

STEERING

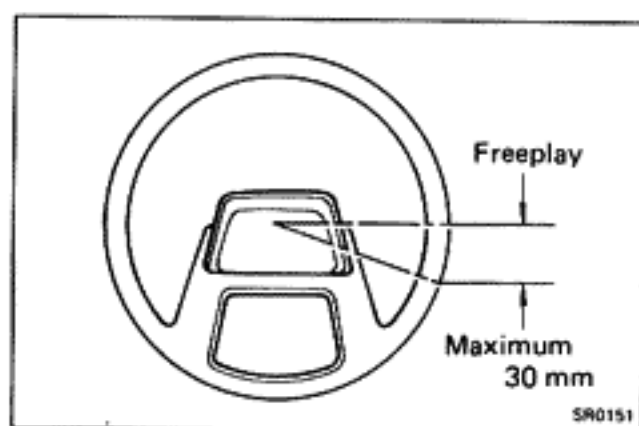
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PRECAUTIONS

Care must be taken to replace parts properly because they could affect the performance of the steering system and result in a driving hazard.

TROUBLESHOOTING

Problem	Possible cause	Remedy	Page
Hard steering	Tires improperly inflated Power steering belt loose Oil level in reservoir low Insufficient lubricant	Inflate tires to proper pressure Tighten belt Check reservoir Lubricate suspension and steering linkage	FA-3 SR-26 SR-13
	Excessive caster Lower arm ball joints worn Power steering unit faulty	Check front end alignment Replace lower arm ball joints Check power steering unit	FA-3 FA-15 SR-13
Poor return	Tires improperly inflated Insufficient lubricant	Inflate tires to proper pressure Lubricate suspension and steering linkage	FA-3
	Wheel alignment incorrect	Check front end alignment	FA-3
Excessive play	Steering gear loose Main shaft worn Lower arm ball joints worn	Tighten gear bolts Replace main shaft Replace lower arm ball joints	SR-5 FA-15



ON-VEHICLE INSPECTION

1. CHECK THAT STEERING WHEEL FREEPLAY IS CORRECT

With the vehicle stopped and pointed straight ahead, rock the steering wheel gently back and forth with light finger pressure. Freeplay should not exceed the maximum limit.

Maximum play: 30 mm (1.18 in.)

If incorrect, repair as required.

2. CHECK STEERING LINKAGE AND GEAR HOUSING

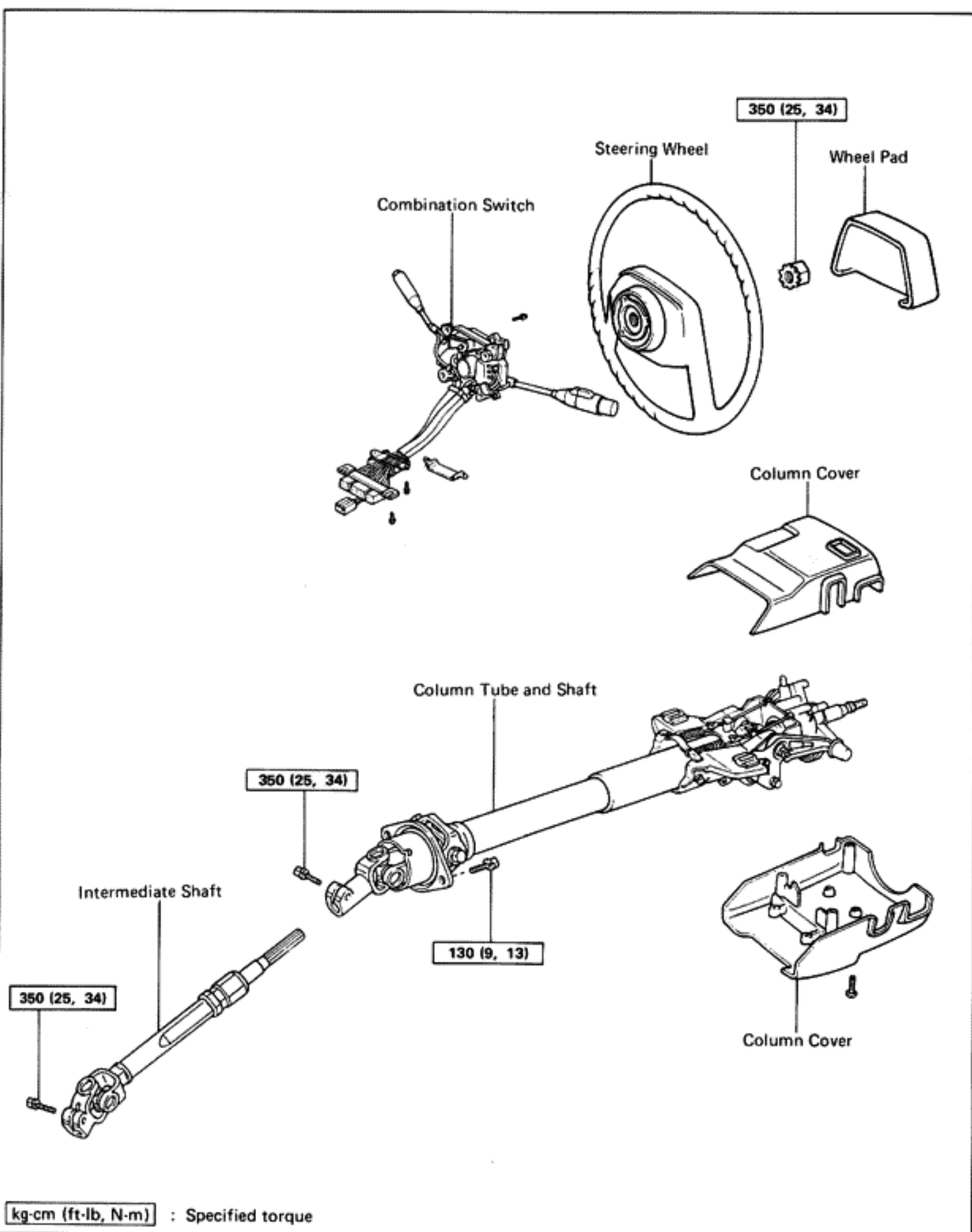
(a) Check the steering linkage for looseness or damage. Check that:

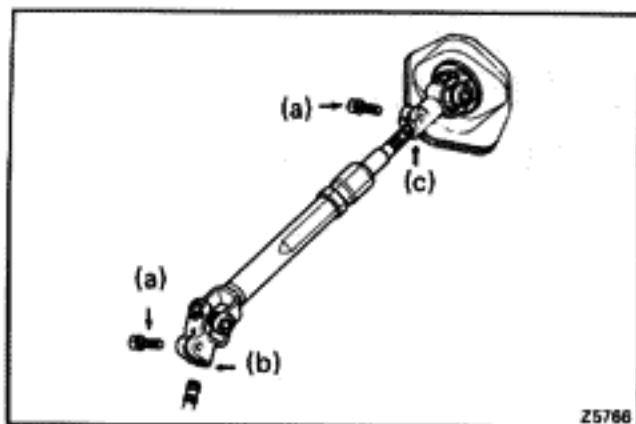
- Tie rod ends do not have excessive play.
- Boots are not damaged.
- Boot clamps are not loose.

(b) Check the gear housing for grease leakage or oozing.

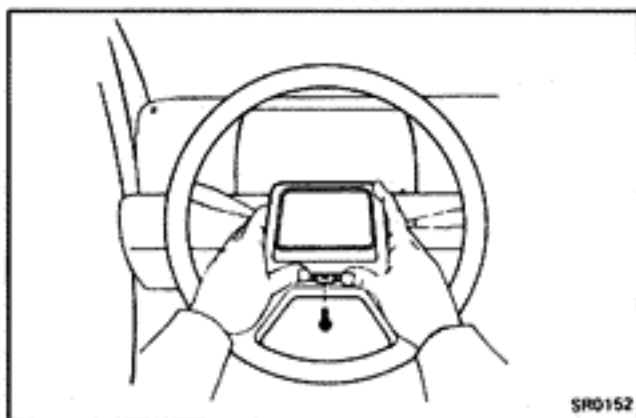
STEERING COLUMN ASSEMBLY WITH TILT STEERING

REMOVAL OF STEERING COLUMN

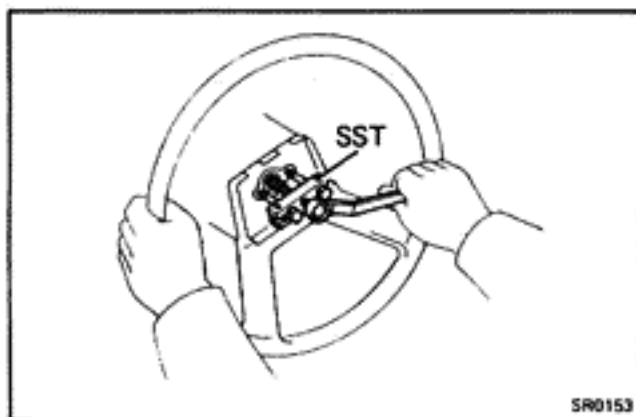




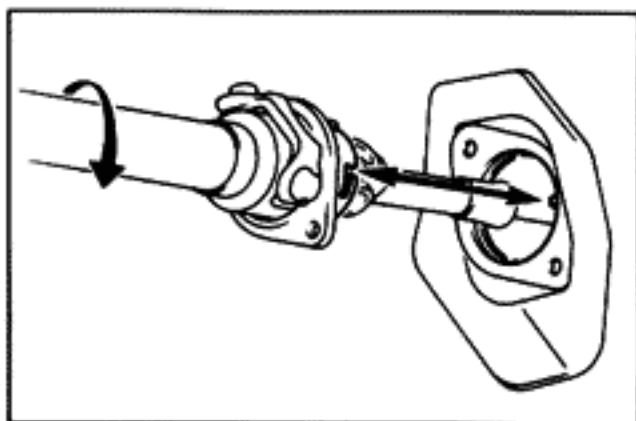
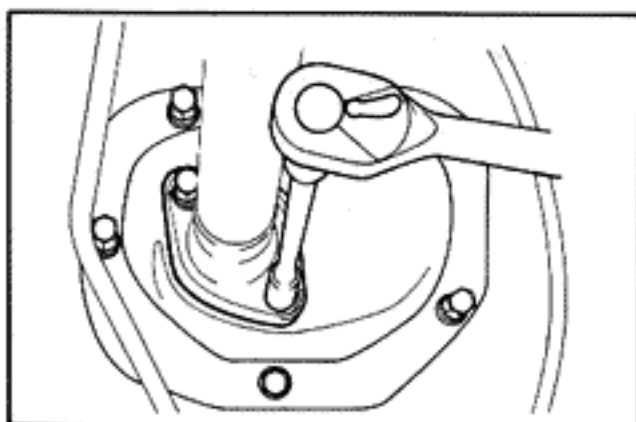
Z5786



SR0152



SR0153



1. REMOVE NEGATIVE CABLE FROM BATTERY

2. REMOVE INTERMEDIATE SHAFT

- (a) Remove the two set bolts.
- (b) Remove the rack housing side first.
- (c) Remove the column side.

3. REMOVE STEERING WHEEL

- (a) Remove the screw at the lower portion of the steering wheel pad and pull the pad out upward.
- (b) Remove the steering wheel nut.

- (c) Using SST, remove the steering wheel.
SST 09609-20011

4. REMOVE INSTRUMENT LOWER PANEL AND AIR DUCT

5. REMOVE COLUMN COVER AND COMBINATION SWITCH

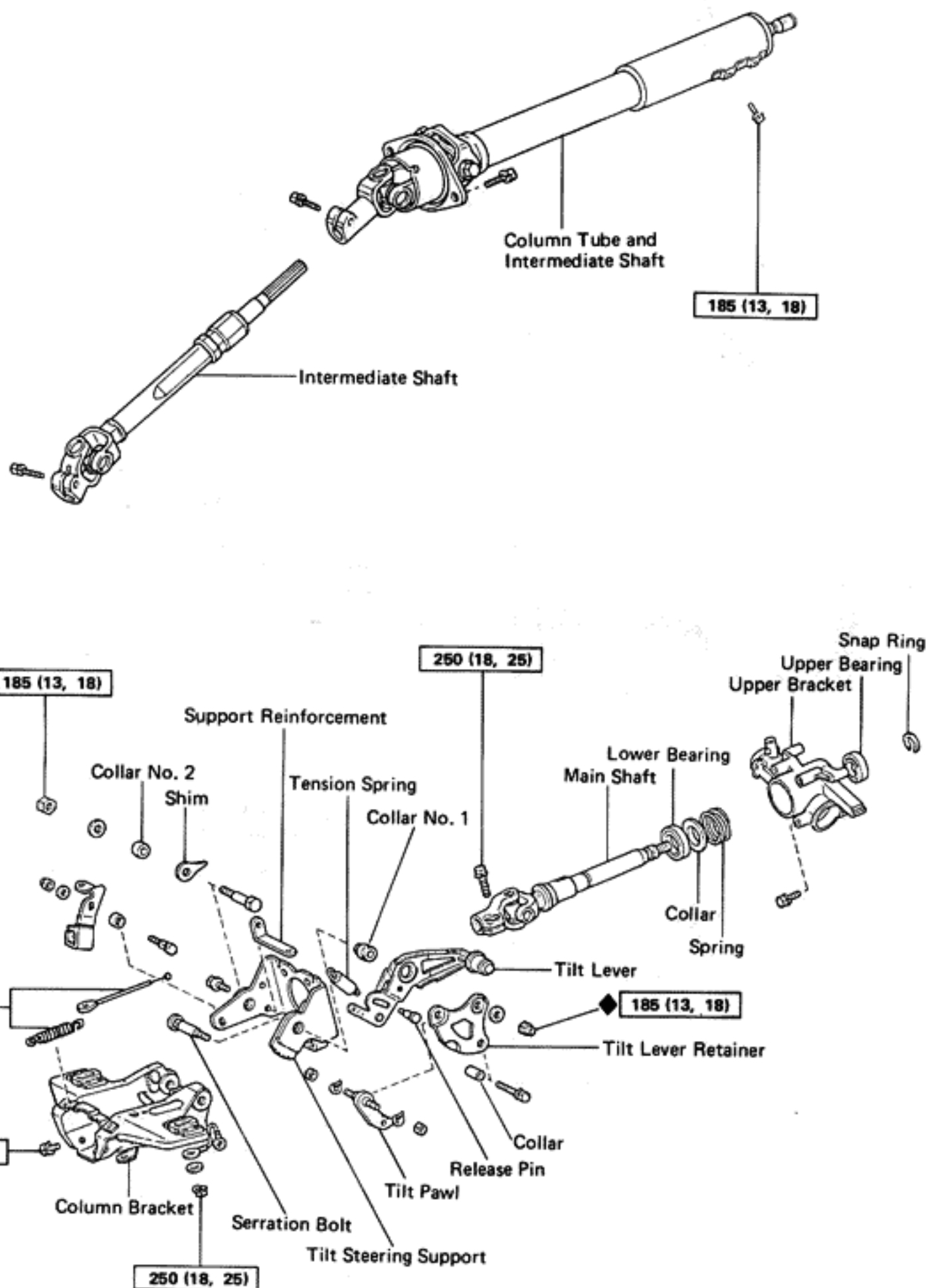
6. REMOVE TWO MOUNTING BOLTS FROM COLUMN HOLE COVER PLATE

7. REMOVE TWO COLUMN BRACKET MOUNTING NUTS

8. PULL OUT COLUMN TUBE AND SHAFT

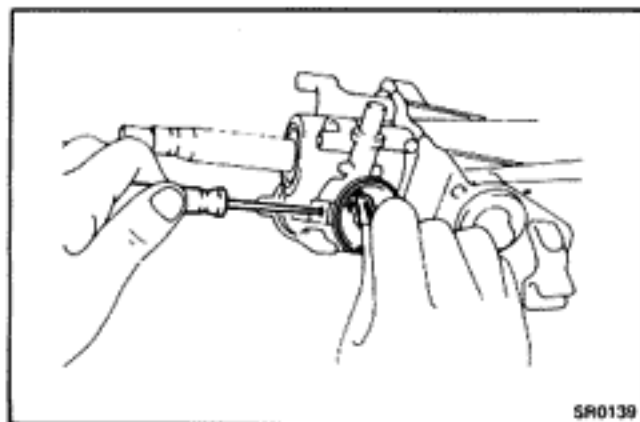
Turn the column tube as shown and pull out the shaft.

COMPONENTS



kg-cm (ft-lb, N·m) : Specified torque

◆ Non-reusable part



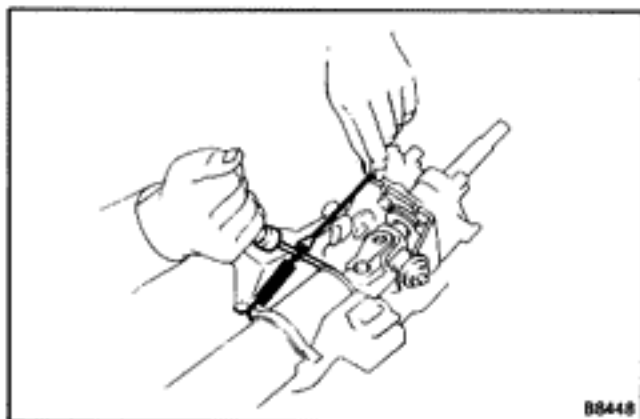
SR0139

DISASSEMBLY OF STEERING COLUMN ASSEMBLY AND TILT MECHANISM

(See page SR-5)

1. REMOVE IGNITION KEY CYLINDER

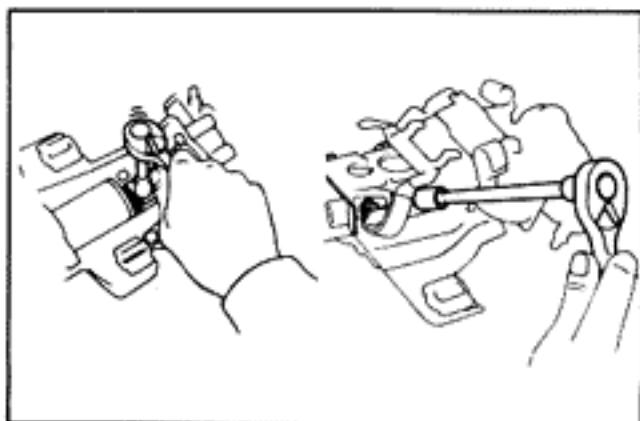
- (a) Place the ignition key at the ACC position.
- (b) Push down the stop key with a thin rod, and pull out the key cylinder.



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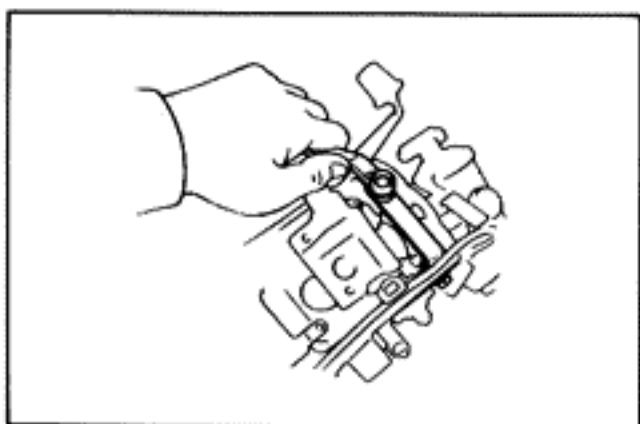
2. REMOVE TENSION SPRINGS AND CORDS

- (a) Fully tilt the main shaft upward.
- (b) Pry the spring and remove the cord and spring.



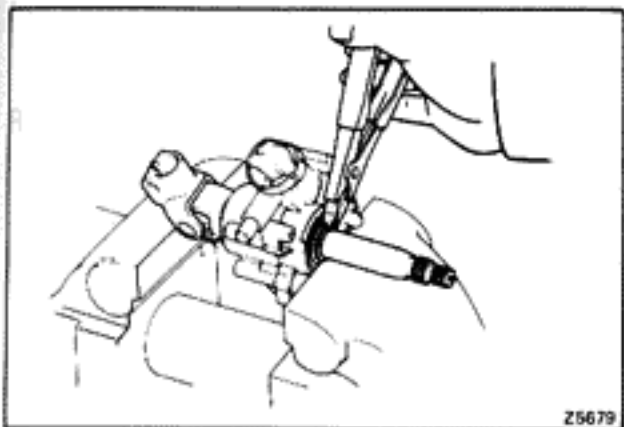
3. DISCONNECT INTERMEDIATE SHAFT AND MAIN SHAFT

- (a) Place matchmarks on the intermediate shaft and universal joint.
- (b) Remove the joint bolt.
- (c) Remove the four bracket bolts.
- (d) Separate the tilt mechanism from the column tube.

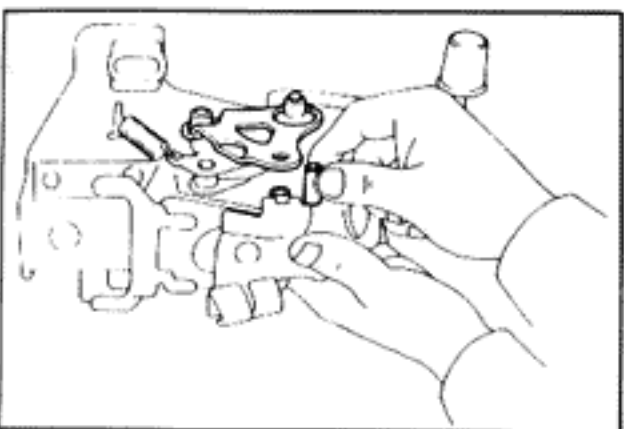


4. DISCONNECT UPPER BRACKET FROM TILT STEERING SUPPORT

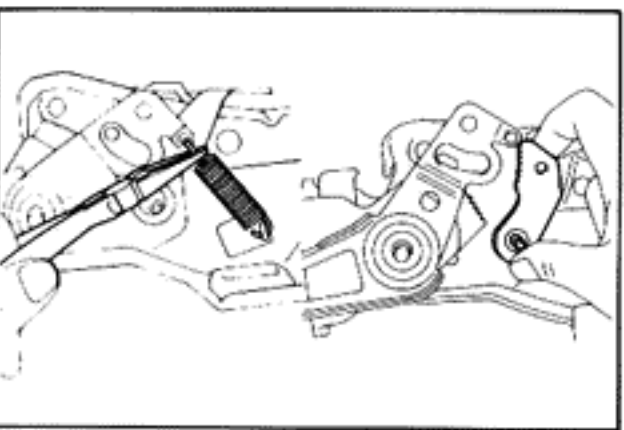
- (a) Remove the support reinforcement.
- (b) Remove the three bolts and disconnect the bracket from the support.

**5. REMOVE MAIN SHAFT FROM UPPER BRACKET**

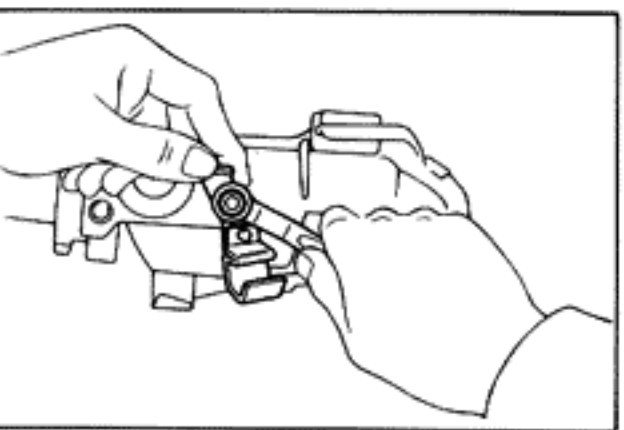
- (a) Using a soft jaw vise and snap ring pliers, remove the snap ring.
- (b) Pull out the main shaft from the bracket.

**6. DISASSEMBLE TILT STEERING SUPPORT AND COLUMN BRACKET**

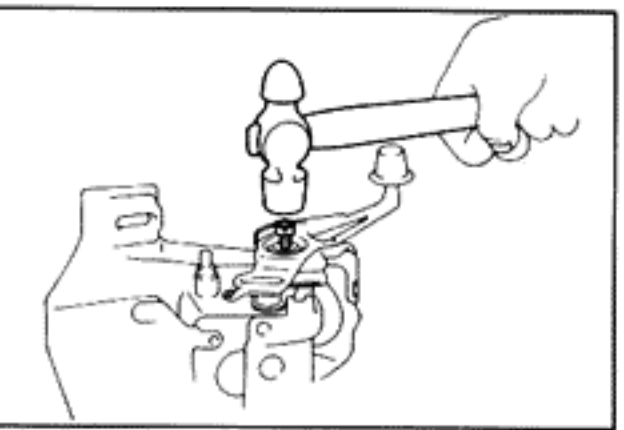
- (a) Remove the two nuts, bolt and retainer.
- (b) Take out the collar and release pin.



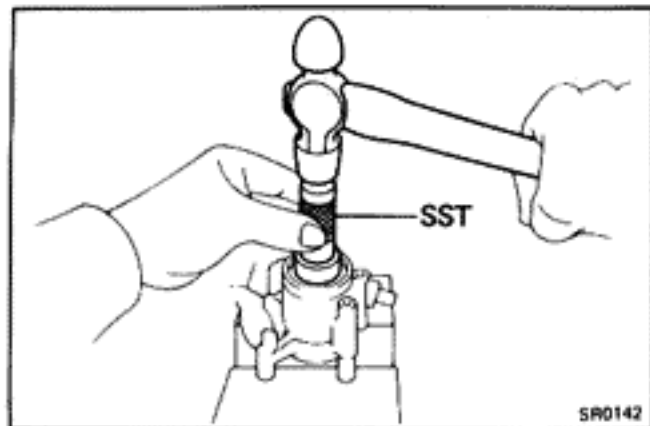
- (c) Remove the tension spring and take out the tilt pawl.



- (d) Remove the guide pin bolt, support bolt and shim.



- (e) Using a hammer, remove the serration bolt and tilt lever.



SR0142

INSPECTION AND REPAIR OF STEERING COLUMN ASSEMBLY

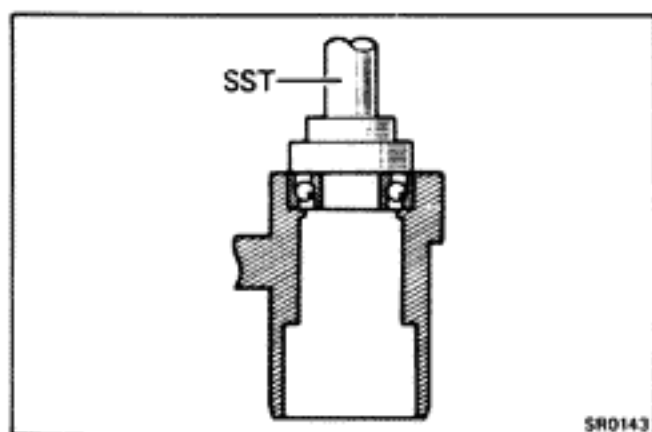
1. IF NECESSARY, REPLACE BEARING IN UPPER BRACKET

- (a) Using SST and a hammer, remove the bearing.
SST 09620-30010 (09623-30010)

- (b) Pack MP grease into the bearing.

- (c) Using SST and a hammer, drive the bearing into the bracket.

SST 09620-30010 (09624-30010, 09631-00020)



SR0143

2. IF NECESSARY, REPLACE LOWER BEARING

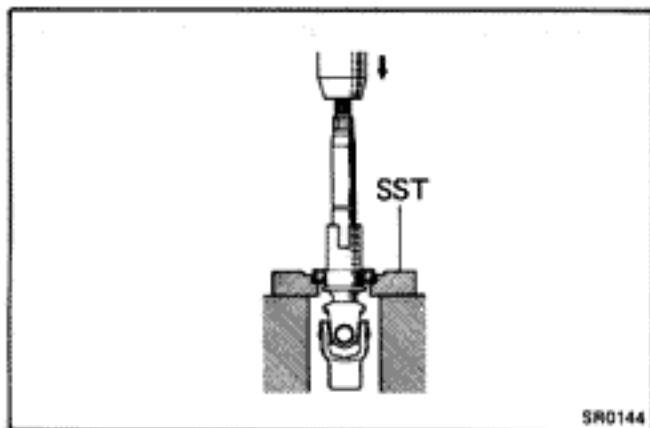
- (a) Using SST and a press, remove the lower bearing from the main shaft.

SST 09527-20011

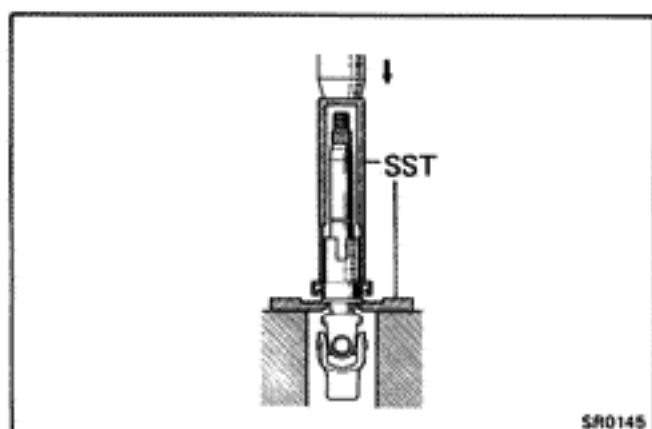
- (b) Pack MP grease into the bearing.

- (c) Using SST and a press, assemble the lower bearing and main shaft.

SST 09236-00101 and 09612-22011



SR0144



SR0145

ASSEMBLY OF STEERING COLUMN ASSEMBLY AND TILT MECHANISM

(See page SR-5)

1. COAT ALL RUBBING PARTS WITH MP GREASE

2. ASSEMBLE PAWL SET BOLT

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

3. ASSEMBLE TILT LEVER TO SUPPORT

- (a) Select a collar No. 1 which will eliminate all play.

Outer diameter	mm (in.)
17.989 – 17.996	(0.7082 – 0.7085)
17.996 – 18.003	(0.7085 – 0.7088)
18.003 – 18.010	(0.7088 – 0.7091)
18.010 – 18.017	(0.7091 – 0.7093)
18.017 – 18.024	(0.7093 – 0.7096)

- (b) Install tilt lever and collar No. 1 to the support.

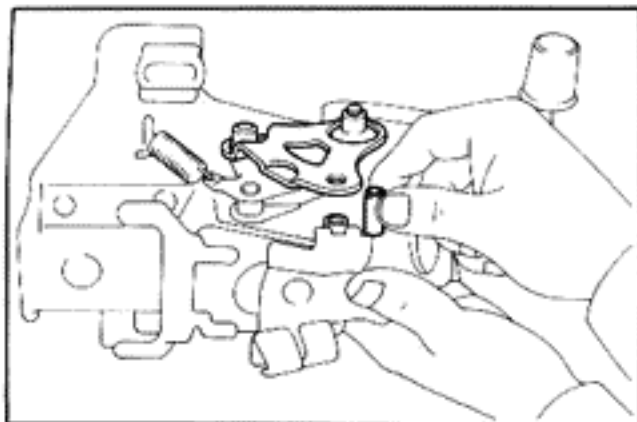
- (c) Select a collar No. 2 which will eliminate all play.

Outer diameter	mm (in.)
17.982 – 18.000	(0.7080 – 0.7087)
18.000 – 18.018	(0.7087 – 0.7094)

- (d) Install collar No. 2 to the support.

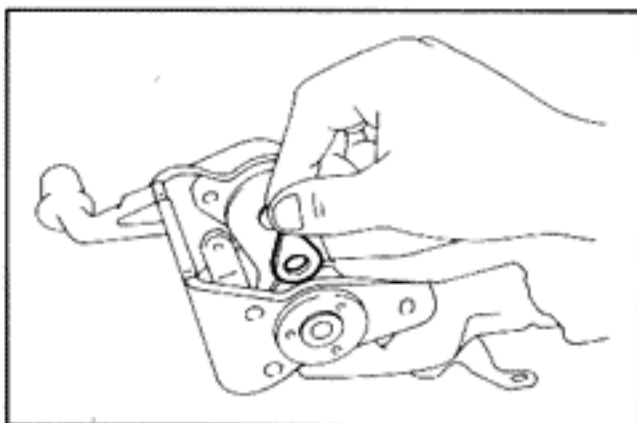
- (e) Drive the serration bolt into the support.

- (f) Install the tilt pawl, tension spring and the release pin.



(g) Assemble the collar and tilt lever retainer.

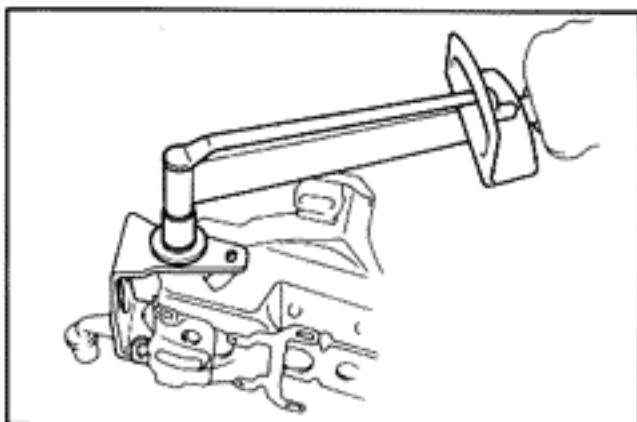
Torque: 185 kg-cm (13 ft-lb, 18 N-m)



4. INSTALL SHIM, BOLT AND NUT

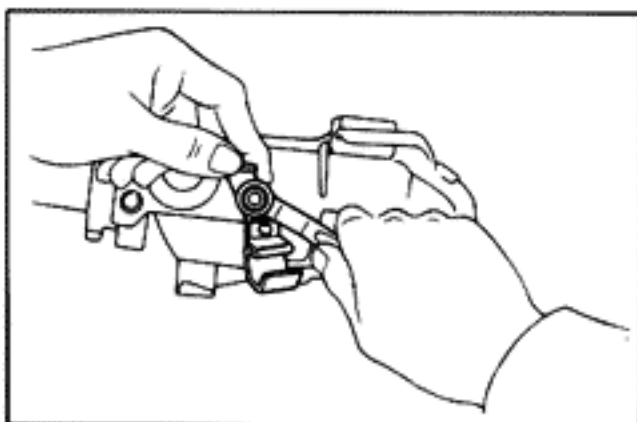
(a) Select a shim which fits snugly when pressed in by hand.

Thickness	mm (in.)	Thickness	mm (in.)
0.2	(0.008)	1.4	(0.055)
0.5	(0.020)	1.8	(0.071)
0.8	(0.031)		



(b) Install the shim, bolt, washer and a lock nut.

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

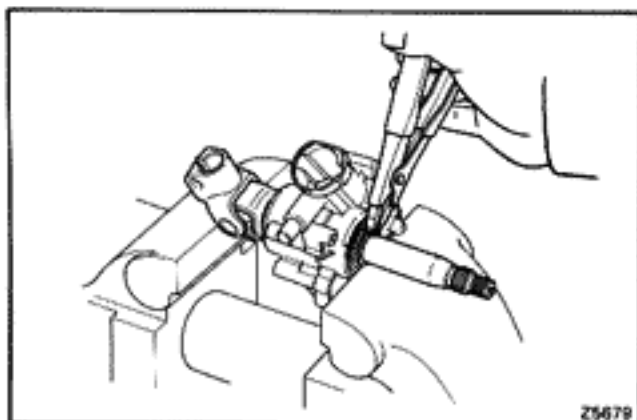


5. INSTALL TILT STEERING SUPPORT STOPPER BOLT

(a) Install the stopper bolt, bracket, washer and nut.

(b) Tighten the nut by holding the bracket with your fingers as shown.

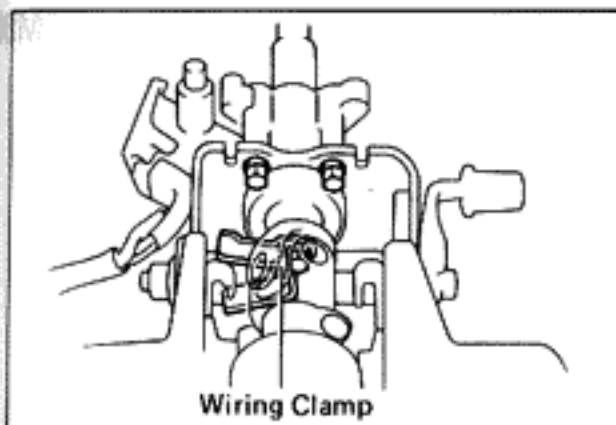
Torque: 100 kg-cm (7 ft-lb, 10 N-m)



6. ASSEMBLE MAIN SHAFT AND UPPER BRACKET

(a) Assemble the collar, spring and main shaft, and insert them into the bracket.

(b) Using a soft jaw vise and snap ring pliers, install a new snap ring by pressing the main shaft and upper bearing.



7. ASSEMBLE UPPER BRACKET AND SUPPORT

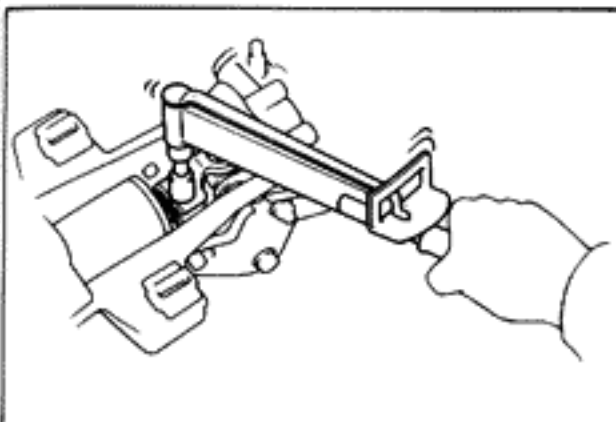
- (a) Apply anaerobic adhesive and sealant [THREE BOND 1324 (Part No. 08833-00070) or equivalent] to 1 or 2 threads of the bolt end.

NOTE: This adhesive will not harden while exposed to air. It will act as a sealer or binding agent only when applied between of threads, etc. and air is cut off.

- (b) Install the two bolts; one with a wiring clamp.

Torque: 75 kg-cm (65 in.-lb, 7.4 N-m)

- (c) Install the support reinforcement.



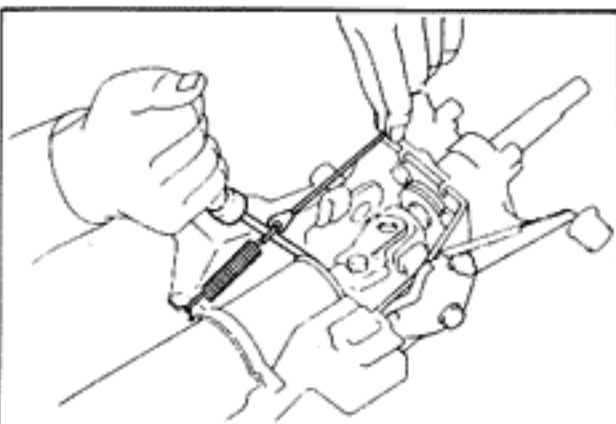
8. ASSEMBLE COLUMN BRACKET TO COLUMN TUBE

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

9. CONNECT MAIN SHAFT AND INTERMEDIATE SHAFT

Align the marks on the joint flange and intermediate shaft and tighten the bolt.

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



10. INSTALL TWO SPRINGS AND TWO CORDS

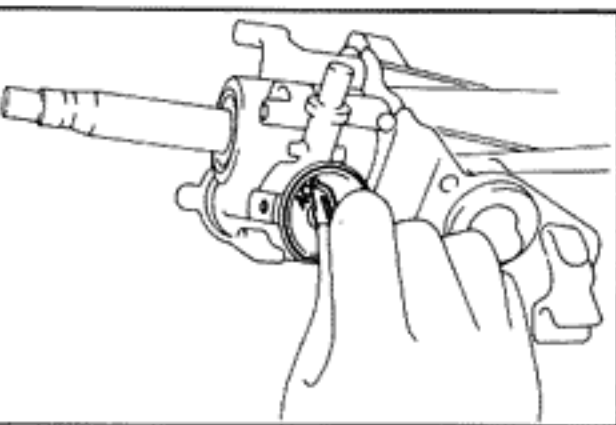
- (a) Connect the tension spring and cord, and hook the spring to the hanger.
- (b) Pry the spring end and hook the cord end to the support.
- (c) Hook the cords to the cord guides.

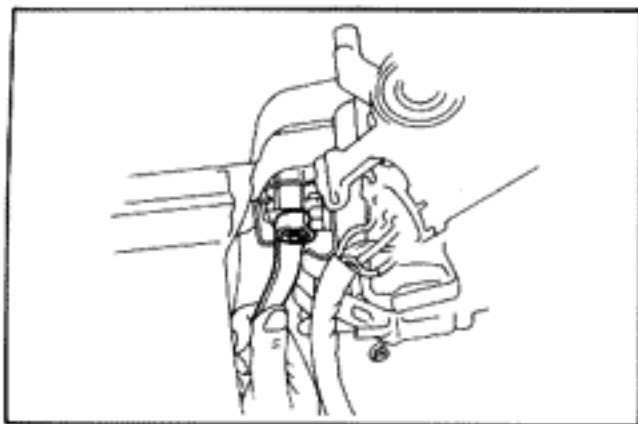
11. CHECK OPERATION OF TILT STEERING LEVER AND SUPPORT

- (a) Check that there is no axial or horizontal play at the end of the main shaft.
- (b) Check that the main shaft lock securely in all six positions.

12. INSTALL IGNITION SWITCH

Turn the ignition key plate to the ACC position, and install the key cylinder into the upper bracket.

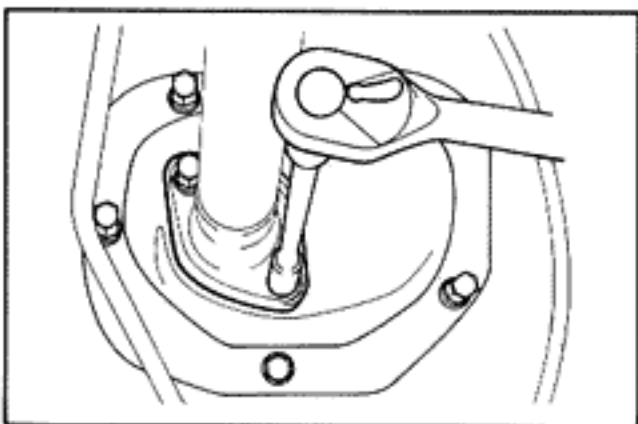




INSTALLATION OF STEERING COLUMN ASSEMBLY

(See page SR-3)

1. PLACE COLUMN AND SHAFT IN INSTALLED POSITION
2. INSTALL COLUMN BRACKET MOUNTING NUTS BY HAND



3. INSTALL STEERING COLUMN HOLE COVER PLATE

Tighten the bolts.

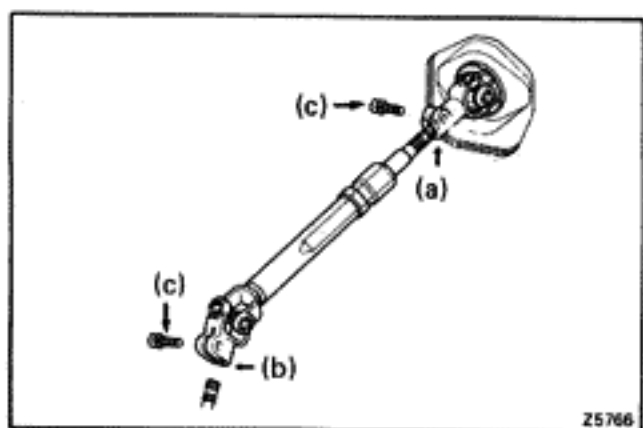
Torque: 130 kg-cm (9 ft-lb, 13 N·m)

4. TORQUE TWO COLUMN BRACKET MOUNTING NUTS

Torque: 250 kg-cm (18 ft-lb, 25 N·m)

5. INSTALL COMBINATION SWITCH AND COLUMN COVER

6. INSTALL AIR DUCT AND INSTRUMENT LOWER PANEL



7. INSTALL INTERMEDIATE SHAFT

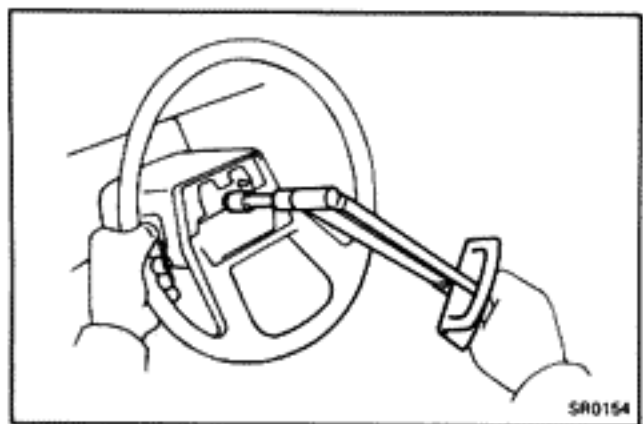
(a) Install the column side first.

(b) Install the rack housing side.

(c) Install the two bolts and torque them.

Torque: 350 kg-cm (25 ft-lb, 34 N·m)

8. CONNECT NEGATIVE CABLE TO BATTERY



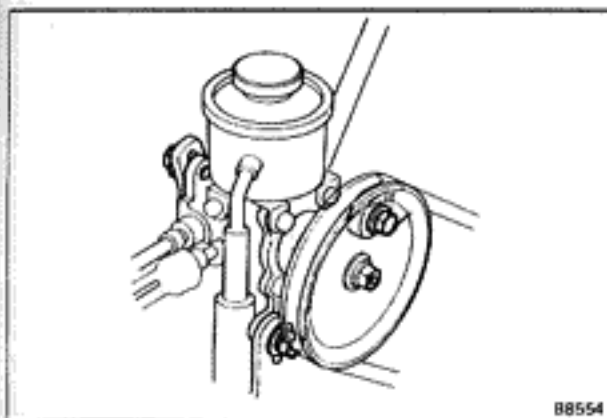
9. INSTALL STEERING WHEEL

(a) Position the front wheels straight ahead and install the steering wheel in the neutral position.

(b) Tighten the nut.

Torque: 350 kg-cm (25 ft-lb, 34 N·m)

(c) Install the steering wheel pad.



POWER STEERING

On-Vehicle Inspection

CHECKING DRIVE BELT TENSION

Using a belt tension gauge, check the drive belt tension.

Belt tension gauge:

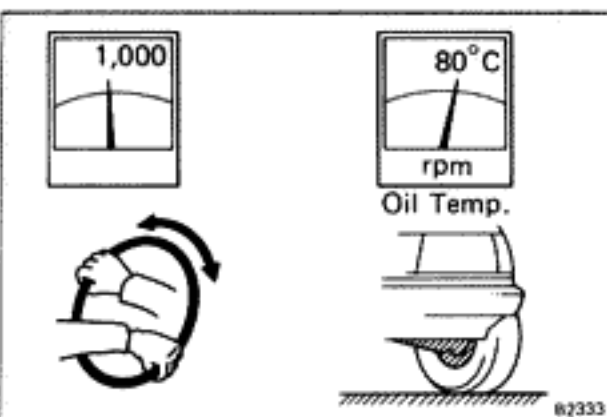
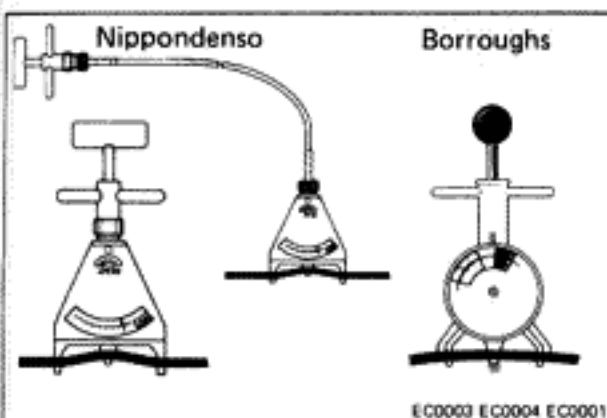
Nippondenso BTG-20 (95506-00020) or
Borroughs No. BT-33-73F

Drive belt tension:

New belt	125 ± 25 lb
Used belt	80 ± 20 lb

NOTE:

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



FLUID LEVEL CHECK

1. KEEP VEHICLE LEVEL
2. BOOST FLUID TEMPERATURE

With the engine idling at 1,000 rpm or less, turn the steering wheel from lock to lock several times to boost the fluid temperature.

Fluid temperature: 80°C (176°F)

3. CHECK FOR FOAMING OR EMULSIFICATION

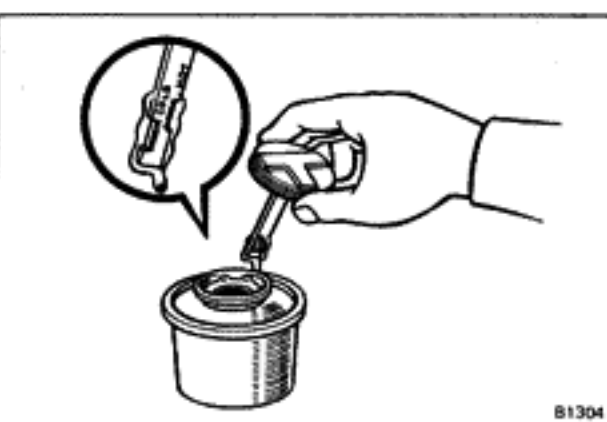
NOTE: Foaming and emulsification indicate the existence of air in the system or that the fluid level is too low.

4. CHECK FLUID LEVEL IN RESERVOIR TANK

Check the fluid level and add fluid if necessary.

Fluid: ATF DEXRON® or DEXRON® II

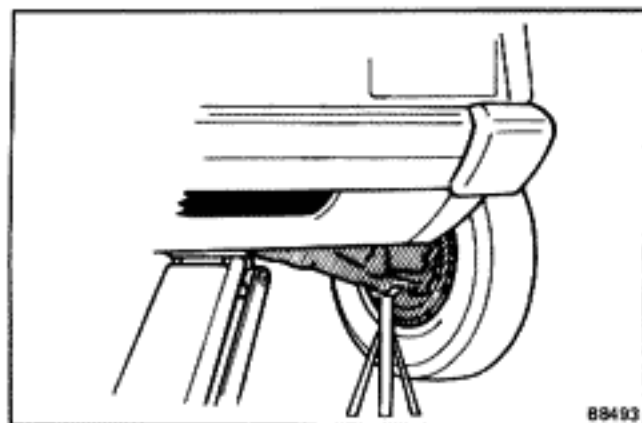
NOTE: Check that the fluid level is within the HOT LEVEL of the dipstick. If the fluid is cold, check that it is within the COLD LEVEL of the dipstick.



CHECK IDLE-UP

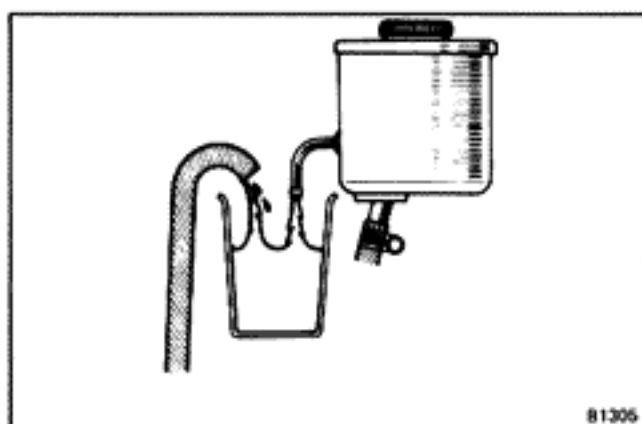
1. WARM UP ENGINE
2. TURN AIR CONDITIONER SWITCH OFF
3. CHECK IDLE-UP

- (a) Fully turn the steering wheel.
- (b) Check that the engine rpm is decrease when the air control valve hose is pinched.
- (c) Check that the engine rpm is increase when the air control valve hose is released.

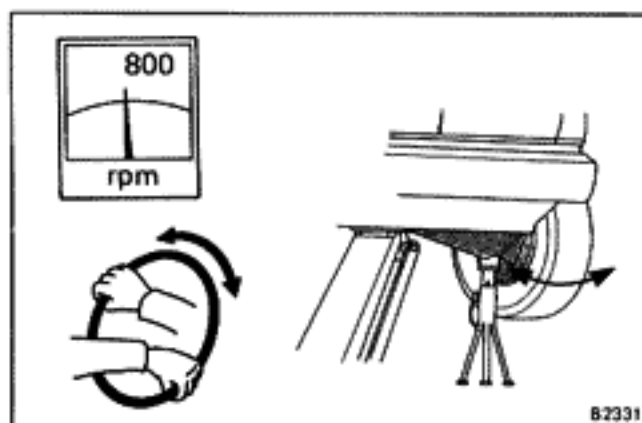


REPLACEMENT OF POWER STEERING FLUID

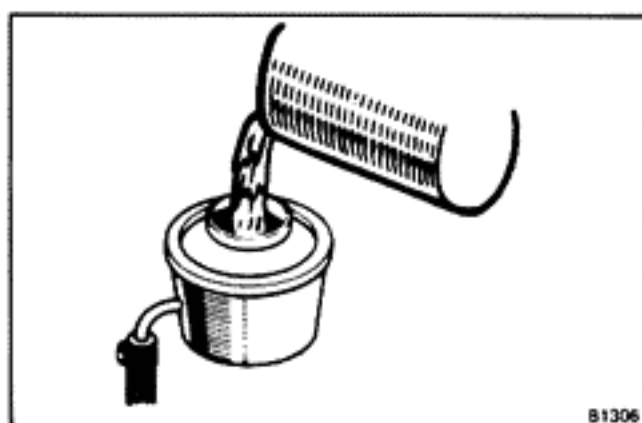
1. JACK UP FRONT OF VEHICLE AND SUPPORT IT WITH STANDS



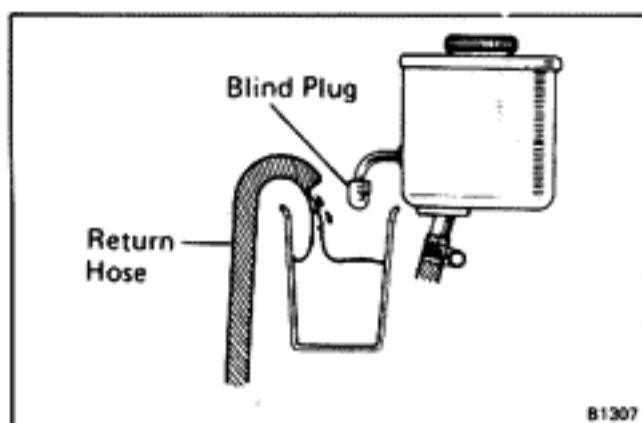
2. REMOVE FLUID RETURN HOSE FROM RESERVOIR TANK AND DRAIN FLUID INTO A CONTAINER



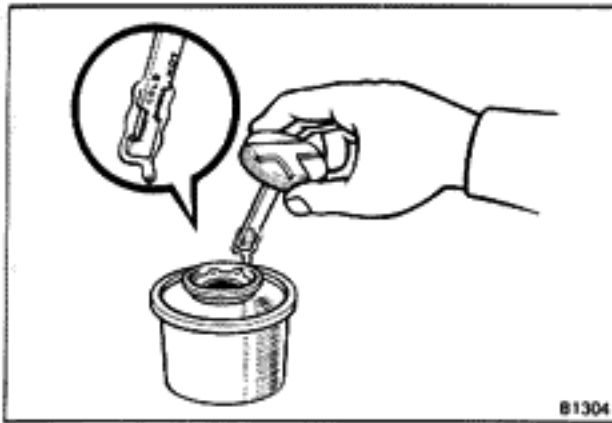
3. WITH ENGINE IDLING, TURN STEERING WHEEL FROM LOCK TO LOCK WHILE DRAINING FLUID
4. STOP ENGINE



5. FILL RESERVOIR WITH FRESH FLUID
Fluid: ATF DEXRON® or DEXRON® II



6. START ENGINE AND RUN IT AT 1,000 RPM
After 1 or 2 seconds, fluid will begin to discharge from the return hose. Stop the engine immediately at this time.
7. REPEAT STEPS 5 AND 6 FOUR OR FIVE TIMES
8. CONNECT RETURN HOSE TO RESERVOIR TANK
9. BLEED POWER STEERING SYSTEM



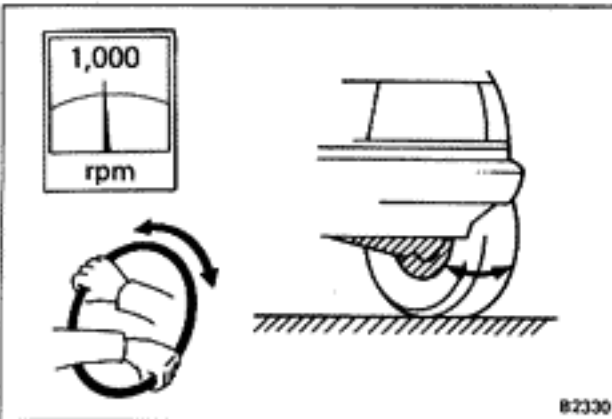
Bleeding of Power Steering System

1. CHECK FLUID LEVEL IN RESERVOIR

Check the fluid level and add fluid if necessary.

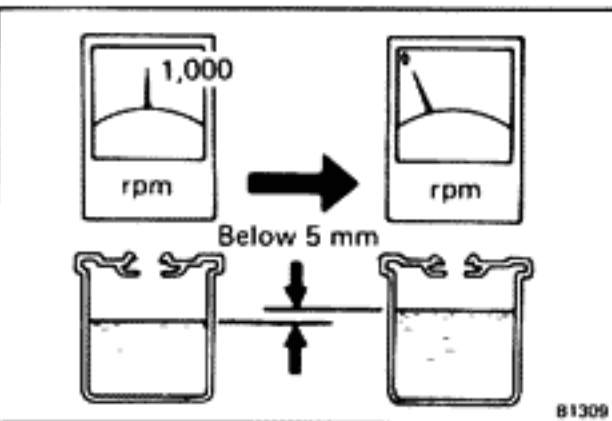
Fluid: ATF DEXRON® or DEXRON® II

NOTE: Check that the fluid level is within the HOT LEVEL of the dipstick. If the fluid is cold, check that it is within the COLD LEVEL of the dipstick.



2. START ENGINE AND TURN STEERING WHEEL FROM LOCK TO LOCK THREE OR FOUR TIMES

Run the engine at 1,000 rpm or less.

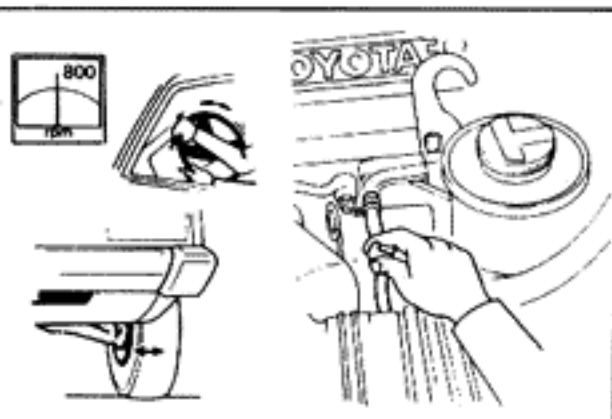


3. CHECK THAT FLUID IN RESERVOIR IS NOT FOAMY OR CLOUDY AND DOES NOT RISE OVER MAXIMUM WHEN ENGINE IS STOPPED

Measure the fluid level with the engine running. Stop the engine and measure the fluid level.

Maximum rise: 5 mm (0.20 in.)

If a problem is found, repeat steps 1 and 2. Repair the PS pump if the problem persists.



CHECK OF AIR CONTROL VALVE

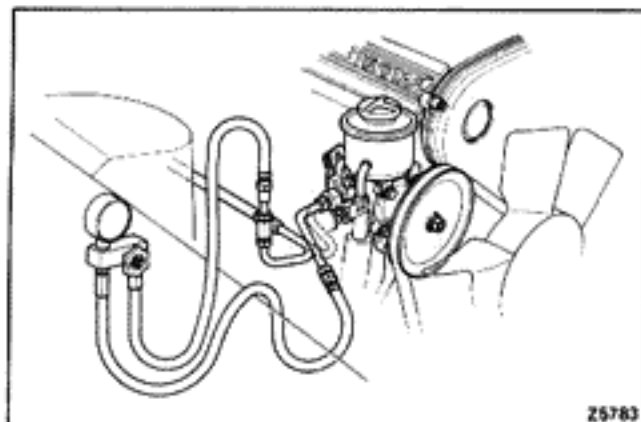
1. START ENGINE AND RUN IT AT IDLE

2. TURN STEERING WHEEL LEFT AND RIGHT

Check that the rpm does not decrease more than 50 rpm.

3. WHILE PINCHING AIR HOSE, TURN STEERING WHEEL LEFT AND RIGHT

Check that the rpm decreases about 200 rpm.



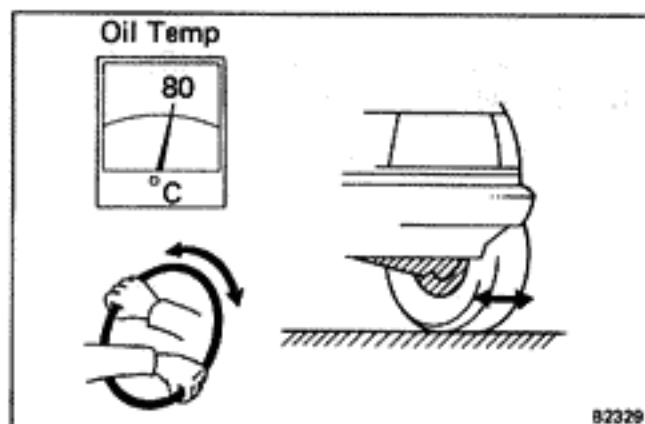
Oil Pressure Check

1. CONNECT PRESSURE GAUGE

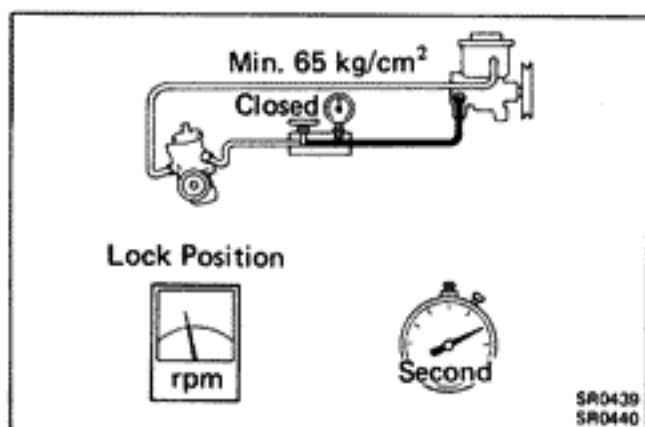
- (a) Using SST, remove the pressure line from the PS pump.

SST 09631-22020

- (b) Connect the gauge side of the pressure gauge to the PS pump.
- (c) Connect the valve side of the pressure gauge to the pressure line.
- (d) Bleed the system. Start the engine and turn the wheel fully in both directions two or three times.
- (e) Check that the fluid level is correct.



2. CHECK THAT FLUID TEMPERATURE IS AT LEAST 80°C (176°F)



3. START ENGINE AND RUN IT AT IDLE

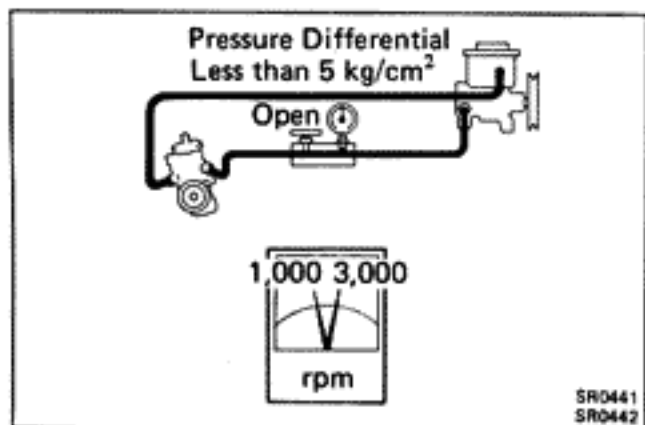
4. CHECK FLUID PRESSURE READING WITH VALVE CLOSED

Close the pressure gauge valve and observe the reading on the gauge.

Minimum pressure: 65 kg/cm² (924 psi, 6,374 kPa)

NOTE: Do not keep the valve closed for more than 10 seconds.

If pressure is low, repair or replace the PS pump.



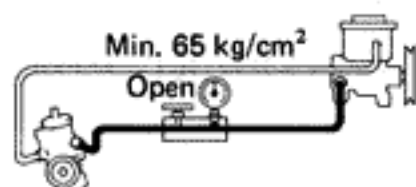
5. OPEN VALVE FULLY

6. CHECK AND RECORD PRESSURE READING AT 1,000 RPM

7. CHECK AND RECORD PRESSURE READING AT 3,000 RPM

Check that there is less than 5 kg/cm² (71 psi, 490 kPa) difference in pressure between the 1,000 rpm and 3,000 rpm checks.

If the difference is greater, repair or replace the PS pump flow control valve.

SR0443
SR0444**8. CHECK PRESSURE READING WITH STEERING WHEEL TURNED TO FULL LOCK**

Be sure the pressure gauge valve is fully opened and the engine idling.

Minimum pressure: 65 kg/cm² (924 psi, 6,374 kPa)

If pressure is low, the gear housing has an internal leak and must be repaired or replaced.

9. MEASURE STEERING EFFORT

Center the steering wheel and run the engine at idle.

Using a scale, measure the steering effort in both directions.

Maximum steering effort: 4 kg (8.8 lb, 39 N)

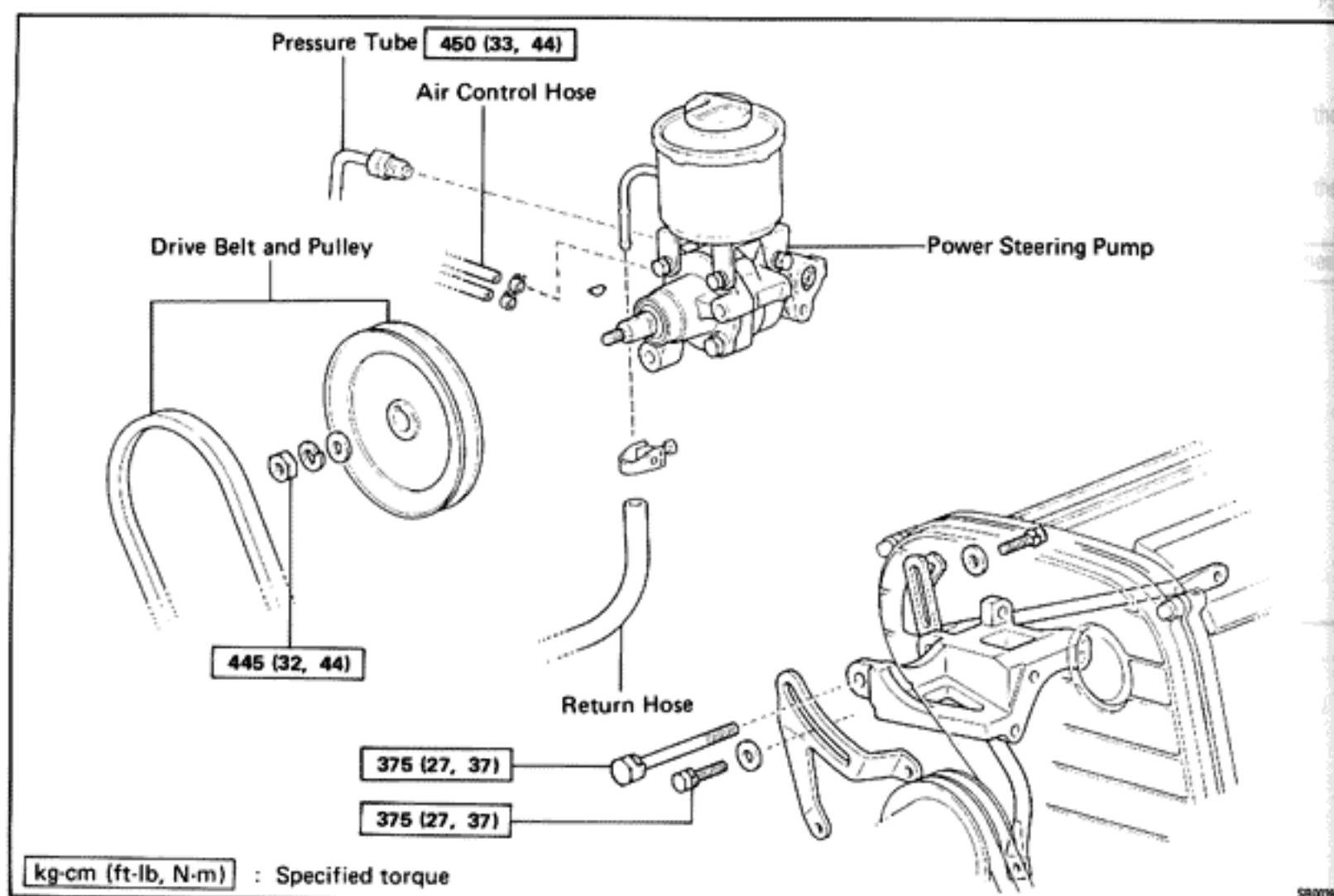
If steering effort is excessive, repair the power steering unit.

NOTE: Be sure to consider tire type, pressure and contact surface before making your diagnosis.

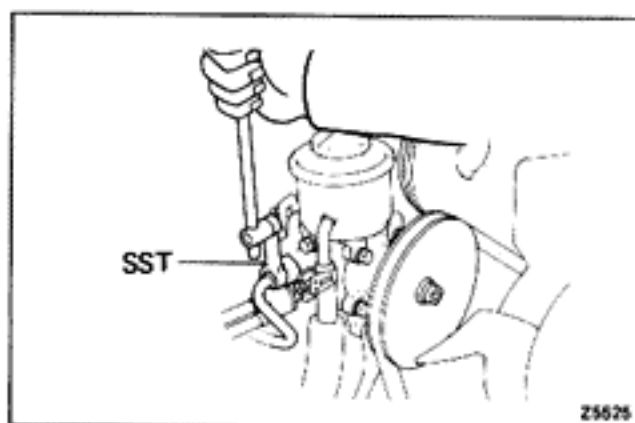


Power Steering Pump

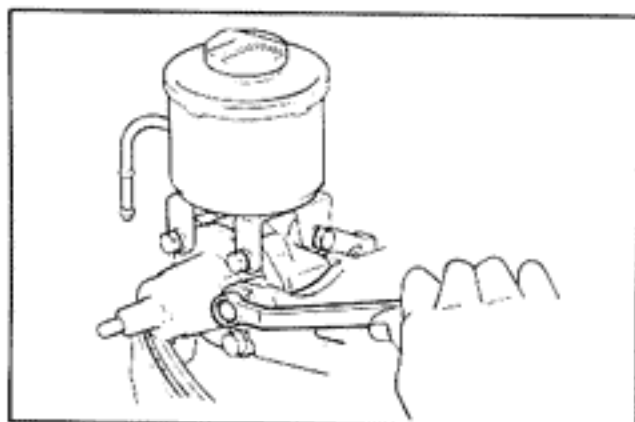
REMOVAL OF POWER STEERING PUMP



SR0028

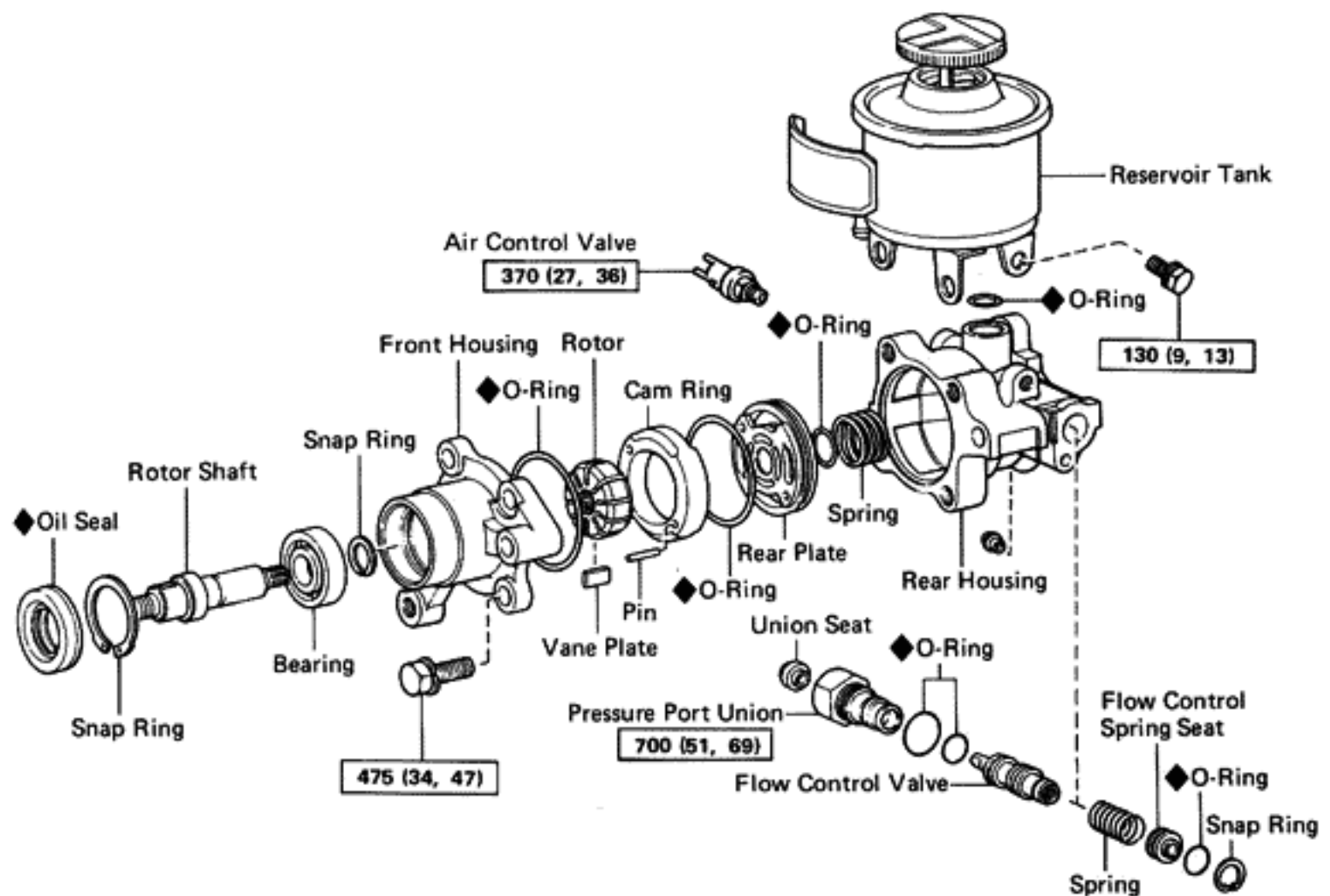


Z5625



1. DISCONNECT AIR HOSES FROM AIR CONTROL VALVE
2. DRAIN FLUID FROM RESERVOIR TANK
3. DISCONNECT RETURN HOSE FROM RESERVOIR TANK
4. DISCONNECT PRESSURE TUBE FROM POWER STEERING PUMP
Using SST, loosen and disconnect the pressure tube.
SST 09631-22020
5. REMOVE DRIVE BELT AND PULLEY
 - (a) Push on the drive belt to hold the pulley in place and remove the pulley set nut.
 - (b) Remove the drive belt adjust bolt.
 - (c) Remove the PS pump rear mount bolt.
 - (d) Remove the drive belt.
 - (e) Remove the pulley and woodruff key.
6. REMOVE POWER STEERING PUMP
Remove the PS pump front mount bolt, and remove the PS pump.

COMPONENTS



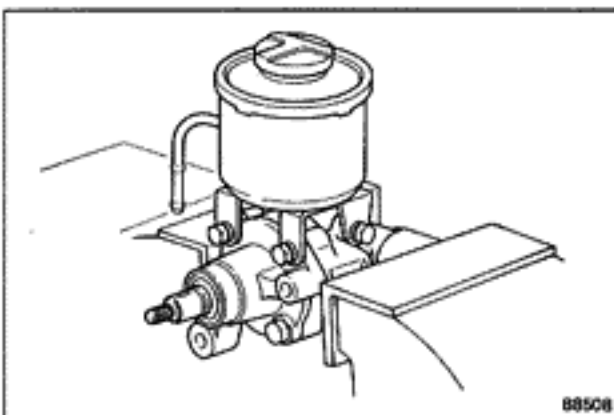
kg-cm (ft-lb, N-m) : Specified torque

◆ Non-reusable part

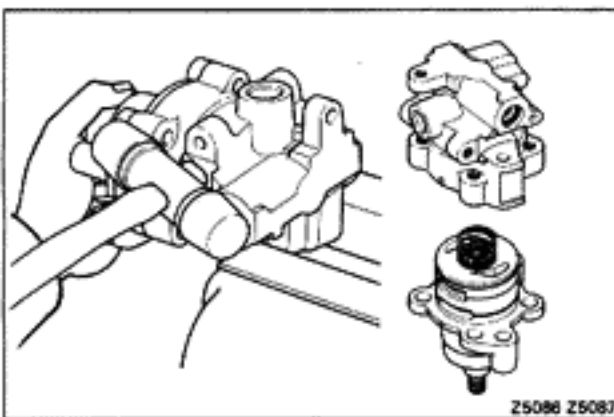
88506

DISASSEMBLY OF POWER STEERING PUMP

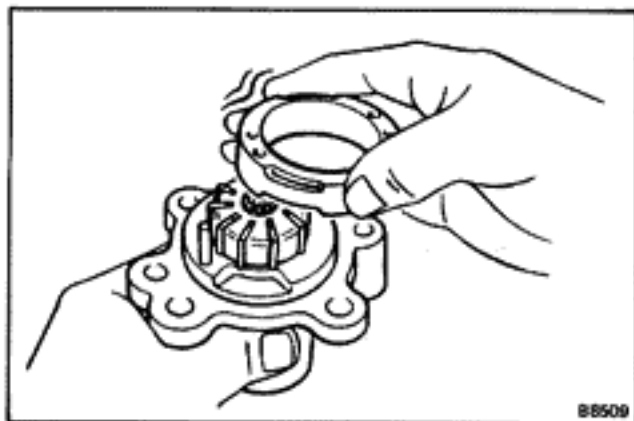
1. CLAMP POWER STEERING PUMP IN VISE
CAUTION: Do not tighten the vise too tight.
2. REMOVE FRONT HOUSING SET BOLTS
3. REMOVE RESERVOIR TANK AND O-RING
Remove the two reservoir tank set bolts, reservoir tank and O-ring.
4. REMOVE AIR CONTROL VALVE
5. MARK FRONT AND REAR HOUSING
Mark these parts to ensure correct reassembly.
6. REMOVE FRONT HOUSING
Using a plastic hammer, tap off the front housing.
CAUTION: Be careful that the vane plates, rotor and cam ring do not fall out.



88508

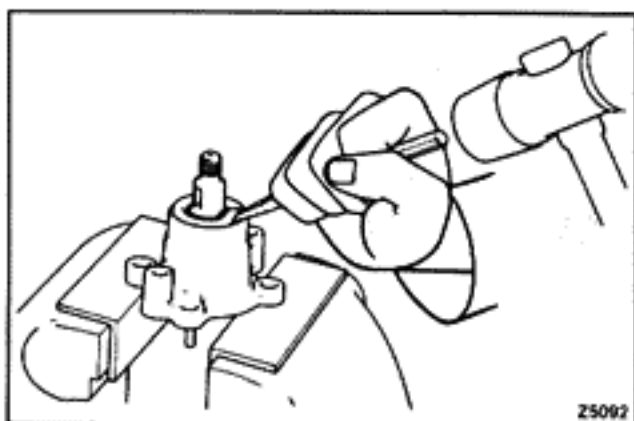


Z5086 Z5087



7. REMOVE CAM RING, ROTOR AND VANE PLATES
CAUTION: Be careful not to scratch the cam ring, rotor or vane plates.

8. REMOVE STRAIGHT PINS



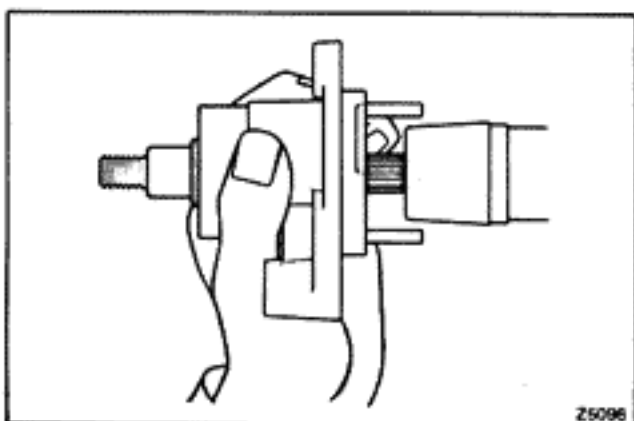
9. REMOVE ROTOR SHAFT

(a) Clamp the front housing in a vise.

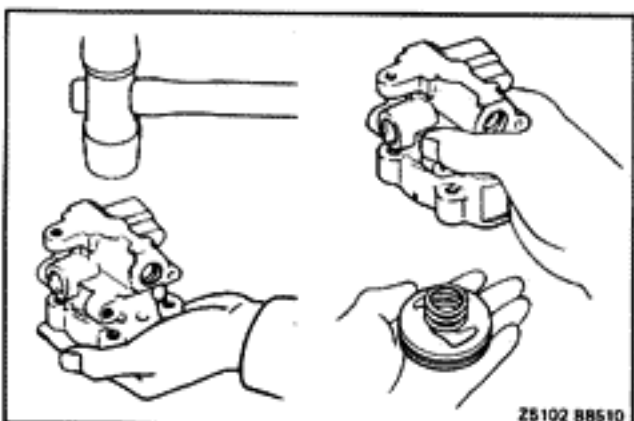
CAUTION: Do not tighten the vise too tight.

(b) Using a chisel and hammer, pry off the oil seal.

(c) Using snap ring pliers, remove the snap ring.



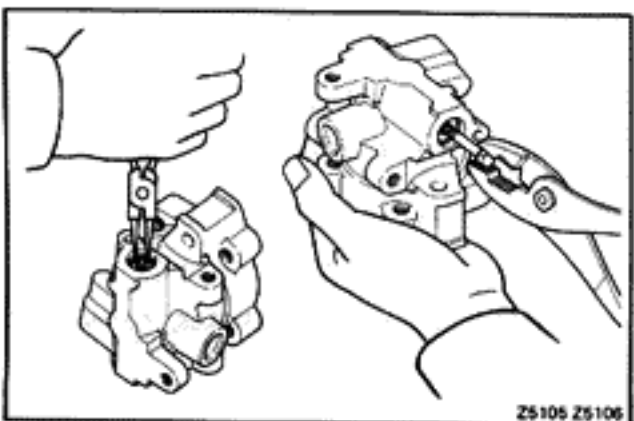
(d) Using a plastic hammer, lightly tap the rotor shaft out of the front housing.



10. REMOVE REAR PLATE AND SPRING

Using a plastic hammer, tap the bottom end of the rear housing, and remove the rear plate and spring.

CAUTION: Avoid gripping the rear plate with pliers as this could damage it.



11. REMOVE PRESSURE PORT UNION

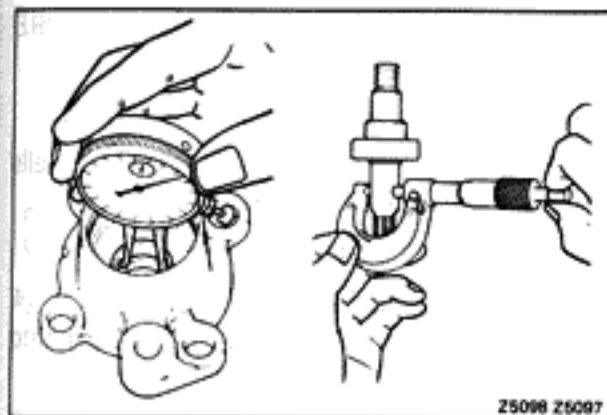
12. REMOVE FLOW CONTROL VALVE AND SPRING

CAUTION: Use care not drop, scratch or nick this valve.

13. REMOVE FLOW CONTROL SPRING SEAT

(a) Using snap ring pliers, remove the snap ring.

(b) Install a suitable bolt to the spring seat and pull it out.



INSPECTION OF POWER STEERING PUMP

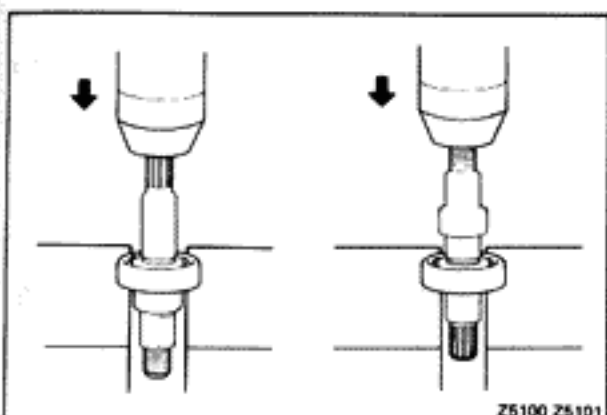
1. INSPECT BUSHING AND MEASURE BUSHING OIL CLEARANCE

- (a) Check bushing for wear or damage. The bushing cannot be replaced separately.

If wear or damage is found, replace entire housing.

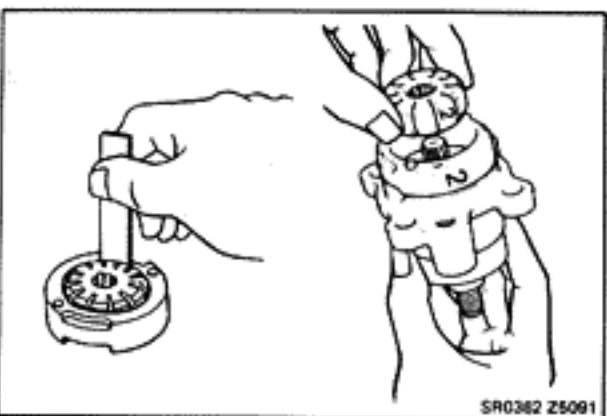
- (b) Check the oil clearance between the bushing and rotor shaft.

Maximum oil clearance: 0.07 mm (0.0028 in.)



2. IF NECESSARY, REPLACE ROTOR SHAFT BEARING

- (a) Using snap ring pliers, remove the snap ring.
 (b) Using a press, press out the bearing.
 (c) Using a press, press in the bearing.
 (d) Using snap ring pliers, install the snap ring.



3. INSPECT ROTOR AND CAM RING

Measure the cam ring thickness. Check that the difference between the rotor and cam ring measurement is less than maximum.

Maximum difference: 0.06 mm (0.0024 in.)

If the difference is excessive, replace the cam ring with one stamped with the same letter on the rotor.

4. INSPECT AND MEASURE VANE PLATES

- (a) Check the vane plates for wear or scratches.
 (b) Measure the length, height and thickness of the vane plates.

Minimum length: 14.97 mm (0.5894 in.)

Minimum height: 7.8 mm (0.307 in.)

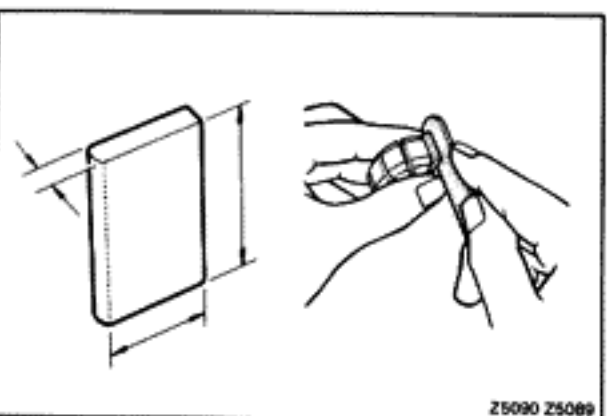
Minimum thickness: 1.7 mm (0.067 in.)

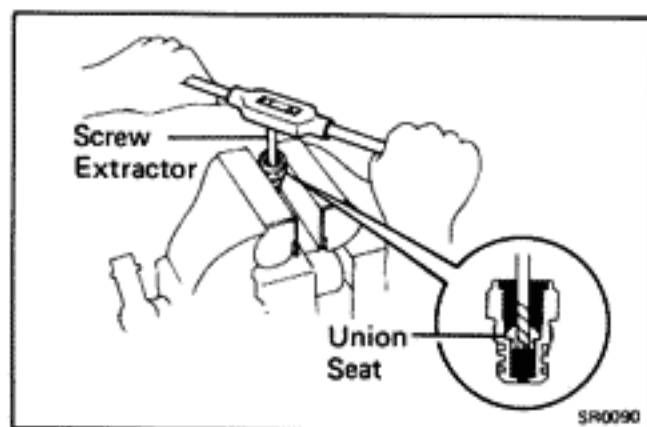
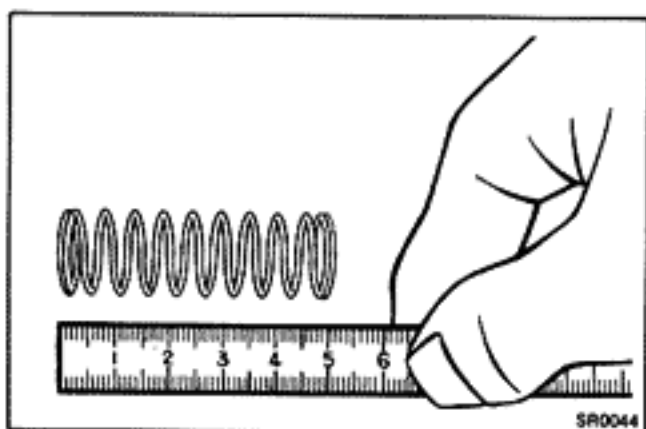
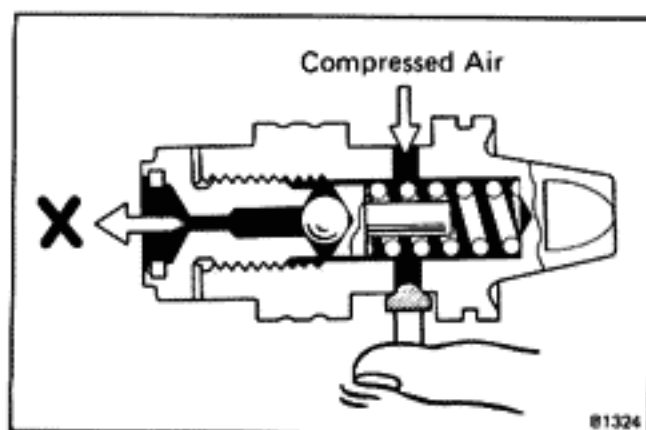
- (c) Measure the clearance between the vane plate and rotor groove.

Maximum clearance: 0.06 mm (0.0024 in.)

NOTE: There are five vane lengths with the following rotor and cam ring marks:

Rotor and cam ring mark	Vane length	mm (in.)
None	14.996 – 14.998	(0.5904 – 0.5905)
1	14.994 – 14.996	(0.5903 – 0.5904)
2	14.992 – 14.994	(0.5902 – 0.5903)
3	14.990 – 14.992	(0.59016 – 0.59024)
4	14.988 – 14.990	(0.5901 – 0.5902)





5. INSPECT FLOW CONTROL VALVE AND MEASURE SPRING

- Check the flow control valve for wear or damage.
- Apply fluid to the valve and check that it falls smoothly into the valve hole by its own weight.
- Check the flow control valve for leakage.
 - Close one of the holes and apply compressed air [4 or 5 kg/cm² (57 or 71 psi, 392 or 490 kPa)] into the opposite side.
 - Confirm that air does not come out from the end hole.

If necessary, replace the valve with one stamped with the same letter on the rear housing.

- Check that the spring is within specification.

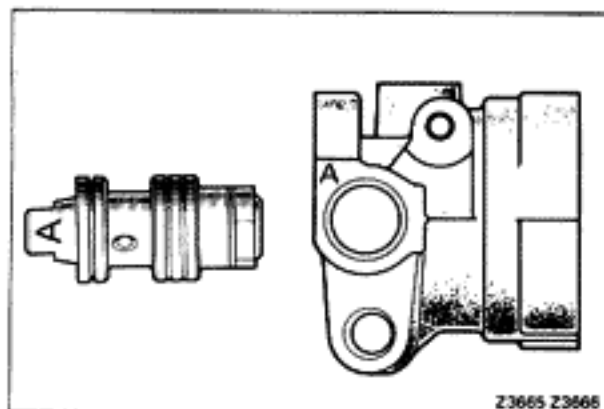
Standard length 50.0 mm (1.969 in.)

Minimum length 47.0 mm (1.850 in.)

If the spring is not within specification, replace the spring.

6. IF NECESSARY REPLACE UNION SEAT

- Using a screw extractor wrench, remove the union seat.
 - Install a new floating type union seat.
- NOTE: Only floating type parts are available.



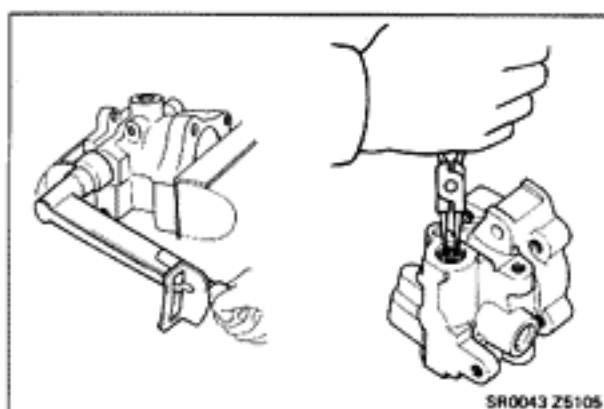
ASSEMBLY OF POWER STEERING PUMP

(See page SR-19)

1. INSTALL SPRING AND FLOW CONTROL VALVE

NOTE: Be sure the letter inscribed on the flow control valve matches the letter stamped on the rear of the pump body.

Inscribed mark: A, B, C, D, E or F



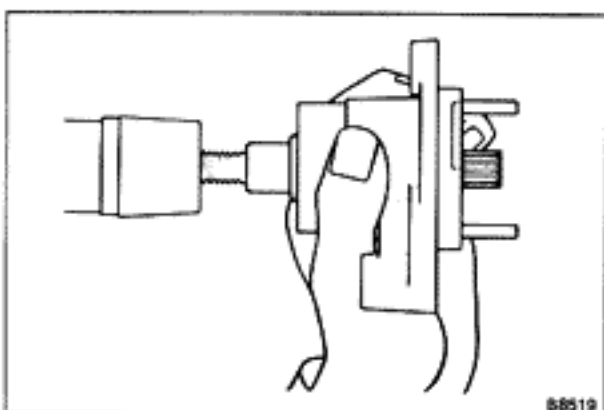
2. INSTALL PRESSURE PORT UNION

Install and torque the union.

Torque: 700 kg-cm (51 ft-lb, 69 N·m)

3. INSTALL FLOW CONTROL SPRING SEAT

- Temporarily install a suitable bolt to the spring seat.
- Push in the bolt and install the snap ring with snap ring pliers.
- Remove the suitable bolt.

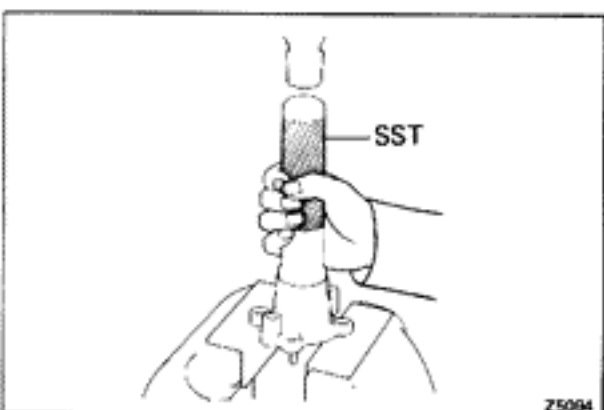


4. INSTALL ROTOR SHAFT TO FRONT HOUSING

Install the rotor shaft into the front housing by tapping it in with a plastic hammer.

5. INSTALL SNAP RING

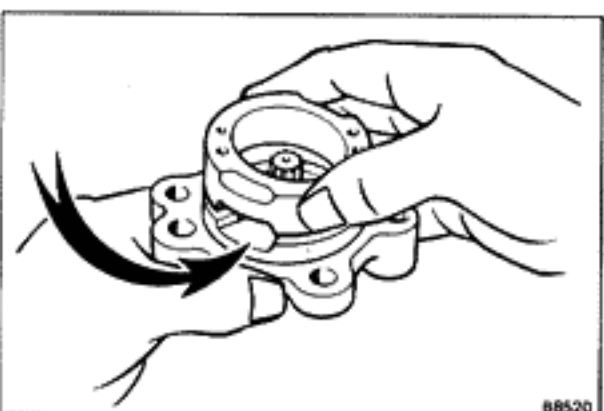
Using snap ring pliers, install the snap ring to the front housing.



6. INSTALL OIL SEAL

- Apply a light coat of MP grease to a new oil seal lip.
- Using SST and a hammer, install the oil seal.

SST 09608-30012 (09608-04030)

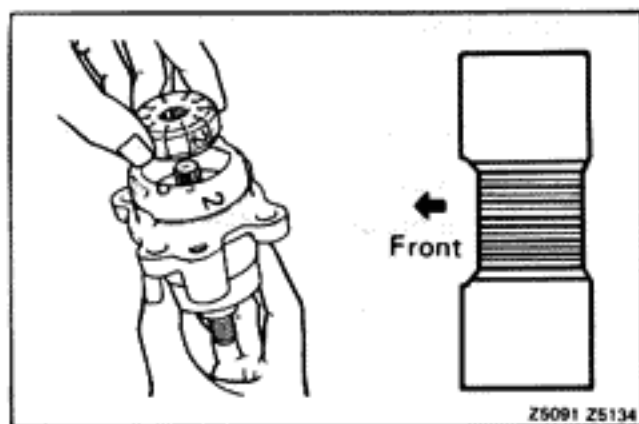


7. INSTALL O-RING

8. INSTALL STRAIGHT PINS

9. INSTALL CAM RING

Align the fluid passages of the cam ring and front housing, and install the cam ring.

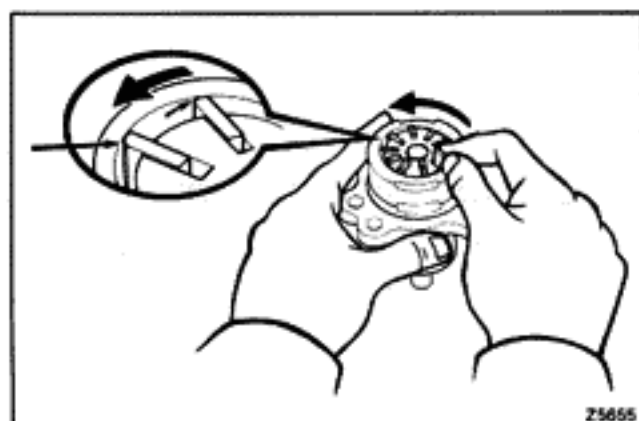


10. INSTALL ROTOR

Install the rotor with the chamfered end facing toward the front.

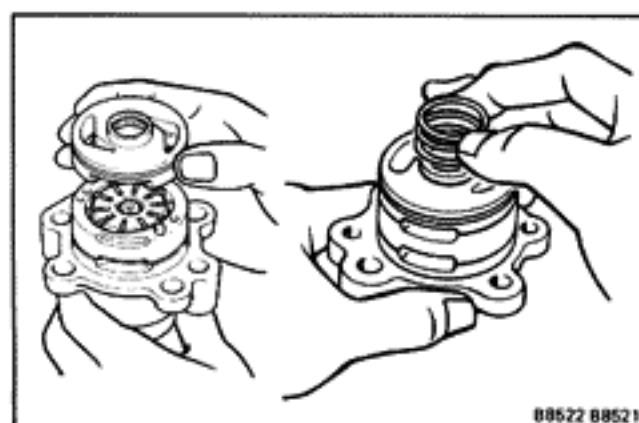
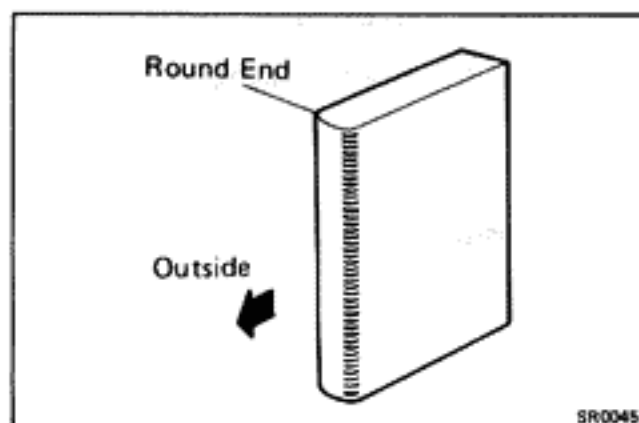
NOTE: Be sure the letters inscribed on the cam ring and rotor are matching.

Inscribed mark: 1, 2, 3, 4 or None



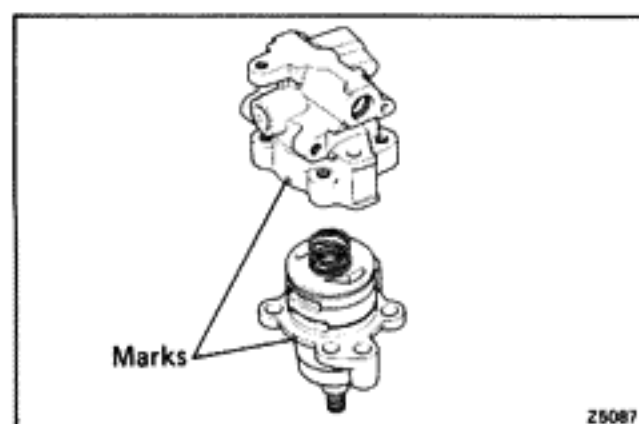
11. INSTALL VANE PLATES

Install the vane plates with the round end facing outward.



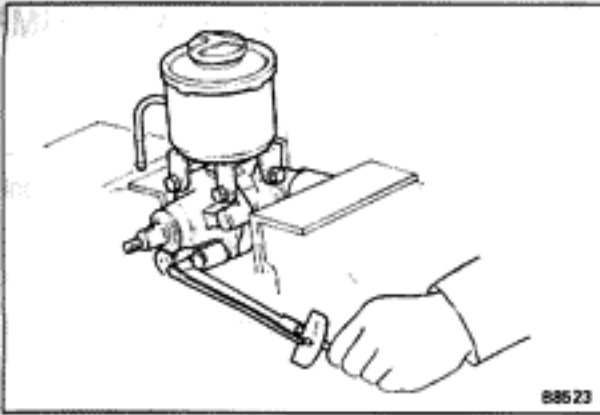
12. INSTALL REAR PLATE AND SPRING

- Place the rear plate on the cam ring with the pin holes aligned with the pins.
- Place the spring on the rear plate.



13. INSTALL REAR HOUSING

- Align the marks on the front and rear housing, and assemble them.
- Install the reservoir tank in place and tighten the reservoir tank set bolts.
- Finger tighten the front and rear housing mounting bolts.

**14. TIGHTEN FOUR HOUSING BOLTS**

(a) Clamp the rear housing in a vise.

CAUTION: Do not tighten the vise too tight.

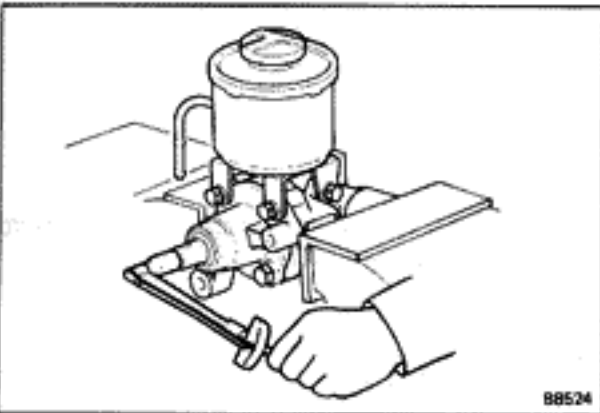
(b) Tighten the four housing bolts evenly in 3 or 4 passes.

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

15. INSTALL RESERVOIR TANK

Install and torque the bolts.

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

**16. CHECK ROTOR SHAFT ROTATION CONDITION**

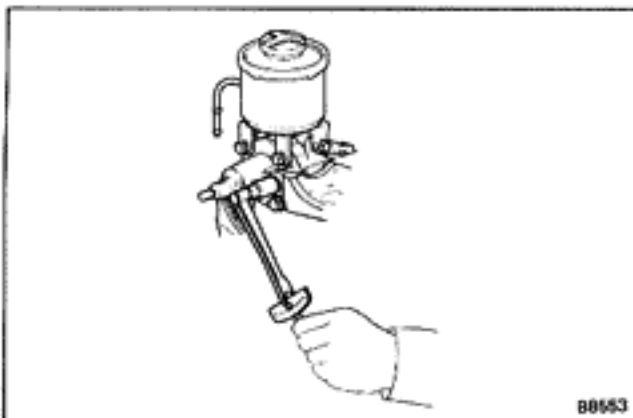
(a) Check that the rotor shaft rotates smoothly without abnormal noise.

(b) Provisionally install the pulley nut and check the rotating torque.

Rotating torque: Less than 2.8 kg-cm (2.4 in.-lb, 0.3 N-m)

17. INSTALL AIR CONTROL VALVE

Torque: 370 kg-cm (27 ft-lb, 36 N-m)



B8553

INSTALLATION OF POWER STEERING PUMP

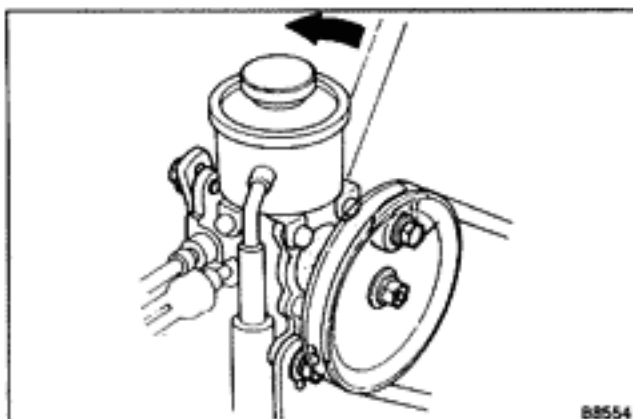
(See page SR-18)

1. INSTALL POWER STEERING PUMP

- (a) Place the PS pump in position and torque the front mount bolt.

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

- (b) Install the drive belt adjust bolt by hand.



B8554

2. INSTALL PULLEY AND DRIVE BELT

- (a) Install the woodruff key and pulley.

- (b) Install the pulley set nut.

- (c) Install the drive belt.

- (d) Insert a bar under the PS pump and ply it upward until the belt tension is at specified value.

Belt tension gauge:

Nippondenso BTG-20 (95506-00020) or

Borroughs No. BT-33-73F

Drive belt tension:

New belt 125 ± 25 lb

Used belt 80 ± 20 lb

NOTE:

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

- (e) Torque the adjust bolt.

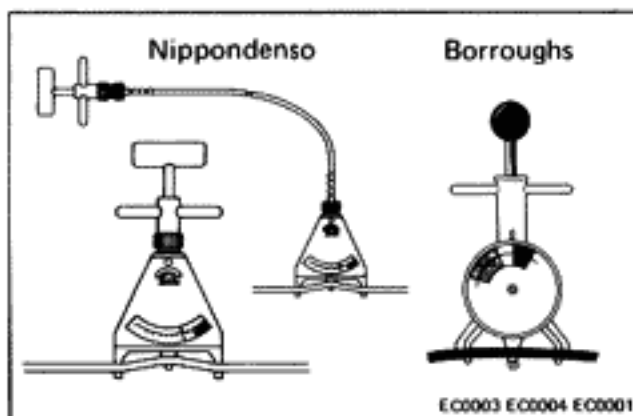
Torque: 375 kg-cm (27 ft-lb, 37 N-m)

- (f) Push down on the drive belt to hold the pulley in place and torque the pulley set nut.

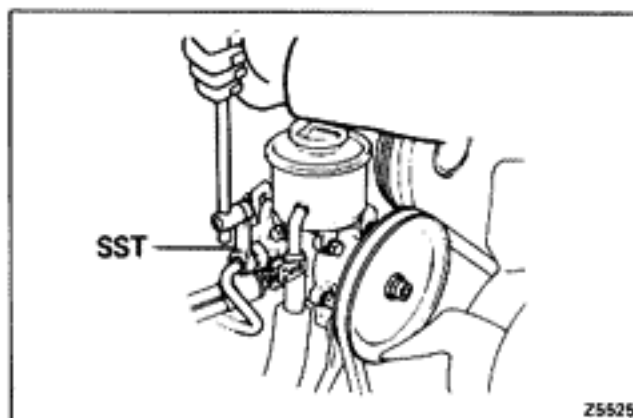
Torque: 445 kg-cm (32 ft-lb, 44 N-m)

- (g) Install and torque the PS pump rear mount bolt.

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



EC0003 EC0004 EC0001



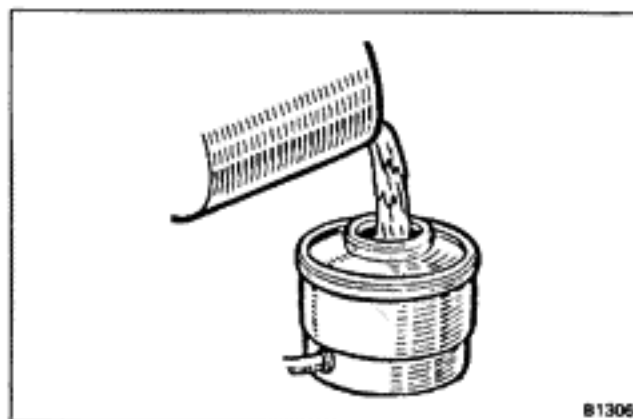
Z5525

3. CONNECT PRESSURE TUBE TO POWER STEERING PUMP

Using SST, connect and torque the pressure tube.

SST 09631-22020

Torque: 450 kg-cm (33 ft-lb, 44 N-m)



B1306

4. CONNECT RETURN HOSE TO RESERVOIR TANK

5. CONNECT AIR HOSES TO AIR CONTROL VALVE

6. FILL RESERVOIR WITH FLUID

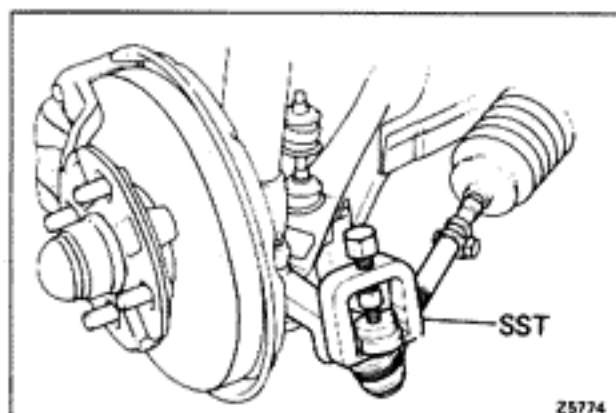
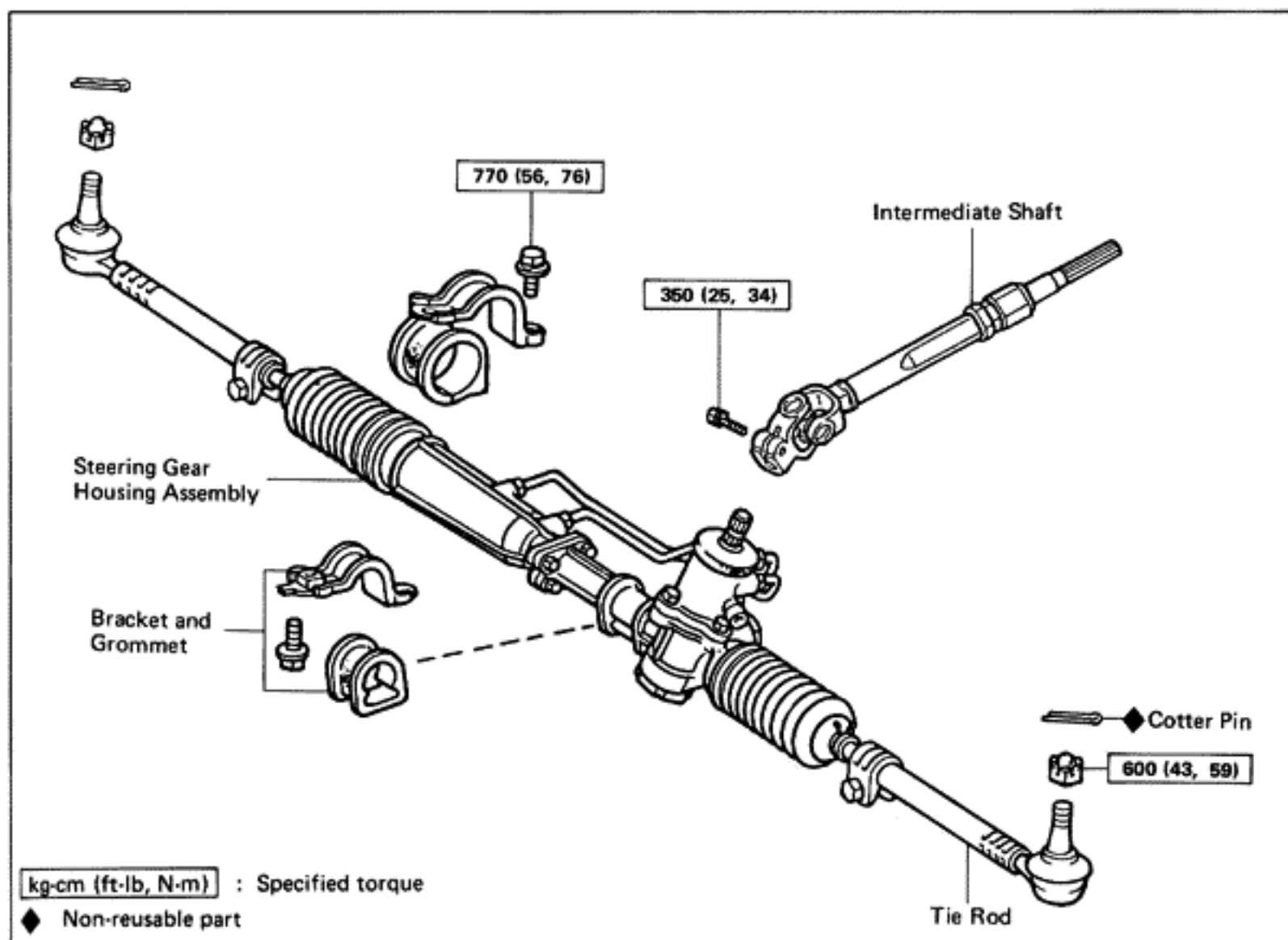
Fluid: ATF DEXRON® or DEXRON® II

7. BLEED POWER STEERING

8. CHECK FOR FLUID LEAKS

Gear Housing

REMOVAL OF GEAR HOUSING

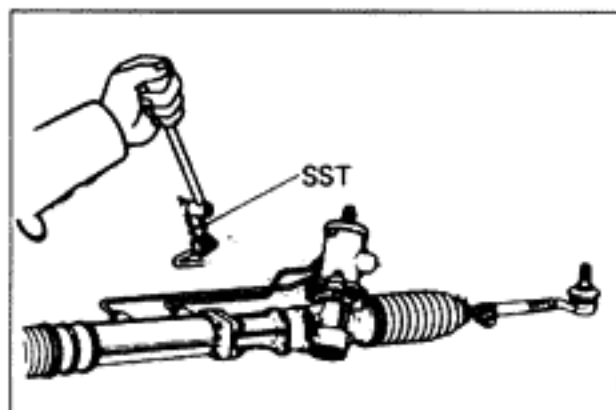


- 1. REMOVE INTERMEDIATE SHAFT**
(See step 2 on page SR-4)

- 2. DISCONNECT TIE ROD END**

- Remove the cotter pin and nut holding the knuckle arm to the tie rod.
- Using SST, disconnect the knuckle arm from the tie rod.

SST 09611-22012

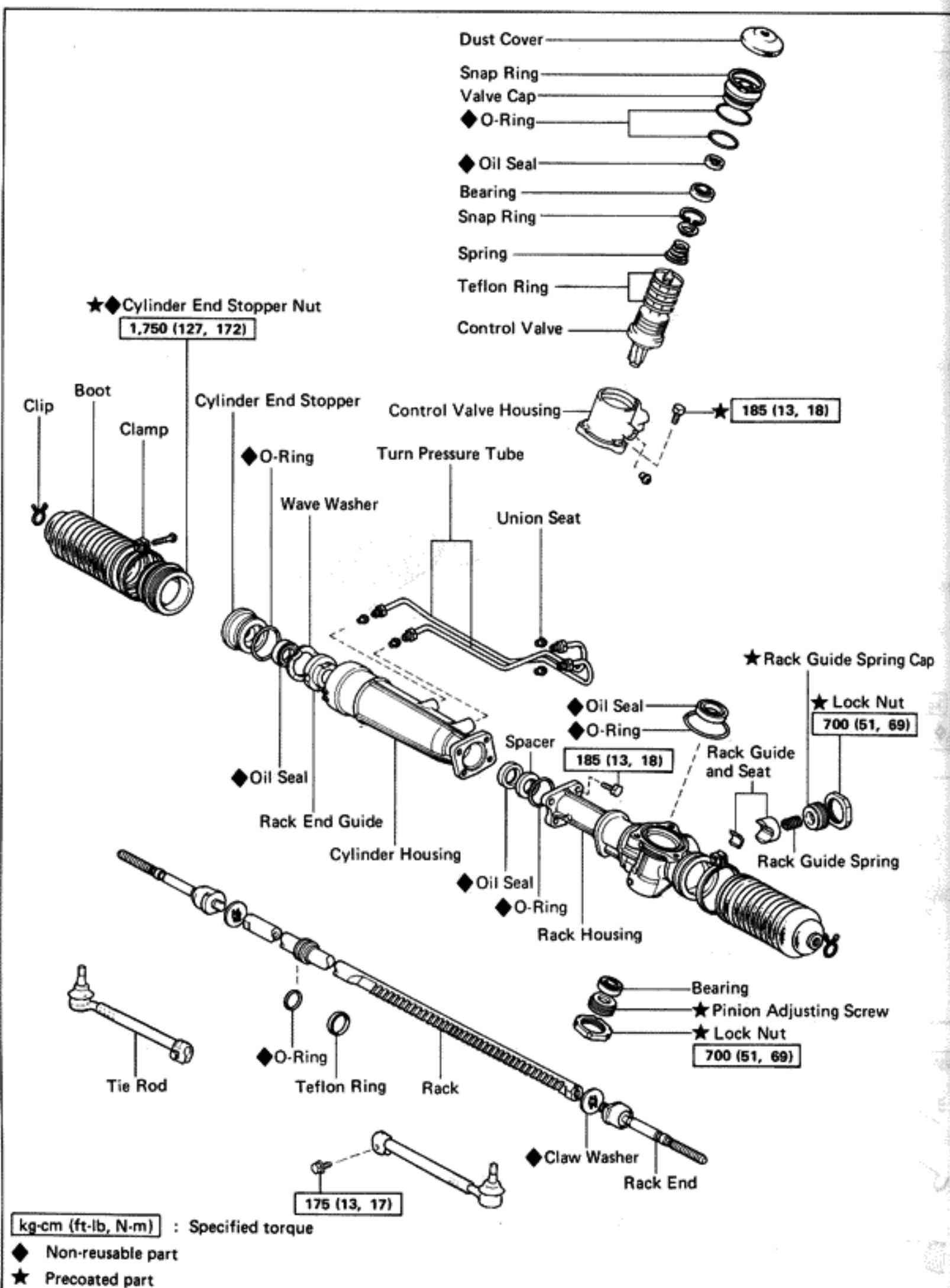


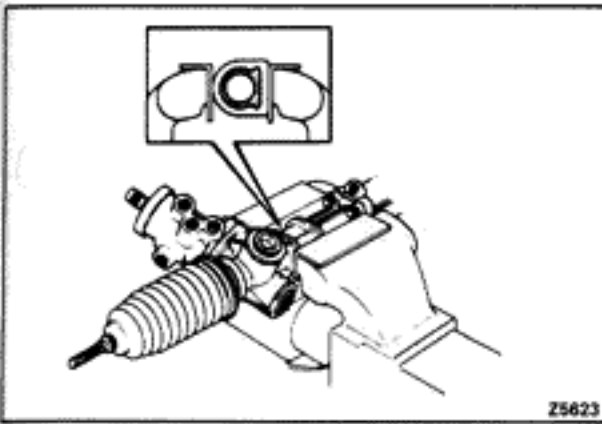
- 3. DISCONNECT RETURN LINE AND PRESSURE LINE**
Using SST, disconnect return and pressure lines. Use a container to catch the power steering fluid.
SST 09631-22020

- 4. REMOVE GEAR HOUSING ASSEMBLY**

- Remove the gear housing bracket set bolts.
- Remove the housing assembly.

COMPONENTS





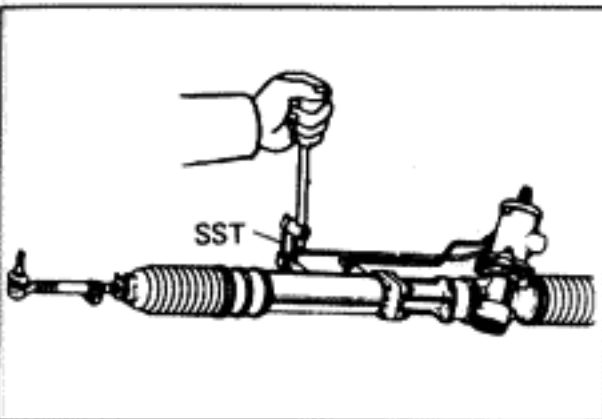
DISASSEMBLY OF GEAR HOUSING

(See page SR-27)

1. CLAMP GEAR HOUSING IN VISE

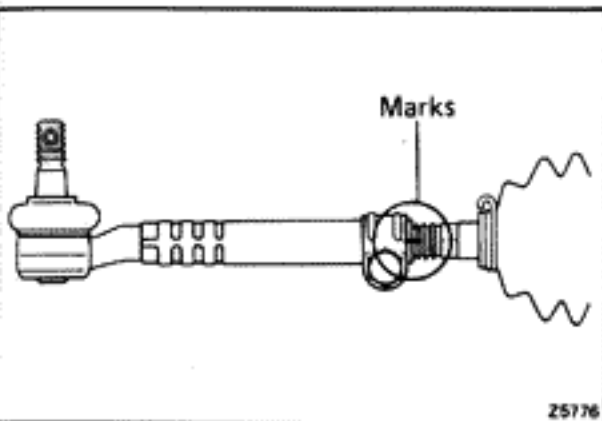
NOTE:

- (1) The rack housing is made of aluminum, so always use soft jaws on the vise and clamp onto the part shown in the figure.
- (2) If clamping onto the center tube, wrap a piece of cloth around it and be careful not to damage the tube.



2. REMOVE TURN PRESSURE RIGHT AND LEFT TUBES AND UNION SEATS

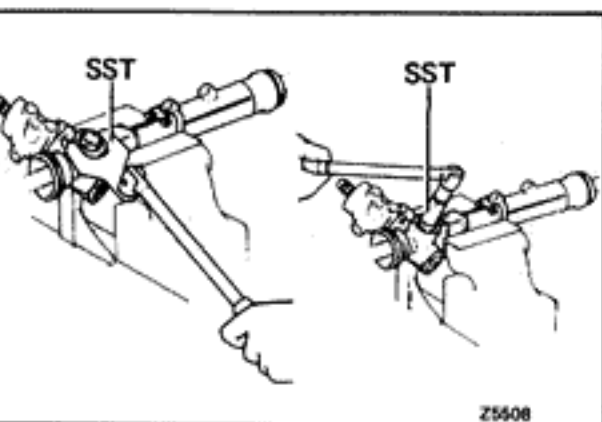
- (a) Using SST, remove the turn pressure tubes.
SST 09631-22020
- (b) Remove the union seats.



3. REMOVE TIE ROD ENDS

- (a) Place matchmarks on the tie rod end and rack end.
- (b) Loosen the clamp and remove the tie rod end from the rack end.

4. REMOVE RACK BOOTS



5. REMOVE RACK GUIDE SPRING CAP LOCK NUT

Using SST, remove the rack guide spring cap lock nut.
SST 09612-24012 (09617-24020)

6. REMOVE RACK GUIDE SPRING CAP

Using SST, remove the rack guide spring cap.
SST 09612-24012 (09612-10021)

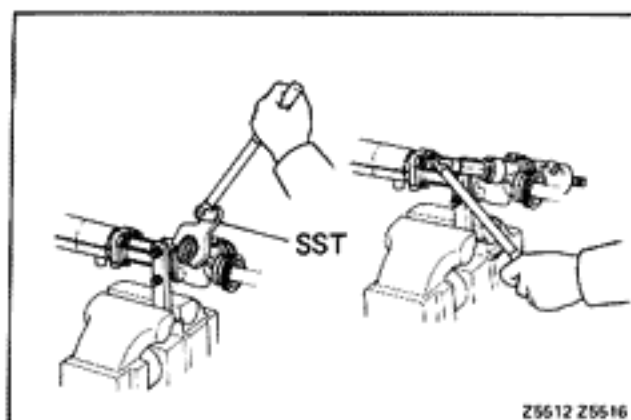
7. REMOVE RACK GUIDE SPRING

8. REMOVE RACK GUIDE AND SEAT

9. REMOVE DUST COVER

10. REMOVE CONTROL VALVE HOUSING

- (a) Place matchmarks on the control valve housing and rack housing.
- (b) Remove the three bolts.
- (c) Remove the control valve housing.
- (d) Remove the O-ring.

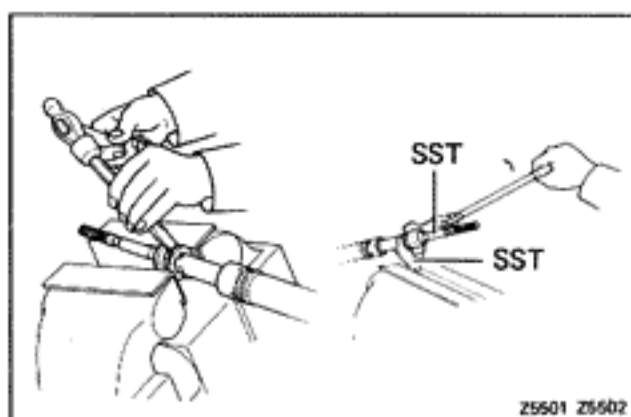


11. REMOVE PINION ADJUSTING SCREW LOCK NUT

Using SST, remove the pinion adjusting lock nut.
SST 09612-24012 (09617-24020)

12. REMOVE PINION ADJUSTING SCREW

Using SST, remove the pinion adjusting screw.
SST 09612-24012 (09612-10021)



13. REMOVE RACK ENDS AND CLAW WASHER

(a) Unstake the claw washer.

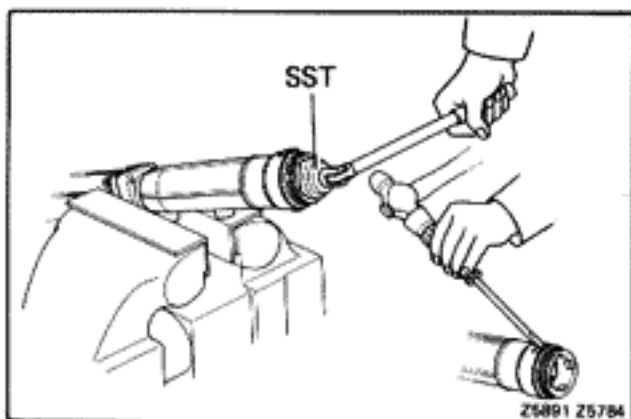
CAUTION: Avoid any impact to the rack.

(b) Using SST, remove the rack ends.

SST 09612-24012 (09617-22030, 09617-24010)

NOTE: Mark the left and right rack ends.

(c) Remove the claw washer.



14. REMOVE CYLINDER END STOPPER NUT

(a) Unstake the staked part of cylinder housing.

(b) Using SST, remove the cylinder end stopper nut.

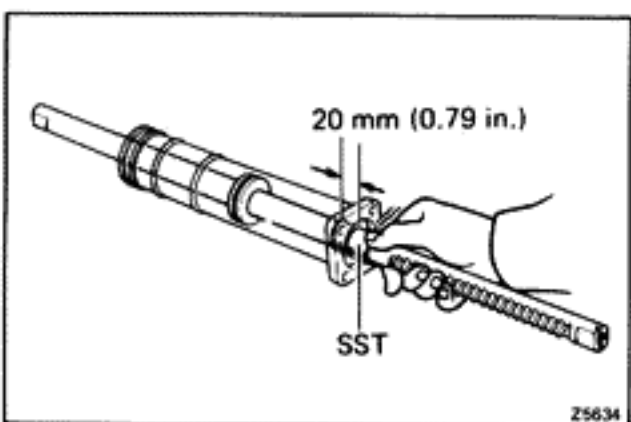
SST 09630-24013 (09631-24060)

15. REMOVE RACK HOUSING

(a) Remove the four bolts.

(b) Remove the rack housing.

(c) Remove the O-ring.



16. REMOVE SPACER FROM RACK HOUSING

17. REMOVE STEERING RACK WITH CYLINDER END STOPPER, O-RING, RACK END GUIDE AND WAVE WASHER FROM CYLINDER HOUSING

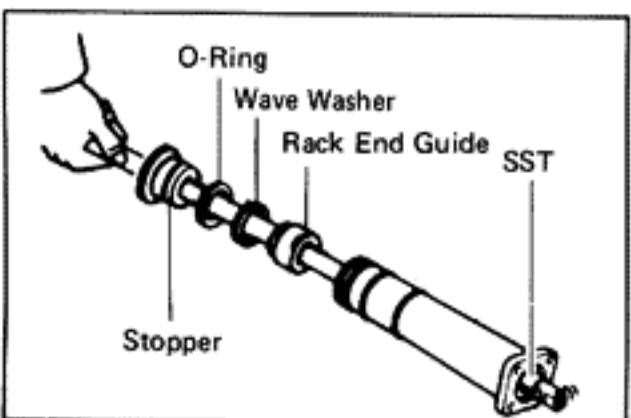
(a) Insert SST into the cylinder housing until oil seal lip.
SST 09630-24013 (09631-24041)

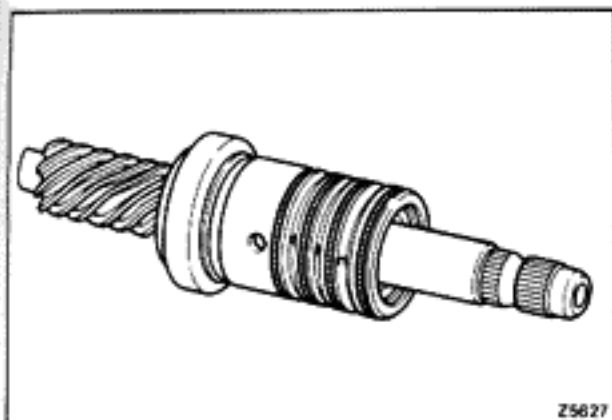
(b) Remove the steering rack with the stopper, O-ring wave washer and rack end guide.

(c) Remove each part from the rack.

(d) Remove SST from rack housing.

SST 09630-24013 (09631-24041)

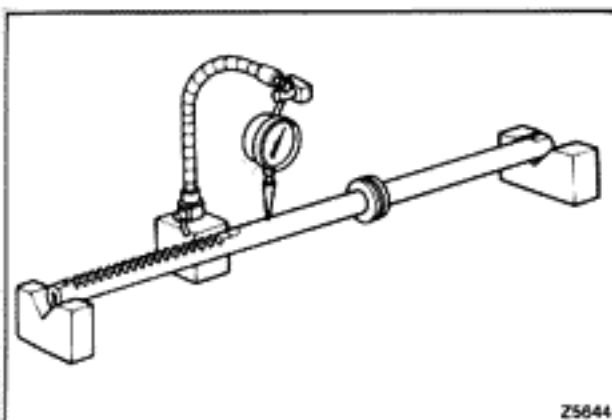




INSPECTION OF GEAR HOUSING

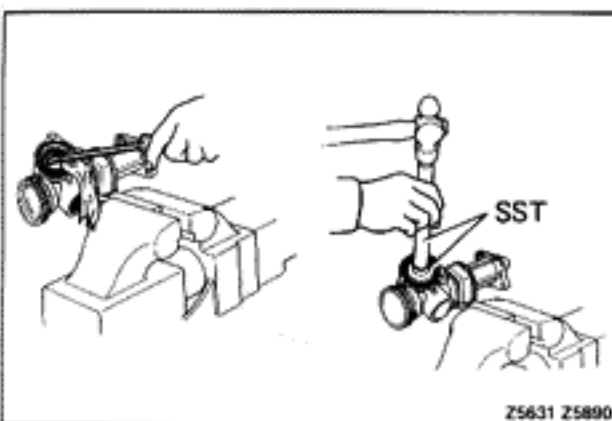
1. INSPECTION CONTROL VALVE

- (a) Remove the control valve with pinion from the yoke housing.
- (b) If necessary, replace the control valve assembly.



2. INSPECT STEERING RACK RUNOUT

Runout: Limit 0.3 mm (0.012 in.)



REPLACEMENT OF GEAR HOUSING

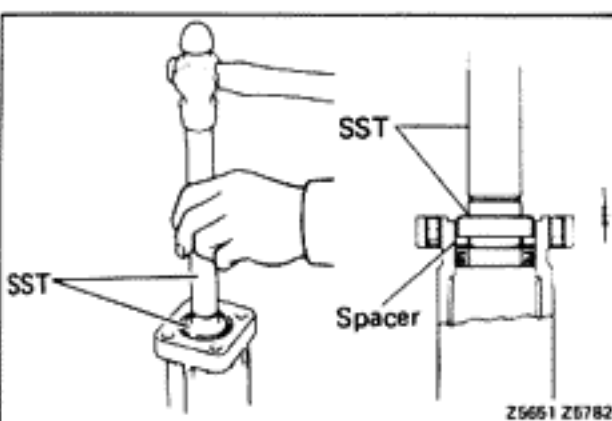
IF NECESSARY, REPLACE FOLLOWING PARTS:

1. OIL SEAL FOR RACK HOUSING

- (a) Remove the oil seal with a screwdriver.
- (b) Using SST, install the new oil seal.

SST 09620-30010 (09631-00020)

SST 09630-24013 (09631-24070)

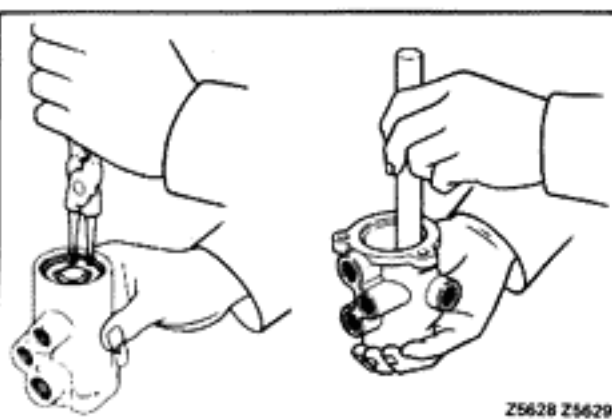


2. OIL SEAL FOR CYLINDER HOUSING

- (a) Using SST, drive out the oil seal.
- (b) Using SST and a hammer, install a new oil seal.

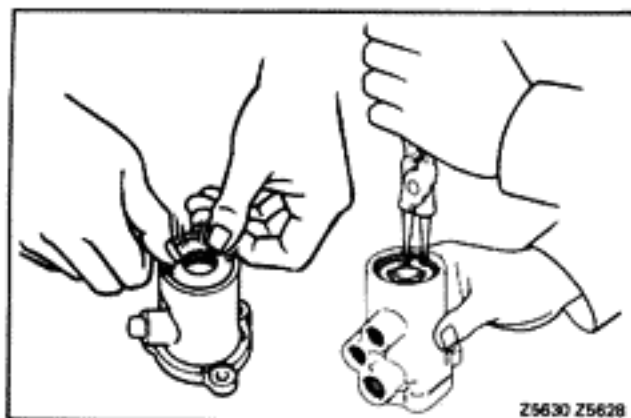
SST 09620-30010 (09625-30010, 09631-00020)

- Install the new oil seal.
- Place the spacer on the oil seal.
- Drive in the oil seal over the spacer until the round surface of SST is flush with housing surface.

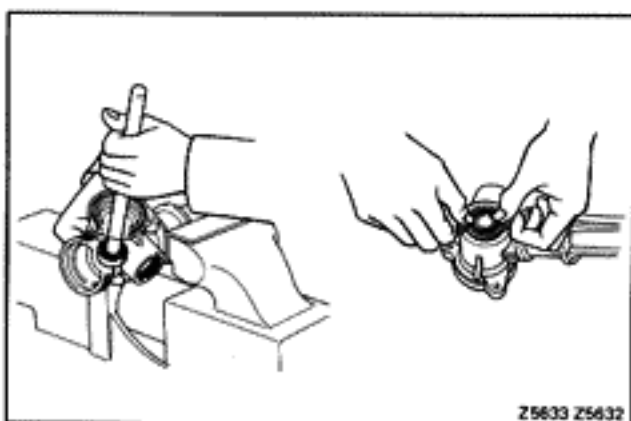


3. OIL SEAL AND BEARING FOR CONTROL VALVE HOUSING

- (a) Remove the snap ring.
- (b) Remove the bearing and oil seal with brass bar.

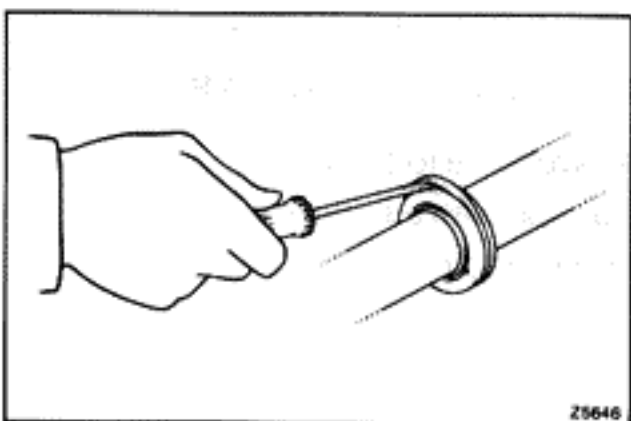


- (c) Install the new bearing and oil seal.
- (d) Install the snap ring.



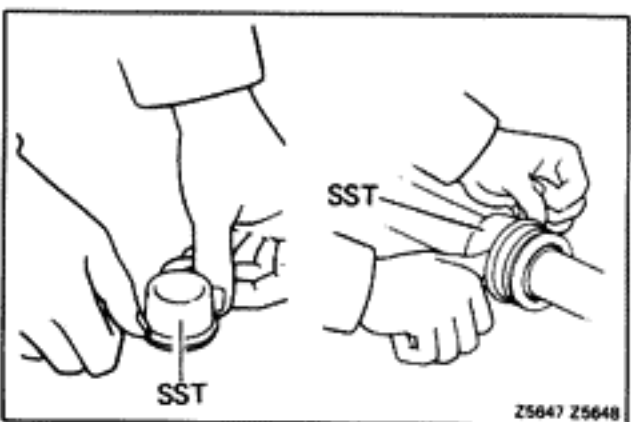
4. PINION LOWER BEARING

- (a) Remove the bearing with brass bar.
- (b) Install a new bearing.



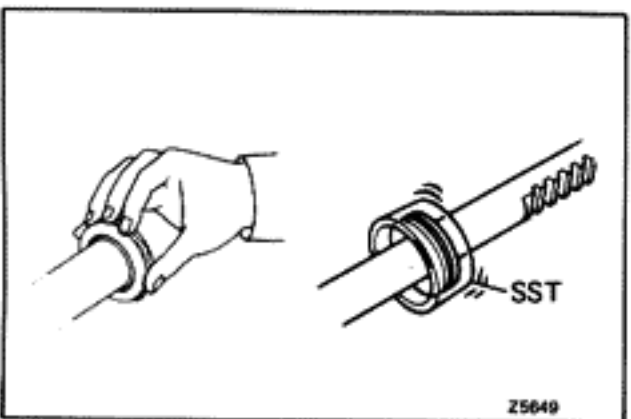
5. TEFLON RING AND O-RING

- (a) Remove the teflon ring and O-ring.
- (b) Install a new O-ring.



- (c) Install a new teflon ring to SST and install it to the steering rack.

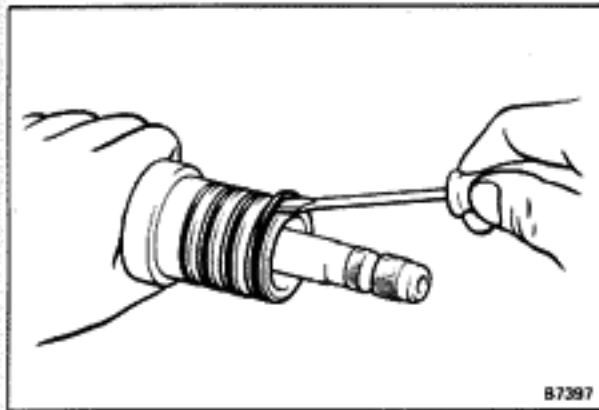
SST 09630-24013 (09631-24020)



- (d) Coat the teflon ring with power steering fluid and snug it down with your fingers.
- (e) Carefully slide the tapered end of SST over the teflon ring to seat the ring.

SST 09630-24013 (09631-24030)

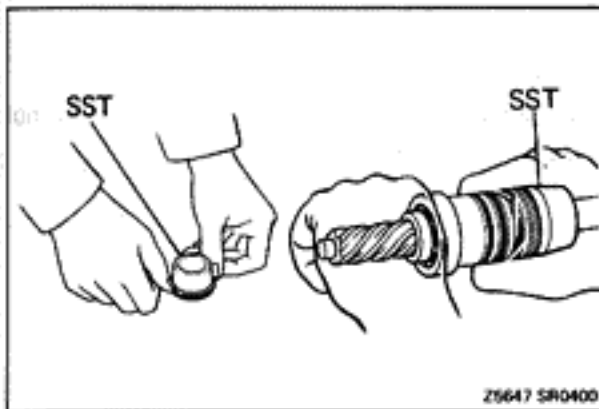
NOTE: Make sure the seal is uniformly spaced around the perimeter of the piston.



6. TEFLON RING FOR CONTROL VALVE

- (a) Remove the teflon rings.

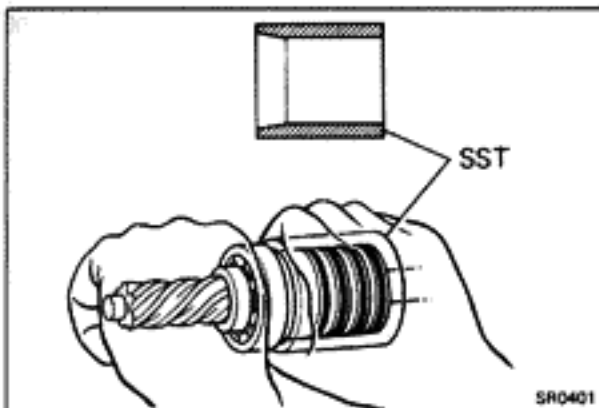
CAUTION: Be careful not to damage the control valve.



- (b) Install a new teflon ring to SST and install it to the control valve.

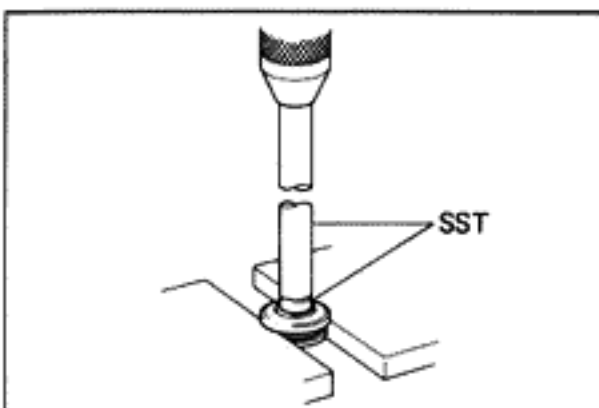
SST 09630-24013 (09631-24020)

- (c) Coat the teflon ring with power steering fluid and snug it down with your fingers.



- (d) Carefully slide the tapered end of the SST over the teflon ring to seat the ring.

SST 09630-24013 (09631-24030)

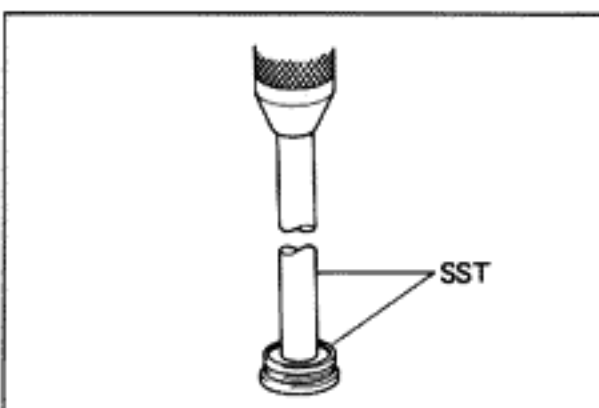


7. OIL SEAL AND BEARING FOR VALVE CAP

- (a) Using SST, press out the oil seal and bearing from the valve cap.

SST 09620-30010 (09631-00020)

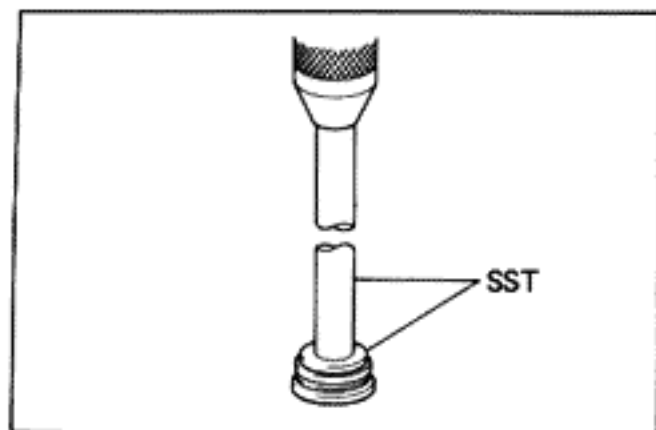
09630-24013 (09620-24010)



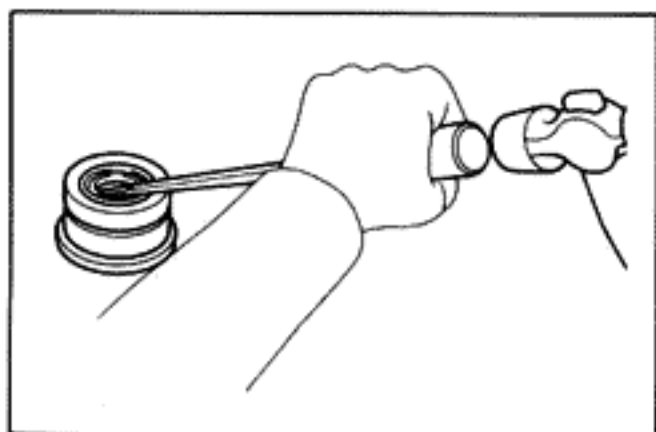
- (b) Using SST, press the oil seal into the valve cap.

SST 09620-30010 (09631-00020)

09630-24013 (09620-24020)



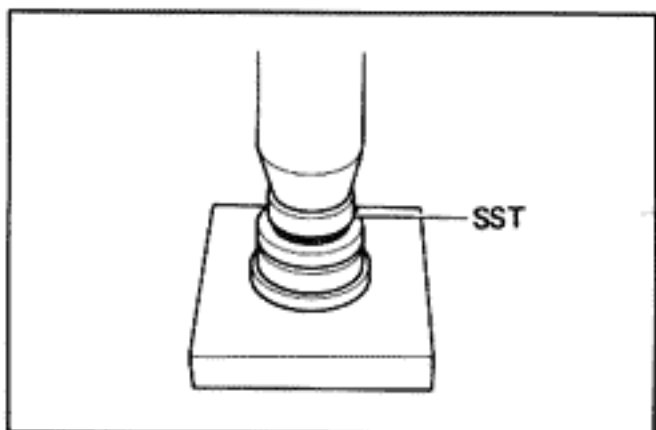
- (c) Using SST, press the bearing into the valve cap.
SST 09620-30010 (09631-00020)
09630-24013 (09620-24030)



8. OIL SEAL FOR CYLINDER END STOPPER

- (a) Tap out the oil seal from the cylinder end stopper.

CAUTION: When tapping out the oil seal, be careful not to damage the inside of cylinder end stopper.



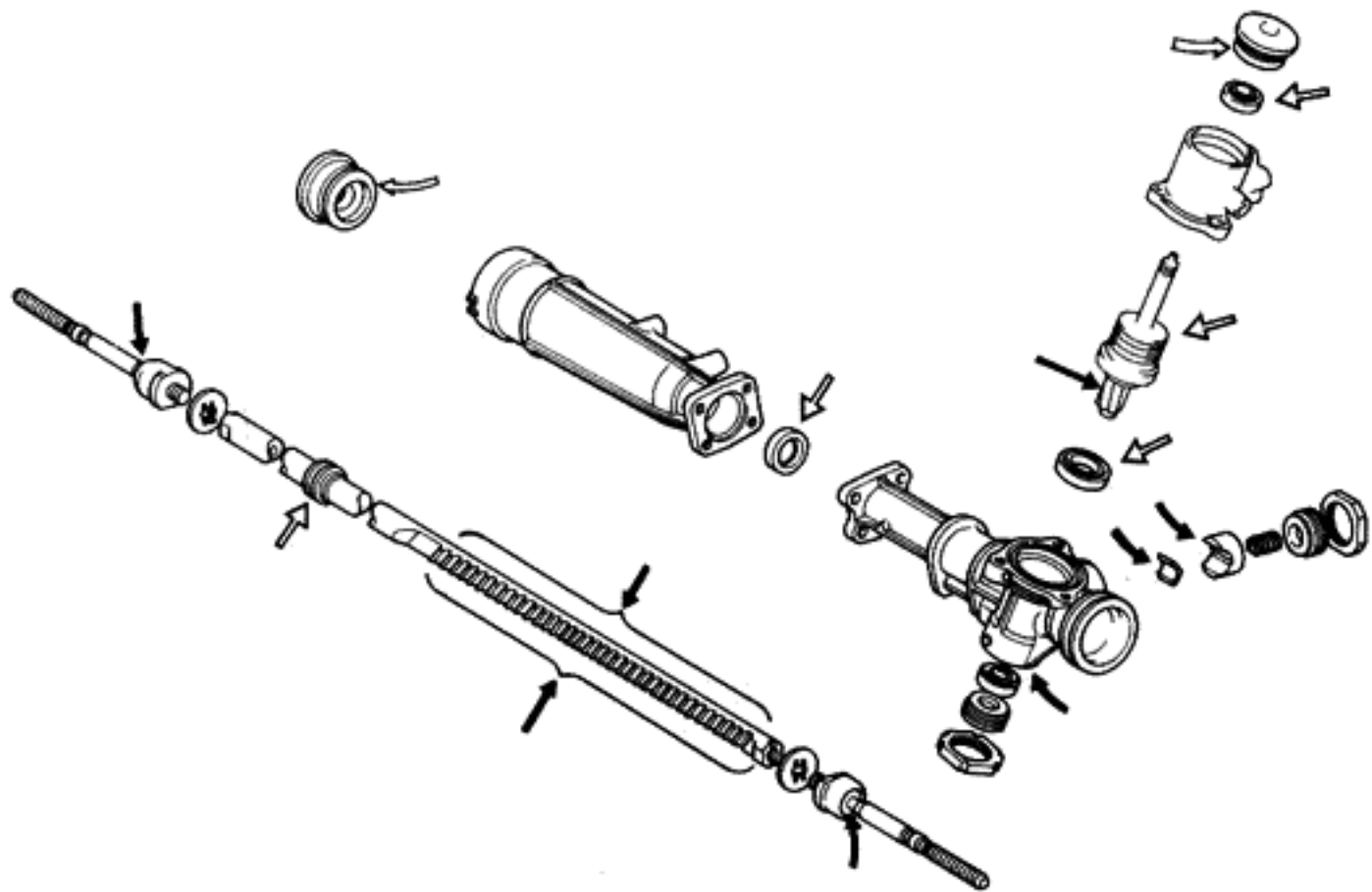
- (b) Using SST, press the oil seal into the cylinder end stopper.

SST 09631-20040

ASSEMBLY OF GEAR HOUSING

(See page SR-27)

1. COAT POWER STEERING FLUID ON FOLLOWING PARTS:



← : Molybdenum Disulphide Lithium Base Grease
 ⇐ : Power Steering Fluid

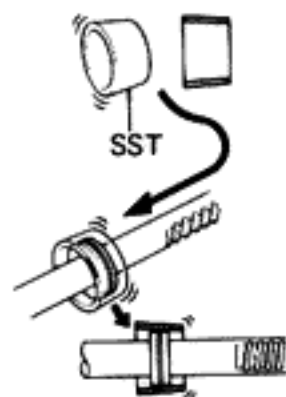
2. INSTALL SEAT AND SPACER

3. INSTALL STEERING RACK ASSEMBLY

(a) Insert SST into a new teflon ring of the piston.

SST 09630-24013 (09631-24030)

NOTE: Protect the teflon ring from damage.

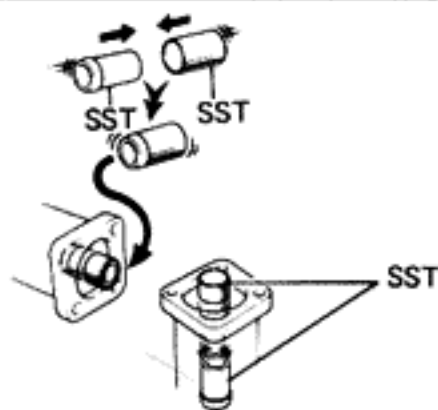


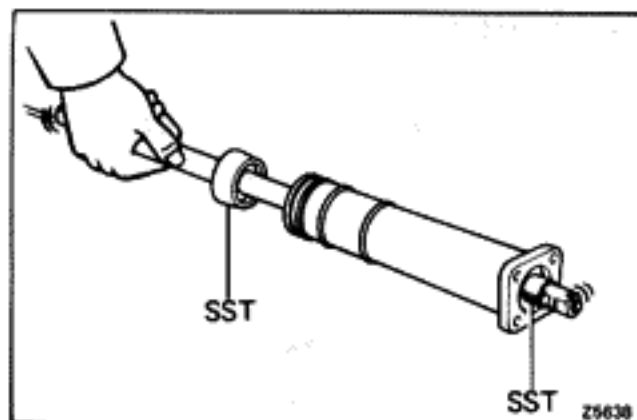
(b) Insert SST into a new oil seal of the cylinder housing.

- Install one SST into the other.
- Insert two SST into the oil seal.
- Remove one SST from the other.

SST 09630-24013 (09631-24041, 09631-24050)

NOTE: Protect the oil seal lip from damage.

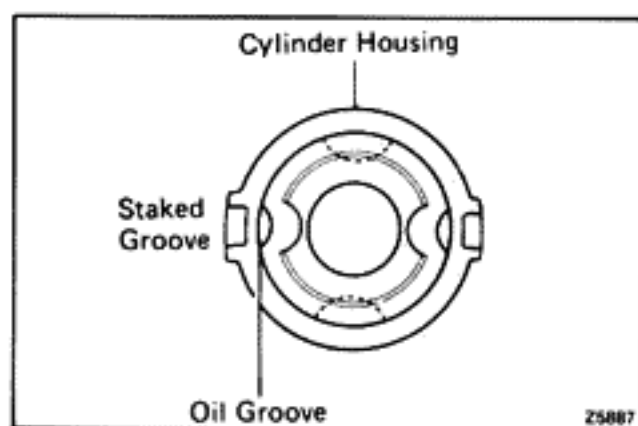




(c) Install the steering rack to the cylinder housing.

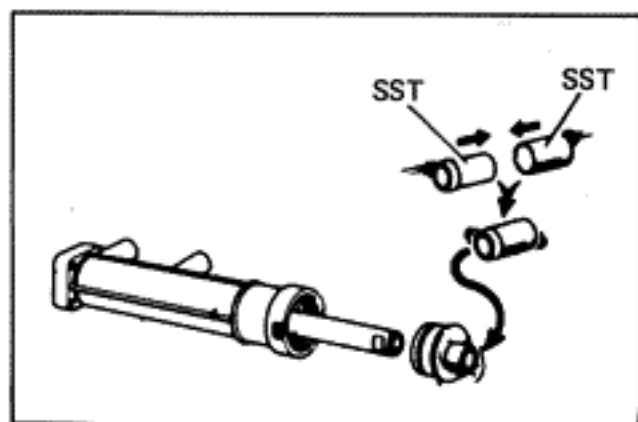
(d) Remove SST.

SST 09630-24013 (09631-24030, 09631-24041)



4. INSTALL RACK END GUIDE AND WAVE WASHER

Install the rack end guide with oil groove facing toward the staked groove.



5. INSTALL CYLINDER END STOPPER WITH O-RING

(a) Insert SST to the oil seal of the cylinder end stopper.

- Install one SST into the other.
- Install two SST into the oil seal.
- Remove one SST from the other.

(b) Install the cylinder end stopper to the cylinder housing.

(c) Remove SST.

SST 09630-24013 (09631-24041, 09631-24050)

6. INSTALL RACK HOUSING TO CYLINDER HOUSING

NOTE: Make sure that the O-ring, spacer and seal are installed between the rack housing and the cylinder housing.

- (a) Install the rack housing.
- (b) Install the four bolts and torque them.

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

7. INSTALL CYLINDER END STOPPER NUT

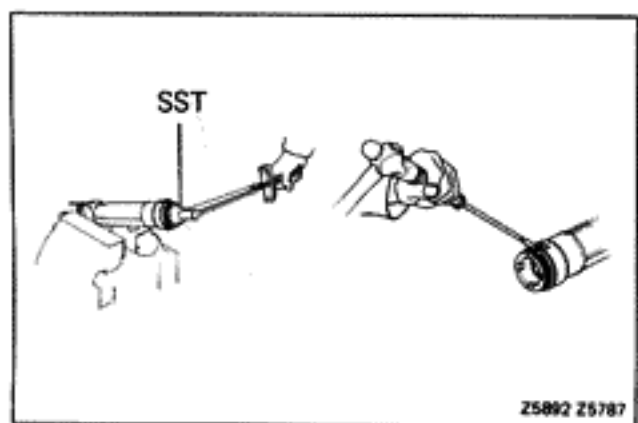
(a) Coat liquid sealer onto the screw surface of the new nut.

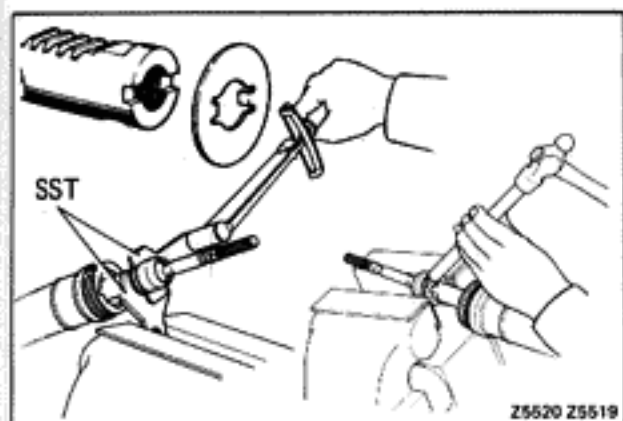
(b) Install the cylinder end stopper nut with SST and torque the nut.

SST 09630-24013 (09631-24060)

Torque: 1,750 kg-cm (127 ft-lb, 172 N-m)

(c) Stake the end stopper nut to the cylinder housing flange.





8. INSTALL CLAW WASHER AND RACK ENDS

- (a) Install the claw washer.

NOTE: Align the claw of the claw washer with the rack groove.

- (b) Tighten the rack end and torque it with SST.

SST 09612-24012 (09617-22030, 09617-24010)

Torque: 1,050 kg-cm (76 ft-lb, 103 N-m)

- (c) Stake the claw washer.

9. INSTALL CONTROL VALVE ASSEMBLY INTO CONTROL VALVE HOUSING

10. INSTALL CONTROL VALVE SPRING SEAT

11. INSTALL COMPRESSION SPRING

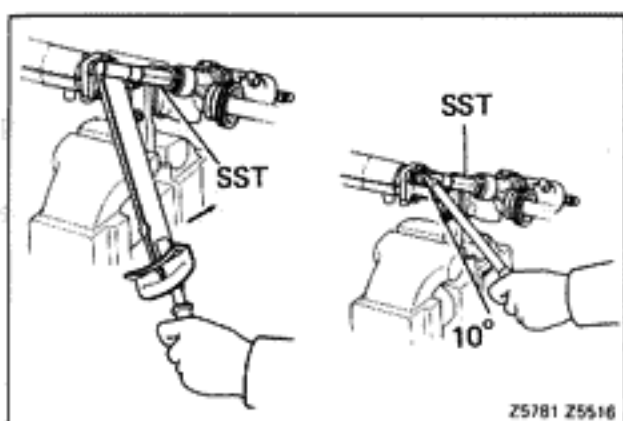
12. INSTALL O-RING AND CONTROL VALVE HOUSING TO RACK HOUSING

- (a) Align the marks on the control housing and rack housing.

- (b) Coat liquid sealer onto the screw surface of the bolt.

- (c) Install the three bolts and torque them.

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



13. ADJUST CONTROL VALVE SHAFT PRELOAD

- (a) Coat liquid sealer onto the screw surface of the bolt.

- (b) Tighten the pinion adjusting screw and torque with SST.

SST 09612-24012 (09612-10021)

Torque: 150 kg-cm (11 ft-lb, 15 N-m)

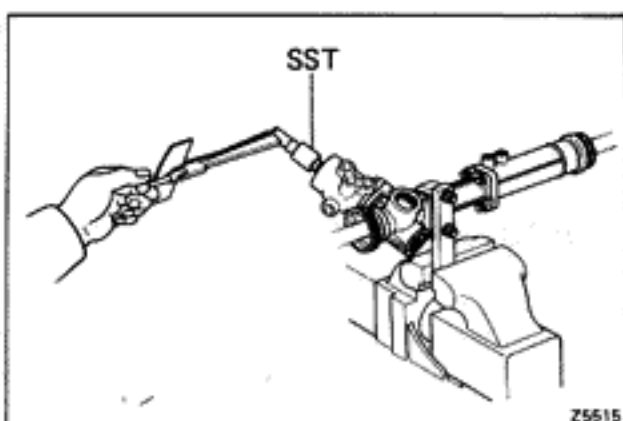
- (c) Return the pinion adjusting screw 10°.

- (d) Using SST, measure the preload.

SST 09616-00010

Preload (turning): 4.5 – 6.5 kg-cm
(3.9 – 5.6 in.-lb, 0.4 – 0.6 N-m)

If incorrect, readjust.



14. INSTALL PINION ADJUSTING SCREW LOCK NUT

- (a) Coat liquid sealer onto the lock nut and gear housing contact surfaces.

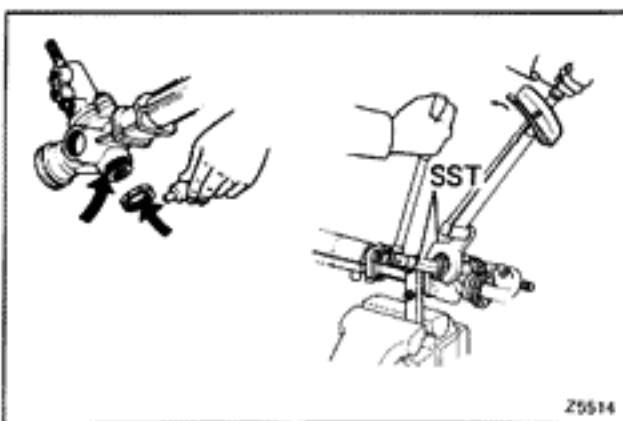
- (b) Install the pinion adjusting screw lock nut and torque it with SST.

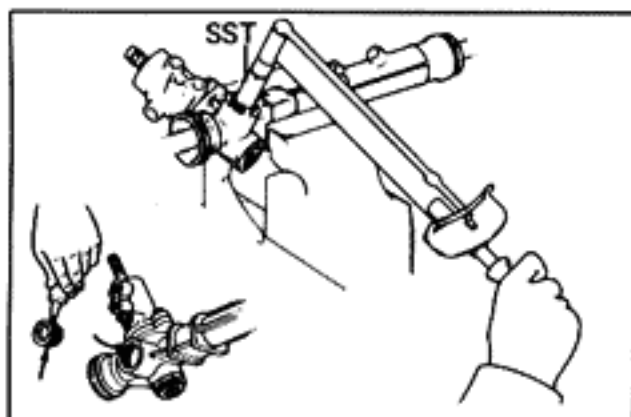
SST 09612-24012 (09612-10021, 09617-24020)

Torque: 700 kg-cm (51 ft-lb, 69 N-m)

- (c) Recheck the control valve shaft preload.

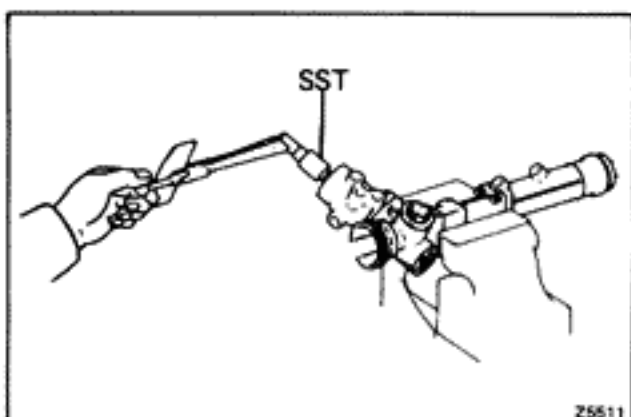
Preload (turning): 4.5 – 6.5 kg-cm
(3.9 – 5.6 in.-lb, 0.4 – 0.6 N-m)



**15. INSTALL SEAT AND RACK GUIDE****16. INSTALL RACK GUIDE SPRING AND CAP**

- (a) Install the rack guide spring.
- (b) Coat liquid sealer onto the screw surface of the cap.
- (c) Using SST, install the rack guide spring cap.

SST 09612-24012 (09612-10021)

**17. ADJUST TOTAL PRELOAD**

- (a) Tighten the rack guide spring cap with SST and torque it.

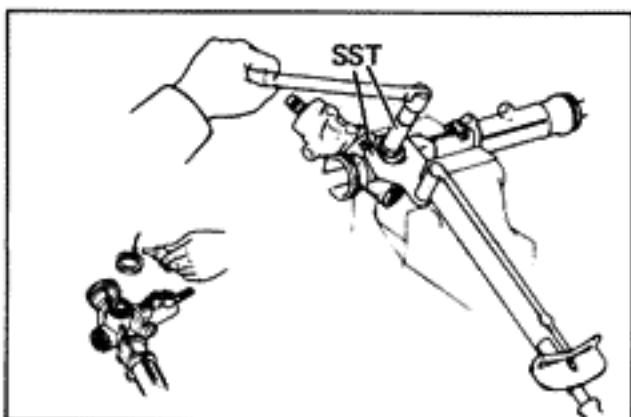
Torque: 250 kg-cm (18 ft-lb, 25 N-m)

- (b) Using SST, return the rack guide spring cap 90°.
- (c) Using SST, measure the preload.

SST 09616-00010

Preload (turning): 9 – 12 kg-cm
(7.8 – 10.4 in.-lb, 0.9 – 1.2 N-m)

If incorrect, readjust.

**18. INSTALL RACK GUIDE SPRING CAP LOCK NUT**

- (a) Coat liquid sealer onto the lock nut and gear housing contact surfaces.
- (b) Tighten the rack guide spring cap lock nut and torque it with SST.

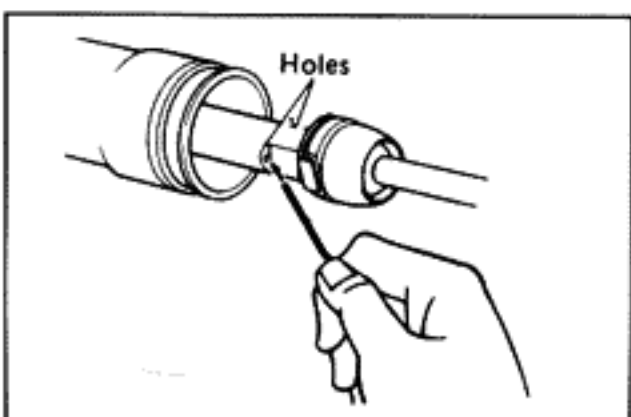
SST 09612-24012 (09612-10021, 09617-24020)

Torque: 700 kg-cm (51 ft-lb, 69 N-m)

- (c) Recheck the total preload.

If incorrect, readjust.

Preload (turning): 9 – 12 kg-cm
(7.8 – 10.4 in.-lb, 0.9 – 1.2 N-m)

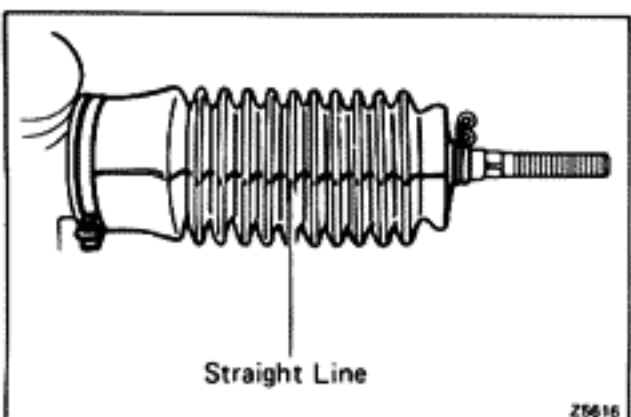
**19. INSTALL DUST COVER****20. INSTALL RACK BOOTS, CLAMPS AND CLIPS**

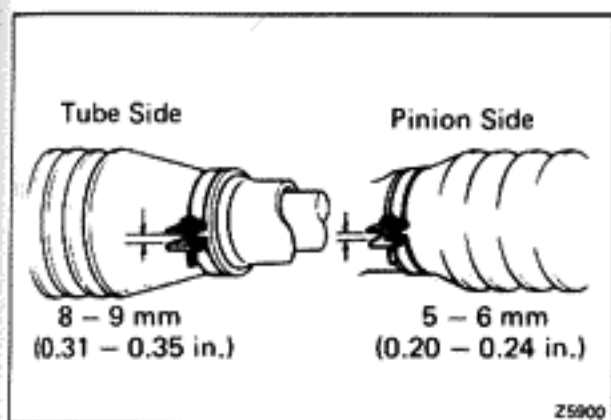
- (a) Insure that the tube hole is not clogged with grease.

NOTE: If the tube hole is clogged, the pressure inside the boot will change after it is assembled and the handle turned.

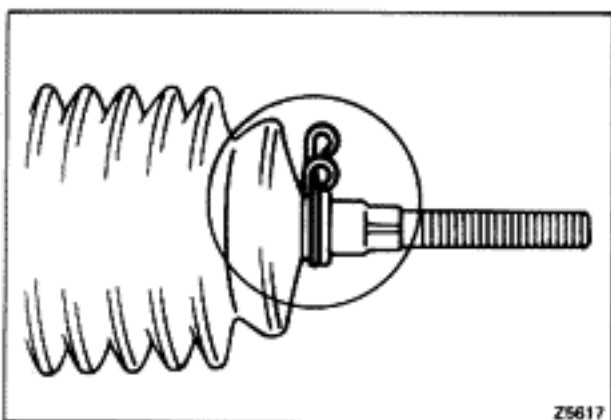
- (b) Install boots.

NOTE: As the left and right boots are different, be careful not to interchange them.





(c) Install the rack boot clamps as shown in the figure.



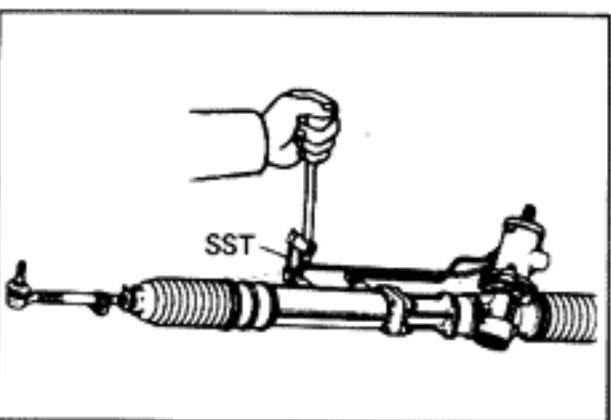
(d) Install rack boot clips.

NOTE: Face the open ends outward, as shown, to avoid damage to the boots.

21. INSTALL TIE ROD

- (a) Align the marks on the tie rod and rack end.
- (b) Tighten the nuts and torque them.

Torque: 175 kg-cm (13 ft-lb, 17 N·m)

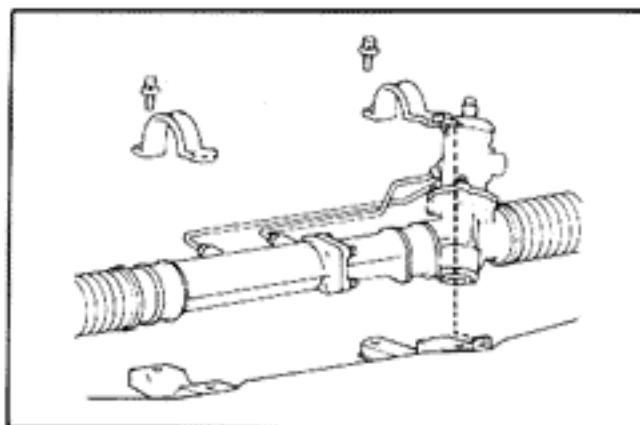


22. INSTALL RIGHT AND LEFT TURN PRESSURE TUBES

- (a) Install the union seats.
- (b) Using SST, tighten the tubes and torque them.

SST 09631-22020

Torque: 300 kg-cm (22 ft-lb, 29 N·m)



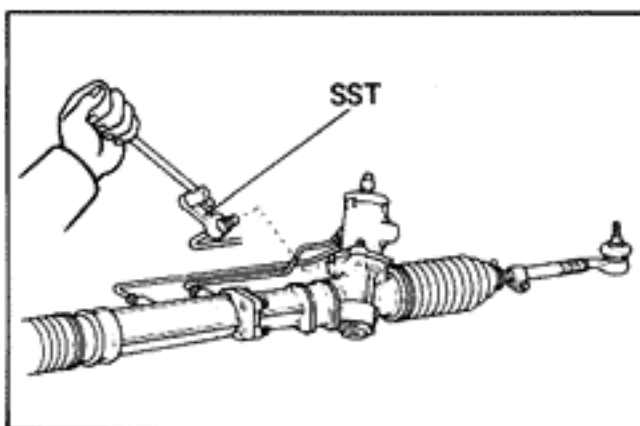
INSTALLATION OF GEAR HOUSING

(See page SR-26)

1. INSTALL GEAR HOUSING ASSEMBLY

NOTE: Be careful not to damage the boots. Install four bolts and torque them.

Torque: 770 kg-cm (56 ft-lb, 76 N-m)

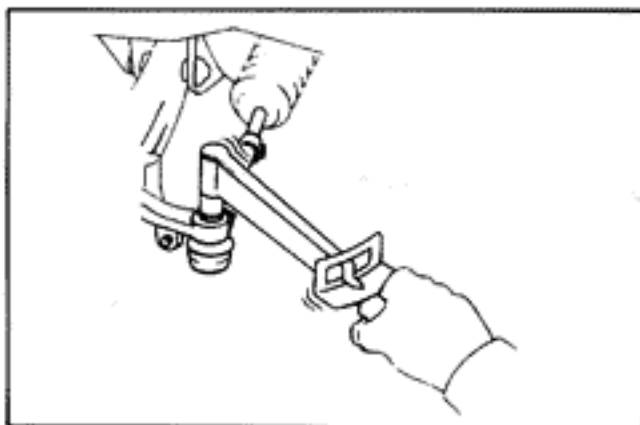


2. CONNECT RETURN AND PRESSURE LINE

(a) Install the union seat.

(b) Using SST, connect the pressure line and torque it.
SST 09631-22020

Torque: 390 kg-cm (28 ft-lb, 38 N-m)

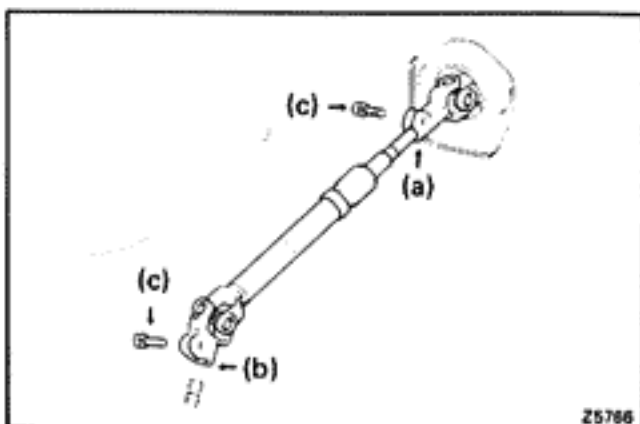


3. CONNECT TIE ROD ENDS

(a) Install the tie rod end set nut and torque it.

Torque: 600 kg-cm (43 ft-lb, 59 N-m)

(b) Install the new cotter pin.



4. INSTALL INTERMEDIATE SHAFT

(a) Install the column side first.

(b) Install the rack housing side.

(c) Install the two bolts and torque them.

Torque: 350 kg-cm (25 ft-lb, 34 N-m)

5. FILL WITH POWER STEERING FLUID (See page SR-14)

6. BLEED SYSTEM (See page SR-15)

7. CHECK FOR FLUID LEAKS

8. ADJUST TOE-IN (See page FA-5)