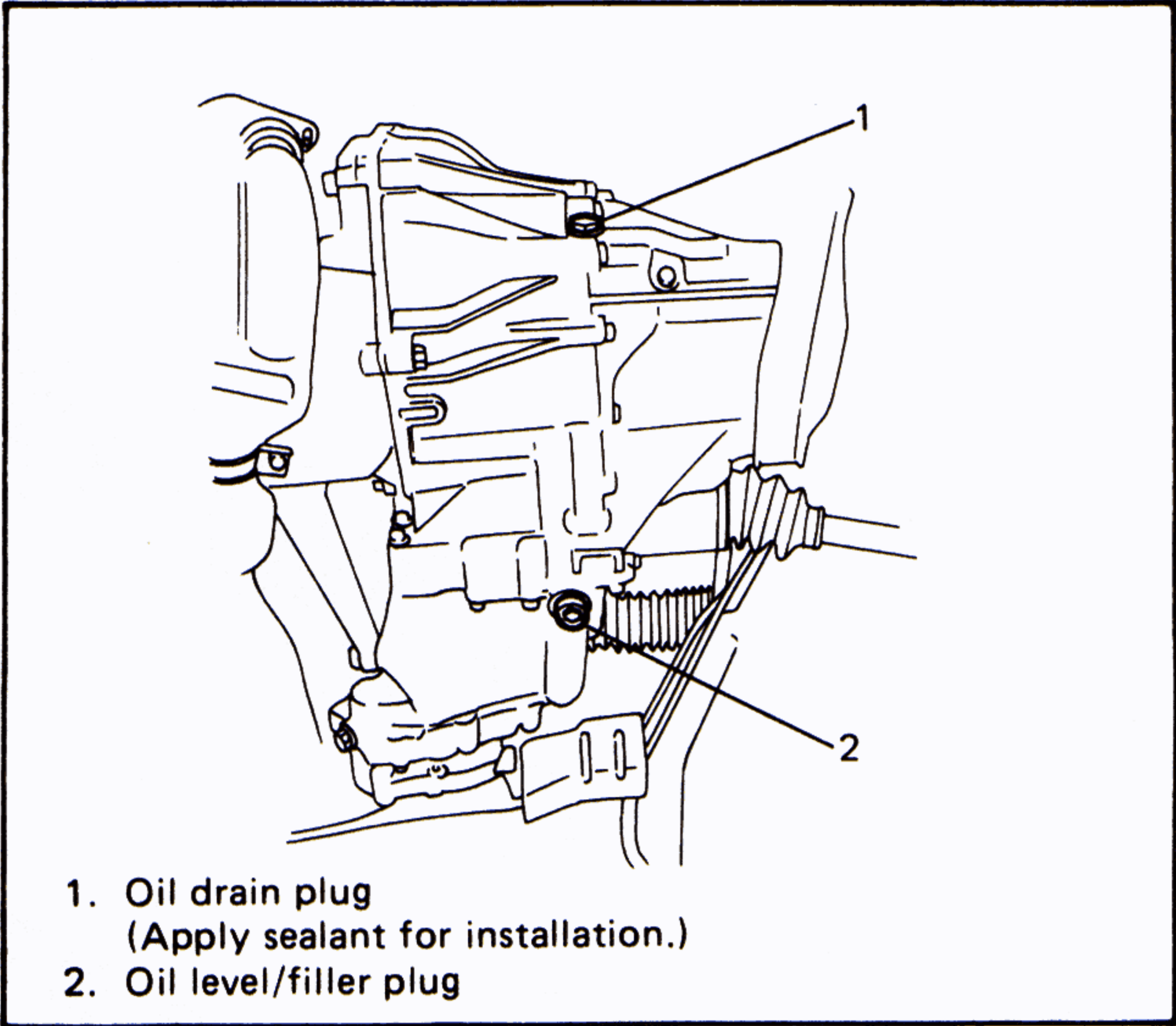
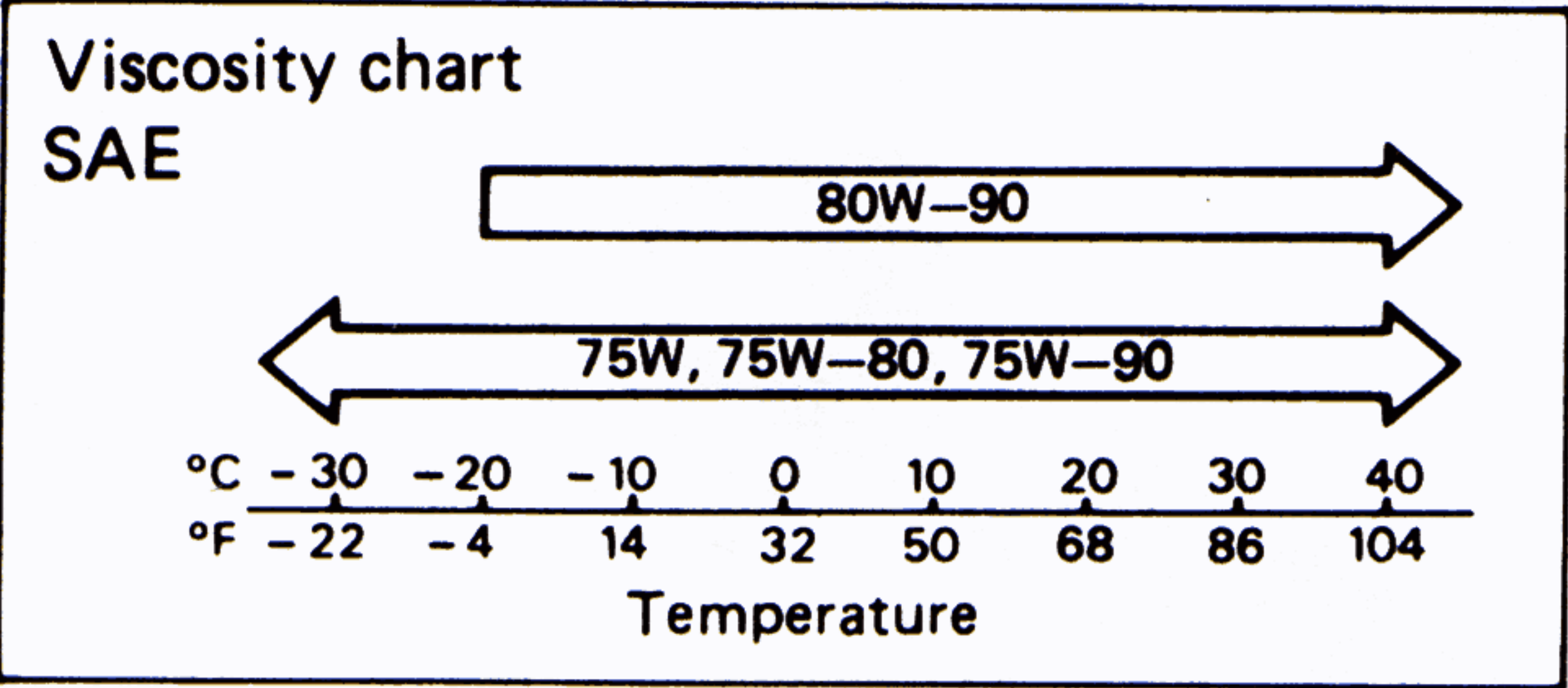


Fig. 7A-9 Changing Transmission Oil



Oil specification	API GL-4 or API GL5 For SAE classification, refer to above viscosity chart.
Oil capacity	4.5 liters 9.5/7.9 US/Imp. pt

Tightening torque	N·m	kg-m	lb-ft
Filler/level plug	36 – 54	3.6 – 5.4	26.5 – 39.0
Drain plug	25 – 30	2.5 – 3.0	18.5 – 21.5

UNIT REPAIR OVERHAUL

DISMOUNTING OF TRANSMISSION

UNDER HOOD

1. Disconnect battery ground cable and then remove battery and its tray.
2. Disconnect clutch operating cylinder from M/T.
3. Remove E-ring, shift and select cables from control cable bracket.

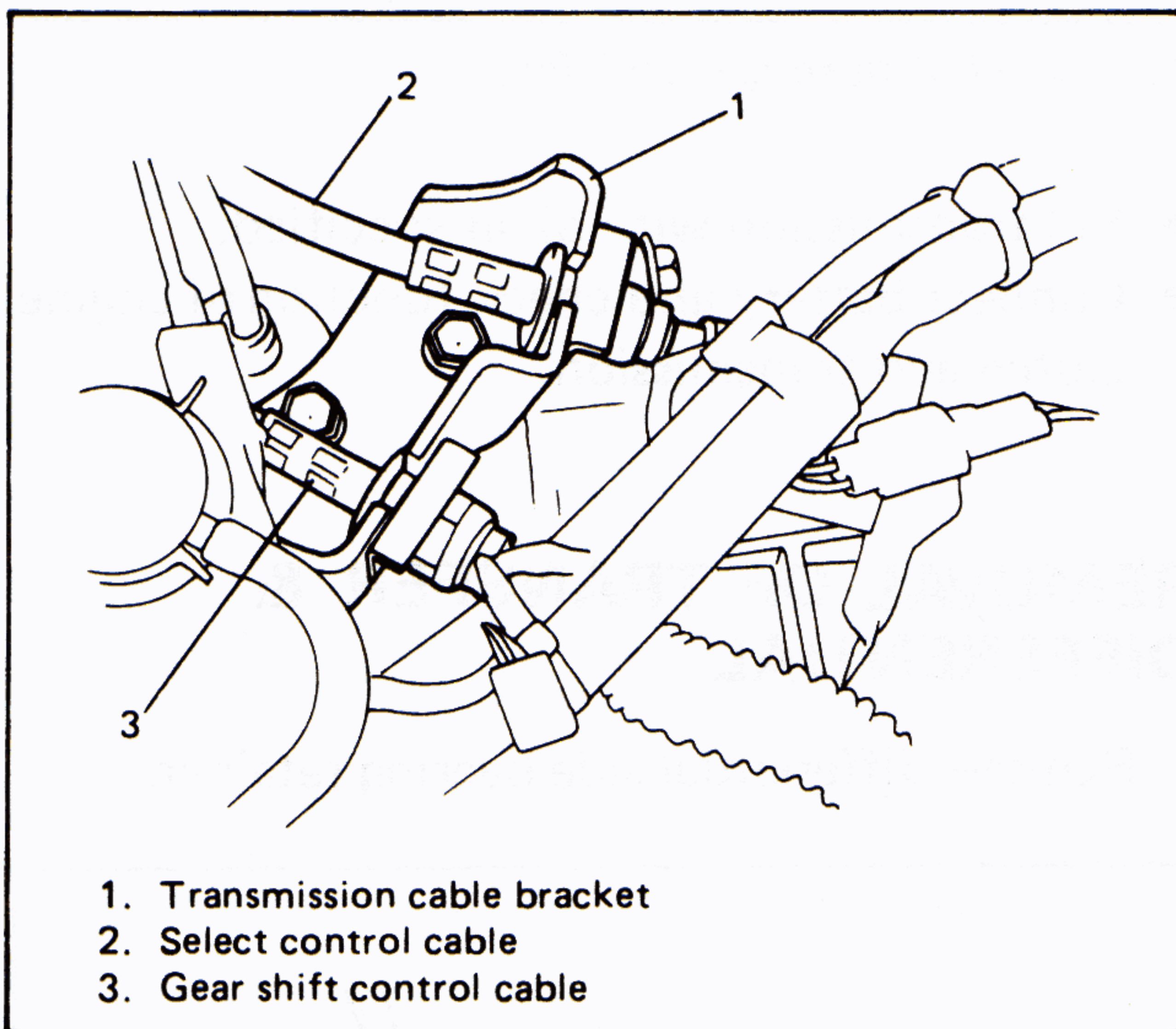


Fig. 7A-18 Removing Rear Portion

4. Undo wiring harness clamps and couplers.
5. Take off speedometer cable boot, speedometer case clip and then speedometer cable from case.
6. Remove radiator outlet pipe.
7. Remove starter motor.
8. Lift up car.
9. Drain transmission oil.
10. Remove left side fender apron extension.
11. Remove exhaust pipe from exhaust manifold.
12. Remove clutch housing lower plate.
13. Remove ball stud bolt and nut from right and left knuckles, then disconnect each suspension arm.
14. By using large size screwdrivers, pull out left drive shaft joints at differential side so as to release snap ring fitting of joint.

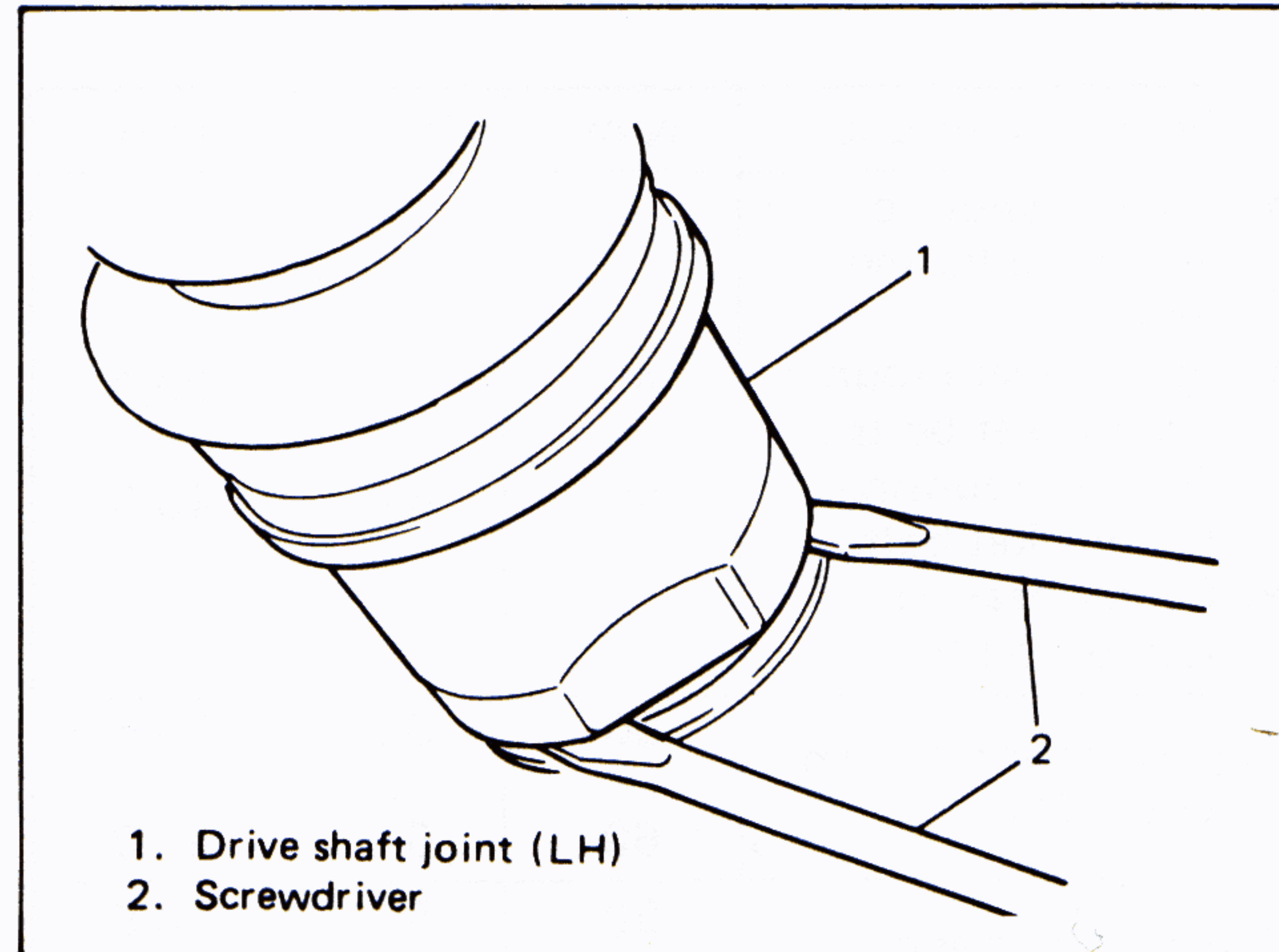


Fig. 7A-19 Detaching Snap Ring From Differential

15. Remove center bearing support mounting bolts and center drive shaft.

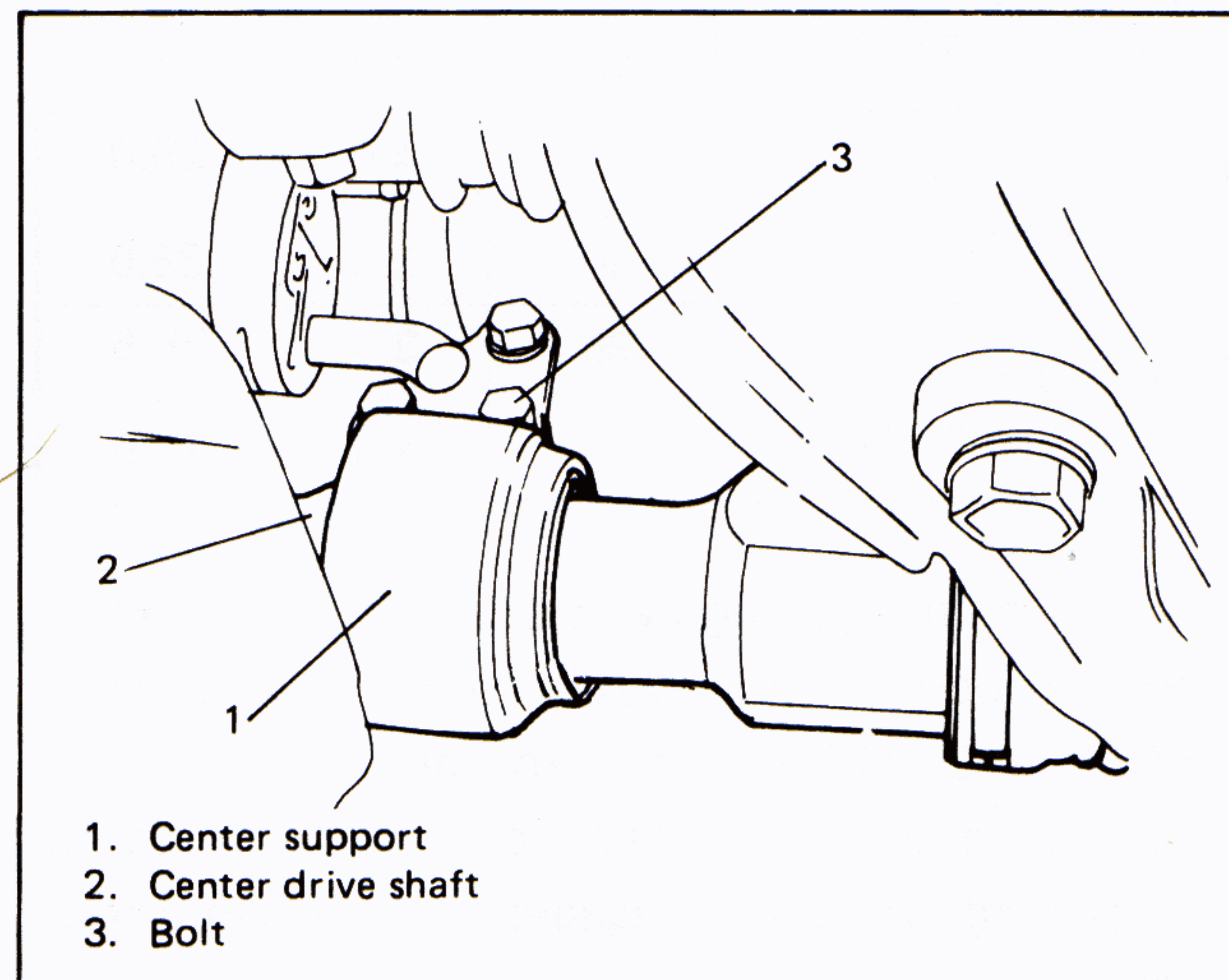


Fig. 7A-20

16. Support engine by using hoist.
17. Remove transmission stiffener.
18. Remove transmission to engine bolt and nut.
19. Remove engine rear mounting bracket bolt.
20. Support transmission with transmission jack.
21. Remove engine mounting LH bracket and its stiffener.
22. Check all around transmission for any other parts required to be removed or disconnected for removal of transmission and remove or disconnect whatever necessary.
23. Pull transmission out so as to disconnect input shaft from clutch disc and then lower it.

REMOUNTING

For remounting, reverse dismounting procedure.
Use specified torque as given below.

Tightening torque	N·m	kg-m	lb-ft
● Transmission to engine bolts and nuts			
● Engine rear mounting bracket bolts	40	4.0	29.0
● Engine mounting LH bracket bolts	60	6.0	43.0
● Center bearing support bolts			
Engine mounting LH bracket nuts	50 60	5.0 6.0	36.5 43.0
Ball stud bolt and nut	50 70	5.0 7.0	36.5 50.5
Extension rod nut	25 40	2.5 4.0	18.5 28.5
Gear shift control shaft bolt and nut	15 20	1.5 2.0	11.0 14.5
Exhaust pipe to manifold bolts	40 50	4.0 5.0	29.0 36.0
Exhaust pipe to muffler mounting nuts	35 45	3.5 4.5	25.5 32.5

- When installing engine mounting LH bracket bolt (upper side), apply sealant (SUZUKI BOND NO. 1215) to thread part.
- Push in each drive shaft joint fully so as to snap ring of shaft engages with differential gear.

NOTE:
Apply grease to gear shift control shaft bushes, however, **DO NOT** lubricate extension rod bush.

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.

- Set each clamp for wiring securely.
- If clutch operating cylinder has been replaced or disconnected from clutch hose, bleed air from system and check clutch pedal free travel.

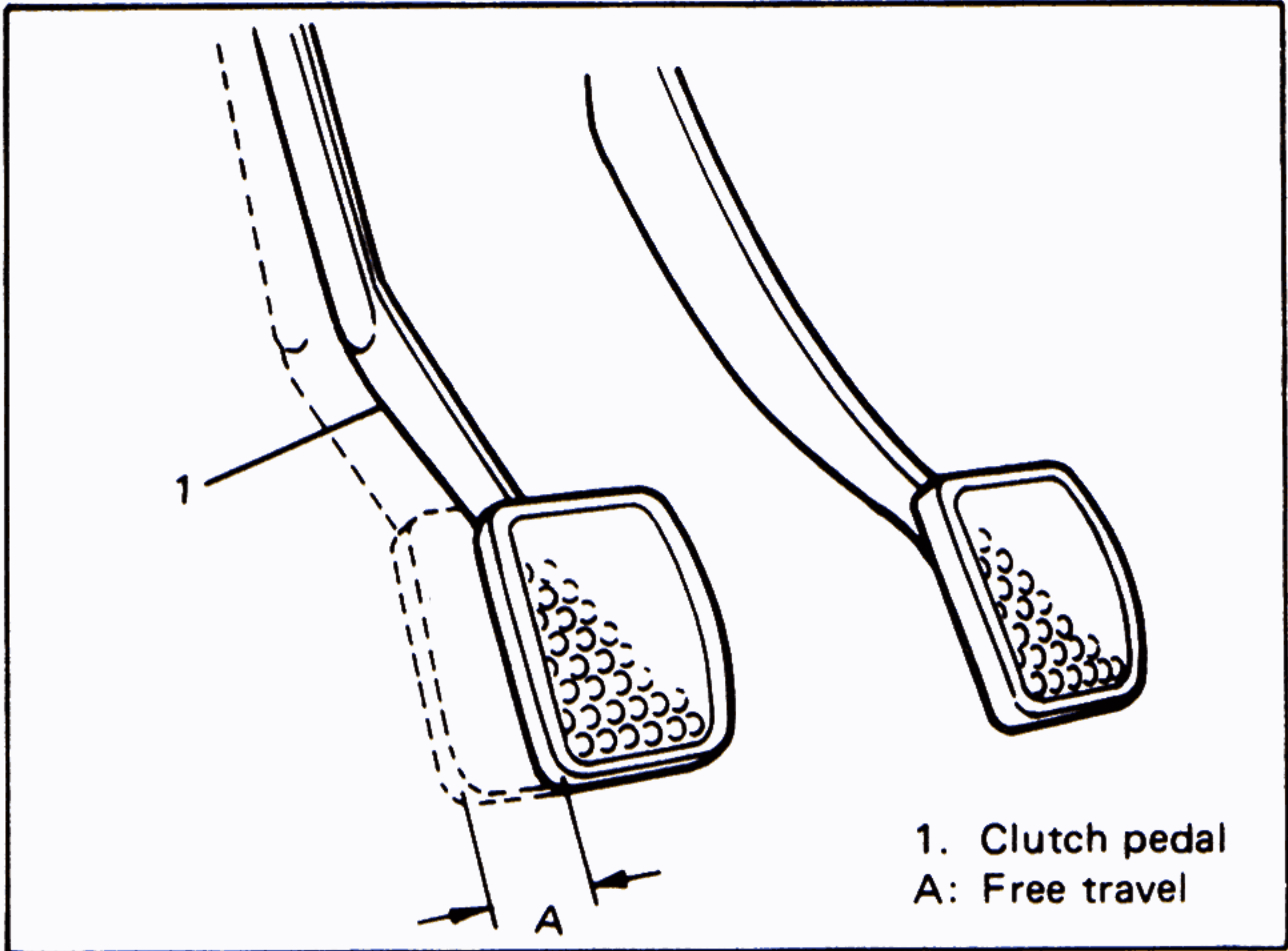


Fig. 7A-21 Adjusting Clutch Play

- Fill transmission with oil as specified.
- Connect battery and check function of engine, clutch and transmission.

REMOVAL OF TRANSFER & DIFFERENTIAL

1. Remove differential side bearing retainer.

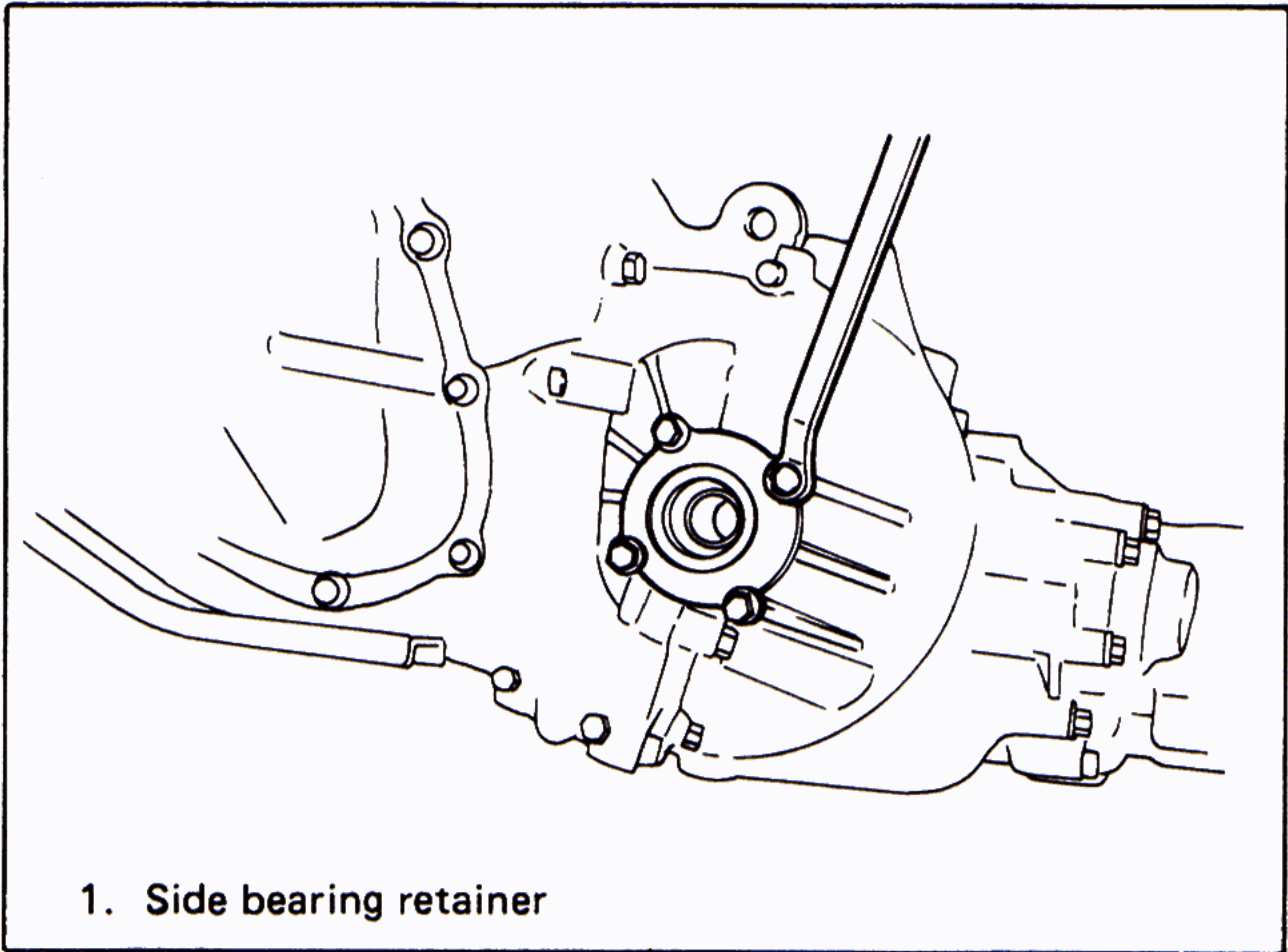


Fig. 7A-21-1

2. Remove speedometer driven gear case.
3. Remove transfer assembly & differential from M/T.

CAUTION:

Be careful not to damage gear teeth surface.

For servicing of transfer assembly & differential, refer to SECTION 7D.

Reverse removal procedure for installation.

SECTION 7D

TRANSFER

CONTENTS

GENERAL DESCRIPTION 7D- 2

 Viscous Coupling 7D- 3

ON CAR SERVICE 7D- 5

 Precaution in Servicing 7D- 5

 Switchin from 4WD to 2WD 7D- 5

 Transfer Assembly 7D- 6

 Disassembly 7D- 6

 Assembly 7D- 8

 Bevel Pinion Shim Adjustment (Bevel pinion bearing shim adjustment) 7D- 8

 Bevel Pinion Shim Adjustment (Mounting distance adjustment) 7D-10

 Drive Bevel Gear Backlash Adjustment and Side Bearing Preload Adjustment 7D-12

 Inspection of Gear Tooth Surface Contact 7D-13

RECOMMENDED TORQUE SPECIFICATIONS 7D-14

SPECIAL TOOLS 7D-15

REQUIRED SERVICE MATERIALS 7D-15

GENERAL DESCRIPTION

This transfer uses a full-time 4WD system in which a viscous coupling is installed in front of rear differential so that optimum amount of drive force is distributed to the front and rear wheels according to the driving conditions. Also, a 2WD to 4WD selector lever is installed to the front transfer case to improve serviceability.

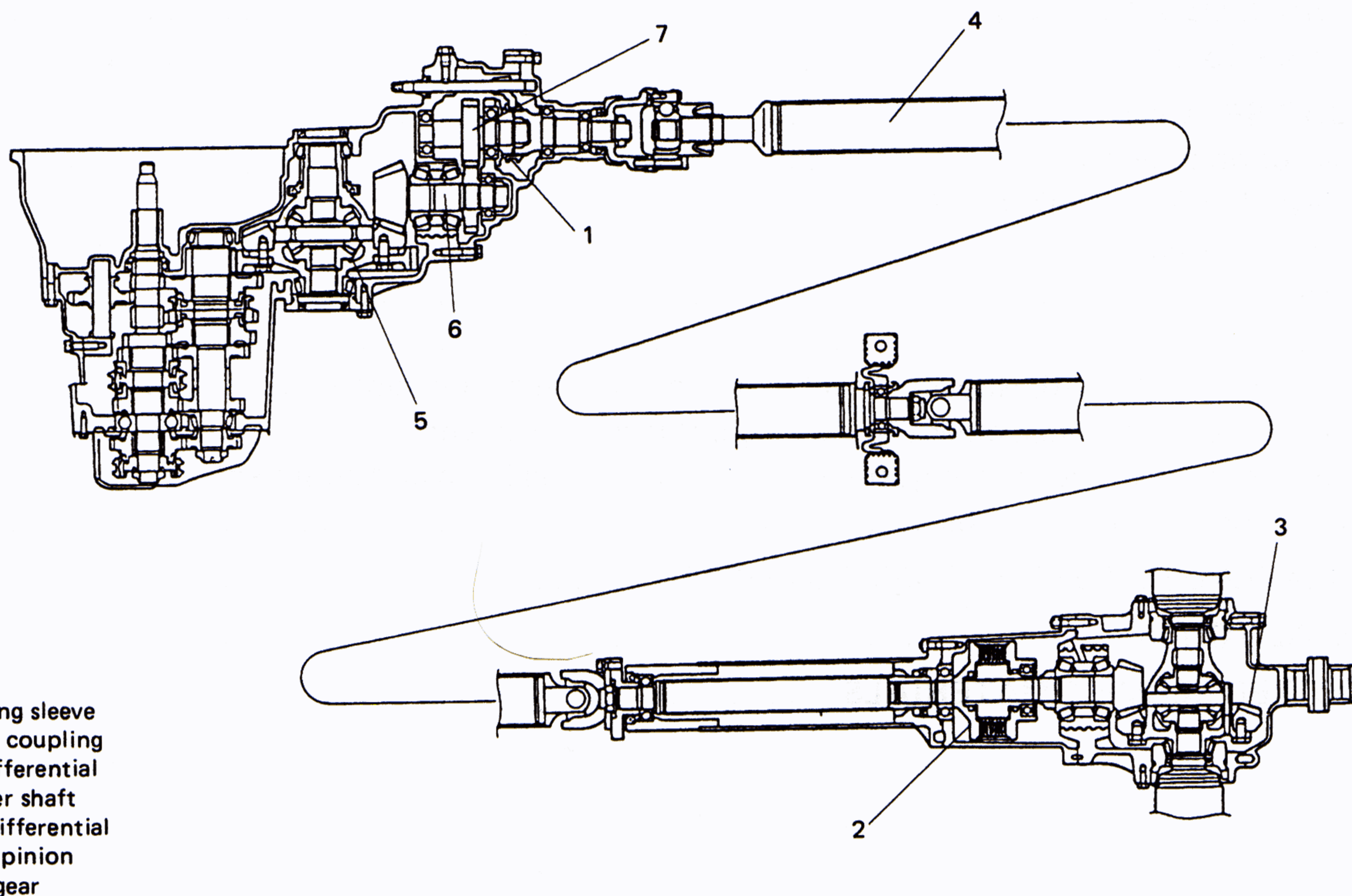


Fig. 7D-1

VISCOUS COUPLING

The full-time 4WD model car is equipped with a viscous coupling which transmits optimum driving force to the rear wheels to make the car 4WD without anything done by the driver. This takes place as soon as a revolution difference occurs between the front and rear wheels due to road conditions and driving conditions.

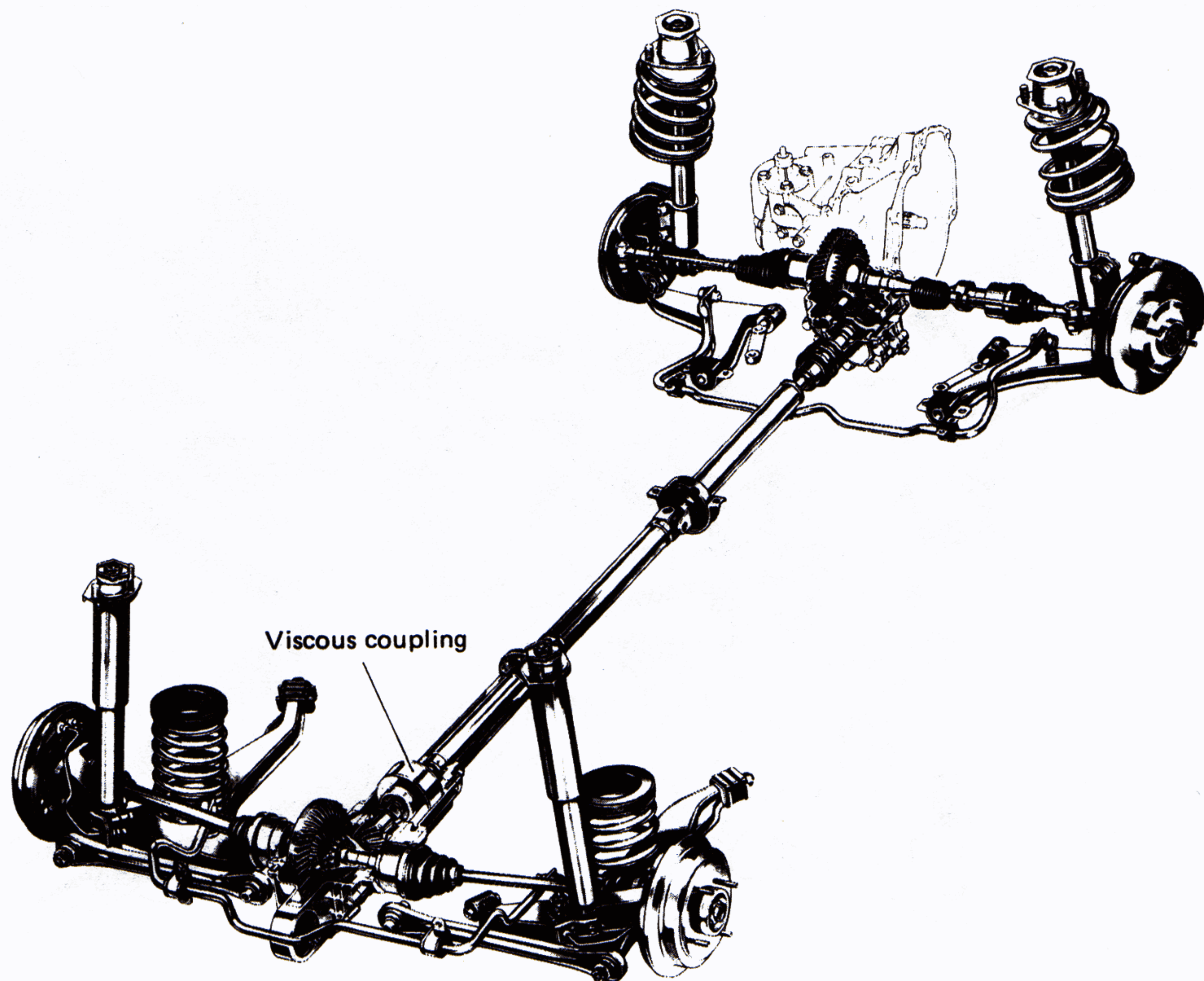


Fig. 7D-2

FEATURES OF VISCOUS COUPLING

- The structure is simple and is free from maintenance.
- It is designed lightweight and compact.
- Stable driving is assured as optimum driving force is transmitted to the rear wheels automatically according to driving conditions.
- Premature locking of the rear wheels is prevented when the brake is applied.
- As the front wheels and rear wheels are not connected directly, no "tight corner brake phenomenon" occurs.

The viscous coupling consists of a housing, hub, outer plates, inner plates, wire & bearing and oil seal. The housing is joined to the propeller shaft and hub to the bevel pinion of the rear differential. The outer plates are fitted to the housing and inner plates to the hub, and they are arrayed alternately with a space inbetween, where silicon oil with high viscosity is filled. When a revolution speed difference occurs between inner plates and outer plates, driving force is conveyed to the rear wheels through viscosity resistance of silicon oil. And the larger the difference is, the more driving force is conveyed.

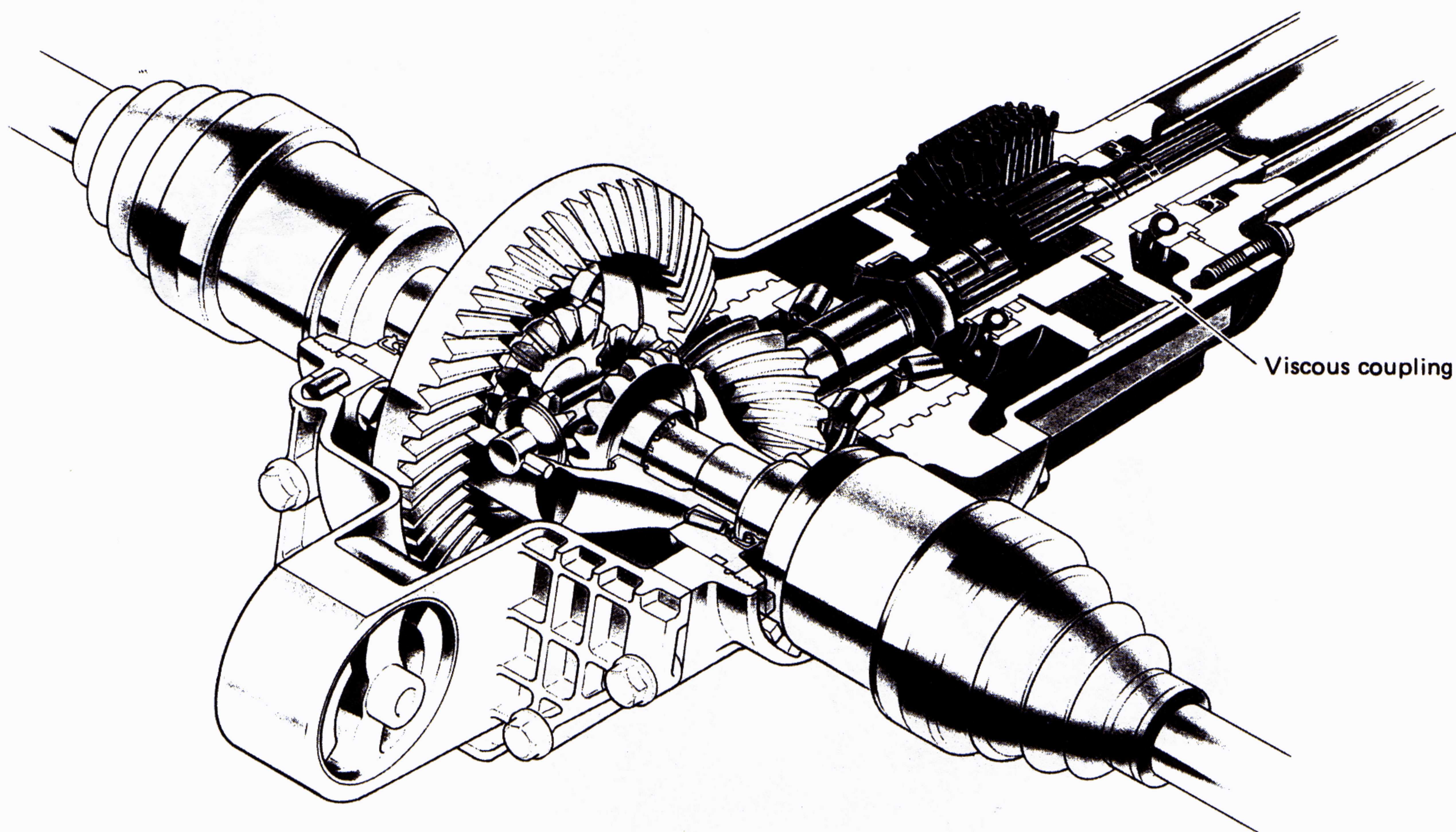


Fig. 7D-3

ON CAR SERVICE

PRECAUTION IN SERVICING (FULL-TIME 4WD)

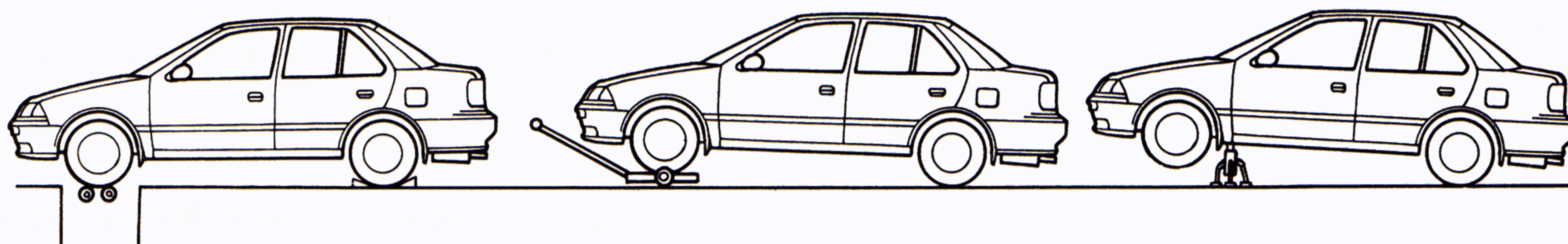
When performing any of the following types of work, it is necessary to make the car as front wheel drive by cutting transmission of driving force to the rear wheels.

Testing following items

- Speedometer
- Chassis dynamo
- Brake
- Wheel balance (on car type)

Towing car with front or rear wheels lifted up

Driving front wheels which are jacked up



SWITCHING FROM 4WD TO 2WD

Set 4WD/2WD selector lever located at lower side of transfer driven case to 2WD.

1. Loosen transfer lock bolt.
2. Push in shift fork shaft fully.
3. With shift fork shaft pushed in, tighten transfer lock bolt.

Tightening torque for transfer lock bolt	N·m	kg-m	lb-ft
	15 – 22	1.5 – 2.2	11.0 – 15.5

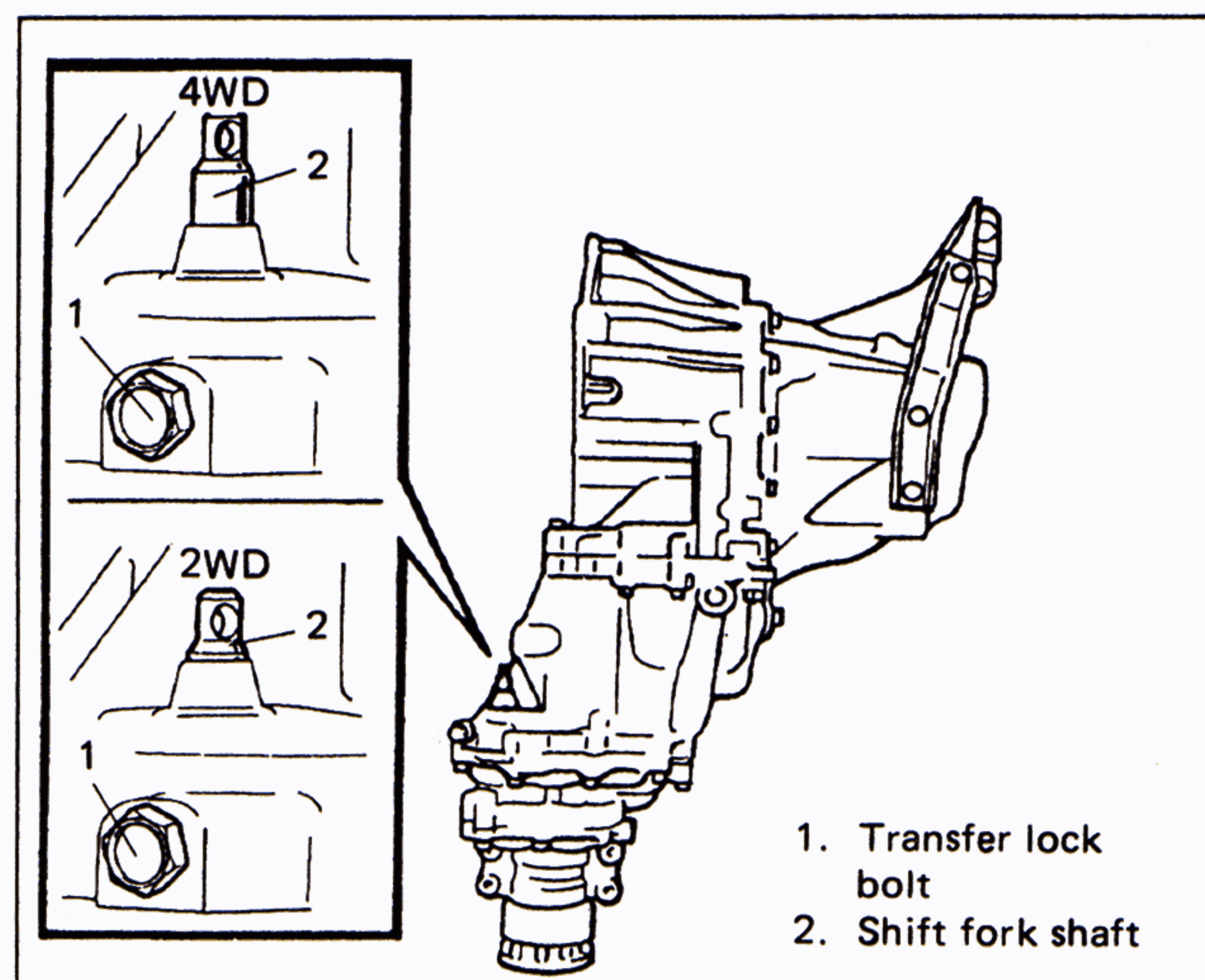


Fig. 7D-4

NOTE:

- If shift fork shaft is hard to move, try to move it while turning it to the right and left little by little. Do the same when setting back to 4WD after servicing car.
- Upon completion of servicing, always set shift fork shaft back to 4WD.

For removal of transmission unit, disassembly of internal structure of transmission and removal of transfer assembly, refer to Section 7A.

TRANSFER ASSEMBLY

DISASSEMBLY

1. Remove output case bolts.

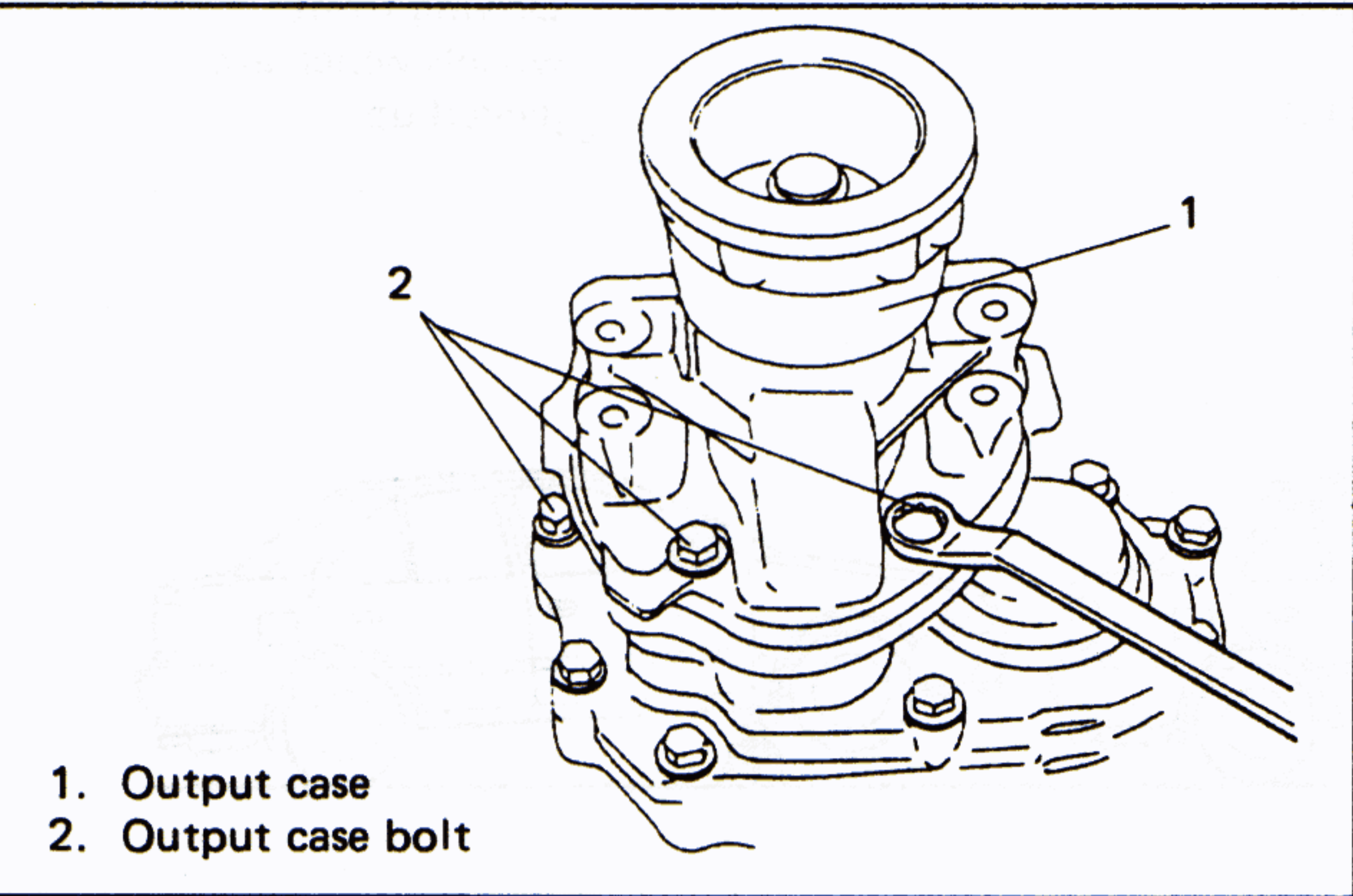


Fig. 7D-5

2. Remove transfer lock bolt from rear case.

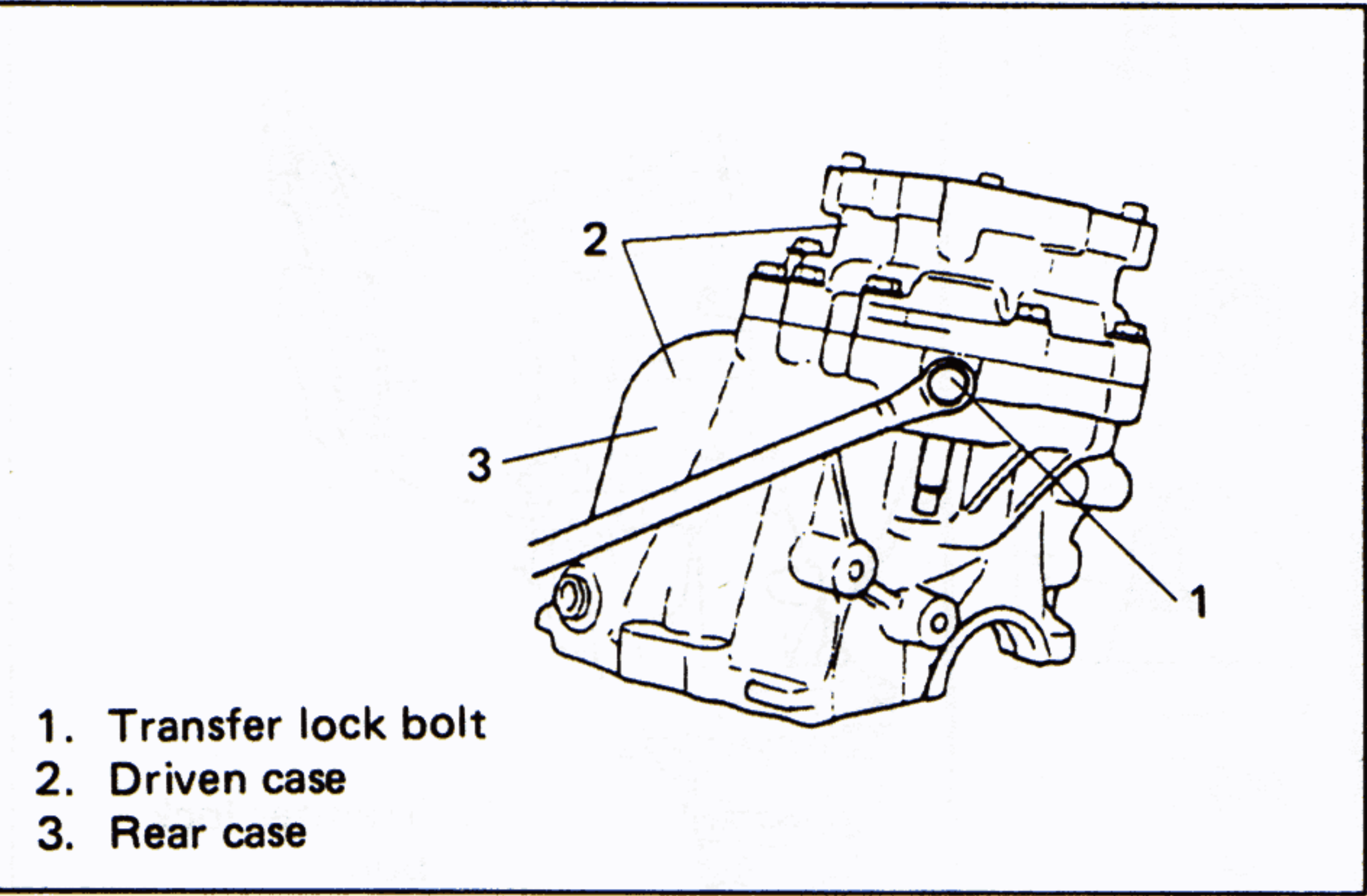


Fig. 7D-6

3. Remove shift frok shaft and then sleeve.

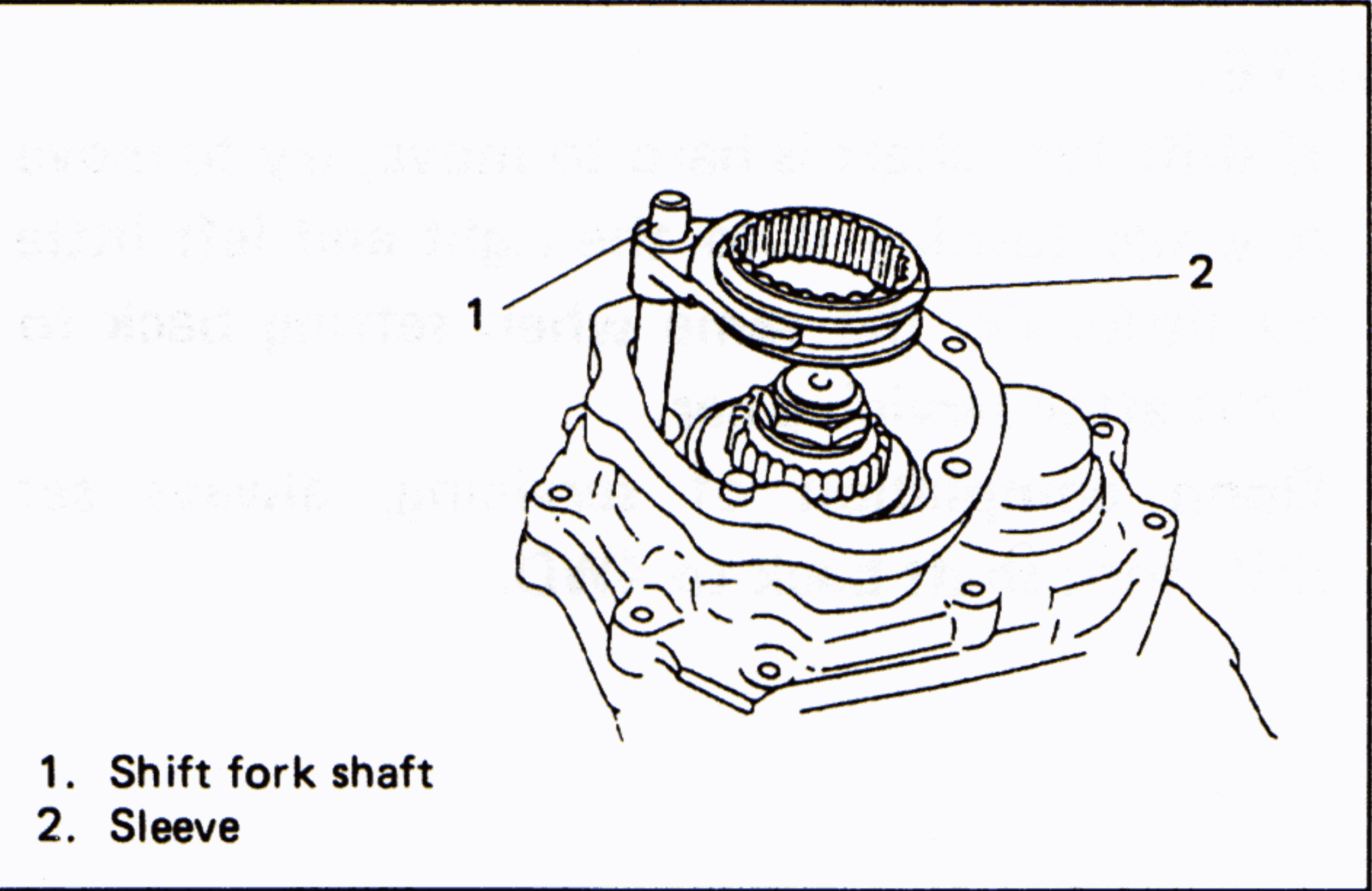


Fig. 7D-7

4. Remove caulking of driven gear nut, loosen nut as shown below and remove clutch dog.

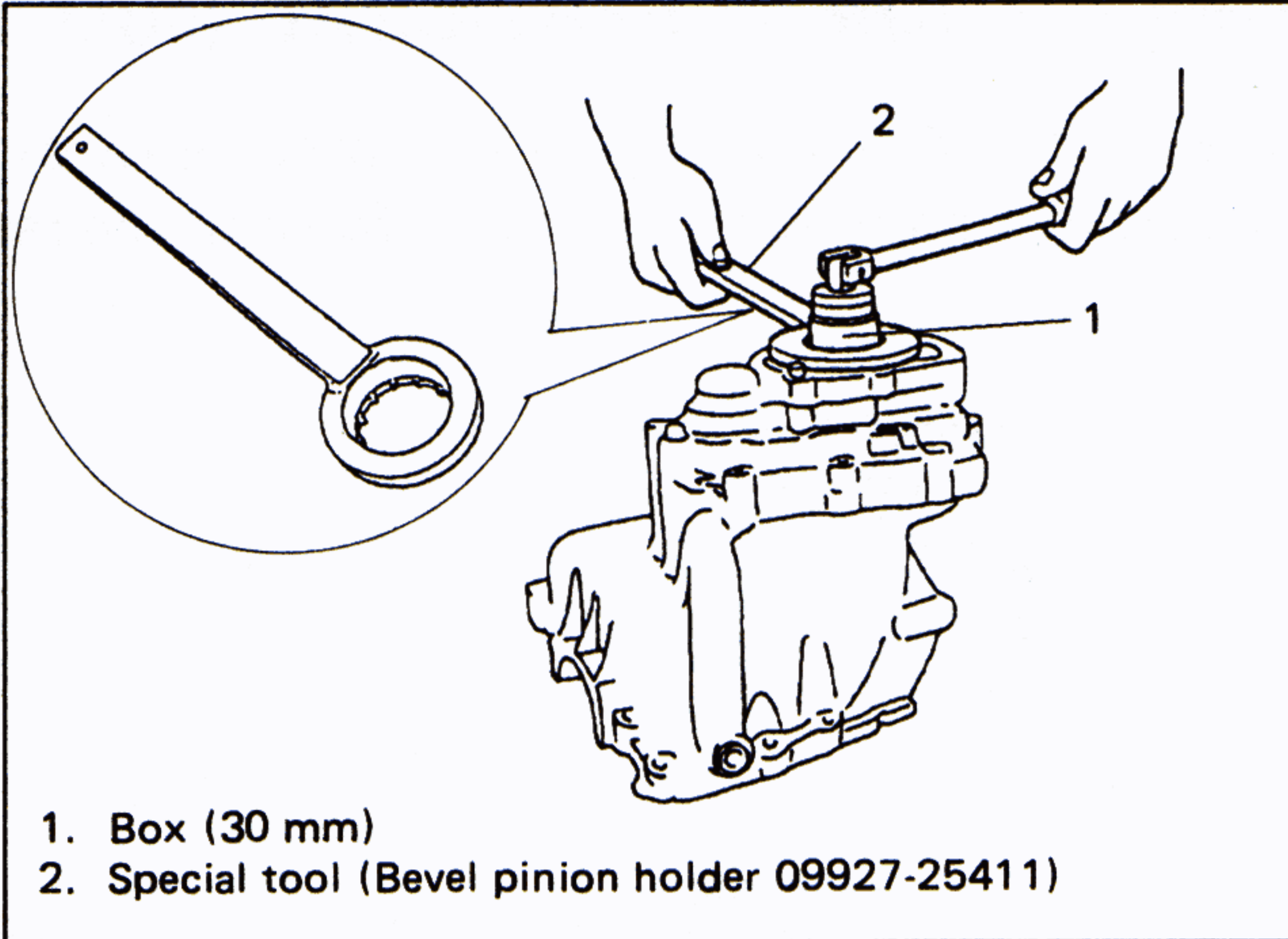


Fig. 7D-8

5. Remove driven gear plate and then circlip of ball bearing.

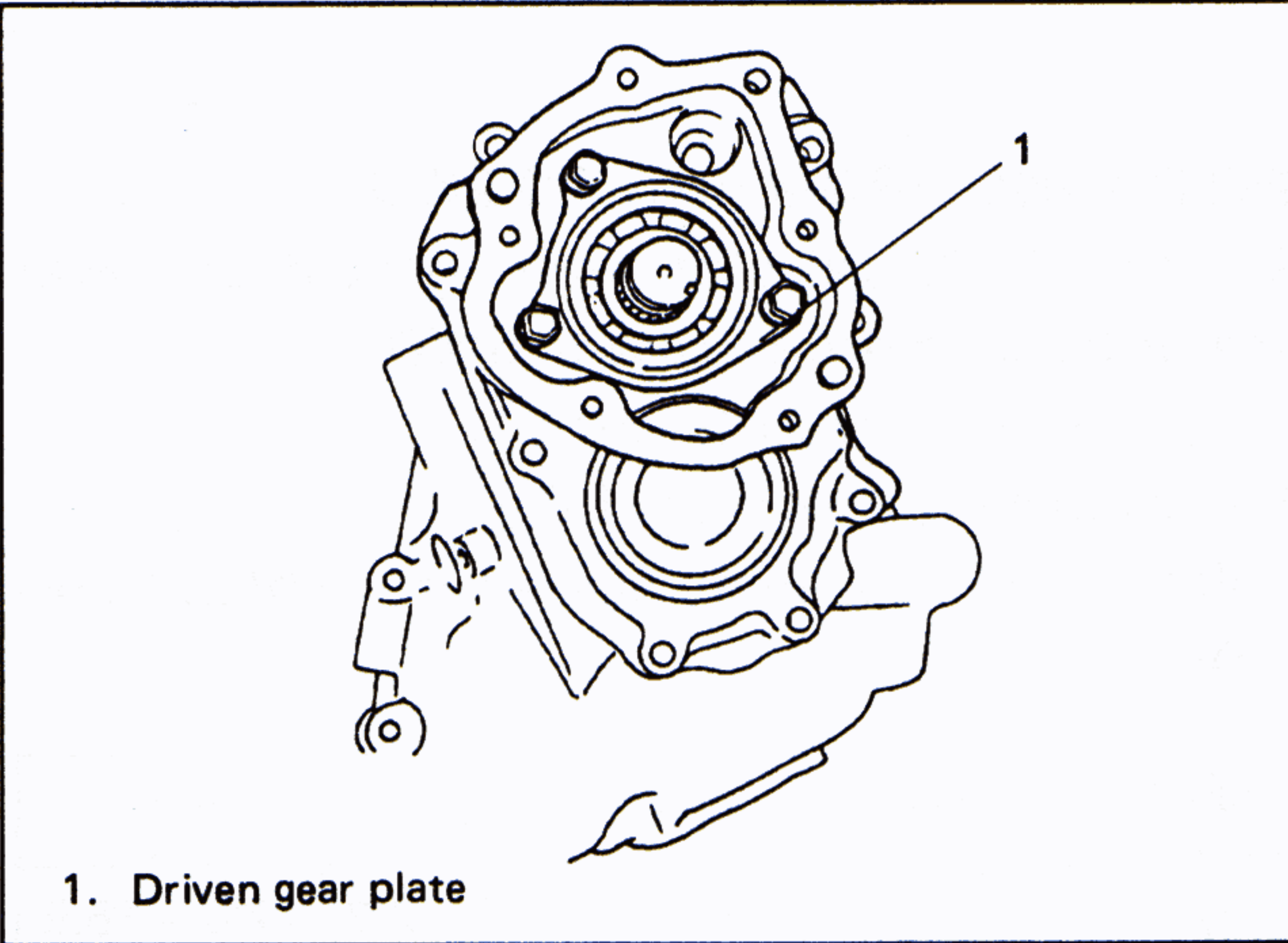


Fig. 7D-9

6. Loosen driven case bolt and remove driven case.

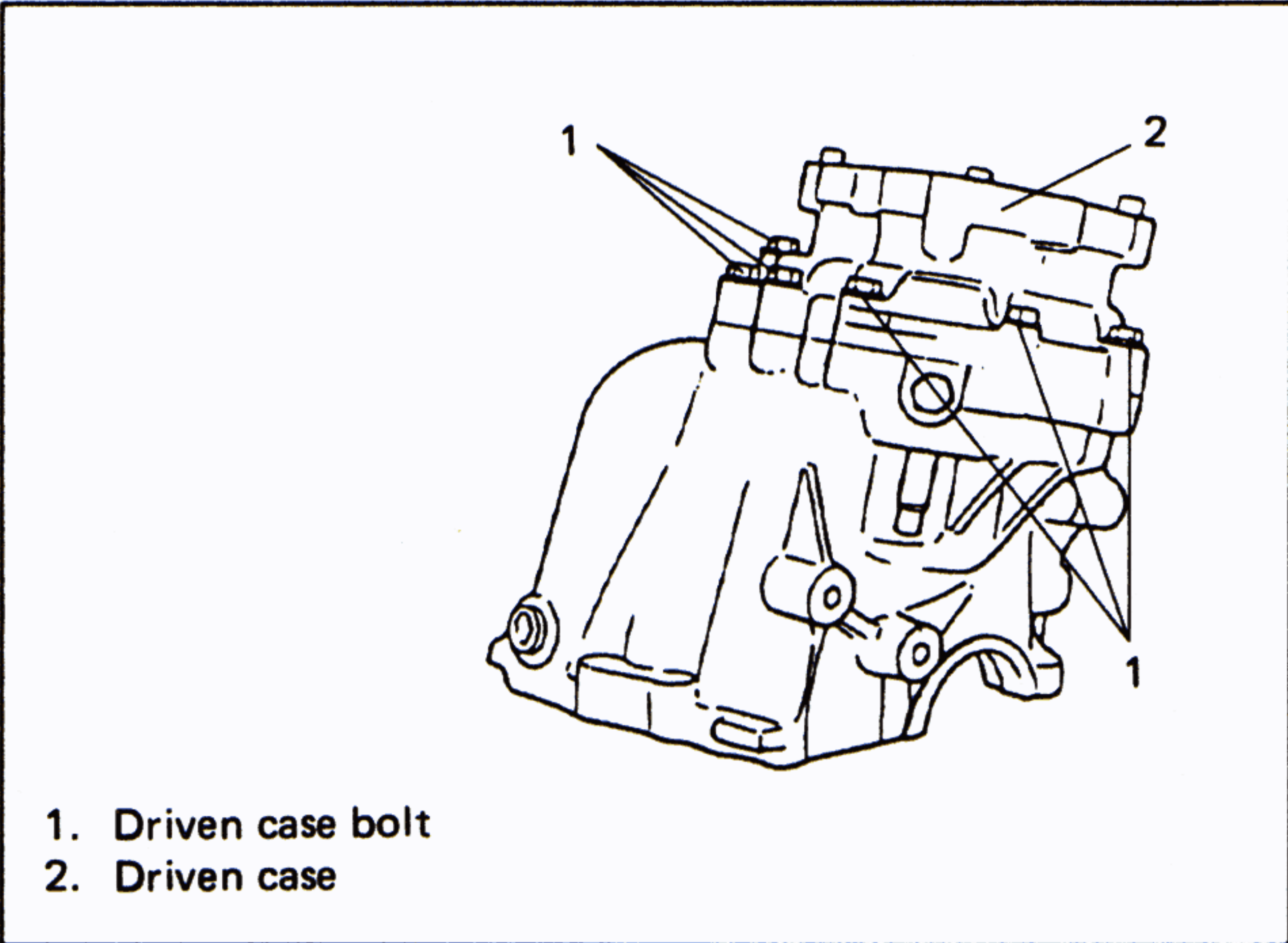


Fig. 7D-10

7. Drive driven gear out of rear case.

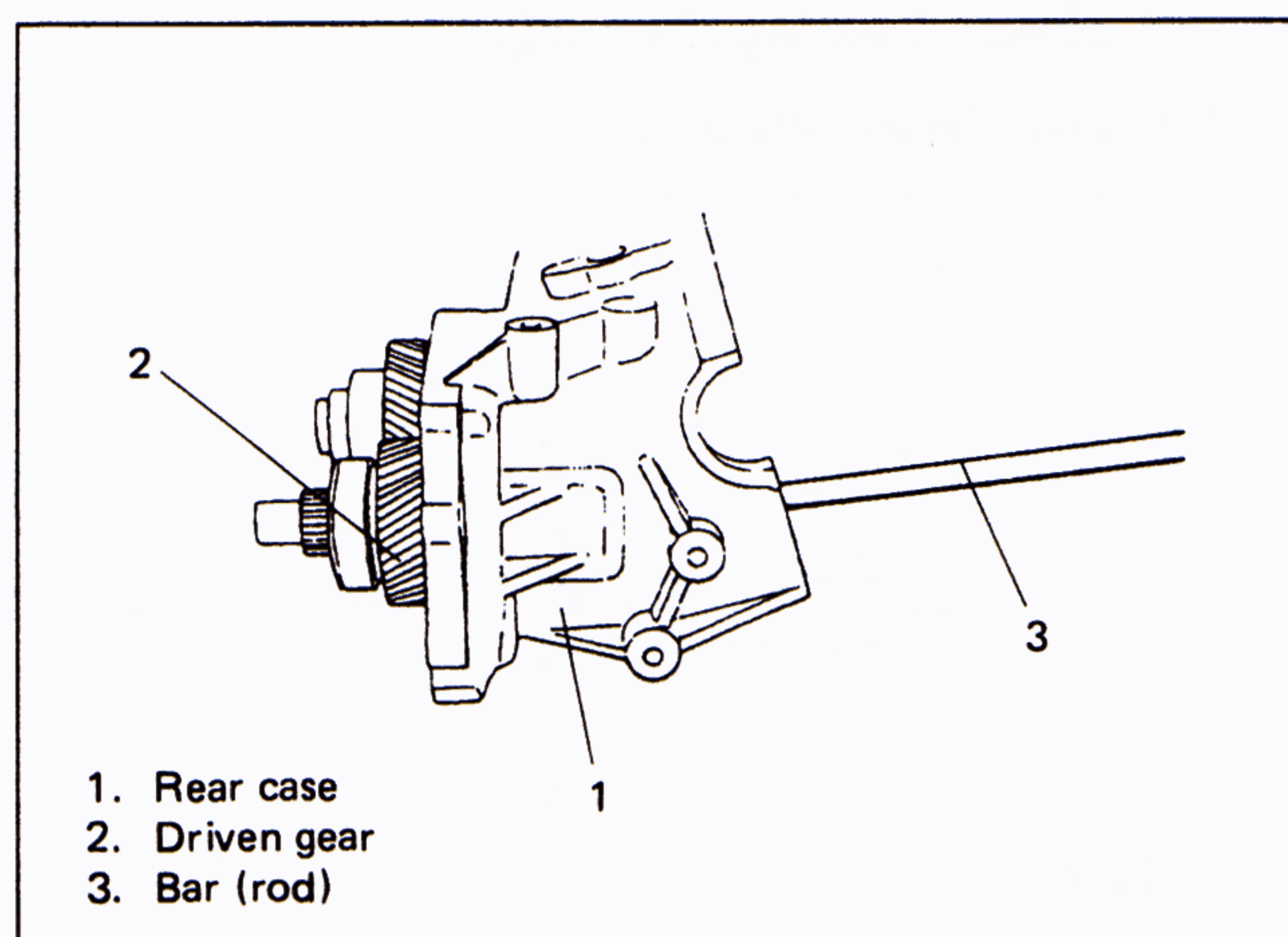


Fig. 7D-11

8. Using special tool, hold drive gear securely and loosen output pinion nut.

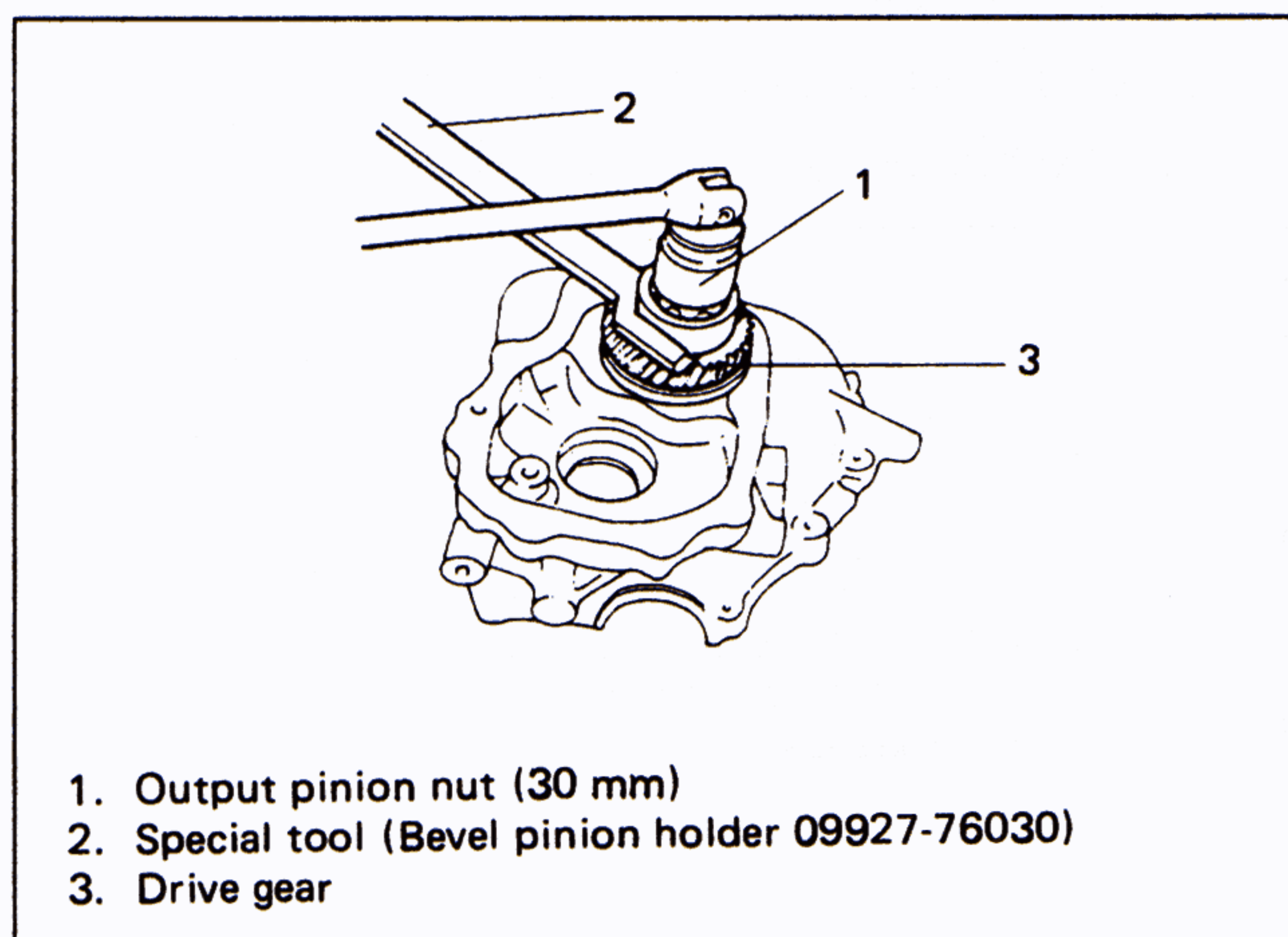


Fig. 7D-12

9. Drive out output pinion with plastic hammer.

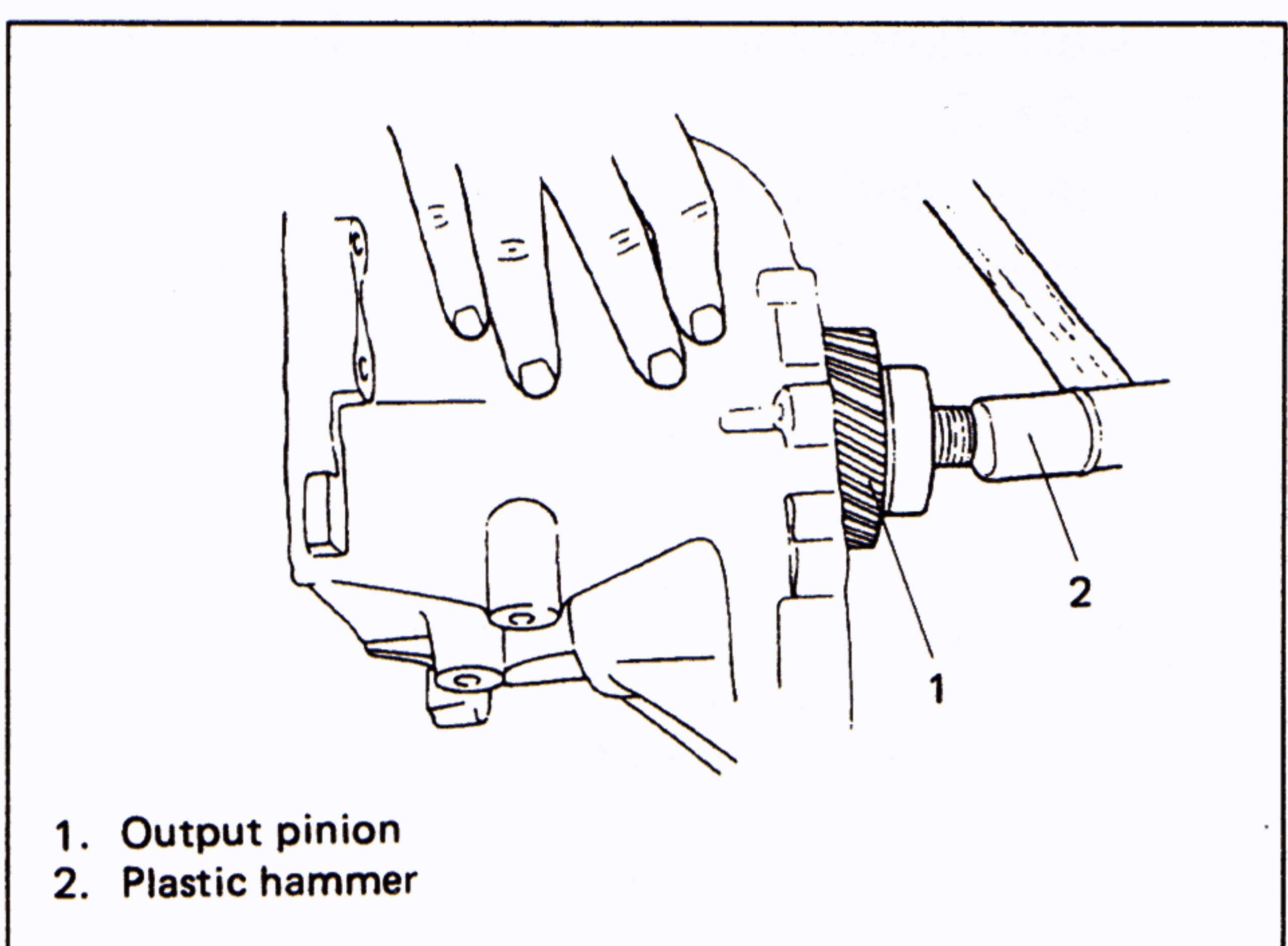


Fig. 7D-13

10. Drive pinion bearing outer race out of rear case.

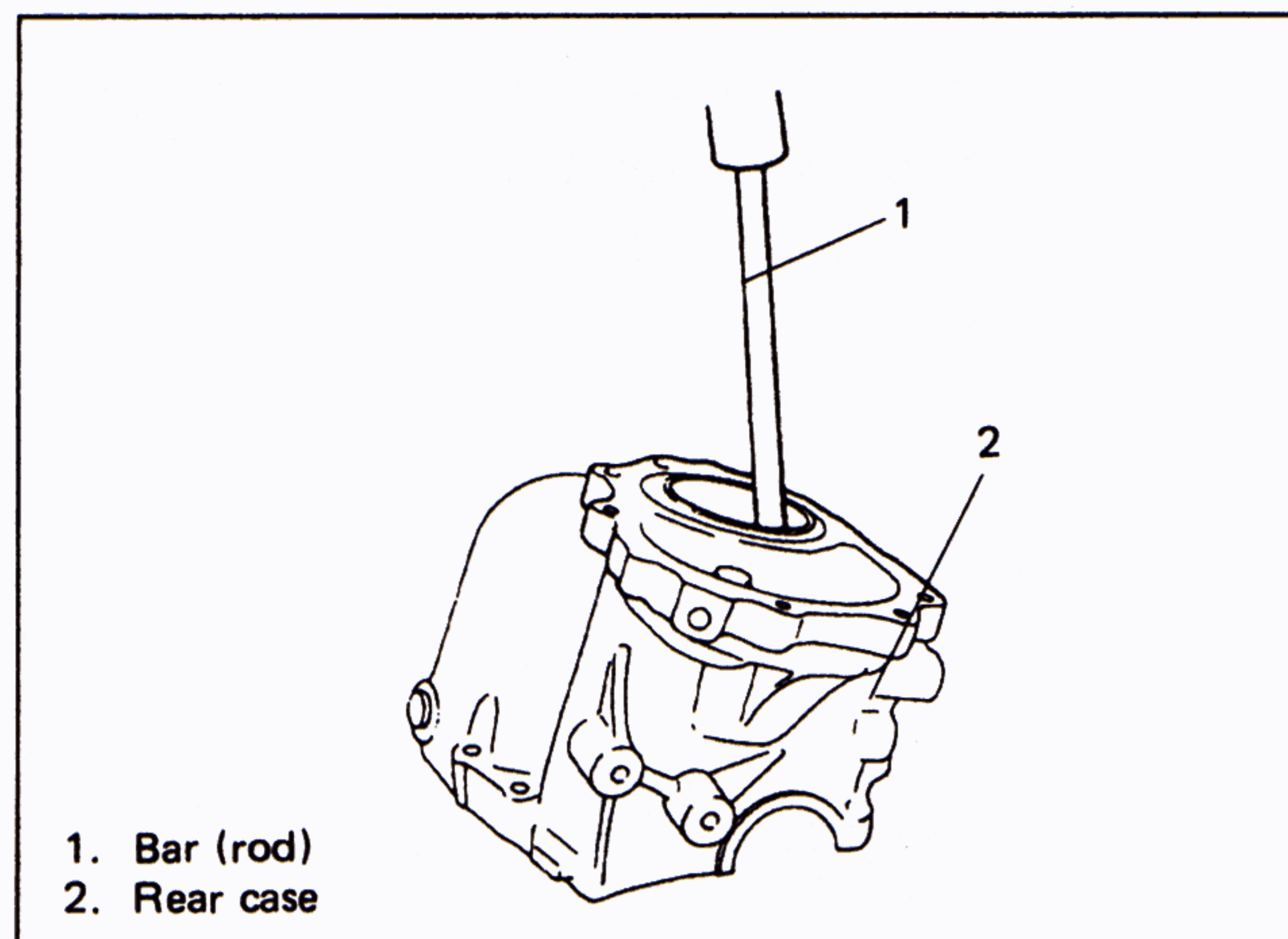


Fig. 7D-14

11. Remove caulking of output shaft nut and loosen it with flange fixed as shown below.

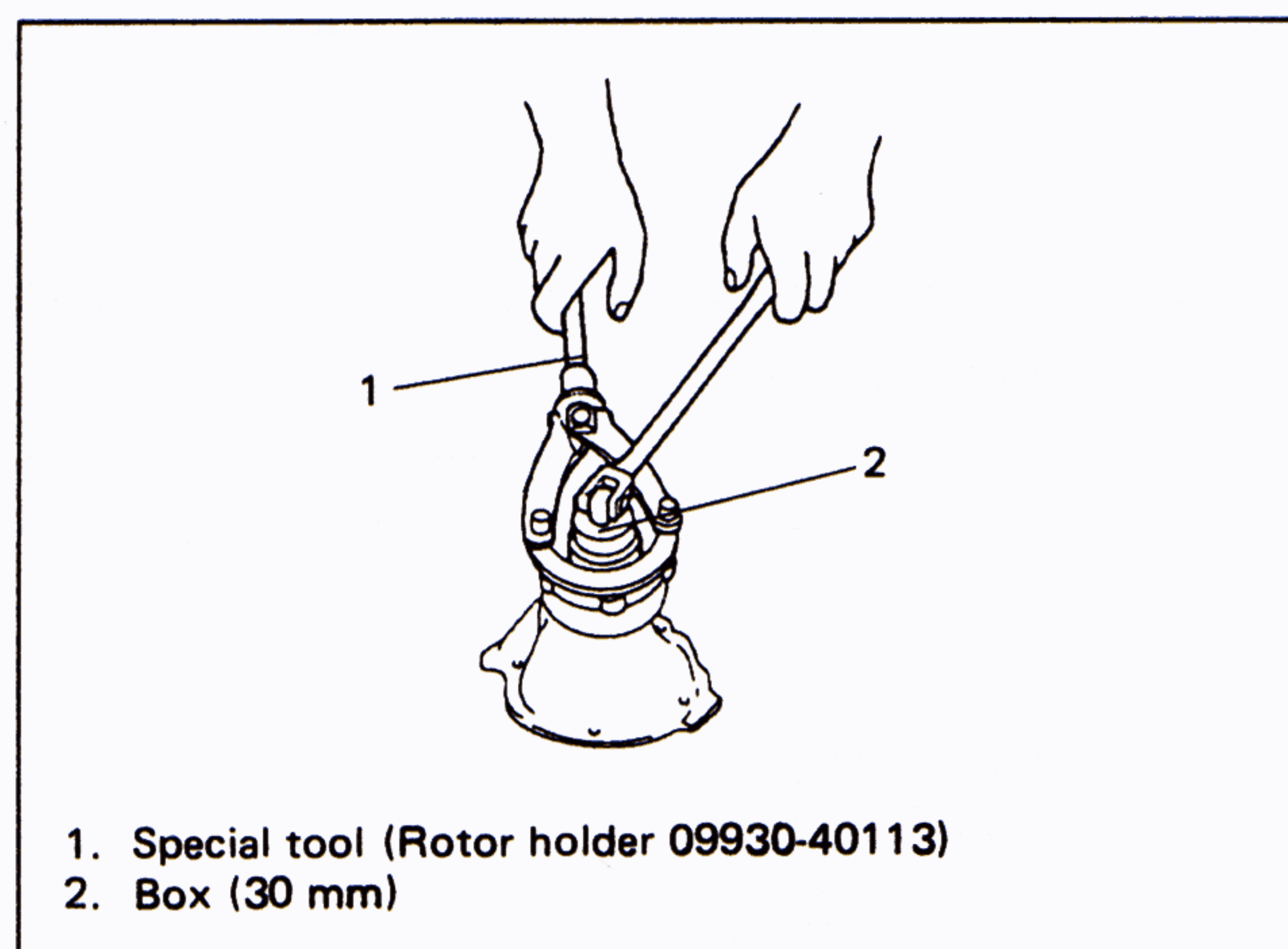


Fig. 7D-15

12. Remove output shaft bearing circlip.

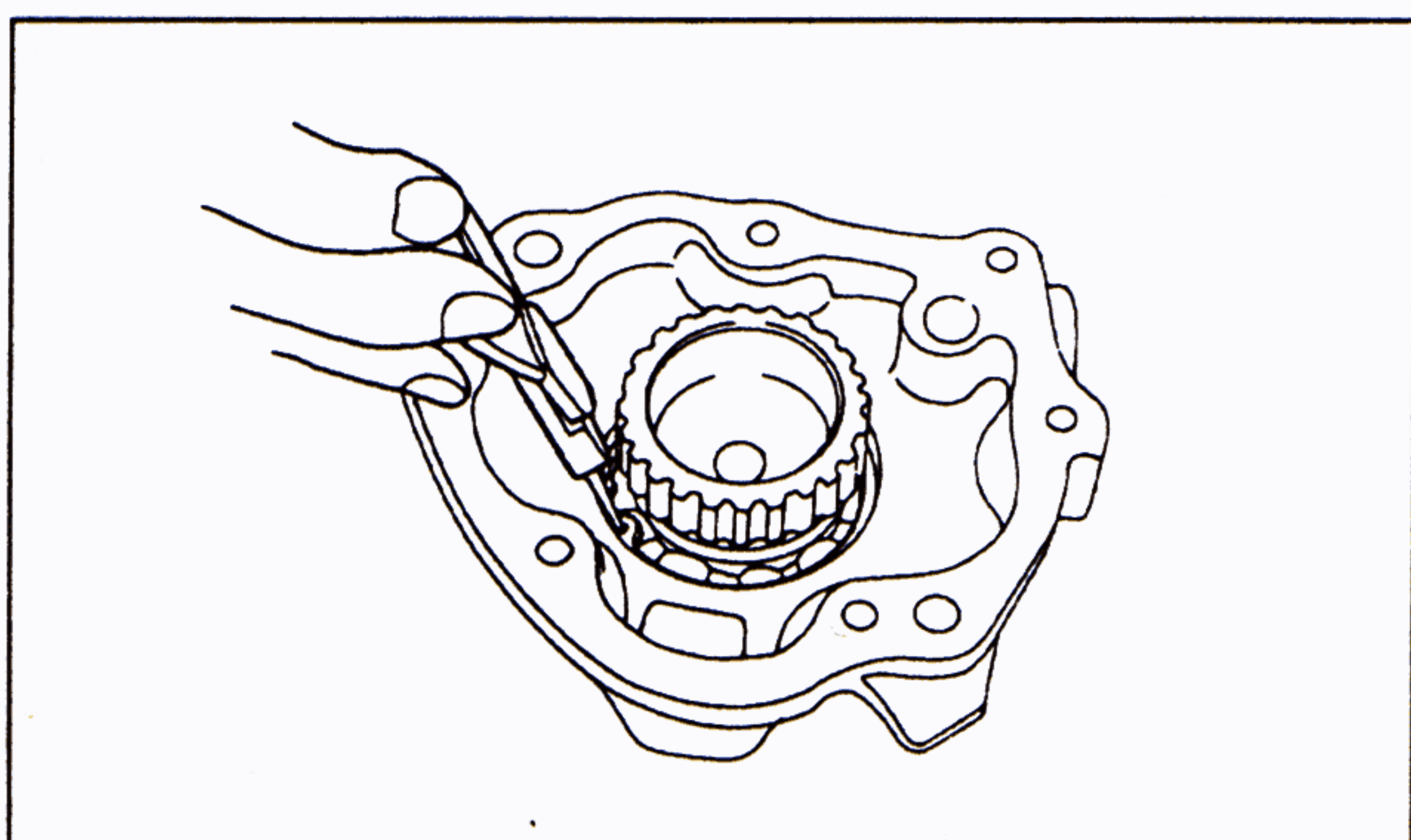


Fig. 7D-16

13. Using plastic hammer, drive out output shaft bearing.

ASSEMBLY

Reverse disassembly procedure, noting following points.

- Apply SUZUKI Bond No. 1215 to mating surface of case before assembly.
- Make sure to put clutch dog with right side up as shown below.

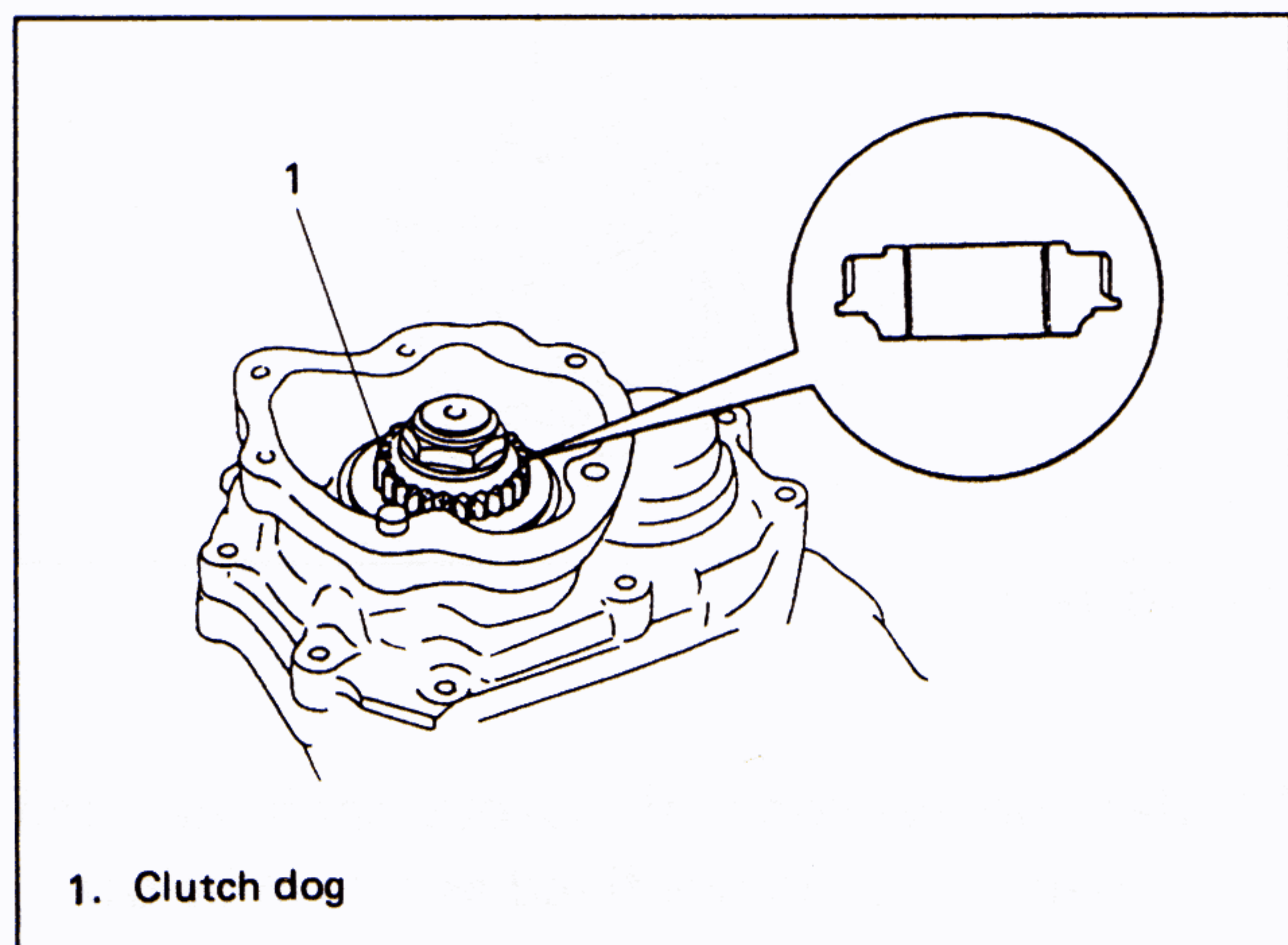


Fig. 7D-17

- Make sure to put clutch sleeve with right side up as shown below.

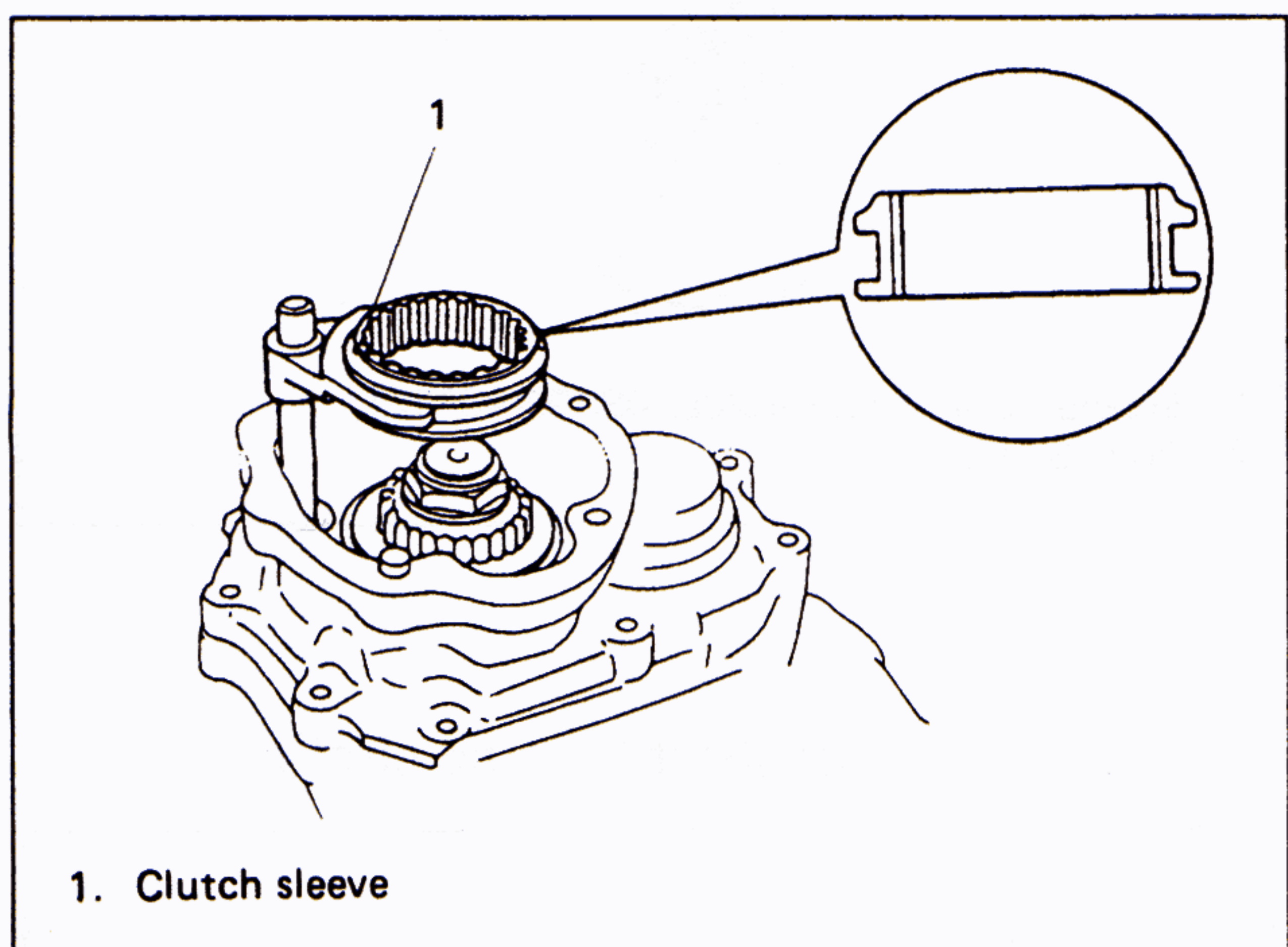


Fig. 7D-18

BEVEL PINION SHIM ADJUSTMENT

(Bevel pinion bearing shim adjustment)

1. Measure drive pinion spacer length A.

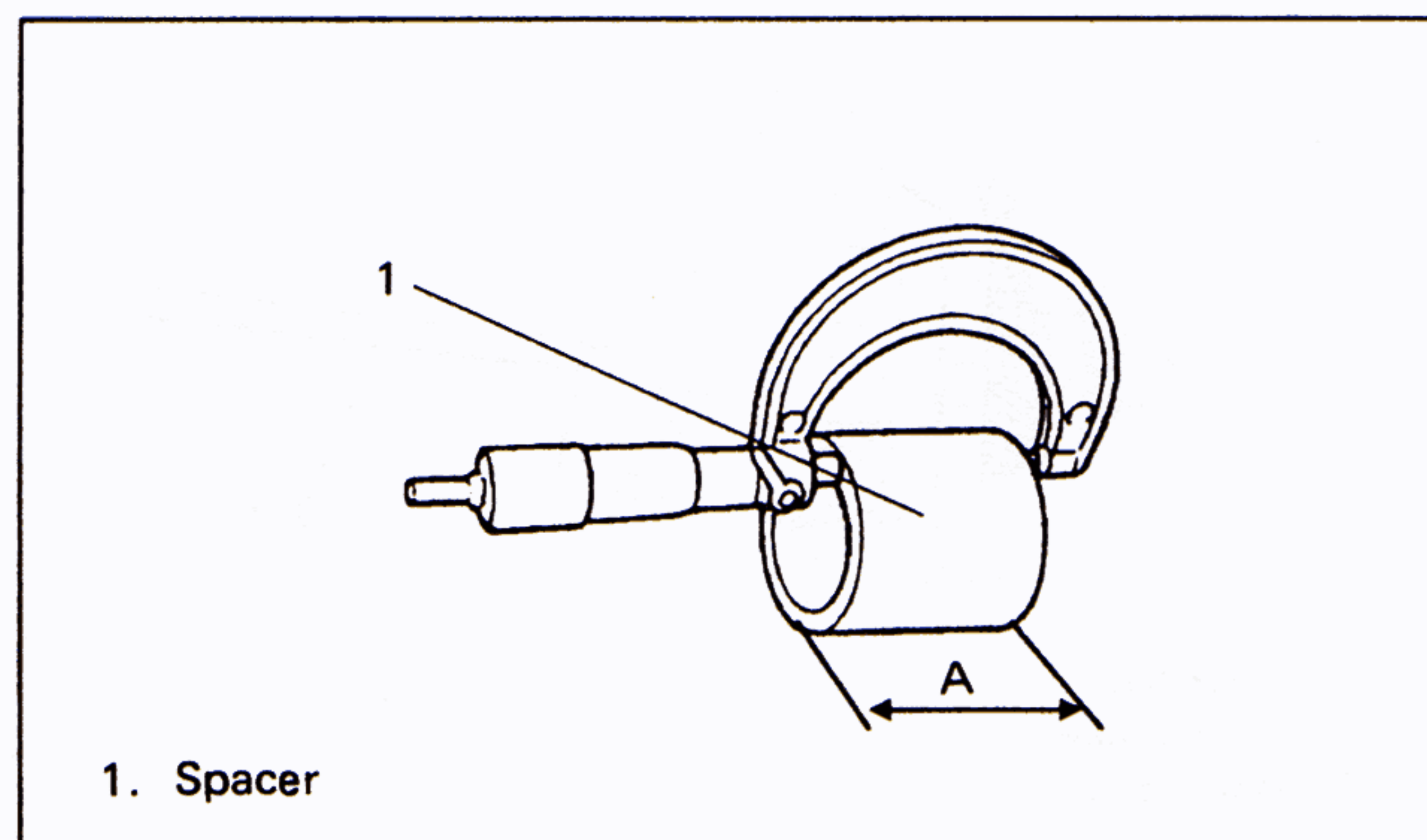


Fig. 7D-19

2. Measure level difference B between outer race and inner race of bevel pinion bearing (at both front and rear).

Level difference at front bearing $B +$
Level difference at rear bearing $B' = C$

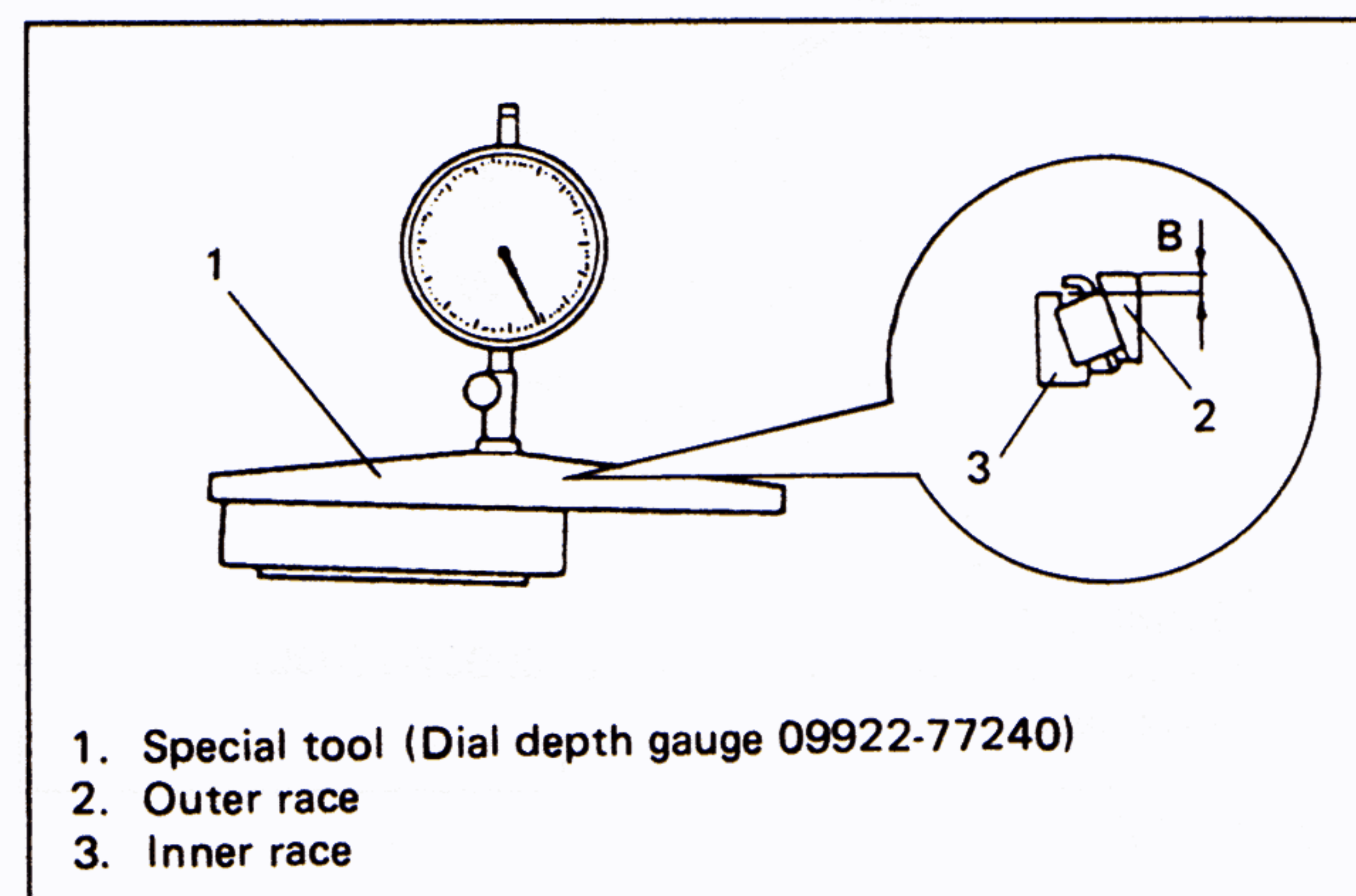


Fig. 7D-20

3. Measure dimension D of differential carrier.

$$C + D = E$$

$$\text{Measured level difference} = E - A$$

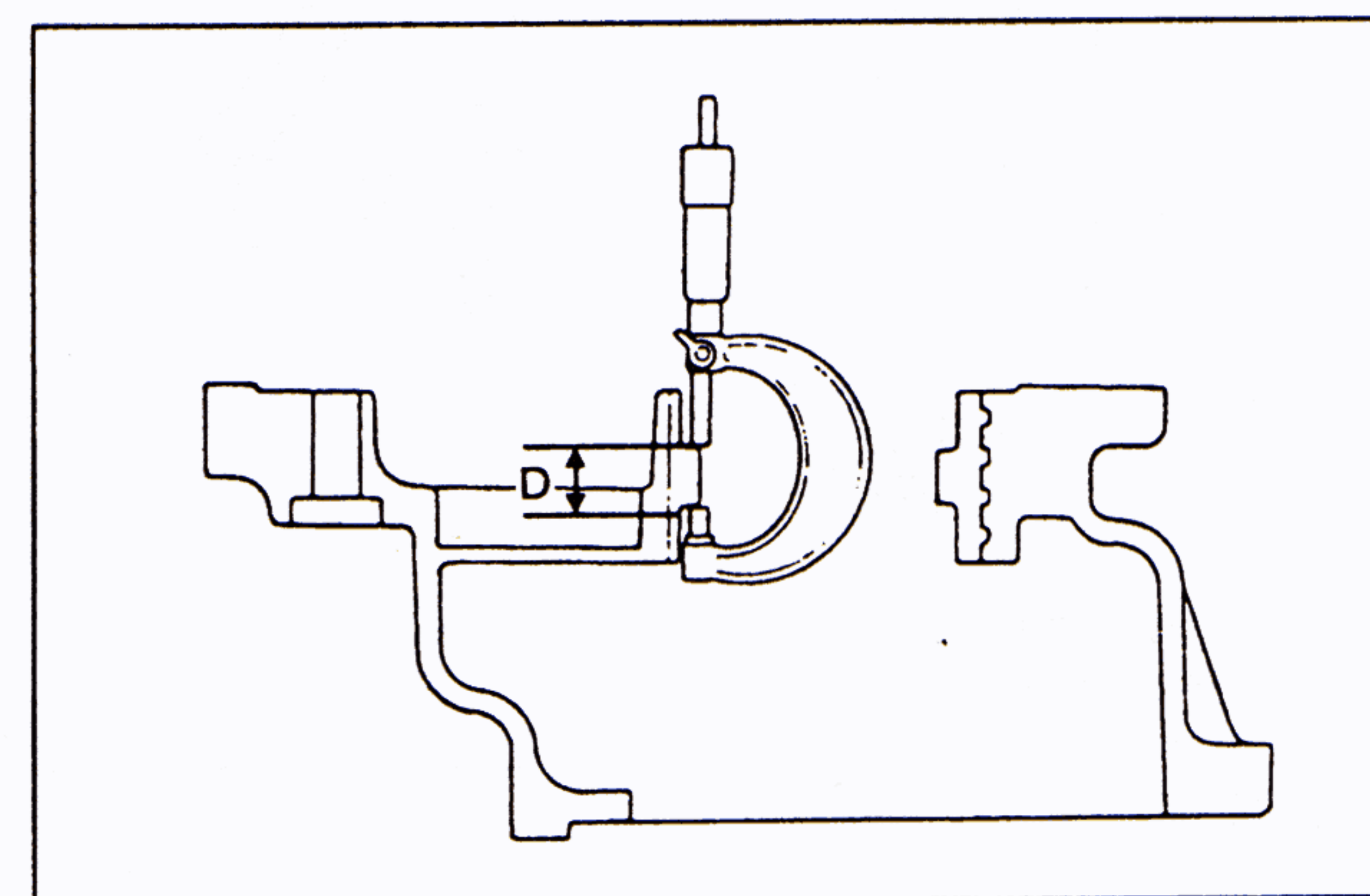


Fig. 7D-21

4. Using following table, select necessary shim(s).

Shim to use Measured level difference	0.60	0.63	0.66	0.69	0.72	0.75	0.78	0.81	0.84	0.87	0.30
0.976 – 1.005	●										●
1.006 – 1.035		●									●
1.036 – 1.065			●								●
1.066 – 1.095				●							●
1.096 – 1.125					●						●
1.126 – 1.155						●					●
1.156 – 1.185							●				●
1.186 – 1.215								●			●
1.216 – 1.245									●		●
1.246 – 1.275										●	●
1.276 – 1.305	●●										
1.306 – 1.335	●	●									
1.336 – 1.365	●		●								
1.366 – 1.395	●			●							
1.396 – 1.425	●				●						
1.426 – 1.455	●					●					
1.456 – 1.485	●						●				
1.486 – 1.515	●							●			
1.516 – 1.545	●								●		
1.546 – 1.575	●									●	
1.576 – 1.605		●								●	
1.606 – 1.635			●							●	
1.636 – 1.665				●						●	

5. Press-fit bevel pinion bearing and outer race into rear case.

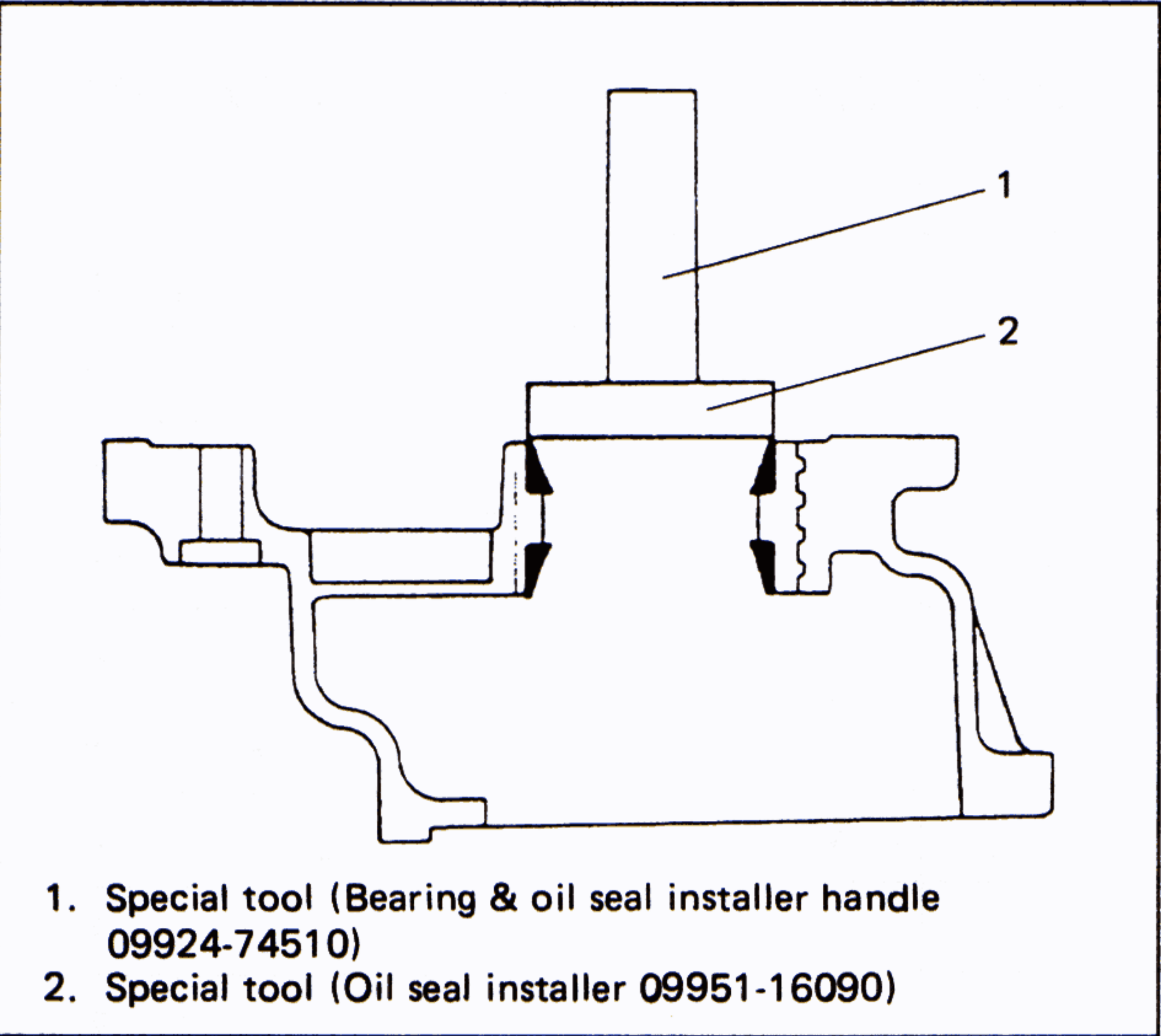


Fig. 7D-22

6. Place bearing, spacer and shim(s) on bevel pinion dummy of special tool (Bevel pinion dummy set) and tighten bevel pinion nut to specified torque.

Tightening torque for bevel pinion	N·m	kg-m	lb-ft
	90-150	9.0-15.0	65.5-108.0

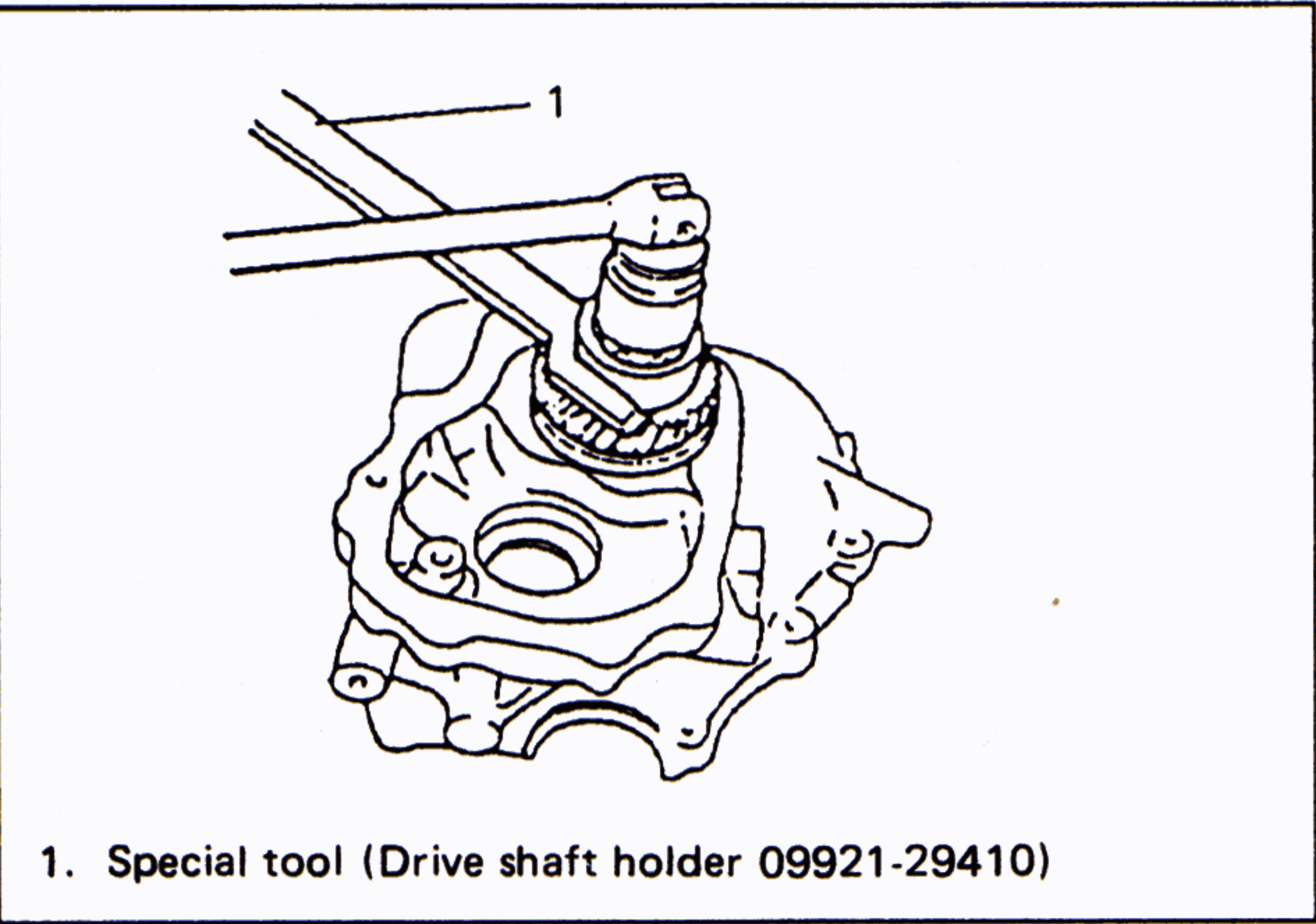


Fig. 7D-23

7. Using torque wrench, measure preload.

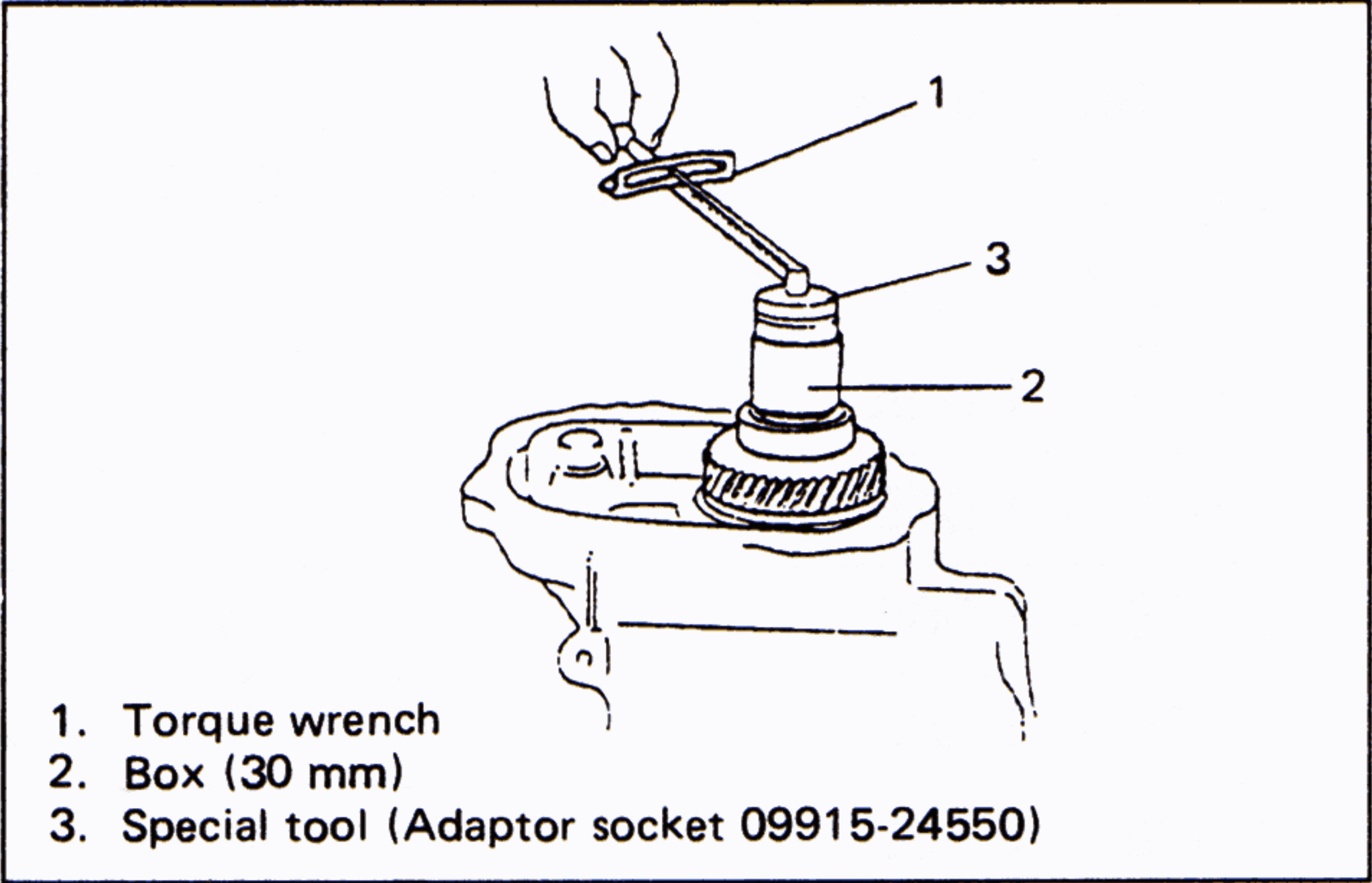


Fig. 7D-24

Standard value of preload	5 - 13 kg-cm 0.37 - 1.08 lb-ft
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NOTE:

- Apply thin coat of gear oil to bearing before measurement.
- Also before measuring preload, turn taper bearing a few times to ensure its good fitting.

BEVEL PINION SHIM ADJUSTMENT
(Mounting distance adjustment)

1. Place bevel pinion adjuster on surface plate as shown and set dial gauge to "0".

NOTE:

As bearing size is different between right and left, use shim supplied in bevel pinion dummy set under smaller size bearing as shown below.

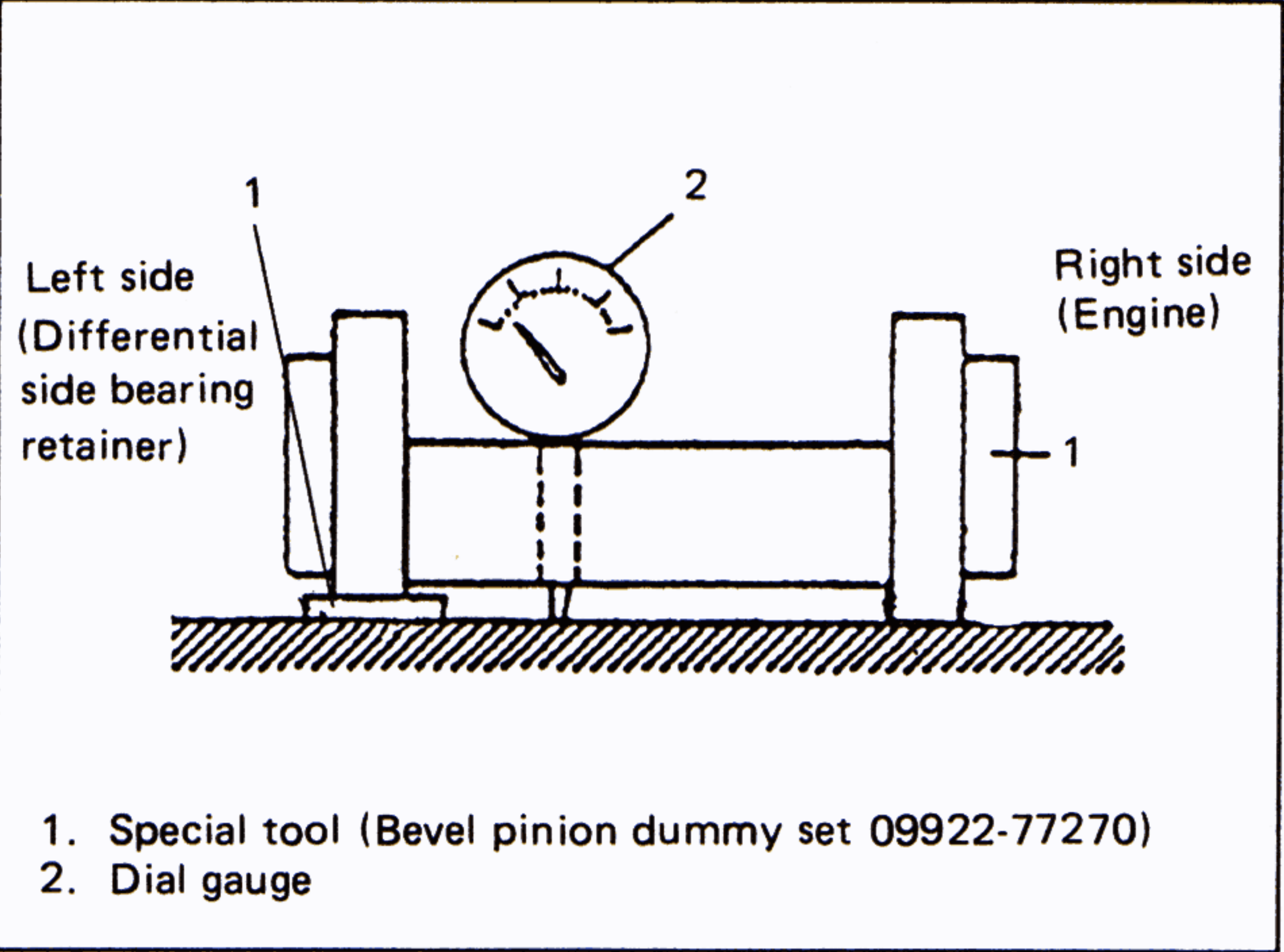


Fig. 7D-25

2. Set bevel pinion dummy, bevel pinion and bevel pinion adjuster on differential carrier. Tighten dummy pinion nut to specified torque which is 90 – 150 N·m (9.0 – 15.0 kg-m, 65.5 – 108.0 lb-ft).

NOTE:

Before setting bevel pinion dummy, adjust bevel pinion bearing shim as described previously.

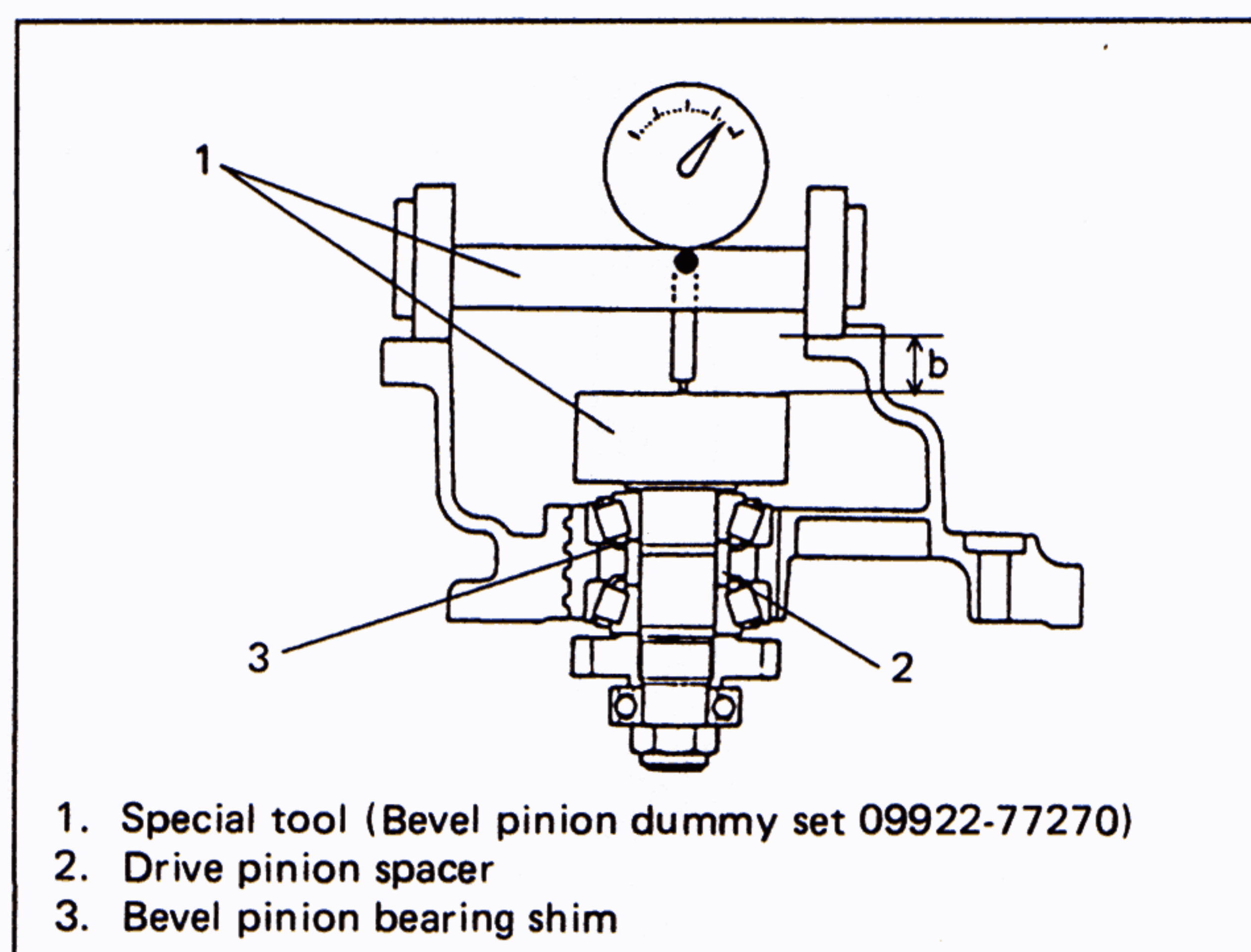


Fig. 7D-26

3. Measure dimension b in figure by reading dial gauge.
4. Using following table, select necessary shim(s).

[illegible]

5. Press-fit bearing into bevel pinion bearing.

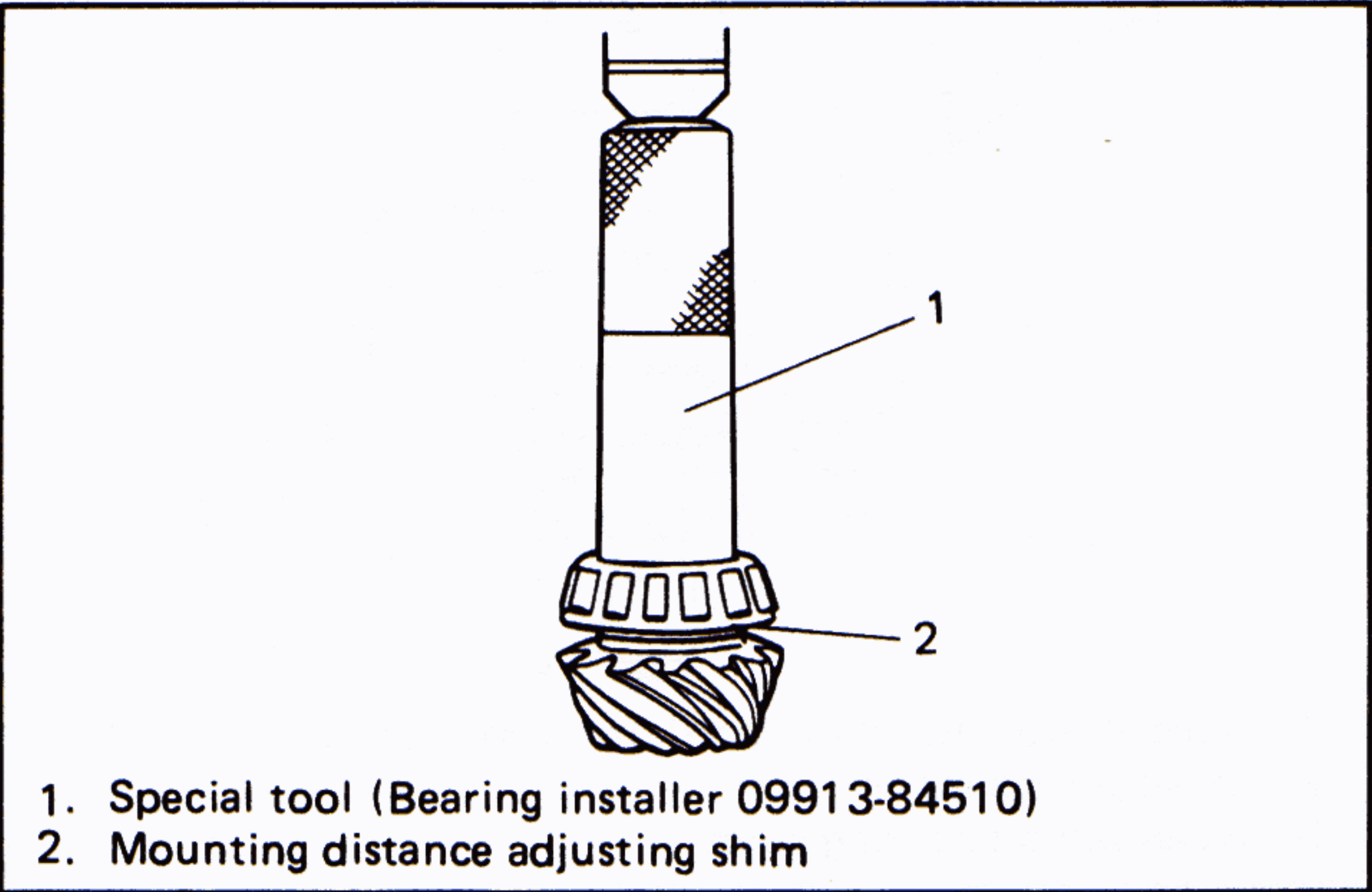


Fig. 7D-27

**DRIVE BEVEL GEAR BACKLASH
ADJUSTMENT AND SIDE BEARING
PRELOAD ADJUSTMENT**

1. Using special tool, install differential assembly into rear case.

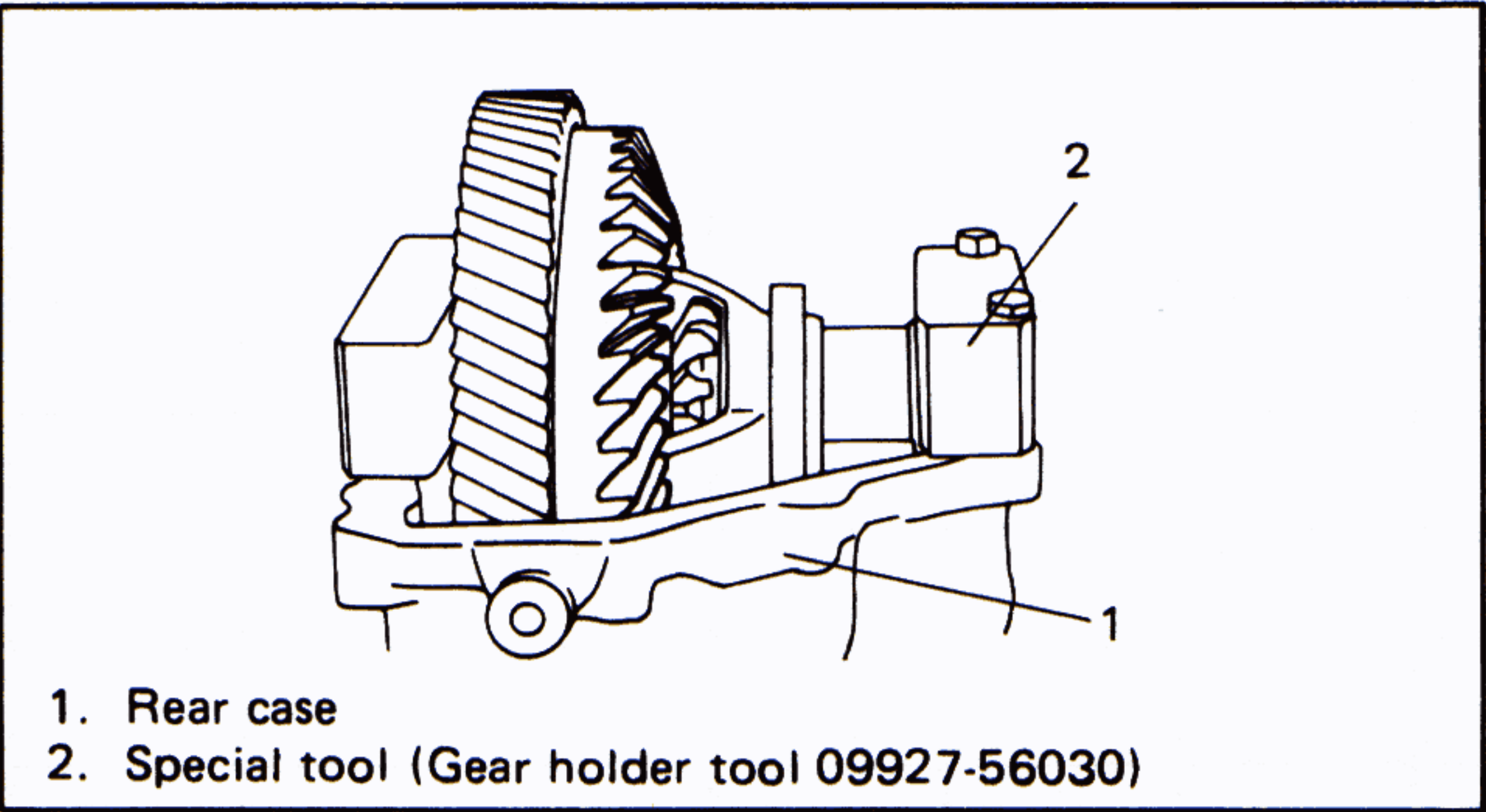


Fig. 7D-28

2. Using depth gauge, measure depth A down to bearing outer race and obtain difference with dimension B of bearing retainer; A – B = C.

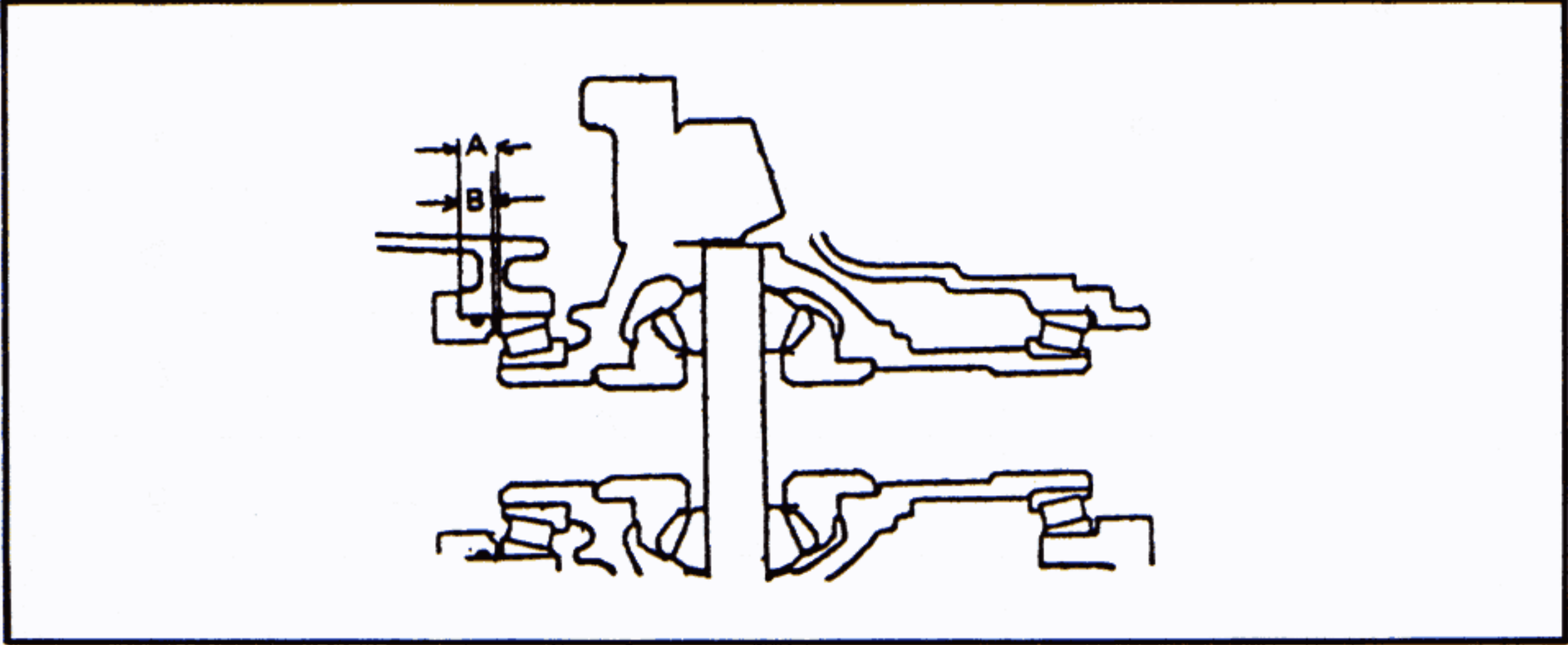
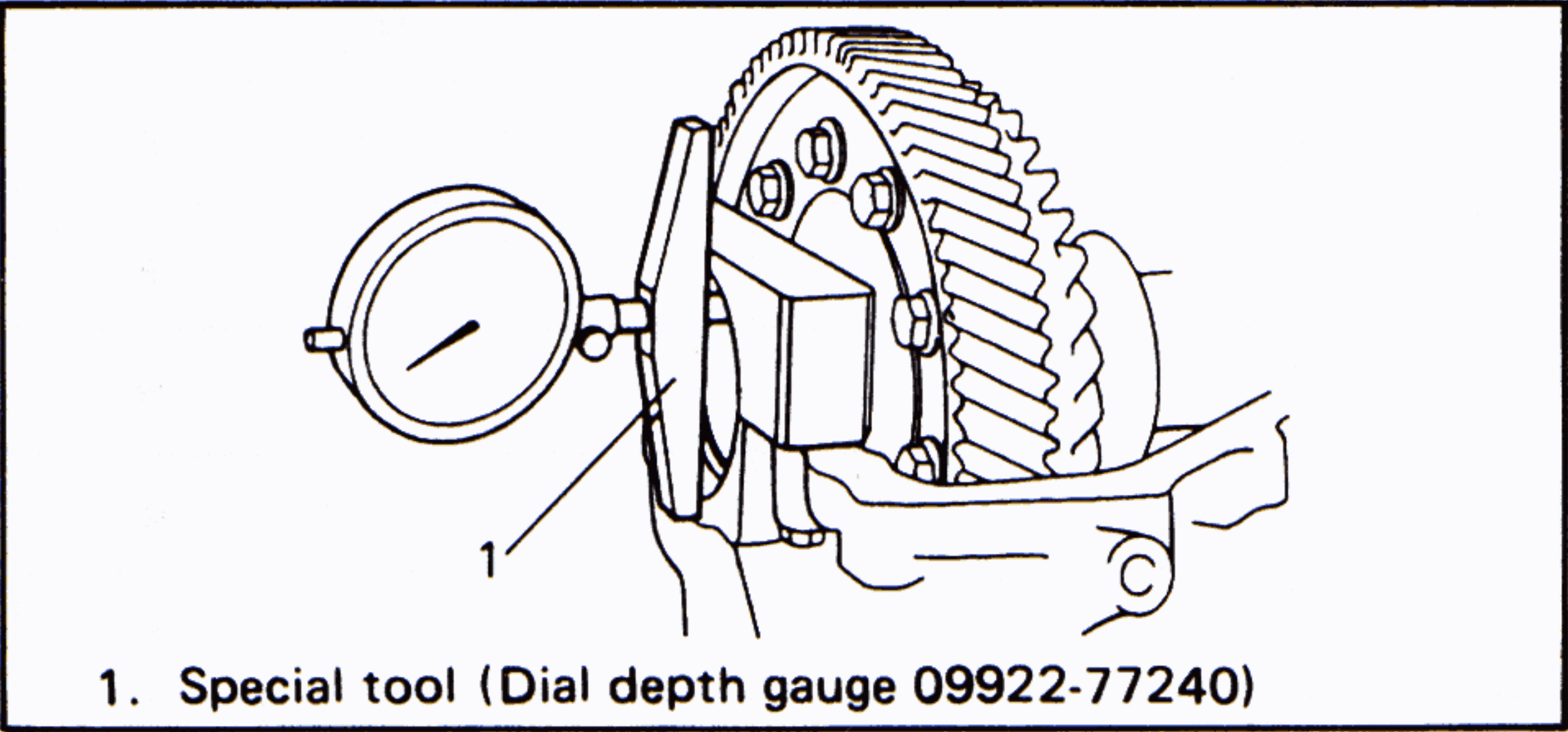


Fig. 7D-29

3. Calculate shim thickness to be inserted into differential side bearing.

Shim thickness = C + (0.1 to 0.5 mm)
(0.004 to 0.019 in.)

4. Select shim(s) to fit within calculated value.

5. Install bevel pinion to case.

Available shims	0.30, 0.87, 0.84, 0.81, 0.78, 0.75, 0.72, 0.69, 0.66, 0.63 and 0.60 mm 0.012, 0.034, 0.033, 0.032, 0.031, 0.029, 0.028, 0.027, 0.026, 0.025 and 0.024 in.
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6. Adjust the driving bevel gear backlash by adding or taking off shims in bearing gap of the left and right cases (stopper) so as to obtain the specified value for the backlash.

7. To measure drive bevel gear backlash, set dial gauge at right angle to bevel gear tooth, fix drive bevel pinion and rear dial gauge while moving bevel gear.

Drive gear backlash	0.10 – 0.18 mm (0.004 – 0.007 in.)
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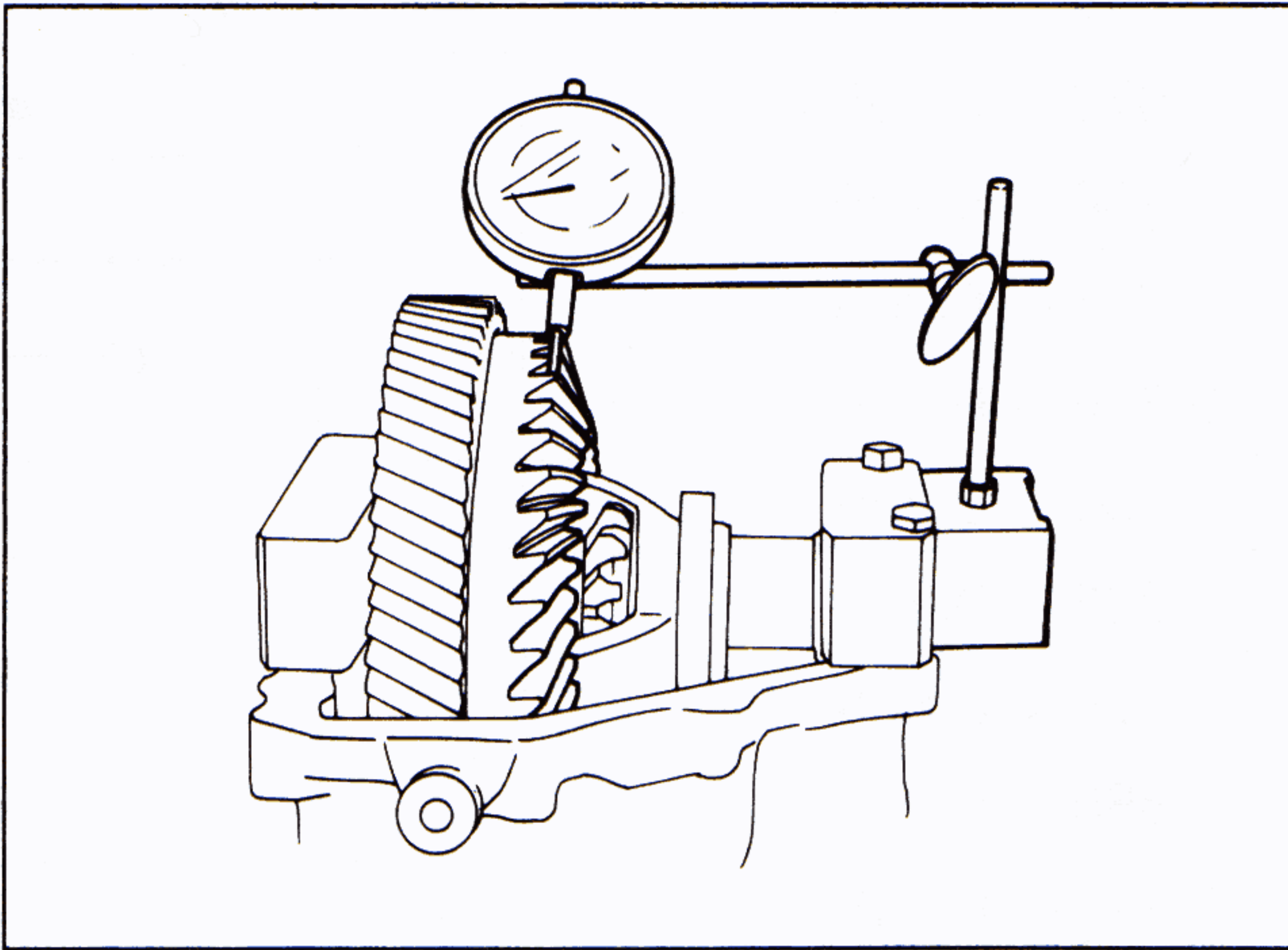


Fig. 7D-30

8. With bevel gear installed, measure starting torque by using differential preload adjusting tool. If bevel pinion starting torque and side bearing starting torque with bevel gear installed (bevel pinion bearing + side bearing preload) is within standard value, side bearing preload is satisfactory.

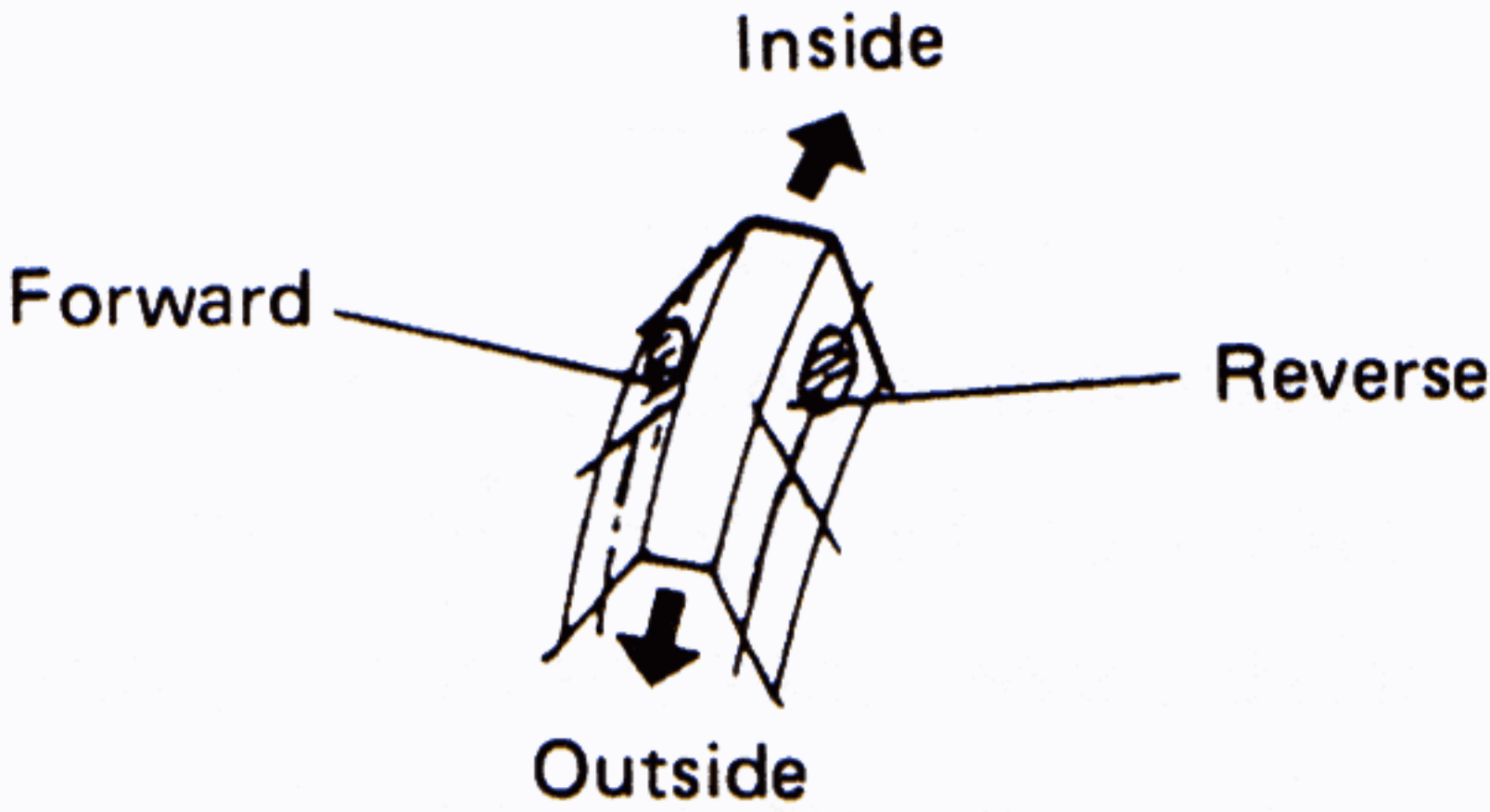
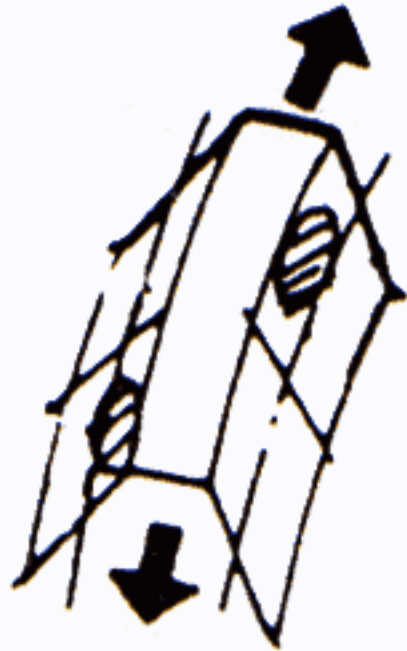
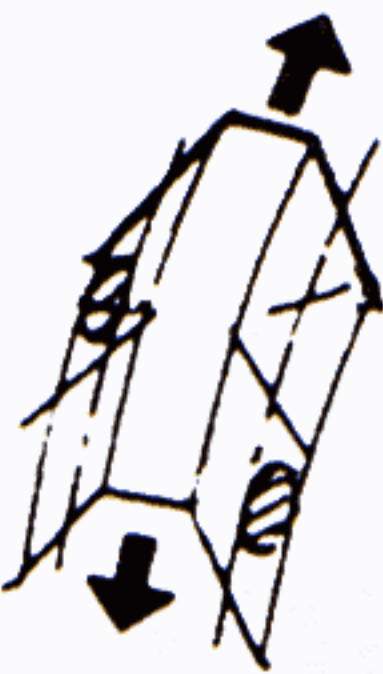
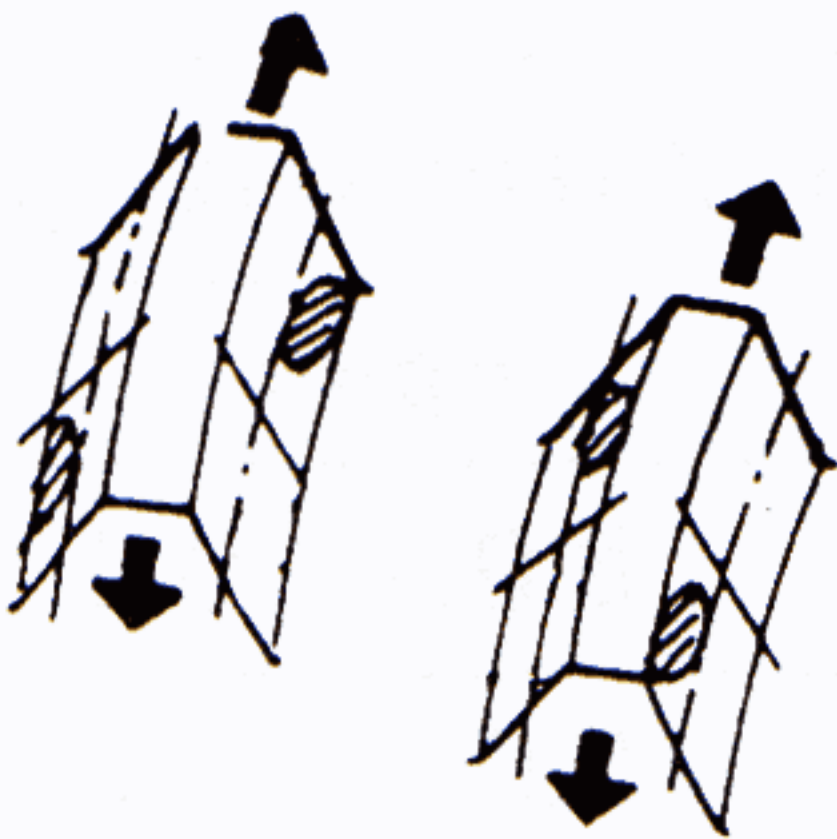
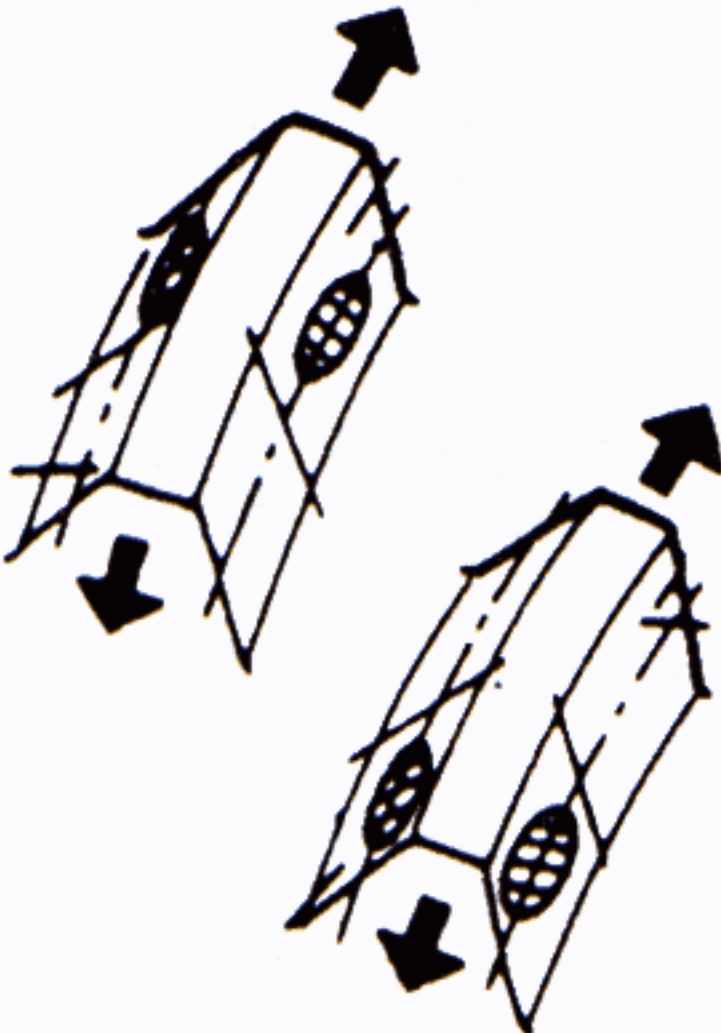
Side bearing preload standard value	Measured bevel pinion preload + 3 – 5 kg-cm (0.217 – 0.361 lb-ft)
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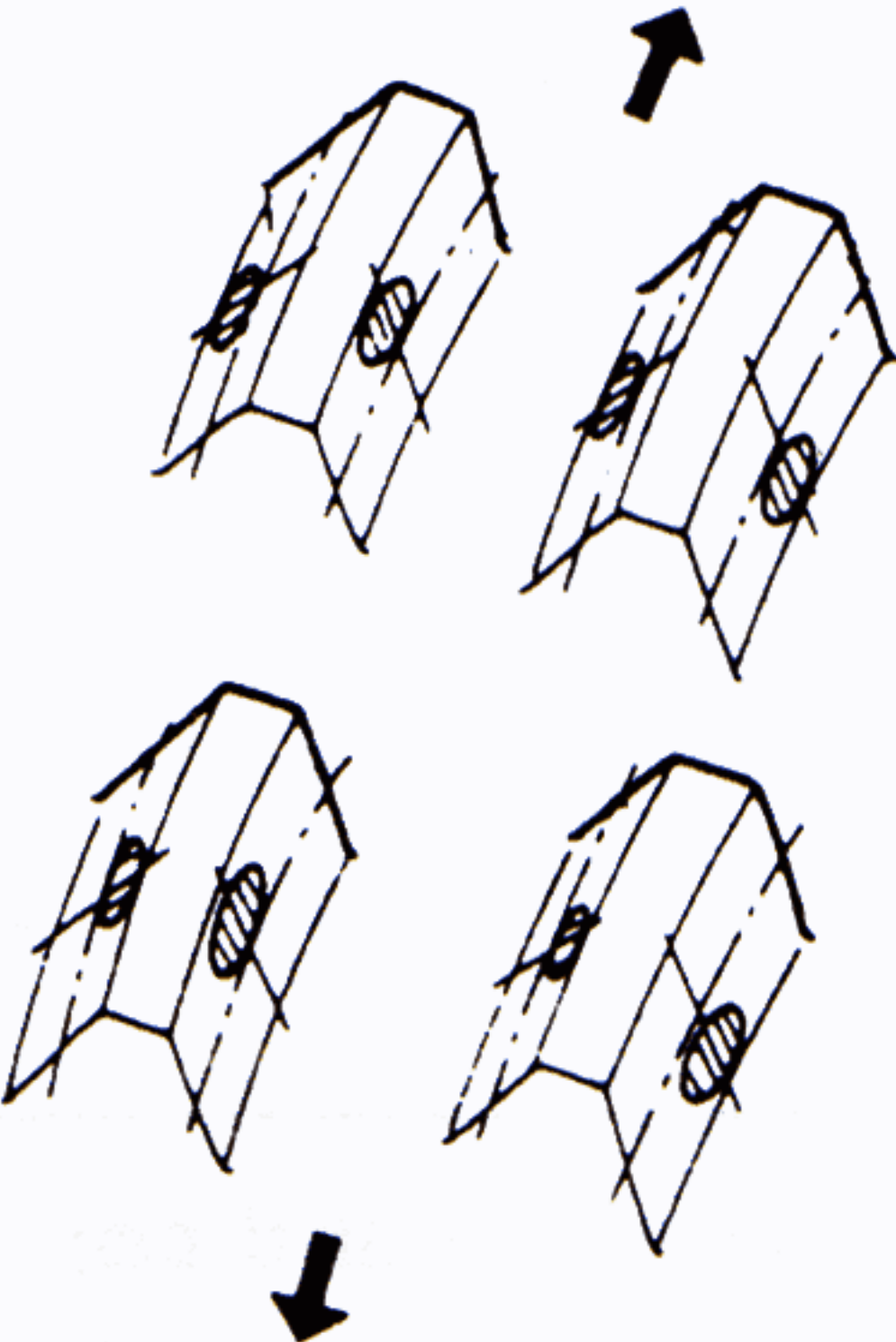
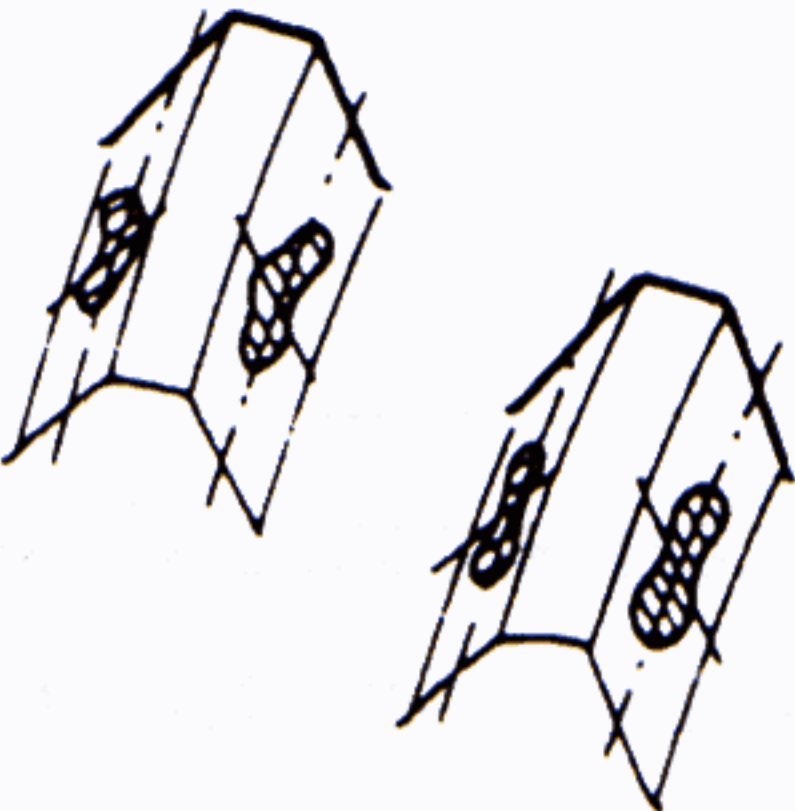
INSPECTION OF GEAR TOOTH SURFACE CONTACT

Upon completion of assembly, apply red lead paste to tooth surface of drive bevel gear and turn it by hand to check its contact with drive bevel pinion. Adjust if check result is not satisfactory.

NOTE:

Apply red lead paste all around bevel gear but not so much as to become sticky.

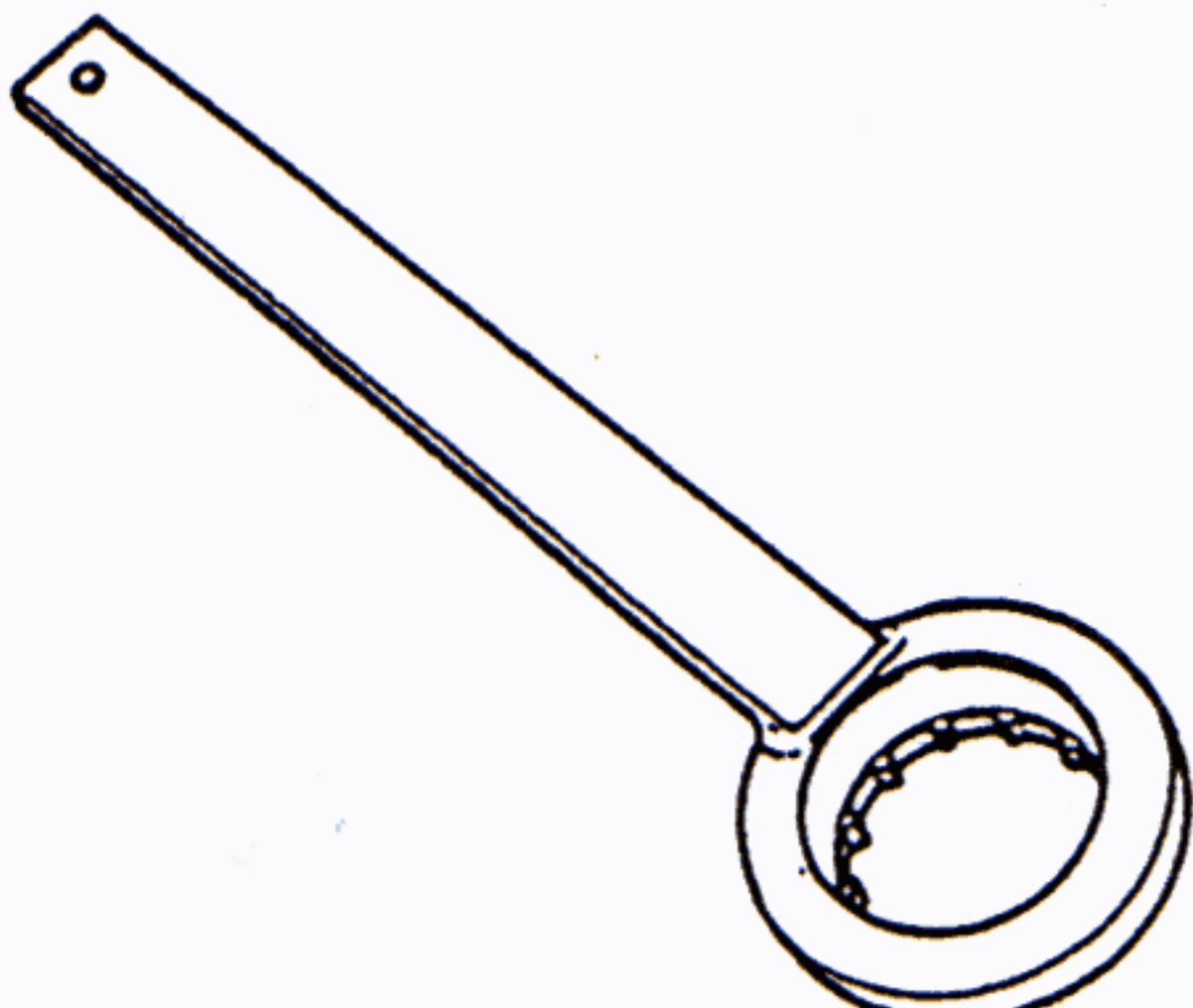
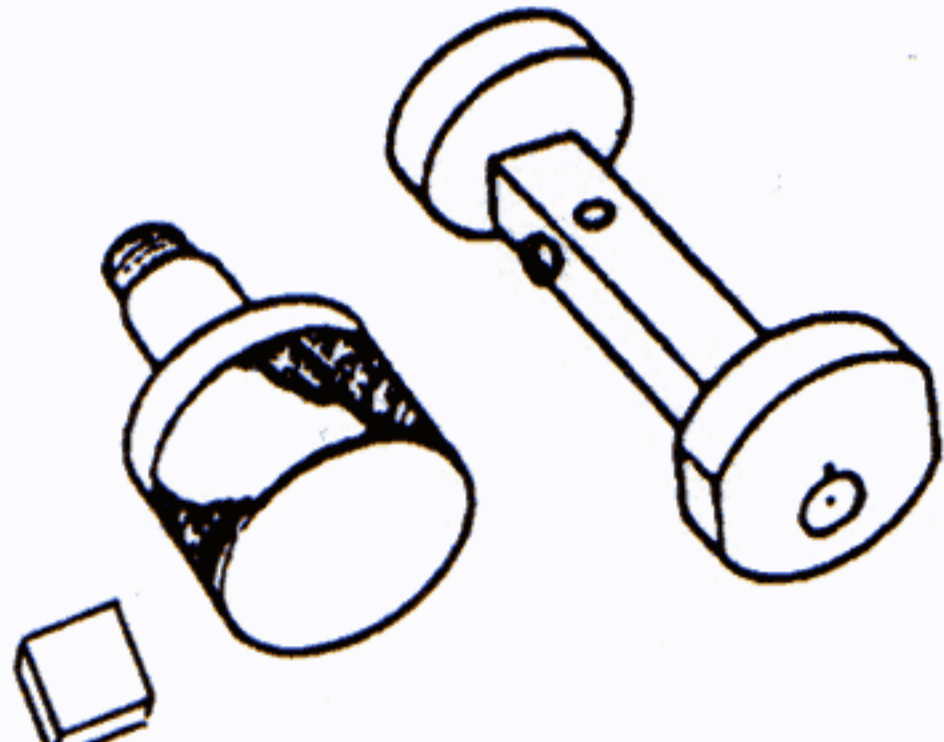
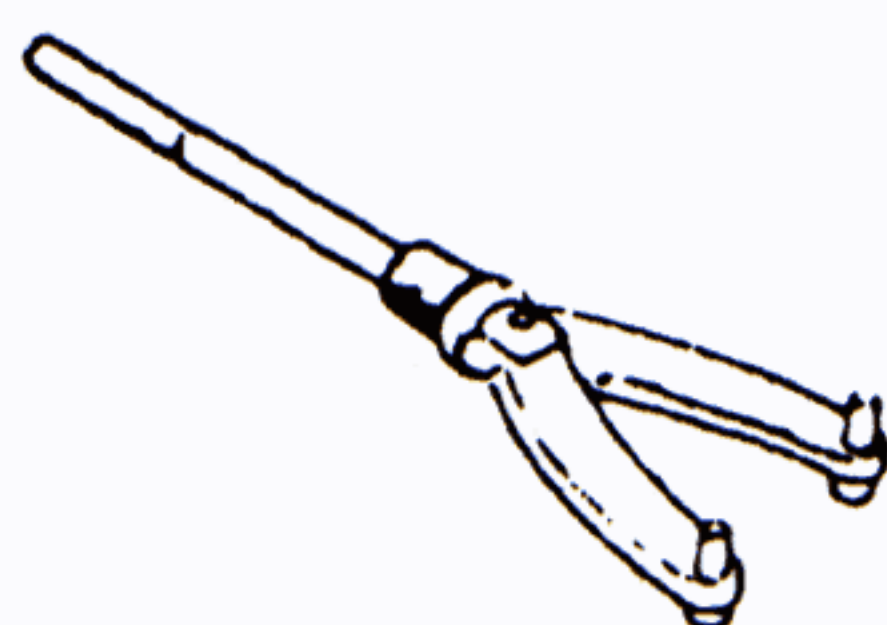
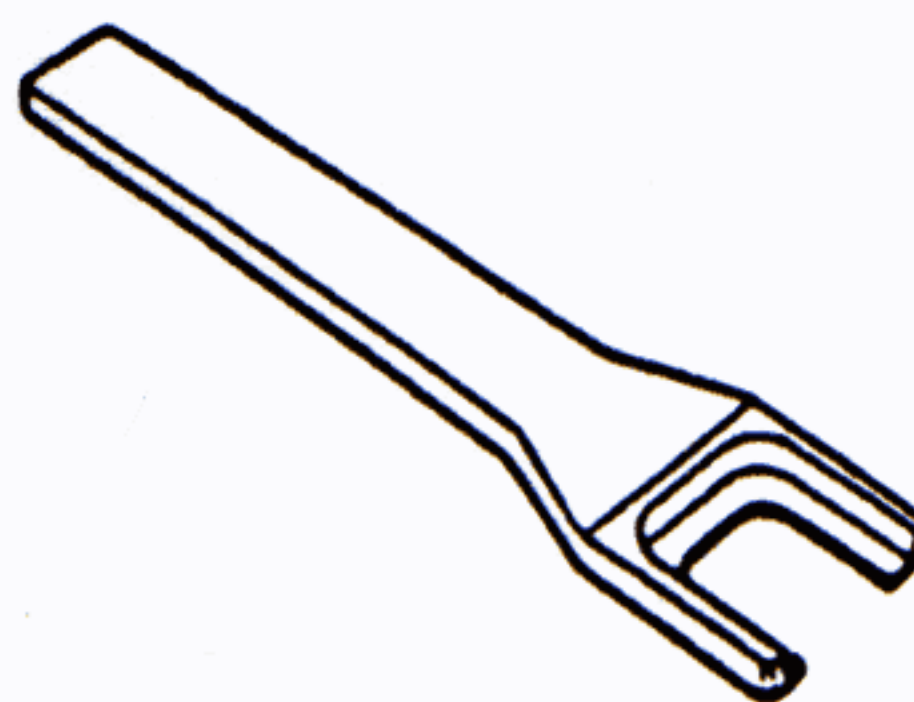
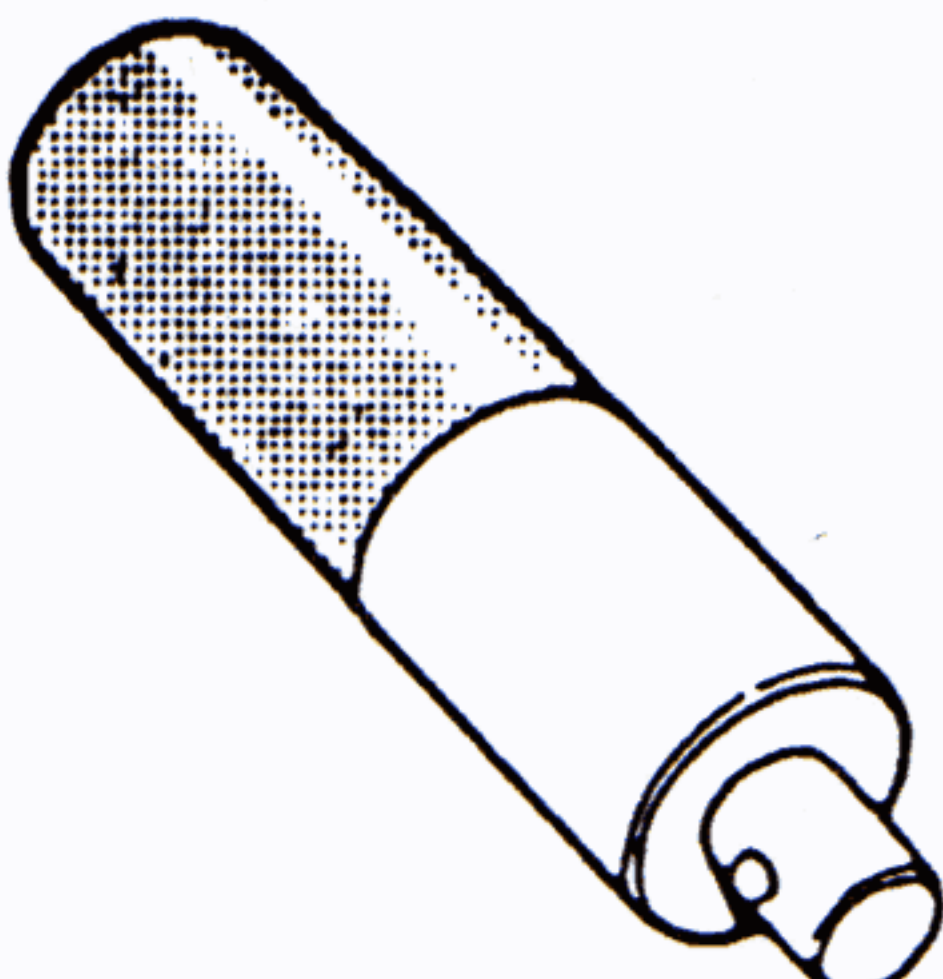
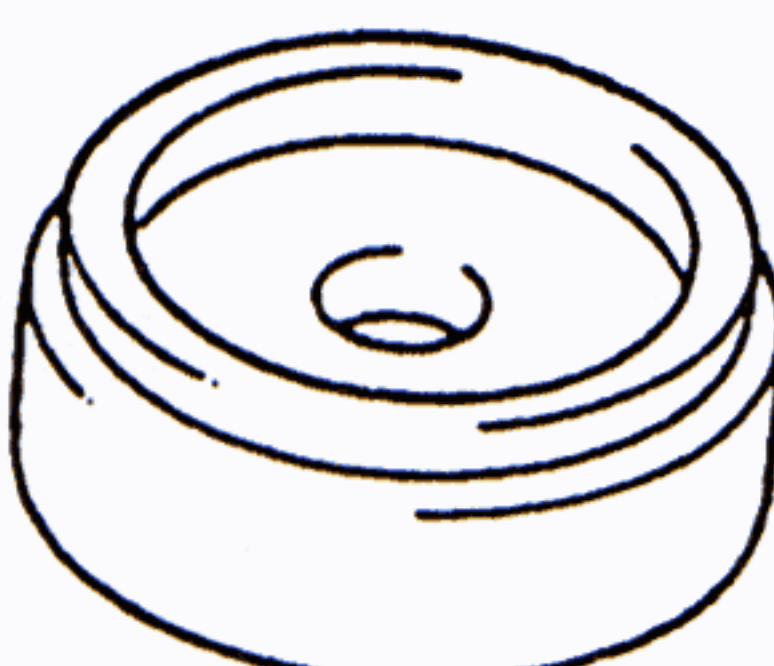
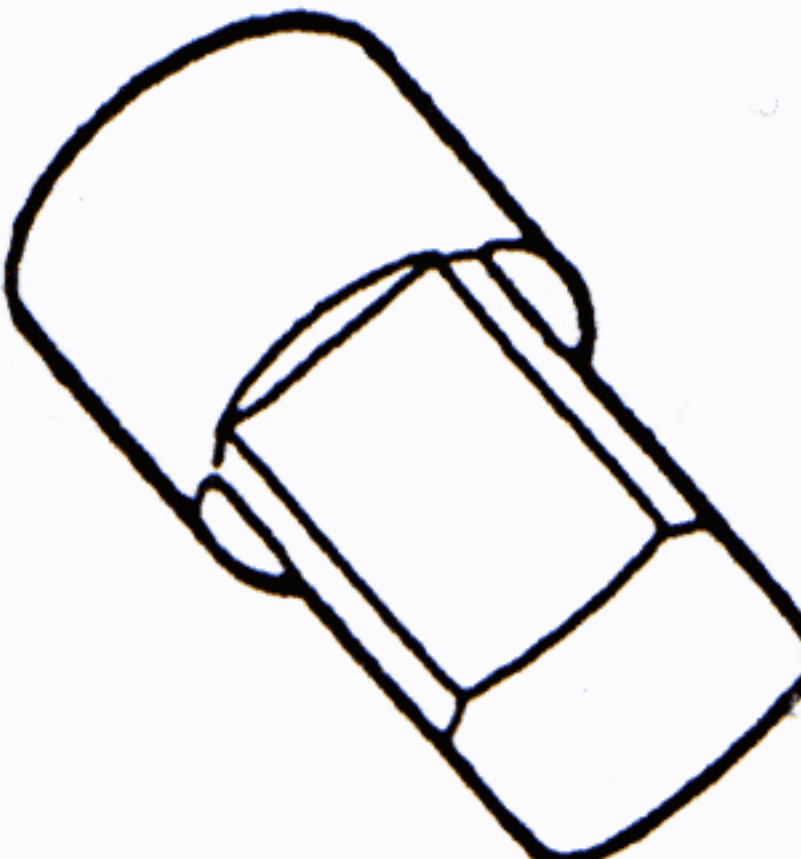
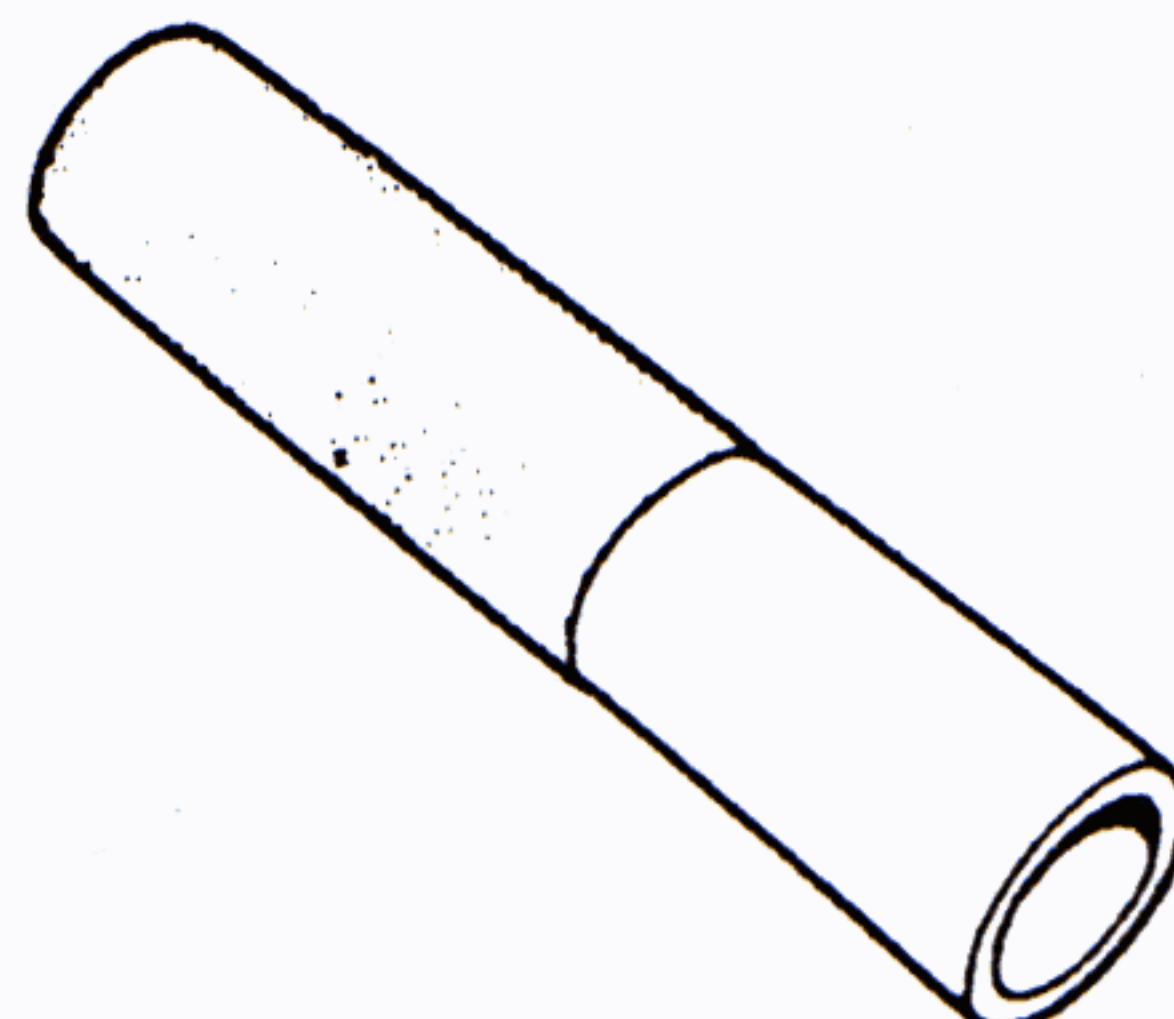
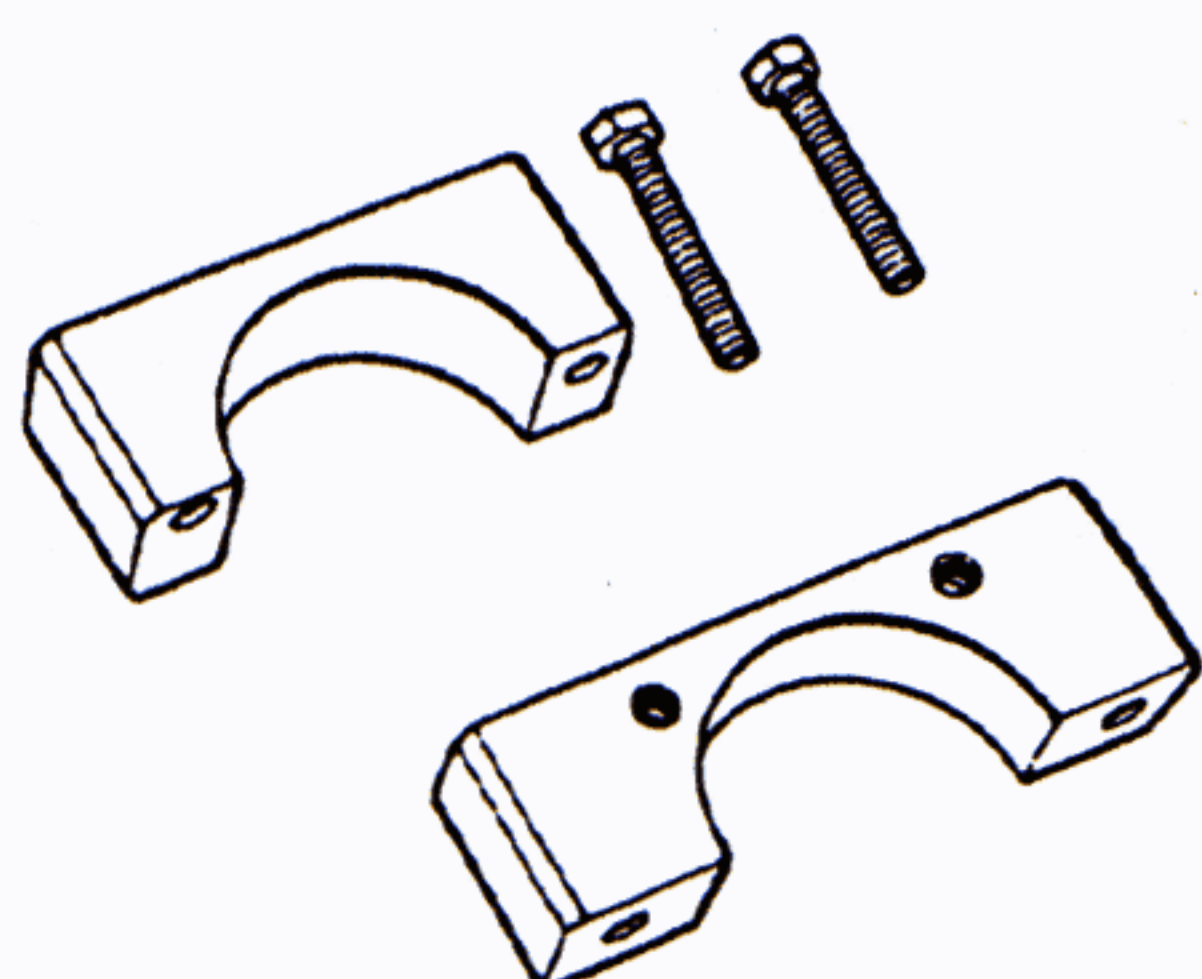
	Tooth surface contact	Possible cause and correction
Correct		Both forward and reverse contacts should occur a little toward inside from the center.
Poor shim adjustment		Forward contact occurs toward outside and reverse contact toward inside from the center and both at higher position. In such case, bevel pinion shim is too thin. Correction: Adjust shim thickness by increasing it.
		Forward contact occurs toward inside and reverse contact toward outside from the center and both at lower position. In such case, bevel pinion shim is too thick. Correction: Adjust shim thickness by reducing it.
Defect in part(s)		When tooth contacts occur as shown at the left, proper rear case offset (18 mm) is not obtained. Correction: Replace rear case (rear case, right case and left case assembly).
		When tooth contacts are deviated toward inside or outside of gear, possible causes are as follows. <ul style="list-style-type: none">• Drive bevel gear or drive bevel pinion defective.• Poor squareness of rear case.• Rear case surface where gear is installed is defective. Correction: Replace defective part as an assembly.

	Tooth surface contact	Possible cause and correction
Defect in part(s)		When tooth contacts occur as shown at the left, gear itself is defective. Correction: Replace drive bevel gear and drive bevel pinion as a set.
		When contact is not oval in shape, gear itself is defective. Abnormal contact is also caused by nick in tooth surface or faulty condition of differential case at its drive bevel gear mounting part. Correction: Replace drive bevel gear and drive bevel pinion as a set and differential gear case as well, if found defective.

RECOMMENDED TORQUE SPECIFICATIONS

Fastening portion	Tightening torque		
	N·m	kg-m	lb-ft
Output shaft nut	80 – 100	8.0 – 10.0	58.0 – 72.0
Output pinion nut	90 – 150	9.0 – 15.0	65.5 – 108.0
Bearing plate bolt	18 – 28	1.8 – 2.8	13.5 – 20.0
Output flange nut	80 – 100	8.0 – 10.0	58.0 – 72.0
Driven case bolt	18 – 28	1.8 – 2.8	13.5 – 20.0
Output case bolt			

SPECIAL TOOLS

 <p>09927-25411 Bevel pinion holder</p>	 <p>09922-77270 Bevel pinion dummy set</p>	 <p>09930-40113 Rotor holder</p>	 <p>09927-76030 Bevel pinion holder</p>
 <p>09924-74510 Bearing & oil seal installer handle</p>	 <p>09951-16090 Oil seal installer</p>	 <p>09915-24550 Adapter socket</p>	 <p>09913-84510 Bearing installer</p>
 <p>09927-56030 Gear holder tool</p>			

REQUIRED SERVICE MATERIALS

MATERIAL	RECOMMENDED SUZUKI PRODUCT	USE
Sealant	SUZUKI BOND NO. 1215 (99000-31110)	<ul style="list-style-type: none"> • Mating surface of transmission and transfer cases • Mating surface of transfer output and driven cases

SECTION 7E

DIFFERENTIAL

CONTENTS

GENERAL DESCRIPTION	7E- 1
ON CAR SERVICE	7E- 2
Differential Oil Change	7E- 2
Front Diffrential	7E- 2
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Bevel Pinion Shim Admustment (Bevel pinion bearing shim adjustment)	7E- 7
Bevel Pinion Shim Adjustment (Mounting Distance Adjustment)	7E- 8
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SPECIAL TOOLS	7E-12
REQUIRED SERVICE MATERIALS	7E-12

GENERAL DESCRIPTION

For the rear differential, a hypoid gear is used and a viscous coupling is provided in front of it.

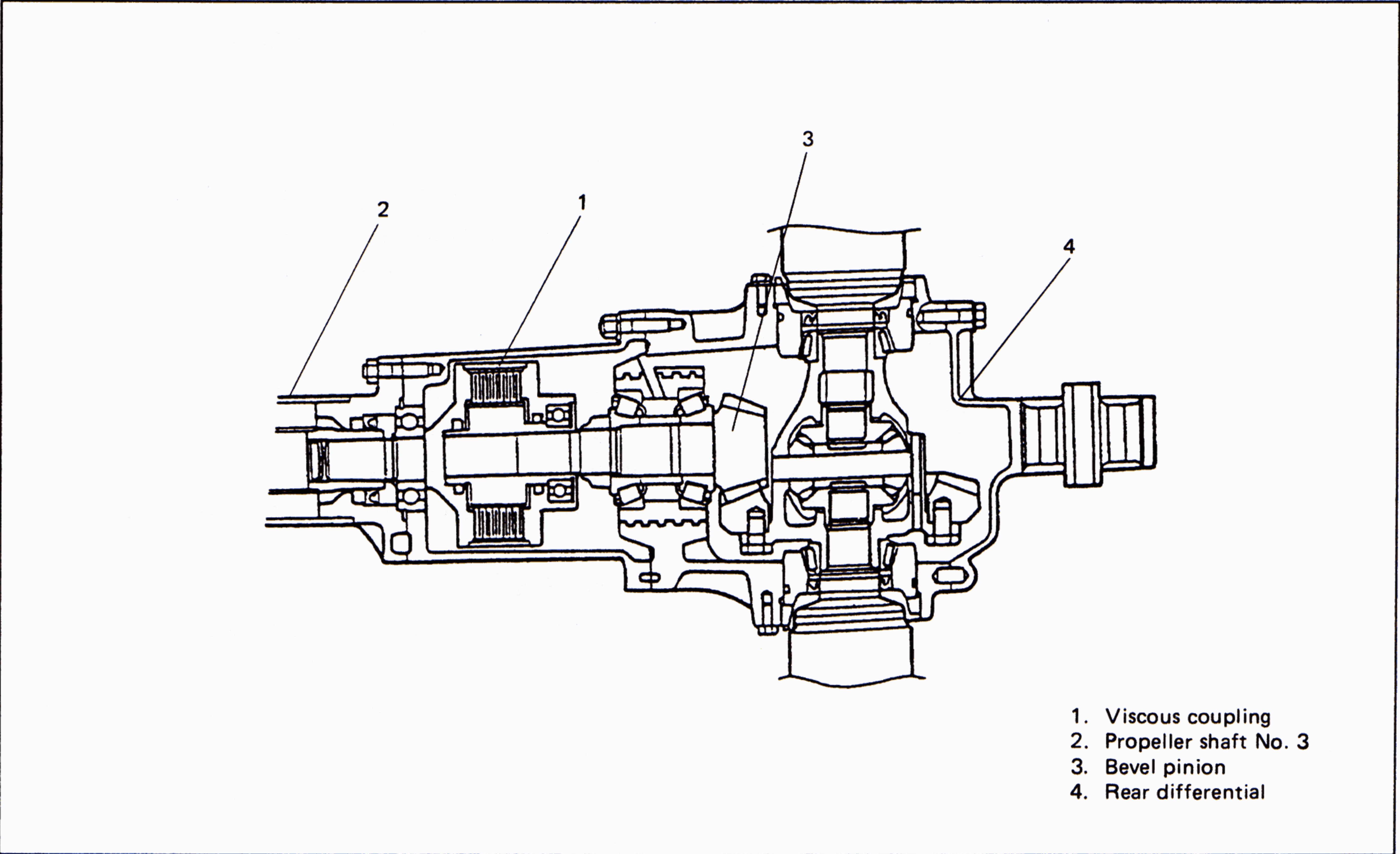


Fig. 7E-1

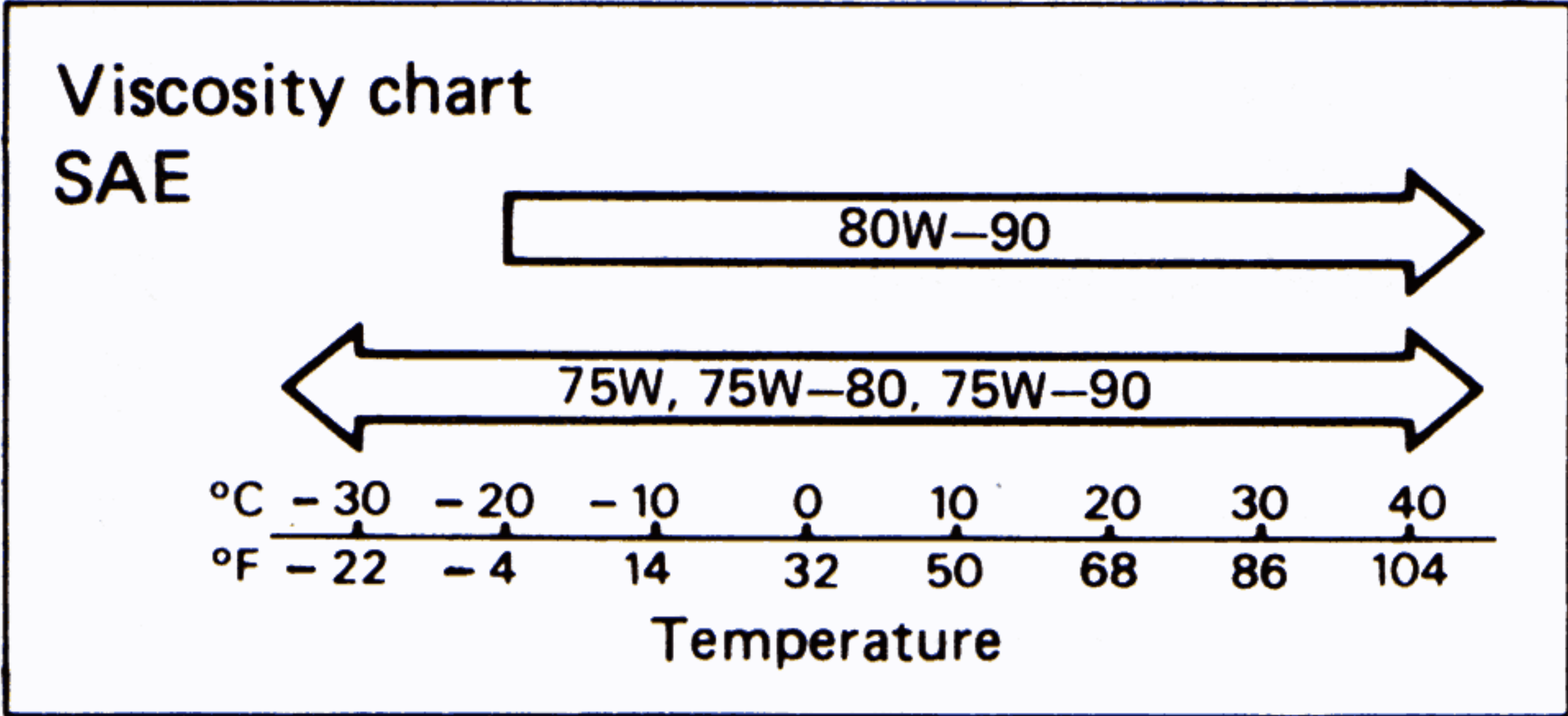
ON CAR SERVICE

DIFFERENTIAL OIL CHANGE

Fill specified gear oil up to mouth of oil level plug.

NOTE:

- It is highly recommended to use API GL-5 SAE 75W-90 hypoid gear oil.
- Whenever car is hoisted for any other service work than oil change, also be sure to check for oil leakage.



Oil capacity	1.1 liters 2.4/2.0 US/Imp. pt
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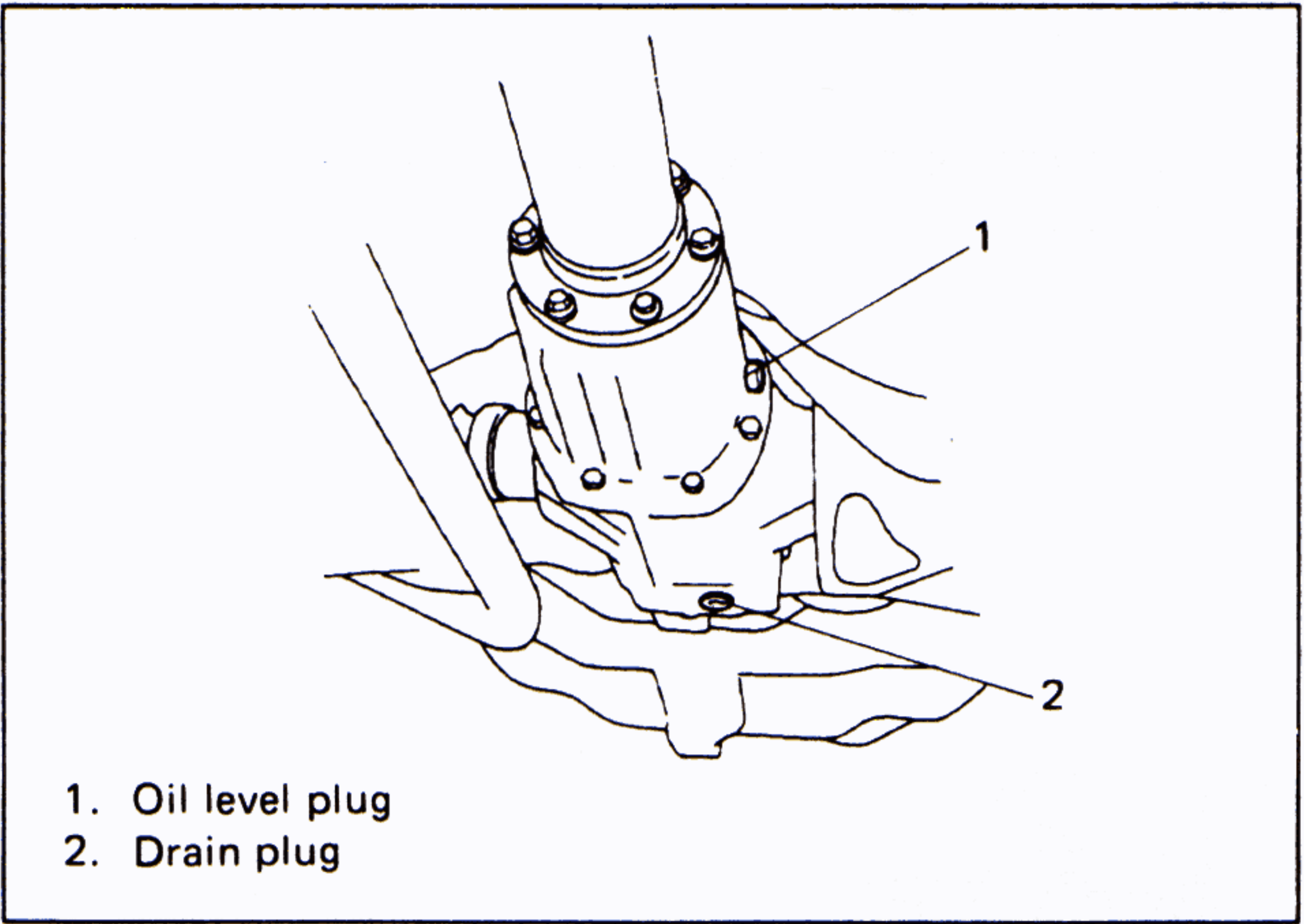


Fig. 7E-2

Tightening torque for oil drain plug	N·m	kg·m	lb·ft
	12-22	1.2-2.2	9.0-15.5

FRONT DIFFERENTIAL

DISASSEMBLY

For removal of differential assembly, refer to Section 7A.

1. Remove differential side bearing.
2. Remove circlip and then speedometer drive gear.
3. Remove final gear bolts (10 pcs.), final gear and bevel gear.

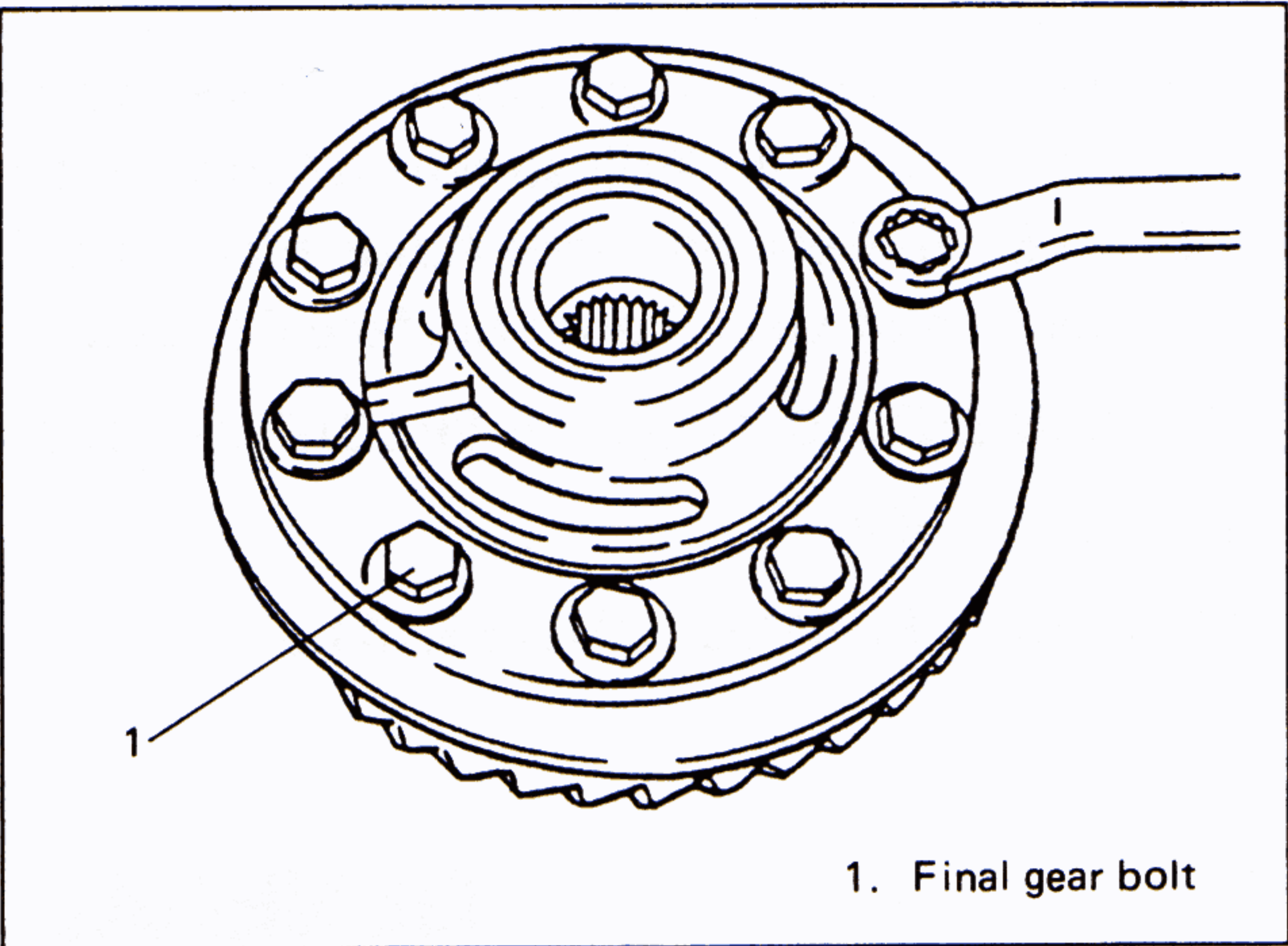


Fig. 7E-3

ADJUSTEMENT AND ASSEMBLY

Before disassembly, check each part for wear and damage. Replace any defective part with new one. Clean all disassembled parts and re-assemble by reversing disassembly procedure.

1. After assembling differential gear, measure its play in thrust direction.

Left Side

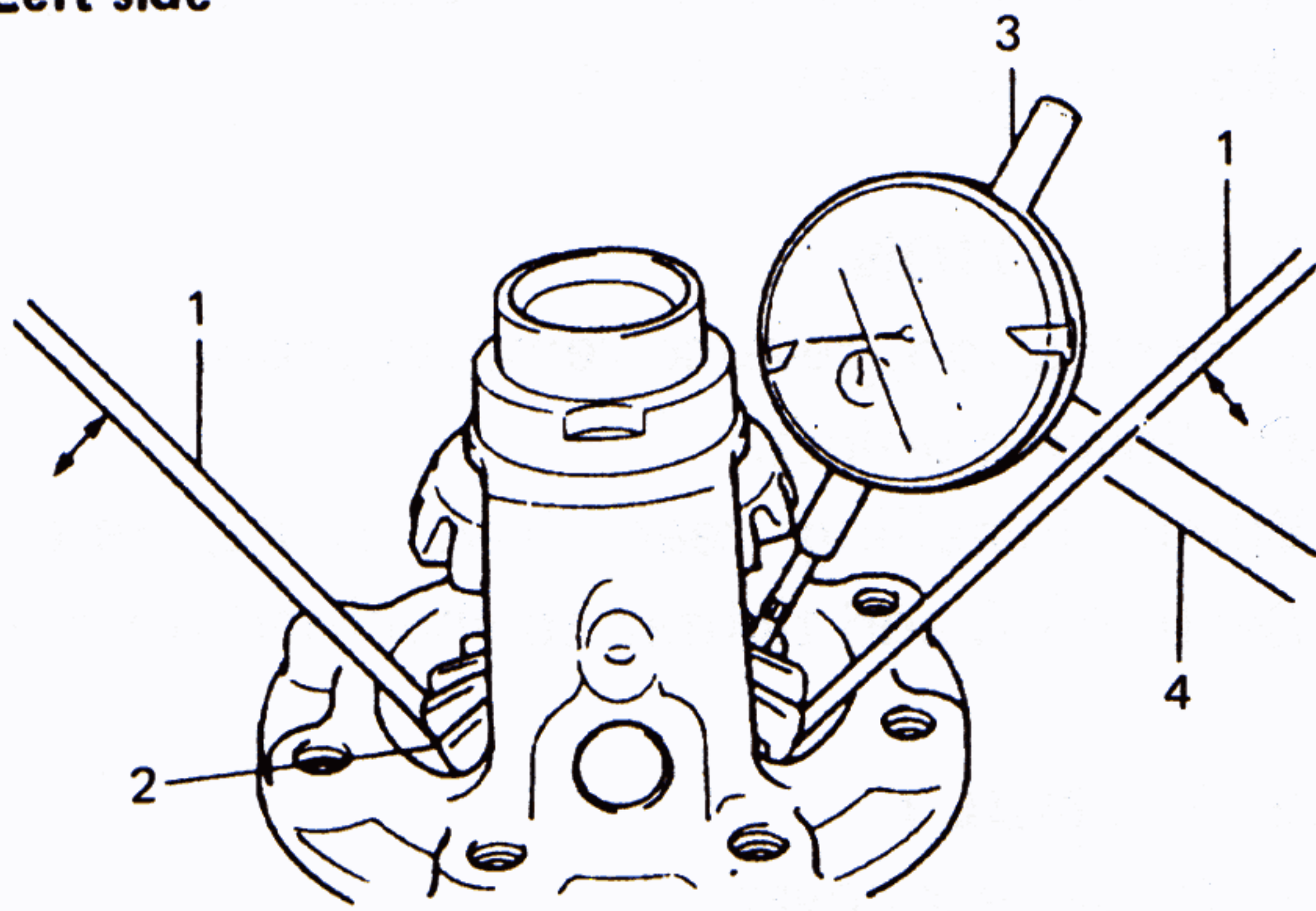
- Apply pointed end of dial gauge to gear thread as shown below.
- While moving gear up and down with two large slotted screwdrivers, read dial gauge.

Right Side

- Apply pointed end of dial gauge to gear shoulder as shown below.
- While moving gear up and down with fingers, read dial gauge.

Play in thrust direction	0.03 – 0.31 mm (0.001 – 0.012 in.)
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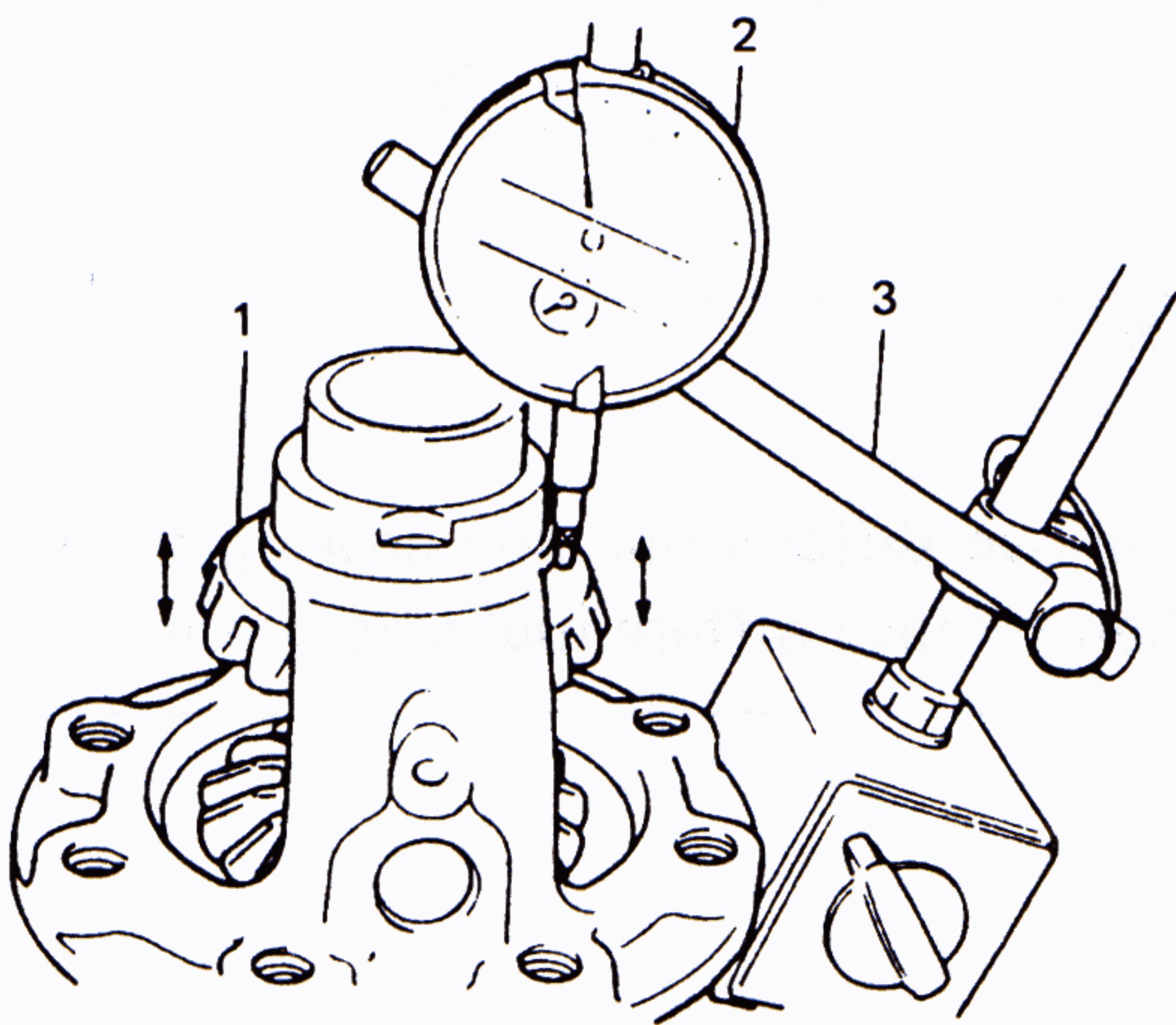
Left side



- 1. Slotted screwdriver
- 2. Differential gear
- 3. Special tool (Dial gauge 09900-20606)
- 4. Special tool (Magnet stand 09900-20701)

Fig. 7E-4

Right side



- 1. Differential gear
- 2. Special tool (Dial gauge 09900-20606)
- 3. Special tool (Magnet stand 09900-20701)

Fig. 7E-5

2. If measured play in thrust direction is not within specified range, insert thrust washer of suitable thickness from among available ones listed below. Measure play again to make sure it is within specification.

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.
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- 3. Install left bearing.
- 4. Install speedometer drive gear and right bearing. When press-fitting right bearing, use such appropriate tool as not to apply load to left bearing.
- 5. Install final gear and tighten its fixing bolts (8 pcs.) to specified torque.

Tightening torque for final gear fixing bolt	N·m	kg·m	lb·ft
	80 – 90	8.0 – 9.0	58.0 – 65.0

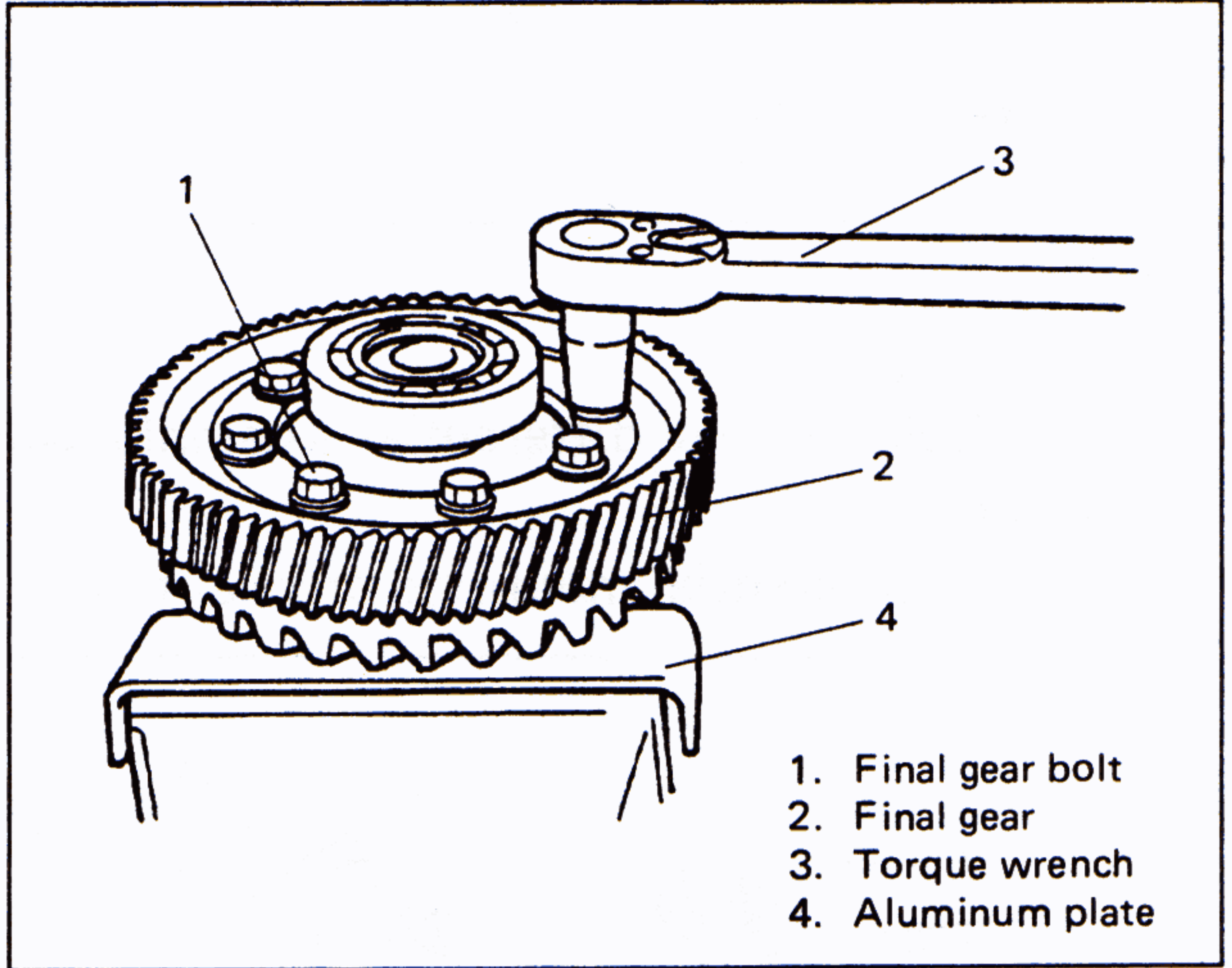
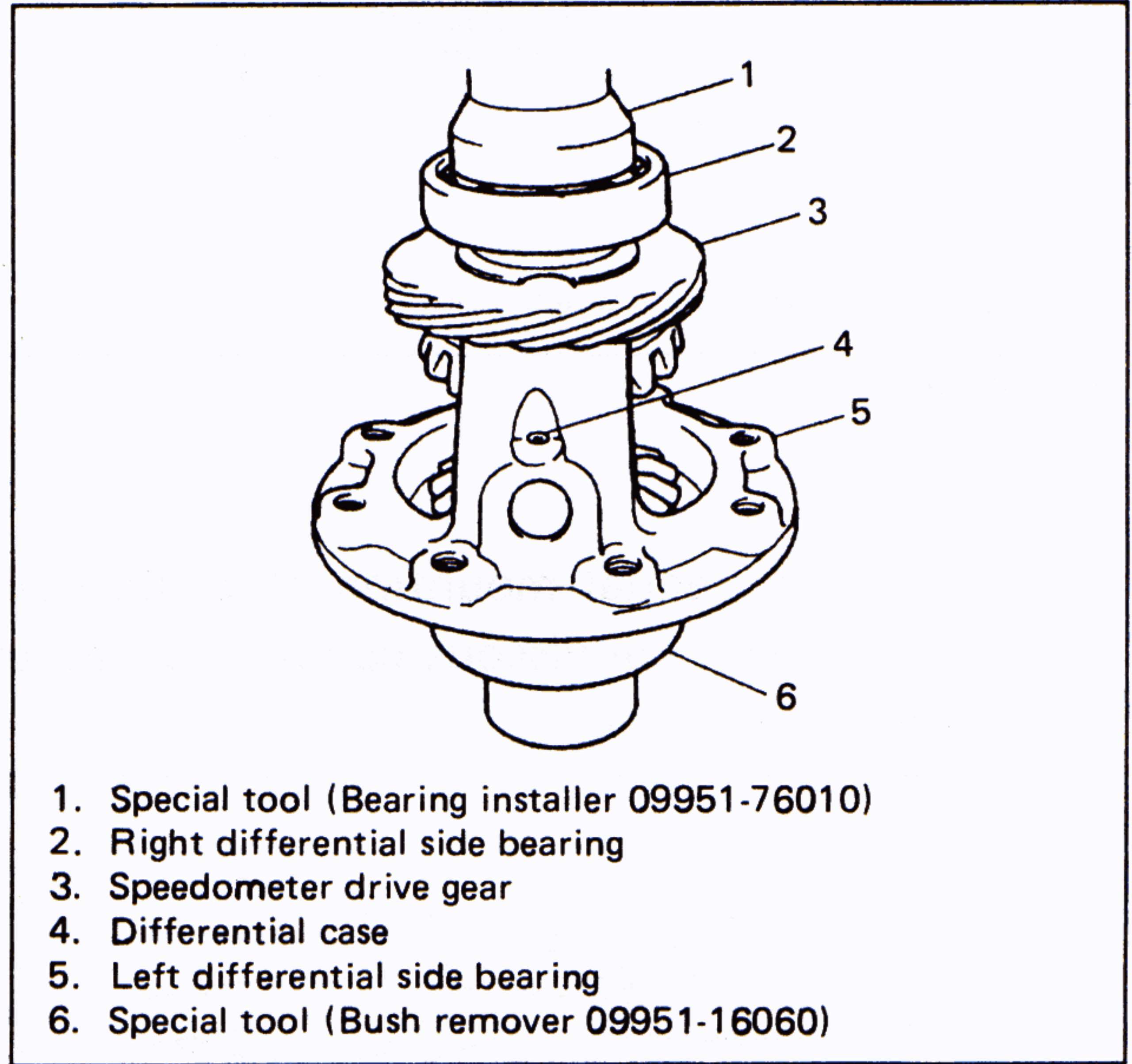


Fig. 7E-6



- 1. Special tool (Bearing installer 09951-76010)
- 2. Right differential side bearing
- 3. Speedometer drive gear
- 4. Differential case
- 5. Left differential side bearing
- 6. Special tool (Bush remover 09951-16060)

Fig. 7E-7

REAR DIFFERENTIAL

REMOVAL

- 1. Remove rear drive shaft. (Refer to Section 4C.)
- 2. Remove exhaust muffler. (Refer to Section 6K.)

3. Remove propeller shafts No. 2 to No. 3 fixing bolts.

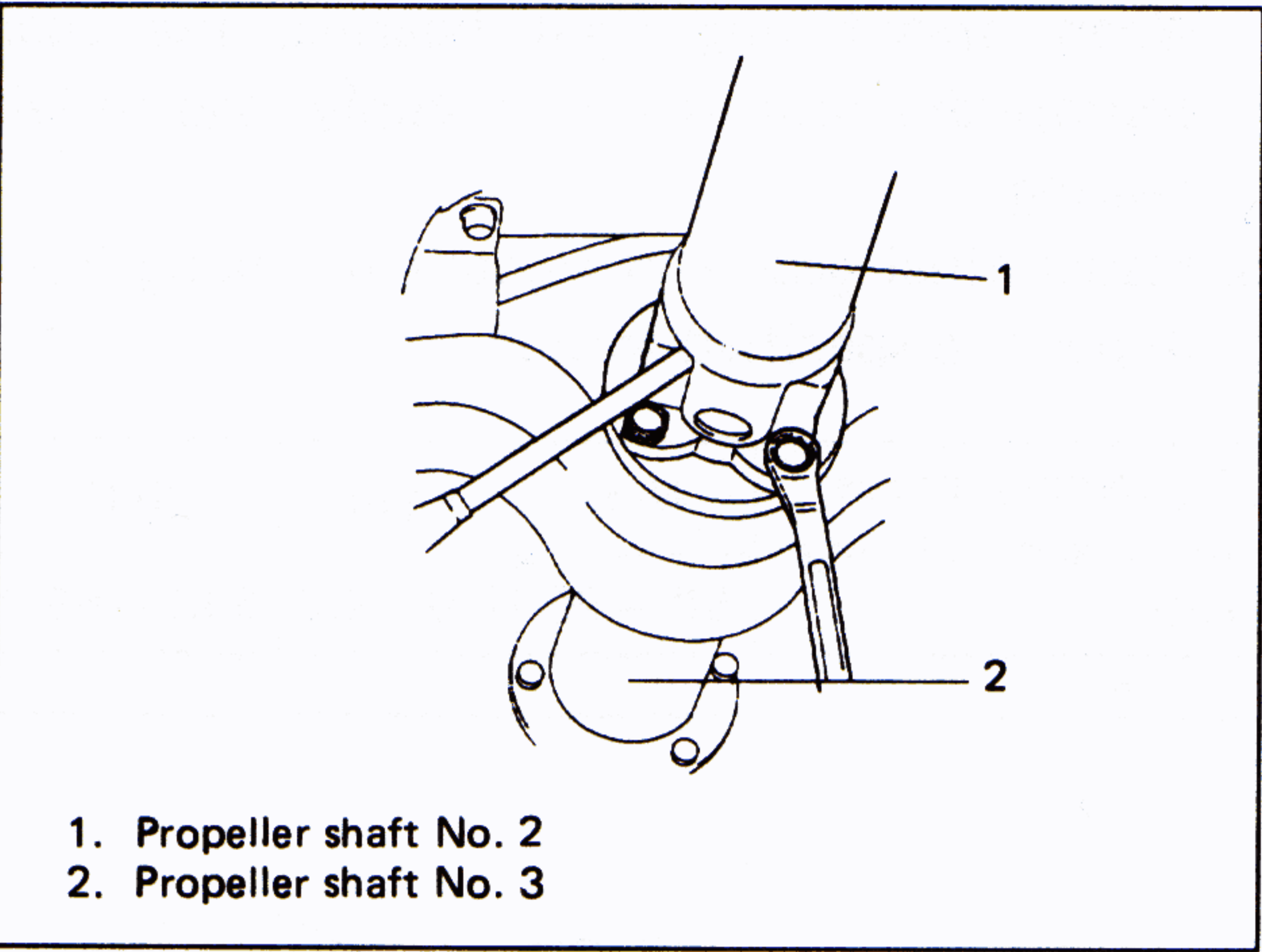


Fig. 7E-8

4. Place jack so that differential assembly will not tilt.
5. Remove differential mounting bracket nut.

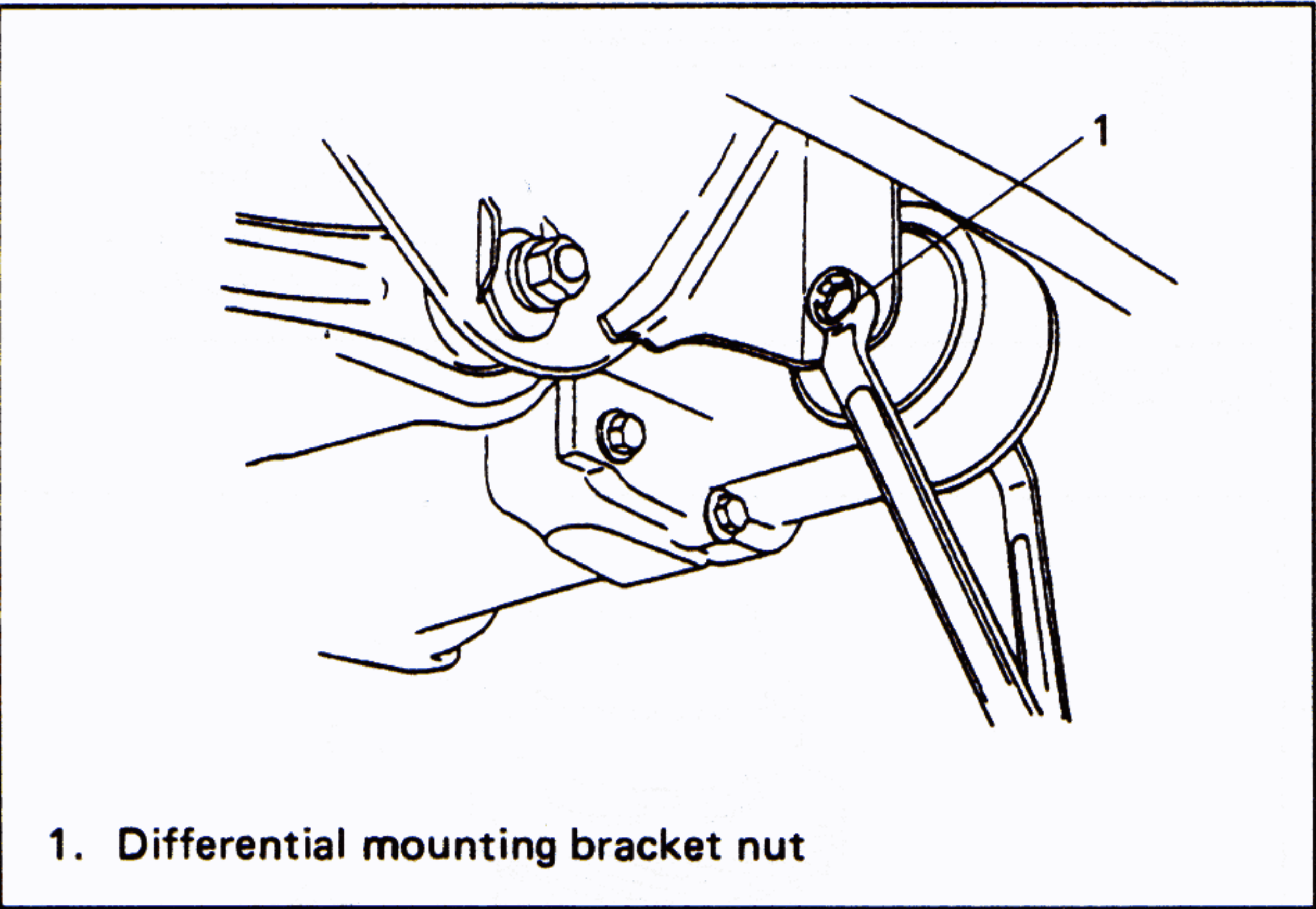


Fig. 7E-9

6. Remove differential mounting nuts and then remove differential viscous coupling propeller shaft No. 3 assembly.

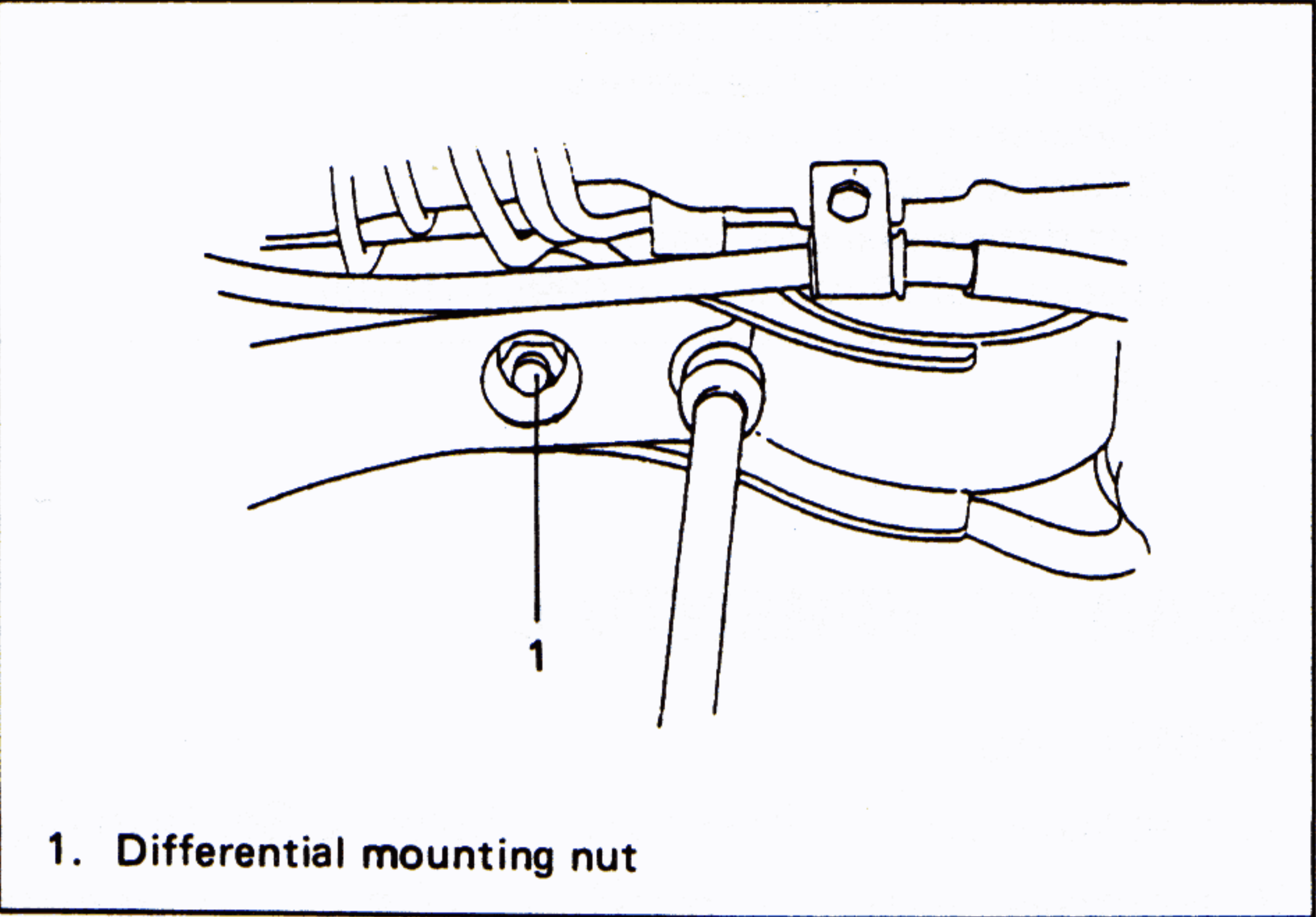


Fig. 7E-10

7. Remove viscous coupling case and propeller shaft No. 3 from differential.

INSTALLATION

For installation, reverse removal procedure, noting following points.

- When installing rear drive shaft, refer to Section 4C and tighten to specified torque.

DISASSEMBLY

1. Remove rear cover.

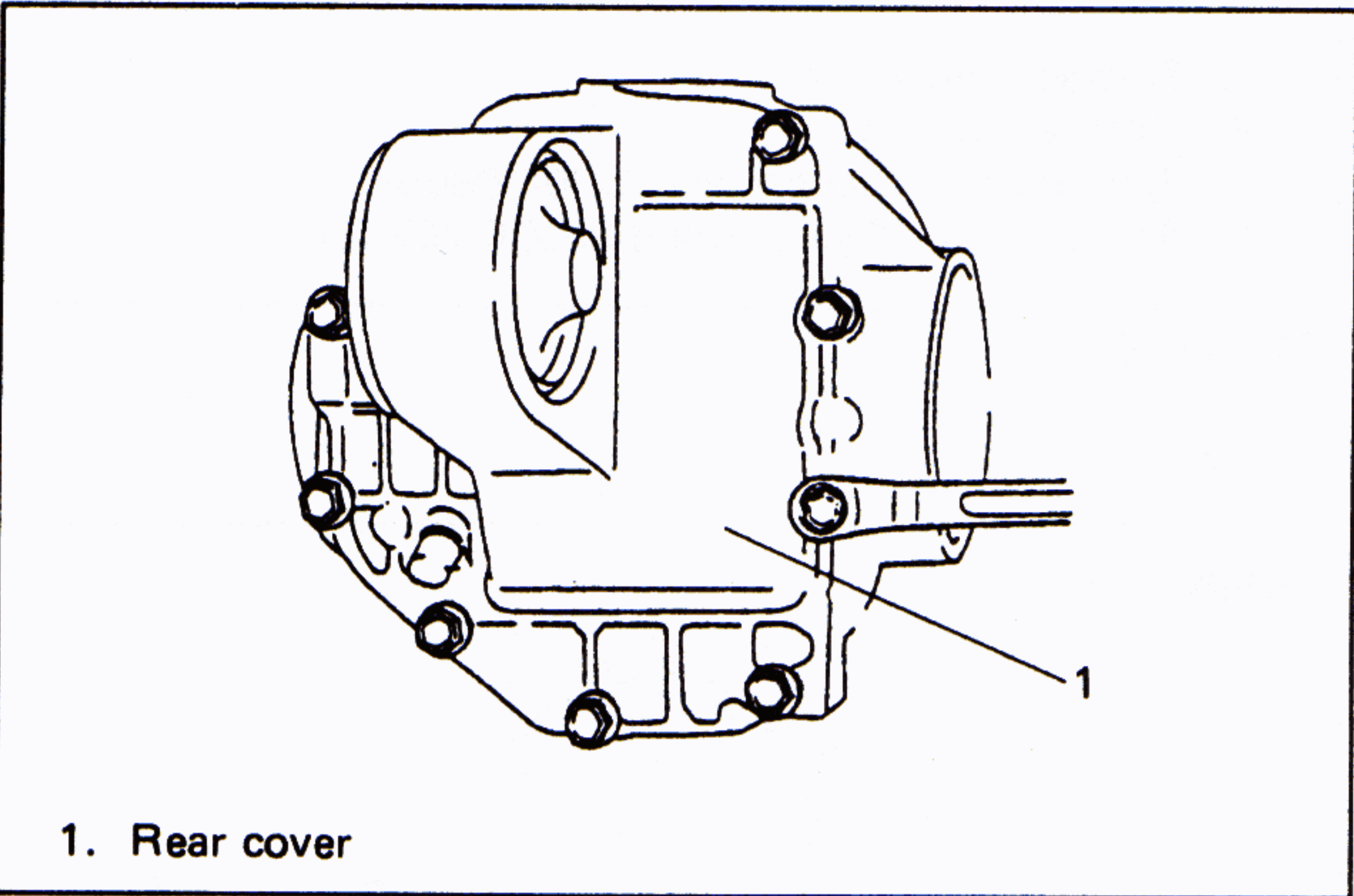


Fig. 7E-11

2. Remove differential side bearing stopper and then remove differential side bearing retainer.

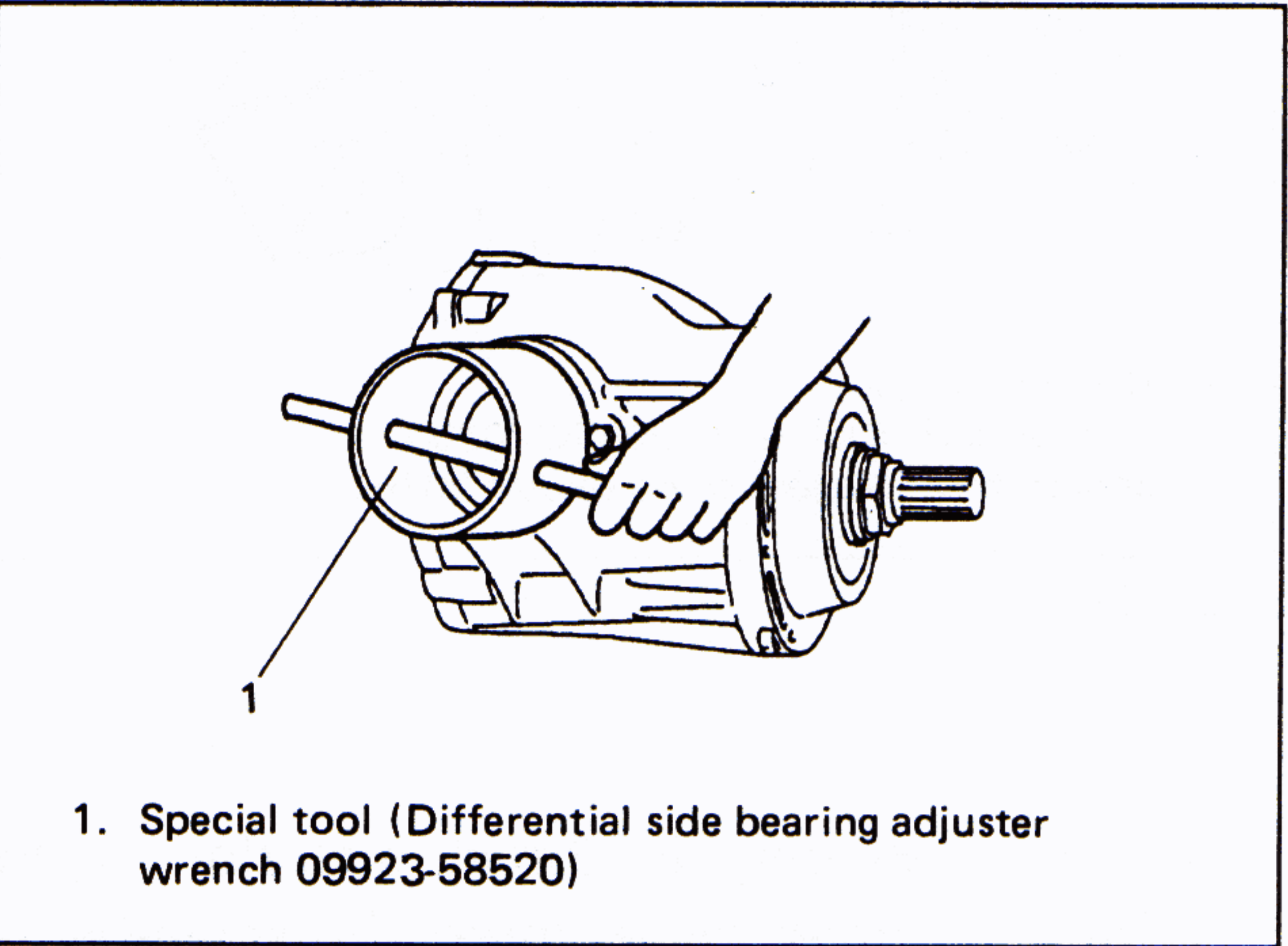


Fig. 7E-12

3. Using some appropriate rod, drive out differential side bearing assembly.

NOTE:

When driving out differential side bearing, be very careful not to cause damage to tooth surface of bevel gear.

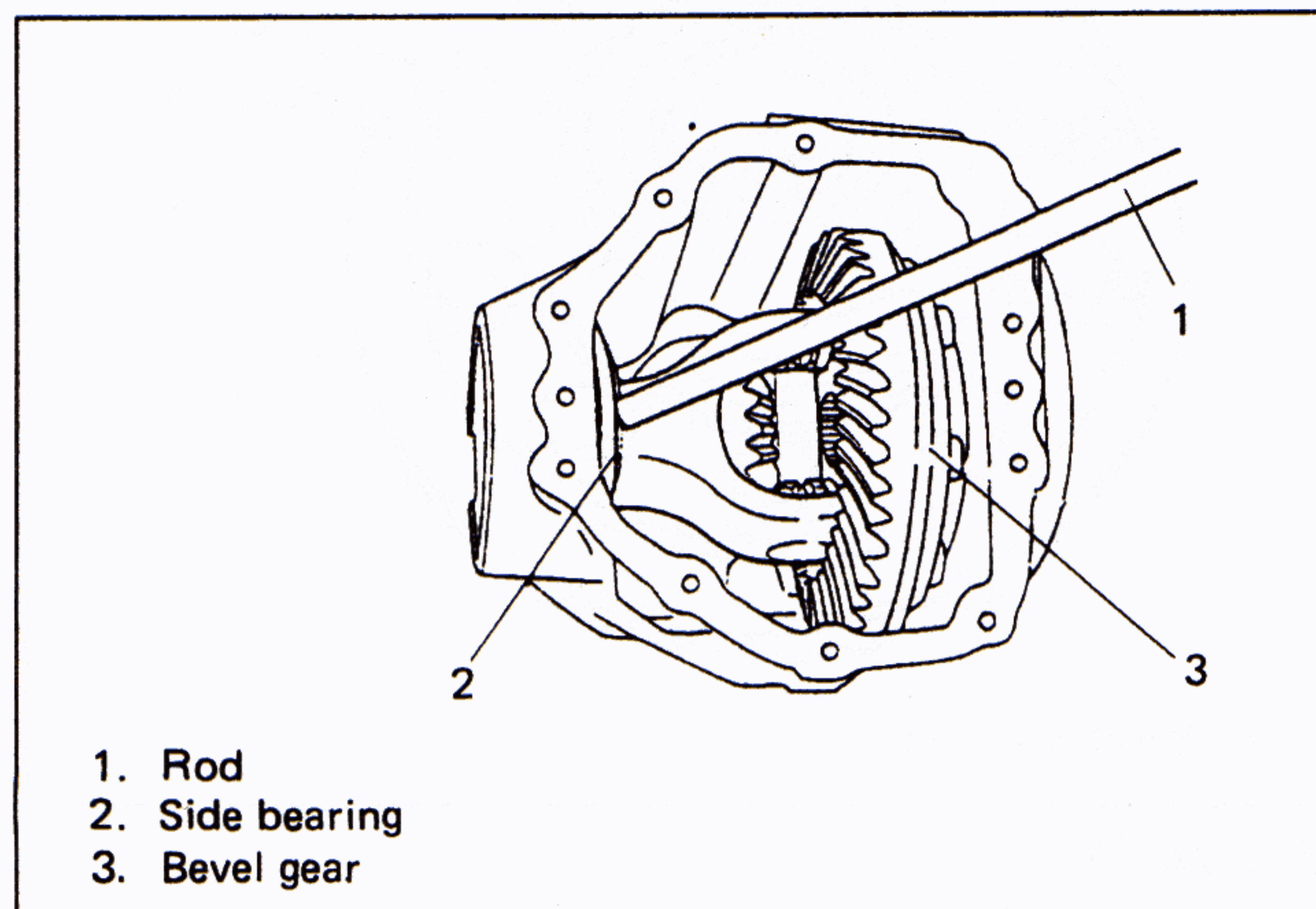


Fig. 7E-13

4. Remove bevel gear assembly.
5. Remove caulking of bevel pinion nut and loosen it as shown below.

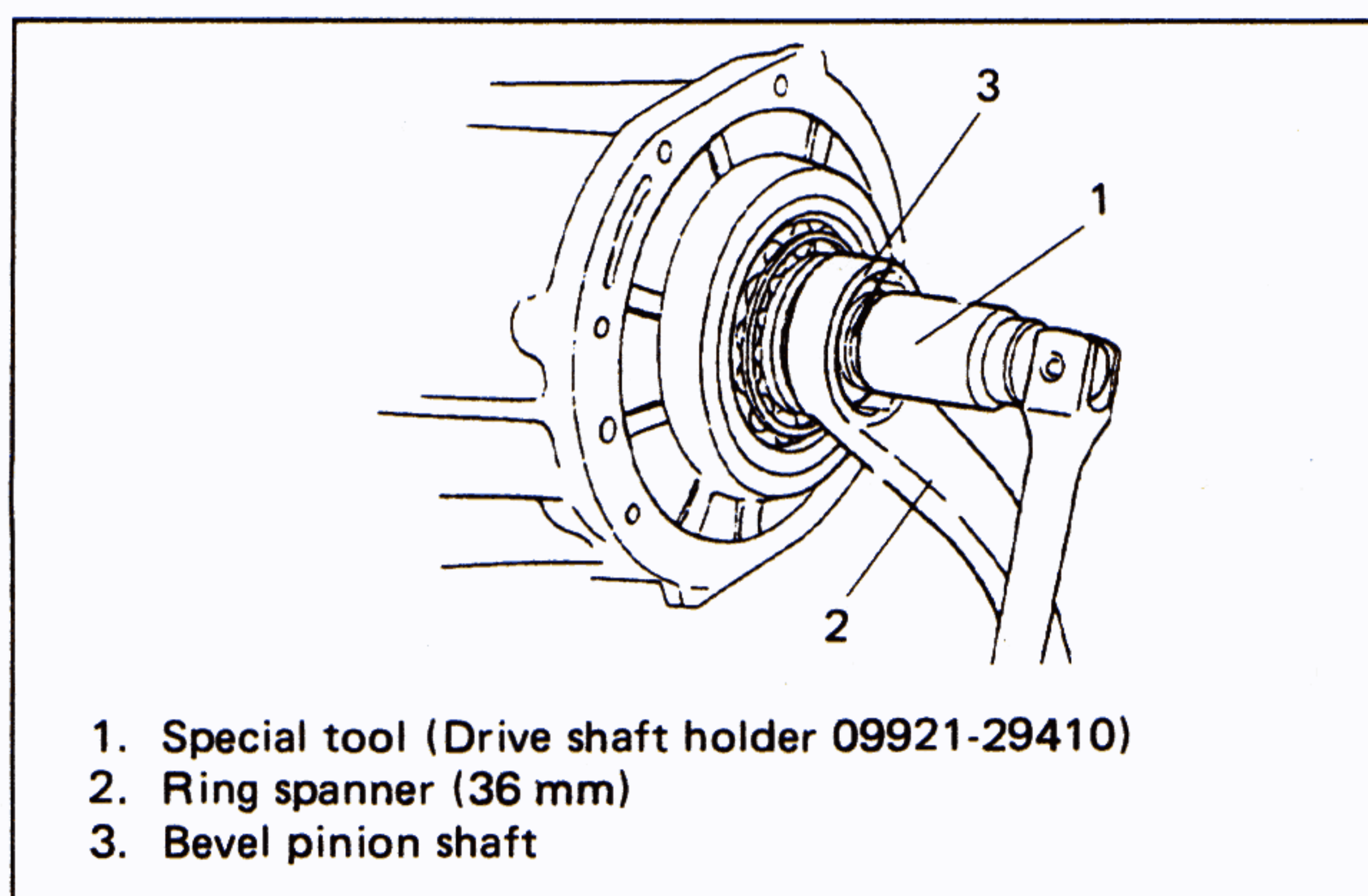


Fig. 7E-14

6. Drive out bevel pinion with plastic hammer.
7. Pull out bearing from bevel pinion.

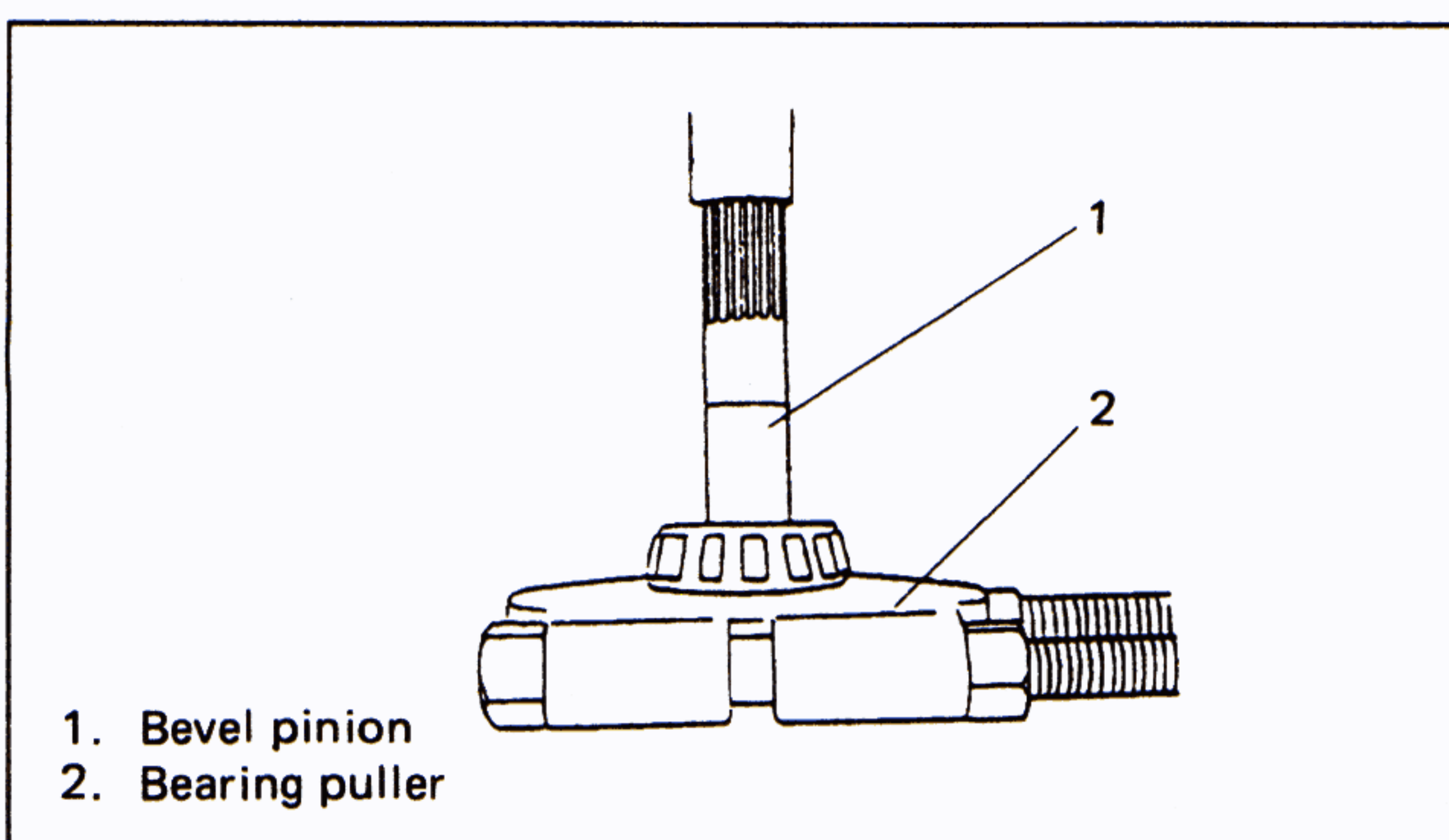


Fig. 7E-15

8. Using some appropriate rod, drive out outer bevel pinion bearing.

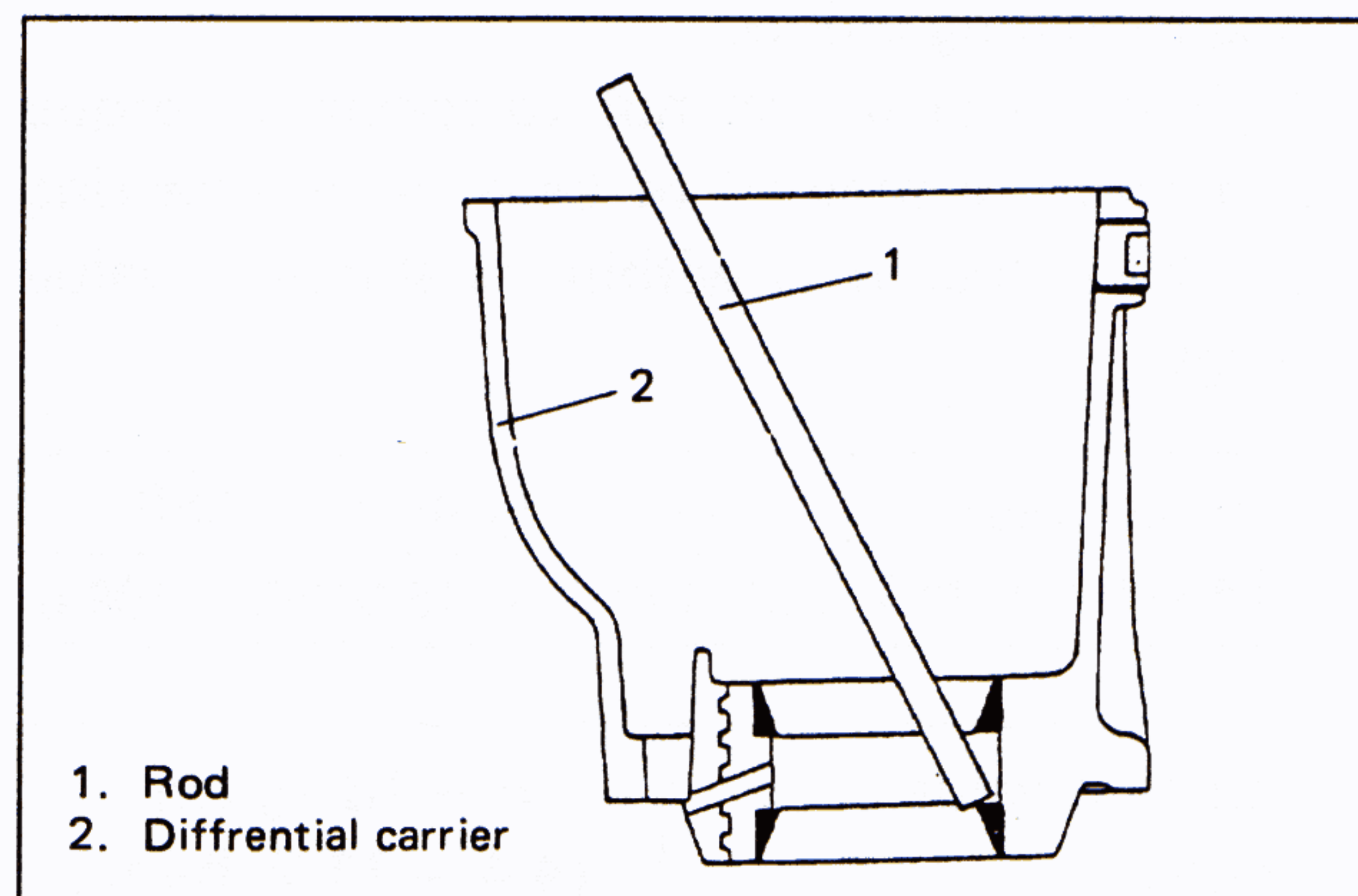


Fig. 7E-16

9. Remove bevel gear bolts.

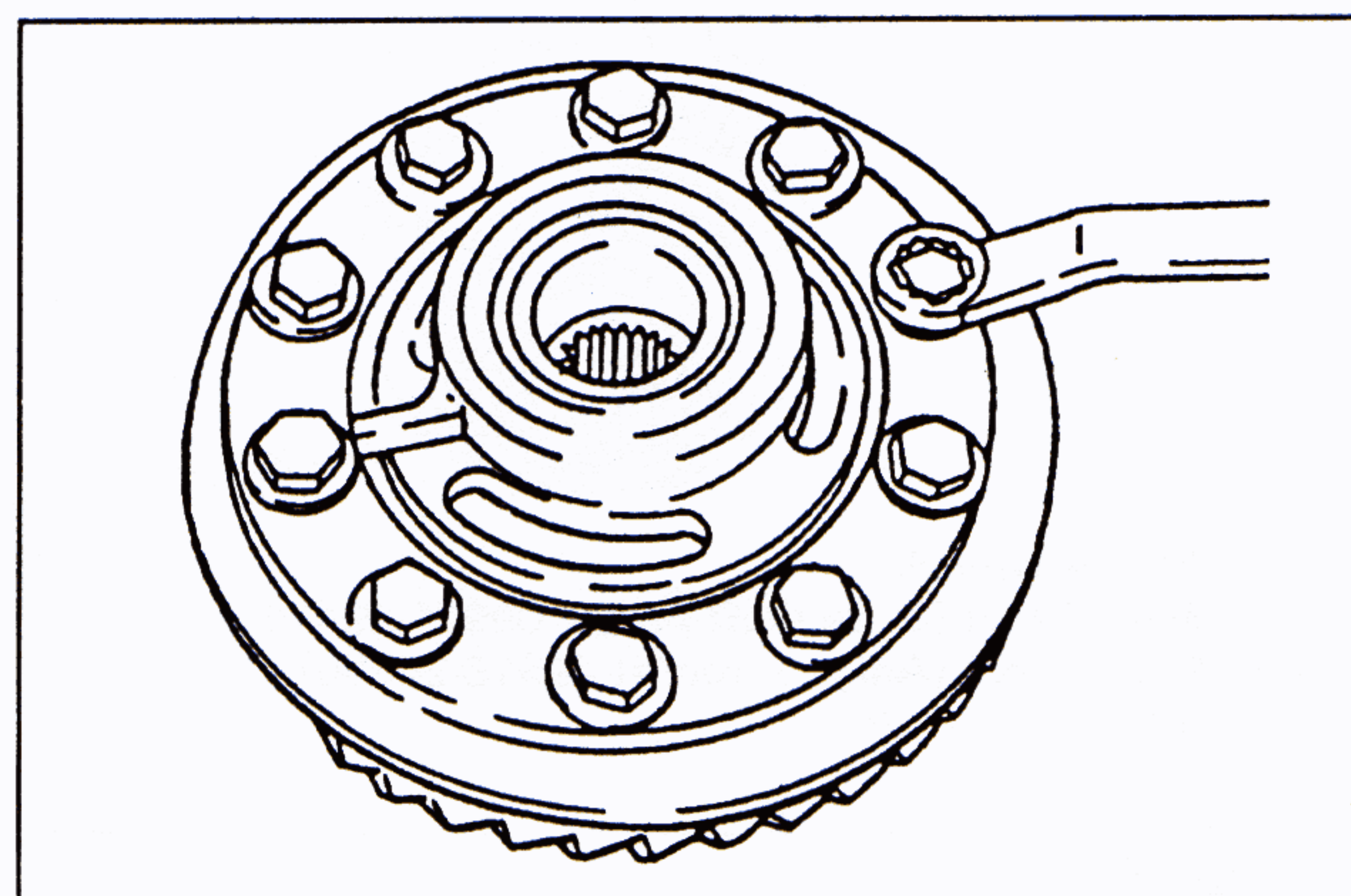


Fig. 7E-17

10. Remove differential side bearing.
11. Remove differential side pinion shaft pin.
12. Remove pinion shaft.

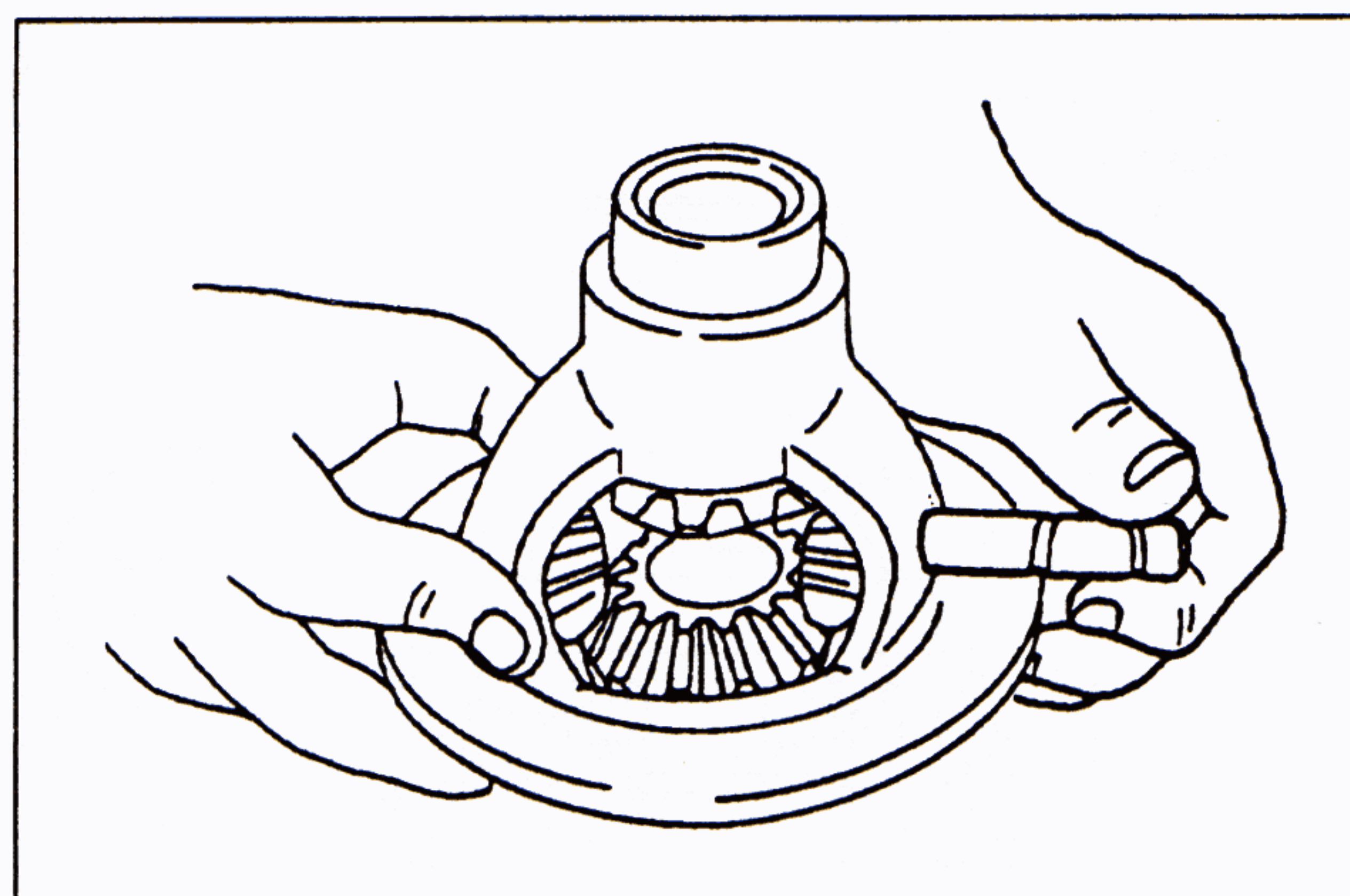


Fig. 7E-18

13. Remove side pinion and side gear.

NOTE:

Be sure to keep washers for side gear and spring washers separately from other shims.

ASSEMBLY

For assembly, reverse disassembly procedure noting following points.

- Tighten bevel pinion nut to specified torque and measure preload of bevel pinion bearing to check that it is within its standard value range.

Tighteing torque for bevel pinion nut	N·m	kg-m	lb-ft
	90 – 150	9.0–15.0	65.5–108.0

Standard value of preload	5 – 13 kg-cm (4.4 – 11.2 lb-in)
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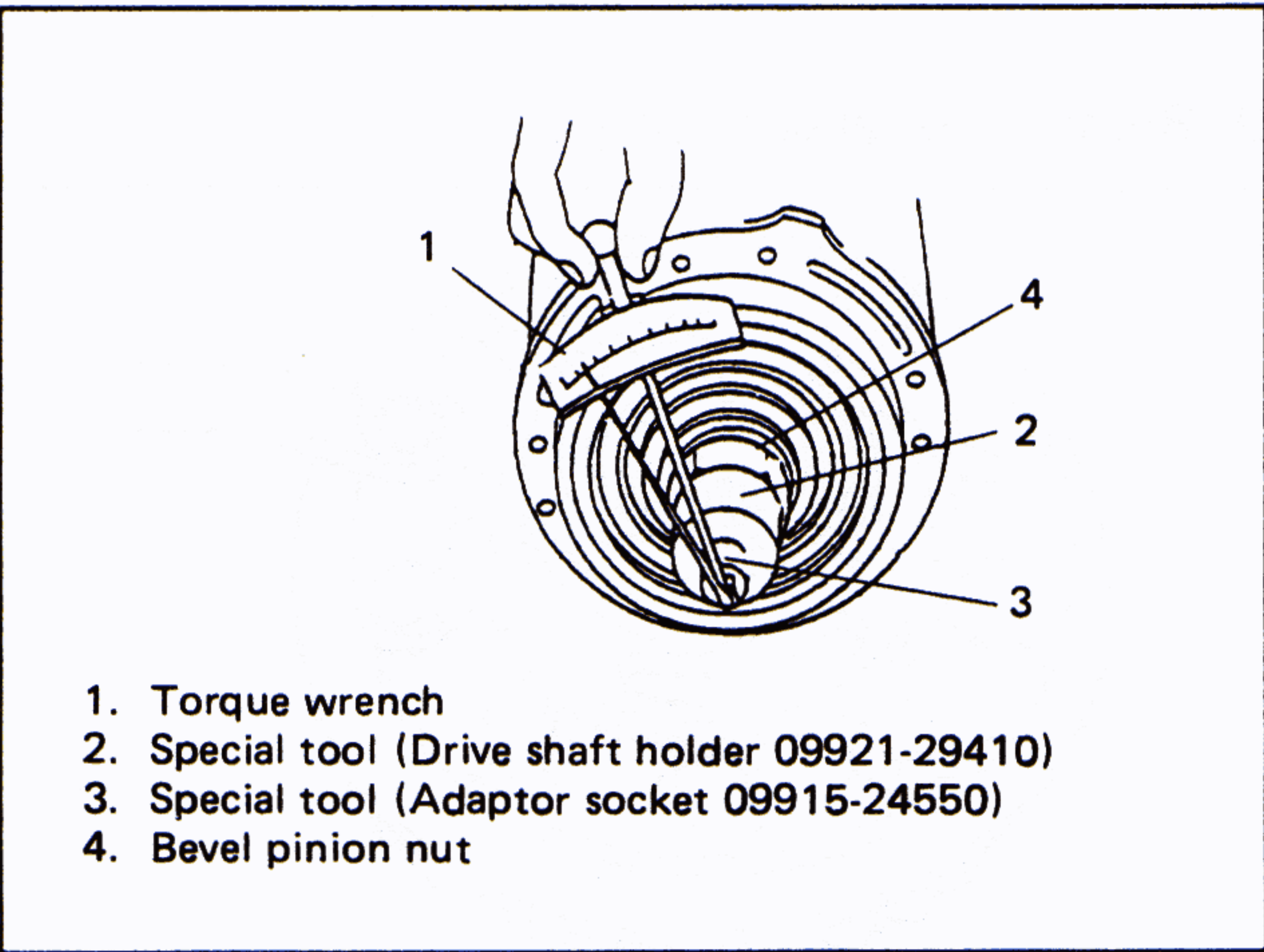


Fig. 7E-19

- Install side gear washer and spring washer in correct order, also making sure that spring washer is in correct direction.

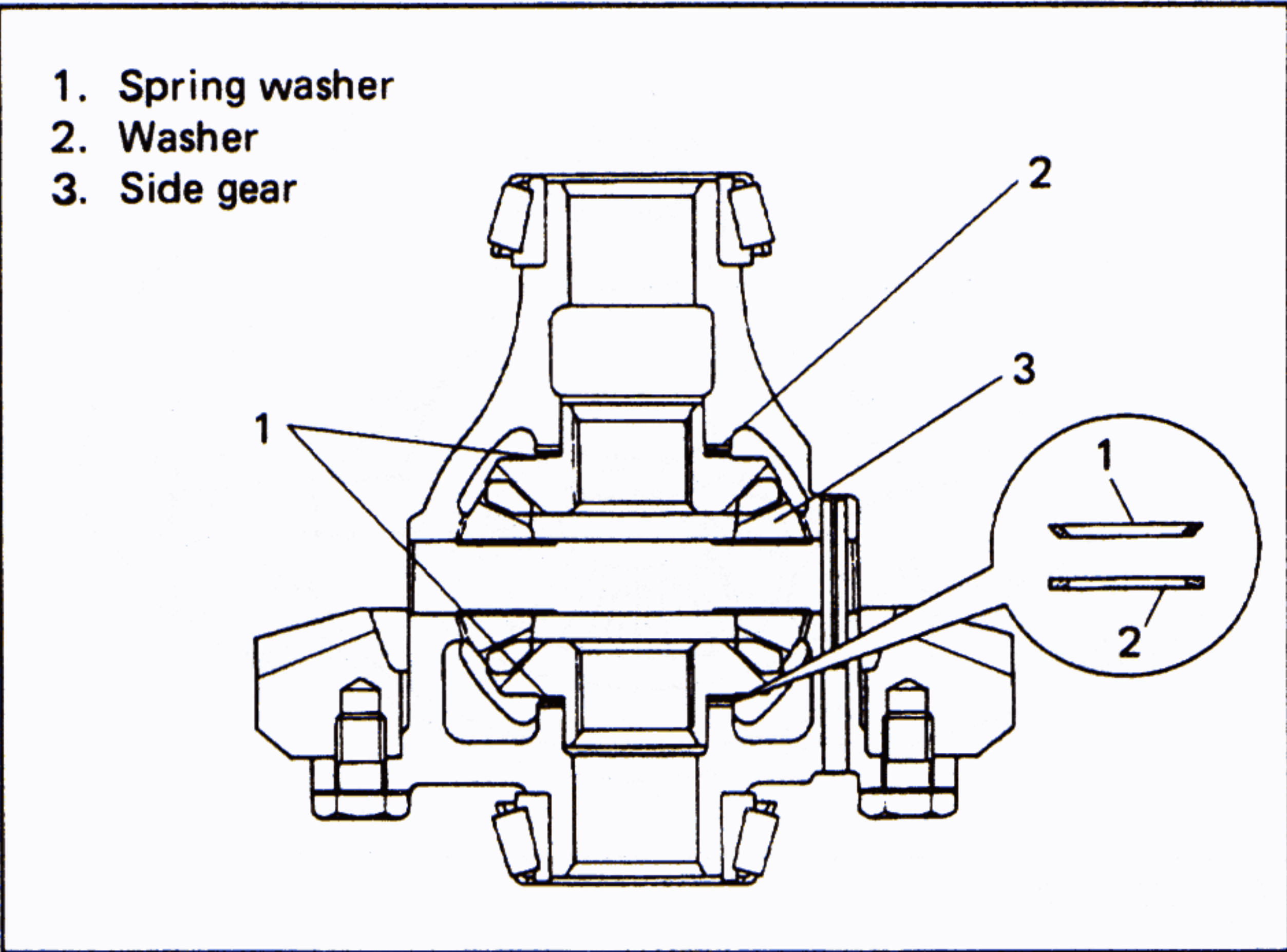


Fig. 7E-20

- Tighten bevel gear bolt to specified torque.

Tightening torque for bevel gear bolt	N·m	kg-m	lb-ft
	65 – 80	6.5 – 8.0	47.5 – 57.5

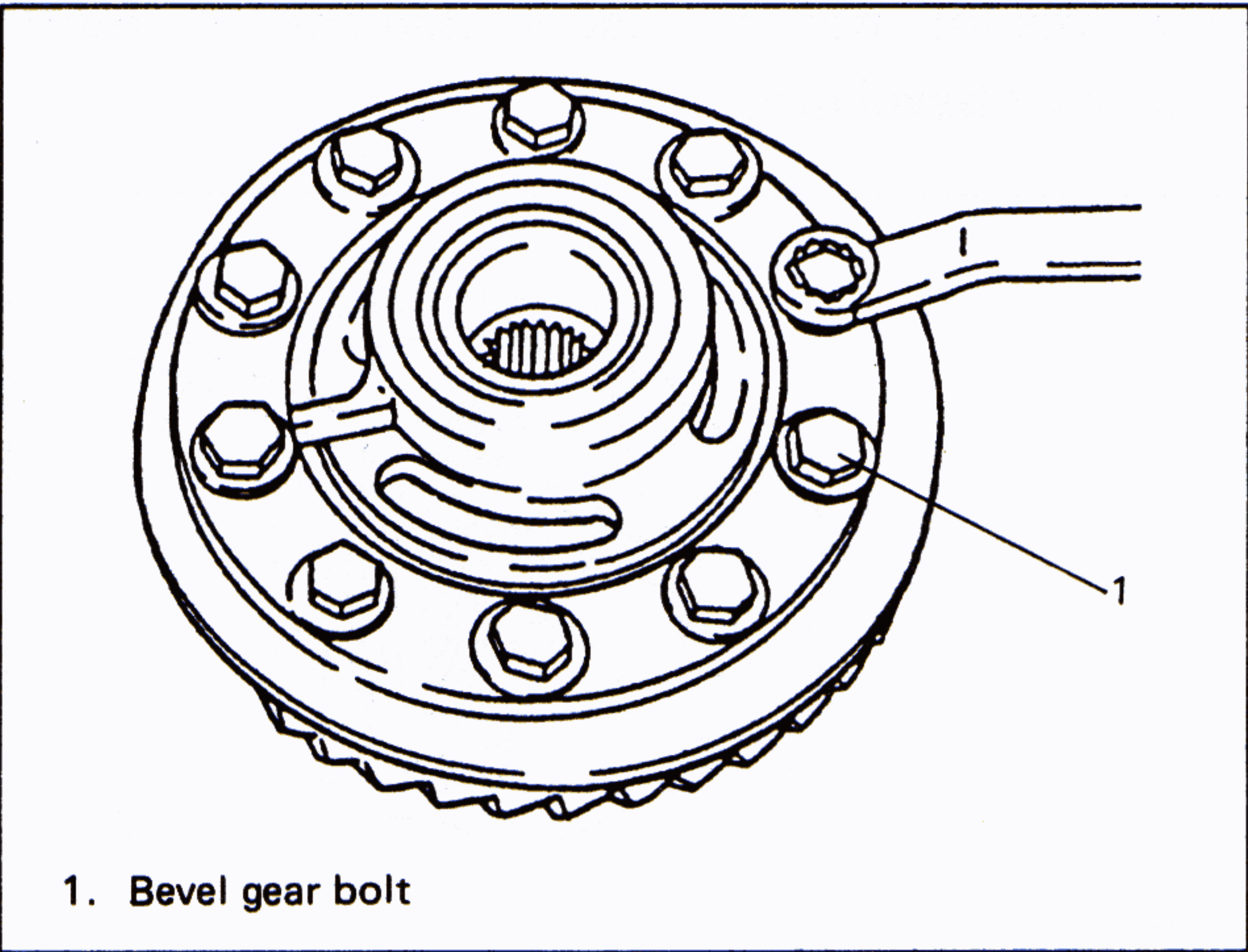


Fig. 7E-21

- Apply SUZUKI Bond No. 1215 to mating surface of case before installing it.

BEVEL PINION SHIM ADJUSTMENT

(Bevel pinion bearing shim adjustment)

1. Measure drive pinion spacer length A.

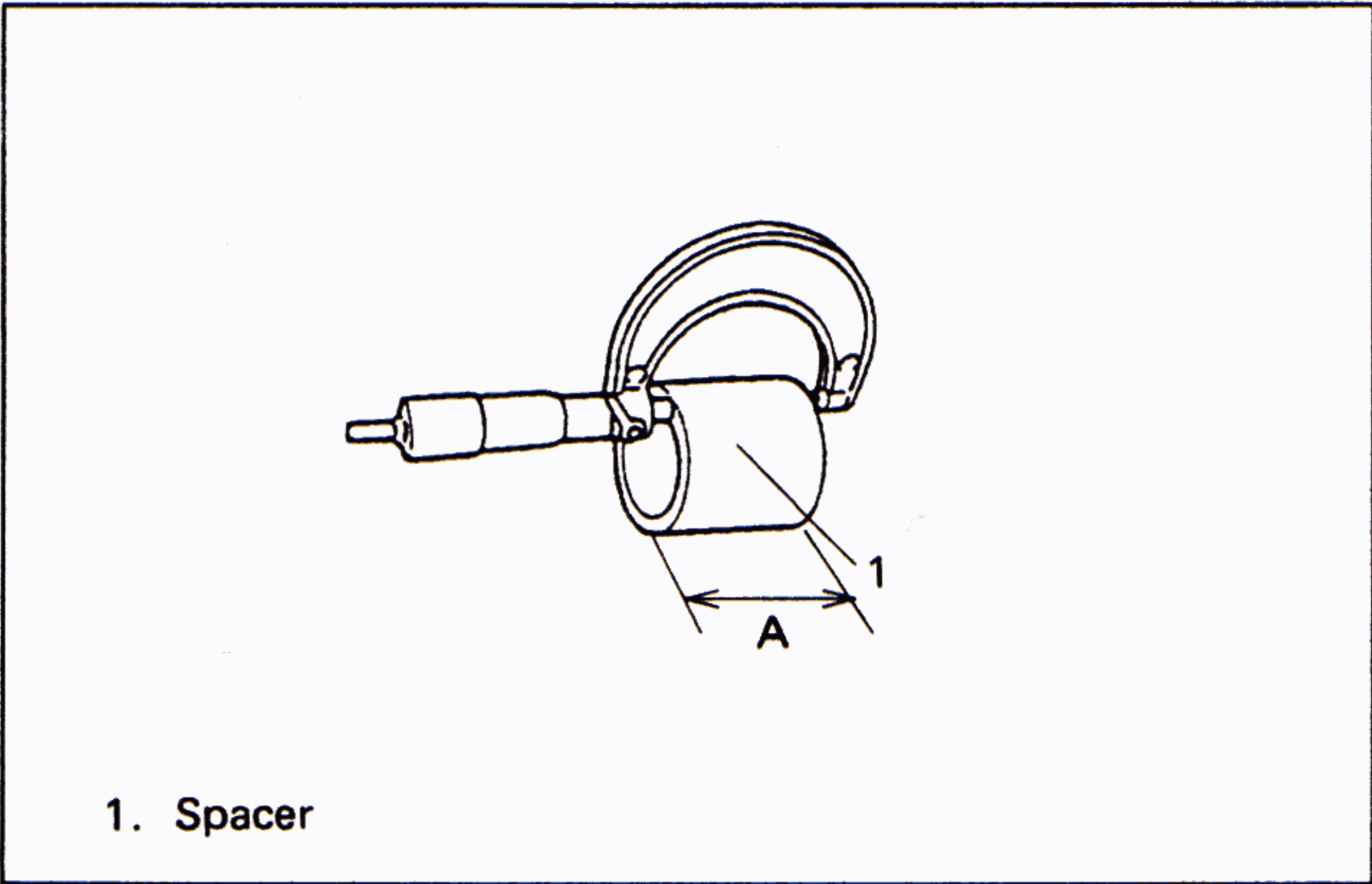


Fig. 7E-22

2. Measure level difference B between outer race and inner race of bevel pinion bearing (at both front and rear).
- Level difference at front bearing B + Level difference at rear bearing B = B'

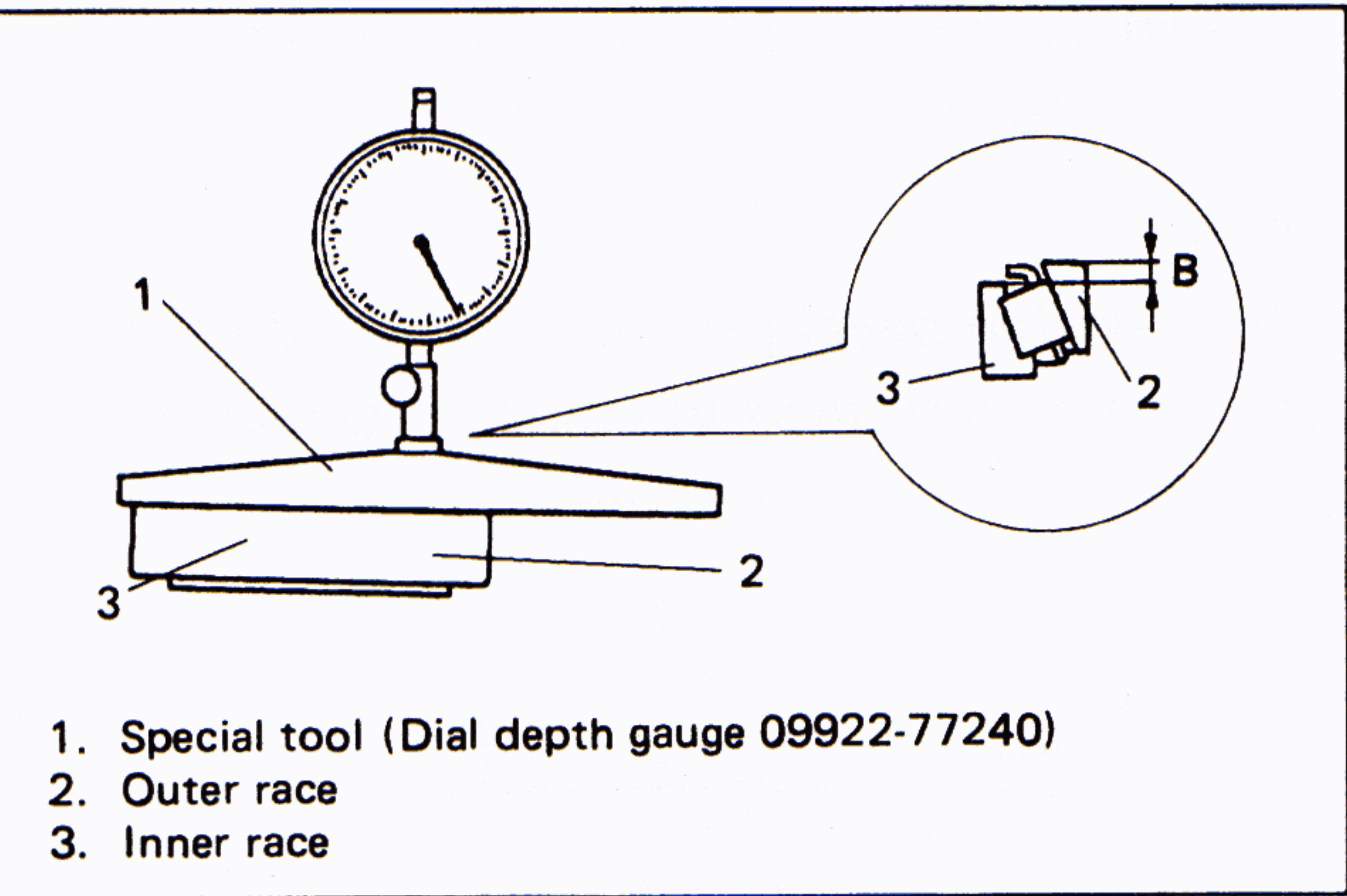


Fig. 7E-23

3. Measure dimension C of differential carrier.
- B' + C = D

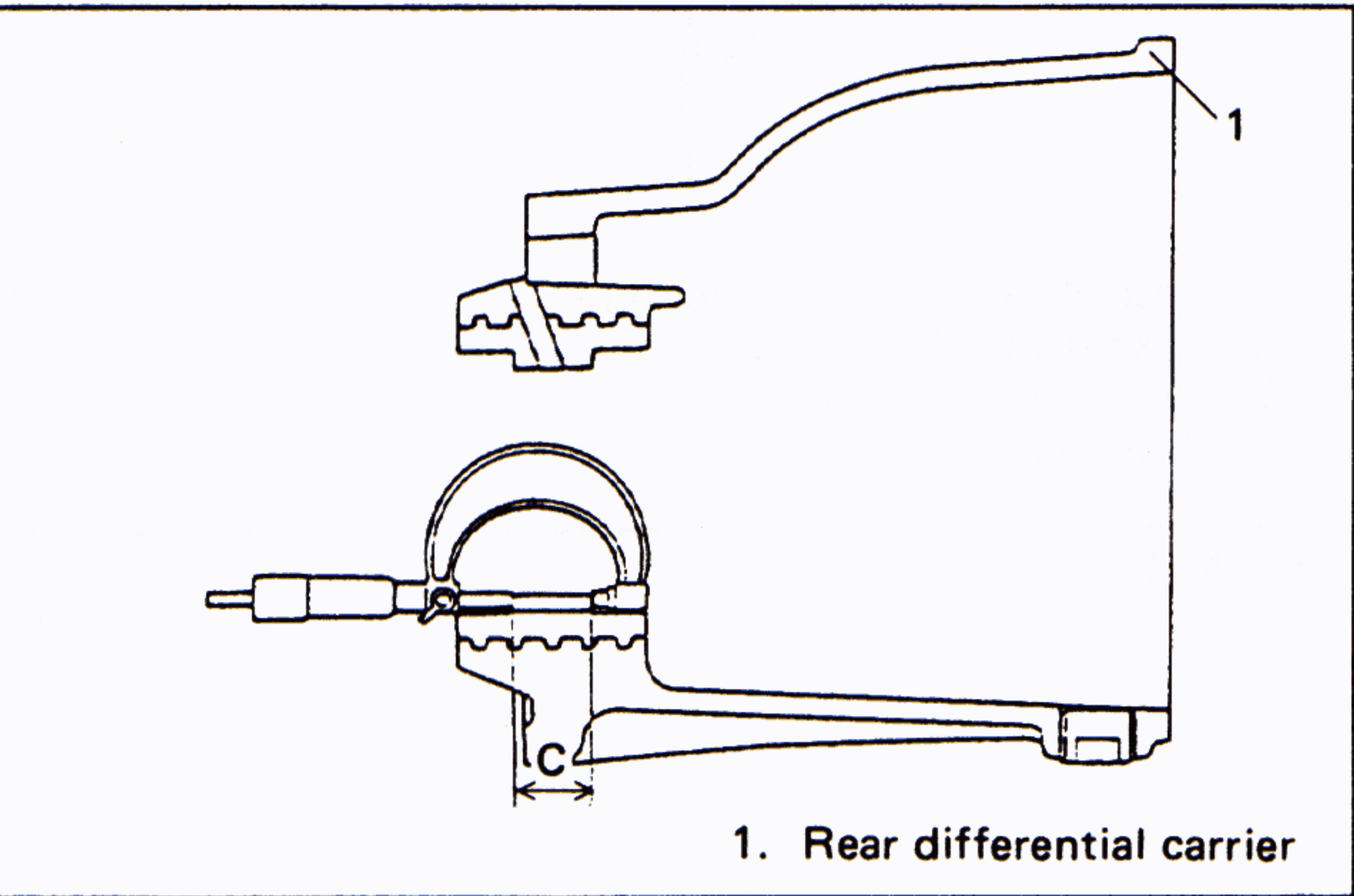


Fig. 7E-24

4. Calculate thickness of shim to be inserted into (M) in figure below.
- Shim thickness = (D – A – 0.1 ± 0.015 (mm))
5. Select necessary shim(s) so that thickness will be within above calculated value.

Available shim thickness	0.30, 0.87, 0.84, 0.81, 0.78, 0.75, 0.72, 0.69, 0.66, 0.63 and 0.60 mm 0.012, 0.034, 0.033, 0.032, 0.031, 0.029, 0.028, 0.027, 0.026, 0.025 and 0.024 in.
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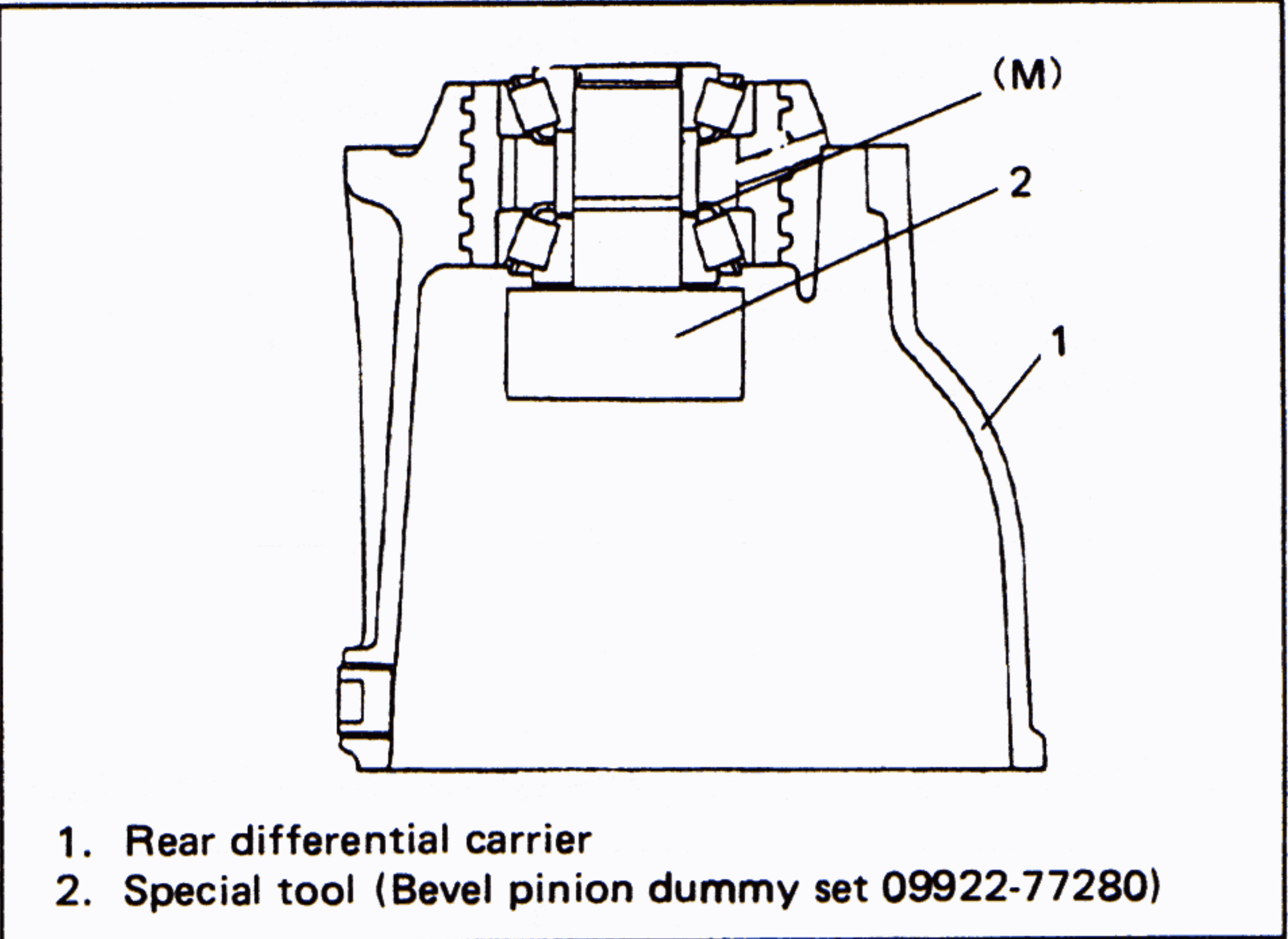


Fig. 7E-25

6. Press-fit bevel pinion bearing and outer race into differential carrier.

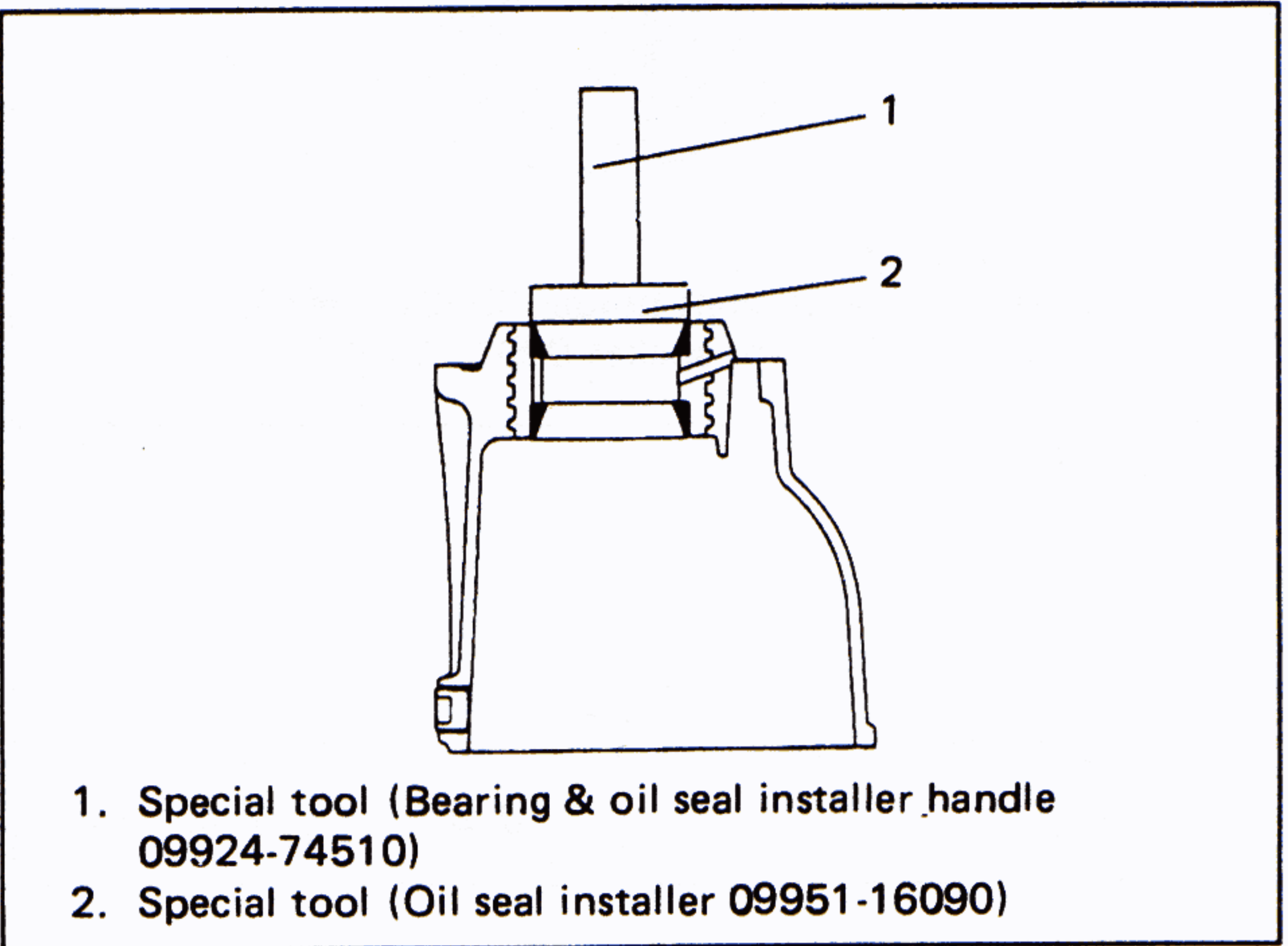


Fig. 7E-26

7. Place bearing, spacer and shim(s) on bevel pinion dummy of special tool (Bevel pinion dummy set) and tighten bevel pinion nut to specified torque.

Tightening torque for bevel pinion nut	N·m	kg·m	lb·ft
	90—150	9.0—15.0	65.5—108.0

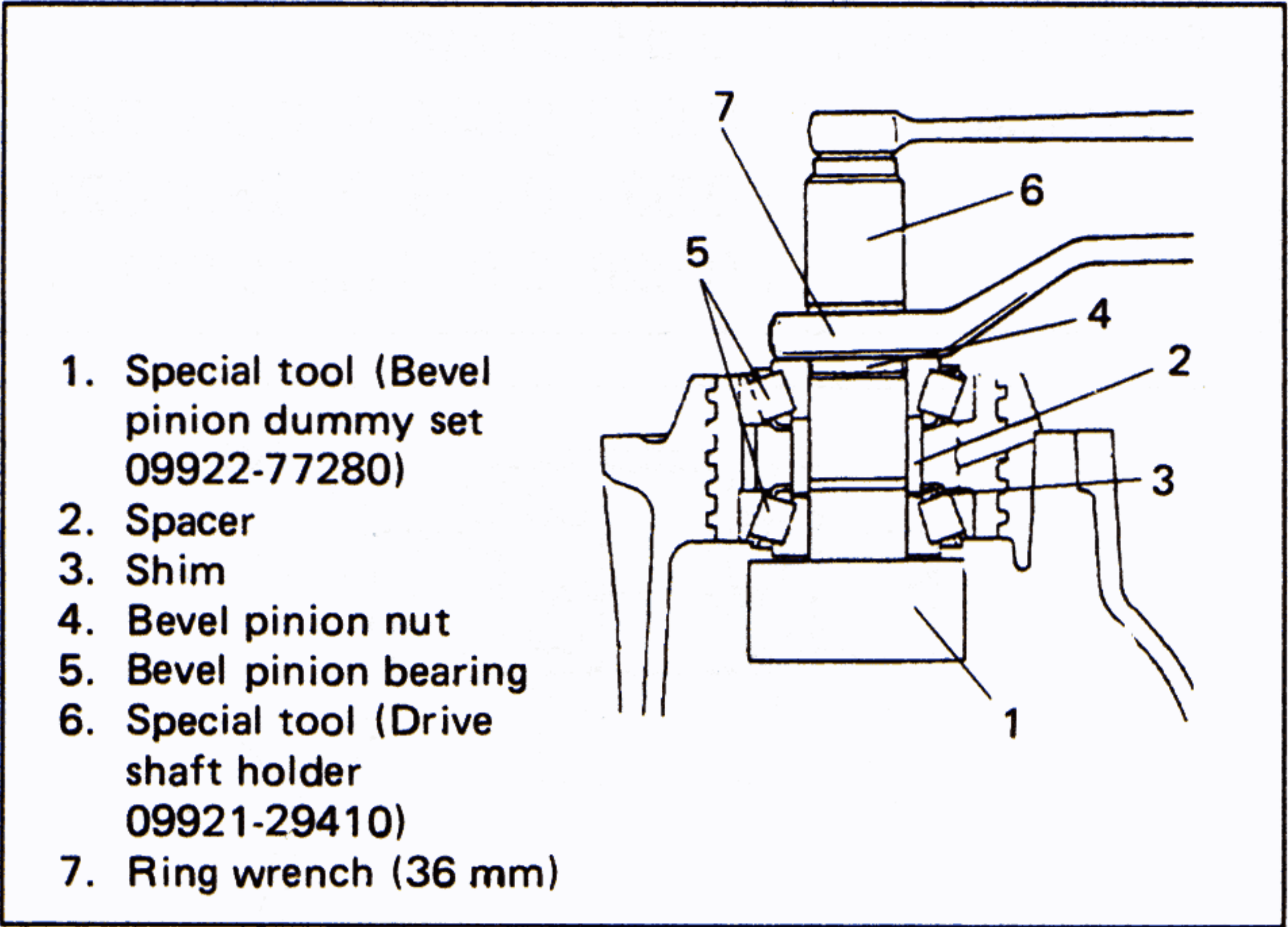


Fig. 7E-27

8. Using torque wrench, measure starting torque.

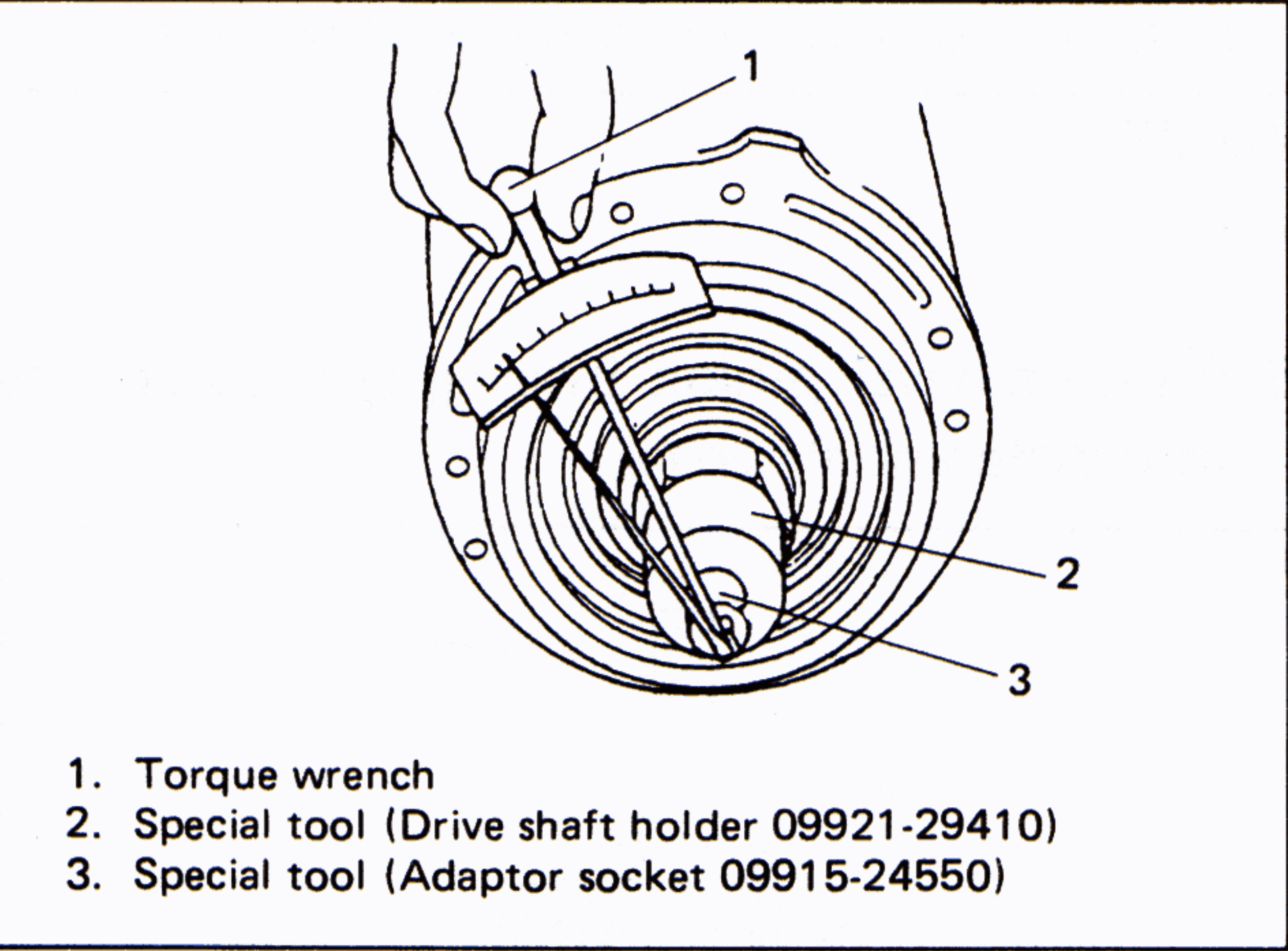


Fig. 7E-28

Standard value of preload	5 — 13 kg·cm (4.4 — 11.2 lb·in)
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- NOTE:**
- Apply thin coat of gear oil to bearing before measurement.
 - Also before measuring preload, turn taper bearing a few times to ensure its good fitting.
 - Preload can be adjusted, if only a little, by adjusting tightening torque of bevel pinion (but only within its specified range).

BEVEL PINION SHIM ADJUSTMENT

(Mounting distance adjustment)

1. Place bevel pinion adjuster on surface plate as shown and set dial gauge to "0".

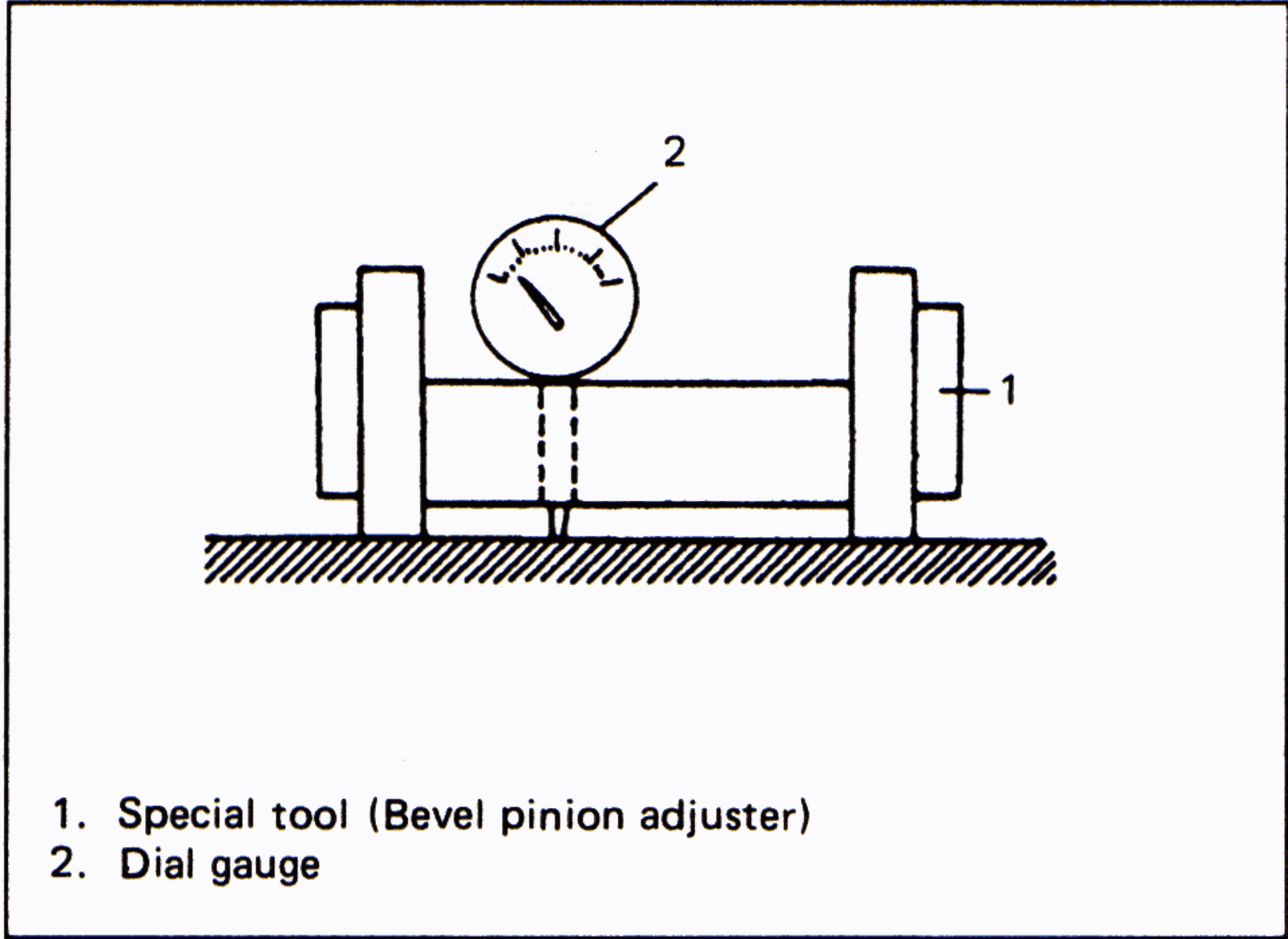


Fig. 7E-29

2. Set bevel pinion dummy, bevel pinion and bevel pinion adjuster on differential carrier. Tighten dummy pinion nut to specified torque which is 90 — 150 N·m (9.0 — 15.0 kg·m, 65.5 — 108.0 lb·ft).

NOTE:
Before setting bevel pinion dummy, adjust bevel pinion bearing shim as described previously.

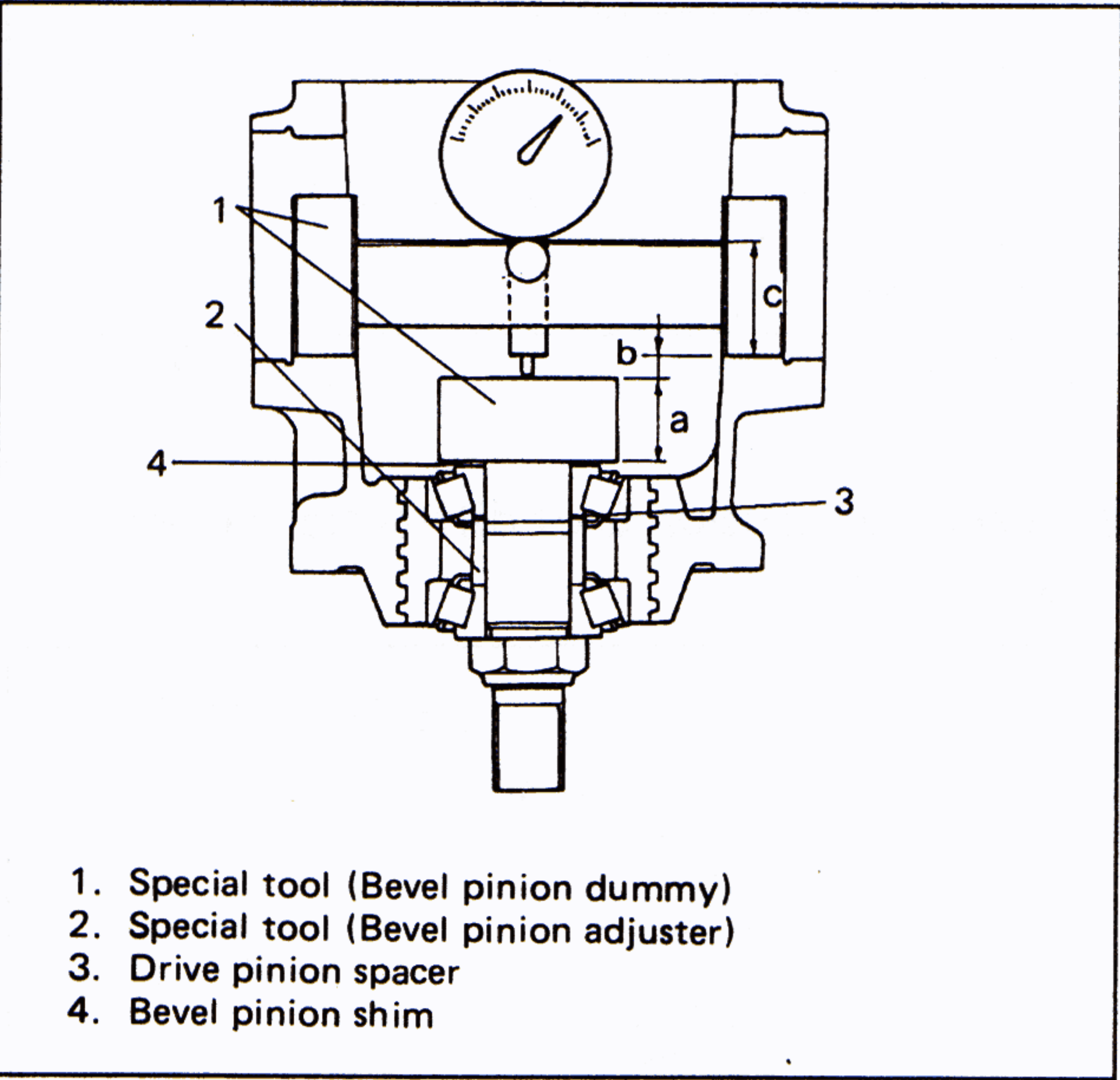


Fig. 7E-30

- 3. Measure dimension b in figure by reading dial gauge.
- 4. Calculate thickness of shim to be inserted into (4) in figure above.
Shim thickness = $(a + b + c) - 8.0 \pm 0.02$
 $= b \pm 0.02 \text{ mm}$
a + c: Measurement of special tool (mounting distance) which is 80 mm
b: Reading on dial gauge
- 5. Select necessary shim(s) so that thickness will be within above calculated value.

Available shim thickness	0.30, 0.87, 0.84, 0.81, 0.78, 0.75, 0.72, 0.69, 0.66, 0.63 and 0.60 mm 0.012, 0.034, 0.033, 0.032, 0.031, 0.029, 0.028, 0.027, 0.026, 0.025 and 0.024 in.
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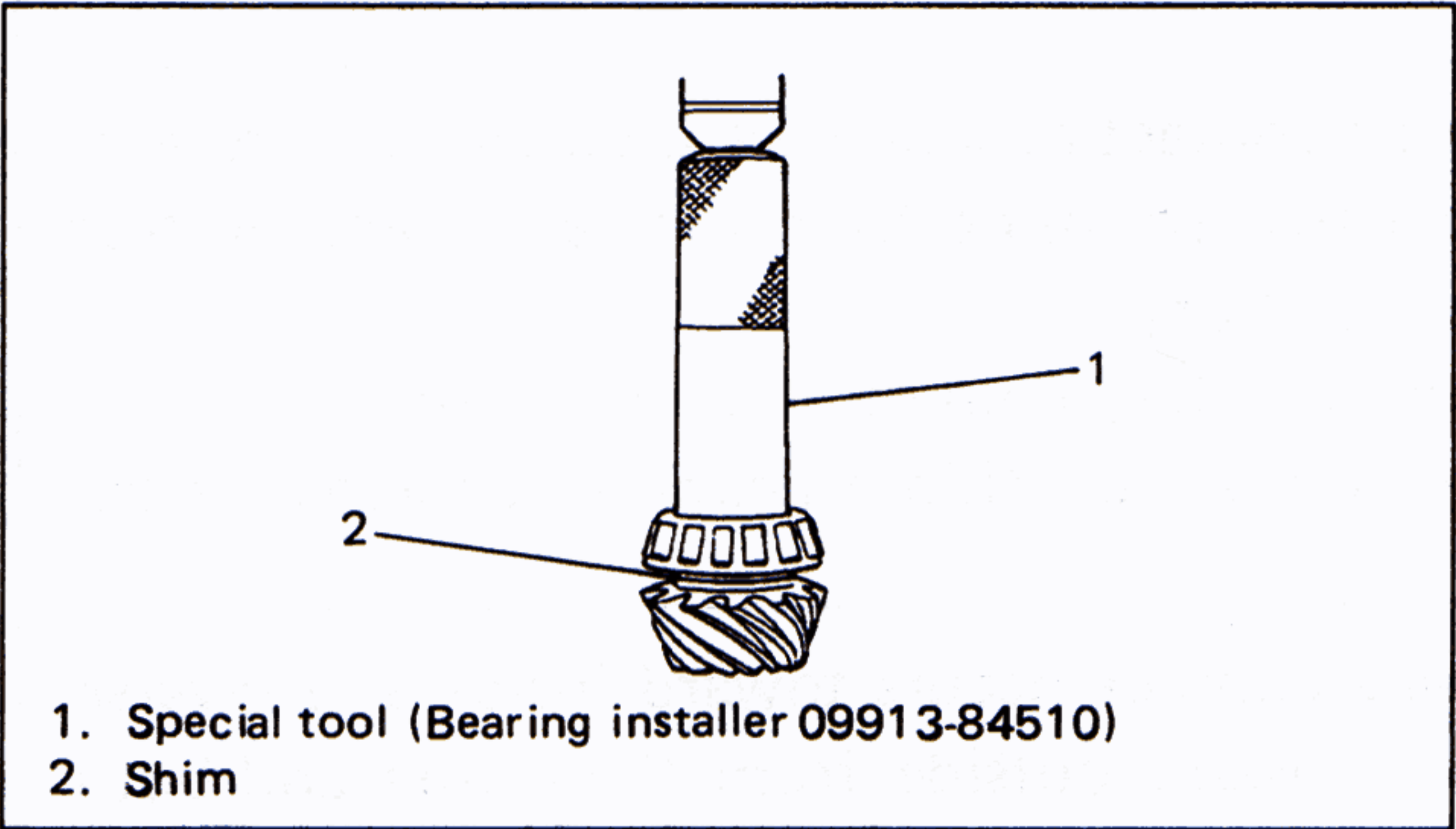


Fig. 7E-31

DRIVE BEVEL GEAR BACKLASH ADJUSTMENT AND SIDE BEARING PRELOAD ADJUSTMENT

- 1. Using special tool, tighten bearing retainer.

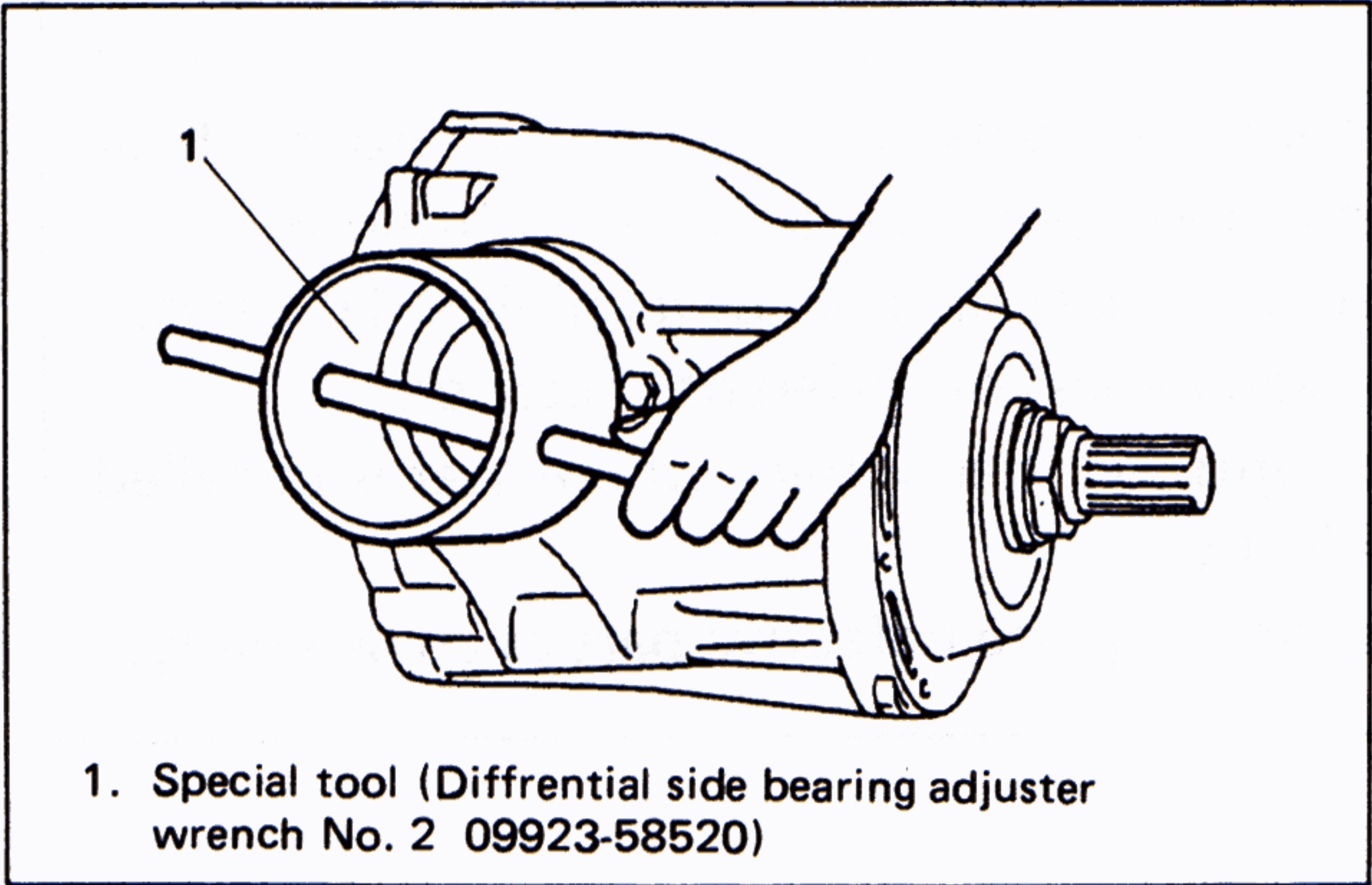


Fig. 7E-32

- 2. To measure drive bevel gear backlash, set dial gauge at right angle to bevel gear tooth, fix drive bevel pinion and read dial gauge while moving bevel gear.

Drive bevel gear backlash	0.1 – 0.2 mm (0.004 – 0.008 in.)
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Tightening torque for retainer stopper bolt	N·m	kg·m	lb·ft
	9 – 13	0.9 – 1.3	7.0 – 9.0

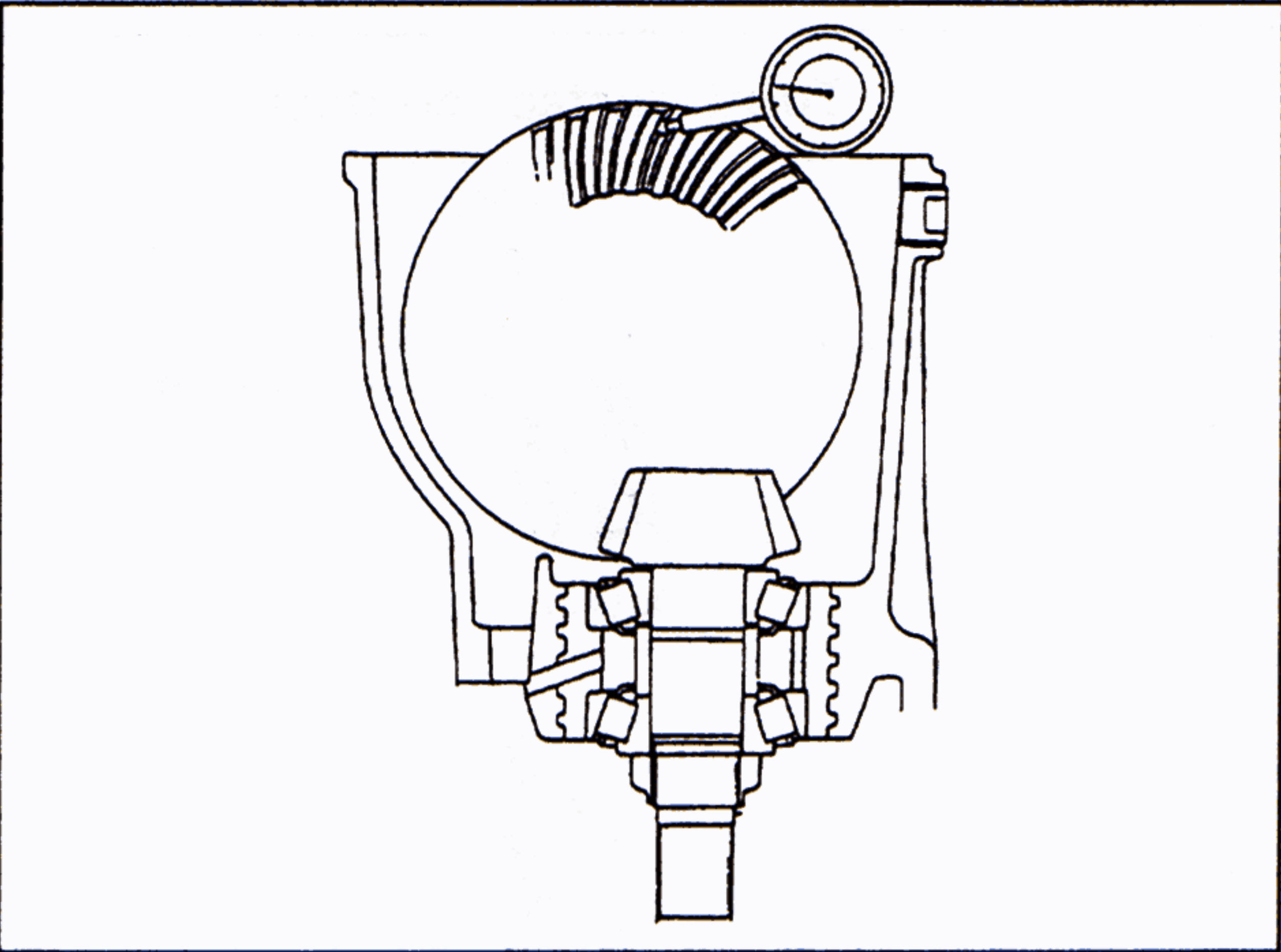


Fig. 7E-33

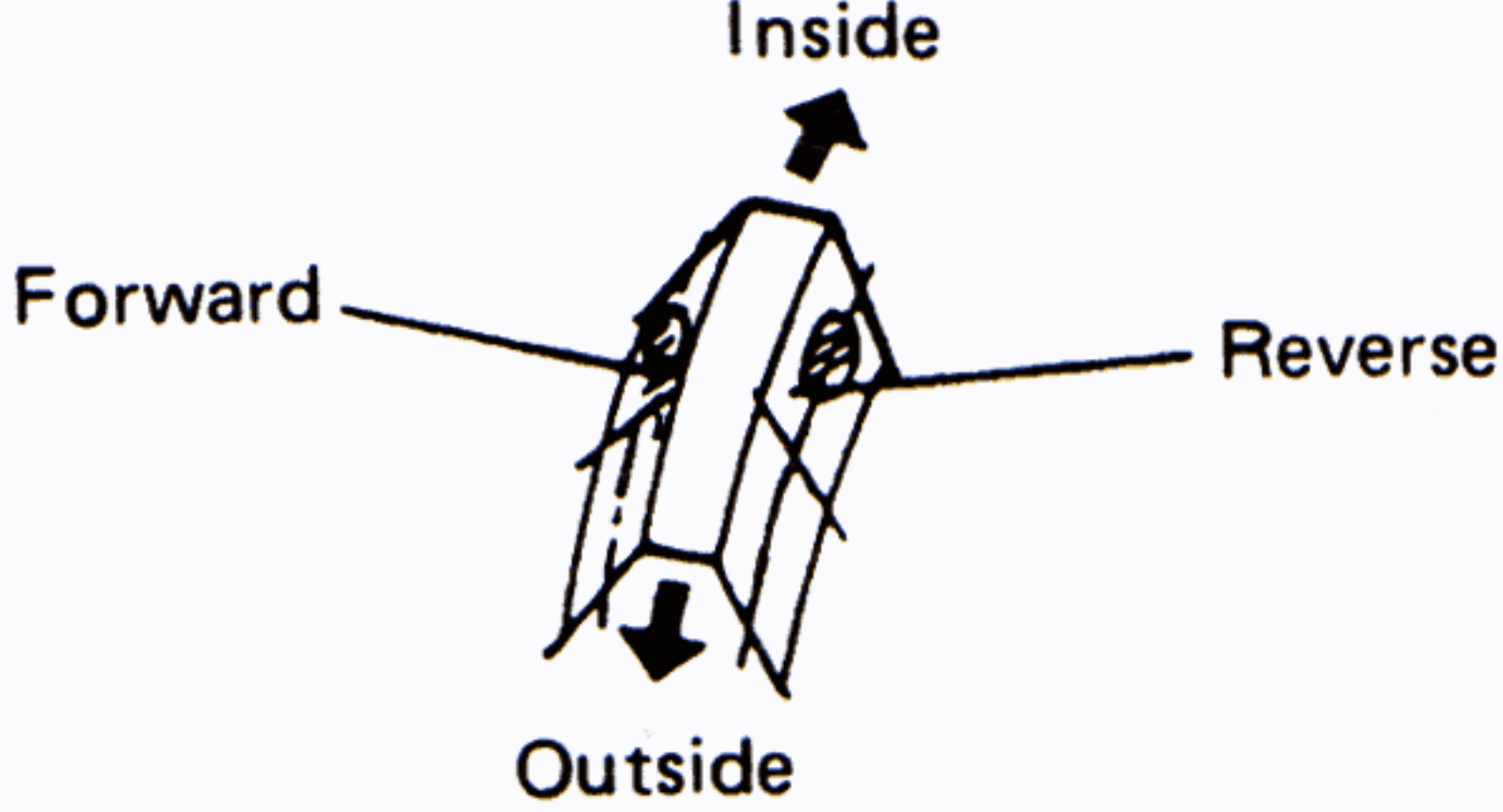
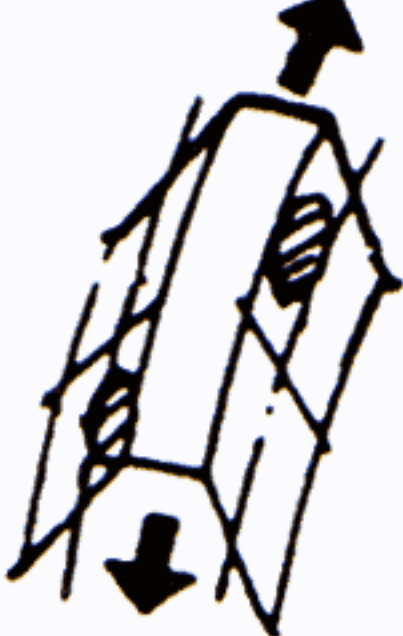
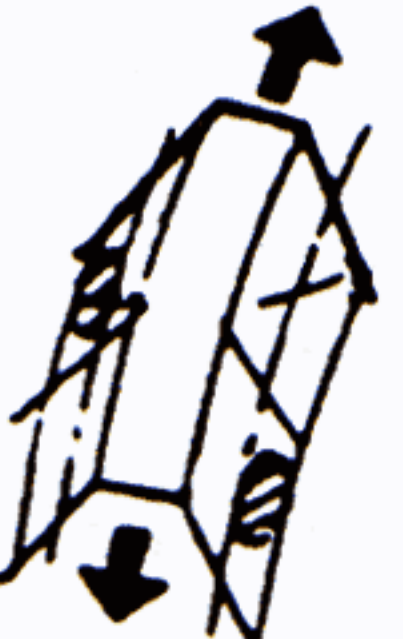
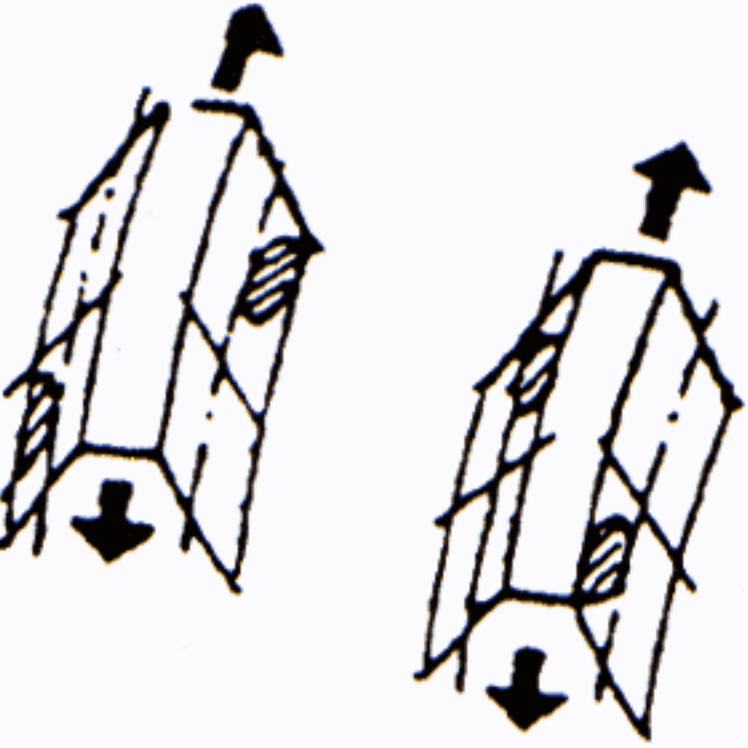
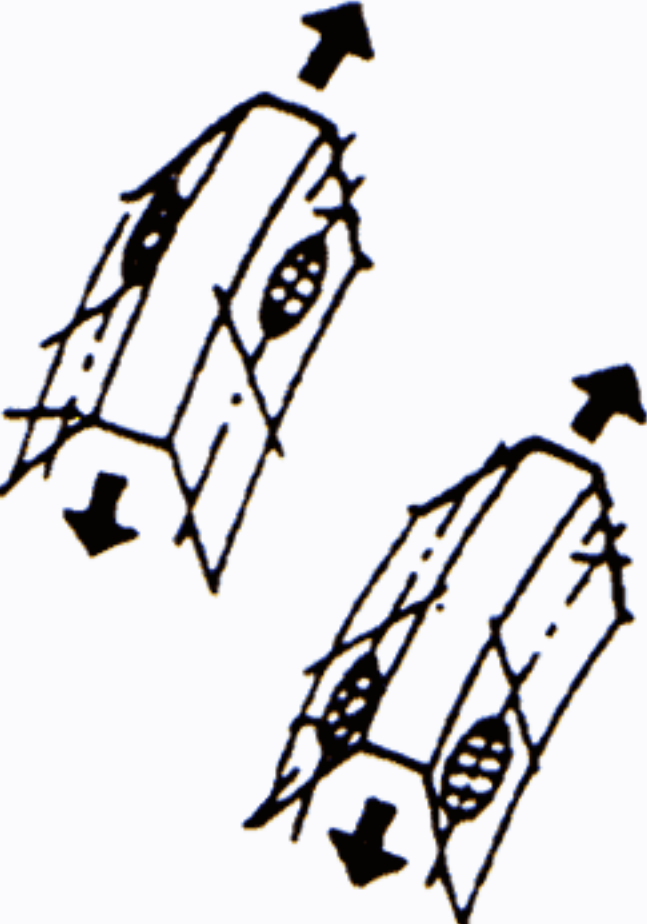
- 3. With bevel gear installed, measure starting torque by using differential preload adjusting tool. If bevel pinion starting torque and side bearing starting torque with bevel gear installed (bevel pinion bearing + side bearing preload) is within standard value, side bearing preload is satisfactory.

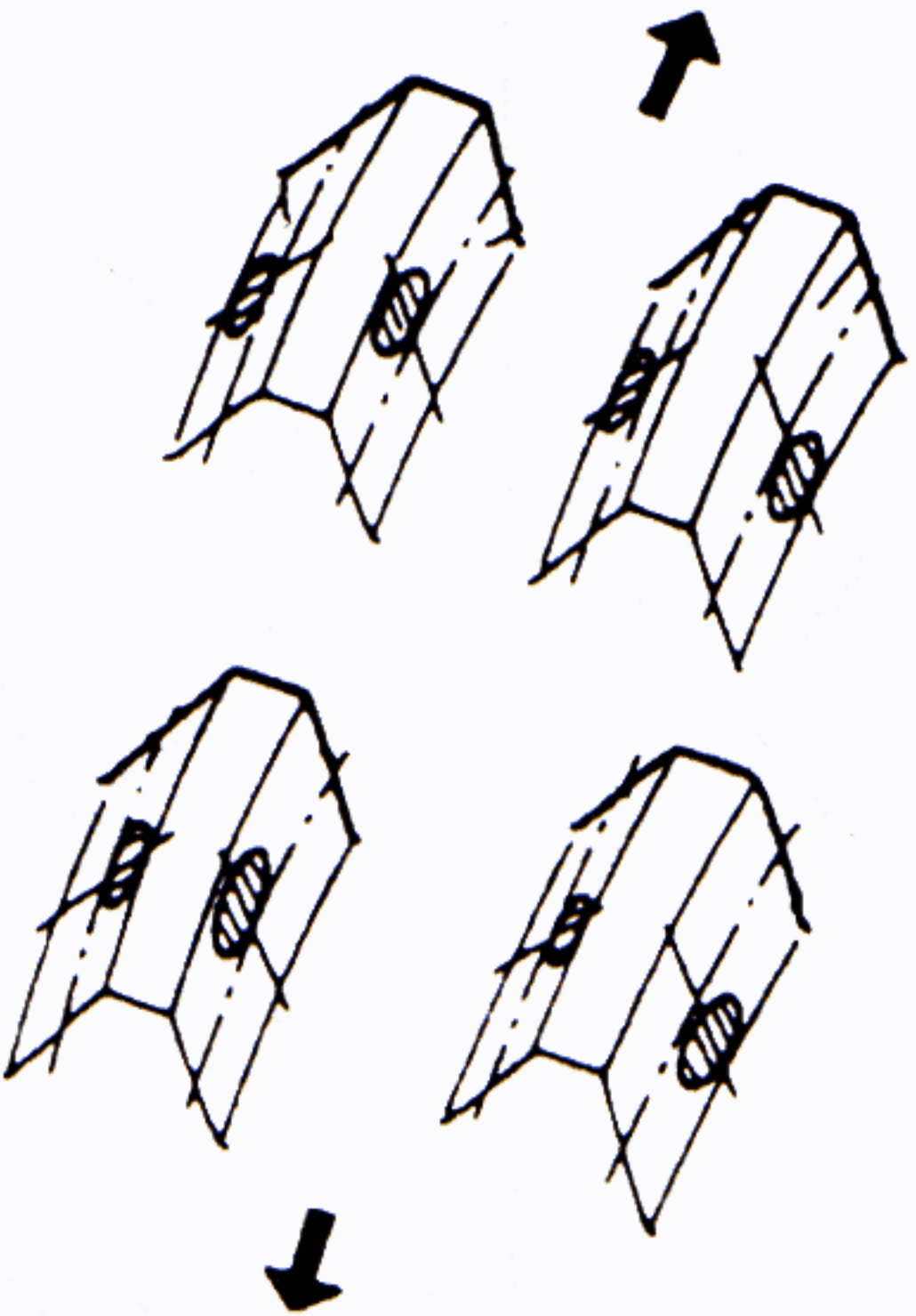
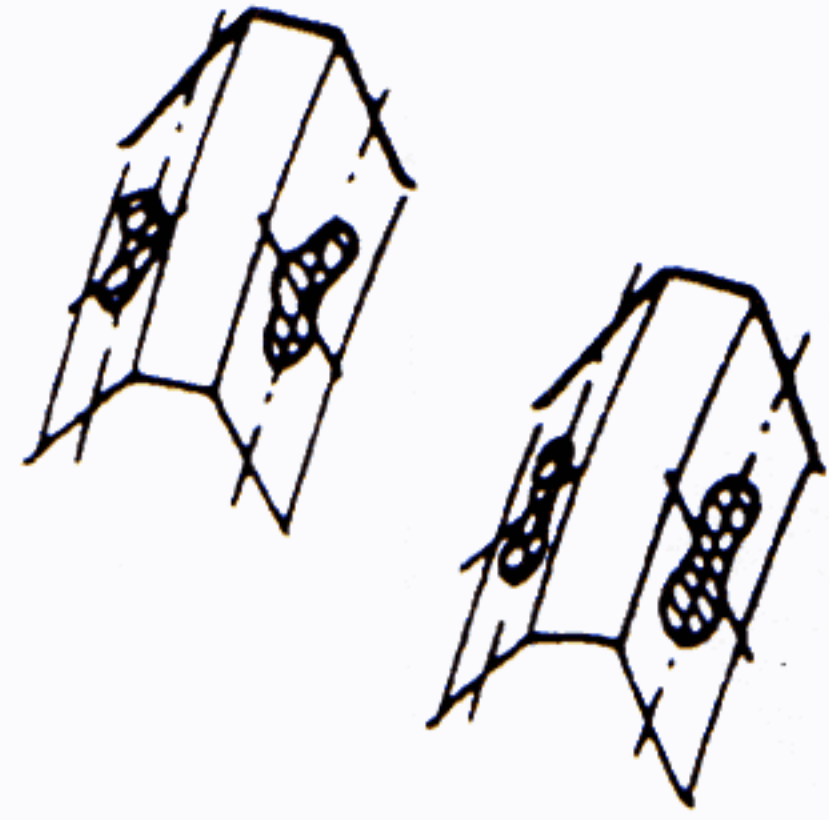
Side bearing pre-load standard value	Measured bevel pinion preload + 4 kg·cm 3.5 lb-in)
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INSPECTION OF GEAR TOOTH SURFACE CONTACT

Upon completion of assembly, apply red lead paste to tooth surface of drive bevel gear and turn it by hand to check its contact with drive bevel pinion. Adjust if check result is not satisfactory.

NOTE:
Apply red lead paste all around bevel gear but not so much as to become sticky.

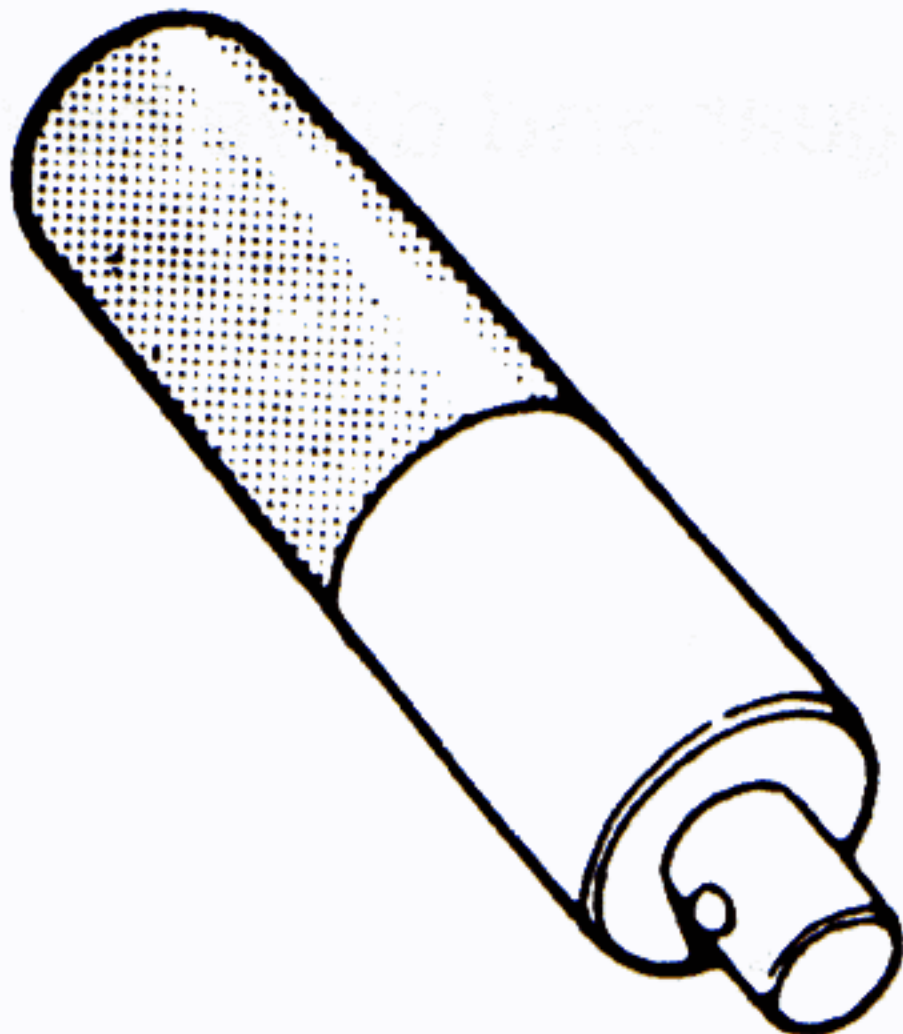
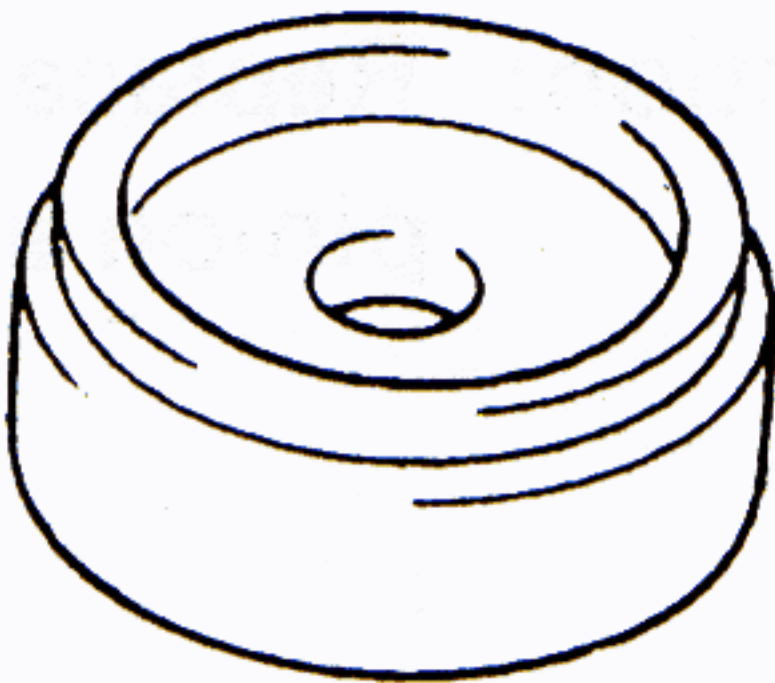
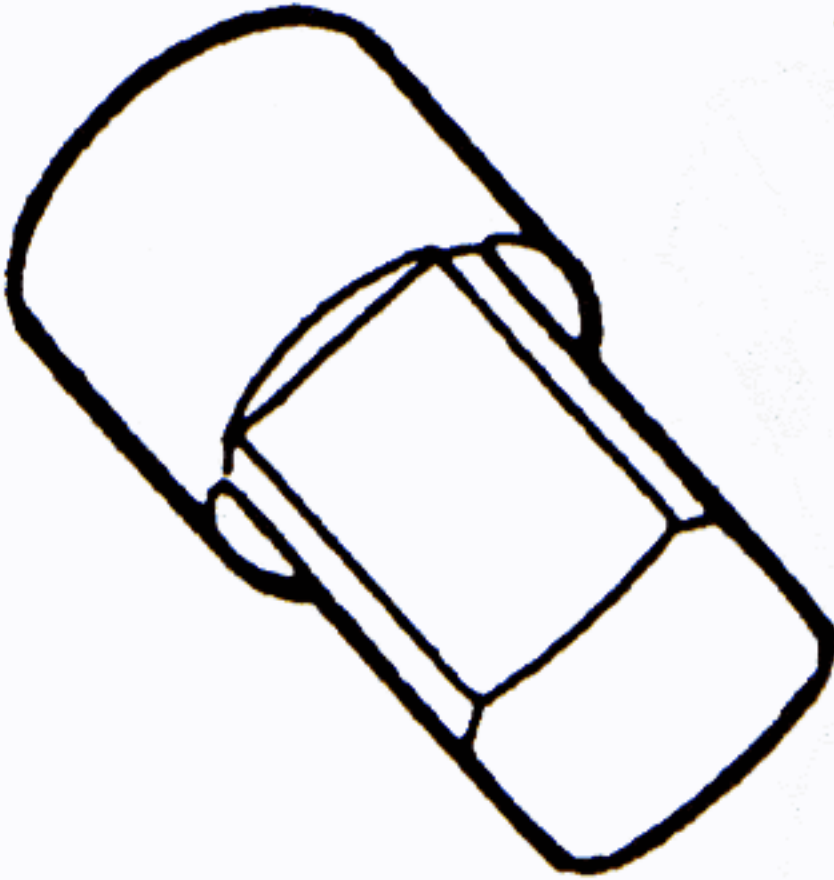
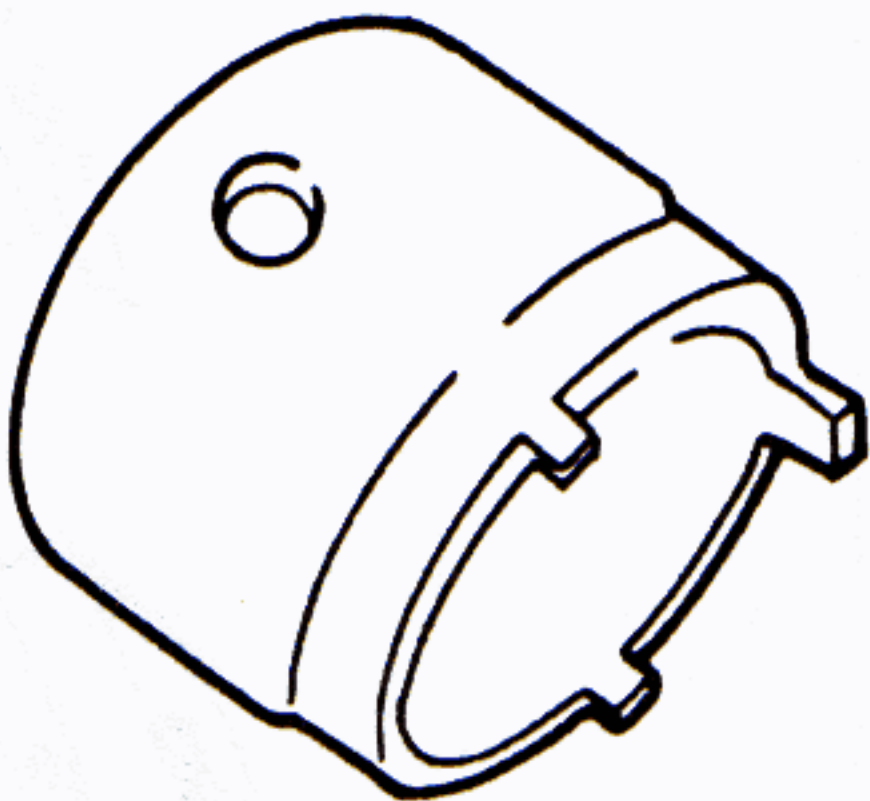
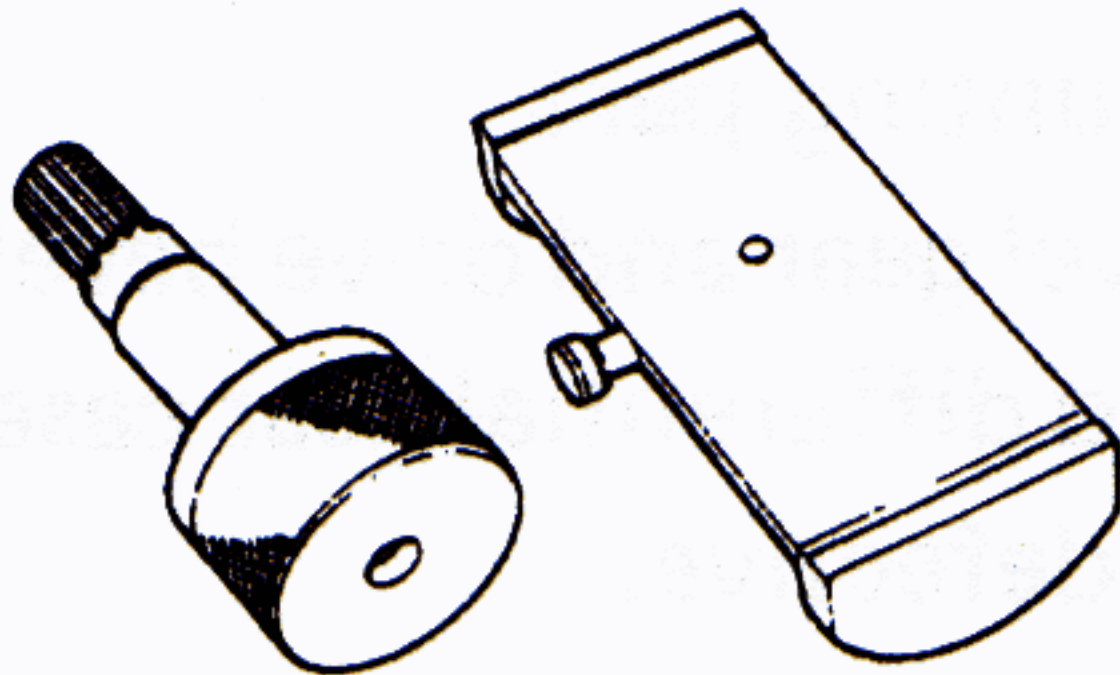
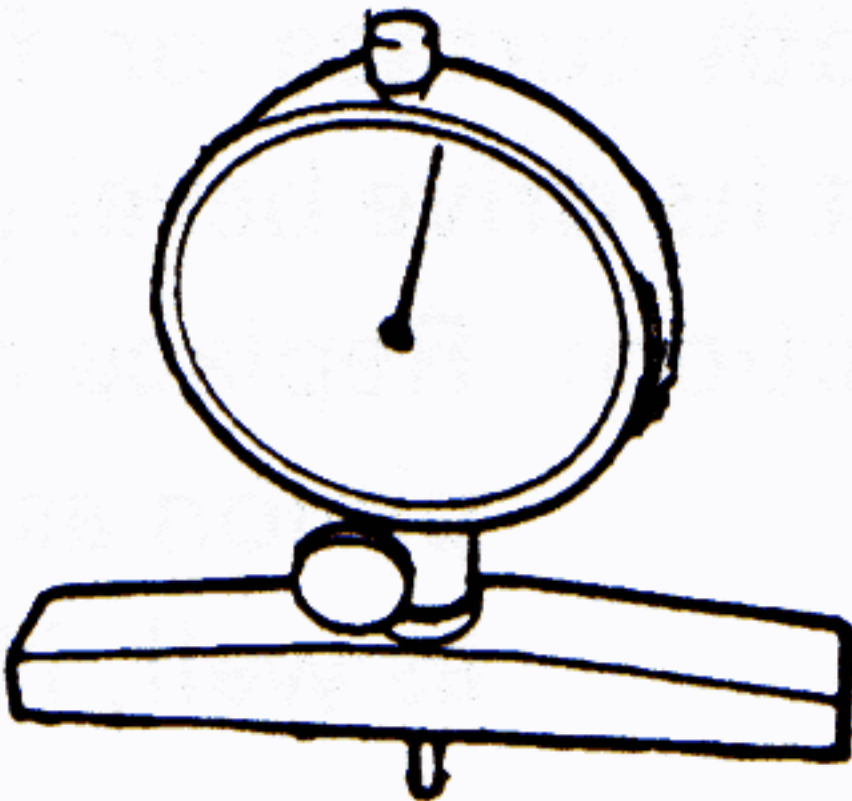
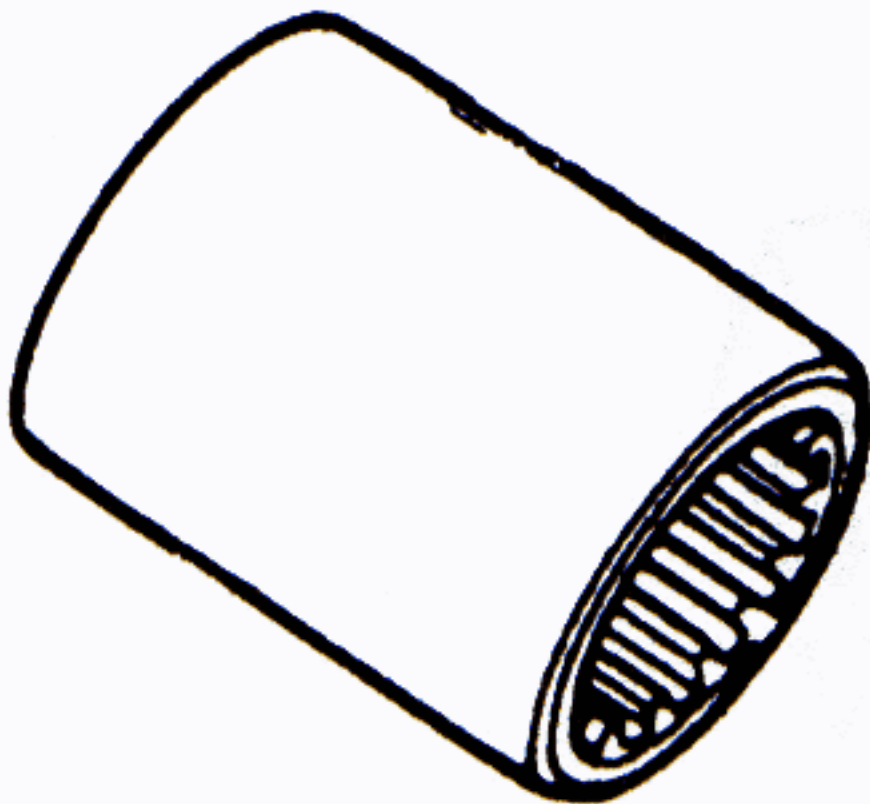
	Tooth surface contact	Possible cause and correction
Correct		Both forward and reverse contacts should occur a little toward inside from the center.
Poor shim adjustment		Forward contact occurs toward outside and reverse contact toward inside from the center and both at higher position. In such case, bevel pinion shim is too thin. Correction: Adjust shim thickness by increasing it.
		Forward contact occurs toward inside and reverse contact toward outside from the center and both at lower position. In such case, bevel pinion shim is too thick. Correction: Adjust shim thickness by reducing it.
Defect in part(s)		When tooth contacts occur as shown at the left, proper differential carrier offset (18 mm) is not obtained. Correction: Replace differential carrier.
		When tooth contacts are deviated toward inside or outside of gear, possible causes are as follows. <ul style="list-style-type: none">• Drive bevel gear or drive bevel pinion defective.• Poor squareness of differential carrier.• Differential carrier surface where gear is installed is defective. Correction: Replace defective part as an assembly.

	Tooth surface contact	Possible cause and correction
Defect in part(s)		<p>When tooth contacts occur as shown at the left, gear itself is defective.</p> <p>Correction: Replace drive bevel gear and drive bevel pinion as a set.</p>
		<p>When contact is not oval in shape, gear itself is defective. Abnormal contact is also caused by nick in tooth surface or faulty condition transmission case at its drive bevel gear mounting part.</p> <p>Correction: Replace drive bevel gear and drive bevel pinion as a set and differential gear case as well, if found defective.</p>

RECOMMENDED TORQUE SPECIFICATIONS

Fastening portion	Tightening torque		
	N·m	kg-m	lb-ft
Rear differential oil drain plug	12 – 22	1.2 – 2.2	9.0 – 15.5
Bevel pinion nut	90 – 150	9.0 – 15.0	65.5 – 108.0
Bevel gear bolt	65 – 80	6.5 – 8.0	47.5 – 57.5
Differential mount bolt	40 – 60	4.0 – 6.0	29.0 – 43.0

SPECIAL TOOLS

			
09924-74510 Bearing & oil seal installer	09951-16090 Oil seal installer	09915-24550 Adapter socket	09923-58520 Differential side bearing adjuster No. 2
			
09922-77280 Bevel pinion adjuster set	09922-77240 Dial depth gauge	09921-29410 Drive shaft holder	

REQUIRED SERVICE MATERIALS

MATERIALS	RECOMMENDED SUZUKI PRODUCT	USE
Sealant	SUZUKI BOND No. 1215 (99000-31110)	<ul style="list-style-type: none">• Mating surface of differential carrier and rear cover• Mating surface of differential carrier and viscous case• Mating surface of viscous case and propeller shaft No. 3

SECTION 8

BODY ELECTRICAL SYSTEM

CONTENTS

INSTRUMENTS AND GAUGES	8-1
Fuel Level Meter and Gauge Unit	8-1
Wiring Diagram	Wiring diagrams are attached at the end of this manual.

INSTRUMENTS AND GAUGES

FUEL LEVEL METER AND GAUGE UNIT

DESCRIPTION OF CIRCUIT

The fuel level meter circuit consists of the fuel level meter installed inside the combination meter and the fuel level gauge installed to the fuel tank.

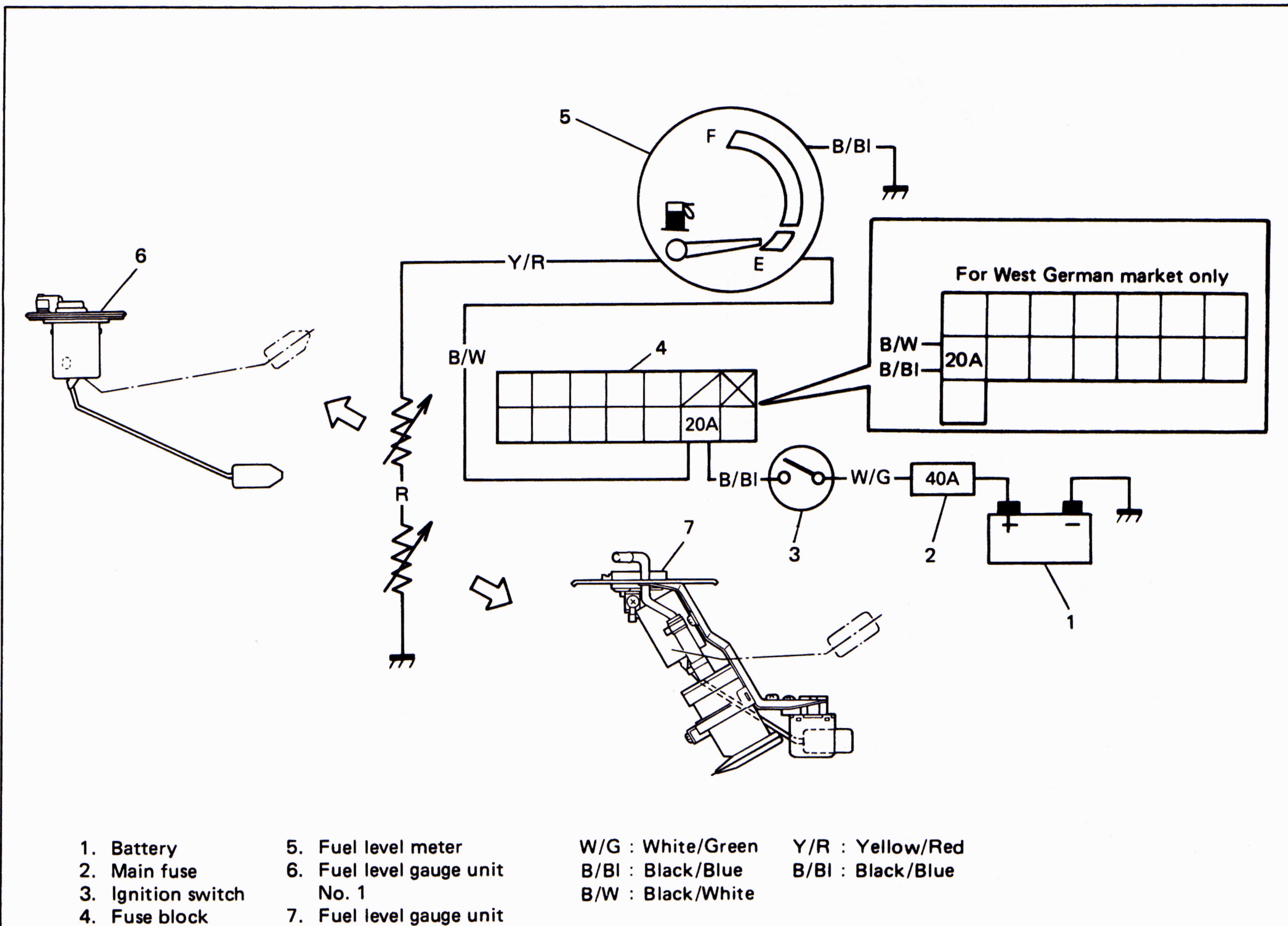


Fig. 8-1

INSPECTION

GAUGE UNIT

Use an ohmmeter to confirm that resistance of level gauge unit changes with change of float position. Float position-to-resistance relationship can be plotted in a graph as shown below.

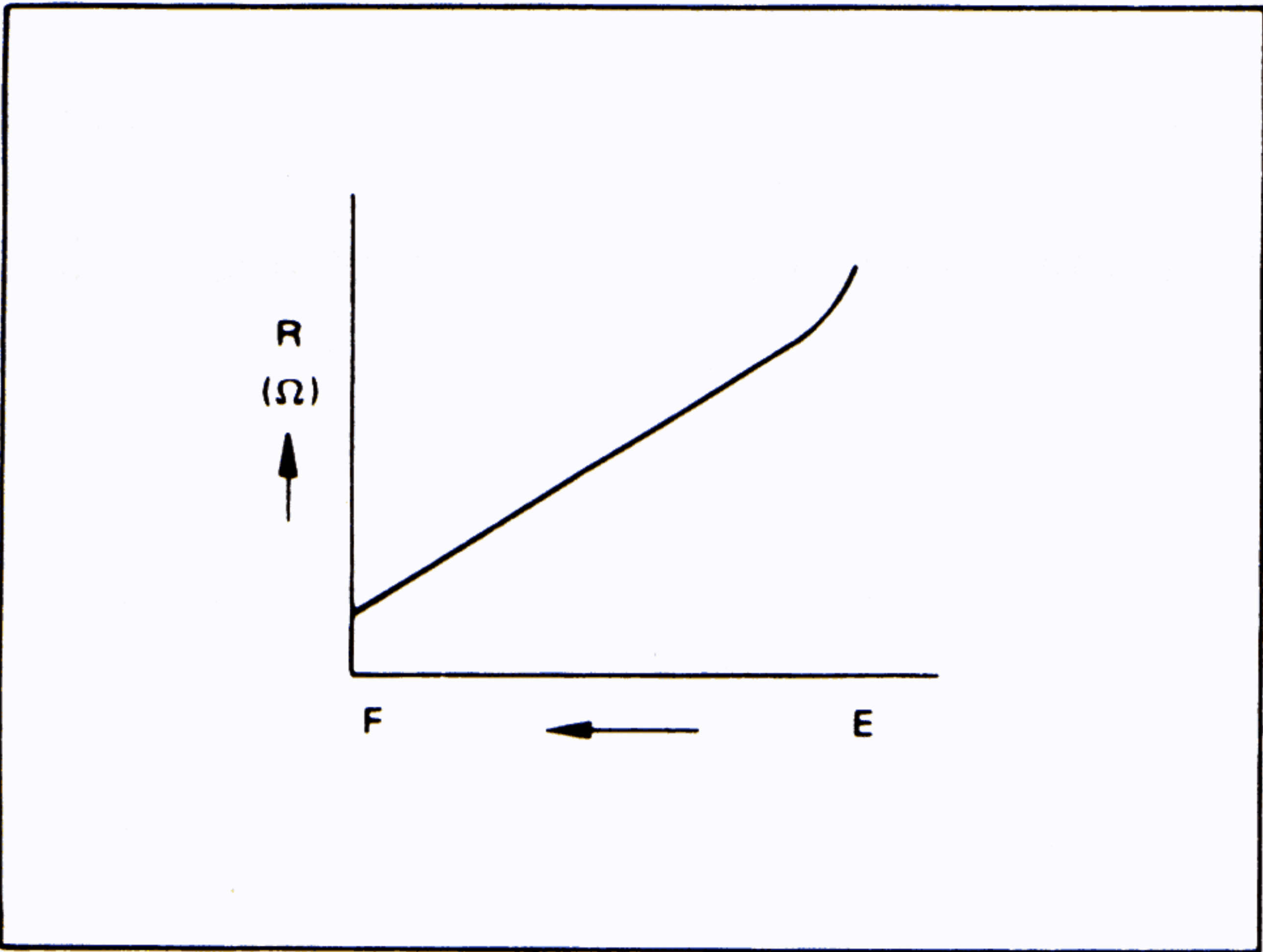


Fig. 8-2 Resistance-Fuel Level Relationship

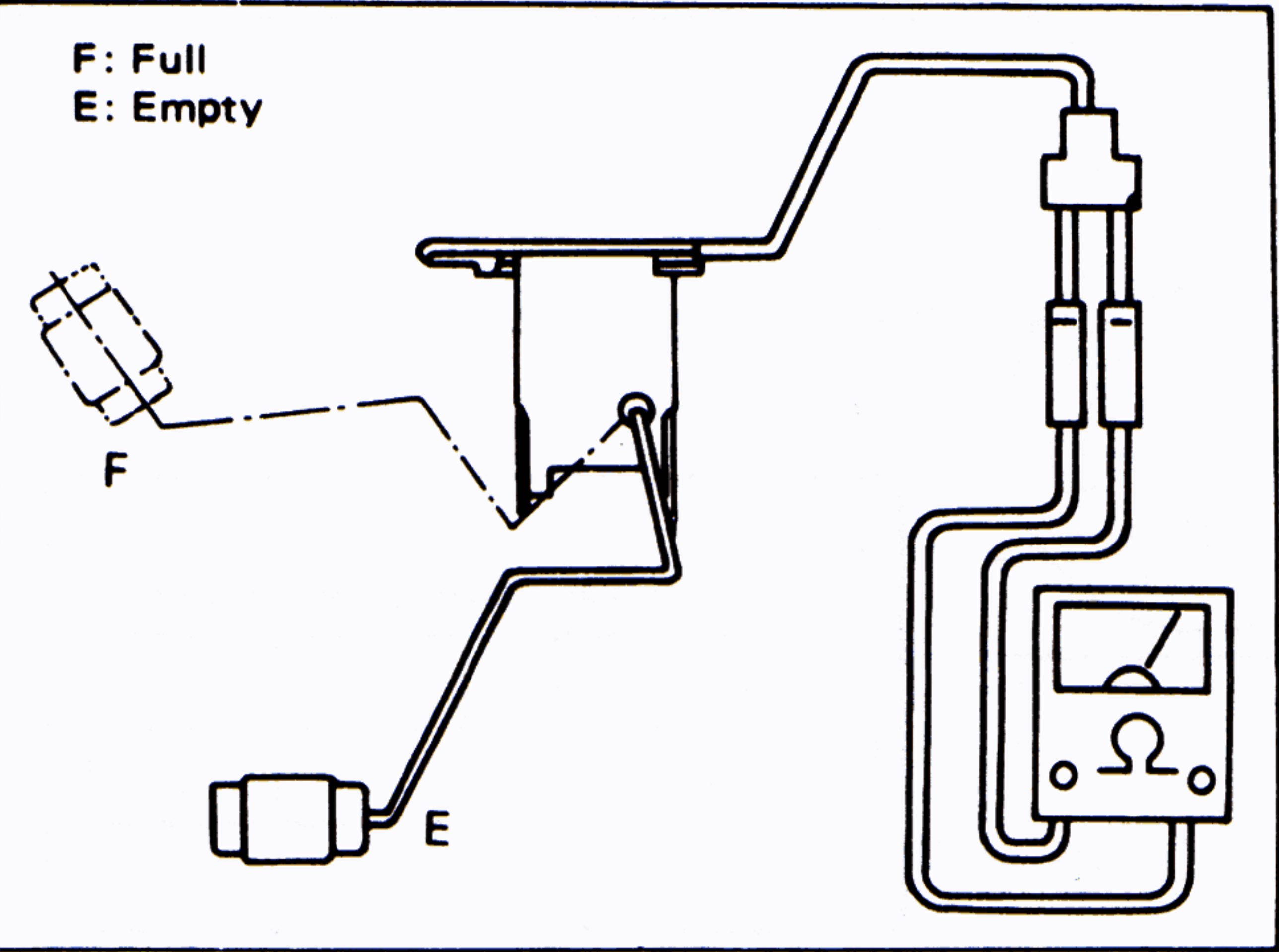


Fig. 8-3 Checking Fuel Gauge Unit

● Fuel level gauge No. 1

Position	Resistance
E	78 ± 7 Ω
F	2 ± 2 Ω

● Fuel level gauge No. 2

Position	Resistance
E	43 ± 1 Ω
F	1 ± 1 Ω

SECTION 9

BODY SERVICE

UNDERBODY DIMENSIONS

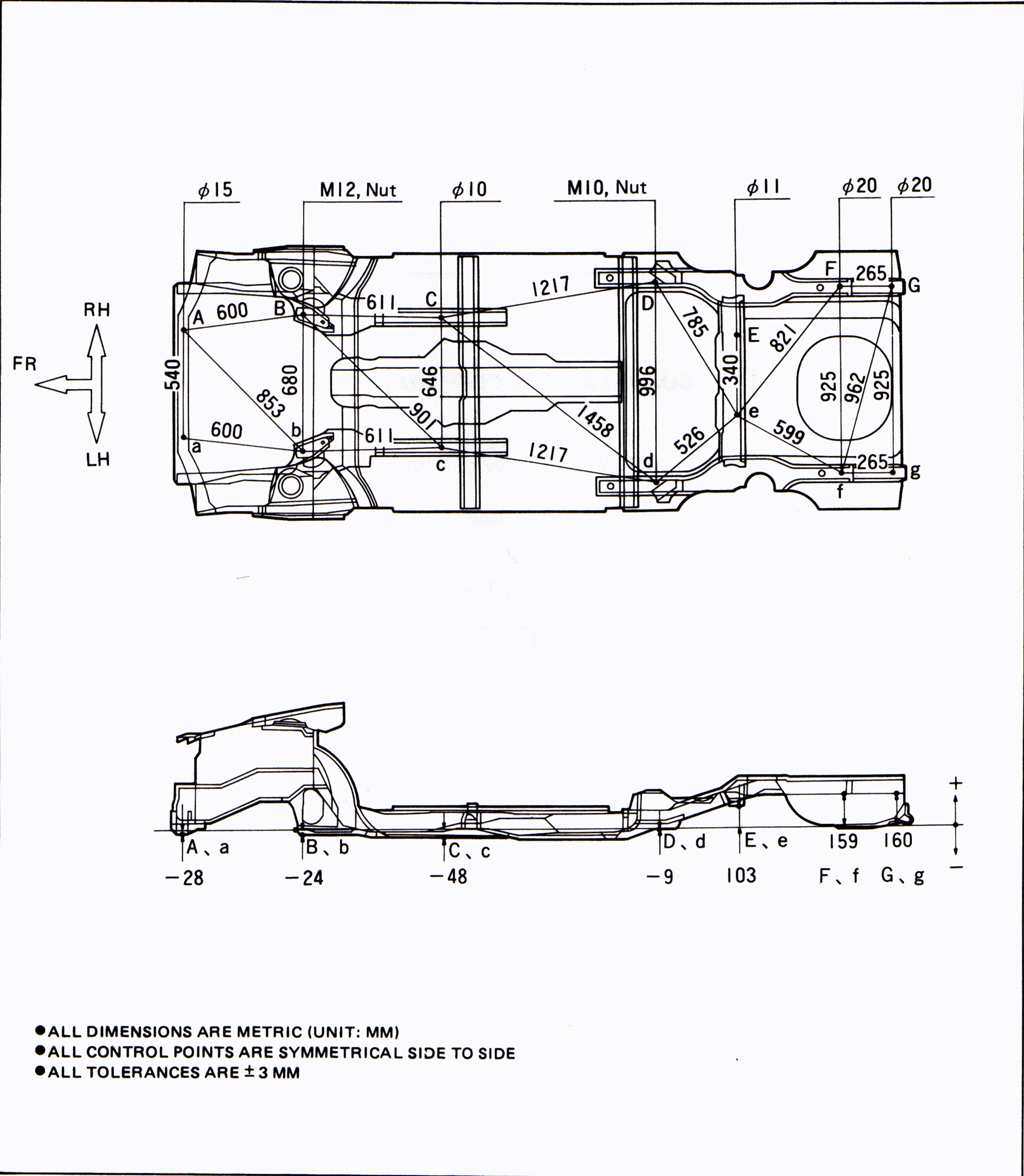


Fig. 9-1 Underbody Dimensions – 4WD Model

SUZUKI MOTOR CORPORATION