GROUP 37A

STEERING

CONTENTS

Continued on next page

WARNINGS REGARDING SERVICING OF SUPPLEMENTAL RESTRAINT SYSTEM (SRS) EQUIPPED VEHICLES

⚠ WARNING

- ***Improper service or maintenance of any component of the SRS, or any SRS-related component, can lead to personal injury or death to service personnel (from inadvertent firing of the air bag) or to the driver and passenger (from rendering the SRS inoperative).***
- ***Service or maintenance of any SRS component or SRS-related component must be performed only at an authorized MITSUBISHI dealer.***
- ***MITSUBISHI dealer personnel must thoroughly review this manual, and especially its GROUP 52B - Supplemental Restraint System (SRS) before beginning any service or maintenance of any component of the SRS or any SRS-related component.***

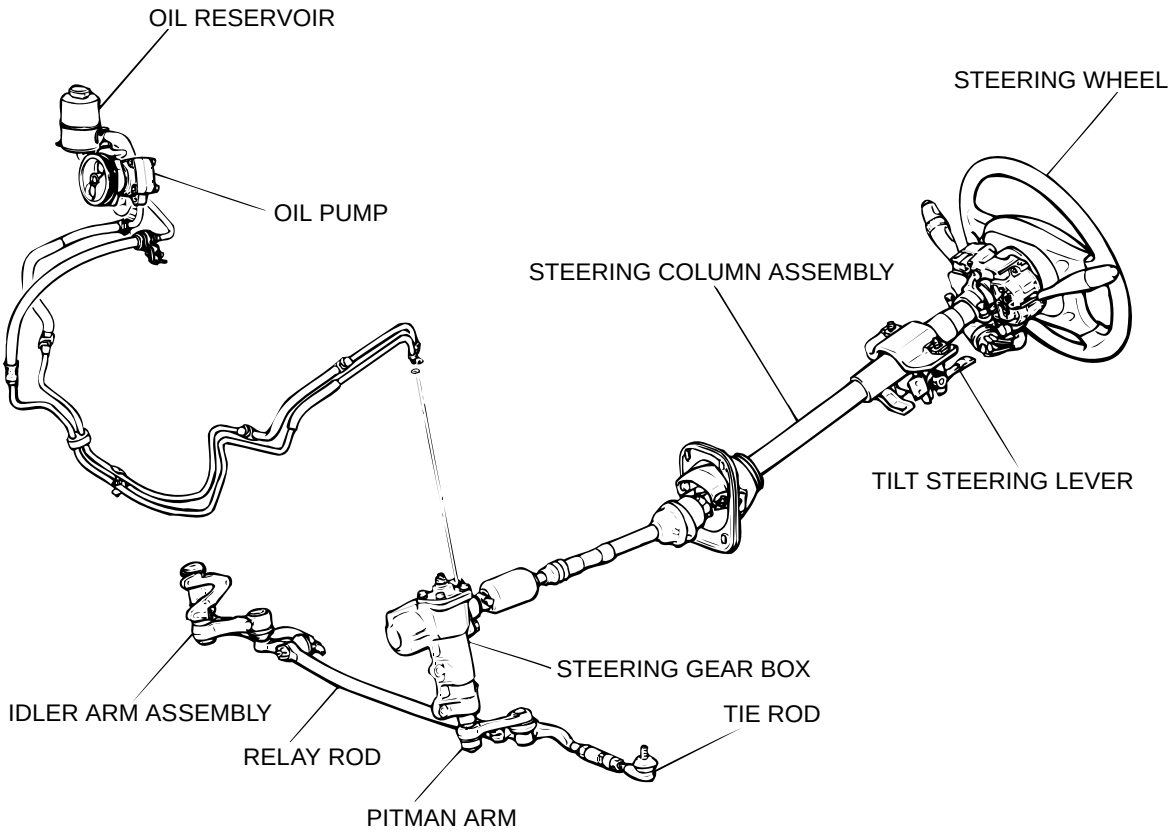
NOTE
The SRS includes the following components: SRS air bag control unit, SRS warning light, front impact sensors, air bag module, clock spring, and interconnecting wiring. Other SRS-related components (that may have to be removed/installed in connection with SRS service or maintenance) are indicated in the table of contents by an asterisk (*).

GENERAL DESCRIPTION

M1372000100177

The vehicle uses engine speed-responsive hydraulic power steering.
The steering wheel has four spokes. All vehicles are equipped with SRS (Supplemental Restraint System).
The steering column has a shock absorber mechanism and a tilt steering mechanism.
A vane-type oil pump with a fluid flow control system has been included. The steering gear and linkage is ball and nut type.

CONSTRUCTION DIAGRAM



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POWER STEERING DIAGNOSIS

INTRODUCTION TO POWER STEERING DIAGNOSIS

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Hydraulic power steering is used for all vehicles. Faults in the power steering can include excessive play of the steering wheel, difficult steering wheel operation, noise, vibration, and oil leaks, etc. Possible causes of these faults can include defects in the gear box, oil pump or steering linkage.

POWER STEERING DIAGNOSTIC TROUBLESHOOTING STRATEGY

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Use these steps to plan your diagnostic strategy. If you follow them carefully, you will be sure that you have exhausted most of the possible ways to find a power steering fault.

1. Gather information from the customer.
2. Verify that the condition described by the customer exists.
3. Find the malfunction by following the Symptom Chart.
4. Verify that the malfunction is eliminated.

SYMPTOM CHART

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SYMPTOM	INSPECTION PROCEDURE	REFERENCE PAGE
Excessive play of steering wheel	1	P.37A-5
Difficult steering wheel operation (insufficient power assist)	2	P.37A-6
Rattling noise	3	P.37A-7
Shrill noise	4	P.37A-8
Squealing noise	5	P.37A-8
Hissing noise	6	P.37A-8
Droning noise	7	P.37A-9
Squeaking noise	8	P.37A-10
Vibration	9	P.37A-11
Oil leakage from hose connection	10	P.37A-11
Oil leakage from hose assembly	11	P.37A-11
Oil leakage from oil reservoir	12	P.37A-12
Oil leakage from oil pump	13	P.37A-12
Oil leakage from gear box	14	P.37A-12

SYMPTOM PROCEDURES

INSPECTION PROCEDURE 1: Excessive Play of Steering Wheel

DIAGNOSIS

STEP 1. Check for looseness at the steering shaft coupling section and at the steering linkage.

Q: Is there any looseness?

YES : Repair or replace the part. Then go to Step 3.
NO : Go to Step 2.

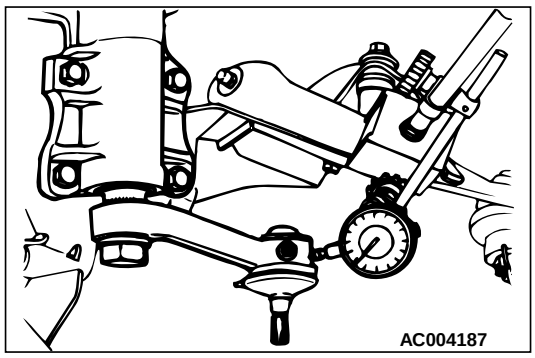
STEP 2. Check the steering gear backlash (excessive).

NOTE: Be sure to adjust with the steering wheel in the straight ahead position.

NOTE: If the adjusting bolt is over tightened, more steering effort will be required, and return of the wheel will be adversely affected.

(1) Jack up the vehicle front and hold the steering wheel in the straight ahead position.
(2) Take a parts the pitman arm and the relay rod.(Refer to P.37A-27.)
(3) Measure the steering gear backlash at the pitman arm top end with a dial indicator.

Limit: 0.5 mm (0.02 inch)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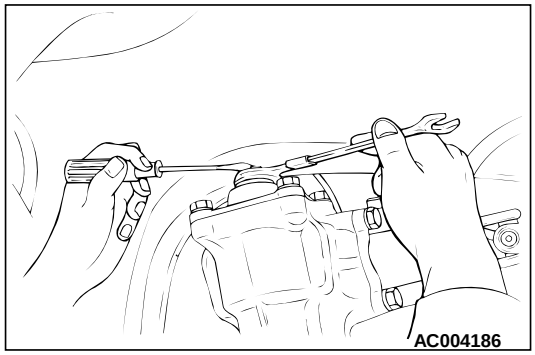
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Q: Does the play exceed the limit?

YES : Screw in the steering gear box adjusting bolt until the steering wheel free play is within the standard value. Then go to Step 3.
NO : Go to Step 3.

STEP 3. Check steering wheel play.

Verify that the steering wheel play is not excessive.

Q: Is the steering wheel play excessive?

YES : Repeat from Step 1.
NO : The procedure is complete.

INSPECTION PROCEDURE 2: Difficult Steering Wheel Operation (Insufficient Power Assist)

DIAGNOSIS

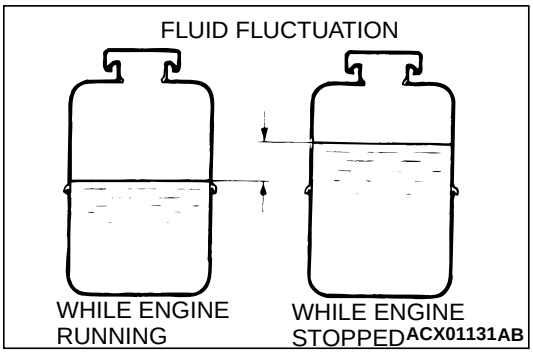
STEP 1. Check the power steering belt tension.
Refer to GROUP 00, Maintenance Service – Drive Belt P.00-43.

Q: Is the power steering belt tension within the standard value?
YES : Go to Step 2.
NO : Adjust it. Then go to Step 10.

STEP 2. Check the belt for damage.

Q: Is the belt damaged?
YES : Replace the belt. Then go to Step 10.
NO : Go to Step 3.

STEP 3. Check the fluid level.
(1) Park the vehicle on a flat, level surface, start the engine, and then turn the steering wheel several times in both directions to raise the temperature of the fluid to approximately 50 – 60°C (122 – 140°F).
(2) With the engine running, turn the wheel all the way to the left and right several times.
(3) Check the fluid in the oil reservoir for foaming or milkiness. Check the difference of the fluid level when the engine is stopped, and while it is running. If the change of the fluid level is 5 mm (0.2 inch) or more, bleed air from the system. (Refer to P.37A-19.)



Q: Is fluid foamy?
YES : Go to Step 4.
NO : Go to Step 10.

STEP 4. Check for entry of air.

Q: Has air entered?
YES : Bleed the air. Refer to P.37A-19. Then go to Step 10.
NO : Go to Step 5.

STEP 5. Check each hose for crushing or twisting.

Q: Is any hose crushed or twisted?
YES : Repair or replace the hose. Then go to Step 10.
NO : Go to Step 6.

STEP 6. Check for oil leaks.

Q: Are there oil leaks?
YES : Repair it. Then go to Step 10.
NO : Go to Step 7.

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STEP 7. Check the wheel alignment (camber and caster).
Refer to GROUP 33A, On-vehicle Service – Front Wheel Alignment Check and Adjustment P.33A-3.

Q: Is the alignment incorrect?
YES : Adjust it. Then go to Step 10.
NO : Go to Step 8.

STEP 8. Check the gear box rack piston seal for damage.

Q: Is there damage?
YES : Replace it. Then go to Step 10.
NO : Go to Step 9.

STEP 9. Check for excessive tie rod end ball joint breakaway torque.
Refer to P.37A-16.

Q: Is there fault?
YES : Replace the part. Then go to Step 10.
NO : There is no action to be taken.

STEP 10. Check steering wheel operation.
Verify that steering wheel operation is not difficult.

Q: Is the steering wheel operation difficult?
YES : Repeat from Step 1.
NO : The procedure is complete.

INSPECTION PROCEDURE 3: Rattling Noise

DIAGNOSIS

STEP 1. Check for proper oil pump and gear box installation.

Q: Is the oil pump and gear box installation correct?
YES : Go to Step 2.
NO : Repair it. Then go to Step 4.

STEP 2. Check for interference of other parts with the steering column and power steering hoses.

Q: Is there interference?
YES : Correct the interference. Then go to Step 4.
NO : Go to Step 3.

STEP 3. Check for noise from inside the oil pump or gear box.

Q: Is there noise?
YES : Replace the part. Then go to Step 4.
NO : There is no action to be taken.

STEP 4. Check for rattling noise.
Confirm that no noise is generated.

Q: Is there noise?
YES : Repeat from Step 1.
NO : The procedure is complete.

INSPECTION PROCEDURE 4 : Shrill Noise

DIAGNOSIS

STEP 1. Check for entry of air.

Q: Is the power steering fluid foamy?
YES : Bleed the air. Refer to P.37A-19. Then go to Step 3.
NO : Go to Step 2.

STEP 2. Check for seizure in the oil pump.

Q: Is there seizure?
YES : Replace the part. Then go to Step 3.
NO : There is no action to be taken.

STEP 3. Retest the system.
Confirm that no noise is generated.

Q: Is there noise?
YES : Repeat from Step 1.
NO : The procedure is complete.

INSPECTION PROCEDURE 5 : Squealing Noise

DIAGNOSIS

STEP 1. Check the belt tension.
(1) Refer to GROUP 00, Maintenance Service – Drive Belt P.00-43.

Q: Is the belt tension incorrect?
YES : Adjust the belt tension. Then go to Step 3.
NO : Go to Step 2.

STEP 2. Check for seizure in the oil pump.

Q: Is there seizure?
YES : Replace the part. Then go to Step 3.
NO : There is no action to be taken.

STEP 3. Retest the system.
Confirm that no noise is generated.

Q: Is there noise?
YES : Repeat from Step 1.
NO : The procedure is complete.

INSPECTION PROCEDURE 6 : Hissing Noise

DIAGNOSIS

STEP 1. Check for entry of air.

Q: Is the power steering fluid foamy?
YES : Bleed the air. Refer to P.37A-19. Then go to Step 4.
NO : Go to Step 2.

STEP 2. Check each hose for crushing or twisting.

Q: Is any hose crushed or twisted?
YES : Repair or replace the hose. Then go to Step 4.
NO : Go to Step 3.

STEP 3. Check the steering box for damage.

Q: Is there damage?
YES : Repair or replace the part. Then go to Step 4.
NO : There is no action to be taken.

STEP 4. Retest the system.
Confirm that no noise is generated.

Q: Is there noise?
YES : Repeat from Step 1.
NO : The procedure is complete.

INSPECTION PROCEDURE 7 : Droning Noise

DIAGNOSIS

STEP 1. Check the oil pump or oil pump bracket installation.

Q: Is the oil pump or oil pump bracket installation correct?
YES : Go to Step 2.
NO : Repair it. Then go to Step 3.

STEP 2. Check the oil pump for damage.

NOTE: If a slight "beat noise" is produced by the oil pump when the steering wheel is turned fully and held in that position, this is not a malfunction.

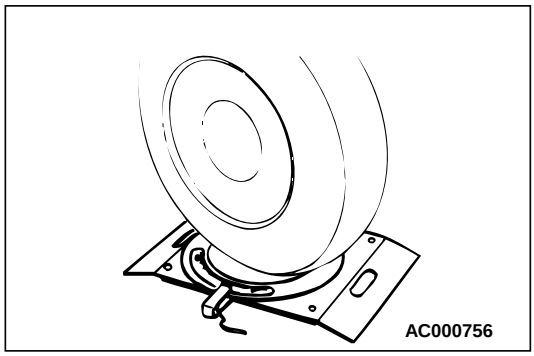
Q: Is there damage?
YES : Replace the oil pump. Then go to Step 3.
NO : There is no action to be taken.

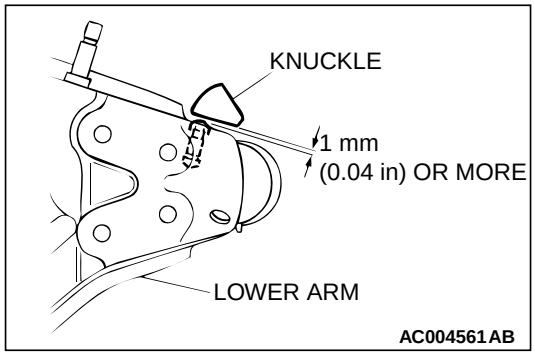
STEP 3. Retest the system.

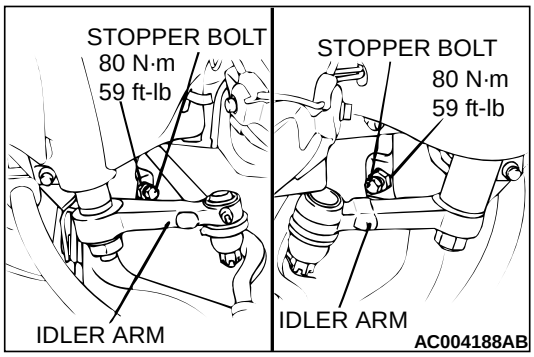
Confirm that no noise is generated.

Q: Is there noise?
YES : Repeat from Step 1.
NO : The procedure is complete.

INSPECTION PROCEDURE 8: Squeaking Noise







DIAGNOSIS

STEP 1. Check for interference of the wheel and vehicle body.

If interfering, adjust the steering angle.

(1) Place the front wheel on a turning radius gauge and measure the steering angle.

Standard value:

ITEM	SPECIFICATION
Inside wheel	29°40' – 32°40'
Outside wheel (reference)	29°30'

⚠ CAUTION

When the steering wheel is turned to lock, check that the clearance between the knuckle and the stopper is 1 mm (0.04 inch) or more.

(2) Check that the toe-in is within the standard value. If the steering angle is outside the standard value, adjust the toe-in. (Refer to GROUP 33A, On-vehicle Service P.33A-3.)

Standard value: 3.5 ± 3.5 mm (0.14 ± 0.14 inch)

(3) Adjust the steering angle with the stopper bolt.

Q: Is the steering angle normal?

YES : Go to Step 2.
NO : Adjust the steering angle, and Then go to Step 3.

STEP 2. Check the steering gear box for damage.

Q: Is there damage?

YES : Repair or replace the part. Then go to Step 3.
NO : There is no action to be taken.

STEP 3. Retest the system.

Confirm that no noise is generated.

Q: Is there noise?

YES : Repeat from Step 1.
NO : The procedure is complete.

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INSPECTION PROCEDURE 9: Vibration

NOTE: A slight vibration may be felt when the stationary steering effort is made due to the condition of the road surface. To check whether the vibration actually exists or not, test-drive the vehicle on a dry concrete or asphalt surface. A very slight amount of vibration is not a malfunction.

DIAGNOSIS

STEP 1. Check for entry of air.

Q: Is the power steering fluid foamy?
YES : Bleed the air. Refer to P.37A-19. Then go to Step 3.
NO : Go to Step 2.

STEP 2. Check the steering gear box for damage.

Q: Is there damage?
YES : Repair or replace the part. Then go to Step 3.
NO : There is no action to be taken.

STEP 3. Retest the system.
Confirm that no vibration is generated.

Q: Is there vibration?
YES : Repeat from Step 1.
NO : The procedure is complete.

INSPECTION PROCEDURE 10: Oil Leakage from Hose Connection

DIAGNOSIS

STEP 1. Check for loosening of the flare nut.

Q: Is the flare nut loose?
YES : Tighten it to 15 N·m (11 ft-lb). Then go to Step 3.
NO : Go to Step 2.

STEP 2. Check the hose connection and the clamp installation.

Q: Are they installed correctly?
YES : There is no action to be taken.
NO : Repair or replace the part. Then go to Step 3.

STEP 3. Retest the system.
Check that no oil is leaking.

Q: Is there oil leakage?
YES : Repeat from Step 1.
NO : The procedure is complete.

INSPECTION PROCEDURE 11 : Oil Leakage from Hose Assembly

DIAGNOSIS

STEP 1. Check the hose for damage or clogging.

Q: Is the hose damaged or clogged?
YES : Repair or replace it. Then go to Step 2.
NO : There is no action to be taken.

STEP 2. Retest the system.
Check that no oil is leaking.

Q: Is there oil leakage?
YES : Repeat from Step 1.
NO : The procedure is complete.

INSPECTION PROCEDURE 12: Oil Leakage from Oil Reservoir

DIAGNOSIS

STEP 1. Check the oil reservoir for damage.

Q: Is there damage?
YES : Repair or replace it. Then go to Step 3.
NO : Go to Step 2.

STEP 2. Check for overflowing.

Q: Is there oil overflowing from the reservoir?
YES : Adjust fluid level. Then go to Step 3.
NO : Check that no oil is leaking.

STEP 3. Retest the system.

Q: Is there oil leakage?
YES : Repeat from Step 1.
NO : The procedure is complete.

INSPECTION PROCEDURE 13 : Oil Leakage from Oil Pump

DIAGNOSIS

STEP 1. Check the oil pump body for damage.

Q: Is there damage?
YES : Replace the part. Then go to Step 3.
NO : Go to Step 2.

STEP 2. Check the O-ring or oil seal for damage.

Q: Is there damage?
YES : Replace the part. Then go to Step 3.
NO : Check that no oil is leaking.

STEP 3. Retest the system.
Check that no oil is leaking.

Q: Is there oil leakage?
YES : Repeat from Step 1.
NO : The procedure is complete.

INSPECTION PROCEDURE 14 : Oil Leakage from Gear Box

DIAGNOSIS

STEP 1. Check the gear box housing for damage.

Q: Is there damage?
YES : Replace the part. Then go to Step 3.
NO : Go to Step 2.

STEP 2. Check the oil-ring or oil seal for damage.

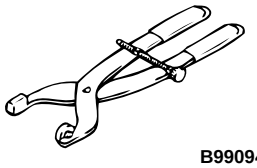
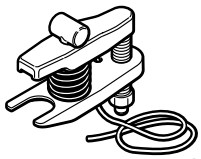
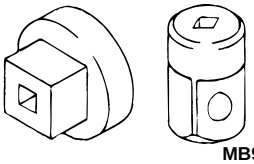
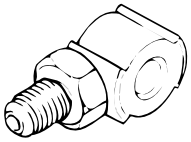
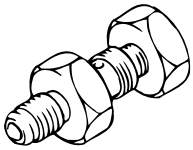
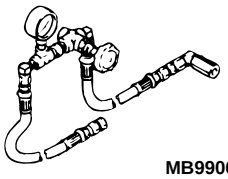
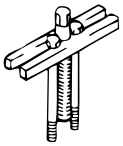
Q: Is there damage?
YES : Replace the part. Then go to Step 3.
NO : Check that no oil is leaking.

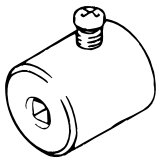
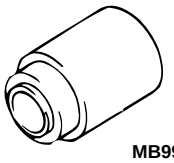
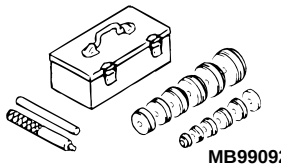
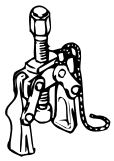
STEP 3. Retest the system.
Check that no oil is leaking.

Q: Is there oil leakage?
YES : Repeat from Step 1.
NO : The procedure is complete.

SPECIAL TOOLS

M1372000600202

TOOL	TOOL NUMBER AND NAME	SUPERSESSION	APPLICATION
 B990948	MB990948 Linkage joint gauge	General service tool	Ball joint variation check for shaft direction
 AC106827	MB991897 Ball joint remover	MB991113-01, MB990635-01 or General service tool	Ball joint removal *NOTE: Steering linkage puller (MB990635 or MB991113) is also used to disconnect knuckle and tie rod end ball joint.*
 MB990326	MB990326 Preload socket	General service tool	Tie rod end ball joint breakaway torque check
 MB991548	MB990993 or MB991217 Power steering oil pressure gauge adapter (Pump side)	MB990993-01	Oil pump pressure test
 MB991549	MB990994 Power steering oil pressure gauge adapter (Hose side)	MB990994-01	
 MB990662	MB990662 Oil pressure gauge assembly	MB990662-01	
 MB990803	MB9900803 Steering wheel puller	General service tool	Steering wheel removal

TOOL	TOOL NUMBER AND NAME	SUPERSESSION	APPLICATION
 MB991006	MB990228 or MB991006 Preload socket	MB990228-01	Gear box total pinion torque check
 MB990776	MB990776 Front axle base	MB990776-01	Dust cover installation
 MB990925	MB990925 Bearing and oil seal installer set	MB990925-01 or general service tool	Oil seal and bearing installation MB990926, MB990938
 B990915	MB990915 Pitman arm puller	MB990809-01	Pitman arm removal

ON-VEHICLE SERVICE

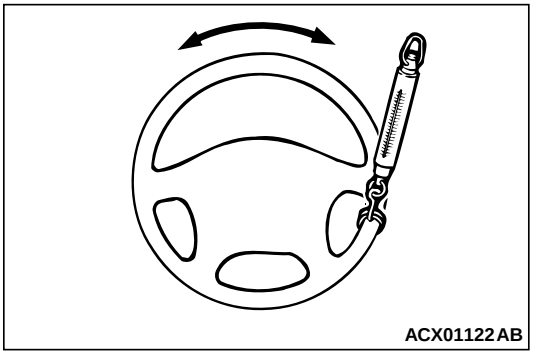
STEERING WHEEL FREE PLAY CHECK

M1372001000195

1. With the engine running (hydraulic operation), set the front wheels straight ahead.
2. Measure the play on the steering wheel circumference before the wheels start to move when slightly moving the steering wheel in both directions.

   Limit: 50 mm (1.2 inches)
3. When the play exceeds the limit, check for the play on the steering shaft and steering linkage connection. Correct or replace.
4. If the free play still exceeds the limit value, set the steering wheel straight ahead with the engine stopped. Load 5 N (1.1 pound) towards the steering wheel circumference and check the play.

   Standard value (steering wheel play with the engine stopped): 10 mm (0.4 inch) or less
5. If the play exceeds the standard value, check the steering gear backlash and ball joint end play (Refer to P.37A-15).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STEERING ANGLE CHECK

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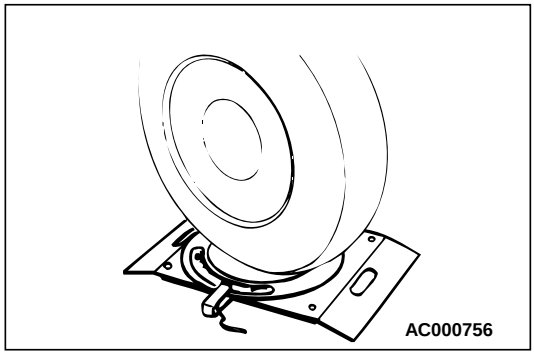
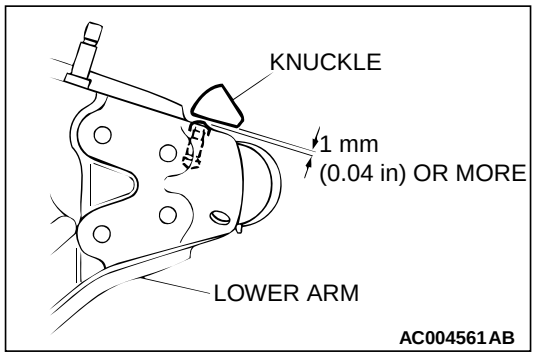


1. Place the front wheel on a turning radius gauge and measure the steering angle.

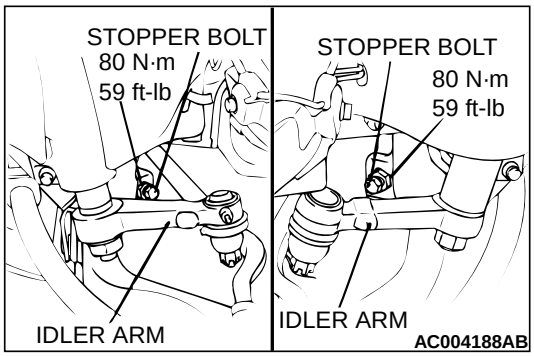
   Standard value:

ITEM	SPECIFICATION
Inside wheel	29°40' – 32°40'
Outside wheel (reference)	29°30'



⚠ CAUTION

When the steering wheel is turned to lock, check that the clearance between the knuckle and the stopper is 1 mm (0.04 inch) or more.



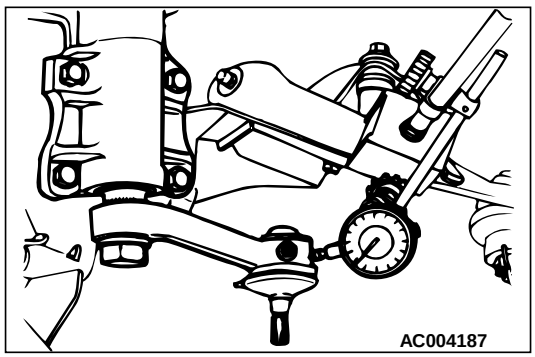
2. Check that the toe-in is within the standard value. If the steering angle is outside the standard value, adjust the toe-in. (Refer to GROUP 33A, On-vehicle Service P.33A-3.)

   Standard value: 3.5 ± 3.5 mm (0.14 ± 0.14 inch)

3. Adjust the steering angle with the stopper bolt.

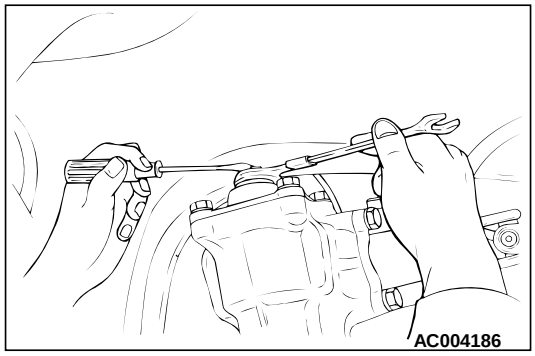
STEERING GEAR BACKLASH CHECK

M1372001300055



1. Jack up the vehicle front and hold the steering wheel in the straight ahead position.
2. Take a part the pitman arm and the relay rod. (Refer to P.37A-27.)
3. Measure the steering gear backlash at the pitman arm top end with a dial indicator.

   Limit: 0.5 mm (0.02 inch)



4. If the measured value exceeds the limit, screw in the steering gear box adjusting bolt until the steering wheel free play is within the standard value.

   NOTE: Be sure to make the adjustment with the steering wheel in the straight ahead position.

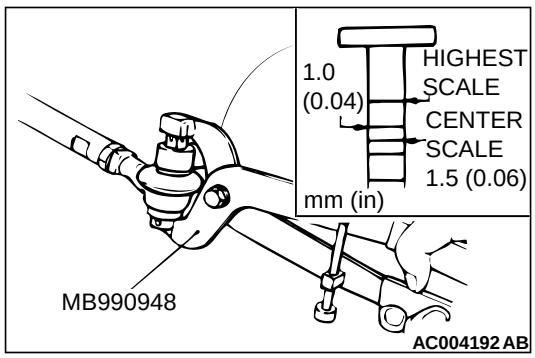
   NOTE: If the adjusting bolt is overtightened, more steering effort will be required, and return of the wheel will be adversely affected.

TIE ROD END BALL JOINT VARIATION CHECK (SHAFT DIRECTION)

M1372001400052

Required Special Tools:

- MB99948: Linkage Joint Gauge



1. Hold the ball joint with special tool MB990984.
2. Set special tool MB990948 scale at its highest and measure variation with the ball stud compressed. The variation should locate between the highest and center scales.

   Limit: 1.5 mm (0.06 inch)

3. When the variation exceeds the center scale, replace the tie rod end.

   NOTE: Even if the variation is within the limit, check the ball joint breakaway torque.

TIE ROD END BALL JOINT BREAKAWAY TORQUE CHECK

M1372001500190

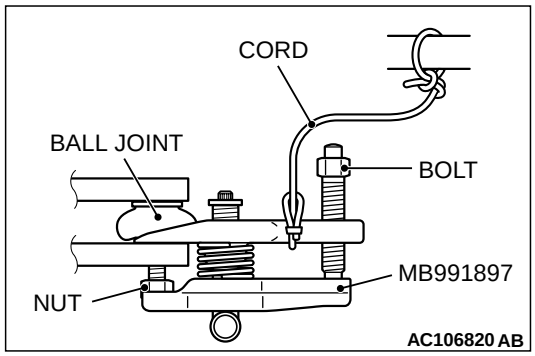
Required Special Tools:

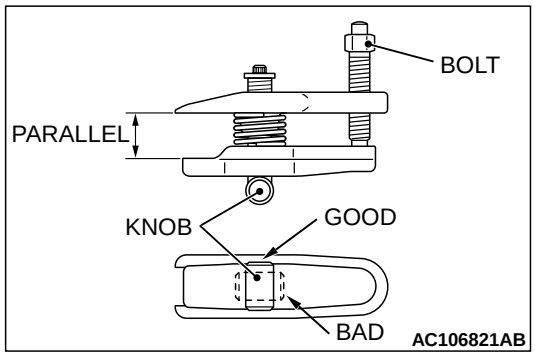
- MB990326: Preload Socket
- MB991897: Ball Joint Remover

⚠ CAUTION

- **Do not remove the nut from ball joint. Loosen it and use special tool MB991897 to avoid possible damage to the ball joint threads.**
- **Hang special tool MB991897 with cord to prevent it from falling.**

1. Install the special tool MB991897 as shown in the figure.

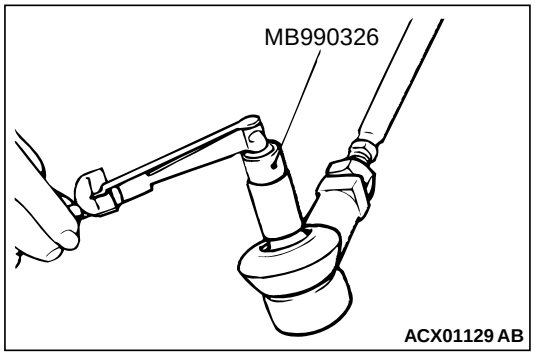




2. Turn the bolt and knob as necessary to make the jaws of special tool MB991897 parallel, tighten the bolt by hand and confirm that the jaws are still parallel.

   NOTE: When adjusting the jaws in parallel, make sure the knob is in the position shown in the figure.

3. Tighten the bolt with a wrench to disconnect the tie rod end.



4. Move the ball joint stud several times and install the nut on the stud. Measure the ball joint breakaway torque with special tool MB990326.

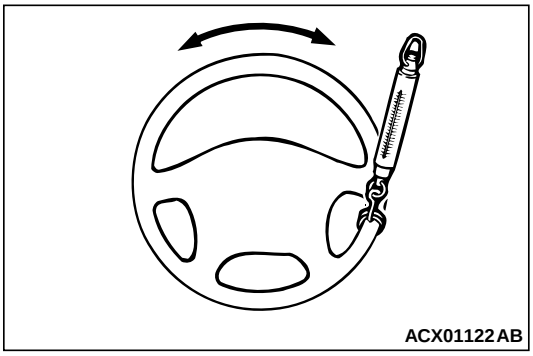
   Standard value: 3.0 N·m (27 in-lb)

5. If the breakaway torque exceeds the standard value, replace the tie rod end.
6. If the breakaway torque is under the standard value, check the ball joint for end play or ratcheting. If no end play or ratcheting, the ball joint can be re-used.
7. Tighten the nut to the specified torque and install a new cotter pin.

   Tightening torque: 40 N·m (30 ft-lb)

STATIONARY STEERING EFFORT CHECK

M1372001700194


ACX01122AB

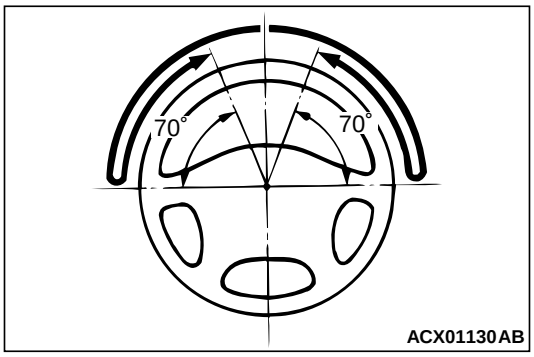
1. With the vehicle stopped on a flat and paved surface, turn the steering wheel to the straight ahead position.
2. Start the engine and check the engine idle speed.

   Standard value:700 ± 100 r/min
3. Attach a spring scale to the outer circumference of the steering wheel and measure the steering force required to turn the steering wheel from the straight ahead position to the left and right (within a range of 1.5 turns). Also check to be sure that there is no significant change in the required steering effort.

   Standard value:
   Steering effort: 39.2 N (8.81 lb) or less
   Fluctuation allowance: 5 N (1.12 lb) or less
4. If the measured value did not conform to the standard value, refer to POWER STEERING DIAGNOSIS P.37A-4 to check and adjust the steering force.

STEERING WHEEL RETURN TO CENTER CHECK

M1372001800191



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Conduct a road test:

1. Make both gradual and sudden turns and check the steering wheel return.
2. At a vehicle speed of approximately 35 km/h (22 mph), turn the steering wheel 90 degrees, hold a few seconds, then release. If the steering wheel then returns 70 degrees or more, the return can be judged satisfactory.

   NOTE: There will be a momentary feeling or "heaviness" when the wheel is turned quickly, but this is not abnormal. (Oil pump discharge amount is especially apt to be insufficient during idling.)

DRIVE BELT TENSION CHECK

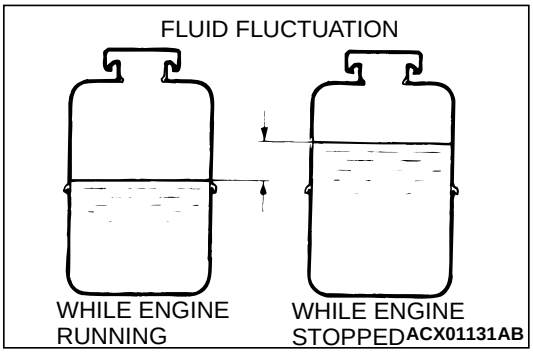
M1372001900198

Refer to GROUP 00, Maintenance Service – Drive Belt P.00-43.

FLUID LEVEL CHECK

M1372002000198

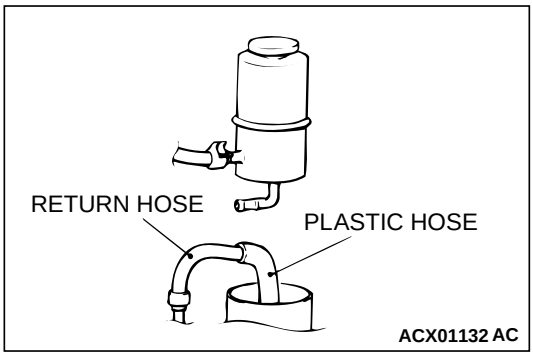
1. Park the vehicle on a flat, level surface, start the engine, and then turn the steering wheel in both directions several times to raise the temperature of the fluid to approximately 50 – 60°C (122 – 140°F).
2. With the engine running, turn the wheel all the way to the left and right several times.
3. Check the fluid in the oil reservoir for foaming or milkiness.



4. Check the difference of the fluid level when the engine is stopped, and while it is running. If the change of the fluid level is 5 mm (0.2 inch) or more, air bleeding should be done.

POWER STEERING FLUID REPLACEMENT

M1372002100203



1. Jack up the front wheels and support them.
2. Disconnect the return hose connection. (Refer to P.37A-41.)
3. Connect a vinyl hose to the return hose, and drain the fluid into a container.

⚠ CAUTION

Be careful not to position the high-tension cable near the fuel rail.

4. Disconnect the high-tension cable.
5. While operating the starting motor intermittently, turn the steering wheel all the way to the left and right several times to drain all of the fluid.
6. Connect the return hose securely, and then secure with the clip.
7. Fill the oil reservoir with GENUINE MITSUBISHI POWER STEERING FLUID up to the lower position of the filler, and then bleed the air.

POWER STEERING SYSTEM AIR BLEEDING

M1372002200200

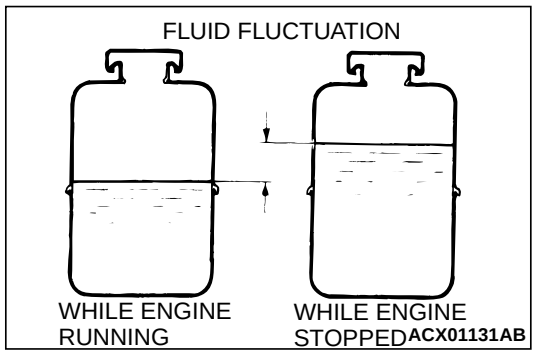
Perform air bleeding procedure as necessary after replacing the steering gear box or the steering fluid lines.

1. Raise and support the front wheels.
2. Disconnect the high-tension cable. Turn the steering wheel all the way to the left and right five or six times while using the starter motor to crank the engine intermittently several times (for 15 to 20 seconds).

⚠ CAUTION

- **Be careful not to place the high-tension cable near the fuel rail.**
- **Perform air bleeding only while cranking the engine. If air bleeding is performed while the engine is running, air could enter the fluid.**
  During air bleeding, refill the steering fluid supply so that the level never falls below the lower mark on the dipstick.

3. Connect the high-tension cable. Start the engine (idling).
4. Turn the steering wheel to the left and right until there are no air bubbles in the oil reservoir.



5. Confirm that the fluid is not milky, and that the level is between the high and low dipstick marks.
6. Confirm that there is very little change in the fluid level when the steering wheel is turned left and right.
7. Confirm that the change in the fluid level is no more than 5 mm (0.2 inch) when the engine is stopped and when it is running.

⚠ CAUTION

- **If the fluid level rises suddenly after the engine is stopped, the air has not been completely bled.**
- **If air bleeding is not complete, there will be abnormal noises from the pump and the flow-control valve, and this condition could cause reduce the life of the power steering components.**

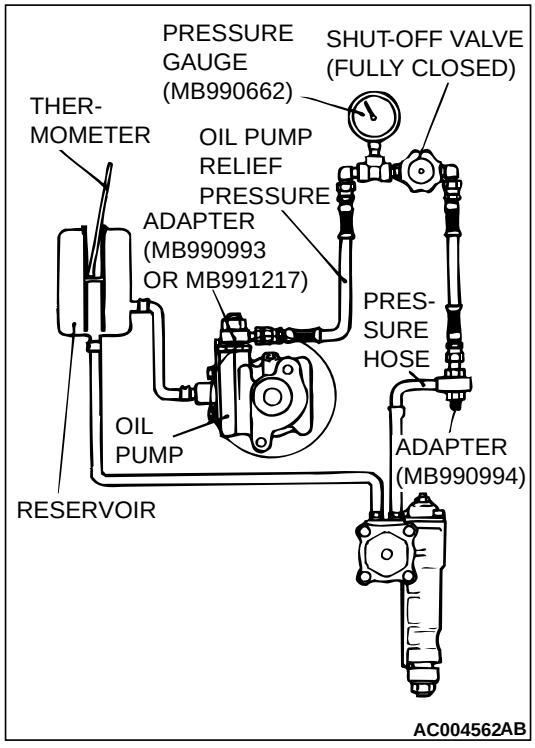
8. If the change of the fluid level is 5 mm (0.2 inch) or more, the air has not been completely bled from the system. The air bleeding procedure must be repeated.

OIL PUMP PRESSURE TEST

M1372002300199

Required Special Tools:

- MB990662: Pressure Gauge
- MB990993 or MB991217: Power Steering Oil Pressure Gauge Adapter (Pump Side)
- MB990994: Power Steering Oil Pressure Gauge Adapter (Hose Side)



1. Disconnect the pressure hose from the oil pump, and then connect special tools MB990662, MB990993 or MB991217 and MB990994.
2. Bleed air, then turn the steering wheel several times while the vehicle is not moving so that the temperature of the fluid rises to approximately 50 – 60°C (122 – 140°F).
3. Start the engine and idle it at 1,000 ± 100 r/min.

⚠ CAUTION

The pressure gauge shut-off valve must not remain closed for more than 10 seconds.

4. Fully close the shut-off valve of the pressure gauge and measure the oil pump relief pressure to confirm that it is within the standard value range. Open it again immediately after checking the pressure.

   Standard value: 8.3 – 9.0 MPa (1,209 – 1,305 psi)

5. If it is not within the standard value, replace the oil pump.
6. Check whether or not the hydraulic pressure is the standard value when no-load conditions are created by fully opening the shut-off valve of the pressure gauge.

   Standard value: 0.8 – 1.0 MPa (116 – 145 psi)

7. If it is not within the standard value, the probable cause is a malfunction of the oil line or steering gear box, so check these parts and repair as necessary.

8. Turn the steering wheel all the way to the left or right; then check whether or not the retention hydraulic pressure is the standard value.

   Standard value: 8.3 – 9.0 MPa (1,209 – 1,305 psi)

9. If the measured value is smaller than the standard value, disassemble and assemble the steering gear, and if it is larger than the standard value, disassemble and assemble the oil pump flow control valve, and then measure oil pressure again.
10. Remove special tools MB990662, MB990993 or MB991217 and MB990994, and then tighten the pressure hose to the specified torque.

    Tightening torque: 20 N·m (14 ft-lb)

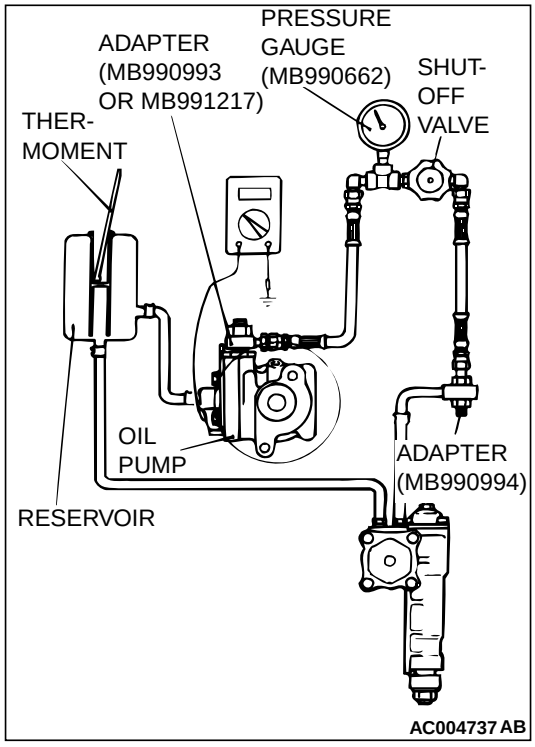
11. Bleed the system.

POWER STEERING PRESSURE SWITCH CHECK

M1372007200197

Required Special Tools:

- MB990662: Pressure Gauge
- MB990993 or MB991217: Power Steering Oil Pressure Gauge Adapter (Pump Side)
- MB990994: Power Steering Oil Pressure Gauge Adapter (Hose Side)



1. Disconnect the pressure hose from the oil pump, and then connect special tools MB990662, MB990993 or MB991217 and MB990994.
2. Bleed air, and then turn the steering wheel several times while the vehicle is not moving so that the temperature of the fluid rises to approximately 50 – 60°C (122 – 140°F).
3. The engine should be idling.
4. Disconnect the connector for the oil pressure switch, and place an ohmmeter at the switch.
5. Gradually close the shut-off valve of the pressure gauge and increase the hydraulic pressure, then check whether or not the hydraulic pressure that activates the switch is the standard value.

   Standard value: 1.5 – 2.0 MPa (218 – 290 psi)

6. Gradually open the shut-off valve and reduce the hydraulic pressure; then check whether or not the hydraulic pressure that deactivates the switch is the standard value.

   Standard value: 0.7 – 1.2 MPa (102 – 174 psi)

7. Remove special tools MB990662, MB990993 or MB991217 and MB991549, and then tighten the pressure hose to the specified torque.

   Tightening torque: 20 N·m (14 ft-lb)

8. Bleed the system.

BALL JOINT DUST COVER INSPECTION

M1372008600198

1. Press the dust cover with your finger to check whether the dust cover is cracked or damaged.
2. If the dust cover is cracked or damaged, replace the tie rod end.

   NOTE: If the dust cover is cracked or damaged, the ball joint could be damaged.

STEERING WHEEL AND SHAFT ASSEMBLY

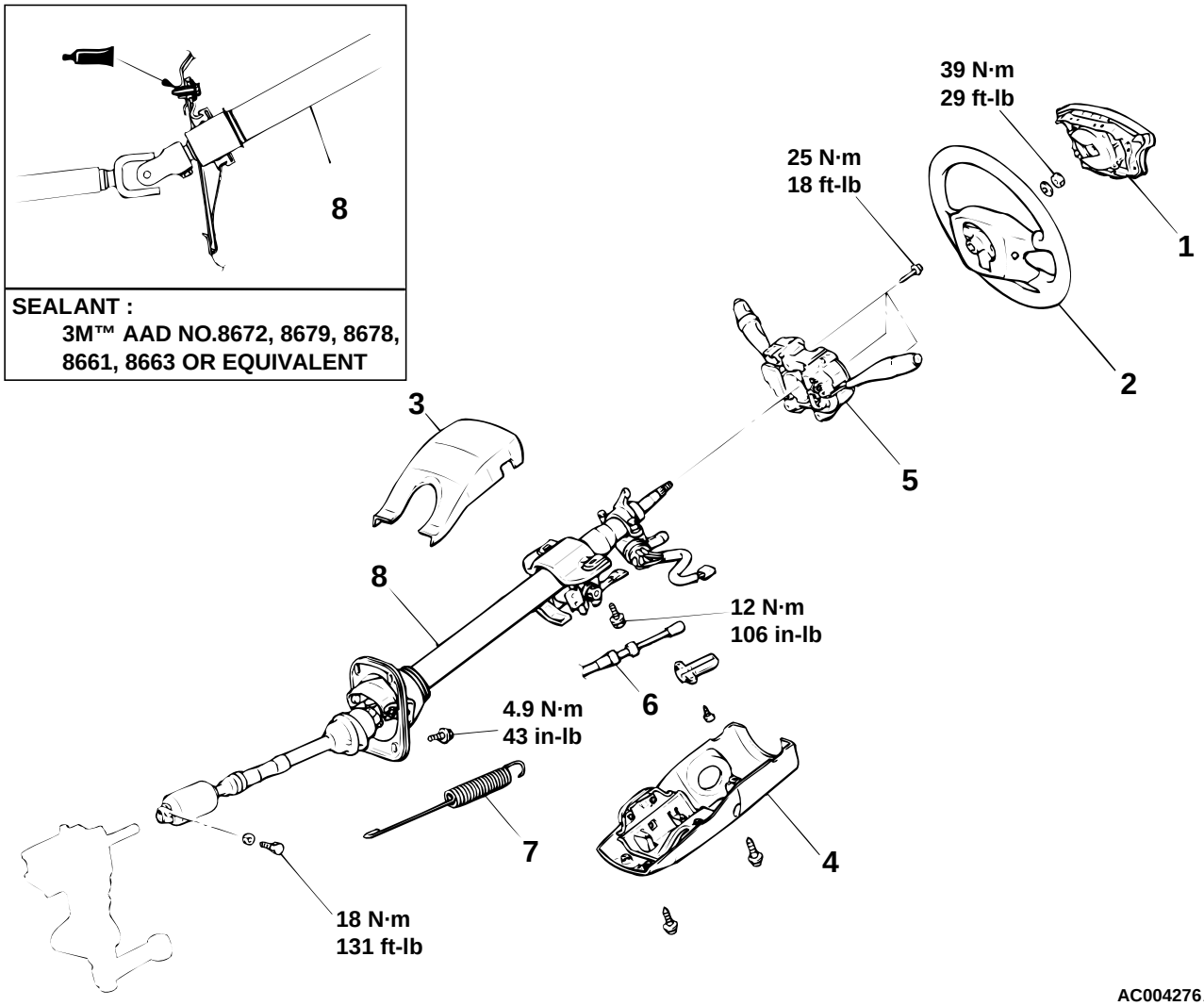
REMOVAL AND INSTALLATION

M1372002600190

⚠ WARNING

- ***Before removing the air bag module, refer to GROUP 52B, Service Precautions and Air Bag Module and Clock Spring P.52B-72.***
- ***When removing and installing the steering wheel, do not let it bump against the air bag module.***

Post-installation Operation
Checking Steering Wheel Position with Wheels Straight Ahead



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REMOVAL STEPS

1. AIR BAG MODULE (REFER TO GROUP 52B, AIR BAG MODULE AND CLOCK SPRING P.52B-72.)

<<A>> 2. STEERING WHEEL

- KNEE PROTECTOR ASSEMBLY (REFER TO GROUP 52A, INSTRUMENT PANEL P.52A-32.)

3. UPPER COLUMN COVER ASSEMBLY

REMOVAL STEPS (Continued)

4. LOWER COLUMN COVER ASSEMBLY

>>A<< 5. CLOCK SPRING AND COLUMN SWITCH ASSEMBLY (REFER TO GROUP 52B, AIR BAG MODULE AND CLOCK SPRING P.52B-72.)

6. KEY INTERLOCK CABLE

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REMOVAL STEPS (Continued)

7. BRAKE PEDAL RETURN SPRING
8. STEERING COLUMN ASSEMBLY

Required Special Tool:

- MB990803: Steering Wheel Puller

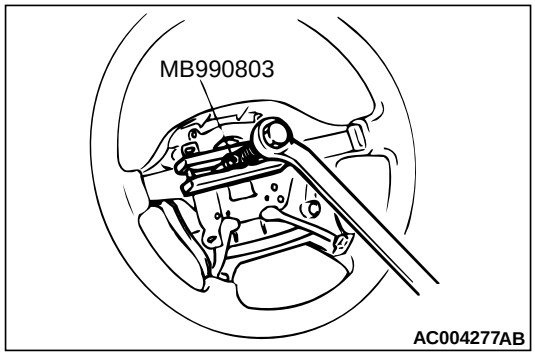
REMOVAL SERVICE POINT

<<A>> STEERING WHEEL REMOVAL

⚠ CAUTION

Do not hammer on the steering wheel to remove it; doing so will damage the collapsible mechanism.

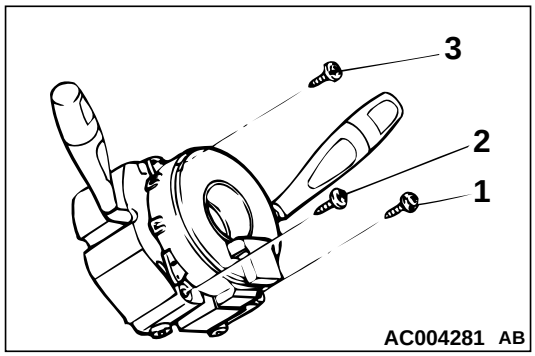
Use special tool MB990803 to remove the steering wheel.



INSTALLATION SERVICE POINT

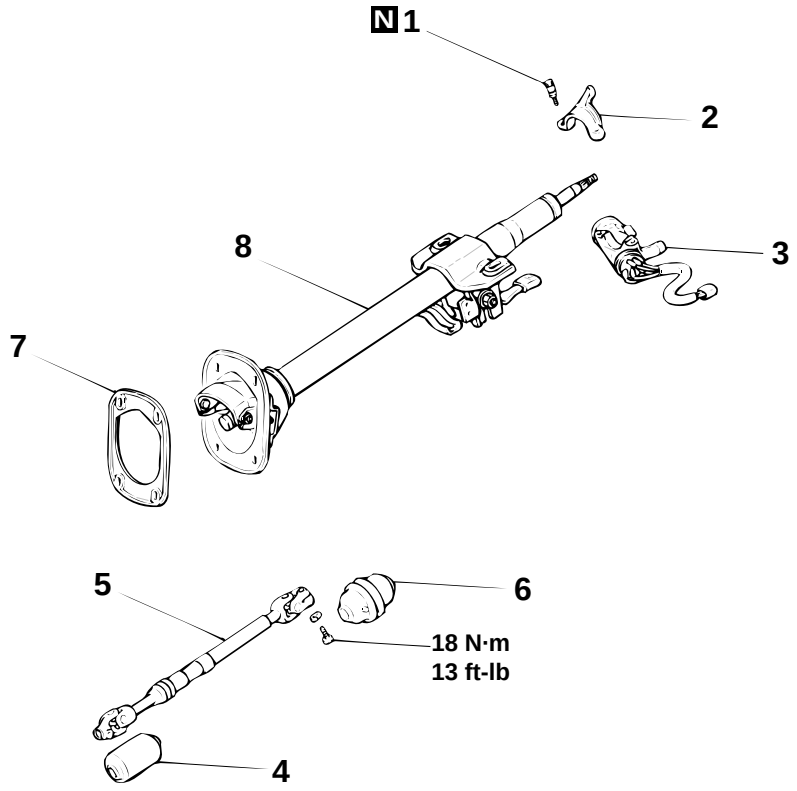
>>A<< CLOCK SPRING AND COLUMN SWITCH INSTALLATION

1. Align the clock spring mating marks. (Refer to GROUP 52B, Air Bag Modules And Clock Spring P.52B-72.)
2. Tighten the screws in the order shown in the illustration.



DISASSEMBLY AND ASSEMBLY

M1372002800172



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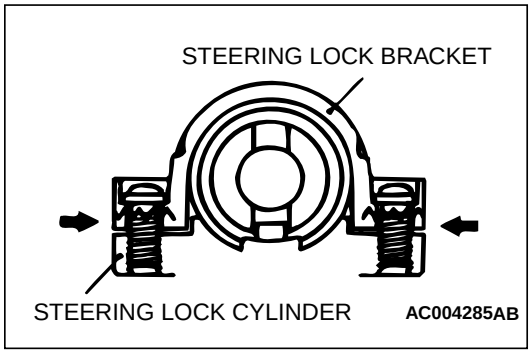
		DISASSEMBLY STEPS
>>B<<	1.	SPECIAL BOLT
<<A>> >>B<<	2.	STEERING LOCK BRACKET
<<A>> >>B<<	3.	STEERING LOCK CYLINDER ASSEMBLY
>>A<<	4.	LOWER BOOT
	5.	JOINT ASSEMBLY
>>A<<	6.	UPPER BOOT
	7.	PACKING
	8.	COLUMN SUB ASSEMBLY

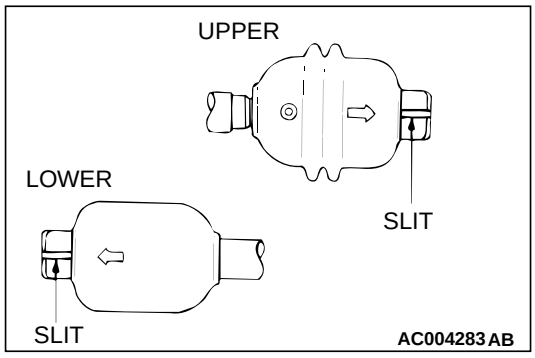
DISASSEMBLY SERVICE POINT

<<A>> STEERING LOCK BRACKET/STEERING LOCK CYLINDER REMOVAL

If it is necessary to remove the steering lock cylinder, use a hacksaw to cut the special bolts at the steering lock bracket side.



ASSEMBLY SERVICE POINTS



>>A<< UPPER BOOT/LOWER BOOT INSTALLATION

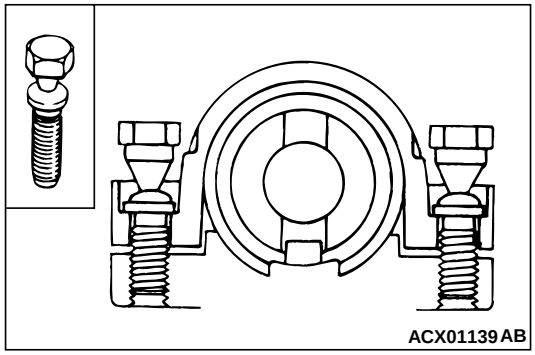
1. Assemble the upper and lower boots and the dust cover.

NOTE: Align the arrows on the upper and lower boots to the slit on the yokes in order to assemble.

>>B<< STEERING LOCK CYLINDER/STEERING LOCK BRACKET/SPECIAL BOLT INSTALLATION

⚠ CAUTION

The steering lock bracket and bolts must be replaced with new ones when the steering lock is installed.



1. When installing the steering lock cylinder and steering lock bracket to the column tube, temporarily install the steering lock in alignment with the column boss.
2. After checking that the lock works properly, tighten the special bolts until the head twists off.

POWER STEERING GEAR BOX ASSEMBLY

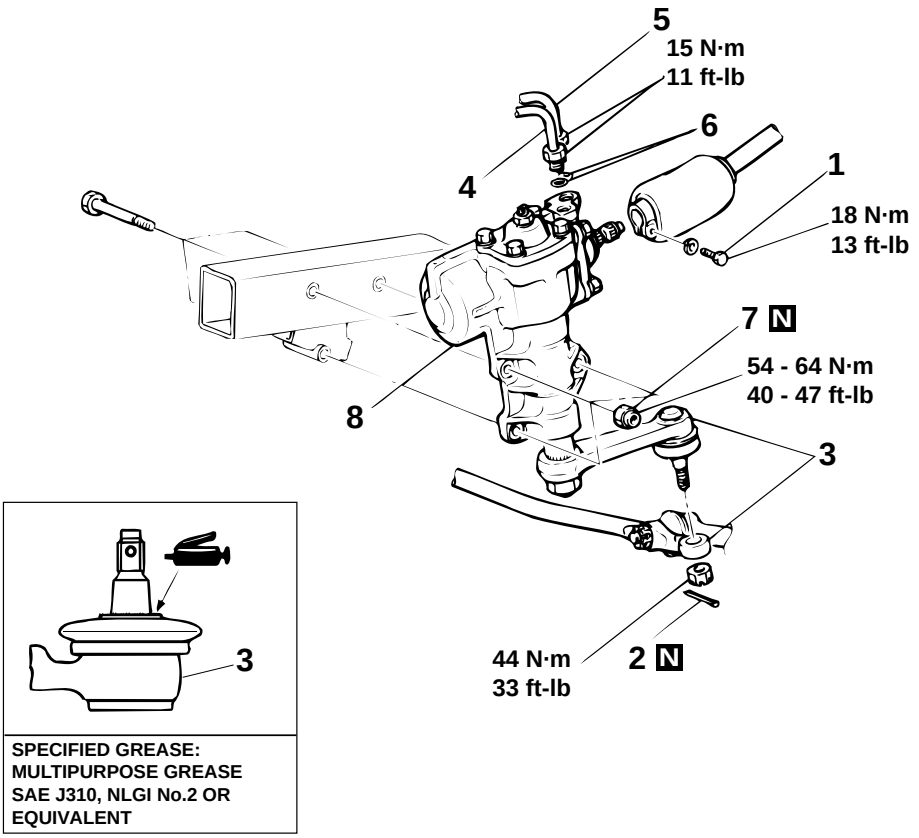
REMOVAL AND INSTALLATION

M1372003900202

⚠ WARNING

For vehicles with SRS, before removing the steering gear box refer to GROUP 52B. Center the front wheels and remove the ignition key. Failure to do so may damage the SRS clock spring and render the SRS system inoperative, risking serious driver injury.

Pre-removal Operation	Post-installation Operation
Power Steering Fluid Draining (Refer to P.37A-19.)	• Power Steering Fluid Supplying (Refer to P.37A-19.) • Power Steering Fluid Line Bleeding (Refer to P.37A-19.) • Checking Steering Wheel Position with Wheels Straight Ahead • Front Wheel Alignment Adjustment (Refer to GROUP 33A, On-vehicle Service.) • Check the dust cover for cracks or damage by pushing it with your finger.



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REMOVAL STEPS

1. CONNECTING BOLT FOR STEERING GEAR BOX AND STEERING SHAFT
2. COTTER PIN

<<A>> >>A<< 3. CONNECTION FOR PITMAN ARM AND RELAY ROD

4. PRESSURE TUBE
5. RETURN TUBE

REMOVAL STEPS (Continued)

6. O-RING
7. SELF-LOCKING NUT
8. POWER STEERING GEAR BOX

Required Special Tool:

- MB991897: Ball Joint Remover

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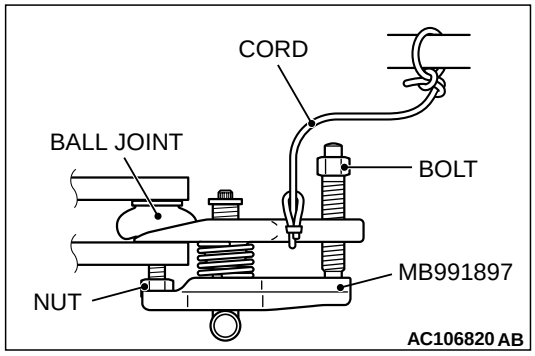
REMOVAL SERVICE POINT

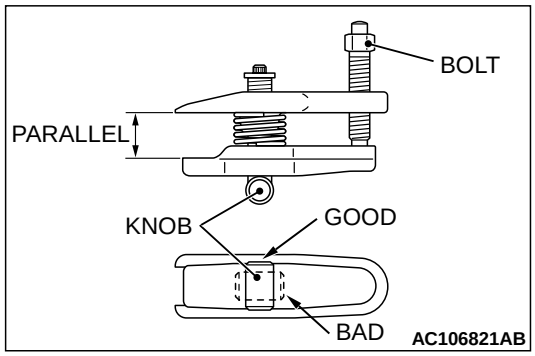
<<A>> PITMAN ARM AND RELAY ROD DISCONNECTION

⚠ CAUTION

- **Do not remove the nut from ball joint. Loosen it and use special tool MB991897 to avoid possible damage to ball joint threads.**
- **Hang special tool MB991897 with a cord to prevent it from falling.**

1. Install special tool MB991897 as shown in the figure.





2. Turn the bolt and knob as necessary to make the jaws of special tool MB991897 parallel, tighten the bolt by hand and confirm that the jaws are still parallel.

   NOTE: When adjusting the jaws in parallel, make sure the knob is in the position shown in the figure.

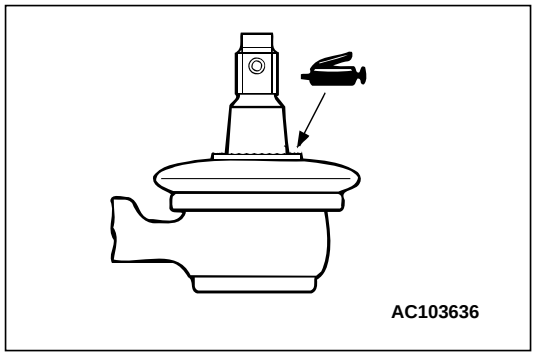
3. Tighten the bolt with a wrench to disconnect the pitman arm and relay end.

INSTALLATION SERVICE POINT

>>A<< PITMAN ARM AND RELAY ROD CONNECTION

Apply the specified grease to the top (lip) of the dust cover.

Specified grease: Multipurpose grease SAE J310, NLGI No.2 or equivalent



INSPECTION

PITMAN ARM DUST COVER CHECK

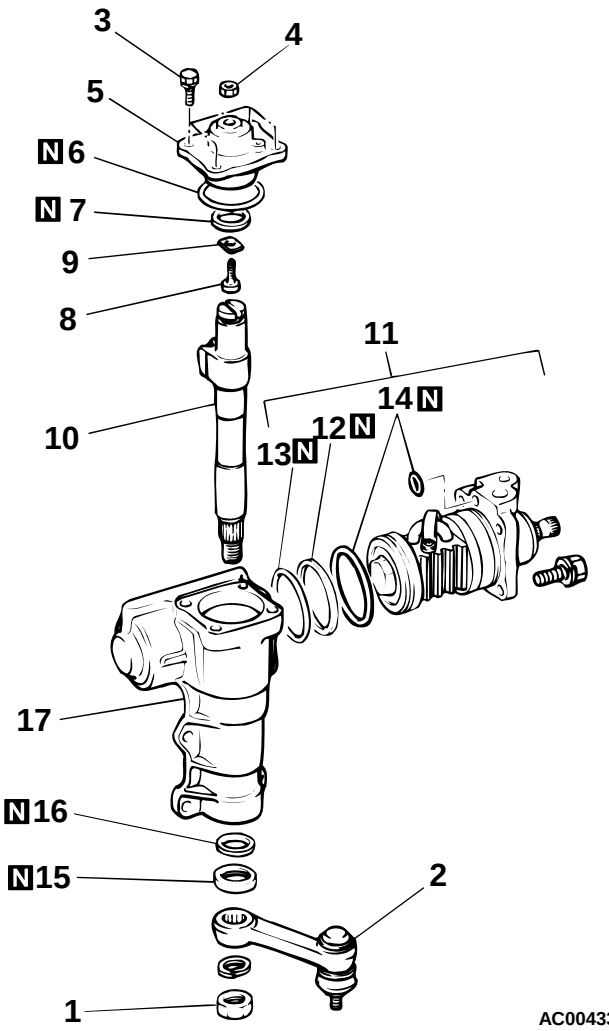
M1372010700040

1. Press the dust cover with a finger to check whether the dust cover is cracked or damaged.
2. If there are any cracks in or damage to the dust cover, replace the pitman arm. (Refer to P.37A-31.)

NOTE: Cranked or damaged dust cover may cause damage to the ball joint. In addition, if the dust cover is damaged during service work, replace the dust cover. Refer to P.37A-35.

DISASSEMBLY

M1372004200057



DISASSEMBLY STEPS

1. JAM NUT
<<A>> 2. PITMAN ARM
3. BOLTS
4. ADJUSTING BOLT JAM NUT
<<B>> 5. SIDE COVER
6. O-RING
7. Y-PACKING
8. ADJUSTING BOLT
9. ADJUSTING PLATE
<<C>> 10. CROSS-SHAFT
11. MAINSHAFT AND VALVE ASSEMBLY

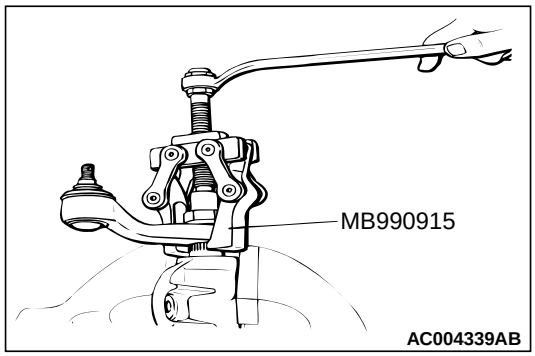
DISASSEMBLY STEPS (Continued)

12. SEAL RING
13. O-RING
14. O-RING
15. OIL SEAL
16. Y-PACKING
17. GEAR BOX HOUSING

Required Special Tool:

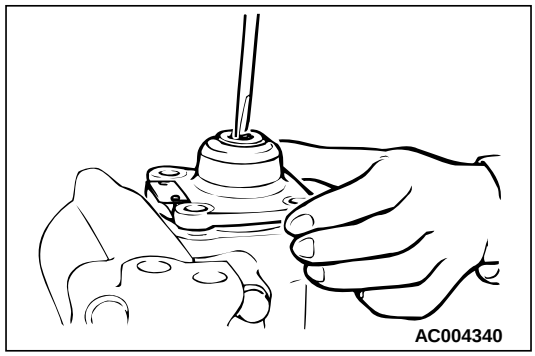
- MB990915: Pitman Arm Puller

DISASSEMBLY SERVICE POINTS



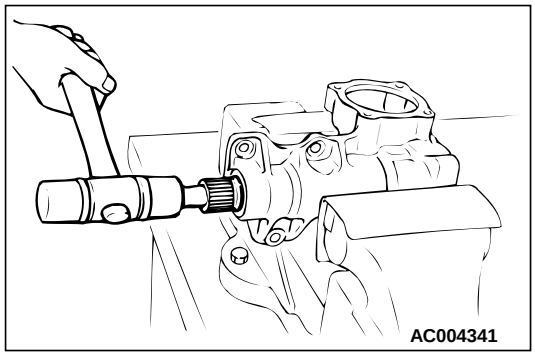
<<A>> PITMAN ARM REMOVAL

Use special tool MB990915, remove the pitman arm from the gear box.



<<B>> SIDE COVER REMOVAL

1. Loosen the adjusting bolt jam nut and then turn the adjusting bolt counterclockwise slightly.
2. Screw in the adjusting bolt without turning the side cover, and then remove the side cover.

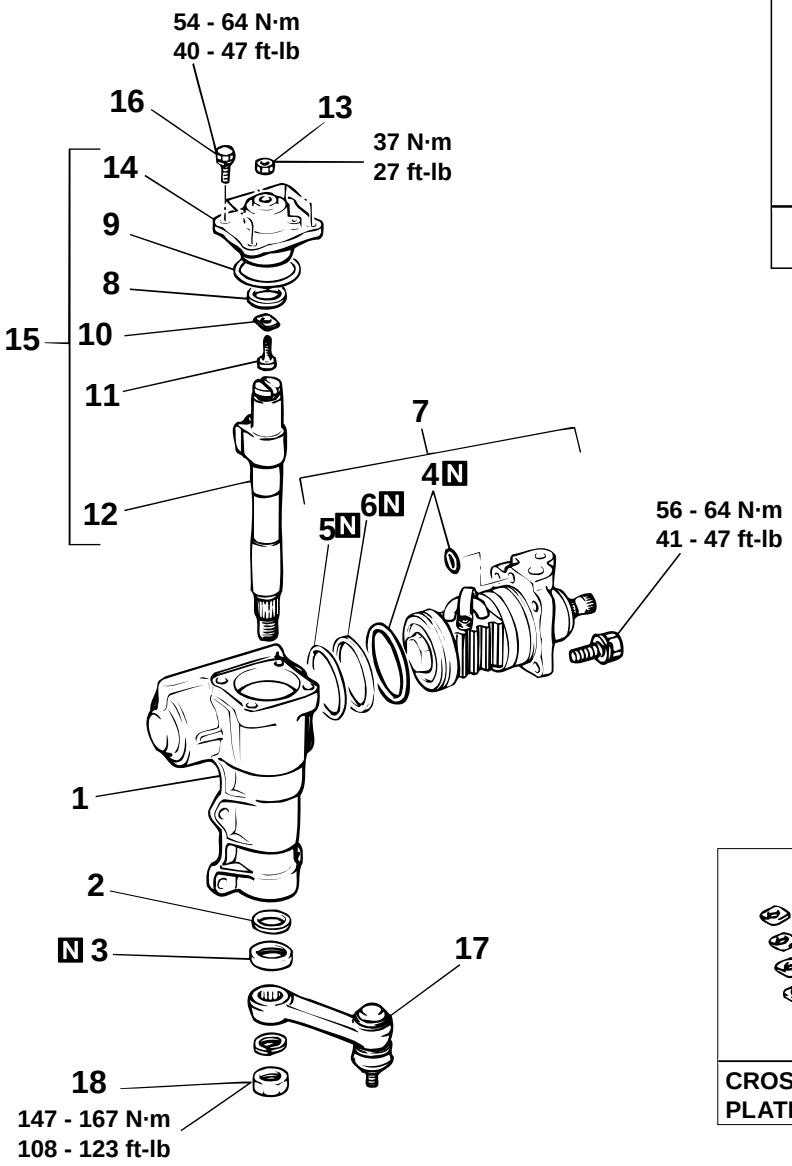


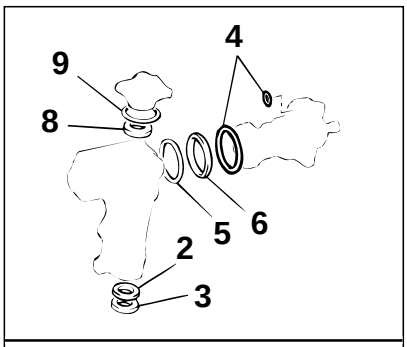
<<C>> CROSS-SHAFT REMOVAL

With the mainshaft and cross-shaft placed in the straight ahead position, tap the bottom of the cross-shaft with a plastic hammer to take out the cross-shaft together with the side cover.

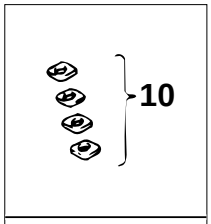
ASSEMBLY

M1372004300065

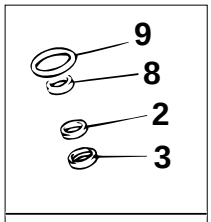




GEAR BOX SEAL KIT



CROSS SHAFT PLATE SET



CROSS SHAFT SEAL KIT

AC004351AB

DISASSEMBLY STEPS

1. GEAR MOUNTING RUBBER
2. Y-PACKING
- **>>A<<** 3. OIL SEAL
4. O-RING
5. O-RING
6. SEAL RING
7. MAINSHAFT AND VALVE ASSEMBLY
8. Y-PACKING
9. O-RING
- **>>B<<** 10. ADJUSTING PLATE
- **>>B<<** 11. ADJUSTING BOLT
- **>>C<<** 12. CROSS-SHAFT
- **>>C<<** 13. ADJUSTING BOLT JAM NUT
14. SIDE COVER

DISASSEMBLY STEPS (Continued)

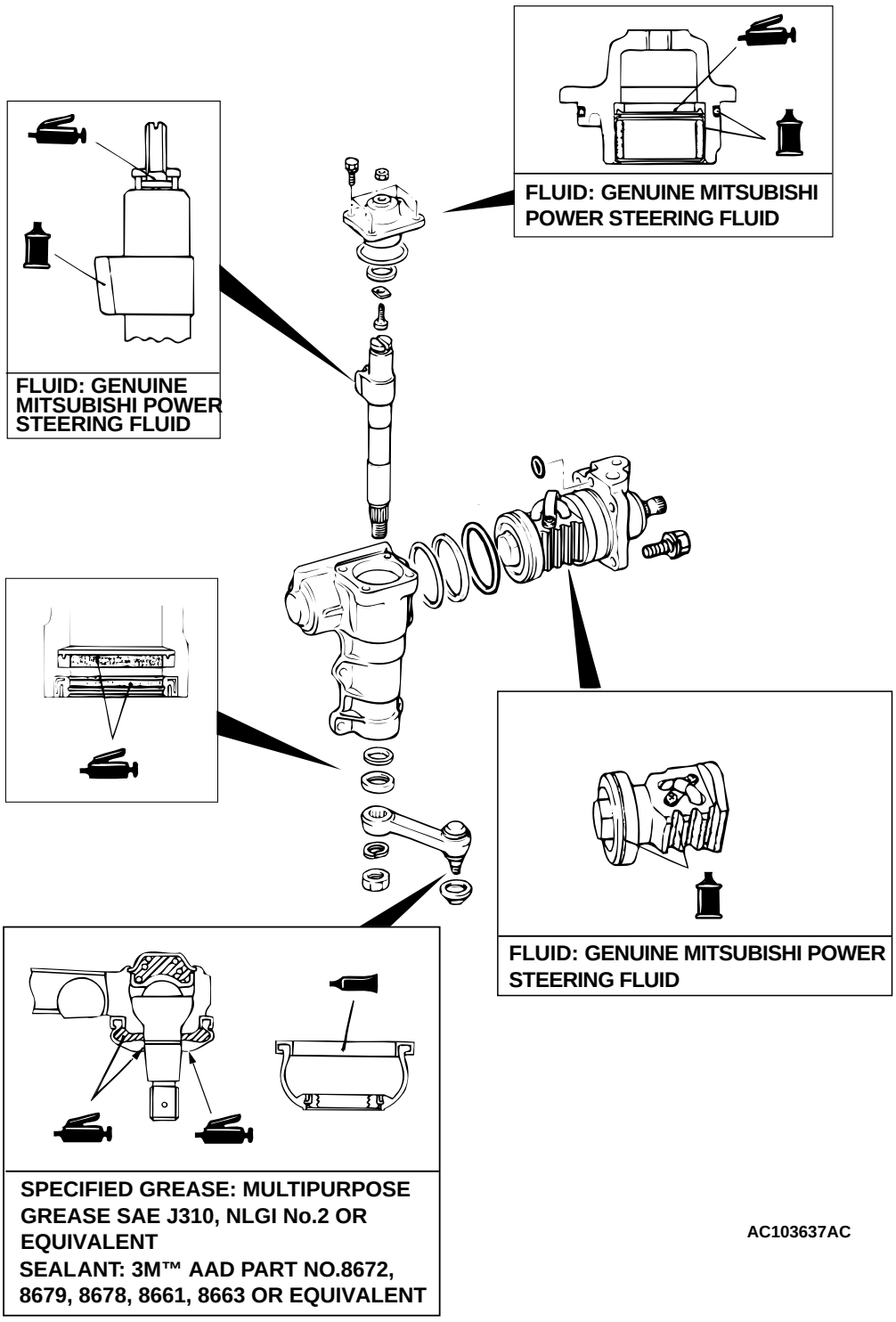
- **>>D<<** 15. SIDE COVER AND CROSS-SHAFT ASSEMBLY
16. BOLT
- **>>E<<** • MAINSHAFT TOTAL BREAKAWAY TORQUE ADJUSTMENT
- **>>F<<** 17. PITMAN ARM
18. JAM NUT

Required Special Tools:

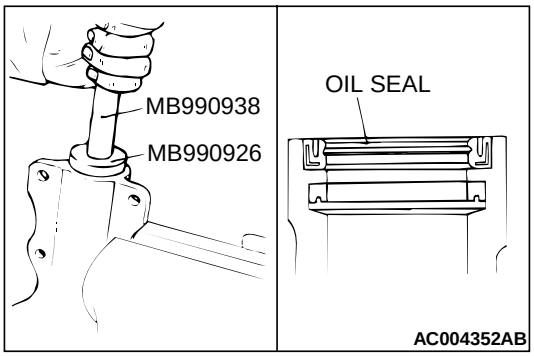
- MB990228 or MB991006: Preload Socket
- MB990926: Installer Adapter
- MB990938: Bar (Snap-in type)

TSB Revision

LUBRICATION AND SEALING POINTS

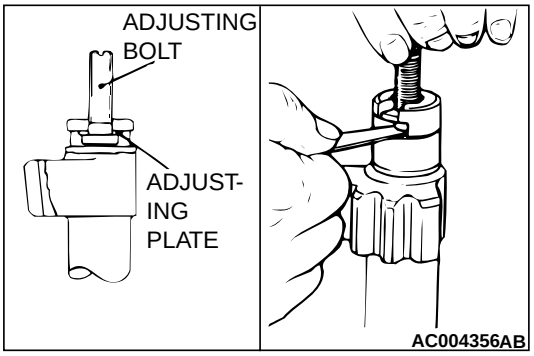


ASSEMBLY SERVICE POINTS



>>A<< OIL SEAL INSTALLATION

Apply a coating of GENUINE MITSUBISHI POWER STEERING FLUID to the outside of the oil seal. Using special tools MB991199 and MB991197, press the oil seal into the rack housing.



>>B<< ADJUSTING PLATE/ADJUSTING BOLT INSTALLATION

1. Install the adjusting plate so that the beveled part is facing downward.
2. Use a feeler gage to measure the clearance between the adjusting bolt and the cross-shaft.

   Standard value: 0.05 mm (0.02 inch)
3. If the clearance exceeds the standard value, replace with a suitable adjusting plate.

>>C<< CROSS-SHAFT/ADJUSTING BOLT JAM NUT INSTALLATION

Install the cross-shaft to the side cover, and then temporarily tighten the adjusting bolt jam nut.

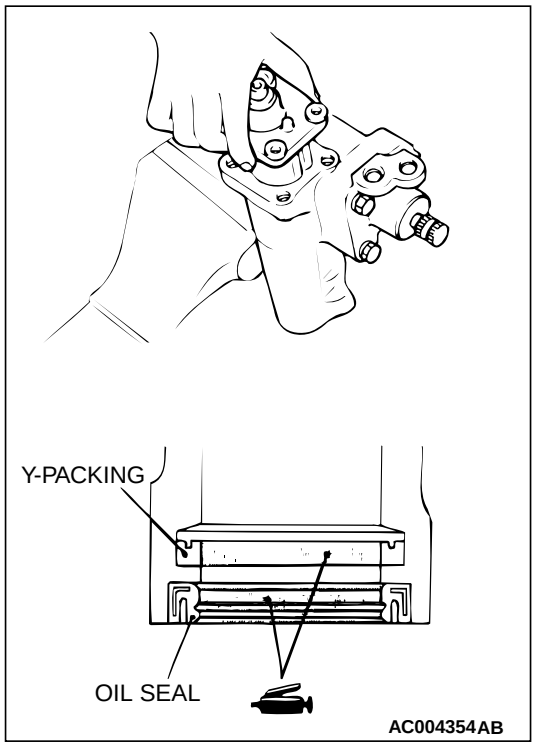
>>D<< SIDE COVER AND CROSS-SHAFT ASSEMBLY INSTALLATION

⚠ CAUTION

Do not rotate the side cover during installation. Take care not to damage the cross-shaft oil seal.

Install the side cover assembly (with the cross-shaft) to the gear box.

NOTE: Apply GENUINE MITSUBISHI POWER STEERING FLUID to the teeth and shaft areas of the rack piston, and apply multipurpose grease to the oil seal lip.



>>E<< MAINSHAFT TOTAL BREAKAWAY TORQUE ADJUSTMENT

⚠ CAUTION

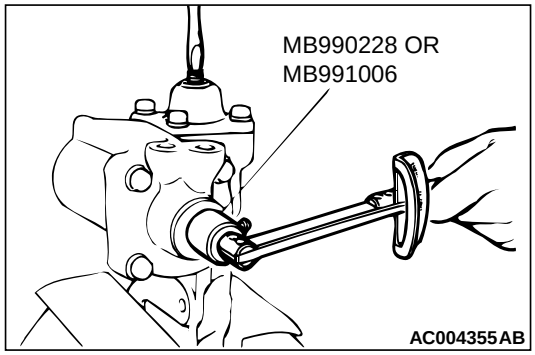
Adjust by turning the adjusting bolt so that the breakaway torque at the center position of the rack piston is approximately 0.2 N·m (1.8 in-lb) higher than the values at the both ends of the rack piston.

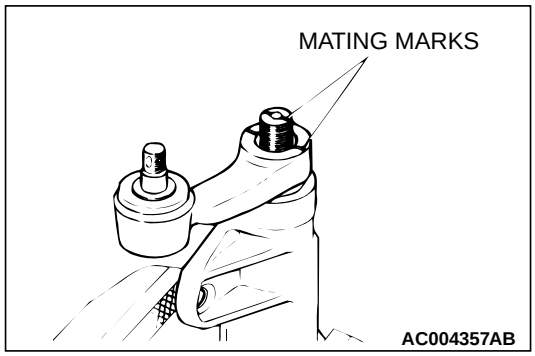
1. While turning the adjusting bolt, measure the mainshaft total breakaway torque by using special tool MB990228 or MB991006.

   Standard value: 0.69 – 1.28 N·m (6 -12 in-lb)

2. Tighten the adjusting bolt jam nut to the specified torque.

   Tightening torque: 37 N·m (27 ft-lb)





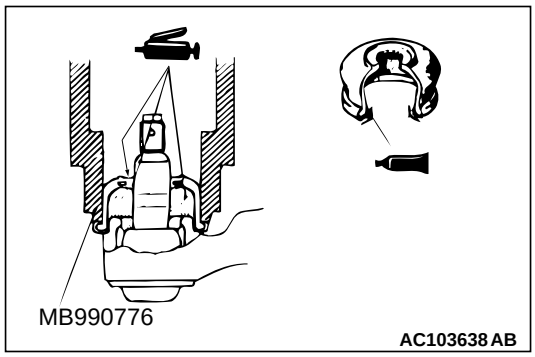
>>F<< PITMAN ARM INSTALLATION

Install the pitman arm to the gear box with the mating marks aligned.

INSPECTION

DUST COVER REPLACEMENT

M1372008200242



When the dust cover is damaged accidentally during service work, replace the dust cover only as follows:

1. Fill the dust cover with the specified grease, and apply the grease to the go to top of the dust cover and contact surface of the lip.

   Specified grease: Multipurpose grease SAE J310, NLGI No.2 or equivalent

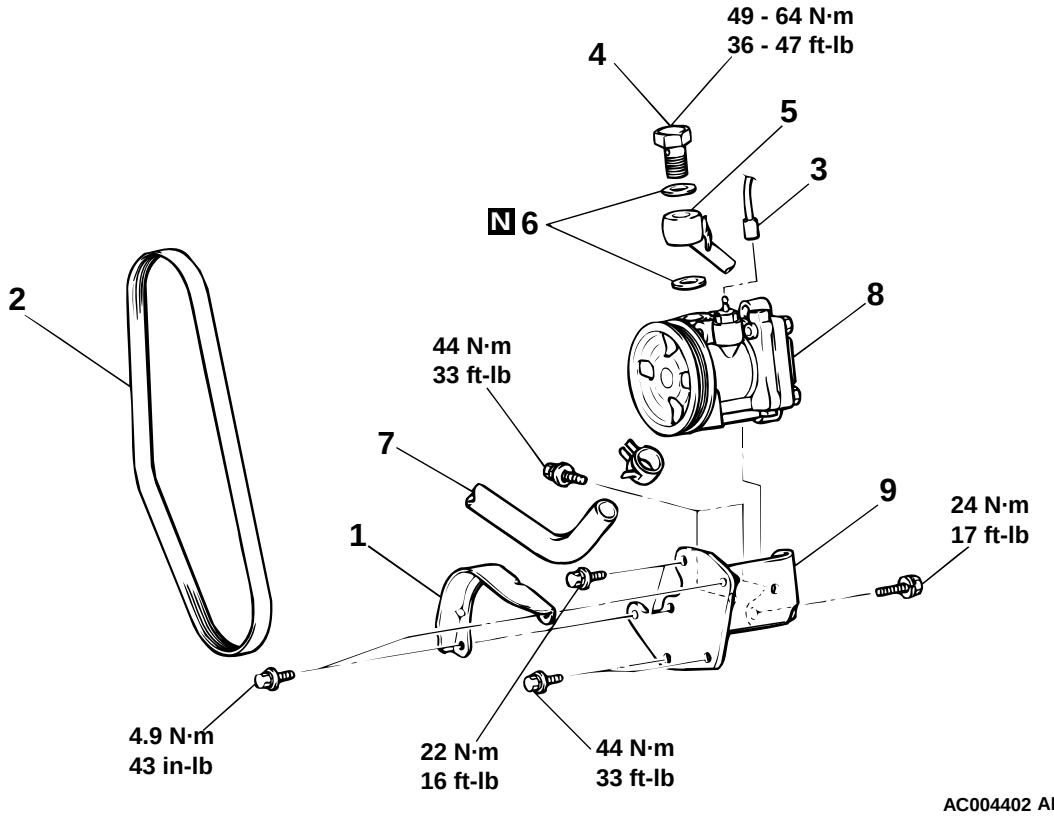
2. Apply the 3M™ AAD Part number 8672, 8679, 8678, 8661, 8663 or equivalent to the mounting surface of the dust cover at the pitman arm.
3. Using special tool MB990776, install the dust cover to the pitman arm.
4. Press the dust cover with a finger to check whether the dust cover is cracked or damaged.

POWER STEERING OIL PUMP ASSEMBLY

REMOVAL AND INSTALLATION

M1372005200191

Pre-removal Operation	Post-installation Operation
• Power Steering Fluid Draining (Refer to P.37A-19.)	• Power Steering Fluid Level Check (Refer to P.37A-18.) • Drive Belt Tension Check (Refer to P.37A-18.) • Power Steering Fluid Line Bleeding (Refer to P.37A-19.) • Oil Pump Pressure Test (Refer to P.37A-20.)



AC004402 AB

REMOVAL STEPS
1. PULLEY COVER
2. DRIVE BELT
3. PRESSURE SWITCH CONNECTOR
4. EYE BOLT

REMOVAL STEPS (Continued)
5. PRESSURE HOSE
6. GASKET
7. SUCTION HOSE
8. OIL PUMP
9. OIL PUMP BRACKET

INSPECTION

M1372005300154

- Check the drive belt for cracks.
- Check the pulley assembly for uneven rotation.

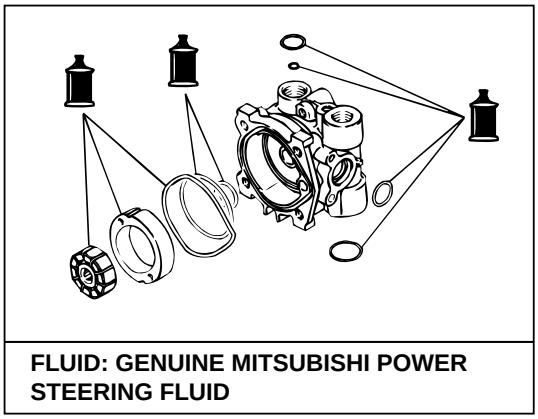
TSB Revision

DISASSEMBLY AND ASSEMBLY

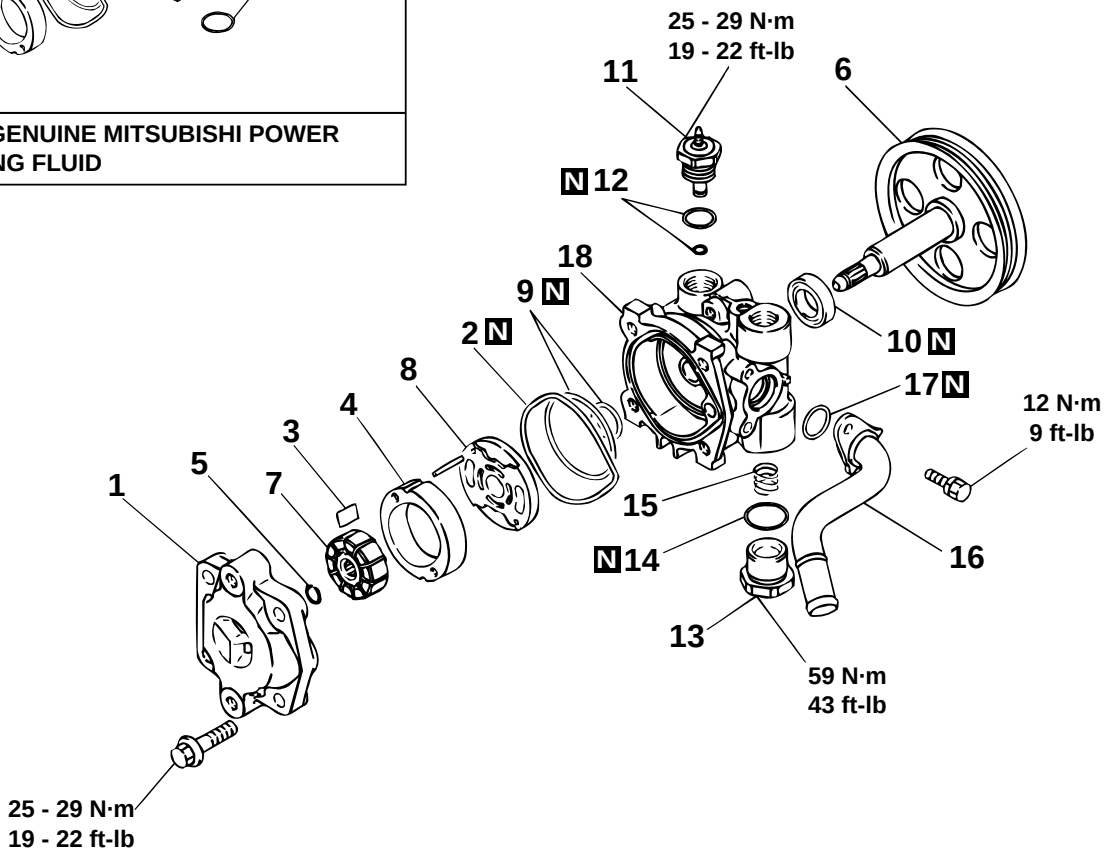
M1372005400203

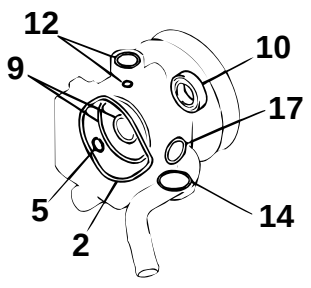
⚠ CAUTION

Do not disassemble the pressure switch assembly and valve subassembly.

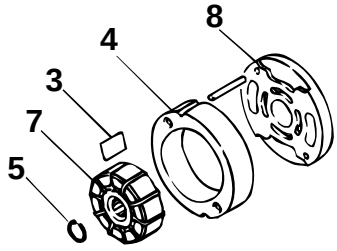


FLUID: GENUINE MITSUBISHI POWER STEERING FLUID

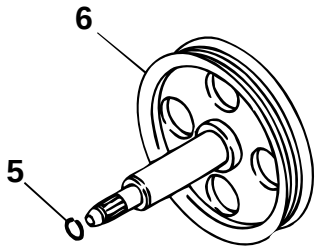




OIL PUMP SEAL KIT



OIL PUMP CARTRIDGE KIT



PULLEY AND SHAFT KIT

AC103764AC

TSB Revision

DISASSEMBLY STEPS

1. PUMP COVER
2. O-RING
- **>>F<<** 3. VANES
- **>>E<<** 4. CAM RING
- **>>A<<** 5. SNAP RING
6. PULLEY ASSEMBLY
- **>>C<<** 7. ROTOR
8. SIDE PLATE
9. O-RING
- **>>B<<** 10. OIL SEAL
11. TERMINAL ASSEMBLY
- **>>A<<** 12. O-RING

DISASSEMBLY STEPS (Continued)

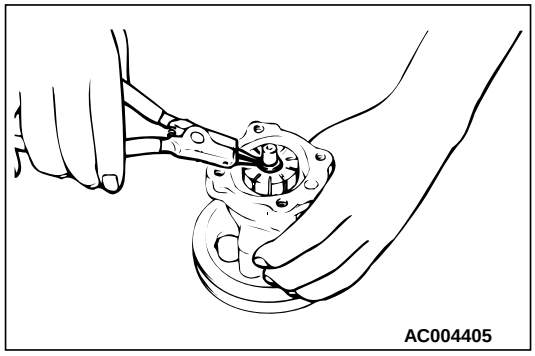
13. PLUG
- **>>A<<** 14. O-RING
15. FLOW CONTROL SPRING
- **>>A<<** 16. SUCTION CONNECTOR
17. O-RING
- **>>A<<** 18. OIL PUMP BODY

Required Special Tools:

- MB990926: Installer Adapter
- MB990938: Bar (snap-in type)

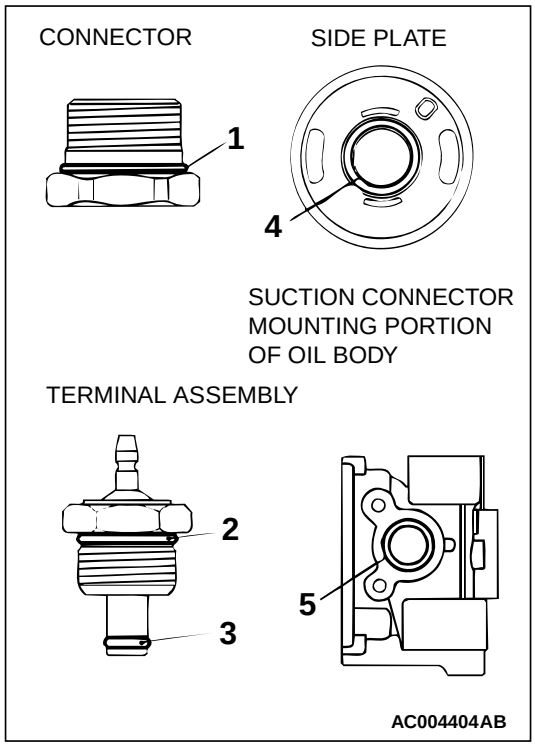
DISASSEMBLY SERVICE POINT

<<A>> SNAP RING REMOVAL


AC004405

ASSEMBLY SERVICE POINTS

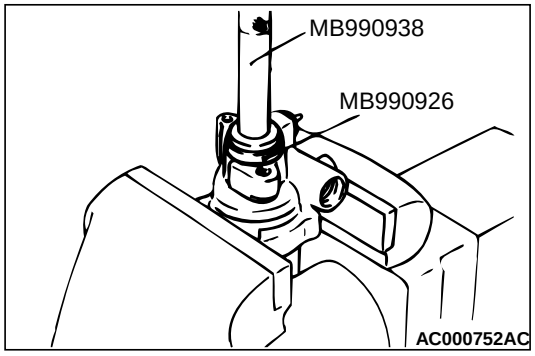
>>A<< O-RING INSTALLATION



AC004404AB

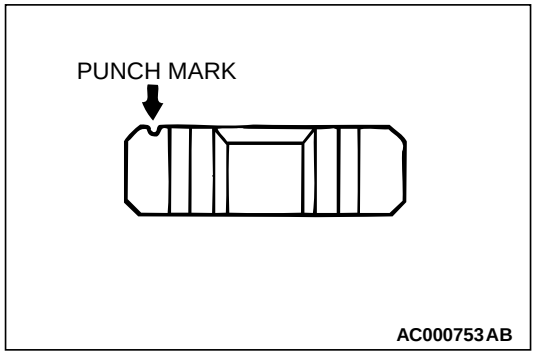
NO.	ID × WIDTH mm (in)
1	21 × 1.9 (0.8 × 0.07)
2	14.8 × 2.4 (0.58 × 0.09)
3	3.8 × 1.9 (0.15 × 0.07)
4	14.8 × 1.9 (0.58 × 0.07)
5	15.8 × 2.4 (0.62 × 0.09)

TSB Revision



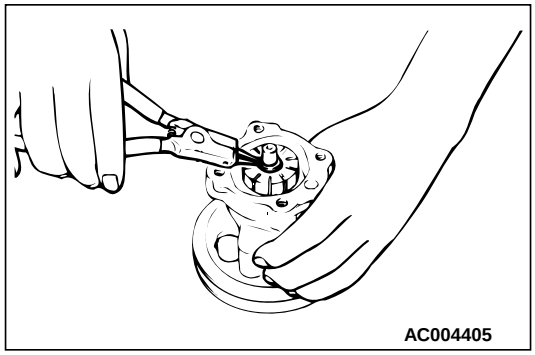
>>B<< OIL SEAL INSTALLATION

Use special tool MB990926 and MB990938 to install the oil seal.



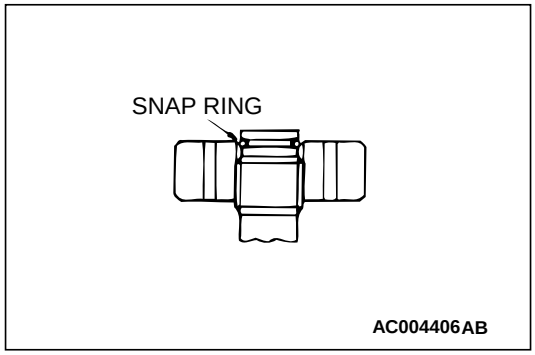
>>C<< ROTOR INSTALLATION

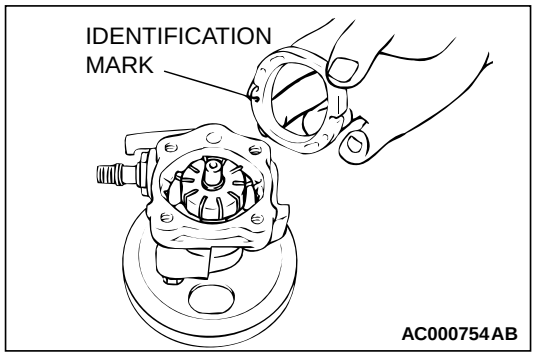
Install the rotor to the pulley assembly so that the rotor's punch mark is at the pump cover side.



>>D<< SNAP RING INSTALLATION

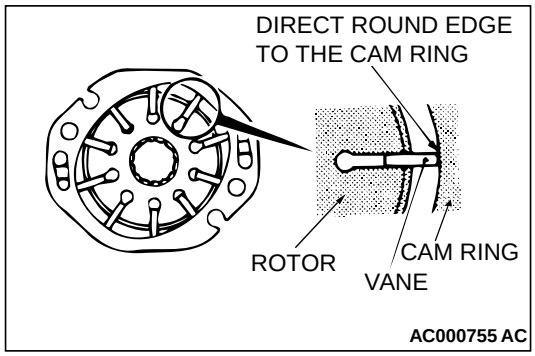
After installation of the snap ring, lift the rotor and check that the snap ring has entered the countersunk part.





>>E<< CAM RING INSTALLATION

Install the cam ring with its identification mark towards the side plate.



>>F<< VANE INSTALLATION

Install the vanes on the rotor, paying close attention to the installation direction.

INSPECTION

M1372005500169

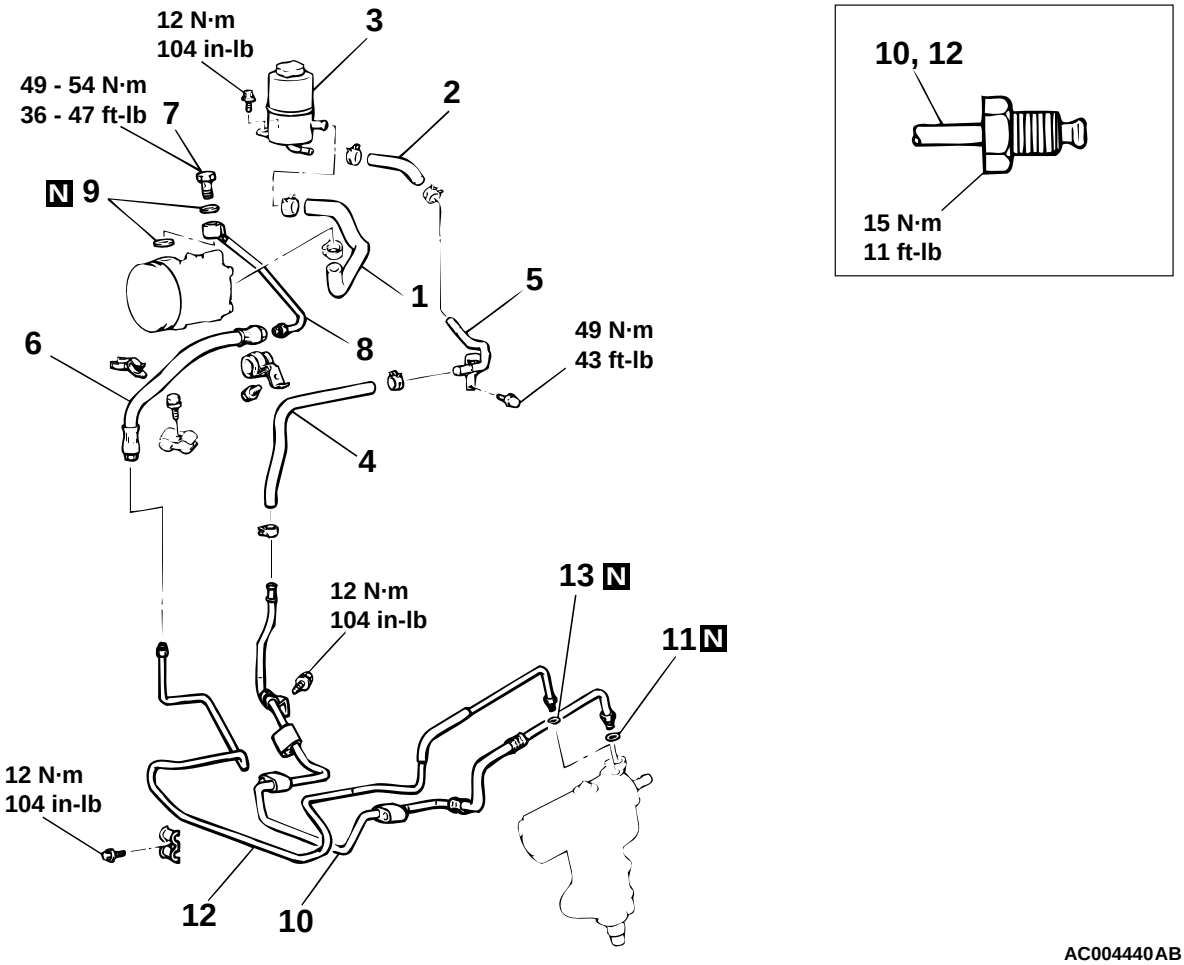
- Check the pulley assembly for wear or damage.
- Check the rotor and vane groove for "stepped" wear.
- Check the contact surface of cam ring and vanes for "stepped" wear.
- Check the vanes for damage.

POWER STEERING HOSES

REMOVAL AND INSTALLATION

M1372005700204

Pre-removal Operation	Post-installation Operation
• Power Steering Fluid Draining (Refer to P.37A-19.) • Radiator Grill Removal	• Radiator Grill Installation • Power Steering Fluid Level Check (Refer to P.37A-18.) • Power Steering Fluid Line Bleeding (Refer to P.37A-19.)



AC004440AB

REMOVAL STEPS

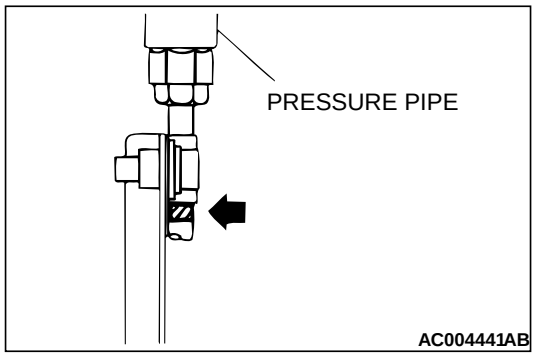
>>E<< 1. SUCTION HOSE
2. RETURN HOSE
3. OIL RESERVOIR
>>D<< 4. RETURN HOSE
5. RETURN PIPE
>>C<< 6. PRESSURE HOSE
7. EYE BOLT

REMOVAL STEPS (Continued)

>>C<< 8. PRESSURE PIPE
9. GASKET
>>B<< 10. RETURN PIPE ASSEMBLY
11. O-RING
>>A<< 12. PRESSURE PIPE ASSEMBLY
13. O-RING

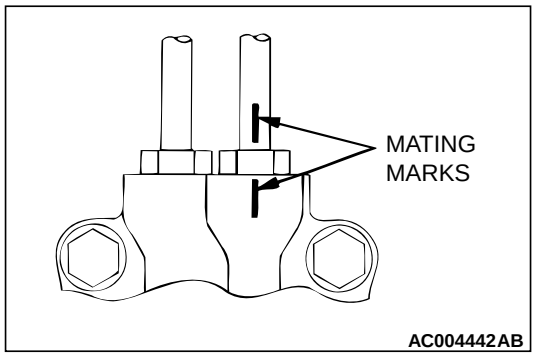
TSB Revision

INSTALLATION SERVICE POINTS



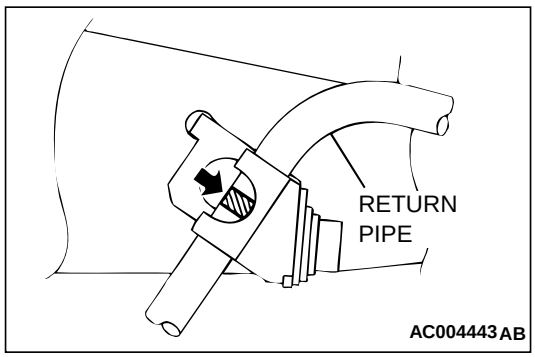
>>A<< PRESSURE PIPE ASSEMBLY INSTALLATION

Connect the pressure pipe so that the marking is positioned as shown in the illustration.

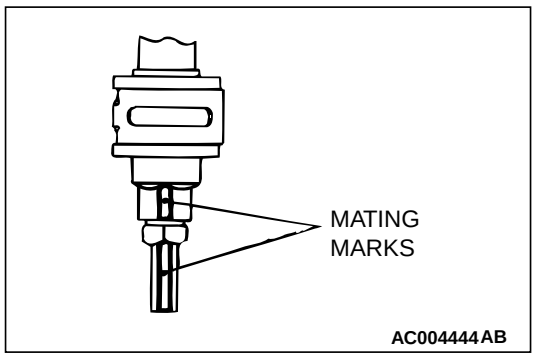


>>B<< RETURN PIPE ASSEMBLY INSTALLATION

1. Align the mating marks on the return pipe and steering gear box, and install the return pipe.

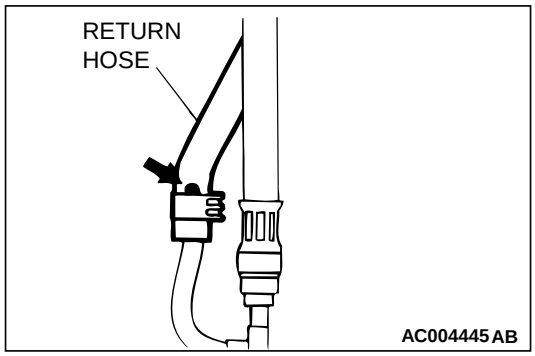


2. Connect the return pipe so that the marking is positioned as shown in the illustration.



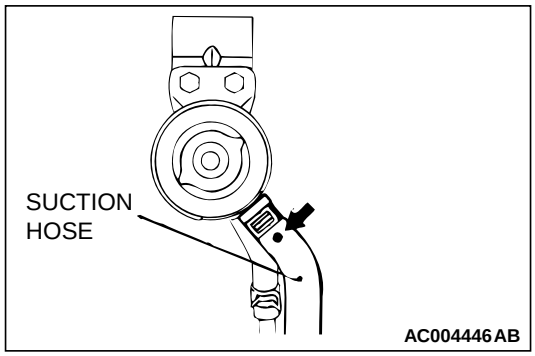
>>C<< PRESSURE PIPE/PRESSURE HOSE INSTALLATION

Align the mating marks on the pressure hose and pressure pipe, and install the pressure hose.



>>D<< RETURN HOSE INSTALLATION

Install the return hose so that the marking faces towards front of the vehicle.



>>E<< SUCTION HOSE INSTALLATION

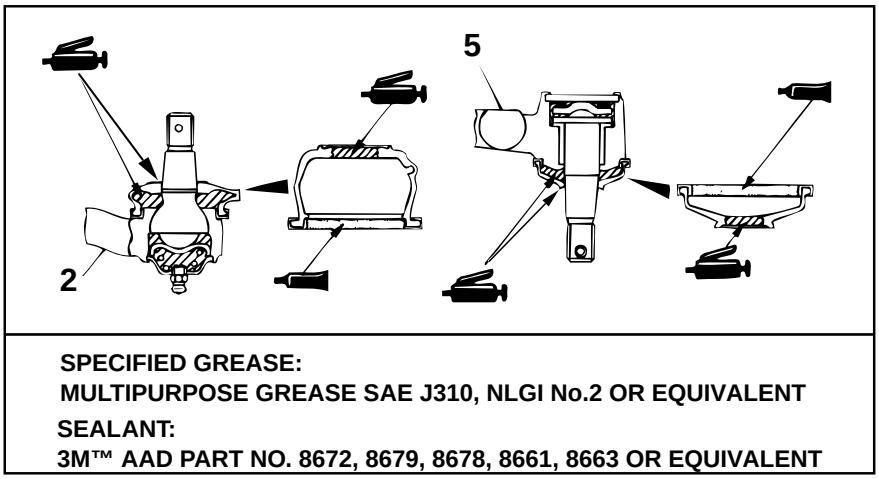
Connect the suction hose so that the marking is positioned as shown in the illustration.

STEERING LINKAGE

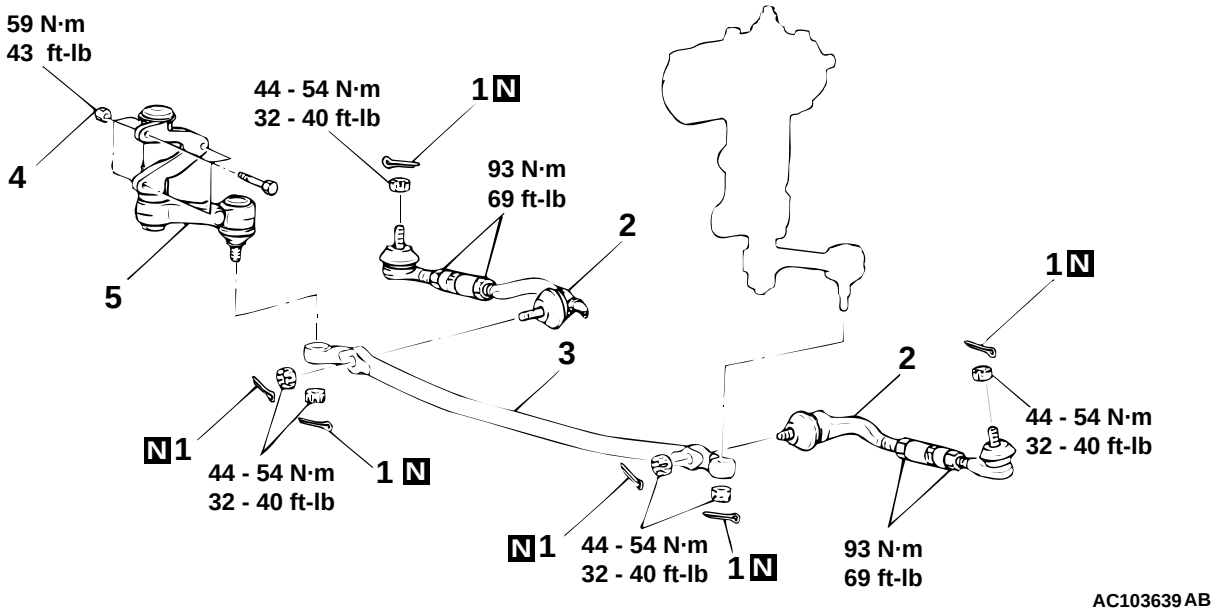
REMOVAL AND INSTALLATION

M1371003000068

Post-installation Operation
- Checking Steering Wheel Position with Wheels Straight Ahead
- Front Wheel Alignment (Refer to GROUP 33A, On-vehicle Service P.33A-3.)
- Press the dust cover with a finger to check whether the dust cover is cracked or damaged.



SPECIFIED GREASE:
MULTIPURPOSE GREASE SAE J310, NLGI No.2 OR EQUIVALENT
SEALANT:
3M™ AAD PART NO. 8672, 8679, 8678, 8661, 8663 OR EQUIVALENT



AC103639 AB

REMOVAL STEPS
1. COTTER PIN
<<A>> >>B<< 2. TIE ROD ASSEMBLY
<<A>> >>A<< 3. RELAY ROD
4. SELF-LOCKING NUT
<<A>> 5. IDLER ARM ASSEMBLY

Required Special Tool:
- MB991897: Ball Joint Remover

TSB Revision

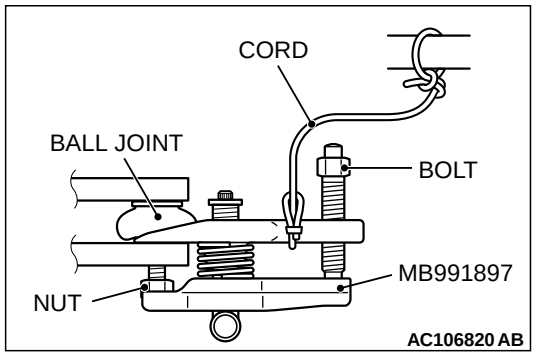
REMOVAL SERVICE POINT

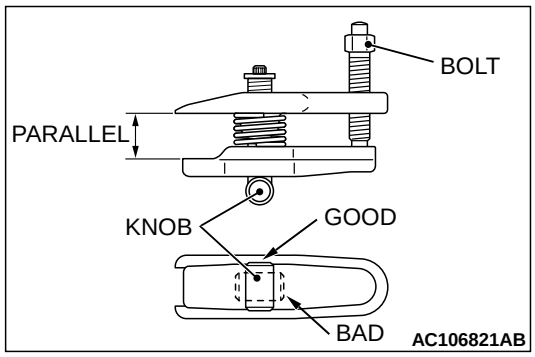
<<A>> TIE ROD ASSEMBLY/RELAY ROD/ IDLER ARM ASSEMBLY REMOVAL

⚠ CAUTION

- **Do not remove the nut from ball joint. Loosen it and use special tool MB991897 to avoid possible damage to ball joint threads.**
- **Hang special tool MB991897 with cord to prevent it from falling.**

1. Install special tool MB991897 as shown in the figure.



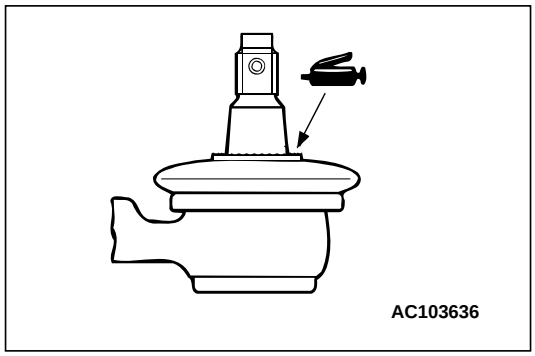


2. Turn the bolt and knob as necessary to make the jaws of special tool MB991897 parallel, tighten the bolt by hand and confirm that the jaws are still parallel.

   NOTE: When adjusting the jaws in parallel, make sure the knob is in the position shown in the figure.

3. Tighten the bolt with a wrench to disconnect the tie rod assembly, relay rod and idler arm assembly.

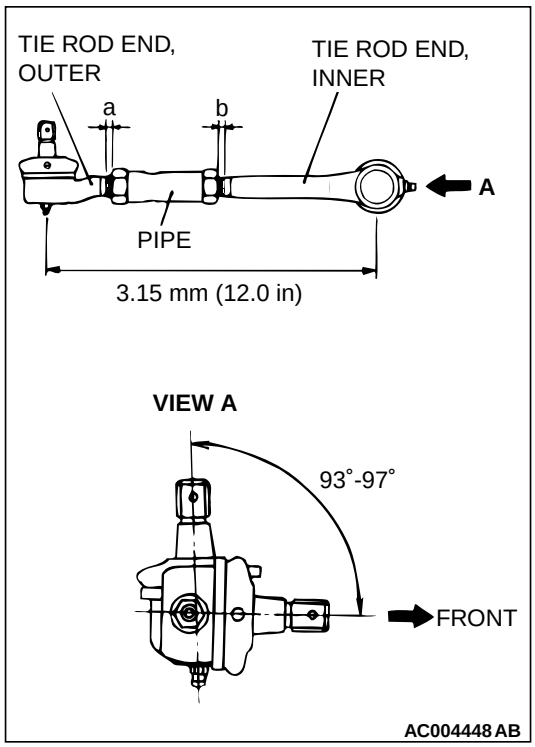
INSTALLATION SERVICE POINTS



>>A<< RELAY ROD AND BALL JOINT CONNECTION

Apply the specified grease to the top (lip) of the dust cover.

Specified grease: Multipurpose grease SAE J310, NLGI No.2 or equivalent



>>B<< TIE ROD ASSEMBLY INSTALLATION

⚠ CAUTION

The outer end of the tie rod end has left thread.

1. Install the tie rod assembly so that the dimension is as shown in the illustration.

   NOTE: The illustration at left shows the left side tie rod assembly. The right side tie rod assembly is symmetrical to the left side assembly.

2. Adjust the pipe so that the difference between dimensions (a) and (b) is 1.5 mm (0.059 inch) or less, and then temporarily tighten the lock nut.

   NOTE: Fully tighten the lock nut after the tie rod assembly is installed to the body and the toe-in has been adjusted.

INSPECTION

M1371003100054

Check the rubber parts for cracks and break.

DUST COVER CHECK

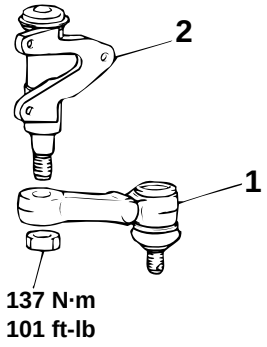
1. Press the dust cover with a finger to check whether the dust cover is cracked or damaged.
2. If there are any cracks in or damage to the dust cover, replace the tie rod end assembly or idler arm.

   NOTE: Cracked or damaged dust cover may cause damage to the ball joint. In addition, if the dust cover is damaged during service work, replace the dust cover.

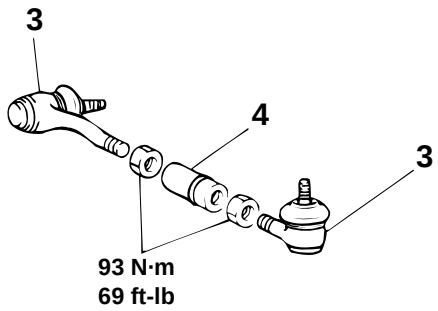
DISASSEMBLY AND ASSEMBLY

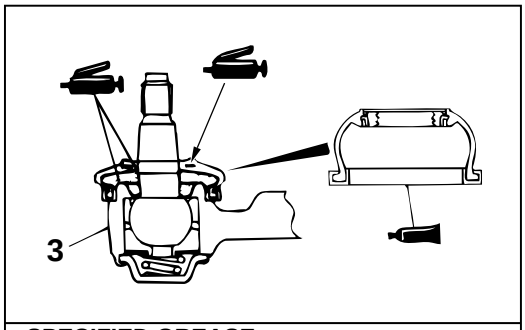
M1371003400066

IDLER ARM



TIE ROD ASSEMBLY





SPECIFIED GREASE:
MULTIPURPOSE GREASE SAE J310, NLGI No.2 OR EQUIVALENT
SEALANT:
3M™ AAD PART NO.8672, 8679, 8678, 8661, 8663 OR EQUIVALENT

AC103940 AB

IDLER ARM DISASSEMBLY STEPS

1. IDLER ARM
2. IDLER ARM SUPPORT

TIE ROD DISASSEMBLY STEPS

>>A<< 3. TIE ROD END ASSEMBLY
4. PIPE

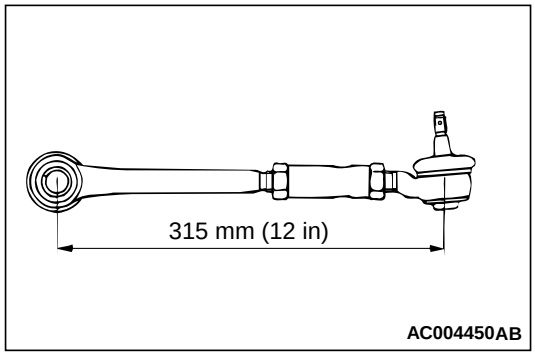
Required Special Tool:

- MB990776: Front Axle Base

ASSEMBLY SERVICE POINT

>>A<< TIE ROD END INSTALLATION

1. Apply multipurpose grease to the threaded section of the tie rod end.
2. Screw in the right and left tie rod ends to the pipe by the same amount, and then and provisionally tighten the tie rod end fixing nut.



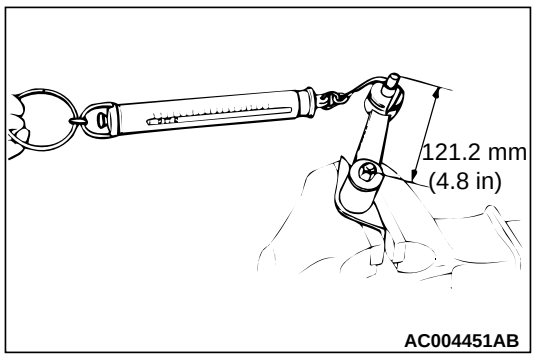
AC004450AB

INSPECTION

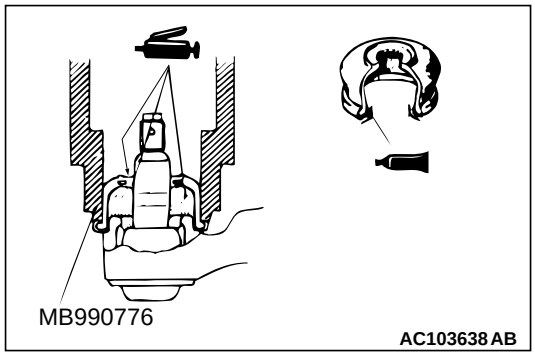
M1371003500063

IDLER ARM SLIDING RESISTANCE

Standard value:
2.4 – 16 N (0.5 – 3.6 lb)
[0.3 – 2.0 N·m] (2.7 – 17.7 in-lb)



AC004451AB



DUST COVER REPLACEMENT

When the dust cover is damaged accidentally during service work, replace the dust cover only as follows:

1. Fill the dust cover with the specified grease, and apply the grease to the go to top of the dust cover and contact surface of the lip.

   Specified grease: Multipurpose grease SAE J310, NLGI No.2 or equivalent

2. Apply the 3M™ AAD Part number 8672, 8679, 8678, 8661, 8663 or equivalent to the dust cover lip.
3. Using special tool MB990776, install the dust cover to the tie rod end ball joint.
4. Press the dust cover with a finger to check whether the dust cover is cracked or damaged.

SPECIFICATIONS

FASTENER TIGHTENING SPECIFICATIONS

M1372008400213

ITEM	SPECIFICATION
Power steering gear box	
Gear box housing jam nut	147 – 167 N·m (108 – 123 ft-lb)
Return tube flare	15 N·m (11 ft-lb)
Side cover bolt	54 – 64 N·m (40 – 47 ft-lb)
Side cover nut	37 N·m (27 ft-lb)
Steering gear bolt	18 N·m (13 ft-lb)
Steering gear self-locking nut	44 N·m (33 ft-lb)
Valve housing bolt	56 – 64 N·m (41 – 47 ft-lb)
Power steering hose	
Eye bolt	49 – 64 N·m (108 – 123 ft-lb)
Flare nut	15 N·m (11 ft-lb)
Oil reservoir bolt	12 N·m (104 in-lb)
Pressure pipe bolt	12 N·m (104 in-lb)
Return pipe	4.9 N·m (43 in-lb)
Power steering oil pump	
Eye bolt	49 – 64 N·m (108 – 123 ft-lb)
Oil pump bolt	24 N·m (17 ft-lb)
Oil pump bracket bolt	44 N·m (33 ft-lb)
Plug	59 N·m (43 ft-lb)
Pulley cover bolt	4.9 N·m (43 in-lb)
Pump cover bolt	25 – 29 N·m (19 – 22 ft-lb)
Suction connector bolt	12 N·m (104 in-lb)
Terminal assembly	25 – 29 N·m (19 – 22 ft-lb)

ITEM		SPECIFICATION
Steering linkage		
Idler arm assembly		59 N·m (43 ft-lb)
Idler arm nut		137 N·m (101 in-lb)
Relay rod nut		44 – 54 N·m (32 – 40 ft-lb)
Tie rod nut	M12	44 – 54 N·m (32 – 40 ft-lb)
Tie rod nut	M16	93 N·m (69 ft-lb)
Steering wheel and shaft		
Clock spring and column switch bolt		39 N·m (29 in-lb)
Joint assembly bolt		18 N·m (13 ft-lb)
Steering column assembly bolt	M8 × 30 mm	12 N·m (106 in-lb)
	M8 × 25 mm	18 N·m (13 ft-lb)
	M6	4.9 N·m (43 in-lb)
Steering wheel bolt		25 N·m (18 ft-lb)

GENERAL SPECIFICATIONS

M1372000200174

ITEM		SPECIFICATION
Power steering gear box	Type	Ball and nut
	Gear ratio	16.4 – 18.0
Oil pump	Type	Vane type
	Displacement cm^3/rev (cu.in/rev)	9.6 (0.59)
	Relief set pressure MPa (psi)	8.3 – 9.0 (1,204 – 1,305)

SERVICE SPECIFICATIONS

M1372000300212

ITEM			STANDARD VALUE	LIMIT
Steering wheel free play mm (in)	With engine running		-	50 (2.0)
	With engine stopped		10 (0.4) or less	-
Steering angle	Inside wheel		29°40' – 32°40'	-
	Outside wheel (reference)		29°30'	-
Toe-in mm (in)			3.5 ± 3.5 (0.14 ± 0.14)	-
Steering gear backlash mm (in)			-	0.5 (0.02)
Variation of the rod end ball joint shaft direction mm (in)			-	1.5 (0.06)
Tie rod end ball joint breakaway torque N·m (in-lb)			3.0 (27)	-
Engine idle speed r/min			700 ± 100	-
Stationary steering effort N (lb) [Fluctuation allowance N (lb)]			39.2 (8.81) or less [5.9 (1.33)]	-
Oil pump pressure MPa (psi)	Oil pump relief pressure		8.3 – 9.0 (1,204 – 1,305)	-
	Pressure under no-load conditions		0.8 – 1.0 (116 – 145)	-
	Steering gear retention hydraulic pressure		8.3 – 9.0 (1,204 – 1,305)	-
Oil pressure switch operating pressure MPa (psi)		OFF → ON	1.5 – 2.0 (218 – 290)	-
		ON → OFF	0.7 – 1.2 (102 – 174)	-

TSB Revision

ITEM	STANDARD VALUE	LIMIT
Cross-shaft end play mm (in)	0.05 (0.002) or less	-
Mainshaft total breakaway torque N·m (in-lb)	0.69 – 1.28 (6 – 12)	-
Idler arm sliding resistance N (lb)	2.4 – 16 (0.5 – 3.6)	-

LUBRICANTS

M1372000400219

ITEM	SPECIFIED LUBRICANTS	QUANTITY dm^3 (qt)
Power steering fluid	GENUINE MITSUBISHI POWER STEERING FLUID	0.8(0.85)
Rack piston, cross-shaft, O-ring, oil seal, vane	GENUINE MITSUBISHI POWER STEERING FLUID	As required
Lip portion of ball joint dust cover	Multipurpose grease SAE J310,NLGI No.2 or equivalent	As required
Inside of ball joint dust cover		

SEALANT

M1372000500205

ITEM	SPECIFIED SEALANT	REMARK
Cover assembly installation hole adjust bolt, seal bolt, packing, adjust shim, dust cover lip for ball joint	3M™ AAD Part No.8672, 8679, 8678, 8661, 8663 or equivalent	Semi-drying sealant