SECTION 3B

STEERING GEAR BOX (MANUAL TYPE) AND LINKAGE

WARNING:

For vehicles equipped with Supplemental Restraint (Air Bag) System

- **Service on and around the air bag system components or wiring must be performed only by an authorized SUZUKI dealer. Refer to "Air Bag System Components and Wiring Location View" under "General Description" in air bag system section in order to confirm whether you are performing service on or near the air bag system components or wiring. Please observe all WARNINGS and "Service Precautions" under "On-Vehicle Service" in air bag system section before performing service on or around the air bag system components or wiring. Failure to follow WARNINGS could result in unintentional activation of the system or could render the system inoperative. Either of these two conditions may result in severe injury.**
- **Technical service work must be started at least 90 seconds after the ignition switch is turned to the "LOCK" position and negative cable is disconnected from the battery. Otherwise, the system may be activated by reserve energy in the Sensing and Diagnostic Module (SDM)**

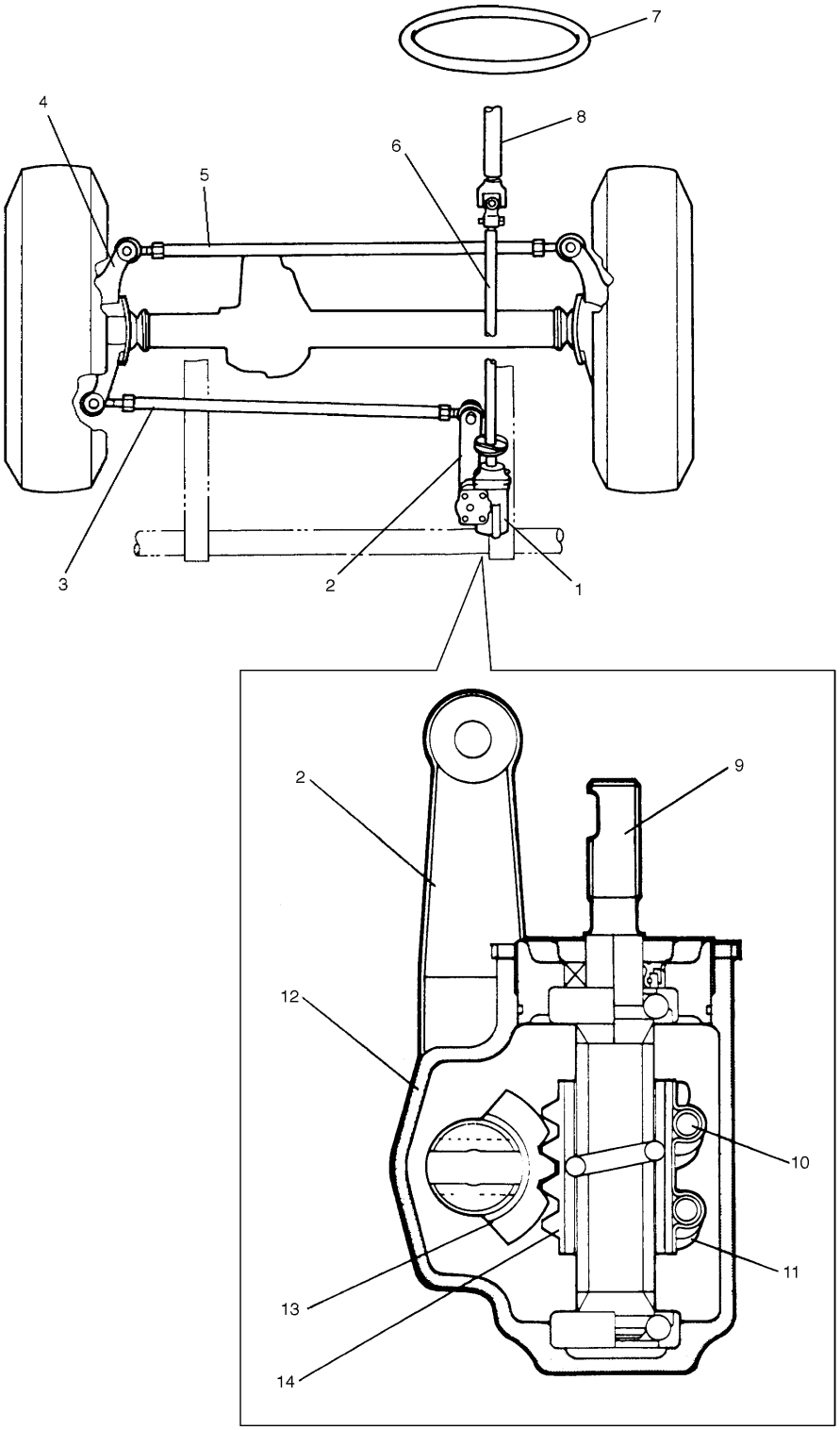
NOTE:

All steering gear fasteners are important attaching parts in that they could affect the performance of vital parts and systems, and/or could result in major repair expense. They must be replaced with one of the same part number or with an equivalent part if replacement becomes necessary. Do not use a replacement part of lesser quality or substitute design. Torque values must be used as specified during reassembly to assure proper retention of these parts.

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General Description



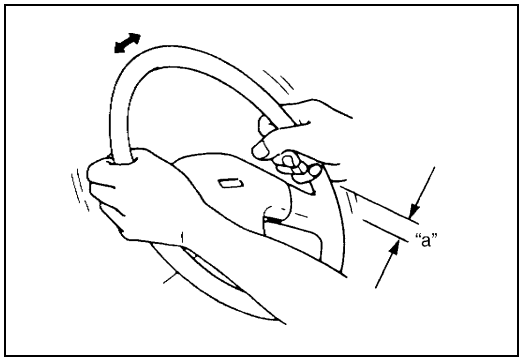
1. Steering gear box	5. Tie rod	9. Worm shaft	13. Sector shaft
2. Pitman arm	6. Steering lower shaft	10. Ball	14. Rack gear
3. Drag rod	7. Steering wheel	11. Ball nut	
4. Knuckle arm	8. Steering upper shaft	12. Gear case	

Diagnosis

Diagnosis Table

Refer to “Diagnosis Table” in Section 3.

Steering Wheel Play Check



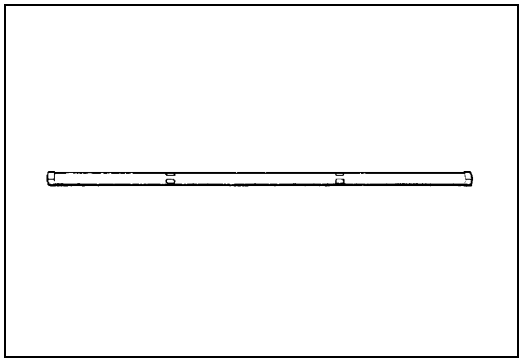
Check steering wheel for play and rattle, holding vehicle in straight forward condition on ground.

Steering wheel play
“a” : 10 – 30 mm (0.4 – 1.2 in.)

If play is not within specification, inspect for the following. If found defective, replace.

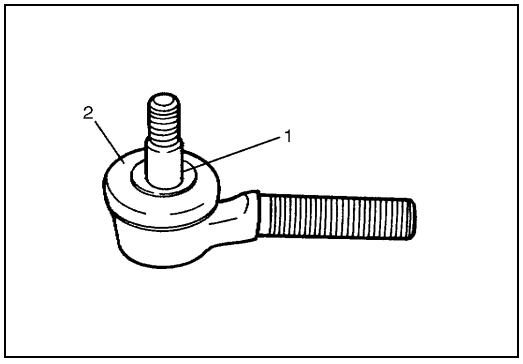
- Wear of tie rod end ball stud.
- Wear of king pin bearing
- Wear of steering shaft joint.
- Loosely install or joined parts.
- Wear of steering rack / sector gear.

Tie Rod And Drag Rod Check



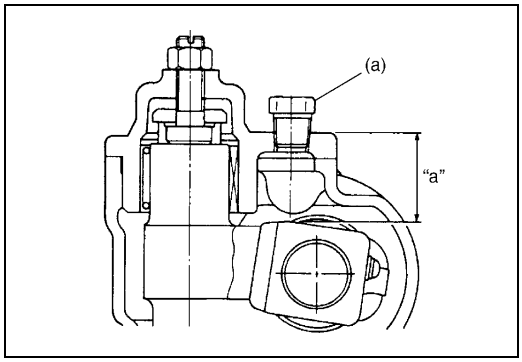
Inspect deformation or damage. Replace any defective part.

INSPECTION



1) Inspect for play in tie rod end ball joint (1). If found defective, replace.
2) Inspect boot (2) for tear. If even a small tear is noted, replace with new one.

Steering Gear Box Oil Level Check



Oil surface should be up to the level as shown in figure. If not, add prescribed gear oil, SAE 90.

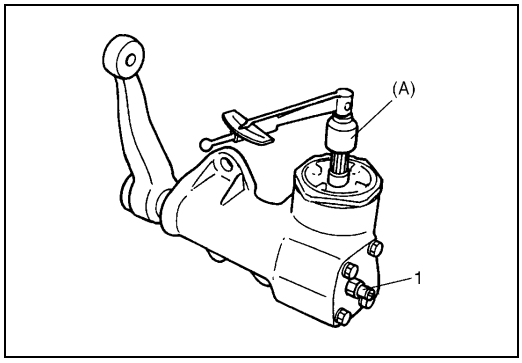
Steering gear box oil level
"a" : 23 mm (0.91 in.)

Apply sealant to thread parts of breathing plug and tighten breathing plug to specified torque.

(A) : Sealant 99000-31110

Tightening torque
Breathing plug
(a) : 4 N·m (0.4 kg-m, 3.0 lb-ft)

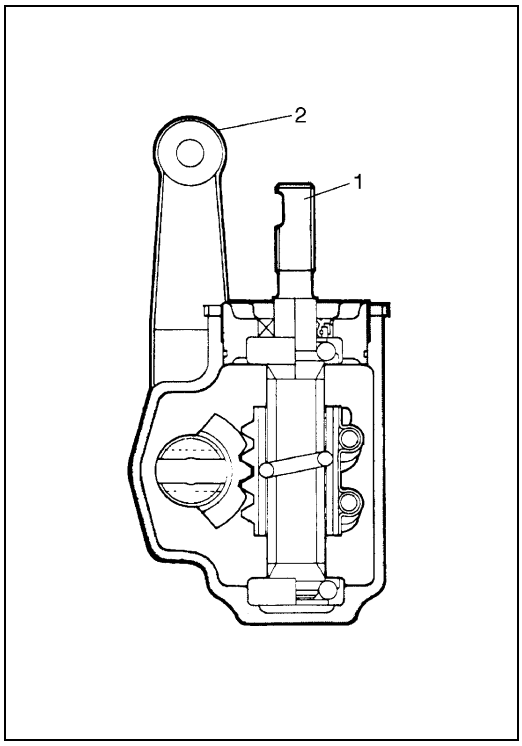
Adjustment of Worm Shaft Starting Torque



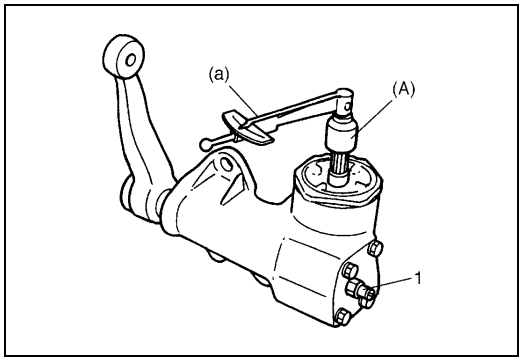
Steering gear box has adjusting bolt (1) which gives preload to sector shaft.

Special tool
(A) : 09944-18211

MAKE ADJUSTMENT ACCORDING TO FOLLOWING PROCEDURE.



1) Check worm shaft (1) to ensure that it is free from thrust play.
2) Position pitman arm (2) in nearly parallel with worm shaft (1) as shown. (With pitman arm (2) in this position, front wheels are in straightforward state.)

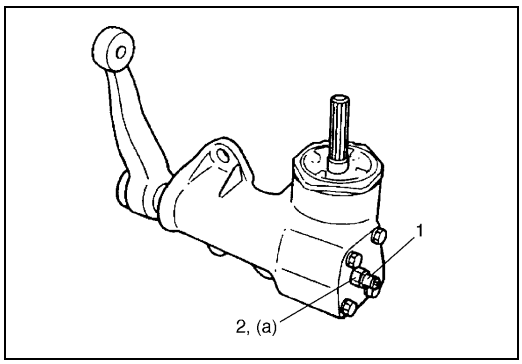


3) Measure worm shaft starting torque from its position in straight forward state as described in Step 2).

Starting Torque for Worm shaft
(a) : 50 – 100 N·cm (5.0-10.0 kg-cm, 0.4-0.7 lb-ft)

Special tool
(A) : 09944-18211

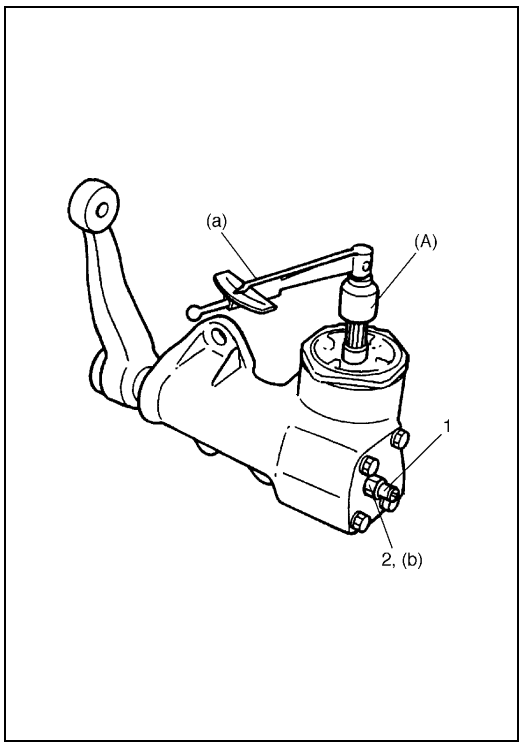
1. Adjusting bolt



If measured torque is not within specification, carry out adjustment with adjusting bolt (1) to meet specification and check to confirm it again.

Tightening torque
Steering gear box adjusting bolt lock nut
(a) : 30 N·m (3.0 kg-m, 22.0 lb-ft)

2. Lock nut



4) If worm shaft starting torque is checked all right, another check should be carried out on worm shaft operating torque in its entire operating range (by turning worm shaft all the way to the right and left).

Worm Shaft (Including sector shaft) Operating Torque
(a) : Under 120 N·cm (12.0 kg-cm, 10.9 lb-ft)

Special tool
(A) : 09944-18211

If measured torque does not conform to specification, readjust worm shaft starting torque in straightforward state by means of adjusting bolt (1), and then recheck worm shaft operating torque.

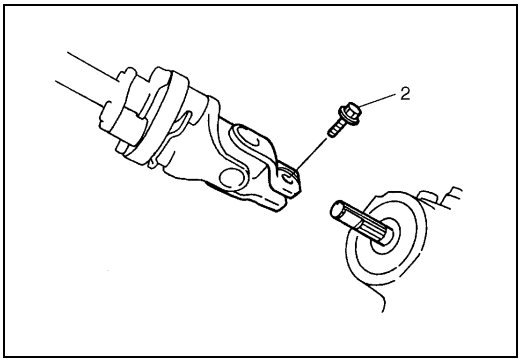
Tightening torque
Steering gear box adjusting bolt lock nut
(b) : 30 N·m (3.0 kg-m, 22.0 lb-ft)

If specified value is not attained even after readjustment, it is advisable to replace gear box with new gear box assembly.

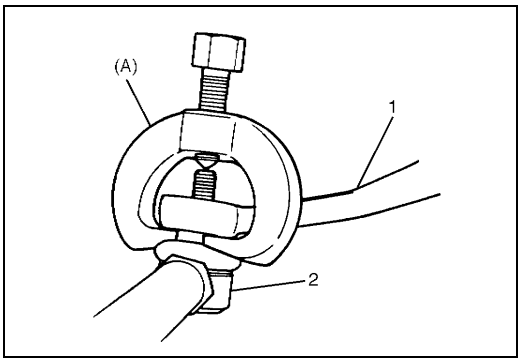
On-Vehicle Service

Steering Gear Box

REMOVAL



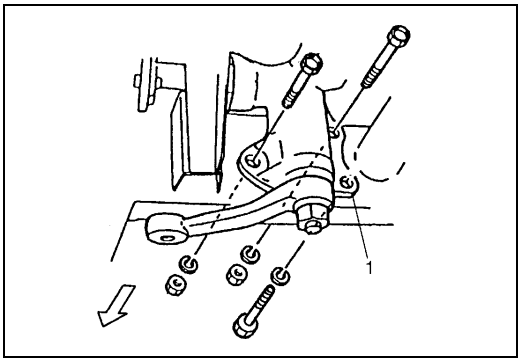
1) Remove steering lower shaft joint bolt (2).



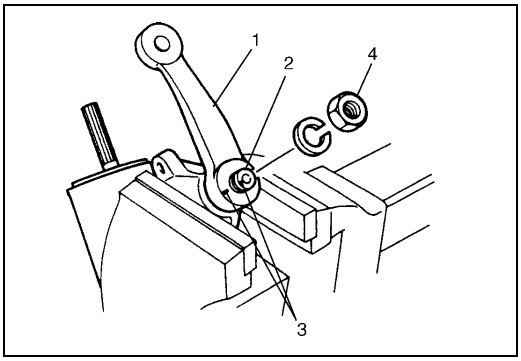
2) Remove drag rod end nut from pitman arm (1).
3) Disconnect drag rod end (2) from pitman arm (1), using special tool.

Special tool
(A) : 09913-65210

4) Remove radiator support member.



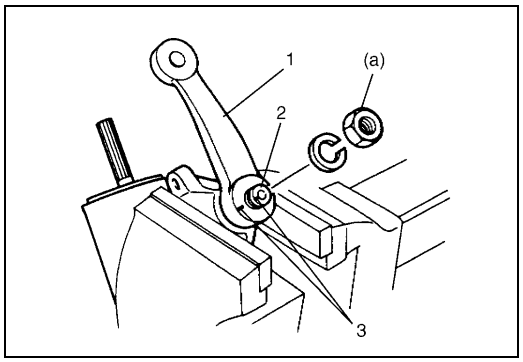
5) Remove steering gear box bolts, and remove steering gear box (1).



6) Remove pitman arm mounting nut (4).
7) Make match marks (3) on pitman arm (1) and sector shaft (2), for a guide during reinstallation.
8) Remove pitman arm (1) by using puller.

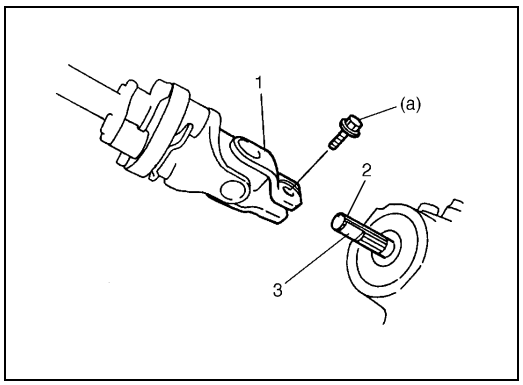
INSTALLATION

Reverse removal procedure to install steering gear box.



1) Install pitman arm (1) to sector shaft (2) of steering gear box with match marks (3) aligned as shown in figure and torque to specification.

Tightening torque
Pitman arm mounting nut
(a) : 135 N·m (13.5 kg-m, 98.0 lb-ft)

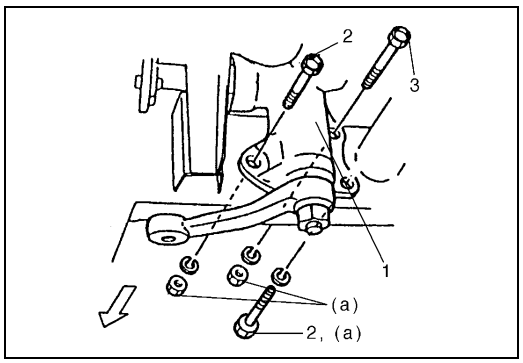


2) Install sector shaft (2) to steering lower shaft joint (1). Tighten joint bolt to specified torque.

NOTE:

Align flat part (3) of sector shaft with bolt hole of lower shaft joint as shown. Then insert sector shaft into lower shaft joint.

Tightening torque
Steering lower shaft joint bolt
(a) : 25 N·m (2.5 kg-m, 18.0 lb-ft)

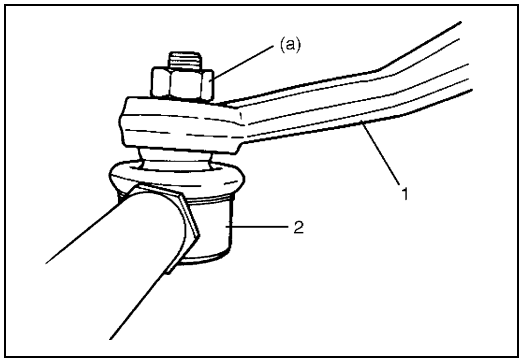


3) Install steering gear box mounting bolts (2), (3) with short bolt (3) positioned as shown in figure.
Tighten nuts and bolt to specified torque.

Tightening torque
Steering gear box mounting bolt and nuts
(a) : 80 N·m (8.0 kg-m, 58.0 lb-ft)

2. Steering gear box

4) Install radiator support member.



5) Connect drag rod (2) to pitman arm (1).
Tighten new drag rod end nut to specified torque.

NOTE:

To prevent ball stud from being rotated while tightening tie rod end nut, tighten Nut (M12 × 1.25) to about 20 N·m (2.0 kg-m, 14.5 lb-ft) and remove it.
Then tighten new nut to specified torque.

Tightening torque
Drag rod end nut (pitman arm side)
(a) : 50 N·m (5.0 kg-m, 36.5 lb-ft)