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# STEERING

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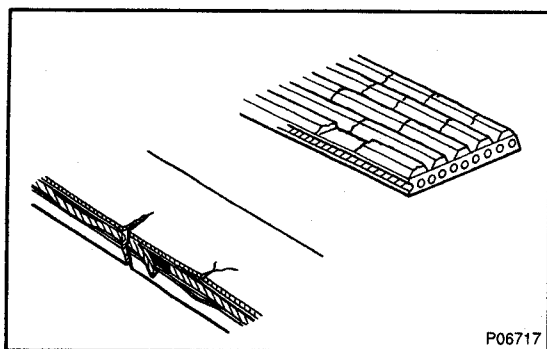
## REFER TO FOLLOWING REPAIR MANUALS:

Manual Name	Pub. No.
YARIS / ECHO Chassis and Body Repair Manual	RM685E
YARIS / ECHO Chassis and Body Repair Manual Supplement (Aug., 1999)	RM737E
YARIS / ECHO Chassis and Body Repair Manual Supplement (Jan., 2001)	RM838E

NOTE: The above pages contain only the points which differ from the above listed manuals.

SR





## DRIVE BELT (1ND-TV)

### INSPECTION

SR101-03

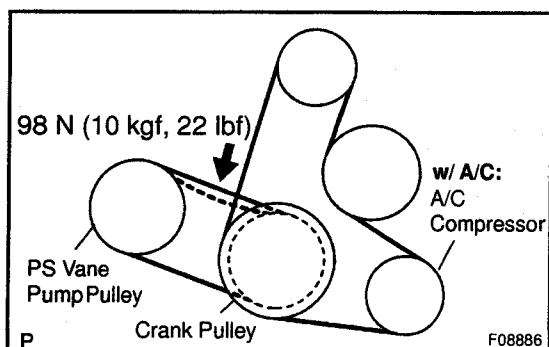
#### INSPECT DRIVE BELT

- (a) Visually check the belt for excessive wear, frayed cords, etc.

If any defect has been found, replace the drive belt.

#### HINT:

Cracks on the rib side of a belt are considered acceptable. If the missing chunks from the ribs are found on the belt, it should be replaced.



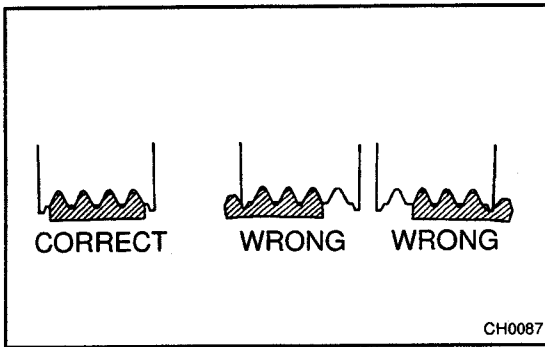
- (b) Measure the drive belt deflection.

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

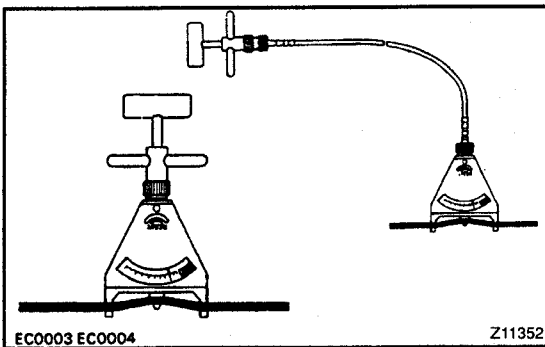
**New belt: 8 – 10 mm (0.315 – 0.394 in.)**

**Used belt: 11 – 13 mm (0.433 – 0.512 in.)**

If the belt deflection is not as specified, adjust it.

**HINT:**

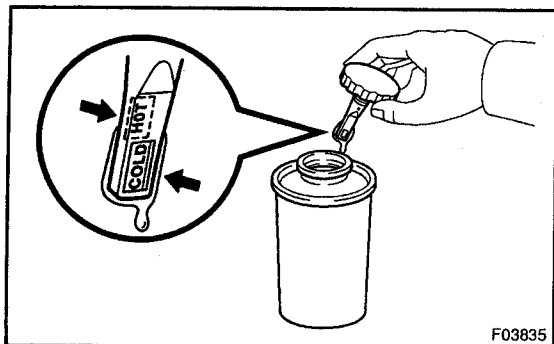
- "New belt" refers to a belt which has been used less than 5 minutes on a running engine.
- "Used belt" refers to a belt which has been used on a running engine for 5 minutes or more.
- After installing a belt, check that it fits properly in the ribbed grooves.
- Check with your hand to confirm that the belt has not slipped out of the groove on the bottom of the pulley.
- After installing a new belt, run the engine for about 5 minutes and recheck the belt tension.

**SR**

- **Reference:**  
Using a belt tension gauge, measure the drive belt tension.

**Drive belt tension:****New belt: 440 – 540 N (45 – 55 kgf)****Used belt: 240 – 340 N (25 – 35 kgf)**

If the belt tension is not as specified, adjust it.



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## POWER STEERING FLUID (1ND-TV) INSPECTION

SR102-02

### 1. CHECK FLUID LEVEL

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

If necessary, add fluid.

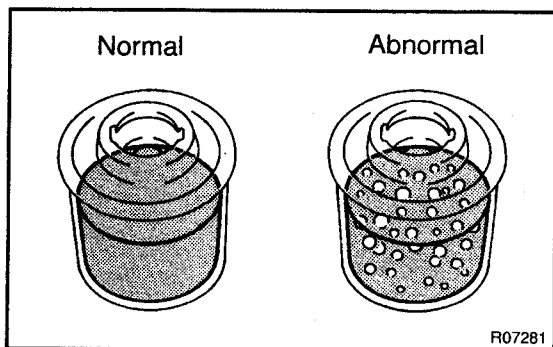
**Fluid: ATF DEXRON® II or III**

#### HINT:

Check that the fluid level is within the HOT LEVEL range on the reservoir cap dipstick. If the fluid is cold, check that it is within the COLD LEVEL range.

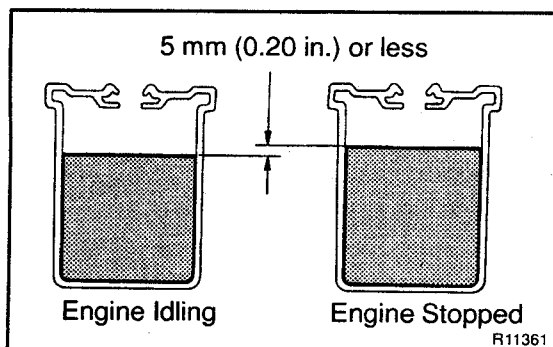
- Start the engine and run it at idle.
- Turn the steering wheel from lock to lock several times to boost fluid temperature.

**Fluid temperature: 80°C (176°F)**



R07281

- Check for foaming or emulsification. If there is foaming or emulsification, bleed power steering system (See Pub. No. RM685E on page SR-7).



R11361

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

**Maximum fluid level rise: 5 mm (0.20 in.)**

If a problem is found, bleed power steering system (See Pub. No. RM685E on page SR-7).

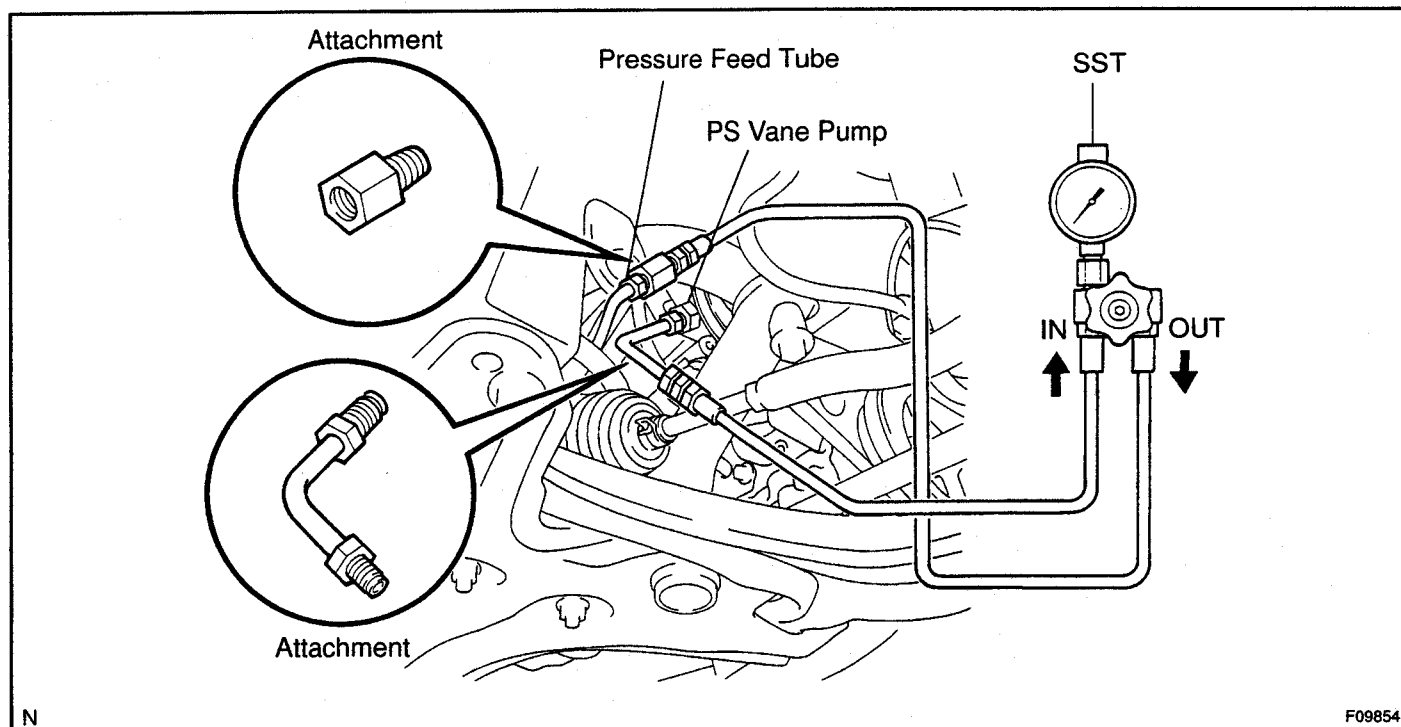
- Check the fluid level.

**2. CHECK STEERING FLUID PRESSURE**

- (a) Disconnect the pressure feed tube from the PS vane pump (See page SR-15).
- (b) Connect SST, as shown in the illustration below.  
SST 09640-10010 (09641-01010, 09641-01030, 09641-01060)

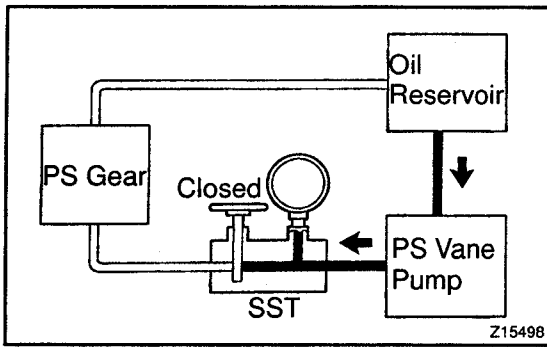
**NOTICE:**

Check that the valve of the SST is in the open position.



- (c) Bleed the power steering system (See Pub. No. RM685E on page SR-7).
- (d) Start the engine and run it at idle.
- (e) Turn the steering wheel from lock to lock several times to boost fluid temperature.

**Fluid temperature: 80 °C (176 °F)**

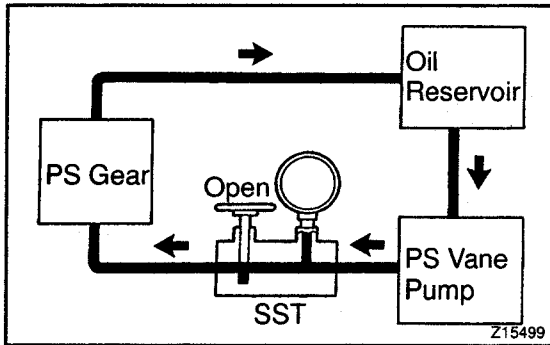


- (f) With the engine idling, close the valve of the SST and observe the reading on the SST.

**Minimum fluid pressure:**  
5,400 kPa (55 kgf/cm<sup>2</sup>, 781 psi)

**NOTICE:**

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

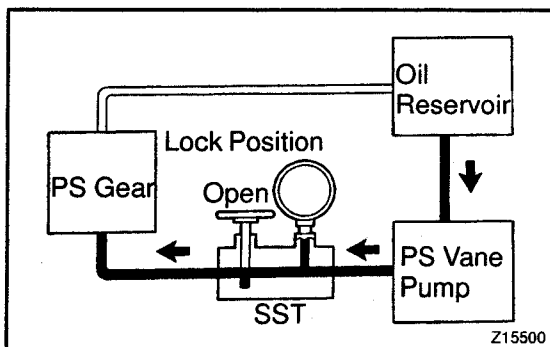


- (g) With the engine idling, open the valve fully.  
(h) Measure the fluid pressure at engine speeds of 1,000 rpm and 3,000 rpm.

**Difference fluid pressure:**  
490 kPa (5 kgf/cm<sup>2</sup>, 71 psi) or less

**NOTICE:**

Do not turn the steering wheel.



- (i) With the engine idling and valve fully opened, turn the steering wheel to full lock position.

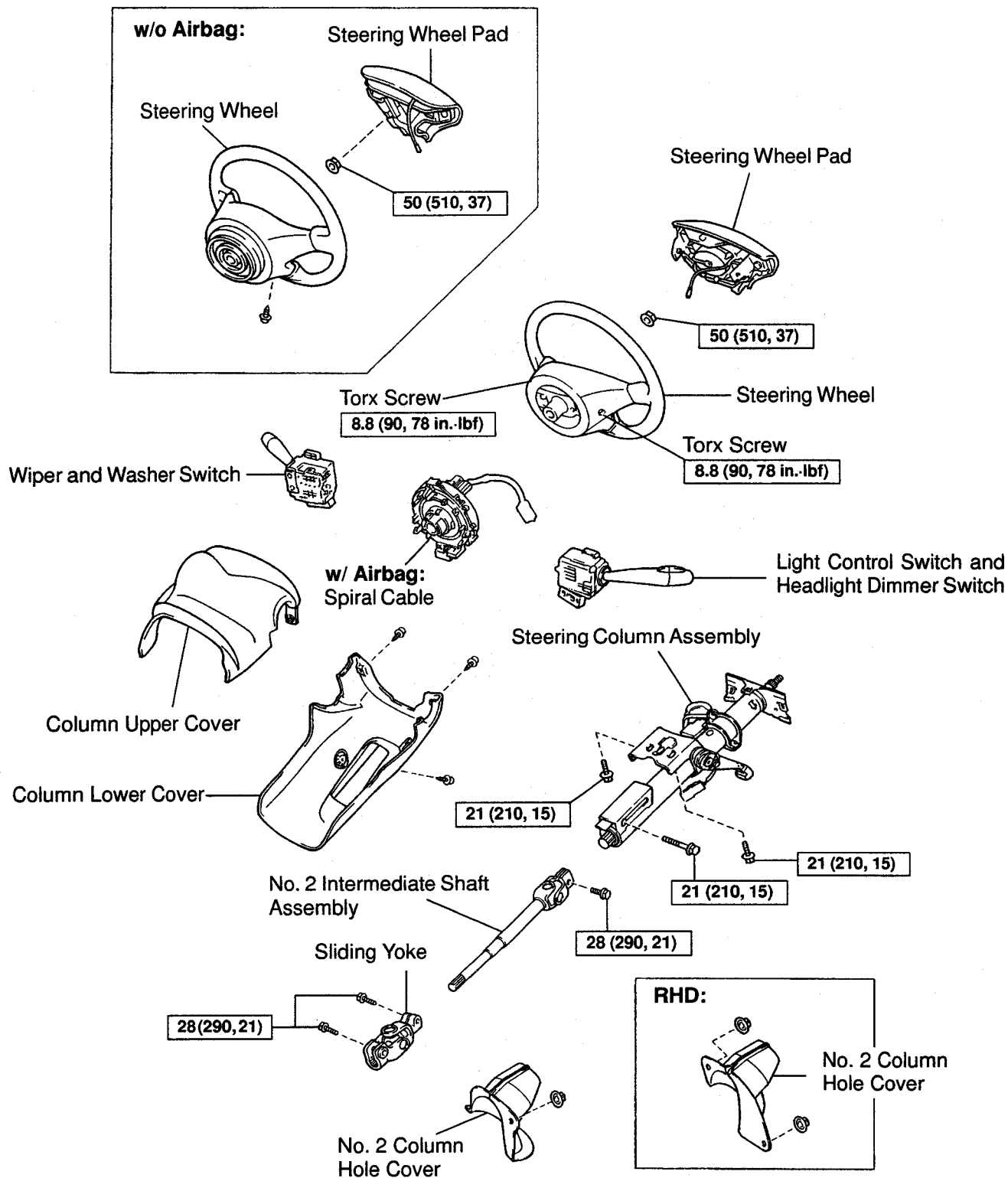
**Minimum fluid pressure:**  
5,400 kPa (55 kgf/cm<sup>2</sup>, 781 psi)

**NOTICE:**

- Do not maintain lock position for more than 10 seconds.
  - Do not let the fluid temperature become too high.
- (j) Disconnect the SST.  
SST 09640-10010 (09641-01010, 09641-01030, 09641-01060)
- (k) Connect the pressure feed tube to the PS vane pump (See page SR-23).
- (l) Bleed the power steering system (See Pub. No. RM685E on page SR-7).

# TILT STEERING COLUMN (1ND-TV) COMPONENTS

SR10P-02

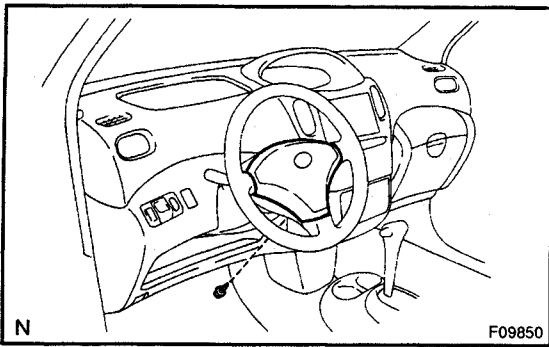


N·m (kgf·cm, ft·lbf) : Specified torque

N

F09851



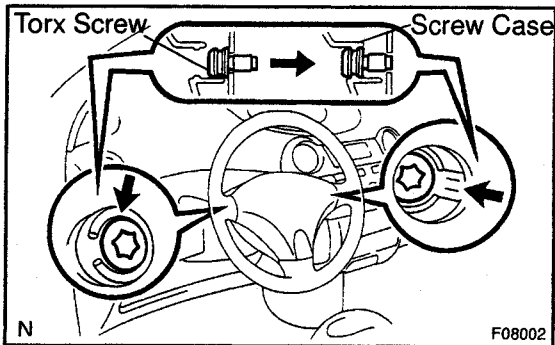


## REMOVAL

### 1. w/o Airbag

#### REMOVE STEERING WHEEL PAD

- (a) Remove the screw.
- (b) Disconnect the terminal and remove the steering wheel pad.



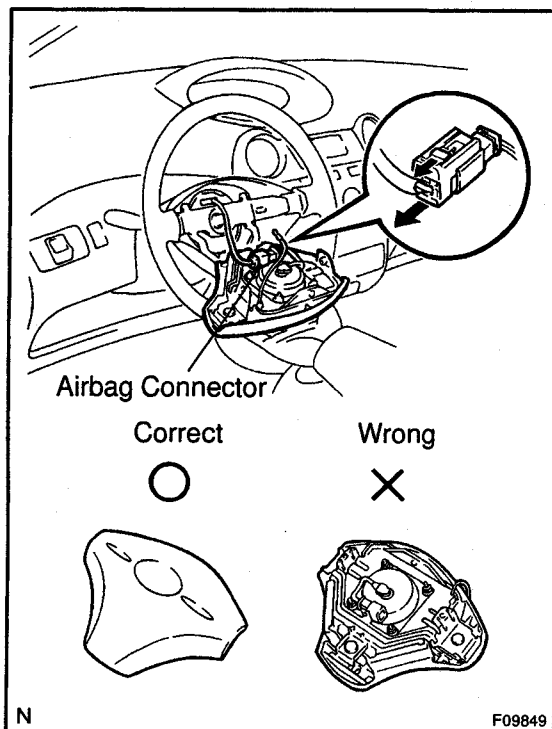
### 2. w/ Airbag:

#### REMOVE STEERING WHEEL PAD

#### NOTICE:

If the airbag connector is disconnected with the ignition switch at ON, DTCs will be recorded.

- (a) Place the front wheels facing straight ahead.
- (b) Using a torx socket wrench, loosen the 2 torx screws until the groove along the screw circumference catches on the screw case.



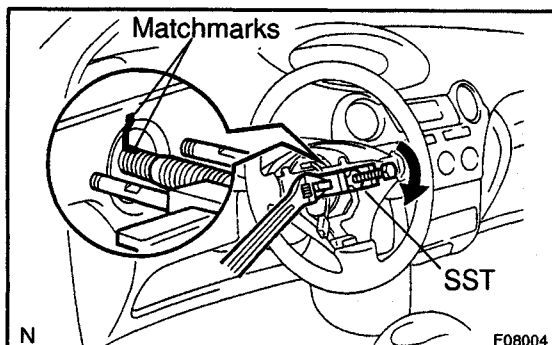
- (c) Pull out the wheel pad from the steering wheel and disconnect the airbag connector.
- (d) Except sports type steering wheel:  
Disconnect the connector.

#### 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.



### 3. REMOVE STEERING WHEEL

- (a) Sports type steering wheel:  
Disconnect the connector.
- (b) Remove the steering wheel set nut.
- (c) Place matchmarks on the steering wheel and main shaft assembly.
- (d) Using SST, remove the steering wheel.  
SST 09950-50013 (09951-05010, 09952-05010, 09953-05020, 09954-05021)

**4. REMOVE COLUMN LOWER COVER**

Remove the 3 screws and column lower cover.

**5. w/o Airbag:****REMOVE LIGHT CONTROL SWITCH AND HEADLIGHT DIMMER SWITCH, WIPER AND WASHER SWITCH AND COLUMN UPPER COVER**

- (a) Disconnect the 2 connectors from the light control switch and headlight dimmer switch and wiper and washer switch.

- (b) Push the claw and pull out the light control switch and headlight dimmer switch.

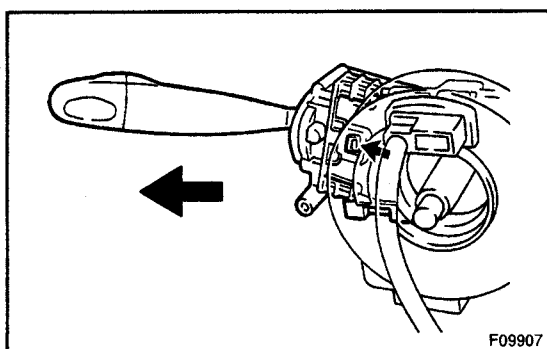
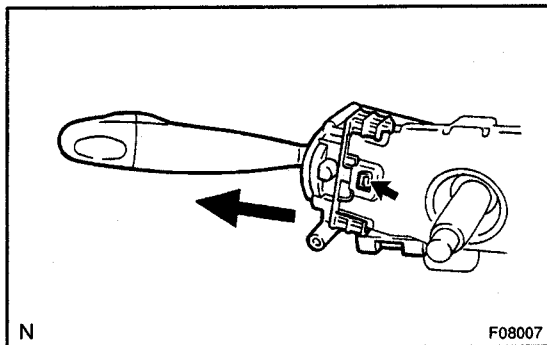
- (c) Employ the same manner described above to the wiper and washer switch.

- (d) Remove the column upper cover.

**6. w/ Airbag:****REMOVE SPIRAL CABLE, LIGHT CONTROL SWITCH AND HEADLIGHT DIMMER SWITCH, WIPER AND WASHER SWITCH AND COLUMN UPPER COVER**

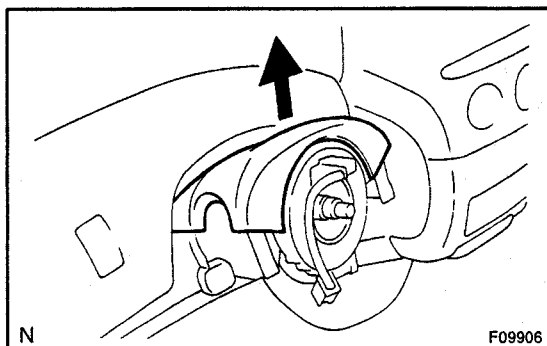
- (a) Disconnect the 3 connectors from the spiral cable, light control switch and headlight dimmer switch and wiper and washer switch.

- (b) Disconnect the airbag connector from the spiral cable.



- (c) Push the claw and pull out the light control switch and headlight dimmer switch.

- (d) Employ the same manner described above to the wiper and washer switch.



- (e) Slide the column upper cover and remove the spiral cable.

**NOTICE:**

**Do not disassemble the spiral cable or apply oil to it.**

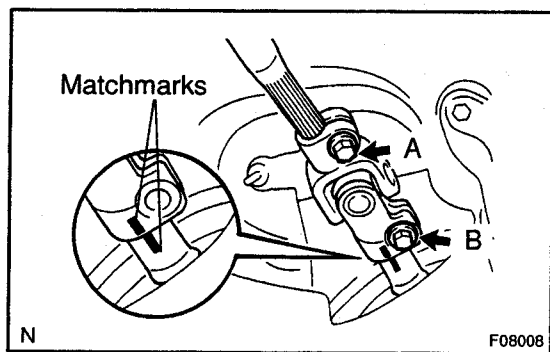
- (f) Remove the column upper cover.

**7. A/T:****REMOVE KEY INTERLOCK CABLE**

(See Pub. No. RM737E on page AX-18 and AX-11)

**8. REMOVE NO. 2 COLUMN HOLE COVER**

- LHD:  
Remove the clip and No. 2 column hole cover.
- RHD:  
Remove the 2 clips and No. 2 column hole cover.

**9. DISCONNECT SLIDING YOKE**

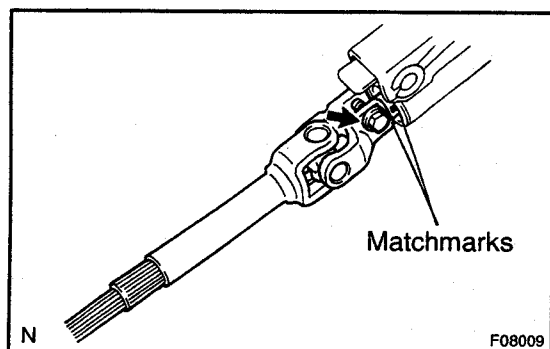
- (a) Place matchmarks on the sliding yoke and No. 3 intermediate shaft assembly.
- (b) Loosen the bolt A and remove the bolt B, then disconnect the sliding yoke.

**10. REMOVE STEERING COLUMN ASSEMBLY**

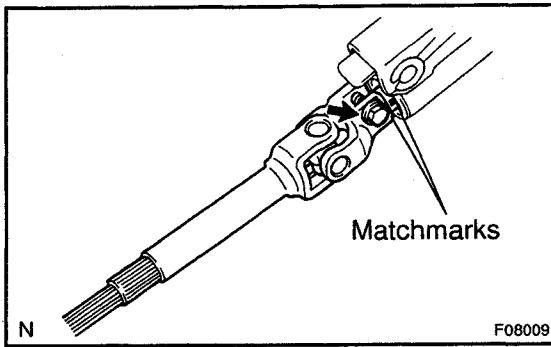
- (a) Disconnect the connectors.
- (b) Remove the lower mount bolt, 2 upper mount bolts and steering column assembly.

**11. REMOVE SLIDING YOKE**

Remove the bolt A and sliding yoke.

**12. REMOVE NO. 2 INTERMEDIATE SHAFT ASSEMBLY**

- (a) Place matchmarks on the No. 2 intermediate shaft assembly and main shaft assembly.
- (b) Remove the bolt and No. 2 intermediate shaft assembly.



## INSTALLATION

### 1. INSTALL NO. 2 INTERMEDIATE SHAFT ASSEMBLY

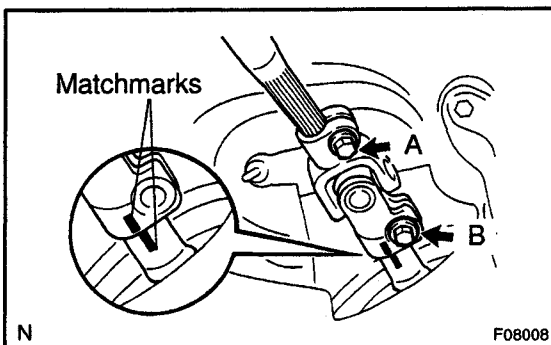
- Align the matchmarks on the No. 2 intermediate shaft assembly and main shaft assembly.
- Install the No. 2 intermediate shaft assembly with the bolt.  
**Torque: 28 N·m (290 kgf·cm, 21 ft·lbf)**

### 2. INSTALL SLIDING YOKE

Temporarily install the sliding yoke to the No. 2 intermediate shaft assembly with the bolt A.

### 3. INSTALL STEERING COLUMN ASSEMBLY

- Install the steering column assembly with the lower mount bolt and 2 upper mount bolts.  
**Torque: 21 N·m (210 kgf·cm, 15 ft·lbf)**
- Connect the connectors.



### 4. CONNECT SLIDING YOKE

- Align the matchmarks on the sliding yoke and No. 3 intermediate shaft assembly.

- Install the bolt B.

**Torque: 28 N·m (290 kgf·cm, 21 ft·lbf)**

- Torque the bolt A.

**Torque: 28 N·m (290 kgf·cm, 21 ft·lbf)**

### 5. INSTALL NO. 2 COLUMN HOLE COVER

- LHD:

Install the No. 2 column hole cover with the clip.

- RHD:

Install the No. 2 column hole cover with the 2 clips.

### 6. A/T:

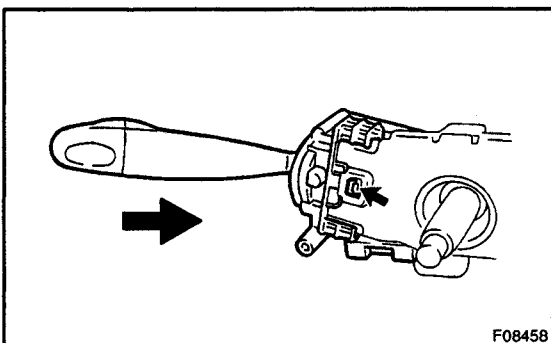
#### INSTALL KEY INTERLOCK CABLE

(See Pub. No. RM737E on page AX-24 and AX-17)

### 7. w/o Airbag:

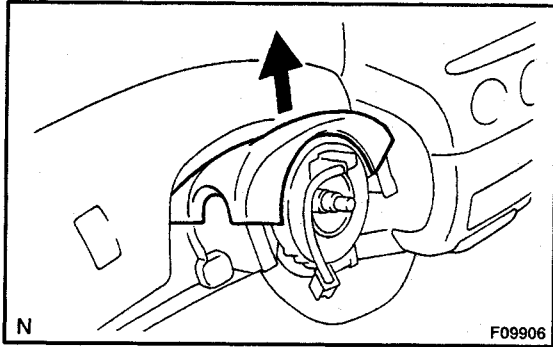
#### INSTALL COLUMN UPPER COVER, LIGHT CONTROL SWITCH AND HEADLIGHT DIMMER SWITCH AND WIPER AND WASHER SWITCH

- Install the column upper cover.
- Push into the light control switch and headlight dimmer switch until the claw is latched.
- Employ the same manner described above to the wiper and washer switch.
- Connect the 2 connectors to the light control switch and headlight dimmer switch and wiper and washer switch.

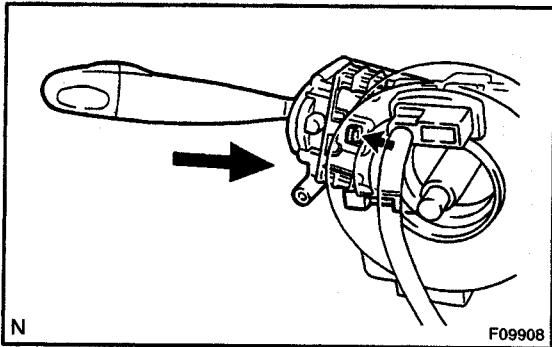


**8. w/ Airbag:****INSTALL COLUMN UPPER COVER, LIGHT CONTROL SWITCH AND HEADLIGHT DIMMER SWITCH, WIPER AND WASHER SWITCH AND SPIRAL CABLE**

- (a) Install the column upper cover.



- (b) Slide the column upper cover and install the spiral cable.



- (c) Push into the light control switch and headlight dimmer switch until the claw is latched.  
 (d) Employ the same manner described above to the wiper and washer switch.  
 (e) Connect the airbag connector to the spiral cable.  
 (f) Connect the 3 connectors to the spiral cable, light control switch and headlight dimmer switch and wiper and washer switch.

**9. INSTALL COLUMN LOWER COVER**

Install the column lower cover with the 3 screws.

**10. w/ Airbag:****CENTER SPIRAL CABLE**

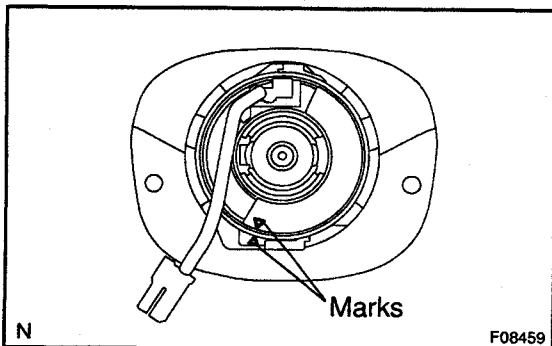
- (a) Check that the front wheels are facing straight ahead.  
 (b) Turn the cable counterclockwise by hand until it becomes harder to turn.  
 (c) Then rotate the cable clockwise about 2.5 turns to align the marks.

**HINT:**

The cable will rotate about 2.5 turns to either left or right of the center.

**11. INSTALL STEERING WHEEL**

- (a) Align the matchmarks on the steering wheel and main shaft assembly.  
 (b) Install the steering wheel set nut.  
**Torque: 50 N·m (510 kgf·cm, 37 ft·lbf)**  
 (c) Sports type steering wheel:  
 Connect the connector.

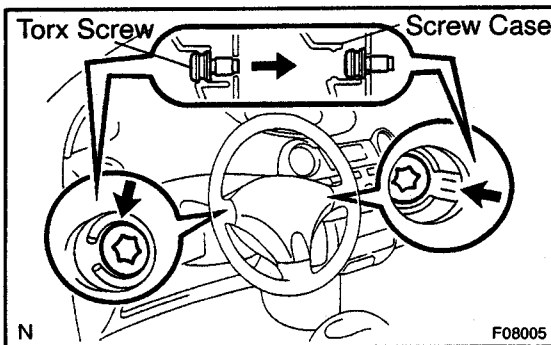


**12. w/o Airbag:****INSTALL STEERING WHEEL PAD**

- (a) Connect the terminal and install the steering wheel pad.
- (b) Install the screw.

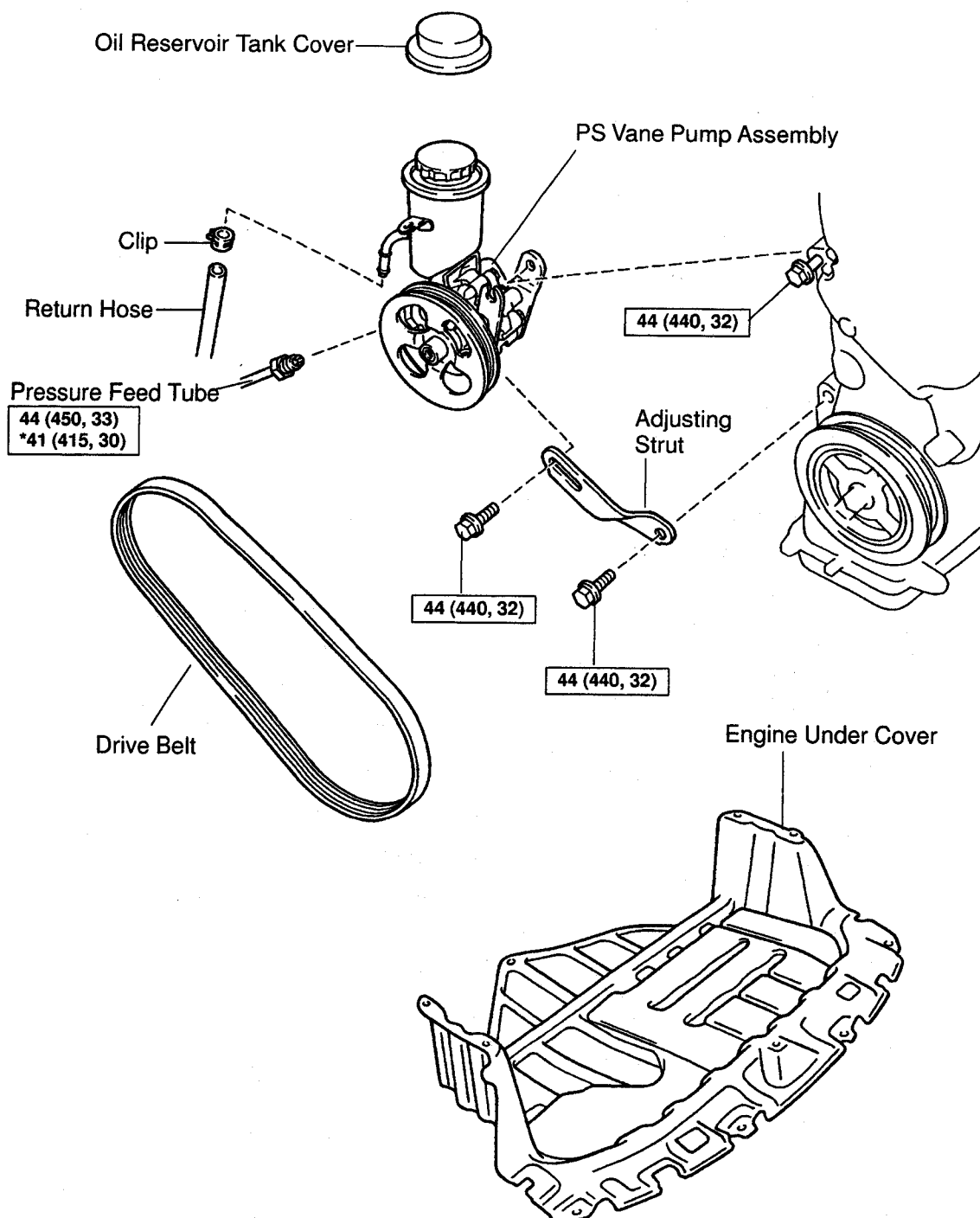
**13. w/ Airbag:****INSTALL STEERING WHEEL PAD****NOTICE:**

- **Never use airbag parts from another vehicle. When replacing parts, replace with new ones.**
  - **Make sure the wheel pad is installed with 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 that they are not pinched between other parts.**
- (a) Except sports type steering wheel:  
Connect the connector.
  - (b) Connect the airbag connector.
  - (c) Install the steering wheel pad after confirming that the circumference groove of the torx screws is caught on the screw case.
  - (d) Using a torx socket wrench, torque the 2 screws.  
**Torque: 8.8 N·m (90 kgf·cm, 78 in.-lbf)**
- 14. CHECK STEERING WHEEL CENTER POINT**



# POWER STEERING VANE PUMP (1ND-TV) COMPONENTS

SR106-02



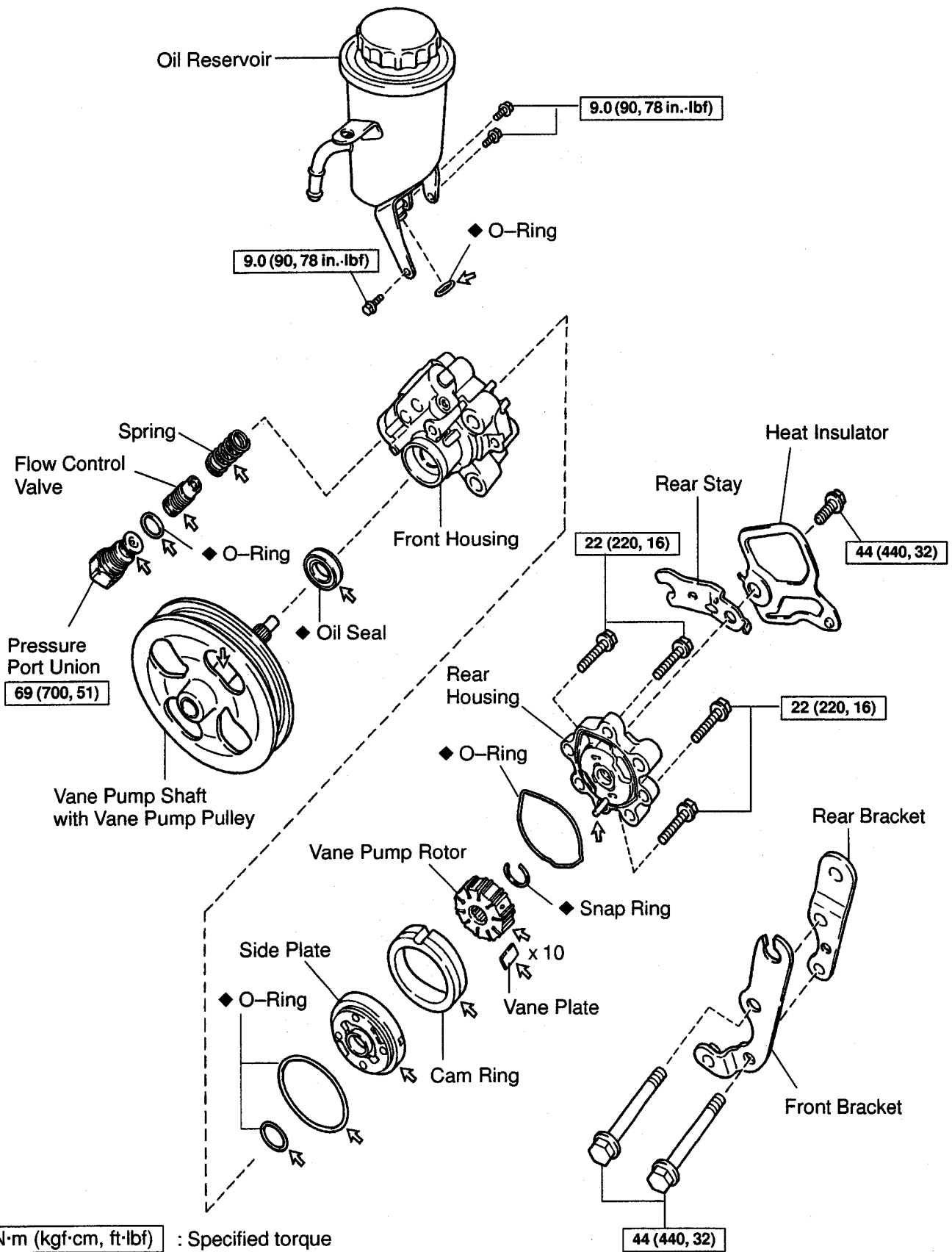
N·m (kgf·cm, ft·lbf) : Specified torque

◆ Non-reusable part

\* For use with SST

N

F14164



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

◆ Non-reusable part

⇨ Power steering fluid



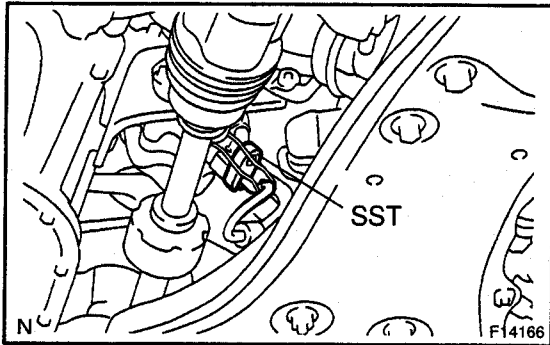
## REMOVAL

1. REMOVE ENGINE UNDER COVER
2. REMOVE OIL RESERVOIR TANK COVER
3. DISCONNECT RETURN HOSE

Remove the clip, and disconnect the return hose.

### NOTICE:

Take care not to spill fluid on the drive belt.

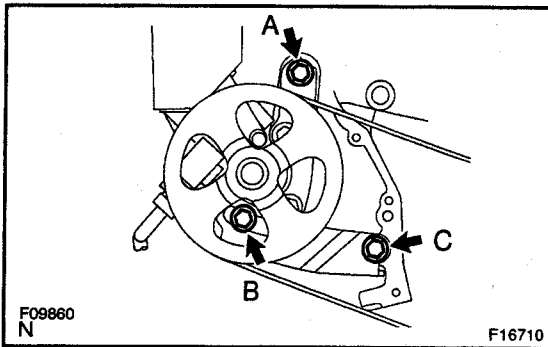


4. DISCONNECT PRESSURE FEED TUBE

Using SST, disconnect the pressure feed tube.

SST 09023-12700

5. DISCONNECT OIL PRESSURE SENSOR CONNECTOR



6. REMOVE DRIVE BELT

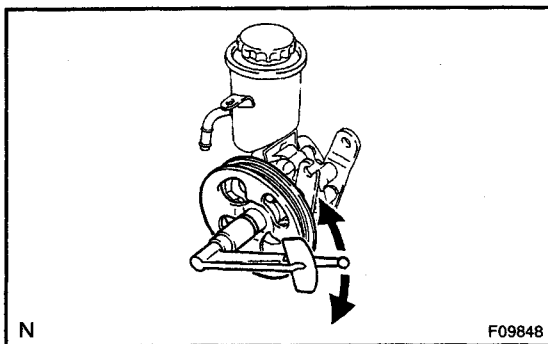
Loosen the bolt A and B, and remove the drive belt.

7. REMOVE PS VANE PUMP ASSEMBLY

- (a) Remove the bolt B, bolt C and adjusting strut.
- (b) Loosen the bolt A sufficiently so that PS vane pump assembly can be removed.

### HINT:

Bolt A cannot be removed.



## 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 OIL RESERVOIR

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

#### 3. REMOVE HEAT INSULATOR AND REAR STAY

Remove the bolt, heat insulator and rear stay.

#### 4. REMOVE FRONT AND REAR BRACKETS

Remove the 2 bolts, front and rear brackets.

#### 5. REMOVE PRESSURE PORT UNION, FLOW CONTROL VALVE AND SPRING

- (a) Remove the pressure port union, flow control valve and spring.
- (b) Remove the O-ring from the pressure port union.

#### 6. REMOVE REAR HOUSING

- (a) Remove the 4 bolts and rear housing.
- (b) Remove the O-ring from the rear housing.

#### 7. REMOVE CAM RING, 10 VANE PLATES, VANE PUMP ROTOR AND SIDE PLATE

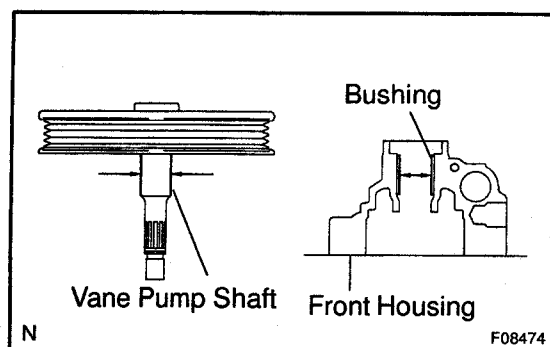
- (a) Remove the cam ring and 10 vane plates.

### NOTICE:

**Take care not to drop the vane plate.**

- (b) Using a screwdriver, remove the snap ring, vane pump rotor and side plate.
- (c) Remove the 2 O-rings from the side plate.

#### 8. REMOVE VANE PUMP SHAFT WITH VANE PUMP PULLEY



## INSPECTION

### 1. MEASURE OIL CLEARANCE BETWEEN VANE PUMP SHAFT AND BUSHING

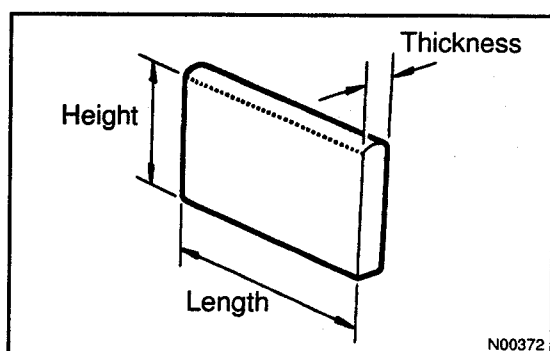
Using a micrometer and a caliper gauge, measure the oil clearance.

**Standard clearance:**

**0.021 – 0.043 mm (0.0008 – 0.0017 in.)**

**Maximum clearance: 0.07 mm (0.0028 in.)**

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



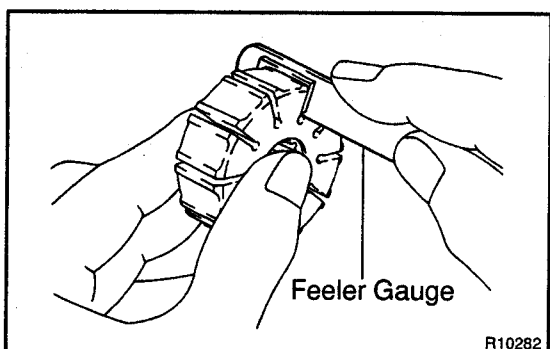
### 2. INSPECT VANE PUMP ROTOR AND VANE PLATES

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

**Minimum height: 7.6 mm (0.299 in.)**

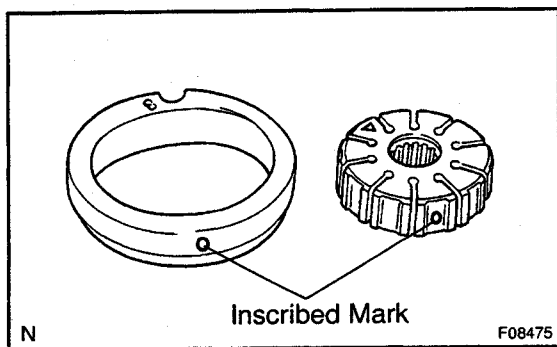
**Minimum thickness: 1.405 mm (0.0553 in.)**

**Minimum length: 11.993 mm (0.4722 in.)**



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

**Maximum clearance: 0.03 mm (0.0012 in.)**



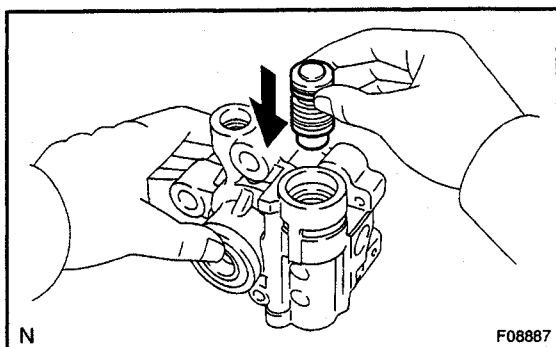
If it is more than the maximum, replace the vane plate and/or vane pump rotor with the one having the same mark stamped on the cam ring.

**Inscribed mark: 0, 1, 2, 3, or 4**

**HINT:**

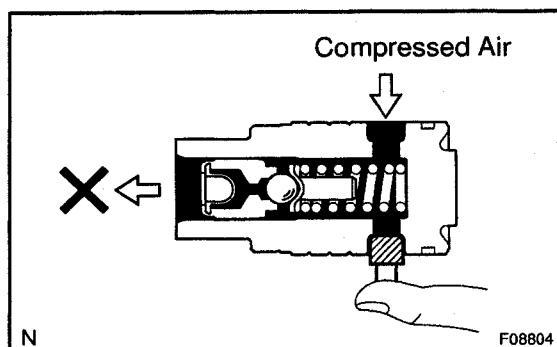
There are 5 vane plate lengths corresponding to the following vane pump rotor and cam ring marks:

Vane pump rotor and cam ring mark	Vane plate part number	Vane plate length mm (in.)
0	44345 – 32100	12.001 – 12.003 (0.47248 – 0.47256)
1	44345 – 32110	11.999 – 12.001 (0.47240 – 0.47248)
2	44345 – 32120	11.997 – 11.999 (0.47232 – 0.47240)
3	44345 – 32130	11.995 – 11.997 (0.47224 – 0.47232)
4	44345 – 32140	11.993 – 11.995 (0.47216 – 0.47224)

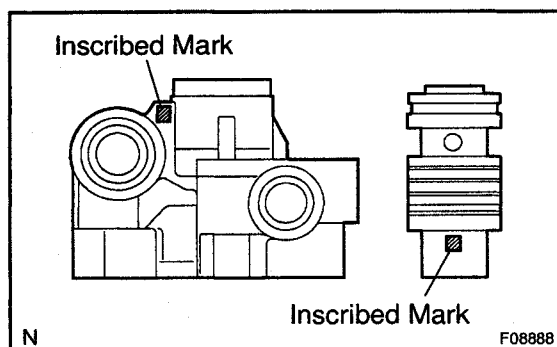


### 3. INSPECT FLOW CONTROL VALVE

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

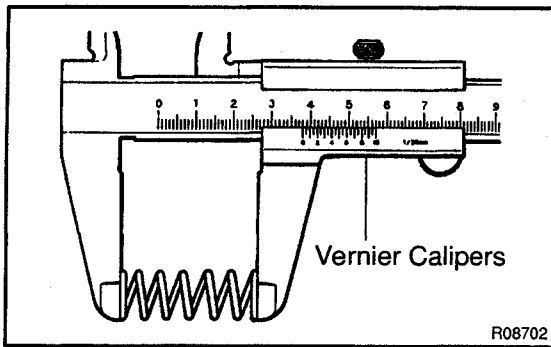


- (b) Check the flow control valve for leakage. Close one of the holes and apply compressed air of 392 – 490 kPa (4 – 5 kgf/cm<sup>2</sup>, 57 – 71 psi) into the opposite side hole, and confirm that air does not come out from the end hole.



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

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

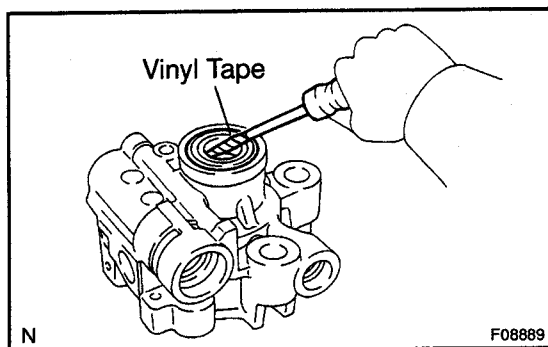


#### 4. INSPECT SPRING

Using vernier calipers, measure the free length of the spring.

**Minimum free length: 35.8 mm (1.409 in.)**

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



## REPLACEMENT

### NOTICE:

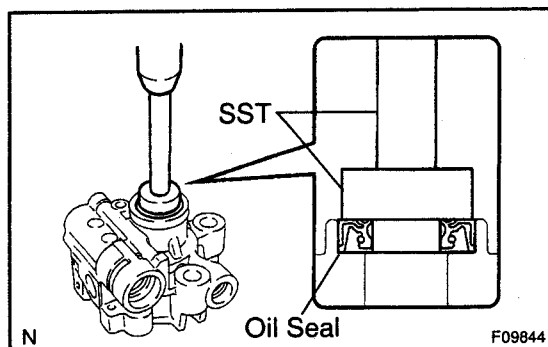
**When using a vise, do not overtighten it.**

### 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 (09951-00280),  
09950-70010 (09951-07100)

### NOTICE:

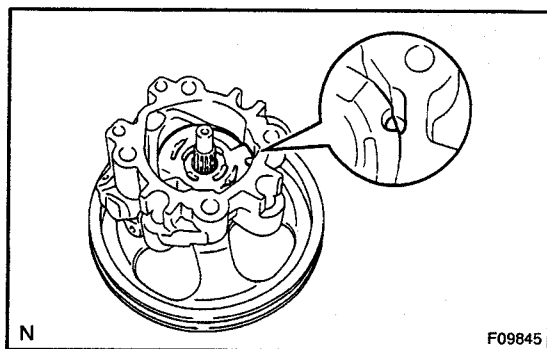
**Make sure that the oil seal is installed facing in the correct direction.**

## REASSEMBLY

### NOTICE:

When using a vise, do not overtighten it.

1. **COAT PARTS INDICATED BY ARROWS WITH POWER STEERING FLUID (See page SR-13)**
2. **INSTALL VANE PUMP SHAFT WITH VANE PUMP PULLEY**

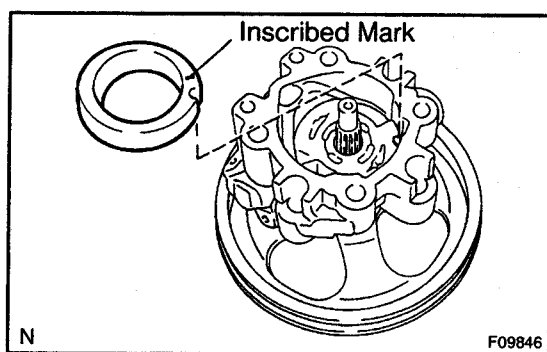


### 3. INSTALL SIDE PLATE

- (a) Coat 2 new O-rings with power steering fluid, and install them to the side plate.
- (b) Align the dent of the side plate with the dent of the front housing, and install the side plate.

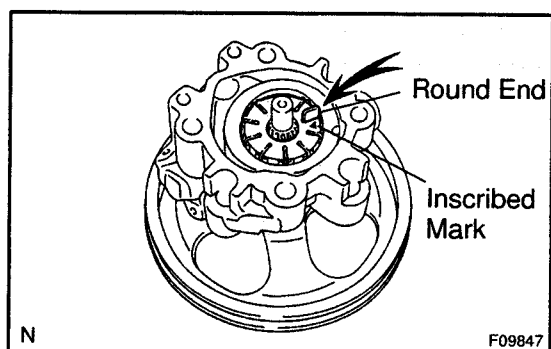
### NOTICE:

**Make sure that the side plate is installed facing in the correct direction.**



### 4. INSTALL CAM RING

Align the dent of the cam ring with the dent of the side plate, and install the cam ring with the inscribed mark facing outward.



### 5. INSTALL VANE PUMP ROTOR

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

### 6. INSTALL 10 VANE PLATES

Install the 10 vane plates with the round end facing outward.

### 7. INSTALL REAR HOUSING

- (a) Coat a new O-ring with power steering fluid, and install it to the rear housing.
- (b) Align the straight pin of the rear housing with the dents of the cam ring, side plate and front housing, and install the rear housing with the 4 bolts.

**Torque: 22 N·m (220 kgf·cm, 16 ft·lbf)**

### 8. INSTALL OIL PRESSURE SENSOR

- (a) Coat a new O-ring with power steering fluid, and install it to the oil pressure sensor.
- (b) Install the oil pressure sensor.

**Torque: 21 N·m (210 kgf·cm, 15 ft·lbf)**

**9. INSTALL SPRING, FLOW CONTROL VALVE AND PRESSURE PORT UNION**

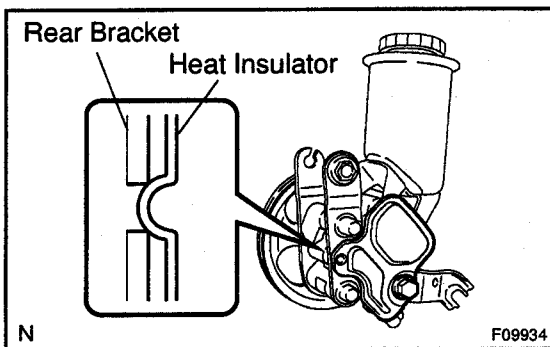
- (a) Install the spring.
- (b) Install the flow control valve facing in the correct direction (See page SR-13).
- (c) Coat a new O-ring with power steering fluid, and install it to the pressure port union.
- (d) Install the pressure port union.

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

**10. INSTALL FRONT AND REAR BRACKETS**

Install the front and rear brackets with the 2 bolts.

**Torque: 44 N·m (440 kgf·cm, 32 ft·lbf)**

**11. INSTALL HEAT INSULATOR AND REAR STAY**

Install the heat insulator and rear stay with the bolt.

**Torque: 44 N·m (440 kgf·cm, 32 ft·lbf)**

**NOTICE:**

Install the heat insulator, pressing its projection into a hole in the rear bracket, as shown in the illustration.

**12. INSTALL OIL RESERVOIR**

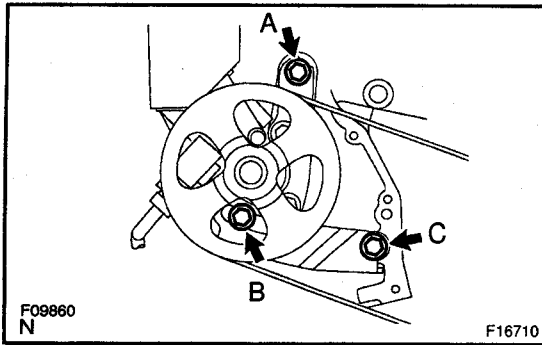
- (a) Coat a new O-ring with power steering fluid, and install it to the oil reservoir.
- (b) Install the oil reservoir with the 3 bolts.

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

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

(See page SR-13)





## INSTALLATION

### 1. INSTALL PS VANE PUMP ASSEMBLY

- Temporarily install the PS vane pump assembly with the bolt A.
- Install the adjusting strut with the bolt C.  
**Torque: 44 N·m (440 kgf·cm, 32 ft·lbf)**
- Temporarily install the bolt B.

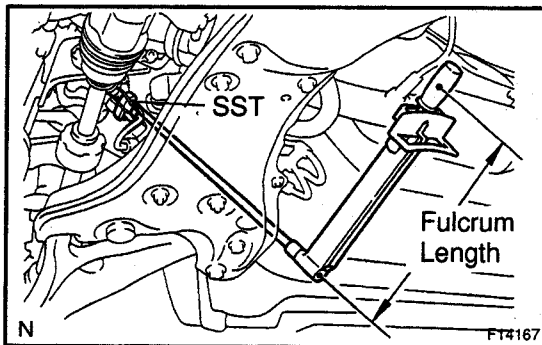
### 2. INSTALL DRIVE BELT

- Install the drive belt and adjust the drive belt tension (See page SR-1).
- Torque the bolt A.  
**Torque: 44 N·m (440 kgf·cm, 32 ft·lbf)**
- Torque the bolt B.  
**Torque: 44 N·m (440 kgf·cm, 32 ft·lbf)**

### 3. CONNECT OIL PRESSURE SENSOR CONNECTOR

#### NOTICE:

Be careful to prevent oil from being attached to the connector.

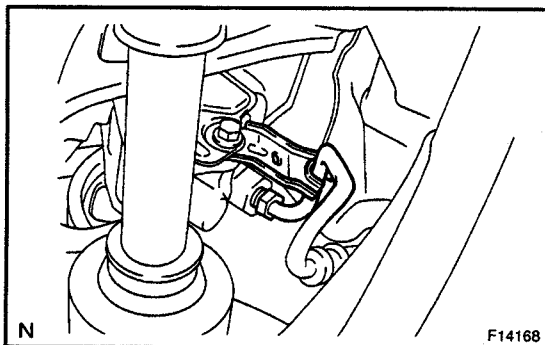


### 4. CONNECT PRESSURE FEED TUBE

Using SST, connect the pressure feed tube.

SST 09023-12700

**Torque: 41 N·m (415 kgf·cm, 30 ft·lbf)**



#### NOTICE:

Check that the pressure feed tube is properly installed to the rear stay.

#### HINT:

- Use a torque wrench with a fulcrum length of 345 mm (13.58 in.).
- This torque value is effective in case that SST is parallel to a torque wrench.

### 5. CONNECT RETURN HOSE

Connect the return hose with the clip.

### 6. INSTALL ENGINE UNDER COVER

### 7. BLEED POWER STEERING SYSTEM

(See Pub. No. RM685E on page SR-7)

### 8. INSTALL OIL RESERVOIR TANK COVER

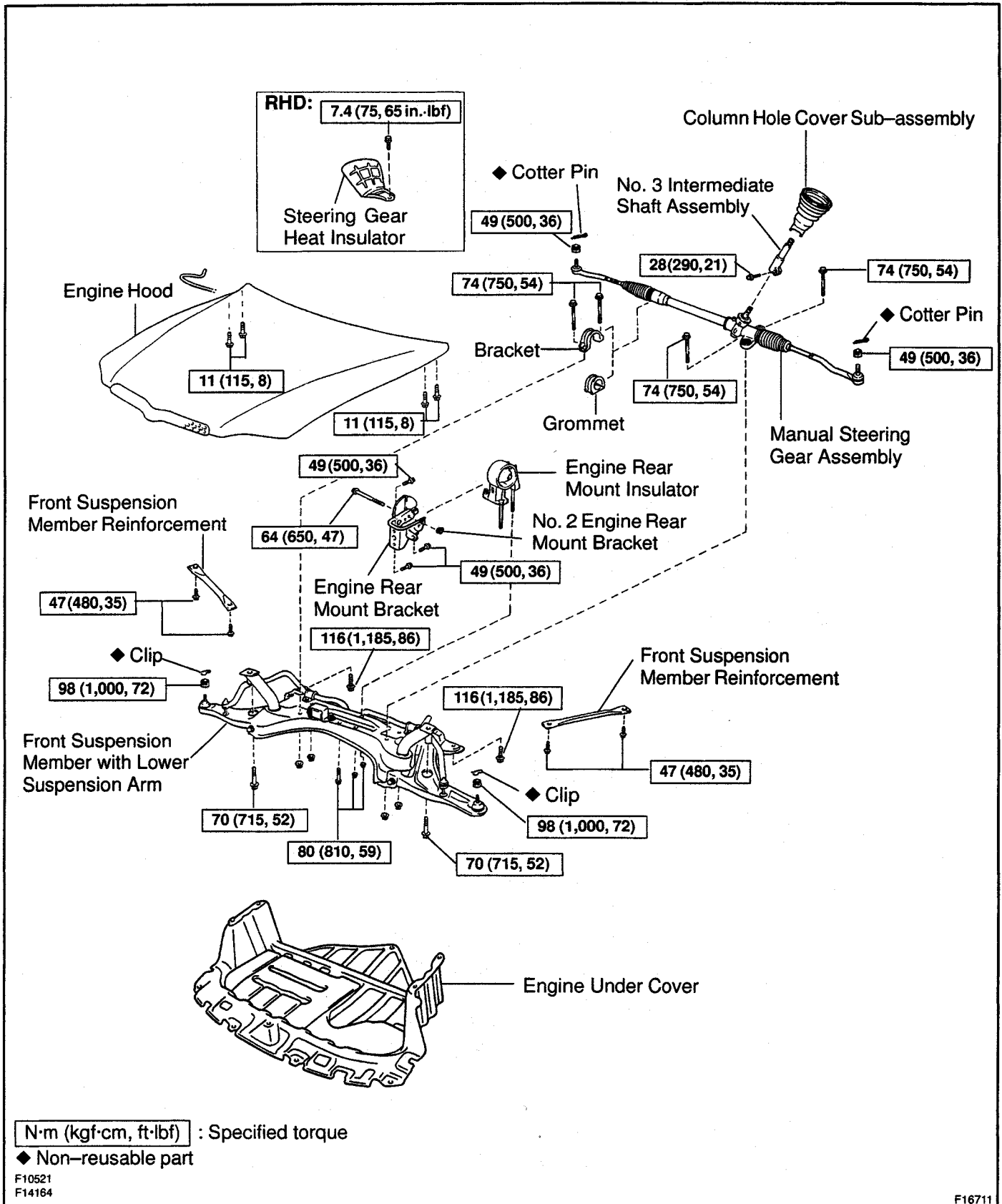
#### NOTICE:

Push the oil reservoir tank cover completely.

# MANUAL STEERING GEAR (1ND-TV)

## COMPONENTS

SR100-02



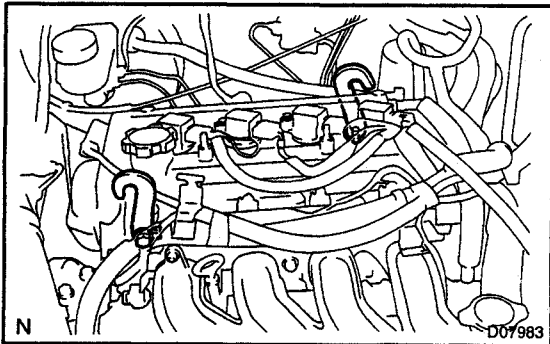
## REMOVAL

### NOTICE:

w/ Airbag:

Remove the steering wheel assembly before the steering gear removal, because there is possibility of breaking of the spiral cable.

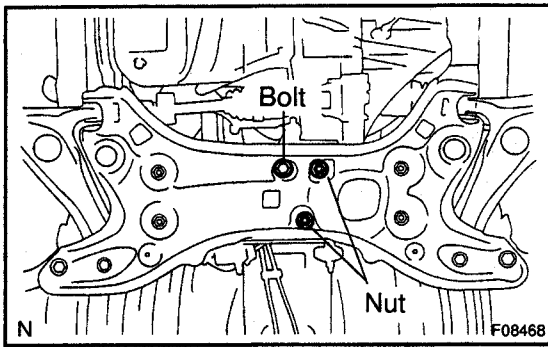
1. PLACE FRONT WHEELS FACING STRAIGHT AHEAD
2. w/ Airbag:  
REMOVE STEERING WHEEL PAD (See page SR-7)
3. w/ Airbag:  
REMOVE STEERING WHEEL (See page SR-7)
4. REMOVE ENGINE UNDER COVER
5. DISCONNECT RH AND LH TIE ROD ENDS  
(See Pub. No. RM685E on page SA-10)
6. REMOVE NO. 2 COLUMN HOLE COVER  
(See page SR-7)
7. DISCONNECT SLIDING YOKE (See page SR-7)
8. REMOVE ENGINE HOOD  
(See Pub. No. RM685E on page BO-16)
9. ATTACH ENGINE SLING DEVICE TO ENGINE HANGERS
  - (a) Install the 2 No. 1 engine hangers with the bolt in the correct direction.  
**Parts No.:**  
**No. 1 engine hanger:** 12281-21010  
**Bolt:** 91511-60818  
**Torque:** 20 N·m (204 kgf·cm, 15 ft·lbf)
  - (b) Attach the engine chain hoist to the engine hangers.



### CAUTION:

Do not attempt to hang the engine by hooking the chain to any other part.

10. DISCONNECT LOWER SUSPENSION ARM FROM STEERING KNUCKLE (See Pub. No. RM737E on page SA-17)
11. REMOVE RH AND LH FRONT SUSPENSION MEMBER REINFORCEMENT
  - (a) Remove the 2 bolts and front suspension member reinforcement.
  - (b) Employ the same manner described above to the other side.

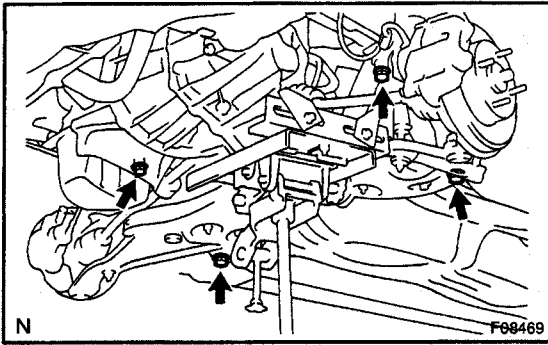


## 12. DISCONNECT ENGINE REAR MOUNT INSULATOR AND FRONT SUSPENSION MEMBER

Remove the bolt and 2 nuts, and disconnect the engine rear mount insulator and front suspension member.

## 13. SUPPORT FRONT SUSPENSION MEMBER WITH LOWER SUSPENSION ARM

Using a transmission jack, support the front suspension member with lower suspension arm.

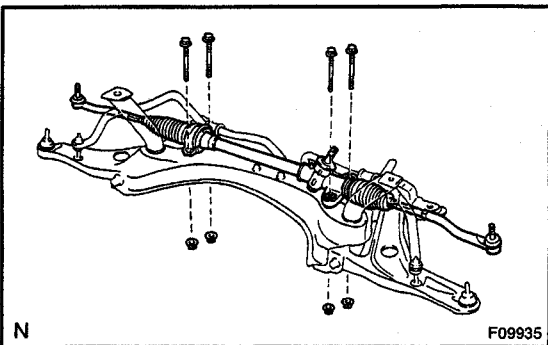


## 14. REMOVE FRONT SUSPENSION MEMBER WITH LOWER SUSPENSION ARM AND MANUAL STEERING GEAR ASSEMBLY

- (a) Disconnect the column hole cover sub-assembly.
- (b) Remove the 4 bolts and front suspension member with lower suspension arm and manual steering gear assembly.

## 15. REMOVE MANUAL STEERING GEAR ASSEMBLY

- (a) RHD:  
Remove the bolt and steering gear heat insulator.
- (b) Remove the column hole cover sub-assembly.

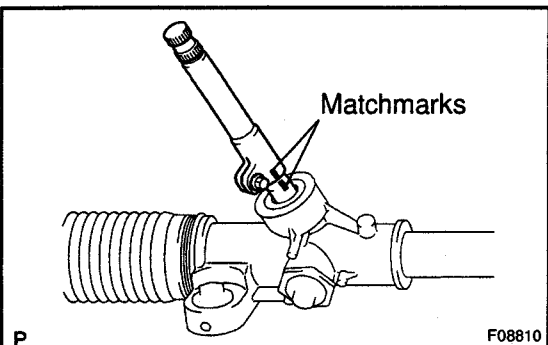


- (c) Remove the 4 bolts, nuts and manual steering gear assembly from the front suspension member.

### NOTICE:

**Because the nut has its own stopper, do not turn the nut and torque the bolt with the nut fixed.**

- (d) Remove the bracket and grommet from the manual steering gear assembly.



- (e) Place matchmarks on the No. 3 intermediate shaft assembly and steering pinion.

- (f) Remove the bolt and No. 3 intermediate shaft assembly.

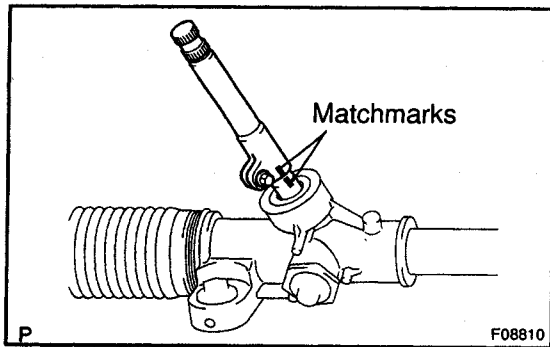
## 16. REMOVE ENGINE REAR MOUNT INSULATOR AND ENGINE REAR MOUNT BRACKET

- (a) Remove the through bolt, No. 2 engine rear mount bracket and engine rear mount insulator.
- (b) Remove the 3 bolts and engine rear mount bracket.

## INSTALLATION

### 1. INSTALL ENGINE REAR MOUNT INSULATOR AND ENGINE REAR MOUNT BRACKET

- (a) Install the engine rear mount bracket with the 3 bolts.  
**Torque: 49 N·m (500 kgf·cm, 36 ft·lbf)**
- (b) Install the engine rear mount insulator with the through bolt and No. 2 engine rear mount bracket.  
**Torque: 64 N·m (650 kgf·cm, 47 ft·lbf)**

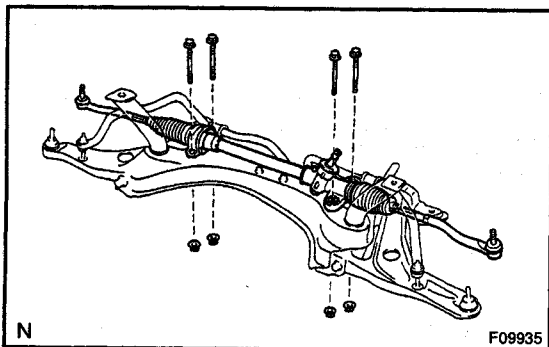
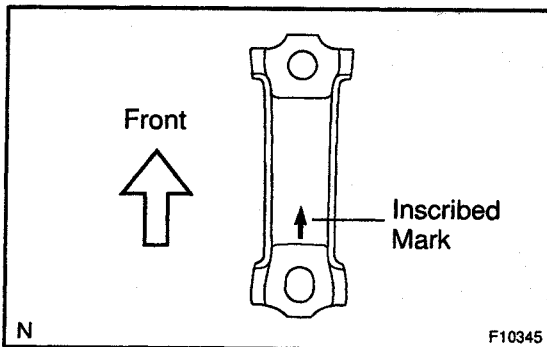


### 2. INSTALL MANUAL STEERING GEAR ASSEMBLY

- (a) Align the matchmarks on the No. 3 intermediate shaft assembly and steering pinion.
- (b) Install the No. 3 intermediate shaft assembly with the bolt.  
**Torque: 28 N·m (290 kgf·cm, 21 ft·lbf)**
- (c) Install the grommet and bracket to the manual steering gear assembly.

#### HINT:

Install the bracket with the inscribed mark facing to the front of the vehicle.



- (d) Install the manual steering gear assembly with the 4 bolts and nuts to the front suspension member.  
**Torque: 74 N·m (750 kgf·cm, 54 ft·lbf)**

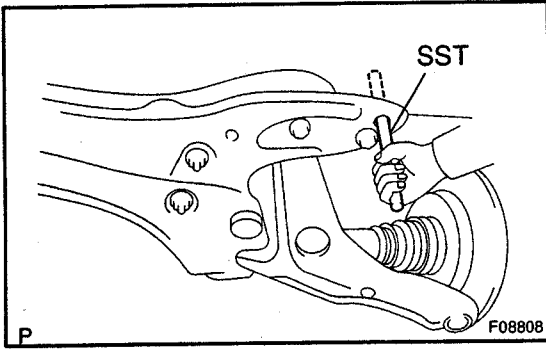
#### NOTICE:

**Because the nut has its own stopper, do not turn the nut and torque the bolt with the nut fixed.**

- (e) Install the column hole cover sub-assembly.
- (f) RHD:  
Install the steering gear heat insulator with the bolt.  
**Torque: 7.4 N·m (75 kgf·cm, 65 in·lbf)**

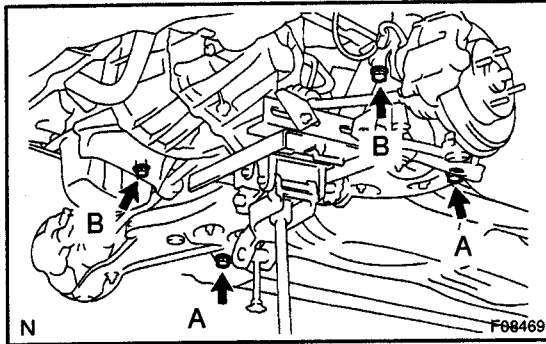
#### HINT:

When assembling the steering gear heat insulator, set a projection of the column hole cover sub-assembly to the interlocking port of the steering gear heat insulator.



### 3. INSTALL FRONT SUSPENSION MEMBER WITH LOWER SUSPENSION ARM AND MANUAL STEERING GEAR ASSEMBLY

- (a) Using SST, align the holes of the front suspension member and body.  
SST 09670-00010
- (b) Employ the same manner described above to the other side.



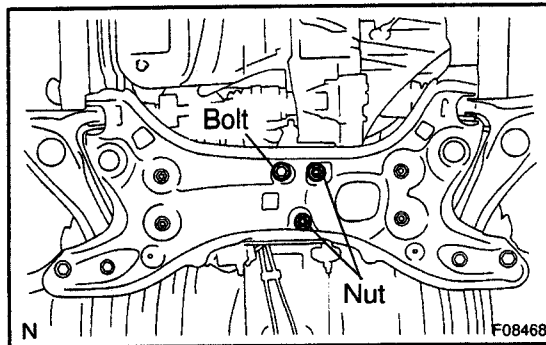
- (c) Install the front suspension member with lower suspension arm and manual steering gear assembly with the 4 bolts.

#### Torque:

**Bolt A: 116 N·m (1,185 kgf·cm, 86 ft·lbf)**

**Bolt B: 70 N·m (715 kgf·cm, 52 ft·lbf)**

- (d) Connect the column hole cover sub-assembly.



### 4. CONNECT ENGINE REAR MOUNT INSULATOR AND FRONT SUSPENSION MEMBER

Connect the engine rear mount insulator and front suspension member with the bolt and 2 nuts.

**Torque: 80 N·m (810 kgf·cm, 59 ft·lbf)**

### 5. INSTALL RH AND LH FRONT SUSPENSION MEMBER REINFORCEMENT

- (a) Install the front suspension member reinforcement with the 2 bolts.

**Torque: 47 N·m (480 kgf·cm, 35 ft·lbf)**

- (b) Employ the same manner described above to the other side.

### 6. CONNECT LOWER SUSPENSION ARM TO STEERING KNUCKLE (See Pub. No. RM737E on page SA-18)

### 7. DISENGAGE ENGINE SLING DEVICE FROM ENGINE HANGERS

- (a) Disengage the engine chain hoist from the engine hangers.
- (b) Remove the 2 No. 1 engine hangers.

### 8. INSTALL ENGINE HOOD

(See Pub. No. RM685E on page BO-16)

### 9. CONNECT SLIDING YOKE (See page SR-10)

### 10. INSTALL NO. 2 COLUMN HOLE COVER

(See page SR-10)

### 11. CONNECT RH AND LH TIE ROD ENDS

(See Pub. No. RM685E on page SA-14)

### 12. INSTALL ENGINE UNDER COVER

**13. PLACE FRONT WHEELS FACING STRAIGHT AHEAD****HINT:**

Do it with the front of the vehicle jacked up.

**14. w/ Airbag:**

**CENTER SPIRAL CABLE (See page SR-10)**

**15. w/ Airbag:**

**INSTALL STEERING WHEEL**

(a) Align the matchmarks on the steering wheel and steering column main shaft.

(b) Temporarily tighten the steering wheel set nut.

**16. w/ Airbag:**

**CHECK STEERING WHEEL CENTER POINT**

**17. w/ Airbag:**

**TORQUE STEERING WHEEL SET NUT**

Torque: 34 N·m (350 kgf·cm, 25 ft·lbf)

**18. w/ Airbag:**

**INSTALL STEERING WHEEL PAD (See page SR-10)**

**19. CHECK FRONT WHEEL ALIGNMENT**

(See page SA-3)

## SP10G-02





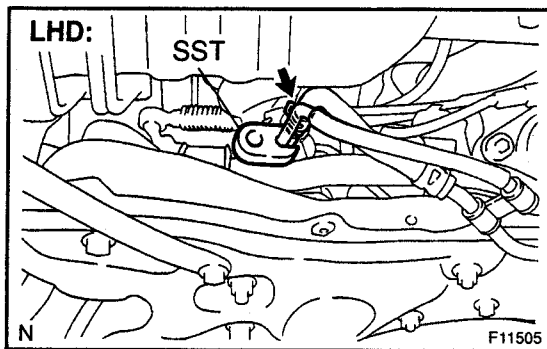
## REMOVAL

### NOTICE:

w/ Airbag:

Remove the steering wheel assembly before the steering gear removal, because there is possibility of breaking of the spiral cable.

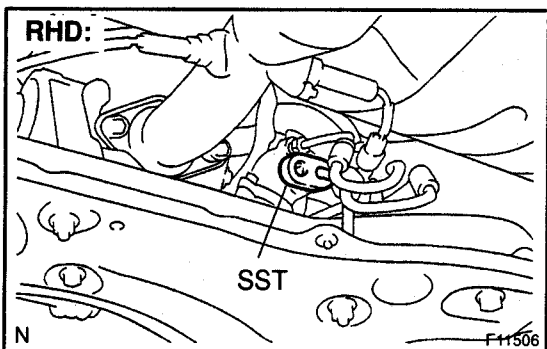
1. PLACE FRONT WHEELS FACING STRAIGHT AHEAD
2. w/ Airbag:  
REMOVE STEERING WHEEL PAD (See page SR-7)
3. w/ Airbag:  
REMOVE STEERING WHEEL (See page SR-7)
4. REMOVE RH AND LH ENGINE UNDER COVERS
5. DISCONNECT RH AND LH TIE ROD ENDS  
(See Pub. No. RM685E on page SA-10)
6. REMOVE NO. 2 COLUMN HOLE COVER  
(See page SR-7)
7. DISCONNECT SLIDING YOKE (See page SR-7)



### 8. DISCONNECT PRESSURE FEED AND RETURN TUBES

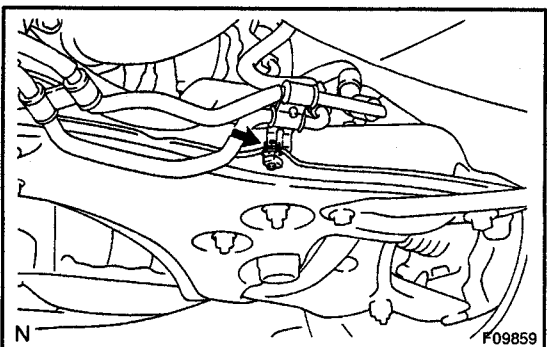
- (a) Disconnect the column hole cover sub-assembly.
- (b) LHD:  
Remove the clip and disconnect the return hose.
- (c) LHD:  
Using SST, disconnect the pressure feed and return tubes.

SST 09023-12900



- (d) RHD:  
Using SST, disconnect the pressure feed and return tubes.

SST 09023-12700

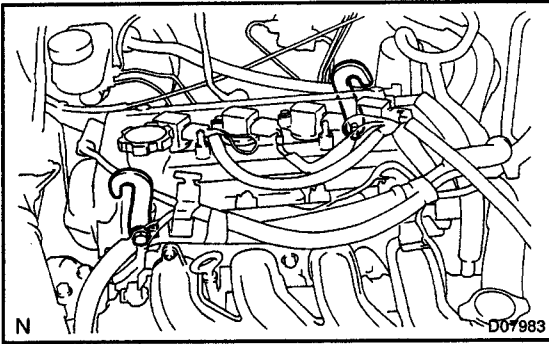


### 9. DISCONNECT TUBE CLAMP

Remove the bolt and disconnect the tube clamp.

### 10. REMOVE ENGINE HOOD

(See Pub. No. RM685E on page BO-16)



# 11. ATTACH ENGINE SLING DEVICE TO ENGINE HANGERS

- (a) Install the 2 No. 1 engine hangers with the bolt in the correct direction.

**Parts No.:**

**No. 1 engine hanger: 12281-21010**

**Bolt: 91511-60818**

**Torque: 20 N·m (204 kgf·cm, 15 ft·lbf)**

- (b) Attach the engine chain hoist to the engine hangers.

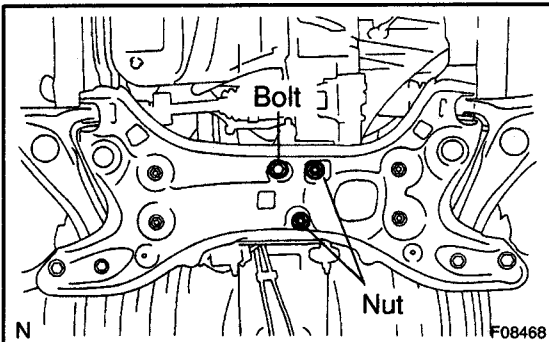
## CAUTION:

**Do not attempt to hang the engine by hooking the chain to any other part.**

# 12. DISCONNECT LOWER SUSPENSION ARM FROM STEERING KNUCKLE (See Pub. No. RM737E on page SA-17)

# 13. REMOVE RH AND LH FRONT SUSPENSION MEMBER REINFORCEMENT

- (a) Remove the 2 bolts and front suspension member reinforcement.
- (b) Employ the same manner described above to the other side.

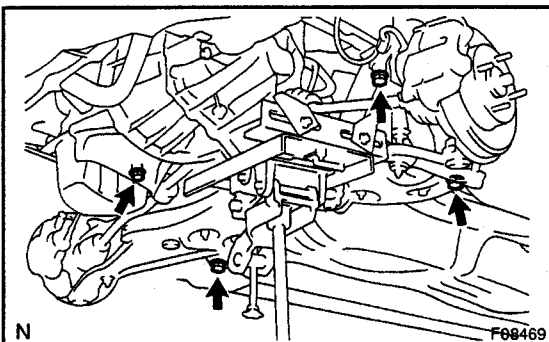


# 14. DISCONNECT ENGINE REAR MOUNT INSULATOR AND FRONT SUSPENSION MEMBER

Remove the bolt and 2 nuts, and disconnect the engine rear mount insulator and front suspension member.

# 15. SUPPORT FRONT SUSPENSION MEMBER WITH LOWER SUSPENSION ARM

Using a transmission jack, support the front suspension member with lower suspension arm.

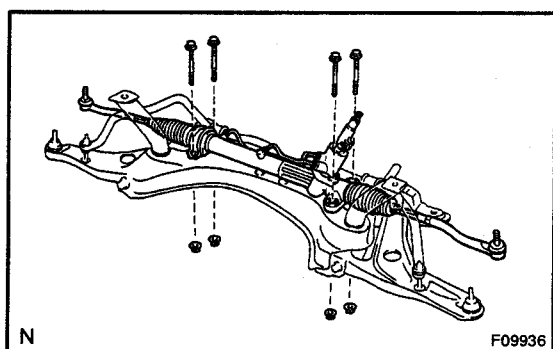


# 16. REMOVE FRONT SUSPENSION MEMBER WITH LOWER SUSPENSION ARM AND PS GEAR ASSEMBLY

Remove the 4 bolts and front suspension member with lower suspension arm and PS gear assembly.

**17. REMOVE PS GEAR ASSEMBLY**

- (a) RHD:  
Remove the bolt and rack housing heat insulator.
- (b) LHD:  
Remove the stabilizer bar (See Pub. No. RM737E on page SA-20).
- (c) LHD:  
Remove the bolt of the rack housing heat insulator.
- (d) LHD:  
Remove the 2 bolts, rack housing heat insulator and dynamic damper.
- (e) Remove the column hole cover sub-assembly.

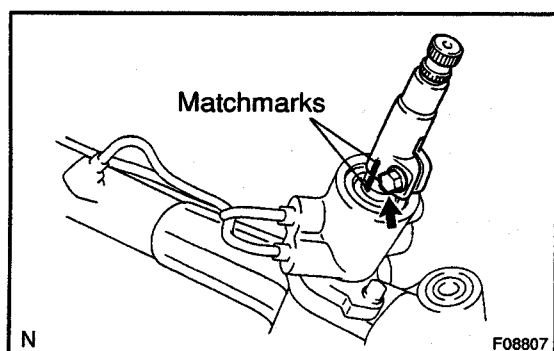


- (f) Remove the 4 bolts, nuts and PS gear assembly from the front suspension member.

**NOTICE:**

**Because the nut has its own stopper, do not turn the nut and torque the bolt with the nut fixed.**

- (g) Remove the bracket and grommet from the PS gear assembly.



- (h) Place matchmarks on the No. 3 intermediate shaft assembly and control valve shaft.

- (i) Remove the bolt and No. 3 intermediate shaft assembly.

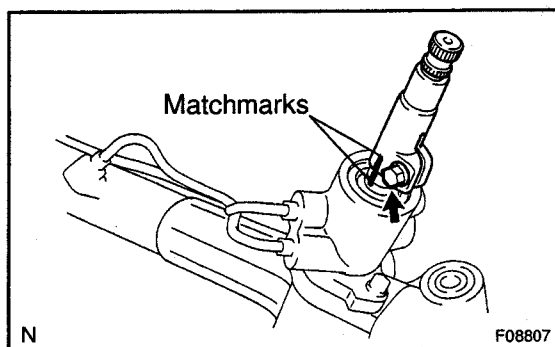
**18. REMOVE ENGINE REAR MOUNT INSULATOR AND ENGINE REAR MOUNT BRACKET**

- (a) Remove the through bolt, No. 2 engine rear mount bracket and engine rear mount insulator.
- (b) Remove the 3 bolts and engine rear mount bracket.

## INSTALLATION

### 1. INSTALL ENGINE REAR MOUNT INSULATOR AND ENGINE REAR MOUNT BRACKET

- (a) Install the engine rear mount bracket with the 3 bolts.  
**Torque: 49 N·m (500 kgf·cm, 36 ft·lbf)**
- (b) Install the engine rear mount insulator with the through bolt and No. 2 engine rear mount bracket.  
**Torque: 64 N·m (650 kgf·cm, 47 ft·lbf)**

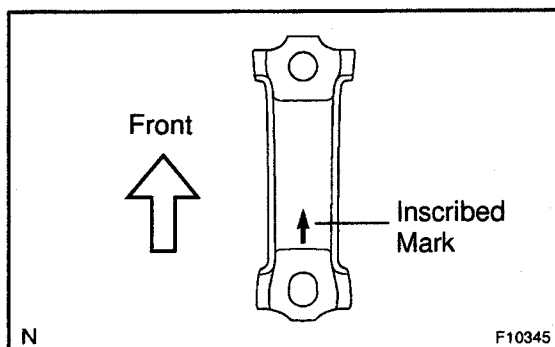


### 2. INSTALL PS GEAR ASSEMBLY

- (a) Align the matchmarks on the No. 3 intermediate shaft assembly and control valve shaft.
- (b) Install the No. 3 intermediate shaft assembly with the bolt.  
**Torque: 28 N·m (290 kgf·cm, 21 ft·lbf)**
- (c) Install the grommet and bracket to the PS gear assembly.

#### HINT:

Install the bracket with the inscribed mark facing to the front of the vehicle.



- (d) Install the PS gear assembly with the 4 bolts and nuts to the front suspension member.  
**Torque: 74 N·m (750 kgf·cm, 54 ft·lbf)**

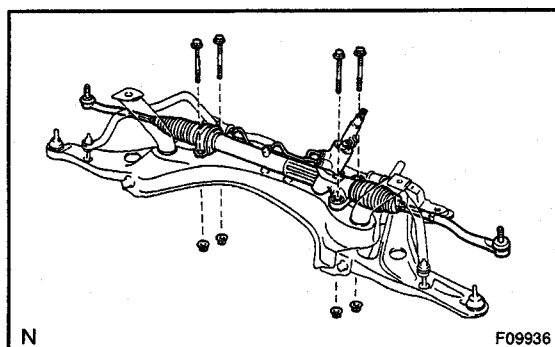
#### NOTICE:

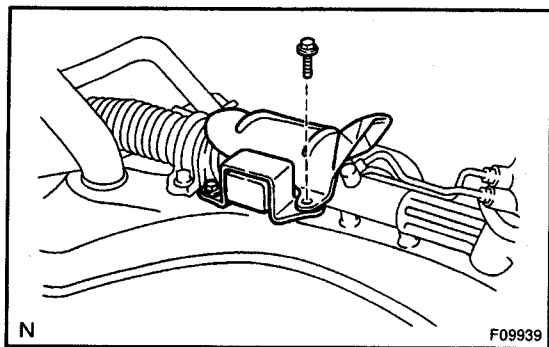
**Because the nut has its own stopper, do not turn the nut and torque the bolt with the nut fixed.**

- (e) Install the column hole cover sub-assembly.
- (f) RHD:  
Install the rack housing heat insulator with the bolt.  
**Torque: 7.4 N·m (75 kgf·cm, 65 in·lbf)**

#### HINT:

When assembling the steering gear heat insulator, set a projection of the column hole cover sub-assembly to the interlocking port of the steering gear heat insulator.





- (g) LHD:  
Install the dynamic damper and rack housing heat insulator with the 2 bolts as shown in the illustration.  
**Torque: 18 N·m (180 kgf·cm, 13 ft·lbf)**

- (h) LHD:  
Install the bolt of the rack housing heat insulator.  
**Torque: 35 N·m (360 kgf·cm, 26 ft·lbf)**

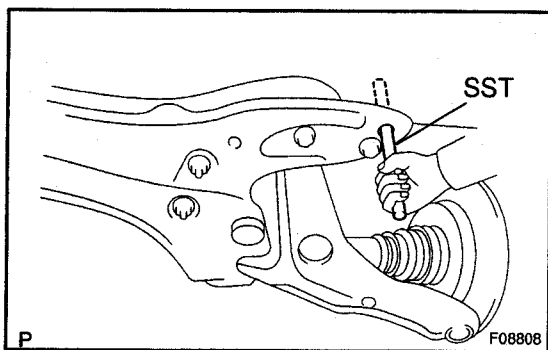
- (i) LHD:  
Install the stabilizer bar (See Pub. No. RM737E on page SA-22).

### 3. INSTALL FRONT SUSPENSION MEMBER WITH LOWER SUSPENSION ARM AND PS GEAR ASSEMBLY

- (a) Using SST, align the holes of the front suspension member and body.

SST 09670-00010

- (b) Employ the same manner described above to the other side.

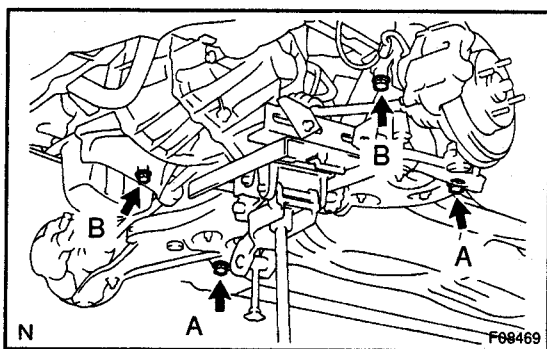


- (c) Install the front suspension member with lower suspension arm and PS gear assembly with the 4 bolts.

**Torque:**

**Bolt A: 116 N·m (1,185 kgf·cm, 86 ft·lbf)**

**Bolt B: 70 N·m (715 kgf·cm, 52 ft·lbf)**



### 4. CONNECT ENGINE REAR MOUNT INSULATOR AND FRONT SUSPENSION MEMBER

Connect the engine rear mount insulator and front suspension member with the bolt and 2 nuts.

**Torque: 80 N·m (810 kgf·cm, 59 ft·lbf)**

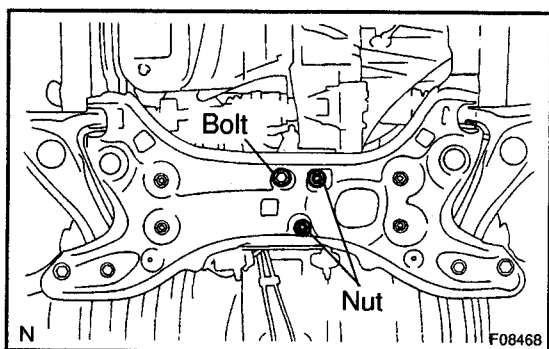
### 5. INSTALL RH AND LH FRONT SUSPENSION MEMBER REINFORCEMENT

- (a) Install the front suspension member reinforcement with the 2 bolts.

**Torque: 47 N·m (480 kgf·cm, 35 ft·lbf)**

- (b) Employ the same manner described above to the other side.

### 6. CONNECT LOWER SUSPENSION ARM TO STEERING KNUCKLE (See Pub. No. RM737E on page SA-18)

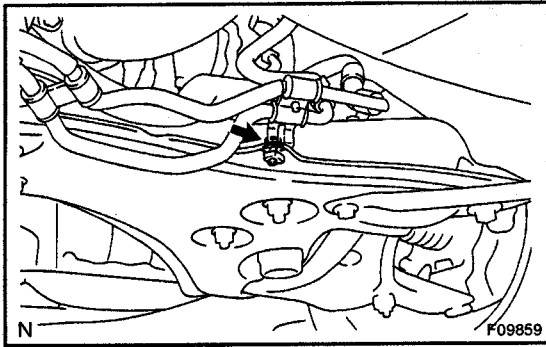


**7. DISENGAGE ENGINE SLING DEVICE FROM ENGINE HANGERS**

- (a) Disengage the engine chain hoist from the engine hangers.
- (b) Remove the 2 No. 1 engine hangers.

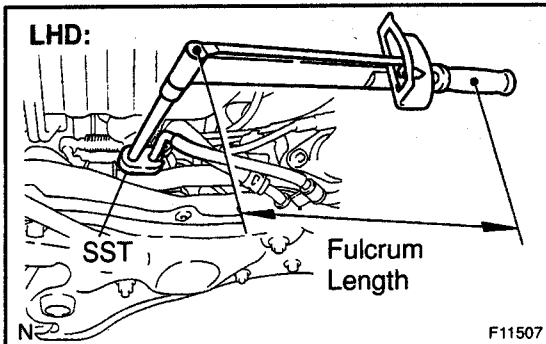
**8. INSTALL ENGINE HOOD**

(See Pub. No. RM685E on page BO-16)

**9. CONNECT TUBE CLAMP**

- (a) Temporarily connect the pressure feed and return tubes.
- (b) Connect the tube clamp with the bolt.

**Torque: 7.8 N·m (80 kgf·cm, 69 in.-lbf)**

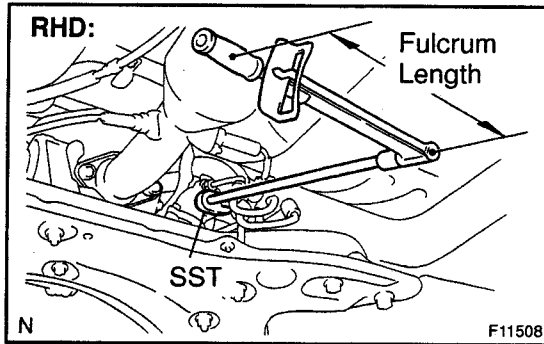
**10. CONNECT PRESSURE FEED AND RETURN TUBES**

- (a) LHD:  
Using SST, connect the pressure feed and return tubes.  
SST 09023-12900  
**Torque: 27 N·m (280 kgf·cm, 20 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.

- (b) LHD:  
Connect the return hose with the clip.



- (c) RHD:  
Using SST, connect the pressure feed and return tubes.  
SST 09023-12700  
**Torque: 41 N·m (415 kgf·cm, 30 ft·lbf)**

**HINT:**

- Use a torque wrench with a fulcrum length of 345 mm (13.58 in.).
  - This torque value is effective in case that SST is parallel to a torque wrench.
- (d) Connect the column hole cover sub-assembly.
11. **CONNECT SLIDING YOKE (See page SR-10)**
  12. **INSTALL NO. 2 COLUMN HOLE COVER (See page SR-10)**
  13. **CONNECT RH AND LH TIE ROD ENDS (See Pub. No. RM685E on page SA-14)**
  14. **INSTALL RH AND LH ENGINE UNDER COVERS**
  15. **PLACE FRONT WHEELS FACING STRAIGHT AHEAD**

**HINT:**

Do it with the front of the vehicle jacked up.

16. **w/ Airbag:**  
**CENTER SPIRAL CABLE (See page SR-10)**
17. **w/ Airbag:**  
**INSTALL STEERING WHEEL**
  - (a) Align the matchmarks on the steering wheel and steering column main shaft.
  - (b) Temporarily tighten the steering wheel set nut.
18. **BLEED POWER STEERING SYSTEM (See Pub. No. RM685E on page SR-7)**
19. **w/ Airbag:**  
**CHECK STEERING WHEEL CENTER POINT**
20. **w/ Airbag:**  
**TORQUE STEERING WHEEL SET NUT**  
**Torque: 34 N·m (350 kgf·cm, 25 ft·lbf)**
21. **w/ Airbag:**  
**INSTALL STEERING WHEEL PAD (See page SR-10)**
22. **CHECK FRONT WHEEL ALIGNMENT (See page SA-3)**

