

# SERVICE BULLETIN

AFTERSALES SERVICE OFFICE, MITSUBISHI MOTORS CORPORATION

|   |  |                   |
|---|--|-------------------|
| PURPOSE : CORRECTION  | ISSUE NO. : MSB-08E37-501  | DATE : 2008-02-20 |
| SUBJECT : SUPPLYING UNIT OF POWER STEERING GEAR BOX AND LINKAGE PARTS | <div> <div>&lt;MODEL&gt;</div> <div>(EUR/RUSSIA)</div> <div>LANCER</div> <div>(GS41)(CY0A)</div> <div>OUTLANDER</div> <div>(GS45X)(CW0W)</div> </div> <div> <div>&lt;M/Y&gt;</div> <div>07-</div> </div> |                   |
| GROUP : STEERING  |  |                   |

## 1. Description:

According to the correction of supplying unit of the power steering gear box and linkage parts, the related descriptions are modified in the applicable Workshop Manuals. This Service Bulletin contains the corrected descriptions.

## 2. Applicable Manuals:

| Manual  | Pub. No.   | Title (Info-ID)   | Attachment   |
|---|--|---|--------------|
| 2007 OUTLANDER Workshop Manual                                | CGXE07E1CD(English)<br>CGXS07E1CD(Spanish)<br>CGXF07E1CD(French)<br>CGXG07E1CD(German) | Power Steering Gear Box and Linkage Disassembly and Reassembly (M372-01-110-54600-01) | Attachment 1 |
| 2008 OUTLANDER Workshop Manual (added data for 4HN)           | CGXE08E2CD(English)<br>CGXS08E2CD(Spanish)<br>CGXF08E2CD(French)<br>CGXG08E2CD(German) | Power Steering Gear Box and Linkage Disassembly and Reassembly (M372-01-110-79500-01) | Attachment 2 |
| 2008 LANCER Workshop Manual (including RUSSIA)                | CG1E08E1CD(English)<br>CG1S08E1CD(Spanish)<br>CG1F08E1CD(French)<br>CG1G08E1CD(German) | Power Steering Gear Box and Linkage Disassembly and Reassembly (M372-01-110-71700-01) | Attachment 3 |
| 2008 LANCER Workshop Manual (RUSSIA)                          | CG1R08E1CD   | Power Steering Gear Box and Linkage Disassembly and Reassembly (M372-01-110-69800-01) | Attachment 4 |
| 2008 LANCER Workshop Manual (classification for RUSSIA added) | N/A  | Power Steering Gear Box and Linkage Disassembly and Reassembly (M372-01-110-76200-01) | Attachment 5 |

## 3. Effective Date:

From the first production models

## 4. Corrected Specifications:

See Attachments 1 to 5.

## POWER STEERING POWER STEERING GEAR BOX AND LINKAGE

2. Measure the oscillating resistance (oscillating torque) using a spring scale as shown in the figure with the tie-rod end facing downward.

**Standard value: 5 – 18 N (1.5 – 4.9 N·m)**

3. If the measurement is greater than the standard value, replace the tie-rod.
4. If the measurement value is below the standard value, check the ball joint for looseness or scraping feeling. If the ball joint swings smoothly, it is judged to be usable.

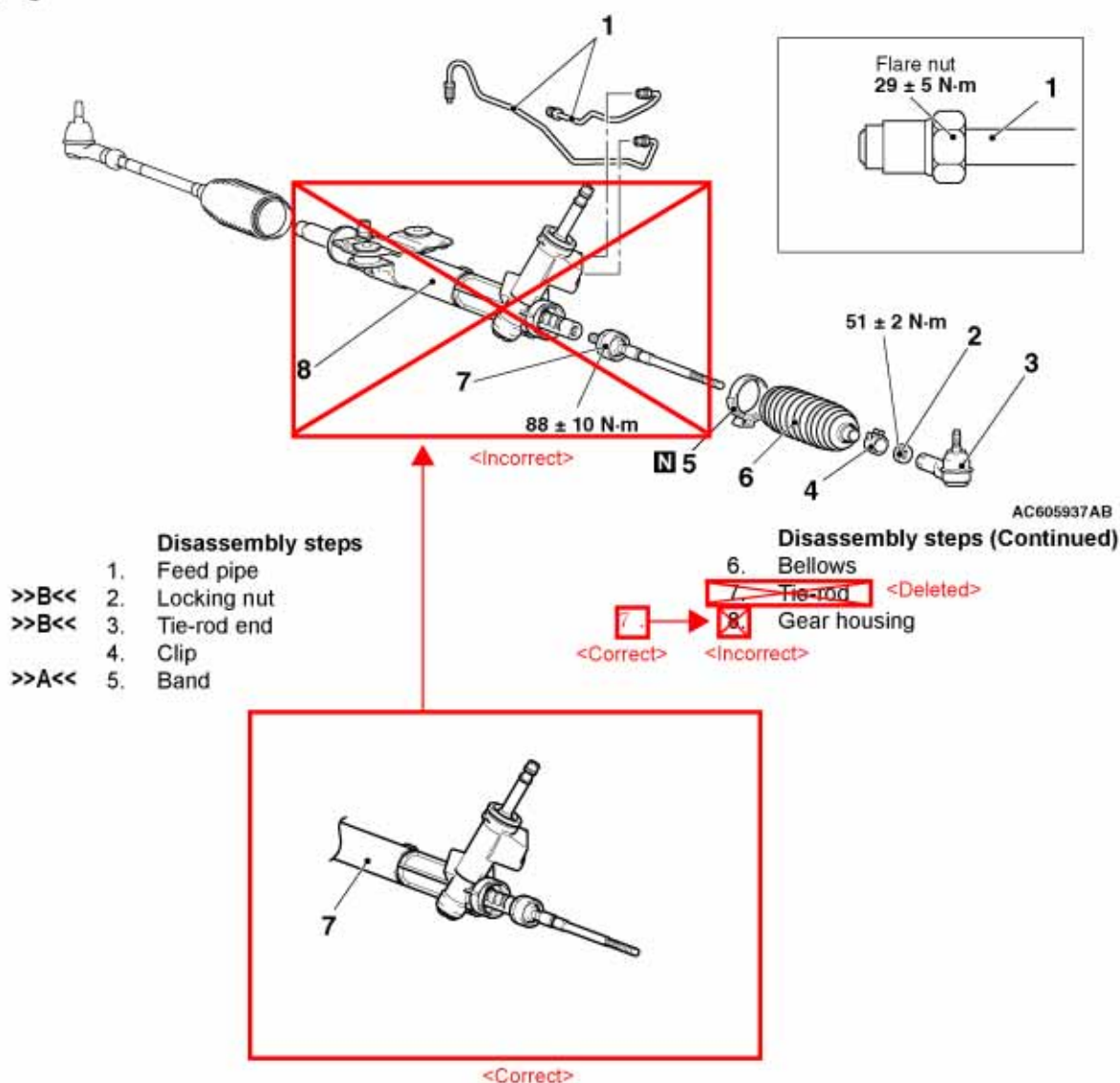
### TIE-ROD END BALL JOINT DUST COVER CHECK

1. Using your fingers, press the dust cover to check for a crack or damage.
2. If there are any cracks or damage in the dust cover, replace the tie-rod end (Refer to ).

*NOTE: If the dust cover has a crack or damage, the ball joint could be damaged.*

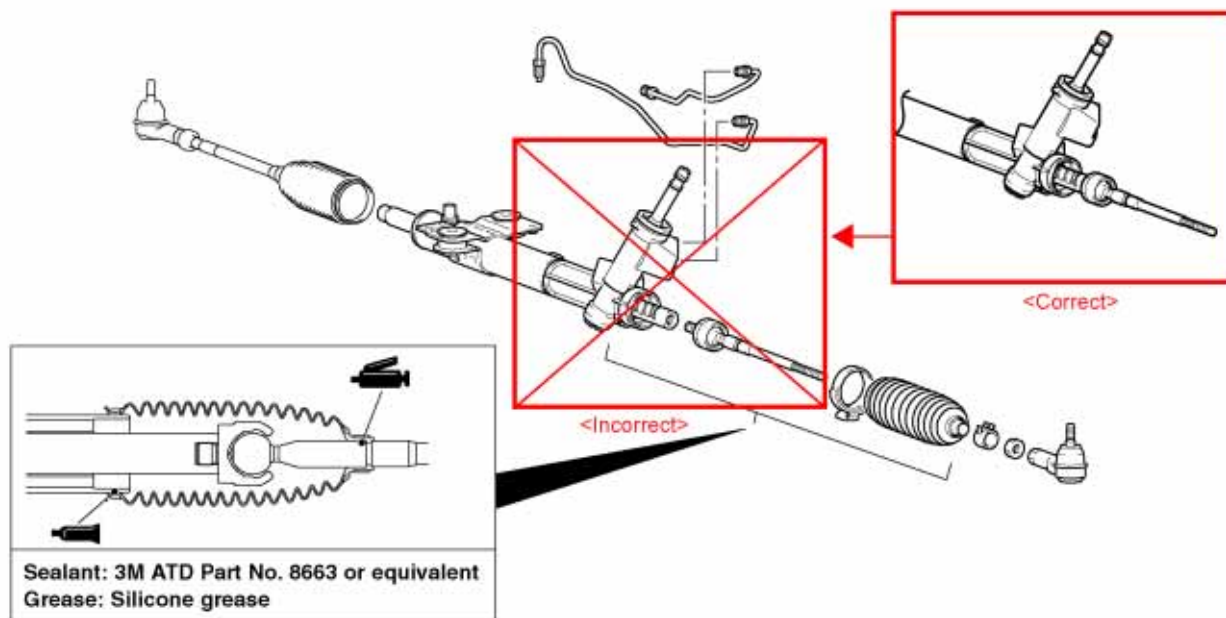
### DISASSEMBLY AND ASSEMBLY

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**POWER STEERING  
POWER STEERING GEAR BOX AND LINKAGE**

**GREASE/SEALANT APPLICATION  
POINTS**

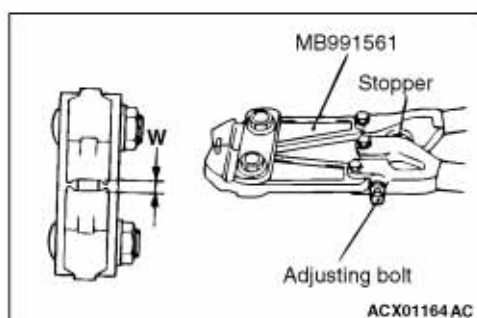


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**ASSEMBLY SERVICE POINT**

**>>A<< BAND INSTALLATION**

1. Turn the adjusting bolt for the special tool boot band clipping tool (MB991561) to adjust the opening dimension (W) to the standard value.



Standard value (W): 2.9 mm

<When opening dimension is more than 2.9 mm>

Tighten the adjusting bolt.

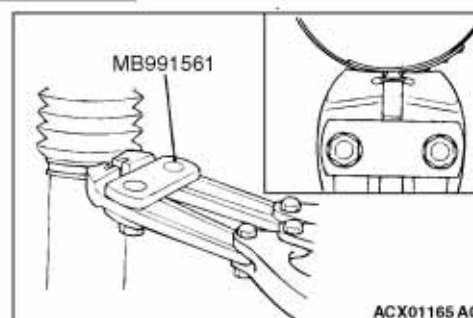
<When opening dimension is less than 2.9 mm>

Loosen the adjusting bolt.

**NOTE:**

- The adjusting bolt changes W approximately 0.7 mm for each rotation.
- Do not rotate the adjusting bolt more than one rotation.

**CAUTION**



Secure the gear housing, and crimp the crimping part of the band firmly with the tip of the special tool.

- Crimp the boot band securely until the special tool contacts the stopper.

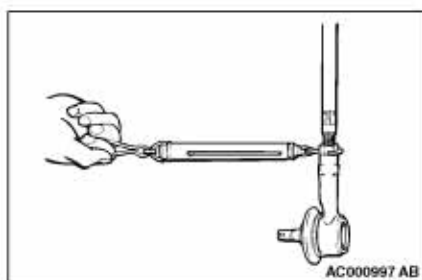
2. Use the special tool to crimp the boot band.

## POWER STEERING POWER STEERING GEAR BOX AND LINKAGE

### NOTE:

- During measurement, remove the bellows from the gear housing.
  - Rotate the pinion by 180° in left and right directions from the neutral position, and measure the pinion total rotation torque.
2. If the measurement value is outside the standard value, replace the gear housing.

### TIE-ROD OSCILLATING TORQUE CHECK



1. Swing the tie-rod ten times strongly.  
<2000, 2200, 2400>

2. Measure the oscillating resistance (oscillating torque) using a spring scale as shown in the figure with the tie-rod end facing downward.

**Standard value: 5 – 18 N (1.5 – 4.9 N·m)**

3. If the measurement is greater than the standard value, replace the tie-rod.  
4. If the measurement value is below the standard value, check the ball joint for looseness or scraping feeling. If the ball joint swings smoothly, it is judged to be usable.

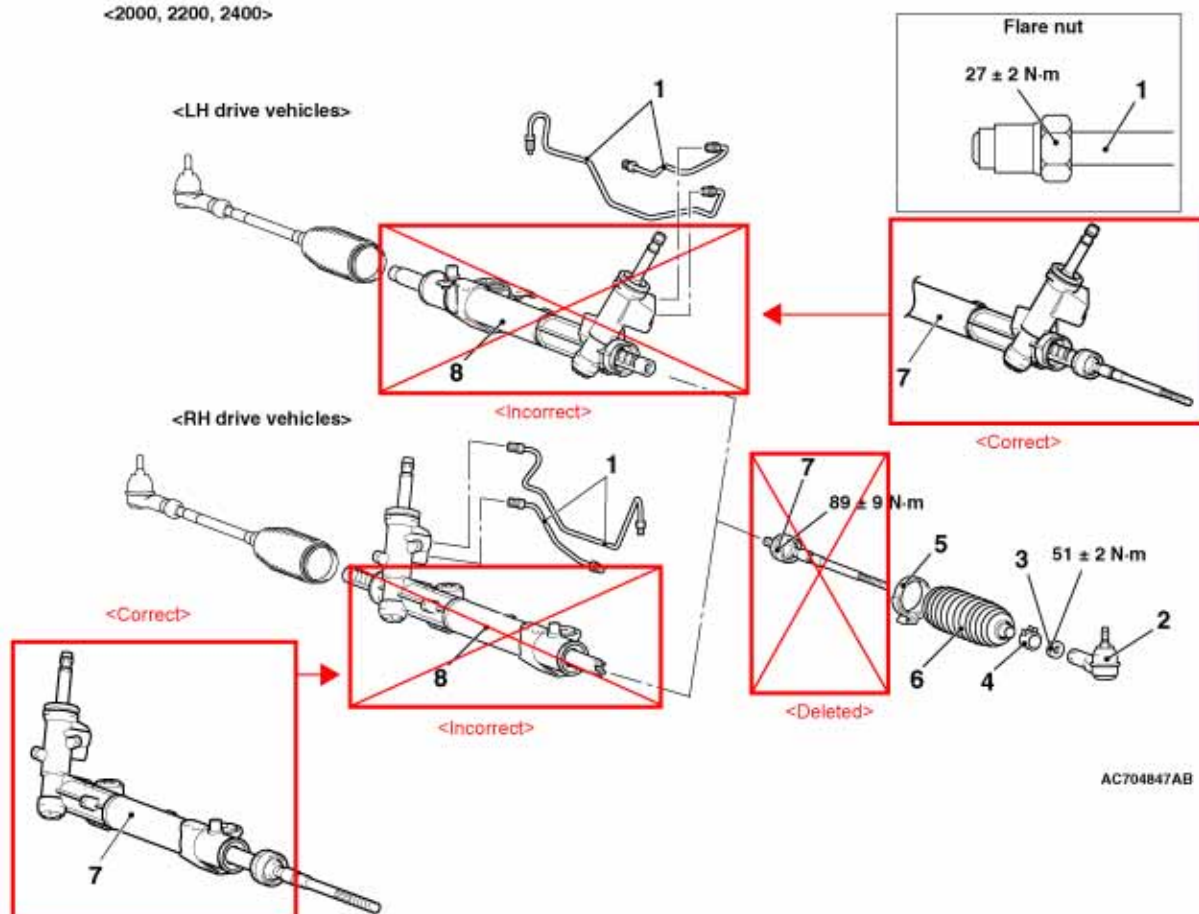
### TIE-ROD END BALL JOINT DUST COVER CHECK

1. Using your fingers, press the dust cover to check for a crack or damage.  
2. If there are any cracks or damage in the dust cover, replace the tie-rod end (Refer to ).

**NOTE:** If the dust cover has a crack or damage, the ball joint could be damaged.

### DISASSEMBLY AND REASSEMBLY

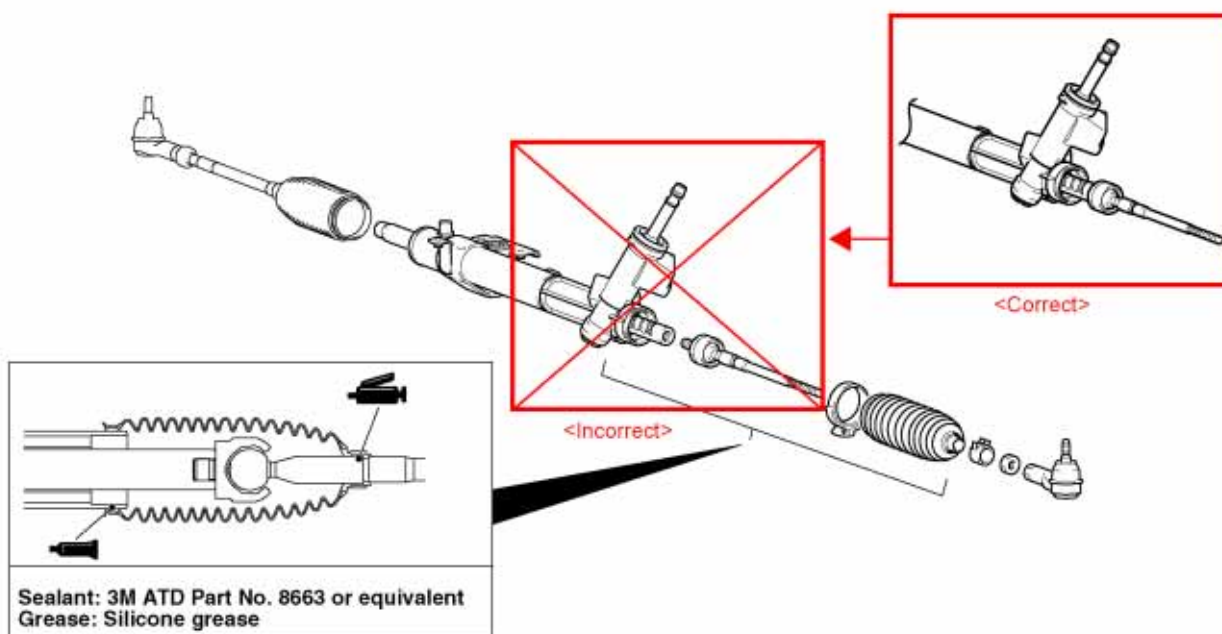
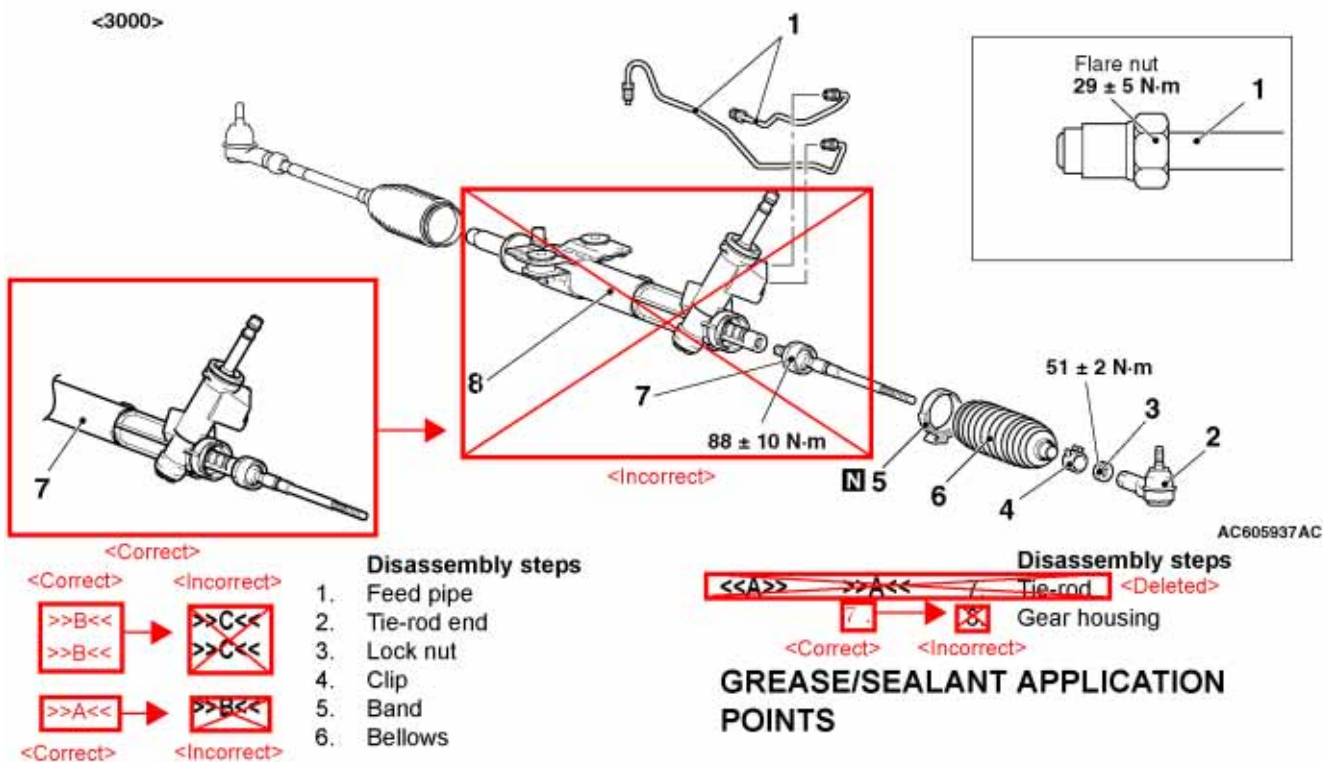
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# POWER STEERING POWER STEERING GEAR BOX AND LINKAGE

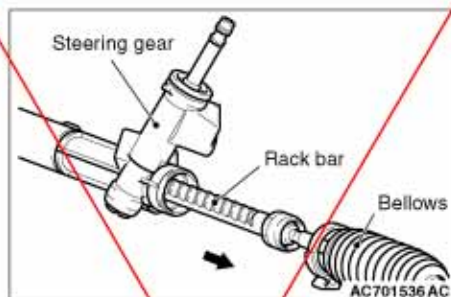
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# POWER STEERING POWER STEERING GEAR BOX AND LINKAGE

## DISASSEMBLY SERVICE POINT

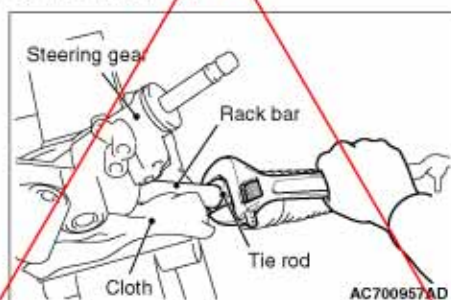
### <<A>> TIE-ROD REMOVAL



1. Move the bellows and pull the rack bar toward arrow direction.

### **CAUTION**

Do not tighten the vise strongly in order not to damage the rack bar.



2. Wrap rack bar with cloth in order not to damage and fix the rack bar with a vise.
3. Use the tool to remove the tie-rod.

## REASSEMBLY SERVICE POINTS

### >>A<< TIE-ROD INSTALLATION

### **CAUTION**

Do not tighten the vise strongly in order not to damage the rack bar.



1. Wrap rack bar with cloth in order not to damage, and fix the rack bar with a vise.

2. Use the tool to install the tie-rod. <Deleted>

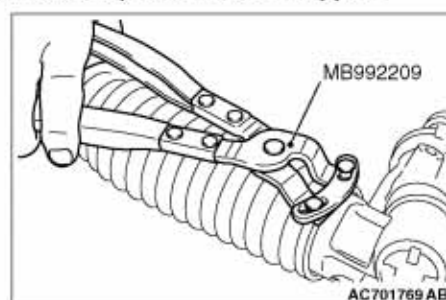
Tightening torque:  $88 \pm 10 \text{ N}\cdot\text{m}$

<Incorrect>

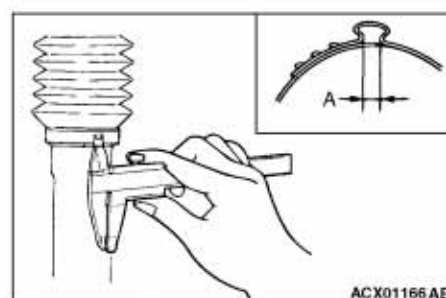
### >>B<< BAND INSTALLATION >>A<< <Correct>

### **CAUTION**

- Hold the rack housing, and use special tool bellows band crimping tool (MB992209) to crimp the bellows band securely.
- Crimp the bellows band until special tool (MB992209) touches the stopper.



1. Use special tool (MB992209) to crimp the bellows band.



2. Check that crimped width (A) is within the standard value.

Standard value (A): 2.4 – 2.8 mm

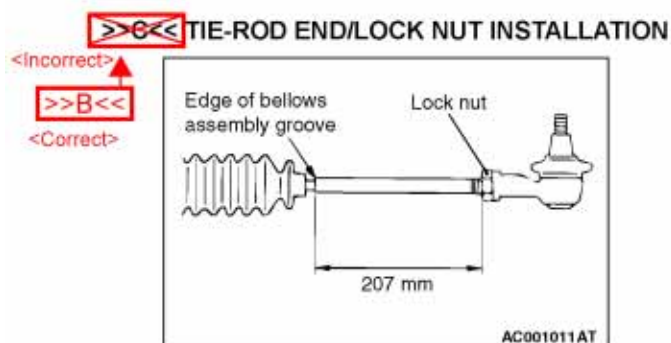
<When more than 2.8 mm>: Readjust the dimension (W) of step (1) to the value calculated by the following equation, and repeat step (2).

$W = 5.5 \text{ mm} - A$  [Example: if (A) is 2.9 mm, (W) is 2.6 mm.]

<When less than 2.4 mm>: Remove the bellows band, readjust the dimension (W) of step (1) to the value calculated by the following equation, and use a new bellows band to repeat steps (2) to (3).

$W = 5.5 \text{ mm} - A$  [Example: if (A) is 2.3 mm, (W) is 3.2 mm.]

## POWER STEERING POWER STEERING OIL PUMP ASSEMBLY



Screw in the tie-rod to the length shown in the figure, and hand-tighten the lock nut.

**NOTE:** Install the steering gear and linkage to the body, adjust the toe-in, and then tighten the lock nut to the specified torque.

## POWER STEERING OIL PUMP ASSEMBLY REMOVAL AND INSTALLATION

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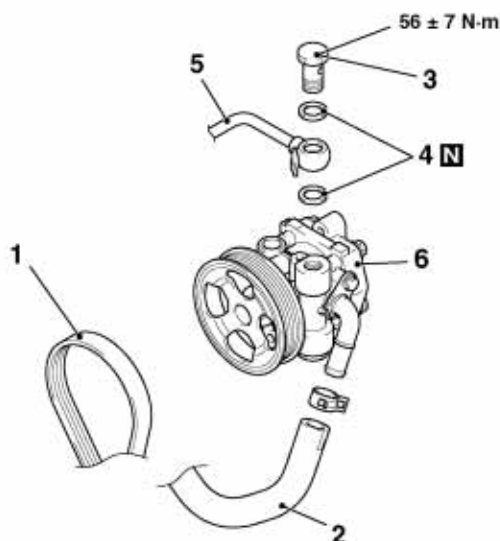
### Pre-removal operation

- Power Steering Fluid Draining (Refer to ).
- Engine Cover Removal (Refer to GROUP 11E – Engine assembly ).

### Post-installation operation

- Engine Cover Installation (Refer to GROUP 11E – Engine assembly ).
- Power Steering Fluid Refilling and Bleeding (Refer to ).
- Drive Belt Tension Adjustment (Refer to GROUP 11A – On-vehicle service – Drive Belt Tension Adjustment <2000>, GROUP 11C – On-vehicle service – Drive Belt Tension Adjustment <3000>, GROUP 11E – On-vehicle service – Drive Belt Tension Adjustment <2400>, GROUP 11G – On-vehicle service – Drive Belt Tension Adjustment <2200>).

<2000>



### Removal steps

1. Alternator and Others Belt (Refer to GROUP 11A – Engine assembly ).
2. Suction hose connection
3. Eye bolt

>>A<<

### Removal steps (Continued)

4. Gasket
5. Pressure hose connection
6. Oil pump assembly

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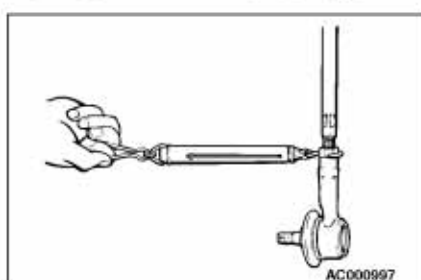
## POWER STEERING POWER STEERING GEAR BOX AND LINKAGE

**Torque fluctuation: 0.4 N·m or less**

**NOTE:**

- During measurement, remove the bellows from the gear housing.
  - Rotate the pinion by 180° in left and right directions from the neutral position, and measure the pinion total rotation torque.
2. If the measurement value is outside the standard value, replace the gear housing.

### TIE-ROD OSCILLATING TORQUE CHECK



1. Swing the tie-rod ten times strongly.
2. Measure the oscillating resistance (oscillating torque) using a spring scale as shown in the figure with the tie-rod end facing downward.

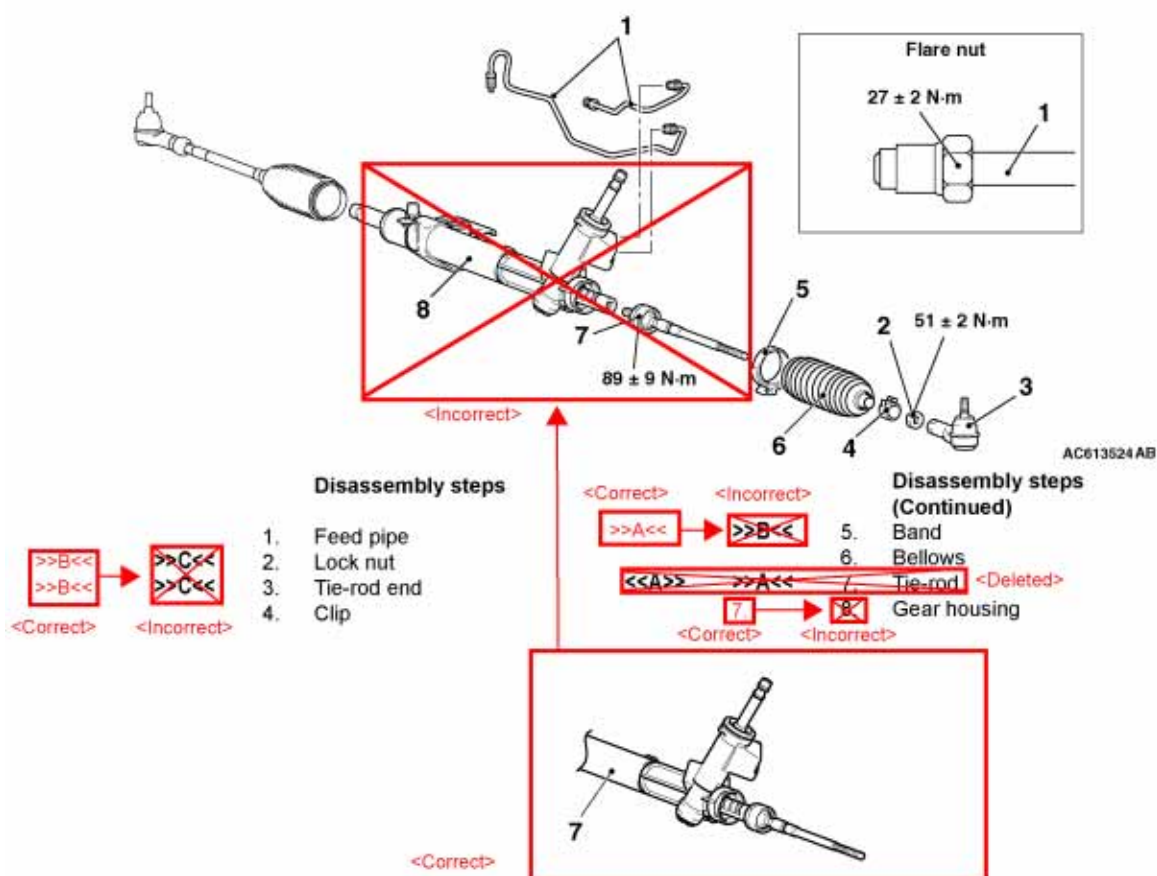
**Standard value:**

**5.5 – 18 N  
(1.5 – 4.9 N·m)**

3. If the measurement is greater than the standard value, replace the tie-rod.
4. If the measurement value is below the standard value, check the ball joint for looseness or scraping feeling. If the ball joint swings smoothly, it is judged to be usable.

### DISASSEMBLY AND REASSEMBLY

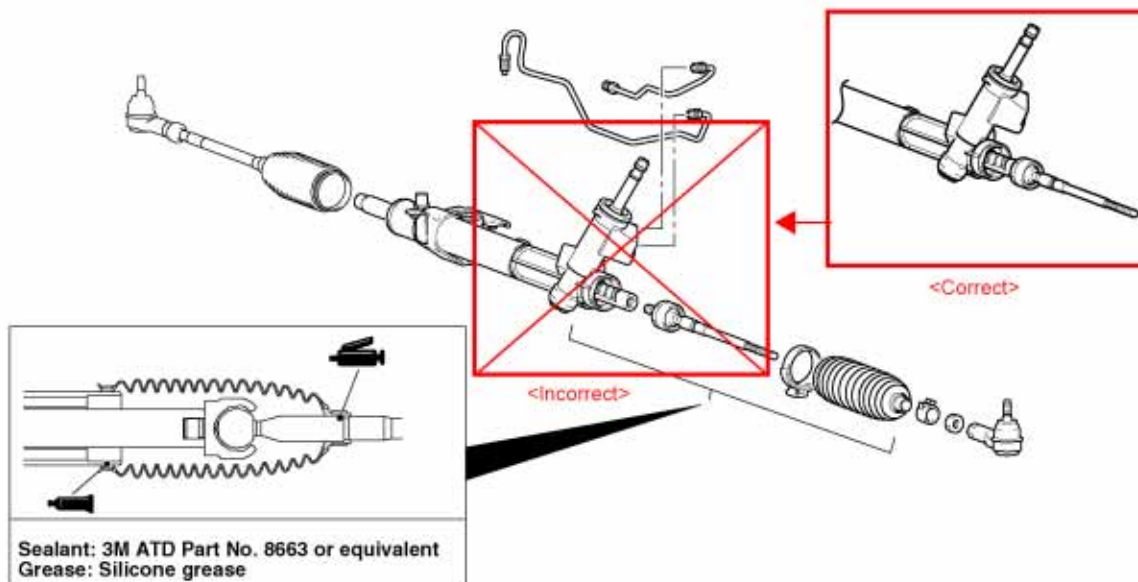
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## POWER STEERING POWER STEERING GEAR BOX AND LINKAGE

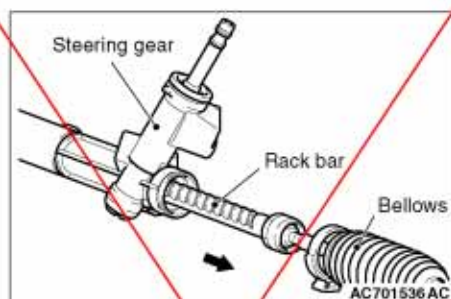
### LUBRICATION AND SEALING POINTS



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#### DISASSEMBLY SERVICE POINT

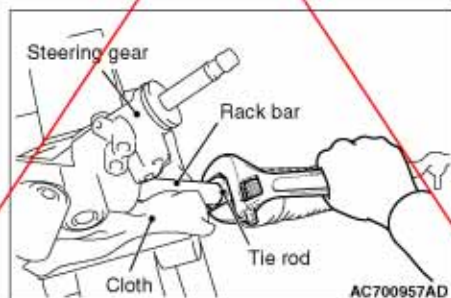
##### <<A>> TIE ROD REMOVAL



1. Move the bellows and pull the rack bar toward arrow direction.

#### ⚠ CAUTION

Do not tighten the vise strongly in order not to damage the rack bar.



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2. Wrap rack bar with cloth in order not to damage, and fix the rack bar with a vise.
3. Use the tool to remove the tie rod.

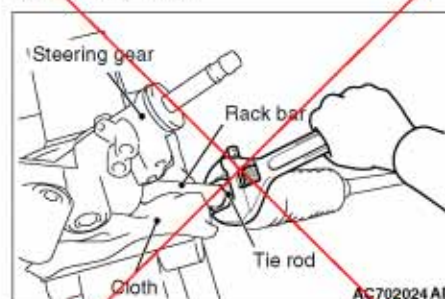
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#### REASSEMBLY SERVICE POINTS

##### >>A<< TIE-ROD INSTALLATION

#### ⚠ CAUTION

Do not tighten the vise strongly in order not to damage the rack bar.



1. Wrap rack bar with cloth in order not to damage, and fix the rack bar with a vise.
2. Use the tool to install the tie rod.

Tightening torque:  $88 \pm 10$  N·m

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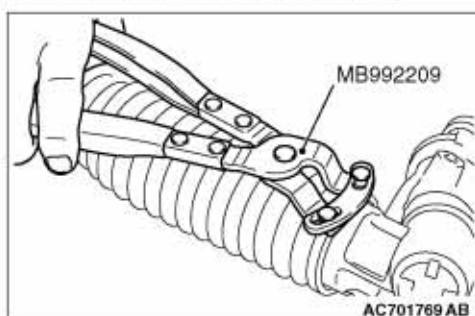
## POWER STEERING POWER STEERING GEAR BOX AND LINKAGE

&gt;&gt;A&lt;&lt; &lt;Correct&gt;

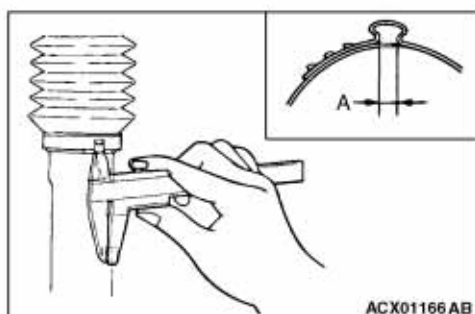
&gt;&gt;B&lt;&lt; &lt;Incorrect&gt;

**BAND INSTALLATION****CAUTION**

- Hold the rack housing, and use special tool bellows band crimping tool (MB992209) to crimp the bellows band securely.
- Crimp the bellows band until special tool (MB992209) touches the stopper.



1. Use special tool (MB992209) to crimp the bellows band.



2. Check that crimped width (A) is within the standard value.

Standard value (A): 2.4 – 2.8 mm

<When more than 2.8 mm>: Readjust the dimension (W) of step (1) to the value calculated by the following equation, and repeat step (2).

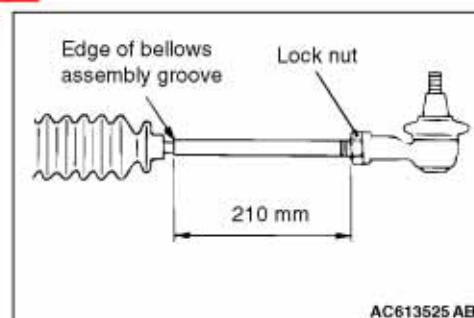
$W = 5.5 \text{ mm} - A$  [Example: if (A) is 2.9 mm, (W) is 2.6 mm.]

<When less than 2.4 mm>: Remove the bellows band, readjust the dimension (W) of step (1) to the value calculated by the following equation, and use a new bellows band to repeat steps (2) to (3).

$W = 5.5 \text{ mm} - A$  [Example: if (A) is 2.3 mm, (W) is 3.2 mm.]

&gt;&gt;B&lt;&lt; &lt;Correct&gt;

&gt;&gt;C&lt;&lt; &lt;Incorrect&gt;

**TIE-ROD END/LOCK NUT INSTALLATION**

Screw in the tie-rod to the length shown in the figure, and hand-tighten the lock nut.

**NOTE:** Install the steering gear and linkage to the body, adjust the toe-in, and then tighten the lock nut to the specified torque.

## POWER STEERING POWER STEERING GEAR BOX AND LINKAGE

2. Measure the oscillating resistance (oscillating torque) using a spring scale as shown in the figure with the tie-rod end facing downward.

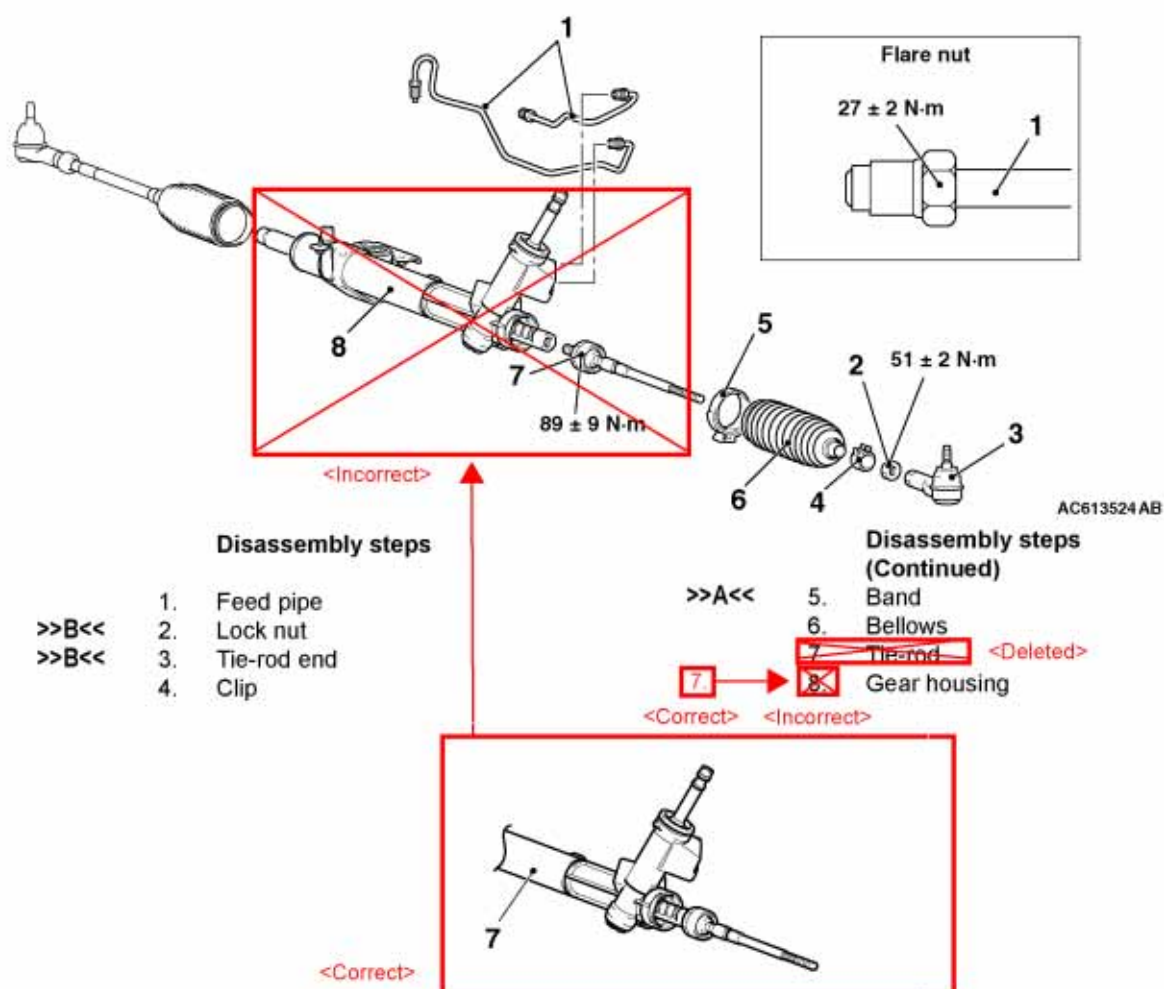
**Standard value: 5.5 – 18 N (1.5 – 4.9 N·m)**

3. If the measurement is greater than the standard value, replace the tie-rod.

4. If the measurement value is below the standard value, check the ball joint for looseness or scraping feeling. If the ball joint swings smoothly, it is judged to be usable.

## DISASSEMBLY AND REASSEMBLY

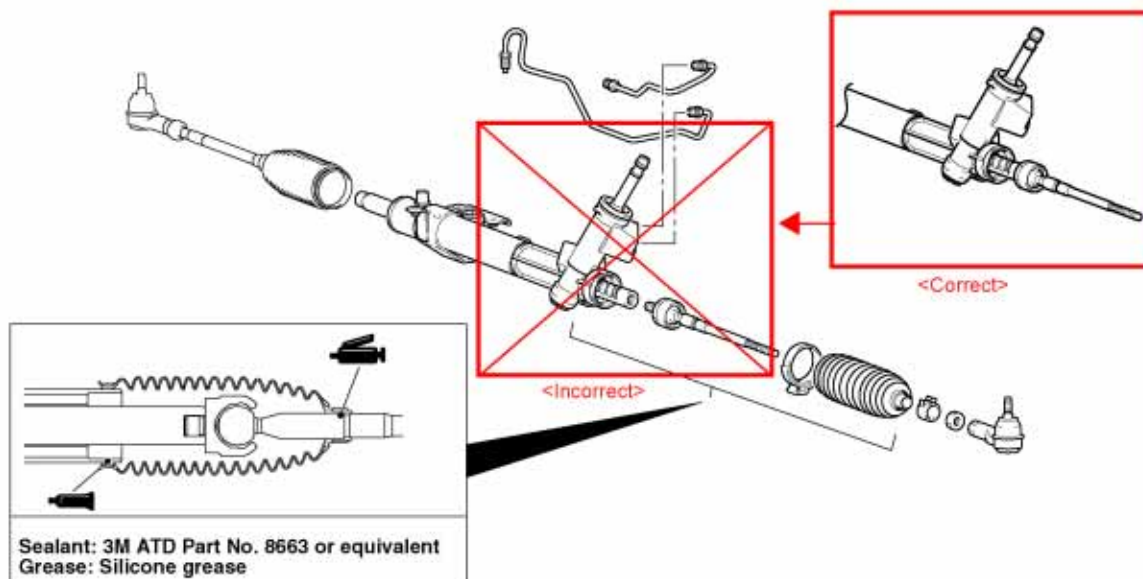
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## POWER STEERING POWER STEERING GEAR BOX AND LINKAGE

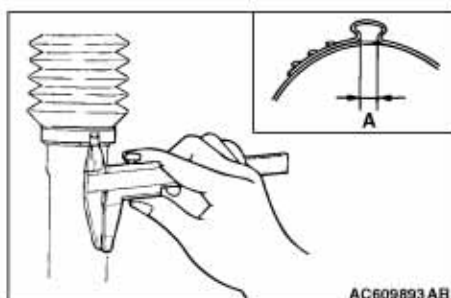
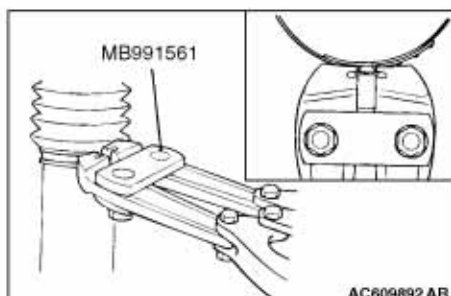
### LUBRICATION AND SEALING POINTS



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### REASSEMBLY SERVICE POINTS

#### >>A<< BAND INSTALLATION



1. Turn the adjusting bolt for the special tool boot band clipping tool (MB991561) to adjust the opening dimension (W) to the standard value.

Standard value (W): 2.9 mm

When opening dimension is more than 2.9 mm tighten the adjusting bolt.

When opening dimension is more than 2.9 mm loosen the adjusting bolt.

#### NOTE:

- The adjusting bolt changes W approximately 0.7 mm for each rotation.
- Do not rotate the adjusting bolt more than one rotation.

#### CAUTION

- Secure the gear housing, and crimp the crimping part of the band firmly with the tip of the special tool.
  - Crimp the boot band securely until the special tool contacts the stopper.
2. Use the special tool to crimp the boot band.
  3. Check that the crimping width of the boot band (A) is within the range of the standard value.

Standard value(A): 2.4 – 2.8 mm

Readjust the value W described in Step 1 to the following formula, and perform the operation in Step 2 again.

$W = 5.5 - A$  (Example: When A is 2.9, W is 2.6)

When the crimping width is less than 2.4 mm Remove the boot band, readjust the value W described in Step 1 to the following formula, and perform the Step 2 and 3 using a new boot band.

$W = 5.5 - A$  (Example: When A is 2.3, W is 3.2)



# POWER STEERING POWER STEERING GEAR BOX AND LINKAGE

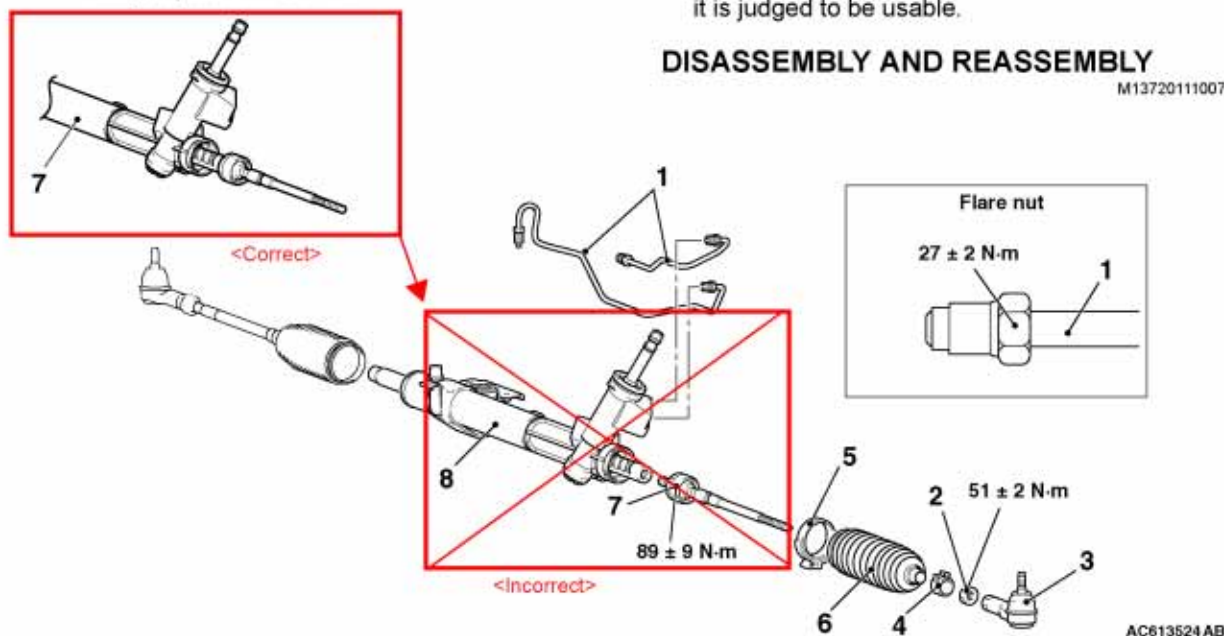
Standard value: 5.5 – 18 N (1.5 – 4.9 N·m)

3. If the measurement is greater than the standard value, replace the tie-rod.

4. If the measurement value is below the standard value, check the ball joint for looseness or scraping feeling. If the ball joint swings smoothly, it is judged to be usable.

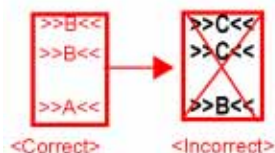
## DISASSEMBLY AND REASSEMBLY

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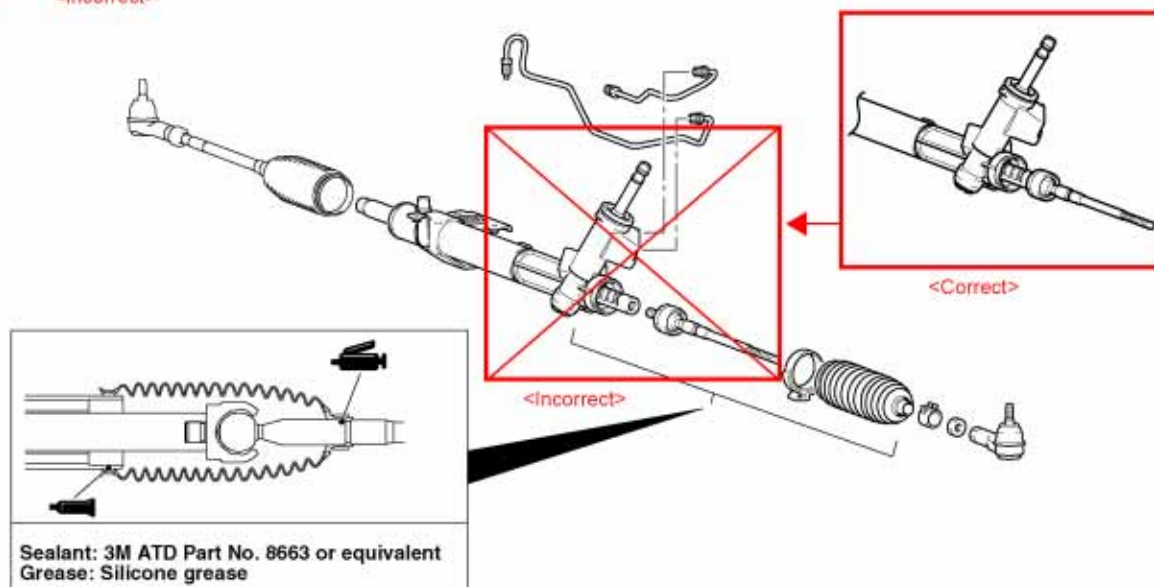


### Disassembly steps

1. Feed pipe
2. Lock nut
3. Tie-rod end
4. Clip
5. Band



## LUBRICATION AND SEALING POINTS

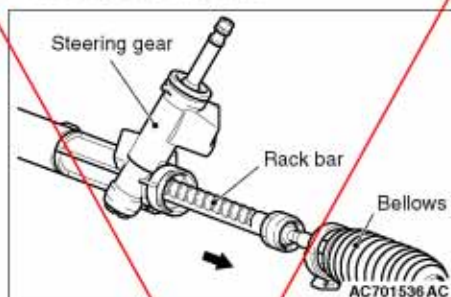


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# POWER STEERING POWER STEERING GEAR BOX AND LINKAGE

## DISASSEMBLY SERVICE POINT

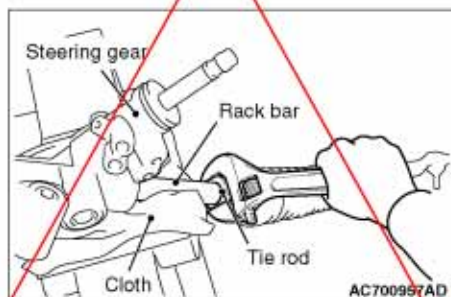
### <<A>> TIE ROD REMOVAL



1. Move the bellows and pull the rack bar toward arrow direction.

#### **CAUTION**

Do not tighten the vise strongly in order not to damage the rack bar.



2. Wrap rack bar with cloth in order not to damage, and fix the rack bar with a vise.
3. Use the tool to remove the tie rod.

## REASSEMBLY SERVICE POINTS

### >>A<< TIE-ROD INSTALLATION

#### **CAUTION**

Do not tighten the vise strongly in order not to damage the rack bar.



1. Wrap rack bar with cloth in order not to damage, and fix the rack bar with a vise.

2. Use the tool to install the tie rod.

Tightening torque:  $88 \pm 10 \text{ N}\cdot\text{m}$

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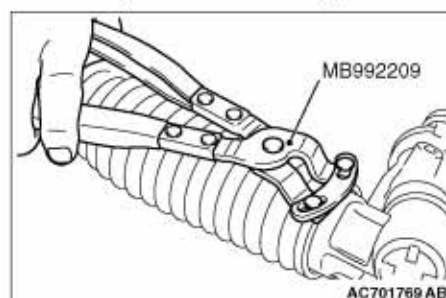
### >>B<< BAND INSTALLATION

>>A<<

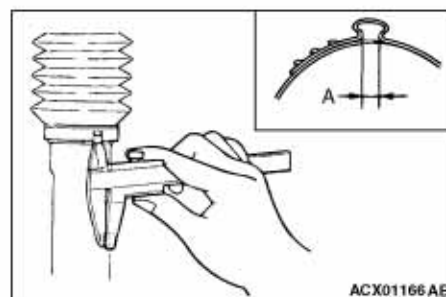
<Correct>

#### **CAUTION**

- Hold the rack housing, and use special tool bellows band crimping tool (MB992209) to crimp the bellows band securely.
- Crimp the bellows band until special tool (MB992209) touches the stopper.



1. Use special tool (MB992209) to crimp the bellows band.



2. Check that crimped width (A) is within the standard value.

Standard value (A): 2.4 – 2.8 mm

<When more than 2.8 mm>: Readjust the dimension (W) of step (1) to the value calculated by the following equation, and repeat step (2).

$W = 5.5 \text{ mm} - A$  [Example: if (A) is 2.9 mm, (W) is 2.6 mm.]

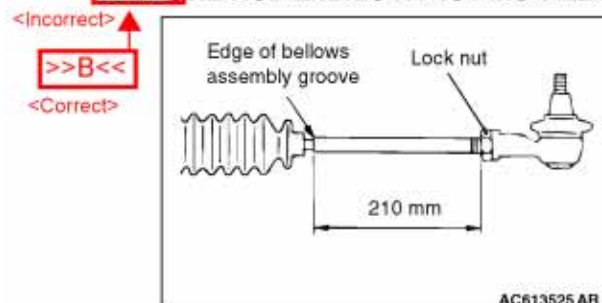
<When less than 2.4 mm>: Remove the bellows band, readjust the dimension (W) of step (1) to the value calculated by the following equation, and use a new bellows band to repeat steps (2) to (3).

$W = 5.5 \text{ mm} - A$  [Example: if (A) is 2.3 mm, (W) is 3.2 mm.]

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## POWER STEERING POWER STEERING OIL PUMP ASSEMBLY

### >>C<< TIE-ROD END/LOCK NUT INSTALLATION



Screw in the tie-rod to the length shown in the figure, and hand-tighten the lock nut.

**NOTE:** Install the steering gear and linkage to the body, adjust the toe-in, and then tighten the lock nut to the specified torque.

## POWER STEERING OIL PUMP ASSEMBLY REMOVAL AND INSTALLATION

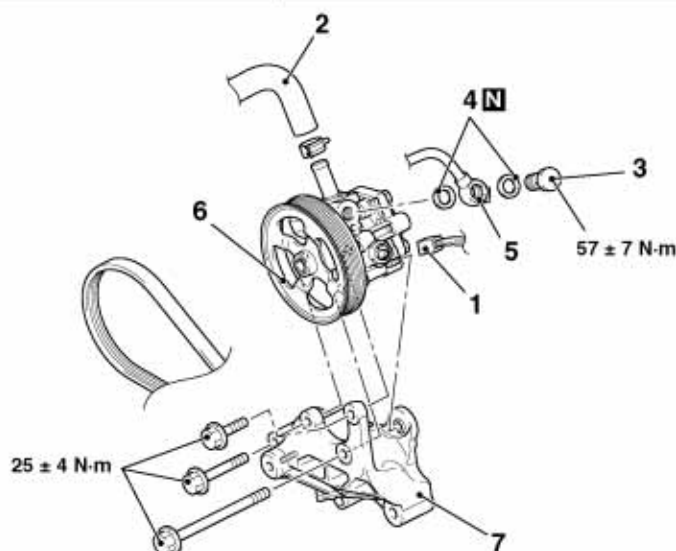
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### Pre-removal Operation

- Power Steering Fluid Draining (Refer to ).
- Engine Cover Removal (Refer to GROUP 11A – Engine Assembly ).
- Radiator Condenser Tank Removal (Refer to GROUP 14 – Radiator ).
- Drive Belt Removal (Refer to GROUP 11A – Engine Assembly ).

### Post-installation Operation

- Drive Belt Installation (Refer to GROUP 11A – Engine Assembly ).
- Engine Cover Installation (Refer to GROUP 11A – Engine Assembly ).
- Radiator Condenser Tank Installation (Refer to GROUP 14 – Radiator ).
- Power Steering Fluid Supplying and Bleeding (Refer to ).
- Drive Belt Tension Adjusting (Refer to GROUP 11A – On-vehicles service – Drive Belt Tension Check and Adjusting ).



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- Removal steps**
1. Pressure switch harness
  2. Suction hose
  3. Eye bolt

- Removal steps (Continued)**
4. Gasket
  5. Pressure tube assembly