STEERING

CONTENTS

E37AA–

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

WARNING!

(1) 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 (from rendering the SRS inoperative).

(2) Service or maintenance of any SRS component or SRS-related component must be performed only at an authorized MITSUBISHI dealer.

(3) 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 diagnosis unit, SRS warning lamp, 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 as asterisk (*).

SPECIFICATIONS

E37CA--

GENERAL SPECIFICATIONS

Items	Specifications
Gear box	
Steering gear type	Rack and pinion
Oil pump	
Oil pump type	Vane type
Displacement ml/rev. (cu.in./rev.)	
<Vehicles built up to September, 1993>	7.2 (0.44)
<Vehicles built from October, 1993>	
LHD	5.9 (0.36)
RHD	7.2 (0.44)
Relief set pressure MPa (kg/cm^2, psi.)	
<Vehicles built up to September, 1993>	8 (80, 1,138)
<Vehicles built from October, 1993>	
LHD	10 (100, 1,422)
RHD	8 (80, 1,138)

SERVICE SPECIFICATIONS

E37CB--

Items	Specifications
Standard value	
Steering wheel free play mm (in.)	10 (3.90) or less
Power steering (with engine stopped)	
Steering angle	
Inner wheel	
COLT, LANCER–Sedan, LANCER–Wagon (2WD)	37°18'±1°30'
LANCER-Wagon (4WD)	38°24'±1°30'
Outer wheel	
COLT, LANCER–Sedan, LANCER–Wagon (2WD)	31°00'
LANCER-Wagon (4WD)	32°00'
Tie rod end ball joint starting torque Nm (kgcm, in.lbs.)	0.5–2.5 (5–25, 4–22)
Stationary steering effort N (kg, lbs.)	37 (3.7, 26.7) or less [Fluctuation allowance 6 (0.6, 1.3) or less]
Drive-belt tension	
Deflection mm (in.), Tension N (kg, lbs.)	
1300	
When belt tension is inspected	5.5–7.5 (0.217–0.295), 300–500 (30–50, 66–110)
When belt tension is readjusted	5.5–7.5 (0.217–0.295), 300–500 (30–50, 66–110)
When new belt is installed	4.0–5.5 (0.157–0.217), 500–850 (50–85, 110–187)
1600 and 1800 without A/C	
When belt tension is inspected	8.5–13.0 (0.335–0.512), 300–650 (30–65, 66–143)
When belt tension is readjusted	9.5–11.5 (0.374–0.453), 400–600 (40–60, 88–132)
When new belt is installed	7.5–9.0 (0.295–0.354), 650–850 (65–85, 143–187)

Items	Specifications
1600 and 1800 with A/C	
When belt tension is inspected	6.8–7.6 (0.268–0.299), 500–630 (50–63, 110–139)
When belt tension is readjusted	6.8–7.6 (0.268–0.299), 500–630 (50–63, 110–139)
When new belt is installed	5.5–6.0 (0.217–0.236), 750–800 (75–80, 165–176)
2000D	
When belt tension is inspected	6.5–9.0 (0.256–0.354), 300–500 (30–50, 66–110)
When belt tension is readjusted	6.5–9.0 (0.256–0.354), 300–500 (30–50, 66–110)
When new belt is installed	4.5–6.5 (0.177–0.256), 500–850 (50–85, 110–187)
Oil pump pressure MPa (kg/cm^2, psi)	
Oil pump relief pressure	7.5–8.2 (75–82, 1067–1166)
Pressure under no-load conditions	0.8–1.0 (8–10, 114–142)
Steering gear retention hydraulic pressure	7.5–8.2 (75–82, 1067–1166)
Oil pressure switch operating pressure MPa (kg/cm^2, psi)	
OFF → ON	1.5–2.0 (15–20, 213–284)
ON → OFF	0.7–2.0 (7–20, 100–284)
Total pinion preload Nm (kgcm, in.lbs.)	
Manual steering gear box	0.3–1.4 (3–14, 3–12)
Power steering gear box	0.6–1.4 (6–14, 5–12)
Tie-rod joint swing torque Nm (kgcm, in.lbs.)	2–5 (20–50, 17–43)

NOTES

Items		Specifications
Limit		
Steering wheel free play	mm (in.)	
Manual steering		30 (1.2)
Power steering (when hydraulic operation)		30 (1.2)
Oil pump pulley assembly backlash	mm (in.)	0.1 (0.004)

LUBRICANTS

E37CD--

Items	Specified lubricant	Quantity
Manual steering gear box		
Bellows	Silicone grease	As required
Power steering gear box		
Bearing, O-ring and Oil seal	Automatic transmission fluid DEXRON or DEXRON II	As required
Bush inside rack stopper	Automatic transmission fluid DEXRON or DEXRON II	As required
Special tool (MB991212)	Automatic transmission fluid DEXRON or DEXRON II	As required
Pinion and valve assembly seal ring part	Automatic transmission fluid DEXRON or DEXRON II	As required
Bellows	Silicone grease	As required
Oil pump		
Power steering fluid	Automatic transmission fluid DEXRON or DEXRON II	0.9 dm^3 (0.95 U.S.qt., 0.79 Imp.qt.)
Flow control valve	Automatic transmission fluid DEXRON or DEXRON II	As required
Friction surface of rotor, vane, cam ring and pump cover	Automatic transmission fluid DEXRON or DEXRON II	As required
O-ring	Automatic transmission fluid DEXRON or DEXRON II	As required

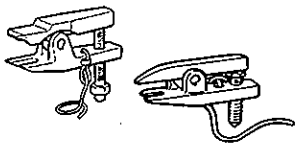
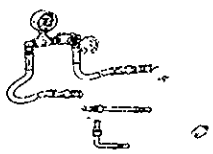
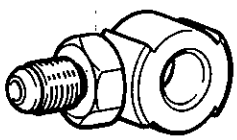
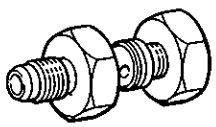
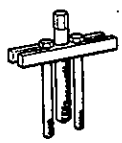
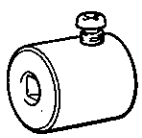
SEALANT AND ADHESIVES

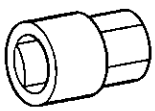
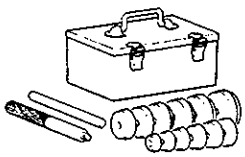
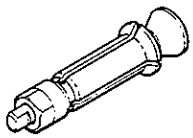
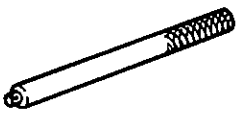
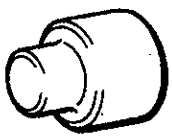
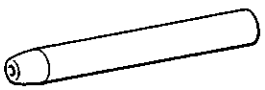
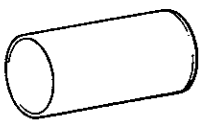
E37CE--

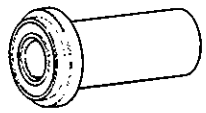
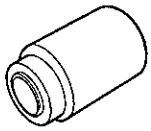
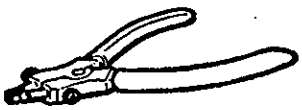
Items	Specified sealant and adhesive	Remarks
Gear box		
Rack support cover screw		
Dust cover lip for tie rod end ball joint	3M ATD Part No. 8661 or equivalent	Semi-drying sealant
End plug screw (power steering)		

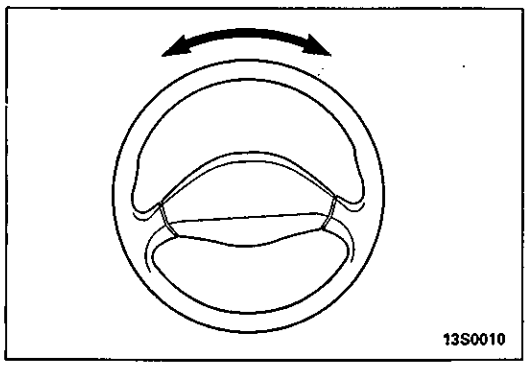
SPECIAL TOOLS

E37DA--

Tool	Number	Name	Use
	MB991113 or MB990635	Steering linkage puller	Disconnection of tie-rod end
	MB990685	Torque wrench	Measurement of the ball joint starting torque Measurement of the pinion shaft preload
	MB990326	Preload socket	Measurement of the ball joint starting torque
	MB990662	Oil pressure gauge assembly	Measurement of oil pressure
	MB990993 or MB991217	Power steering oil pressure gauge adapter (pump side)	
	MB990994	Power steering oil pressure gauge adapter (hose side)	
	MB990803	Steering wheel puller	Disconnection of the steering wheel
	MB990826	Torque wrench	Removal and installation of the tilt bracket or upper bracket
	MB991006	Preload socket	Measurement of the pinion shaft preload

Tool	Number	Name	Use
	MB990607	Torque wrench socket	Adjustment of rack support Removal of rack support cover
	MB990925	Bearing and oil seal installer set (Refer to GROUP 26)	Installation of the oil seal and bearing MB990926 MB990938 MB990939
	MB991120	Needle bearing puller	Removal of rack housing needle bearing
	MB991197	Bar (long type)	To press in the oil seal for the rack
	MB991452	Oil seal installer	
	MB991202	Oil seal & bearing installer	Press fitting of rack housing bearing
	MB991212	Rack installer	Rack installation
	MB991203	Oil seal & bearing installer	To press in the valve housing oil seal and bearing
	MB991317	Seal ring installer	Compression of the seal rings after replacement of the pinion seal rings

Tool	Number	Name	Use
	MB990941	Dust cover installer	To press in the column tube lower part bearing
	MB990776	Front axle base	Installation of dust cover for tie rod end ball joint
	MB990628	Snap ring pliers	To remove and install the snap ring of the pulley and shaft



SERVICE ADJUSTMENT PROCEDURES

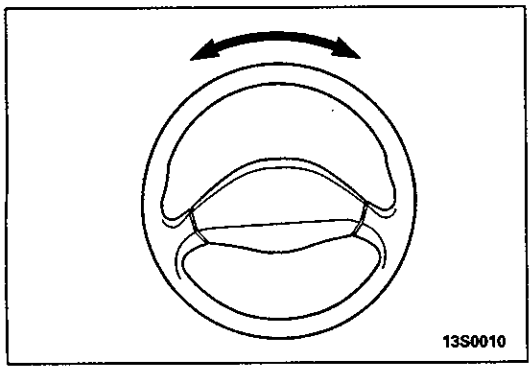
E37FAAG

STEERING WHEEL FREE PLAY CHECK

<Manual steering>

1. Set front wheels straight ahead.
2. Measure the play on steering wheel circumference before wheels move when slightly moving steering wheel in both directions.

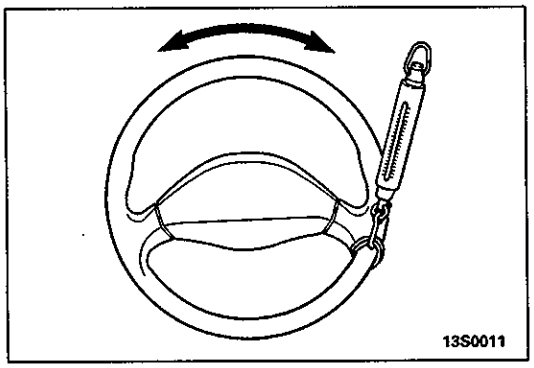
   Limit: 30 mm (1.2 in.)
3. When the play exceeds the limit, check play in steering shaft connection and steering linkage. Correct or replace.
4. When (3) check provides good results, check the following to adjust:
   - Remove the steering gear box, check and adjust total pinion starting torque.



<Power steering>

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

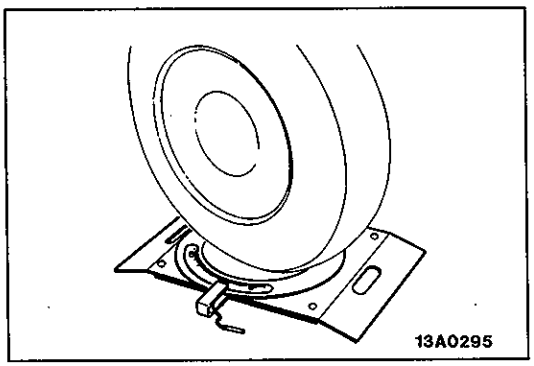
   Limit: 30 mm (1.2 in.)



3. When play exceeds the limit, check for play on steering shaft connection and steering linkage. Correct or replace.
4. If the free play still exceeds the limit value, set steering wheel straight ahead with engine stopped. Load 5 N (0.5 kg, 1 lb.) towards steering wheel circumference and check play.

   Standard value (steering wheel play with engine stopped): 10 mm (0.39 in.) or less

   If the play exceeds the standard value, remove steering gear box and check total pinion torque.



STEERING ANGLE CHECK

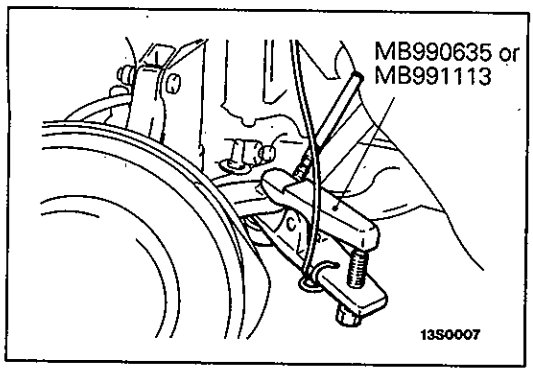
E37FDAE

1. Locate front wheels on turning radius gauge and measure steering angle.

   Standard value:

	Inside wheel	Outside wheel
COLT, LANCER-Sedan, LANCER-Wagon (2WD)	37°18' ± 1°30'	31°00'
LANCER-Wagon (4WD)	38°24' ± 1°30'	32°00'

2. When the angle is not within the standard value, the toe is probably incorrect. Adjust toe (Refer to GROUP 33A – Service Adjustment Procedures) and recheck steering angle.

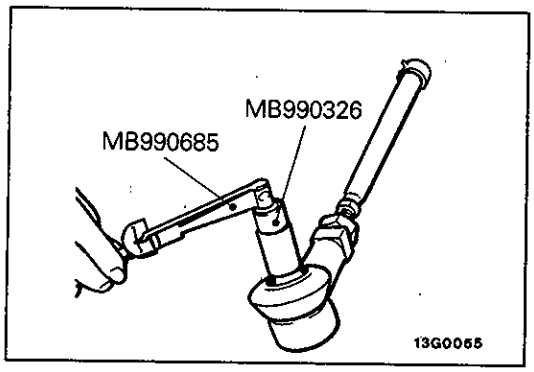


TIE ROD END BALL JOINT STARTING TORQUE CHECK

E37FMAD

1. Disconnect tie rod and knuckle with special tool.

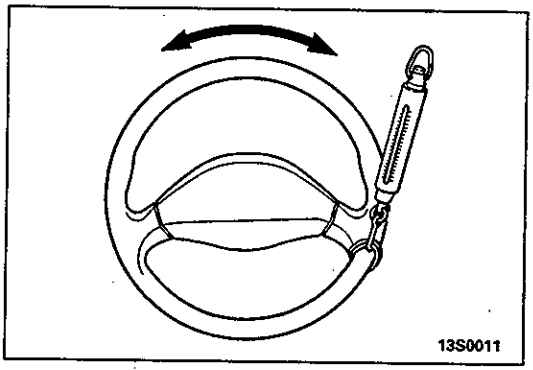
Caution
1. Be sure to tie the cord of the special tool to the nearby part.
2. Loosen the nut but do not remove it.



2. Move ball joint stud several times and install nut on stud. Measure ball joint starting torque with special tools.

Standard value: 0.5–2.5 Nm (5–25 kgcm, 4–22 in.lbs.)

3. When the starting torque exceeds the standard value, replace the rod end.
4. When the starting torque is under the standard value, check ball joint for end play or ratcheting. If none of these, the joint is still serviceable.



STATIONARY STEERING EFFORT CHECK

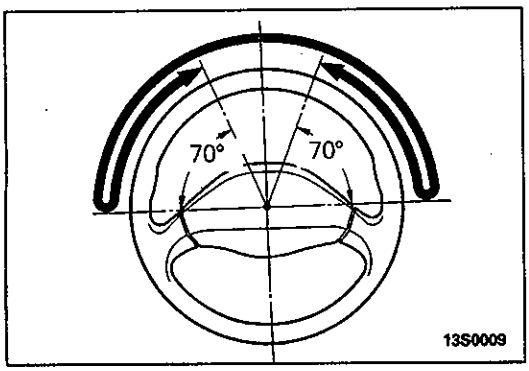
E37FFAH

1. With the vehicle stopped on a flat, paved surface, turn the steering wheel to the straight ahead position.
2. Start the engine and set it to 1,000±100 r/min.

Caution
After checking the engine r/min., there must be a return to the standard idling r/min.

3. Attach a spring balance 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 fluctuation of the required steering force.

Standard value: 37 N (3.7 kg, 26.7 lbs.) or less
(Fluctuation allowance: 6 N (0.6 kg, 1.3 lbs.) or less)



CHECKING STEERING WHEEL RETURN TO CENTRE E37FGAA

To make this test, conduct a road test and check as follows.

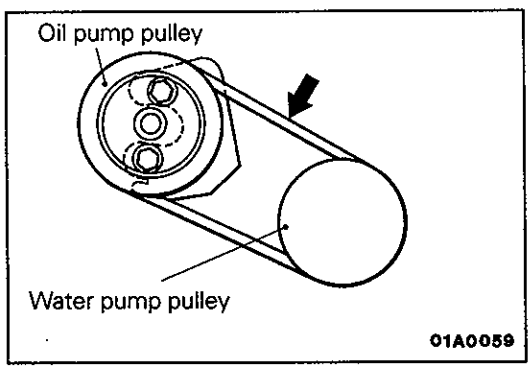
1. Make both gradual and sudden turns and check the steering "feeling" to be sure that there is no difference in the steering force required and the wheel return between left and right turns.
2. At a speed of 35 km/h (22 mph), turn the steering wheel 90°, and release the steering wheel after 1 or 2 seconds. If the steering wheel then returns 70° or more, the return can be judged to the satisfactory.

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

DRIVE BELT TENSION CHECK E37FHAL

Check to be sure that the belt is not damaged and that the drive-belt is correctly attached to the groove of the pulley.

NOTE
If there is abnormal noise or belt slippage, check the belt tension and check for unusual wear or abrasion, or damage, of the pulley contact surface, and for scars or scratches on the pulley.



<1300, 2000D>

1. Press in drive belt at the illustrated position with about 100 N (10 kg, 22 lbs.) and measure deflection.

   Use a belt tension gauge to check whether the belt tension is at the standard value.

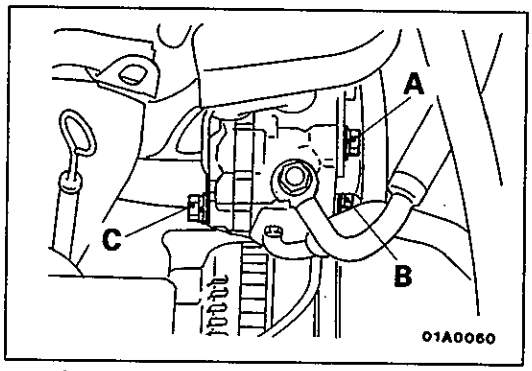
   Standard value

   1300

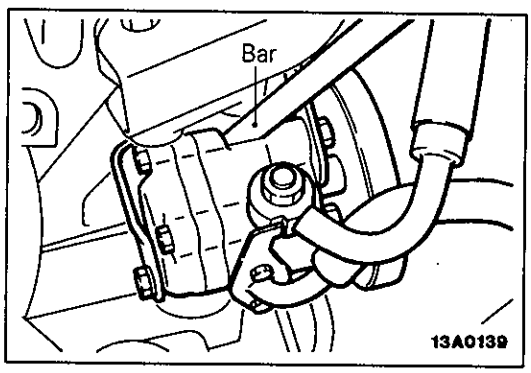
	Deflection mm (in.)	Tension N (kg, lbs.)
When belt tension is inspected	5.5–7.5 (0.217–0.295)	300–500 (30–50, 66–110)
When belt tension is readjusted	5.5–7.5 (0.217–0.295)	300–500 (30–50, 66–110)
When new belt is installed	4.0–5.5 (0.157–0.217)	500–850 (50–85, 110–187)

2000D

	Deflection mm (in.)	Tension N (kg, lbs.)
When belt tension is inspected	6.5–9.0 (0.256–0.354)	300–500 (30–50, 66–110)
When belt tension is readjusted	6.5–9.0 (0.256–0.354)	300–500 (30–50, 66–110)
When new belt is installed	4.5–6.5 (0.177–0.256)	500–850 (50–85, 110–187)



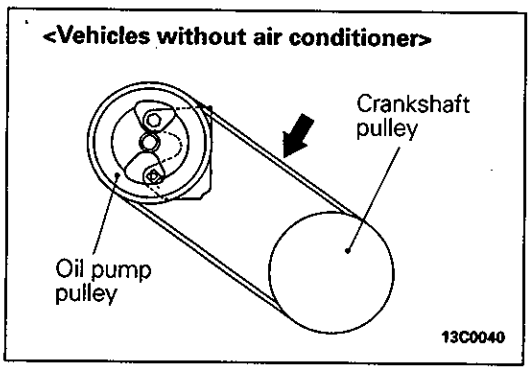
2. If the deflection is out of the standard values, adjust the belt tension using the following procedure.
   (1) Loosen bolts A, B and C (for holding the oil pump).



   (2) Set a bar or similar tool against the oil pump body, and while applying tension to the belt, tighten the oil pump mounting bolts in the order A, B, C.
   (3) Check the belt deflection amount and tension and adjust if necessary.

Caution
The check should be made after turning the engine one time or more in the regular direction of rotation (to the right).

<Vehicles without air conditioner>



<1600, 1800>

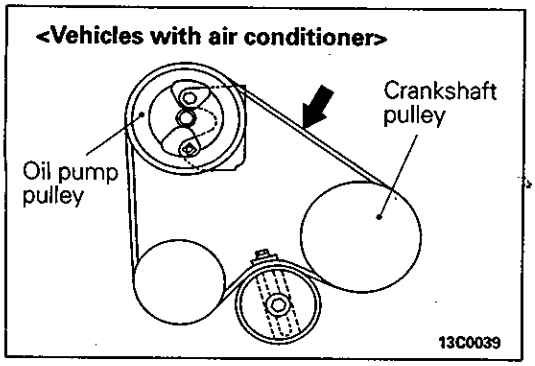
1. Press in drive belt at the illustrated position with about 100 N (10 kg, 22 lbs.) and measure deflection.

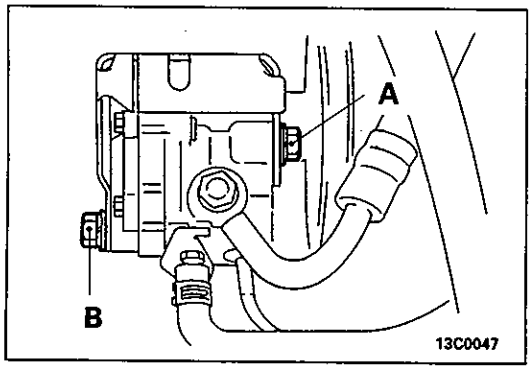
   Use a belt tension gauge to check whether the belt tension is at the standard value.

Standard value

	Vehicles without air conditioner		Vehicles with air conditioner	
	Deflection mm (in.)	Tension N (kg, lbs.)	Deflection mm (in.)	Tension N (kg, lbs.)
When belt tension is inspected	8.5–13.0 (0.335–0.512)	300–650 30–65, 66–143	6.8–7.6 (0.268–0.299)	500–630 50–63, 110–139
When belt tension is readjusted	9.5–11.5 (0.374–0.453)	400–600 40–60, 88-132	6.8–7.6 (0.268–0.299)	500–630 50–63, 110–139
When new belt is installed	7.5–9.0 (0.295–0.354)	650–850 65–85, 143–187	5.5–6.0 (0.217–0.236)	750–800 75–80, 165–176

<Vehicles with air conditioner>

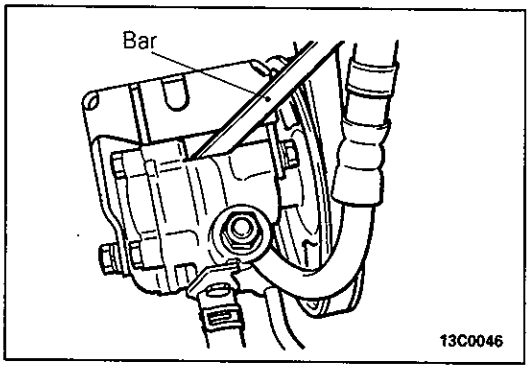




2. If the deflection is out of the standard values, adjust the belt tension using the following procedure.

Vehicles without air conditioner

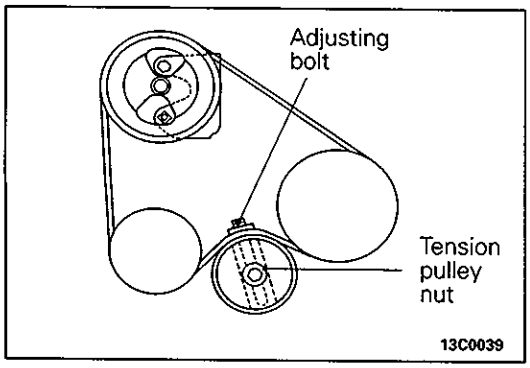
① Loosen bolts A and B (for holding the oil pump).



② Set a bar or similar tool against the oil pump body, and while applying tension to the belt, tighten the oil pump mounting bolts in the order A, B.

③ Check the belt deflection amount and tension and adjust if necessary.

Caution
The check should be made after turning the engine one time or more in the regular direction of rotation (to the right).

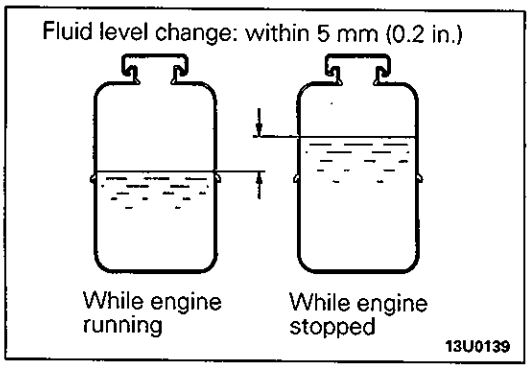


Vehicles with air conditioner

① After loosening the tension pulley nut, apply tension to the belt with the adjusting bolt.

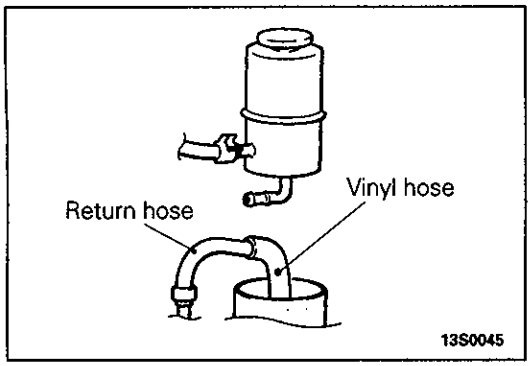
② Check the belt deflection amount and tension, and if they are at the standard values, tighten the tension pulley nut.

Caution
The check should be made after turning the engine one time or more in the regular direction of rotation (to the right).



FLUID LEVEL CHECK E37FIAD

1. Park the vehicle on a flat, level surface, start the engine, and then turn the steering wheel 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. Check the difference of the fluid level when the engine is stopped, and while it is running. If the fluid level changes considerably, air bleeding should be done.



FLUID REPLACEMENT

E37FJAF

1. Raise the front wheels on a jack, and then support them with rigid racks.
2. Disconnect the return hose connection.
3. Connect a vinyl hose to the return hose, and drain the oil into a container.
4. On vehicles with a petrol engine, disconnect the high-tension cable.
   On vehicles with a diesel engine, remove the fuel cut valve connector attached to the injection pump.
   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.

   Caution
   Be careful not to position the high-tension cable near the carburettor or the delivery pipe.
5. Connect the return hoses securely, and then secure it with the clip.
6. Fill the oil reservoir with the specified fluid up to the lower position of the filter, and then bleed the air.

   Specified fluid: Automatic transmission fluid DEXRON or DEXRON II

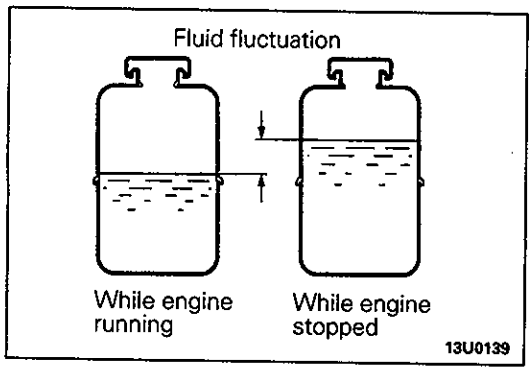
BLEEDING

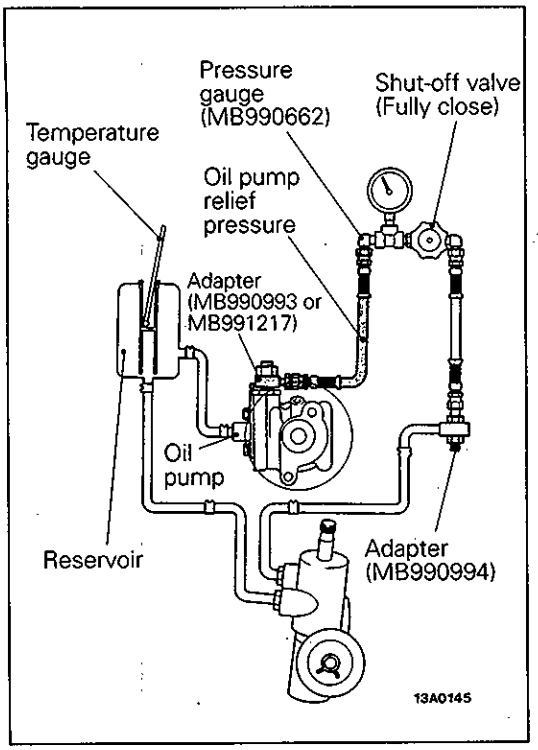
E37FKAK

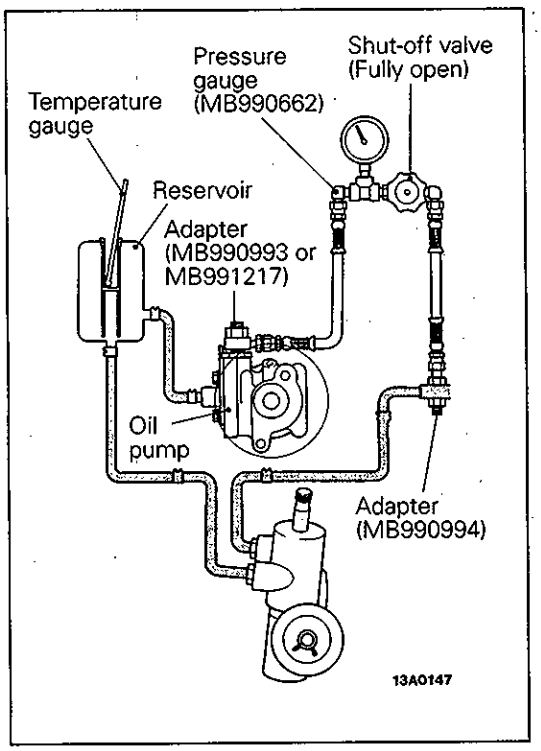
1. Jack up the front wheels and support them by using a rigid rack.
2. Manually turn the oil pump pulley a few times.
3. Turn the steering wheel all the way to the left and to the right five or six time.
4. On vehicles with a petrol engine, disconnect the high-tension cable. On vehicles with a diesel engine, remove the fuel cut valve connector attached to the injection pump.
   While operating the starting motor intermittently, turn the steering wheel all the way to the left and right five or six times (for 15 of 20 seconds).

   Caution
   1. **During air bleeding, replenish the fluid supply so that the level never falls below the lower position of the filter.**
   2. **If air bleeding is done while engine is running, the air will be broken up and absorbed into the fluid; be sure to do the bleeding only while cranking.**
5. On vehicles with a petrol engine, connect the high-tension cable. On vehicles with a diesel engine, connect the fuel cut valve connector attached to the injection pump. Start the engine (idling).
6. Turn the steering wheel to the left and right until there are no air bubbles in the oil reservoir.
7. Confirm that the fluid is not milky, and that the level is up to the specified position on the level gauge.
8. Confirm that there is very little change in the fluid level when the steering wheel is turned left and right.
9. Check whether or not the change in the fluid level is within 5 mm (0.2 in.) when the engine is stopped and when it is running.
10. If the change of the fluid level is 5 mm (0.2 in.) or more, the air has not been completely bled from the system, and thus must be bled completely.

    Caution
    1. **If the fluid level rises suddenly after the engine is stopped, the air has not been completely bled.**
    2. **If air bleeding is not complete, there will be abnormal noises from the pump and the flow-control valve, and this condition could cause a lessening of the life of the pump, etc.**







OIL PUMP PRESSURE TEST E37FLAE

CHECKING THE OIL PUMP RELIEF PRESSURE

1. Disconnect the pressure hose from the oil pump, and then connect the special tools.
2. Bleed the 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. Start the engine and idle it at 1,000 ± 100 r/min.
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.

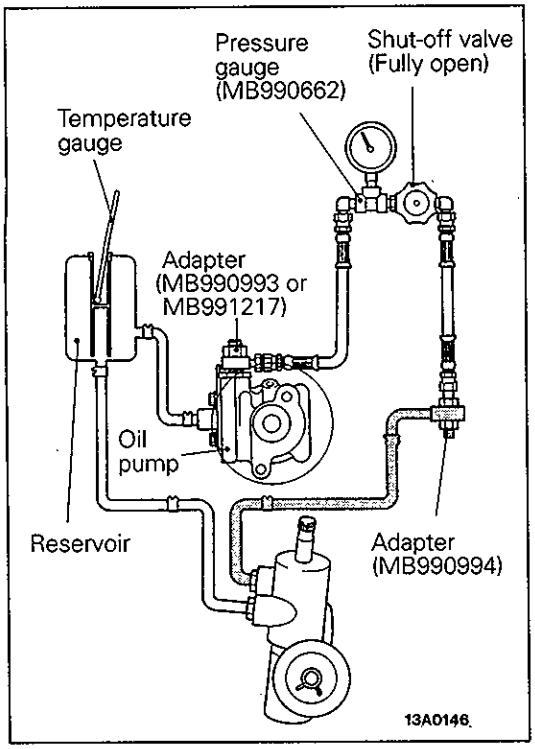
   Standard value: 7.5–8.2 MPa (75–82 kg/cm^2, 1,067–1,166 psi.)

   Caution
   Pressure gauge shut off valve must not remain closed for more than 10 seconds.
5. If it is not within the standard value, overhaul the oil pump.
6. Remove the special tools, and the tighten the pressure hose to the specified torque.
7. Bleed the system.

CHECKING THE PRESSURE UNDER NO-LOAD CONDITIONS

1. Disconnect the pressure hose from the oil pump, and then connect the special tools.
2. Bleed the 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. Start the engine and idle it at 1,000 ± 100 r/min.
4. 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.

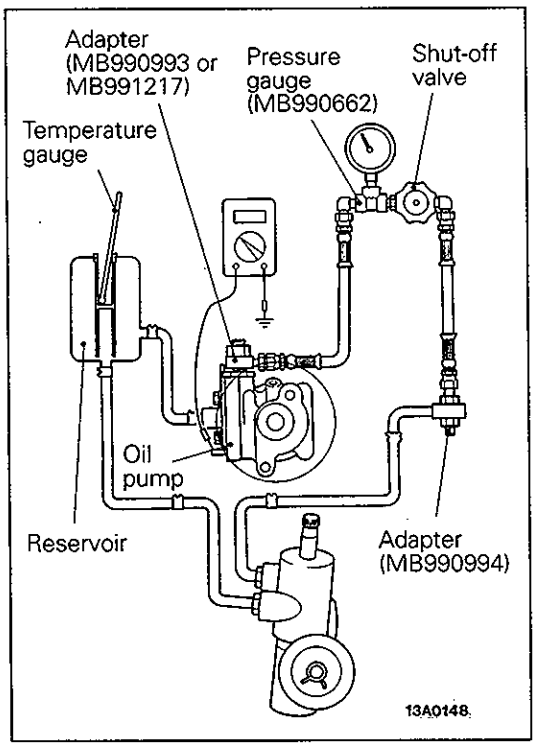
   Standard value: 0.8–1.0 MPa (8–10 kg/cm^2, 114–142 psi.)
5. If it is not within the standard value, the probable cause is a malfunction of the oil line or steering gear box, so check these parts and repair as necessary.
6. Remove the special tools, and then tighten the pressure hose to the specified torque.
7. Bleed the system.



CHECKING THE STEERING GEAR RETENTION HYDRAULIC PRESSURE

1. Disconnect the pressure hose from the oil pump, and then connect the special tools.
2. Bleed the 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. Start the engine and idle it at 1,000 ± 100 r/min.
4. Fully close and fully open the shut-off valve of the pressure gauge.
5. 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: 7.5–8.2 MPa (75–82 kg/cm^2, 1,067–1,166 psi.)
6. When not within the standard value, overhaul the steering gear box. Remeasure fluiid pressure.
7. Remove the special tools, and then tighten the pressure hose to the specified torque.
8. Bleed the system.



POWER STEERING OIL PRESSURE SWITCH CHECK E37FQAA

1. Disconnect the pressure hose from the oil pump, and then connect the special tools.
2. Bleed the 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 connection of the connector for the oil pressure switch, and place an ohmmeter in position.
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 (15–20 kg/cm^2, 213–284 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: 0.7–2.0 MPa (7–20 kg/cm^2, 100–284 psi.)
7. Remove the special tools, and then tighten the pressure hose to the specified torque.
8. Bleed the system.

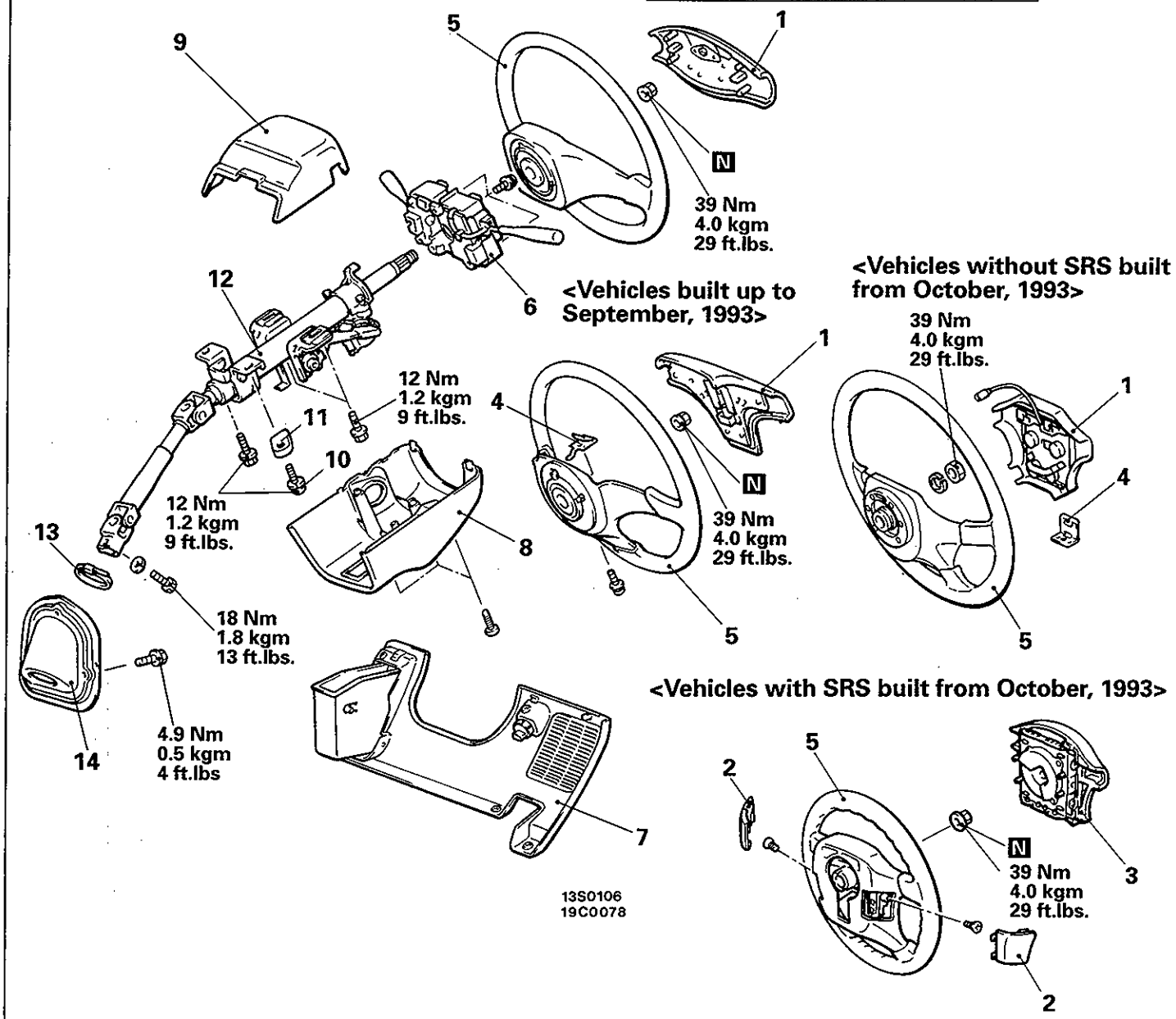
STEERING WHEEL AND SHAFT

REMOVAL AND INSTALLATION

E37HA--

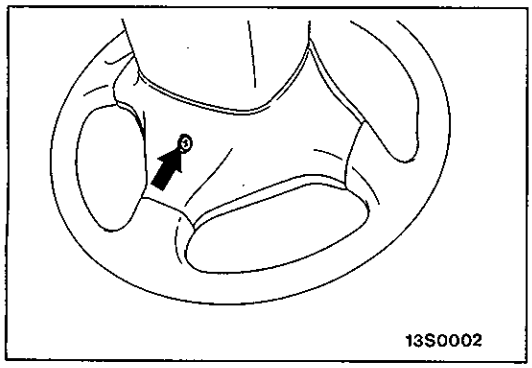
Post-installation Operation
- Inspection of Steering Wheel Centering

Caution: SRS
Before removal of air bag module, refer to GROUP 52B – SRS Service Precautions and Air bag Module and Clock Spring.



Removal steps

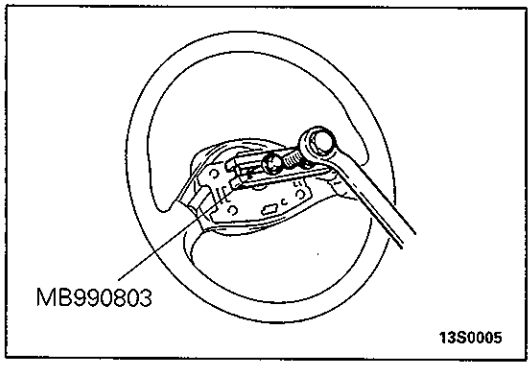
- ◆◆ ◆◆ 1. Horn pad
- 2. Cover
- 3. Air bag module (Refer to GROUP 52B – Air Bag Module and Clock Spring)
- ◆◆ ◆◆ 4. Spring holder
- ◆◆ 5. Steering wheel
- 6. Column switch
- 7. Instrument lower panel (Refer to GROUP 52A-Instrument Panel.)
- 8. Lower column cover
- 9. Upper column cover
- ◆◆ ◆◆ 10. Special screw
- 11. Special washer
- 12. Steering column assembly
- 13. Band
- 14. Steering cover



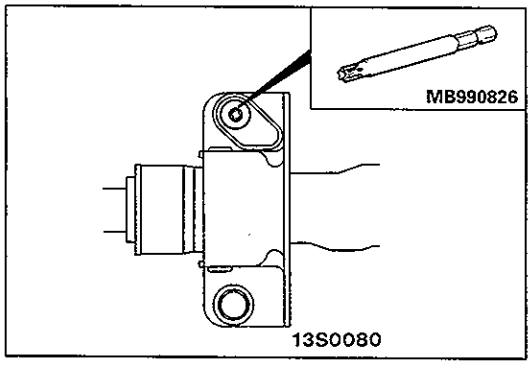
SERVICE POINTS OF REMOVAL E37HBBA

1. REMOVAL OF HORN PAD/4. SPRING HOLDER

<Three-spoke steering wheel>
After removing the spring holder mounting screws from the reverse side of the steering wheel, remove the horn pad.



5. REMOVAL OF STEERING WHEEL

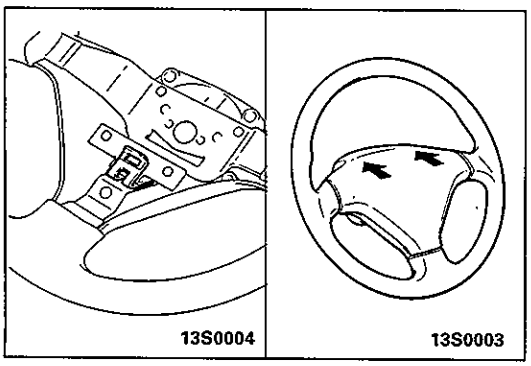


10. REMOVAL OF SPECIAL SCREW

SERVICE POINTS OF INSTALLATION E37HDAN

10. INSTALLATION OF SPECIAL SCREW

Tighten the special screw using the special tool (MB990826).



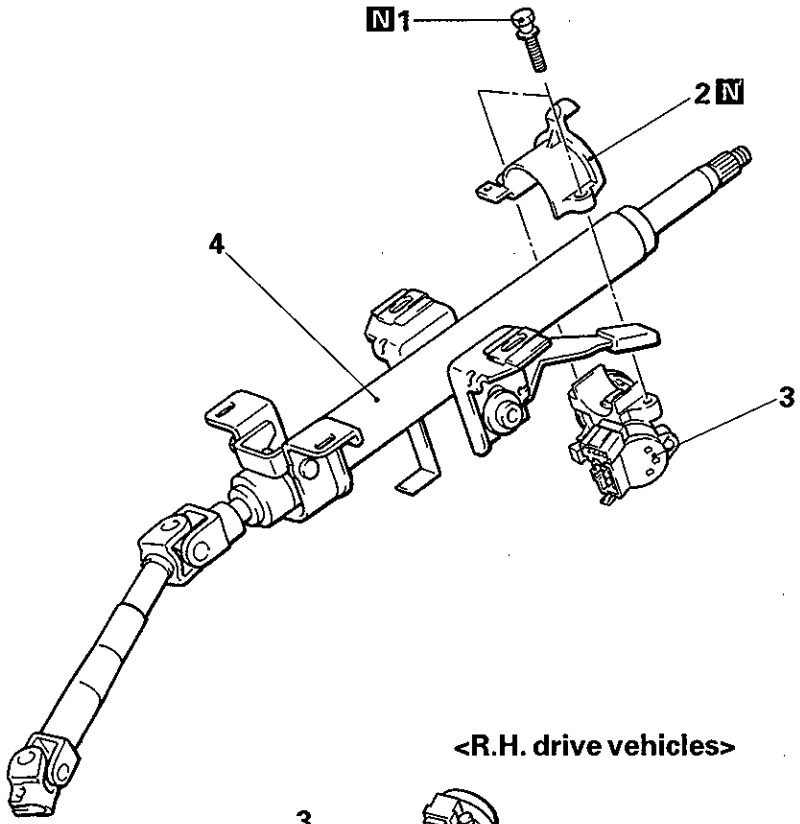
4. INSTALLATION OF SPRING HOLDER/1. HORN PAD

<Three-spoke steering wheel>
(1) Install the spring holder to the steering wheel.
(2) After inserting the lower section of the horn pad into the spring holder, push the top section to install it to the steering wheel.

DISASSEMBLY AND REASSEMBLY

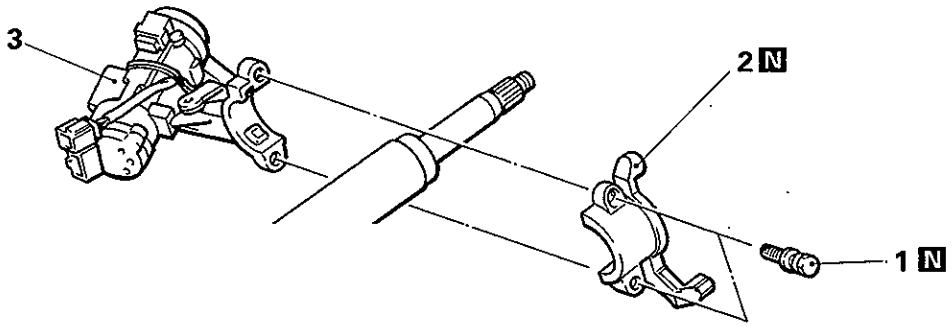
E37HE--

<L.H. drive vehicles>



13S0083

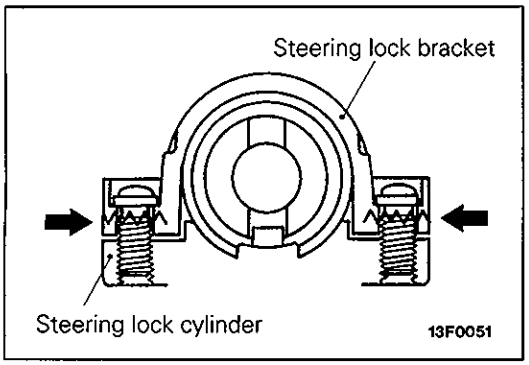
<R.H. drive vehicles>



Disassembly steps

◆◆ ◆◆ 1. Special bolt
◆◆ ◆◆ 2. Steering lock bracket
◆◆ ◆◆ 3. Steering lock cylinder assembly
4. Steering column assembly

13S0049



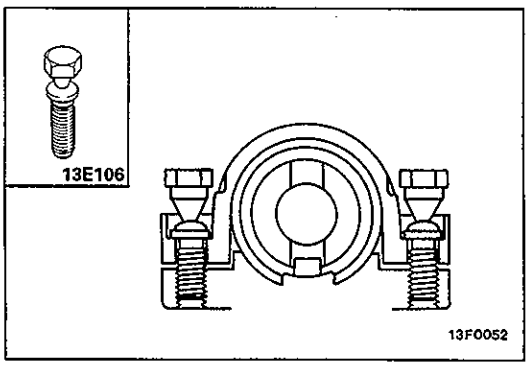
SERVICE POINTS OF DISASSEMBLY E37HFAT

1. REMOVAL OF SPECIAL BOLT/2. STEERING LOCK BRACKET/3. STEERING LOCK CYLINDER ASSEMBLY

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

INSPECTION E37HGAP

- Check the universal joint for end play.
- Check for bent steering column assembly.
- Check for damaged or defective steering column.



SERVICE POINTS OF REASSEMBLY E37HHAT

3. INSTALLATION OF STEERING LOCK CYLINDER ASSEMBLY/2. STEERING LOCK BRACKET/1. SPECIAL BOLT

(1) When installing the steering lock 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.

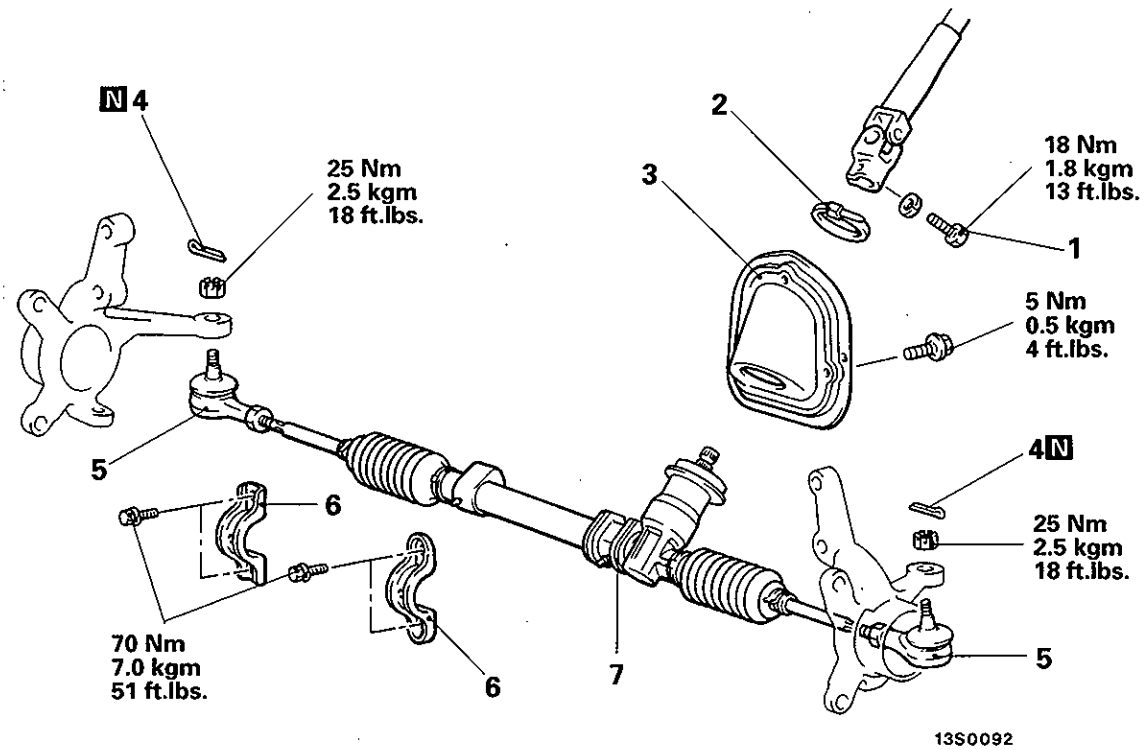
MANUAL STEERING GEAR BOX

E37LA--

REMOVAL AND INSTALLATION

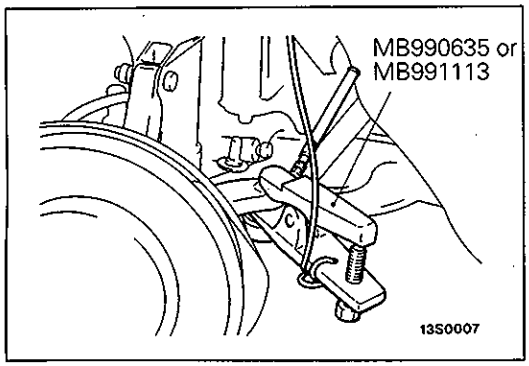
Pre-removal Operation
- Removal of Centermember (Refer to GROUP 32 – Engine Roll Stopper and Centermember)
- Removal of Front Exhaust Pipe (Refer to GROUP 15 – Exhaust Pipe and Main Muffler)
- For L.H. drive vehicles, turn the steering wheel to the left to move the rack to the right. For R.H. drive vehicles turn the opposite way to move the rack to the left.

Post-installation Operation
- Installation of Front Exhaust Pipe (Refer to GROUP 15 – Exhaust Pipe and Main Muffler)
- Installation of Centermember (Refer to GROUP 32 – Engine Roll Stopper and Centermember)
- Inspection of Steering Wheel Centering
- Adjustment of the Front Wheel Alignment (Refer to GROUP 33A – Service Adjustment Procedures)



Removal steps

1. Joint assembly and gear box connecting bolt
2. Band
3. Steering cover
4. Split pin
5. ◆◆ Connection for tie-rod end and knuckle
6. Clamp
7. ◆◆ Gear box assembly



SERVICE POINTS OF REMOVAL E37LBAG

5. DISCONNECTION OF TIE-ROD END

Caution

1. Be sure to tie the cord of the special tool to the nearby part.

2. Loosen the nut but do not remove it.

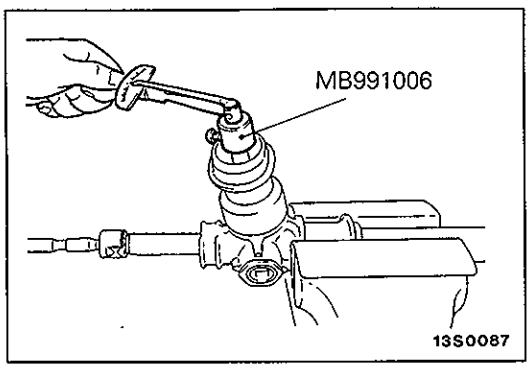
7. REMOVAL OF GEAR BOX ASSEMBLY

Caution

When removing the gear box, pull it out carefully and slowly to avoid damaging the bellows and tie-rod end dust cover.

(1) For L.H. drive vehicles, move the gear box assembly to the right and pull out the left-side tie-rod from the fender shield. For R.H. drive vehicles, move the opposite way and pull out the right-side tie-rod from the fender shield.

(2) For L.H. drive vehicles, lower the left side of the gear box assembly and remove it. For R.H. drive vehicles, lower the right side and remove it.



INSPECTION E37LCAF

- Check the rubber parts for cracks and breakage.

GEAR BOX FOR TOTAL PINION PRELOAD

(1) Install the special tools to the pinion.

(2) Place the rack in the neutral condition, and then measure the total pinion preload (at a speed of one rotation every four to six seconds).

NOTE

Make measurements when rotation is to the left and to the right of the neutral position.

Standard value: 0.3–1.4 Nm (3–14 kgcm, 3–12 in.lbs.)

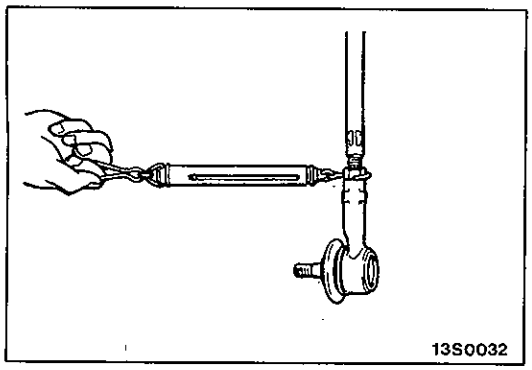
[Change in torque: 0.4 Nm (4 kgcm, 3 in.lbs.)]

NOTE

Measure the pinion preload through the whole stroke of the rack.

If the measured value is not within the standard range, first adjust the rack support cover, and then check the total pinion preload again.

If the total pinion preload cannot be adjusted to within the standard range by adjusting the rack support cover, check the rack support cover, rack support spring, rack support and replace any parts necessary.



CHECK THE TIE ROD FOR SWING RESISTANCE

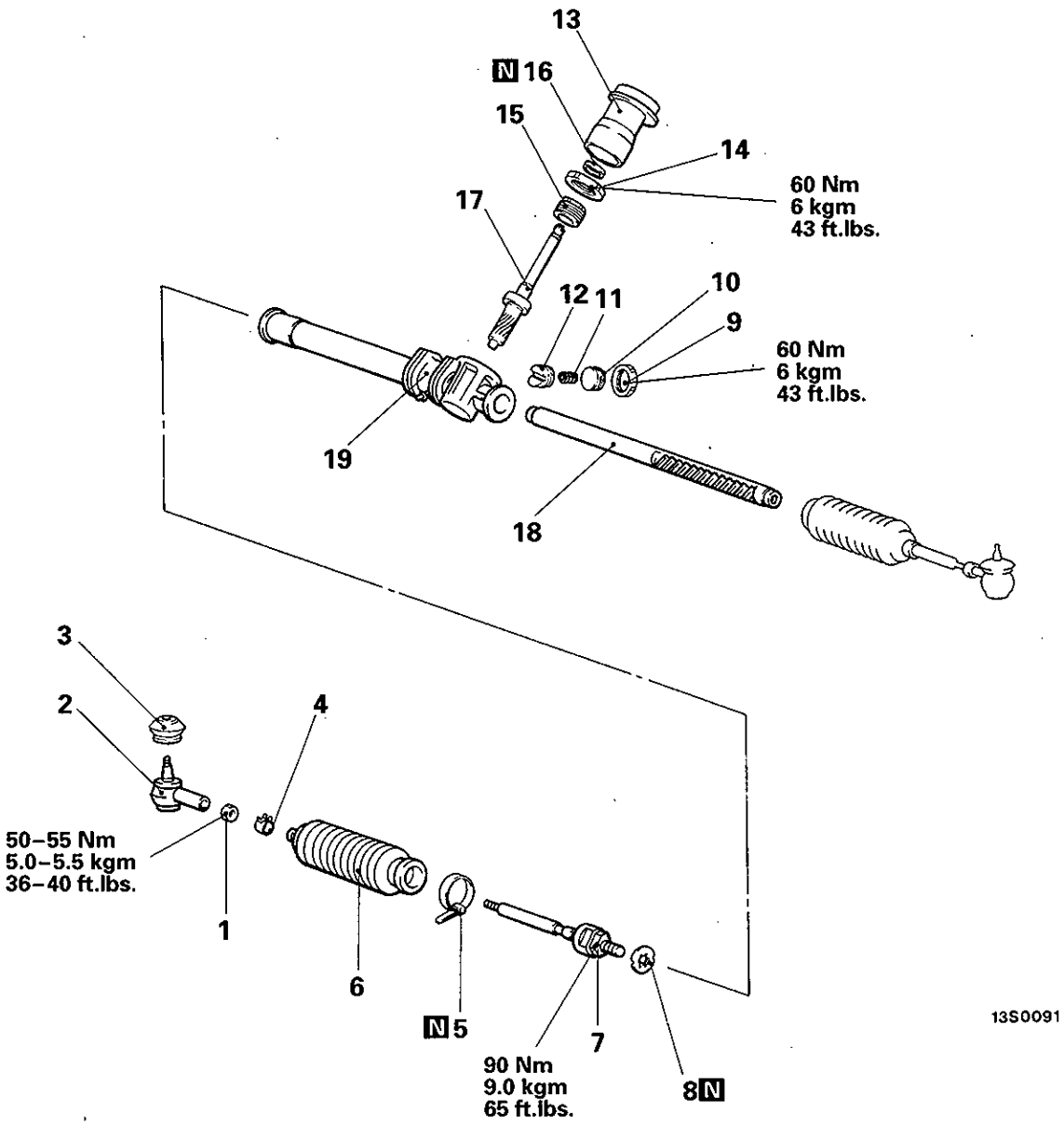
(1) Give 10 hard swings to the tie rod.
(2) Measure the tie rod swing resistance with a spring balance.

Standard value: 8–20 N (0.8–2.0 kg, 1.9–4.6 lbs.)
[2–5 Nm (20–50 kgcm, 17–43 in.lbs.)]

(3) If the measured value exceeds the standard value, replace the tie rod assembly.
(4) Even if the measured value is below the standard value, the tie rod which swings smoothly without excessive play may be used.

DISASSEMBLY AND REASSEMBLY

E37LE--

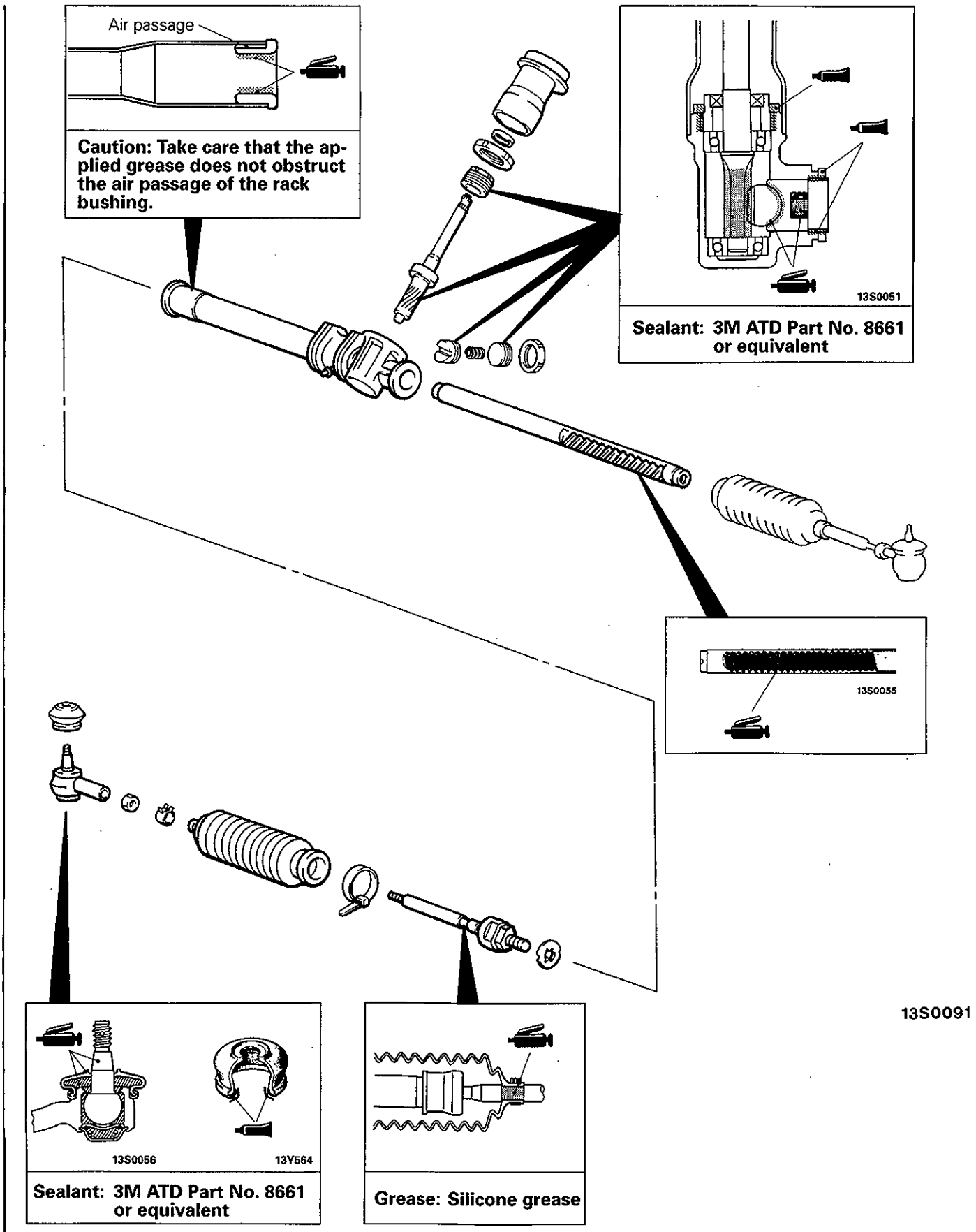


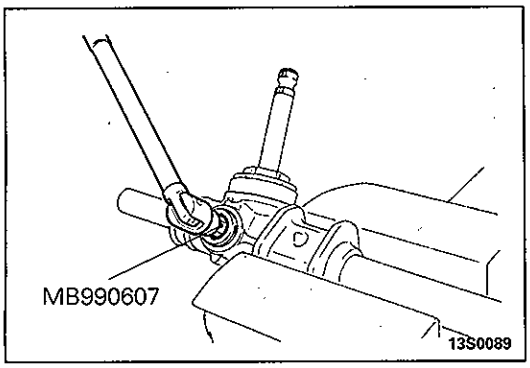
13S0091

Disassembly steps

- ◆◆ 1. Tie-rod end locking nut
- ◆◆ 2. Tie-rod end
- ◆◆ 3. Dust cover
- 4. Bellows clip
- 5. Bellows band
- 6. Bellows
- ◆◆ 7. Tie-rod
- ◆◆ 8. Tab washer
- ◆◆ ● Adjustment of total pinion preload
- 9. Locking nut
- ◆◆ 10. Rack support cover
- 11. Rack support spring
- 12. Rack support
- 13. Joint cover
- 14. Locking nut
- 15. Top cover
- ◆◆ 16. Oil seal
- 17. Pinion
- ◆◆ 18. Rack
- 19. Gear housing

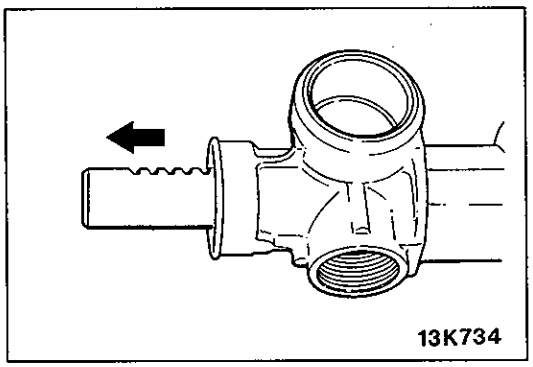
LUBRICATION AND SEALING POINTS





SERVICE POINTS OF DISASSEMBLY E37LFAF

10. REMOVAL OF RACK SUPPORT COVER



18. REMOVAL OF RACK

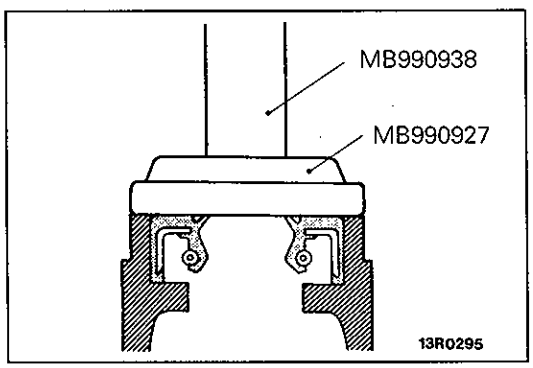
Pull out the rack from the gear housing in the direction shown in the illustration.

Caution

If the rack is pulled out in the wrong direction, the bushing in the gear box may be damaged by the rack threads.

INSPECTION E37LGAC

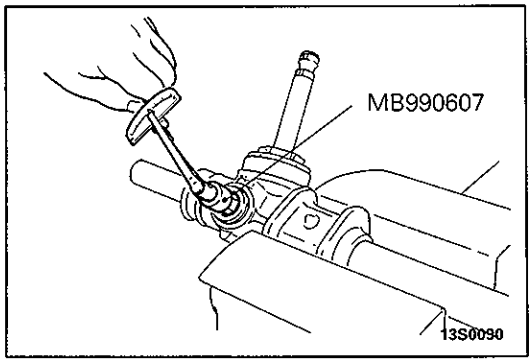
- Check the rack support for uneven wear or damage.
- Check the rack support spring for deterioration.
- Check the rack pinion tooth surfaces for wear or damage.
- Check the ball bearings or pinion bushing for noise, uneven rotation, or damage.
- Check the rack bushing for damage.
- Check the dust cover for cracks or damage.



SERVICE POINTS OF REASSEMBLY E37LHAF

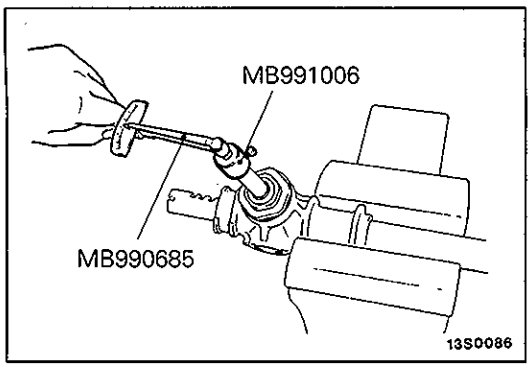
16. INSTALLATION OF OIL SEAL

(1) Using the special tool, press the oil seal into the top plug.



- **ADJUSTMENT OF TOTAL PINION PRELOAD**

(1) Position rack at its centre and tighten rack support cover to 15 Nm (1.5 kgm, 11 ft.lbs.)



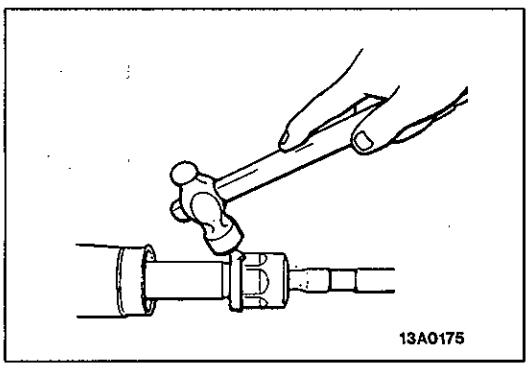
(2) In neutral position, rotate pinion shaft clockwise one turn/4-6 seconds with special tool. Return rack support cover 30° – 60° and adjust torque to the standard value.

Standard value: 0.3–1.4 Nm (3–14 kgcm, 3–12 in.lbs.)
[Torque variation: 0.4 Nm (4 kgcm, 3 in.lbs.)]

Caution
1. **When adjusting, set the standard value at its highest value.**
2. **Assure no ratchetting or catching when operating rack towards the shaft direction.**

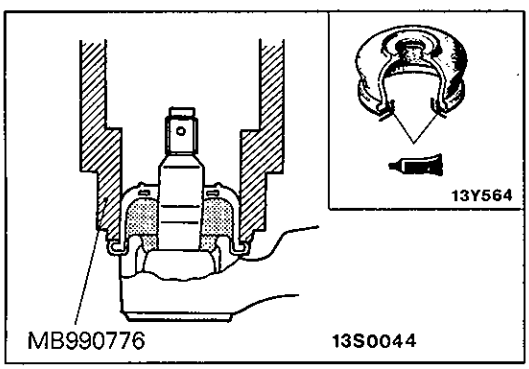
NOTE
When it cannot be adjusted within the specified return angle, check rack support cover components or replace.

(3) After adjusting, lock rack support cover with lock nut.



8. INSTALLATION OF TAB WASHER/7. TIE-ROD

After installing tie-rod to rack, fold tab washer end (2 locations) to tie-rod notch.

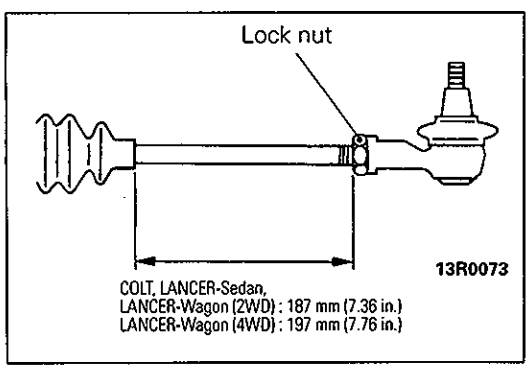


3. INSTALLATION OF DUST COVER

(1) Pack dust cover interior with multipurpose grease.
(2) Apply specified sealant to dust cover lip.

Specified sealant: 3M ATD Part No. 8661 or equivalent

(3) Using the special tool, install the dust cover to the tie rod end ball joint.



2. INSTALLATION OF TIE-ROD END/1. TIE-ROD END LOCKING NUT

Screw in tie rod-end to have its right and left length as illustrated. Lock with lock nut.

Caution
Be careful not to damage the inner surface of the rack cylinder of the gear housing.

POWER STEERING GEAR BOX

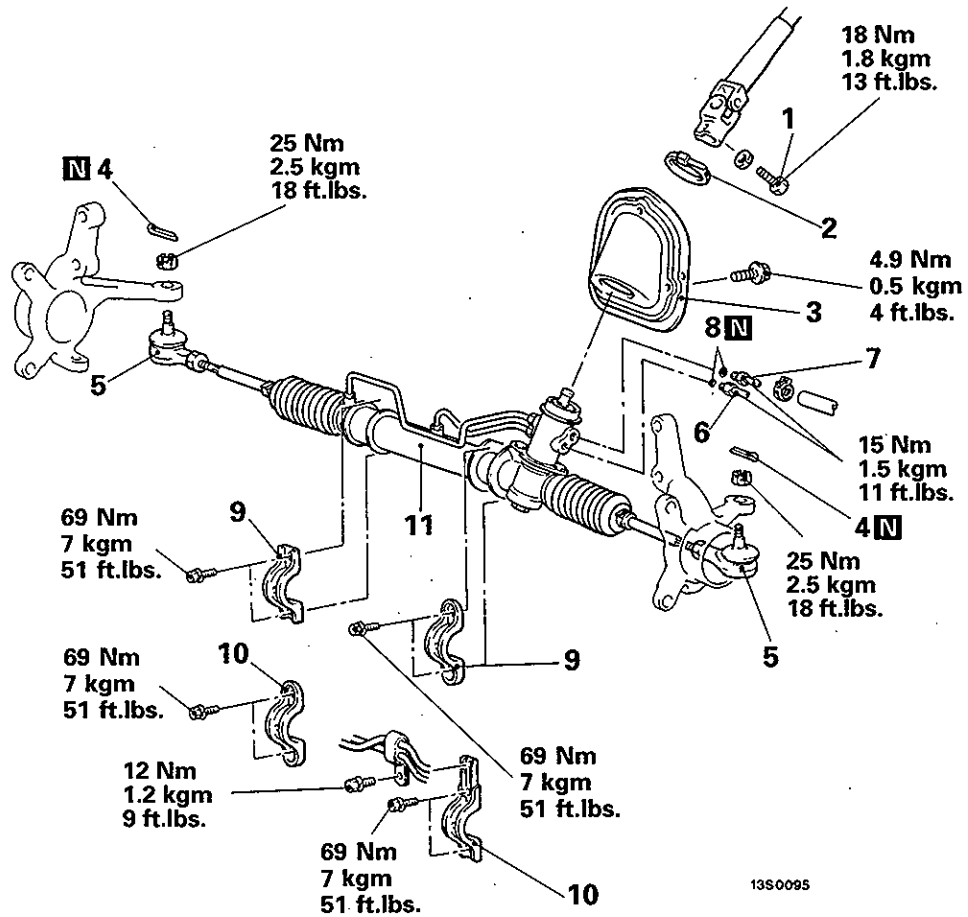
REMOVAL AND INSTALLATION

E37PA--

Pre-removal Operation
- Draining of the Power Steering Fluid (Refer to P.37A-12.)
- Removal of Centermember (Refer to GROUP 32 – Engine Roll Stopper and Centermember.)
- Removal of Front Exhaust Pipe (Refer to GROUP 15 – Exhaust Pipe and Main Muffler)
- For L.H. drive vehicles, turn the steering wheel to the left to move the rack to the right. For R.H. drive vehicles turn the opposite way to move the rack to the left.

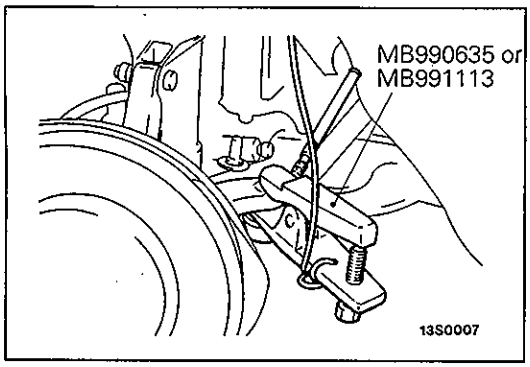
Post-installation Operation
- Installation of Front Exhaust Pipe (Refer to GROUP 15 – Exhaust Pipe and Main Muffler)
- Installation of Centermember (Refer to GROUP 32 – Engine Roll Stopper and Centermember.)
- Supplying of the Power Steering Fluid (Refer to P.37A-12.)
- Bleeding of the Power Steering Fluid Line (Refer to P.37A-13.)
- Inspection of Steering Wheel Centering
- Adjustment of the Front Wheel Alignment (Refer to GROUP 33A – Service Adjustment Procedures.)

CAUTION: SRS
For vehicles with SRS, before removal of steering gear box, refer to GROUP 52B – SRS, center front wheels and remove ignition key. Failure to do so may damage SRS clock spring and render SRS system inoperative, risking serious driver injury.



Removal steps

1. Joint assembly and gear box connecting bolt
2. Band
3. Steering cover
4. Split pin
5. Connection for tie-rod end and knuckle
6. Pressure pipe
7. Return pipe
8. O-ring
9. Clamp <L.H. drive vehicles>
10. Clamp <R.H. drive vehicles>
11. Gear box assembly



SERVICE POINTS OF REMOVAL

E37PBAH

5. DISCONNECTION OF TIE-ROD END

Caution

1. Be sure to tie the cord of the special tool to the nearby part.

2. Loosen the nut but do not remove it.

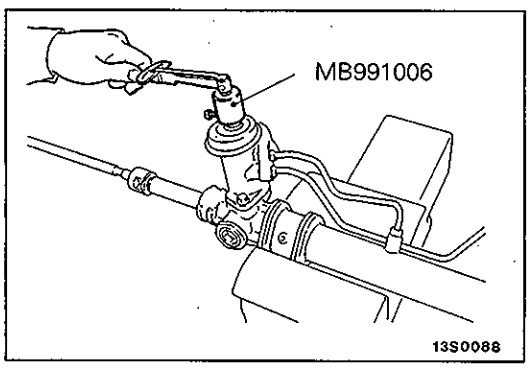
11. REMOVAL OF GEAR BOX ASSEMBLY

Caution

Be careful not to damage the bellows and the tie-rod end dust cover when removing the gear box assembly.

(1) For L.H. drive vehicles, move the gear box assembly to the right and pull out the left-side tie-rod from the fender shield. For R.H. drive vehicles, move the opposite way and pull out the right-side tie-rod from the fender shield.

(2) For L.H. drive vehicles, lower the left side of the gear box assembly and remove it. For R.H. drive vehicles, lower the right side and remove it.



INSPECTION

E37PCAI

- Check the rubber parts for cracks and breakage.

GEAR BOX FOR TOTAL PINION PRELOAD

Using the special tools, rotate the pinion gear at the rate of one rotation in approximately 4 to 6 seconds to check the total pinion preload.

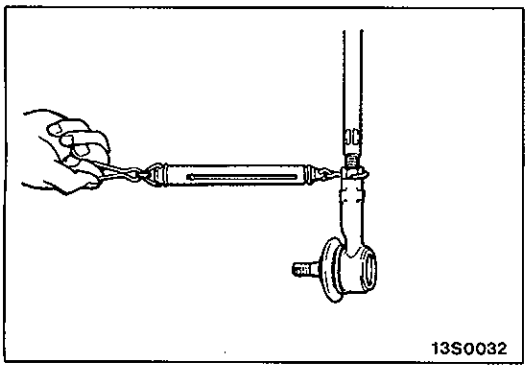
Standard value: 0.6–1.4 Nm (6–14 kgcm, 5–12 in.lbs.)
[Change in torque: 0.4 Nm (4 kgcm, 3 in.lbs.)]

NOTE

Measure the pinion preload through the whole stroke of the rack.

If the measured value is not within the standard range, first adjust the rack support cover, and then check the total pinion starting torque again.

If the total pinion starting torque cannot be adjusted to within the standard range by adjusting the rack support cover, check the rack support cover, rack support spring, rack support and replace any parts necessary.



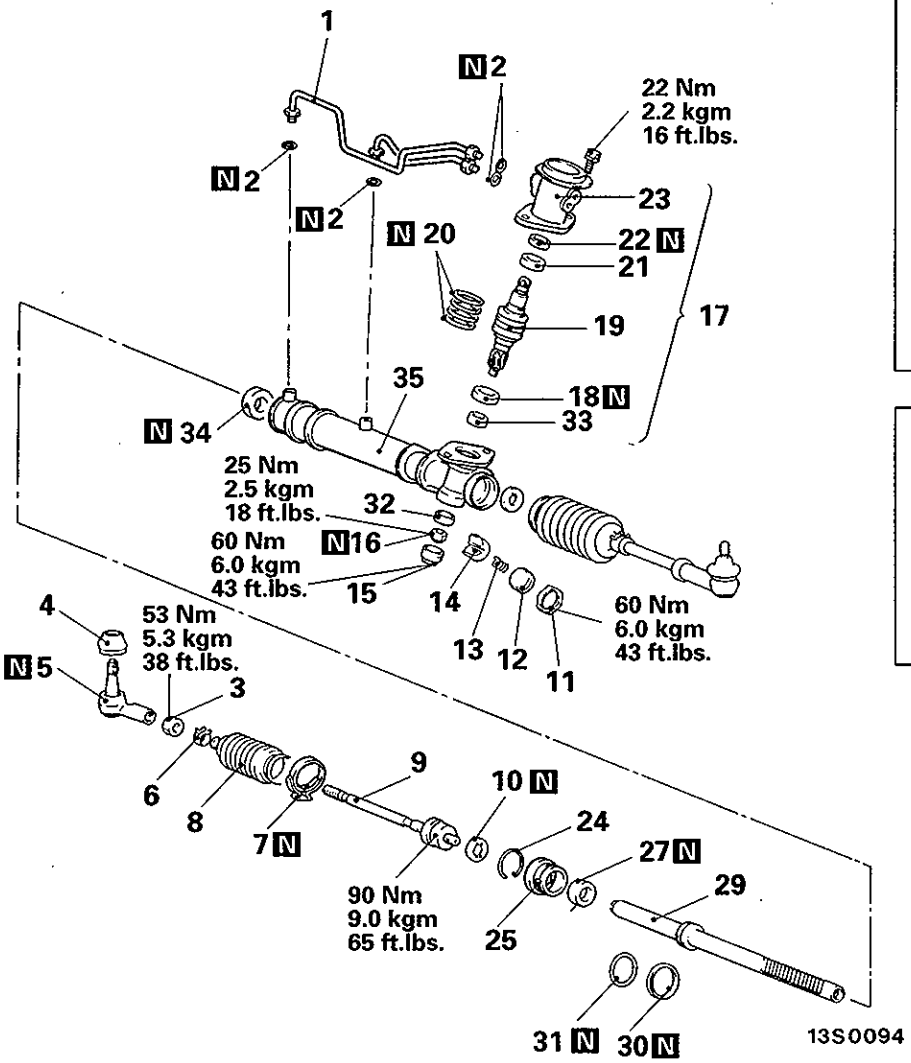
CHECK THE TIE ROD FOR SWING RESISTANCE

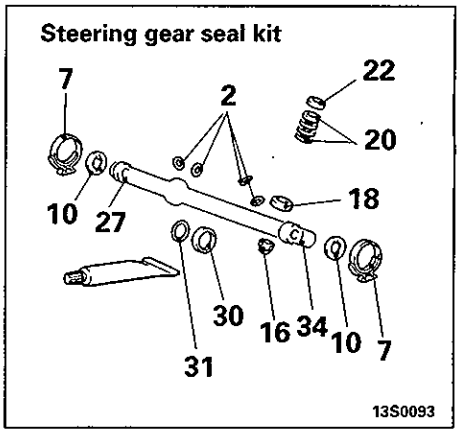
(1) Give 10 hard swings to the tie rod.
(2) Measure the tie rod swing resistance with a spring balance.

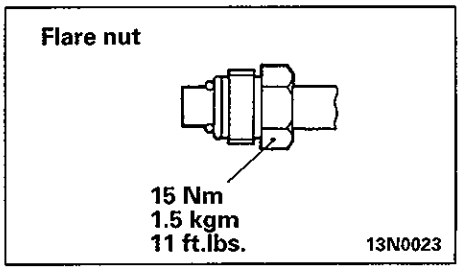
Standard value: 8–20 N (0.8–2.0 kg, 1.9–4.4 lbs.)
[2–5 Nm (20–50 kgcm, 17–43 in.lbs.)]

(3) If the measured value exceeds the standard value, replace tie rod assembly.
(4) Even if the measured value is below the standard value, the tie rod which swings smoothly without excessive play may be used.

DISASSEMBLY AND REASSEMBLY <L.H. drive vehicles built up to April, 1992 and R.H. drive vehicles built up to May, 1992>



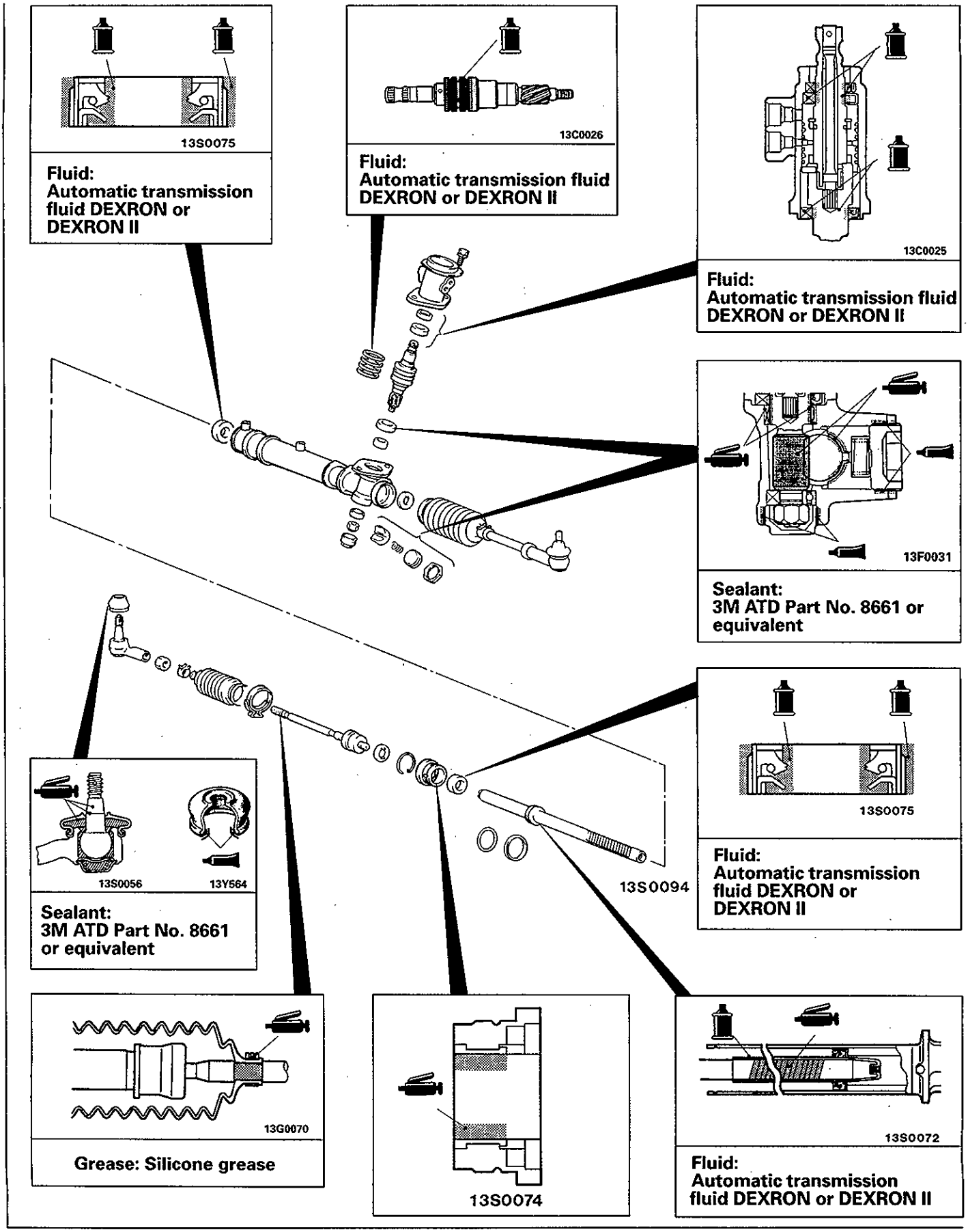




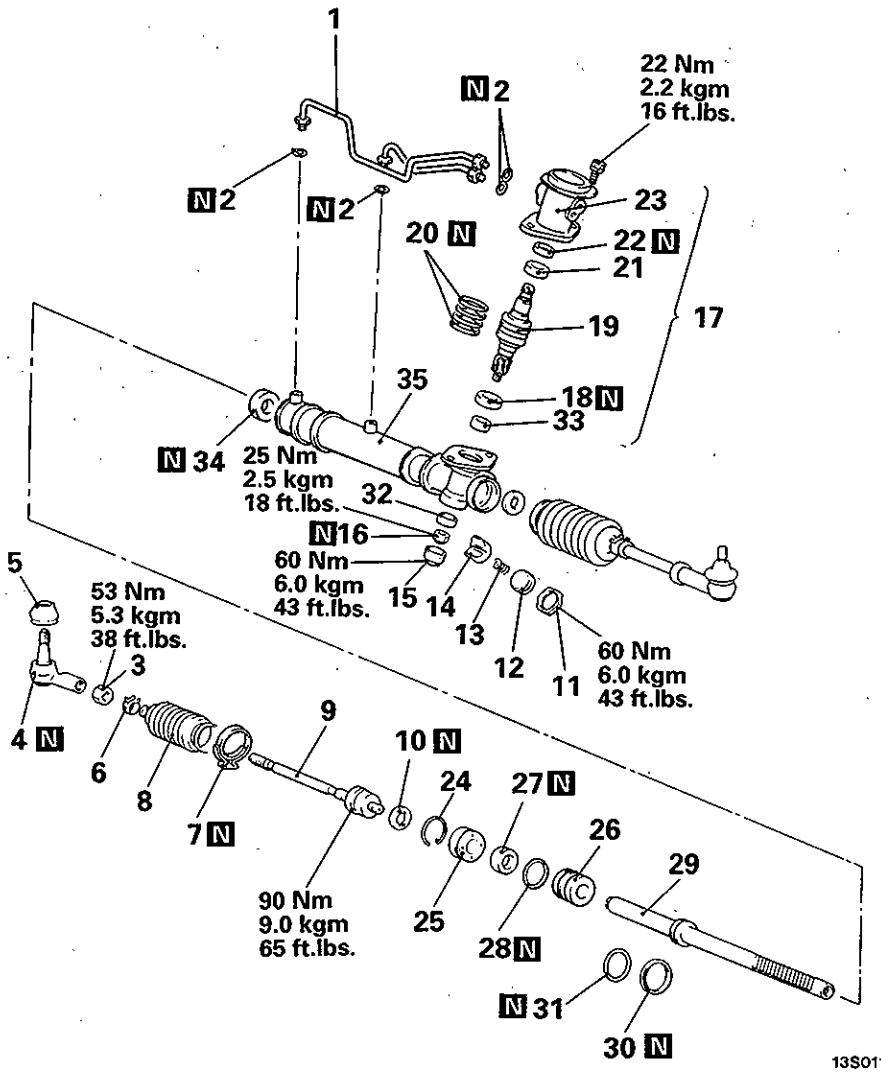
Disassembly steps

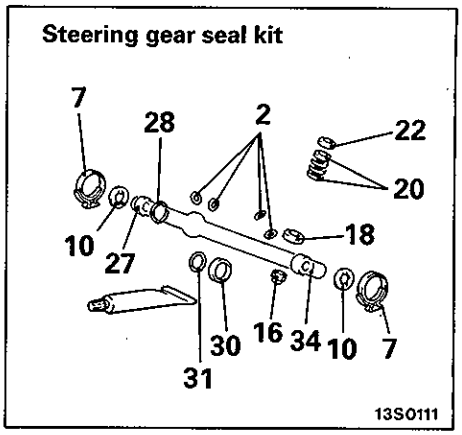
1. Feed pipe
2. O-ring
3. Tie-rod end locking nut
4. Tie-rod end
5. Dust cover
6. Bellows clip
7. Bellows band
8. Bellows
9. Tie-rod
10. Tab washer
    - Adjustment of total pinion preload
11. Locking nut
12. Rack support cover
13. Rack support spring
14. Rack support
15. End plug
16. Self-locking nut
17. Valve housing assembly
18. Oil seal
19. Pinion and valve assembly
20. Seal ring
21. Ball bearing
22. Oil seal
23. Valve housing
24. Circlip
25. Rack stopper
27. Oil seal
29. Rack
30. Seal ring
31. O-ring
32. Ball bearing
33. Needle roller bearing
34. Oil seal
35. Rack housing

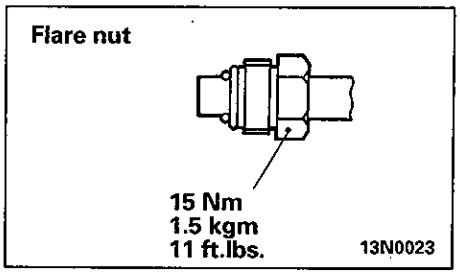
LUBRICATION AND SEALING POINTS <L.H. drive vehicles built up to April, 1992 and R.H. drive vehicles built up to May, 1992>



DISASSEMBLY AND REASSEMBLY <L.H. drive vehicles built from May, 1992 and R.H. drive vehicles built from June, 1992>



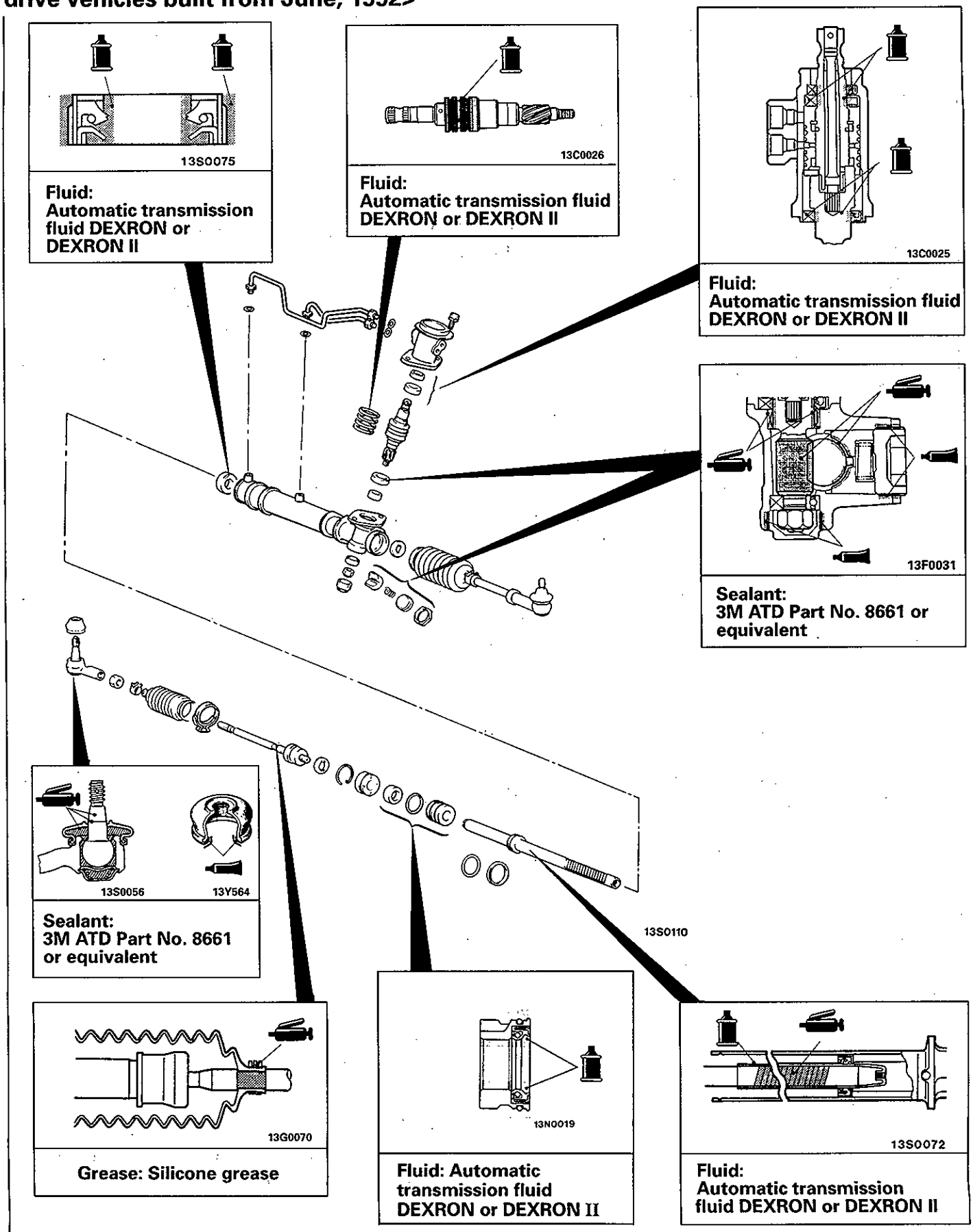


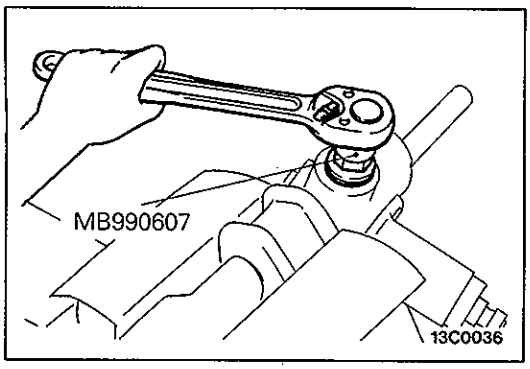


Disassembly steps

1. Feed pipe
2. O-ring
3. Tie-rod end locking nut
4. Tie-rod end
5. Dust cover
6. Bellows clip
7. Bellows band
8. Bellows
9. Tie-rod
10. Tab washer
- Adjustment of total pinion preload
11. Locking nut
12. Rack support cover
13. Rack support spring
14. Rack support
15. End plug
16. Self-locking nut
17. Valve housing assembly
18. Oil seal
19. Pinion and valve assembly
20. Seal ring
21. Ball bearing
22. Oil seal
23. Valve housing
24. Circlip
25. Rack stopper
26. Rack bushing
27. Oil seal
28. O-ring
29. Rack
30. Seal ring
31. O-ring
32. Ball bearing
33. Needle roller bearing
34. Oil seal
35. Rack housing

LUBRICATION AND SEALING POINTS <L.H. drive vehicles built from May, 1992 and R.H. drive vehicles built from June, 1992>

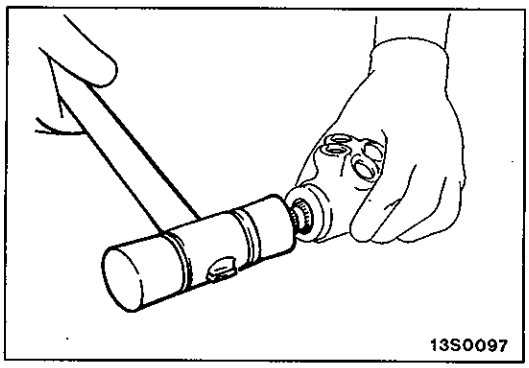




SERVICE POINTS OF DISASSEMBLY E37PFAN

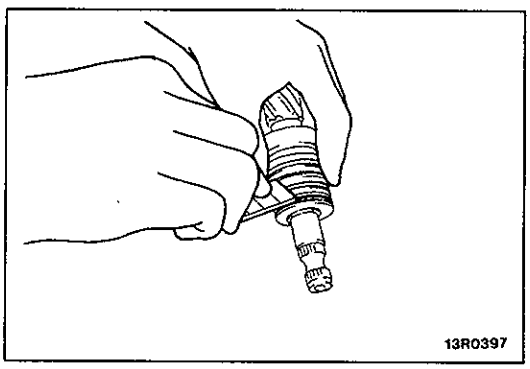
12. REMOVAL OF RACK SUPPORT COVER

Using the special tool, remove the rack support cover from the gear box.



18. REMOVAL OF OIL SEAL/19. PINION AND VALVE ASSEMBLY

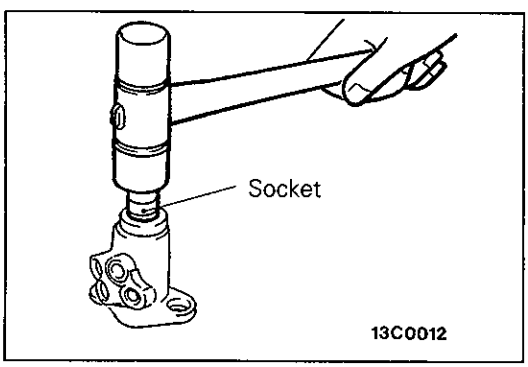
Using a plastic hammer, gently tap the pinion to remove it.



20./30. REMOVAL OF SEAL RING

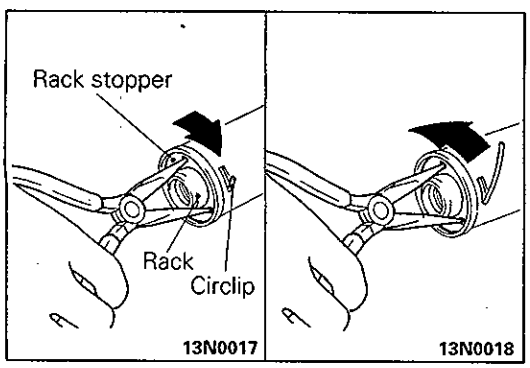
Cut the seal ring and remove it from the pinion and valve assembly and the rack.

Caution
When cutting the seal ring, be careful not to damage the pinion and valve assembly or the rack.



21. REMOVAL OF BALL BEARING/22. OIL SEAL

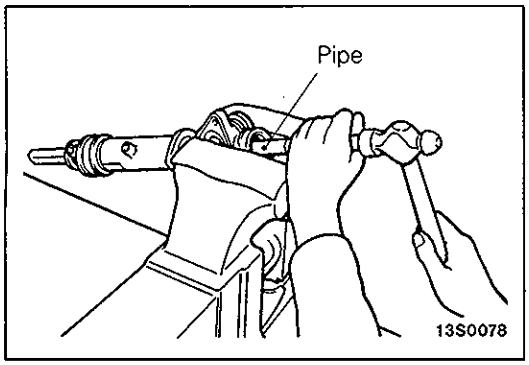
Using a socket, remove the oil seal and the ball bearing from the valve housing simultaneously.



24. REMOVAL OF CIRCLIP

(1) Turn the rack stopper clockwise until the end of the circlip comes out of the slot in the rack housing.
(2) Turn the rack stopper anticlockwise to remove the circlip.

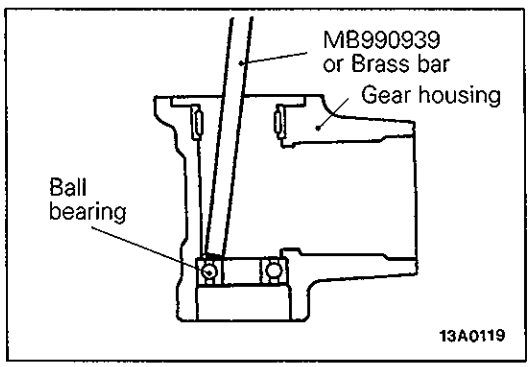
Caution
Note that if the rack stopper is first turned anticlockwise, the circlip will get caught in the slot in the housing and the rack stopper will not turn.



27. REMOVAL OF OIL SEAL/29. RACK

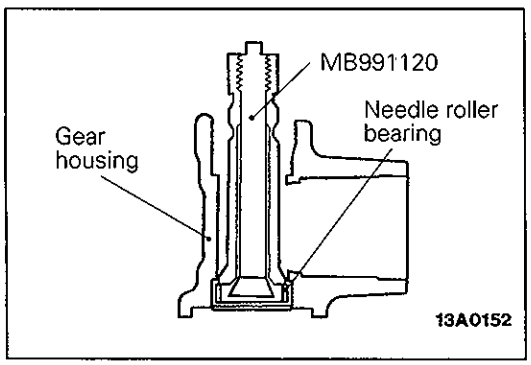
Use a pipe or similar tool to pull out the oil seal together with the rack.

Caution
Be careful not to damage the inner surface of the rack cylinder of the gear housing.



32. REMOVAL OF BALL BEARING

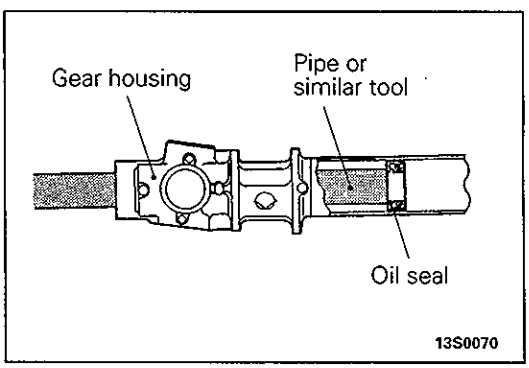
Use a brass bar or special tool to remove the ball bearing from the gear housing.



33. REMOVAL OF NEEDLE ROLLER BEARING

Use the special tool to remove the needle roller bearing from the rack housing.

Caution
Do not open special tool excessively to prevent damaging housing interior.



34. REMOVAL OF OIL SEAL

Use a piece of pipe or similar tool to remove the oil seal from the gear housing.

Caution
Be careful not to damage the inner surface of the rack cylinder of the gear housing.

INSPECTION

E37PGAG

RACK

- Check the rack tooth surfaces for damage or wear.
- Check the oil seal contact surfaces for uneven wear.
- Check the rack for bends.

PINION AND VALVE ASSEMBLY

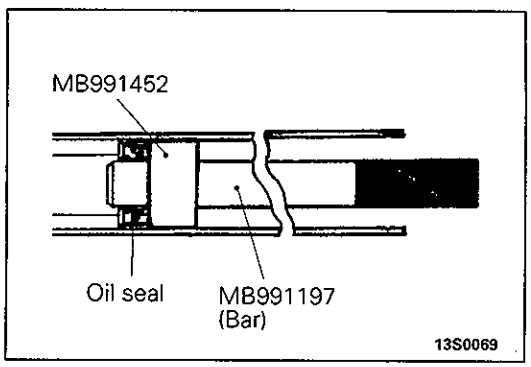
- Check the pinion gear tooth surfaces for damage or wear.
- Check for worn or defective seal ring.

BEARING

- Check for roughness or abnormal noise during bearing operation.
- Check the bearing for play.
- Check the needle roller bearings for roller slip-off.

OTHERS

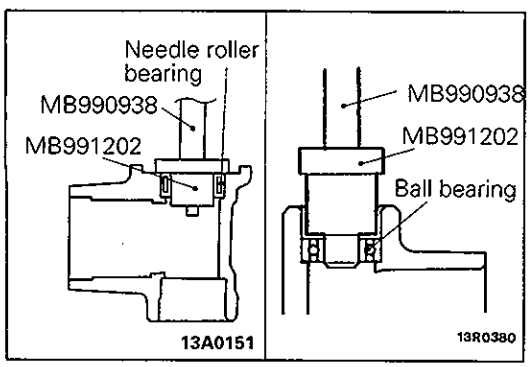
- Check the cylinder inner surface of the rack housing for damage.
- Check the boots for damage, cracking or deterioration.
- Check the rack support for uneven wear or dents.
- Check the rack bushing for uneven wear or damage.



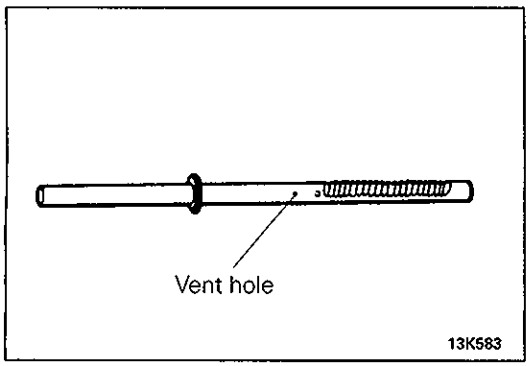
SERVICE POINTS OF REASSEMBLY

E37PHAR

34. INSTALLATION OF OIL SEAL



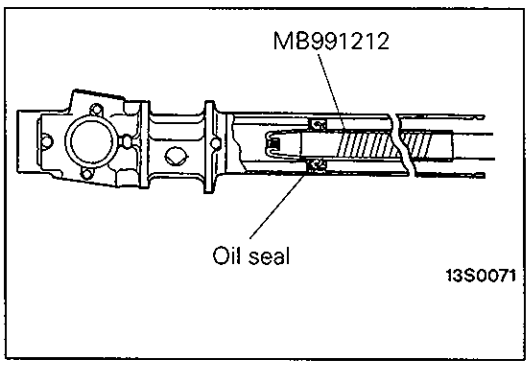
33. INSTALLATION OF NEEDLE ROLLER BEARING/32. BALL BEARING



29. INSTALLATION OF RACK

(1) Apply a coating of multipurpose grease to the rack teeth face.

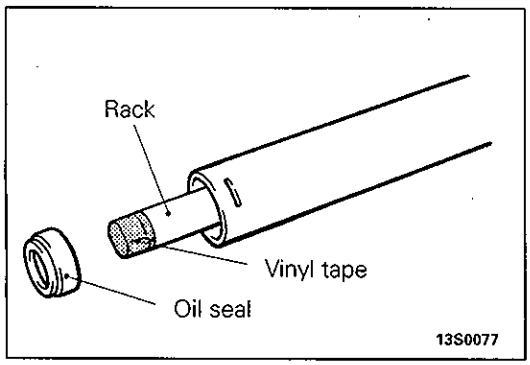
Caution
Do not close the vent hole in the rack with grease.



(2) Cover rack serrations with special tool.
(3) Apply specified fluid on special tool.

Specified fluid: Automatic transmission fluid DEXRON or DEXRON II

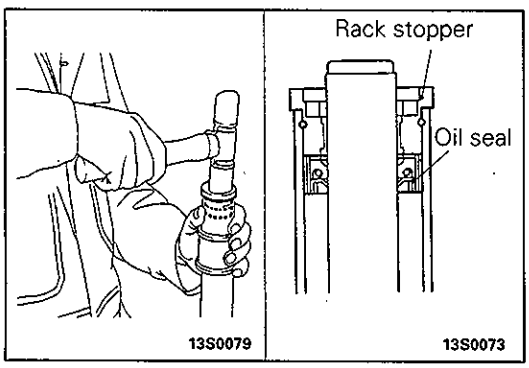
(4) Match oil seal centre with rack to prevent retainer spring from slipping and slowly insert rack from power cylinder side.



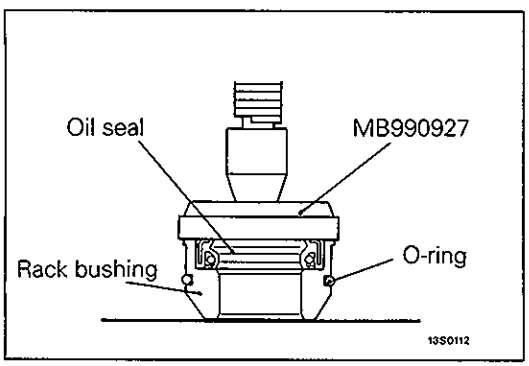
27. INSTALLATION OF OIL SEAL/25. RACK STOPPER

<L.H. drive vehicles built up to April, 1992 and R.H. drive vehicles built up to May, 1992>

(1) Apply specified fluid to the inside and outside surfaces of the oil seal.
(2) Wind vinyl tape around the edge of the rack and install the oil seal to the rack.



(3) Use the rack stopper to press-fit the oil seal.

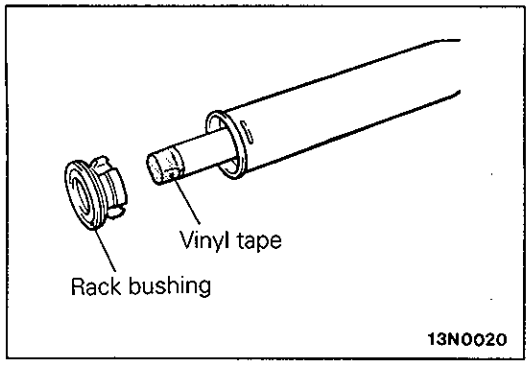


27. INSTALLATION OF OIL SEAL/26. RACK BUSHING

<L.H. drive vehicles built from May, 1992 and R.H. drive vehicles built from June, 1992>

(1) Apply specified fluid to the outer surface of the oil seal. Press-fit the oil seal using the special tool until it is flush with the bushing end face.

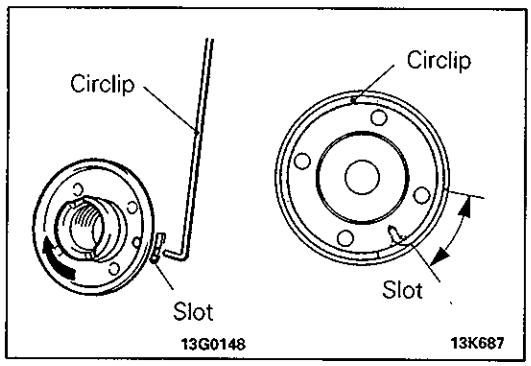
Specified fluid: Automatic transmission fluid DEXRON or DEXRON II



(2) Apply specified fluid to the oil seal inner surface and the O-ring.

Specified fluid: Automatic transmission fluid DEXRON or DEXRON II

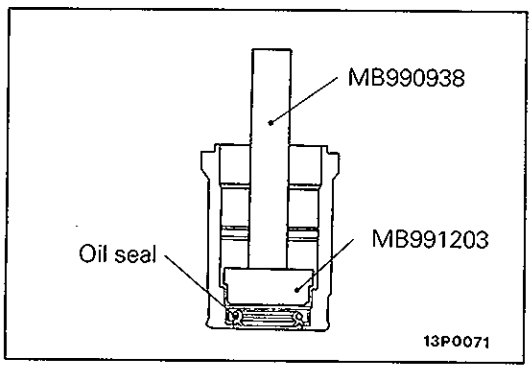
(3) Wrap the rack end with vinyl tape, and push the rack bushing onto the rack.



24. INSTALLATION OF CIRCLIP

Insert circlip to rack stopper hole through cylinder hole. Turn rack stopper clockwise and insert circlip firmly.

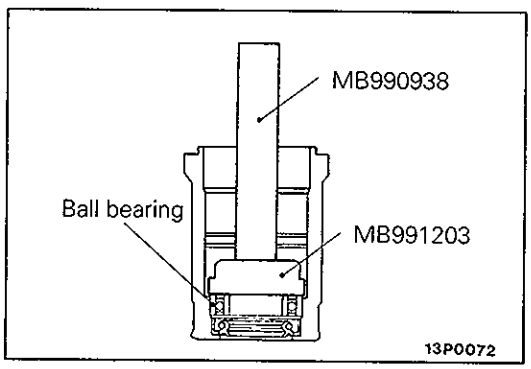
Caution
Insert circlip to rack stopper hole while turning rack stopper clockwise.



22. INSTALLATION OF OIL SEAL

Apply a coating of the specified fluid to the outside of the oil seal. Using the special tools, press the oil seal into the valve housing.

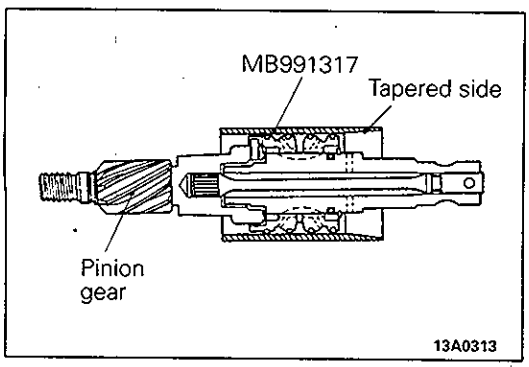
Specified fluid: Automatic transmission fluid DEXRON or DEXRON II



21. INSTALLATION OF BALL BEARING

Apply a coating of the specified fluid to the outside of the ball bearing. Using the special tools, press the ball bearing into the valve housing.

Specified fluid: Automatic transmission fluid DEXRON or DEXRON II

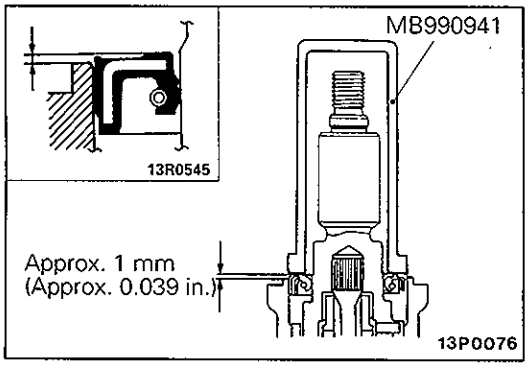


20. INSTALLATION OF SEAL RING

(1) Kneed the seal ring to soften it.
(2) Apply the specified fluid to the seal ring, and install to the rack groove.

Specified fluid: Automatic transmission fluid DEXRON or DEXRON II

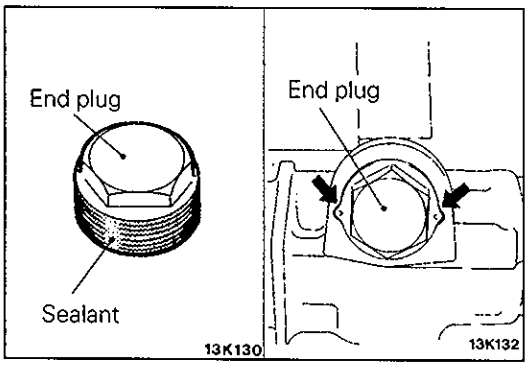
(3) Insert the tapered side of the special tool from the pinion gear side, and compress the seal ring.



18. INSTALLATION OF OIL SEAL

Using the special tool, press the oil seal into the valve housing.

Caution
In order to eliminate a seal malfunction at the valve housing alignment surface, the upper surface of the oil seal should project outward approximately 1 mm (0.039 in.) from the housing edge surface.

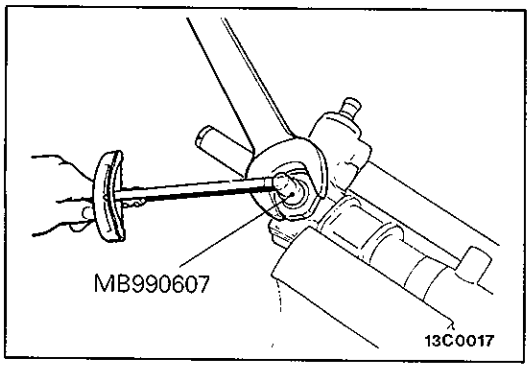


15. INSTALLATION OF END PLUG

(1) Apply the specified sealant to the threaded part of the end plug.

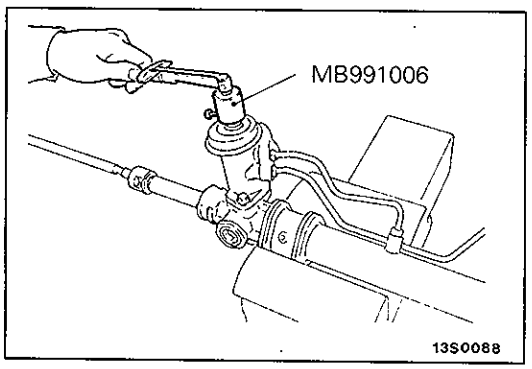
Specified sealant: 3M ATD Part No. 8661 or equivalent

(2) Secure the threaded portion of the end plug at two places by using a punch.



• ADJUSTMENT OF TOTAL PINION PRELOAD

(1) Position rack at its centre. With special tool, tighten rack support cover to 15 Nm (1.5 kgm, 11 ft.lbs.)
(2) In neutral position, rotate pinion shaft clockwise one turn/4-6 seconds with special tool. Return rack support cover 30° – 60° and adjust torque to the standard value.



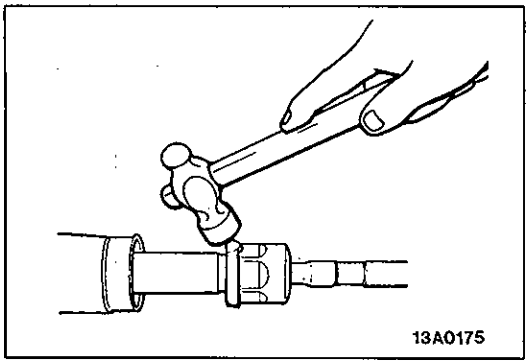
(3) Using the special tool, rotate the pinion gear at the rate of one rotation in approximately 4 to 6 seconds to check the total pinion preload.

Standard value: 0.6–1.4 Nm
(6–14 kgcm, 5–12 in.lbs.)
[Change in torque: 0.4 Nm (4 kgcm, 3 in.lbs.)]

Caution
1. **When adjusting, set the standard value at its highest value.**
2. **Assure no ratcheting or catching when operating rack towards the shaft direction.**

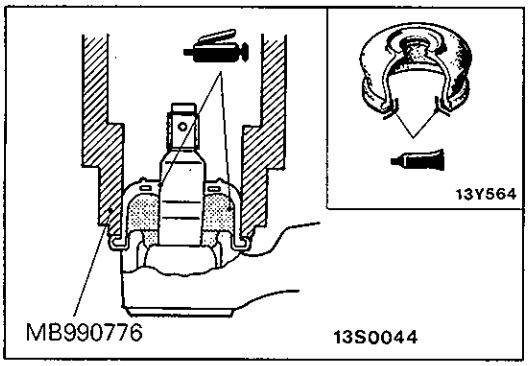
NOTE
When it cannot be adjusted within the specified return angle, check rack support cover components or replace.

(4) After adjusting, lock rack support cover with lock nut.



10. INSTALLATION OF TAB WASHER/9. TIE ROD

After installing tie-rod to rack, fold tab washer end (2 locations) to tie rod notch.

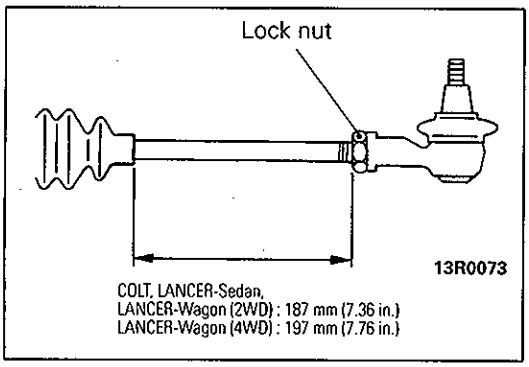


5. INSTALLATION OF DUST COVER

(1) Pack dust cover interior with multipurpose grease.
(2) Apply specified sealant to dust cover lip.

Specified sealant: 3M ATD Part No. 8661 or equivalent

(3) Using the special tool, install the dust cover to the tie rod end ball joint.



4. INSTALLATION OF TIE ROD END/3. TIE ROD END LOCKING NUT

Screw in tie-rod end to have its right and left length as illustrated. Lock with lock nut.

Caution
Fully tighten the lock nut after installing the gear box and adjusting the toe-in.

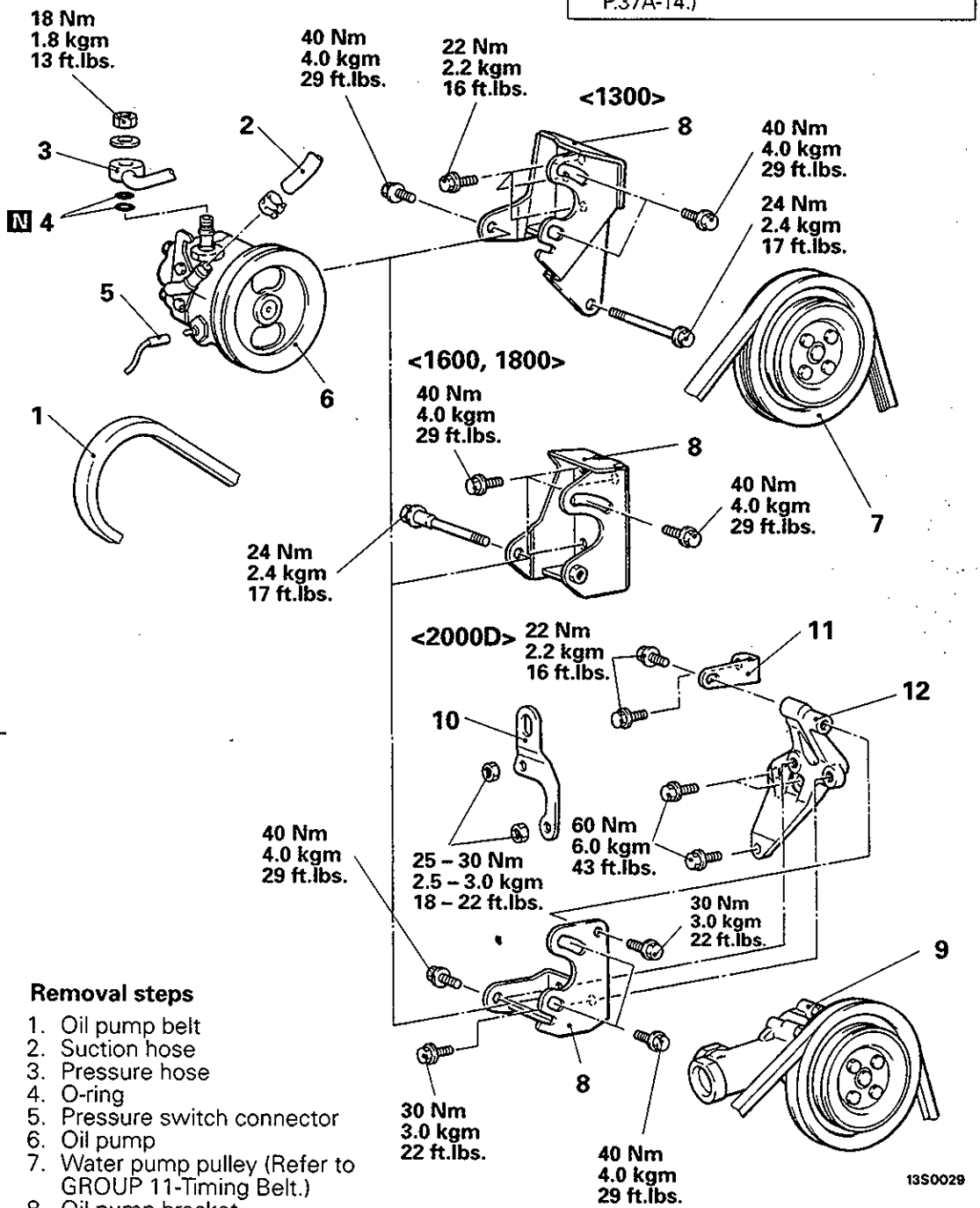
POWER STEERING OIL PUMP

REMOVAL AND INSTALLATION

E37RA--

Pre-removal Operation
- Draining of the Power Steering Fluid (Refer to P.37A-12.)

Post-installation Operation
- Supplying of the Power Steering Fluid
- Adjusting Drive-belt Tension (Refer to P.37A-9.)
- Bleeding of the Power Steering Fluid Line (Refer to P.37A-13.)
- Check the Oil Pump Pressure (Refer to P.37A-14.)



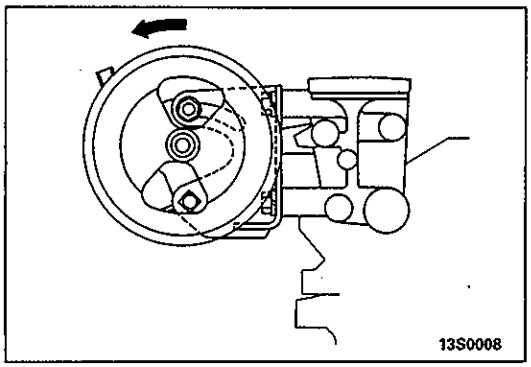
Removal steps

1. Oil pump belt
2. Suction hose
3. ◆◆ Pressure hose
4. O-ring
5. Pressure switch connector
6. ◆◆ Oil pump
7. Water pump pulley (Refer to GROUP 11-Timing Belt.)
8. Oil pump bracket
9. Water pump (Refer to GROUP 14 – Water Pump)
10. Engine hanger
11. Bracket stay
12. Bracket

INSPECTION

E37RCAAB

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

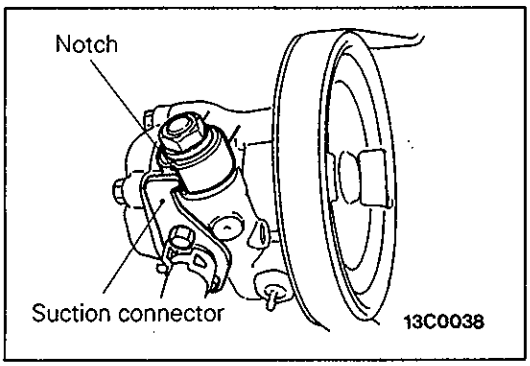


SERVICE POINTS OF INSTALLATION

E37RDAM

6. INSTALLATION OF OIL PUMP <1600, 1800>

For vehicles with air conditioner, install the oil pump to the bracket so that it is in a position towards the front, and adjust the belt tension using the air conditioner tension pulley. (Refer to P.37A–10.)

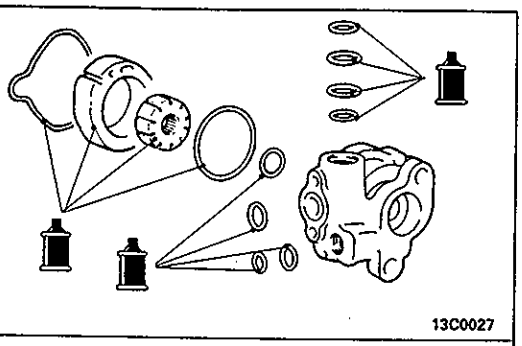


3. INSTALLATION OF PRESSURE HOSE

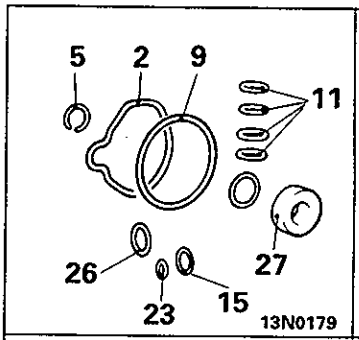
Connect the pressure hose so that its notch part contacts the suction connector.

DISASSEMBLY AND REASSEMBLY

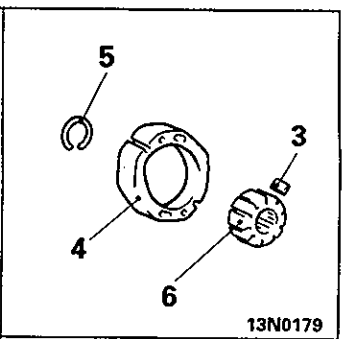
E37RE--



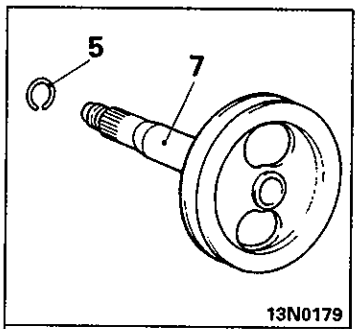
Fluid: Automatic transmission fluid DEXRON or DEXRON II



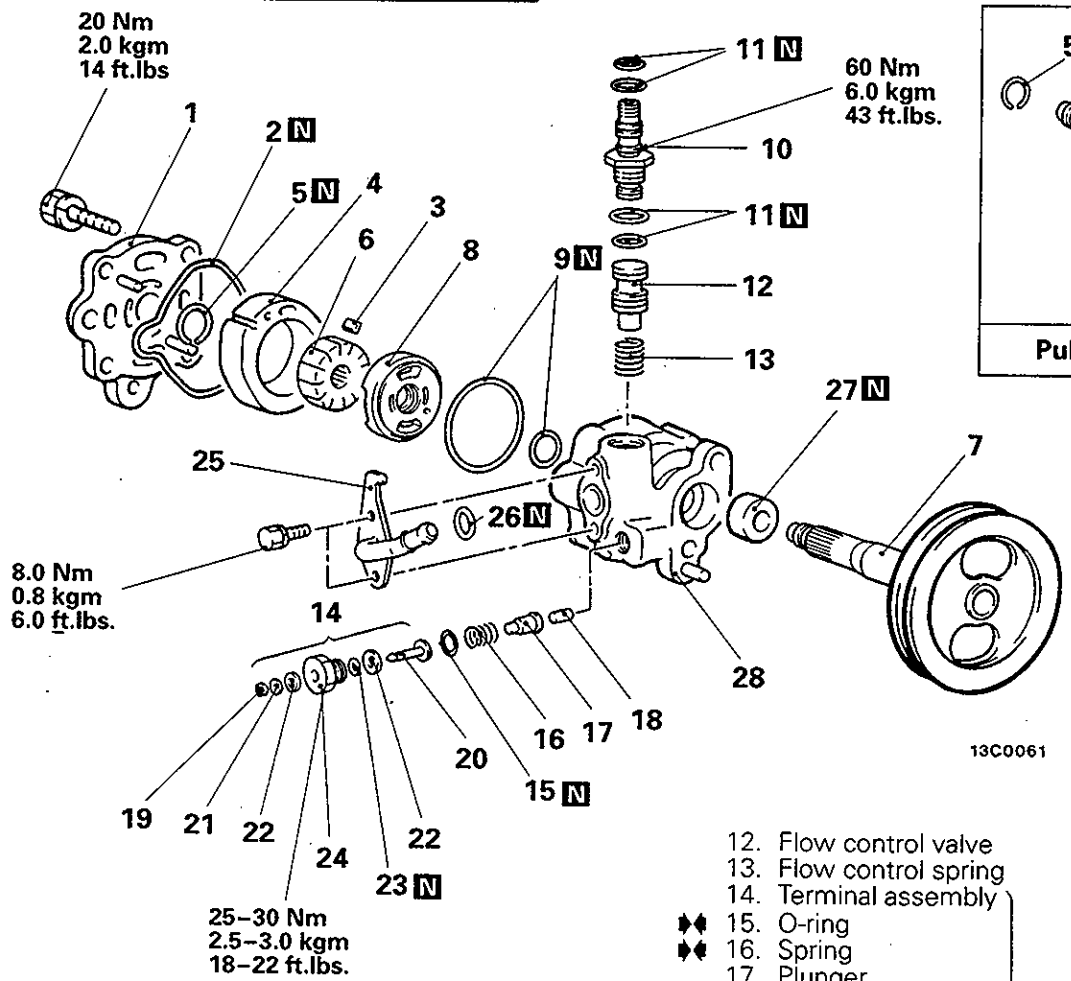
Oil pump seal kit



Oil pump cartridge kit



Pulley and shaft kit

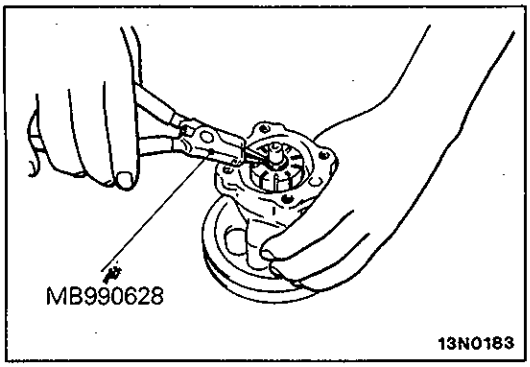


Disassembly steps

1. Pump cover
2. O-ring
3. Vanes
4. Cam ring
5. Snap ring
6. Rotor
7. Pulley assembly
8. Side plate
9. O-ring
10. Connector
11. O-ring
12. Flow control valve
13. Flow control spring
14. Terminal assembly
15. O-ring
16. Spring
17. Plunger
18. Piston rod
19. Snap ring
20. Terminal
21. Washer
22. Insulator
23. O-ring
24. Plug
25. Suction connector
26. O-ring
27. Oil seal
28. Oil pump body

(Steps 14–24: Petrol-powered vehicles)

Caution
Do not disassemble the flow control valve.

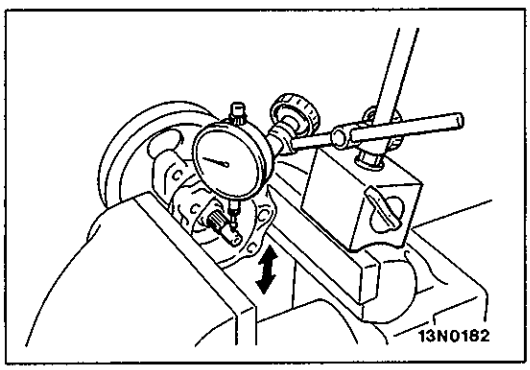


SERVICE POINTS OF DISASSEMBLY E37RFAH

5. REMOVAL OF SNAP RING

INSPECTION E37RGAH

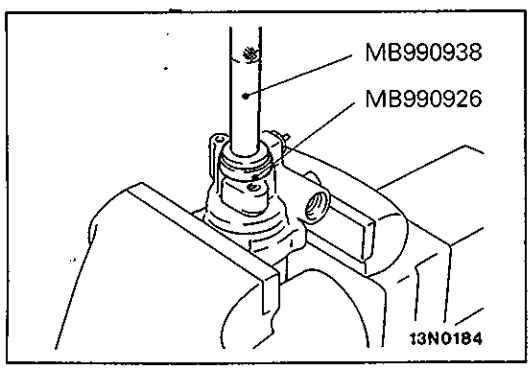
- Check the flow control valve for clogging.
- Check the pulley assembly for wear or damage.
- Check the groove of rotor and vane for "Stepped" wear.
- Check the contact surface of cam ring and vanes for "stepped" wear.
- Check the vanes for damage.



CLEARANCE BETWEEN SHAFT AND PUMP BODY

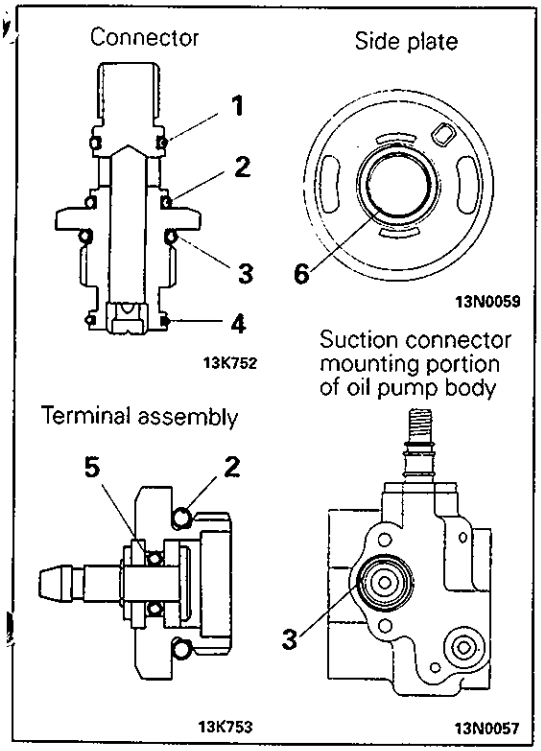
(1) Place the dial gauge against the end of the pulley assembly's shaft.
(2) Move the pulley assembly up and down and measure the play.

Limit: 0.1 mm (0.004 in.)



SERVICE POINTS OF REASSEMBLY E37RHAL

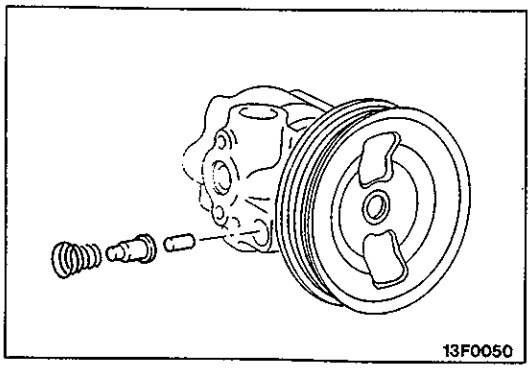
27. INSTALLATION OF OIL SEAL



26. 23.15.11.9. INSTALLATION OF O-RINGS

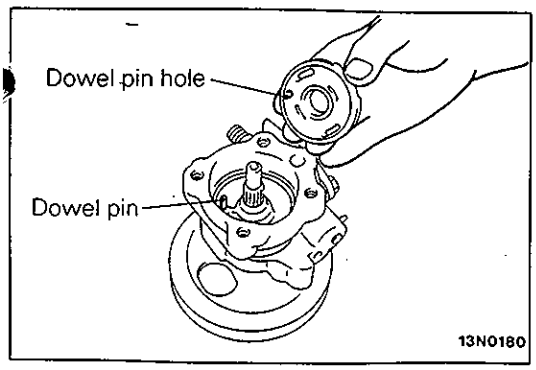
Apply specified fluid on O-rings to install.

No.	I.D. × Width	mm (in.)
1	11 × 1.9	(0.433 × 0.075)
2	13 × 1.9	(0.512 × 0.075)
3	17.8 × 2.4	(0.701 × 0.094)
4	13.5 × 1.5	(0.531 × 0.059)
5	3.8 × 1.9	(0.150 × 0.075)
6	16.8 × 2.4	(0.661 × 0.094)



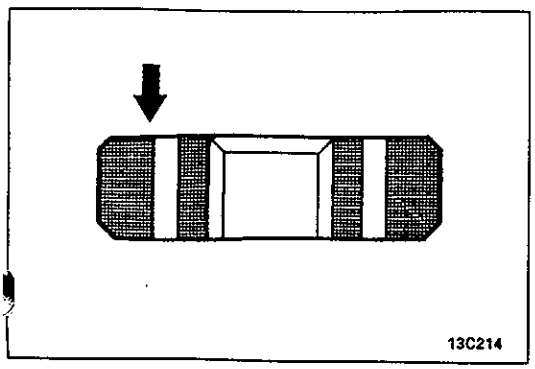
16. INSTALLATION OF SPRING

Fit the spring to the oil pump body with the larger diameter end at the terminal assembly side.



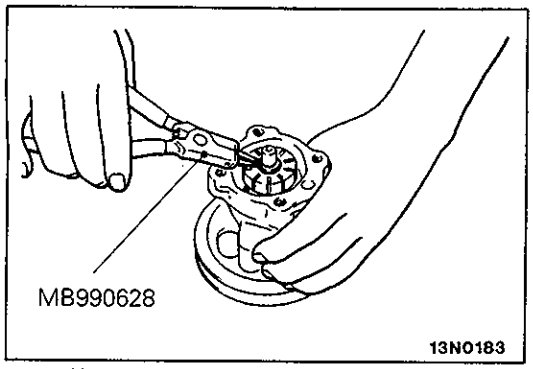
8. INSTALLATION OF SIDE PLATE

Line up the dowel pin hole of the side plate with the dowel pin of the pump body when installing the side plate.

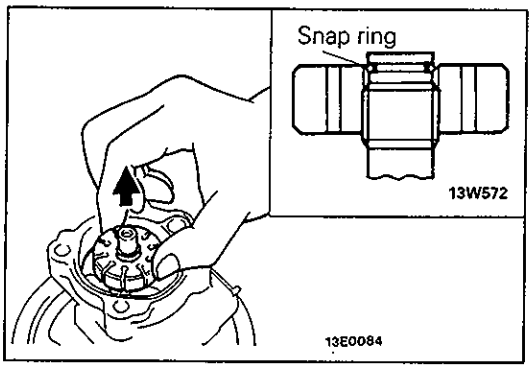


6. INSTALLATION OF ROTOR

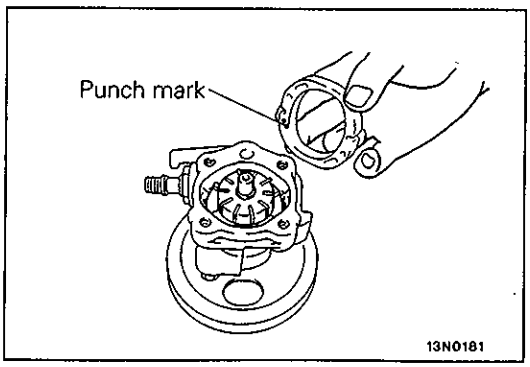
Install the rotor to the pulley assembly so that the rotor's punch mark is at the pump cover side.



5. INSTALLATION OF SNAP RING

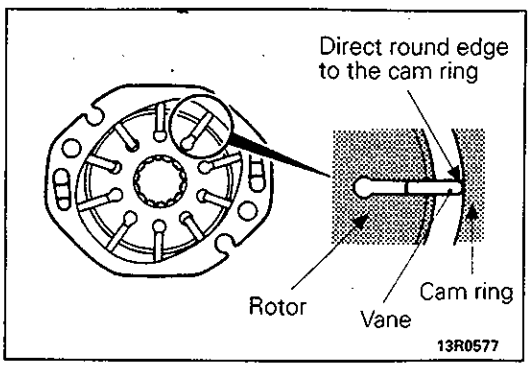


After installation of the snap ring, lift the rotor and check that the snap ring has entered the countersunk part.



4. INSTALLATION OF CAM RING

Install the cam ring with the punch mark facing the side plate.



3. INSTALLATION OF VANES

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

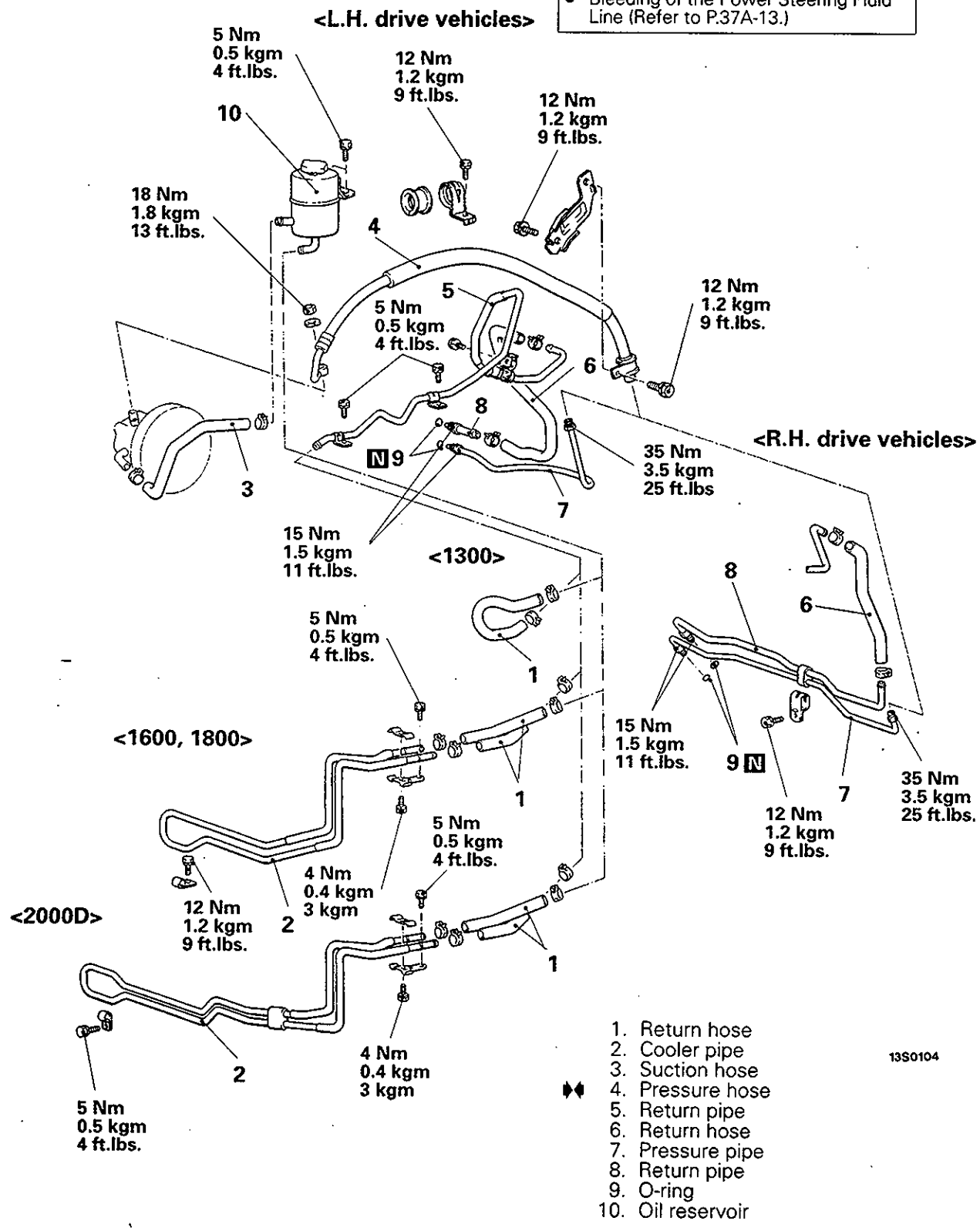
POWER STEERING HOSES

REMOVAL AND INSTALLATION

E37TA--

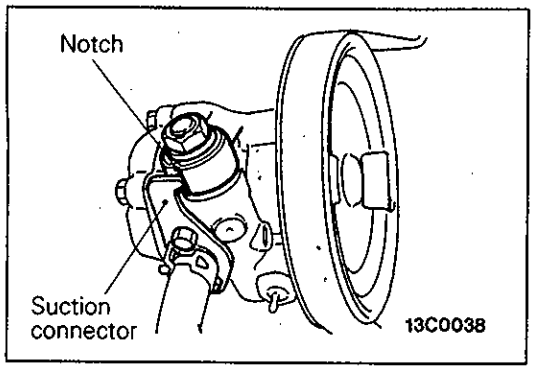
Pre-removal Operation
- Draining of the Power Steering Fluid
- Removal of Front Bumper <1600, 1800 and 2000D> (Refer to GROUP 51 – Front Bumper.)

Post-installation Operation
- Installation of Front Bumper <1600, 1800 and 2000D> (Refer to GROUP 51 – Front Bumper.)
- Supplying of the Power Steering Fluid
- Bleeding of the Power Steering Fluid Line (Refer to P.37A-13.)



1. Return hose
2. Cooler pipe
3. Suction hose
4. Pressure hose
5. Return pipe
6. Return hose
7. Pressure pipe
8. Return pipe
9. O-ring
10. Oil reservoir

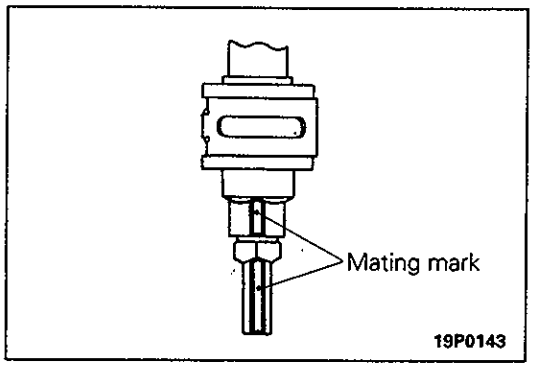
13S0104



SERVICE POINTS OF INSTALLATION E37TDAK

4. INSTALLATION OF PRESSURE HOSE

(1) Connect the pressure hose so that its notch part contacts the suction connector.



(2) Align the marks on the pressure hose and pressure pipe, and install the pressure hose.