

# **TOYOTA**

## **REPAIR MANUAL SUPPLEMENT FOR CHASSIS & BODY**

# **LAND CRUISER**

## **(Heavy Duty)**

**FJ6\_, 7\_ series**

**BJ7\_ series**

**HJ6\_, 7\_ series**

**Nov., 1985**

# FOREWORD

This repair manual has been prepared to provide information covering general service repairs for the chassis and body of the TOYOTA LAND CRUISER (Heavy-Duty).

Applicable models:

FJ 62, 75 series

BJ 74 series

HJ 60, 61, 75 series

For other service items of the TOYOTA LAND CRUISER (Heavy-Duty) not listed in this manual, refer to the following repair manual.

3F Engine Repair Manual (Pub. No. 36253E)

B series Engine Repair Manual (Pub. No. 36047E)

11B, 13B, 13B-T Engine Repair Manual

(Pub. No. RM024E)

2H, 12H-T Engine Repair Manual

(Pub. No. RM012E)

A440L, A440F Automatic Transmission

Repair Manual

(Pub. No. 36264E)

LAND CRUISER (Heavy-Duty) Chassis and Body

Repair Manual

(Pub. No. 36262E)

All information in this manual is based on the latest product information at the time of publication. However, specifications and procedures are subject to change without notice.

**TOYOTA MOTOR CORPORATION**

# **TOYOTA LAND CRUISER (Heavy-Duty) REPAIR MANUAL SUPPLEMENT FOR CHASSIS & BODY**

<b>INTRODUCTION</b>	<b>IN</b>
<b>FRONT AXLE AND SUSPENSION</b>	<b>FA</b>
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<b>SERVICE SPECIFICATIONS</b>	<b>A</b>
<b>STANDARD BOLT TORQUE SPECIFICATIONS</b>	<b>B</b>
<b>SST AND SSM</b>	<b>C</b>

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# INTRODUCTION

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**IN**

# HOW TO USE THIS MANUAL

To assist you in finding your way through the manual, the Section Title and major heading are given at the top of every page.

An **INDEX** is provided on the first page of each section to guide you to the item to be repaired.

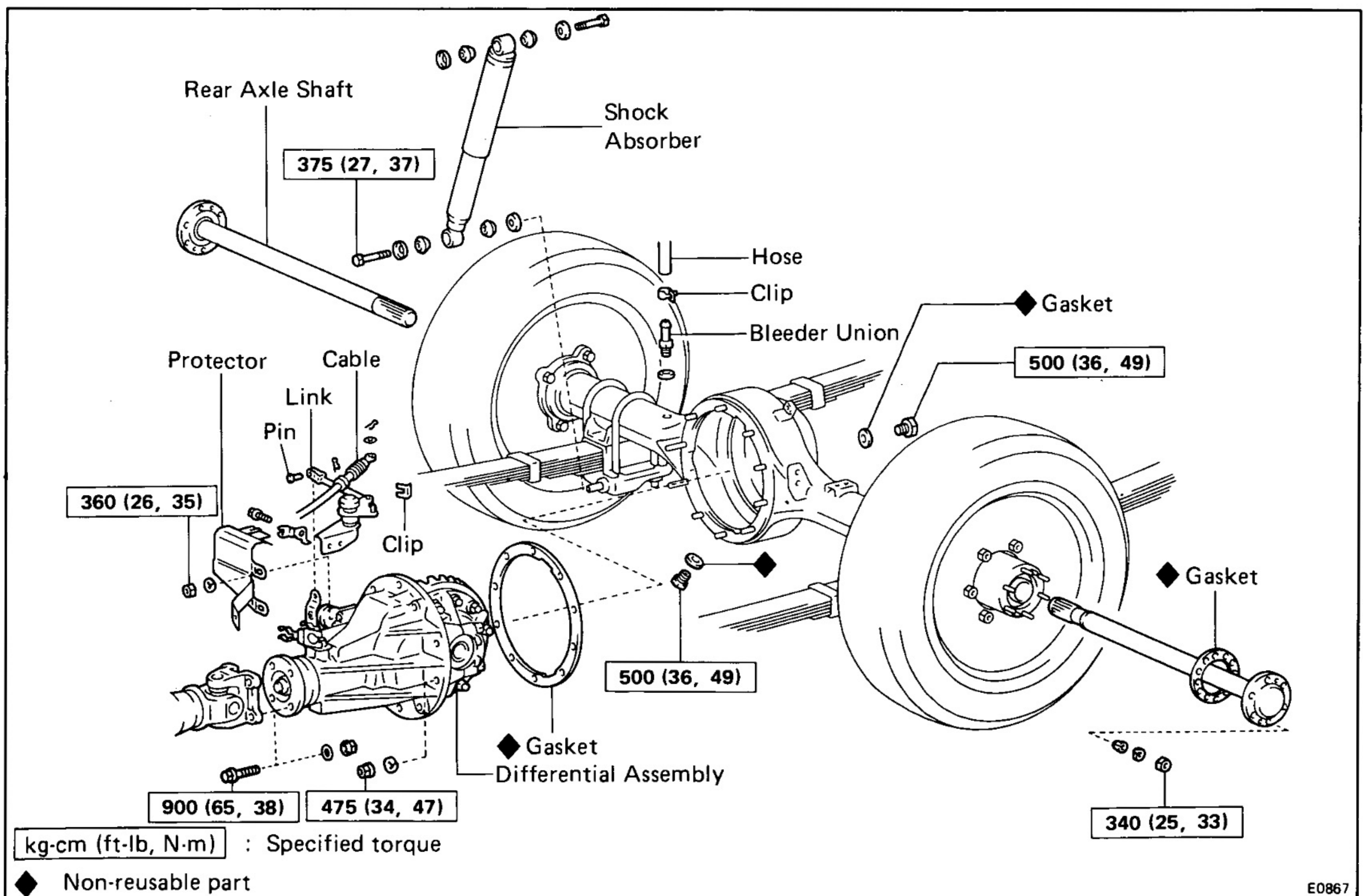
At the beginning of each section, **PRECAUTIONS** are given that pertain to *all* repair operations contained in that section. *Read these precautions before starting any repair task.*

**TROUBLESHOOTING** tables are included for each system to help you diagnose the system problem and find the cause. The repair for each possible cause is referenced in the remedy column to quickly lead you to the solution.

## REPAIR PROCEDURES

Most repair operations begin with an overview illustration. It identifies the components and shows how the parts fit together.

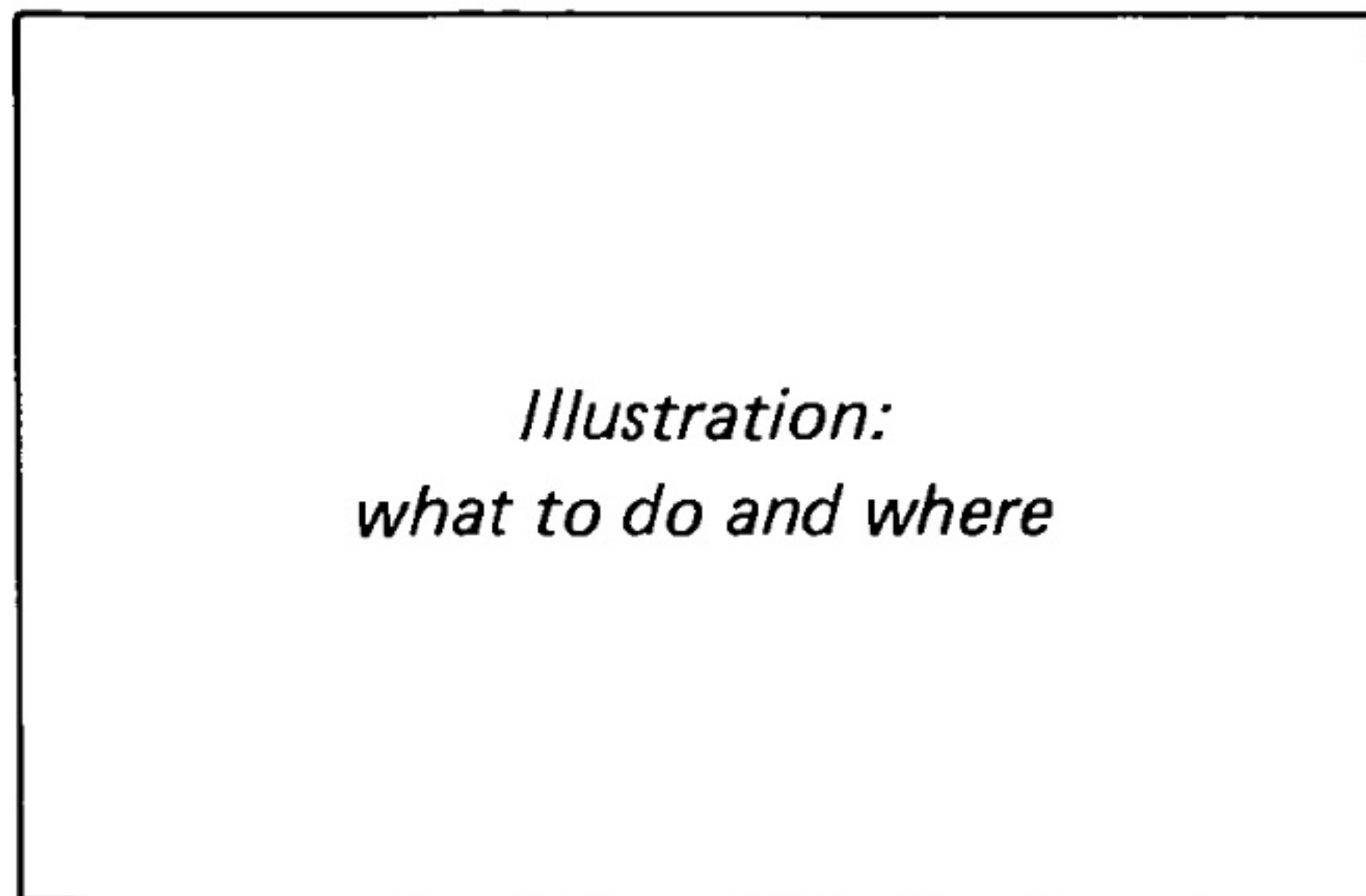
Example:



The procedures are presented in a step-by-step format:

- The illustration shows *what* to do and *where* to do it.
- The task heading tells *what* to do.
- The detailed text tells *how* to perform the task and gives other information such as specifications and warnings.

Example:



- Task heading: what to do*
- 21. CHECK PISTON STROKE OF OVERDRIVE BRAKE**
- (a) Place SST and a dial indicator onto the overdrive brake piston as shown in the figure.
- SST 09350-30020 (09350-06120)
- Set part No.*                      *Component part No.*
- Detail text: how to do it*
- (b) Measure the stroke applying and releasing the compressed air (4 – 8 kg/cm<sup>2</sup>, 57 – 114 psi or 392 – 785 kPa) as shown in the figure.
- Piston stroke: 1.40 – 1.70 mm (0.0551 – 0.0669 in.)**
- Specification*

This format provides the experienced technician with a FAST TRACK to the information needed. The upper case task heading can be read at a glance and only when necessary, the text below it provides detailed information. Important specifications and warnings always stand out in bold type.

## REFERENCES

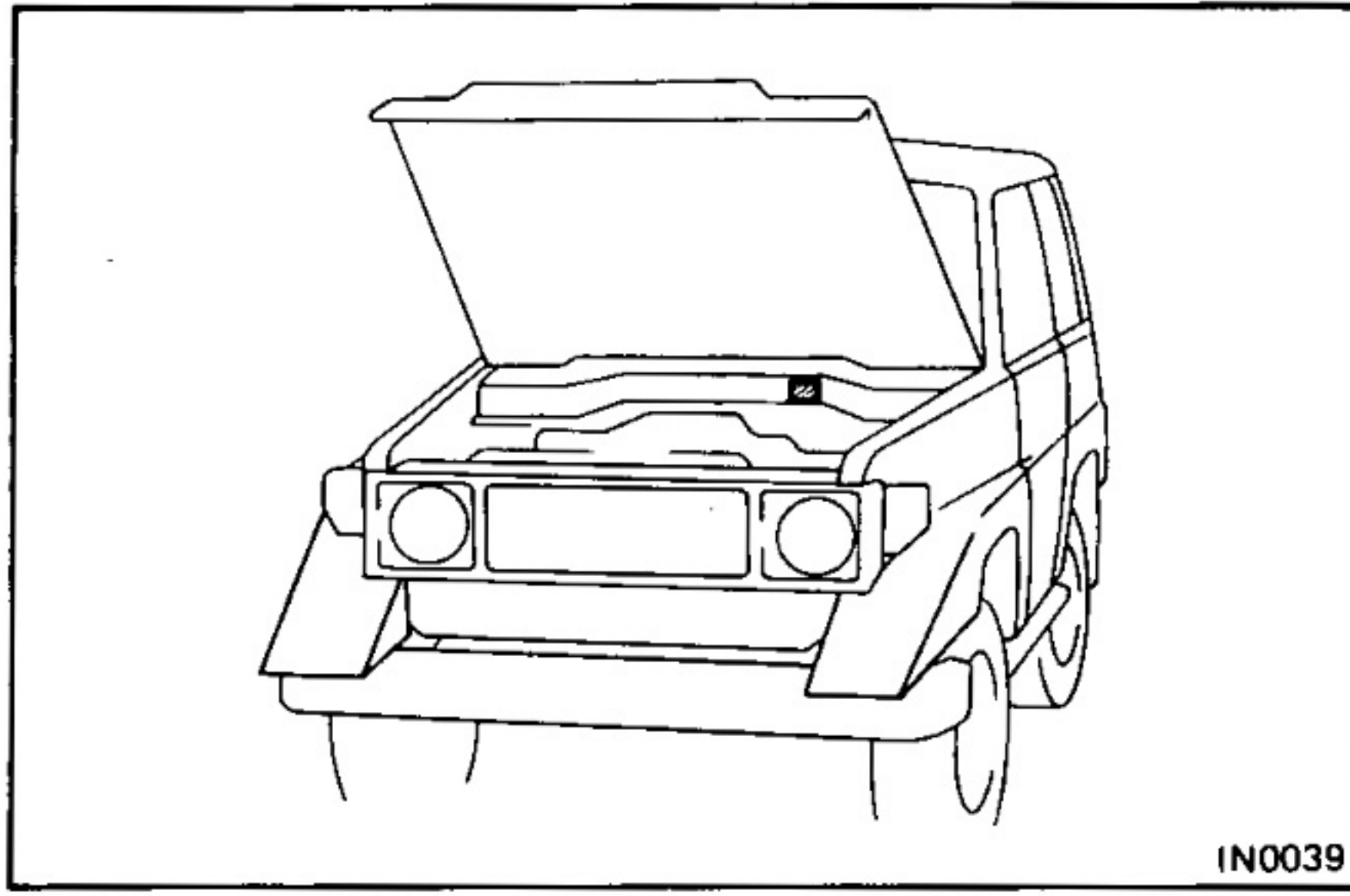
References have been kept to a minimum. However, when they are required you are given the page to go to.

## SPECIFICATIONS

Specifications are presented in bold type throughout the text in the applicable step. You never have to leave the procedure to look up your specs. All specifications are also found in Appendix A, specifications, for quick reference.

## WARNINGS, CAUTIONS, NOTES:

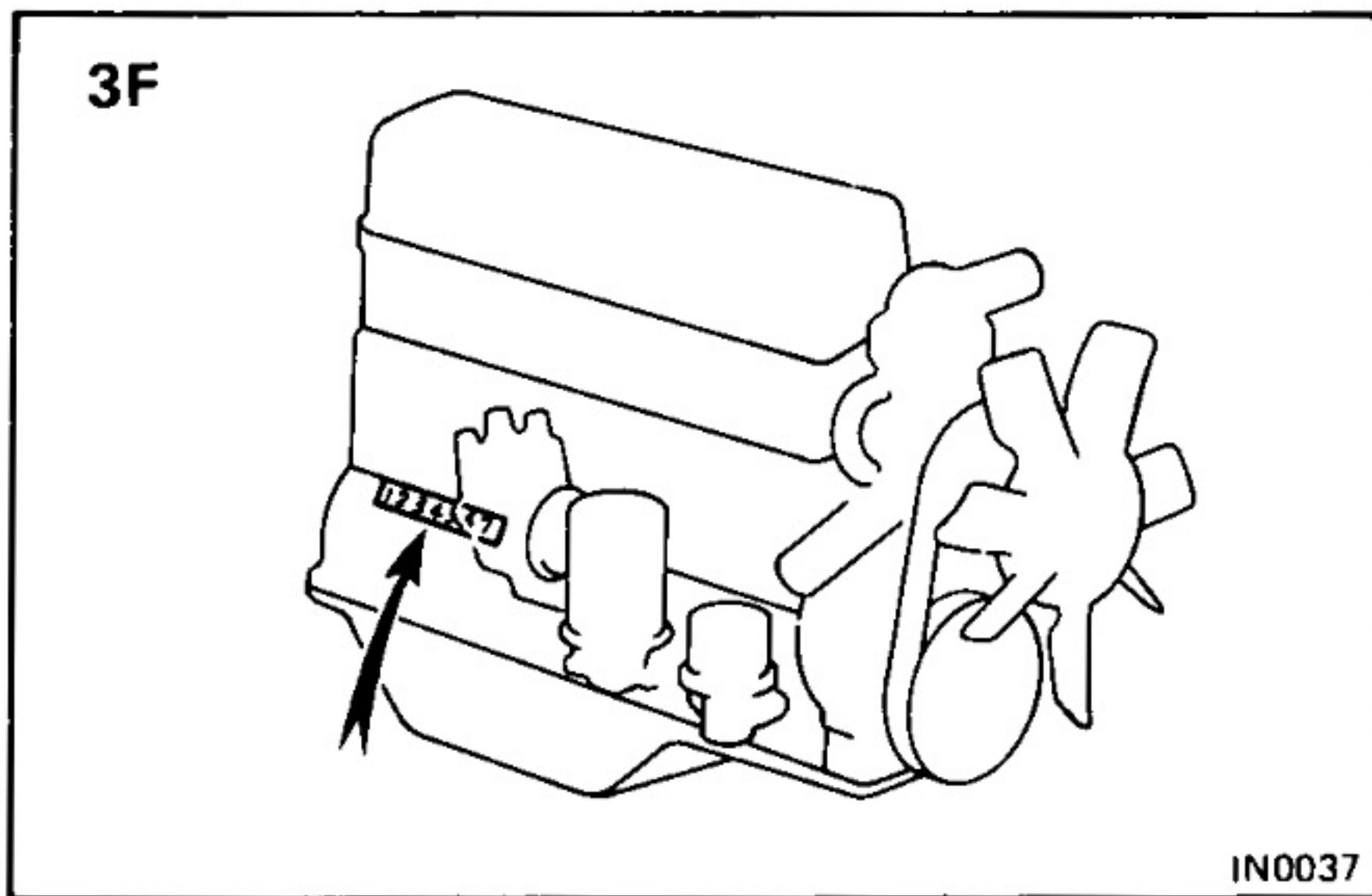
- **WARNINGS** are presented in bold type, and indicate there is a possibility of injury to you or other people.
- **CAUTIONS** are also presented in bold type, and indicate the possibility of damage to the components being repaired.
- **NOTES** are separated from the text but do not appear in bold. They provide additional information to help you efficiently perform the repair.



## IDENTIFICATION INFORMATION

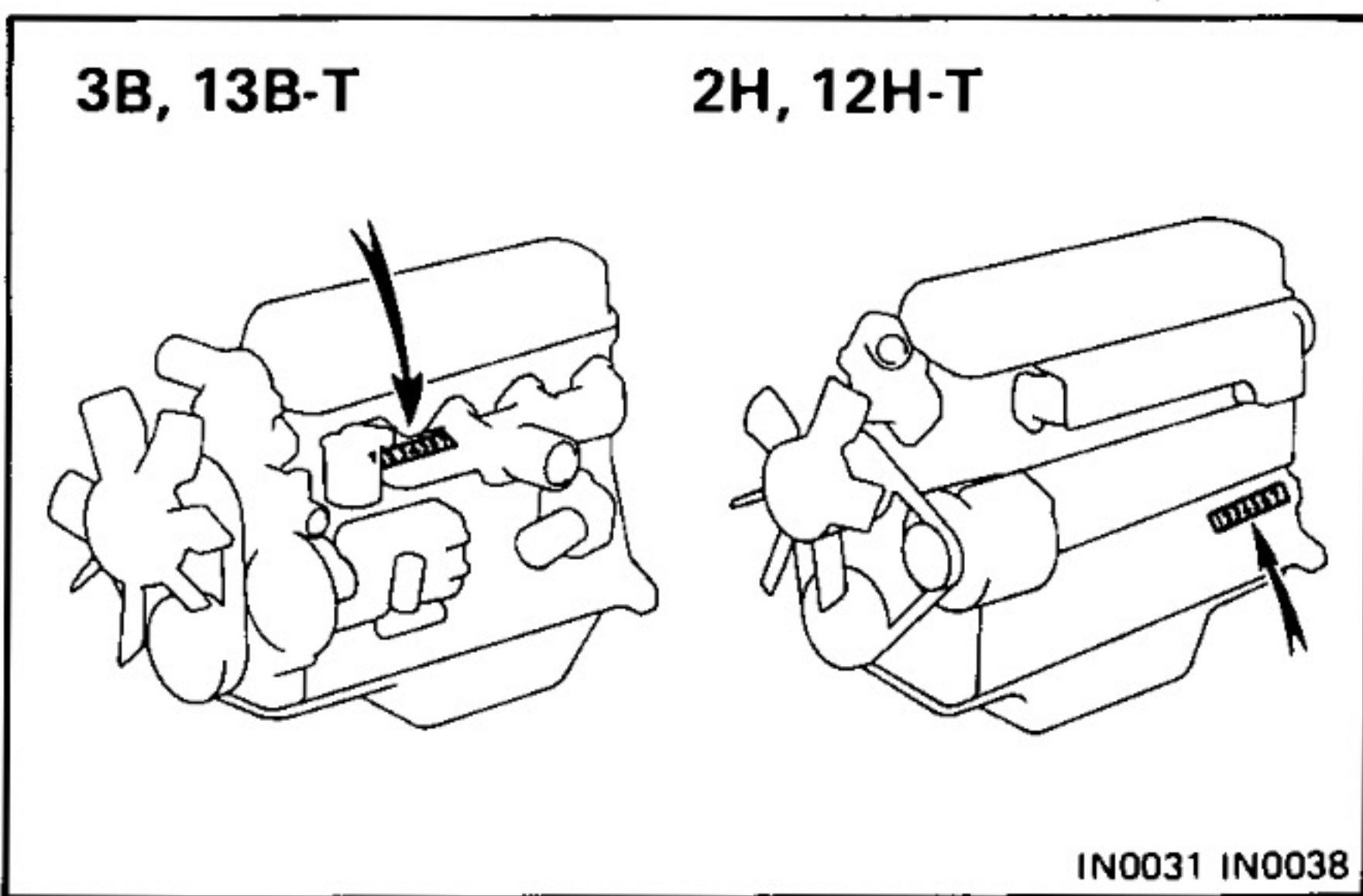
### VEHICLE IDENTIFICATION NUMBER

The vehicle identification number is stamped on the cowl panel of the engine compartment.



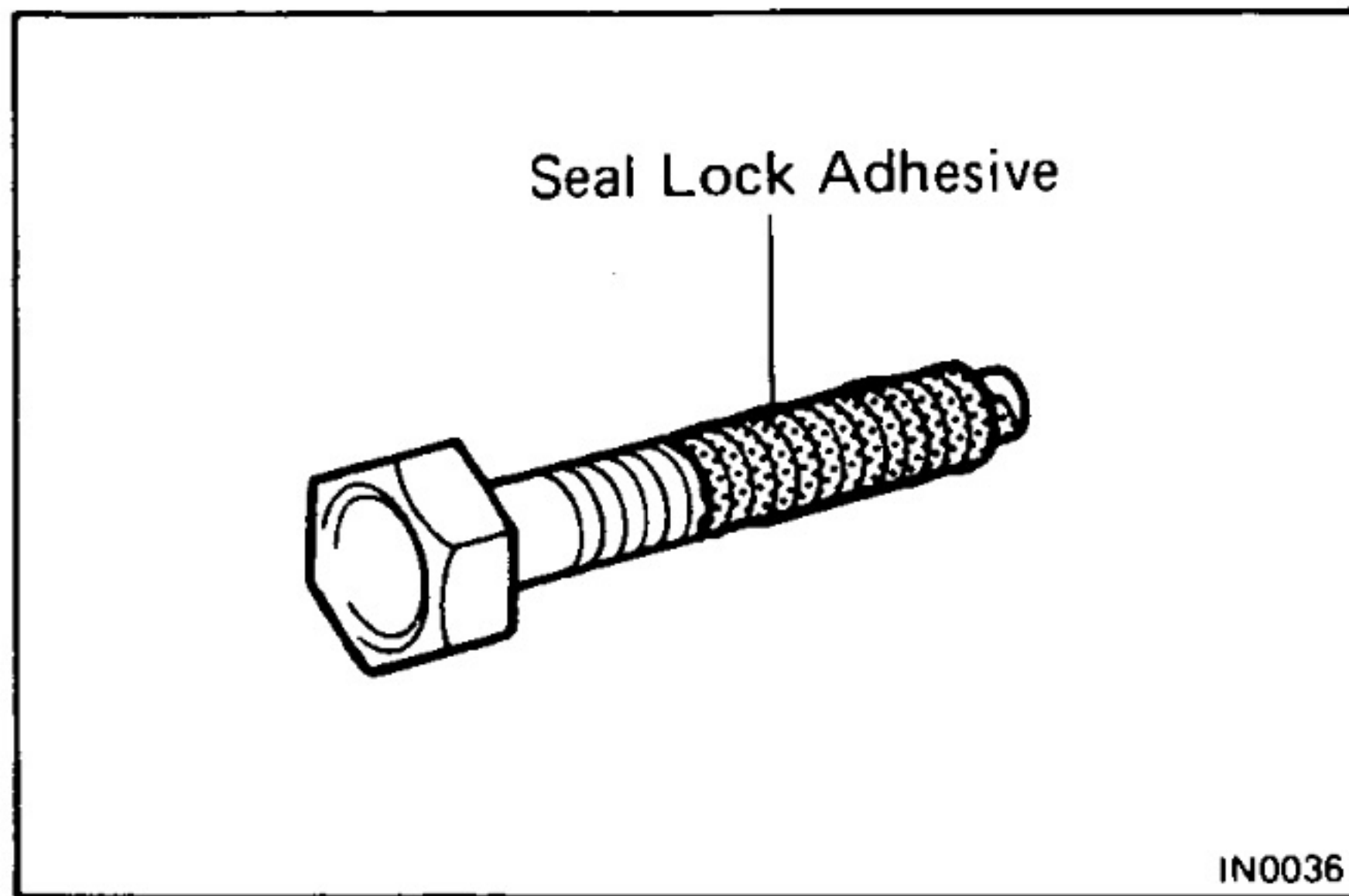
### ENGINE SERIAL NUMBER

The engine serial number is stamped on the cylinder block, as shown.



## GENERAL REPAIR INSTRUCTIONS

1. Use fender, seat and floor covers to keep the vehicle clean and prevent damage.
2. During disassembly, keep part in order to facilitate re-assembly.
3. Observe the following:
  - (a) Before performing electrical work, disconnect the negative cable from the battery terminal.
  - (b) If it is necessary to disconnect the battery for inspection or repair, always disconnect the cable from the negative (-) terminal which is grounded to the vehicle body.
  - (c) To prevent damage to the battery terminal post, loosen the terminal nut and raise the cable straight up without twisting it or prying it.
  - (d) Clean the battery terminal posts and cable terminals with a shop rag. Do not scrape them with a file or other abrasive object.



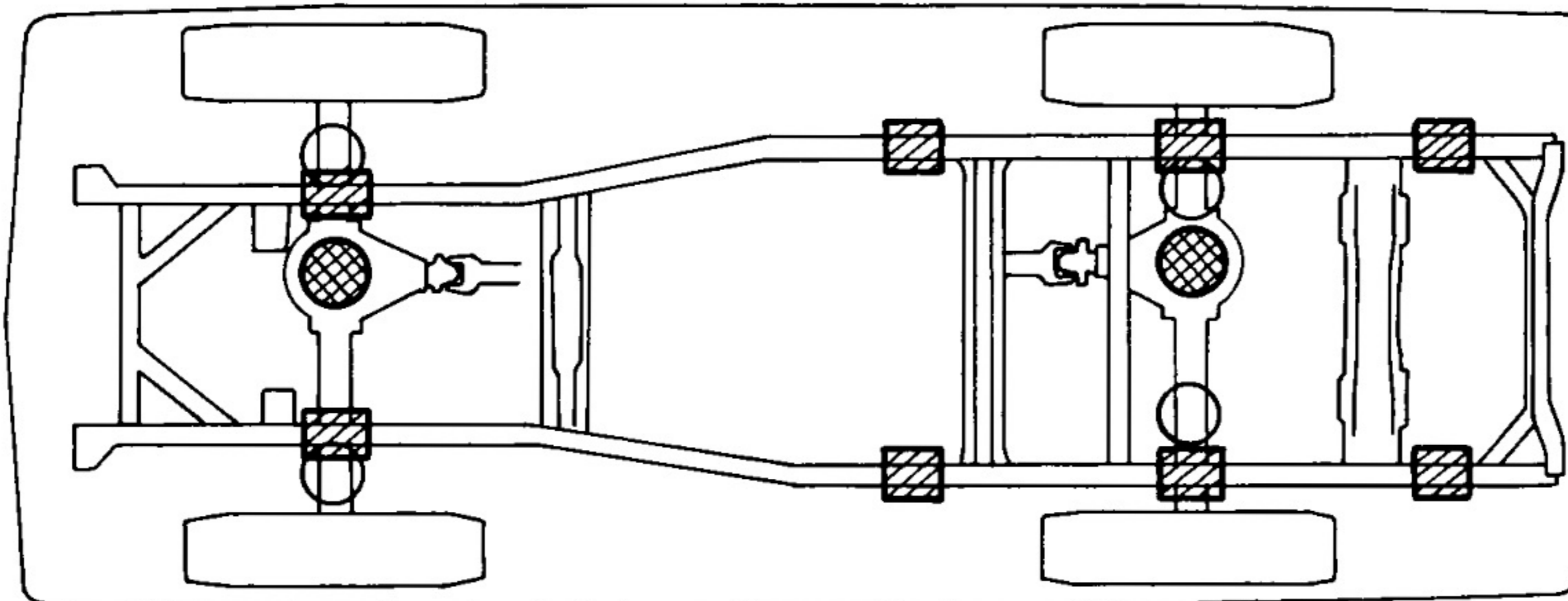
- (e) Install the cable terminal to the battery post with the nut loose, and tighten the nut after installation. Do not use a hammer to tap the terminal onto the post.
  - (f) Be sure the cover for the positive (+) terminal is properly in place.
4. Check hose and wiring connectors to make sure that they are secure and correct.
5. Non-reusable parts
  - (a) Always replace cotter pins, gaskets, O-rings and oil seals etc. with new ones.
  - (b) Non-reusable parts are indicated in the component illustrations by the "◆" symbol.
6. Precoated parts
 

Precoated parts are the bolts and nuts, which have been coated with a seal lock adhesive at the factory.

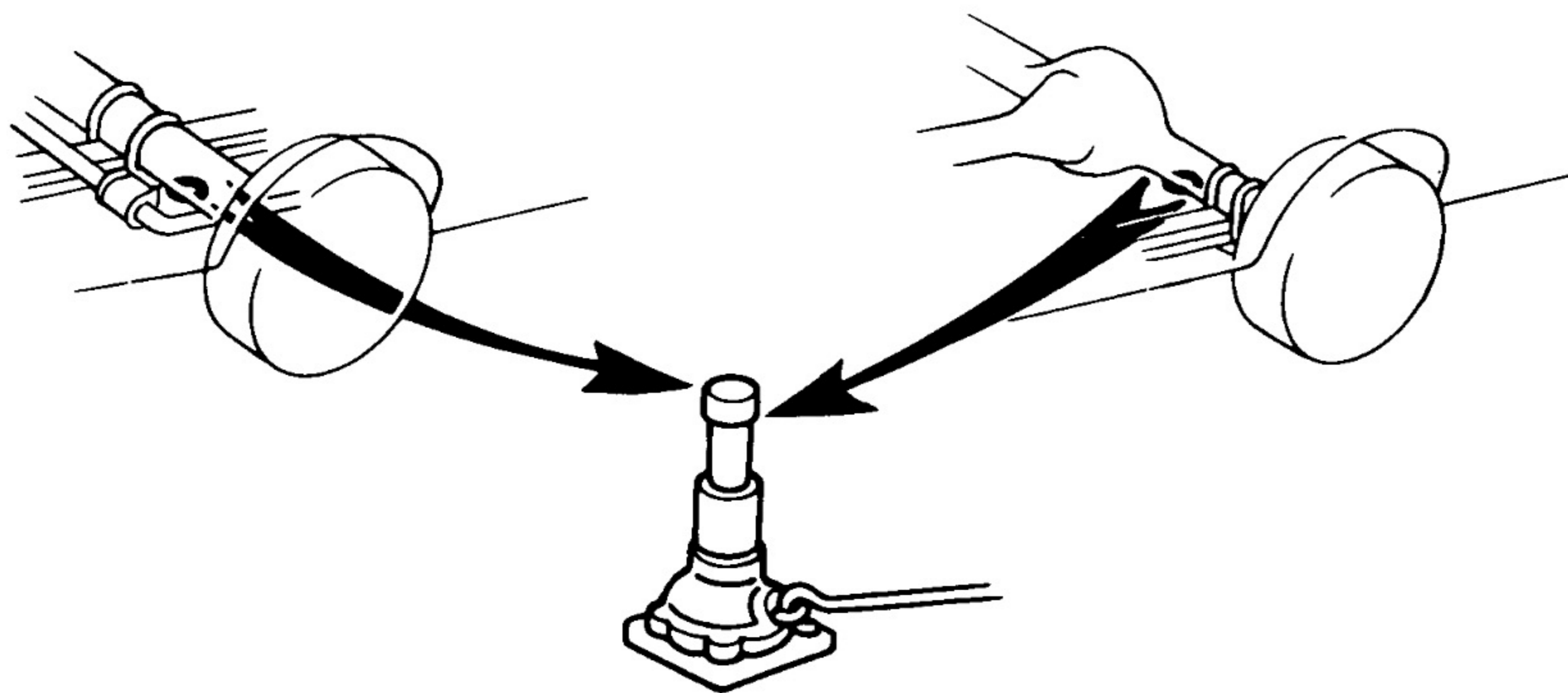
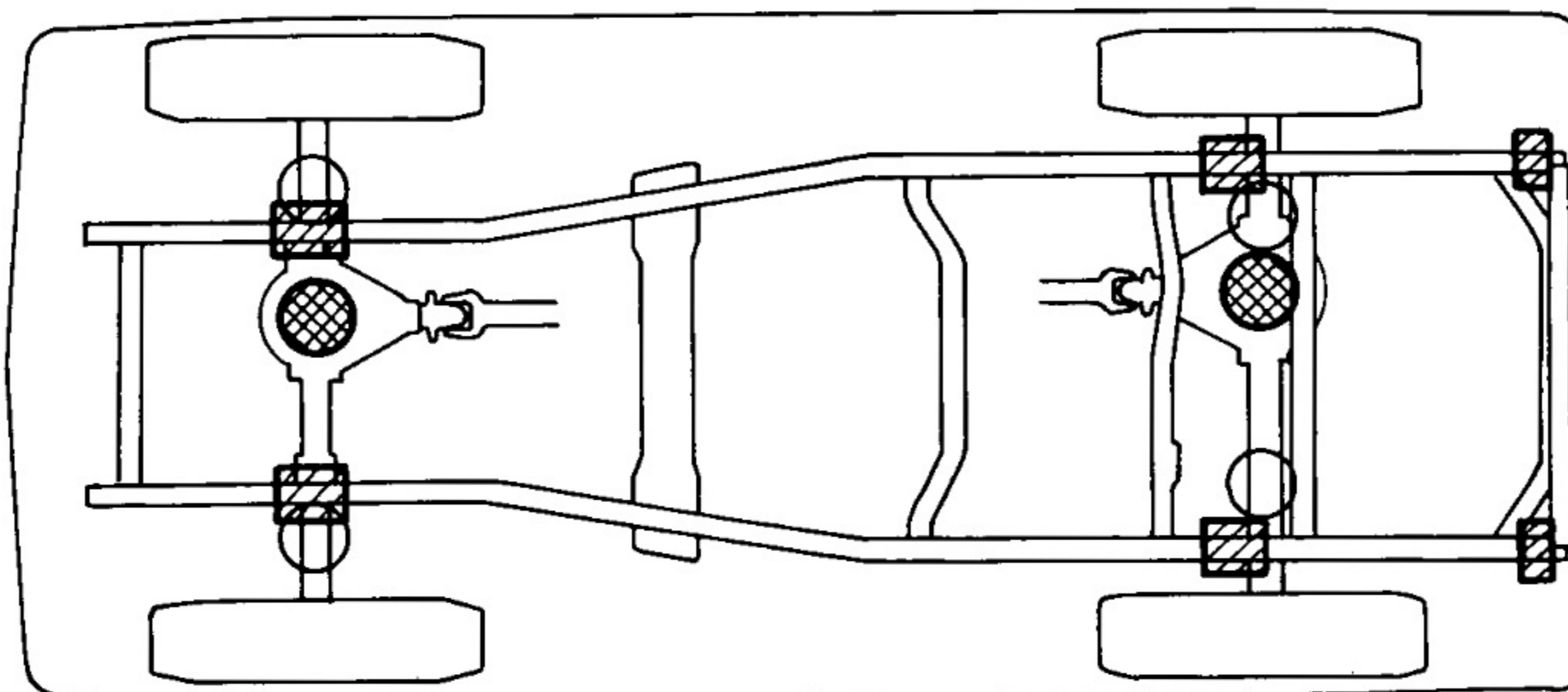
  - (a) If a precoated part is retightened, loosened or caused to move in any way, it must be recoated with the specified adhesive.
  - (b) Recoating of precoated parts
    - (1) Clean off the old adhesive from the bolt, nut or installation part threads.
    - (2) Dry with compressed air.
    - (3) Apply the specified seal lock adhesive to the bolt or nut threads.
  - (c) Precoated parts are indicated in the component illustrations by the "★" symbol.
7. When necessary, use a sealer on gaskets to prevent leaks.
8. Carefully observe all specifications for bolt tightening torques. Always use a torque wrench.
9. Use of special service tools (SST) and special service materials (SSM) may be required, depending on the nature of the repair. Be sure to use SST and SSM where specified and follow the proper work procedure. A list of SST and SSM can be found at the back of this manual.
10. When replacing fuses, be sure the new fuse has the correct amperage rating. DO NOT exceed the fuse amp rating or use one of a lower rating.
11. Care must be taken when jacking up and supporting the vehicle. Be sure to lift and support the vehicle at the proper locations. (See pages IN-6, 7)
  - (a) If the vehicle is to be jacked up only at the front or rear end, be sure to block the wheels in order to ensure safety.
  - (b) 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, even for a small job that can be finished quickly.

# VEHICLE LIFT AND SUPPORT LOCATIONS

60 series



70 series (short)



JACK POSITION —————



Front . . . . . Under the front differential  
 Rear . . . . . Under the rear differential

SUPPORT POSITION

Safety stand . . . . .

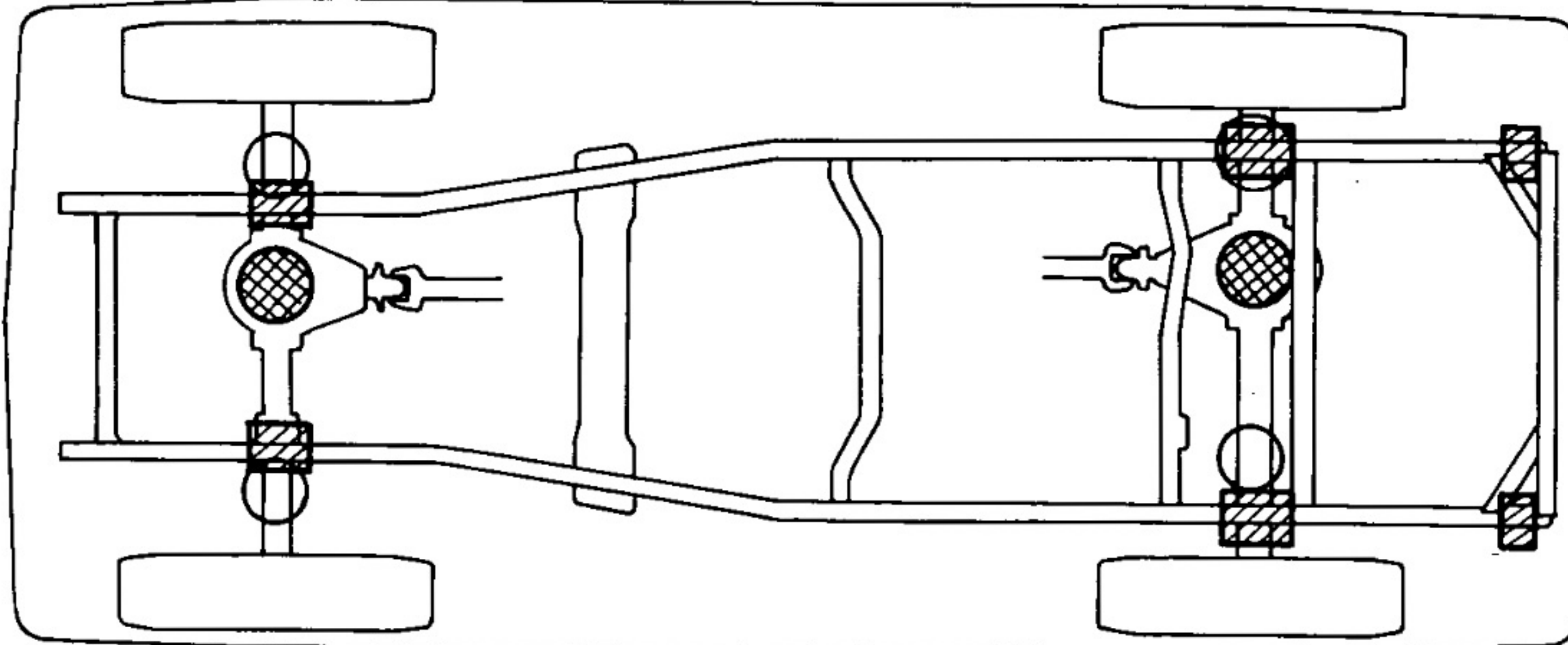


SCREW TYPE JACK POSITION . . . . .

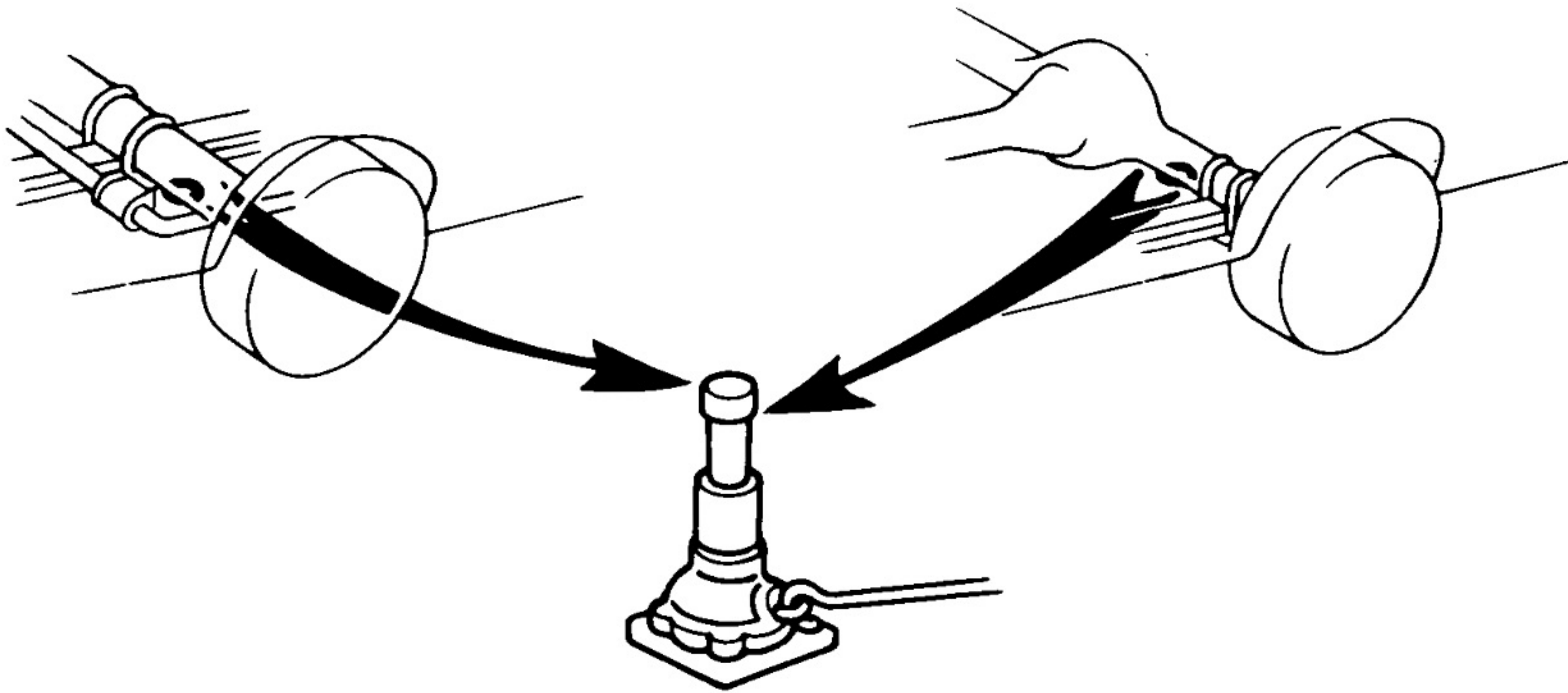
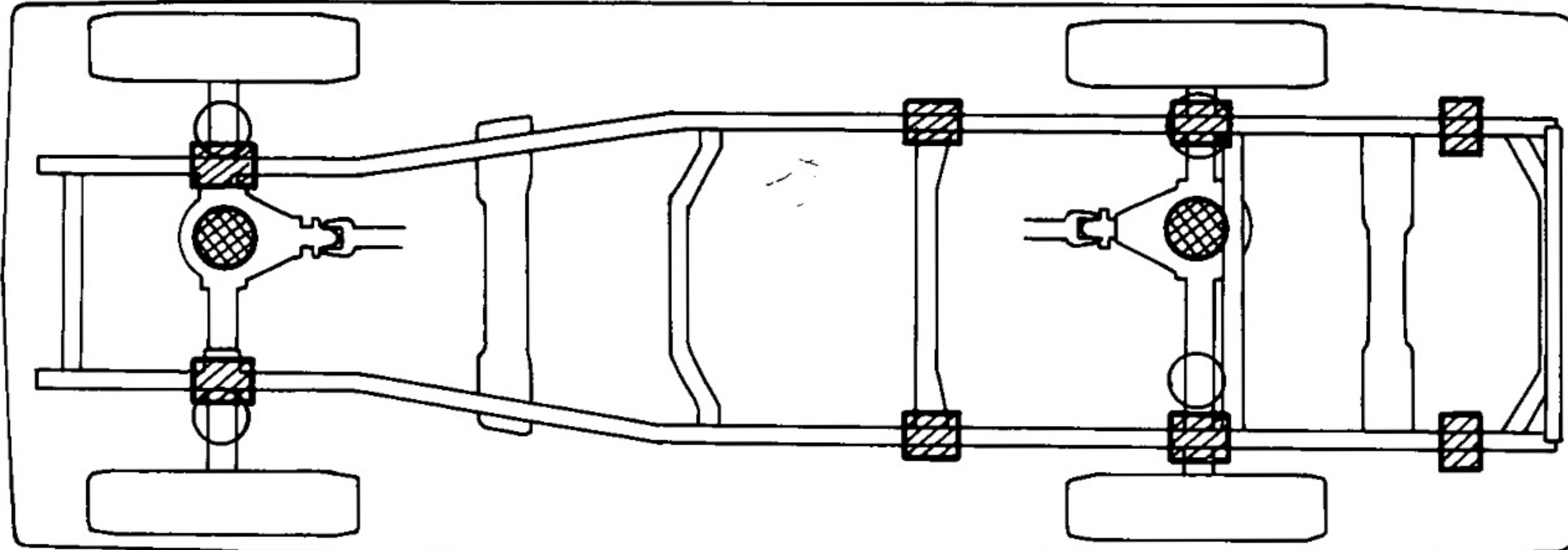


# VEHICLE LIFT AND SUPPORT LOCATIONS (Cont'd)

73 series (middle)



75 series (long)



JACK POSITION ————— ●  
 Front . . . . . Under the front differential  
 Rear . . . . . Under the rear differential

SUPPORT POSITION  
 Safety stand . . . . . ▨

SCREW TYPE JACK POSITION . . . . . ○

**ABBREVIATIONS USED IN THIS MANUAL**

A/C	Air Conditioner
Fr	Front
in.	Inch
IG	Ignition
LH	Left-hand
MP	Multipurpose
PS	Power Steering
RH	Right-hand
SSM	Special Service Materials
SST	Special Service Tools
S/W	Switch
Temp.	Temperature
VSV	Vacuum Switching Valve
w/	With
w/o	Without

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# FRONT AXLE AND SUSPENSION

	Page
FRONT AXLE HUB .....	FA-2
FRONT DIFFERENTIAL .....	FA-2

**FA**

## FRONT AXLE HUB

The wheel nut tightening torque has been changed as follows.

**Torque:**

**Previous** 1,400 kg-cm (101 ft-lb, 137 N·m)



**New** 1,500 kg-cm (108 ft-lb, 147 N·m)

## FRONT DIFFERENTIAL

Carry out removal and reinstallation of the front differential following the instructions in the Land Cruiser Heavy Duty Repair Manual (Pub. No. 36262E), section FA, and supplement (Pub. No. RM033E) section RA.

For disassembly and reassembly, refer to the supplement section RA.

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# REAR AXLE AND SUSPENSION

REFER TO REPAIR MANUAL CHASSIS & BODY

LAND CRUISER (Heavy-Duty) Pub No. 36262E

NOTE: The following pages contain only the points which differ from the above listed-manual.

	Page
TROUBLESHOOTING .....	RA-2
DIFFERENTIAL LOCKING SYSTEM .....	RA-3
Differential Lock Cable and Link .....	RA-3
Differential Lock Lever and Lock Control Shaft .....	RA-4
Differential Lock Cylinder .....	RA-15
Differential .....	RA-22
Electric Control .....	RA-46

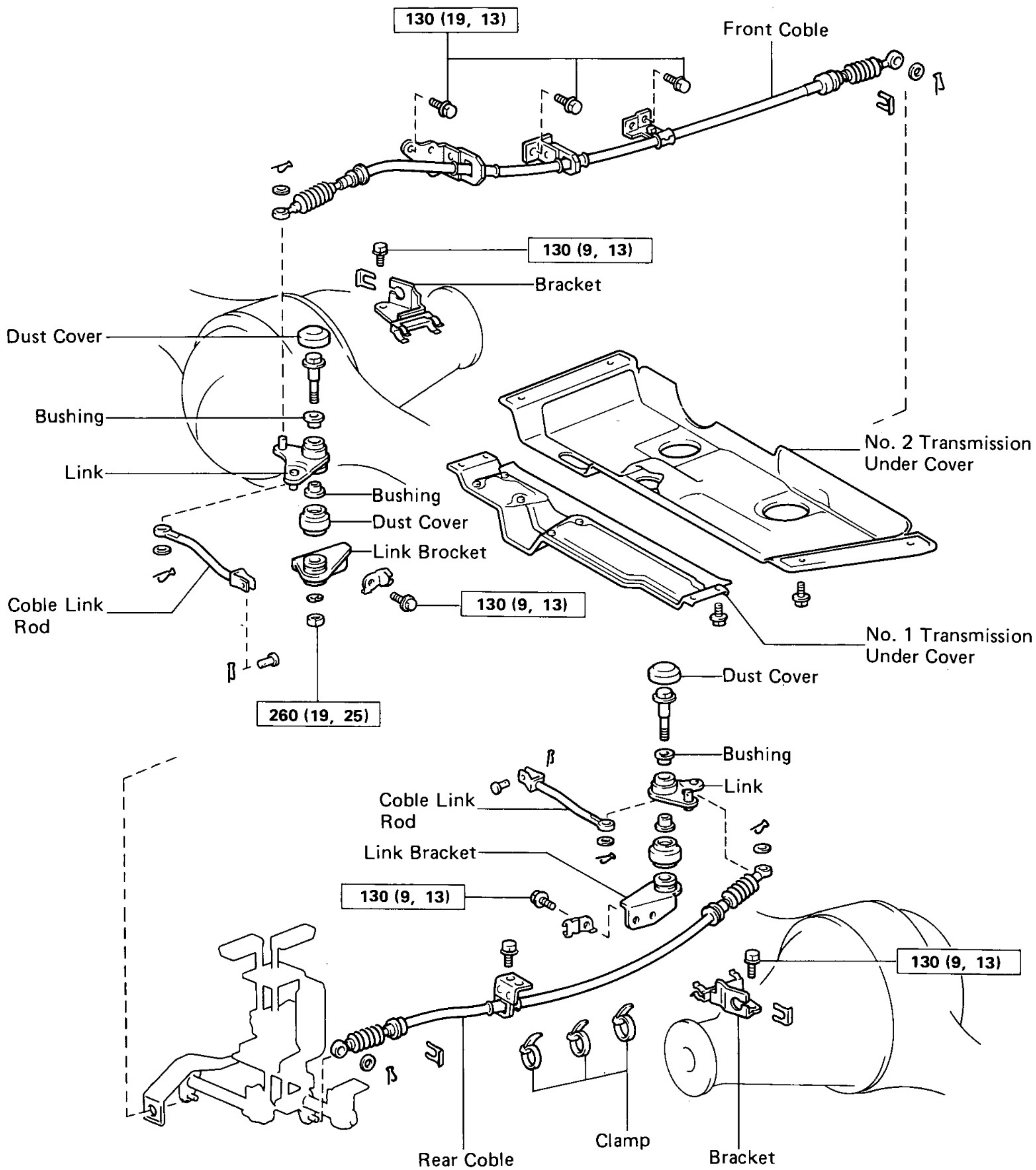
**RA**

## TROUBLESHOOTING

Problem	Possible cause	Remedy	Page
Oil leak from pinion shaft	Oil level too high or wrong grade Oil seal worn or damaged Companion flange loose or damaged	Drain and replace oil Replace oil seal Tighten or replace flange	RA-23 RA-23
Noises in rear axle	Oil level low or wrong grade Excessive backlash between pinion and ring or side gear Ring, pinion or side gears worn or chipped Pinion shaft bearing worn Differential bearing loose or worn	Drain and replace oil Check backlash Inspect gears Replace bearing Tighten or replace bearings	RA-29 RA-34 RA-32 RA-34
Differential does not lock, or disengages	Differential lock lever out of adjustment Differential lock cylinder faulty Differential faulty	Adjust lock lever Repair lock cylinder Repair differential	RA-4 RA-15 RA-22

# DIFFERENTIAL LOCKING SYSTEM

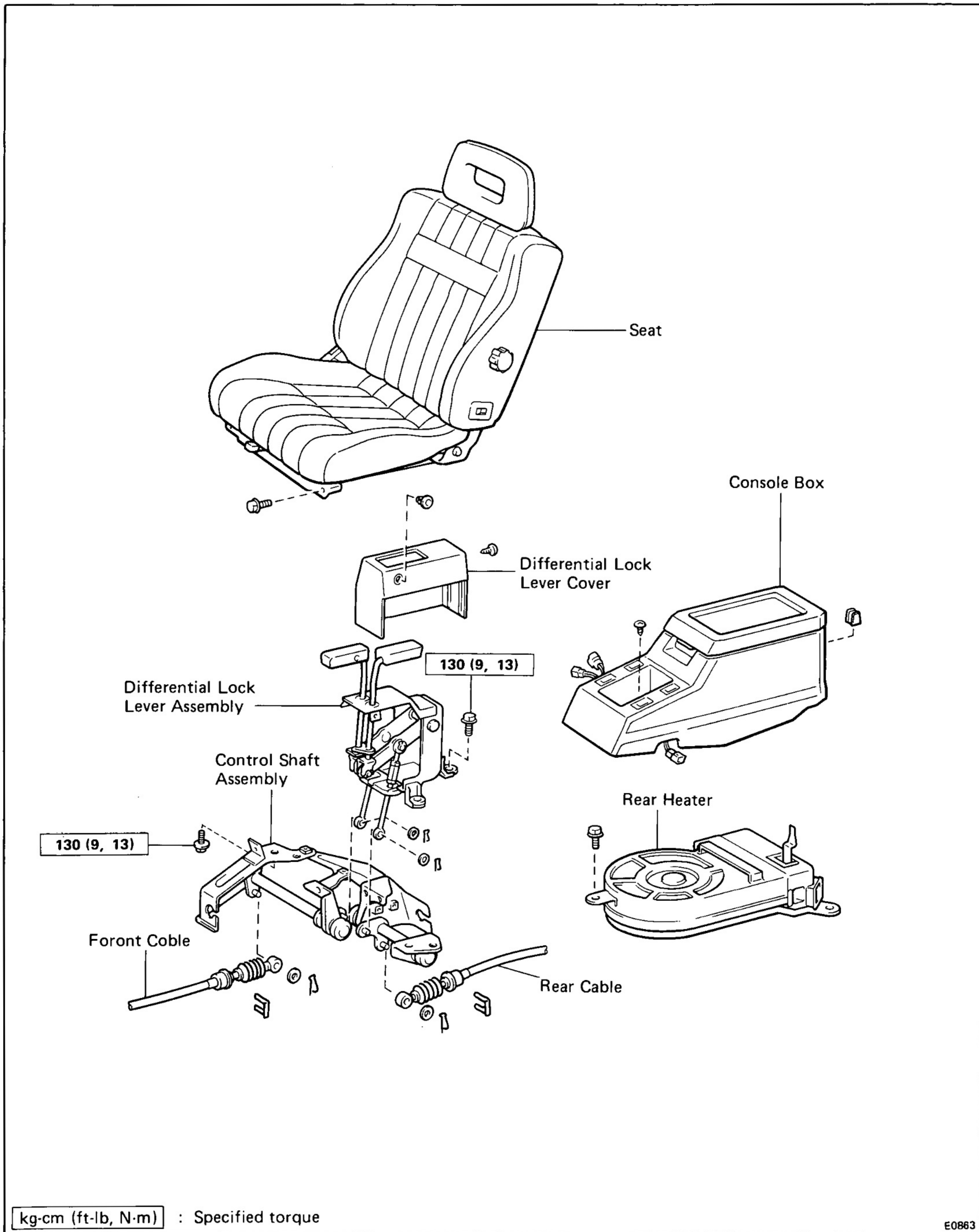
## Differential Lock Cable and Link COMPONENTS



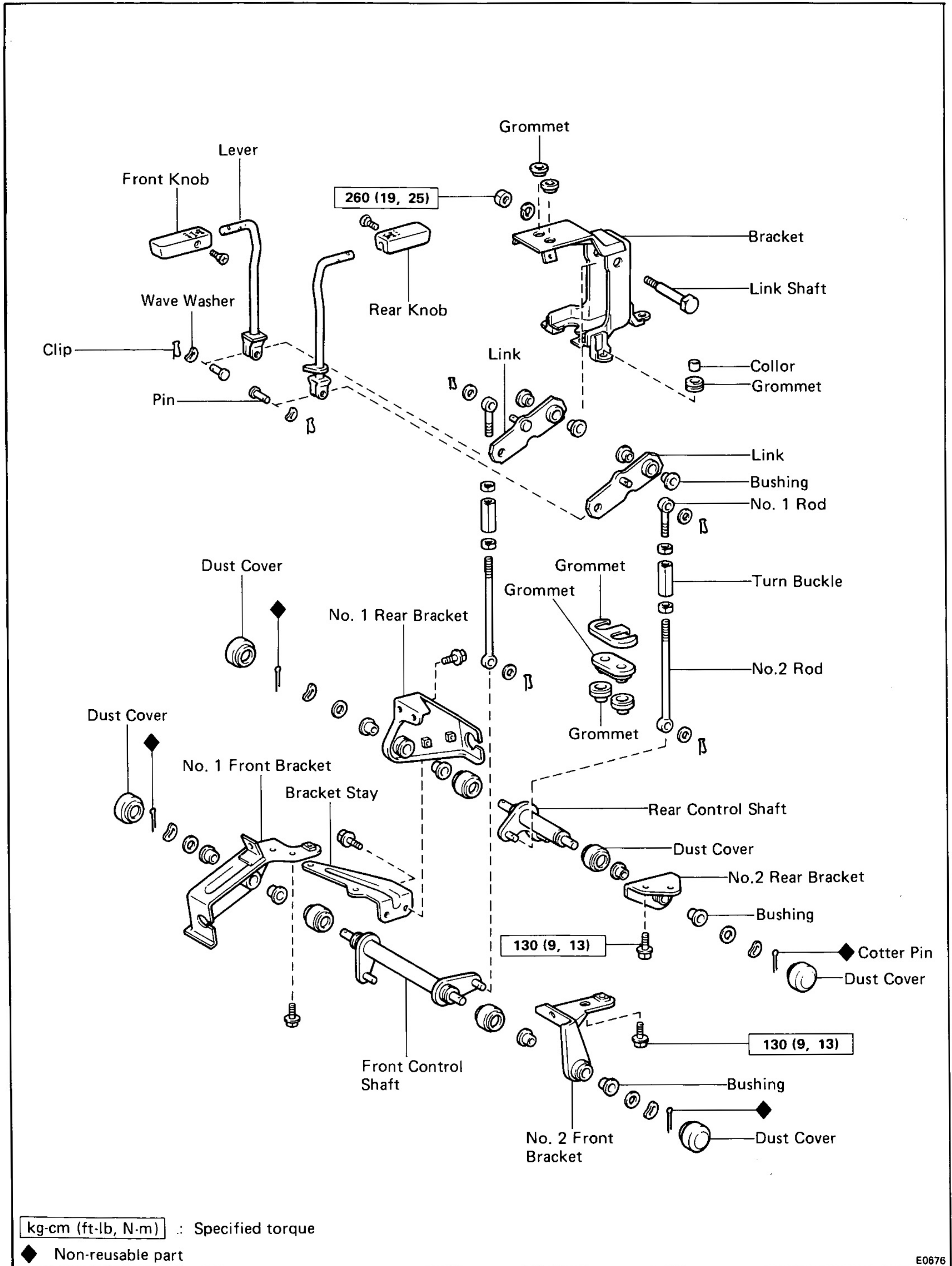
kg-cm (ft-lb, N-m) : Specified torque

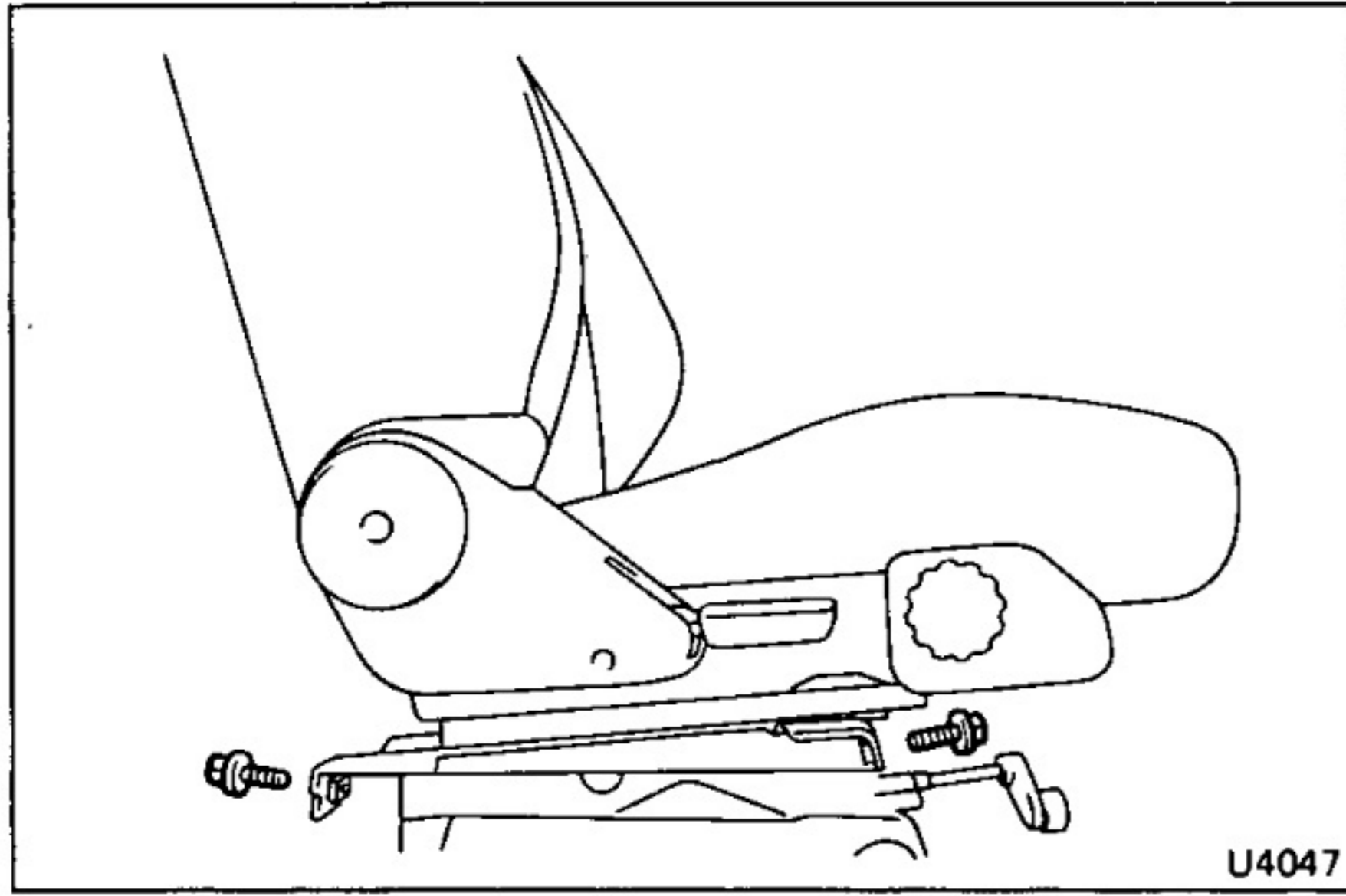
◆ Non-reusable part

# Differential Lock Lever and Lock Control Shaft COMPONENT



COMPONENTS (Cont'd)



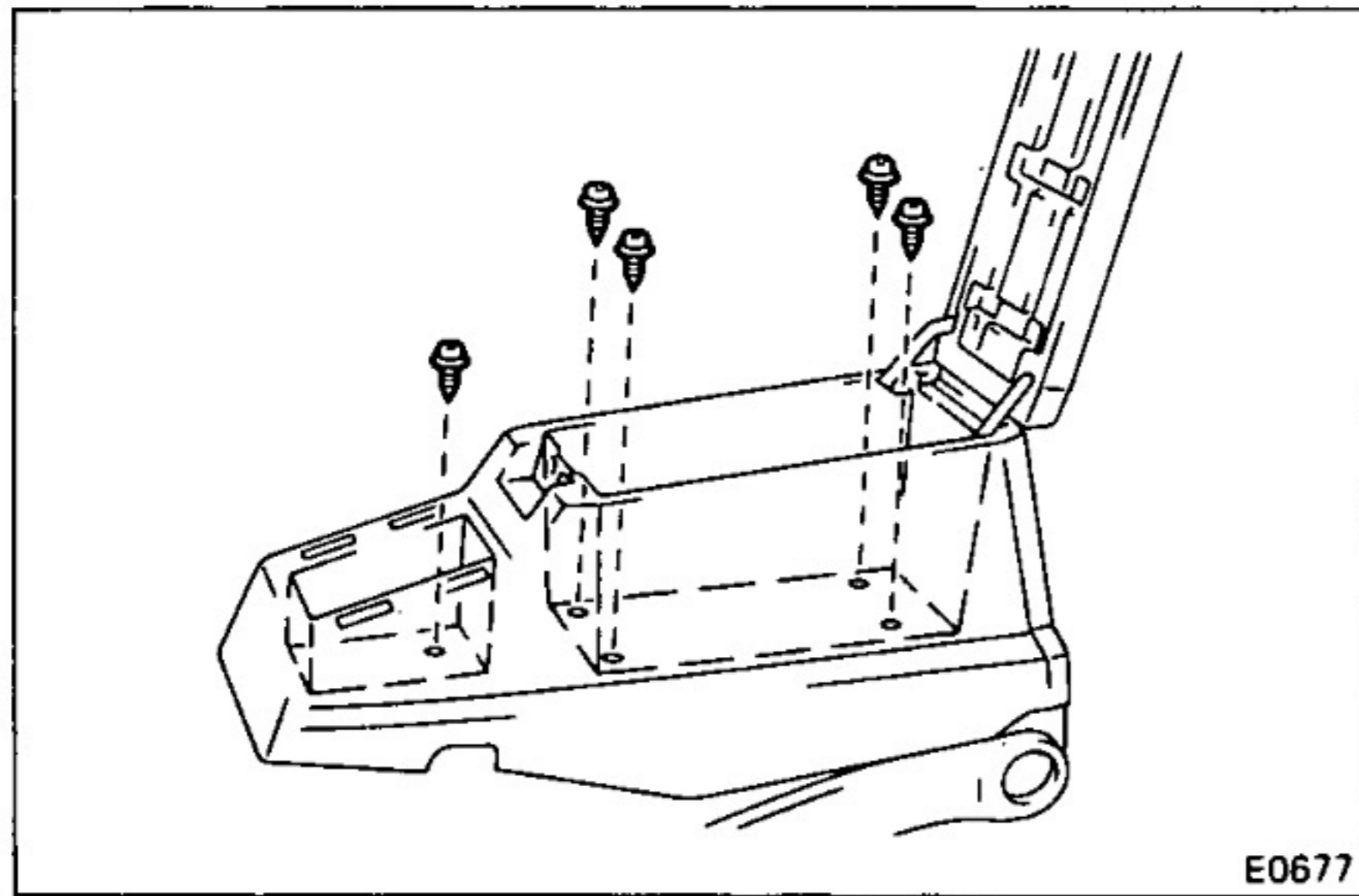


U4047

## REMOVAL OF DIFFERENTIAL LOCK LEVER

### 1. REMOVE DRIVERS SEAT

Remove the four bolts and seat.

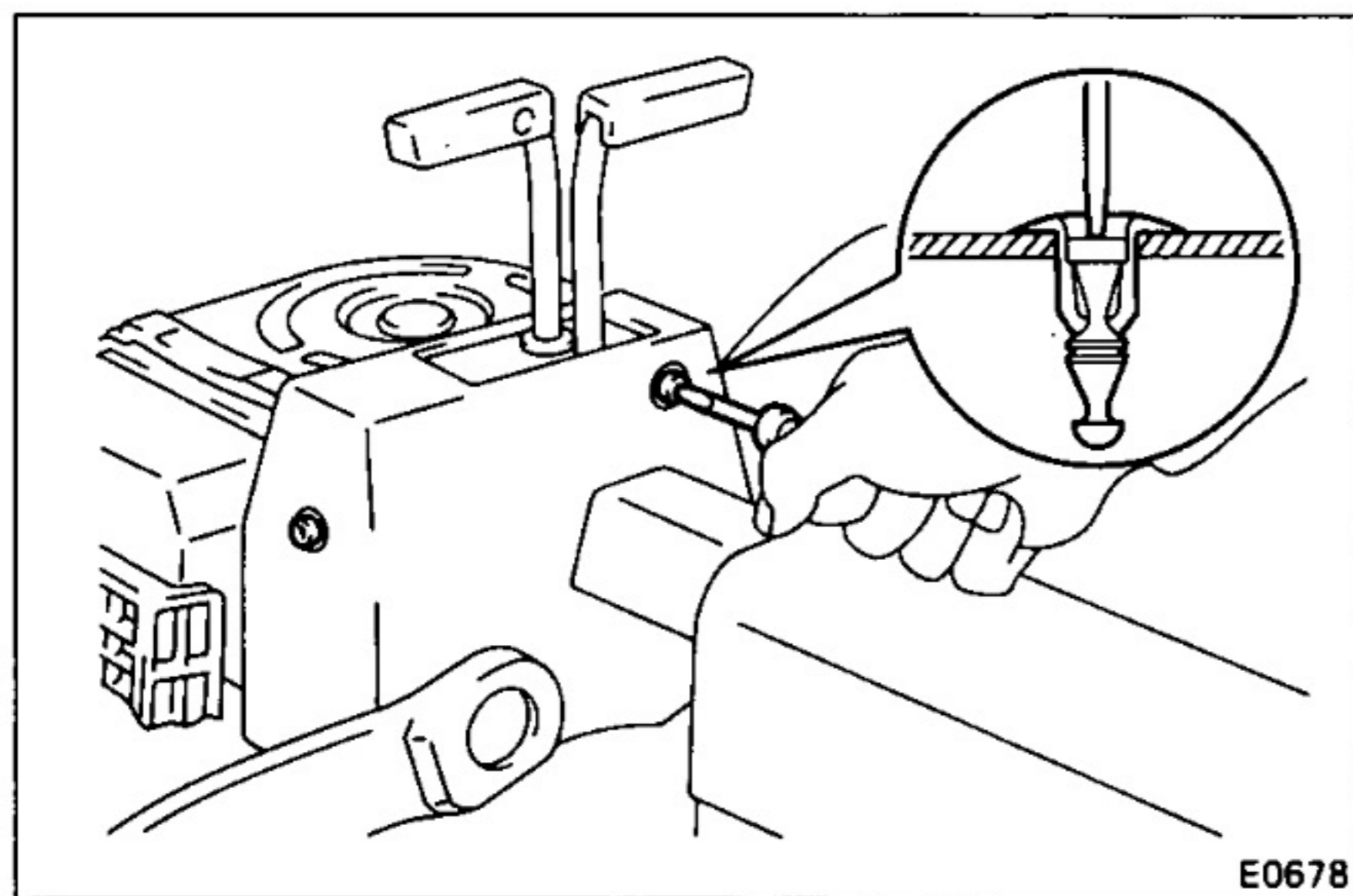


E0677

### 2. REMOVE CONSOLE BOX

(a) Remove the heater knob.

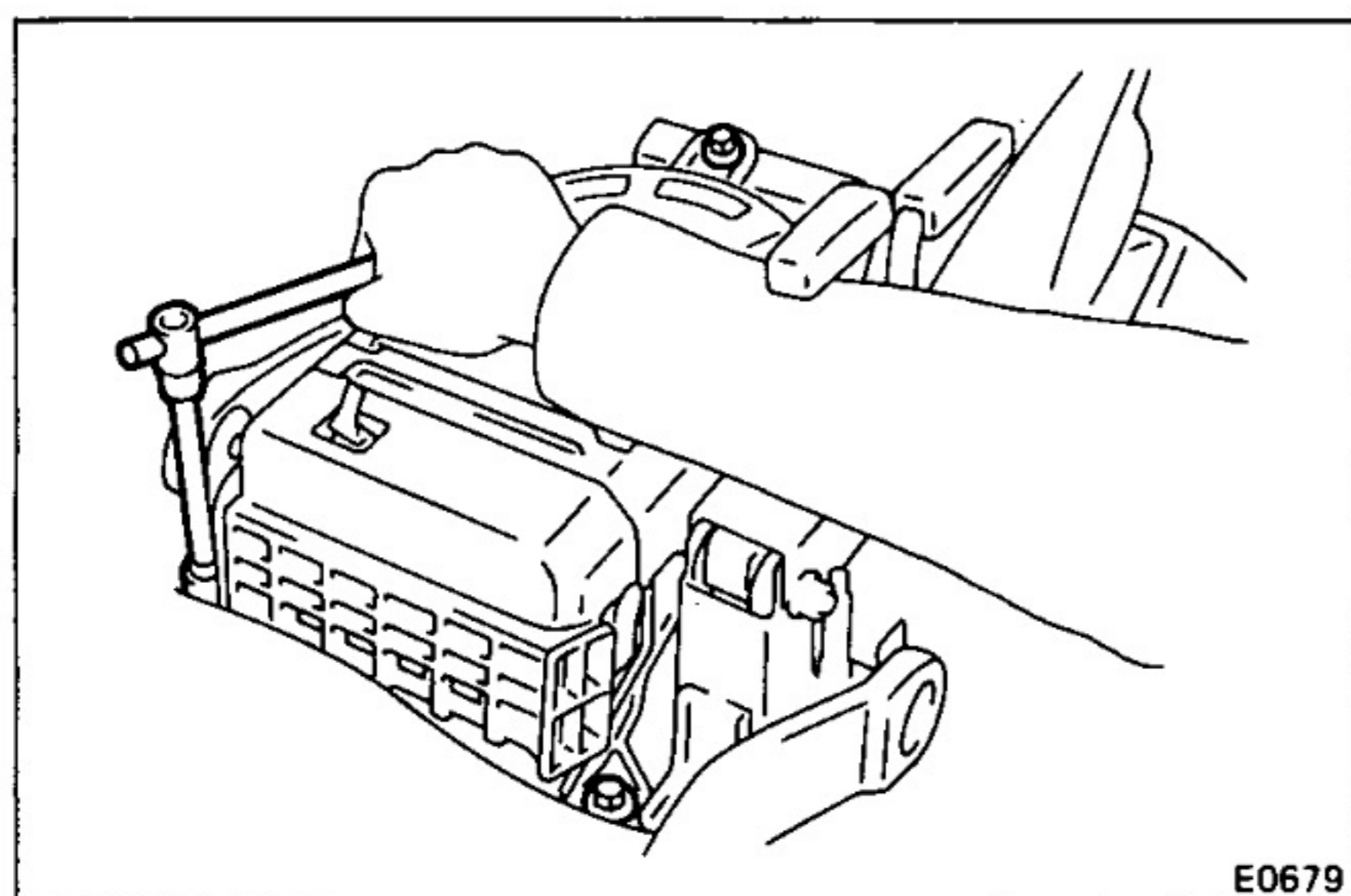
(b) Remove the five screws and console box.



E0678

### 3. REMOVE DIFFERENTIAL LOCK LEVER COVER

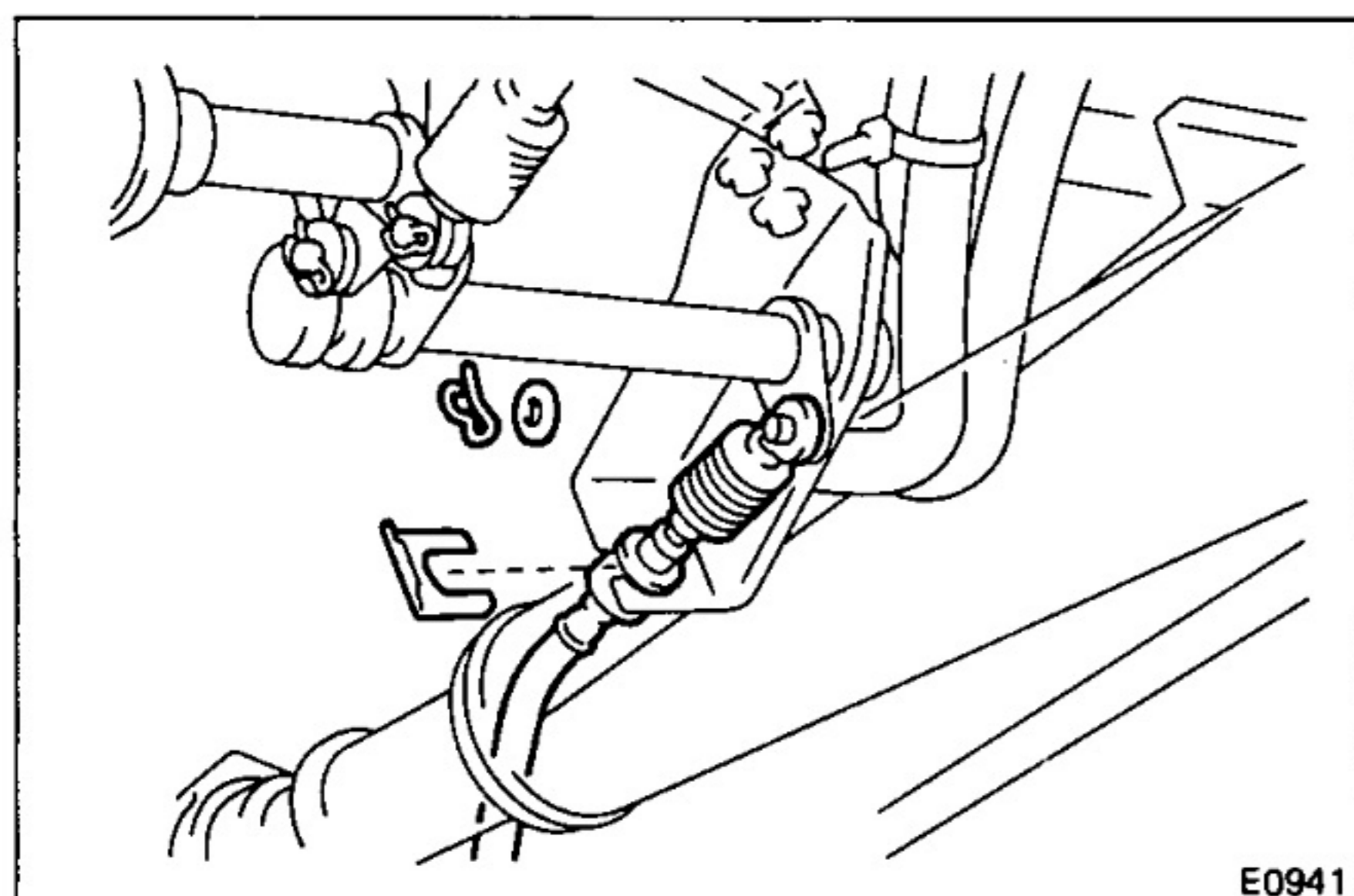
Remove a screw and two clips, remove the cover.



E0679

### 4. REMOVE REAR HEATER MOUNTING BOLTS

Remove the three heater mounting bolts.

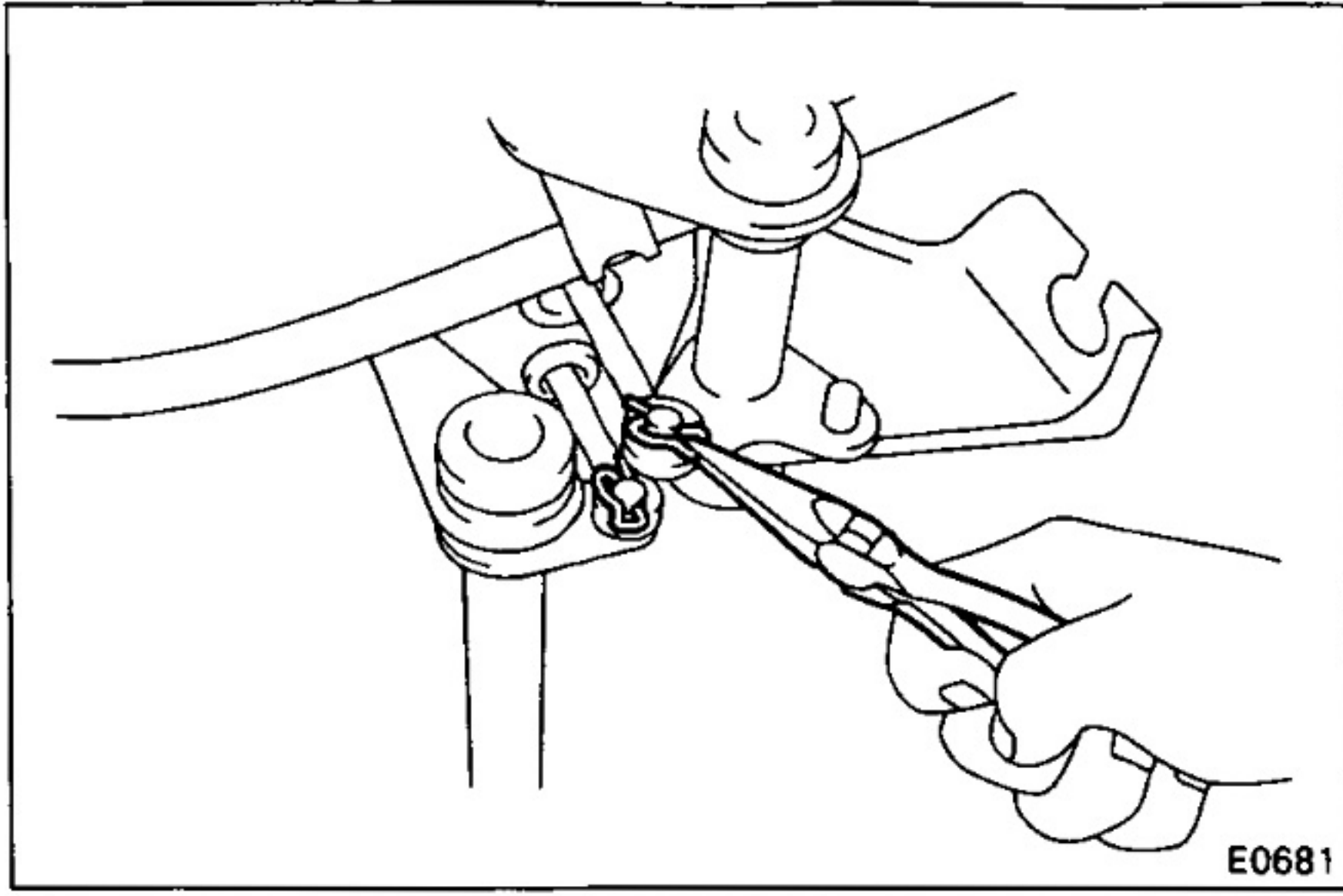


E0941

### 5. DISCONNECT FRONT AND REAR DIFFERENTIAL LOCK CABLES FROM BRACKET

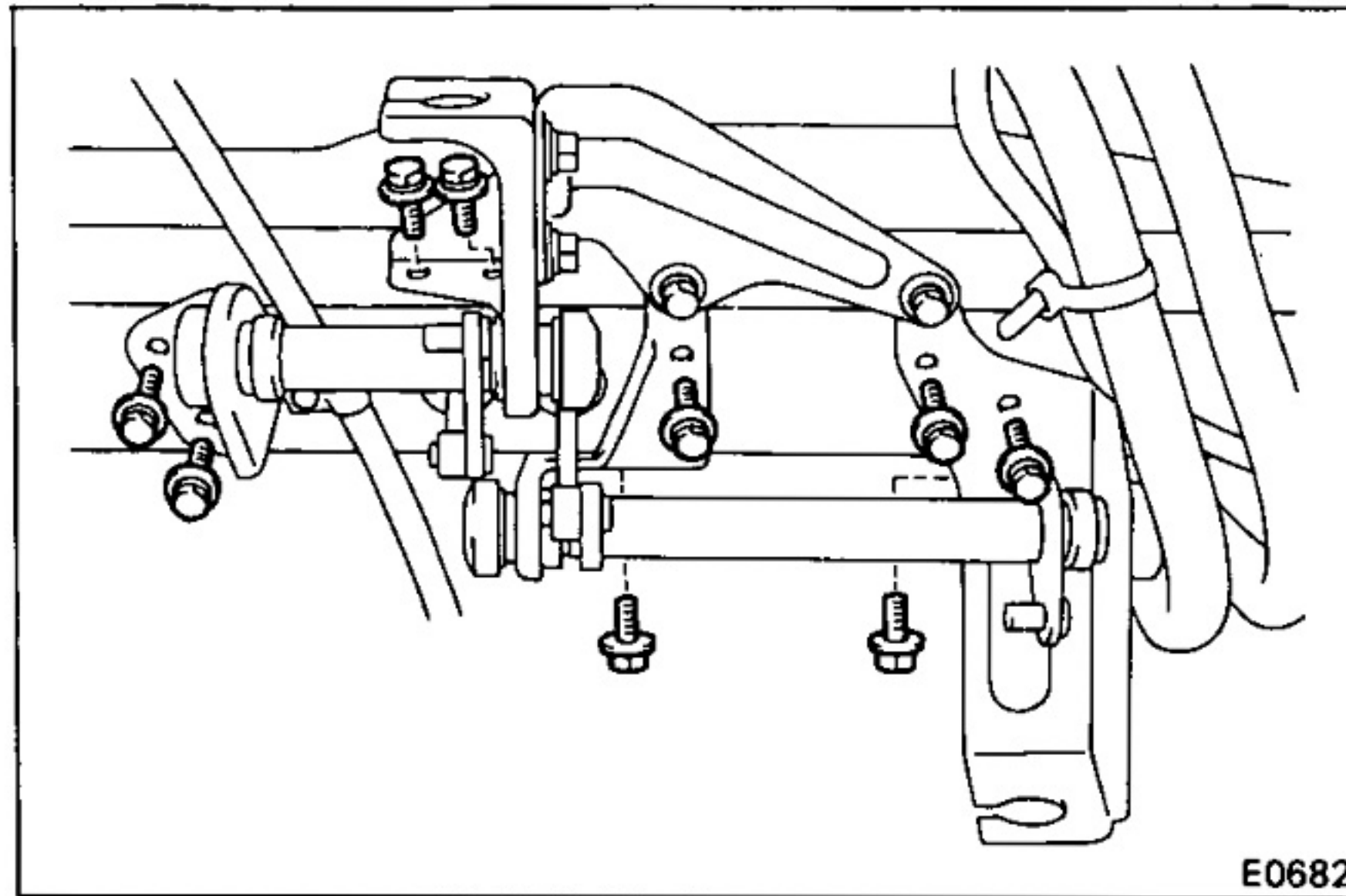
(a) Remove the clip and plate washer.

(b) Remove the clip and disconnect the cable from the bracket.

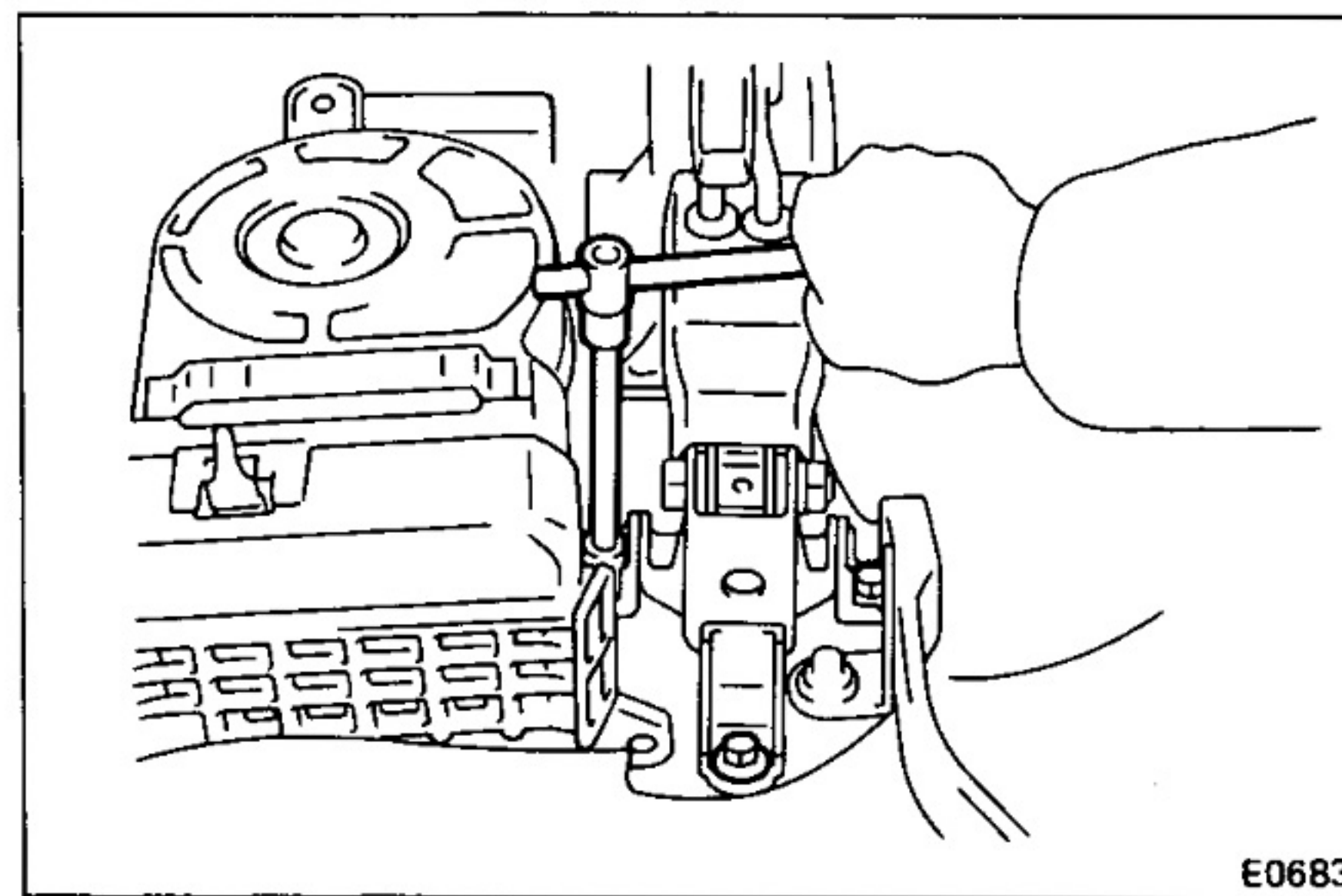


**6. REMOVE DIFFERENTIAL LOCK CONTROL SHAFT ASSEMBLY**

(a) Remove the two clips and washers.



(b) Remove the nine bolts and lock control shaft assembly.

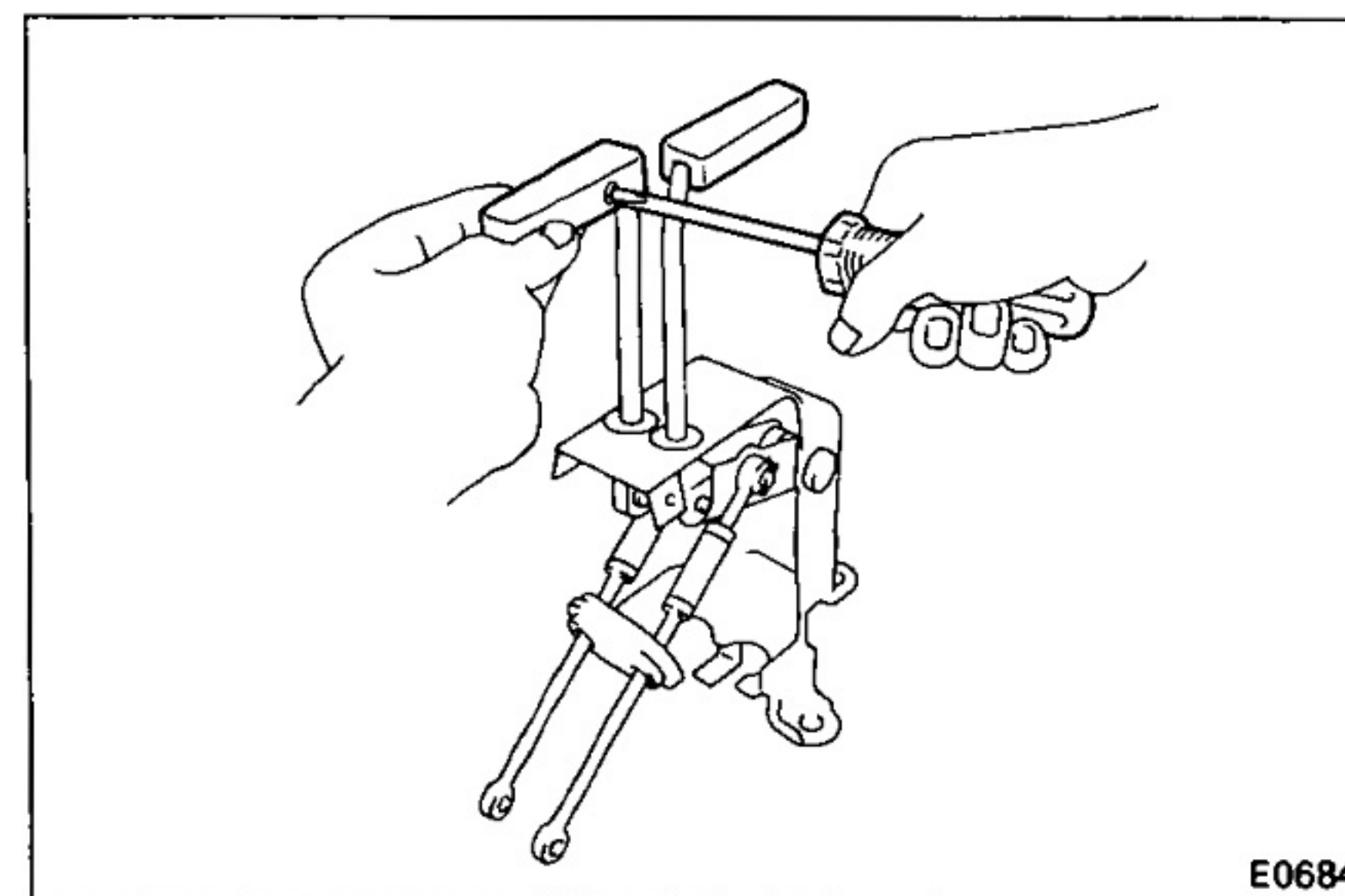


**7. REMOVE DIFFERENTIAL LOCK LEVER ASSEMBLY**

Remove the three bolts and lock lever assembly.

**DISASSEMBLY OF DIFFERENTIAL LOCK LEVER**

**1. REMOVE FRONT AND REAR LOCK KNOBS**

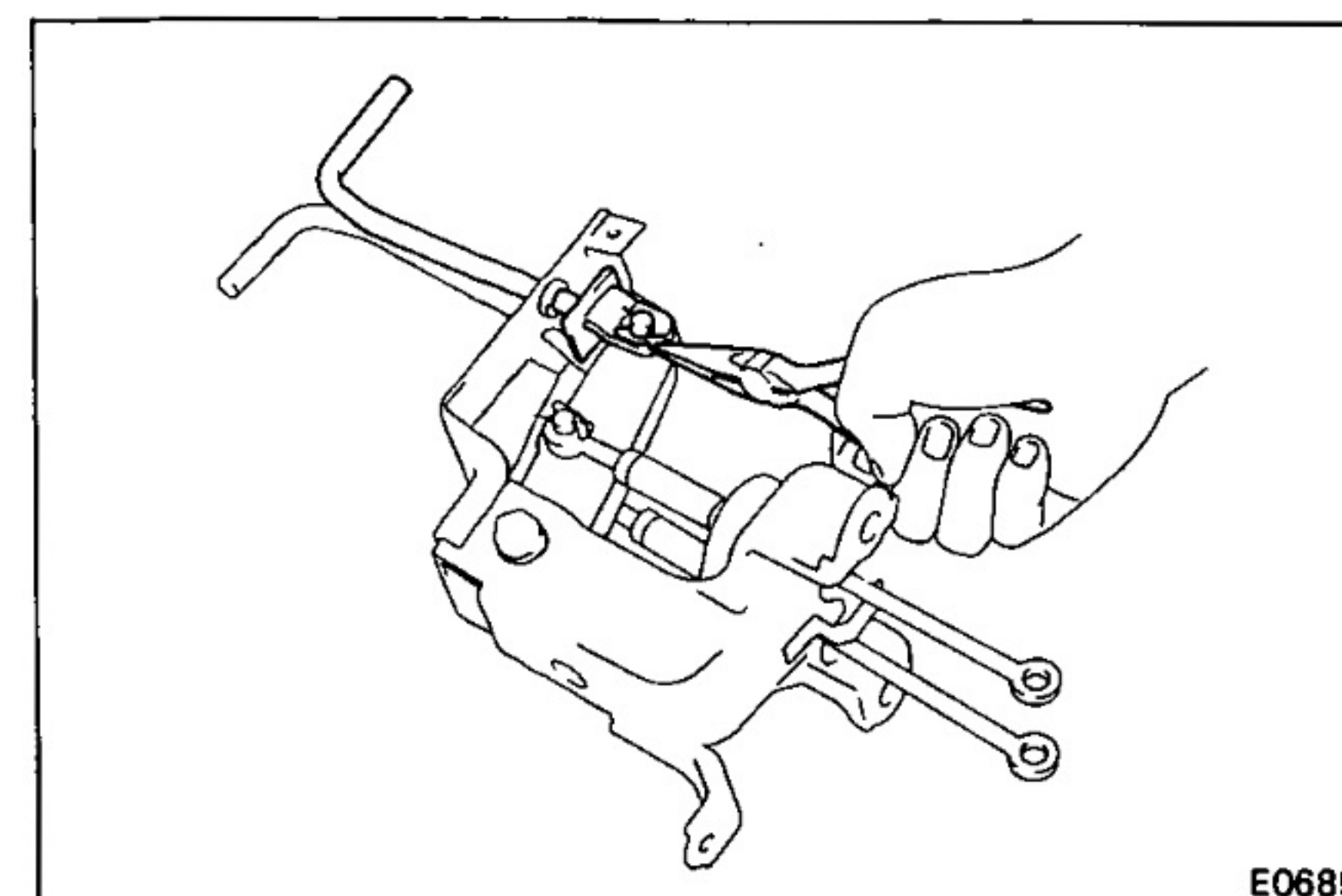


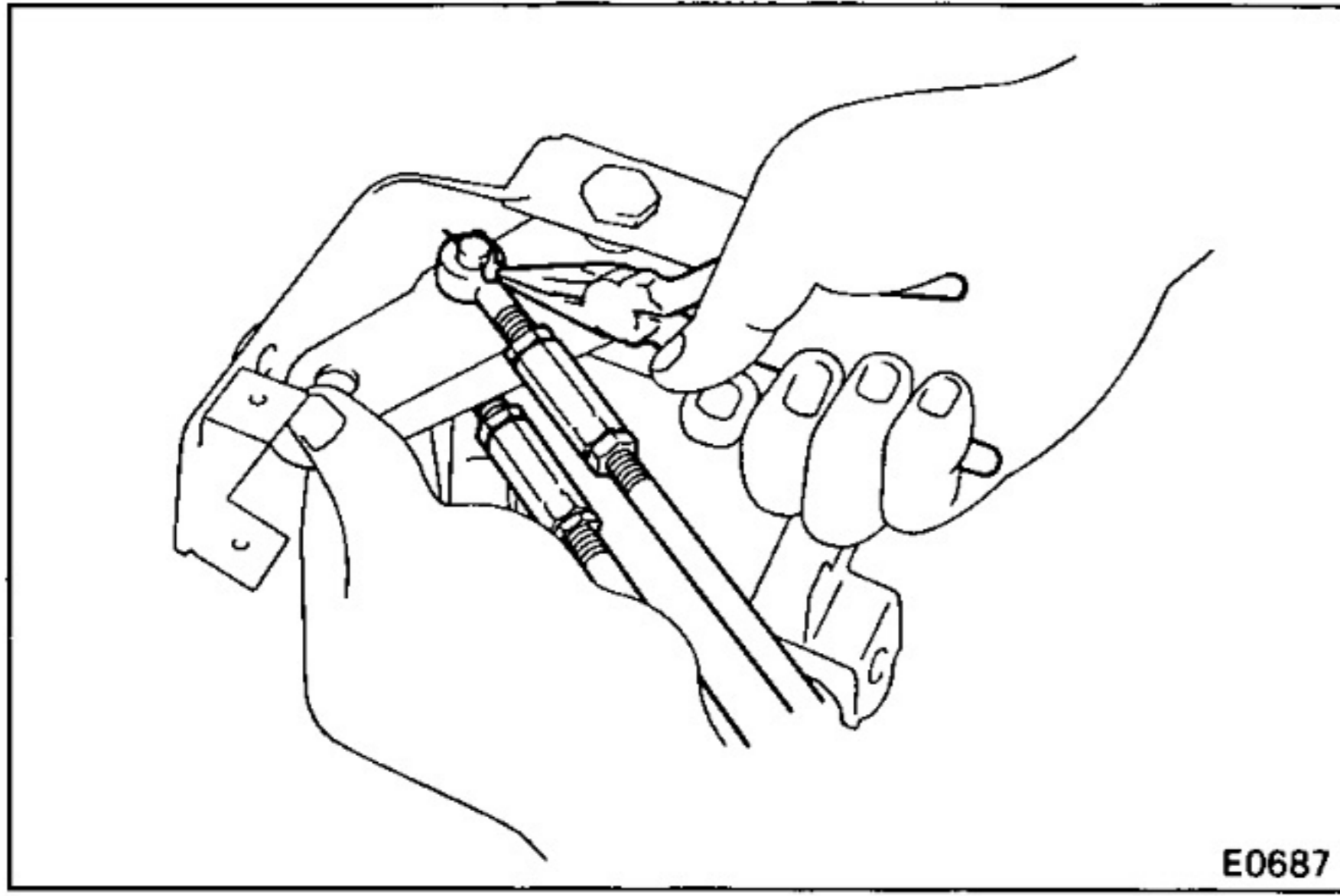
**2. REMOVE FRONT AND REAR LOCK LEVERS**

(a) Remove the clip, pin and wave washer.

(b) Remove the lock lever from the bracket.

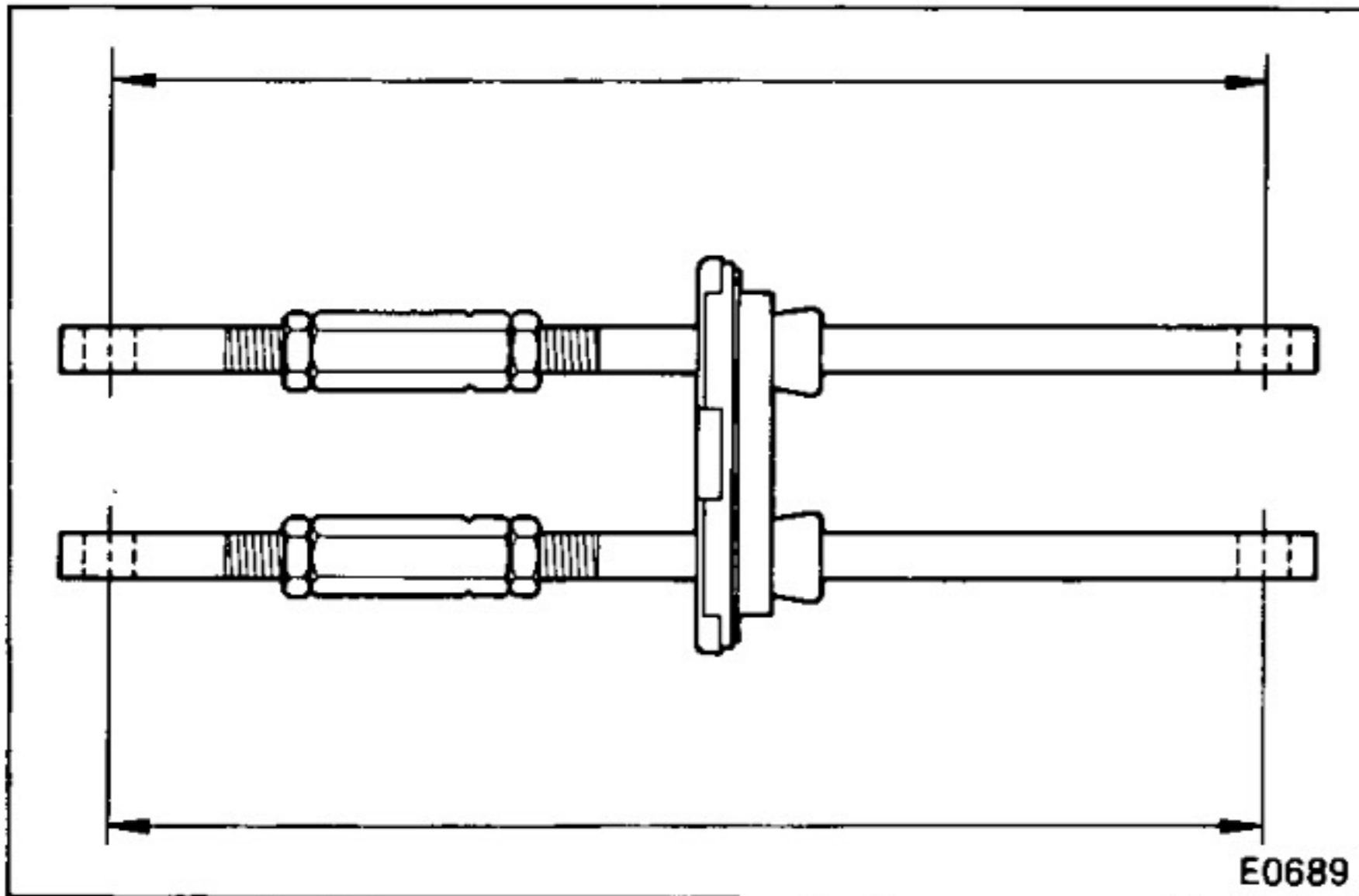
**3. REMOVE TWO GROMMETS**





#### 4. REMOVE DIFFERENTIAL LOCK ROD ASSEMBLY

Remove the two clips and washers, remove rod assembly from the rod link.



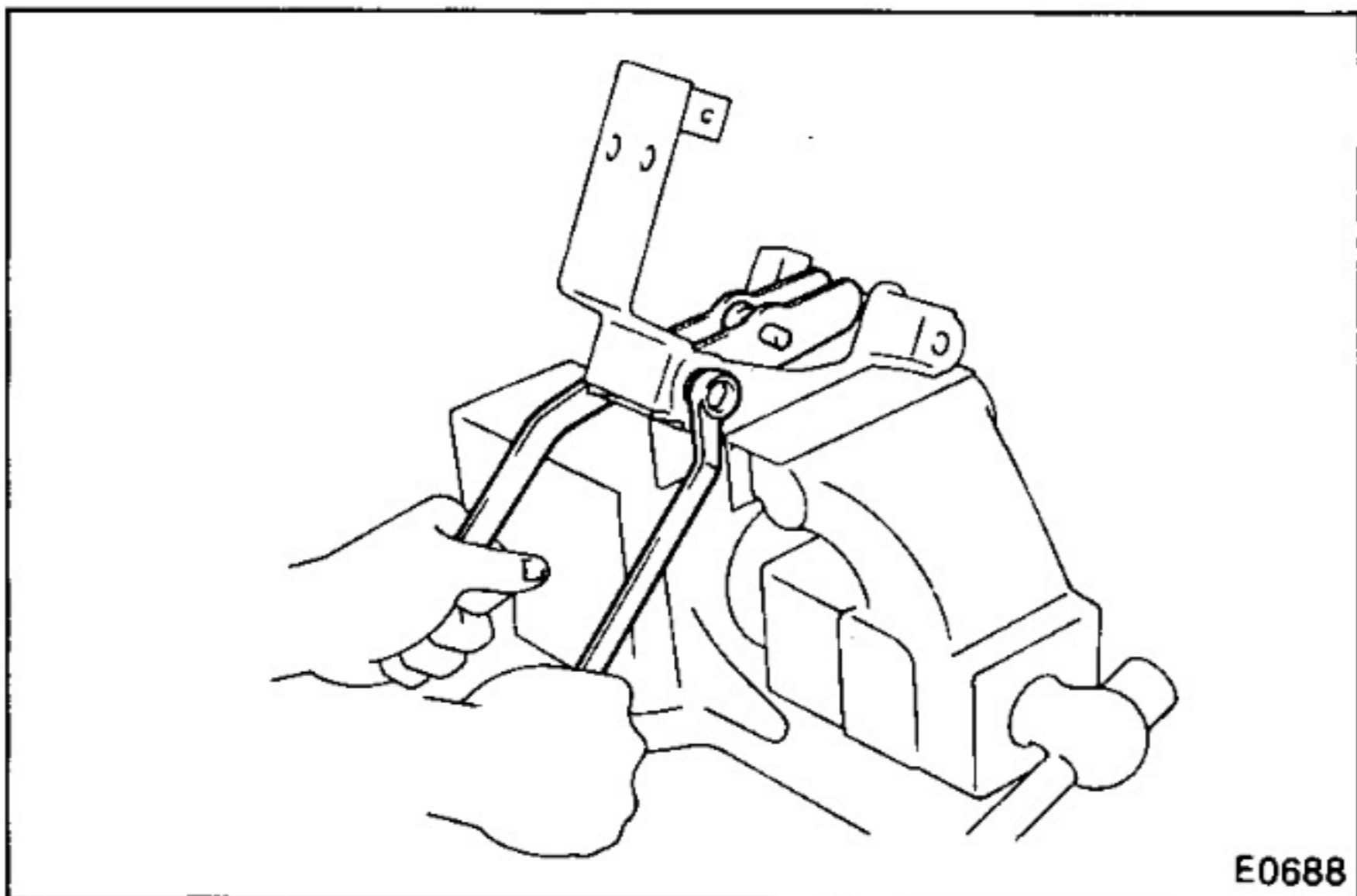
#### 5. REMOVE NO.1 AND NO.2 RODS

(a) Measure the length of the rod assembly.

NOTE: For assembling the rod arm assembly, record the arm lengths for reference.

(b) Loosen the lock nut and remove the No.1 and No.2 rod from the turn buckle.

(c) Remove the grommet cover and grommet.



#### 6. REMOVE DIFFERENTIAL LOCK LINK

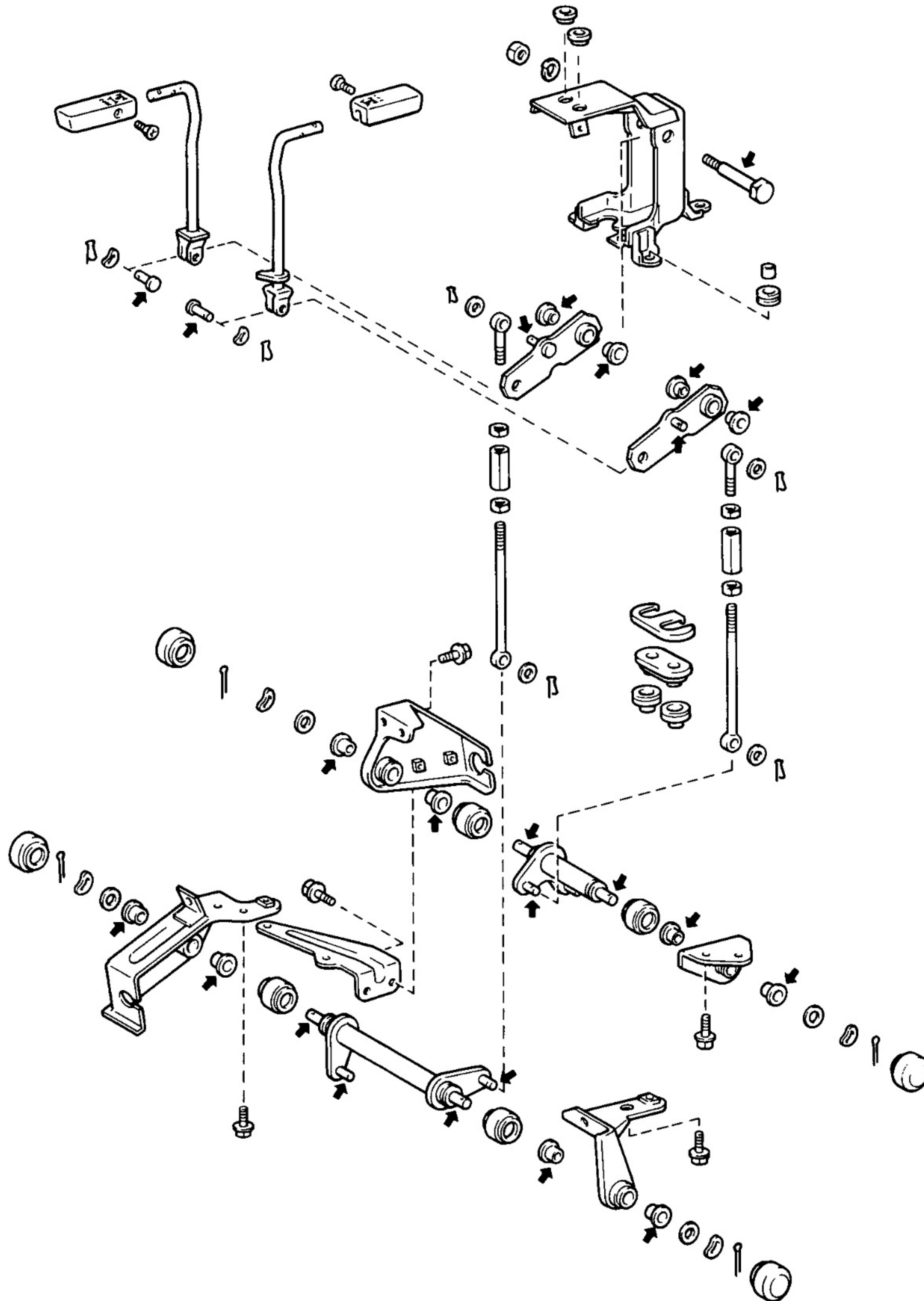
(a) Remove the nut and lock link shaft.

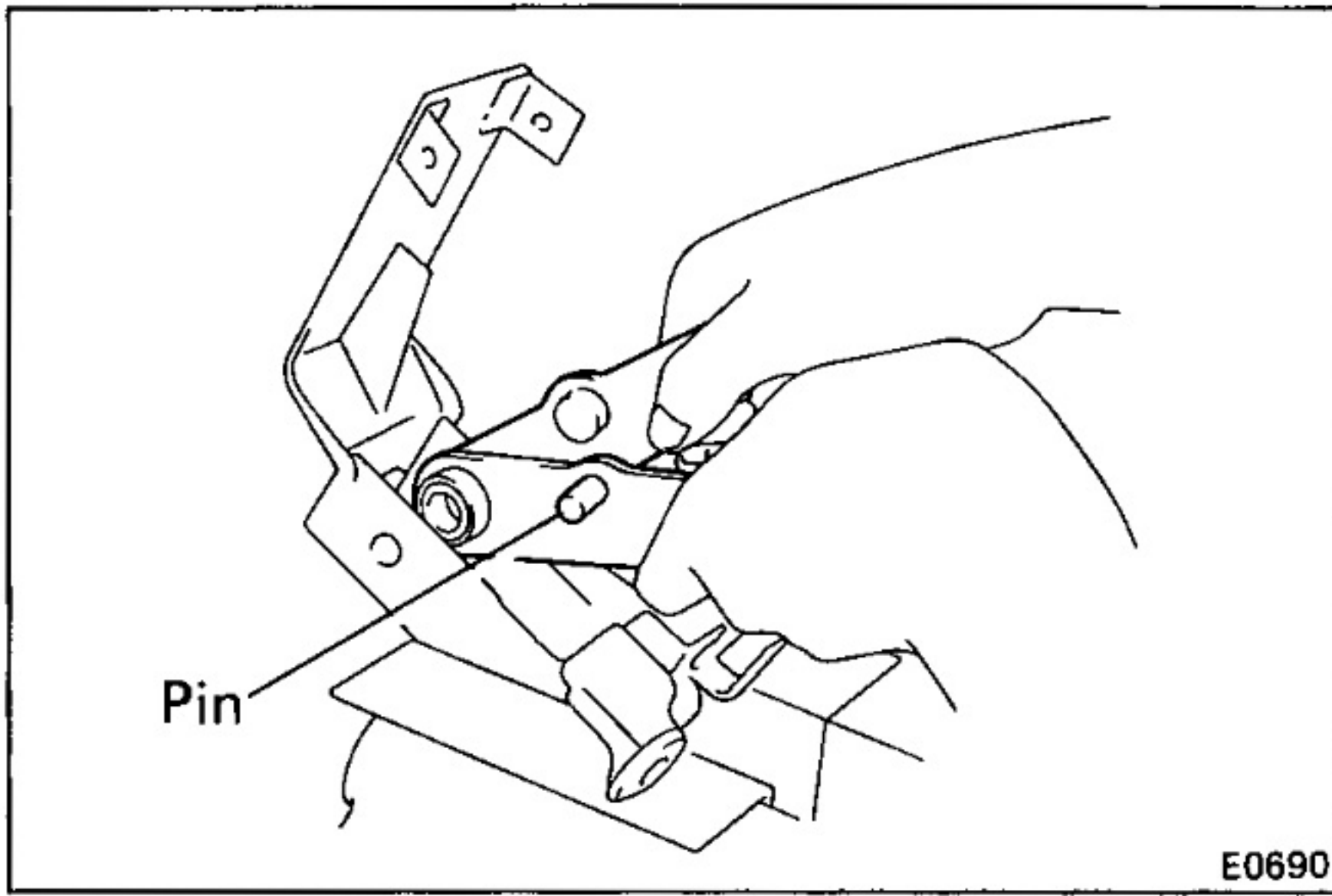
(b) Remove the two lock links and four bushings.

#### 7. REMOVE BRACKET GROMMET AND COLLAR

### ASSEMBLY OF DIFFERENTIAL LOCK LEVER

1. APPLY MP GREASE TO THE FOLLOWING PARTS



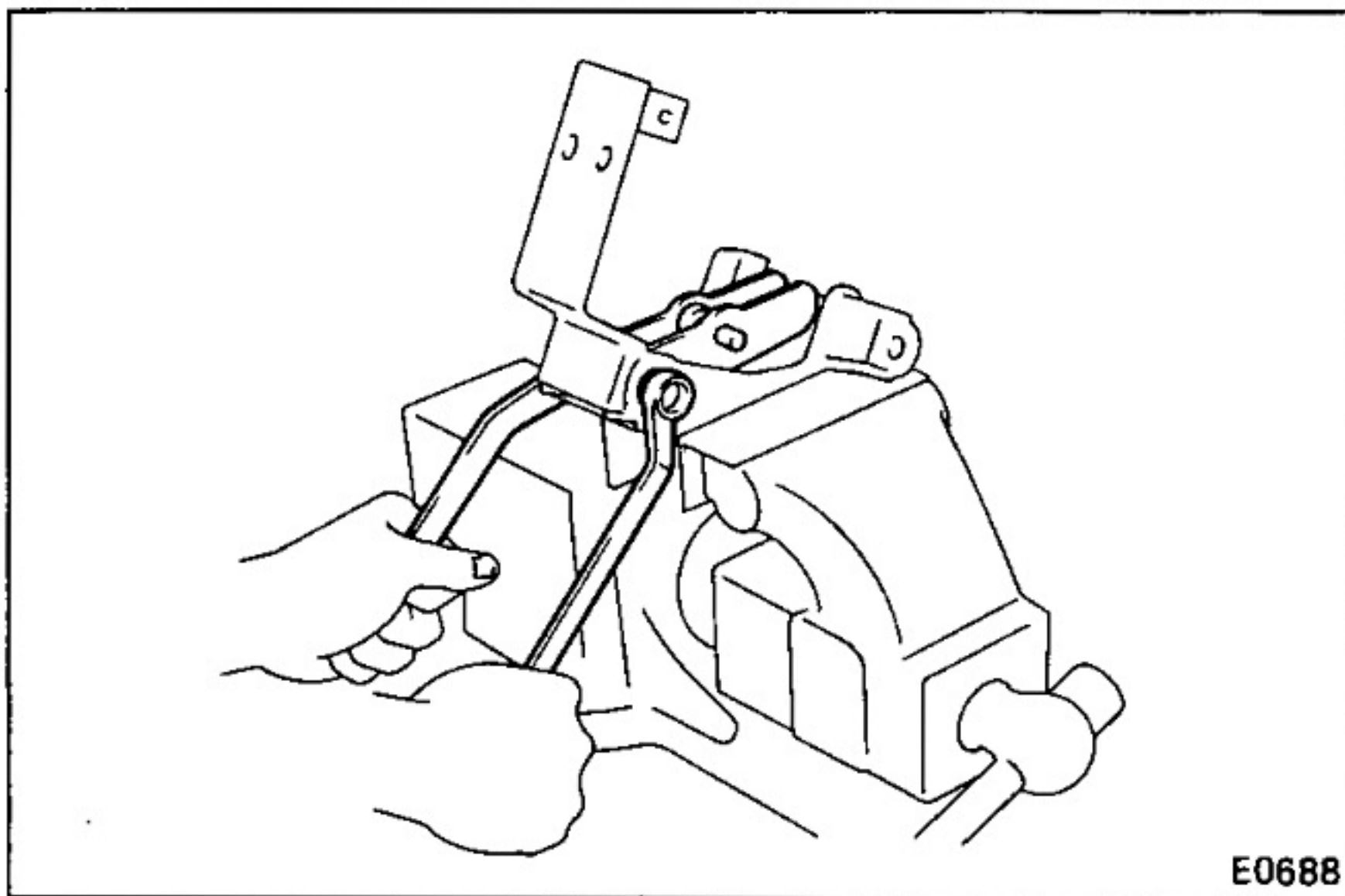


## 2. INSTALL LOCK BRACKET GROMMET AND COLLAR

## 3. INSTALL DIFFERENTIAL LOCK LINK TO BRACKET

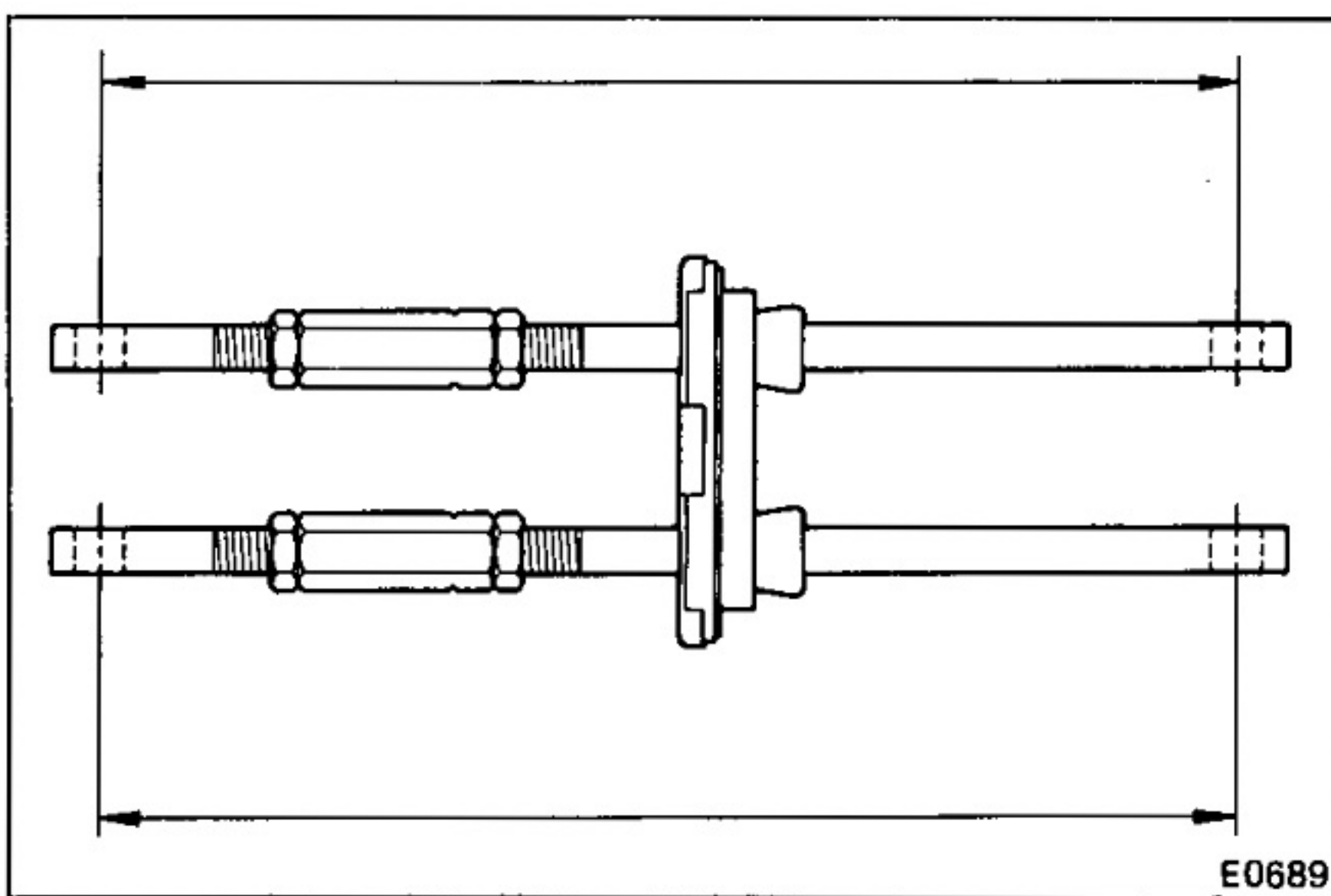
- (a) Install the four bushings to the two lock link.
- (b) Install the two lock links to the bracket.

NOTE: The link has a pin on one side. When installing the link and bracket, keep the pin side faced outwards.



- (c) Install the lock link shaft to the lock bracket and torque the nut.

**Torque: 260 kg-cm (19 ft-lb, 25 N·m)**

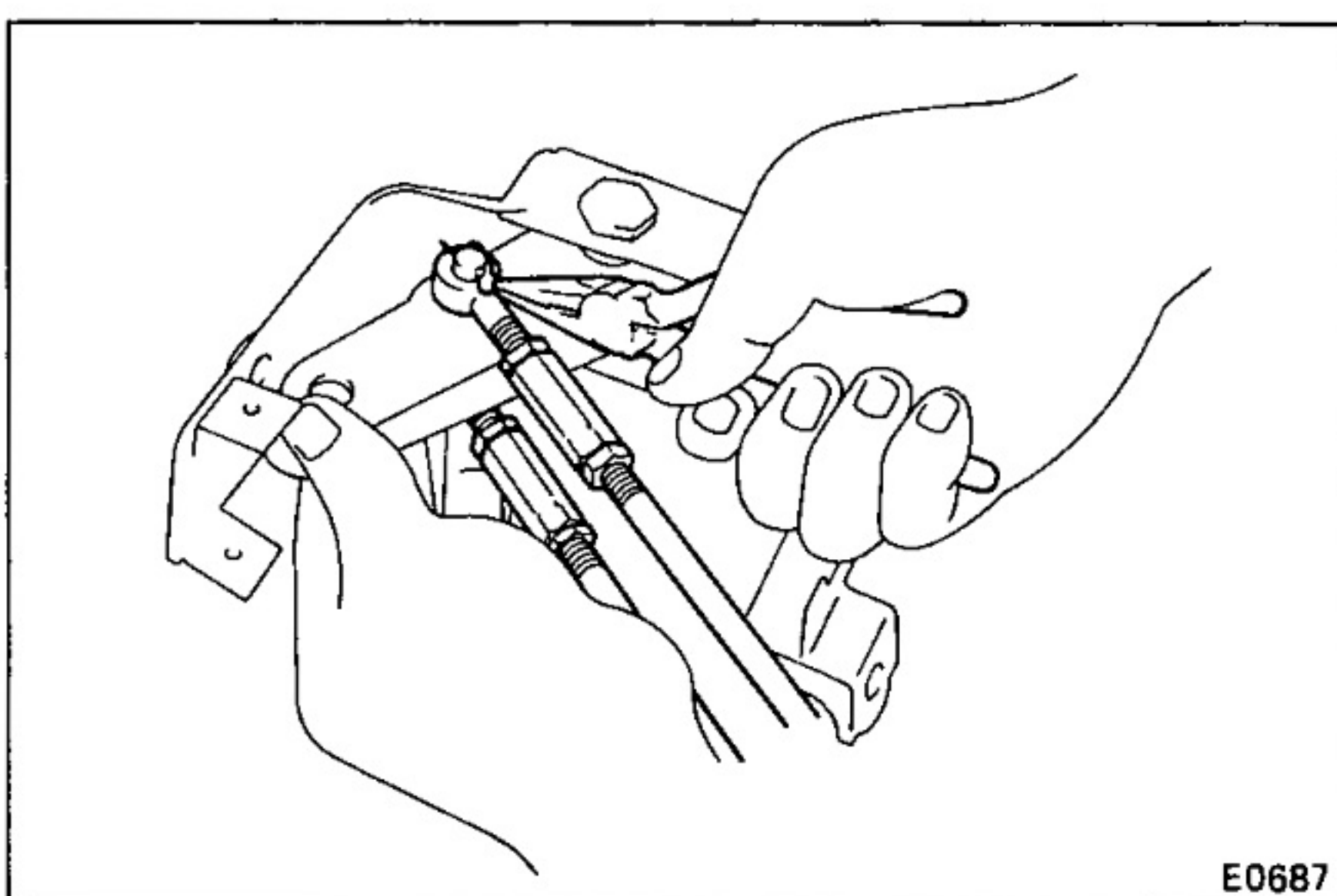


## 4. INSTALL NO.1 AND NO.2 LOCK RODS

- (a) Install the grommet and grommet cover to the No.2 lock rod.
- (b) To keep the lengths of the No.1 and No.2 lock the same as that before removal, install the buckle and tighten the lock nut.

**Torque: 130 kg-cm (9 ft-lb, 13 N·m)**

NOTE: Keep the pin holes on both No.1 and No.2 lock rods facing outward.

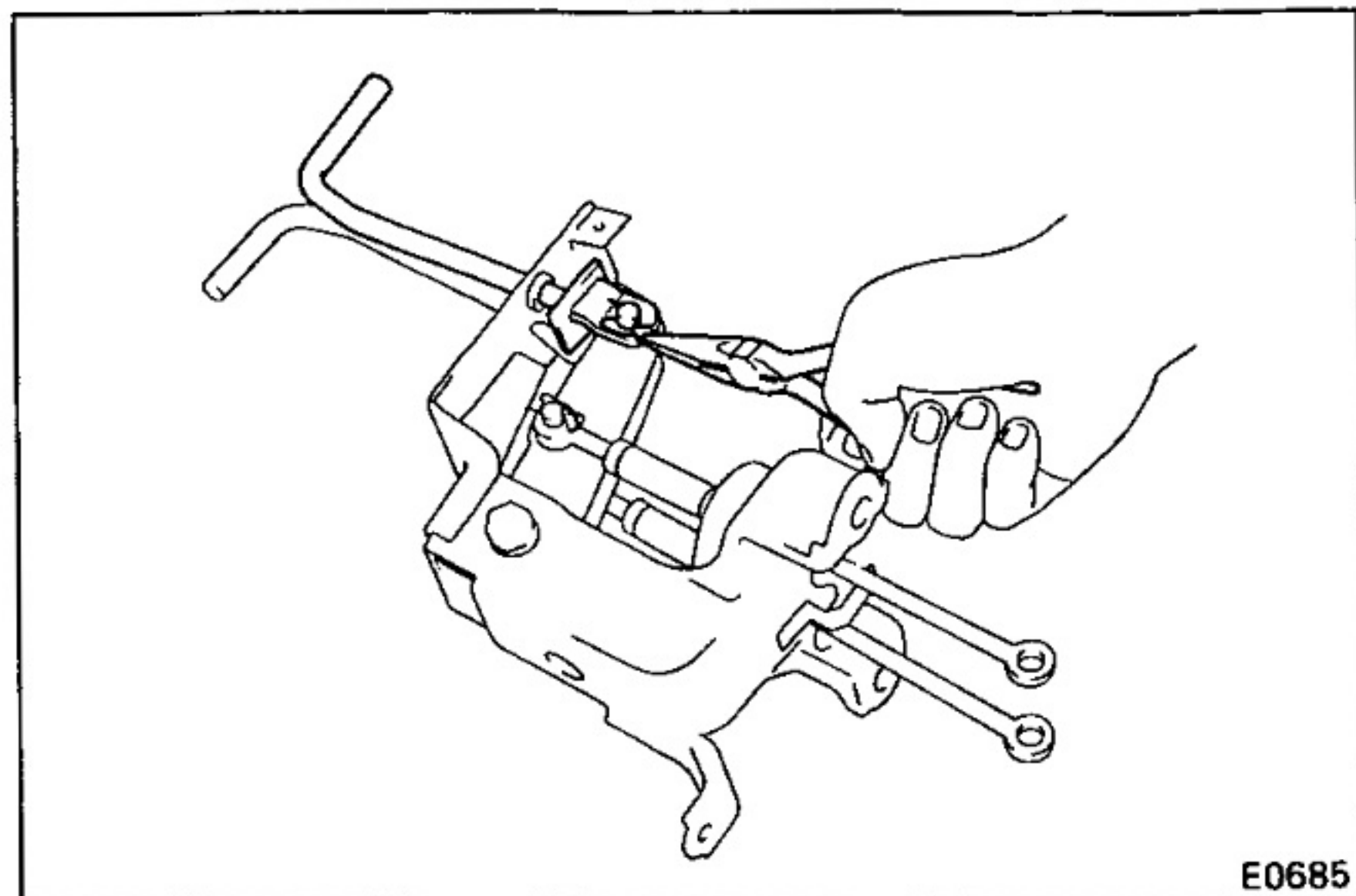


## 5. INSTALL LOCK ROD ASSEMBLY

- (a) Connect the No.1 lock rod to the lock link.
- (b) Install the plate washer and clip.

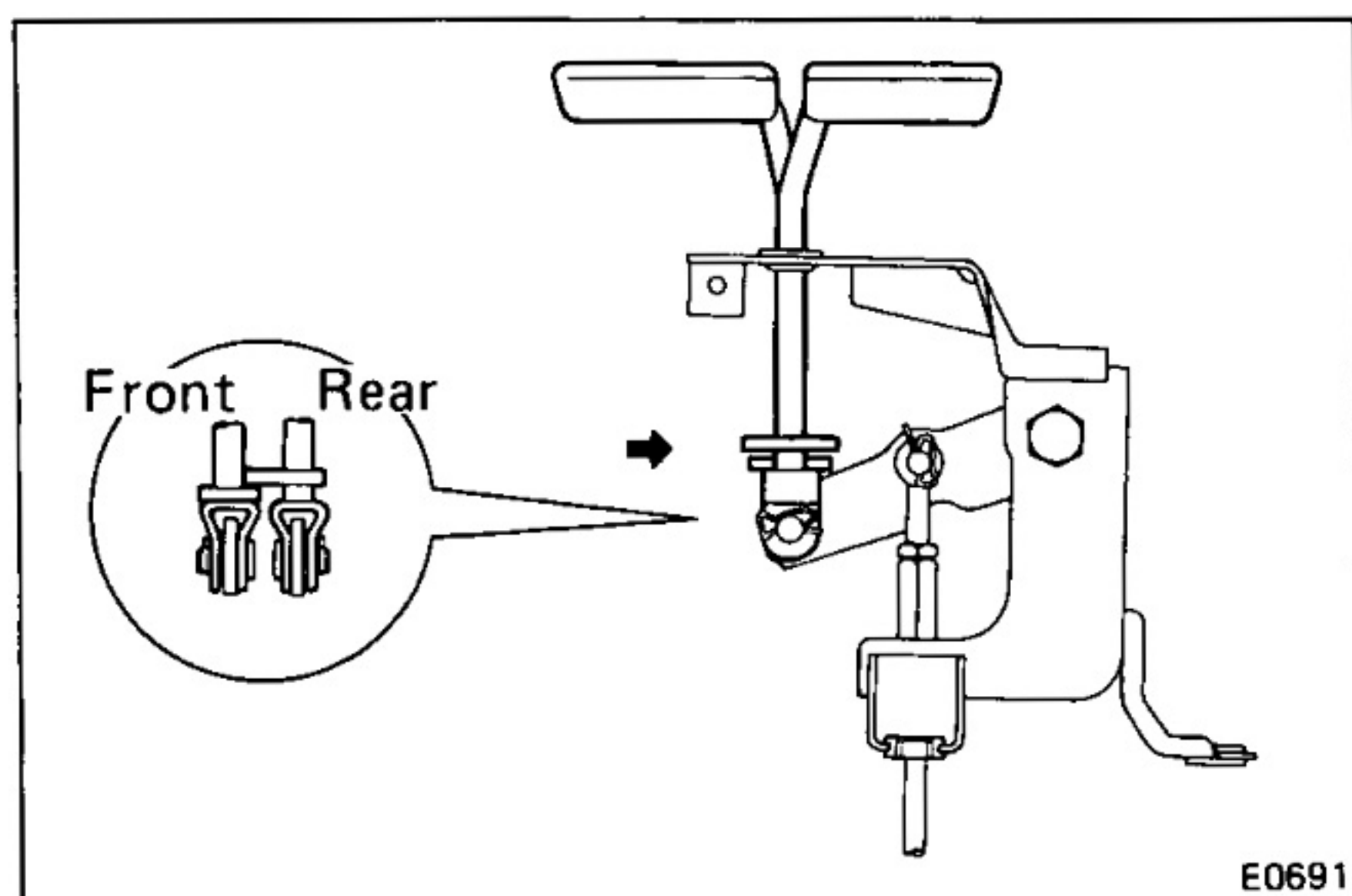
## 6. INSTALL LOCK LEVER GROMMET

Install the two lock lever grommets to the lock bracket.



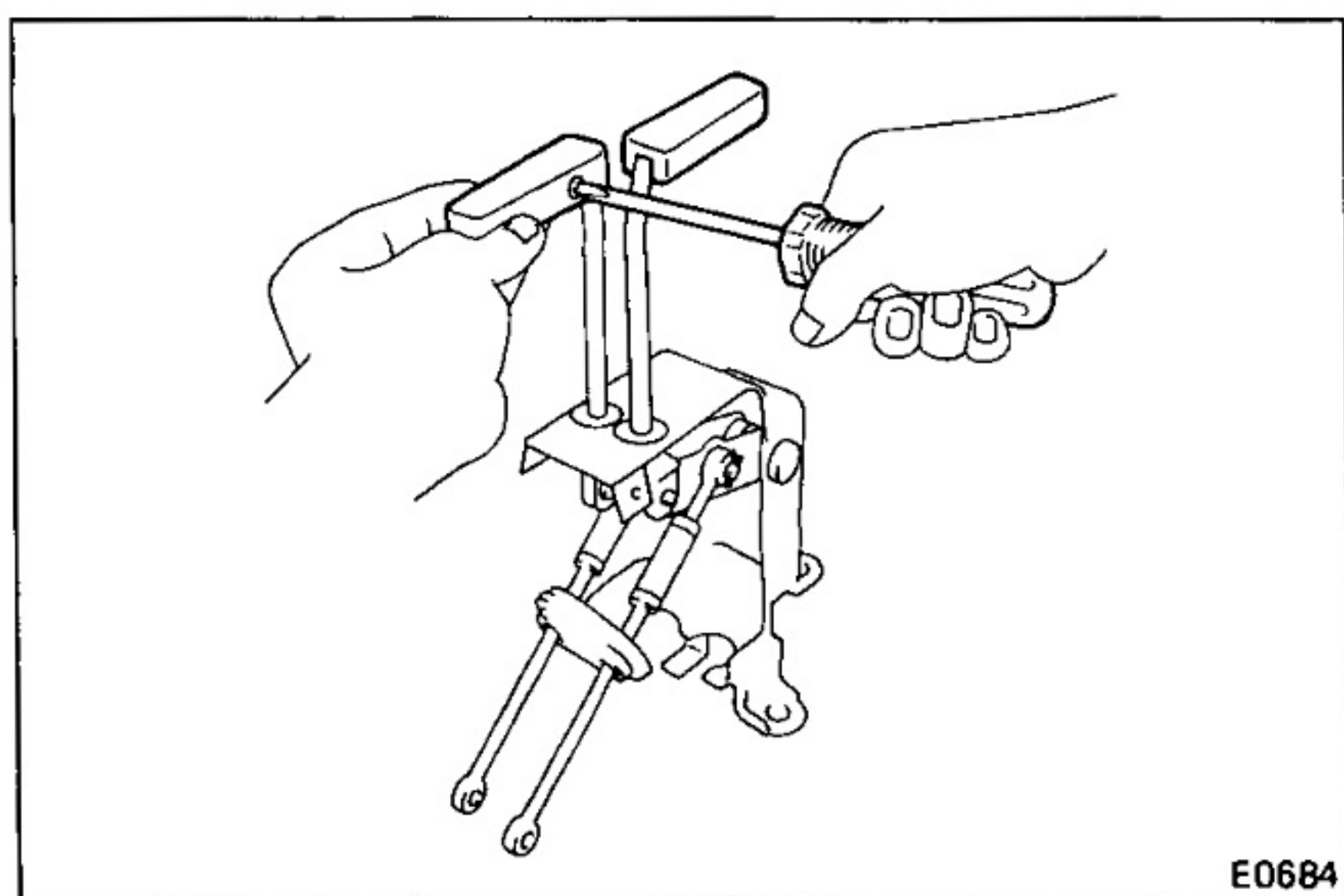
**7. INSTALL FRONT AND REAR LOCK LEVERS**

- (a) Install the lever to the lock bracket.
- (b) Install the wave washer, pin and clip to the lock link.

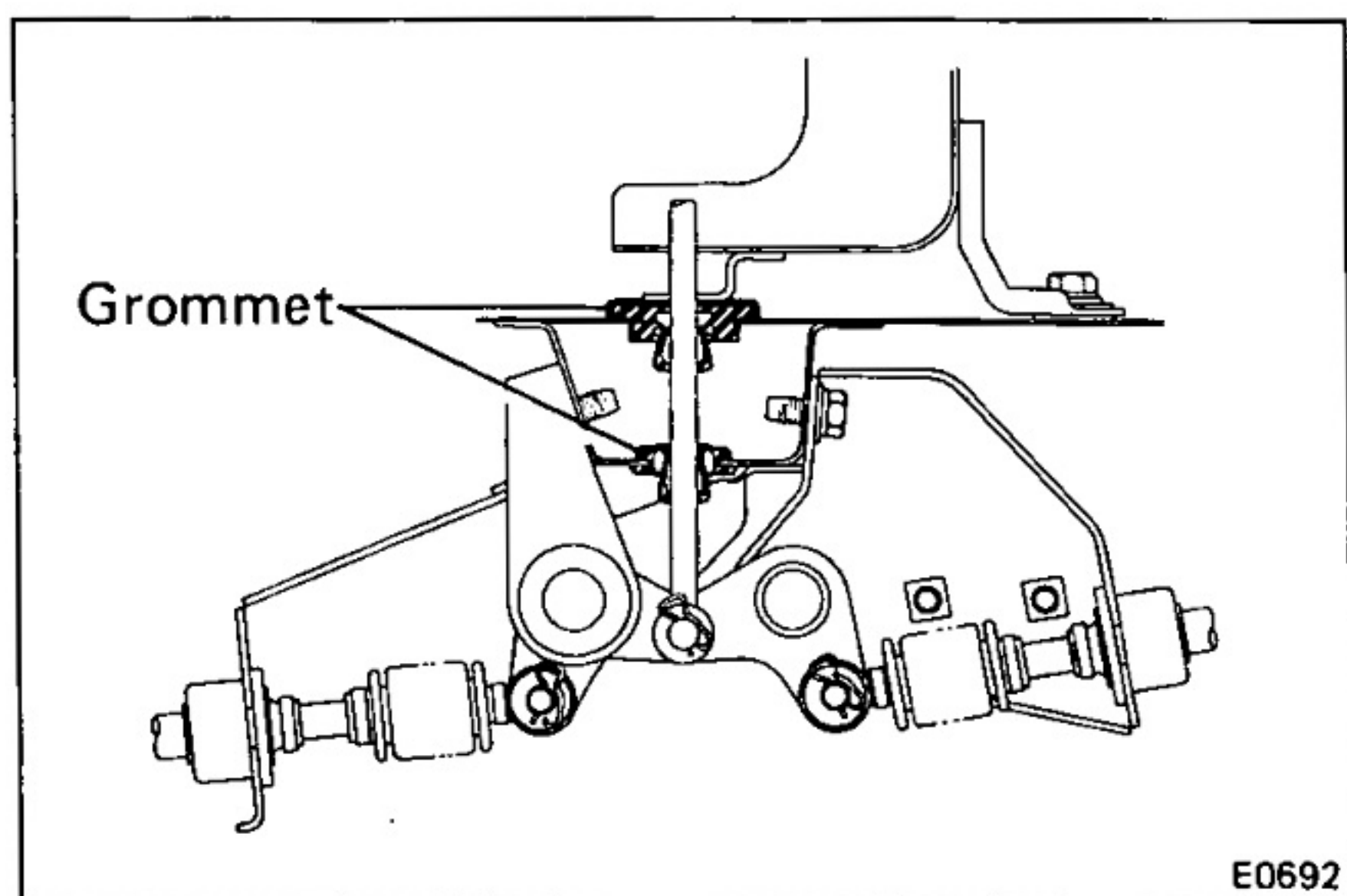


**8. CHECK LOCK LEVER INSTALLATION**

Check that the front and rear lock levers have been installed as shown in the illustration.



**9. INSTALL FRONT AND REAR LOCK KNOBS**



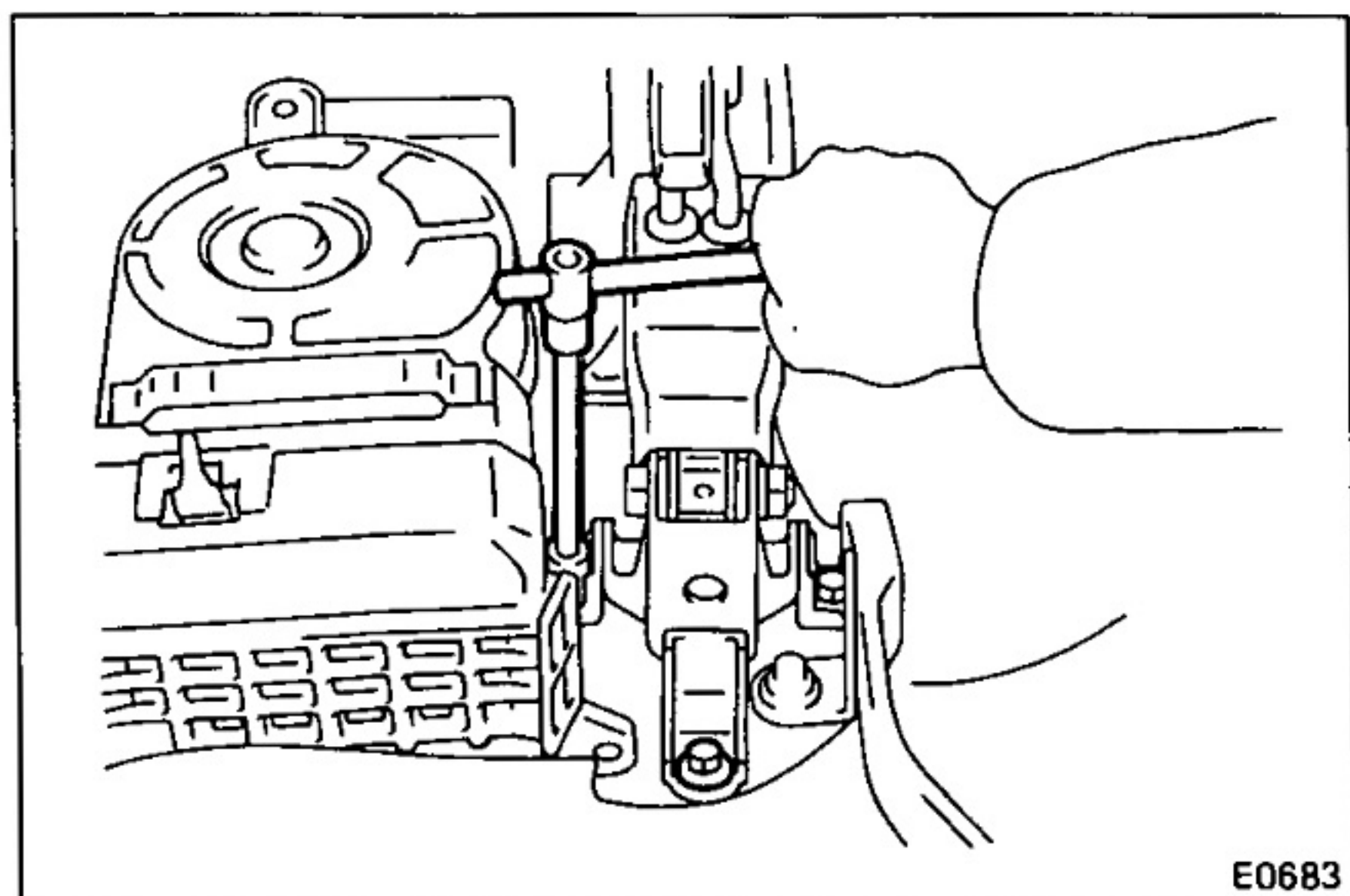
**INSTALLATION OF DIFFERENTIAL LOCK LEVER**

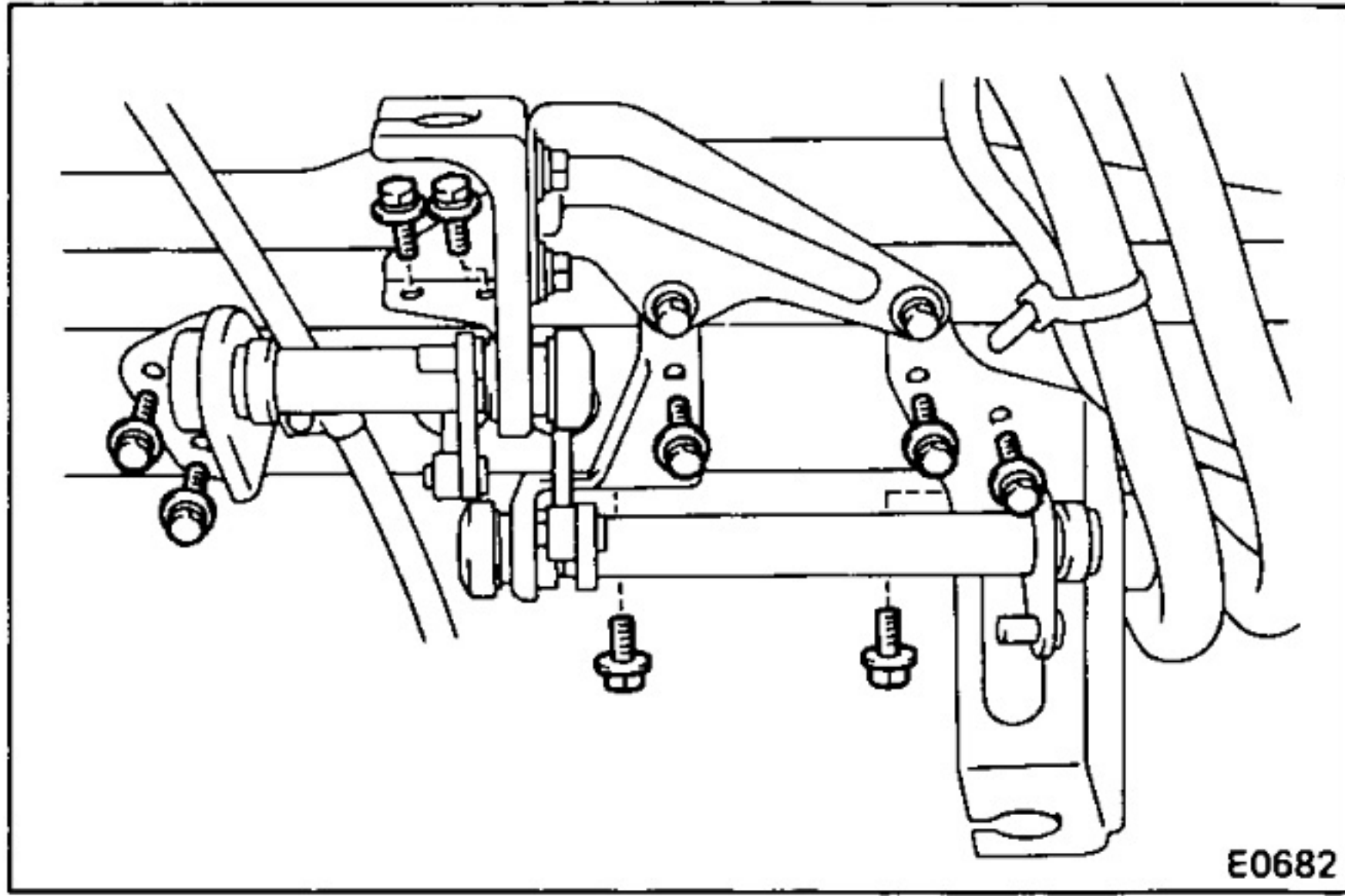
**1. INSTALL DIFFERENTIAL LOCK LEVER ASSEMBLY**

- (a) Install the two grommets.

- (b) Install the lock lever assembly and torque the three bolts.

**Torque: 130 kg-cm (9 ft-lb, 13 N·m)**

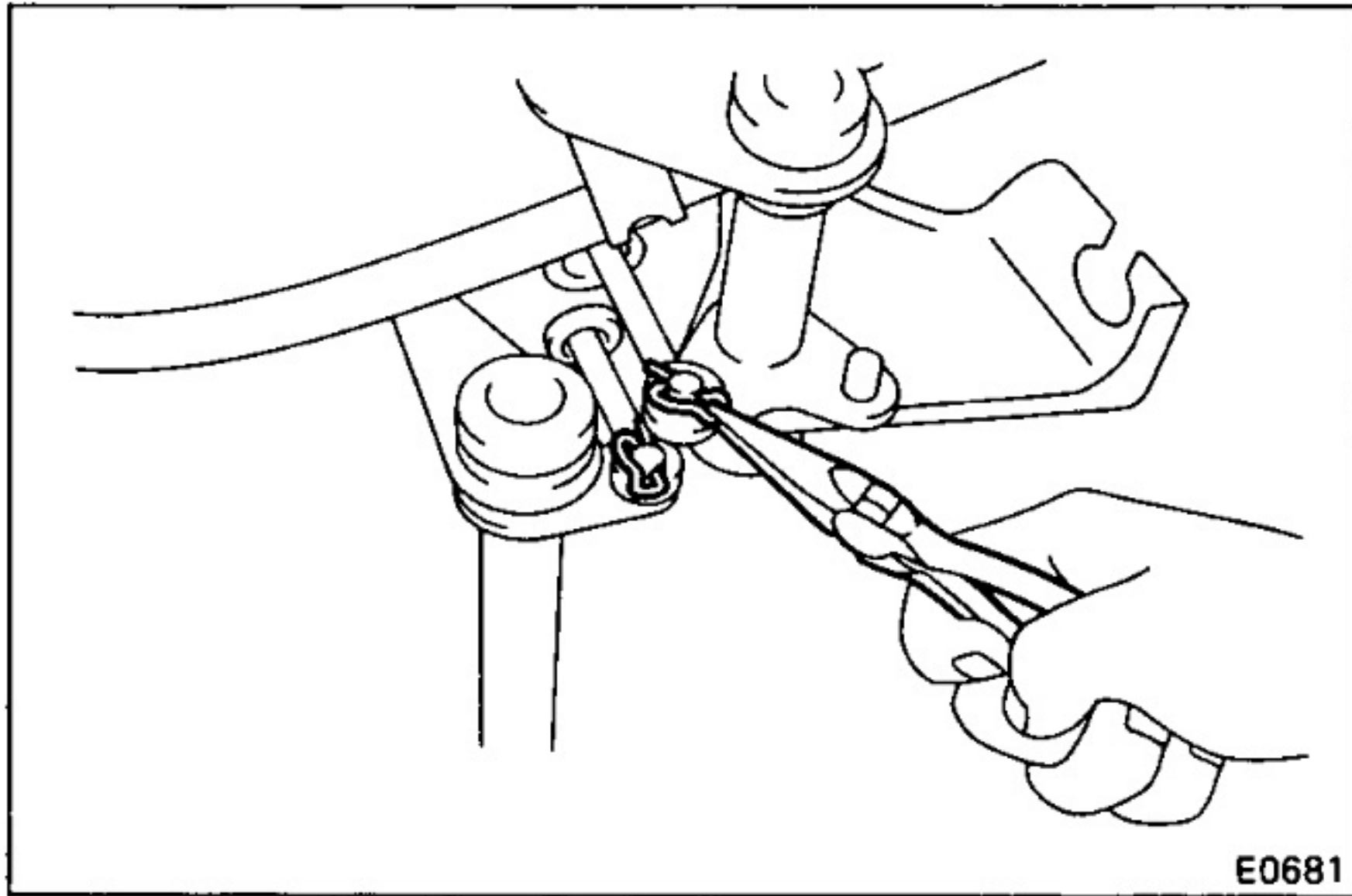




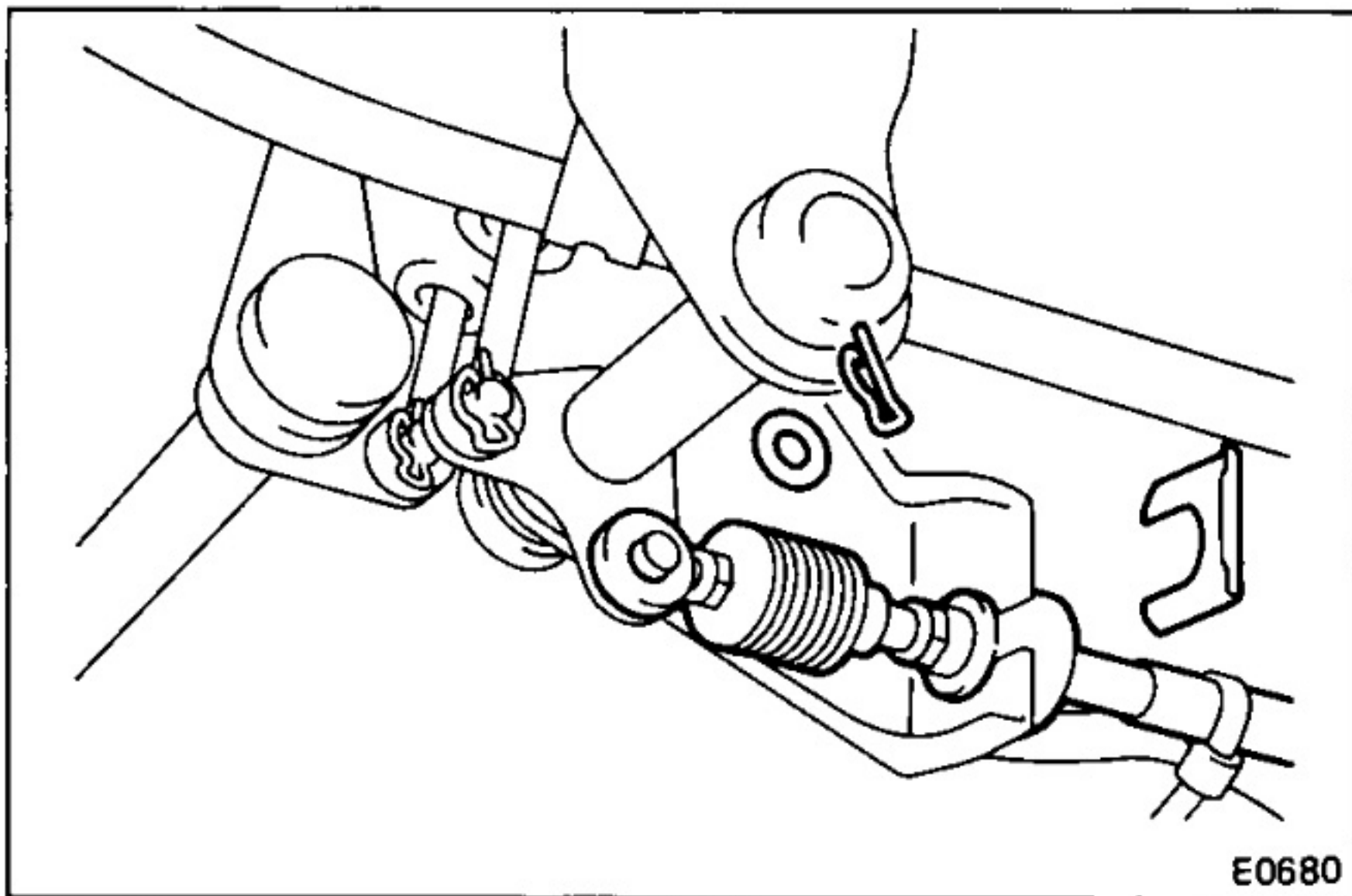
## 2. INSTALL DIFFERENTIAL LOCK CONTROL SHAFT ASSEMBLY

- (a) Install the lock rod to the control shaft.
- (b) Torque the nine bolts.

**Torque: 130 kg-cm (9 ft-lb, 13 N·m)**

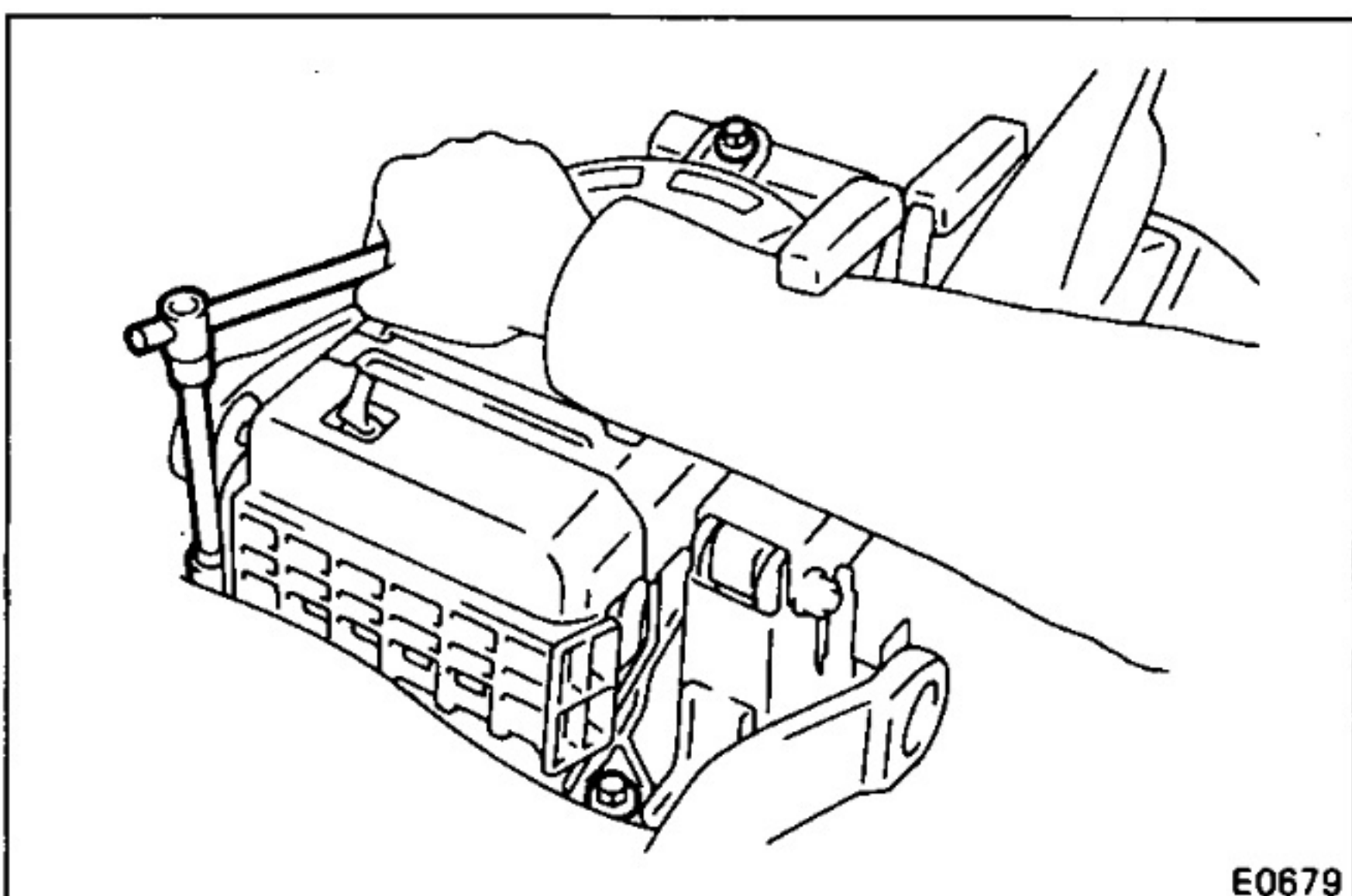


- (c) Install the two washers and clip.



## 3. CONNECT FRONT AND REAR LOCK CABLES

- (a) Connect the front and rear cable to the lock control bracket and install the clip.
- (b) Connect the cable to the control shaft and install the washer and clip.

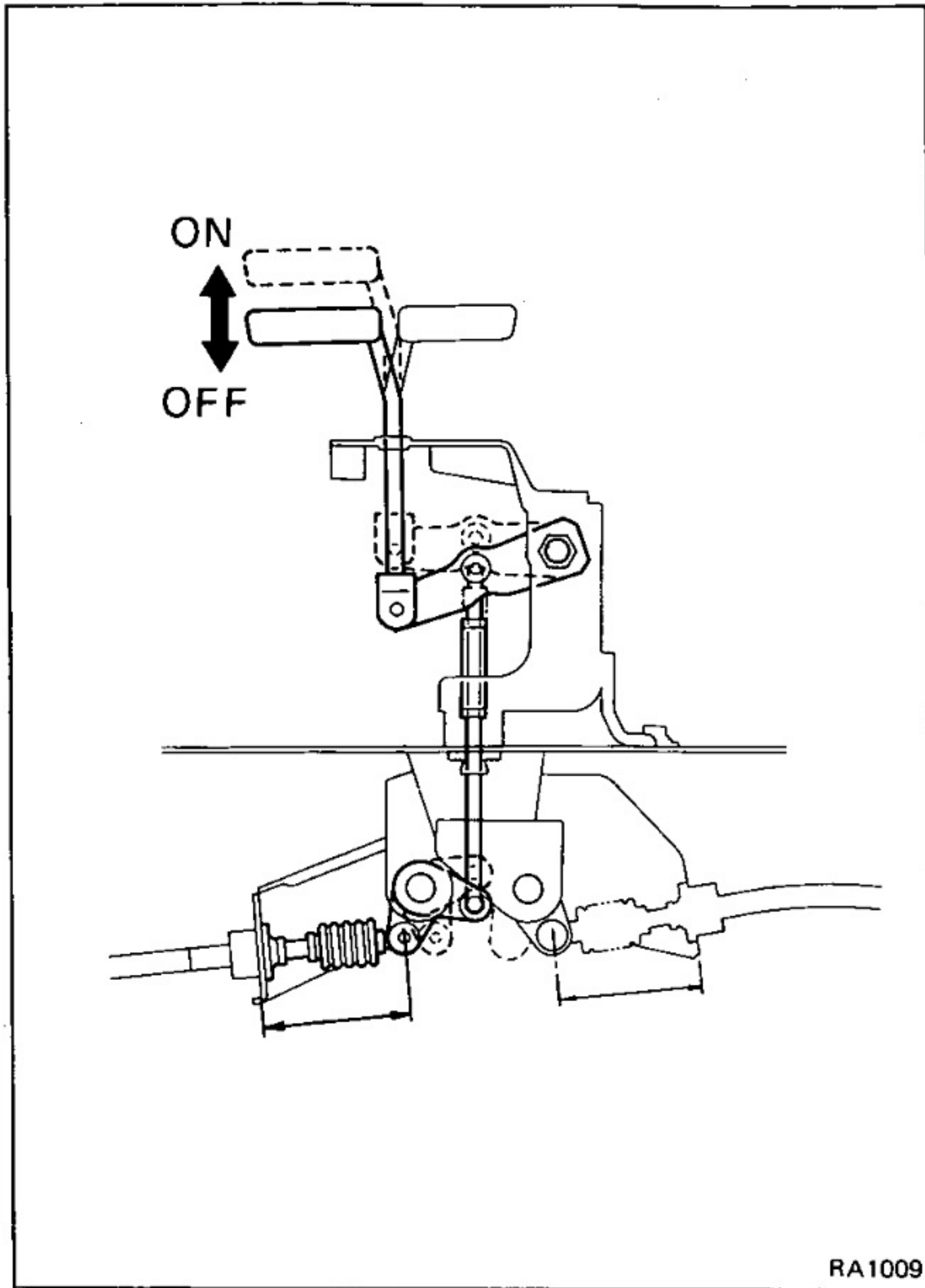


## 4. INSTALL REAR HEATER MOUNTING BOLTS

Install the three heater mounting bolts.

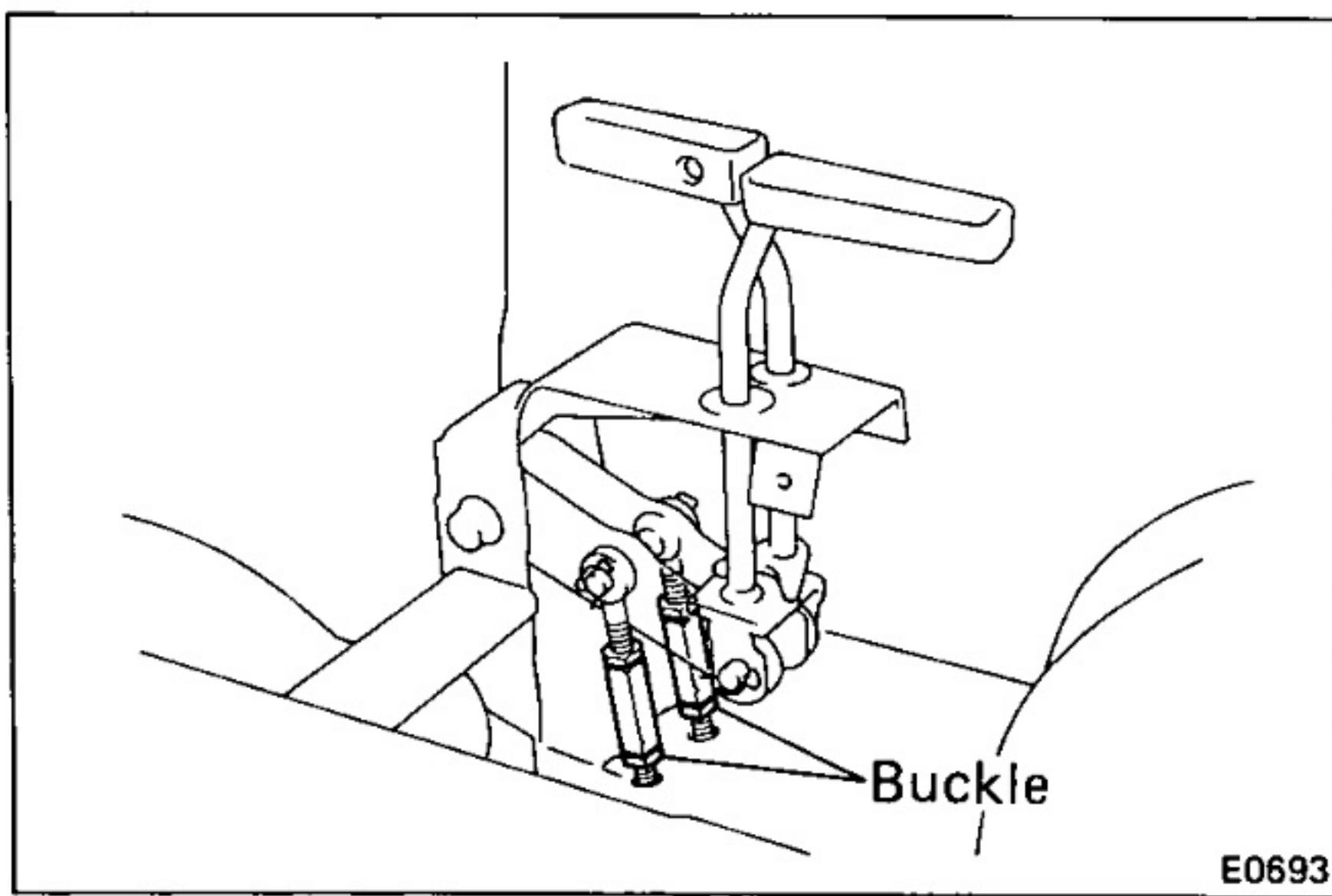
## 5. CHECK OPERATION LOCK LEVER

- (a) Turn the lock lever two or three times and check that the differential locks and unlocks in the order shown below.
  - (1) Rear ON
  - (2) Front ON
  - (3) Front OFF
  - (4) Rear OFF

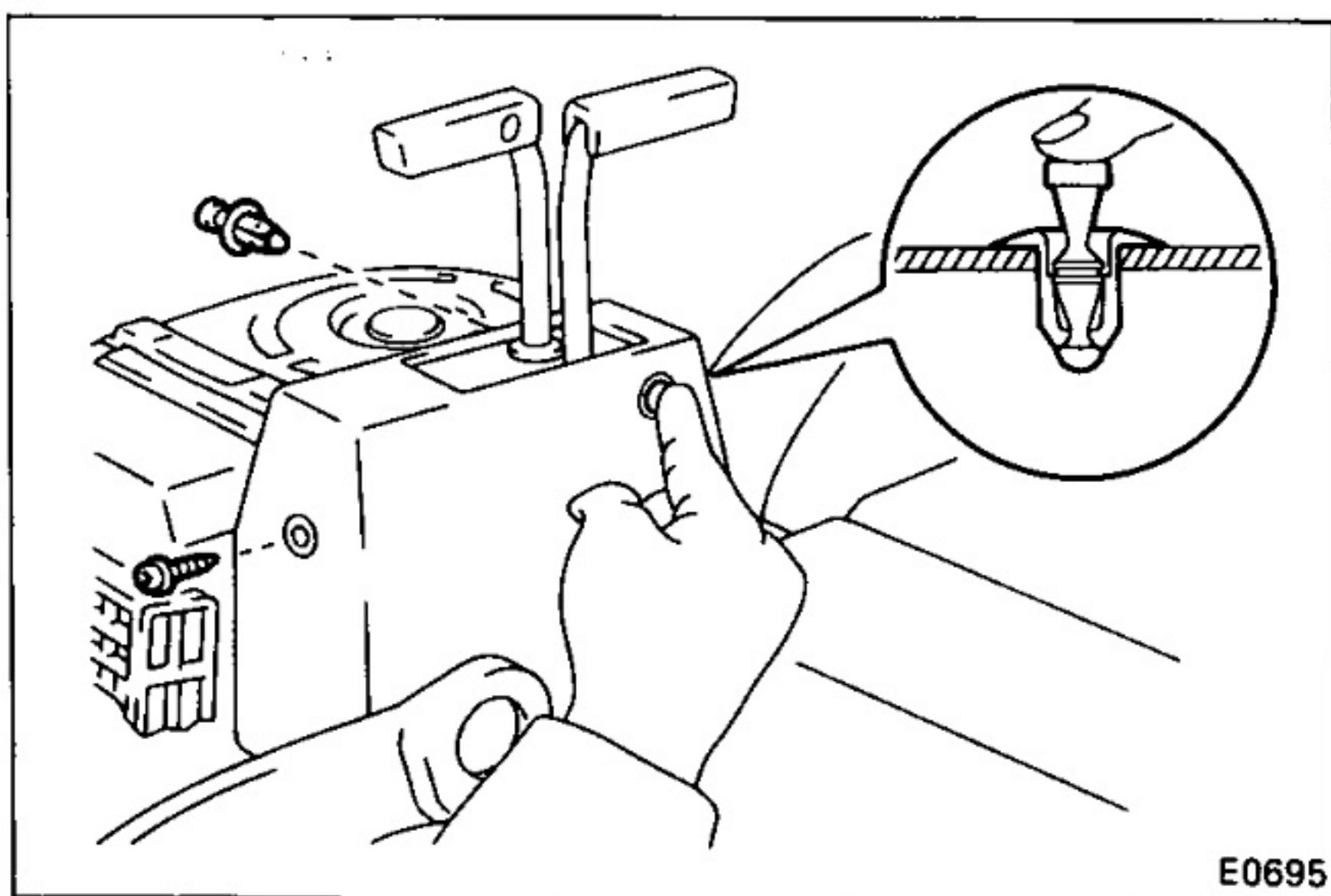


(b) With each differential lock levers OFF, measure the lengths of both the front and rear cables.

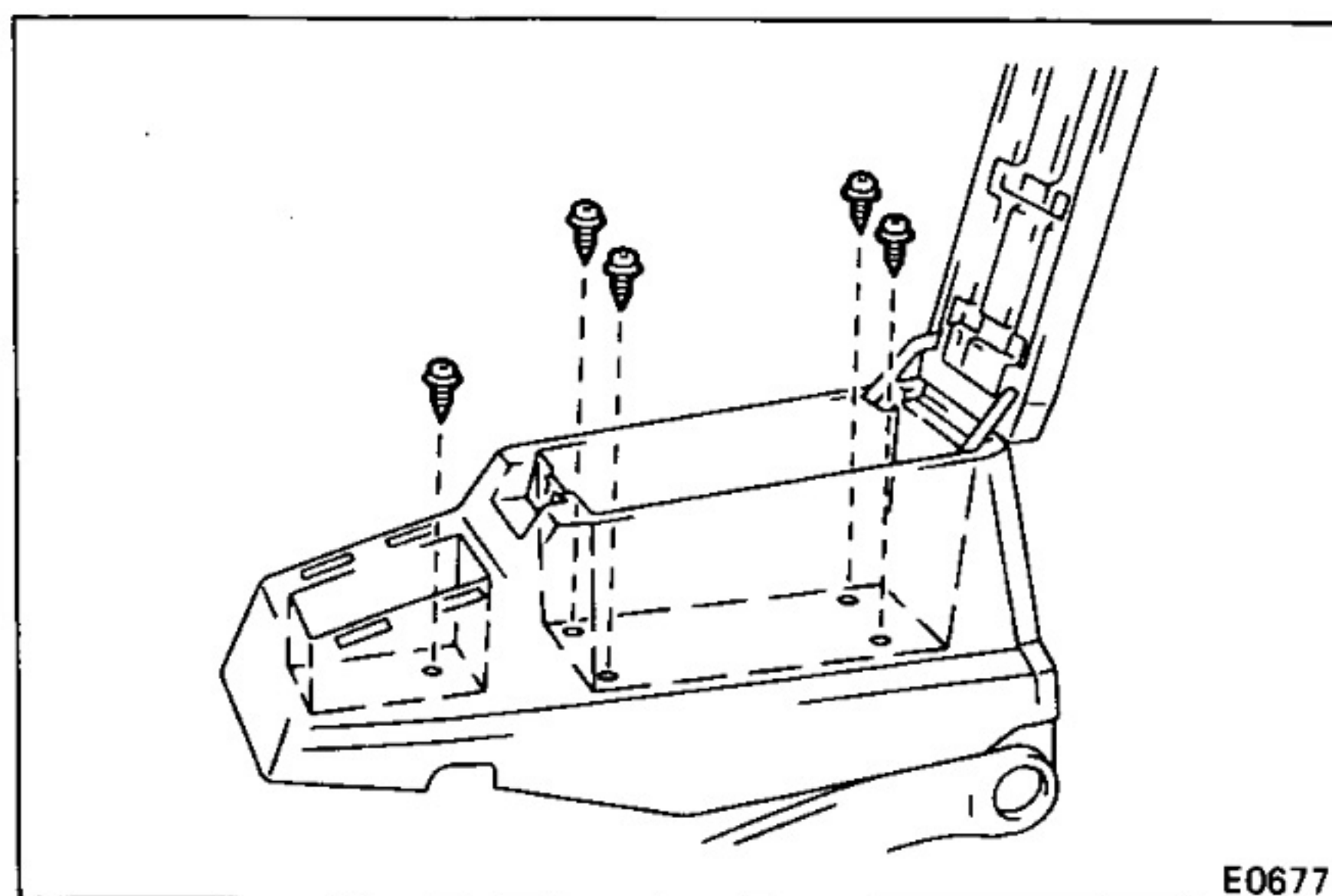
Standard length: 80 – 86 mm (3.15 – 3.39 in.)



(c) If in the OFF position the height of the front and rear lever knobs are not the same, adjust the buckle.



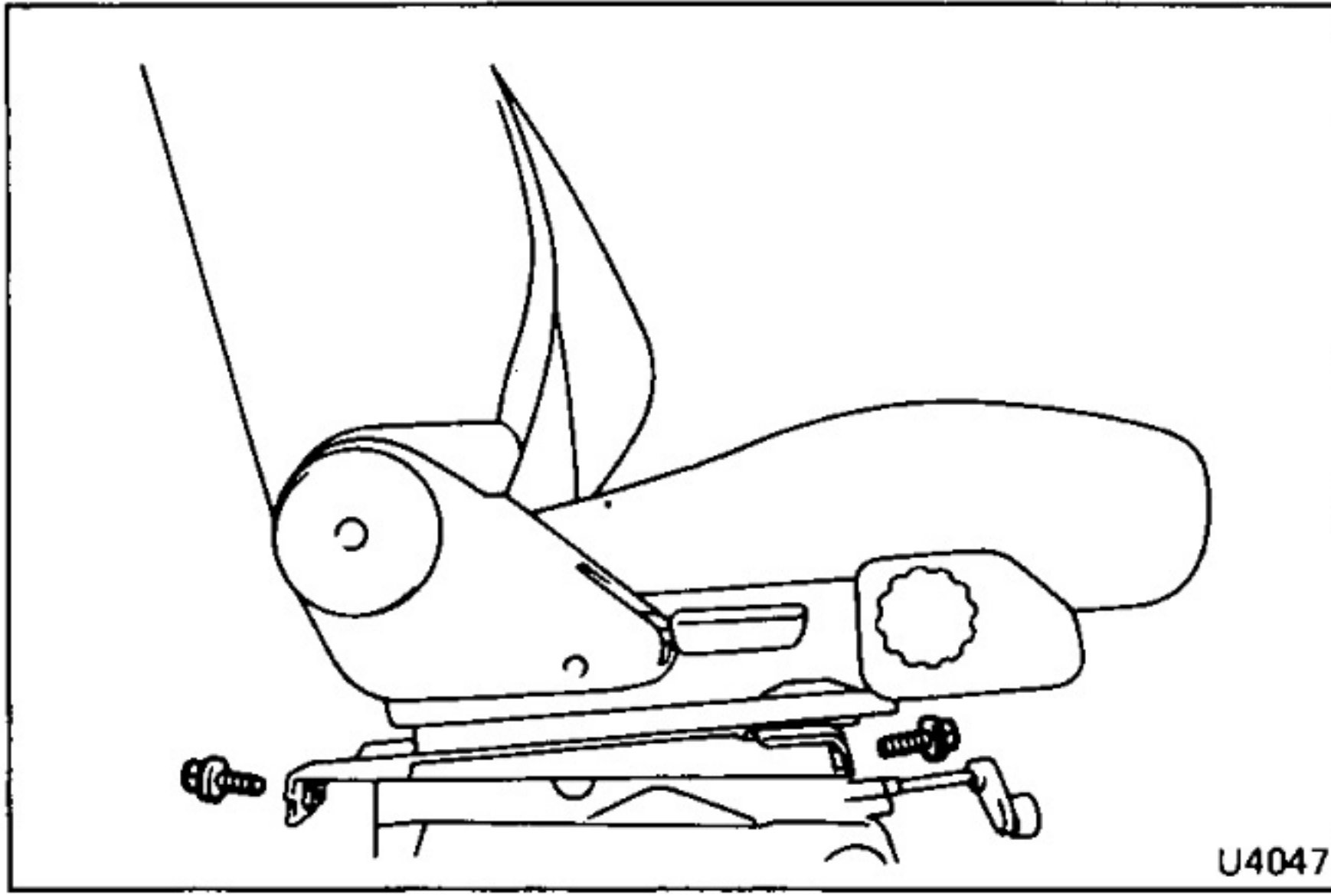
6. INSTALL DIFFERENTIAL LOCK LEVER COVER



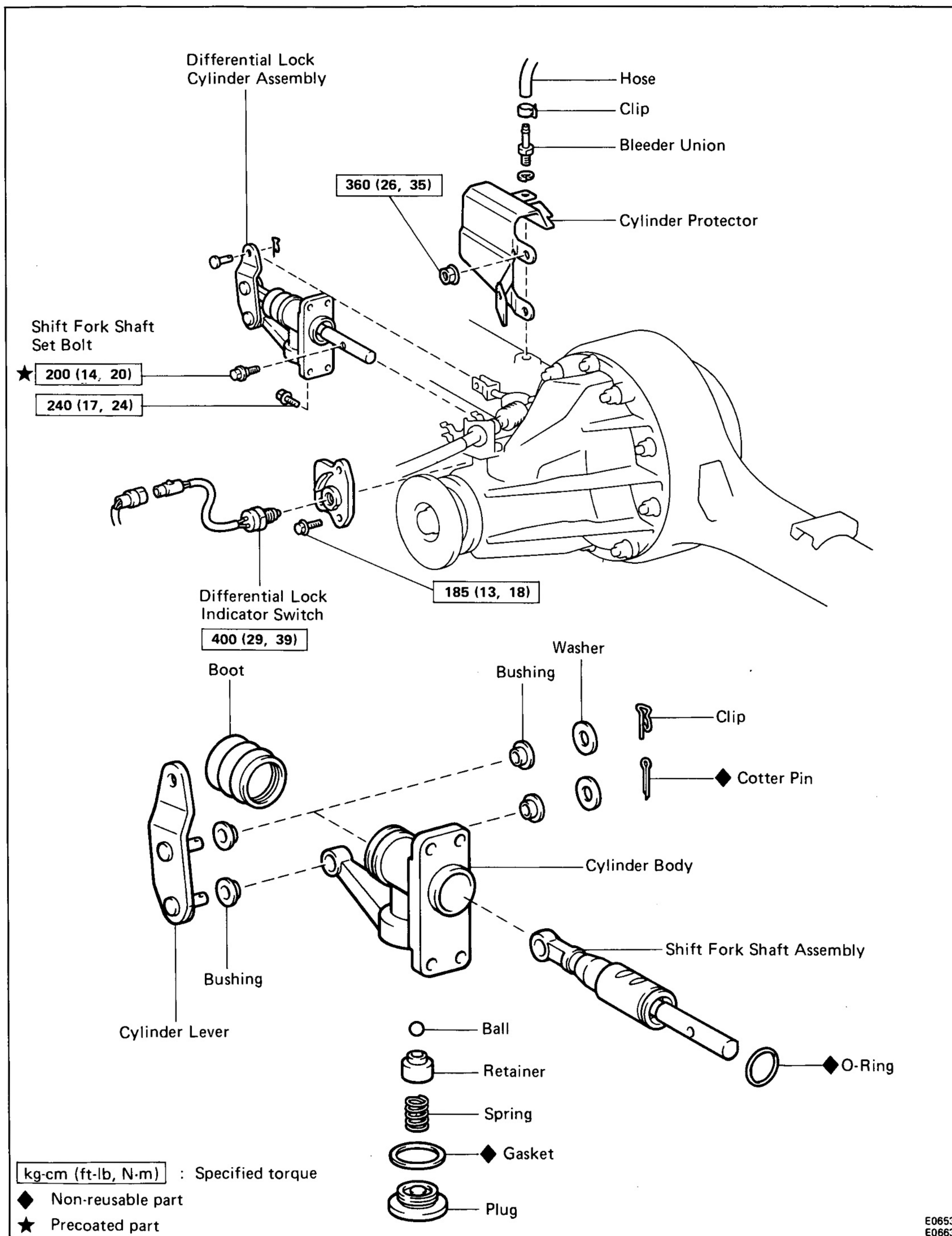
7. INSTALL CONSOLE BOX

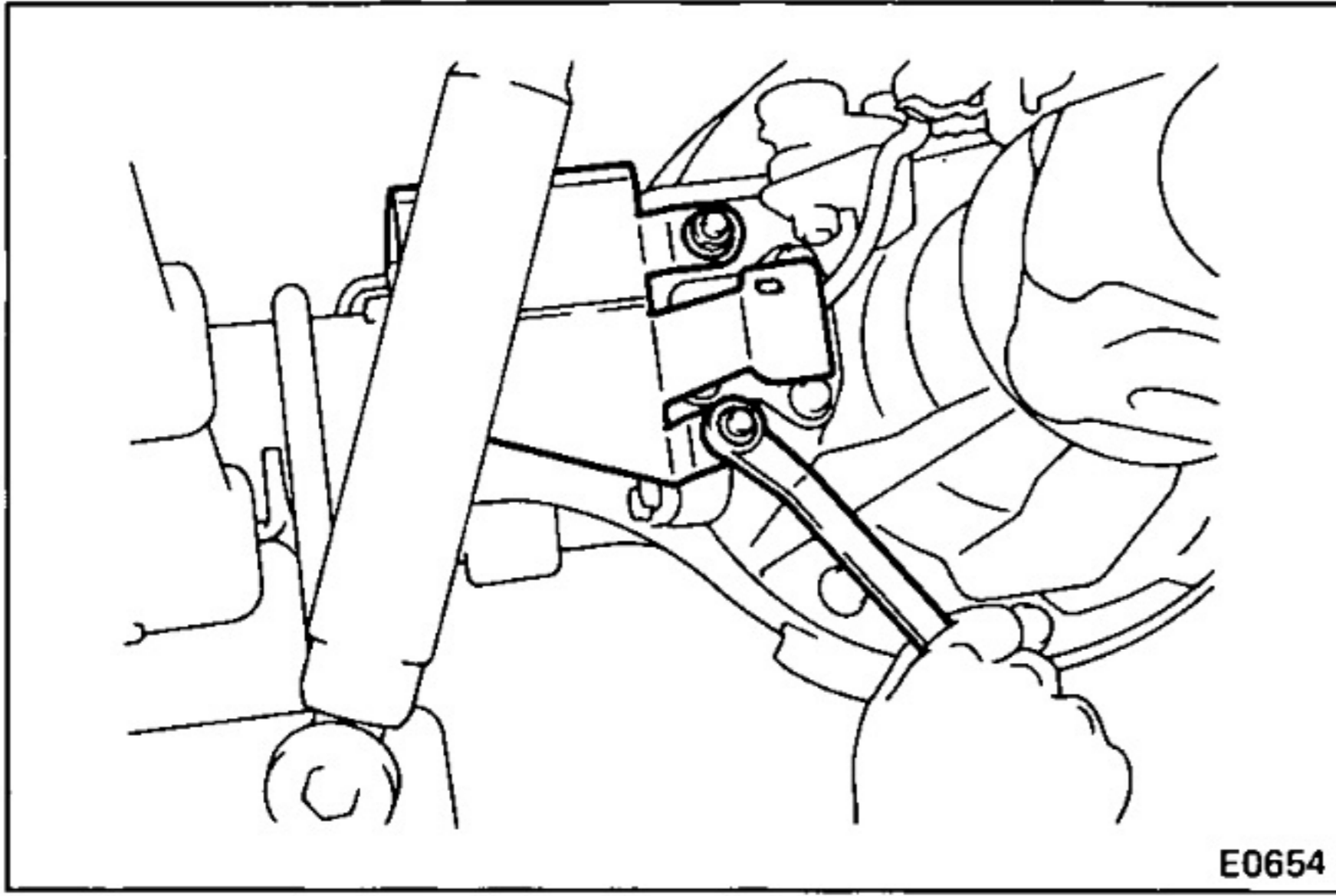
(a) Install the console box.

(b) Install heater knob.

**8. INSTALL DRIVERS SEAT****Torque: 380 kg-cm (27 ft-lb, 37 N·m)**

# Differential Lock Cylinder COMPONENTS

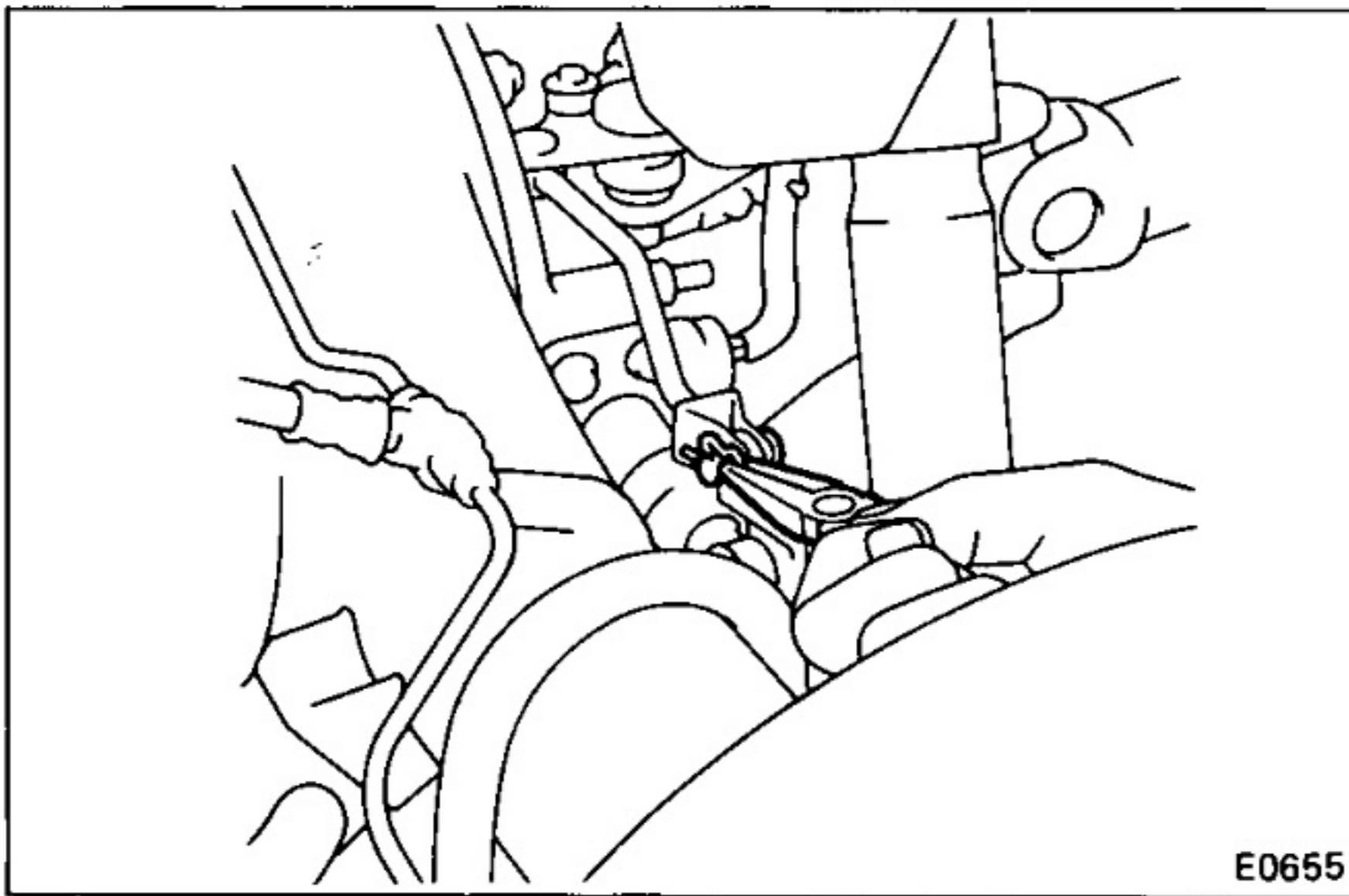




E0654

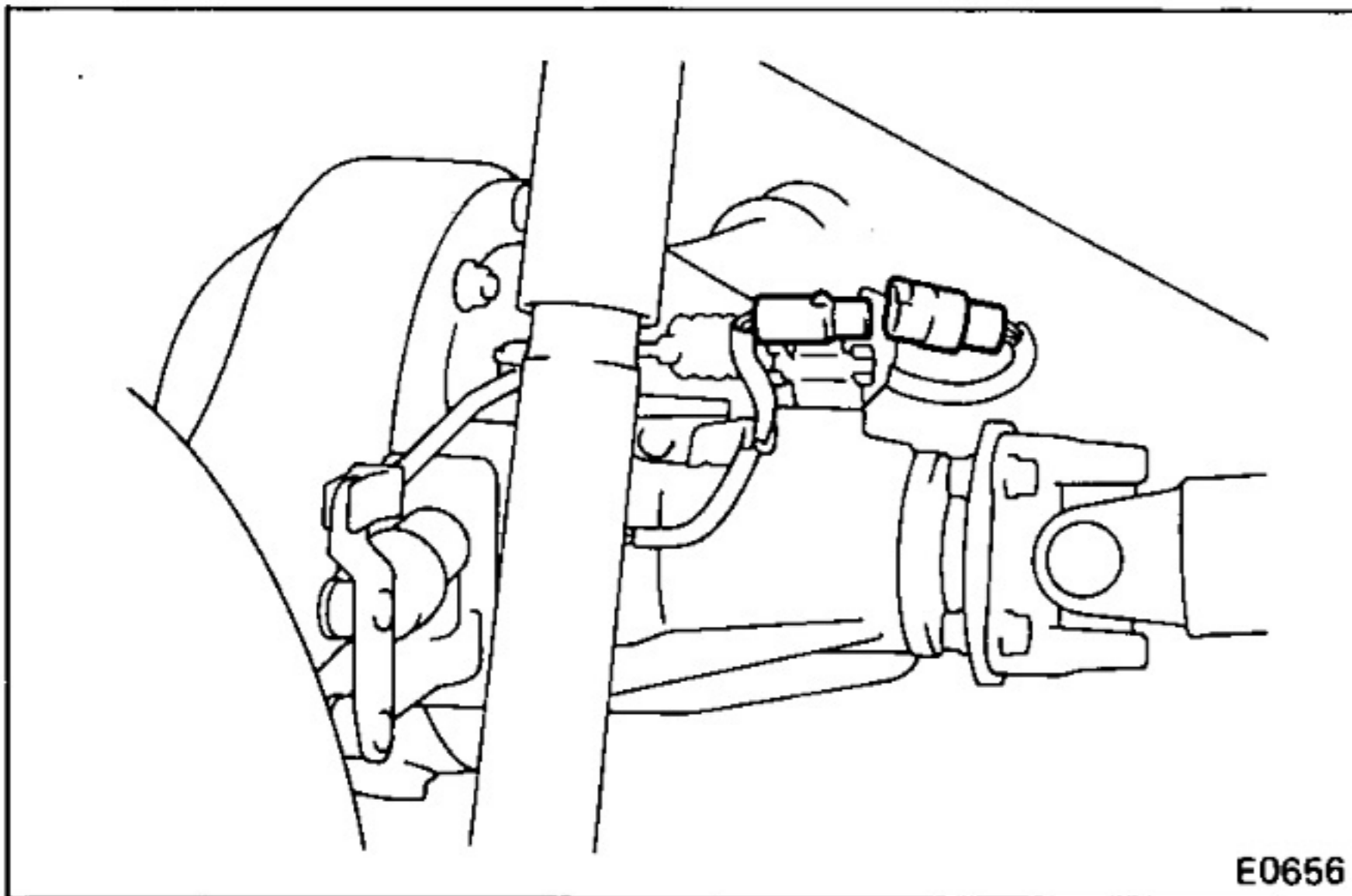
## REMOVAL OF DIFFERENTIAL LOCK CYLINDER

1. REMOVE RIGHT SIDE REAR WHEEL
2. REMOVE LOCK CYLINDER PROTECTOR
  - (a) Disconnect hose from the bleeder union.
  - (b) Remove the bleeder union from the axle housing.
  - (c) Remove the two nuts and protector.



E0655

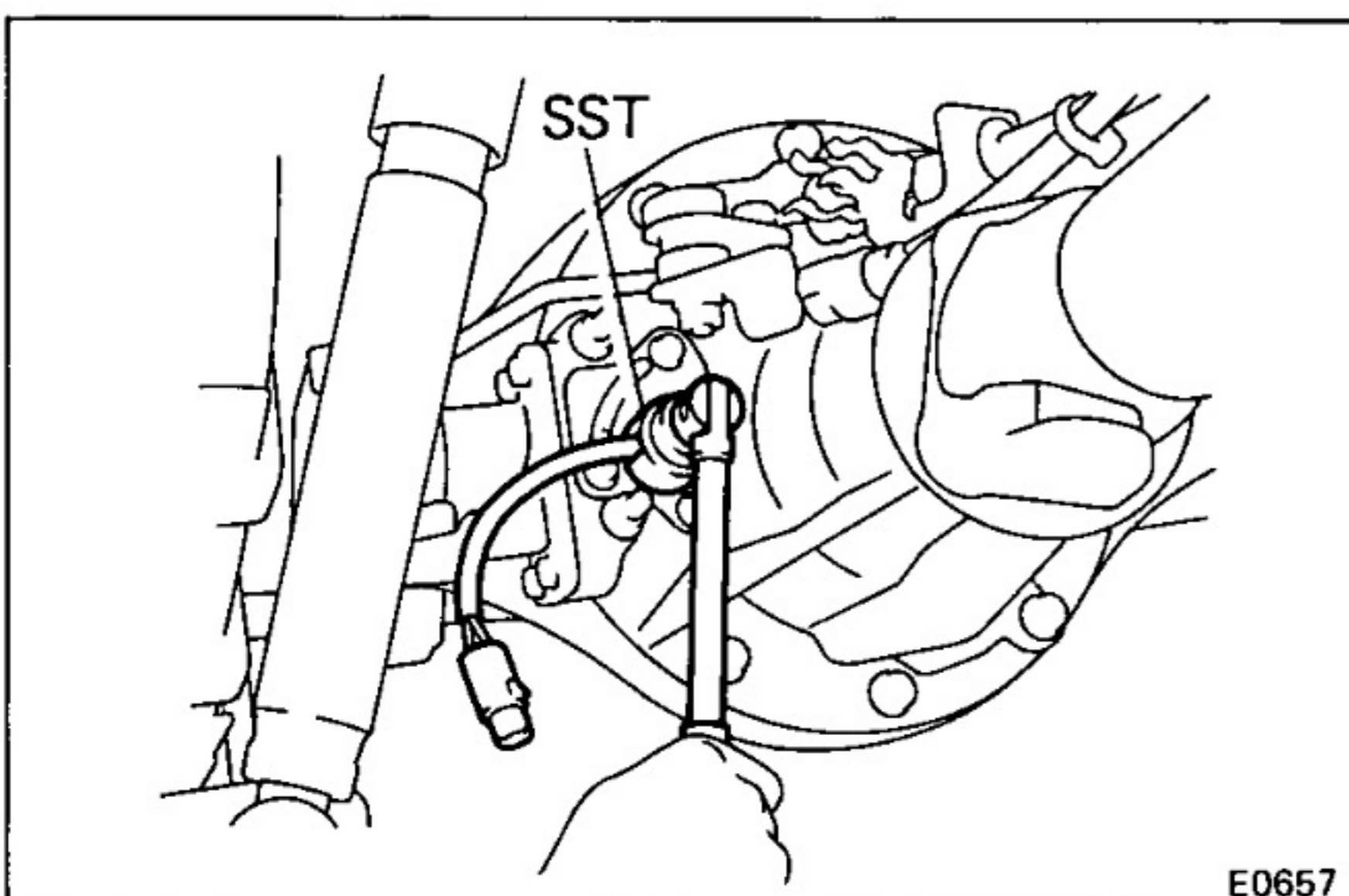
3. DISCONNECT DIFFERENTIAL LOCK CABLE LINK ROD  
Remove the clip and pin from the link rod.



E0656

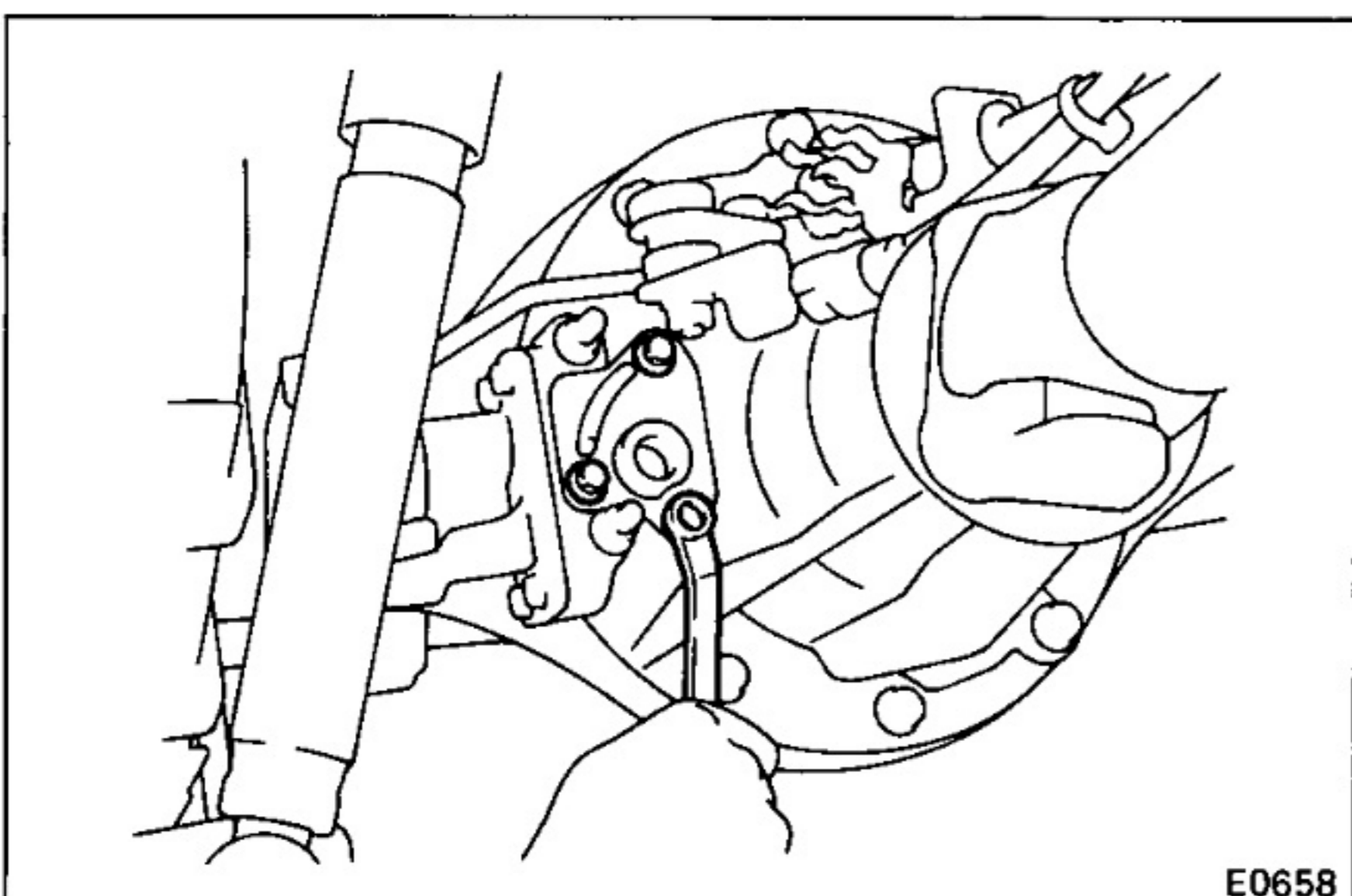
4. REMOVE DIFFERENTIAL LOCK INDICATOR SWITCH
  - (a) Disconnect the switch connector.

(b) Using SST, remove the indicator switch.  
SST 09817-16011

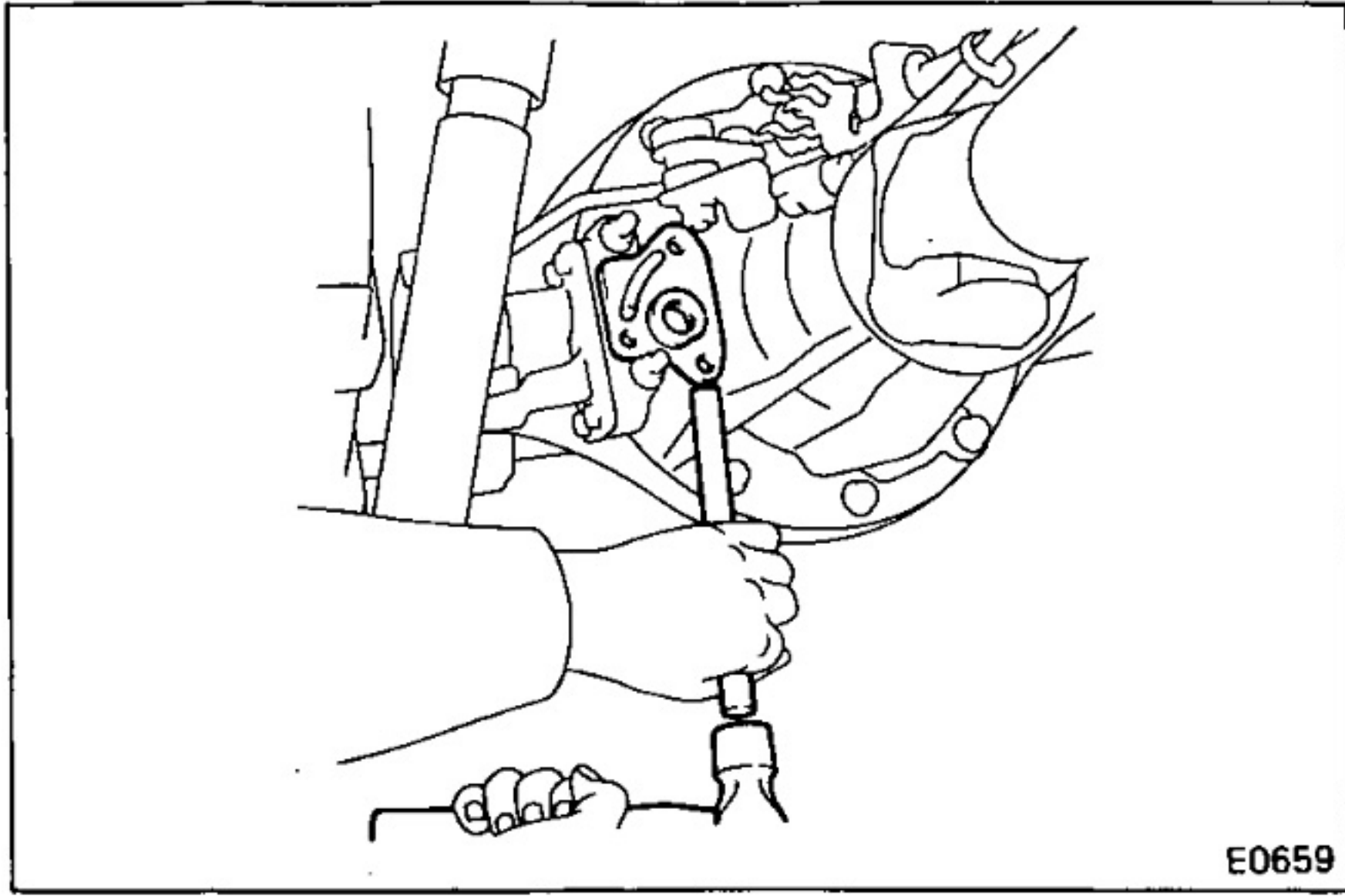


E0657

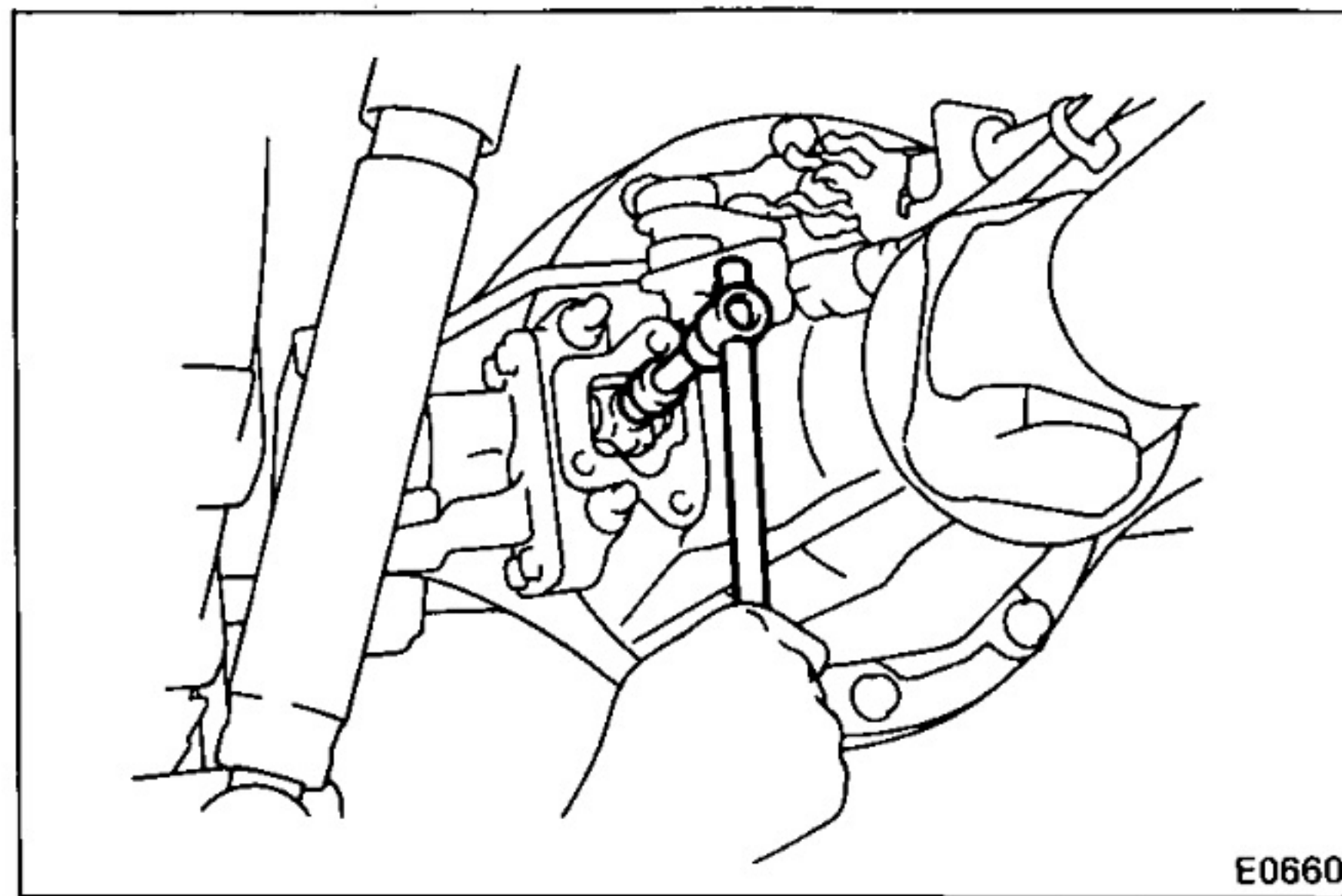
5. REMOVE DIFFERENTIAL LOCK COVER
  - (a) Remove the three bolts.



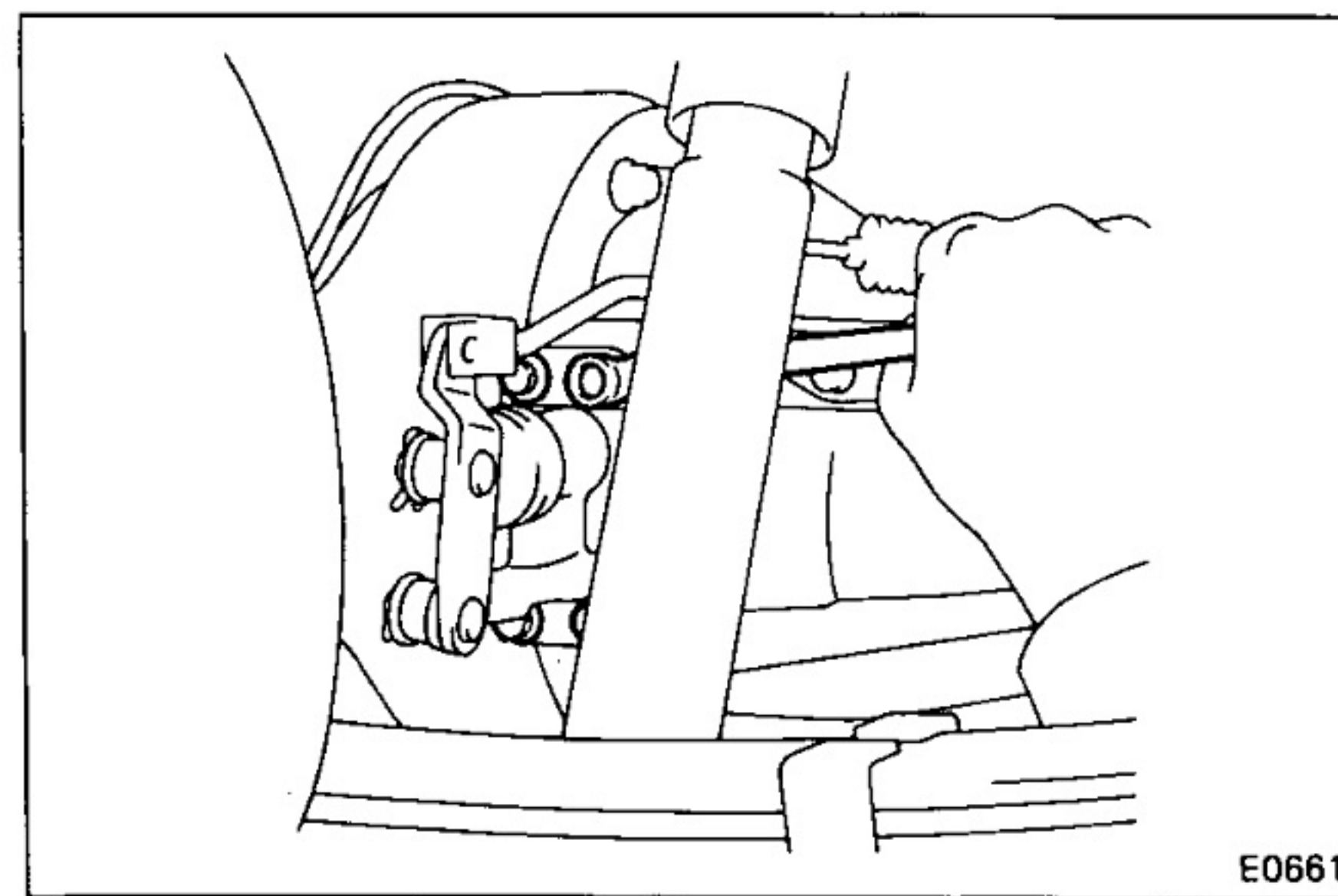
E0658



- (b) Using a brass bar, tap and separate the cover and differential carrier.

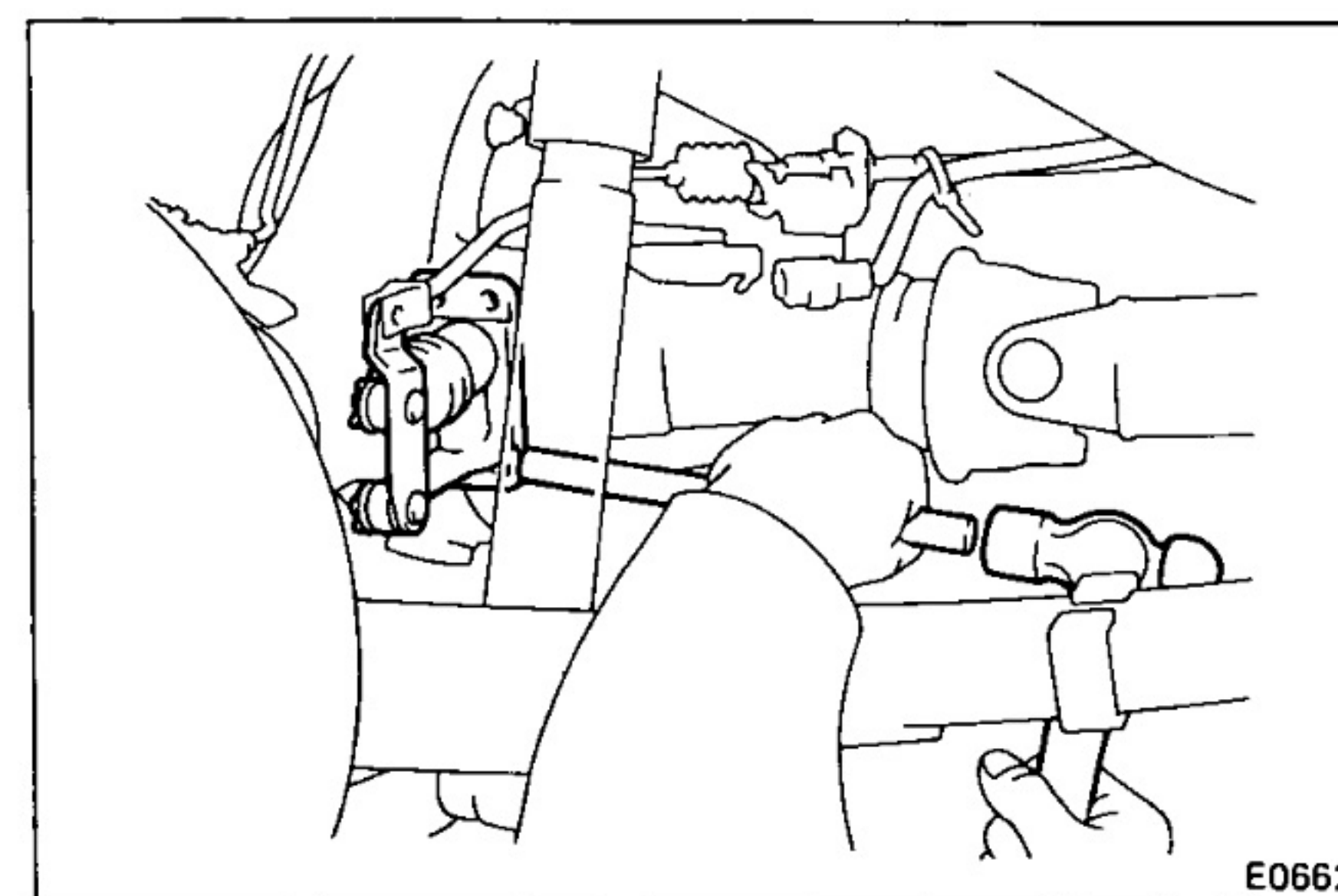


**6. REMOVE SHIFT FORK SHAFT SET BOLT**

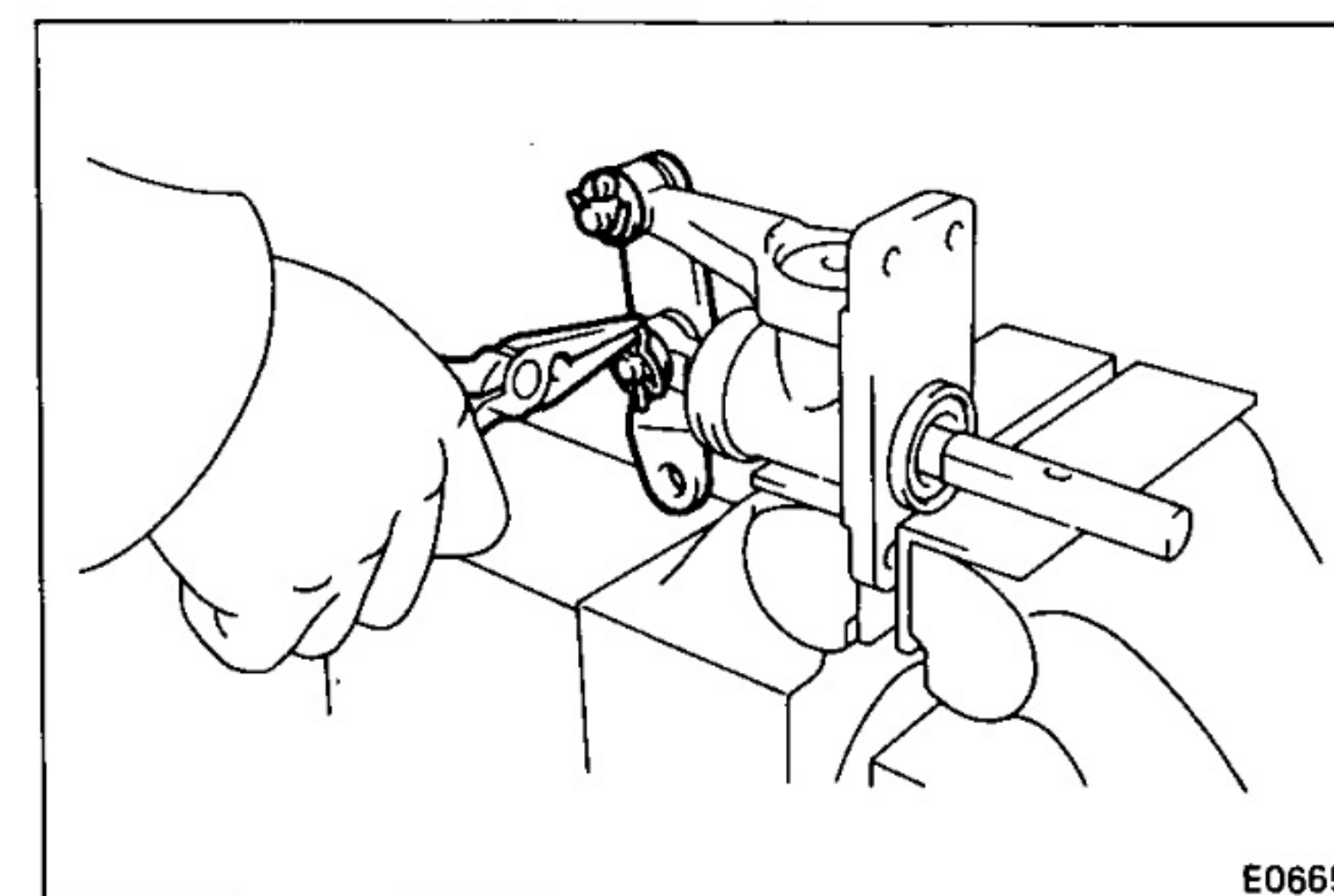


**7. REMOVE DIFFERENTIAL LOCK CYLINDER ASSEMBLY**

- (a) Remove the four set bolts.



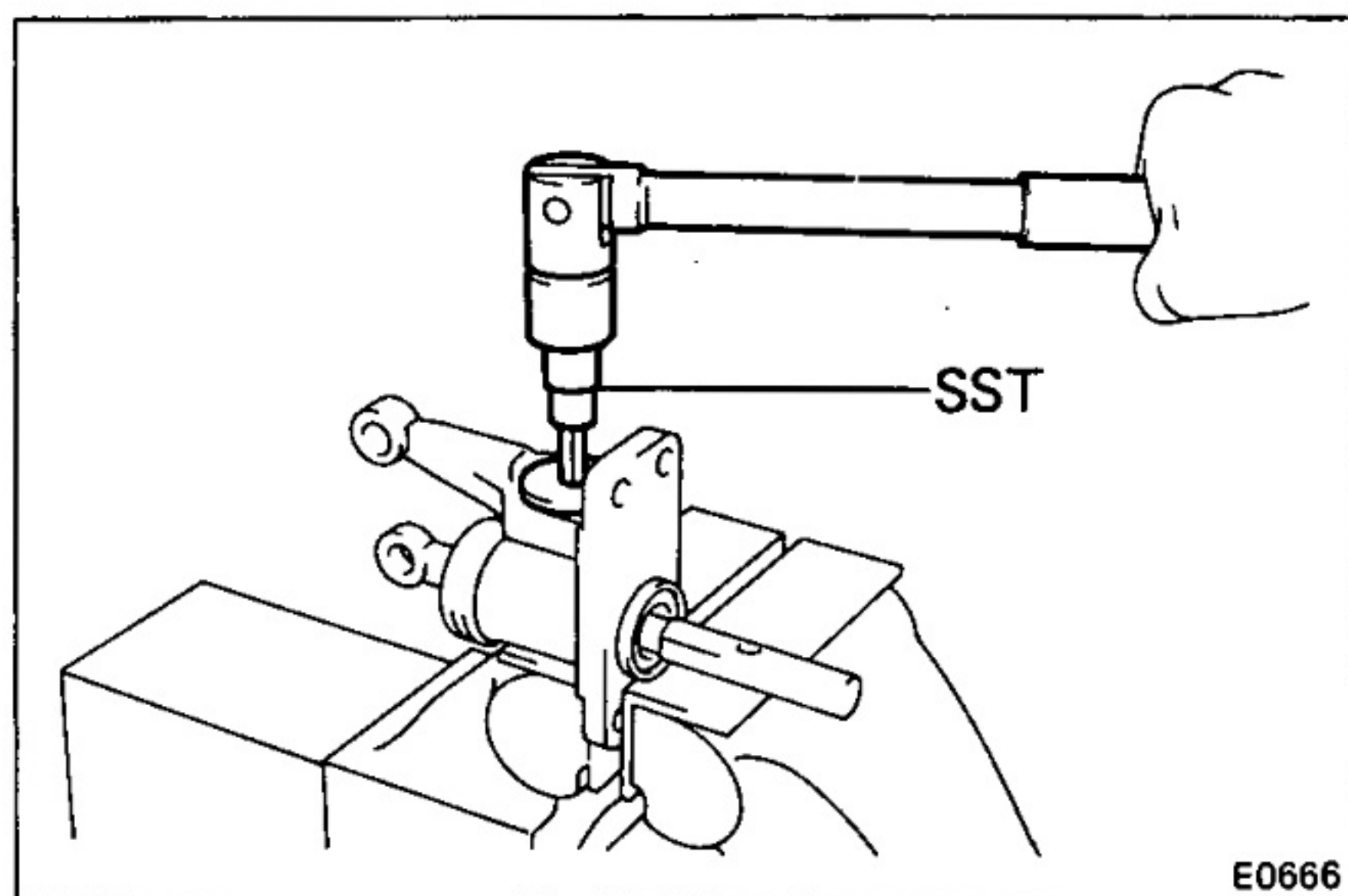
- (b) Using a brass bar, remove the cylinder assembly from the axle housing.



**DISASSEMBLY OF DIFFERENTIAL LOCK CYLINDER**

**1. REMOVE DIFFERENTIAL LOCK CYLINDER LEVER**

- Remove the clip, pin, lock cylinder lever, two washers and four bushings.

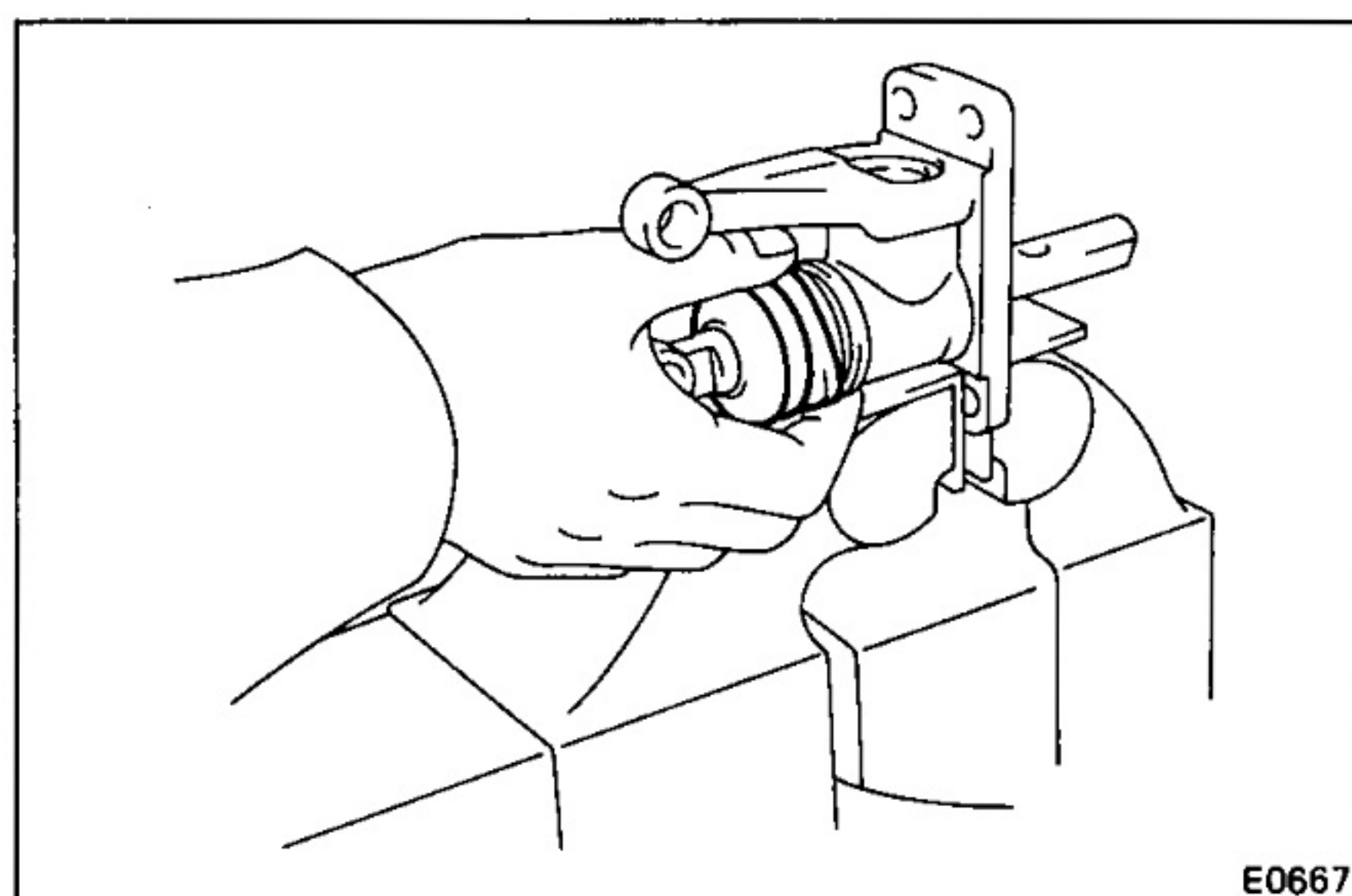


## 2. REMOVE PLUG

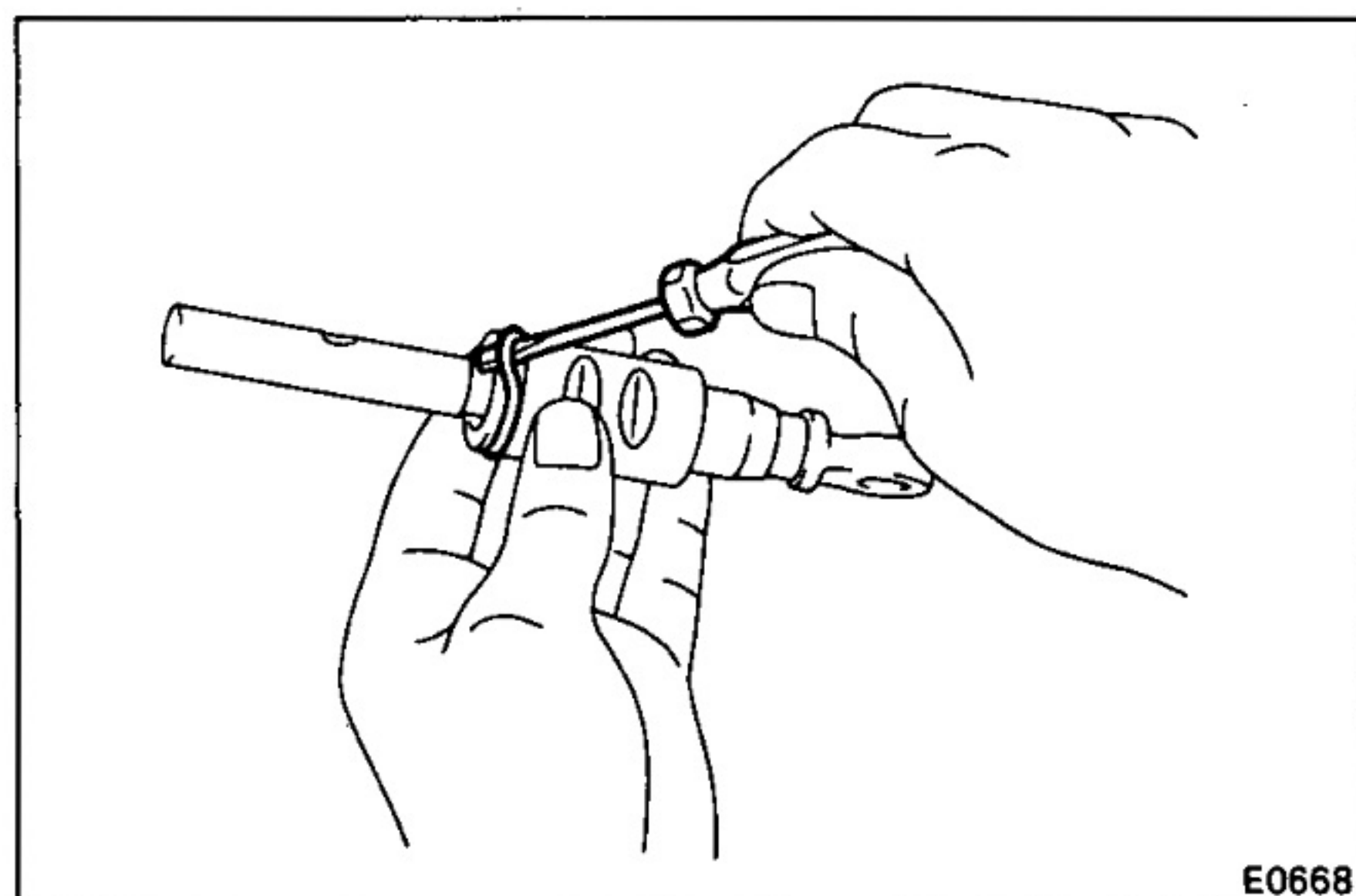
(a) Using SST, remove the plug.

SST 09923-00020

(b) Remove the gasket, spring, lock cylinder retainer.



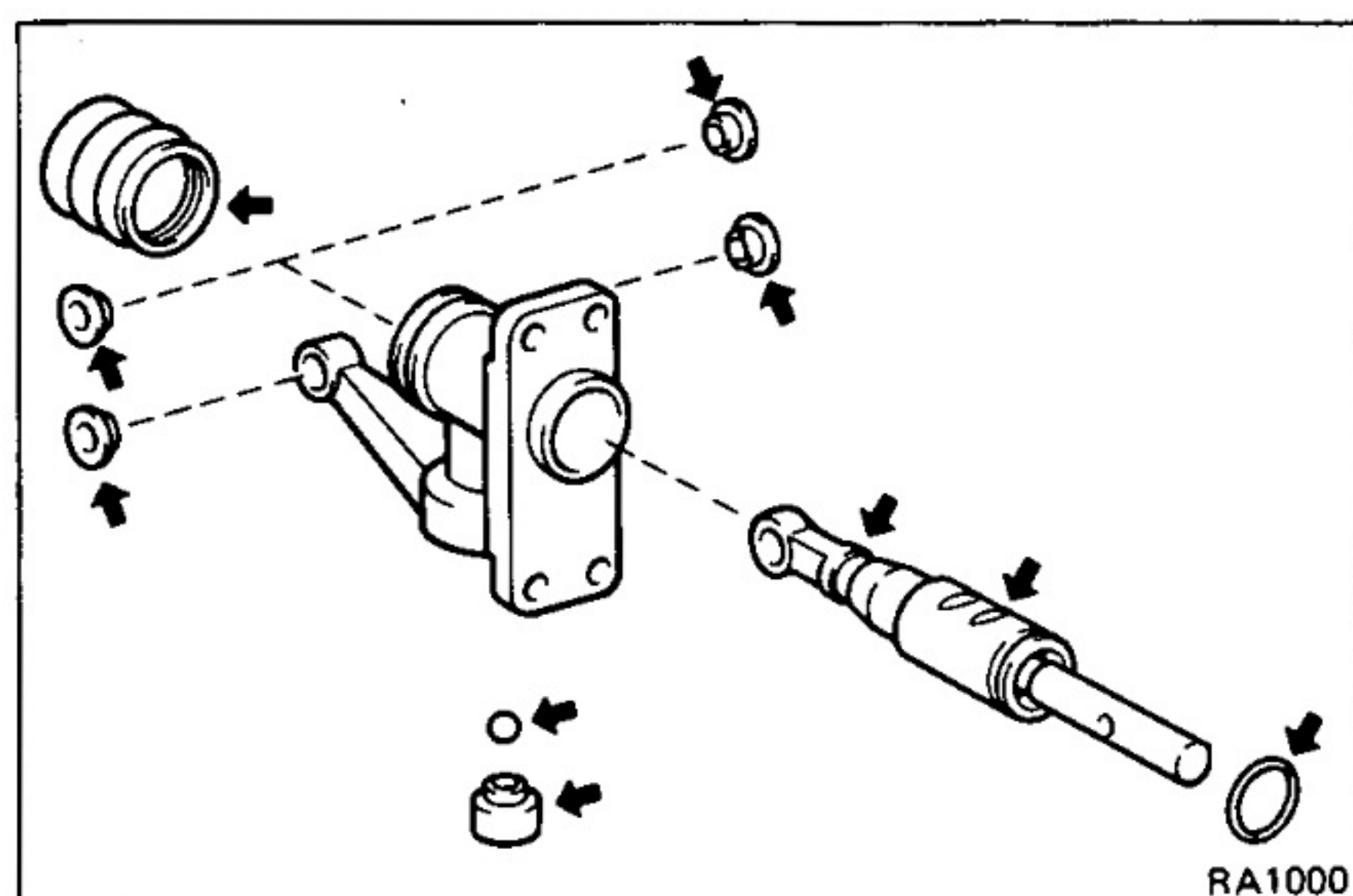
## 3. REMOVE DIFFERENTIAL LOCK CYLINDER BOOT



## 4. REMOVE DIFFERENTIAL LOCK SHIFT FORK SHAFT

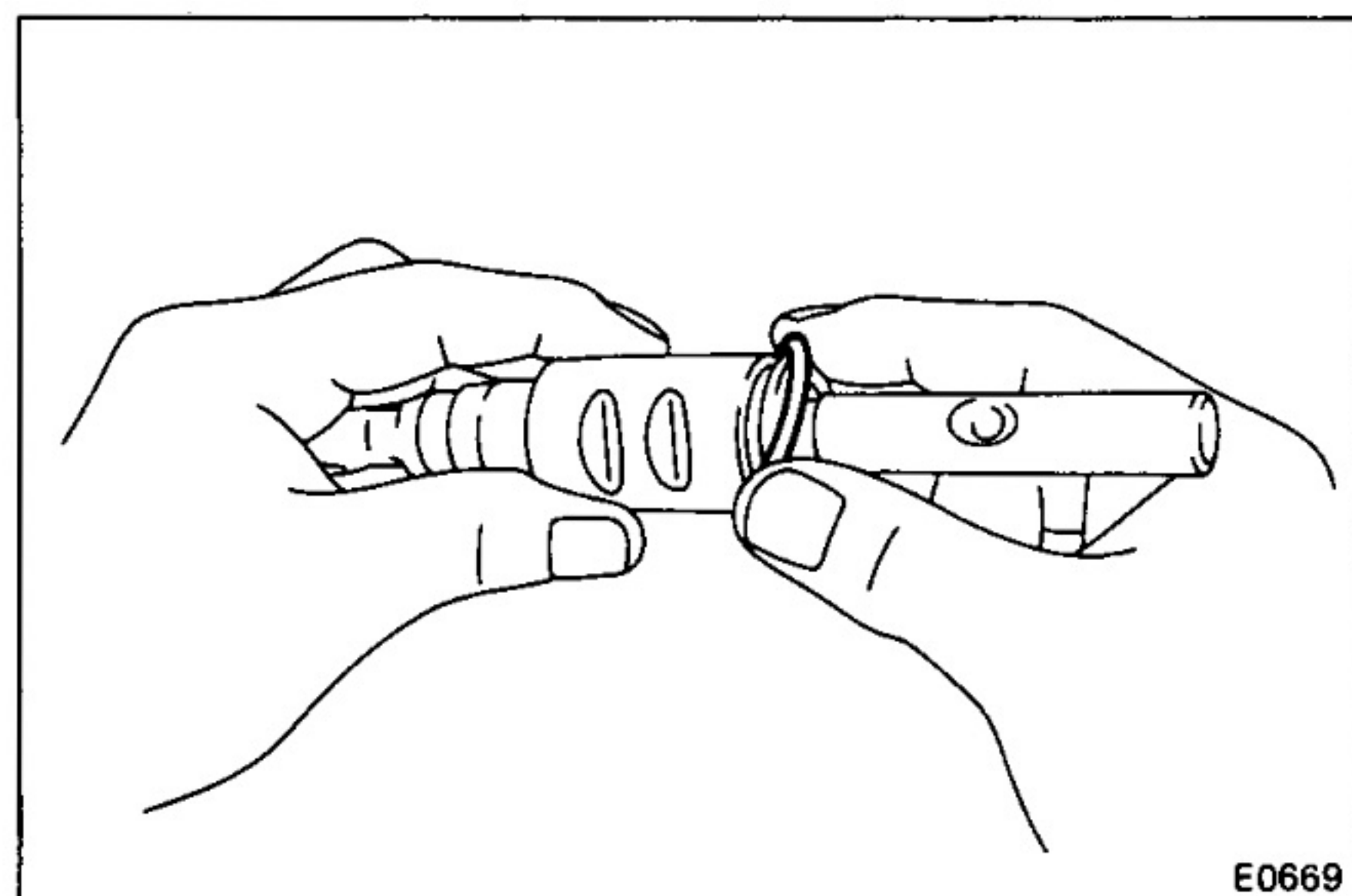
(a) Pull out the lock shift fork shaft from the body.

(b) Remove the O-ring from the lock shift fork shaft.



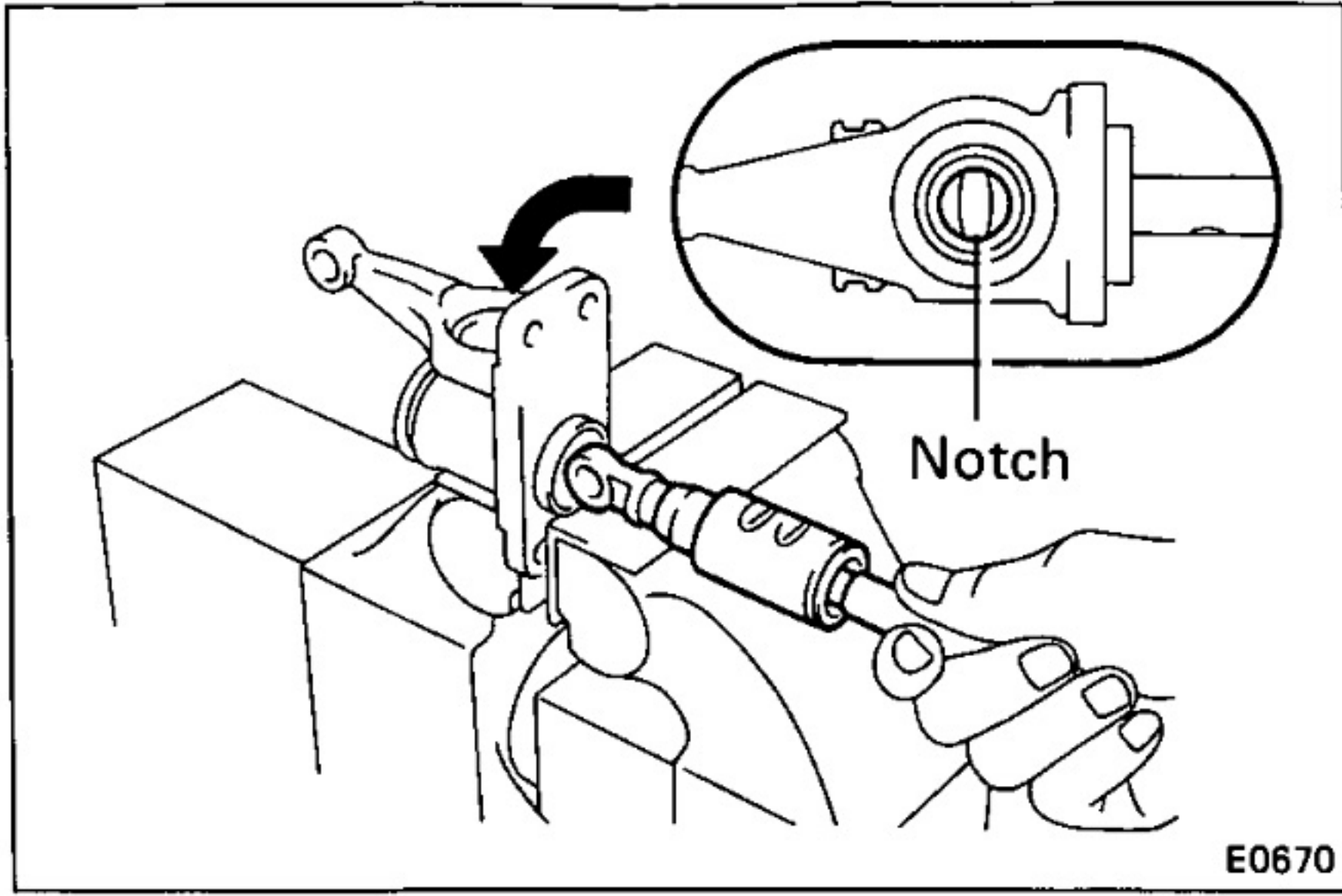
## ASSEMBLY OF DIFFERENTIAL LOCK CYLINDER

### 1. APPLY MP GREASE TO PARTS SHOWN BELOW



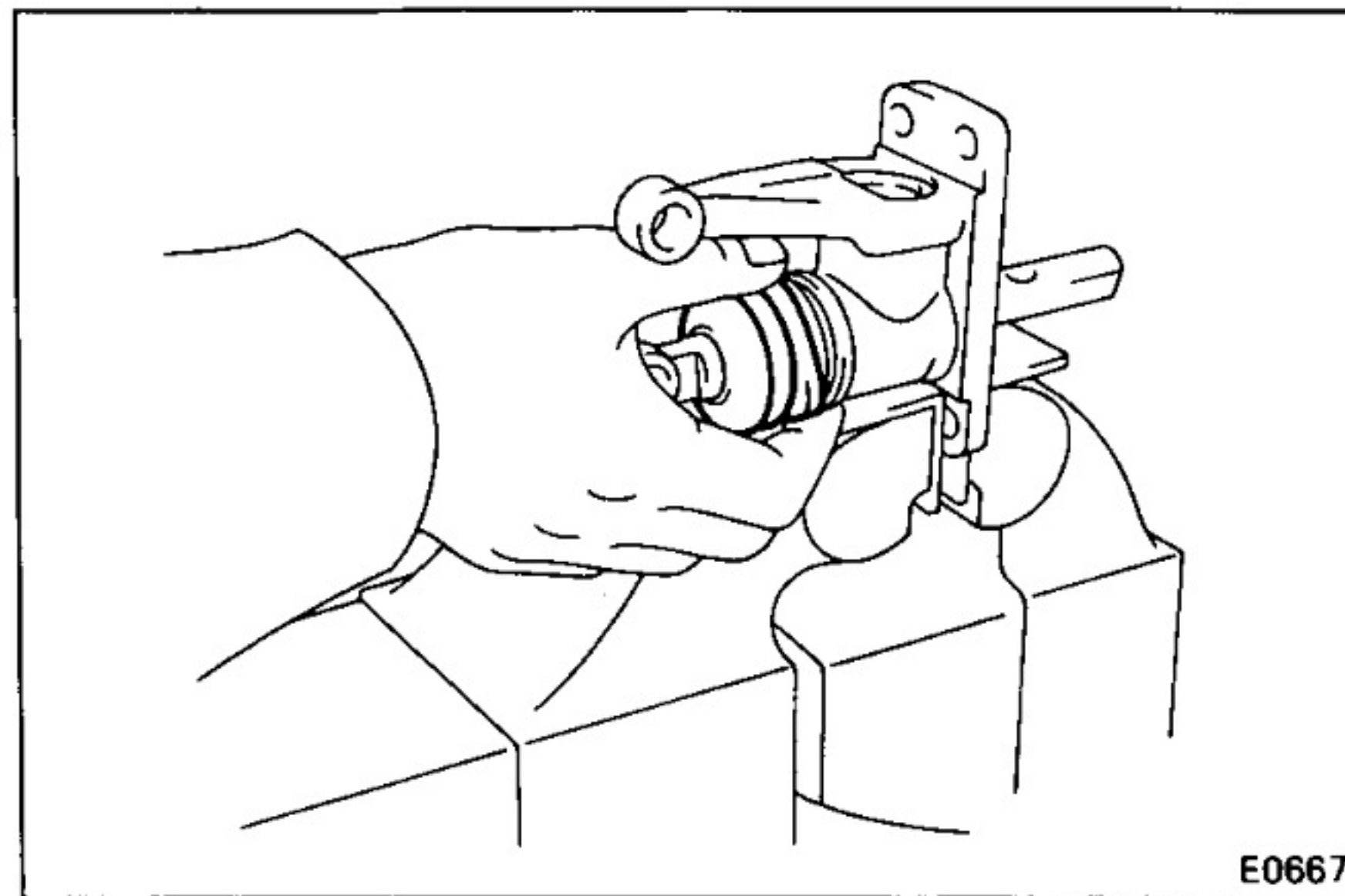
### 2. INSTALL DIFFERENTIAL LOCK SHIFT FORK SHAFT

(a) Install a new O-ring to the shift fork shaft.



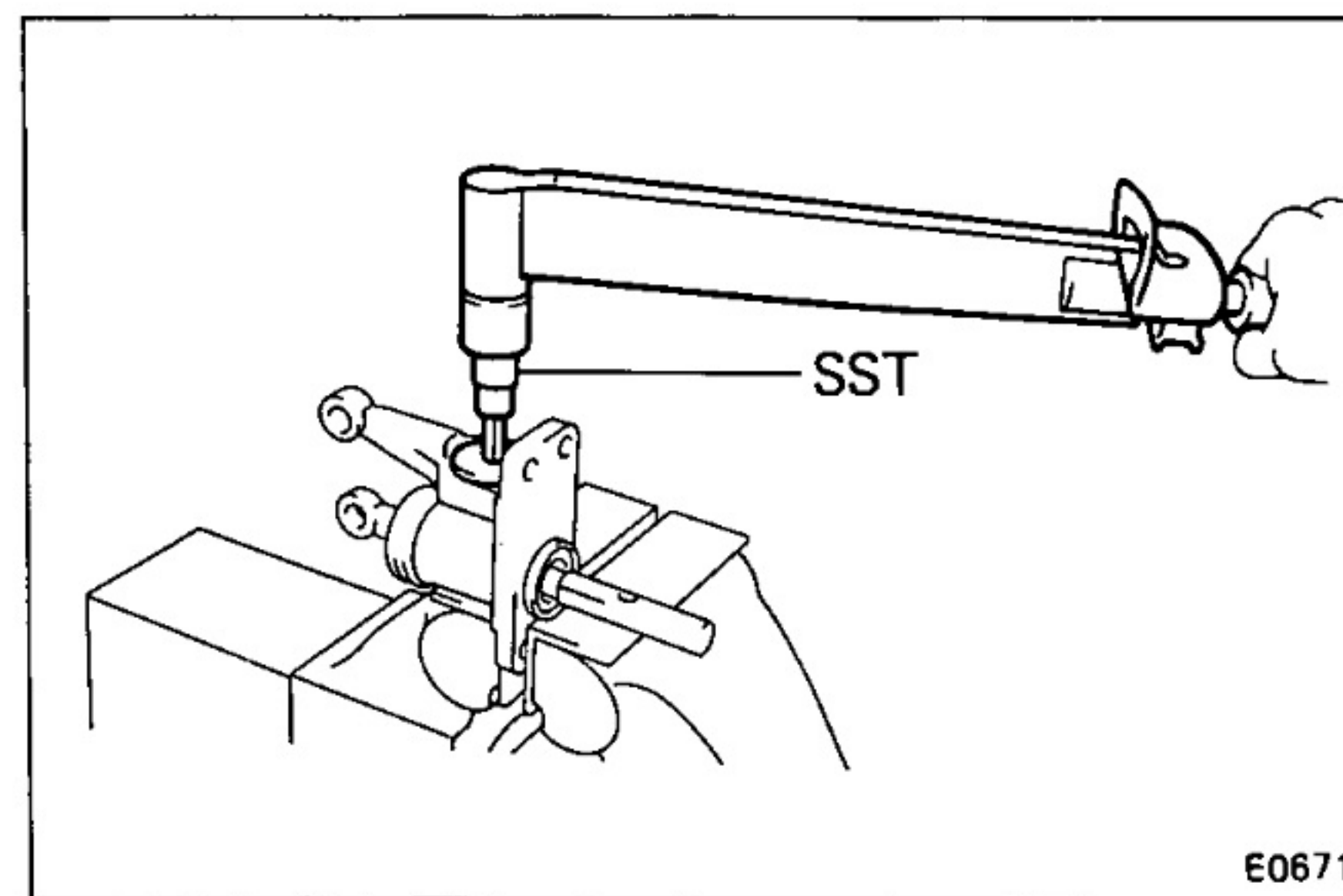
(b) Install shift fork shaft to the cylinder body.

NOTE: When installing the shift fork shaft to the cylinder body, install the shift fork with the notched side facing up.



**3. INSTALL BOOT TO CYLINDER BODY**

Attach the boot firmly to the cylinder body and shift fork shaft grooves.



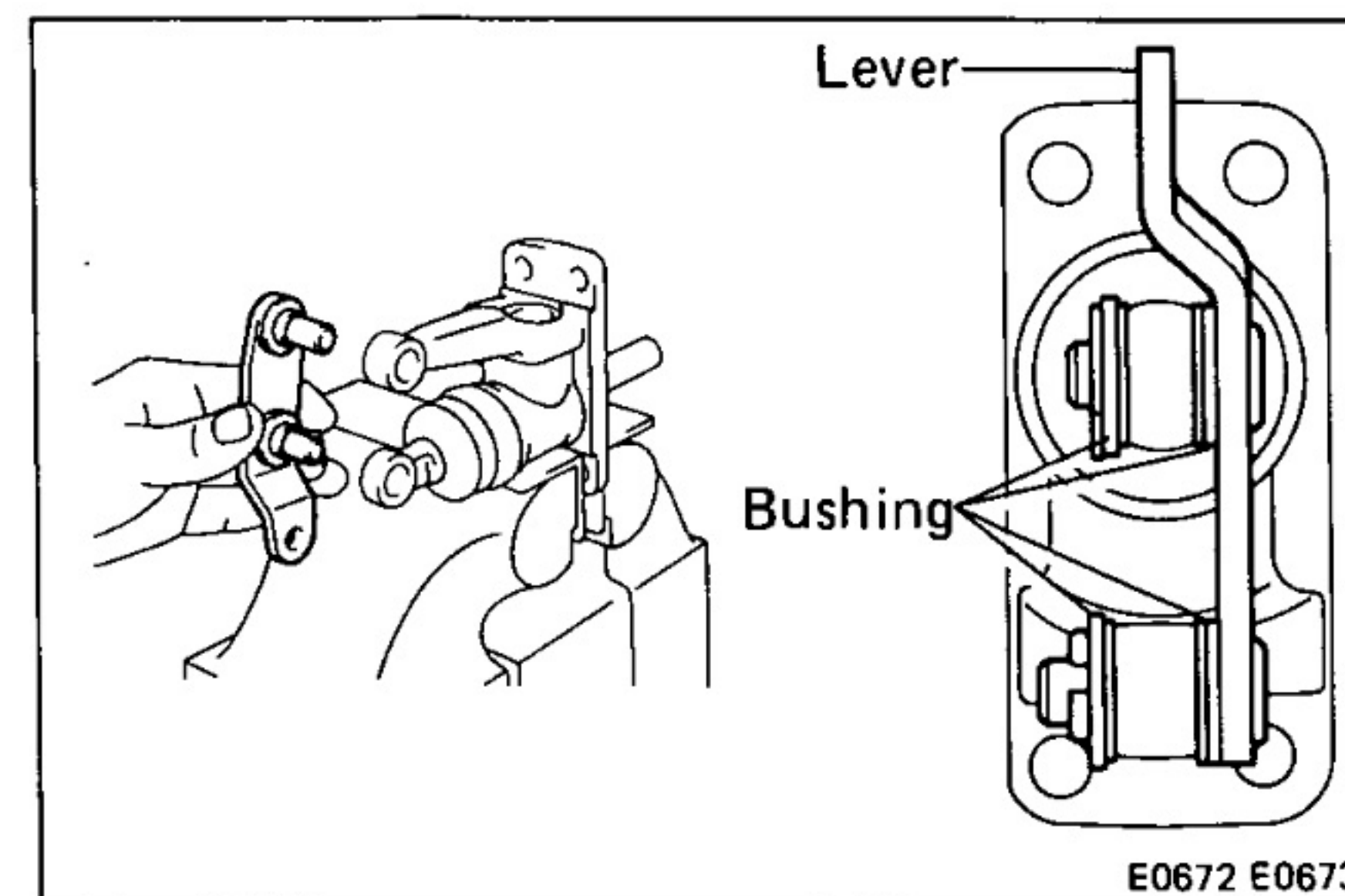
**4. INSTALL PLUG TO CYLINDER BODY**

(a) Install the ball, spring retainer, spring and new gasket.

(b) Using SST, install and tighten the plug.

SST 09923-00020

Torque: 700 kg-cm (51 ft-lb, 69 N·m)

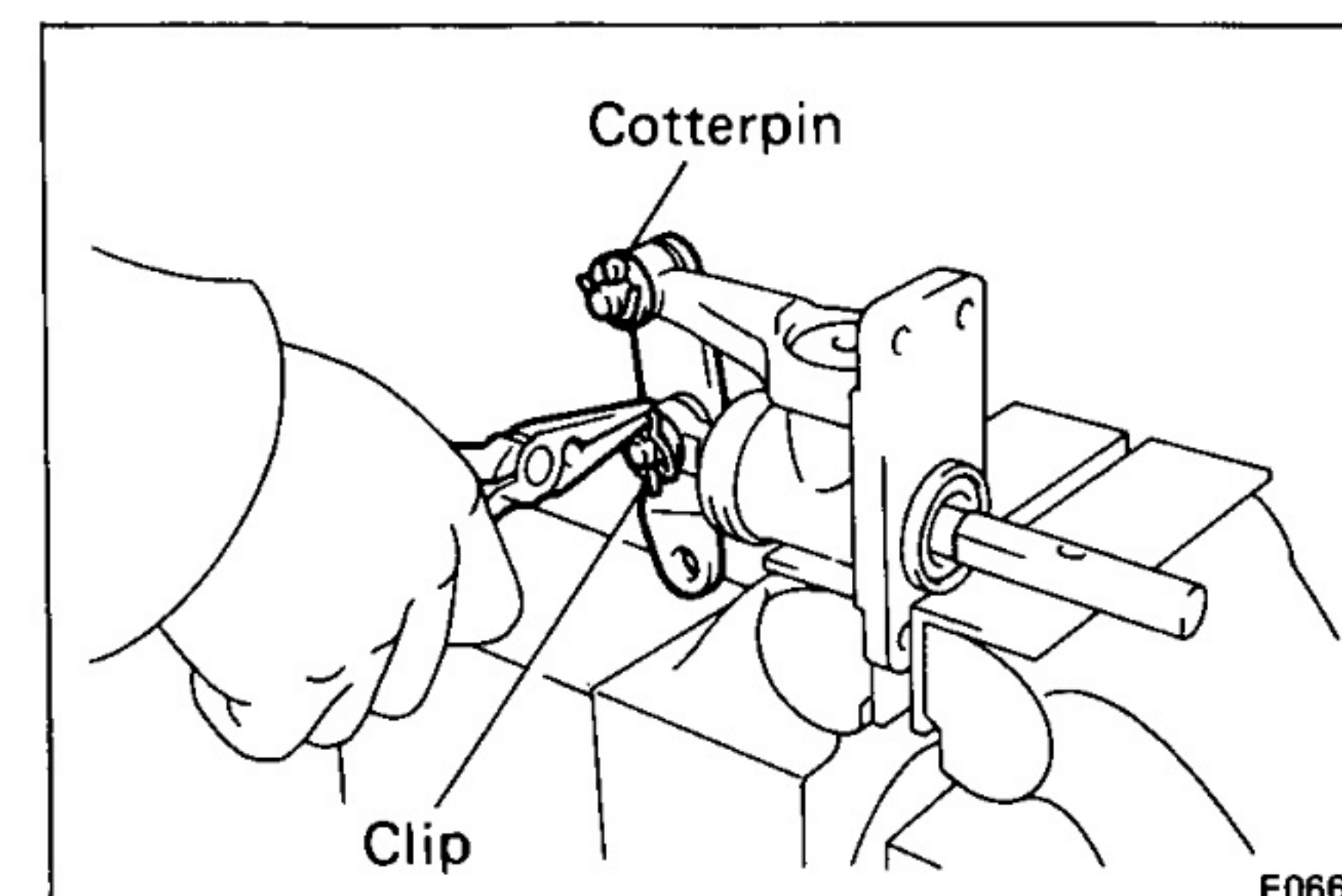


**5. INSTALL DIFFERENTIAL LOCK CYLINDER LEVER**

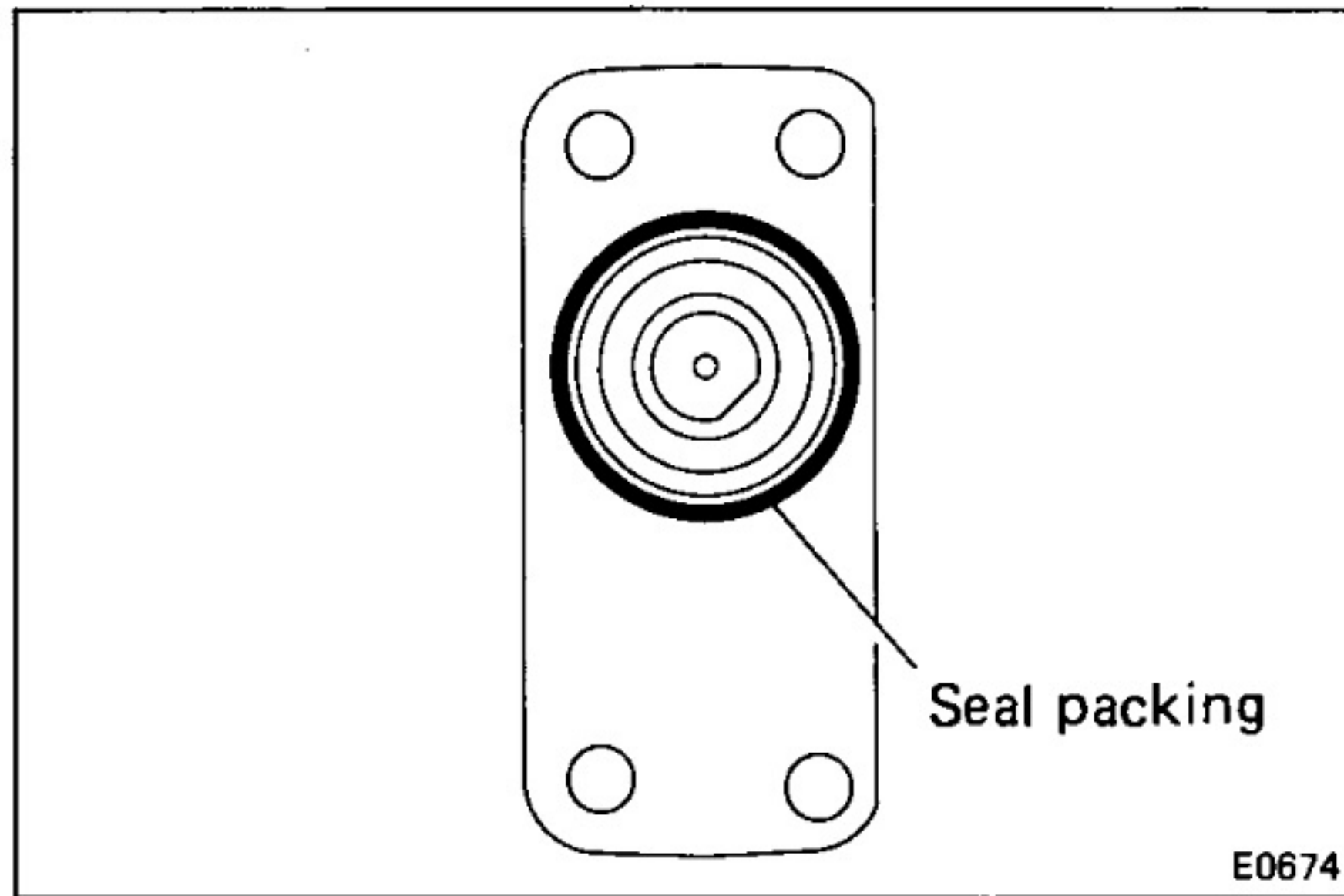
(a) Install the two bushing to the lever.

(b) Install the lever to the lock cylinder.

(c) Install the two bushing to the lever.



(d) Install a clip and new cotter pin.



## INSTALLATION OF DIFFERENTIAL LOCK CYLINDER ASSEMBLY

### 1. INSTALL DIFFERENTIAL LOCK CYLINDER ASSEMBLY

(a) Clean contacting surfaces of any residual packing material using gasoline or alcohol.

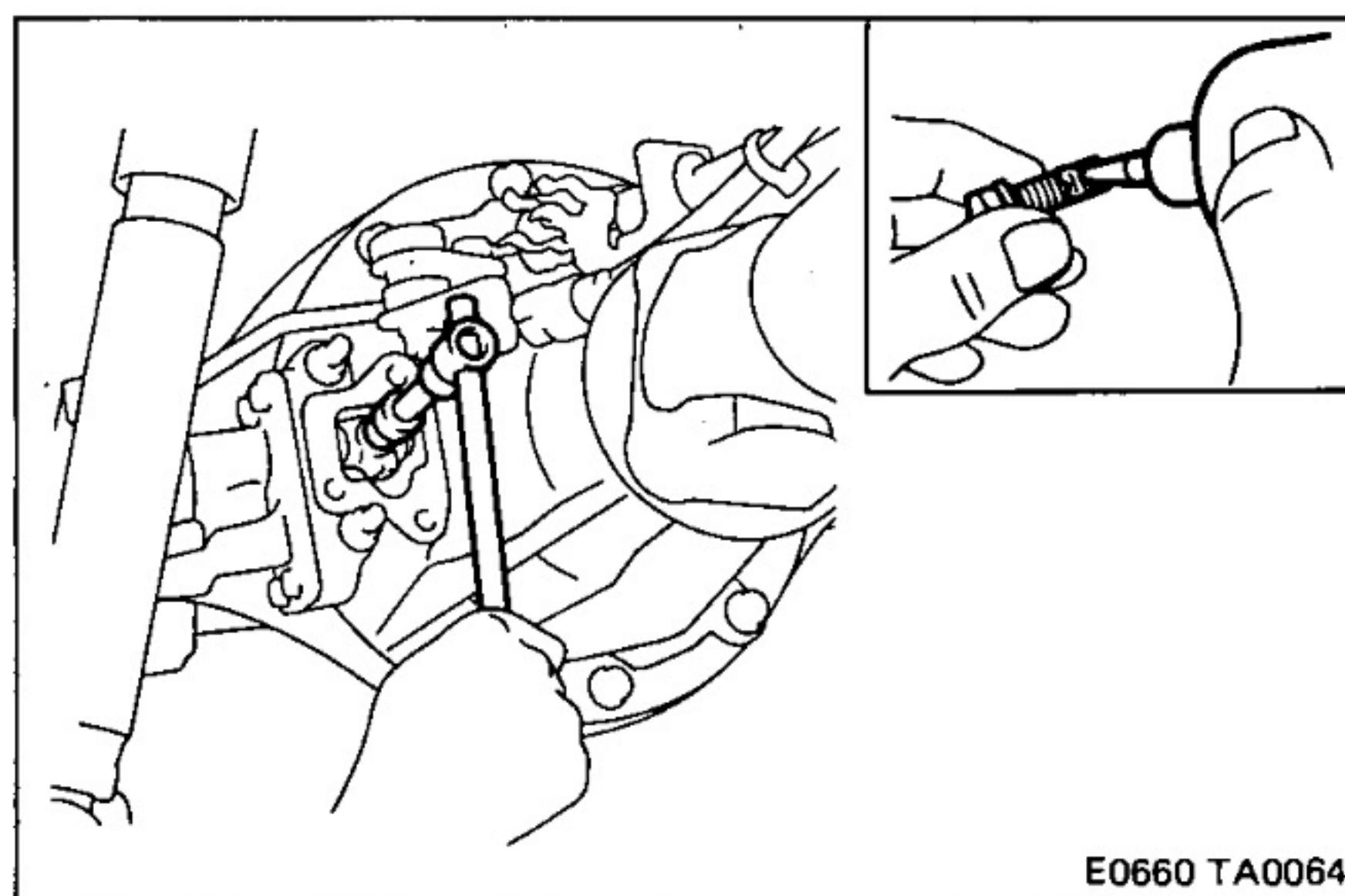
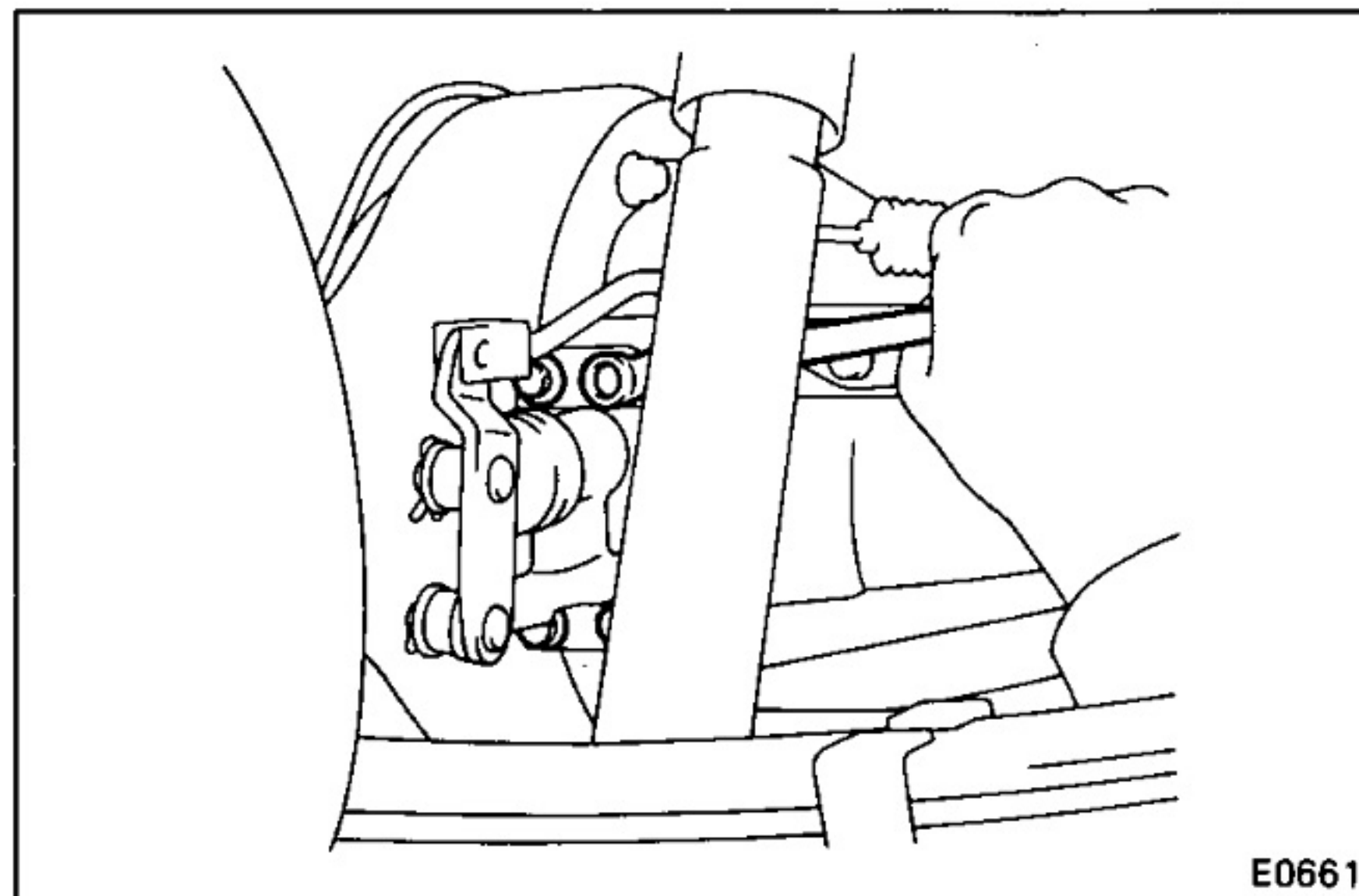
(b) Apply seal packing to the cylinder body.

**Seal packing: Part No. 08826-00090, THREE BOND 1281 or equivalent**

**NOTE:** Install the cylinder body within 3 minutes after applying seal packing.

(c) Torque the four set bolts.

**Torque: 240 kg-cm (17 ft-lb, 24 N·m)**



### 2. INSTALL AND TORQUE SHIFT FORK SHAFT SET BOLT

(a) Clean the threads of the set bolt and fork shaft with the white gasoline.

(b) Coat the threads of the set bolt with sealer.

**Sealer: Part No. 08833-00070, THREE BOND 1324 or equivalent**

**Torque: 200 kg-cm (14 ft-lb, 20 N·m)**

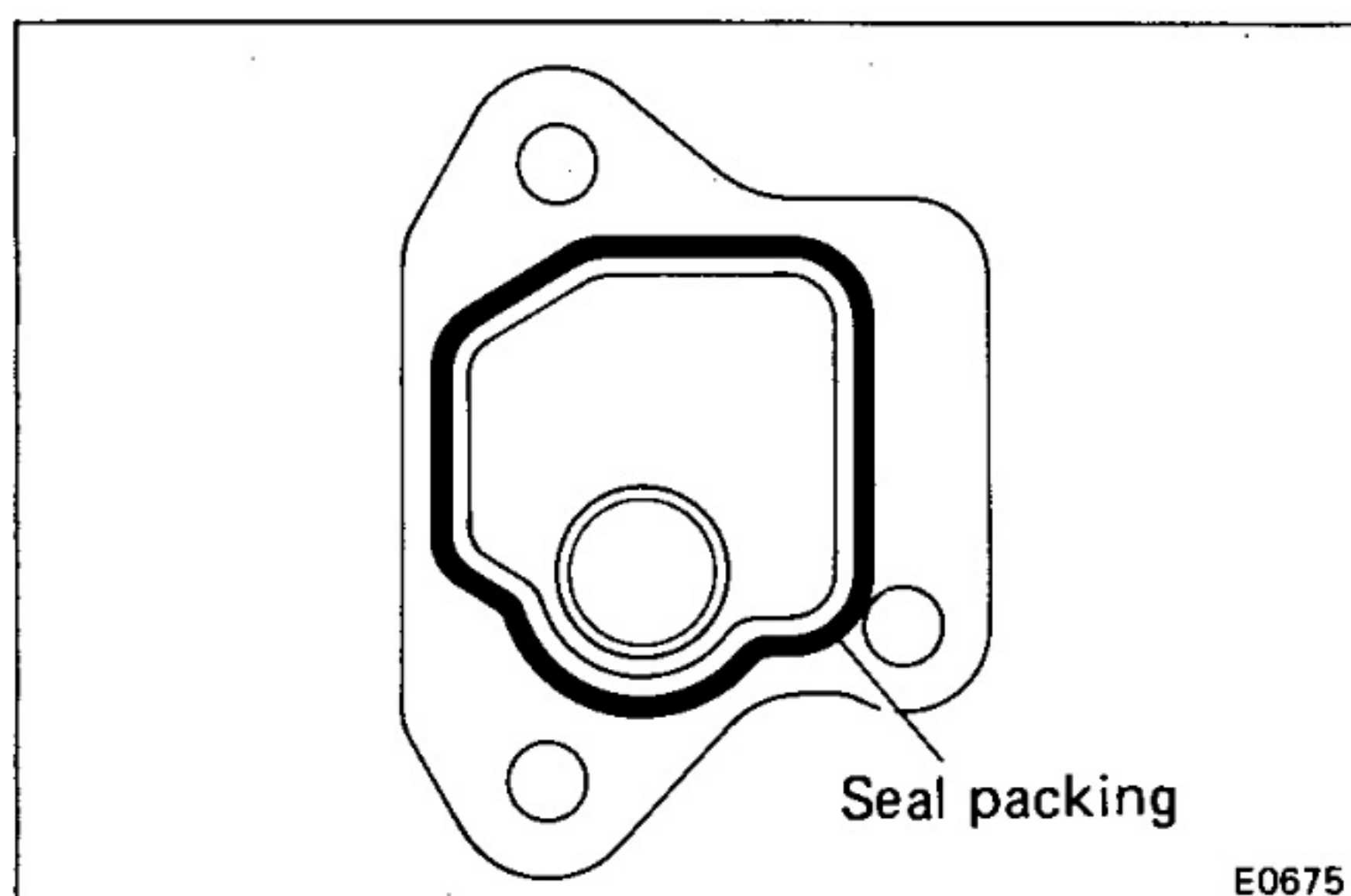
### 3. INSTALL DIFFERENTIAL LOCK CYLINDER COVER

(a) Clean contacting surfaces of any residual packing material using gasoline or alcohol.

(b) Apply seal packing to the cylinder cover.

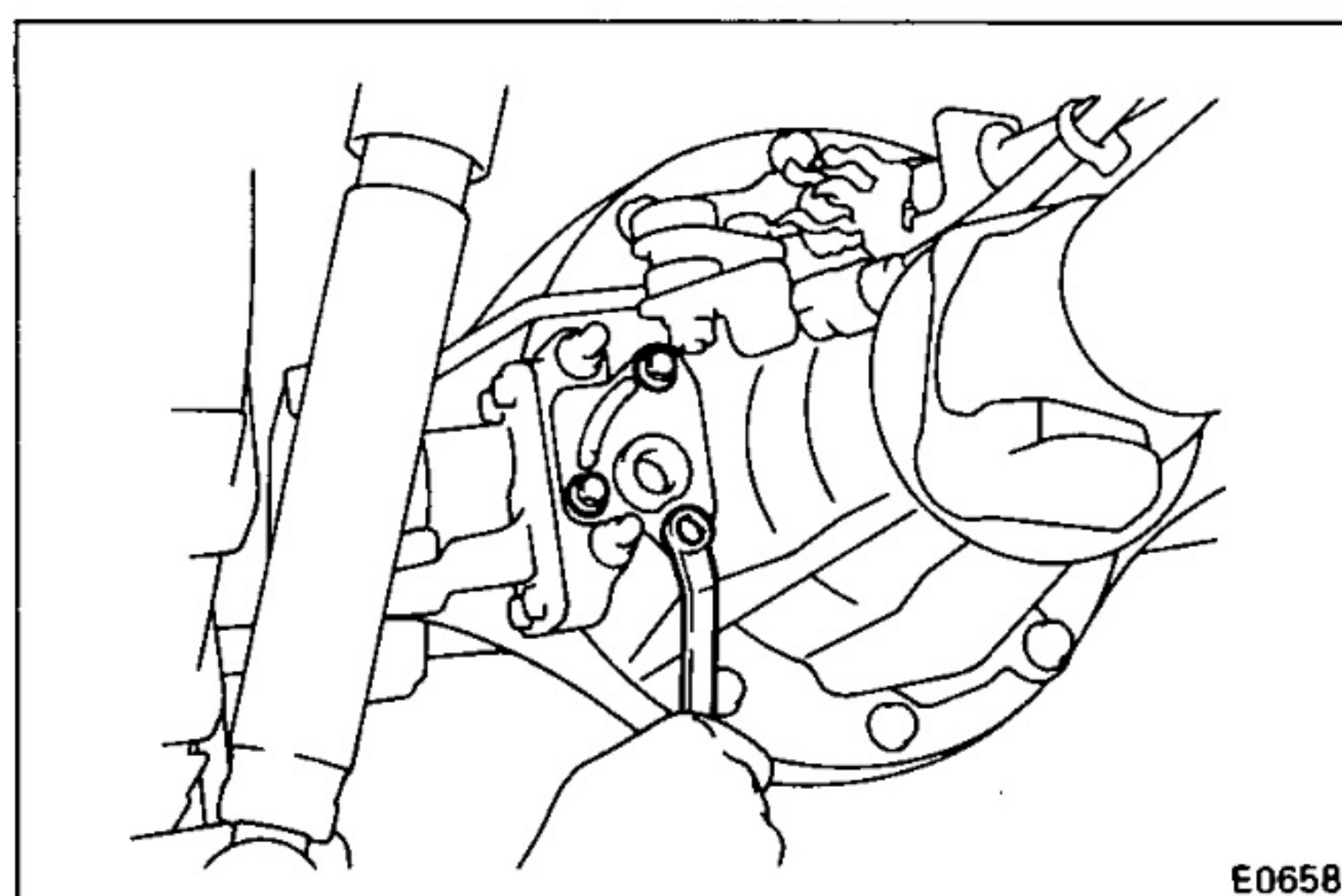
**Seal packing: Part No. 08826-00090, THREE BOND 1281 or equivalent**

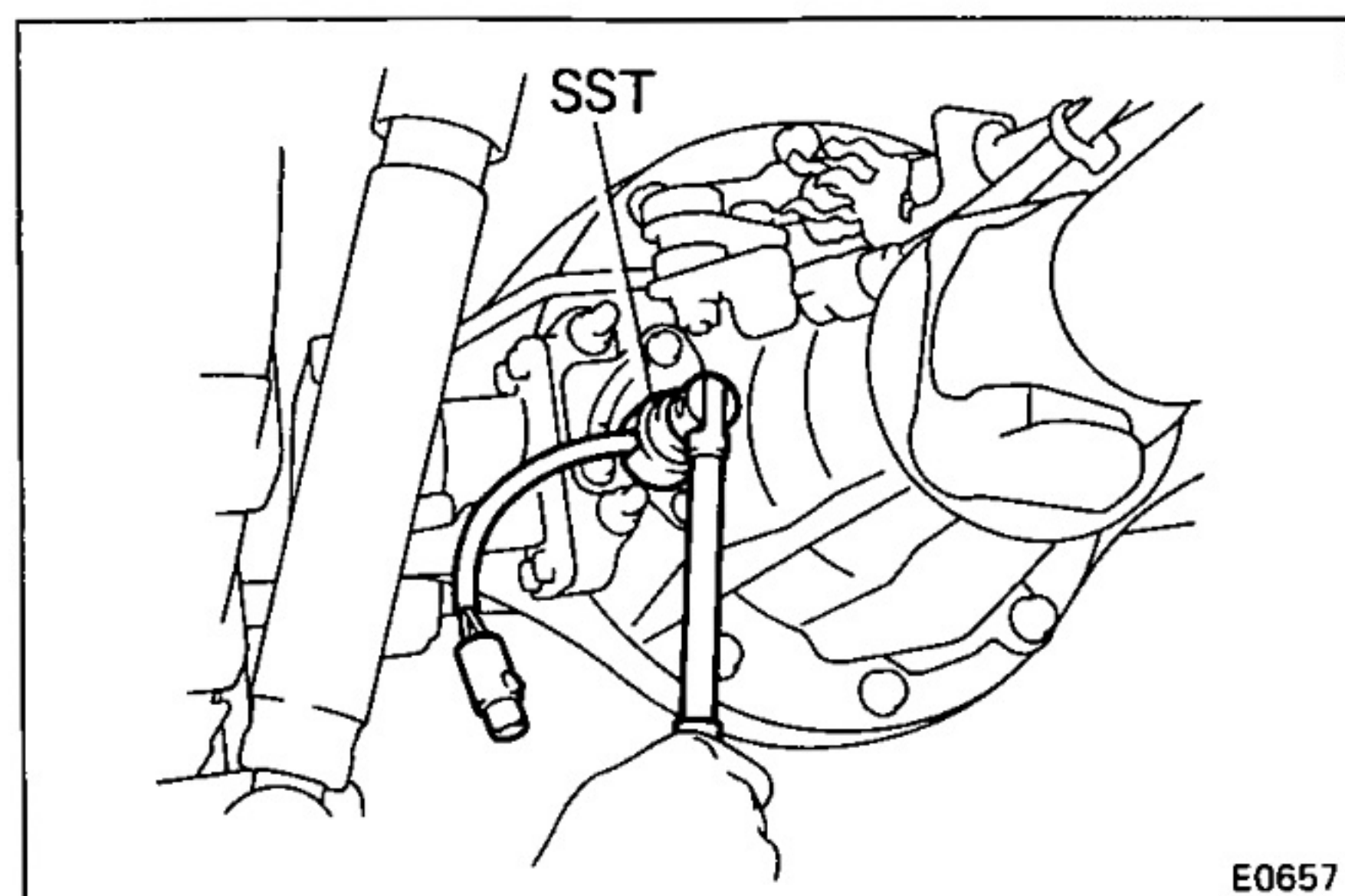
**NOTE:** Install the cylinder cover within 3 minutes after applying seal packing.



(c) Torque the three set bolts.

**Torque: 185 kg-cm (13 ft-lb, 18 N·m)**

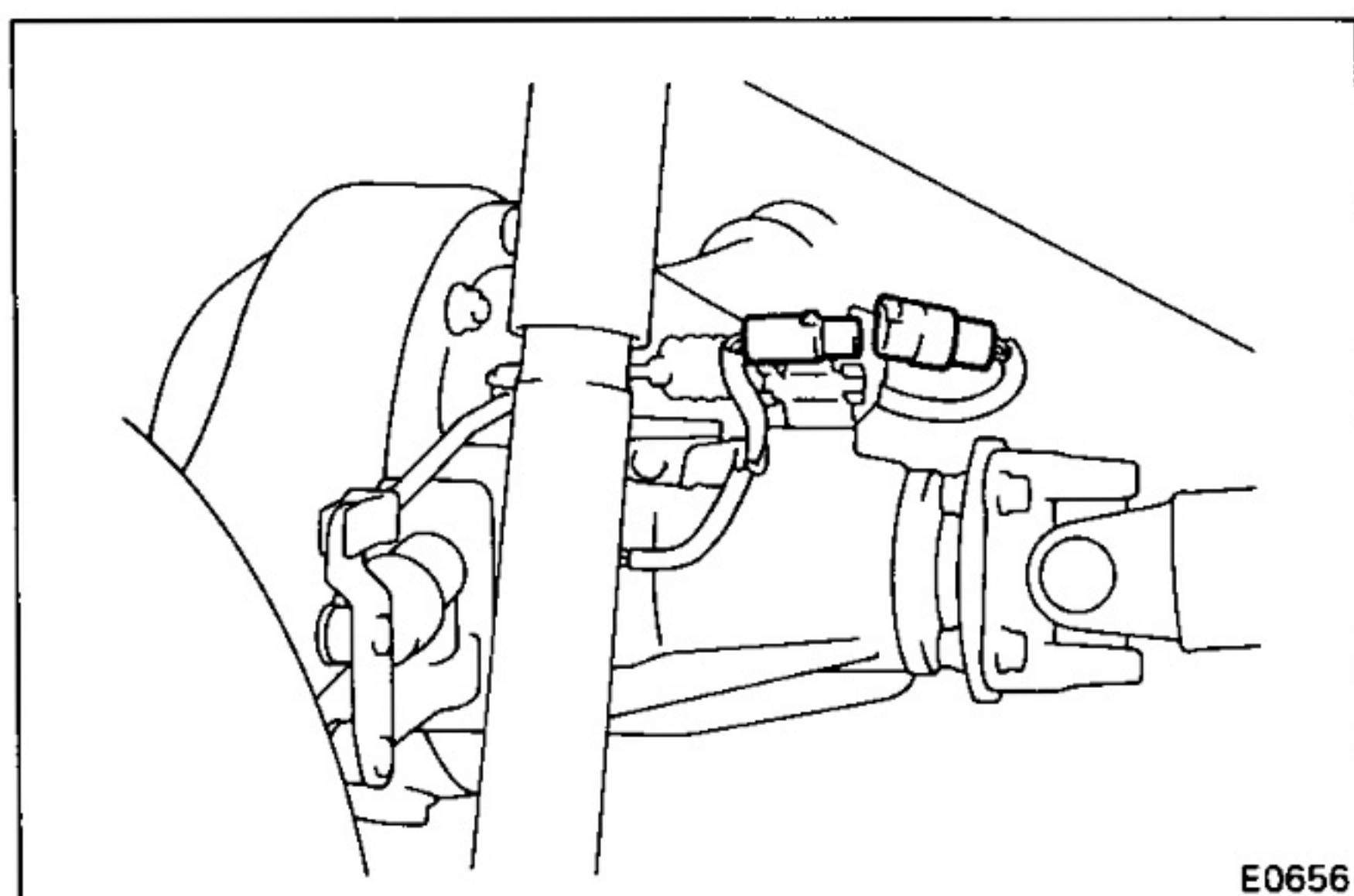




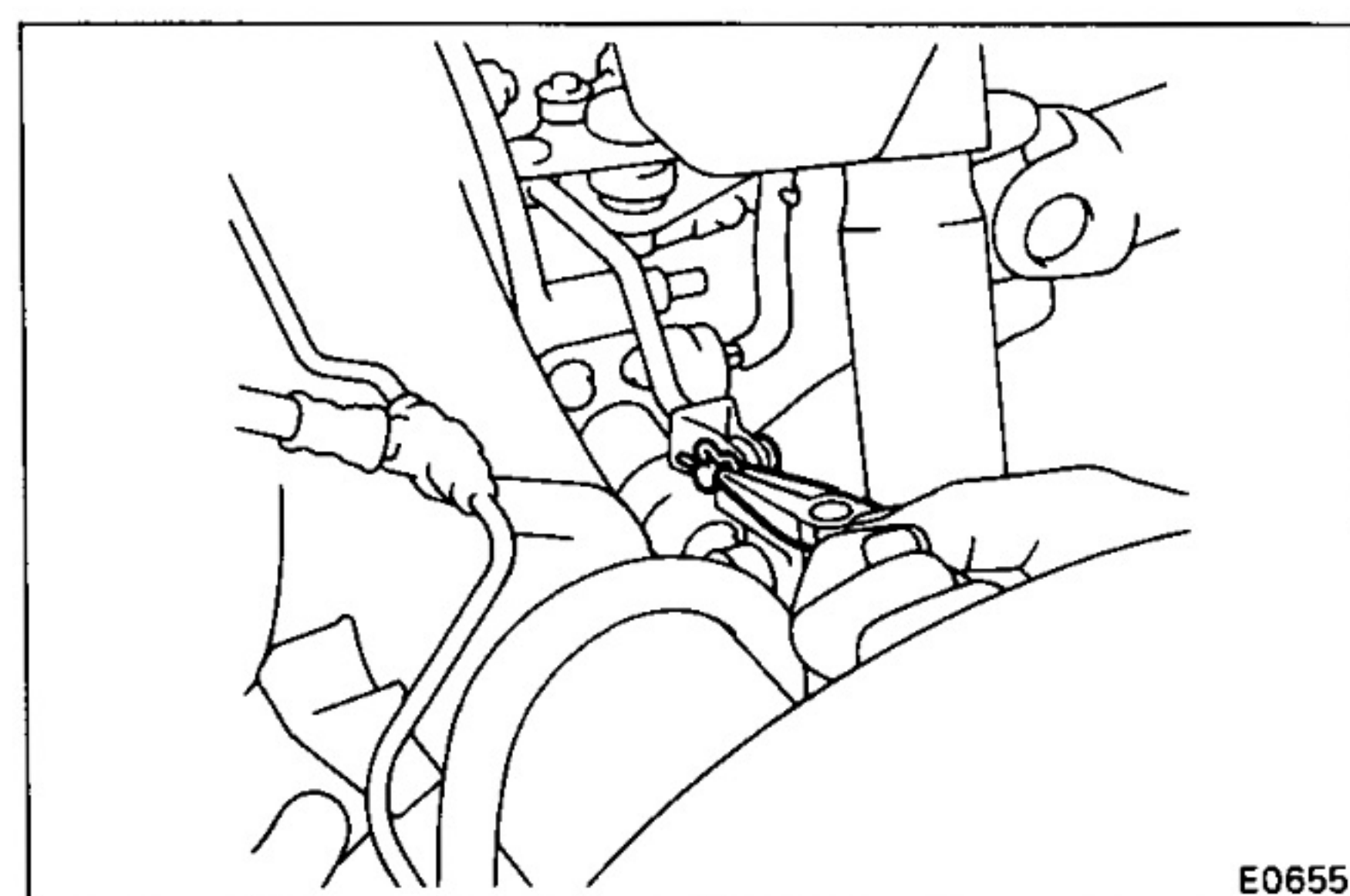
- 4. INSTALL DIFFERENTIAL LOCK INDICATOR SWITCH**  
 (a) Using SST, install the indicator switch to the cylinder cover.

SST 09817-16011

**Torque: 400 kg-cm (29 ft-lb, 39 N·m)**

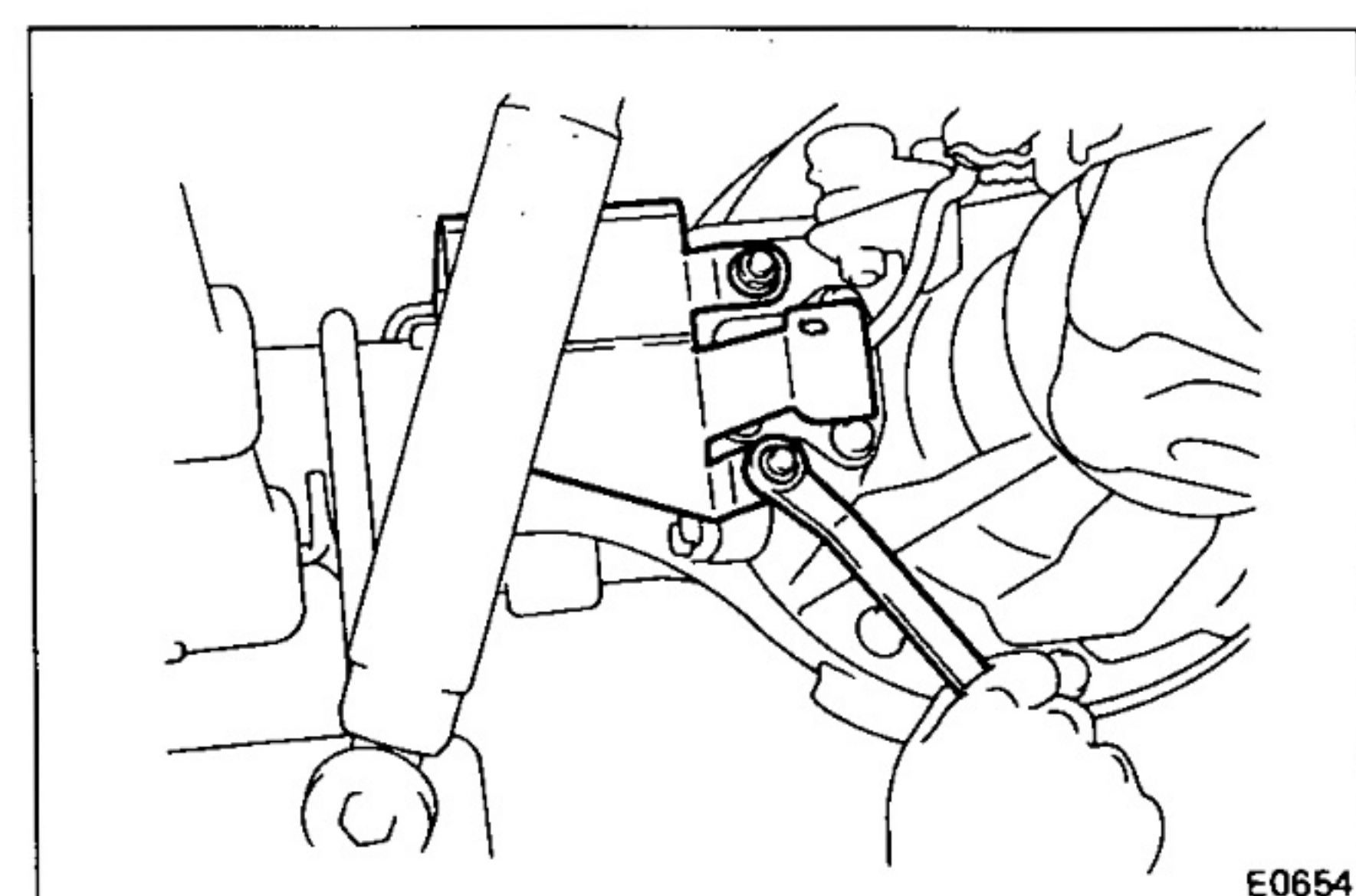


- (b) Connect the switch connector.  
 (c) Install the switch connector to the connector bracket.



- 5. CONNECT DIFFERENTIAL LOCK CABLE LINK ROD**

Connect the cable link rod with pin and clip.



- 6. INSTALL DIFFERENTIAL LOCK CYLINDER PROTECTOR**

(a) Install the protector to the axle housing.

**Torque: 360 kg-cm (26 ft-lb, 35 N·m)**

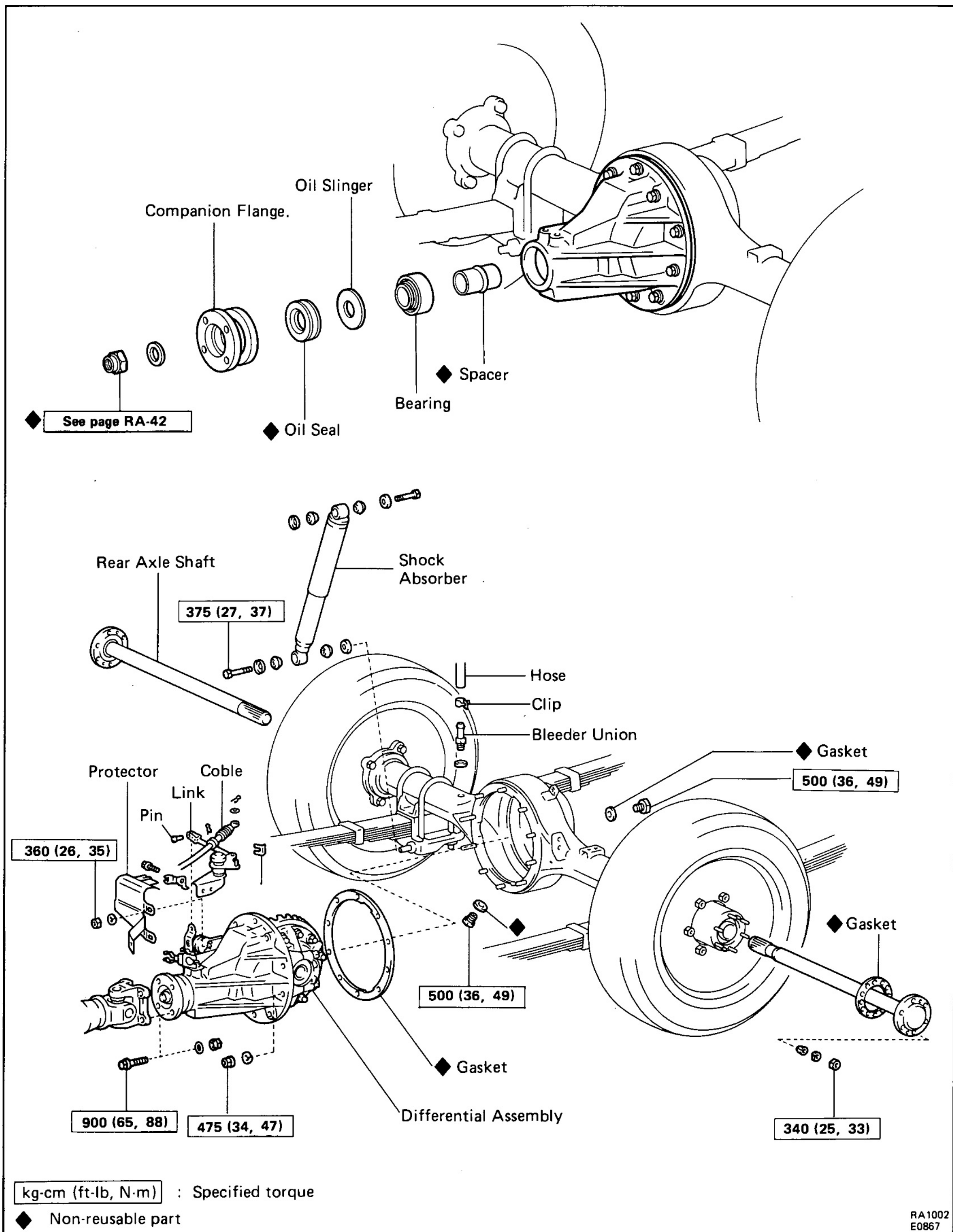
(b) Install the bleeder and connect the hose.

**Torque: 250 kg-cm (18 ft-lb, 25 N·m)**

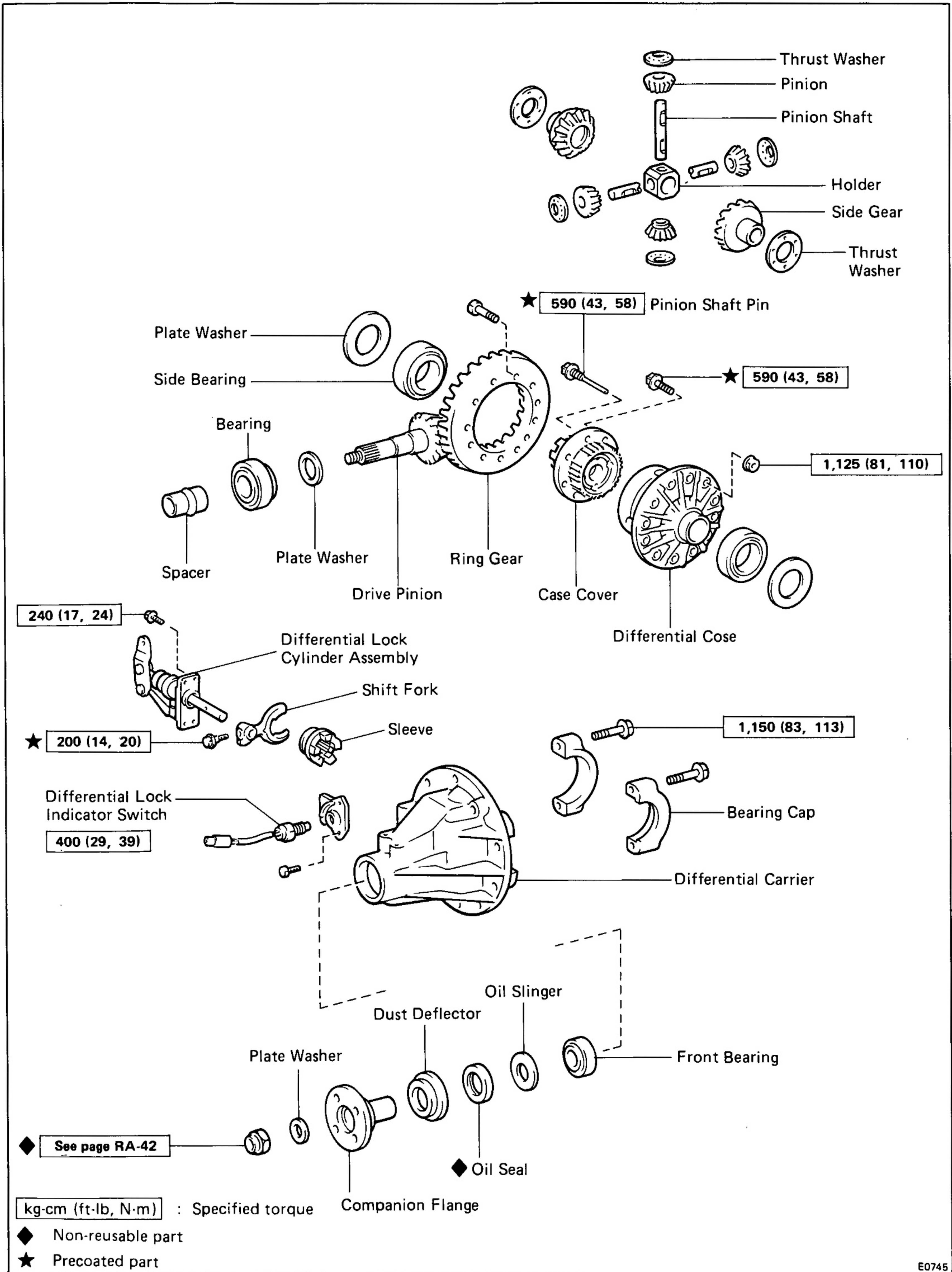
- 7. INSTALL RIGHT SIDE REAR WHEEL**

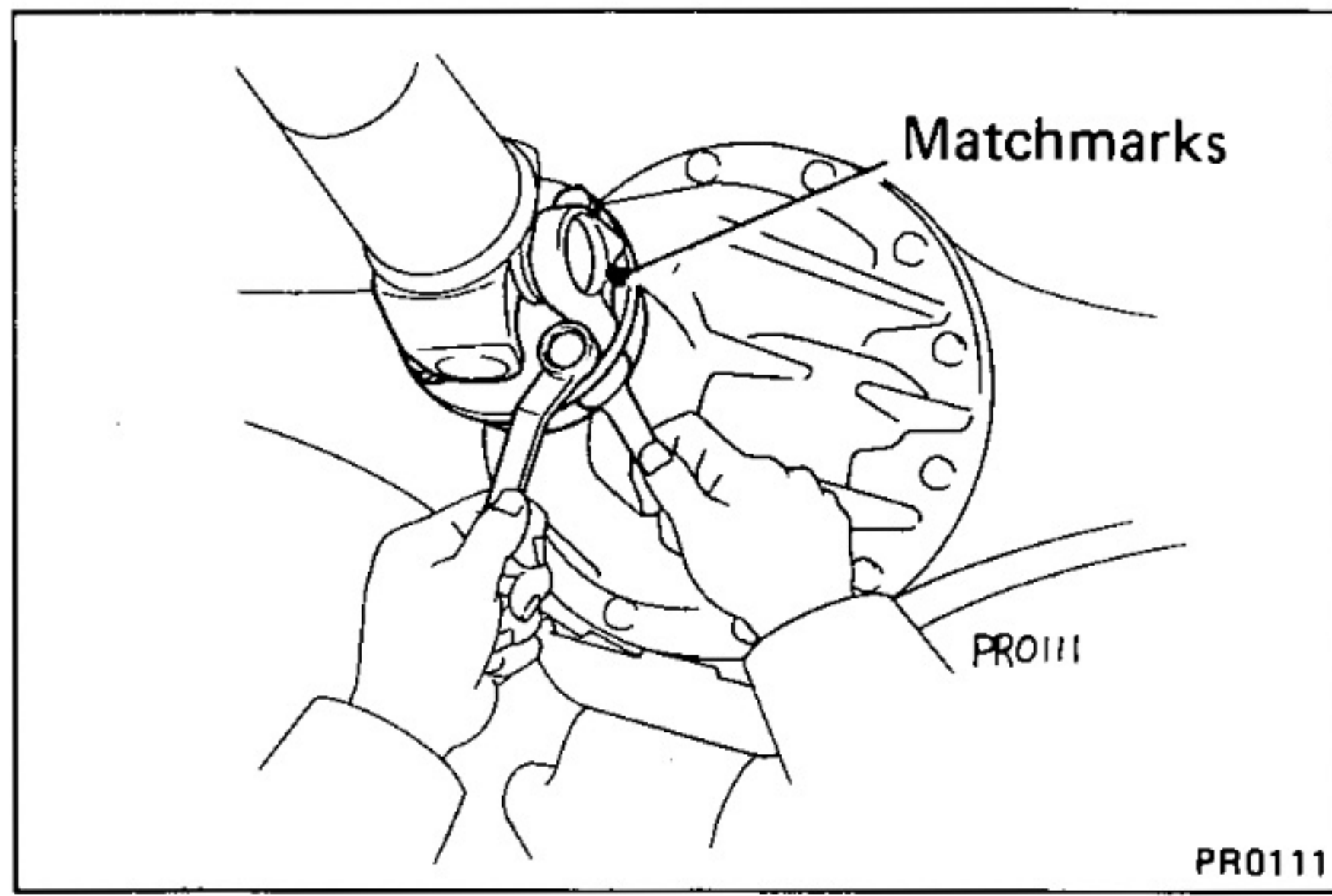
**Torque: 1,400 kg-cm (101 ft-lb, 137 N·m)**

# Differential COMPONENTS



COMPONENTS (Cont'd)

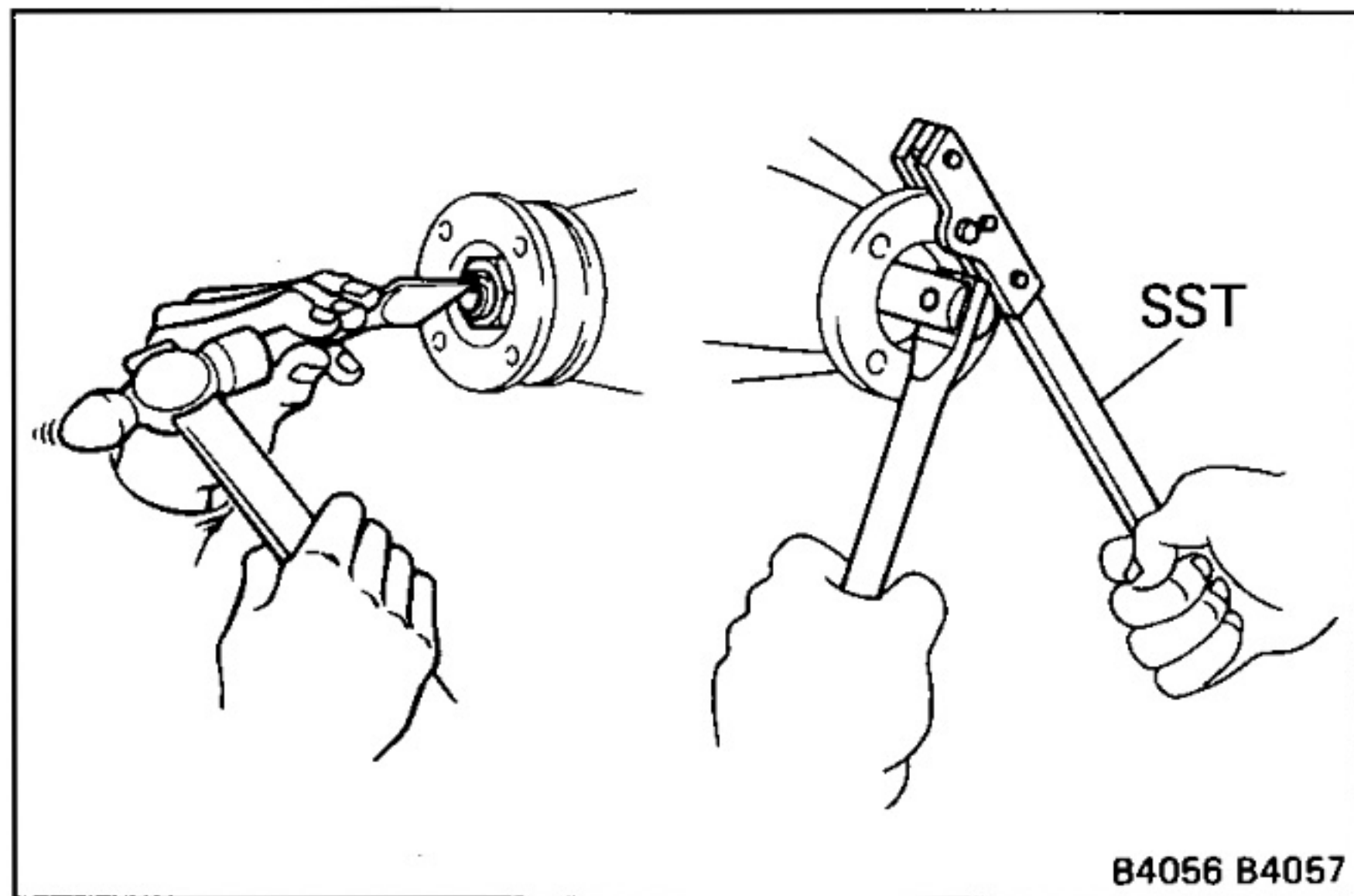




## ON-VEHICLE REPLACEMENT OF DRIVE PINION OIL SEAL

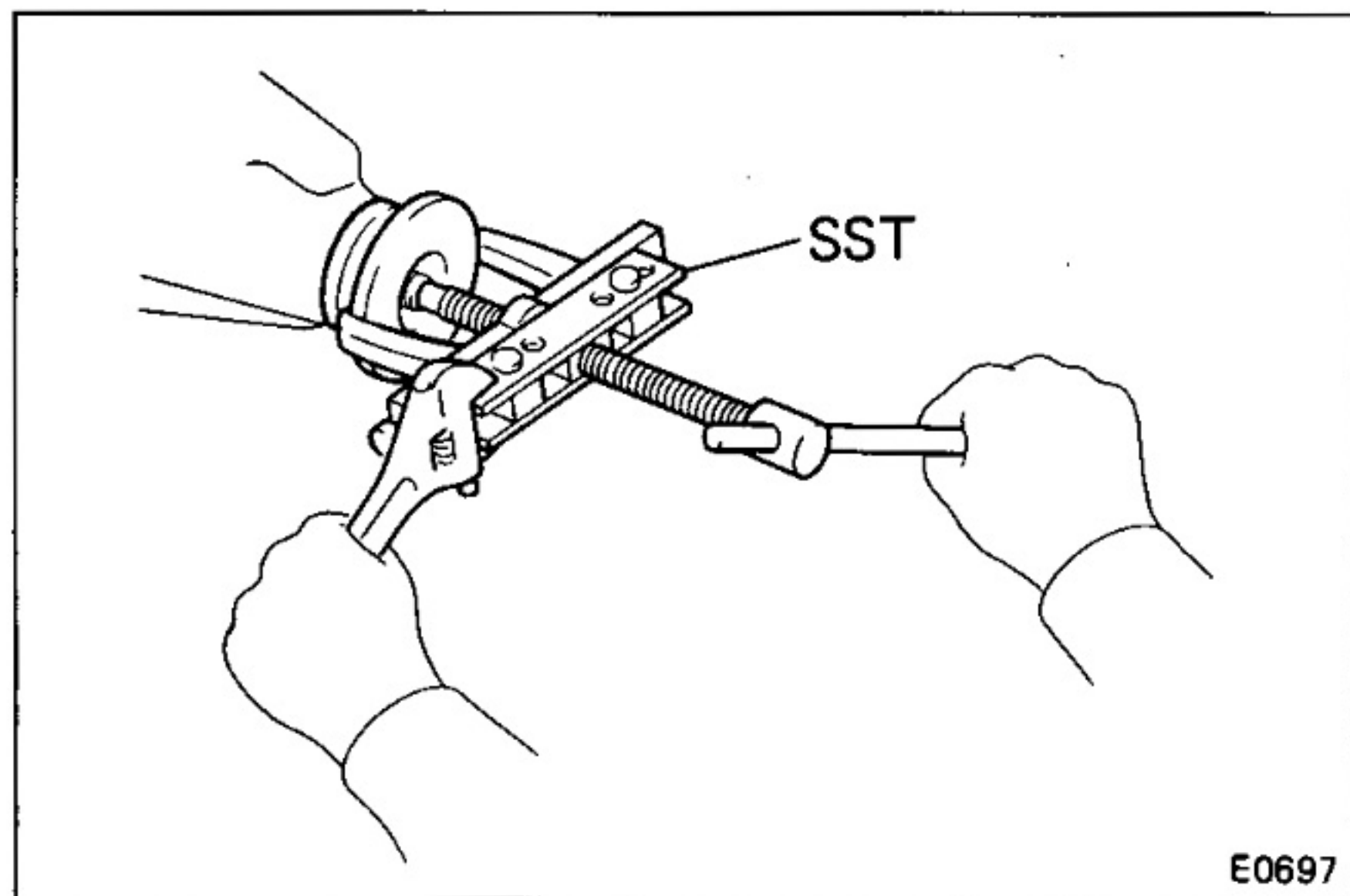
### 1. DISCONNECT PROPELLER SHAFT

- (a) Place the matchmarks on the both flanges.
- (b) Remove the four bolts and nuts and disconnect the propeller shaft from the differential.

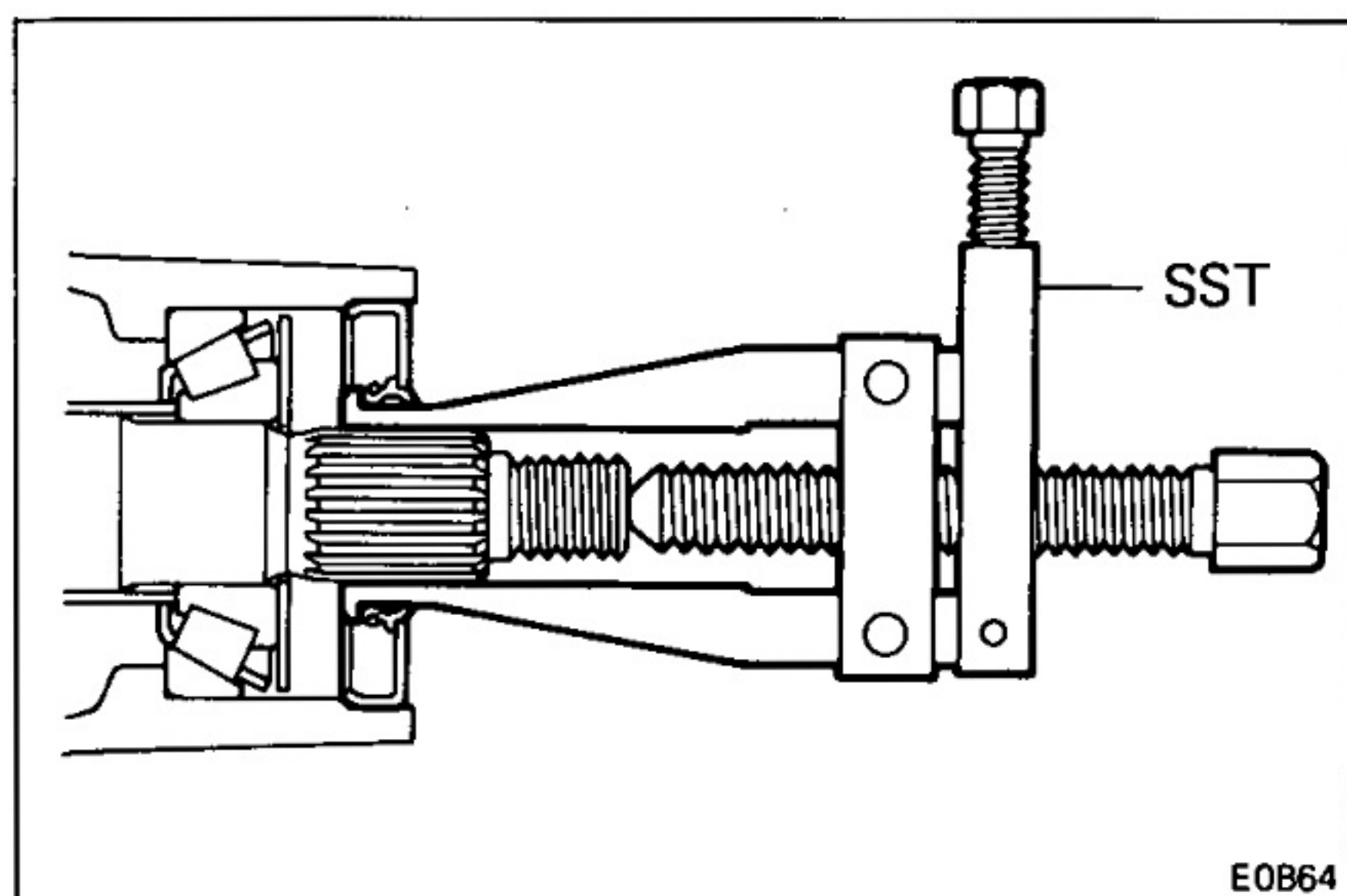


### 2. REMOVE COMPANION FLANGE

- (a) Using a hammer and chisel, loosen the staked part of the nut.
- (b) Using SST to hold the flange, remove the nut.  
SST 09330-00021



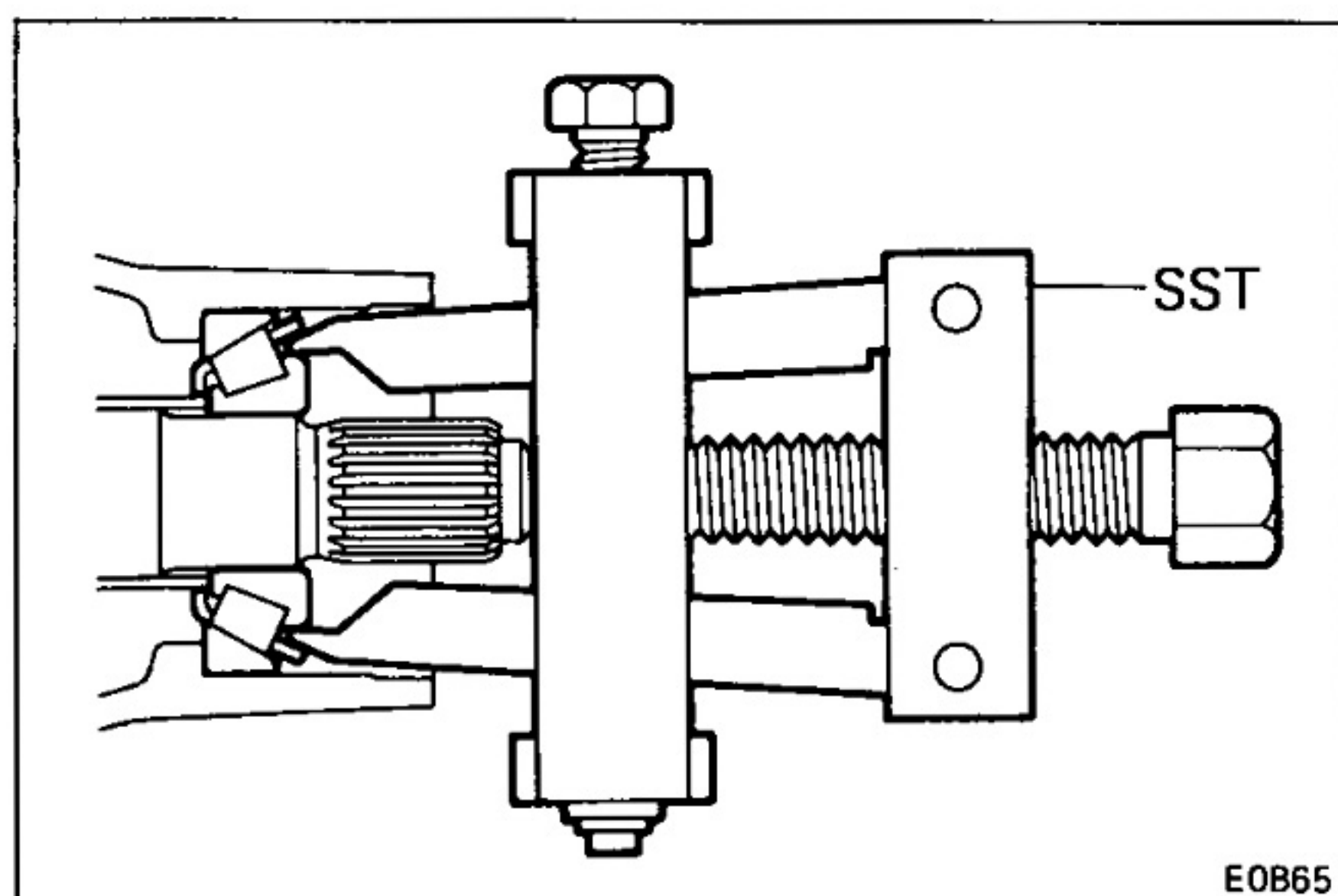
- (c) Using SST, remove the companion flange.  
SST 09950-20017



### 3. REMOVE OIL SEAL

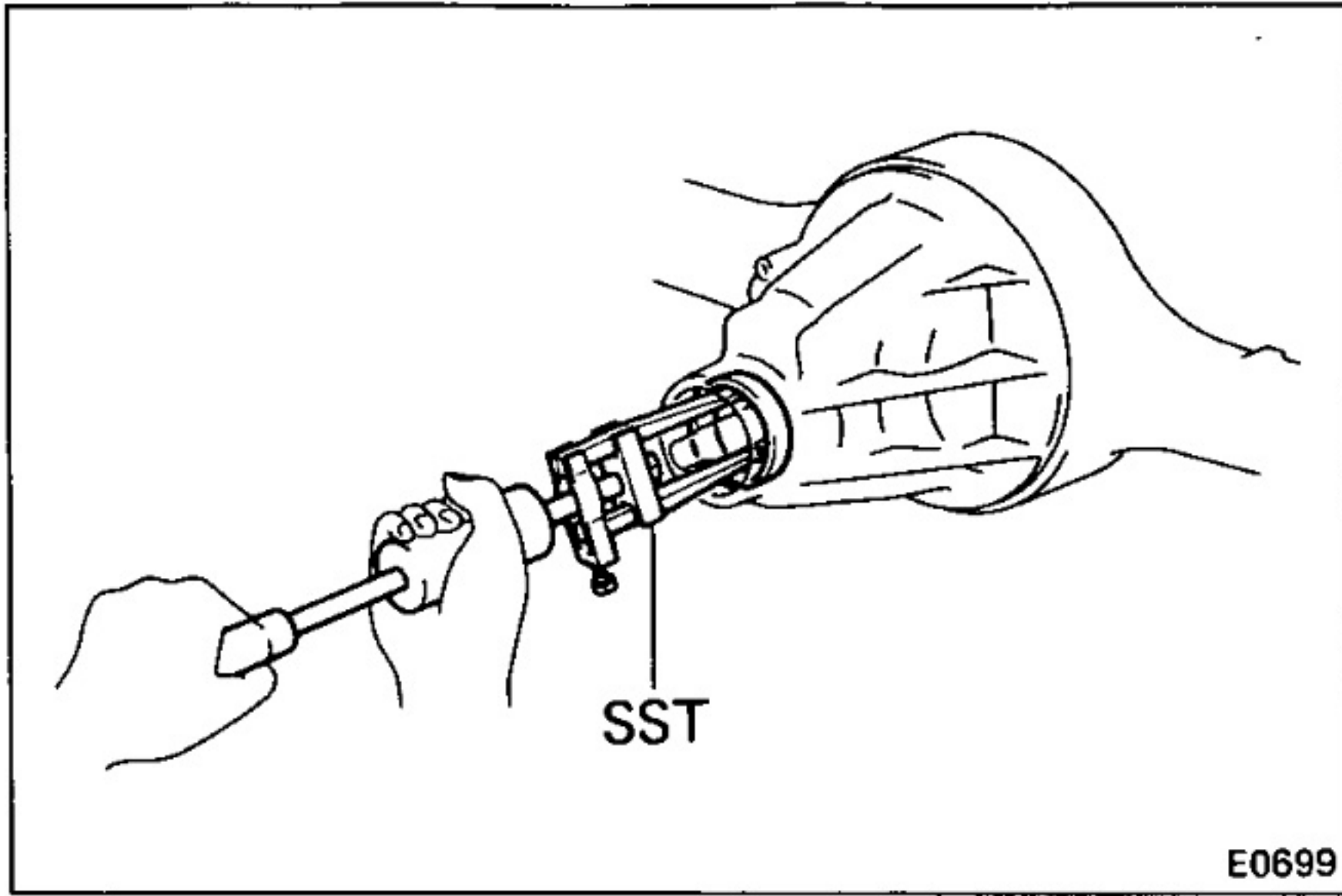
- Using SST, remove the oil seal.  
SST 09308-10010

### 4. REMOVE OIL SLINGER



### 5. REMOVE FRONT BEARING

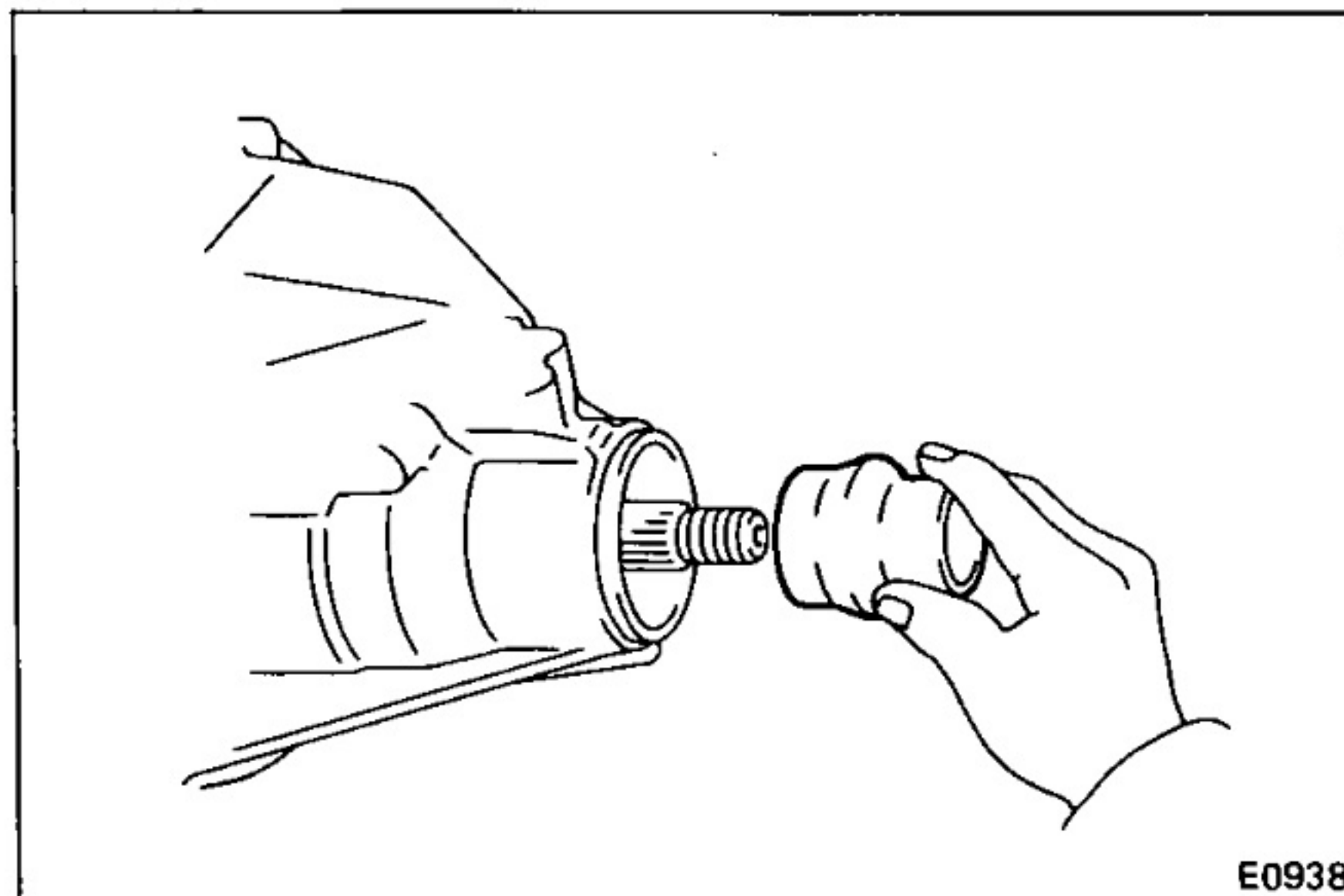
- Using SST, remove the front bearing.  
SST 09556-22010



**6. REMOVE BEARING OUTER RACE**

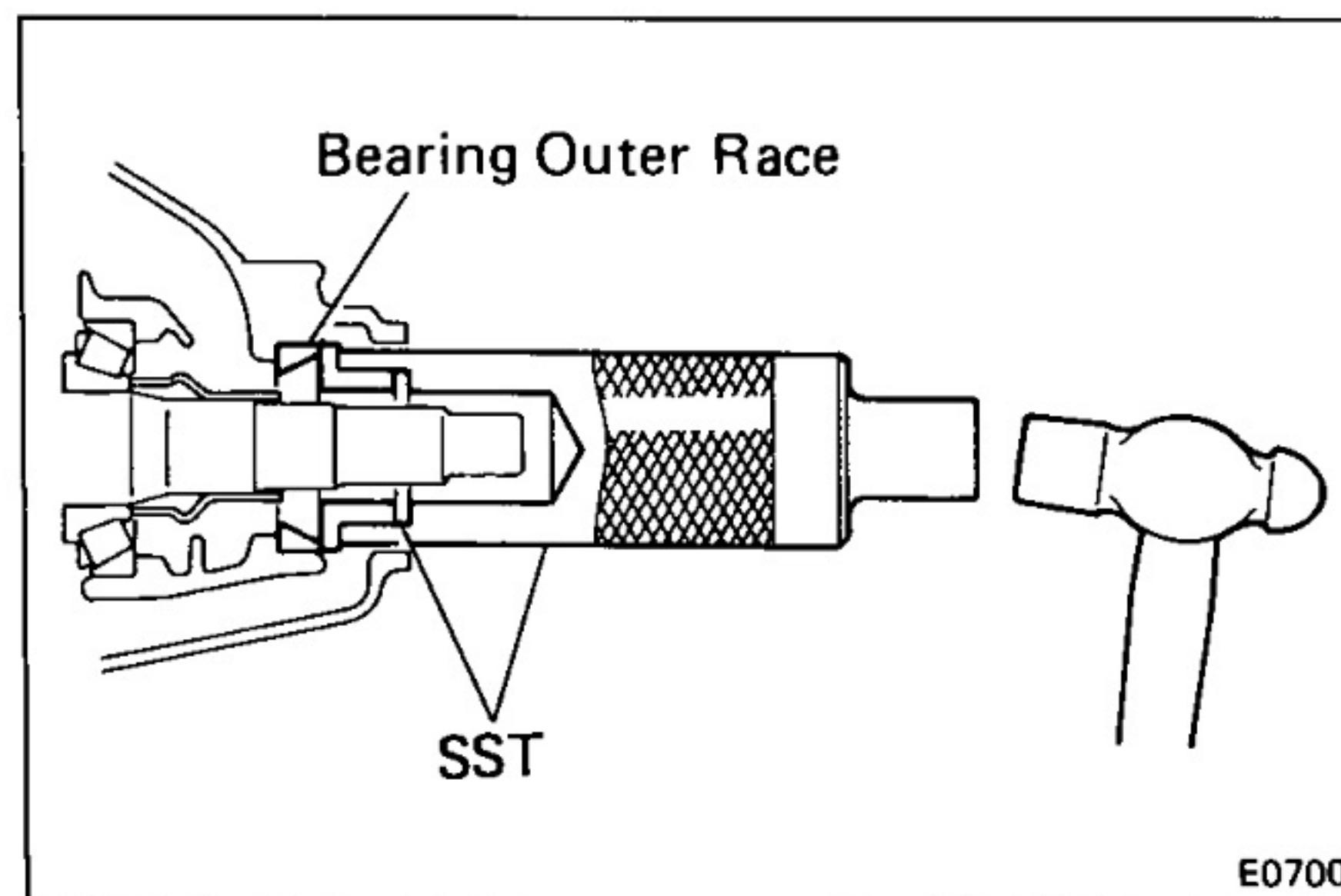
Using SST, remove the bearing outer race.  
SST 09308-00010

**7. REMOVE DRIVE PINION SPACER**



**8. INSTALL DRIVE PINION SPACER**

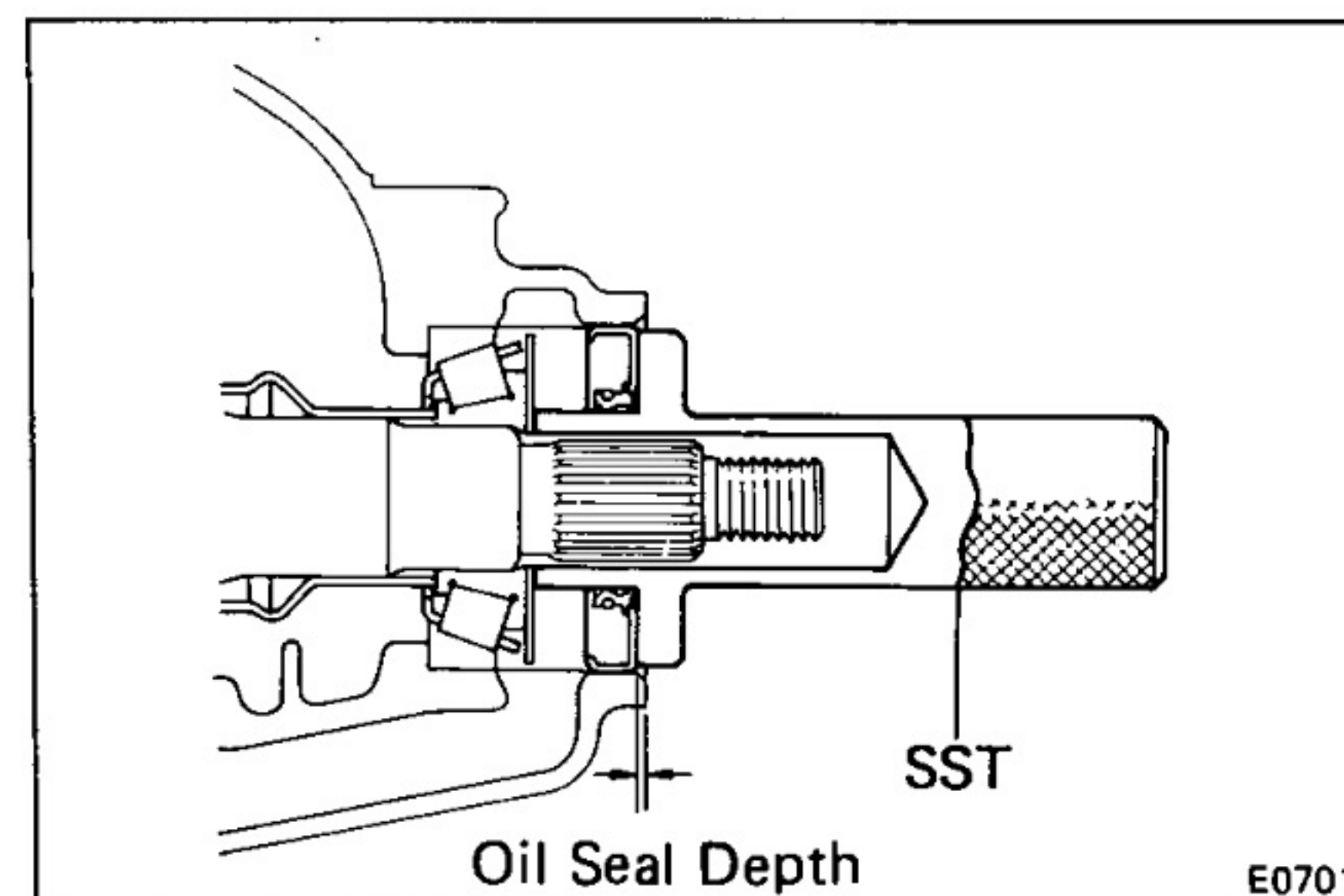
Install a new spacer into the differential.



**9. INSTALL BEARING OUTER RACE**

Using SST, drive in a new outer race.  
SST 09316-60010 (09316-00010, 09316-00020)

**10. INSTALL NEW FRONT BEARING AND OIL SLINGER**

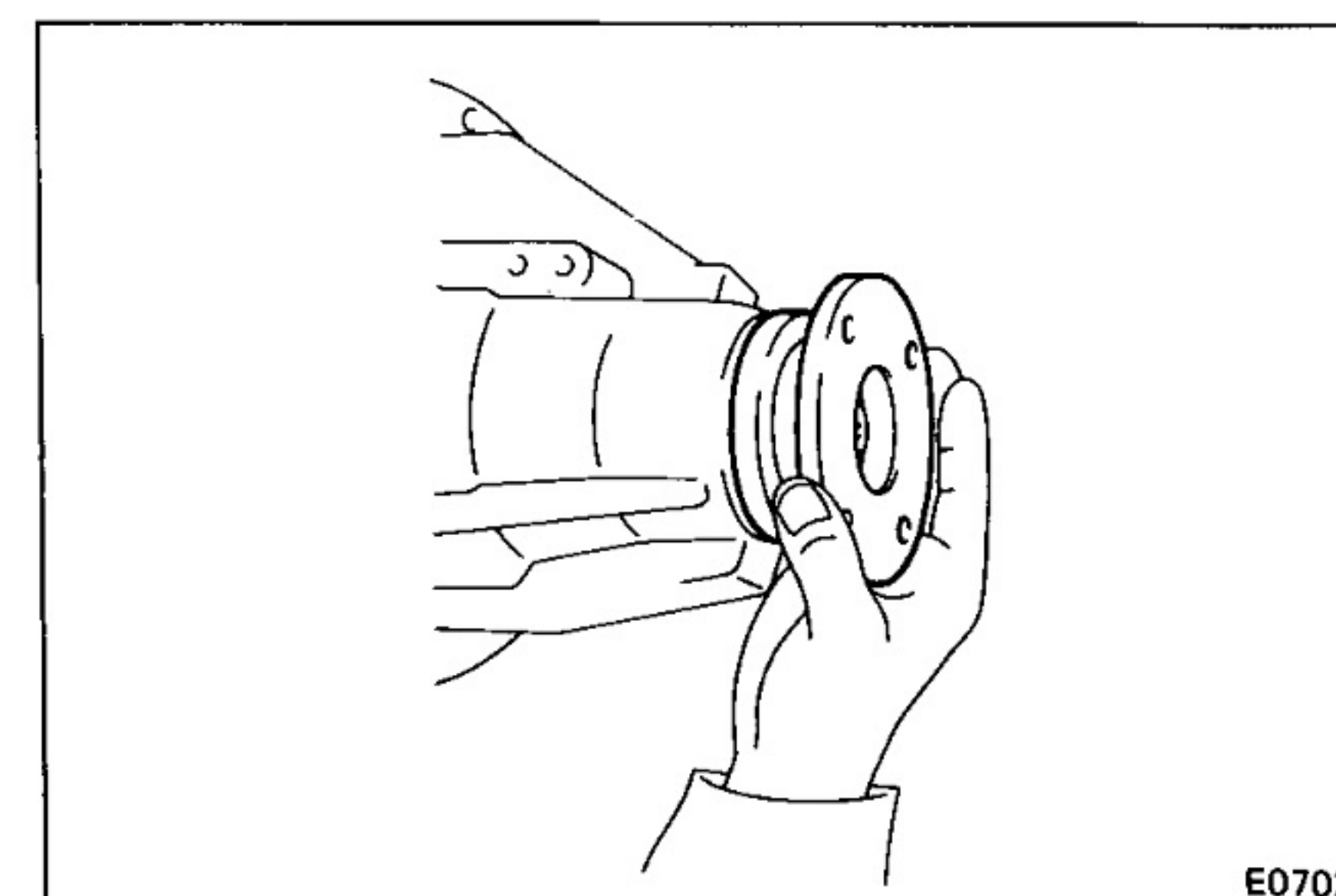


**11. INSTALL OIL SEAL**

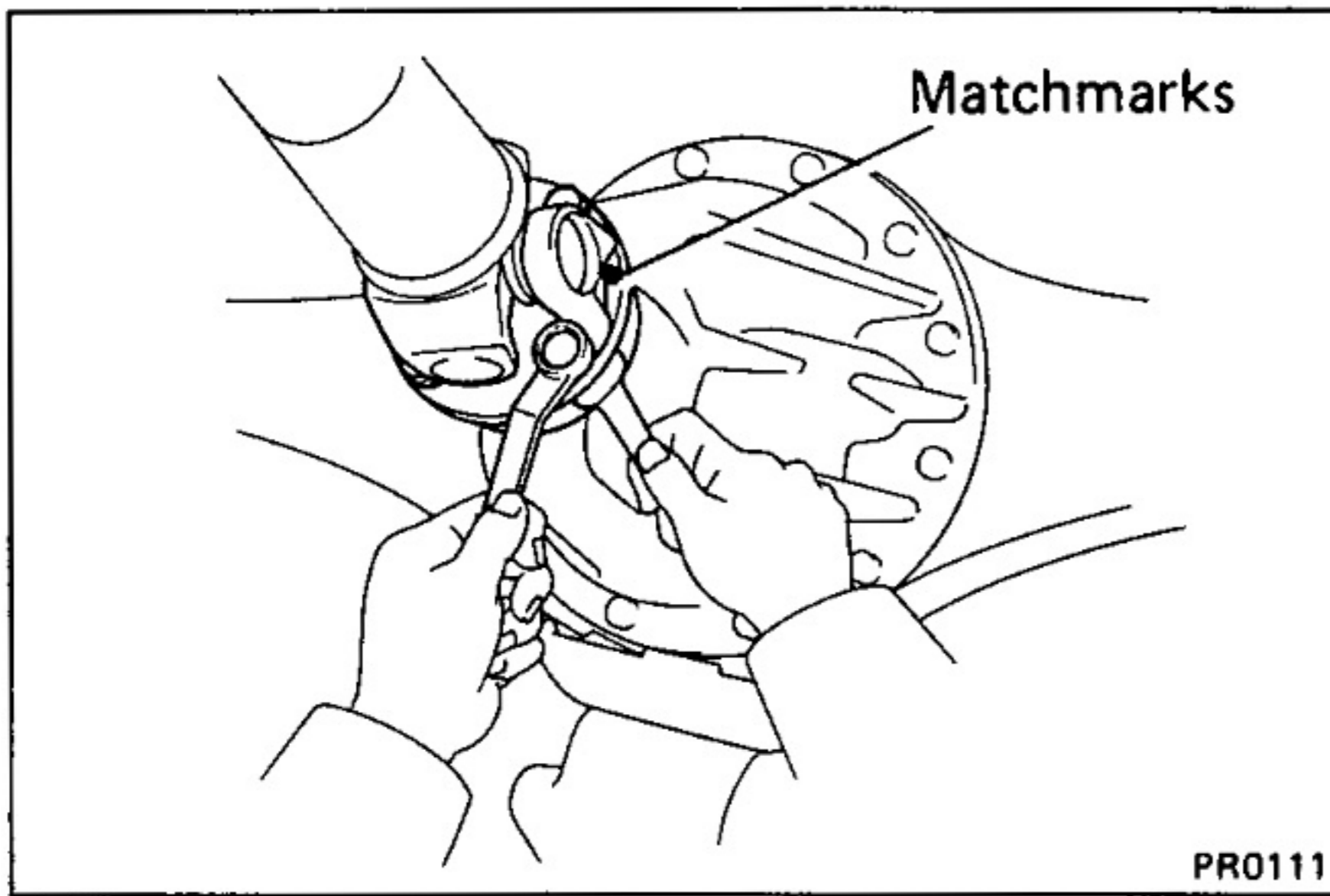
(a) Using SST, drive in a new oil seal.  
SST 09554-30011

**Oil seal depth: 1.0 mm (0.039 in.)**

(b) Apply MP grease to the oil seal lip.



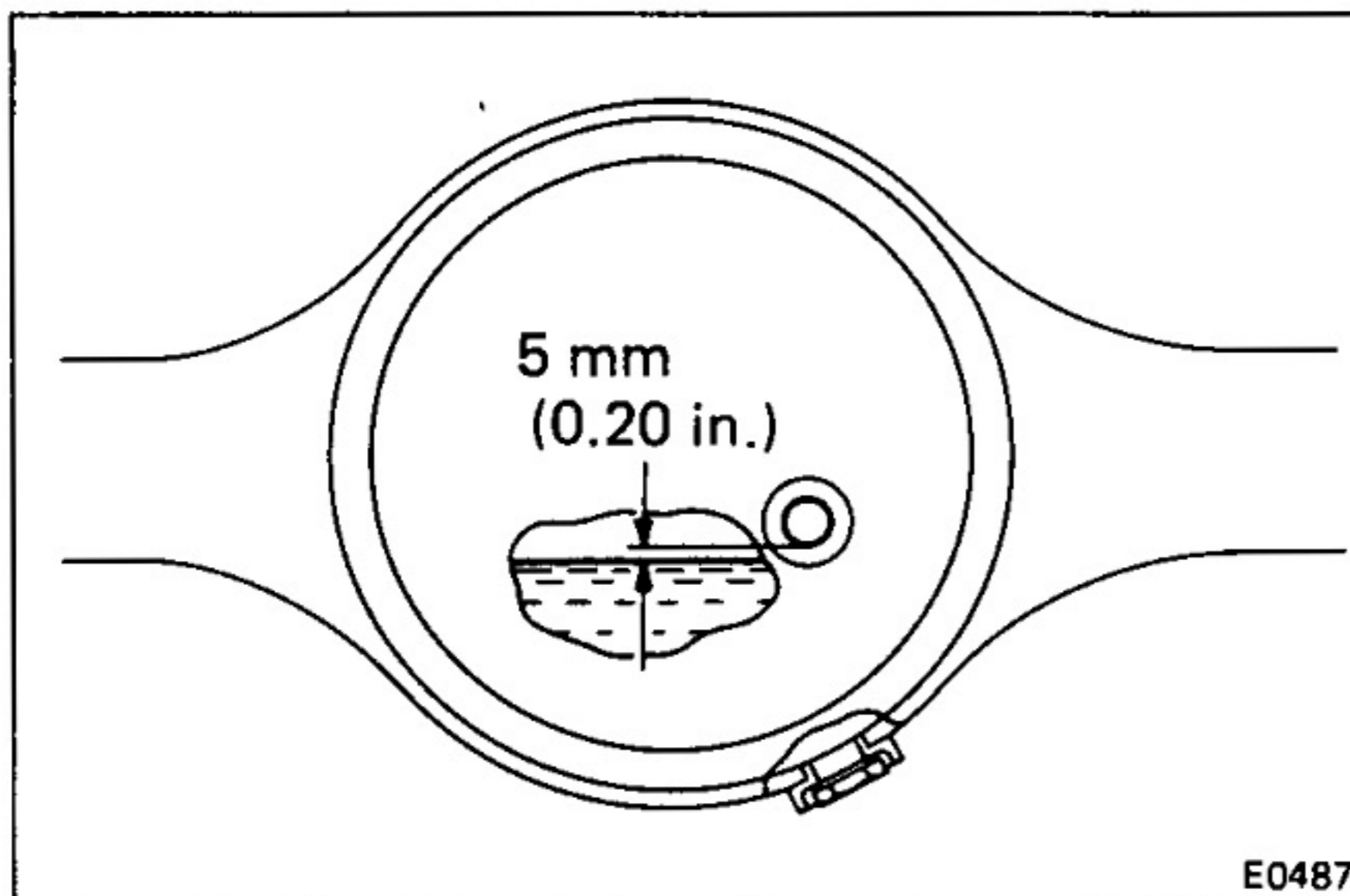
**12. INSTALL COMPANION FLANGE AND CHECK FRONT BEARING PRELOAD**  
(See page RA-42)



### 13. CONNECT PROPELLER SHAFT

- (a) Align the matchmarks on the both flanges.
- (b) Torque the bolts and nuts.

**Torque: 900 kg-cm (65 ft-lb, 88 N·m)**



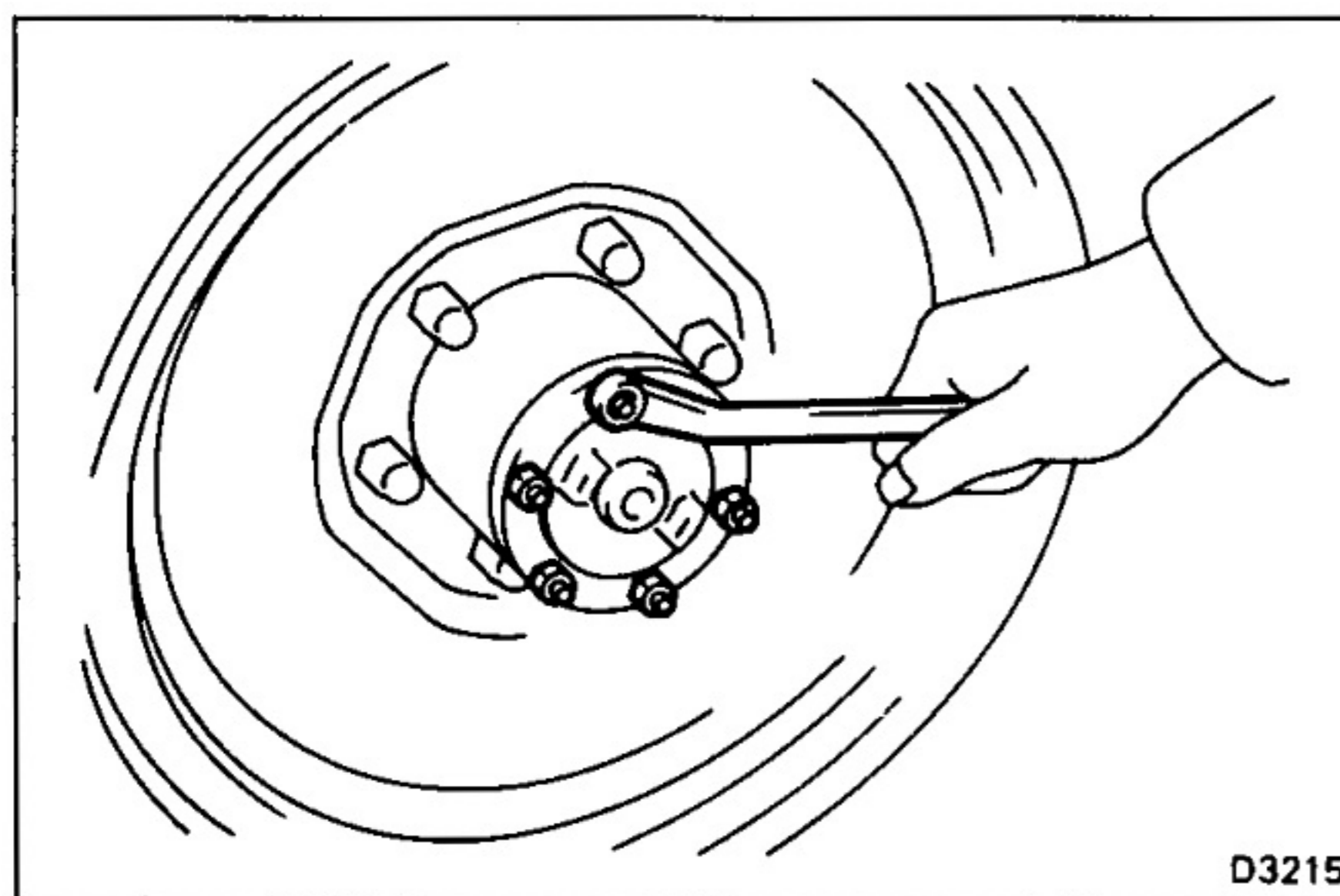
### 14. CHECK DIFFERENTIAL OIL LEVEL

**Oil grade: API GL-5 hypoid gear oil**

**Viscosity: Above -18°C (0°F) SAE 90**

**Below -18°C (0°F) SAE 80W-90 or 80W**

**Capacity: 2.5 liters (2.6 US qts, 2.2 Imp. qts)**



## REMOVAL OF DIFFERENTIAL

### 1. DRAIN DIFFERENTIAL OIL

### 2. REMOVE REAR AXLE SHAFT

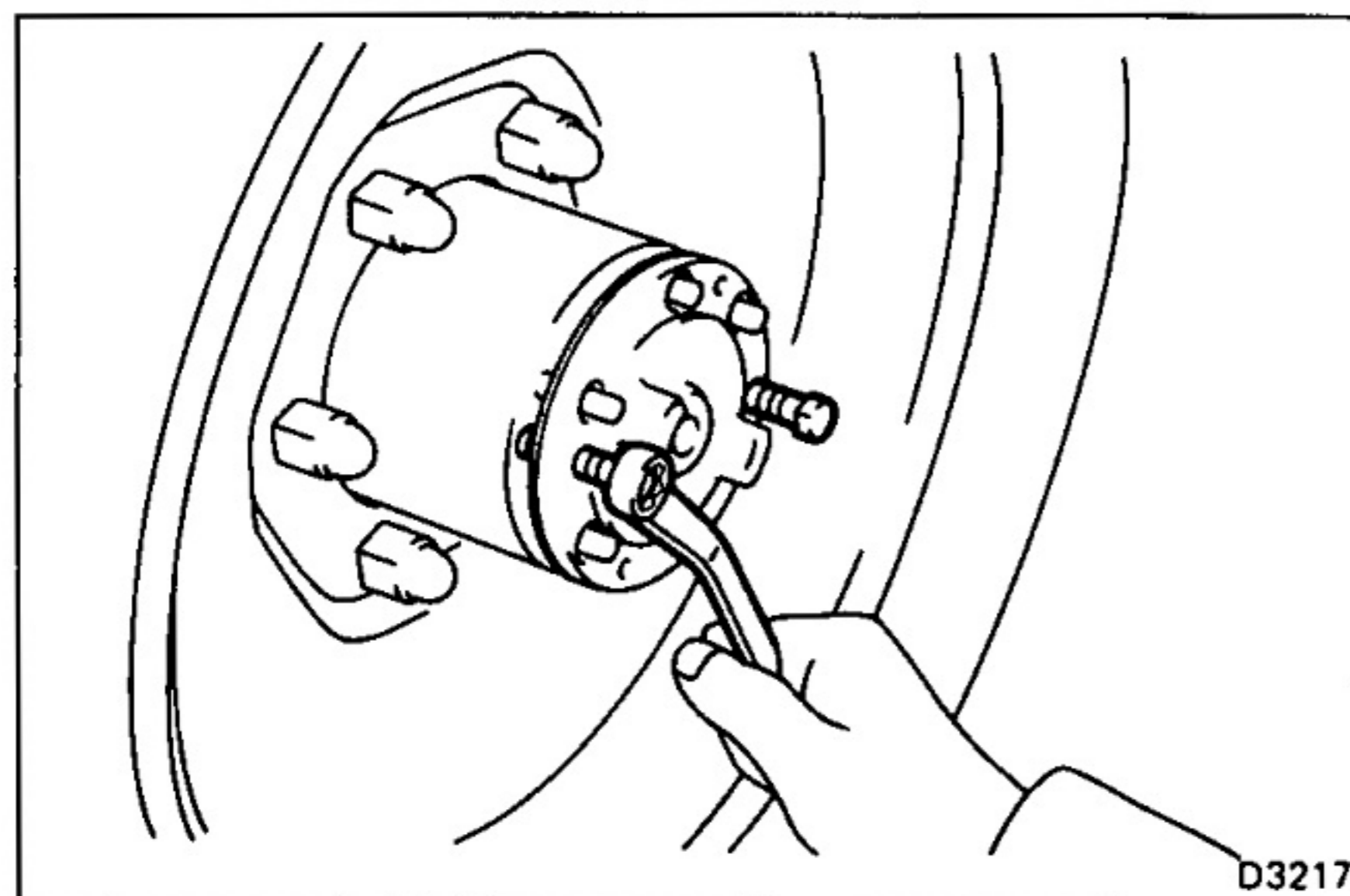
- (a) Remove the six nuts and washers.
- (b) Insert two service bolts and one turn.
- (c) Tap on the shaft and remove the six cone washers.

(d) Tighten the two service bolts and separate the axle shaft

(e) Remove the axle shaft with the gasket.

**NOTE:** Be careful not to damage the oil seal with the spline.

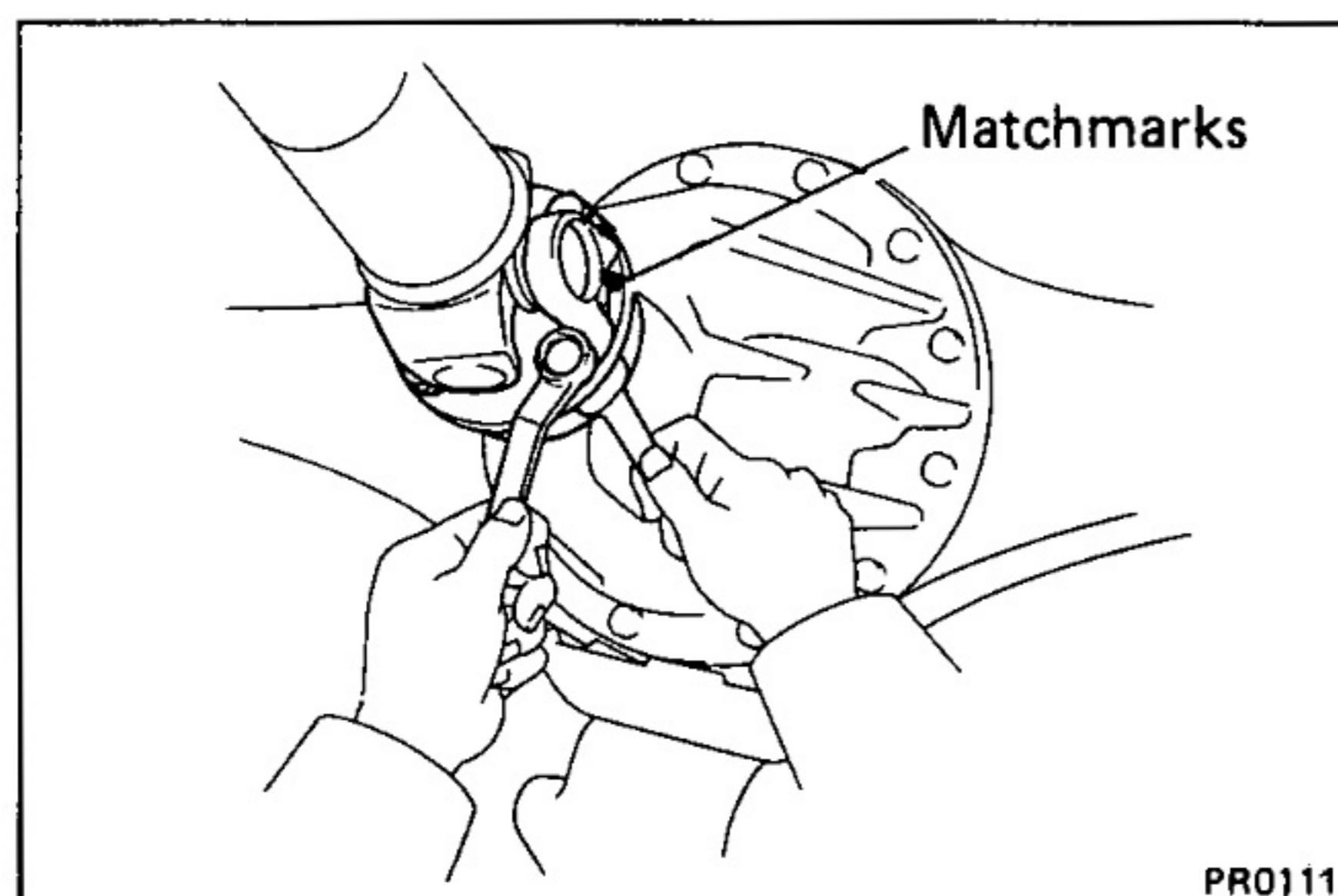
(f) Remove the two service bolts.

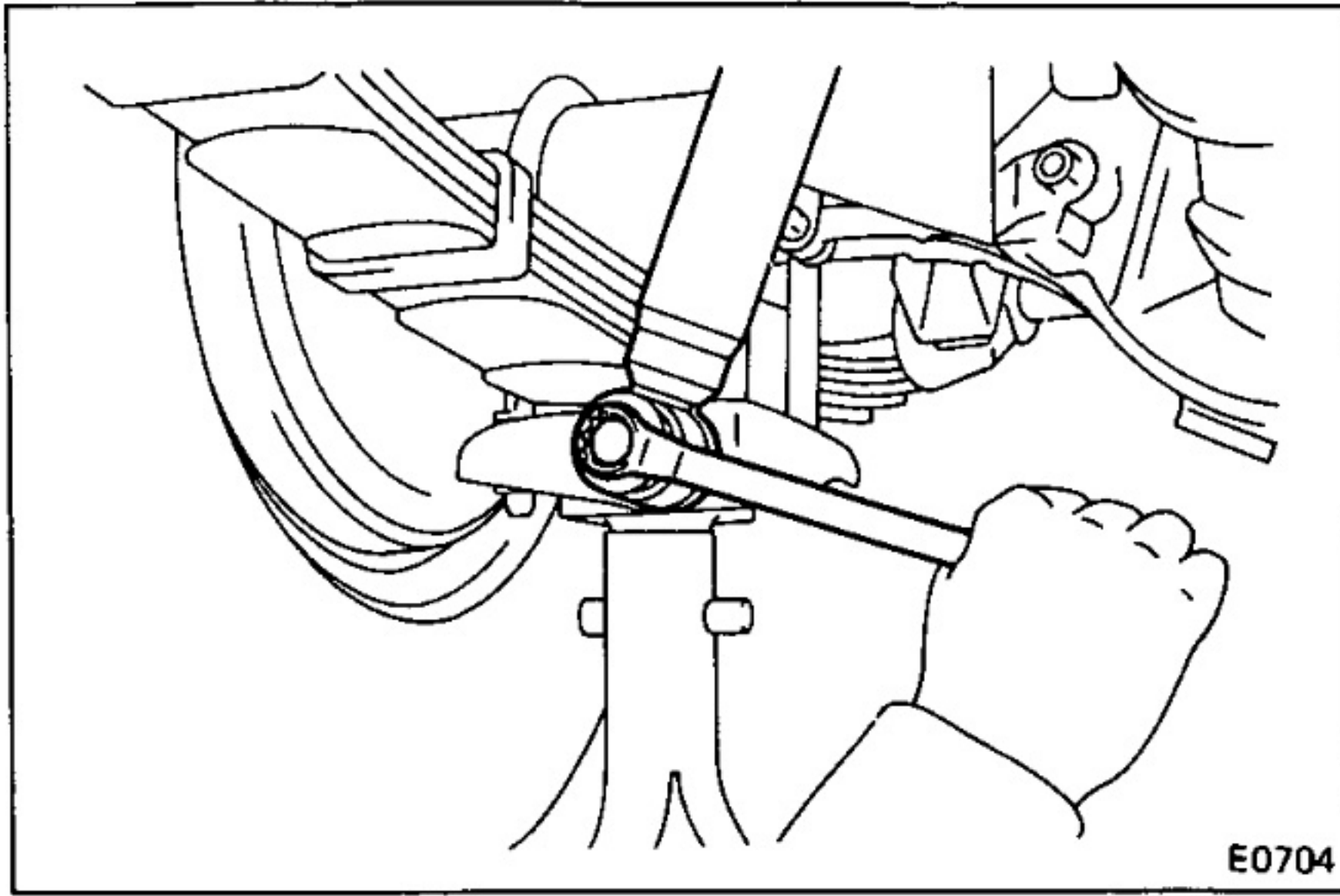


### 3. DISCONNECT PROPELLER SHAFT

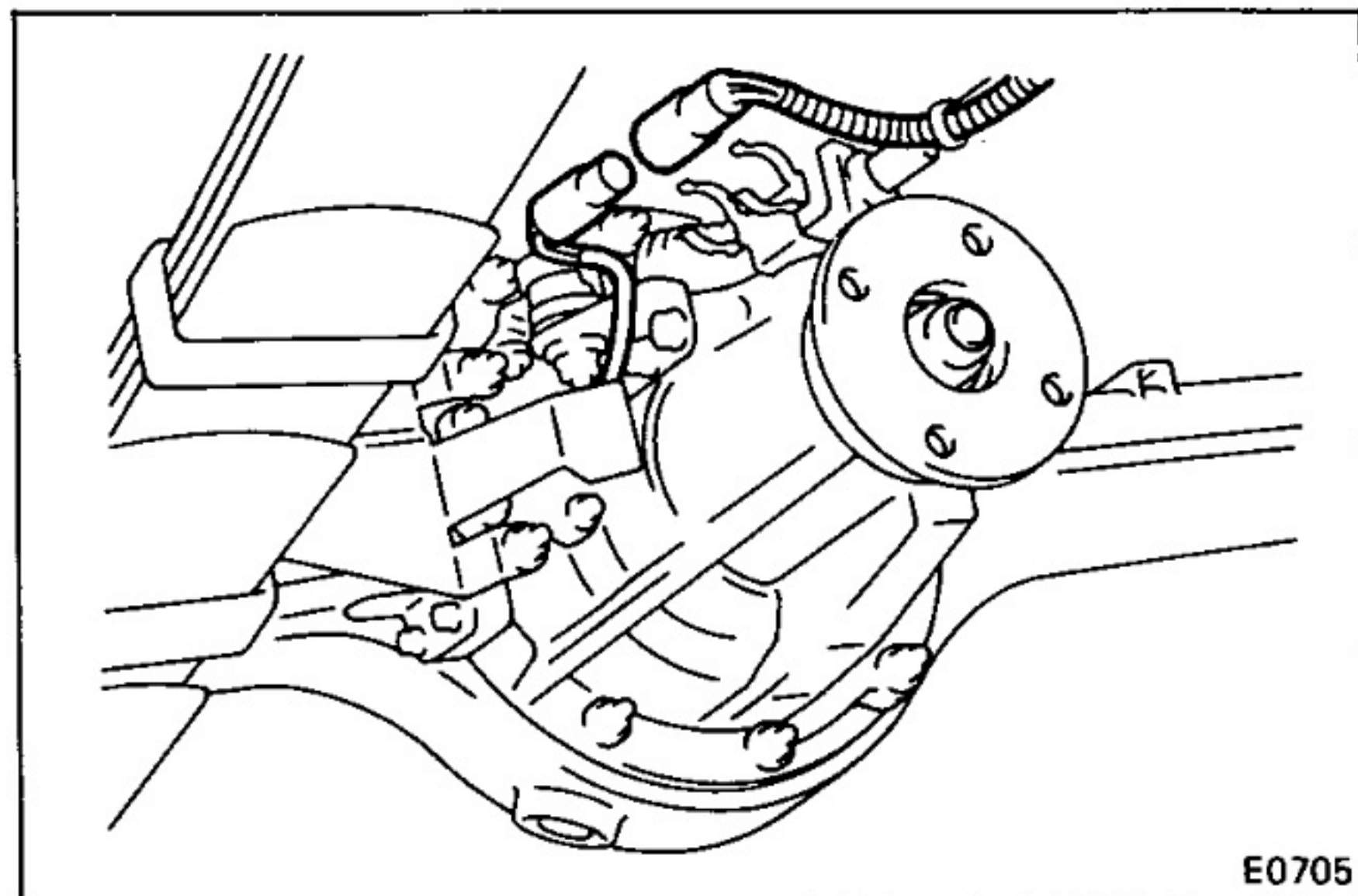
(a) Place the matchmarks on the both flanges.

(b) Remove the four bolts and nuts, disconnect the propeller shaft from the differential.

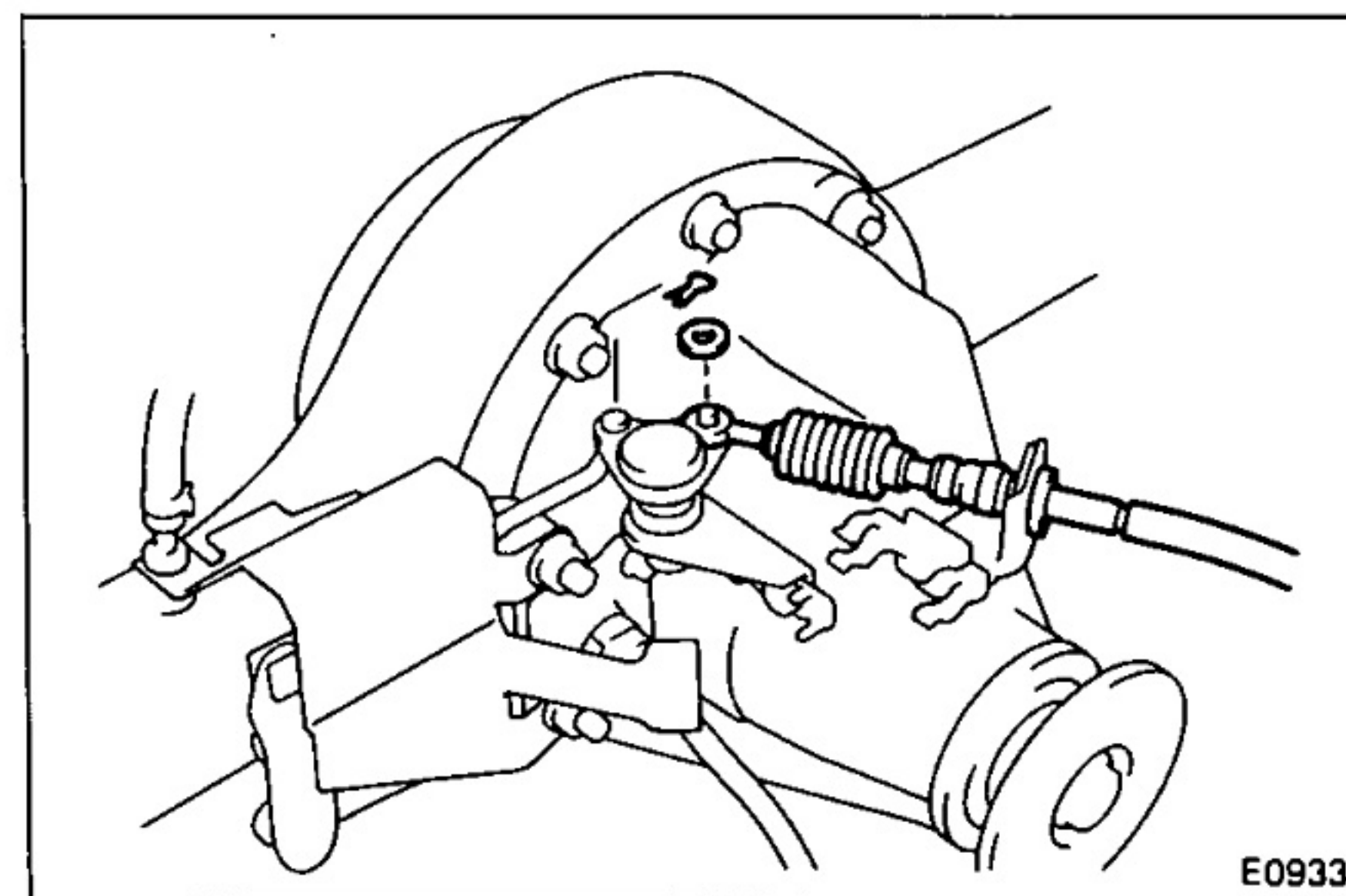




4. **DISCONNECT RIGHT SIDE SHOCK ABSORBER FROM SPRING SEAT**

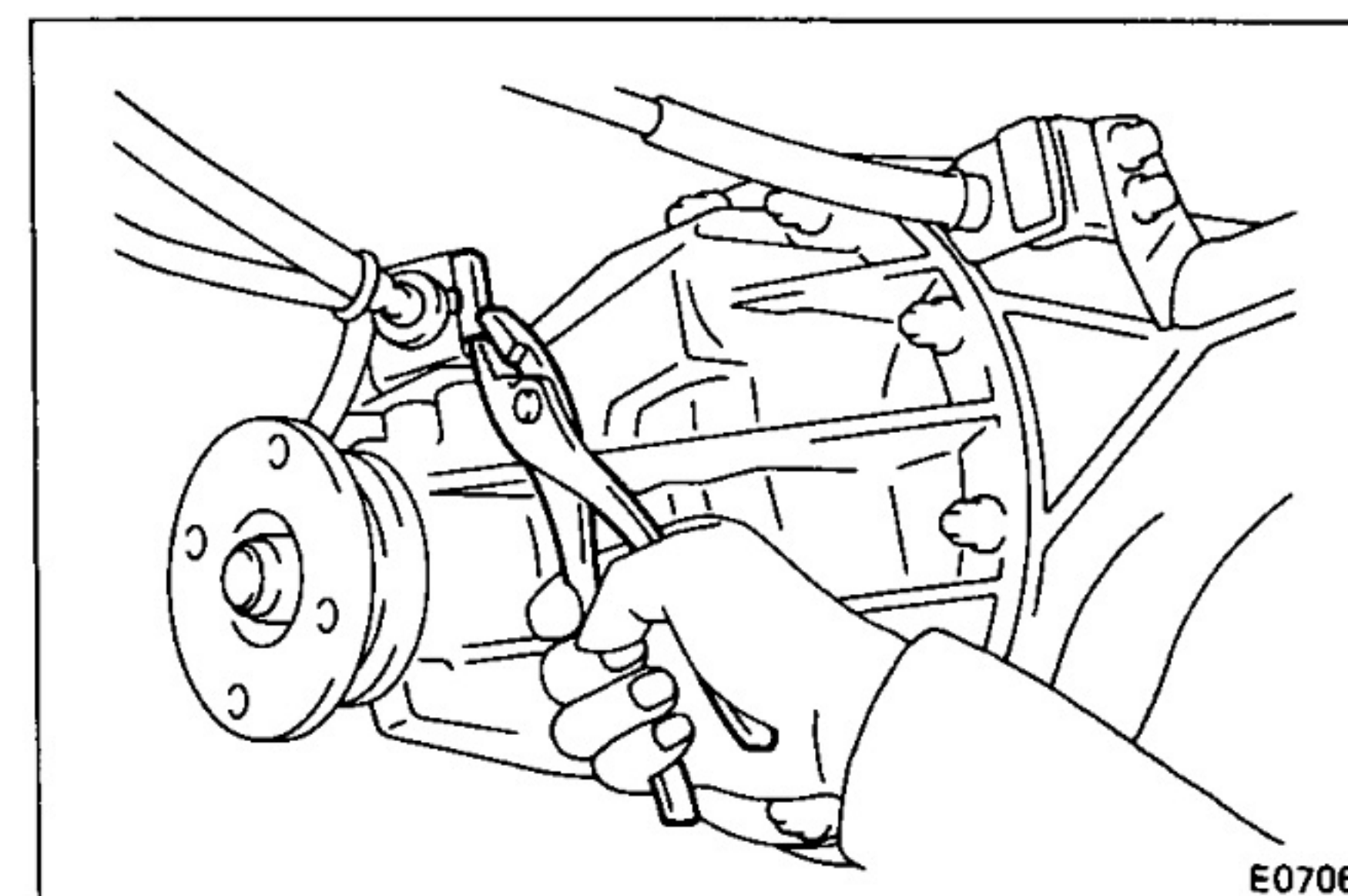


5. **DISCONNECT DIFFERENTIAL LOCK INDICATOR SWITCH CONNECTOR**

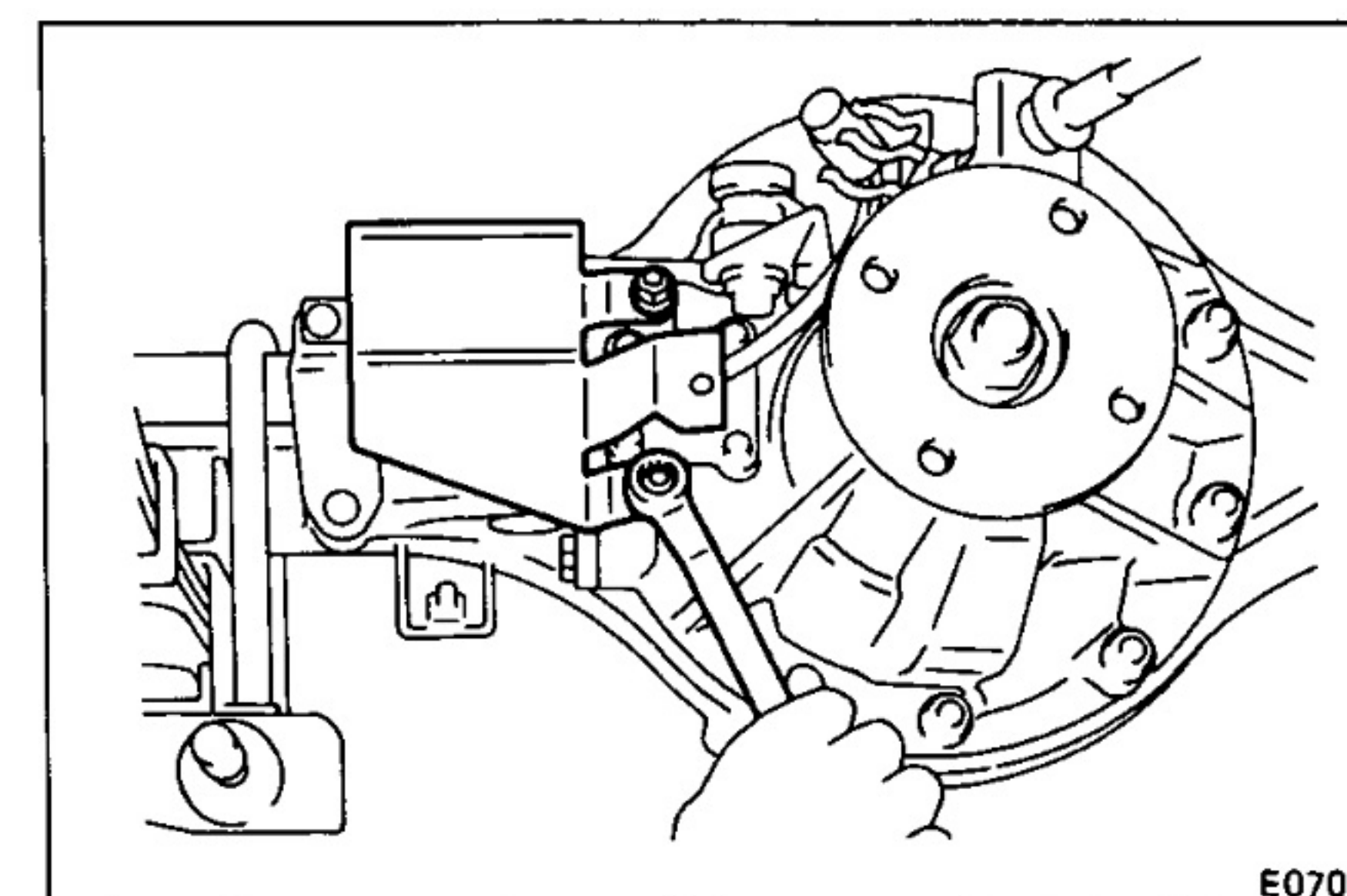


6. **DISCONNECT DIFFERENTIAL LOCK CABLE**

(a) Remove the clip and washer, disconnect the cable from the cable link.

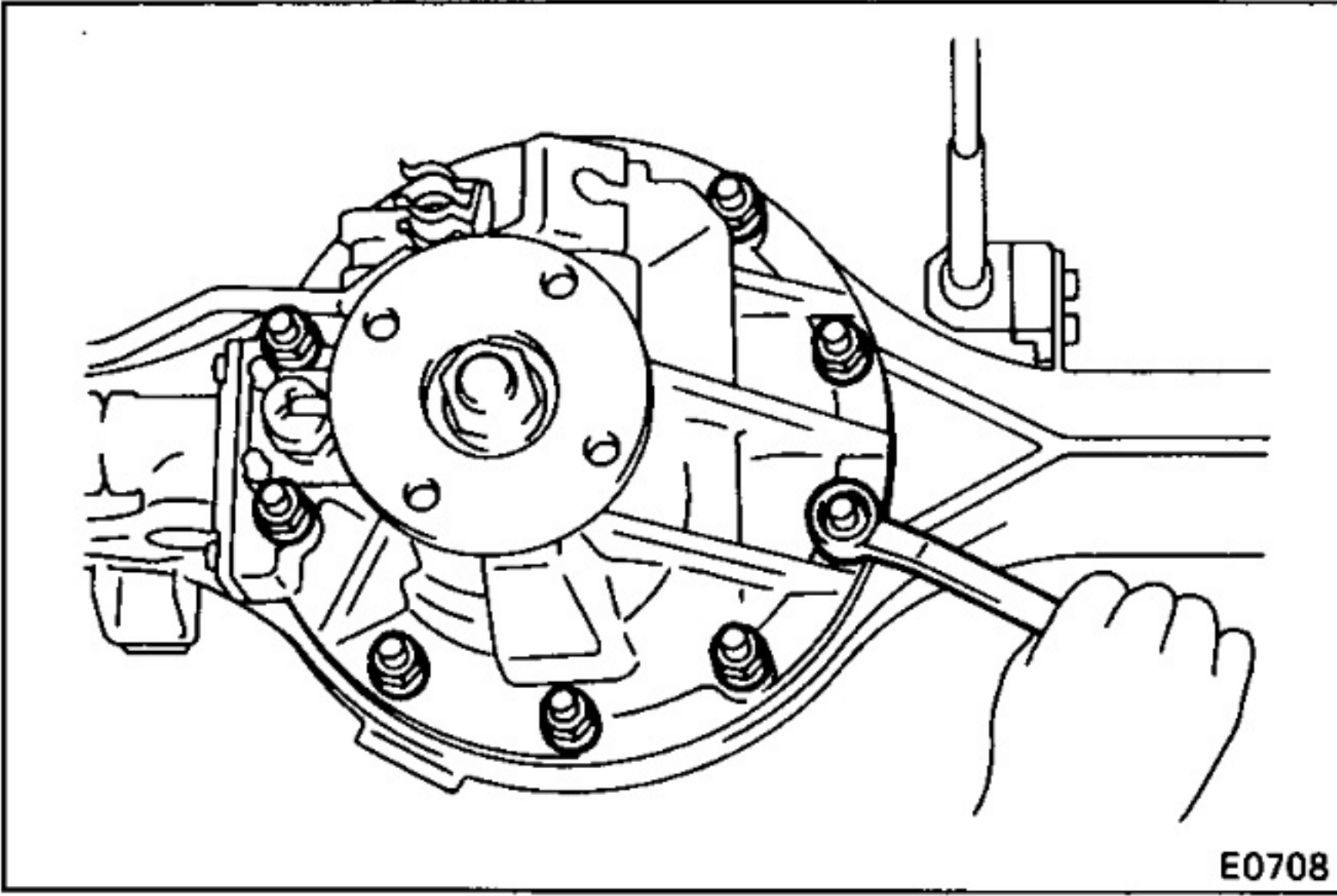


(b) Remove the clip, disconnect the cable from the cable bracket.

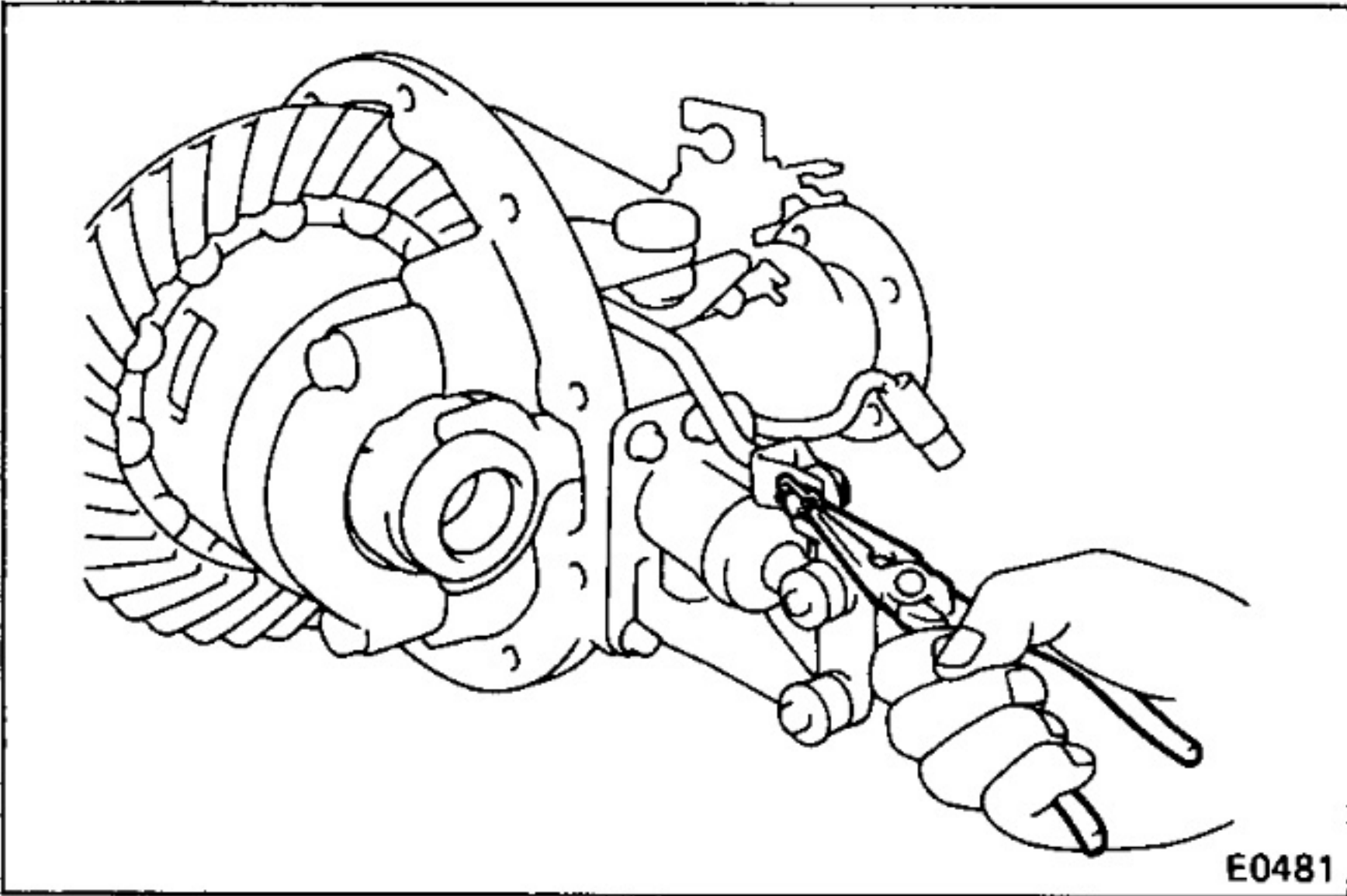


7. **DISCONNECT BLEEDER HOSE AND REMOVE BLEEDER UNION**

8. **REMOVE DIFFERENTIAL LOCK PROTECTOR**  
Remove the two nuts, remove the protector.



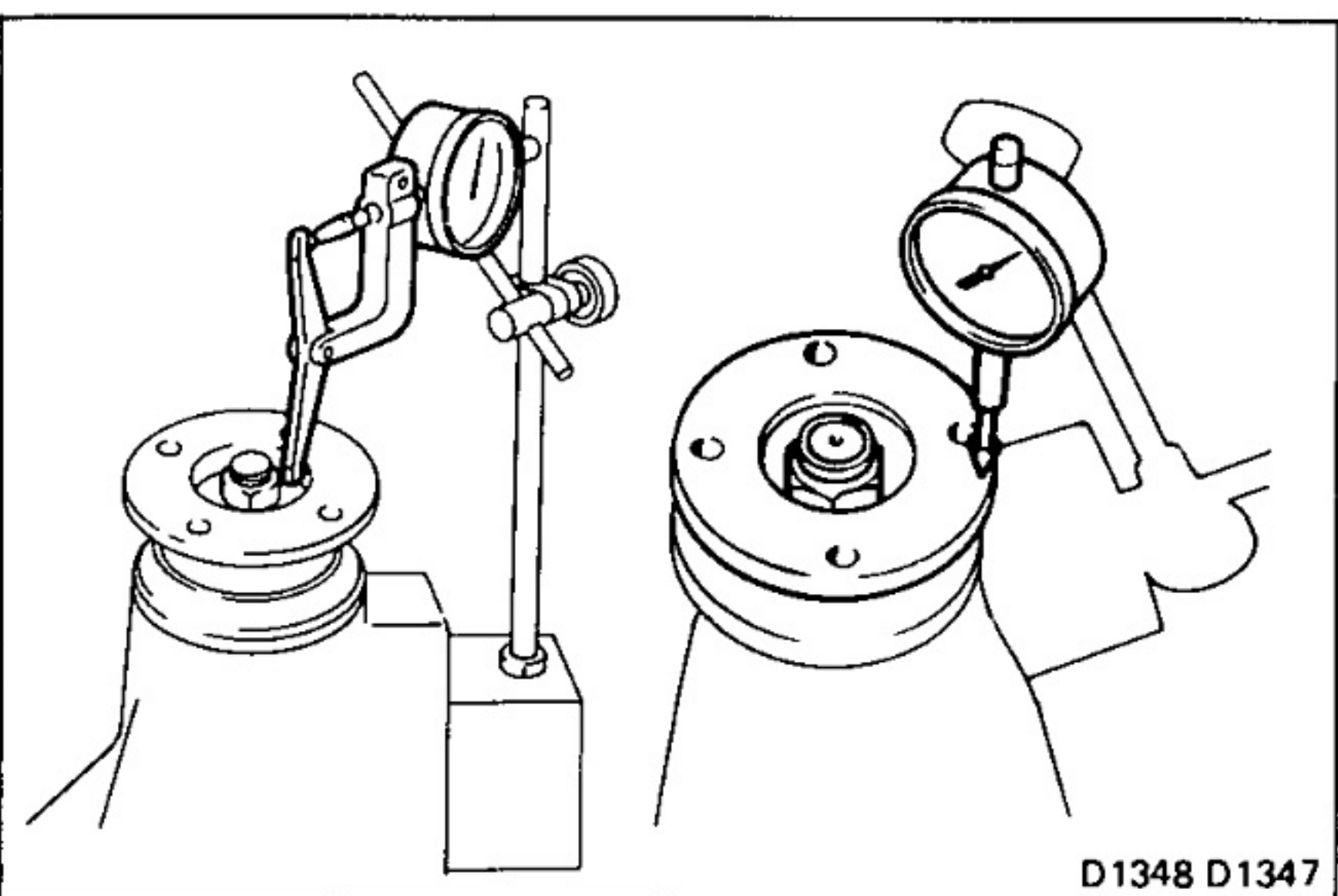
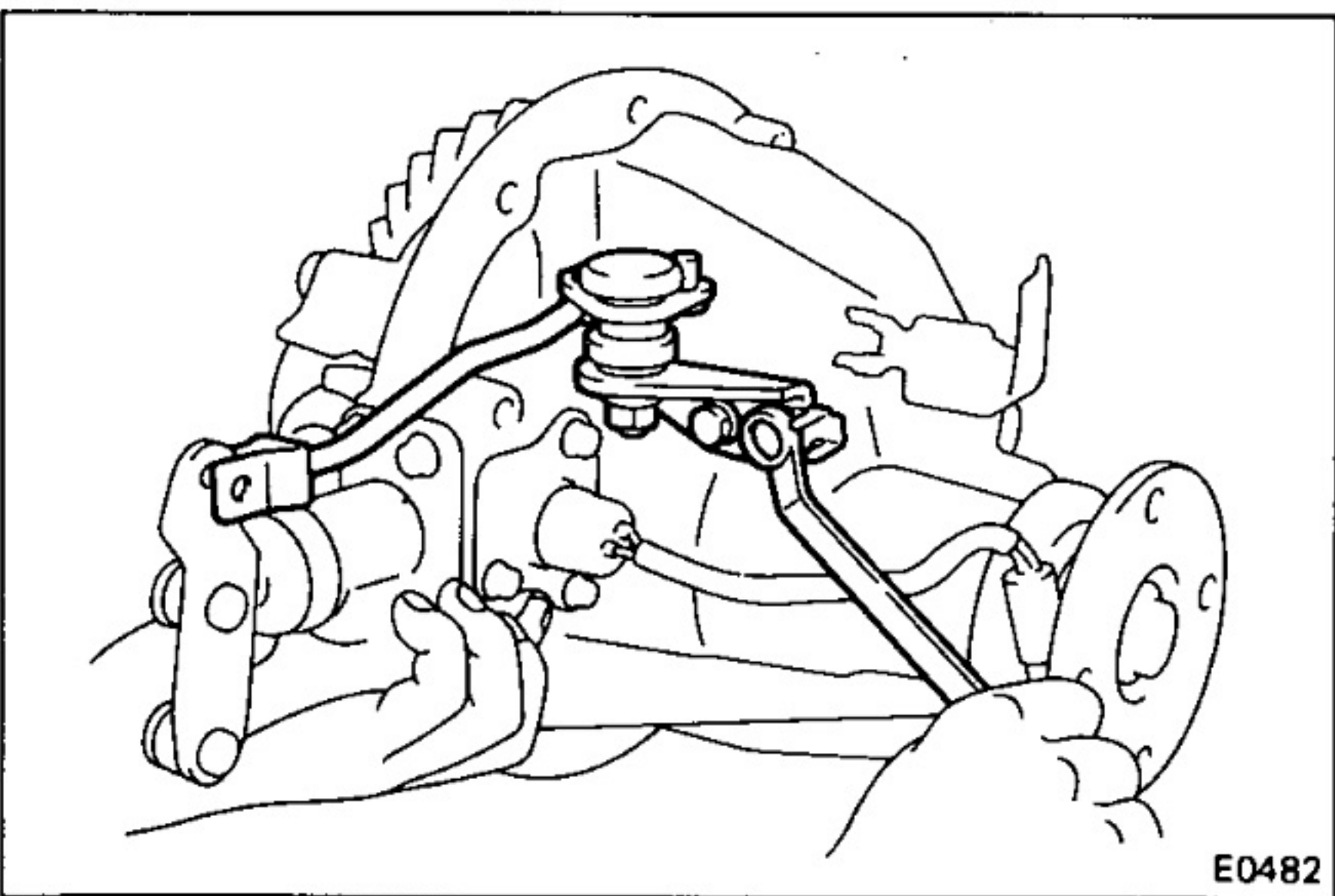
## 9. REMOVE DIFFERENTIAL



## 10. REMOVE DIFFERENTIAL LOCK CABLE LINK ASSEMBLY

(a) Remove the clip and pin.

(b) Remove the two bolts, and the cable link assembly.



## DISASSEMBLY OF DIFFERENTIAL

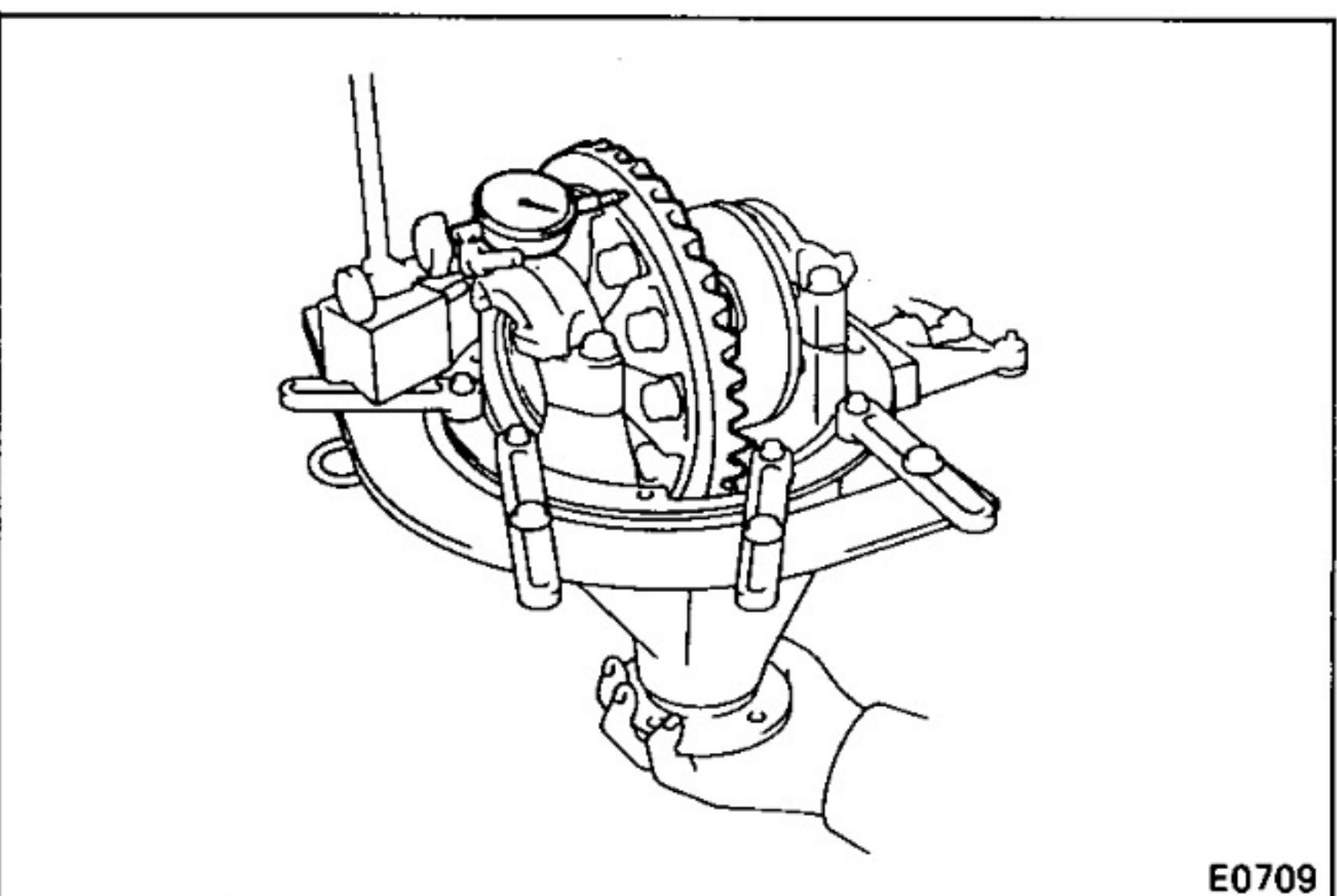
### 1. CHECK RUNOUT OF COMPANION FLANGE

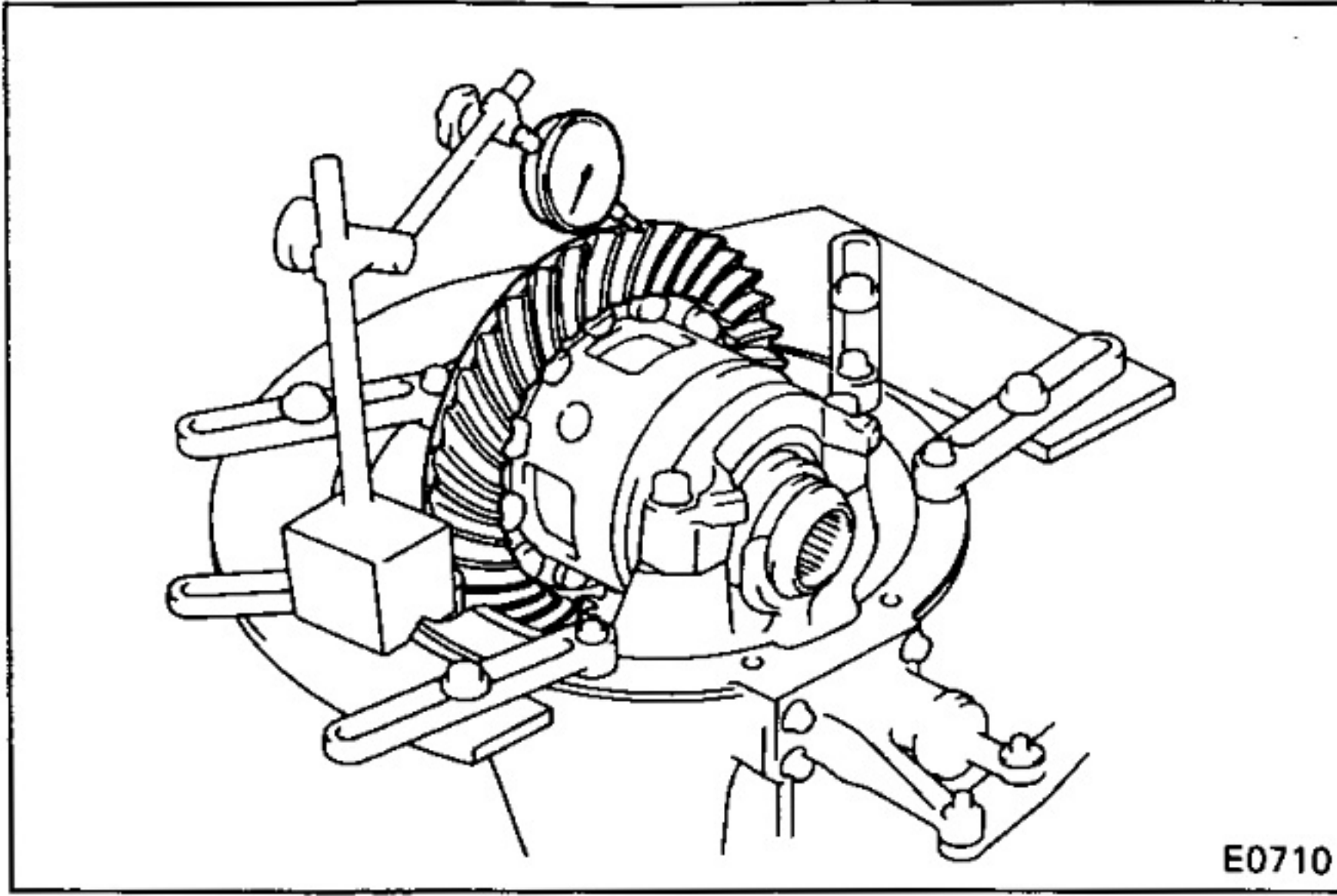
Maximum lateral runout: 0.1 mm (0.004 in.)

Maximum radial runout: 0.1 mm (0.004 in.)

### 2. CHECK RUNOUT OF RING GEAR

Maximum runout: 0.1 mm (0.004 in.)





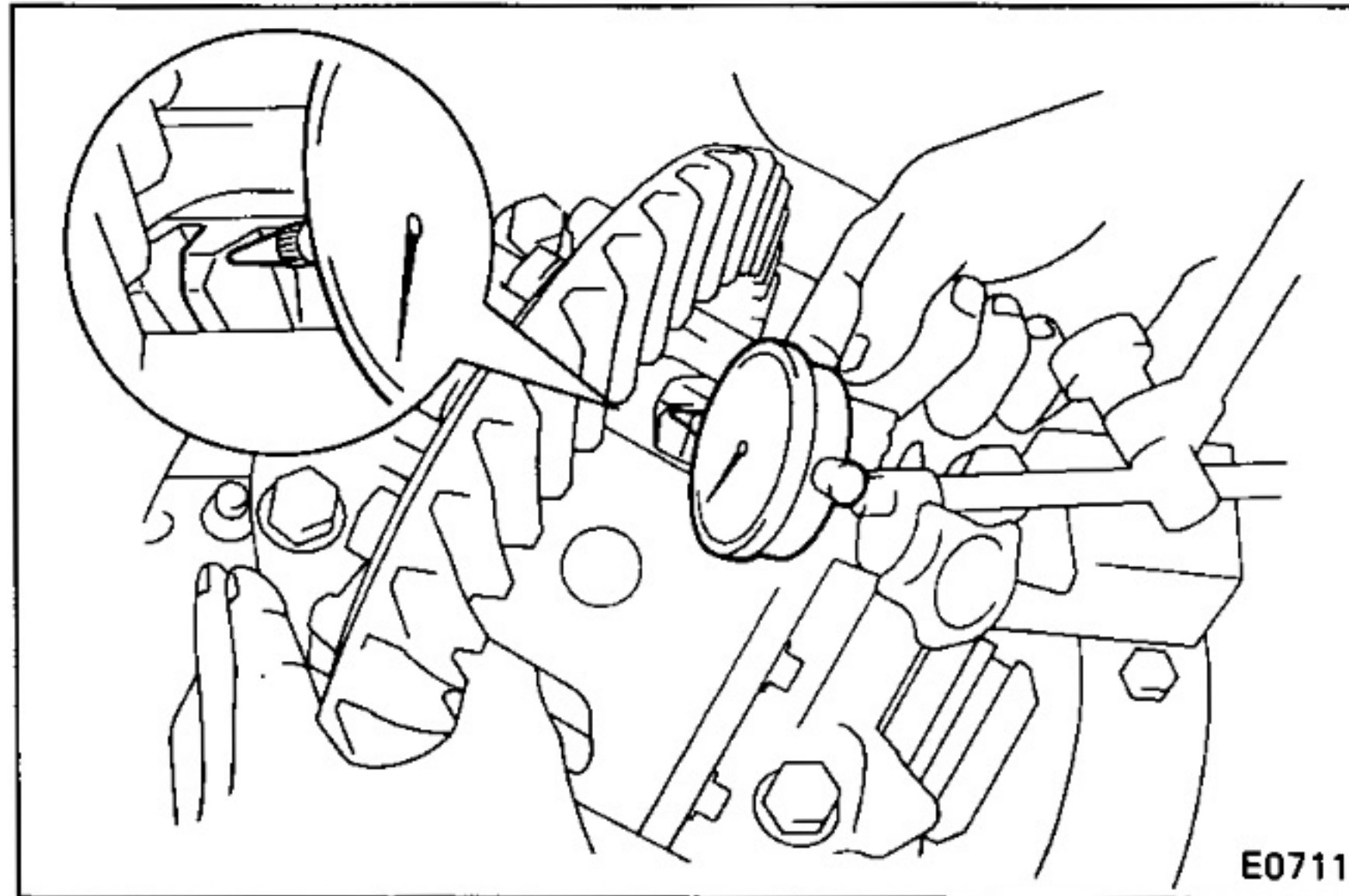
**3. CHECK BACKLASH OF RING GEAR**

Standard backlash:

0.15 – 0.20 mm (0.0059 – 0.0079 in.)

**4. INSPECT TOOTH CONTACT BETWEEN RING GEAR AND DRIVE PINION**

(See page RA-40)

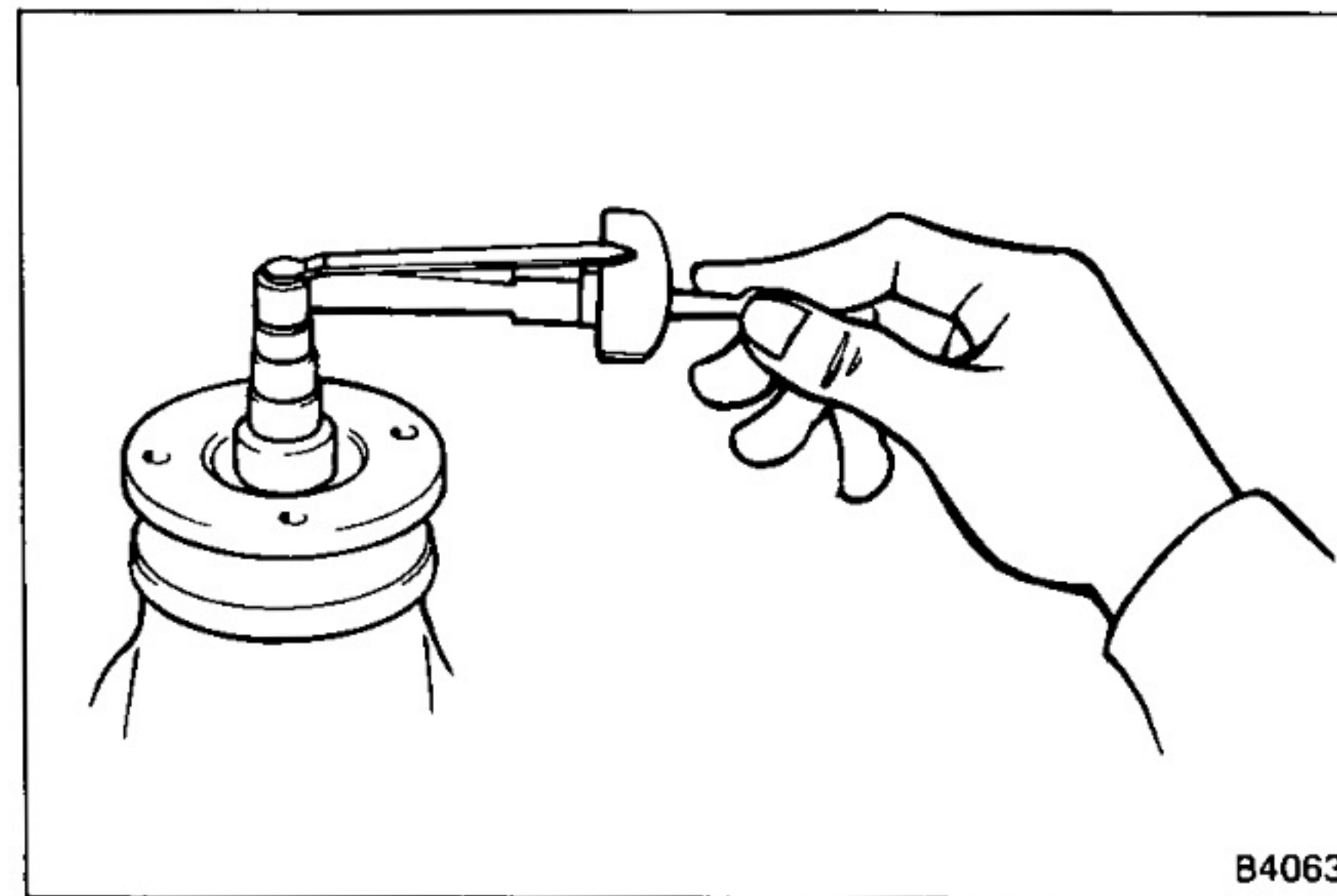


**5. CHECK BACKLASH OF SIDE GEAR**

Hold the pinion gear and measure the backlash.

Standard backlash:

0.02 – 0.20 mm (0.0008 – 0.0079 in.)



**6. MEASURE DRIVE PINION PRELOAD**

Using a torque wrench, measure the preload in the backlash between the drive pinion and ring gear.

Preload (starting): 7 – 10 kg-cm

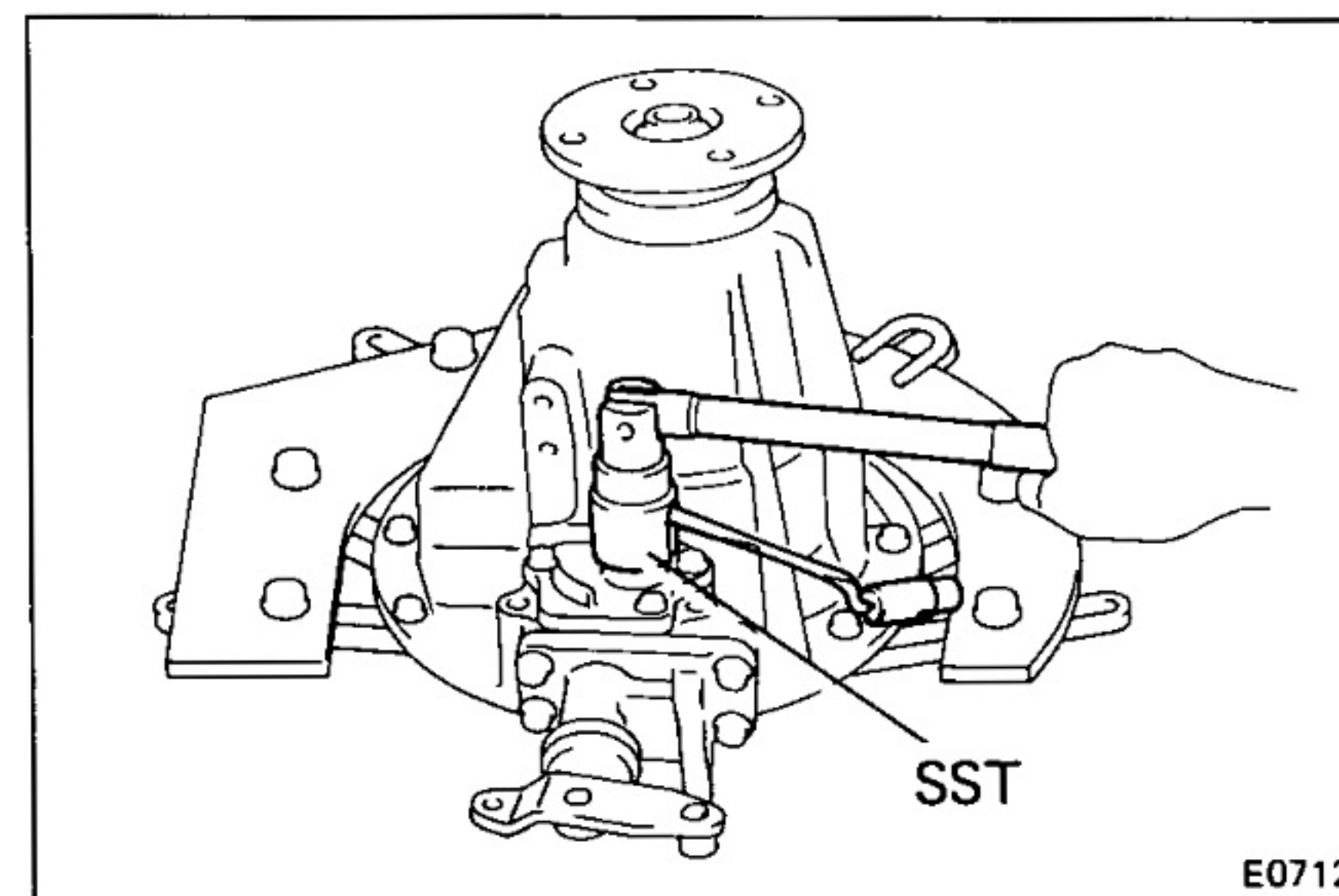
(6.1 – 8.7 in.-lb, 0.7 – 1.0 N·m)

**7. CHECK TOTAL PRELOAD**

Using a torque wrench, measure the total preload.

Total preload: In addition to drive pinion preload

3 – 7 kg-cm (2.6 – 6.1 in.-lb, 0.3 – 0.7 N·m)

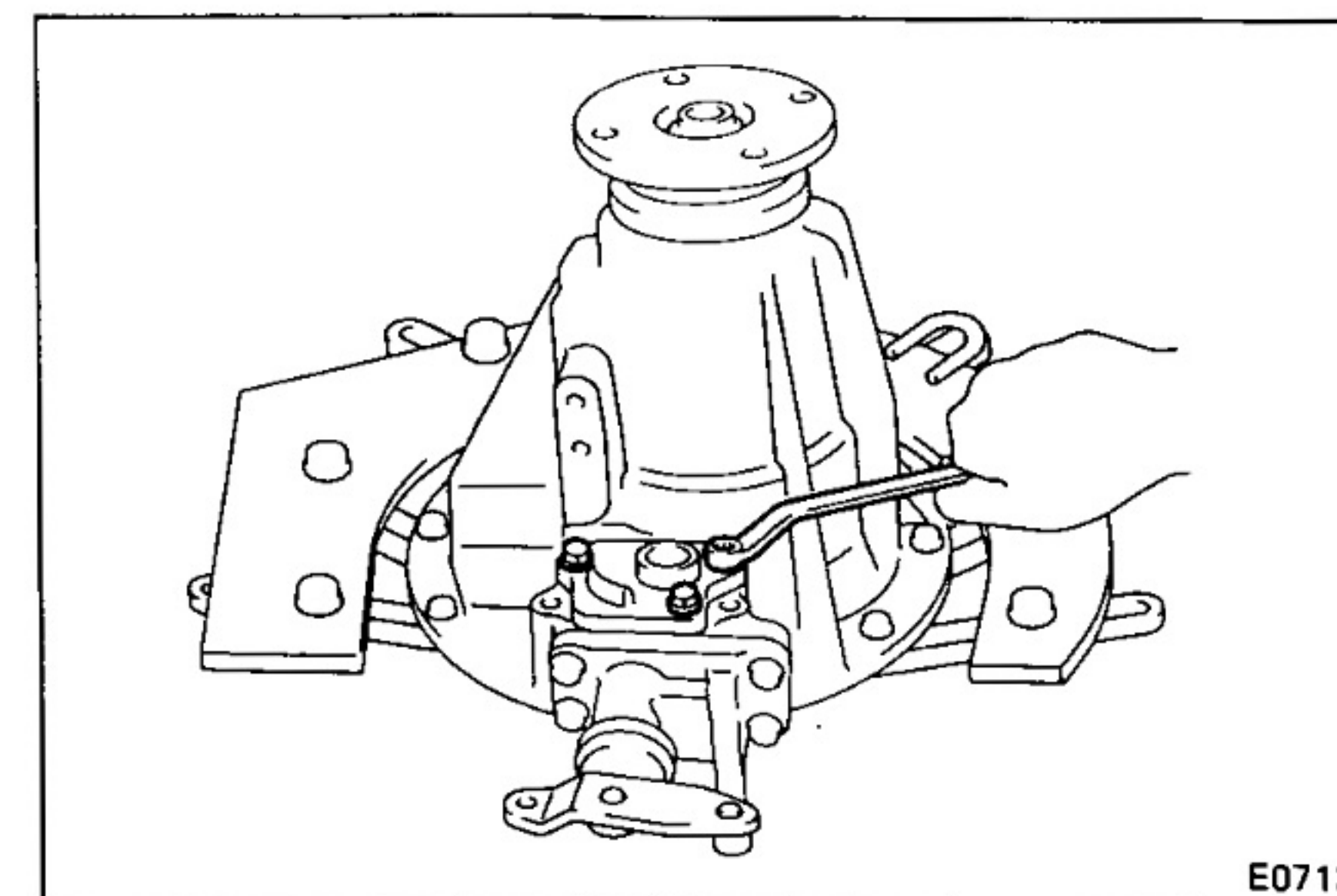


**DISASSEMBLY OF DIFFERENTIAL**

**1. REMOVE DIFFERENTIAL LOCK INDICATOR SWITCH**

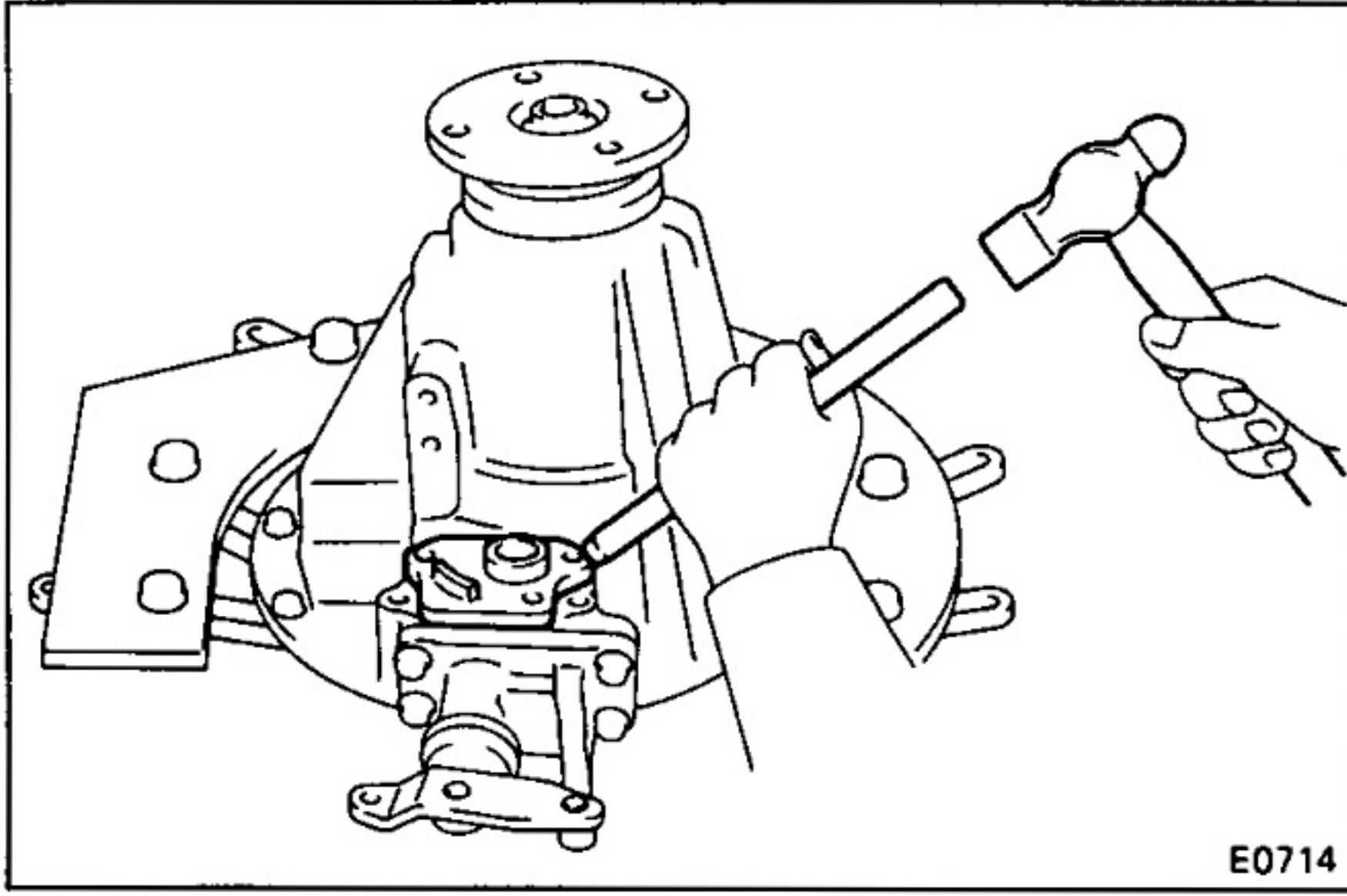
Using SST, remove the switch.

SST 09817-16011

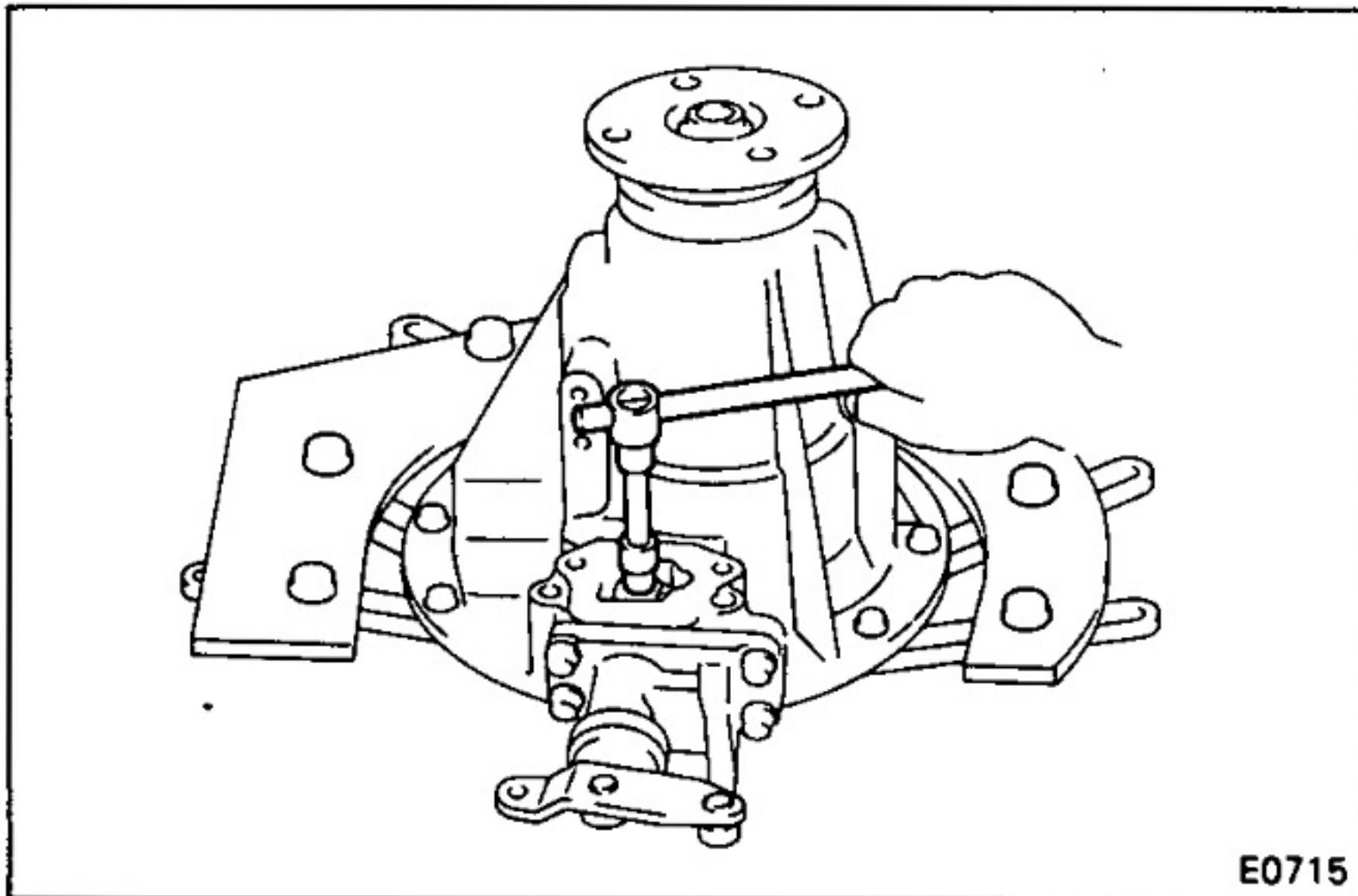


**2. REMOVE DIFFERENTIAL LOCK COVER**

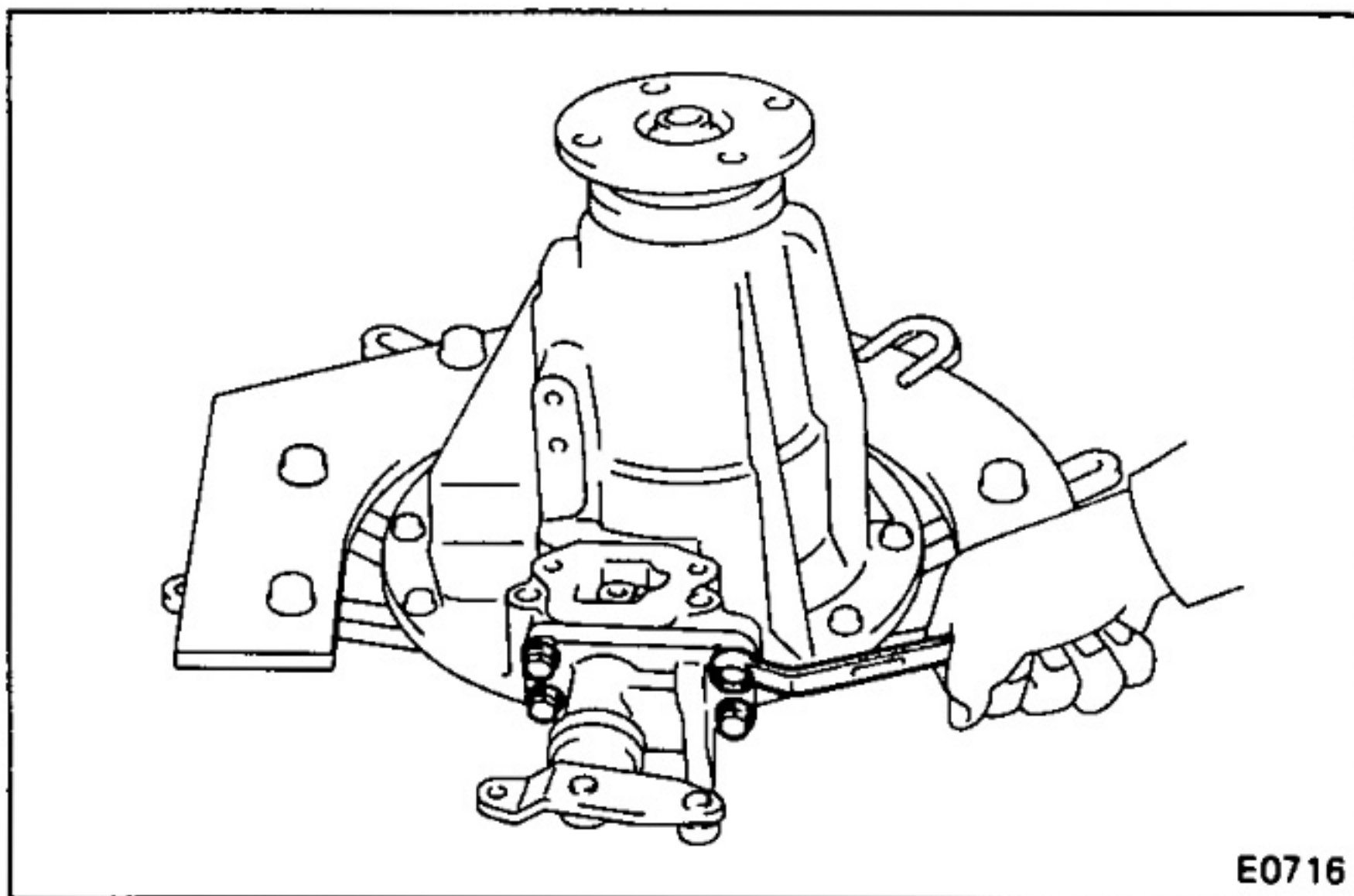
(a) Remove the three bolts.



(b) Using a brass bar and hammer, remove the cover.

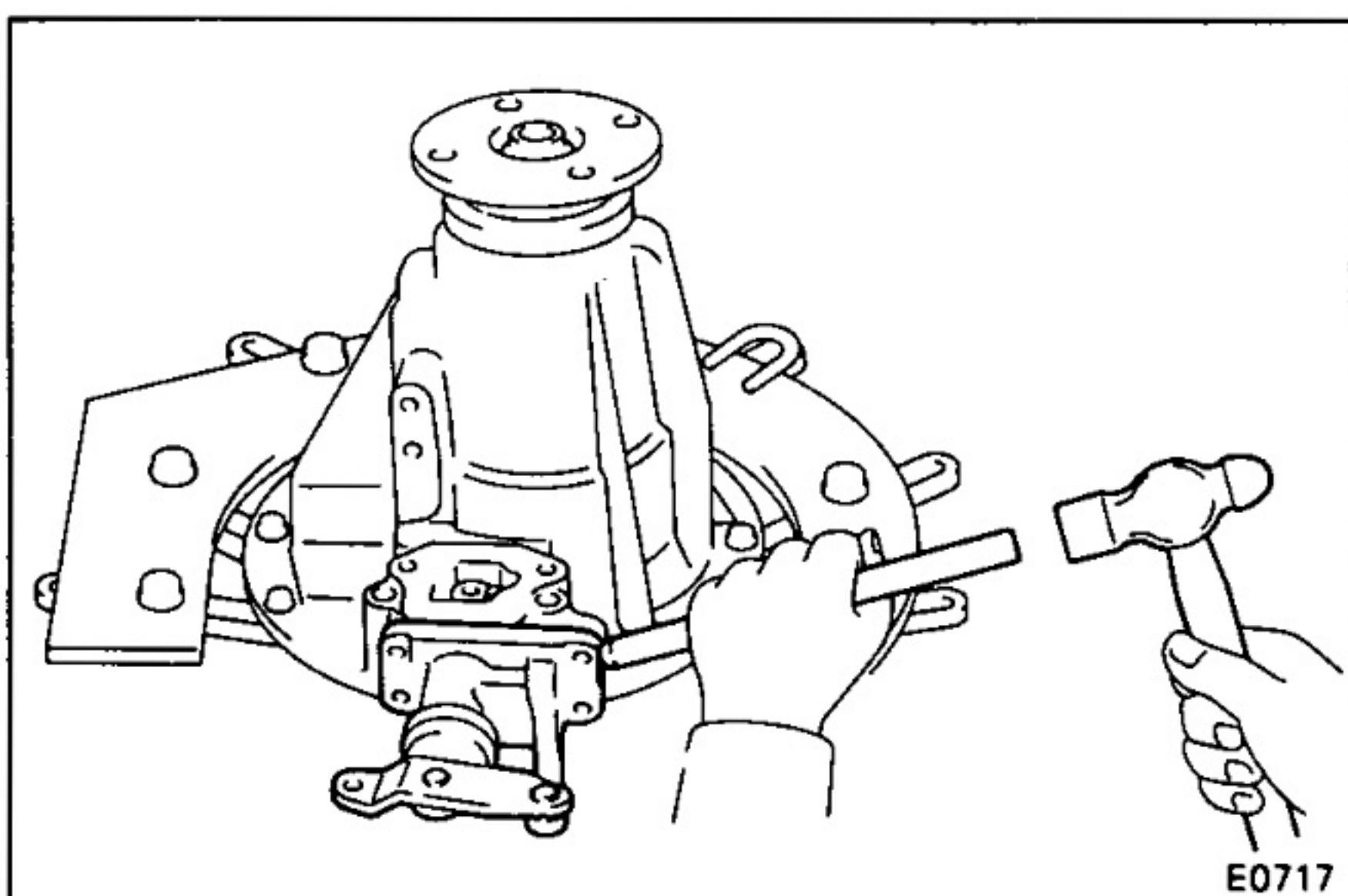


### 3. REMOVE SHIFT FORK SHAFT SET BOLT



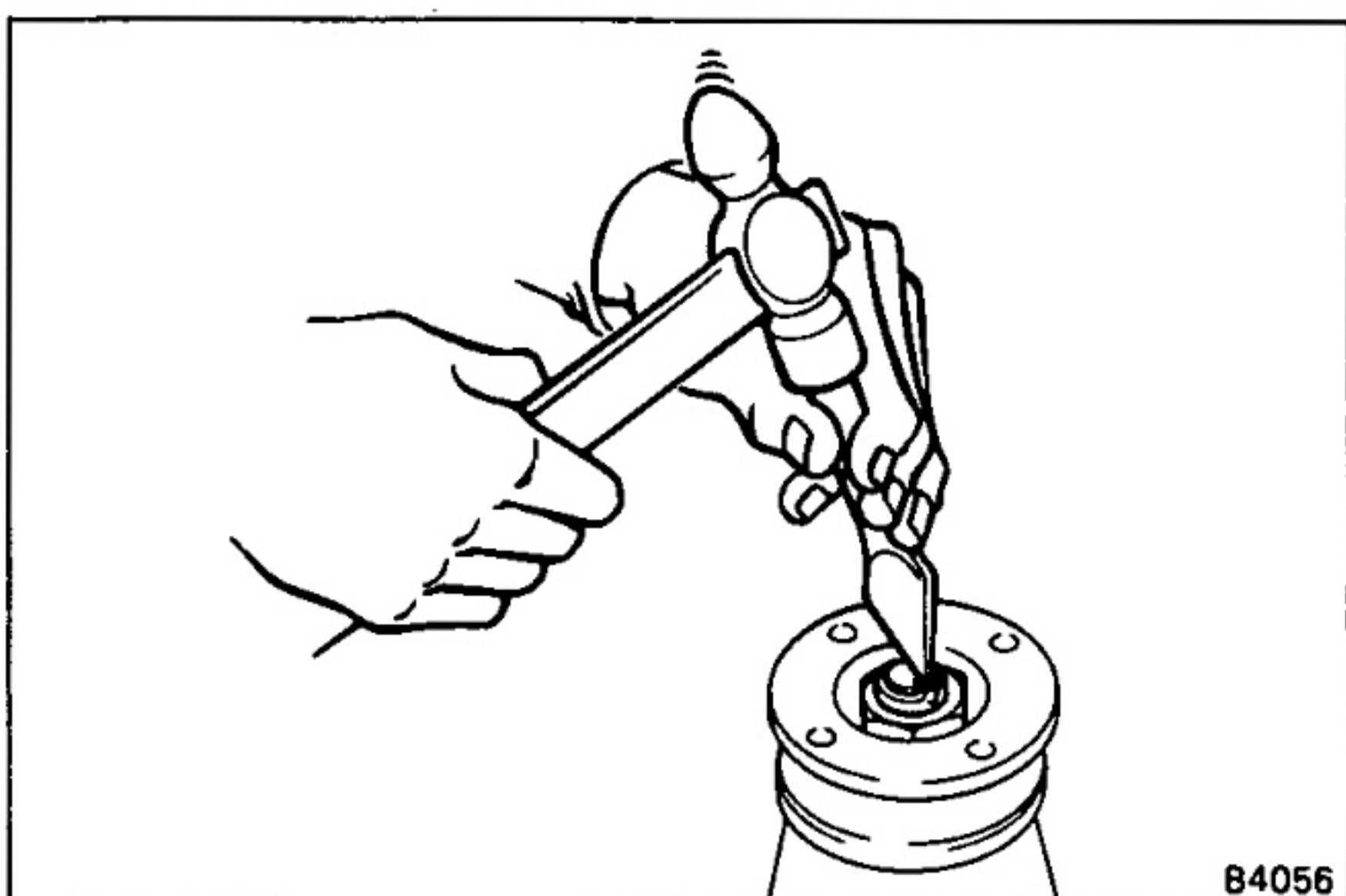
### 4. REMOVE DIFFERENTIAL LOCK CYLINDER ASSEMBLY

(a) Remove the four bolts.



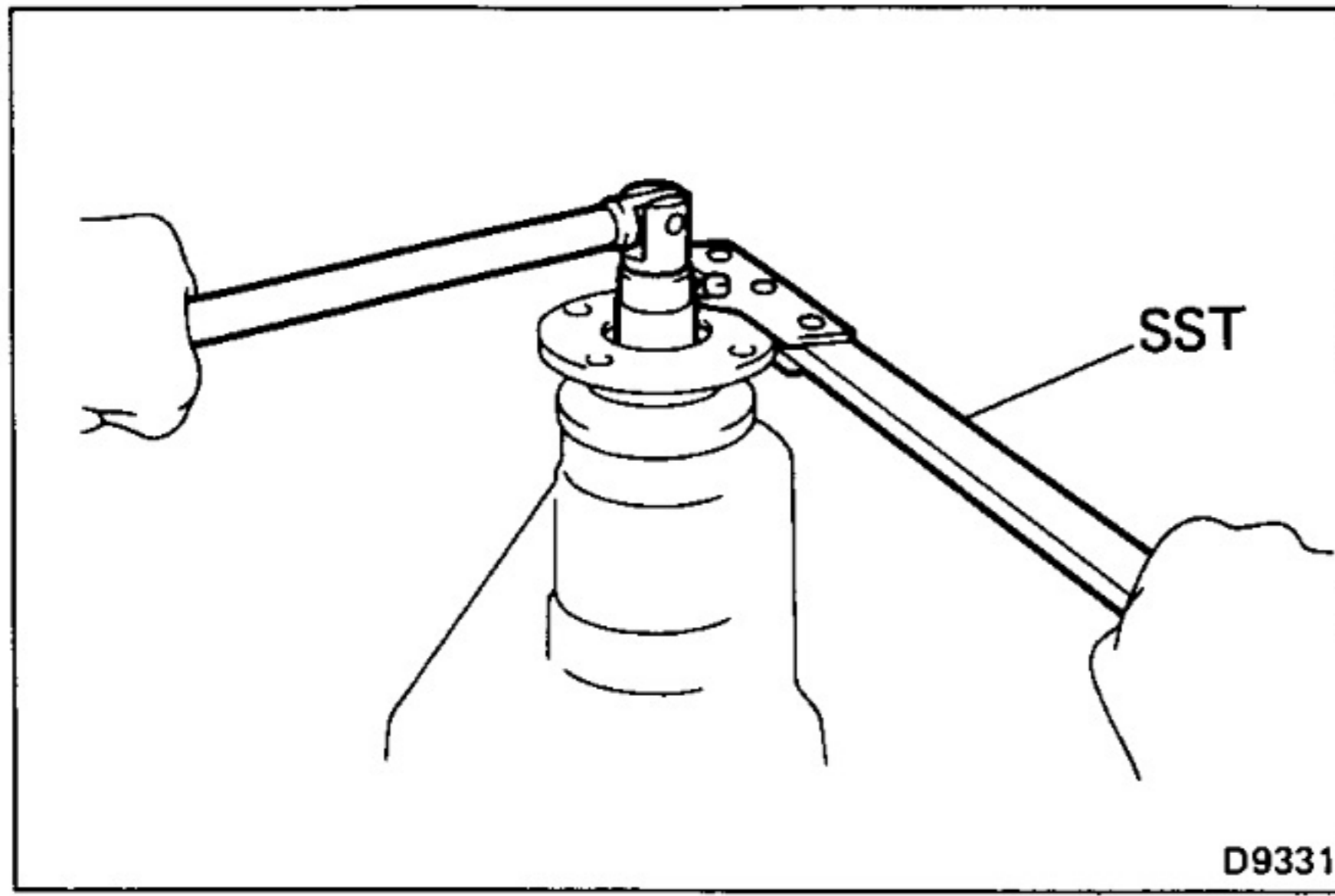
(b) Using a brass bar and hammer, remove the cylinder.

### 5. REMOVE DIFFERENTIAL LOCK SLEEVE AND SHIFT FORK SHAFT

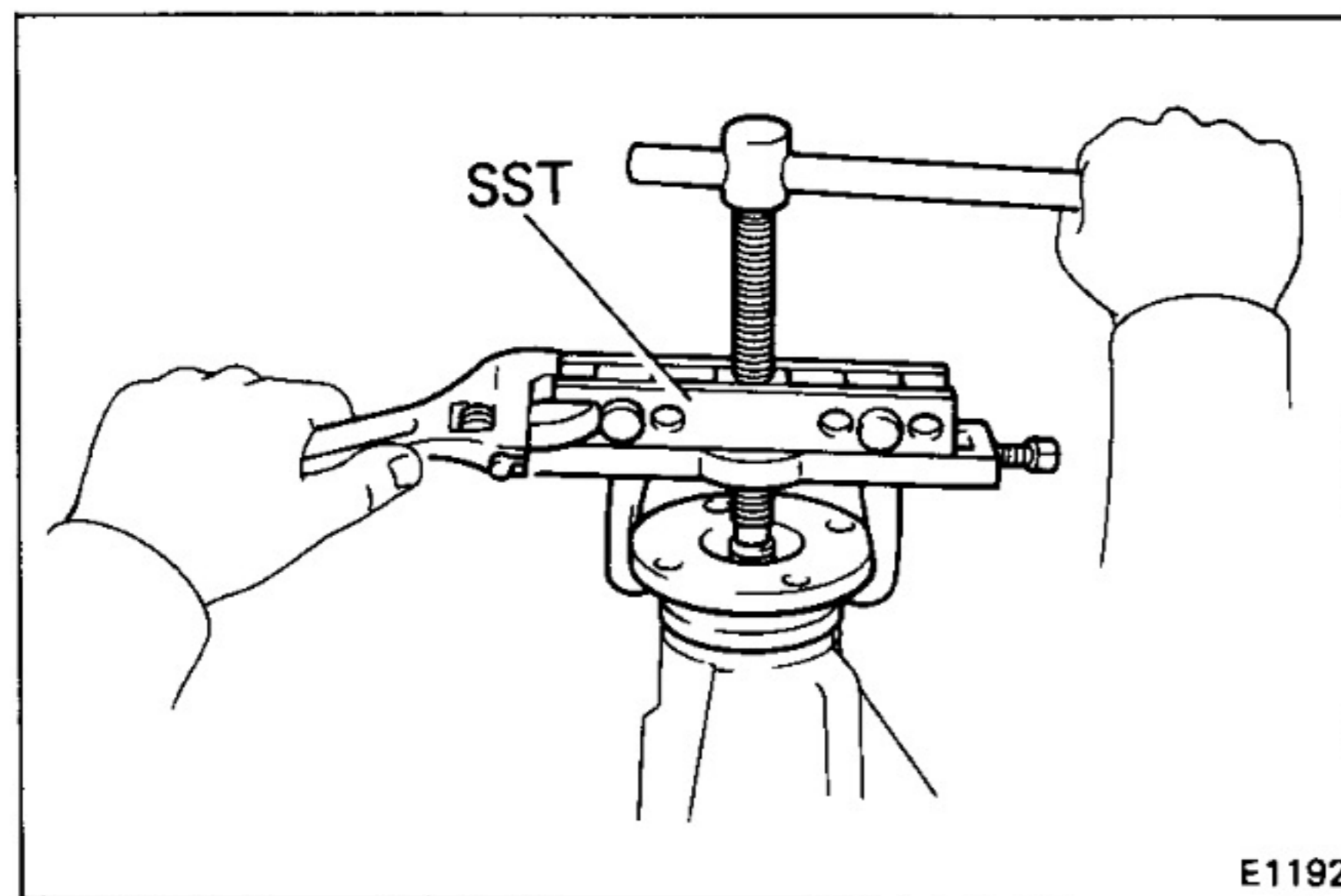


### 6. REMOVE COMPANION FLANGE

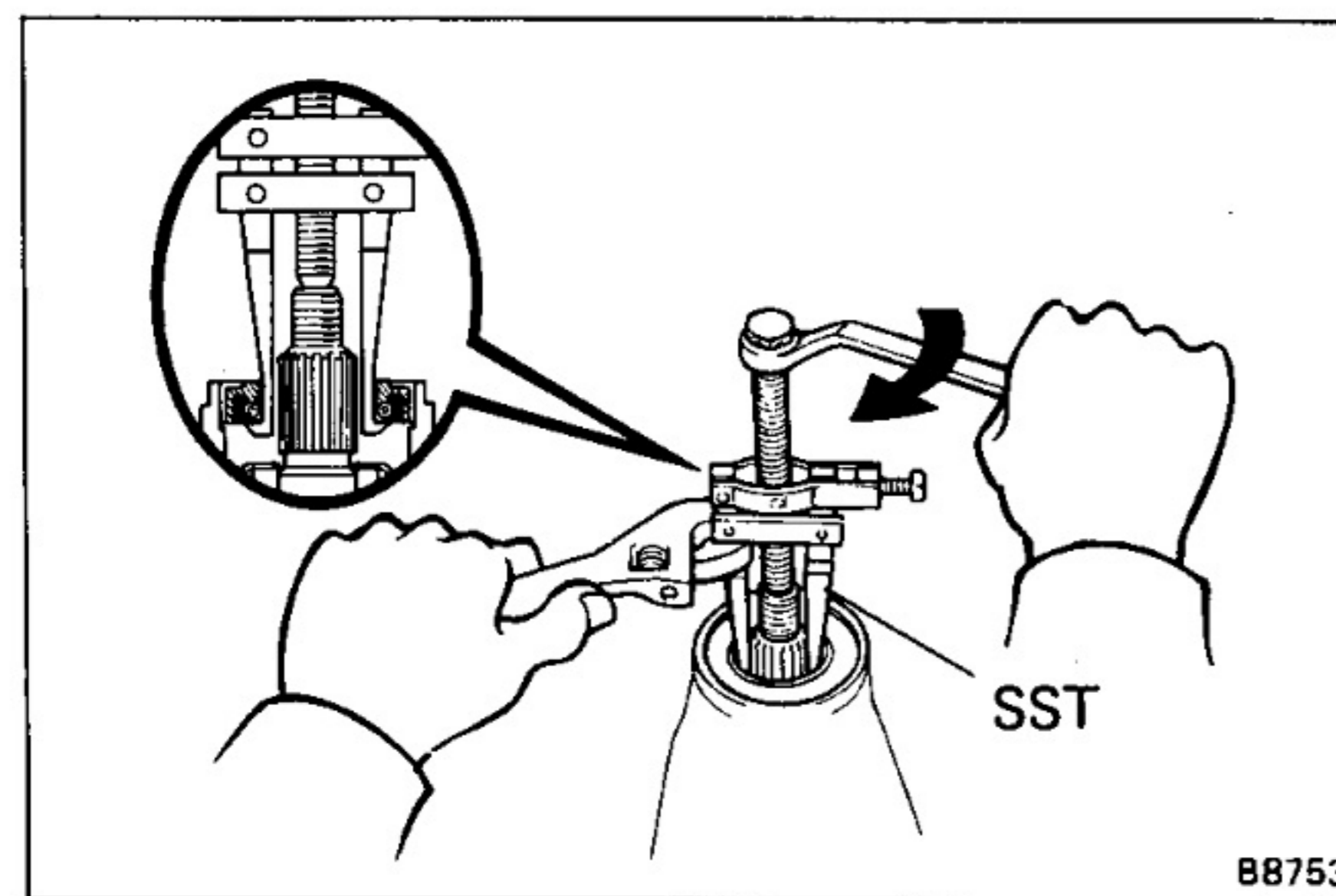
(a) Using a hammer and chisel, loosen the staked part of the nut.



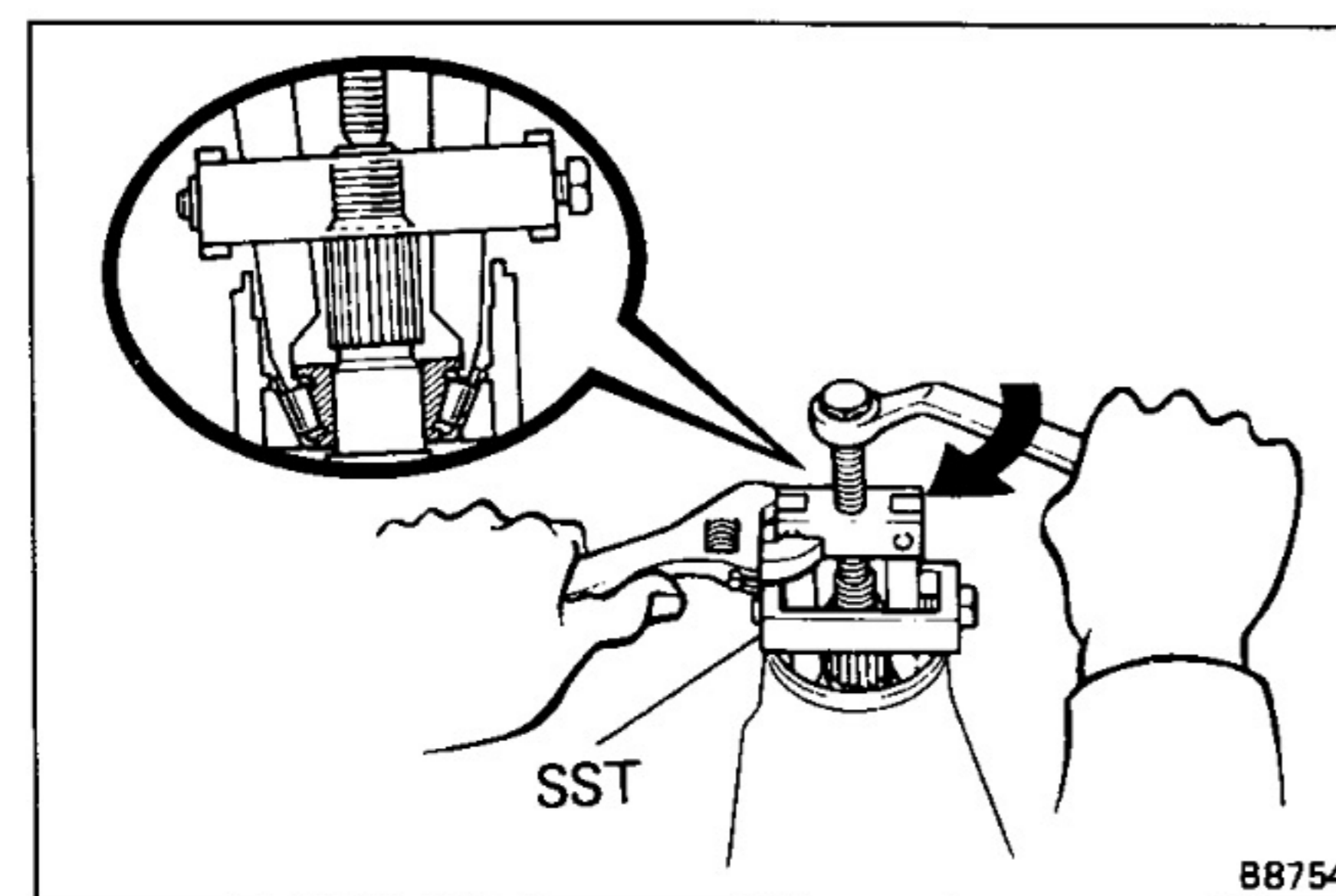
(b) Using SST to hold the flange, remove the nut.  
SST 09330-00021



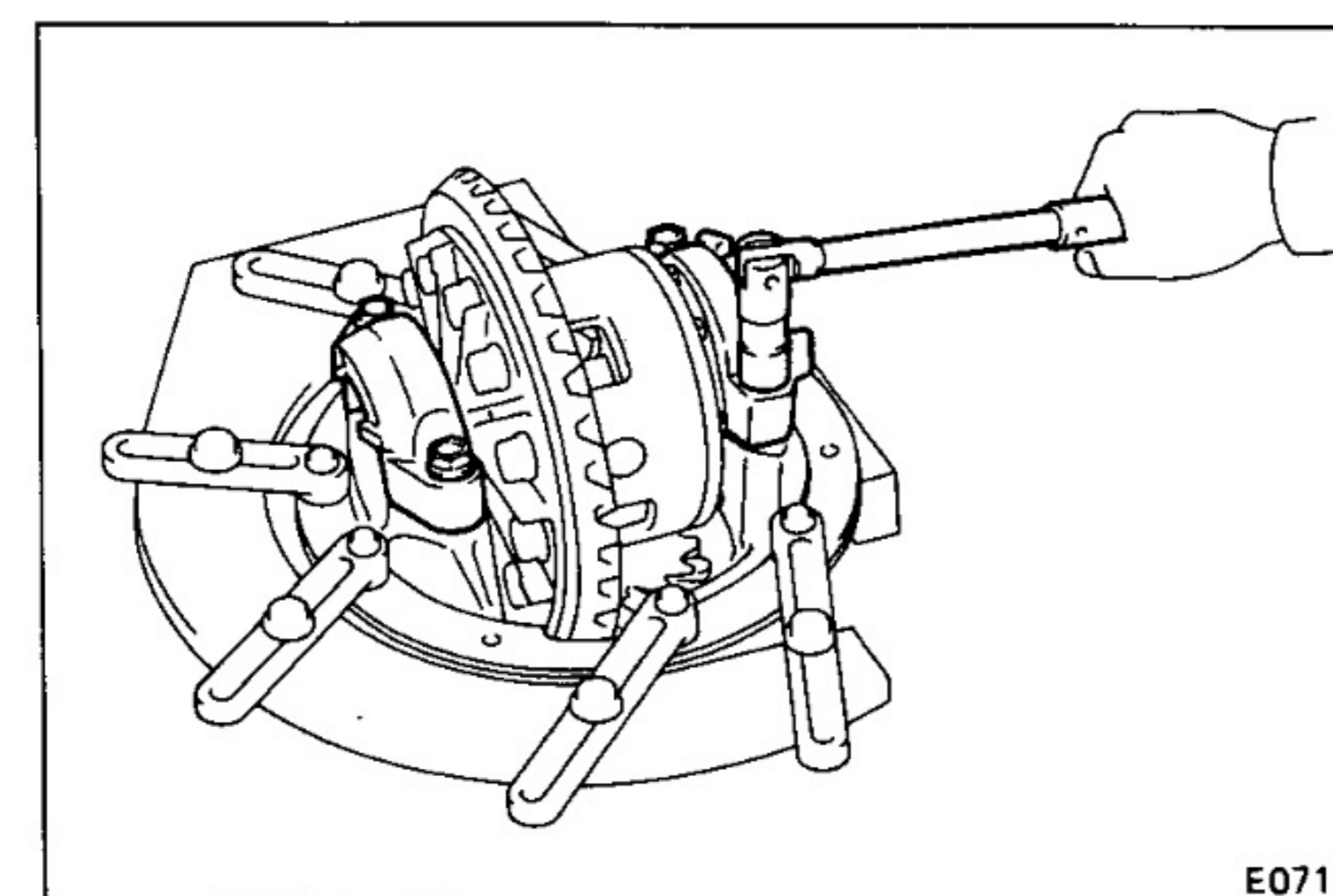
(c) Using SST, remove the flange.  
SST 09950-20017



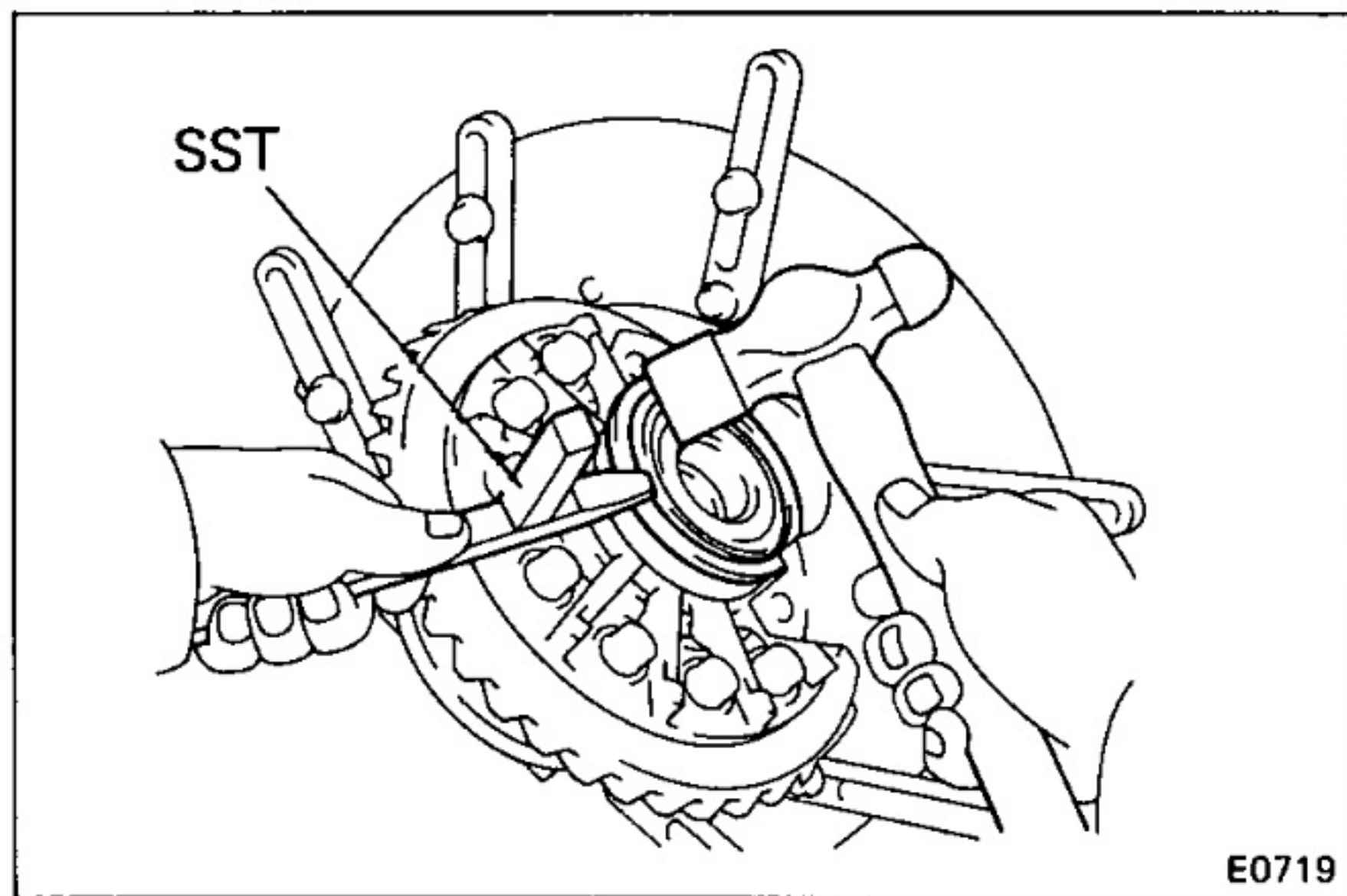
**7. REMOVE OIL SEAL AND OIL SLINGER**  
Using SST, remove the oil seal and oil slinger.  
SST 09308-10010



**8. REMOVE FRONT BEARING**  
Using SST, remove the bearing.  
SST 09556-22010



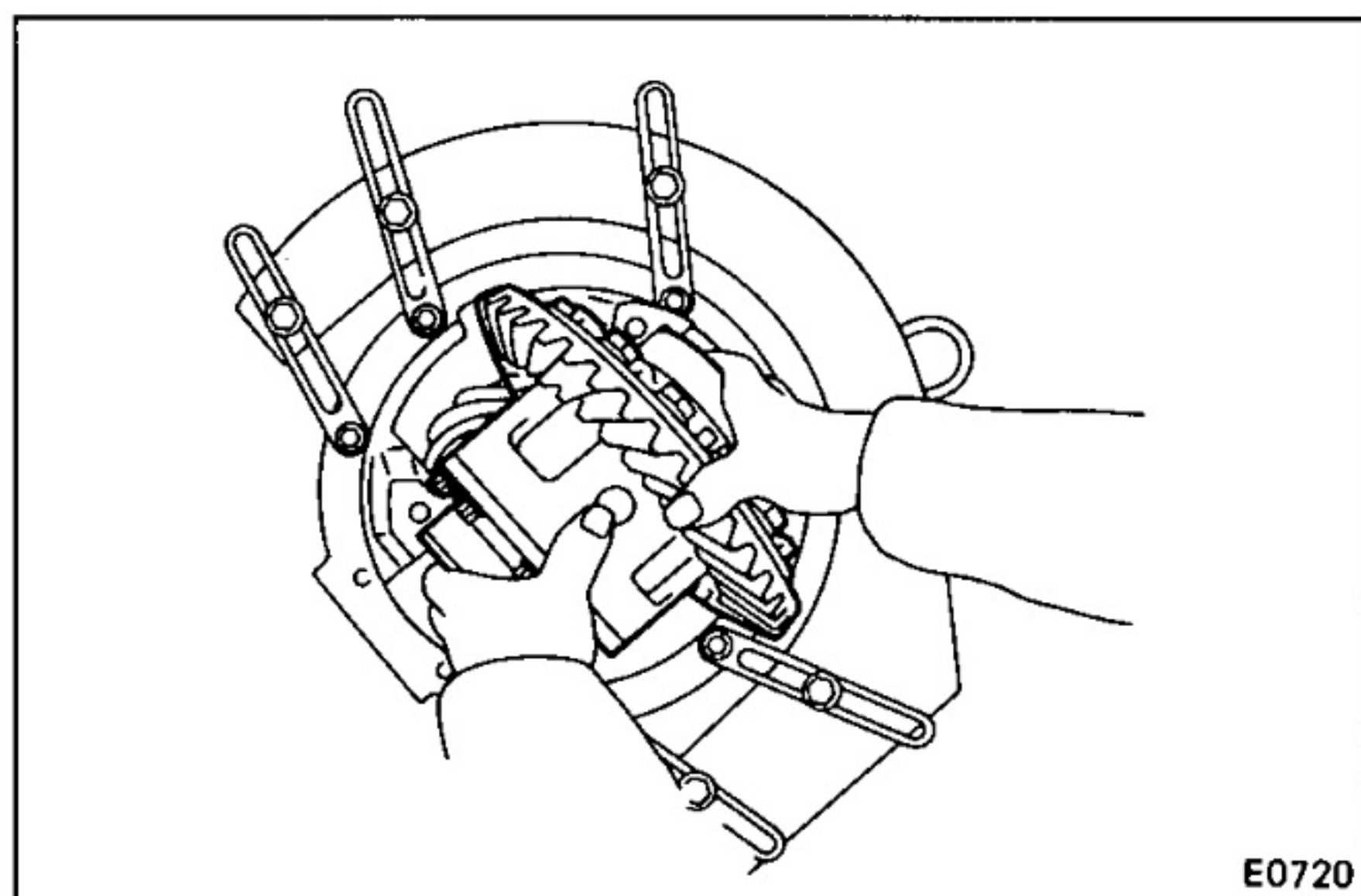
**9. REMOVE DIFFERENTIAL CASE**  
(a) Remove the four bolts and remove the two bearing caps.



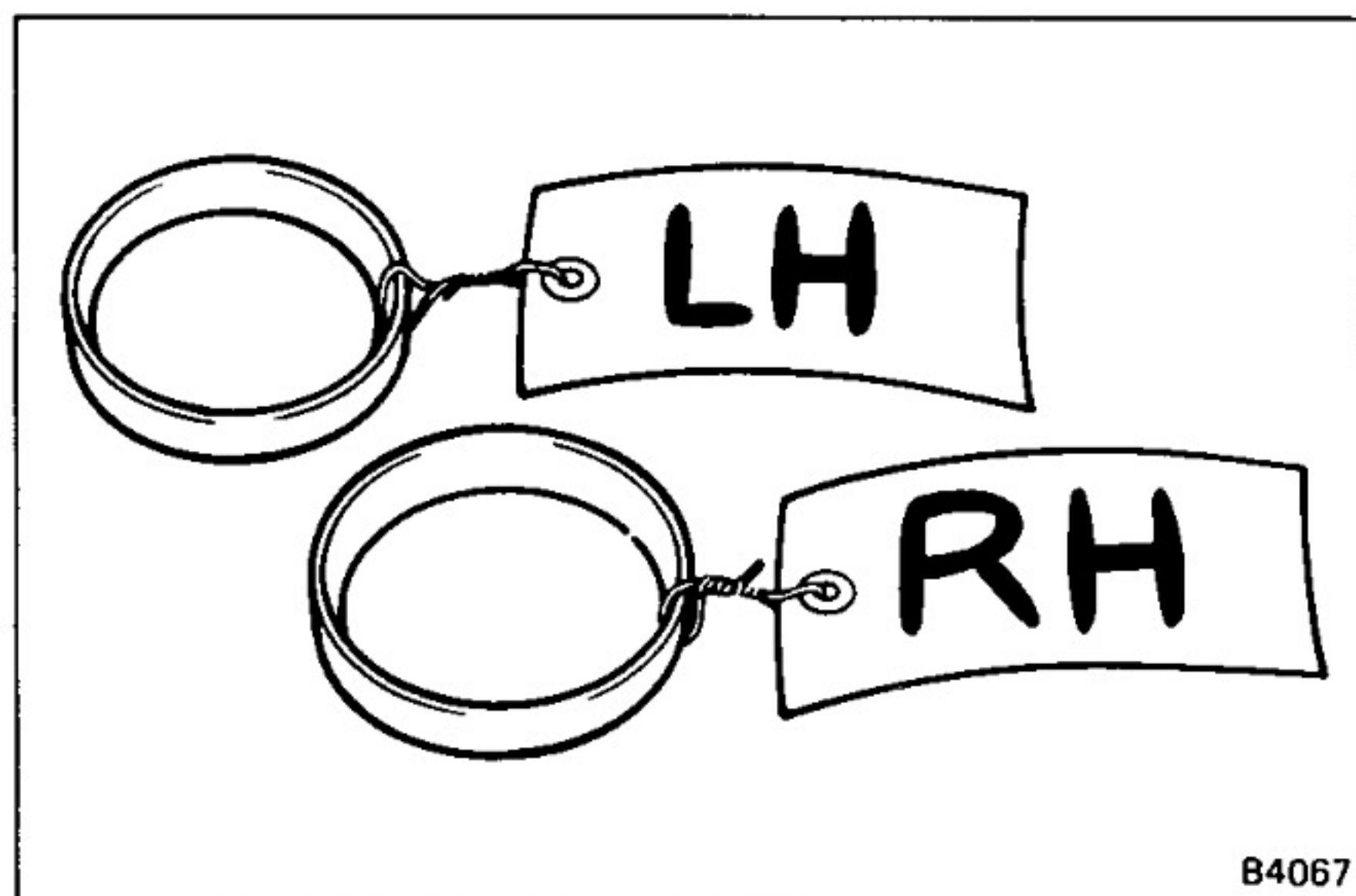
(b) Using SST, remove the plate washer.

SST 09504-22010

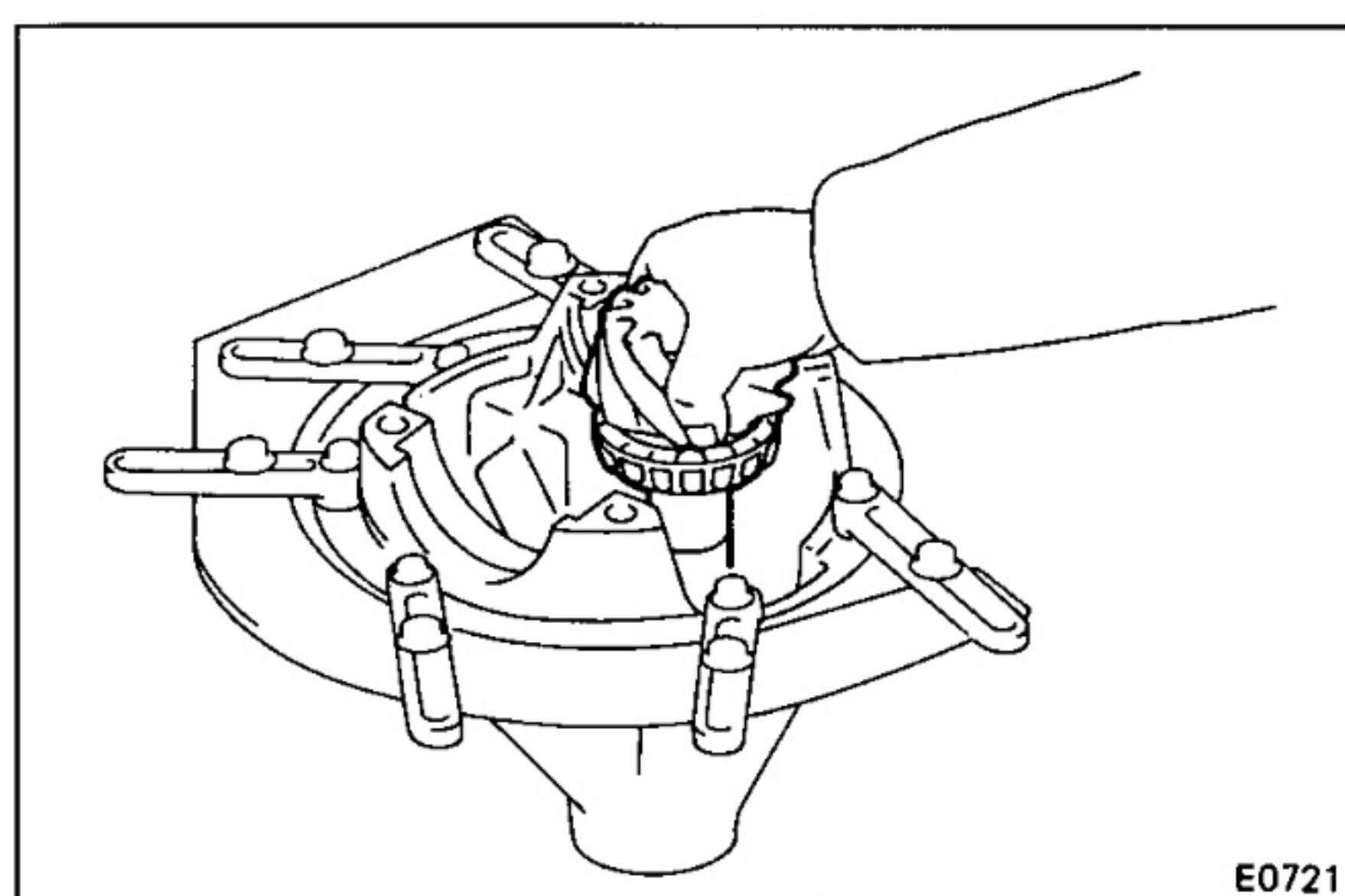
NOTE: Measure the plate washer thickness and note it.



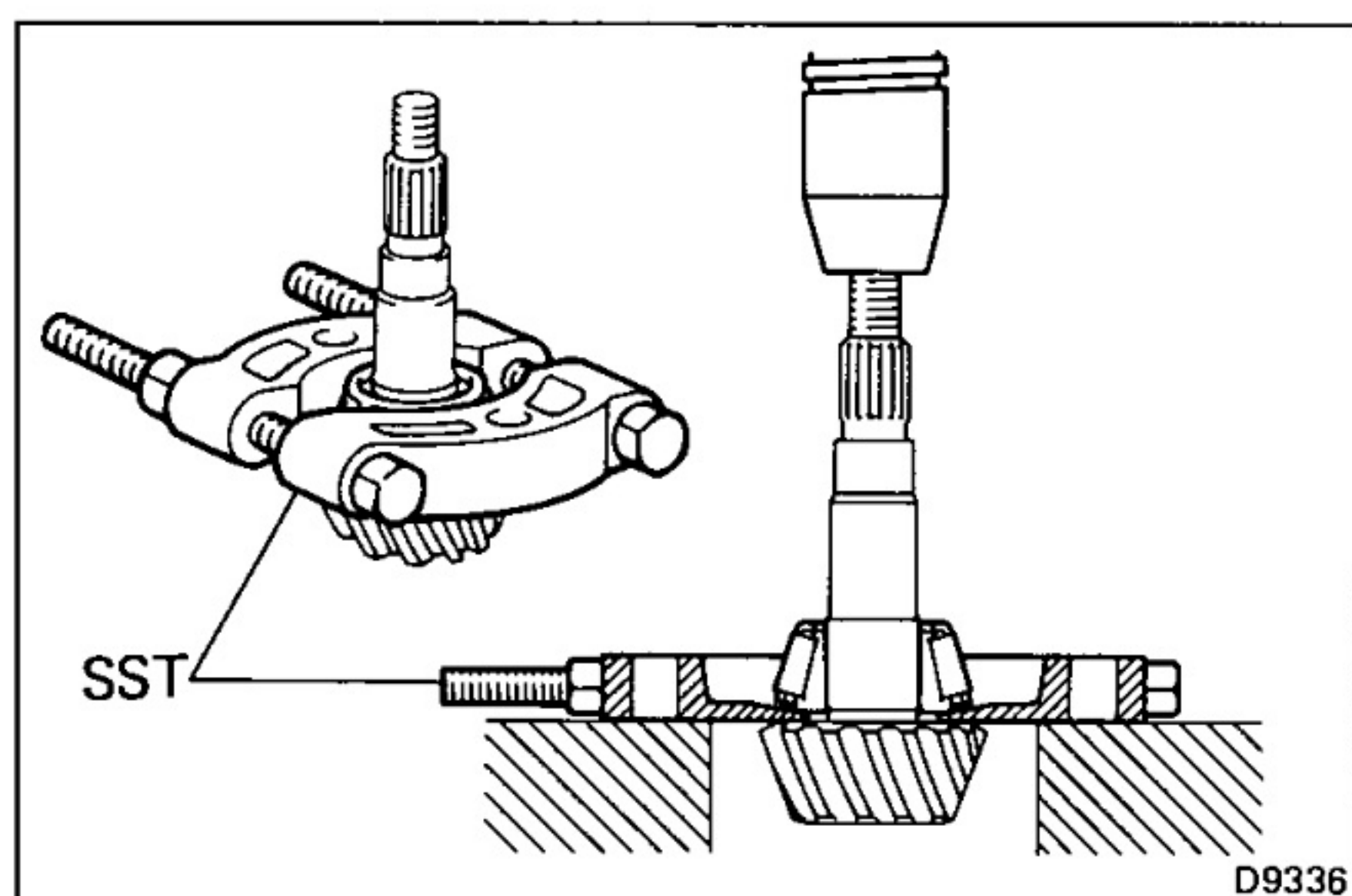
(c) Remove the differential case and bearing outer race.



NOTE: Tag the bearing outer races to show the location for reassembly.



## 10. REMOVE DRIVE PINION AND BEARING SPACER



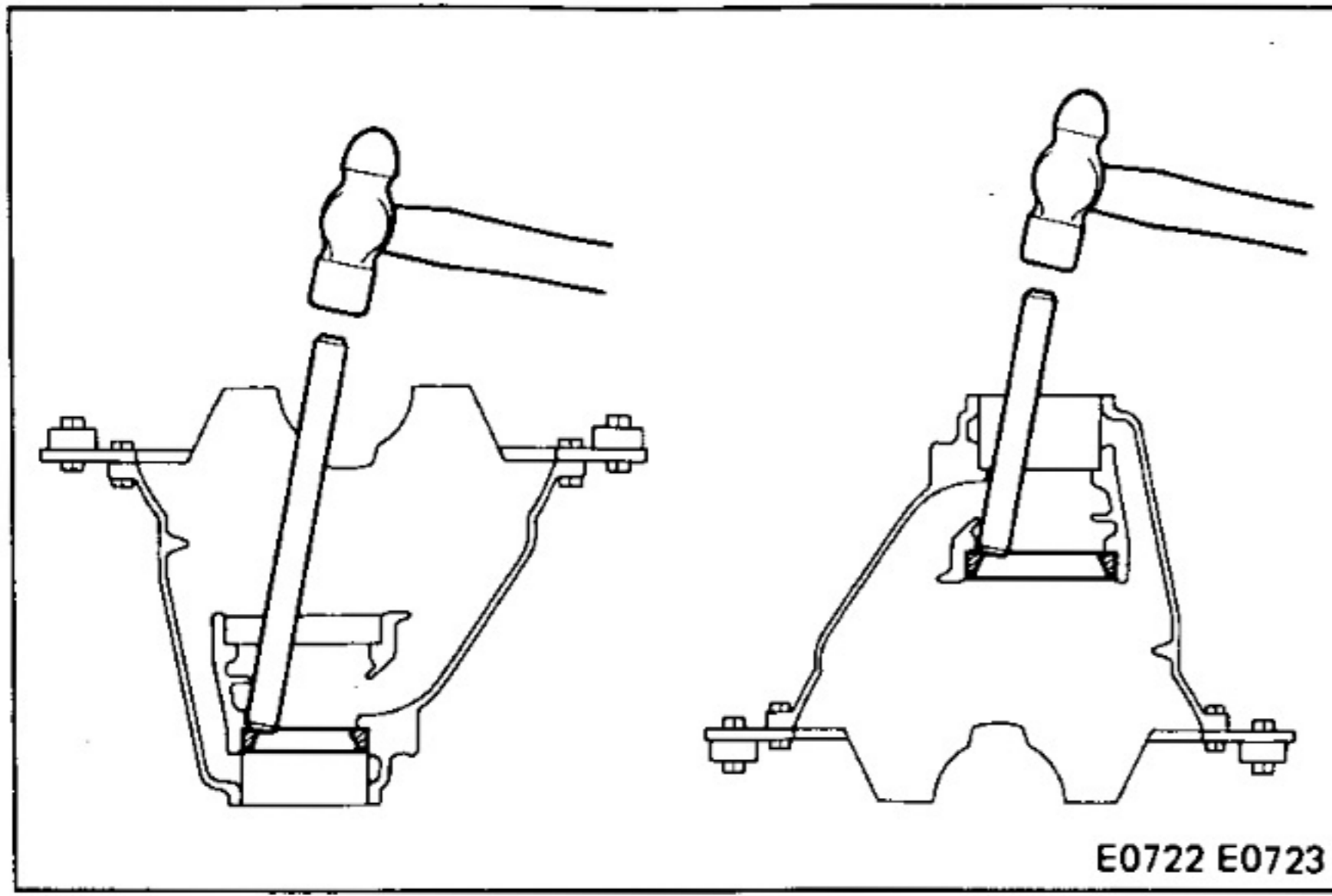
## 11. REMOVE DRIVE PINION REAR BEARING

(a) Using SST, press out the rear bearing from the drive pinion.

SST 09950-00020

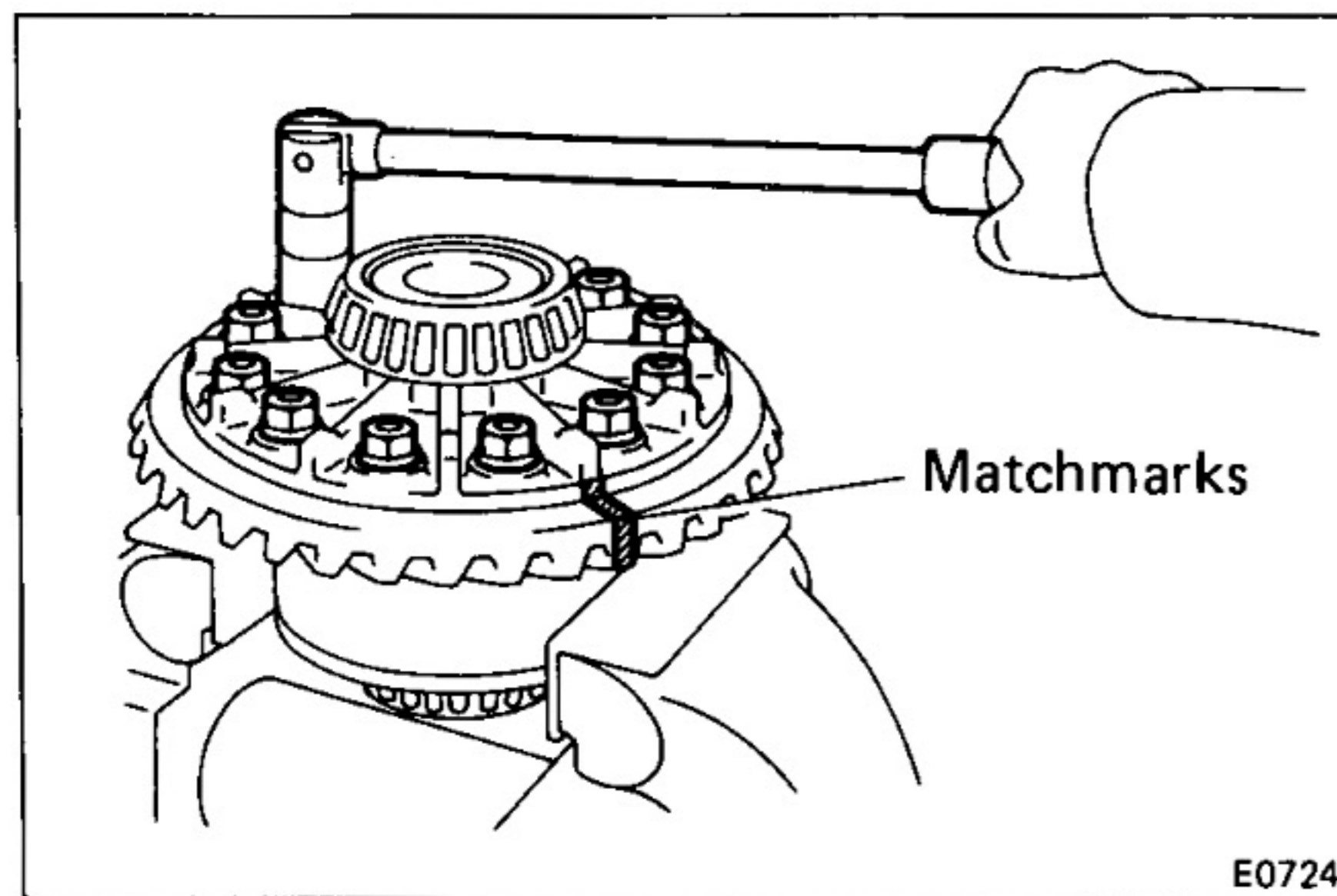
NOTE: If the drive pinion or ring gear are damaged replace them as a set.

(b) Remove the plate washer from the drive pinion.



**12. REMOVE DRIVE PINION FRONT AND REAR BEARING OUTER RACES**

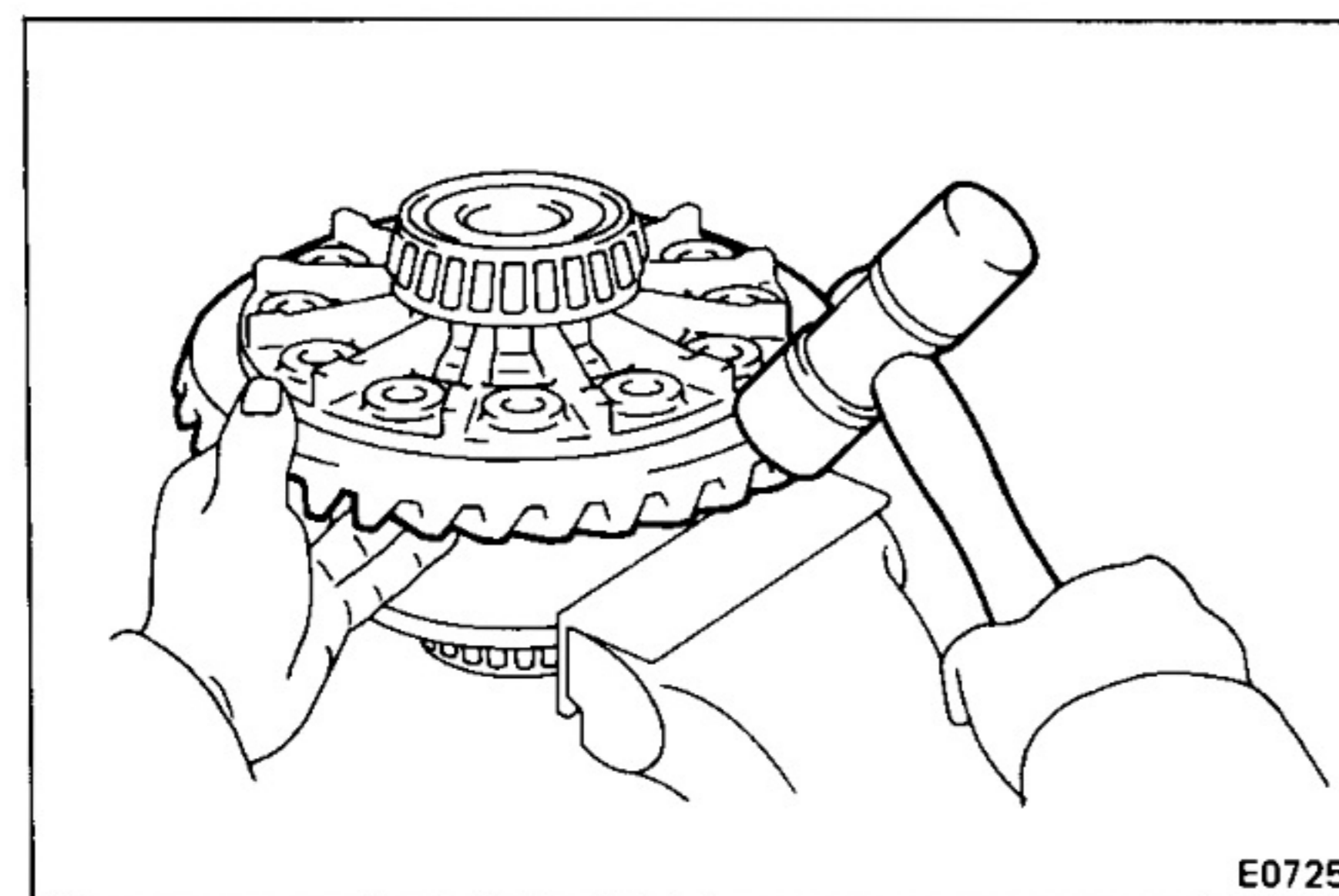
Using a brass bar and hammer, remove the bearing outer race.



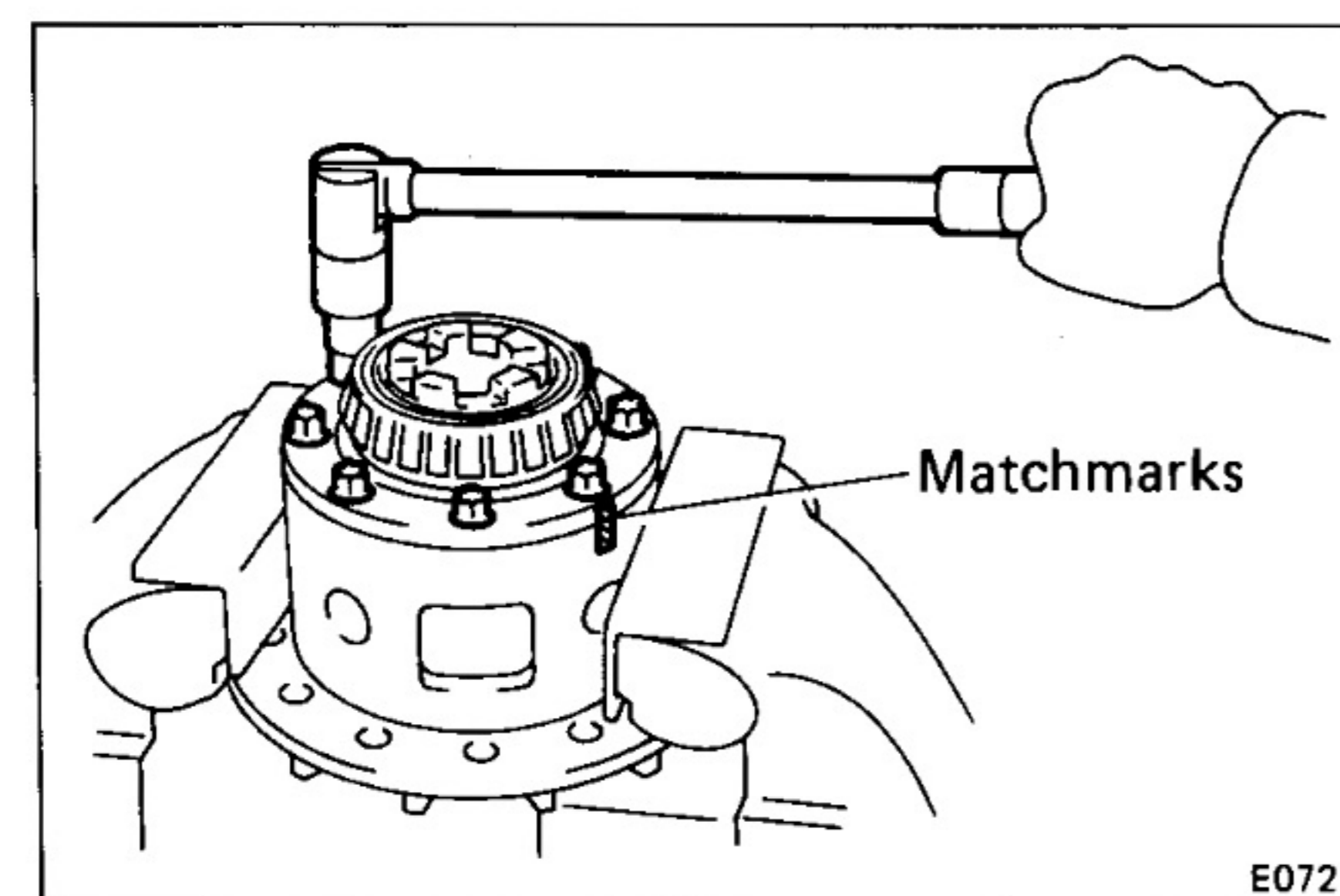
**13. REMOVE RING GEAR**

(a) Place matchmarks between the ring gear and differential case.

(b) Remove the twelve nuts from the ring gear.



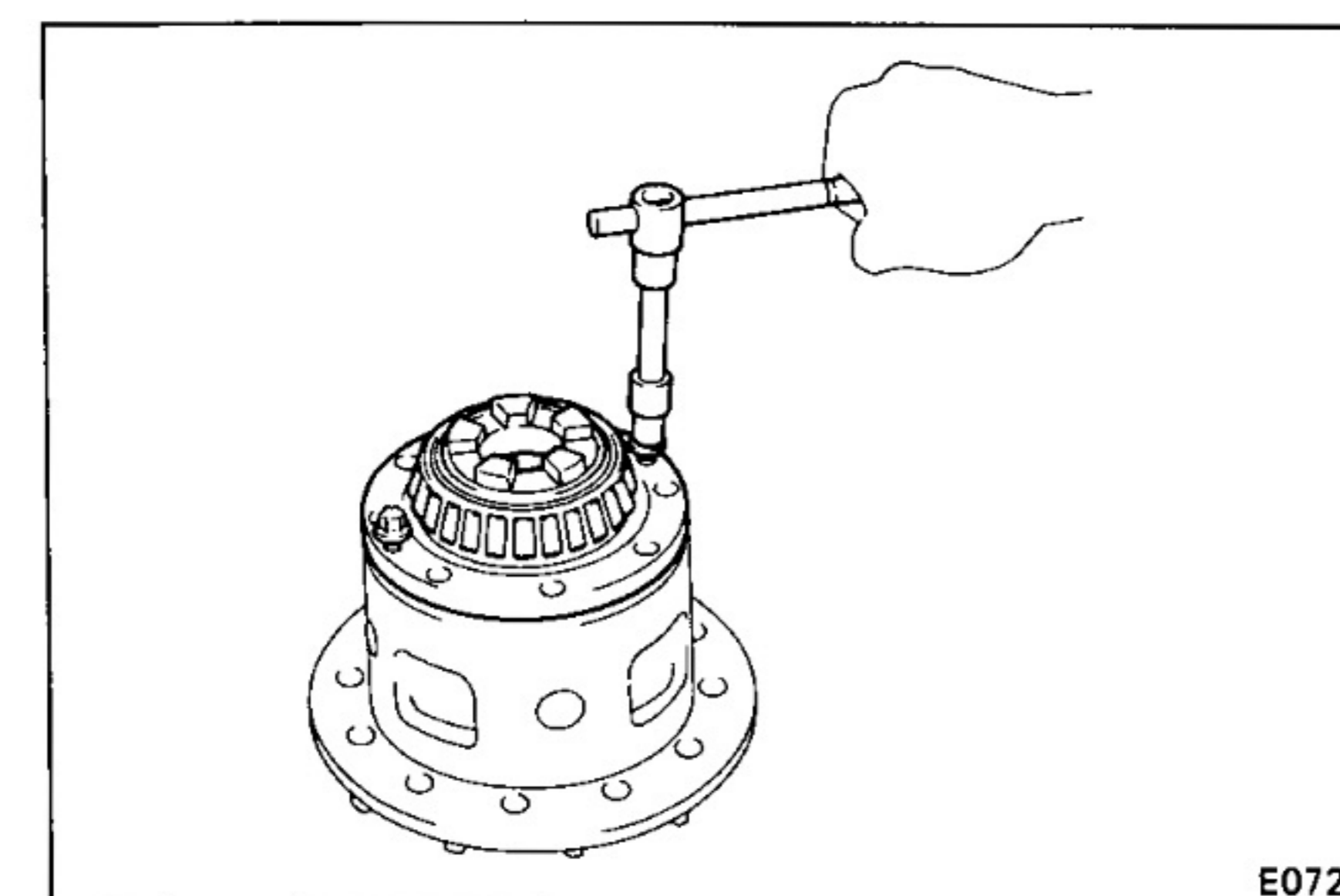
(c) Using a plastic hammer, remove the ring gear.



**14. DISASSEMBLE DIFFERENTIAL CASE**

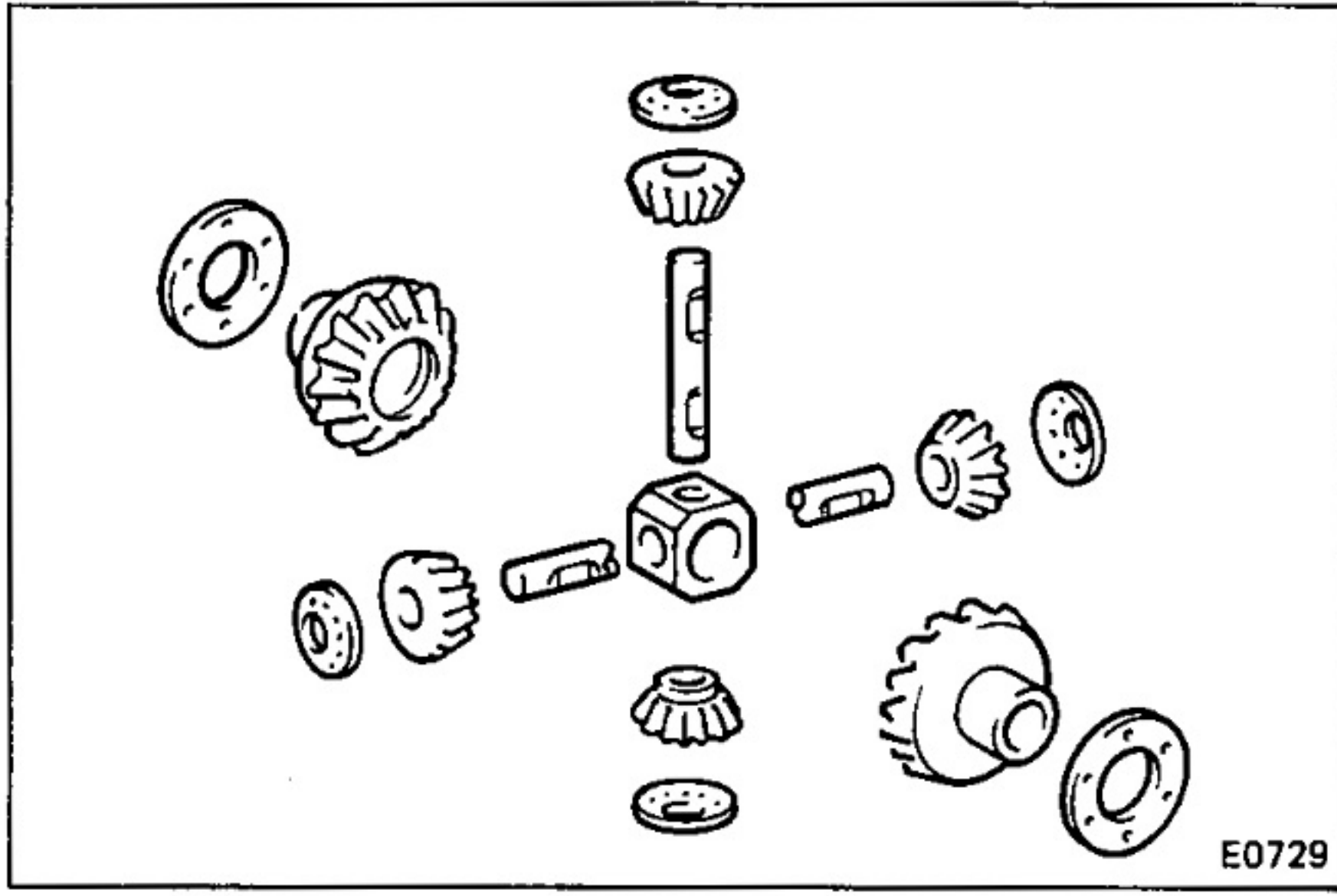
(a) Place matchmarks on the case and cover.

(b) Using a trox socket wrench (09044-00200), remove the five set bolts and three pinion shaft pins.



(c) Using two cover installation bolts, separate the cover and case.

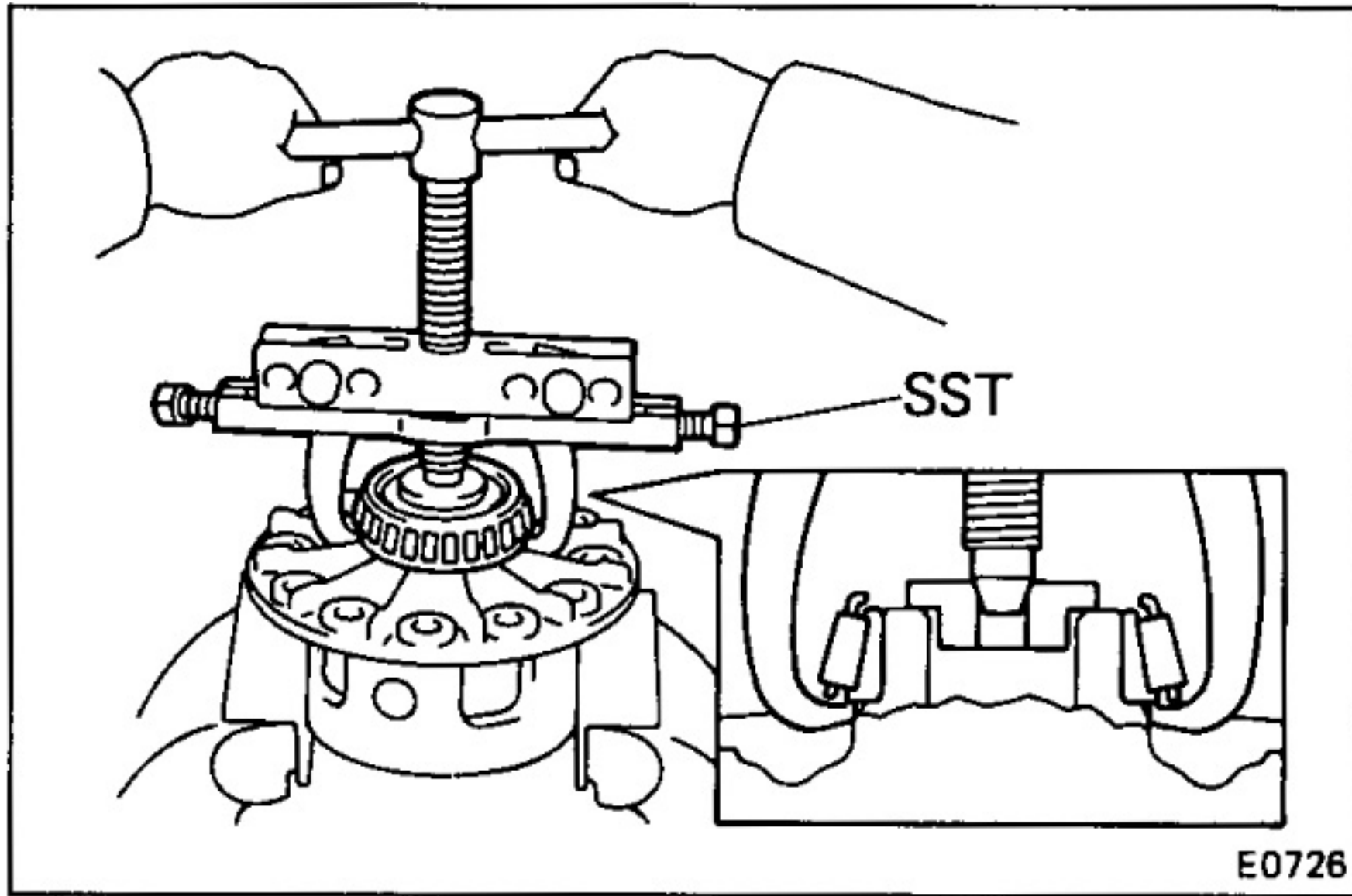
(d) Remove the two cover installation bolts.



E0729

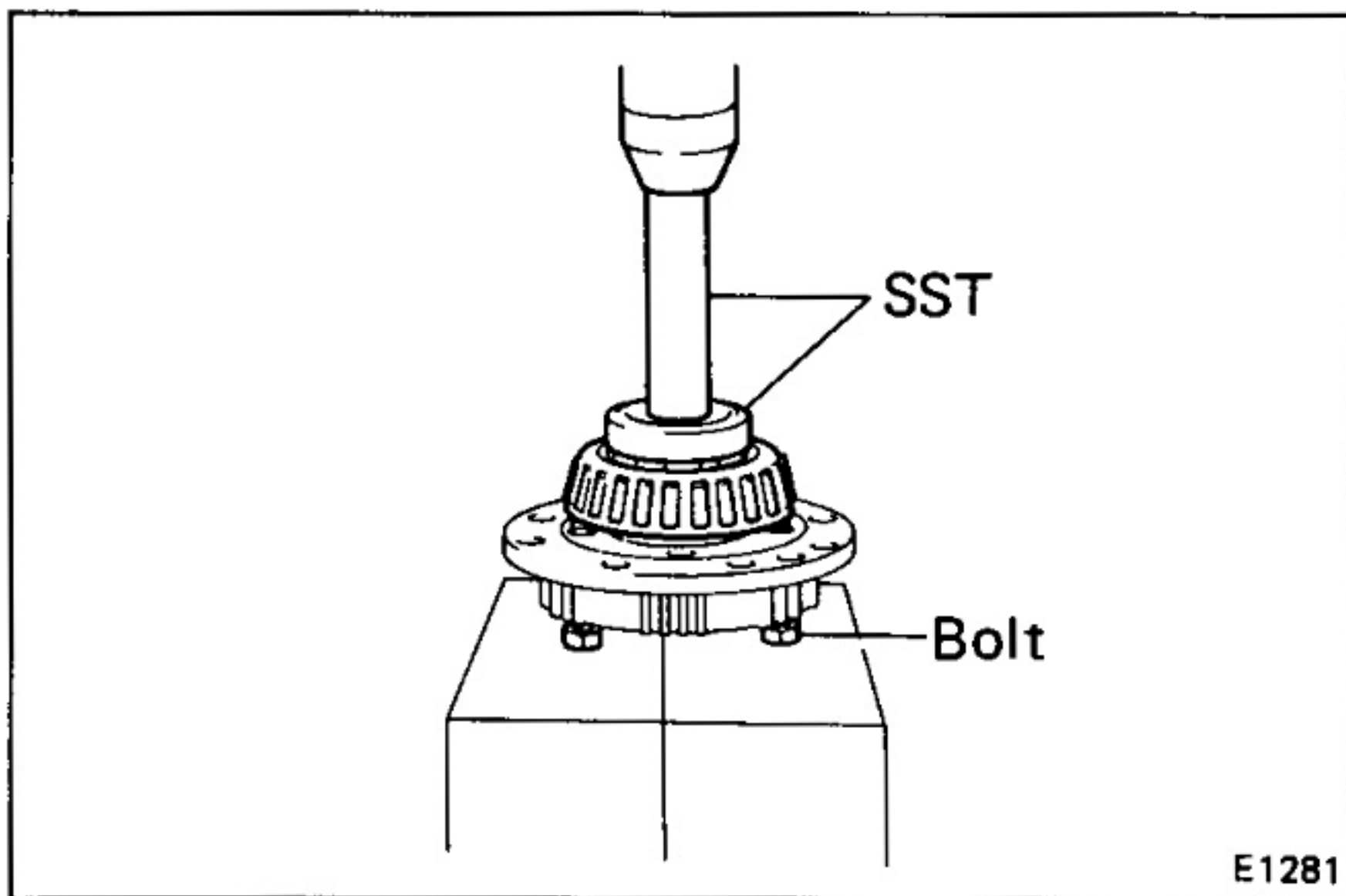
- (e) Remove the following parts:
- Two side gears
  - Two side gear thrust washers
  - Four pinions
  - Four pinion thrust washers
  - Three pinion shafts
  - Pinion shaft holder

## 15. REMOVE SIDE BEARING



E0726

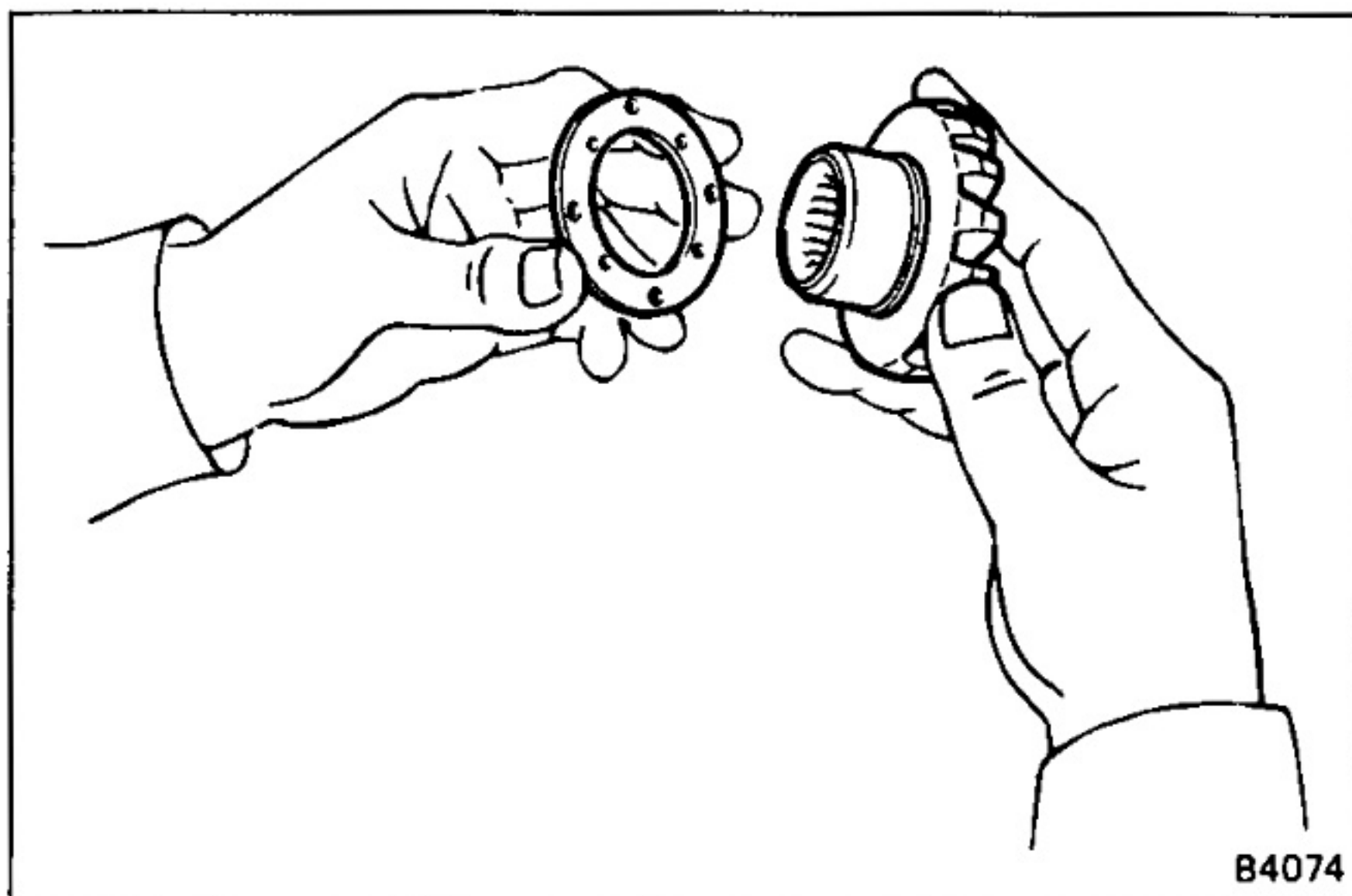
- (a) Using SST, remove the side bearing (ring gear side).  
SST 09950-20017



E1281

- (b) Using a bolt and SST, remove the side bearing (cover side).

SST 09550-10012 (09252-10010 09557-10010)

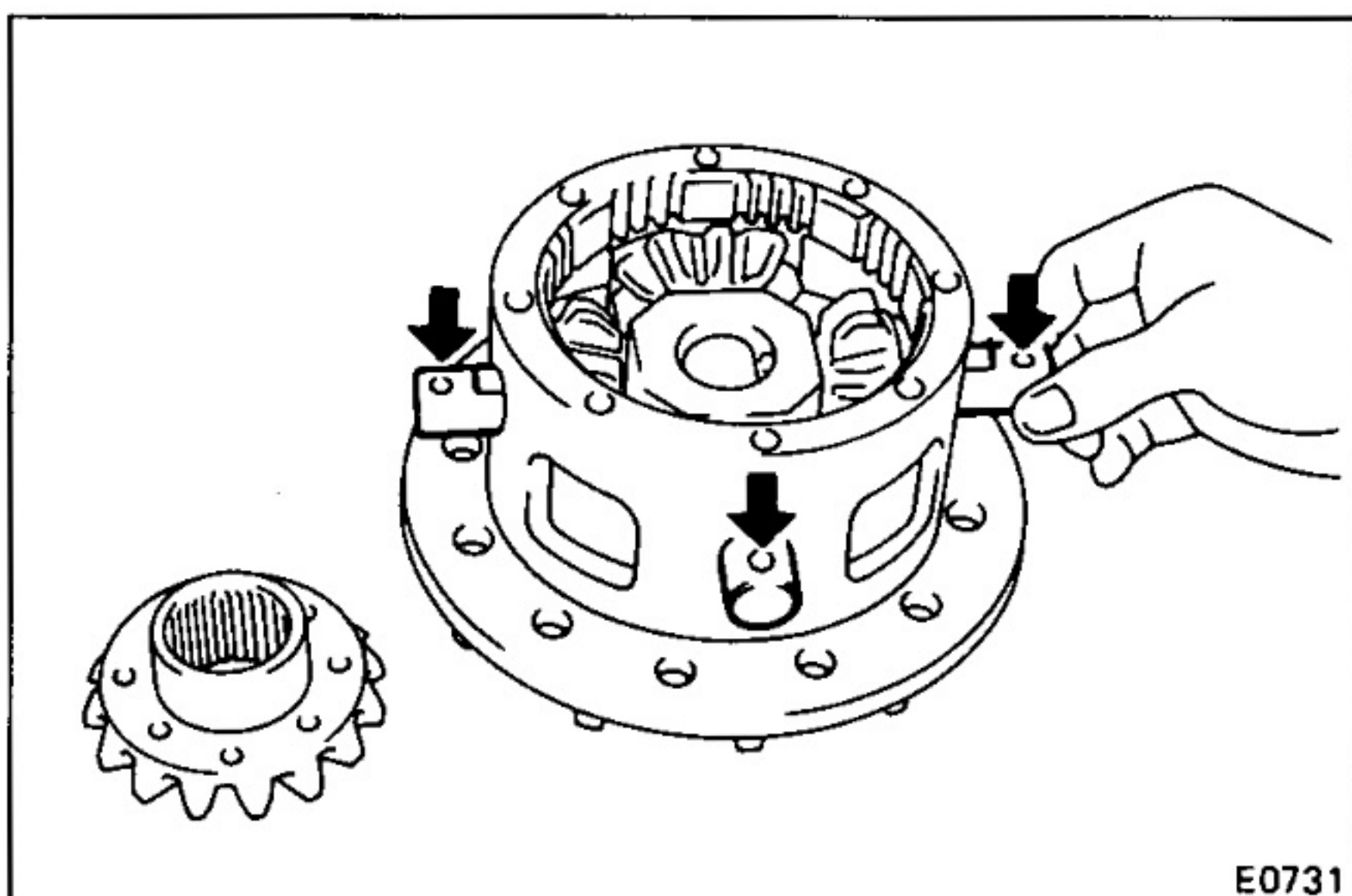


B4074

## ASSEMBLY OF DIFFERENTIAL

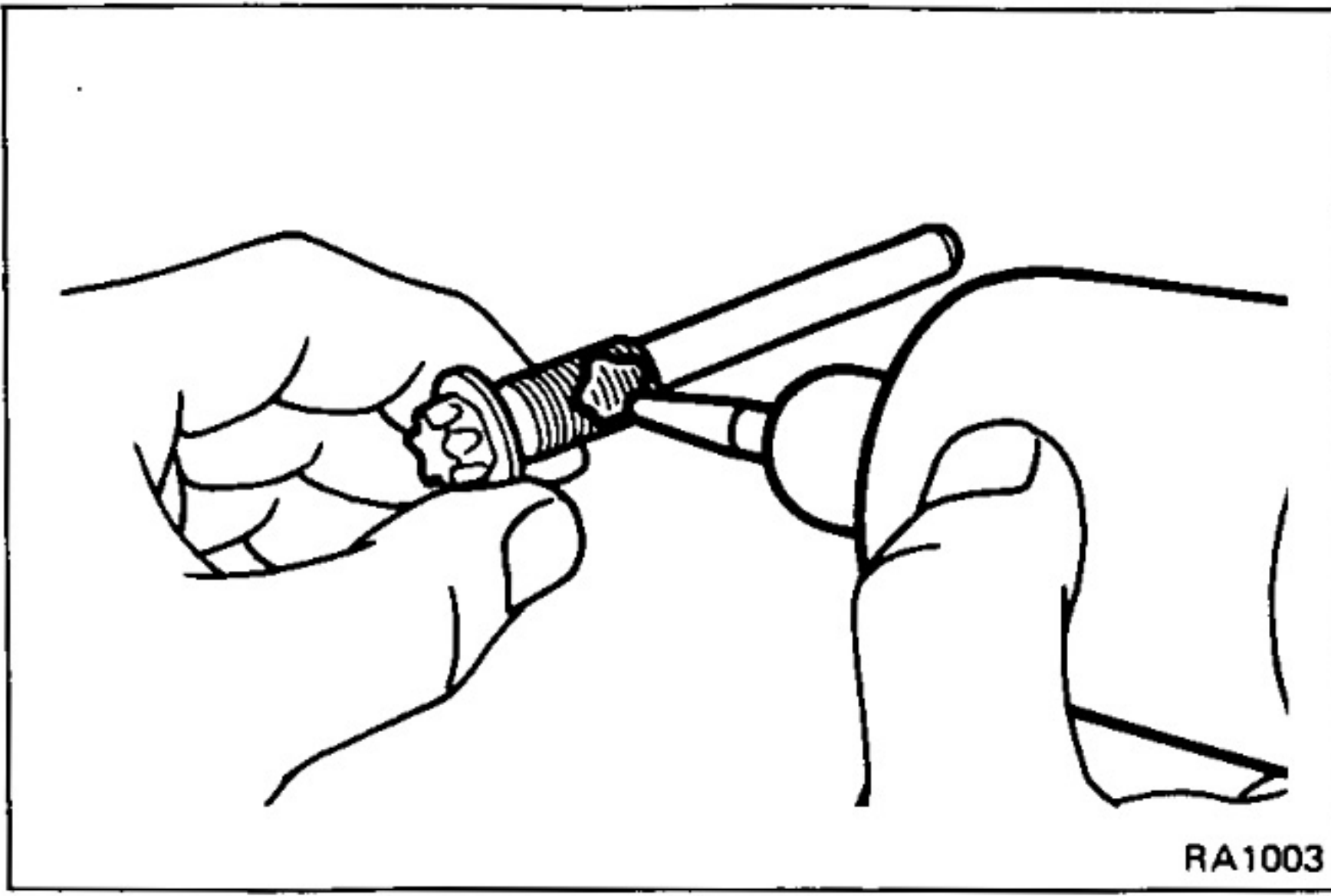
### 1. ASSEMBLE DIFFERENTIAL CASE

- (a) Apply gear oil to each part.  
(b) Install the thrust washer to the side gear.  
(c) Install the thrust washer to the pinion.



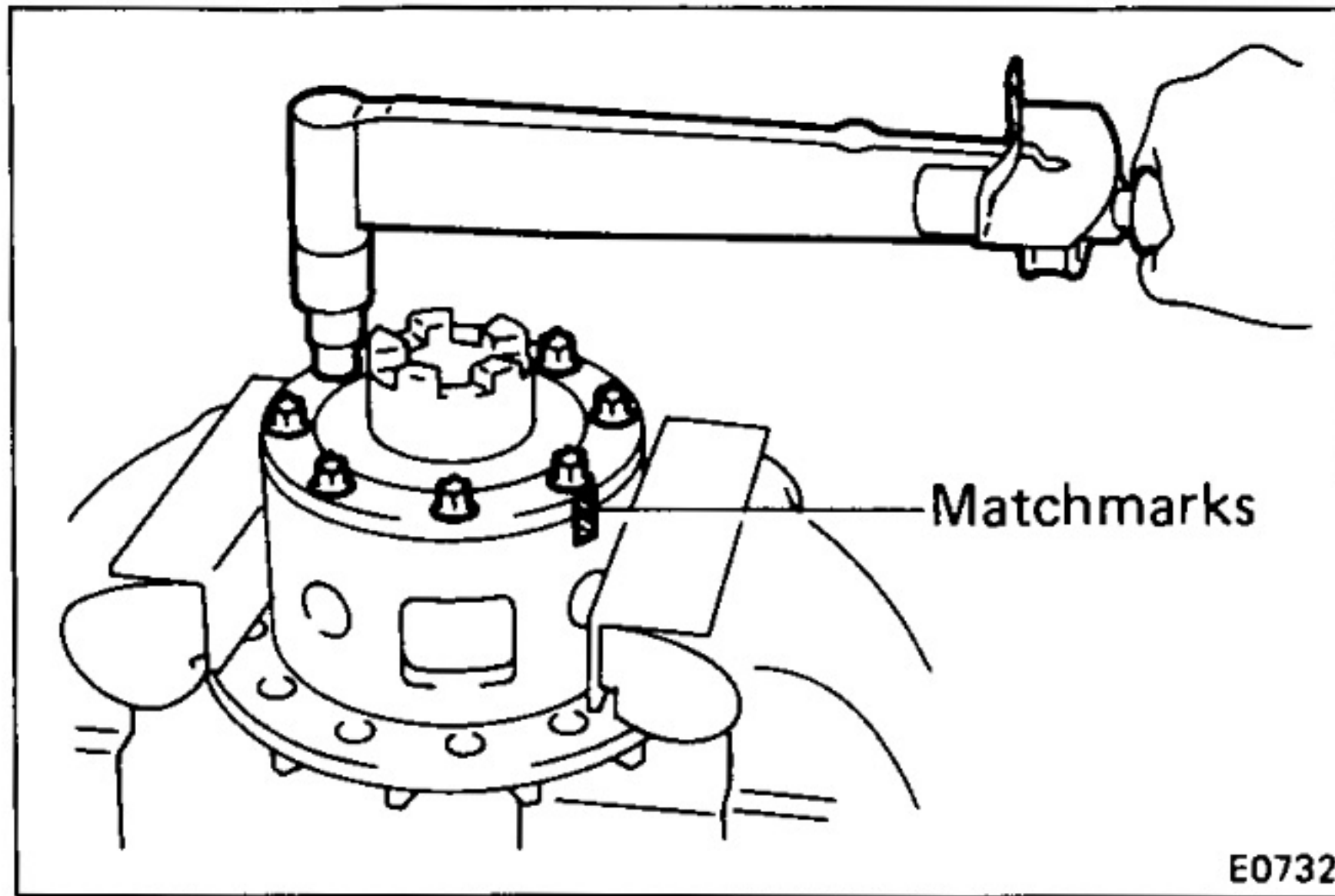
E0731

- (d) Install the side gear into the case.  
(e) Install the holder into the case.  
(f) Install the four pinions.  
(g) Align the pinion shaft hole and case pinion shaft pin hole, install the pinion shaft.  
(h) Install the side gear to the cover.



- (i) Clean the threads of the bolts, pinion shaft pins, case and cover with the white gasoline.
- (j) Coat the threads of the bolts and pinion shaft pins with sealer.

**Sealer: Part No. 08833-00070, THREE BOND 1324 or equivalent**



- (k) Align the matchmarks, install the case and cover.
- (l) Using a trox socket wrench(09044-00200), torque the five bolts and three pinion shaft pin.

**Torque: 590 kg-cm(43 ft-lb, 58 N·m)**

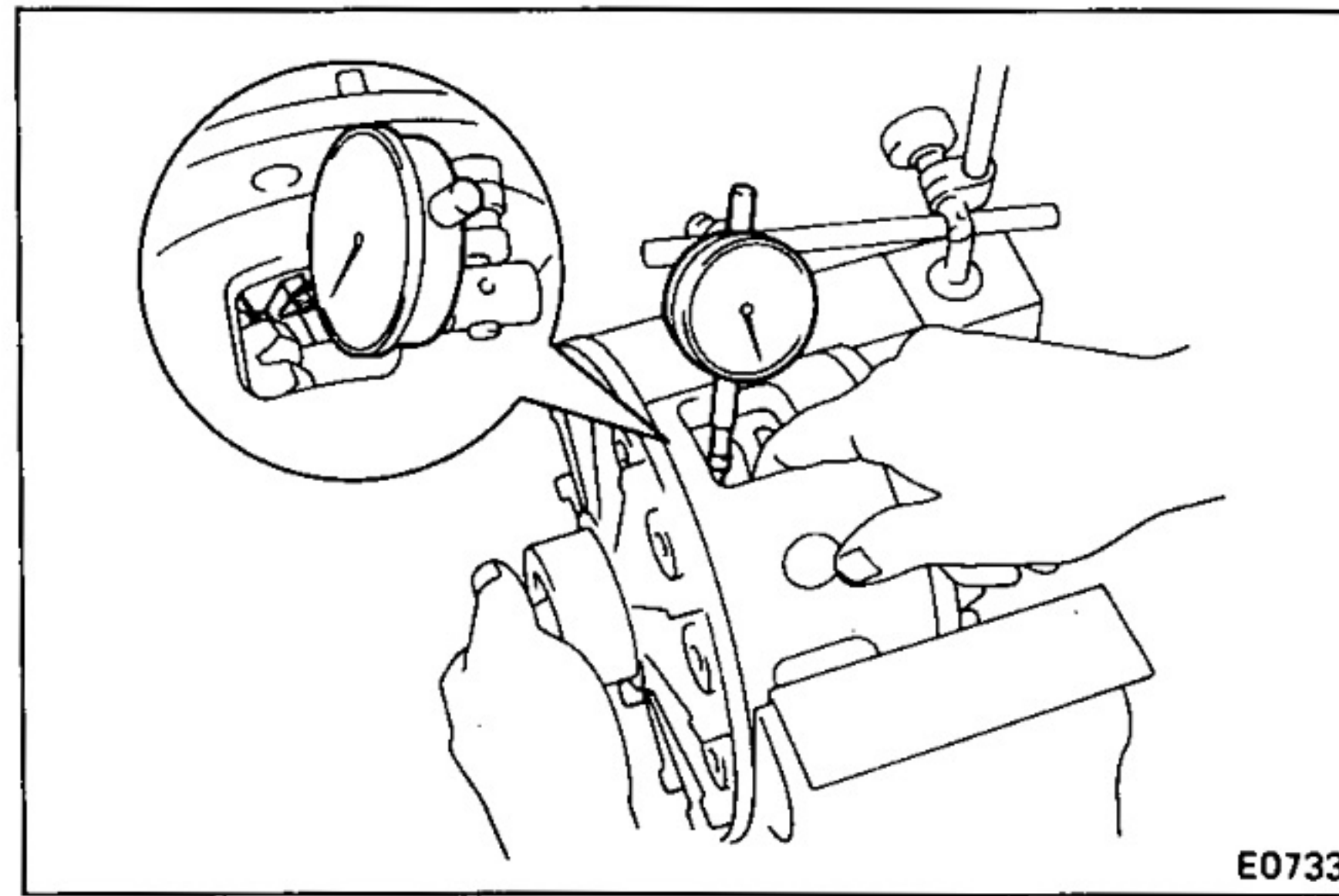
**2. MEASURE SIDE GEAR BACKLASH**

- (a) Hold the side gear measure the backlash.

**Standard backlash:**

**0.02 – 0.20 mm(0.0008 – 0.0079 in.)**

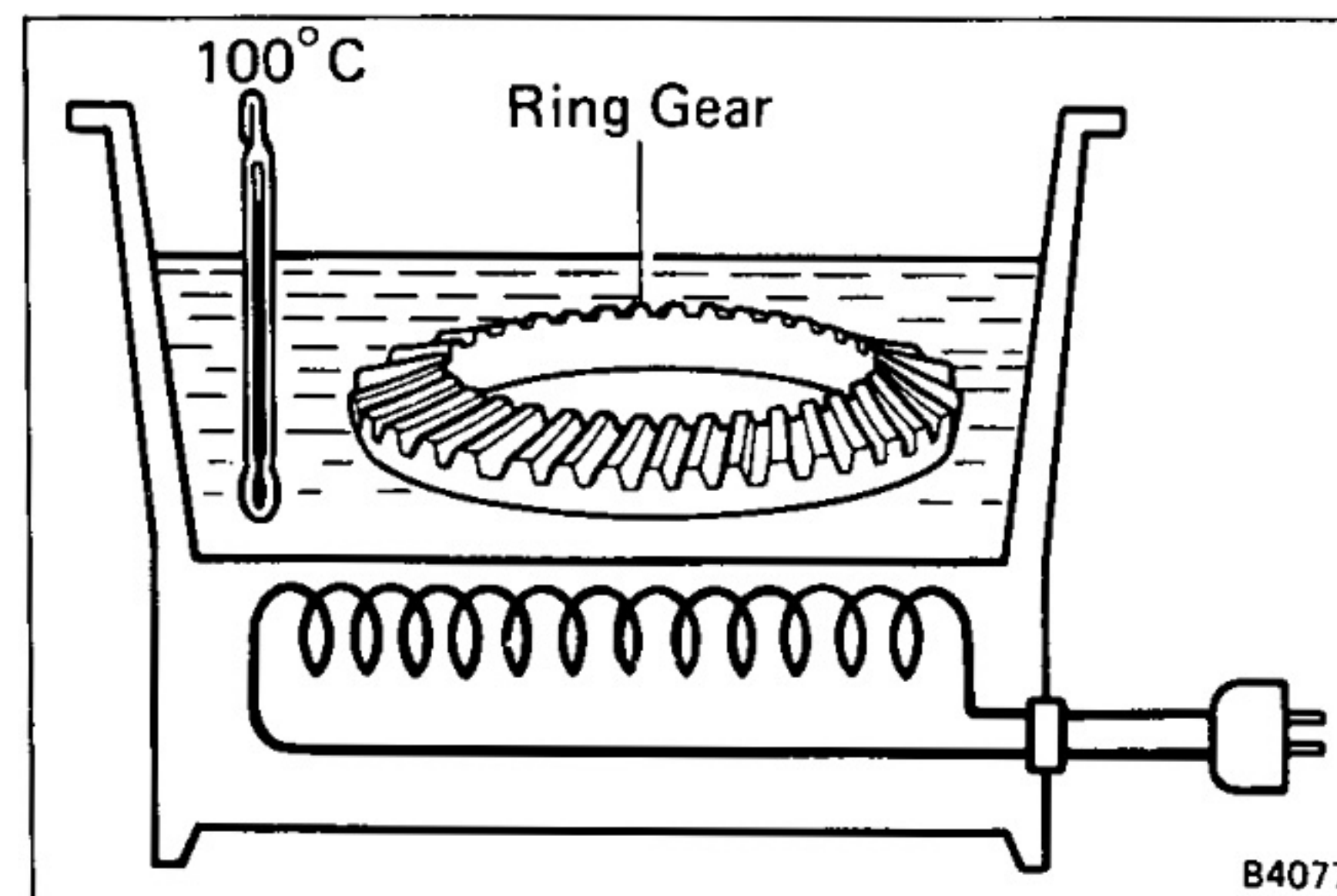
- (b) If the backlash is not within specification install the thrust washer of a different thickness.



Thrust washer tickness

Thickness		mm (in.)
1.55 – 1.65	(0.0610 – 0.0650)	
1.70 – 1.80	(0.0670 – 0.0709)	
1.85 – 1.95	(0.0728 – 0.0768)	
2.00 – 2.10	(0.0787 – 0.0827)	

**3. INSTALL RING GEAR**

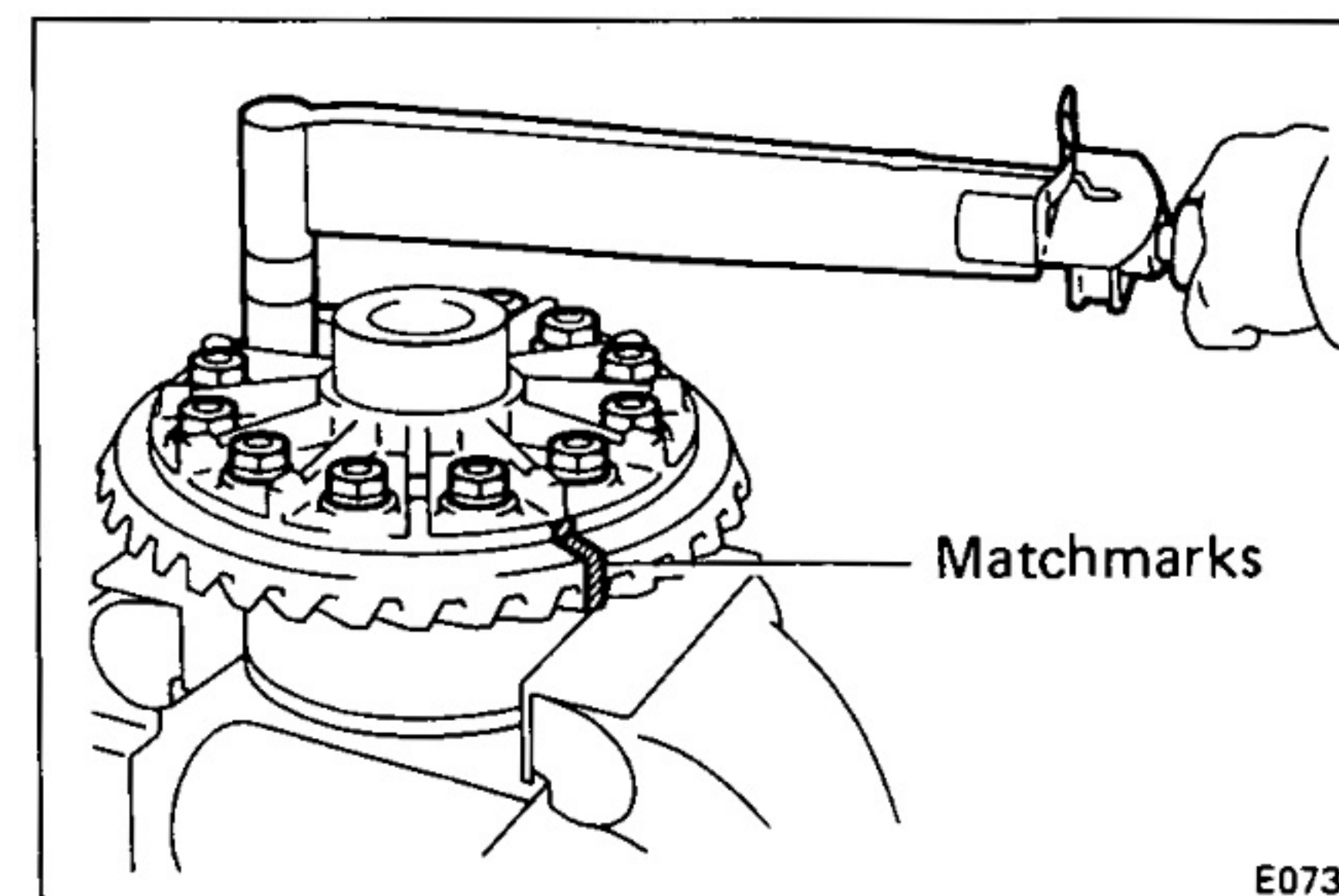


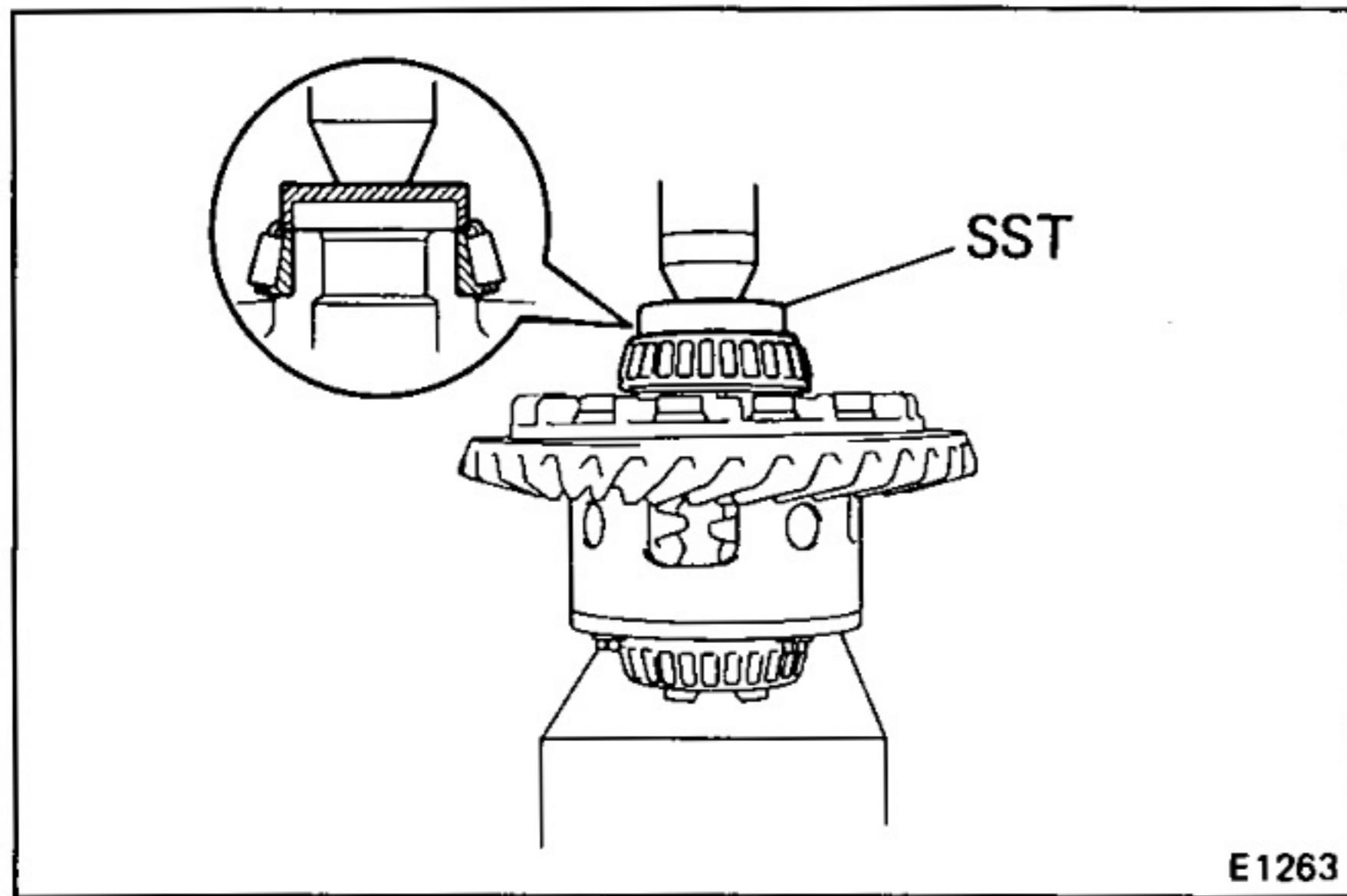
- (a) Clean the contacting surface of the differential case.
- (b) Heat the ring gear to about 100°C (212°F) in an oil bath and clean the contacting surface of the ring gear with cleaning solvent.
- (c) Then quickly install the ring gear on the differential case.
- (d) Align the matchmarks on the ring gear and differential case.

**NOTE:** Do not heat the ring gear to more than 110°C (230°F).

- (e) Coat the ring gear set bolts with gear oil.
- (f) Torque the twelve set bolts uniformly, a little at a time.

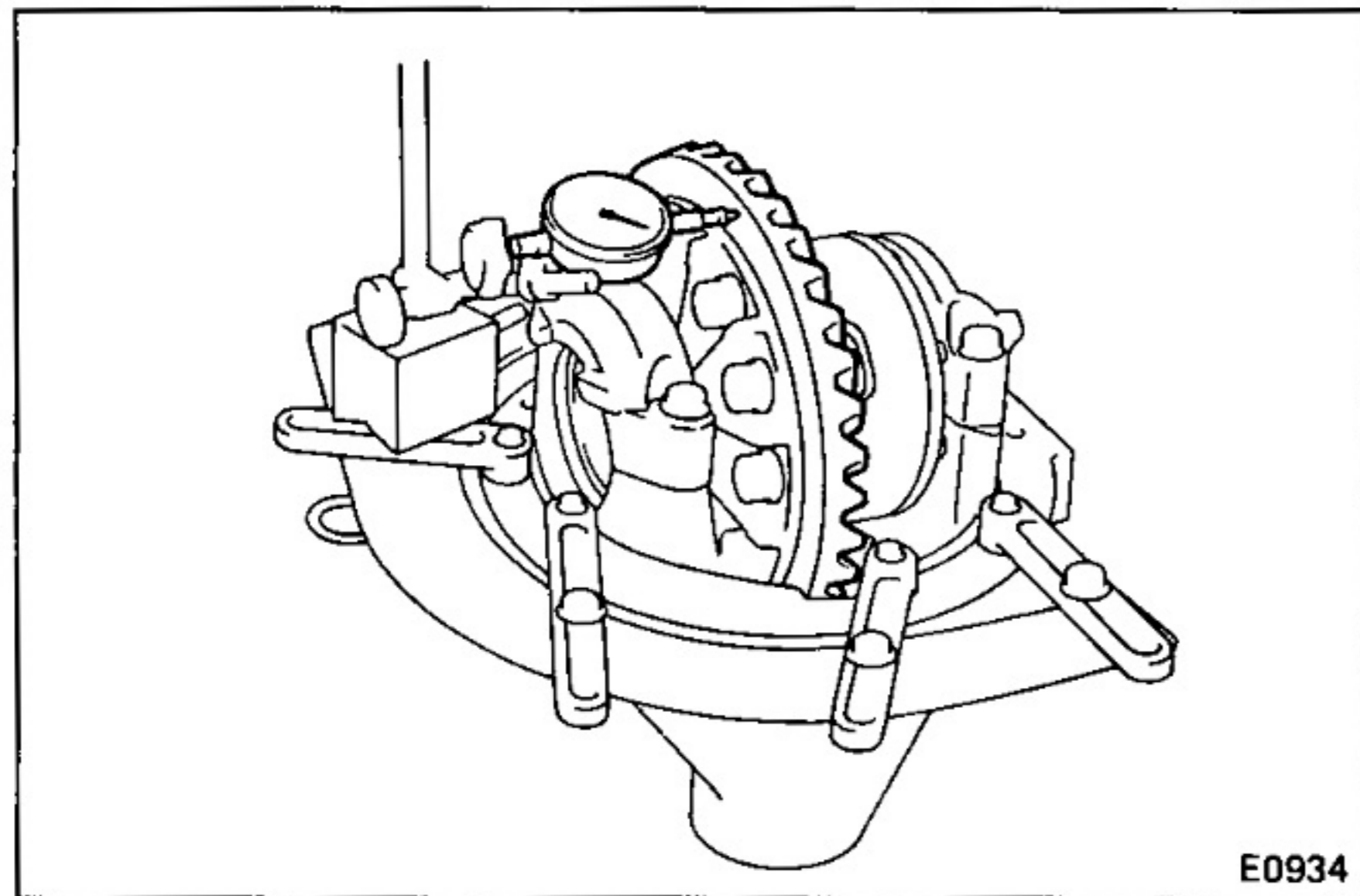
**Torque: 1,125 kg-cm (81 ft-lb, 110 N·m)**





#### 4. INSTALL SIDE BEARING

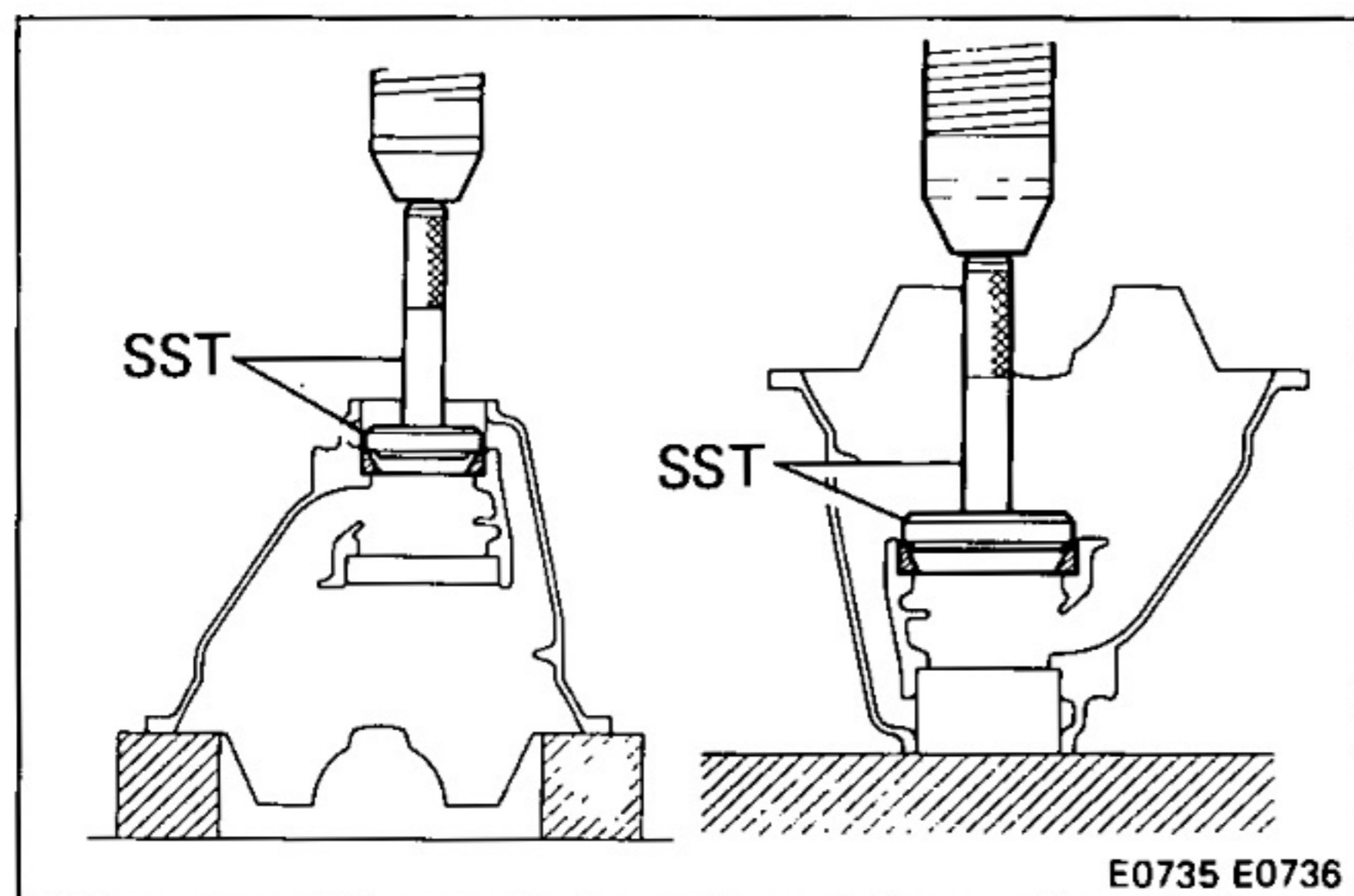
Using SST, press in a new side bearing.  
SST 09550-60010



#### 5. INSPECT RING GEAR RUNOUT

Install the differential case onto the carrier and tighten the adjusting nut to where there is no play in the bearing.

**Maximum runout: 0.10 mm (0.0039 in.)**



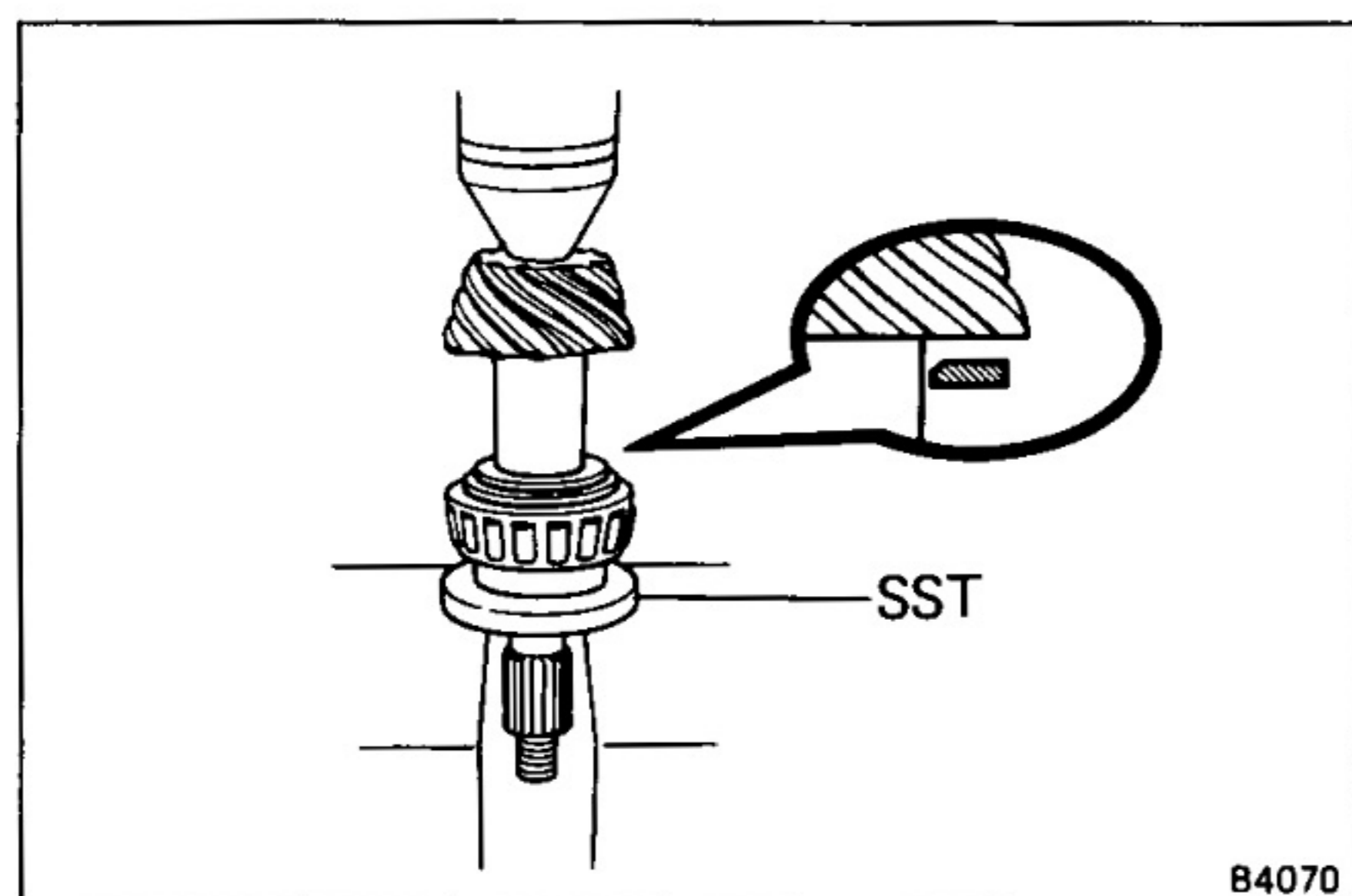
#### 6. INSTALL FRONT AND REAR BEARING OUTER RACE

Using SST, press in a new bearing outer race to the carrier.

SST 09608-35014

Front (09608-06020, 09608-06110)

Rear (09608-06020, 09608-06180)

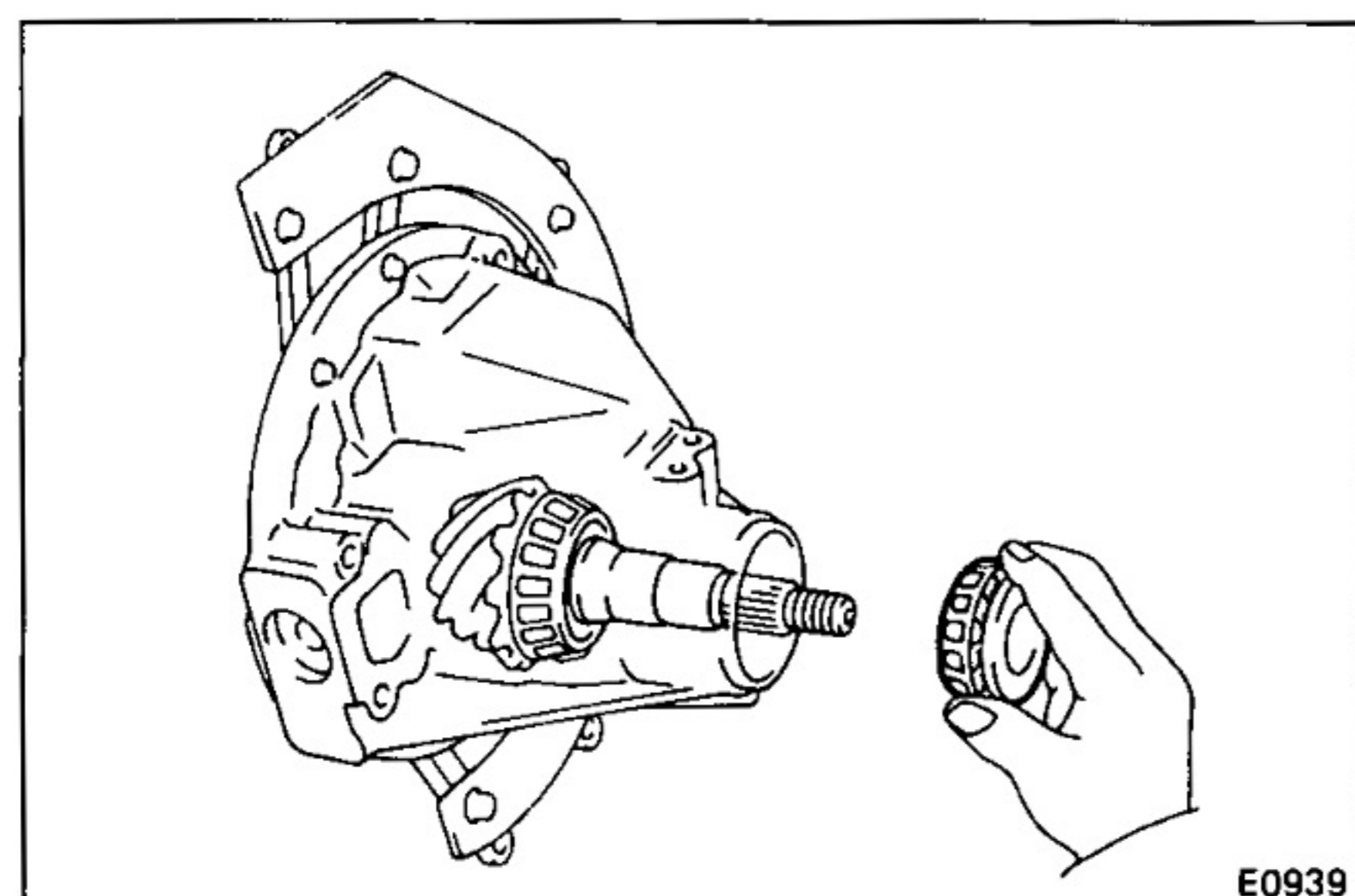


#### 7. INSTALL DRIVE PINION REAR BEARING

(a) Install the washer on the drive pinion with the chamfered end facing the pinion gear.

(b) Using SST, press in the reused washer and rear bearing onto the drive pinion.

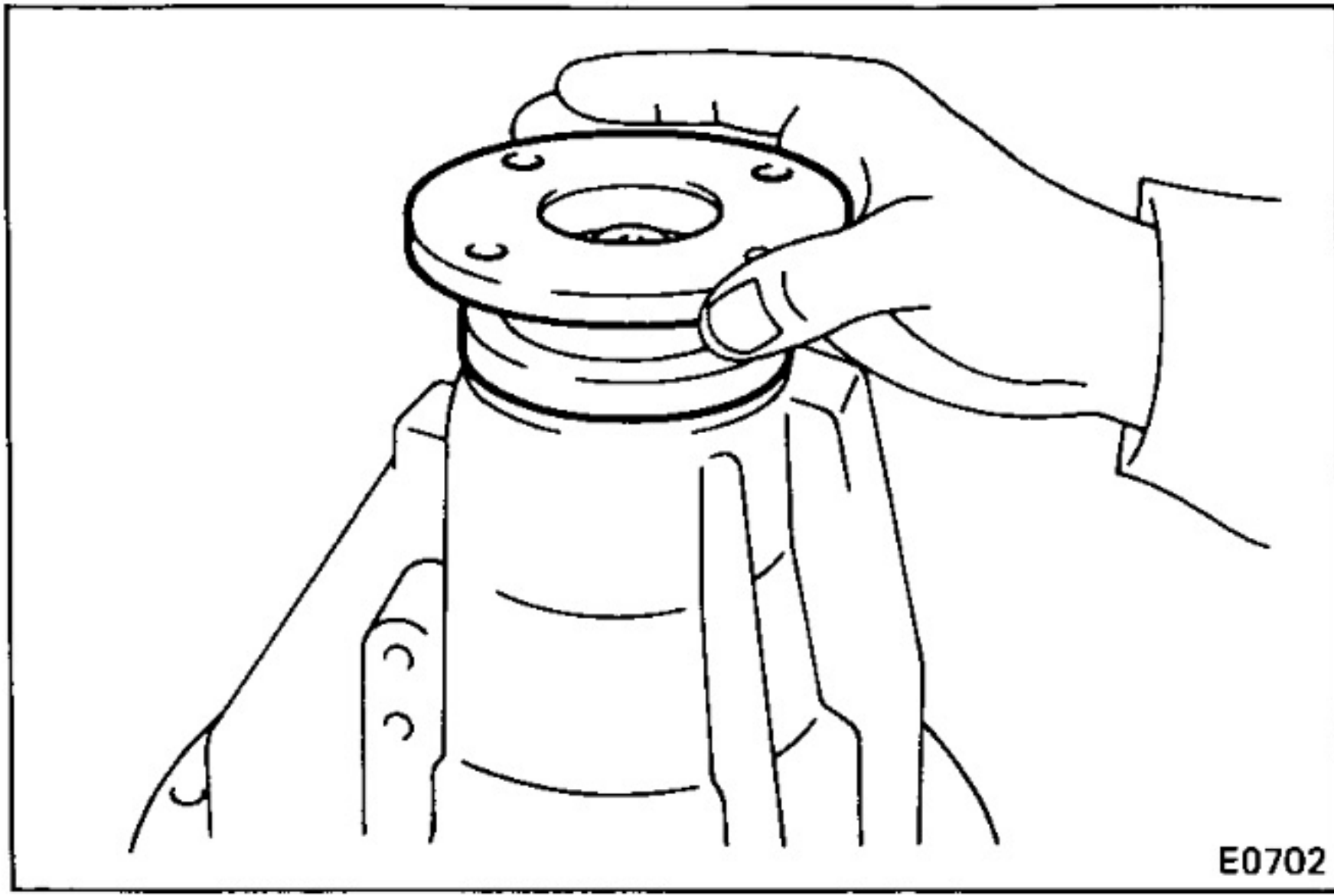
SST 09506-35010



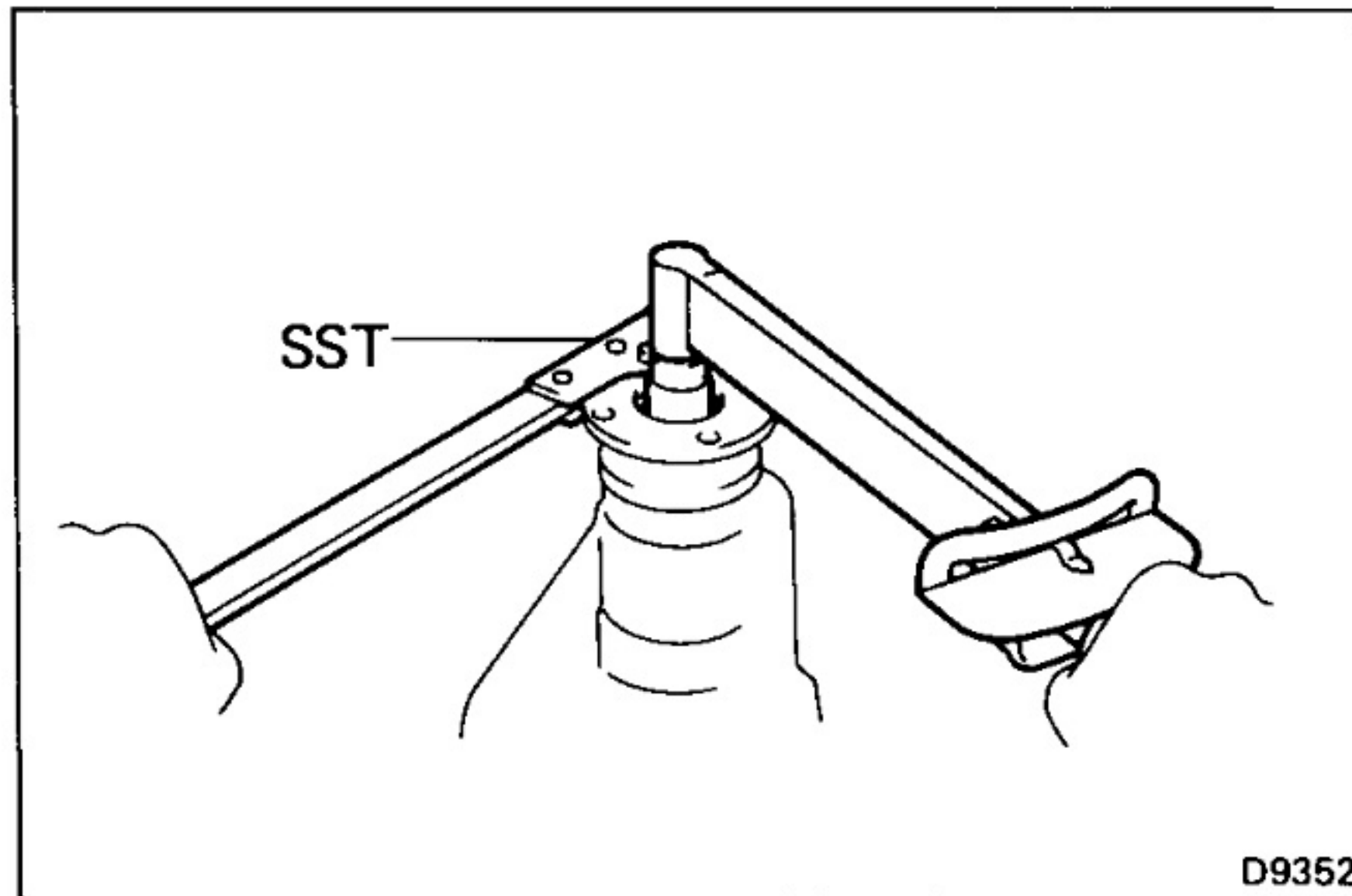
#### 8. TEMPORARILY ADJUST DRIVE PINION PRELOAD

(a) Install the drive pinion and front bearing.

**NOTE:** Assemble the spacer, oil slinger and oil seal after adjusting the gear contact pattern.



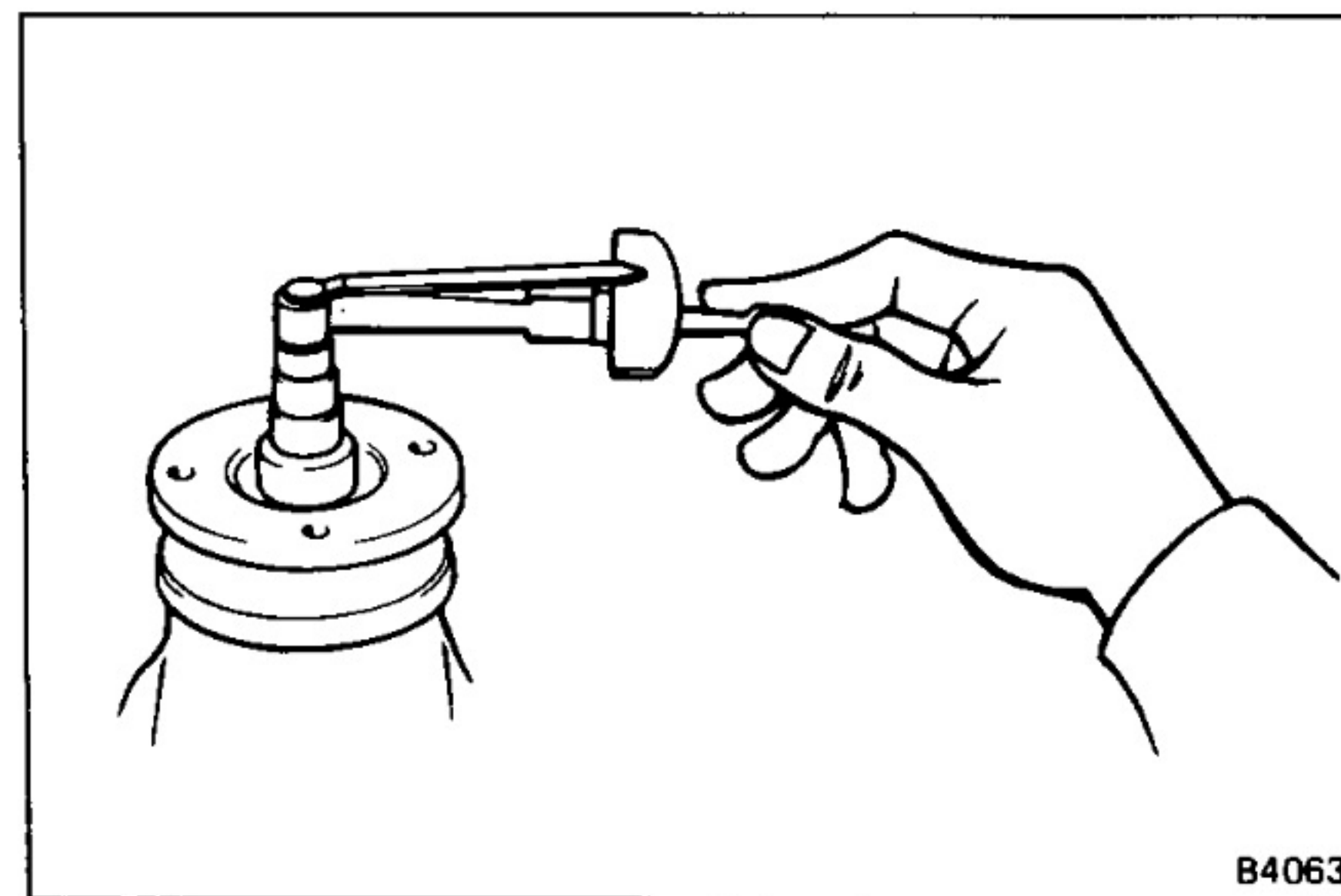
- (b) Install the companion flange.  
Coat the threads of the nut with MP grease.



- (c) Adjust the drive pinion preload by tightening the companion flange nut.  
Using SST to hold the flange, tighten the nut.

SST 09330-00021

**CAUTION:** As there is no spacer, tighten a little at a time, being careful not to overtighten it.



- (d) Using a torque wrench, measure the preload.

**Preload:**

**New bearing**

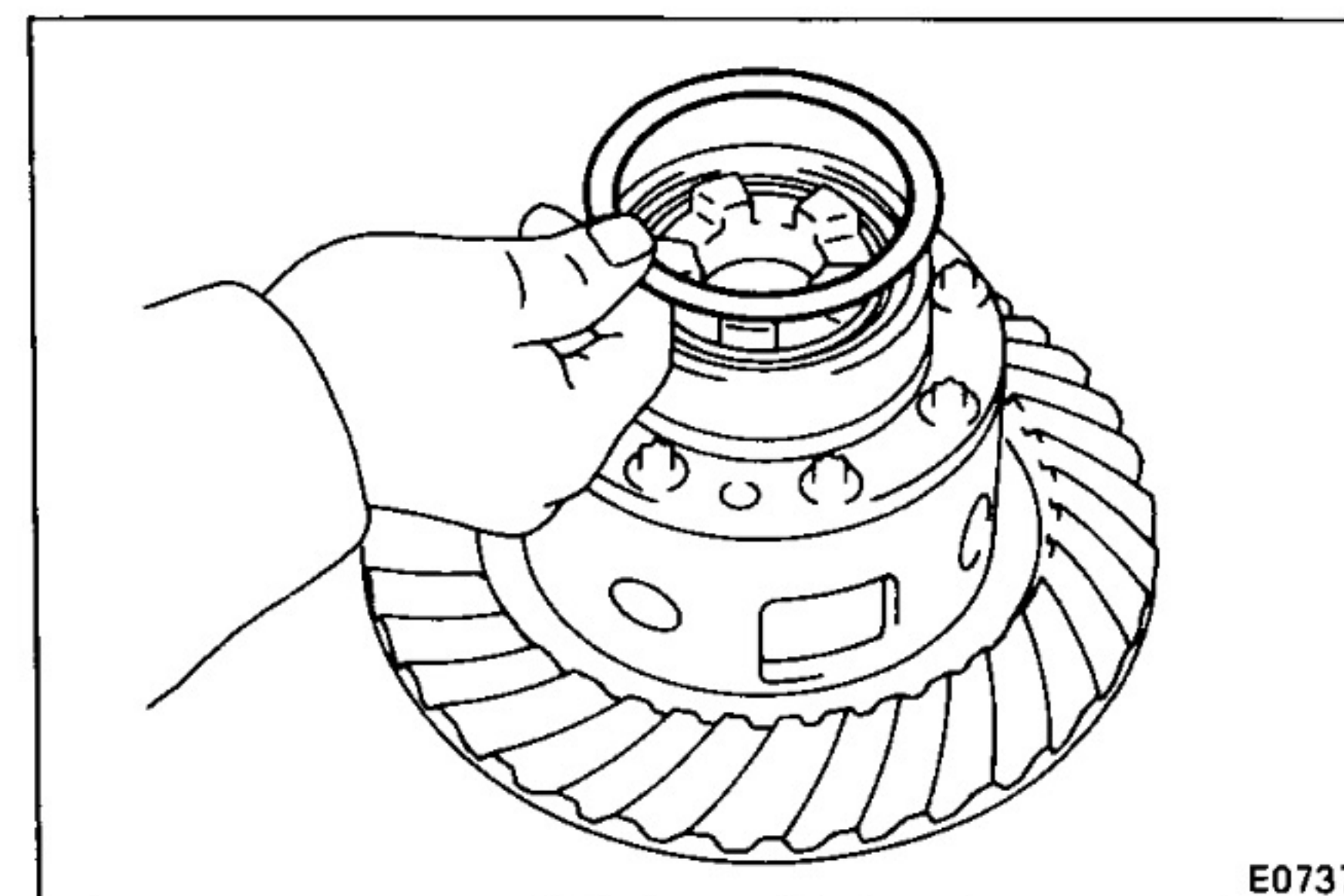
13 – 20 kg-cm

(11.3 – 17.4 in.-lb, 1.3 – 2.0 N·m)

**Reused bearing**

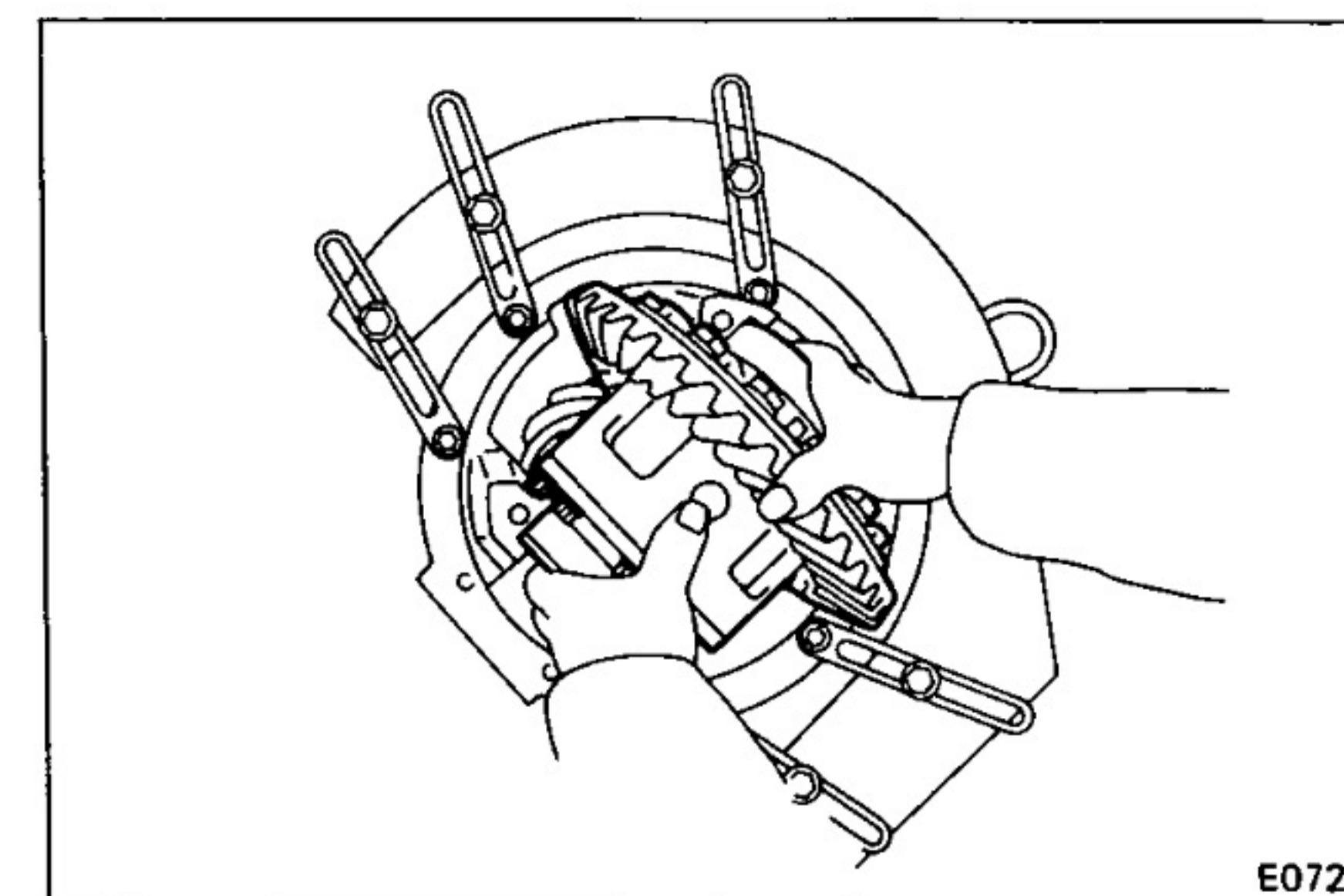
7 – 10 kg-cm

(6.1 – 8.7 in.-lb, 0.7 – 1.0 N·m)

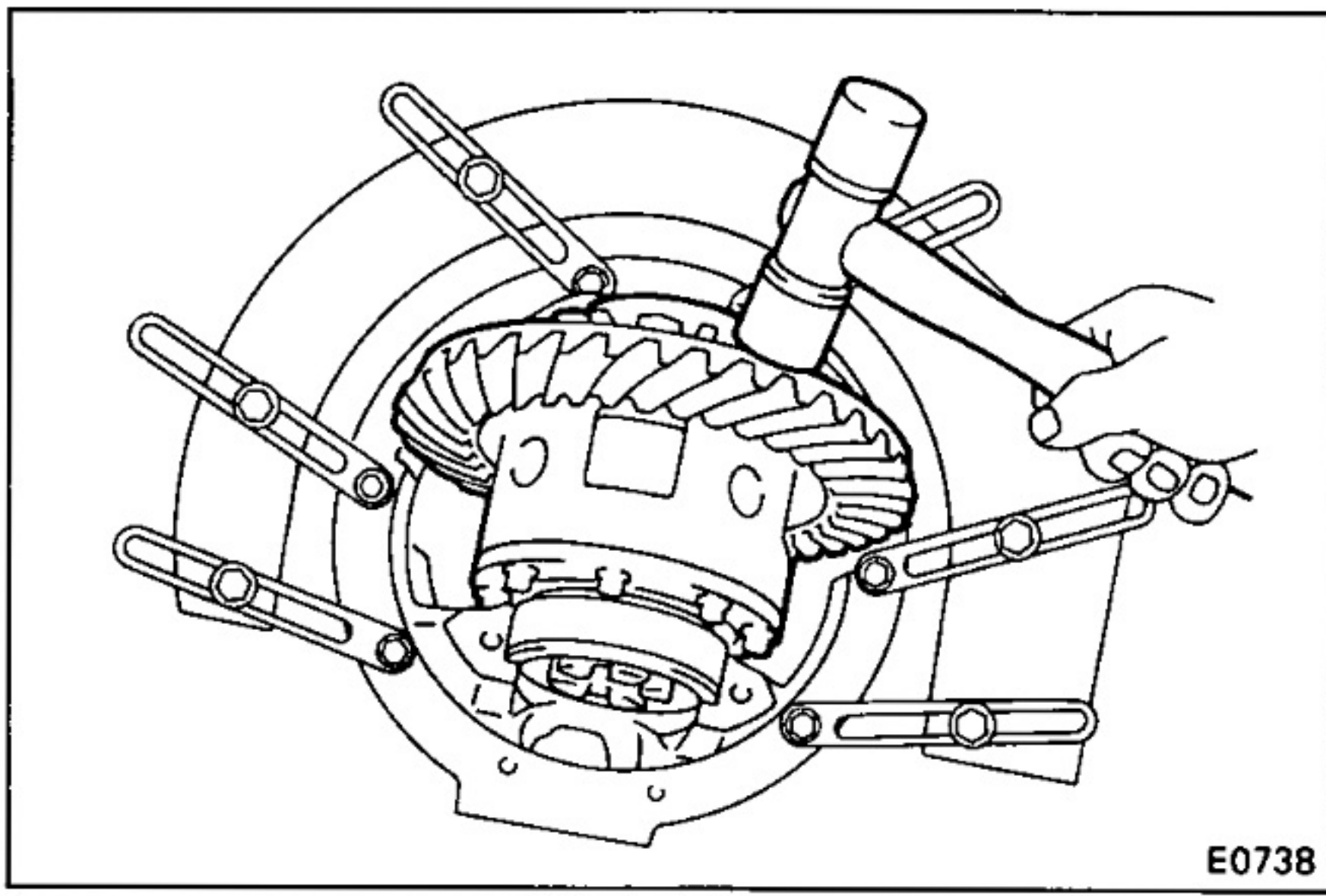


## 9. INSTALL DIFFERENTIAL CASE IN CARRIER

- (a) Place the bearing outer races on their respective bearings. Make sure the left and right races are not interchanged.
- (b) Install the assembled plate washer onto the side bearing.

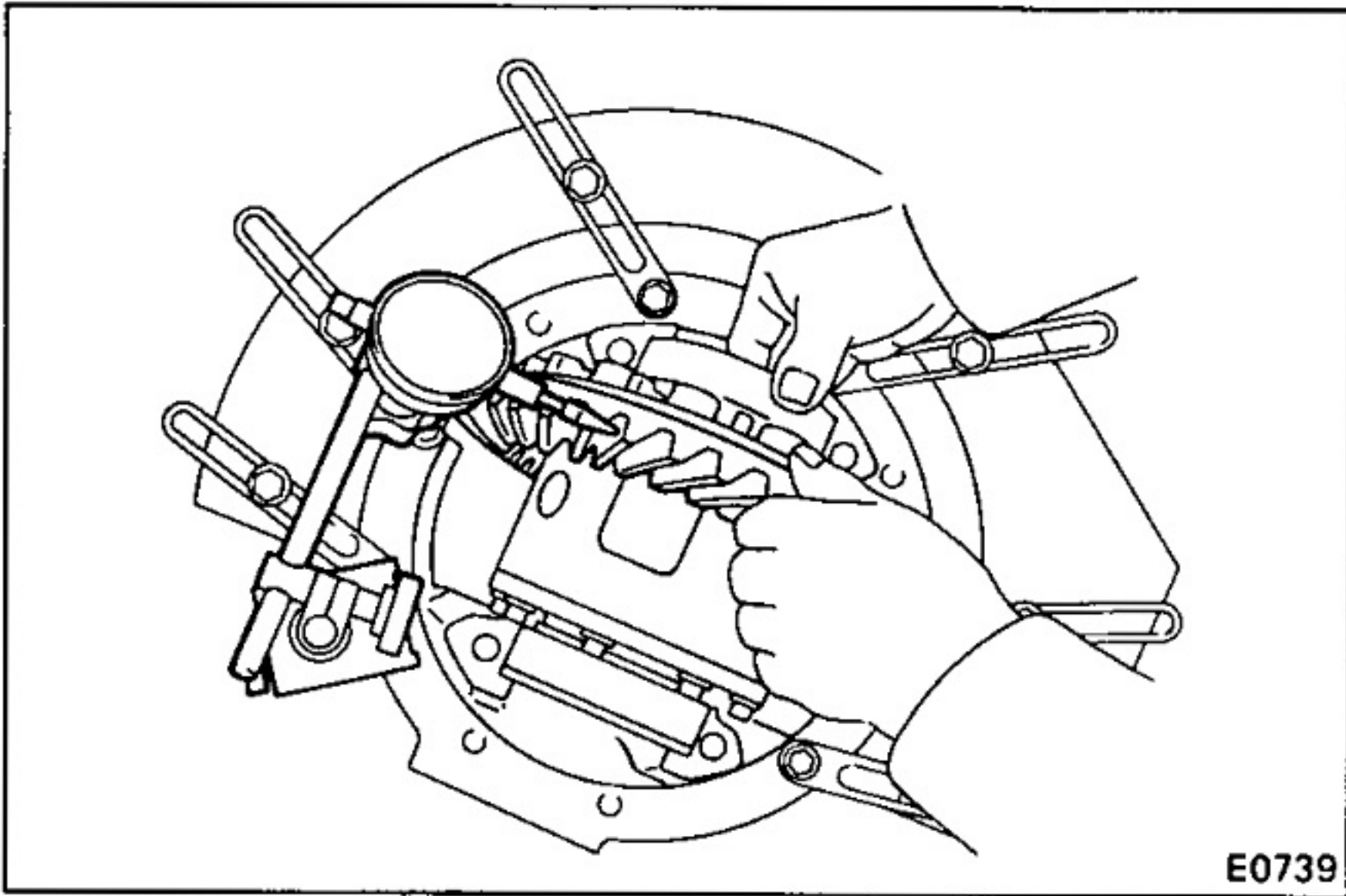


- (c) Install the differential case in the carrier.



(d) Snug down the washer and bearing by tapping on the ring gear with a plastic hammer.

NOTE: If it is difficult to install the differential case into the carrier, replace the plate washer with a thinner one. However, select a plate washer that allows no clearance between it and the carrier.



**10. ADJUST RING GEAR BACKLASH**

(a) Hold the side bearing of the ring gear side and measure the backlash.

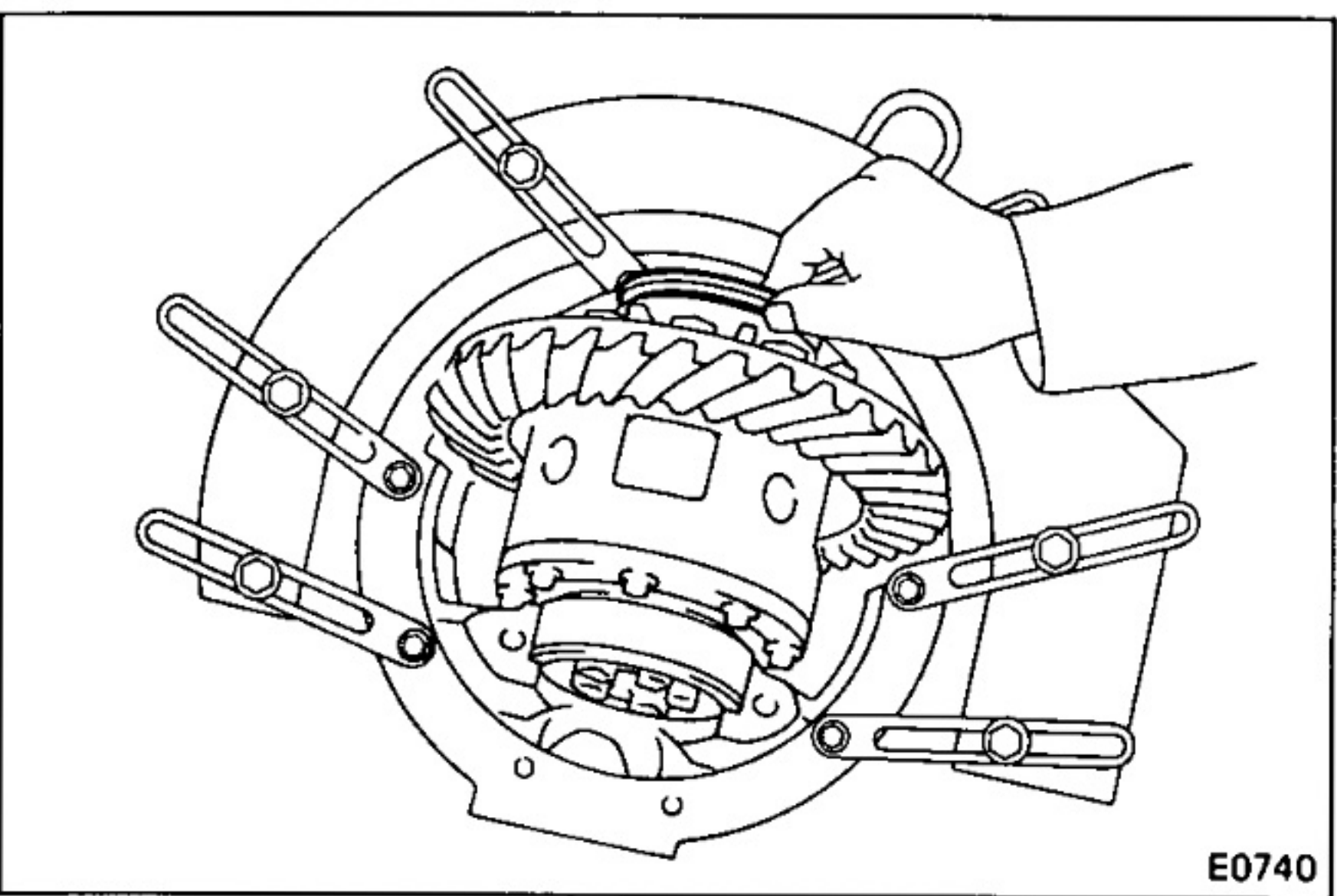
**Backlash (reference): 0.15 mm (0.0059 in.)**

(b) Select a case cover side plate washer using the backlash as reference.

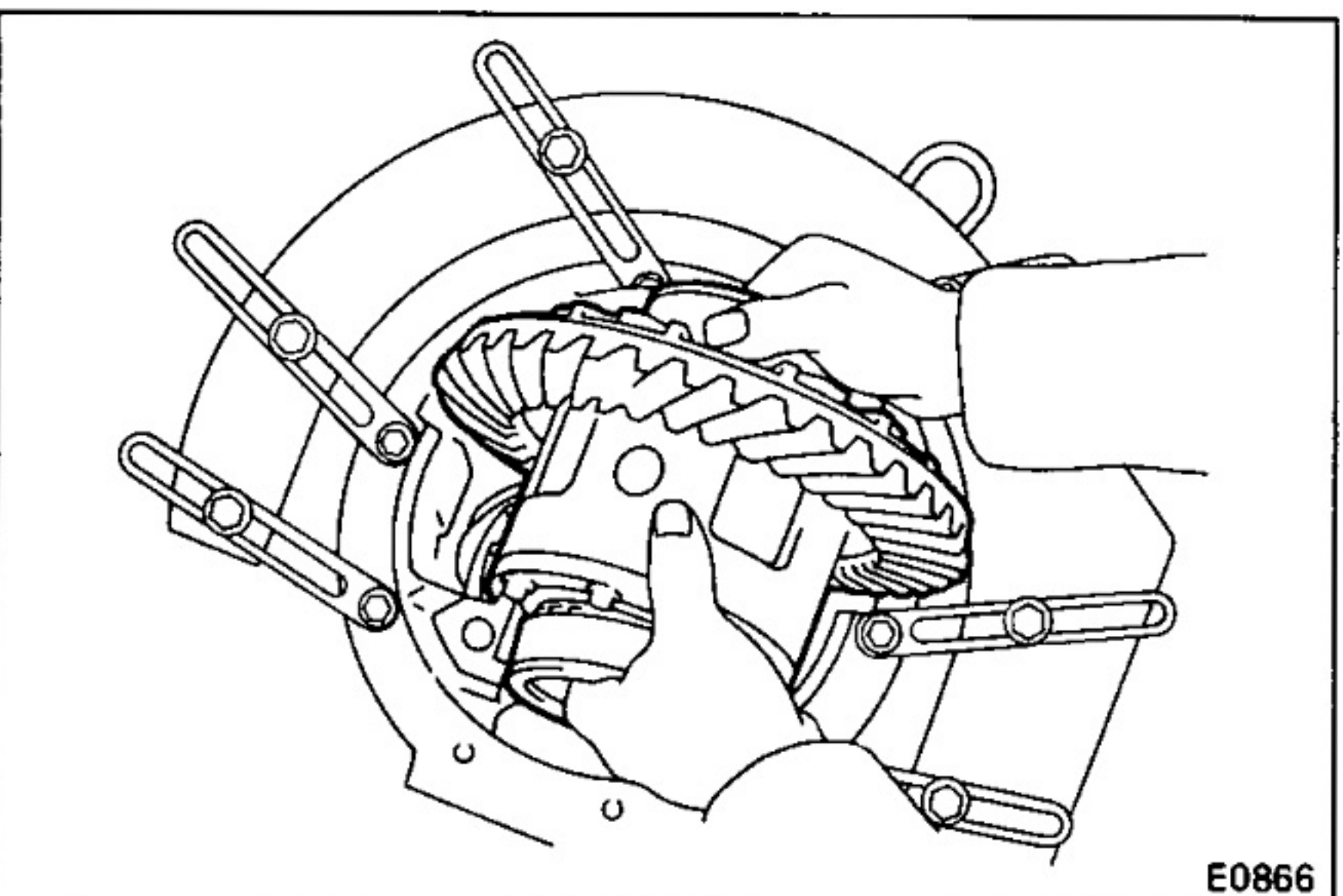
Plate washer thickness

mm (in.)

Mark	Thickness	Mark	Thickness	Mark	Thickness
1	2.66 – 2.68 (0.1047 – 0.1055)	9	2.90 – 2.92 (0.1142 – 0.1150)	17	3.14 – 3.16 (0.1236 – 0.1244)
2	2.69 – 2.71 (0.1059 – 0.1067)	10	2.93 – 2.95 (0.1154 – 0.1161)	18	3.17 – 3.19 (0.1248 – 0.1256)
3	2.72 – 2.74 (0.1071 – 0.1079)	11	2.96 – 2.98 (0.1165 – 0.1173)	19	3.20 – 3.22 (0.1260 – 0.1268)
4	2.75 – 2.77 (0.1083 – 0.1091)	12	2.99 – 3.01 (0.1177 – 0.1185)	20	3.23 – 3.25 (0.1272 – 0.1280)
5	2.78 – 2.80 (0.1094 – 0.1102)	13	3.02 – 3.04 (0.1189 – 0.1197)	21	3.26 – 3.28 (0.1283 – 0.1291)
6	2.81 – 2.83 (0.1106 – 0.1114)	14	3.05 – 3.07 (0.1201 – 0.1209)	22	3.29 – 3.31 (0.1295 – 0.1303)
7	2.84 – 2.86 (0.1118 – 0.1126)	15	3.08 – 3.10 (0.1213 – 0.1220)	23	3.32 – 3.34 (0.1307 – 0.1315)
8	2.87 – 2.89 (0.1130 – 0.1138)	16	3.11 – 3.13 (0.1224 – 0.1232)		

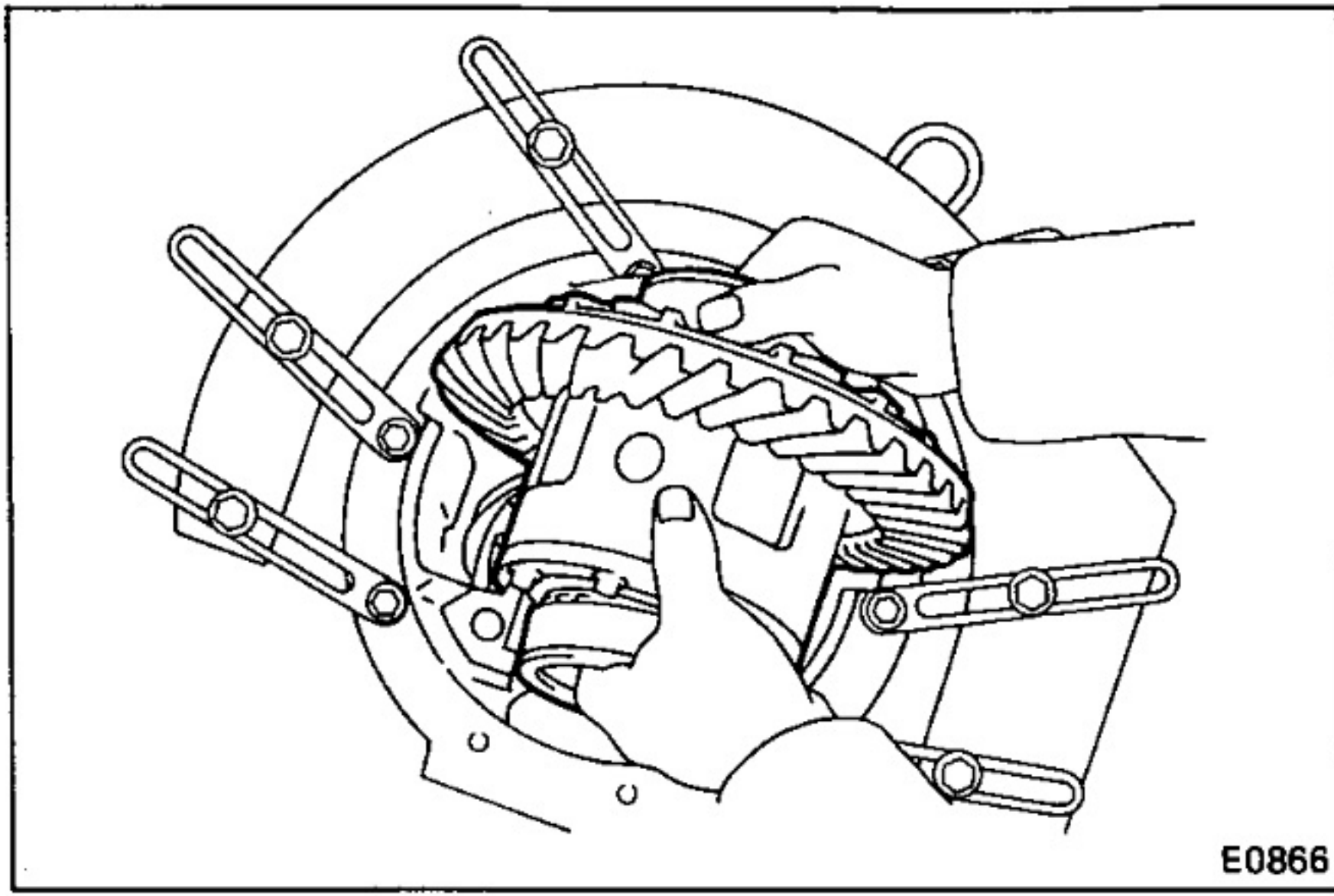


(c) Select a ring gear side plate washer of a thickness which eliminates any clearance between the plate washer and carrier.

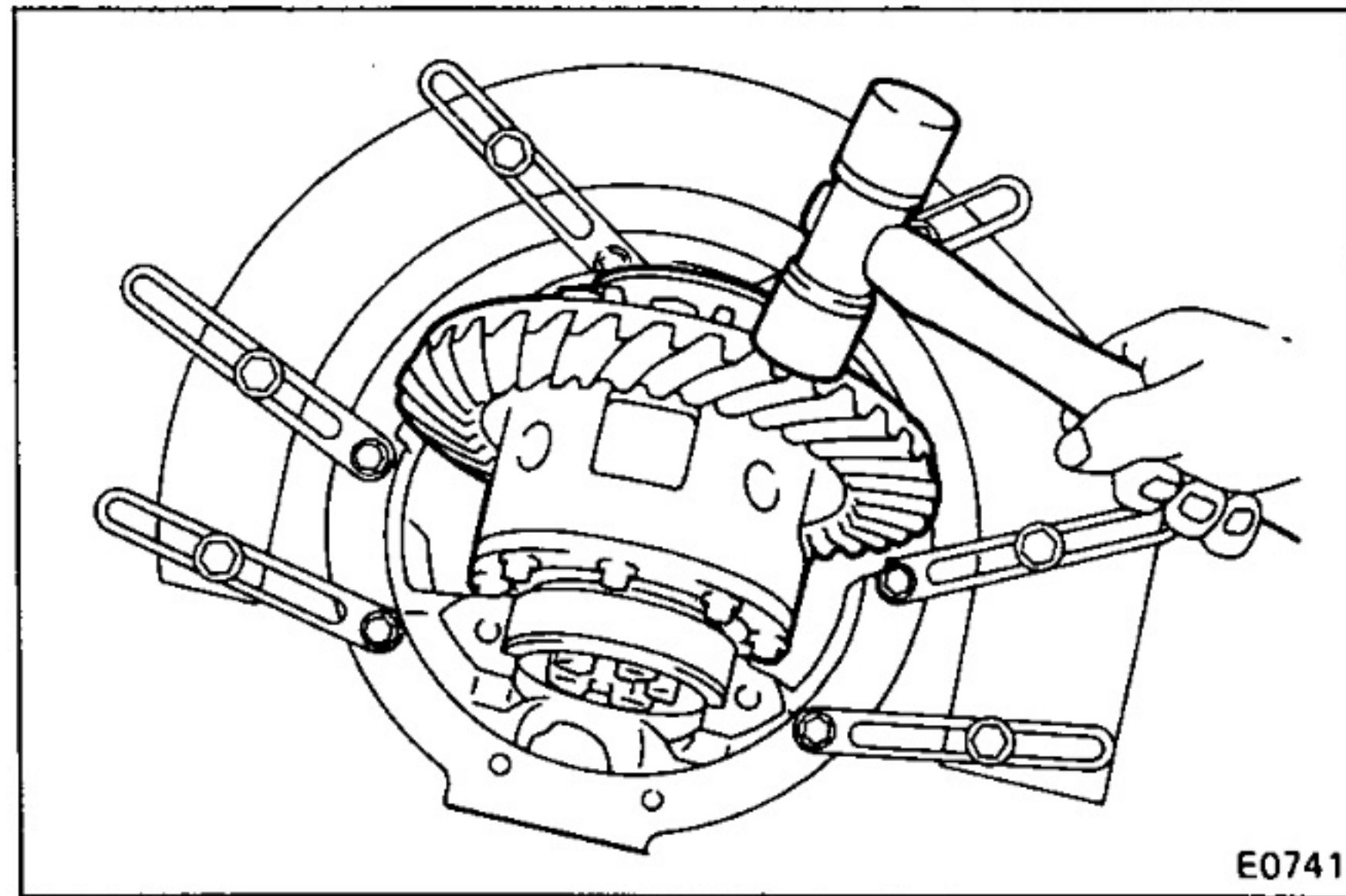


(d) Remove the plate washers and differential case.

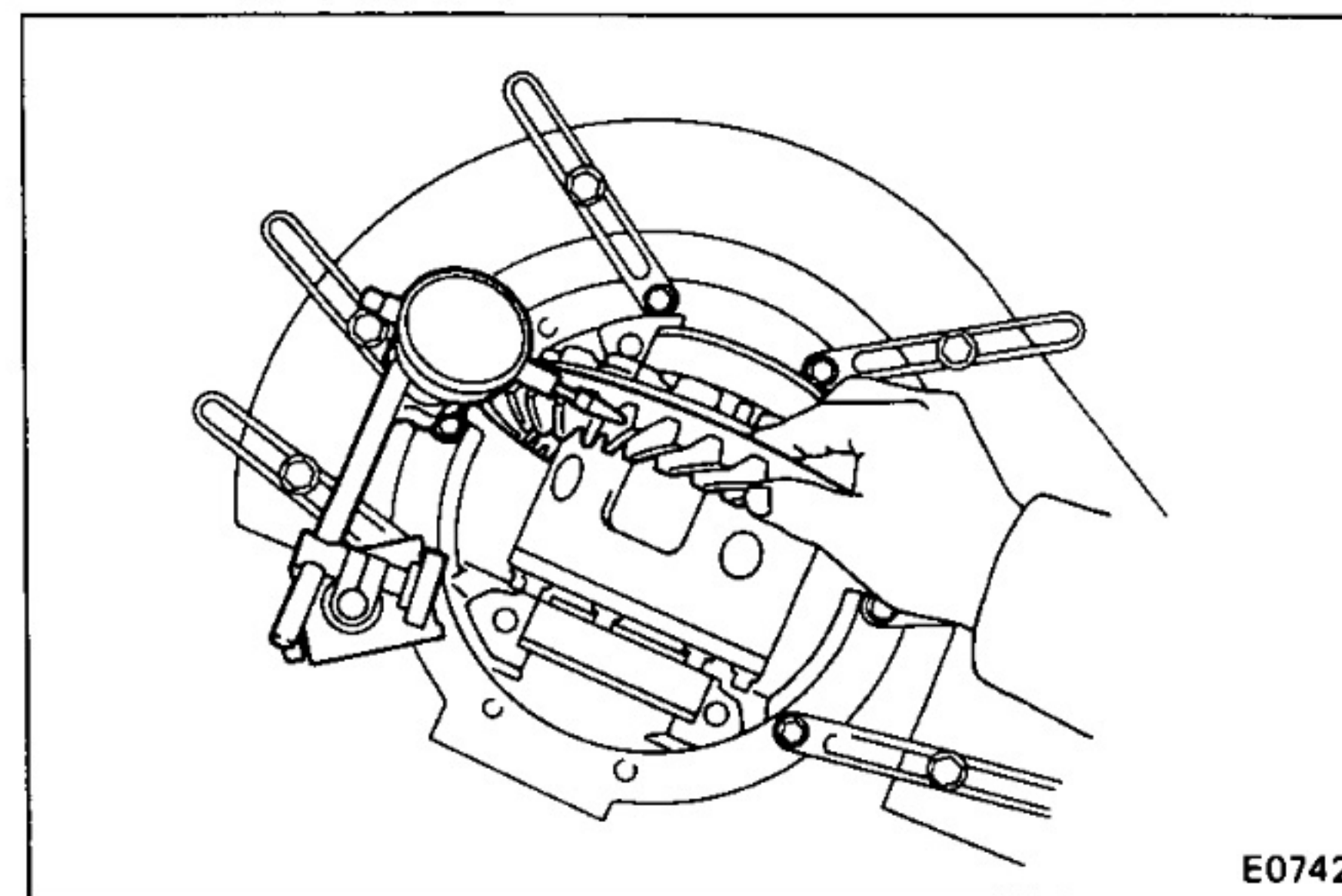
(e) Install the plate washer into the lower part of the carrier.



- (f) Place the plate washer onto the differential case together with the outer race, and install the differential case with the outer race into the carrier.



- (g) Using a plastic hammer, snug down the washer and bearing by tapping the ring gear.



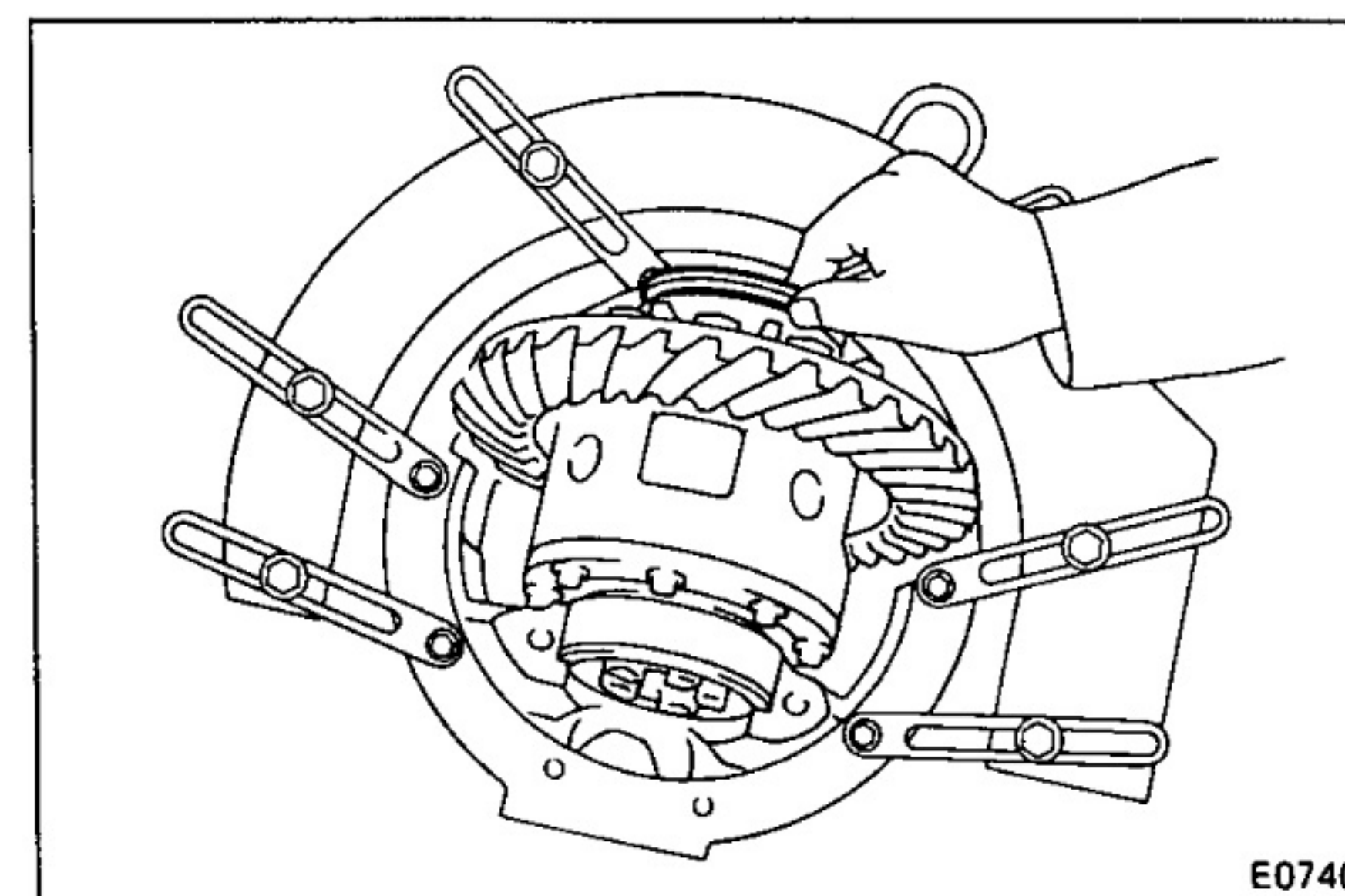
- (h) Measure the ring gear backlash.

**Backlash: 0.15 — 0.20 mm (0.0059 — 0.0079 in.)**

If not within specification, adjust by either increasing or decreasing the number of washers on both sides by an equal amount.

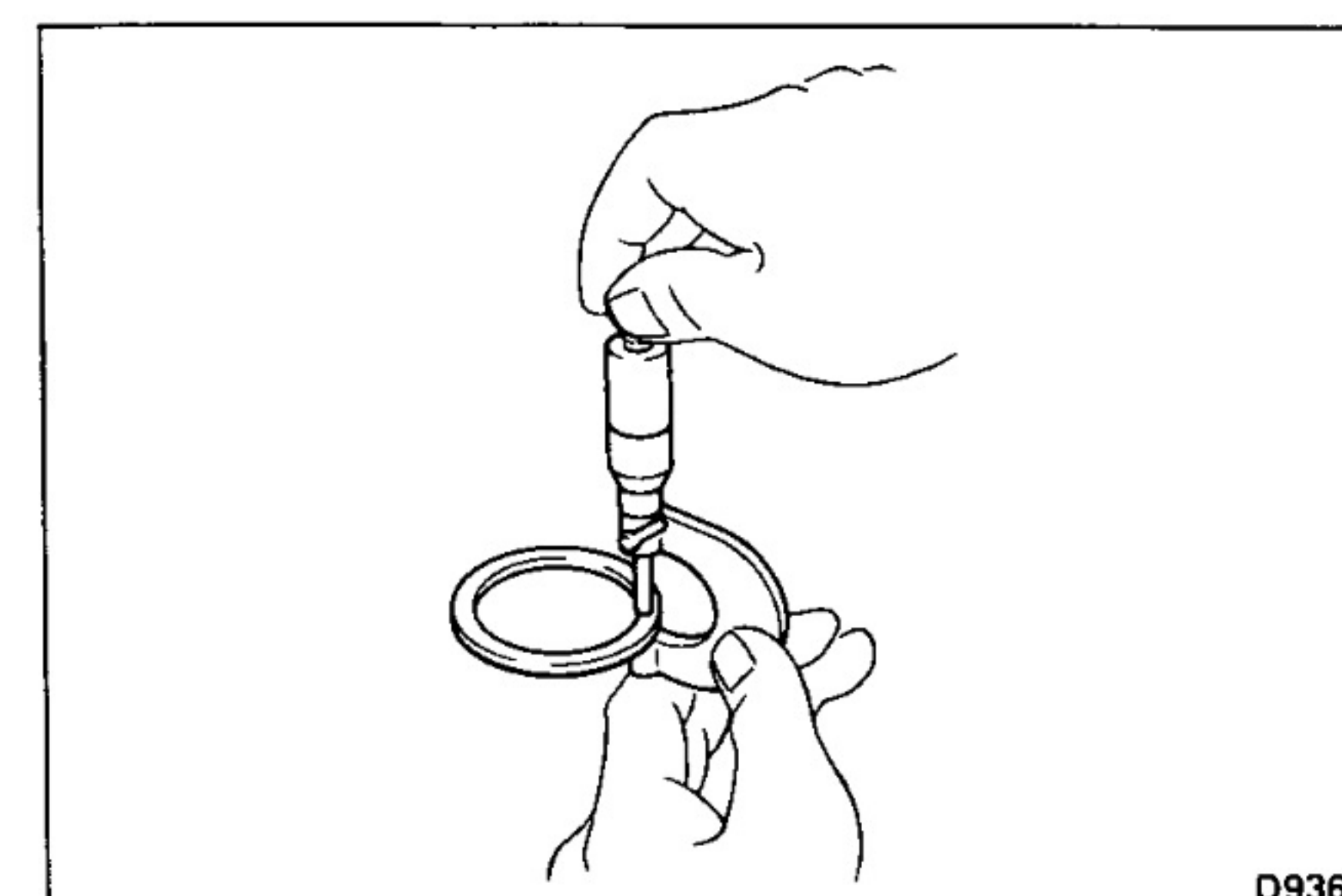
NOTE: There should be no clearance between the plate washer and case.

Insure that there is ring gear backlash.



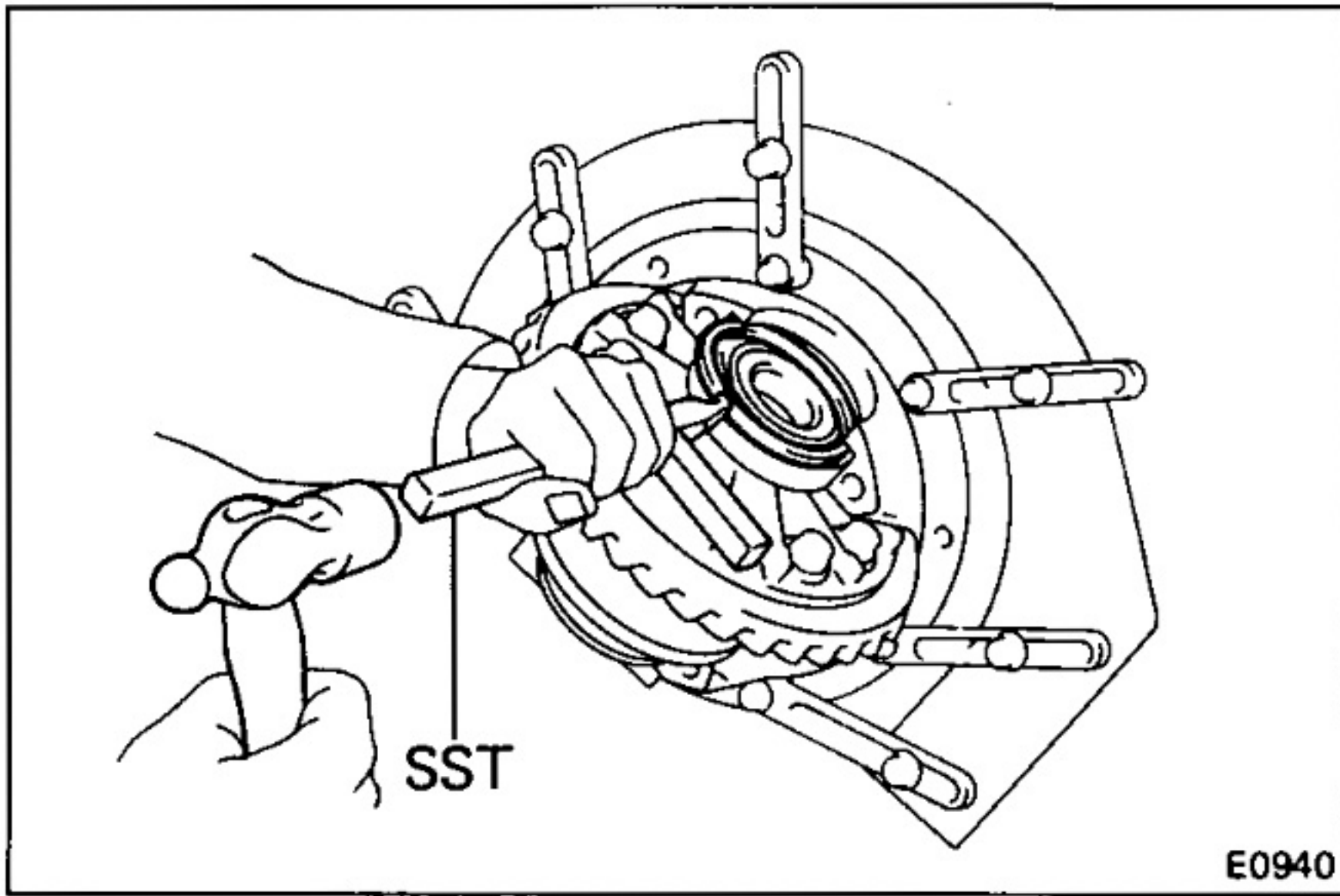
## 11. ADJUST SIDE BEARING PRELOAD

- (a) After adjustment with the backlash as reference, remove the ring gear side plate washer.

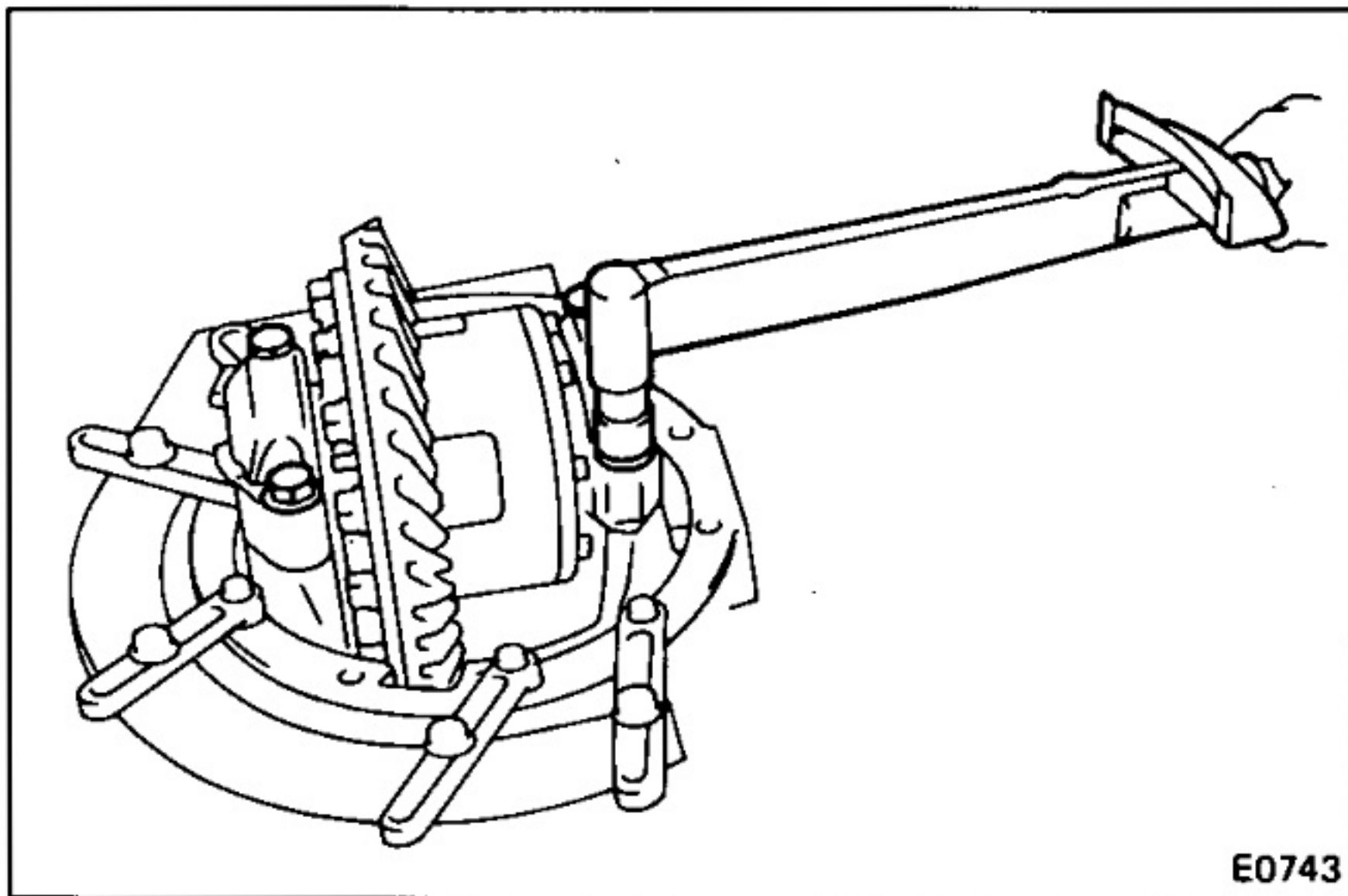


- (b) Measure the thickness of the removed plate washer.  
 (c) Install a new washer of 0,006 — 0.009 mm (0.0024 — 0.0035 in.) thicker than the washer removed.

NOTE: Select a washer which can be pressed in 2/3 of the way with finger.



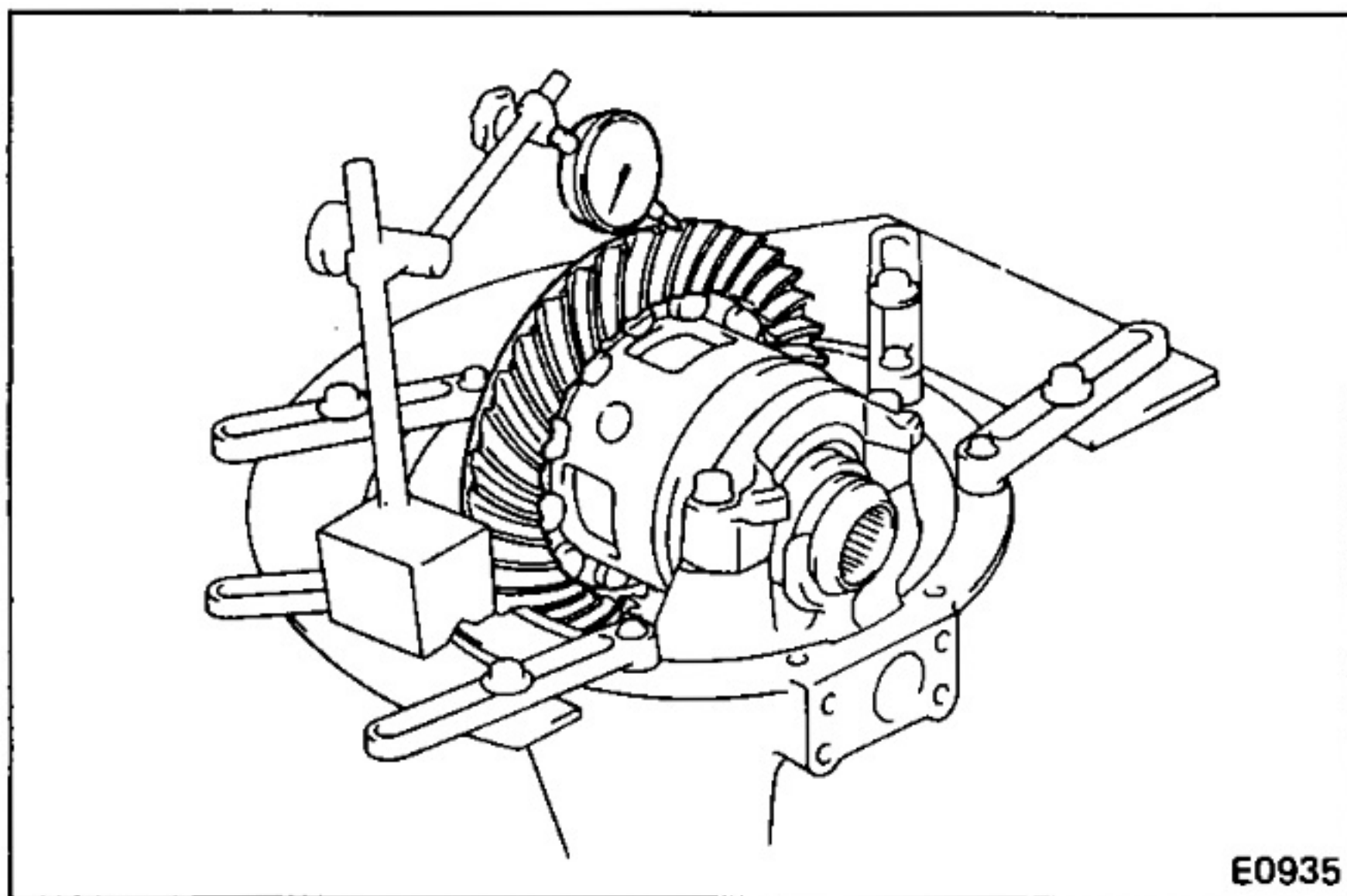
- (d) Using SST, tap in the plate washer.  
SST 09504-22010



## 12. INSTALL SIDE BEARING CAPS

Align the marks on the cap and carrier.

**Torque: 1,150 kg-cm (83 ft-lb, 113 N·m)**



## 13. RECHECK RING GEAR BACKLASH

**Backlash: 0.15 – 0.20 mm (0.0059 – 0.0079 in.)**

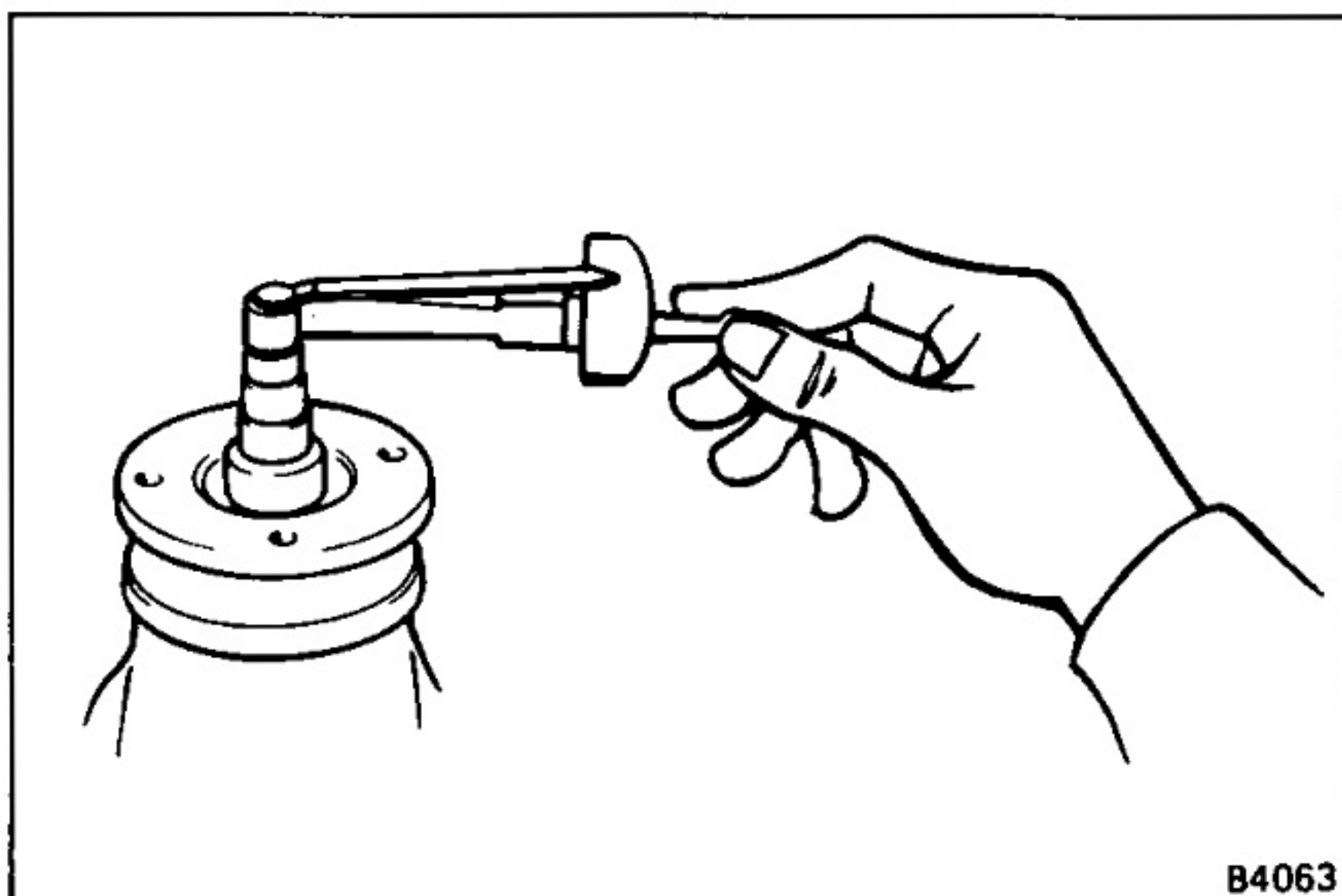
If not within standard, follow the procedure listed below.

If backlash is greater than specification:

Replace the cover side washer with thinner washer. When doing so replace the ring gear side plate washer with one having a thickness equalling the amount the cover side plate washer thickness was decreased.

If backlash is less than specification:

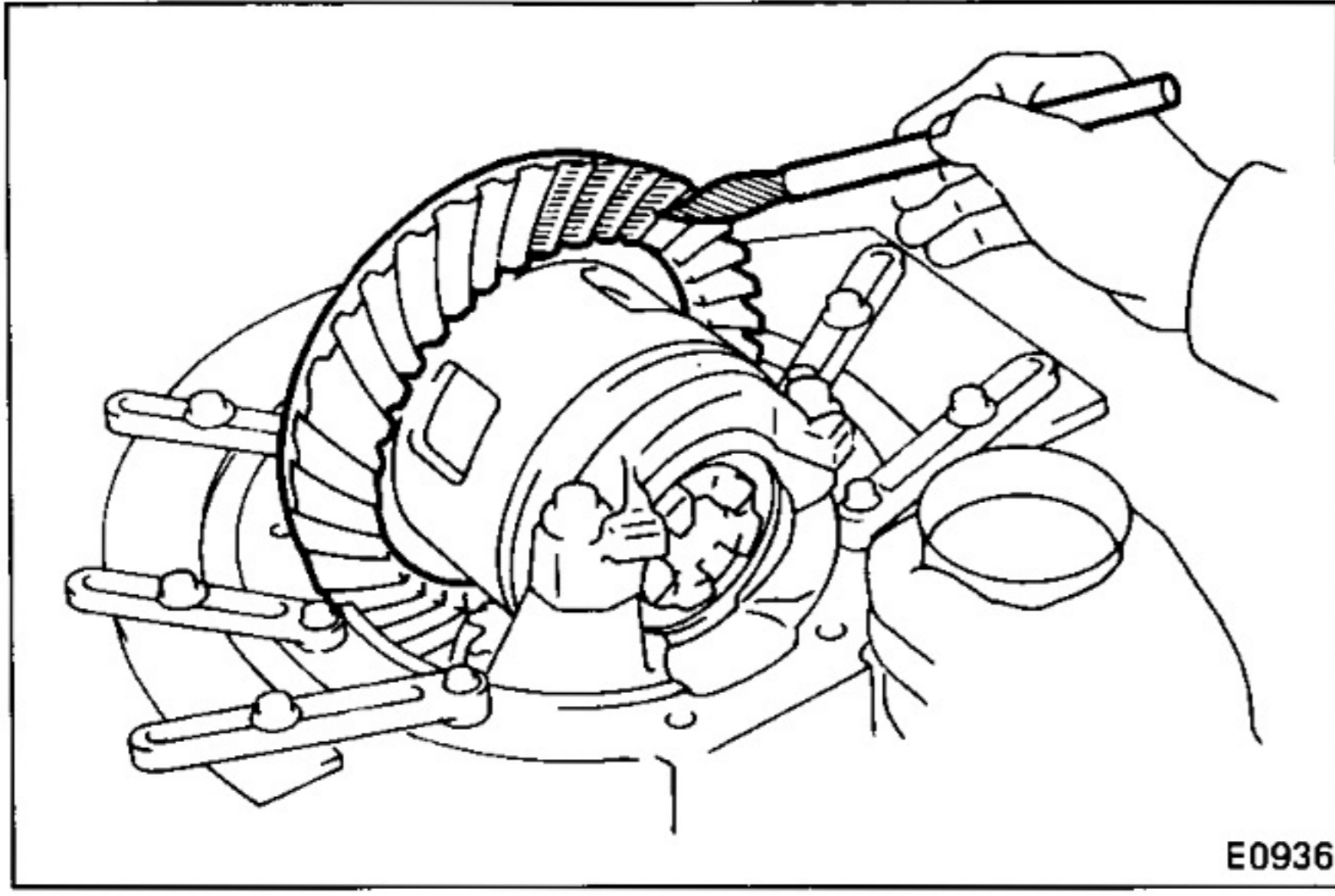
Replace the cover side plate washer with thicker washer. When doing so replace the ring gear side plate washer with one having a thickness equalling the amount the cover side plate washer thickness was increased.



## 14. MEASURE TOTAL PRELOAD

Using a torque wrench, measure the total preload.

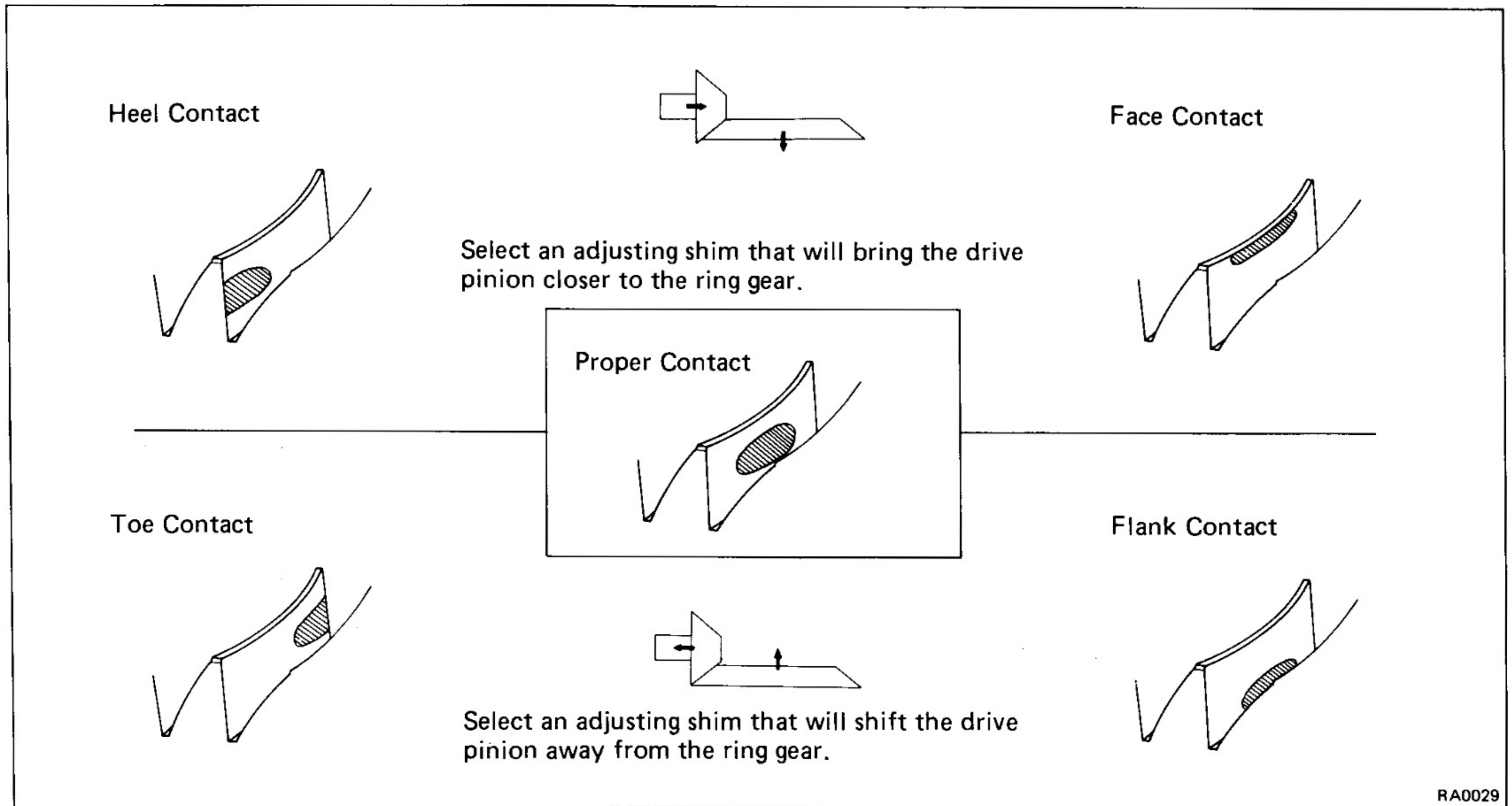
**Total preload: In addition to drive pinion preload  
3 – 7 kg-cm (2.6 – 6.1 in.-lb, 0.3 – 0.7 N·m)**



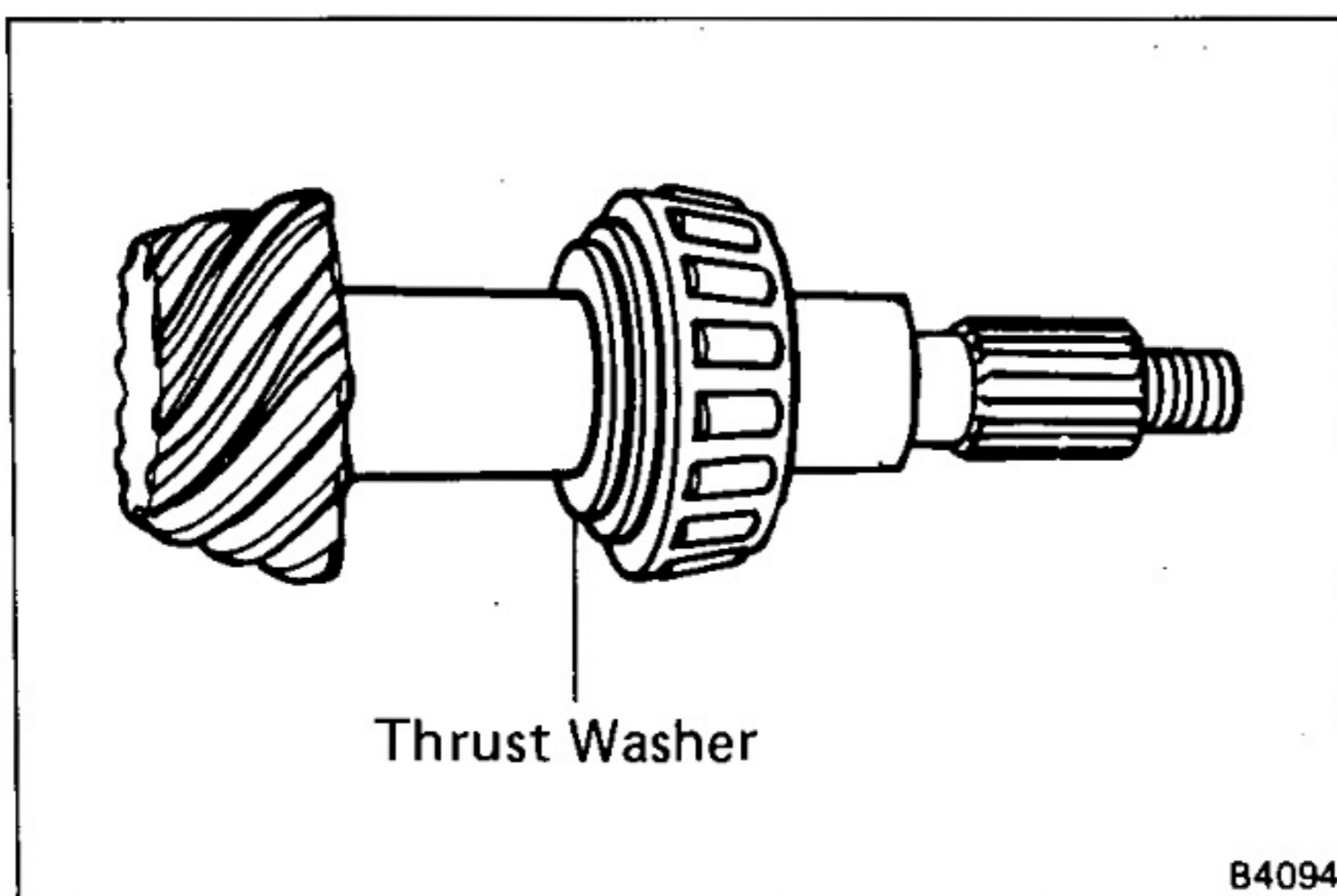
E0936

**15. INSPECT TOOTH CONTACT BETWEEN RING GEAR AND DRIVE PINION**

- (a) Coat 3 or 4 teeth at three different position on the ring gear with red lead.
- (b) Hold the companion flange firmly and rotate the ring gear in both directions.
- (c) Inspect the tooth pattern.



RA0029

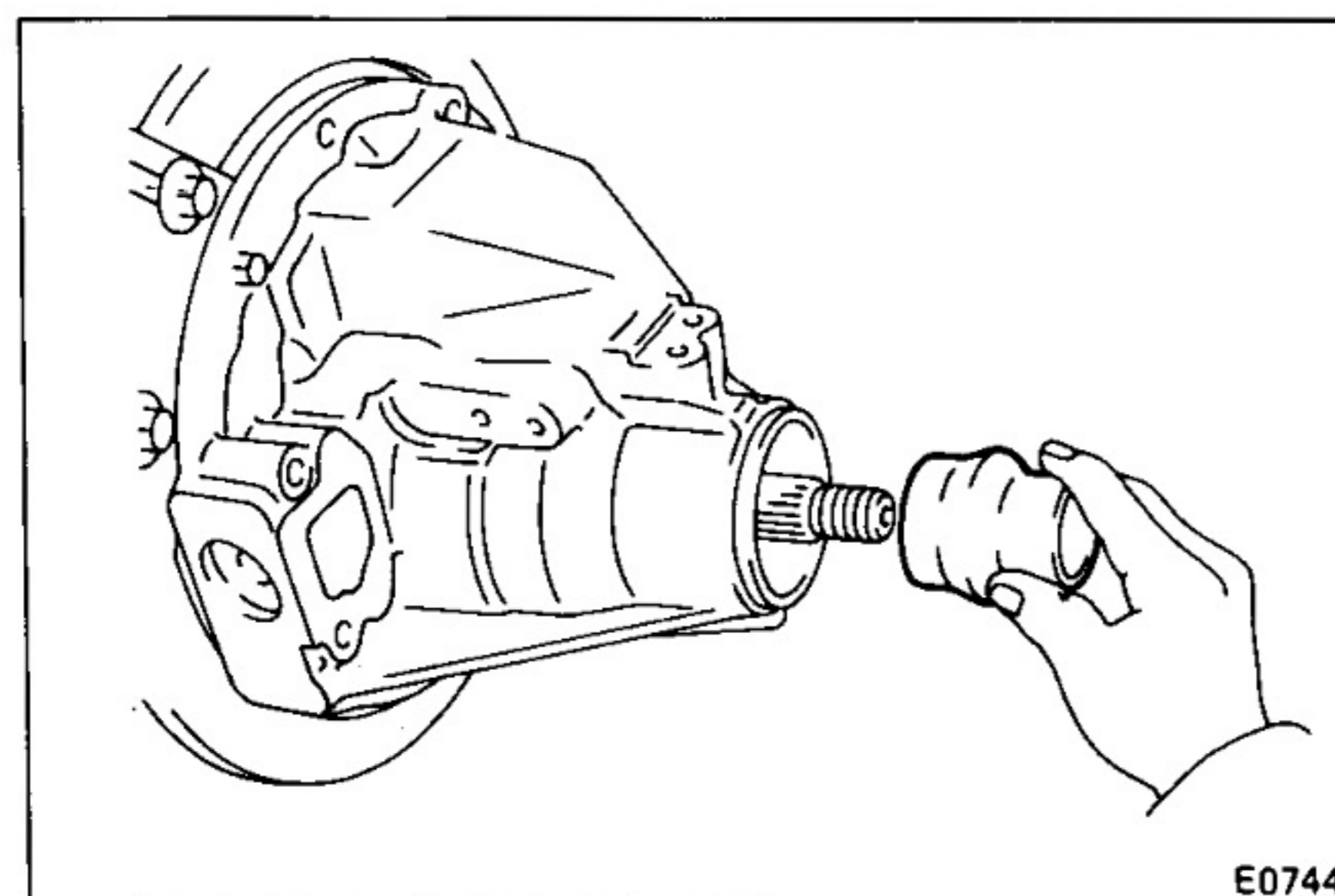


Thrust Washer

B4094

If the teeth are not contacting properly, use the following chart to select a proper washer for correction.

Thrust washer thickness		mm (in.)	
1.05	(0.0413)	1.35	(0.0531)
1.10	(0.0433)	1.40	(0.0551)
1.15	(0.0453)	1.45	(0.0571)
1.20	(0.0492)	1.50	(0.0591)
1.25	(0.0492)	1.55	(0.0610)
1.30	(0.0512)		



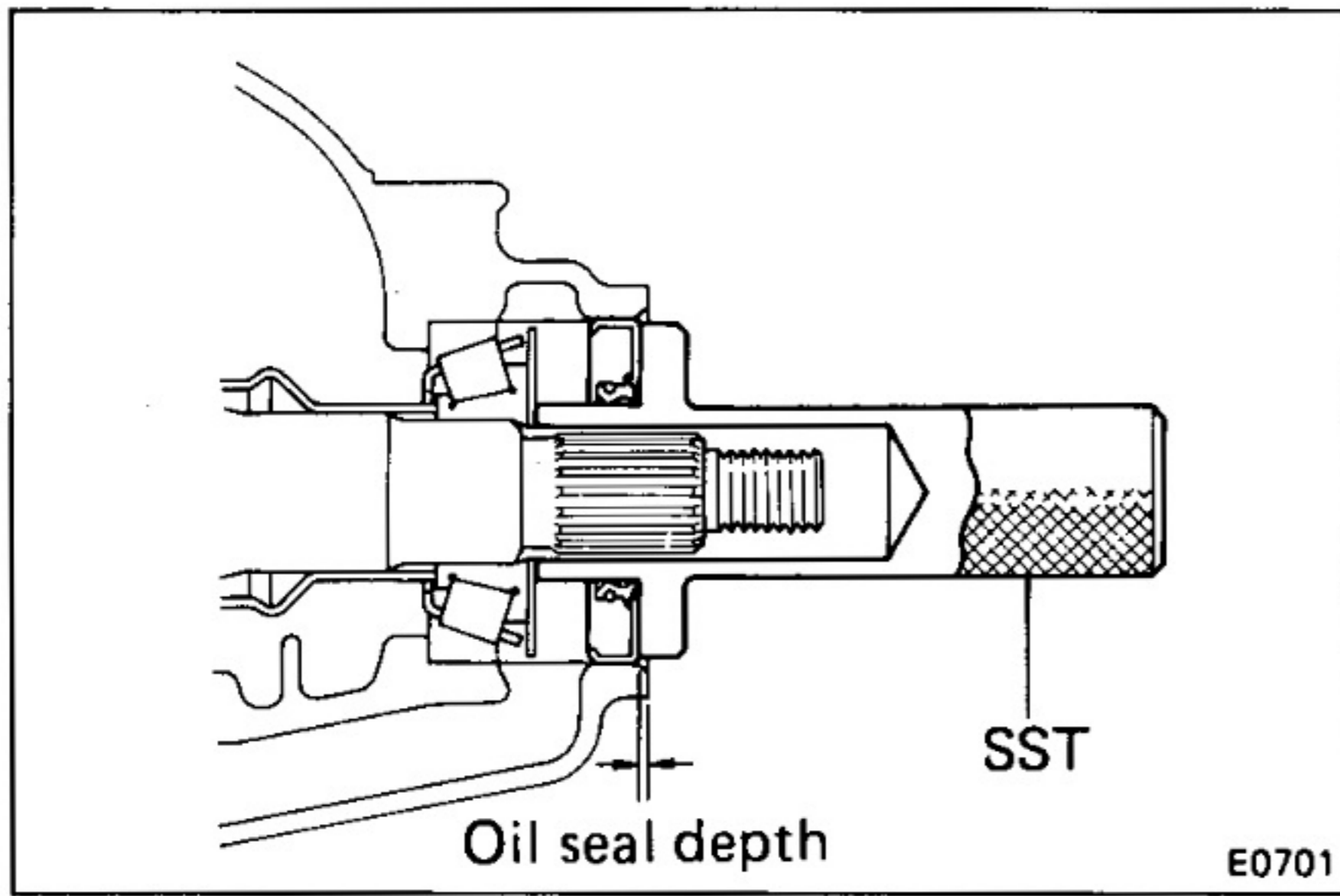
E0744

**16. REMOVE COMPANION FLANGE**

(See page RA-27)

**17. REMOVE FRONT BEARING (See page RA-27)**

**18. INSTALL NEW BEARING SPACER AND FRONT BEARING**



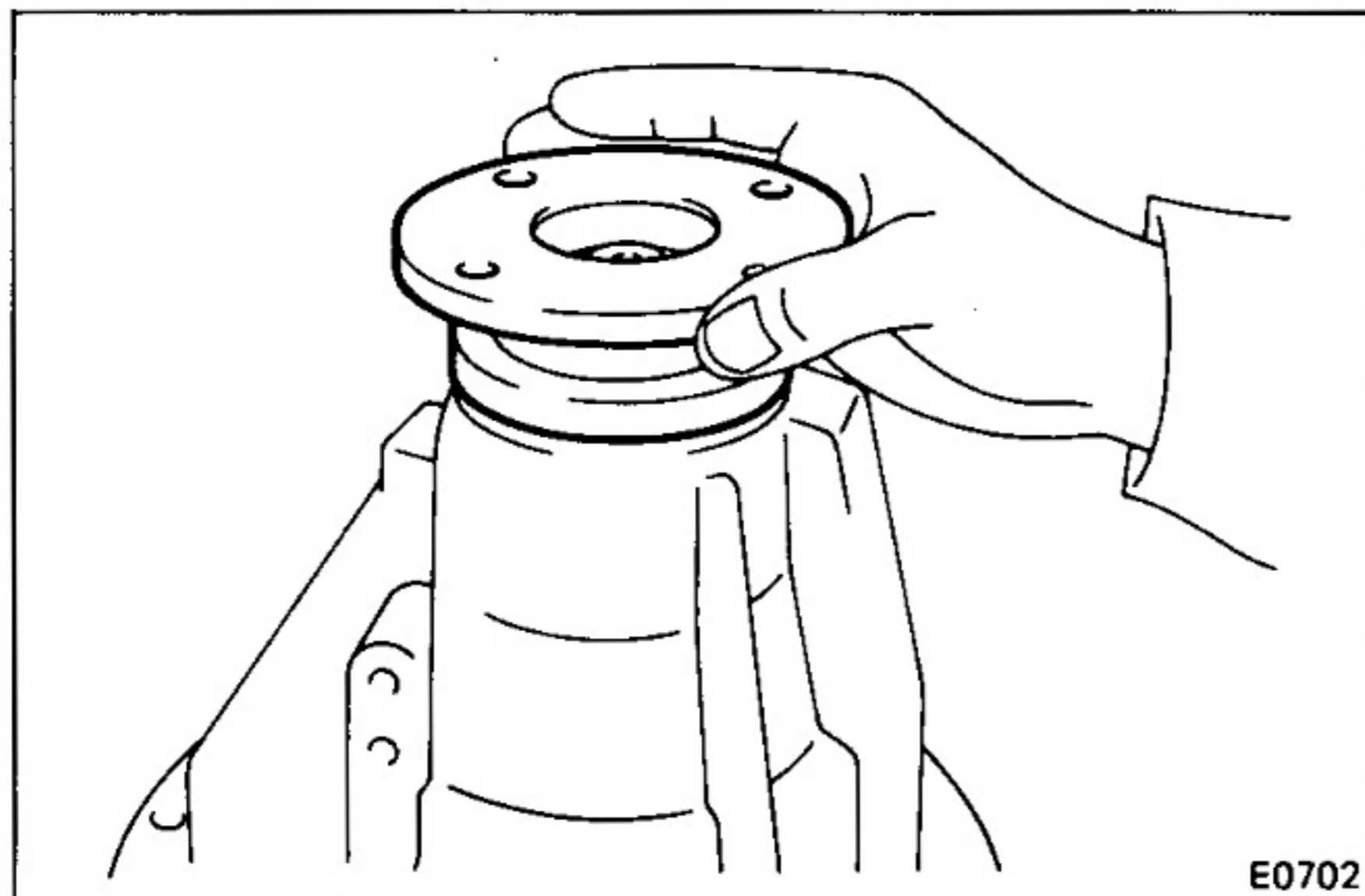
### 19. INSTALL OIL SLINGER AND NEW FRONT OIL SEAL

- (a) Install the oil slinger.
- (b) Using SST, drive in a new oil seal.

SST 09554-30011

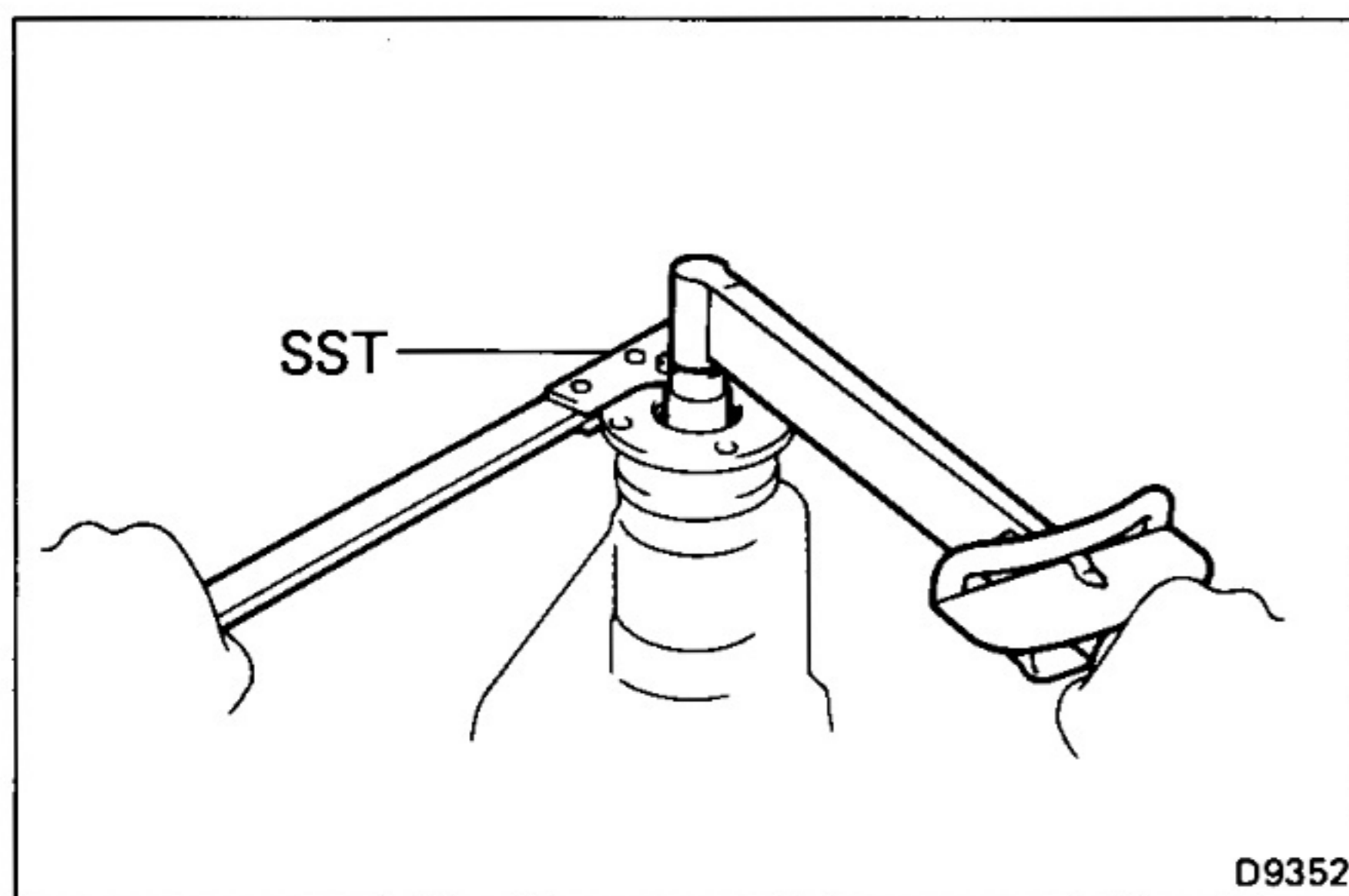
Oil seal drive in depth: 1.5 mm (0.059 in.)

- (c) Apply MP grease to the oil seal lip.



### 20. INSTALL COMPANION FLANGE

- (a) Install the companion flange.

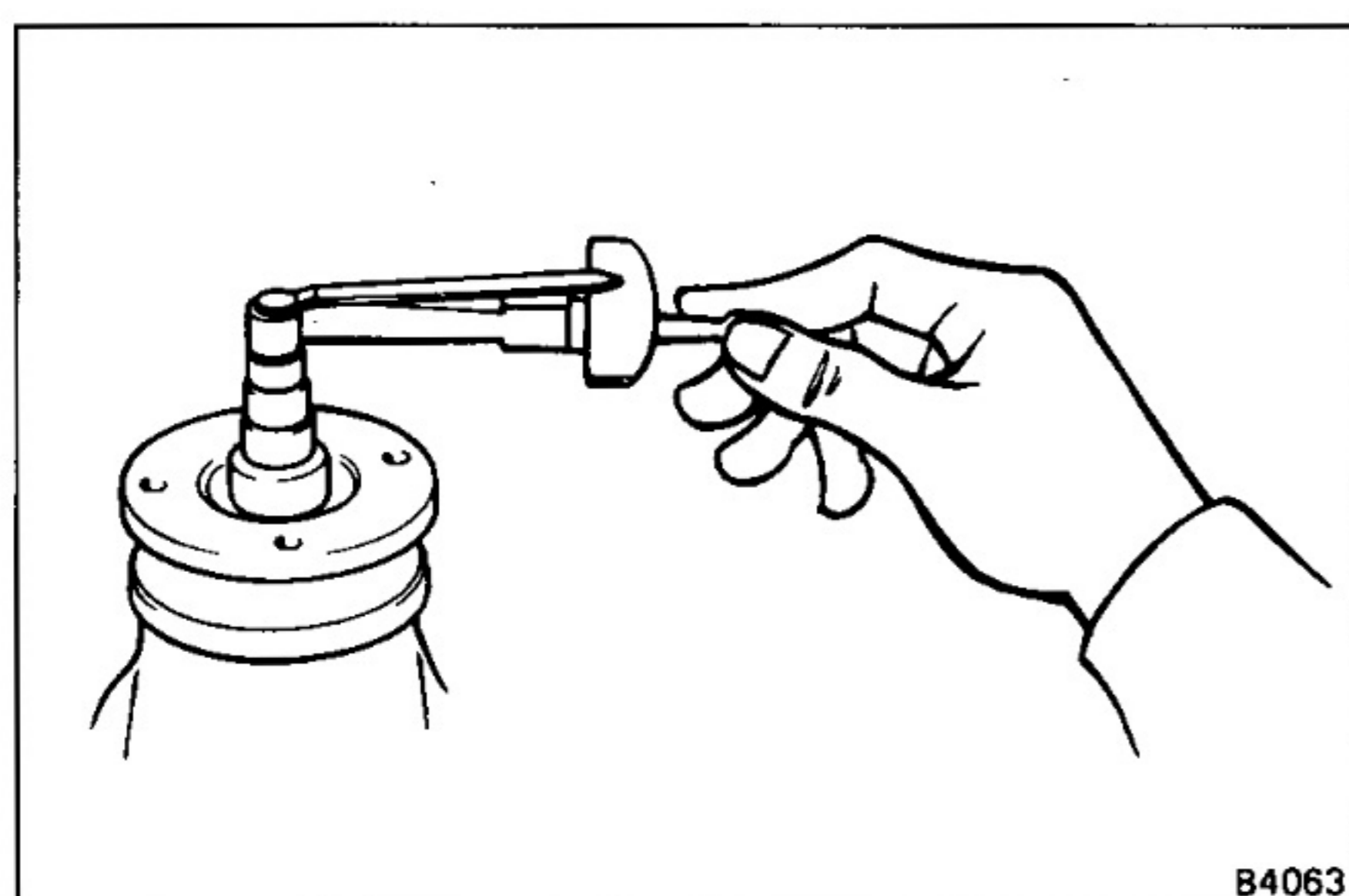


- (b) Coat the threads of a new nut with MP grease.

- (c) Using SST to hold the flange, tighten the nut.

SST 09330-00021

Torque: 2,500 kg-cm (181 ft-lb, 245 N·m)



### 21. CHECK FRONT BEARING PRELOAD

Using a torque wrench, measure the preload of the backlash between the drive pinion and ring gear.

Preload:

New bearing

13 – 20 kg-cm  
(11.3 – 17.4 in.-lb, 1.3 – 2.0 N·m)

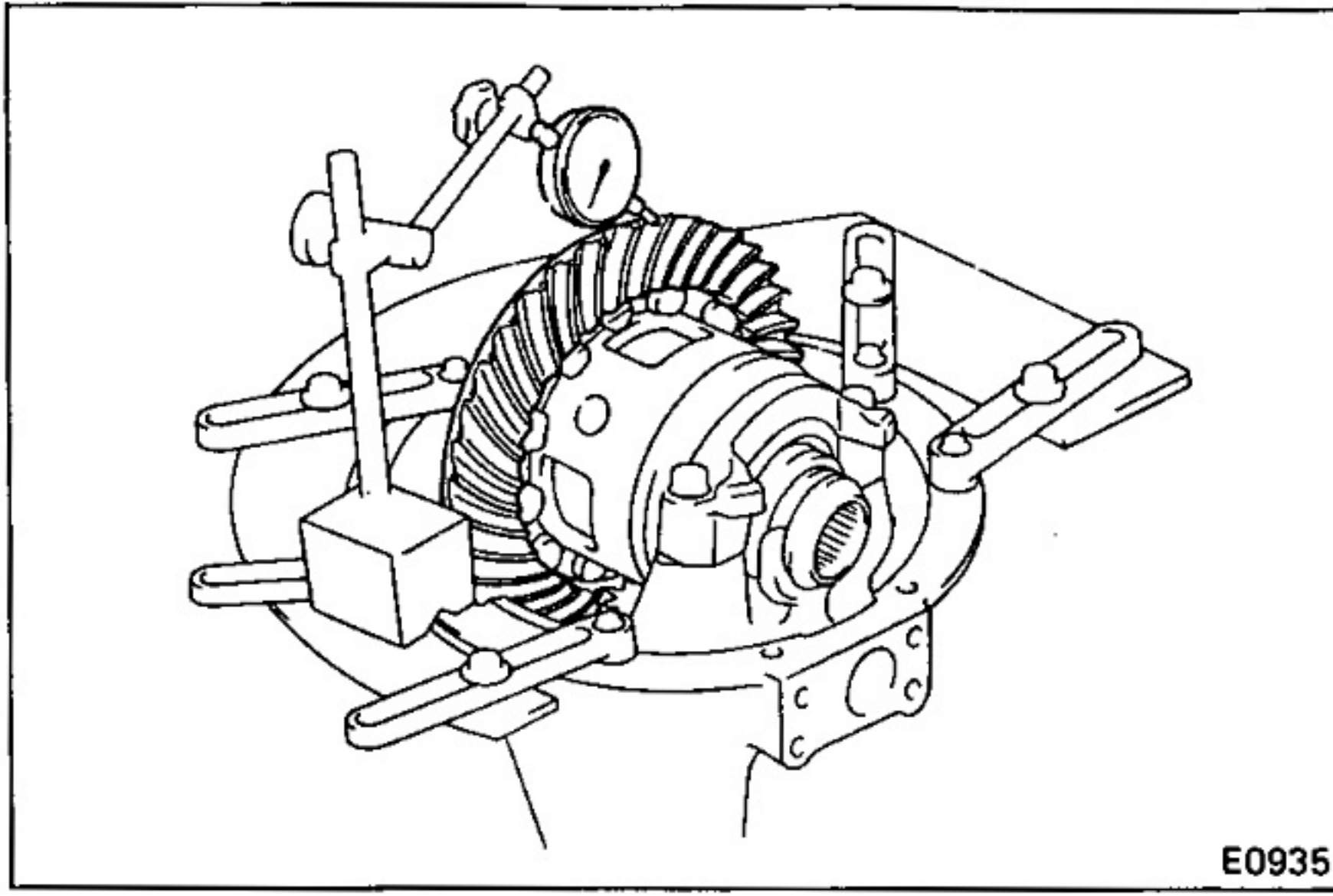
Reused bearing

7 – 10 kg-cm  
(6.1 – 8.7 in.-lb, 0.7 – 1.0 N·m)

- If preload is greater than specification, replace the bearing spacer.
- If preload is less than specification, retighten the nut 130 kg-cm (9 ft-lb, 13 N·m) at a time until the specified preload is reached.

If the maximum torque is exceeded while retightening the nut, replace the bearing spacer and repeat the preload procedure. Do not back off the pinion nut to reduce the preload.

Maximum torque: 3,450 kg-cm (250 ft-lb, 338 N·m)

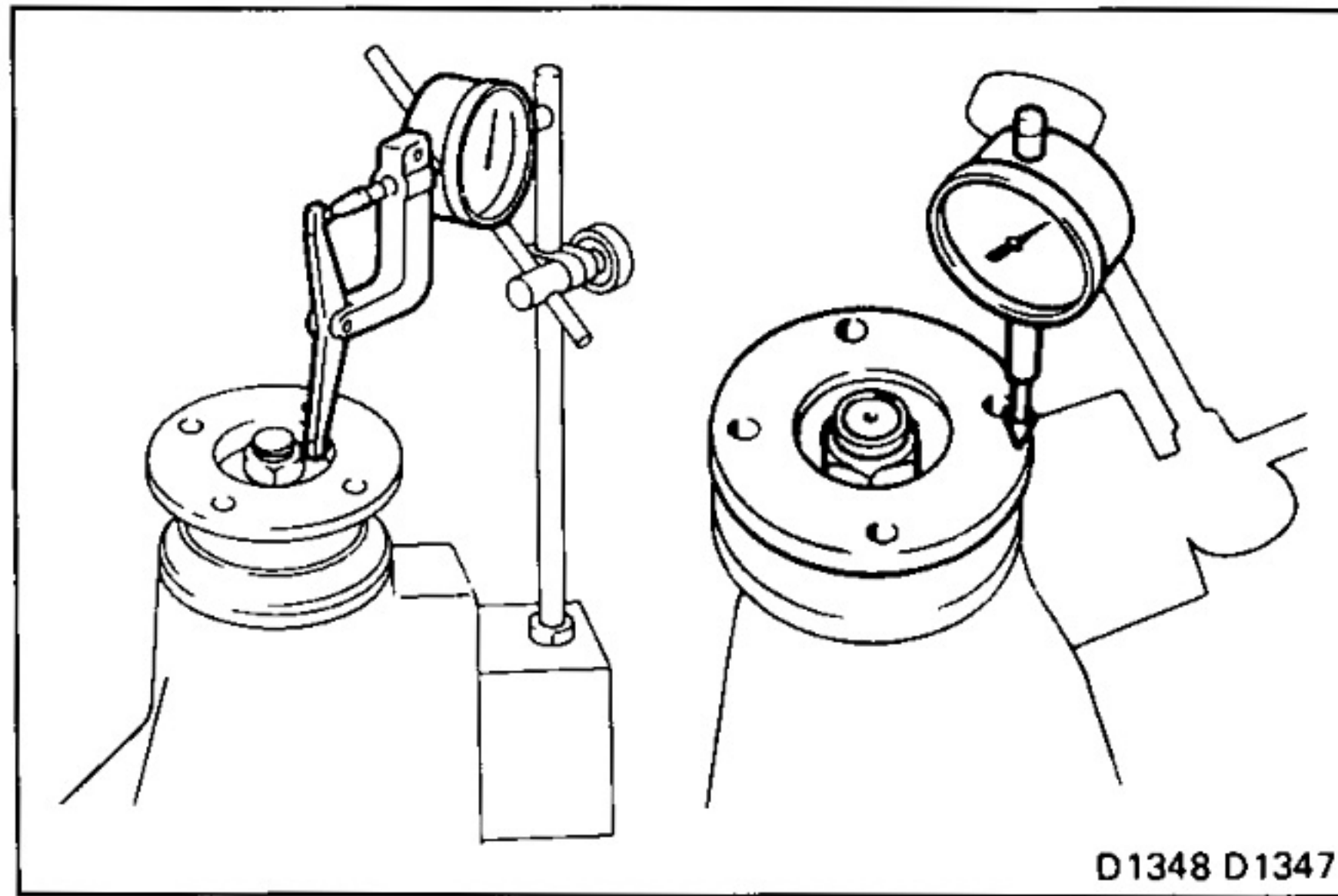


**22. RECHECK RING GEAR BACKLASH**

Backlash: 0.15 – 0.20 mm (0.0059 – 0.0079 in.)

**23. RECHECK TOOTH CONTACT BETWEEN RING GEAR AND DRIVE PINION**

(See page RA-40)



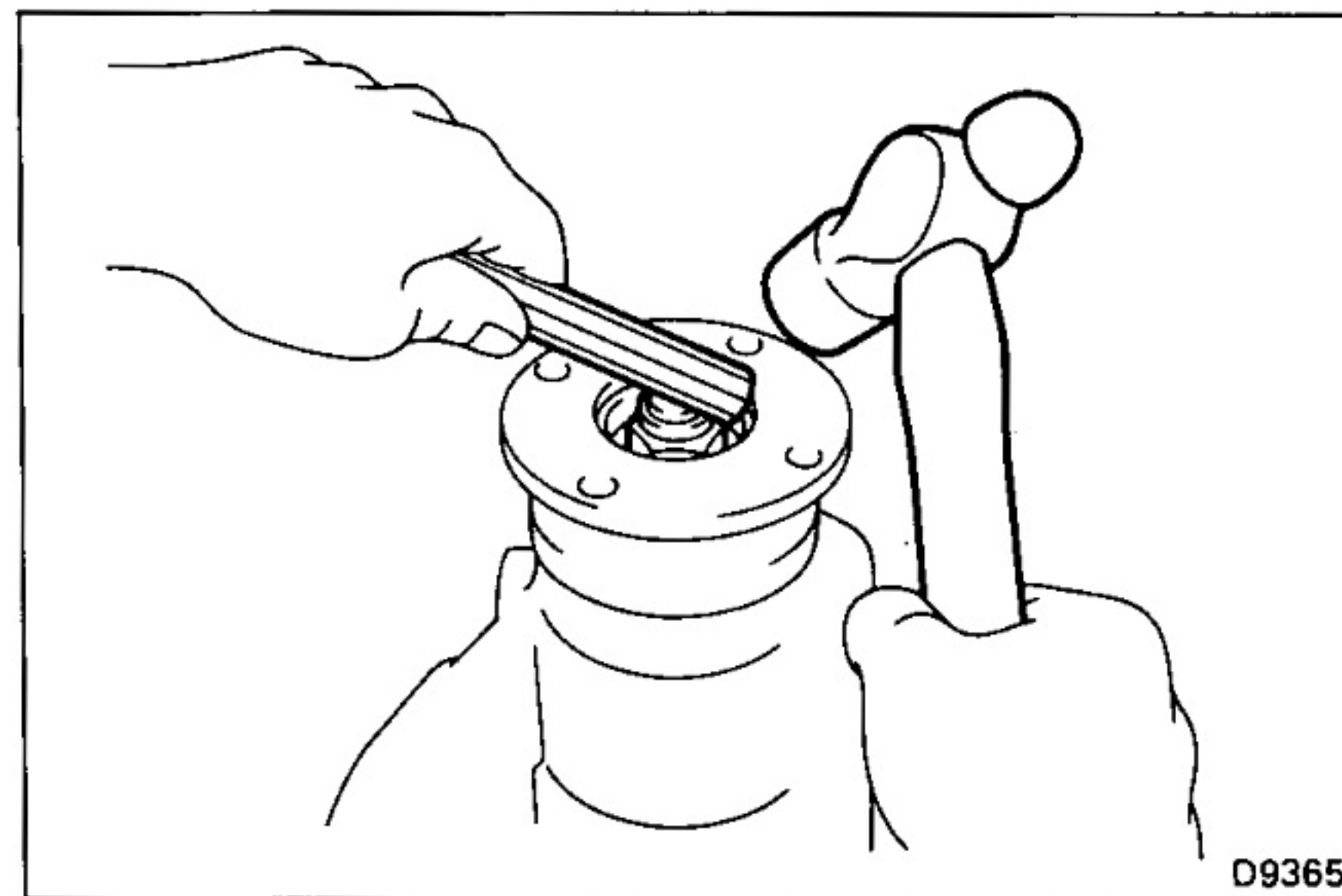
**24. CHECK RUNOUT OF COMPANION FLANGE**

Using a dial indicator, measure the lateral and radial runout of the companion flange.

If the runout is greater than the maximum, inspect the bearing.

**Maximum lateral runout: 0.1 mm (0.004 in.)**

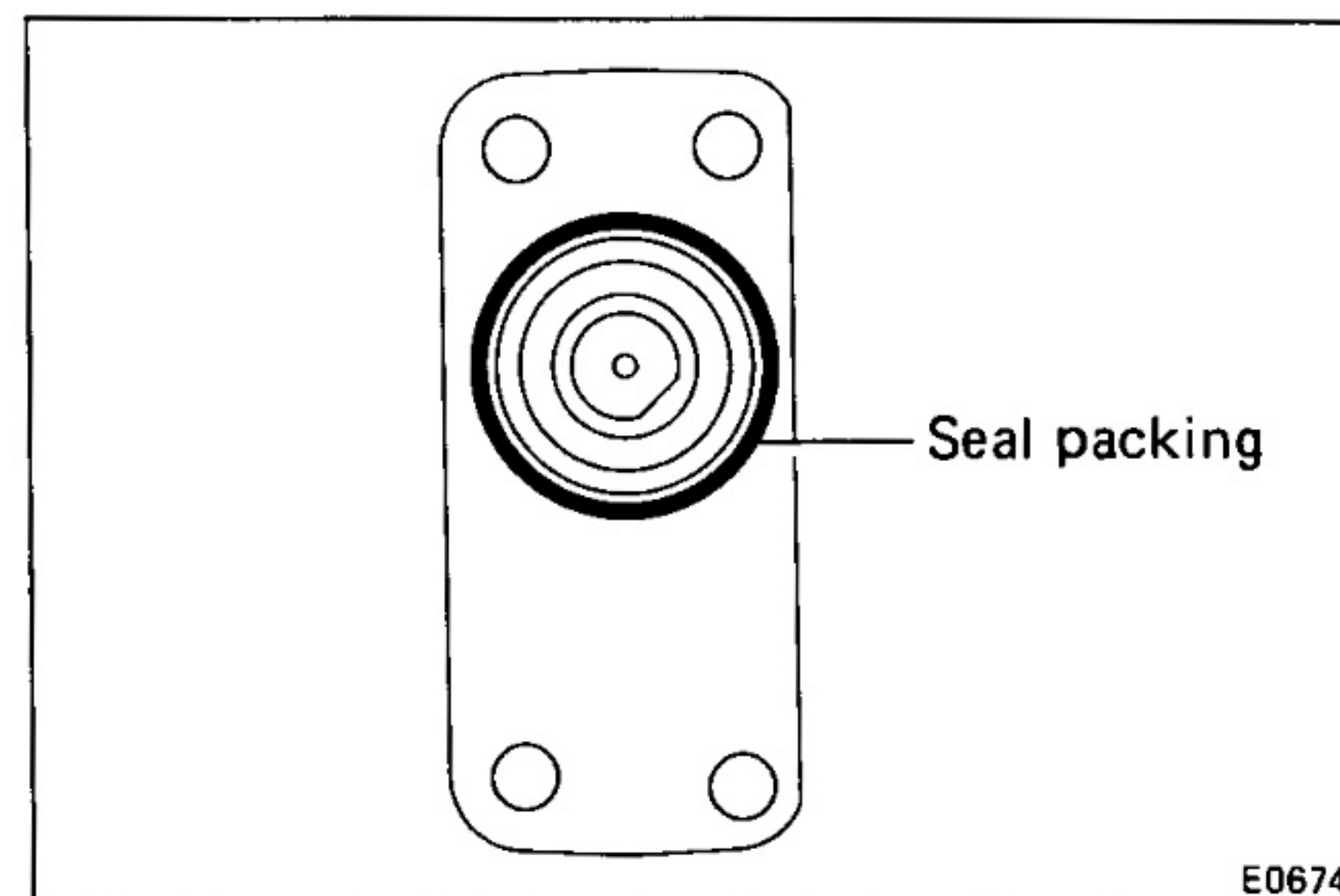
**Maximum radial runout: 0.1 mm (0.004 in.)**



**25. STAKE DRIVE PINION NUT**

**26. INSTALL DIFFERENTIAL LOCK SHIFT FORK**

**27. INSTALL DIFFERENTIAL LOCK SLEEVE**



**28. INSTALL DIFFERENTIAL LOCK CYLINDER ASSEMBLY**

(a) Clean contacting surfaces of any residual packing material using gasoline or alcohol.

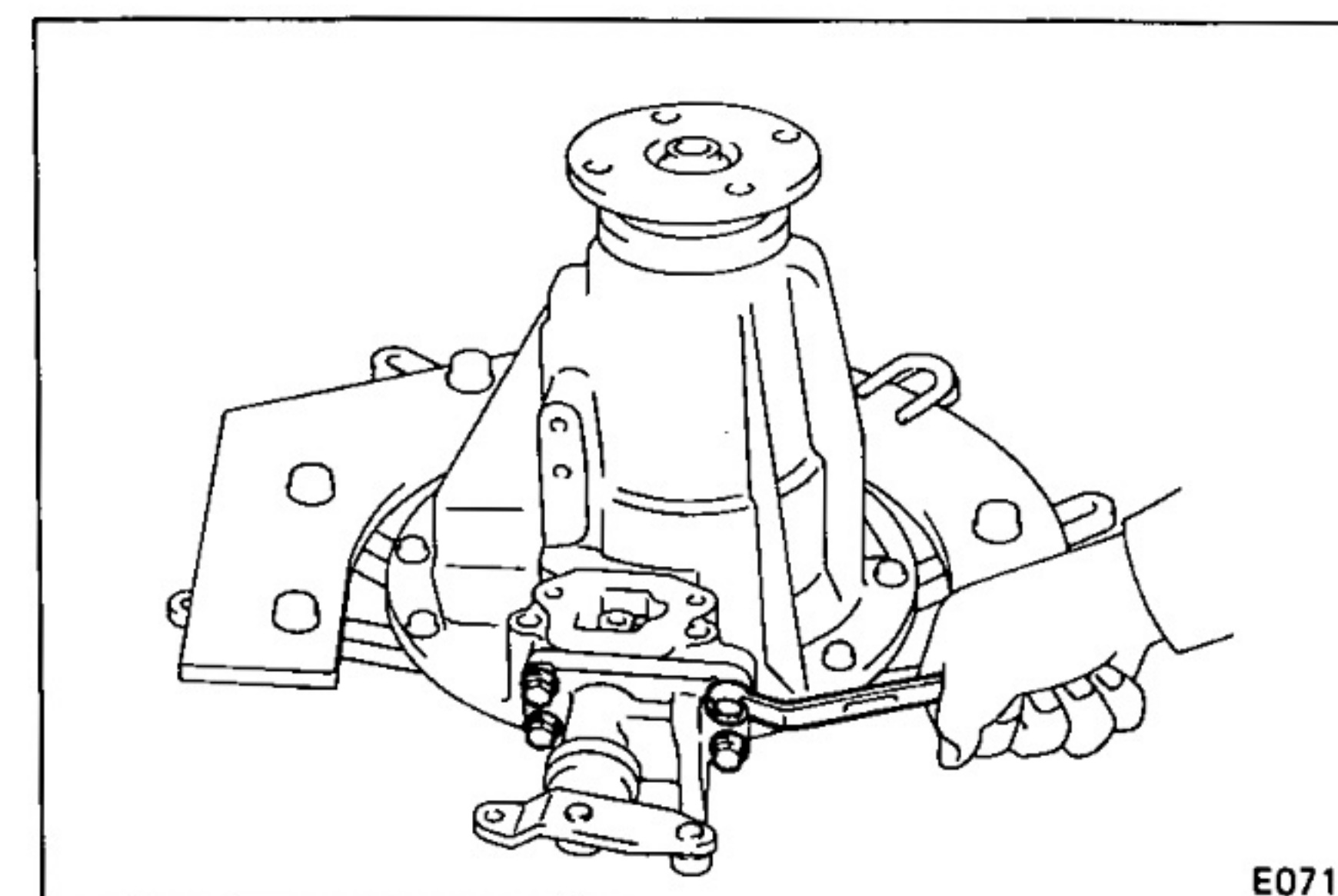
(b) Apply seal packing to the cylinder body.

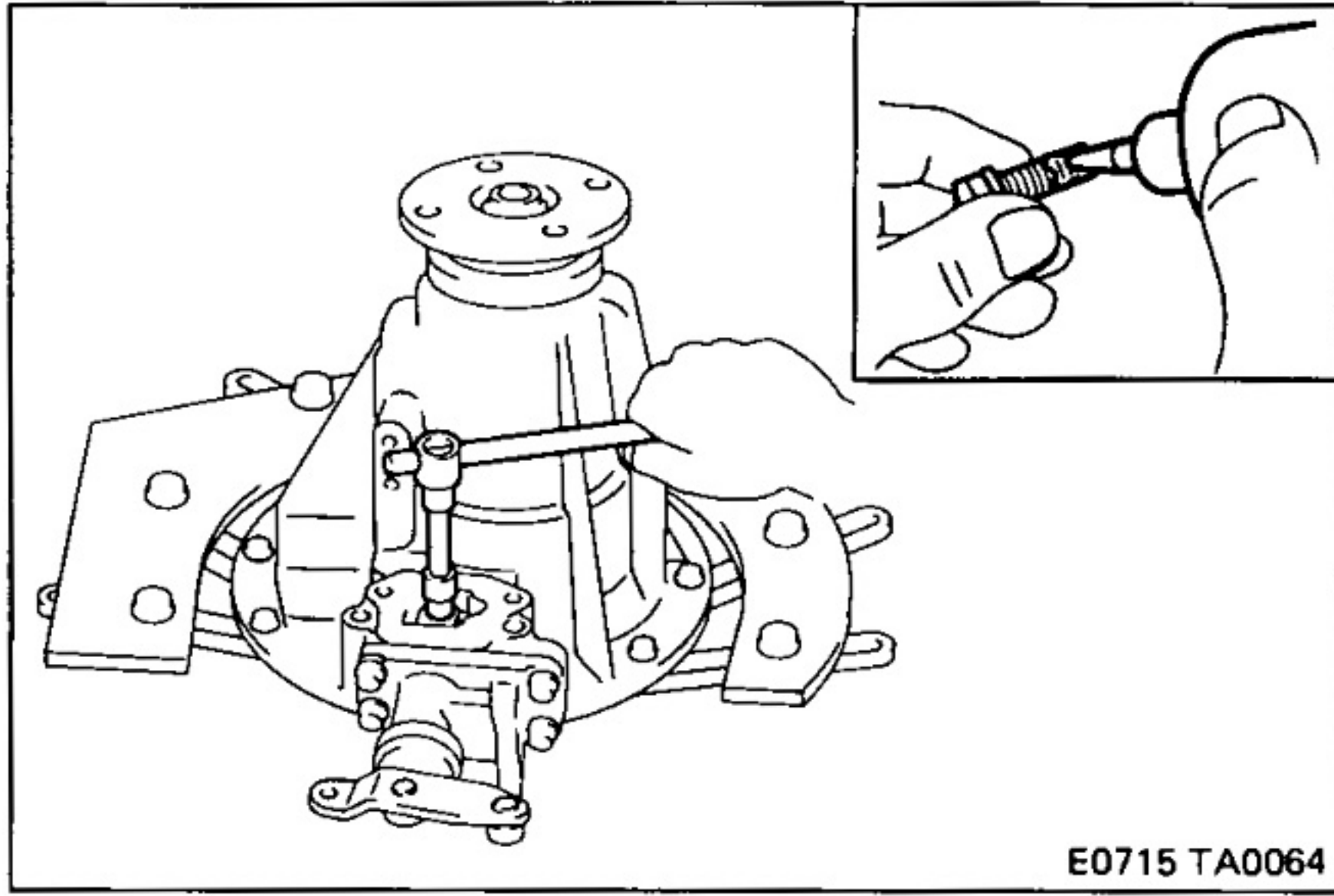
**Seal packing: Part No. 08826-00090, THREE BOND 1281 or equivalent**

NOTE: Install the cylinder body within 3 minutes after applying seal packing.

(c) Torque the four set bolts.

**Torque: 240 kg-cm (17 ft-lb, 24 N·m)**

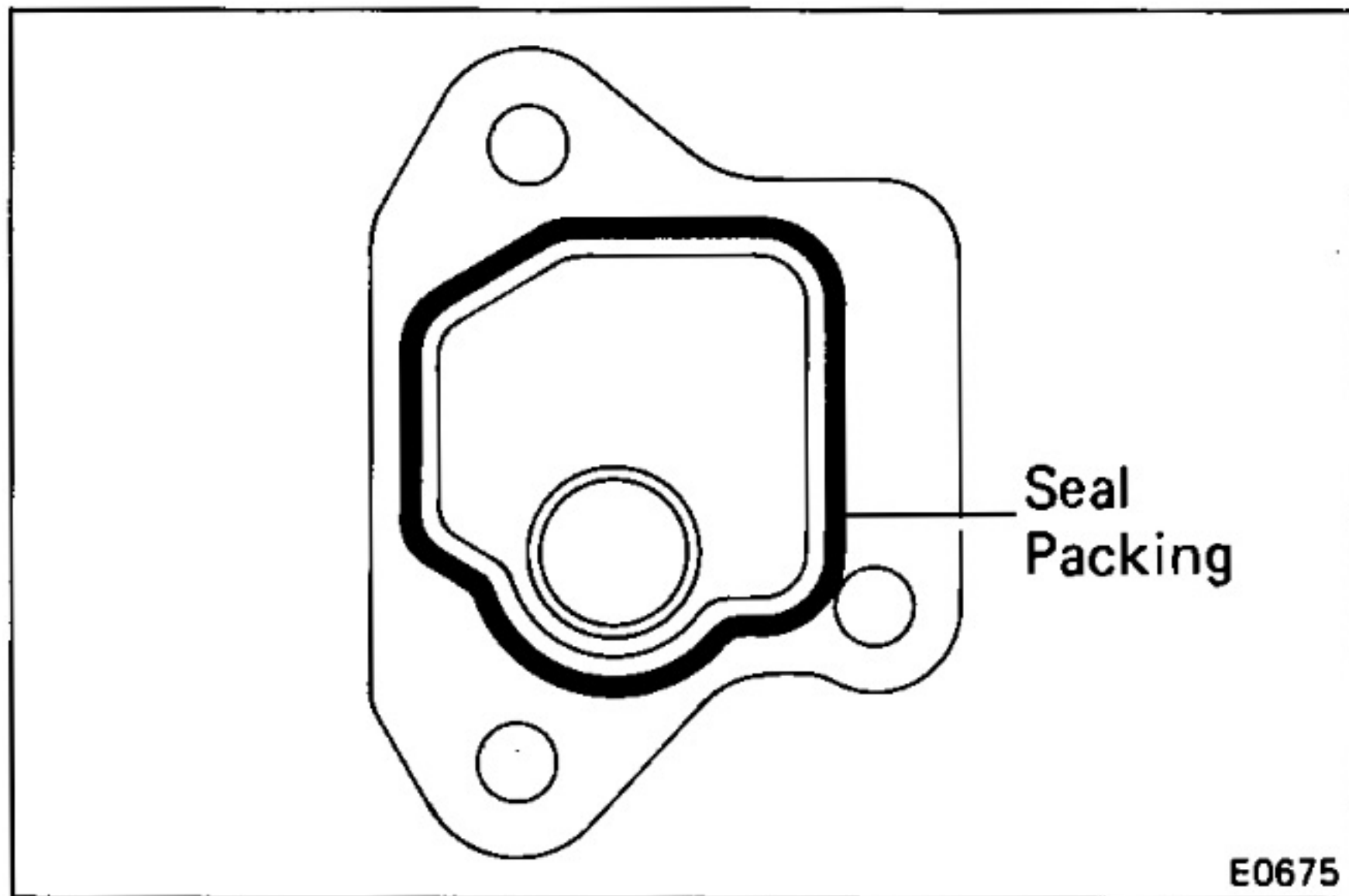


**29. INSTALL AND TORQUE SHIFT FORK SHAFT SET BOLT**

- (a) Clean the threads of the set bolt and fork shaft with the white gasoline.
- (b) Coat the threads of the set bolt with sealer.

**Sealer: Part No. 08833-00070, THREE BOND 1324 or equivalent**

**Torque: 200 kg-cm (14 ft-lb, 20 N·m)**

**30. INSTALL DIFFERENTIAL LOCK CYLINDER COVER**

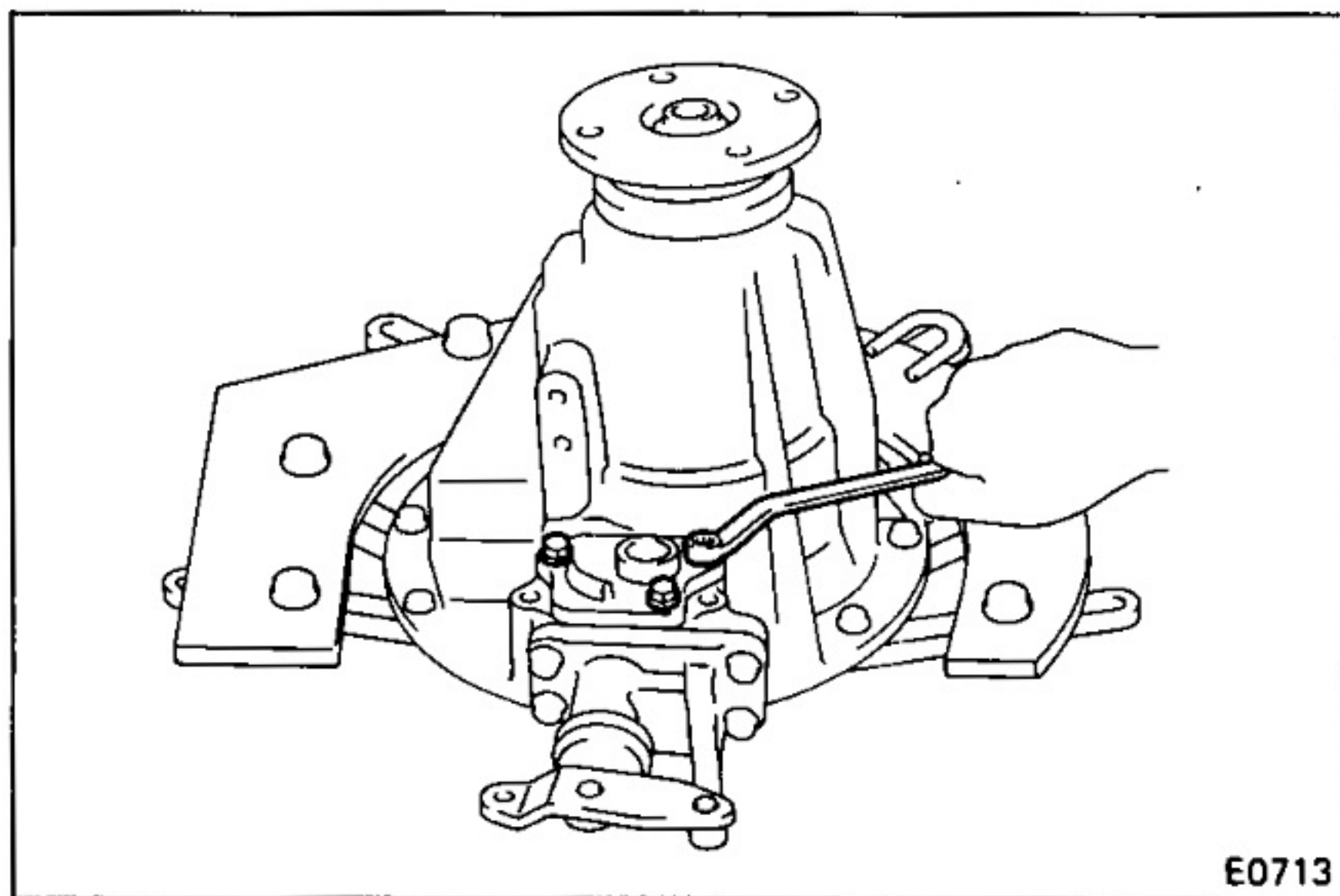
- (a) Clean contacting surfaces of any residual packing material using gasoline or alcohol.
- (b) Apply seal packing to the cylinder cover.

**Seal packing: Part No. 08826-00090, THREE BOND 1281 or equivalent**

**NOTE:** Install the cylinder cover within 3 minutes after applying seal packing.

- (c) Torque the three set bolts.

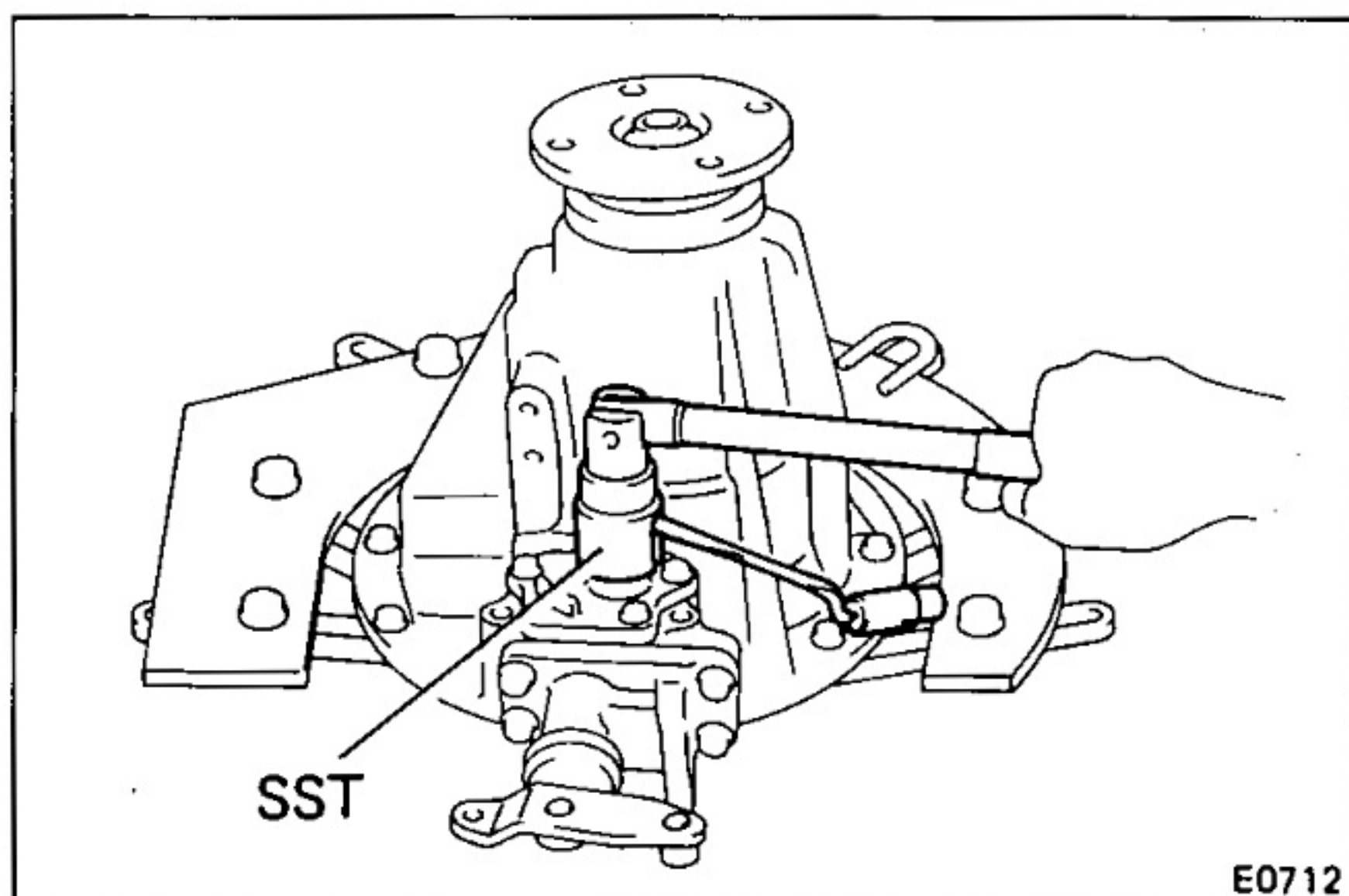
**Torque: 185 kg-cm (13 ft-lb, 18 N·m)**

**31. INSTALL DIFFERENTIAL LOCK INDICATOR SWITCH**

Using SST, install the indicator switch to the cylinder cover.

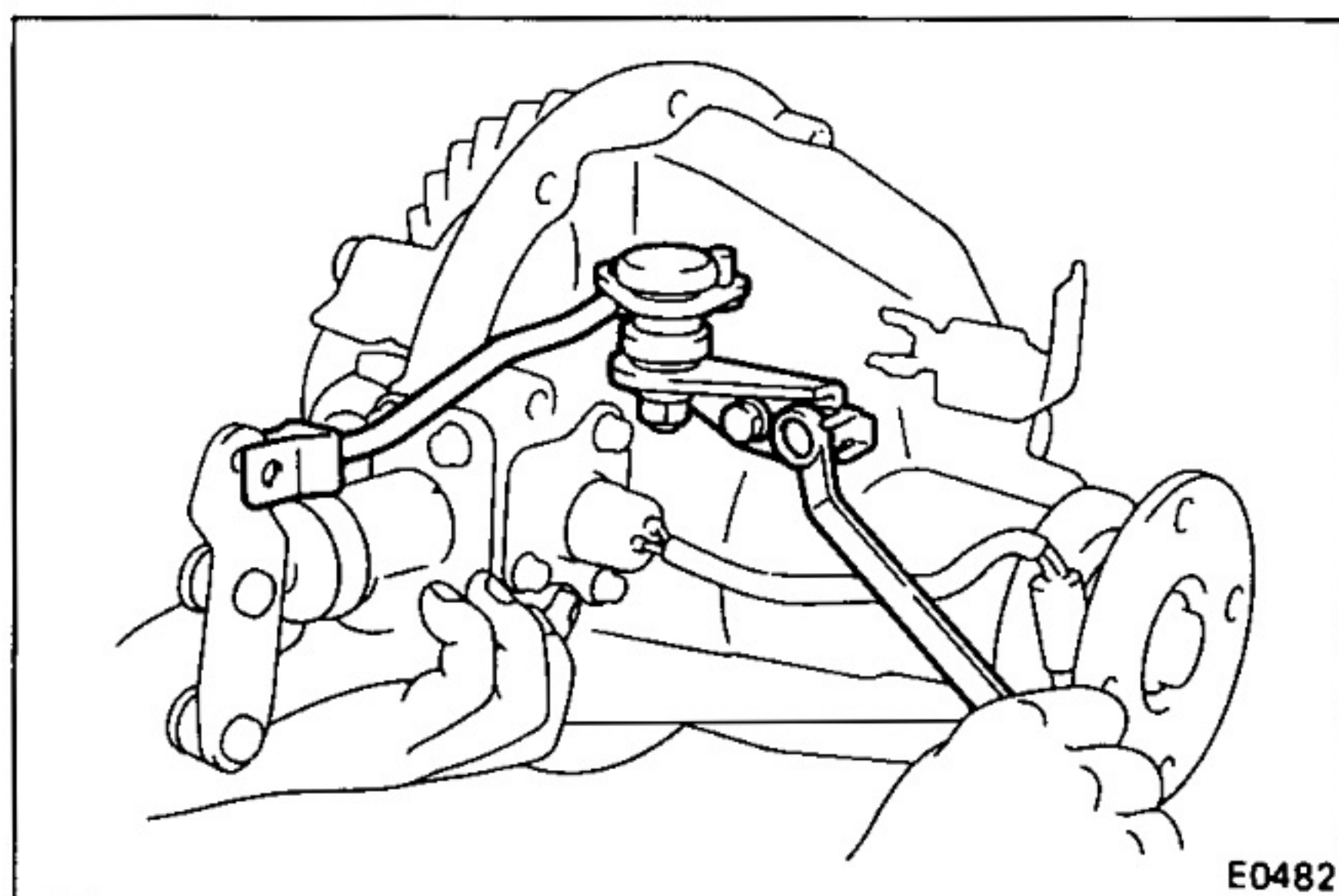
**SST 09817-16011**

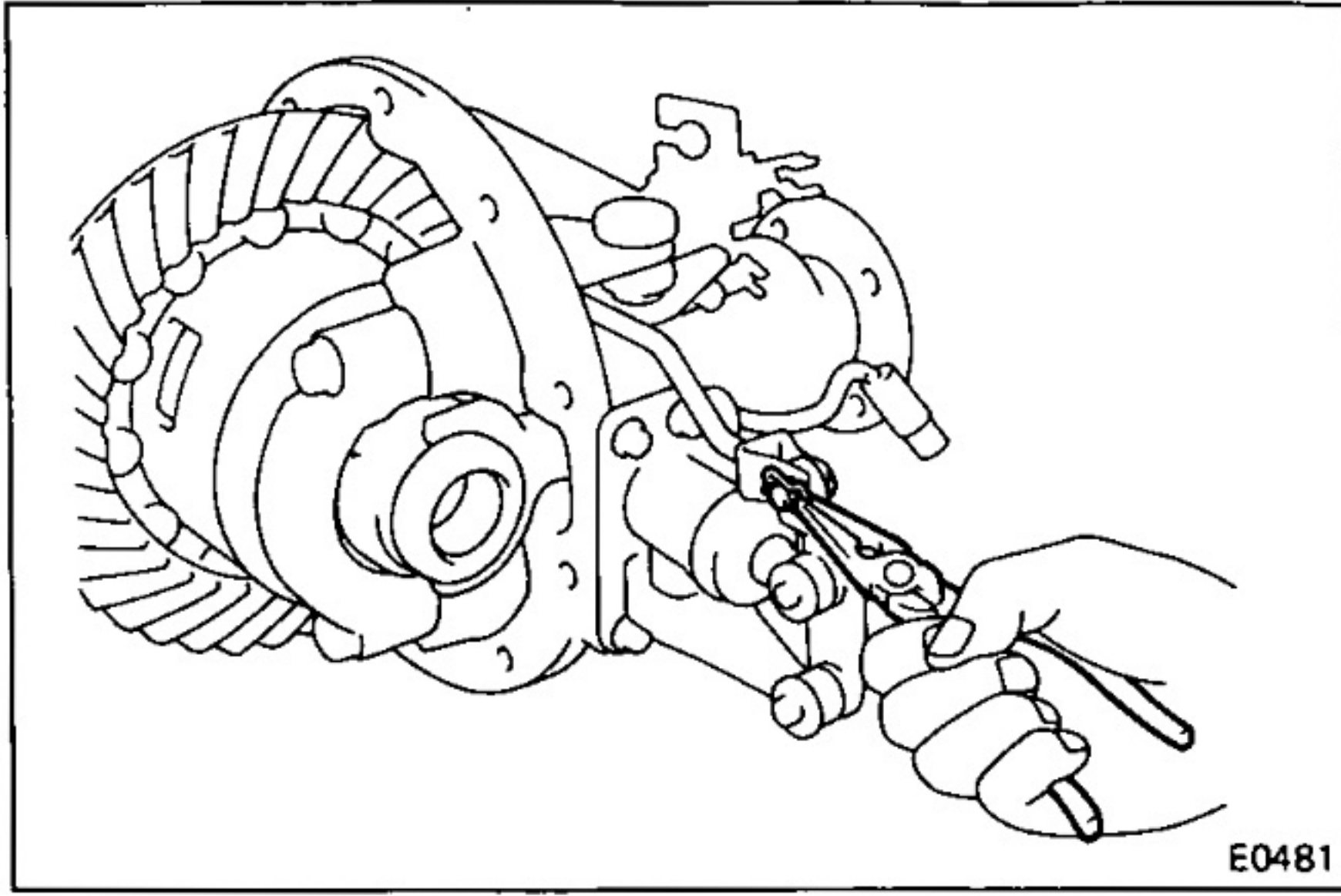
**Torque: 400 kg-cm (29 ft-lb, 39 N·m)**

**INSTALLATION OF DIFFERENTIAL****1. INSTALL DIFFERENTIAL LOCK CABLE LINK ASSEMBLY**

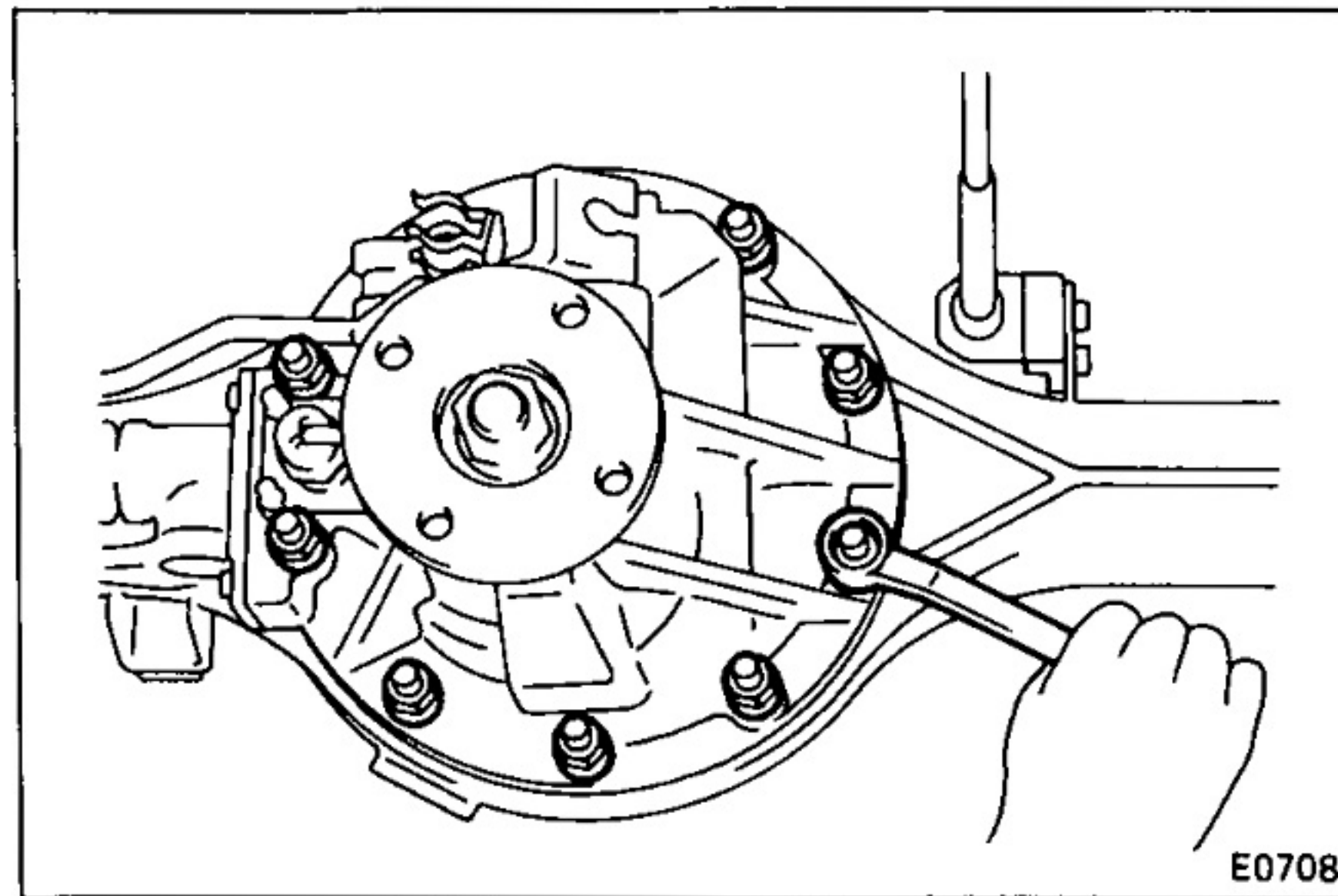
- (a) Install cable link and harness clamp to the differential.

**Torque: 130 kg-cm (9 ft-lb, 13 N·m)**





(b) Install clip and pin.

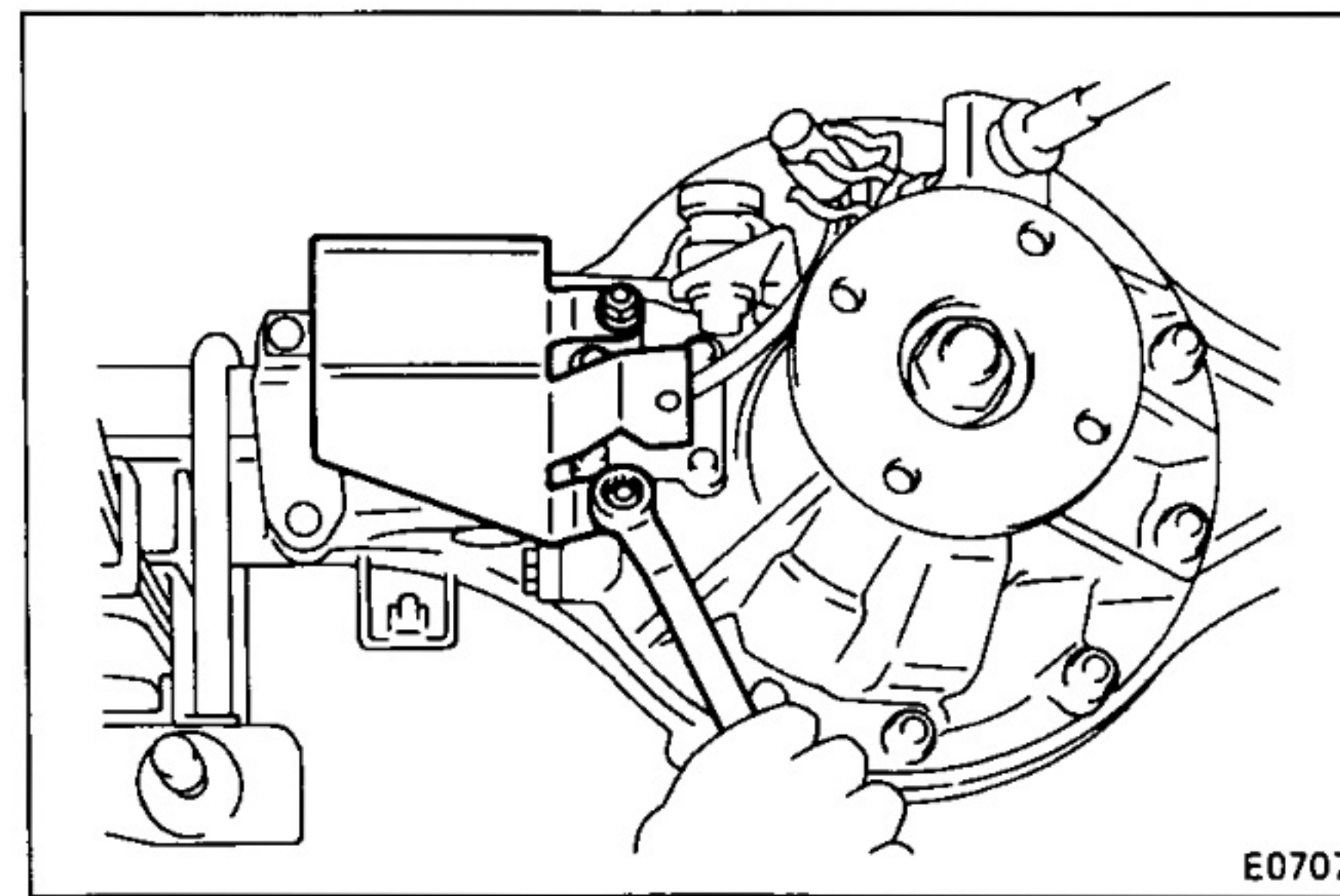


**2. INSTALL DIFFERENTIAL CARRIER TO AXLE HOUSING**

(a) Apply seal packing to both side of the new gasket.  
**Seal packing: Part No. 08826-00090, THREE BOND 1281 or equivalent**

(b) Install the differential to the axle housing with a gasket.

**Torque: 475 kg-cm (34 ft-lb, 47 N·m)**



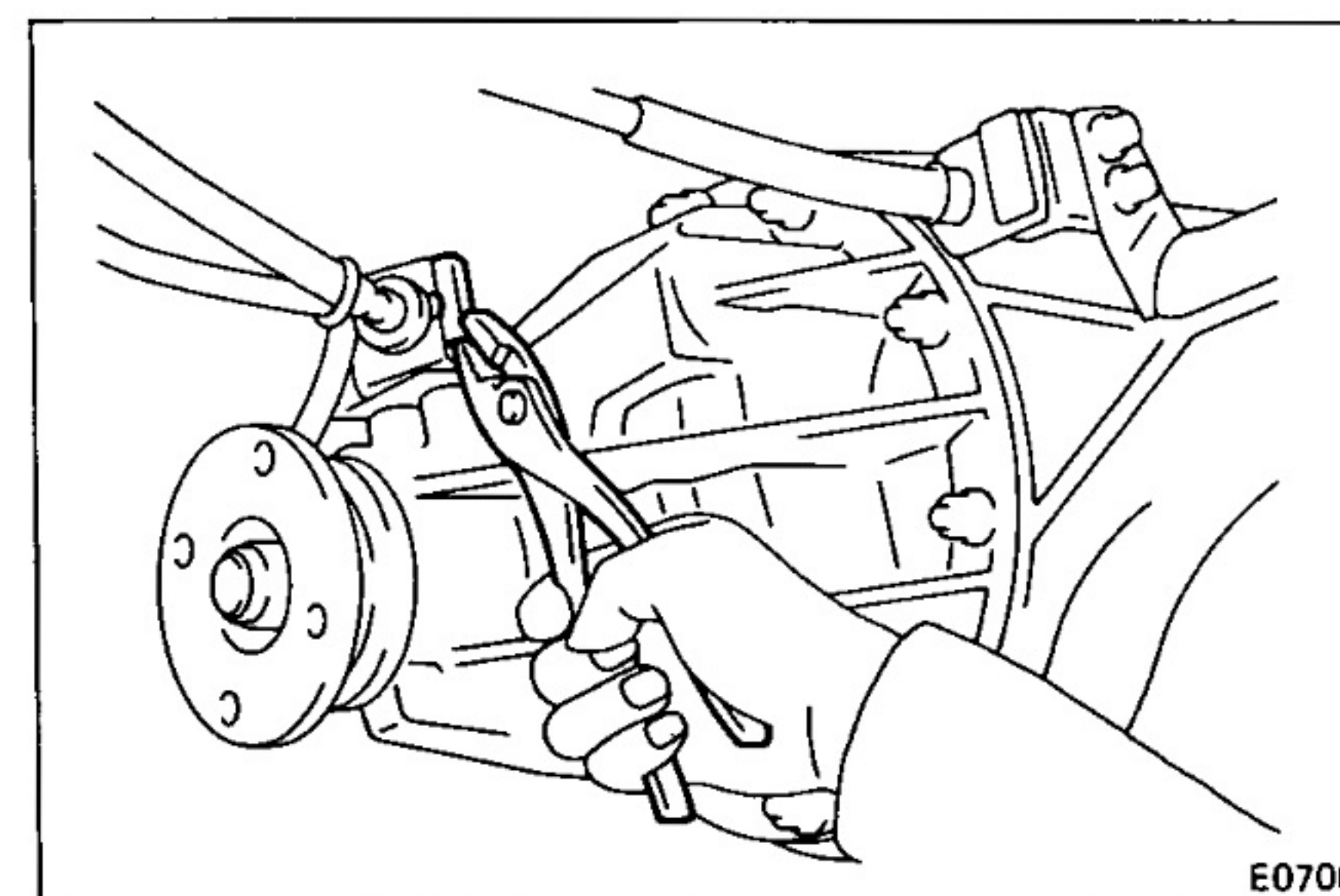
**3. INSTALL DIFFERENTIAL LOCK CYLINDER PROTECTOR**

(a) Install the protector to the axle housing.

**Torque: 360 kg-cm (26 ft-lb, 35 N·m)**

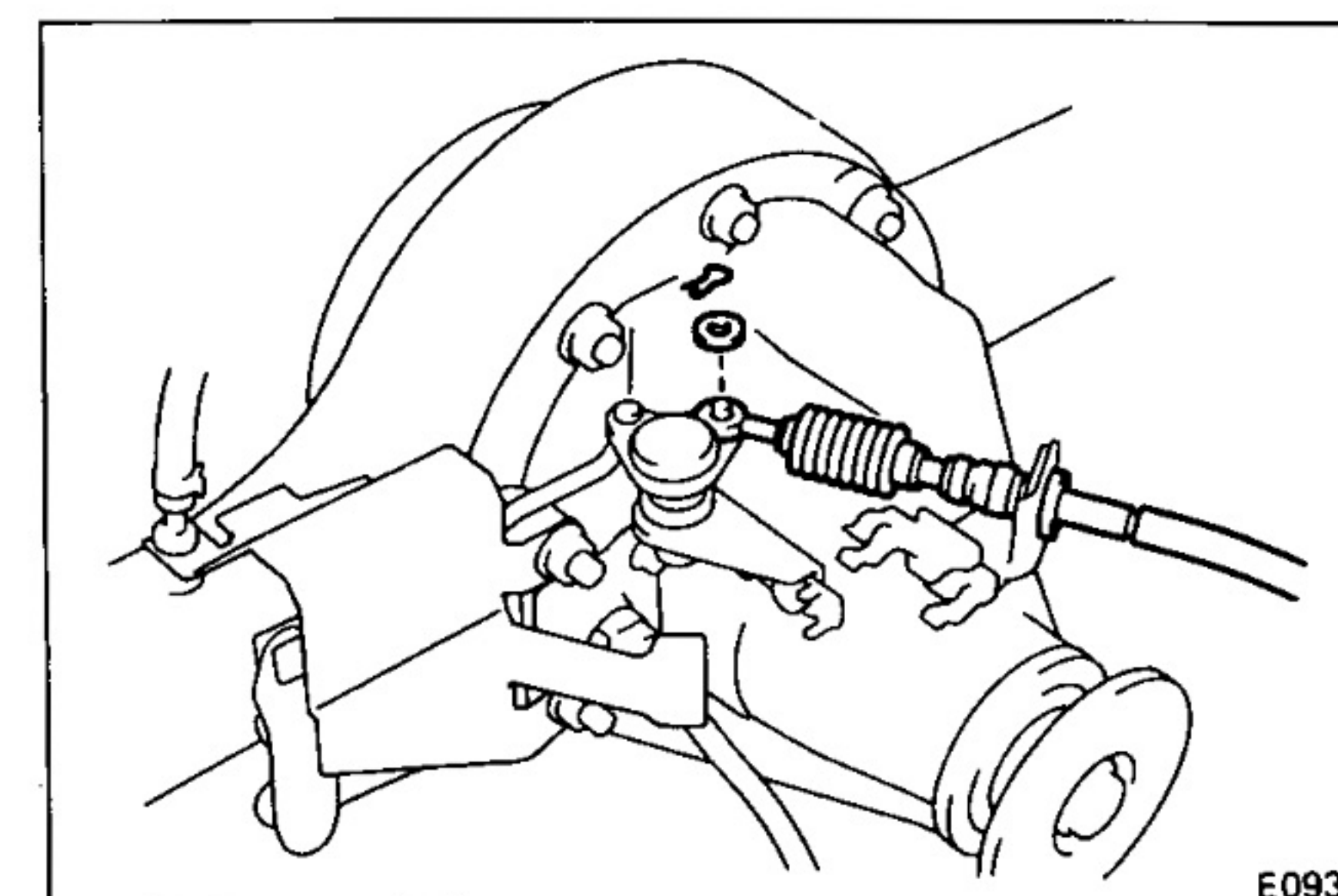
(b) Install the bleeder union and connect the hose.

**Torque: 250 kg-cm (18 ft-lb, 25 N·m)**

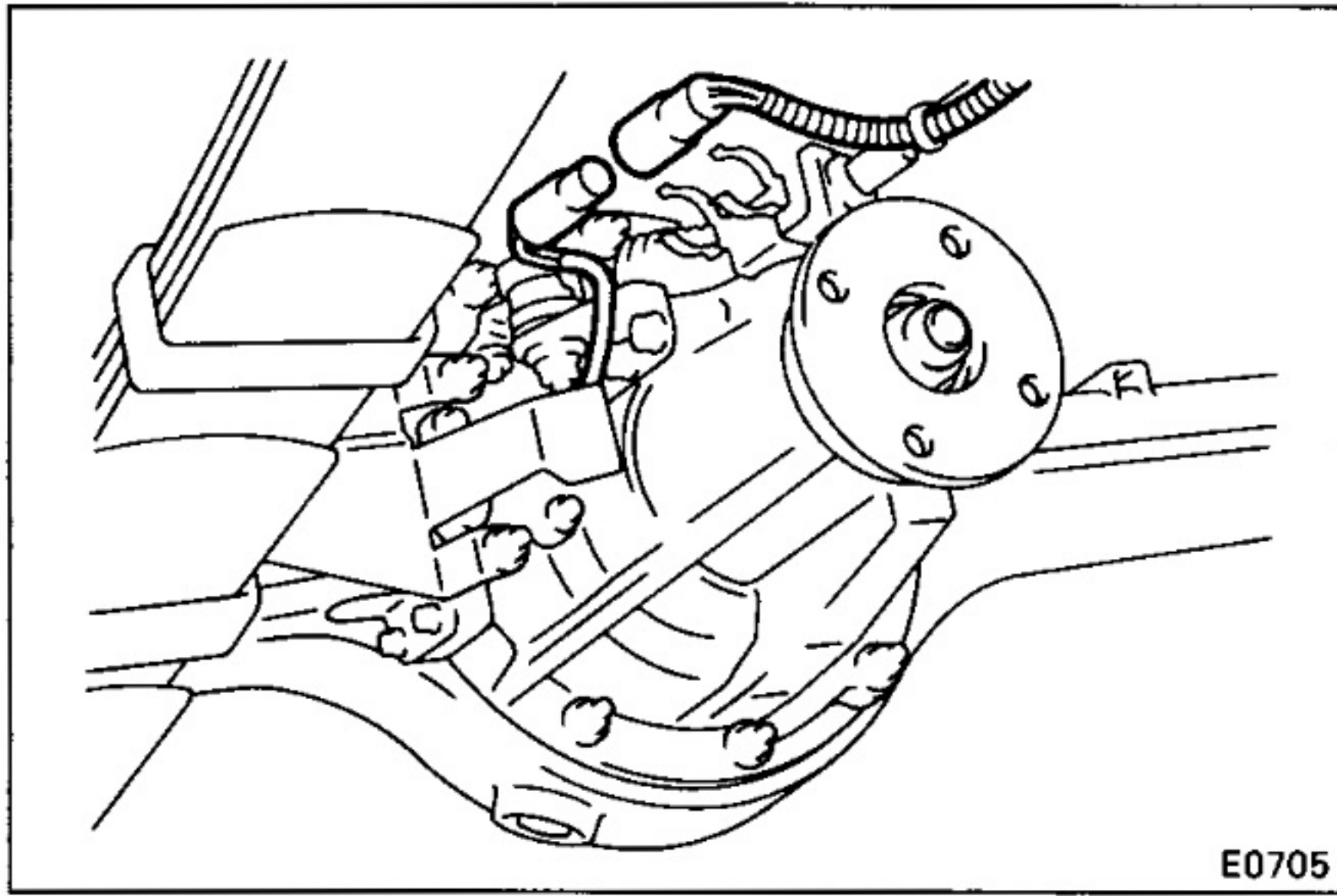


**4. CONNECT DIFFERENTIAL LOCK CABLE**

(a) Connect the cable to the cable bracket and install clip.

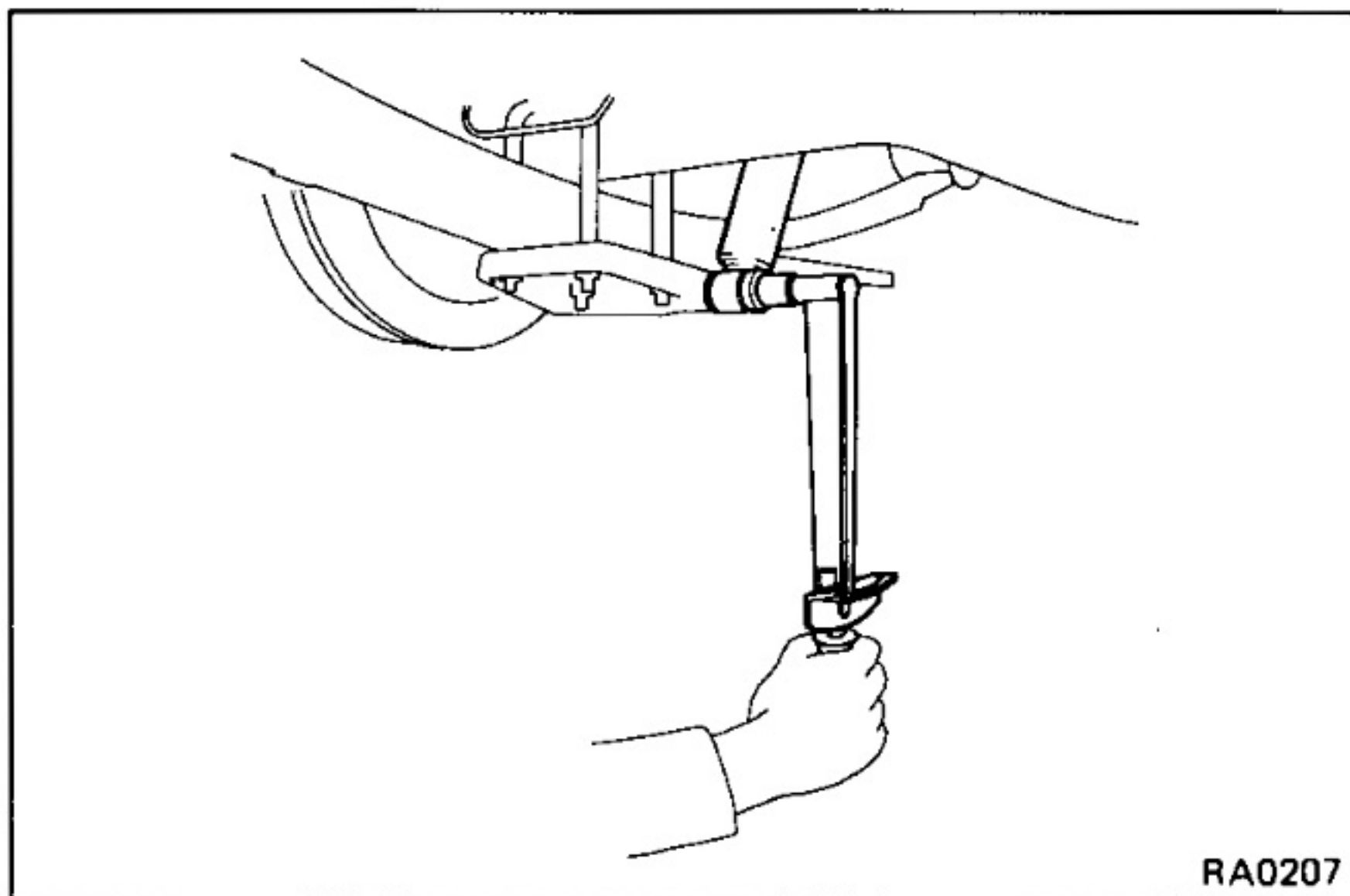


(b) Connect the cable to the cable link and install plate washer and clip.



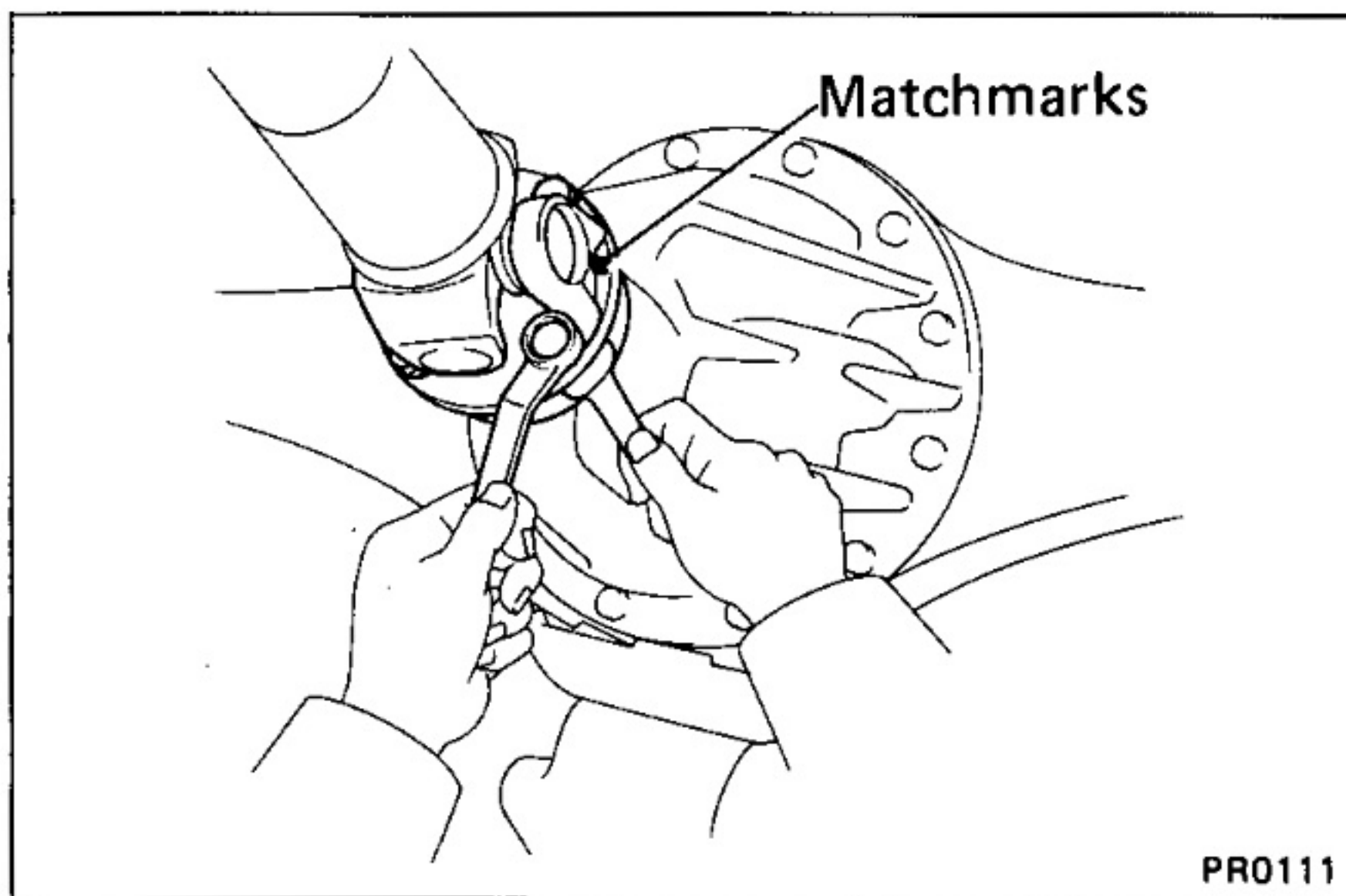
**5. CONNECT DIFFERENTIAL LOCK INDICATOR SWITCH CONNECTOR**

Connect the indicator switch connector and install it to the connector bracket.



**6. CONNECT SHOCK ABSORBER TO SPRING SEAT**

**Torque: 375 kg-cm (27 ft-lb, 37 N·m)**

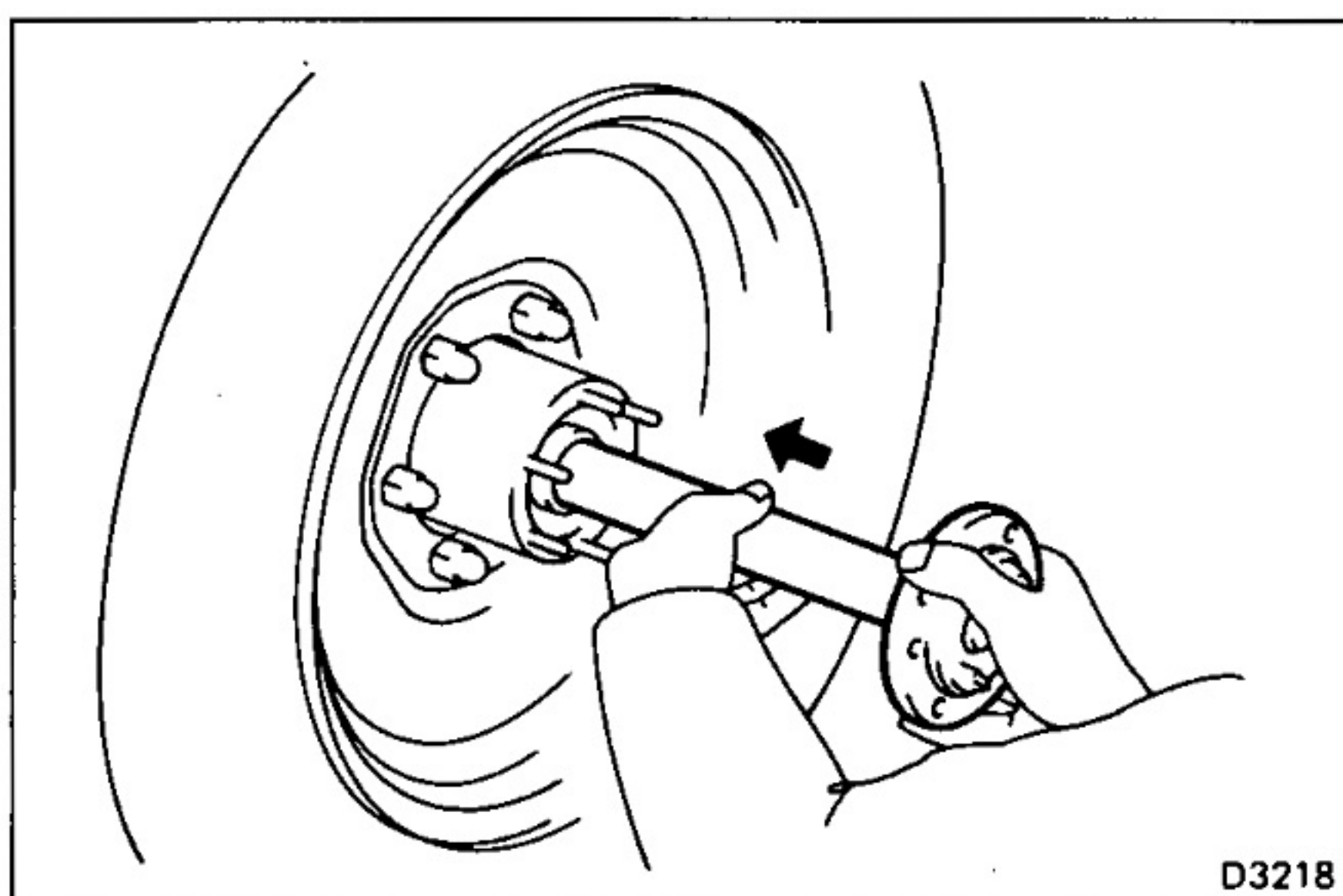


**7. CONNECT PROPELLER SHAFT TO DIFFERENTIAL**

(a) Align the matchmarks on the both flanges.

(b) Torque the four bolts and nuts.

**Torque: 900 kg-cm (65 ft-lb, 88 N·m)**

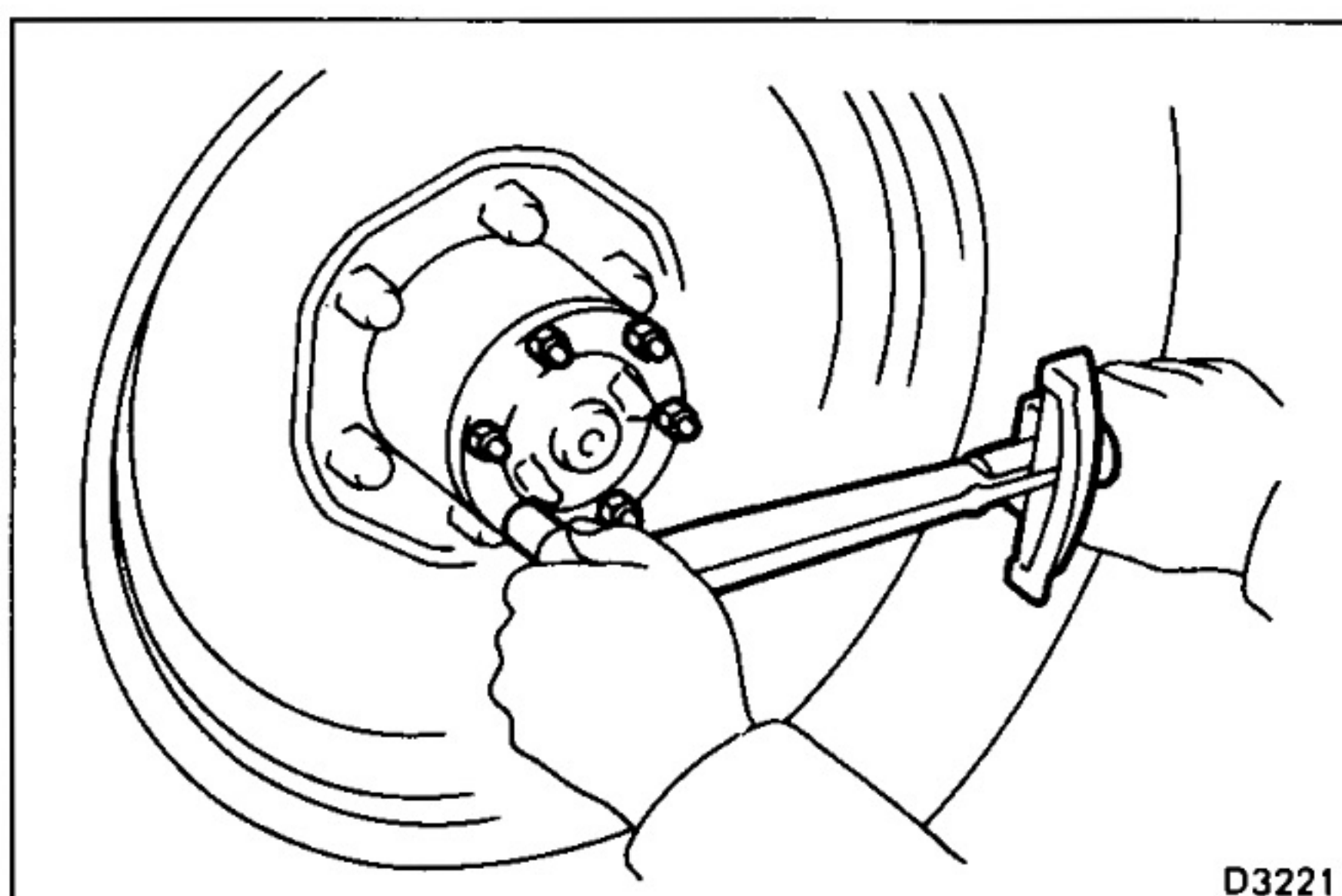


**8. INSTALL REAR AXLE SHAFT**

(a) Install a new gasket to the axle housing.

(b) Insert the axle shaft into the axle housing.

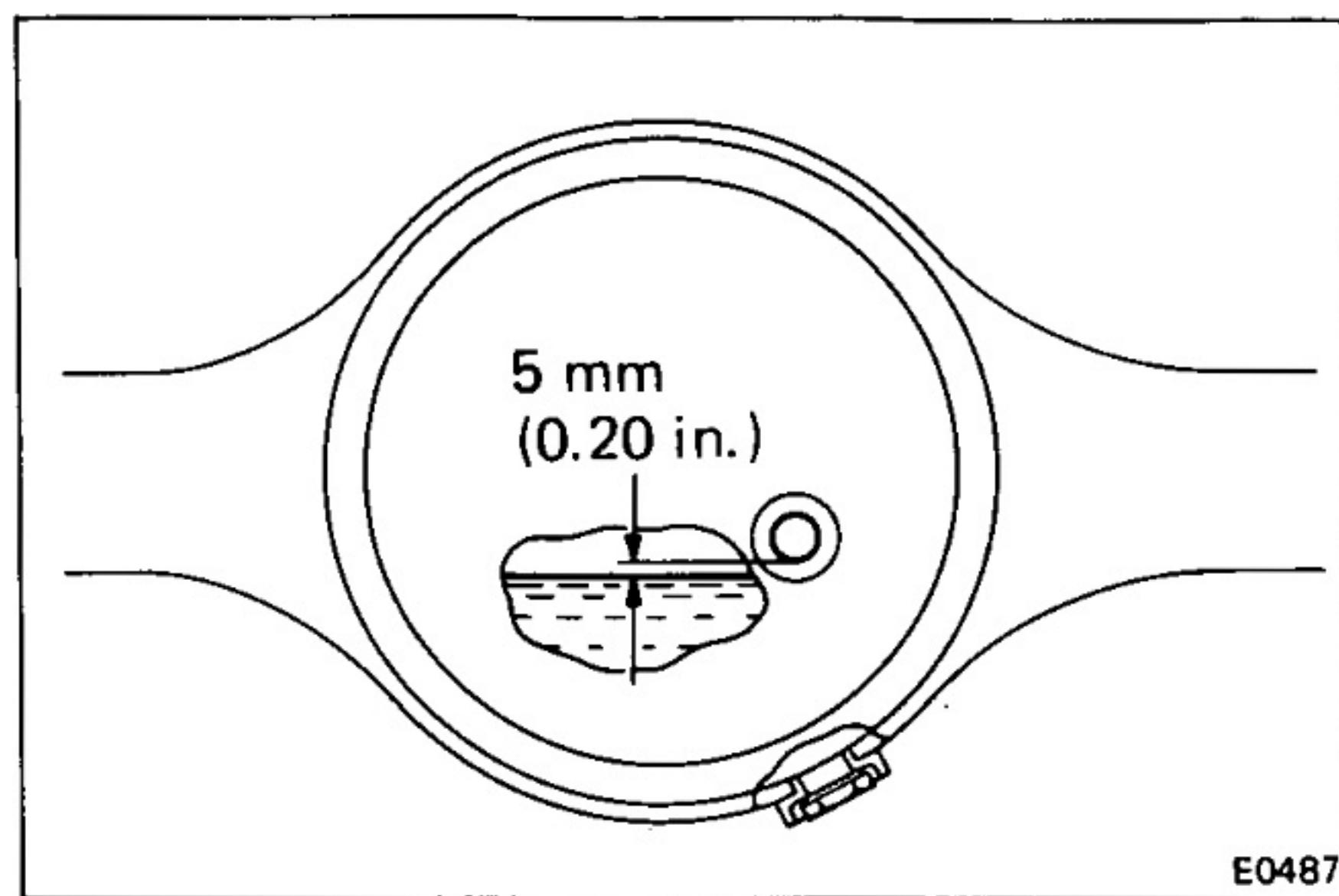
**CAUTION: When inserting the axle shaft, be careful not to damage the oil seal.**



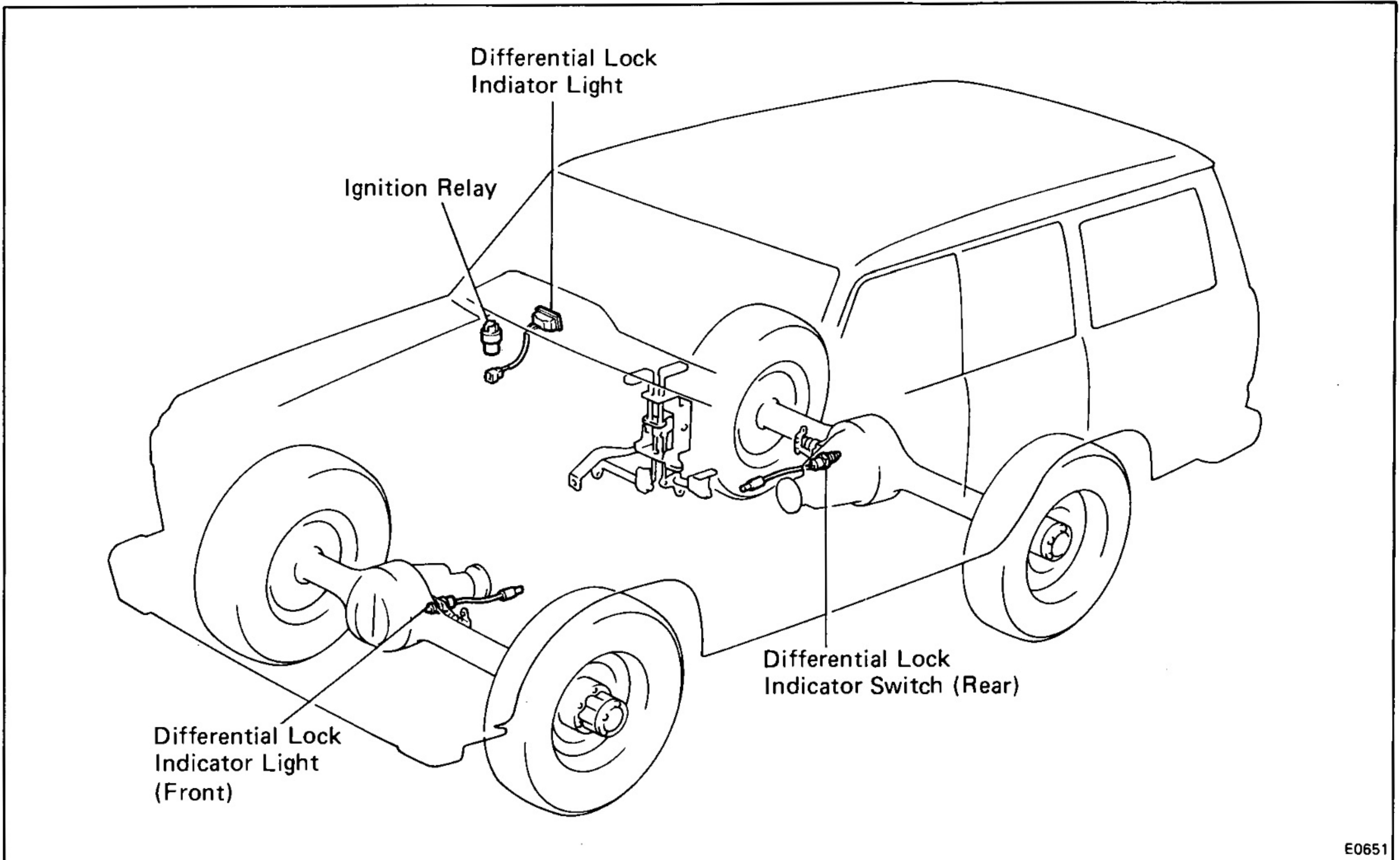
(c) Install the six cone washers and spring washers.

(d) Torque the six nuts.

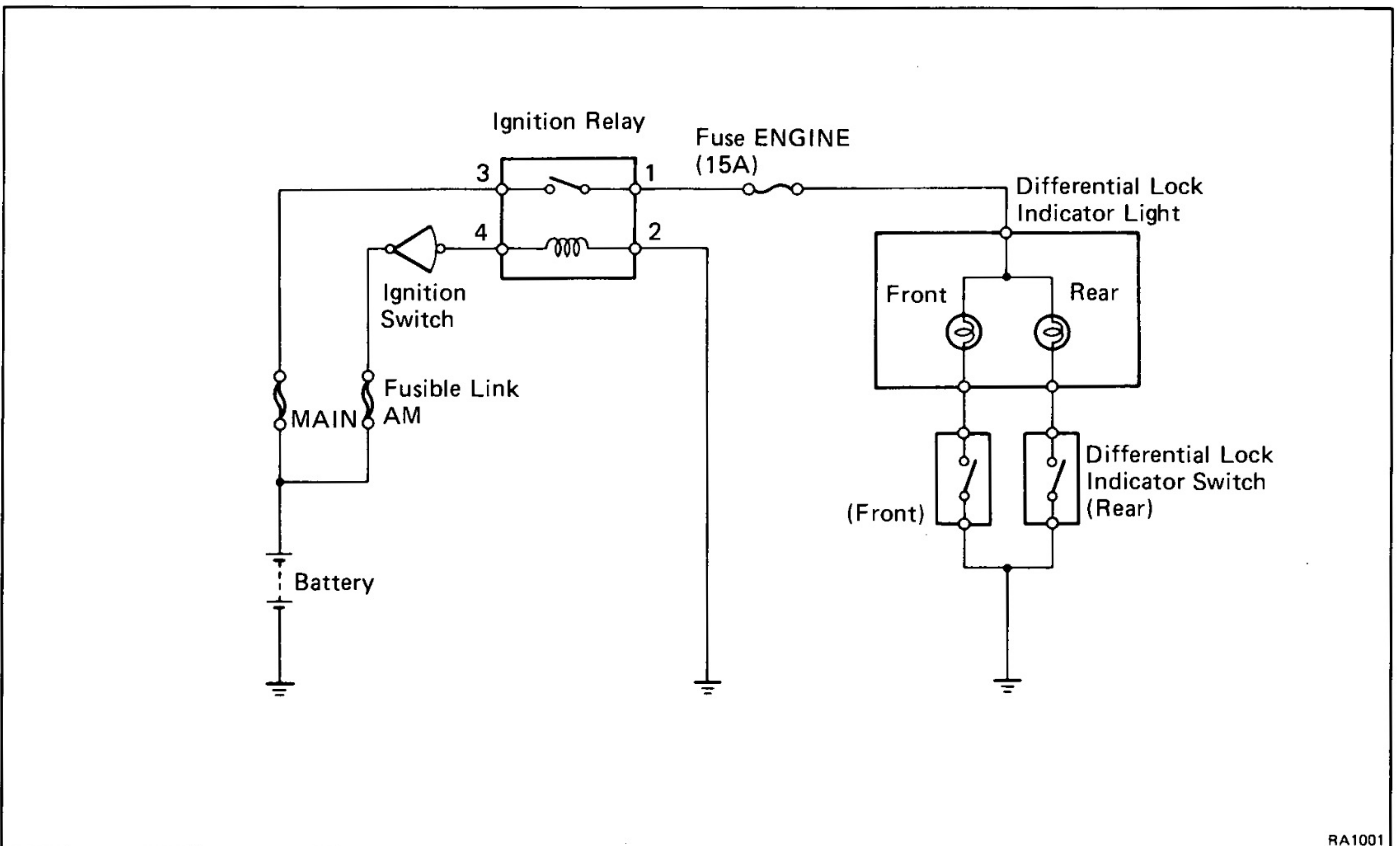
**Torque: 340 kg-cm (25 ft-lb, 33 N·m)**

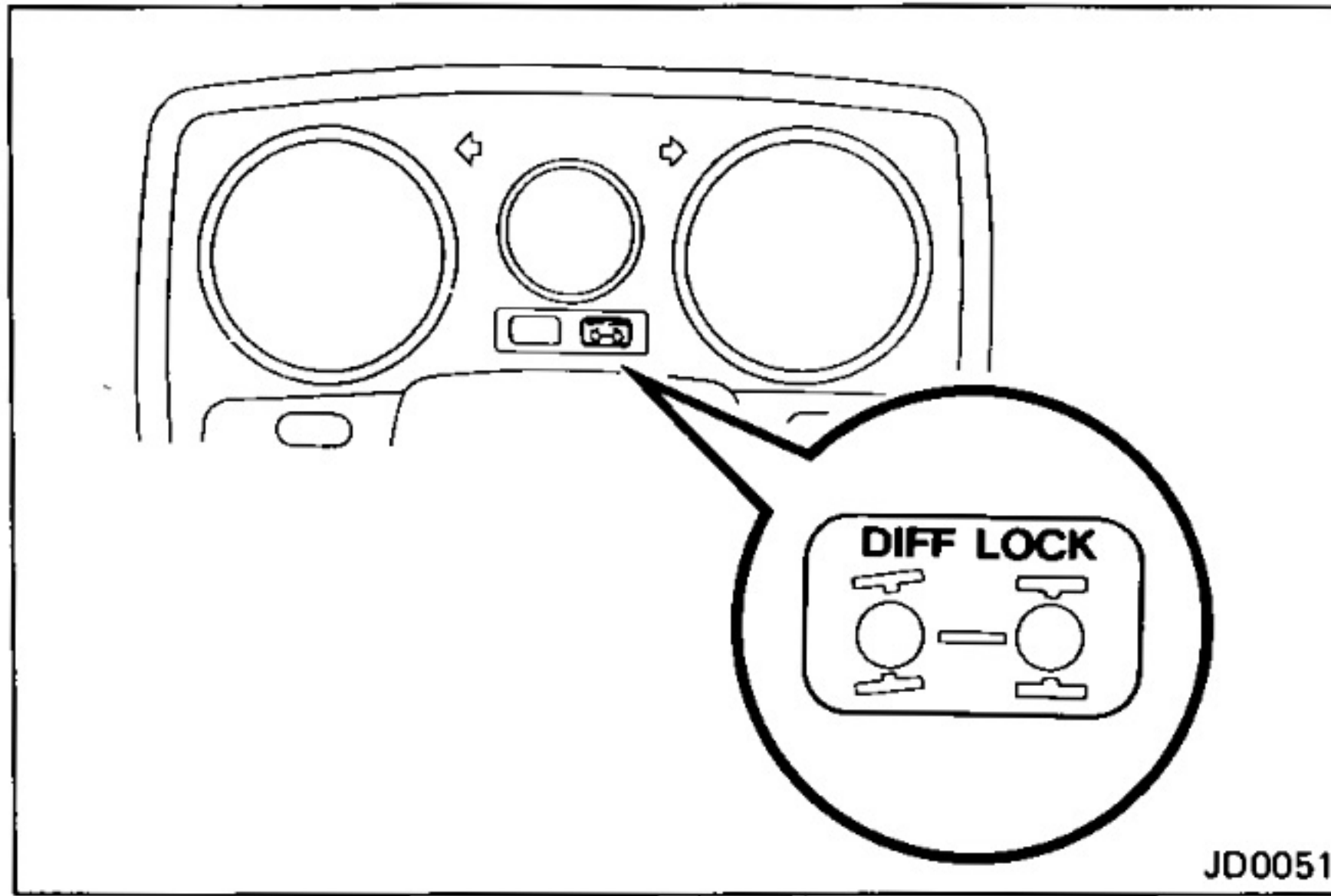
**9. FILL DIFFERENTIAL WITH GEAR OIL****Oil grade: API GL-5 hypoid gear oil****Viscosity: Above -18°C (0°F) SAE 90****Below -18°C (0°F) SAE 80W-90 or 80W****Capacity: 2.5 liters (2.6 US qts, 2.2 Imp. qts)**

# Electric Control COMPONENTS



## CIRCUIT

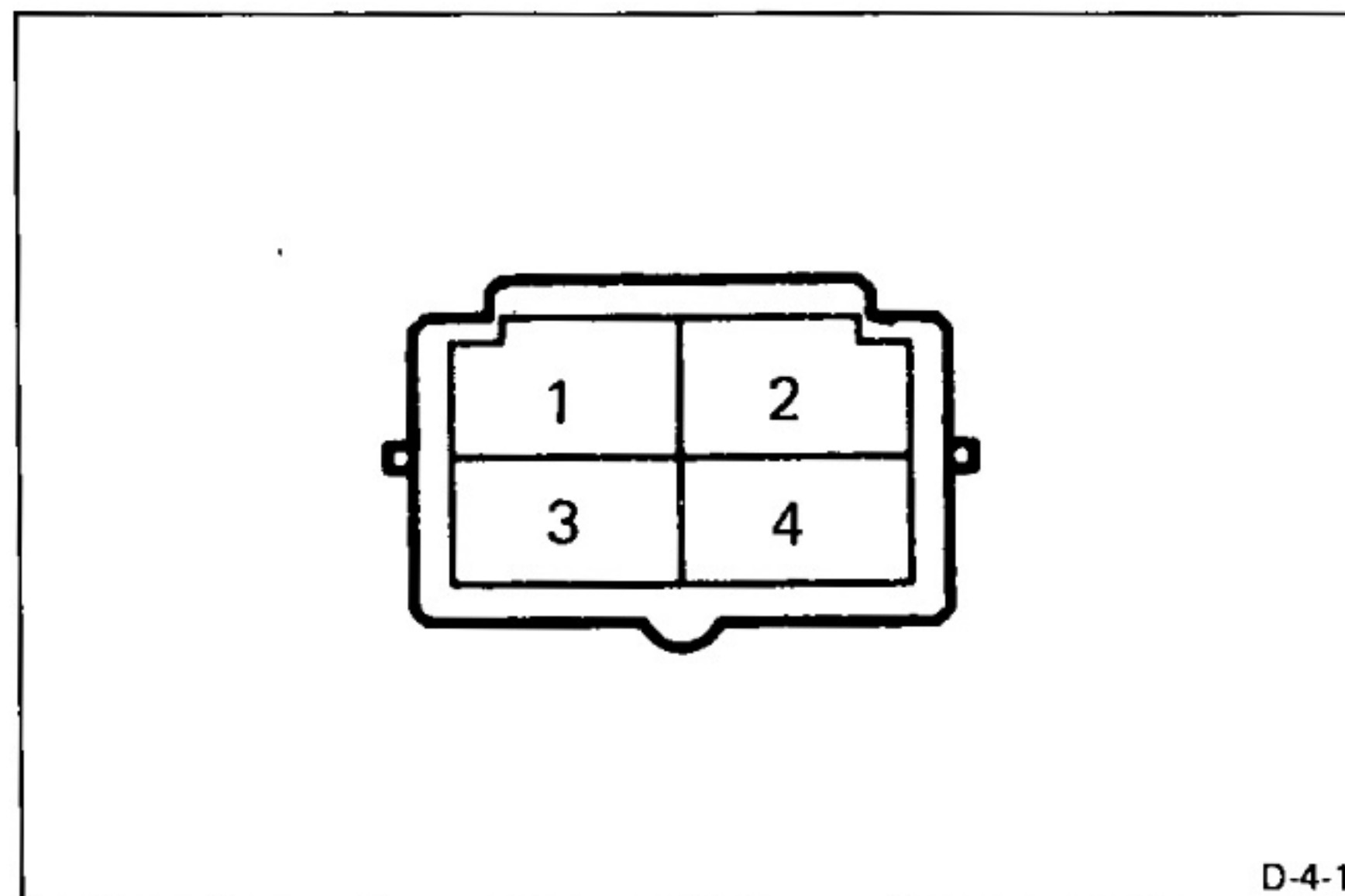




## INSPECTION ELECTRIC CONTROL COMPONENTS

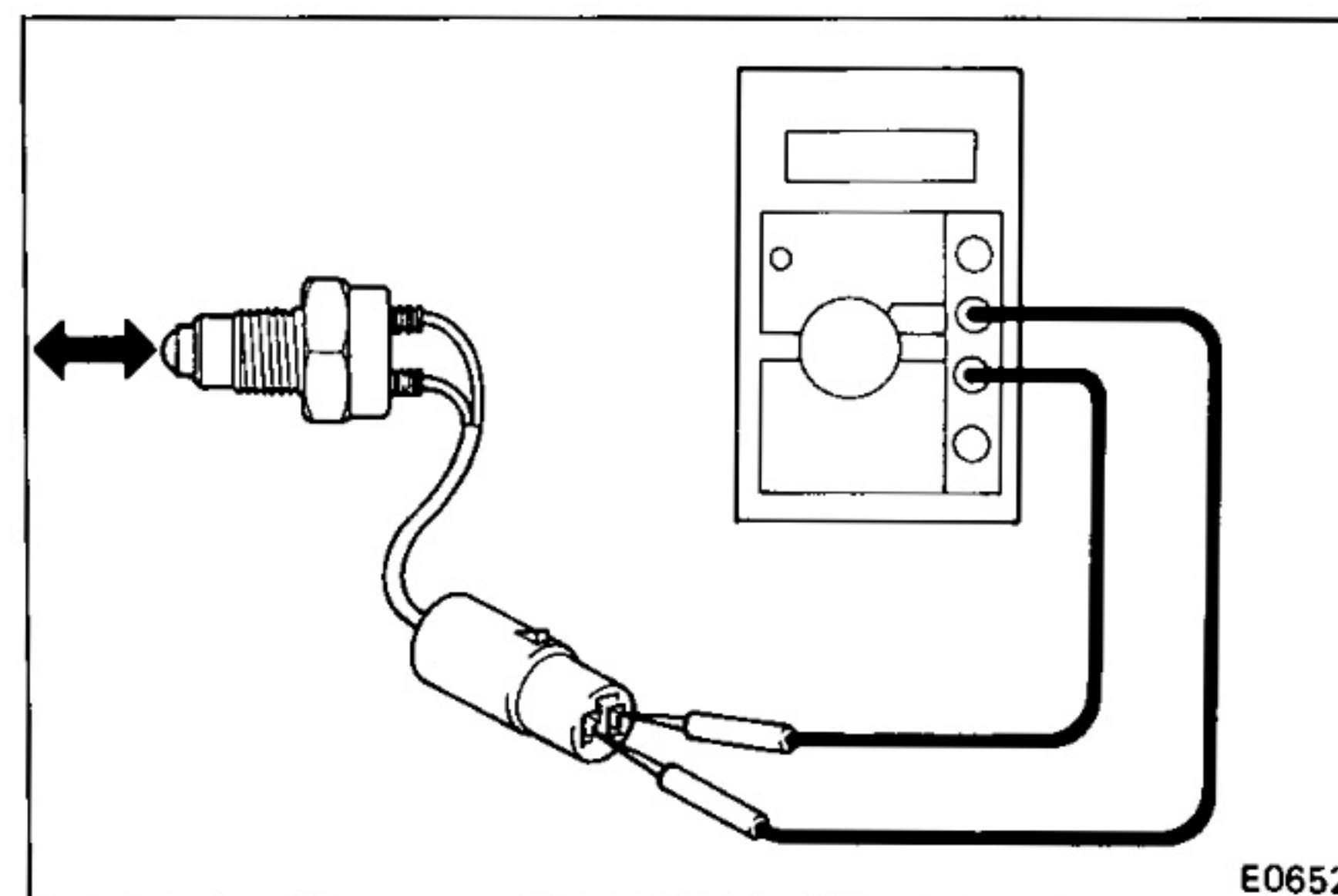
### 1. INSPECT INDICATOR LIGHT

- (a) Turn the ignition switch to ON.
- (b) With the front and rear lock lever in the raised position, check that the indicator light comes on.
- (c) With the front and rear lock levers in the down position, check that the indicator light goes out.



### 2. INSPECT IGNITION RELAY

- (a) Check that there is continuity between terminals 2 and 4.
- (b) Check that there is no continuity between terminals 1 and 3.



### 3. INSPECT DIFFERENTIAL LOCK INDICATOR SWITCH

- (a) Check that there is no continuity between both terminals when the switch is free.
- (b) Check that there is continuity between both terminals when the switch is pushed.

# AIR CONDITIONING SYSTEM

REFER TO REPAIR MANUAL CHASSIS & BODY

LAND CRUISER (Heavy-Duty) Pub No. 36262E

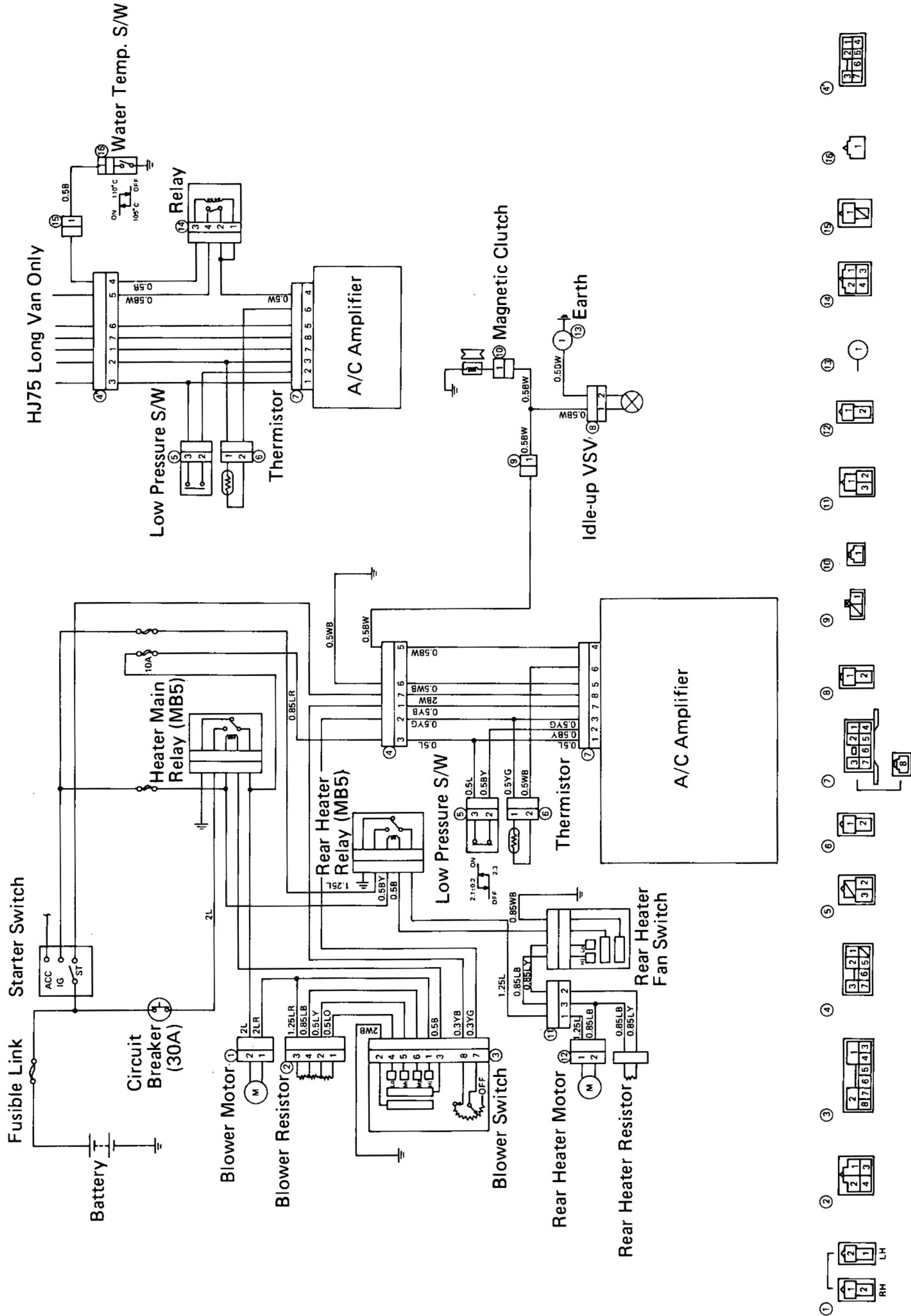
NOTE: The following pages contain only the points which differ from the above-listed manual.

	Page
AIR CONDITIONING SYSTEM CIRCUIT .....	AC-2
ON-VEHICLE INSPECTION .....	AC-5
SYSTEM COMPONENTS .....	AC-6
COMPRESSOR .....	AC-7
REAR COOLING UNIT .....	AC-9
REFRIGERATOR .....	AC-11
REAR A/C SWITCH .....	AC-12



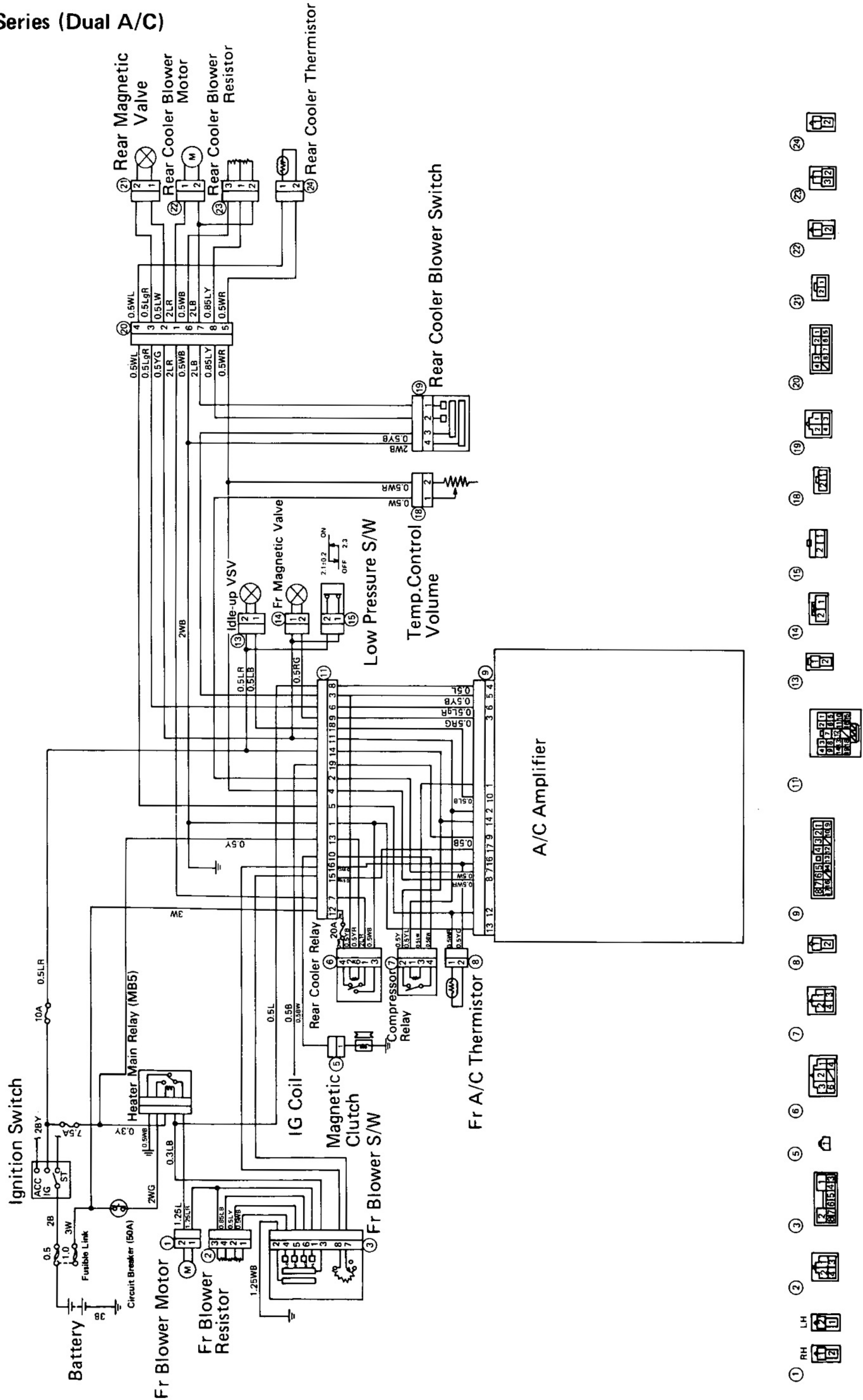
# AIR CONDITIONING SYSTEM CIRCUIT

BJ74, HJ75 Series



# AIR CONDITIONING SYSTEM CIRCUIT (Cont'd)

FJ62, 75 Series (Dual A/C)





## ON-VEHICLE INSPECTION

1. **CHECK CONDENSER FINS FOR BLOCKAGE OR DAMAGE**  
If the fins are clogged, clean them with pressurized water.

2. **CHECK DRIVE BELT TENSION**

Drive belt tension at 10 kg (22.0 lb, 98 N):

mm (in.)

Engine	New belt	Used belt
3F	12 – 15 (0.47 – 0.59)	15 – 21 (0.59 – 0.83)
3B, 13B-T	9 – 12 (0.35 – 0.47)	12 – 16 (0.47 – 0.63)
2H, 12H-T	14 – 19 (0.55 – 0.75)	19 – 25 (0.75 – 0.98)

**NOTE:**

- "New belt" refers to a new belt which has never been used.
- "Used belt" refers to a belt which has been used on a running engine for 5 minutes or more.

3. **START ENGINE**

4. **POSITION TEMPERATURE CONTROL RESISTOR ON "MAX COOL" OR TURN ON A/C SWITCH**

Check that the A/C operates at each position of the blower switch.

If A/C does not operate, check A/C fuse.

5. **CHECK MAGNETIC CLUTCH OPERATION**

6. **CHECK THAT IDLE INCREASES**

When the magnetic clutch engages, engine revolution should increase.

Standard idle up rpm:

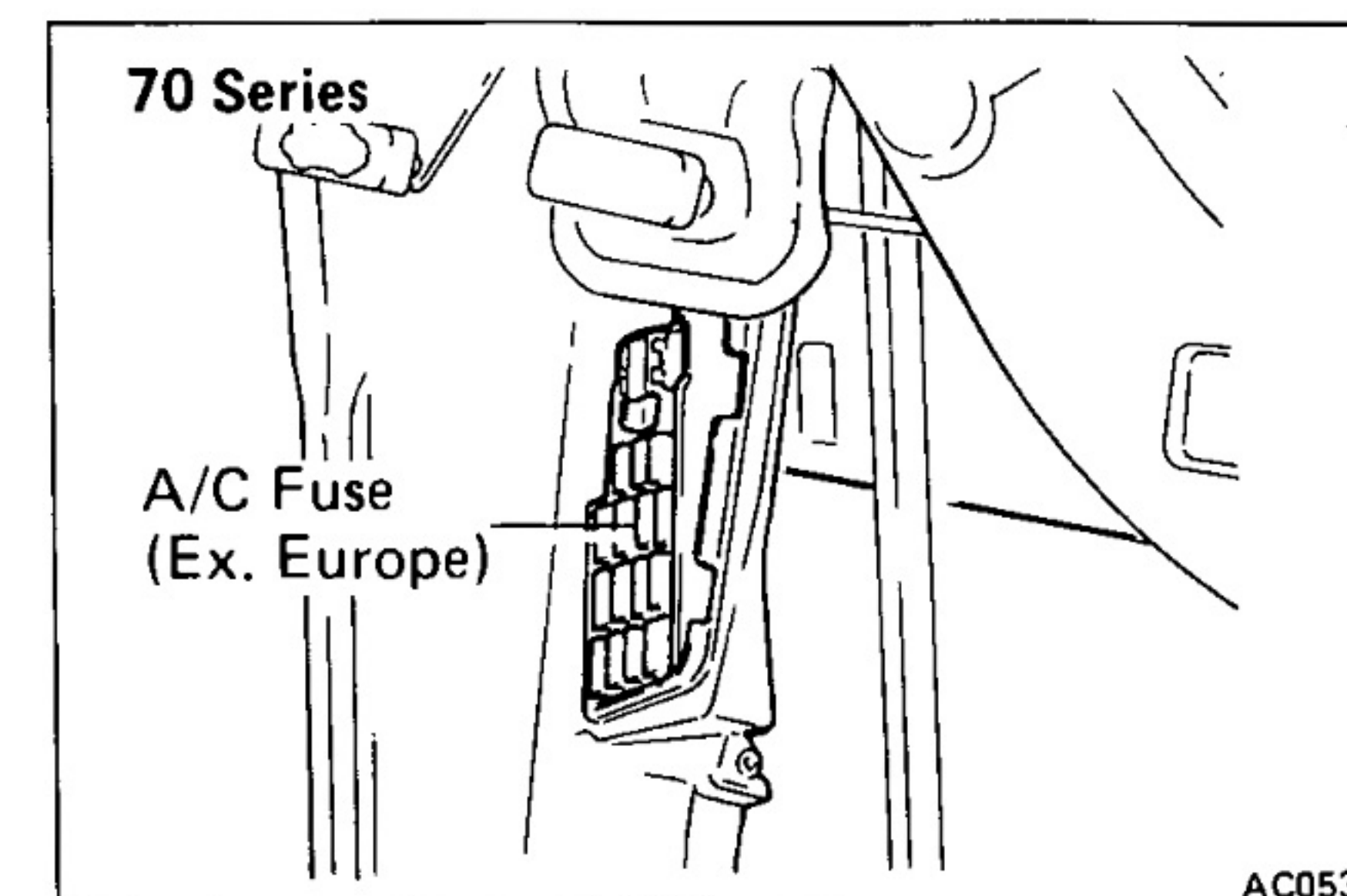
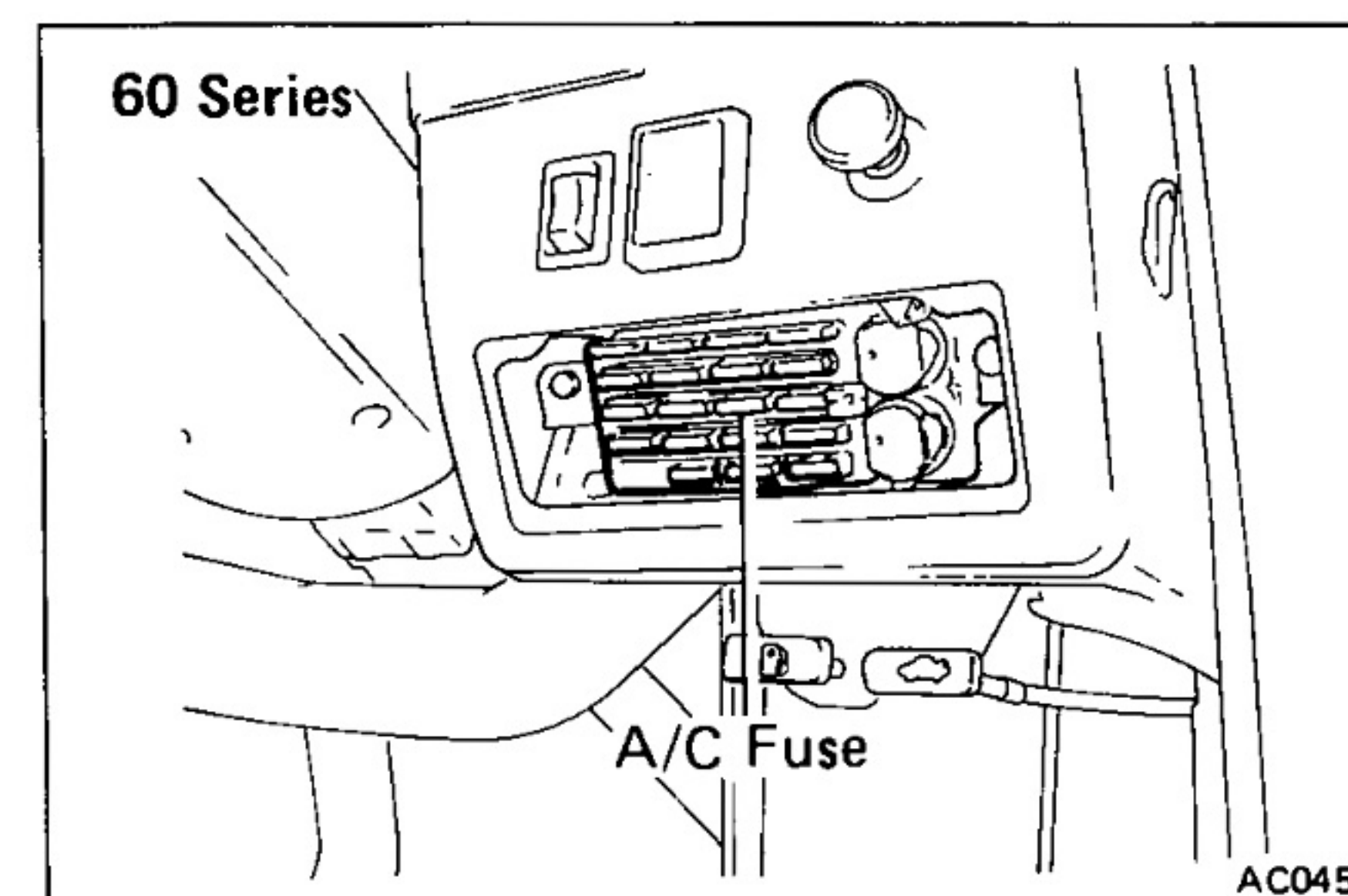
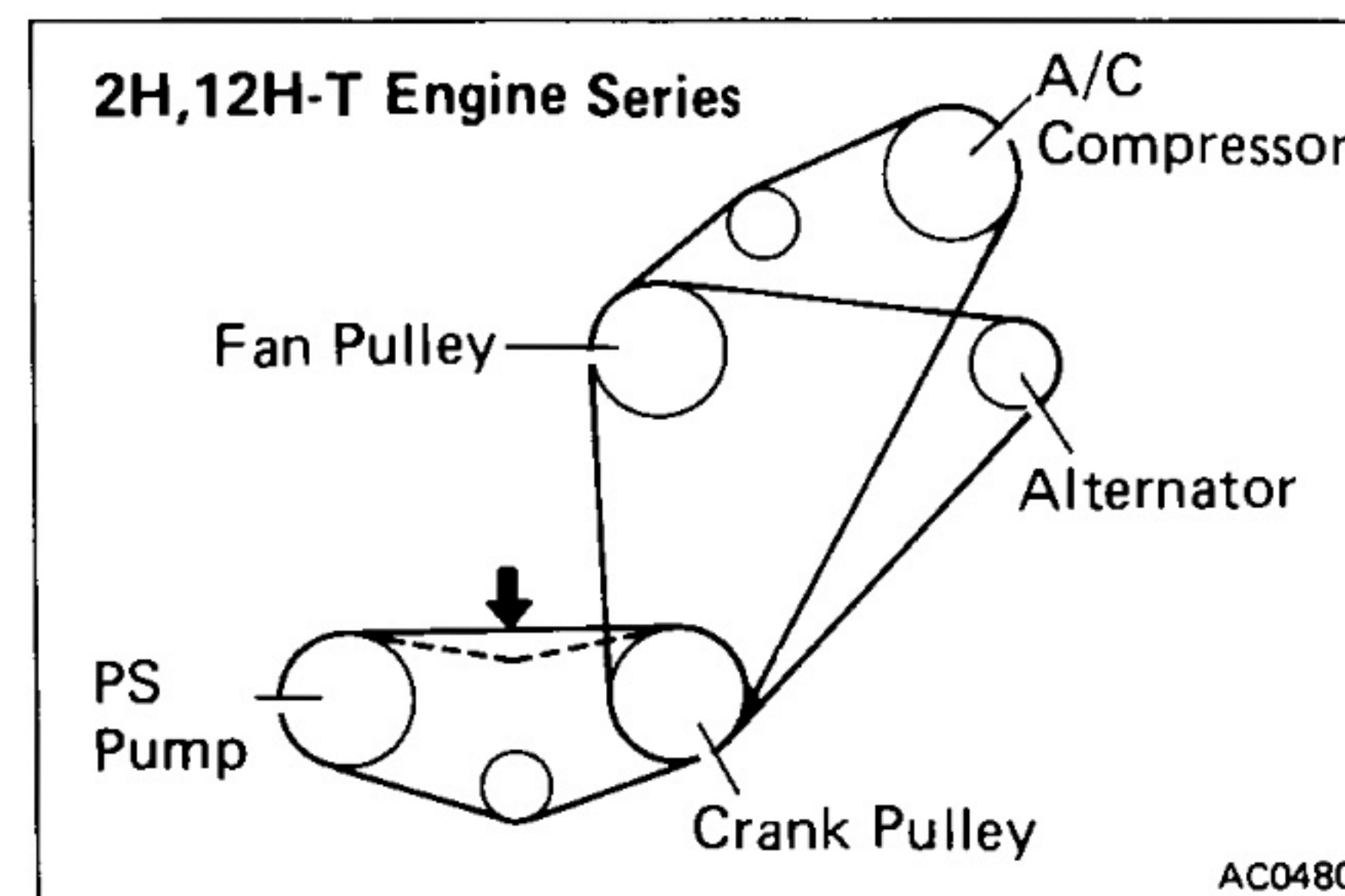
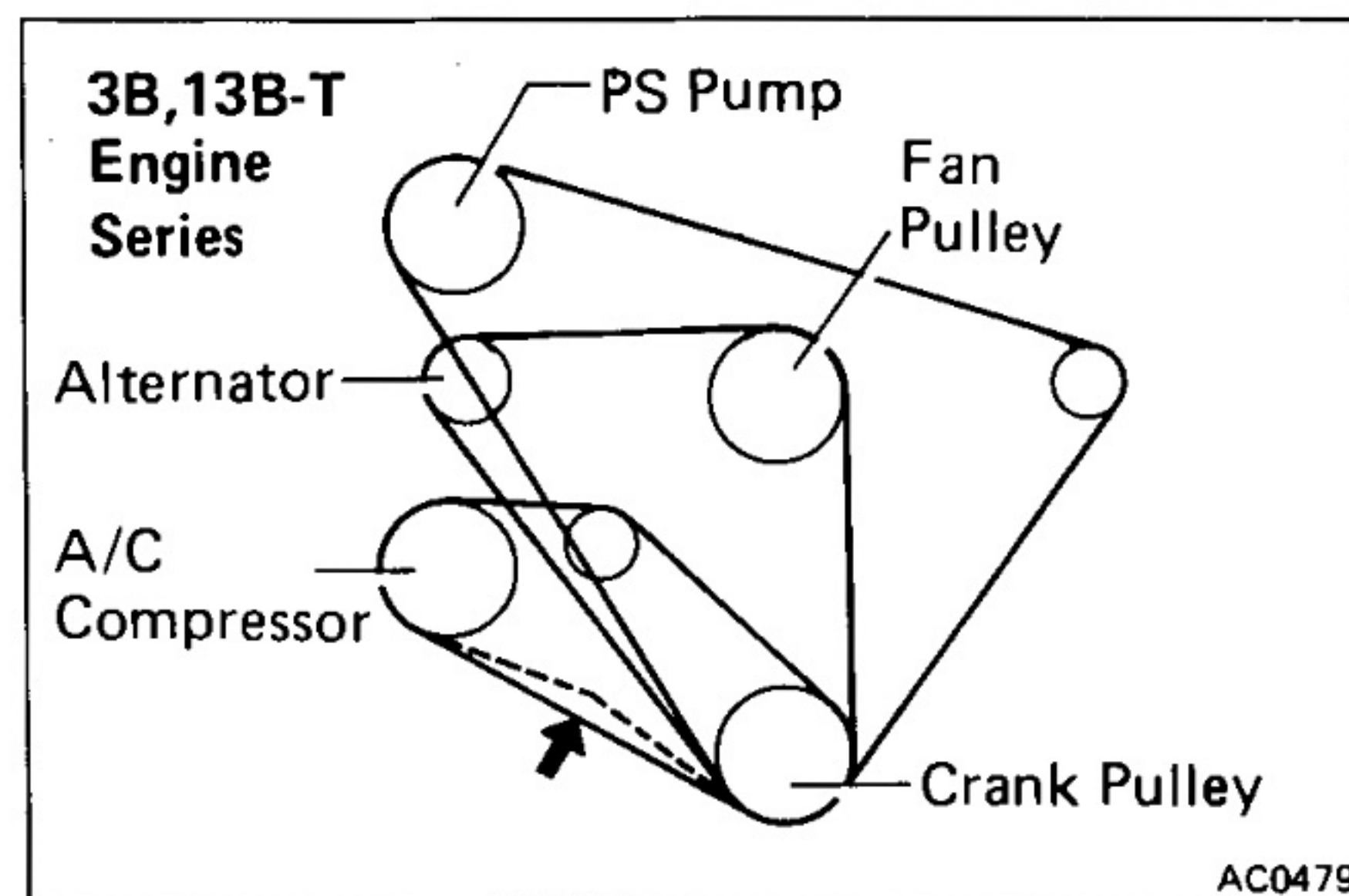
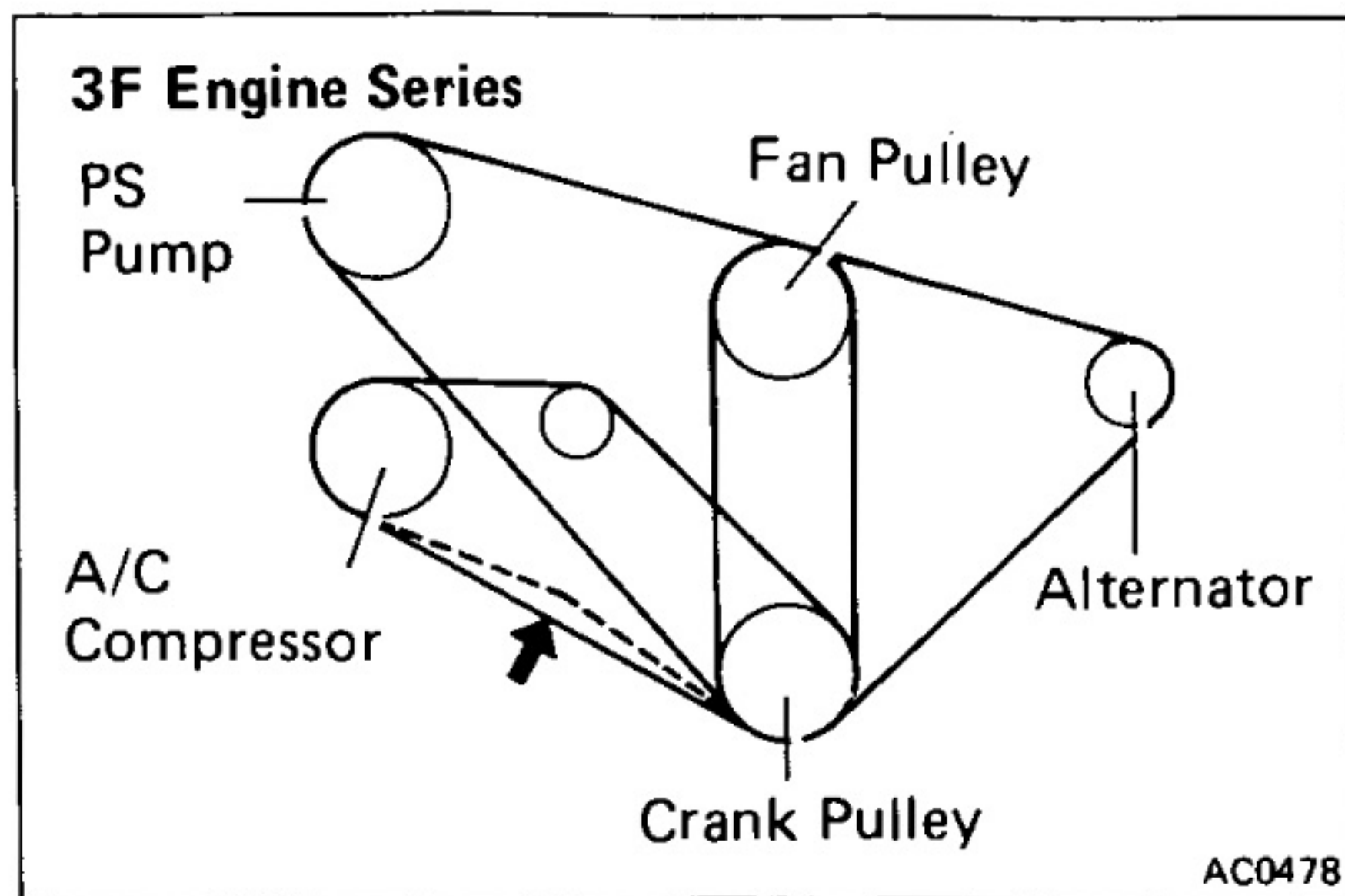
3F, 3B, 13B-T 900–1,000 rpm  
2H, 12H-T 800–900 rpm

7. **CHECK AMOUNT OF REFRIGERANT**

If you can see bubbles in the sight glass, additional refrigerant is needed.

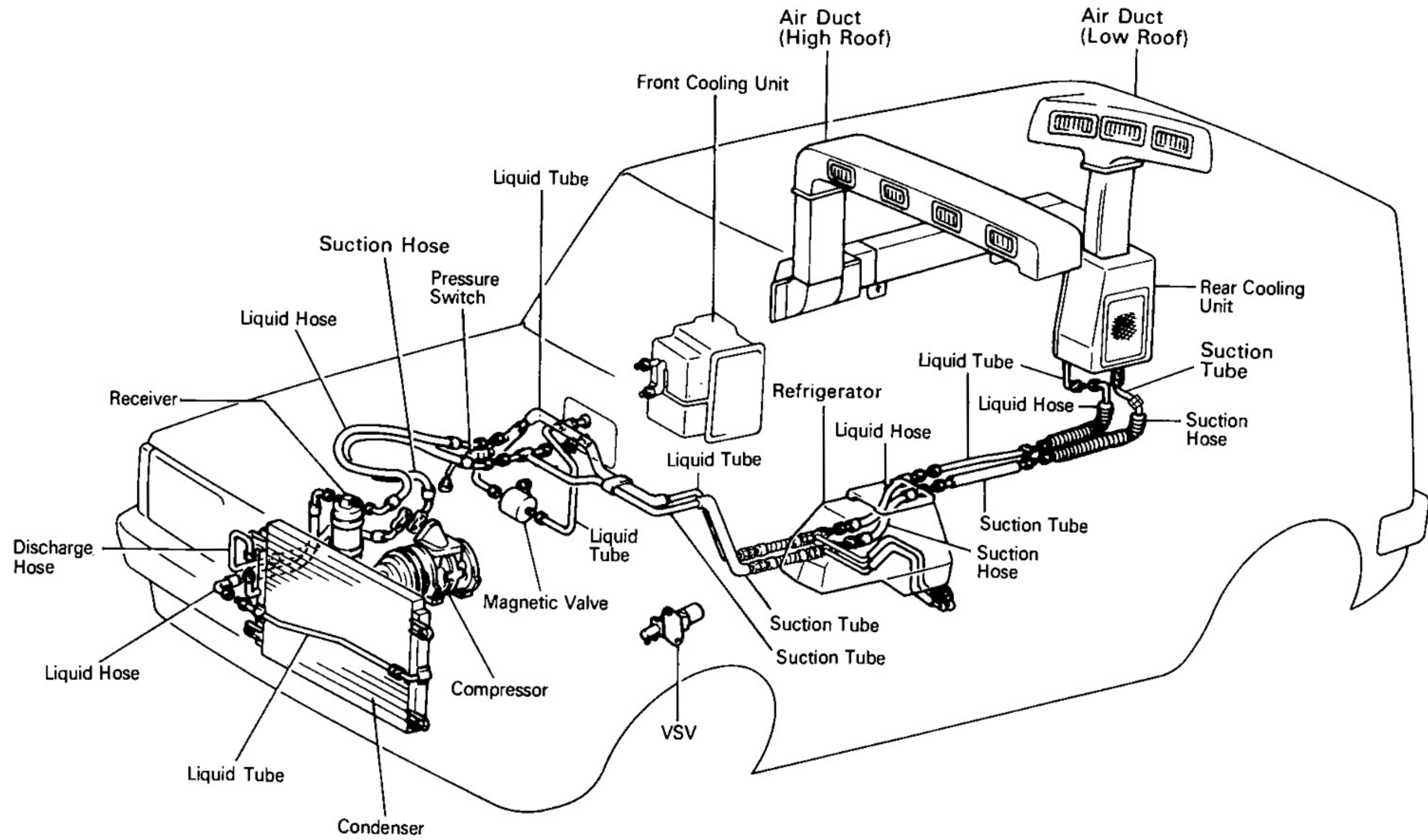
8. **IF NO OR INSUFFICIENT COOLING, INSPECT FOR LEAKAGE**

Using a gas leak tester, inspect each component of the refrigeration system.

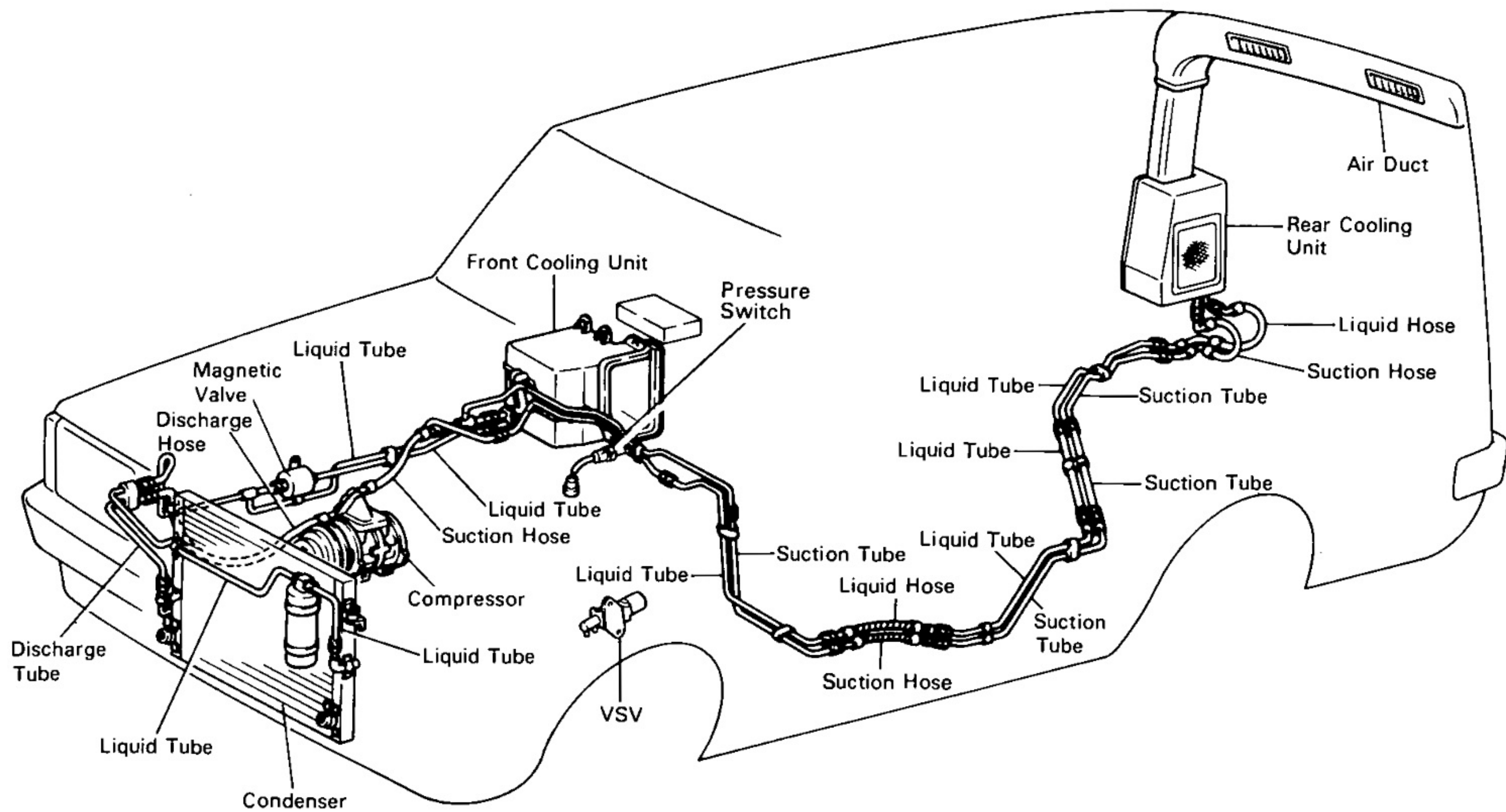


# SYSTEM COMPONENTS

## 60 Series Dual A/C

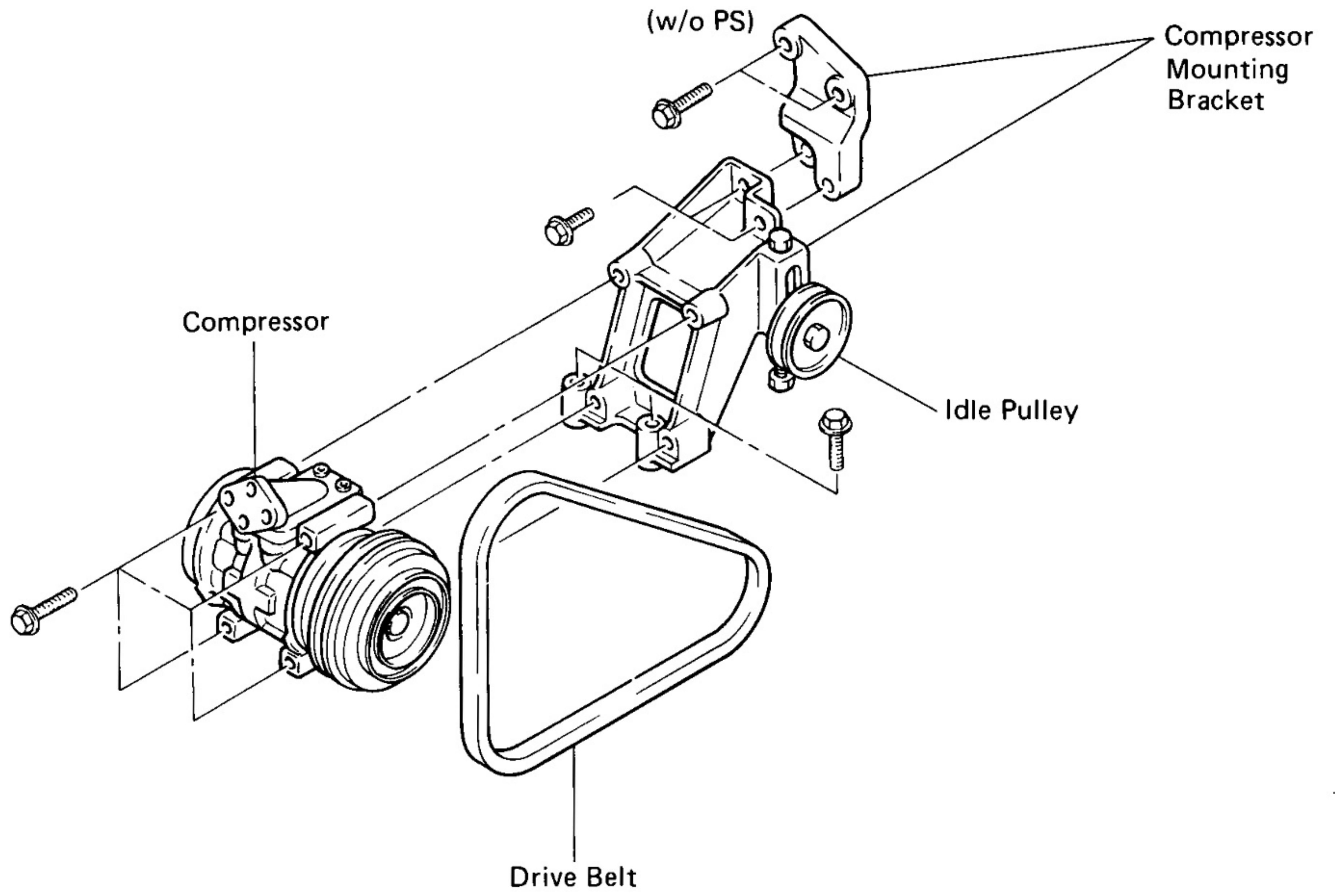


## 70 Series Dual A/C

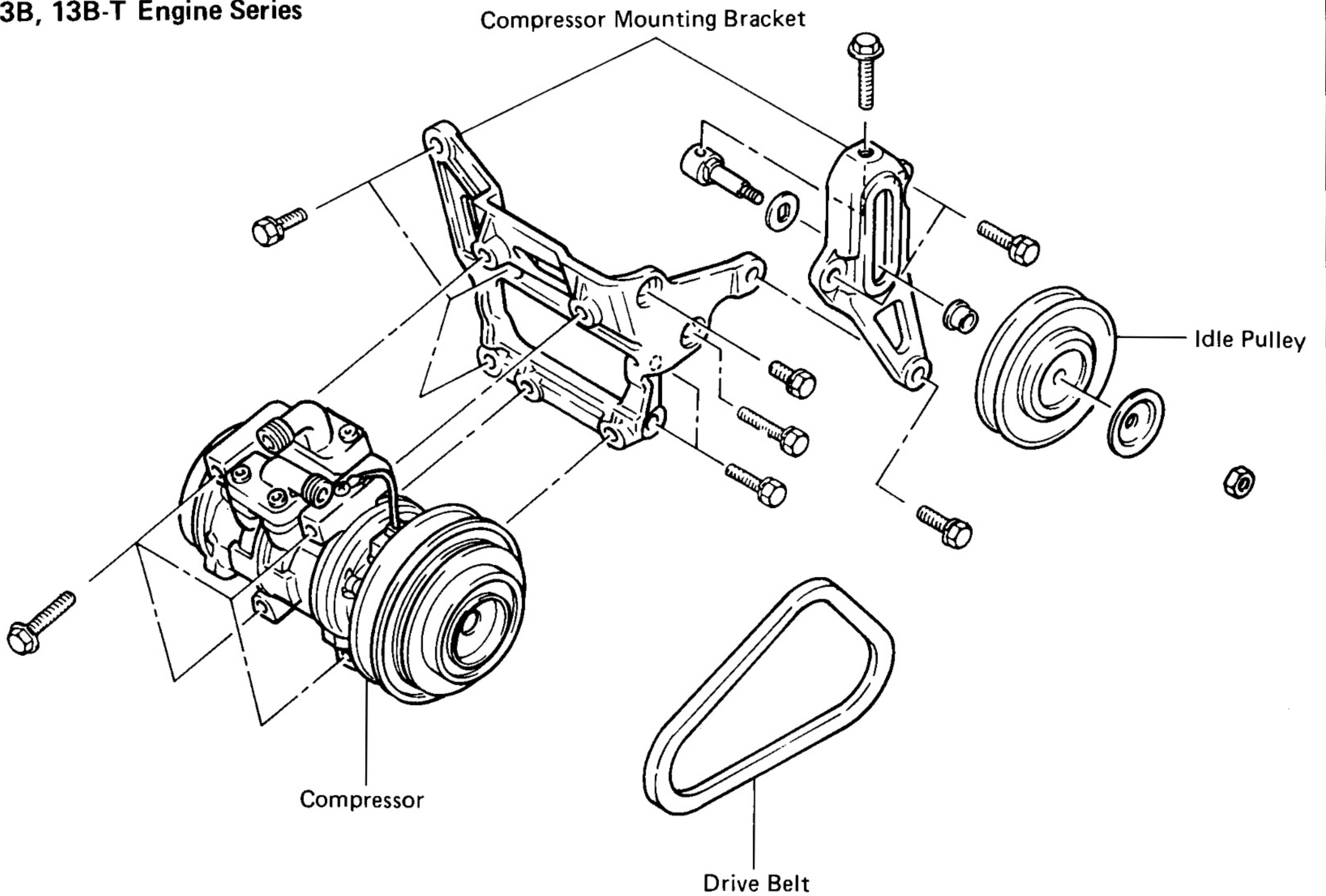


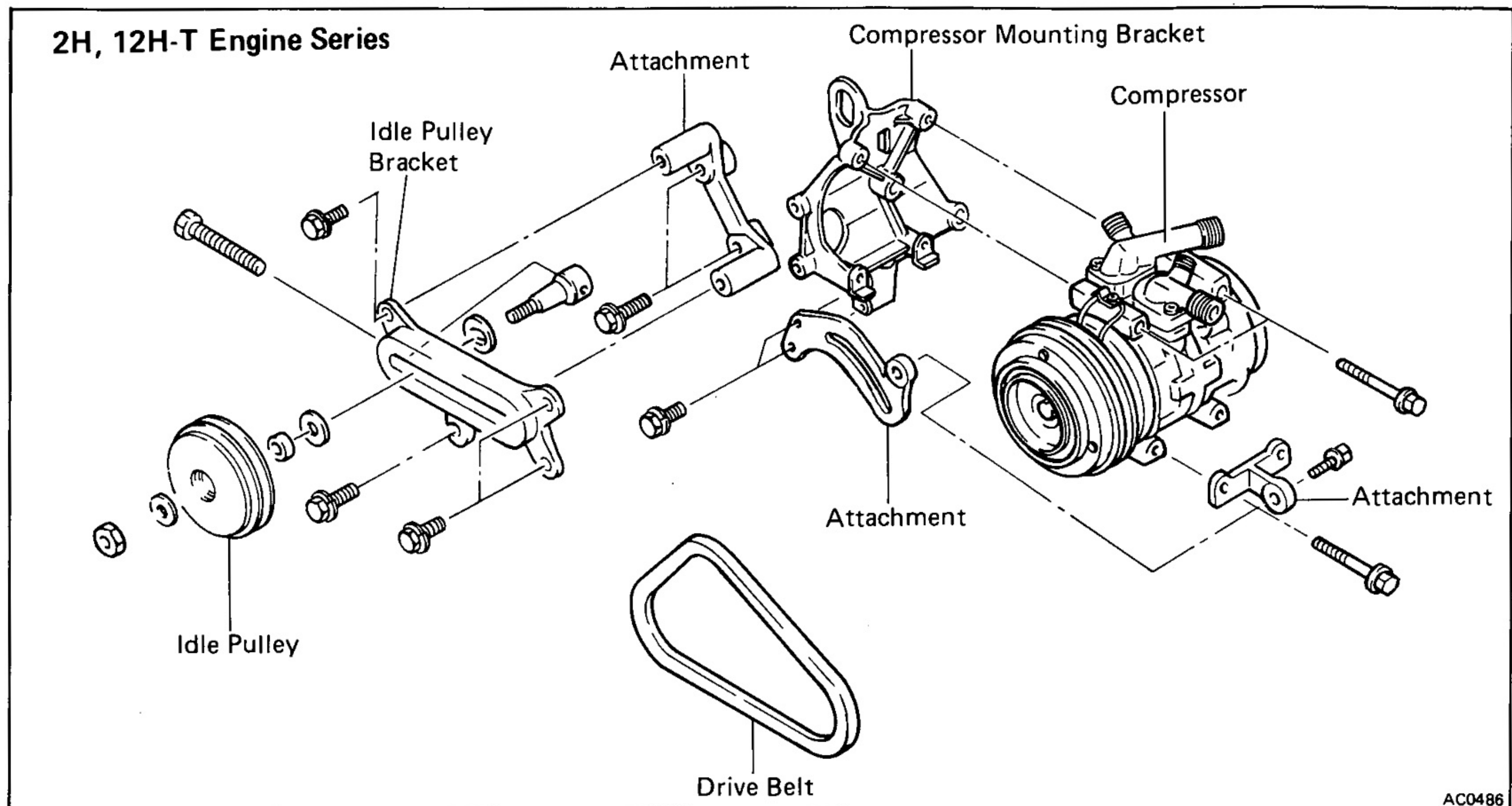
# COMPRESSOR

## 3F Engine Series



## 3B, 13B-T Engine Series





## REMOVAL OF COMPRESSOR

1. RUN ENGINE AT IDLE FOR 10 MINUTES WITH AIR CONDITIONING ON
2. DISCONNECT NEGATIVE CABLE FROM BATTERY
3. DISCONNECT CLUTCH LEAD WIRE FROM WIRING HARNESS
4. DISCHARGE REFRIGERANT FROM REFRIGERANT SYSTEM
5. DISCONNECT TWO FLEXIBLE HOSES FROM COMPRESSOR SERVICE VALVES

Cap the open fitting immediately to keep moisture out of the system.

6. REMOVE COMPRESSOR
  - (a) Loosen the drive belt.
  - (b) Remove the compressor mounting bolts and the compressor.

### INSTALLATION OF COMPRESSOR

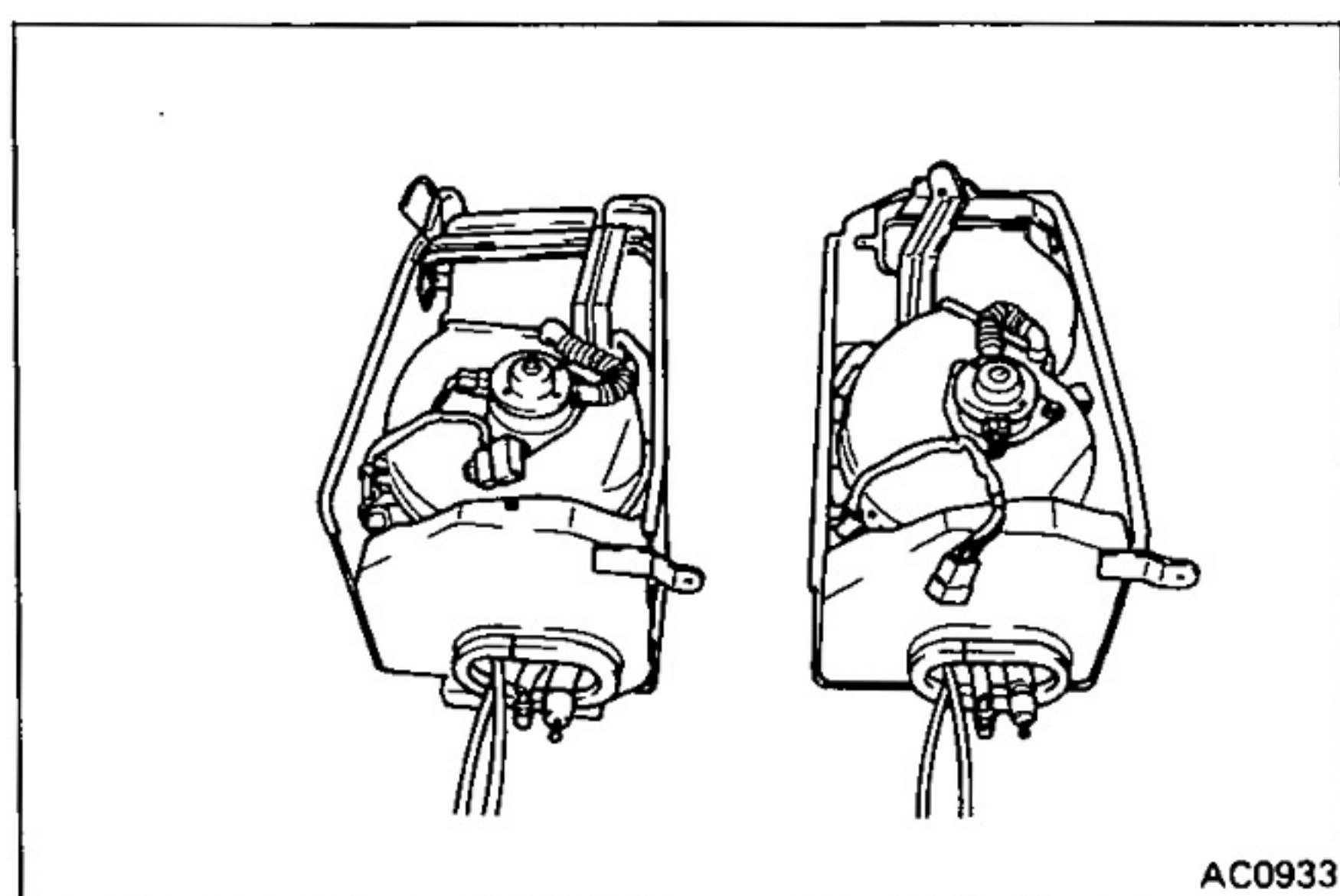
1. INSTALL COMPRESSOR WITH FOUR MOUNTING BOLTS
2. INSTALL DRIVE BELT
3. ADJUST DRIVE BELT (See page AC-5)
4. CONNECT TWO FLEXIBLE HOSES TO COMPRESSOR SERVICE VALVES

Torque: Discharge line 225 kg-cm (16 ft-lb, 22 N·m)  
 Suction line 325 kg-cm (24 ft-lb, 32 N·m)

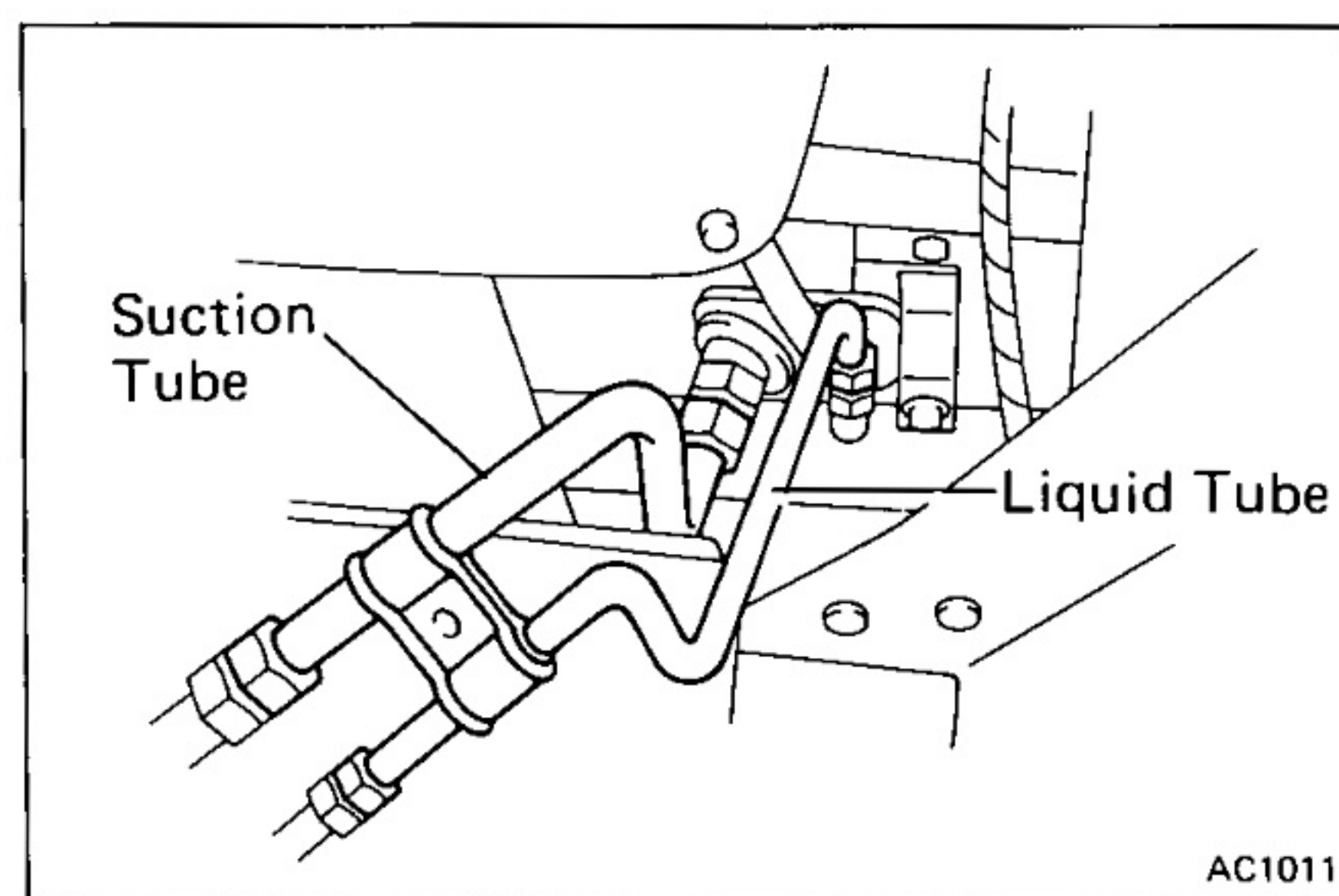
5. CONNECT CLUTCH LEAD WIRE TO WIRING HARNESS
6. CONNECT NEGATIVE CABLE TO BATTERY
7. EVACUATE AND CHARGE REFRIGERATION SYSTEM

### REAR COOLING UNIT(Dual A/C)

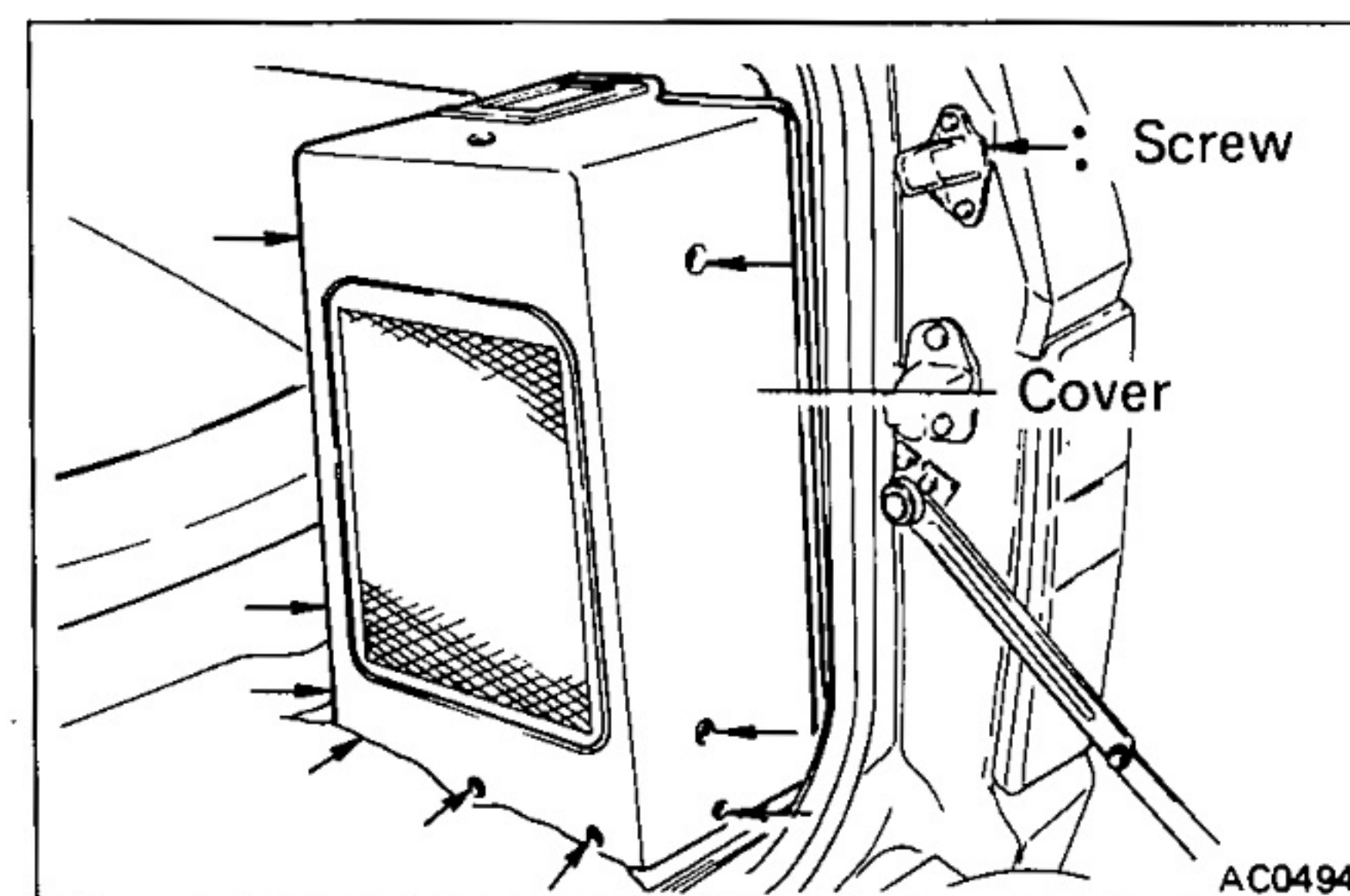
#### REMOVAL OF COOLING UNIT



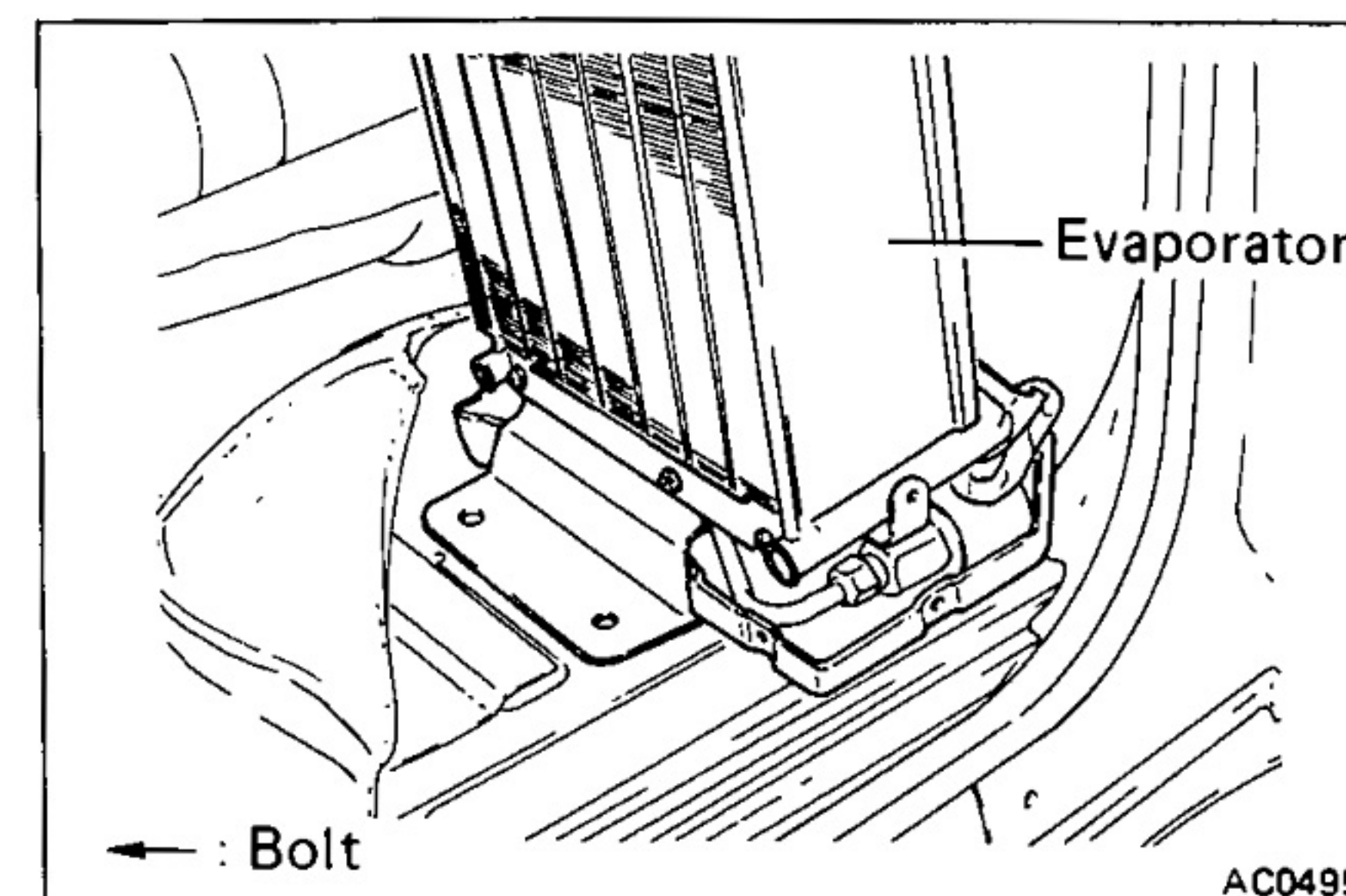
1. REMOVE SUCTION TUBE AND LIQUID TUBE

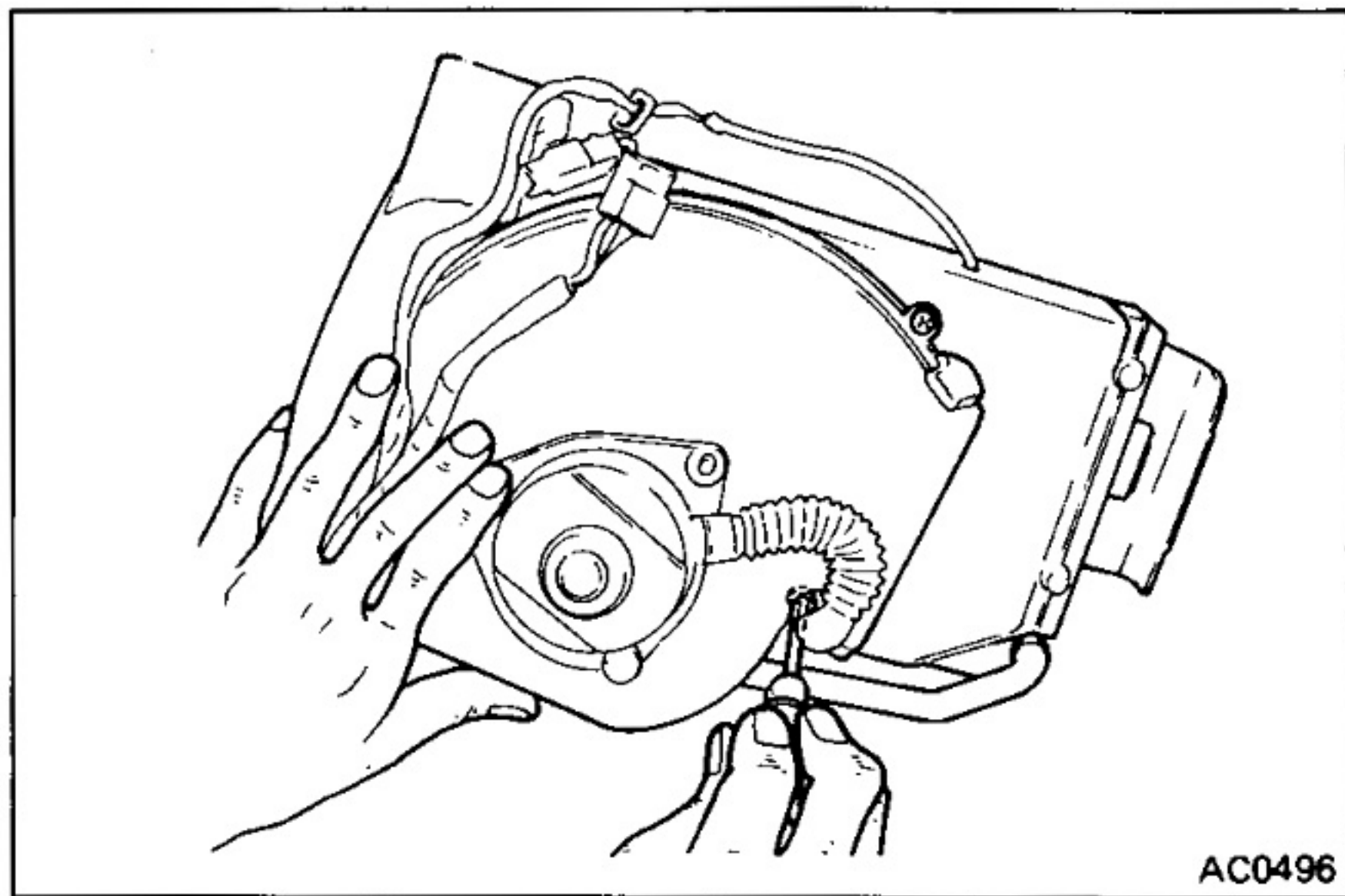


2. REMOVE COVER  
Remove ten screws.



3. REMOVE REAR COOLING UNIT FRONT CAR BODY  
Remove three bolts.



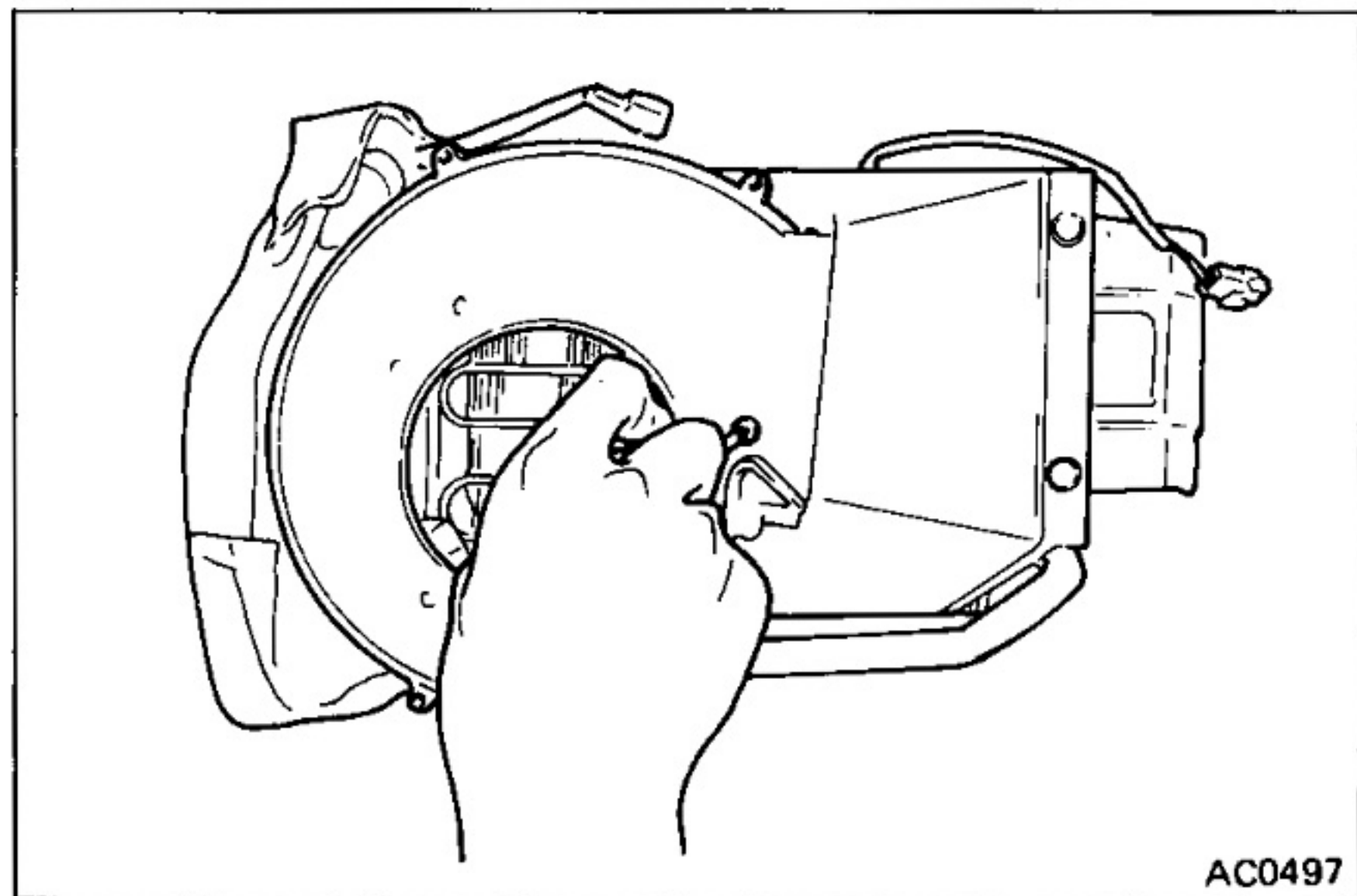


AC0496

## DISASSEMBLY OF REAR COOLING UNIT

### 1. REMOVE BLOWER

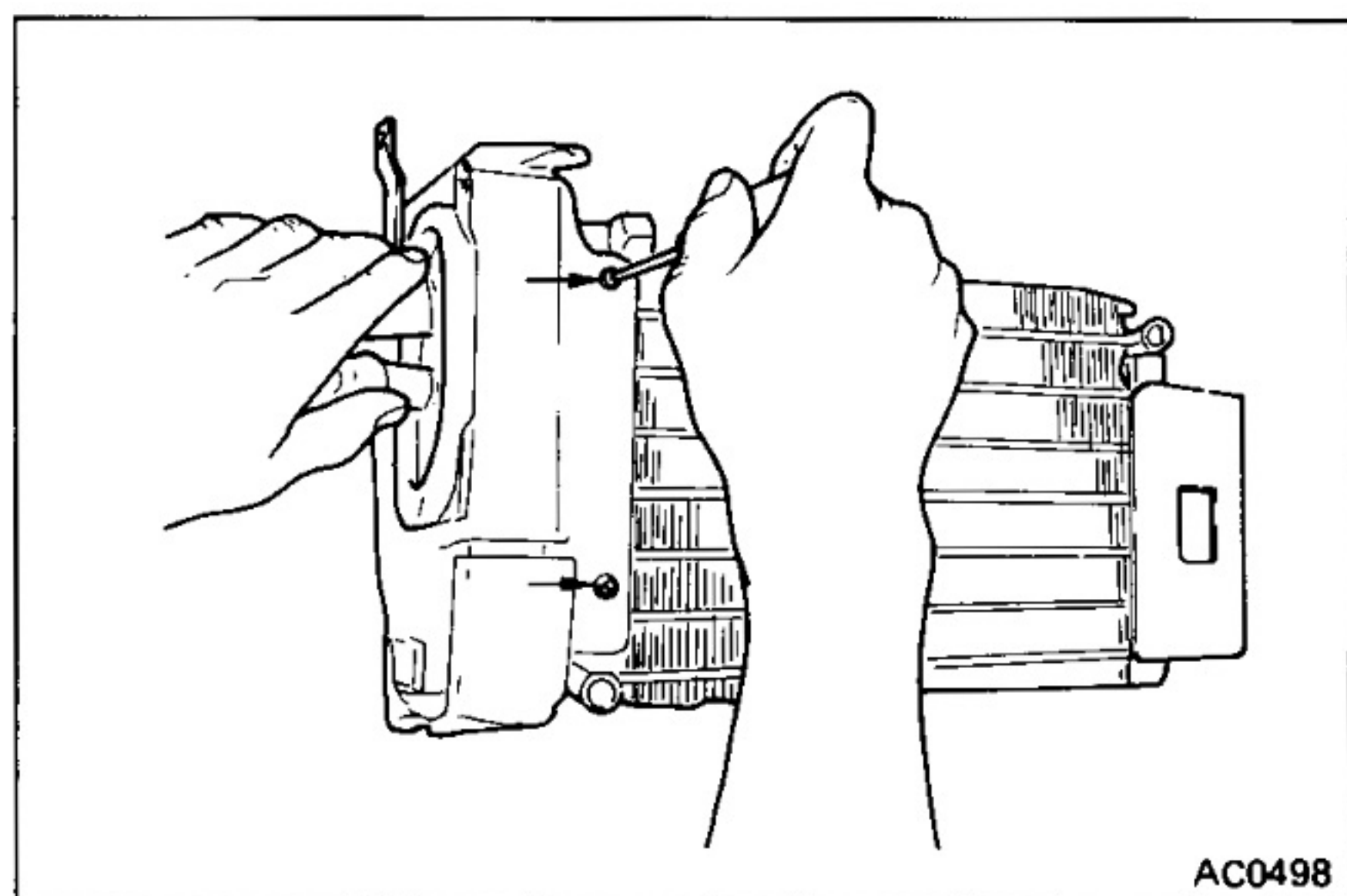
Remove four screws.



AC0497

### 2. REMOVE BLOWER COVER

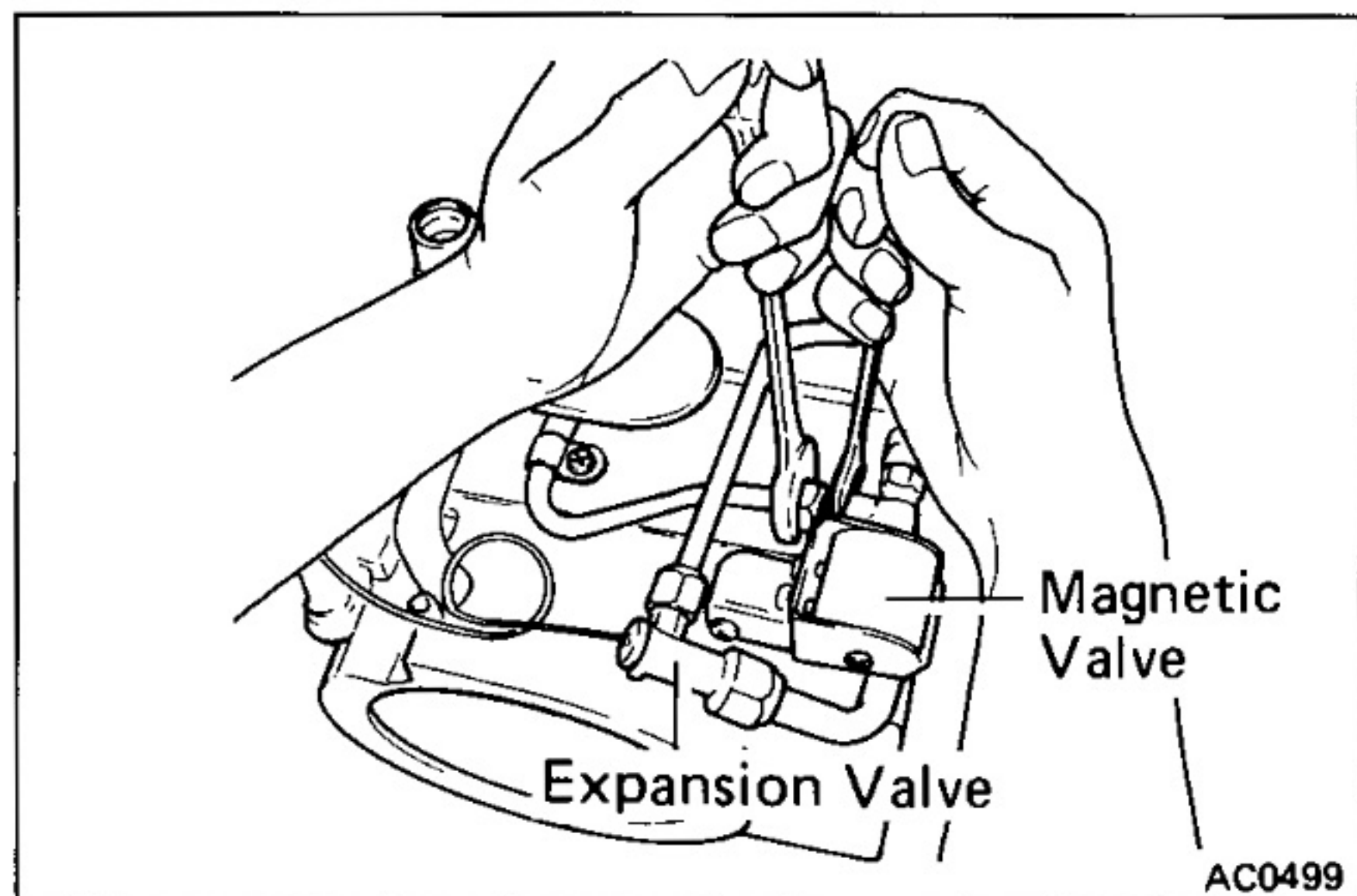
Remove five screws.



AC0498

### 3. REMOVE REAR COOLING UNIT STAY

Remove two long screws.



AC0499

### 4. REMOVE COMPONENTS FRONT REAR COOLING UNIT

- (a) Remove the magnetic valve from the cooling unit.
- (b) Disconnect the magnetic valve from inlet fitting of expansion valve.
- (c) Disconnect the expansion valve from the inlet fitting of the evaporator.
- (d) Remove the pressure switch if necessary.

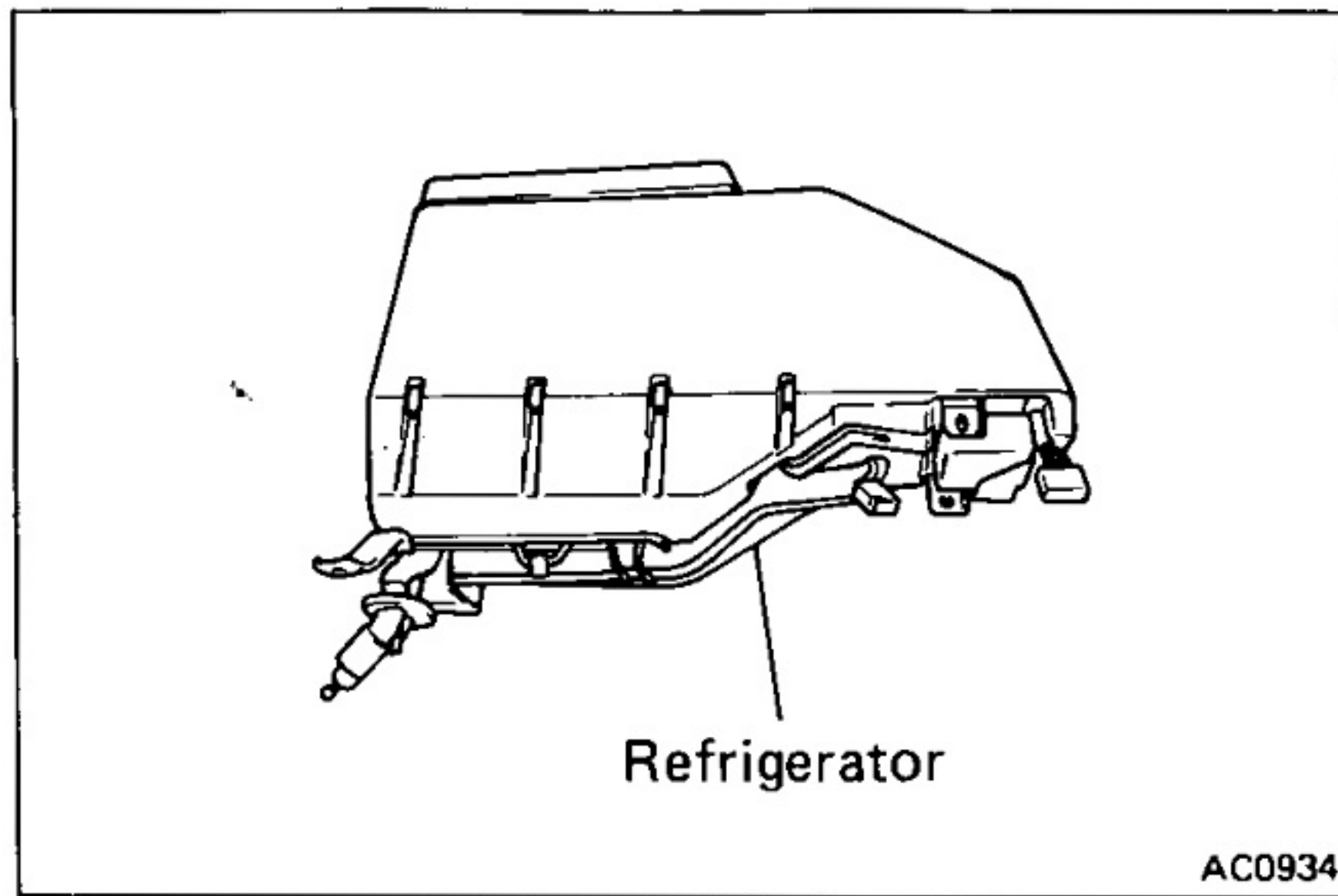
### 5. CHECK THERMISTOR AND EXPANSION VALVE IN SAME ORDER AS FRONT COOLING UNIT AND EXPANSION VALVE

## INSTALLATION OF REAR COOLING UNIT

### INSTALL REAR COOLING UNIT IN REVERSE SEQUENCE OF REMOVAL

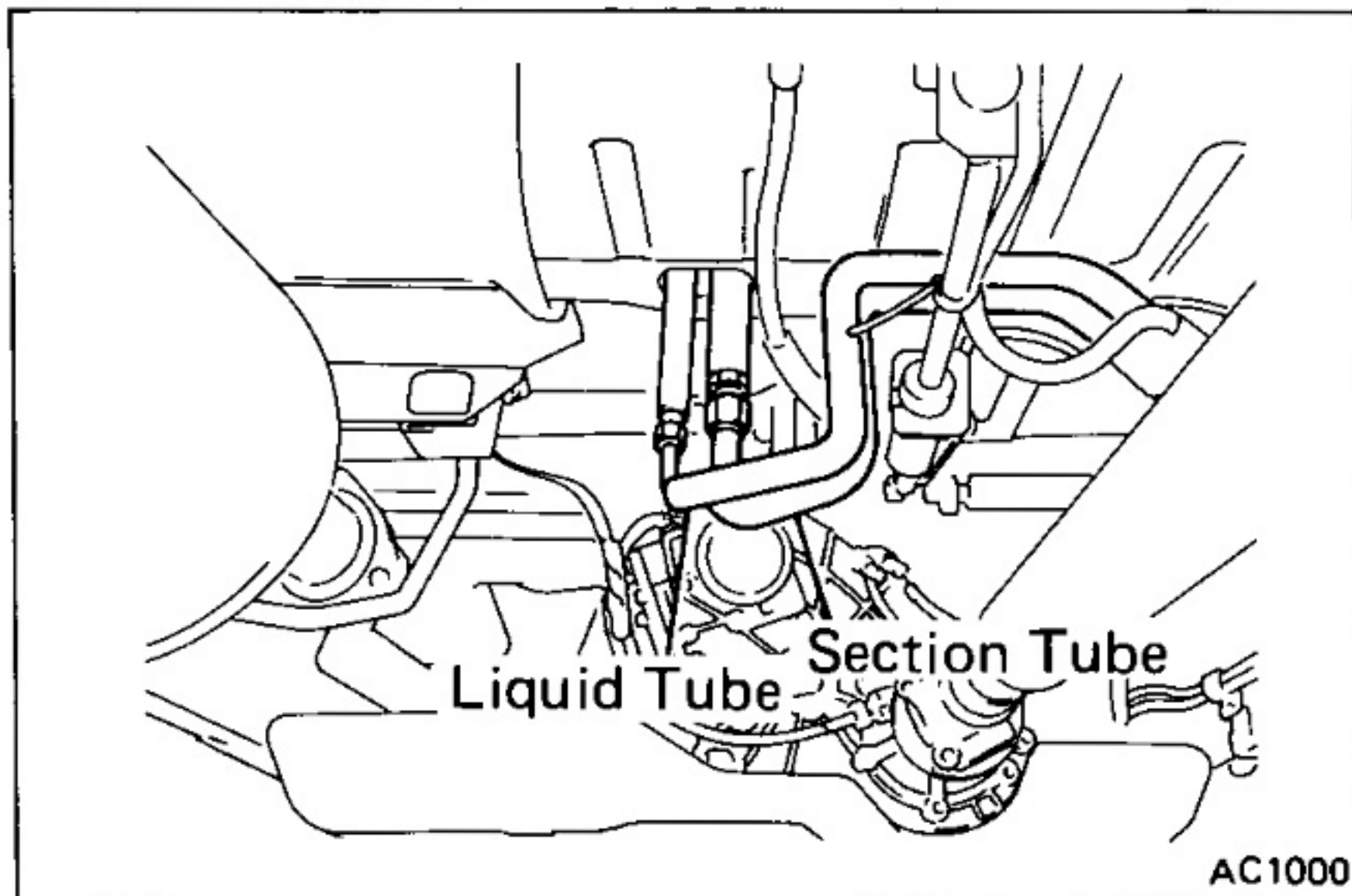
Torque: Suction Hose 135 kg-cm (10 ft-lb, 13 N·m)  
 Discharge Hose 325 kg-cm (24 ft-lb, 32 N·m)

## REFRIGERATOR (60, 61, 62 Series Dual A/C)

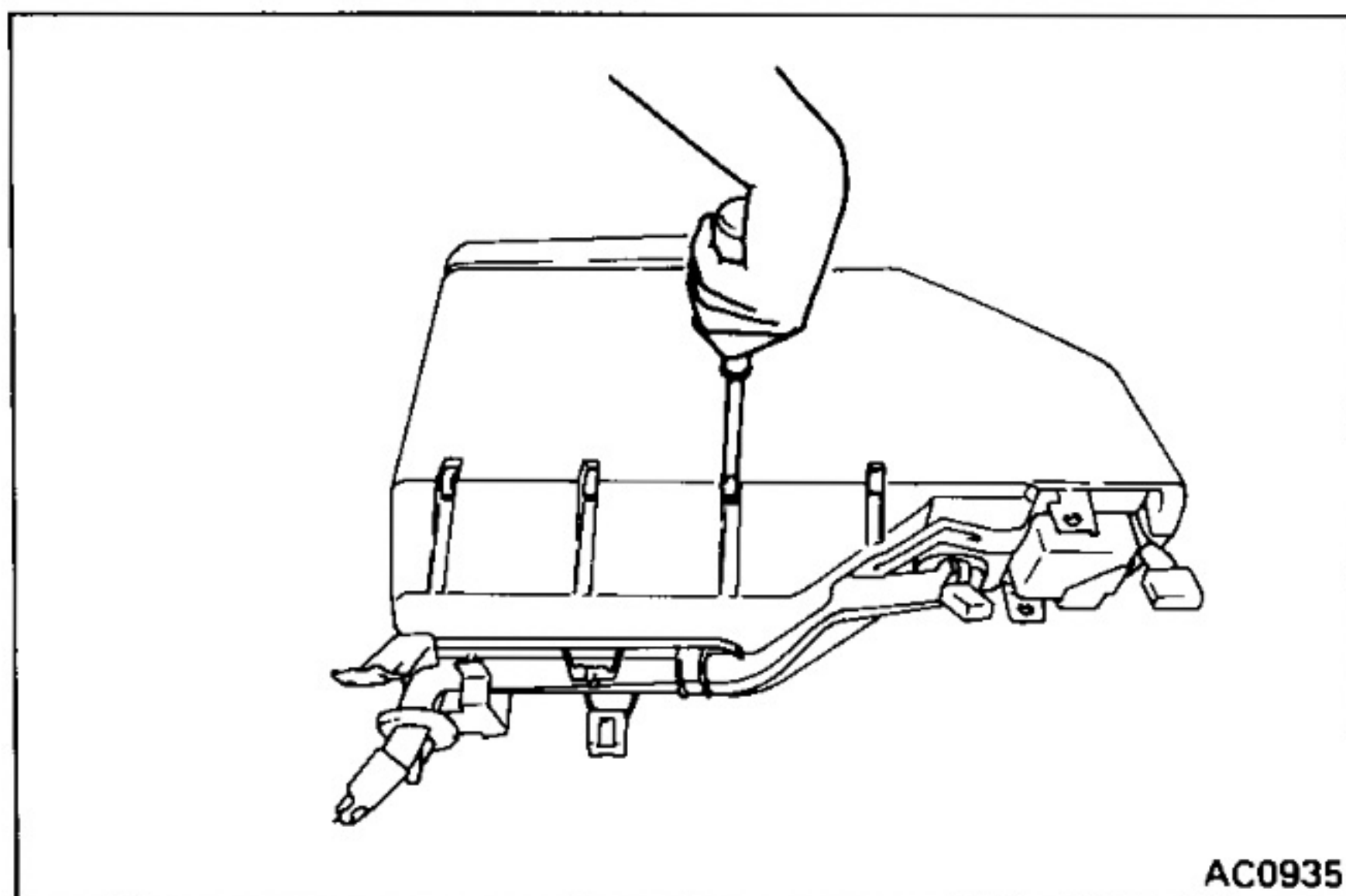


### REMOVAL OF REFRIGERATOR

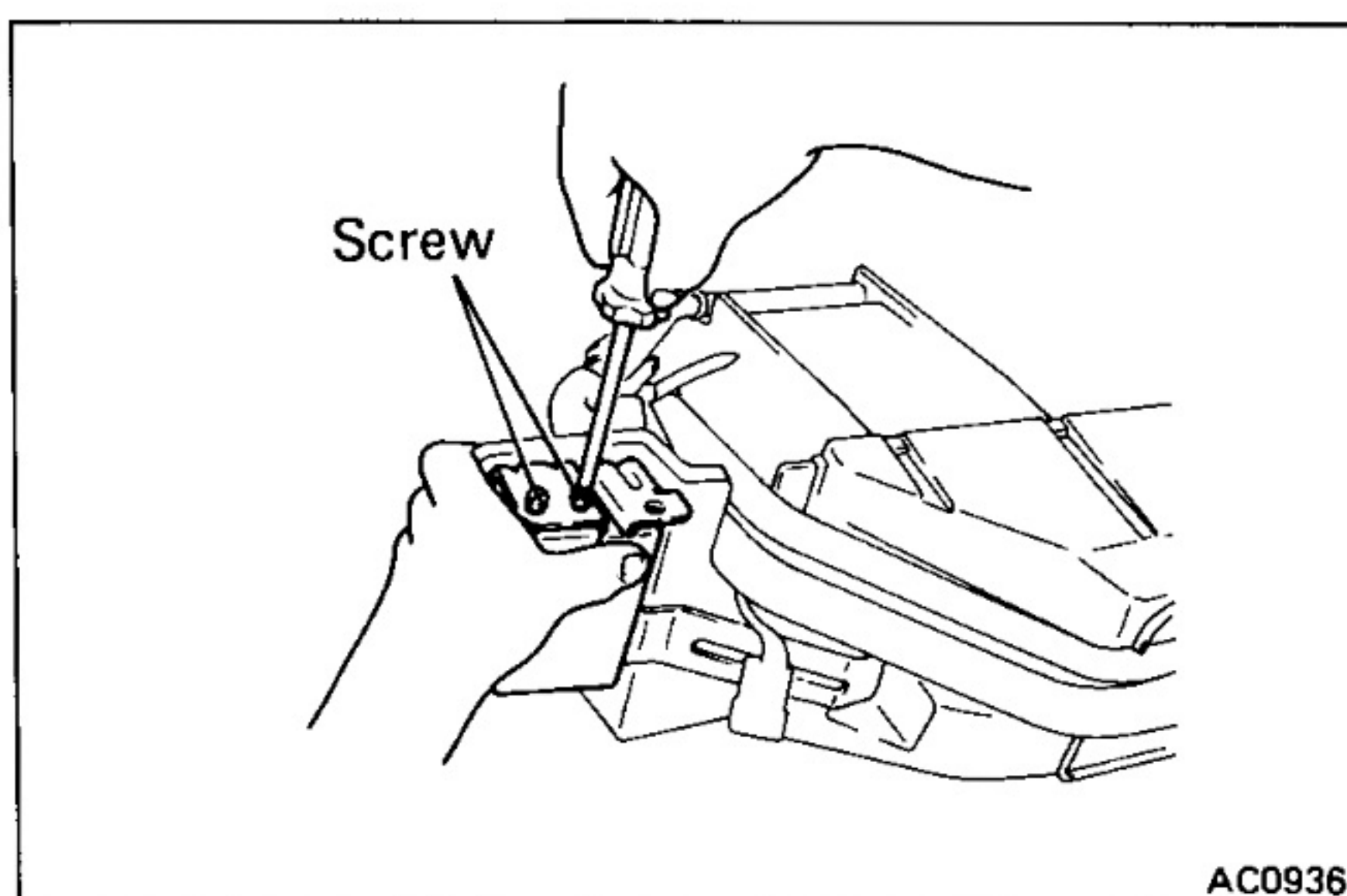
1. DISCONNECT LIQUID TUBE AND SUCTION TUBE



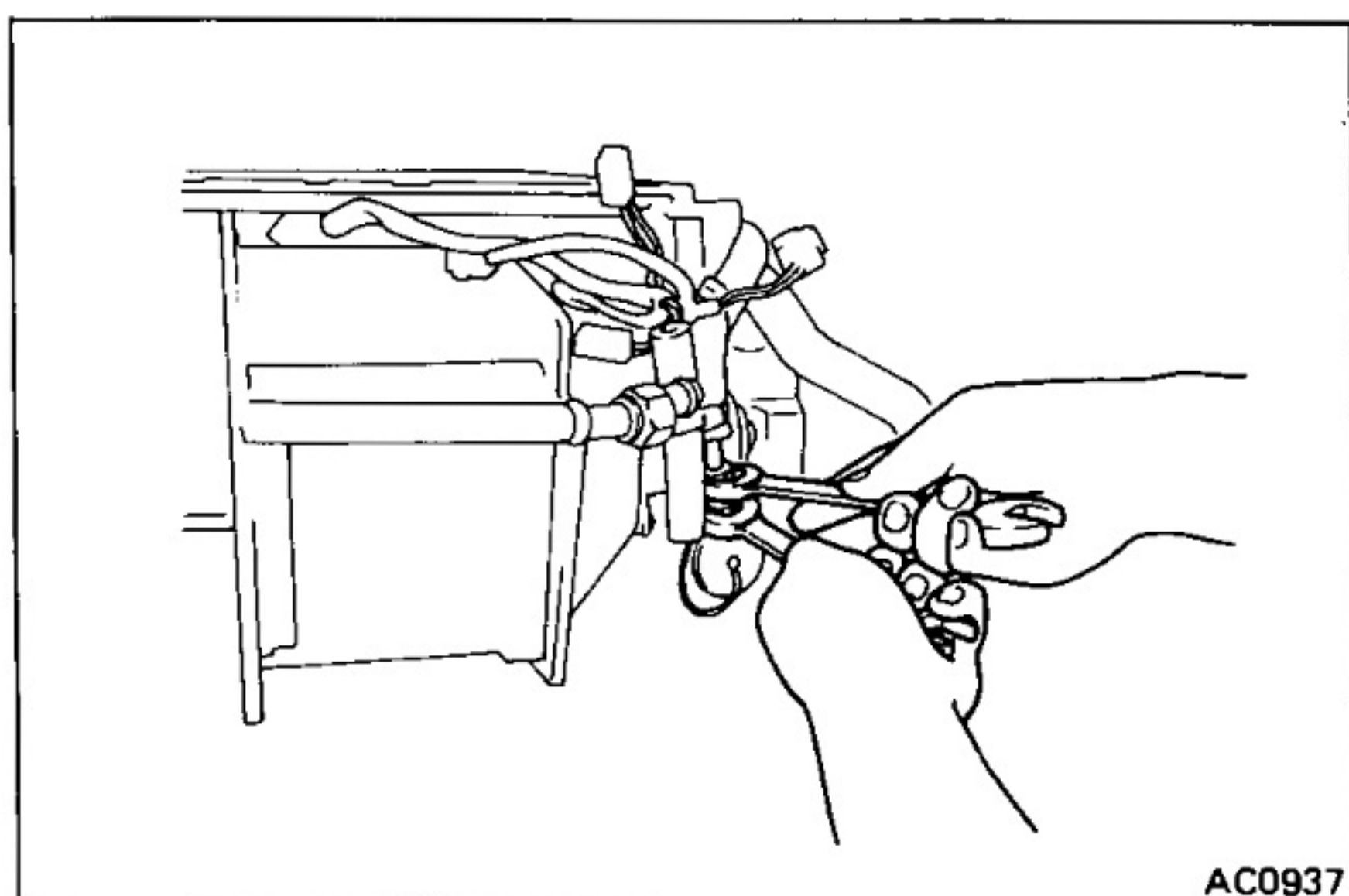
2. REMOVE EIGHT CLIPS AND UPPER CASE

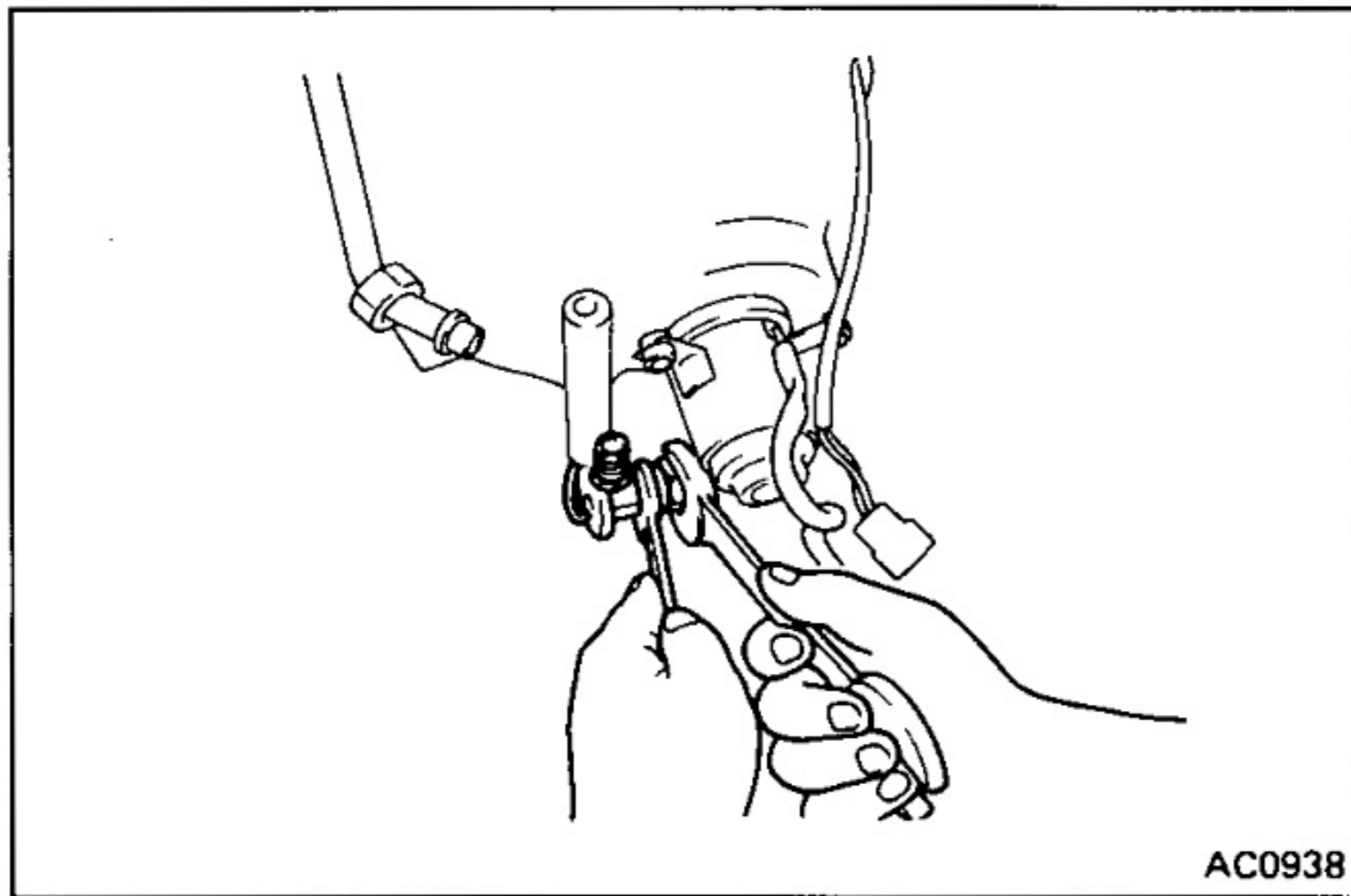


3. REMOVE REFRIGERATOR AMPLIFIER  
Remove two screws.

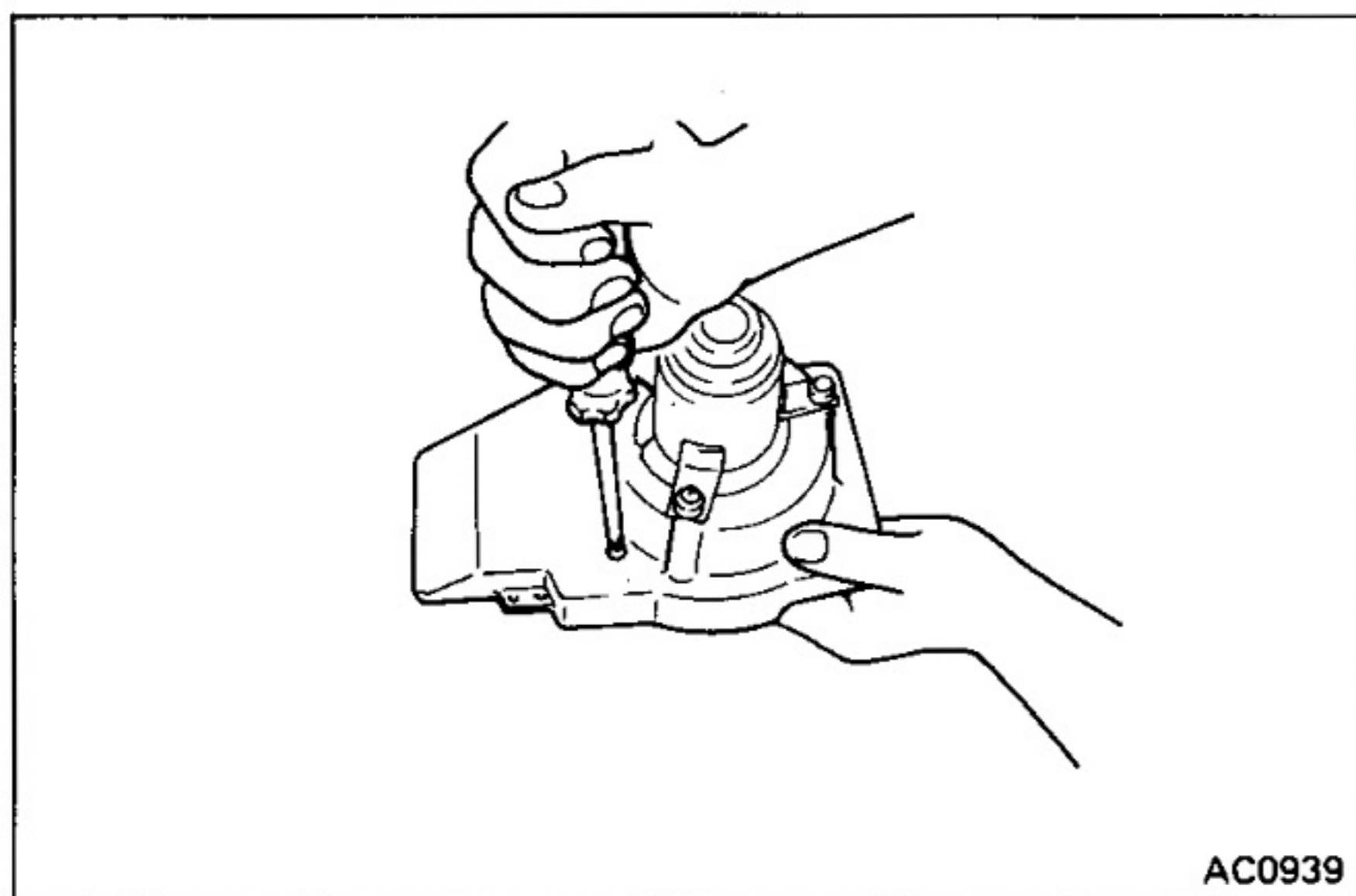


4. DISCONNECT SUCTION TUBE AND LIQUID TUBE





### 5. REMOVE EXPANSION VALVE



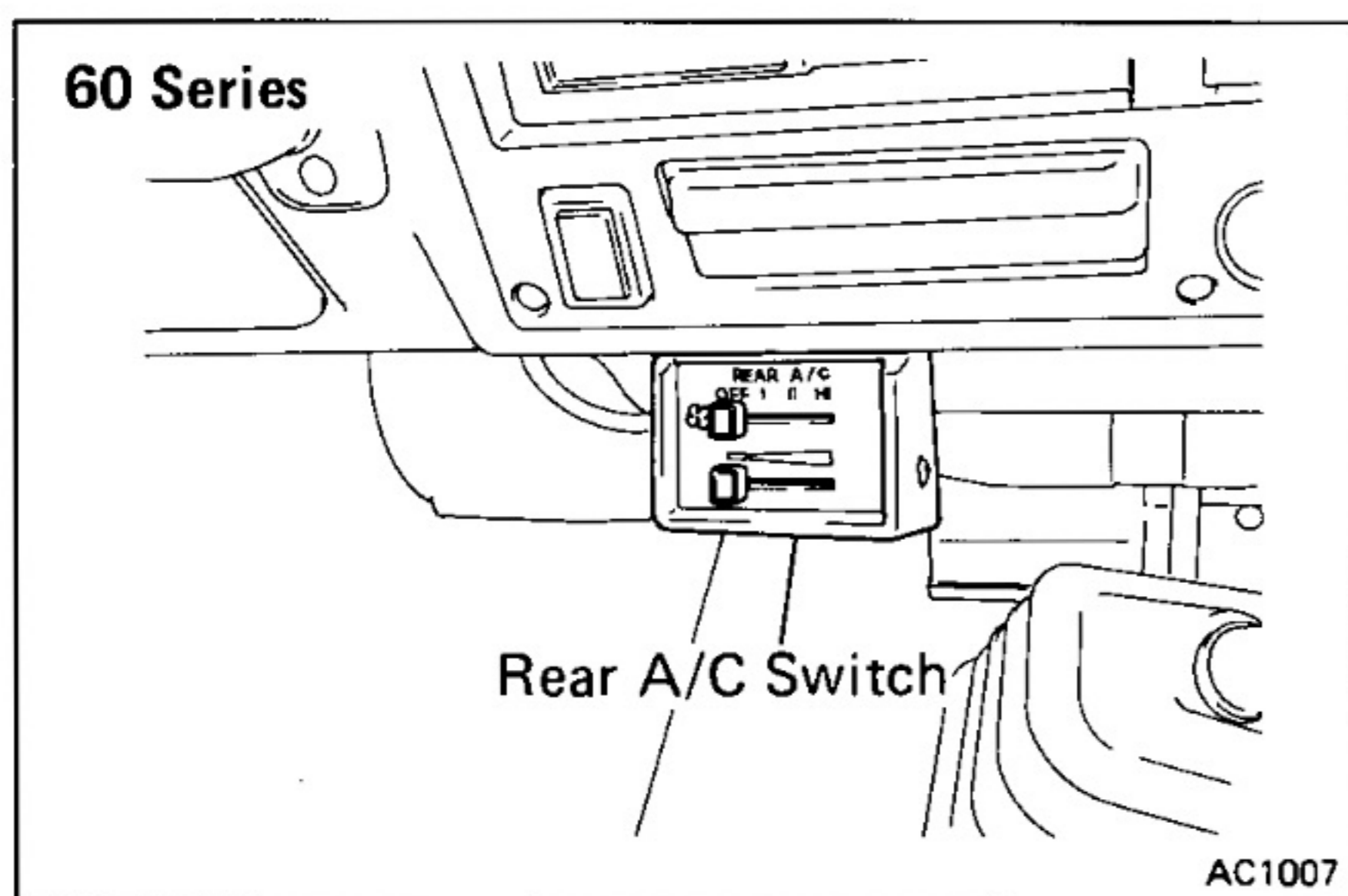
### 6. REMOVE BLOWER ASSEMBLY

CHECK THERMISTOR AND EXPANSION VALVE IN SAME ORDER AS FRONT COOLING UNIT AND EXPANSION VALVE

## INSTALLATION OF REFRIGERATOR

INSTALL REFRIGERATOR IN REVERSE SEQUENCE OF REMOVAL

Torque: Suction Hose 135 kg-cm (10 ft-lb, 13 N·m)  
Discharge Hose 325 kg-cm (24 ft-lb, 32 N·m)



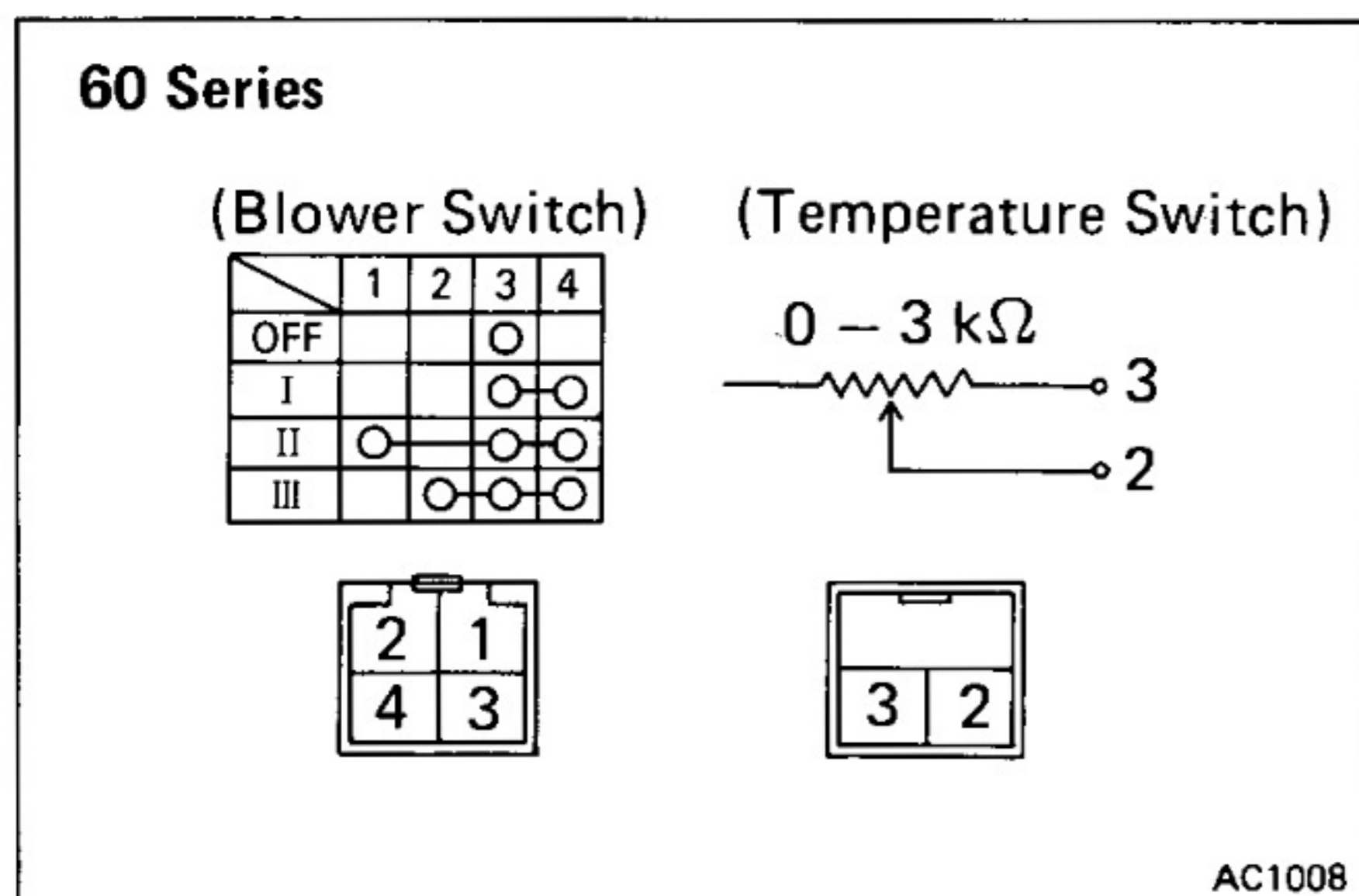
## REAR A/C SWITCH (Dual A/C)

### ON-VEHICLE INSPECTION

1. DISCONNECT NEGATIVE CABLE FROM BATTERY
2. DISCONNECT TWO CONNECTORS
3. REMOVE REAR A/C SWITCH

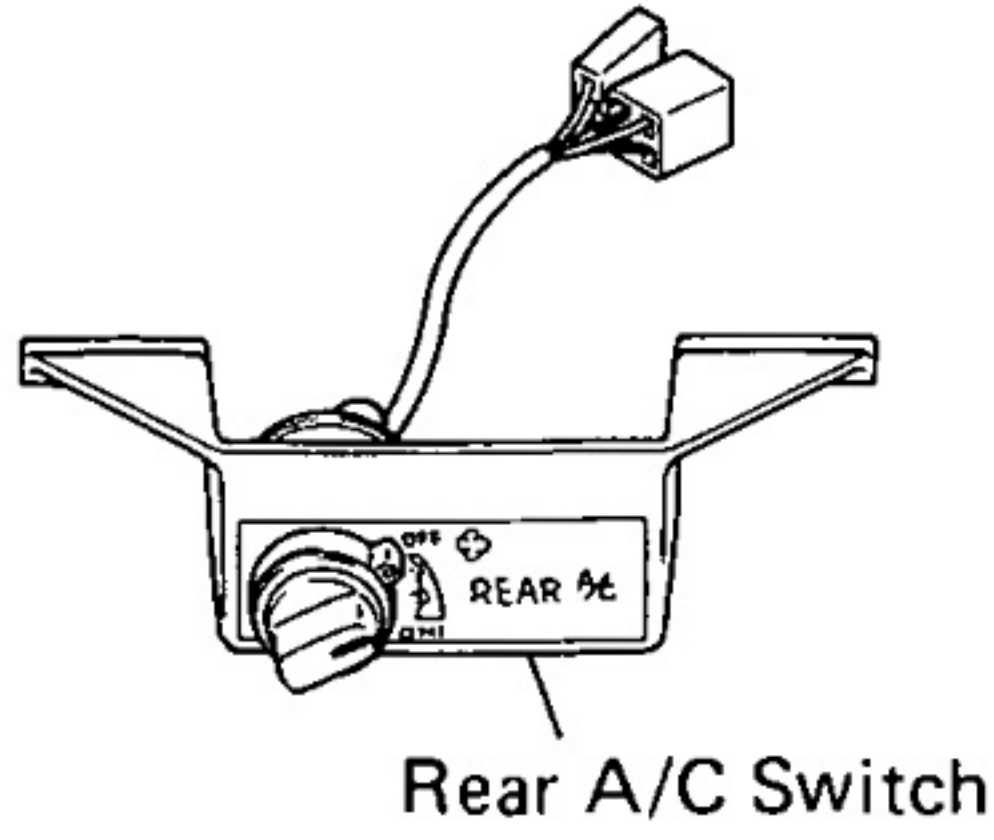
### 4. CHECK REAR A/C SWITCH

- (a) Blower switch  
Using an ohmmeter, check continuity between terminals for each switch position.  
If there is no continuity, replace the A/C switch.
- (b) Temperature control switch  
Using an ohmmeter, check the resistance between terminals while moving the switch.  
If an ohmmeter indicates incorrect resistance, replace the switch.



AC1008

70 Series



Rear A/C Switch

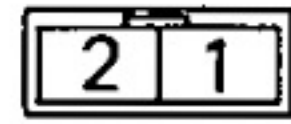
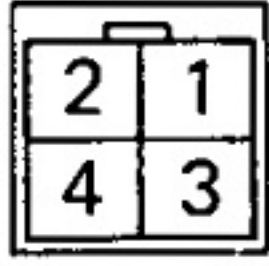
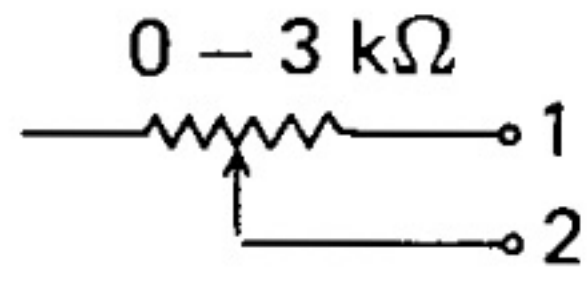
AC1009

5. INSTALL REAR A/C SWITCH
6. CONNECT TWO CONNECTORS
7. CONNECT NEGATIVE CABLE TO BATTERY

70 Series

(Blower Switch) (Temperature Switch)

	1	2	3	4
OFF				○
I			○	○
II		○	○	○
III	○		○	○



AC1010

# SERVICE SPECIFICATIONS

	Page
FRONT AXLE AND SUSPENSION .....	A-2
REAR AXLE AND SUSPENSION .....	A-2
LUBRICANT .....	A-3

## FRONT AXLE AND SUSPENSION

### Torque Specifications

Part tightened	kg-cm	ft-lb	N·m
Wheel nut	1,500	108	147

## REAR AXLE AND SUSPENSION

### Specifications

Differential	Drive pinion bearing preload	at Starting		
	New bearing		13–20 kg-cm 11.3–17.4 in.-lb 1.3–2.0 N·m	
	Reused bearing		7–10 kg-cm 6.1–8.7 in.-lb 0.7–1.0 N·m	
	Total preload	at Starting	Add drive pinion bearing preload	
	New and reused bearing		4–6 kg-cm 3.5–5.2 in.-lb 0.4–0.6 N·m	
	Drive pinion to ring gear backlash		0.15 – 0.20 mm 0.0059 – 0.0079 in.	
	Pinion gear to side gear backlash		0.02 – 0.20 mm 0.0008 – 0.0079 in.	
	Ring gear runout	Limit	0.1 mm 0.004 in.	
	Companion flange runout	Limit		
		Radial	0.1 mm 0.004 in.	
		Lateral	0.1 mm 0.004 in.	
	Ring gear installing temperature		90 – 110°C 194 – 230°F	
	Side gear thrust washer thickness		1.55 – 1.65 mm 0.0610 – 0.0650 in.	
			1.70 – 1.80 mm 0.0670 – 0.0709 in.	
			1.85 – 1.95 mm 0.0728 – 0.0768 in.	
			2.00 – 2.10 mm 0.0787 – 0.0827 in.	
		Drive pinion adjusting plate washer thickness		1.05 mm 0.0413 in.
				1.10 mm 0.0433 in.
				1.15 mm 0.0453 in.
				1.20 mm 0.0472 in.
				1.25 mm 0.0492 in.
				1.30 mm 0.0512 in.
			1.35 mm 0.0531 in.	
	1.40 mm 0.0551 in.			
	1.45 mm 0.0571 in.			
	1.50 mm 0.0591 in.			
	1.55 mm 0.0610 in.			
Side bearing adjusting plate thickness		2.66 – 2.68 mm 0.1047 – 0.1055 in.		
		2.69 – 2.71 mm 0.1059 – 0.1067 in.		
		2.72 – 2.74 mm 0.1071 – 0.1079 in.		
		2.75 – 2.77 mm 0.1083 – 0.1091 in.		
		2.78 – 2.80 mm 0.1094 – 0.1102 in.		
		2.81 – 2.83 mm 0.1106 – 0.1114 in.		
		2.84 – 2.86 mm 0.1118 – 0.1126 in.		
		2.87 – 2.89 mm 0.1130 – 0.1138 in.		
		2.90 – 2.92 mm 0.1142 – 0.1150 in.		
		2.93 – 2.95 mm 0.1154 – 0.1161 in.		
		2.96 – 2.98 mm 0.1165 – 0.1173 in.		
		2.99 – 3.01 mm 0.1177 – 0.1185 in.		
		3.02 – 3.04 mm 0.1189 – 0.1197 in.		
		3.05 – 3.07 mm 0.1201 – 0.1209 in.		

**Specifications (Cont'd)**

Differential (Cont'd)	Side bearing adjusting plate thickness (Cont'd)	3.08 – 3.10 mm	0.1213 – 0.1220 in.
		3.11 – 3.13 mm	0.1224 – 0.1232 in.
		3.14 – 3.16 mm	0.1236 – 0.1244 in.
		3.17 – 3.19 mm	0.1248 – 0.1256 in.
		3.20 – 3.22 mm	0.1260 – 0.1268 in.
		3.23 – 3.25 mm	0.1272 – 0.1280 in.
		3.26 – 3.28 mm	0.1283 – 0.1291 in.
		3.29 – 3.31 mm	0.1295 – 0.1303 in.
		3.32 – 3.34 mm	0.1307 – 0.1315 in.

**Torque Specifications**

Differential	Part tightened	kg-cm	ft-lb	N·m
	Companion flange x Propeller shaft	900	65	88
	Differential carrier x Axle housing	475	34	47
	Ring gear x Differential case	1,125	81	110
	Differential case x Case cover	590	43	58
	Side bearing cap x Differential carrier	1,150	83	113
	Drain plug	500	36	49
	Filler plug	500	36	49
	Differential lock indicator switch	400	29	39
	Differential lock cylinder assembly x Differential carrier	240	17	24
	Cylinder cover x Differential carrier	185	13	18
	Shift fork shaft set bolt	200	14	20
	Differential lock lever assembly x Body	130	9	13
	Control shaft assembly x Body	130	9	13
	Differential lock cable x Bracket	130	9	13
	Link bracket	260	19	25
Axle shaft and suspension	Axle shaft x Axle housing	340	25	33
	Shock absorber x Spring seat	375	27	37
	Wheel nut	1,500	108	147

**LUBRICANT**

Item	Capacity			Classification
	Liters	US qts	Imp. qts	
Differential oil				API GL-5 hypoid gear oil
Front differential	3.0	3.2	2.6	Above –18°C (0°F)
Rear differential	2.5	2.6	2.2	SAE 90
				Below –18°C (0°F)
				SAE 80W-90 or 80W






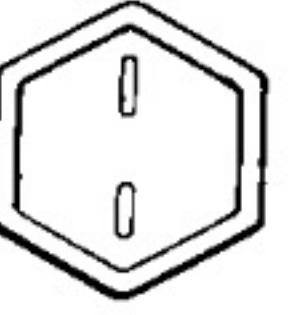

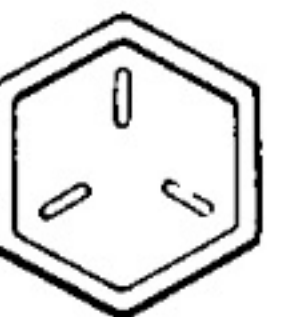
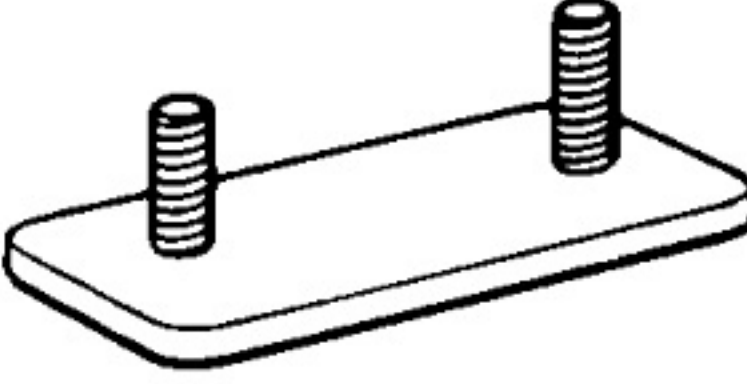
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# STANDARD BOLT TORQUE SPECIFICATIONS

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STANDARD BOLT TORQUE SPECIFICATIONS .....	B-2

# STANDARD BOLT TORQUE SPECIFICATIONS

## HOW TO DETERMINE BOLT STRENGTH

	Mark	Class		Mark	Class
Hexagon head bolt	 Bolt head No. 4 — 5 — 6 — 7 —	4T 5T 6T 7T	Stud bolt	 No mark	4T
	 No mark	4T			
Hexagon flange bolt w/washer hexagon bolt	 No mark	4T	Welded bolt	 Grooved	6T
Hexagon head bolt	 Two protruding lines	5T			
Hexagon flange bolt w/washer hexagon bolt	 Two protruding lines	6T			
Hexagon head bolt	 Three protruding lines	7T		4T	

## SPECIFIED TORQUE FOR STANDARD BOLTS

Class	Diameter mm	Pitch mm	Specified torque					
			Hexagon head bolt			Hexagon flange bolt		
			kg-cm	ft-lb	N·m	kg-cm	ft-lb	N·m
4T	6	1	55	48 in.-lb	5.4	60	52 in.-lb	5.9
	8	1.25	130	9	13	145	10	14
	10	1.25	260	19	25	290	21	28
	12	1.25	480	35	47	540	39	53
	14	1.5	760	55	75	850	61	83
	16	1.5	1,150	83	113	—	—	—
5T	6	1	65	56 in.-lb	6.4	—	—	—
	8	1.25	160	12	16	—	—	—
	10	1.25	330	24	32	—	—	—
	12	1.25	600	43	59	—	—	—
	14	1.5	930	67	91	—	—	—
	16	1.5	1,400	101	137	—	—	—
6T	6	1	80	69 in.-lb	7.8	90	78 in.-lb	8.8
	8	1.25	195	14	19	215	16	21
	10	1.25	400	29	39	440	32	43
	12	1.25	730	53	72	810	59	79
	14	1.5	—	—	—	1,250	90	123
7T	6	1	110	8	11	120	9	12
	8	1.25	260	19	25	290	21	28
	10	1.25	530	38	52	590	43	58
	12	1.25	970	70	95	1,050	76	103
	14	1.5	1,500	108	147	1,700	123	167
	16	1.5	2,300	166	226	—	—	—

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# SST AND SSM

	Page
SST (SPECIAL SERVICE TOOLS) .....	C-2
SSM (SPECIAL SERVICE MATERIALS) .....	C-3


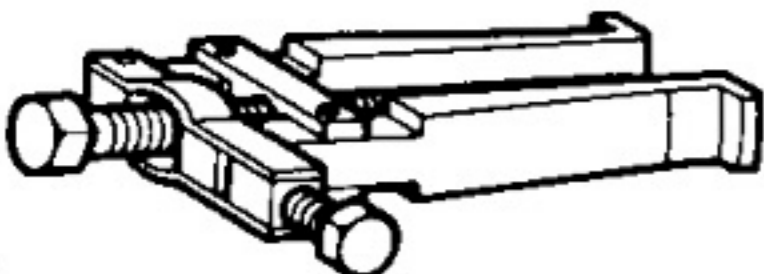
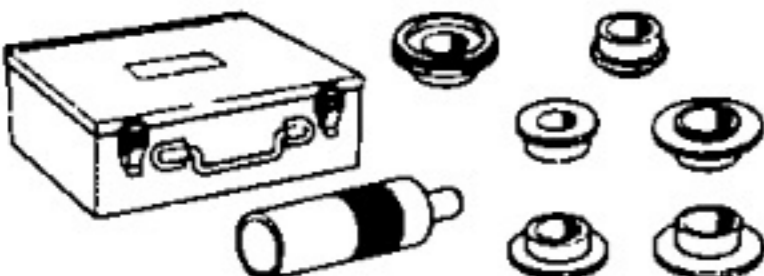
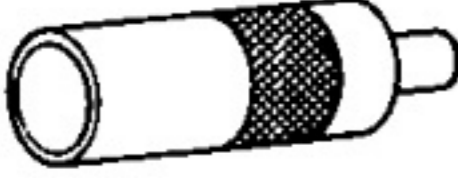



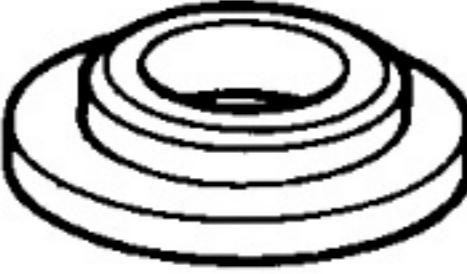
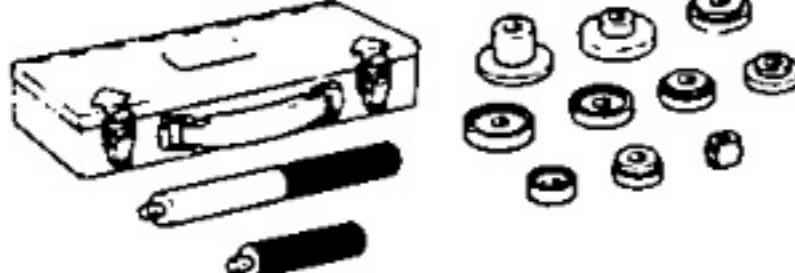



## SST (SPECIAL SERVICE TOOLS)

NOTE: Classification

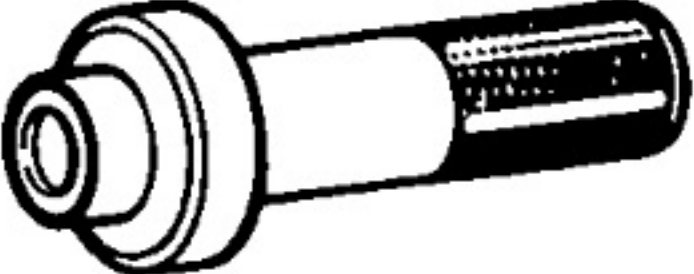
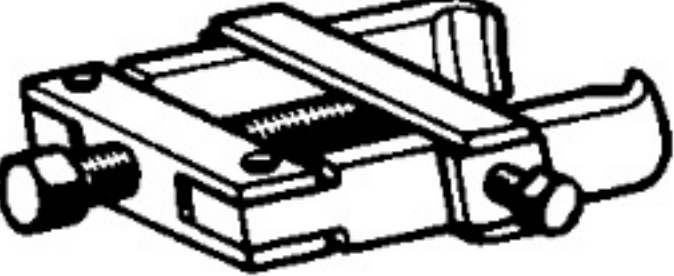
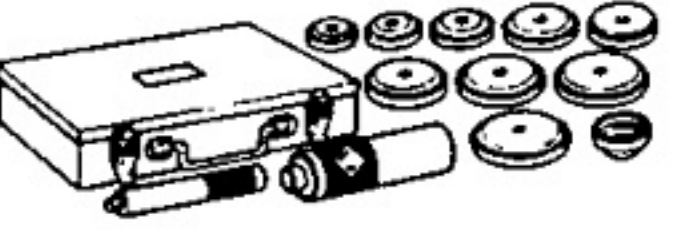


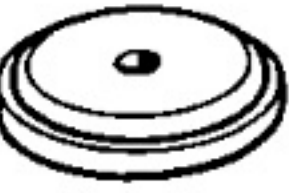
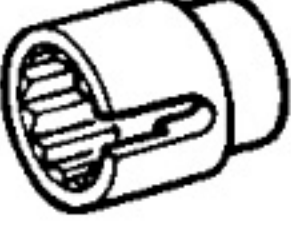
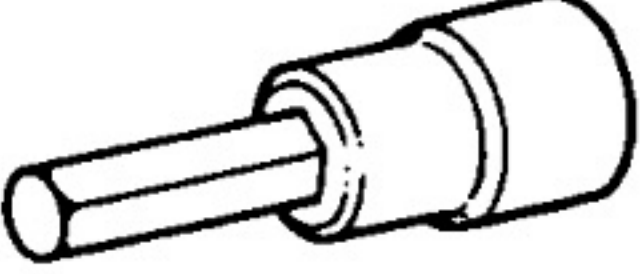
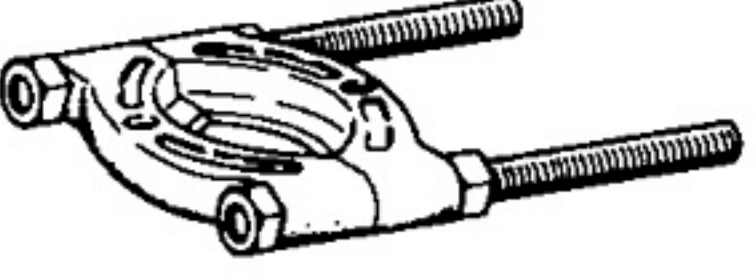
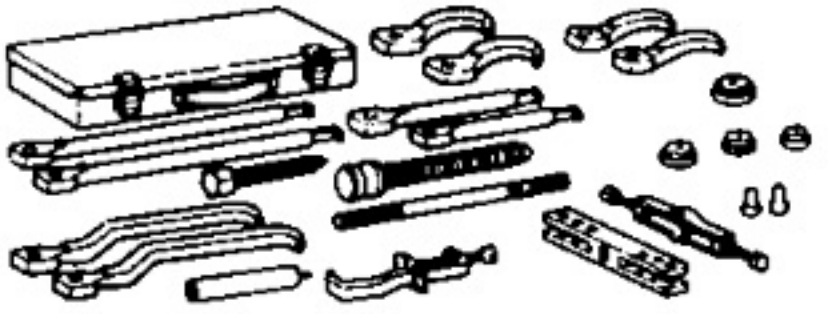
A = SST required for vehicle inspections and minor repairs and multipurpose SST.

B = SST required for major repairs involving disassembly of components.

C = SST required for rather special, less frequent work not of classifiable as either A or B.

Illustration	Part No.	Classification	Part Name	RA
	09308-00010	A	Oil Seal Puller	●
	09308-10010	A	Oil Seal Puller	●
	09316-60010	B	Transmission & Transfer Bearing Replacer	●
	(09316-00010)		(Replacer Pipe)	●
	(09316-00020)		(Replacer "A")	●
	09330-00021	A	Companion Flange Holding Tool	●
	09504-22010	B	Differential Side Washer Remover & Replacer	●
	09506-35010	B	Differential Drive Pinion Rear Bearing Replacer	●
	09550-10012	B	"B" Replacer Set	●
	(09252-10010)		(No. 1 Replacer Handle)	●
	(09557-10010)		(Differential Drive Pinion Front Bearing Replacer)	●
	09550-60010	B	Differential Side Bearing Replacer	●

**SST (SPECIAL SERVICE TOOLS) (Cont'd)**

Illustration	Part No.	Classification	Part Name	RA
	09554-30011	A	Differential Oil Seal Replacer	●
	09556-22010	B	Drive Pinion Front Bearing Remover	●
	09608-35014	B	Axle Hub & Drive Pinion Bearing Tool Set	●
	(09608-06020)		(Handle)	●
	(09608-06110)		(Front Hub Inner & Drive Pinion Pinion Front Bearing Cup Replacer)	●
	(09608-06180)		(Drive Pinion Rear Bearing Cup Replacer)	●
	09817-16011	A	Back-up Light Switch Tool	●
	09923-00020	B	Hexagon Wrench	●
	09950-00020	B	Bearing Remover	●
	09950-20017	A	Universal Puller	●

**SSM (SPECIAL SERVICE MATERIALS)**

Part Name	Part No.	Sec.	Use etc.
Adhesive 1324, Three bond 1324 or equivalent	08833-00070	RA	Shift fork shaft set bolt Differential pinion shaft pins
Seal packing 1281, Three bond 1281 or equivalent	08826-00090	RA	Differential lock cylinder Differential lock cylinder cover Differential carrier