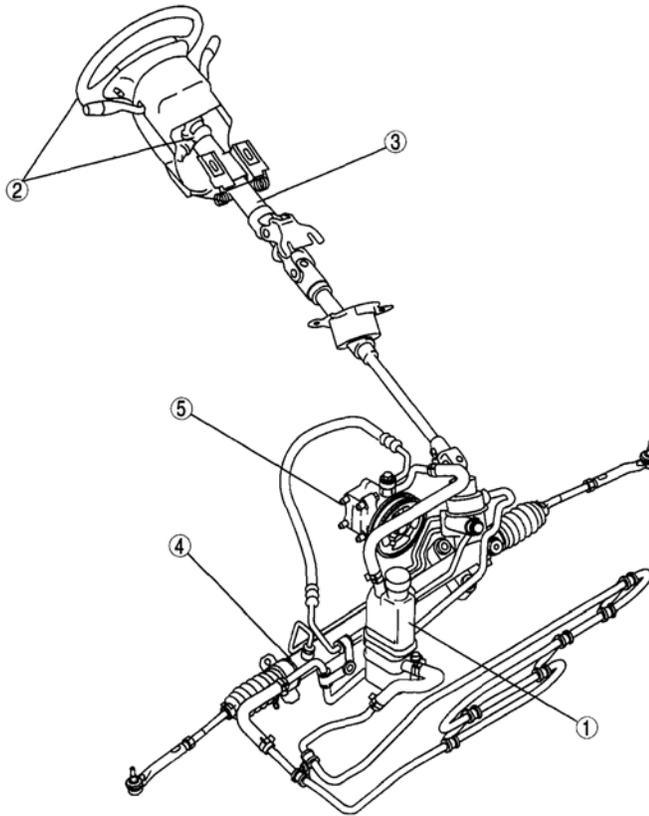


2008 STEERING

Power Steering - MX-5 Miata

STEERING LOCATION INDEX



E5U614ZW5025

1	Power steering fluid tank
2	Steering wheel and column
3	Steering shaft
4	Steering gear and linkage
5	Power steering oil pump

**Fig. 1: Identifying Location Of Steering Components**  
Courtesy of MAZDA MOTORS CORP.

**AIR BLEEDING**

- CAUTION:**
- Do not turn the steering wheel during the fluid level inspection, otherwise the fluid level changes and cannot be inspected correctly.

1. Inspect the fluid level. (See **POWER STEERING FLUID INSPECTION** .)
2. Jack up the front of the vehicle and support it on safety stands.
3. Turn the steering wheel fully to the left and right several times with the engine not running.
4. Reinspect the fluid level.
  - If it has dropped, add fluid.
5. Repeat Steps 3 and 4 until the fluid level stabilizes.
6. Lower the vehicle.
7. Start the engine and let it idle.
8. Turn the steering wheel fully to the left and right several times.
9. Verify that the fluid is not foamy and that the fluid level has not dropped.
  - If the fluid level has dropped, add fluid as necessary and repeat Steps 8 and 9.

## **POWER STEERING FLUID INSPECTION**

### **FLUID LEVEL INSPECTION**

1. Inspect the power steering fluid level.
  - Add fluid to the specified level as necessary.

#### **Power steering fluid type**

**ATF M-III or equivalent (e.g. Dexron®RII)**

#### **Power steering fluid capacity (approximate quantity)**

**1.19 L {1.25 US qt, 1.04 Imp qt}**

### **FLUID LEAKAGE INSPECTION**

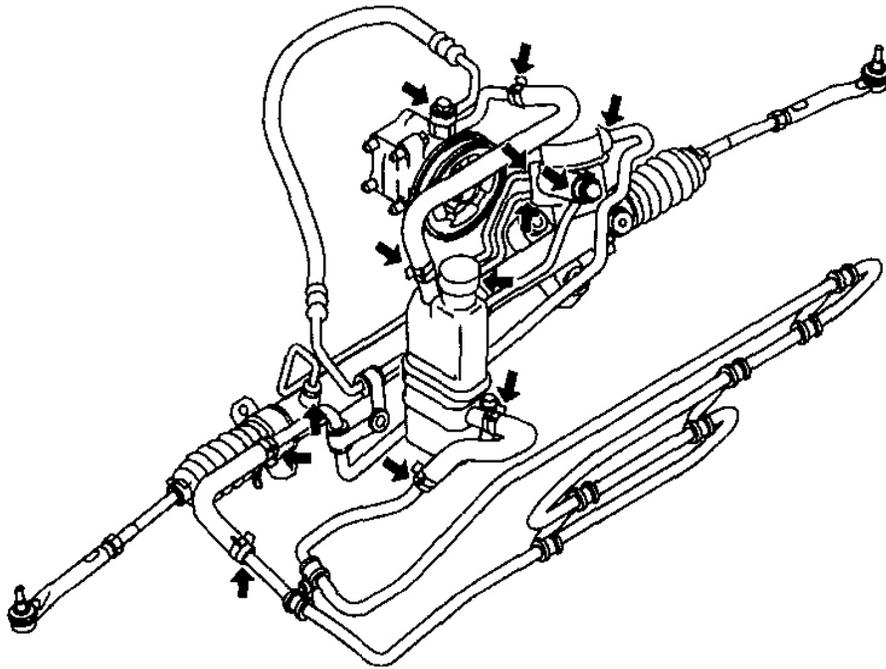
1. Start the engine and let it idle.
2. Turn the steering wheel fully to the left and right to apply fluid pressure.

- CAUTION:**
- If the steering wheel is kept in the fully turned position for more than 5 seconds, the fluid temperature will rise excessively and adversely affect the oil pump.

3. Inspect for fluid leakage.
  - If fluid leakage is found, replace related pipe or hose.

**NOTE:**

- The points where fluid leakage may occur are indicated in the figure.

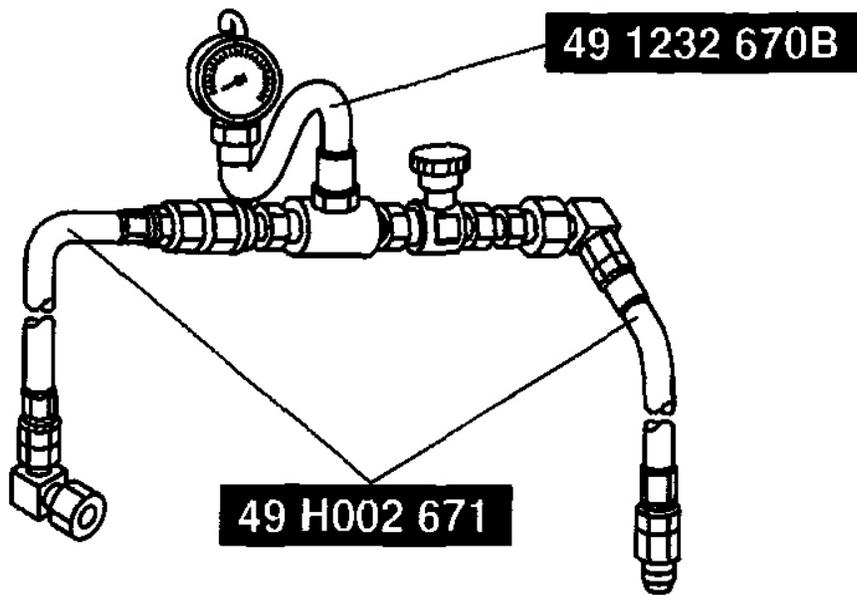


E5U614ZW5019

**Fig. 2: Identifying Fluid Leakage Points**  
Courtesy of MAZDA MOTORS CORP.

**FLUID PRESSURE INSPECTION**

1. Assemble the SSTs as shown in **Fig. 3**.



A6E0612W101

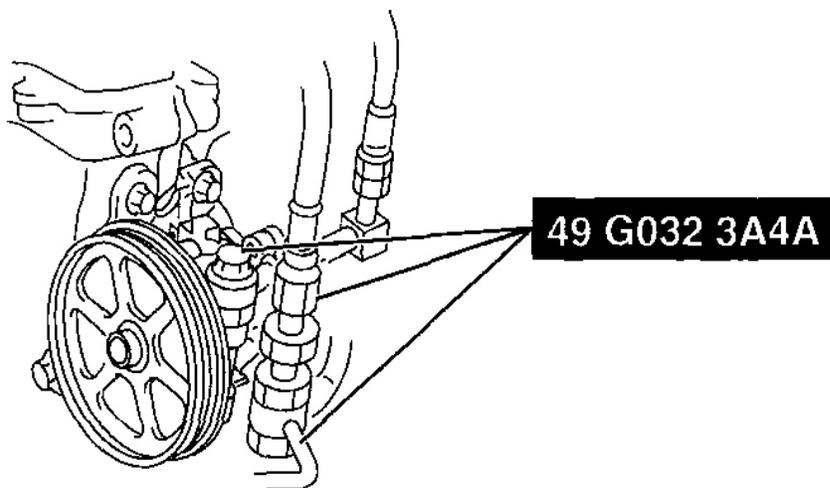
**Fig. 3: Assembling SSTs**

Courtesy of MAZDA MOTORS CORP.

2. Disconnect the pressure pipe from the oil pump, and connect the SSTs .

**Tightening torque**

29.4-44.1 N.m {3.00-4.49 kgf.m, 21.7-32.5 ft.lbf}



E5U614ZW5003

**Fig. 4: Connecting SSTs**  
Courtesy of MAZDA MOTORS CORP.

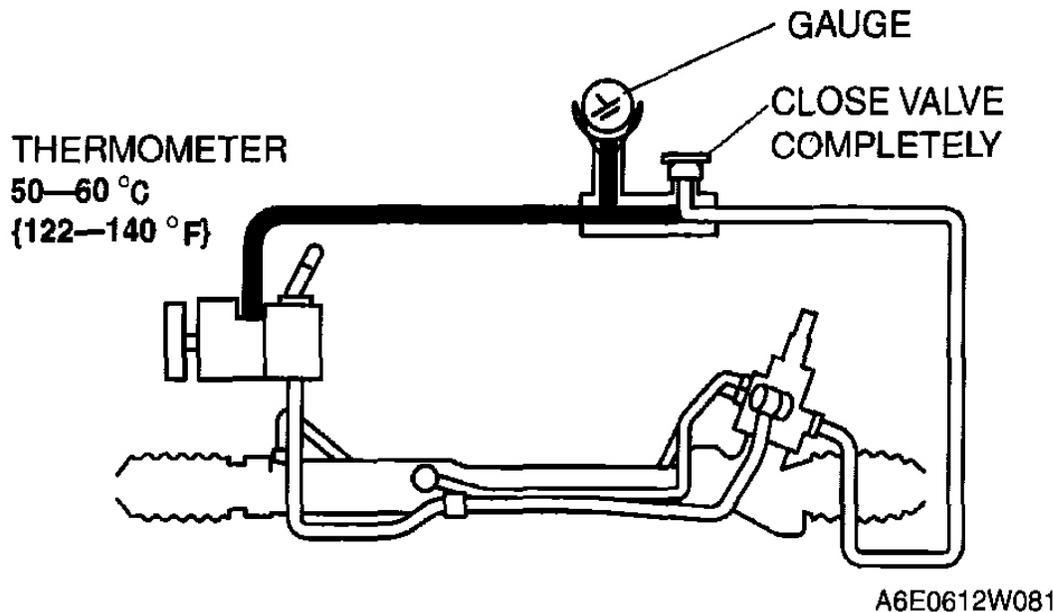
3. Bleed the air from the system. (See **AIR BLEEDING** .)
4. Open the gauge valve fully.
5. Start the engine and turn the steering wheel fully left and right to raise the fluid temperature to **50-60°C {122-140°F}** .
6. Close the gauge valve completely.
7. Increase the engine speed to **1,000-1,500 rpm** and measure the fluid pressure generated by the oil pump.
  - If the pressure is not within the specification, repair or replace the oil pump component.

**CAUTION:**

- If the valve is left closed for more than 5 seconds, the fluid temperature will rise excessively and adversely affect the oil pump.

**Oil pump fluid pressure**

**7.55-8.05 MPa {77.0-82.0 kgf/cm<sup>2</sup> , 1095-1167 psi}**



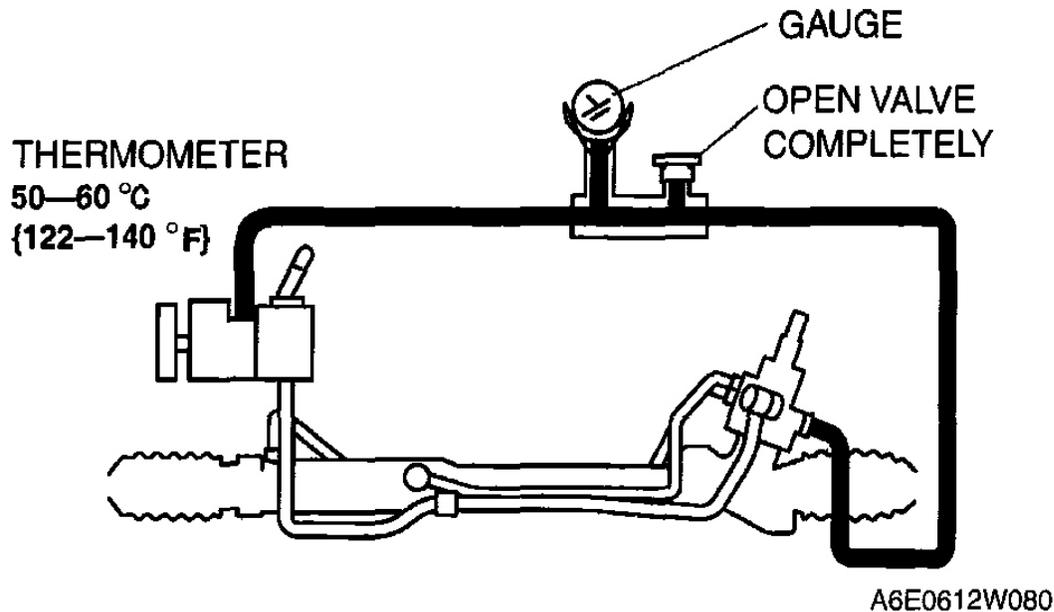
**Fig. 5: Inspecting Fluid Pressure (Valve Closed)**  
Courtesy of MAZDA MOTORS CORP.

8. Open the gauge valve fully and increase the engine speed to **1,000-1,500 rpm** .
9. Turn the steering wheel fully to the left and right, then measure the fluid pressure generated at the gear housing.
  - If the pressure is not within the specification, repair or replace the steering gear component.

**CAUTION:**     • If the steering wheel is kept in the fully turned position for more than 5 seconds, the fluid temperature will rise excessively and adversely affect the oil pump.

**Gear housing fluid pressure**

7.55-8.05 MPa {77.0-82.0 kgf/cm<sup>2</sup> ,1095-1167 psi}



**Fig. 6: Inspecting Fluid Pressure (Valve Open)**  
Courtesy of MAZDA MOTORS CORP.

10. Remove the SSTs . Install and tighten the pressure pipe to the specified torque.

**Tightening torque**

**29.4-44.1 N.m {3.00-4.49 kgf.m, 21.7-32.5 ft.lbf}**

11. Bleed the air from the system.

## STEERING WHEEL AND COLUMN INSPECTION

### STEERING WHEEL PLAY INSPECTION

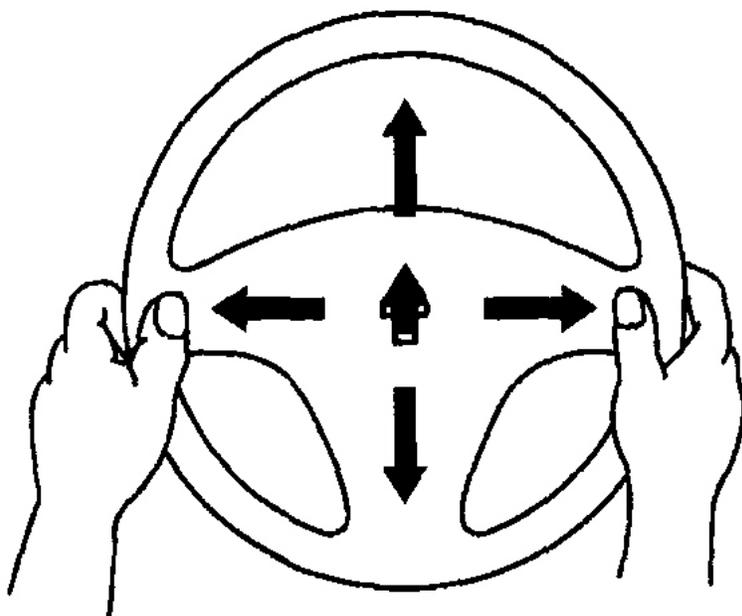
1. With the wheels in the straight-ahead position, gently turn the steering wheel to the left and right and verify that the play is within the specification.
  - If the play exceeds the specification, either the steering joints are worn or the backlash of the steering gear is excessive. Correct as necessary.

**Steering wheel play**

**0-30 mm {0-1.18 in}**

### STEERING WHEEL LOOSENESS INSPECTION

1. Move the steering wheel as shown in **Fig. 7** to inspect for column bearing wear, steering shaft joint play, steering wheel looseness, and column looseness.
  - Repair or replace as necessary.



A6E0612W015

**Fig. 7: Inspecting Steering Wheel Play**  
Courtesy of MAZDA MOTORS CORP.

### STEERING WHEEL EFFORT INSPECTION

1. Inspect the following points:
  - Tire size and tire pressure
  - Fluid level
  - Drive belt deflection
2. With the vehicle on a hard, level surface, put the wheels in the straight-ahead position.
3. Remove the air bag module.

**WARNING:**

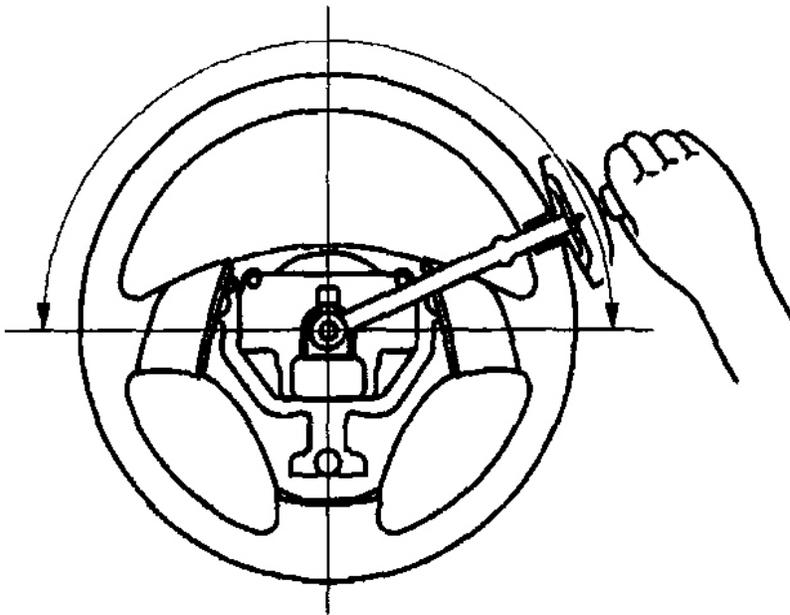
- Handling the air bag module improperly can accidentally deploy the air bag module, which may seriously injure you. Read AIR BAG SYSTEM WARNINGS before handling the air

**bag module. (See AIR BAG SYSTEM SERVICE WARNINGS .)  
(See AIR BAG SYSTEM SERVICE CAUTIONS .)**

4. Start the engine and warm the power steering fluid to **50-60°C {122-140°F}** .
5. Measure the steering wheel effort using a torque wrench.
  - If not within the specification, verify the following:
    - No air in steering system
    - No fluid leakage at hose or connectors
    - Function of oil pump and steering gear

### Steering wheel effort

**7.8 N.m {80 kgf.cm, 58 in.lbf} max.**



A6E0612W016

**Fig. 8: Measuring Steering Wheel Effort Using Torque Wrench**  
Courtesy of MAZDA MOTORS CORP.

### NOTE:

- To determine whether the steering effort is satisfactory or not, perform the inspection on another vehicle of the same model and under the same conditions, and compare the results.

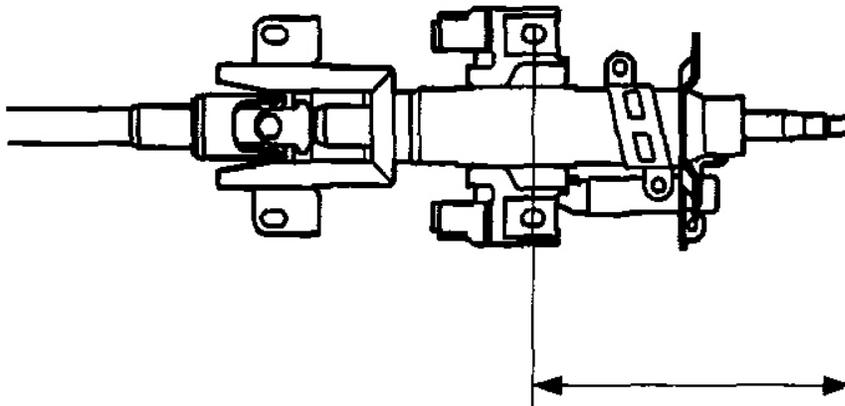
- The steering wheel effort varies with conditions as shown below.
  - Road conditions, such as dry or wet, and asphalt or concrete.
  - Tire conditions, such as brand, wear, and tire pressure.

## STEERING SHAFT INSPECTION

1. Inspect the following.
  1. Column bearing for damage
  2. Steering shaft length
    - Replace the steering shaft component as necessary.

### Steering shaft length

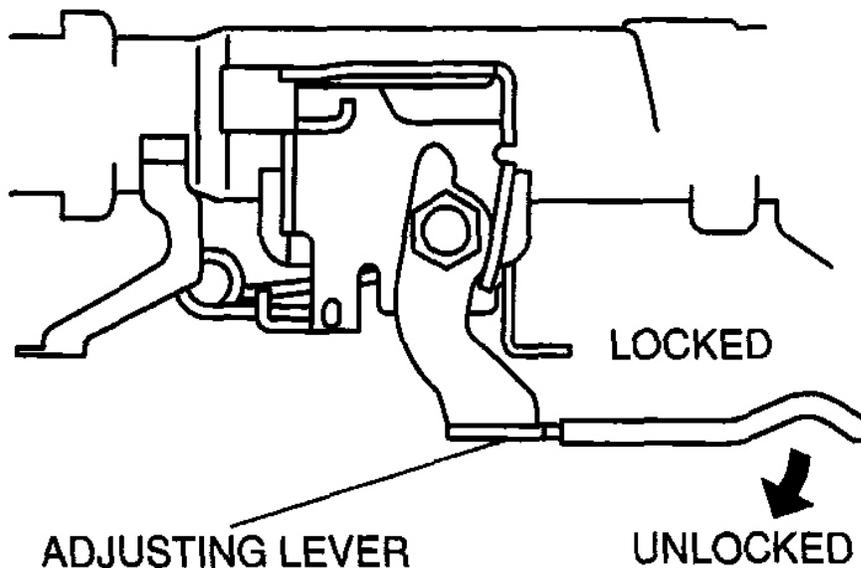
247.3 mm {9.736 in}



A6E0612W022

**Fig. 9: Identifying Steering Shaft Length**  
Courtesy of MAZDA MOTORS CORP.

2. Inspect the tilt operation.
  1. Verify that the adjusting lever moves smoothly from unlock position to lock position.
  2. Verify that the steering shaft is fixed firmly when the adjusting lever is locked.
    - Replace the steering shaft component as necessary.



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**Fig. 10: Inspecting Tilt Operation**  
Courtesy of MAZDA MOTORS CORP.

## STEERING WHEEL AND COLUMN REMOVAL/INSTALLATION

**WARNING:**

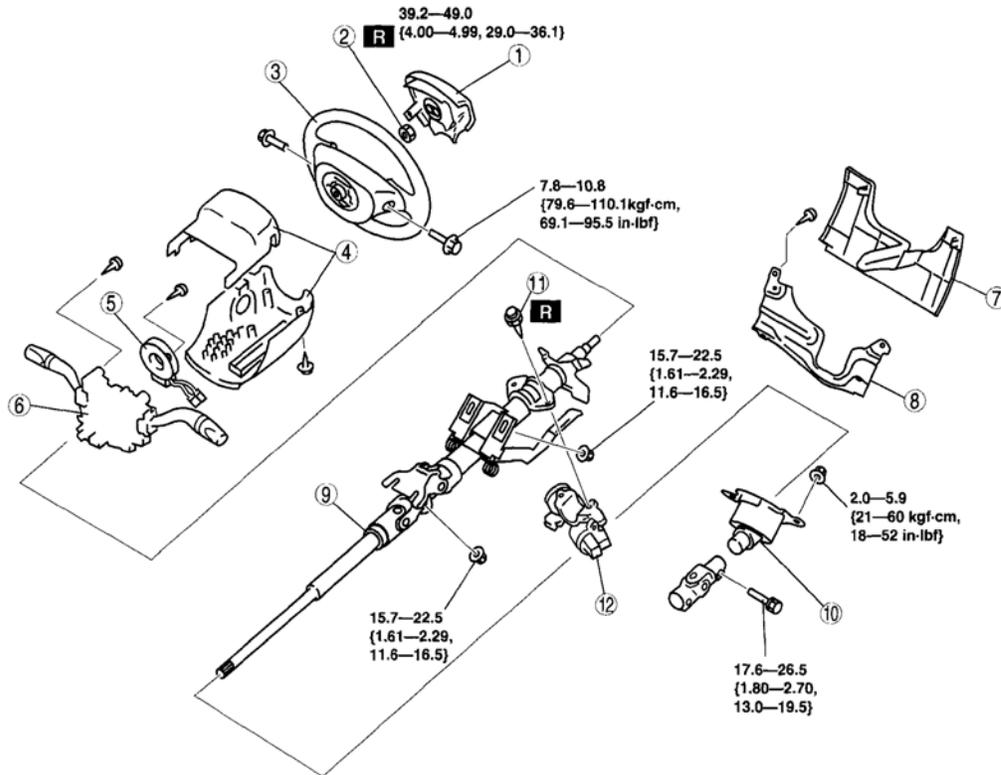
- Handling the air bag module improperly can accidentally deploy the air bag module, which may seriously injure you. Read **AIR BAG SYSTEM WARNINGS** before handling the air bag module. (See **AIR BAG SYSTEM SERVICE WARNINGS** .) (See **AIR BAG SYSTEM SERVICE CAUTIONS** .)

1. Remove in the order indicated in **Fig. 11**.
2. Install in the reverse order of removal.
3. If the steering lock component of a vehicle equipped with the advanced keyless system is replaced, perform the following procedure after installation.
  - Without immobilizer system
    - Steering lock unit programming (See **STEERING LOCK UNIT ID CODE REGISTRATION[ADVANCED KEYLESS SYSTEM]** .)
  - With immobilizer system
    - Immobilizer system resetting (See **IMMOBILIZER SYSTEM COMPONENT REPLACEMENT/KEY ADDITION AND CLEARING[ADVANCED KEYLESS**

# 2008 Mazda MX-5 Miata Grand Touring

## 2008 STEERING Power Steering - MX-5 Miata

### SYSTEM] .)



N-m {kgf·m, ft-lbf}

E5U614ZW5004

1	Air bag module
2	Locknut
3	Steering wheel
4	Column cover
5	Clock spring
6	Combination switch
7	Lower panel
8	Knee bolster
9	Steering shaft
10	Dust cover
11	Steering lock mounting bolts
12	Steering lock component

**Fig. 11: Steering Wheel & Column Components (With Torque Specifications)**  
 Courtesy of MAZDA MOTORS CORP.

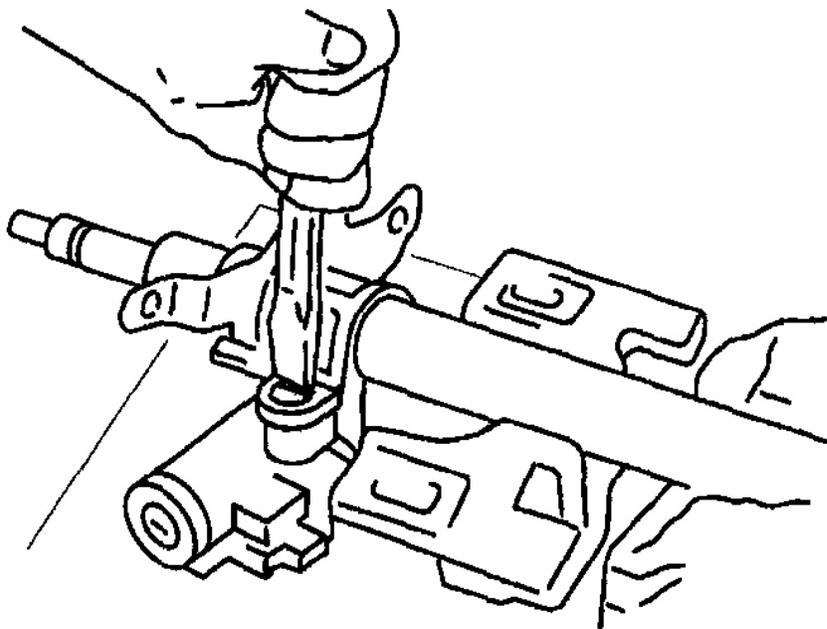
### STEERING WHEEL REMOVAL NOTE

- CAUTION:**
- Do not try to remove the steering wheel by hitting the shaft with a hammer. The column will collapse.

1. Set the vehicle in the straight-ahead position.
2. Remove the steering wheel using a suitable puller.

### STEERING LOCK MOUNTING BOLTS REMOVAL NOTE

1. Make a groove in the heads of the steering lock mounting bolts using a chisel and a hammer.
2. Remove the bolts using a screwdriver.
3. Disassemble the steering lock component.

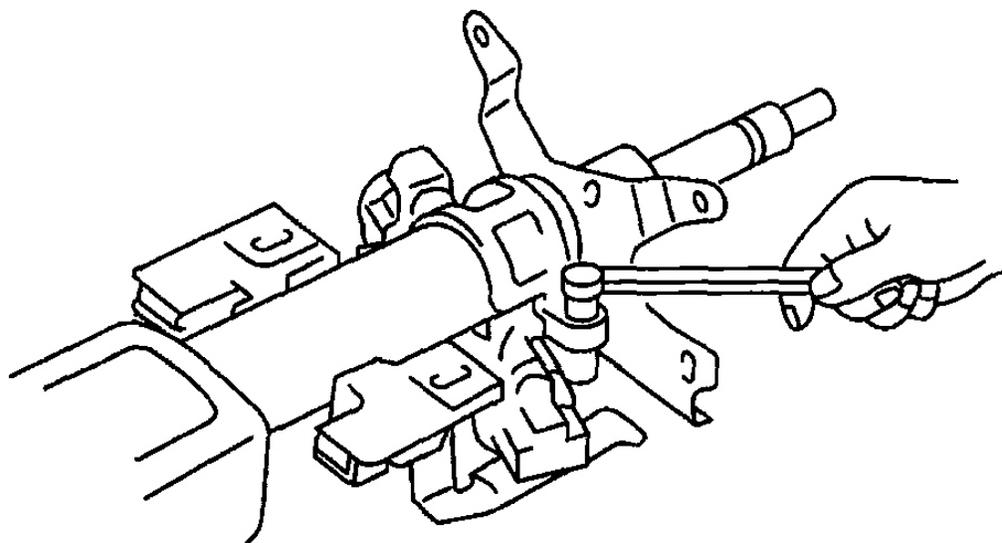


A6E0612W018

**Fig. 12: Removing Bolts Using Screwdriver**  
Courtesy of MAZDA MOTORS CORP.

### STEERING LOCK MOUNTING BOLTS INSTALLATION NOTE

1. Assemble the steering lock component to the steering shaft.
2. Verify that the lock operates correctly.
3. Install new steering lock mounting bolts.
4. Tighten the bolts until the heads break off.



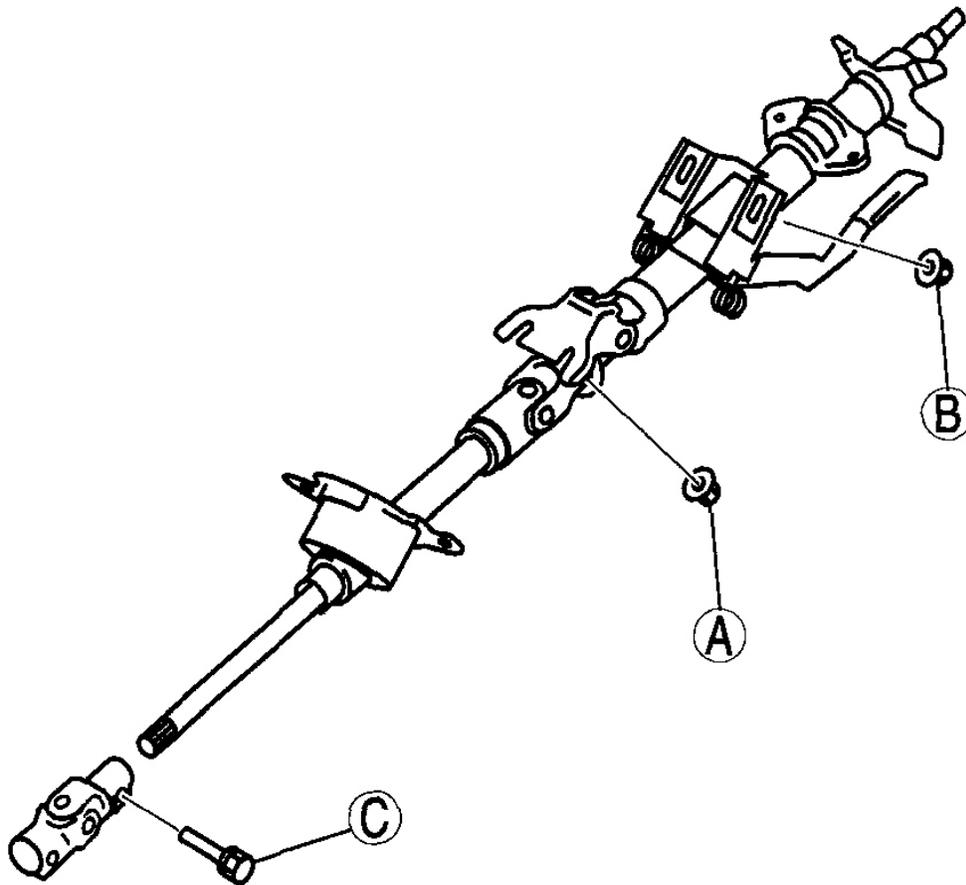
A6E0612W020

**Fig. 13: Installing Steering Lock Mounting Bolts**  
Courtesy of MAZDA MOTORS CORP.

#### STEERING SHAFT INSTALLATION NOTE

**CAUTION:** • Do not apply a shock in the axial direction of the shaft.

1. Lock the tilt lever.
2. Tighten nut A.
3. Tighten nut B.
4. Tighten bolt C.



E5U614ZW5024

**Fig. 14: Steering Shaft Nuts**  
Courtesy of MAZDA MOTORS CORP.

### STEERING WHEEL INSTALLATION NOTE

1. Make sure the wheels in the straight-ahead position, and install the steering wheel.

### STEERING GEAR AND LINKAGE REMOVAL/INSTALLATION

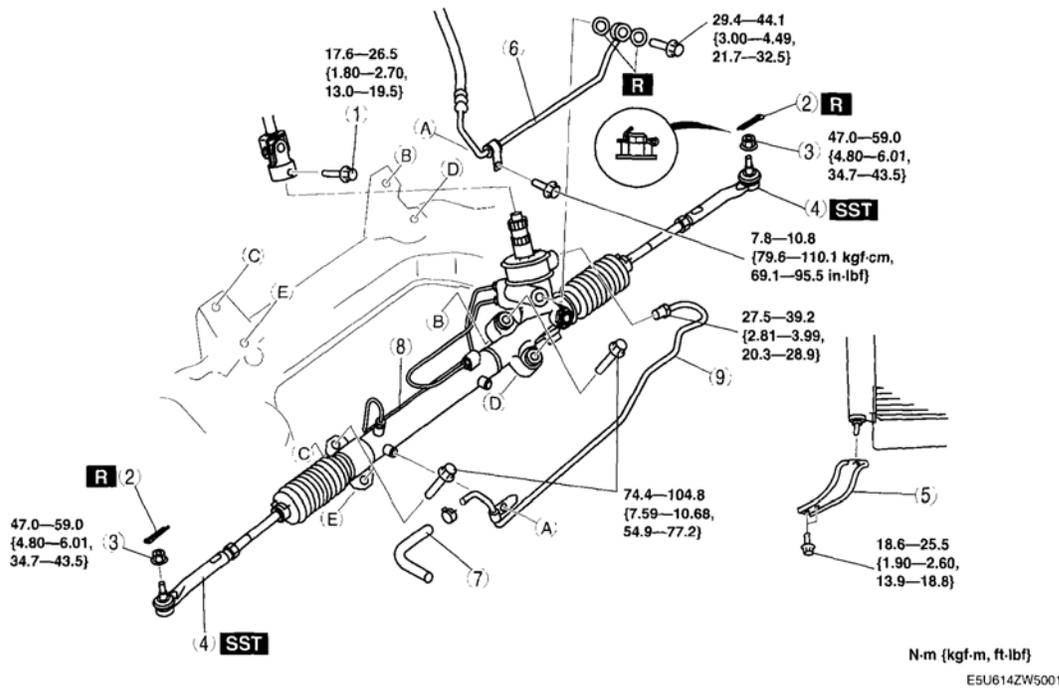
**CAUTION:**

- Performing the following procedures without first removing the ABS wheel-speed sensor may possibly cause an open circuit in the harness if it is pulled by mistake. Before performing the following procedures, remove the ABS wheel-speed sensor (axle side) and fix it to an appropriate place where the sensor will not be pulled by mistake while servicing the vehicle.

## 2008 Mazda MX-5 Miata Grand Touring

### 2008 STEERING Power Steering - MX-5 Miata

1. Remove the ABS wheel-speed sensor. (See **FRONT ABS WHEEL-SPEED SENSOR REMOVAL/INSTALLATION** .)
2. Remove the front stabilizer. (See **FRONT STABILIZER REMOVAL/INSTALLATION** .)
3. Remove in the order indicated in **Fig. 15**.
4. Install in the reverse order of removal.
5. After installation, adjust the total toe-in. (See **FRONT WHEEL ALIGNMENT** .)

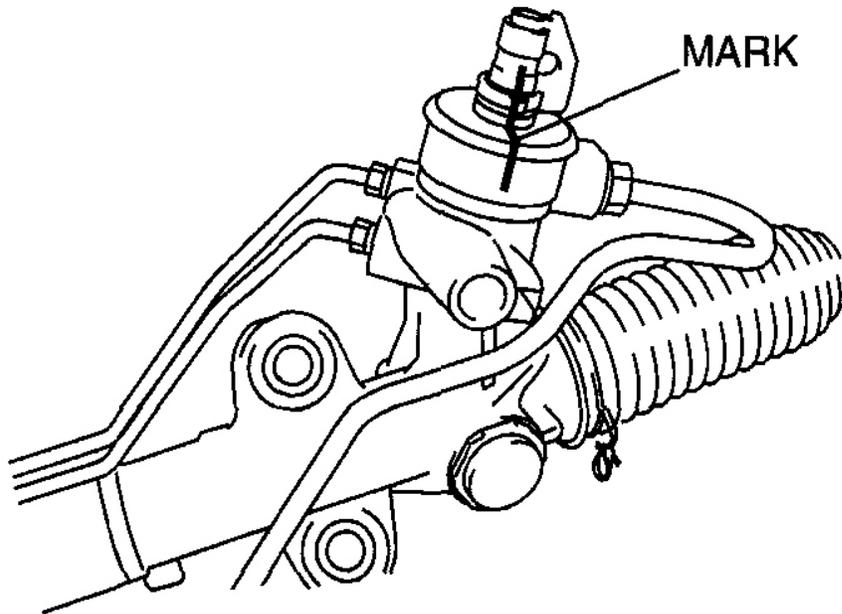


1	Bolt (intermediate shaft)
2	Cotter pin
3	Nuts (tie-rod end ball joint)
4	Tie-rod end ball joint
5	Lower mounting rubber bracket
6	Pressure pipe
7	Return hose
8	Steering gear and linkage
9	Return pipe

**Fig. 15: View Of Steering Gear & Linkage Components (With Torque Specifications)**  
Courtesy of MAZDA MOTORS CORP.

#### **BOLT (INTERMEDIATE SHAFT) REMOVAL NOTE**

1. Mark the pinion shaft and gear housing for proper installation.

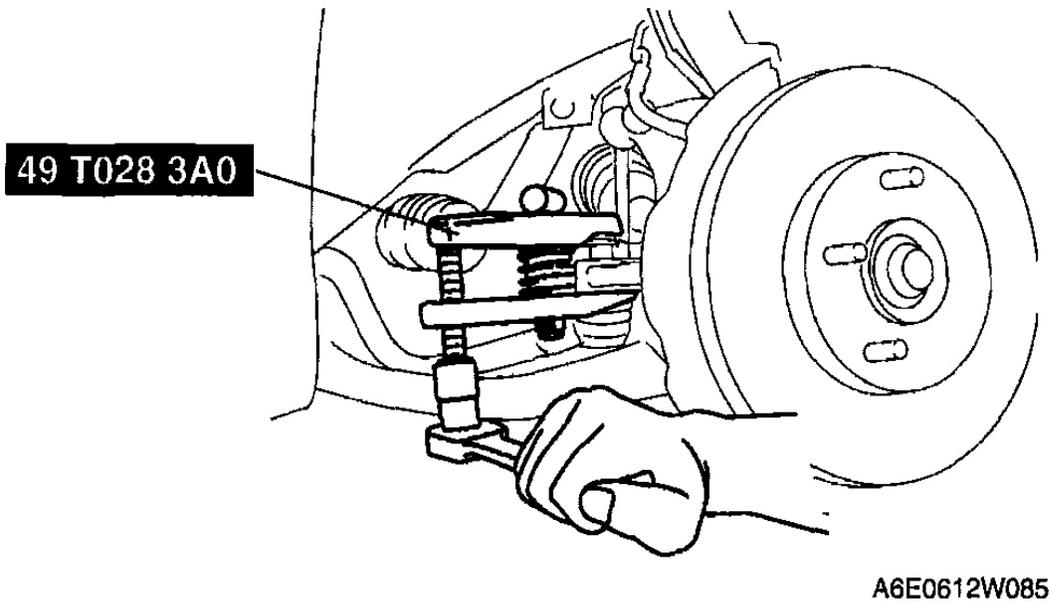


E5U614ZW5002

**Fig. 16: Locating Mark On Pinion Shaft & Gear Housing**  
Courtesy of MAZDA MOTORS CORP.

**TIE-ROD END BALL JOINT REMOVAL NOTE**

1. Remove the tie-rod nut.
2. Separate the tie-rod end from the steering knuckle using the SSTs .



A6E0612W085

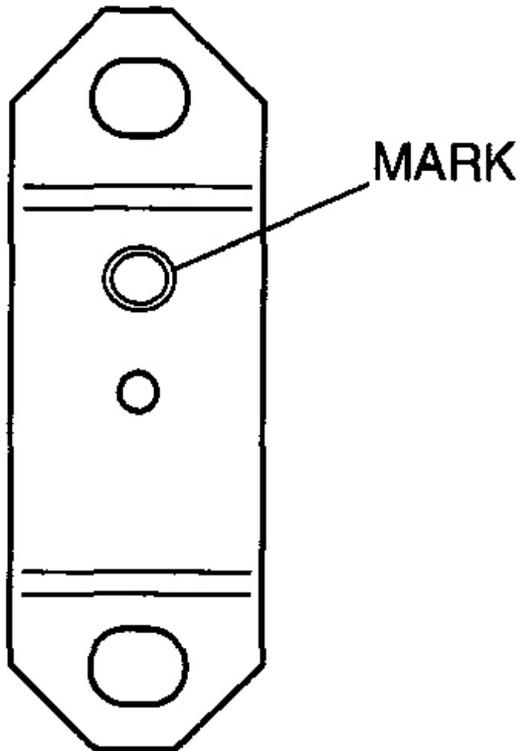
**Fig. 17: Separating Tie-Rod End From Steering Knuckle Using SSTs**  
Courtesy of MAZDA MOTORS CORP.

#### **STEERING GEAR AND LINKAGE REMOVAL NOTE**

1. Remove the steering gear and linkage by pulling it from the right side.

#### **STEERING GEAR AND LINKAGE INSTALLATION NOTE**

1. Tighten bolts loosely.
2. Assemble the mounting bracket with the mark on the bracket facing the vehicle rear.



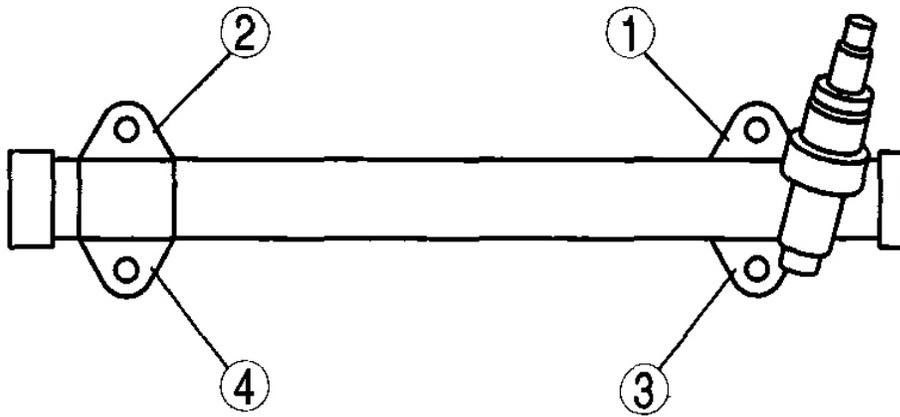
E5U614ZW5021

**Fig. 18: Locating Mark On Bracket**  
Courtesy of MAZDA MOTORS CORP.

3. Tighten the mounting bracket bolts to the specified torque in the order shown.

**Tightening torque**

74.4-104.8 N.m {7.587-10.68 kgf.m, 54.88-77.29 ft.lbf}



E5U614ZW5005

**Fig. 19: Mounting Bracket Bolts Tightening Order**  
Courtesy of MAZDA MOTORS CORP.

#### **BOLT (INTERMEDIATE SHAFT) INSTALLATION NOTE**

1. Align the marks and install the intermediate shaft and bolt.

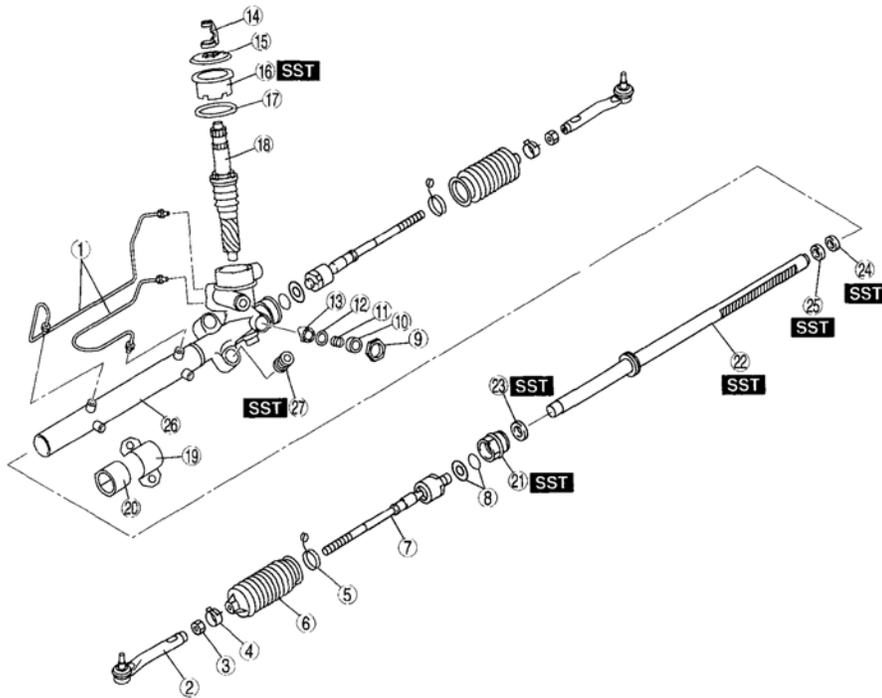
#### **STEERING GEAR AND LINKAGE DISASSEMBLY**

- CAUTION:**
- Place copper plates, rag, or similar material in a vise, when securing the mounting bracket portion of the steering gear.

1. Disassemble in the order indicated in **Fig. 20**.

# 2008 Mazda MX-5 Miata Grand Touring

## 2008 STEERING Power Steering - MX-5 Miata



E5U614ZW5006

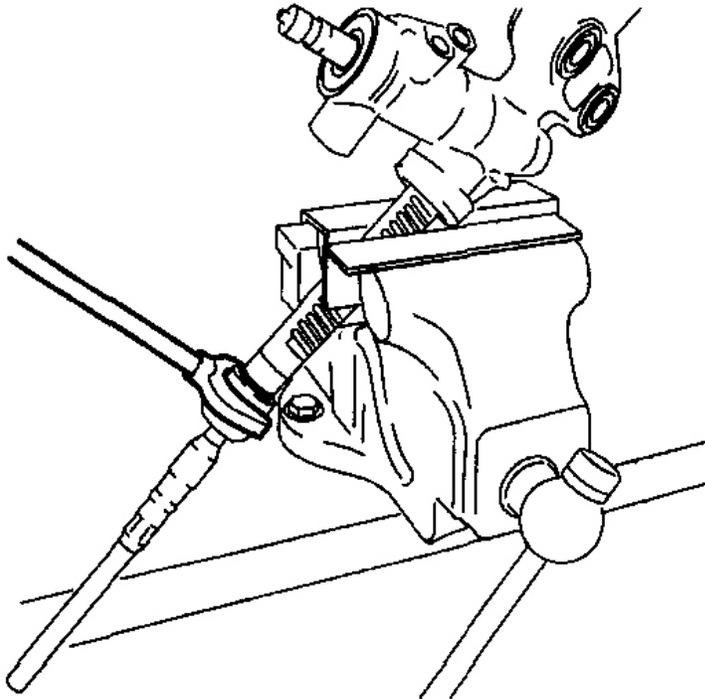
1	Oil pipe
2	Tie-rod end
3	Locknut
4	Boot clamp
5	Boot band
6	Boot
7	Tie rod
8	Lock washer and o-ring
9	Locknut (adjusting cover)
10	Adjusting cover
11	Yoke spring
12	Washer
13	Support yoke
14	Clip
15	Dust cover
16	Pinion plug
17	O-ring

18	Pinion shaft component
19	Mounting bracket
20	Mounting rubber
21	Holder
22	Steering rack
23	Oil seal (holder side)
24	Inner guide
25	Oil seal (gear housing side)
26	Gear housing
27	Mounting rubber

**Fig. 20: Exploded View Of Steering Gear & Linkage**  
 Courtesy of MAZDA MOTORS CORP.

### TIE ROD DISASSEMBLY NOTE

1. Unclamp the washer.
2. Remove the tie rod.

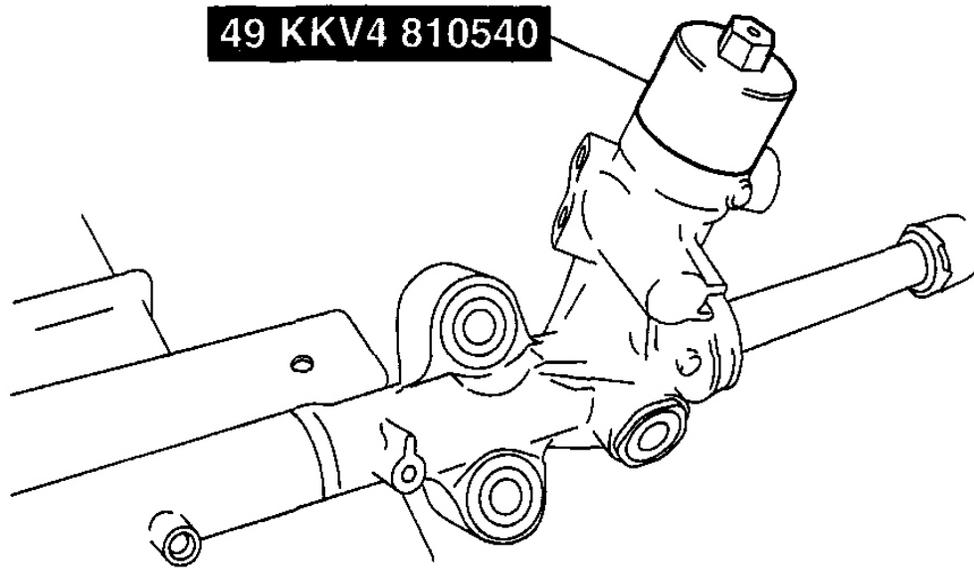


E5U614ZW5009

**Fig. 21: Removing Tie Rod**  
Courtesy of MAZDA MOTORS CORP.

**PINION PLUG, PINION SHAFT COMPONENT DISASSEMBLY NOTE**

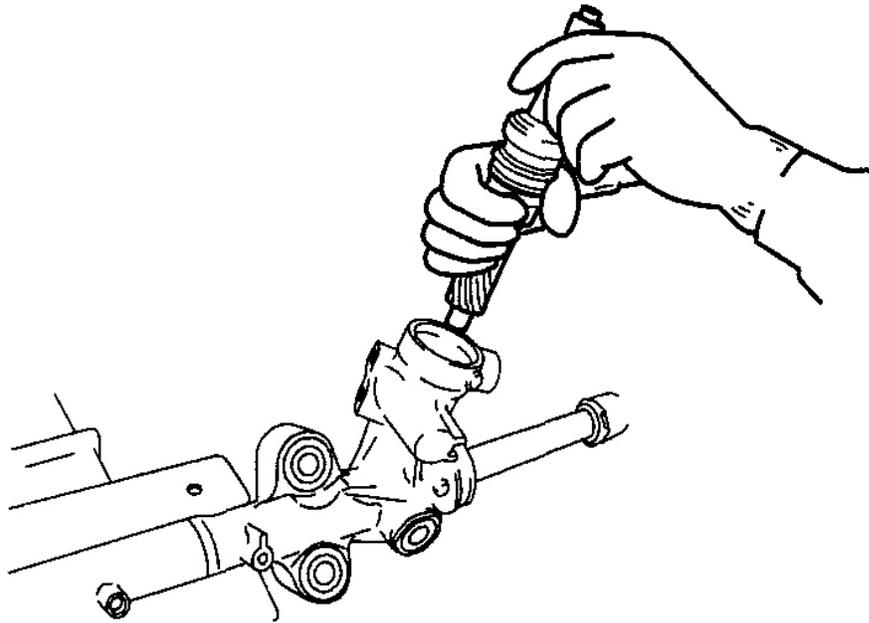
1. Remove the clip and the dust cover, then remove the pinion plug using the SST .



E5U614ZW5020

**Fig. 22: Removing Pinion Plug Using SST**  
**Courtesy of MAZDA MOTORS CORP.**

2. Remove the pinion shaft component from the gear housing.

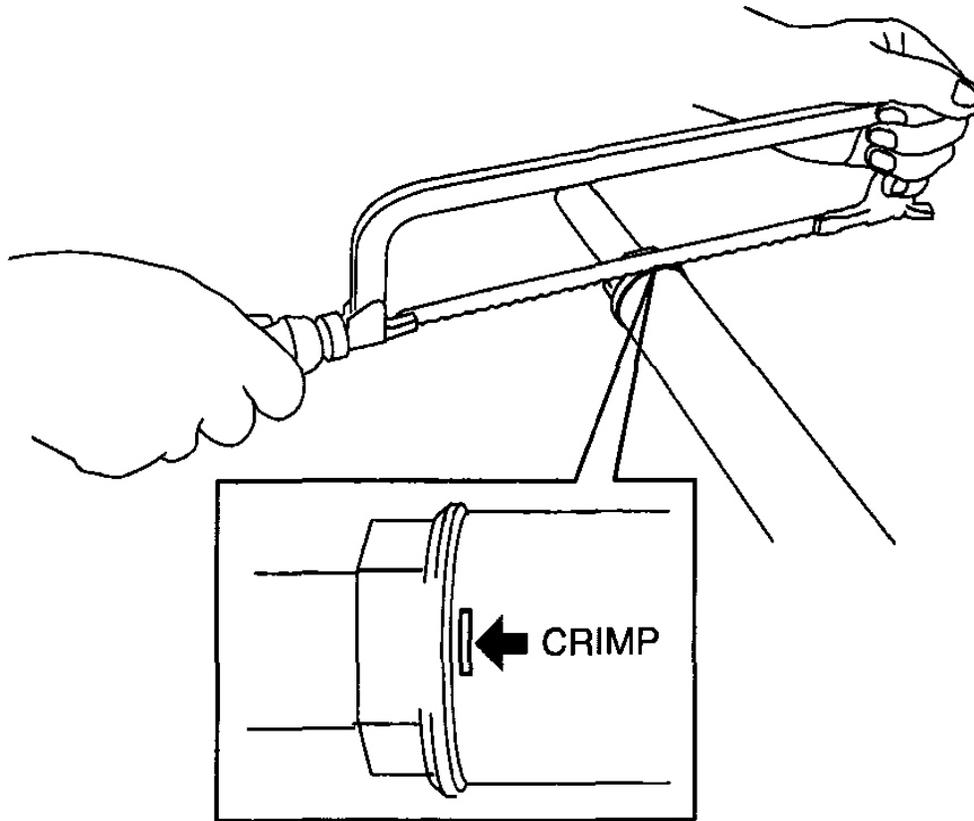


E5U614ZW5012

**Fig. 23: Removing Pinion Shaft Component From Gear Housing**  
Courtesy of MAZDA MOTORS CORP.

#### **HOLDER DISASSEMBLY NOTE**

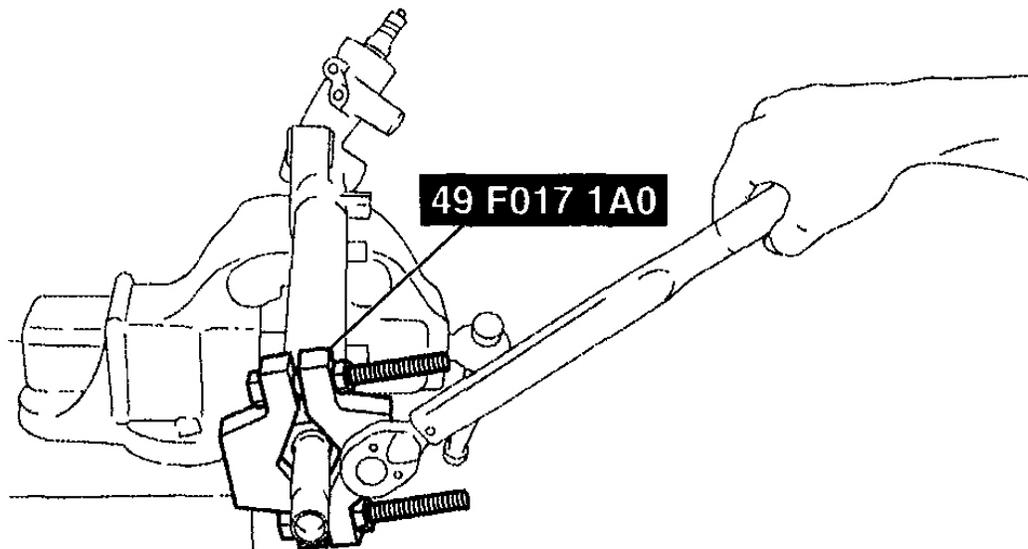
1. Remove the crimp from the holder and cylinder ends using a hacksaw.



E5U614ZW5007

**Fig. 24: Removing Crimp From Holder & Cylinder Ends Using Hacksaw**  
Courtesy of MAZDA MOTORS CORP.

2. Remove the holder using the SST .

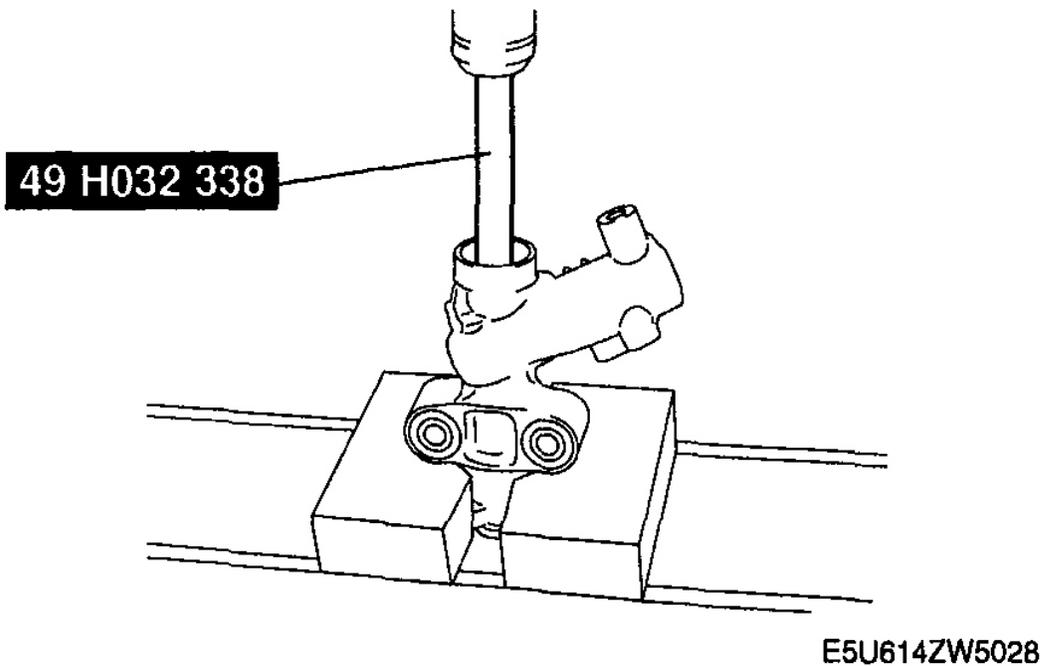


E5U614ZW5027

**Fig. 25: Removing Holder Using SST**  
Courtesy of MAZDA MOTORS CORP.

**STEERING RACK, OIL SEAL (HOLDER SIDE) DISASSEMBLY NOTE**

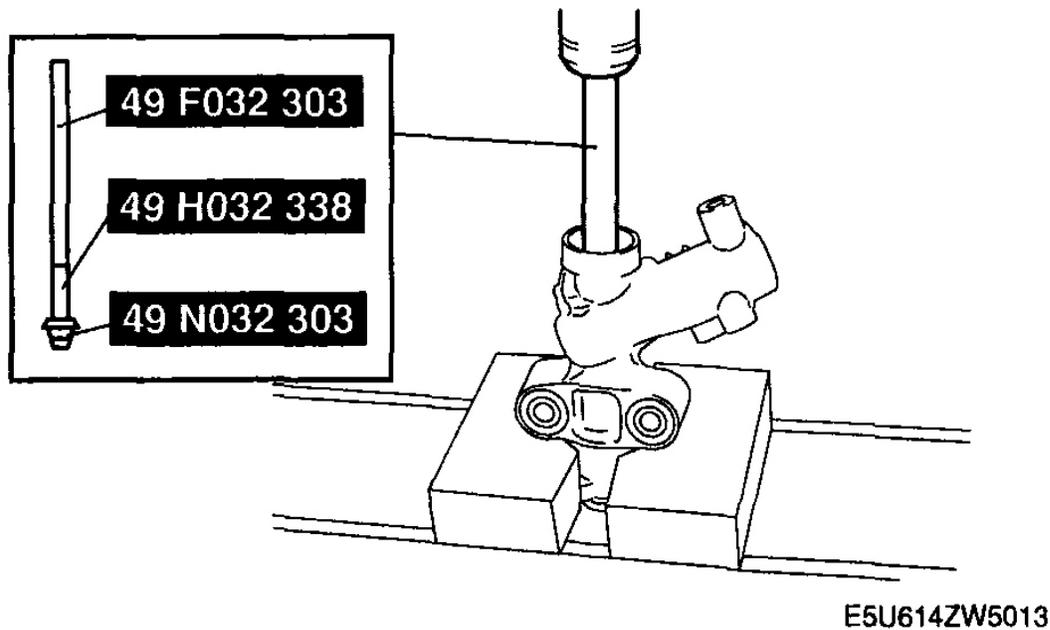
1. Install the **SST** to the gear housing.
2. Remove the steering rack and oil seal (holder side) using a press.
3. Remove the oil seal (holder side) from the steering rack.



**Fig. 26: Removing Steering Rack, Oil Seal (Holder Side)**  
Courtesy of MAZDA MOTORS CORP.

**OIL SEAL (GEAR HOUSING SIDE), INNER GUIDE DISASSEMBLY NOTE**

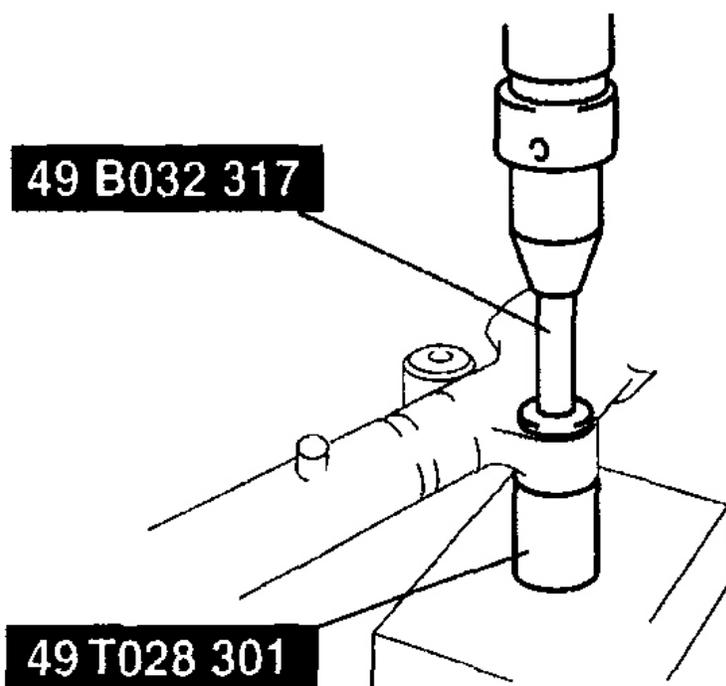
1. Set the **SSTs** as shown.
2. Install the **SST** to the gear housing.
3. Remove the oil seal (gear housing side) and inner guide using a press.



**Fig. 27: Disassembling Oil Seal (Gear Housing Side)**  
Courtesy of MAZDA MOTORS CORP.

#### **MOUNTING RUBBER DISASSEMBLY NOTE**

- Press the mounting rubber out from the gear housing using the **SSTs** and a press.



A6E0612W040

**Fig. 28: Disassembling Mounting Rubber**  
Courtesy of MAZDA MOTORS CORP.

## STEERING GEAR AND LINKAGE INSPECTION

### RACK INSPECTION

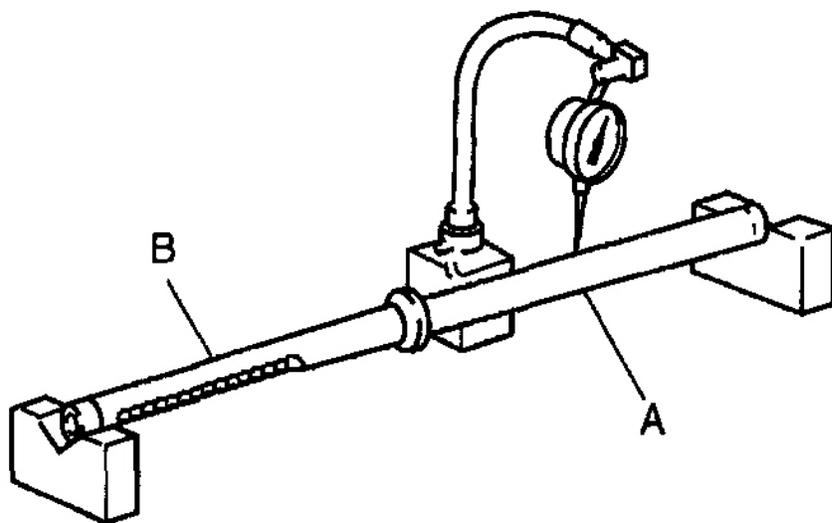
1. Inspect the rack for cracking, damage, and tooth wear. Replace it if necessary.
2. Measure the runout of the rack.

#### Steering rack runout

Near point A: 0.08 mm {0.003 in} max.

Near point B: 0.15 mm {0.006 in} max.

3. If not within the specification, replace the rack.



A6E0612W041

**Fig. 29: Measuring Rack Runout**  
Courtesy of MAZDA MOTORS CORP.

### TIE-ROD END INSPECTION

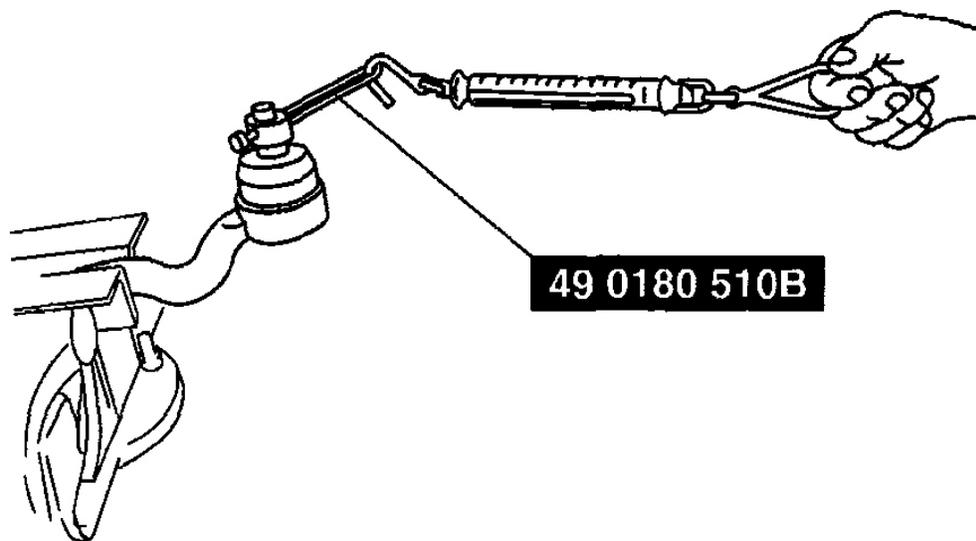
1. Inspect the tie-rod end for damage and boot cracks. Replace it if necessary.
2. Inspect the ball joint for looseness. Replace the tie-rod end if necessary.
3. Rotate the ball joint five times.
4. Measure the rotation torque of the ball joint using the SST and a pull scale.

#### **Tie-rod end rotational torque**

**0.4-3.0 N.m {3.5-30.5 kgf.cm, 3.1-26.5 in.lbf}**

**[Pull scale reading: 3.5-29.9 N {0.35-3.05 kgf, 0.8-6.7 lbf}]**

5. If not within the specification, replace the tie-rod end.



A6E6316W100

**Fig. 30: Measuring Rotational Torque Of Ball Joint**  
Courtesy of MAZDA MOTORS CORP.

## TIE ROD INSPECTION

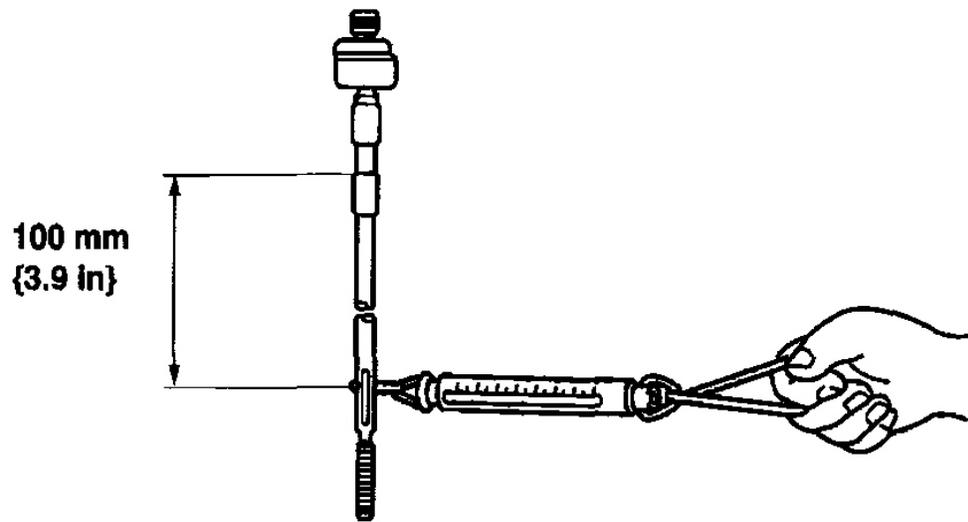
1. Inspect the tie rod for bending and damage. Replace it if necessary.
2. Inspect the ball joint for looseness. Replace the tie rod if necessary.
3. Swing the tie rod five times.
4. Measure the swinging torque using a pull scale.

### Tie-rod swing torque

**0.1-4.1 N.m {1.1-41.8 kgf.cm, 1.0-36.2 in.lbf}**

**[Pull scale reading: 0.6-24.4 N {0.06-2.49 kgf, 0.2-5.4 lbf}]**

5. If not within the specification, replace the tie rod.



A6E0612W043

**Fig. 31: Measuring Swinging Torque**  
Courtesy of MAZDA MOTORS CORP.

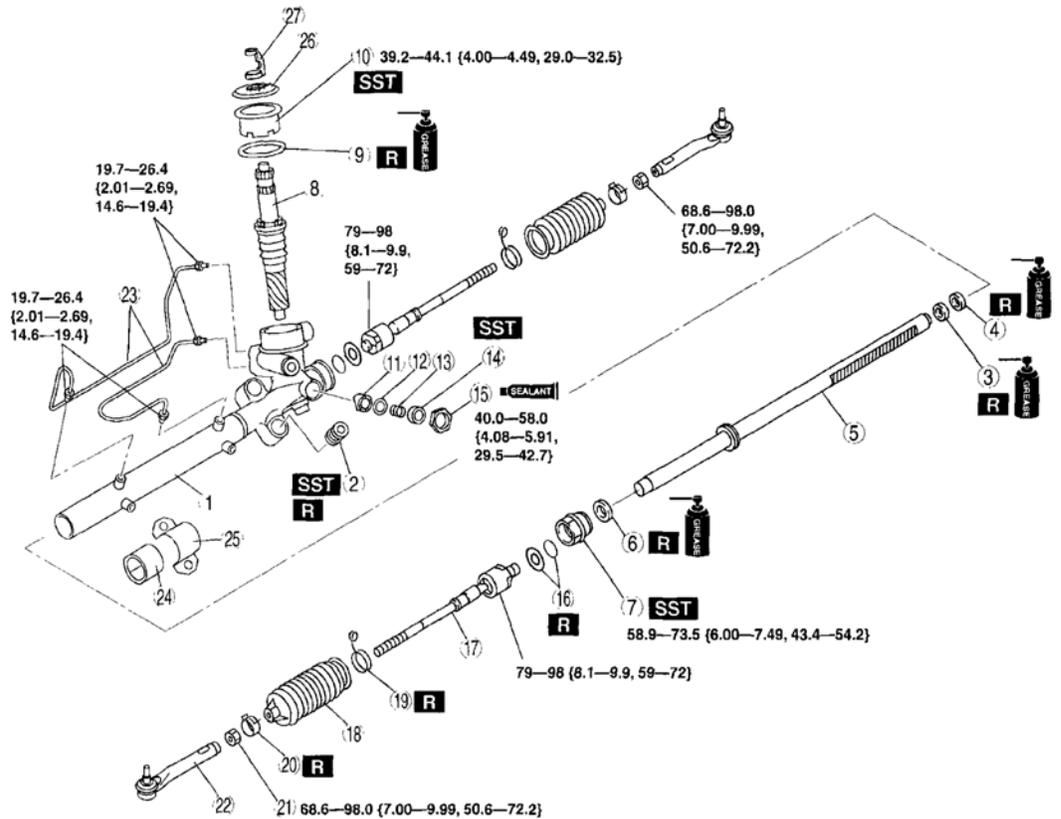
## STEERING GEAR AND LINKAGE ASSEMBLY

- CAUTION:**
- Place copper plates, rag, or similar material in a vise, when securing the mounting bracket portion of the steering gear.

1. Assemble in the order indicated in **Fig. 32**.

# 2008 Mazda MX-5 Miata Grand Touring

## 2008 STEERING Power Steering - MX-5 Miata



N-m (kgf-m, ft-lbf)

ESU614ZW5023

1	Gear housing
2	Mounting rubber
3	Oil seal (gear housing side)
4	Inner guide
5	Steering rack
6	Oil seal (holder side)
7	Holder
8	Pinion shaft component
9	O-ring
10	Pinion plug
11	Support yoke
12	Washer
13	Yoke spring

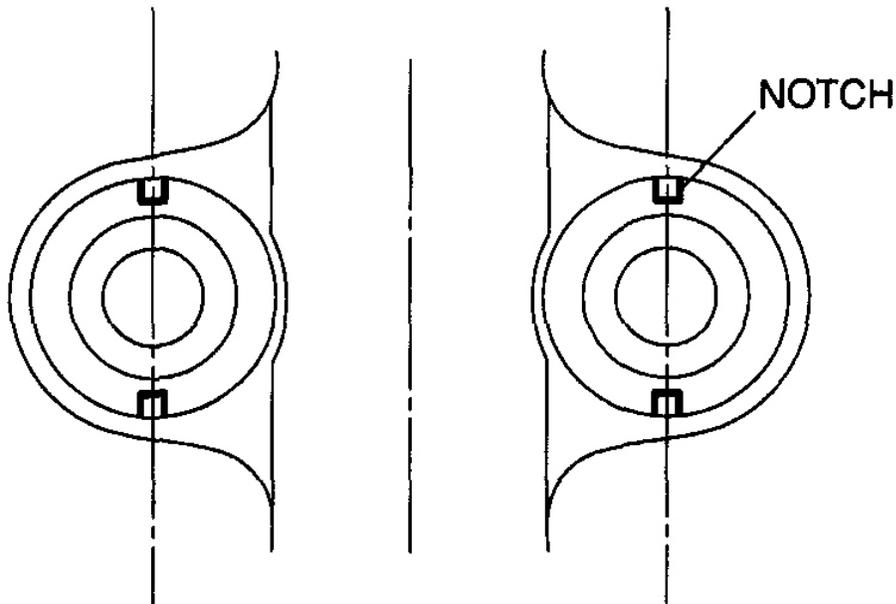
14	Adjusting cover
15	Locknut (adjusting cover)
16	Washer and O-ring
17	Tie rod
18	Boot
19	Boot band
20	Boot clamp
21	Locknut
22	Tie-rod end
23	Oil pipe
24	Mounting rubber
25	Mounting bracket
26	Dust cover
27	Clip

**Fig. 32: View Of Steering Gear & Linkage Components (With Torque Specifications)**  
 Courtesy of MAZDA MOTORS CORP.

### MOUNTING RUBBER ASSEMBLY NOTE

1. Install the mounting rubber so that two notches of mounting rubber are aligned to the steering rack.

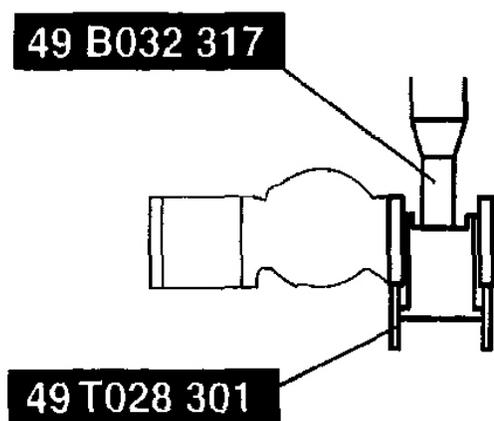
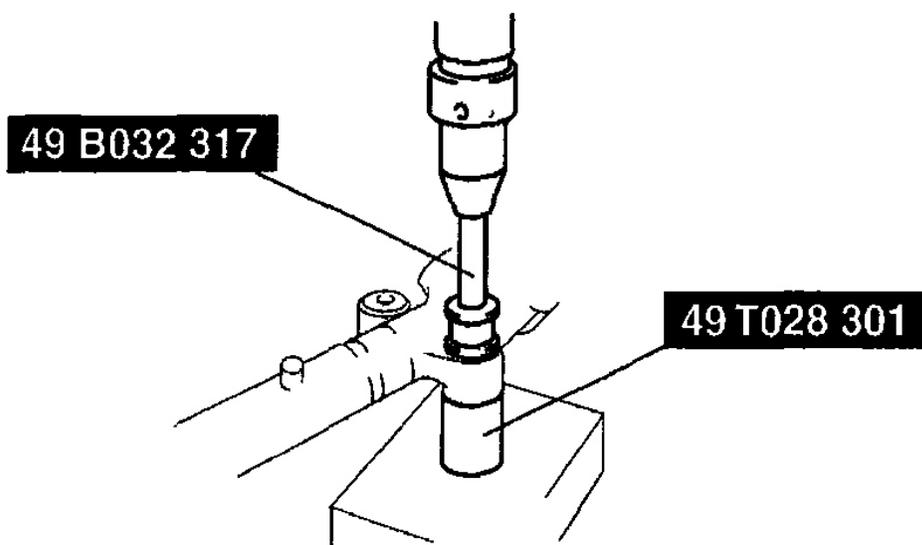
2. Apply soapy water to the rubber part of the mounting rubber.



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**Fig. 33: Aligning Notches Of Mounting Rubber**  
Courtesy of MAZDA MOTORS CORP.

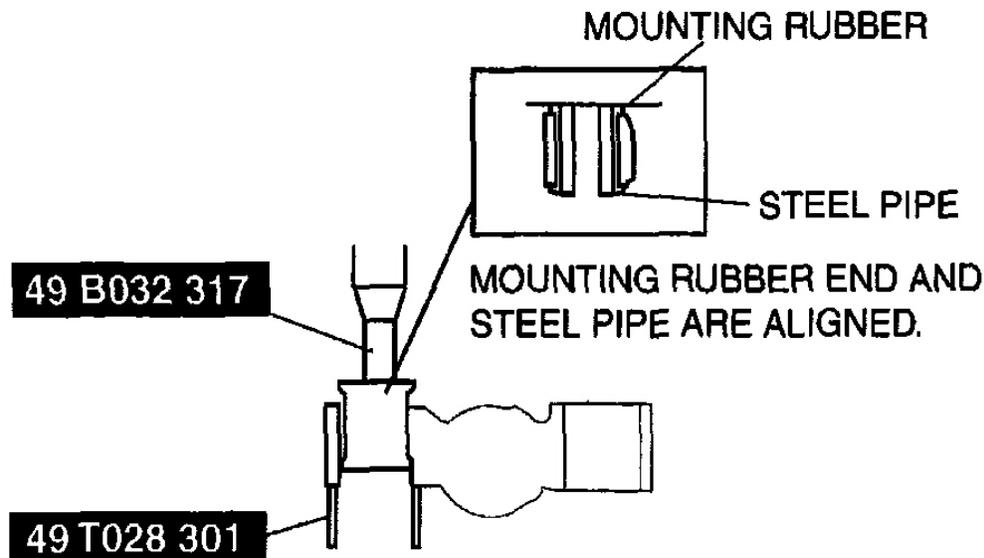
3. Press the mounting rubber until the mounting rubber end comes out completely from the gear housing using the SSTs and a press.



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**Fig. 34: Installing Mounting Rubber**  
Courtesy of MAZDA MOTORS CORP.

4. Reverse the gear housing, then press the mounting rubber until the mounting rubber end comes out completely from the other side. At this time, the mounting rubber end and steel pipe are aligned.

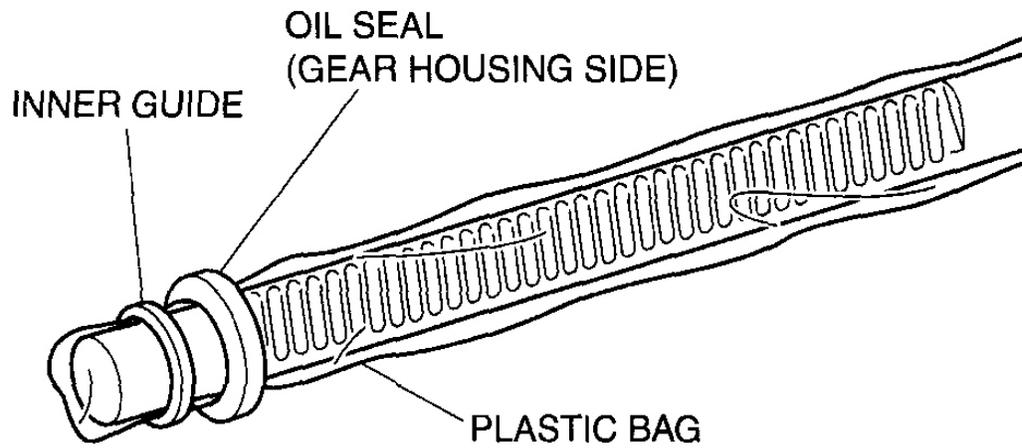


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**Fig. 35: Aligning Mounting Rubber End & Steel Pipe**  
Courtesy of MAZDA MOTORS CORP.

**STEERING RACK, OIL SEAL (GEAR HOUSING SIDE), INNER GUIDE ASSEMBLY NOTE**

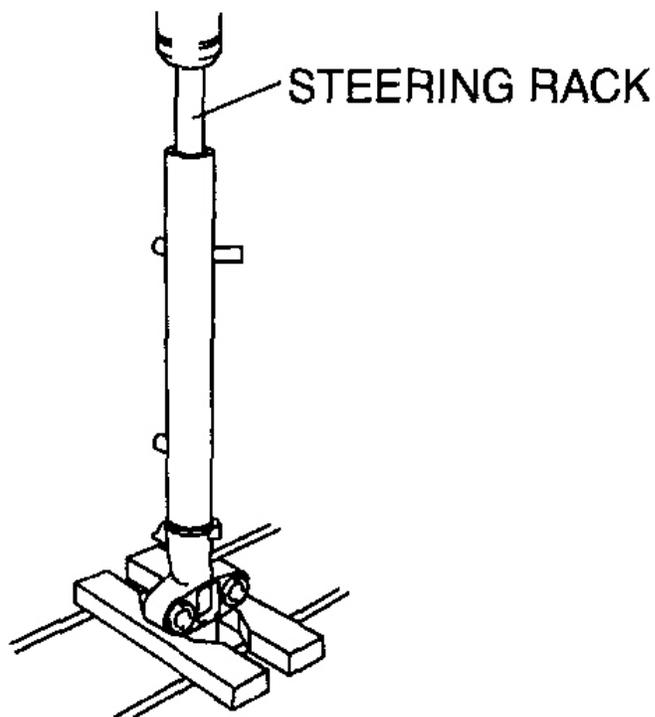
1. Apply multi-purpose grease to the oil seal (gear housing side) and Inner guide.
2. Install the plastic bag to the steering rack teeth so as not to damage the oil seal (gear housing side) and the inner guide, and install the oil seal (gear housing side) and the inner guide to the seal. Move the oil seal (gear housing side) and the inner guide together with the plastic bag so that they pass the steering rack teeth, then remove the plastic bag.



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**Fig. 36: Installing Plastic Bag To Steering Rack Teeth**  
Courtesy of MAZDA MOTORS CORP.

3. Put the steering rack into the gear housing.



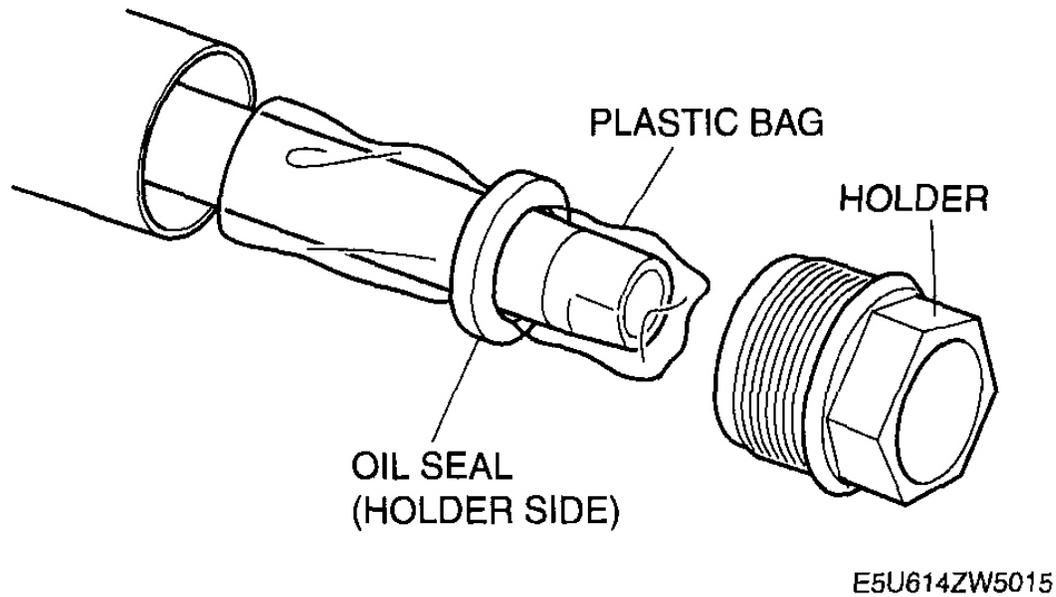
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**Fig. 37: Putting Steering Rack Into Gear Housing**  
Courtesy of MAZDA MOTORS CORP.

4. Using a press, press-in the oil seal (gear housing side) and inner guide until the press-in force increases rapidly.

**OIL SEAL (HOLDER SIDE), HOLDER ASSEMBLY NOTE**

1. Apply multi-purpose grease to the oil seal holder side)
2. Install the plastic bag to the steering rack end so as not to damage the oil seal (holder side) and install the oil seal (holder side) to the seal. Move the oil seal (holder side) together with the plastic bag so that they pass the steering rack end, then remove the plastic bag.
3. Install the holder and move the steering rack until it contacts the housing.

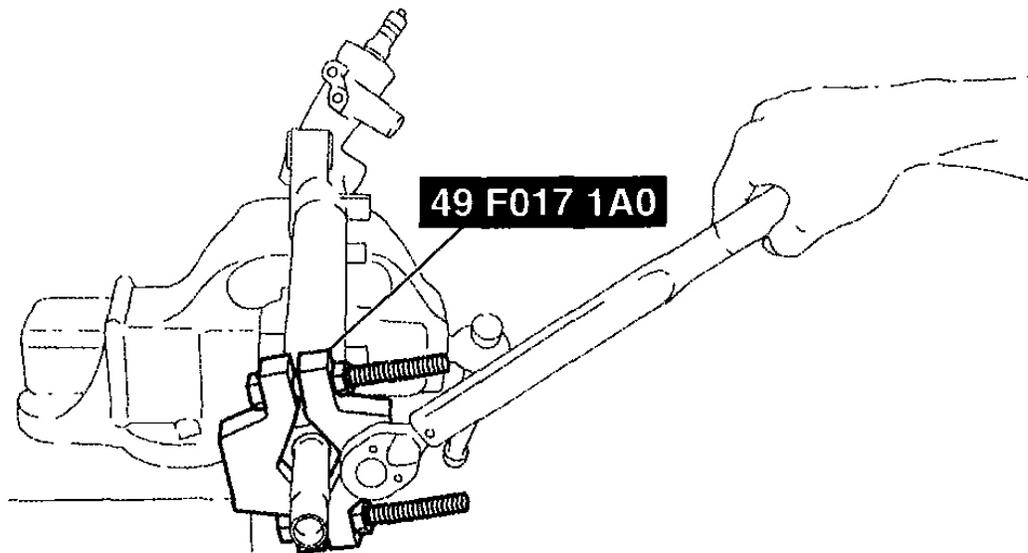


**Fig. 38: Identifying Oil Seal (Holder Side), Plastic Bag And Holder**  
Courtesy of MAZDA MOTORS CORP.

4. Tighten the holder to the specified torque using the SST .

**Tightening torque**

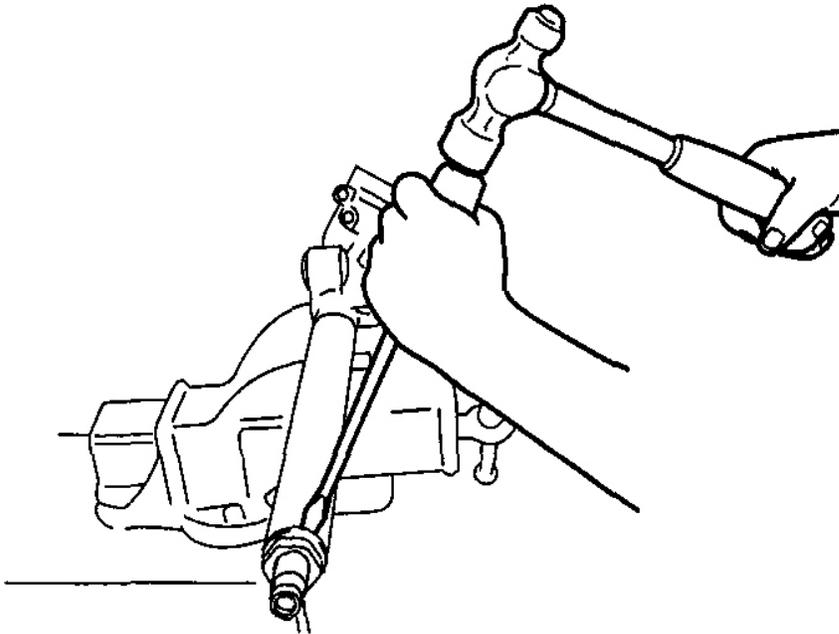
**58.9-73.5 N.m {6.00-7.49 kgf.m, 43.4-54.2 ft.lbf}**



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**Fig. 39: Tightening Holder To Specified Torque**  
Courtesy of MAZDA MOTORS CORP.

5. After tightening the holder, crimp the cylinder end as shown in **Fig. 40** using a flathead screwdriver so that the holder does not loosen.



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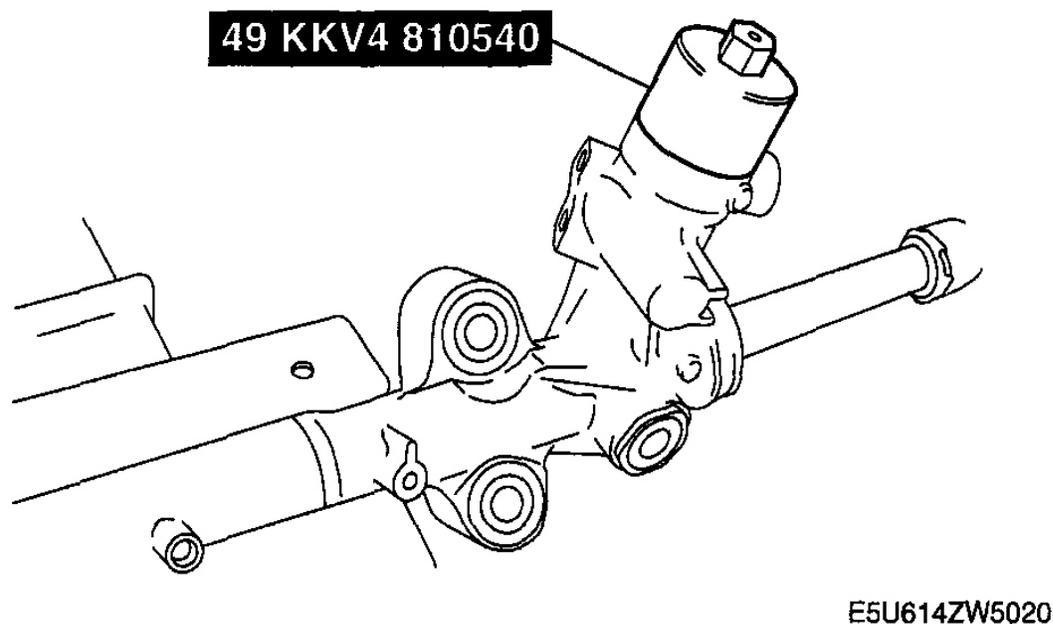
**Fig. 40: Crimping Cylinder End Using Flathead Screwdriver**  
Courtesy of MAZDA MOTORS CORP.

#### **PINION PLUG ASSEMBLY NOTE**

1. Tighten the pinion plug using the SST .

#### **Tightening torque**

**39.2-44.1 N.m {4.00-4.49 kgf.m, 29.0-32.5 ft.lbf}**

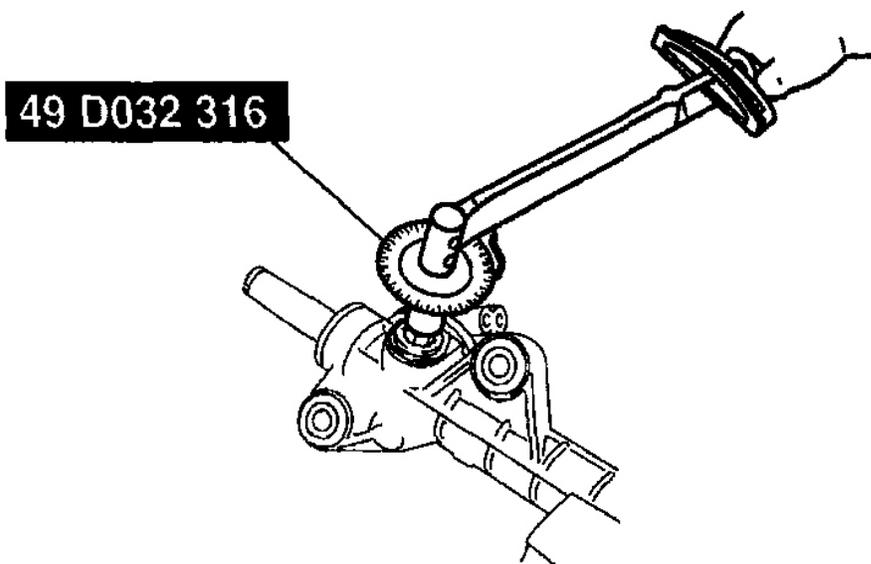


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**Fig. 41: Tightening Pinion Plug Using SST**  
Courtesy of MAZDA MOTORS CORP.

#### ADJUSTING COVER ASSEMBLY NOTE

1. Set the rack to the center position.
2. Tighten the adjusting cover to **20 N.m {2.0 kgf.m, 15 ft.lbf}** .
3. Rotate the pinion shaft thoroughly three times to make sure that the pinion shaft and the rack engage smoothly, then loosen the adjusting cover.
4. Retighten the adjusting cover to **4.9 N.m {0.5 kgf.m, 3.6 ft.lbf}** , then loosen it about **0 to 15°** using the **SST** .



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**Fig. 42: Tightening Adjusting Cover**  
Courtesy of MAZDA MOTORS CORP.

5. Measure the rotation torque in the range  $\pm 90^\circ$  from the pinion gear neutral point using a SST and a pull-scale.
  - If not within the specification, repeat Steps 2 - 4 .

**Pinion shaft rotation torque**

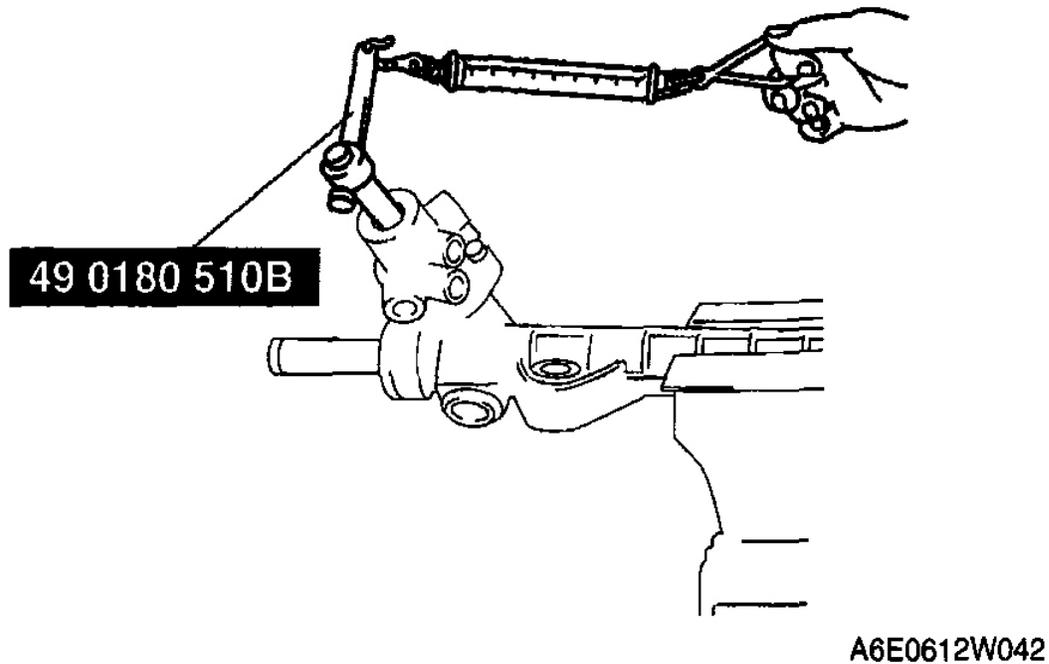
Center of rack  $\pm 90^\circ$ : 0.98-1.38 N.m {10.0-14.0 kgf.cm, 8.7-12.2 in.lbf}

[Pull scale reading: 9.8-13.8 N {1.00-1.40 kgf, 2.21-3.10 lbf}]

Except center of rack  $\pm 90^\circ$ : Less than 1.87 N.m {19.1 kgf.cm, 16.6 in.lbf}

[Pull scale reading: Less than 19.5 N {1.99 kgf, 4.38 lbf}]

6. Apply sealant to the thread of the locknut.

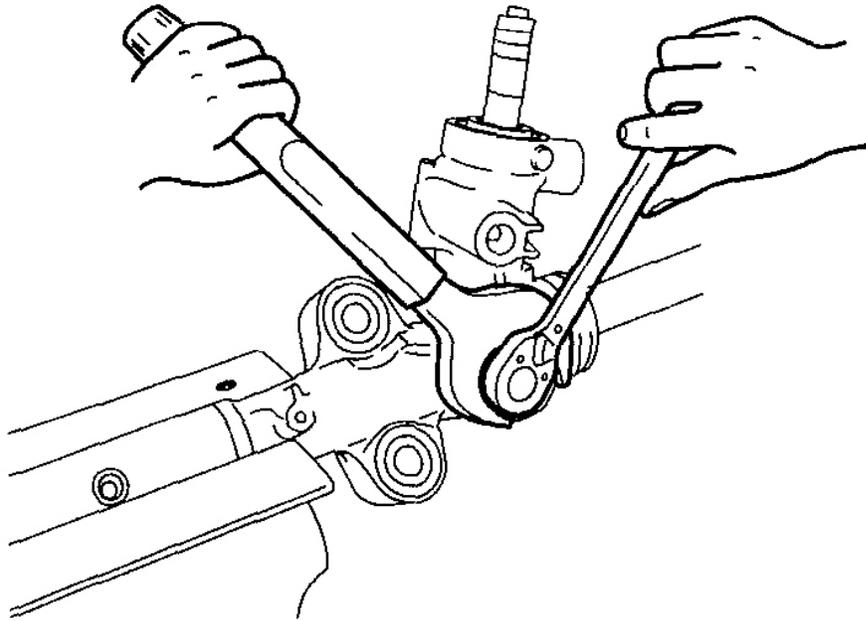


**Fig. 43: Measuring Rotation Torque From Pinion Gear**  
Courtesy of MAZDA MOTORS CORP.

7. Hold the adjusting cover so as not to rotate and tighten the locknut.

**Tightening torque**

**40.0-58.0 N.m {4.08-5.91 kgf.m, 29.5-42.7 ft.lbf}**

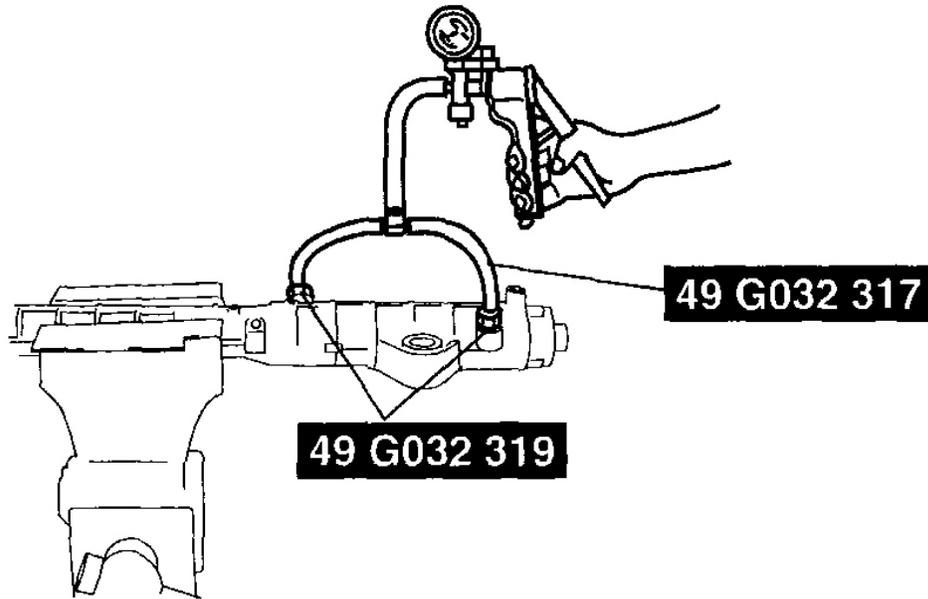


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**Fig. 44: Tightening Locknut**  
Courtesy of MAZDA MOTORS CORP.

#### HERMETIC SEALING INSPECTION

1. Connect the SSTs to the power cylinder section of the gear housing.
2. Apply **53.3 kPa {400 mmHg, 15.7 inHg}** vacuum with a vacuum pump and verify that it is held for at least **30 seconds**.
3. If the vacuum is not held, replace the oil seal.



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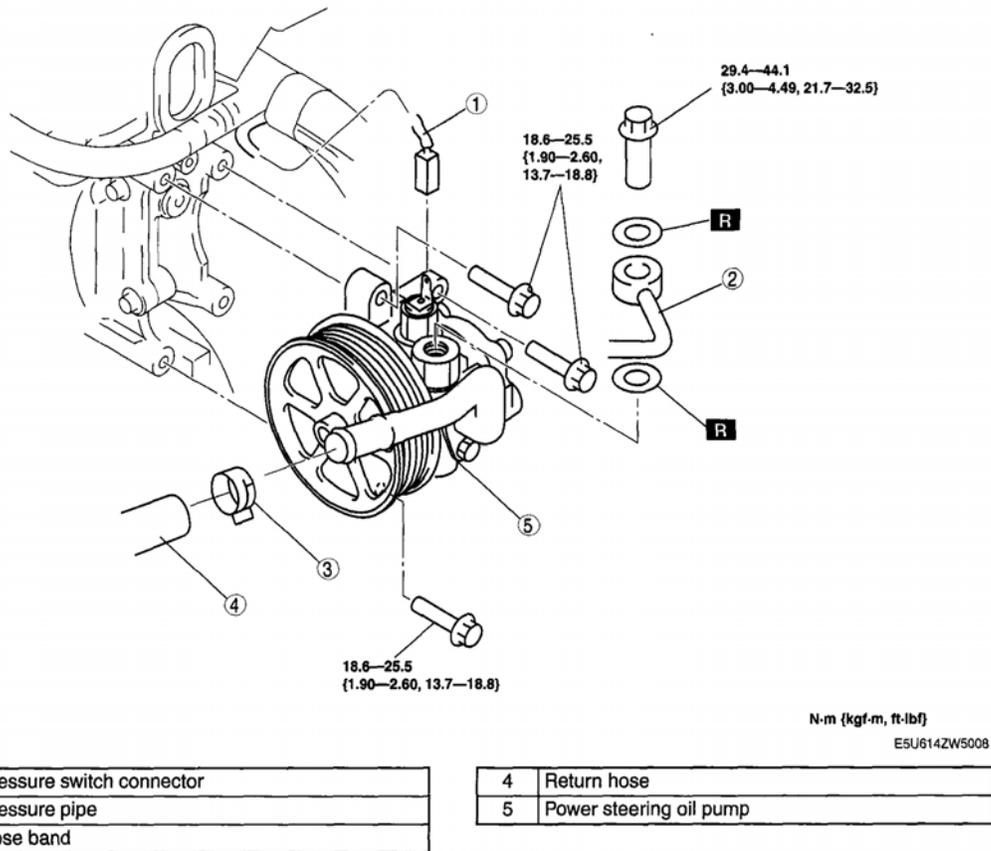
**Fig. 45: Inspecting Hermetic Sealing**  
Courtesy of MAZDA MOTORS CORP.

## POWER STEERING OIL PUMP REMOVAL/INSTALLATION

1. Remove the drive belt. (See **DRIVE BELT REPLACEMENT [LF]** .)
2. Remove in the order indicated in **Fig. 46** .
3. Install in the reverse order of removal.

## 2008 Mazda MX-5 Miata Grand Touring

### 2008 STEERING Power Steering - MX-5 Miata



**Fig. 46: View Of Power Steering Oil Pump Components (With Torque Specifications)**  
 Courtesy of MAZDA MOTORS CORP.

## POWER STEERING OIL PUMP DISASSEMBLY/ASSEMBLY

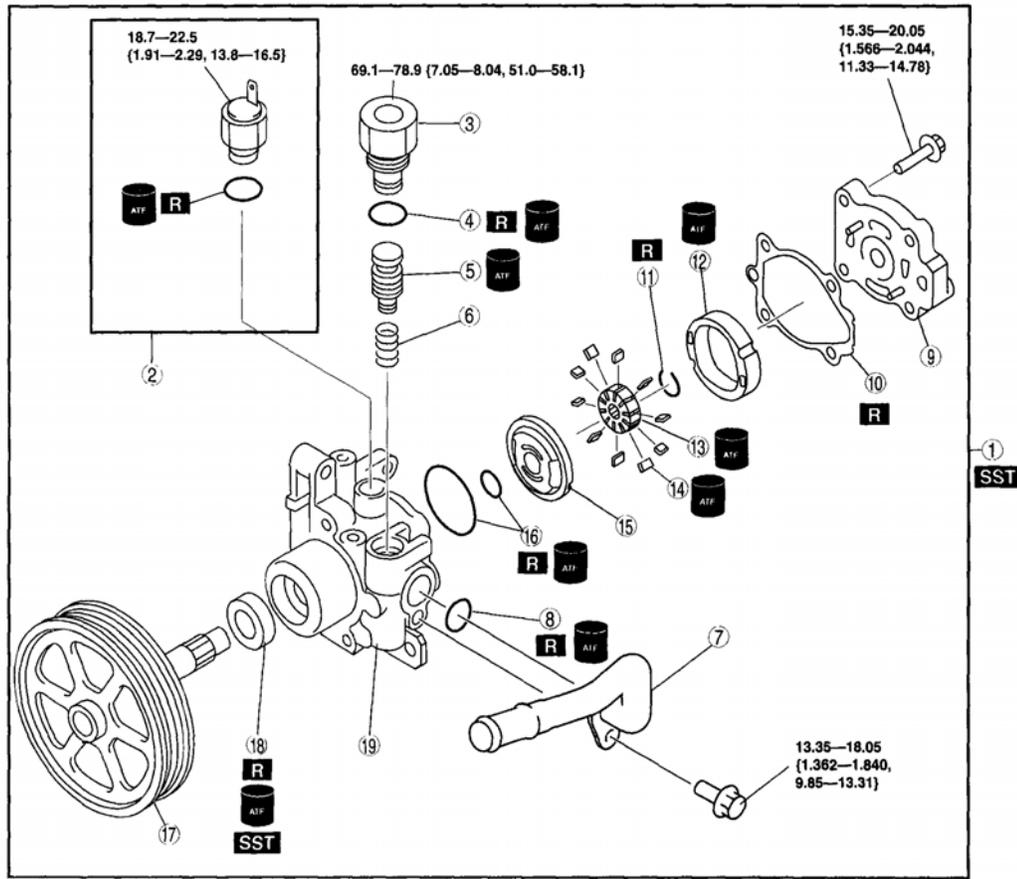
**NOTE:**

- The following procedure is for replacement of the O-ring and oil seal only. Replace the pump component if other repairs are necessary.

1. Disassemble in the order indicated in **Fig. 47** .
2. Assemble in the reverse order of disassembly.

# 2008 Mazda MX-5 Miata Grand Touring

## 2008 STEERING Power Steering - MX-5 Miata



N-m (kgf-m, ft-lbf)

ESU614ZW5018

1	Power steering oil pump component
2	Pressure switch component
3	Pressure pipe fitting
4	O-ring
5	Control valve
6	Spring
7	Suction pipe
8	O-ring
9	Rear pump body
10	Gasket

11	Clip
12	Cam ring
13	Rotor
14	Vane
15	Side plate
16	O-rings
17	Shaft component
18	Oil seal
19	Front pump body

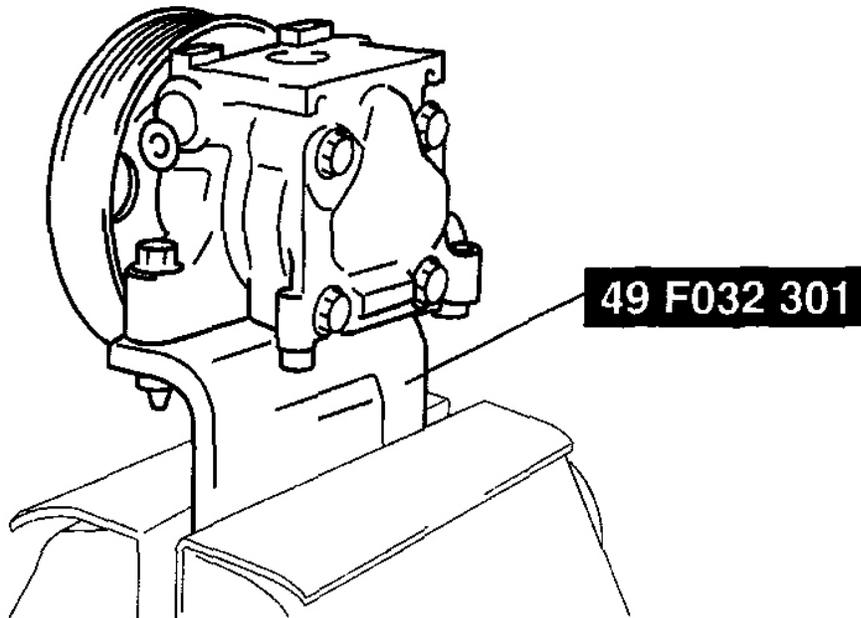
**Fig. 47: Exploded View Of Power Steering Oil Pump (With Torque Specifications)**  
 Courtesy of MAZDA MOTORS CORP.

### POWER STEERING OIL PUMP COMPONENT DISASSEMBLY NOTE

1. Secure the power pressure oil pump using the SST .

#### CAUTION:

- Use the SST to prevent damage to the pump when securing it in a vise.

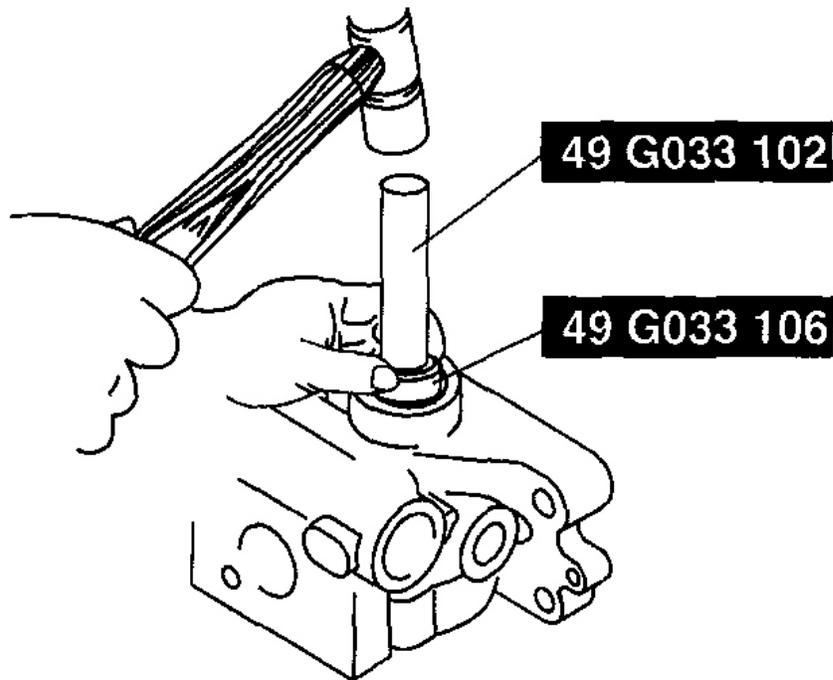


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**Fig. 48: Securing Power Pressure Oil Pump Using SST**  
Courtesy of MAZDA MOTORS CORP.

**OIL SEAL ASSEMBLY NOTE**

1. Install the oil seal in the front pump body using the **SST** and plastic hammer.

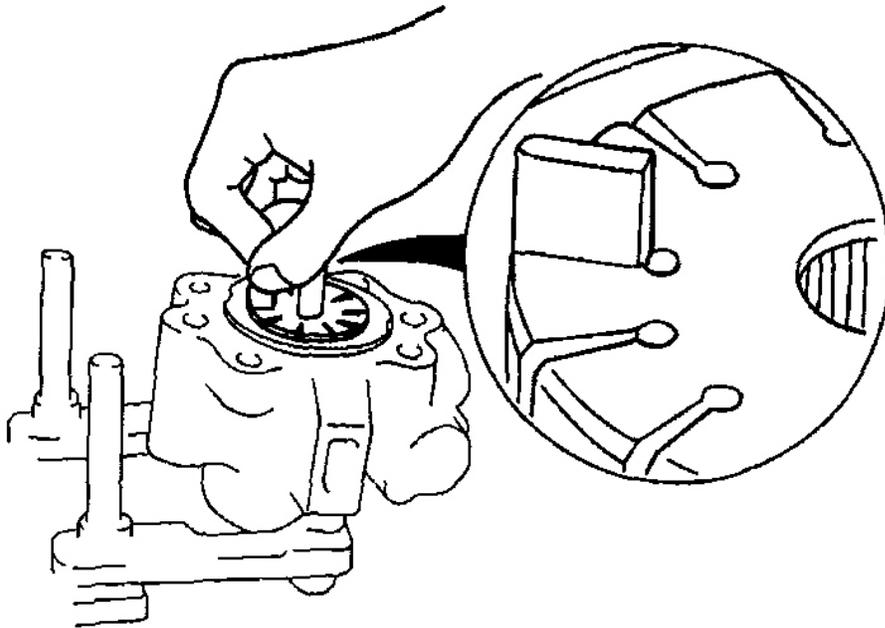


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**Fig. 49: Installing Oil Seal In Front Pump Body Using SST & Hammer**  
Courtesy of MAZDA MOTORS CORP.

**VANE ASSEMBLY NOTE**

1. Place the vanes in the rotor with the rounded edges contacting the cam.

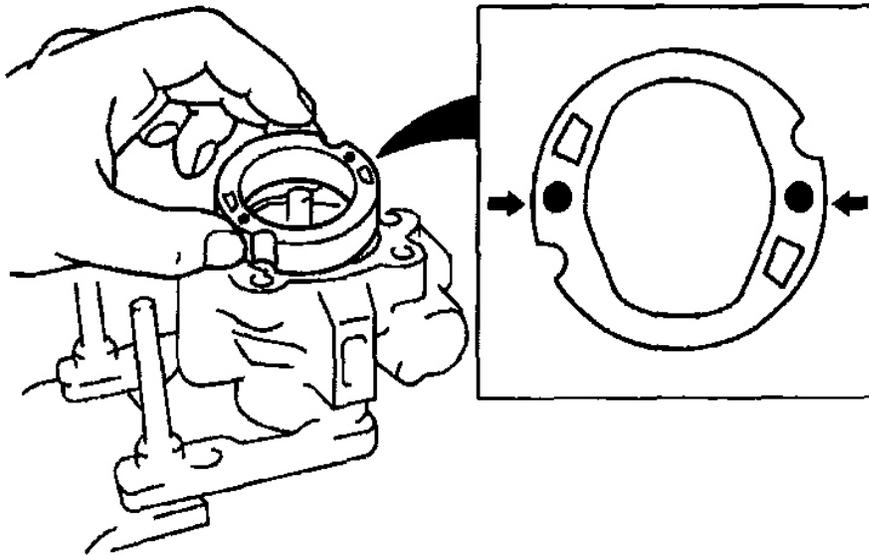


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**Fig. 50: Placing Vanes In Rotor With Rounded Edges Contacting Cam**  
Courtesy of MAZDA MOTORS CORP.

**CAM RING ASSEMBLY NOTE**

1. Install the cam ring in the front pump body with the mark facing upward.



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**Fig. 51: Installing Cam Ring In Front Pump Body**  
Courtesy of MAZDA MOTORS CORP.

**REAR PUMP BODY ASSEMBLY NOTE**

1. After installing the rear body, manually turn the shaft to verify that it rotates smoothly.