

STEERING

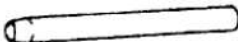
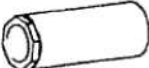
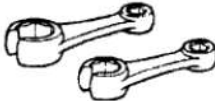
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PRECAUTION

- Care must be taken to replace parts properly because they could affect the performance of the steering system and result in a driving hazard.
- The LAND CRUISER 90 is equipped with SRS (Supplemental Restraint System) such as the driver airbag and front passenger airbag. Failure to carry out service operation in the correct sequence could cause the SRS to unexpectedly deployed during servicing, possibly leading to a serious accident. Before servicing (including removal or installation of parts, inspection or replacement), be sure to read the precautionary notices in the RS section.

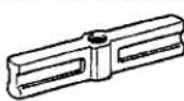
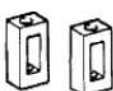
PREPARATION

SST (SPECIAL SERVICE TOOLS)

	09608-04031 Front Hub Inner Bearing Cone Replacer	PS vane pump (3RZ-F, 3RZ-FE)
	09612-00012 Rack & Pinion Steering Rack Housing Stand	PS gear
	09616-00010 Steering Worm Bearing Adjusting Socket	PS gear
	09631-00350 Steering Rack Cover 35	PS gear
	09631-10030 Oil Seal Remover	PS vane pump (3L, 3RZ-F, 3RZ-FE)
	09631-12031 Oil Seal "A" Remover	PS vane pump (1KZ-T, 1KZ-TE)
	09631-12071 Steering Rack Oil Seal Test Tool	PS gear
	09631-20060 Bearing Guide Nut Wrench	PS gear
	09631-20081 Seal Ring Tool	PS gear
	09631-22020 Power Steering Hose Nut 14 x 17 mm Wrench Set	PS vane pump (3L) PS gear

STEERING — PREPARATION

SR-3

	09633-00020 Power Steering Hose Nut Wrench	PS gear
	09640-10010 Power Steering Pressure Gauge Set	
	(09641-01010) Gauge Assy	On-vehicle inspection
	(09641-01020) Attachment A	On-vehicle inspection
	(09641-01030) Attachment B	On-vehicle inspection
	(09641-01040) Attachment C	On-vehicle inspection
	(09641-01060) Attachment E	On-vehicle inspection
	09922-10010 Variable Open Wrench	PS gear
	09950-00020 Bearing Remover	PS vane pump (1KZ-T, 1KZ-TE)
	09950-40010 Puller B Set	
	(09958-04010) Holder	Tilt steering column
	09950-50010 Puller C Set	
	(09951-05010) Hanger 150	Non-tilt steering column Tilt steering column
	(09952-05010) Slide Arm	Non-tilt steering column Tilt steering column

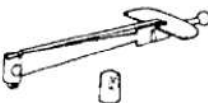
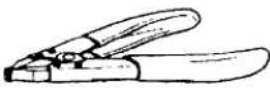
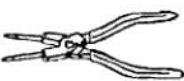
STEERING — PREPARATION

	(09953-05020) Center Bolt 150	Non-tilt steering column Tilt steering column
	(09954-05020) Claw No.2	Non-tilt steering column Tilt steering column
	09950-60010 Replacer Set	
	(09951-00180) Replacer 18	PS gear
	(09951-00230) Replacer 23	PS vane pump (1KZ-T, 1KZ-TE)
	(09951-00250) Replacer 25	PS gear
	(09951-00280) Replacer 28	PS gear
	(09951-00310) Replacer 31	PS vane pump (3L)
	(09951-00320) Replacer 32	PS gear
	(09951-00330) Replacer 33	PS vane pump (3RZ-F, 3RZ-FE, 5VZ-FE) PS gear
	(09951-00360) Replacer 36	PS gear
	(09951-00490) Replacer 49	PS gear
	(09952-06010) Adapter	PS gear
	09950-70010 Handle Set	

	(09951-07100) Handle 100	PS vane pump (3L, 3RZ-F, 3RZ-FE, 5VZ-FE, 1KZ-T, 1KZ-TE) PS gear
	(09951-07150) Handle 150	PS gear
	(09951-07360) Handle 360	PS gear
	09960-10010 Variable Pin Wrench Set	
	(09962-01000) Variable Pin Wrench Arm Assy	PS vane pump (3RZ-F, 3RZ-FE, 5VZ-FE)
	(09963-01000) Pin 10	PS vane pump (3RZ-F, 3RZ-FE, 5VZ-FE)

RECOMMENDED TOOLS

PPO48-02

	09025-00010 Torque Wrench (30 kgf-cm) .	PS vane pump (3RZ-F, 3RZ-FE, 5VZ-FE, 1KZ-T, 1KZ-TE) PS gear
	09042-00010 Torx Socket T30 .	Non-tilt steering column Tilt steering column
	09216-00021 Belt Tension Gauge .	On-vehicle inspection
	09904-00010 Expander Set .	
	(09904-00050) No. 4 Claw	
	09905-00012 Snap Ring No.1 Expander .	
	09905-00013 Snap Ring Pliers .	

EQUIPMENT

Caliper gauge	PS vane pump (3RZ-F, 3RZ-FE, 5VZ-FE, 1KZ-T, 1KZ-TE)
Calipers	PS vane pump (3RZ-F, 3RZ-FE, 5VZ-FE, 1KZ-T, 1KZ-TE)
Dial indicator	PS gear
Feeler gauge	PS vane pump (3RZ-F, 3RZ-FE, 5VZ-FE, 1KZ-T, 1KZ-TE)
Micrometer	PS vane pump (3RZ-F, 3RZ-FE, 5VZ-FE, 1KZ-T, 1KZ-TE)
Torque wrench	

LUBRICANT

Item	Capacity	Classification
Power steering fluid Total	0.8 liters (0.85 US qts, 0.70 Imp.qts)	ATF DEXRON® II or III

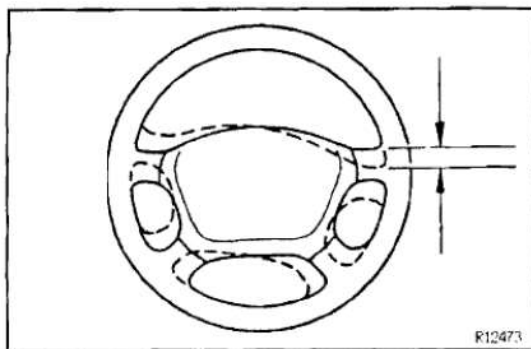
SSM (SPECIAL SERVICE MATERIALS)

08833-00080	Adhesive 1344, THREE BOND 1344, LOCTITE 242 or equivalent	PS gear
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TROUBLESHOOTING

Use the table below to help you find the cause of the problem. The numbers indicate the priority of the likely cause of the problem. Check each part in order. If necessary, repair or replace these parts.

See Page	SA-3	SA-4	SR-10	SR-8	—	SA-57 SA-58	—	—	SR-64	SA-11
Parts Name	Tires (improperly inflated)	Front wheel alignment (Incorrect)	PS fluid level (Low)	Drive belt (Loose)	Steering system joints (Worn)	Suspension arm Ball joints (Worn)	Steering column (Binding)	Universal Joint Intermediate shaft Sliding yoke (Worn)	Steering gear	Front wheel bearing (Worn)
Trouble										
Hard steering	1	4	2	3	5	6	7		8	
Poor return	1	2					3		4	
Excessive play					1	2		3	5	4
Abnormal noise			1		2				3	



R12473

ON-VEHICLE INSPECTION STEERING WHEEL FREEPLAY CHECK

BR187-08

With the vehicle stopped and tires pointed straight ahead, rock the steering wheel gently back and forth with light finger pressure.

Freeplay should not exceed the maximum.

	Freeplay	mm (in.)
Maximum	30 (1.18)	

BR182-02

DRIVE BELT TENSION ADJUSTMENT

CHECK DRIVE BELT TENSION

Measure the drive belt deflection.

Drive belt tension: at 98 N (10 kgf, 22 lbf)

3L Engine:

	Drive belt tension	mm (in.)
New belt	8 – 10 (0.31 – 0.39)	
Used belt	10 – 15 (0.39 – 0.59)	

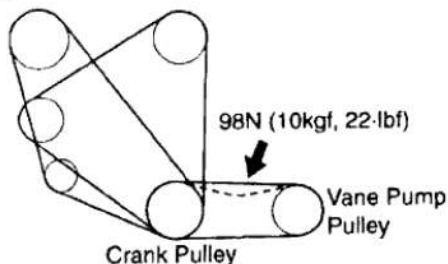
3RZ-F and 3RZ-FE Engines:

	Drive belt tension	mm (in.)
New belt	4.5 – 5.5 (0.177 – 0.217)	
Used belt	6 – 7.5 (0.236 – 0.295)	

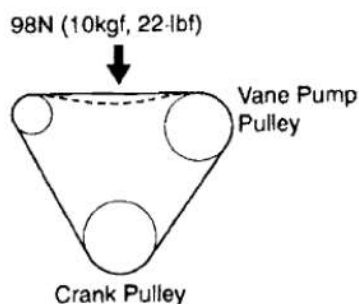
5VZ-FE Engine:

	Drive belt tension	mm (in.)
New belt	8.5 – 7.5 (0.258 – 0.295)	
Used belt	8.5 – 10.0 (0.335 – 0.393)	

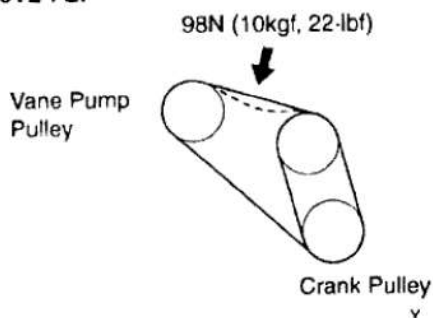
3L:



3RZ-F, 3RZ-FE:

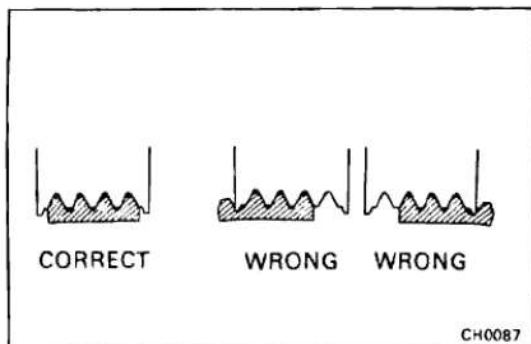


5VZ-FE:



IX2540

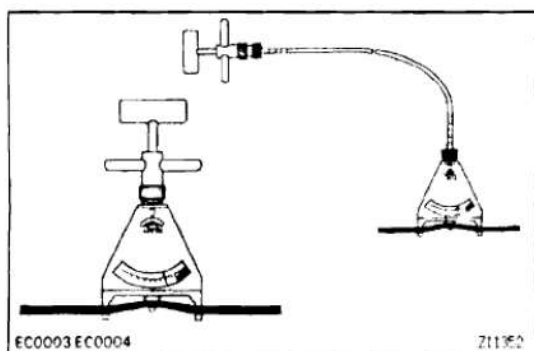
SR



CH0087

HINT:

- "New belt" refers to a belt which has been less than 5 minutes on a running engine.
- "Used belt" refers to a belt which has been used on a running engine for 5 minutes or more.
- After installing the drive belt, check that it fits properly in the ribbed grooves.



(Reference)

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

Drive belt tension:

3L Engine:

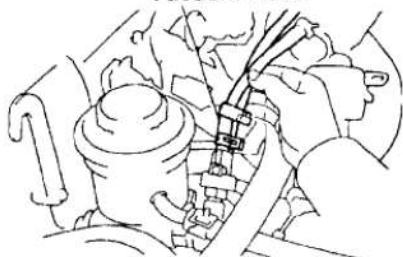
	Drive belt tension	N (kgf)
New belt	441 – 539 (45 – 55)	
Used belt	196 – 343 (20 – 35)	

3RZ – F, 3RZ – FE and 5VZ – FE Engines:

	Drive belt tension	N (kgf)
New belt	539 – 637 (55 – 65)	
Used belt	245 – 392 (25 – 40)	

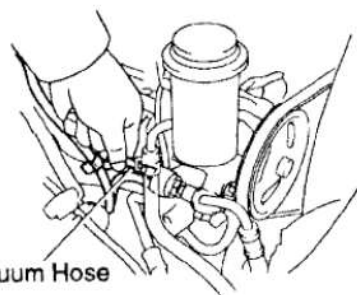
3RZ-F, 3RZ-FE

Vacuum Hose



5VZ-FE

Vacuum Hose



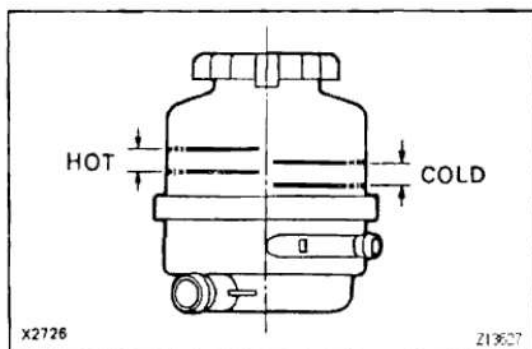
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IDLE – UP CHECK

SR13V-06

- TURN AIR CONDITIONER SWITCH OFF
- CHECK IDLE – UP
 - Start engine and run it at idle.
 - Fully turn the steering wheel.
 - Check that the engine rpm decreases when the vacuum hose of the air control valve is pinched.
 - Check that the engine rpm increases when the hose is released.

SR



FLUID LEVEL CHECK

1. **KEEP VEHICLE LEVEL**
2. **CHECK FLUID LEVEL**

With the engine stopped, check the fluid level in the oil reservoir.

If necessary, add fluid.

Fluid:

ATF DEXRON® II or III

HINT: Check that the fluid level is within the **HOT LEVEL** range on the reservoir. If the fluid is cold, check that it is within the **COLD LEVEL** range.

3. **BOOST FLUID TEMPERATURE**

- (a) Start the engine and run it at idle.
- (b) Turn the steering wheel from lock to lock several times to boost fluid temperature.

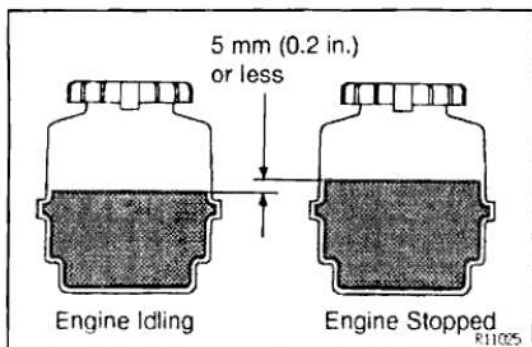
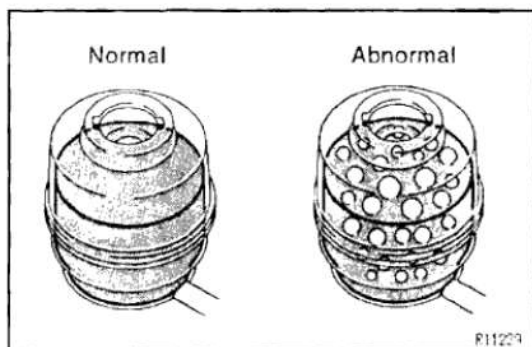
Fluid temperature:

80°C (176°F)

4. **CHECK FOR FOAMING OR EMULSIFICATION**

If there is foaming or emulsification, bleed power steering system.

(See page SR-11)



5. **CHECK FLUID LEVEL RISE**

- (a) With the engine idling, measure the fluid level in the oil reservoir.
- (b) Stop the engine.
- (c) Wait a few minutes and remeasure the fluid level in the oil reservoir.

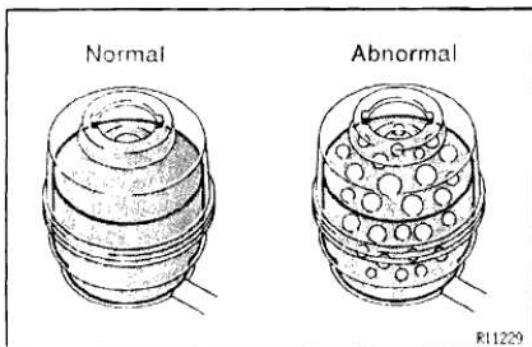
	Fluid level rise	mm (in.)
Maximum	5 (0.20)	

If a problem is found, bleed power steering system.
(See page SR-11)

6. **CHECK FLUID LEVEL**

POWER STEERING SYSTEM BLEEDING

1. **CHECK FLUID LEVEL**
(See page SR-10)
2. **JACK UP FRONT OF VEHICLE AND SUPPORT IT WITH STANDS**
3. **TURN STEERING WHEEL**
With the engine stopped, turn the wheel slowly from lock to lock several times.
4. **LOWER VEHICLE**
5. **START ENGINE**
Run the engine at idle for a few minutes.
6. **TURN STEERING WHEEL**
 - (a) With the engine idling, turn the wheel to left or right full lock and keep it there for 2-3 seconds, then turn the wheel to the opposite full lock and keep it there for 2-3 seconds.
 - (b) Repeat (a) several times.
7. **STOP ENGINE**
8. **CHECK FOR FOAMING OR EMULSIFICATION**
If the system has to be bled twice specifically because of foaming or emulsification, check for fluid leaks in the system.
9. **CHECK FLUID LEVEL**
(See page SR-10)

**FLUID PRESSURE CHECK**

1. **CONNECT SST**
 - (a) **5VZ-FE Engine:**
Remove the air cleaner assembly.
(See page SR-49)
 - (b) **1KZ-T and 1KZ-TE Engines:**
Remove the front fender apron seal.
(See page SR-57)
 - (c) Disconnect the pressure feed tube from the PS vane pump.
3L Engine: (See page SR-32)
3RZ-F, 3RZ-FE Engines: (See page SR-41)
5VZ-FE Engine: (See page SR-49)
1KZ-T, 1KZ-TE Engines: (See page SR-57)

(d) Connect SST, as shown below.

3L Engine:

SST 09640-10010 (09641-01010, 09641-01020, 09641-01030)

3RZ-F, 3RZ-FE, 5VZ-FE Engines:

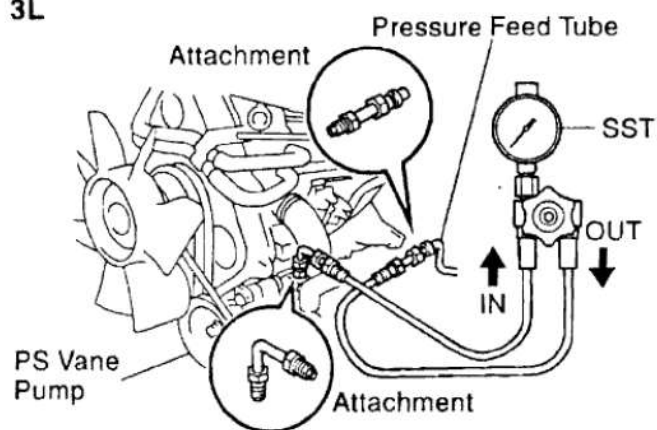
SST 09640-10010 (09641-01010, 09641-01030, 09641-01060)

1KZ-T, 1KZ-TE Engines:

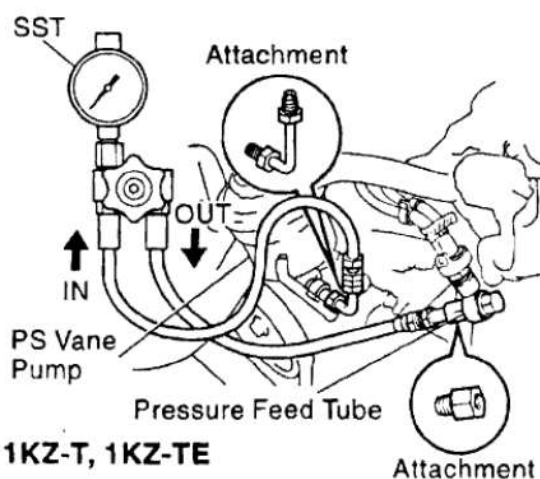
SST 09640-10010 (09641-01010, 09641-01030, 09641-01040)

NOTICE: Check that the valve of the gauge is in the open position.

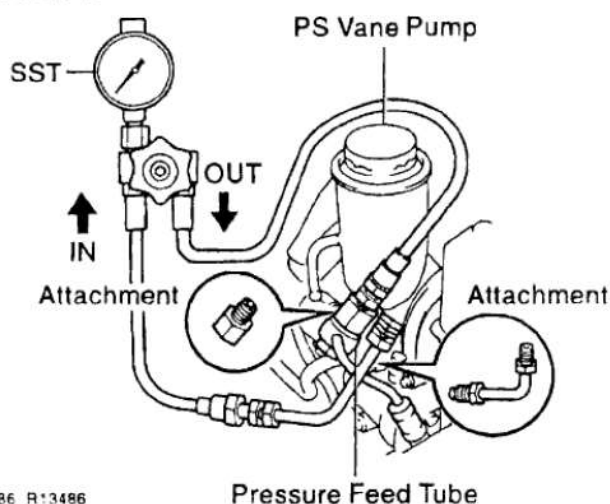
3L



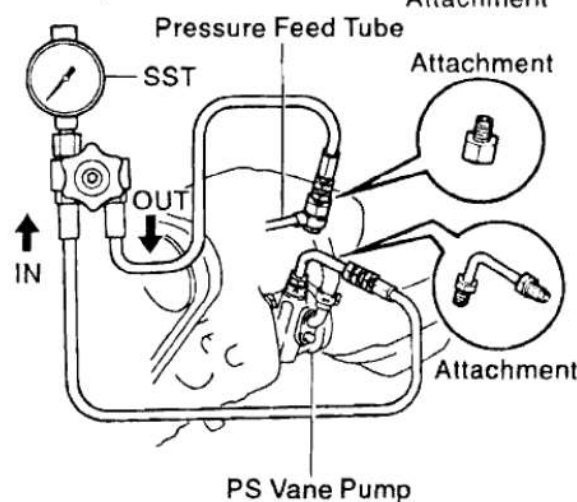
3RZ-F, 3RZ-FE



5VZ-FE



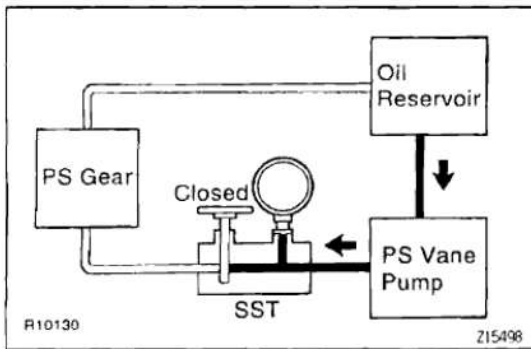
1KZ-T, 1KZ-TE



W02486 R13486
W02659 W02020

718347

2. BLEED POWER STEERING SYSTEM (See page SR-11)

**3. BOOST FLUID TEMPERATURE**

- Start the engine and run it at idle.
- Turn the steering wheel from lock to lock several times to boost fluid temperature.

Fluid temperature: 80 °C (176 °F)

4. CHECK FLUID PRESSURE READING WITH VALVE CLOSED

With the engine idling, close the valve of the SST and observe the reading on the SST.

3L Engine:

	Fluid pressure kPa (kgf/cm ² , psi)
Minimum	7,355 (75, 1,067)

3RZ – F, 3RZ – FE and 5VZ – FE Engines:

	Fluid pressure kPa (kgf/cm ² , psi)
Minimum	8,335 (85, 1,209)

1KZ – T and 1KZ – TE Engines:

	Fluid pressure kPa (kgf/cm ² , psi)
Minimum	8,826 (90, 1,280)

NOTICE:

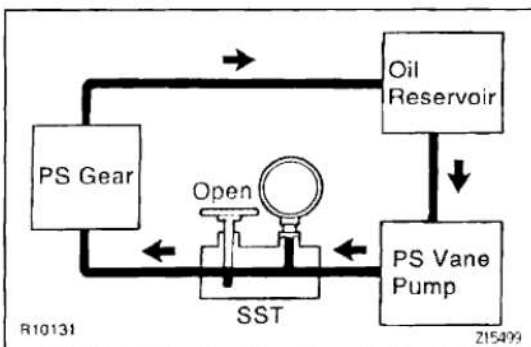
- Do not keep the valve closed for more than 10 seconds.
- Do not let the fluid temperature become too high.

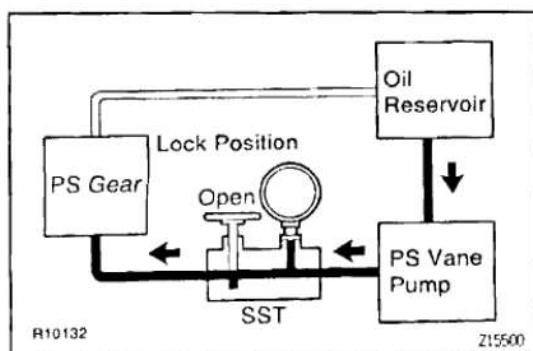
5. CHECK FLUID PRESSURE READING WITH VALVE OPENED

- With the engine idling, open the valve fully.
- Measure the fluid pressure at engine speeds of 1,000 rpm and 3,000 rpm.

	Fluid pressure kPa (kgf/cm ² , psi)
Difference	490 (5, 71) or less

NOTICE: Do not turn the steering wheel.





6. CHECK FLUID PRESSURE READING WITH STEERING WHEEL TURNED TO FULL LOCK

With the engine idling and valve fully opened, turn the wheel to full lock.

3L Engine:

	Fluid pressure kPa (kgf/cm ² , psi)
Minimum	7,355 (75, 1.067)

3RZ-F, 3RZ-FE and 5VZ-FE Engines:

	Fluid pressure kPa (kgf/cm ² , psi)
Minimum	8,335 (85, 1.209)

1KZ-T and 1KZ-TE Engines:

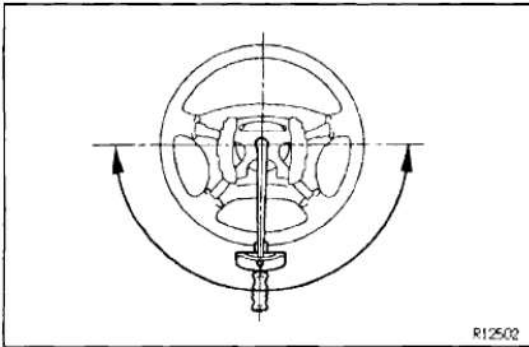
	Fluid pressure kPa (kgf/cm ² , psi)
Minimum	8,826 (90, 1.280)

NOTICE:

- Do not maintain the valve in the lock position for more than 10 seconds.
- Do not let the fluid temperature become too high.

7. DISCONNECT SST

- Disconnect the SST.
 - Connect the pressure feed tube.
 3L Engine: (See page SR-38)
 3RZ-F, 3RZ-FE Engines: (See page SR-46)
 5VZ-FE Engine: (See page SR-54)
 1KZ-T, 1KZ-TE Engines: (See page SR-63)
 - 5VZ-FE Engine:
 Install the air cleaner assembly.
 (See page SR-54)
 - 1KZ-T and 1KZ-TE Engines:
 Install the front fender apron seal.
 (See page SR-63)
- ## 8. BLEED POWER STEERING SYSTEM
- (See page SR-11)



STEERING EFFORT MEASUREMENT

1. CENTER STEERING WHEEL

2. MEASURE STEERING EFFORT

- (a) Remove the steering wheel pad.
(See page SR—18)
- (b) Start the engine and run it at idle.
- (c) Measure the steering effort in both directions.

Reference:

7.8 N·m (80 kgf·cm, 69 in.-lbf)

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

- (d) Torque the steering wheel set nut.

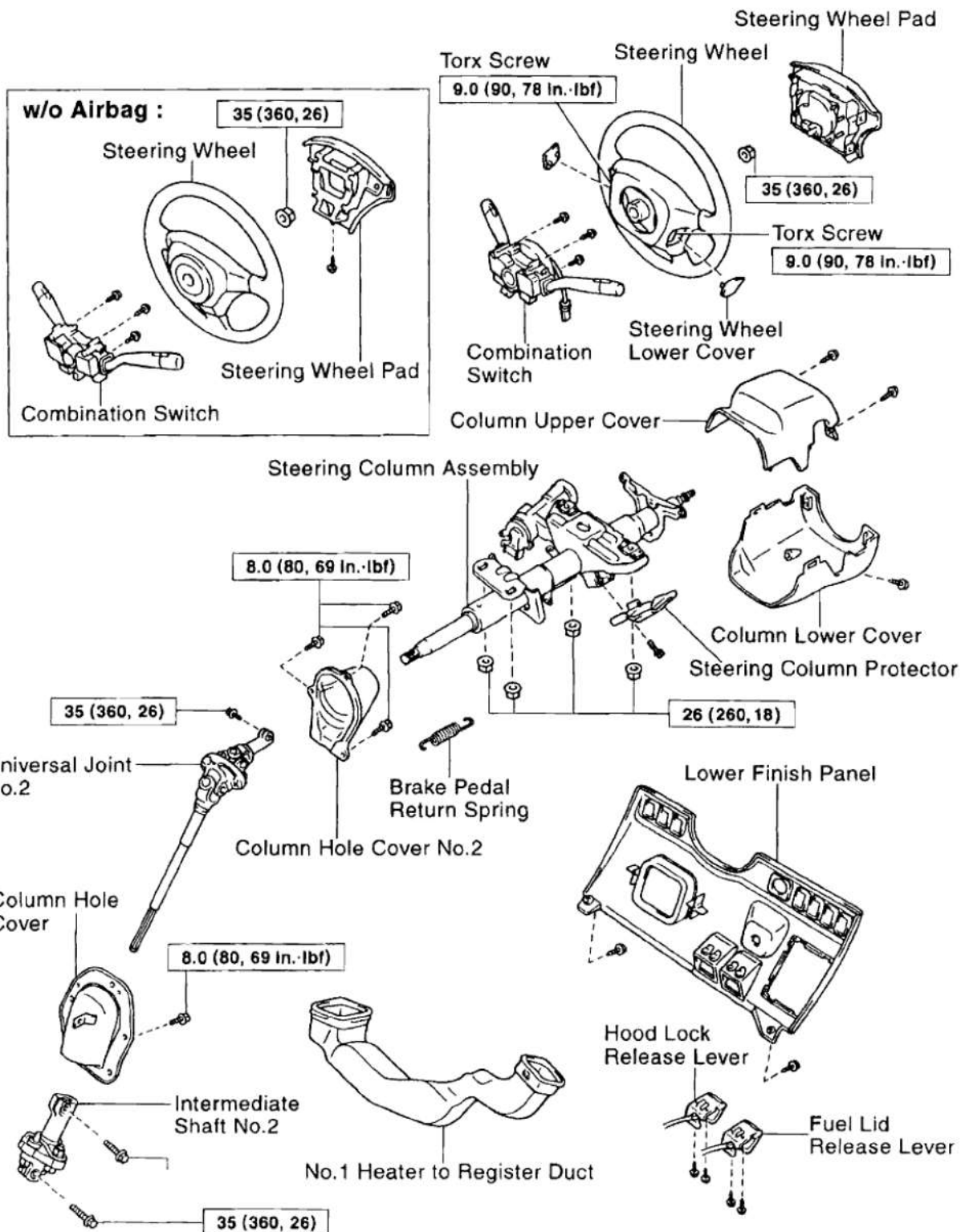
Torque: 35 N·m (360 kgf·cm, 26 ft·lbf)

- (e) Install the steering wheel pad.

(See page SR—24)

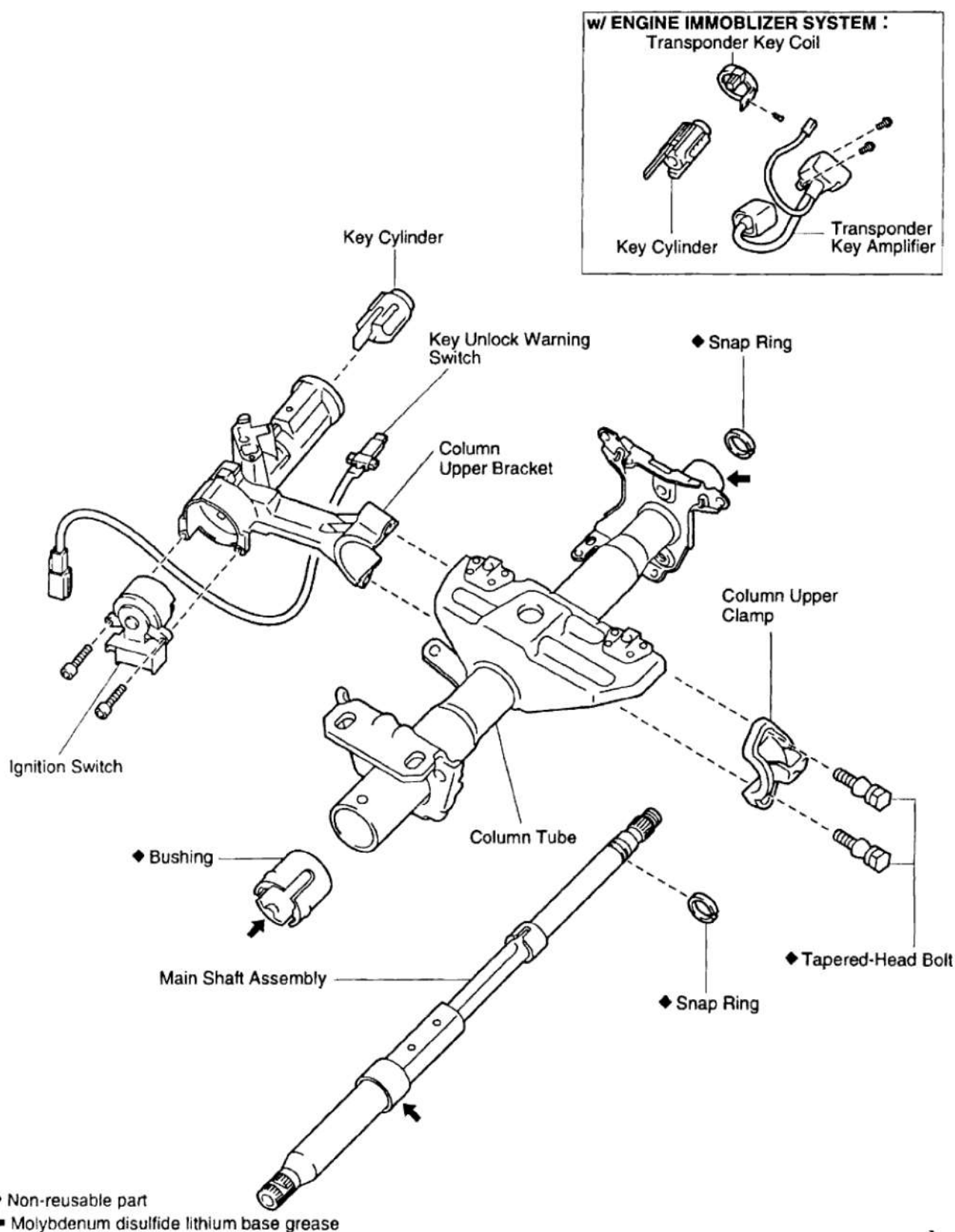
NON-TILT STEERING COLUMN COMPONENTS

M11/2-02



N·m (kgf·cm, ft·lbf) : Specified torque

W02533



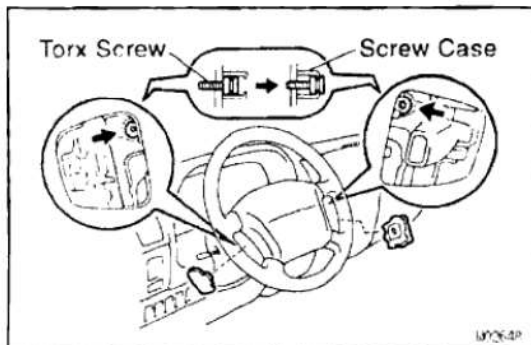
NON-TILT STEERING COLUMN REMOVAL

1. REMOVE STEERING WHEEL PAD

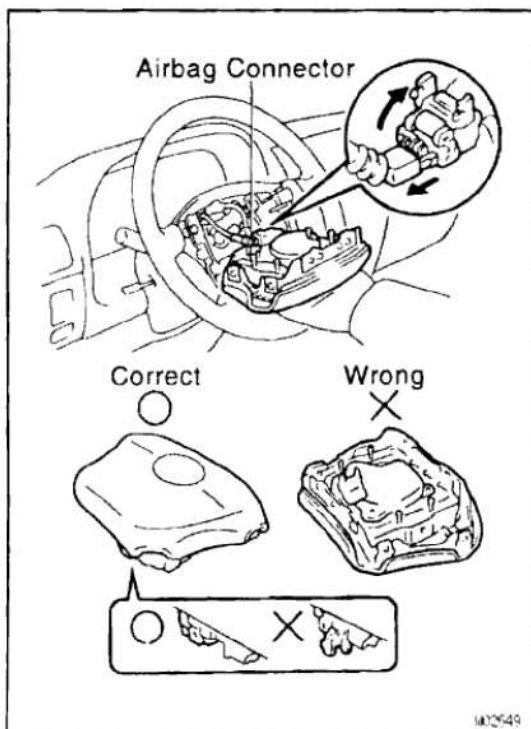
w/ Airbag:

NOTICE:

- If the airbag connector is disconnected with the ignition switch at ON or ACC, DTCs will be recorded.
- Never use airbag parts from another vehicle. When replacing parts, replace with new parts.



- Place the front wheels facing straight ahead.
- Remove the 2 steering wheel lower covers.
- Using a torx socket wrench, loosen the 2 torx screws. HINT: Loosen the screw until the groove along the screw circumference catches on the screw case.



- Pull out the wheel pad from the steering wheel and disconnect the airbag connector.

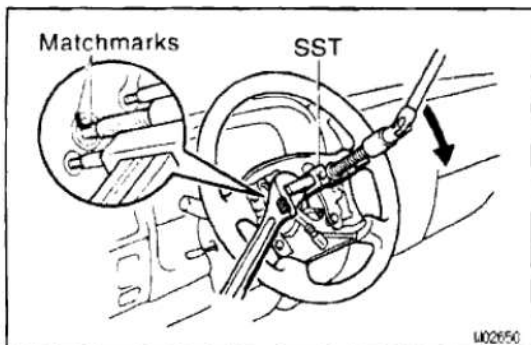
CAUTION:

- When storing the wheel pad, keep the upper surface of the pad facing upward.
- Never disassemble the wheel pad.

NOTICE: When removing the wheel pad, take care not to pull the airbag wire harness.

w/o Airbag:

- Remove the screw.
- Remove the pad.
- Disconnect the terminal.



2. REMOVE STEERING WHEEL

- Disconnect the connector.
- Remove the steering wheel set nut.
- Place matchmarks on the steering wheel and main shaft assembly.
- Using SST, remove the wheel.

SST 09950-50010 (09951-05010, 09952-05010, 09953-05020, 09954-05020)

3. REMOVE UPPER AND LOWER COLUMN COVERS

Remove the 3 screws.

4. REMOVE LOWER FINISH PANEL

- (a) Remove the 2 screws and disconnect the hood lock release lever from the panel.
- (b) Remove the 2 screws and disconnect the fuel lid release lever from the panel.
- (c) Remove the 2 panel set screws.

5. REMOVE STARTER SWITCH BEZEL**6. REMOVE NO.1 HEATER TO REGISTER DUCT****7. REMOVE COMBINATION SWITCH WITH SPIRAL CABLE**

- (a) Disconnect the 2 connectors.
- (b) w/ Airbag:
Disconnect the airbag connector.
- (c) Remove the 3 screws.

8. w/ Airbag:**REMOVE SPIRAL CABLE**

(See page BE-15)

NOTICE: Do not disassemble the cable or apply oil to it.

9. REMOVE BRAKE PEDAL RETURN SPRING**10. REMOVE INTERMEDIATE SHAFT NO.2**

- (a) Place matchmarks on the universal joint No.2 and intermediate shaft No.2.
- (b) Remove the A bolt.
- (c) Place matchmarks on the intermediate shaft No.2 and control valve shaft.
- (d) Remove the B bolt.
- (e) Slide the intermediate shaft No.2 and remove the intermediate shaft No.2.

11. REMOVE COLUMN HOLE COVER AND COLUMN HOLE COVER NO.2

Remove the 5 bolts.

12. REMOVE STEERING COLUMN PROTECTOR

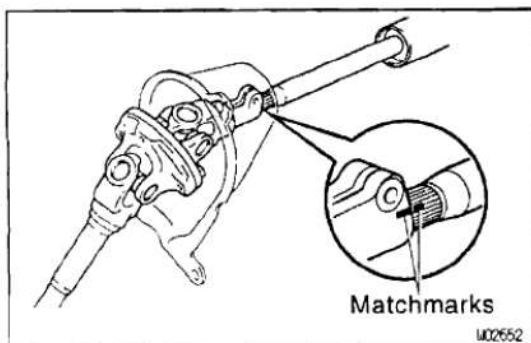
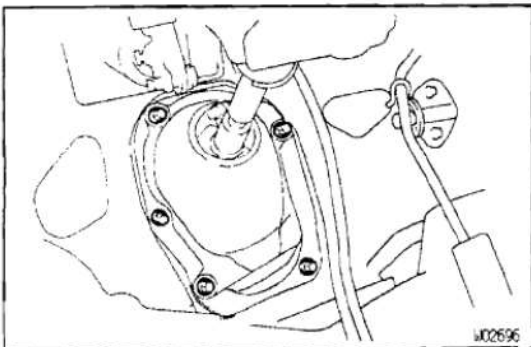
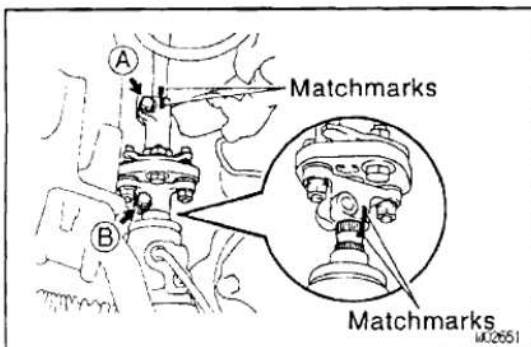
Remove the bolt.

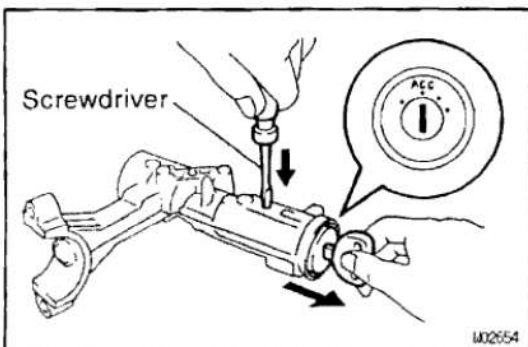
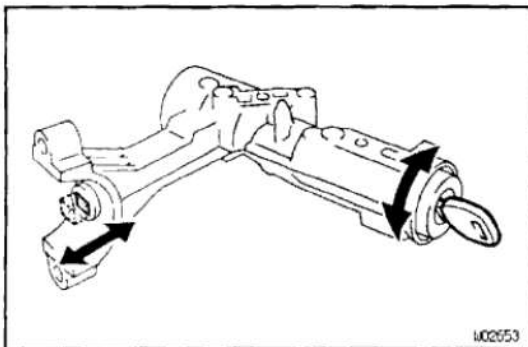
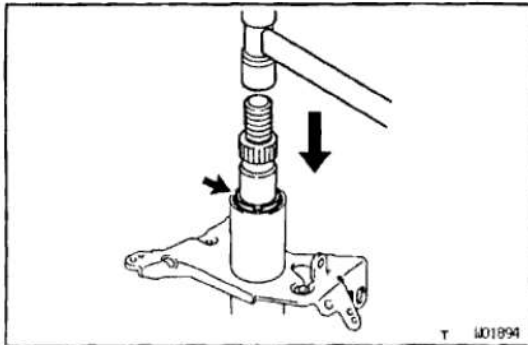
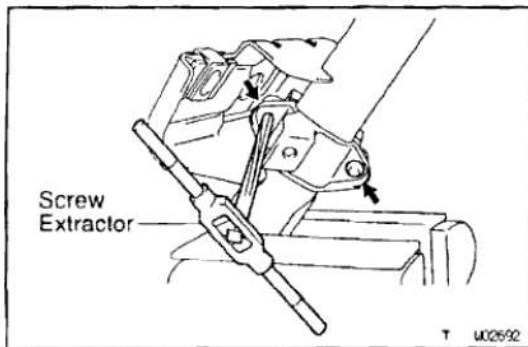
13. REMOVE STEERING COLUMN ASSEMBLY WITH UNIVERSAL JOINT NO.2

- (a) Disconnect the connectors.
- (b) Remove 4 column assembly set nuts.
- (c) Pull out the column assembly with universal joint No. 2.

14. DISCONNECT UNIVERSAL JOINT NO.2

- (a) Place matchmarks on the column assembly and universal joint No.2.
- (b) Remove the bolt.
- (c) Remove the column hole cover and column hole cover No.2.





NON-TILT STEERING COLUMN DISASSEMBLY

NOTICE: When using a vise, do not overtighten it.

1. REMOVE COLUMN UPPER BRACKET AND COLUMN UPPER CLAMP

- Using a centering punch, mark the center of the 2 tapered-head bolts.
- Using a 3–4 mm (0.12–0.16 in.) drill, drill into the 2 bolts.
- Using a screw extractor, remove the 2 bolts.

2. REMOVE MAIN SHAFT ASSEMBLY

- Using a snap ring expander, remove the snap ring from the shaft assembly.
- Using a plastic hammer, tap out the shaft from the column tube.
- Using a snap ring expander, remove the snap ring from the shaft assembly.

NON-TILT STEERING COLUMN INSPECTION AND REPLACEMENT

NOTICE: When using a vise, do not overtighten it.

1. INSPECT STEERING LOCK OPERATION

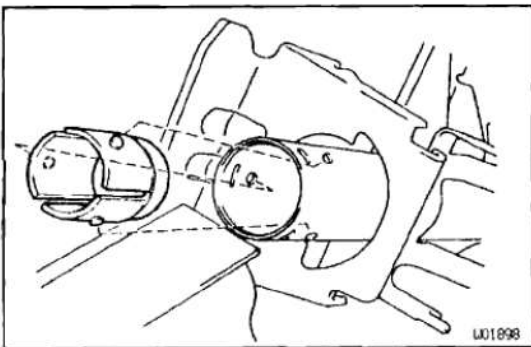
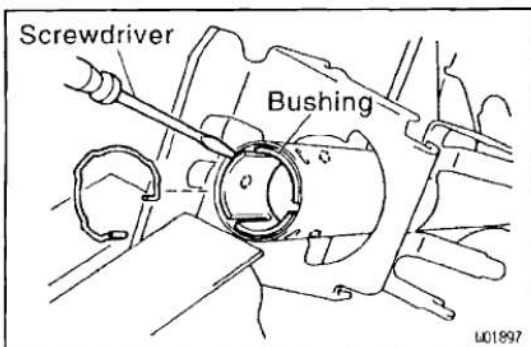
Check that the steering lock mechanism operates properly.

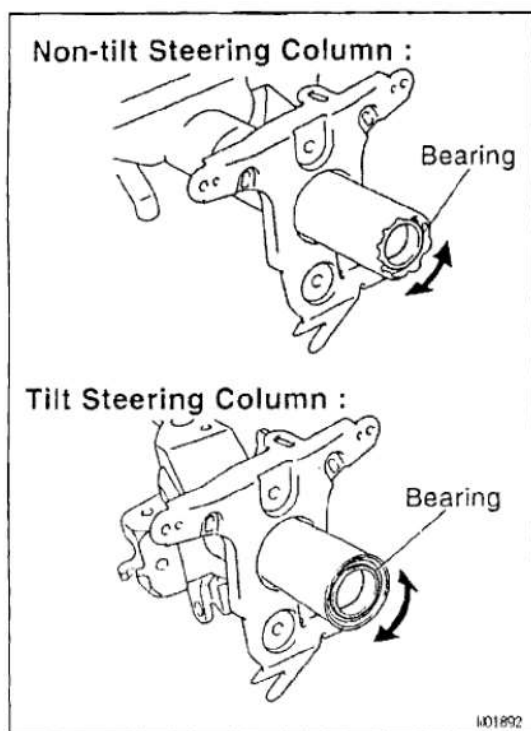
2. IF NECESSARY, REPLACE KEY CYLINDER

- Place the ignition key at the ACC position.
- Using a screwdriver, push down the stop pin of the cylinder, and pull out the key cylinder.
- Install a new cylinder.

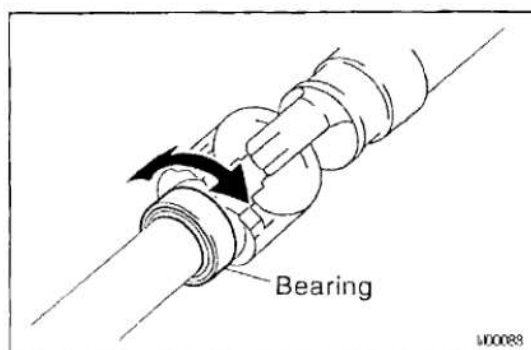
HINT: Make sure the key is at the ACC position.

3. **INSPECT IGNITION SWITCH**
(See page BE—7)
4. **IF NECESSARY, REPLACE IGNITION SWITCH**
 - (a) Remove the 2 screws.
 - (b) Install a new switch with the 2 screws.
5. **INSPECT KEY UNLOCK WARNING SWITCH**
(See page BE—7)
6. **IF NECESSARY, REPLACE KEY UNLOCK WARNING SWITCH**
Install a new switch.
7. **w/ ENGINE IMMOBILIZER SYSTEM:**
INSPECT TRANSPONDER KEY COIL
(See page BE—92)
8. **w/ ENGINE IMMOBILIZER SYSTEM:**
IF NECESSARY, REPLACE TRANSPONDER KEY COIL
 - (a) Disconnect the connector.
 - (b) Remove the screw.
 - (c) Install a new key coil with the screw.
9. **w/ ENGINE IMMOBILIZER SYSTEM:**
IF NECESSARY, REPLACE TRANSPONDER KEY AMPLIFIER
 - (a) Remove the 2 screws.
 - (b) Install a new key amplifier with the 2 screws.
10. **IF NECESSARY, REPLACE BUSHING**
 - (a) Using a screwdriver, loosen the 3 projections of the bushing, and remove the bushing from the column tube.
 - (b) Coat a new bushing with molybdenum disulfide lithium base grease.
 - (c) Align the projections on the bushing with the holes in the column tube, then install the bushing until the projections are firmly engaged in the holes.



**11. INSPECT BEARING**

- (a) Check the bearing rotation condition and check for abnormal noise.
If the bearing is worn or damaged, replace the column tube/column upper tube.
- (b) Coat the bearing with molybdenum disulfide lithium base grease.

**12. TILT STEERING COLUMN: INSPECT BEARING**

- (a) Check the bearing rotation condition of the main shaft assembly and check for abnormal noise.
If necessary, replace bearing.
- (b) Coat the bearing with molybdenum disulfide lithium base grease.

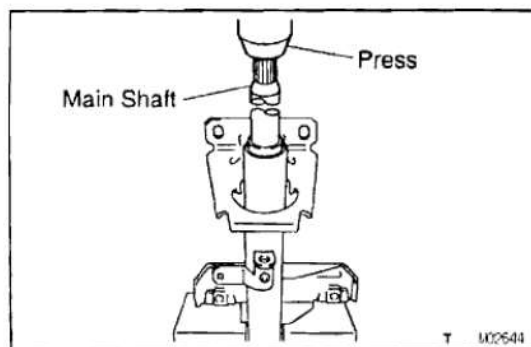
NON—TILT STEERING COLUMN ASSEMBLY

SR108-02

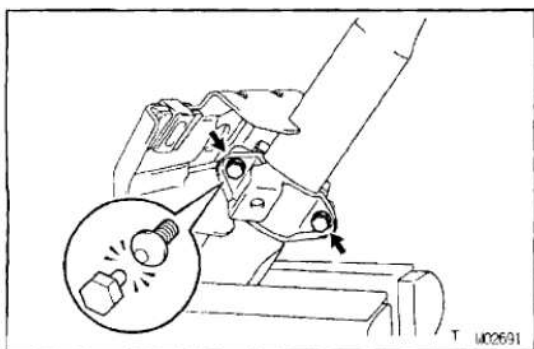
NOTICE: When using a vise, do not overtighten it.

1. COAT WITH MOLYBDENUM DISULFIDE LITHIUM BASE GREASE

(See page SR—17)

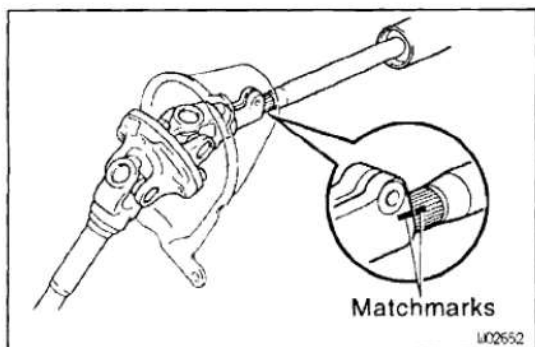
**2. INSTALL MAIN SHAFT ASSEMBLY**

- (a) Using a snap ring expander, install a new snap ring to the shaft assembly.
- (b) Install the main shaft assembly to the column tube.
If the shaft can not be installed by hand, use a press.
NOTICE: Do not apply too much pressure.
- (c) Using a snap ring expander, install a new snap ring to the shaft assembly.



3. INSTALL COLUMN UPPER BRACKET AND COLUMN UPPER CLAMP

Tighten 2 new tapered—head bolts until the bolt head breaks off.



NON—TILT STEERING COLUMN INSTALLATION

1. CONNECT UNIVERSAL JOINT NO.2

- Insert the column hole cover and column hole cover No.2.
- Align the matchmarks on the column assembly and universal joint No.2.
- Torque the bolt.

Torque: 35 N·m (360 kgf·cm, 26 ft·lbf)

2. INSTALL COLUMN ASSEMBLY WITH UNIVERSAL JOINT NO.2

- Install the column assembly with universal joint No.2.
- Torque the 4 column assembly set nuts.
- Connect the connectors.

Torque: 26 N·m (260 kgf·cm, 18 ft·lbf)

3. INSTALL STEERING COLUMN PROTECTOR

Tighten the bolt.

4. INSTALL COLUMN HOLE COVER AND COLUMN HOLE COVER NO.2

Torque the 5 bolts.

Torque : 8.0 N·m (80 kgf·cm, 69 in·lbf)

5. INSTALL INTERMEDIATE SHAFT NO.2

- Align the matchmarks on the universal joint No.2 and intermediate shaft No.2.
- Align the matchmarks on the control valve shaft and intermediate shaft No.2.
- Torque the A and B bolts.

Torque: 35 N·m (360 kgf·cm, 26 ft·lbf)

6. INSTALL BRAKE PEDAL RETURN SPRING

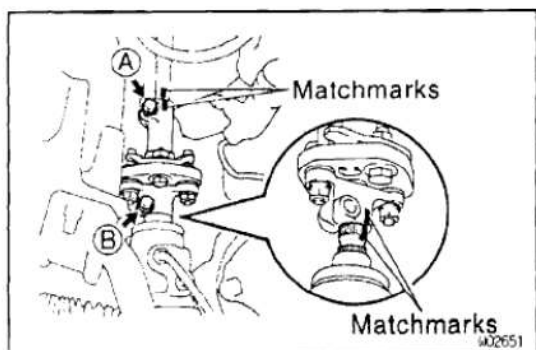
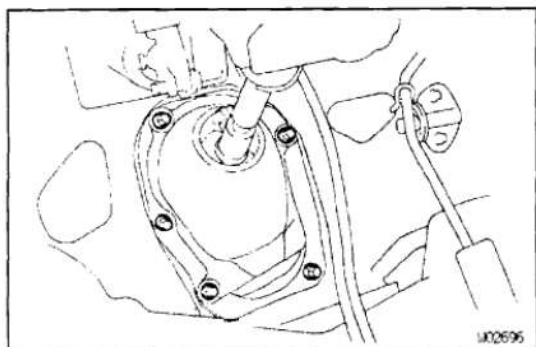
7. w/ Airbag:

INSTALL SPIRAL CABLE

(See page BE—15)

8. INSTALL COMBINATION SWITCH WITH SPIRAL CABLE

- Tighten the 3 screws.
- w/ Airbag:
Connect the airbag connector.
- Connect the 2 connectors.

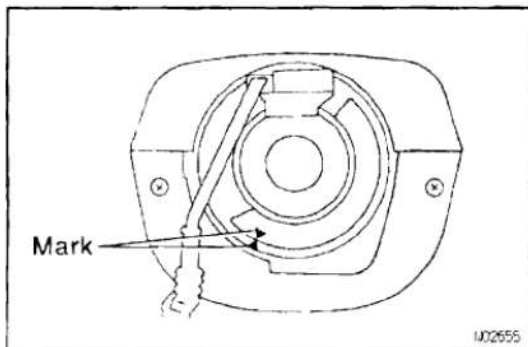


9. INSTALL STARTER SWITCH BEZEL**10. INSTALL LOWER FINISH PANEL**

- (a) Install the 2 panel set screws.
- (b) Connect the hood lock release lever and fuel lid release lever with the 4 screws.

11. INSTALL UPPER AND LOWER COLUMN COVERS

Install the 3 screws.

**12. CENTER SPIRAL CABLE**

- (a) Check that the front wheels are facing straight ahead.
- (b) Turn the cable counterclockwise by hand until it becomes harder to turn the cable.
- (c) Then rotate the cable clockwise about 3 turns to align the mark.

HINT: The cable will rotate about 3 turns to either left or right of the center.

13. INSTALL STEERING WHEEL

- (a) Align the matchmarks on the wheel and main shaft.
- (b) Torque the wheel set nut.

Torque: 35 N·m (360 kgf·cm, 26 ft·lbf)

- (c) Connect the connector.

14. INSTALL STEERING WHEEL PAD

w/ Airbag:

NOTICE:

- Make sure the wheel pad is installed to the specified torque.
- If the wheel pad has been dropped, or there are cracks, dents or other defects in the case or connector, replace the wheel pad with a new one.
- When installing the wheel pad, take care that the wirings do not interfere with other parts and are not pinched between other parts.

- (a) Connect the airbag connector.
- (b) Install the wheel pad after confirming that the circumference groove of the torx screw is caught on the screw case.

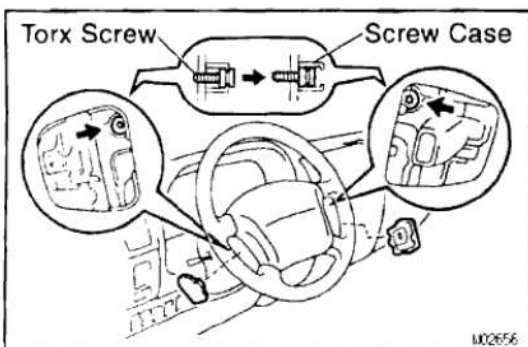
- (c) Using a torx socket wrench, torque the 2 screws.

Torque: 9.0 N·m (90 kgf·cm, 78 in·lbf)

- (d) Install the 2 steering wheel lower covers.

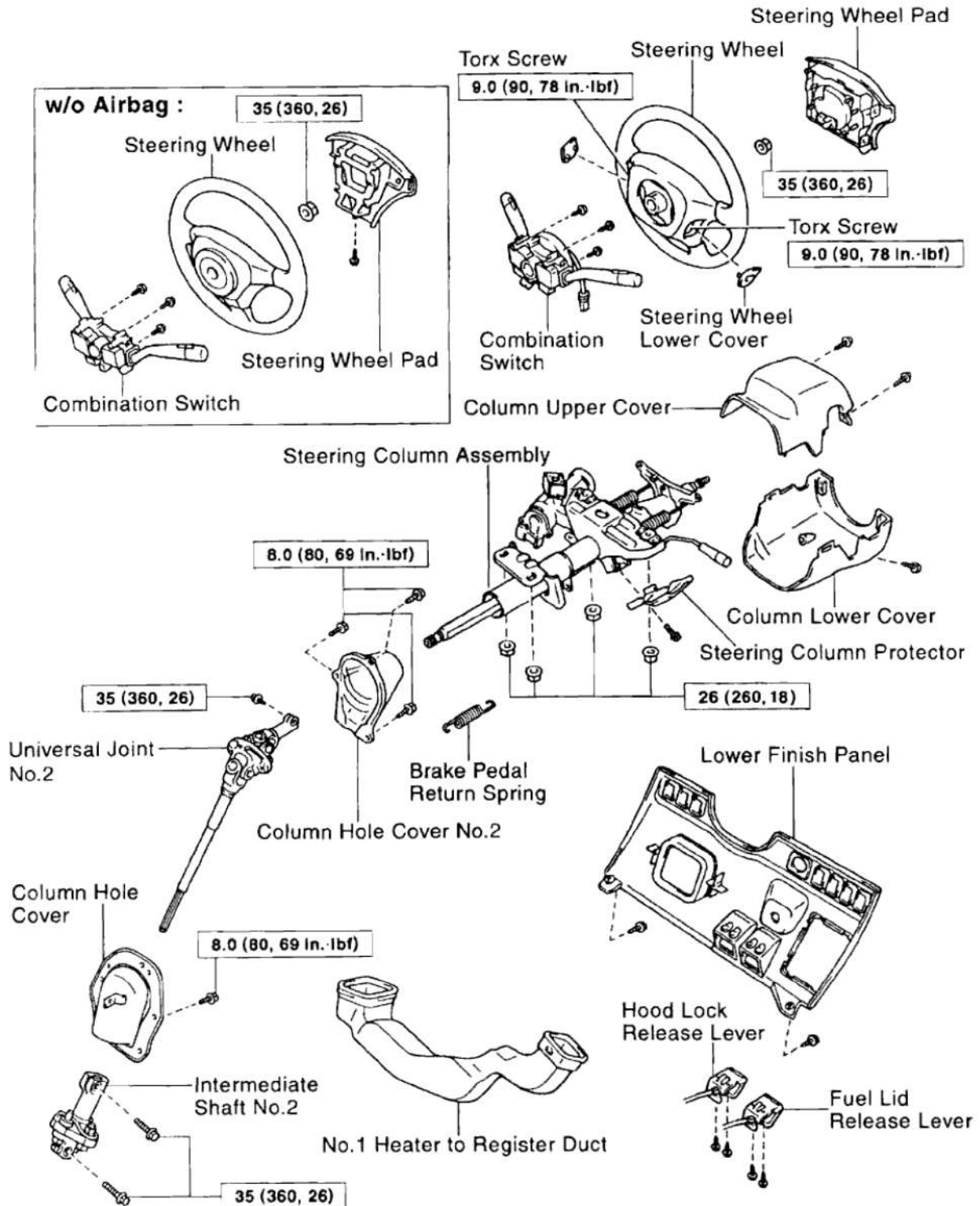
w/o Airbag:

- (a) Connect the terminal.
- (b) Install the pad.
- (c) Install the screw.

15. CHECK STEERING WHEEL CENTER POINT

TILT STEERING COLUMN COMPONENTS

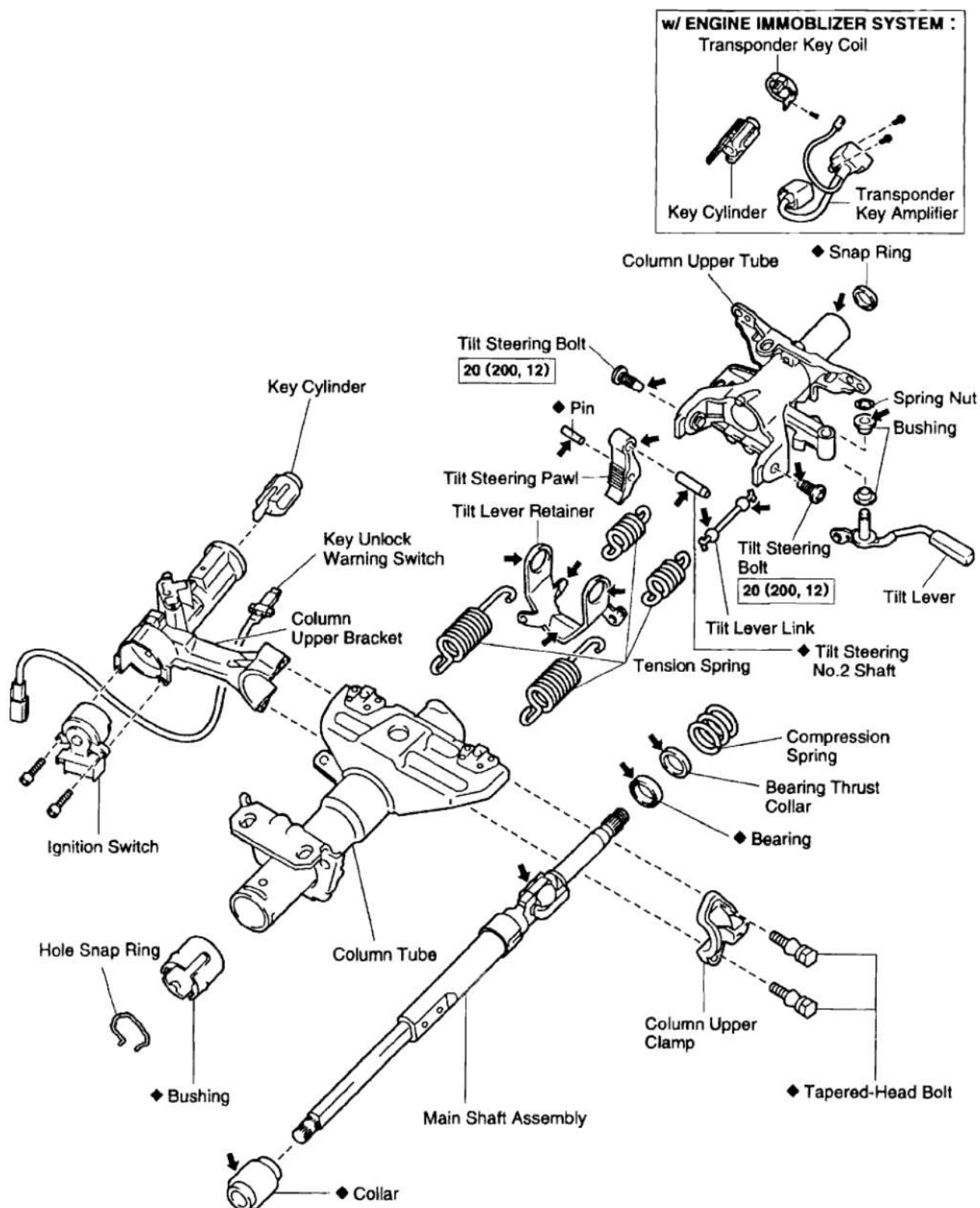
M1148-02



N·m (kgf·cm, ft·lbf) : Specified torque

W02689

SR



N·m (kgf·cm, ft·lbf): Specified torque

◆ Non-reusable part

◆ Molybdenum disulfide lithium base grease

TILT STEERING COLUMN REMOVAL

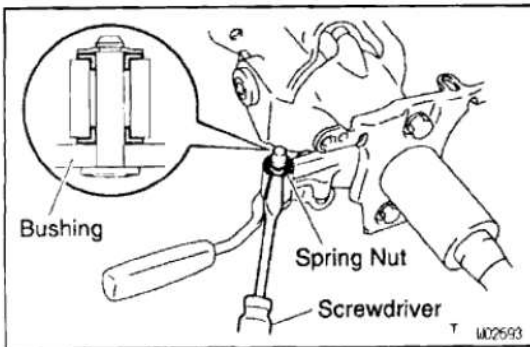
(See page SR-18)

TILT STEERING COLUMN DISASSEMBLY

NOTICE: When using a vise, do not overtighten it.

1. **REMOVE COLUMN UPPER BRACKET AND COLUMN UPPER CLAMP**
(See page SR-20)

2. **REMOVE 4 TENSION SPRINGS**

HINT: Remove the springs with the tilt function at maximum tilt up.

3. **REMOVE TILT LEVER**

- (a) Using a screwdriver, remove the spring nut.
- (b) Remove the lever.
- (c) Remove the 2 bushings from the column upper tube.

4. **REMOVE TILT LEVER LINK**

5. **REMOVE COLUMN UPPER TUBE WITH MAIN SHAFT ASSEMBLY**

- (a) Using a hexagon wrench, remove the 2 tilt steering bolts.
- (b) Remove the upper tube with the shaft from the column tube.

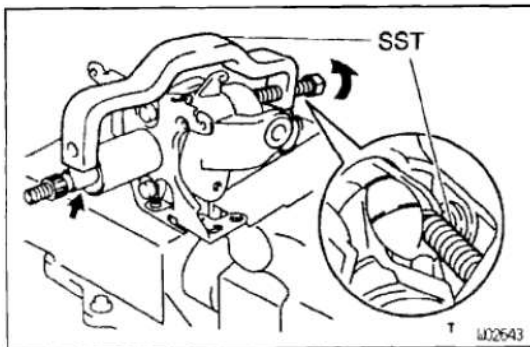
6. **REMOVE TILT LEVER RETAINER**

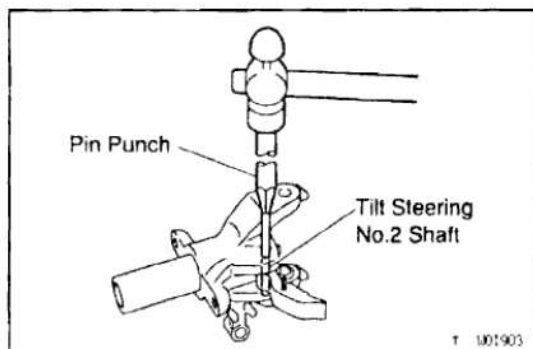
7. **REMOVE MAIN SHAFT ASSEMBLY**

- (a) Using SST, compress the compression spring.
SST 09950-40010 (09958-04010)

NOTICE: Do not bend the universal joint of the shaft more than 20°.

- (b) Using a snap ring expander, remove the snap ring from the shaft assembly.
- (c) Remove the shaft assembly from the column upper tube.
- (d) Remove the compression spring and bearing thrust collar from the shaft assembly.
- (e) Remove the collar from the shaft assembly.





8. REMOVE TILT STEERING PAWL

Using a pin punch and hammer, tap out the tilt steering No.2 shaft.

TILT STEERING COLUMN INSPECTION AND REPLACEMENT

(See page SR-20)

TILT STEERING COLUMN ASSEMBLY

NOTICE: When using a vise, do not overtighten it.

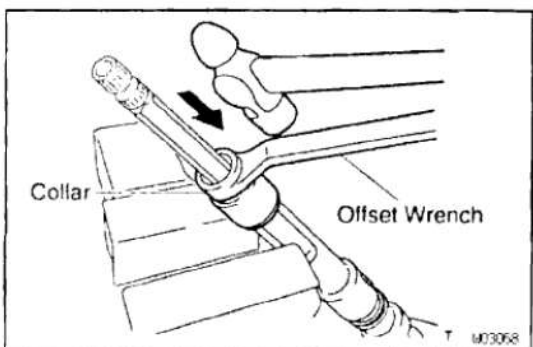
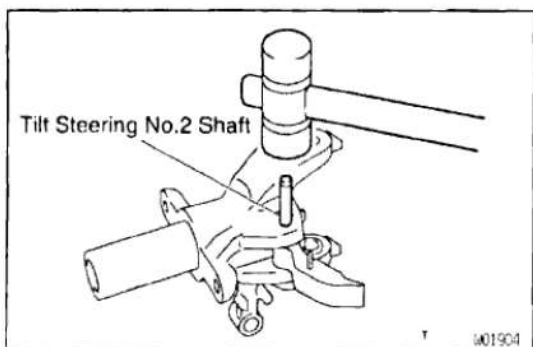
1. COAT WITH MOLYBDENUM DISULFIDE LITHIUM BASE GREASE

(See page SR-26)

2. INSTALL TILT STEERING PAWL

Using a plastic hammer, tap in a new tilt steering No. 2 shaft and install the pawl.

NOTICE: Tap the shaft completely into the steering column upper tube.



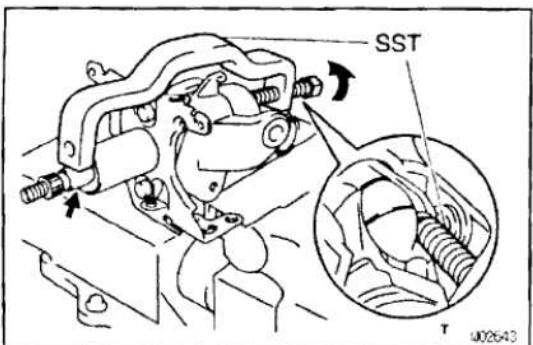
3. INSTALL MAIN SHAFT ASSEMBLY

(a) Using an offset wrench and hammer, drive in a new collar to the shaft assembly.

NOTICE: Be careful not to damage the collar.

(b) Install the bearing thrust collar and compression spring to the shaft assembly.

(c) Install the shaft assembly to the column upper tube.



(d) Using SST, compress the compression spring.

SST 09950-40010 (09958-04010)

NOTICE: Do not bend the universal joint of the shaft more than 20°.

(e) Using a snap ring expander, install a new snap ring to the shaft assembly.

4. INSTALL TILT LEVER RETAINER

5. INSTALL COLUMN UPPER TUBE WITH MAIN SHAFT ASSEMBLY

- (a) Install the upper tube with the shaft to the column tube.
- (b) Using a hexagon wrench, torque the 2 tilt steering bolts.

Torque: 20 N·m (200 kgf·cm, 14 ft·lbf)

- (c) Check that the upper tube turns smoothly.

6. INSTALL TILT LEVER LINK**7. INSTALL TILT LEVER**

- (a) Install the 2 bushings to the column upper tube, as shown in the illustration.
- (b) Install the lever, as shown in the illustration.
- (c) Install a new spring nut to the lever.

8. INSTALL 4 TENSION SPRINGS

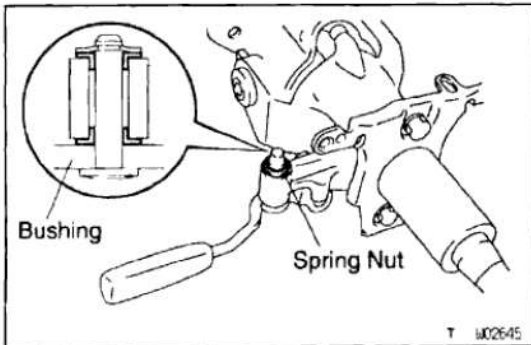
HINT: Install the springs with the tilt function at maximum tilt up.

9. INSTALL COLUMN UPPER BRACKET AND COLUMN UPPER CLAMP

(See page SR-23)

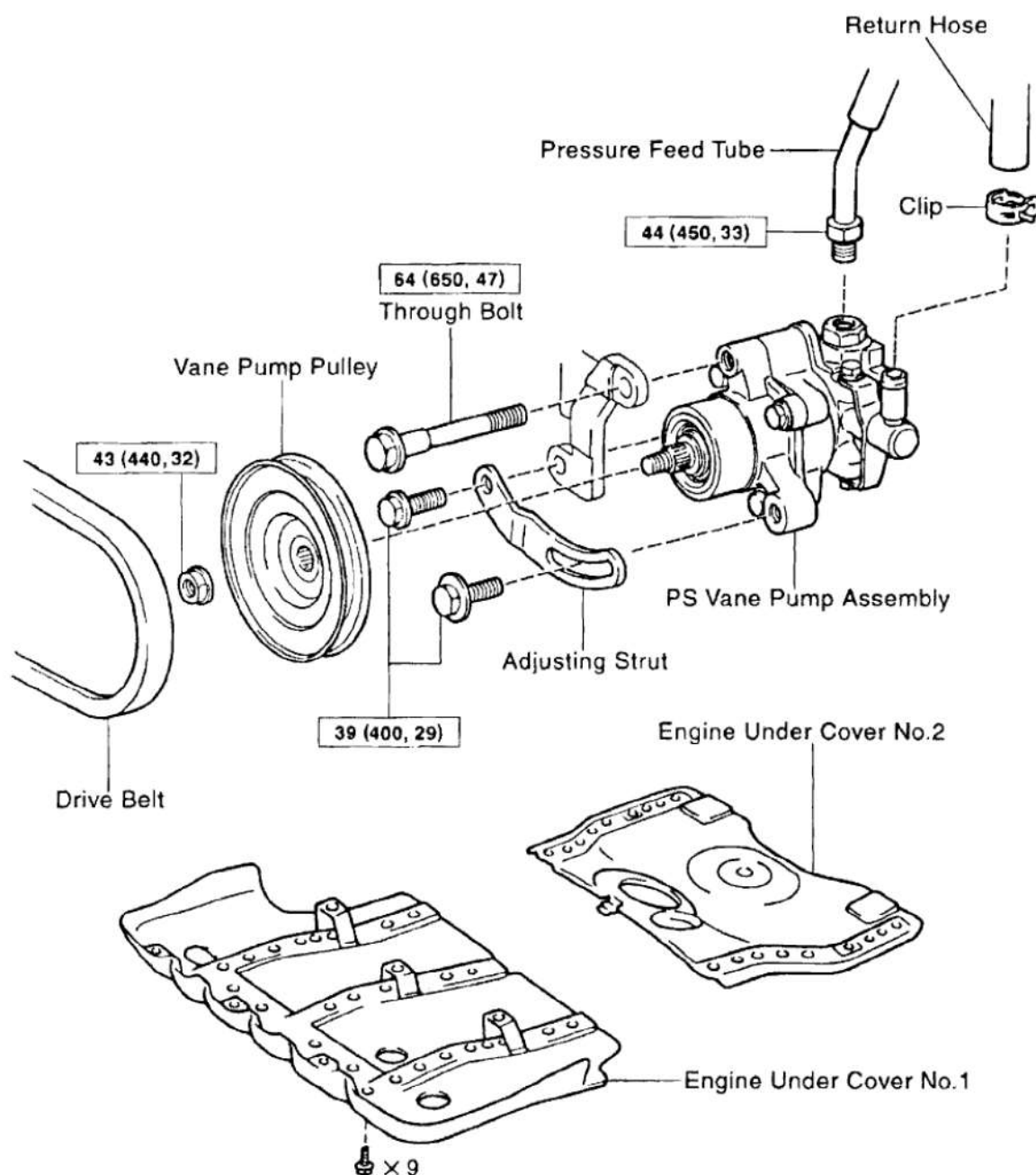
10. CHECK TILT STEERING OPERATION

- (a) Check that there is no axial play at the end of the main shaft.
- (b) With the main shaft in the neutral position, pull the tilt lever and check that the main shaft rises to the uppermost position.
- (c) Lower the main shaft, and check that it locks in the lowermost position.

**TILT STEERING COLUMN INSTALLATION**
(See page SR-23)

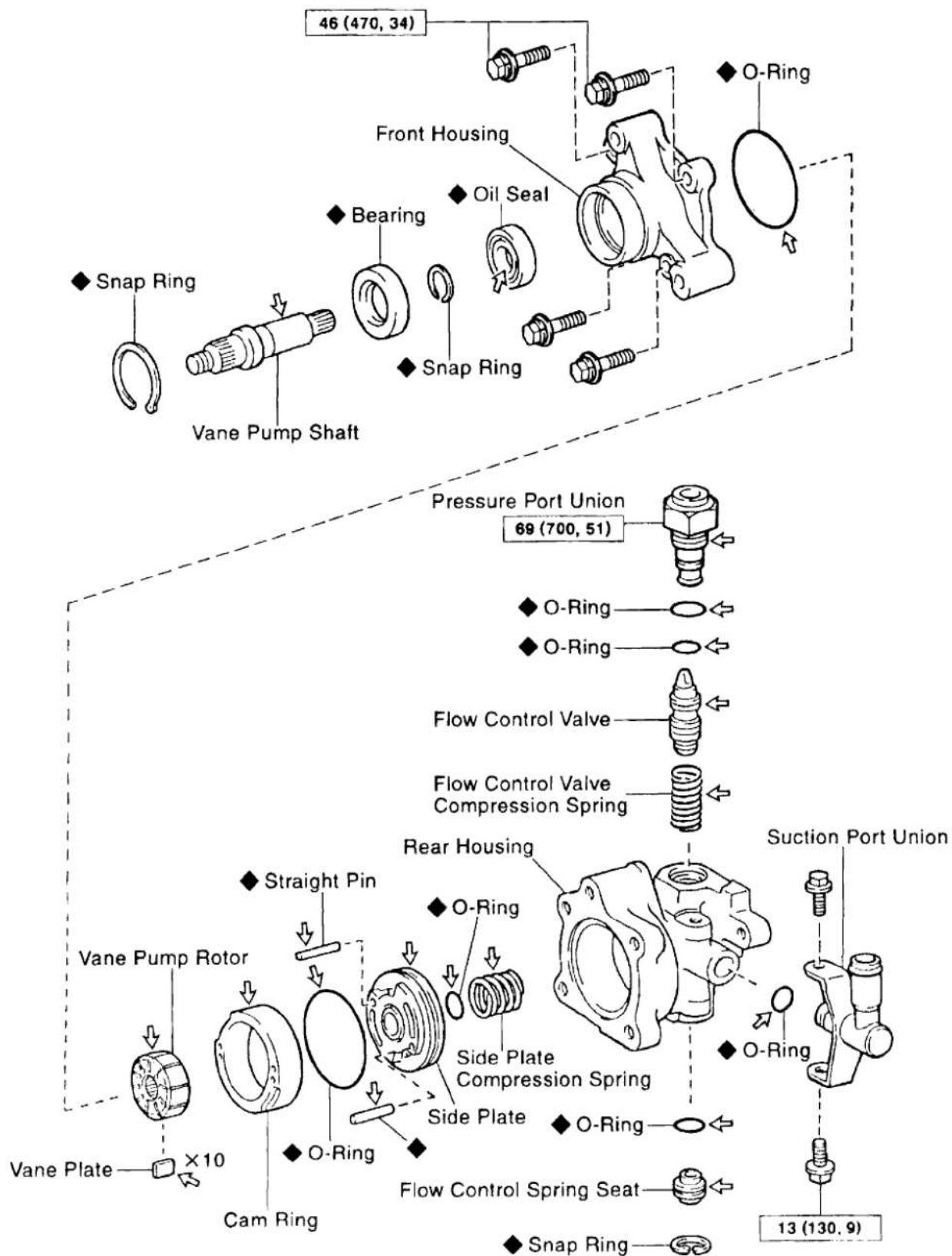
POWER STEERING VANE PUMP (3L) COMPONENTS

SR137-02



N·m (kgf·cm, ft·lbf) : Specified torque

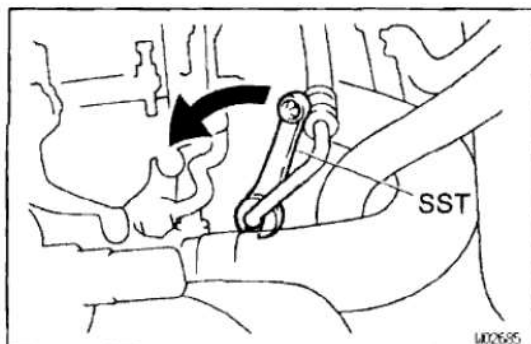
102583



N·m (kgf·cm, ft·lbf) : Specified torque

◆ Non-reusable part

↗ Power steering fluid



POWER STEERING VANE PUMP REMOVAL

1. **REMOVE ENGINE UNDER COVER NO. 1 AND ENGINE UNDER COVER NO.2**

Remove the 9 bolts.

2. **DISCONNECT RETURN HOSE**

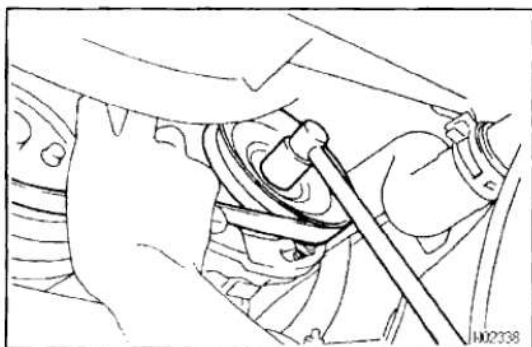
3. **DISCONNECT PRESSURE FEED TUBE**

Using SST, disconnect the pressure feed tube.

SST 09631-22020

4. **REMOVE DRIVE BELT AND PS VANE PUMP ASSEMBLY**

- (a) Push on the drive belt with your hand to stop the vane pump pulley rotating, loosen the pulley set nut.

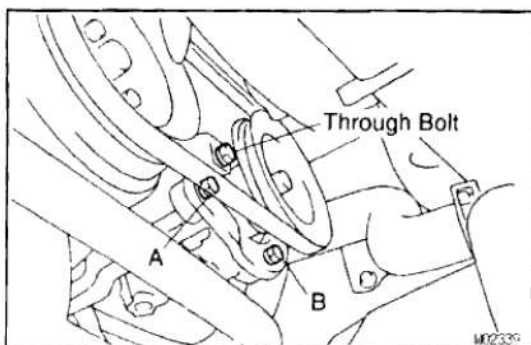


- (b) Loosen the through bolt and bolt B, remove the drive belt.

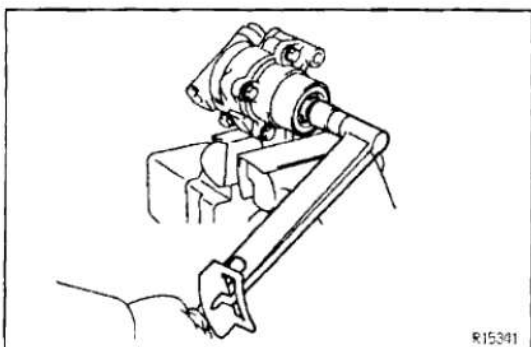
- (c) Remove the pulley set nut and vane pump pulley.

- (d) Remove the A, B bolts and adjusting strut.

- (e) Remove the through bolt and PS vane pump.



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POWER STEERING VANE PUMP DISASSEMBLY

NOTICE: When using a vise, do not overtighten it.

1. **MEASURE PS VANE PUMP ROTATING TORQUE**

- (a) Check that the pump rotates smoothly without abnormal noise.

- (b) Temporarily install the vane pump pulley set nut.

- (c) Using a torque wrench, check the pump rotating torque.

Rotating torque:

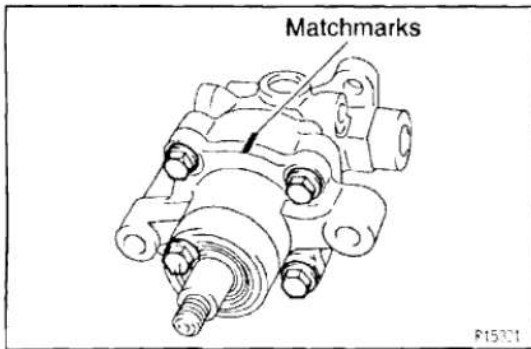
0.3 N·m (2.8 kgf·cm, 2.4 in.-lbf) or less

2. **REMOVE SUCTION PORT UNION**

- (a) Remove the 2 bolts.

- (b) Remove the O-ring from the suction port union.

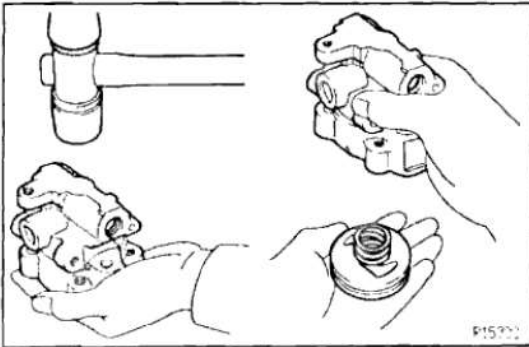
1KH-02

**3. REMOVE REAR HOUSING**

- (a) Place matchmarks on the front and rear housing.
- (b) Remove the 4 bolts.

NOTICE: When removing the rear housing, be careful that the vane plates, vane pump rotor and cam ring do not fall out.

- (c) Remove the O—ring from the front housing.

**4. REMOVE SIDE PLATE**

- (a) Using a plastic hammer, tap out the side plate and side plate compression spring from the rear housing.
- (b) Remove the 2 O—rings from the side plate.

5. REMOVE CAM RING, VANE PUMP ROTOR AND VANE PLATES

Remove the 10 plates.

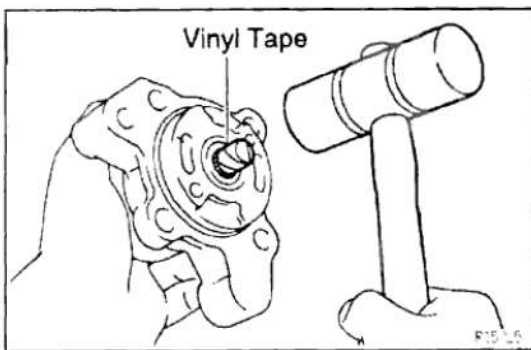
NOTICE: Take care not to drop the plate.

6. REMOVE 2 STRAIGHT PINS

Using pliers, remove the 2 straight pins from the front housing.

7. REMOVE VANE PUMP SHAFT WITH BEARING

- (a) Using snap ring pliers, remove the snap ring from the front housing.
- (b) Wind vinyl tape on the serrated part of the vane pump shaft.
- (c) Using a plastic hammer, tap out the shaft with bearing.

**8. REMOVE PRESSURE PORT UNION**

- (a) Remove the pressure port union.
- (b) Remove the 2 O—rings from the pressure port union.

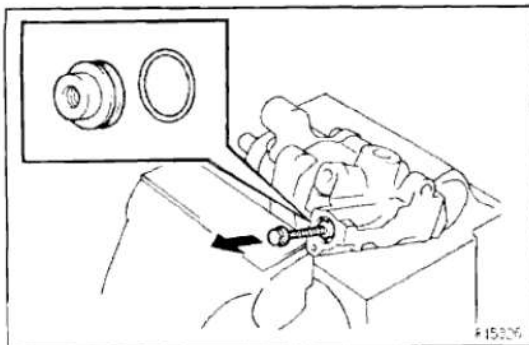
9. REMOVE FLOW CONTROL VALVE AND FLOW CONTROL VALVE COMPRESSION SPRING**10. REMOVE FLOW CONTROL SPRING SEAT**

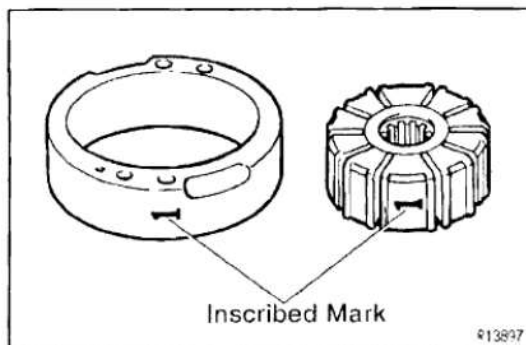
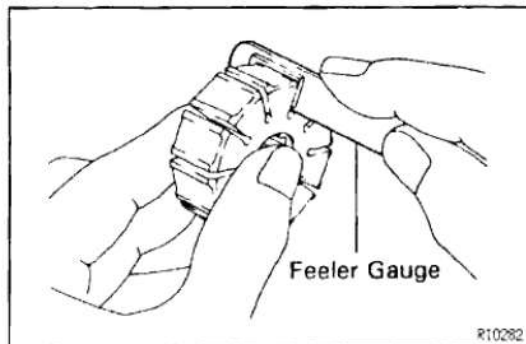
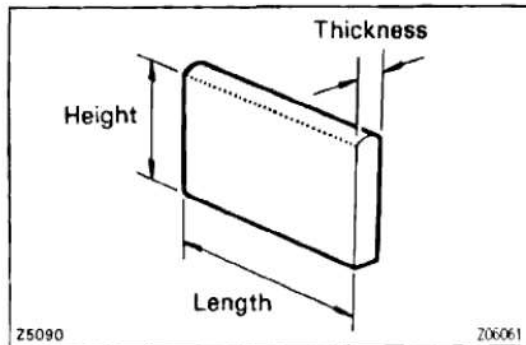
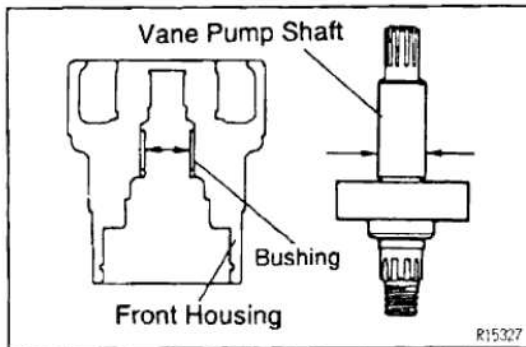
- (a) Using snap ring pliers, remove the snap ring from the rear housing.
- (b) Install the 2 or 3 threads of a bolt (6 mm nominal diameter, 1.0 mm pitch, 50 mm length) to the flow control spring seat.

Reference

Bolt: 91651—60650

- (c) Using pliers, remove the spring seat from the rear housing.
- (d) Remove the O—ring from the flow control spring seat.





POWER STEERING VANE PUMP INSPECTION AND REPLACEMENT

NOTICE: When using a vise, do not overtighten it.

1. CHECK OIL CLEARANCE BETWEEN VANE PUMP SHAFT AND BUSHING

Using a micrometer and caliper gauge, measure the oil clearance.

	Clearance	mm (in.)
Standard	0.03–0.05 (0.0012–0.0020)	
Maximum	0.07 (0.0028)	

If it is more than maximum, replace the front housing and vane pump shaft.

2. INSPECT VANE PUMP ROTOR AND VANE PLATES

(a) Using a micrometer, measure the height, thickness and length of the 10 plates.

	Minimum	mm (in.)
Height	8.1 (0.319)	
Thickness	1.797 (0.0708)	
Length	14.988 (0.5901)	

(b) Using a feeler gauge, measure the clearance between the rotor groove and plate.

	Oil clearance	mm (in.)
Maximum	0.028 (0.0011)	

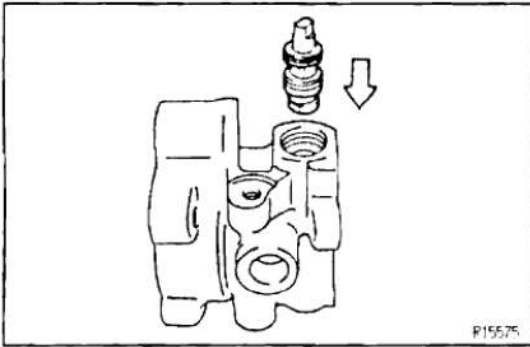
If it is more than the maximum, replace the plate and/or rotor with one having the same mark stamped on the cam ring.

Inscribed mark:

1, 2, 3, 4 or None

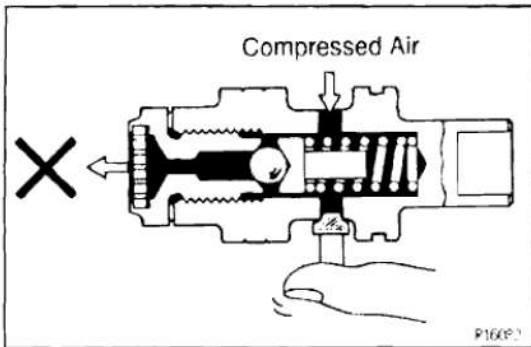
HINT: There are 5 vane plate lengths with the following rotor and cam ring marks:

Rotor and cam ring mark	Vane plate part number	Vane plate length mm (in.)
None	44345–12010	14.996–14.998 (0.59039–0.59047)
1	44345–12020	14.994–14.996 (0.59031–0.59039)
2	44345–12030	14.992–14.994 (0.59023–0.59031)
3	44345–12040	14.990–14.992 (0.59016–0.59023)
4	44345–12050	14.988–14.990 (0.59007–0.59016)



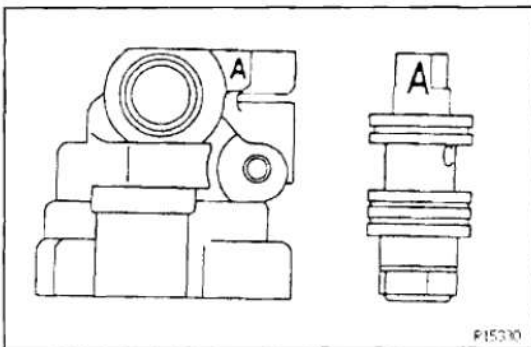
3. INSPECT FLOW CONTROL VALVE

- (a) Coat the valve with power steering fluid and check that it falls smoothly into the valve hole by its own weight.



- (b) Check the flow control valve for leakage.

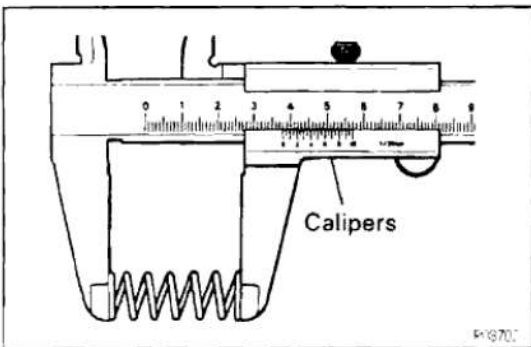
Close one of the holes and apply compressed air 392 – 490 kPa (4–5 kgf/cm², 57–71 psi) into the opposite side, and confirm that air does not come out from the end hole.



If necessary, replace the valve with one having the same letter as inscribed on the front housing.

Inscribed mark:

A, B, C, D, E or F

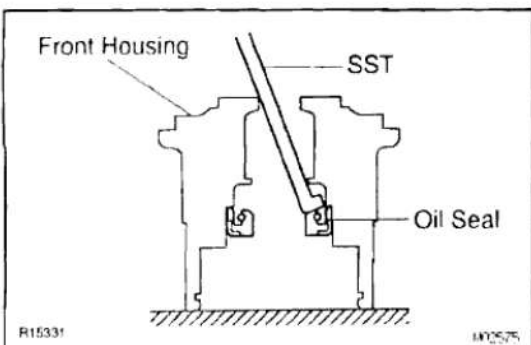


4. INSPECT FLOW CONTROL VALVE COMPRESSION SPRING

Using calipers, measure the free length of the spring.

	Free length	mm (in.)
Minimum	36.0	(1.417)

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

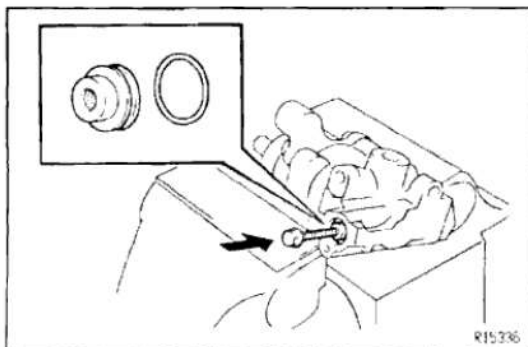
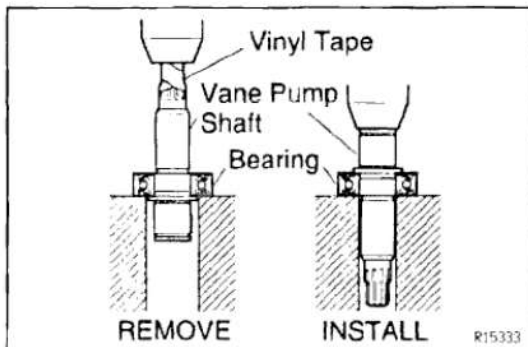
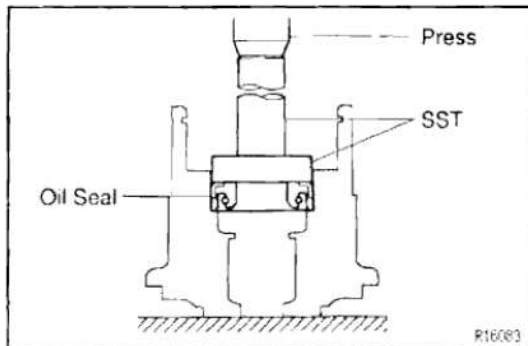


5. IF NECESSARY, REPLACE OIL SEAL

- (a) Using SST and a hammer, tap out the oil seal from the front housing.

SST 09631 – 10030

NOTICE: Be careful not to damage the front housing.



(b) Coat a new oil seal with power steering fluid.

(c) Using SST, press in the oil seal.

SST 09950-60010 (09951-00310),

09950-70010 (09951-07100)

NOTICE: Make sure to install the oil seal facing the correct direction.

6. IF NECESSARY, REPLACE BEARING

(a) Wind vinyl tape on the serrated part of the vane pump shaft.

(b) Using a snap ring expander, remove the snap ring from the shaft.

NOTICE: Be careful not to damage the shaft.

(c) Press out the bearing from the shaft.

(d) Coat a new bearing with power steering fluid.

(e) Using a press, press in the bearing to the shaft.

(f) Using a snap ring expander, install a new snap ring to the shaft.

NOTICE: Be careful not to damage the shaft.

POWER STEERING VANE PUMP ASSEMBLY

NOTICE: When using a vise, do not overtighten it.

1. COAT WITH POWER STEERING FLUID (See page SR-31)

2. INSTALL FLOW CONTROL SPRING SEAT

(a) Coat a new O-ring with power steering fluid and install it to the flow control spring seat.

(b) Install the 2-3 threads of the bolt.

(c) Using pliers, install the spring seat to the rear housing.

NOTICE:

- Be careful not to damage the O-ring.

- Make sure to install the seat facing the correct direction.

(d) Using snap ring pliers, install a new snap ring.

3. INSTALL FLOW CONTROL VALVE COMPRESSION SPRING AND FLOW CONTROL VALVE

Install the valve facing the correct direction.

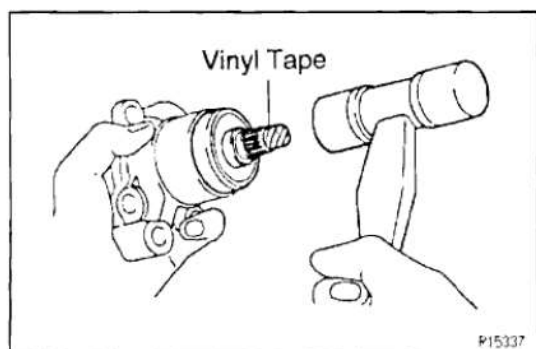
(See page SR-31)

4. INSTALL PRESSURE PORT UNION

(a) Coat 2 new O-rings with power steering fluid and install them to the pressure port union.

(b) Torque the pressure port union.

Torque: 69 N·m (700 kgf·cm, 51 ft·lbf)



5. INSTALL VANE SHAFT WITH BEARING

- Wind vinyl tape on the serrated part of the vane pump shaft.
- Using a plastic hammer, tap in the shaft with the bearing to the front housing.
- Using snap ring pliers, install a new snap ring to the front housing.

6. INSTALL STRAIGHT PINS

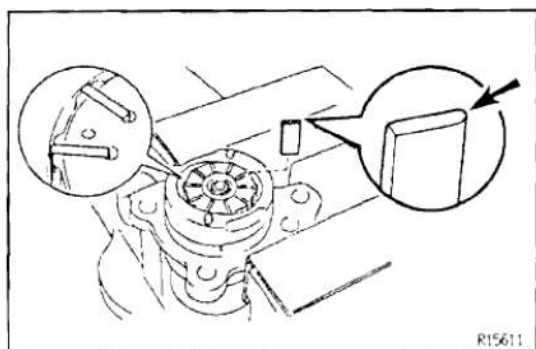
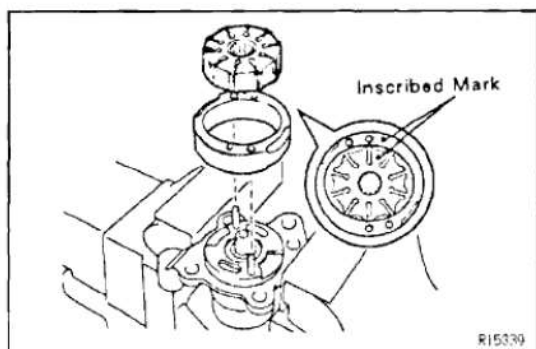
Using a plastic hammer, tap in 2 new pins to the front housing.

NOTICE: Be careful not to damage the pins.

7. INSTALL CAM RING AND VANE PUMP ROTOR

Install the ring and rotor to the front housing with the inscribed mark facing outward.

HINT: Align the holes of the cam ring with the straight pins.



8. INSTALL VANE PLATES

Install the 10 plates with the round end facing outward.

9. INSTALL SIDE PLATE

- Coat 2 new O-rings with power steering fluid and install them to the side plate.
- Install the side plate and side plate compression spring.

HINT: Align the holes of the side plate with the straight pins.

10. INSTALL REAR HOUSING

- Coat a new O-ring with power steering fluid and install it to the front housing.
- Align the matchmarks on the front housing and rear housing.
- Torque the 4 bolts.

Torque: 46 N·m (470 kgf·cm, 34 ft·lbf)

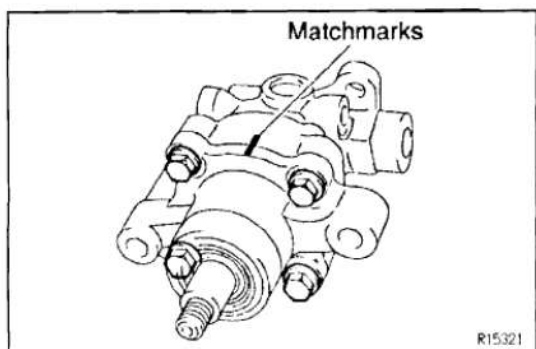
11. INSTALL SUCTION PORT UNION

- Coat a new O-ring with power steering fluid and install it to the suction port union.
- Torque the 2 bolts.

Torque: 13 N·m (130 kgf·cm, 9 ft·lbf)

12. MEASURE PS VANE PUMP ROTATING TORQUE

(See page SR-32)



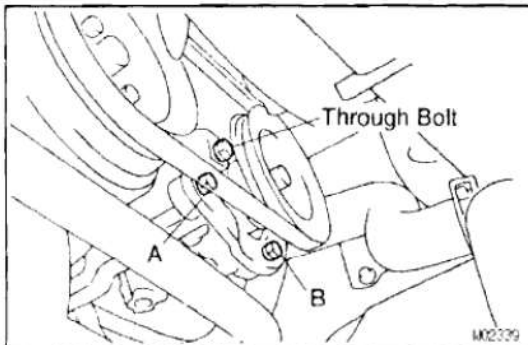
POWER STEERING VANE PUMP INSTALLATION

1. INSTALL PS VANE PUMP ASSEMBLY

- Temporarily tighten the through bolt.
- Temporarily install the adjusting strut and 2 bolts.

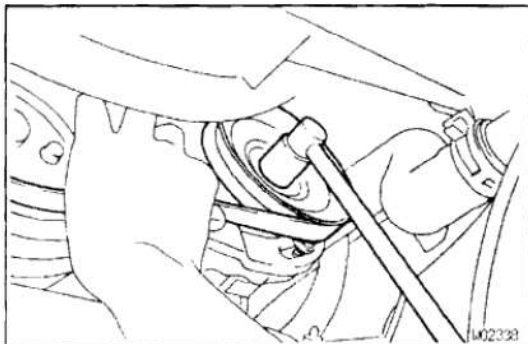
2. INSTALL VANE PUMP PULLEY

Temporarily tighten the vane pump pulley set nut.

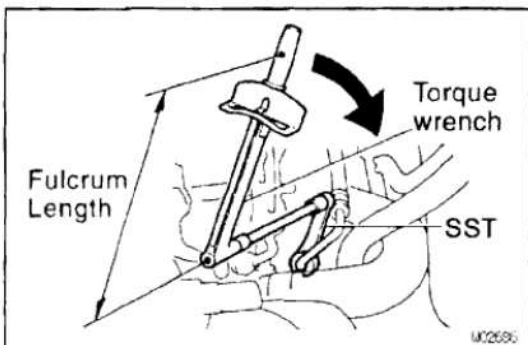


3. INSTALL DRIVE BELT

- Install the drive belt to the pulley.
- Adjust drive belt tension.
(See page SR-8)
- Torque the A bolt.
Torque: 39 N·m (400 kgf·cm, 29 ft·lbf)
Torque the through bolt.
Torque: 64 N·m (650 kgf·cm, 47 ft·lbf)
Torque the B bolt.
Torque: 39 N·m (400 kgf·cm, 29 ft·lbf)
- Push on the drive belt with your hand to stop the pulley rotating, torque the pulley set nut.
Torque: 43 N·m (440 kgf·cm, 32 ft·lbf)



SR



4. CONNECT PRESSURE FEED TUBE

Using SST, connect the pressure feed tube.
SST 09631-22020

Torque: 36 N·m (365 kgf·cm, 26 ft·lbf)

HINT:

- Use a torque wrench with a fulcrum length of 300 mm (11.81 in.)
- This torque value is effective in case that SST is parallel to a torque wrench.

5. CONNECT RETURN HOSE

6. INSTALL ENGINE UNDER COVER NO. 1 AND ENGINE UNDER COVER NO.2

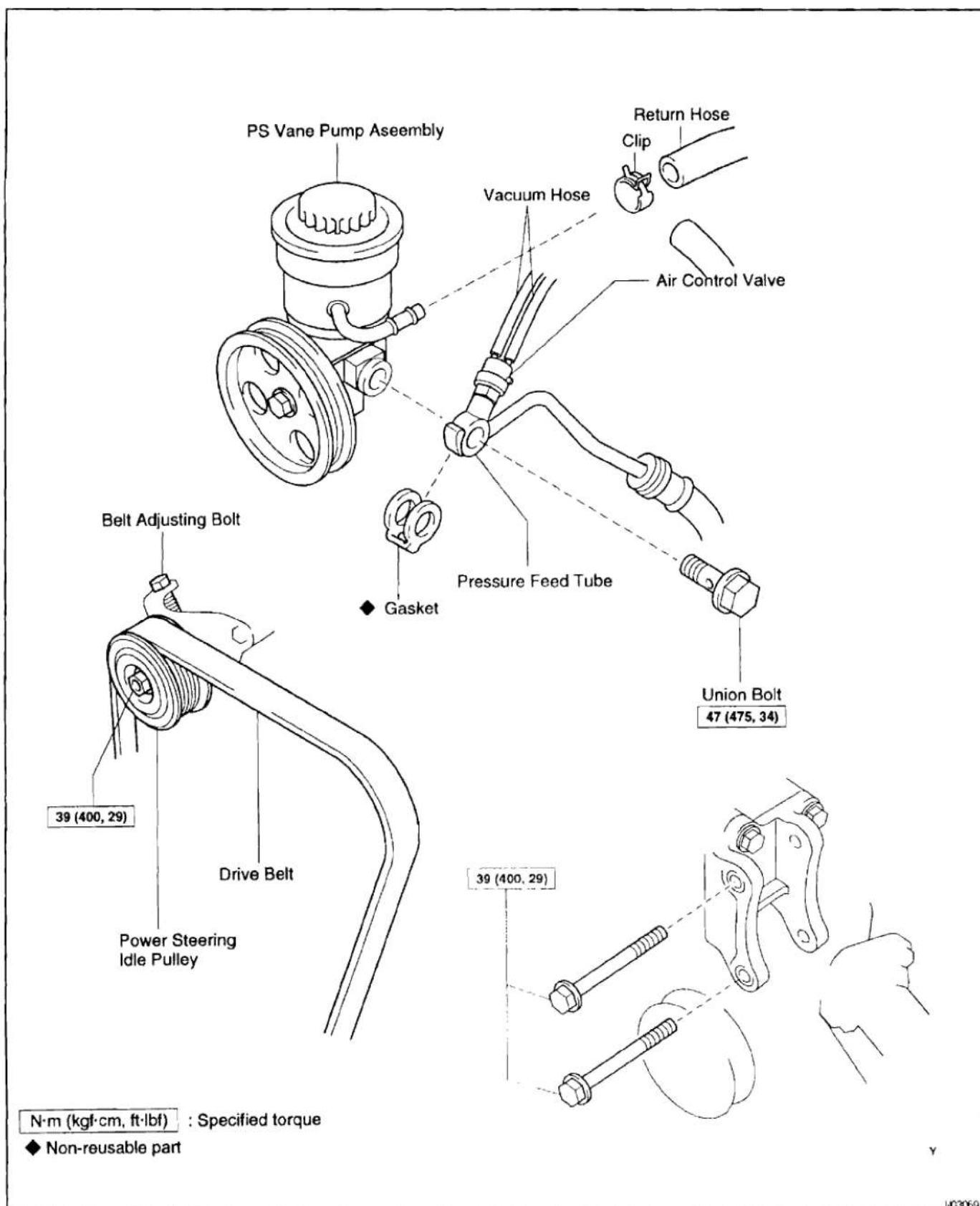
Tighten the 9 bolts.

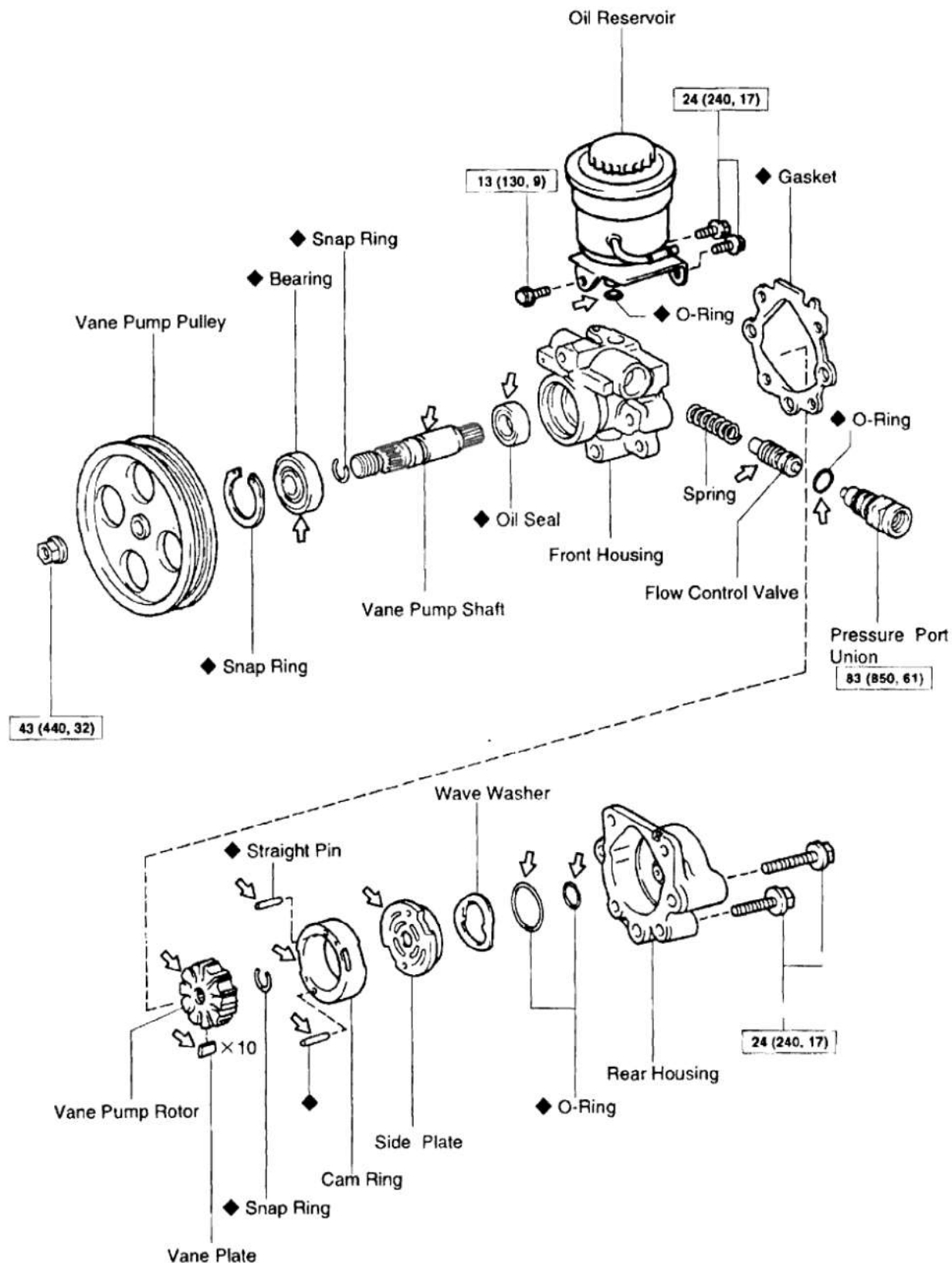
7. BLEED POWER STEERING SYSTEM

(See page SR-11)

POWER STEERING VANE PUMP (3RZ—F, 3RZ—FE) COMPONENTS

SR170-02





W01566

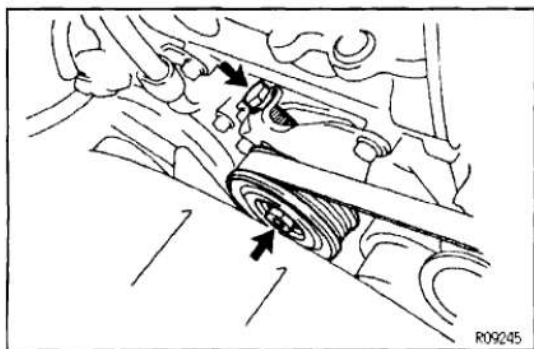
N·m (kgf·cm, ft·lbf) : Specified torque

◆ Non-reusable part

⇨ Power steering fluid

Y

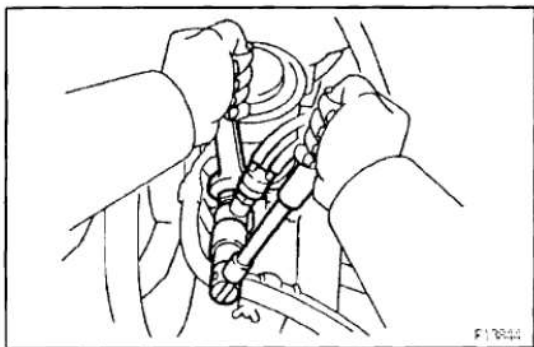
218500



POWER STEERING VANE PUMP REMOVAL

1. REMOVE DRIVE BELT

- Loosen the power steering idle pulley set bolt.
- Loosen the belt adjusting bolt.



2. DISCONNECT PRESSURE FEED TUBE

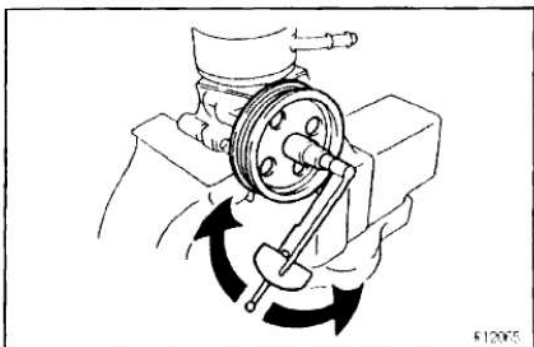
Using a spanner (24 mm) to hold the pressure port union, remove the union bolt and 2 gaskets.

3. DISCONNECT RETURN HOSE

NOTICE: Take care not to spill fluid on the drive belt.

4. REMOVE PS VANE PUMP ASSEMBLY

Remove the 2 pump assembly set bolts.



POWER STEERING VANE PUMP DISASSEMBLY

NOTICE: When using a vise, do not overtighten it.

1. MEASURE PS VANE PUMP ROTATING TORQUE

- Check that the pump rotates smoothly without abnormal noise.
- Using a torque wrench, check the pump rotating torque.

Rotating torque:

0.25 N·m (2.5 kgf·cm, 2.2 in.-lbf) or less

2. REMOVE VANE PUMP PULLEY

Using SST to stop the pulley rotating, remove the pulley set nut.

SST 09960-10010 (09962-01000, 09963-01000)

3. REMOVE OIL RESERVOIR

- Remove the 3 bolts and oil reservoir.
- Remove the O-ring from the oil reservoir.

4. REMOVE PRESSURE PORT UNION, FLOW CONTROL VALVE AND SPRING

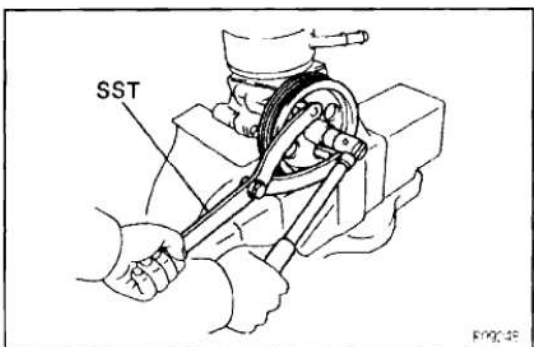
Remove the O-ring from the union.

5. REMOVE REAR HOUSING

- Remove the 2 bolts and rear housing.
- Remove the 2 O-rings from the housing.

6. REMOVE WAVE WASHER

7. REMOVE SIDE PLATE



8. REMOVE CAM RING, VANE PLATES AND VANE PUMP ROTOR

- (a) Remove the 10 plates.

NOTICE: Take care not to drop the plate.

- (b) Using a screwdriver, remove the snap ring from the vane pump shaft.

9. REMOVE STRAIGHT PINS

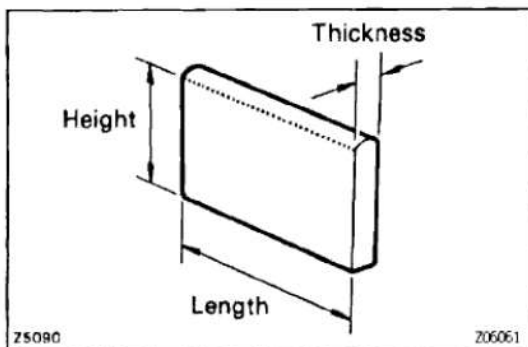
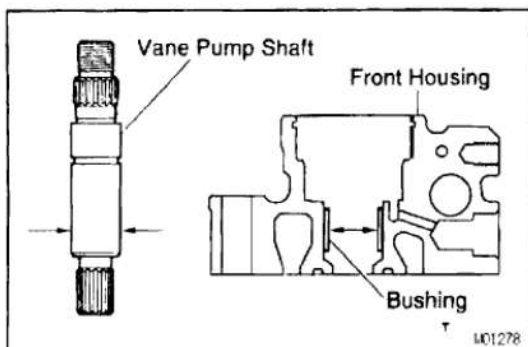
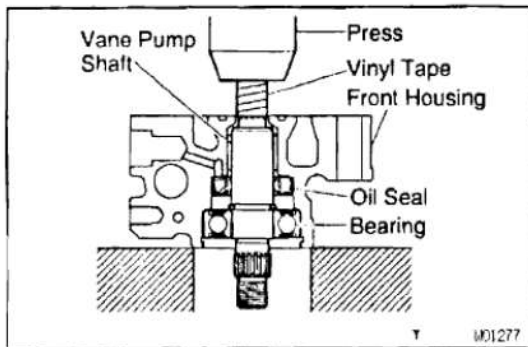
Remove the 2 pins from the front housing.

10. REMOVE GASKET**11. REMOVE VANE PUMP SHAFT WITH BEARING**

- (a) Using snap ring pliers, remove the snap ring from the front housing.

- (b) Wind vinyl tape on the serrated part of the vane pump shaft.

- (c) Using a press, press out the shaft with the bearing.

NOTICE: Be careful not to damage the oil seal lip.**POWER STEERING VANE PUMP INSPECTION AND REPLACEMENT****NOTICE:** When using a vise, do not overtighten it.**1. CHECK OIL CLEARANCE BETWEEN VANE PUMP SHAFT AND BUSHING**

Using a micrometer and caliper gauge, measure the oil clearance.

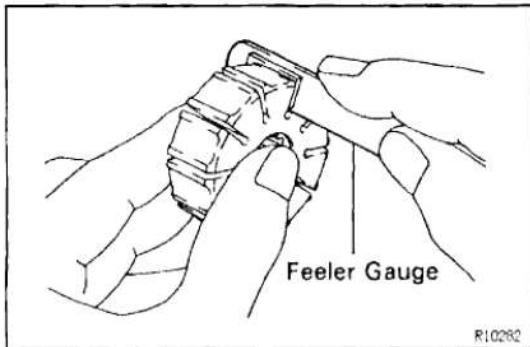
	Clearance	mm (in.)
Standard	0.03–0.05	(0.0012–0.0020)
Maximum	0.07	(0.0028)

If it is more than maximum, replace the front housing and vane pump shaft.

2. INSPECT VANE PUMP ROTOR AND VANE PLATES

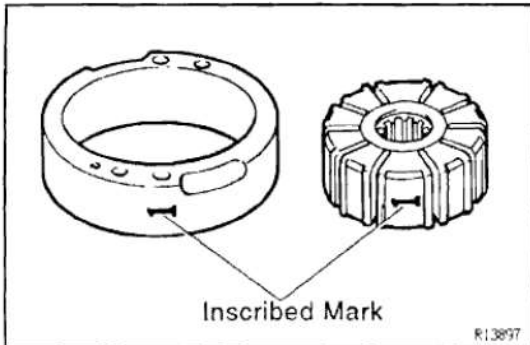
Using a micrometer, measure the height, thickness and length of the 10 plates.

	Minimum	mm (in.)
Height	8.6	(0.339)
Thickness	1.397	(0.0550)
Length	14.991	(0.5902)



- (b) Using a feeler gauge, measure the clearance between the rotor groove and plate.

	Clearance	mm (in.)
Maximum	0.035	(0.0014)



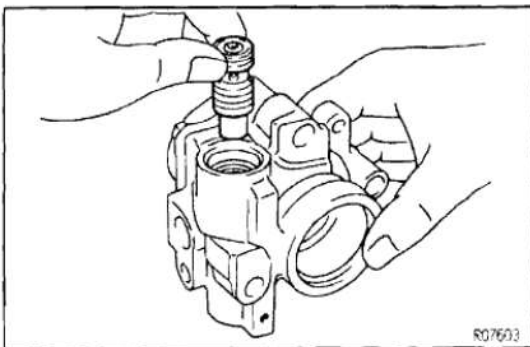
If it is more than the maximum, replace the plate and/or rotor with one having the same mark stamped on the cam ring.

Inscribed mark:

1, 2, 3, 4 or None

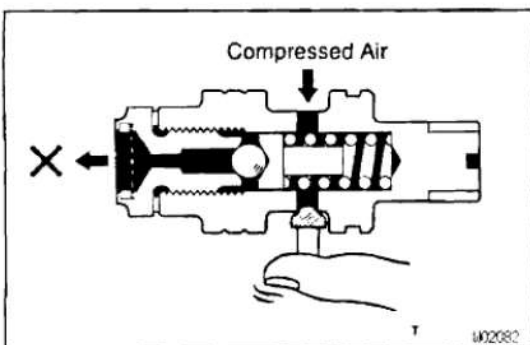
HINT: There are 5 vane plate lengths with the following rotor and cam ring marks:

Rotor and cam ring mark	Vane plate part number	Vane plate length mm (in.)
None	44345-26010	14.999 – 15.001 (0.59051 – 0.59059)
1	44345-26020	14.997 – 14.999 (0.59043 – 0.59051)
2	44345-26030	14.995 – 14.997 (0.59035 – 0.59043)
3	44345-26040	14.993 – 14.995 (0.59027 – 0.59035)
4	44345-26050	14.991 – 14.993 (0.59020 – 0.59027)

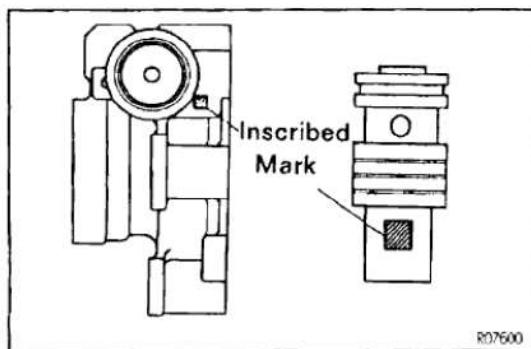


3. INSPECT FLOW CONTROL VALVE

- (a) Coat the valve with power steering fluid and check that it falls smoothly into the valve hole by its own weight.



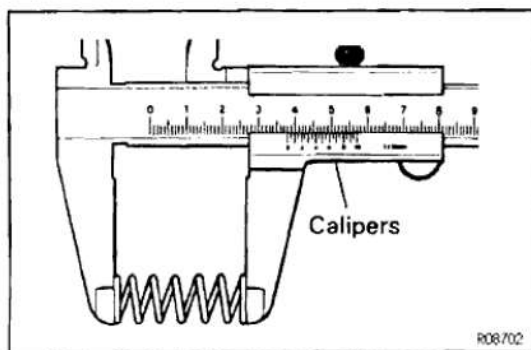
- (b) Check the flow control valve for leakage. Close one of the holes and apply compressed air 392 – 490 kPa (4–5 kgf/cm², 57–71 psi) into the opposite side, and confirm that air does not come out from the end hole.



If necessary, replace the valve with one having the same letter as inscribed on the front housing.

Inscribed mark:

A, B, C, D, E or F

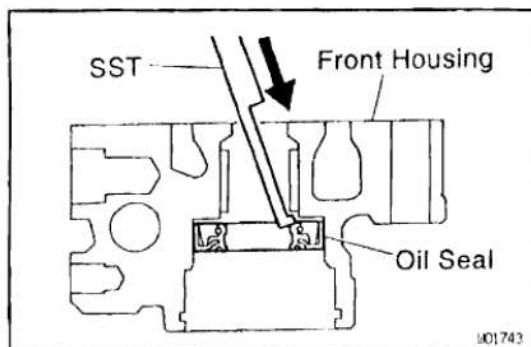


4. INSPECT SPRING

Using calipers, measure the free length of the spring.

	Free length	mm (in.)
Minimum	33.2	(1.307)

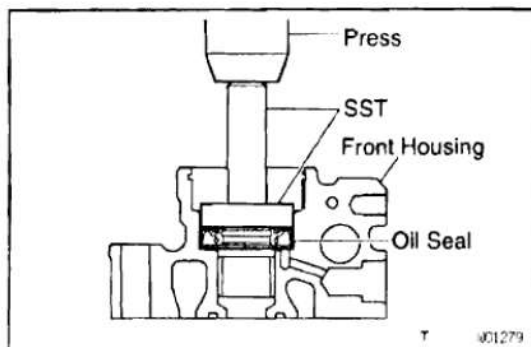
If it is not within the specification, replace the spring.



5. IF NECESSARY, REPLACE OIL SEAL

- (a) Using SST, tap out the oil seal from the front housing.
SST 09631-10030

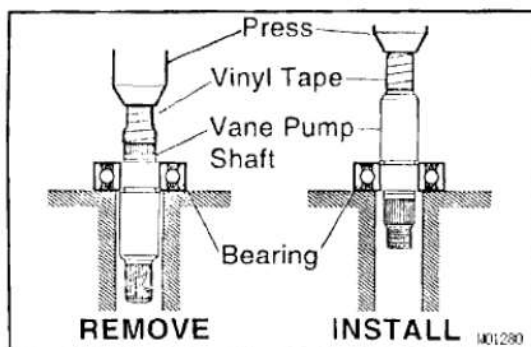
NOTICE: Be careful not to damage the bushing of the front housing.



- (b) Coat a new oil seal lip with power steering fluid.

- (c) Using SST, press in the oil seal.
SST 09950-60010 (09951-00330),
09950-70010 (09951-07100)

NOTICE: Make sure to install the oil seal facing the correct direction.



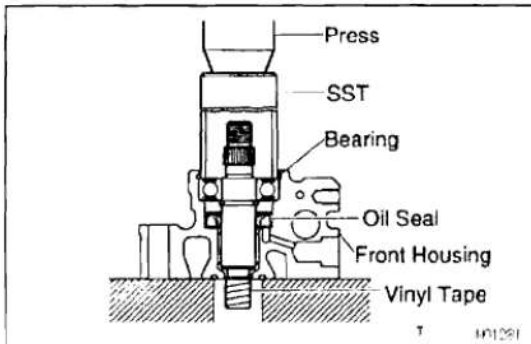
6. IF NECESSARY, REPLACE BEARING

- (a) Press out the bearing from the shaft.
(b) Using a snap ring expander, replace the snap ring with a new one.
NOTICE: Be careful not to damage the shaft.
(c) Coat a new bearing with power steering fluid.
(d) Press in the bearing to the shaft.

POWER STEERING VANE PUMP ASSEMBLY

NOTICE: When using a vise, do not overtighten it.

1. **COAT WITH POWER STEERING FLUID**
(See page SR—40)



2. **INSTALL VANE PUMP SHAFT WITH BEARING**

- (a) Wind vinyl tape on the serrated part of the vane pump shaft.
- (b) Using SST, press in the shaft with the bearing.
SST 09608—04031

NOTICE: Be careful not to damage the oil seal.

- (c) Using snap ring pliers, install a new snap ring to the front housing.

3. **INSTALL STRAIGHT PINS**

Using a plastic hammer, tap in 2 new pins to the front housing.

NOTICE: Be careful not to damage the pins.

4. **INSTALL CAM RING**

Install the ring with the inscribed mark facing outward.

HINT: Align the holes of the cam ring with the straight pins.

5. **INSTALL VANE PUMP ROTOR**

- (a) Install the rotor with the inscribed mark facing outward.

- (b) Install a new snap ring to the vane pump shaft.

6. **INSTALL VANE PLATES AND GASKET**

- (a) Install the 10 plates with the round end facing outward.

- (b) Install a new gasket on the front housing.

NOTICE: Be careful the direction of the gasket.

7. **INSTALL SIDE PLATE**

Align the holes of the side plate and straight pins, and install the plate.

8. **INSTALL WAVE WASHER**

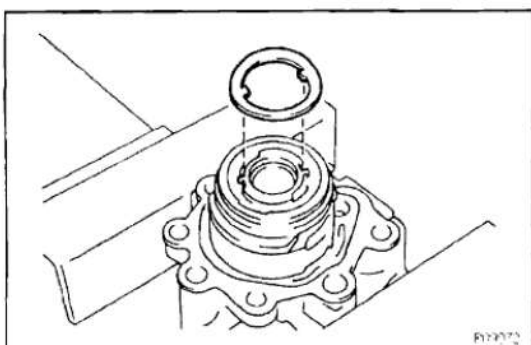
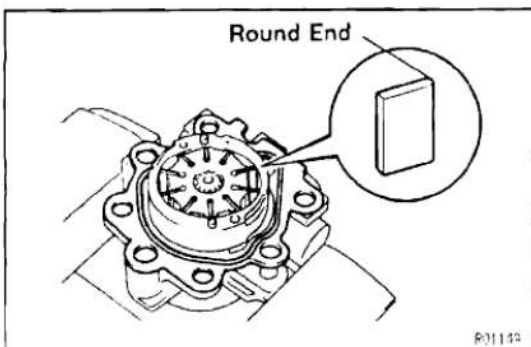
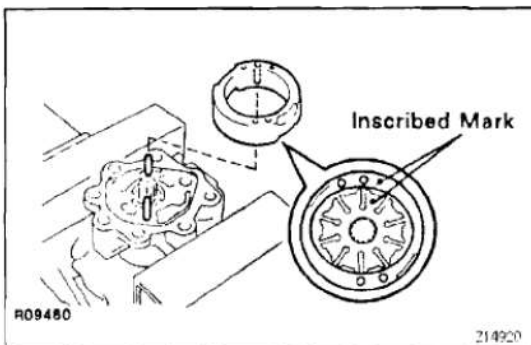
Install the wave washer so that its protrusions fit into the slots in the side rear plate.

9. **INSTALL REAR HOUSING**

- (a) Coat 2 new O—rings with power steering fluid and install them to the housing.

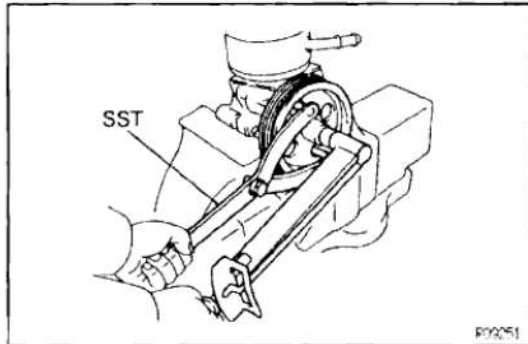
- (b) Torque the 2 bolts.

Torque: 24 N·m (240 kgf·cm, 17 ft·lbf)



10. INSTALL SPRING, FLOW CONTROL VALVE AND PRESSURE PORT UNION

- (a) Install the valve facing the correct direction.
(See page SR-40)
- (b) Coat a new O-ring with power steering fluid and install it to the union.
- (c) Torque the union.
Torque: 83 N·m (850 kgf·cm, 61 ft·lbf)

**11. INSTALL OIL RESERVOIR**

- (a) Coat a new O-ring with power steering fluid and install it to the oil reservoir.
- (b) Install the oil reservoir with the 3 bolts.
Torque:

Front side bolt: 13 N·m (130 kgf·cm, 9 ft·lbf)

Rear side bolts: 24 N·m (240 kgf·cm, 17 ft·lbf)

12. INSTALL VANE PUMP PULLEY

Using SST to stop the pulley rotating, torque the nut.
SST 09960-10010 (09962-01000, 09963-01000)
Torque: 43 N·m (440 kgf·cm, 32 ft·lbf)

13. MEASURE PS VANE PUMP ROTATING TORQUE
(See page SR-41)

SR

POWER STEERING VANE PUMP INSTALLATION

M11TV-02

1. INSTALL PS VANE PUMP ASSEMBLY

Torque the 2 pump assembly set bolts.

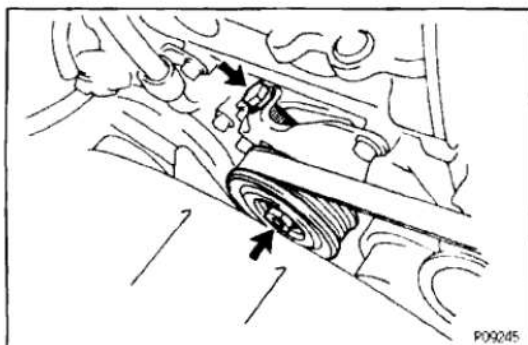
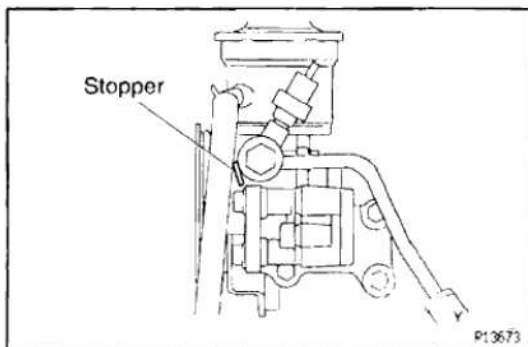
Torque: 39 N·m (400 kgf·cm, 29 ft·lbf)

2. CONNECT RETURN HOSE**3. CONNECT PRESSURE FEED TUBE**

Torque the union bolt with a new gasket.

Torque: 47 N·m (475 kgf·cm, 34 ft·lbf)

HINT: Make sure that the stopper of the tube is touching the PS pump body as shown, then torque the union bolt.

**4. INSTALL DRIVE BELT**

- (a) Tightening the belt adjusting bolt and adjust drive belt tension.
(See page SR-8)

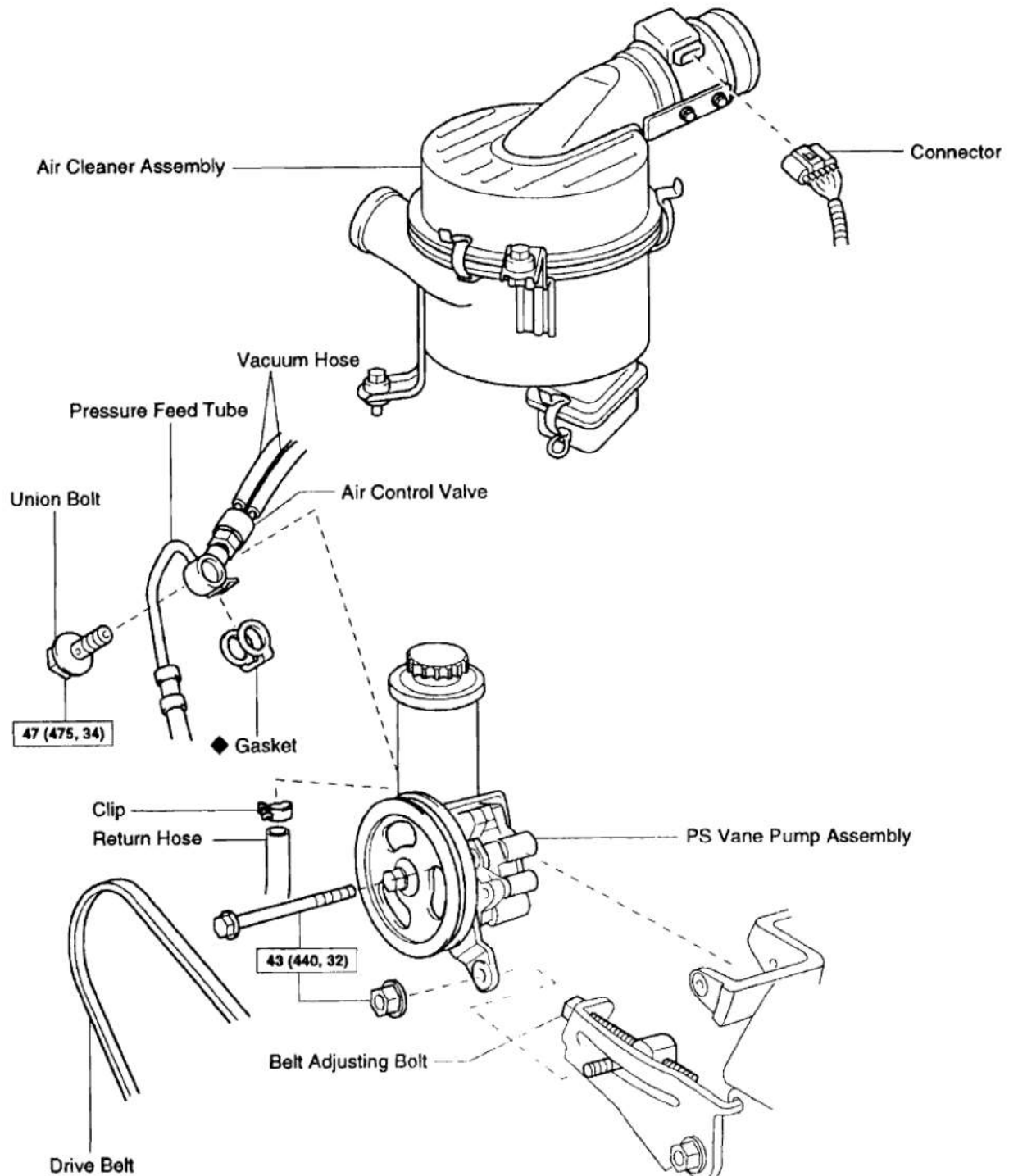
- (b) Torque the power steering idle pulley set nut.
Torque: 39 N·m (400 kgf·cm, 29 ft·lbf)

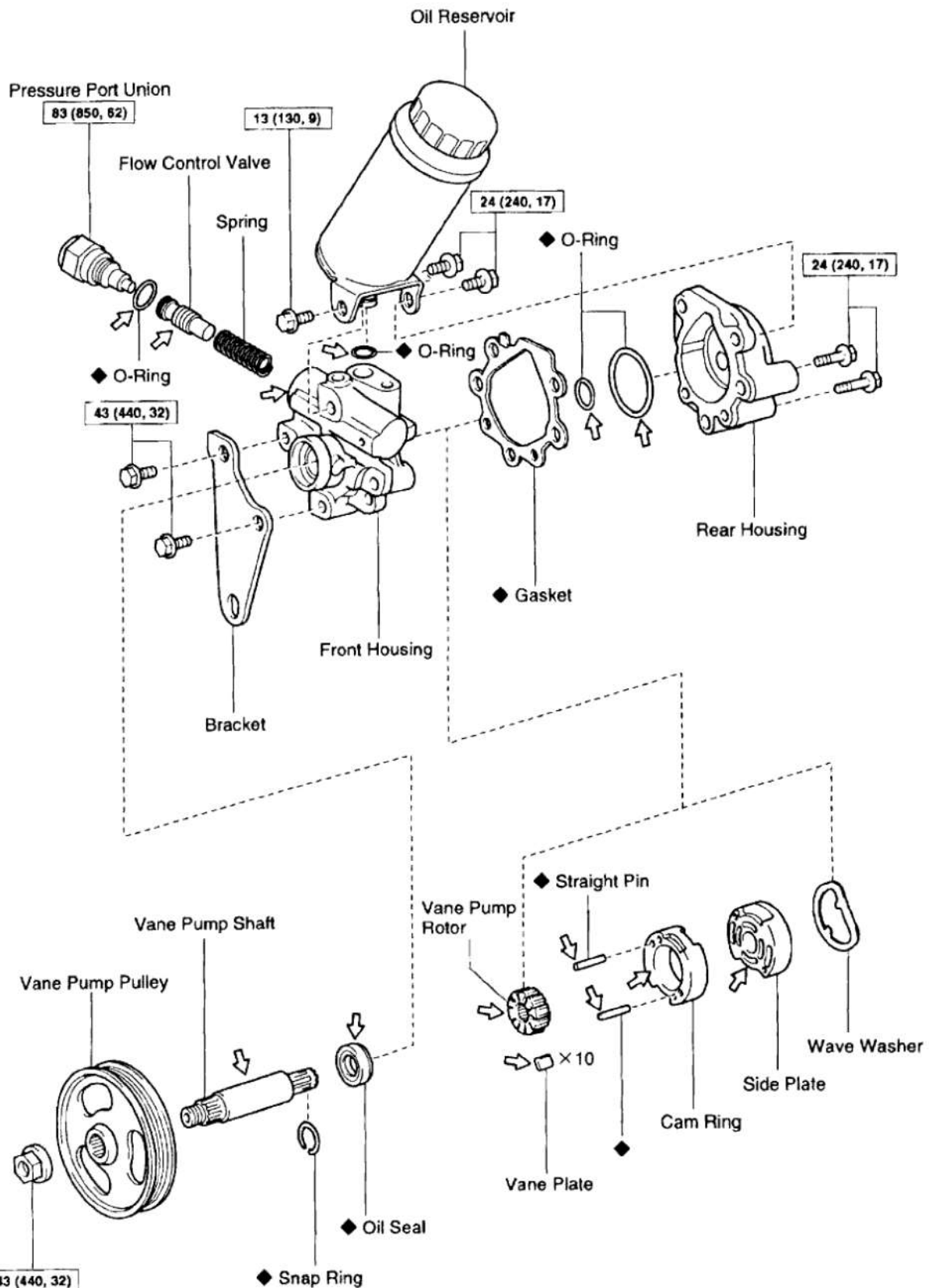
5. BLEED POWER STEERING SYSTEM

(See page SR-11)

POWER STEERING VANE PUMP (5VZ—FE) COMPONENTS

M11TW-02





W01597

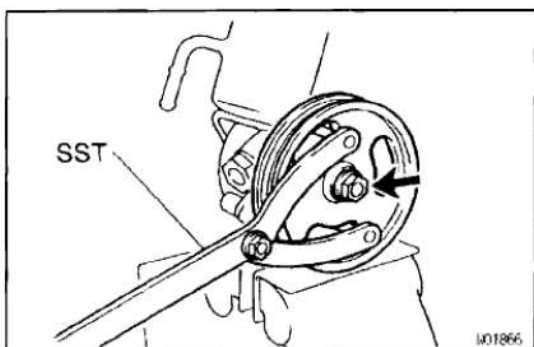
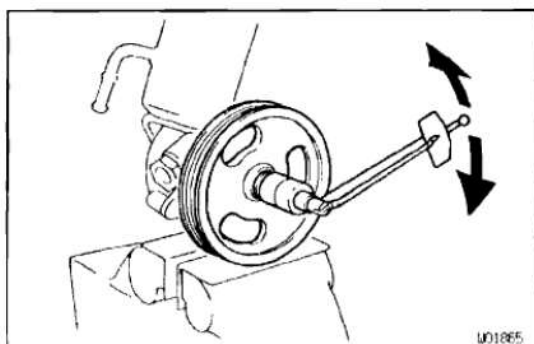
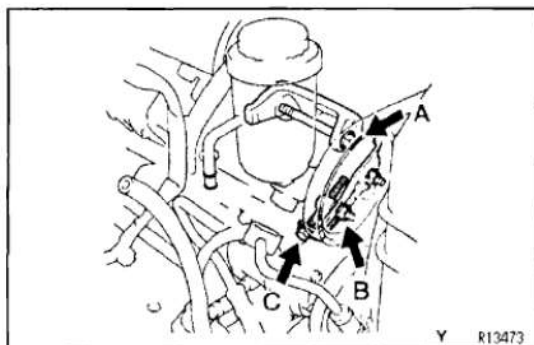
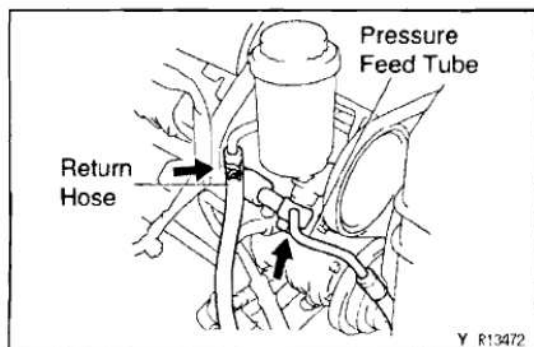
N·m (kgf·cm, ft·lbf) : Specified torque

◆ Non-reusable part

⇨ Power steering fluid

Y

712601



POWER STEERING VANE PUMP REMOVAL

1. REMOVE AIR CLEANER ASSEMBLY

- (a) Disconnect the connector.
- (b) Remove the 3 bolts.

2. DISCONNECT RETURN HOSE

NOTICE: Take care not to spill fluid on the drive belt.

3. DISCONNECT PRESSURE FEED TUBE

Remove the union bolt and gasket, and disconnect the tube from the PS vane pump assembly.

4. REMOVE DRIVE BELT

- (a) Loosen the bolt A and nut B.
- (b) Loosen the bolt C.

5. REMOVE PS VANE PUMP ASSEMBLY

Remove the bolt A and nut B.

POWER STEERING VANE PUMP DISASSEMBLY

NOTICE: When using a vise, do not overtighten it.

1. MEASURE PS VANE PUMP ROTATING TORQUE

- (a) Check that the pump rotates smoothly without abnormal noise.
- (b) Using a torque wrench, check the pump rotating torque.

Rotating torque:

0.27 N·m (2.8 kgf·cm, 2.4 in.-lbf) or less

2. REMOVE VANE PUMP PULLEY

Using SST to stop the pulley rotating, remove the pulley set nut.

SST 09960-10010 (09962-01000, 09963-01000)

3. REMOVE OIL RESERVOIR

- (a) Remove the 3 bolts and oil reservoir.
- (b) Remove the O-ring from the oil reservoir.

4. REMOVE PRESSURE PORT UNION, FLOW CONTROL VALVE AND SPRING

Remove the O-ring from the union.

5. REMOVE BRACKET

Remove the 2 bolts.

6. REMOVE REAR HOUSING

- (a) Remove the 2 bolts.
- (b) Remove the 2 O-rings from the housing.

7. REMOVE WAVE WASHER

8. REMOVE SIDE PLATE

9. REMOVE GASKET**10. REMOVE CAM RING, VANE PLATES AND VANE PUMP ROTOR**

- (a) Remove the 10 plates.

NOTICE: Take care not to drop the plate.

- (b) Using a screwdriver, remove the snap ring from the vane pump shaft.

11. REMOVE VANE PUMP SHAFT**12. REMOVE STRAIGHT PINS**

Remove the 2 pins from the front housing.

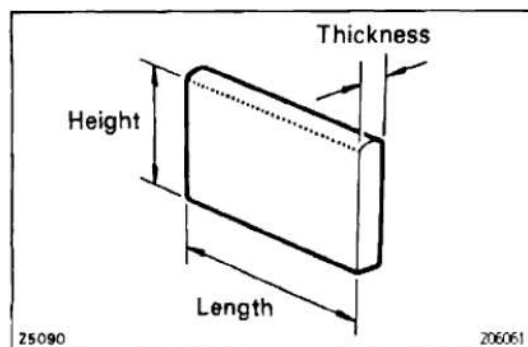
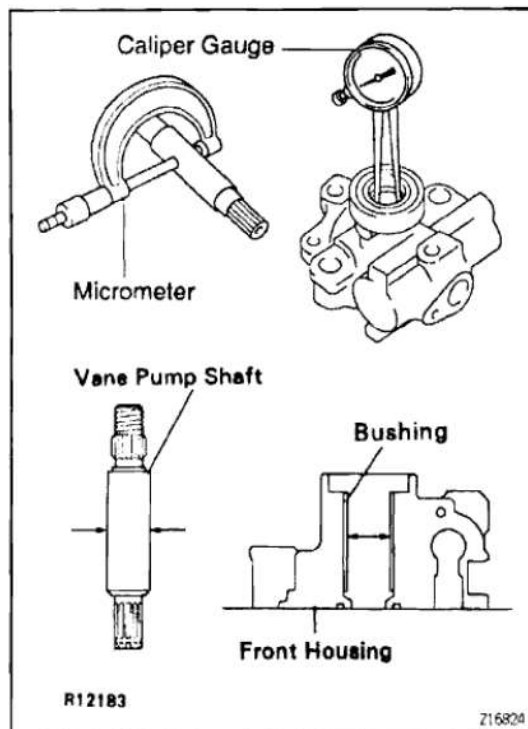
M117E-02

**POWER STEERING VANE PUMP
INSPECTION AND REPLACEMENT****NOTICE:** When using a vise, do not overtighten it.**1. CHECK OIL CLEARANCE BETWEEN VANE PUMP
SHAFT AND BUSHING**

Using a micrometer and caliper gauge, measure the oil clearance.

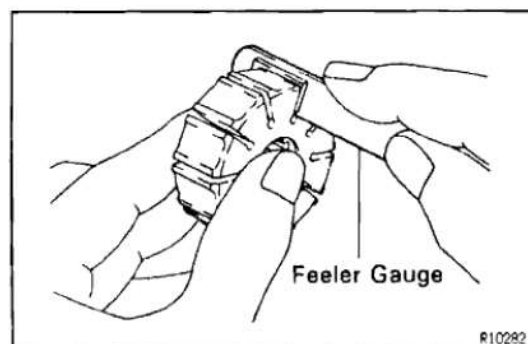
	Oil clearance	mm (in.)
Standard	0.03–0.05	(0.0012–0.0020)
Maximum	0.07	(0.0028)

If it is more than maximum, replace the front housing and vane pump shaft.

**2. INSPECT VANE PUMP ROTOR AND VANE PLATES**

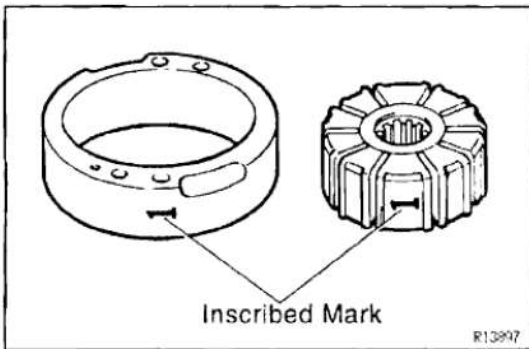
- (a) Using a micrometer, measure the height, thickness and length of the 10 plates.

	Minimum	mm (in.)
Height	8.6	(0.339)
Thickness	1.397	(0.0550)
Length	14.991	(0.5902)



- (b) Using a feeler gauge, measure the clearance between the rotor groove and plate.

	Clearance	mm (in.)
Maximum	0.035	(0.0014)



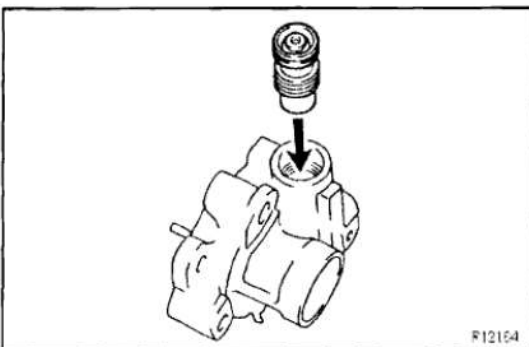
If it is more than the maximum, replace the plate and/or rotor with one having the same mark stamped on the cam ring.

Inscribed mark:

1, 2, 3, 4 or None

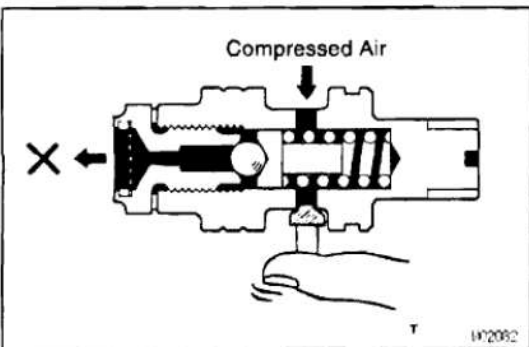
HINT: There are 5 vane plate lengths with the following rotor and cam ring marks:

Rotor and cam ring mark	Vane plate part number	Vane plate length mm (in.)
None	44345-26010	14.999 - 15.001 (0.59051 - 0.59059)
1	44345-26020	14.997 - 14.999 (0.59043 - 0.59051)
2	44345-26030	14.995 - 14.997 (0.59035 - 0.59043)
3	44345-26040	14.993 - 14.995 (0.59027 - 0.59035)
4	44345-26050	14.991 - 14.993 (0.59020 - 0.59027)



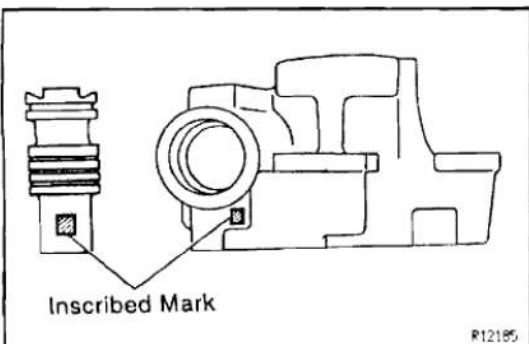
3. INSPECT FLOW CONTROL VALVE

- (a) Coat the valve with power steering fluid and check that it falls smoothly into the valve hole by its own weight.



- (b) Check the flow control valve for leakage.

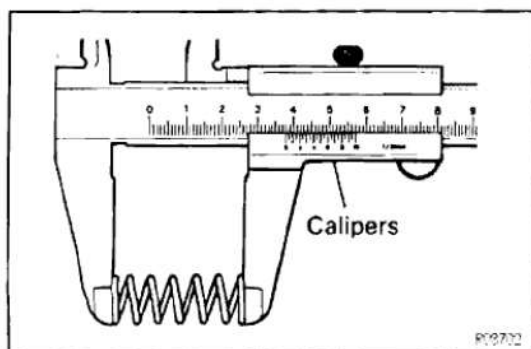
Close one of the holes and apply compressed air 392 - 490 kPa (4-5 kgf/cm², 57-71 psi) into the opposite side, and confirm that air does not come out from the end hole.



If necessary, replace the valve with one having the same letter as inscribed on the front housing.

Inscribed mark:

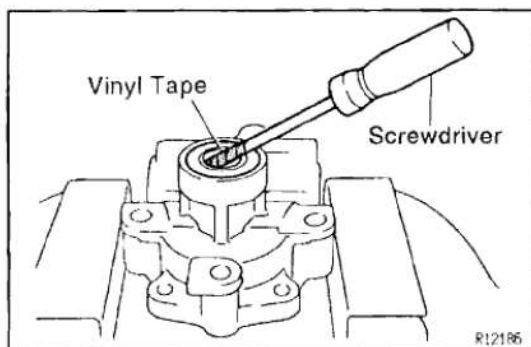
A, B, C, D, E or F

**4. INSPECT SPRING**

Using calipers, measure the free length of the spring.

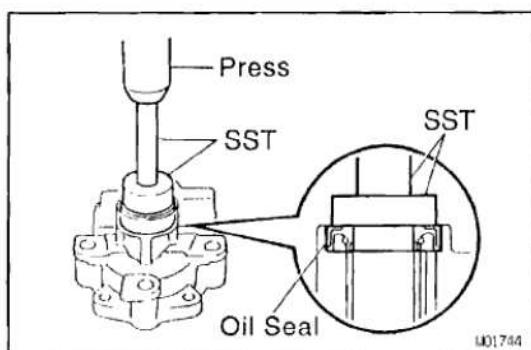
	Free length	mm (in.)
Minimum	33.2 (1.307)	

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

**5. IF NECESSARY, REPLACE OIL SEAL**

- (a) Using a screwdriver with vinyl tape wound around its tip, remove the oil seal.

NOTICE: Be careful not to damage the bushing of the front housing.



- (b) Coat a new oil seal lip with power steering fluid.

- (c) Using SST, press in the oil seal.

SST 09950—60010 (09951—00330),

09950—70010 (09951—07100)

NOTICE: Make sure to install the oil seal facing the correct direction.

SR

POWER STEERING VANE PUMP ASSEMBLY

SR1100—02

NOTICE: When using a vise, do not overtighten it.

1. COAT WITH POWER STEERING FLUID

(See page SR—48)

2. INSTALL STRAIGHT PINS

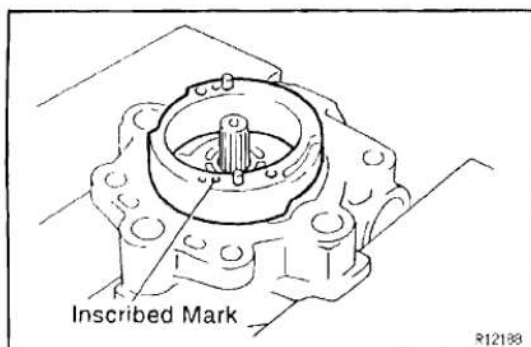
Using a plastic hammer, tap in 2 new pins to the front housing.

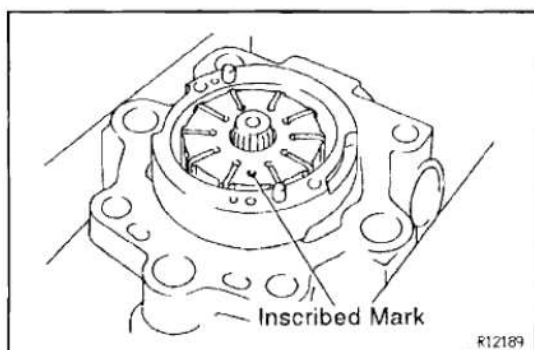
NOTICE: Be careful not to damage the pins.

3. INSTALL VANE PUMP SHAFT**4. INSTALL CAM RING**

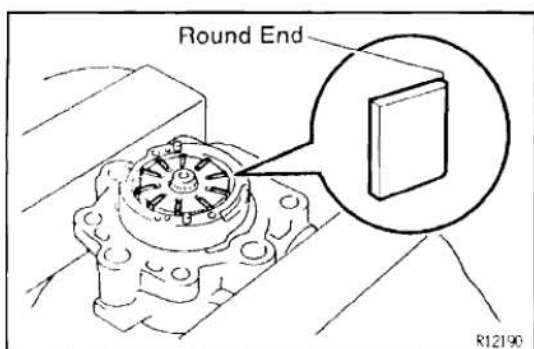
Install the ring with the inscribed mark facing outward.

HINT: Align the holes of the cam ring with the straight pins.

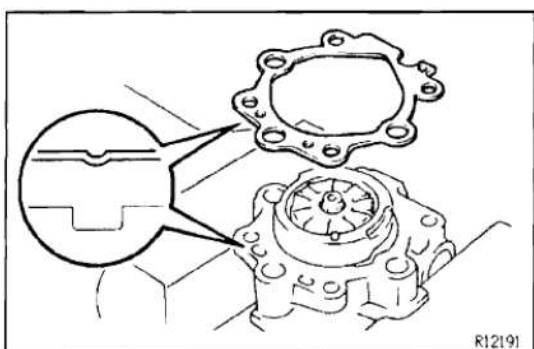


**5. INSTALL VANE PUMP ROTOR**

- (a) Install the rotor with the inscribed mark facing outward.
- (b) Install a new snap ring to the vane pump shaft.

**6. INSTALL VANE PLATES**

Install the 10 plates with the round end facing outward.

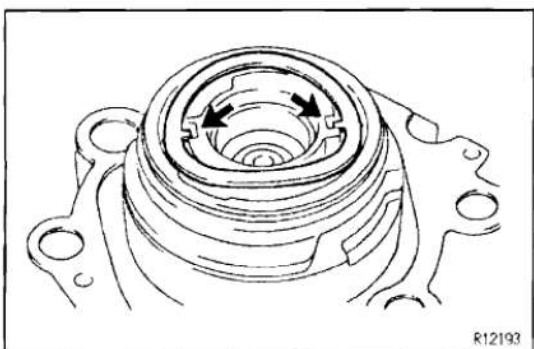
**7. INSTALL GASKET**

Install a new gasket on the front housing.

NOTICE: Be careful the direction of the gasket.

8. INSTALL SIDE PLATE

Align the 2 straight pins and holes of the plate.

**9. INSTALL WAVE WASHER**

Install the washer so that its protrusions fit into the slots in the side plate.

10. INSTALL REAR HOUSING

- (a) Coat 2 new O-rings with power steering fluid and install them to the housing.
- (b) Torque the 2 bolts.
Torque: 24 N·m (240 kgf·cm, 17 ft·lbf)

11. INSTALL SPRING, FLOW CONTROL VALVE AND PRESSURE PORT UNION

- (a) Install the valve facing the correct direction.
(See page SR-48)
- (b) Coat a new O-ring with power steering fluid and install it to the union.
- (c) Torque the union.
Torque: 83 N·m (850 kgf·cm, 62 ft·lbf)

12. INSTALL BRACKET

Torque the 2 bolts.

Torque: 43 N·m (440 kgf·cm, 32 ft·lbf)

13. INSTALL OIL RESERVOIR

(a) Coat a new O-ring with power steering fluid and install it to the oil reservoir.

(b) Install the oil reservoir with the 3 bolts.

Torque:

Front side bolt: 13 N·m (130 kgf·cm, 9 ft·lbf)

Rear side bolts: 24 N·m (240 kgf·cm, 17 ft·lbf)

14. INSTALL VANE PUMP PULLEY

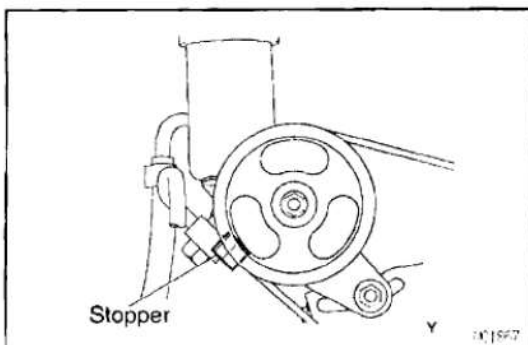
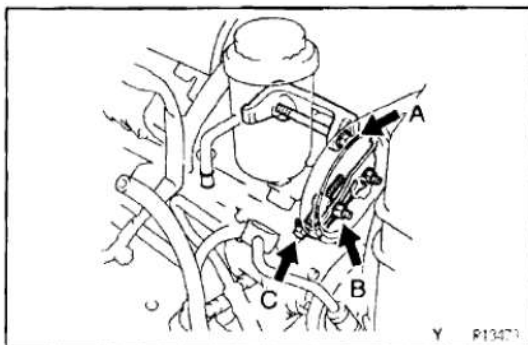
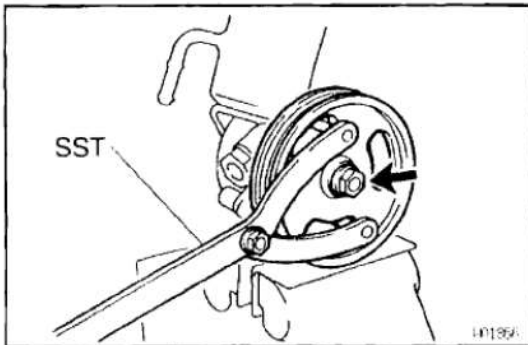
Using SST to stop the pulley rotating, torque the nut.

SST 09960-10010 (09962-01000, 09963-01000)

Torque: 43 N·m (440 kgf·cm, 32 ft·lbf)

15. MEASURE PS VANE PUMP ROTATING TORQUE

(See page SR-49)

**POWER STEERING VANE PUMP INSTALLATION****1. INSTALL PS VANE PUMP ASSEMBLY**

Temporarily tighten the bolt A and nut B.

2. INSTALL DRIVE BELT

(a) Tightening the bolt C, adjust drive belt tension.
(See page SR-8)

(b) Torque the bolt A and nut B.
Torque: 43 N·m (440 kgf·cm, 32 ft·lbf)

3. CONNECT PRESSURE FEED TUBE

Torque the union bolt with a new gasket.

Torque: 47 N·m (475 kgf·cm, 34 ft·lbf)

HINT: Make sure that the stopper of the tube is touching the PS pump body as shown, then torque the union bolt.

4. CONNECT RETURN HOSE**5. INSTALL AIR CLEANER ASSEMBLY**

(a) Tighten the 3 bolts.

(b) Connect the connector.

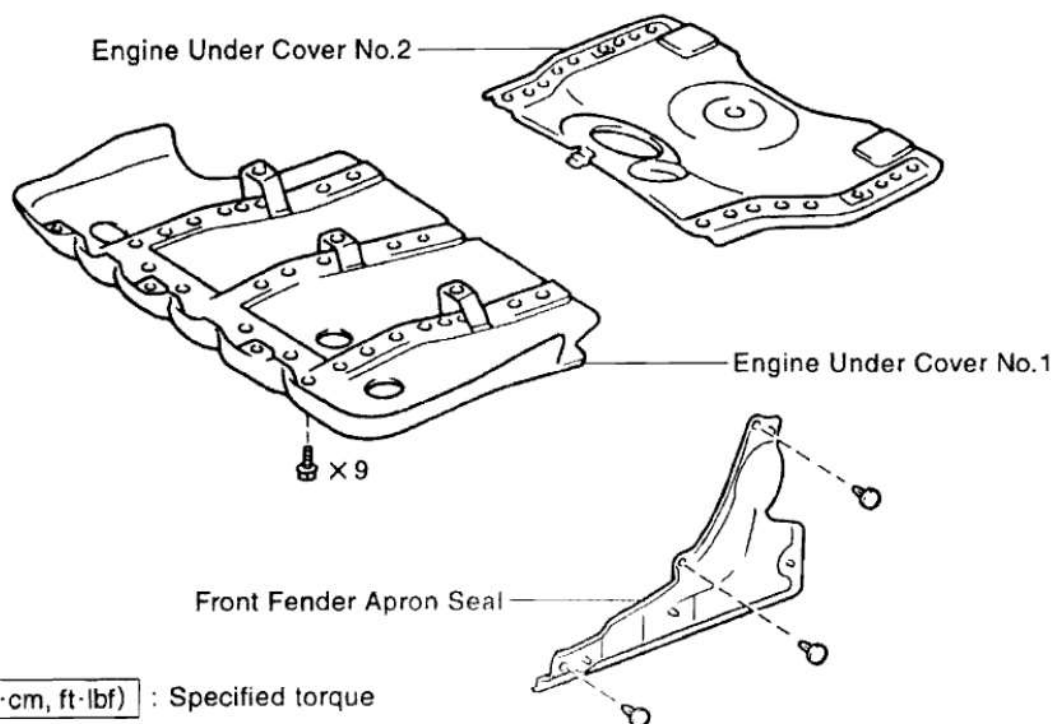
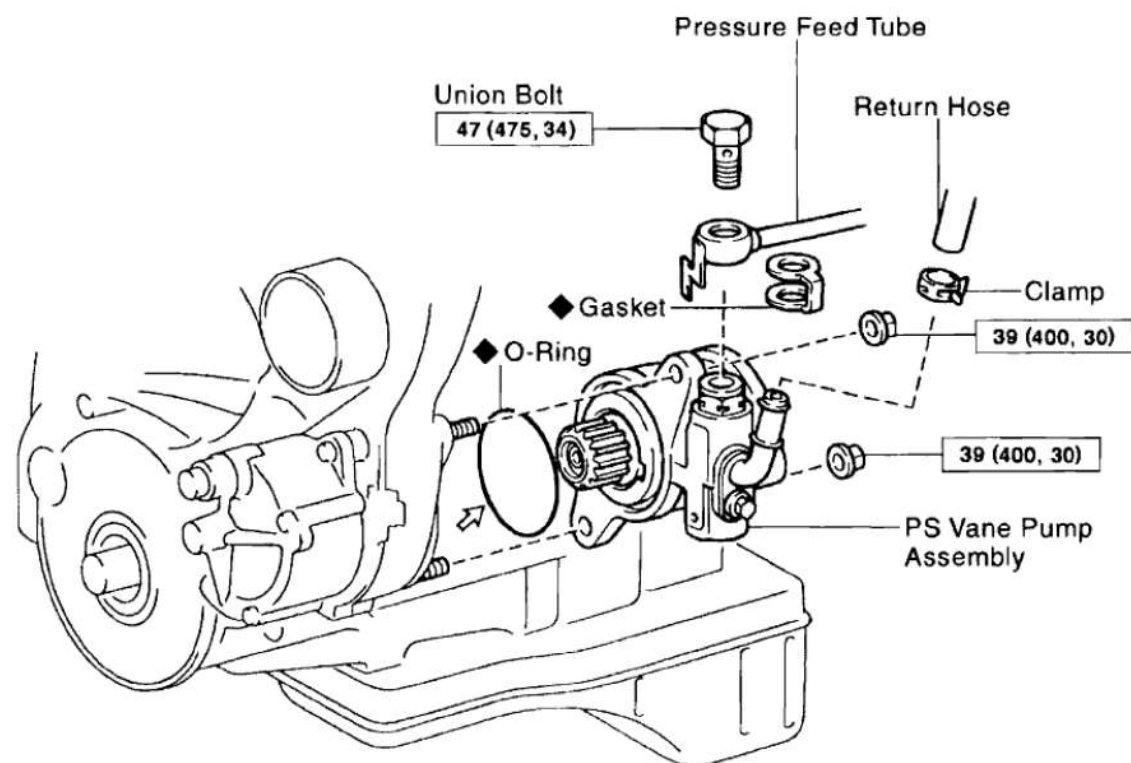
6. BLEED POWER STEERING SYSTEM

(See page SR-11)

BR101-02

POWER STEERING VANE PUMP (1KZ-T, 1KZ-TE) COMPONENTS

SR1V7-02

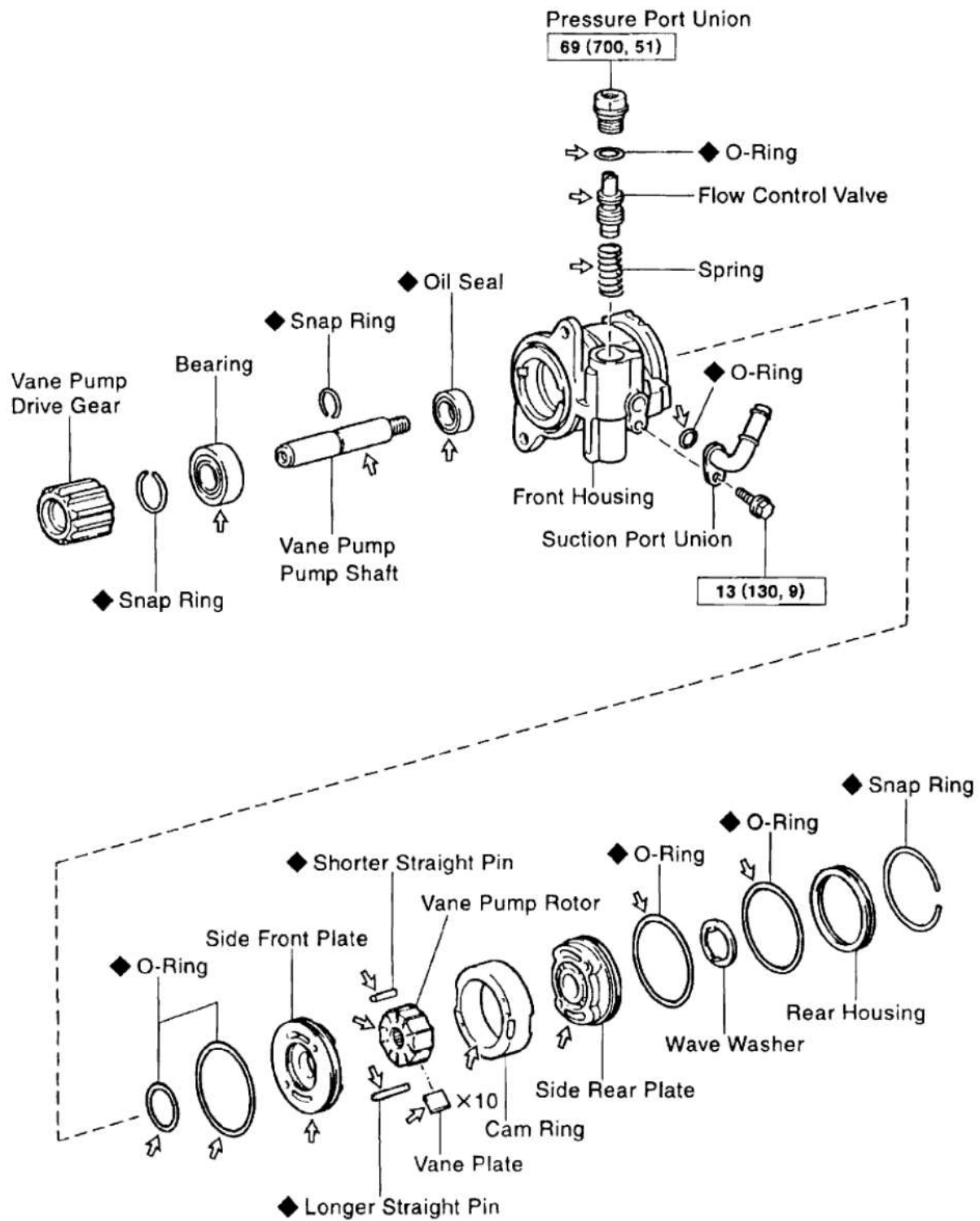


N·m (kgf·cm, ft·lbf) : Specified torque

◆ Non-reusable part

↪ Power steering fluid

U02684



POWER STEERING VANE PUMP REMOVAL**1. REMOVE ENGINE UNDER COVER NO. 1 AND ENGINE UNDER COVER NO.2**

Remove the 9 bolts.

2. REMOVE FRONT FENDER APRON SEAL

Remove the 3 clips.

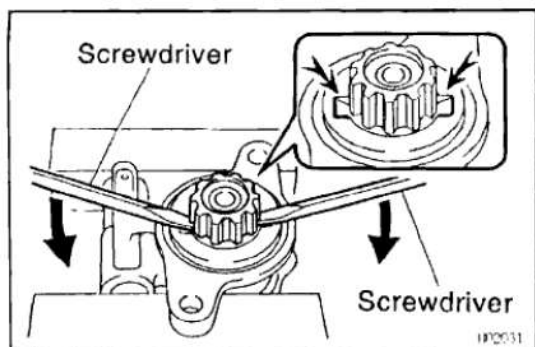
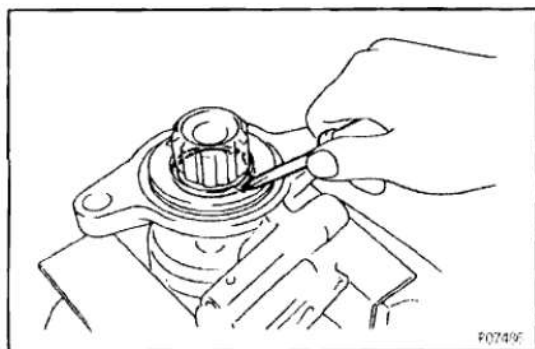
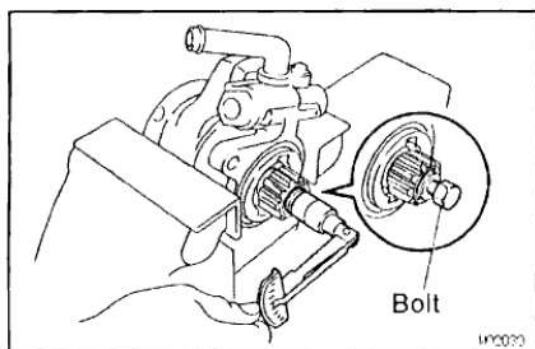
3. DISCONNECT RETURN HOSE**4. DISCONNECT PRESSURE FEED TUBE**

Remove the union bolt and gasket.

5. REMOVE PS VANE PUMP ASSEMBLY

(a) Remove the 2 nuts.

(b) Remove the O—ring from the vane pump assembly.

**POWER STEERING VANE PUMP DISASSEMBLY****NOTICE:** When using a vise, do not overtighten it.**1. MEASURE POWER STEERING VANE PUMP ROTATING TORQUE**

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

(b) Temporarily install a bolt to the shaft.

(c) Check the pump rotating torque.

Reference

Bolt: 91111—51035

Rotating torque:

0.3 N·m (2.8 kgf·cm, 2.4 in.-lbf) or less

2. REMOVE SUCTION PORT UNION

(a) Remove the bolt.

(b) Remove the O—ring from the union.

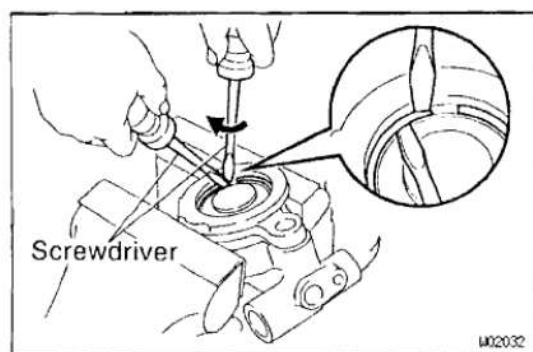
3. REMOVE VANE PUMP SHAFT AND VANE PUMP DRIVE GEAR WITH BEARING

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

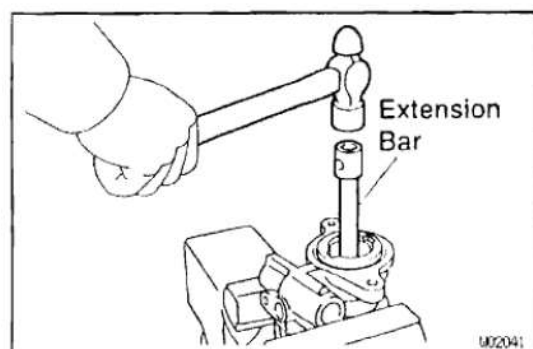
(b) Using 2 screwdrivers, remove the shaft and the gear with the bearing.

4. REMOVE PRESSURE PORT UNION, FLOW CONTROL VALVE AND SPRING

Remove the O—ring from the union.

**5. REMOVE REAR HOUSING AND WAVE WASHER**

- (a) Using 2 screwdrivers, remove the snap ring.

NOTICE: Take care not to damage the housing.

- (b) Using a hammer and extension bar, tap out the housing.

- (c) Remove the O-ring from the housing.

6. REMOVE SIDE REAR PLATE

Remove the O-ring from the plate.

7. REMOVE CAM RING, VANE PUMP ROTOR AND 10 VANE PLATES**NOTICE:** Be careful not to drop the vane plate.**8. REMOVE SHORTER STRAIGHT PIN**

Remove the pin from the side front plate.

9. REMOVE SIDE FRONT PLATE

Remove the 2 O-rings from the plate.

10. REMOVE LONGER STRAIGHT PIN

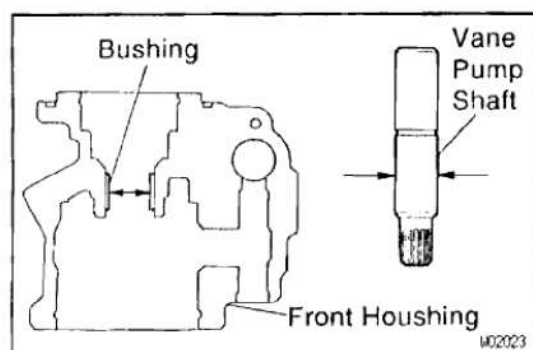
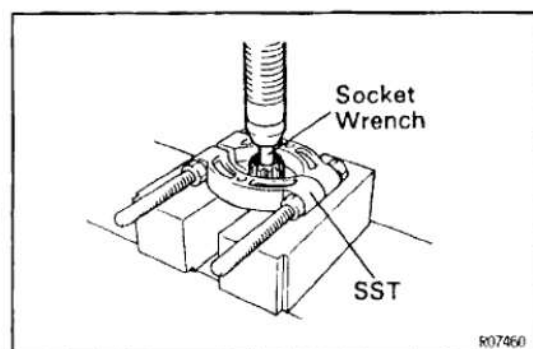
Using pliers, remove the pin from the front housing.

11. REMOVE VANE PUMP DRIVE GEAR FROM VANE PUMP SHAFT

- (a) Place the socket wrench (12 mm) on the shaft.

- (b) Using SST, press out the shaft.

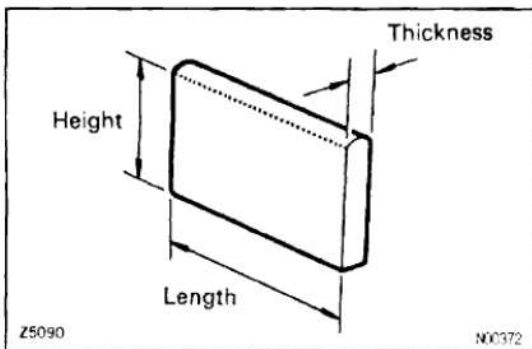
SST 09950-00020

**POWER STEERING VANE PUMP INSPECTION AND REPLACEMENT****1. MEASURE OIL CLEARANCE BETWEEN VANE PUMP SHAFT AND BUSHING**

Using a micrometer and a caliper gauge, measure the oil clearance.

	Clearance	mm (in.)
Standard	0.03 - 0.05 (0.0012 - 0.0020)	
Maximum	0.07 (0.0028)	

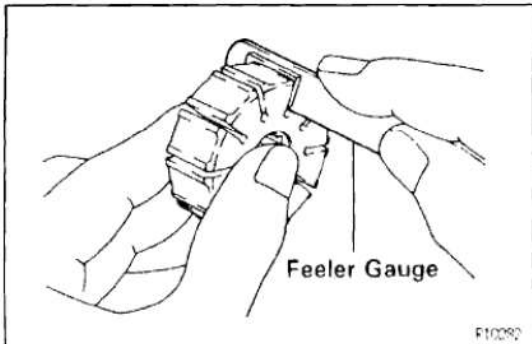
If it is more than maximum, replace the front housing and vane pump shaft.



2. INSPECT VANE PUMP ROTOR AND 10 VANE PLATES

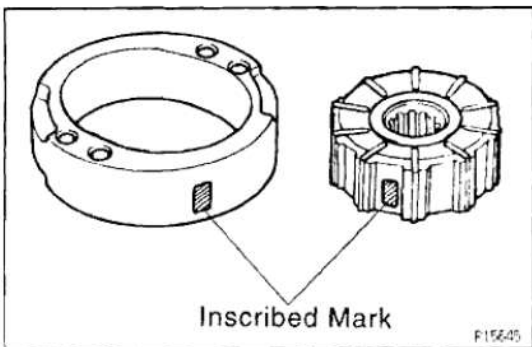
- (a) Using a micrometer, measure the height, thickness and length of the plate.

	Minimum	mm (in.)
Height	8.6 (0.339)	
Thickness	1.397 (0.0550)	
Length	14.991 (0.5902)	



- (b) Using a feeler gauge, measure the clearance between the rotor groove and plate.

	Clearance	mm (in.)
Maximum	0.035 (0.0014)	



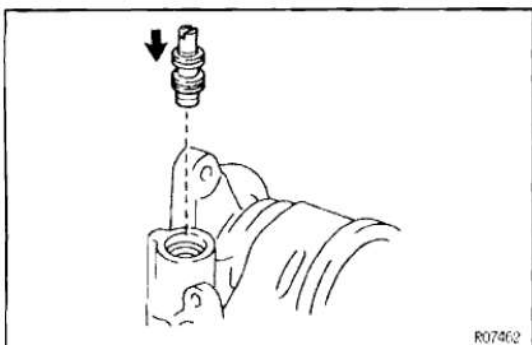
If it is more than the maximum, replace the plate and/or rotor with one having the same mark stamped on the cam ring.

Inscribed mark:

1, 2, 3, 4 or None

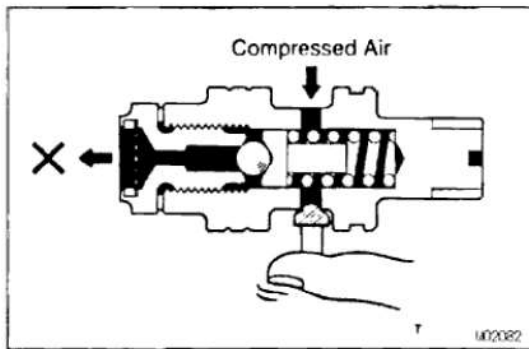
HINT: There are 5 vane plate lengths with the following rotor and cam ring marks:

Rotor and cam ring mark	Vane plate part number	Vane plate length mm (in.)
None	44345-26010	14.999-15.001 (0.59051-0.59059)
1	44345-26020	14.997-14.999 (0.59043-0.59051)
2	44345-26030	14.995-14.997 (0.59035-0.59043)
3	44345-26040	14.993-14.995 (0.59027-0.59035)
4	44345-26050	14.991-14.993 (0.59020-0.59027)

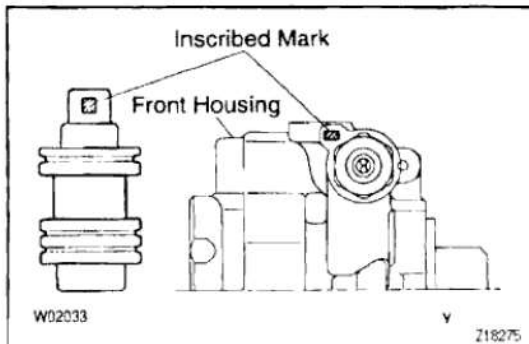


3. INSPECT FLOW CONTROL VALVE

- (a) Coat the valve with power steering fluid and check that it falls smoothly into the valve hole by its own weight.



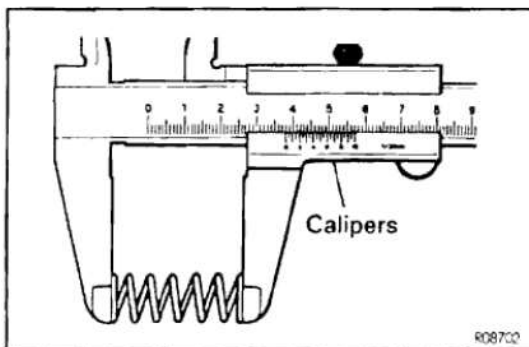
- (b) Check the flow control valve for leakage. Close one of the holes and apply compressed air 392–490 kPa (4–5 kgf/cm², 57–71 psi) into the opposite side, and confirm that air does not come out from the end hole.



If necessary, replace the valve with one having the same letter as inscribed on the front housing.

Inscribed mark:

A, B, C, D, E or F

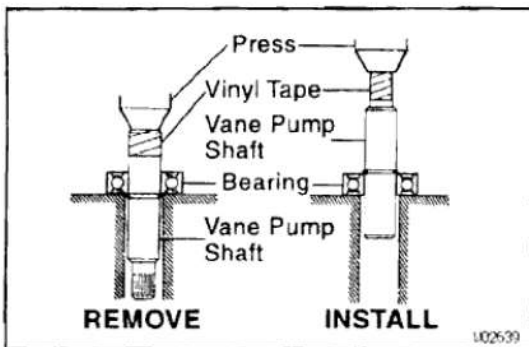


4. INSPECT SPRING

Using calipers, measure the free length of the spring.

	Free length	mm (in.)
Standard	36.9 (1.453)	

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

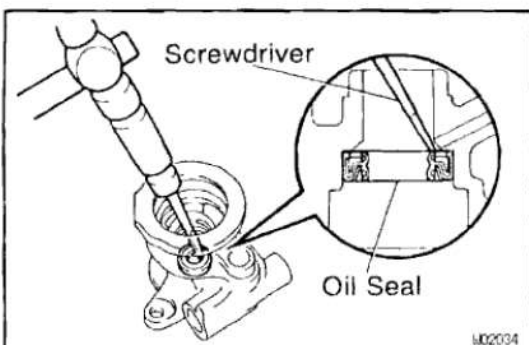


5. IF NECESSARY, REPLACE BEARING

- Press out the bearing from the shaft.
- Using a snap ring expander, replace the snap ring with a new one.

NOTICE: Be careful not to damage the shaft.

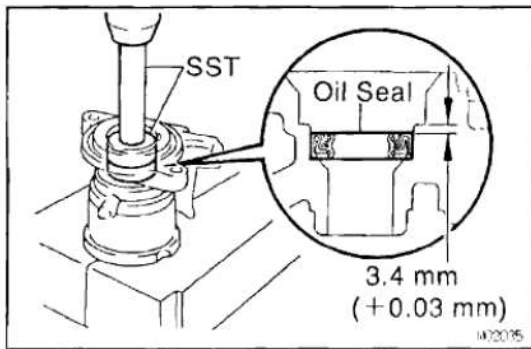
- Coat a new bearing with power steering fluid.
- Press in the bearing to the shaft.



6. IF NECESSARY, REPLACE OIL SEAL

- Using a screwdriver and a hammer, tap out the oil seal from the front housing.

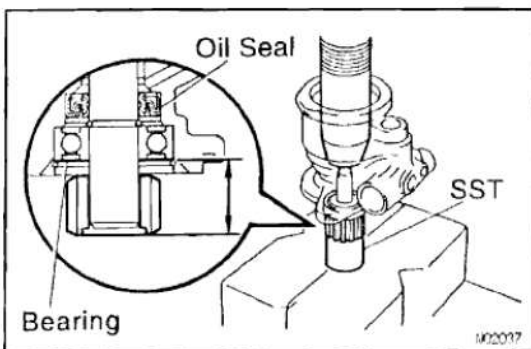
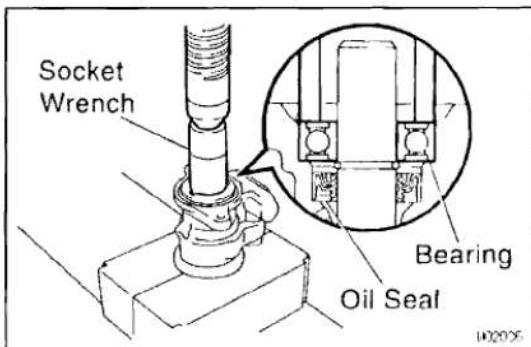
NOTICE: Be careful not to damage the housing.



- (b) Coat a new oil seal lip with power steering fluid.
 (c) Using SST, press in the oil seal.
 SST 09950-60010 (09951-00230),
 09950-70010 (09951-07100)

NOTICE:

- Make sure to install the oil seal facing the correct direction.
- Be careful not to damage the front housing.



POWER STEERING VANE PUMP ASSEMBLY

NOTICE: When using a vise, do not overtighten it.

1. COAT WITH POWER STEERING FLUID

(See page SR-56)

2. INSTALL VANE PUMP SHAFT WITH BEARING

- (a) Using a socket wrench (29 mm), press in the shaft with the bearing to the front housing.

NOTICE: Be careful not to damage the oil seal lip.

- (b) Using a snap ring expander, install a new snap ring to the pump shaft.

3. INSTALL VANE PUMP DRIVE GEAR

Using SST, press in the drive gear.

SST 09631-12031

Standard length:

25.1-26.2 mm (0.99-1.03 in.)

4. INSTALL LONGER STRAIGHT PIN

Install a new pin to the front housing.

NOTICE: Be careful not to damage the pin.

5. INSTALL SIDE FRONT PLATE

- (a) Coat 2 new O-rings with power steering fluid and install them to the plate.

- (b) Align the hole of the plate and longer straight pin.

NOTICE: Make sure to install the plate facing the correct direction.

(See page SR-56)

6. INSTALL SHORTER STRAIGHT PIN

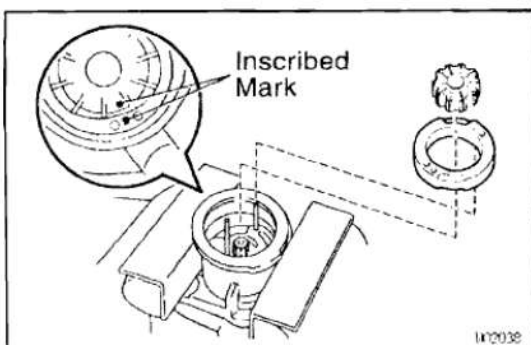
Install a new pin to the side front plate.

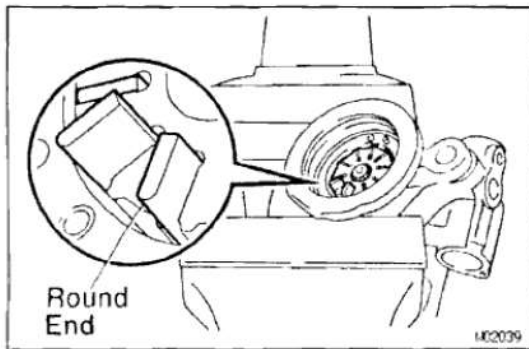
NOTICE: Be careful not to damage the pin.

7. INSTALL CAM RING AND VANE PUMP ROTOR

- (a) Align the holes of the ring and straight pins, and install the ring with the inscribed mark facing outward.

- (b) Install the rotor with the inscribed marks facing outward.

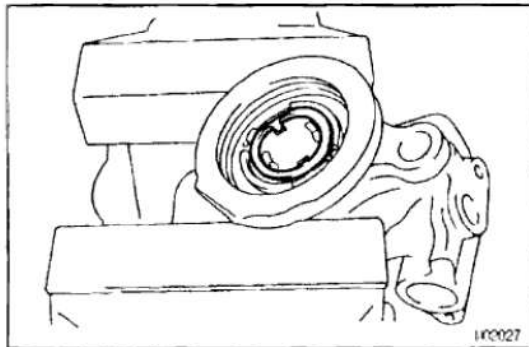


**8. INSTALL VANE PLATES**

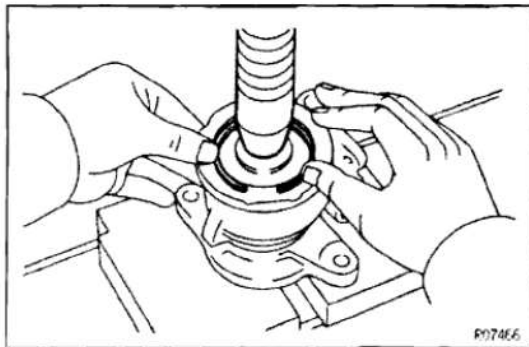
Install the 10 plates with the round end facing outward.

9. INSTALL SIDE REAR PLATE

- (a) Coat a new O-ring with power steering fluid and install it to the plate.
- (b) Align the holes of the plate and the straight pins.

**10. INSTALL WAVE WASHER**

Install the washer so that its protrusions fit into the slots in the side rear plate.

**11. INSTALL REAR HOUSING**

- (a) Coat a new O-ring with power steering fluid and install it to the housing.
- (b) Using a press, apply just enough pressure to compress the wave washer, and install a new snap ring to the front housing.

12. INSTALL SPRING, FLOW CONTROL VALVE AND PRESSURE PORT UNION

- (a) Install the valve facing the correct direction.
(See page SR-56)
- (b) Coat a new O-ring with power steering fluid and install it to the union.
- (c) Torque the union.

Torque: 69 N·m (700 kgf·cm, 51 ft·lbf)

13. MEASURE POWER STEERING PUMP ROTATING TORQUE

(See page SR-57)

14. INSTALL SUCTION PORT UNION

- (a) Coat a new O-ring with power steering fluid and install it to the union.
- (b) Torque the bolt.

Torque: 13 N·m (130 kgf·cm, 9 ft·lbf)

POWER STEERING VANE PUMP INSTALLATION

1. INSTALL PS VANE PUMP ASSEMBLY

- (a) Coat a new O—ring with power steering fluid and install it to the vane pump assembly.

- (b) Torque the 2 nuts.

Torque: 39 N·m (400 kgf·cm, 30 ft·lbf)

2. CONNECT PRESSURE FEED TUBE

Torque the union bolt with a new gasket.

Torque: 47 N·m (475 kgf·cm, 34 ft·lbf)

HINT: Make sure that the stopper of the tube is touching the PS pump body as shown, then torque the union bolt.

3. CONNECT RETURN HOSE

4. INSTALL FRONT FENDER APRON SEAL

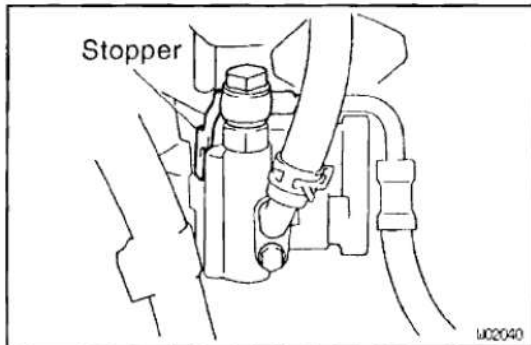
Install the 3 clips.

5. INSTALL ENGINE UNDER COVER NO. 1 AND ENGINE UNDER COVER NO.2

Tighten the 9 bolts.

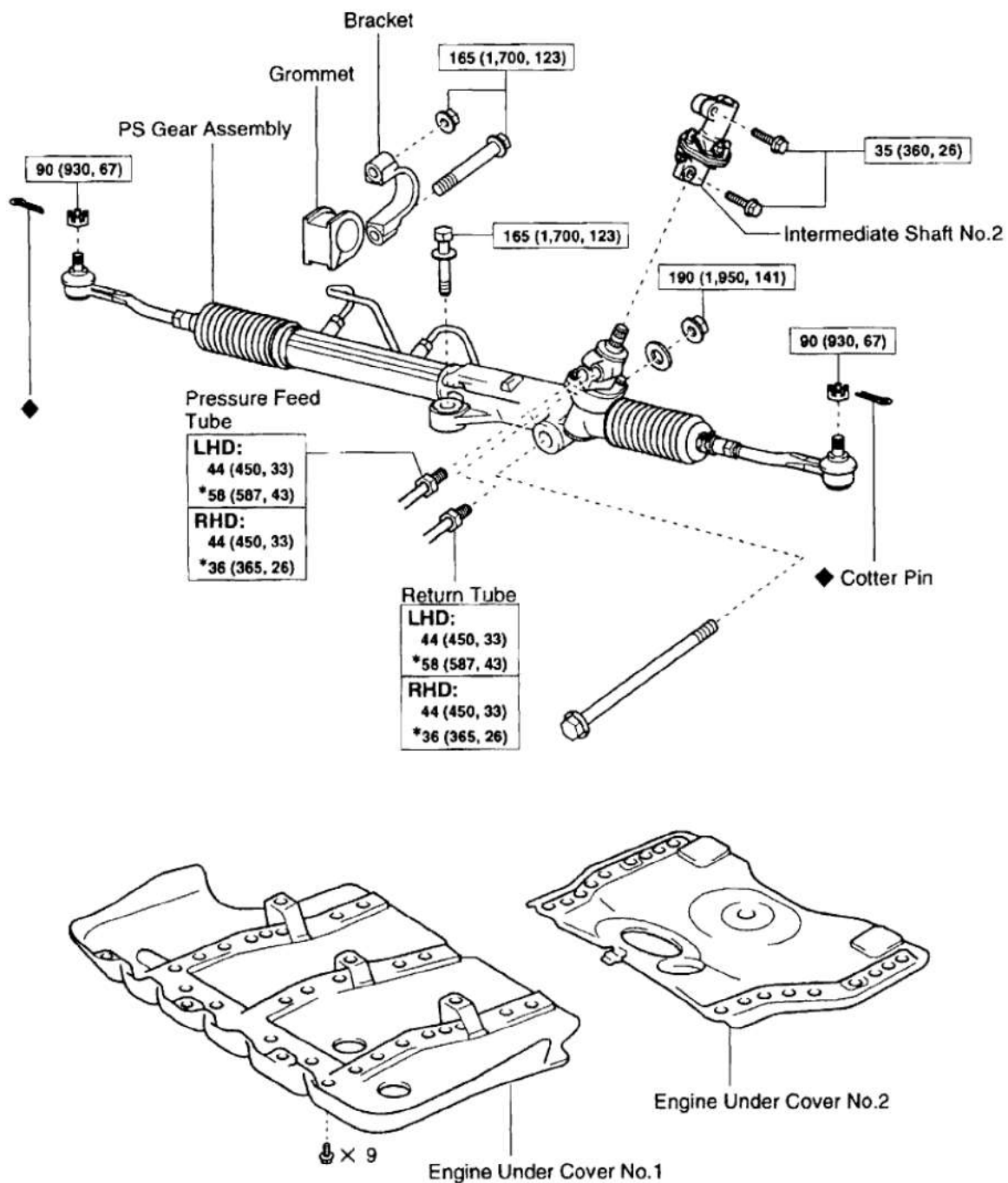
6. BLEED POWER STEERING SYSTEM

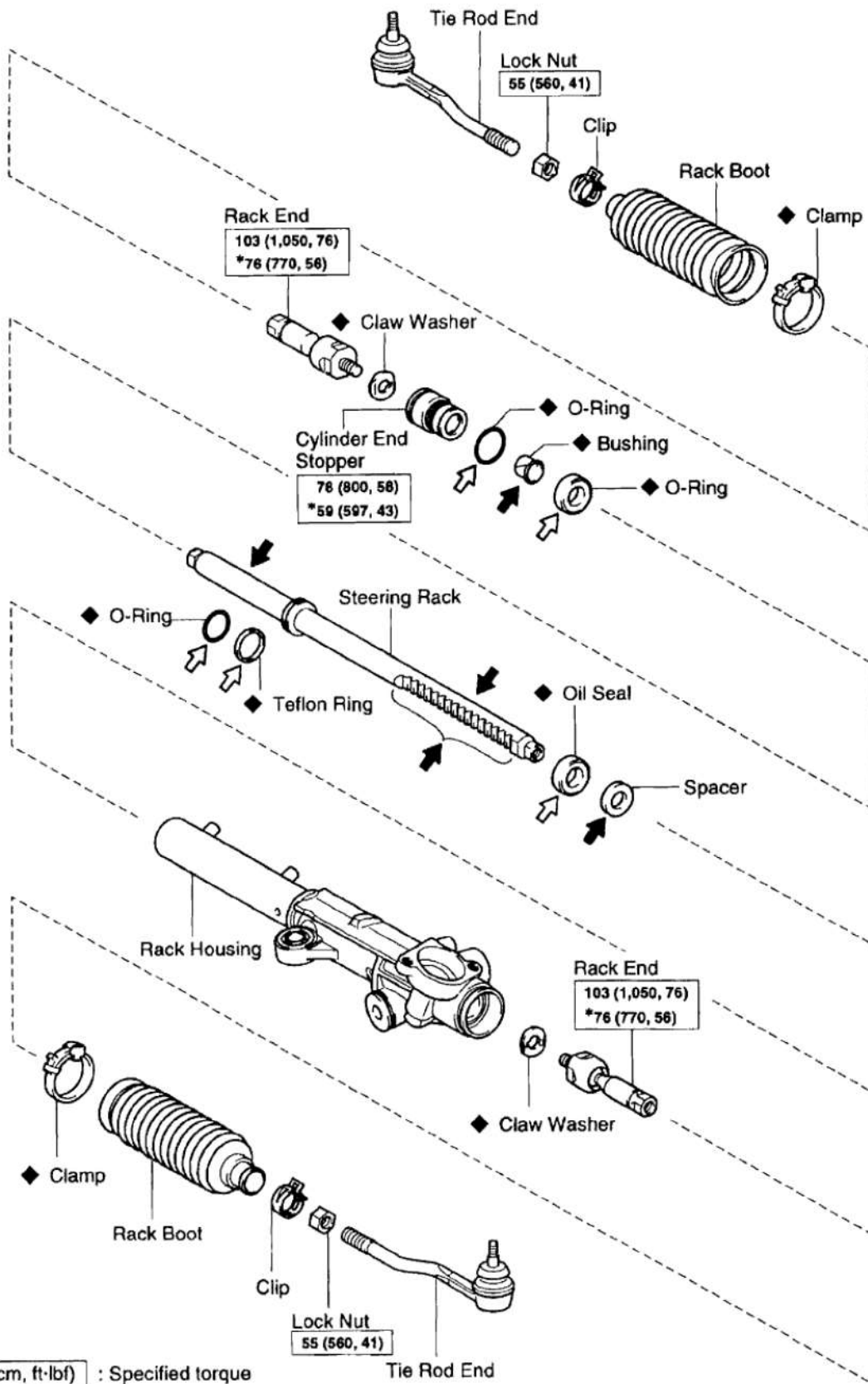
(See page SR—11)



POWER STEERING GEAR COMPONENTS

MA1UE-02





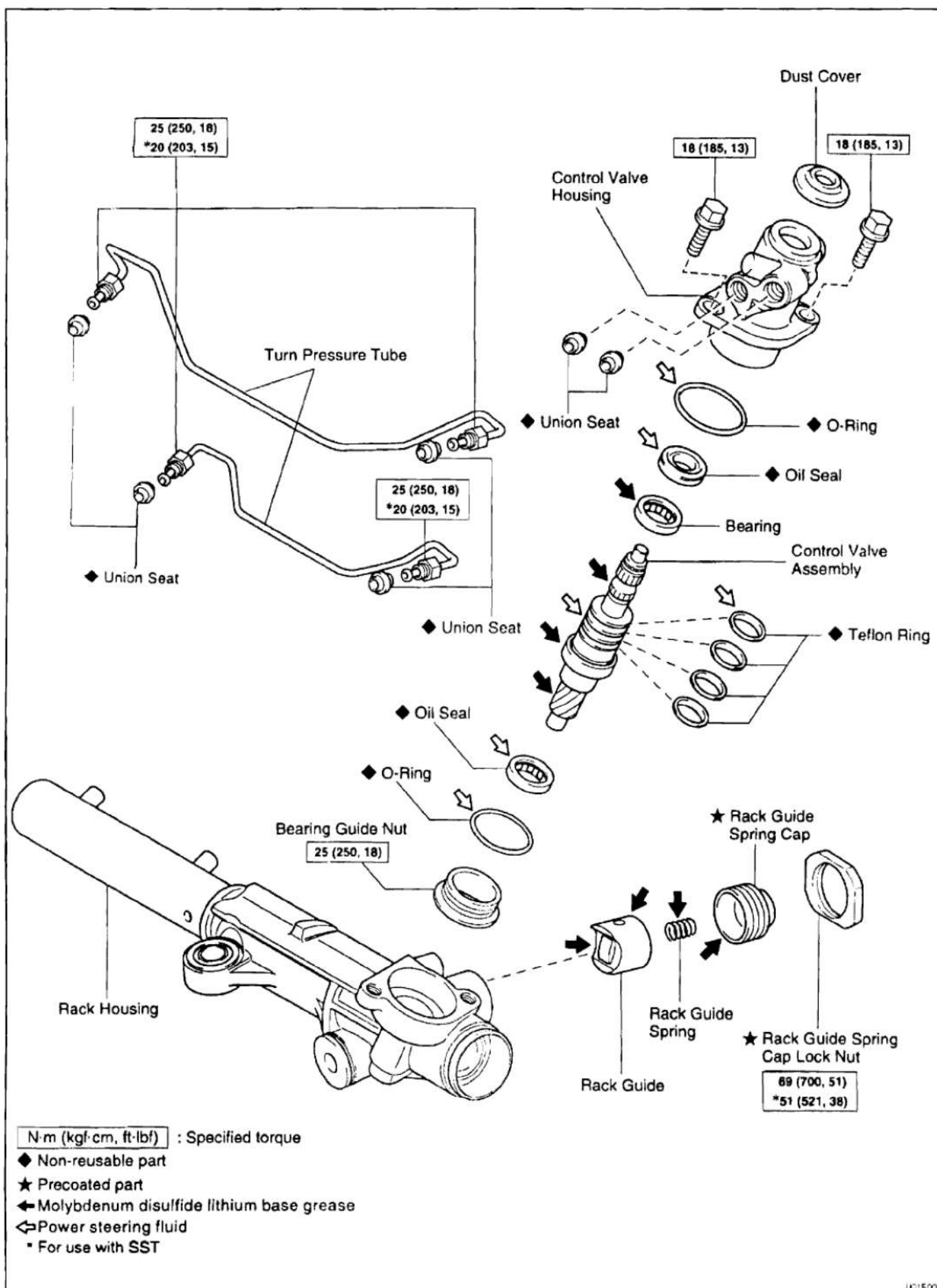
N·m (kgf·cm, ft·lbf) : Specified torque

◆ Non-reusable part

← Molybdenum disulfide lithium base grease

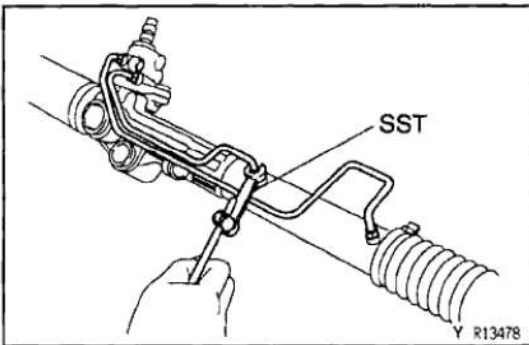
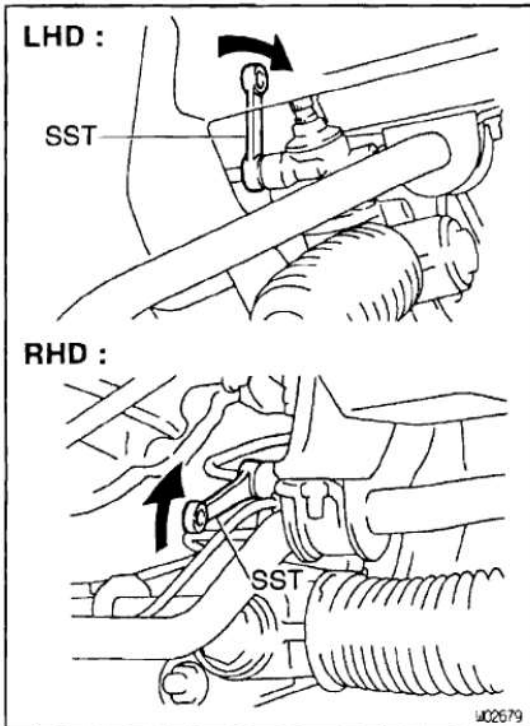
↔ Power steering fluid

* For use with SST



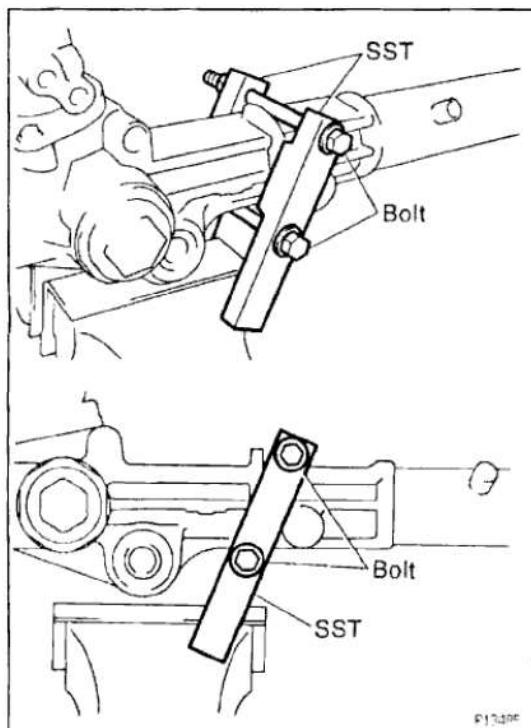
POWER STEERING GEAR REMOVAL

1. PLACE FRONT WHEELS FACING STRAIGHT AHEAD
2. w/ Airbag:
REMOVE STEERING WHEEL PAD
(See page SR-18)
3. w/ Airbag:
REMOVE STEERING WHEEL
(See page SR-18)
4. REMOVE ENGINE UNDER COVER NO. 1 AND ENGINE UNDER COVER NO.2
Remove the 9 bolts.
5. DISCONNECT RH AND LH TIE ROD ENDS
(See page SA-58)
6. REMOVE INTERMEDIATE SHAFT NO.2
(See page SR-19)
7. DISCONNECT PRESSURE FEED AND RETURN TUBES
Using SST, disconnect the tube.
SST 09631-22020
8. REMOVE PS GEAR ASSEMBLY
 - (a) Remove the bolt and nut from the bracket.
 - (b) Remove the 2 set bolts and nut.
9. REMOVE BRACKET AND GROMMET

**POWER STEERING GEAR DISASSEMBLY**

NOTICE: When using a vise, do not overtighten it.

1. REMOVE 2 TURN PRESSURE TUBES
 - (a) Using SST, remove the tube.
SST 09633-00020
 - (b) Remove the union seat from the rack housing and control valve housing.

**2. SECURE PS GEAR ASSEMBLY IN VISE**

Using SST and 2 bolts, secure the gear assembly in a vise, as shown in the illustration.

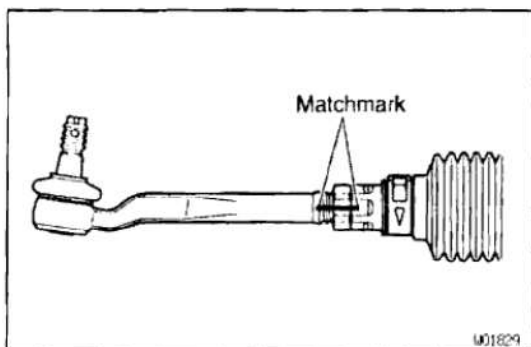
SST 09612-00012

Reference:

Bolt: 90105-10346

Nut: 90170-10198

HINT: Use 2 of the same type of SST.

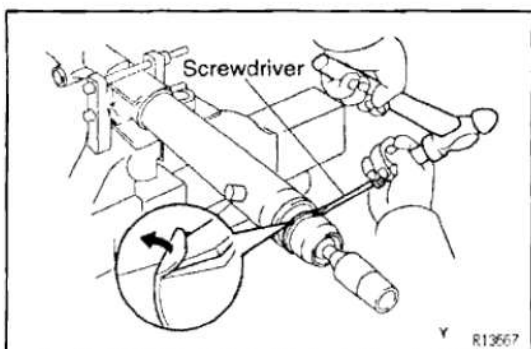
**3. REMOVE RH AND LH TIE ROD ENDS AND LOCK NUTS**

Place matchmarks on the tie rod end and rack end.

4. REMOVE RH AND LH CLIPS, RACK BOOTS AND CLAMPS

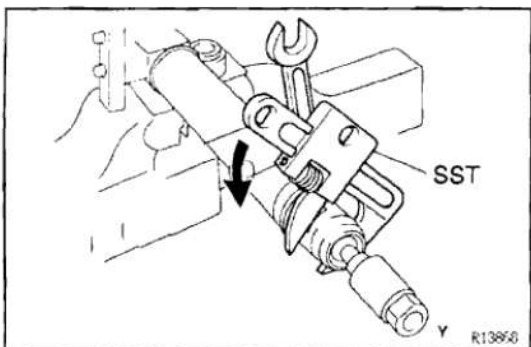
NOTICE:

- Be careful not to damage the boot.
- Mark the RH and LH boots.

**5. REMOVE RH AND LH RACK ENDS AND CLAW WASHERS**

(a) Using a screwdriver and hammer, unstake the washer.

NOTICE: Avoid any impact to the steering rack.

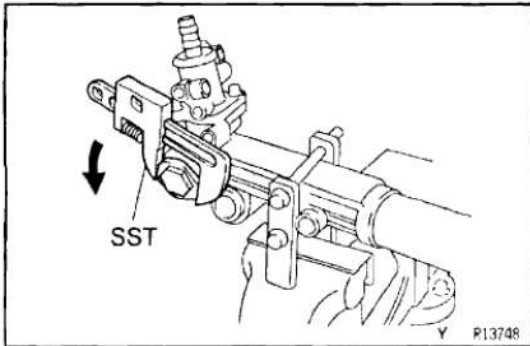


(b) Using a spanner to hold the steering rack steady, and using SST, remove the rack end.

SST 09922-10010

NOTICE:

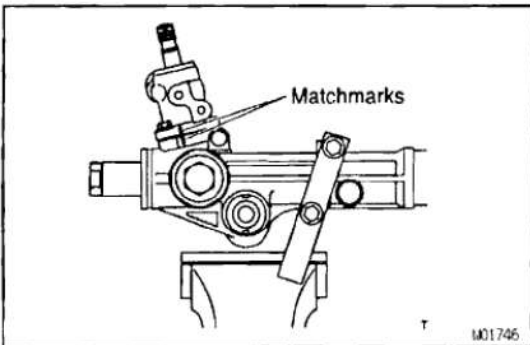
- Use SST 09922-10010 in the direction shown in the illustration.
- Mark the RH and LH rack ends.

**6. REMOVE RACK GUIDE SPRING CAP LOCK NUT**

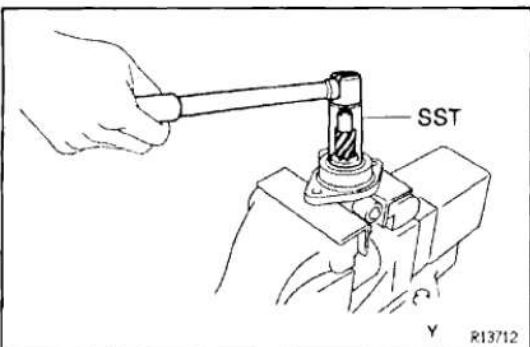
Using SST, remove the nut.

SST 09922-10010

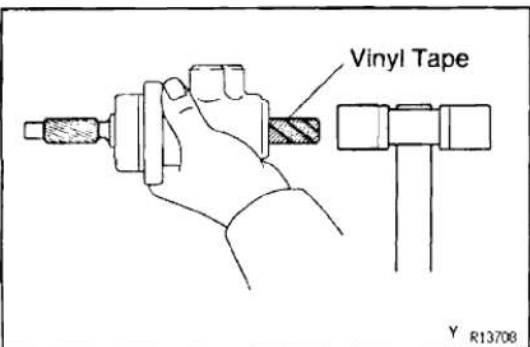
NOTICE: Use SST 09922-10010 in the direction shown in the illustration.

7. REMOVE RACK GUIDE SPRING CAP**8. REMOVE RACK GUIDE SPRING AND RACK GUIDE****9. REMOVE DUST COVER****10. REMOVE CONTROL VALVE HOUSING WITH CONTROL VALVE ASSEMBLY**

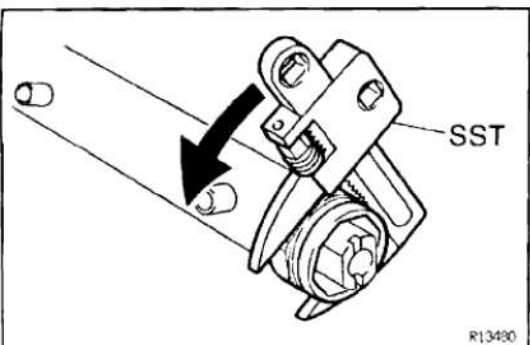
- (a) Place matchmarks on the valve housing and rack housing.
- (b) Remove the 2 bolts.
- (c) Pull out the control valve assembly with the valve housing.
- (d) Remove the O-ring from the rack housing.

**11. REMOVE CONTROL VALVE ASSEMBLY**

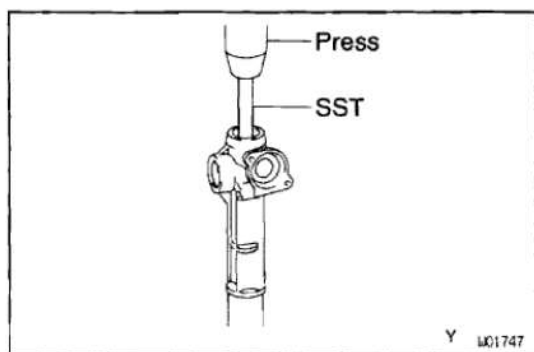
- (a) Using SST, loosen the bearing guide nut.
SST 09631-20060



- (b) Wind vinyl tape to the control valve shaft.
- (c) Using a plastic hammer, tap out the valve assembly with the nut from the control valve housing.
NOTICE: Be careful not to damage the oil seal lip.
- (d) Remove the nut from the valve assembly.
NOTICE: Be careful not to damage the oil seal lip.
- (e) Remove the O-ring from the nut.

**12. REMOVE CYLINDER END STOPPER**

- (a) Using SST, remove the stopper.
SST 09922-10010
NOTICE: Use SST 09922-10010 in the direction shown in the illustration.
- (b) Remove the O-ring from the stopper.

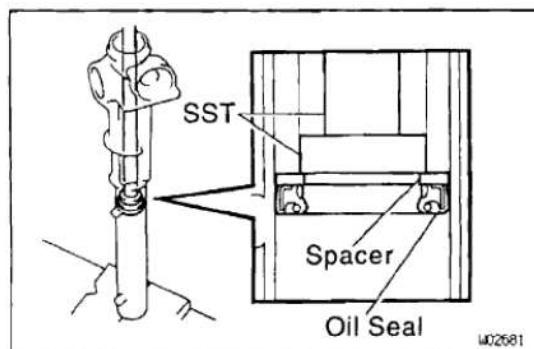
**13. REMOVE STEERING RACK AND OIL SEAL**

- (a) Using SST, press out the rack and oil seal.

NOTICE: Take care not to drop the rack.

SST 09950-70010 (09951-07360)

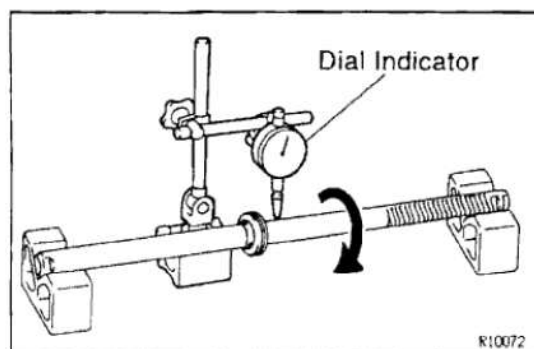
- (b) Remove the oil seal from the rack.

**14. REMOVE OIL SEAL AND SPACER**

Using SST, press out the oil seal and spacer.

SST 09950-60010 (09951-00360),

09950-70010 (09951-07360)

**POWER STEERING GEAR INSPECTION AND REPLACEMENT****1. INSPECT STEERING RACK**

- (a) Using a dial indicator, check the rack for runout and for teeth wear and damage.

	Runout	mm (in.)
Maximum	0.03 (0.0012)	

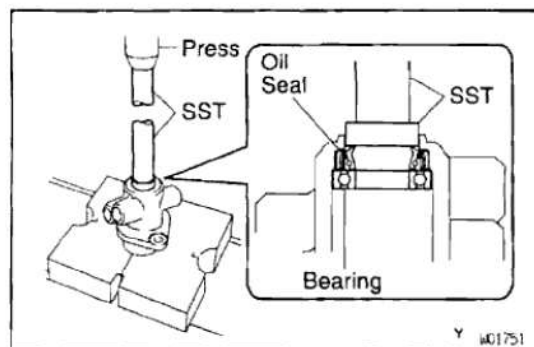
- (b) Check the back surface for wear and damage.

2. IF NECESSARY, REPLACE OIL SEAL AND BEARING

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

SST 09950-60010 (09951-00250),

09950-70010 (09951-07150)



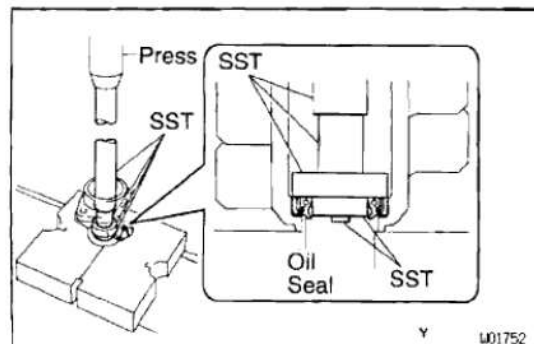
- (b) Coat a new oil seal lip with power steering fluid.

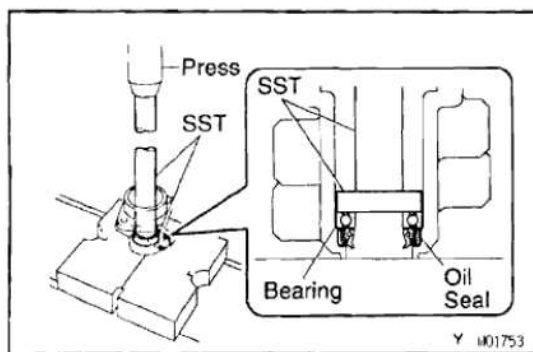
- (c) Using SST, press in the oil seal.

SST 09950-60010 (09951-00180, 09951-00320,
09952-06010),

09950-70010 (09951-07150)

NOTICE: Make sure to install the oil seal facing the correct direction.

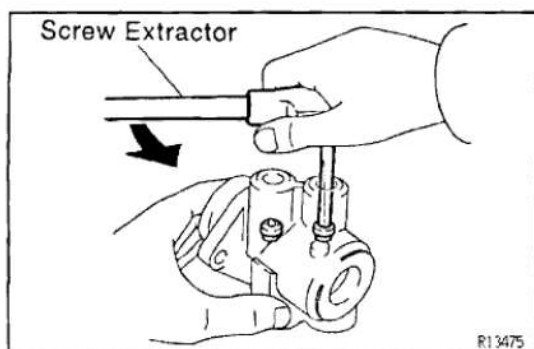




- (d) Coat a new bearing with molybdenum disulfide lithium base grease.
- (e) Using SST, press in the bearing.
SST 09950-60010 (09951-00330),
09950-70010 (09951-07150)

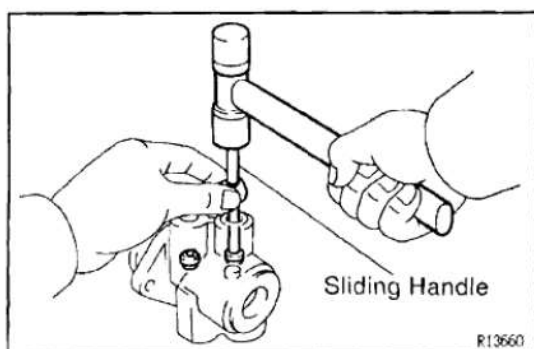
3. IF NECESSARY, REPLACE UNION SEATS

- (a) Using a screw extractor, remove the 2 seats from the control valve housing.



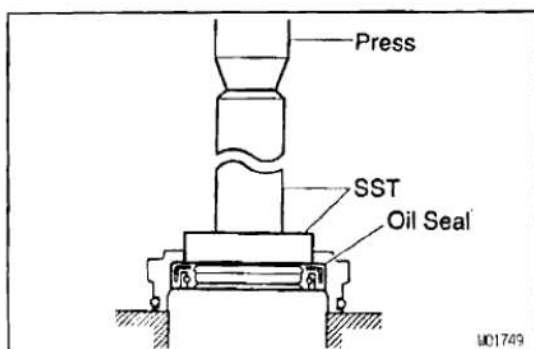
- (b) Using a plastic hammer and sliding handle, lightly tap in 2 new seats.

NOTICE: Before installing the union seat, remove dust sticking to the control valve housing.

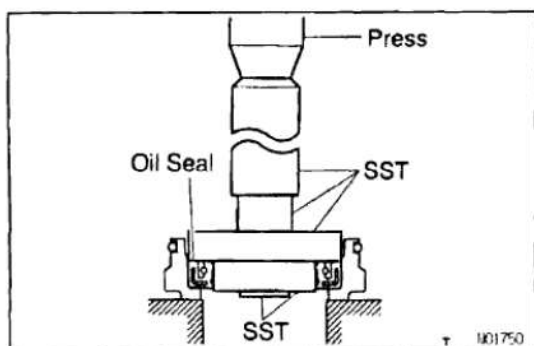


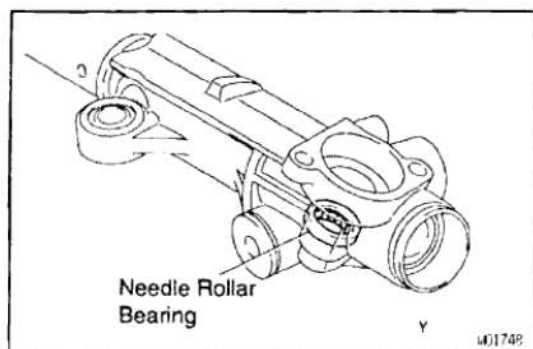
4. IF NECESSARY, REPLACE OIL SEAL

- (a) Using SST, press in the oil seal from the bearing guide nut.
SST 09950-60010 (09951-00320),
09950-70010 (09951-07100)

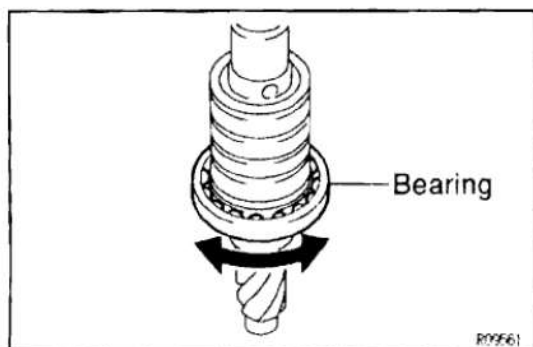


- (b) Coat a new oil seal lip with power steering fluid.
 - (c) Using SST, press in the oil seal.
SST 09950-60010 (09951-00280, 09951-00360,
09952-06010),
09950-70010 (09951-07100)
- NOTICE:** Make sure to install the oil seal facing the correct direction.

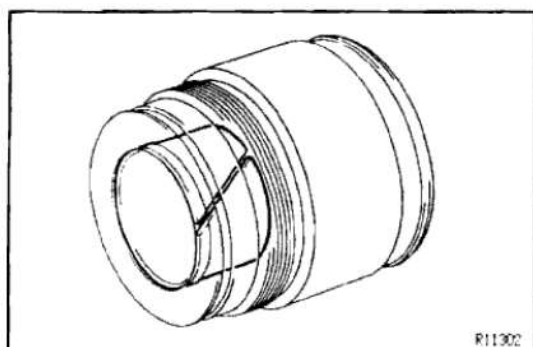


**5. INSPECT BEARING**

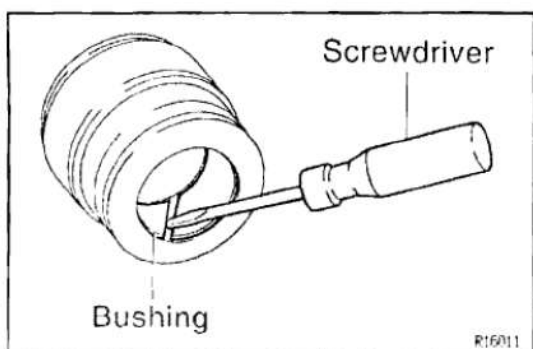
- (a) Check the needle roller bearing of the rack housing for pitmarks or damage. If faulty, replace the rack housing.
- (b) Coat the inside of the bearing with molybdenum disulfide lithium base grease.

**6. INSPECT BEARING**

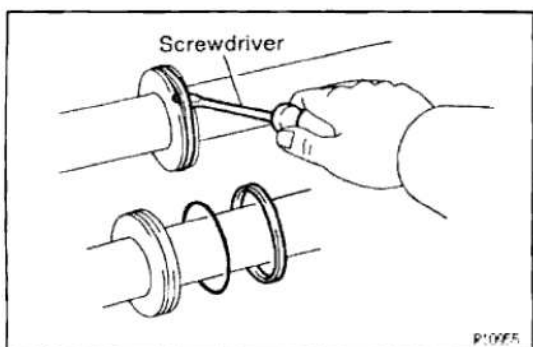
- (a) Check the bearing rotation condition and check for abnormal noise. If the bearing is worn or damaged, replace the control valve assembly.
- (b) Coat the bearing with molybdenum disulfide lithium base grease.

**7. INSPECT BUSHING**

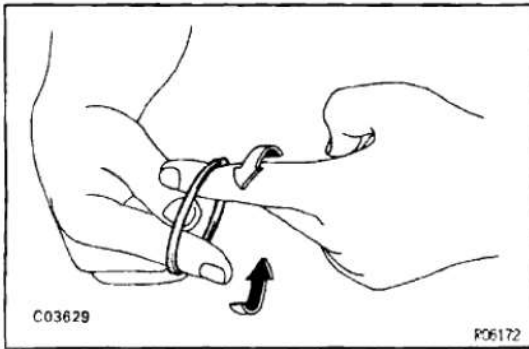
- (a) Check the inside of the bushing of the cylinder end stopper for cracks. If faulty, replace the bushing.
- (b) Apply molybdenum disulfide lithium base grease to the inside of the bushing.

**8. IF NECESSARY, REPLACE BUSHING**

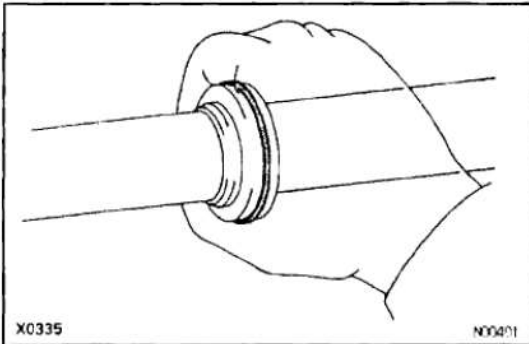
- (a) Using a screwdriver, remove the bushing from the cylinder end stopper.
NOTICE: Be careful not to damage the cylinder end stopper.
- (b) Coat the inside of a new bushing with molybdenum disulfide lithium base grease.
- (c) Install the bushing.

**9. IF NECESSARY, REPLACE TEFLON RING AND O-RING**

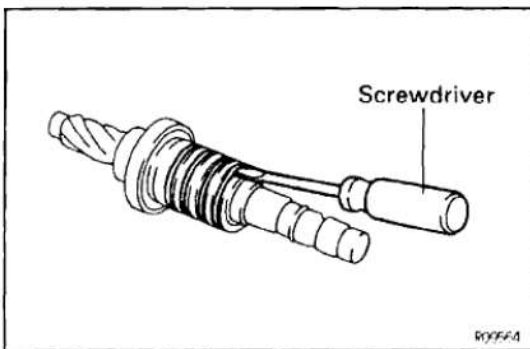
- (a) Using a screwdriver, remove the teflon ring and O-ring from the steering rack.
NOTICE: Be careful not to damage the groove for the ring.
- (b) Coat a new O-ring with power steering fluid and install it.



- (c) Expand a new teflon ring with your fingers.
NOTICE: Be careful not to overexpand the ring.



- (d) Coat the ring with power steering fluid.
 (e) Install the ring to the rack, and snug it down with your fingers.

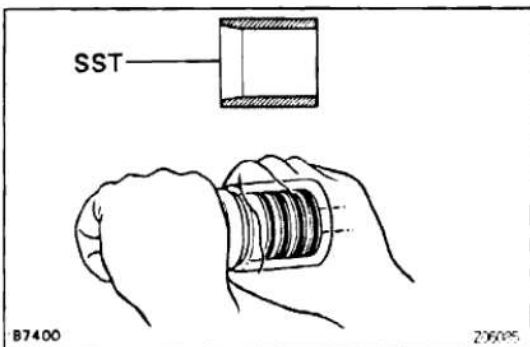


10. IF NECESSARY, REPLACE TEFLON RINGS

- (a) Using a screwdriver, remove the 4 rings from the control valve assembly.

NOTICE: Be careful not to damage the grooves for the ring.

- (b) Expand 4 new rings with your fingers.
NOTICE: Be careful not to overexpand the ring.
 (c) Coat the rings with power steering fluid.



- (d) Install the rings to the control valve assembly, and snug them down with your fingers.
 (e) Carefully slide the tapered end of SST over the rings to seat them.

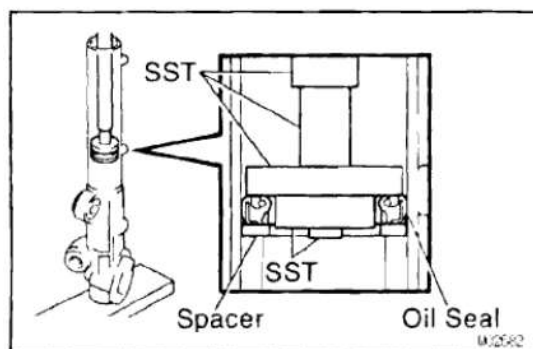
SST 09631-20081

NOTICE: Be careful not to damage the rings.

POWER STEERING GEAR ASSEMBLY

NOTICE: When using a vise, do not overtighten it.

1. **COAT WITH POWER STEERING FLUID OR MOLYBDENUM DISULFIDE LITHIUM BASE GREASE**
(See pages SR-65 and 66)



2. **INSTALL SPACER AND OIL SEAL**

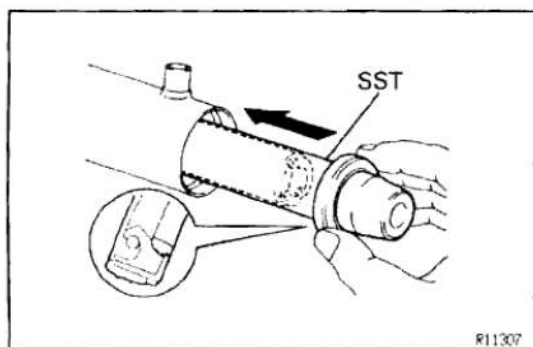
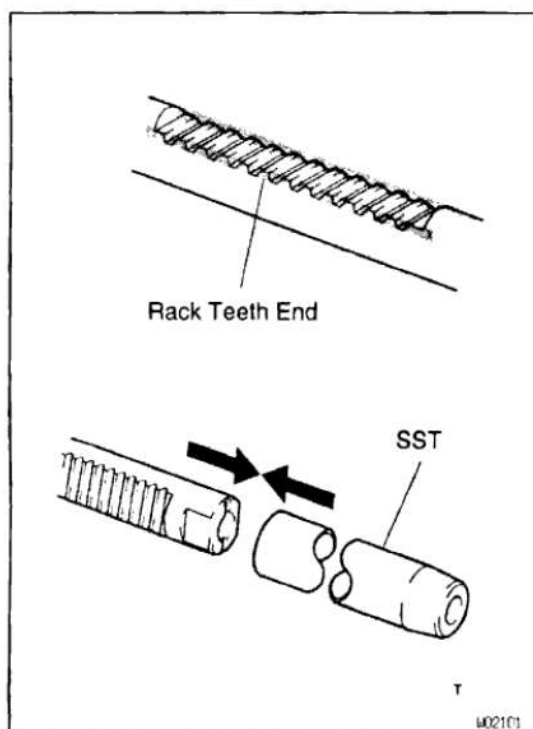
- (a) Coat a new oil seal lip with power steering fluid.
- (b) Using SST, press in the oil seal and spacer.
SST 09951-60010 (09951-00330, 09951-00490, 09952-06010),
09950-70010 (09951-07360)

NOTICE:

- Make sure to install the oil seal facing the correct direction.
- Take care that the oil seal does not get reversed as you install it.

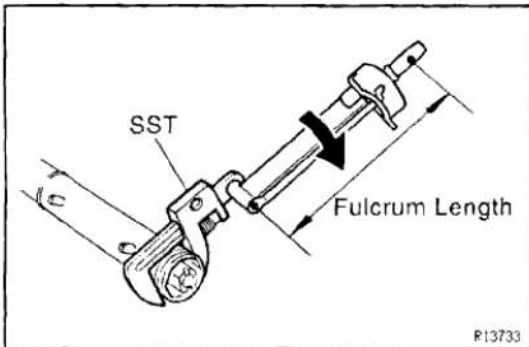
3. **INSTALL STEERING RACK**

- (a) Install SST to the rack.
SST 09631-00350
HINT: If necessary, scrape the burrs off the rack teeth end and burnish.
- (b) Coat SST with power steering fluid.
- (c) Install the rack into the rack housing.
- (d) Remove the SST.



4. **INSTALL OIL SEAL**

- (a) Install SST to the steering rack opposite end.
SST 09631-00350
- (b) Coat SST with power steering fluid.
- (c) Coat a new oil seal lip with power steering fluid.
- (d) Install the oil seal by pushing it onto the SST without tilting.
NOTICE: Make sure to install the oil seal facing the correct direction.
- (e) Remove the SST.



5. INSTALL CYLINDER END STOPPER

- (a) Coat a new O-ring with power steering fluid, and install it to the stopper.
- (b) Using SST, torque the stopper.

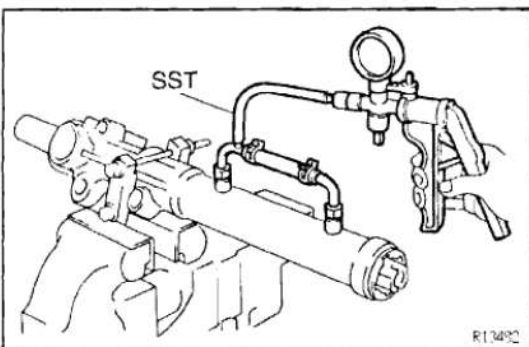
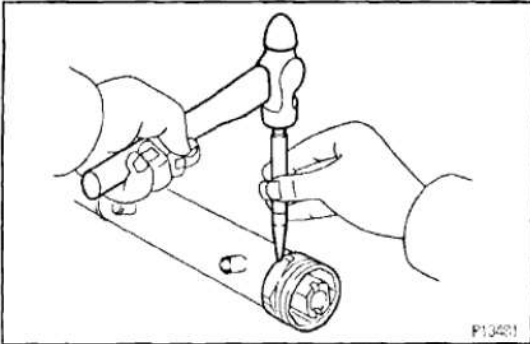
SST 09922-10010

Torque: 59 N·m (597 kgf·cm, 43 ft·lbf)

NOTICE: Use SST 09922-10010 in the direction shown in the illustration.

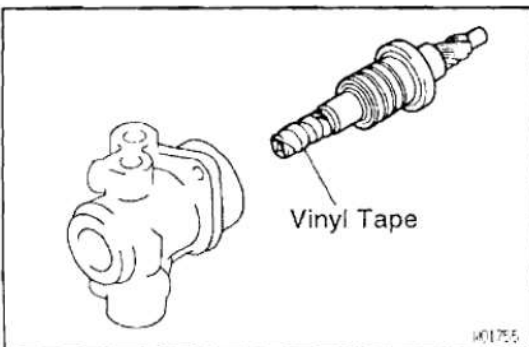
HINT: Use a torque wrench with a fulcrum length of 345 mm (13.58 in.).

- (c) Using a punch and hammer, stake the rack housing.



6. AIR TIGHTNESS TEST

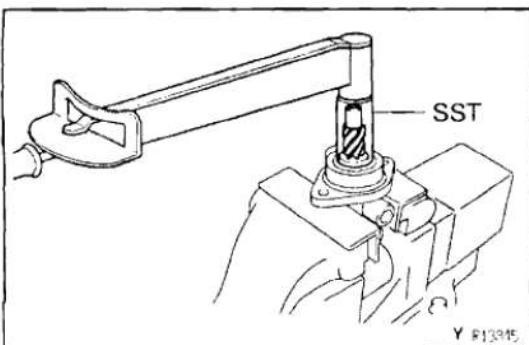
- (a) Install SST to the unions of the rack housing.
SST 09631-12071
- (b) Apply 53 kPa (400 mmHg, 15.75 in.Hg) of vacuum for about 30 seconds.
- (c) Check that there is no change in the vacuum.
If there is change in the vacuum, check the installation of the oil seals.



7. INSTALL CONTROL VALVE ASSEMBLY

- (a) Coat the teflon rings with power steering fluid.
- (b) To prevent oil seal lip damage, wind vinyl tape on the serrated part of the control valve shaft.
- (c) Push the valve assembly into the control valve housing.

NOTICE: Be careful not to damage the teflon rings and oil seal lip.

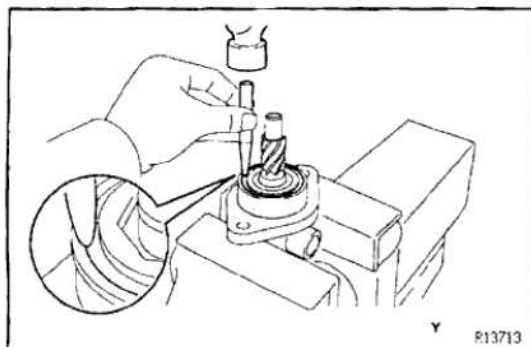


- (d) Coat a new O-ring with power steering fluid, and install it to the bearing guide nut.
- (e) Using SST, torque the nut.

SST 09631-20060

Torque: 25 N·m (250 kgf·cm, 18 ft·lbf)

NOTICE: Be careful not to damage the oil seal lip.



(f) Using a punch, stake the nut.

8. INSTALL CONTROL VALVE HOUSING WITH CONTROL VALVE ASSEMBLY

- Coat a new O-ring with power steering fluid, and install it to the valve housing.
- Align the matchmarks on the valve housing and rack housing, and install the valve housing with the valve assembly to the rack housing.
- Torque the 2 bolts.

Torque: 18 N·m (185 kgf·cm, 13 ft·lbf)

9. INSTALL DUST COVER

10. INSTALL RACK GUIDE, RACK GUIDE SPRING AND RACK GUIDE SPRING CAP

- Apply sealant to 2 or 3 threads of the cap.

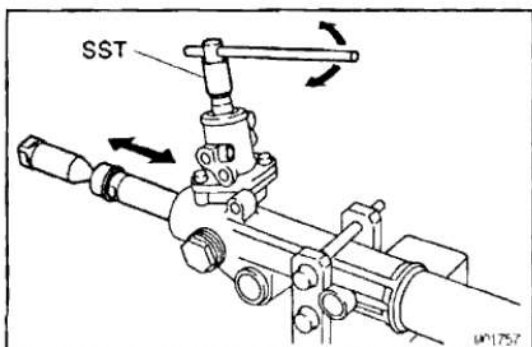
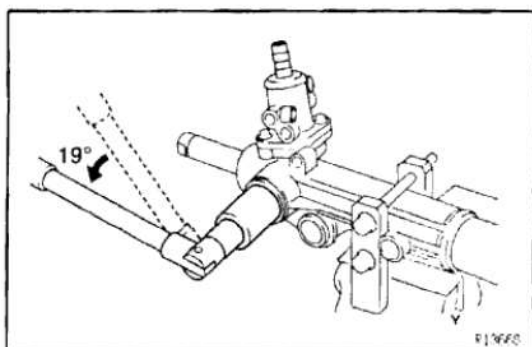
Sealant:

Part No. 08833-00080, THREE BOND 1344,
LOCTITE 242 or equivalent

- Temporarily install the cap.

11. ADJUST TOTAL PRELOAD

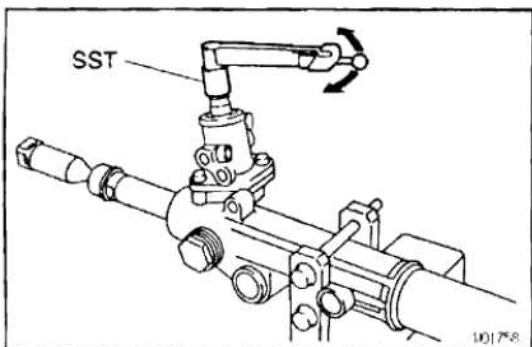
- To prevent the steering rack teeth from damaging the oil seal lip, temporarily install the RH and LH rack ends.
- Torque the rack guide spring cap.
Torque: 25 N·m (250 kgf·cm, 18 ft·lbf)
- Return the cap 19°.



- Using SST, turn the control valve shaft right and left 1 or 2 times.

SST 09616-00010

- Loosen the cap until the rack guide spring is not functioning.

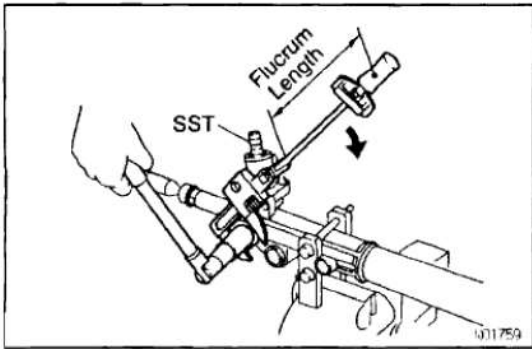


- Using SST and a torque wrench, tighten the cap until the preload is within specification.

SST 09616-00010

Preload (turning):

0.5–1.6 N·m (5–16.5 kgf·cm, 4.3–14.3 in·lbf)

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

- (a) Apply sealant to 2 or 3 threads of the nut.

Sealant:

Part No.08833-00080, THREE BOND 1344,
LOCTITE 242 or equivalent

- (b) Holding the rack guide spring cap rotating, and using SST, torque the nut.

SST 09922-10010

Torque: 51 N·m (521 kgf·cm, 38 ft·lbf)

NOTICE: Use SST 09922-10010 in the direction shown in the illustration.

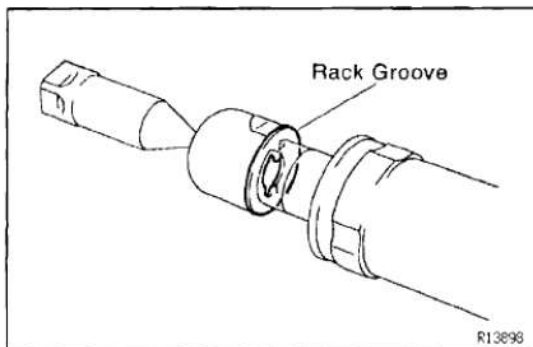
HINT: Use a torque wrench with a fulcrum length of 345 mm (13.58 in.).

- (c) Recheck the total preload.

Preload (turning):

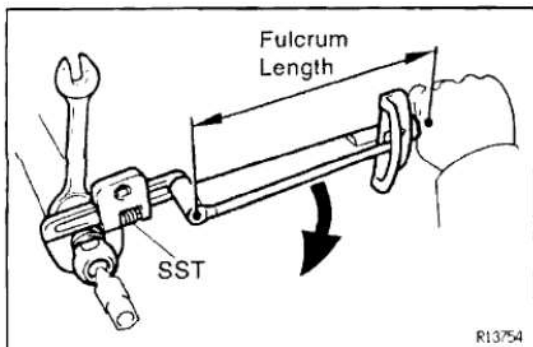
0.5-1.6 N·m (5-16.5 kgf·cm, 4.3-14.3 in·lbf)

- (d) Remove the RH and LH rack ends.

**13. INSTALL RH AND LH CLAW WASHERS AND RACK ENDS**

- (a) Install a new washer, and temporarily tighten the rack end.

HINT: Align the claws of the washer with the steering rack grooves.



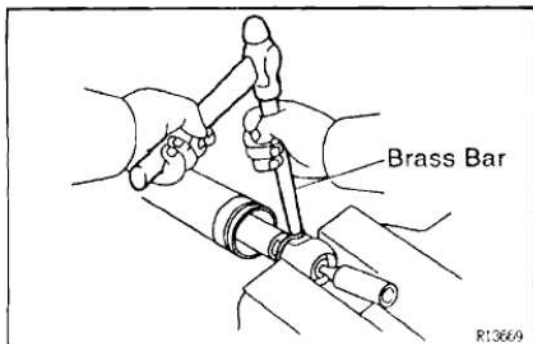
- (b) Using a spanner to hold the steering rack steady, and using SST, torque the rack end.

SST 09922-10010

Torque: 76 N·m (770 kgf·cm, 56 ft·lbf)

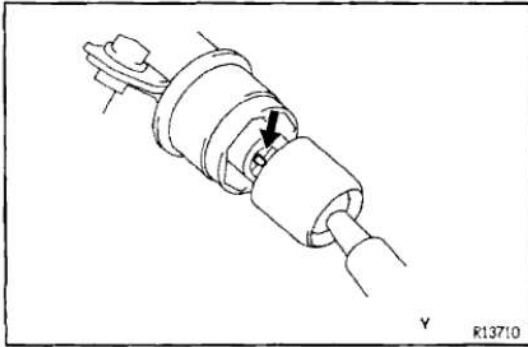
NOTICE: Use SST 09922-10010 in the direction shown in the illustration.

HINT: Use a torque wrench with a fulcrum length of 345 mm (13.58 in.).



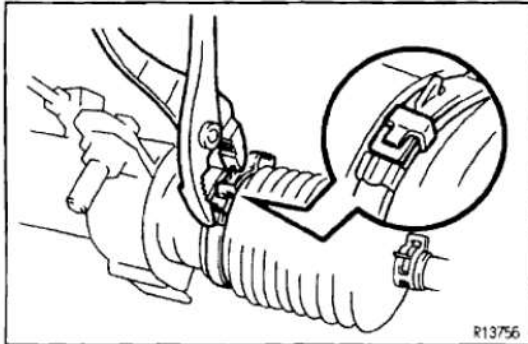
- (c) Using a brass bar and hammer, stake the washer.

NOTICE: Avoid any impact to the rack.

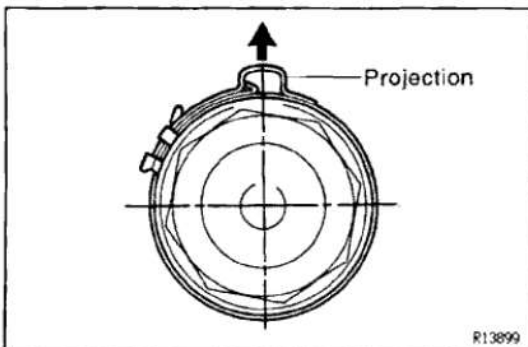


14. INSTALL RH AND LH RACK BOOTS, CLAMPS AND CLIPS

- (a) Ensure that the tube hole is not clogged with grease.
HINT: If the tube hole is clogged, the pressure inside the boot will change after it is assembled and the steering wheel is turned.

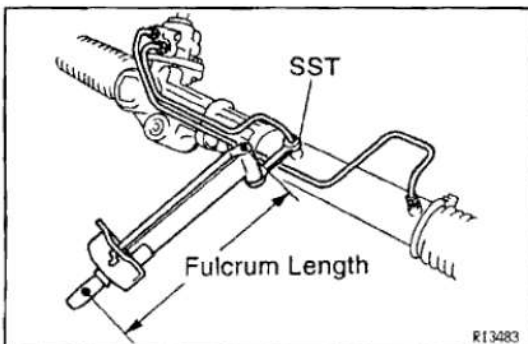


- (b) Install the boot.
NOTICE: Be careful not to damage or twist the boot.
 (c) Tighten a new clamp, as shown in the illustration.



15. INSTALL RH AND LH TIE ROD ENDS AND LOCK NUTS

- (a) Screw the lock nut and tie rod end onto the rack end until the matchmarks are aligned.
 (b) After adjusting toe-in, torque the nut.
 (See page SA-6)
Torque: 55 N·m (560 kgf·cm, 41 ft·lbf)

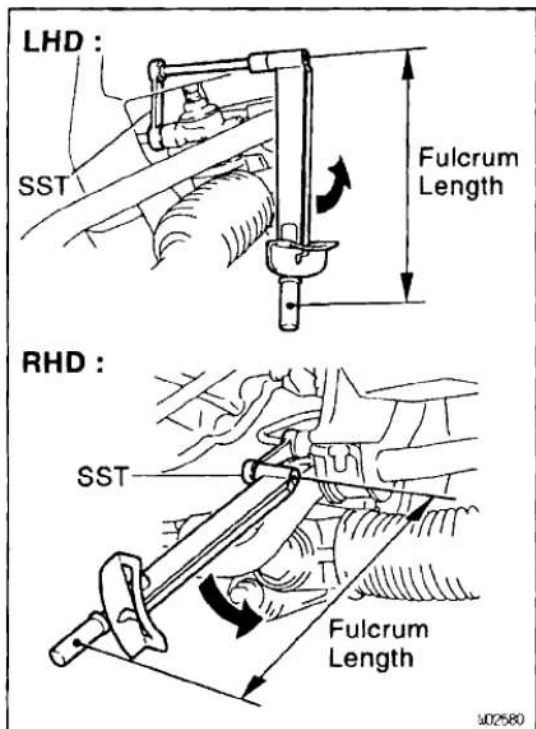
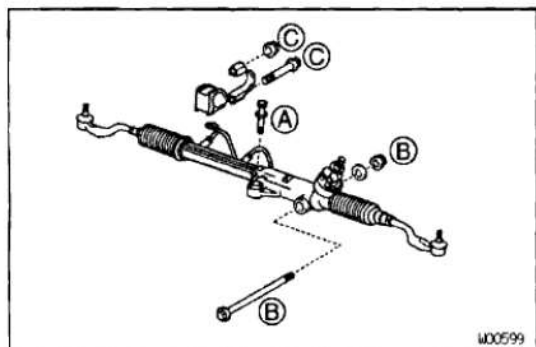


16. INSTALL 2 TURN PRESSURE TUBES

- (a) Install a new union seat to the rack housing and control valve housing.
 (b) Using SST, install the tube.
SST 09633-00020
Torque: 20 N·m (203 kgf·cm, 15 ft·lbf)

HINT:

- Use a torque wrench with a fulcrum length of 300 mm (11.81 in.).
- This torque value is effective in case that SST is parallel to a torque wrench.



POWER STEERING GEAR INSTALLATION

1. INSTALL GROMMET AND BRACKET

2. INSTALL PS GEAR ASSEMBLY

- (a) Torque the gear assembly set bolt.

Bolt A: Torque: 165 N·m (1,700 kgf·cm, 123 ft·lbf)

- (b) Torque the gear assembly set bolt and nut.

Bolt B: Torque: 190 N·m (1,950 kgf·cm, 141 ft·lbf)

- (c) Torque the bolt and nut to the bracket.

Bolt C: Torque: 165 N·m (1,700 kgf·cm, 123 ft·lbf)

3. CONNECT PRESSURE FEED AND RETURN TUBES

Using SST, connect the tube.

SST 09631-22020

Torque:

LHD: 58 N·m (587 kgf·cm, 43 ft·lbf)

RHD: 36 N·m (365 kgf·cm, 26 ft·lbf)

HINT:

- Use a torque wrench with a fulcrum length of 300 mm (11.81 in.).
- This torque value is effective in case that SST is parallel to a torque wrench.

4. INSTALL INTERMEDIATE SHAFT NO.2

(See page SR-23)

5. CONNECT RH AND LH TIE ROD ENDS

(See page SA-58)

6. INSTALL ENGINE UNDER COVER NO. 1 AND ENGINE UNDER COVER NO.2

Tighten the 9 bolts.

7. w/ Airbag:

POSITION FRONT WHEEL FACING STRAIGHT AHEAD

HINT: Do it with the front of the vehicle jacked up.

8. w/ Airbag:

CENTER SPIRAL CABLE

(See page SR-24)

9. w/ Airbag:

INSTALL STEERING WHEEL

- (a) Align the matchmarks on the wheel and steering column main shaft.
- (b) Temporarily tighten the wheel set nut.
- (c) Connect the connector.

10. **BLEED POWER STEERING SYSTEM**
(See page SR-11)
11. **CHECK STEERING WHEEL CENTER POINT**
12. **w/ Airbag:**
TORQUE STEERING WHEEL SET NUT
Torque: 35 N·m (360 kgf·cm, 26 ft·lbf)
13. **w/ Airbag:**
INSTALL STEERING WHEEL PAD
(See page SR-24)
14. **CHECK FRONT WHEEL ALIGNMENT**
(See page SA-4)

SERVICE SPECIFICATIONS

SERVICE DATA

M1XX-08

ON-VEHICLE INSPECTION		
Steering wheel freeplay	Maximum	30 mm (1.18 in.)
3L Engine:		
Drive belt tension at 98 N (10 kgf, 22 lbf)	New belt	8–10 mm (0.31–0.39 in.)
Drive belt tension at 98 N (10 kgf, 22 lbf)	Used belt	10–15 mm (0.39–0.59 in.)
3RZ-F and 3RZ-FE Engines:		
Drive belt tension at 98 N (10 kgf, 22 lbf)	New belt	4.5–5.5 mm (0.177–0.217 in.)
Drive belt tension at 98 N (10 kgf, 22 lbf)	Used belt	6–7.5 mm (0.236–0.295 in.)
5VZ-FE Engine:		
Drive belt tension at 98 N (10 kgf, 22 lbf)	New belt	6.5–7.5 mm (0.256–0.295 in.)
Drive belt tension at 98 N (10 kgf, 22 lbf)	Used belt	8.5–10.0 mm (0.335–0.393 in.)
3L Engine:		
*Drive belt tension	New belt	441–539 N (45–55 kgf)
*Drive belt tension	Used belt	196–343 N (20–35 kgf)
3RZ-F, 3RZ-FE and 5VZ-FE Engines:		
*Drive belt tension	New belt	539–637 N (55–62 kgf)
*Drive belt tension	Used belt	245–392 N (25–40 kgf)
Fluid level rise	Maximum	Below 5 mm (0.20 in.)
3L Engine:		
Oil pressure at idle speed with valve closed	Minimum	7,355 kPa (75 kgf/cm ² , 1,067 psi)
3RZ-F, 3RZ-FE and 5VZ-FE Engines:		
Oil pressure at idle speed with valve closed	Minimum	8,335 kPa (85 kgf/cm ² , 1,209 psi)
1KZ-T and 1KZ-TE Engines:		
Oil pressure at idle speed with valve closed	Minimum	8,826 kPa (90 kgf/cm ² , 1,280 psi)
Steering effort at idle speed	Maximum	7.8 N·m (80 kgf·cm, 69 in.-lbf)
PS VANE PUMP		
3L Engine:		
Vane pump rotating torque	Maximum	0.3 N·m (2.8 kgf·cm, 2.4 in.-lbf)
Pump shaft and front housing bushing oil clearance	STD	0.03–0.05 mm (0.0012–0.0020 in.)
Pump shaft and front housing bushing oil clearance	Maximum	0.07 mm (0.0028 in.)
Vane plate height	Minimum	8.1 mm (0.319 in.)
Vane plate thickness	Minimum	1.797 mm (0.0708 in.)
Vane plate length	Minimum	14.988 mm (0.5901 in.)
Vane plate and pump rotor groove clearance	Maximum	0.028 mm (0.0011 in.)
Vane plate length	Pump rotor and cam ring mark	
	None	14.996–14.998 mm (0.59039–0.59047 in.)
	1	14.994–14.996 mm (0.59031–0.59039 in.)
	2	14.992–14.994 mm (0.59023–0.59031 in.)
	3	14.990–14.992 mm (0.59015–0.59023 in.)
	4	14.998–14.990 mm (0.59007–0.59015 in.)
Flow control valve compression spring length	Minimum	36.0 mm (1.417 in.)

*: For use with belt tension gauge

3RZ – F, 3RZ – FE and 5VZ – FE Engines:		
Vane pump rotating torque	3RZ – F, 3RZ – FE: Maximum	0.25 N·m (2.5 kgf·cm, 2.2 in.-lbf) or less
Vane pump rotating torque	5VZ – FE: Maximum	0.27 N·m (2.8 kgf·cm, 2.4 in.-lbf) or less
Pump shaft and front housing bushing oil clearance	STD	0.03 – 0.05 mm (0.0012 – 0.0020 in.)
Pump shaft and front housing bushing oil clearance	Maximum	0.07 mm (0.0028 in.)
Vane plate height	Minimum	8.6 mm (0.339 in.)
Vane plate thickness	Minimum	1.397 mm (0.0550 in.)
Vane plate length	Minimum	14.991 mm (0.5902 in.)
Vane plate and pump rotor groove clearance	Maximum	0.035 mm (0.0014 in.)
Vane plate length	Pump rotor and cam ring mark	
	None	14.999 – 15.001 mm (0.59051 – 0.59059 in.)
	1	14.997 – 14.999 mm (0.59043 – 0.59051 in.)
	2	14.995 – 14.997 mm (0.59035 – 0.59043 in.)
	3	14.993 – 14.995 mm (0.59027 – 0.59035 in.)
	4	14.991 – 14.993 mm (0.59020 – 0.59027 in.)
Flow control valve spring length	Minimum	33.2 mm (1.307 in.)
1KZ – T, 1KZ – TE Engines:		
Vane pump rotating torque	Maximum	0.3 N·m (2.8 kgf·cm, 2.4 in.-lbf) or less
Pump shaft and front housing bushing oil clearance	STD	0.03 – 0.05 mm (0.0012 – 0.0020 in.)
Pump shaft and front housing bushing oil clearance	Maximum	0.07 mm (0.0028 in.)
Vane plate height	Minimum	8.6 mm (0.339 in.)
Vane plate thickness	Minimum	1.397 mm (0.0550 in.)
Vane plate length	Minimum	14.991 mm (0.5902 in.)
Vane plate to rotor groove clearance	Maximum	0.035 mm (0.0014 in.)
Vane plate length	Pump rotor and cam ring mark	
	None	14.999 – 15.001 mm (0.59051 – 0.59059 in.)
	1	14.997 – 14.999 mm (0.59043 – 0.59051 in.)
	2	14.995 – 14.997 mm (0.59035 – 0.59043 in.)
	3	14.993 – 14.995 mm (0.59027 – 0.59035 in.)
	4	14.991 – 14.993 mm (0.59020 – 0.59027 in.)
Flow control valve spring length		36.9 mm (1.453 in.)
PS GEAR		
Steering rack runout	Maximum	0.03 mm (0.0012 in.)
Total preload	Turning	0.5 – 1.6 N·m (5 – 16.5 kgf·cm, 4.3 – 14.3 in.-lbf)

TORQUE SPECIFICATIONS

Part tightened	N·m	kgf·cm	ft·lbf
NON-TILT AND TILT STEERING COLUMN:			
Steering wheel set nut	35	360	26
Steering wheel pad set screw (Torx screw)	9.0	90	78 in.·lbf
Steering column assembly set nut	26	260	18
Main shaft assembly x Universal joint No.2	35	360	26
Universal joint No.2 x Intermediate shaft No.2	35	360	26
Control valve shaft x Intermediate shaft No.2	35	360	26
Column hole cover No.2 x Column hole cover x Body	8.0	80	69 in.·lbf
Tilt lever retainer set bolt Tilt steering column	20	200	14
PS VANE PUMP			
3L Engine:			
Pressure feed tube x PS vane pump assembly	36 (44)	365 (450)	26 (33)
Pulley set nut	43	440	32
Adjusting strut set bolt	39	400	29
Through bolt	64	650	47
Suction port union set bolt	13	130	9
Front housing x Rear housing	46	470	34
Pressure port union	69	700	51
3RZ-FE, 3RZ-FE Engines:			
Idle pulley set nut	39	400	29
Union bolt x Pressure feed tube	47	475	34
Vane pump assembly set bolt	39	400	29
Vane pump pulley set nut	43	440	32
Oil reservoir set bolt Front	13	130	9
Rear	24	240	17
Pressure port union x Pump housing	83	850	61
Front housing x Rear housing	24	240	17
5VZ-FE Engine:			
Union bolt x Pressure feed tube	47	475	34
Vane pump assembly with bracket set bolt and nut	43	440	32
Vane pump pulley set nut	43	440	32
Oil reservoir set bolt Front	13	130	9
Rear	24	240	17
Bracket x Pump assembly	43	440	32
Pressure port union x Pump housing	83	850	61
Front housing x Rear housing	24	240	17
1KZ-T, 1KZ-TE Engines:			
Union bolt x Pressure feed tube	47	475	34
PS vane pump assembly set nut	39	400	30
Suction port union set bolt	13	130	9
Pressure port union	69	700	51

(): For use without SST

Part tightened	N·m	kgf·cm	ft·lbf
PS GEAR			
Cylinder end stopper	59 (78)	597 (800)	43 (58)
Bearing guide nut	25	250	18
Control valve housing set bolt	18	185	13
Rack guide spring cap lock nut	51 (60)	521 (700)	38 (51)
Rack x Rack end	76 (103)	770 (1,050)	56 (78)
Tie rod end lock nut	55	560	41
Turn pressure tube union nut	20 (25)	203 (250)	15 (18)
PS gear assembly set bolt	165	1,700	123
PS gear assembly set bolt and nut	190	1,950	141
Bracket x Body	165	1,700	123
Pressure feed and return tubes x Control valve housing LHD	58 (44)	587 (450)	43 (33)
Pressure feed and return tubes x Control valve housing RHD	36 (44)	365 (450)	26 (33)
Universal joint No.2 x Intermediate No.2 shaft	35	360	26
Control valve shaft x Intermediate No.2 shaft	35	360	26
Steering wheel set nut	35	360	26
Tie rod end x Lower arm	90	912	66

(): For use without SST