

# ***SERVICE BULLETIN***

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## **INTRODUCTION OF RECIRCULATING BALL TYPE STEERING FOR SR (P) 311**



**NISSAN MOTOR CO., LTD.**

**T O K Y O ,   J A P A N**

## FOREWORD

In order to improve the durability and reliability of the steering gear of the DATSUN 1600, 2000 SPORTS, the recirculating ball type steering gear, which is already used on the model 510 and earning a high reputation, has been adopted. According to this alternation, some parts of the steering system, frame and radiator have been modified, therefore, there is no interchangeability between the former type and new type. These modifications have begun from the following chassis numbers.

SP-05001

SPL-25001

SR-04001

SRL-09001

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## I. MODIFIED PARTS

All modified parts, due to the adoption of the Recirculating Ball Type Steering, are as follows. Refer to the Spare Parts Bulletin S68-869.

1. ASSY-STEERING GEAR
2. ASSY-STEERING UNIVERSAL JOINT
3. ASSY-STEERING COLUMN LOWER SHAFT
4. ARM-STEERING GEAR
5. ASSY-IDLER
6. ASSY-MEMBER FRONT SUSPENSION
7. SPACER-IDLER ARM
8. CHANNEL-UPPER & LOWER
9. ASSY-RADIATOR
10. SHROUD-RADIATOR
11. HOSE-RADIATOR UPPER
12. HOSE-RADIATOR LOWER
13. HOSE-RADIATOR TO CYLINDER HEAD

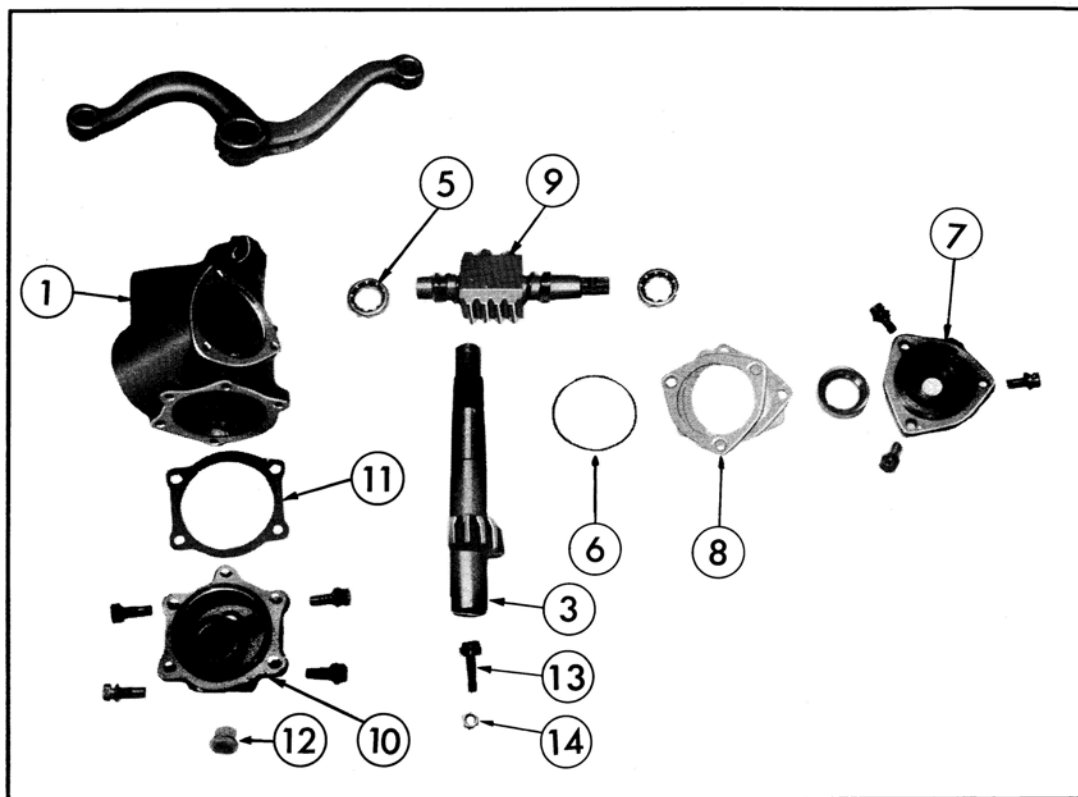
## II. EXPLANATION OF MODIFIED PARTS

### I. ASSY-STEERING GEAR

As this steering gear is basically same as the model 510's steering gear, some inner parts of this steering gear are interchangeable with the 510's.

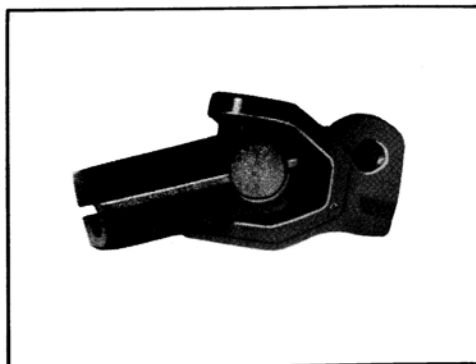
The component parts and their interchangeability with the 510's are listed below.

INNER PART NAME		INTERCHANGEABILITY WITH 510
①	Comp-Housing steering gear	No
	Comp-Needle bearing	No
	Plug-Expansion	Yes
②	Seal-Oil sector shaft	No
③	Shaft-Sector steering	No
④	Shim-Sector shaft adjust	No
⑤	Assy-Bearing worm	Yes
⑥	O-Ring	Yes
⑦	Comp-Rear cover housing	Yes
	Seal-Oil worm	Yes
⑧	Shim-Worm bearing	Yes
⑨	Assy-Steering worm	No
⑩	Cover-Sector shaft	No
⑪	Gasket-Sector shaft cover	No
⑫	Assy-Plug filler	Yes
⑬	Screw-Sector shaft adjust	No
⑭	Nut-Lock adjust screw	No



## 2. UNIVERSAL JOINT & LOWER COLUMN SHAFT

As the joint angle has been changed in adopting the R. B. Steering, the universal joint and lower column shaft have been modified.

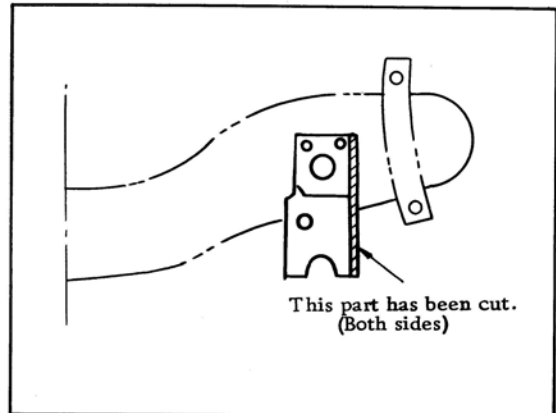


## 3. ARM STEERING GEAR AND ASSEMBLY IDLER

In order to make use of the existing steering linkage of this car, even with the new R. B. Steering installed, the gear arm and idler arm have been modified.

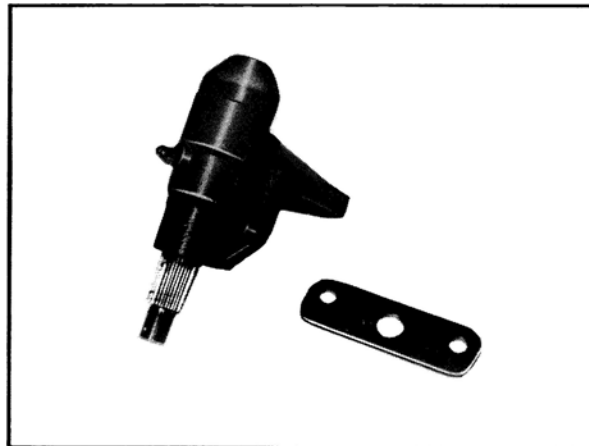
#### 4. ASSY-MEMBER FRONT SUSPENSION

In order to make use of the existing steering linkage of this car, compensation had to be made for the dimensional difference which comes from adoption of 27 mm (1.06 in) diameter sector shaft, the assembly-member front suspension has been modified as shown in the accompanying drawing.



#### 5. SPACER-IDLER ARM

In order to install the idler arm in the specified position on the existing steering linkage, the spacer-idler arm has been newly installed between the idler arm body and suspension member.

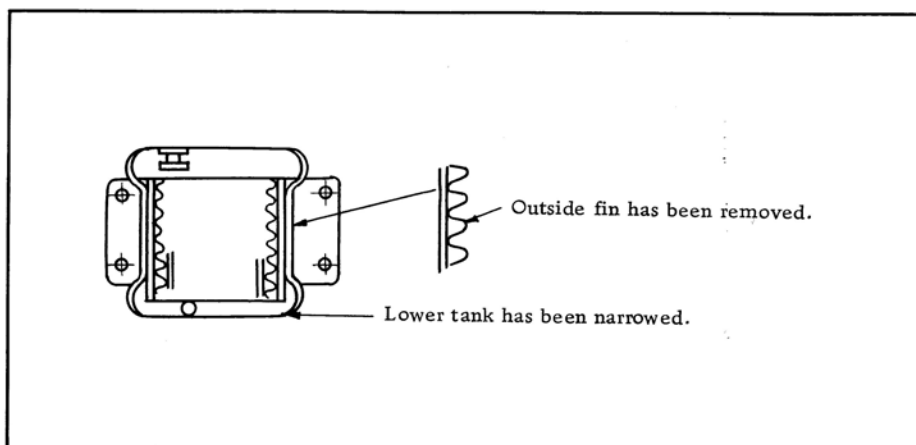


#### 6. CHANNEL-UPPER AND LOWER

In order to move radiator by 12 mm (0.47 in), the hole position on the channel-upper and lower has been moved.

## 7. RADIATOR

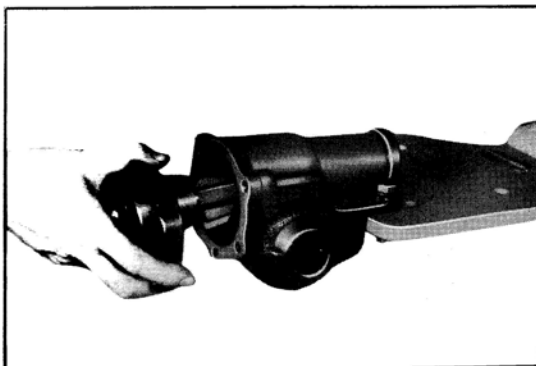
The 48CF type radiator, which is already being used on cars for the U.S.A., has been adopted for all models by modifying as follows.



## III. DISASSEMBLY AND REASSEMBLY OF STEERING GEAR ASSEMBLY

### I. DISASSEMBLY OF STEERING GEAR ASSEMBLY

- (1) Attach the steering gear assembly to Steering Gear Box Attachment (ST49110000).
- (2) Remove the steering gear arm fixing nut and pull out the gear arm by using the Steering Gear Arm Puller (ST46440000).
- (3) Remove the drain plug and drain the oil from the steering gear housing.
- (4) Remove four bolts fixing sector shaft cover, then pull out the sector shaft cover with sector shaft from the gear housing.
- (5) Remove adjust screw lock nut then, by turning adjust screw, separate sector shaft cover from sector shaft.
- (6) Remove adjust screw and take out sector shaft adjust shim from sector shaft.



(7) Unscrew the three bolts securing the rear cover to the gear housing and pull out the steering worm assembly from the gear housing.

**Note:** Take care that the ball nut does not run down to either end of the worm. Damage will be done to the ends of the ball guides if the nut is allowed to rotate until stopped at the end of the worm.



(8) Remove the sector shaft oil seal.

**Note:** The sector shaft needle bearings are press-fitted on the gear housing and sector shaft cover.

(9) Take out the rear bearing outer race from the rear cover using a puller.

(10) Take out the bearing inner races of the front and rear worm bearing.

## 2. INSPECTION AND REPAIR

(1) Check on axial play and radial play between nut and worm steel balls and ball nut and if the clearance is more than 0.08 mm (0.0031 in), replacement should be made as a complete unit.

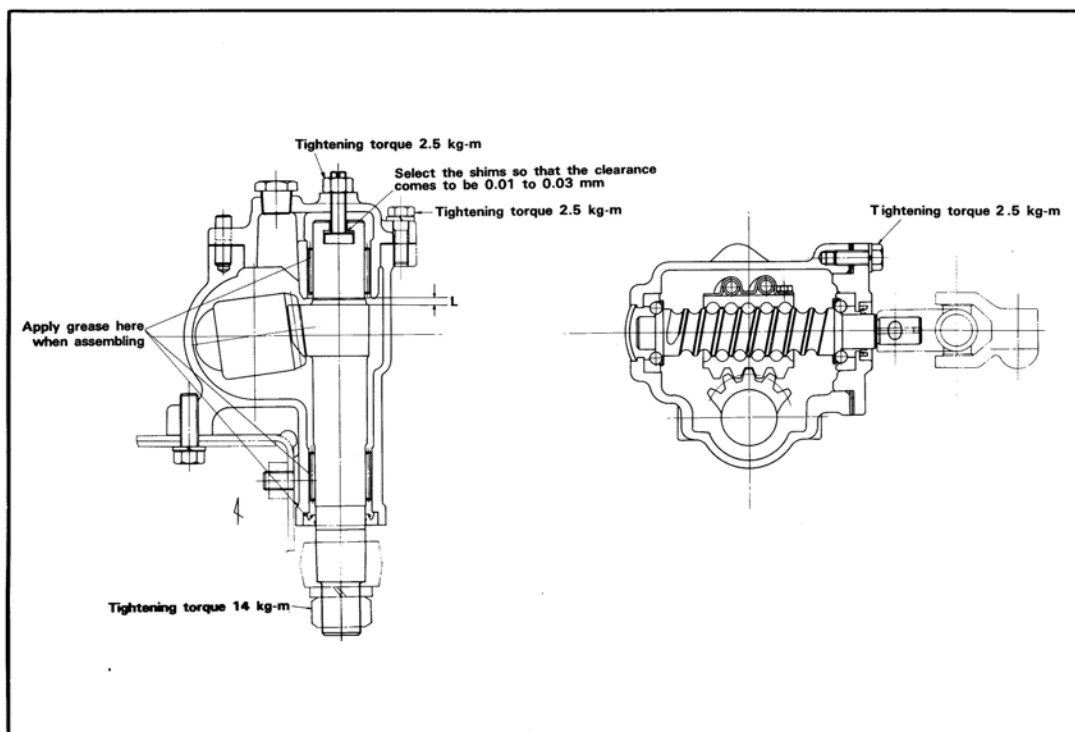
(2) Inspect gear teeth of sector shaft and ball nut for wear or damage, if there is any signs of damage it should be replaced.

(3) Inspect bearings for wear or chip, replace bearings which are not in perfect condition.

(4) Inspect the serration of sector shaft and column for wear.



### 3. ASSEMBLY AND ADJUSTMENT



- (1) Press oil seal into the housing.

Note: Apply chassis grease to the oil seal lip before assembling.

- (2) Install assembly steering worm with worm bearing shims and "O" ring to the gear housing by means of three flange fixing bolts. Tightening torque is 1.8 to 2.5 kg-m (13.0 to 18.1 ft lb).

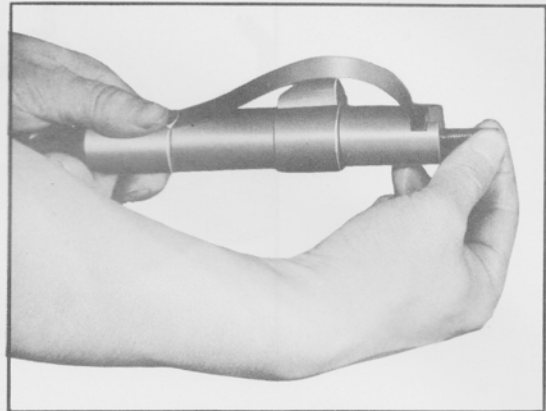
- (3) Adjust the preload of the worm bearing by selecting the thickness of the worm bearing shim so that the initial turning torque of the column assembly is 4.0 to 6.0 kg-cm (55.5 to 83.3 in oz) without sector shaft.

Note: Apply oil to the worm bearings. The turning torque (wheel in motion) should be 200 to 450 grams (7.0 to 15.9 oz) at 20 cm (7.874 in) radius of the steering wheel. As to the standard number of worm bearing shims, refer to the following table.

0.762 mm (0.0300 in)	1 piece	0.127 mm (0.0050 in)	1 piece
0.254 mm (0.0100 in)	2 pieces	0.050 mm (0.0020 in)	1 piece

(4) Assemble sector shaft adjusting screw with shim in the slot of the sector shaft end. Check clearance which should be between 0.01 to 0.03 mm (0.0004 to 0.0012 in).

To obtain this clearance six shims of various thickness are available, 1.45 to 1.57 mm (0.0571 to 0.0618 in).



(5) Push the sector shaft into sector shaft cover and screw the adjusting screw in the sector shaft cover.

In this case, 'L' dimension should be 1 to 2 mm (0.0394 to 0.0787 in).

(6) Attach the sector shaft with cover to the gear housing.

a. Rotate steering worm by hand until ball nut is in center of its travel, so that the center tooth of sector shaft enters into the center tooth space of ball nut.

b. With new gasket in place, push the sector shaft cover with sector shaft in place.

After making sure there is some lash between the rack and sector teeth, tighten side cover bolts.

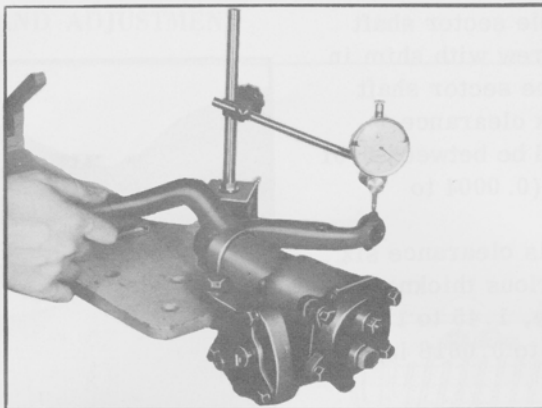
Note: Apply oil on the sector shaft.

c. Lock the adjust screw with the adjusting screw nut temporarily.

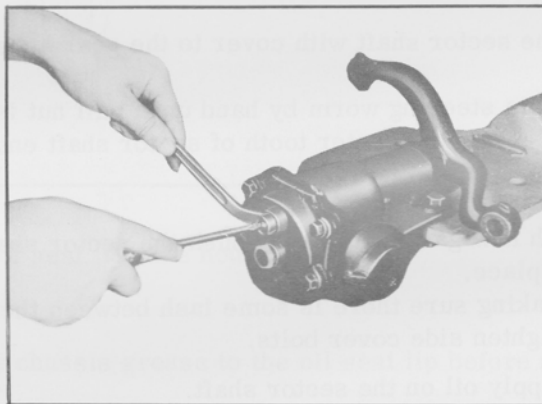
d. Move the sector shaft several times from the side of the gear arm and make sure it turns smoothly.

e. Connect the gear arm to the sector shaft. At fitting gear arm, the aligning mark of gear arm and sector shaft should be match center.

f. Adjust the backlash at the neutral point by screwing the adjusting screw so that the movement of the gear arm top end [radius 215 mm (8.46 in)] will be within 0 to 0.1 mm (0 to 0.0039 in).



g. Finally screw in the adjusting screw 1/8 to 1/6 turn and lock it firmly with the lock nut.



(7) Fill gear oil MP 90 [ about 0.33 liter (0.697 US pts/0.581 UK pts) ] into assembly through filler hole and install a filler plug.

