DATSUN
240Z SPORTS

SERVICE MANUAL

MODEL S30 SERIES
CHASSIS & BODY

NISSAN

NISSAN MOTOR CO., LTD.
TOKYO, JAPAN

QUICK REFERENCE INDEX

FOREWORD

This service manual has been prepared for the purpose of assisting service personnels of our distributors and dealers for effective service and maintenance of DATSUN 240Z SPORTS (model S30 series).

Since proper maintenance and service are most essential to satisfy our customers by keeping their cars in the best condition, this manual should be read carefully. The followings should be noted for effective utilization of this manual.

1. *Explanations in this manual are mainly concerning the model HLS30-U (left hand drive) but will easily be referred also for the right hand drive models and for the version models.*

2. *Please, refer to both this and L20A, L24 SERIES ENGINE SERVICE MANUAL for complete details of the car, because this manual describes information concerning the chassis and body only.*

3. *All part name in this manual conform to DATSUN SPORTS 240Z PARTS CATALOG, and only the genuine service parts listed in this parts catalog should be used for replacements.*

4. *All information, illustrations and specifications contained in this manual are based on the latest product information available at the time of publication approval.*

5. *It is emphasised that those who use this manual revise the contents according to the SERVICE JOURNAL and SERVICE DATA AND SPECIFICATIONS issued by the factory, which carry the latest factory approved servicing method.*

6. *Rights for alternation in specifications and others at any time are reserved.*

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GI

SECTION GI

GENERAL INFORMATION

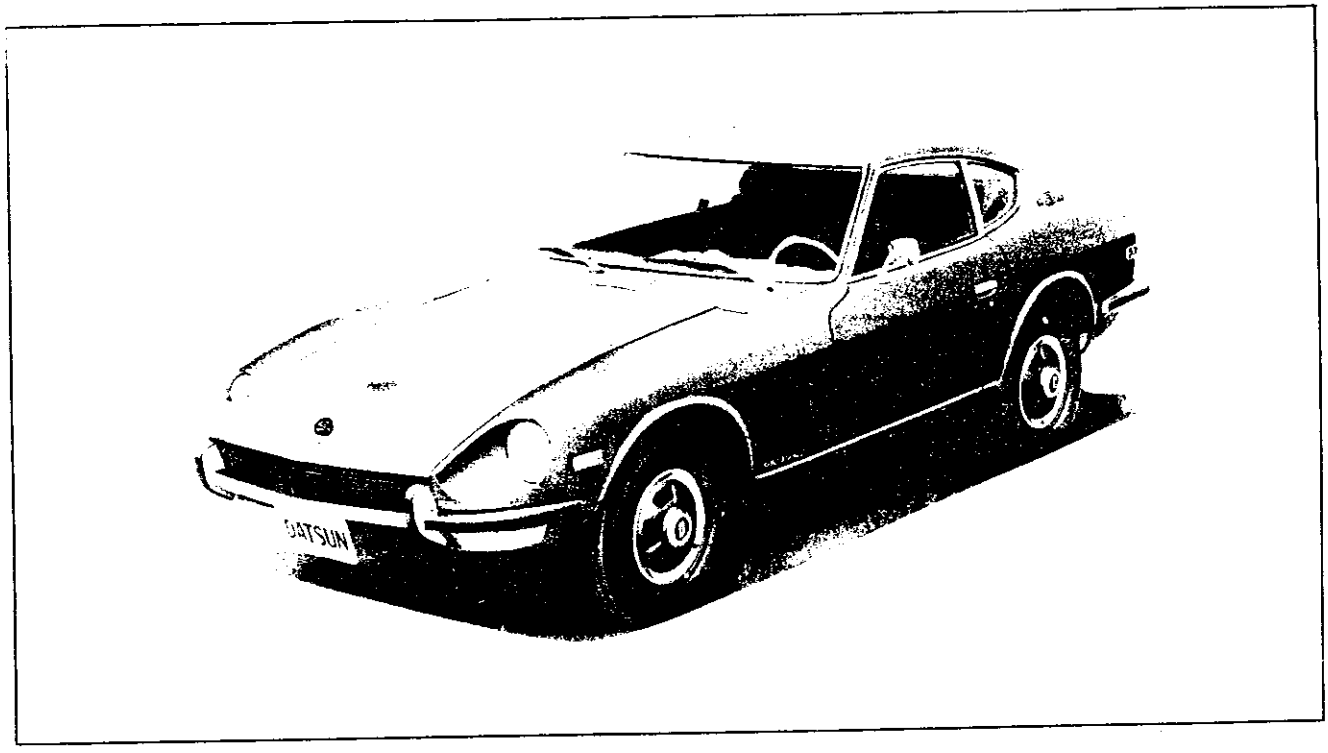

Fig. GI-1 DATSUN 240Z SPORTS (Model HLS30-U)

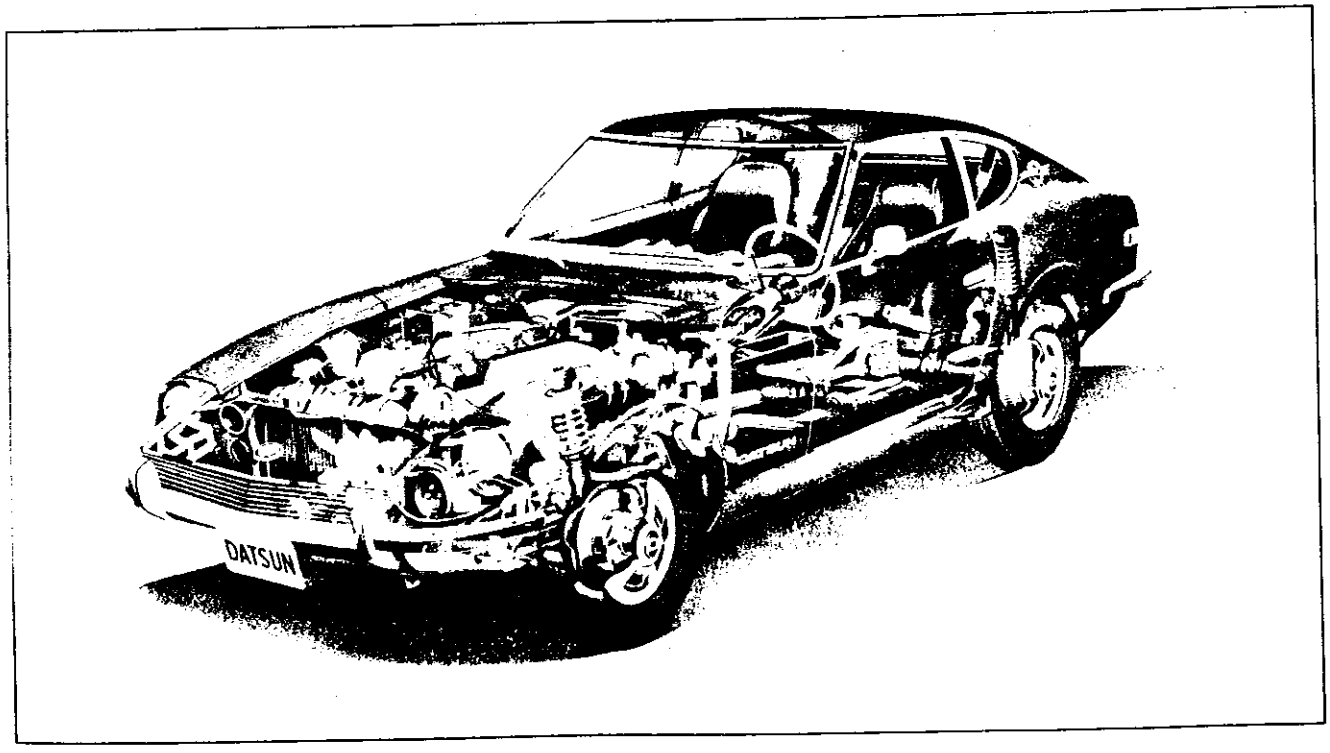

Fig. GI-2 Clairvoyant view (Model HLS30-U)

MODEL IDENTIFICATION

Vehicle model	Engine model	Transmission – speeds	Remark
HLS30-U	L24 (SU carb.)	F4W71A–4	Left hand drive for U.S.A. Canada.
HLS30	L24 (SU carb.)	FS5C71A–5	Left hand drive
HS30-U	L24 (SU carb.)	FS5C71A–5	Right hand drive

IDENTIFICATION NUMBER

The identification number is stamped on instrument panel, and can be seen from outside. (For U.S.A.)

The body number plate identifies the type of car, engine capacity, maximum horse power [SAE (New)], wheel base, engine number and car number.

The body number plate is attached to the right front strut housing.

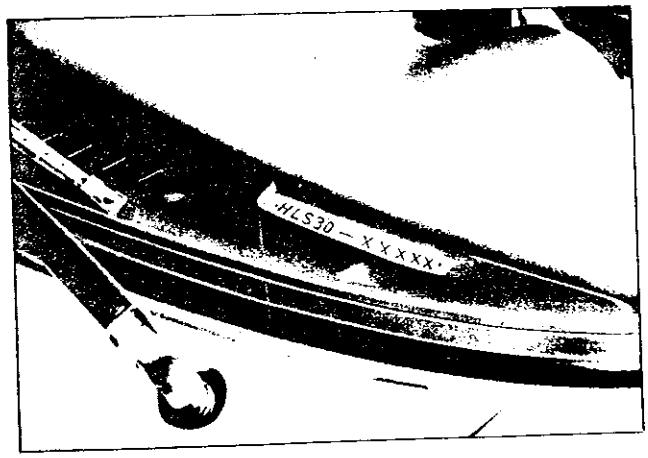

Fig. GI-3 Identification number

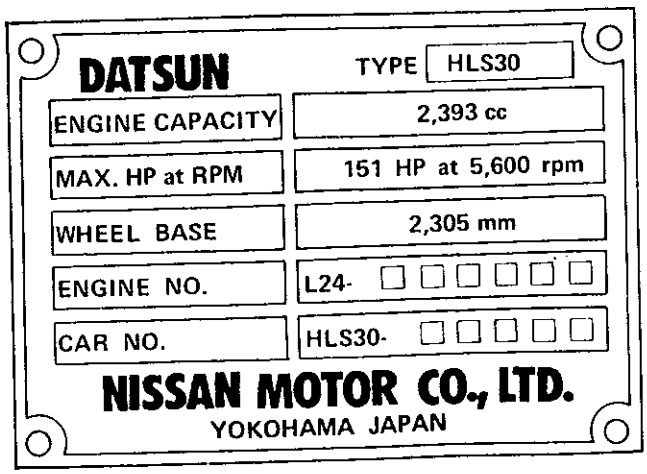

Fig. GI-4 Body number plate

GENERAL VIEW

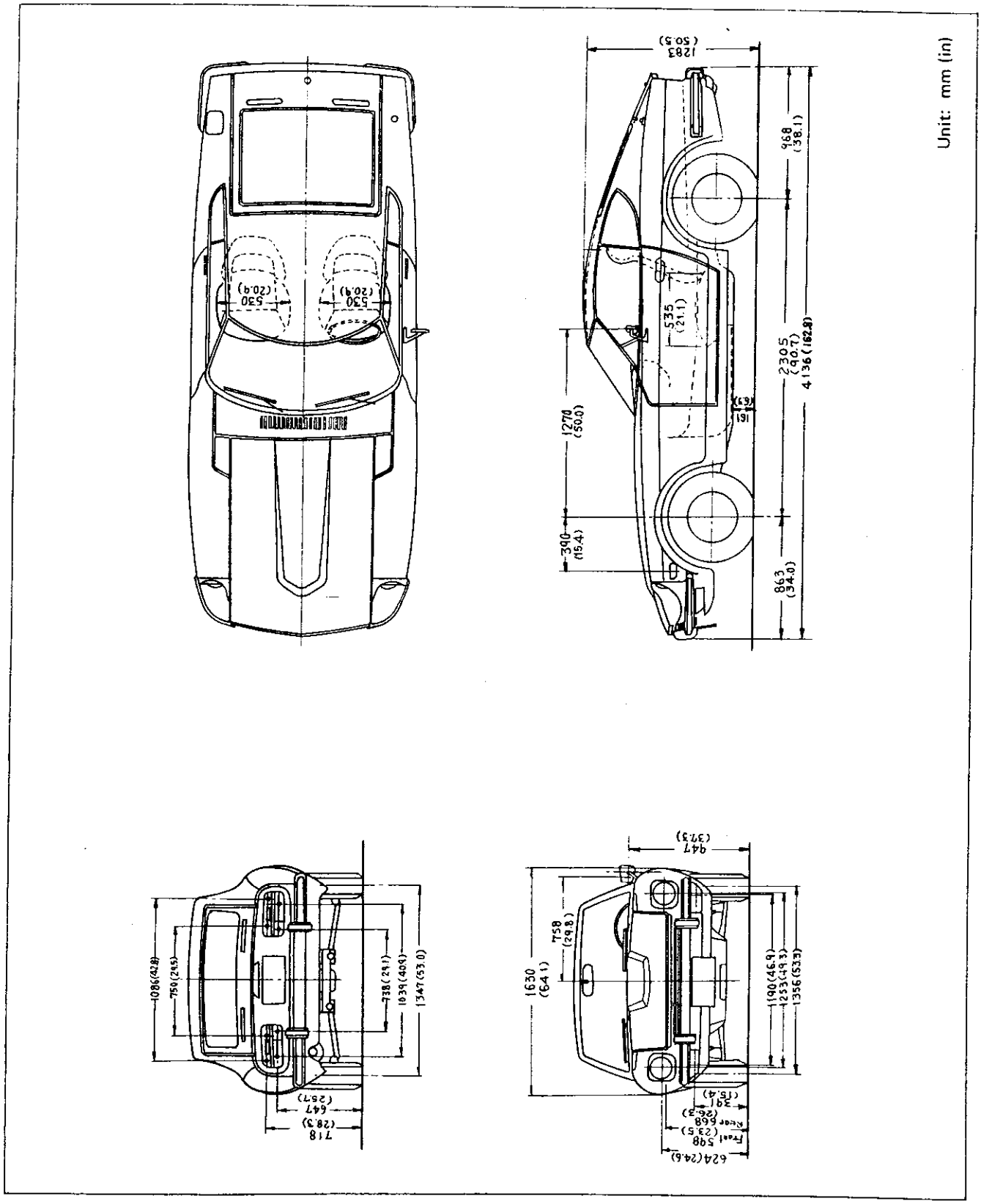

Fig. GI-5 General view

GENERAL SPECIFICATIONS

Item \ Model			DATSUN 240Z SPORTS	
			HLS30-U	H(L)S30-(U)
Dimensions & Weight	Overall length		4,136 mm (162.8 in)	←
	Overall width		1,630 mm (64.1 in)	←
	Overall height		1,283 mm (50.5 in)	←
	Wheel base		2,305 mm (90.7 in)	←
	Tread	Front	1,356 mm (53.3 in)	←
		Rear	1,347 mm (53.0 in)	←
	Minimum road clearance		161 mm (6.3 in)	←
	Seating capacity		2	←
	Vehicle weight		1,044 kg (2,300 lb)	1,025 kg (2,260 lb)
Performance	Maximum speed		200 km/h (125 mph)	205 km/h (129 mph)
	Maximum grade ability	(Sin θ)	0.436	0.436
	Minimum turn radius		4.8 m (15.7 ft)	←
Engine model			L24 (SU carb.)	←
Clutch type			Dry single disc Diaphragm spring.	←
Transmission	Model		F4W71A	FS5C71A
	Synchro type		Warner	Servo
	Control system		Floor shift	←
	Gear ratio	1st	3.549	2.957
		2nd	2.197	1.858
		3rd	1.420	1.311
		4th	1.000	1.000
		5th	—	0.852
		Reverse	3.146	2.922
Final gear	Gear type		Hypoid gear	←
	Gear ratio		3.364	3.900

Speedometer gear ratio			17/6	19/6
Suspension	Front	Type	Independent strut type	←
		Spring	Coil spring	←
		Shock absorber type	Telescopic double-acting	←
	Rear	Type	Independent strut type	←
		Spring	Coil spring	←
		Shock absorber type	Telescopic double-acting	←
		Drive shaft	Ball spline	←
Brake system	Front		Girling-Sumitomo S-16 type Disc brake	←
	Rear		Leading training type with Self-adjuster	←
		Drum	Aluminum drum with fins	←
	Parking		Mechanical operated on rear wheels	←
	Master Vac		6 in	←
	Master cylinder		7/8 in tandem Master cylinder	←
	Skid control valve		Proportioning valve	←
Fuel tank	Tank capacity		60 ℓ (15.9 US gal 13.2 UK gal)	←
	Reservoir tank capacity		*4.2 ℓ (1.1 USgal 0.9 UK gal)	—
Battery			N50	←
Steering	Gear type		Rack-and-pinion	←
	Lock to lock		2.7	←
Wheel & Tire	Size		175SR-14 175HR-14 6.45H14-4PR	6.45H14-4PR 165HR-14 6.95H14-4PR
	Rim size		4½J x 14	←

* For U.S.A. California

LUBRICATION CHART

MAINTENANCE FREQUENCY EVERY					LUBRICATION	MAINTENANCE PERIODS											
50,000 km (30,000 miles)	40,000 km (24,000 miles)	20,000 km (12,000 miles)	10,000 km (6,000 miles)	5,000 km (3,000 miles)		1,000 km (600 miles)	3,000 km (2,000 miles)	6,000 km (4,000 miles)	10,000 km (6,000 miles)	15,000 km (9,000 miles)	20,000 km (12,000 miles)	25,000 km (15,000 miles)	30,000 km (18,000 miles)	35,000 km (21,000 miles)	40,000 km (24,000 miles)	45,000 km (27,000 miles)	50,000 km (30,000 miles)
				●	Change engine oil.	●	●	●	●	●	●	●	●	●	●	●	●
	○				Lubricate foot operated bushings.						○				○		
				○	Check transmission & differential gear oil level, top up if necessary.		○	○	○	○	○	○	○	○	○	○	
●					Change transmission & differential gear oil.	●											●
			○		Grease distributor shaft & cam heel.				○		○		○		○		○
	○				Grease hand brake system linkage.										○		
	○				Grease brake shoe metal-to-metal contact parts.										○		
●					Change suspension ball joint grease.												●
●					Change wheel bearing grease.												●
●					Change rear axle drive shaft joint & ball spline grease.												●
●					Change steering linkage ball joint grease.												●
●					Change steering gear grease.												●
			○		Check steering grease reservoir (replace if necessary).				○		○		○		○		○
●					Change propeller shaft joint grease.												●
	○				Grease wiper motor linkage.										○		
	○				Grease window regulator & lock.										○		
		○			Grease body metal-to-metal contact parts.						○				○		
		●			Change brake fluid.						●				●		
	●				Change cooling water (Long Life Coolant).										●		

○ = Clean, check, adjust or supply ● = Change

CHECKING CHART

MAINTENANCE FREQUENCY EVERY					CHECKING POINTS (ENGINE)	MAINTENANCE PERIODS											
50,00 km (30,000 miles)	40,000 km (24,000 miles)	20,000 km (12,000 miles)	10,000 km (6,000 miles)	5,000 km (3,000 miles)		1,000 km (600 miles)	3,000 km (2,000 miles)	6,000 km (4,000 miles)	10,000 km (6,000 miles)	15,000 km (9,000 miles)	20,000 km (12,000 miles)	25,000 km (15,000 miles)	30,000 km (18,000 miles)	35,000 km (21,000 miles)	40,000 km (24,000 miles)	45,000 km (27,000 miles)	50,000 km (30,000 miles)
			○		Adjust valve clearance.	○			○		○		○		○		○
			○		Check ignition timing (adjust if necessary).	○			○		○		○		○		○
			○		Check fan belt tension.	○			○		○		○		○		○
	○				Measure compression pressure.										○		
	●				Change air cleaner element (viscous type).										●		
	○				Check fuel line for leak.		○								○		
	●				Change cartridge type fuel strainer.										●		
		○			Check fuel pump for proper function.						○				○		
					Retighten carburetor & fitting parts.		○										
	○				Overhaul carburetor.										○		
			●		Change cartridge type oil filter.		●		●		●		●		●		●
		○			Check battery for electrolyte specific gravity.	○					○				○		
		●	○		Check (or change) spark plugs.		○		○		●		○		●		○
				○	Check distributor breaker point.		○	○	○	○	○	○	○	○	○	○	○
	○				Check condenser for proper function.										○		
		○			Check alternator, regulator for proper function.						○				○		
		○			Check alternator brush.						○				○		
		○			Check starter for proper function.						○				○		
			○		Check engine for oil and water leaks.	○			○		○		○		○		○
		○			Retighten cylinder head, manifolds & exhaust pipe flange.	○											○
	○				Check for weak or damage of engine mountings.												○
					Retighten engine mountings.	○											
			○		Adjust idling speed.		○		○		○		○		○		○
			○		Check engine starting condition, abnormal noise and exhaust color.		○		○		○		○		○		○
			○		Check high tension cable.				○		○		○		○		○
			○		Clean ignition coil distributor and battery.				○		○		○		○		○

Special maintenance for emission control system is described on page GI-9.

○ = Clean, check, adjust or sapply ● = Change

MAINTENANCE FREQUENCY EVERY					CHECKING POINTS (CHASSIS & BODY)	MAINTENANCE PERIODS											
50,000 km (30,000 miles)	40,000 km (24,000 miles)	20,000 km (12,000 miles)	10,000 km (6,000 miles)	5,000 km (3,000 miles)		1,000 km (600 miles)	3,000 km (2,000 miles)	6,000 km (4,000 miles)	10,000 km (6,000 miles)	15,000 km (9,000 miles)	20,000 km (12,000 miles)	25,000 km (15,000 miles)	30,000 km (18,000 miles)	35,000 km (21,000 miles)	40,000 km (24,000 miles)	45,000 km (27,000 miles)	50,000 km (30,000 miles)
					Check clutch & brake pedal free play.	O											
				O	Check clutch & brake system for oil leak or defect.	O	O	O	O	O	O	O	O	O	O	O	O
			O		Check clutch operation.		O		O		O		O		O		O
			O		Check foot & hand brake operation.		O		O		O		O		O		O
O					Check brake drum for wear.												O
		O			Check drum brake lining.						O				O		
				O	Check disc brake lining pad.				O	O	O	O	O	O	O	O	O
		O			Check master vac for proper function. (Change rubber parts every two years.)						O				O		
	O				Overhaul Master-Vac.										O		
O					Overhaul master cylinder, wheel cylinder & caliper assembly.												O
				O	Check steering wheel free play.	O	O	O	O	O	O	O	O	O	O	O	O
		O			Retighten steering gear housing.	O					O				O		
	O				Retighten steering coupling & joint.	O									O		
				O	Check steering linkage for loose connection.	O	O	O	O	O	O	O	O	O	O	O	O
		O			Retighten steering knuckle.	O					O				O		
			O		Check and retighten front and rear suspension parts.		O		O		O		O		O		O
O					Check P-valve operation.												O
	O				Check strut assembly.										O		
		O			Check wheel alignment and turning angle.						O				O		
			O		Rotate wheel position.				O		O		O		O		O
			O		Check wheel disc for damage.				O		O		O		O		O
			O		Measure wheel balance (correct if necessary).				O		O		O		O		O
		O			Retighten propeller shaft universal joint flange.	O					O				O		
		O			Check propeller shaft spline and joint for wear or damage.						O				O		
		O			Retighten transmission case and differential carrier.						O				O		
	O				Check exhaust pipe & muffler fitting parts.										O		
			O		Check wire harness and contact parts.				O		O		O		O		O
		O			Retighten door hinge, lock & striker (align door if necessary).						O				O		
			O		Road test.	O			O		O		O		O		O
O					Check headlight aiming.												O
O					Check wheel bearing for wear.												O

SPECIAL MAINTENANCE FOR EMISSION CONTROL SYSTEM

MAINTENANCE FREQUENCY EVERY				CHECKING POINTS		MAINTENANCE PERIODS									
40,000 km (24,000 miles)	20,000 km (12,000 miles)	10,000 km (6,000 miles)	5,000 km (3,000 miles)	Engines equipped with emission control system		1,000 km (600 miles)	3,000 km (2,000 miles)	6,000 km (4,000 miles)	10,000 km (6,000 miles)	15,000 km (9,000 miles)	20,000 km (12,000 miles)	25,000 km (15,000 miles)	30,000 km (18,000 miles)	35,000 km (21,000 miles)	40,000 km (24,000 miles)
			O	Engine	Check ignition timing.	O	O	O	O	O	O	O	O	O	O
			O		Check engine idling.	O	O	O	O	O	O	O	O	O	O
	O				Engine major tune-up.						O				O
	●		O		Check or replace spark plugs.		O	O	O	O	●	O	O	O	●
	●		O		Check or replace distributor breaker points.		O	O	O	O	●	O	O	O	●
	O				Check high tension cable.						O				O
	O				Apply grease to distributor rotor shaft, cam, and wick.						O				O
	O				Replace carburetor air cleaner element.						O				O
	O			Crank-case emission	Check for leaks of hoses and hose connections.						O				O
	O				Check for proper function of crankcase ventilation control valve.						O				O
	O			Exhaust emission	Check for proper function of air pump.						O				O
	O				Check for proper function of relief valve.						O				O
	O				Check for proper function of check valve.						O				O
	O				Check for proper function of anti-backfire valve.						O				O
	O				Check for leaks of air gallery and nozzle connections.						O				O
	O				Check for leaks of hoses and lose connections.						O				O
			O		Check air pump belt tension.	O	O	O	O	O	O	O	O	O	O
	O				Check operating negative pressure of throttle control valve, adjust if necessary.						O				O
	O			Evapo-rative emission	Check hoses, hose connectors and piping for leaks.						O				O
	O				Check for proper function of flow guide valve.						O				O

O = Clean, check, adjust or supply ● = Change

JACKING UP AND TOWING THE CAR

CONTENTS

JACK UP

Pantograph jack

App'y a jack to the indicated position where sill flange is cut for identification. Do not jack up other position.

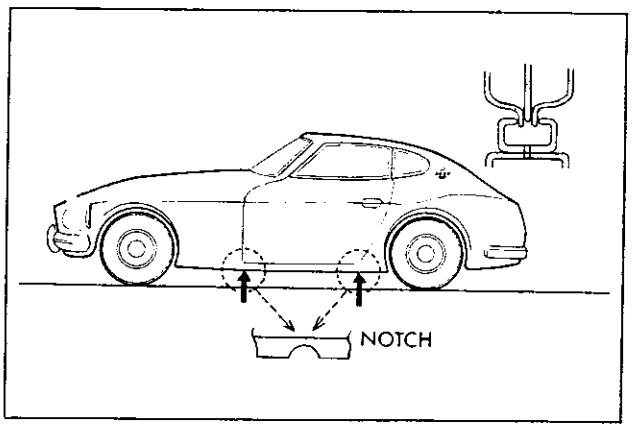

Fig. GI-6 Jacking point

Garage jack

The front jacking point is center of front suspension member and rear is differential gear carrier.

Do not apply a jack to center portion of front suspension transverse link.

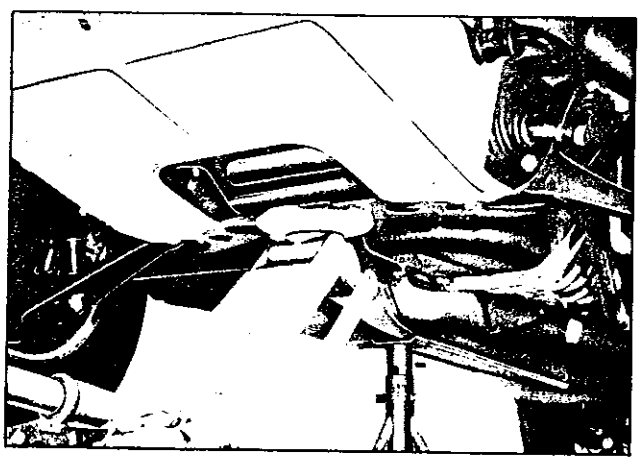

Fig. GI-7 Front jacking point

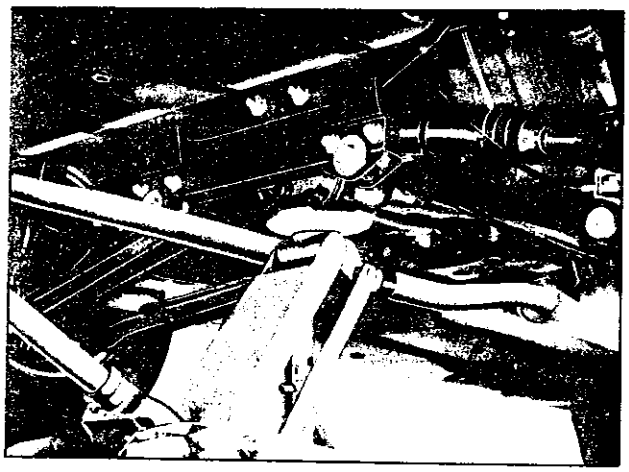

Fig. GI-8 Rear jacking point

Supportable point

Front supportable points for stand are both front side members. Rear supportable points are both sides of front differential mounting cross member.

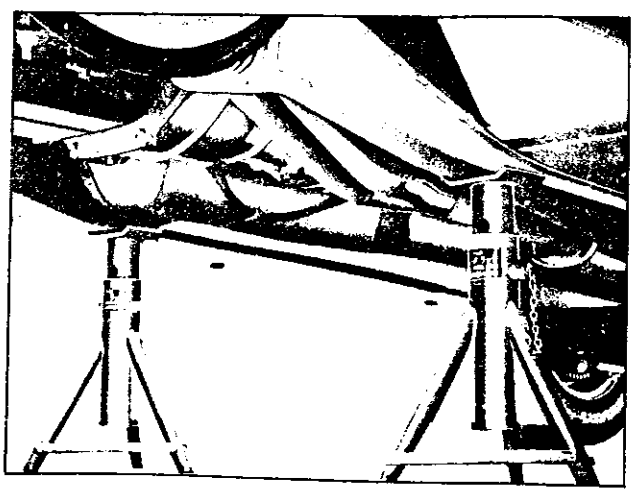

Fig. GI-9 Front supportable point

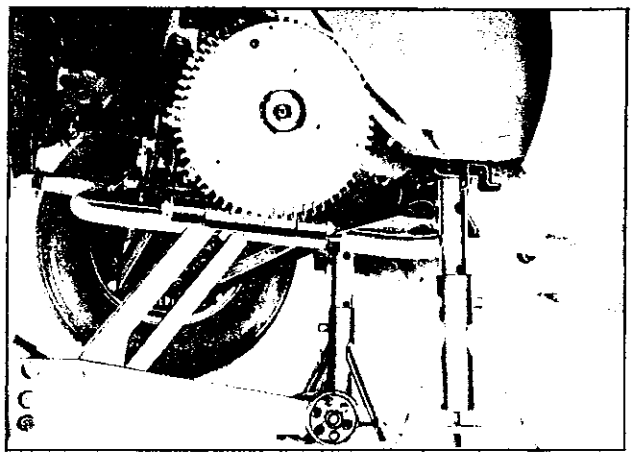

Fig. GI-10 Rear supportable point

TOWING

Tow forward at hook as shown in Figure GI-11. Do not tow at front suspension member or transverse link. Be careful not to apply impact load to the hook.

Admittable load of hook is less than 1,000 kg (2,205 lb).

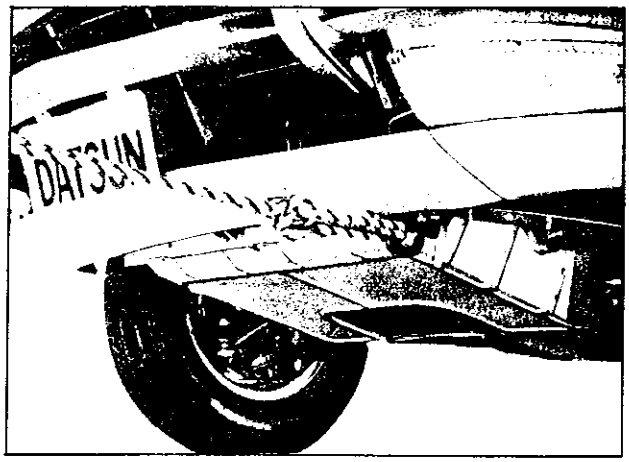

Fig. GI-11 Front towing point

SERVICE JOURNAL OR BULLETIN REFERENCE

DATE	JOURNAL or BULLETIN No.	PAGE No.	SUBJECT

SERVICE JOURNAL OR BULLETIN REFERENCE

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SECTION ER

ENGINE REMOVAL & INSTALLATION

ER

ENGINE REMOVAL AND INSTALLATION

CONTENTS

Experience has shown that it is much easier to remove the engine with transmission as a single unit that to remove the engine only.

The engine can then be separated from the transmission assembly.

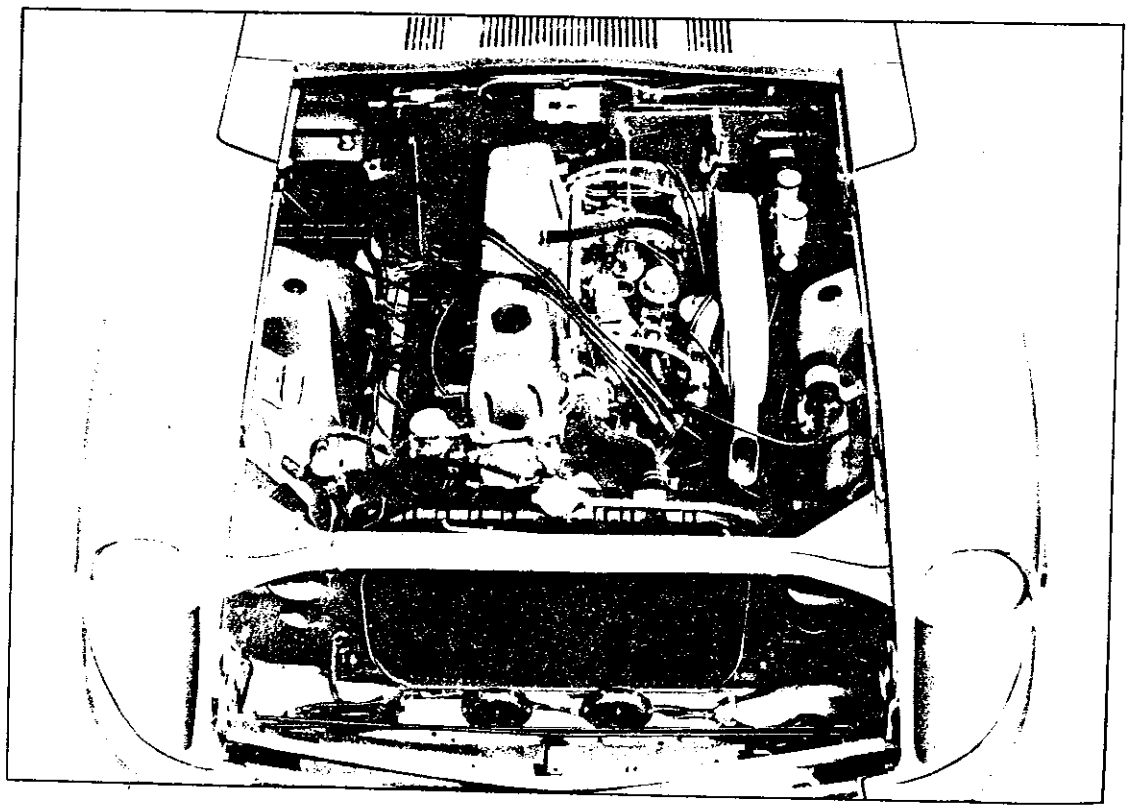

Fig. ER-1 Engine compartment

REMOVAL

1. Scribe alignment marks on hood around hood hinges and remove hood from hinges.

2. Completely drain the cooling system, engine and transmission lubricant.

3. Disconnect the battery cable.

4. Take off both upper and lower radiator hoses by removing the hose clamps. Then loosen the fixing bolts of the radiator, and take it out in sequence.

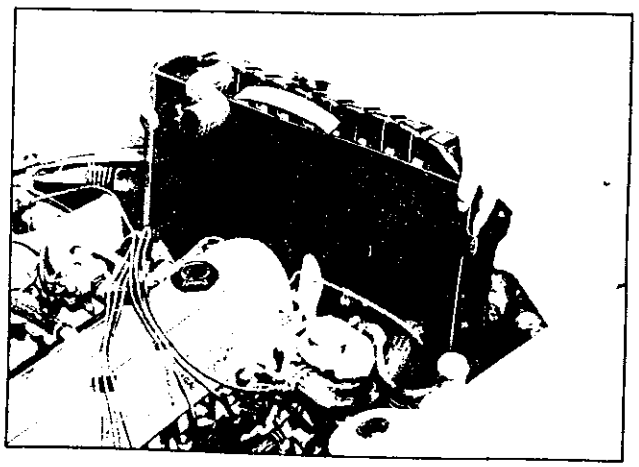

Fig. ER-2 Removing radiator

5. Disconnect the fuel tube from the fuel pump.

6. If equipped with heater, remove its hoses at engine attachment.

7. Disconnect master vac vacuum hose from engine.

8. Disconnect accelerator control linkage, throttle control wire and choke control wire at the carburetor side.

9. Disconnect the wirings for the starter, alternator, ignition coil, oil pressure switch and thermal transmitter.

10. Remove the clutch operating cylinder and its return spring.

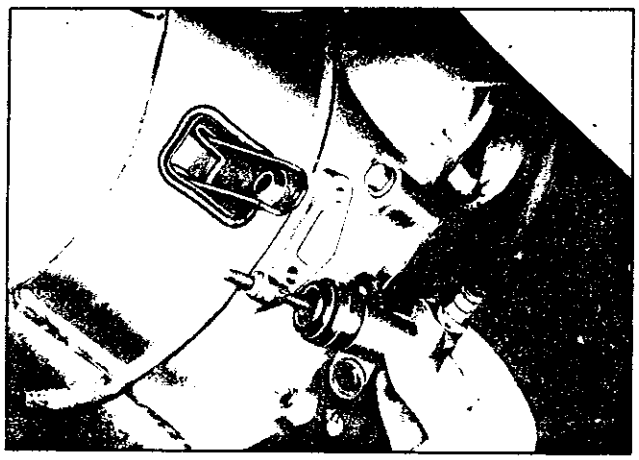

Fig. ER-3 Removing clutch operating cylinder

11. Disconnect the speedometer cable. Disconnect the reverse lamp switch.

12. Disconnect the transmission control lever from the control lever bracket, and remove the control lever.

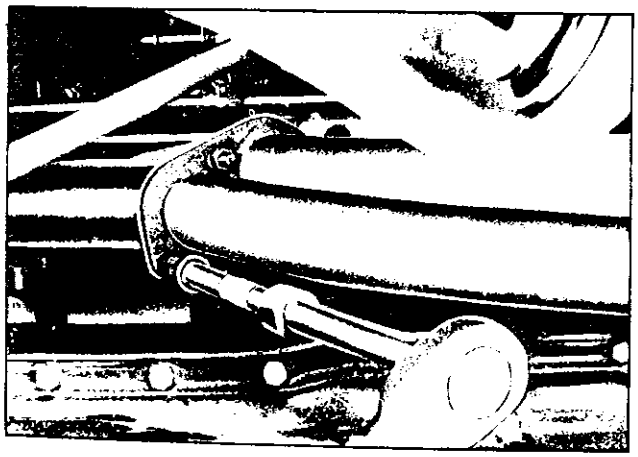

Fig. RE-4 Disconnecting exhaust tube

13. Disconnect the front exhaust tube from the exhaust manifold.

14. Disconnect the center tube from the main muffler and remove the front tube, pre-muffler and center tube assembly.

15. Disconnect the propeller shaft by disconnecting it from the companion flange of the gear carrier.

16. Jack up the transmission a little and then remove the rear engine mounting cross member by removing the fixing bolts of the engine mounting insulator, mounting cross member.

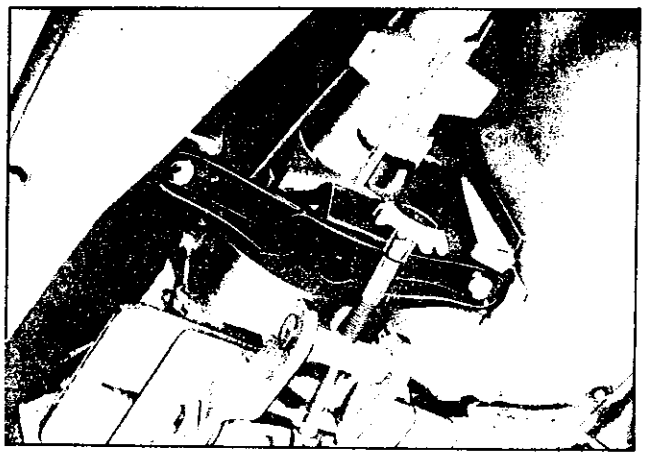

Fig. ER-5 Removing rear engine mounting

17. Remove the fixing bolts securing the front engine mounting brackets to engine mounting insulators.

18. Hook with cable or chain to the slingers (hooks) which are installed on the engine cylinder head one at the front and the other at the rear.

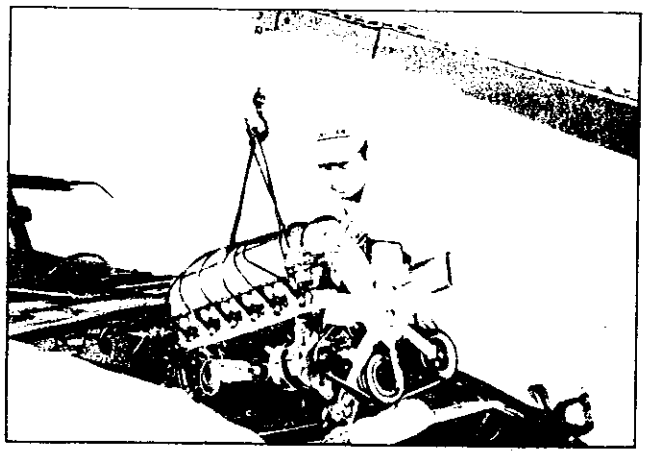

Fig. ER-6 Lifting engine

At this lifting, lower the jack placed under the transmission gradually (draw off the jack at adequate stage), hoist up engine observing the tension of wire and adjusting the position of chain block so that the engine tilts in order to make it cleared off the body. At this lifting, take care that accessories installed on the body side do not touch the engine and transmission.

INSTALLATION

Reverse the removal procedure but do not connect any parts to the engine steadily until the engine mounting insulators have been replaced and the power unit weight is taken by them.

FRONT ENGINE MOUNTING INSULATOR

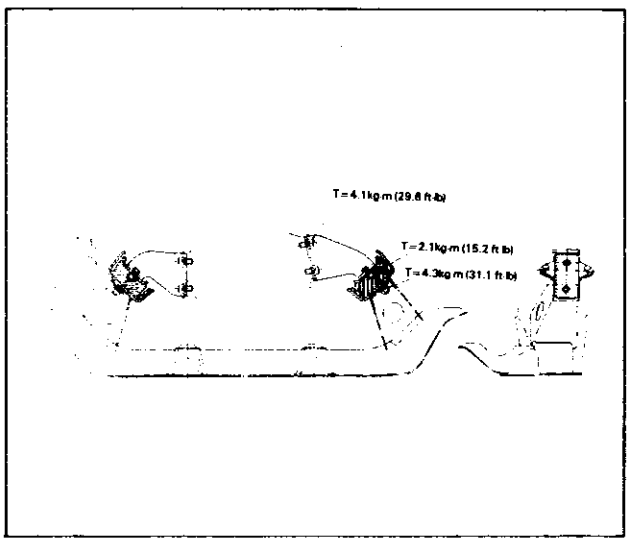

Fig. ER-7 Sectional view of front engine mounting

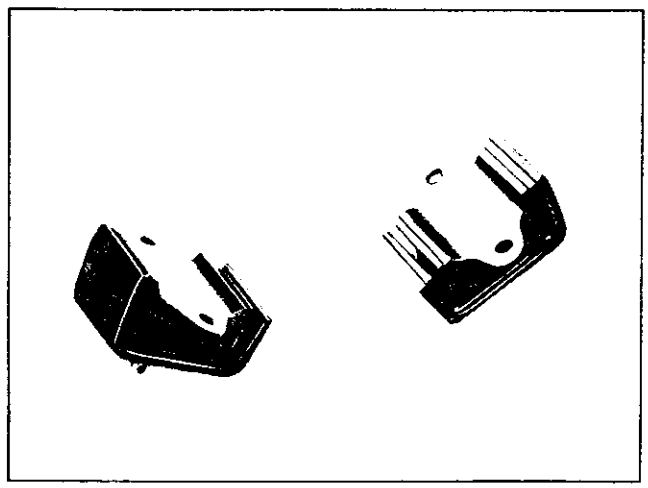

Fig. ER-8 Front engine mounting insulator

REMOVAL AND INSTALLATION

1. Support the engine weight by a jack.

2. Remove the nut connecting the front engine mounting insulator and the front suspension member. Remove the bolts connecting the engine mounting insulator and the engine mounting bracket.

3. Jack up the engine a little and remove the insulator.

4. Reverse the removal procedure.

Note: Keep the insulator free from Oil or Grease.

INSPECTION

If there is damage, deterioration, or separation of bonded surface, renew the parts.

REAR ENGINE MOUNTING INSULATOR

CONTENTS

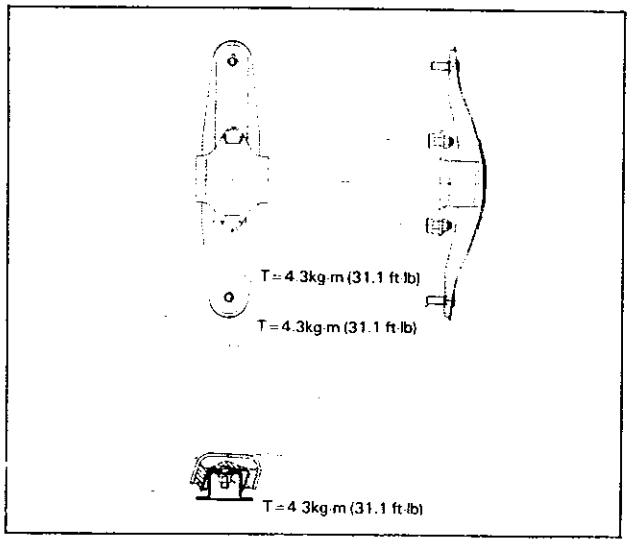

Fig. ER-9 Sectional view of rear engine mounting

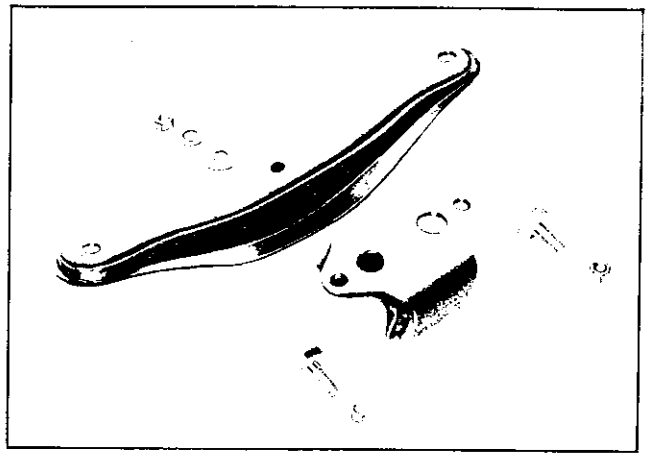

Fig. ER-10 Rear engine mounting

REMOVAL AND INSTALLATION

1. Support the transmission weight by a jack.

2. Remove the bolts connecting the rear engine mounting insulator and the transmission rear extension housing. Remove the fixing bolts connecting the mounting insulator and the cross member.

3. Remove the bolts fixing the cross member to under the body. Then remove the insulator.

4. Reverse the removal procedure.

Note: Keep the insulator free from Oil or Grease.

INSPECTION

If there is damage, deterioration, or separation of bonded surface, renew the parts.

SERVICE JOURNAL OR BULLETIN REFERENCE

DATE	JOURNAL or BULLETIN No.	PAGE No.	SUBJECT

SERVICE JOURNAL OR BULLETIN REFERENCE

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DATSUN 240Z SPORTS
MODEL S30 SERIES

CHASSIS & BODY

NISSAN MOTOR CO., LTD.
TOKYO, JAPAN

SECTION CL

CLUTCH

CL

CLUTCH

CONTENTS

DESCRIPTION

The clutch is a single dry disc diaphragm spring type clutch. The major components are clutch cover, pressure plate, diaphragm spring, and wire rings. The clutch disc is provided with riveted plates on both surfaces and coil springs arranged in a link. The coil springs absorb shock while engaging the clutch softening and smoothing clutch engagement.

Release bearing, sleeve, and withdrawal lever are used to control clutch engagement and disengagement.

Each part of the clutch assembly is secured with rivets. Therefore, when a trouble is uncorrectable, replace the clutch assembly with a new assembly.

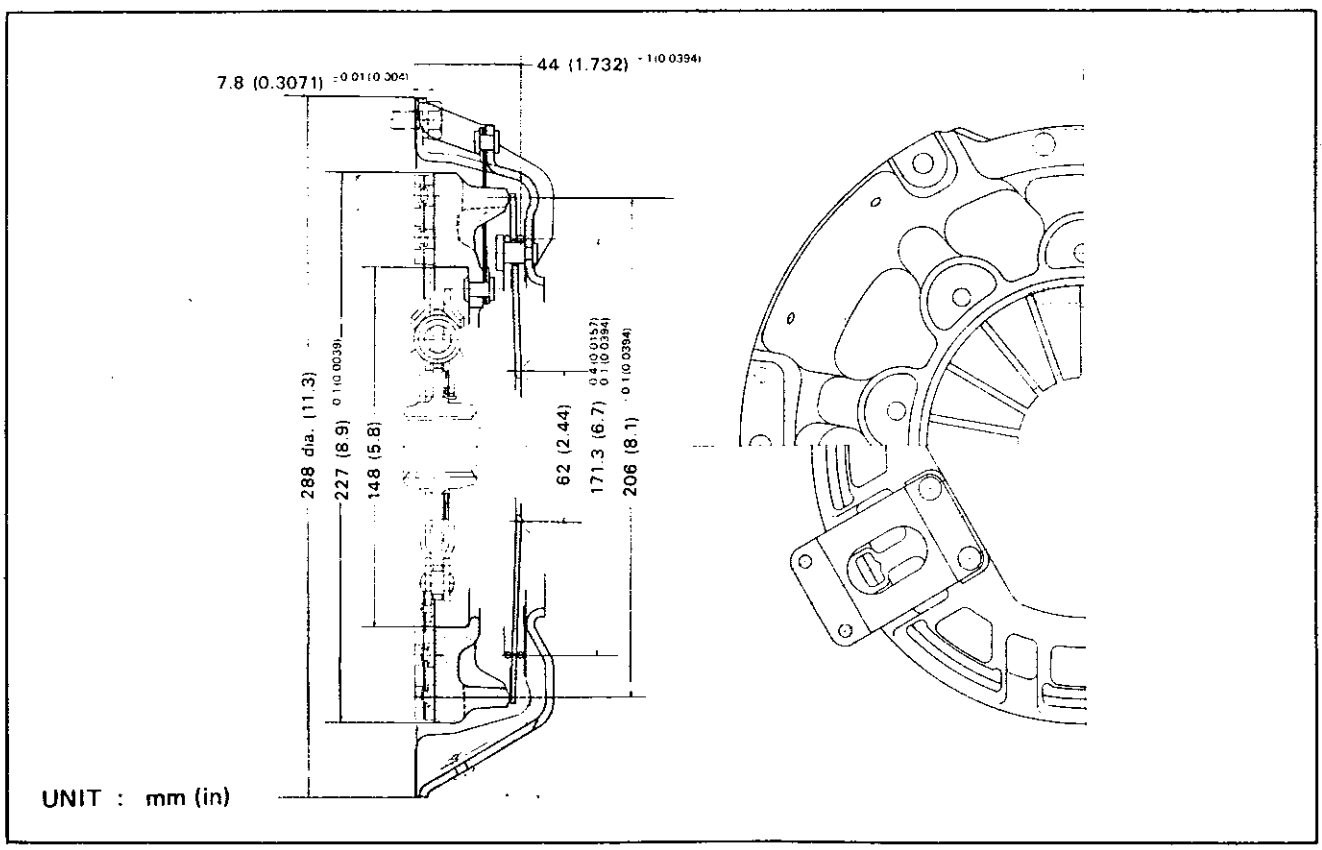
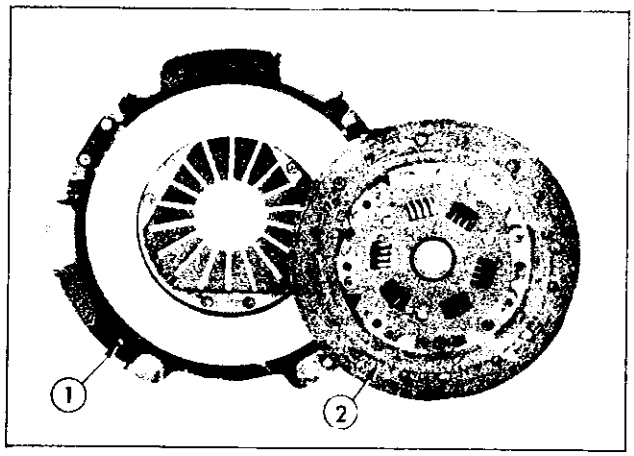


Fig. CL-1 Construction of clutch

REMOVAL

The clutch assembly is dismounted primarily in the same manner as the engine assembly. Thus, when dismounting the clutch assembly, refer to the Section ER (Engine Removal) and other relative sections.



1	Clutch assembly	2	Clutch disc assembly

Fig. CL-2 Clutch assembly and disc assembly

DISASSEMBLY

1. When separating the clutch assembly from the flywheel, loosen and remove the installation bolts diagonally and gradually.

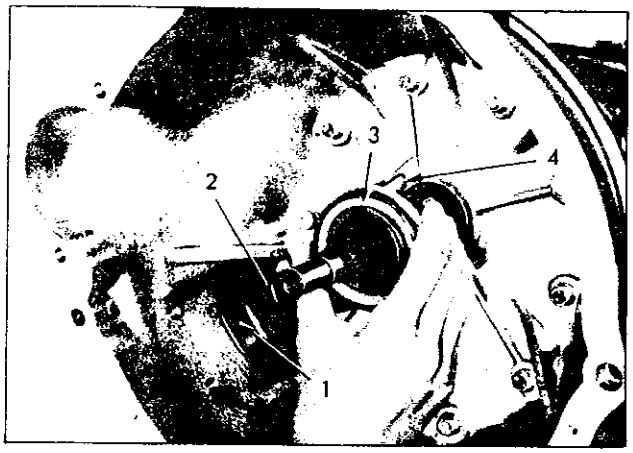
Note: When separating the clutch assembly from the flywheel, support the clutch cover sufficiently and loosen the installation bolts gradually and carefully because the diaphragm spring tension is always applied.

2. Removing release mechanism

(1) Remove the dust cover from the clutch housing.

(2) Remove the holder spring from the bearing sleeve, and separate the withdrawal lever from the bearing sleeve.

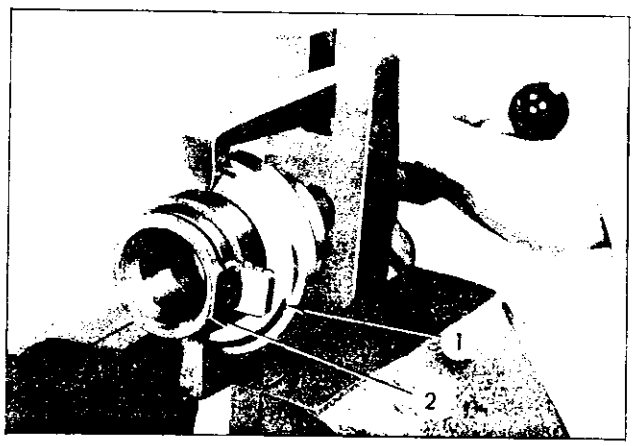
(3) Remove the release bearing and bearing sleeve from the front cover, and remove the withdrawal lever from the withdrawal lever ball pin.



1	Dust cover	3	Release bearing
2	Withdrawal lever	4	Holder spring

Fig. CL-3 Disassembling release mechanism

3. Withdraw the release bearing from the bearing sleeve by the use of a bearing puller.



1	Release bearing	2	Bearing sleeve

Fig. CL-4 Withdrawing release bearing

INSPECTION AND ADJUSTMENT

Thoroughly clean all disassembled parts, except for disc assembly and release bearing, and check them for wear, crack, and other defective conditions.

Clutch assembly

1. Check the clutch cover, diaphragm spring, pressure plate, etc. for excessive wear, crack and damage. When noise occurs on the clutch assembly, replace.

2. Measuring and adjusting height of diaphragm spring

(1) Line up distance piece (special tool ST20058001) on clutch assembly base plate (special tool ST20051000).

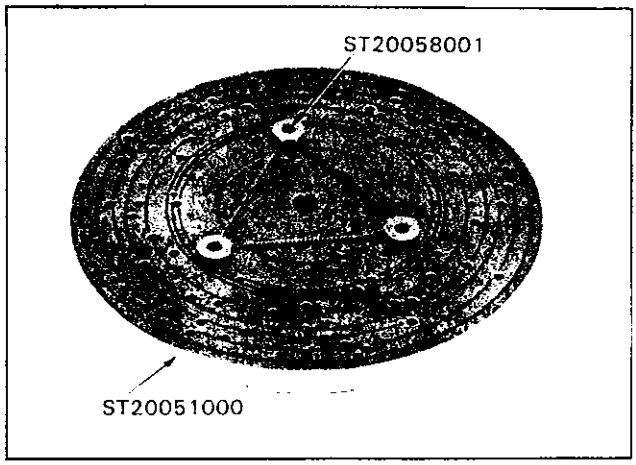


Fig. CL-5 Base plate and distance piece

(2) Place the clutch assembly on the distance piece, and set the clutch assembly on the base plate stationarily. (Under this condition, the distance piece is placed beneath the pressure plate.)

(3) Raise center pole (special tool ST20052000) on the base plate. Install height gauge (special tool ST20240000) on the pole, and measure height of the diaphragm spring end from the upper surface of the base plate.

Height of diaphragm spring end:

43.0 to 45.0 mm (1.693 to 1.772 in)

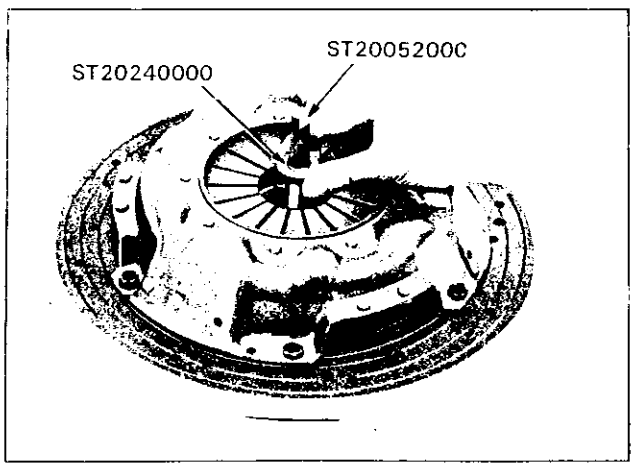


Fig. CL-6 Measuring height of diaphragm spring

(4) Adjust height of the diaphragm spring by the use of diaphragm spring adjusting wrench (special tool ST20500000), if required.

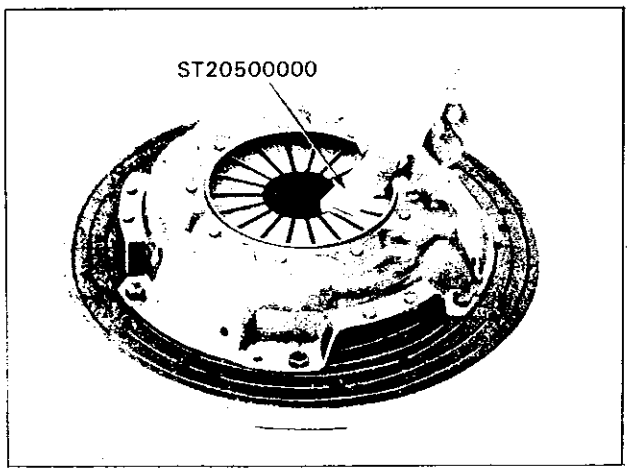


Fig. CL-7 Adjusting diaphragm spring height

Disc assembly

1. If the facing is soiled with grease or oil, clean off with gasoline tetrachloride and dress the facing with a wire brush. Replace the facing, if required.

2. Check the disc for deflection, and repair or replace if the deflection at the outer circumference of the facing exceeds the following value:

Upper limit of the deflection:

0.5 mm (0.0197 in) at
112 mm (4.40 in) radius

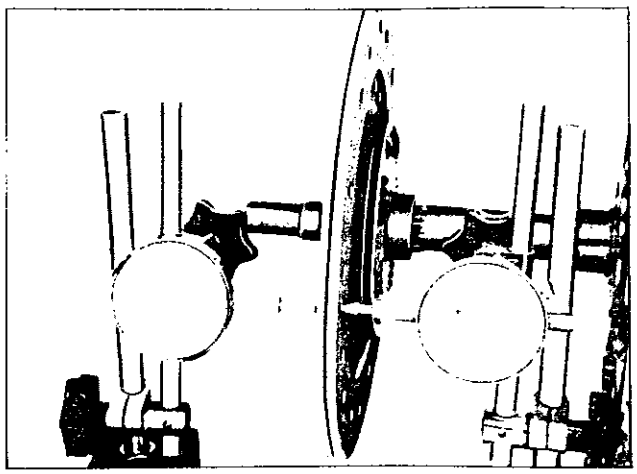


Fig. CL-8 Checking disc for deflection

3. Replace the disc assembly if the facing is worn to such an extent that the facing height above rivet is less than 0.3 mm (0.0118 in), the facing is worn unevenly, or rivets are loose.

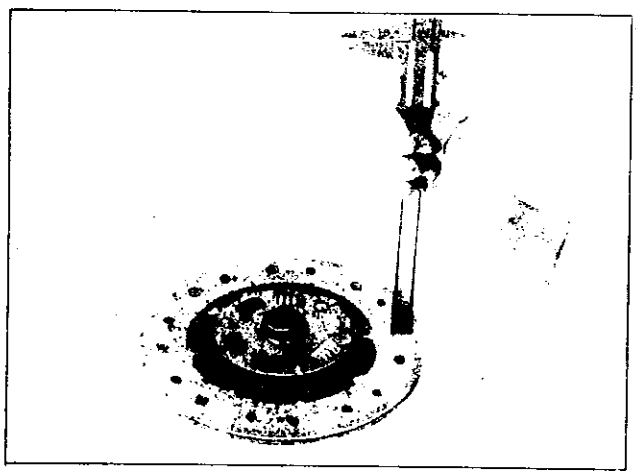


Fig. CL-9 Checking clutch facing for wear

Release bearing and sleeve

1. When withdrawal lever and bearing sleeve contact point is worn in step, replace the sleeve.

2. When grease leaks from the release bearing, or noise occurs on the release bearing, replace the release bearing.

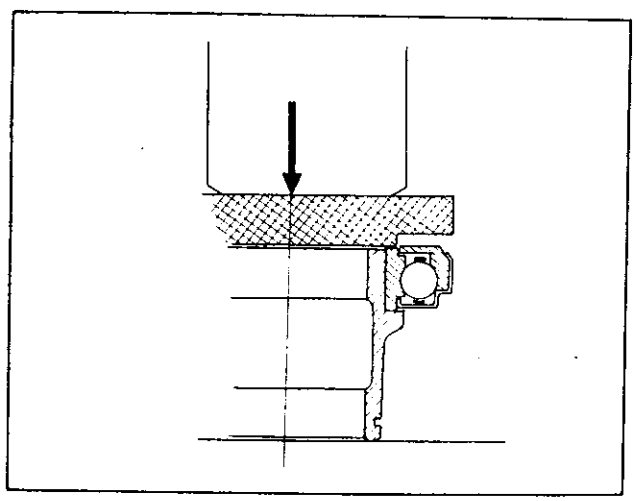


Fig. CL-10 Fitting release bearing

REASSEMBLY

Release mechanism

1. Tightly fit the release bearing to the place on the bearing sleeve as shown in Figure CL-10. When the bearing is installed completely, turn the bearing with a finger, and make sure that the bearing operates smoothly.

2. Apply multi-purpose grease (MIL G-2108 or 10924) to the following places:

- Bearing sleeve inside groove

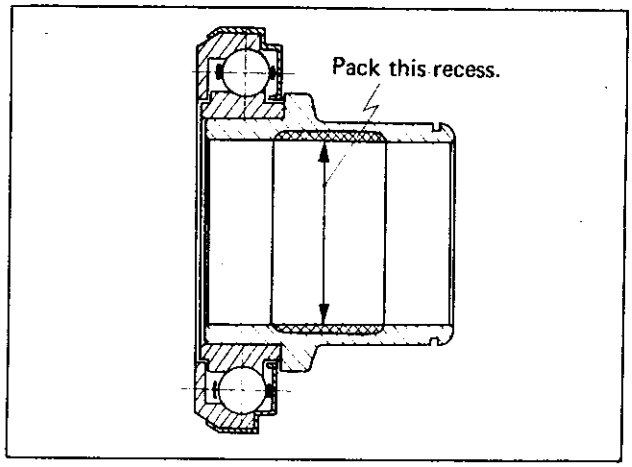
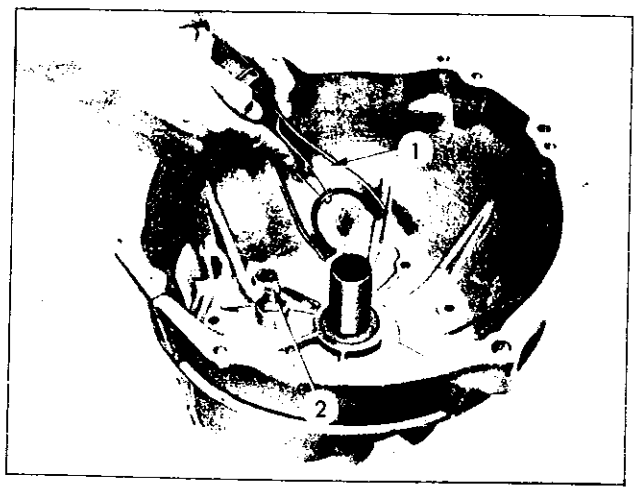


Fig. CL-11 Lubricated position on the bearing sleeve

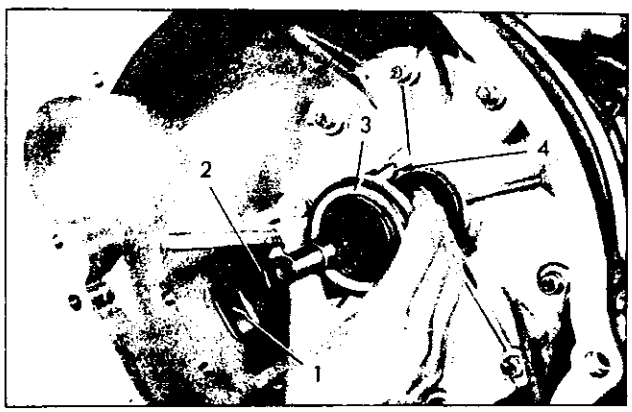
- Withdrawal lever and bearing sleeve contact point
- Withdrawal lever ball pin and withdrawal lever contact surface.



1	Withdrawal lever	2	Withdrawal lever ball pin

Fig. CL-12 Position on the withdrawal lever to which grease is applied.

3. When grease is applied to the necessary places, install the withdrawal lever, release bearing, and bearing sleeve on the clutch housing, connect them with holder spring, and install the dust cover on the clutch housing.



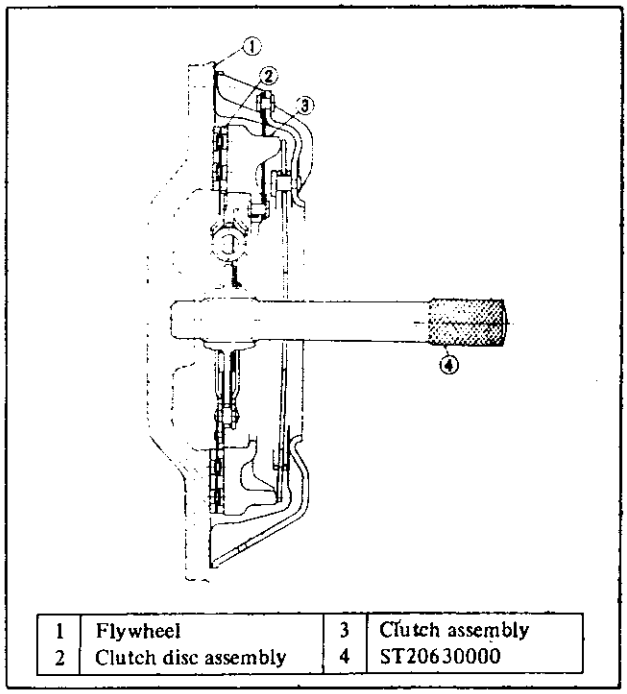
1	Dust cover	3	Release bearing
2	Withdrawal lever	4	Holder spring

Fig. CL-13 Installing release mechanism

REINSTALLATION

1. Clean the clutch pilot bushing, and fill it with multi-purpose grease (MIL G-2108, 10924).

2. Install the disc assembly and clutch assembly on the flywheel by the use of a clutch aligning bar (special tool ST20630000).



1	Flywheel	3	Clutch assembly
2	Clutch disc assembly	4	ST20630000

Fig. CL-14 Installing disc and clutch assembly

CLUTCH CONTROL

CONTENTS

DESCRIPTION

The hydraulic clutch control consists of a pendent pedal, master cylinder, operating cylinder and withdrawal lever.

When the clutch pedal is depressed, the piston of the master cylinder forwards the fluid to the operating cylinder through a pipe line. The movement of the

operating cylinder piston is transmitted to the withdrawal lever through the push rod, and thus, the clutch is disengaged.

CLUTCH PEDAL

Removal

1. Remove the return spring.

2. Loosen the lock nut of the master cylinder push rod, and disconnect the push rod end.

3. Remove the cotter pin and washer of the pedal shaft, and remove the pedal lever.

Note: Before removing the pedal, measure the pedal head height from toe board without fail.

Inspection

Thoroughly clean all disassembled parts (indicated below) and carefully check them for wear, damage and other abnormal conditions. Repair or replace them with new ones, if required.

1. Pedal head rubber
2. Return spring
3. Pedal lever boss
4. Clevis pin
5. Nylon bushing
6. Pedal shaft, etc.

Reinstallation

Reinstall the clutch pedal in reverse sequence of removal.

Adjustment

Adjust the pedal head height to 202 mm (8.0 in) for both right-hand and left-hand drive by adjusting the master cylinder push rod length.

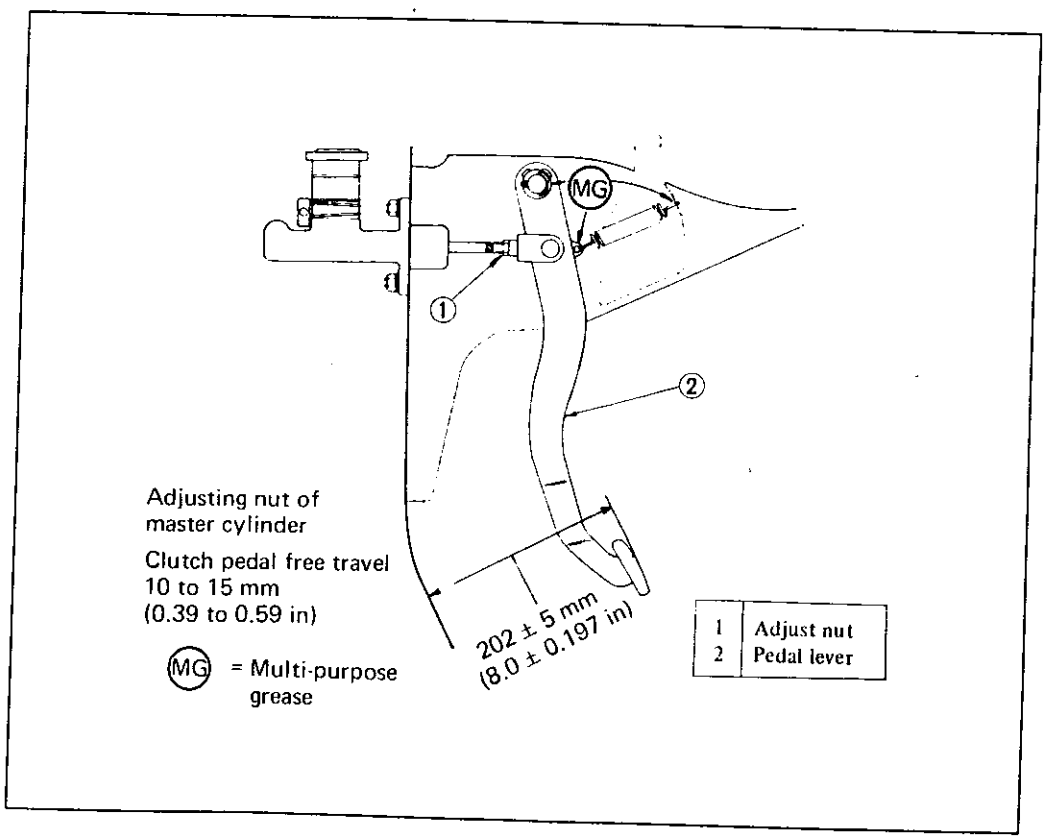


Fig. CL-15 Pedal height adjustment

CLUTCH MASTER CYLINDER

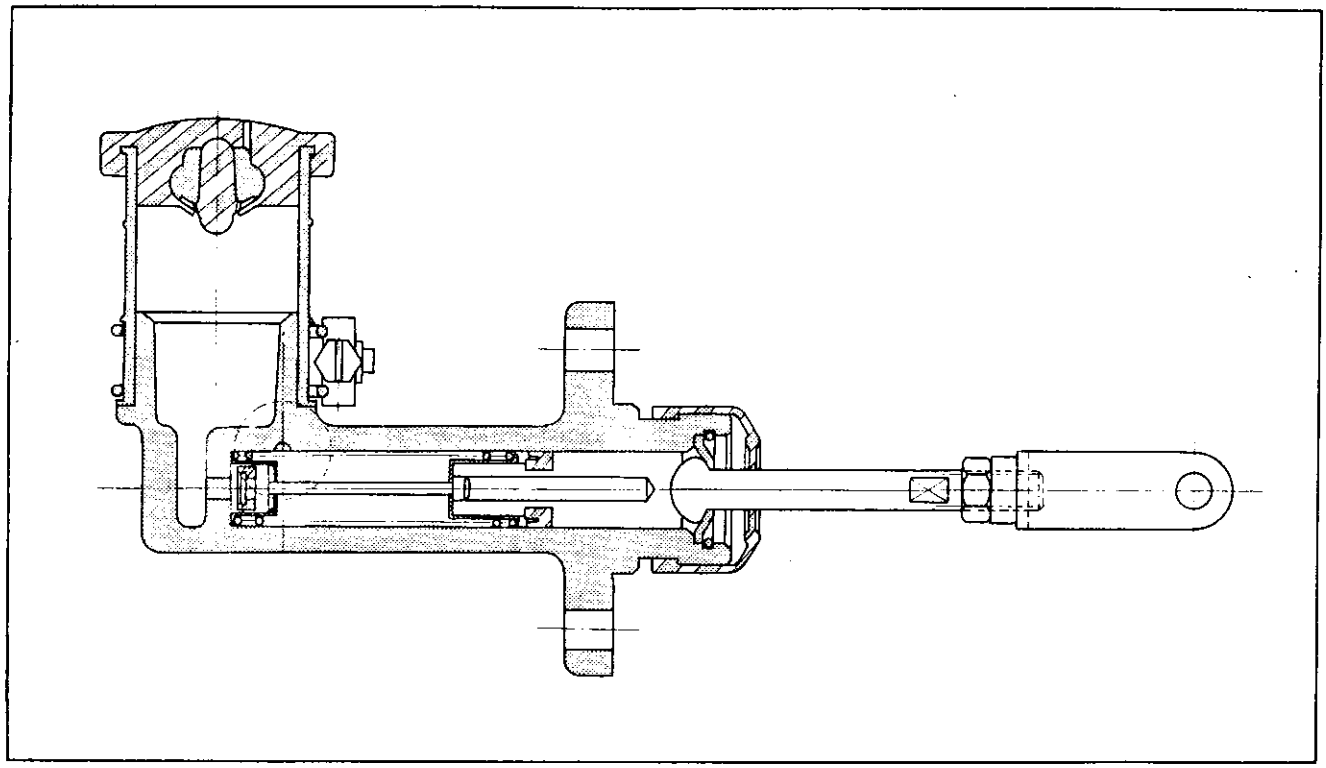


Fig. CL-16 Clutch master cylinder

Removal

1. Loosen the lock nut of the master cylinder push rod and disconnect the push rod from the clevis.

2. Disconnect the clutch line from the master cylinder, and drain fluid.

3. Remove the securing bolts and remove the master cylinder assembly from the vehicle.

Disassembly

1. Remove the filler cap and drain fluid.

2. Pull back the dust cover and remove the snap ring. The stopper, push rod, piston assembly, primary cup and return spring assembly can be removed.

Inspection

Thoroughly clean all parts with brake fluid before inspection.

1. Check the cylinder and piston for uneven wear or damage. Replace if required.

2. When clearance between the cylinder and piston is more than 0.15 mm (0.0059 in), replace the cylinder.

3. Replace the piston cup, primarily, whenever the master cylinder is disassembled. It must also be replaced when wear or deformation due to fatigue or damage is found.

4. Check the dust cover, oil reservoir, filler cap, and clutch line for damage or deformation. If abnormal condition is found, replace with new one.

Reassembly

Reassemble the master cylinder assembly in reverse sequence of disassembly noting the following matters.

1. The piston cup should be soaked in brake fluid before reassembly. Install the piston cup carefuliy so that it is correctly faced.

2. Apply brake fluid sufficiently to the cylinder and piston, and assemble them.

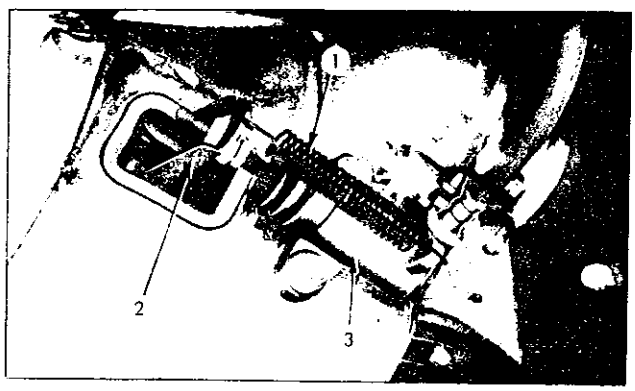
Reinstallation

Reinstall the master cylinder assembly in reverse sequence of removal, and adjust as follows.

1. Adjust the pedal height by changing the push rod length.

2. Bleed air out of the hydraulic system.

OPERATING CYLINDER



1	Return spring	3	Operating cylinder
2	Withdrawal lever		

Fig. CL-17 Operating cylinder

Removal

1. Remove the return pring.

2. Disconnect the clutch line from the operating cylinder.

3. Disconnect the push rod from the withdrawal lever.

4. Release two bolts used to mount the operating cylinder to the clutch housing.

Disassembly

1. Remove the dust cover.

2. Remove the snap ring. All other parts are can be disassembled.

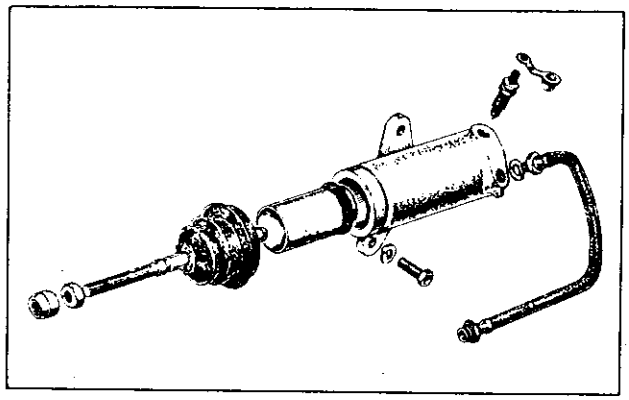


Fig. CL-18 Operating cylinder disassembled

Inspection

Check all parts (especially the piston cup), and replace if worn or damaged.

Reassembly

Reassemble the operating cylinder in reverse sequence of disassembly noting the following matters.

1. Soak the piston cup in fluid before reassembly. Install the piston cup carefully so that it is faced correctly.

2. Apply brake fluid sufficiently to the cylinder and piston, and assemble them.

Reinstallation

Reinstall the operating cylinder in reverse sequence of removal.

1. Bleed air out of the hydraulic system.

2. Adjust the clearance between the top of withdrawal lever and release bearing to 2.0 mm (0.0786 in) in accordance with the following instructions.

ADJUSTING WITHDRAWAL LEVER

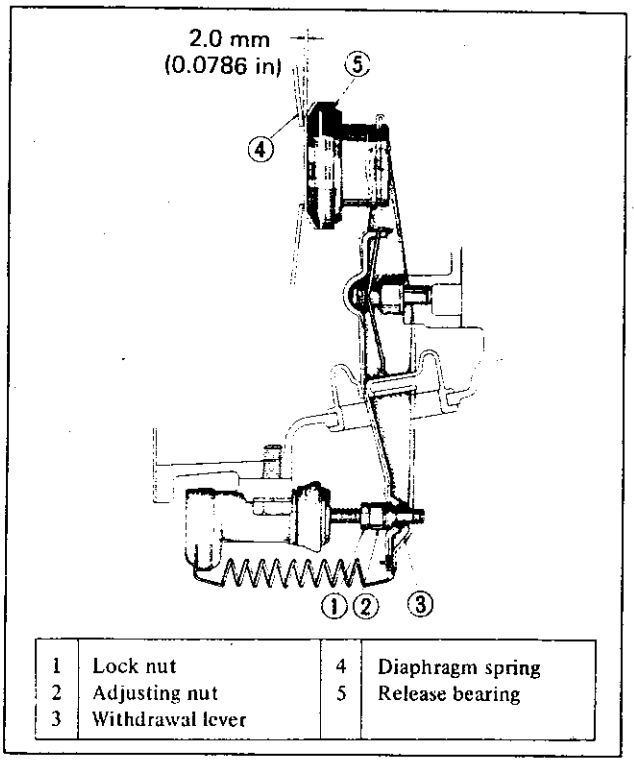
Correct adjustment of the clutch withdrawal lever is essential. Insufficient free travel between the release bearing and the diaphragm spring fingers causes the clutch to slip, while excessive free travel affects full disengagement of the clutch.

The clearance between the release bearing and the diaphragm spring fingers can be adjusted at the withdrawal lever end as follows.

1. Loosen the lock nut, tighten the adjusting nut and eliminate clearance between the top of the withdrawal lever and release bearing.

2. Return the adjusting nut from that position 1.5 turns and set the adjusting nut stationarily with the lock nut.

When the adjusting nut is returned 1.5 turns, the withdrawal lever end is returned 2.0 mm (0.0786 in).



1	Lock nut	4	Diaphragm spring
2	Adjusting nut	5	Release bearing
3	Withdrawal lever		

Fig. CL-19 Adjusting withdrawal lever play

BLEEDING CLUTCH SYSTEM

1. Remove the bleed screw dust cap from the operating cylinder.

2. Open the bleed screw approximately three-quarters of a turn. Attach a tube immersing the open end into a clean container which contains a small amount of brake fluid.

3. Fill the master cylinder reservoir with the recommended fluid.

4. Depress the clutch pedal quickly while keeping it down retighten the bleed screw, and allow it to return slowly. Repeat this pumping action until the fluid entering the container is free from air bubbles.

5. Screw up the bleed screw on a down stroke of the pedal, remove the bleed tube and replace the dust cap.

SERVICE DATA AND SPECIFICATIONS

Clutch release lever

Release bearing-to-diaphragm spring (withdrawal lever) clearance	2.0 mm (0.0786 in)
Diaphragm spring to-flywheel height	44 ± 1.0 mm (1.73 ± 0.00394 in)

Clutch disc

Facing size	
Outer dia. x inside dia. x thickness	225 x 150 x 8.6 mm (8.86 x 5.90 x 0.338 in)
Total friction area	444 cm² (68.8 sq in)
Thickness of disc assembly	
Free	8.3 to 8.9 mm (0.327 to 0.350 in)
Compressed	7.6 to 8.0 mm (0.300 to 0.315 in)
Number of torsion spring	6
Allowable minimum depth of rivet head from facing surface	0.3 mm (0.0118 in)
Allowable facing run-out	0.5 mm (0.0197 in)
Allowable free play of spline	0.4 mm (0.0157 in)

Clutch pedal

Pedal height when not depressed	202 mm (8.0 in)
Free travel of pedal head	10 to 15 mm (0.394 to 0.590 in)
Pressing strength at full stroke	10 to 15 kg (22 to 33 lb)

Master cylinder – clutch

Master cylinder diameter	15.87 mm (5/8 in)
Allowable maximum clearance between cylinder and piston	0.15 mm (0.0059 in)

Operating cylinder – clutch

Operating cylinder diameter	15.87 mm (5/8 in)

Tightening torque

Clutch assembly securing bolt	2.4 to 2.6 kg-m (17.4 to 18.8 ft-lb)

TROUBLE DIAGNOSES AND CORRECTIONS

Troubles	Possible causes	Corrective action
Noises audible on pedal depression	Excessively worn, damaged or poorly lubricated release bearing	Replace the bearing which, being cased, cannot be greased inside.
	Seized release bearing and diaphragm spring fingers	Replace the release bearing. Clean diaphragm spring fingers with metal brush and smooth out bearing contact faces with felt polishers.
	Insufficient pedal free travel	Readjust pedal free travel correctly.
	Weakened, unhooked or broken clutch pedal return and control springs	Set springs in position or replace them, if weakened or snapped.
	Weakened clutch yoke lever return spring broken or unhooked	Replace the spring or hook it up, as required.
	Excessive play between clutch disc hub and drive shaft spline	Replace the clutch disc and ensure that clearance between hub of new clutch and drive shaft is within 0.50 mm (0.0197 in) endwise and 0.20 to 0.0079 in) crosswise. When clearances exceed above limits, replace the drive shaft also.
Noises audible on pedal release	Misalignment of clutch disc to flywheel causes slight movement of disc hub in respect of facings. This noise is especially audible with engine idling or at low speed.	Set level of clutch disc with clutch disc in place on drive shaft, set it under slight rotation and check for no run-out, using a scriber.
	Broken or weakened clutch disc cushion springs	Replace the clutch disc.
	Insufficient pedal free travel	Set pedal free travel correctly.
	Weakened, unhooked or broken clutch control nd pedal return springs	Check the springs for correct position, and replace them, if necessary.
	Weakened, broken or unhooked clutch yoke lever return pring	Replace the spring or hook it up, as required.
	Distorted or worn drive shaft	Replace the drive shaft and clutch disc if necessary.
	Excessive play of release bearing on slip sleeve	Replace the worn parts.

The clutch drags.	Insufficient push rod length	Adjust the push rod length correctly.
	Excessive pedal free travel	Adjust free travel correctly
	Warped clutch disc	Set level of clutch disc, if possible. Maximum plate run-out; 0.25 mm (0.0098 in)
	Roughened linings	Repolish linings with a metal brush or replace them, if necessary.
	Improperly fitted, loose or broken lining	Replace linings. Lining rivets should be clenched with no protrusion, to avoid damaging pressure plate and flywheel.
	Incorrect release bearing-to-diaphragm spring finger clearance	Adjust correctly.
	Clutch disc hub forcing on drive shaft	Locate cause of trouble and remove it, if possible. Otherwise replace the clutch disc.
	Damaged drive shaft splines prevent the clutch disc from sliding	Replace the drive shaft; also the clutch disc, if required.
	Oil or grease on linings	Locate the cause of oil or grease leakage and correct it as required. Clean or replace linings.
	Warped or damaged pressure plate or clutch cover	Replace defective parts.
	Air pockets in the hydraulic system (not bled correctly)	Bleed out completely.
	Dirt or foreign matter on sealing faces of master cylinder piston cup	Clean, replace piston cup, if damaged, and bleed the system.
	Air pockets in master cylinder due to loose piston	Replace piston cup and bleed the system.
	Fluid leakage from cylinder	Replace piston cup, if damaged; bleed the system.
	Low fluid level in reservoir	Top up with brake fluid and bleed the system, if necessary.
	Clogged vent hole in reservoir cap promotes vacuum in master cylinder allowing air to infiltrate past the seal	Clean reservoir cap, unclog the vent hole and bleed the system.
Abnormal lining wear	Insufficient pedal free travel	Adjust clutch pedal free travel correctly.

	Driver steps unnecessarily on pedal; this causes lining wear and damage to release bearing	Advise driver to discontinue wrong practice and step on clutch pedal only when necessary.
	Weakened or snapped pressure springs	Check pressure springs for tension as specified, and replace springs, if they are unserviceable.
	Incorrectly installed linings	Replace linings with new ones and install them correctly. Check clutch disc for center alignment.
The clutch grabs.	Oil or grease on flywheel, pressure plate and linings	Remove cause of leakage, clean flywheel and pressure plate thoroughly, replace linings.
	Loose disc linings due to poor rivet tightness	If linings are not worn, replace defective rivets. Otherwise, replace linings and clench rivets securely.
	Clutch disc hub does not slide freely on drive shaft spline	Remove any foreign matter or dirt deposits from shaft splines. When trouble is still present, replace damaged part.
	Warped or cracked pressure plate	Replace pressure plate.
	Misalignment	Locate the defective point, and if possible, adjust alignment or replace distorted parts.
	Stiffened hydraulic control mechanism	Check spring tension: If necessary, take down pedal and lubricate components.
	Worn out lining	Install new linings and make sure that the clutch disc, pressure plate and flywheel are not damaged.
The clutch slips.	Insufficient clutch pedal return travel, due to the control and pedal return springs being weak or misadjusted	Locate cause of failure and replace defective springs.
	Weakened or broken diaphragm spring	Overhaul clutch and replace springs.
	Oil or grease on linings	Remove cause of leakage and replace linings if cleaning is ineffective.
	Worn or burned disc linings	Replace linings.
	Overloaded master cylinder due to a restricted transfer port	Overhaul the master cylinder, replace the piston cup if swollen or damaged, and clean the transfer port; bleed the system.

SERVICE JOURNAL OR BULLETIN REFERENCE

DATE	JOURNAL or BULLETIN No.	PAGE No.	SUBJECT

DATSUN 240Z SPORTS
MODEL S30 SERIES

CHASSIS & BODY

NISSAN

NISSAN MOTOR CO., LTD.
TOKYO, JAPAN

SECTION TM

TRANSMISSION

TM

TRANSMISSION

CONTENTS

The type F4W71A transmission a warner type synchromesh 4-forward speed 1-reverse speed transmission. For some territories, type FS5C71A servo type synchromesh 5-forward speed 1-reverse speed transmission is used.

This chapter described mainly about the type F4W71A transmission.

Specifications

Model		HLS30U	HS30U HLS30
Type		F4W71A	FS5C71A
Gear ratio	1st	3.549	2.957
	2nd	2.197	1.858
	3rd	1.420	1.311
	4th	1.000	1.000
	5th	—	0.852
	Rev.	3.164	2.922
Final gear ratio		3.364	3.900
Speedometer		17/6	19/6
Oil capacity		1.5 ℓ (0.4 US gal, 0.3 UK gal)	1.5 ℓ (0.4 US gal, 0.3 UK gal)

DESCRIPTION

The transmission assembly consists of clutch housing, transmission case which contains gear assembly, and rear extension.

The cast iron adapter plate supports each ends of the main shaft, counter shaft, and reverse idler shaft, and front side of the transmission case supports the other

ends. Moreover, the rear extension supports the main shaft rear end.

The gear assembly can be disassembled with the gear assembly installed on the adapter plate.

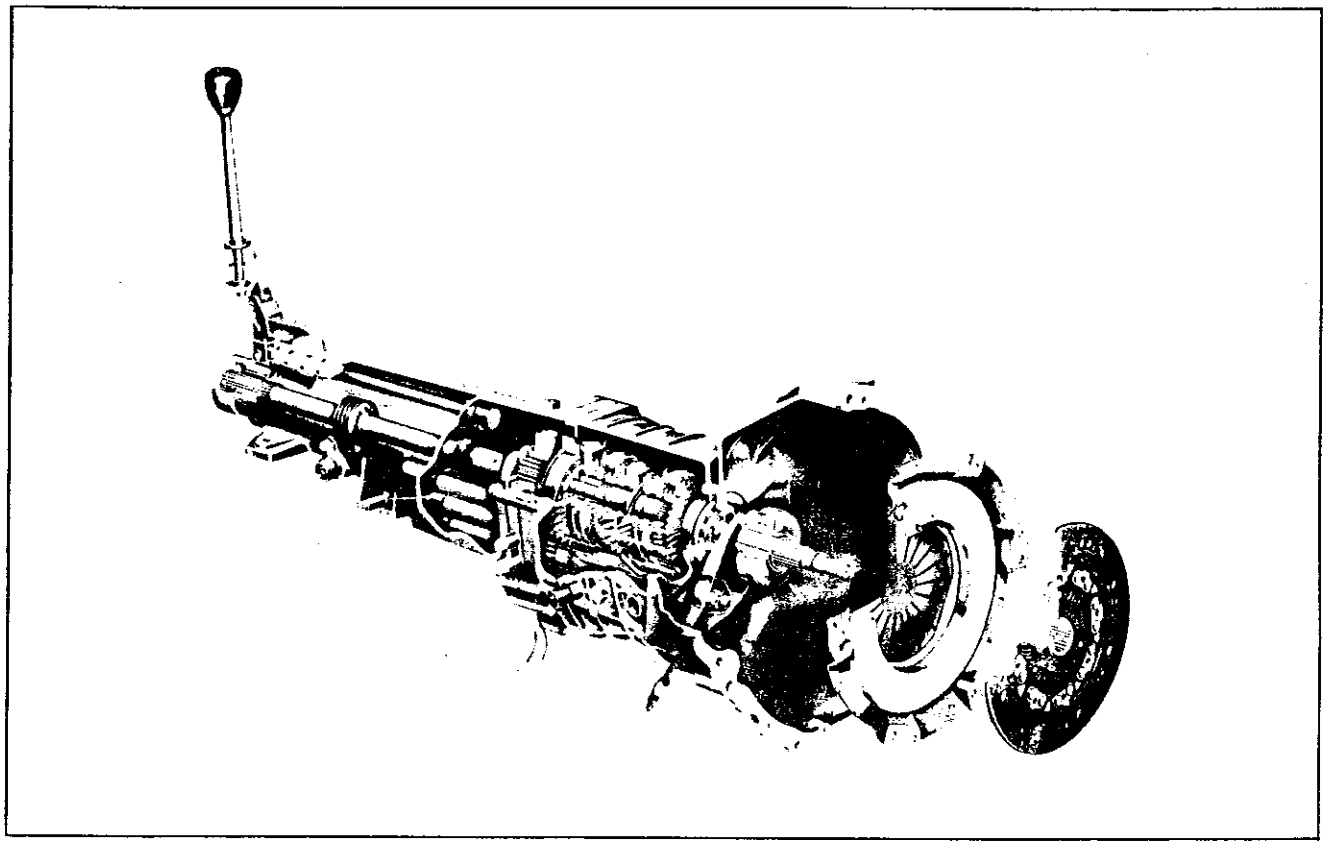


Fig. TM-1 Clairvoyant view of type F4W71A transmission

REMOVAL

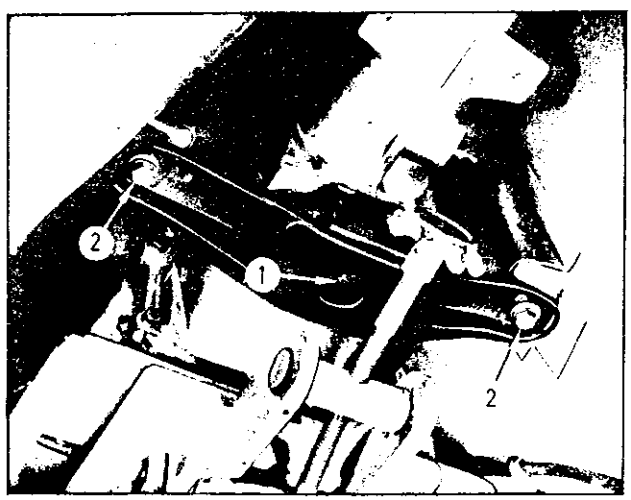
The transmission assembly is dismounted from the vehicle primarily in the same manner as the engine assembly. For transmission dismounting, refer to the Section "ER" (Engine removal) and other relative sections for details.

To remove the transmission assembly; disconnect or remove

- Speedometer cable
- Propeller shaft
- Exhaust system
- Clutch operating cylinder
- Back-up lamp switch
- Starter motor
- Transmission control lever knob;

Hold the engine, support the transmission with a transmission jack, remove

Rear engine mounting



1	Rear engine mounting nut	2	Rear mounting member installation bolt

Fig. TM-2 Removing rear mounting member

Transmission installation bolts;

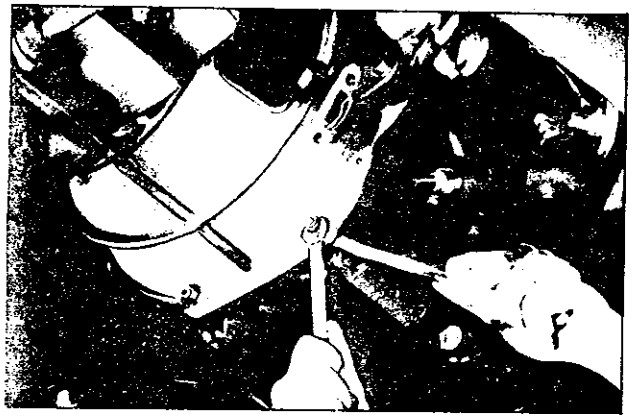


Fig. TM-3 Removing transmission installation bolt

And sliding the transmission jack rearward, remove the transmission.

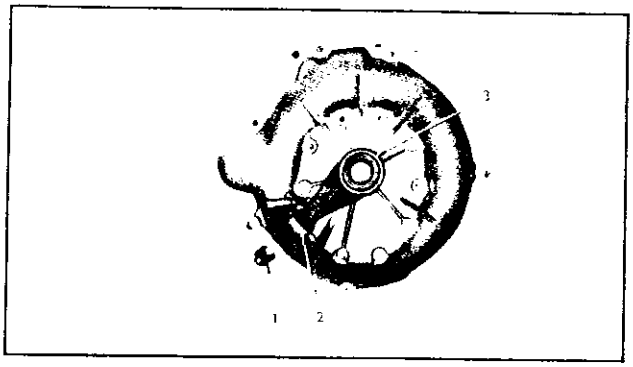
Note: a. In order to prevent damaging the serration of the main drive shaft, be sure not to dismount the transmission unless the main drive shaft is removed from the engine completely.

b. When the propeller shaft is removed, transmission oil will flow out from rear side of the rear extension. Apply a proper cap or other proper item to cover the rear extension rear side.

DISASSEMBLY

1. Before disassembling the transmission assembly, thoroughly remove mud and other foreign matters from the exterior, and drain oil.

2. Remove the dust cover from the clutch housing, and remove the holder spring, bearing sleeve, and withdrawal lever.



1	Withdrawal lever	3	Release bearing
2	Dust cover		

Fig. TM-4 Removing release mechanism

3. Remove the back-up lamp switch.

4. Remove the installation bolts (used to join the clutch housing and transmission case), separate the clutch housing from the transmission case by the use of a wooden mallet, and remove the gasket, main drive gear bearing spacer, and counter bearing shim.

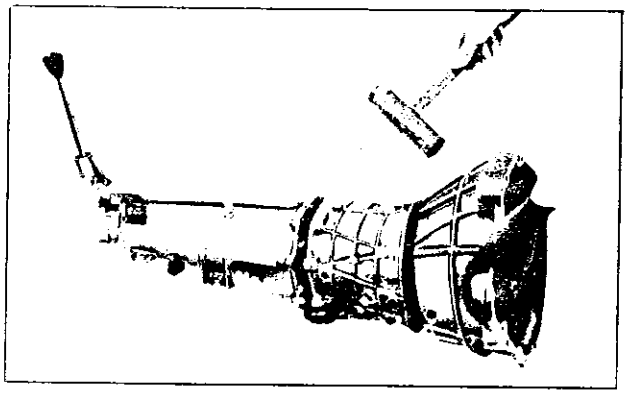


Fig. TM-5 Removing clutch housing

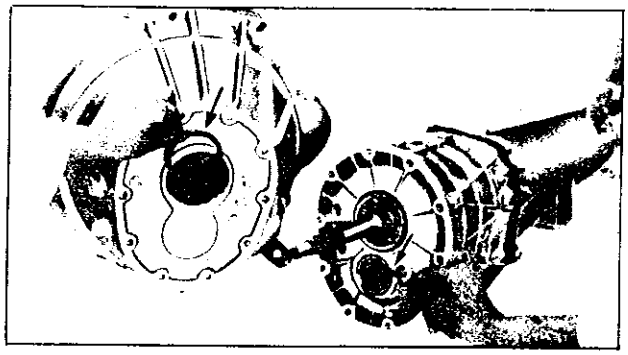
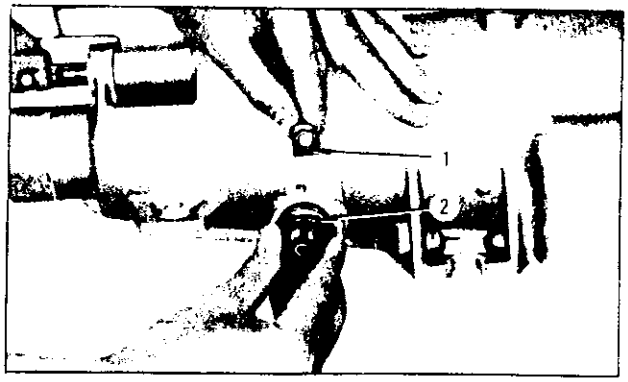


Fig. TM-6 Removing main drive bearing spacer and counter bearing shim

5. Loosen the speedometer pinion sleeve locking plate bolt, and remove the speedometer pinion sleeve.

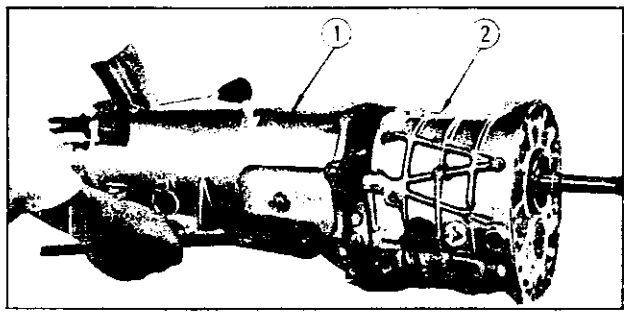


1	Lock plate	2	Speedometer pinion sleeve

Fig. TM-7 Removing speedometer pinion

6. Remove the striking rod pin from the striking rod rear end, and separate the striking rod from the control lever bracket.

7. Loosen the transmission case and rear extension connecting bolts, and separate the rear extension from the transmission case by the use of a wooden mallet.



1	Rear extension	2	Transmission case

Fig. TM-8 Removing rear extension

8. Remove the main shaft bearing snap ring with a pair of snap ring pliers.

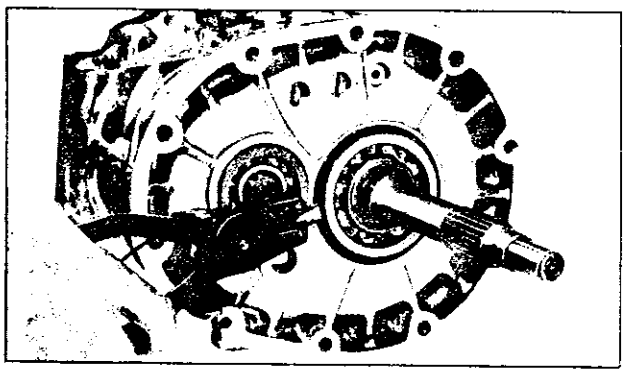
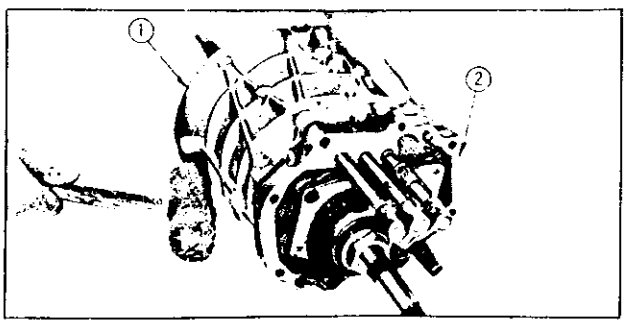


Fig. TM-9 Removing main shaft bearing snap ring

9. Separate the transmission case from the adapter plate by the use of wooden mallet.



1	Transmission case	2	Adaptor plate

Fig. TM-10 Removing transmission case

10. Install a setting plate adapter (special tool ST23810000) on the adapter plate on the gear assembly, and secure them in a vise. Remove the reverse gear, 3rd & 4th gear, and 1st & 2nd gear fork rod retaining pins by the use of a fork rod pin punch (special tool ST23500000).

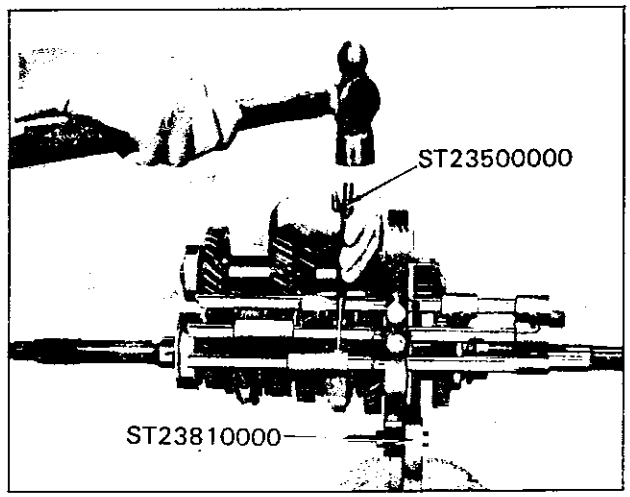


Fig. TM-11 Removing retaining pin

11. Remove the fork rod snap ring by the use of a screwdriver or other proper tool.

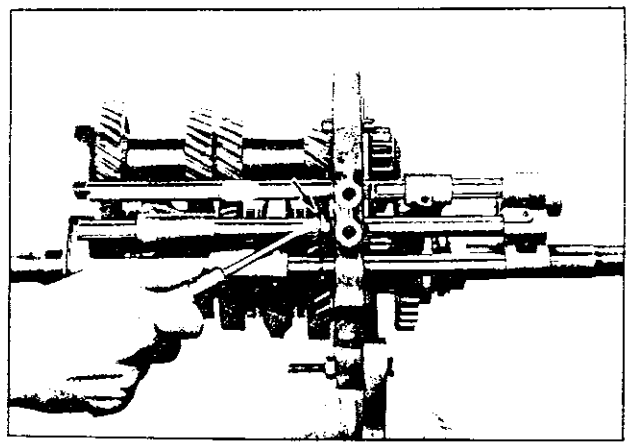
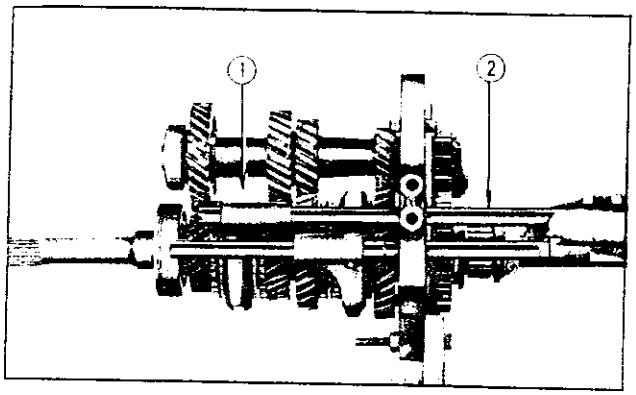


Fig. TM-12 Removing fork rod snap ring

12. Loosen each check ball plug, and withdraw the reverse gear fork rod, 3rd & 4th gear fork rod and 1st & 2nd gear fork rod from the adapter plate. In this operation, be careful not to lose the check balls and interlock balls. Moreover, withdraw the fork rod carefully so that the shift fork is not dropped off.
(The check ball plug, check ball spring, and check ball may be removed before removing the fork rod.)



1	Shift fork	2	Fork rod

Fig. TM-13 Withdrawing fork rod

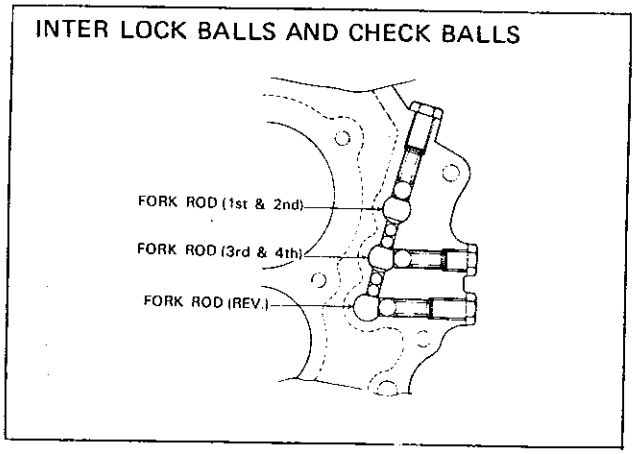
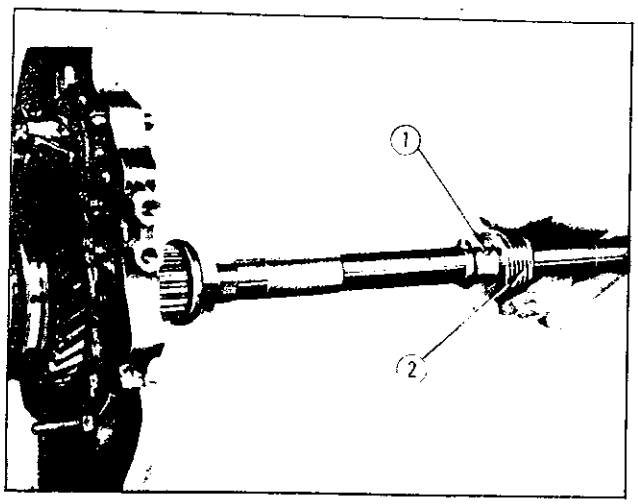


Fig. TM-14 Layout of check ball and interlock ball

13. Remove the snap ring, and remove the speedometer drive gear together with the steel ball.



1	Steel ball	2	Speedometer drive gear

Fig. TM-15 Removing speedometer drive gear

14. Unbend the main shaft lock washer, loosen the main shaft nut, and remove the main shaft lock washer, thrust washer, reverse hub, and reverse gear.

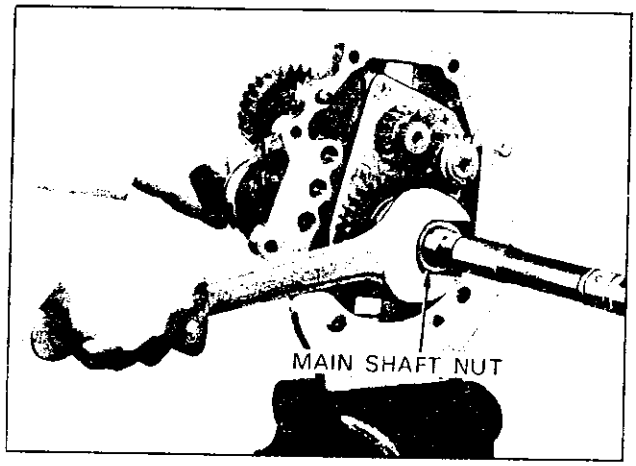


Fig. TM-16 Removing main shaft nut

15. Remove the snap ring, and remove the counter reverse gear.

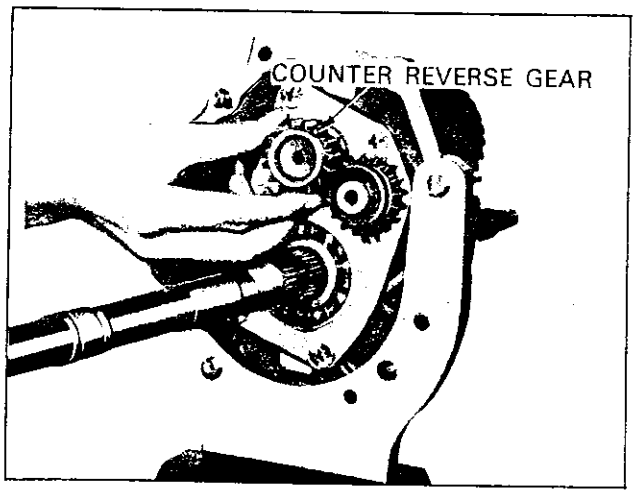
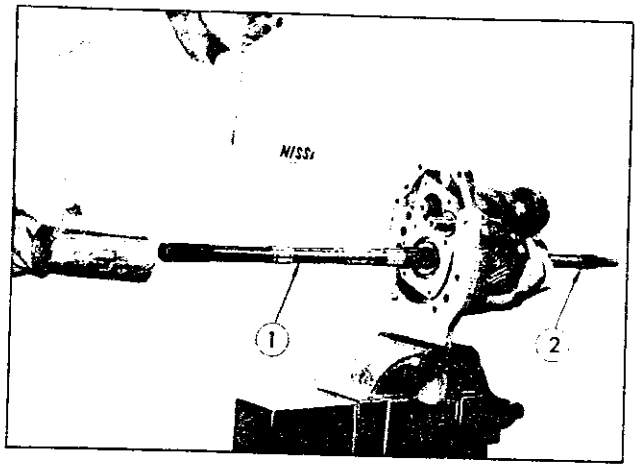


Fig. TM-17 Removing counter reverse gear

16. Remove the snap ring, and remove the reverse idler gear together with the thrust washer and needle bearing.

17. Supporting the front side gear assembly, tap and remove the gear assembly from the rear side of the main shaft and counter shaft by the use of a wooden mallet. Split the counter shaft and main drive shaft into three pieces. In this operation, be careful not to drop off the shafts because they are split simultaneously.



1	Main shaft	2	Main drive shaft

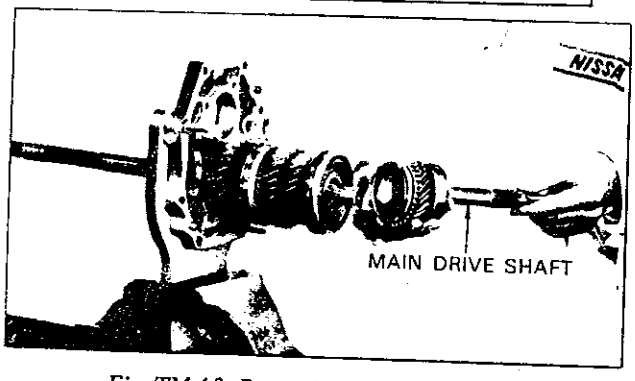
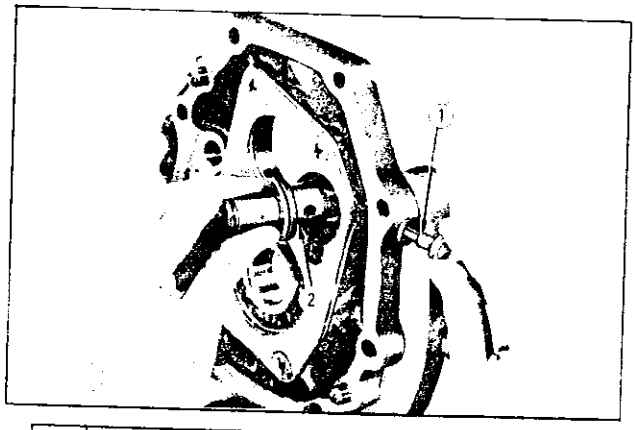


Fig. TM-18 Removing gear assembly

18. Remove the set screw, reverse idler shaft nut, spring washer, and plain washer, and remove the reverse idler shaft.

Note: Note that the reverse idler shaft cannot be removed unless the set screw is removed.



1	Set screw	2	Reverse idler shaft

Fig. TM-19 Removing reverse idler shaft

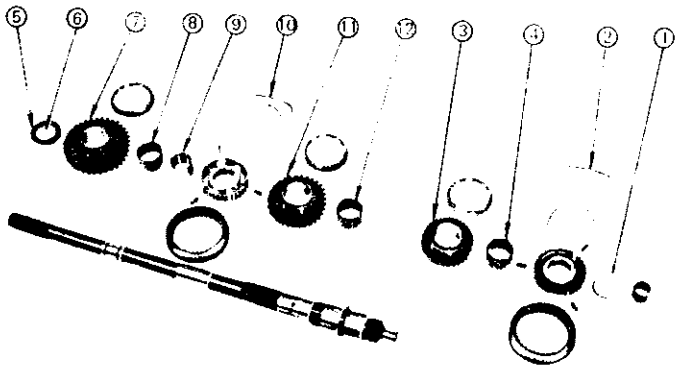
19. Loosen the machine screws (six screws) by the use of an impact wrench, and remove the bearing retainer.

Main shaft assembly

20. Remove the main shaft rear bushing from the adapter plate.

21. Remove the snap ring ① from the front side of the main shaft, and remove the 3rd & 4th synchro. assembly ②, 3rd gear ③, and needle bearing ④.

Moreover, remove the thrust washer ⑤, steel ball ⑥, 1st gear ⑦, needle bearing ⑧, 1st gear bushing ⑨, 1st & 2nd synchro. assembly ⑩, 2nd gear ⑪, and needle bearing ⑫ rearward, and disassemble the main shaft.



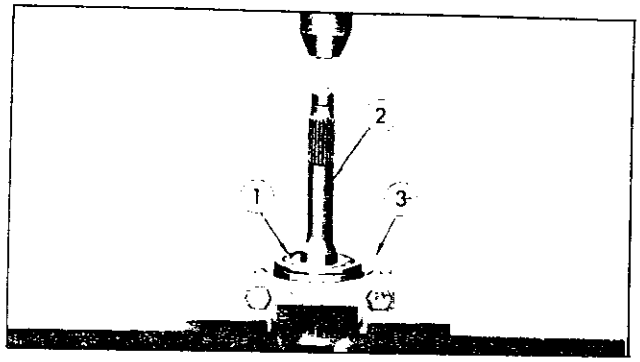
1	Snap ring	5	Thrust washer	9	First gear bushing
2	Synchronizer assembly (3rd & 4th)	6	Steel ball	10	Synchronizer assembly (1st & 2nd)
3	Third gear	7	First gear	11	Second gear
4	Needle bearing	8	Needle bearing	12	Needle bearing

Fig. TM-20 Removing main shaft assembly

Main drive assembly

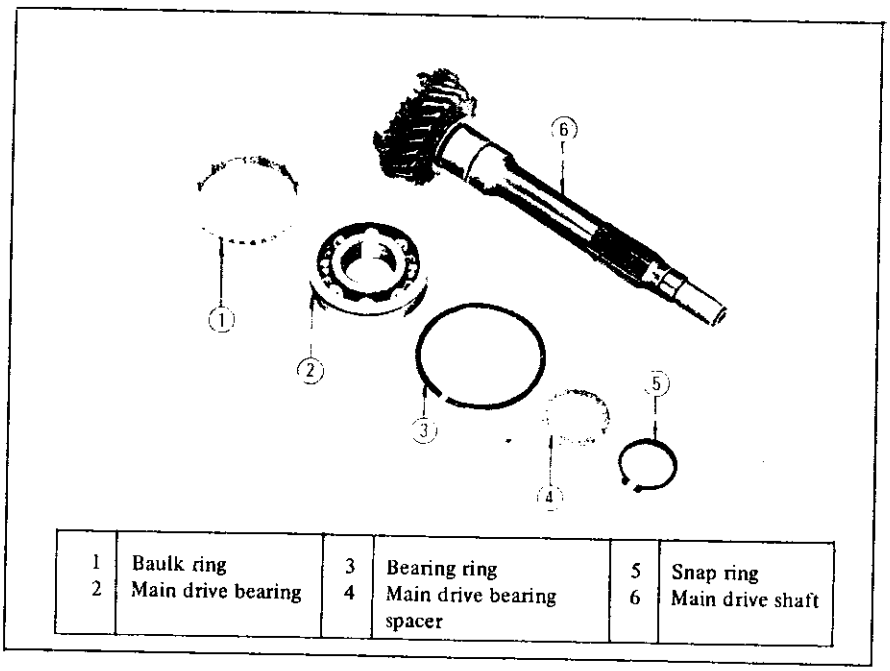
22. Remove the snap ring with a pair of snap ring pliers and main drive bearing spacer.

23. Install the drive pinion bearing replacer (special tool ST30030000) on the main drive bearing, and remove the main drive bearing with a press. In this operation, support the shaft by hand from the lower side so that the main drive shaft is not dropped off.



1	Main drive bearing	3	Special tool ST30030000
2	Main drive shaft		

Fig. TM-21 Removing main drive bearing



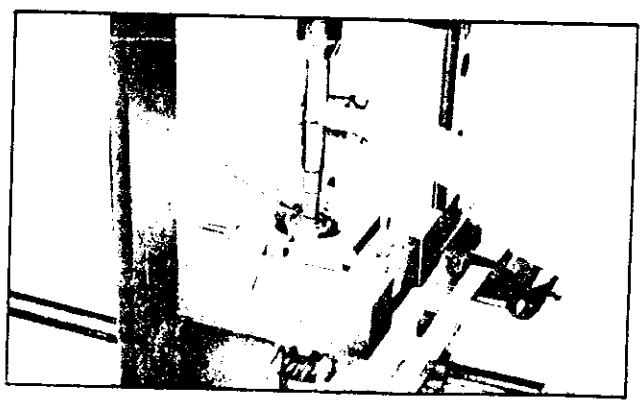
1	Baulk ring	3	Bearing ring	5	Snap ring
2	Main drive bearing	4	Main drive bearing spacer	6	Main drive shaft

Fig. TM-22 Main drive assembly

Counter shaft assembly

24. Install a drive pinion bearing replacer (special tool ST30030000) on the counter shaft front bearing, and applying a proper rod, remove the bearing with a press.

Remove the counter shaft rear bearing in the same manner. When removing, support the counter shaft by hand from the lower side so as not to drop off the shaft.

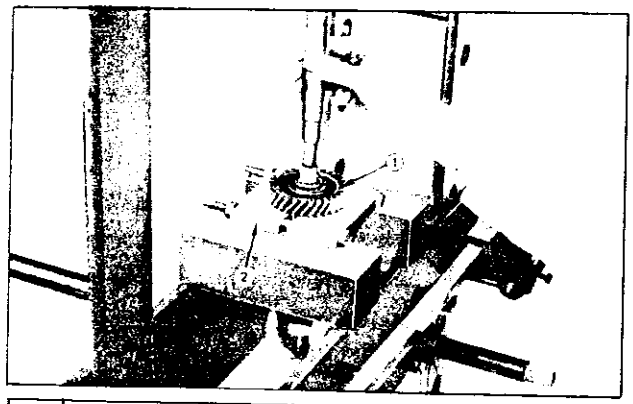


1	Counter shaft front bearing	2	Special tool ST30030000

Fig. TM-23 Removing counter shaft bearing

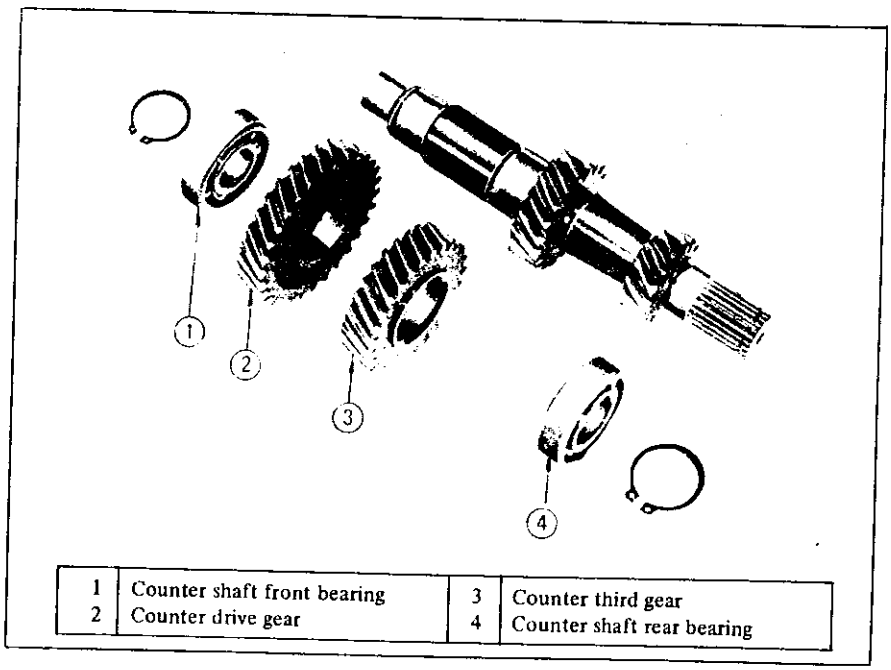
25. Remove the snap ring, install a drive pinion bearing replacer (special tool ST30030000) on the counter drive gear, applying a proper rod, remove the counter gear with a press, and remove two woodruff keys.

Remove the counter third gear in the same manner, also. When removing the gear, support the shaft by hand from the lower side so as not to drop off the counter shaft.



1	Counter drive gear	2	Special tool ST30030000

Fig. TM-24 Removing counter gear



1	Counter shaft front bearing	3	Counter third gear
2	Counter drive gear	4	Counter shaft rear bearing

Fig. TM-25 Counter shaft assembly

26. Remove the self-locking nut from the lower end of the control lever, and remove the control lever.

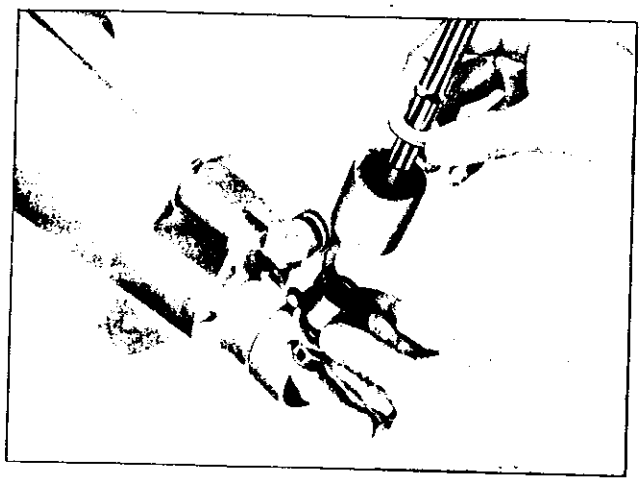


Fig. TM-26 Removing control lever

27. Remove the retaining pin from the control arm pin, remove the control arm pin, and separate the control arm from the control lever bracket.

INSPECTION

Thoroughly clean all disassembled parts with solvent, and check them for wear, damage, and other defective conditions.

Transmission case and rear extension

Clean them with solvent thoroughly, and check for crack which may cause oil leaking and other defective conditions.

Bearing

1. Thoroughly clean the bearing, and dry and remove dust with compressed air.

2. When the ball bearing inner race and center race ball sliding surfaces are worn unevenly and/or unsmooth due to crack, or out-of-round of ball is excessive due to wear or rough surface, replace the bearing with a new one.

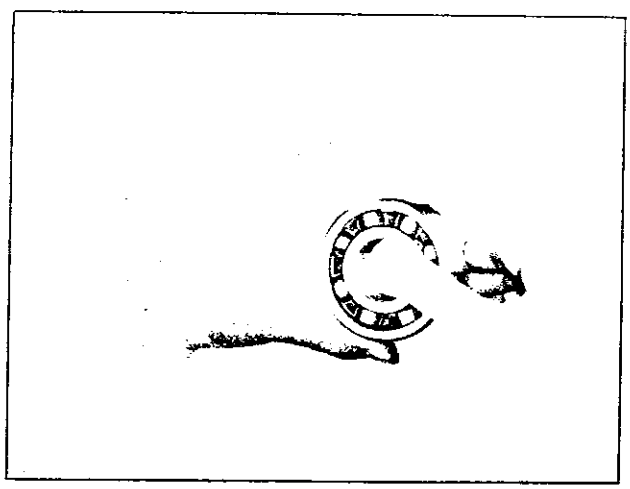


Fig. TM-27 Inspecting ball bearing

3. Replace needle bearing, if worn or damaged.

4. Replace rear extension bushing, if worn or cracked.

Gear and shaft

1. Check the gear for wear, damage and/or crack, and replace, if required.

2. Check the shaft for bending, crack, wear, and worn spline, and replace, if required.

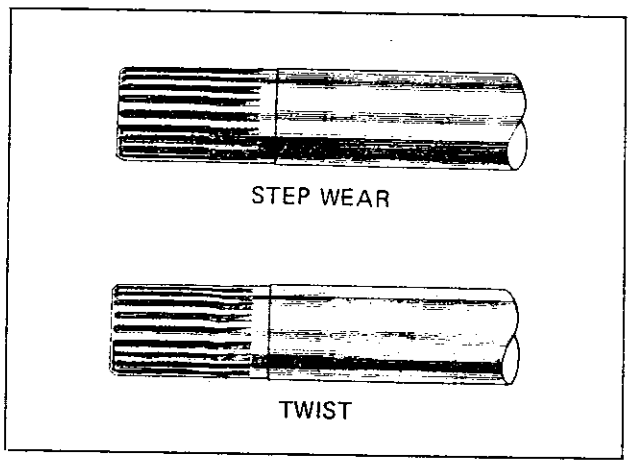


Fig. TM-28 Checking main shaft spline for twisting

3. Measure each gear backlash, and make sure that backlash is in range from 0.05 to 0.15 mm (0.0020 to 0.0059 in). When backlash exceeds this range, recommend both driving and driven gears be replaced as a set.

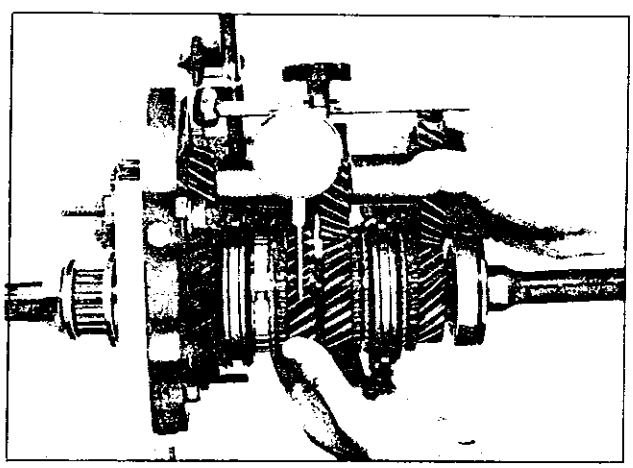


Fig. TM-29 Measuring gear backlash

4. Measure end play between individual gears.

End play of the reverse idler gear should be in range from 0.05 to 0.35 mm (0.0020 to 0.0138 in), and end play for other gears should be in range from 0.12 to 0.19 mm (0.0047 to 0.0075 in). When end play is deviated from this range, again select proper snap ring.

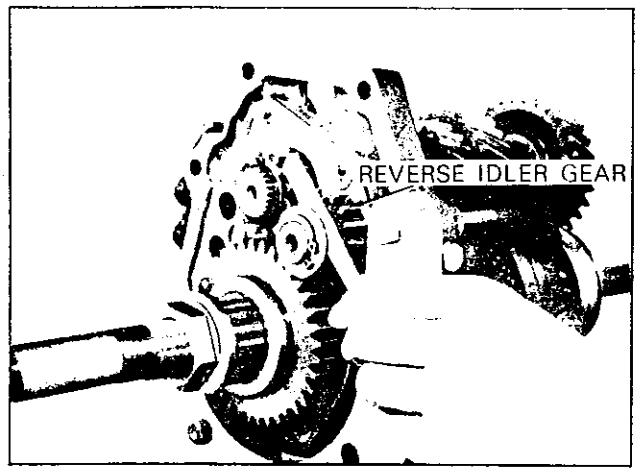


Fig. TM-30 Measuring reverse idler gear end play

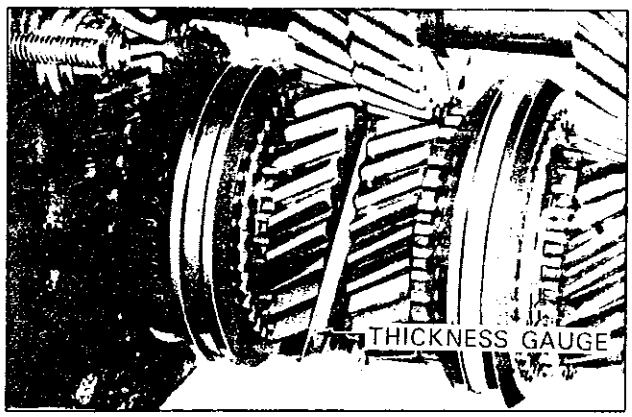


Fig. TM-31 Measuring end play between 2nd and 3rd gears

Baulk ring

1. Replace, if deformed, cracked, or damaged.

2. Measure the baulk ring inside serration for wear as shown in Figure TM-32 below.

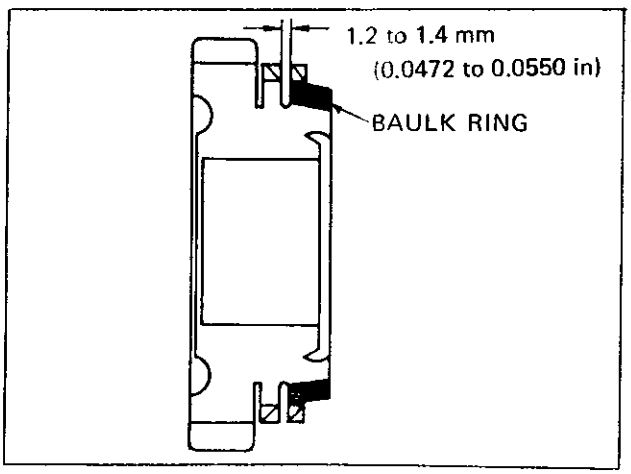


Fig. TM-32 Baulk ring-to-cone installing dimension

Oil seal

Replace the oil seal with a new one, if lip is deformed, worn, or cracked, or when the spring is dropped off.

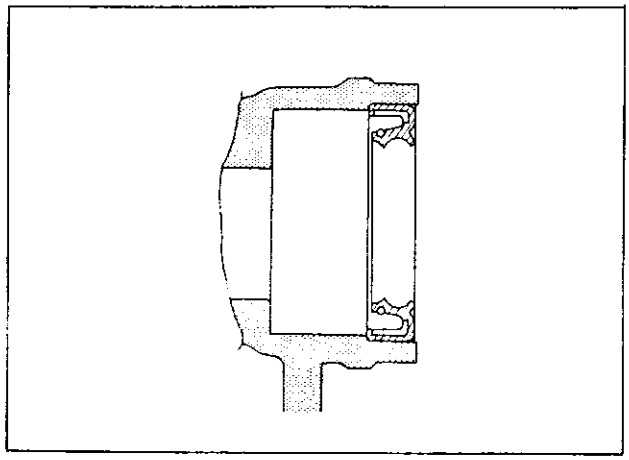


Fig. TM-33 Rear extension oil seal

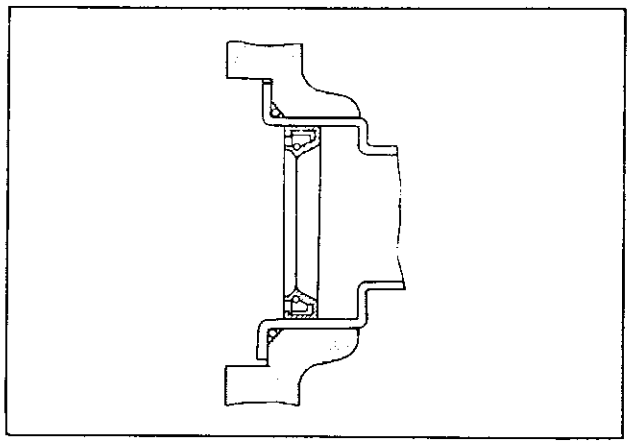
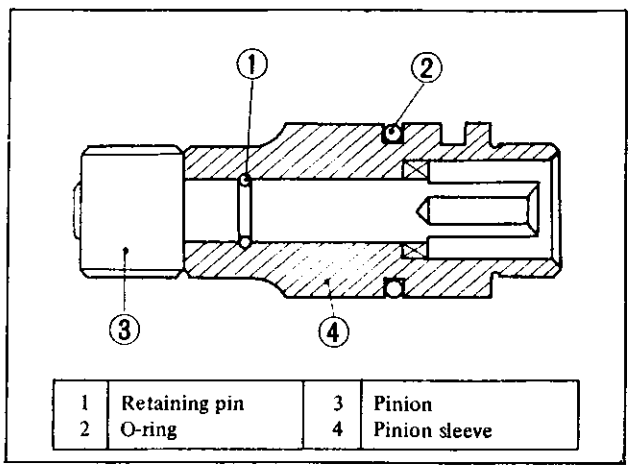


Fig. TM-34 Clutch housing oil seal



1	Retaining pin	3	Pinion
2	O-ring	4	Pinion sleeve

Fig. TM-35 O-ring of speedometer pinion sleeve

Gasket

Replace, whenever the transmission is disassembled.

Rear engine mounting insulator

Replace rear engine mounting insulator, if weakened, deteriorated, or cracked.

REASSEMBLY

Reassemble the transmission at a place where no dust rises, and handle all component parts with bare hand. Gloves, rags, and other cloth should not be used.

Clutch housing

Apply O-ring to the front cover, and fit the front cover to the clutch housing by the use of a drift and press.

Fit oil seal to the front cover.

Rear extension

Install the rear extension oil seal by the use of a drift.

Gear assembly

1. Thoroughly clean all component parts with solvent, dry and remove dust from the parts with compressed air.

2. Assemble the low and high synchromesh assemblies. When installing spring spreads, be sure to shift directions of the front and rear spring spread splits.

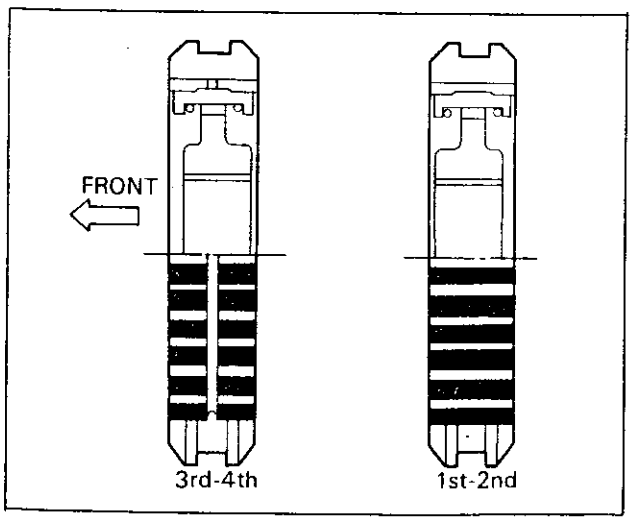
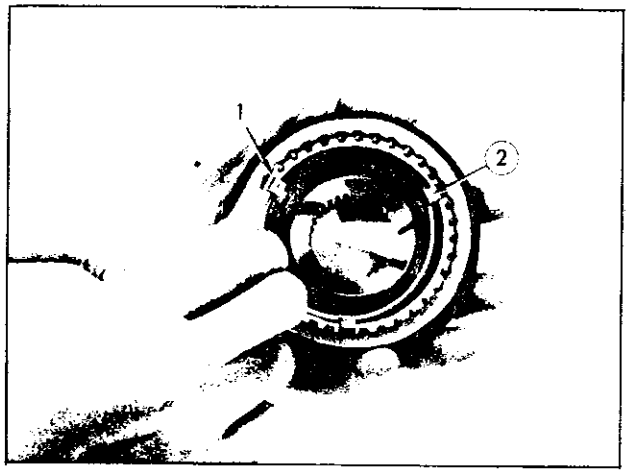


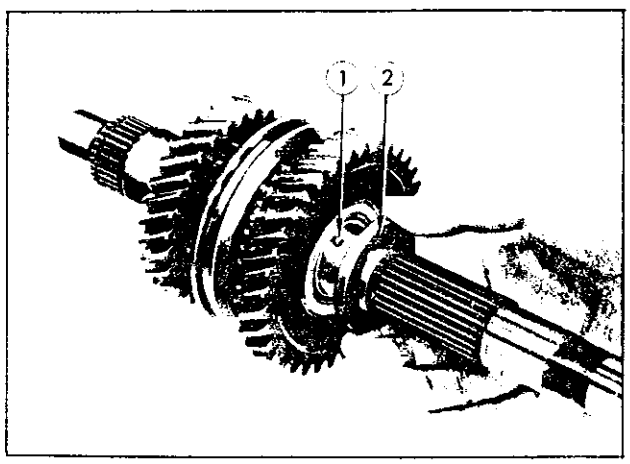
Fig. TM-36 Installing direction of synchro-hubs



1	Spread spring	2	Shifting insert

Fig. TM-37 Installing spring spread

3. Install the needle bearing, 2nd gear, baulk ring, synchromesh assembly for 1st to 2nd speed, baulk ring, 1st gear bushing, needle bearing, 1st gear, steel ball, and thrust washer on the shaft from the main shaft rear side.



1	Steel ball	2	Thrust washer

Fig. TM-38 Installing steel ball and thrust washer

4. Fit the main shaft rear bearing to the main shaft by the use of a transmission adapter (special tool ST23800000).

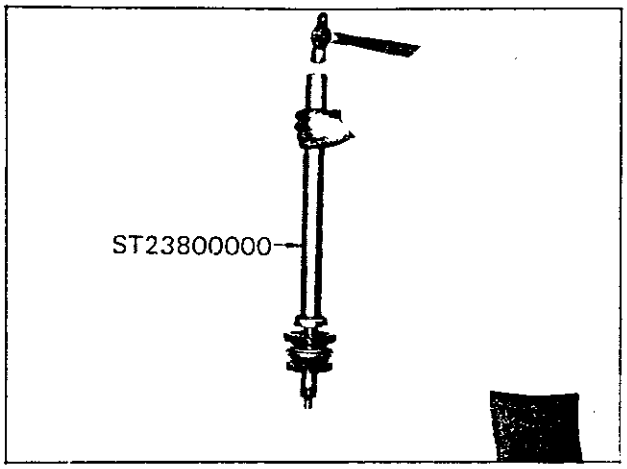


Fig. TM-39 Fitting main shaft rear bearing

5. Fit the counter shaft rear bearing to the adapter plate.

6. Fit the main shaft rear bearing to the adapter plate up to such an extent that the snap ring groove on the outer race of the main shaft rear bearing comes out to the rear side of the adapter plate, by the use of a drift B (special tool ST30600000), gradually and carefully so as not to affect the bearing accuracy.

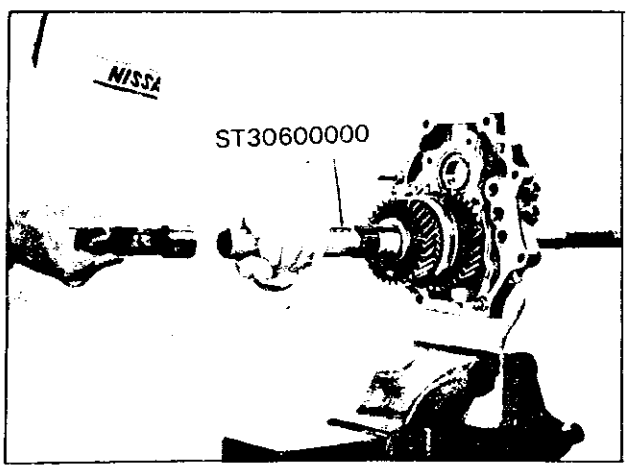


Fig. TM-40 Fitting main shaft

7. Fit the snap ring to the main shaft rear bearing. Make sure that the snap ring has been tightly fitted to the adapter plate. If not, tap the main shaft from the rear side and fit the snap ring to the adapter plate tightly.

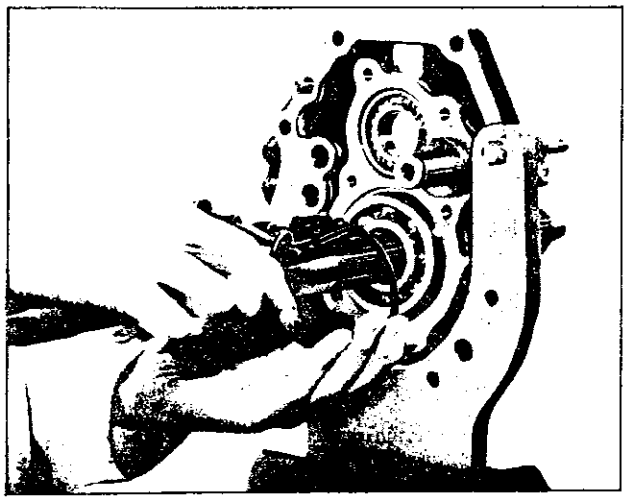
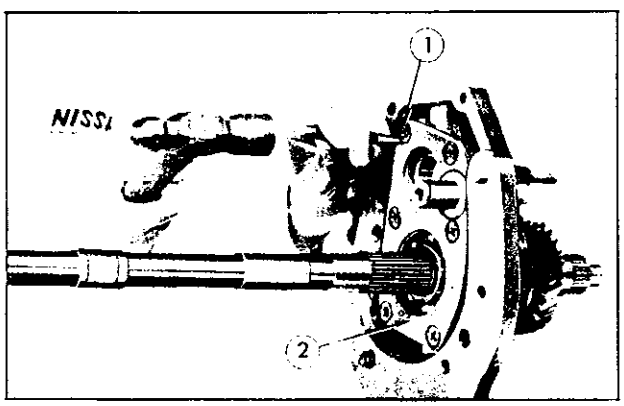


Fig. TM-41 Installing snap ring

8. Insert the counter shaft bearing ring between the counter shaft rear bearing and bearing retainer.

9. Install the bearing retainer on the adapter plate, tighten each machine screw to tightening torque in range from 1.20 to 1.80 kg-m (8.7 to 13.0 ft-lb), and caulk both ends of the machine screw to lock by the use of a punch.

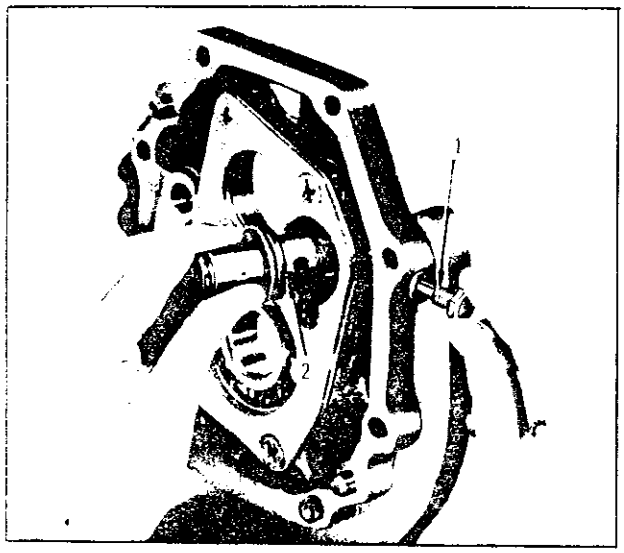


1	Machine screw	2	Bearing retainer

Fig. TM-42 Caulking machine screw

10. Insert the reverse idler shaft from the rear side, line it up to the set screw hole position, put locking agent, and tighten the set screw to tightening torque in range from 1.20 to 1.80 kg-m (8.7 to 13.0 ft-lb).

11. Install spring washer and plain washer on the shaft, and tighten the nut to tightening torque in range from 6.0 to 8.0 kg-m (43.4 to 57.8 ft-lb).



1	Set screw	2	Reverse idler shaft

Fig. TM-43 Installing reverse idler shaft

Counter shaft assembly

12. Apply two woodruff keys to the counter shaft, and apply gear oil slightly to portion of gear where the gear is applied.

Lining up direction of the counter 3rd gear to the woodruff key direction, fit the counter 3rd gear to the counter shaft by the use of a drive pinion bearing replacer (special tool ST30030000), and install a snap ring.

13. Fit the counter shaft to which the counter 3rd gear has been installed to the counter shaft rear bearing, install the needle bearing, 3rd gear, baulk ring, and synchromesh assembly for 3rd to 4th gear to the front side of the main shaft, and secure them with a snap ring.

Select a snap ring from five different types shown below:

Snap ring thickness		
1.	1.625 mm	(0.0640 in)
2.	1.575 mm	(0.0620 in)
3.	1.525 mm	(0.0600 in)
4.	1.475 mm	(0.0581 in)
5.	1.425 mm	(0.0561 in)

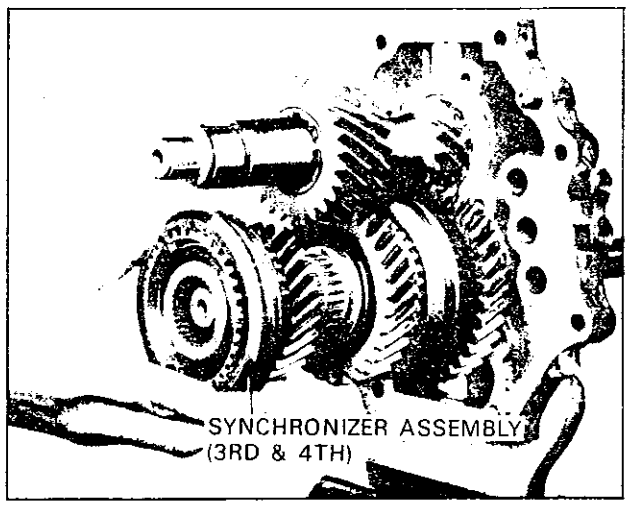


Fig. TM-44 Installing 3rd gear and synchromesh assembly

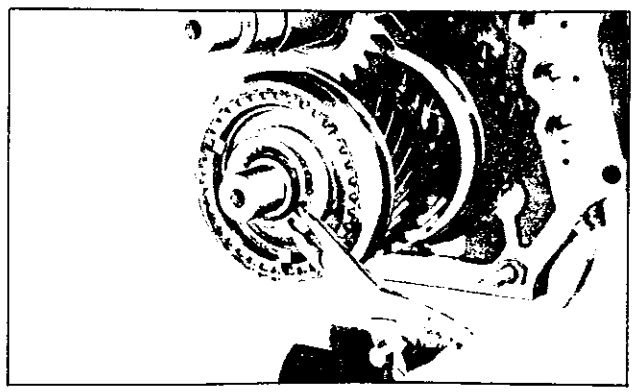


Fig. TM-45 Installing snap ring

Main drive gear assembly

14. Fit the main drive bearing to the main drive gear shaft by the use of a drive pinion bearing replacer (special tool ST30030000) and press carefully so that the bearing is faced to the correct direction.

Install the main drive gear spacer, and install a snap ring. Select a snap ring from five different types shown below:

Snap ring thickness	
1.	1.80 mm (0.0710 in)
2.	1.87 mm (0.0736 in)
3.	1.94 mm (0.0765 in)
4.	2.01 mm (0.0790 in)
5.	2.08 mm (0.0820 in)

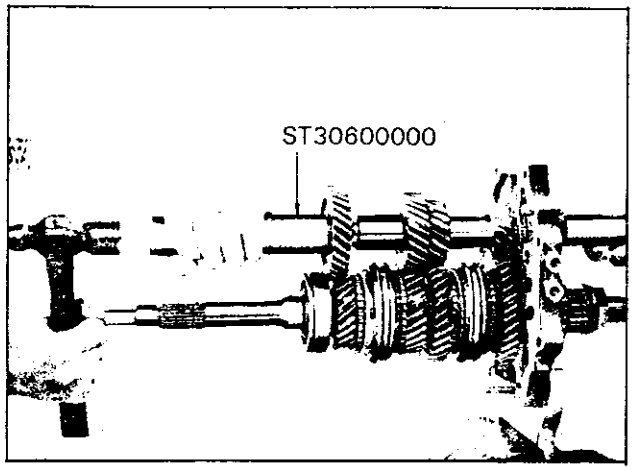
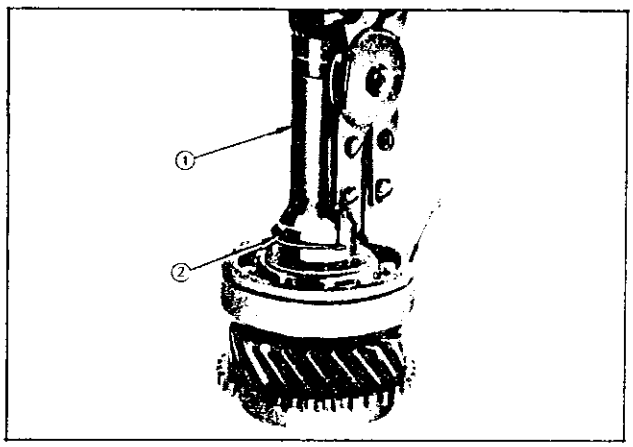
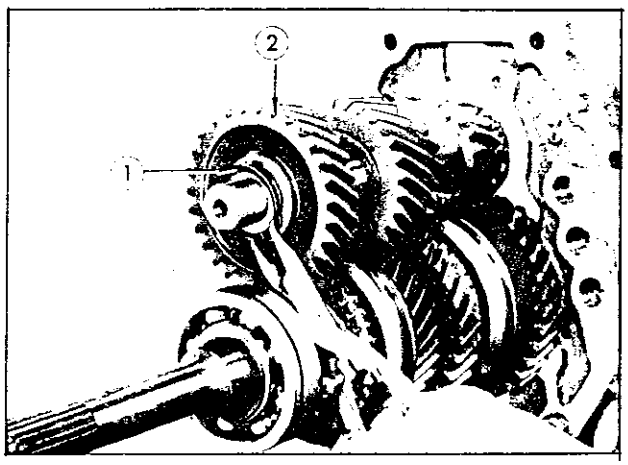


Fig. TM-47 Fitting counter drive gear



1	Main drive shaft	3	Main drive bearing
2	Snap ring		

Fig. TM-46 Installing snap ring



1	Snap ring	2	Counter drive gear

Fig. TM-48 Installing snap ring

15. Insert a woodruff key to the counter drive gear side of the counter shaft.

16. Insert pilot bearing to the main drive gear assembly, engage the counter drive gear with the 4th gear, apply them to the main shaft and counter shaft front side, line up the counter drive gear to the direction of the woodruff key, fit the counter drive gear to the shaft by the use of a drift B (special tool ST30600000), and install a snap ring. In this operation, support the other side of the shaft to protect the counter shaft rear bearing.

17. Install the reverse hub, reverse gear, thrust washer, and lock plate on the rear side of the main shaft, and temporarily secure them with the main shaft nut.

18. Slightly apply gear oil to the reverse idler shaft, apply needle bearing, reverse idler gear, and thrust washer to the idler shaft, and install a snap ring.

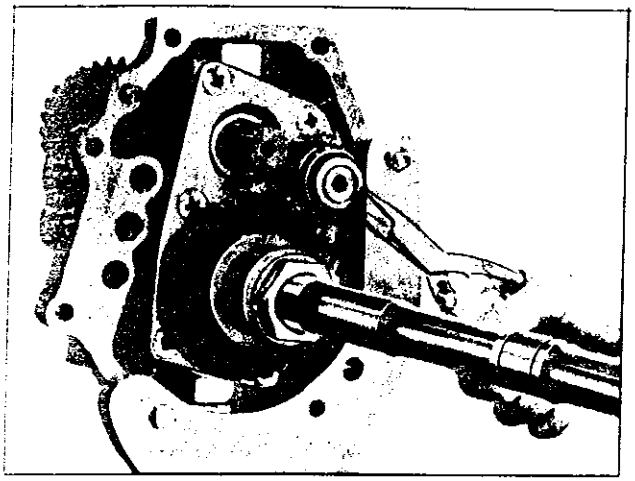


Fig. TM-49 Installing snap ring of reverse idler gear

19. Apply the counter reverse gear to the rear side of the counter shaft, and install a snap ring. Select a snap ring from five different types shown below:

	Snap ring thickness	
1.	1.1 mm	(0.0433 in)
2.	1.2 mm	(0.0472 in)
3.	1.3 mm	(0.0512 in)
4.	1.4 mm	(0.0552 in)
5.	1.5 mm	(0.0590 in)

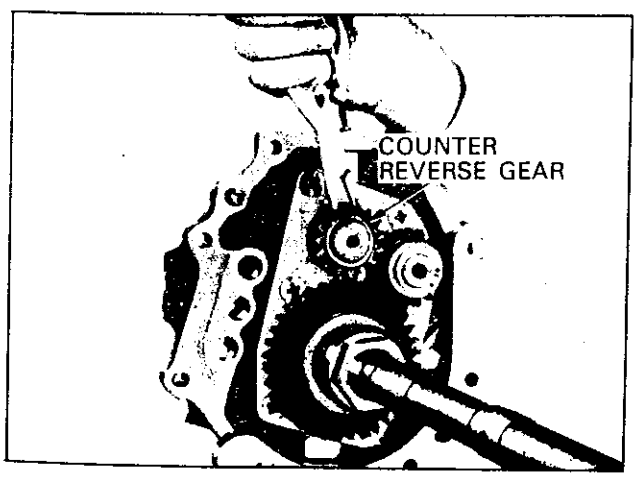


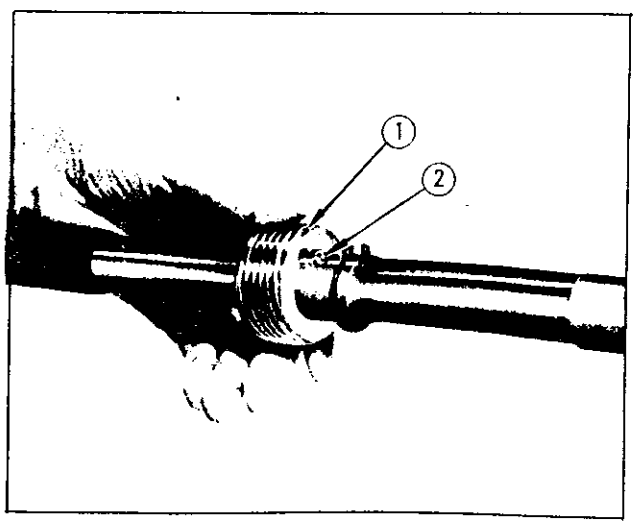
Fig. TM-50 Installing snap ring of counter reverse gear

20. Intermesh the synchromesh assembly for the 1st to 2nd speed gear with the reverse gear simultaneously, tighten the main shaft nut to tightening torque in range from 18.0 to 21.0 kg-m (130.2 to 151.8 ft-lb), and bend the lock washer to the main shaft nut side.

Fig. TM-51 Bending lock washer

21. Install the snap ring, steel ball, and speedometer drive gear in that order, and secure them with a snap ring. Select a proper snap ring from five different types shown below:

	Snap ring thickness	
1.	1.1 mm	(0.0433 in)
2.	1.2 mm	(0.0472 in)
3.	1.3 mm	(0.0512 in)
4.	1.4 mm	(0.0552 in)
5.	1.5 mm	(0.0590 in)



1	Speedometer drive gear	2	Steel ball

Fig. TM-52 Installing speedometer drive gear

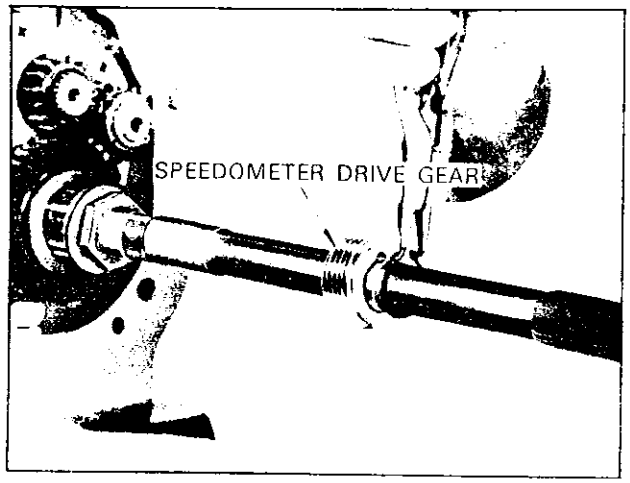
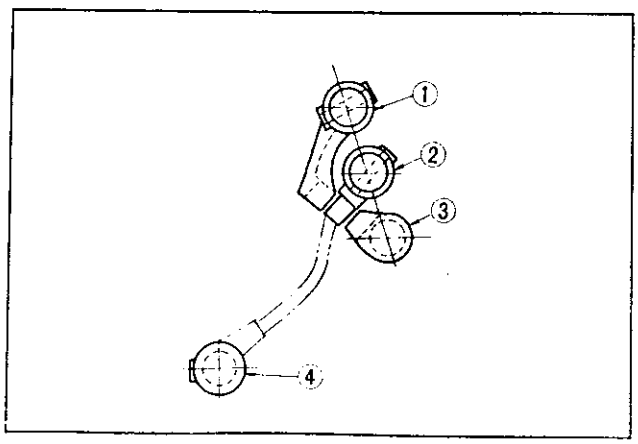


Fig. TM-53 Installing speedometer drive gear snap ring

22. Measure the gear end play and backlash. For the details, refer to the section covering the inspection.

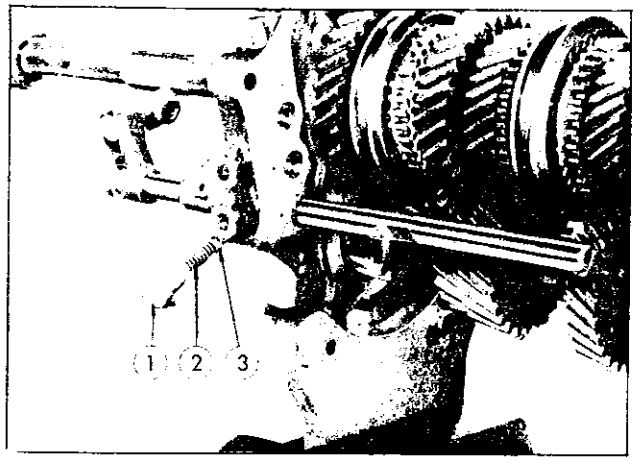
23. Turn the gear assembly 180° and reinstall the setting plate adapter (special tool ST23810000).

24. Install the reverse shift fork on the reverse gear, and apply the reverse fork rod to the shift fork and adapter plate. Apply the check ball, and check ball spring, put locking agent to the check ball plug, and temporarily tighten them.



1	Reverse gear fork rod	3	1st & 2nd gear fork rod
2	3rd & 4th gear fork rod	4	Striking rod

Fig. TM-54 Layout for fork rod



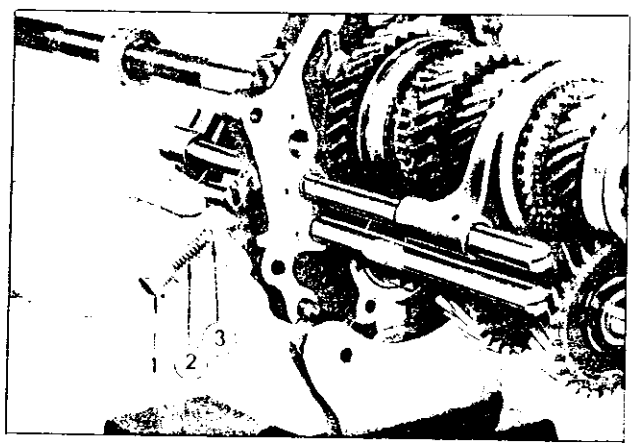
1	Check ball plug	3	Check ball
2	Check ball spring		

Fig. TM-55 Installing reverse fork rod

25. Install the retaining pin, and secure the shift fork and fork rod stationarily.

26. Apply two interlock balls between the reverse fork rod and 3rd to 4th speed fork rod.

27. Install the 3rd to 4th shift fork on the grooved portion of the coupling sleeve for the 3rd to 4th gear, and apply the 3rd to 4th fork rod to the shift fork and adapter plate. Apply the check ball and check ball spring, apply locking agent to the check ball plug, and tighten them temporarily. Note that the total length of this plug is shorter than that of the reverse fork rod and 1st to 2nd speed fork rod.



1	Check ball plug	3	Check ball
2	Check ball spring		

Fig. TM-56 Installing 3rd to 4th speed fork rod

28. Install the retaining pin, and set the shift fork and fork rod stationarily.

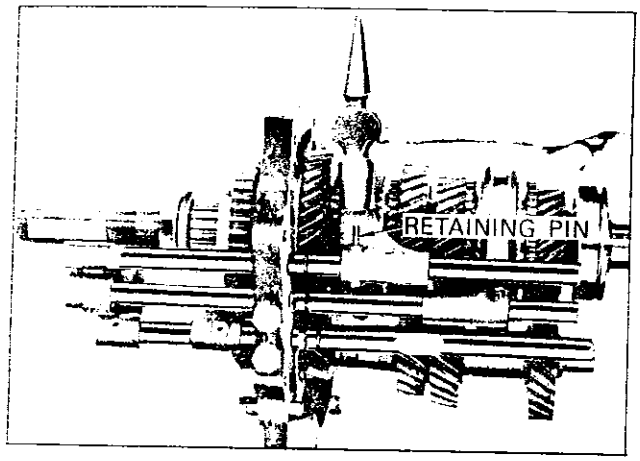


Fig. TM-57 Installing retaining pin

29. Apply two interlock balls between the 1st to 2nd speed fork rod and 3rd to 4th speed fork rod.

30. Install the shift fork into the groove on the coupling sleeve for the 1st to 2nd gear, and apply the 1st to 2nd speed fork rod to the shift fork and adapter plate. Apply the check ball and check ball spring, put locking agent on the check ball plug, and temporarily tighten them.

31. Tighten each check ball plug to tightening torque in range from 2.2 to 3.0 kg-m (15.9 to 21.7 ft-lb).

Install the retaining pin, and set the shift fork and fork rod stationarily.

32. Fit the fork rod ring.

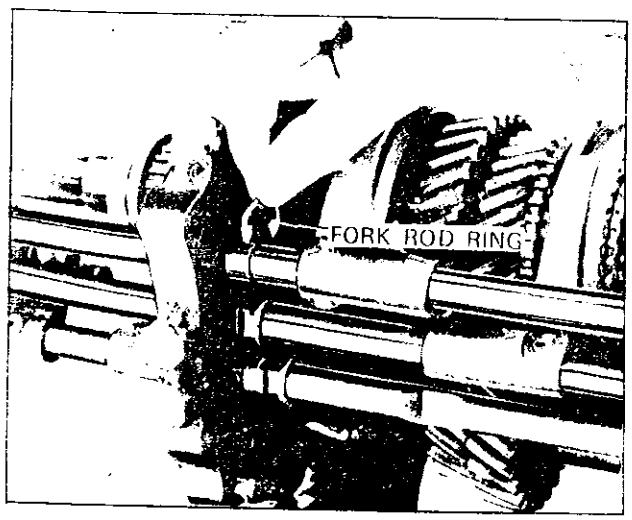


Fig. TM-58 Installing fork rod ring

33. Apply gear oil to the individual sliding portions, intermesh the synchromesh assembly to each gear, and make sure that the synchromesh mechanism operates smoothly and that each gear intermeshes smoothly.

Installing the transmission case

34. Clean the adapter plate joint, put liquid packing to the adapter plate and rear extension gasket, install the transmission case on the adapter plate, and tighten them temporarily with the bolts.

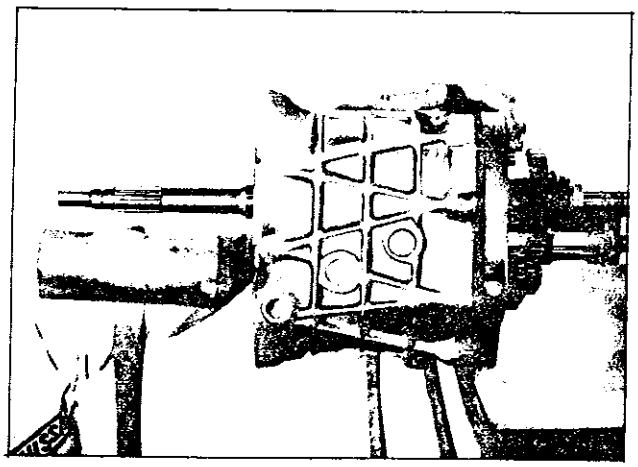


Fig. TM-59 Installing transmission case

35. Fit the counter shaft front bearing to the transmission case by the use of a drift C (special tool ST22360000).

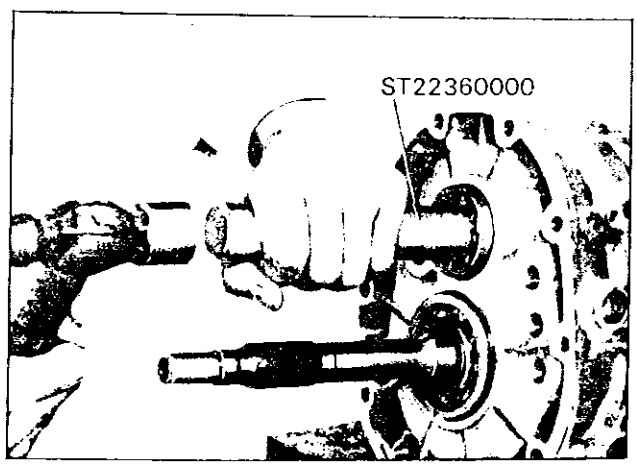


Fig. TM-60 Fitting counter shaft front bearing

36. Fit the main drive bearing ring to the ring groove on the main drive bearing.

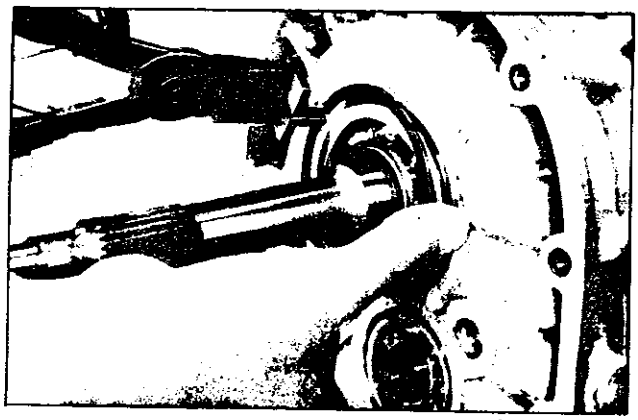


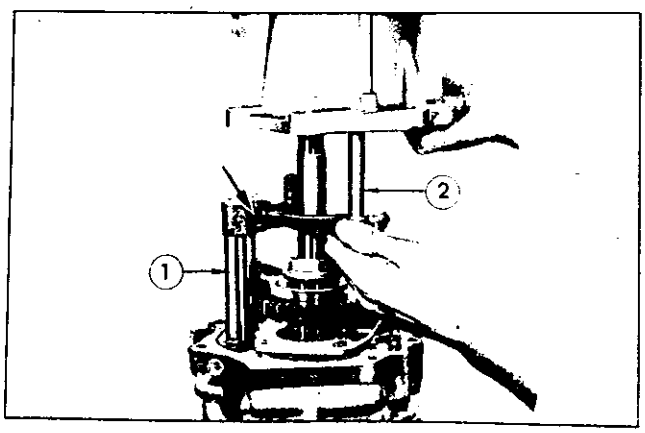
Fig. TM-61 Installing main drive bearing ring

Installing rear extension

37. Clean the adapter plate and rear extension contact surfaces, and apply liquid packing to the adapter plate and gasket.

38. When installing the rear extension on the transmission, arrange each fork rod to the neutral position, line up fork rod rear portions in a box shape, and install the striking rod in it. Apply washer to installation bolt, and tighten the rear extension to tightening torque in range from 1.5 to 2.2 kg-m (10.8 to 15.9 ft-lb).

When inserting the rear extension, be careful not to damage the rear extension oil seal with the main shaft spline.



1	Fork rod	2	Striking rod

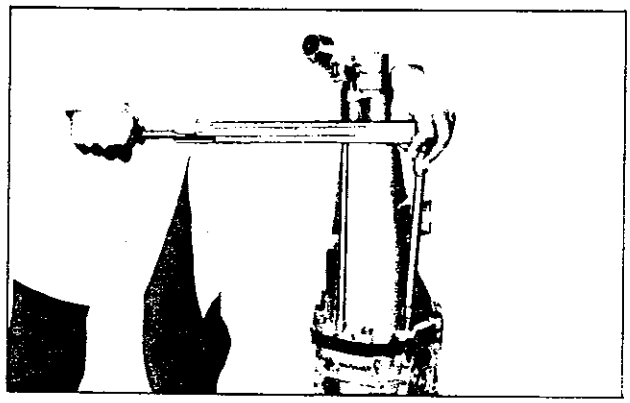


Fig. TM-62 Installing rear extension

39. Insert a striking rod pin, connect the striking rod to the control lever bracket, and secure them with a striking pin ring.

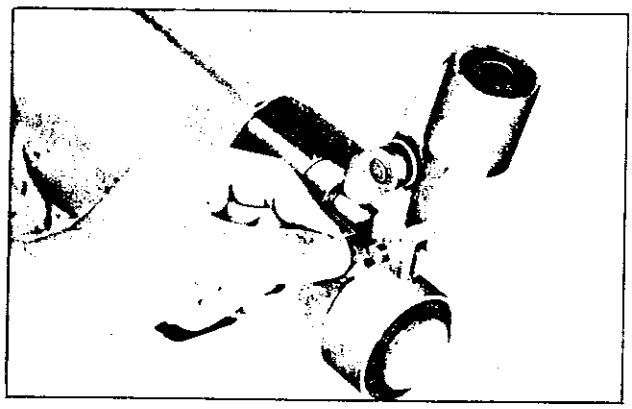
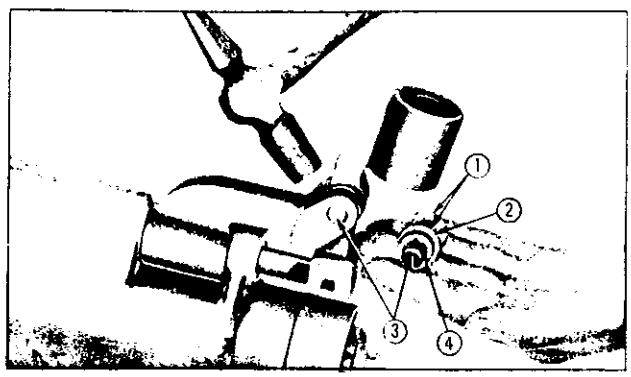


Fig. TM-63 Installing striking rod pin

40. When installing the control arm pin, install the control spring, thrust washer, and washer on their positions correctly and fit retaining pin by means of driving.

When removing the retaining pin use a solid punch (special tool ST23530000) and drive with a hammer.



1	Washer	3	Striking rod pin
2	Thrust washer	4	Spring

Fig. TM-64 Installing control arm pin

41. Selecting main drive bearing shim

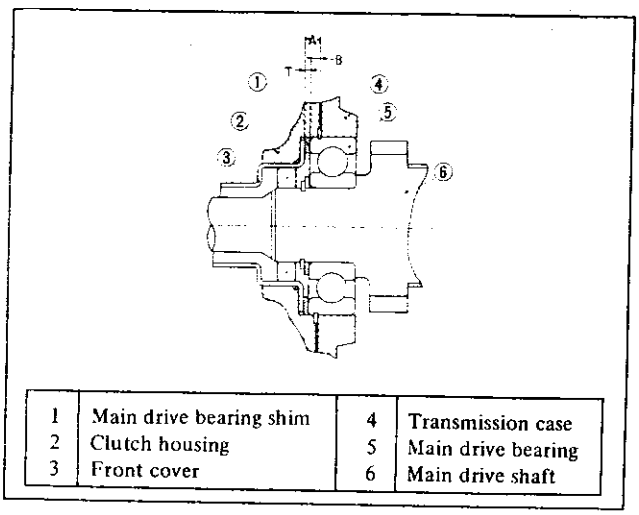
1) Measure height of the transmission case from front end surface of the main drive bearing. The height is referred to as "B".

2) Measure depth of rear end surface of the front cover from the clutch housing rear end surface. The depth is referred to as "A".

3) Thickness of a required shim "T" is obtained by the following formula:

$$T = A - B$$

Ring thickness for selection		
1.	1.4 mm	(0.0551 in)
2.	1.6 mm	(0.0630 in)



1	Main drive bearing shim	4	Transmission case
2	Clutch housing	5	Main drive bearing
3	Front cover	6	Main drive shaft

Fig. TM-65 Main drive bearing spacer

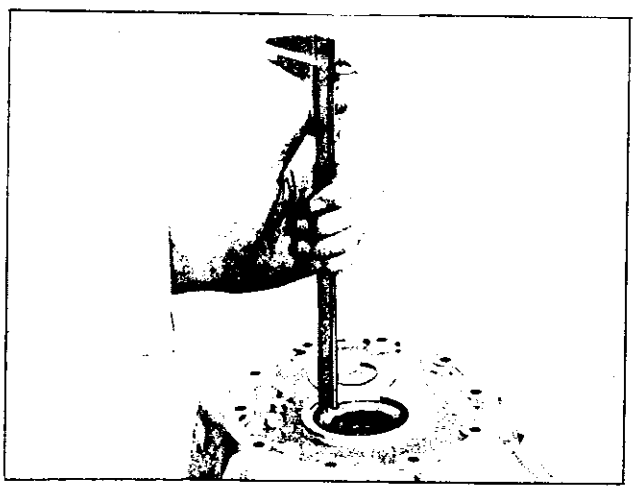


Fig. TM-66 Selection main drive bearing spacer (Measuring depth "A")

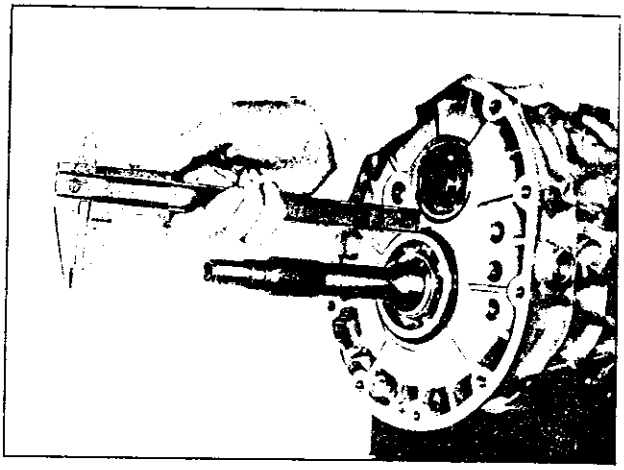
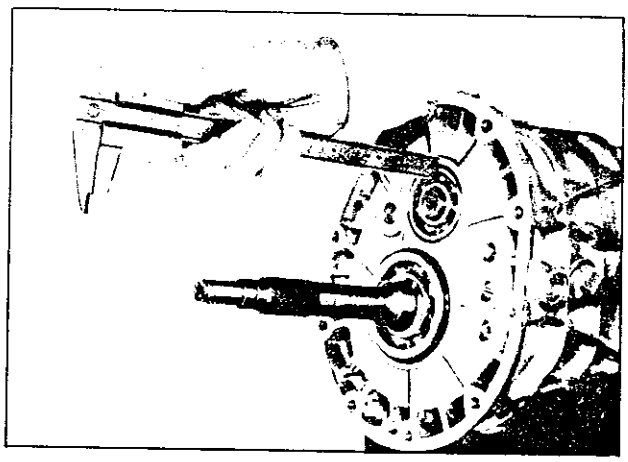


Fig. TM-67 Selection main drive bearing spacer (Measuring depth "B")

42. Selecting counter shaft front bearing shim

Measure depth of counter shaft front bearing down to the front end surface from the transmission case front end surface (referred to as "A"), and select a proper shim based on the depth "A".



Spacer thickness for selection	
1.	0.4 mm (0.0157 in)
2.	0.5 mm (0.0197 in)
3.	0.6 mm (0.0236 in)
4.	0.7 mm (0.0275 in)
5.	0.8 mm (0.0315 in)
6.	0.9 mm (0.0354 in)
7.	1.0 mm (0.0394 in)

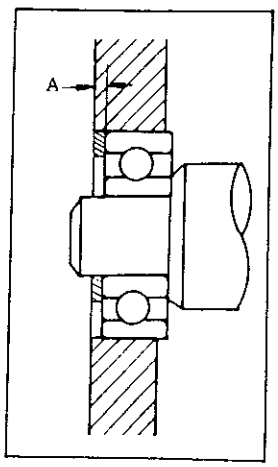


Fig. TM-68 Selecting counter shaft front bearing shim

43. Clean the clutch housing and transmission case contact surfaces, apply liquid packing to the clutch housing installing surface and gasket, and attach the clutch housing to the transmission case. Tighten the installation bolts and washer to tightening torque in range from 1.5 to 2.2 kg-m (10.8 to 15.9 ft-lb), and secure the clutch housing.

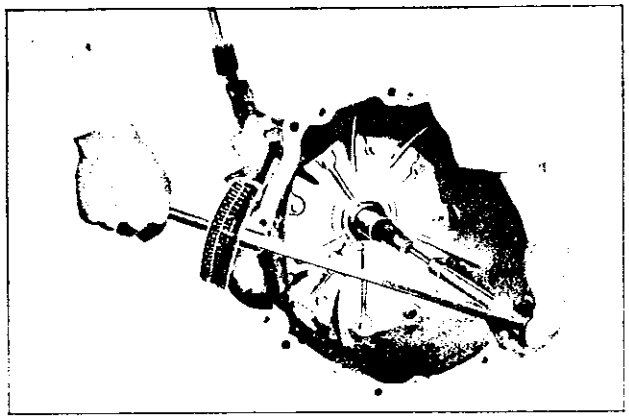


Fig. TM-69 Installing clutch housing

44. Install the clutch release mechanism. (See Section CL.)

45. Shift the transmission control lever to each gear, and make sure that the gear operates smoothly.

46. Remount the transmission assembly in reverse sequence of dismounting.

47. Pour gear oil into the transmission [1.5 liters (0.4 US gal)].

TYPE FS5C71A TRANSMISSION

CONTENTS

The type FS5C71A transmission is a servo type synchromesh 5-forward (with over drive) 1-reverse speed transmission, which is adopted at some territories only.

The items which differ from the type F4W71A transmission are as follows.

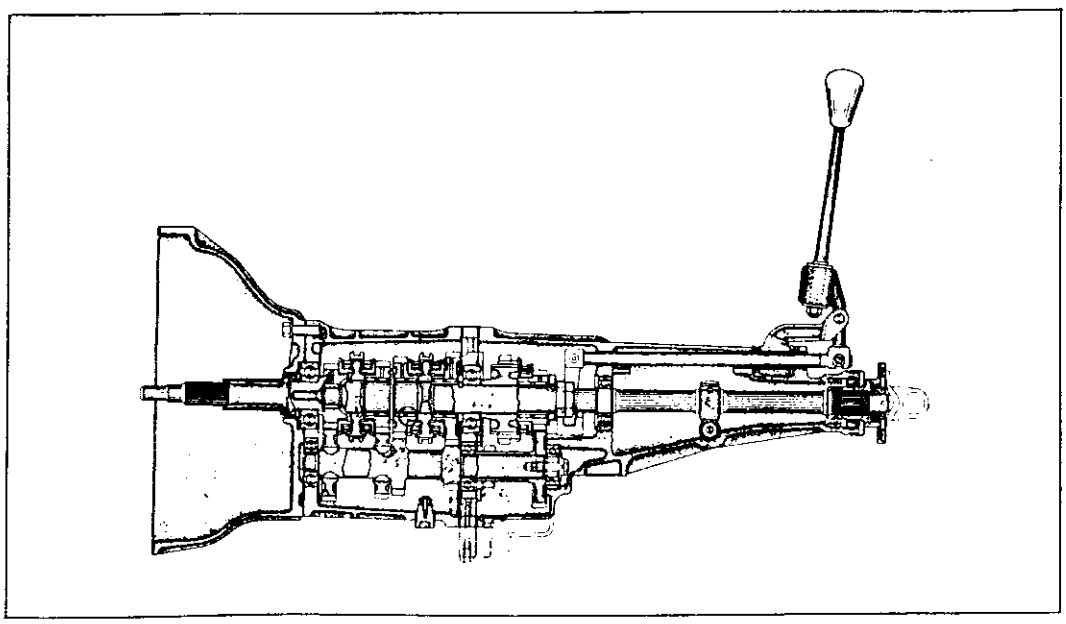
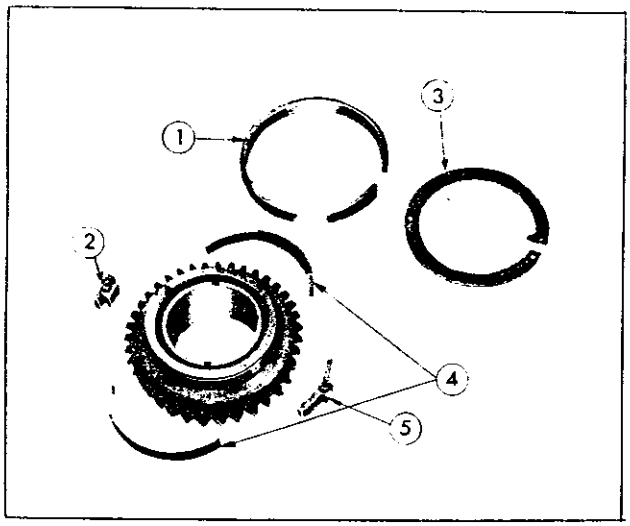


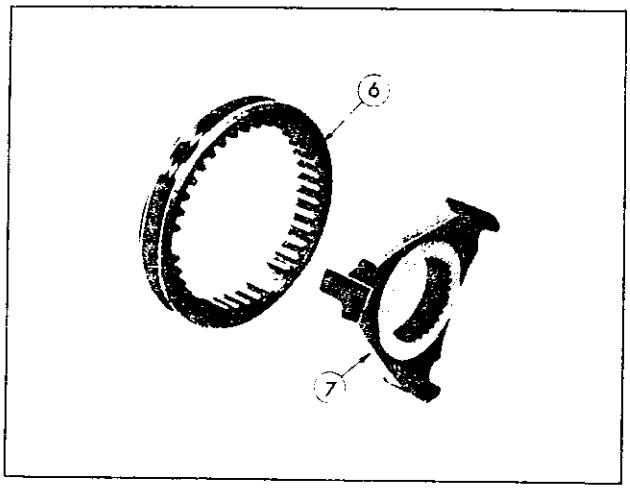
Fig. TM-70 Cross-sectional view of type FS5C71A transmission

DISASSEMBLY

Synchronizer assembly

Remove the circlip, and remove the synchronizer ring, thrust block, brake band, and anchor block.





1	Synchro. ring	5	Thrust block
2	Anchor block	6	Synchro. sleeve
3	Circlip	7	Synchro. hub
4	Brake band		

Fig. TM-71 Components of synchronizer assembly

INSPECTION

1. Gear backlash

Main drive gear Reverse gear	0.04 to 0.15 mm (0.0016 to 0.0059 in)
1st gear 2nd gear 3rd gear 5th gear	0.04 to 0.20 mm (0.0016 to 0.0079 in)

2. Gear end play

1st gear 2nd gear 5th gear	0.12 to 0.19 mm (0.0039 to 0.0075 in)
3rd gear	0.12 to 0.24 mm (0.0039 to 0.0094 in)
Reverse idler gear	0.05 to 0.35 mm (0.0019 to 0.0137 in)

3. Synchronizer assembly

Replace, if synchronizer hub, anchor block, thrust block, brake band, etc. are damaged, cracked, or worn.

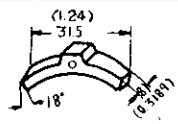
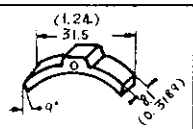
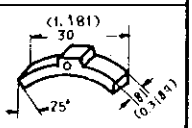
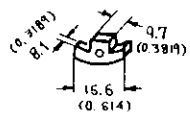
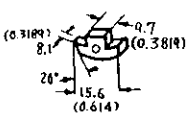
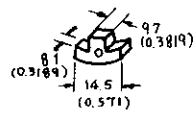
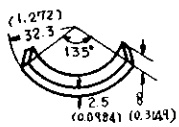
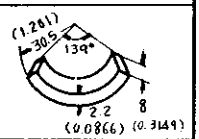
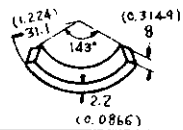
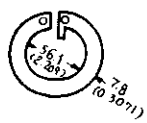
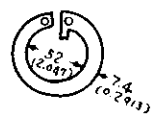
REASSEMBLY

Synchronizer assembly

The following table indicates three types of synchronizer. When assembling the individual components, be careful to combine appropriate components correctly.

Component parts of synchronizer assembly

mm (in)

	4th	3rd	2nd	1st	5th (OD)
Thrust block		←	←		
Anchor block		←	←		
Brake band		←	←	←	
Brake band	Same as above	←	←		Same as above
Synchronizer ring		←	←	←	
Circlip		←	←	←	

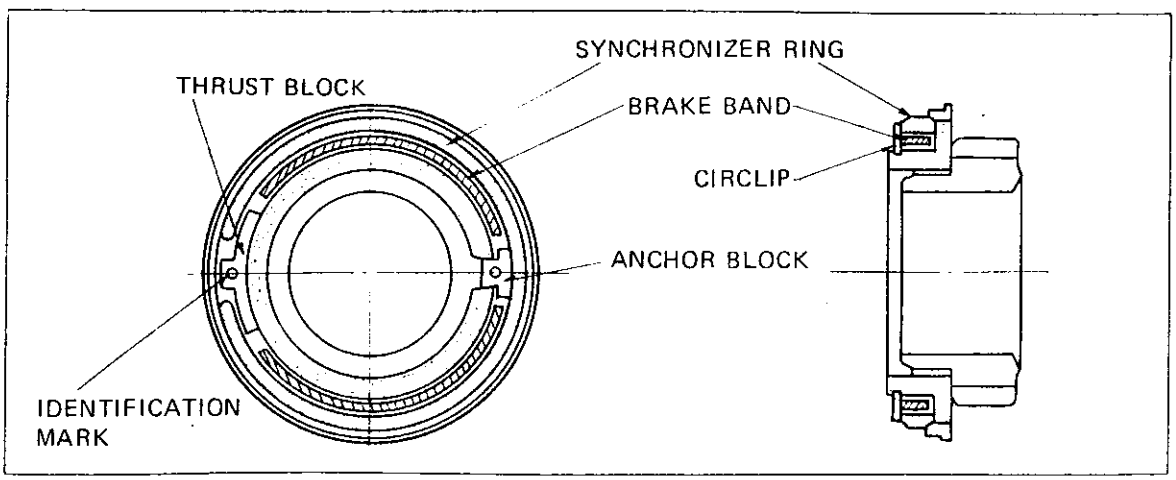


Fig. TM-72 Synchronizer assembly

Note: When assembling synchronizer for 1st speed gear, be sure to install 2.2 mm (0.0866 in) thick brake band in the lower side in the above figure.

Main shaft

Apply the 3rd speed gear (3), synchronizer hub, and coupling sleeve (2), select and install a snap ring (1) so that synchronizer hub play is minimized.

Note: **a. When installing the synchronizer hub (2), be sure to face the longer boss to the rear side.**

b. When installing the synchronizer hub (5), be sure to face the longer boss to the front side.

Snap ring for selection

	Thickness
1.	1.55 to 1.60 mm (0.0610 to 0.0630 in)
2.	1.50 to 1.55 mm (0.0591 to 0.0610 in)
3.	1.45 to 1.50 mm (0.0571 to 0.0591 in)

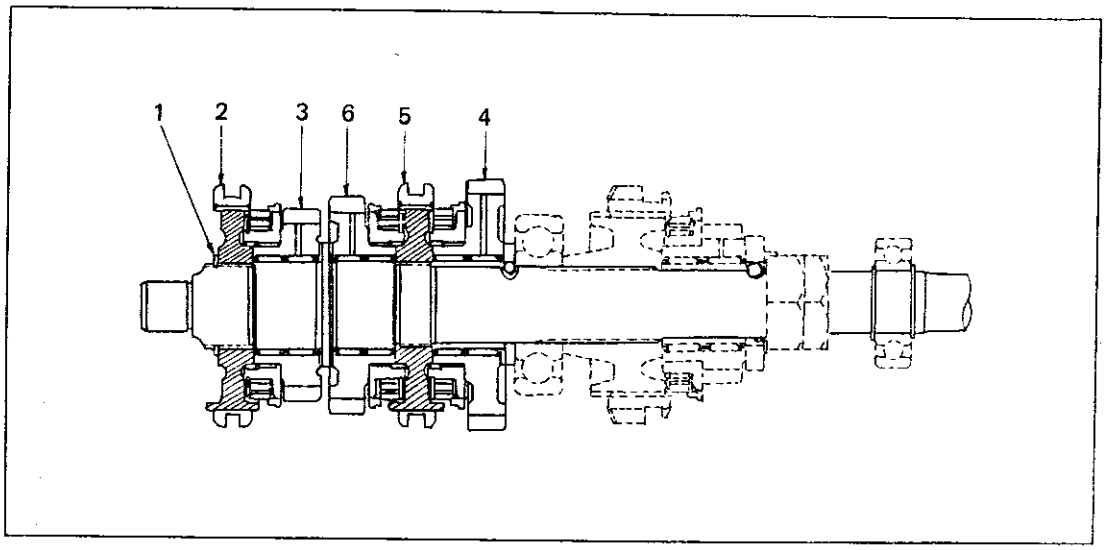


Fig. TM-73 Main shaft assembly

Gear assembly

1. Install the main shaft, counter shaft, and gears on the adapter plate.

2. Tightening the main shaft lock nuts

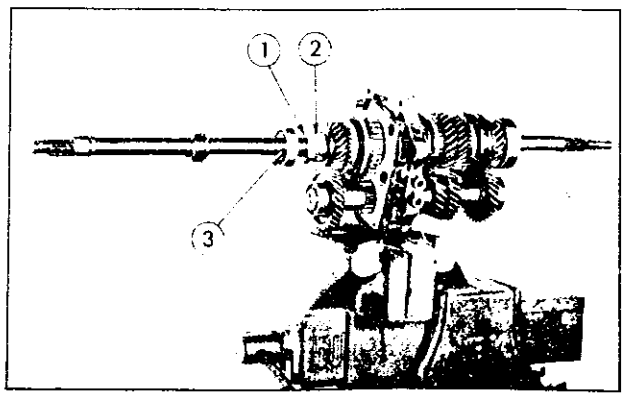
(1) Tighten the 1st nut and 2nd nut respectively to tightening torque ranging from 2 to 3 kg-m (14.5 to 21.7 ft-lb) and 1 to 2 kg-m (7.2 to 14.5 ft-lb).

(2) Set the 2nd nut stationarily, and tighten the 1st nut toward loosening direction under 30 kg-m (216.9 ft-lb).

3. For the snap ring used in the rear side of the over drive bearing, select a proper snap ring so that the bearing play toward the axial direction is minimized.

Snap ring for selection

	Thickness
1.	1.1 mm (0.0433 in)
2.	1.2 mm (0.0472 in)
3.	1.3 mm (0.0512 in)
4.	1.4 mm (0.0551 in)



1	2nd nut	2	1st nut	3	snap ring

Fig. TM-74 Tightening lock nuts

SERVICE DATA AND SPECIFICATIONS

GENERAL SPECIFICATIONS

Type		F4W71A	FS5C71A
No. of speeds		4-forward, 1-reverse	5-forward, 1-reverse
Synchromesh type		Warner type	Servo type
Gear ratio			
	1st	3.549	2.957
	2nd	2.197	1.857
	3rd	1.420	1.311
	4th	1.000	1.000
	5th	—	0.852
	Rev.	3.164	2.922
Speedometer pinion		17/6	19/6
Oil capacity		1.5 ℓ (0.4 US gal)	1.5 ℓ (0.4 US gal)

TIGHTENING TORQUE

Machine screw for bearing retainer	1.20 to 1.80 kg-m (8.7 to 13.0 ft-lb)
Set screw for reverse idler shaft	1.20 to 1.80 kg-m (8.7 to 13.0 ft-lb)
Reverse idler shaft nut	6.0 to 8.0 kg-m (43.4 to 57.8 ft-lb)
Main shaft nut	18.0 to 21.0 kg-m (130.2 to 151.8 ft-lb)
Check ball plug	2.2 to 3.0 kg-m (15.9 to 21.7 ft-lb)
Rear extension installation bolt	1.5 to 2.2 kg-m (10.8 to 15.9 ft-lb)
Clutch housing installation bolt	1.5 to 2.2 kg-m (10.8 to 15.9 ft-lb)
Locking plate nut for speedometer pinion sleeve	0.3 to 0.6 kg-m (2.2 to 4.3 ft-lb)
Reverse lamp switch	2.0 to 3.0 kg-m (14.5 to 21.7 ft-lb)
Gear oil drain plug	2.0 to 4.0 kg-m (14.5 to 28.9 ft-lb)
Transmission installation bolt (Used to join the transmission and engine)	2.7 to 3.7 kg-m (19.5 to 26.8 ft-lb)

SPECIFICATIONS

	Type F4W71A	Type FS5C71A
Gear backlash		
Main drive and reverse gear	0.05 to 0.15 mm (0.0020 to 0.0059 in)	0.04 to 0.15 mm (0.0016 to 0.0059 in)
The other gears	0.05 to 0.15 mm (0.0020 to 0.0059 in)	0.04 to 0.20 mm (0.0016 to 0.0079 in)
Gear end play		
1st gear	0.12 to 0.19 mm (0.0047 to 0.0075 in)	0.12 to 0.19 mm (0.0047 to 0.0075 in)
2nd gear	0.12 to 0.19 mm (0.0047 to 0.0075 in)	0.12 to 0.19 mm (0.0047 to 0.0075 in)
3rd gear	0.12 to 0.19 mm (0.0047 to 0.0075 in)	0.12 to 0.24 mm (0.0047 to 0.0094 in)
5th gear	0.12 to 0.19 mm (0.0047 to 0.0075 in)	0.12 to 0.19 mm (0.0047 to 0.0075 in)
Reverse idler gear	0.05 to 0.35 mm (0.0020 to 0.0138 in)	0.05 to 0.35 mm (0.0020 to 0.0138 in)
Clearance between baulk ring and gear	1.2 to 1.4 mm (0.0472 to 0.0550 in)	1.2 to 1.4 mm (0.0472 to 0.0550 in)

TROUBLE DIAGNOSES AND CORRECTIONS

Symptom and possible cause	Corrective action
Difficult to intermesh gears Causes for difficult gear hifting are classified to troubles concerning the control system and transmission. When the gear shift lever is heavy and it is difficult to shift gears, clutch disengagement may also be unsmooth. First, make sure that the clutch operates correctly, and inspect the transmission.	
Worn gears, shaft, and/or bearing	Replace.
Insufficient operating stroke due to worn or loose sliding part	Repair or replace.
Defective or damaged synchronizer	Replace.

Gear slips out of mesh In the most cases, this trouble occurs when the interlock plunger, check ball, and/or spring is worn or weakened, or when the control system is defective. In this case, the trouble cannot be corrected by replacing gears, and therefore, trouble shooting must be carried out carefully. It should also be noted that gear slips out of mesh due to vibration generated by weakened front and rear engine mounts.	
Worn interlock plunger	Replace.
Worn check ball and/or weakened or broken spring	Replace.
Worn fork rod ball groove	Replace.
Worn or damaged bearing	Replace.
Worn or damaged gear	Replace.
Noise When noise occurs under engine idling and stops while the clutch is disengaged, or when noise occurs while shifting gears, it may judged that the noise is from the transmission.	
Insufficient or improper lubricant	Add oil or replace with designated oil.
Oil leaking due to defective oil seal and gasket, clogged breather, etc.	Clean or replace.
Worn bearing (High humming occurs at a high speed.)	Replace.
Damaged bearing (Cyclic knocking sound occurs also at a low speed.)	Replace.
Worn each spline	Replace.
Worn each bushing	Replace.

SERVICE JOURNAL OR BULLETIN REFERENCE

DATE	JOURNAL or BULLETIN No.	PAGE No.	SUBJECT

SERVICE JOURNAL OR BULLETIN REFERENCE

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SERVICE JOURNAL OR BULLETIN REFERENCE

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DATSUN 240Z SPORTS
MODEL S30 SERIES

CHASSIS & BODY

NISSAN

NISSAN MOTOR CO., LTD.
TOKYO, JAPAN

SECTION PD

PROPELLER SHAFT & DIFFERENTIAL CARRIER

PD

PROPELLER SHAFT AND UNIVERSAL JOINT

CONTENTS

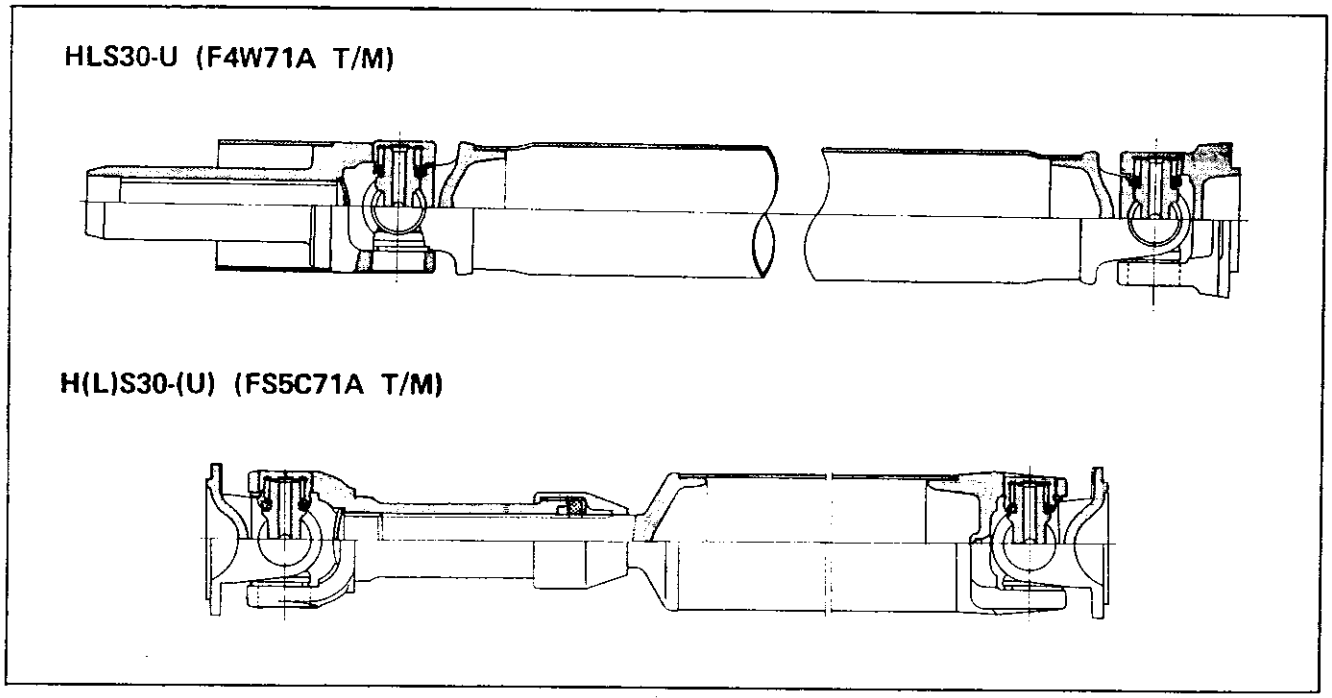


Fig. PD-1 Cross-sectional view of propeller shaft

SPECIFICATIONS

Propeller shaft \ Model	HLS30-U (F4W71A T/M)	H(L)S30-(U) (FS5C71A T/M)
Length between joints	540 mm (21.26 in)	520 mm (20.47 in)
Tube outer diameter	63.5 mm dia. (2.500 in dia.)	63.5 mm dia. (2.500 in dia.)
Tube thickness	1.6 mm (0.0630 in)	1.6 mm (0.0630 in)
Type of joint	63H non-lubricating	63H non-lubricating

DESCRIPTION

The propeller shaft is of a 2-joint type. The sliding part of the propeller shaft for the F4W71A transmission is on the rear extension of transmission unit in form of an involute spline, and is lubricated with gear oil.

The propeller shaft for the FS5C71A transmission differs from that for the F4W71A. For the FS5C71A transmission, the sliding part is on the propeller shaft and is lubricated with multi-purpose grease.

REMOVAL, INSPECTION, AND REPAIR

1. The propeller shaft is balanced an assembly. When removing the propeller shaft, verify the spline/flange yoke match marks in two places. When the match marks are unverifiable, put match marks by means of punching for convenience' sake during reassembling.

2. Remove the submuffler, remove four bolts and nuts from the propeller shaft rear end flange yoke and differential carrier flange connecting unit, and remove the propeller shaft.

Note: Carry out this operation carefully so as not to damage the spline and rear oil seal. Take proper action to prevent oil leaking from the transmission rear end.

3. The permissible unbalance of the propeller shaft (in condition of an assembly) is 15 gr-cm (0.21 in-oz) at 4,000 rpm, [less than 20 gr-cm (0.28 in-oz) at 6,000 rpm].

Journal

Before disassembling, check the journal (without removing from the propeller shaft) for the movement; and when,

1. The journal does not operate smoothly [Bending resistance: more than 10 kg-cm (9 in-lb)], and/or,

2. The yoke in one side is set stationarily, a load of 10 kg (22 lb) is applied to the other yoke alternately, and the relative displacement toward the yoke axial direction is more than 0.1 mm (0.039 in);

Disassemble the journal and inspect the components and alignment.

Before disassembling the journal, verify the component alignment and relationship so that the yoke direction and snap ring thickness are not changed (When the yoke direction and/or snap ring thickness is changed, the tube and journal center alignment is deviated and the propeller shaft is unbalanced.) because the journal is balanced as an assembly.

It is desired not to disassemble the propeller shaft so that the alignment is not unbalanced.

Removal

1. Lightly tap the yoke unit with a wooden mallet (or copper hammer), and remove the bearing race from the yoke.

2. Tap and remove both bearing races from the yoke, and remove the journal from the yoke carefully so that the journal is not damaged.

Inspection and repair

Check the clearance toward the thrust direction (clearance between the journal and bearing assembly) and replace if excessively worn. The clearance of a new journal is 0.006 to 0.037 mm (0.0002 to 0.0015 in). When the roller is damaged or rusted and/or bearing race and journal sliding surface is pitted, replace the bearing as an assembly.

Reassembly

The component parts are reassembled in reverse sequence of disassembly. When reassembling, select and use a proper snap ring out of the following types (four types) so that the journal moves under the following conditions:

1. Bending resistance of the journal unit is less than 10 kg-cm (9 in-lb).

2. When a yoke in one side is set stationarily and a load of 10 kg (22 lb) is applied to the other yoke alternately, the relative displacement of the yoke toward the axial direction is less than 0.02 mm (0.0008 in).

Snap rings:

White	2.00 mm (0.0787 in)
Yellow	2.02 mm (0.0795 in)
Red	2.04 mm (0.0803 in)
Green	2.06 mm (0.0811 in)

SERVICE DATA

Permissible dynamic unbalance	15 gr-cm (0.21 in-oz)/4,000 rpm [20 gr-cm (0.28 in-oz)/6,000 rpm]

Axial play of spider journal	Less than 0.02 mm (0.0008 in)
Spider journal swinging torque	Less than 10 kg-cm (9 in-lb)
Clearance between bearing assembly and journal	0.006 to 0.037 mm (0.0002 to 0.0015 in)
Available snap ring thickness	
White	2.00 mm (0.0787 in)
Yellow	2.02 mm (0.0795 in)
Red	2.04 mm (0.0803 in)
Green	2.06 mm (0.0811 in)
Tightening torque	
Companion flange fixing nuts	2.5 kg-m (18 ft-lb)

DIFFERENTIAL CARRIER

CONTENTS

DESCRIPTION

The gear carrier assembly, designed for use in the rear independent suspension is made of malleable cast iron. The gears used are hypoid bevel gears. To serve as part of the suspension, its housing is highly rigid, basically in a combined cylindrical and oval form.

Adjustment figures stamped on screws, adjusting shims, washers, differential case, drive pinion and carrier are given in meters in accordance with the metric standardization of parts recently adopted.

The front part of the gear carrier assembly is mounted on the center of the rear suspension member with four bolts and the rear part is mounted on the body through a leaf spring with rubber insulators to prevent vibration from the road condition.

The gear housing requires a proper lubrication, or otherwise, durability of the gear is affected causing troubles.

The lubricant should be checked each 5,000 km (3,000 miles) and replenished as necessary.

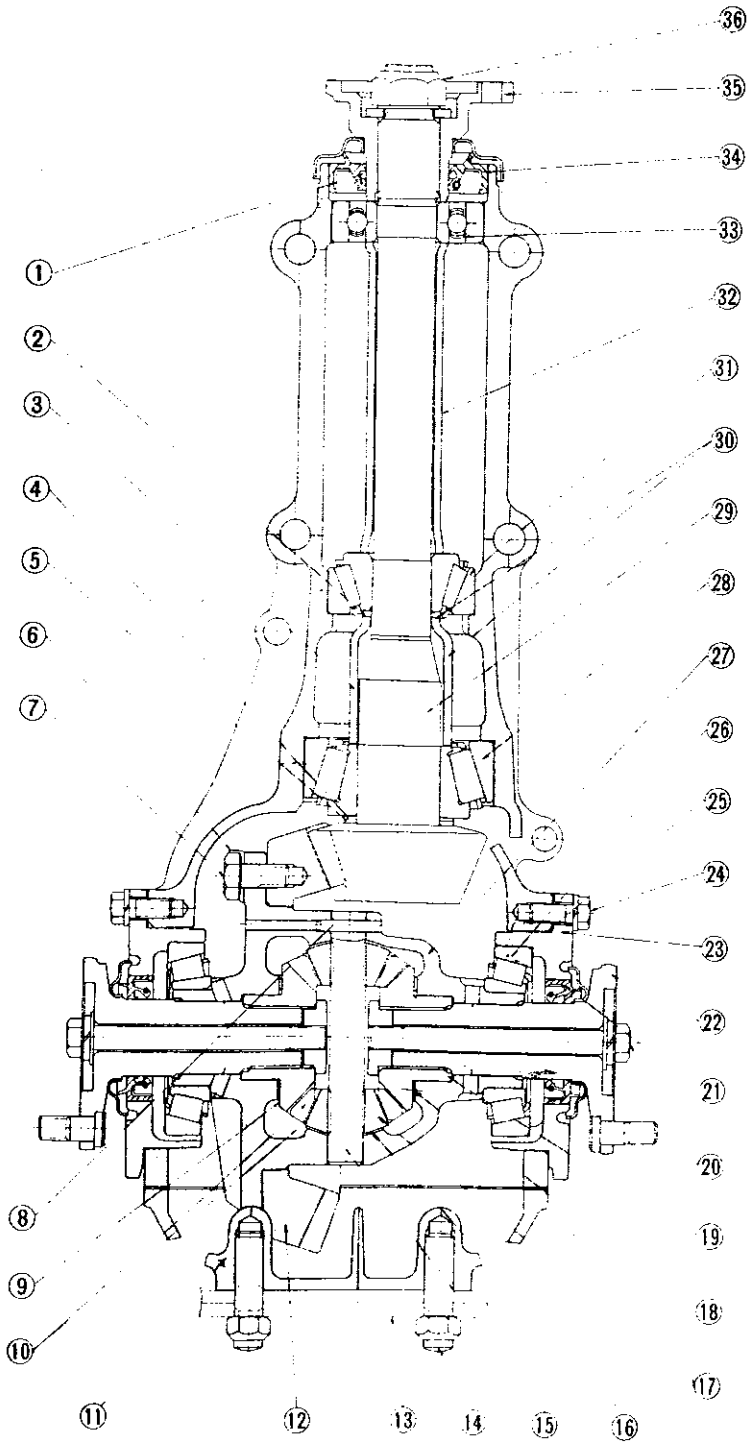
The lubricant should be replaced completely at the end of the first 1,000 km (600 miles) to eliminate metal particles and other forein matters accumulated during the break-in period. Thereafter differential lubricant should be changed at least every 50,000 km (30,000 miles).

Considerations should be given to the following matters:

1. Nominated hypoid gear oil API.GL-5 MIL-L-2105B be used. (Refer to Section GI.)

2. It is prohibited to use any gear oil having different viscosity. The same brand must always be selected.

3. The standard oil capacity is about 1.0 ltr. (0.22 US gal).



1	Supply multi-purpose grease to oil seal lip when assembly.
2	Pinion bearing adjusting washer
3	Pinion bearing adjusting spacer
4	Pinion height adjusting shims
5	Pinion height adjusting washer
6	Lock strap
7	Bolt drive gear T=7.0 to 8.0 kg-m (50.6 to 57.8 ft-lb) Tighten by tapping bolt head with 1/4 lbs. hammer
8	Lock pin
9	Adjust the clearance between the differential case and the rear face of the side gear to 0.1 to 0.2 mm (0.0039 to 0.0079 in) by side gear thrust washer.
10	Tooth contact of differential gear is more than 3/4 of its width and backlash is 0.1 to 0.2 mm (0.0039 to 0.0079 in)
11	Rear cover
12	Drive gear
13	Diff. mounting member
14	Bolt diff. to diff. mounting member T=6.0 to 8.0 kg-m (43.4 to 7.8 ft-lb)
15	Shaft pinion mate
16	Thrust washer
17	Pinion mate
18	Thrust washer
19	Side gear
20	Bolt side flange T=1.9 to 2.6 kg-m (13.7 to 18.8 ft-lb)
21	Oil seal. Supply chassis grease to oil seal lip when assembly.
22	Side flange
23	Side retainer
24	Bolt side retainer T=0.9 to 1.2 kg-m (6.5 to 8.7 ft-lb)
25	O-ring
26	Side bearing
27	Diff. gear case
28	Pinion rear bearing
29	Drive pinion
30	Adjust pinion bearing preload by selecting pinion bearing adjusting spacer and washer
31	Pinion front bearing
32	Spacer-front pilot bearing
33	Front pilot bearing
34	Oil seal
35	Companion flange
36	Drive pinion nut T=17 to 20 kg-m (122.9 to 144.6 ft-lb)

Fig. PD-2 Sectional view of gear carrier

INSPECTION BEFORE DISASSEMBLY

Check the parts and components to be disassembled or being disassembled carefully so that the causes for the defects can be determined definitely.

1. Place the carrier assembly on the Gear Carrier, Strut & Steering Gear Box Attachment (Special tool ST06270000).

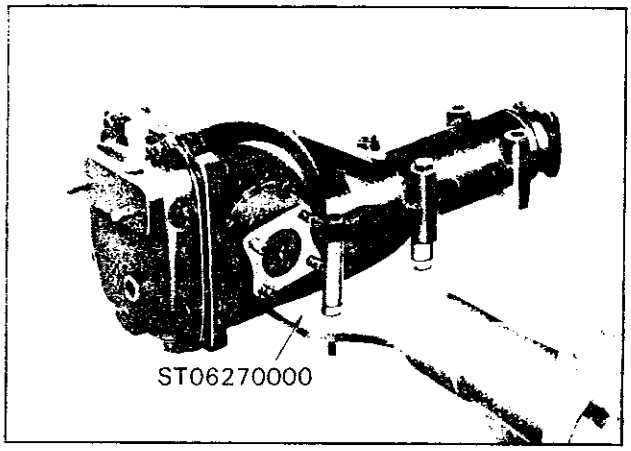


Fig. PD-3 Holding differential carrier

2. Check the tooth contact pattern (2 or 3 points) with lead oxide.

Note: For the tooth contact pattern, see paragraph dealing with "tooth contact pattern adjustment".

3. Measure the backlash between the drive gear and pinion using a dial indicator [backlash: 0.10 to 0.20 mm (0.0039 to 0.0079 in)].

4. Check the drive gear for run-out at the rear, and make sure that the tooth contact pattern or the backlash is normal. [run-out limit: 0.08 mm (0.0031 in)].

5. Measure the turning torque of the driven pinion. [Turning torque: 3 to 15 kg-cm (2.6 to 13.0 in-lb)].

DISASSEMBLY

1. Remove the clamp bolt that holds the flange.

2. Attach the Gear Carrier Side Flange Stand (Special tool ST33730000) to the side flange and extract the flange using the Sliding Hammer (Special tool ST36230000).

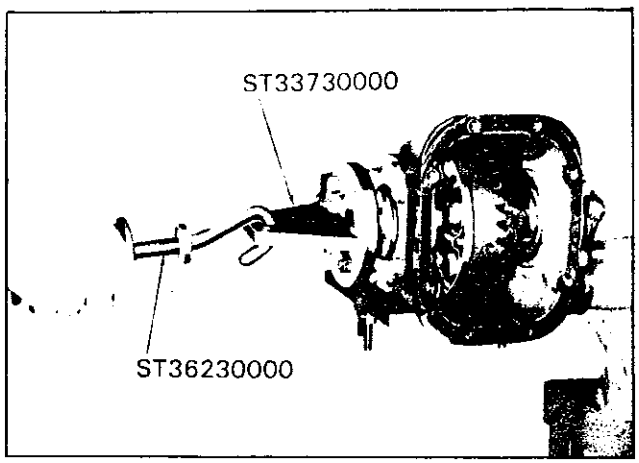


Fig. PD-4 Removing side flange

3. Remove the left side retainer and right side retainer using the Gear Carrier Side Retainer Attachment [(Special tool ST33710000) and standard puller].

Note: a. Provide the right and left side retainers with identification marks before removal.

b. Be careful not to confuse the right and left hand side retainers and shims so that reassembly will be made with the same parts in the original position.

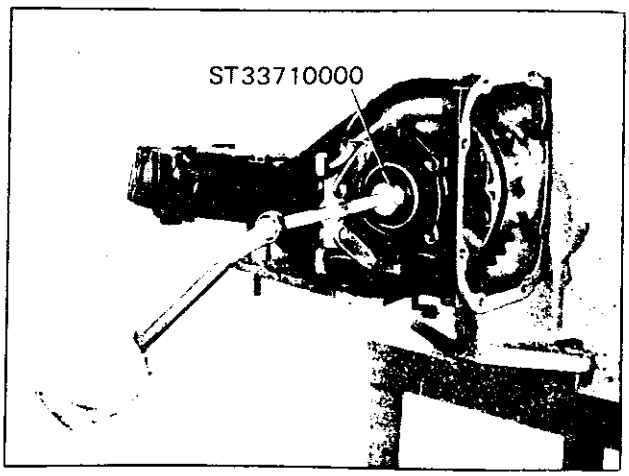


Fig. PD-5 Removing side retainer

4. Remove the differential case from the gear carrier.

5. When replacing the side thrust bearing, remove the bearing outer race from the side retainer using the Gear Carrier Oil Seal Puller (Special tool ST33290000).

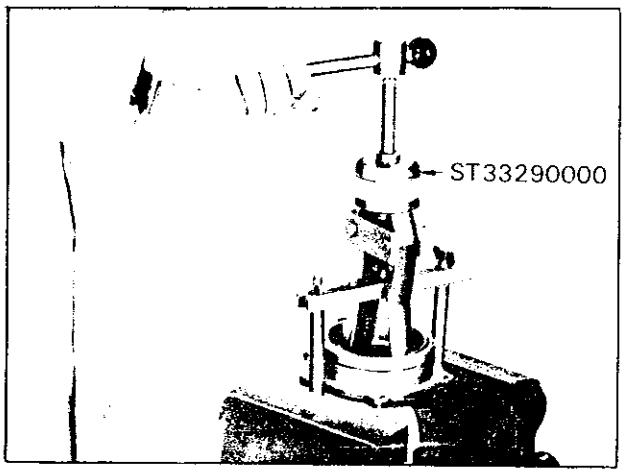


Fig. PD-6 Removing side bearing outer race

6. Hold the companion flange with the Drive Pinion Flange Wrench (Special tool ST31530000) and loosen the drive pinion nut.

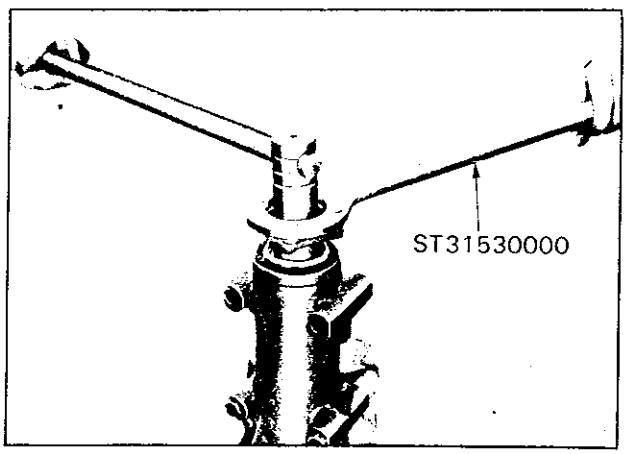


Fig. PD-7 Removing drive pinion nut

7. Insert the companion flange into the drive pinion, tighten the pinion nut to the given torque, and check the turning torque of the drive pinion. [pinion nut tightening torque: 17 to 20 kg-m (122.9 to 144.6 ft-lb)].

Loosen the pinion nut and pull off the companion flange. Remove the oil seal.

8. Remove the drive pinion from the gear carrier with a press. Disassemble the front pilot bearing with pilot bearing drift (Special tool ST30650000). The drive pinion can be removed together with the front and rear bearing inner races, bearing spacers and adjusting washers.

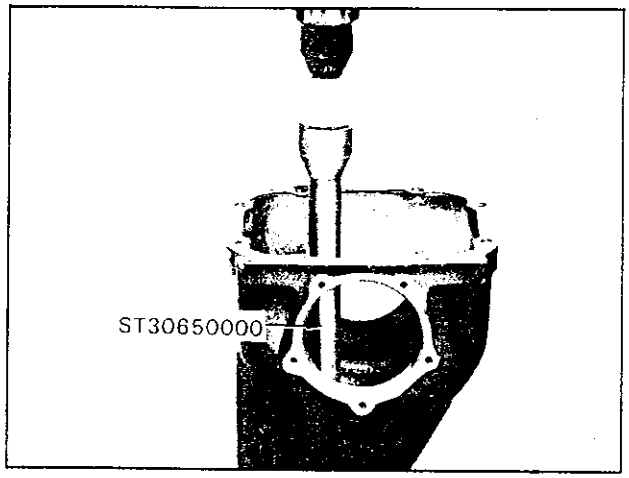


Fig. PD-8 Removing front pilot bearing

9. Hold the rear bearing inner race with the Drive Pinion Rear Bearing Inner Race Replacer (Special tool ST30030000) and remove it from the drive pinion with a press.

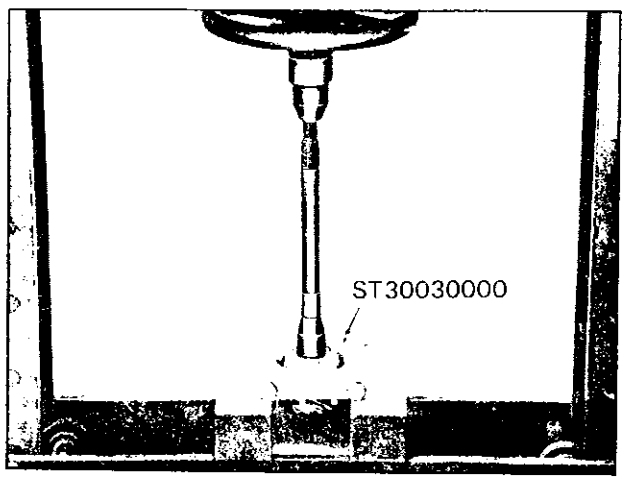


Fig. PD-9 Removing rear bearing inner race

Note: As the result of inspection before disassembly, if proper tooth contact pattern has been obtained and the drive gear, drive pinion carrier, rear bearing, washers, etc. can be reused without replacing the proper tooth contact pattern can be obtained without a pinion height adjustment. Consequently, it is not necessary to remove the bearing inner race.

10. Remove the front and rear bearing outer races by the use of a press and the Drive Pinion Outer Race Drift Assembly (Special tool ST30610000).

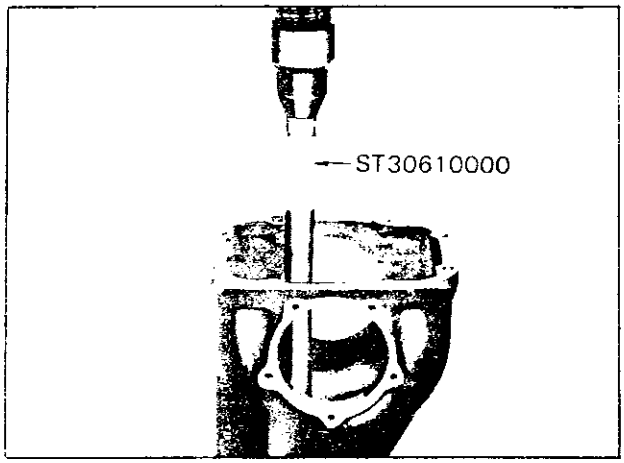


Fig. PD-10

Disassembling differential case

1. Remove the bearing cone with the Puller and Adapter (Special tool ST33012000).

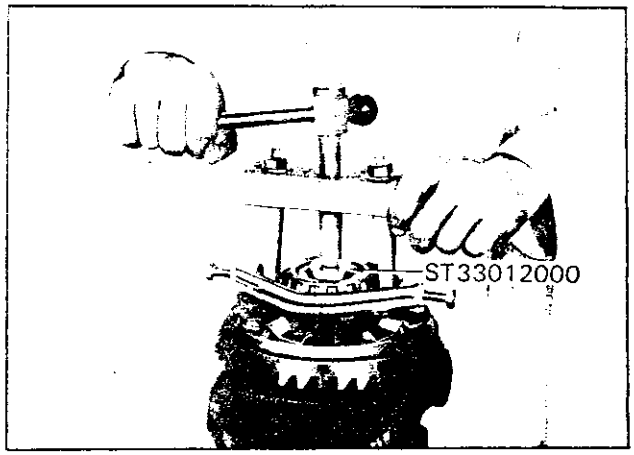


Fig. PD-11 Remvoing side bearing cone

Remove the left hand one after removing the drive gear.

Note: a. The puller should be handled carefully so as to catch the edge of bearing inner race.

b. Be careful not to confuse the right and left hand parts.

2. Remove the hypoid drive gear by spreading out the lock strap and loosening the drive gear bolts.

Note: Loosen the bolts diagonally and alternately.

3. Punch off the pinion mate shaft lock pin from the drive gear side with the Solid Punch (Special tool ST23510000).

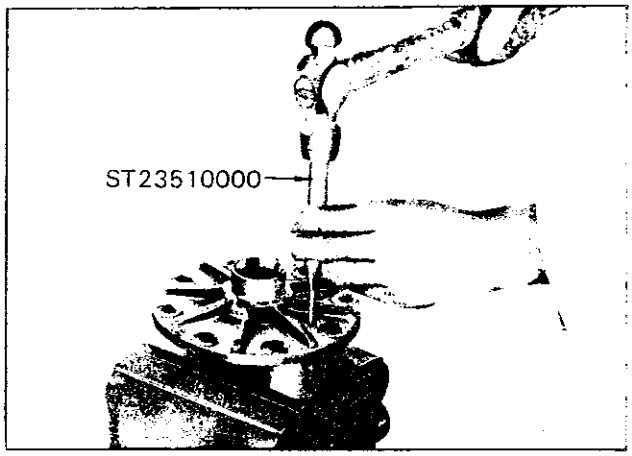


Fig. PD-12 Punching off lock pin

Note: The lock pin is caulked at the pin hole mouth of the differential case. Do not punch it off forcibly without checking how it is caulked.

4. Draw out the pinion mate shaft and remove the pinion mate gears, side gears and thrust washers.

Note: The left, right, front and rear gears as well as thrust washers should be marked or preserved separately.

Replacement of oil seal

Replacing front oil seal

(1) Drain gear oil.

(2) Jack up the rear wheel.

(3) Remove exhaust system (Refer to Section FE.).

(4) Detach the propeller shaft from the companion flange of the carrier.

(5) Hold the companion flange and drive pinion companion flange with a Drive Pinion Flange Wrench (Special tool ST31530000) remove pinion nuts.

(6) Remove the companion flange and the front retainer with a standard puller.

(7) Remove the oil seal from the front retainer with the Gear Carrier Oil Seal Puller (Special tool ST33290000).

(8) Install the new oil seal in position by the use of the Gear Carrier Oil Seal Drift (Special tool ST33252000).

Note: Apply grease in between the seal lips when driving in the oil seal.

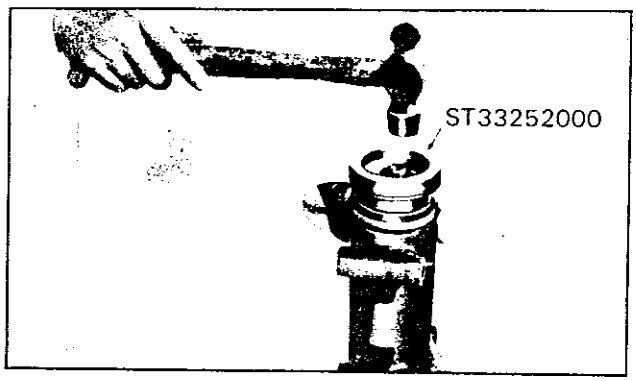


Fig. PD-13 Removing front retainer

(9) Re-install the front retainer when the oil seal is replaced, in reverse sequence of removal.

Replacing side oil seal

(1) Remove the drive shaft from the side flange of the gear carrier.

(2) Remove the side flange by the use of the Sliding Hammer (Special tool ST36230000) and Gear Carrier Side Flange Stand (Special tool ST33730000).

(3) Remove the oil seal.

(4) Install the new oil seal by the use of the Gear Carrier Oil Seal Drift (Special tool ST33270000).

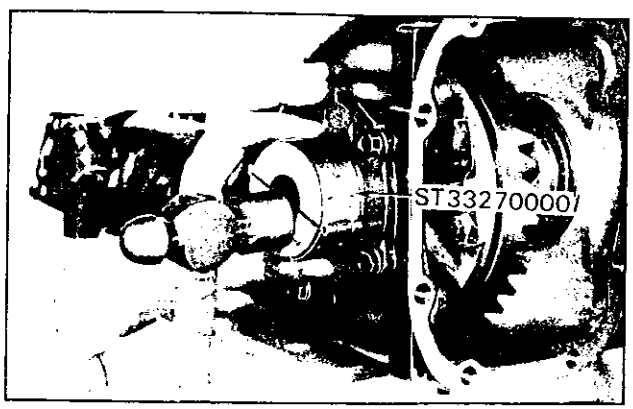


Fig. PD-14 Removing side flange

Note: Apply grease in between the oil seal lips.

INSPECTION

Thoroughly clean all disassembled parts and check them for wear, damage and other defects. Examine how they are affected. Repair or replace all defective parts as applicable.

1. Check gear teeth for scoring, cracking and chipping, and make sure that tooth contact pattern indicates correct meshing depth.

If any defect is evident, replace parts as required.

Note: Drive pinion and drive gear are supplied for replacement as a set, therefore, should either parts be damaged, replace as a set.

2. Check the pinion gear shaft and pinion, and gear mating faces for scoring and signs of wear. Replace as required.

Follow the same procedure for inner faces of side gear and their seats on differential case.

3. Inspect all bearing races and rollers for scoring, chipping or excessive wear.

They should be in tiptop condition, with mirror-like surfaces. Replace if there is a shadow of doubt on their efficiency, because an incorrect bearing operation may result in noisiness and gear seizure.

4. Inspect thrust washer faces

Minor defects may be corrected with emery paper.

When the backlash between the side gear and the pinion mate exceeds 0.2 mm (0.0079 in) and the clearance between the side gear and thrust washer exceeds 0.3 mm (0.0118 in), replace the thrust washer.

Three types of thrust washers are available.

5. Measure the run-out of the drive gear at its rear side with a dial indicator.

When the run-out exceeds 0.08 mm (0.0031 in), replace the drive gear and pinion gear as a set.

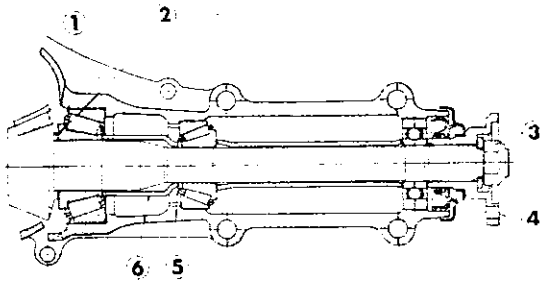
6. Inspect carrier and differential case for cracks or distortion.

If cracked or distorted replace defective parts.

7. As a general rule, oil seal should be replaced every disassembly.

REASSEMBLY AND ADJUSTMENT

Reassembly can be proceeded in reverse order of disassembly. The following directions for the adjustment and usage of special tools enable to obtain a perfect differential operation.



1	Pinion bearing adjusting washer	4	Preload for pinion bearing without oil seal and drive 7 to 10 kg-m (50.6 to 72.3 ft-lb)
2	Pinion height adjusting shims		
3	Tightening torque of nut-drive pinion 17 to 20 kg-m (122.9 to 144.6 ft-lb)	5	Pinion bearing adjusting washer
		6	Pinion bearing adjusting spacer

Fig. PD-15 Sectional view of drive pinion

Precautions in reassembly

1. Arrange shims, washers and other relative parts in order so that they will be installed correctly.

2. Thoroughly clean the surfaces on which shims, washers, bearings and bearing retainers are installed.

3. Apply gear oil when installing bearings.

4. Apply grease in between the lips when fitting oil seal.

Differential case

1. Install the side gear and pinion mate in the differential case using the corresponding thrust washers.

2. Fit the pinion shaft to the differential case so that it meets the lock pin holes.

3. Measure the clearance between the differential case and the rear face of the side gear.

If the clearance is deviated from the normal range, use a suitable side gear thrust washer to bring the clearance to normal.

Note: Normal clearance between the side gear and thrust washer is 0.1 to 0.2 mm (0.0039 to 0.0079 in).

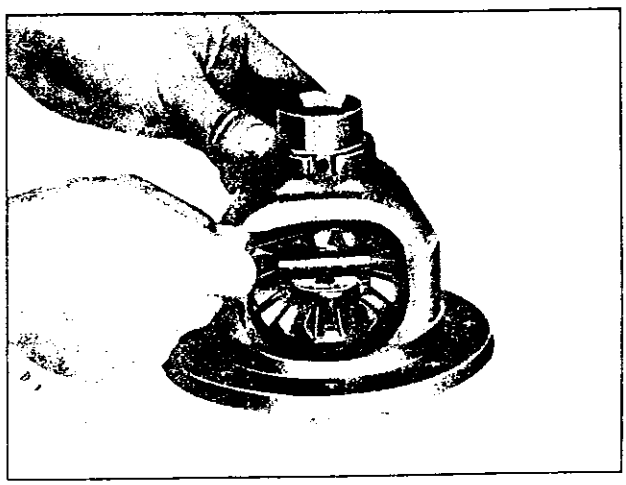


Fig. PD-16 Measuring the clearance between the side gear and thrust washer

4. Lock the pinion shaft lock pin using a punch after it is secured into the place.

5. Apply oil to the gear tooth surfaces and thrust surfaces and make sure that they turn properly.

6. Fit the drive gear to the differential case and tighten the bolts to the given torque.

Tightening torque: 7.0 to 8.0 kg-m
(50.6 to 57.8 ft-lb)

Note: a. Only genuine drive gear bolts and new lock bolts straps should be used.

b. Tighten the clamp bolts in the diagonal order by tapping its head.

7. Before replacing the side bearing, measure the bearing width using a 2.5 kg (5.5 lb) weight block.

The normal bearing width is 20.00 mm (0.787 in).

8. Press fit the side bearing cone in the differential case with Gear Carrier Side Bearing Drift (Special tool ST33230000).

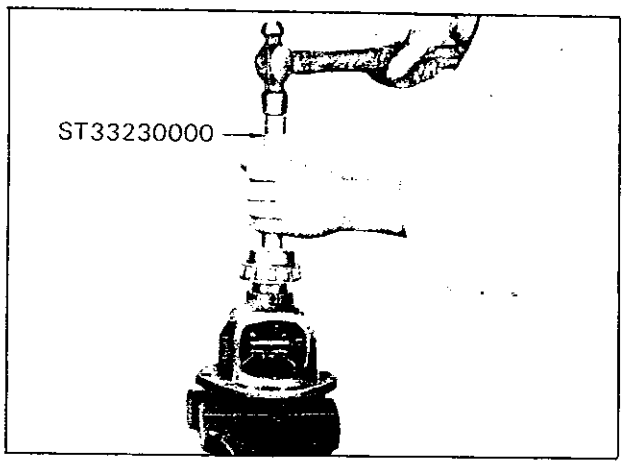


Fig. PD-17 Pressing side bearing cone

Adjustment of drive pinion preload

Adjust the preload of the drive pinion with spacer and washer between the front and rear bearing cones, regardless of the thickness of pinion height adjusting washer and shims.

This adjustment must be carried out without the oil seal inserted.

1. Press fit the front and rear bearing outer races into the gear carrier using the drift.
(Special Tool Drive Pinion Outer Race Drift Assembly (Special tool ST30610000).

2. Insert pinion height adjusting washer, shims and rear bearing inner race into a dummy shaft to facilitate adjustment of the pinion height: Gear Carrier Height Gauge Assembly (Special tool ST31210000).

Note: Re-use the old washer and shims if they have been found with normal tooth contact pattern during inspection before disassembly.

3. Apply drive pinion bearing spacer, washer, front bearing, drive Pinion Collar (Special tool ST31500000) and companion flange in that order to a dummy shaft and tighten the drive pinion nut to the given torque to secure them.

[Pinion nut tightening torque: 17 to 20 kg-m (122.9 to 144.6 ft-lb)]

Note: Replace the bearing washer and spacer with ones having proper thickness if the pinion cannot be turned by hand while it is being tightened.

4. Measure the pinion bearing preload, and select proper washer and spacer that will provide the required preload.

Note: a. The initial turning torque is measured by means of the Preload Gauge

b. Correct pinion bearing preload when using new bearings. [7 to 10 kg-cm (97.2 to 138.9 in-oz) when using old bearings 3 to 6 kg-cm (41.7 to 83.3 in-oz)].

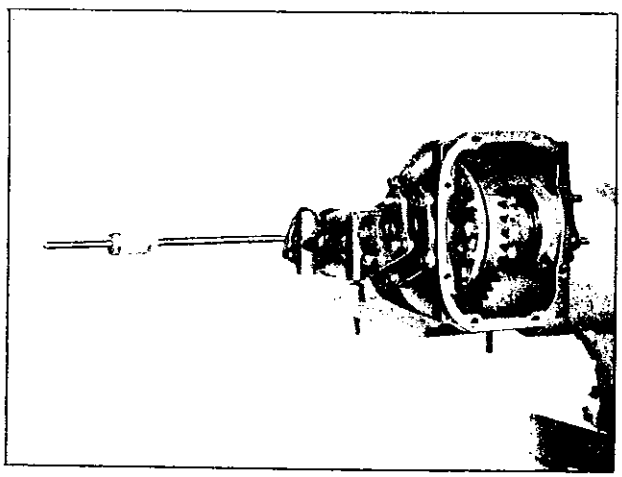


Fig. PD-18 Measuring pinion bearing preload

Adjustment of pinion height

Adjust the pinion height with washer and shims applied between the rear bearing cone and the back of the pinion gear.

1. Install the Dummy Pinion (Special tool ST31210000), the Dummy Spacer (Special tool ST31850000), the Drive Pinion Collar (Special tool ST31500000) in the gear carrier case.

2. Install the Height Gauge (Special tool ST31210000) on the carrier, with the dummy pinion mounted.

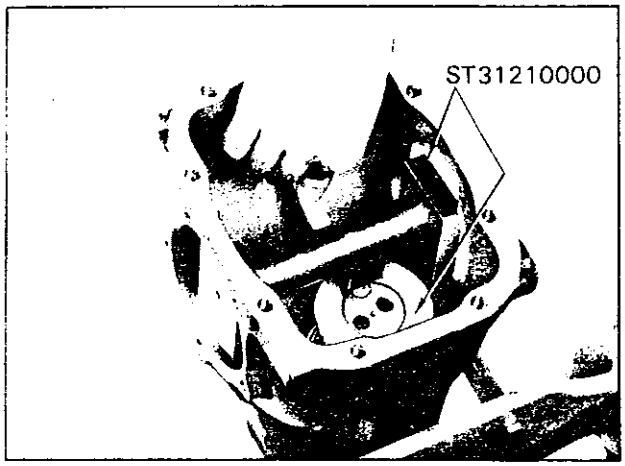


Fig. PD-19 Measuring the clearance

3. Measure the clearance between the tip end of the height gauge and end surface of the dummy shaft with a thickness gauge.

4. The thickness of a drive pinion height adjusting shim can be obtained from the following equation:

$$S = W + T - (H \times 0.01) - 0.20$$

Where, W = Thickness of inserted washer and shim (mm).
T = Value measured with thickness gauge (mm).
H = Head figure on drive pinion
S = Required thicknesses of washer and shim used on drive pinion (mm).

Example

W = 2.20 + 1.20 = 3.40 mm
T = 0.24 mm (0.0094 in)
H = −2

$$S = 3.40 + 0.24 - (-2 \times 0.01) - 0.20 = 3.46 \text{ mm}$$

5. Fit the selected pinion height adjusting washer and shim in the drive pinion, and press fit the rear bearing inner race in it (Special tool ST30030000).

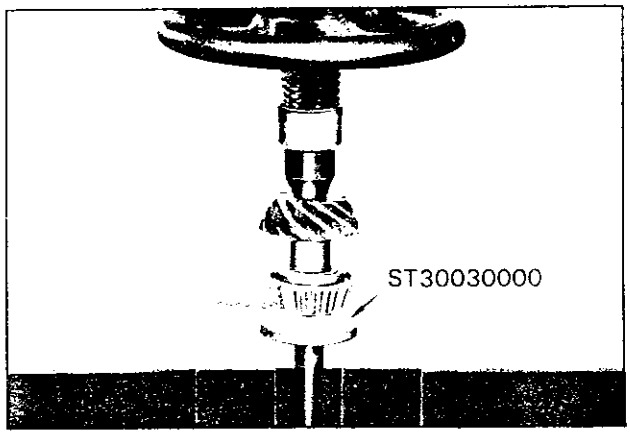


Fig. PD-20 Pressing rear bearing inner race

6. Install the drive pinion on the gear carrier assembly onto which fit the drive pinion bearing spacer and washer, front bearing inner race and front bearing pilot spacer.

7. Install the front pilot bearing and oil seal on their positions with oil seal draft (Special tool ST33252000).

8. Install the companion flange and flat washer on the drive pinion, and secure them in position by tightening the nut to the given torque.

Note: a. The drive pinion lock nut tightening torque 17 to 20 kg-m (122.9 to 144.6 ft-lb)

b. If the drive pinion lock nut is worn replace it.

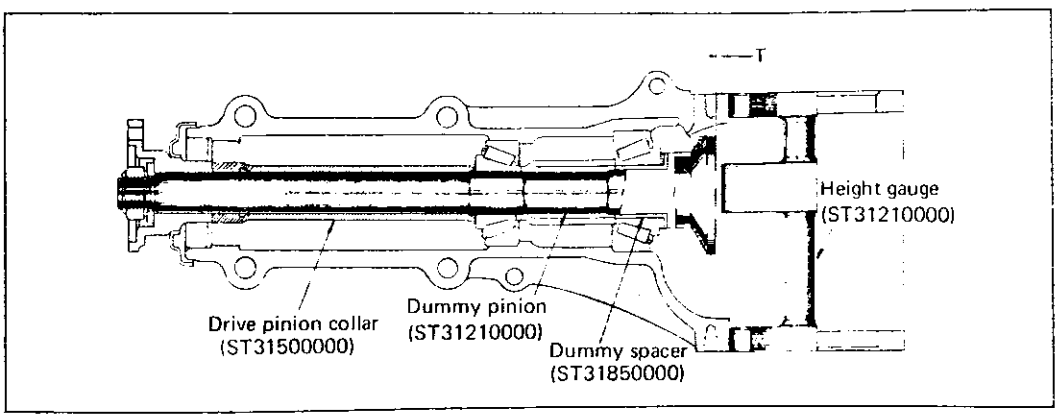


Fig. PD-21 Adjusting pinion height

Adjustment the side retainer shims

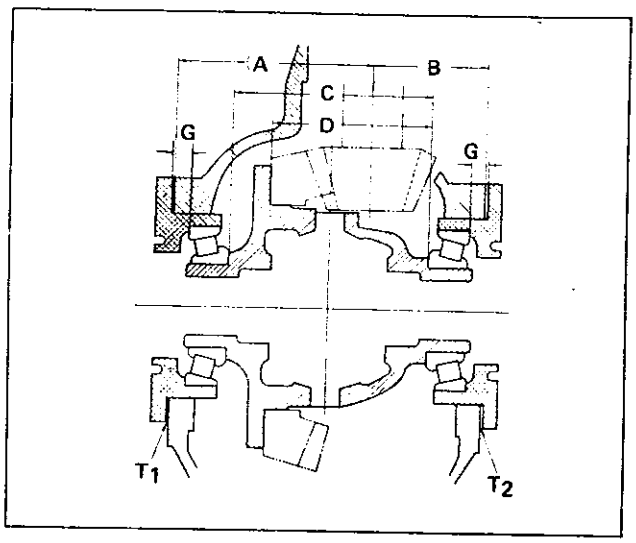


Fig. PD-22 Thickness of shims in left side
Thickness of shims in right side

1. When the carrier, differential case, side bearing or side bearing retainer are replaced with new ones, adjust the side bearing preload with adjusting shim. The required thicknesses of the left and right retainer shims can be obtained from the following equations:

T1 (left) = (A + C + G - D - E + H) x 0.01 + 0.76
T2 (right) = (B + D + G - F - H) x 0.01 + 0.76

The figures of A,B,C,D,G and H show dimensional variations in a unit of 1/100 mm against the individual standard measurements.

Where

- A & B = The figure marked on the gear carrier
- C & D = The figure marked on the differential case
- F & F = The difference of the width of left or right side bearing against the standard width 20.0 mm (0.7874 in), given in a unit of 1/100 mm.
- G = The figure marked on both side retainers.
- H = The figure marked on the drive gear by an electric pen.

To measure the width of the side bearing, use the standard gauge (20.0 mm, 0.7847 in thickness) and dial indicator placed on a small surface plate.

In this case, place load on the bearing with the aid of weight block for about 2.5 kg (5.5 lb) to acquire the steady figures.

When the measured width of the left side bearing is, for example, 19.8 mm (0.7795 in), the width is -0.2 mm (-0.008 in) against the standard width and the diffirence is expressed by excluding the minus sign, as 20 (=0.2 mm – 0.01 mm).

Note: Normally preload of used bearing is 60 to 80% of that of new one. Therefore, if it is necessary to use the old bearing again the thickness of each side adjusting shims of left and right must be increased by 0.03 to 0.07 mm (0.001 to 0.003 in).

E1, E2 and E3 represent 19.99, 19.88, and 19.97, respectively.

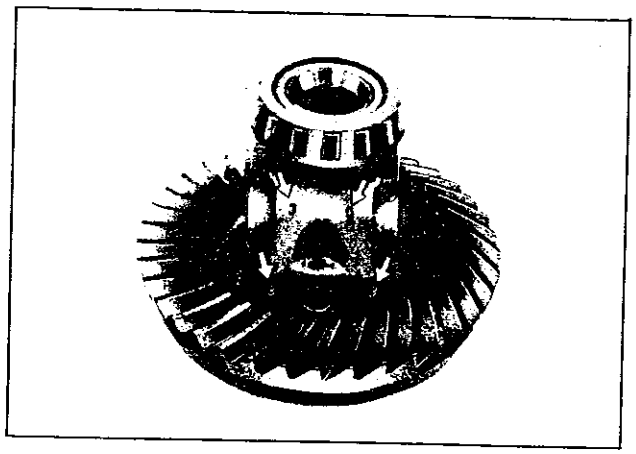


Fig. PD-23 C & D figures

G: Numerical figure given on side retainers.

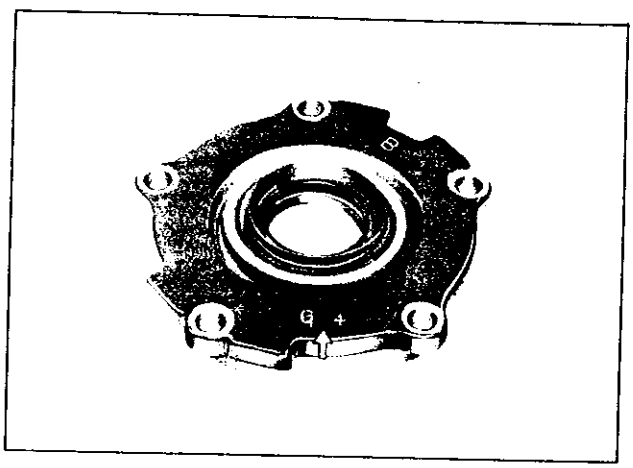


Fig. PD-24 G figures

2. Install the differential case assembly in the gear carrier in reverse order of disassembly.

3. Fit given shims and O-rings in the both side retainers, and install retainers in the carrier using the Gear Carrier Side Retainer Guide (Special tool ST33720000).

Note: When installing the retainers, be careful not to damage the side bearing outer races with the roller.

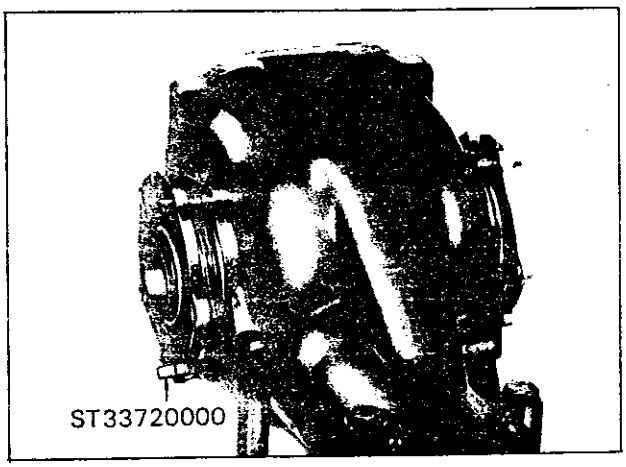


Fig. PD-25 Installation of side retainer

4. Measure the backlash of the drive gear and the drive pinion by using the dial indicator, and adjust it to 0.10 to 0.20 mm (0.0039 to 0.0079 in), if required.

If it is less than the prescribed value, move the shim from the right to the left. If it is excessive, move it inversely.

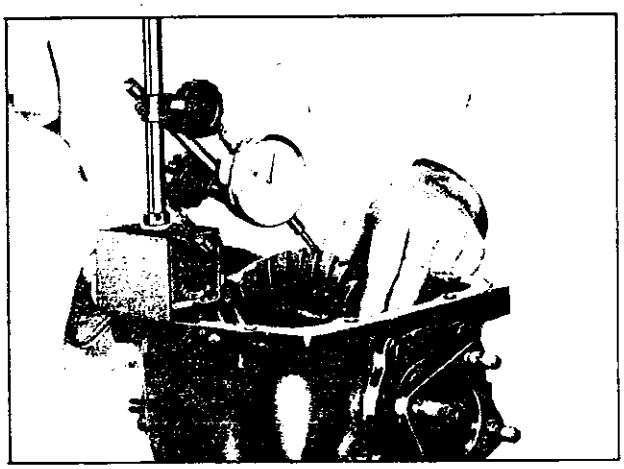


Fig. PD-26 Measuring the backlash of the drive gear and pinion

5. If the turning torque is not more than that measured before the differential case is installed on the gear carrier in range from 1 to 3 kg-cm (0.07 to 0.22 ft-lb), adjust it with side retainer shims.

Incidentally, decrease or increase in the thickness of the shims changes the drive gear and the pinion backlash. Thus, make sure that they have the proper backlash.

6. Check and adjust the tooth contact pattern of the drive gear and drive pinion.

Apply red lead slightly and evenly to 4 to 5 teeth at two places of the drive gear, and turn it backward and forward several times by hand. This causes the gear to impress a pattern on the painted section of the drive gears and coast side.

This is the tooth contact pattern that is the final proof of the adjustments.

Incorrect contact pattern of teeth shall be adjusted in the following manner.

a. Heel contact

Increase the thickness of drive pinion adjusting shim and washer so that the drive pinion is moved to the drive gear.

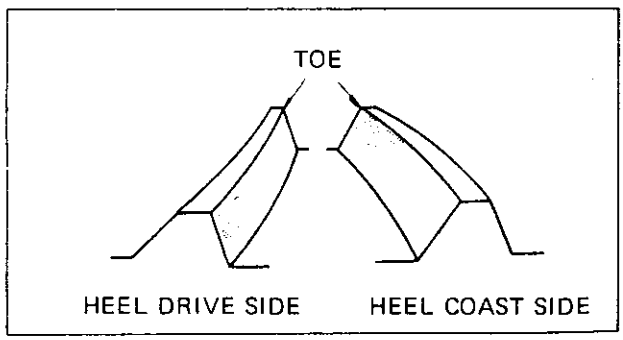


Fig. PD-27 Heel contact

b. Toe contact

Reduce the thickness of drive pinion adjusting shim and washer so that drive pinion is moved away from drive gear.

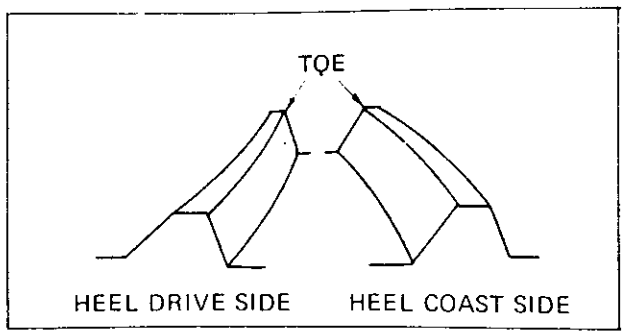


Fig. PD-28 Toe contact

all component parts, and make sure that dirt and other foreign matters are completely removed. During reassembly, do not use cloth or gloves.

1. Secure the strut outer casing in a vise.

2. Insert the piston rod and cylinder assembly into the strut outer casing.

3. Fill the strut outer casing with correct amount of oil.

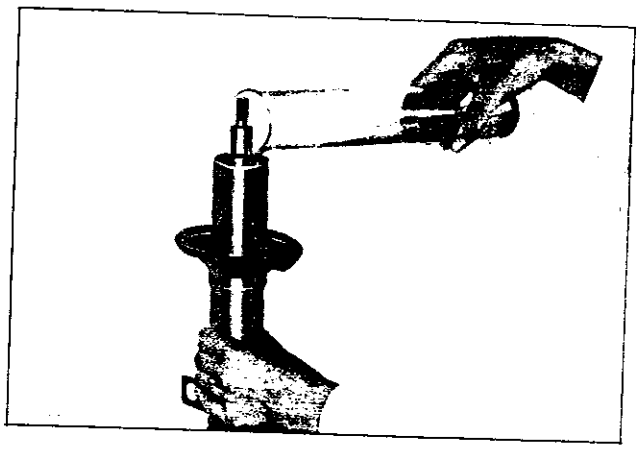


Fig. FA-34 Pouring shock absorber oil

Note: a. Correctly measure amount of shock absorber oil to be poured because amount of oil directly affects damping power. [290 cc (17.7 cu in)]

b. Use Nissan genuine oil (Nisseki Shock Absorber Oil A-1) for the shock absorber oil.

4. Install a rubber O-ring on top of the piston rod guide, and install the gland packing by the use of a gland packing guide (special tool ST35540000).

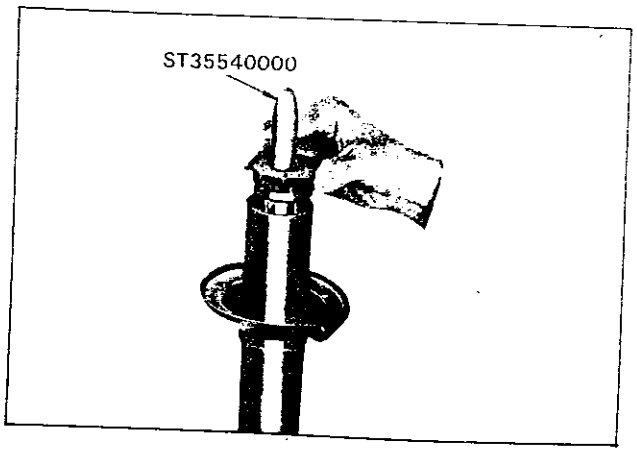


Fig. FA-35 Installing gland packing

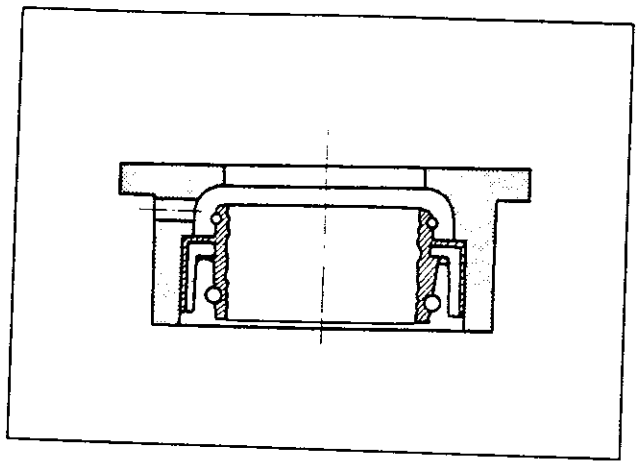


Fig. FA-36 Cross-sectional view of gland packing

5. Tighten the gland packing to 6.0 to 6.5 kg-m (43.4 to 47.0 ft-lb) by the use of a gland packing wrench (special tool ST35500000).

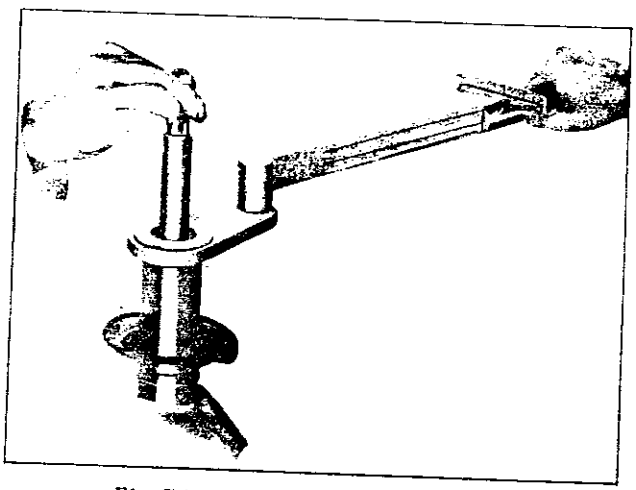


Fig. FA-37 Tightening gland packing

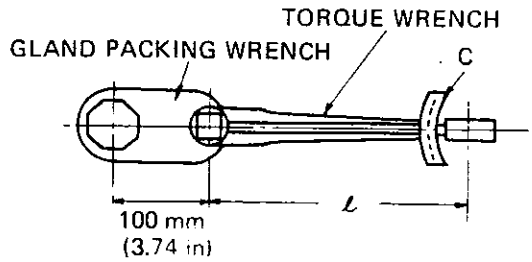
Note: a. Before tightening the gland packing, pull the piston rod approximately 90 mm (3.543 in) upward. This will provide the shock absorber system with the best condition for bleeding.

b. Gland packing tightening torque is rated at 6.0 to 6.5 kg-m (43.4 to 47.0 ft-lb). However, arm length of this tool is extended by 100 mm (3.94 in) as shown in the following figure. Thus, when actually tightening the gland packing, measure effective length (ℓ) of a torque wrench to be used, and set up torque wrench value based on the following formula.

$$C = 6 \times \left(\frac{\ell}{\ell + 100} \right)$$

where, C ..... Value read on the torque wrench [kg-m (ft-lb)]

ℓ ..... Effective length of torque wrench [mm (in)]



6. Conduct air bleeding on the shock absorber system

(1) Stand the strut assembly vertically with the spindle side down, and pull the piston rod within its stroke. Turn over the strut assembly (with the spindle side up), and depress the piston rod in the full stroke.

(2) Repeat the above described operations several times.

(3) Make sure that there is no feeling variation on pressure while depressing or pulling the piston rod. Thus, air bleeding completes.

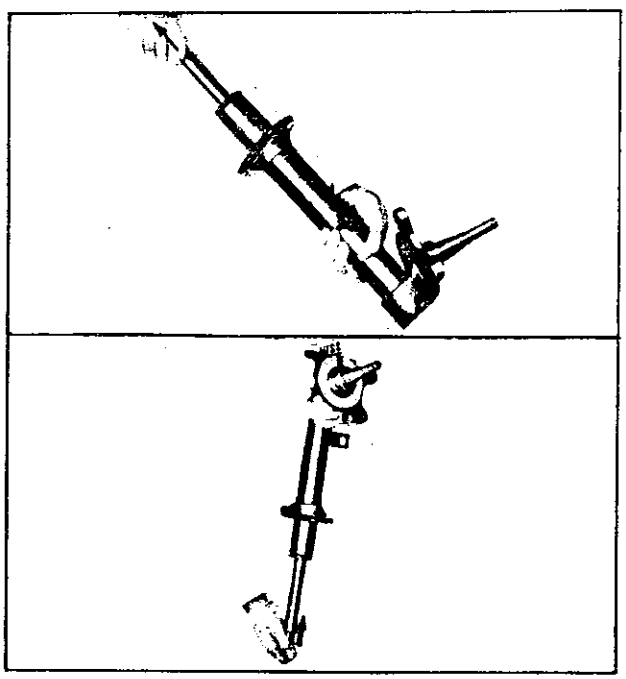


Fig. FA-38 Conducting air bleeding on the shock absorber system

7. Place the front spring on the lower spring seat correctly, compress the front spring with a coil spring compressor (special tool ST35650000), install the upper spring seat, strut mounting bearing, and strut mounting insulator, and tighten the self-locking nut.

Tightening torque:
7.5 to 9.5 kg-m (54.2 to 68.7 ft-lb)

Note: a. Use new self-locking nuts whenever the strut assembly is reassembled.

b. Install the strut mounting bearing carefully so that it is installed correctly toward the prescribed direction, and be sure to apply multi-purpose grease (MIL G2108 or 10924) to the portion indicated by asterisk (*) in Figure FA-39.

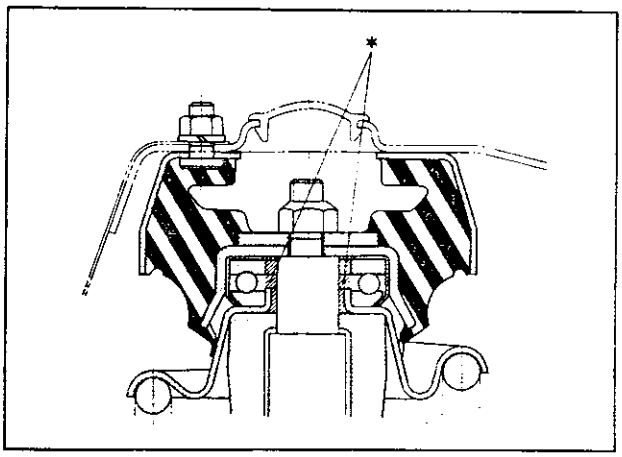


Fig. FA-39 Strut mounting bearing greasing point

8. Release the coil spring gradually from the coil spring compressor, and set the spring to the upper and lower spring seats correctly.

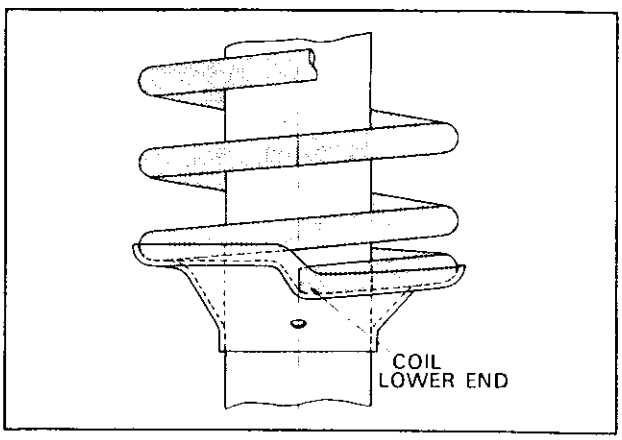


Fig. FA-40 Installing front spring

Breakage of differential	Shortage of oil or use of improper oil	Disassemble differential and replace parts as required.
	An excessive loading, and/or improper use of clutch Incorrect adjustment of bearings Incorrect adjustment of drive gear and drive pinion	After adjusting preload of bearings, backlash and engaging condition of gears, secure parts and apply specified volume of genuine gear oil.
	Excessive backlash due to defacement of side gear and thrust washer	Operate the vehicle under proper and correct manner.
	Loose bolts and nuts, such as drive gear clamp bolt	
Oil leakage	Worn-out, damaged or improperly installed front oil seal, or bruised, dented or abnormally worn slide face of companion flange	Replace the defective oil seal. Ammend the affected flange with sand paper or replace if necessary.
	Worn, damaged or improperly installd side flange oil seal, or bruised, dented or abnormally worn slide face of side flange	Treat as above.
	Loose side flange or side retainer installation	Retighten the bolts to the designated torque.
	Defective O-rings for these parts	Replace defective O-rings with new ones.
	Damaged rear cover or rear cover gasket	Tighten the bolts to the designated torque. Replace the defective gasket with new one.
	Loose filler or drain plug	Retighten
	Clogged or damaged breather	Repair or replace.

SERVICE DATA AND SPECIFICATIONS

Final gear type ..... Hypoid

Final gear ratio (number of teeth)

with 4-speed T/M ..... 3.900 : 1 (39 : 10)

with 5-speed T/M ..... 3.364 : 1 (37 : 11)

Drive pinion

Initial turning torque (without oil seal)	7 to 10 kg-cm (0.506 to 0.723 ft-lb)
Depth from axle center	Approximately 48.5 mm (1.909 in)
Thickness of pinion height adjusting washer	2.000, 2.200, 2.400 mm (78.7, 86.6, 94.5 in)
Thickness of pinion height adjusting shims	From 1.08 to 1.28 mm spacing 0.02 mm (From 0.0425 to 0.0504 in spacing 0.0008 in)
Length of drive pinion bearing adjusting spacers	From 52.20 to 53.20 mm spacing 0.20 mm (From 2.055 to 2.094 in spacing 0.0079 in)
Thickness of drive pinion bearing adjusting washers	From 2.31 to 2.70 mm spacing 0.02 mm (From 0.0909 to 0.106 spacing 0.0008 in)

Drive gear

Backlash between drive gear and pinion	0.10 to 0.20 mm (0.0039 to 0.0079 in)
Run-out of rear side of drive gear	Less than 0.08 mm (0.0031 in)

Side gear and pinion mate

Thickness of side gear thrust washer	0.775, 0.825, 0.875 mm (0.0305, 0.0325, 0.0344 in)
Clearance between side gear and thrust washer	0.10 to 0.20 mm (0.0039 to 0.0079 in)

Side retainer

Thickness of side retainer adjusting shims	0.05, 0.07, 0.10, 0.20, 0.50 mm (0.0020, 0.0028, 0.0039, 0.0079, 0.0200 in)

TIGHTENING TORQUE

Drive pinion nuts	17.0 to 20.0 kg-m (122.9 to 144.6 ft-lb)
Drive gear bolts	7.0 to 8.0 kg-m (50.6 to 57.8 ft-lb)
Side retainer bolts	0.9 to 1.2 kg-m (6.5 to 8.7 ft-lb)
Side flange fix bolts	1.9 to 2.6 kg-m (13.7 to 18.8 ft-lb)
Rear cover fix bolts	1.9 to 2.6 kg-m (13.7 to 18.8 ft-lb)
Gear carrier to rear differential mounting member lock nuts	7.5 to 9.5 kg-m (54.2 to 68.7 ft-lb)

Final drive

Companion flange to propeller shaft fix nuts	2.5 kg-m (18 ft-lb)

Differential to drive shaft fix nuts	7.0 to 8.0 kg-m (50.6 to 57.8 ft-lb)
Gear carrier to front differential mounting insulator bolt	6.0 to 8.0 kg-m (43.4 to 57.8 ft-lb)

SERVICE JOURNAL OR BULLETIN REFERENCE

DATE	JOURNAL or BULLETIN No.	PAGE No.	SUBJECT

SERVICE JOURNAL OR BULLETIN REFERENCE

DATE	JOURNAL or BULLETIN No.	PAGE No.	SUBJECT

SERVICE JOURNAL OR BULLETIN REFERENCE

DATE	JOURNAL or BULLETIN No.	PAGE No.	SUBJECT

DATSUN 240Z SPORTS
MODEL S30 SERIES

CHASSIS & BODY

NISSAN MOTOR CO., LTD.
TOKYO, JAPAN

SECTION FA

FRONT AXLE & FRONT SUSPENSION

FA

FRONT AXLE AND FRONT SUSPENSION

CONTENTS

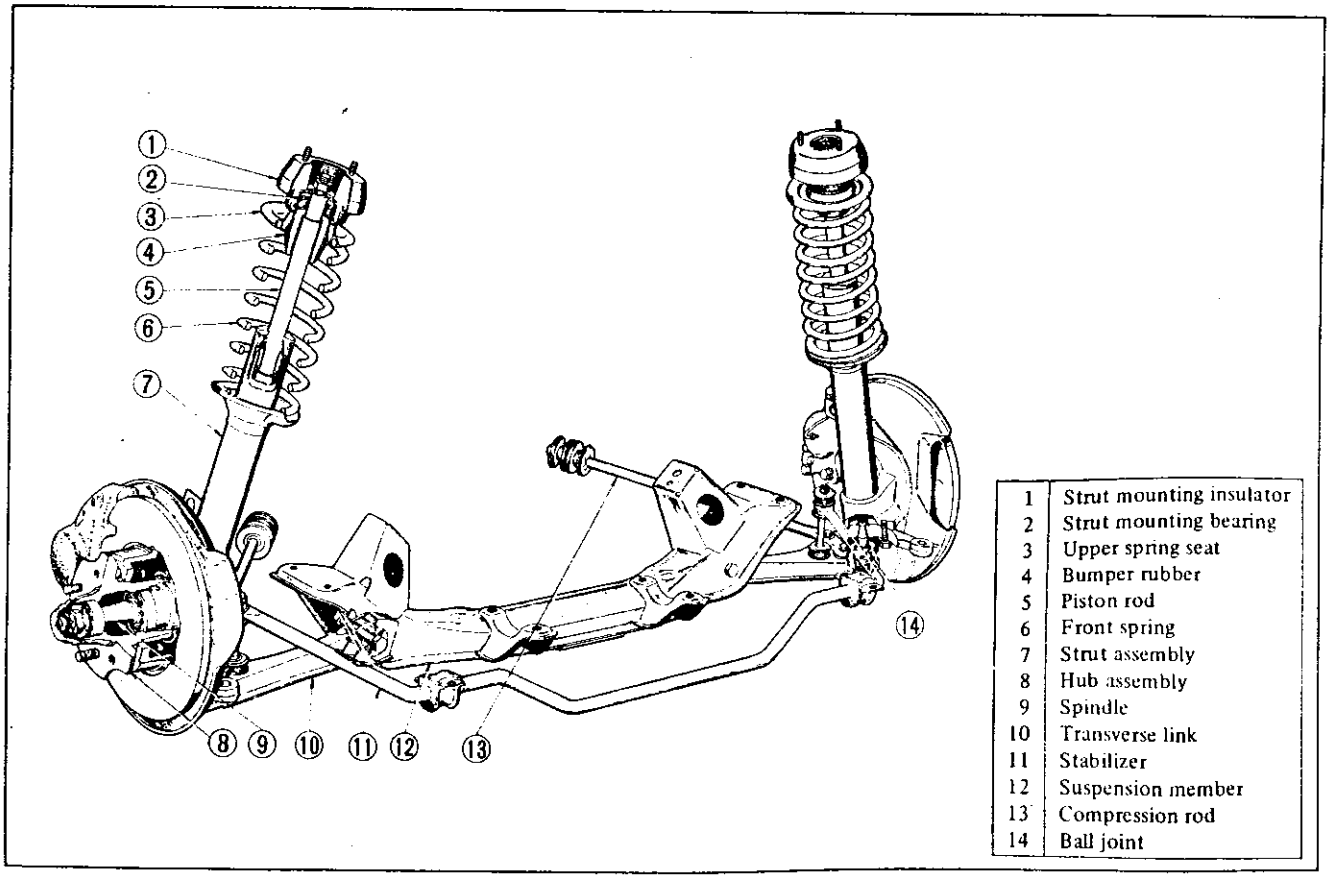


Fig. FA-1 Front axle and suspension assembly

DESCRIPTION

The front suspension is of a strut type. The shock absorber and spindle are combined to a single unit which is supported by the coil spring at the upper end and by the transverse link at the lower end.

The spindle is installed on the bottom of the strut outer casing by means of welding.

A ball-joint is attached to the lower part of the spindle. The ball-joint and the transverse link (lower link) are connected and they are fitted to the suspension member through a rubber bushing. The shock absorber mechanism is built in the strut outer casing. A coil-spring is applied between the upper end of the piston rod and spring seat welded to the outer casing. These components, assembled to a single unit, are fitted to the chassis frame at their upper part through the thrust bearing. Moreover, the transverse link supports the overall forward and backward strut movements by means of the compression rod fitted to the chassis through a rubber bushing. The rubber bushing adopts a non-linear shape with which the forward and rearward rigidities are changed. The torsion-bar type stabilizer adopted in this suspension system is used so that the strut maintains connection between both side struts.

Thus, this suspension mechanism absorbs shocks toward all directions into the chassis effectively and efficiently; the compression rod absorbs forward and backward shocks, the strut absorbs vertical shock, and the transverse-link absorbs shock applied toward sideway.

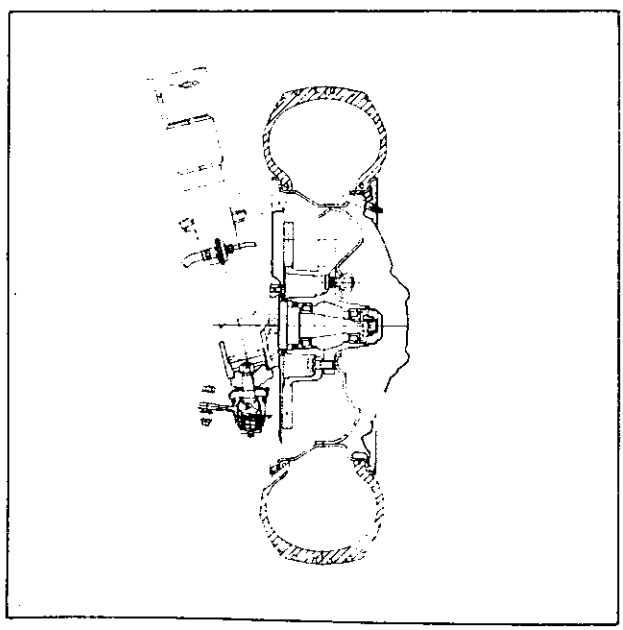


Fig. FA-2 Cross-sectional view of front axle

FRONT AXLE AND SUSPENSION ASSEMBLY

Removal

1. Jack up the vehicle, and support the vehicle with stands. (See the Section GI.)

2. Remove the hub nuts and remove the wheel.

3. Remove the splash board.

4. Loosen the brake tube, remove the brake hose locking spring, withdraw the plate, and remove the brake hose from the strut assembly bracket.

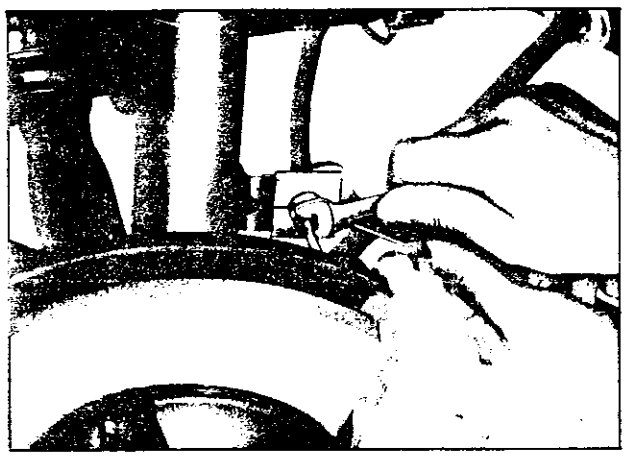


Fig. FA-3 Detaching brake hose

Note: Be careful not allow dust entering the brake hose.

5. Remove the stabilizer from the body.

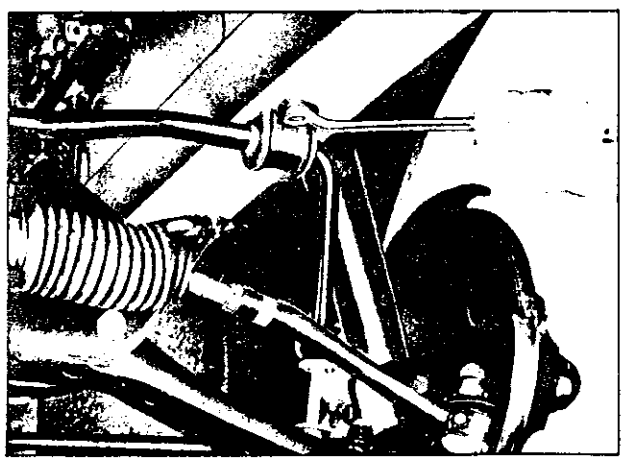


Fig. FA-4 Removing stabilizer

6. Remove the steering coupling bolt and remove the steering shaft at the rubber coupling unit. (See Section ST.)

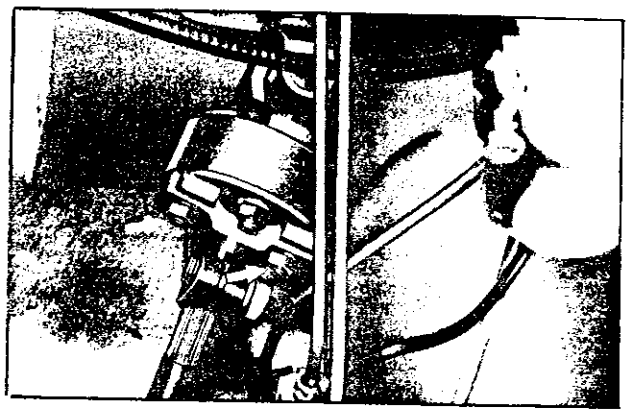


Fig. FA-5 Removing steering coupling bolt

7. Loosen the compression rod securing bolts and nuts, and remove the compression rod.

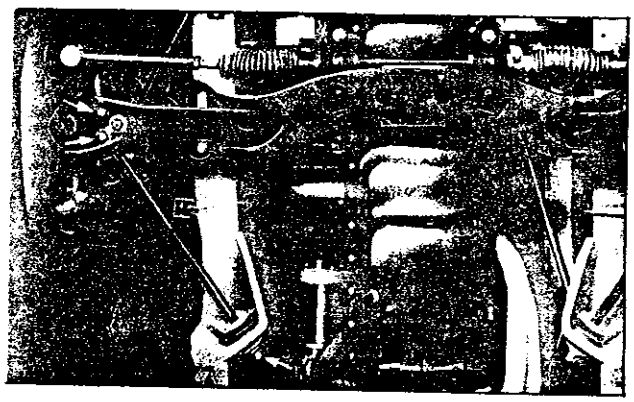


Fig. FA-6 Removing compression rod

8. Support the engine, remove the engine mounting bolts (indicated by arrow marks), and separate the suspension cross member from the engine assembly.

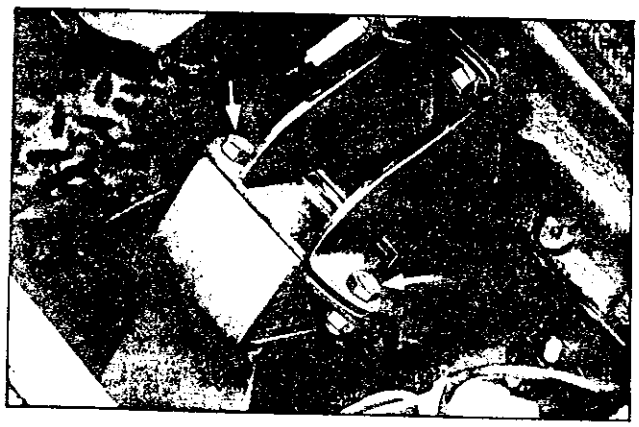


Fig. FA-7 Removing engine mounting bolts

9. Apply a jack to the patch unit in the center of the suspension cross member to support the member, loosen the bolts (indicated by arrow marks), and separate the suspension cross member from the body.

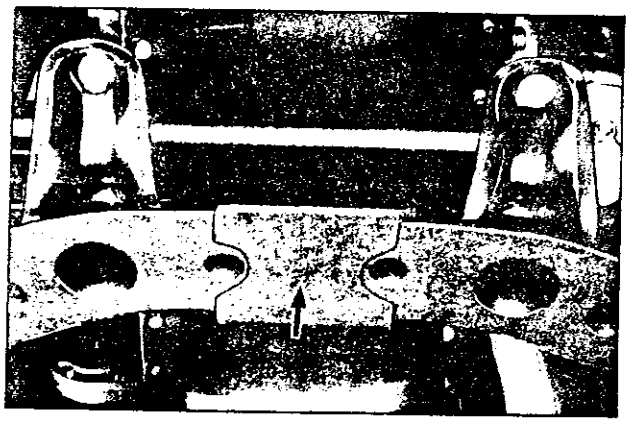


Fig. FA-8 Jack-up point of suspension cross member

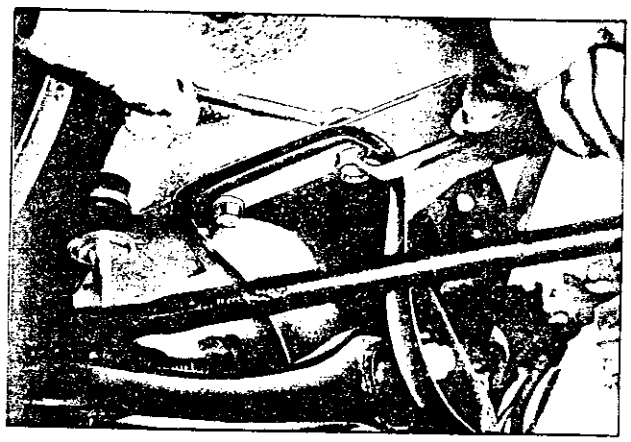


Fig. FA-9 Removing suspension cross member

10. Loosen the self-locking nut on the strut assembly, and holding the strut assembly, dismount the front suspension assembly.

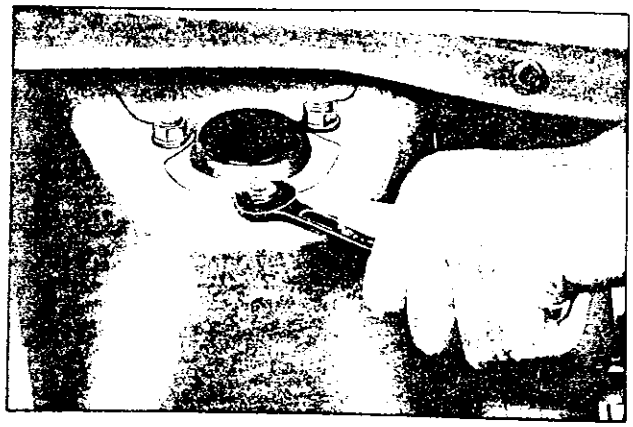


Fig. FA-10 Removing self-locking nut

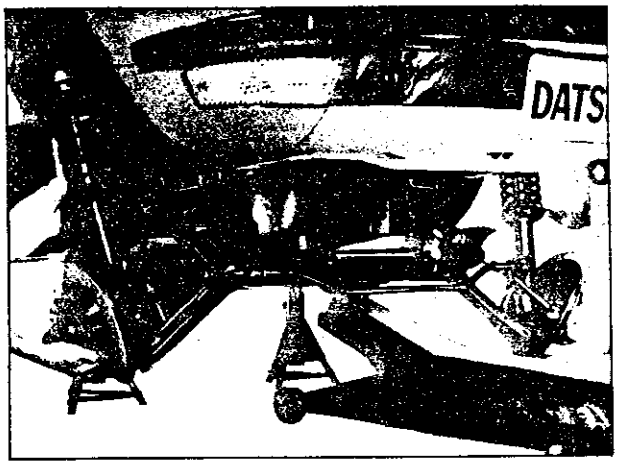


Fig. FA-11 Removing front axle and suspension assembly

11. Remove the cotter pin from the side rod socket, remove the slotted nut, and separate the knuckle arm from the side rod assembly.

12. Remove the bolts from the rack mounting bracket, and separate the steering gear assembly from the suspension member.

Reinstallation

1. First, check rubber parts such as compression rod mounting bushing, stabilizer bar bushing, etc. for deterioration, crack, and other defective conditions, and replace as required.

2. Reinstall the front axle and suspension assembly in reverse sequence of removal, noting the following matters.

(1) Tighten the transverse link mounting bolts and stabilizer bar body side installation bolt to the rated tightening torque with the vehicle loaded with the standard load (two passengers).

(2) Install the stabilizer bar correctly so that the position painted in white is in the position indicated in Figure FA-12.

(3) When assembling the stabilizer connecting rod and transverse link, be sure to tighten the first nut to 1.2 to 1.9 kg-m (8.7 to 13.7 ft-lb) tightening torque and tighten the lock nut to secure the first nut.

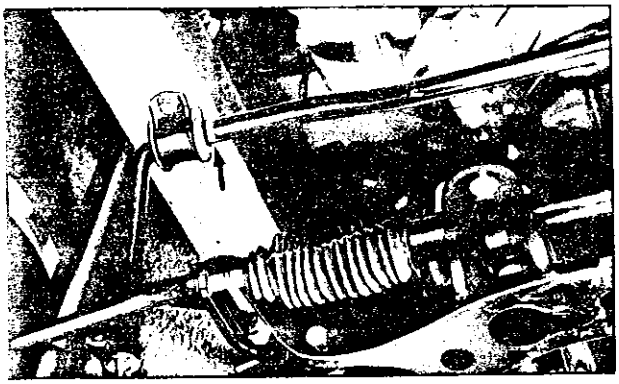


Fig. FA-12 Installing stabilizer bar

FRONT AXLE

Removal

1. Jack up the vehicle, remove the wheel, and disconnect the brake hose. (For the details, see "Removal of front axle and suspension assembly" above.)

2. Remove the caliper fitting bolts, and remove the caliper assembly.

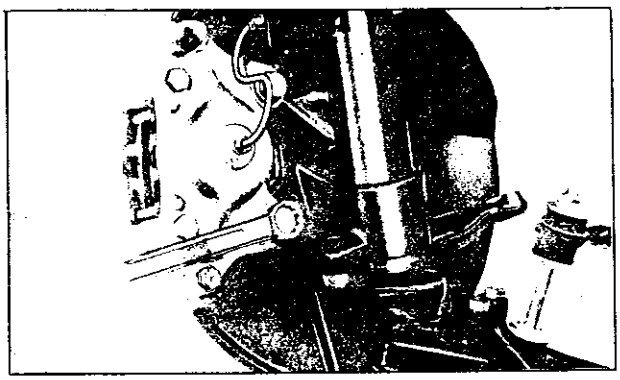


Fig. FA-13 Removing caliper assembly

3. Remove the hub cap with a flat-headed (-) screw driver or other proper tool and hammer as shown in Figure FA-14.

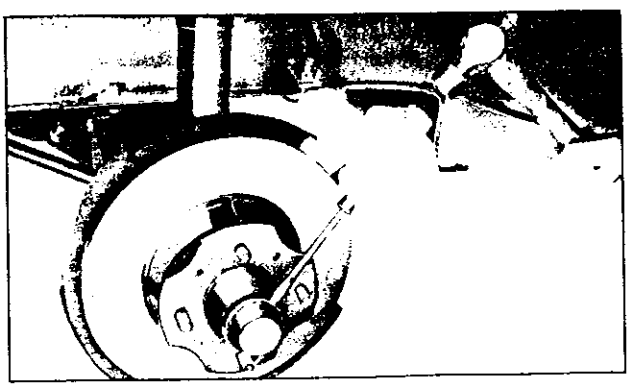


Fig. FA-14 Removing hub cap

4. Withdraw the cotter pin, and remove the wheel bearing lock nut.

5. Remove the wheel hub with the wheel bearing washer, wheel bearing and brake disc rotor installed on the wheel hub, from the spindle.

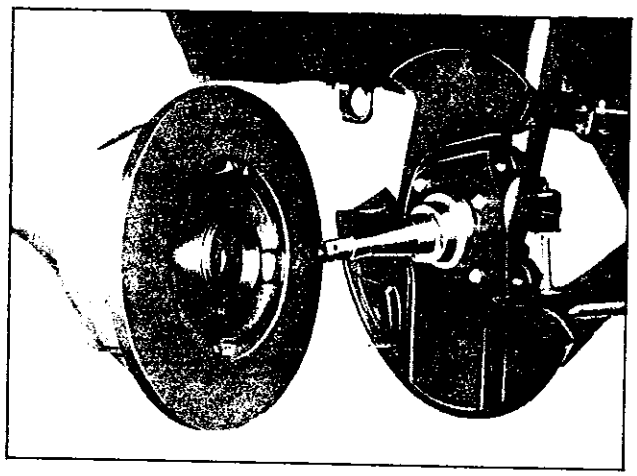


Fig. FA-15 Removing wheel hub assembly

6. Remove set screws and remove the baffle plate.

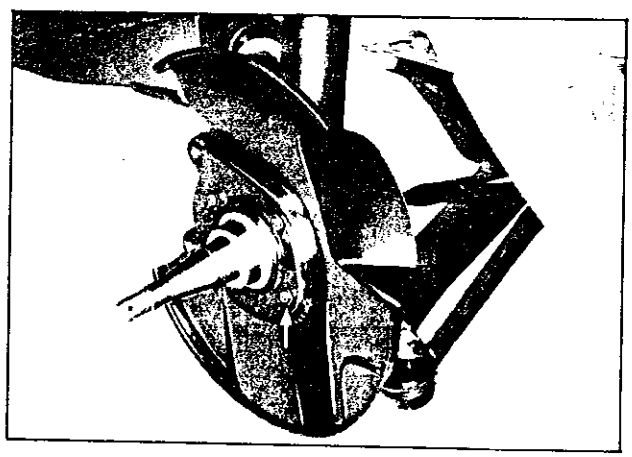


Fig. FA-16 Removing baffle plate

7. Utilizing two grooves inside the wheel hub, tap and remove the wheel bearing outer race from the hub.

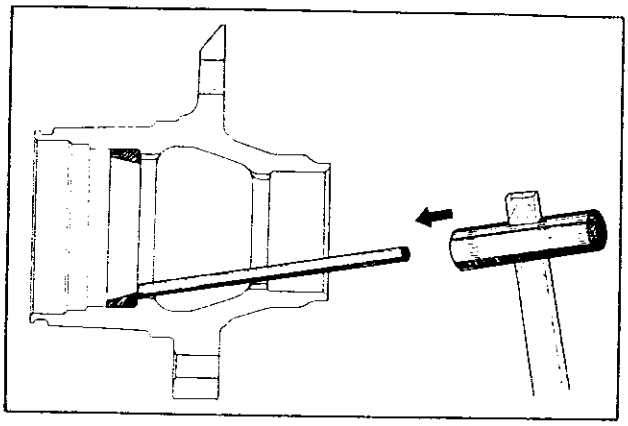


Fig. FA-17 Removing wheel bearing outer race

8. Remove four brake disc fitting bolts, and remove the brake disc rotor from the wheel hub assembly.

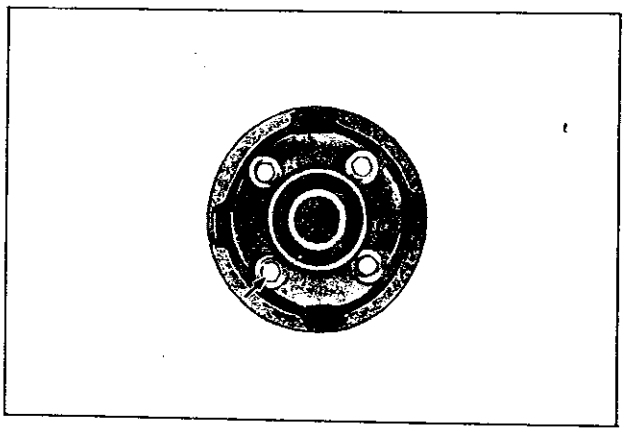


Fig. FA-18 Removing brake disc rotor

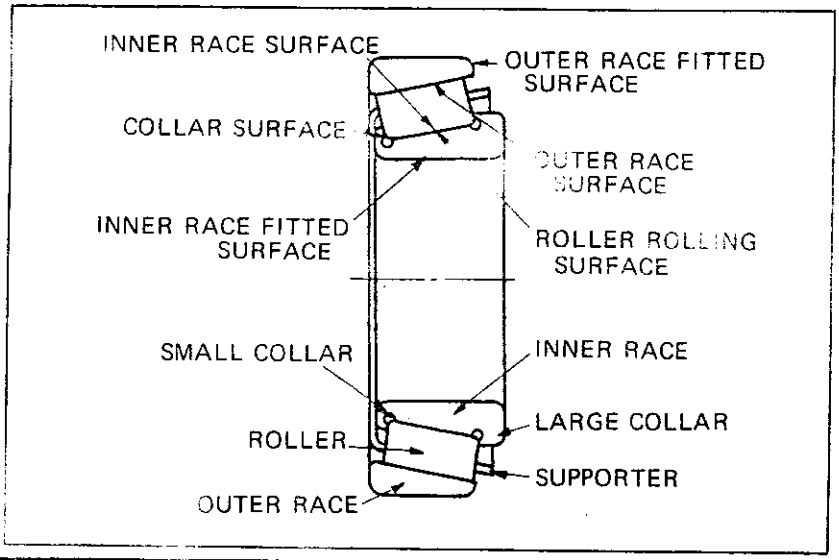
Inspection

1. Wheel bearing

Remove used grease from the wheel bearing with solvent, and inspect the bearing for operating condition from the rotation, operating sound and appearance. The outer race may be checked for the condition of rolling surface with the race installed on the wheel hub.

Visual serviceability judgement standard for the wheel bearing is indicated in the following table.

Visual Serviceability Judgement Standard for Wheel Bearing



Judgement	x : Unserviceable △ : May be used when minor. * : Rust should be removed with #0 emery paper.			
	Race and roller		Supporter	Cause
	Race surface roller and collar surface	Fitted surface		
Flaking	x			Service life due to rolling fatigue. However, this symptom occurs before the service life. The following causes are considered. . Abnormal load (overload) . Improper handling or improper installation
Crack	x	x	x	. Excessive tightening . Gap is excessive and a considerable shock is received from the outside. . Rapid heat generation on the race due to creep . Rollers bite the supporter due to seizure . Abnormal thrust load . Tapped with a hammer while removing
Seizure	x	x	x	In the most cases, seizure occurs as the result of grown discoloring or flaking
Scratch	△	△	△	. Shock is given carelessly during installation · Bit foreign matter

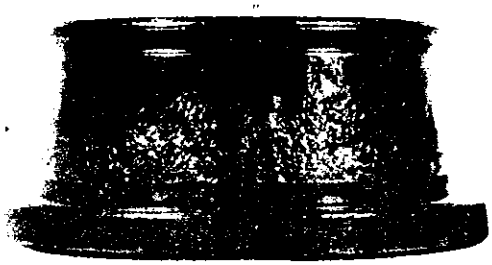
Recess or wear made by pressing or striking	△	△	△	. Careless installation, removal, or other handling (scar due to striking) . Recess made by bit foreign matter
Wear	△	△	△	. Poor lubricant quality or deteriorated lubricant . Intrusion of dust. Fitted surface is worn remarkably. . Wear due to excessive preliminary pressure
Biting	△	△	△	. Excessive preliminary pressure or faulty lubrication
Fretting	△*	△*	△*	. The fitted part is discolored to brown or black . Fretting corrosion (rust on fitted part) means fine relative slip on metal) contact surface.
Rust	△*	△*	△*	. Temperature increased during operation lowers when the bearing stops, moisture inside the bearing is condensed, becoming fine drips, and the grease is moistened. . The bearing has been placed in a highly moistened place for a long period of time. . Intrusion of moisture, chemicals, etc., or the bearing is touched with bare hand and no rustproof action has been taken.
Discoloring	The wheel bearing is serviceable if discoloring can be removed with solvent (such as thinner) or by polishing.			. Slight discoloring may become like oxidized oil stain due to grease . In the most cases, this occurs when preliminary pressure is too high.

Inner race

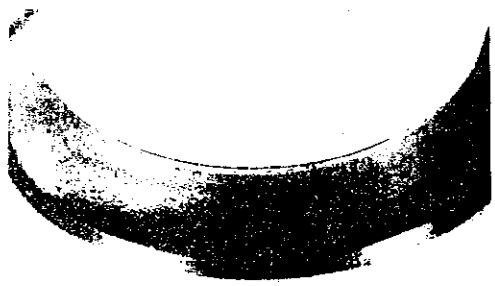
Roller flaking

Cracked inner race

Cracked roller



Recess on inner race made by bit foreign matter



Recess on outer race made by bit foreign matter

Recess on roller made by bit foreign matter

2. Grease seal

(1) When grease leakage is detected during disassembly, replace.

(2) Replace the grease seal with a new one, if worn or cracked.

Reinstallation

1. Reinstall the wheel bearing in reverse sequence of removal.

2. Install the bearing outer race by the use of a front wheel bearing drift (special tool ST35300000).

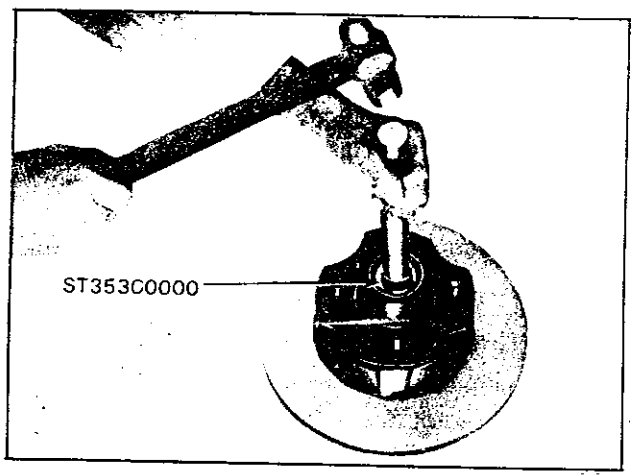


Fig. FA-19 Installing wheel bearing outer race

3. Fill the wheel hub and hub cap with muiti-purpose grease (MIL G2108 or 10924) up to the line indicated in Figure FA-20.

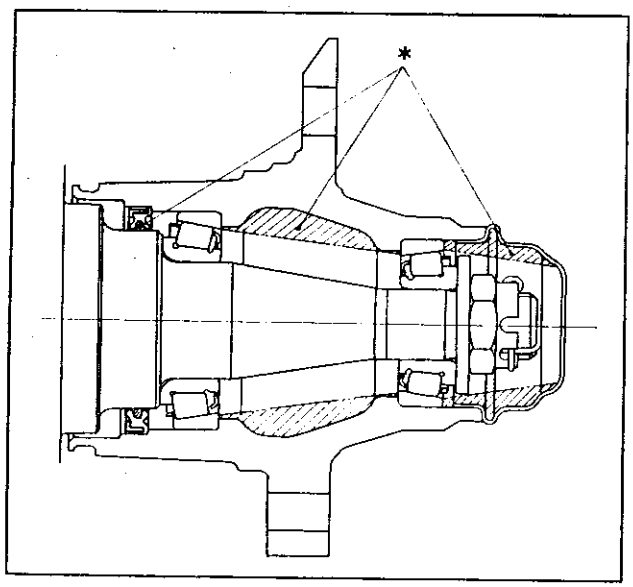


Fig. FA-20 Greasing points of hub assembly

4. Fill the spaces between wheel bearing rollers and grease seal lip pocket with multi-purpose grease sufficiently. (See Figures FA-21 and FA-22.)

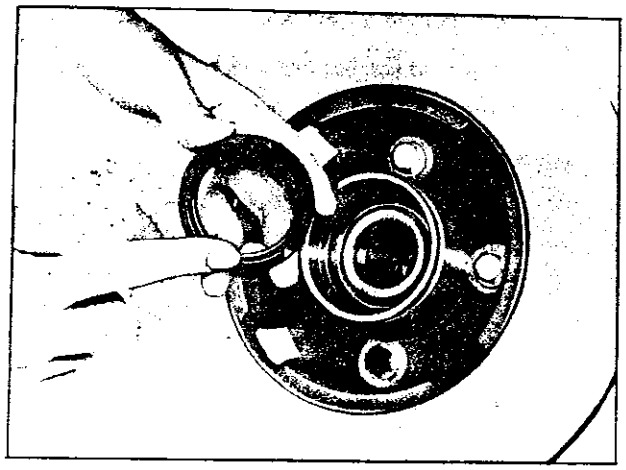


Fig. FA-21 Filling grease seal lip pocket with grease

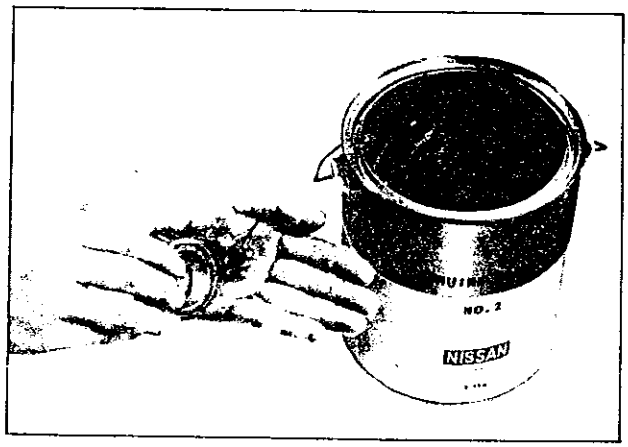


Fig. FA-22 Filling spaces between wheel bearing rollers with grease

5. Apply multi-purpose grease to the spindle shaft and threaded portions, wheel bearing washer, and wheel bearing lock nut surfaces slightly.

6. Install the wheel bearing and grease seal on the wheel hub, and install them on the spindle.

Note: In order to provide the bearing with a proper prepressure and to extend the bearing service life, install the wheel bearing, grease seal, washer, and lock nut carefully so that no dust and foreign matters stick on grease applied to them.

Wheel bearing adjustment

1. Tighten the wheel bearing lock nut to 2.5 to 3.0 kg-m (18.1 to 21.7 ft-lb) tightening torque.

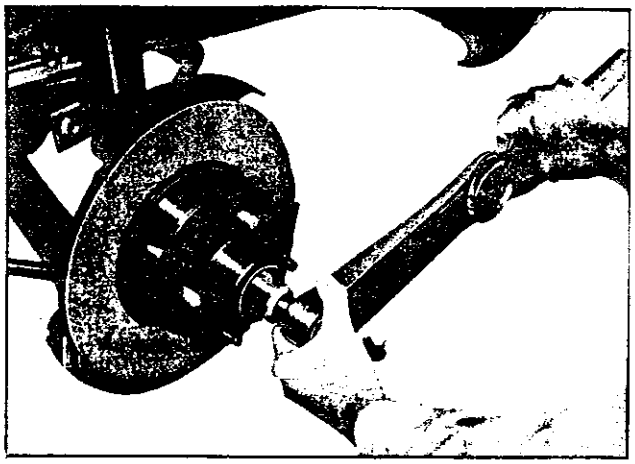


Fig. FA-23 Tightening wheel bearing lock nut

2. Turn the wheel hub in a few turns toward both clockwise and counterclockwise to settle down the bearing, and retighten the wheel bearing lock nut to the same tightening torque.

3. Return the wheel bearing lock nut 60° and coincide it with cotter pin hole on the spindle. When the wheel bearing lock nut is returned 60° and not coincided with the cotter pin hole, turn the nut toward loosening direction in maximum range of 15° and correctly coincide it with the cotter pin hole.

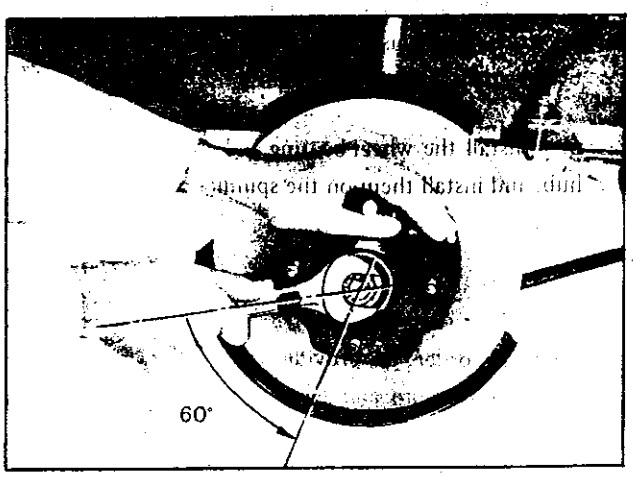


Fig. FA-24 Returning wheel bearing lock nut 60°

4. Turn the wheel hub in a few turns toward both clockwise and counterclockwise again to allow the bearing breaking-in, measure bearing rotation starting torque, apply a cotter pin to secure the nut (if the measured starting torque is within the rated value), and install the hub cap.

Wheel bearing rotation starting torque:
4.0 to 8.5 kg-cm (3.47 to 7.37 in-lb)

- At the hub bolt: 0.7 to 1.5 kg (1.54 to 3.30 lb)
- No slackness should exist toward the axis direction.
- Be sure to remove the brake pad.
- Correctly measure starting force toward tangential direction against the hub bolt.
- When bearing is reused (without replacing), adjust the rotation starting torque so that the wheel hub starts rotating at a starting torque as closer to 4.0 kg-cm (3.47 in-lb) as possible within the permissible rotation starting torque range 4.0 to 8.5 kg-cm (3.47 to 7.37 in-lb).

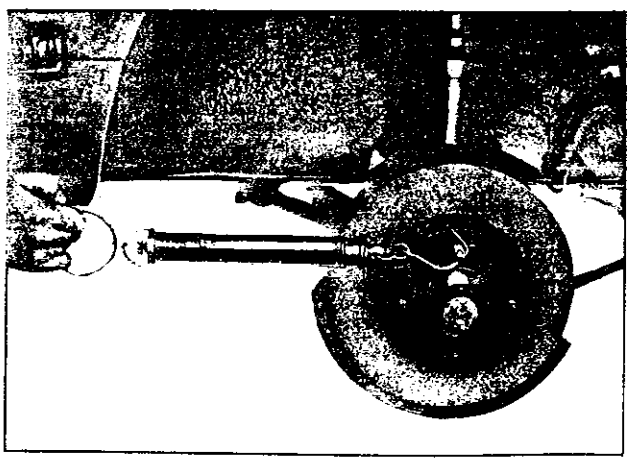


Fig. FA-25 Measuring wheel bearing rotation starting torque

STRUT ASSEMBLY

The strut assembly, consisting of a strut-outer casing with spindle, forms a cylinder between the piston rod guide and bottom valve.

The inner components are precisely assembled, and no dirt and foreign matter intrusions are permitted. The components such as piston rod, piston rod guide, cylinder, and bottom valve are handled together as an assembly. When replacing them, be sure to replace the inner components as an assembly.

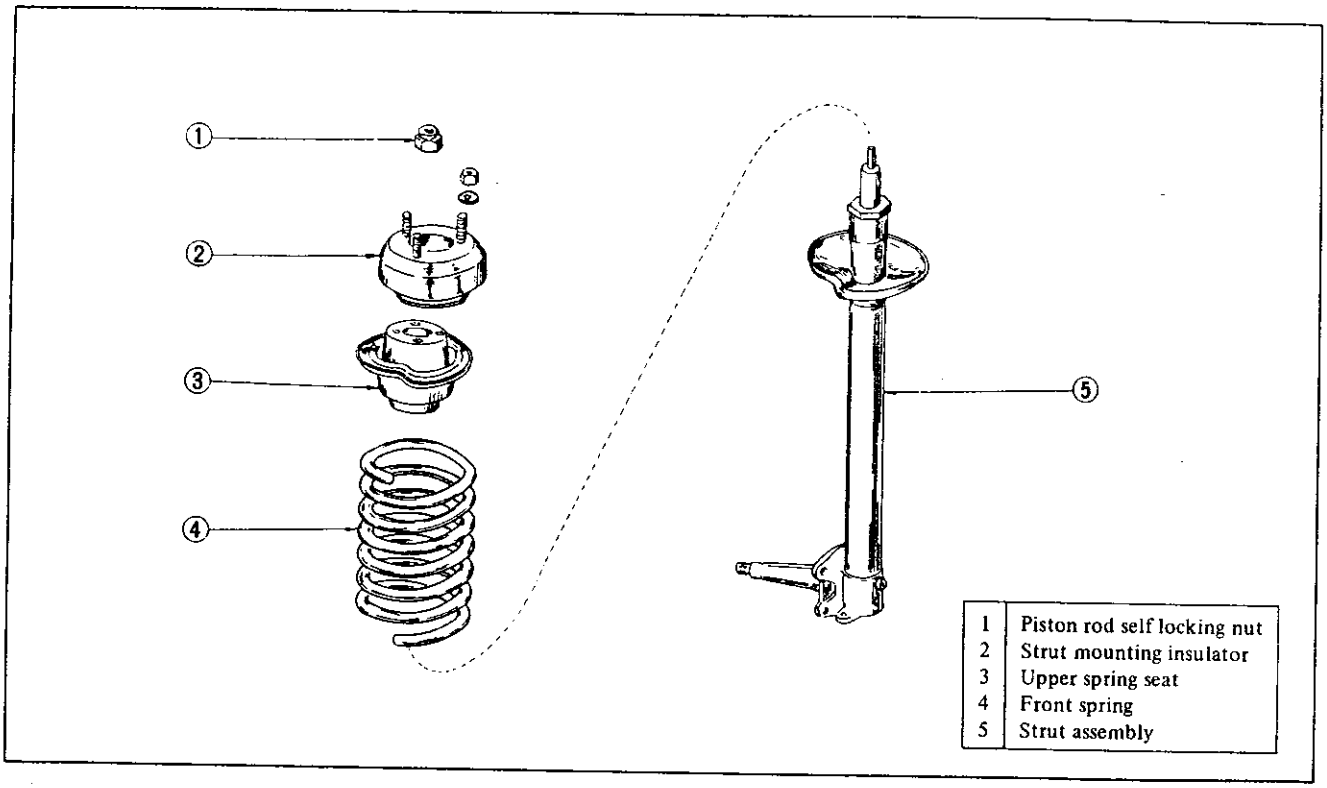


Fig. FA-26 Exploded view of strut assembly

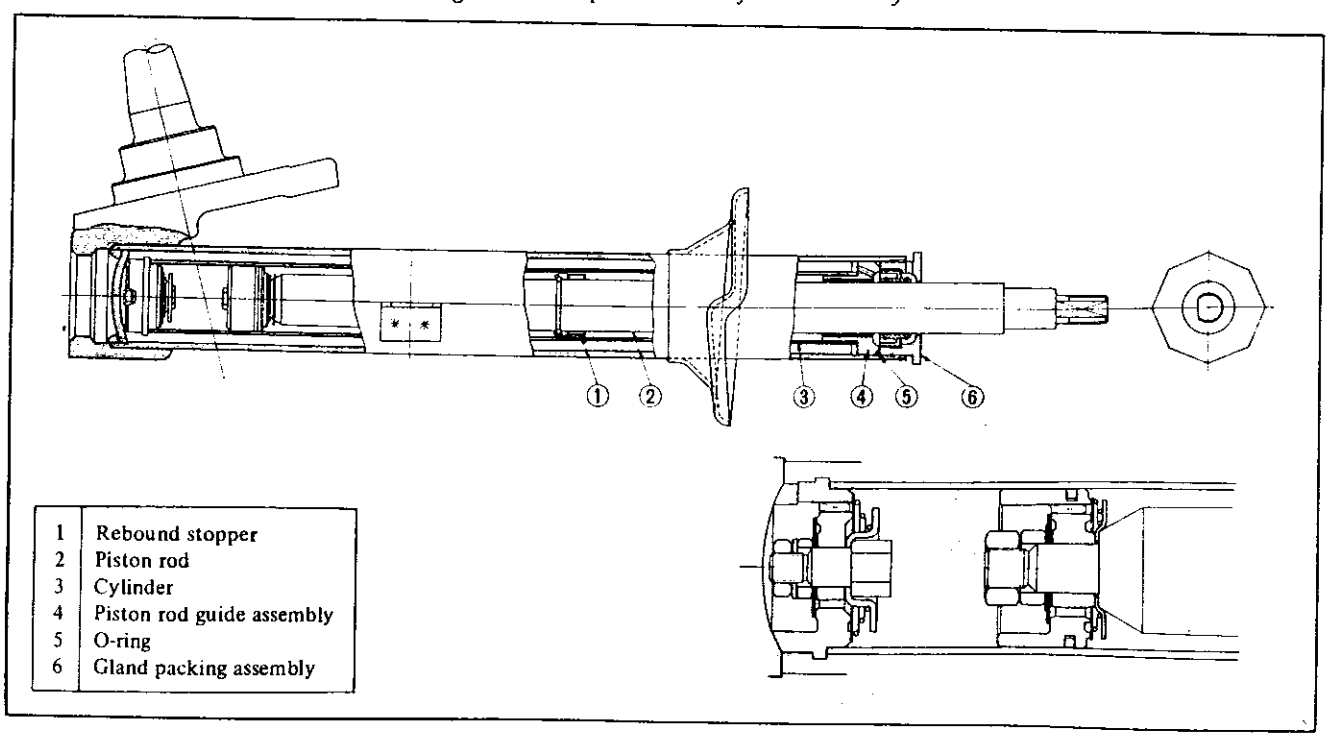


Fig. FA-27 Sectional view of strut assembly

Disassembly

Disassemble and reassemble the strut assembly in a clean place so that the inner components are protected from dirt and other foreign matters.

1. Jack up the vehicle, remove the wheel, and remove the stabilizer bar and compression rod from the transverse link. Loosen the knuckle arm fixing bolts, and separate the strut assembly from the ball-joint. Loosen the self-locking nut on the upper portion of the strut, and remove the strut assembly. (See the "Removal of Front Axle and Suspension Assembly" above, for details.)

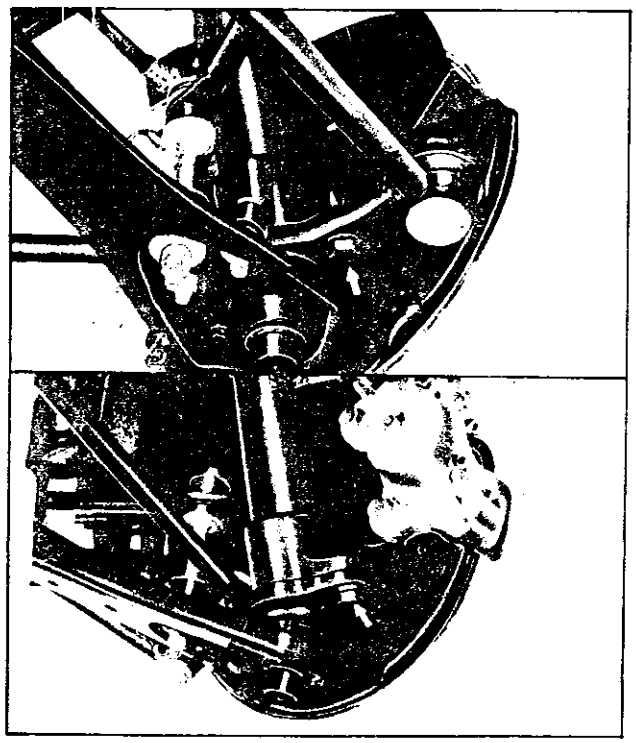


Fig. FA-28 Removing knuckle arm fixing bolt

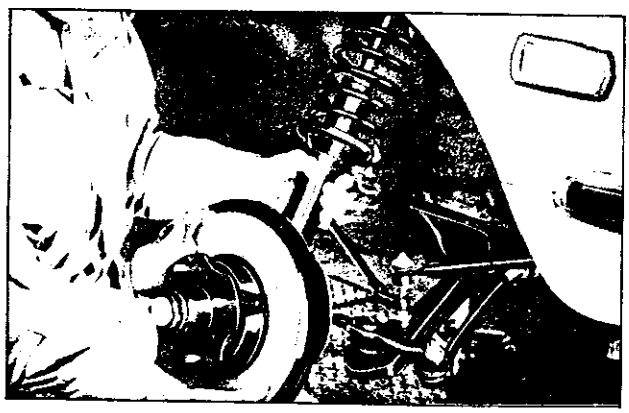


Fig. FA-29 Removing front strut assembly

2. Install a strut attachment (special tool ST35650000) on the strut outer casing, and secure the strut assembly in a vise.

3. Install a coil spring compressor (special tool ST35650000) on the spring, compress the spring up to such an extent that the strut mounting insulator can be readily turned by hand, and remove the self-locking nut (used to hold down the spring).

Note: When loosening the self-locking nut, use a screwdriver as a shifter. Moreover, when loosening the self-locking nut (used to hold down the spring), install a nut on the bolt (used to install the strut on the body) and apply the screwdriver to the nut so that the thread of the bolt is not damaged.

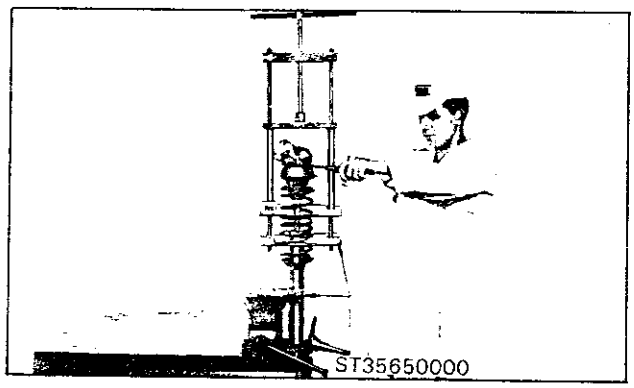


Fig. FA-30 Removing self-locking nut

4. Remove the strut mounting insulator, strut mounting bearing, and upper spring seat.

5. Remove the spring with the coil spring compressor (special tool ST35650000) installed on the spring, from the strut.

6. Depress the piston rod down to the bottom and remove the gland packing with a gland packing wrench (special tool ST35500000).

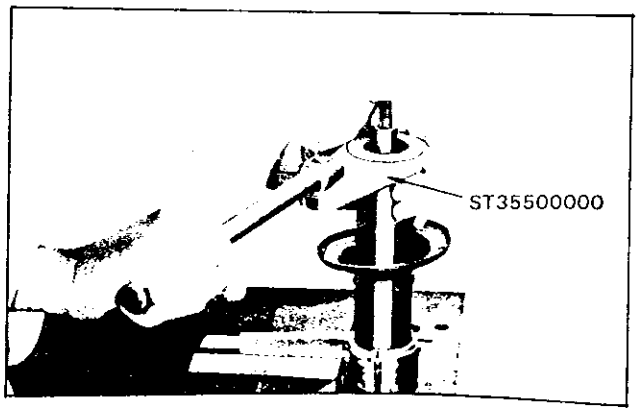


Fig. FA-31 Removing gland packing

Note: Remove mud and other foreign matters from the gland packing.

7. Remove the O-ring from the upper portion of the piston rod guide.

8. Separate the piston rod and cylinder assembly upward from the strut tube slowly and carefully.

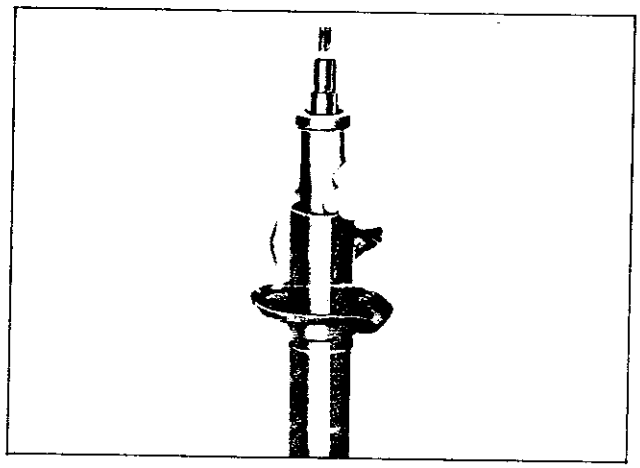


Fig. FA-32 Removing piston rod and cylinder assembly

Note: Do not remove the piston rod and guide from the cylinder. They are precisely assembled and thus, should be handled as an assembly.

9. Drain damping oil from the cylinder and strut outer casing into a clean container.

Note: This procedure should be strictly observed because shock absorber performance is directly affected by amount of damping oil. When refilling, measure amount of damping oil correctly.

Inspection

1. Be sure to replace the gland packing, O-ring and damping oil with new ones whenever the strut assembly is disassembled.

2. Wash all disassembled parts, except for nonmetal parts, with gasoline or thinner, and remove dirt and other foreign matters with compressed air.

3. Clean the nonmetal parts with compressed air.

- **Strut outer casing**

  Replace, if deformed, cracked or damaged.

- **Spindle**

  Check the spindle especially carefully for hair crack on the base and damaged threaded portion. Replace the strut assembly, if faulty condition exists.

- **Strut mounting insulator**

  Replace if rubber and metal joint is melted or cracked. Replace the rubber parts, if they are deteriorated.

- **Front spring**

  Replace, if weakened or cracked.

Specifications for spring

	LH	RH
Free length:	373 mm (24.68 in)	386 mm (15.20 in)
Installed height/load	201 mm/255 kg (8 in/562 lb)	201 mm/274 kg (8 in/604 lb)

- **Strut mounting bearing**

  Replace, if unusual sound occurs during rotation or slackness toward the axis direction is excessive.
  When installing the strut mounting bearing, be sure to fill it with multi-purpose grease (MIL G-2108 or 10924).

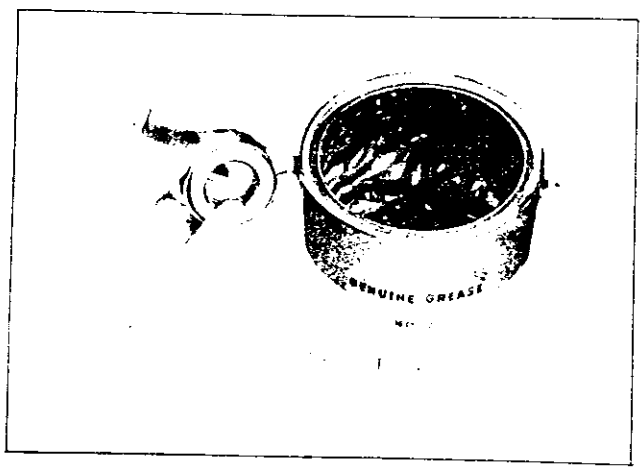


Fig. FA-33 Greasing strut mounting bearing

Reassembly

Be careful not to drop or scratch part since all parts are precision finished. When reassembling, thoroughly clean

all component parts, and make sure that dirt and other foreign matters are completely removed. During reassembly, do not use cloth or gloves.

1. Secure the strut outer casing in a vise.

2. Insert the piston rod and cylinder assembly into the strut outer casing.

3. Fill the strut outer casing with correct amount of oil.

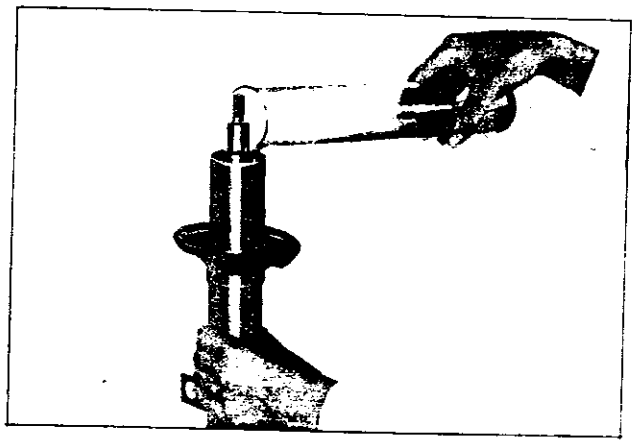


Fig. FA-34 Pouring shock absorber oil

Note: a. Correctly measure amount of shock absorber oil to be poured because amount of oil directly affects damping power. [290 cc (17.7 cu in)]

b. Use Nissan genuine oil (Nisseki Shock Absorber Oil A-1) for the shock absorber oil.

4. Install a rubber O-ring on top of the piston rod guide, and install the gland packing by the use of a gland packing guide (special tool ST35540000).

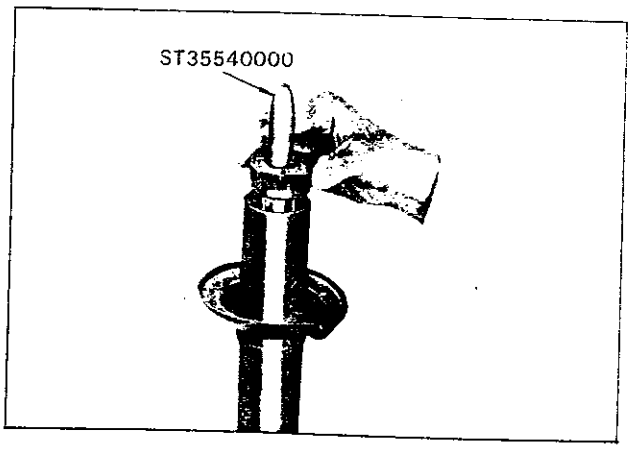


Fig. FA-35 Installing gland packing

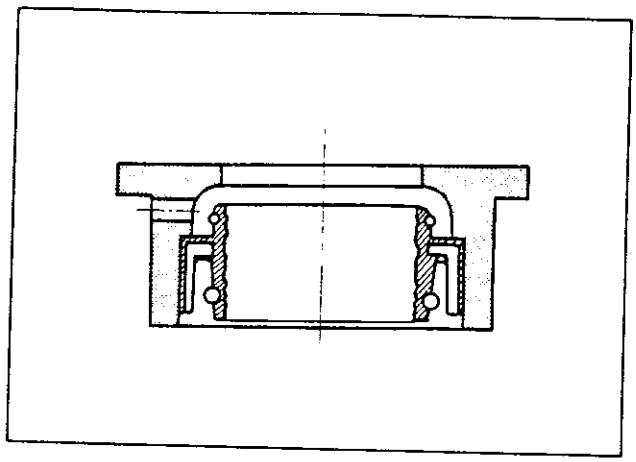


Fig. FA-36 Cross-sectional view of gland packing

5. Tighten the gland packing to 6.0 to 6.5 kg-m (43.4 to 47.0 ft-lb) by the use of a gland packing wrench (special tool ST35500000).

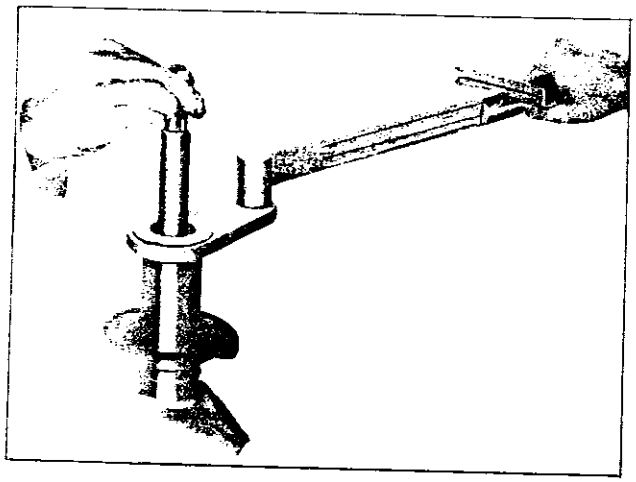


Fig. FA-37 Tightening gland packing

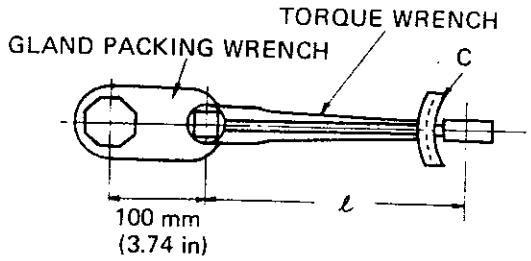
Note: a. Before tightening the gland packing, pull the piston rod approximately 90 mm (3.543 in) upward. This will provide the shock absorber system with the best condition for bleeding.

b. Gland packing tightening torque is rated at 6.0 to 6.5 kg-m (43.4 to 47.0 ft-lb). However, arm length of this tool is extended by 100 mm (3.94 in) as shown in the following figure. Thus, when actually tightening the gland packing, measure effective length (ℓ) of a torque wrench to be used, and set up torque wrench value based on the following formula.

$$C = 6 \times \left(\frac{\ell}{\ell + 100} \right)$$

where, C ..... Value read on the torque wrench [kg-m (ft-lb)]

ℓ ..... Effective length of torque wrench [mm (in)]



6. Conduct air bleeding on the shock absorber system

(1) Stand the strut assembly vertically with the spindle side down, and pull the piston rod within its stroke. Turn over the strut assembly (with the spindle side up), and depress the piston rod in the full stroke.

(2) Repeat the above described operations several times.

(3) Make sure that there is no feeling variation on pressure while depressing or pulling the piston rod. Thus, air bleeding completes.

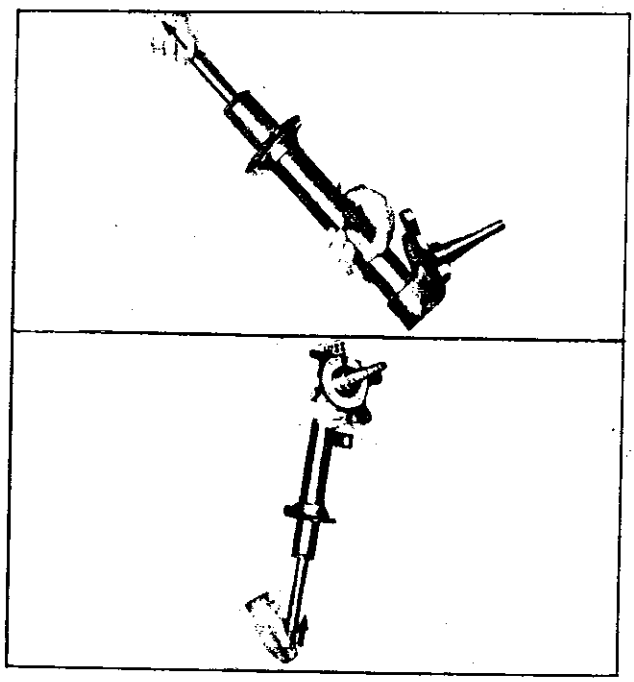


Fig. FA-38 Conducting air bleeding on the shock absorber system

7. Place the front spring on the lower spring seat correctly, compress the front spring with a coil spring compressor (special tool ST35650000), install the upper spring seat, strut mounting bearing, and strut mounting insulator, and tighten the self-locking nut.

Tightening torque:
7.5 to 9.5 kg-m (54.2 to 68.7 ft-lb)

Note: a. Use new self-locking nuts whenever the strut assembly is reassembled.

b. Install the strut mounting bearing carefully so that it is installed correctly toward the prescribed direction, and be sure to apply multi-purpose grease (MIL G2108 or 10924) to the portion indicated by asterisk (*) in Figure FA-39.

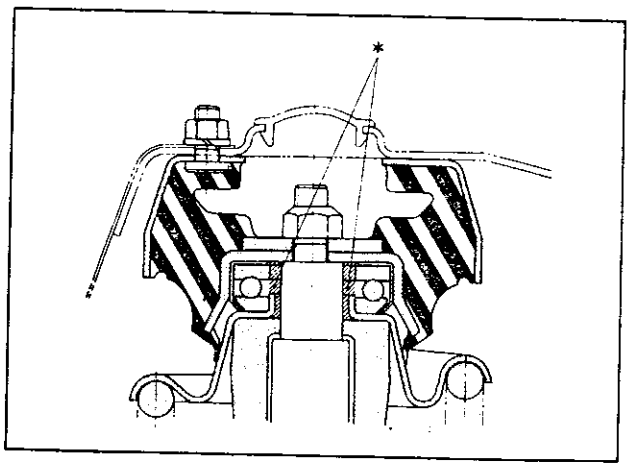


Fig. FA-39 Strut mounting bearing greasing point

8. Release the coil spring gradually from the coil spring compressor, and set the spring to the upper and lower spring seats correctly.

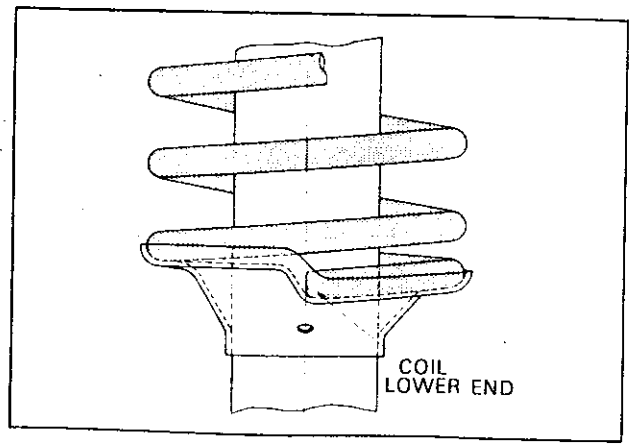


Fig. FA-40 Installing front spring

Tighteing torque:

Nuts used to install the strut assembly on the body:
2.5 to 3.5 kg-m (18.1 to 25.3 ft-lb)

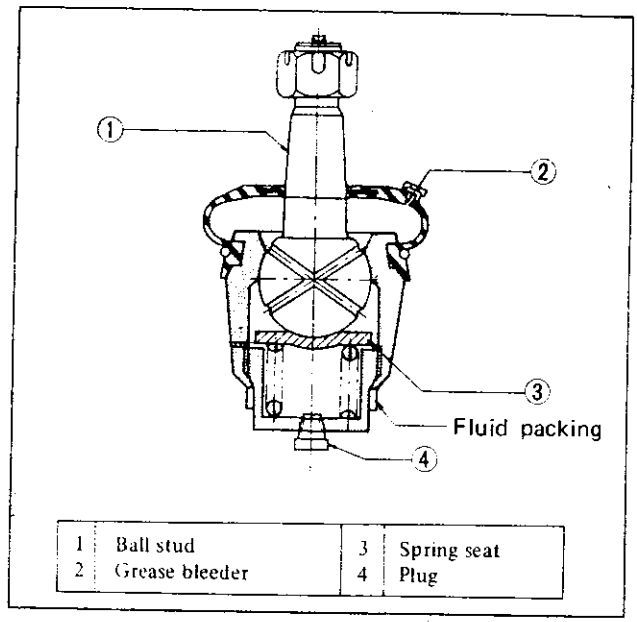
Bolts used to install the knuckle arm to strut:
7.3 to 10.0 kg-m (52.8 to 72.3 ft-lb)

Nut used to install the compression rod on the transverse link:
5.0 to 6.2 kg-m (36.2 to 44.8 ft-lb)

Stabilizer installation bolts

Transverse link bracket side:
1.2 to 1.7 kg-m (8.7 to 12.3 ft-lb)

Frame bracket side:
1.9 to 2.5 kg-m (13.7 to 18.1 ft-lb)



1	Ball stud	3	Spring seat
2	Grease bleeder	4	Plug

Fig. FA-42 Cross-sectional view of ball joint

TRANSVERSE LINK AND LOWER BALL JOINT

The transverse link is connected to the suspension member with the rubber bushing both the inner and outer tubes of which are adhered, the transverse link is also connected to the strut assembly through the lower ball joint, and thus, the front suspension link mechanism is formed.

The lower ball joint is of a non-disassembled type. Lubricate the lower ball joint every 50,000 km (30,000 miles) or two years.

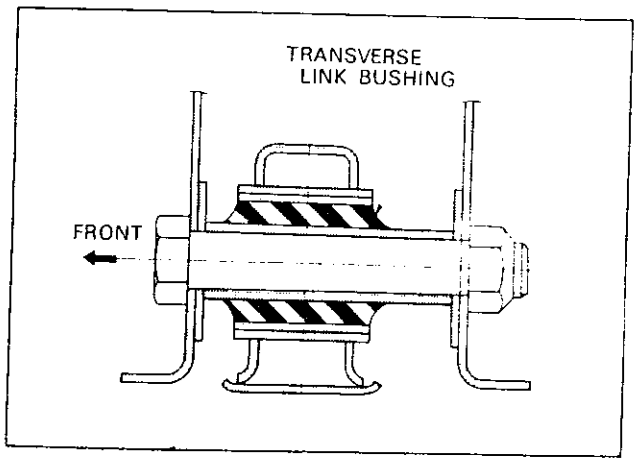


Fig. FA-41 Cross-sectional view of transverse link bushing

Removal

1. Jack up the vehicle, remove the wheel, and remove the stabilizer bar and compression rod from the transverse link. Loosen the knuckle arm fixing bolts ① and ②, and separate the ball joint from the strut assembly. (See "Removal of front axle and suspension assembly" above for details.)

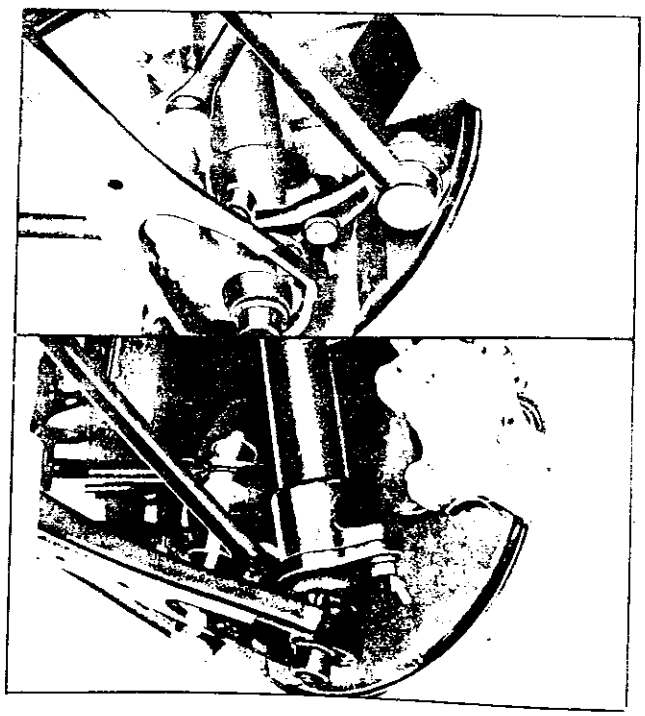


Fig. FA-43 Loosening knuckle arm fixing bolts

2. Loosen the transverse link mounting bolt, and separate the transverse link from the suspension member.

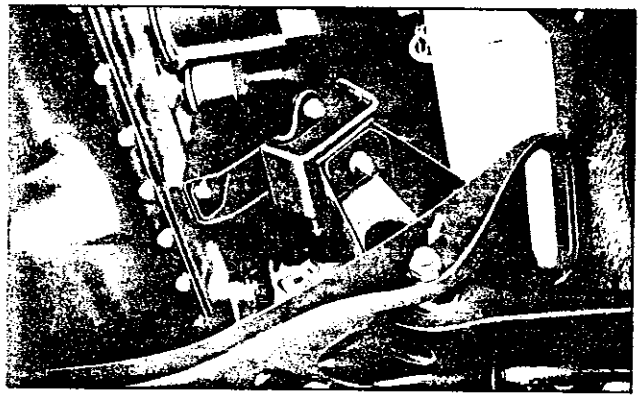


Fig. FA-44 Loosening transverse link mounting bolt

3. Remove cotter pin from the castle nut on the knuckle arm, loosen the castle nut, and remove the knuckle arm from the ball joint.

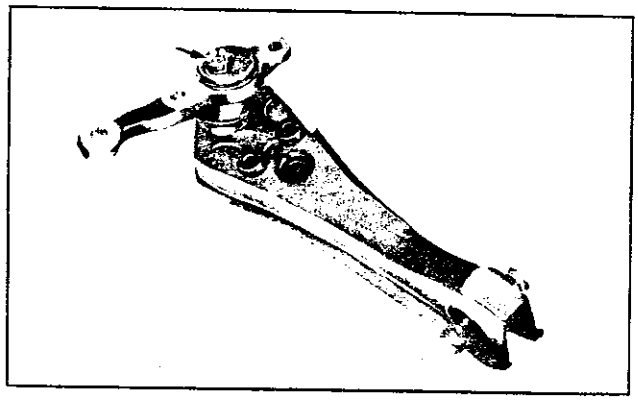


Fig. FA-45 Removing knuckle arm

4. Loosen the ball joint installation nut, and remove the ball joint from the transverse link.

5. Withdraw the transverse link bushing from the transverse link with a front transverse link bushing replacer (special tool ST36710000) and a press.

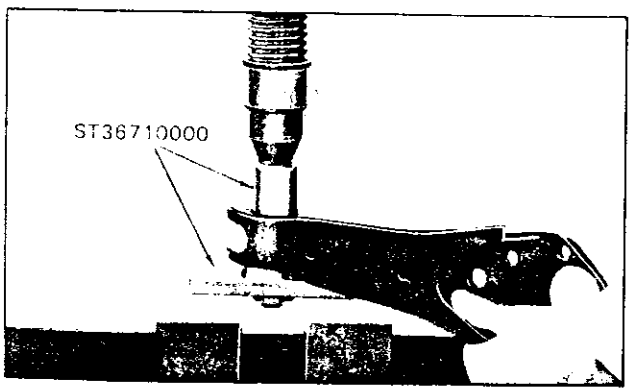


Fig. FA-46 Removing transverse link bushing

Inspection

- **Transverse link bushing**

  Rubber and inner/outer tube joints (adhered) are sticky (melted) or cracked, replace the transverse link as an assembly.

- **Ball joint**

  1. The ball joint is of a non-disassembled type, and therefore, the ball joint cannot be disassembled. Measure end play toward the axial direction and shaking torque, and replace, when deviated from the standards.

  Standard end play (axial direction):
  0.03 to 0.6 mm (0.0012 to 0.0136 in)

  Shaking torque: 20 to 90 gr-cm
  (0.28 to 1.25 in-oz)

  [At the cotter pin opening position:
  3.9 to 17.3 kg (8.6 to 38.1 lb)]

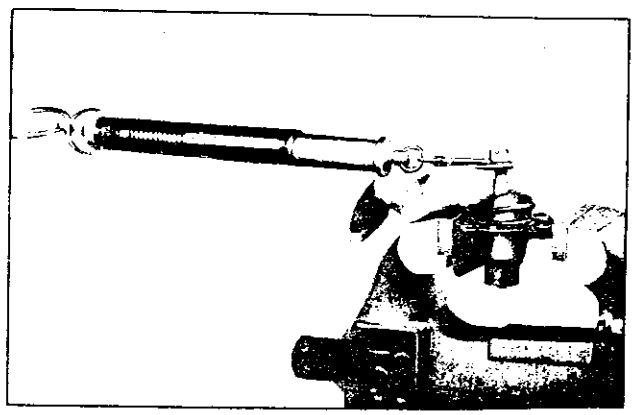


Fig. FA-47 Measuring ball joint shaking torque

2. Replace the ball joint with a new one, when the dust cover is cracked.

3. Lubricate the ball joint with multi-purpose grease (MIL G2108 or 10924) every 50,000 km (30,000 miles) or two years.
Install a grease knipple on the plug hole, and grease completely so that old grease is replaced with new grease. Be sure to reinstall the plug when completely greased.

Note: When a high-pressure grease gun is used, operate the grease gun carefully so that grease is injected slowly and new grease does not come out from the clamp portion.

Reinstallation

Reinstall the transverse link and lower ball joint in reverse sequence of removal. However, when installing the transverse link bushing, use the special tool (special tool ST36710000), and fit it to such an extent that the transverse link bushing inner tube end surface is aligned flush with the transverse link end surface. Be careful to align the bushing direction correctly (front and rear). (See Figure FA-41.)

First, tighten the transverse link mounting bolt temporarily, and finally tighten to the rated tightening torque with the vehicle loaded with the standard load (two passengers).

Tightening torque:

Ball joint bolt:
4.9 to 6.3 kg-m (35.4 to 45.6 ft-lb)

Ball joint castle nut:
5.5 to 7.5 kg-m (39.8 to 54.2 ft-lb)

Transverse link mounting bolt:
11.0 to 13.0 kg-m (79.6 to 94.0 ft-lb)

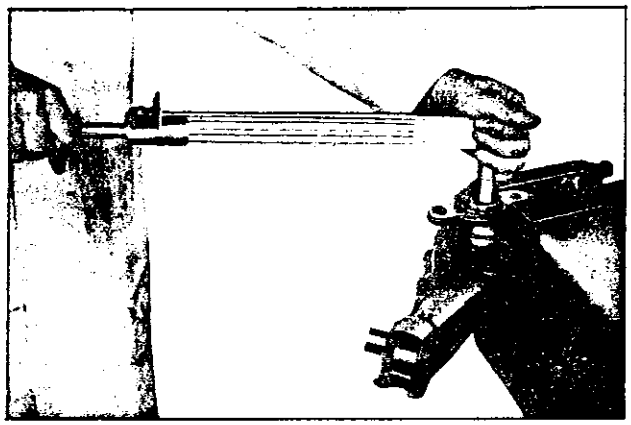


Fig. FA-48 Tightening knuckle arm castle nut

ADJUSTMENT

CONTENTS

1. Carry out wheel alignment on a flat surface with tire air pressure adjusted to the normal pressure.

2. Thoroughly check all component parts of the steering and suspension systems, and repair or replace defective parts before starting the wheel alignment.

3. The camber and caster angles are preset and cannot be adjusted. Adjust the toe-in and vehicle level only.

ADJUSTMENT DATA

Wheel alignment	Without load	With standard load
Camber	50' ± 30'	30' ± 30'
Caster	2°55' ± 30'	3° ± 30'
Toe-in	2 to 5 mm (0.0787 to 0.1969 in)	0 to 3 mm (0 to 0.1181 in)
King pin inclination	12°10' ± 30'	12°25' ± 30'

Steering angle		
In	32.5° ± 30'	33° ± 30'
Out	31.9° ± 30'	31.7° ± 30'
Tire pressure (when not heated)		
175 SR-14	2.0 kg/cm²	(0.31 lb/sq in)
175 HR-14	2.0 kg/cm²	(0.31 lb/sq in)
6.45 H14-4PR	1.7 kg/cm²	(0.26 lb/sq in)

ADJUSTMENT OF WHEEL ALIGNMENT

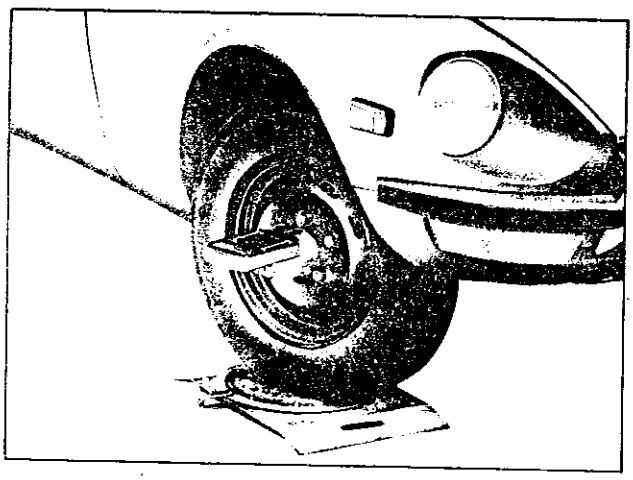


Fig. FA-49 Measuring steering angle, camber and caster

1. Use a turning radius gauge and alignment gauge for the measurement.

2. Carry out wheel alignment on a flat surface with tire air pressure adjusted to the normal pressure.

ADJUSTMENT OF VEHICLE LEVEL

Vehicle level is adjusted by changing springs.

ADJUSTMENT OF TOE-IN

1. Measure toe-in with a toe-in gauge.

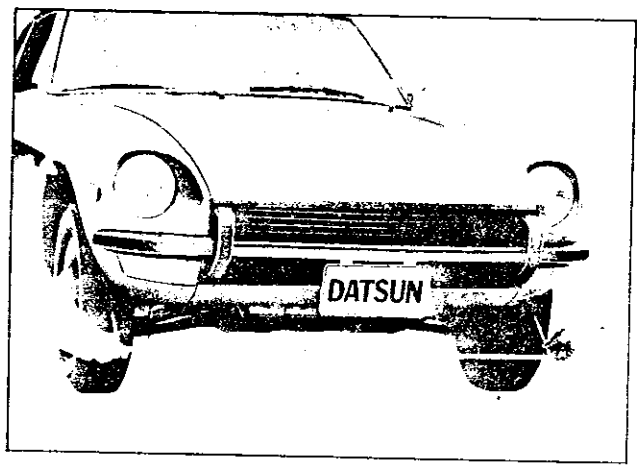


Fig. FA-50 Measuring toe-in

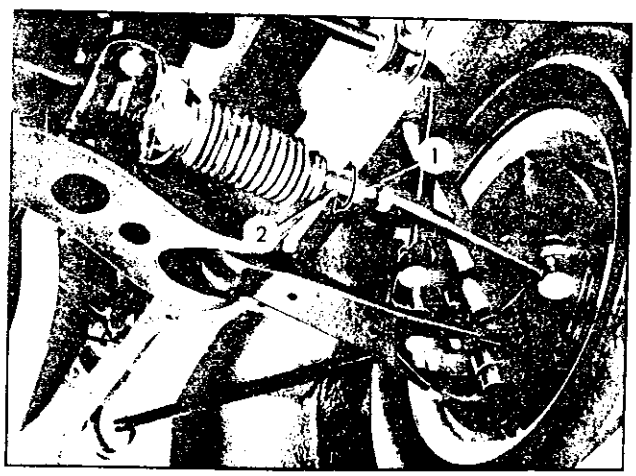


Fig. FA-51 Adjusting toe-in

2. Loosen the side rod lock nut (1), and adjust length of side rod (2) properly to the standard value.

Note: a. Primarily, both side side rod ball joint center distances should be balanced.

Standard distance between side rod ball joint centers: 276.6 mm (10.89 in)

b. When the steering gear housing is removed, be sure to adjust the steering angle at the side rod unit with a turning radius gauge upon completion of reinstallation.

c. Adjust toe-in upon completion of the steering angle adjustment.

d. When adjusting toe-in, be sure to move the left and right side rods equally.

e. When steering angle is incorrect, reassemble the rack and pinion because incorrectly assembled rack and pinion cause improper steering angle.

f. Side rod lock nut end surface comes into contact with steering gear housing end forming a steering stopper.

SERVICE DATA AND SPECIFICATIONS

Wheel alignment

		Without load	Without standard load
Caster		2°55' ± 30'	3° ± 30'
Camber		50' ± 30'	30' ± 30'
King pin inclination		12°10' ± 30'	12°25' ± 30'
Toe-in		2 to 5 mm (0.0787 to 0.1969 in)	0 to 3 mm (0 to 0.1181 in)
Steering angle	In	32.5° ± 30'	33° ± 30'
	Out	31.9° ± 30'	31.7° ± 30'

Coil spring

	LH	RH
Wire diameter	10.6 mm (0.417 in)	10.6 mm (0.417 in)
Coil diameter	100 mm (3.94 in)	100 mm (3.94 in)
Coil turns	10	10
Coil effective turns	8.5	8.5
Free length	373.5 mm (22.72 in)	386 mm (23.56 in)
Installed height/load	201 mm/255 kg (8in/562 lb)	201 mm/274 kg (8 in/604 lb)
Spring constant	1.48 kg/mm (83 in/lb)	1.48 kg/mm (83 in/lb)

Strut assembly

Strut outer diameter	50.8 mm (2.0 in)
Piston rod diameter	25 mm (0.984 in)
Piston diameter	32 mm (1.260 in)
Damping force at piston speed	0.3 m/sec (1.08 ft/sec)
Expansion	35 kg (77.1 lb)
Compression	20 kg (44.1 lb)
Piston rod	
Bend limit	0.1 mm (0.0039 in)

Wear limit	0.05 mm (0.0020 in)
Piston cylinder	
Bend limit	0.2 mm (0.0079 in)
Wear limit	0.1 mm (0.0039 in)
Stabilizer bar diameter	16 mm (0.630 in)
Front wheel bearing rotation starting torque	4.0 to 8.5 kg-cm (3.47 to 7.37 in-lb)
Ball joint shaking torque	20 to 90 gr-cm (0.28 to 1.25 in-oz)
Ball joint end play (axial direction)	0.03 to 0.6 mm (0.0012 to 0.0136 in)

TIGHTENING TORQUE

Front axle

Brake disc rotor and hub assembly tightening bolt	3.9 to 5.3 kg-m (28.2 to 38.3 ft-lb)
Brake tube caliper installation nut	1.5 to 1.8 kg-m (10.9 to 13.0 ft-lb)
Wheel bearing lock nut	2.5 to 3.0 kg-m (18.1 to 21.7 ft-lb)
Disc brake caliper fixing bolt	7.3 to 9.9 kg-m (52.8 to 71.6 ft-lb)
Baffle plate installation screw	0.32 to 0.44 kg-m (2.3 to 3.2 ft-lb)

Strut assembly

Gland packing tightening torque	6.0 to 6.5 kg-m (43.4 to 47.0 ft-lb)
Piston rod self-locking nut	7.5 to 9.5 kg-m (54.2 to 68.7 ft-lb)
Nut used to install the strut assembly on the body	2.5 to 3.5 kg-m (18.1 to 25.3 ft-lb)

Transverse link and ball joint

Bolts used to install the knuckle arm to strut	7.3 to 10.0 kg-m (52.8 to 72.3 ft-lb)
Ball joint castle nut	5.5 to 7.5 kg-m (39.8 to 54.2 ft-lb)
Bolts used to install the transverse link to ball joint	4.9 to 6.3 kg-m (35.4 to 45.6 ft-lb)
Transverse link mounting bolt	11.0 to 13.0 kg-m (79.6 to 94.0 ft-lb)

Compression rod

Transverse link side	5.0 to 6.2 kg-m (36.2 to 44.8 ft-lb)
Body side	4.5 to 5.5 kg-m (32.6 to 39.8 ft-lb)

Stabilizer bar

Connecting rod and transverse link installation nut	1.9 to 2.6 kg-m (13.7 to 18.8 ft-lb)
Connecting rod and stabilizer bar installation nut	1.2 to 2.7 kg-m (8.7 to 19.5 ft-lb)
Stabilizer bar and body installation bolt	1.9 to 2.5 kg-m (13.7 to 18.1 ft-lb)

Suspension member	
Body side	4.0 to 5.0 kg-m (28.9 to 36.2 ft-lb)
Engine mounting bolt	1.6 to 2.6 kg-m (11.6 to 18.8 ft-lb)
Steering mounting bolt	2.2 to 3.0 kg-m (15.9 to 21.7 ft-lb)
Side rod socket and knuckle arm	5.5 to 7.5 kg-m (39.8 to 54.2 ft-lb)
Hub nut	8.5 to 9.0 kg-m (61.5 to 65.1 ft-lb)

TROUBLE DIAGNOSES AND CORRECTIONS

Troubles	Possible causes	Corrective action
Vibration, shock and shimmying of steering wheel. **Vibration:** Loose connection of the serration parts and rubber coupling parts, defective rubber coupling and wear of each part of linkage and vibration of front wheels are, in many cases, transmitted to the steering wheel. This is very noticeable when travelling over rough road. **Shock:** When the front wheels are travelling over bumpy roads, the play of the steering linkage is transmitted to the steering wheel. This is especially noticeable when travelling rough road. **Shimmying:** Abnormal vibrations of the front suspension group and the whole steering linkage, which occur when a specific speed is attained.	Improper air pressure of tire.	Adjust.
	Unbalance and deformation of road-wheel.	Correct the unbalance or replace.
	Unevenly worn tire or insufficient tightening.	Replace or tighten.
	Improperly adjusted or worn front wheel bearing.	Adjust or tighten.
	Faulty wheel alignment.	Adjust.
	Worn fitting transverse link bushings.	Replace.
	Insufficiently tightened steering gear housing.	Retighten.
	Wear of steering linkage.	Replace defective parts.
	Worn suspension ball-joint.	Replace.
	Excessive backlash due to improper adjustment of the retainer parts.	Adjust correctly.
	Defective rubber coupling, or loose connection of rubber coupling (serration parts) and loose bolts.	Check the parts for tightness, and retighten if necessary. Otherwise, replace the rubber coupling.
	Worn column bearing, weakened column bearing spring, or loose clamp.	Check and repair correctly.
	Malfunction of shock absorber (inside the strut) or loose installation bolts.	Replace or retighten.
	Unbalance of vehicle level.	Correct the unbalance.

Vehicle pulls to right or left. When driving with hands off the steering wheel over a flat road, the vehicle gently swerves to right or left. **Note: A defective rear suspension may also be the cause of this trouble and, therefore, see also the chapter dealing with the rear suspension.**	Improper air-pressure of tire or insufficient tightening of wheel nuts.	Adjust or tighten.
	Difference in height of right and left tire treads.	Replace tires.
	Incorrect adjustment or abrasion of front wheel bearing.	Adjust or replace.
	Collapsed or twisted front spring.	Replace.
	Incorrect wheel alignment.	Adjust.
	Incorrect brake adjustment (binding).	Adjust.
	Worn rubber bushings for transverse link and compression rod.	Replace.
	Deformed of steering linkage and suspension link	Replace.
	Unbalanced vehicle level	Correct the unbalance.
Instability of vehicle	Improper air pressure of tire.	Adjust.
	Worn rubber bushings for transverse link and compression rod.	Adjust.
	Incorrect wheel alignment	Adjust.
	Worn or deformed steering linkage and suspension link	Replace.
	Incorrect adjustment of steering gear	Adjust.
	Deformed unbalanced wheel	Correct or replace.
Stiff steering wheel (checking up procedure) Jack up front wheels, detach the steering gear and operate the steering wheel, and; If it is light, check steering linkage, and suspension groups. If it is heavy, check steering gear and steering column groups.	Improper air pressure of tire.	Adjust.
	Insufficient lubricants or mixing impurities in steering linkage or excessively worn steering linkage.	Replenish grease or replace the part.
	Stiff or damaged suspension ball-joint, or lack of grease	Replace.
	Worn or incorrectly adjusted wheel bearing.	Replace or adjust.
	Worn damaged steering gear and bearing	Replace.
	Incorrectly adjusted steering gear.	Adjust.
	Deformed steering linkage	Replace.

	Incorrect wheel alignment	Adjust.
	Damaged strut upper end bearing	Replace.
	Damaged or stiff piston or shock absorber rod (in the strut)	Replace.
	Interference of steering column with turn signal switch	Adjust.
Excessive steering wheel play	Incorrectly adjusted steering gear housing	Adjust.
	Worn steering linkage	Replace.
	Improperly fitted of gear box	Retighten.
	Incorrectly adjusted wheel bearing	Adjust.
	Worn transverse link and compression fitting bushings	Replace.
Noises	Improper air pressure of tire	Adjust.
	Insufficient lubricating oil and grease for suspension ball joint and steering linkage, or their breakage.	Replenish lubrication oil and grease, or replace.
	Loose steering gear bolts. linkage and suspension groups.	Retighten.
	Defective shock absorber (inside the strut).	Replace.
	Defective wheel bearing	Replace.
	Worn steering linkage	Replace.
	Worn transverse link and tension rod fitting bushings	Replace.
	Broken collapsed coil spring	Replace.
	Loose strut mounting insulator tightening nuts	Retighten.
Grating tire noise	Improper air pressure of tire	Adjust.
	Incorrect wheel alignment	Adjust.
	Deformed knuckle spindle and suspension linkage	Replace.
Jumping of disc wheel	Improper air pressure of tire	Adjust.
	Unbalanced wheels	Adjust.

	Defective shock absorber	Replace.
	Defective tire	Replace.
	Deformed wheel rim	Replace.
Excessively or partially worn tire	Improper air pressure of tire	Adjust.
	Incorrect wheel alignment	Adjust.
	Defective wheel bearing	Replace.
	Incorrect brake adjustment	Adjust.
	Improper tire shifting (rotation)	Adjust.
	Rough and improper driving manner.	Drive more gently.

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DATSUN 240Z SPORTS
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CHASSIS & BODY

NISSAN

NISSAN MOTOR CO., LTD.
TOKYO, JAPAN

SECTION RA

REAR AXLE & REAR SUSPENSION

RA

REAR AXLE AND REAR SUSPENSION

CONTENTS

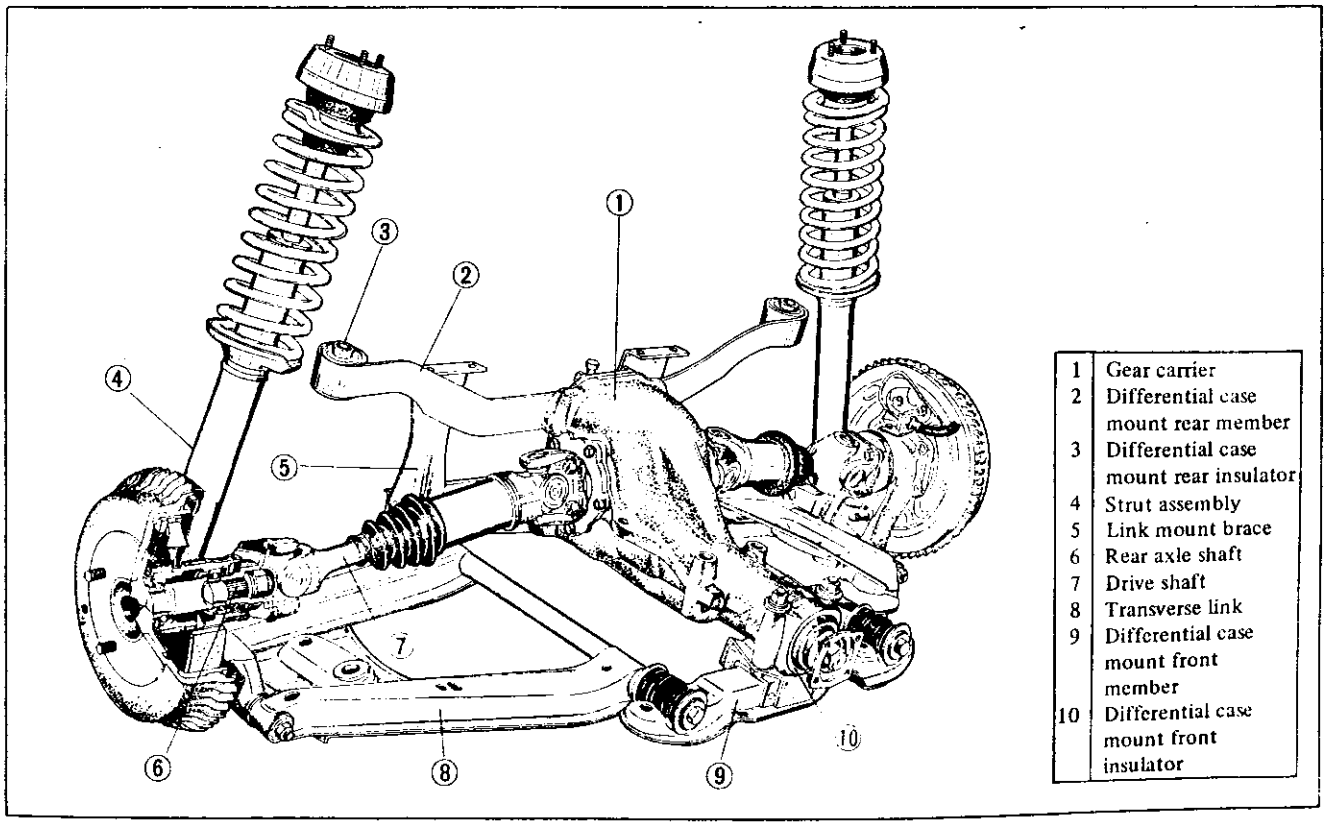


Fig. RA-1 Rear axle and rear suspension assembly

DESCRIPTION

The rear suspension is a strut type independent suspension. Primarily, rear wheel is supported with the strut and transverse link, the gear carrier is aligned independently and separately from the suspension, and the gear carrier is installed on the body directly with rubber insulators. Thus, three major rear suspension elements providing the left wheel, right wheel, and gear carrier, are separated, and very high suspension performance is obtained.

As for the construction, the rear axle housing is bronged on the lower end of the strut which sefl-contains a shock absorber, and the lower side is connected to the transverse link through rubber bushing. On the intermediate position of the strut, the body is suspended with coil spring, the upper end is installed on the body through rubber cushion, and the transverse link is also installed on the body directly with rubber cushion.

A horizontal leaf spring is connected to the rear end of the gear carrier, and the gear carrier is installed on the body at three positions (both ends of the leaf spring and front end of the gear carrier) through rubber cushions. Driving power is transmitted to the rear axle shaft with the freely extensible drive shaft through side flanges on both ends of the gear carrier. The rear axle shaft is supported with two ball bearings in the axle housing.

Specifications

Type of suspension	Strut (independent suspension)
Type of drive shaft	Ball spline
Type of shock absorber	Hydraulic cylindrical multi-motion
Spring	Coil spring

Rear wheel alignment

	With standard load*	Without load
Camber	-24'	48'
Tread	1,362.5 mm (53.64 in)	1,344.5 mm (52.93 in)
Toe-in	0°	0°

Road clearance (At the transverse link mount member lower end)

	With standard load*	Without load
S30	231 mm (9.09 in)	261 mm (10.28 in)

* "With standard load" means total weight of two riders weighing 68 kg (150 lb) each.

REAR SUSPENSION ASSEMBLY

Removal

1. Remove the strut assemblies from both sides. (See the paragraphs for strut and coil spring removals.)

2. Remove the main muffler. (Refer to section FE Engine control, Fuel, Exhaust system.)

3. Separate the propeller shaft from the final drive.

4. Loosen the transverse link inner bolts (indicated by arrow mark) (for front, rear, left, and right).

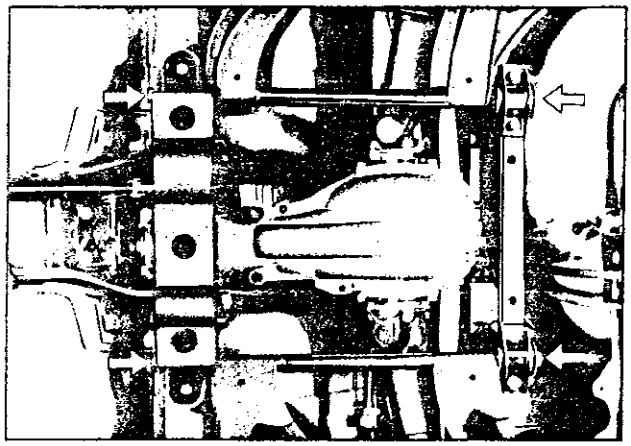


Fig. RA-2 Removing the transverse link inner bolts

5. Apply a jack to the lower end of the gear carrier.

6. Remove the differential mount front member installation bolts (indicated by arrow mark).

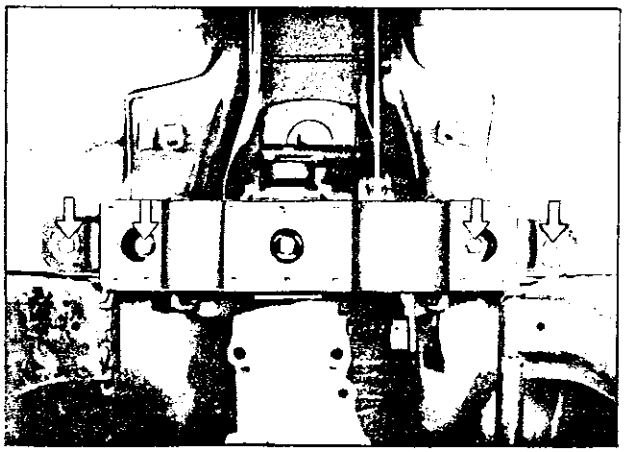


Fig. RA-3 Removing the differential mount front member

7. Remove the link mount brace installation bolt 1 and differential mount rear insulator installation bolt 2. (For both sides)

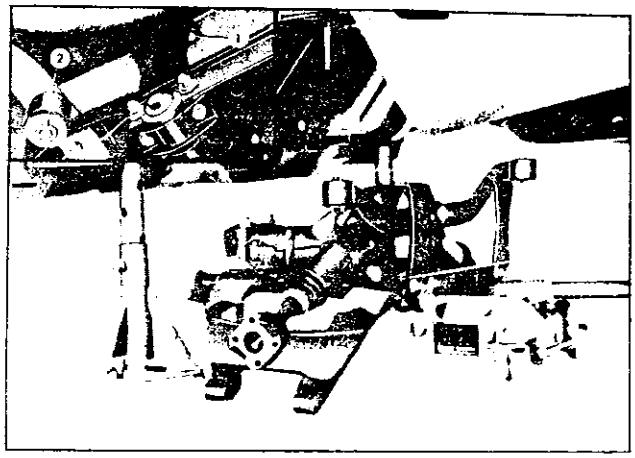


Fig. RA-4 Removing the rear axle and suspension assembly

8. Lower the jack slowly, and remove the rear suspension assembly slowly.

Disassembly

1. Remove the link mount rear bracket, and remove the transverse link. (For both sides)

2. Remove the drive shaft installation bolt (in the gear carrier side), and separate the drive shaft from the gear carrier. (For both sides.)

3. Remove the inner bushing from the transverse link.

4. Remove the outer bushing from the transverse link by the use of rear transverse link bushing replacer (special tool ST38800000).

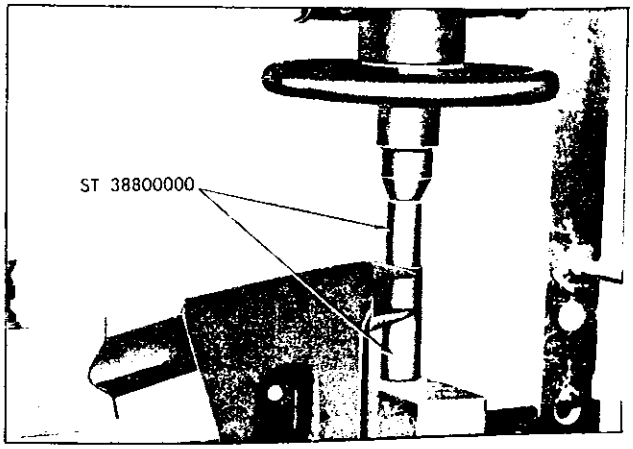


Fig. RA-5 Removing the transverse link outer bushing

5. Remove the differential mount rear member and differential mount front insulator from the gear carrier.

6. Remove the differential mount rear insulator from the differential mount rear member by the use of drift set (special tool ST33260000).

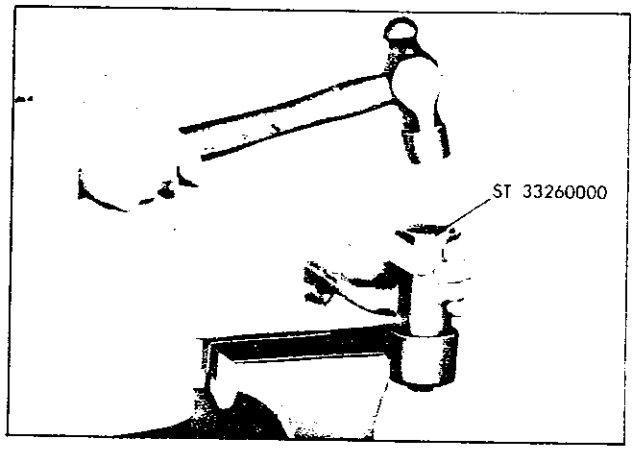


Fig. RA-6 Removing the differential mount rear insulator

Inspection

1. Check the suspension system components such as differential mount front and rear members, transverse link, etc. for crack, deformation, and damage. Replace as required.

2. Replace the differential mount front insulator with new one, if the dimension "A" (Figure RA-7) is 9 mm (0.3543 in) or greater or 2 mm (0.0787 in) or smaller. (unloaded)

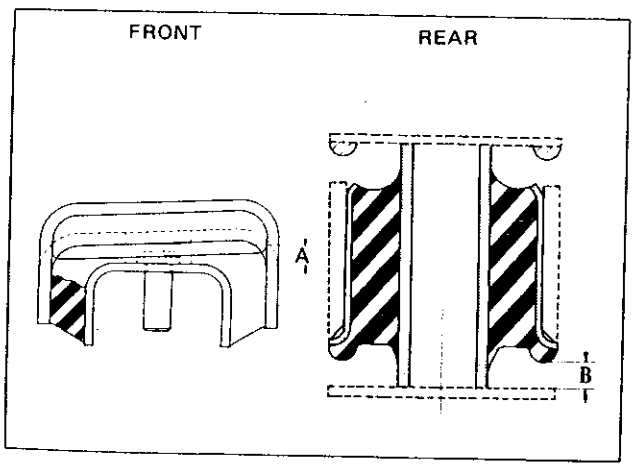


Fig. RA-7 Sectional view of the differential mount insulator

3. Replace the differential mount rear insulator with new one, if the dimension "B" (Figure RA-7) is less than 5 mm (0.1969 in). (unloaded)

4. Check other rubber parts (transverse link inner bushing and outer bushing, etc.) for crack, deformation and damage. Replace as required.

Reinstallation

1. Reinstall and reassemble the rear suspension assembly in reverse sequence of removal and disassembly.

2. Instructions for installation of the transverse link inner bushing

(1) Apply the inner bushing to the link shaft.

(2) Align the projection on the bushing (directed to the axis direction) horizontally.

(3) Align the center of bushing (directed toward the axis direction) to the center of bracket.

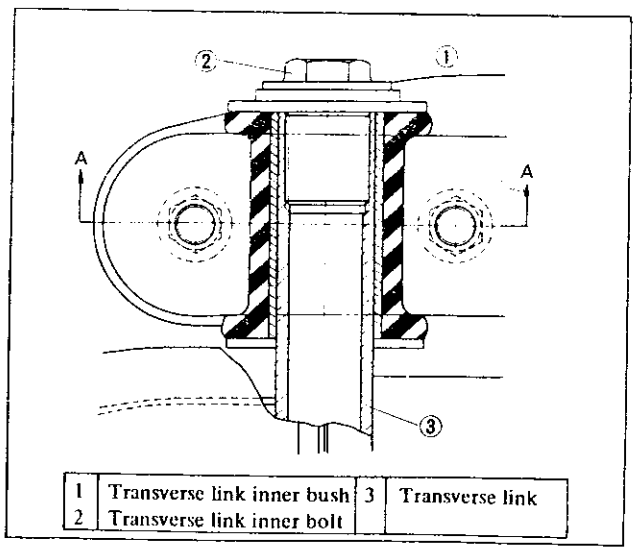


Fig. RA-8 Cross sectional view of the transverse link inner bushing (I)

(4) First, tighten bolts supported toward the vertical direction (differential mount front member or link mount rear bracket).

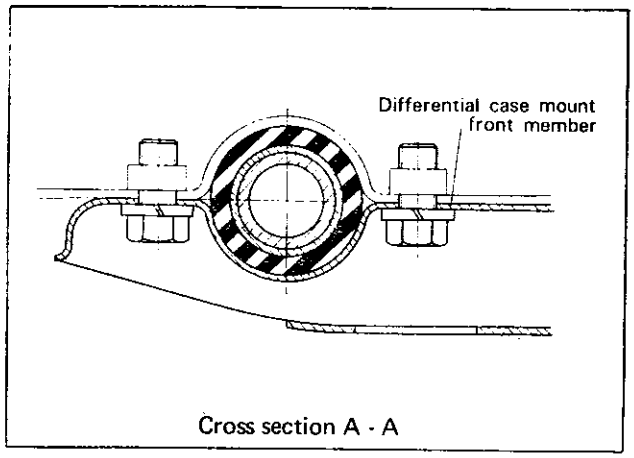


Fig. RA-9 Cross sectional view of the transverse link inner bushing (II)

(5) Temporarily tighten the transverse link inner bolts.

Note: a. Tighten the transverse link inner bolt and outer sefl-lock nut after installing wheels and placing the vehicle on ground under the standard load. (See RA-2 Rear wheel alignment)
b. Install the differential carrier front insulator carefully so that the front and rear direction are correctly faced. (Indicated by mark "F")

STRUT AND COIL SPRING

Removal

1. Choke the front wheels.

2. Loosen the wheel nuts, jack up the vehicle, and support the body with a stand.

3. Remove the wheel nuts and remove the wheels.

4. Disconnect the brake line connector (body side) ① and side brake linkage ②. (Figure RA-10)

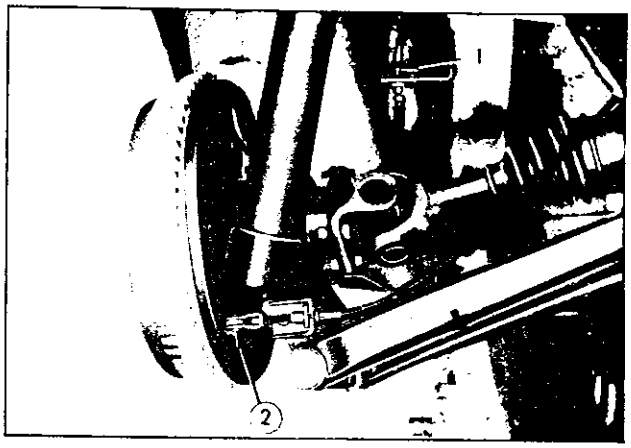


Fig. RA-10 Removing the brake hose and side brake linkage

5. Remove the transverse link outer self-lock nut ② and lock bolt ① from the lower end of the bearing housing.

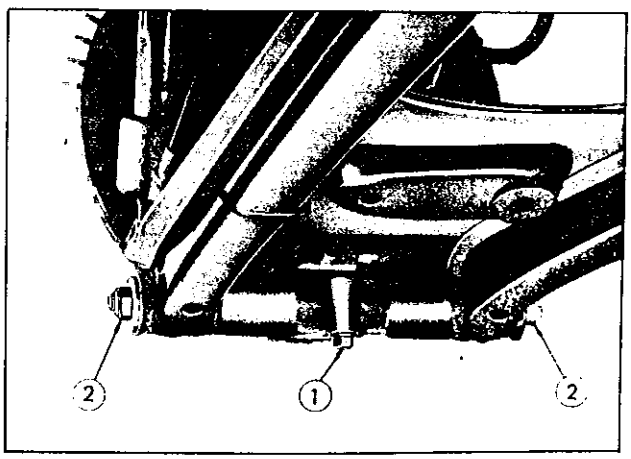


Fig. RA-11 Removing the lock bolt and self-lock nut

6. Withdraw the spindle, and separate the transverse link from the strut assembly.

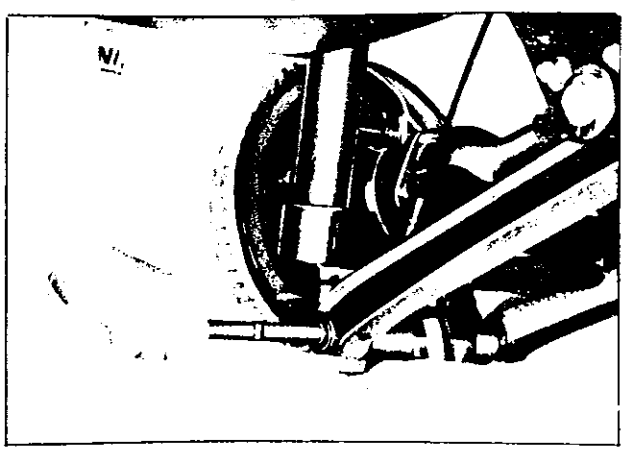


Fig. RA-12 Removing the spindle

7. Disconnect the drive shaft (wheel side) (indicated by arrow mark).

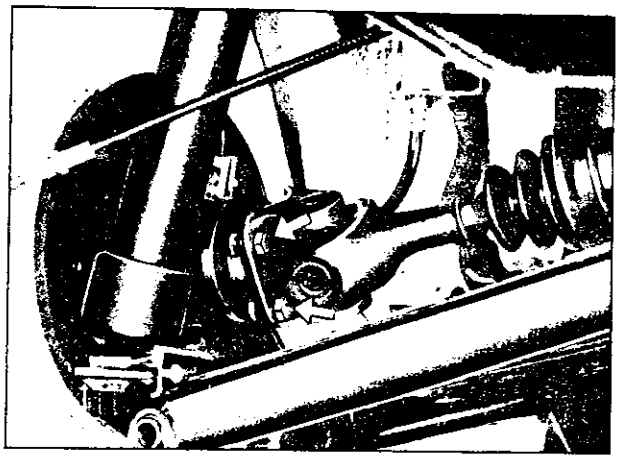


Fig. RA-13 Removing the drive shaft

8. Remove the strut installation nut (from the rider's compartment side). The strut assembly can be removed downward.

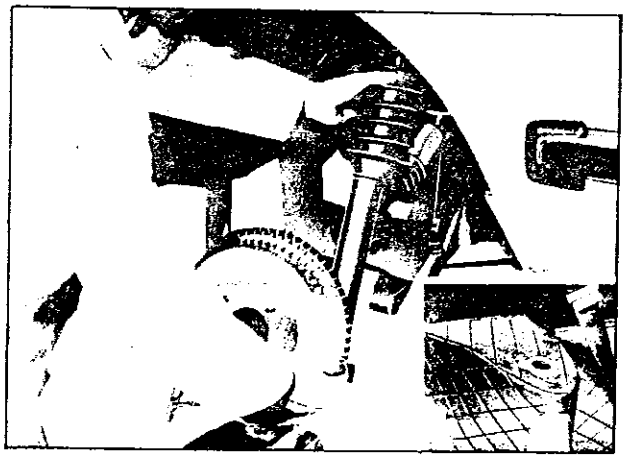


Fig. RA-14 Removing the strut assembly

Note: When removing the strut assembly, apply a jack to the lower end of the strut, and remove it gradually.

9. For the removal and reinstallation of the spring from the strut assembly, disassembly of the strut, inspection, and adjustment, the instructions for the front strut assembly apply.

Refer to section "FA-Front Axle and Front Suspension".

Reinstallation

Install the strut assembly in reverse sequence of removal.

Note: a. Install the spindle so that the shorter side (when measured from the position where the lock bolt is installed) is faced to the front side of the vehicle.

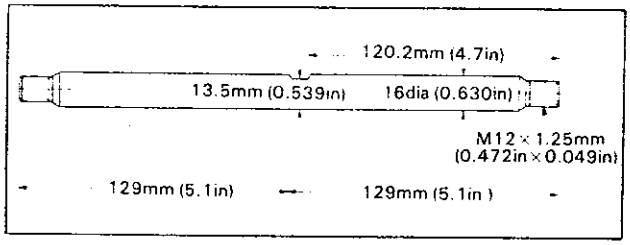


Fig. RA-15 The spindle

b. Tighten the transverse link outer self-lock nut completely after installing wheels and placing the vehicle under the standard load

c. When installing the spring, make sure that the spring has been correctly seated on the spring seat.

TRANSVERSE LINK

Removal

1. Choke the front wheels.

2. Loosen the wheel nuts, jack up the vehicle, and support the body with a stand.

3. Remove the wheel nuts, and remove the wheel.

4. Separate the transverse link from the strut. (Refer to the paragraph for strut and coil spring.)

5. Apply a jack beneath the gear carrier, and support it.

6. Loosen the transverse link inner bolt ① (for both front and rear). (Figure RA-16)

7. Remove the differential mount front insulator installation nut ②. (Figure RA-16)

8. Remove the differential mount front member installation nut ③, and remove the differential mount front member ④.

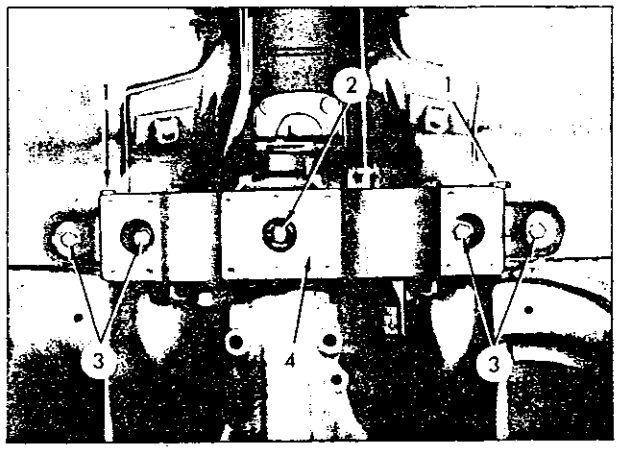


Fig. RA-16 Remving the differential mount front member

9. Remove the link mount rear bracket (indicated by arrow mark). The transverse link can be removed.

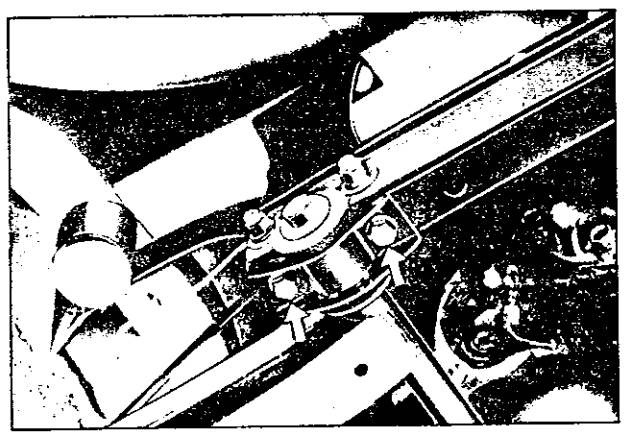


Fig. RA-17 Removing the transverse link

10. Withdraw the inner bushing and outer bushing from the transverse link. (Refer to the paragraph for rear suspension assembly.)

Inspection

1. Check the transverse link differential mount front member for crack, deformation, and damage. Replace as required.

2. Check the rubber bushing for decline, wear, or other defective condition, replace as required.

Reinstallation

1. Install the transverse link in reverse sequence of removal.

2. For the installation, refer to the precautions for installation of rear suspension assembly (page RA-4).

GEAR CARRIER

Removal

1. Choke the front wheels.

2. Jack up the vehicle, and support the body with a stand.

3. Remove the main muffler. (Refer to section FE Engine control, Fuel and Exhaust system.)

4. Separate the propeller shaft from the gear carrier.

5. Loosen the front side transverse link inner bolt ①. (Figure RA-18)

6. Remove the drive shaft installation bolt (gear carrier side) ②, and separate the drive shaft from the gear carrier.

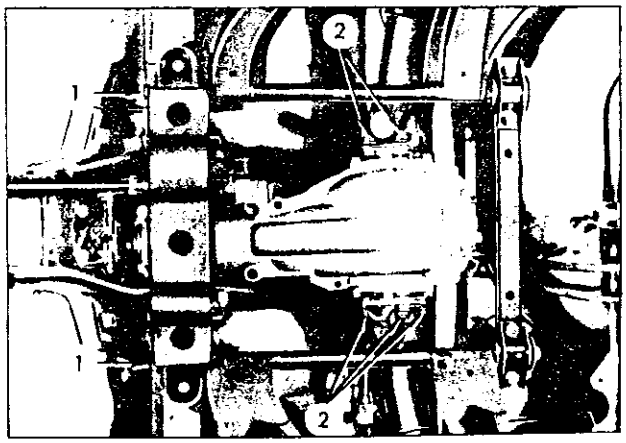


Fig. RA-18 Separating the drive shaft

7. Apply a jack beneath the gear carrier and support it.

8. Remove the differential mount rear member installation nut (indicated by arrow mark).

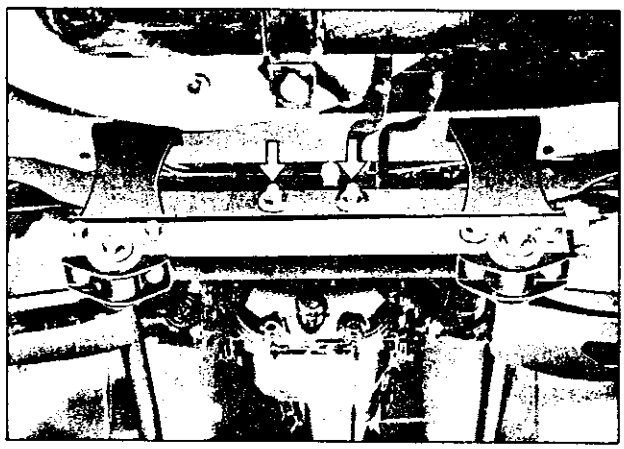


Fig. RA-19 Removing the differential mount rear member

9. Remove the differential mount front member installation bolt (indicated by arrow mark), lower the jack slowly, and remove the gear carrier.

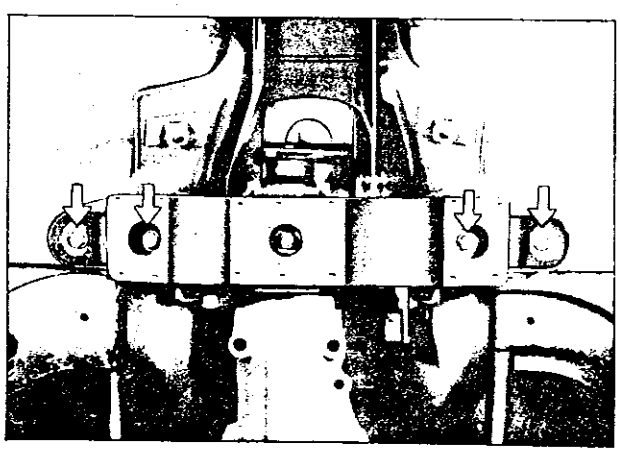


Fig. RA-20 Removng the differential mount front member

10. Remove the differential mount front member and differential mount front insulator from the gear carrier.

Reinstallation

1. Install the gear carrier in reverse sequence of removal.

2. When installing the gear carrier, refer to the precautions for installation of rear suspension assembly (page RA-4).

WHEEL BEARING, OIL SEAL, AND REAR AXLE SHAFT

Removal

1. Choke the front wheels.

2. Loosen the wheel nuts, jack up the vehicle, and support it with stand.

3. Remove the wheel nuts and wheel.

4. Remove the drive shaft installation bolt (wheel side). (Figure RA-13)

5. Remove the rear wheel bearing lock nut.

Note: Do not release the rear wheel bearing lock nut from caulking when removing it.

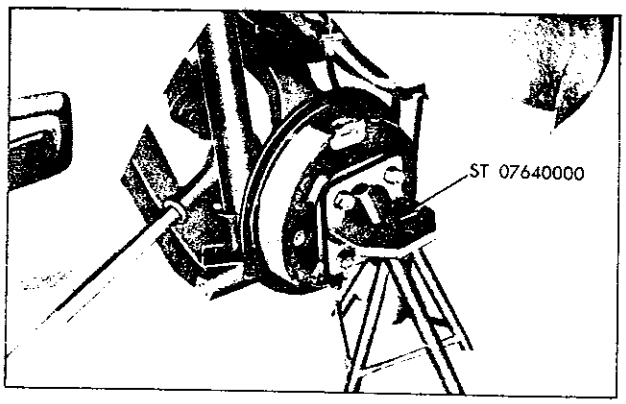


Fig. RA-21 Removing the rear wheel bearing lock nut

6. Remove the rear axle shaft by the use of rear axle stand (special tool ST07640000) and sliding hammer (special tool ST36230000).

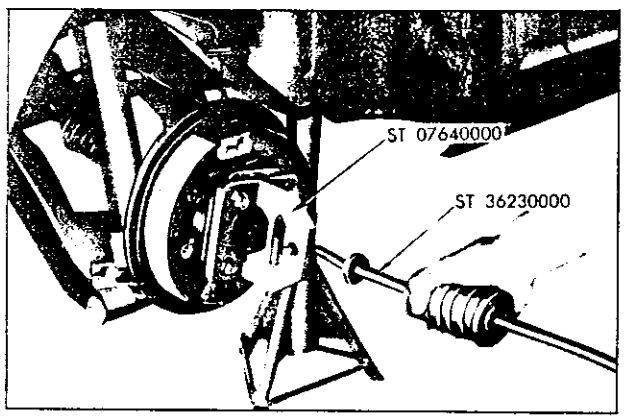


Fig. RA-22 Removing the rear axle shaft

7. Remove the distance piece and companion flange.

8. Remove the inner rear wheel bearing and oil seal.

9. Remove the rear wheel bearing (outer side) from the rear axle shaft.

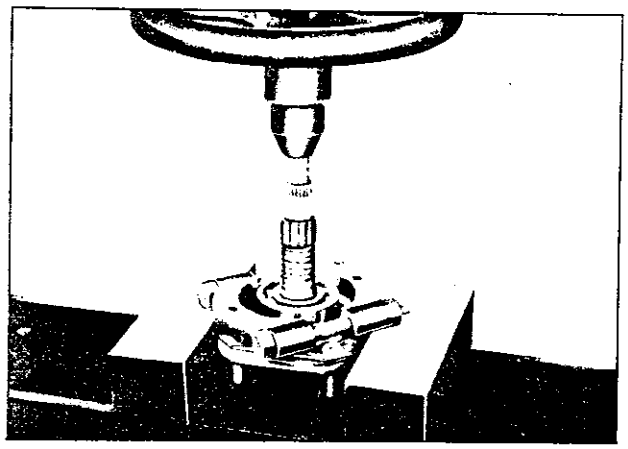


Fig. RA-23 Removing the rear wheel bearing (outer side)

Inspection

1. Check the wheel bearing for end play, and the rolling surface for flaking, wear, seizure, and oil seal for crack, deformation.

Replace the wheel bearing as required.

2. Check the rear axle shaft for crack, for seizure.

Replace the rear axle shaft and wheel bearing replace as required.

3. Check the lip of oil seal for damage and wear.

Reinstallation

Install the wheel bearing, oil seal and rear axle shaft in reverse sequence of removal.

Instructions for assembly of rear wheel bearing

1. The outer bearing is provided with a seal in one side. Apply the outer bearing to the rear axle shaft so that the side to which the seal is attached is faced to the wheel. (See Figure RA-25)

2. Relationship between the rear bearing housing and distance piece is shown in Figure RA-24

Mark "A", "B", or "C" is stamped on the housing. Select a distance piece having a mark coincided with the mark on the housing.

When a distance piece is reused, make sure that both ends are not collapsed or deformed.

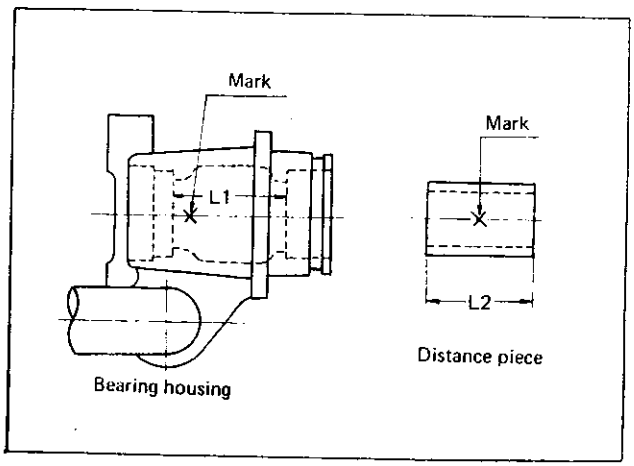


Fig. RA-24 The rear bearing houisng and distance piece

Rear bearing housing		Distance piece	
Mark	Size mm (in)	Mark	Size mm (in)
A	52.63 (2.072) or more but less than 52.73 (2.076)	A	52.60 (2.070) or more but less than 62.66 (2.467)
B	52.53 (2.068) or more but less than 52.63 (2.072)	B	52.50 (2.067) or more but less than 52.56 (2.069)
C	52.43 (2.064) or more but less than 52.53 (2.068)	C	52.40 (2.063) or more but less than 52.46 (2.065)

3. For the wheel bearing grease, use multipurpose grease (MIL G2108 or G10924).

Fill the portion indicated by asterisk (*) in Figure RA-25

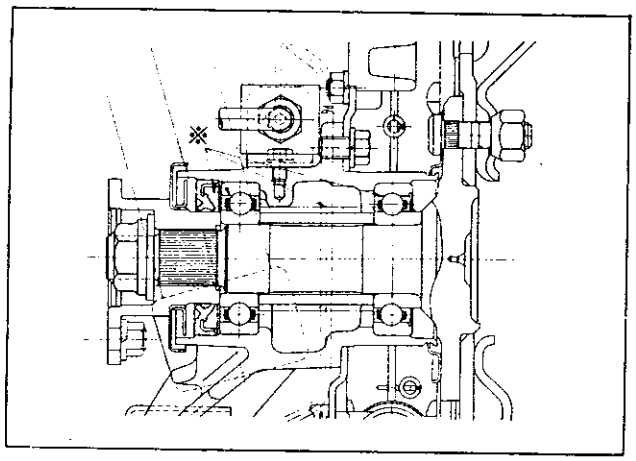


Fig. RA-25 Lubrication chaft of rear axle

4. Tighten the wheel bearing lock nut, and measure the rear axle shaft turning starting torque and rear axle shaft end play. Readjust as required.

Rear axle shaft turning starting torque:

4.5 kg-cm (390 in-lb)

At the hub bolt 790 gr (28.7 oz) or less

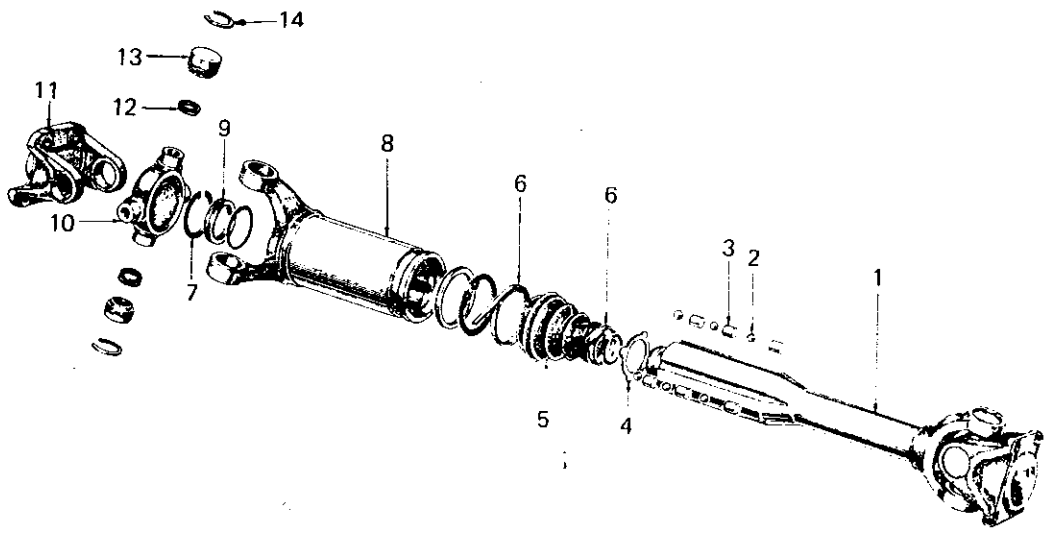
Rear axle shaft end play:

0 to 0.15 mm (0 to 0.0057 in)

5. Securely caulk the wheel nuts after tightening.

6. When fitting the wheel side wheel bearing, use rear axle shaft outer bearing drift (special tool ST37780000)

DRIVE SHAFT



1	Drive shaft	6	Boot band	11	Flange yoke
2	Drive shaft ball	7	Snap ring	12	Oil seal
3	Ball spacer	8	Sleeve yoke	13	Needle bearing
4	Drive shaft stopper	9	Sleeve yoke plug	14	Snap ring
5	Rubber boot	10	Spider journal		

Fig. RA-26 Drive shaft components

Removal

Remove the drive shaft universal joint yoke flange bolts from both sides. (indicated by arrow mark)

Note: Handle the drive shaft carefully because it is easily damaged.

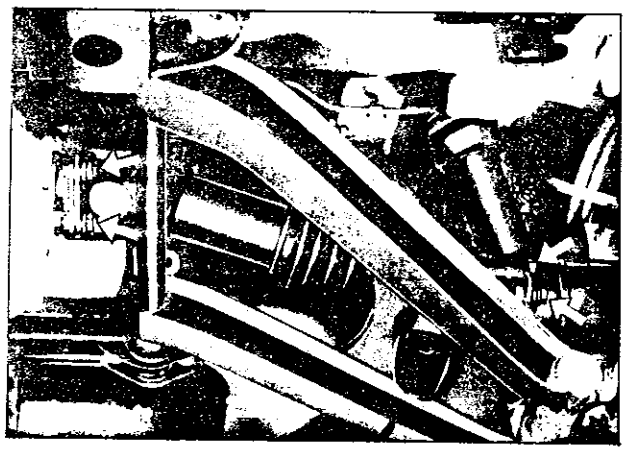


Fig. RA-27 Removing the drive shaft

Disassembly

The drive shaft should be disassembled only when lubricating the ball spline.

The lubrication is required every 50,000 km (30,000 miles).

1. Remove the universal joint spider from the differential side. Refer to the paragraph covering the propeller shaft.

2. Remove the snap ring from the sleeve yoke plug and remove the plug. Use drive shaft snap ring plier (special tool ST38300000).

Depress the drive shaft and remove the snap ring from the stopper.

Remove the stopper. Disconnect the boot and separate the drive shaft carefully so as not to lose the balls and spacers.

Inspection

1. Replace the boot and O-ring of the sleeve yoke plug, if damaged.

2. Check the drive shaft for straightness, crack, damage, wear or distortion.

Replace the drive shaft assembly as required.

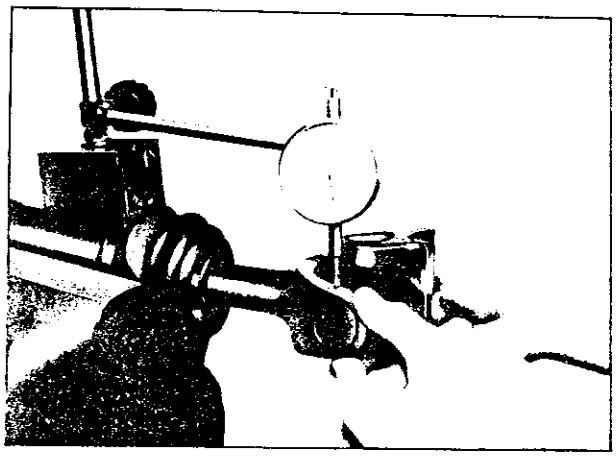


Fig. RA-28 Measuring drive shaft play

3. Check the steel balls and sleeve yoke for damage, wear or distortion.

Replace the drive shaft assembly as required.

4. Replace the universal joint in accordance with the instructions described in the paragraph covering the propeller shaft if faulty condition is detected.

5. Thoroughly remove grease from the sleeve yoke, drive shaft ball rolling groove and oil groove, and clean them. (Multipurpose grease MIL G2108, G10924)

6. Measure the drive shaft play as shown in the Figure RA-28. If the play exceeds 0.1 mm (0.0039 in), replace the drive shaft assembly. Be sure to measure the drive shaft play with the drive shaft compressed completley.

7. Check the drive shaft for radial play, and replace, if excessive.

Reassembly

Reassemble the drive shaft in reverse sequence of disassembly regarding the following matters:

1. Correctly align the yokes, and make sure that the steel balls and spacers have been installed in the correct order.

2. Selecting a suitable snap ring, adjust the axial play of the universal joint to within 0.02 mm (0.0008 in). Snap rings having four different thicknesses are available.

3. Apply multipurpose grease (MIL G2108 or G-10924) to the ball rolling groove and oil groove in an adequate volume. [Approximately 10 gr (0.35 oz)]

Moreover, apply grease in volume of approximately 35 gr (1.23 oz) to the area shown in Figure RA-29.

Note: The drive shaft component parts are not available as separate parts.
Therefore, the drive shaft assembly should be replaced in form of an assembly, although only one component is defective.

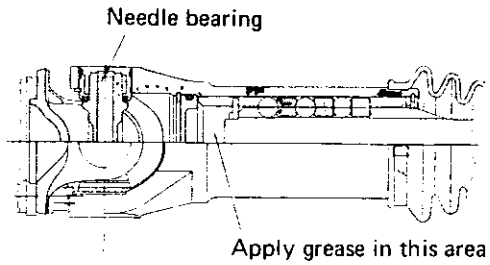


Fig. RA-29 Cross-sectional view of drive shaft

SERVICE DATA AND SPECIFICATIONS

SPECIFICATIONS FOR SPRING

Spring wire diameter	11.4 mm (0.449 in)
Spring coil diameter	100 mm (3.94 in)
Number of windings	10.65
Free height	381 mm (15.0 in)
Height when installed	225 mm (8.86 in)
Normal load	288 kg (635 lb)
Spring constant	1.85 kg/mm (103.6 lb/in)

SPECIFICATIONS FOR STRUT

Outer diameter	50.8 mm (2.000 in)
Piston rod diameter	24.945 to 24.975 mm (0.982 to 0.983 in)
Piston cylinder bore	32.020 to 32.060 mm (1.261 to 1.262 in)
Damping force at v = 0.3 m/s	
Expanding side	35 kg (77 lb)
Contracting side	20 kg (44 lb)
Piston rod	
Bend limit	0.1 mm (0.0039 in)
Wear limit	0.05 mm (0.0020 in)
Piston cylinder	
Bend limit	0.2 mm (0.0079 in)
Wear limit	0.1 mm (0.0039 in)
Strut oil manufacturer	NISSEKI shock absorber oil A-1
Volume of strut oil	320 cc (19.5 cu in)

REAR WHEEL ALIGNMENT

	With standard load*	With out load	When fully bounded	When fully rebounded
Camber	−24'	48'	−3°49'	3°19'
Tread	1,362.5 mm (53.64 in)	1,344.5 mm (52.93 in)	—	—
Toe-in	0°	0°	0°	0°

* "With standard load" means total weight of two riders or weighting 68 kg (150 lb) each.

TIGHTENING TORQUE

Drive shaft installation bolts (both wheel and gear carrier sides)	5 to 6 kg-m (36.2 to 43.4 ft-lb)
Strut installation nut	1.6 to 2.1 kg-m (11.6 to 15.2 ft-lb)
Strut rod self-lock nut	7.5 to 9.5 kg-m (54.2 to 68.7 ft-lb)
Packing gland	6.0 to 6.5 kg-m (43.4 to 47.0 ft-lb)
Rear axle bearing lock nut	25 to 33 kg-m (181 to 239 ft-lb)
Brake disc installation bolt	2.7 to 3.7 kg-m (19.5 to 26.8 ft-lb)
Brake hose (line) clamp nut	0.54 to 0.74 kg-m (3.9 to 5.4 ft-lb)
Wheel nut	8 to 9 kg-m (57.8 to 65.1 ft-lb)
Bearing housing spindle lock bolt	1.0 to 1.2 kg-m (7.2 to 8.7 ft-lb)
Transverse link outer self-lock nut	7.5 to 9.5 kg-m (54.2 to 68.7 ft-lb)
Transverse link inner bolt	14 to 16 kg-m (101 to 116 ft-lb)
Rear link mount bracket installation bolt	3.2 to 4.3 kg-m (23.1 to 31.1 ft-lb)
Front differential mount member installation bolt	3.2 to 4.3 kg-m (23.1 to 31.1 ft-lb)
Front differential mount member and front differential mount insulation insulator nut	3.2 to 4.3 kg-m (23.1 to 31.1 ft-lb)
Gear carrier and differential mount front insulator installation nut	6.0 to 8.0 kg-m (43.4 to 57.8 ft-lb)
Belt fitting self-lock nut	11.3 to 13.8 kg-m (82 to 100 ft-lb)
Belt fitting bracket installation bolt	3.2 to 4.3 kg-m (23.1 to 31.1 ft-lb)
Rear differential mount member installation nut	7.5 to 9.5 kg-m (54.2 to 68.7 ft-lb)
Rear differential mount insulator installation nut	7.5 to 9.5 kg-m (54.2 to 68.7 ft-lb)
Transverse link mounting brace installation bolt	3.2 to 4.3 kg-m (23.1 to 31.1 ft-lb)
Propeller shaft and differential companion flange installation nut	1.6 to 2.4 kg-m (11.6 to 17.4 ft-lb)

TROUBLE DIAGNOSES AND CORRECTIONS

Troubles	Possible causes	Corrective action
Noise (Unusual sound) It is difficult to definitely identify noise (unusual sound) of the rear axle from other noises (unusual sounds) generated from the differential carrier and propeller shaft. However, when unusual sound occurs, make sure that it comes from the rear axle.	1) Loose joint	Retighten.
	2) Unbalanced tires	Adjust.
	3) Insufficient lubrication, improper adjustment, worn, or damaged wheel bearing	Lubricate, adjust, or replace.
	4) Damaged transverse link rubber bushing	Replace.
	5) Defective shock absorber (in strut)	Replace.
	6) Damaged differential mount insulator	Replace.
	7) Damaged universal joint	Replace.
	8) Worn or seized drive shaft ball spline	Replace.
	9) Broken coil spring	Replace.
Unstable running This trouble is also related to the front suspension. When diagnoses trouble, refer to the paragraph covering the front suspension, also.	1) Loose wheel nut(s)	Retighten.
	2) Damaged transverse link bushing	Replace.
	3) Reduced shock absorber damping force	Replace.
	4) Seized or damaged drive shaft ball spline	Replace.
	5) Weakened spring	Replace.
Oil Leaking	1) Damaged drive shaft dust cover	Disassemble, clean, and reassemble, or replace the dust cover with new one.
	2) Worn or damaged rear axle shaft grease seal	Replace.

SERVICE JOURNAL OR BULLETIN REFERENCE

DATE	JOURNAL or BULLETIN No.	PAGE No.	SUBJECT

SERVICE JOURNAL OR BULLETIN REFERENCE

DATE	JOURNAL or BULLETIN No.	PAGE No.	SUBJECT

DATSUN 240Z SPORTS
MODEL S30 SERIES

CHASSIS & BODY

NISSAN

NISSAN MOTOR CO., LTD.
TOKYO, JAPAN

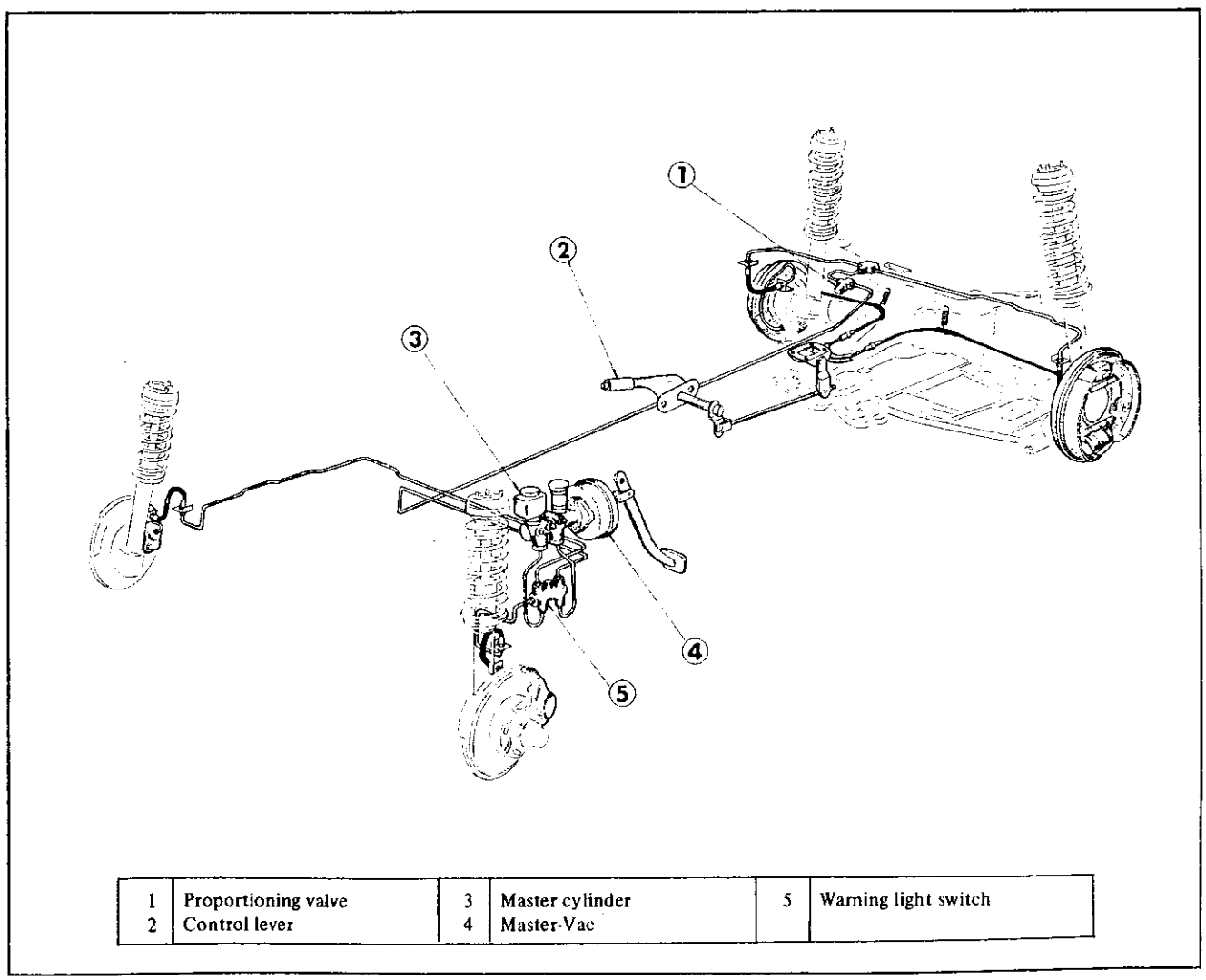
SECTION BR

BRAKE

BR

BRAKE SYSTEM

CONTENTS



1	Proportioning valve	3	Master cylinder	5	Warning light switch
2	Control lever	4	Master-Vac		

Fig. BR-1 Brake system

DESCRIRTION

The S30 series vehicles is installing disc brake for front, drum brake for rear, and a six inch master-vac. to get great braking force.

The front disc brake is Girling-Sumitomo model S-16, and the pad is operated with two pistons.

The leading-trailing type rear drum brake is equipped with auto-adjuster, and in order to get enough cooling effect, aluminum finned brake drums are used.

Moreover, the brake system is equipped with a proportioning valve to prevent skid due to early rear wheel locking.

The hand brake is of a mechanical type, which brakes rear wheels, and is operated by the control lever through linkage and wire.

The control lever is located in the seat side center, and is operated easily. The hand brake force satisfies the MVSS sufficiently, and it may also be used as an emergency brake.

BRAKE PEDAL

The brake pedal is installed on the bracket which also supports the steering column, and the bracket is secured on the dash panel together with the master cylinder. The stop lamp switch is installed on the pedal bracket, and is operated by pedal arm.

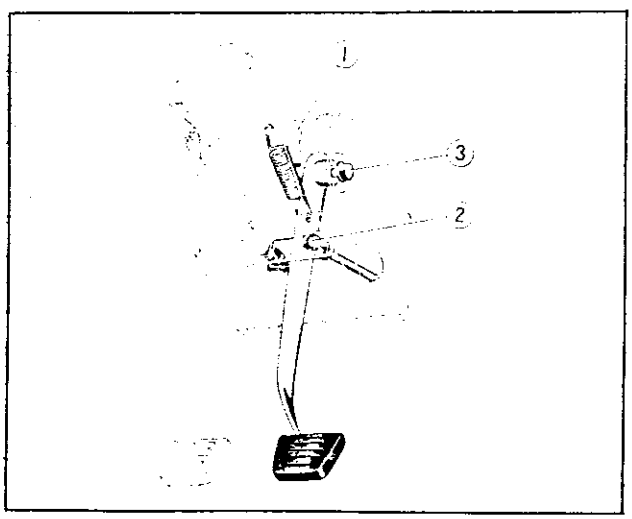


Fig. BR-2 Brake pedal mounting

Removal

1. Remove the return spring ①.

2. Remove the clevis pin ② from the push rod, and separate the pedal from the master vac.

3. Remove the fulcrum pin ③ and remove the pedal.

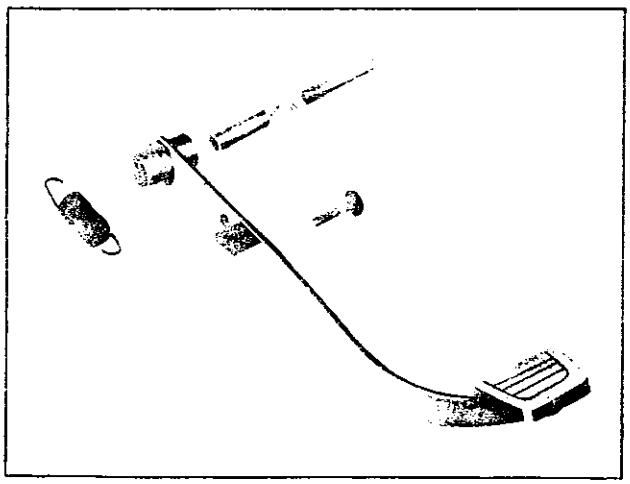


Fig. BR-3 Brake pedal components

Inspection

Check the brake pedal for the following items, and correct or replace if required.

1. Pedal bushing and sleeve for wear, deformation, and/or damage.

2. Pedal arm for twisting, bending, and/or cracking.

Reinstallation

Install the brake pedal in reverse sequence of removal, noting following matters.

1. Be sure to fill the pedal shaft sleeve unit and clevis pin unit with multipurpose grease (MIL G-2108 or G-10924)sufficiently.

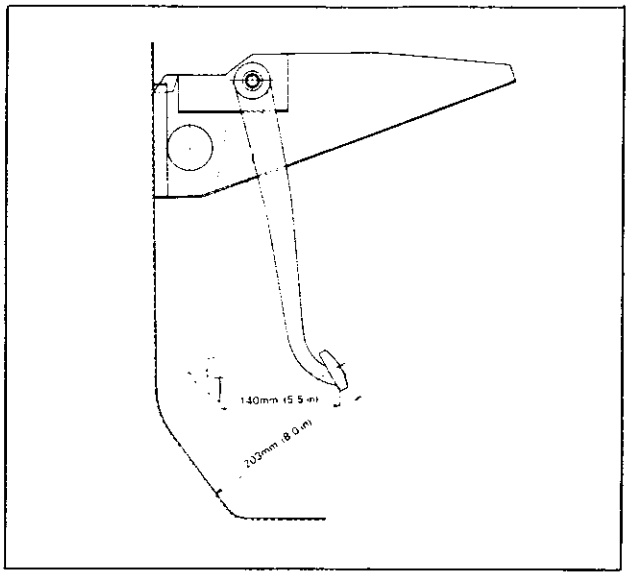
2. Be sure to tighten the fulcrum pin under tightening torque of 3.5 to 4.0 kg-m (25.3 to 28.9 ft-lb).

ADJUSTMENT

Adjusting brake pedal

1. Loosen the lock nut, turn the push rod clevis, and adjust push rod length properly so that height of pedal pad upper surface is 206 mm (8.11 in) with the pedal stopper non-effected.

2. Next, turn back the stopper, and depress the pedal so that pedal pad height is reduced from 206 mm (8.11 in) to 203 mm (7.99 in).



Note: Install the stop lamp switch so that the installation screw end surface is flush against the bracket.

Fig. BR-4 Adjusting brake pedal

MASTER CYLINDER

The brake system adopts a tandem type master cylinder. Even the front or rear hydraulic circuit falls into a trouble, sufficient braking force can be obtained by another. For the front wheels, the disc brake is used, and thus, a large capacity reservoir is used.

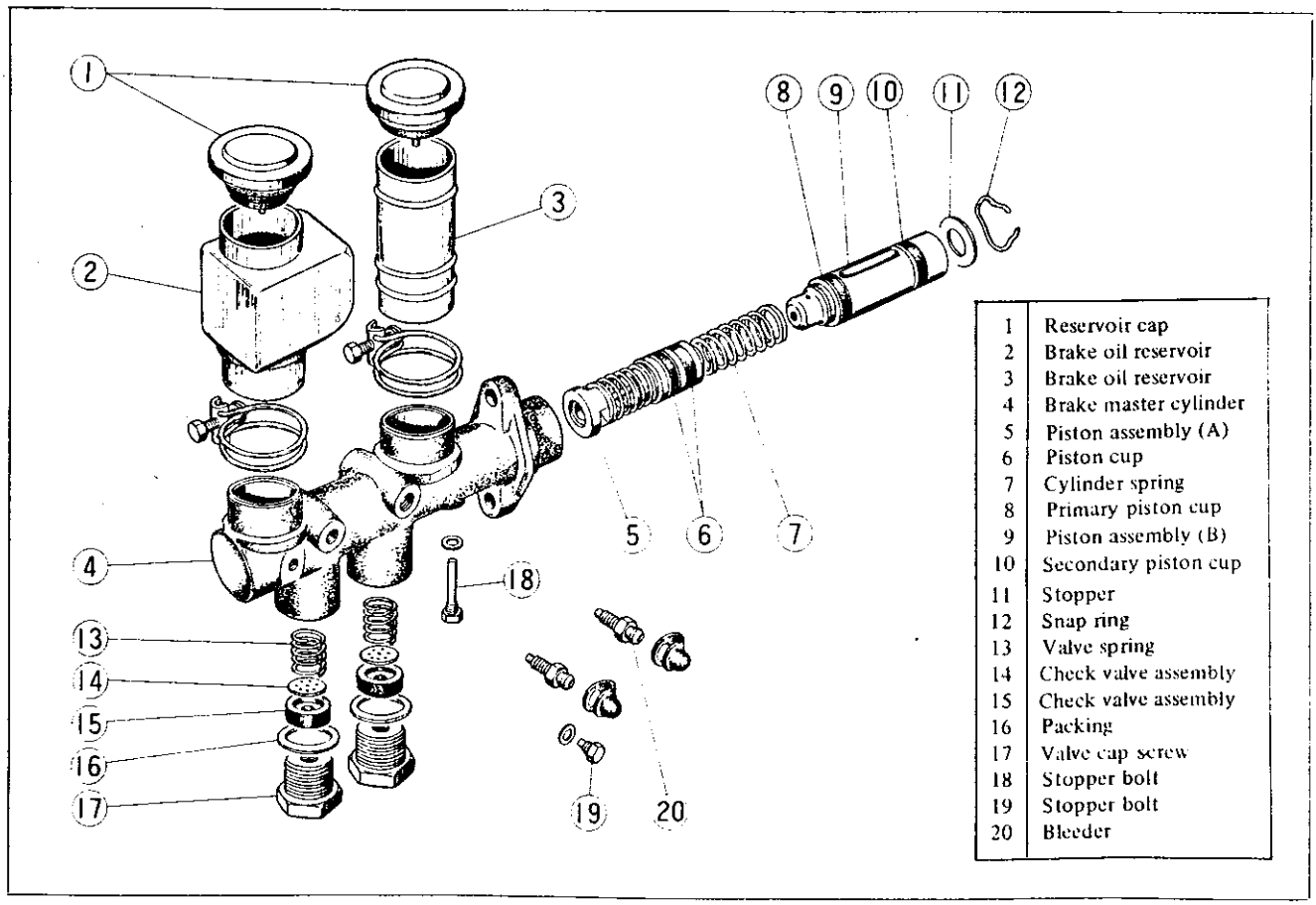


Fig. BR-5 Master cylinder

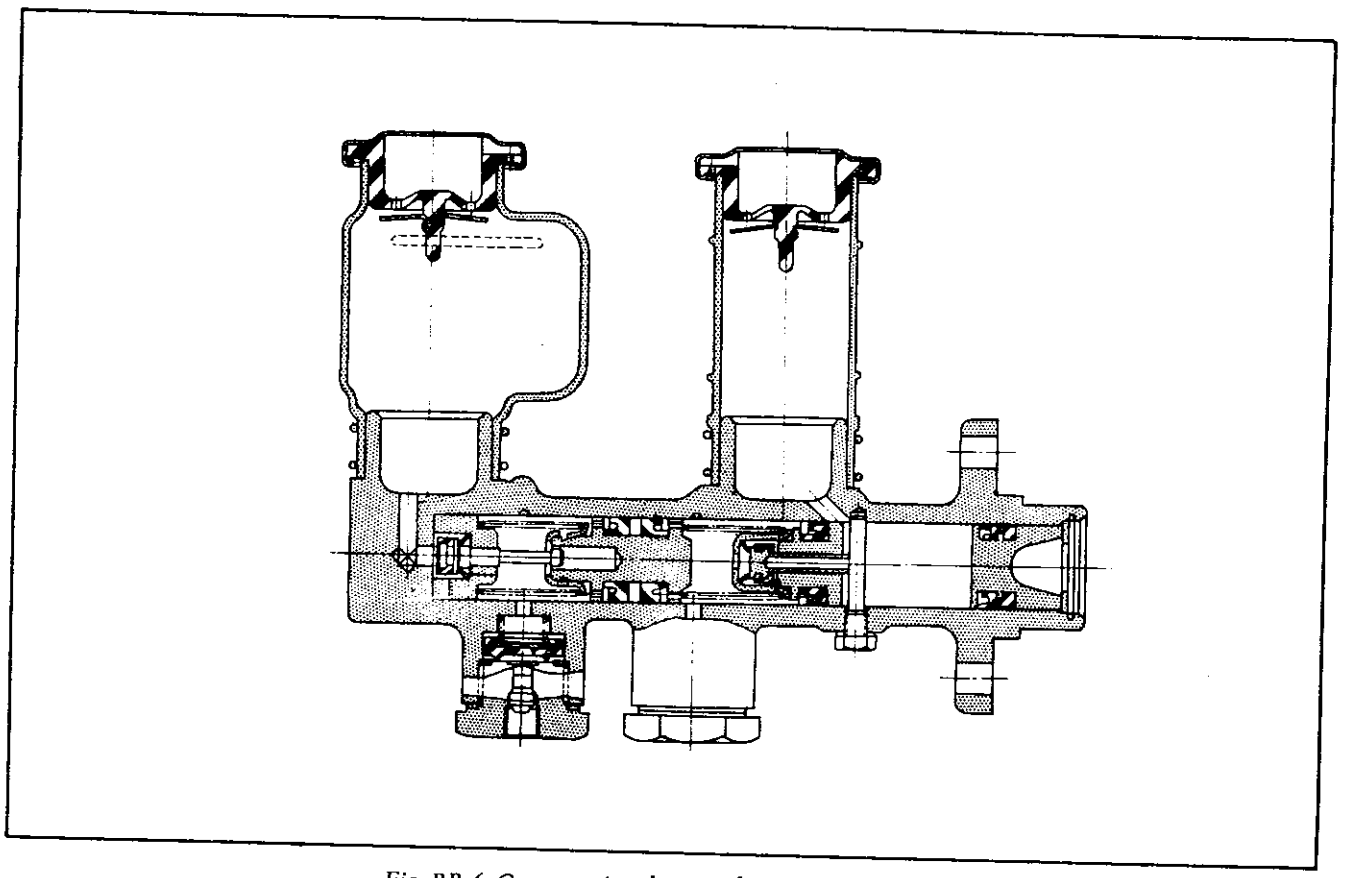


Fig. BR-6 Cross-sectional view of master cylinder

Removal

1. Disconnect the brake tubes from the master cylinder.

2. Remove the master cylinder installation nuts, and remove the master cylinder from the master vac.

Disassembly (Parts number refer to Figure BR-5)

1. Drain brake fluid, and remove stopper bolts ⑱ and ⑲.

2. Remove the snap ring ⑫, and remove the primary piston assembly, secondary piston assembly, and other parts.

3. Remove the valve cap screw ⑰, and remove the check valve.

Note: Disassemble the master cylinder carefully so that the sliding surface of the piston and piston cup are not damaged. Do not remove the fluid reservoir unless really necessary. Moreover, do not remove the piston cup unless the piston is replaced.

Inspection

Thoroughly clean all disassembled parts, check for wear, damage, and other defective conditions, and replace if necessary.

Note: Do not clean rubber parts with mineral oil since they are deteriorated. Use brake fluid or alcohol. When alcohol is used, however, do not immerse rubber parts under alcohol longer than 30 seconds. After the parts are cleaned, dry them with compressed air.

1. Check the cylinder and piston for damage and uneven wear on the sliding surface and for other defective conditions. Replace as required.

2. Replace, if the cylinder and piston clearance is more than 0.15 mm (0.006 in).

3. In principle replace the piston cup, packing and valves with new ones whenever the master cylinder is disassembled. Be sure to replace, if damaged, worn, weakened, or expanded.

4. Check the return springs for wear, damage and other defective conditions, and replace as required.

Primary side return spring: Standard values: (Free length x Installing load - Length)

5. Replace others, if deformed, damaged, or defective.

Reassembly

Assemble the master cylinder in reverse sequence of disassembly, noting the following matters.

Apply brake fluid to the component parts such as cylinder bore, piston, etc., and install carefully so as not to damage them. Moreover, for rubber parts such as piston cup, etc., apply rubber grease slightly.

Tightening torque

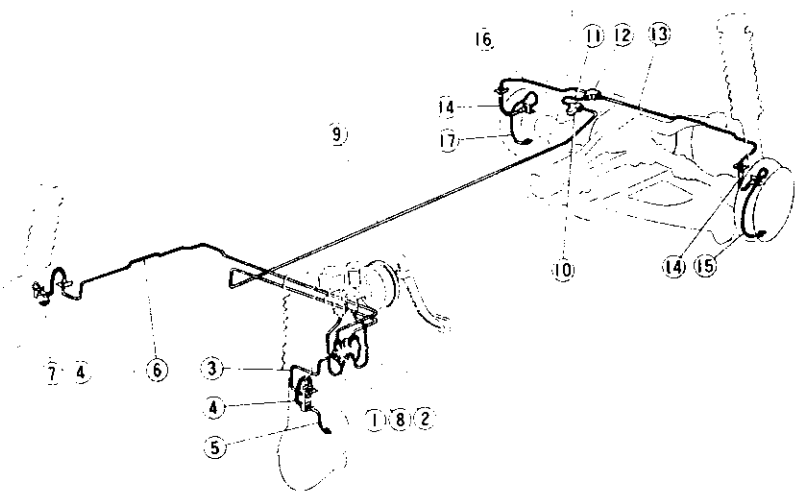
- Stopper screw
  0.4 to 0.5 kg-m (2.7 to 3.6 ft-lb)
- Valve cap
  8 to 9 kg-m (5.8 to 6.5 ft-lb)

Reinstallation

Reinstall the master cylinder in reverse sequence of removal. After air bleeding, make sure that no brake fluid leaks from the circuit. For the pedal height adjustment, refer to the paragraph pedal adjustment.

BRAKE LINE

The brake lines branched from the tandem type master cylinder are extended to the front and rear wheels, forming independent hydraulic circuits. An indicator switch is equipped for trouble alarming in brake line. In addition, the rear wheel side circuit is equipped with the proportioning valve in front of the 3-way connector so as to protect the rear wheels from locking during rapid braking. The brake line is a galvanized double-layer steel tube.



1	Brake tube A	7	Brake tube F	13	Brake tube I
2	Brake tube B	8	Warning light switch	14	Pressure hose
3	Brake tube C	9	Brake tube G	15	Brake tube J
4	Pressure hose	10	Proportioning valve	16	Brake tube K
5	Brake tube D	11	Brake tube H	17	Brake tube L
6	Brake tube E	12	3-way connector		

Fig. BR-7 Brake line

Check the brake lines (tubes and hoses) for crack and/or damage, and replace, if defective. When brake fluid leaks from the joint, retighten or replace.

Pay attention on the following matters when installing brake lines.

1. Provide a sufficient space between the brake lines and other parts so that the brake lines are not interfered with other parts due to vibration during driving.

2. Be careful not to warp or twist the brake hose, and particularly be careful not to interfence the brake hose to tires and suspension components.

3. Do not tighten the brake line installation flare nut forcedly or excessively.

4. Upon completion of the brake line installation, be sure to bleed the air.

PROPORTIONING VALVE

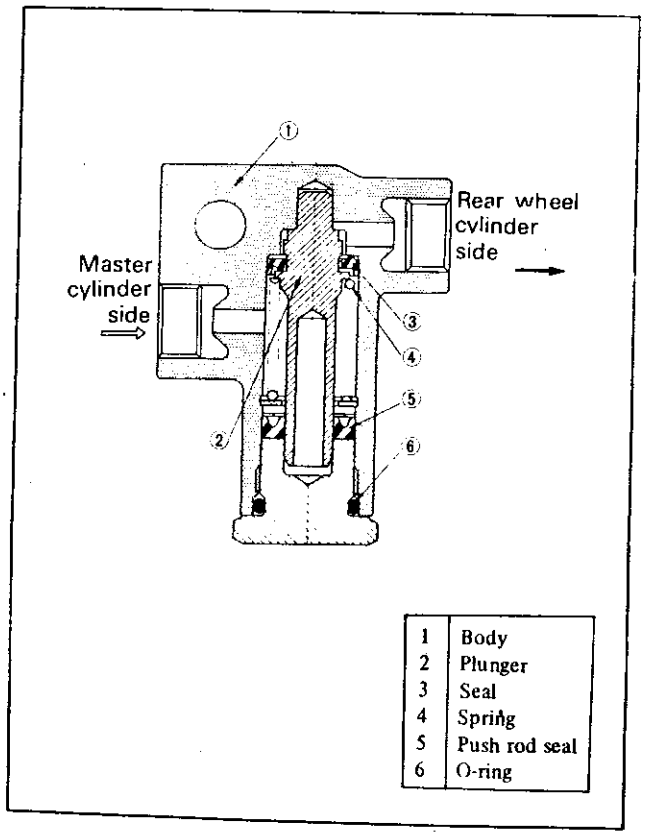


Fig. BR-8 Cross-sectional view of proportioning valve

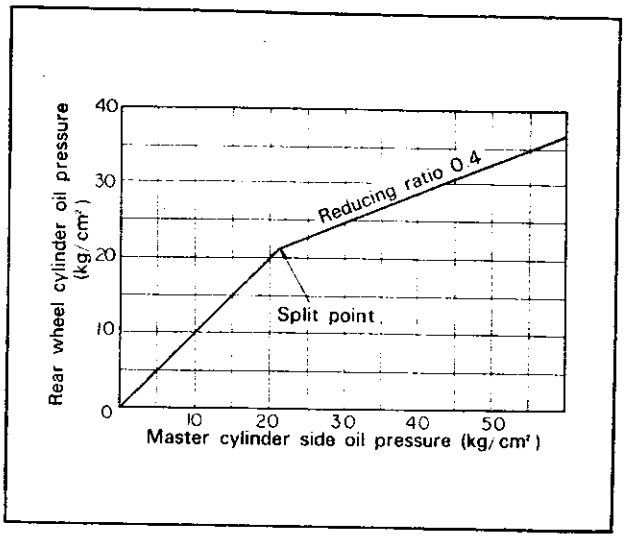


Fig. BR-9 Performance curve

Operation

1. When pressure is applied (under split point)

P_1; Master cylinder oil pressure
P_2; Rear wheel cylinder oil pressure
A_1; Cross-sectional area of diameter D_1
A_2; Cross-sectional area of diameter D_2
F; Spring and friction forces

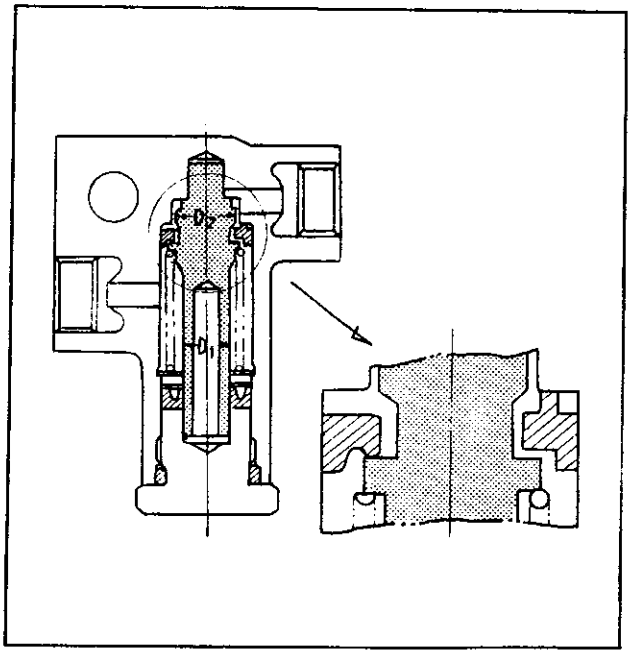


Fig. BR-10 Plunger and seal operation when pressure is applied (under split point)

The plunger is depressed downward by force of $P_1 \times A_1$, passage of seal is opened until it overcomes spring

force F, and hence, oil pressure in the master cylinder side is balanced with that in the rear wheel cylinder side.

$$P_1 = P_2 \quad \ldots\ldots (1)$$

Consequently, oil pressure at the split point is expressed as follows:

$$P_s = F/A_1 \quad \ldots\ldots (2)$$

2. When pressure is applied (over split point)

When oil pressure rises to split point, the plunger lowers, and the circuit is sealed at "C" periphery. When oil pressure further rises, the plunger rises, the seal is released, the plunger finely rises and lowers so that pressures are balanced under the following equation, and thus, seal opening and closing are repeated.

$$P_2 \times A_2 = P_1(A_2 - A_1) + F \quad \ldots\ldots (3)$$

As the result, rear wheel cylinder side oil pressure rises in a ratio lower than that in the master cylinder side (reducing ratio).

$$\text{Reducing ratio} = \frac{A_2 - A_1}{A_2}$$

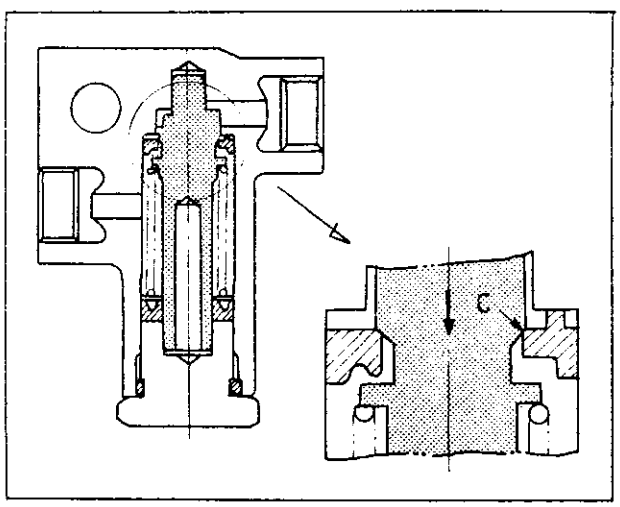


Fig. BR-11 Plunger and seal operation when pressure is applied (over split point)

3. When releasing

When master cylinder side oil pressure is reduced, the plunger drops to contact the stopper [refer to Figure BR-12(a)] depressing oil seal down.

And keeping balance of equation (3) the wheel cylinder side pressure is reduced also. But on this situation the wheel cylinder side pressure drops no more.

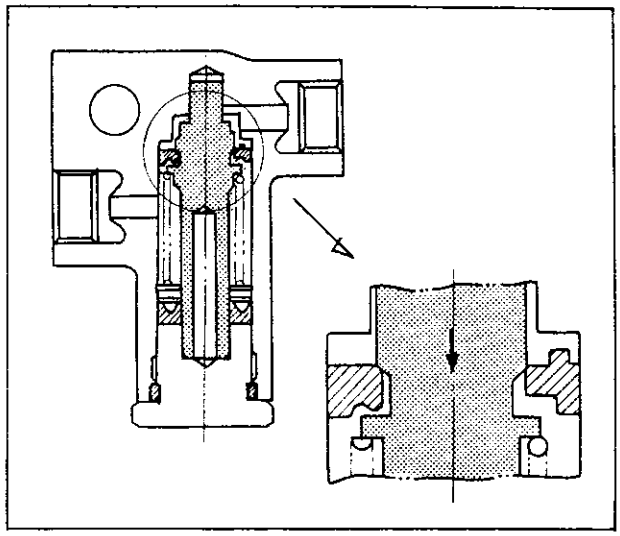


Fig. BR-12(a) Plunger and seal operation when releasing

Further being reduced master cylinder side pressure lower than the rear wheel cylinder side, the seal drops some more [refer to Figure BR-12(b)], and keeping balance of equation (1) the wheel cylinder side pressure is reduced also.

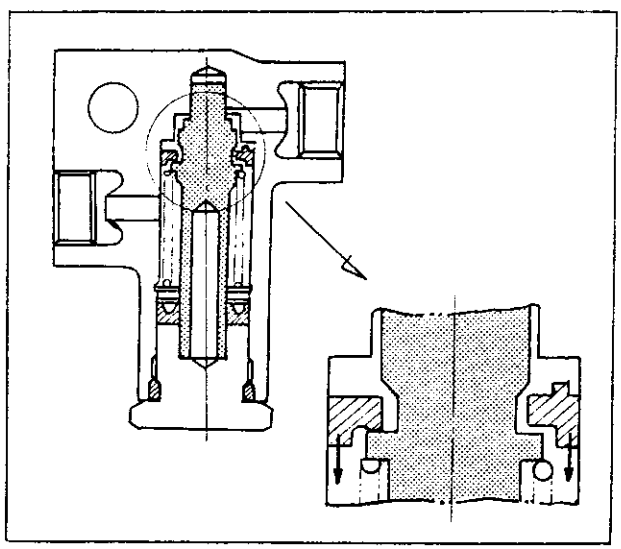


Fig. BR-12(b) Plunger and seal operation when releasing

When pressure further drops down to the split point, the plunger is pushed up by spring force, the condition recovers to the original condition, and with the balance of equation (1) being maintained, oil pressure drops. (refer to Figure BR-10)

Inspection

Inspect the proportioning valve every two years or 50,000 km (30,000 miles) in accordance with the following instruction, and replace the valve as an assembly.

With the vehicle loaded with one person (driver), drive the vehicle on dry concrete road, and rapidly brake at vehicle speed of 50 km/h (31 MPH).

1. The proportioning valve is serviceable (normal) when front and rear wheels are locked simultaneously or front wheels are locked first.

2. Proportioning valve is faulty if the rear wheels are locked before the front wheels.

Removal and reinstallation

The proportioning valve can be removed easily by removing the installation bolts. When reinstalling, however, note the following matters:

1. Appearance of proportioning valve for S30 series is the same as 510, C30 series vehicles. However, the performance differs. Be careful not to mix up.

Note: Proportioning valve for S30 indicates the part No. E4100 on it by means of stamping.

2. When installing the brake line, be sure to face the mark "M" to the master vac side and "R" to the rear brake side.

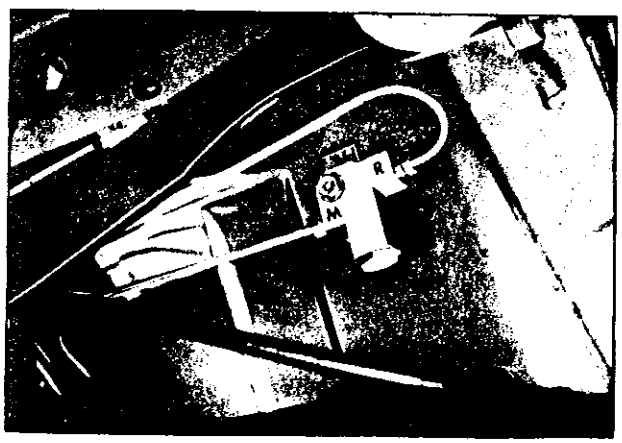


Fig. BR-13 Proportioning valve

BRAKE LINE PRESSURE DIFFERENTIAL WARNING LIGHT SWITCH

A warning light is located on the instrument panel to warn the driver when a pressure difference of 13 to 17 kg-cm² (185 to 242 lb/sq in) exists between the front and rear brake systems.

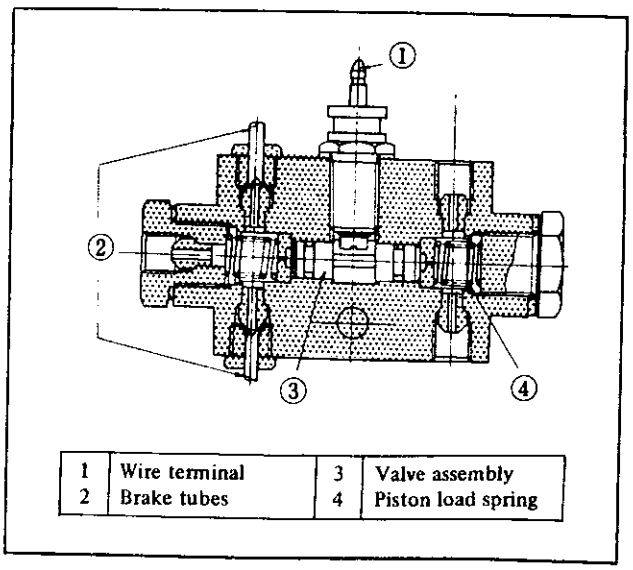
A hydraulically actuated warning light switch is positioned in the engine compartment. Both front and rear brake systems are connected to this switch assembly.

When a pressure difference of 13 to 17 kg/cm² (185 to 242 lb/sq in) occurs between the front and rear brake systems, the valves will shuttle toward the side with the low pressure. The valve contacts with the switch terminal and the ground circuit for the warning light is completed, thus the warning light lights.

The hydraulic brake problem must then be corrected and bleed the brakes.

Check the warning light switch assembly for a proper operation. Check the switch assembly for fluid leakage.

DO NOT ATTEMPT TO REPAIR SWITCH FOR ANY REASON: REPLACE COMPLETE SWITCH ASSEMBLY.



1	Wire terminal	3	Valve assembly
2	Brake tubes	4	Piston load spring

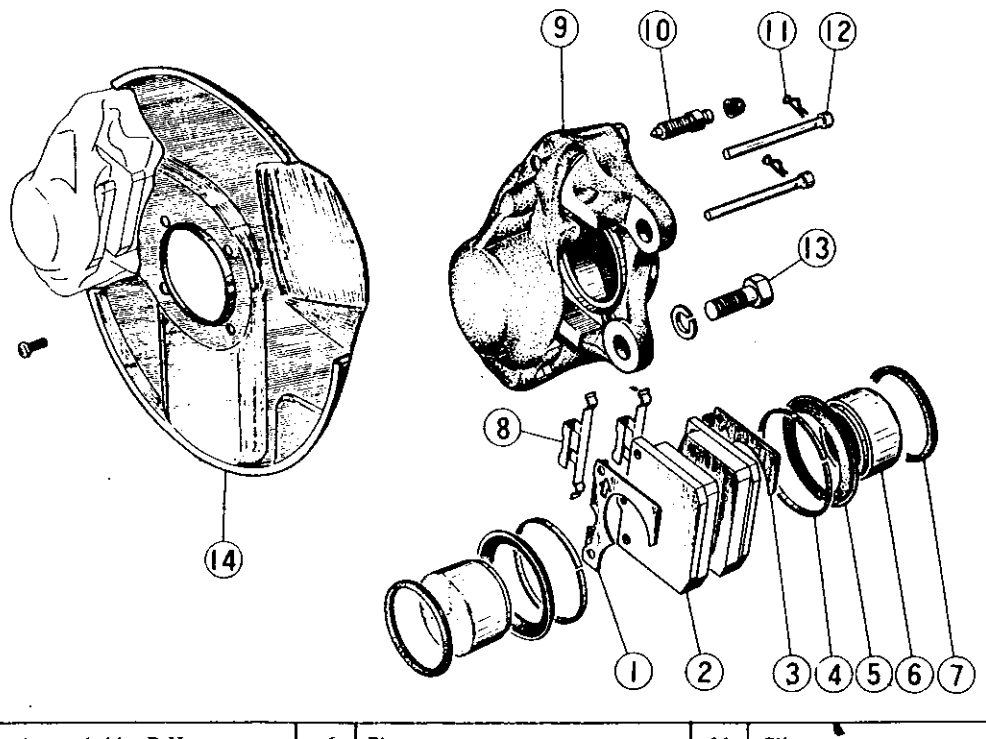
Fig. BR-14 Sectional view of warning light switch

FRONT DISC BRAKE

CONTENTS

Girling-Sumitomo Model S-16 disc brake is used. Rigidity of the caliper is high, brake pedal feeling is adequate, and the pad dragging is minimized. The pad is returned by elasticity of the piston seal. When the pad is worn, the piston operating stroke increases, slipping occurs on the piston seal surface, and thus, clearance is adjusted automatically.

Moreover, in order to prevent brake squealing, a shim is inserted behind the pad.



1	Anti squeal shim R.H	6	Piston	11	Clip
2	Pad	7	Piston seal	12	Retaining pin
3	Anti squeal shim L.H	8	Anti squeal spring	13	Caliper fixing bolt
4	Retaining ring	9	Caliper assembly	14	Baffle plate
5	Dust cover	10	Bleeder		

Fig. BR-15 Front disc brake

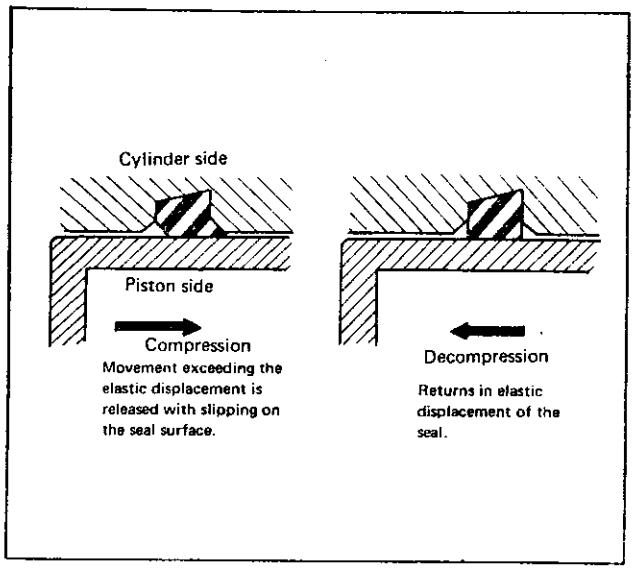


Fig. BR-16 Piston seal automatic adjusting operation

REPLACING PAD

Removal

1. Jack up the front side of the vehicle, and remove the wheel.

2. Remove the clip ①, retaining pin ②, and anti-squeal spring ③, and remove the pad ④ together with the shim.

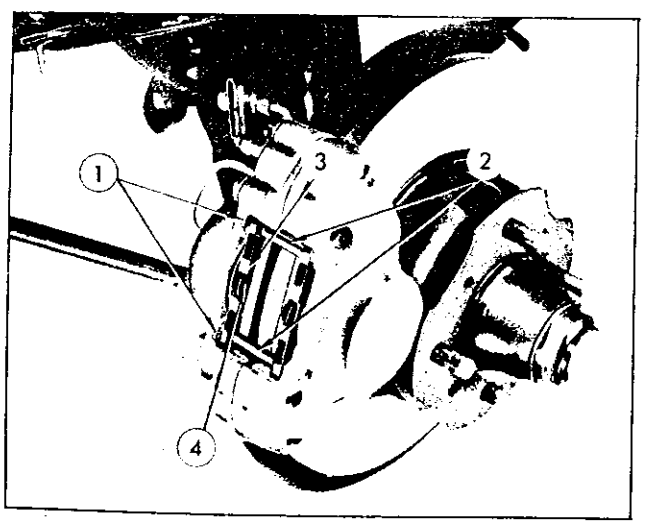


Fig. BR-17 Removing pad

Inspection

1. Clean the pad with carbon tetrachloride or gasoline.

2. When oil and/or grease is heavily sticked on the pad, or when deteriorated or deformed due to overheating, replace the pad with a new one.

3. When thickness of the friction material is less than 2 mm (0.0315 in), replace. (Replace, when total pad thickness is less than 7.5 mm (0.2953 in).

Note: Recommend pads be replaced as a set. Replacement at only one position may cause uneven brake effect. Recommend rotation of pads be made periodically.

Reinstallation

1. Clean the calipers and piston pad installing parts.

Note: Do not use mineral oil. Be careful not to apply oil on the rotor.

2. Depress the piston into the cylinder so that new pad can be installed.

Note: Note that brake fluid may overflow from the reservoir. Recommend operation be carried out by loosening the breather to release brake fluid.

3. Install pad and anti-squeal shim, assemble the anti-squeal spring and retaining pin, and secure them with clip.

Note: Install the shim so that the arrow mark is met the rotor forward rotating direction.

4. When the pad is installed, depress the brake pedal several times so as to settle down the pad in its position.

REPLACING PISTON SEAL

If brake fluid leaks from the piston unit or pad does not return properly, replace the piston seal with new one in accordance with the following instructions. It should be noted that the components should be maintained under clean state while disassembling.

Removal

1. Remove the pad.

2. Disconnect the brake line ① and caliper installation

bolt ②, and remove the caliper assembly from the knuckle spindle.

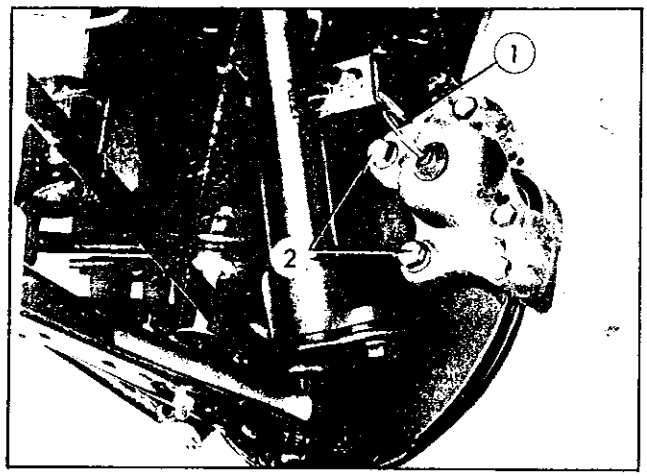


Fig. BR-18 Removing calipers

Disassembly

1. Remove mud and dust from the caliper assembly before disassembly.

2. Remove the retaining ring ① and dust seal ② in that order. (Refer to Figure BR-15.)

3. Hold piston in one side with finger, feed air from the brake line joint, and remove the other piston.

4. Remove the piston seal from the cylinder, and clean inside.

Note: Remove the piston seal carefully with finger so that the cylinder wall is not damaged.

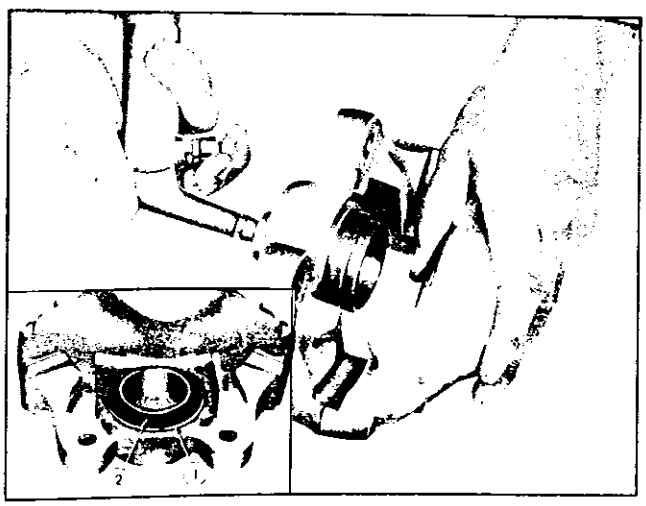


Fig. BR-19 Removing piston

Inspection

Thoroughly clean all disassembled parts, and check them for the following items.

Note: When cleaning rubber parts, use alcohol or brake fluid. If rubber parts are cleaned with mineral oil, they will be deteriorated.

1. Calipers

If the cylinder wall is damaged or worn, replace. If the cylinder wall is rusted or foreign matters are accumulated on the cylinder wall, carefully polish with fine emery paper so that the cylinder wall is not damaged. If rusted or roughened excessively, replace.

2. Pad

See paragraph covering replacement of pad.

3. Piston

Replace, if unevenly worn, damaged, and/or rusted.

Note: The piston sliding surface is plated. Thus, although rusted or foreign matters are sticked on the sliding surface, do not use emery paper.

4. Seals

Primarily, replace both piston and dust seals whenever overhauling.

Note: The piston seal affects not only leaking but also piston return. For this reason, replace although damage is minor.

Reassembly

1. Install the piston seal carefully so that the seal is not damaged.

Note: Be sure to apply rubber grease to the piston seal before installing.

2. Install dust seal on the piston, and the piston into the cylinder. Clamp the dust seal with the retaining ring.

Note: When inserting the piston, apply brake fluid to the piston sliding unit.

3. After reassembly is completely accomplished on one cylinder, assemble the another side in the same manner.

Reinstallation

Reinstallation is reverse sequence of removal. After the pad is installed completely, bleed the hydraulic line.

Tightening torque

Caliper attaching bolt
7.3 to 9.9 kg-m (53 to 71 ft-lb)

DISASSEMBLING CALIPERS

Do not remove the bridge bolt.

If brake fluid leaks from the bridge seal, replace a new assembly: **(Be sure to replace the calipers as an assembly.)**

INSPECTING ROTOR

Remove the caliper assembly, check the rotor for deflection and damage, and correct or replace as required.

1. **Deflection**

With the wheel bearing adjusted correctly, measure deflection at the center of rotor pad contact surface using dial gauge.

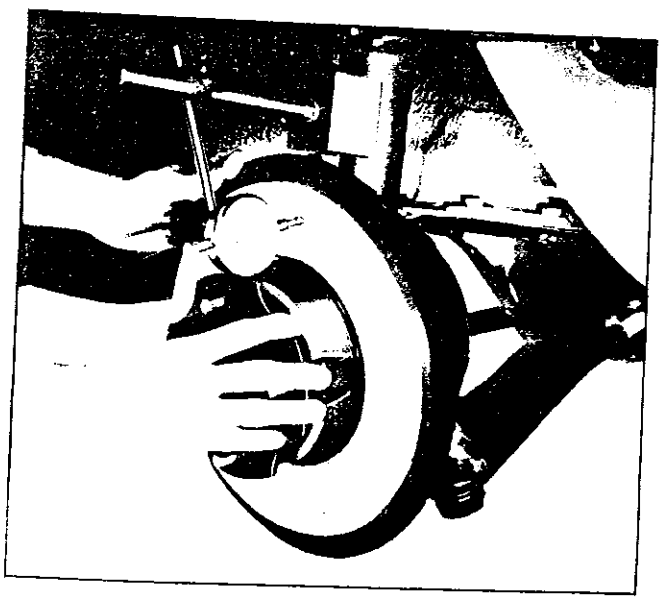


Fig. BR-20 Measuring deflection

Deflection

Total deflection:
Less than 0.15 mm (0.0059 in)
Usage limit 0.2 mm (0.0079 in)

2. **Parallelism**

Measure thickness toward the entire periphery on the same circumference using a micrometer.

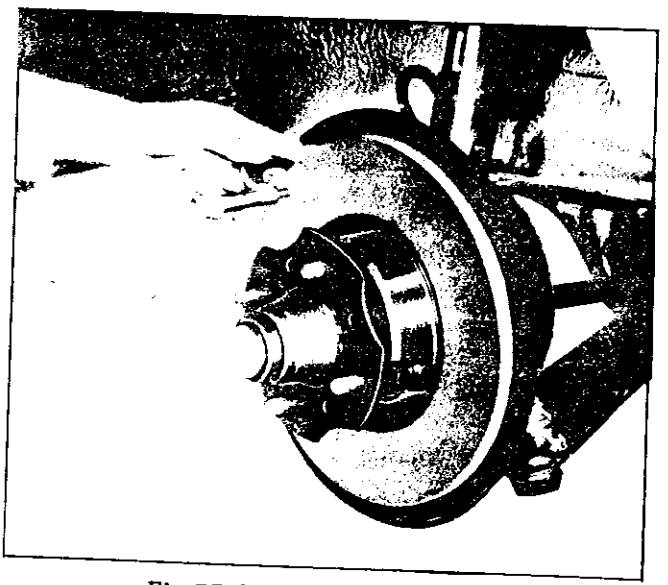


Fig. BR-21 Measuring parallelism

Parallelism (when new):
Less than 0.03 mm (0.0012 in)
Usage limit 0.07 mm (0.0028 in)

3. **Thickness**

If the rotor thickness in out of limit, replace. When correcting thickness, be sure that the thickness after correction does not exceed the limit.

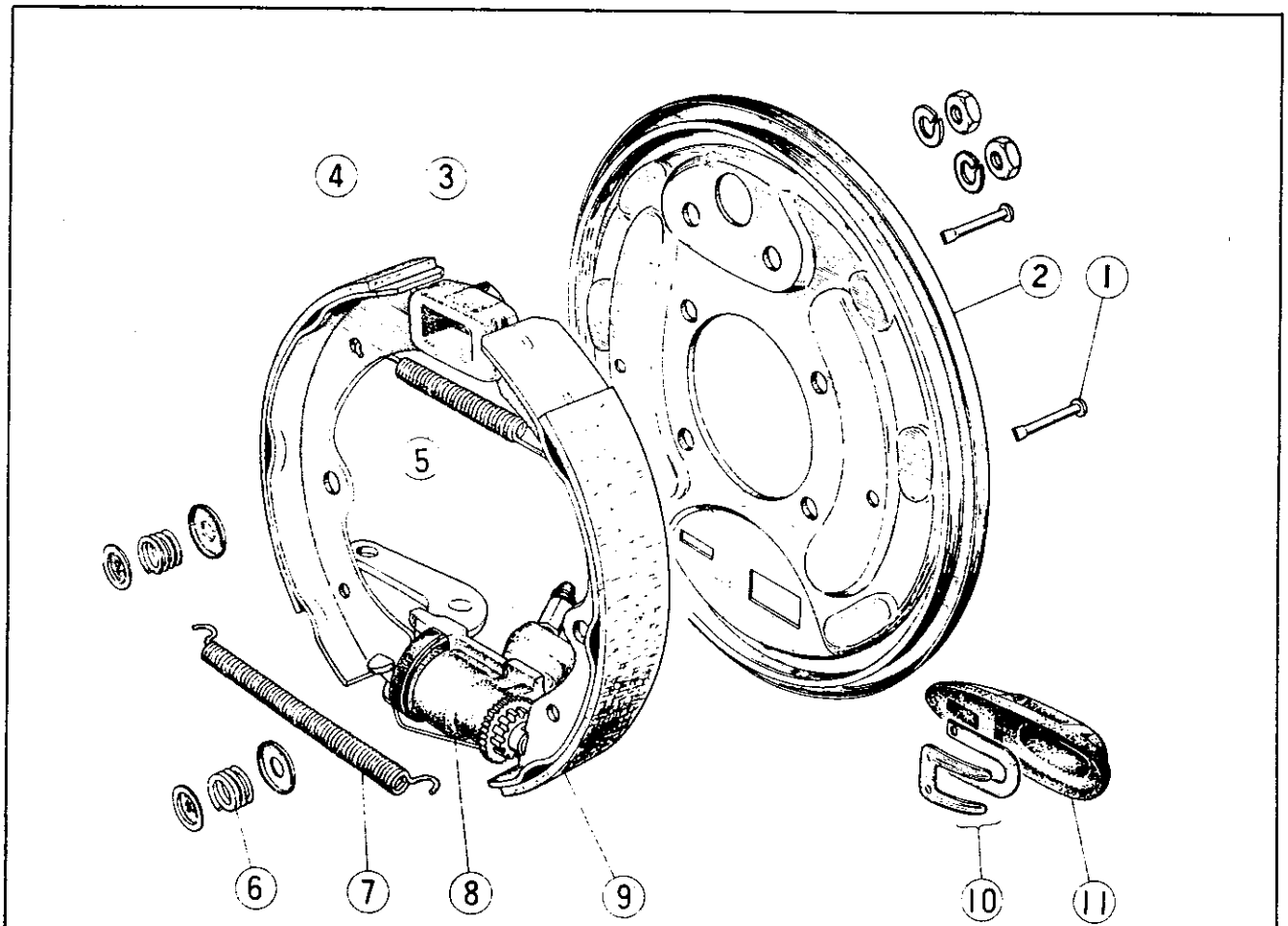
Standard thickness: 12.5 mm (0.492 in)
Wear limit: 10.5 mm (0.413 in)

ADJUSTING FRONT BRAKE

Ordinarily, adjustment is not required because clearance between pad and rotor is adjusted automatically by elasticity of the piston seal.

REAR BRAKE

CONTENTS



1	Anti-rattle pin	5	Return spring	9	Fore shoe assembly
2	Brake disc	6	Anti-rattle spring	10	Retaining shim
3	Anchor block	7	Return spring	11	Dust cover
4	After shoe assembly	8	Wheel cylinder		

Fig. BR-22 Rear brake

The leading-trailing system rear brake adopts sliding system cylinder. When the hand brake is operated, the wheel cylinder lever turns the adjust wheel, and thus, clearance between the brake shoe and brake drum is adjusted automatically.

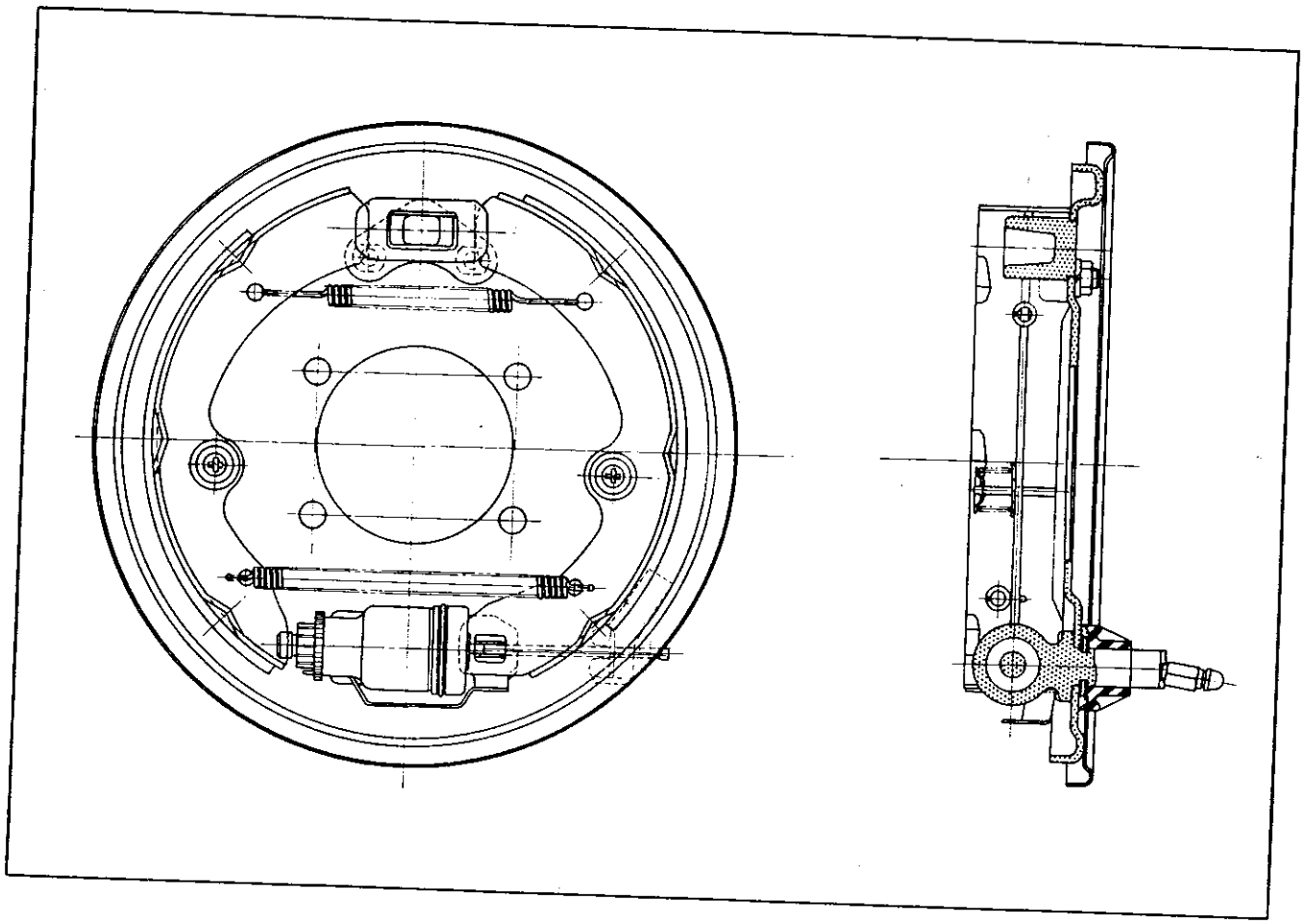


Fig. BR-23 Sectional view of rear brake

REPLACING BRAKE SHOE

Removal

1. Jack up the vehicle, support it with a stand, and remove the tire.

2. Remove the brake drum. When it is hard to remove the brake drum, the following instructions apply.

(1) Remove the clevis pin (indicated by arrow mark) from the wheel cylinder lever, and disconnect the hand brake wire.

(2) Remove the brake drum adjust hole plug, and remove the adjust lever from the adjust wheel with a screwdriver.

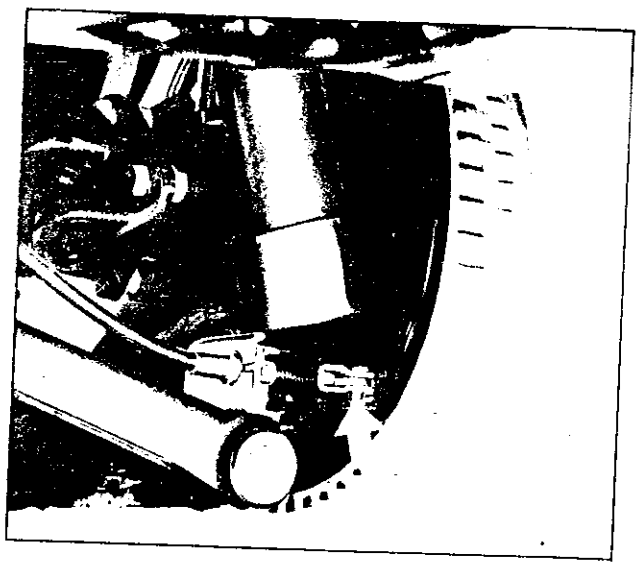


Fig. BR-24 Removing hand brake wire

(3) Turn the adjust wheel downward with a screwdriver, loosen the brake shoe, and remove the brake drum.

3. Remove the anti-rattling spring, and remove the brake shoe together with.

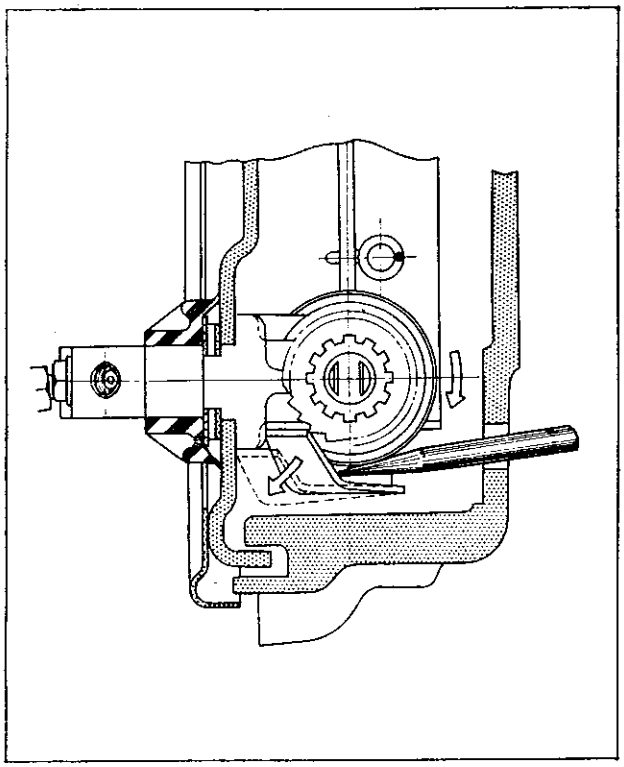


Fig. BR-25 Adjust wheel

Reinstallation

Before installing the brake shoe, check the wheel cylinder for operating and sliding condition, and disassemble and adjust it operation is faulty. For the details, see the paragraph covering disassembly. When replacing the brake shoe lining, be sure to match the new brake shoe lining with the mark on the brake shoe.

1. Apply brake grease to the adjust wheel, and threaded portion and sliding portion (indicated by arrow mark) of the adjust screw sufficiently.

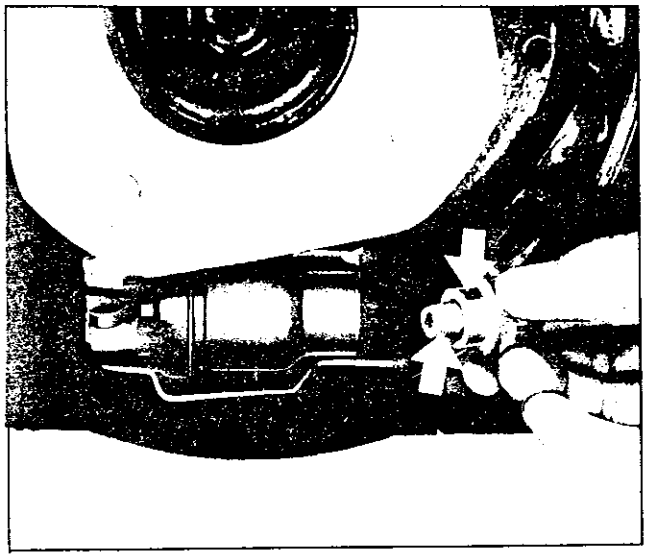


Fig. BR-26 Adjust wheel

2. Apply brake grease to the brake disc, anchor block, and wheel cylinder sliding portions (indicated by arrow marks).

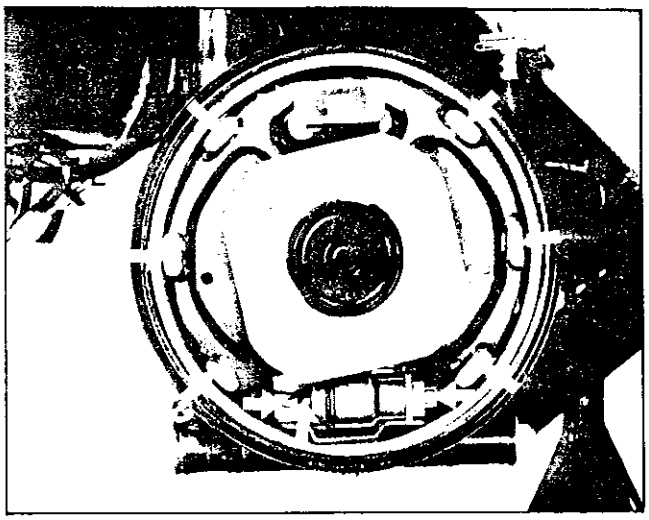


Fig. BR-27 Applying brake grease

3. Install the brake shoe, return spring, and anti-rattling spirng.

Note: Be careful not to allow grease sticking on the brake shoe lining.

4. Install the brake drum, insert a screwdriver from the adjust hole, turn the adjust wheel upward, and lightly apply the brake shoe to the brake drum.

5. Reconnect the hand brake wire to the wheel cylinder lever, pull the hand lever several times, and with the automatic adjusting operation, adjust the brake shoe and brake drum clearance.

Note: Cotinue the adjustment until click is eliminated from the adjust wheel claw.

6. Install the adjust hole plug. Depress the plug head in the center powerfully and make sure that the lip has been fitted completely.

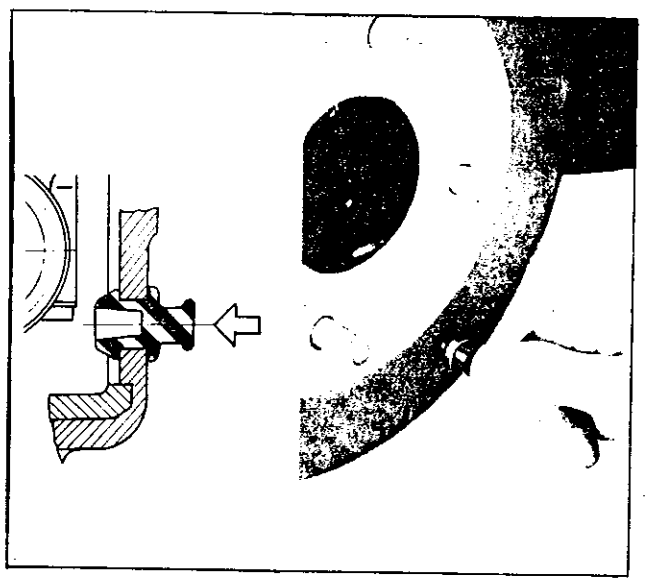


Fig. BR-28 Adjust hole plug

DISASSEMBLY AND INSPECTION

Removal

1. Jack up the vehicle, and remove the tire, brake drum and brake shoe.

Note: For the details, refer to the paragraph covering the brake shoe replacement.

2. Remove the brake tube ① and dust cover ②, drive out the lock plate ③ toward the front, withdraw the adjust plate rearward, and remove the wheel cylinder.

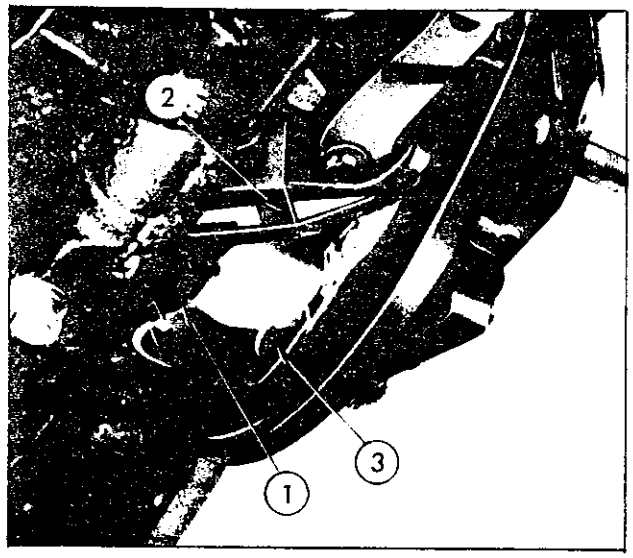


Fig. BR-29 Removing wheel cylinder

3. Remove the anchor block installation nuts from reverse side of the brake disc, and remove the anchor block.

4. When removing the brake disc, withdraw the axle shaft, and remove the attaching bolts.

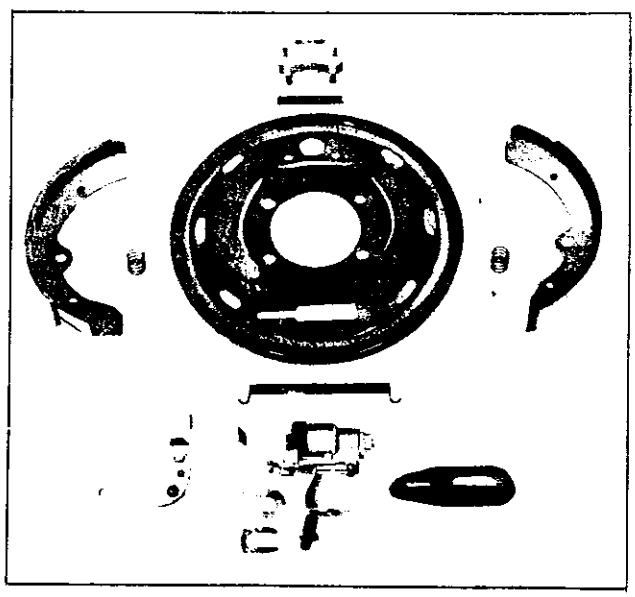


Fig. BR-30 Rear brake component parts

5. Disassemble wheel cylinder

Remove the snap ring and dust cover. Withdraw the piston, and remove the adjust wheel and adjust screw.

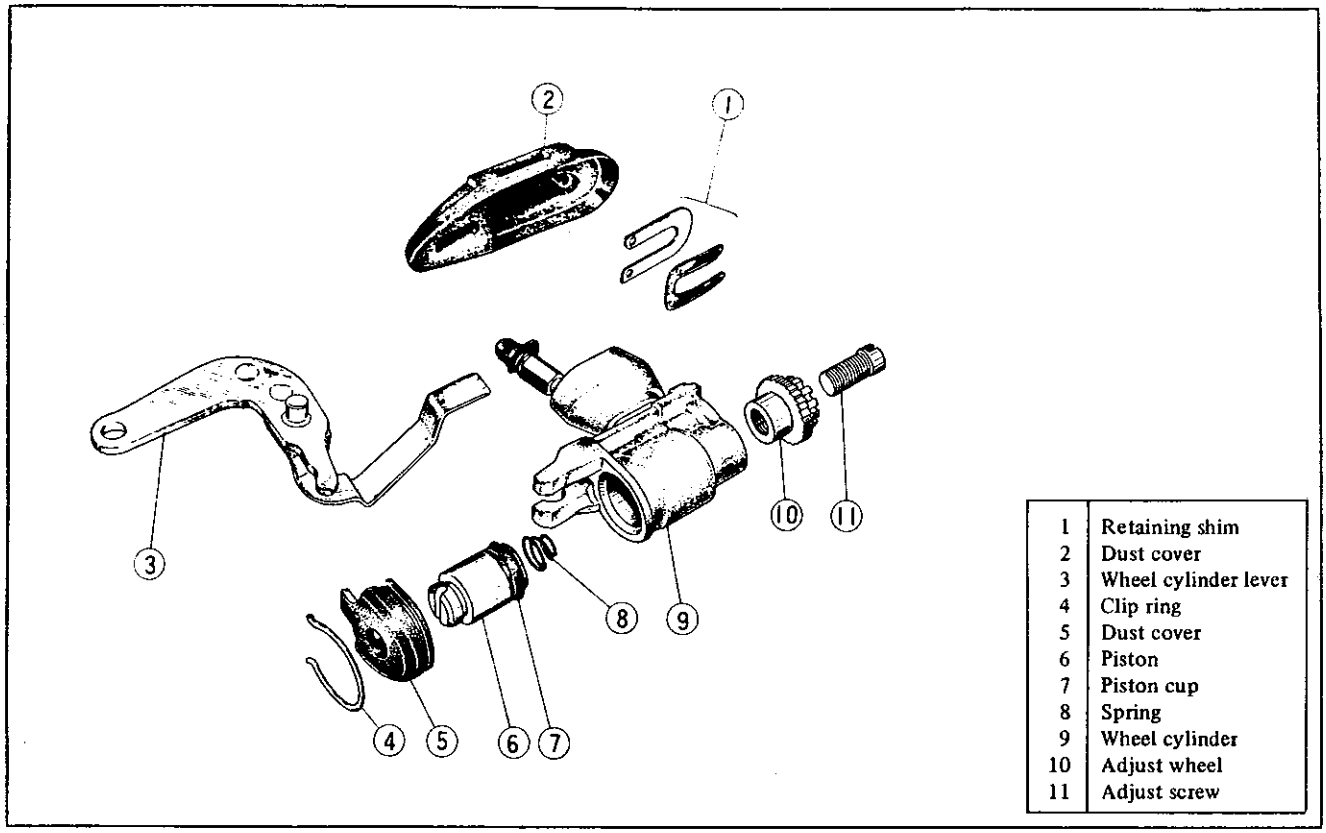


Fig. BR-31 Wheel cylinder component parts

Inspection

1. Inspect the wheel cylinder and piston in the same manner as for the master cylinder.

2. When the adjust wheel and/or adjust lever is damaged, replace.

3. Check the return spring for wear, damage, breakdown, etc., and replace as required.

Return spring

	Free length	Coating color
Cylinder side	122 mm (4.73 in)	Black
Anchor block side	120.4 mm (4.67 in)	Green

4. Replace the brake shoe lining if cracked, floated or unevenly worn. When the brake shoe lining surface is contaminated with grease, oil, etc., clean with carbon tetrachloride or gasoline. When excessively contaminated, replace. When thickness of the brake shoe lining is less than 1.5 mm (0.0591 in), replace.

5. Check the brake drum, and repair or replace if unevenly worn, worn in step or other faulty condition exists.

Brake drum

Standard inner diameter:	228.6 mm (8.98 in)
Usage limit:	229.6 mm (9.04 in)
Out-of-round drum inner diameter:	0.05 mm (0.002 in)

6. Replace brake disc and/or other parts, if defective.

Reassembly and reinstallation

The rear brake is reasembled and reinstalled in reverse sequence of disassembly and removal. However, note the following matters.

1. When assembling the wheel cylinder, be sure to apply rubber grease to the piston cup and other rubber parts slightly.

2. When installing the wheel cylinder to the brake disc, apply brake grease to the cylinder, disc, and adjust plate sliding surfaces and to the wheel cylinder lever fulcrum portion sufficiently so that the wheel cylinder slides smoothly.

3. Measure the wheel cylinder sliding resistance without installing the brake tube as shown in Figure BR-32, and make sure that the sliding resistance is in range from 2 to 7 kg (4.409 to 15.432 lb).

Note: When sliding is improper, the brake shoe does not return smoothly or the automatic adjuster does not operate correctly.

4. Tighten the anchor block installation nut under 1.4 to 1.8 kg-m (10.1 to 13.0 ft-lb) tightening torque.

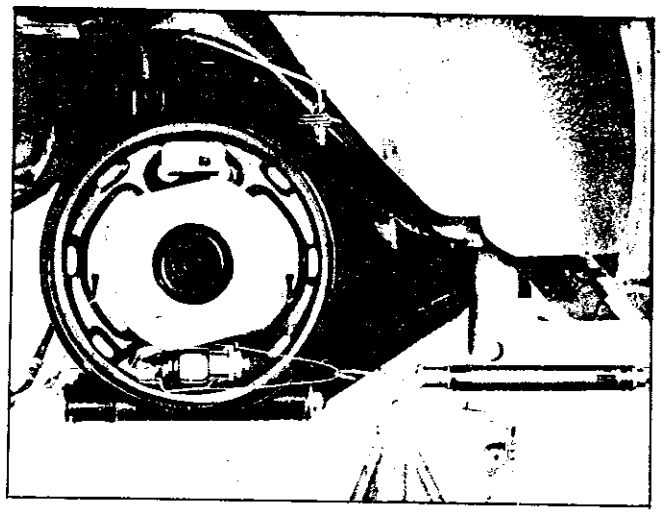


Fig. BR-32 Measuring sliding resistance

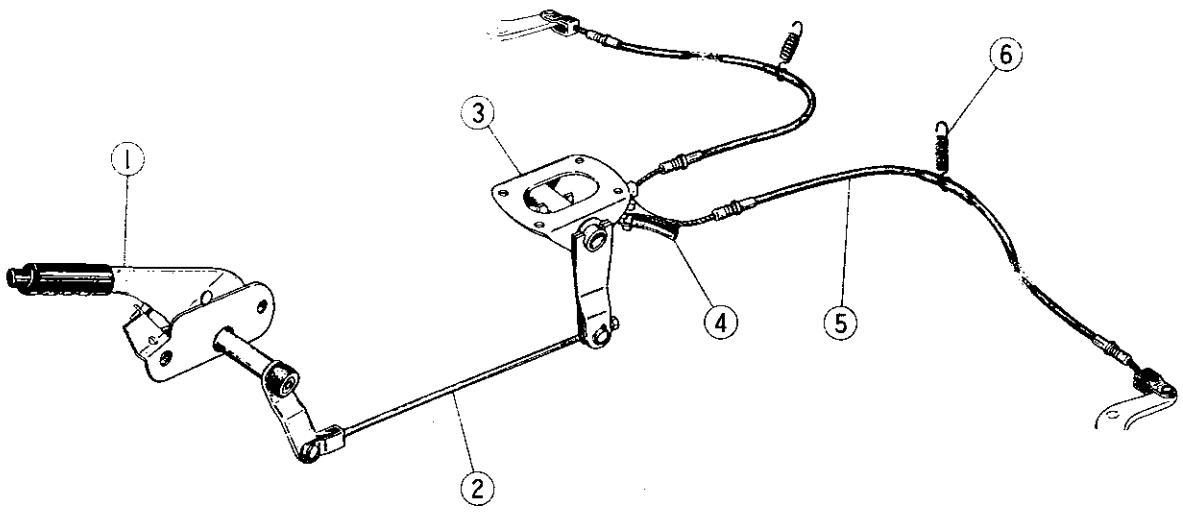
ADJUSTING REAR BRAKE

Ordinarily, adjustment is not required because brake shoe clearance is adjusted automatically by operating the hand brake, as well as the front brake.

HAND BRAKE

CONTENTS

The hand brake linkage is in the floor tonnel. Hence, removal and other operations must be done after removing the propeller shaft.



1	Control lever	4	Equalizer
2	Fiant rod	5	Rear cable
3	Center lever	6	Hunger spring

Fig. BR-33 Hand brake linkage

Removal

1. Remove the lock nut and adjust nut ① from the rear end of the front rod, the clevis pin ② from the front end, and remove the front rod.

2. Remove the hanger spring and clevis pin ③.

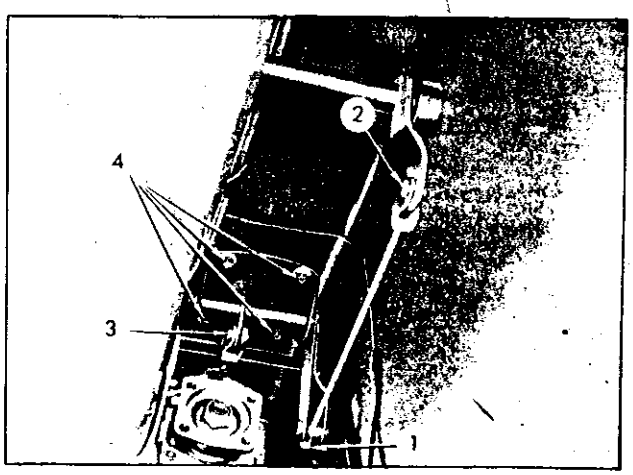


Fig. BR-34 Removal of hand brake

3. Remove the clevis pin ⑤ and separate the rear cable from the lever.

Remove wheel side retainers ⑥ from both sides, and remove the equalizer side retainer in the same manner. The rear cable can be removed.

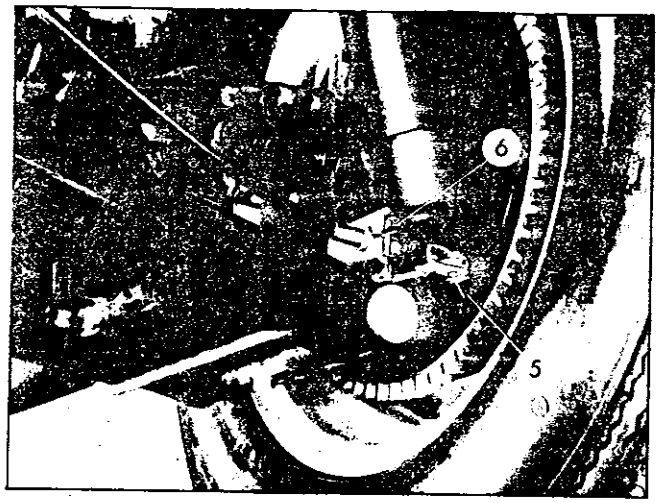


Fig. BR-35 Remvoing rear cable

4. Remove four bolts ④ (shown in the Figure BR-34), and remove the center arm assembly from the floor.

Note: The nuts are secured on the floor panel by means of welding.

5. Remove the front rod end and attaching bolt ①, and remove the control lever toward the passenger's compartment.

Note: When removing the control lever, first, remove the right side seat. The boot is secured with four fasteners ②.

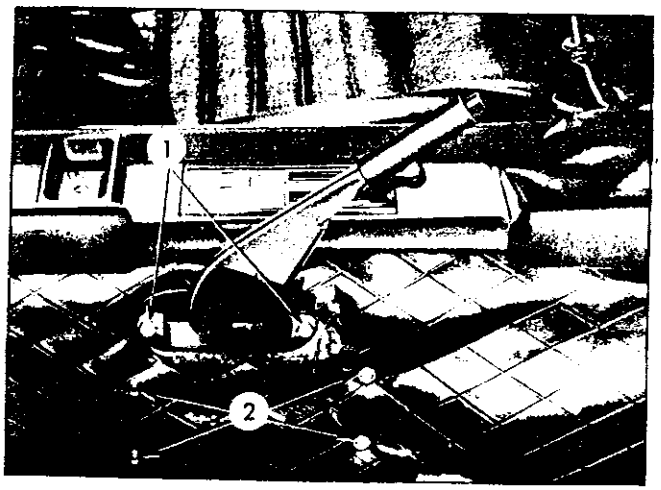


Fig. BR-36 Removing control lever

Inspection

Check all parts for excessive wear and damage, and replace, if necessary.

Reinstallation

Reinstall the hand brake in reverse sequence of removal, noting the following matters.

1. Be sure to apply multi-purpose grease (MIL G2108 or G-10924) to the pivot on the control lever head and other sliding portions sufficiently.

2. When adjusting the hand brake, first, make sure that distance between the wheel cylinder lever pin hole center and buffer plate is in range from 11.5 to 12.5 mm (0.453 to 0.492 in), and reduce the linkage play with the adjust nut on the front rod.

Note: Be sure to perform this adjustment with the control lever returned.

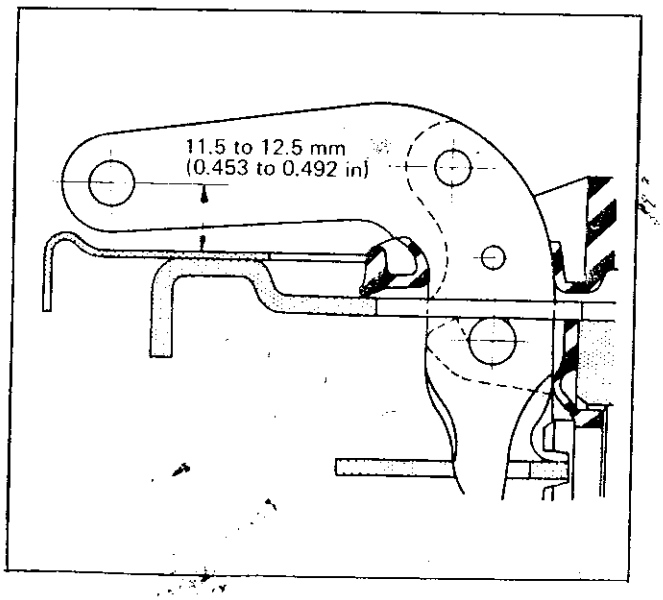
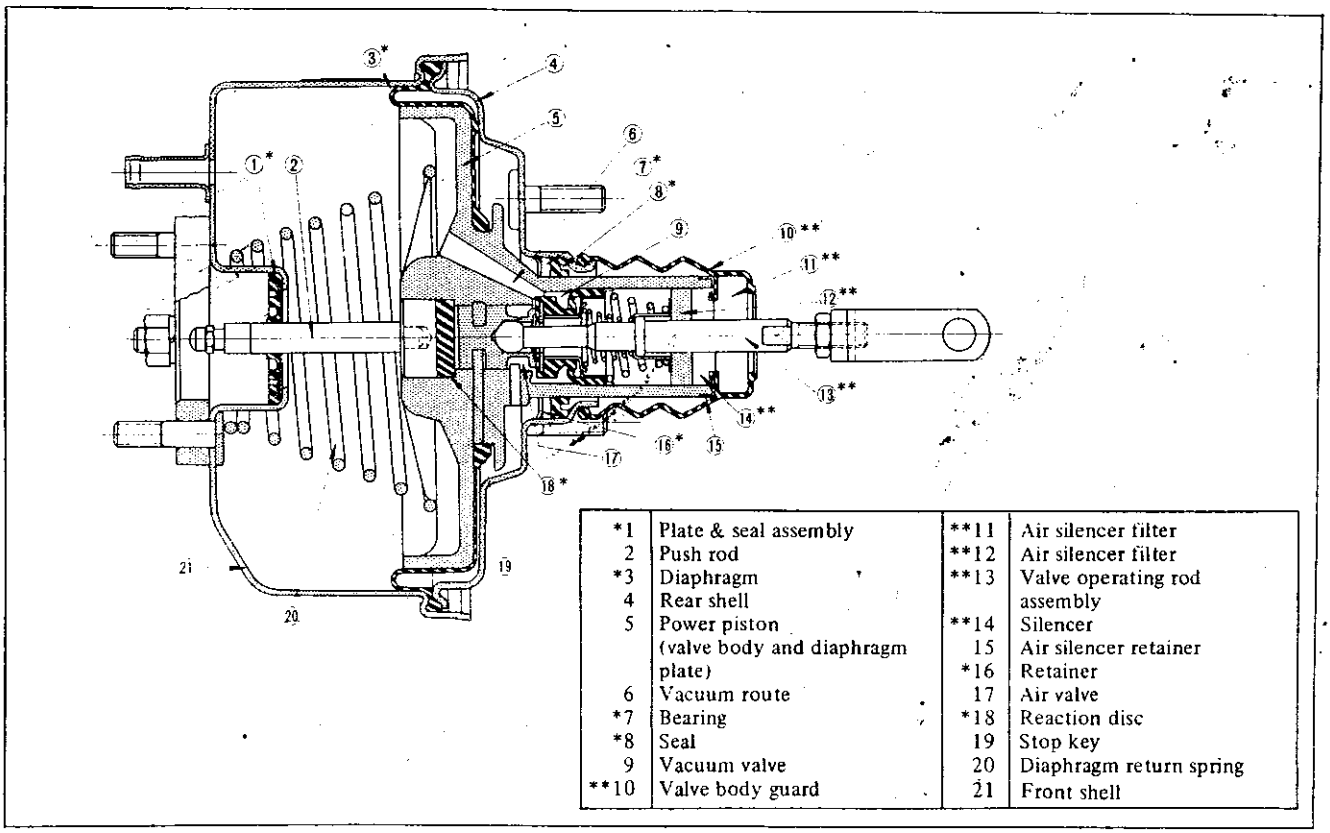


Fig. BR-37 Adjusting hand brake

MASTER-VAC

CONTENTS



*1	Plate & seal assembly	**11	Air silencer filter
2	Push rod	**12	Air silencer filter
*3	Diaphragm	**13	Valve operating rod assembly
4	Rear shell	**14	Silencer
5	Power piston (valve body and diaphragm plate)	15	Air silencer retainer
		*16	Retainer
6	Vacuum route	17	Air valve
*7	Bearing	*18	Reaction disc
*8	Seal	19	Stop key
9	Vacuum valve	20	Diaphragm return spring
**10	Valve body guard	21	Front shell

Fig. BR-38 Cross-sectional view of Master-Vac

Overhaul the Master-Vac every two years, replacing those rubber parts accompanied with single asterisk (*) every two years and those with double asterisks (**) and check valve every four years. The parts required in replacing are available as Master-Vac repair kit.

Note: Repair Kit A: Parts to be replaced every two years

Repair Kit B: Parts to be replaced every four years (including the Kit A)

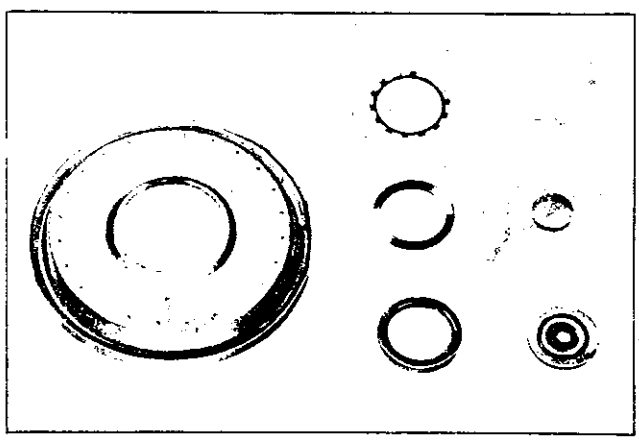


Fig. BR-39 Repair kit A

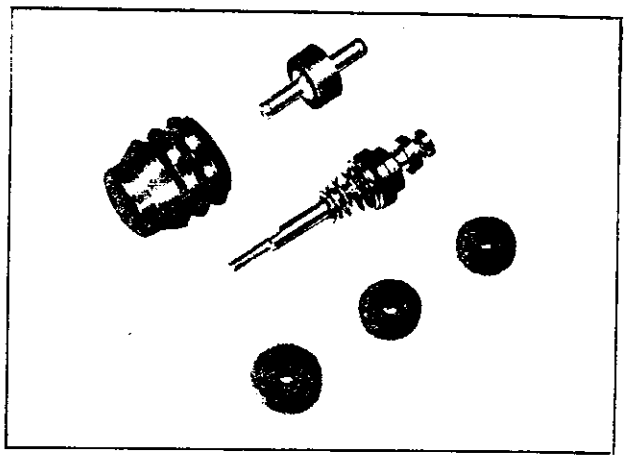


Fig. BR-40 Repair kit B

Inspecting vacuum pressure

1. Install a vacuum gauge between the check valve and Master-Vac.

2. Increase engine speed, and stop the engine when the vacuum gauge indicates 500 mmHg (19.7 in Hg).

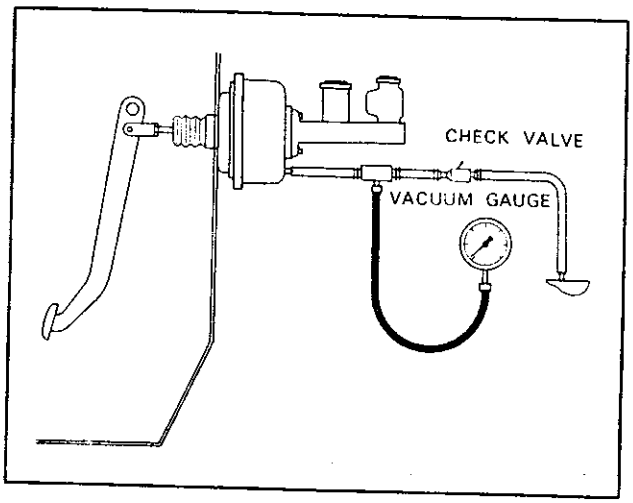


Fig. BR-41 Installing vacuum gauge

(1) When 15 seconds are elapsed after stopping the engine without braking and pressure drops more than 25 mmHg (0.984 in Hg);

Possible cause	Corrective action
1. Faulty check valve air-tight	Replace.
2. Faulty push rod seal air-tight	Replace.
3. Faulty air-tight between valve body and seal	Repair or replace.
4. Faulty valve plunger seat air-tight	Repair or replace.
5. Damaged piping or faulty joint air-tight	Repair or replace.

(2) When 15 seconds are elapsed after stopping the engine by applying full braking force, and pressure drops more than 25 mmHg (0.984 in Hg);

Possible cause	Corrective action
1. Faulty check valve air-tight	Replace.
2. Damaged diaphragm	Replace.
3. Dropped off reaction disc	Reinstall and check the push rod for returning.
4. Faulty air-tight on poppet assembly seat surface and valve body surface.	Repair or replace.

Note: When a replacement is required, be sure to replace the Master-Vac as an assembly.

Inspecting check valve

1. Remove the clip (indicated by arrow mark) and disconnect the hoses from both ends. The check valve can be removed.

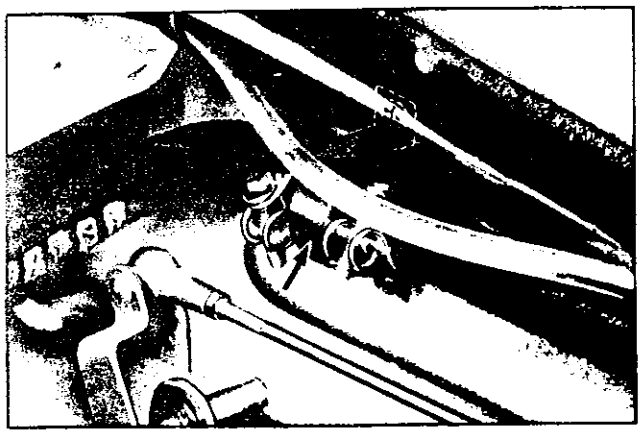


Fig. BR-42 Removing check valve

2. Using a Master-Vac tester, apply vacuum pressure of 500 mmHg (19.7 in Hg) to Master-Vac side of the check valve. When pressure drops more than 10 mmHg (0.394 in Hg) within 15 seconds, replace the check valve with a new one.

3. When pressure is applied to the Master-Vac side of the check valve and the valve does not open, replace the check valve with a new one.

Note: **When no Master-Vac tester is available, apply soap water to the Master-Vac side (to form soap water film), blow air from the engine side. If soap water film swells (being a soap bubble), replace the check valve with a new one. Subsequently, blow air from the Master-Vac side, and if the check valve does not open, replace.**

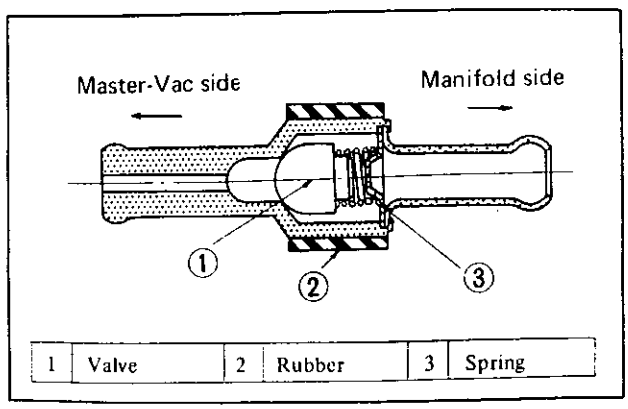


Fig. BR-43 Cross-sectional view of check valve

Removal

1. Remove the clevis pin from the push rod connected with the brake pedal, and disengage the Master-Vac from the brake pedal.

2. Disconnect the brake tube from the master cylinder.

3. Disconnect the vacuum hose from the Master-Vac.

4. Unscrew master cylinder fixing nuts and remove the master cylinder from the Master-Vac.

5. Unscrew four fixing nuts of Master-Vac from the dash board and remove the Master-Vac.

Disassembly

Remove dust and mud from the Master-Vac, and disassemble it at a clean place.

1. Before disassembling the Master-Vac, put marks on the front shell, rear shell and stud assembly so that make sure their relative positions.

2. Secure the flange and bolt assembly in a vise.

3. Remove the clevis ①, lock nut ② and valve body guard ③.

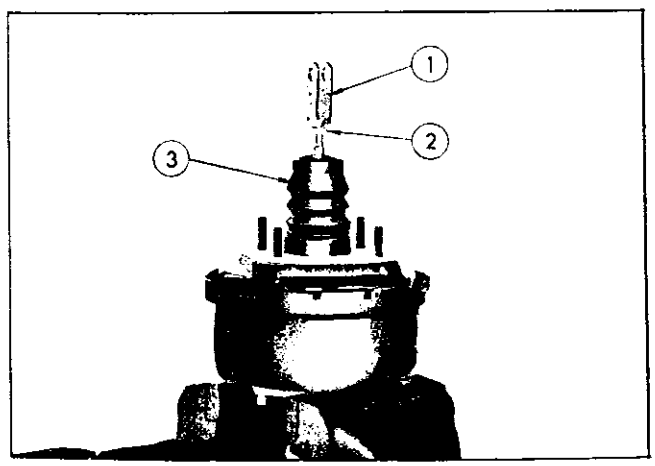


Fig. BR-44 Removing rear shell

4. When separating the front shell from the rear shell use the Master-Vac wrench set (special tool ST08050000).

Push the rear shell and stud assembly down and slide them off by rotating them approximately 17 degrees counterclockwise.

Note: When the valve body and diaphragm plate are detached together with the rear shell and stud assembly from the front shell, be careful not to drop them while disassembling the Master-Vac.

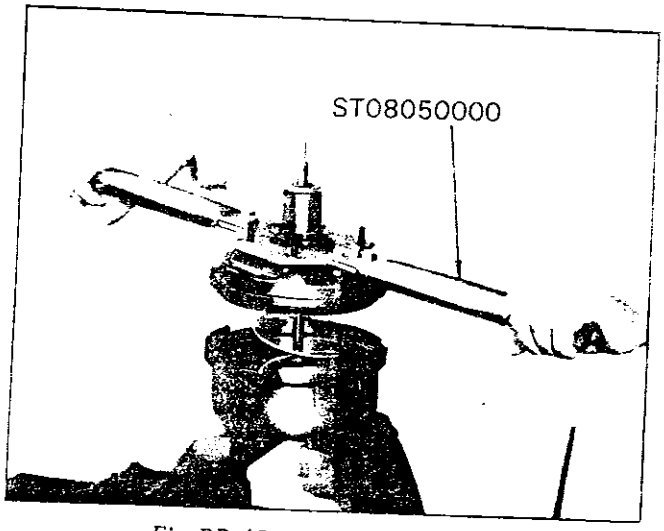


Fig. BR-45 Removing rear shell

5. Remove the push rod from the diaphragm plate.

6. Detach the valve body and diaphragm from the rear shell and stud assembly. Then the Master-Vac is disassembled in three subassemblies as shown below:

Rear shell & seal assembly
Diaphragm plate assembly
Front shell & stud assembly

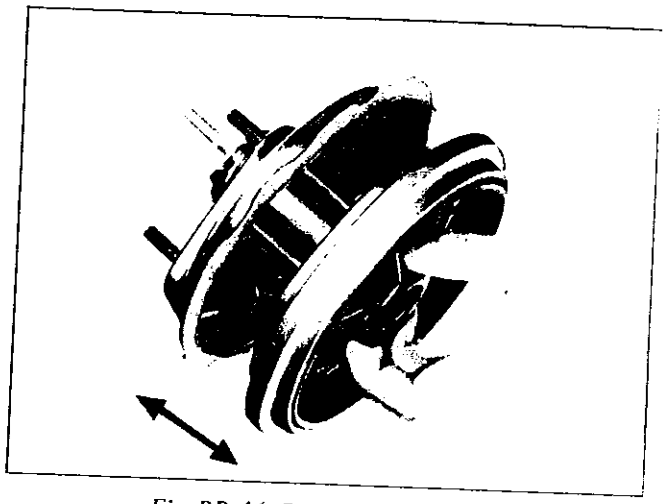


Fig. BR-46 Removing valve body

7. Disassembly of rear shell and seal assembly. Remove the retainer using a screwdriver and detach the bearing and seal.

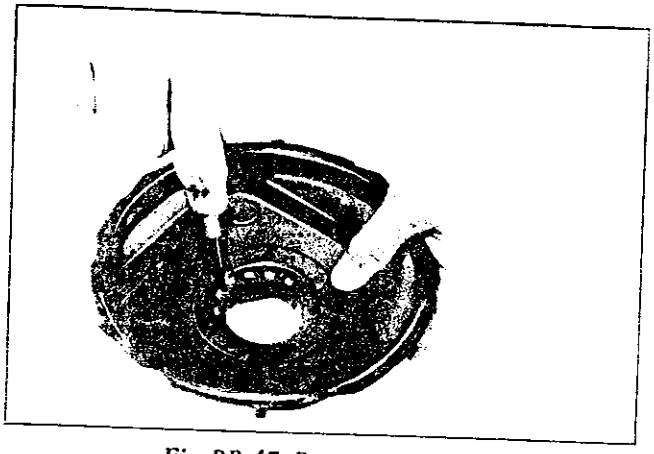


Fig. BR-47 Removing retainer

8. Disassembly of the diaphragm plate assembly. Work on a clean bench.

(1) Pull out the diaphragm from the groove of the diaphragm plate.

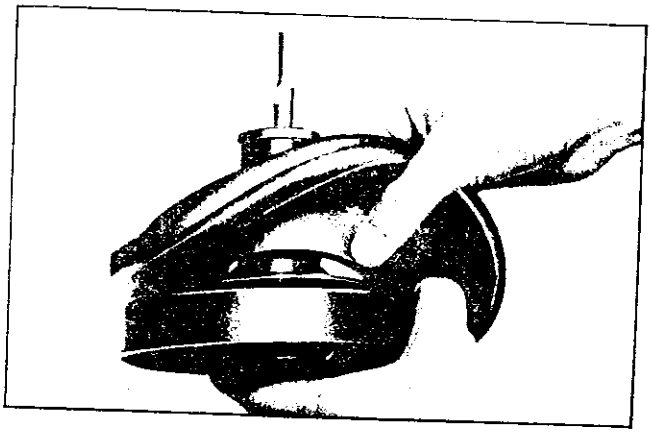


Fig. BR-48 Pulling out diaphragm

(2) Remove the air silencer retainer by tapping the periphery with a screwdriver and a hammer lightly and evenly.

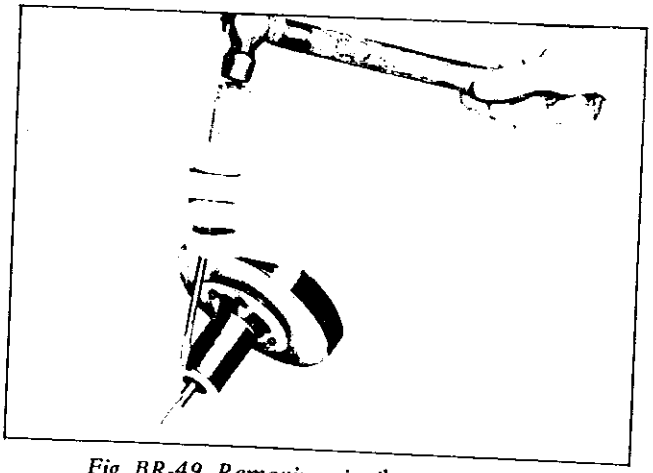


Fig. BR-49 Removing air silencer retainer

Note: Do not tap rapidly, or otherwise the valve body may be cracked.

(3) Depress the valve operating rod, face the key hole downward, and give a vibration. The valve plunger stop key will come out.

(4) After removing the valve plunger stop key, detach the valve operating rod assembly, and the air silencer filter from the valve body and diaphragm plate.

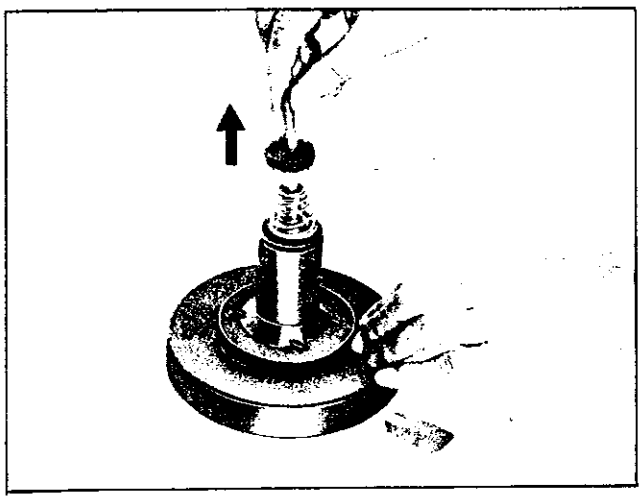


Fig. BR-50 Removing valve operating rod assembly

(5) Push out the reaction disc from the valve body side.

9. Disassembly of the front shell and stud assembly.

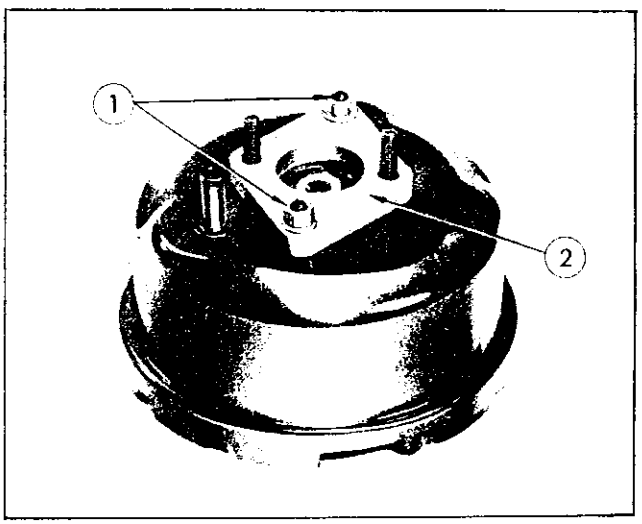


Fig. BR-51 Removing flange

(1) Remove the nut ① and flange ② .

(2) Remove the plate and seal assembly.

Inspection

1. Check the poppet assembly.

If wear or abnormal conditions are found, replace it as the valve operating rod assembly.

2. Check components.

If abnormal conditions are found, replace them with new ones.

Assembly and adjustment

Assemble in reverse sequence of disassembly.

1. Apply silicon grease thinly to the following:
   - Seal: lip and face contacting with the rear shell and seal assembly.
   - Poppet: lip
   - Reaction disc: both faces
   - Diaphragm: edge contacting with front and rear shells
   - Plate and seal assembly: face contacting with the front shell and the push rod
   - Push rod: face contacting with the diaphragm plate

Note: Grease is contained in the repair kit.

2. Insert the valve operating rod assembly correctly and perpendicularly so that it is not tilted against the valve body. When inserting the stop key, depress the valve operating rod assembly.

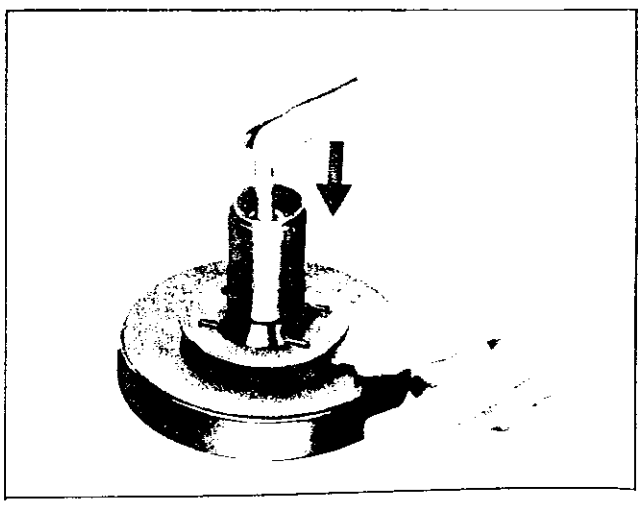


Fig. BR-52 Inserting stop key

3. When installing the retainer on the rear shell, use the press fit tool (special tool ST08060000) and fit it completely down to such an extent that the tool flange surface comes into contact with the bottom.

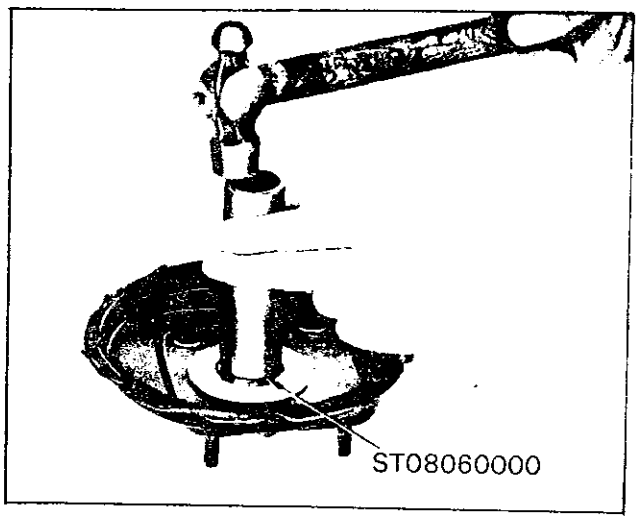


Fig. BR-53 Fitting retainer

4. Upon completion of the assembly, adjust push rod end height so that depth from the flange surface to the push rod end is 3.5 to 4.0 mm (0.1377 to 0.1575 in).

Note: When adjusting the depth, face the push rod end upward so that the reaction disc is not dropped off into the master vac.

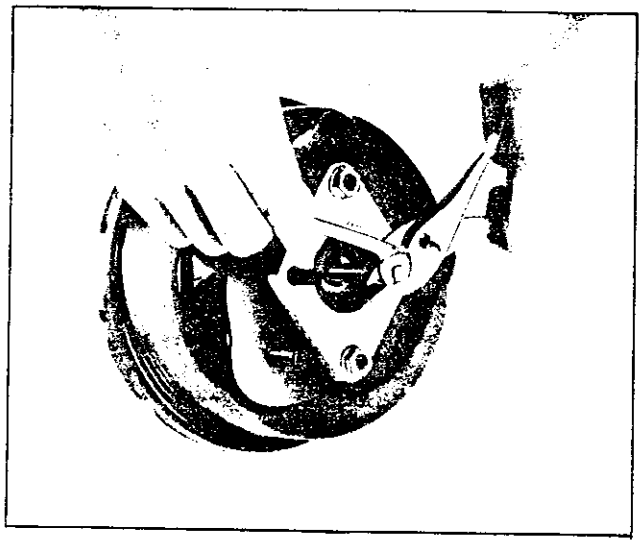


Fig. BR-54 Adjusting push rod length

Reinstallation

Reinstallation is reverse sequence of removal.

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SERVICE DATA AND SPECIFICATIONS

Brake pedal

Pedal free height	203 mm (8.05 in)
Full stroke of pedal head	140 mm (5.51 in)

Master cylinder

Inner dia. of master cylinder	22.22 mm (7/8 in)
Allowable max. clearance between cylinder wall and piston	0.15 mm (0.0059 in)

Wheel cylinder

Inner dia. of wheel cylinder	
Front	53.98 mm (2 1/8 in)
Rear	22.22 mm (7/8 in)
Allowable max. clearance between cylinder wall and piston	0.15 mm (0.0059 in)
Rear wheel cylinder sliding resistance	2 to 7 kg (4.4 to 15.4 lb)

Brake drum and rotor

Rear brake drum inner dia.	228.6 mm (9 in)
Front brake rotor outer dia.	271 mm (10.67 in)
Drum inside out-of-round	less than 0.05 mm (0.0020 in)
Limit of reconditioning drum in dia.	229.6 mm (9.04 in)
Run out of the rotor	less than 0.15 mm (0.0059 in)
Limit of reconditioning rotor in thickness	10.5 mm (0.413 in)

Lining dimension

Rear (width x thickness x length)	40 x 4.1 x 219.5 mm (1.575 x 0.161 x 8.64 in)
Material	B701
Pad (width x thickness x length)	51.6 x 10 x 78.4 mm (2.032 x 0.394 x 3.087 in)
Pad material	M33S

Total braking area

Front	161.6 cm² (25.0 sq in)
Rear	351 cm² (54.4 sq in)

Tightening torque

Fulcrum pin of brake pedal	3.5 to 4.0 kg-m (25.3 to 28.9 ft-lb)

Connection of brake tube	1.5 to 1.8 kg-m (10.9 to 13.0 ft-lb)
Rotor fixing bolts	3.9 to 5.3 kg-m (28.2 to 38.3 ft-lb)
Caliper to knuckle flange	7.3 to 9.9 kg-m (52.8 to 71.6 ft-lb)
Disc to bearing housing	2.7 to 3.7 kg-m (19.5 to 26.8 ft-lb)
Anchor block installation nut	1.4 to 1.8 kg-m (10.1 to 13.0 ft-lb)
Master cylinder stopper screw	0.4 to 0.5 kg-m (2.9 to 3.6 ft-lb)
Valve cap	8 to 9 kg-m (57.9 to 65.1 ft-lb)
Spindle nut	2.5 to 3.0 kg-m (18.1 to 21.7 ft-lb)

TROUBLE DIAGNOSES AND CORRECTIONS

Troubles	Possible causes	Corrective action
Locked brake pedal	Swollen master cylinder selas due to poor fluid quality or contamination by kerosene, gasoline or mineral oil.	Flush the system, replace all rubber parts, refill with new fluid and air bleed the lines.
	Pistons or valve carrier locked by deposits of fluid, foreign matter, etc.	Clean and bleed the system.
	Seized master cylinder piston due to infiltrations of water through rear end due to defective boot or seals.	Service the master cylinder, replace the piston and the boot and/or seals, to prevent water infiltration.
	Seized pedal shaft.	Unbined, smooth bushings, or if sliding parts are damaged to a remarkable extent, replace them and lubricate.
	Clogged transfer port.	Disassemble and clean master cylinder.
	No compensation takes place. Weak return spring.	Replace defective spring.

Spongy pedal	Air in brake system because of imperfect bleeding.	Bleed thoroughly.
	Swollen hose due to deterioration.	Replace the hose and bleed the system.
	Hose swells under fluid pressure due to poor hose quality.	Fit new hoses and bleed the system.
	Use of a poor quality brake fluid (boiling point of which is too low).	Replace the fluid with the specified brake fluid and bleed the system.
	Clogged reservoir filler cap vent hole. This promotes a vacuum in master cylinder that sucks air through rear seal.	Clean reservoir filler cap and bleed the system.
Pedal yields under slight pressure	Deteriorated check valve.	Fit a new check valve, make sure that there are no burrs, roughness or blow holes in master cylinder, and bleed the system.
	Fluid leaks through connection.	Tighten connections, and if necessary, replace faulty parts. Bleed the system.
	Fluid leaks at wheel cylinders.	Replace the seals and packings being damaged. Wipe and clean brake shoe linings.
	Fluid leaks through hoses.	Replace the damaged hose, and bleed the system.
	Low fluid level in reservoir.	Add specified fluid up to correct level.
Poor pedal reserve	Master cylinder relief port clogged foreign matter.	Clean and bleed the system.
	System has not been bled.	Bleed the system.
	Excessive clearance between shoes and drum.	Adjust auto-adjuster operation.
Excessive pedal reserve	Fluid level in reservoir is too low.	Top up with specified brake fluid, bleed the system, if required.
	Deteriorated rubber seals in master cylinder or in wheel cylinders.	Replace seals and bleed the system.
	Excessively swollen hoses due to poor hose quality.	Replace by designated hoses and bleed the system.
	Thermal expansion of drums due to excessive overheating.	Allow drums to cool off. Check brake shoe linings and drums. Replace damaged parts.
Brake locked after pedal return	Worn or broken return spring.	Replace defective springs.

	Improper brake shoe return.	Grease brake shoe and wheel cylinder sliding surface.
	Clogged master cylinder relief port.	Clean and bleed the system.
	Swollen or stuck rubber seals due to contamination by kerosene, mineral oil, gasoline, etc.	Flush the system, replace all rubber parts, refill with new brake fluid and bleed the system.
Unbalanced brakes	Fluid leakage at one wheel cylinder only.	Wipe, clean or replace the brake shoe linings or lining pads, service the wheel cylinder and bleed the system.
	Rusted or corroded edges of a wheel cylinder.	Eliminate rust and replace the boots.
	Seized piston in wheel cylinder or caliper assembly.	Service the wheel cylinder, replace the rear wheel cylinder piston or caliper assembly and bleed the system.
	Hose obstructed due to swollen or clogged inner lining.	Replace or clean the hose and bleed the system.
	Obstructed flow in metal pipe due to crushing or clogging (if the brakes on one axle are excluded, weak braking may result).	Replace or clean the pipe and bleed the system.
	Faulty seals at one half caliper.	Take down and strip the half caliper, replace seals and dust covers.
Brake linings dragging all the time on drums or brake discs	Insufficient shoe-to-drum clearance.	Adjust clearance.
	Weak shoe return springs.	Replace the springs.
	Brake pedal has no free travel.	Set the push rod length as prescribed.
	Seized master cylinder piston.	Service the master cylinder, replace the piston and bleed the system.
	Master cylinder flooded due to clogged relief port.	Service the master cylinder, replace the check valve if deteriorated, clean the relief port and bleed the system.
	Brake disc run-out.	Check brake disc for run-out, and replace defective parts, if necessary.
Weak brakes	Fluid leakage from wheel cylinders.	Wipe and clean the brake shoe linings, service the wheel cylinder replacing damaged parts, and bleed the system.
	Fluid leakage from caliper cylinders.	Take down and strip the calipers; replace all rubber seals and clean lining pads.

	—Master-Vac— This trouble mainly resulting from improper function of Master-Vac. Please check as follows:	
	Improper master vac function due to poor vacuum.	Check the pipe or hose connections, and fasten if necessary. Or replace a defective vacuum hose.
	Required vacuum is not maintained.	Wipe, clean or replace the check valve and check the grommet for loose fit, re-fit or replace it. Replace seal or retighten plate and seal assembly-to-front shell bolts. Clean or replace poppet rubber, Replace diaphragm and diaphragm plate.
	Weak pressure on shoes due to use of too thick fluid.	Flush the system and refill with specified fluid. Bleed the system.
	Dust on drums or linings soiled with oil.	Remove and clean drums thoroughly.
	Weak shoe return springs.	Check springs and replace as required.
	Drum out of round.	Correct drums by means of a lathe.

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DATSUN 240Z SPORTS
MODEL S30 SERIES

CHASSIS & BODY

NISSAN MOTOR CO., LTD.
TOKYO, JAPAN

SECTION WT

WHEEL AND TIRE

WHEEL AND TIRE

CONTENTS

DESCRIPTION

The disc wheel dimensions are 14 x 4-1/2 J with 15 mm (0.59 in) wheel offset. The hub bolt hole pitch diameter is 114.3 mm (4.5 in).

Tire size

Model	Tire size	Disc wheel
HLS30-U	175 SR-14 (Tubeless) 175 HR-14 (Tubeless) 6.45 H14-4PR (Tubeless)	14-4½J
HLS30 HS30-U	6.45 H14-4PR (Tubeless) 165 HR-14 (Tubeless) 6.95 H14-4PR (Tubeless)	14-4½J

Tire pressure (To be measure when tire are cold.)

	175 SR-14 175 HR-14 165 HR-14	6.45 H14 6.95 H14
Under 160 km/h (100 MPH)	2.0 kg/cm² (28 lb/sq in)	1.7 kg/cm² (2.4 lb/sq in)
Over 160 km/h (100 MPH)	2.3 kg/cm² (32 lb/sq in)	2.3 kg/cm² (32 lb/sq in)

PERIODICAL SERVICES

Inflation of tires

Tires with proper pressure improve riding comfort and steering stability, reduce driving sound to the minimum, and extend the service life.

The tires should be checked for proper pressure on monthly basis or more frequently depending on driving conditions, while the tires are cold.

Ordinarily, tire pressure rises 10 to 15% of that when the tire is cold during continuous driving under a constant speed due to the tire tempreature rise. When measuring tire pressure accurately, first, find out whether the tire is hot or cold.

When tire valve caps are removed, be sure to reinstall

them on the valves without fail. The valve caps assist in keeping air in the tire in case of a valve leak, and keep dust and water out of the valves.

When inflation pressure is too high, the following troubles will result:

1. Hard ride
2. Bruised tire or damaged carcass immediately inside the tread
3. Poor traction at rear wheel resulting in uneven wear
4. Rapid tread wear at center of tire

When inflation pressure is too low, the following troubles will result:

1. Tire squeal on turns
2. Hard steering
3. Rapid and uneven wear on tire tread edges
4. Bruised tire rim and various types of rupture
5. Tire cord fatigue or breakage
6. Tramp and shimmy troubles
7. Unusual tire temperature rise
8. Car roll while turning a corner or making a sharp swerve in traffic

Tighten wheel nuts to a torque of 8.0 to 9.0 kg-m (58 to 65 ft-lb).

Be sure to retighten wheel nuts after running 100 to 200 km (60 to 120 miles).

Radial tire

When comparing to the ordinary tires, camber power of a radial tire is lower and cornering power is higher, and consequently, toe-in increases excessively, causing unevenly worn tire and/or rapid tire wear. Thus, the front wheel alignment should be carried out carefully and correctly. (See Chapter FA.)

Characteristics of a radial tire differ from that of an ordinary tire. Do not mingle radial tires with an ordinary tire or viceversa. When replacing a radial tire with an ordinary tire due to unavoidable reason, use ordinary tires for front tires.

Tire rotation

Service life of a tire is indicated by miles driven. The tires are provided with "tread wear indicator" [marks in six positions on the tire circumference, which indicate limit of 1.6 mm (0.06 in) tread depth]. When the tire is worn to the service life, the tread wear indicator appears. (In other words, when the indicator appears, the tire has reached its service life.) Generally speaking, service life of a tire is 40,000 km (24,000 miles).

When it is intended to use five tires including the spare tire evenly, conduct tire rotation in accordance with the tire shifting order shown in Figure WT-1 whenever the vehicle is driven 10,000 km (6,000 miles).

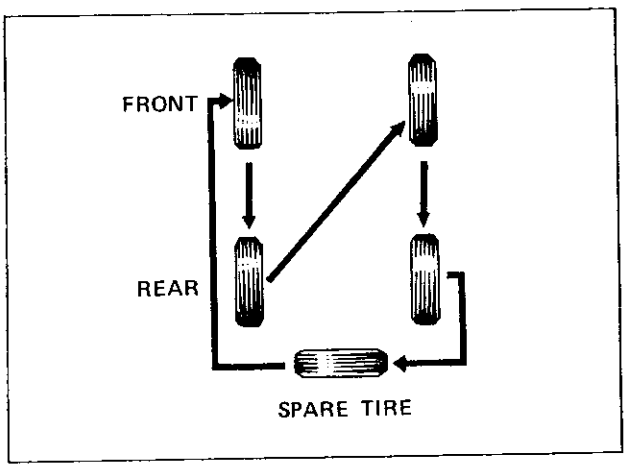

Fig. WT-1 Tire rotation

INSPECTION

Wheel balance

The permissible unbalance of wheel and tire assembly is 10 gr (0.35 oz) or less [190 gr-cm (2.64 in-oz) or less] at the rim circumference. In no event should a 100 gr (3.63 oz) or heavier balance weight be attached to the wheel. Balance weights are available from 10 gr to 100 gr (0.35 oz to 3.52 oz) with every 10 gr (0.35 oz) interval.

Wheel

When the wheel deflections toward vertical and horizontal axes at the points indicated by the asterisk (*) in Figure WT-2 are 1.0 mm (0.04 in) or more, replace the wheel.

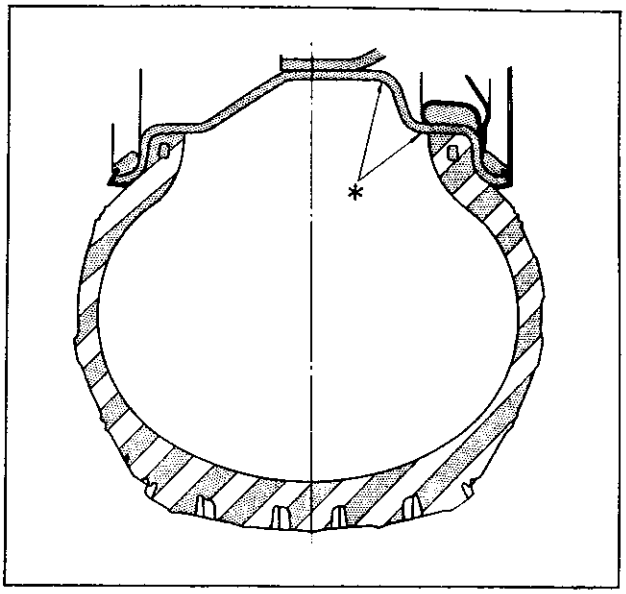

Fig. WT-2 Wheel rim run-out check points

TROUBLE DIAGNOSES AND CORRECTIONS

Troubles	Possible causes	Corrective action
Wheel wobbls.	Improper tire pressure	Measure and adjust correctly.
	Damaged tire or distorted wheel rim	Repair or replace.
	Unbalanced wheel	Balance correctly.
	Loose wheel nuts	Retighten.
	Worn or damaged wheel bearing, or excessive play of wheel bearing	Correct play or replace.
	Improper front wheel alignment	Adjust.
	Worn or damaged ball joint and link bushing	Replace.
	Excessive steering linkage play or worn steering linkage	Adjust or replace.
	Loose steering linkage connection	Retighten the nuts with the rated tightening torque, or replace worn parts if any.
	Broken suspension spring	Replace.
	Defective shock absorber	Replace.

Unevenly or excessively worn tire	Improper tire rotation	Conduct tire rotation periodically. [Standard: Every 10,000 km (6,000 miles)]
	Improper tire pressure	Measure and adjust correctly.
	Unbalanced wheel	Balance or replace.
	Improperly adjusted brake	Readjust correctly.
	Improper wheel alignment	Realign.
	Excessively distorted or improperly installed suspension link	Repair correctly or replace if necessary, or reinstall correctly.
	High speed on curves	Reduce speed.
	Sudden start and improper speeding due to rapid acceleration or improper brake application	Follow correct and proper driving manner.
Tire squeals	Improper tire pressure	Measure and adjust correctly.
	Improper front wheel alignment	Realign correctly.
	Distorted knuckle or suspension link	Repair or replace if necessary.

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DATSUN 240Z SPORTS
MODEL S30 SERIES

CHASSIS & BODY

NISSAN

NISSAN MOTOR CO., LTD.
TOKYO, JAPAN

SECTION ST

STEERING

STEERING SYSTEM

CONTENTS

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.

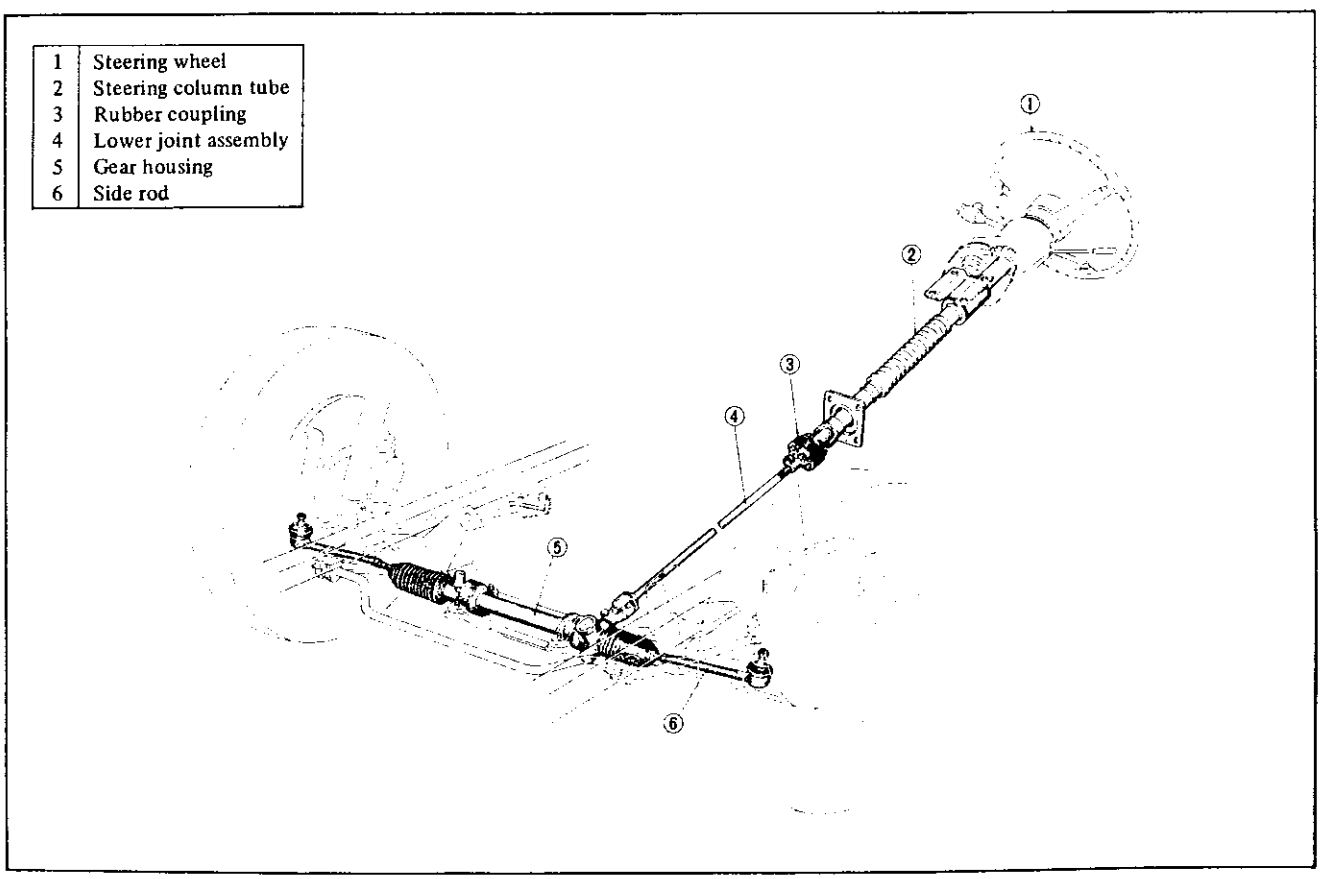


Fig. ST-1 Steering gear components

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 compress 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 of 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 (at 510 series side rod) 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 40,000 km (24,000 miles). The grease used is a lithium base type having excellent waterproof characteristics.

Lithium base multipurpose NLGI No. 2 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. Replace 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.

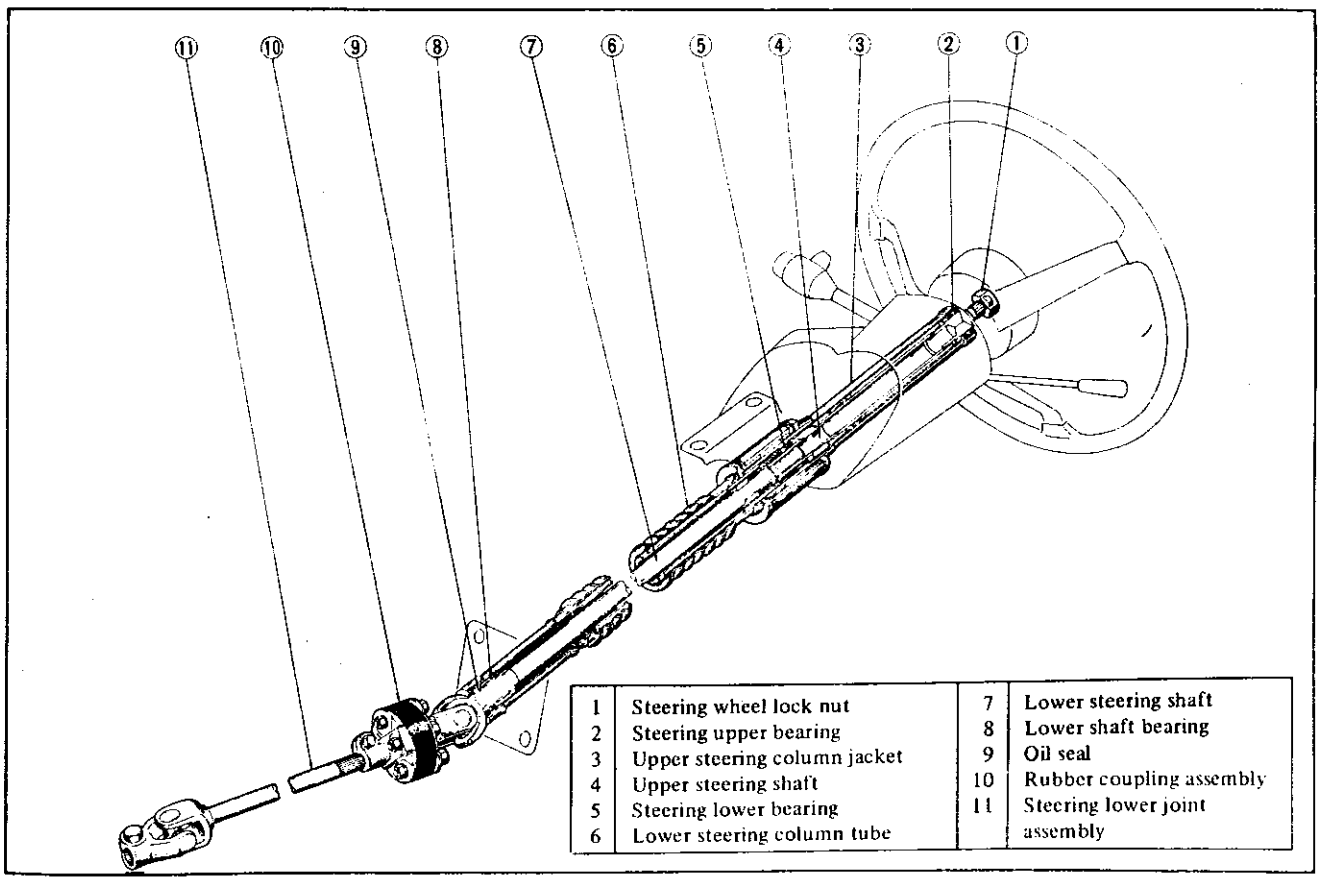
c. Assemble the rack-and-pinion.

d. Lubricate through the grease nipple.

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

RECOMMENDED LUBRICANTS										
Lubricant \ Make / Grade		TEXACO INC.	CHEVRON OIL CO.	CALTEX	MOBIL	SHELL	ESSO	BP	CASTROL	Lubricating points
Multi-purpose grease	NLGI No. 2	Marfak All Purpose Grease Marfak Multi-Purpose Grease	RPM Multi-Motive Grease	Marfak All Purpose Grease Marfak Multi-Purpose Grease	Mobil Grease MP	Retinax A	Esso Multi-Purpose Grease	BP Energrease L2	Castrolease LM	. Journal portion of steering column shaft . Pinion bearing . Retainer portion of pinion housing . Meshing portion of the rack-and-pinion . Sliding portion of the housing . Joined portion of the rack and side rod

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.

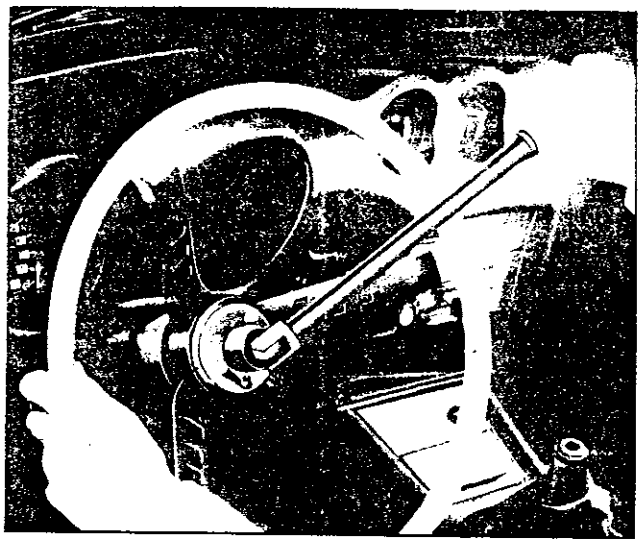


Fig. ST-3 Removing steering wheel

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.

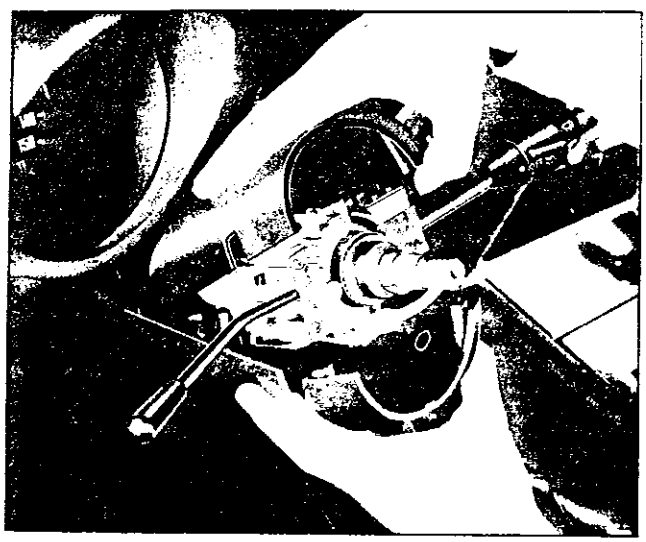


Fig. ST-4 Removing shell cover

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.

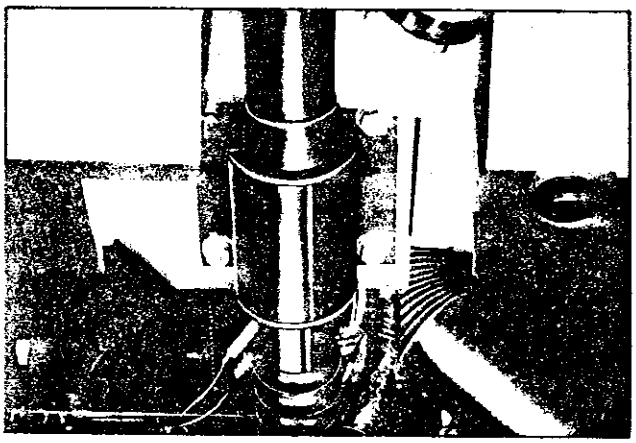


Fig. ST-6 Removing steering post clamp

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.

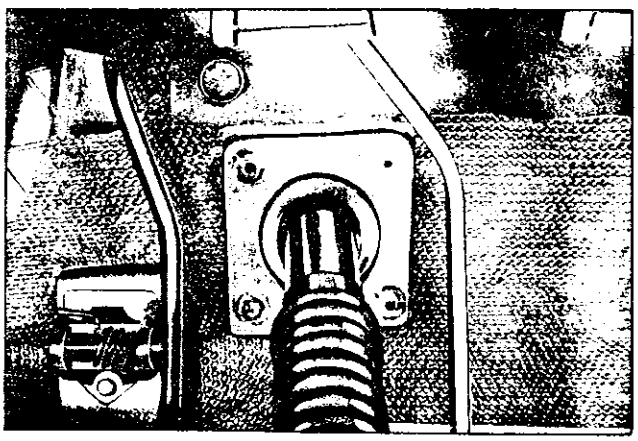


Fig. ST-7 Removing column bracket bolts

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.

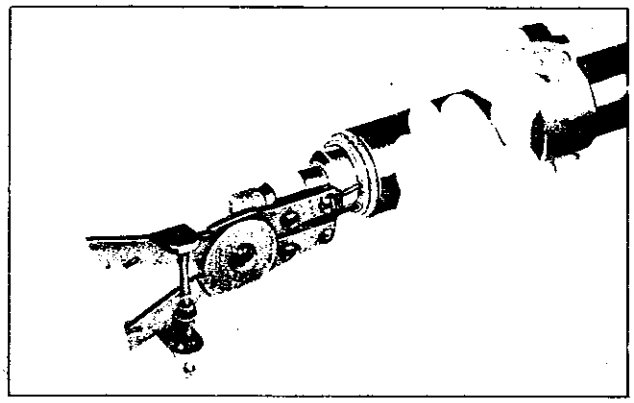


Fig. ST-8 Removing snap ring

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

4. Remove the snap ring and disassemble the steering lower joint.

Note: Do not disassemble the joint unless otherwise defects found.

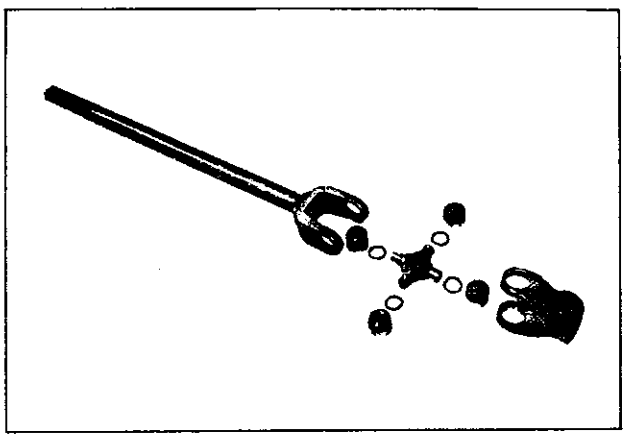
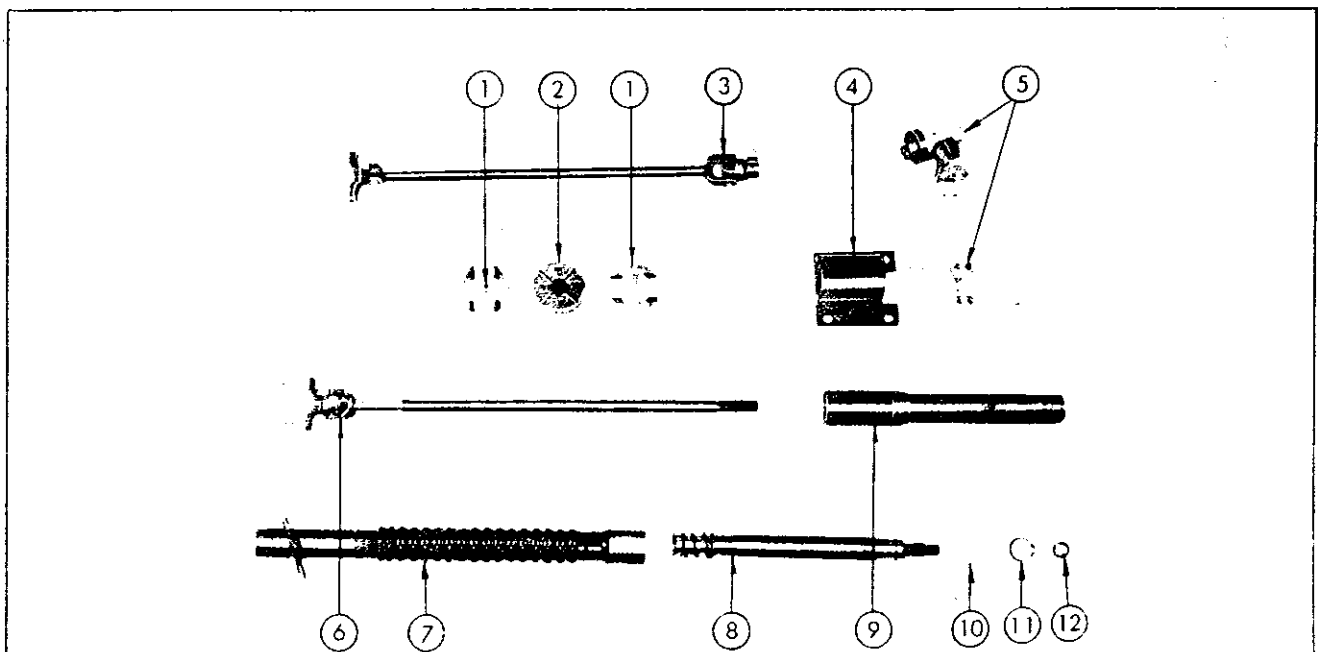


Fig. ST-9 Steering lower joint components



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-10 Components of steering column assembly

Inspection

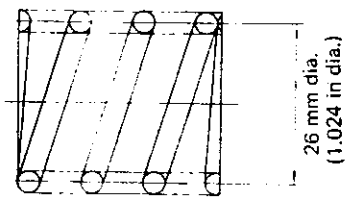
Thoroughly clean and examine all parts of the assembly; components showing signs of wear, chipping, or damage must be replaced with new parts.

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: When the lower steering shaft spline is fit 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 shaft (See figure ST-11).

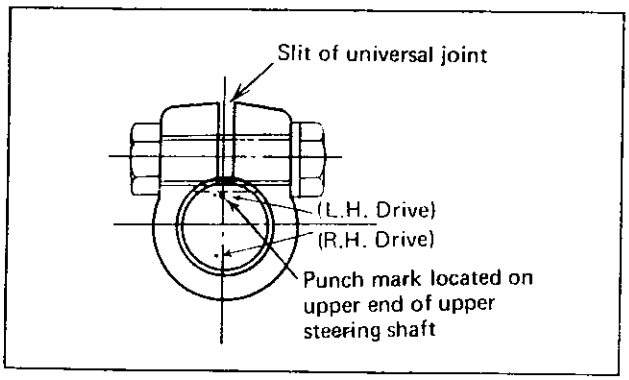


Fig. ST-11 Aligning slit with punch mark

1. When assembling, apply multipurpose NLGI No. 2 grease to the steering column shaft journal and also fill up in the dust cover.

2. When assembling the universal joint, apply multipurpose NLGI No. 2 grease to the needle bearing.

3. When fitting the needle bearing, use the tightest snap ring among the variations.

Snap ring oversize

Thickness	
0.95 mm	(0.0374 in)
1.05 mm	(0.0413 in)
1.15 mm	(0.0453 in)

Thrust play of journal:	0 to 0.15 mm (0 to 0.0059 in)

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		

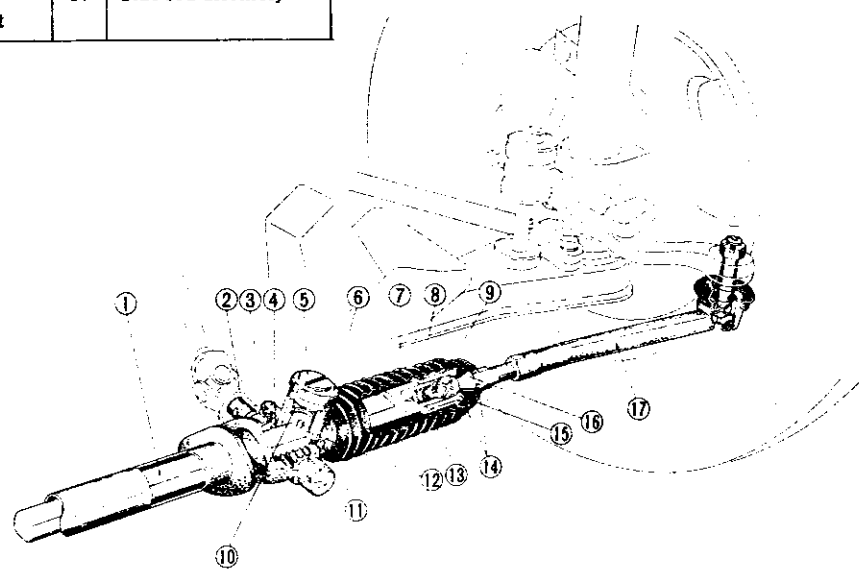


Fig. ST-12 Cross-section of rack-and-pinion with side rod assembly

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.

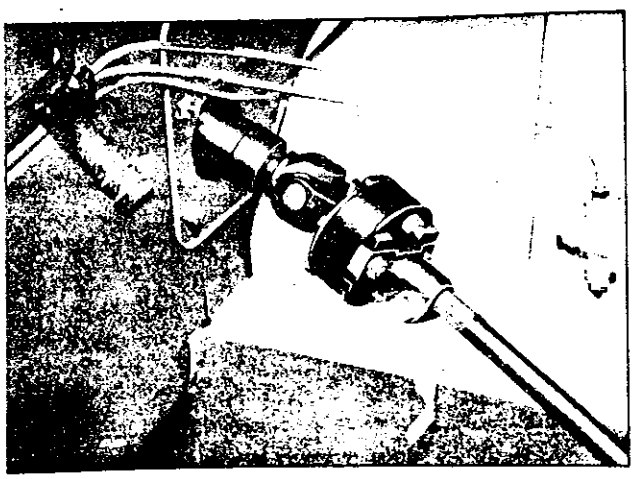


Fig. ST-13 Rubber coupling bolts

3. Remove the splash-board.

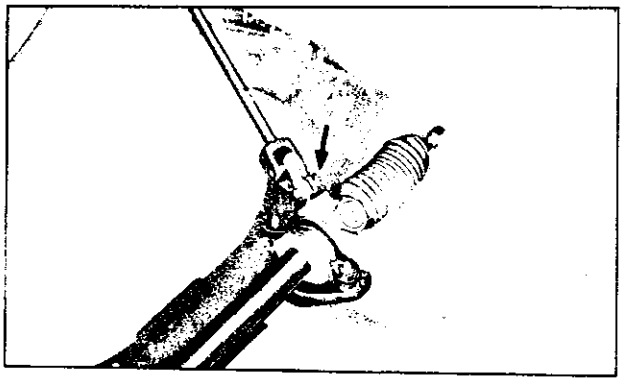


Fig. ST-14 Disconnecting lower joint from pinion

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

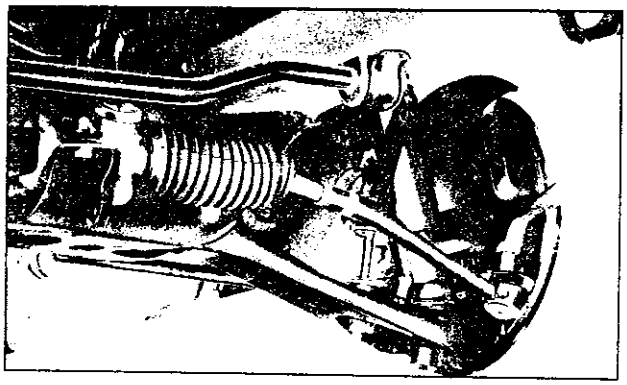


Fig. ST-15 Disconnecting side rod socket

5. Hoist the engine slightly.

Note: Be careful not to damage the accelerator linkage or drop off the control linkage.

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

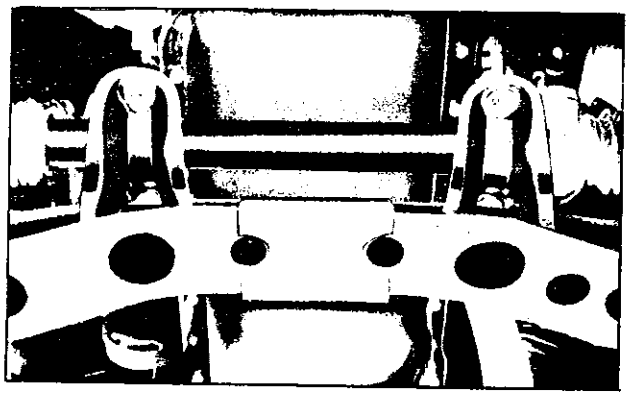


Fig. ST-16 Bolts securing housing to the suspension member

7. 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.)

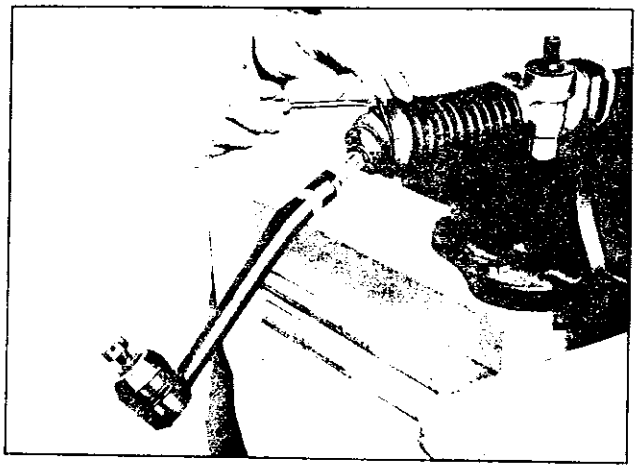


Fig. ST-17 Removing dust cover clamp

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

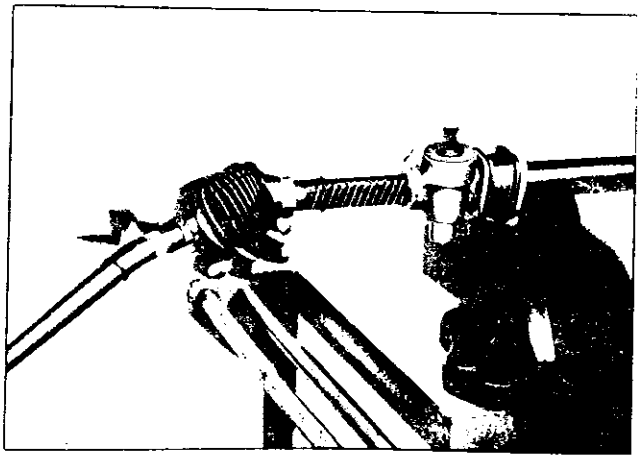


Fig. ST-18 Removing side rod assembly

5. Withdraw the spring seat and side rod spring.

6. Detach the steering gear boots. (Both left and right hand.)

7. Loosen the side rod lock nut and disconnect the side rod outer socket assembly from the side rod ball.

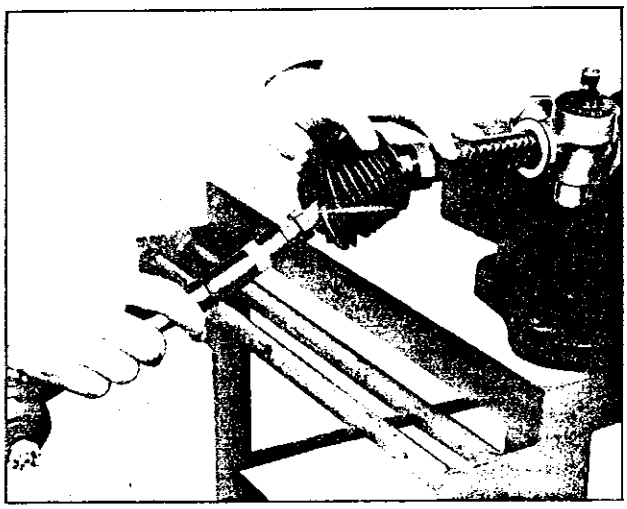


Fig. ST-19 Removing side rod outer socket

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

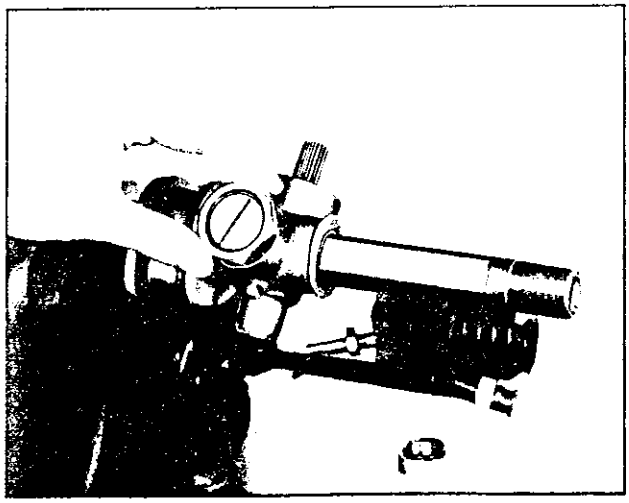


Fig. ST-20 Removing lock nut

9. Pry off the oil seal.

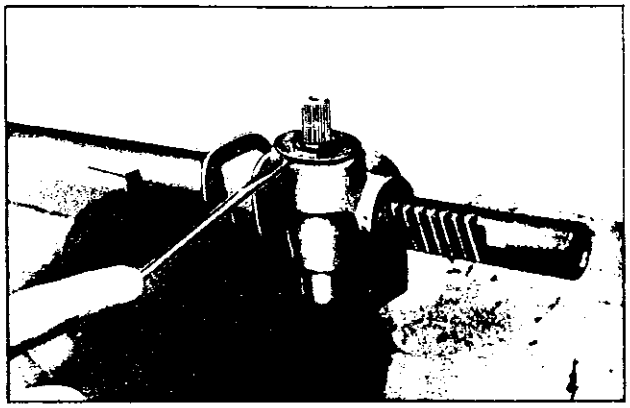


Fig. ST-21 Removing oil seal

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

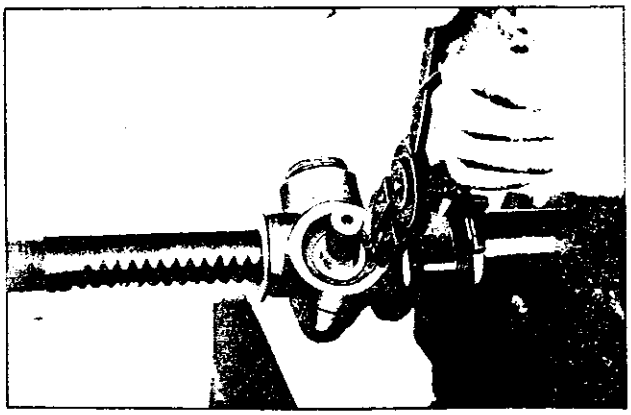


Fig. ST-22 Removing snap ring

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

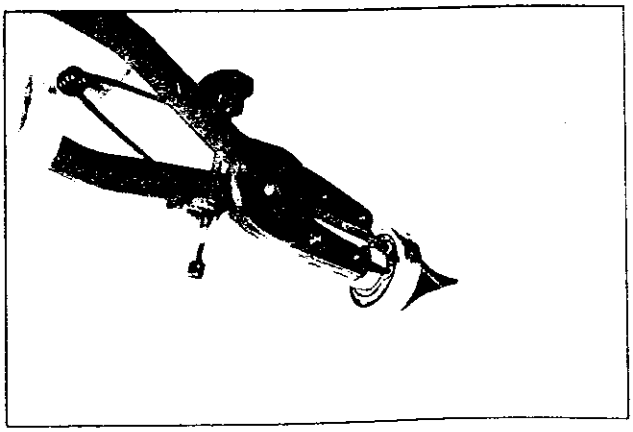
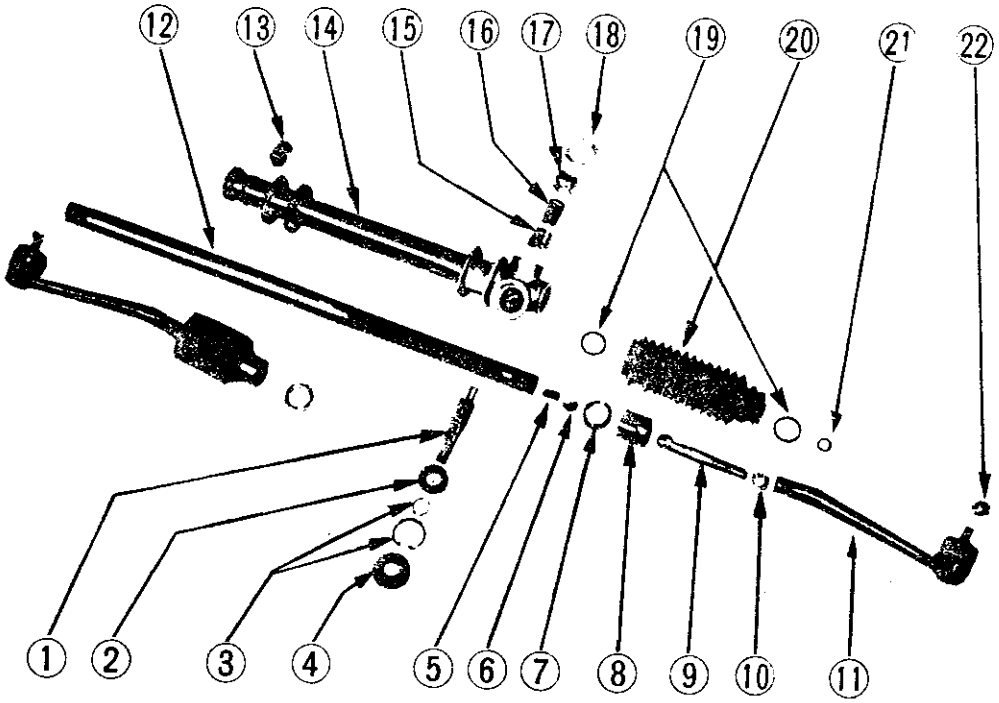


Fig. ST-23 Removing snap ring

12. 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	14	Steering gear housing	19	Dust cover clamp
3	Snap ring	9	Side rod ball	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-24 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 indicate 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 ball joint

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

Side rod inner ball joint	
Swinging torque:	0.8 to 1.5 kg-m (5.8 to 10.8 ft-lb)
Axial play:	0.06 mm (0.0024 in)
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)

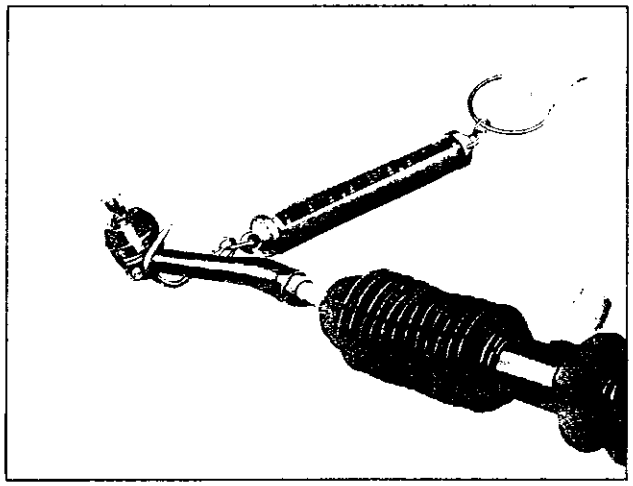


Fig. ST-25 Measuring swinging torque

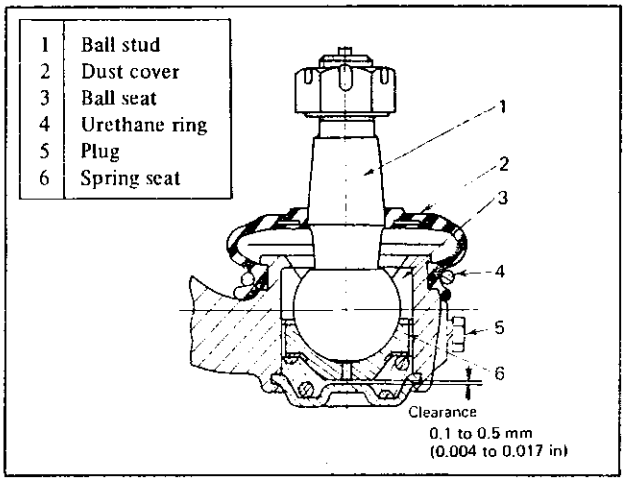


Fig. ST-26 Cross-section of ball stud

Bearing

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

Bushing

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

Oil seal

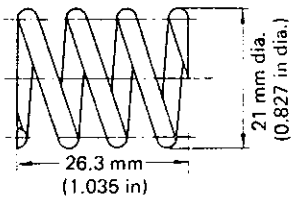
As a rule, replacement is made during overhaul.

Spring

Specified values are shown below.

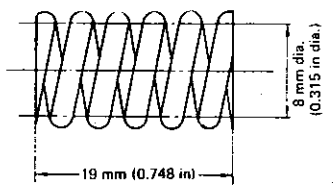
Retainer spring

Wire diameter	2.6 mm (0.102 in)
Free length	26.3 mm (1.035 in)
Coil turns	5.5
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.

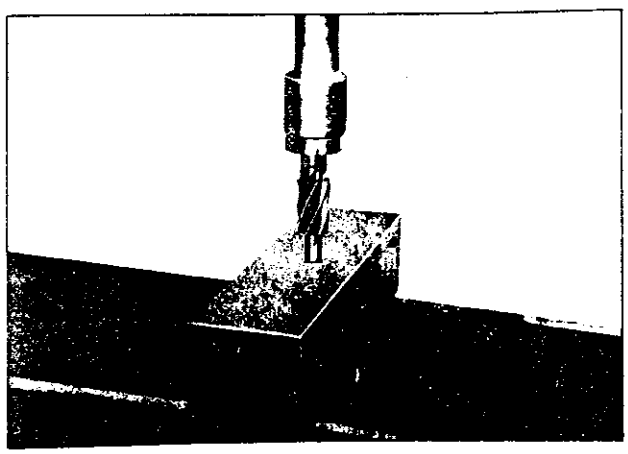


Fig. ST-27 Pressing bearing

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 multiporpose NLGI No. 2 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 (3.800 in)] and that rack teeth are directed toward the pinion shaft.

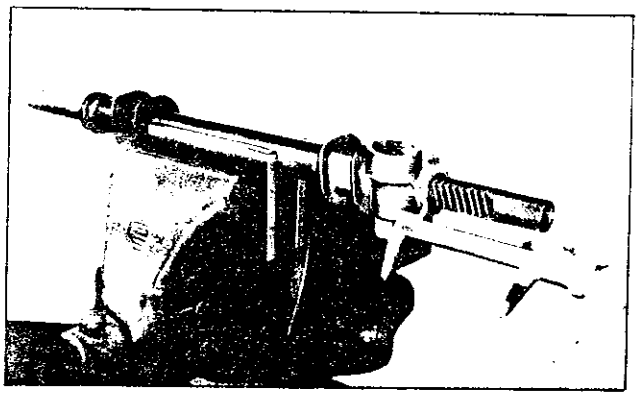


Fig. ST-28 Measuring protruding portion of rack

6. Evenly apply multipurpose NLGI No. 2 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.

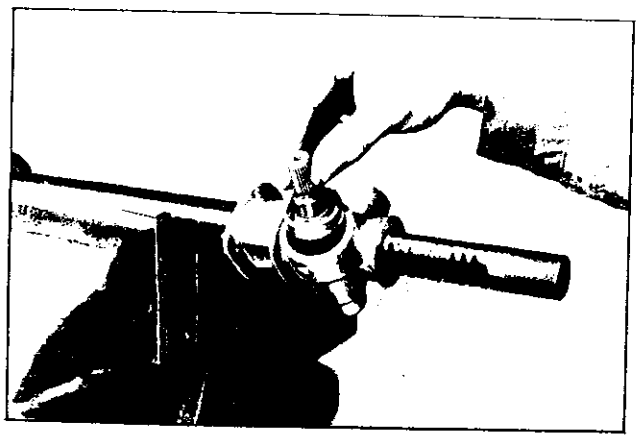


Fig. ST-29 Inserting pinion

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.

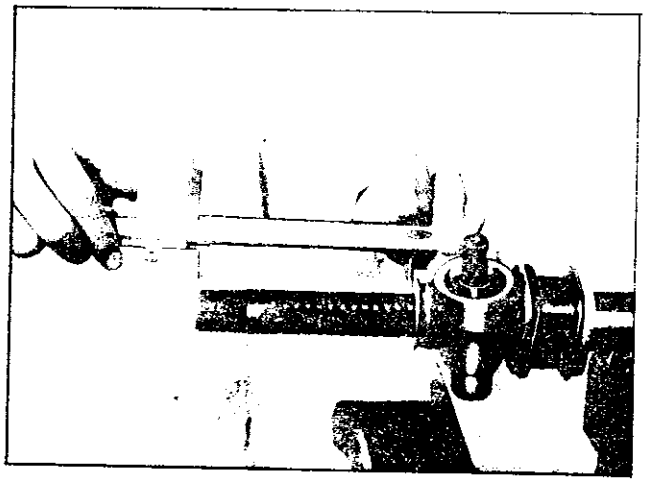


Fig. ST-30 Measuring protruding portion of rack

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

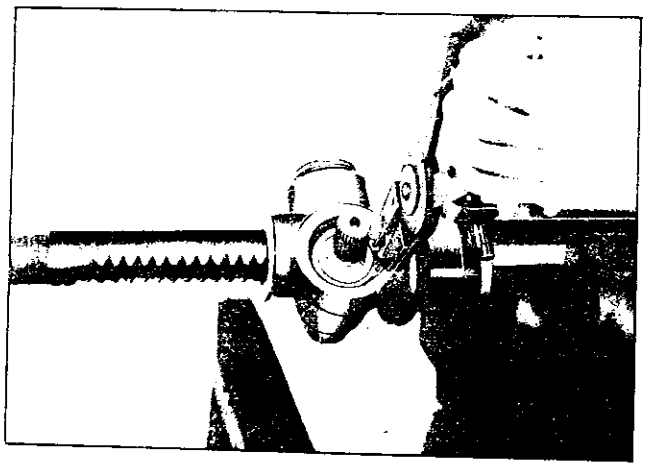


Fig. ST-31 Fitting snap ring

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.

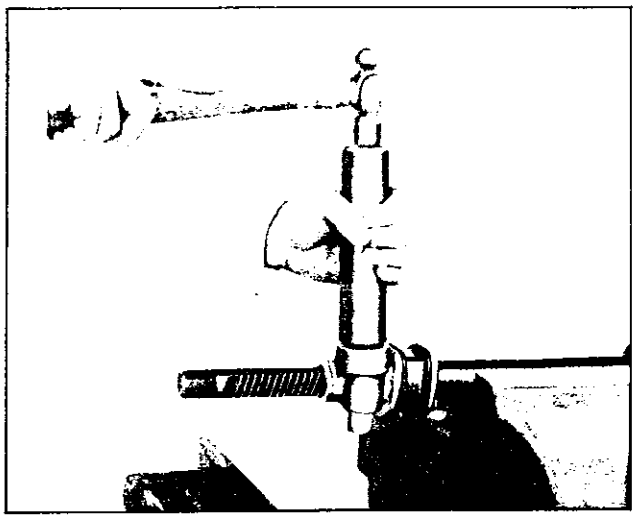


Fig. ST-32 Fitting oil seal

11. Measure thrust play of the pinion.

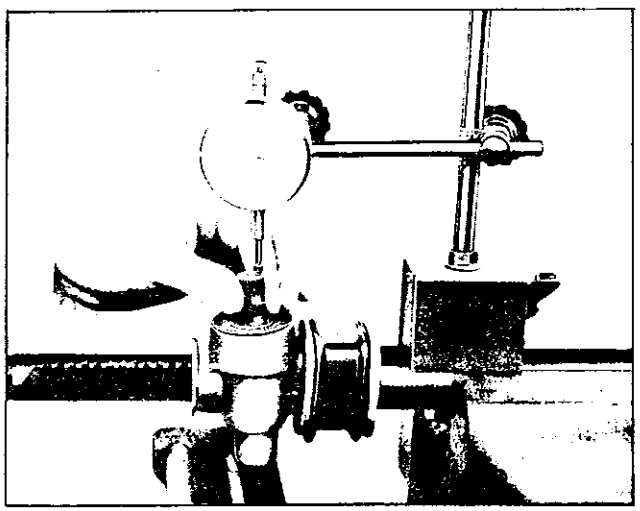


Fig. ST-33 Measuring thrust play of the pinion

Thrust play of the pinion: less than 0.09 mm (0.0035 in)

12. Apply an adequate amount of the multipurpose NLGI No. 2 grease to the retainer.

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

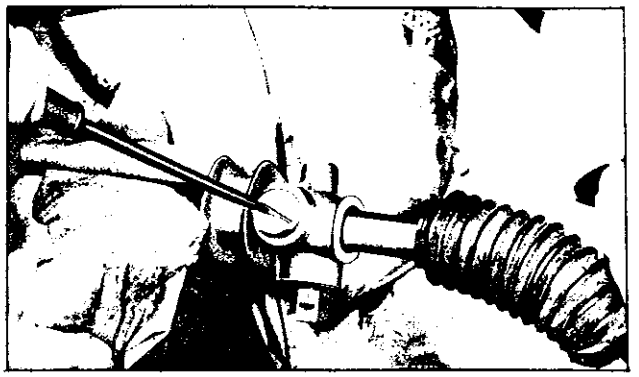


Fig. ST-34 Threading in adjust screw

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

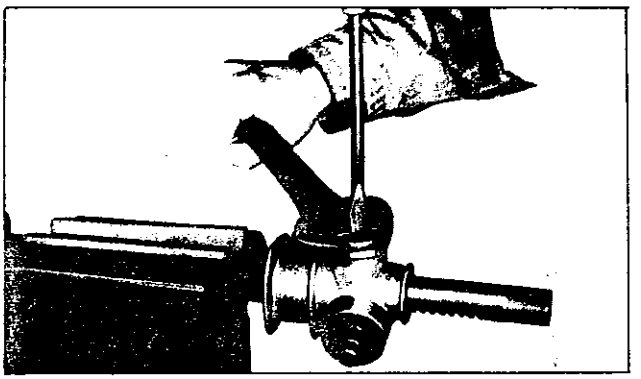


Fig. ST-35 Locking retainer lock nut

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".

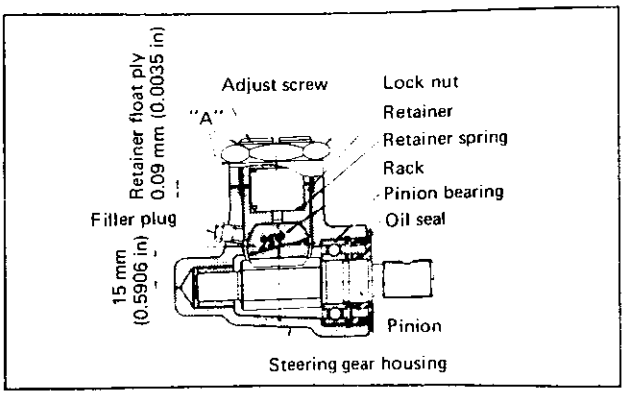


Fig. ST-36 Area to which liquid packing is covered

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

Pinion rotation torque:	8 to 20 kg-cm (7 to 17 in-lb)
Rack preload:	8 to 18 kg (17.6 to 39.7 lb)

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

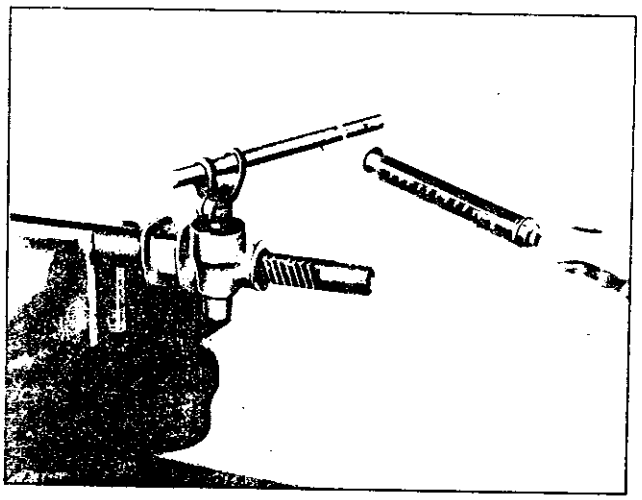


Fig. ST-37 Measuring pinion rotation torque

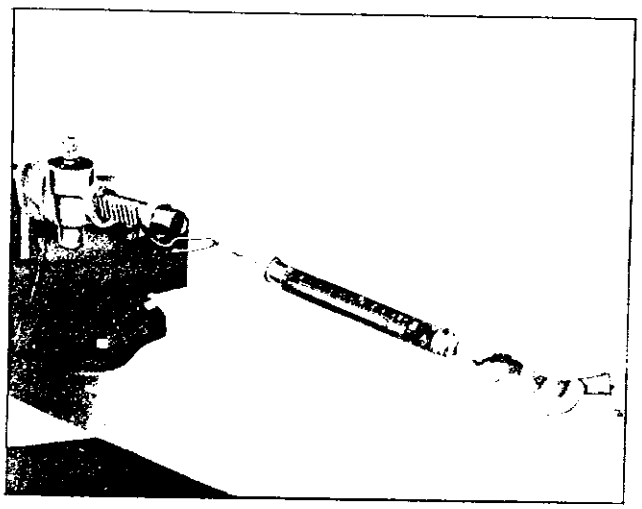


Fig. ST-38 Measuring rack preload

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 grease to the ball joint friction portion of the side rod assembly.

20. Assemble the spring and ball seat, and fit the inner socket portion of the side rod assembly to the rack.

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.)

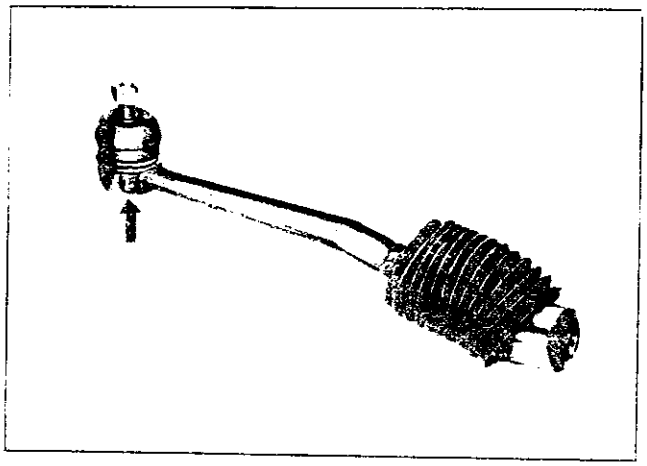


Fig. ST-39 L-mark

21. Tighten the inner socket portion until the ball seat reaches the rack end, back off the inner socket 20 to 25 degrees, and lock with the stopper nut.

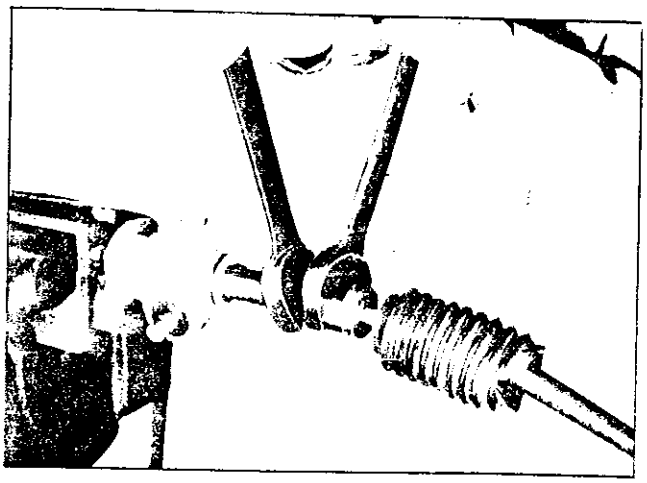


Fig. ST-40 Locking the stopper nut

Stopper nut tightening torque: 8 to 10 kg-m (57.8 to 72.3 ft-lb)

22. After assembly of the side rod, measure the swinging torque and axial play of the side rod assembly.

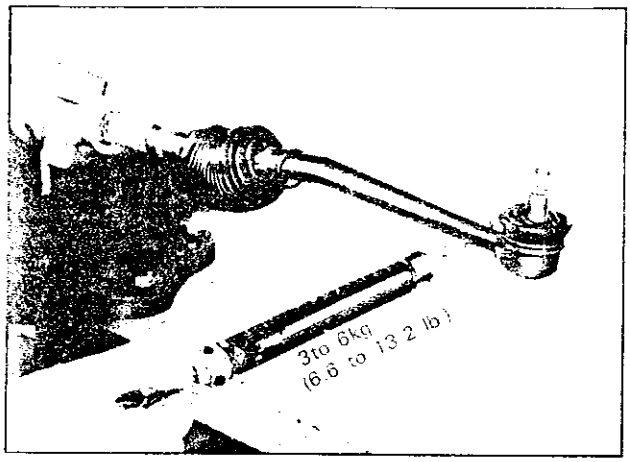


Fig. ST-41 Measuring swinging torque of side rod assembly

Side rod inner ball joint axial play

Side rod inner ball joint swinging torque: (at the side rod end)	
3 to 6 kg	(6.6 to 13.2 lb)

23. Measure the rack stroke.

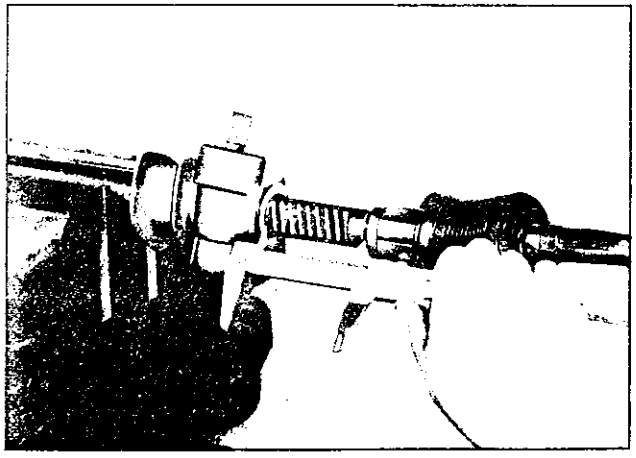


Fig. ST-42 Measuring rack stroke

Rack stroke:	60.7 mm (2.390 in)

24. Install a grease nipple at both ends of the rack-and-pinion housing, and apply multipurpose NLGI No. 2 grease to each joint.

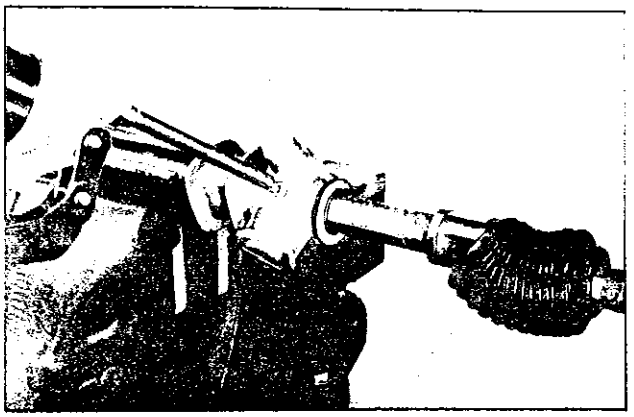


Fig. ST-43 Supplying the grease

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 so that a small amount of grease appears between the rack and housing.
Do not apply excessive amounts of grease.

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

26. Fit the boot.

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

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

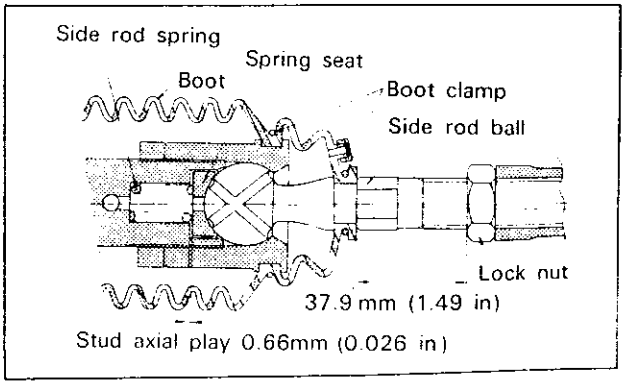


Fig. ST-44 Side rod

29. 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 brakets 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).	Adjust.
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 and deformation of loadwheel.	Correct the imbalance or replace.
Uneven wear of tires and 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.	Adjust.
Incorrect wheel alignment.	Adjust.
Wear and deformation of steering linkage and suspension link.	Replace.

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	Two years or 40,000 km (24,000 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	2.6 mm (0.102 in)
	- Free length	26.3 mm (1.035 in)
	- Coil turns	5.5
	- 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 inner ball joint axial play		0.06 mm (0.0024 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 inner ball joint swinging torque	0.8 to 1.5 kg-m (5.8 to 10.8 ft-lb)
Side rod outer ball joint swinging torque	0.8 to 1.5 kg-m (5.8 to 10.8 ft-lb)
Pinion rotation torque	8 to 20 kg-cm (7 to 17 in-lb)
Rack preload	8 to 18 kg (17.6 to 39.7 lb)

TIGHTENING TORQUE

Steering wheel nut

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	8 to 10 kg-m (52.8 to 72.3 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)

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DATSUN 240Z SPORTS
MODEL S30 SERIES
CHASSIS & BODY

NISSAN

NISSAN MOTOR CO., LTD.
TOKYO, JAPAN

SECTION FE

ENGINE CONTROL, FUEL & EXHAUST SYSTEM

FE

ENGINE CONTROL SYSTEM

ACCELERATOR LINKAGE

Description

The accelerator linkage with the minimized weight has been constructed so that it is not affected by the engine vibration and operated smoothly.

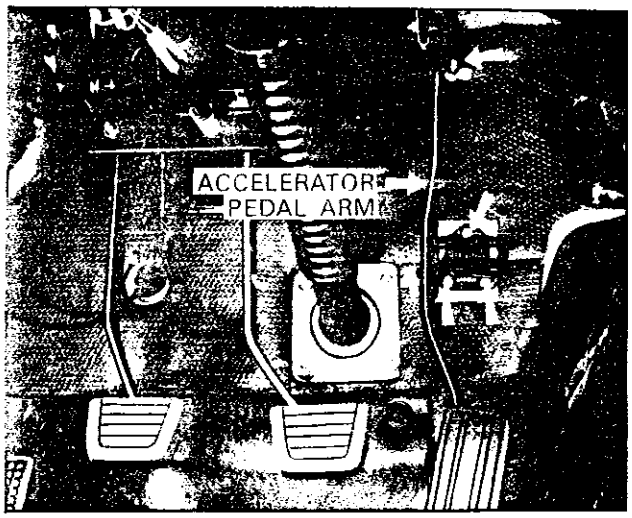


Fig. FE-1 Accelerator pedal arm removal

Removal

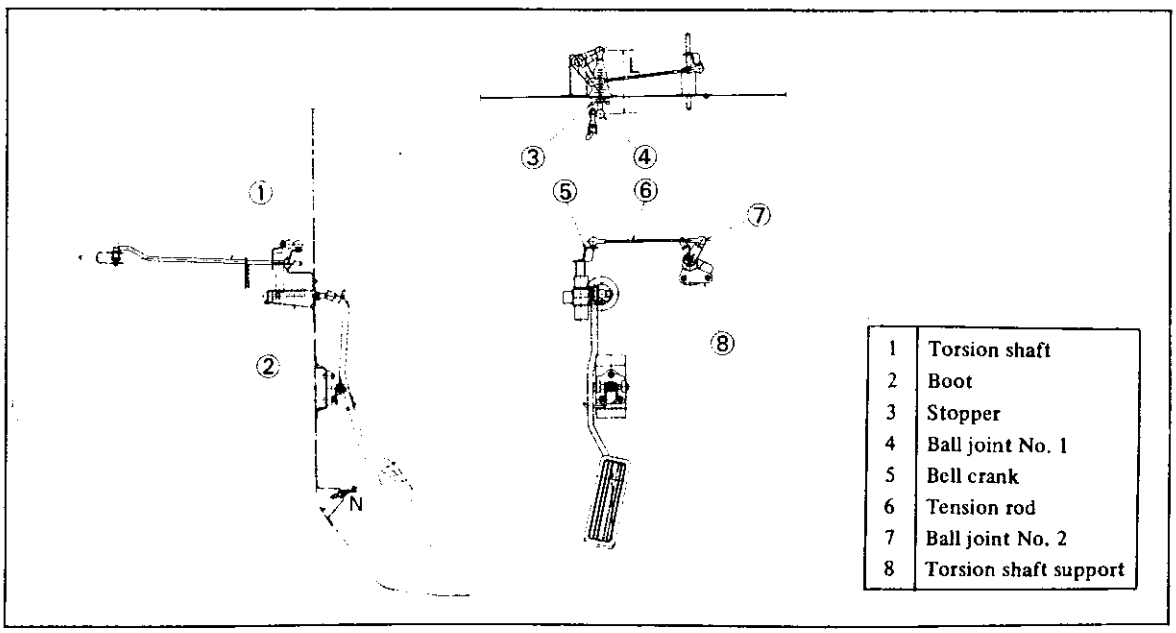
1. Remove three screws from the accelerator pedal bracket.

2. Separate the accelerator rod from the pedal arm at the ball joint.

3. Remove two bolts from the torsion shaft support in the engine compartment and remove the accelerator linkage.

Reinstallation is carried out in reverse sequence of removal.

Adjustment



1	Torsion shaft
2	Boot
3	Stopper
4	Ball joint No. 1
5	Bell crank
6	Tension rod
7	Ball joint No. 2
8	Torsion shaft support

Fig. FE-2 Accelerator linkage setting

1. Properly adjust the screw on the ball joint No. 1 so that the dimension "L" is correctly aligned to 108 mm (4.25 in).

2. Adjust the screw on the ball joint No. 2 properly so that the length of the tension rod (length between both end ball joint centers) is correctly aligned to 182 mm (7.17 in).

3. Install the accelerator linkage on the vehicle, and readjust the tension rod length so that the throttle shaft of the carburetor is correctly positioned in "Fully Close" position. In this adjustment, the tension rod length adjusting range is 182±6 mm (7.17±0.2362 in) and the size "N" should be 148 mm (5.83 in). (The free height is adjusted automatically by the stopper shown in the Figure FE-2.)

4. Upon completion of the above adjustment, depress the accelerator pedal, and adjust the stopper bolt properly so that it comes into contact with the pedal when the throttle shaft is positioned in the "Fully Open" position. Now, turn the stopper bolt clockwise in one full turn and lock the stopper bolt with the lock nut.

FUEL AND EXHAUST SYSTEM

CONTENTS

EXHAUST SYSTEM

Description

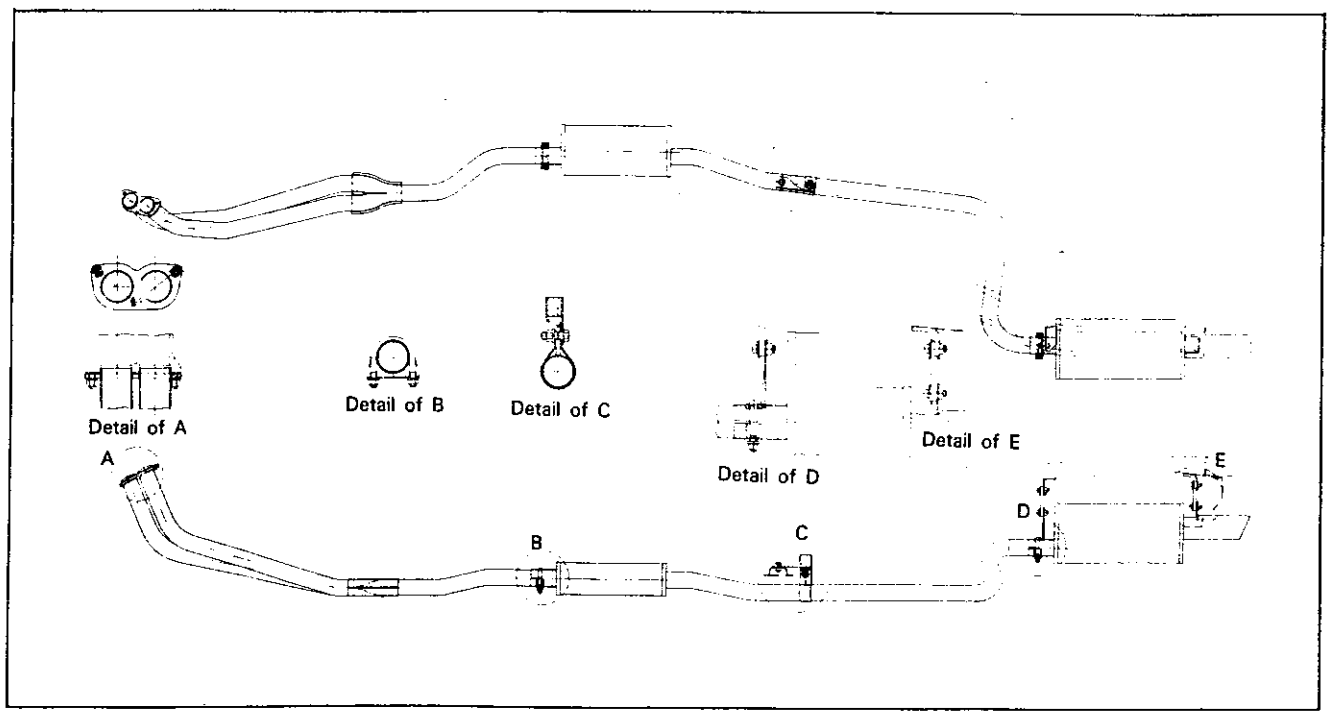


Fig. FE-3 Exhaust system

The exhaust system consists of three units providing front tube, pre-muffler and center tube, and main muffler and tail pipe. As seen in the Figure FE-3, the exhaust system is mounted at the points "C", "D" and "E" and clamped at the points "B" and "D" with U-bolts.

Removal

1. Remove three front tube and exhaust manifold connecting bolts.

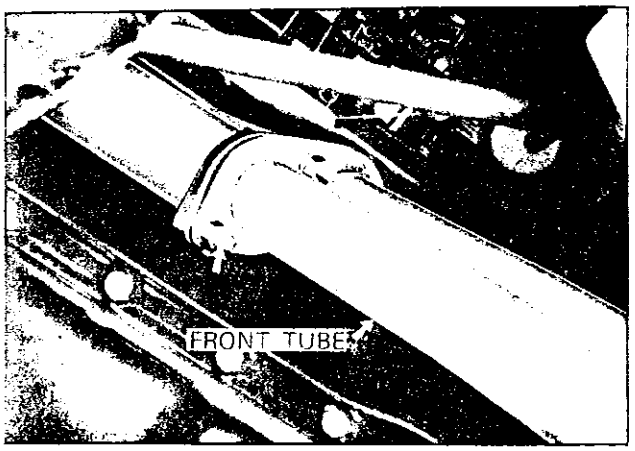


Fig. FE-4 Removing front tube

2. Remove the exhaust hanger strap (the point "E" shown in the Figure FE-3.).

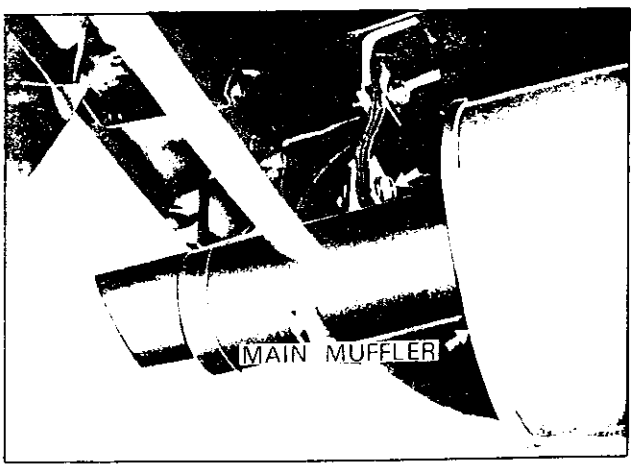


Fig. FE-5 Removing exhaust hanger strap (point "E")

3. Remove the exhaust hanger strap (the point "D" shown in the Figure FE-3.).

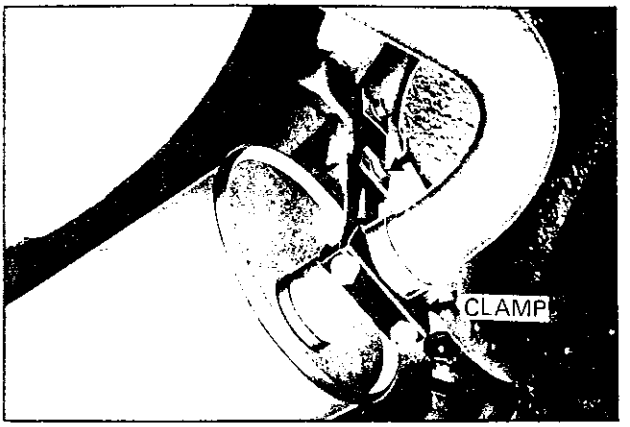


Fig. FE-6 Removing exhaust hanger strap (point "D")

4. Remove the bolt (the point "C" shown in the Figure FE-3.) and dismount the exhaust system.

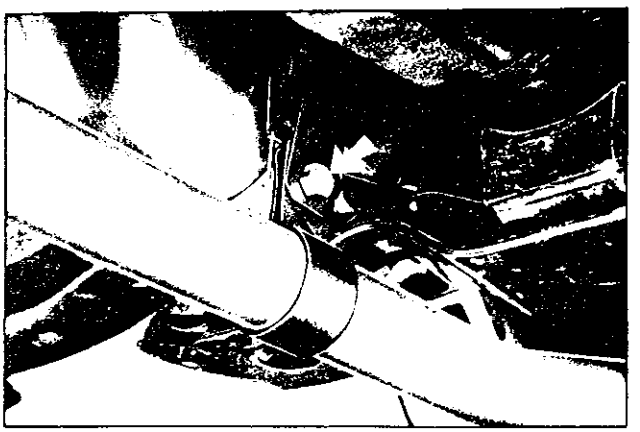


Fig. FE-7 Removing the bolt (point "C")

5. Remove the U-bolts (the points "B" and "D" shown in the Figure FE-3.), and separate the exhaust system into three sections.

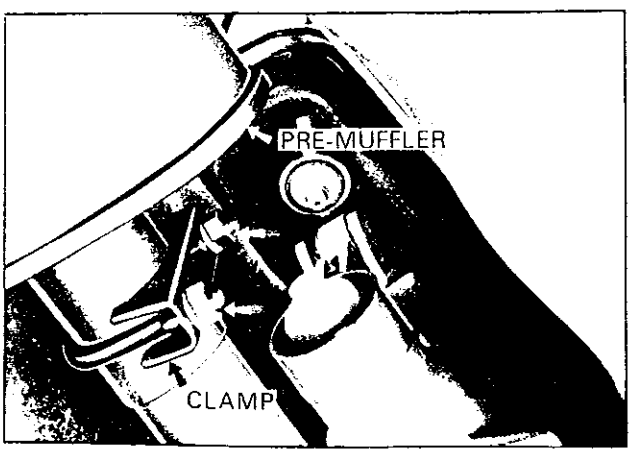


Fig. FE-8 Removing U-bolt (point "B")

Inspection

1. Check the tube and muffler for deformation and damage, and replace as required.

2. Check the insulator rubber and mounting bracket for crack and deformation, and replace as required.

3. Upon completion of the reinstallation, check the exhaust system for exhaust gas leaking and exhaust noise.

FUEL SYSTEM

FUEL TANK

Description

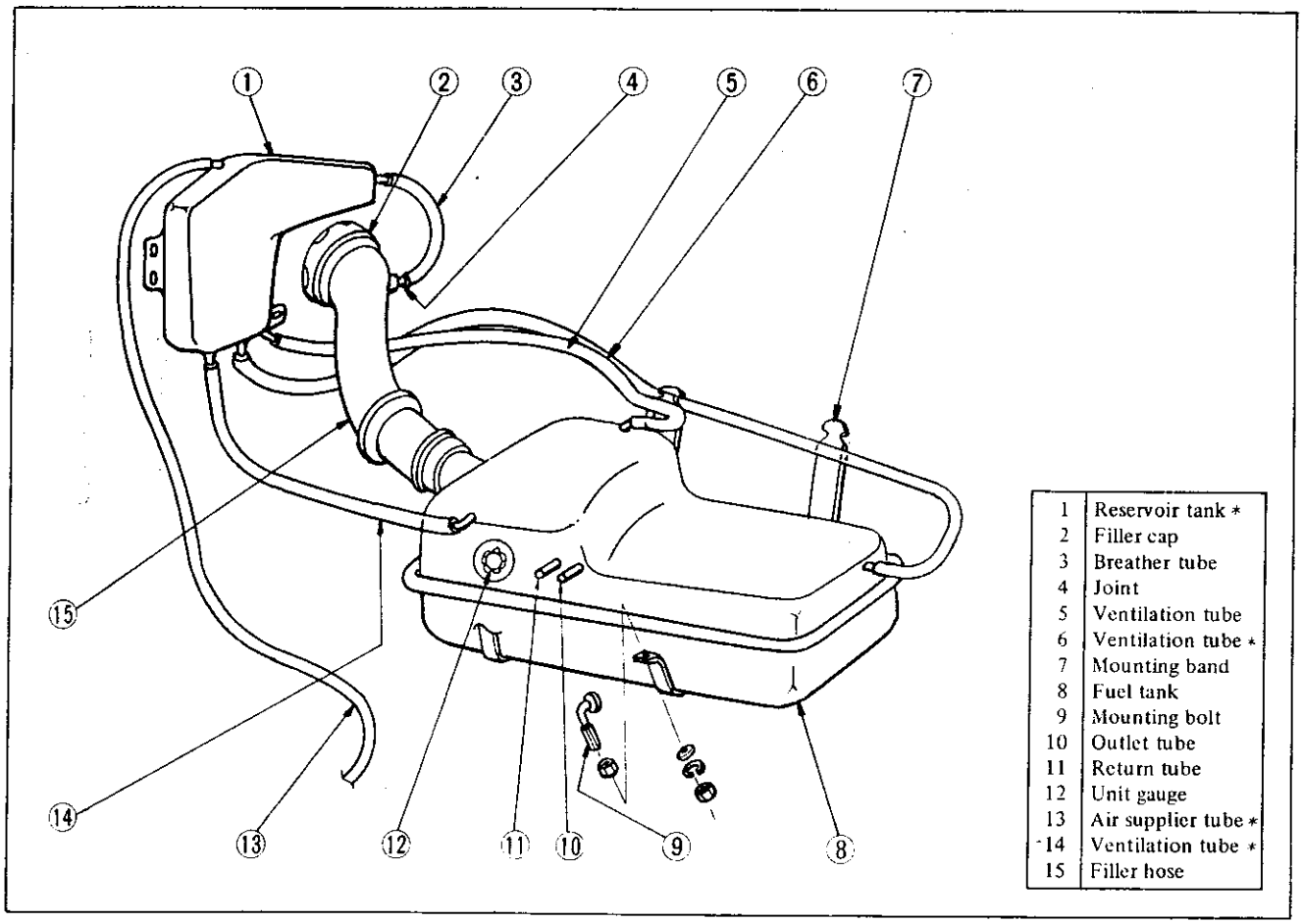


Fig. FE-9 Fuel tank (for California, U.S.A.)*

The fuel tank is installed beneath the rear floor with two bands, and approximately half of it is located beneath the spare tire housing. The fuel tank capacity is 60 liters (15.9 US gal).

The fuel inlet is in the filler lid located in the rear right side panel, and the filler cap is of a hermetic type. The bayonet type unit gauge is installed on the front surface of the tank. A reservoir as shown in the Figure FE-9 is provided so as to relief expansion and bubbles due to heating. (for California, U.S.A.)

Removal

1. Remove the drain plug from the tank bottom, and drain fuel completely.

2. Disconnect the unit gauge cable, outlet tube and return tube hoses from the tank.

3. Remove nuts from two tank securing bands, and slightly lower the tank.

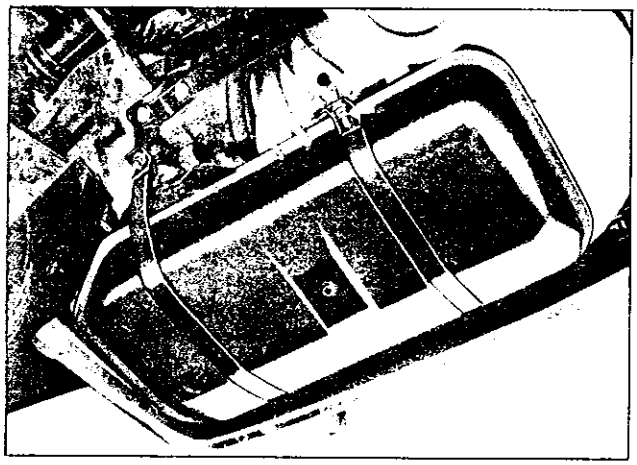


Fig. FE-10 Fuel tank mounting

4. Disconnect three ventilation tubes (used to connect the reservoir to the tank) and filler hose from the tank, and dismount the tank.

5. Disconnect the breather tube and air supplier tube (used to connect the filler hose to the reservoir), remove three reservoir installation bolts, and remove the reservoir.

FUEL LINE

The fuel line between the fuel strainer and fuel tank is a molded single unit, and with this construction, fuel leaking is completely prevented. Moreover, the fuel line is provided with a fuel return pipe, and thus, vapor lock and similar phenomenon is prevented.

FUEL STRAINER

The fuel strainer is a Nylon cartridge type strainer which can be replaced easily. The replacement period is 40,000 km (24,000 miles).

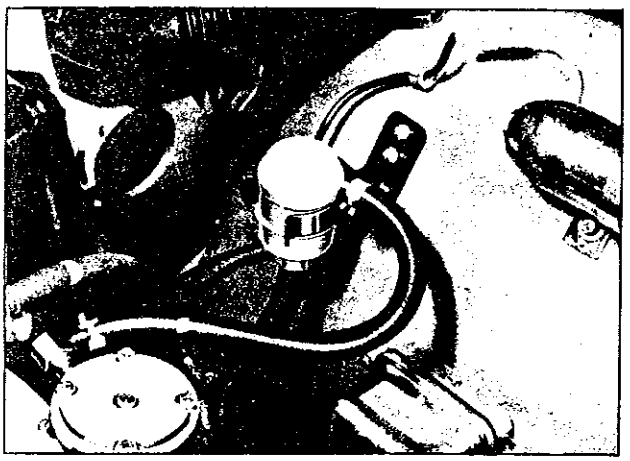


Fig. FE-11 Fuel strainer

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DATSUN 240Z SPORTS
MODEL S30 SERIES

CHASSIS & BODY

NISSAN

NISSAN MOTOR CO., LTD.
TOKYO, JAPAN

SECTION BF

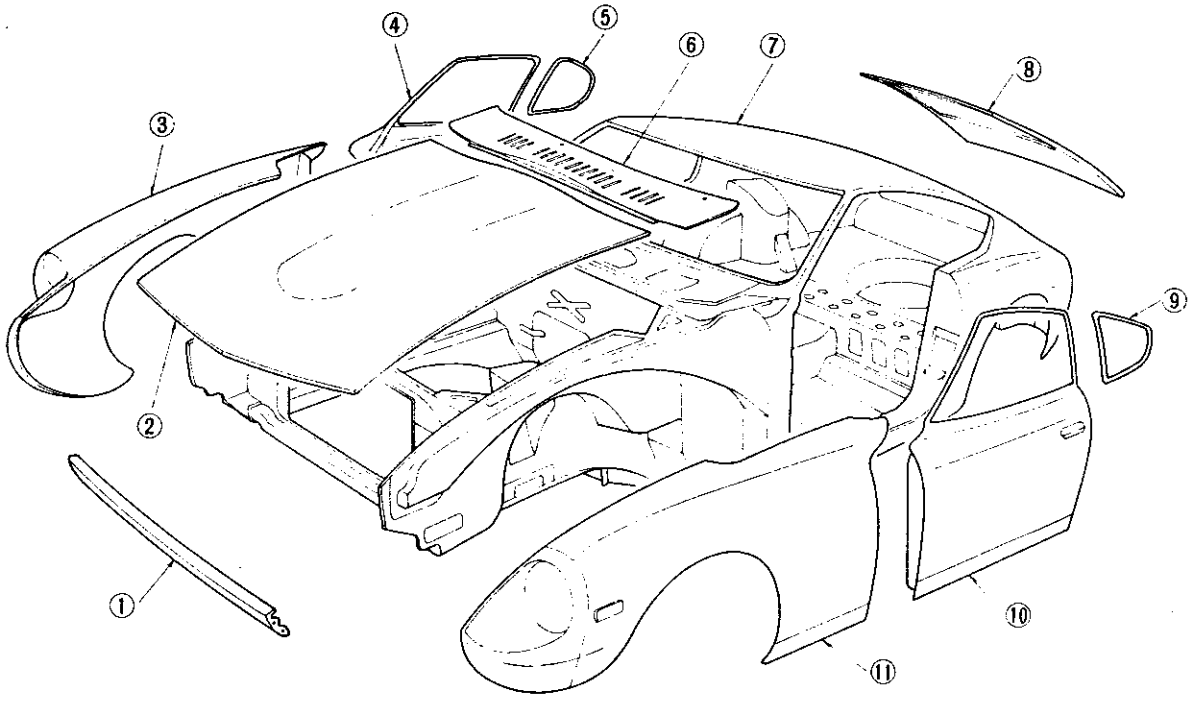
BODY

BF

BODY

Description

The body adopts a unit construction system. With construction, the weight has been reduced to the minimum and rigidity and safety have been highly improved. In order to utilize the rider's compartment effectively, the fuel tank is located beneath the floor and a spare tire is contained in the spare tire housing sunk below the floor level. Thus, flat floor space behind the seats is largely provided for luggages. In addition, the rear of the body is provided with a large tail gate.



1	Front apron	7	Body main unit
2	Hood	8	Tail gate
3	Front fender (RH)	9	Side window (LH)
4	Door (RH)	10	Door (LH)
5	Side window (RH)	11	Front fender (LH)
6	Cowl top grill		

Fig. BF-1 Body structure

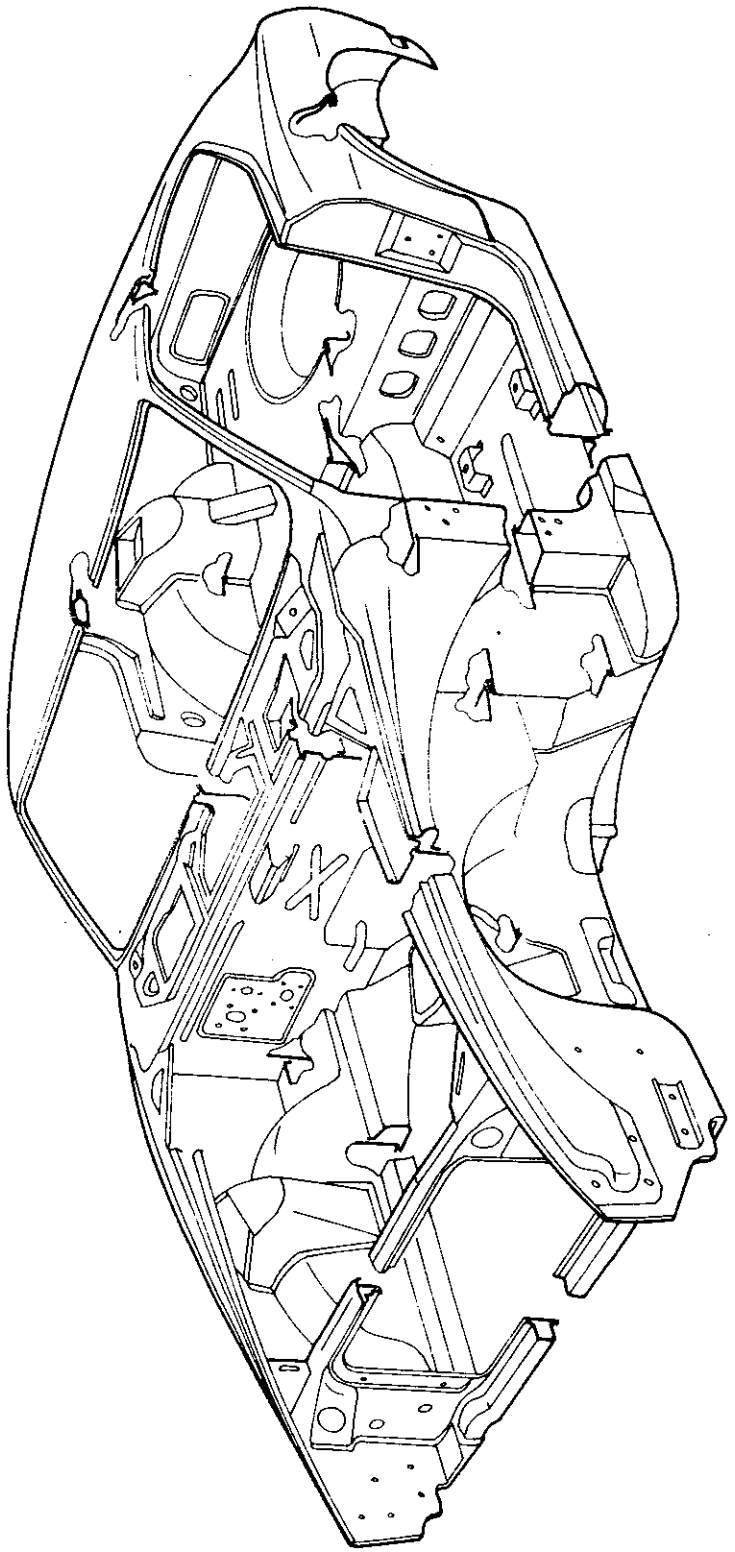


Fig. BF-2 Outline of body

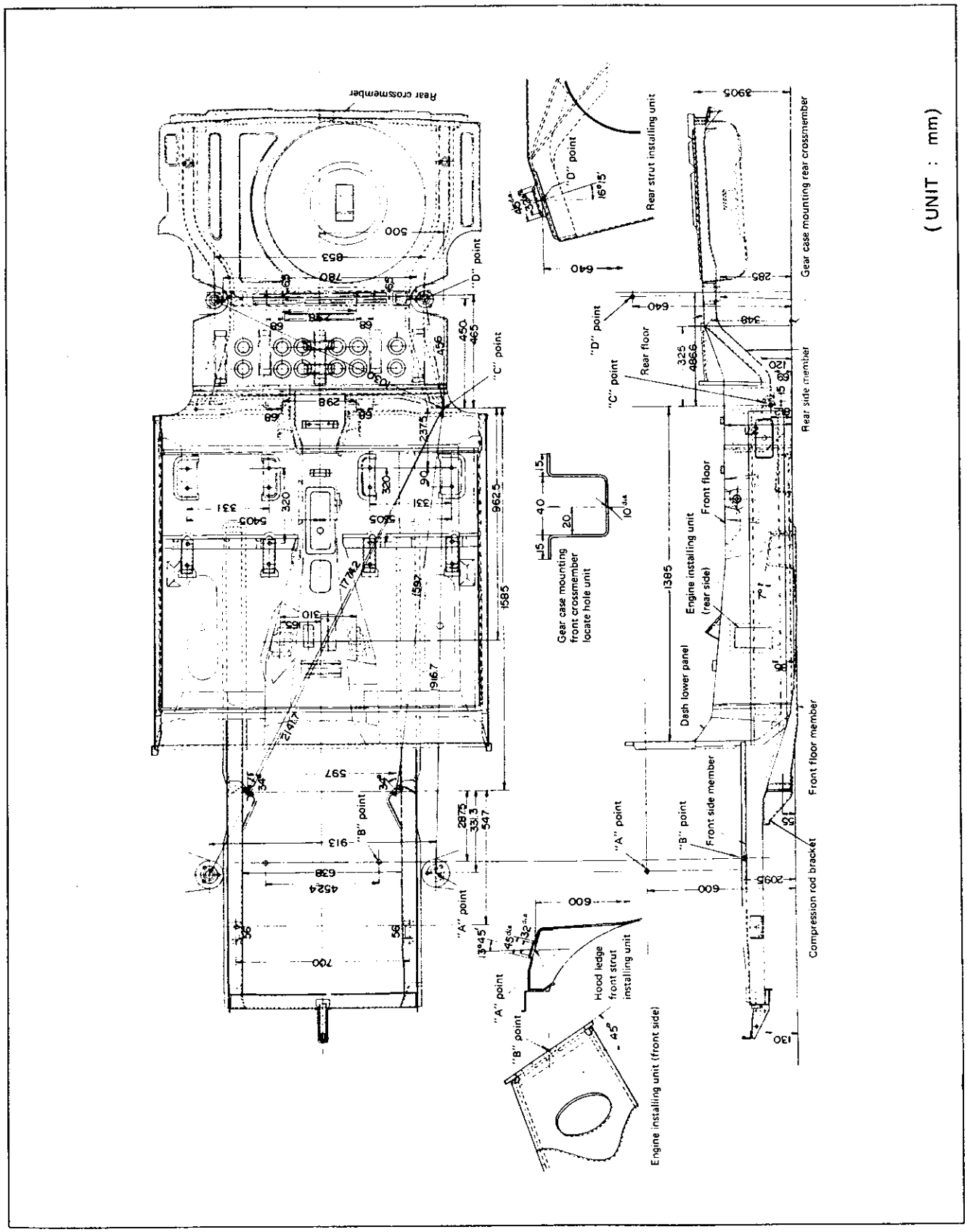
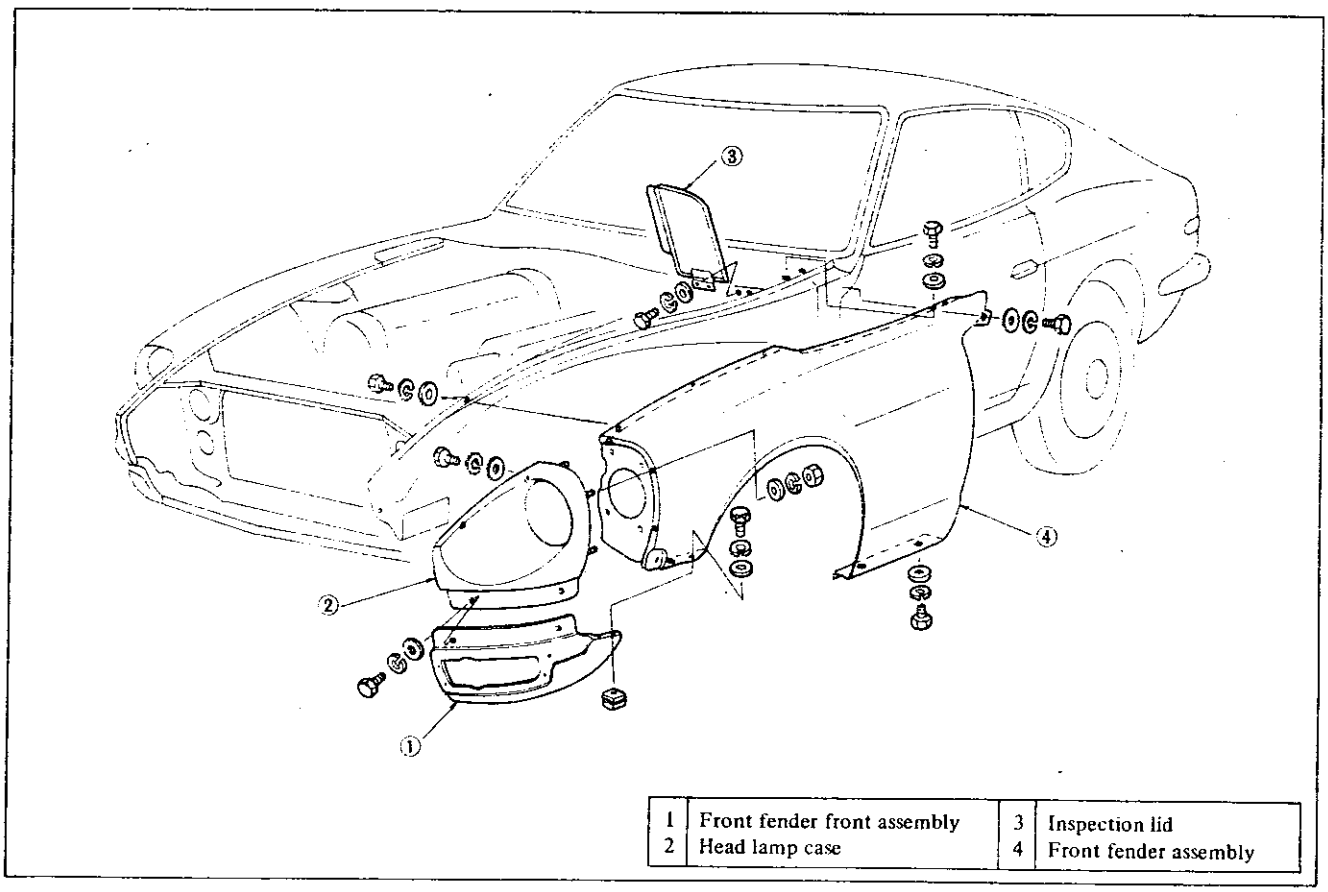


Fig. BF-3 Standard body dimensitons

FRONT END AND FRONT FENDER

CONTENTS



1	Front fender front assembly	3	Inspection lid
2	Head lamp case	4	Front fender assembly

Fig. BF-4 Removing front fender

FRONT FENDER

Removal

1. Remove the front bumper.
2. Disconnect the battery cable from the battery terminal, and remove the head lights and side flasher lamps.
3. Remove the inspection lid and cowl top grill.
4. Remove the front fender front assembly.
5. Remove the head light cases.

6. Remove the bolts and nuts used to clamp the fender.

COWL TOP GRILL

1. Remove the windshield wiper blades together with the arms.

2. Remove the set screws, and remove the cowl top grill toward the front.

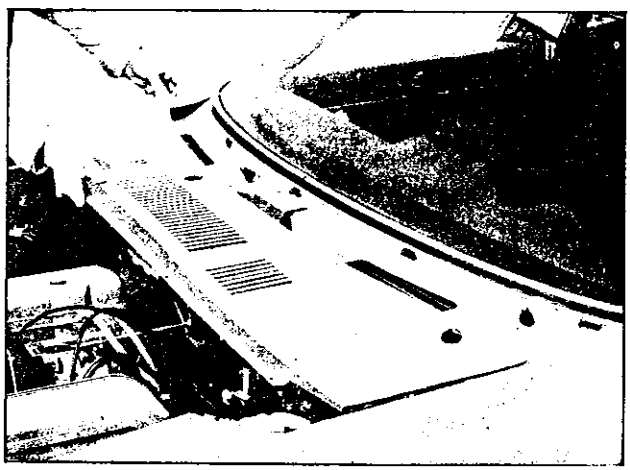


Fig. BF-5 Removing cowl top grill

RADIATOR GRILL

1. Remove the front bumper, and remove the radiator grill installation screws.

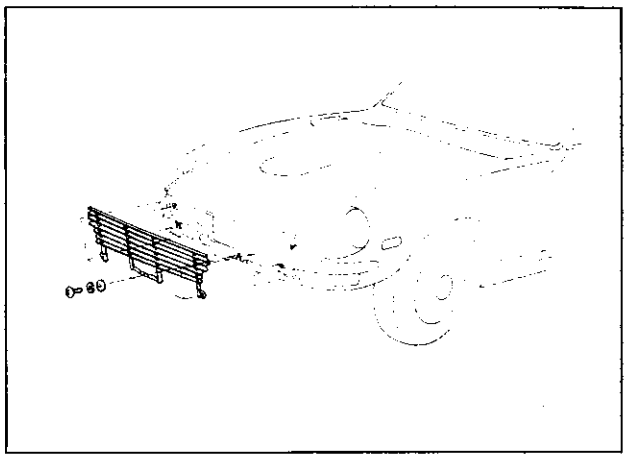


Fig. BF-6 Removing radiator grill

2. Reinstall the radiator grill in reverse sequence of removal.

BUMPER

Fig. BF-7 Removing front bumper

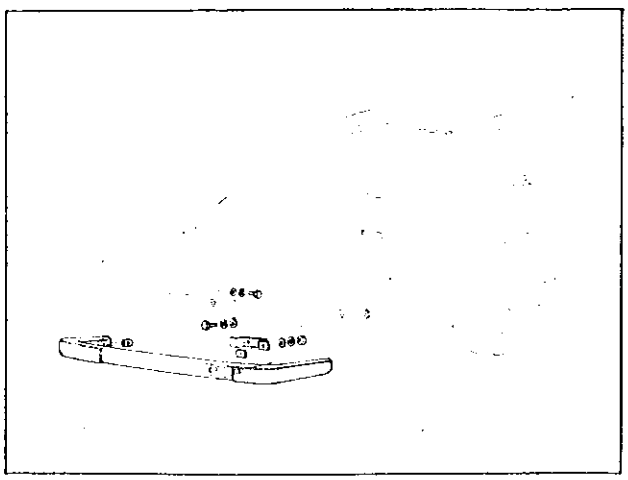


Fig. BF-8 Removing rear bumper

HOOD

CONTENTS

The hood adopts a large size single sheet construction. The hood can be opened widely, and thus, the engine compartment can be inspected easily.

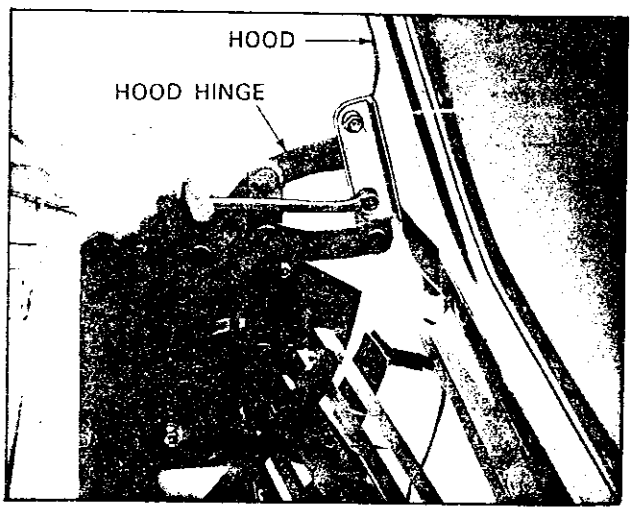


Fig. BF-9 Removing hood

Removal

1. Open the hood and remove bolts from both sides.
2. Hold the hood from both sides with two persons, and remove it.

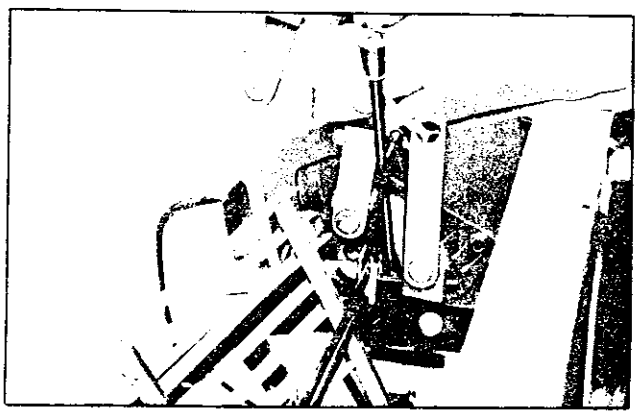


Fig. BF-10 Removing hood torsion bar

HOOD LOCK

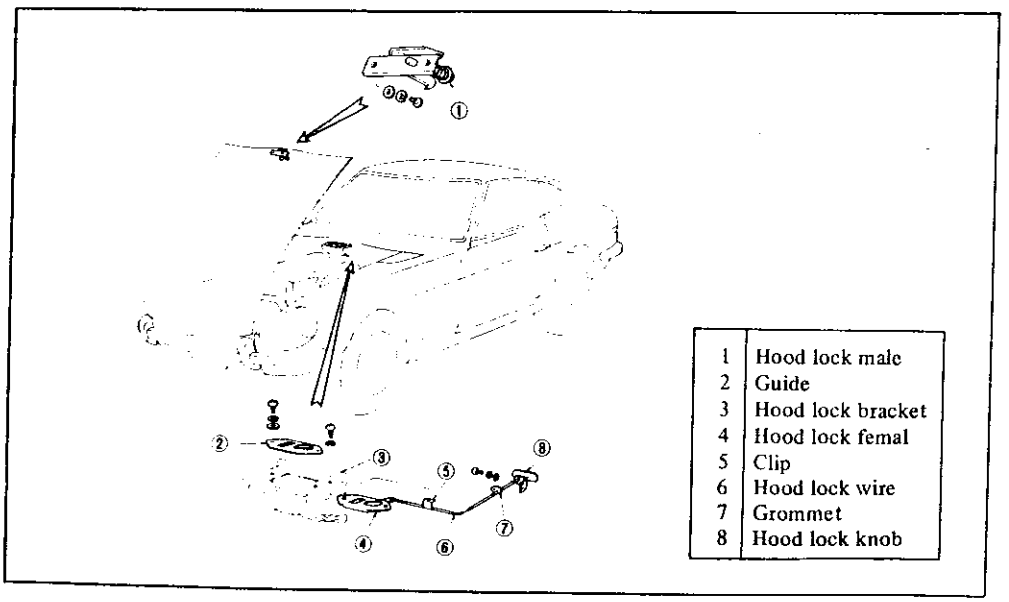


Fig. BF-11 Sctructural view of hood lock

Removal

1. Open the hood, and remove the hood lock male.

2. Remove the clamp from the hood lock bracket, and remove the ball caulked on the hood lock control cable from the lever of the hood lock female.

3. Remove the hood lock female and guide from the hood lock bracket.

4. Remove the hood lock control from the dash side.

Note: When removing the hood lock control only, the caulked clamp must be opened because the grommet is used commonly with the speedometer cable.

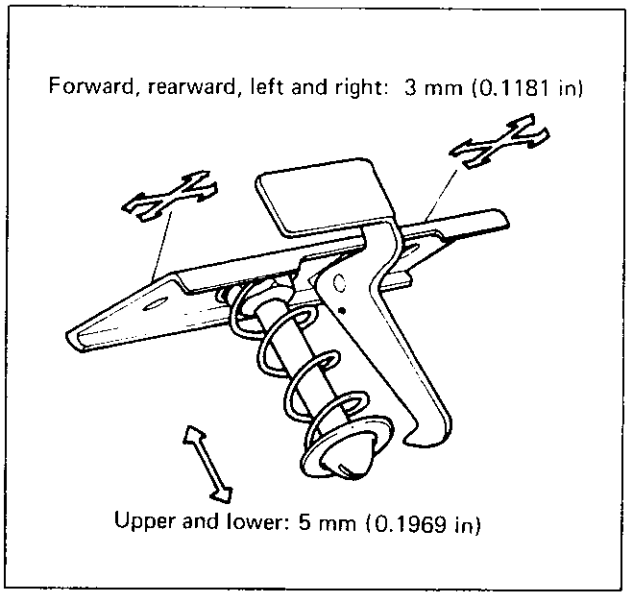


Fig. BF-12 Adjusting hood lock

Adjustment

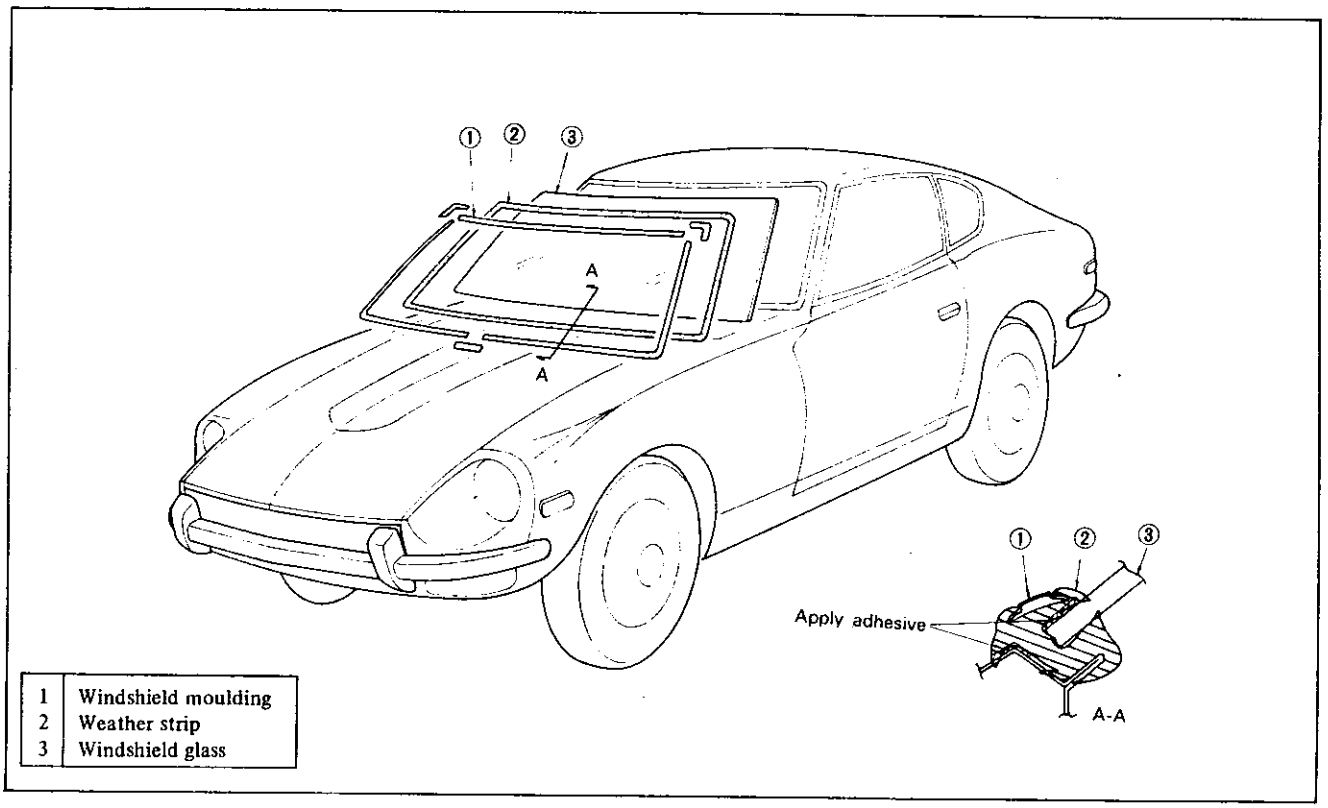
1. When the dovetail of the hood lock male is not coincided with the guide hole, loosen and properly adjust the hood lock male installation bolt.

2. When the lock engagement is too shallow or too deep, adjust the dovetail height properly.

WINDSHIELD GLASS

CONTENTS

FRONT WINDSHIELD GLASS



1	Windshield moulding
2	Weather strip
3	Windshield glass

Fig. BF-13 Front windshield glass

Removal

1. Remove the rear view mirror.

2. Remove the instrument panel garnish.

3. Remove the windshield wiper blades together with the arms.

4. Remove the windshield moulding.

Note: Be careful not to deform the moulding.

5. Detach the adhesion in the windshield flange side by applying a spatula or ordinary [(-) headed] screw driver from the outside.

6. Depressing the weather strip toward outside, lightly tap and remove the windshield glass to the outside.

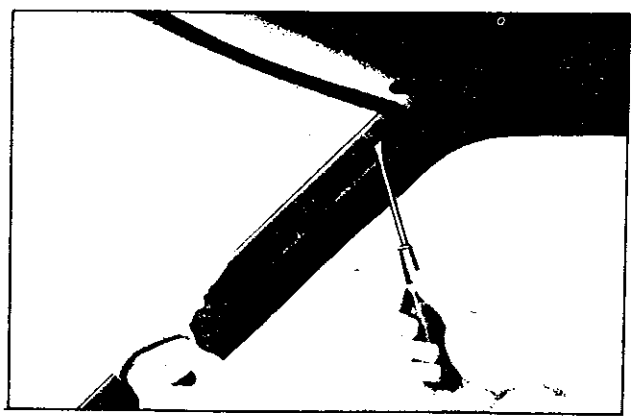


Fig. BF-14 Removing front windshield glass

Note: Recommend the windshield glass removing be started from the upper side portion.

Reinstallation

1. For the installation, use string and spatula shown in Figure BF-15.

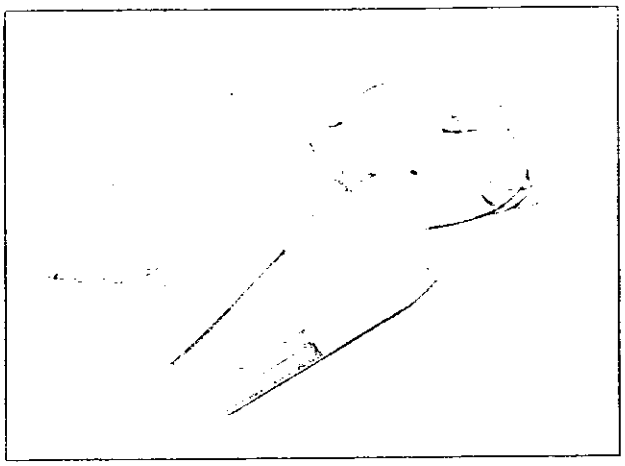


Fig. BF-15 Tools for installation of windshield glass

2. Apply adhesive to the appropriate portions on the weather strip as shown in Figure BF-13, and apply the weather strip to the windshield glass.

3. Apply string into the groove of the weather strip.

4. Set the windshield glass to the windshield flange from the outside, put the string into the compartment side.

Note: The operation should be carried out by two persons, one of them works at outside and the other works at inside.

5. Pull the string (a person working at inside) in such a manner that the weather strip correctly engages with the flange. At the same time, lightly tap the glass (a person working at outside) by hand and assist the person working at inside.

Note: When the weather strip is not fitted into the flange correctly but mounted on the flange, correctly fit the weather strip into the flange by the use of a spatula.

6. Tap the overall glass area lightly to settle the weather strip down on the flange evenly and tightly.

7. Apply adhesive to the entire periphery.

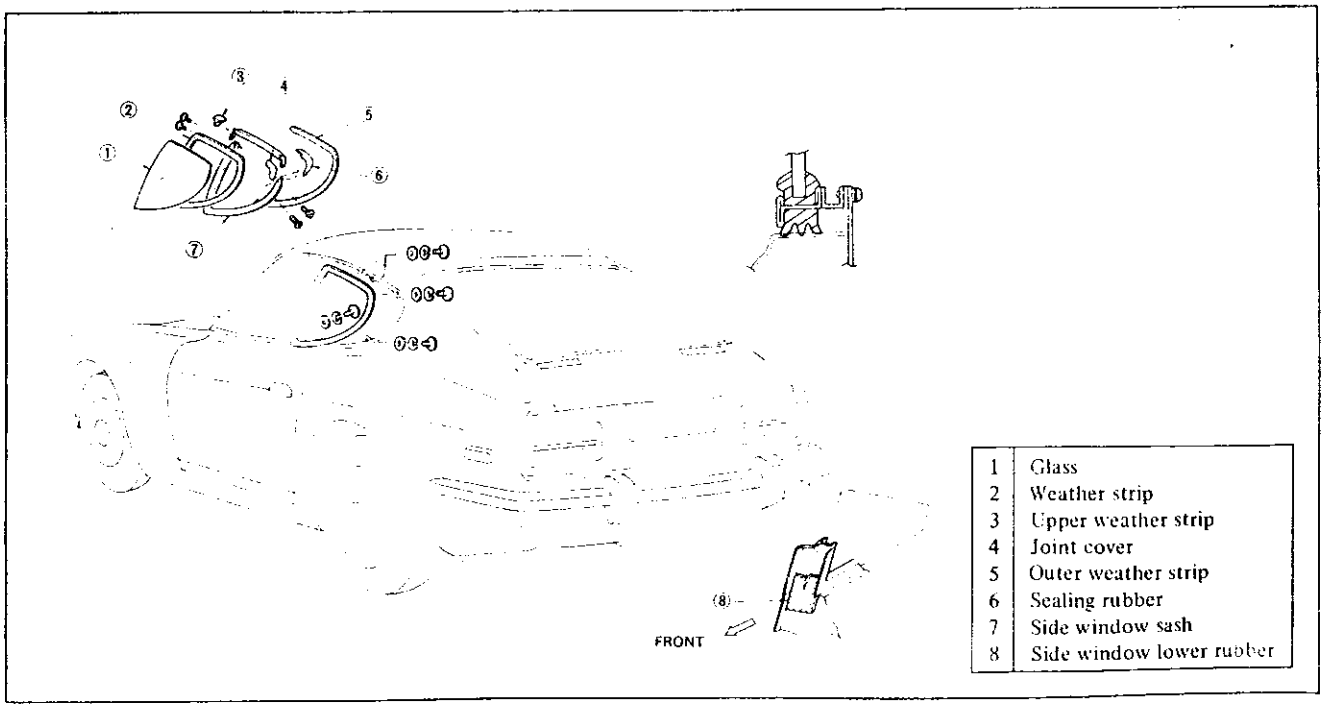
8. Install the windshield moulding.

9. Install the windshield wiper blades and arms.

10. Install the instrument panel garnish.

11. Install the rear view mirror.

SIDE WINDOW

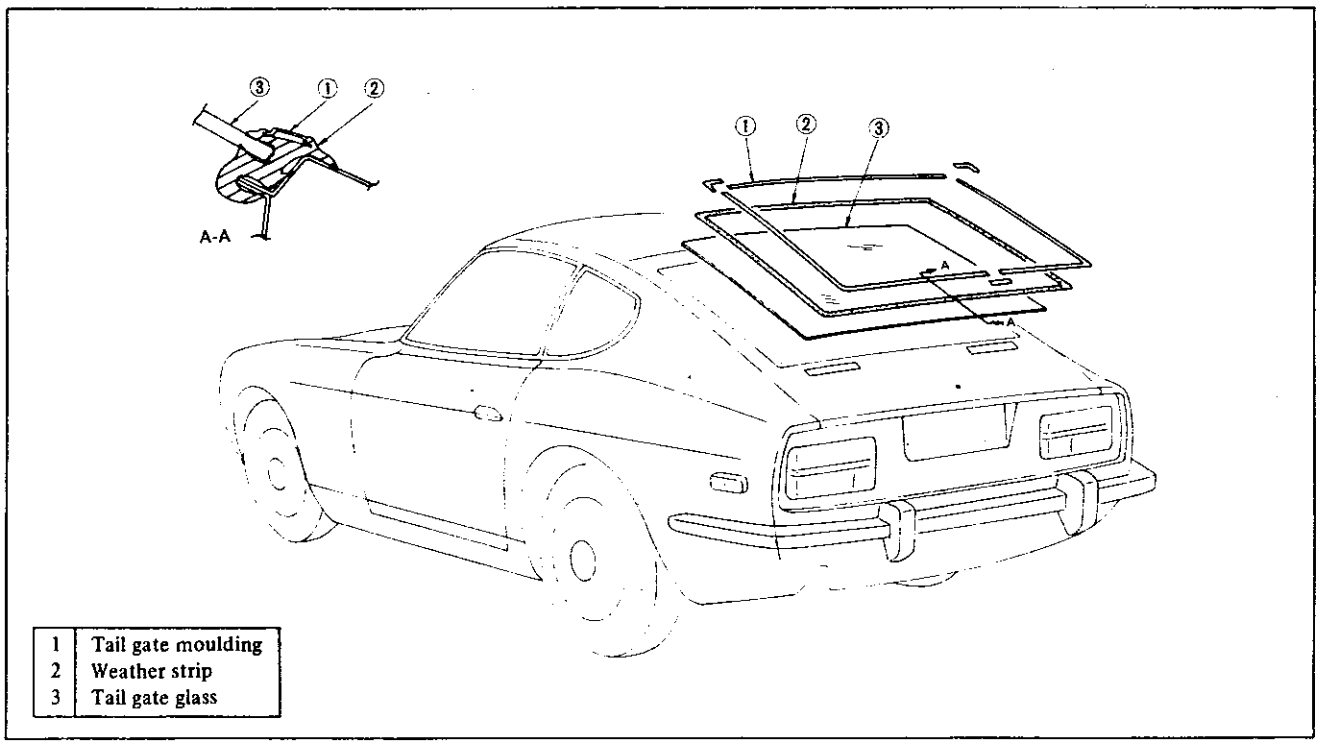


1	Glass
2	Weather strip
3	Upper weather strip
4	Joint cover
5	Outer weather strip
6	Sealing rubber
7	Side window sash
8	Side window lower rubber

Fig. BF-16 Structural view of side window

TAIL GATE GLASS

For the tail gate glass removal and installation, the instructions for windshield glass apply. However, sealing agent is used in lieu of adhesive.



1	Tail gate moulding
2	Weather strip
3	Tail gate glass

Fig. BF-17 Structural view of tail gate glass

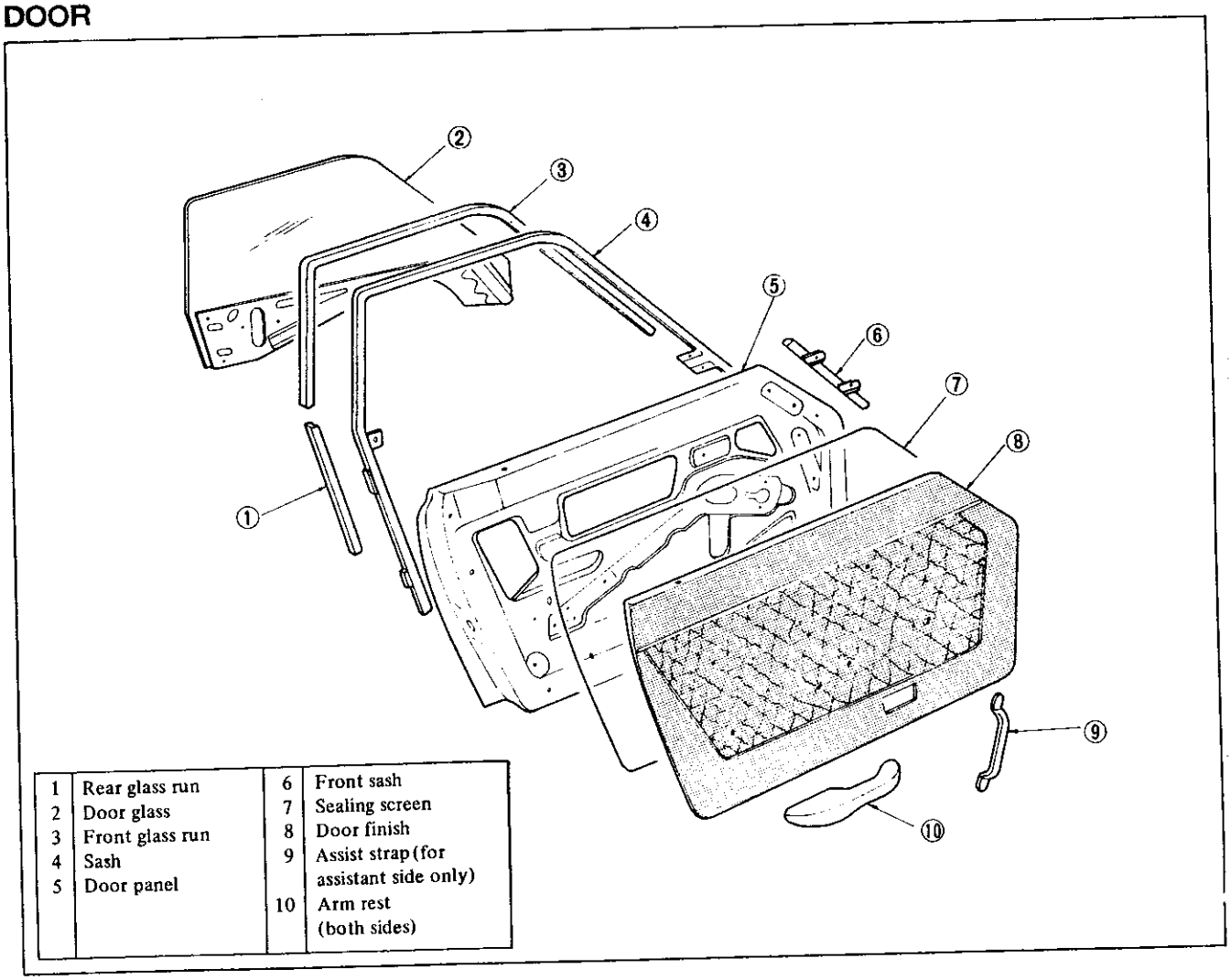
DOOR

CONTENTS

The door, eliminating front side glass ventilation window, adopts curved glass, obtaining wide rider compartment space. The door main unit is rigidly constructed, the outer panel is provided with two stiffeners, and thus, together with the highly rigid inside panel shape, the strength, rigidity, and safety of the rider compartment are highly improved.

For both sides, one each block door lock is installed. The window glass regulator which supports the window glass is of an X-shape double arm type. The side handle is buried in the door, eliminating projection form the interior and improving the safety.

DOOR



1	Rear glass run	6	Front sash
2	Door glass	7	Sealing screen
3	Front glass run	8	Door finish
4	Sash	9	Assist strap (for assistant side only)
5	Door panel	10	Arm rest (both sides)

Fig. BF-18 Structural view of door

Removal

The door may be removed with or without hinges installed on the door. Remove the door with the hinges installed on the door when adjustment is required later. The following instructions are for removal of door with the hinges installed on the door.

1. Disconnect the battery cable from the battery terminal.

2. Disconnect the horn relay from the dash sid (driver's seat side only).

3. Remove the hood lock control installation bracket (driver's seat side only).

4. Remove the dash side trim.

5. With the door opened fully, support the door by applying a stand beneath the door or by means of a jack so that the door is dropped down.

Note: Apply a piece of rag between the door and the stand or jack so as to protect the door panel from scarring.

6. Remove the door hinge installation bolts from the body side.

Fig. BF-19 Removing the door

7. Removing the door from the body

When removing the door without the hinges (the hinges are remained on the body), remove the door side installation bolts from the hinges and remove the door from the hinges.

Reinstallation

Reinstall the door in reverse sequence of removal.

Door hinge installation bolt tightening bolt 0.9 to 1.1 kg-m (6.5 to 8.0 ft-lb).

Note: a. Before installing the door, be sure to apply grease to the hinge link.

b. When the door squeaks during opening and closing, oil to the hinge pin top.

Adjustment

1. When adjusting the door alignment, adjust the body side installation bolts on the hinge. The door side installation bolts on the hinges are not adjustable.

Adjusting stroke: 3 mm (0.1181 in) to upper, lower, forward and rearward

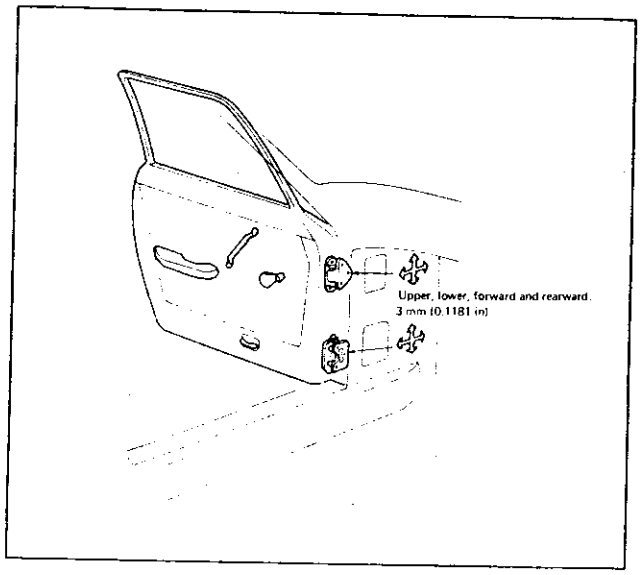


Fig. BF-20 Adjusting door hinge

DOOR LOCK STRIKER

1. Adjust the door position when closed.

2. Adjust the door lock striker correctly so that the door can be closed lightly and securely.

3. Adjust the door lock striker position with three striker installation screws. A dovetail used to protect the door from lowering is tightened together with the striker. Adjust the dovetail also when adjusting the door lock striker.

Adjusting stroke: 3 mm (0.1181 in) to upper, lower, right and left directions

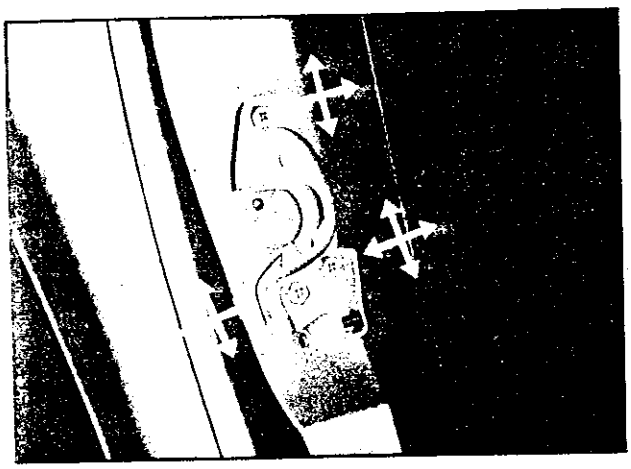
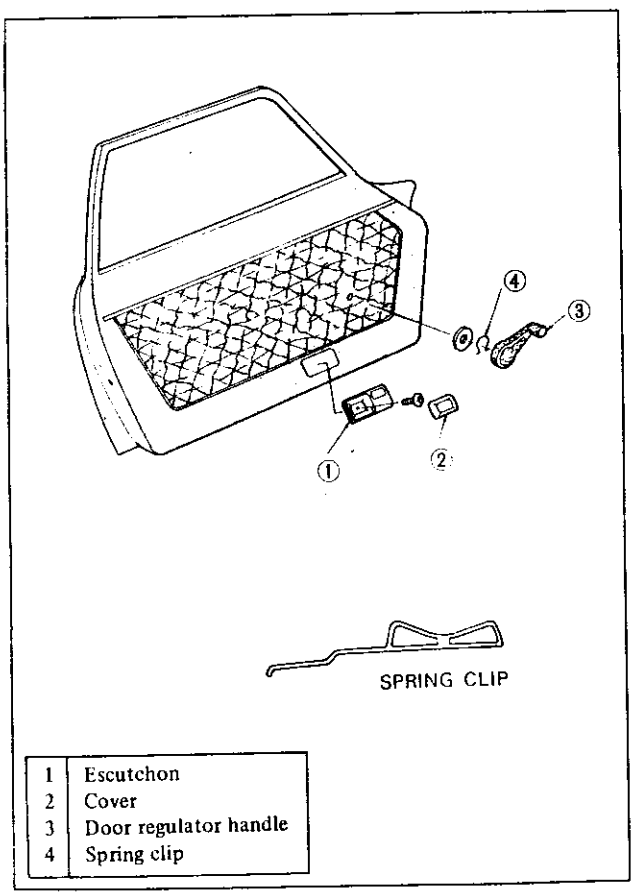


Fig. BF-21 Adjusting striker

DOOR REGULATOR HANDLE

Removal

1. Raising the door regulator handle forward, withdraw the pin.



1	Escutchon
2	Cover
3	Door regulator handle
4	Spring clip

Fig. BF-22 Removing door regulator handle

Note: Recommend the tool shown in the Figure BF-22 be made and used for this operation.

2. Remove the door handle from the door.

Reinstallation

Reinstall the door regulator handle in reverse sequence of removal.

Note: When installing the door regulator handle, make sure that the knob is faced forward with the side window glass completely closed.

DOOR LOCK INSIDE LEVER

1. Remove the cover, screw, and escutcheon in that sequence with an ordinary [(-) headed] screw driver.

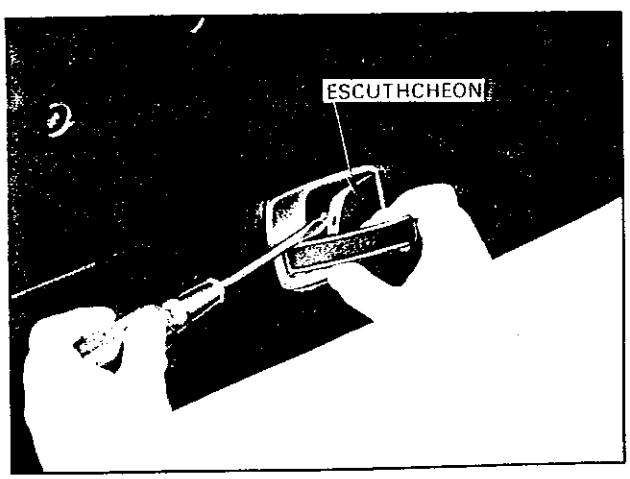


Fig. BF-23 Removing cover

DOOR ASSISTANT STRAP

Removal

1. Raise the cover with an ordinary [(-) headed] screw driver.

2. Remove the installation screws with a cross-headed screw driver.

3. Remove the assistant strap.

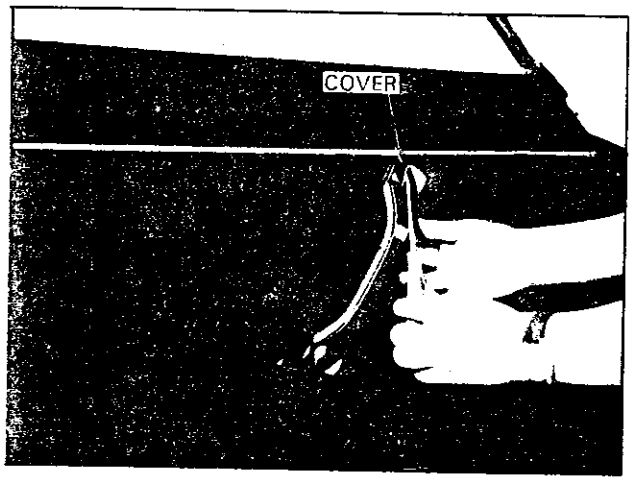
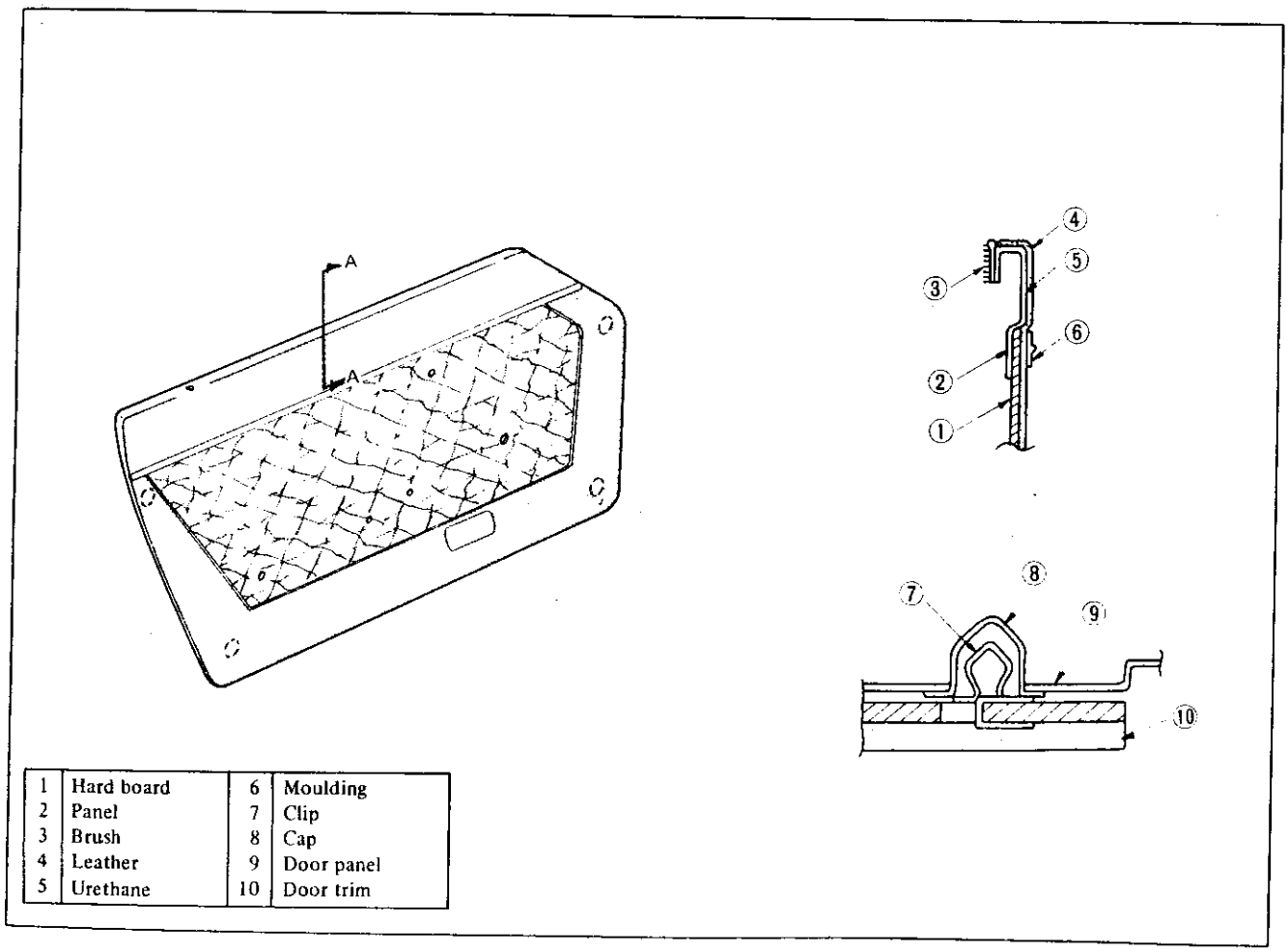


Fig. BF-24 Removing assist strap cover

DOOR TRIM



1	Hard board	6	Moulding
2	Panel	7	Clip
3	Brush	8	Cap
4	Leather	9	Door panel
5	Urethane	10	Door trim

Fig. BF-25 Removing door trim

Removal

1. Remove the inside handle, escutcheon, and regulator handle from the door.

2. Remove the arm rest, assistant strap, and door lock knob from the door.

3. Insert an ordinary [(-) headed] screw driver between the door finish and door inner panel, and unhook the door finish clips from the door panel.

4. Raising the door finish, remove it.

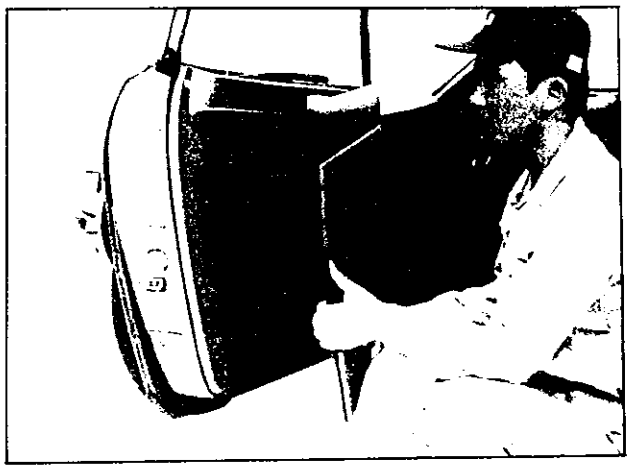


Fig. BF-26 Removing door finish

DOOR SEALING SCREEN

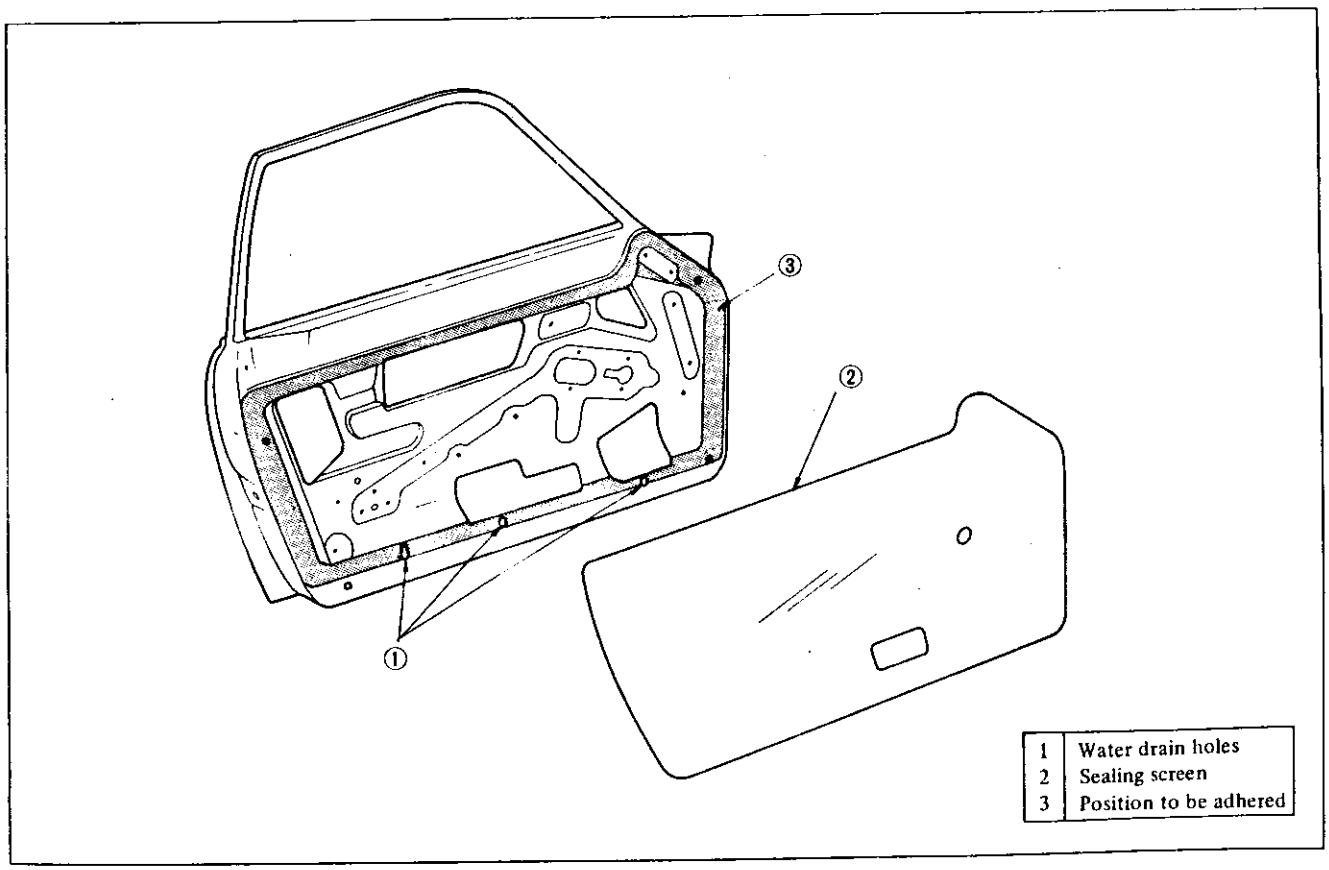


Fig. BF-27 Installing door sealing screen

Installation

1. Apply adhesive to the panel, and stick the sealing screen on the panel.

2. Be careful not to choke the water drain hole on the inner panel.

3. Stick the sealing screen carefully and correctly so that the adhered surface is not wrinkled.

door finish and sealing screen.

2. Remove the door glass assembly. (For the details, refer to page BF-17.)

3. Loosen the nuts by applying tool from the opening on the door inner panel.

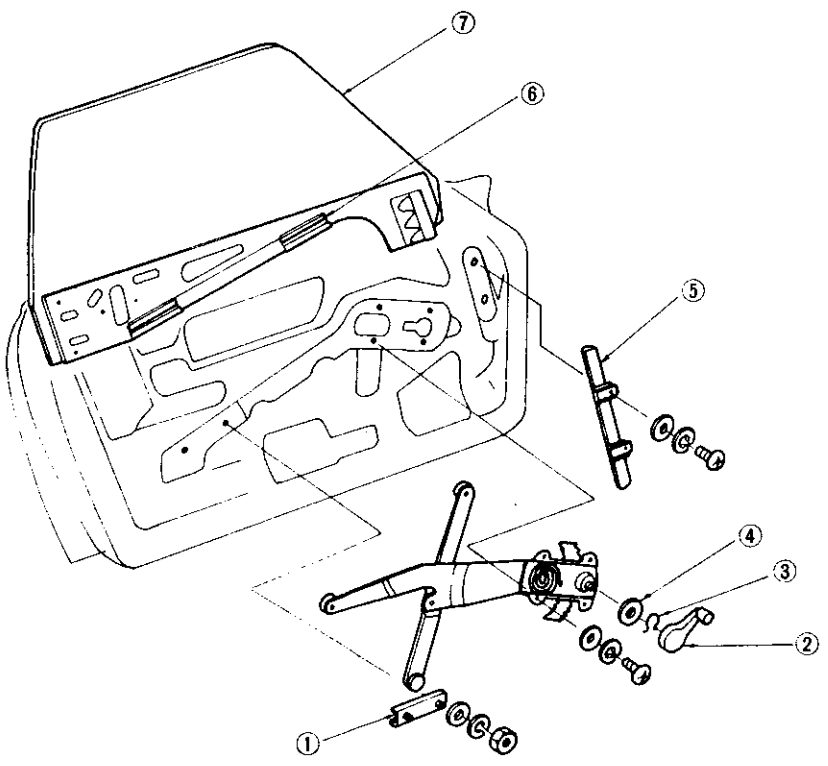
4. Remove the outer mirror.

DOOR OUTER MIRROR

Removal

1. Remove the door components up to extent of the

DOOR WINDOW REGULATOR AND DOOR GLASS



1	Guide channel
2	Regulator handle
3	Spring clip
4	Nylon washer
5	Front sash
6	Bottom channel
7	Door glass

Fig. BF-28 Door window regulator and door glass

Removal

1. Remove the door components up to extent of the door sealing screen.

2. Remove the door outside moulding and glass bamper with an ordinary. [(-) headed] screw driver.

3. Raise the glass to the top, slide the front window sash downward, and remove it.

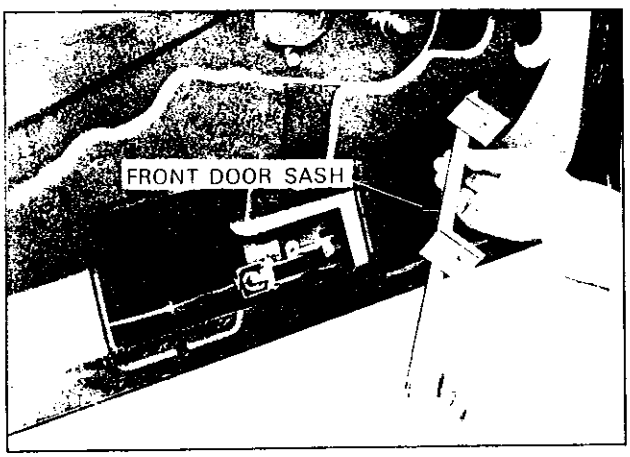


Fig. BF-29 Removing front door sash

4. Lower the window glass down to a half level, and remove the bottom channel from the regulator roller.

5. Raising the rear end of the glass slightly, remove it upward.

6. Remove the regulator assembly and glass guide channel.

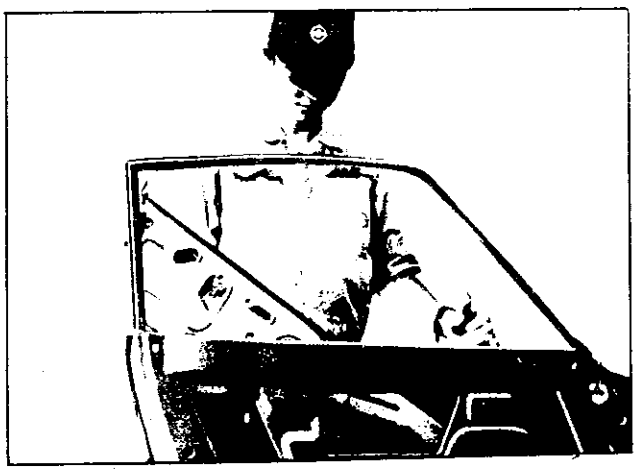


Fig. BF-30 Removing door glass

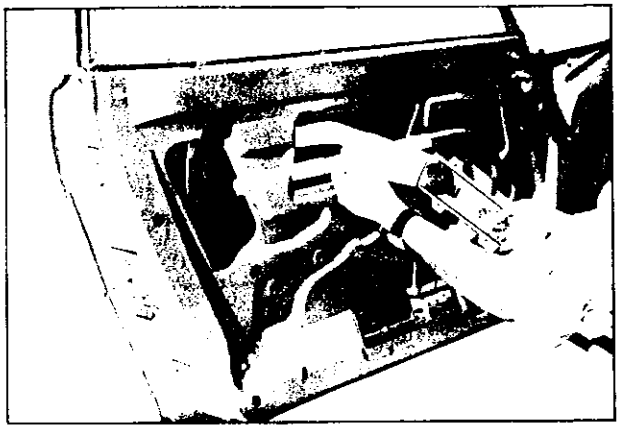


Fig. BF-31 Removing door window regulator

Adjustment of door glass

1. Install the door outside moulding and glass bamper before adjusting the glass alignment.

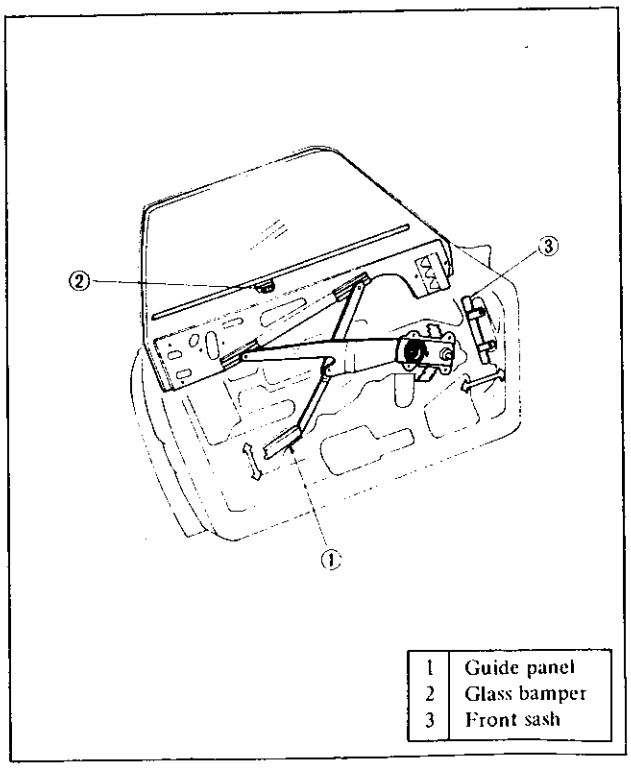


Fig. BF-32 Adjusting door glass

2. Adjust the guide channel and front sash properly so that the window glass rises and lowers smoothly along the front sash.

3. Slide the window glass up and down, and make sure that the rear edge of glass is connected applied to the sash. If not, move the guide channel downward, secure it temporarily, and tighten completely after ensuring that the window glass correctly engages with the sash. Adjust the front sash at the same time.

4. Be sure to install the front sash and in parallel.

DOOR SASH

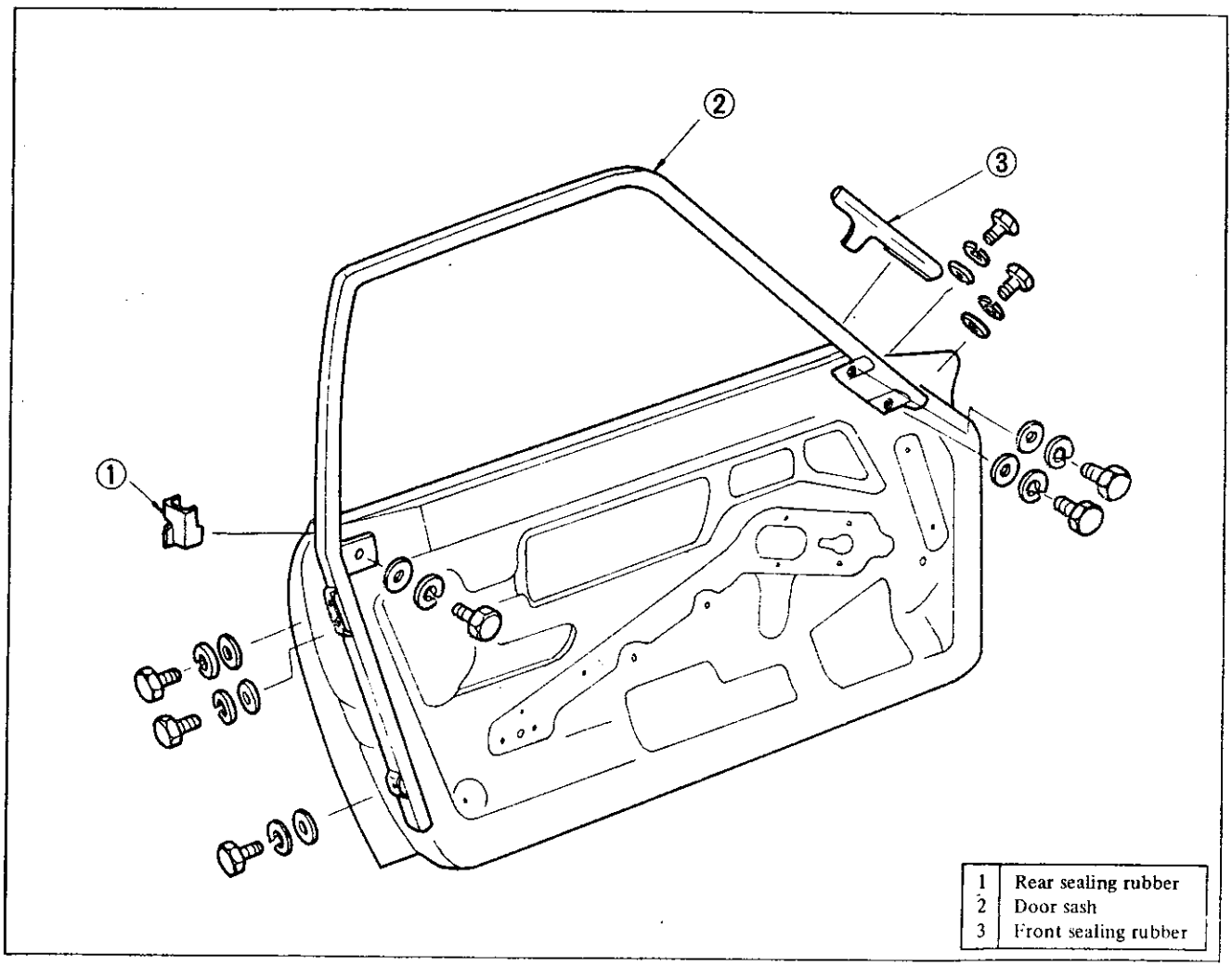


Fig. BF-33 Removing door sash

Removal

1. Remove the door components up to extent of the door glass.

2. Remove both the front and rear sealing rubbers.

3. Remove the door sash.

Reinstallation

Install the door sash in reverse sequence of removal.

Note: The door sash can be adjusted slightly. Adjust as required.

DOOR LOCK

Removal

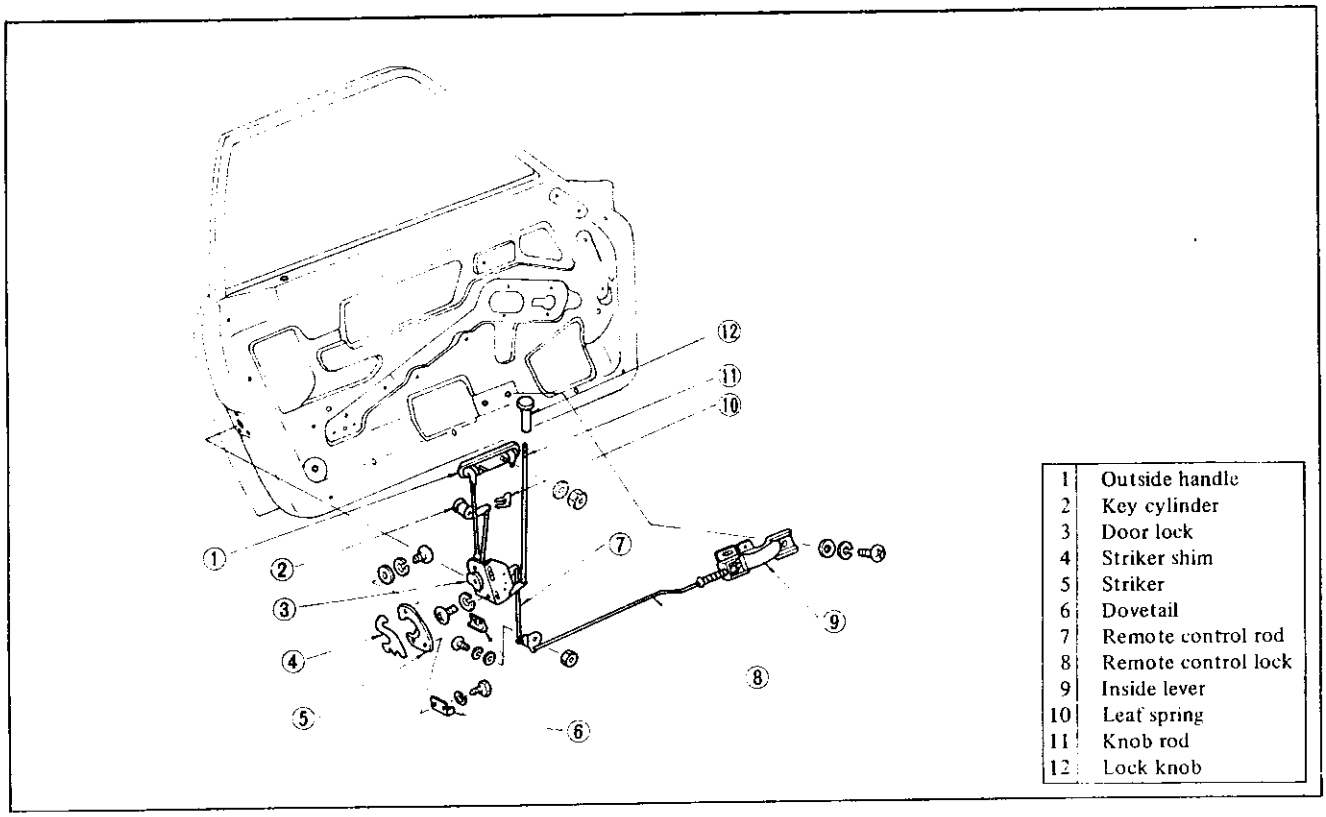


Fig. BF-34 Door lock mechanism

1. Remove the door components up to extent of the sealing screen.

2. Remove the door sash.

3. Remove the key cylinder rod from the key cylinder.

4. Remove the remote control rod from the lock main unit.

5. Remove the remote control side bell crank and inside lever installation screws, and remove the remote control mechanism from the opening on the inner panel.

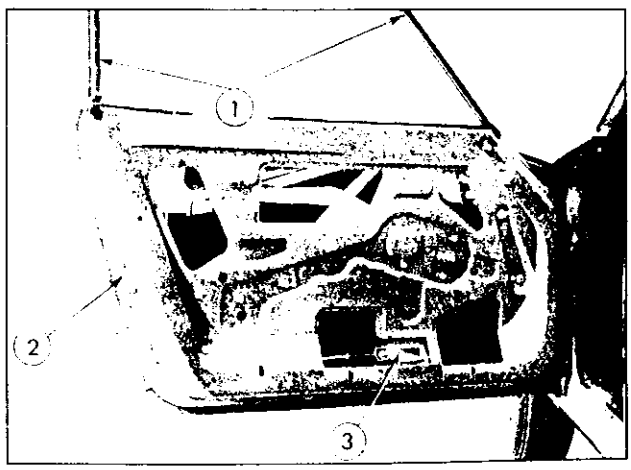


Fig. BF-35 Door without sealing screen

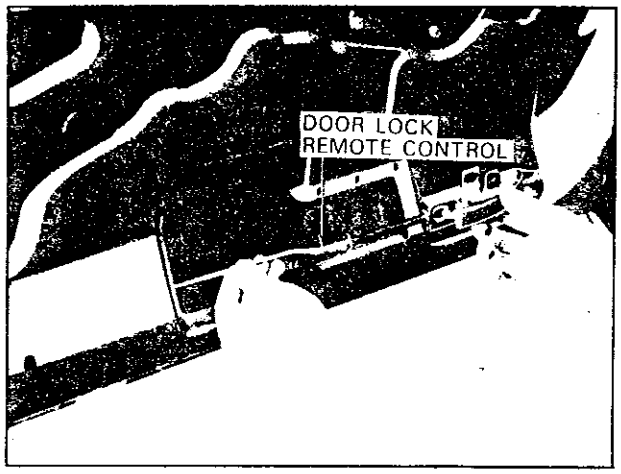


Fig. BF-36 Removing inside lever

6. Remove the door lock main unit installation screw, and removing the outside handle rod from the opening on the door lock main unit, remove the lock main unit from the opening on the inside panel.

7. Remove the key cylinder installation plate clip, and remove the key cylinder.

8. Remove the nut from inside of the door, and remove the outside handle.

Reinstallation

Install the door lock in reverse sequence of removal.

Note: Be sure to screw the door knob lock into the rod after installing the door finish.

TAIL GATE

CONTENTS

Description

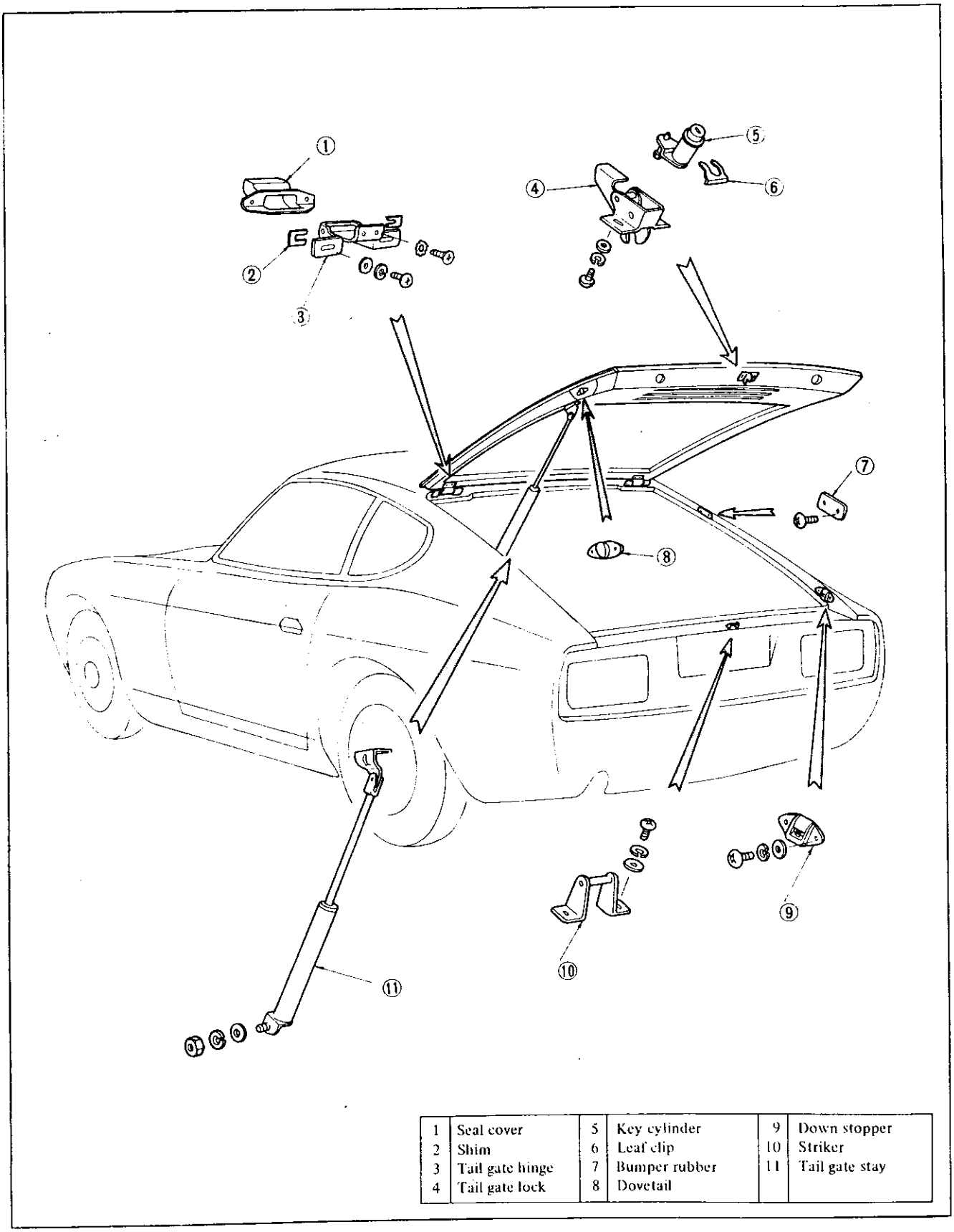
The tail gate opened upward adopts a single-sheet construction, and thus, luggages can be loaded and unloaded conveniently.

The tail gate stay adopts a gas spring (filled with nitrogen gas) increasing the operating smoothness and improving the external appearance.

Note: The gas spring is filled with highly compressed nitrogen gas. Do not disassemble the tail gate stay.

In order to ease thy tail gate installation and removal, split type hinges are used. The hinges are secured with both side installation screws.

A push-button type tail gate lock has been adopted. Moreover, when the push-button is locked, the push-button can be depressed but not unlocked.



1	Seal cover	5	Key cylinder	9	Down stopper
2	Shim	6	Leaf clip	10	Striker
3	Tail gate hinge	7	Bumper rubber	11	Tail gate stay
4	Tail gate lock	8	Dovetail		

Fig. BF-37 Structural view of tail gate

Removal

1. Open the tail gate and remove the tail gate stay.

Note: Do not disassemble the tail gate stay because it adopts the high pressure gas spring.

2. Hold a piece of rag between the tail gate and roof, and securely support the tail gate.

3. Remove the hinge and tail gate installation screws.

4. Hold the tail gate from both sides (two persons are required), and remove it.

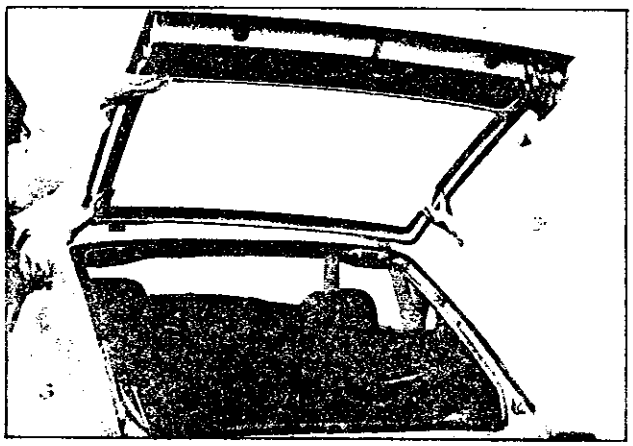


Fig. BF-38 Removing tail gate

Removing tail gate lock

1. Remove the lock from the tail gate.

2. Remove the trim, insert hand into the gate, remove the leaf clip, and remove the key cylinder.

3. Remove the license plate lamp, and remove the striker.

4. The down stopper and rubber bumper can be removed simply by loosening the installation screws.

Adjustment

Tail gate hinge

1. Adjust the tail gate position at the section between the hinge and and body.

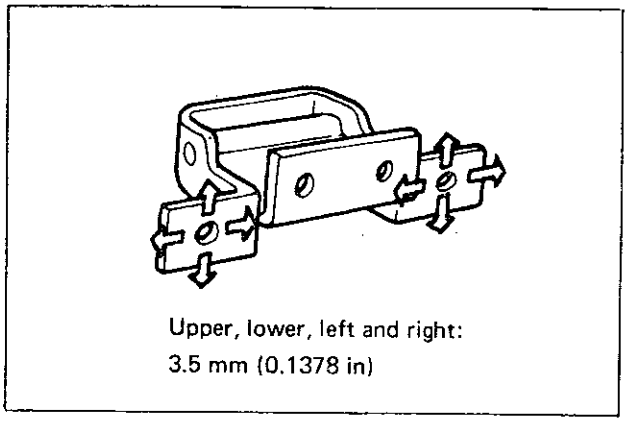


Fig. BF-39 Adjusting tail gate hinge

Tail gate lock

For the front and rear directions, adjust the tail gate lock at the lock proper, and for the upper and lower directions, at the striker. Moreover, the adjustable range toward the left and right sides is 5 mm (0.1969 in).

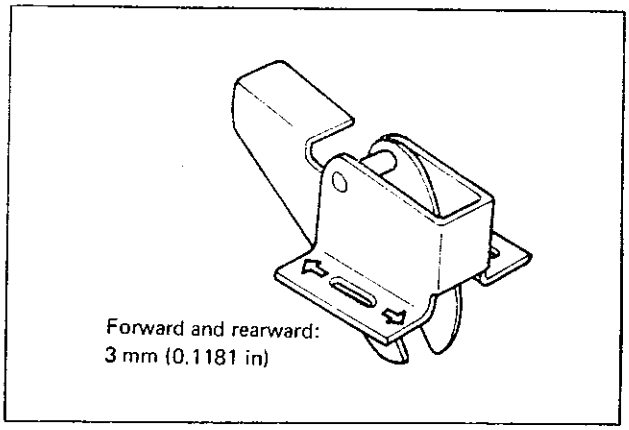


Fig. BF-40 Lock proper

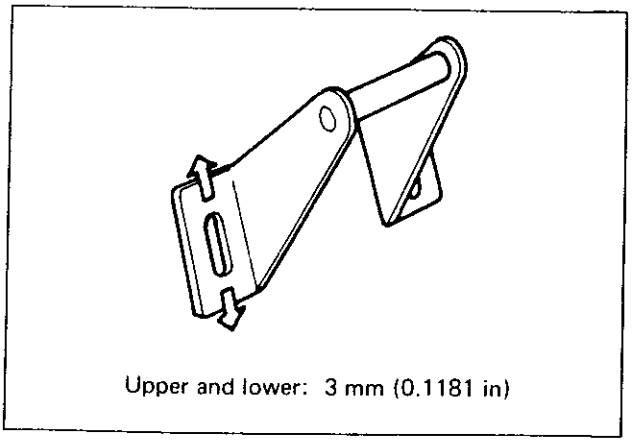
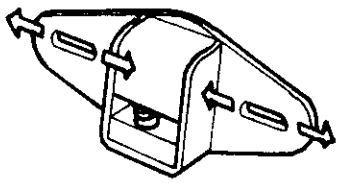


Fig. BF-41 Striker

Down stopper

The down stopper is adjustable to the front and rear directions only. For the upper and lower directions, the adjustable range is 5 mm (0.1969 in).



Forward and rear: 2.5 mm (0.0984 in)

Fig. BF-42 Down stopper

REAR PANEL FINISHER

1	Clipped point	5	Plastic rivet
2	Left finisher	6	Rear panel
3	Center finisher	7	Finisher
4	Right finisher	8	Plastic rivet

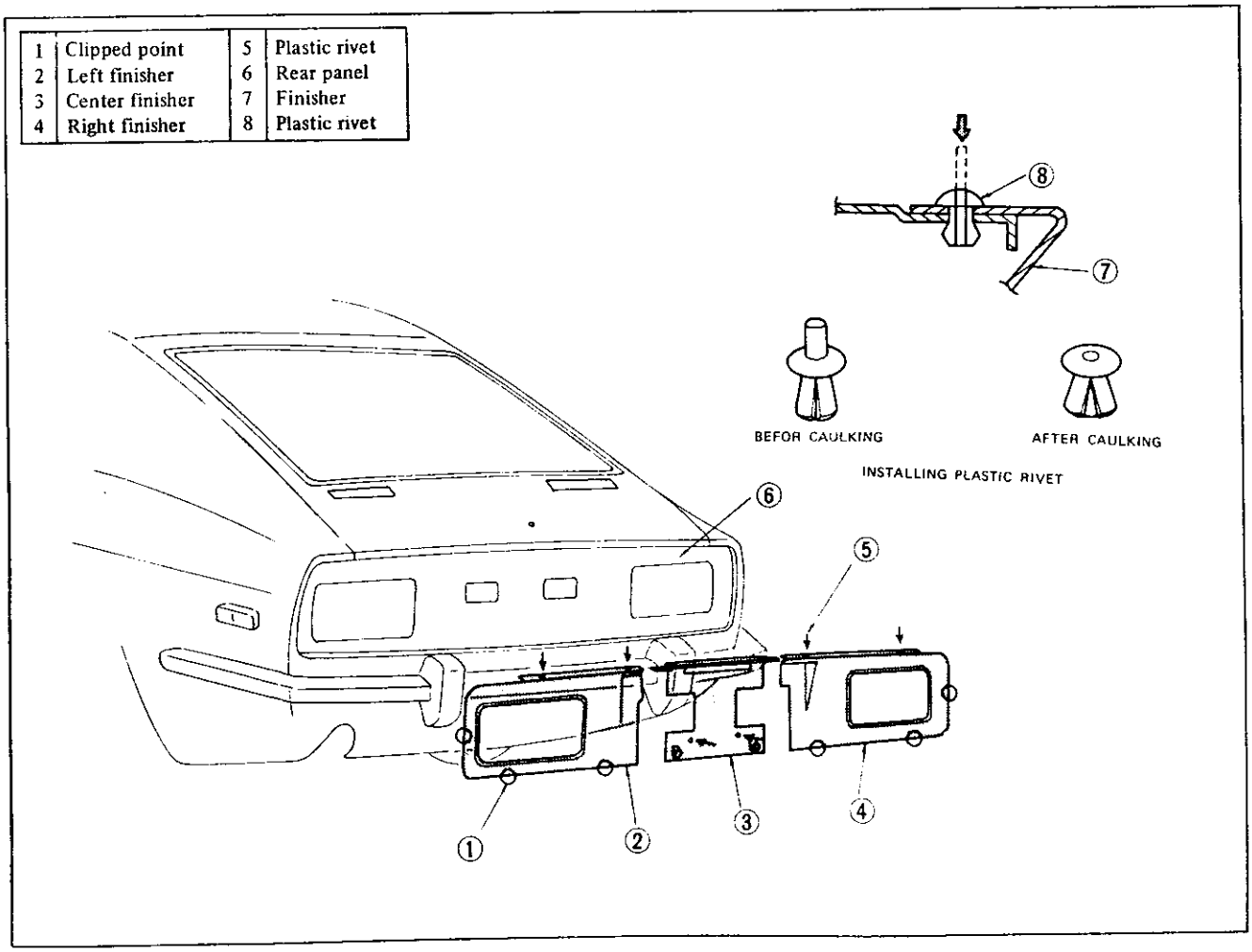


Fig. BF-43 Rear panel finisher

The finisher is split into three pieces providing the center piece, left side piece, and right side piece. The bottom is secured with clip installed on the body side, and the top is secured with plastic rivets.

Removal

1. Remove the plastic rivet from the finisher.

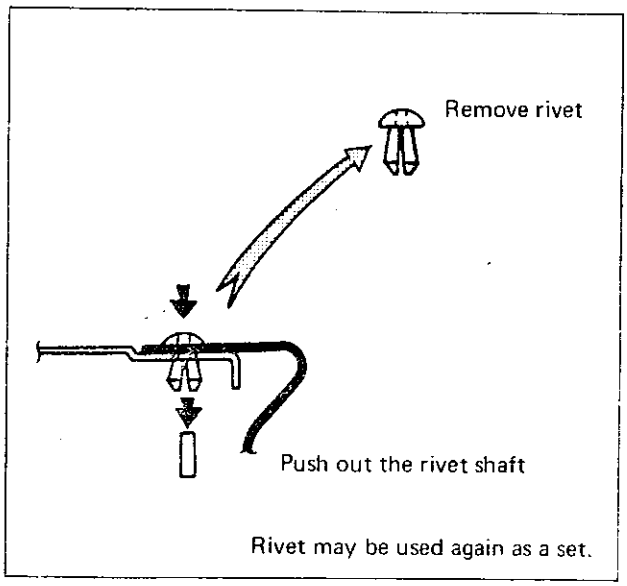


Fig. BF-44 Removing plastic rivet

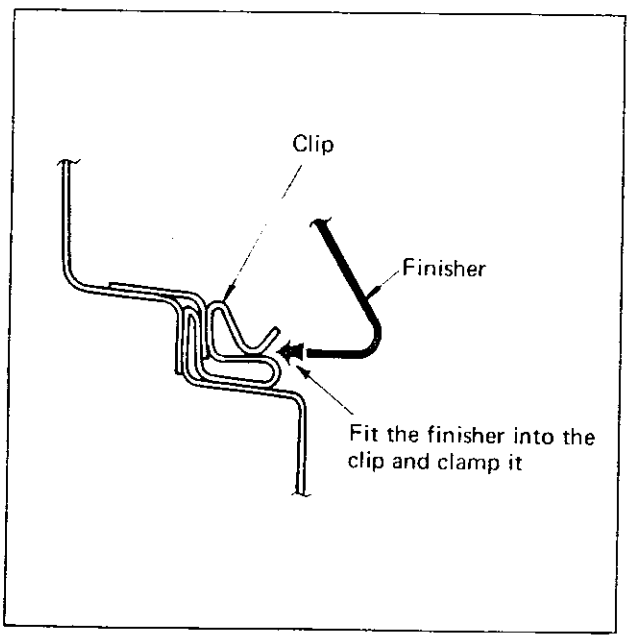


Fig. BF-45 Fitting finisher clip

2. Remove the license plate lamp.

3. Pulling the finisher, remove it from the clip unit.

4. Tilt and withdraw the finisher, and remove it from the license plate unit.

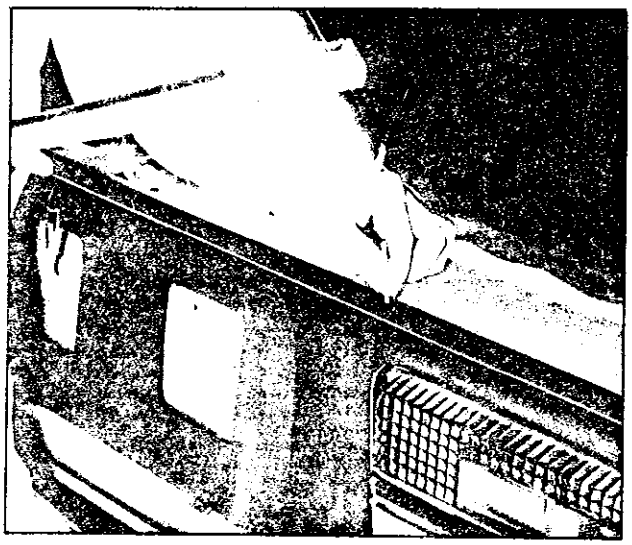


Fig. BF-46 Removing rear panel finisher

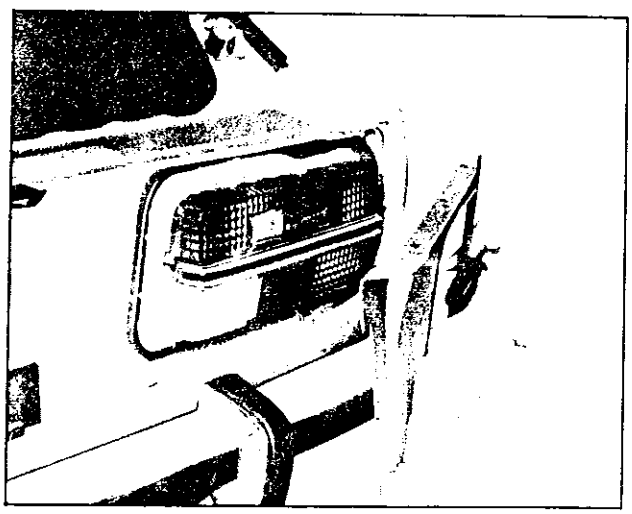


Fig. BF-47 Removing rear panel finisher

Note: Be careful not to scar the painted surface of the body with the finisher flange.

INSTRUMENT PANEL

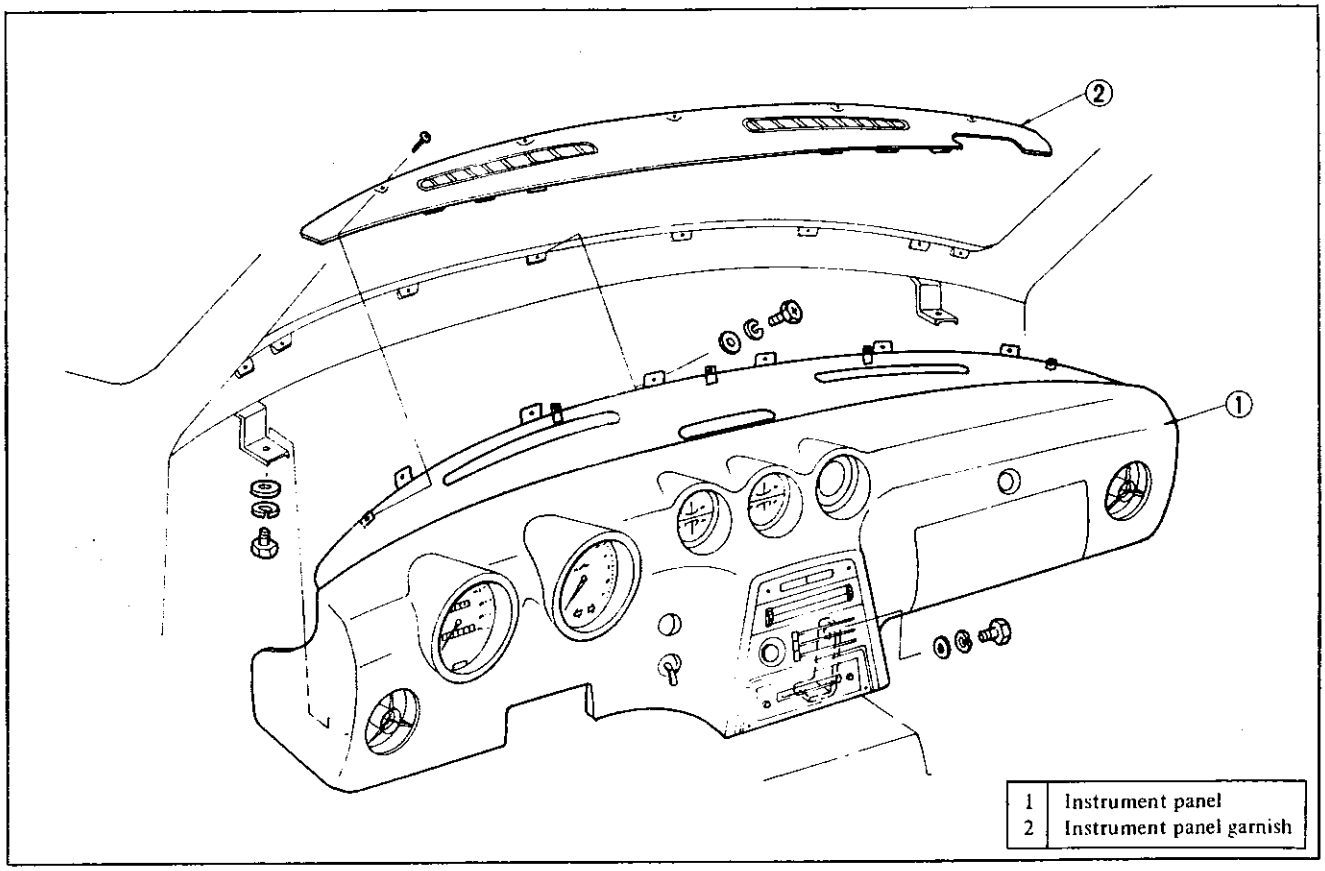


Fig. BF-48 Removing instrument

Removal

1. Disconnect the battery cable from the battery terminal. [Either (+) or (-) terminal]

2. Remove the wiring harness

(1) Disconnect the instrument harness from the engine compartment harness.

(2) Disconnect the instrument harness from the turn signal switch.

(3) Disconnect the instrument harness from the door switch, stop lamp switch, alarm buzzer, flasher unit, hazard flasher unit, horn relay, fuse block, and cigarette lighter.

3. Disconnect the speedometer cable from the speedometer.

Fig. BF-49 Removing instrument

4. Disconnect the heater control cable at the heater side.

5. Remove the steering wheel shell cover.

6. Remove the instrument garnish with a cross-headed screw driver.

7. Remove the floor console.

8. Remove the screws from the instrument panel top and bottom and both sides of the console unit, raise the instrument panel slightly, and remove it toward the rear.

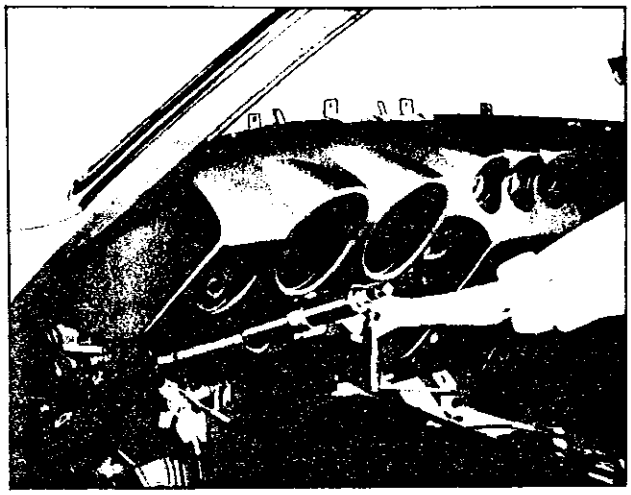


Fig. BF-50 Removing instrument

FLOOR CONSOLE

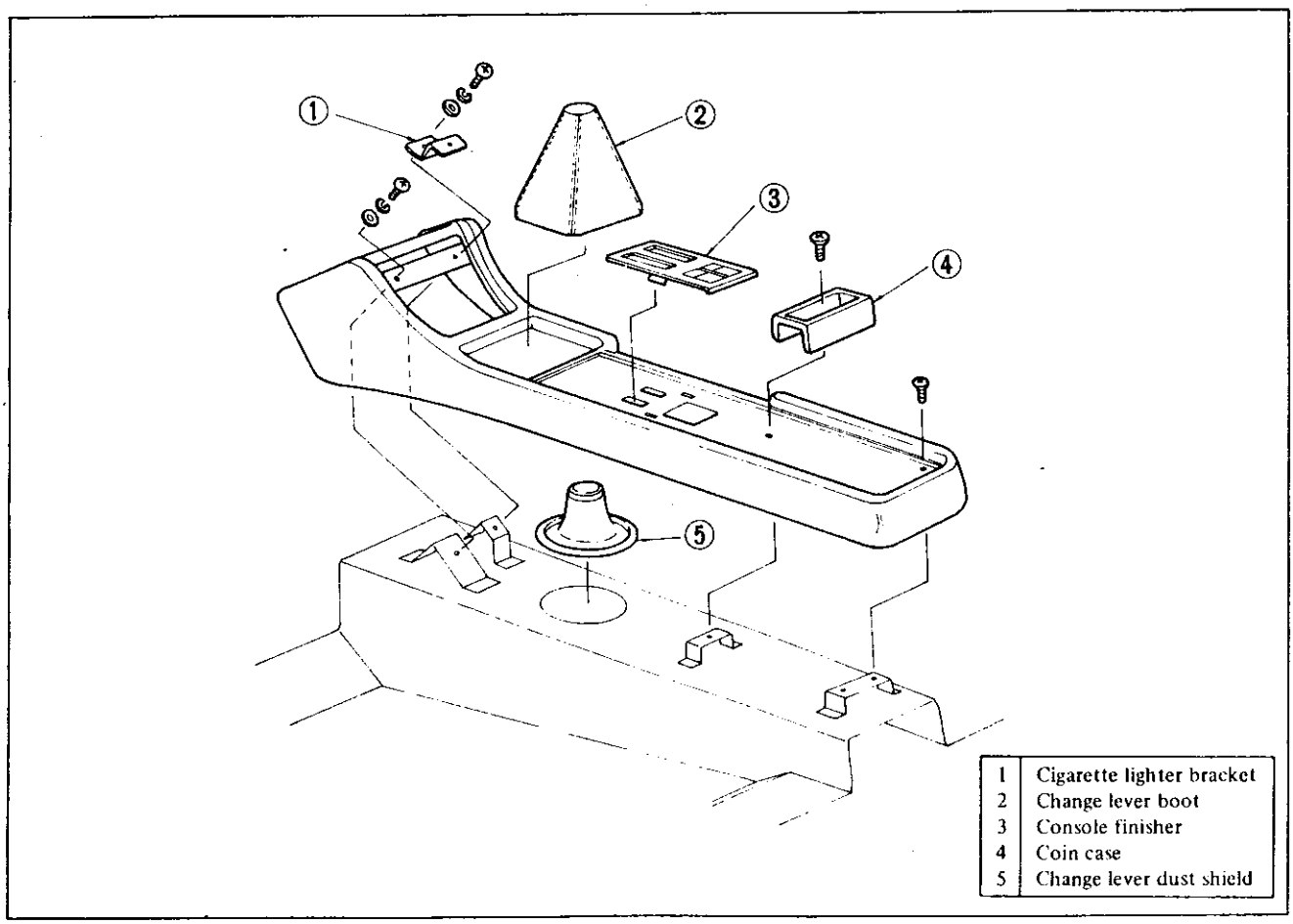


Fig. BF-51 Removing floor console

1. The floor console is installed on the floor with screws.

2. Tighten the coin case with the floor console installation screws together with the floor console.

3. Install the change lever dust cover by fitting it to the floor.

SEAT

CONTENTS

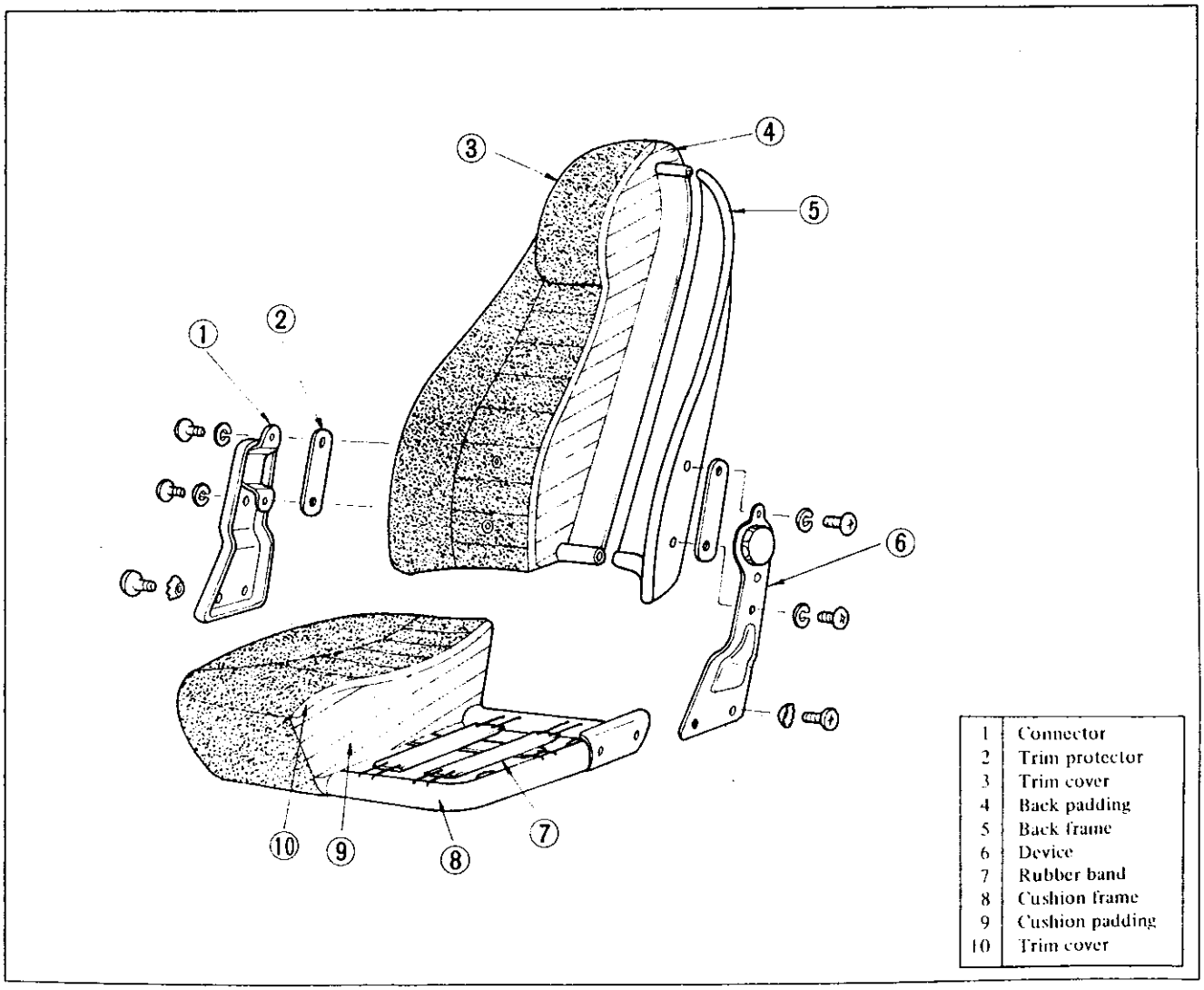


Fig. BF-52 Structural view of seat

The bucket type separate seats completely hold driver and assistant even during a rapid cornering, and the seat back is a high seat back which combines the seat back and head rest.

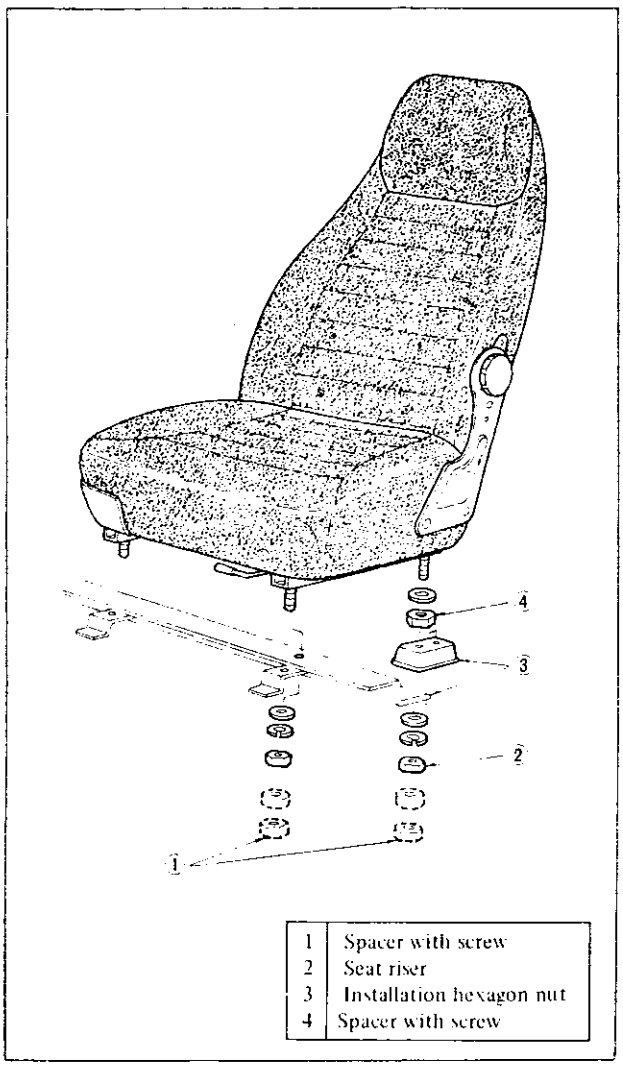


Fig. BF-53 Removing and reinstalling seat

Removal

1. Loosen the seat installation nuts by inserting hand beneath the seat riser, and remove the seat.

Seat slide

Driver's Seat.....The total slide stroke is 180 mm (7.09 in) 100 mm (3.93 in) is forward, 80 mm (3.15 in) is rearward, and the adjusting pitch is 20 mm (0.787 in).

Assistant Driver's Seat.....The total slide stroke is 120 mm (4.72 in), 60 mm (2.362 in) is forward and rearward and the adjusting pitch is 20 mm (0.787 in).

The slide adjust levers are arranged in the body center side.

Seat back tilting (Inclination)

The total adjustable angle is 10° (5° each forward and rearward), the adjusting pitch is stepless, and the inclination can be adjusted without leaving the seat.

Seat elevation

Both seats can be adjusted 20 mm (0.787 in) each upward and downward. The seat elevation is adjusted with the spacer indicated in dotted line in Figure BF-53. When it is desired to raise the seat, place the spacer on the seat riser. Contrarily, when desired to lower the seat, remove the spacer.

Note: When spacers are used, be sure to apply same number of spacers to each seat riser.

INTERIOR TRIMS

CONTENTS

DASH SIDE TRIM

Removal

1. Remove the flasher unit installation screws.
2. Remove the horn relay installation screws.
3. Raise the trim dash side holding clip.
4. Remove the rubber grommet.
5. Remove the dash side trim.

DASH INSULATOR

The dash insulator has been adhered and connected with clips toward the entire area so that sound is insulated effectively. For this reason, the insulator can be removed only by peeling it off. When the insulator is removed once, replace it with new one.

DASH SIDE DRAIN HOSE

1. Remove the hose clamp.
2. Remove the grommet from the dash side.

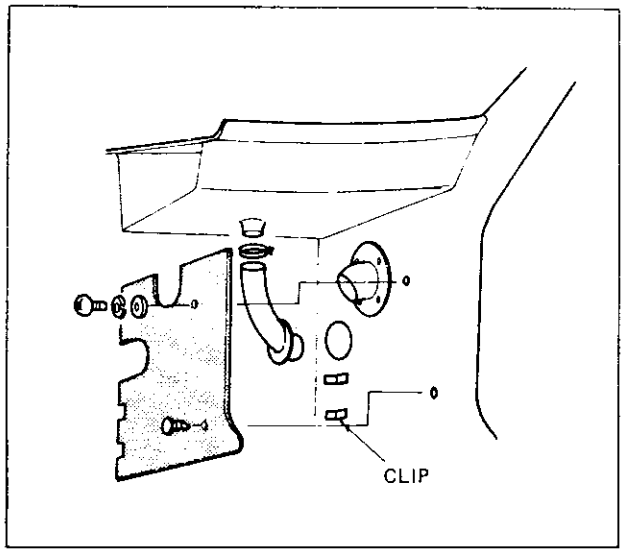


Fig. BF-54 Dash side trim and drain hose

BODY SIDE TRIM

Except for the body side front trim, all trims are installed with plastic rivets.

The body side front trim is installed with clips.

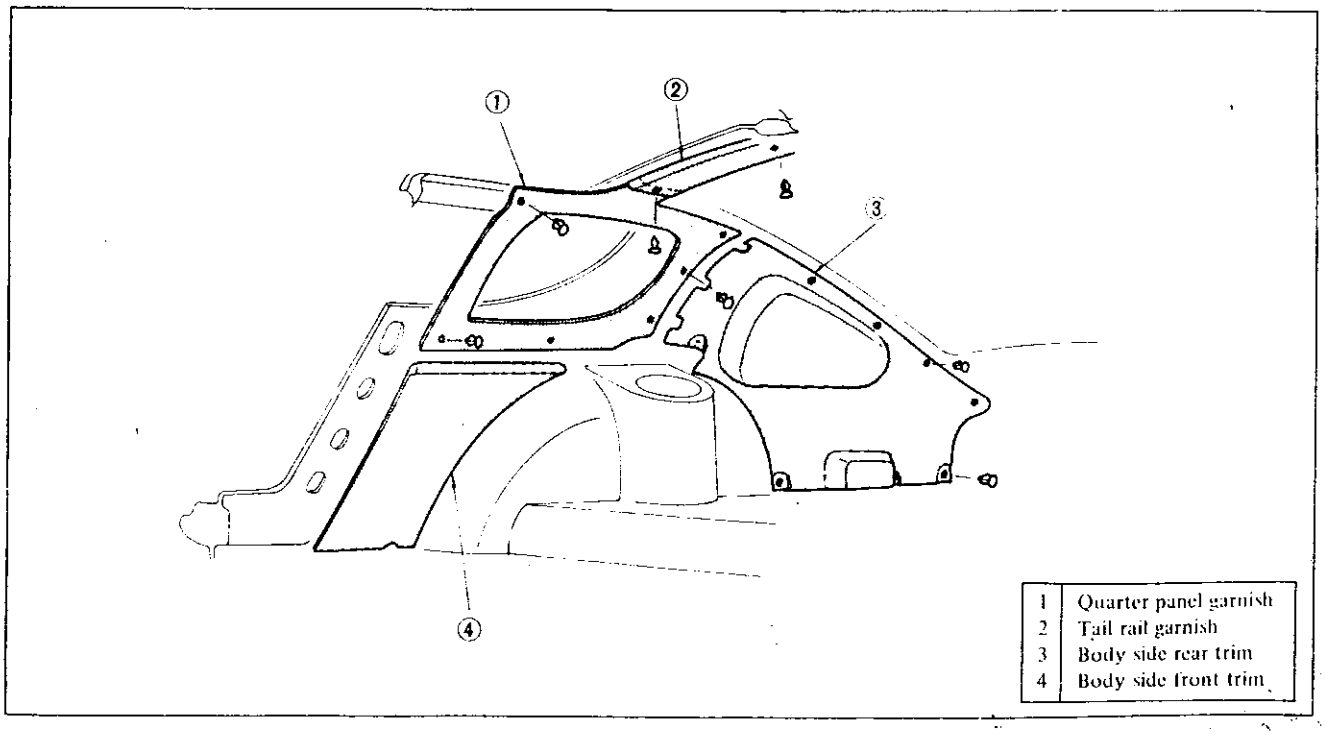
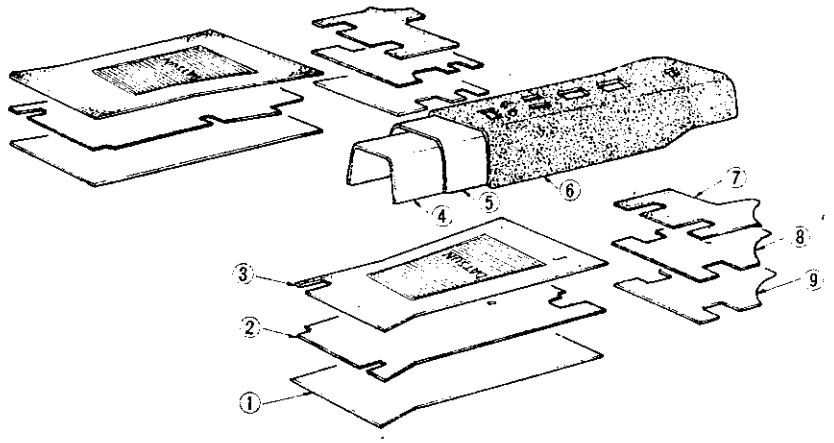


Fig. BF-55 body side trim

FRONT FLOOR MAT AND INSULATOR



1	Front floor front insulator
2	Front floor front jute
3	Front floor front mat
4	Front floor tonnel insulator
5	Front floor tonnel jute
6	Front floor tonnel mat
7	Front floor rear jute
8	Front floor rear jute
9	Front floor rear insulator

Fig. BF-56 Floor mat and insulator

1. Melt and put insulator on the floor panel.

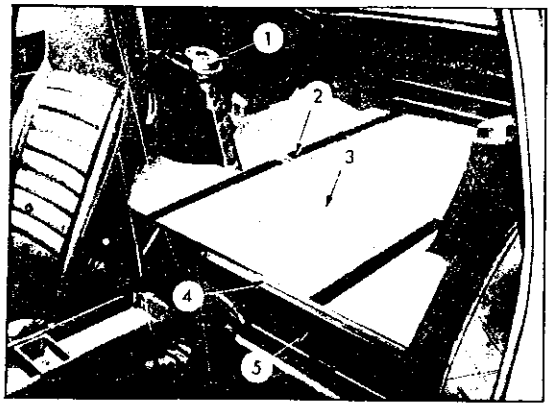
2. Adhere the front floor tonnel jute on the tonnel unit.

3. Do not adhere the front and rear floor jutes on the floor.

4. Both front and rear floor mats are secured with fasteners.

LUGGAGE BELTS

1. Luggage belts used to secure luggages are installed on the rear floor with screws.



1	Rear suspension strut cap	3	Rear floor mat
2	Luggage belt	4	Luggage stopper
		5	Seat riser trim

Fig BF-57 Rear floor trim and luggage belt

REAR FLOOR TRIMS

1. Install the luggage stopper with self-tapping screws.

2. Install the rear floor mat on the floor with fasteners.

3. Install the seat riser trim with adhesive.

4. Install the rear suspension strut cap by means of fitting.

5. Install the luggage belts with machine screws.

INSIDE REAR VIEW MIRROR

Install the rear view mirror on the body through a drop-off system mechanism.

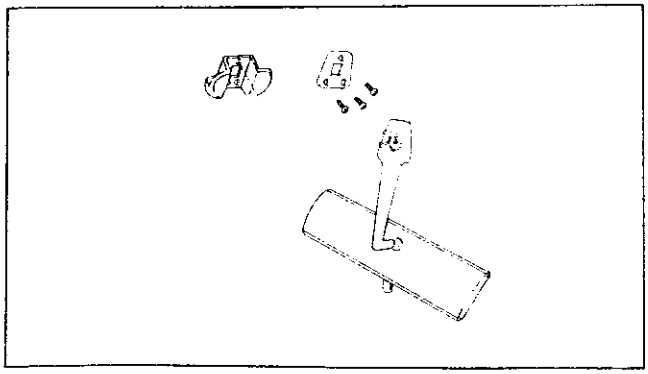


Fig. BF-58 Removing inside rear view mirror

BODY SEALING

Sealer is applied to the individual panel joints, and thus, the body sealing is secured.

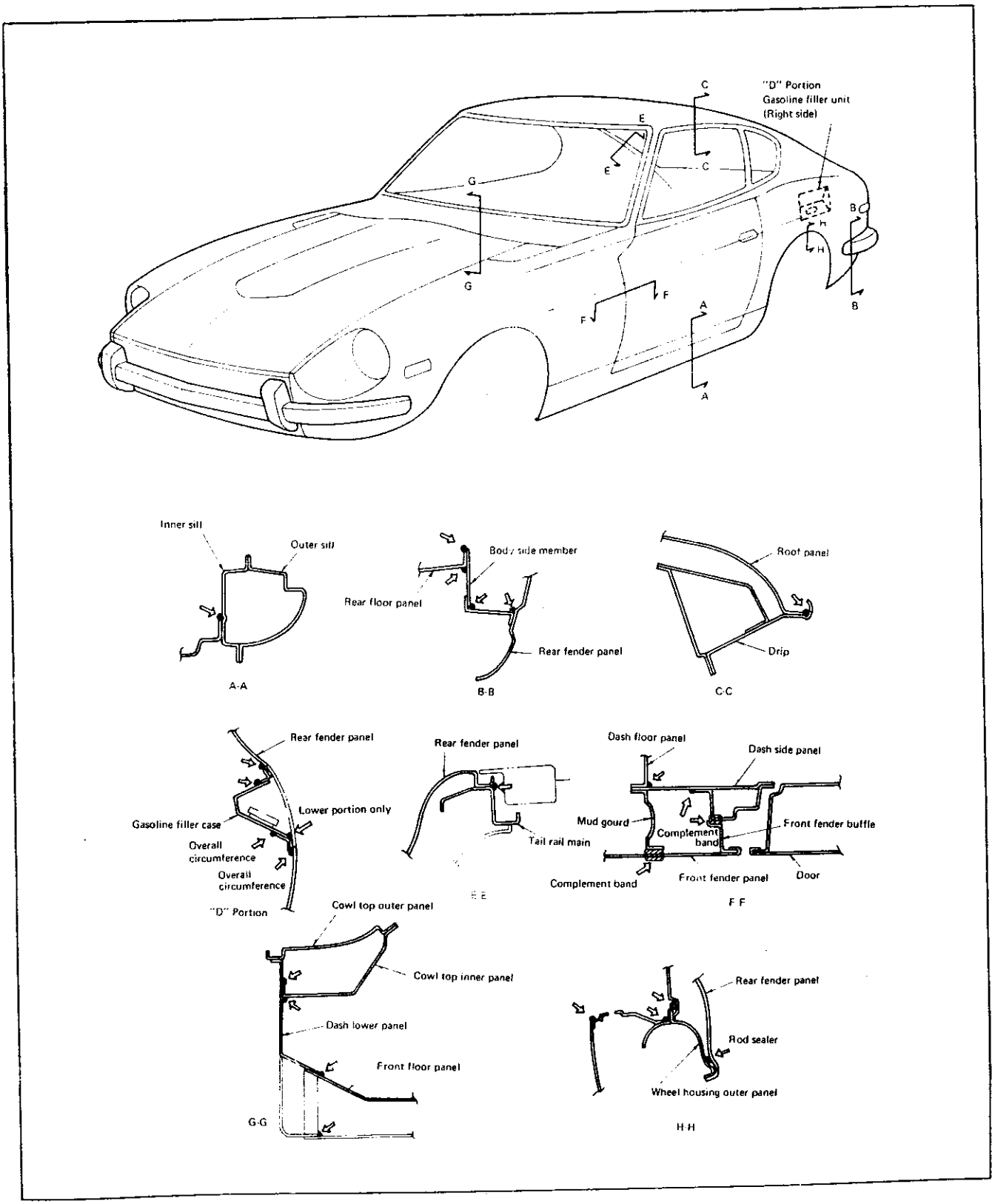


Fig. BF-59 Sealing body panel joint

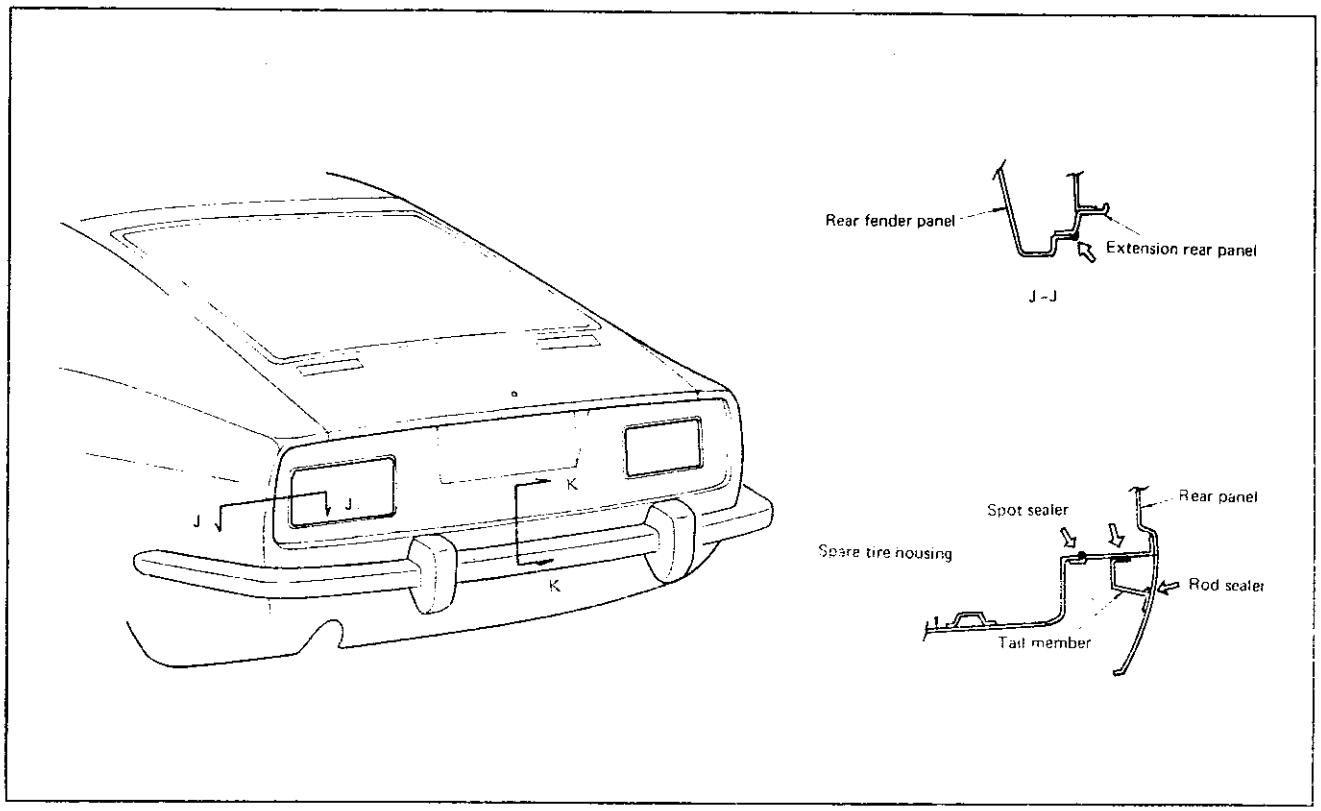


Fig. BF-60 Sealing rear panel joint

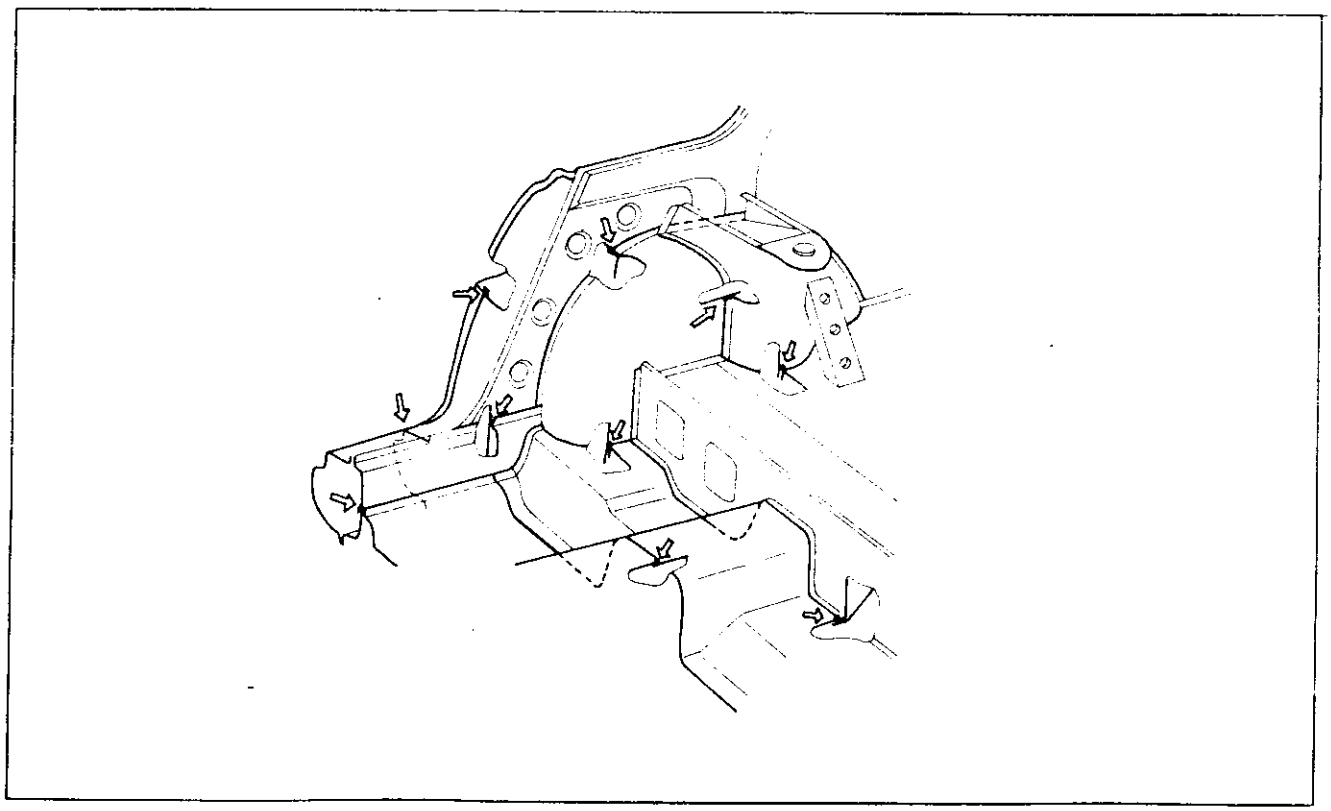


Fig. BF-61 Sealing rear wheel housing

SERVICE JOURNAL OR BULLETIN REFERENCE

DATE	JOURNAL or BULLETIN No.	PAGE No.	SUBJECT

SERVICE JOURNAL OR BULLETIN REFERENCE

DATE	JOURNAL or BULLETIN No.	PAGE No.	SUBJECT

DATSUN 240Z SPORTS
MODEL S30 SERIES

CHASSIS & BODY

NISSAN

NISSAN MOTOR CO., LTD.
TOKYO, JAPAN

SECTION BE

BODY ELECTRICAL

BE

WIRING

CONTENTS

ENGINE COMPARTMENT HARNESS

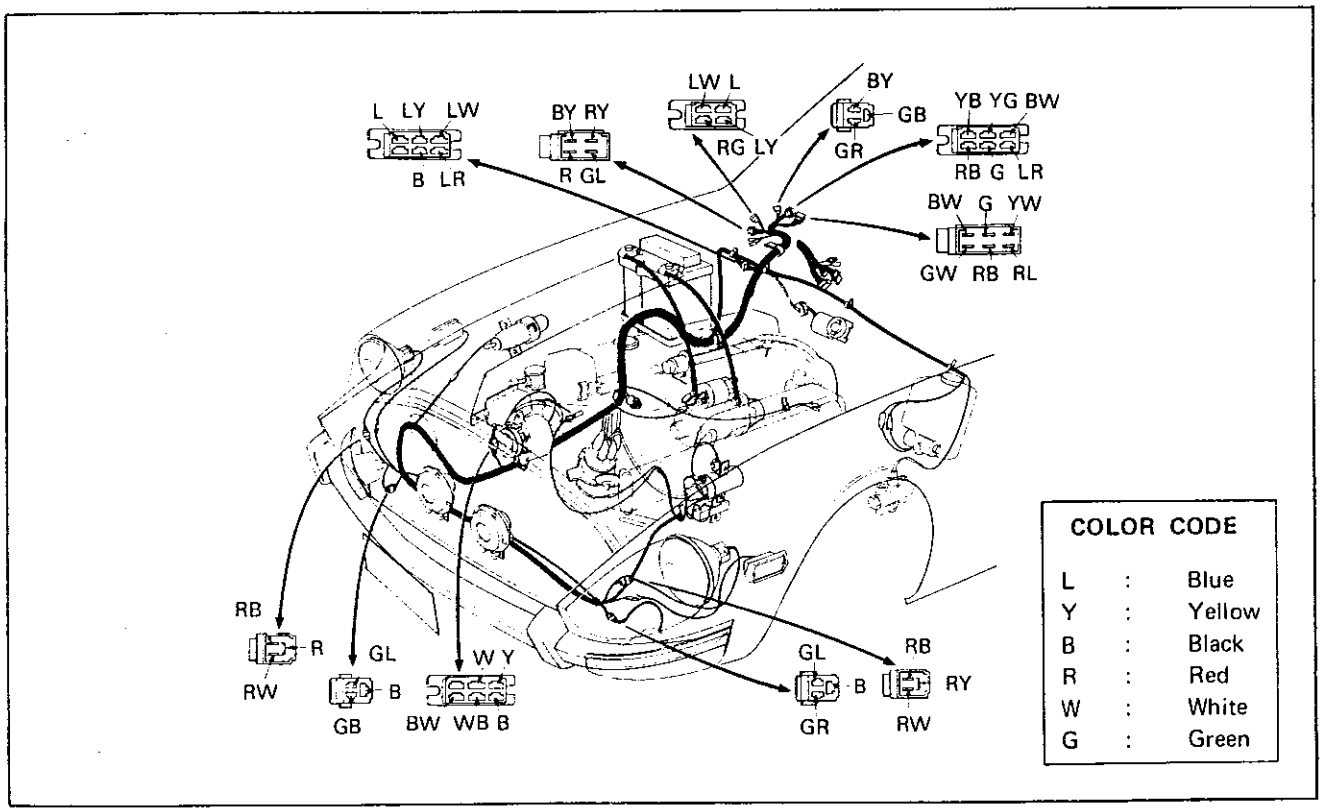


Fig. BE-1 Engine compartment harness

Wiring instructions

1. Connect the engine compartment harness to the instrument harness at the bottom of instrument.

2. Through the dash panel, extend the harness to the radiator support in the engine compartment along the right side of the hood ledge.

3. Extend the harness to the left side of the body through the cross member top in lower front side of the radiator.

4. Through the radiator support, connect the wire to the ignition coil along the left hand hood ledge.

For details, see the above shown figure.

INSTRUMENT HARNESS

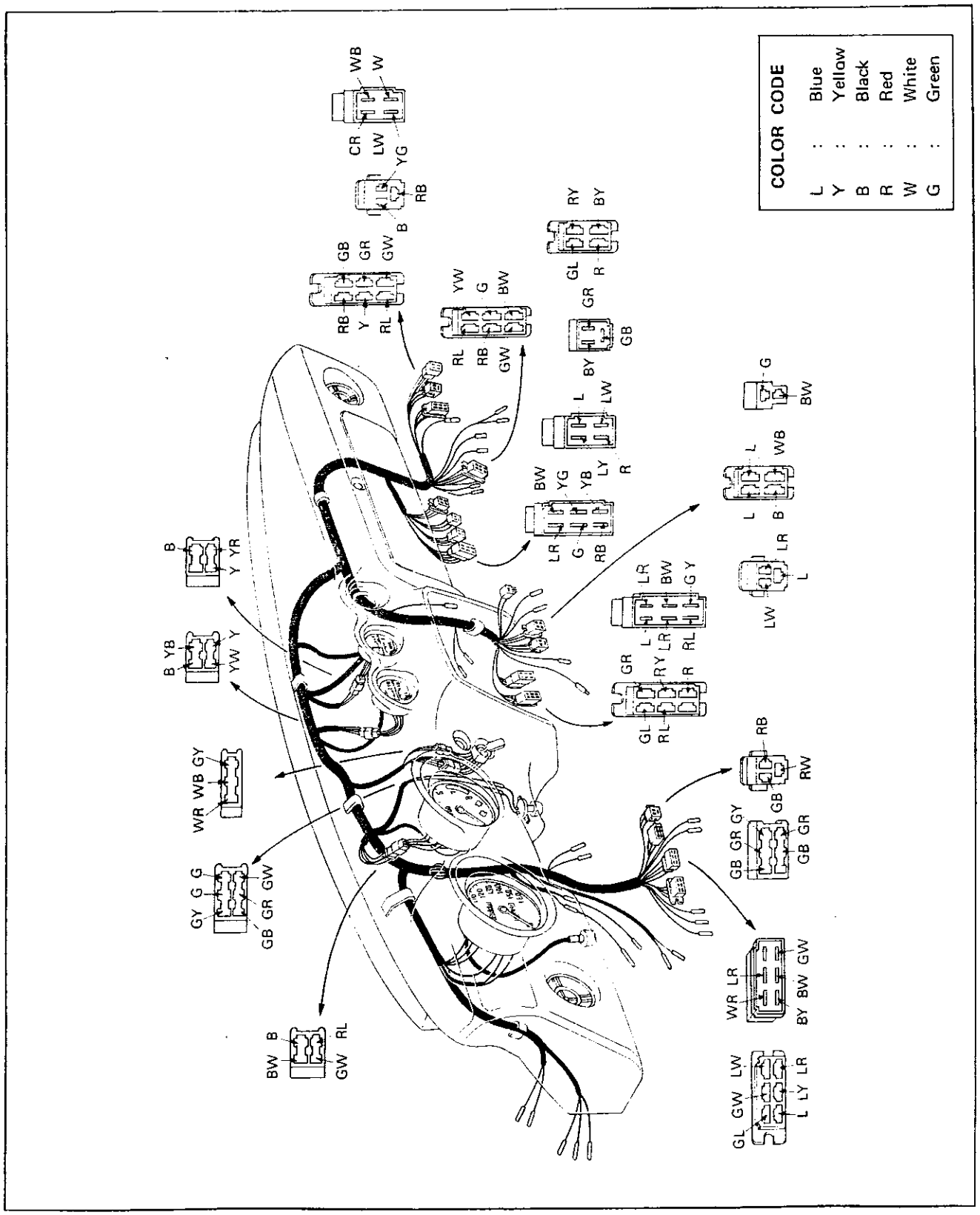


Fig. BE-2 Instrument harness

BODY HARNESS

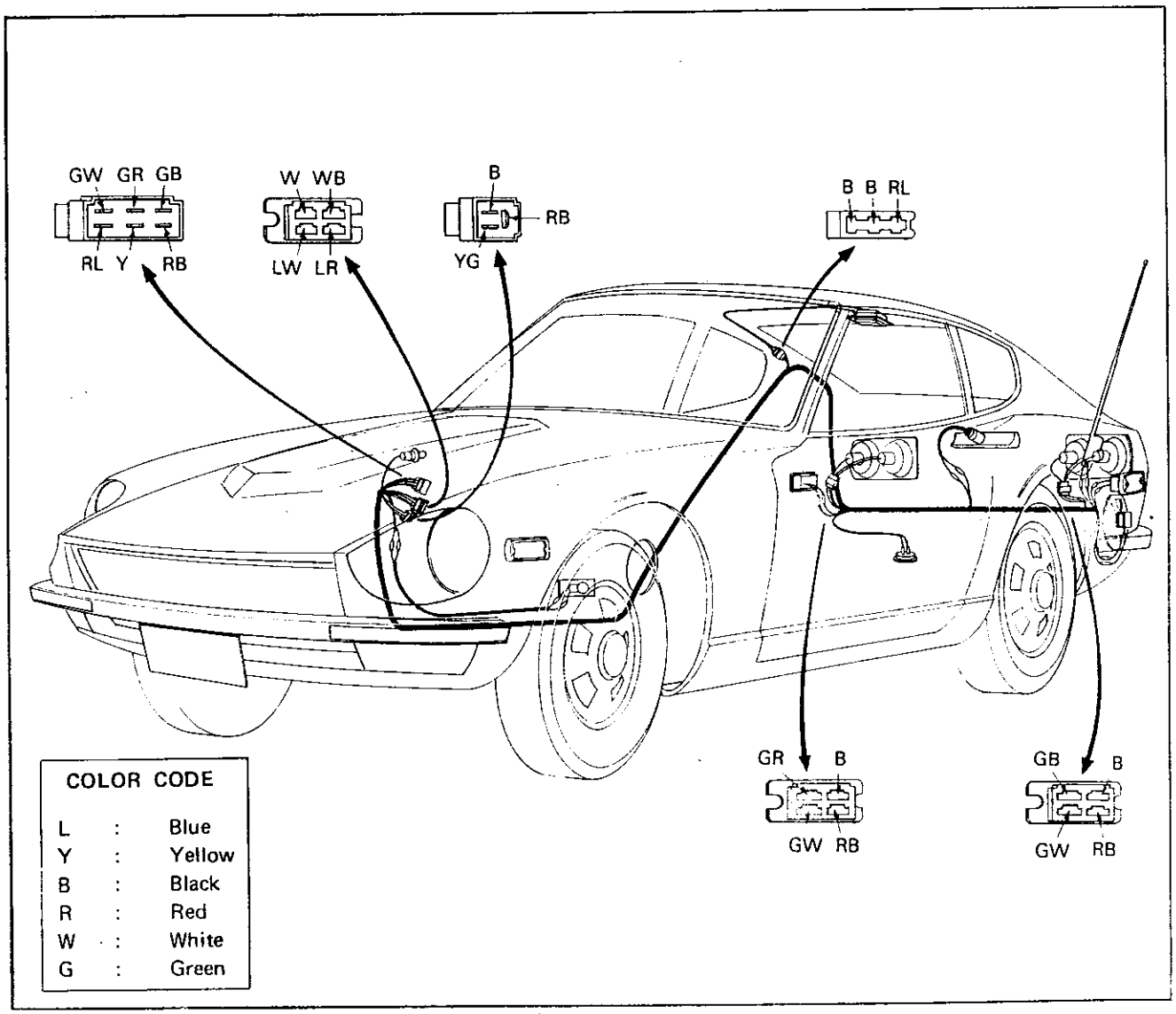


Fig. BE-3 Body harness

Wiring instructions

1. Connect the body harness to the instrument harness at the bottom of the instrument panel.

2. Extend the harness to the wheel housing along the right side floor edge.

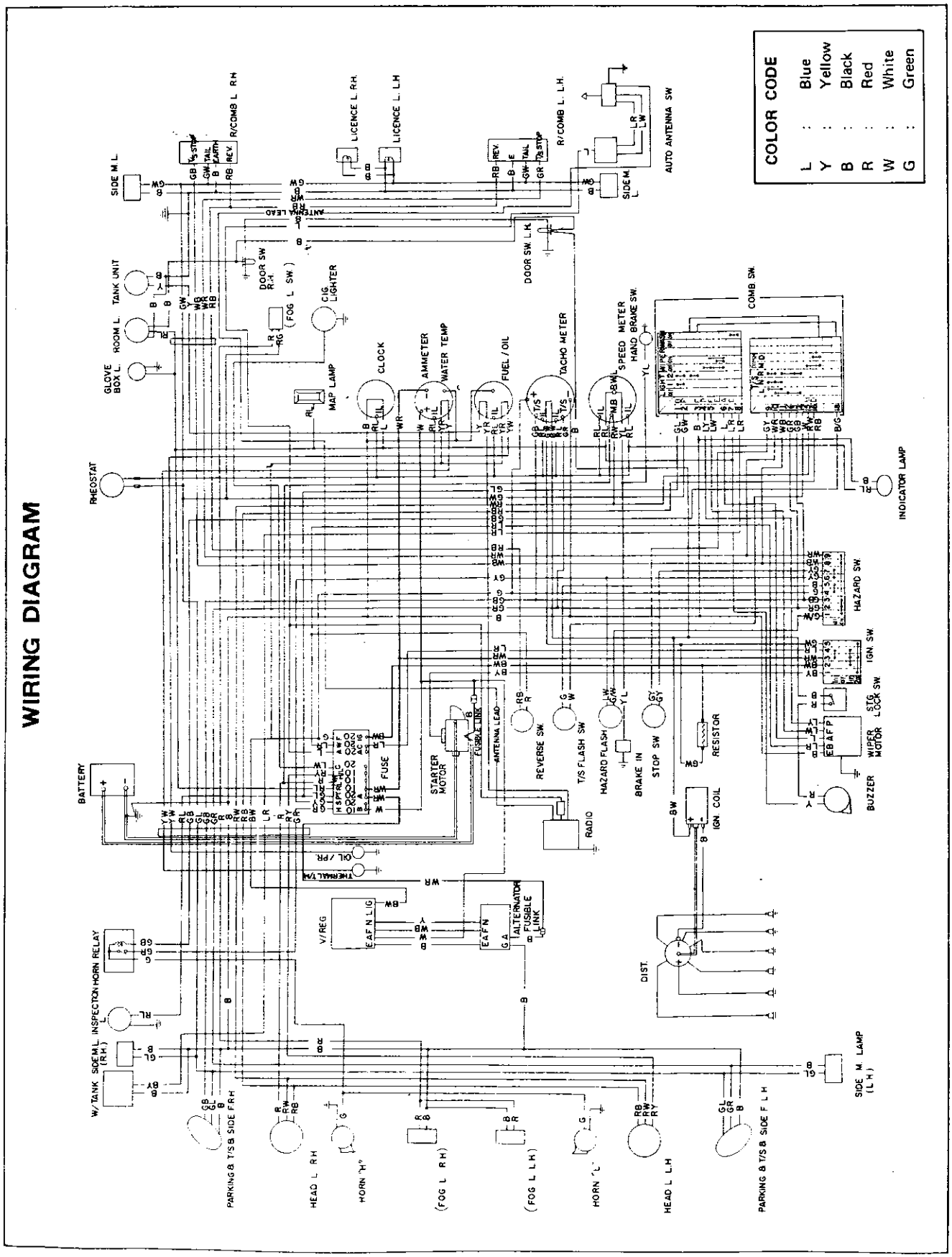
3. Extend the harness to the tail lamps by passing it between the inner panel and outer panel.

4. Branch the harness at rear side of the rear pillar, and extend the branched harness to the room lamp through the rear pillar.

5. Branch the harness at bottom of the tail lamp, and penetrating through the rear floor, extend to the fuel tank unit gauge along the inside of the right hand side member.

6. For details, see the above shown figure.

WIRING DIAGRAM



LAMPS

CONTENTS

BULB SPECIFICATIONS

	Specification	Quantity	Color	Remarks
Head lamp unit	12V-50/40W	2	White	
Side clearance and turn signal lamp	12V-23W/7W	2	Amber	
Side marker lamp	12V-7.5W	4	Amber	Front side: 2 bulbs Rear side: 2 bulbs
License plate lamp	12V-7.5W	2	White	
Rear combination lamps				
Tail lamp	12V-7W	2	Red	
Stop (brake) lamp	12V-23W	2	Red	
Turn signal lamp	12V-23W	2	Amber	
Back up lamp	12V-23W	2	White	
Meter illuminating lamp	12V-3W	6	White	
Brake warning lamp	12V-3W	1	Red	
Turn signal pilot lamp	12V-3W	2	Green	Used also for hazard pilot lamp
Head lamp main (high) beam pilot lamp	12V-3W	1	Blue	
Hazard lamp	12V-23W	4	Amber	Used also for front and rear side clearance and turn signal lamp
Room lamp	12V-10W	1	Milky white	
Engine compartment inspection lamp	12V-8W	1	Milky white	
Glove box illumination lamp	12V-3W	1	White	
Clock illumination lamp	12V-3W	1	White	

HEAD LAMP

1. **Removing the head lamp:**

Remove four screws from the inside of the wheel opening.

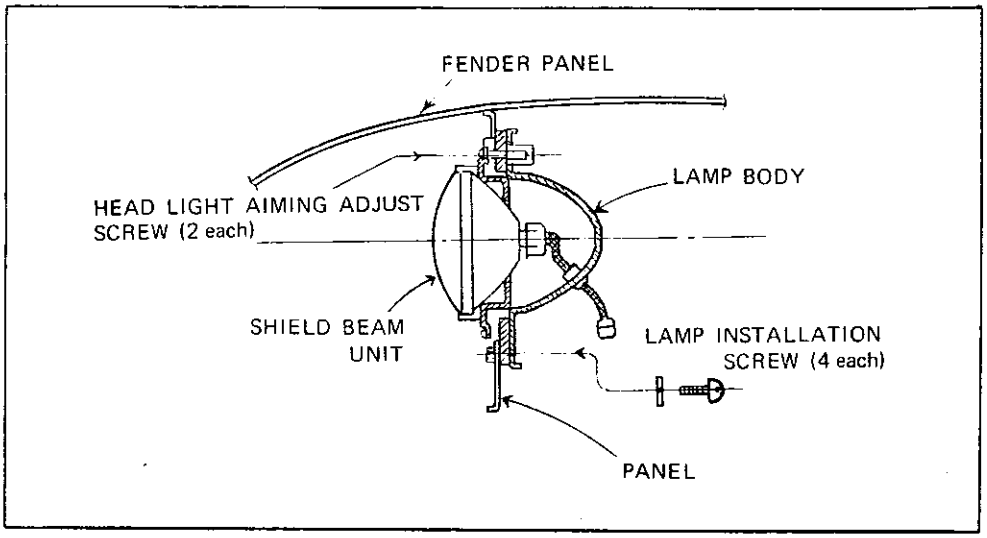


Fig. BE-4 Removing head lamp

2. **Head light aiming adjustment and adjusting values (unladen condition)**

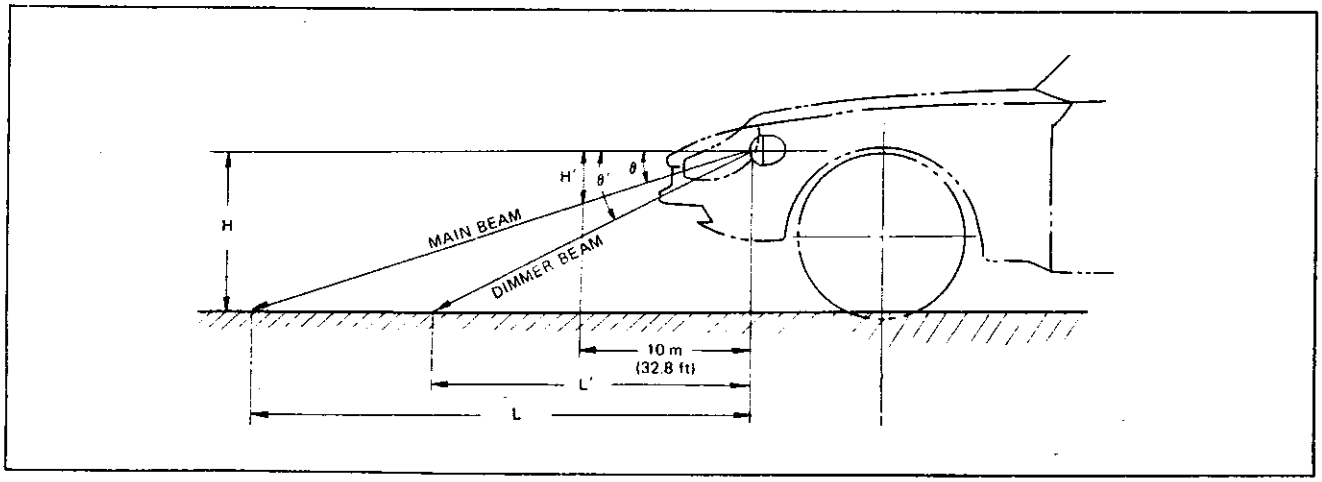


Fig. BE-5 Adjusting head light aiming

Adjusting values

Dimensions/Angle	Values to which adjusted
H	622.0 mm (24.5 in)
θ	45'
θ'	1°35'
L	47.5 m (155.5 ft)
L'	22.5 m (73.8 ft)
H'	130.9 mm (5.15 in)

FRONT PARKING / TURN SIGNAL LAMP

Territory	Bulb capacity		Lens color
	Turn signal lamp	Parking lamp	
Ordinary	23W	7W	White
U.S.A. Canada	23W	7W	Amber

Replacing bulb:

Turn the socket from the rear side, and remove it.

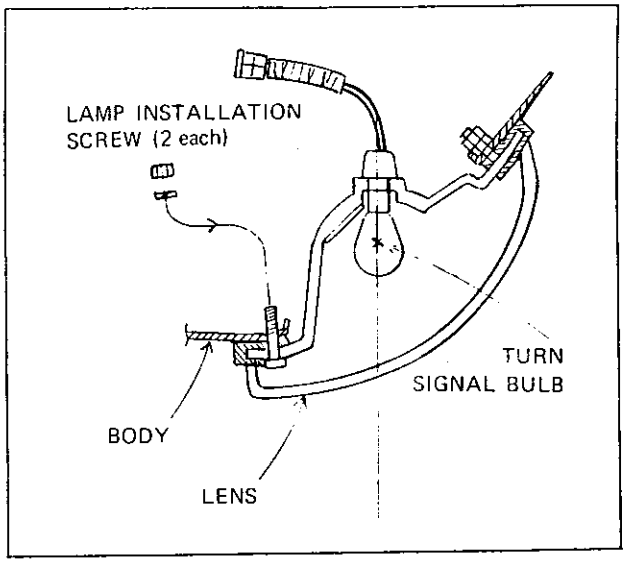


Fig. BE-6 Replacing front parking/turn signal lamp

LICENSE PLATE LAMP

Replacing the bulb:

Remove the lamp cover after removing three set screws.

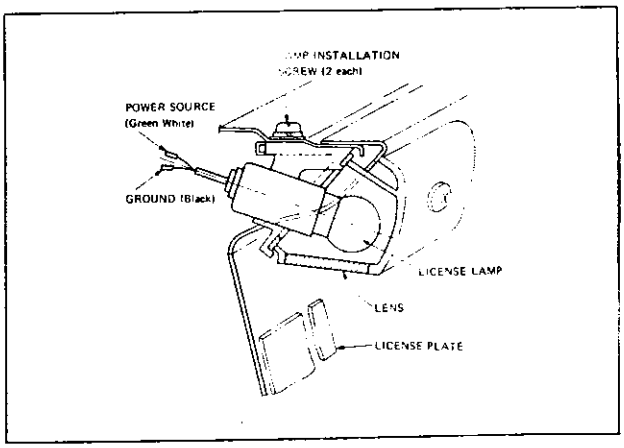
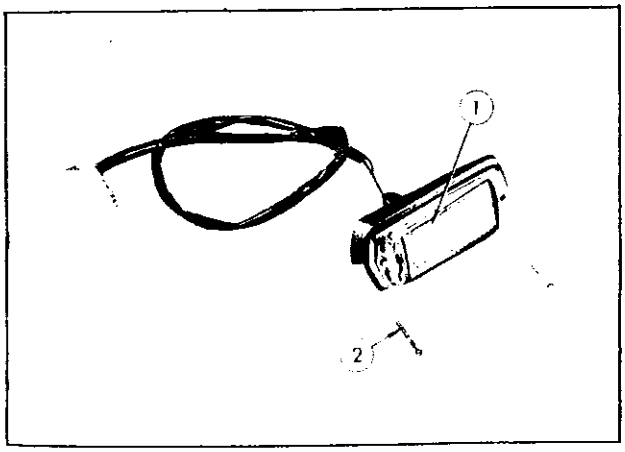


Fig. BE-7 License plate lamp installation

SIDE MARKER REFLEX REFLECTOR

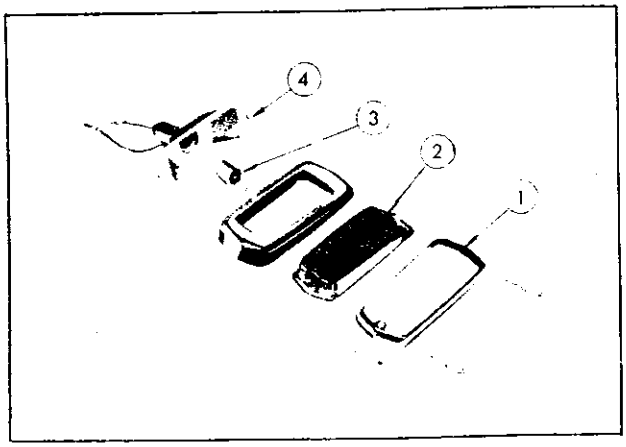
(For U.S.A., CANADA)

Front and rear 7.5W



1	Lens	2	Set screw

Fig. BE-8 Front side marker lamp



1	Limb	3	Bulb
2	Lens (Red)	4	Adapter

Fig. BE-9 Rear side marker lamp

REAR COMBINATION LAMPS

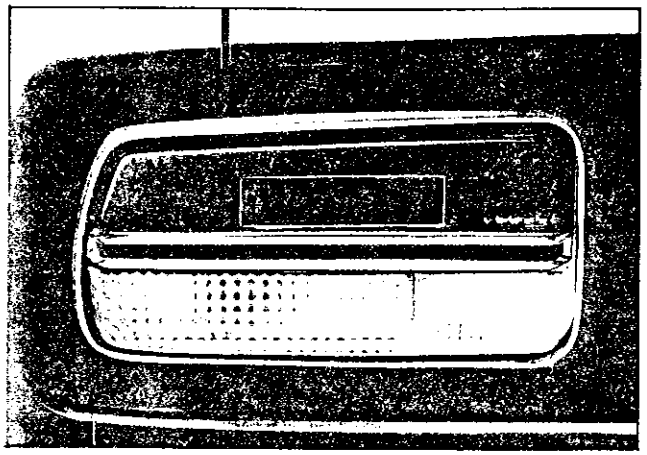


Fig. BE-10 Rear combination lamp

Specification

Rear combination lamp	Bulb capacity
Tail lamp	7W
Stop lamp	23W
Turn signal lamp	23W
Back up lamp	23W

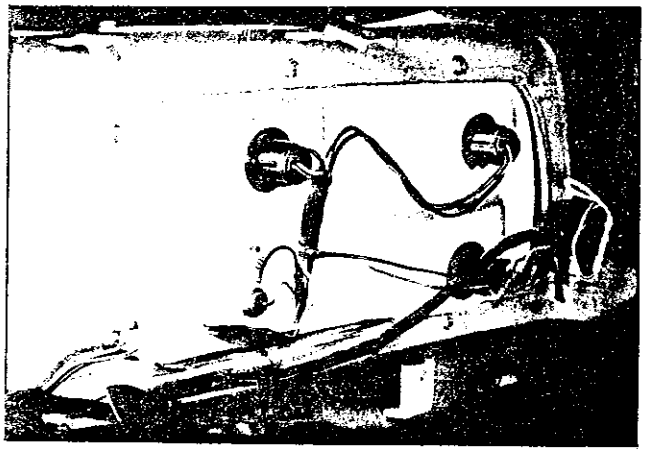


Fig. BE-11 Replacing rear combination lamp bulb

Replacing bulb

Remove the rear panel trim (secured with plastic rivets in eight places), replace the bulb from the rear side of the socket.

Replacing the rear combination lamp assembly

Remove the finisher from the outside of the body, remove eight rear combination lamp installation screws, and remove the rear combination lamp assembly.

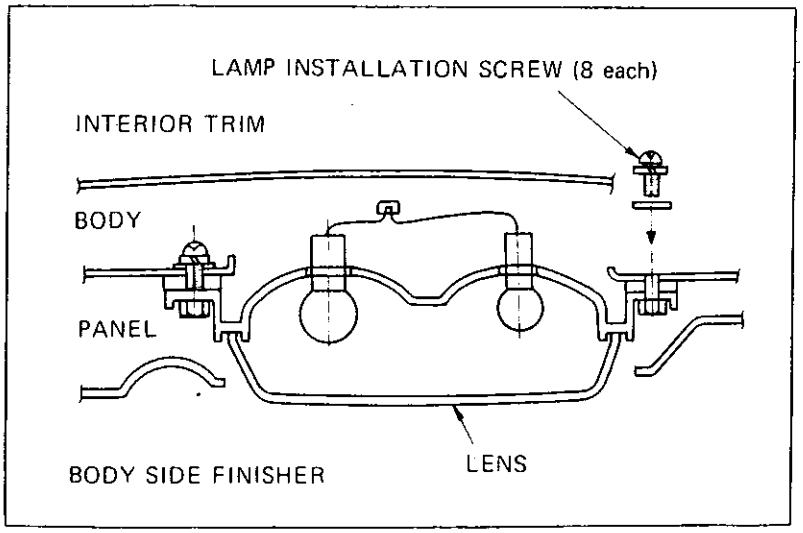


Fig. BE-12 Installing rear combination lamp assembly

METERS

CONTENTS

SPEEDOMETER

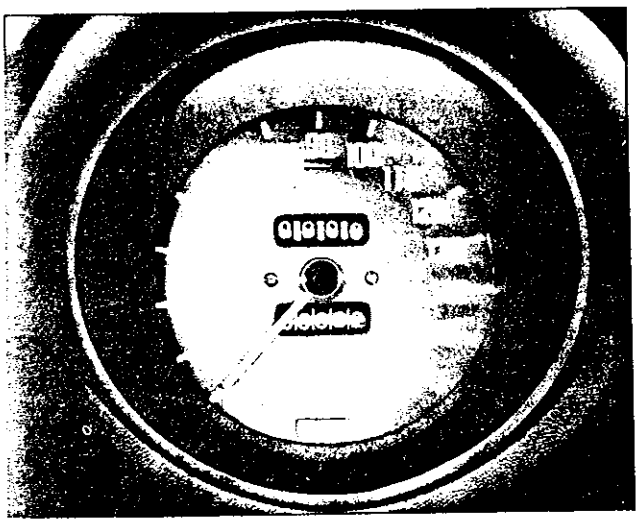


Fig. BE-13 Speedometer

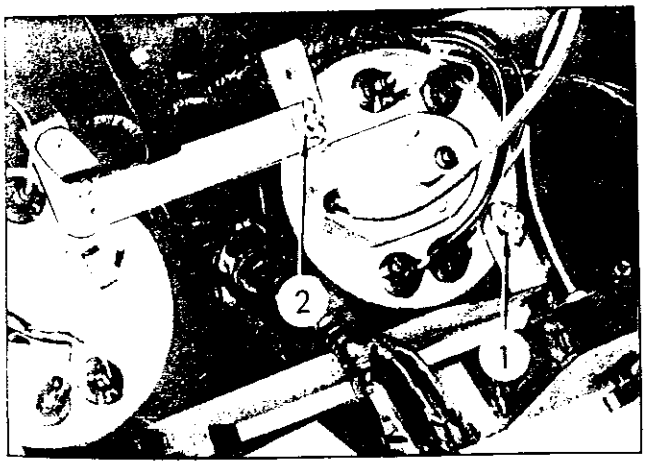


Fig. BE-14 Removing speedometer

Removal

Loosen the wing nuts on the meter brackets [① and ② in Figure BE-14] on the upper and lower sides of the reverse side of the speedometer, and withdraw the speedometer from the instrument panel.

Note: **a. When loosening the wing nuts, use a pair of pliers.**

b. In order to facilitate the operation, remove the heater air duct.

c. See Figure BE-15 for details of the speedometer support bracket and mounting bracket.

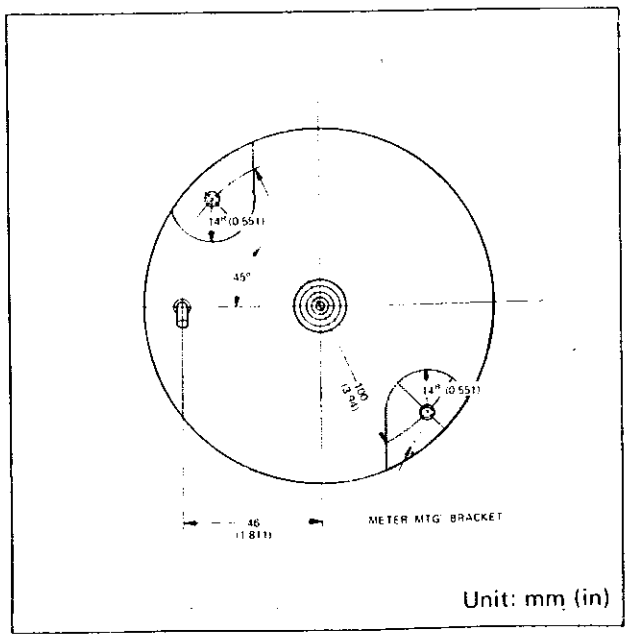


Fig. BE-15 Details of speedometer installation brackets

TACHOMETER

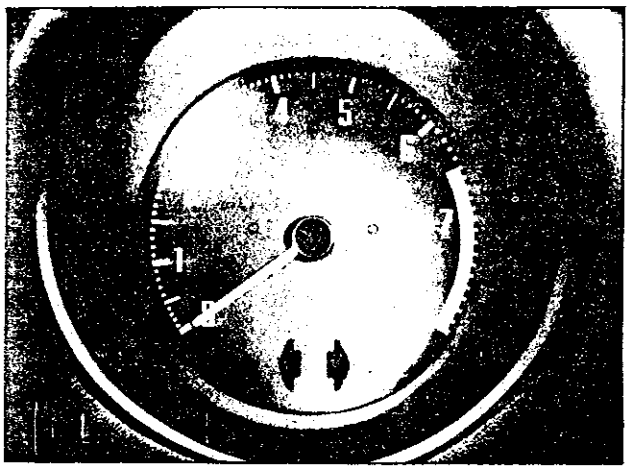


Fig. BE-16 Tachometer

Yellow zone: 6,500 to 7,000 rpm
Red zone: 7,000 to 8,000 rpm

(Engine rpm: Indicated in range 0 to 8000 rpm)

Removal

Remove the tachometer in the same manner as for the speedometer.

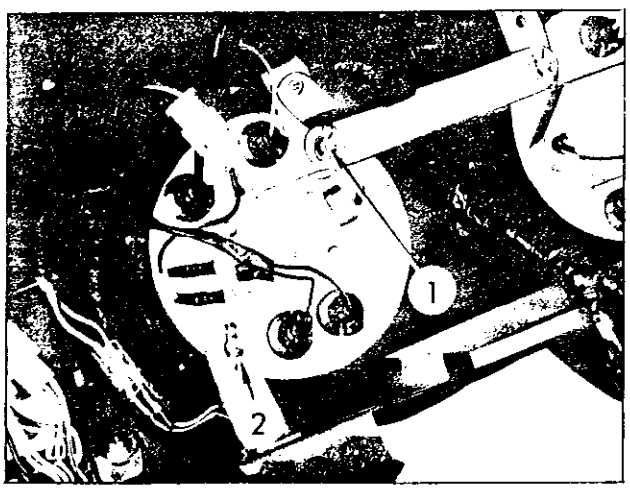


Fig. BE-17

Note: See Figure BE-17 for details of the tachometer support bracket and mounting bracket.

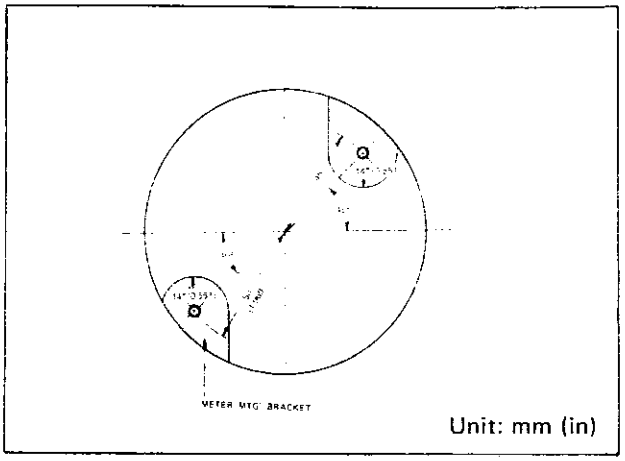


Fig. BE-18 Details of tachometer installation brackets

WATER TEMPERATURE GAUGE OIL PRESSURE GAUGE

The water temperature gauge and oil pressure gauge are combined. The water temperature gauge indicates water temperature in range from 120 to 250°F, and oil pressure gauge indicates oil pressure in range from 0 to 140 lb/sq in. A voltage regulator (meter regulator) is built in the meter unit to compensate thermal effect.

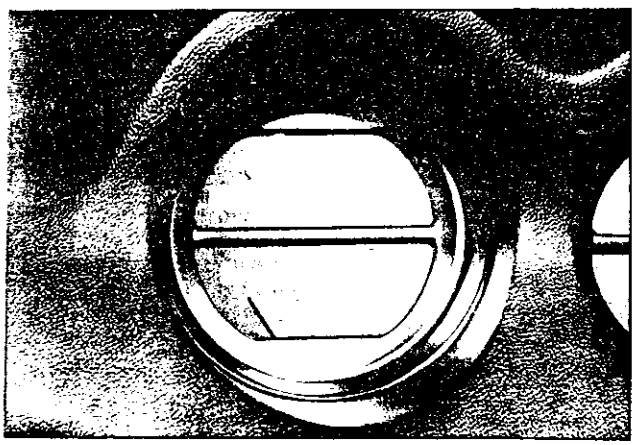


Fig. BE-19 Water temperature gauge and oil pressure gauge

Removal

1. Remove the center console finisher.

2. Inserting hand into the opening where the center console finisher has been removed, loosen hexagonal cross-headed screws [① and ② in Figure BE-21] use pair of pliers, and remove the unit from the reverse side of the instrument panel.

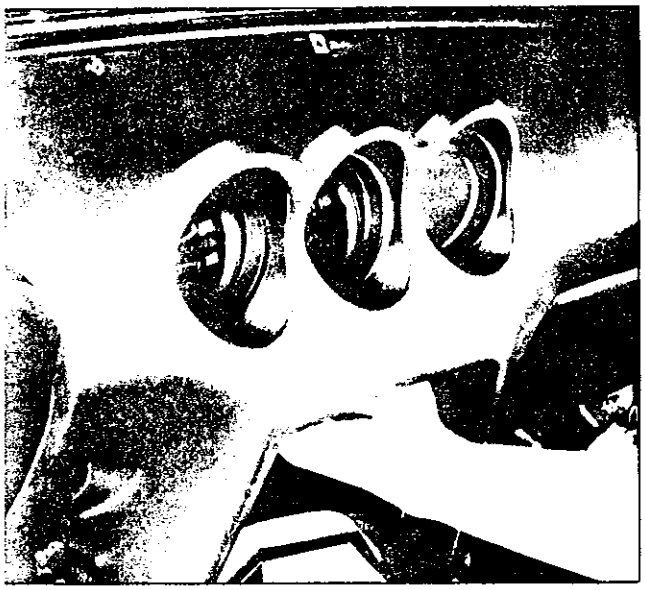


Fig. BE-20 Removing center console finisher

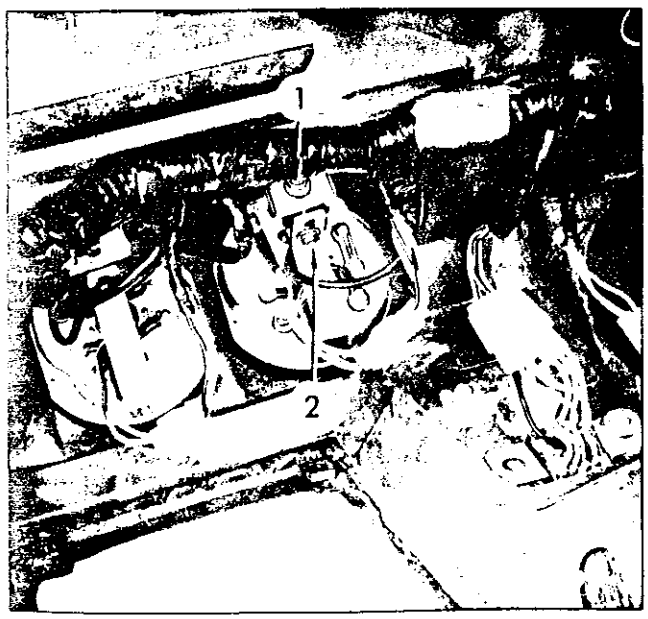


Fig. BE-21 Removing water temperature gauge and oil pressure gauge

AMMETER AND FUEL GAUGE

The ammeter and fuel gauge are combined to a single unit. The ammeter indicates in range from -45 to +45A. "E" and "F" marks on the fuel gauge represent respectively "Empty" [5 liters (18.9 US gal, 122.7 Imp gal)] and "Full" [60 liters (227 US gal, 273 Imp gal))].

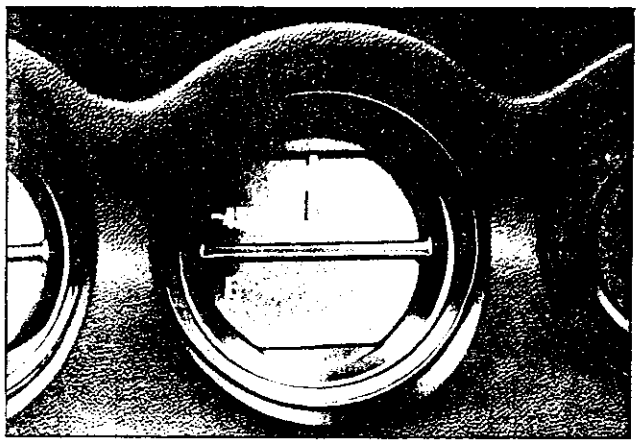


Fig. BE-22 Ammeter and fuel gauge

Removal

Remove the ammeter and fuel gauge unit in the same manner as for the oil pressure gauge and water temperature gauge. To be more specifically, when removing the ammeter and fuel gauge unit, remove the meter bracket, and remove hexagonal cross-headed screws [① and ② in Figure BE-23] from reverse side of the meter.

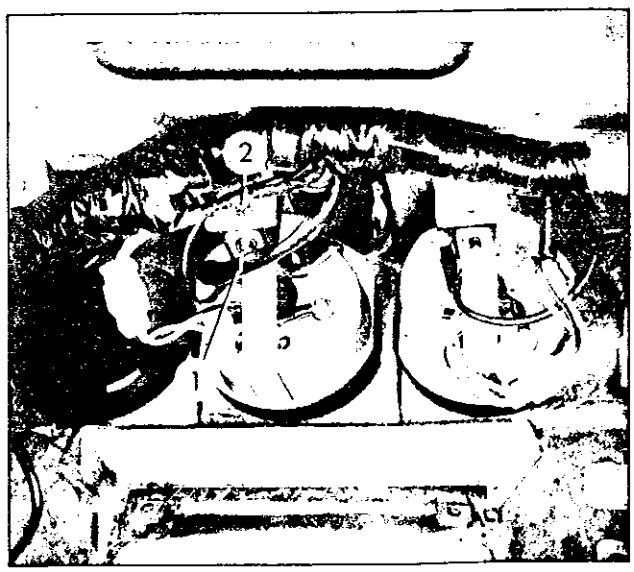


Fig. BE-23 Removing ammeter and fuel gauge

INSTRUMENT UNIT CIRCUIT DIAGRAM

(Speedometer, Tachometer, Ammeter, Oil Pressure Gauge and Others)

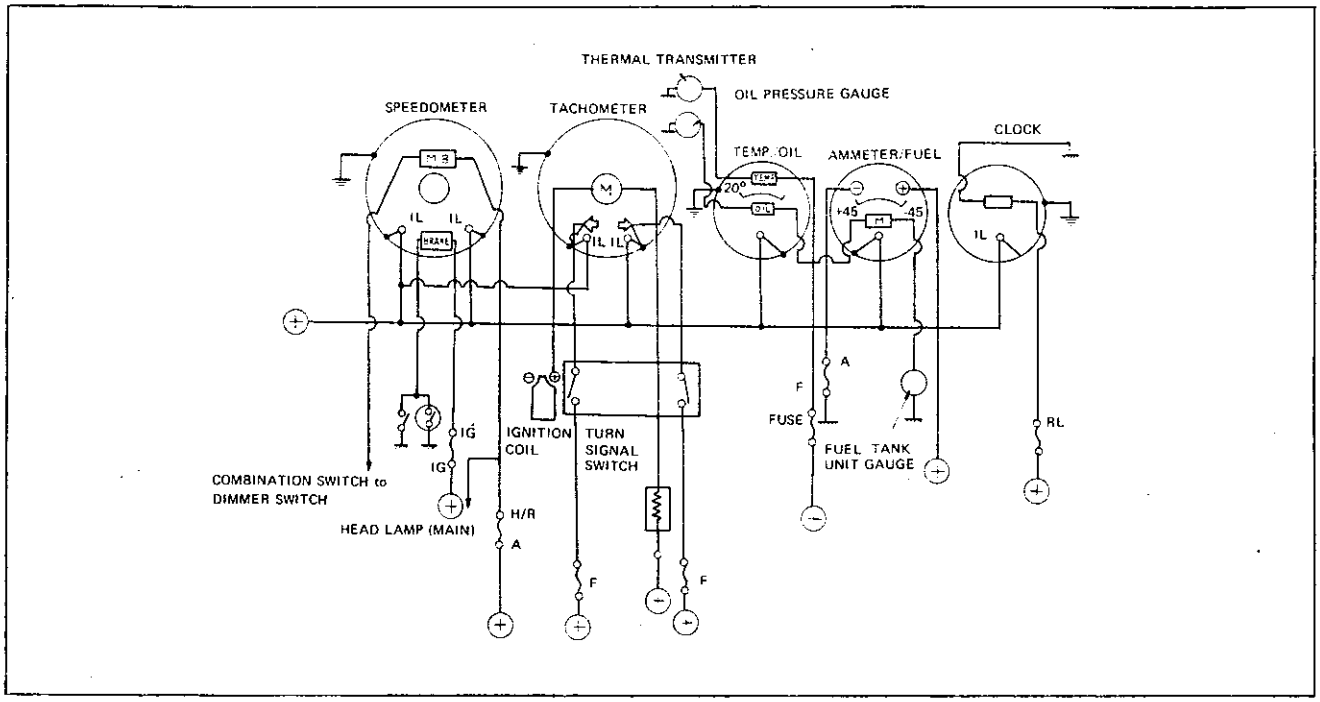


Fig. BE-24 Circuit diagram of instrument unit

ILLUMINATION CONTROL

The illumination control is a variable resistor (Rheostat) with which the meter illumination can be controlled (none step) to get proper brightness so that the meters can be seen clearly.

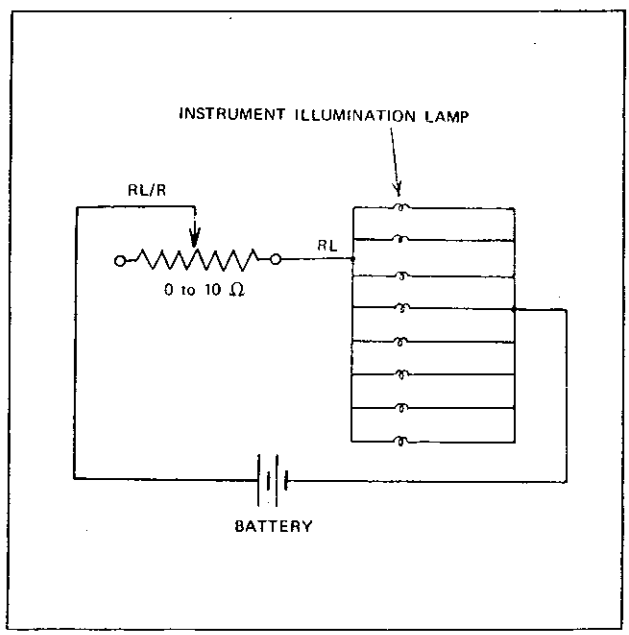


Fig. BE-25 Circuit diagram of illumination control

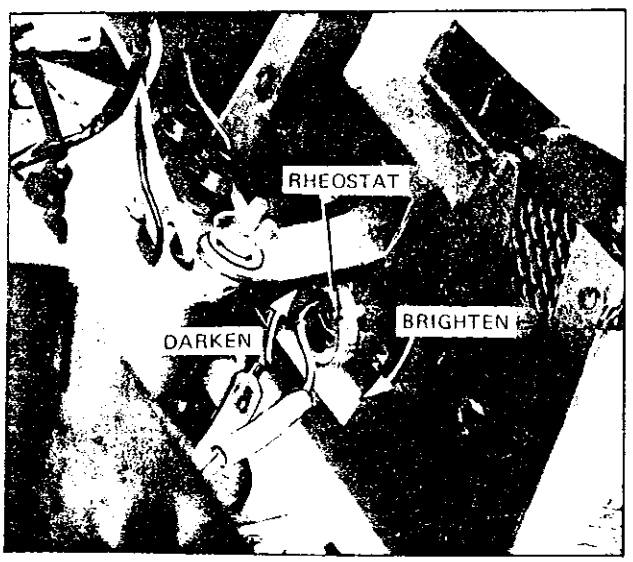


Fig. BE-26 Removing illumination control

TROUBLE DIAGNOSES AND CORRECTIONS

Speedometer

Troubles	Possible causes	Method of inspection	Corrective action
Both pointer and odometer do not operate.	Faulty speedometer cable union nut tightening	Check the union nut for tightness.	Retighten the union nut.
	Broken speedometer cable	Check the speedometer cable.	Replace the cable
	Damaged speedometer drive gear	Check the drive gear	Replace the drive gear and pinion assembly.
	Defective speedometer	Remove the speedometer unit, and check.	Replace the meter unit.
	Rusted cable	Make sure that the cable is rusted.	Replace the cable.
Pointer deflects excessively.	Improperly installed speedometer cable (bent excessively)	Check the cable for installing condition.	Correct bending radius to more than 100 mm (3.9 in).
	Broken speedometer cable	Check the cable for condition.	Replace the cable.
	Damaged speedometer drive gear	Check the drive gear.	Replace the drive gear/ pinion assembly.
	Defective speedometer	Remove the speedometer unit, and check.	Check and replace if required.
Pointer unstable.	Improperly tightened speedometer union nut	Check the union nut for tightening condition.	Retighten or repair if required.
	Defective speedometer cable	Check the speedometer cable.	Replace cable.
	Damaged speedometer drive gear	Check the drive gear.	Replace speedometer unit.
	Defective speedometer	Remove and check the speedometer unit.	
Unusual noise	Excessively bent speedometer cable, lack of lubricant, or twisted speedometer cable.	Check the cable for excessive bending.	Replace the cable.
	Defective speedometer		Replace the meter.

Water temperature gauge

Even the switch is turned on, the pointer does not operate.	Blown off fuse	Check the fuse.	Replace if blown off.
	Defective thermal transmitter	Apply a test lamp (approximately 12V-3W) using DC12V in series to the lead wire yellow/white) which connected to the thermal transmitter, and ground another wire from the test lamp. Then pointer deflects.	Replace the thermal transmitter.
	Defective meter unit or faulty wiring	When above described inspection is conducted and the pointer still does not operate, remove the meter unit, connect the unit with a test lamp (12V-3W) in series, and apply DC12V.	
		o If the pointer deflects;	Repair the wiring.
		o If the pointer does not deflect;	Replace the meter unit.

Fuel gauge

When the source switch is closed, the pointer does not operate.	Blown off fuse	Defective tank unit grounding	Replace if blown off.
	Defective tank unit grounding	Apply a test lamp (12V-3W) using DC12V to the tank unit lead wire in series and ground the tank, then pointer deflects.	
	Defective meter unit or wiring	When above described inspection is conducted and the meter pointer does not deflect, remove the meter unit, apply a test lamp (12V-3W) to the unit in series, and apply DC12V.	
		o The pointer deflects to "F".	Correct the wiring.
		o The pointer does not deflect after repairing.	Replace the meter unit.
The pointer indicates a point constantly regardless of actual fuel level.	Defective tank unit	When the lead wire to the tank is disconnected at the tank unit terminal, the pointer returns to "E".	Replace tank unit.

	Defective meter unit or wiring	When the above described inspection is conducted and the pointer of the meter still does not deflect, remove the meter unit, apply a test lamp (12V-3W) to the unit in series, and apply DC12V. o The pointer deflects to "F". o The pointer does not deflect.	Correct the wiring. Replace the meter unit.

Ammeter

Improper indication	Lack of alternator capacity (45A)	Measure the alternator charging voltage	Repair the voltage regulator/alternator.

WINDSHIELD WIPER

CONTENTS

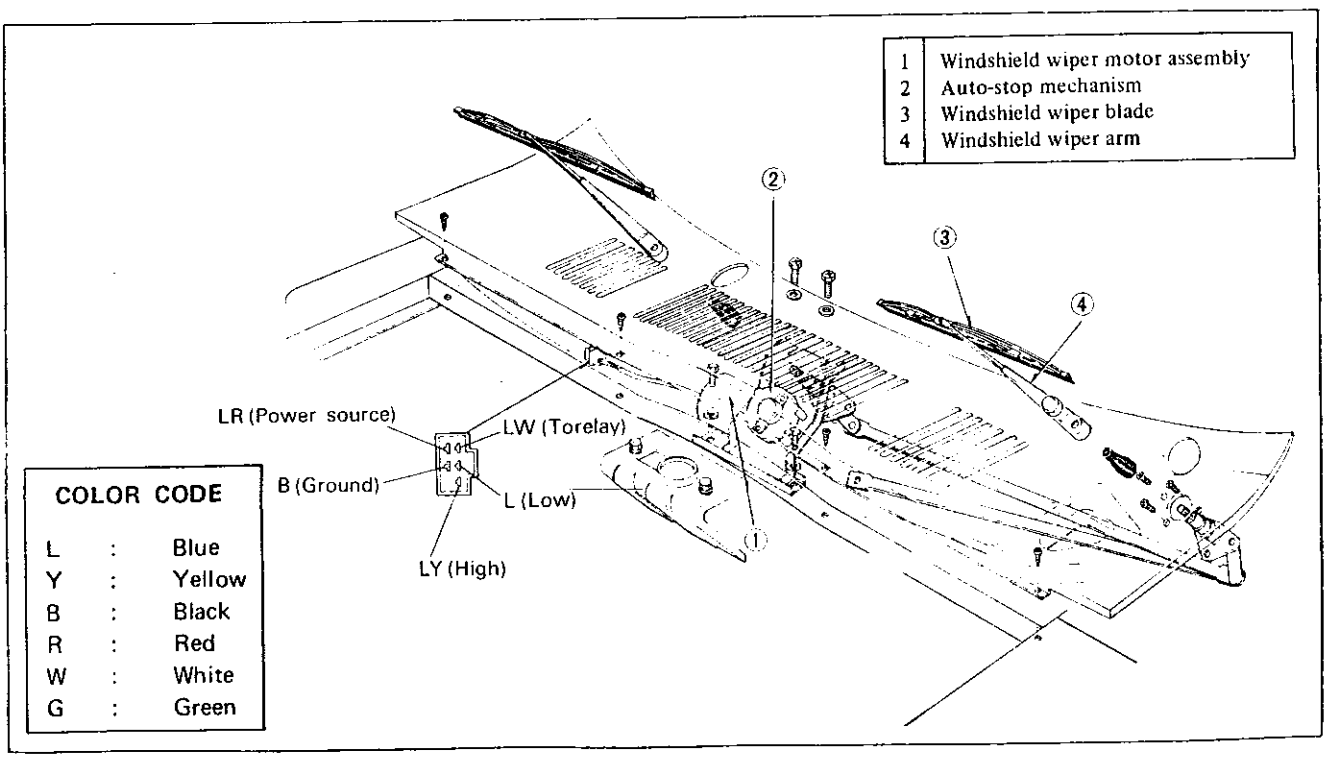
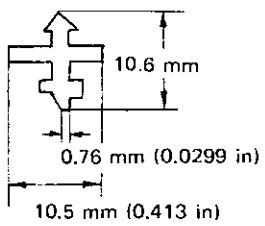


Fig. BE-27 Structure of windshield wiper

Main specifications

Wiping system	Parallel interlock system (tandem type)	
Wiping angle	86° (Driver side)	96° (Assistant side)
Rise-up angle	4° 30' (Driver side)	5° 30' (Assistant side)
Blade length	460 mm (18 in)	
Arm installation method	Tapered serration	

Cross-sectional view of blade rubber:



Motor performance

Item	Specification	
Rated voltage	12V	
Test voltage	13.5V	
Starting voltage	Less than 8V	
	LOW	HIGH
Unloaded speed	56 rpm	78 rpm
Unloaded current	Less than 2.5A	Less than 2.5A
10 kg-cm (8.7 in-lb) loaded speed	52 rpm	68 rpm
loaded current	Less than 3A	Less than 3.5A
40 kg-cm (34.7 in-lb) loaded speed	40 rpm	50 rpm
loaded current	Less than 6A	Less than 7.5A
Locking torque	135 kg-cm (117.2 in-lb) or greater	125 kg-cm (108.5 in-lb) or greater
Locking current	Less than 25A	Less than 25A

Windshield wiper installing position

Install the windshield wiper blade in such a position that the blade comes into contact with the weather strip upper line lightly.

Tighten the windshield wiper blade arm lock nut under 80 to 100 kg-cm (70 to 87 in-lb) tightening torque.

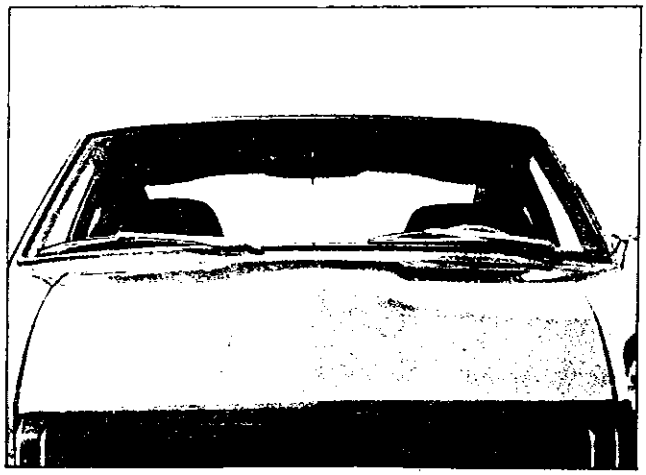
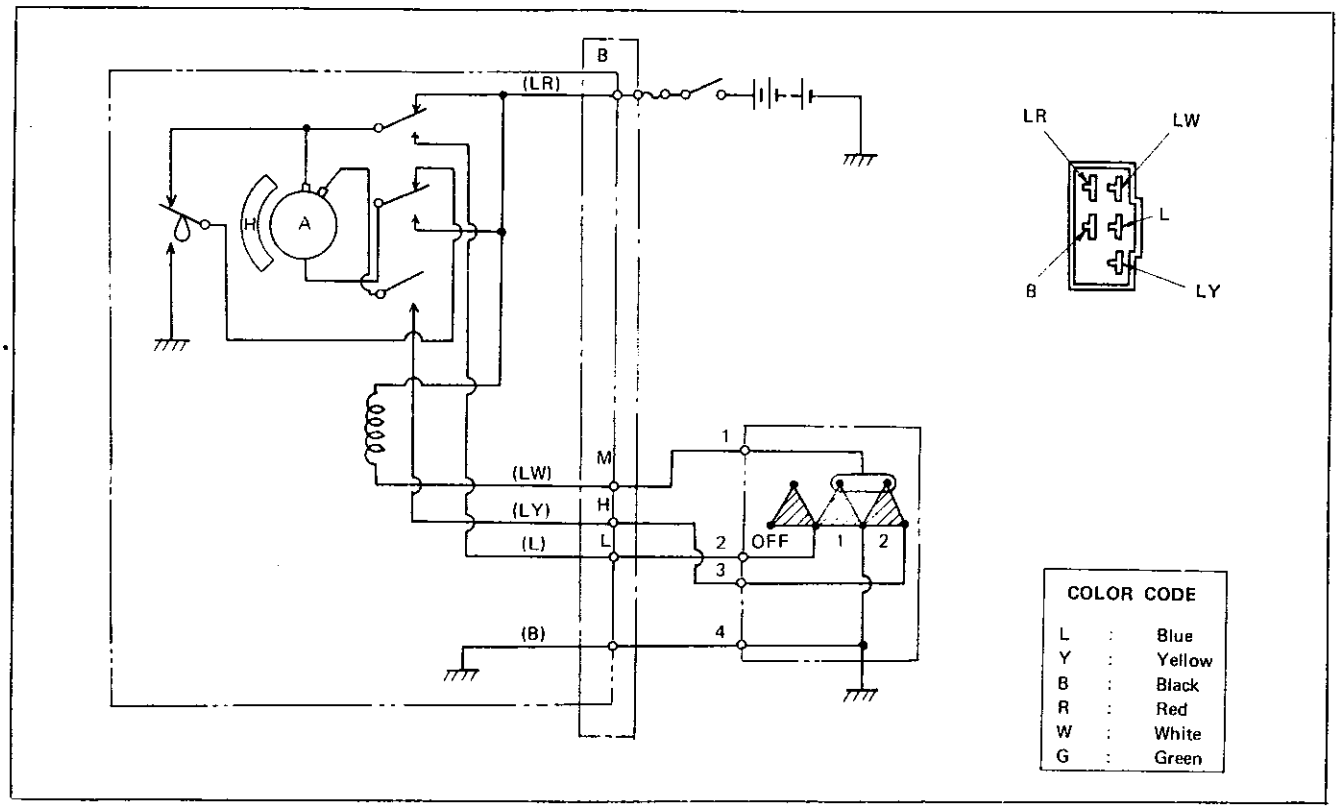


Fig. BE-28

Windshield wiper motor connecting diagram



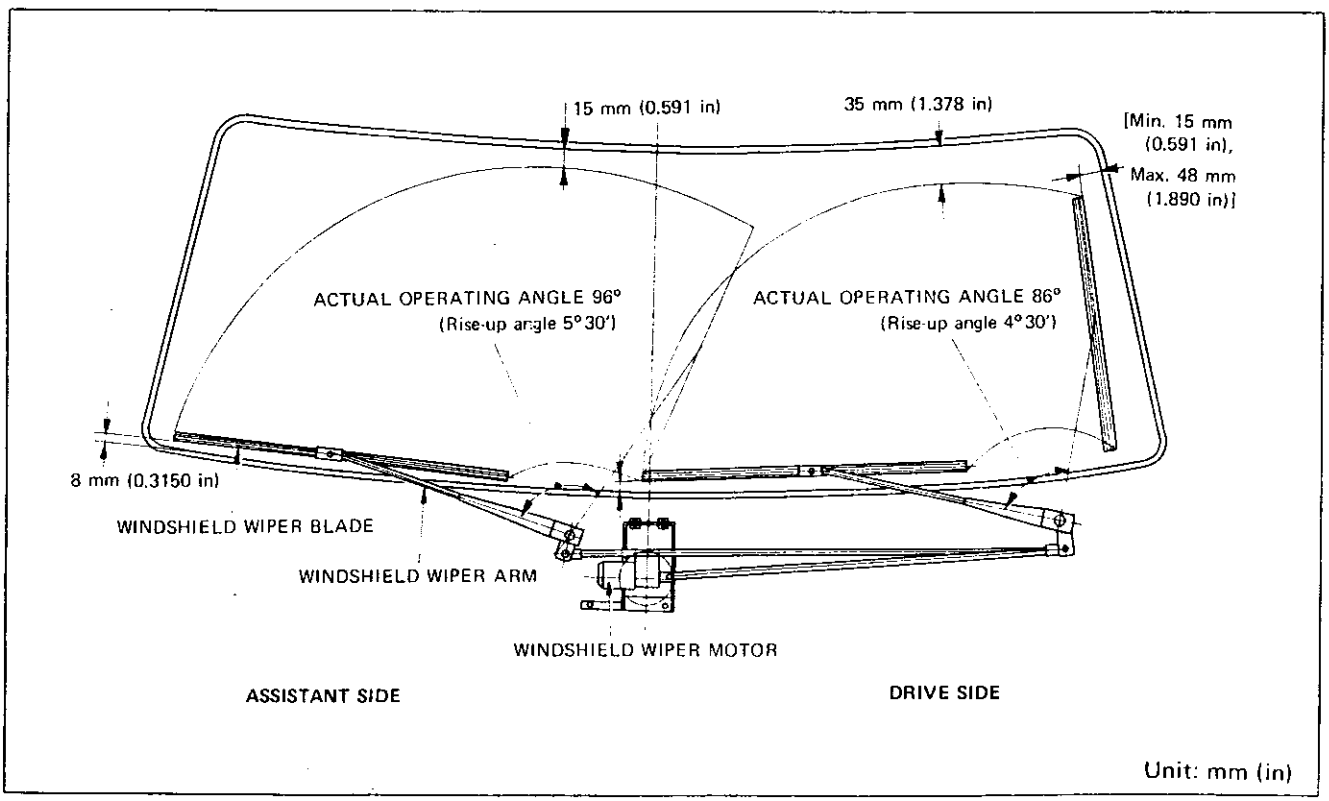


Fig. BE-29 Wiper blade operating range

WINDSHIELD WASHER

CONTENTS

REMOVAL

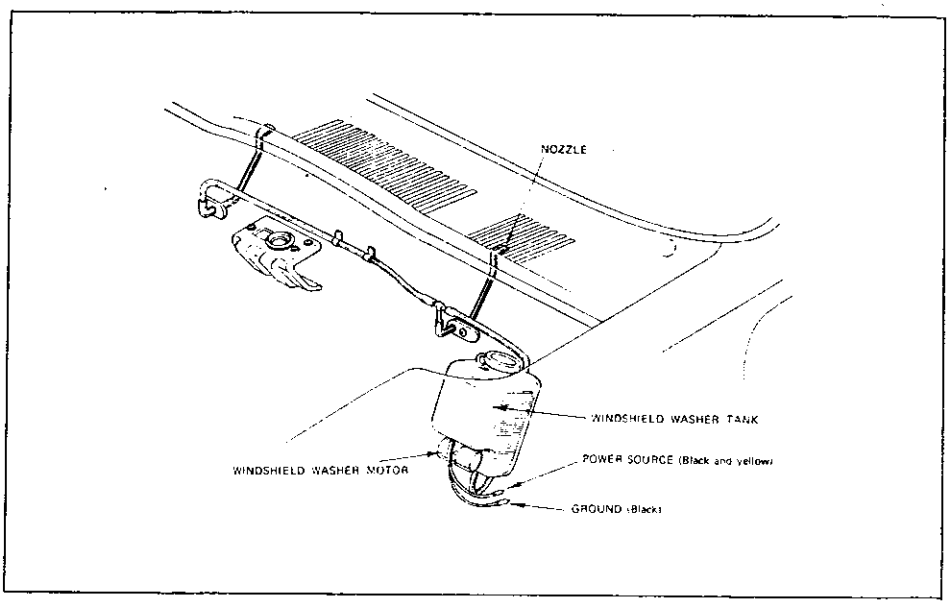


Fig. BE-30 Structural view of windshield washer

Adjusting washer nozzle

When reassembling washer nozzle or washer fluid is not sprayed properly, adjust the nozzle direction using a pair of pliers so that fluid is sprayed in range indicated by asterisk mark (*) in Figure BE-31.

Washer tank capacity 1.5 liters (3.96 US gal, 3.30 Imp gal).

Precautions for usage of washer

Do not operate the windshield washer continuously for longer than 30 seconds or without fluid. (When the windshield washer is operated incorrectly, malfunction will result.)
Ordinarily, limit operating time within 10 seconds.

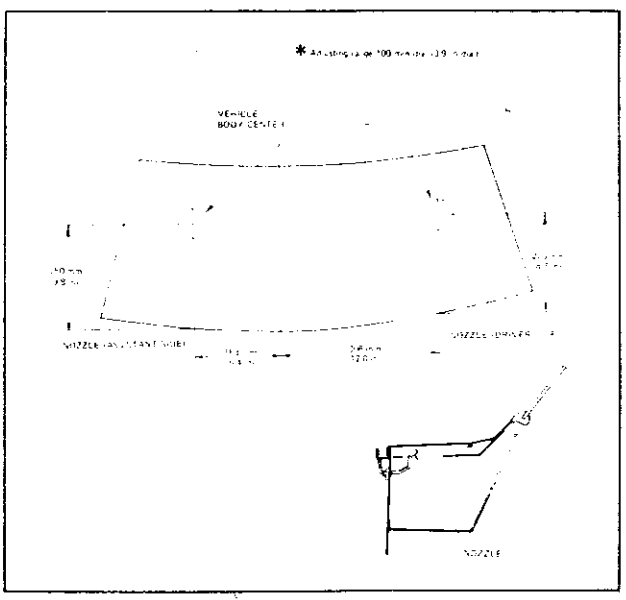


Fig. BE-31 Adjusting washer nozzle

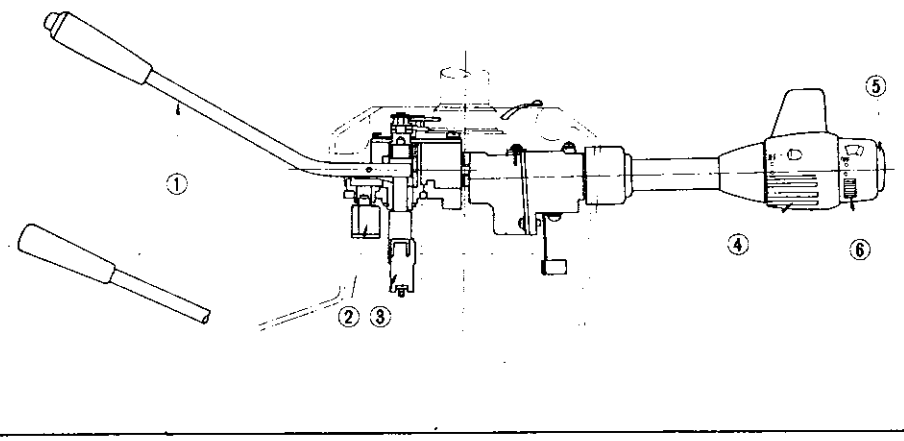
TROUBLE DIAGNOSES AND CORRECTIONS

Troubles		Possible causes	Method of inspection	Corrective action
Fluid does not come out.	No motor operating sound	Blown off fuse	Check the fuse box.	Replace fuse if required.
		Improper contact of each lead wire joint	Check the motor unit and switch unit for proper joint contact.	Correct if required.
		Defective washer motor	Connect (+) and (-) terminals of the battery respectively to motor lead wires (blue) and (blue/red) with separate cables, and see if the motor operates. If not, the motor is defective.	Replace the motor with a new one.
Fluid does not come out.	Motor operating sound is audible	Incorrect piping	With the windshield washer switch turned on, measure voltage between two motor lead wires, and if the battery voltage is not detected, check the individual joints.	Correct.
		Lack of washer fluid	Check fluid level in tank.	Refill fluid.
The windshield washer does not stop.		Defective switch.	With the windshield washer switch turned off, check the circuit between the wiper switch (yellow/blue) and (black) terminals for continuity. If there is continuity, the switch is defective.	Replace the switch with a new one.
		Short circuit.	Check wiring.	Repair wiring.

SWITCH

CONTENTS

COMBINATION SWITCH



1	Turn signal lever
2	Turn signal switch
3	Dimmer switch
4	Lighting switch 2-speed (Turn)
5	Windshield wiper switch 2-speed (Turn)
6	Windshield washer switch (Push-button system)

Fig. BE-32 Structural view of combination switch

The combination switch is split into two compartments; one consists of lighting switch, wiper switch, and windshield washer switch, and the other consists of turn signal switch and dimmer switch.

Each switch operating force

Turn signal switch	0.2 to 0.6 kg (0.44 to 1.32 lb)
Dimmer switch	0.3 to 0.8 kg (0.66 to 1.76 lb)
Windshield wiper switch	1 to 3.3 kg (2.2 to 7.3 .b)
Passing switch	0.2 to 0.6 kg (0.44 to 1.32 lb)
Lighting switch	0.2 to 0.6 kg (0.44 to 1.32 lb)
Windshield washer switch	0.7 to 1.3 kg (1.54 to 2.87 lb)

Combination switch connection circuit

(1) Lighting/windshield wiper switch side

Conjunction table of Lighting Switch:

Terminal / Lever position	Battery	parking lamp	Dimmer switch	Earth
OFF				
First step	6.1A			
Second step	6.1A		9.2A	

Conjunction of Wiper Switch:

Terminal / Lever position	High	Low	Medium	Earth
OFF				
First step		5A	5A	
Second step		5A	5A	

Fig. BE-33

(2) Turn signal lever side

Conjunction table of Dimmer Switch:

Lever position \ Terminal	Earth	Main switch	Dimmer switch
Main switch	9.2A		
Dimmer switch		9.2A	

Conjunction table of Turn Signal Switch :

Lever position \ Terminal	Flasher	Stop switch	Front left	Front right	Rear left	Rear right
Left		2.2A		5.8A		
				5.8A		
Neutral			5.8A		5.8A	
					5.8A	
Right			2.2A			
			5.8A			

Fig. BE-34

HAZARD SWITCH

This switch is a tumbler switch. When removing, remove the installation screw from the switch boss portion.

When removing, use the tumbler switch replacer (special tool ST08900000).

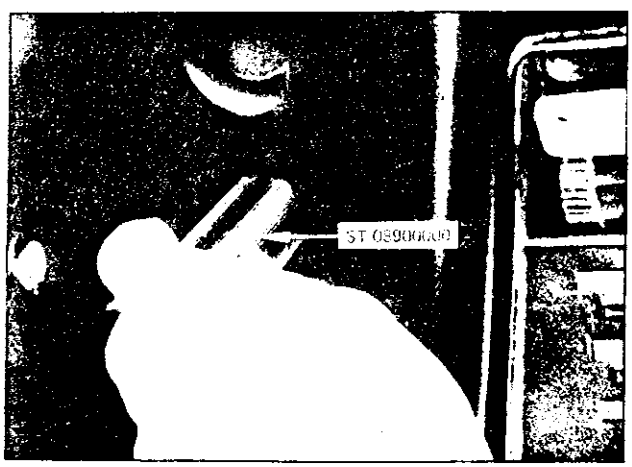


Fig. BE-35

STEERING LOCK

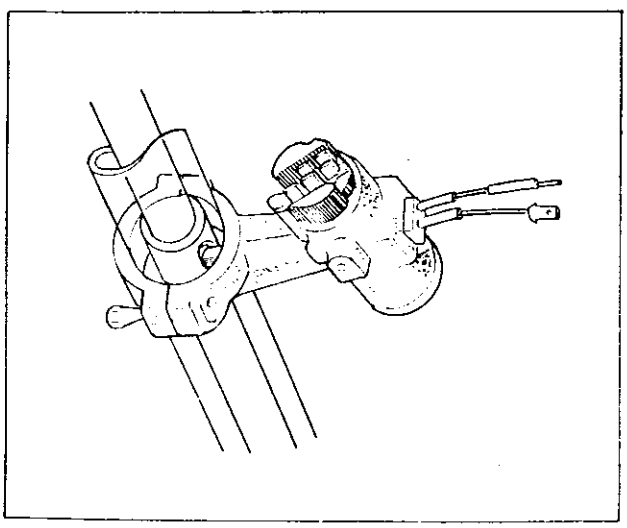


Fig. BE-36 Steering lock

The steering lock is combined with the ignition switch to a single unit which contains warning buzzer microswitch for reminding the drive to lock the steering. The microswitch is connected to a warning buzzer.

WARNING BUZZER

(It operates if the door is unlocked with the key inserted in the steering lock)

The warning buzzer is installed on the steering support. When removing the warning buzzer, disconnect steering lock side microswitch cables, and remove two warning buzzer installation screws.

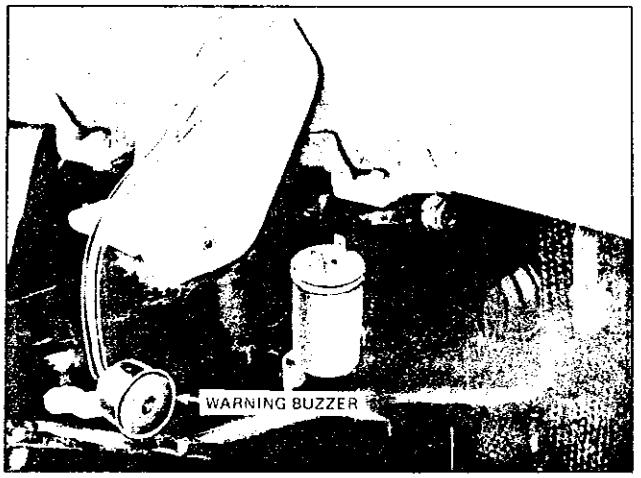


Fig. BE-37 Removing warning buzzer

HORN AND HORN RELAY

CONTENTS

The horn is installed on the top of front crossmember. High tone horn is installed in the driver side and low tone horn is installed in the assistant side facing toward front. The horn relay is installed on the left side dash side panel.

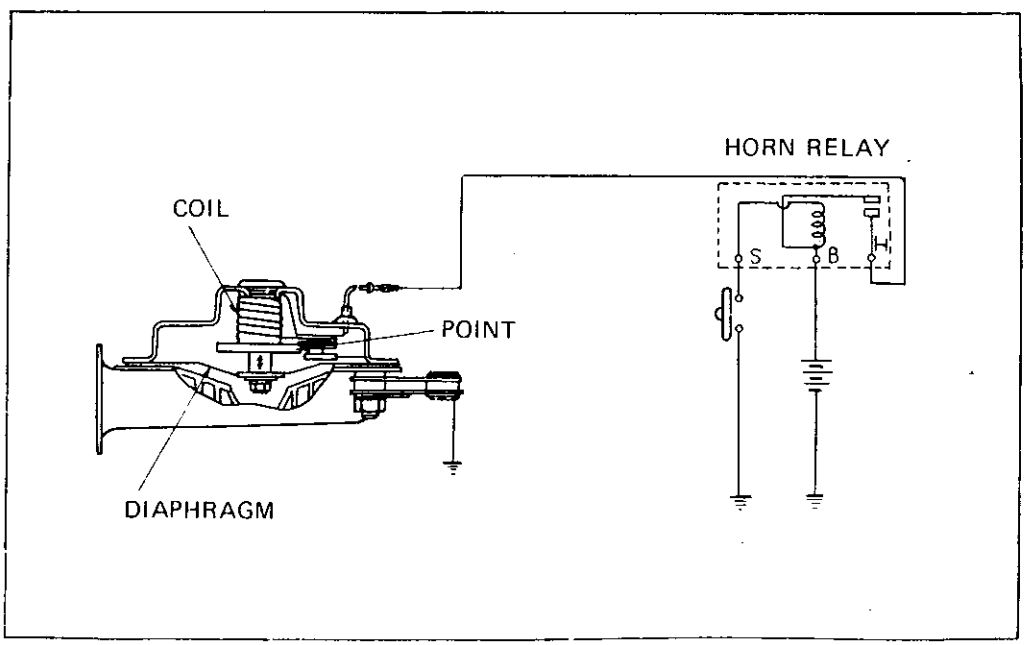


Fig. BE-38 Horn and horn relay circuit diagram

Adjusting horn volume

1. Apply voltage meter and connect cables as shown in Figure BE-39.

2. Turn on the switch, make sure that the voltmeter indicates 12 to 12.5V, and adjust as described below so that the ammeter indicates approximately 3A.

3. Lock nut in reverse side of the body

   (1) Turn the lock nut in counterclockwise .....Volume and current increases.

   (2) Turn the lock nut in clockwise ..... Volume and current reduces.

4. When a proper volume is obtained through the above described method, raise the voltage to 14 or 15V, and further adjust the volume to better sound.

5. A proper sound obtained at range from 12 to 15V is the best adjusting point.
   Lock the nut at that position.

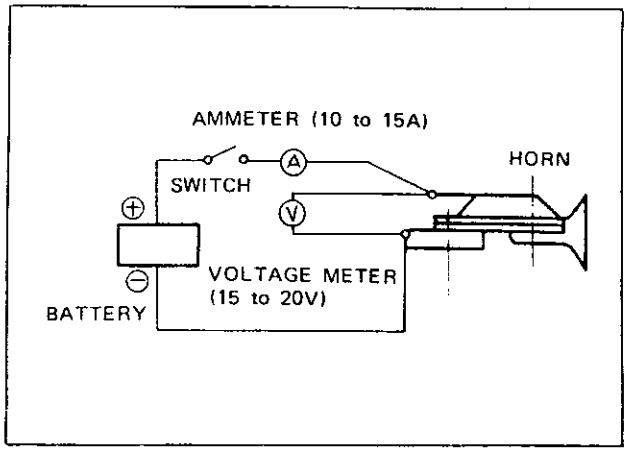


Fig. BE-39 Circuit diagram of horn

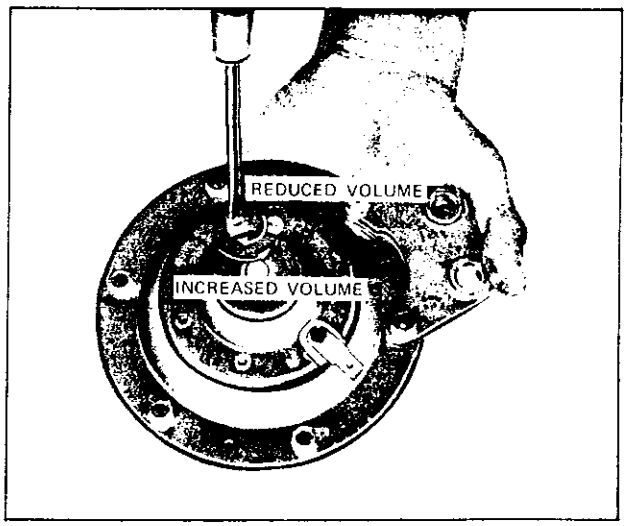


Fig. BE-40 Adjusting horn volume

TROUBLE DIAGNOSES AND CORRECTIONS

Troubles	Possible causes	Method of inspection	Corrective action
The horn does not operate.	Excessively discharged battery	Measure specific gravity of electrolyte.	Charge if discharged.
	The battery is normal.		
	Broken lead wire between horn relay (S) terminal and horn button.	The horn does not sound although the horn relay terminal (S) is grounded, but sounds when the terminals (B) and (H) are short-circuited.	

	. Improper horn button contact . Defective horn relay . Defective horn . Blown off fuse	The horn does not sound although the horn relay terminals (B) and (H) are short-circuited, and the horn still does not sound although the battery (+) terminal is connected to the horn terminal directly. When the horn sounds through the above inspection, check the fuse for wear, fusing, or improper contact.	Replace.
The horn sounds continuously.	. Defective horn relay . Short-circuited horn button and horn relay terminal (S).	The horn does not stop although the horn relay (S) terminal is disconnected. When the horn stops through the above disconnection, check the horn button unit particularly carefully.	Replace horn relay. Replace horn button (Switch).
Reduced volume and/or tone quality	. Improper fuse wire contact . Broken cable . Improper horn button contact . Worn horn point . Broken resistance circuit cable		Correct. Repair. Repair. Adjust or replace. Replace the resistance with a new one.

RADIO

CONTENTS

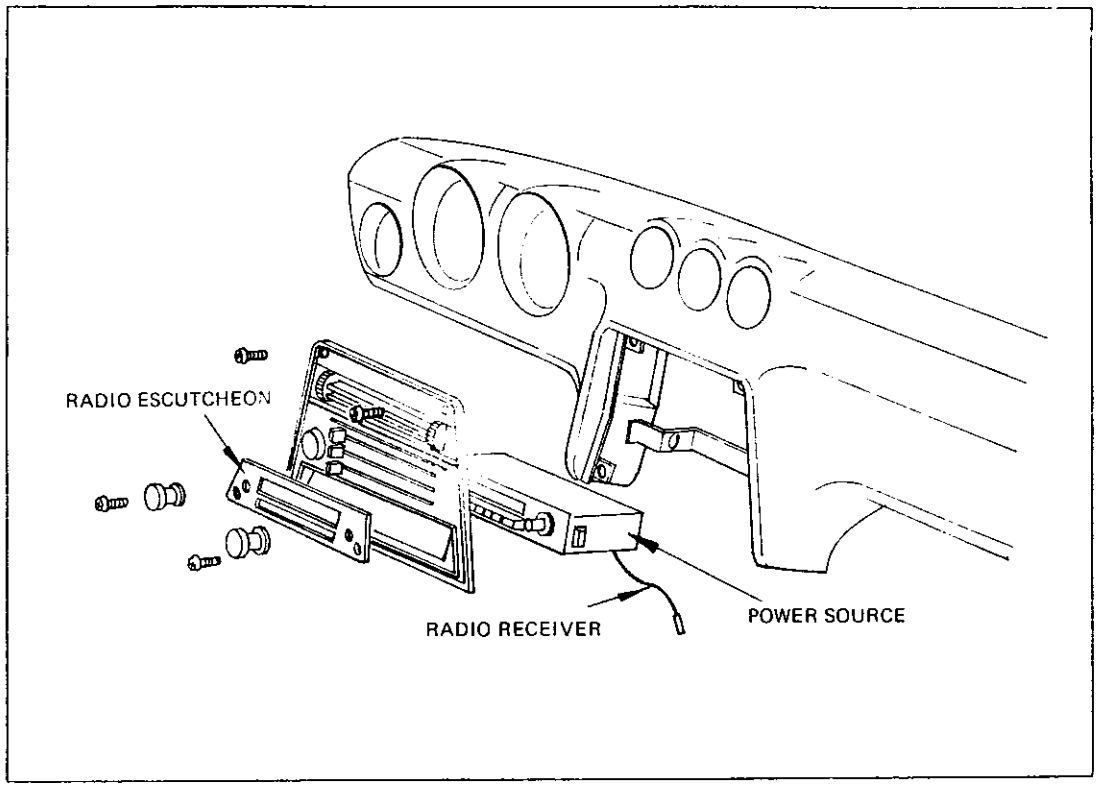


Fig. BE-41 Structural view of radio

The radio receiver proper is a special unit designed for the Model S30 vehicles. The radio receiver unit is fitted into the instrument console box in flush.

The speaker is fitted into the left of the rear side inner. The antenna is a power-drive antenna, and the length is 1,020 mm (40.5 in) when fully extended.

For the detail of Radio refer to "All transistor car Radio MODEL TM-1081ZA service manual" which is published by Hitachi, Ltd.

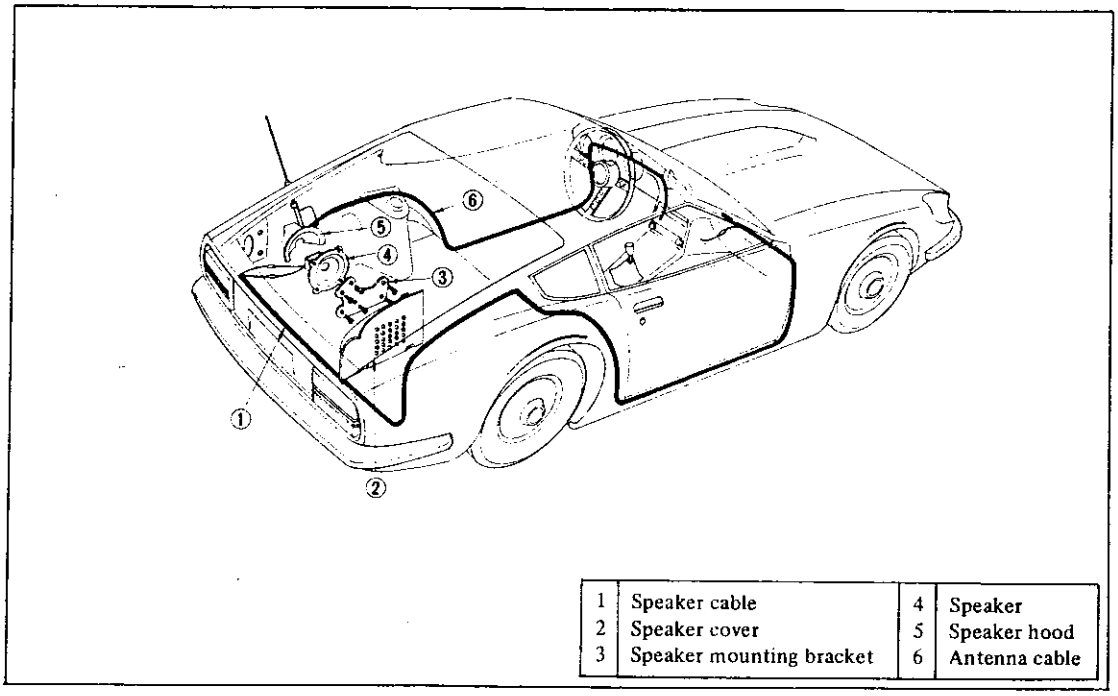
Installation

When installing the radio receiver proper, first, install the radio on the instrument console finisher, and fit it into the instrument console. The radio manufacturer is Hitachi, Ltd.

Radio specifications

Model	TM-1081ZA
Manufacturer	Hitachi, Ltd.
Receiving system	AM
Circuit system	Superheterodyne
Receiving frequency	535 to 1,605 KC
Intermediate frequency	455 KC

Maximum sensitivity	Less than 20 db
Maximum output	6W
Speaker	130 mm (5.12 in) PM Type (Impedance: 4 Ω)
Rated current	90 mA
Rated voltage	12V (–) grounded
Used transistors	10 transistors, 5 diodes, and 2 thermistor



1	Speaker cable	4	Speaker
2	Speaker cover	5	Speaker hood
3	Speaker mounting bracket	6	Antenna cable

Fig. BE-42 Installing speaker and antenna

Installing antenna

First, install the speaker main unit and speaker hood on the speaker mounting bracket. With the speaker installed on the bracket, install the speaker mounting bracket on the body.

Installing speaker

1. Insert the antenna into the antenna installation hole on the left side rear fender from the passenger compartment side.

2. Install the antenna mounting bracket on the body side.

3. Install the antenna upper unit from the outside of the rear fender.

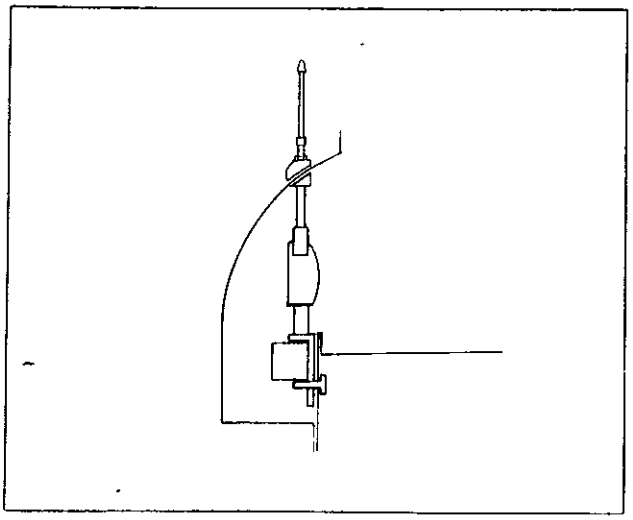


Fig. BE-43 Installing antenna

Antenna specifications

Rated voltage	12V (–) grounded
Rated current	Less than 6A
Operating voltage range	10.5 to 16.0V (Starting voltage: 9V)
Locking current	Less than 6A
Model	RO-74

Auto-anntena switch circuit

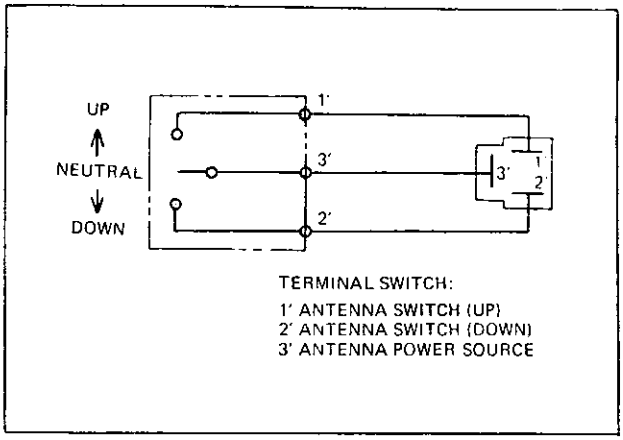
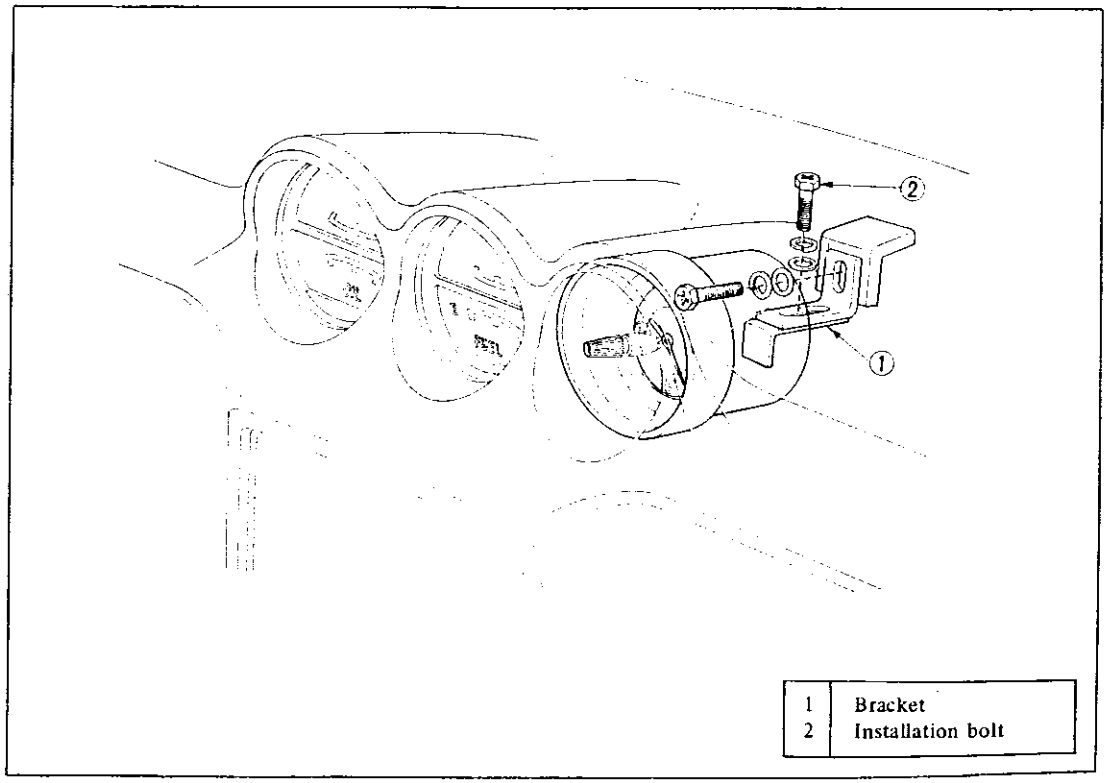


Fig. BE-44 Circuit diagram of auto-antenna

CLOCK

CONTENTS



1	Bracket
2	Installation bolt

Fig. BE-45 Installing clock

Installation

1. Remove the center console finisher.

2. Remove the radio mask, and install the clock thereon.

3. Secure the radio bracket on the L-shape bracket in the instrument panel side with screws.

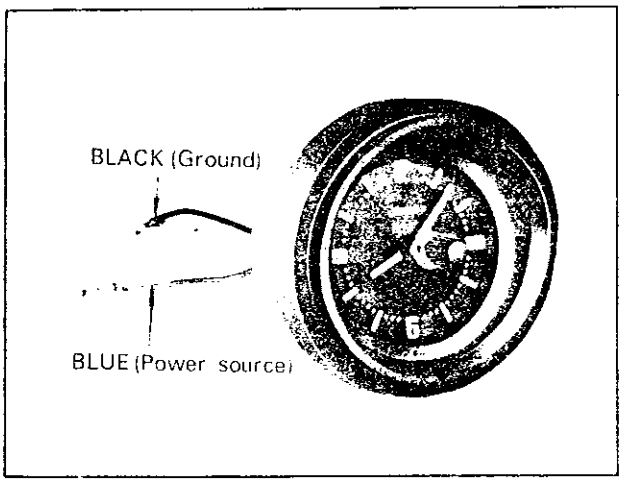


Fig. BE-46 Clock

Adjusting clock

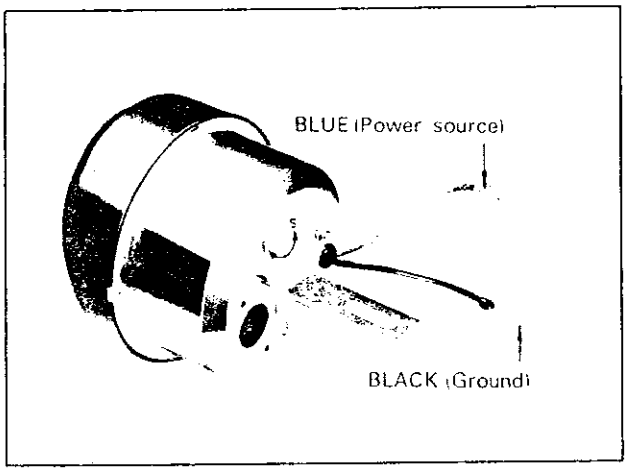


Fig. BE-47 Adjusting clock

Remove the vinyl cover, and adjust the adjusting screw shown in the above figure. When the adjusting screw is turned to "F", the clock gain and retard when turned to "S".

Recommend the adjustment be not made unless the clock is out of order considerably.

Be sure to reinstall the vinyl cover after adjustment. (The vinyl cover protects the clock from dust and other foreign matters.)

SERVICE JOURNAL OR BULLETIN REFERENCE

DATE	JOURNAL or BULLETIN No.	PAGE No.	SUBJECT

SERVICE JOURNAL OR BULLETIN REFERENCE

DATE	JOURNAL or BULLETIN No.	PAGE No.	SUBJECT

DATSUN 240Z SPORTS
MODEL S30 SERIES

CHASSIS & BODY

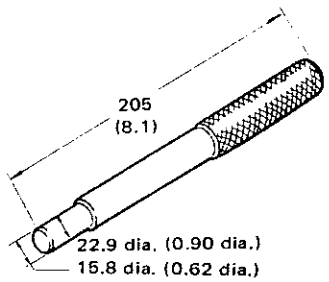
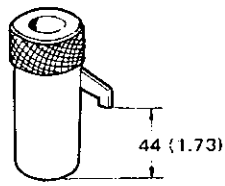
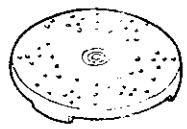
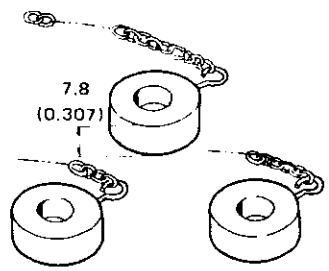
NISSAN MOTOR CO., LTD.
TOKYO, JAPAN

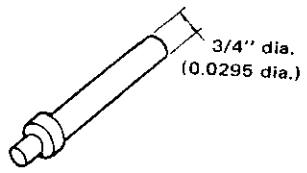
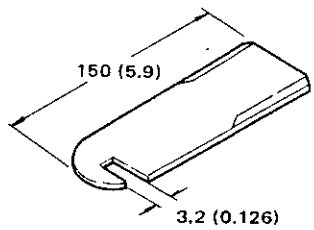
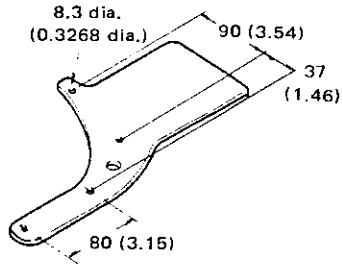
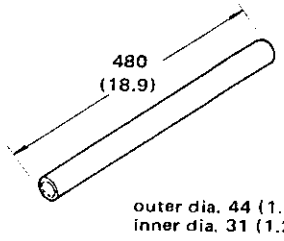
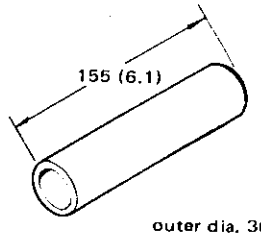
SECTION SE

SERVICE EQUIPMENT

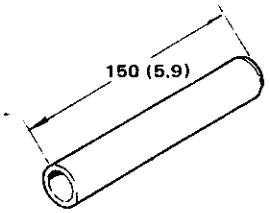
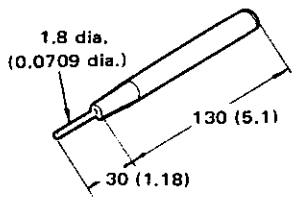
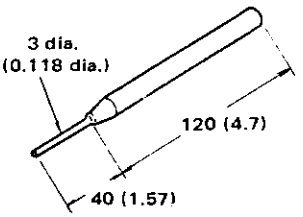
SE

SPECIAL SERVICE TOOL

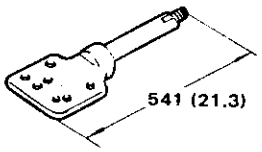
Tool number (Former tool number) Tool name	Figure mm (inch)	Description	S30 special service tool set	510 special service tool set	Applied model	S.M. reference page (See Fig. No.)
Clutch and transmission		S30 special service tool set number ST09290000 510 special service tool set number ST09110000				
ST20630000 (ST44450000) Clutch aligning bar		For centering the clutch disk			130 HA30 521	Fig. CL-14
ST20240000 Height gauge		For measuring the diaphragm spring height (Use with the distance piece)	●		New	Fig. CL-6
ST20051000 Clutch assembly base plate		For measuring the diaphragm spring height (Use with the distance piece)			130 S30 510 521 4W73 60 41 C240 C80	Fig. CL-5
ST20058001 Clutch assembly distance piece		For measuring the diaphragm spring height (Use with the base plate)			510 521	Fig. CL-5

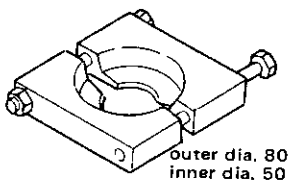
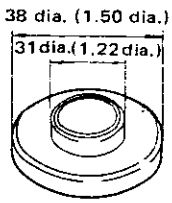
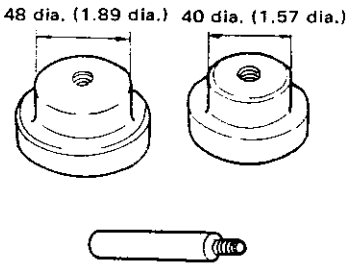
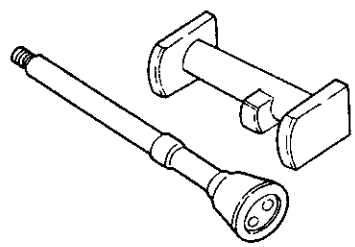
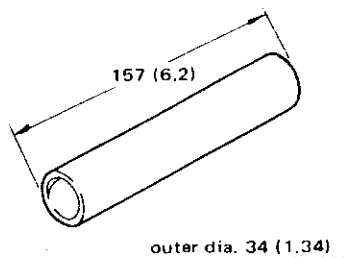
Tool number (Former tool number) Tool name	Figure mm (inch)	Description	S30 special service tool set	S10 special service tool set	Applied model	S.M. reference page (See Fig. No.)
ST20052000 Clutch assembly center pole		For measuring the diaphragm spring height (Use with the height gauge)			130 C30 510 521 4W73 60 41 C240 C80	Fig. CL-6
ST20500000 (ST49400000) Diaphragm adjust wrench		For measuring the diaphragm spring height			HA30 C30 C10 510 SP(R)	Fig. CL-7
ST23810000 (ST44250000) Setting plate adaptor		Setting plate of the transmission gear	●		130 HA30 SP(R)	Fig. TM-11
ST23800000 (ST43920000) Transmission adaptor		For assembly of the main drive gear	●		130	Fig. TM-39
ST30600000 (ST43770000) Drift B		For assembly of the counter drive gear	●		130 HA30 SP(R) B10	Fig. TM-40 Fig. TM-47

SERVICE EQUIPMENT

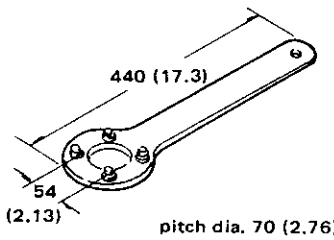
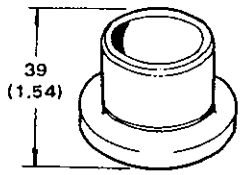
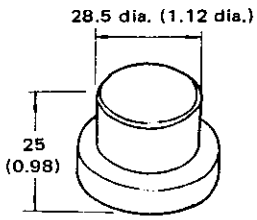
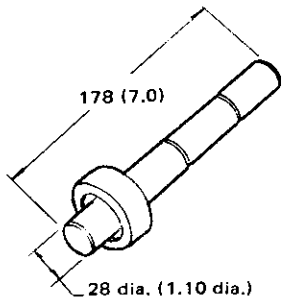
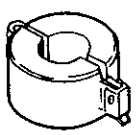
Tool number (Former tool number) Tool name	Figure mm (inch)	Description	S30 special service tool set	510 special service tool set	Applied model	S.M. reference page (See Fig. No.)
ST22360000 (ST43910000) Drift C	 outer dia. 30 (1.18) inner dia. 21 (0.83)	For assembly of the counter bearing	●		130 HA30 SP(R)	Fig. TM-60
ST23530000 Solid punch		For removal of the control arm retaining pin	●		SP(R)	Fig. TM-64
ST23500000 (ST44260000) Fork rod pin punch		For removal of the fork rod retaining pin	●		130 HA30 SP(R)	Fig. TM-11

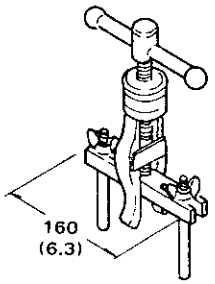
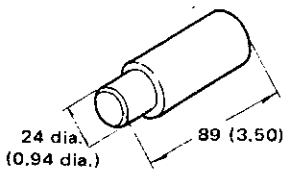
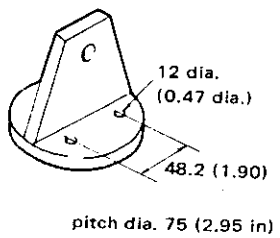
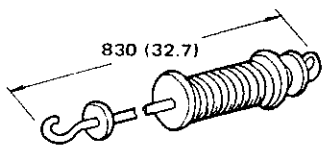
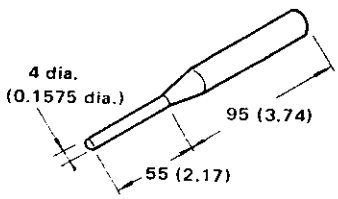
Differential carrier

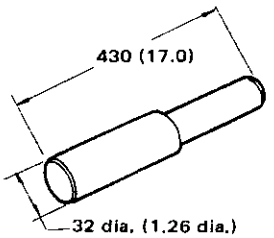
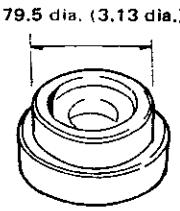
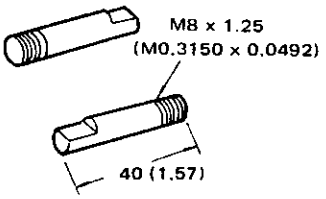
ST06270000 (ST37400510) Gear carrier, strut, gear box attachment		Setting tool of gear carrier (Use with engine stand)			510 C10 C30	Fig. PD-3

Tool number (Former tool number) Tool name	Figure mm (inch)	Description	S30 special service tool set	S10 special service tool set	Applied model	S.M. reference page (See Fig. No.)
ST30030000 (ST49280000) Drive pinion rear bearing inner bearing replacer set	 	For assembly and disassembly of the drive pinion bearing inner race		○	510 C10 C30 521	Fig. TM-21 Fig. TM-23 Fig. TM-24 Fig. PD-9 Fig. PD-20
ST30610000 (ST49290000) Drive pinion outer race drift kit		For assembly of the drive pinion bearing outer race			510 C30	Fig. PD-10
ST31210000 (ST49300000) Gear carrier height gauge assembly		For height adjustment of the drive pinion		○	510	Fig. PD-19 Fig. PD-21
ST31500000 (ST49310000) Drive pinion collar		Dummy shaft for measure of the drive pinion preload (Use with gear carrier height gauge)		○	510 C30	Fig. PD-21

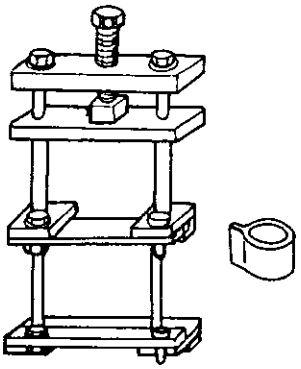
SERVICE EQUIPMENT

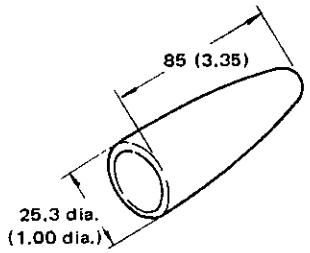
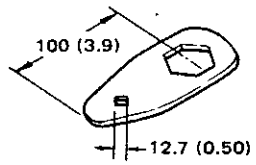
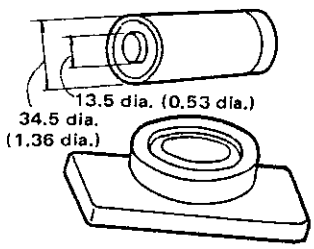
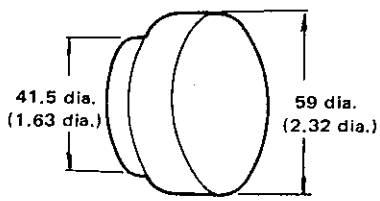
Tool number (Former tool number) Tool name	Figure mm (inch)	Description	S30 special service tool set	510 special service tool set	Applied model	S.M. reference page (See Fig. No.)
ST31530000 (ST47340000) Drive pinion flange wrench		For removal of the drive pinion nut			130 HA30 C30 C10 510 521	Fig. PD-7
ST31850000 (ST49660000) Dummy spacer		Dummy shaft for height adjustment of the drive pinion	●		C30	Fig. PD-21
ST33012000 (ST46862000) Adaptor		For disassembly of the side bearing		○	510 C30	Fig. PD-11
ST33230000 (ST49260000) Gear carrier side bearing drift		For assembly of the side bearing			510 C30	Fig. PD-17
ST33270000 (ST49320000) Gear carrier oil seal drift		For assembly of the oil seal		○	510 C30	Fig. PD-14

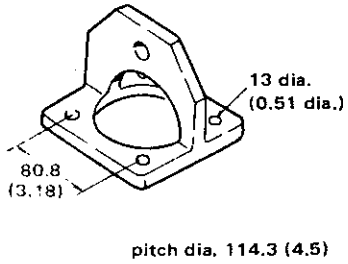
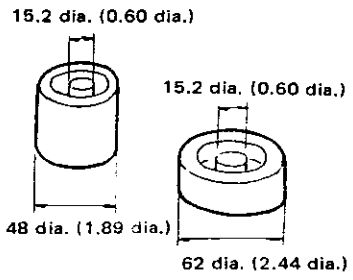
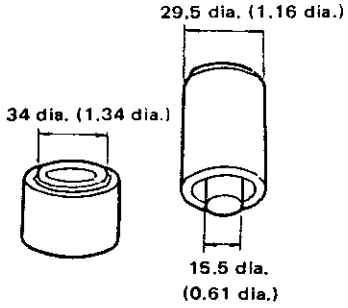
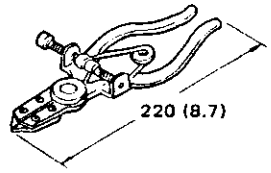
Tool number (Former tool number) Tool name	Figure mm (inch)	Description	S30 special service tool set	S10 special service tool set	Applied model	S.M. reference page (See Fig. No.)
ST33290000 (ST49240000) Gear carrier oil seal puller		For disassembly of the oil seal		○	510 C30	Fig. PD-6
ST33710000 (ST49230000) Gear carrier side retainer attachment		For disassembly of the side retainer		○	510 C30	Fig. PD-5
ST33730000 (ST49250000) Gear carrier side flange stand		For removal of the side flange (Use with sliding hammer)		○	510 C30	Fig. PD-4
ST36230000 (ST46780000) Sliding hammer		Sliding hammer use with rear axle stand or side flange stand			All	Fig. PD-4 Fig. RA-22
ST23510000 (ST49270000) Differential locking pin punch		For removal of pinion mate shaft lock pin		○	510 C10 C30	Fig. PD-12

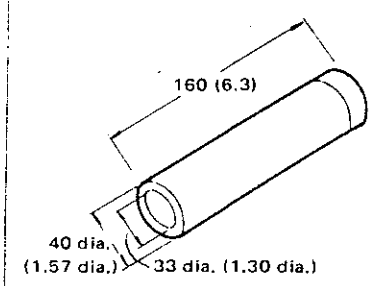
Tool number (Former tool number) Tool name	Figure mm (inch)	Description	S30 special service tool set	510 special service tool set	Applied model	S.M. reference page (See Fig. No.)
ST30650000 Pilot bearing drift		For disassembly of the pilot bearing	●		New	Fig. PD-8
ST33252000 (DT-49942000) Adaptor		For assembly of the front oil seal	●		New	Fig. PD-1?
ST33720000 (DT-4933) Side retainer guide		The guide pin for assembly of the side retainer		○	New	Fig. PD-2.

Front axle and suspension

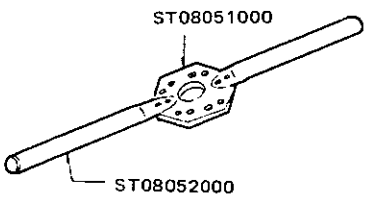
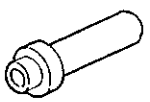
ST35650000 Coil spirng compressor set		For assembly and disassembly of the coil spring coil spring max. dia. 165 (6.5) stroke 50 to 239 (1.97 to 9.4)	●		New 510 C30 C10	Fig. FA-3

Tool number (Former tool number) Tool name	Figure mm (inch)	Description	S30 special service tool set	S10 special service tool set	Applied model	S.M. reference page (See Fig. No.)
ST35540000 Gland packing guide		For assembly of the gland packing	●		New	Fig. FA-35
ST35500000 (ST4913A000) Gland packing wrench		For tightening grand packing		○	510 C10 C30	Fig. FA-31 Fig. FA-37
ST36710000 Front transverse link bushing replacer		For assembly and disassembly	●		New	Fig. FA-46
ST35300000 Front wheel bearing drift		For assembly of the front wheel bearing	●		New	Fig. FA-19

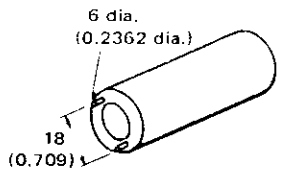
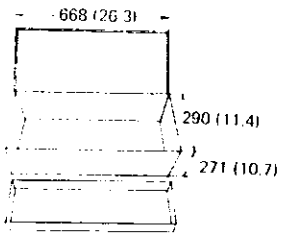
Tool number (Former tool number) Tool name	Figure mm (inch)	Description	S30 special service tool set	510 special service tool set	Applied model	S.M. reference page (See Fig. No.)
Rear axle and suspension						
ST07640000 (ST46790000) Rear axle stand		For removal of the rear axle shaft (Use with sliding hammer)			510 C10 C30 B10	Fig. RA-21 Fig. RA-22
ST33260000 (ST49150000) Differential mounting member insulator drift set		For assembly and disassembly of the differential mounting member insulator		○	510 C30	Fig. RA-6
ST38800000 Rear transverse link bushing replacer		For assembly and disassembly of the rear transverse link bushing	●		New	Fig. RA-5
ST38300000 (ST49210000) Drive shaft snap ring plier		For removal of the drive shaft snap ring		○	510 C30	Page RA-11

Tool number (Former tool number) Tool name	Figure mm (inch)	Description	S30 special service tool set	S10 special service tool set	Applied model	S.M. reference page (See Fig. No.)
ST37780000 Rear axle shaft outer bearing drift		For assembly of the rear wheel bearing (outer side)	●		New	Page RA-10

Master - Vac.

ST08050000 Master-vac. wrench set		For disassembly of the master-vac.	●		C30	Fig. BR-45
ST08060000 Press fit tool		For assembly of the front oil seal retainer	●		C30	Fig. BR-53

Body electrical

Tumbler switch replacer		For assembly and disassembly of the tumbler switch	●			Fig. BE-35
		Tool box for special service tool set	●			

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