SERVICE MANUAL

DATSUN 240Z
MODEL S30 SERIES



SECTION ST

STEERING

ST

STEERING SYSTEM ..... ST- 1

TROUBLE DIAGNOSES AND CORRECTIONS ST-16

SERVICE DATA AND SPECIFICATIONS ST-20

NISSAN

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TOKYO, JAPAN

STEERING SYSTEM

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DESCRIPTION

The steering assembly is a direct-acting rack-and-pinion type with a gear ratio 17.8 : 1, providing sharp, light, and accurate control under all conditions.

It consists of a rack bar and toothed pinion, both working in the plain bearing of the housing. Backlash is held to 0 mm (0 in) by the retainer and the retainer spring.

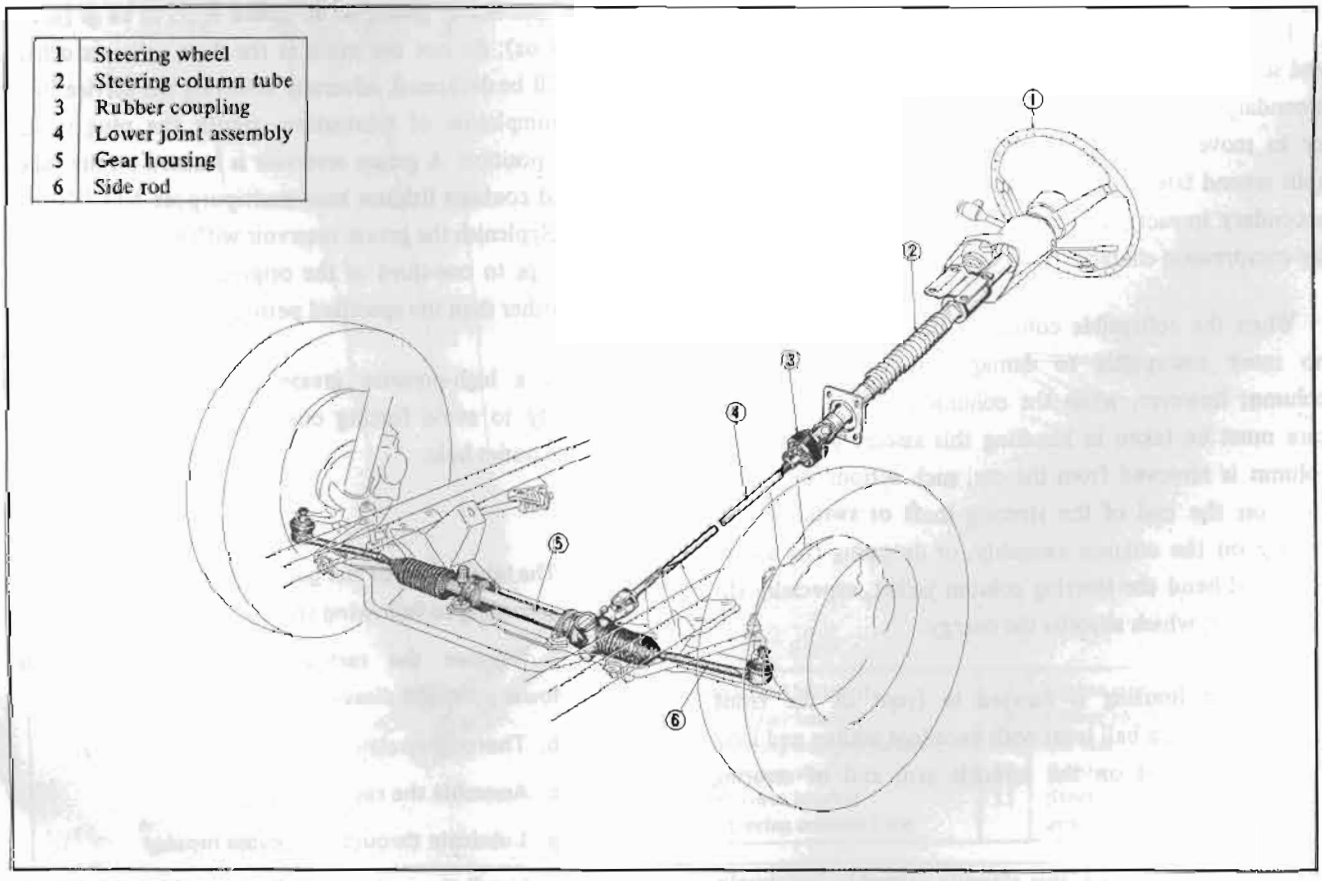


Fig. ST-1 Steering gear components

The steering wheel is a cone type which exhibits excellent safety characteristics. Between the steering wheel and gear assembly, a rubber coupling is used to prevent the vibration from the road surface, insuring excellent handling and safety, and two universal joints are used between the gear assembly and steering wheel to give the most suitable steering wheel position and angle.

These joints require no lubrication and have an excellent service life.

The collapsible steering column is designed to be compressed under impact. When an automobile is being driven, the forward movement of the automobile and the forward movement of the driver both constitute a form of energy or force. When an automobile is involved in a head-on collision, the primary force (forward movement of the car) is suddenly halted, while the secondary force (the driver) continues in the forward direction. A severe collision generally involves these two forces primary and secondary. The secondary impact occurs when the driver is thrust forward onto the steering wheel and column.

The collapsible column is designed to absorb primary and secondary force to the extent that the severity of the secondary impact is reduced, thereby reducing the tendency to move rearward into the driver's compartment. A split second later when the driver is thrown forward (the secondary impact), this energy is also partially absorbed by compression characteristics of the column.

When the collapsible column is installed in a car, it is no more susceptible to damage than is an ordinary column; however, when the column is removed, special care must be taken in handling this assembly. When the column is removed from the car, such actions as a sharp blow on the end of the steering shaft or switch levers, leaning on the column assembly, or dropping the assembly could bend the steering column jacket, especially the bellows part which absorbs the energy.

The gear housing is located in front of the front suspension, and a ball joint with excellent sealing and long durability is used on the knuckle arm end of steering linkage.

As mentioned above, this steering assembly has simple construction. Shim adjustment or selective assembly of parts, essential in the case of conventional assemblies, is not necessary. Thus, servicing is very convenient and structural strength is more than adequate.

MAINTENANCE

All working parts are immersed in grease. A grease is provided to replenish the grease, enabling simple lubrication.

Due to better sealing and durability, the lubrication interval is two years or 50,000 km (30,000 miles). The grease used is a lithium base type having excellent waterproof characteristics.

Lithium base multipurpose grease which has excellent waterproof characteristics is used for meshing portions of the rack-and-pinion, friction portions of the housing, and joined portions of the rack and side rod. Lubrication on the housing side is made through a grease nipple installed in place of the plug.

The amount of grease to be added is 10 to 15 gr (0.35 to 0.53 oz); do not use more as the dust cover or other parts will be deformed, adversely affecting the service life. After completion of lubrication, return the plug to its original position. A grease reservoir is located on the tube side, and contains lithium base multipurpose NLGI No. 0 grease. Replenish the grease reservoir with grease when the level drops to one-third of the original amount. Lubrication at other than the specified period is unnecessary.

When a high-pressure grease gun is used, proceed cautiously to avoid forcing out grease from areas other than the outlet hole.

Note: **The lubrication of the gear housing should be made according to following steps.**

a. Remove the rack-and-pinion assembly with lower joint and disassemble the rack-and-pinion.

b. Thoroughly clean all parts of the assembly.

c. Assemble the rack-and-pinion.

d. Lubricate through the grease nipple.

e. Install the rack-and-pinion assembly with lower joint.

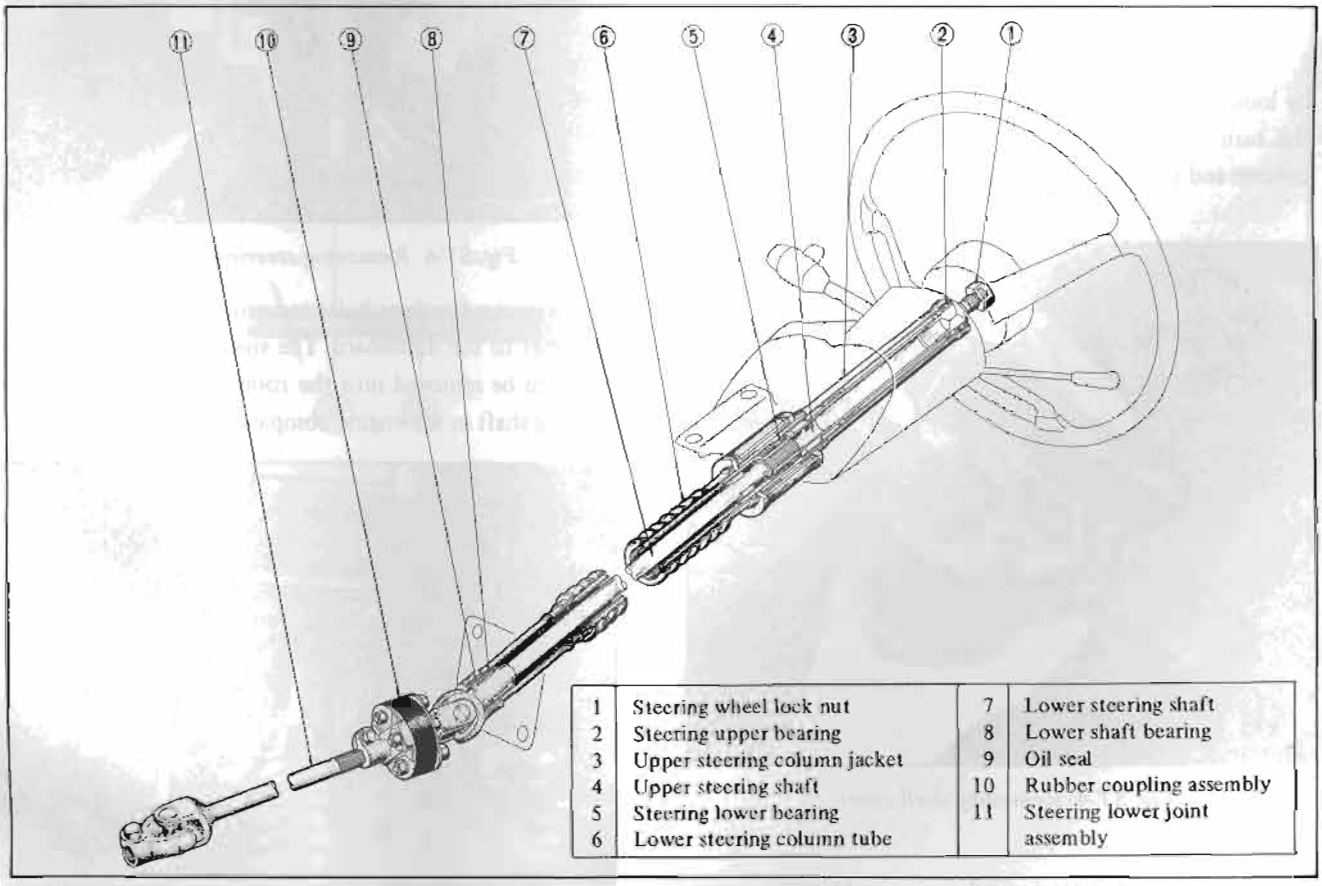
RECOMMENDED LUBRICANTS

MANUFACTURE	TEXACO	CHEVRON	CALTEX
Multi-purpose Grease MIL-G-2108, MIL-G-10924	Marfak Multi-purpose* Marfak All Purpose*	RPM Multi-motive Grease*	Marfak Multi-purpose* Marfak All Purpose*

CASTROL	BP	ESSO (ENCO)	MOBIL	SHELL
Castrol LM*	BP Energrease L2*	Esso (Enco) Multi-purpose grease H*	Mobil grease MP*	Shell Retinax A

* In case the above brand oils are not available, it is permissible to use oils marked*.

STEERING WHEEL AND COLUMN



1	Steering wheel lock nut	7	Lower steering shaft
2	Steering upper bearing	8	Lower shaft bearing
3	Upper steering column jacket	9	Oil seal
4	Upper steering shaft	10	Rubber coupling assembly
5	Steering lower bearing	11	Steering lower joint assembly
6	Lower steering column tube		

Fig. ST-2 Steering column assembly

Removal

1. Remove the horn button by pulling rearward. Remove the steering wheel after removing the steering wheel nut.



Fig. ST-3 Removing steering wheel

2. Remove upper and lower steering column shell covers by loosening six screws. Then loosen two screws retaining the turn signal and lighting switch assembly to steering column and remove the switch assembly.

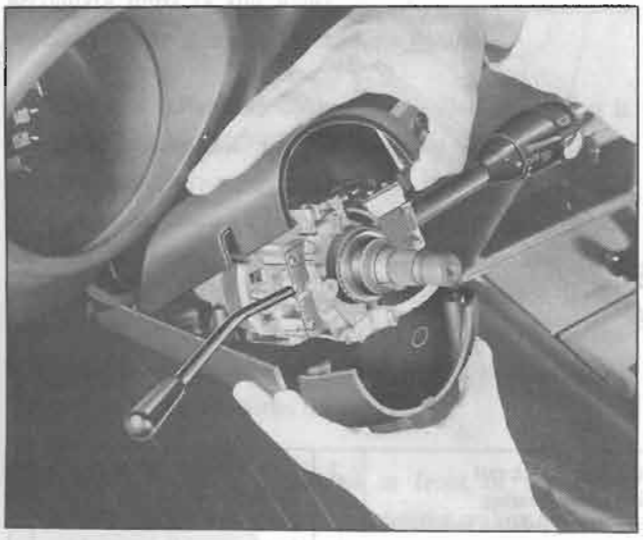


Fig. ST-4 Removing shell cover

3. Disconnect the steering column assembly from lower joint shaft at the rubber coupling by removing two bolts.

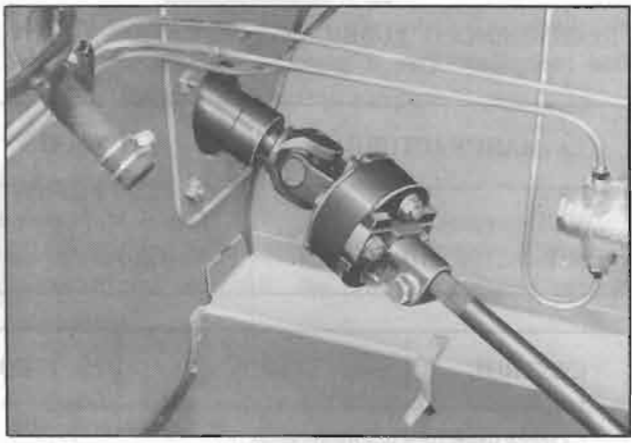


Fig. ST-5 Rubber coupling bolt

4. Remove the steering post clamp by removing four bolts.

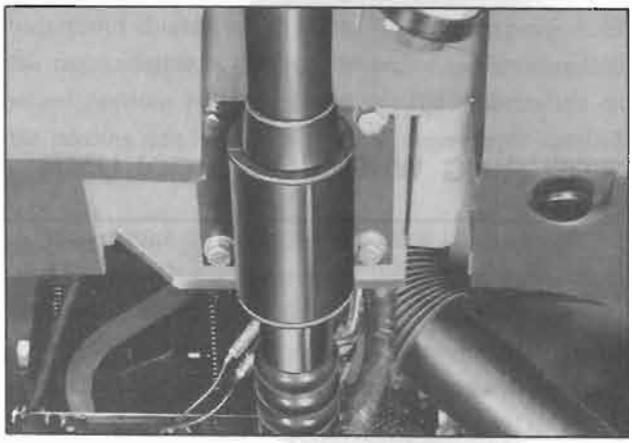


Fig. ST-6 Removing steering post clamp

5. Remove the four bolts securing the steering column grommet to the dashboard. The steering column assembly can then be removed into the room, remaining the lower steering shaft in the engine compartment.

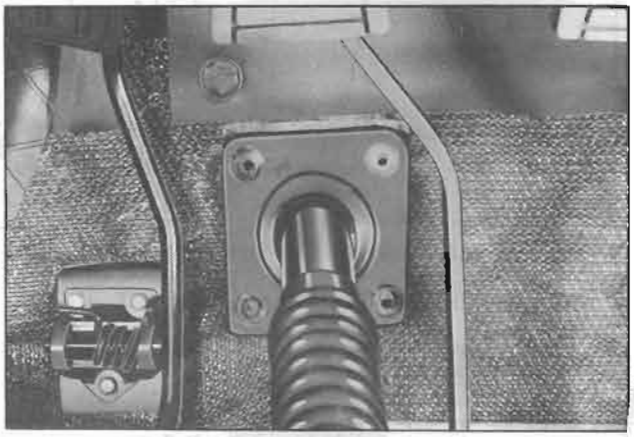


Fig. ST-7 Removing column bracket bolts

Disassembly

1. To disconnect upper and lower steering columns separately, three screws placed back side of the steering post clamp have to be removed.

The clamp can be moved by lightly hitting with a wooden hammer.

2. Remove a snap ring and spacer ring at the upper end of the upper column, and extract the upper column shaft from the steering upper column jacket.

3. Disconnect the rubber coupling from the steering lower joint.

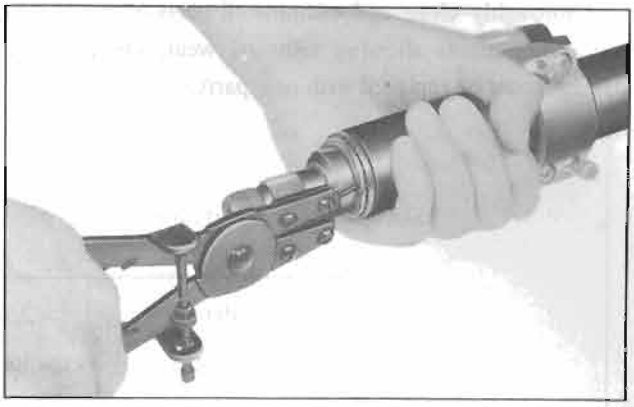
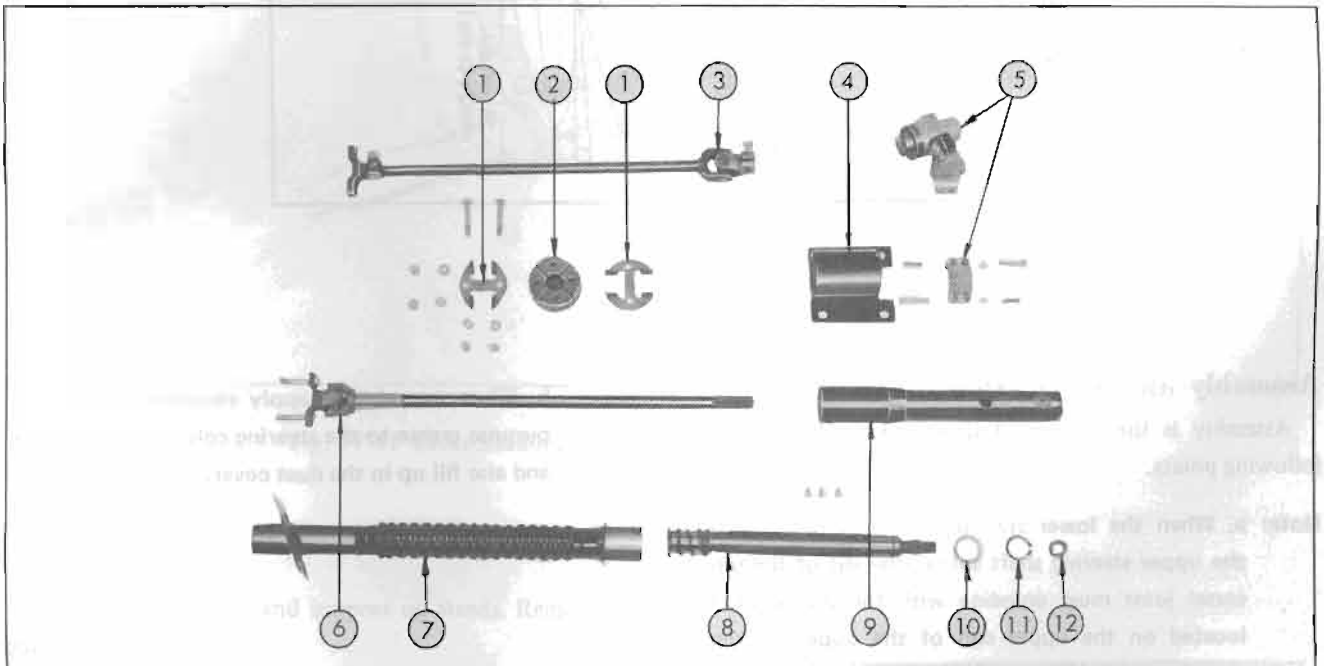


Fig. ST-8 Removing snap ring



1	Rubber coupling stopper plate	5	Steering lock	9	Lower steering column tube
2	Rubber coupling	6	Lower steering shaft	10	Spacer ring
3	Steering lower joint assembly	7	Upper steering column jacket	11	Snap ring
4	Steering column post clamp	8	Upper steering shaft	12	Collar

Fig. ST-9 Components of steering column assembly

Inspection

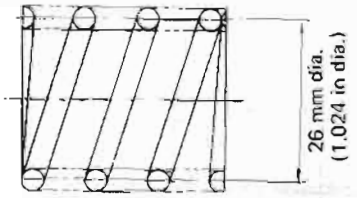
Thoroughly clean and examine all parts of the assembly; components showing signs of wear, chipping, or damage must be replaced with new parts.

Note: a. If there is extraordinary damage on the steering column shaft or jacket, also check the inside of the steering gear housing.

b. A damaged bearing must be replaced along with the steering column jacket assembly.

Steering column shaft spring

Wire diameter	2.9 mm (0.1142 in)
Free length	36.5 mm (1.4370 in)
Coil turns	3
Load x length	30 kg (66 lb) x 18 mm (0.7087 in)



Assembly and lubrication

Assembly is the reverse of disassembly. Observe the following points.

Note: a. When the lower steering shaft spline fits with the upper steering shaft spline, the slit of the universal joint must coincide with the punch mark located on the upper end of the upper steering (See figure ST-10).

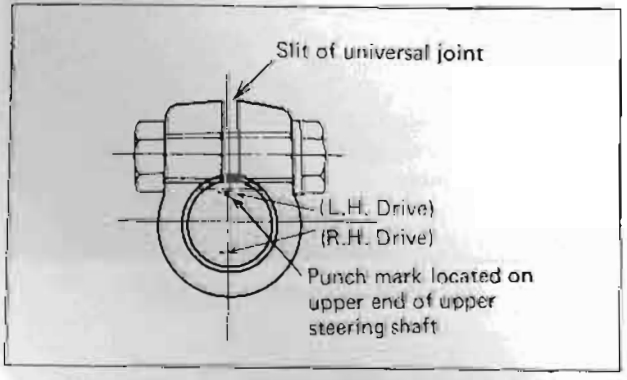


Fig. ST-10 Aligning slit with punch mark

b. When assembling, apply recommended multi-purpose grease to the steering column shaft journal and also fill up in the dust cover.

Installation

Installation is the reverse of removal.

Tightening torque

Steering wheel nut:	4 to 5 kg-m (28.9 to 36.2 ft-lb)
Rubber coupling bolt:	1.5 to 1.8 kg-m (10.8 to 13.0 ft-lb)

RACK-AND-PINION AND SIDE ROD ASSEMBLY

1	Rack	10	Retainer spring
2	Pinion	11	Filler plug
3	Oil seal	12	Retainer
4	Pinion bearing	13	Side rod inner spring
5	Retainer adjust screw	14	Dust cover clamp
6	Lock nut	15	Side rod inner socket
7	Gear boot	16	Ball stud
8	Lock nut	17	Side rod assembly
9	Side rod spring seat		

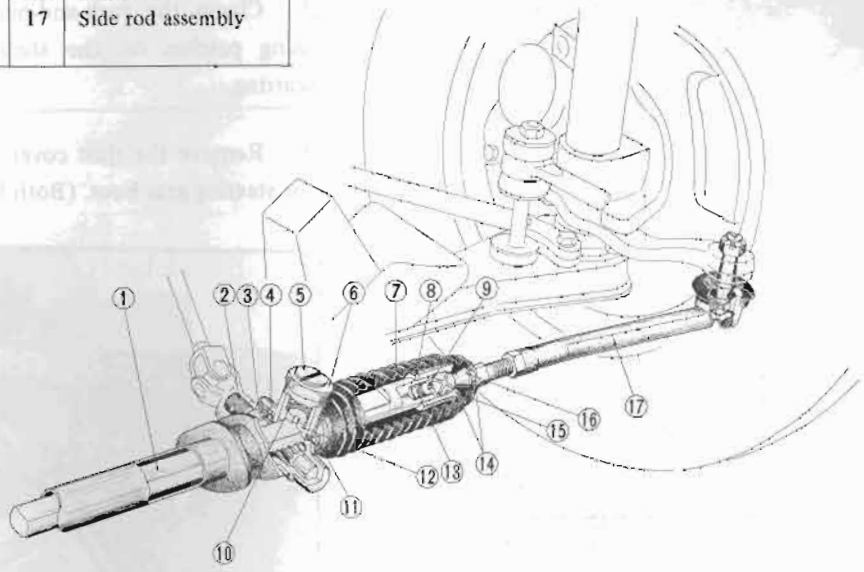


Fig. ST-11 Cross-section of rack-and-pinion and side rod assembly

Removal

1. Jack up the vehicle and support on stands. Remove front wheels.

2. Disconnect the steering lower joint from the steering column at the rubber coupling by removing two bolts.

Loosen the bolt securing the steering lower joint to the pinion, and then remove the lower joint assembly from engine compartment.

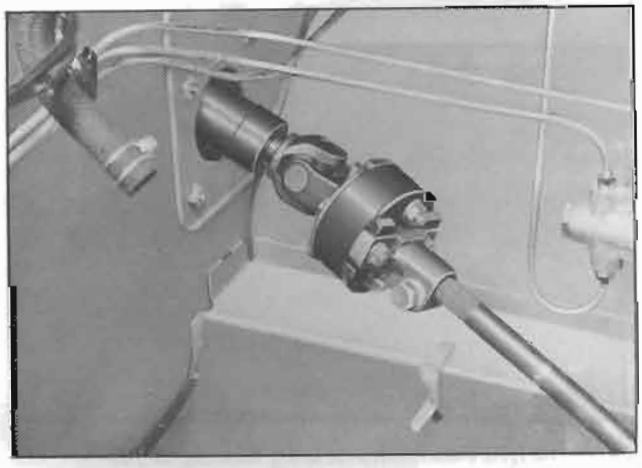


Fig. ST-12 Rubber coupling bolts

3. Remove the splash-board.



Fig. ST-13 Disconnecting lower joint from pinion

4. Remove the side rod ball stud nut and disconnect the side rod from the knuckle arm.

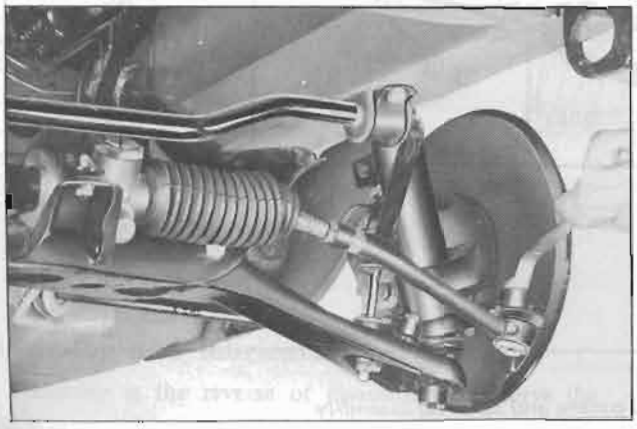


Fig. ST-14 Disconnecting side rod socket

5. Remove bolts securing the steering gear housing to the suspension member.

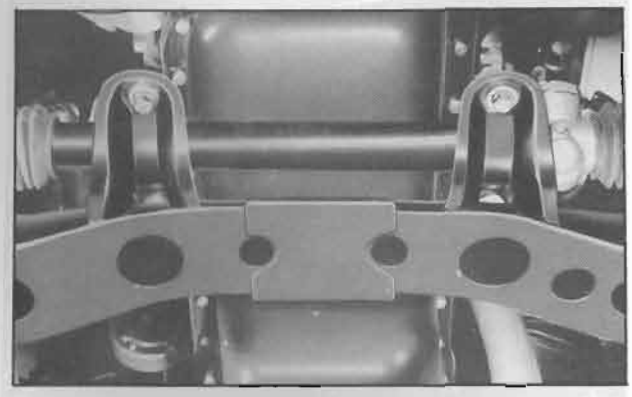


Fig. ST-15 Bolts securing housing to the suspension member

6. Remove the rack-and-pinion assembly.

Disassembly

1. Disconnect the steering lower joint from the rack-and-pinion assembly.

2. Clamp the rack-and-pinion assembly in a vise by using patches on the steering gear housing to avoid scarring.

3. Remove the dust cover clamp and boot clamp from the steering gear boot. (Both left and right.)

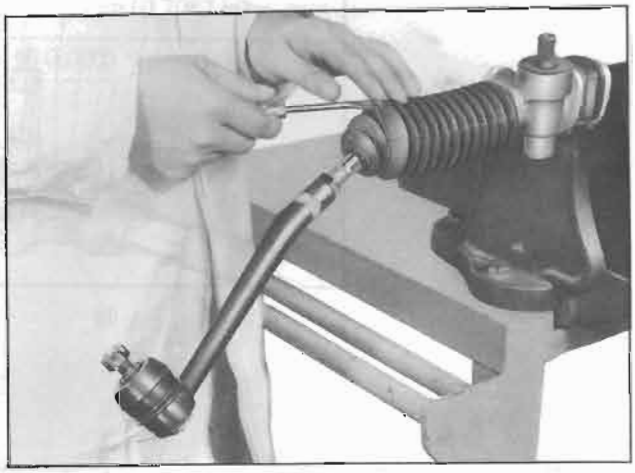


Fig. ST-16 Removing dust cover clamp

4. Loosen the stopper nut, remove the side rod inner socket, and disconnect the side rod assembly from the rack.

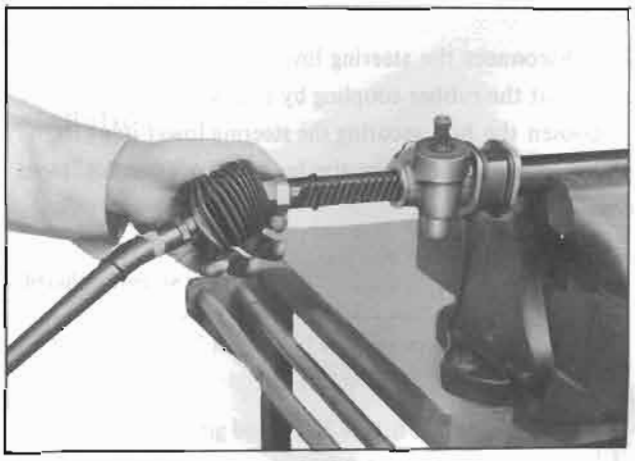


Fig. ST-17 Removing side rod assembly

5. Withdraw the spring seat and side rod spring.

6. Loosen the side rod lock nut and disconnect the side rod outer socket assembly from the side rod bar.



Fig. ST-18 Removing side rod outer socket

7. Loosen the lock nut and remove the retainer adjust screw. And then take out steering gear retainer.

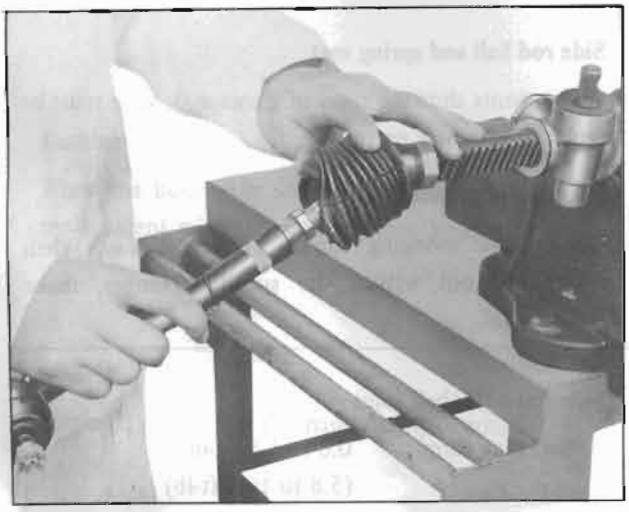


Fig. ST-19 Removing lock nut

8. Pry off the oil seal.

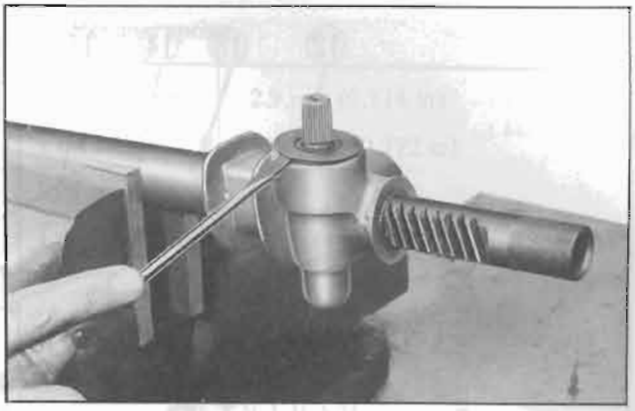


Fig. ST-20 Removing oil seal

9. Remove the snap ring and draw out the steering pinion assembly.



Fig. ST-21 Removing snap ring

10. Remove the snap ring and draw out the bearing from the pinion.

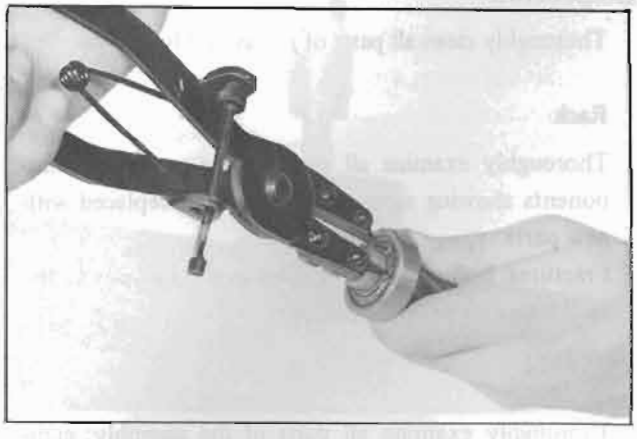
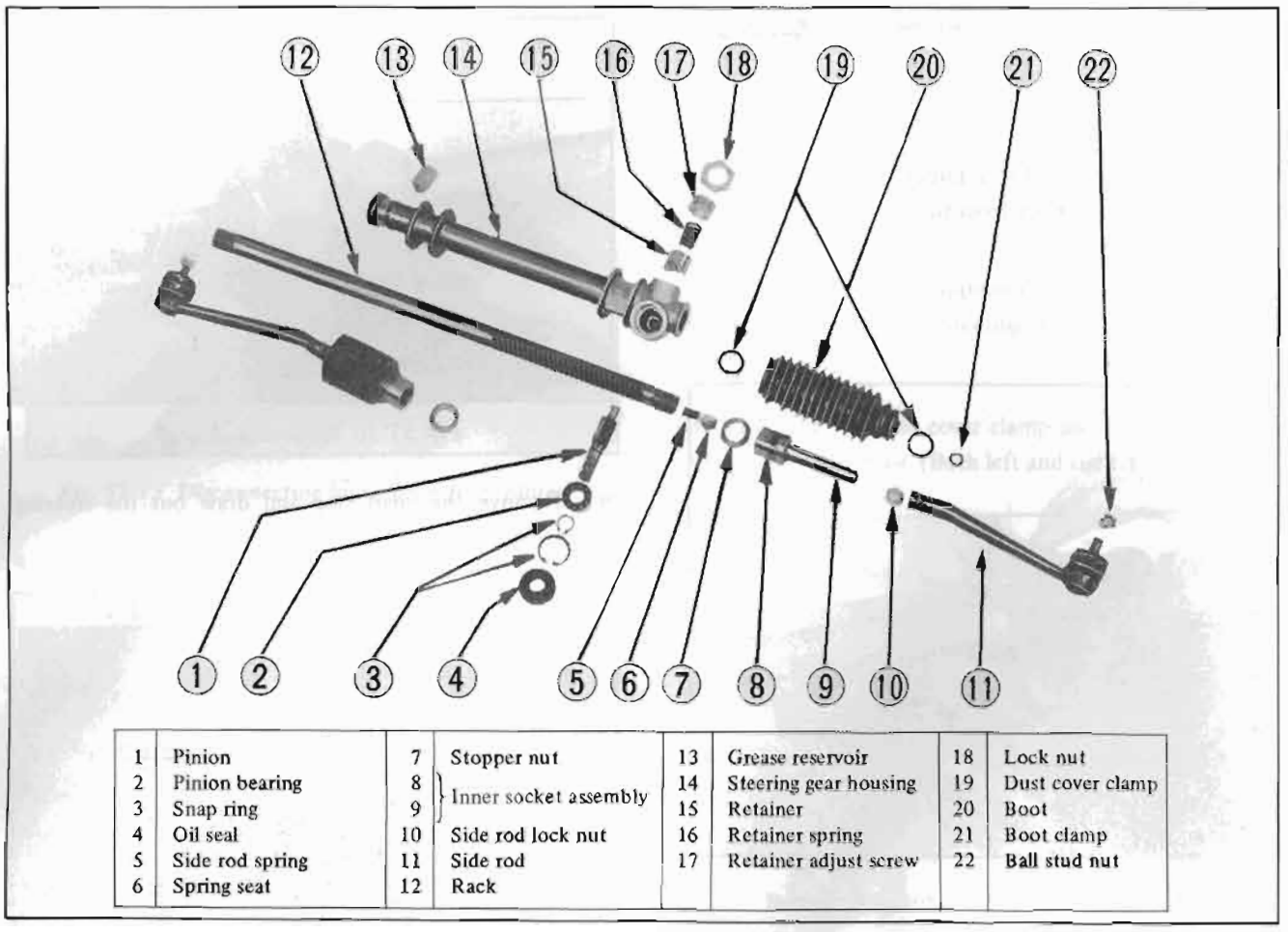


Fig. ST-22 Removing snap ring

11. Remove the filler plug and draw out the rack from the steering gear housing. Remove the grease reservoir.



1	Pinion	7	Stopper nut	13	Grease reservoir	18	Lock nut
2	Pinion bearing	8	Inner socket assembly	14	Steering gear housing	19	Dust cover clamp
3	Snap ring	9		15	Retainer	20	Boot
4	Oil seal	10	Side rod lock nut	16	Retainer spring	21	Boot clamp
5	Side rod spring	11	Side rod	17	Retainer adjust screw	22	Ball stud nut
6	Spring seat	12	Rack				

Fig. ST-23 Rack-and pinion and side rod components

Inspection

Thoroughly clean all parts of the assembly.

Rack

Thoroughly examine all parts of the assembly; components showing signs of wear must be replaced with new parts.
Fractures, hollows, or roughness in the surfaces of the rack indicates unserviceability.

Pinion

Thoroughly examine all parts of the assembly; components showing signs of damage, cracking, or wear must be replaced with new parts. A damaged bearing or oil seal must be replaced.

Side rod ball and spring seat

Components showing signs of damage or wear must be replaced with new parts.

Side rod outer ball joint

Measure the swinging torque and axial play. When values are not within the specified ranges, make replacement.

Side rod outer ball joint

Swinging torque:	0.8 to 1.5 kg-m (5.8 to 10.8 ft-lb)
Axial play:	0.1 to 0.5 mm (0.0039 to 0.0197 in)

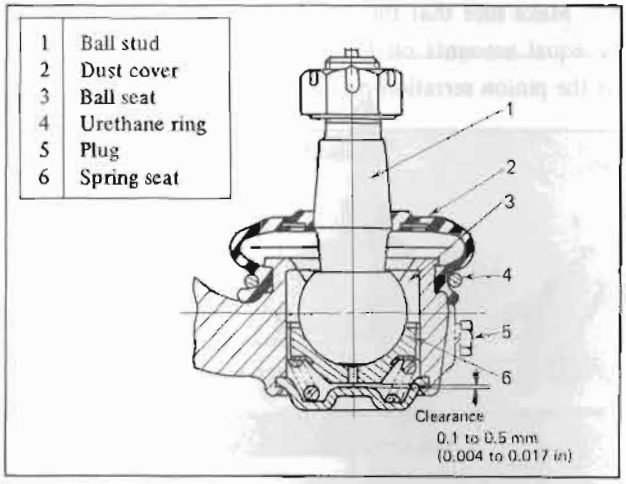


Fig. ST-24 Cross-section of ball stud

Side rod inner ball joint

Check inner ball joint for play. When ball stud is worn and play in axial direction is excessive or joint is hard to swing, replace as a complete unit.

Bearing

When the bearing is damaged, cracked or worn, make replacement.

Bushing

When the bushing is scarred, cracked, or worn, make replacement with the steering gear housing assembly.

Oil seal

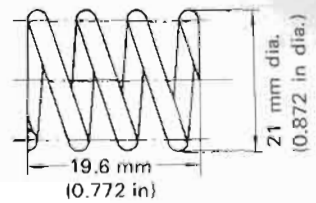
As a rule, replacement is made during overhaul.

Spring

Specified values are shown below.

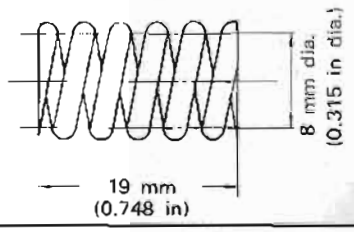
Retainer spring

Wire diameter	2.9 mm (0.114 in)
Free length	19.6 mm (0.772 in)
Coil turns	4.0
Load x length	20 kg (44 lb) x 16.3 mm (0.642 in)



Side rod spring

Wire diameter	2.6 mm (0.102 in)
Free length	19.0 mm (0.748 in)
Coil turns	6.3
Load x length	40 kg (88 lb) x 17.0 mm (0.669 in)



Assembly and adjustment

1. Press the bearing onto the pinion gear.

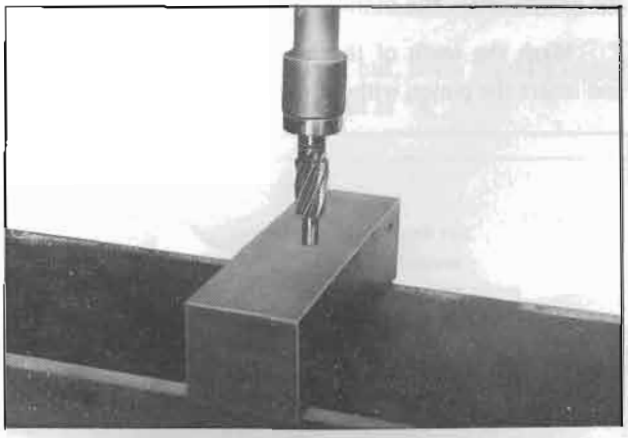


Fig. ST-25 Pressing bearing

2. Fit the snap ring.

Note: Use the tightest snap ring among the variations.

Snap ring oversize

Thickness	
1.04 to 1.09 mm	(0.0409 to 0.0429 in)
1.09 to 1.14 mm	(0.0429 to 0.0449 in)
1.14 to 1.19 mm	(0.0449 to 0.0469 in)
1.19 to 1.24 mm	(0.0469 to 0.0488 in)
1.24 to 1.29 mm	(0.0488 to 0.0502 in)

3. Clamp the steering gear housing in a vise.

4. Evenly apply recommended multipurpose grease to teeth and friction surfaces of the rack, and lubricate the gear housing from the pinion housing side.

5. Make sure that the rack protrudes by the same amount from both ends of the housing [96 mm (3.78 in)] and that rack teeth are directed toward the pinion shaft.

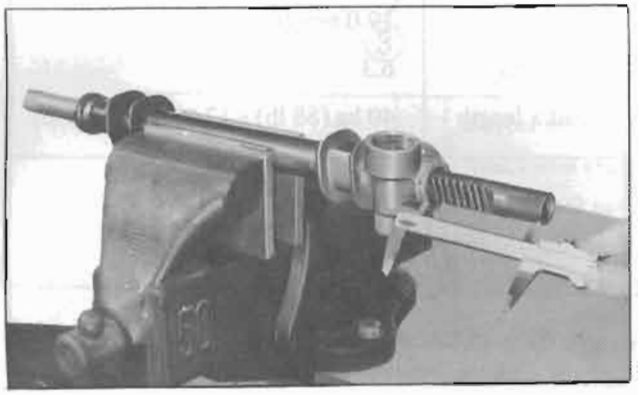


Fig. ST-26 Measuring protruding portion of rack

6. Evenly apply recommended multipurpose grease to the pinion teeth, end bushing, and pinion bearing.

7. Mesh the teeth of the pinion to those of the rack, and insert the pinion without damaging the bushing.

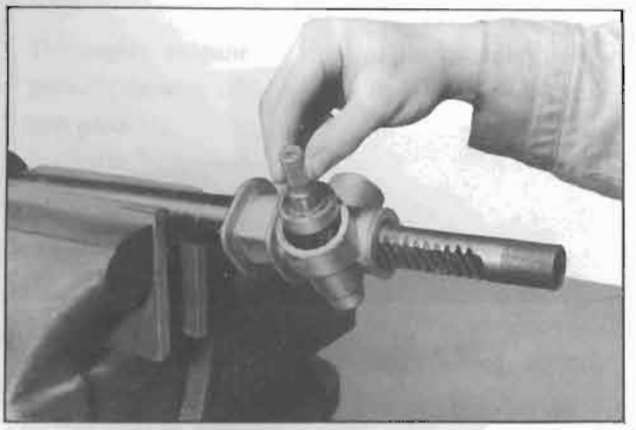


Fig. ST-27 Inserting pinion

8. Make sure that the rack extends beyond the housing by equal amounts on the left and right, with the groove on the pinion serration part directed upward.

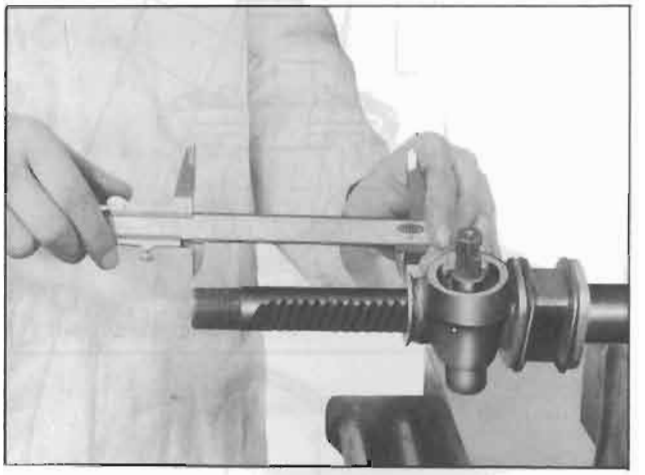


Fig. ST-28 Measuring protruding portion of rack

9. Fit the snap ring, holding the bearing outer race in place.

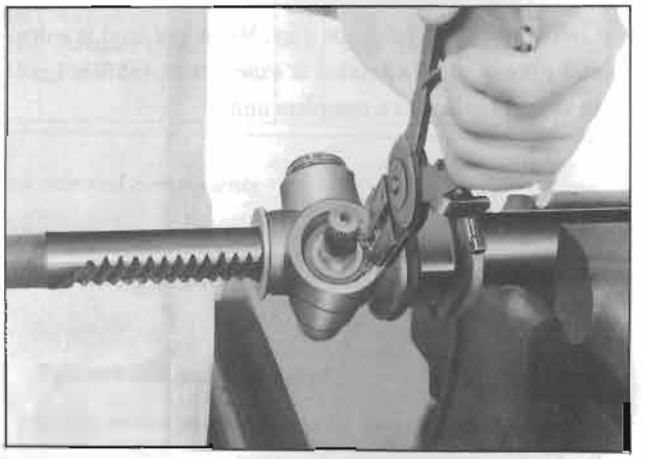


Fig. ST-29 Fitting snap ring

Note: Carefully fit the snap ring to the housing groove. Use the tightest snap ring among the variations.

Snap ring oversize

Thickness	
1.55 to 1.60 mm	(0.0610 to 0.0630 in)
1.60 to 1.65 mm	(0.0630 to 0.0650 in)
1.65 to 1.70 mm	(0.0650 to 0.0669 in)
1.70 to 1.75 mm	(0.0669 to 0.0689 in)

10. Fit the oil seal.

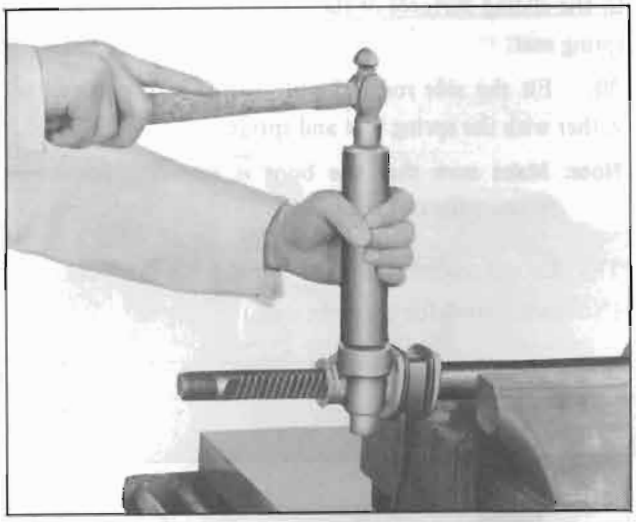


Fig. ST-30 Fitting oil seal

11. Measure thrust play of the pinion.

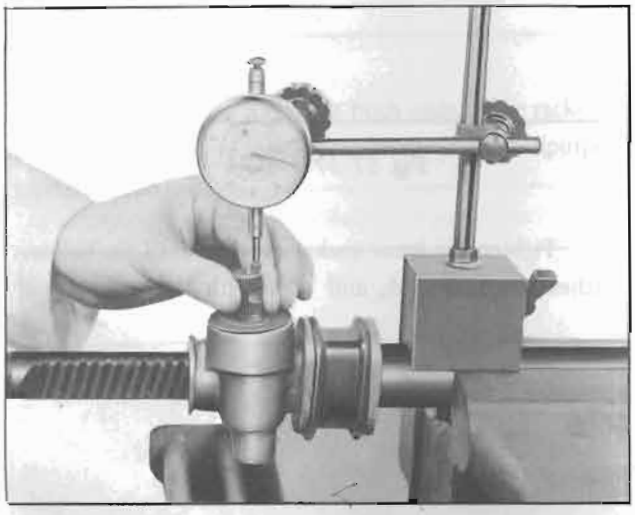


Fig. ST-31 Measuring thrust play of the pinion

Thrust play of the pinion:
less than 0.3 mm (0.0118 in)

12. Apply an adequate amount of recommended multi-purpose grease to the retainer.

13. Insert the retainer and retainer spring into the retainer hole, and thread in the adjusting screw.

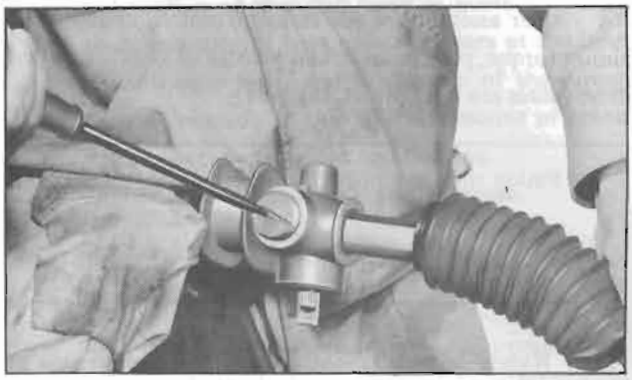


Fig. ST-32 Threading in adjusting screw

14. Fully tighten the adjusting screw and back off 20 to 25 degrees. Lock this screw with the lock nut.

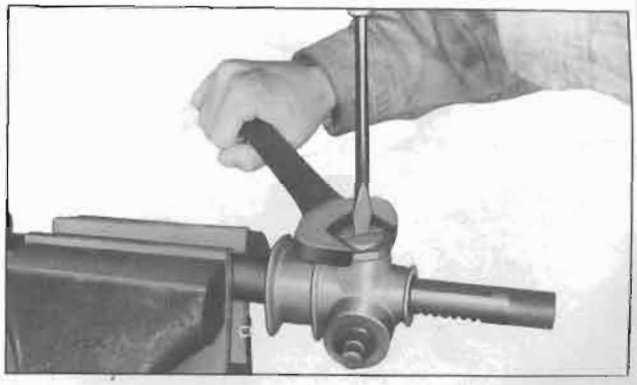


Fig. ST-33 Locking retainer lock nut

Retainer floating play:	0.09 mm (0.0035 in)
Lock nut tightening torque:	4 to 6 kg-m (28.9 to 43.4 ft-lb)

15. After tightening the lock nut, cover liquid packing (Three Bond) around the lock nut at "A".

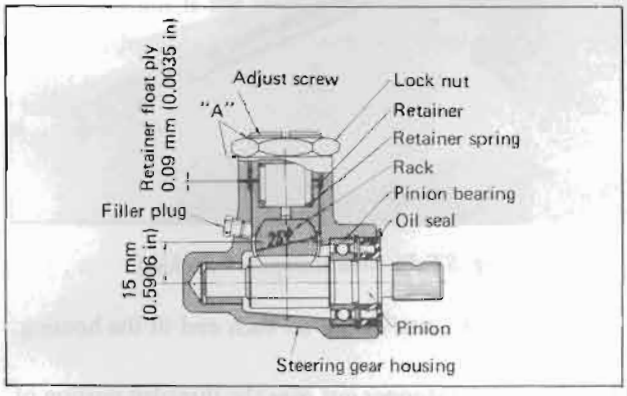


Fig. ST-34 Area to which liquid packing is covered

16. After assembly of the rack-and-pinion, measure the pinion torque, pinion angle, and preload of the rack. When these values are not correct, readjust.

Pinion rotation torque:	less than 20 kg-cm (17 in-lb)
Rack preload:	14 to 17 kg (30.9 to 37.5 lb)

Note: Rotate or slide smoothly over the entire range of the stroke.

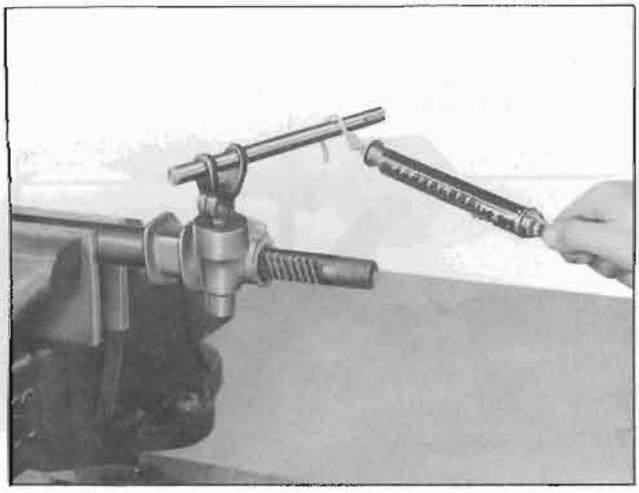


Fig. ST-35 Measuring pinion rotation torque

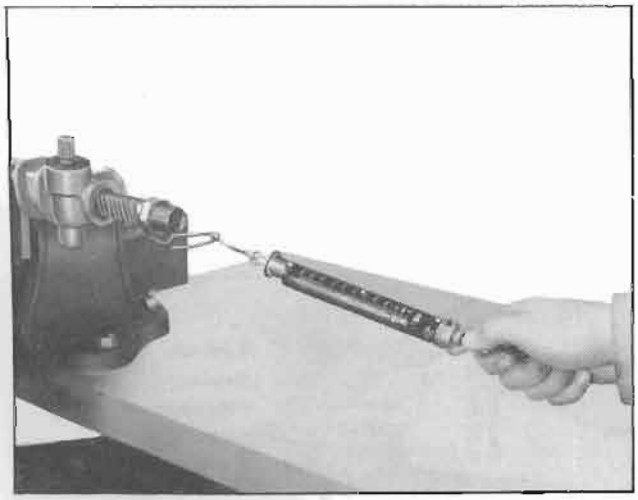


Fig. ST-36 Measuring rack preload

17. Fit a dust cover clamp on each end of the housing.

18. Thread the stopper nut over the threaded portion of the rack.

19. Apply an adequate amount of recommended grease to the sliding surfaces of the side rod inner socket and the spring seat.

20. Fit the side rod assembly to the rack gear end together with the spring seat and spring.

Note: Make sure that the boot is carefully positioned toward the ball stud end.

The side rod assembly for the left side has an L-mark. (No mark is used for the right side.)

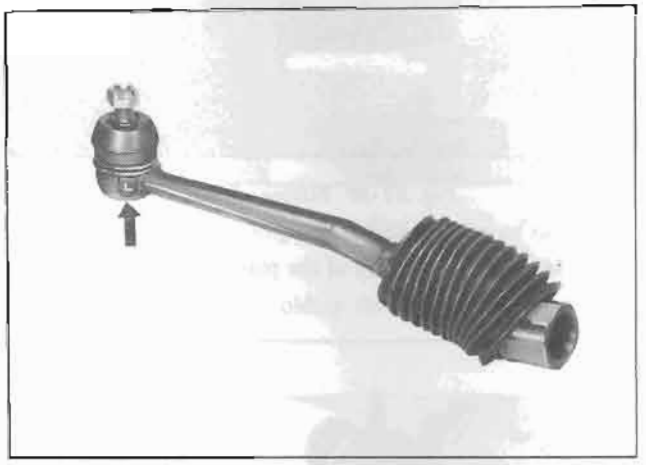


Fig. ST-37 L-mark

21. Tighten the inner socket portion until the ball seat reaches the rack end, and lock with the stopper nut.

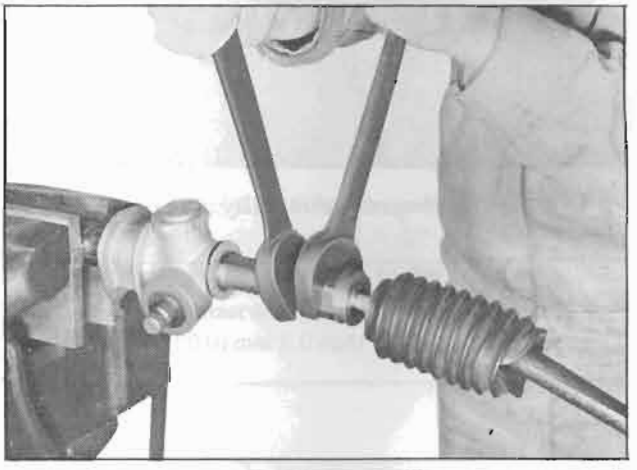


Fig. ST-38 Locking the stopper nut

Stopper nut tightening torque: 7 to 9 kg-m (50.6 to 65.1 ft-lb)

22. Measure the rack stroke.

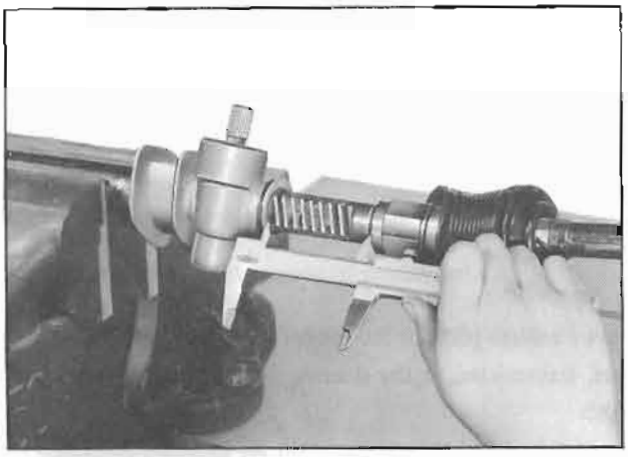


Fig. ST-39 Measuring rack stroke

Rack stroke:	60.7 mm (2.390 in)

23. Install a grease nipple at both ends of the rack-and-pinion housing, and apply recommended multipurpose grease to each joint.



Fig. ST-40 Supplying the grease

Note: Lubrication of the rack ends is made so that a small quantity of new grease appears at the boot grease outlet hole, and lubrication of the pinion housing is made so that a small amount of grease appears between the rack and housing.
Do not apply excessive amount of grease.

24. Remove the grease nipple and install the filler plug.

25. Fit the boot.

26. Fill the grease reservoir with multipurpose NLGI No. 0 grease, and attach the reservoir to the rack housing.

27. Adjust the side rod length. (Both left and right).

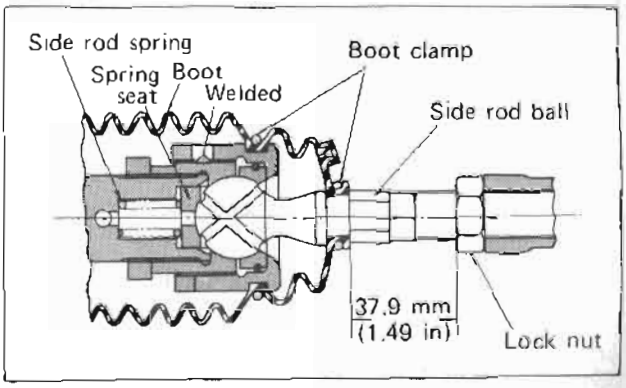


Fig. ST-41 Side rod

28. Fit the steering lower joint to the rack-and-pinion assembly and tighten the lower joint lower bolt.

Lower joint lower bolt:	4 to 5 kg-m (29 to 36 ft-lb)

Installation

Installation is the reverse of removal, taking care that the housing brackets are correctly positioned with the paint mark placed front.

TROUBLE DIAGNOSES AND CORRECTIONS

Troubles in the Front Axle and Front Suspension are discussed at this point, because they are generally associated with steering troubles.

1. Vibration, shock, and shimmying of steering wheel

Vibration: Too much backlash of the steering gear, wear of linkage parts or the rubber coupling, and vibration of front wheels are, in many cases, transmitted to the steering wheel. This is very noticeable when traveling over rough roads.

Shock: When the front wheels are traveling over bumpy roads, shock is transmitted to the steering wheel. This is also very much noticeable when traveling over rough roads.

Shimmying: This is abnormal vibration of the front suspension group and the entire steering linkage, and occurs when a specific speed is attained.

Possible causes	Corrective action
Improper tire pressure or insufficient tightening of wheel nuts.	Adjust or tighten.
Difference in height of right and left tire treads.	Replace tires.
Incorrect adjustment or wear of front wheel bearing.	Adjust or replace.
Collapsing or twisting of front spring.	Replace.
Incorrect wheel alignment.	Adjust.
Incorrect adjustment of brakes (binding).	Readjust.
Wear of rubber bushings for fitting transverse link and compression rod.	Replace.
Deformation of steering linkage and suspension link.	Replace.
Excessive clearance of side rod inner or outer ball joint.	Replace.
Loose side rod lock nut.	Tighten more.
Imbalance of vehicle level.	Correct the imbalance.

2. Wandering of vehicle in one direction

When driving with hands off the steering wheel over a flat road, the car gently pulls to one side of the road.

Note: **Defective rear suspension may also be the cause of this tendency. Refer to information concerning the rear suspension.**

Possible causes	Corrective action
Improper tire pressure.	Adjust.
Imbalance or deformation of loadwheel.	Correct the imbalance or replace.
Uneven wear of tires or insufficient tightening.	Replace or tighten.
Faulty wheel alignment.	Adjust.
Wear of bushings for fitting transverse link and compression rod.	Replace.
Loose steering post clamp.	Retighten.
Wear of steering column bearing.	Replace steering column assembly.
Breakage or collapsing of steering column shaft spring.	Replace.
Loose rubber coupling bolts or wear of rubber coupling.	Retighten or replace.
Excessive serration play.	Replace.
Wear of lower joint journal.	Replace.
Insufficient tightening of steering gear housing.	Retighten.
Wear of suspension ball joint.	Replace.
Improper adjustment of retainer. (Too much backlash)	Adjust.
Malfunction of shock absorber (inside strut) or loose bolts.	Replace or tighten.
Imbalance of vehicle level.	Correct the imbalance.

3. Instability of vehicle

Possible causes	Corrective action
Improper tire pressure.	Adjust.
Wear of rubber bushings for fitting transverse link and compression rod.	Replace.
Incorrect wheel alignment.	Adjust.
Wear or deformation of steering linkage and suspension link.	Replace.

Worn mounting rubber.	Replace.
Loose gear housing bolt.	Retighten.
Loose side rod lock nut.	Retighten.
Excessive play of side rod inner or outer ball joint.	Replace.
Incorrect adjustment of retainer.	Readjust.
Deformation and imbalance of wheel.	Correct or replace.

4. Steering wheel resistance

(Sequence of checking.)

Jack up the front of the vehicle, detach the lower joint upper part and operate the steering wheel, and when resistance is low, check the steering gear, steering linkage, suspension, and, accelerator groups.

If high, check the steering column.

Possible causes	Corrective action
Improper tire pressure.	Adjust.
Insufficient lubricating oil or impurities in gear housing.	Replenish grease or replace gear housing.
Insufficient lubricating oil, impurities in steering linkage, or abnormal wear.	Replenish grease or replace the part.
Stiffness, damage, or insufficient grease in suspension ball joint.	Replace.
Wear or incorrect adjustment of wheel bearing.	Replace or adjust.
Seizing of housing bushing.	Replace with gear housing.
Wear or damage of rack-and-pinion or bearing.	Replace.
Incorrect adjustment of retainer.	Readjust.
Tight retainer.	Adjust.
Deformation of steering linkage.	Replace.
Incorrect wheel alignment.	Adjust.
Damage of bearing at upper end of strut.	Replace.
Damage or stiffness of piston or rod of shock absorber (in the strut).	Replace.
Interference of steering column with turn signal switch.	Adjust.
Damage, seizing, or stiffness of steering column bearing.	Replace with steering column jacket.

Note: In the case of gear housing lubrication, the rack-and-pinion must be disassembled. (Refer to page ST-2).

5. Excessive steering wheel play

Possible causes	Corrective action
Incorrect adjustment of retainer.	Adjust.
Wear of steering linkage.	Replace.
Improper fitting of gear housing.	Tighten.
Worn mounting rubber.	Replace.
Incorrect adjustment of wheel bearing.	Adjust.
Wear of bushings for fitting transverse link and tension rod.	Replace.
Loose rubber coupling bolts.	Retighten.
Wear of rubber coupling.	Replace.
Loose lower joint bolts.	Retighten.

6. Noises

Possible causes	Corrective action
Improper tire pressure.	Adjust.
Insufficient lubricating oil and grease for suspension ball joint and steering linkage, or breakage.	Replenish lubricating oil and grease, or replace.
Loose bolts of steering gear housing, linkage, and suspension groups.	Retighten.
Defective shock absorber (inside strut).	Replace.
Defective wheel bearing.	Replace.
Wear of steering linkage and rack-and-pinion.	Replace.
Wear of bushings for fitting transverse link and compression rod.	Replace.
Breakage or collapsing of coil spring.	Replace.
Loose nuts (holding strut mounting insulator).	Retighten.
Wear of housing bushing.	Replace housing gear assembly.
Excessive thrust play of pinion.	Adjust or replace.
Loose retainer part.	Replace retainer spring or tighten lock nut.

SERVICE DATA AND SPECIFICATIONS

SPECIFICATION

Type	Rack-and-pinion type
Turns of steering wheel (lock to lock)	2.7 m (8.9 ft)
Steering gear ratio	17.8 : 1
Turning angle of front wheel - inside	33° ± 30'
- outside	31°42' ±30'
Minimum turning radius	4.8 m (16.0 ft)
Rack stroke	60.7 mm (2.390 in)
Number of pinion teeth	7
Center distance between the rack-and-pinion	15 mm (0.591 in)
Lubrication period	50,000 km (30,000 miles)

SERVICE DATA

Steering column shaft spring	- Wire diameter	2.9 mm (0.1142 in)
	- Free length	36.5 mm (1.4370 in)
	- Coil turns	3
	- Load x length	25 kg (55 lb) x 18 mm (0.7087 in)
Retainer spring dimension	- Wire diameter	2.9 mm (0.114 in)
	- Free length	19.6 mm (0.772 in)
	- Coil turns	4.0
	- Load x length	20 kg (44 lb) x 16.3 mm (0.642 in)
Side rod spring dimension	- Wire diameter	2.6 mm (0.102 in)
	- Free length	19.0 mm (0.748 in)
	- Coil turns	6.3
	- Load x length	40 kg (88 lb) x 17.0 mm (0.669 in)
Side rod outer ball joint axial play		0.1 to 0.5 mm (0.0039 to 0.0197 in)
Pinion thrust play		less than 0.3 mm (0.0118 in)
Retainer float play		0.09 mm (0.0035 in)
Rack stroke		60.7 mm (2.390 in)

Side rod outer ball joint swinging torque	0.8 to 1.5 kg-m (5.8 to 10.8 ft-lb)
Pinion rotation torque	20 kg-cm (17 in-lb) or less
Rack preload	14 to 17 kg (30.9 to 37.5 lb)

TIGHTENING TORQUE

Steering wheel nut	5 to 7 kg-m (36.2 to 50.6 ft-lb)
Rubber coupling bolt	1.5 to 1.8 kg-m (10.8 to 13.0 ft-lb)
Lower joint bolt	4 to 5 kg-m (28.9 to 36.2 ft-lb)
Retainer lock nut	4 to 6 kg-m (28.9 to 43.4 ft-lb)
Side rod inner socket stopper nut	7 to 9 kg-m (50.6 to 65.1 ft-lb)
Side rod lock nut	9 kg-m (65.1 ft-lb)
Side rod ball stud nut	5.5 to 7.6 kg-m (39.8 to 54.9 ft-lb)

SERVICE JOURNAL OR BULLETIN REFERENCE

DATE	JOURNAL or BULLETIN No.	PAGE No.	SUBJECT

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