

SERVICE MANUAL

DATSUN

MODEL 610 SERIES

CHASSIS AND BODY



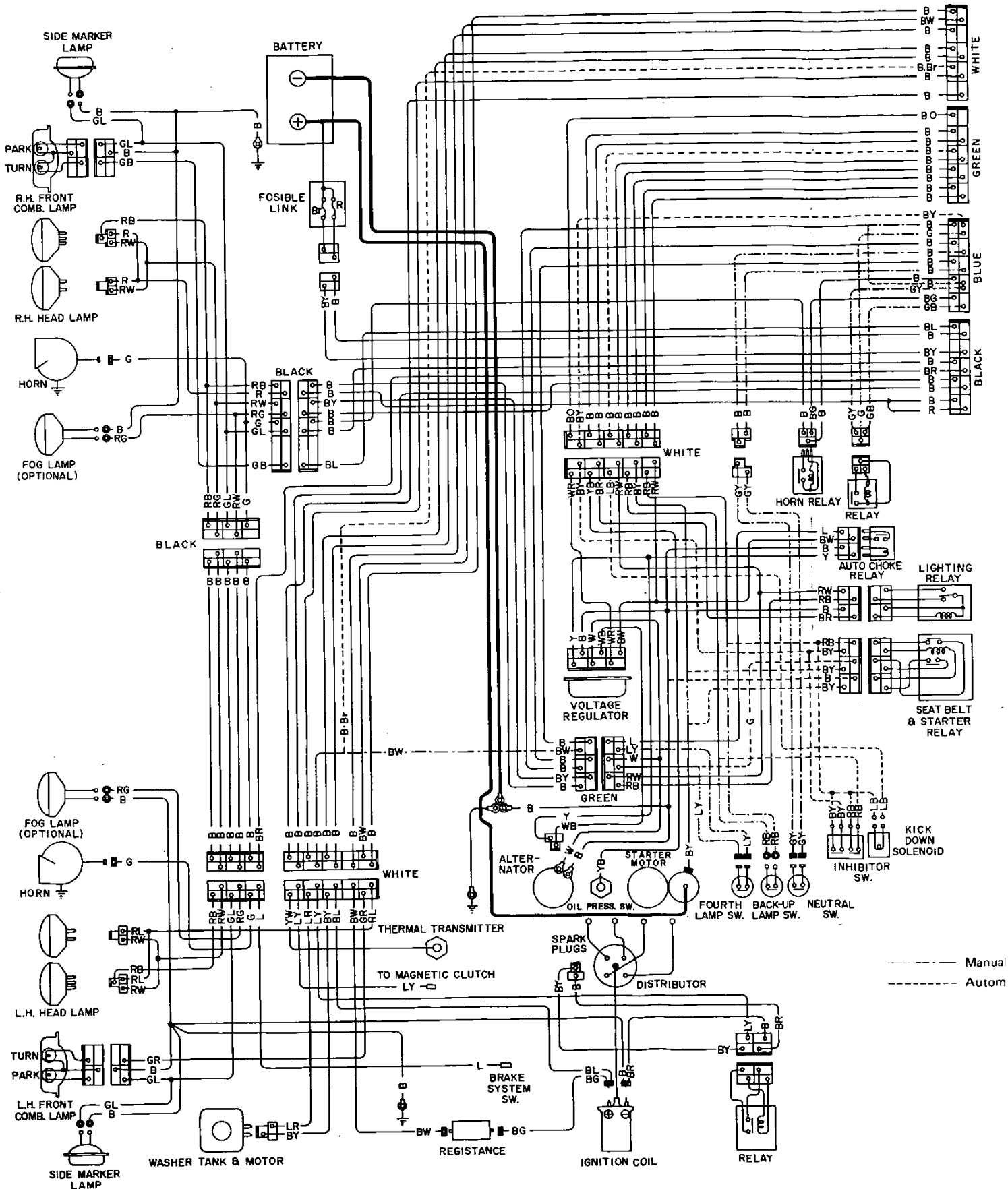
1973

NISSAN MOTOR CO., LTD.

TOKYO, JAPAN



WIRING DIAGRAM





DATSUN

1800

SERVICE MANUAL

**MODEL
610 SERIES
CHASSIS & BODY**



**NISSAN MOTOR CO., LTD.
TOKYO, JAPAN**

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FOREWORD

This service manual has been prepared for the purpose of assisting service personnels of our distributors and dealers in providing effective service and maintenance of the model 610 series.

Since proper maintenance and service are absolutely essential to satisfy our customers, this manual should be read carefully. The following matters should be noted for effective utilization of this manual.

1. Explanations in this manual are mainly concerning the model P610UWT (right hand drive) but will easily be referred to also for the left hand drive models.
2. Please refer to the following SERVICE MANUALS in addition to this manual for complete details of the car, because this manual describes information concerning the chassis and body only.
 - SERVICE MANUAL Model L18 Series Engine
 - SERVICE MANUAL Nissan Automatic Transmission Model 3N71B
3. All part names in this manual conform to the PARTS CATALOG Model 610, and only the genuine service parts listed in this PARTS CATALOG must 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 should be emphasized that those who use this manual are responsible for revising the contents according to the TECHNICAL BULLETIN or DATSUN SERVICE JOURNAL, which carries the latest factory approved service methods.
6. Rights for alternation of specifications and methods at any time are reserved.

NISSAN MOTOR CO., LTD.
TOKYO, JAPAN

SERVICE MANUAL

DATSUN 1800
MODEL 610 SERIES
CHASSIS & BODY

SECTION GI

GI

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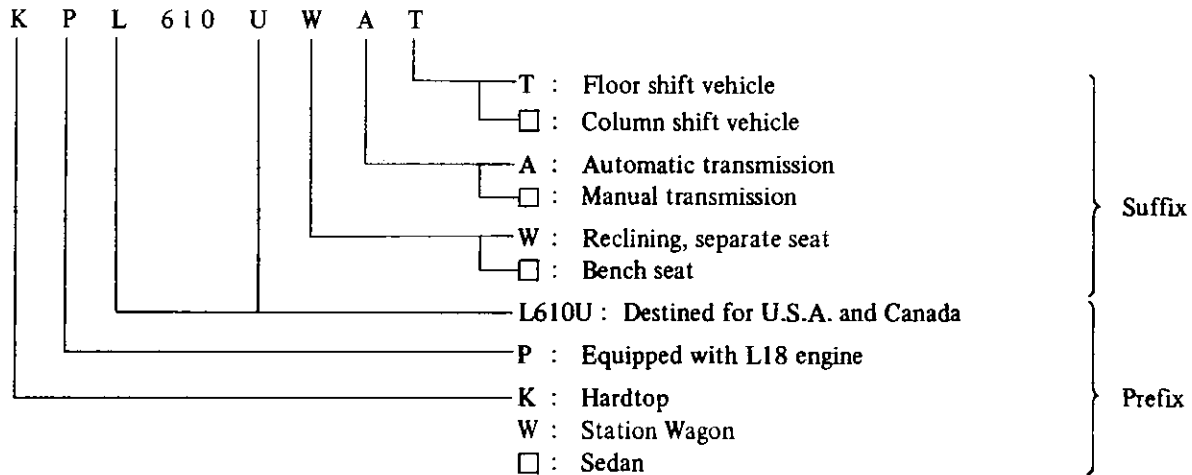
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GENERAL INFORMATION

MODEL VARIATION

Class\	Model	Engine	Transmission	Transmission control	Differential carrier	
					Model	Gear ratio
Hardtop	KPL610UAWT	L18	3N71B	Floor	R160	3.900
	KPL610UWT		F4W63			3.700
Sedan	PL610UAWT		3N71B			Column
	PL610UA			3.700		
	PL610UWT		F4W73			Floor
Station Wagon	WPL610UAWT		3N71B	Column	H165	3.889
	WPL610UA					
	WPL610UWT		F4W73	Floor		

The meaning of prefix and suffix



Note: □ means no indication.

GENERAL INFORMATION

IDENTIFICATION NUMBERS

The unit and car numbers are stamped and registered at the factory.

The engine and vehicle identification numbers are used on legal documents. These numbers are used for factory communication such as Technical Report, Warranty Claim, Service Journal and other information.

Car identification plate

The car identification plate is located at the center of the cowl top. The plate contains the vehicle type, engine capacity, max. horse-power, wheelbase and engine and car serial numbers.

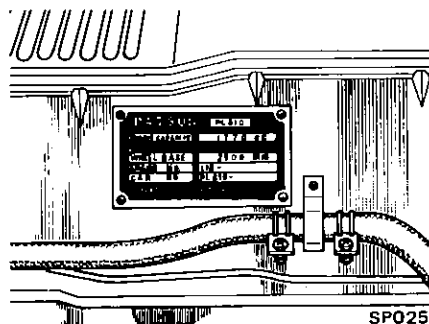


Fig. GI-1 Car identification plate location

Car serial number

The car serial number is stamped on the left side of the cowl top and broken down as shown in the following figure. (Fig. GI-2)

The car number consists of the vehicle model and the serial number. (PL610 - xxxxxx)

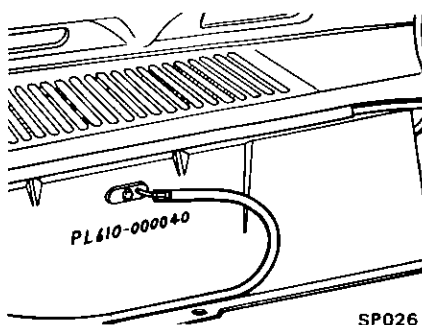


Fig. GI-2 Car serial number location

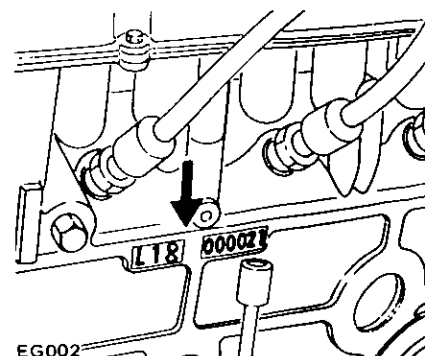


Fig. GI-3 Engine serial number location

Engine serial number

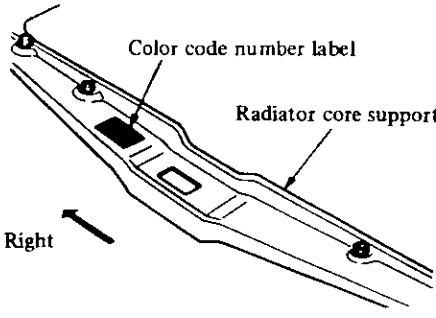
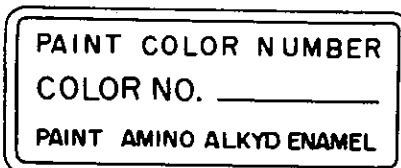
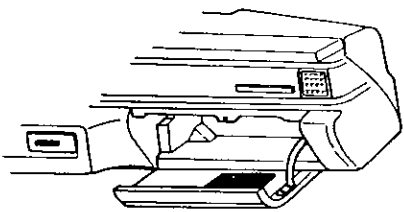
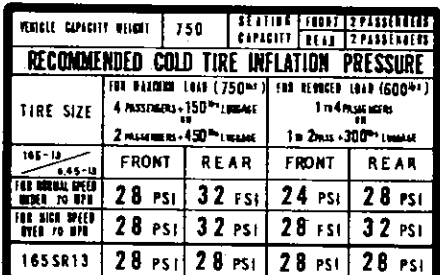
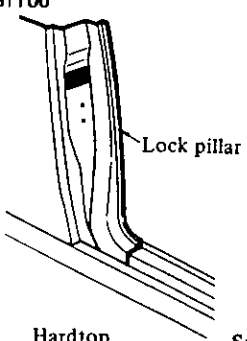
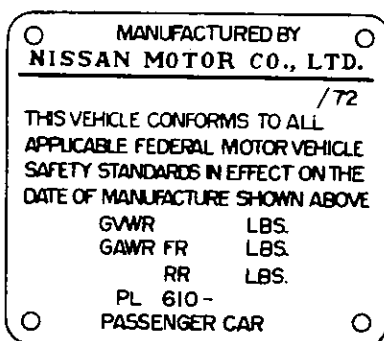
The engine serial number is stamped on the right-hand side of the cylinder block. The number is broken down as shown in the following figure. (Fig. GI-3)

Caution labels

Many labels are stuck on the vehicle as shown in the following table.

Label name	Location	Sample
Car identification plate	Center of cowl top	See Figure GI-1.
Identification number plate	Left, upper side of instrument panel	

GENERAL INFORMATION

Label name	Location	Sample
Color code number label	Right, upper side of radiator core support  G1079	 G1096
Tire inflation pressure label	Inside of glove box lid  G1097	 G1098
Cooling system caution label	Upper side of radiator support panel G1100	NISSAN MOTOR COMPANY'S NEW COOLANT ANTIFREEZE IS INSTALLED IN THIS CAR. NISSAN LONG LIFE COOLANT (ETHYLENE GLYCOL BASE) is the new combination summer coolant winter antifreeze. Freeze protection -31°F (-35°C) Cooling system should be drained every 24 months or 40,000km (24,000miles) under normal conditions, and refilled with NISSAN LONG LIFE COOLANT or equivalent.  NISSAN MOTOR CO., LTD. G1099
M.V.S.S. certificate label	 Lock pillar Center pillar Hardtop Sedan & Station wagon G1101	 G1102

GENERAL INFORMATION

Exhaust emission label (California only)	Right side of rear windshield glass	
Emission control system label		

APPROXIMATE REFILL CAPACITY

	U.S. measure	Imper. measure	Liter
Fuel tank			
Sedan	14 ½ gal	12 ⅝ gal	55
Station Wagon	13 ¾ gal	11 ½ gal	52
Engine cooling system *1	1 ¾ gal	1 ⅝ gal	6.5
Engine crankcase *2	4 ½ qt	3 ¾ qt	4.3
Manual transmission	4 ¼ pt	3 ½ pt	2.0
Automatic transmission *3	5 ⅝ qt	4 ⅝ qt	5.5
Differential carrier			
Sedan	1 ¾ pt	1 ⅝ pt	0.8
Station Wagon	2 ¾ pt	2 ¼ pt	1.3
Steering gear box	¾ pt	½ pt	0.27

*1 Include ½ U.S. qt (½ Imper. qt, 0.5 liter) for heater.

*2 Include ½ U.S. qt (½ Imper. qt, 0.5 liter) for oil filter.

*3 Include 4 ¼ U.S. qt (3 ½ Imper. qt, 4.0 liters) for torque converter.

GENERAL INFORMATION

FINAL, TRANSMISSION AND SPEEDOMETER USAGE CHART

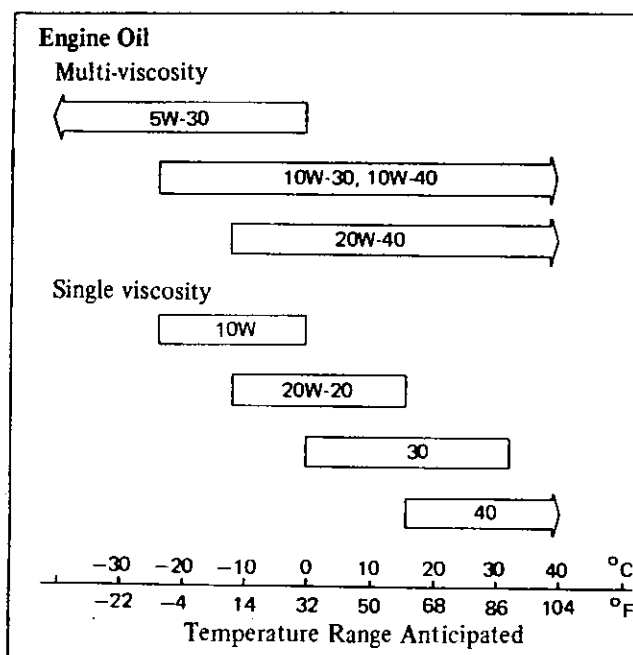
			Sedan		Station Wagon	
			M/T	A/T	M/T	A/T
Transmission	Type		F4W63	3N71B	F4W63	3N71B
	Shift lever position		Floor	Floor Column	Floor	Floor Column
	Gear ratio	1st	3.382	2.458	3.382	2.458
		2nd	2.013	1.458	2.013	1.458
		3rd	1.312	1.000	1.312	1.000
		4th	1.000	—	1.000	—
		Rev.	3.365	2.182	3.365	2.182
Final gear	Type		R160	R160	H165	H165
	Gear ratio		3.700	3.900	3.889	3.889
Speedometer gear ratio			17/5	20/6	17/5	20/6

M/T: Manual Transmission

A/T: Automatic Transmission

RECOMMENDED LUBRICANTS

RECOMMENDED SAE VISCOSITY NUMBER



GENERAL INFORMATION

RECOMMENDED LUBRICANTS

PRODUCING		CHEVRON	ESSO	MOBIL	SHELL	SUNOCO	TEXACO
ENGINE OIL	Gasoline	Multigrade SD MIL-L-2104B	Uniflo 5W-30, 10W-40 Extra Motor Oil 5W-20, 10W-30, 20W-40	Mobiloil Super 5W-30, 5W-40, 10W-40, 10W-50, 20W-50 Mobiloil Special 5W-20, 10W-30, 20W-40, 20W-50	Super Motor Oil 10W-40, 20W-50	Special Motor Oil 5W-30, 10W-40 Dynalube Motor Oil 10W-30	Havoline Super Premium 5W-30, 10W-40, 20W-50
		Monograde SD MIL-L-2104B	-	Mobiloil 10W, 20W-20, 30, 40, 50		Sunlube Motor Oil 10W, 20W-20, 30, 40, 50	Havoline Motor Oil 10W, 20W-20, 30, 40, 50
	Transmission and steering	API GL-4 MIL-L-2105	Gear Oil GP 80, 90, 140	Mobilube EP or GX 80-90, 90, 140	Spirax 75EP, 80EP, 90EP, 140EP	Multipurpose Gear Lub. GL-4 80, 90, 140	Universal Gear Lub. EP 80, 90, 140
GEAR OIL	Differential	Rigid	Multiservice Gear Lub. 75, 80, 90, 140	Mobilube EP or GX 80-90, 90, 140	Spirax 75EP, 80EP, 90EP, 140EP	Multipurpose Gear Lub. GL-4 80, 90, 140	Universal Gear Lub. EP 80, 90, 140
		I.R.S. or limited slip	Gear Oil GX 80, 90, 140	Mobilube HD 80, 80-90, 90, 140	Spirax Heavy Duty 80, 90, 140	Multipurpose Gear Lub. GL-5 75, 80, 90, 140	3450 Gear Oil 90 Multigear Lub. EP 80, 90, 140
	Automatic transmission	Type DEXRON (3N71B A/T)	A.T.F.	A.T.F. 220	A.T.F. DEXRON	Transmatic Fluid DEXRON Type	Texamatic Fluid DEXRON
Brake and clutch fluid	Multipurpose grease	Lithium soap NLGI 2	Multipurpose Grease*	Mobilgrease MP*	Retinax A	Prestige II WB-500*	Marfak Multipurpose 2*
		DOT 3	It must be conform to the Motor Vehicle Safety Standard No. 116.				
	Antifreeze coolant (L.L.C.)	Atlas Perma Guard Antifreeze*	Long Life Coolant* Atlas Long Life Coolant RAD*	Permazone*	Shellzone	Permanent Type*	Antifreeze Coolant* Startex Antifreeze Coolant*

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

GENERAL INFORMATION

JACK UP

PANTOGRAPH JACK

Apply the pantograph jack furnished with the vehicle to the position indicated below in a safe manner.

Notes:

- a. Never get under the vehicle while it is supported only by the jack. Always use safety stands to support frame when you have to get under the vehicle.
- b. Block the wheels diagonally by wheel chocks.

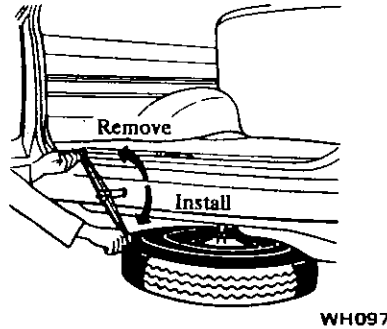


Fig. GI-7 Lowering spare tire (Station Wagon)

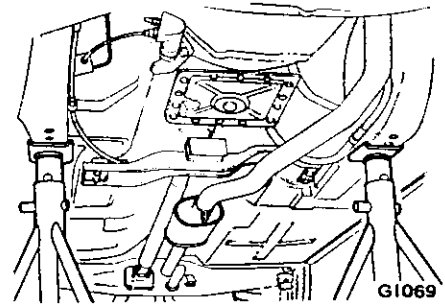


Fig. GI-9 Front supportable points

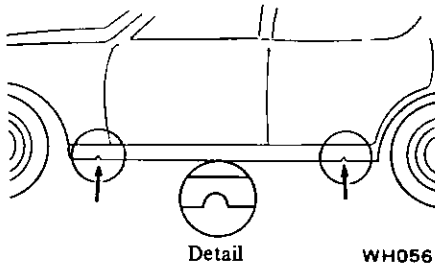


Fig. GI-4 Jack up points

GARAGE JACK

Note: When carrying out operations with the garage jack, be sure to support the car with safety stands.

FRONT SIDE

1. When jacking up the front of the vehicle, place the chocks behind the rear wheels to hold them.
2. Apply the garage jack under the front suspension member. Be sure not to lift up the engine oil pan located just behind the suspension member.
3. Jack up the vehicle gently just high enough to place the safety stands under both the side members. Place the stands at the position indicated in Figure GI-8
4. Release the jack slowly.

REAR SIDE

1. When jacking up the rear of the vehicle, place the chocks at the front side of the front wheels to hold them.
2. Apply the garage jack under the differential carrier (all models), the suspension arm (A) (Sedan) or suspension member (B) (Sedan).
3. Jack up the vehicle gently just high enough to place the safety stands under the rear suspension member or body (Sedan), or under the rear axle case (Station Wagon).
- Place the stands at the positions indicated below.
4. Release the jack slowly.

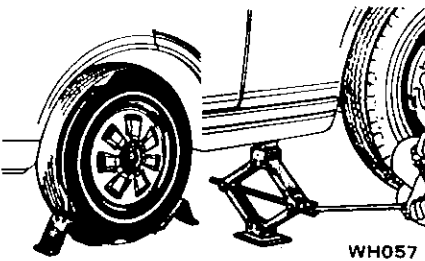


Fig. GI-5 Wheel chocks and jack (Sedan)

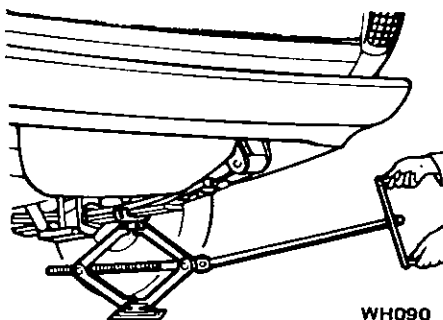


Fig. GI-6 Jack (Station Wagon)

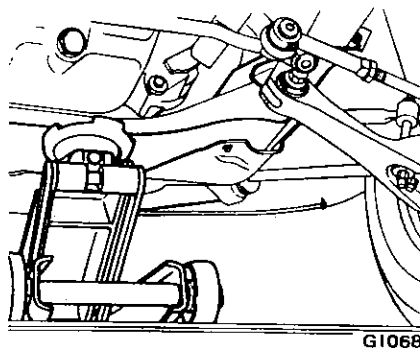


Fig. GI-8 Front jack up point

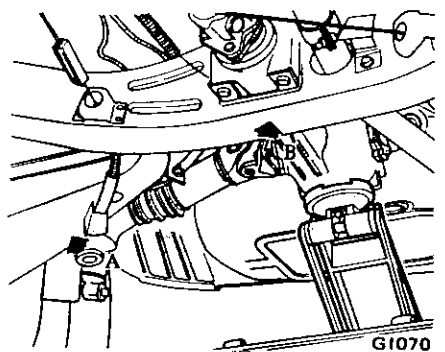


Fig. GI-10 Rear jack up points (Sedan)

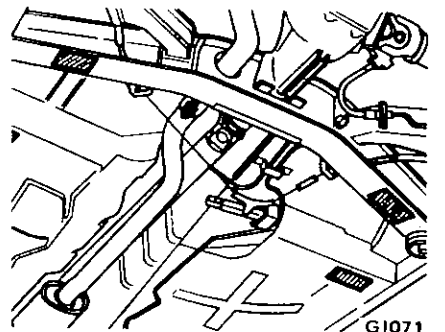
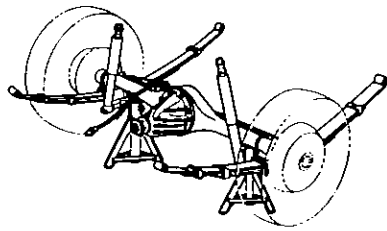


Fig. GI-11 Rear supportable points (Sedan)

GENERAL INFORMATION



G1072

*Fig. G1-12 Rear supportable point
(Station Wagon)*

TOWING

Manual transmission model

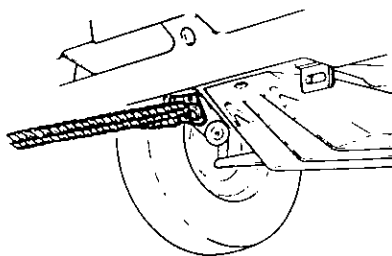
When the car is towed forward, connect the rope securely to the hook attached on the right side tension rod bracket. Do not tow the hook attached on the left side tension rod bracket. This bracket on the left is installed for the tie-down use only.

To tow another car, connect a rope to the rear bumper stay by using a waste to the bumper edge. (Sedan)

In case of the Station Wagon, the rope should be connected to the rear leaf spring shackle.

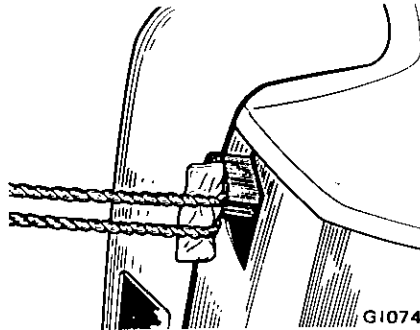
A towing rope should not be connected to any other positions than those described above.

Note: Do not attempt to apply load to a rope suddenly to prevent damage.



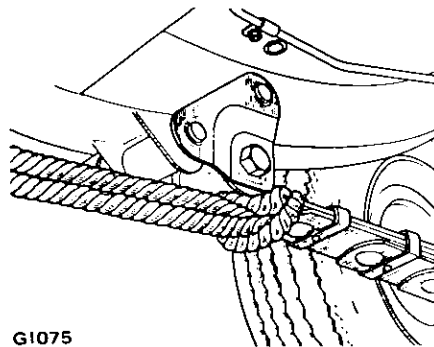
G1073

Fig. G1-13 Towing (front)



G1074

Fig. G1-14 Towing (rear, Sedan)



G1075

Fig. G1-15 Towing (rear, Station Wagon)

Automatic transmission model

The car may be towed safely on its rear wheels on the ground with the select lever in "N" (Neutral) position of at speeds of less than 30 km/h (18.7 MPH). However, the propeller shaft must be disconnected or the car must be towed on its front wheels on the ground under the following conditions:

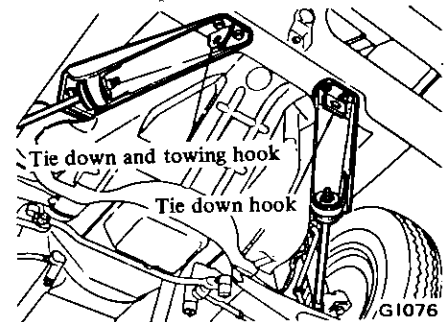
1. Tow speed of more than 30 km/h (18.7 MPH).
2. Car must be towed for a long distance [over 10 km (6 miles)].
3. Transmission is not operating properly.

If car is towed on its front wheels on the ground, the steering wheel should be secured to maintain a straight ahead position.

TIE-DOWN

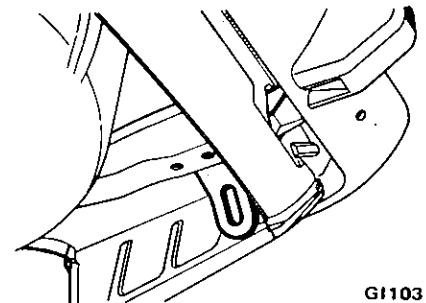
The front tie-down hook is located on both the tension rod brackets. The right side bracket is also available as a towing hook.

The rear tie-down hook is located on both the rear floor members securing with the bumper stay.



G1076

Fig. G1-16 Tie-down hook (front)



G1103

Fig. G1-17 Tie-down hook (rear)

SERVICE MANUAL

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MODEL 610 SERIES
CHASSIS & BODY**



NISSAN MOTOR CO., LTD.
TOKYO, JAPAN

SECTION ER

ER

ENGINE REMOVAL & INSTALLATION

ENGINE REMOVAL ANDER- 2
INSTALLATION

ENGINE REMOVAL & INSTALLATION

ENGINE REMOVAL AND INSTALLATION

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ENGINE MOUNTING INSULATOR	ER-4	TIGHTENING TORQUE	ER-5

REMOVAL

It is much easier to remove engine with transmission as a single unit than to remove only engine from engine compartment. The engine can then be separated from transmission assembly.

Notes:

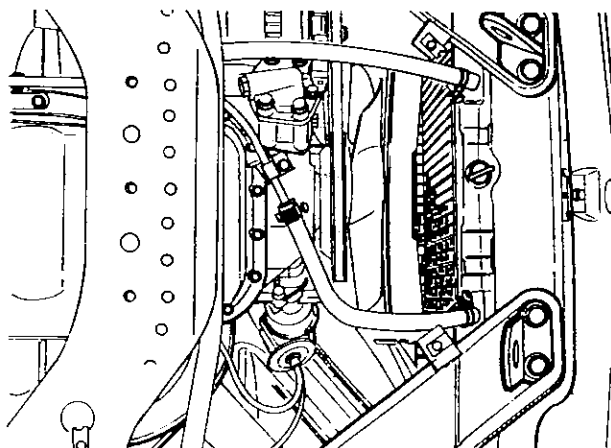
- a. Be sure to hoist engine and to jack up transmission in a safe manner.
- b. Fender cover should be used to prevent damaging vehicle body.

1. Disconnect battery ground cable.

2. Scribe hood mounting location of hood hinge and remove hood.
3. Remove air cleaner after disconnecting blow-by hose from rocker cover.
4. Drain radiator coolant and engine oil.
5. Remove radiator grille.

Note: On automatic transmission equipped vehicles,

- a. Remove under cover.
- b. Disconnect oil cooler hose at oil cooler which is installed to radiator lower end.
- c. Then disconnect vacuum hose.

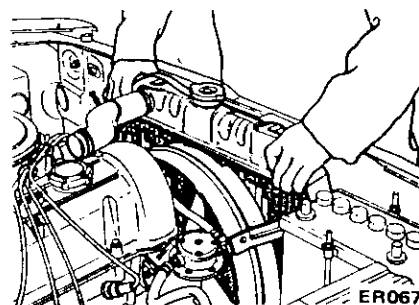


ER066

Fig. ER-1 Disconnecting oil cooler hose

6. Disconnect upper and lower hoses from radiator.

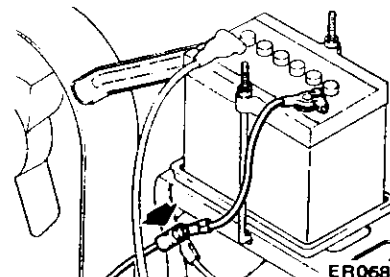
7. Remove four bolts securing radiator and detach radiator.



ER067

Fig. ER-2 Removing radiator

8. Disconnect engine ground cable at battery tray.



ER068

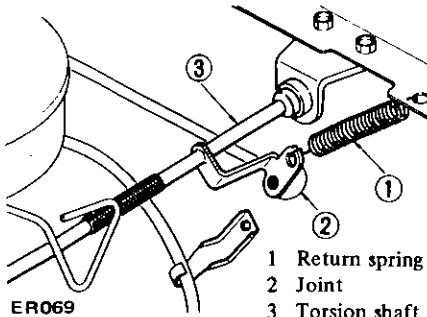
Fig. ER-3 Disconnecting engine ground cable

9. Disconnect wires at:
 - (1) Starter
 - (2) Alternator
 - (3) High tension cable at ignition coil
 - (4) Oil pressure switch and thermal transmitter
10. Disconnect:
 - (1) Fuel line at fuel pump
 - (2) Heater line at engine side
 - (3) Choke wire at carburetor
 - (4) Accelerator linkage

Note: The following is the removal sequence.

- a. Remove return spring and joint.
- b. Detach torsion shaft.

ENGINE REMOVAL & INSTALLATION



ER069

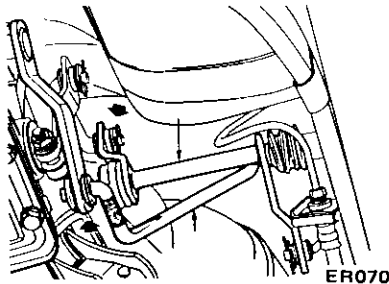
Fig. ER-4 Disconnecting accelerator linkage

(5) Disconnect parking wire at rear cable adjuster.

11. Remove transmission control linkage.

(1) For vehicles equipped with 3-speed transmission

Disconnect transmission cross shaft from control linkage, and rod shaft (2nd-top) from 2nd-top lever.

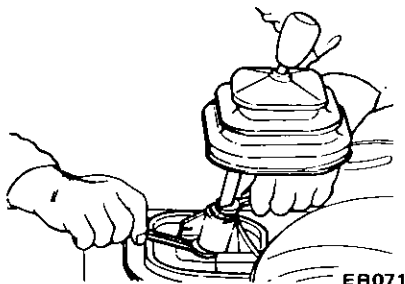


ER070

Fig. ER-5 Disconnecting cross and rod shafts

(2) For vehicles equipped with floor shift control

Detach rubber boot. Remove nut from shift lever and detach shift lever.

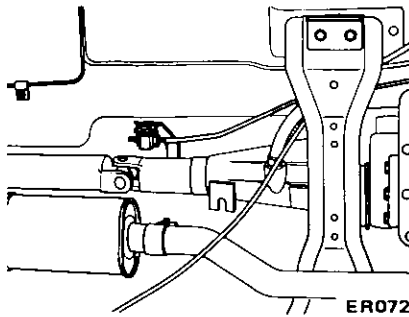


ER071

Fig. ER-6 Removing shift lever

(3) For vehicles equipped with automatic transmission

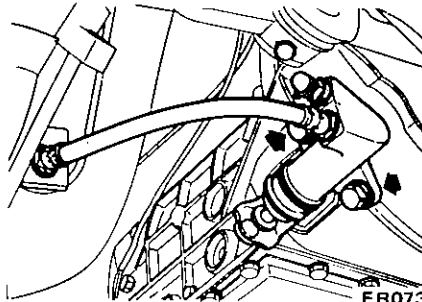
Disconnect joint between control lever and lower selector rod.



ER072

Fig. ER-7 Disconnecting range selector lever

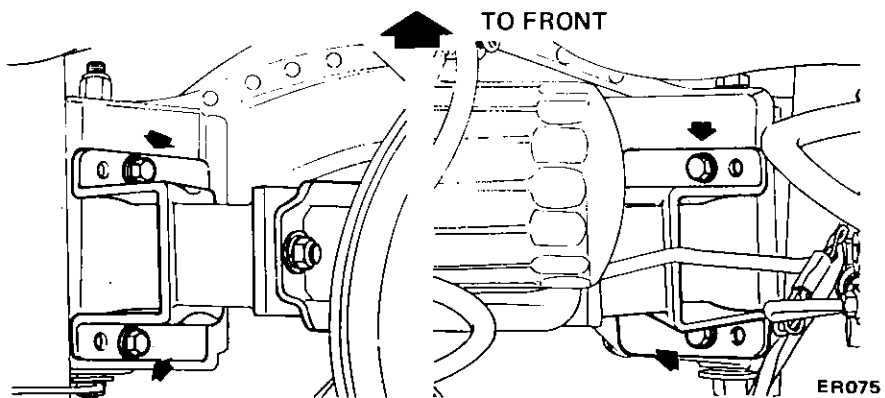
12. Remove two bolts (shown by arrows) securing clutch operating cylinder. Then detach operating cylinder and flexible tube as an assembly.



ER073

Fig. ER-8 Removing clutch operating cylinder

13. Disconnect speedometer cable and reverse lamp wiring.



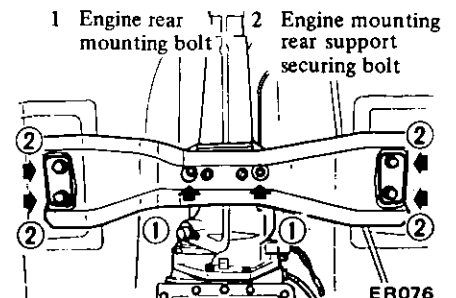
ER075

Fig. ER-10 Removing front mounting bolts

17. Place a jack under transmission and jack it up.

18. Loosen two (1 in Figure ER-11) engine rear mounting bolts.

19. Remove four (2 in Figure ER-11) bolts securing engine mounting rear support and detach it.



ER076

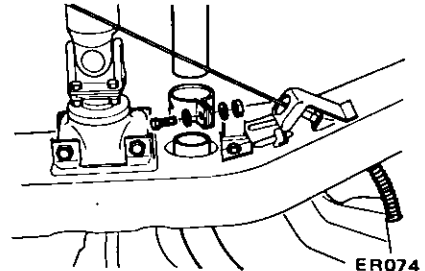
Fig. ER-11 Removing engine mounting rear support

Note: On automatic transmission equipped vehicles, also disconnect wires at:

- Kickdown switch
- Inhibitor switch

14. Disconnect exhaust front tube from exhaust manifold.

Then loosen connector between center and rear tubes. Detach front and center tubes as an assembly.



ER074

Fig. ER-9 Disconnecting exhaust front and center tube assembly

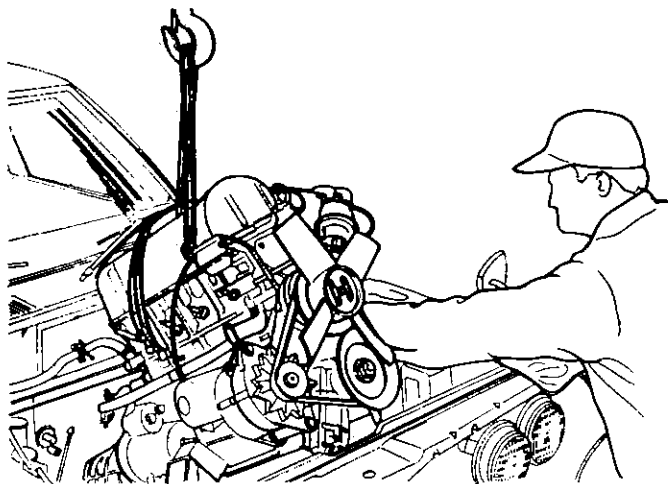
15. Disconnect propeller shaft at companion flange of gear carrier. Plug up rear end of rear extension housing of transmission to prevent oil leakage.

16. Attach a suitable wire to lift engine. Remove engine front mounting bolts (shown by arrows) at front suspension member.

ENGINE REMOVAL & INSTALLATION

20. Raise engine with transmission by means of a hoist and cable. See Figure ER-12. Then support them on engine stand.

Note: In this operation, care should be always taken not to allow the unit hitting against any adjacent parts.



ER077

Fig. ER-12 Lifting engine and transmission

INSTALLATION

To install, reverse the order of removal. Do not connect any parts to the engine until engine mounting insulators are placed and power unit weight is supported by them.

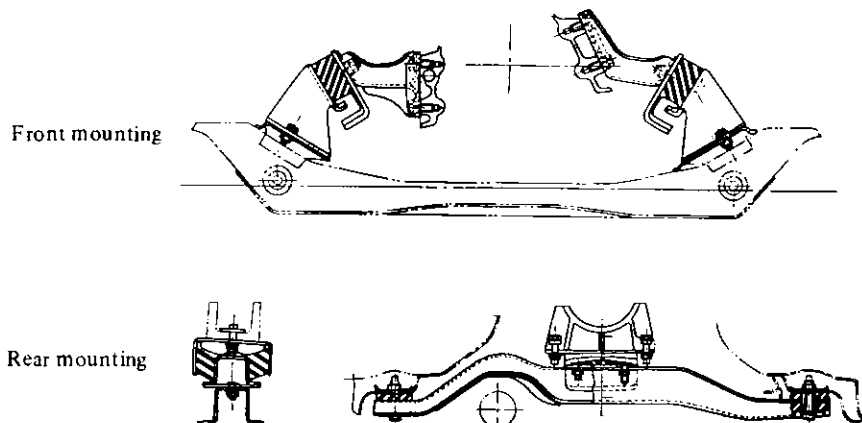
Notes:

- As the sequence of installation, first secure engine mounting rear support to body.

- On automatic transmission equipped engine, be sure to secure oil cooler pipes at oil cooler.

ENGINE MOUNTING INSULATOR

Three insulators are used to mount the engine; two at left and right front ends of the cylinder block and one at transmission rear extension housing.



ER078

Fig. ER-13 Structural view of engine mounting

Notes:

- Replace front or rear insulator assembly, when rubber of engine mounting insulator is cracked, abnormally worn or deteriorated.
- Keep insulator free from oil or grease.

Front insulator

Distinguish between left and right mounting insulators by notch marks on insulator rubber, one notch is at front and two notches at rear.

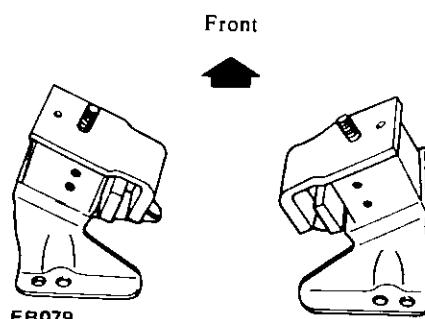


Fig. ER-14 Front mounting insulator

Rear insulator

In assembling engine, always locate "F" mark on the rubber of rear mounting insulator facing toward the front.

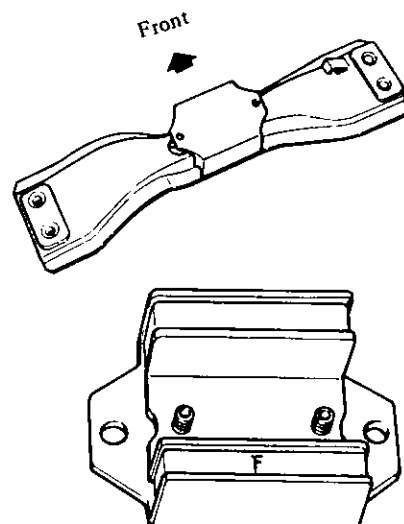


Fig. ER-15 Rear mounting insulator

ENGINE REMOVAL & INSTALLATION

TIGHTENING TORQUE

Fixing bolts and nuts

Front mounting bracket to cylinder block	kg-m (ft-lb)	2.5 to 3.5 (18.1 to 25.3)
Front mounting insulator to bracket	kg-m (ft-lb)	2.5 to 3.5 (18.1 to 25.3)
Front mounting insulator to suspension member	kg-m (ft-lb)	0.9 to 1.2 (6.5 to 8.7)
Rear mounting insulator to transmission	kg-m (ft-lb)	0.9 to 1.2 (6.5 to 8.7)
Rear mounting insulator to mounting support	kg-m (ft-lb)	0.9 to 1.2 (6.5 to 8.7)
Mounting support to body side member	kg-m (ft-lb)	1.9 to 2.6 (13.7 to 18.8)

SERVICE MANUAL

DATSUN 1800
MODEL 610 SERIES
CHASSIS & BODY



NISSAN MOTOR CO., LTD.
TOKYO, JAPAN

SECTION CL

CLUTCH

CL

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CLUTCH CONTROL	CL- 6
SERVICE DATA AND SPECIFICATIONS	CL-11
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CLUTCH

CLUTCH

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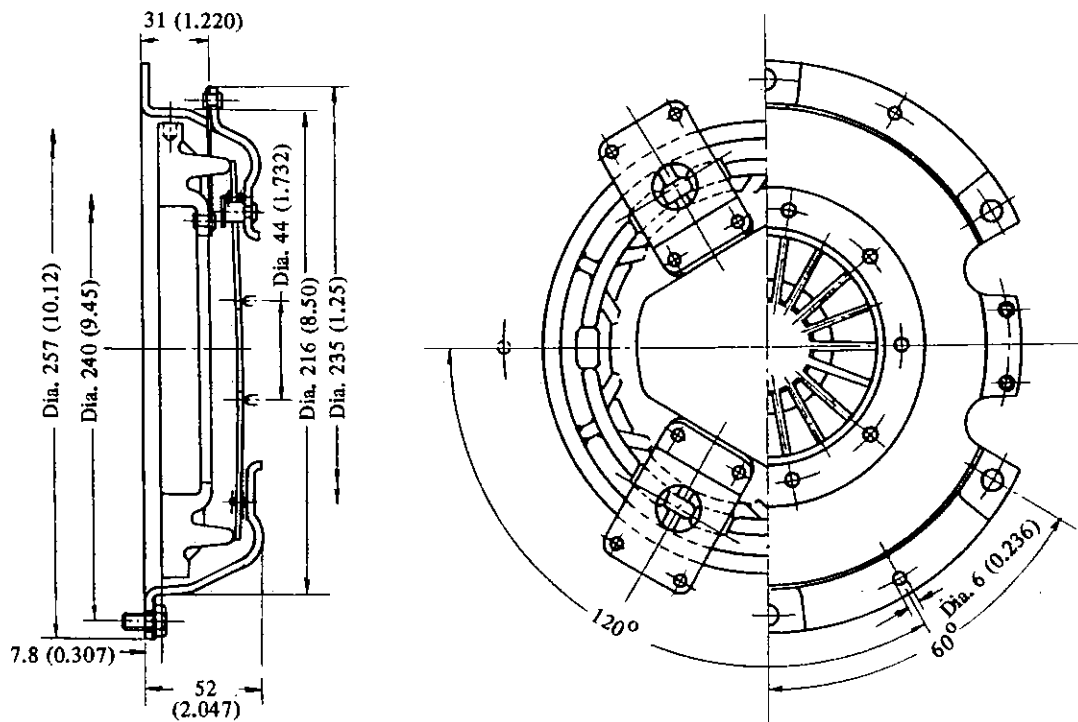
DESCRIPTION	CL-2	INSPECTION AND ADJUSTMENT	CL-4
REMOVAL	CL-3	Assembly	CL-5
DISASSEMBLY	CL-3	INSTALLATION	CL-5

DESCRIPTION

The clutch is a single dry disc type using a diaphragm spring. It consists

of the clutch disc, pressure plate, diaphragm spring, thrust rings, clutch

cover, and clutch release bearing.

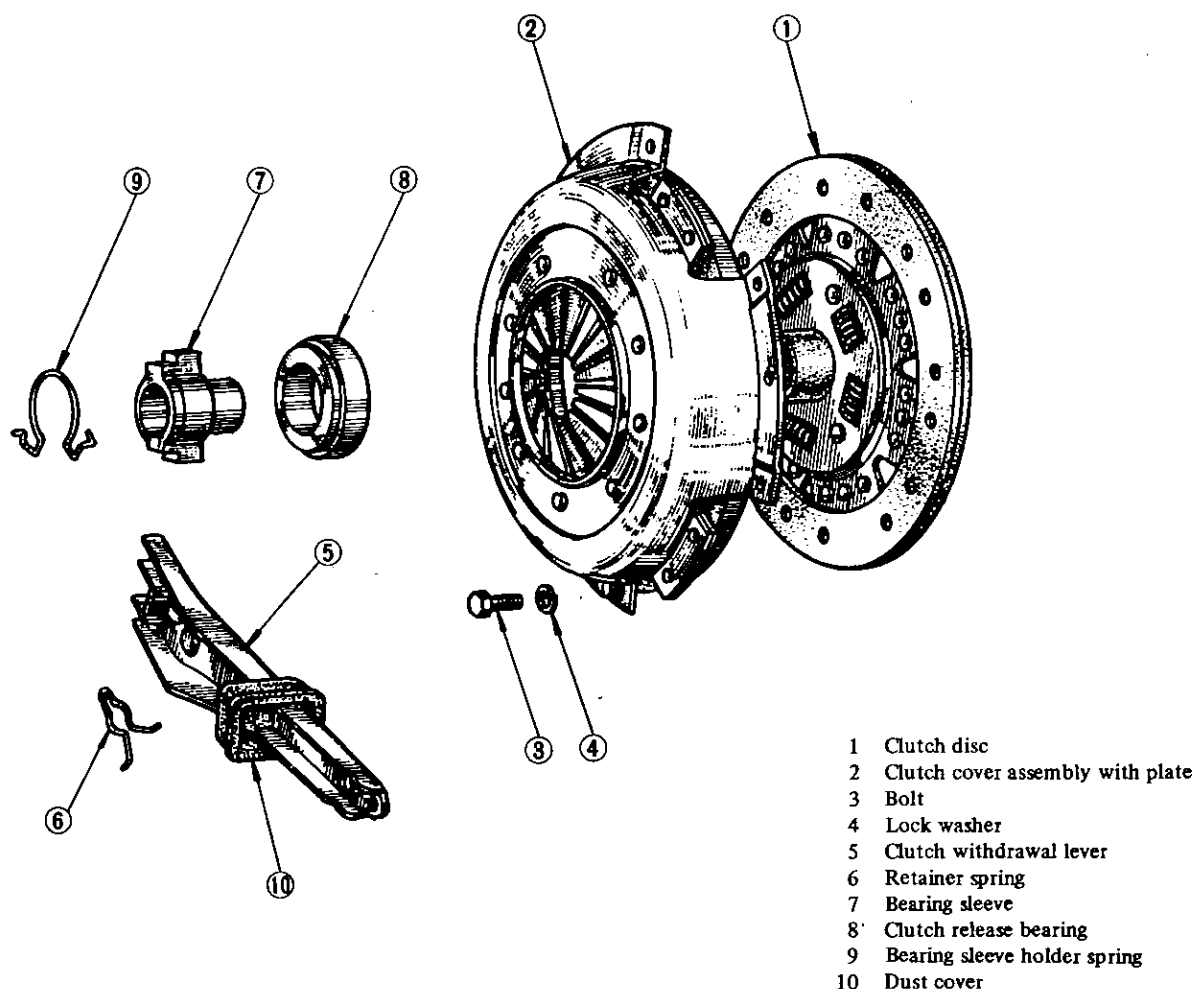


CL084

Unit: mm (in)

Fig. CL-1 Construction of clutch

CLUTCH



CL085

Fig. CL-2 Exploded view of clutch components

REMOVAL

1. Remove transmission from vehicle.

For details of transmission removal, refer to "Transmission Section."

2. Insert special tool "Clutch Aligning Bar ST20600000" into clutch disc hub until it will no longer go. It is important to support weight of clutch disc during further steps.

3. Loosen six screws attaching clutch cover to flywheel one turn at a time each until spring pressure released. Be sure to turn them out in a criss-cross fashion.

Note: Exercise special care to avoid grease or oil getting on clutch linings.

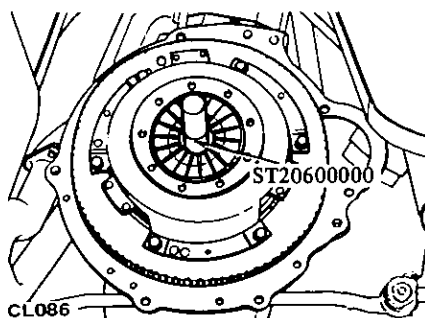


Fig. CL-3 Supporting clutch assembly

DISASSEMBLY

1. Clutch cover assembly cannot be disassembled since diaphragm spring is securely revetted to clutch cover and clutch cover assembly is ballanced.

If necessary, replace clutch cover assembly as a complete unit.

2. Remove clutch release mechanism as follows:

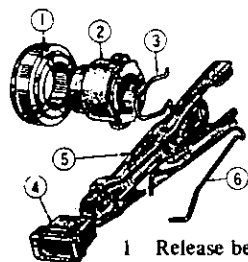
(1) Remove dust cover from clutch housing.

(2) Remove withdrawal lever from clutch housing.

(3) Remove retainer spring from withdrawal lever.

(4) Remove release bearing, bearing sleeve and holder spring from clutch housing as an assembly.

CLUTCH

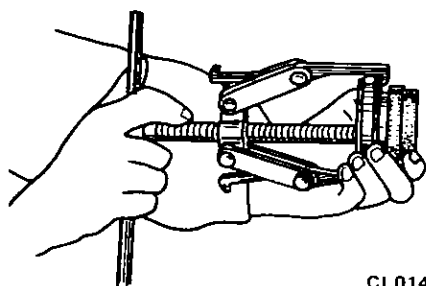


- 1 Release bearing
- 2 Release bearing sleeve
- 3 Holder spring
- 4 Dust cover
- 5 Withdrawal lever
- 6 Retainer spring

CL087

Fig. CL-4 Exploded view of clutch release mechanism

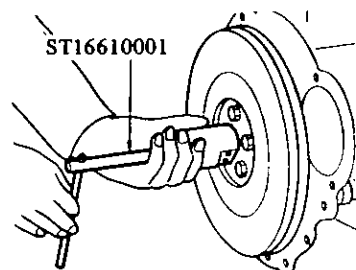
3. Take out clutch release bearing from bearing sleeve, using a universal puller.



CL014

Fig. CL-5 Disassembling release bearing

4. Remove pilot bushing in crankshaft by using special tool "Pilot Bushing Puller ST16610001" if necessary. See Figure CL-6.



CL088

Fig. CL-6 Removing pilot bushing

INSPECTION AND ADJUSTMENT

Wash all the disassembled parts

except release bearing and disc assembly in suitable cleaning solvent to remove dirt and grease before making inspection and adjustment.

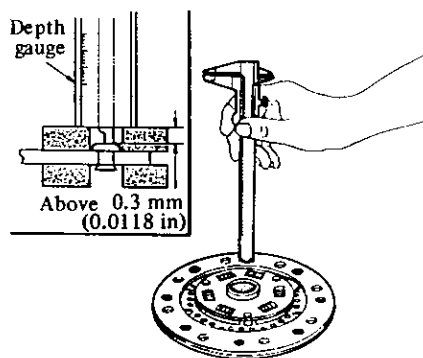
Flywheel and pressure plate

Check friction surface of flywheel and pressure plate for scoring or roughness. Slight roughness may be smoothed by using fine emery cloth. If surface is deeply scored or grooved, the part should be replaced.

Clutch disc assembly

Inspect clutch disc for worn or oily facings, loose rivets, and broken or loose torsional springs.

1. If facings are oily, the disc should be replaced. In this case, inspect transmission front cover oil seal, pilot bushing, engine rear oil seals and other points for oil leakage.
2. The disc should also be replaced when facings are worn locally or worn down less than 0.3 mm (0.0118 in) at rivets.

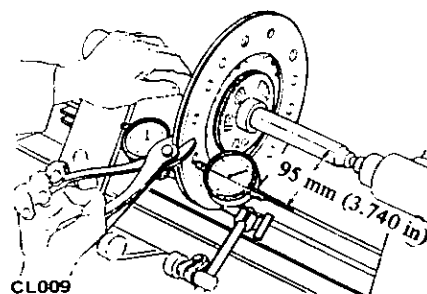


CL089

Fig. CL-7 Measuring clutch lining

3. Check disc plate for runout whenever the old disc or a new one is installed.

4. If runout exceeds 0.5 mm (0.0197 in) at the outer circumference of facing is 95 mm (3.740 in) from the center, replace or repair disc assembly.



CL009

Fig. CL-8 Measuring disc runout

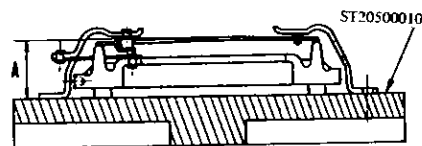
5. Check the fit of disc hub on transmission main drive gear for smoothly sliding. If splines are worn, clutch disc or main drive gear should be replaced; that is, backlash exceeds 0.4 mm (0.0157 in) at the outer edge of clutch disc.

Clutch cover assembly

1. Check the end surface of diaphragm spring for wear. If excessive wear is found, replace clutch cover as an assembly.

2. Measure the height of diaphragm spring as outlined below:

- (1) Place special tool "Distance Piece ST20500100" on "Base Plate ST20500010" and then tighten clutch cover assembly on the base plate by using set bolts.



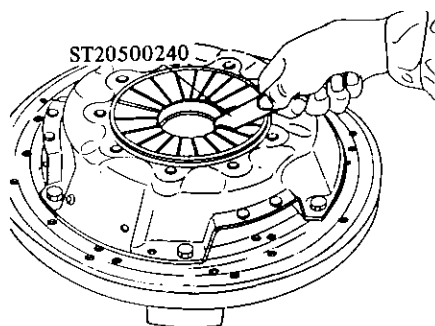
CL090

Fig. CL-9 Measuring the height of diaphragm spring

- (2) Measure the height "A" at several points with a vernier caliper depth gauge or special tool "Center Pole ST20500020 and Height gauge ST20500210." If the height "A" of spring end is beyond the specified

CLUTCH

value of 43 to 45 mm (1.693 to 1.772 in), adjust the spring height with special tool "Diaphragm Spring Adjusting Wrench ST20500240." If necessary, replace clutch cover as an assembly. Also, unevenness of diaphragm spring toe height should be less than 0.5 mm (0.00197 in).



CL091

Fig. CL-10 Adjusting the spring height

3. Inspect thrust rings for wear or damage. As this parts is invisible from outside, shake cover assembly up and down to listen for chattering noise, or lightly hammer on rivets for a slightly cracked noise. Any of these noises require replacement as a complete assembly.

Release bearing and sleeve

1. Check for abnormal wear on contact surface of withdrawal lever, ball pin and bearing sleeve.

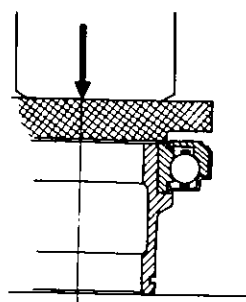
Pilot bushing

Check pilot bushing in crankshaft for wear or roughness. If necessary, replace it. When bushing is defective, be sure to check transmission main drive gear at the same time.

Assembly

Release mechanism

1. When assembling release bearing on sleeve, use a press and seat bearing squarely on sleeve.

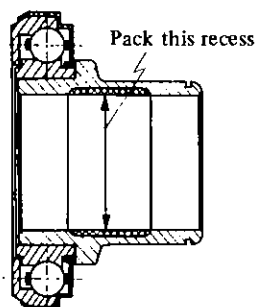


CL092

Fig. CL-11 Installing release bearing

2. Before or during assembling lubricate the following points with a light coat of multi-purpose grease (MIL G2108 or 10924).

(1) Inner groove of release bearing sleeve.

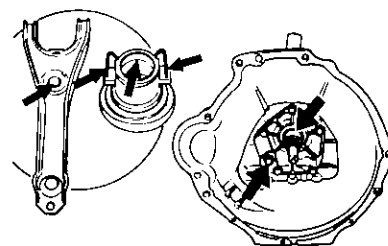


CL093

Fig. CL-12 Lubricating recess of bearing sleeve

(2) Contact surfaces of withdrawal lever, lever ball pin and bearing sleeve.

(3) Contact surfaces of transmission front cover.



CL094

Fig. CL-13 Lubricating points of withdrawal lever and front cover

Note: Very small amount of grease should be coated to the above points. If too much lubricant is applied, it will run out on the friction plates when hot, resulting in damaging clutch disc facings.

3. Install retainer spring to withdrawal lever. Fit holder spring to release bearing and sleeve assembly, then assemble withdrawal lever and bearing sleeve as a unit. Install this assembly on transmission case. Then install dust cover.

Pilot bushing

Install bushing in crankshaft using a soft hammer. Very small amount of lubricant should be applied.

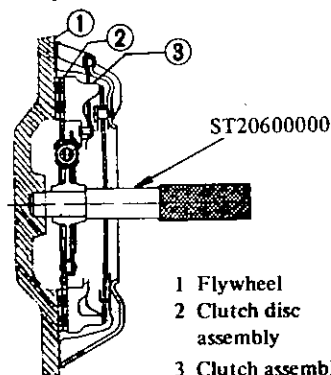
INSTALLATION

1. Apply a light coat of molybdenum desulphide on transmission main drive gear splines. Slide clutch disc on main drive gear several times. Remove clutch disc and wipe off excess lubricant pushed off by disc hub.

2. Install clutch disc and clutch cover assembly on flywheel. Support two assembled with special tool "Clutch Aligning Bar ST20600000."

CLUTCH

Note: Be sure to keep disc facings, flywheel and pressure plate clean and dry.



CL095

Fig. CL-14 Installing clutch cover assembly

3. Install six bolts to tighten clutch cover assembly to flywheel squarely. Each bolt should be tightened one turn at a time to the specified torque, 1.6 to 2.2 kg-m (12 to 16 ft-lb).

Note: Three dowels are used to locate clutch cover on flywheel properly.

4. Remove special tool "Clutch

Aligning Bar ST20600000" after tightening bolts to specified torque.
5. Install transmission.

Note: Make certain that withdrawal lever engages lever ball pin.

6. Connect push rod of clutch operating cylinder to withdrawal lever.

CLUTCH CONTROL

CONTENTS

DESCRIPTION	CL- 6	Inspection	CL- 9
CLUTCH PEDAL	CL- 7	Assembly	CL-10
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Inspection	CL- 8	OPERATING CYLINDER	CL-10
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Adjustment	CL- 8	Disassembly	CL-10
CLUTCH MASTER CYLINDER	CL- 9	Inspection	CL-10
Removal	CL- 9	Assembly	CL-10
Disassembly	CL- 9	Installation	CL-10
		BLEEDING CLUTCH SYSTEM	CL-10

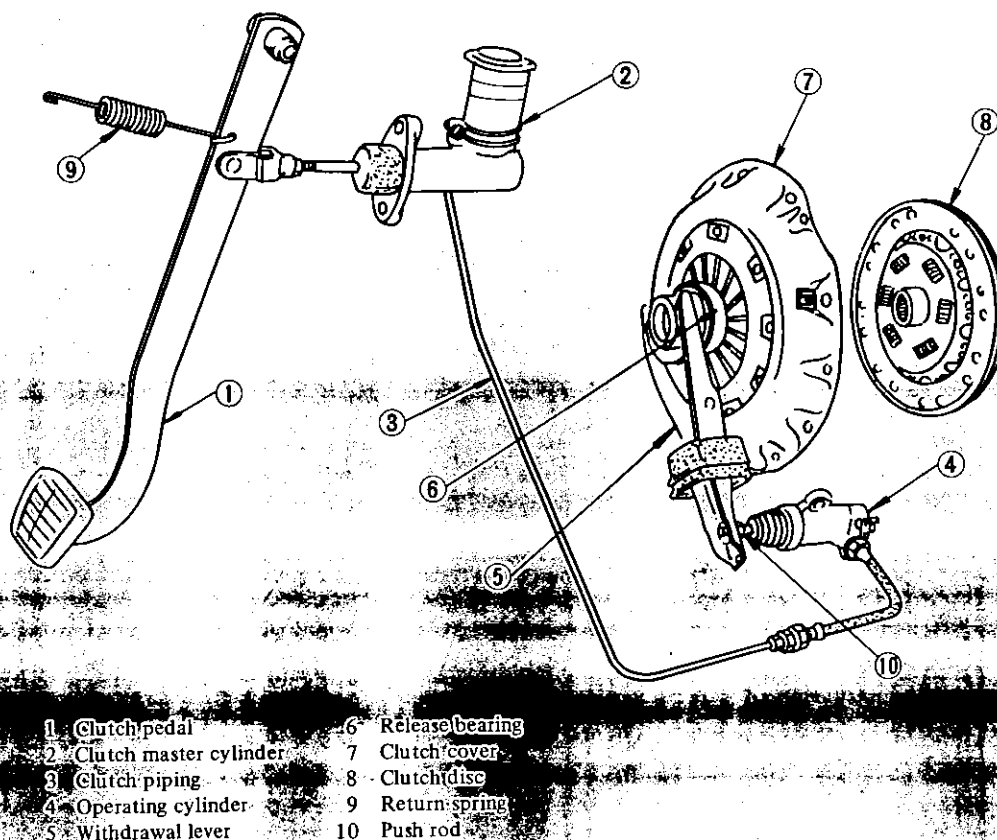
DESCRIPTION

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 clutch fluid to the operating cylinder via a pipe line. The

movement of the operating cylinder piston is transmitted to the withdrawal lever through the push rod, thus disengaging the clutch.

CLUTCH



CL097

Fig. CL-15 Clutch operating system

The operating cylinder is a non-adjustable type that uses no return spring. In this unit, the withdrawal-to-push rod play adjustment is not necessary since the "S" as shown in Figure CL-16 serves to automatically

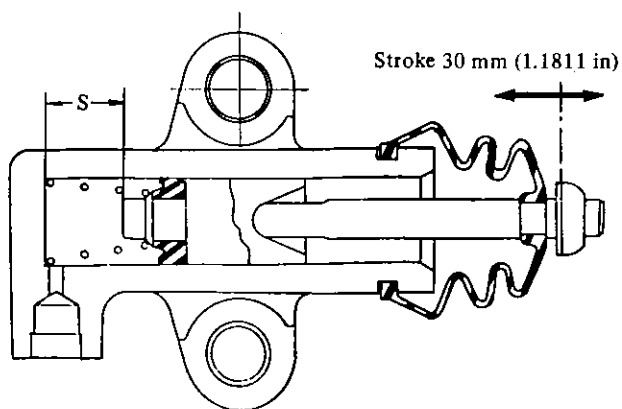
compensate for wear on clutch disc.

CLUTCH PEDAL Removal

1. Pry off cotter pin and take out

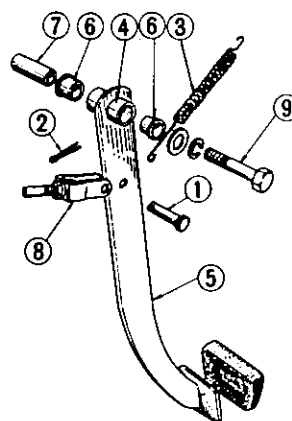
clevis pin; disconnect push rod from pedal assembly.

2. Unhook return spring. Loosen off fulcrum pin and remove pedal assembly.



CL098

Fig. CL-16 Non-adjustable operating cylinder



CL099

Fig. CL-17 Exploded view of clutch pedal

CLUTCH

Note: Before removing clutch pedal, note toe board clearance at pedal pad.

Inspection

Clean all the following parts in cleaning solvent and check for wear, damage or any other abnormal condition. Replace the parts which are defective.

1. Return spring.
2. Pedal sleeve.
3. Pedal boss, etc.

Installation

To install, reverse the order of removal. Apply multi-purpose grease to the friction surfaces of the disassembled parts as shown in Figure CL-20.

Note: Refer to Figure CL-18 for the correct direction of return spring.

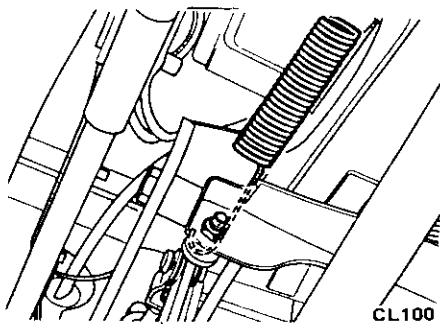


Fig. CL-18 Hooking return spring

Adjustment

1. Adjust the pedal height to 175 mm (6.89 in) by adjusting pedal stopper and tighten lock nut "A" to the specified torque.

2. Turn in or out push rod adjusting screw until a play of 1 to 5 mm (0.0394 to 0.1969 in) at clevis pin is obtained. Then tighten lock nut "B" to the specified torque.

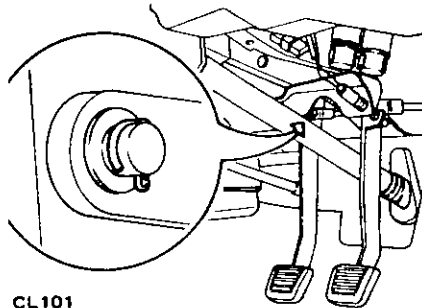


Fig. CL-19 Bending clevis pin

Notes:

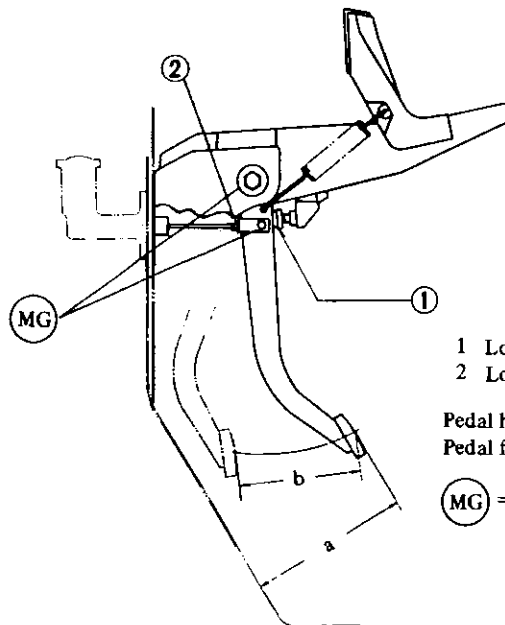
- a. Exercise care in adjusting the play not to block the port on master cylinder. A blocked port may result if too small a play at clevis pin exists.
- b. Bend clevis pin completely.

Tightening torque:

Pedal installation bolt
(Fulcrum pin):

3.06 to 4.14 kg-m
(22 to 30 ft-lb)

Lock nut "A," "B":
0.79 to 1.07 kg-m
(5.7 to 8.0 ft-lb)



- 1 Lock nut "A"
- 2 Lock nut "B"

Pedal height a = 175 mm (6.89 in)

Pedal full stroke b = 135 mm (5.31 in)

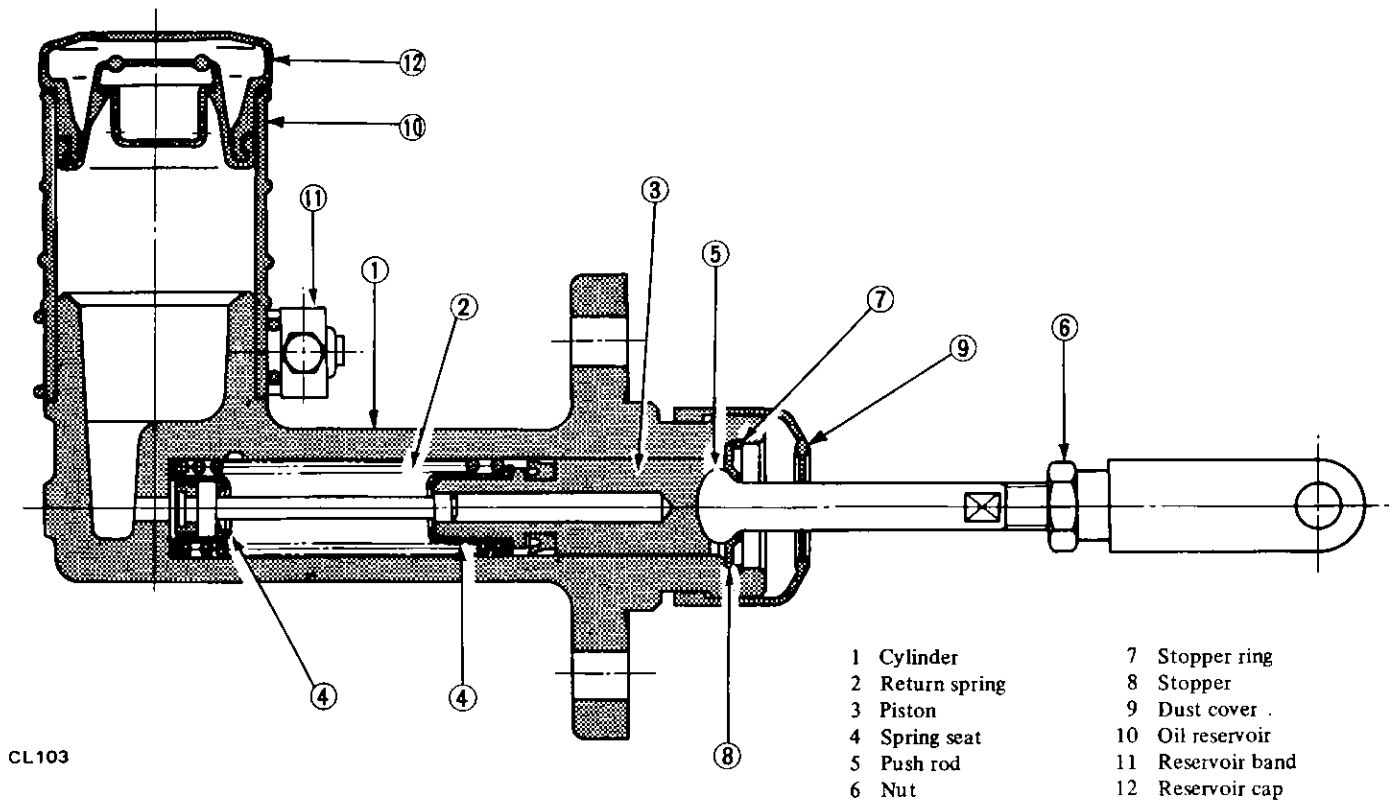
MG = Multi-purpose grease

Fig. CL-20 Adjusting pedal height

Note: Depress and release clutch pedal over its entire stroke to ensure that the clutch linkage operates smoothly without squeak noise, interference and binding.

CLUTCH

CLUTCH MASTER CYLINDER



CL103

Fig. CL-21 Clutch master cylinder

Removal

1. Remove clevis pin at push rod.
2. Disconnect clutch hose from master cylinder and drain clutch fluid.
3. Remove bolt securing master cylinder to the car, and dismount master cylinder.

Note: Remove dust cover from master cylinder body, on the side of driver's seat.

Disassembly

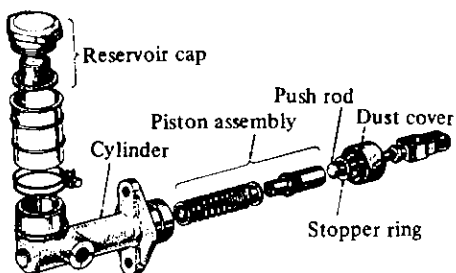
1. Remove dust cover and take off stopper ring from body.
2. Remove push rod and piston assembly.
3. When replacing piston cup, disassemble piston assembly by straightening the tooth of spring seat, if necessary.

Inspection

Wash or clean all disassembled parts before inspection.

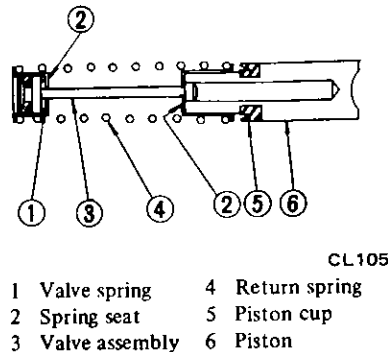
Note: To clean or wash all parts of master cylinder, operating cylinder and piping, clean brake fluid must be used. Never use mineral oils such as gasoline and kerosene. It will ruin the rubber parts of the hydraulic system.

1. Check cylinder and piston for uneven wear or damage, and if necessary, replace.
2. If the clearance between cylinder and piston is more than 0.15 mm (0.0059 in), replace cylinder.
3. Renew piston cup when disassembled. It must also be replaced when wear or deformation due to fatigue or damage is found.
4. Damaged dust cover, oil reservoir or cap, should be replaced.



CL104

Fig. CL-22 Exploded view of master cylinder



CL105

Fig. CL-23 Piston assembly

CLUTCH

Return spring and valve spring must also be replaced when they are broken or weak.

5. Replace clutch hose and tube if any abnormal sign of damage or deformation is found.

Assembly

To assemble, reverse the order of disassembly. Closely observe the following instructions.

1. Dip piston cup in brake fluid before installing.

Make sure that it is correctly faced in position.

2. Apply a coating of brake fluid to cylinder and piston when assembling.

Installation

To install, reverse the order of removal. Closely observe the following instructions.

1. Adjust pedal height by changing pedal stopper length.

2. Bleed air out of hydraulic system.

Tightening torque:

Master cylinder to Dash panel:

0.79 to 1.07 kg-m

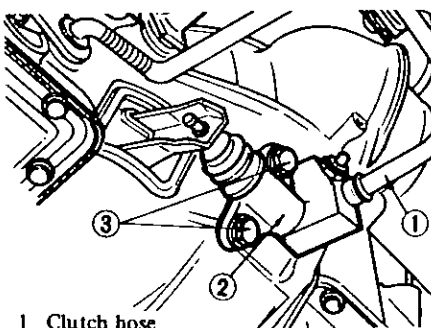
(5.7 to 8.0 ft-lb)

Tube connector:

1.5 to 1.8 kg-m

(11 to 13 ft-lb)

OPERATING CYLINDER



- 1 Clutch hose
- 2 Operating cylinder
- 3 Bolts

Fig. CL-24 Removing operating cylinder

Removal

1. Detach clutch hose from operating cylinder.

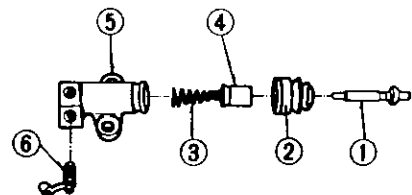
2. Remove two bolts securing operating cylinder to clutch housing.

Disassembly

1. Remove push rod with dust cover.

2. Remove piston assembly and piston spring.

3. Remove bleeder screw.



- 1 Push rod
- 2 Dust cover
- 3 Piston spring
- 4 Piston
- 5 Operating cylinder
- 6 Bleeder screw

Fig. CL-25 Exploded view of operating cylinder

Inspection

Visually inspect all disassembled parts, replacing those found worn or damaged too badly beyond specifications.

Assembly

Assemble in the reverse order of disassembly. Closely observe the following instructions.

1. Prior to assembly, dip piston cup in clean brake fluid.

In installing cup, pay particular attention to its direction.

2. Dip cylinder and piston in clean brake fluid before assembly.

Note: Be sure to install piston assembly with piston spring in place.

Installation

Install in the reverse order of removal. Closely observe the following instructions.

Notes:

a. Bleed air thoroughly from clutch hydraulic system.

b. Do not install return spring, or clutch will not be disengaged properly.

Tightening torque:

Operating cylinder securing bolt:

2.5 to 3.0 kg-m

(18 to 22 ft-lb)

Bleeder screw:

0.7 to 0.9 kg-m

(5.1 to 6.5 ft-lb)

BLEEDING CLUTCH SYSTEM

To bleed clutch system, use the same procedure as described in Brake System.

1. Fill oil reservoir of operating cylinder with brake fluid.

2. Detach cap from bleeder screw on operating cylinder and, in its place, connect a vinyl tube.

3. Pour a small amount of brake fluid into a clean container and insert the open end of the vinyl tube into it.

4. Have a co-worker depress clutch pedal two or three times. With clutch pedal depressed fully, loosen bleeder screw to bleed air out of clutch system.

5. Tighten bleeder screw and release the pedal.

6. Repeat above steps until no air bubbles appear in vinyl tube.

Notes:

a. Always keep brake fluid in oil reservoir so that it flows into the line continuously.

b. Use care not to allow brake fluid coming into contact with painted surfaces.

c. Make sure that no leak occurs at connections.

d. Pour brake fluid into oil reservoir up to the specified level.

CLUTCH

SERVICE DATA AND SPECIFICATIONS

Clutch cover		1.8ℓ	1.6ℓ
Diaphragm spring-to-flywheel distance	mm (in)	43.0 to 45.0 (1.693 to 1.772)	←
Unevenness of diaphragm spring toe height	mm (in)	less than 0.5 (0.0197)	←
Full pressure	kg/cm ² (lb/in ²)	395 to 445 (5.619 to 6.330)	335 to 385 (4.765 to 5.477)
Out of flatness of pressure plate	mm (in)	0.1 (0.004)	←
Allowable refacing limit	mm (in)	1.0 (0.04)	←
Clutch disc			
Facing size			
Outer dia. x inside dia. x thickness	mm (in)	200 x 130 x 3.5 (7.87 x 5.12 x 0.1378)	←
Total friction area	cm ² (in ²)	362 (56)	←
Thickness of disc assembly			
Free	mm (in)	8.6 to 9.0 (0.3386 to 0.3543)	←
Compressed	mm (in)	7.65 to 7.95 (0.3012 to 0.3130)	←
Number of torsion springs		6	←
Allowable min. depth of rivet head from surface	mm (in)	0.3 (0.0118)	←
Allowable facing runout	mm (in)	0.5 (0.0197)	←
Allowable free play of spline (At the outer edge of disc)	mm (in)	0.4 (0.0157)	←
Clutch pedal			
Pedal height	mm (in)	175 (6.89)	←
Play at clevis pin	mm (in)	1 to 5 (0.0394 to 0.1969)	←
Full stroke	mm (in)	135 (5.31)	←
Pressing strength at full stroke	kg (lb)	10.5 (23)	9.5 (21)
Master cylinder-clutch			
Dia. of master cylinder	mm (in)	15.87 (0.6248)	←
Allowable max. clearance between cylinder and piston	mm (in)	0.15 (0.0059)	
Clutch operating cylinder			
Dia. of operating cylinder	mm (in)	19.05 (0.7450)	←
Tightening torque			
Clutch mounting bolt	kg-m (ft-lb)	1.6 to 2.2 (12 to 16)	

CLUTCH

TROUBLE DIAGNOSES AND CORRECTIONS

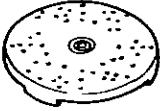
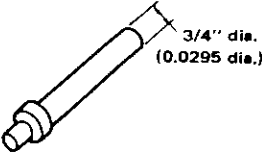
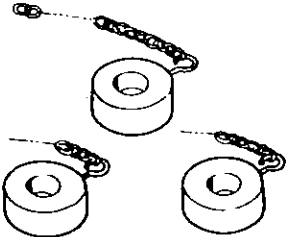
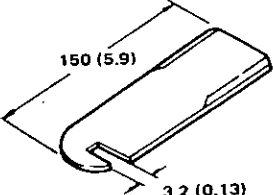
Condition	Probable cause and testing	Corrective action
Slipping clutch	Slipping of clutch is obvious when any of the following symptoms is encountered during operation. (1) Vehicle will not respond to engine speed during acceleration. (2) Insufficient vehicle speed. (3) Lack of power during uphill driving. Some of the above conditions are also experienced when engine is causing troubles. First determine whether engine or clutch is causing a trouble. If slipping clutch is left unheeded, wear and/or overheat will occur on clutch facing to such an extent that it is no longer serviceable. TO TEST THE CLUTCH FOR SLIPPING, proceed as follows: During upgrade travelling, open throttle until engine is running at about 40 to 50 km/h (25 to 31 MPH) with gear shift lever in 3rd-speed position. Now, shift into highest gear and at the same time rev up engine. If clutch is slipping, vehicle will not respond to the operation of accelerator pedal soon.	
	- Clutch facing worn excessively. - Oil or grease on clutch facing. - Warped clutch cover or pressure plate.	Replace. Replace. Repair or replace.
Dragging clutch	Grabbing clutch is particularly obvious when shifting gears from one position into another, especially into low gear. TO TEST THE CLUTCH FOR DRAGGING OR GRABBING, proceed as follows: (1) Start up engine. Disengage clutch. Shift into reverse gear, and then into Neutral. Under this condition, gradually accelerate engine speed, and again shift into reverse gear. If clutch is dragging, gear "grating" is heard when shifting gears from Neutral into Reverse. (2) Stop engine and shift gears. (Conduct this test at each gear position.) (3) In step (2), gears are shifted smoothly except 1st speed position at idling. a. If dragging is encountered at the end of shifting, check for condition of synchromechanism in transmission. b. If dragging is encountered at the beginning of shifting, proceed to step (4) below. (4) Push change lever toward Reverse side, depress pedal to check for free play of pedal. a. If the pedal can be depressed further, check clutch for condition. b. If the pedal cannot be depressed further, proceed to step (5) below. (5) Check clutch control. (pedal height, free play, etc.) If any abnormal condition does not exist and if pedal cannot be depressed further, check clutch for condition.	
	- Clutch disc runout or warped. - Wear or rust on hub splines in clutch disc. - Diaphragm spring toe height out of adjustment or toe tip worn. - Worn or improperly installed parts.	Replace. Clean and lubricate with grease, or replace. Adjust or replace. Repair or replace.

CLUTCH

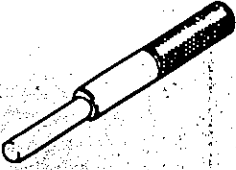
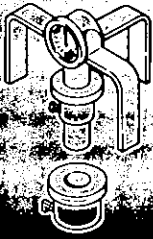
Condition	Probable cause and testing	Corrective action
Pulsating clutch	Pulsating clutch pedal is usually noticeable when vehicle is just rolled off with clutch partially engaged.	
	• Weakened or broken clutch disc torsion spring.	Replace.
	• Oil or grease on clutch facing.	Replace.
	• Clutch facing out of proper contact or clutch disc runout.	Replace.
	• Loose rivets.	Replace.
	• Warped pressure plate or clutch cover surface.	Repair or replace.
	• Unevenness of diaphragm spring toe height. • Loose engine mounting or deteriorated rubber.	Adjust or replace. Retighten or replace.
Noisy clutch	A noise is heard after clutch is disengaged.	
	• Damaged release bearing.	Replace.
	A noise is heard when clutch is disengaged.	
	• Insufficient grease on the sliding surface of bearing sleeve. • Clutch cover and bearing are not installed correctly.	Apply grease. Adjust.
	A noise is heard when the vehicle is suddenly rolled off with clutch partially engaged.	
	• Defective pilot bushing.	Replace.
Rabbit-hopping clutch	When "rabbit-hopping" of clutch occurs, vehicle will not roll off smoothly from a standing start or clutch will be engaged before clutch pedal is fully depressed.	
	• Oil or grease on clutch facing. • Clutch facing worn or loose rivets. • Wear or rust on splines in drive shaft and clutch disc. • Warped flywheel or pressure plate. • Loose mountings for engine or power train units.	Replace. Replace. Clean or replace. Repair or replace. Retighten.

CLUTCH

SPECIAL SERVICE TOOLS

No.	Tool number & tool name	Description Unit: mm (in)	For use on	Reference page or figure No.
1.	ST2050S000 Clutch assembly tool set — ST20500010 Base plate — ST20500020 Center pole — ST20500100 Distance piece (7.8 mm) — ST20500210 Height gauge — ST20500240 Diaphragm spring adjusting wrench	This clutch assembly tool set is used to adjust height of diaphragm.  SE002  SE119  SE003  SE120  SE032	610 510	Fig. CL-9 Page CL-4 Page CL-4 Page CL-4 Page CL-4 Fig. CL-10 Page CL-5

CLUTCH

No.	Tool number & tool name	Description Unit: mm (in)	For use on	Reference page or figure No.
2.	ST20600000 Clutch aligning bar	 SE001	610 510	Fig. CL-3 Fig. CL-14 Page CL-3 Page CL-5 Page CL-6
3.	ST20400000 Clutch release checker	 SE201	610 510 C30	

SERVICE MANUAL

DATSUN 1800
MODEL 610 SERIES
CHASSIS & BODY



NISSAN MOTOR CO., LTD.
TOKYO, JAPAN

SECTION TM

TRANSMISSION

TM

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TRANSMISSION

4-SPEED TRANSMISSION

CONTENTS

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DESCRIPTION

The transmission is a fully synchronized 4-speed type that uses helical gears. The reverse gear is a sliding-mesh type using spur gears. In construction, the main drive shaft gear is meshed with the counter drive gear. The forward speed gears provided on the countershaft are in constant mesh with the main gears. Each of the main gears rides on the main shaft through the needle roller bearing, thus rotating freely on the main shaft. When the transmission is shifted, the action causes the coupling sleeve to slide on the synchro-

nizer hub. This engages its inner teeth with the outer teeth formed on the main shaft gear.

The synchronizer hub is fitted to the main shaft by splines so they turn together as a unit as the main shaft is rotated.

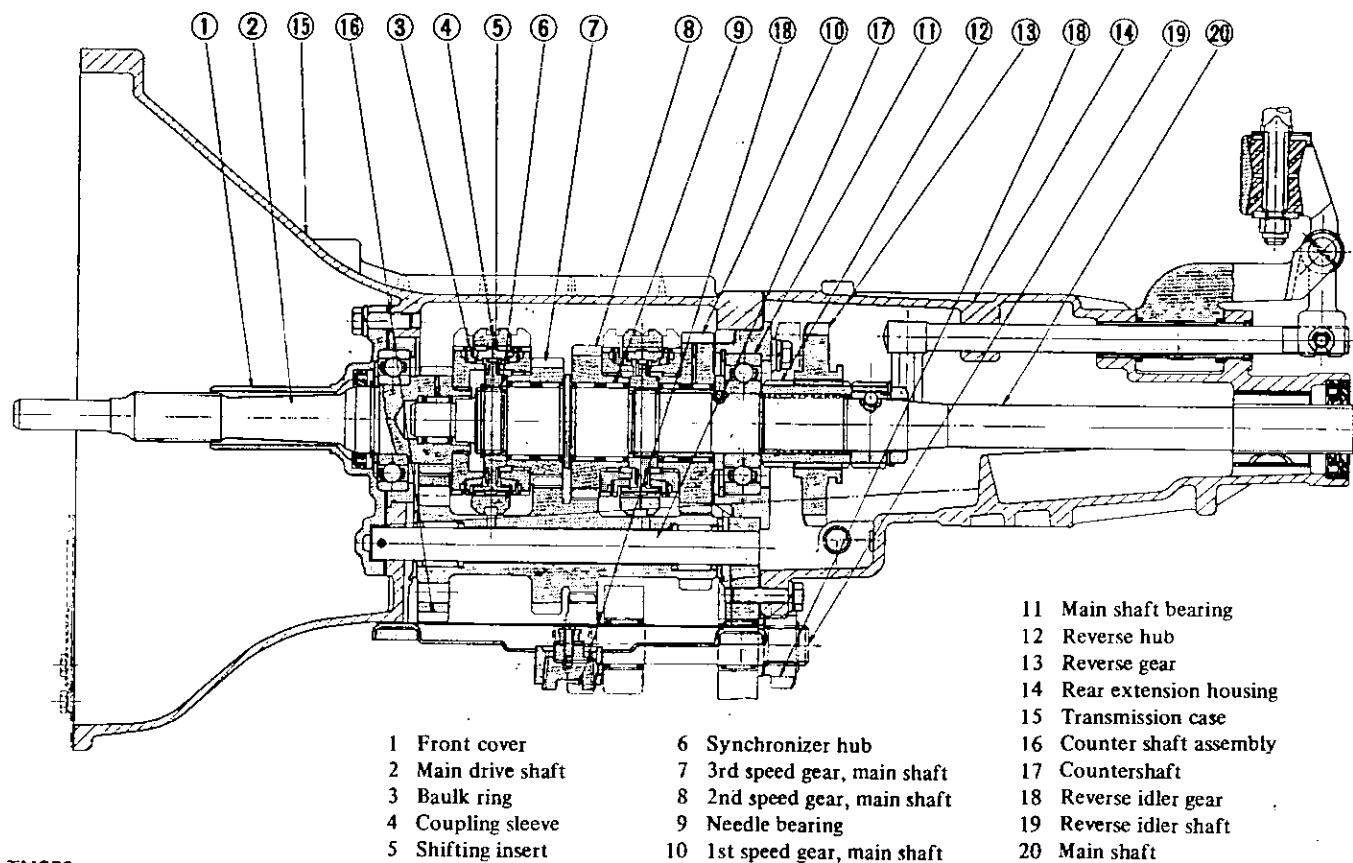
The transmission comes into two types; Warner and Servo types. On Warner type, the baulk rings synchronize the coupling sleeve with the main shaft gear. On Servo type, this action is accomplished by the synchro-ring.

Placing the speed control lever in the reverse position throws the main

shaft reverse gear into engagement with the reverse idler gear; the transmission is reversed.

The transmission consists of two major elements; complete transmission case and rear extension. The case contains all gears and gear shafts.

The Warner type and the Servo type transmissions differ in synchro-mesh device only. The procedures of removal, disassembly, inspection and installation contained in this section will be made on the Warner type with added notes and explanation on the Servo type where necessary.



TM236

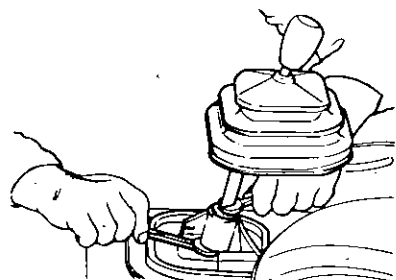
Fig. TM-1 Sectional view of F4W63 transmission

TRANSMISSION

Removal

To dismount transmission from vehicle, proceed as follows:

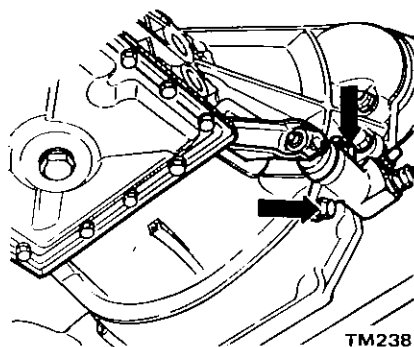
1. Jack up vehicle and support its weight on safety stands. Make sure that safety is insured.
2. Loosen off control lever securing nut and remove lever.



TM237

Fig. TM-2 Removing control lever

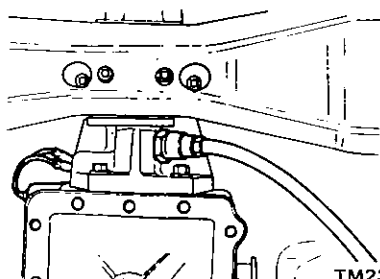
3. Disconnect front exhaust tube.
4. Disconnect wires from reverse light switch at connections.
5. Remove operating cylinder from transmission case.



TM238

Fig. TM-3 Removing operating cylinder

6. Disconnect speedometer cable from rear extension housing.



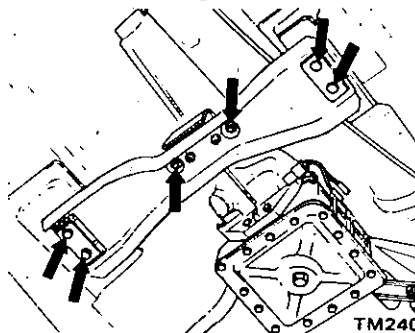
TM239

Fig. TM-4 Disconnecting wires and cables

7. Disengage propeller shaft.

Note: Plug up the opening in the rear extension housing to prevent oil from flowing out.

8. Support engine by locating a jack under oil pan with a wooden block used between oil pan and jack.
9. Support transmission by means of a jack.
10. Remove two bolts securing transmission to rear engine mounting insulator, and remove four cross member mounting bolts.

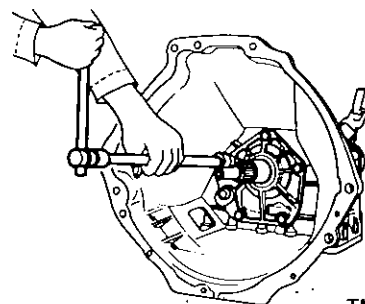


TM240

Fig. TM-5 Removing cross member

11. Lower jack so that transmission can be dismounted from vehicle easily.
12. Remove starter motor.
13. Remove bolts securing transmission to engine, and move transmission backward and away from the vehicle.

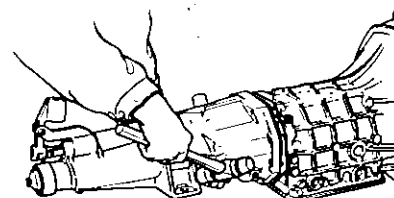
Note: Take care in dismounting transmission not to strike any adjacent parts and drive shaft.



TM241

Fig. TM-6 Removing front cover

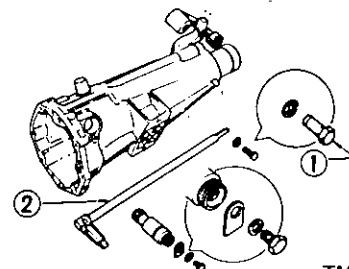
3. Detach bottom cover from transmission case.
4. Remove back-up light switch and speedometer pinion with speedometer sleeve.
5. Move gears to NEUTRAL position.
6. Remove rear extension mounting bolts. Detach rear extension housing by lightly tapping it with a soft hammer as shown.



TM242

Fig. TM-7 Removing rear extension housing

7. Pull out striking rod pin (1), and draw out striking rod (2).



TM243

Fig. TM-8 Disassembling rear extension

Disassembly

1. Thoroughly wipe clean dirt and grease from each component-parts of transmission. Drain out oil in transmission case.

Place transmission on a suitable stand securely.

2. Detach dust cover from transmission case. Remove withdrawal lever and release bearing. Remove five bolts securing front cover to transmission case, and detach cover.

Gear assembly

1. Back off check ball plugs, and remove three locking springs and check balls. Take care not to lose these parts.

TRANSMISSION

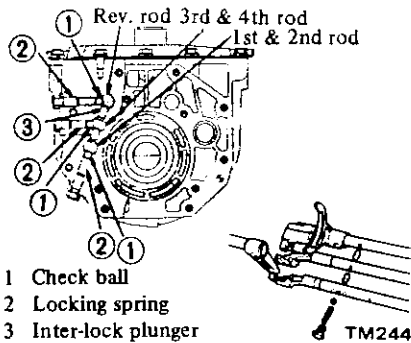
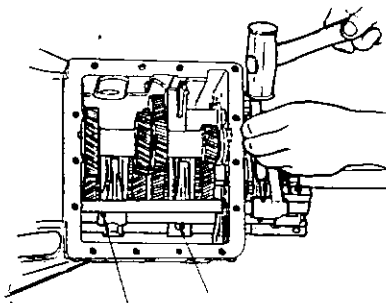


Fig. TM-9 Layout of check balls and interlock plungers

2. Using the special tool "Fork Rod Pin Punch ST23540000," drive out retaining pins from fork rods. Take care not to lose two plungers when drawing out fork rods.



TM245

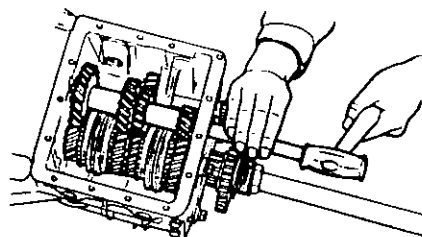
Fig. TM-10 Removing retaining pins

3. Mesh gears at two places. Straighten lock washer and loosen nut on main shaft.

4. Using the special tool "Counter-shaft Guide ST23100000," push out countershaft from the transmission case. Take care not to drop needle bearings into case.

Remove counter gear together with needle bearings and washers from transmission case.

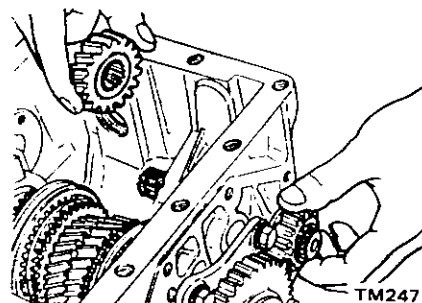
Note: Make sure that washers used between counter gear and transmission case are removed.



TM246

Fig. TM-11 Pushing out countershaft

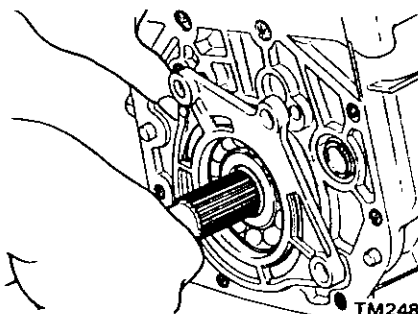
5. Pry off snap ring retaining reverse idler gear in place. Withdraw idler gear shaft from the rear of transmission case.



TM247

Fig. TM-12 Removing reverse idler shaft

6. Remove bolts securing main shaft bearing retainer, and withdraw main shaft assembly from the rear of transmission case.

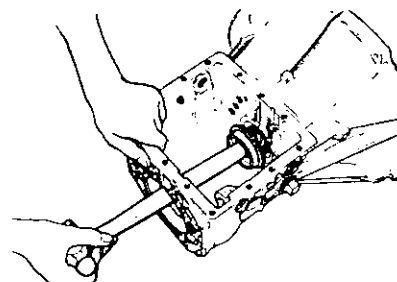


TM248

Fig. TM-13 Removing main shaft assembly

7. Take out pilot bearing located between main shaft and main drive gear.

8. Drive out main drive gear as shown using the wooden handle of a hammer.



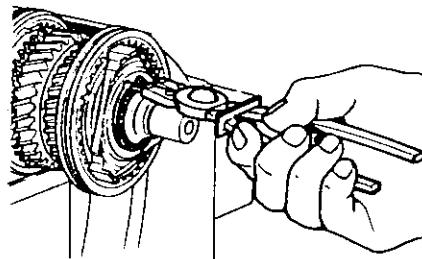
TM249

Fig. TM-14 Removing main drive gear assembly

Main shaft assembly

1. Pry off snap ring on the front end of main shaft, and remove

3rd-4th synchromesh assembly and 3rd gear.



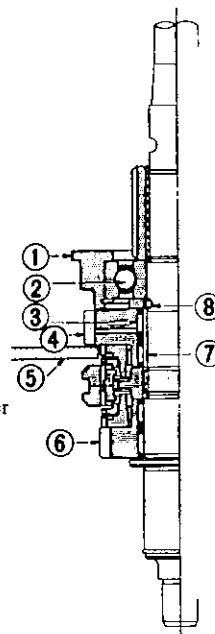
TM250

Fig. TM-15 Removing snap ring

2. Remove lock nut from main shaft, and take out reverse gear, reverse gear hub, speedometer drive gear. Take care not to lose steel ball retaining speedometer drive gear.

3. Attach a suitable tool to the front side of 1st gear as shown, and press out 1st gear together with ball bearing and retainer.

Note: Do not attach this tool to 2nd gear. This may damage 1st gear main shaft bushing.

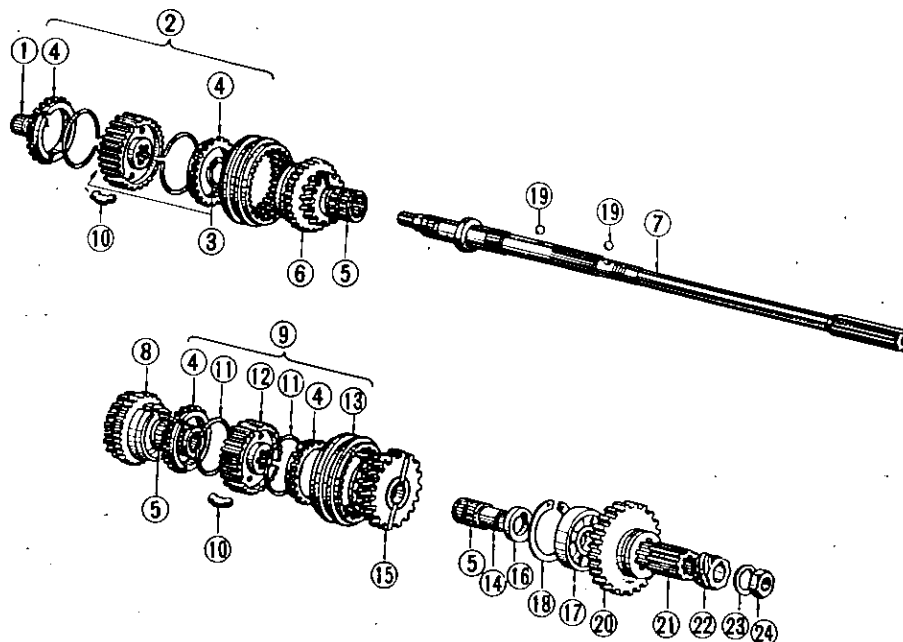


TM251

Fig. TM-16 Drawing out main shaft bearing

4. Then attach a proper puller stand to the front side of 2nd gear in the same manner as step 3, and press out 1st gear bushing together with 1st & 2nd synchromesh assembly and 2nd gear.

TRANSMISSION



TM252

- 1 Pilot bearing
- 2 3rd & 4th synchronesh assembly
- 3 Snap ring
- 4 Baulk ring
- 5 Needle bearing
- 6 3rd speed gear, main shaft
- 7 Main shaft
- 8 2nd speed gear, main shaft

- 9 1st & 2nd synchronesh assembly
- 10 Shifting insert
- 11 Spread spring
- 12 Synchronizer hub
- 13 Coupling sleeve
- 14 Bush, 1st gear
- 15 1st speed gear, main shaft
- 16 Thrust washer, main shaft

- 17 Main shaft bearing
- 18 Snap ring, main shaft bearing
- 19 Steel ball
- 20 Reverse gear
- 21 Reverse hub
- 22 Speedometer drive gear
- 23 Lock plate
- 24 Nut

Fig. TM-17 Exploded view of main shaft assembly (F4W63 transmission)

Main drive shaft assembly

1. Pry off snap ring and remove spacer.
2. Press out main drive shaft bearing with the use of an ordinary bearing puller and a suitable press.

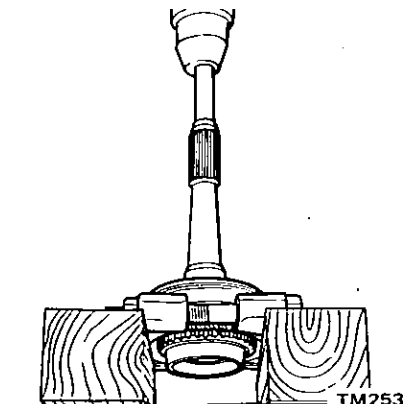


Fig. TM-18 Driving out main drive shaft bearing

TM254

- 1 Snap ring
- 2 Spacer

- 3 Main drive bearing
- 4 Main drive shaft

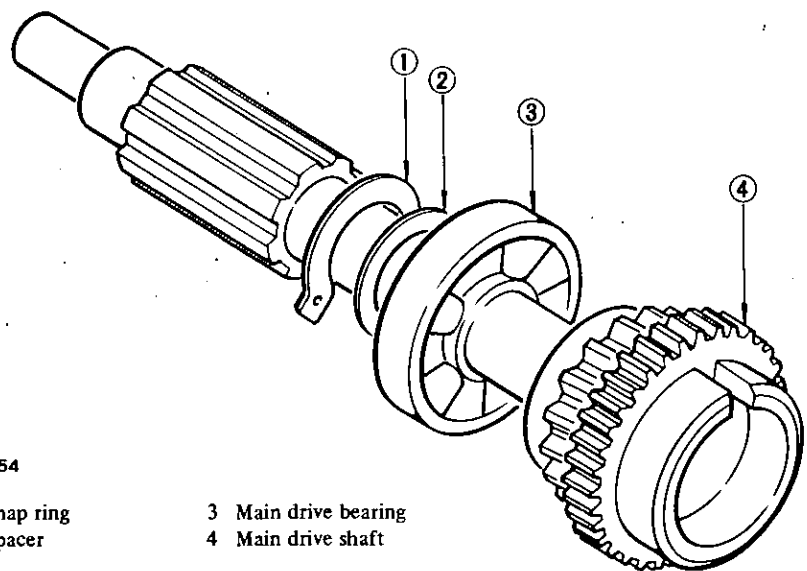


Fig. TM-19 Exploded view of main drive shaft

TRANSMISSION

Synchromesh assembly (Model F4W63 Transmission)

1. Remove spread springs (1) and take out shifting inserts (2).
2. Separate coupling sleeve (3) from synchro hub (4).

(Model F4C63 Transmission)

1. Remove cir-clip (1), and then synchro ring (2), brake bands (3), thrust block (4) and anchor block (5).

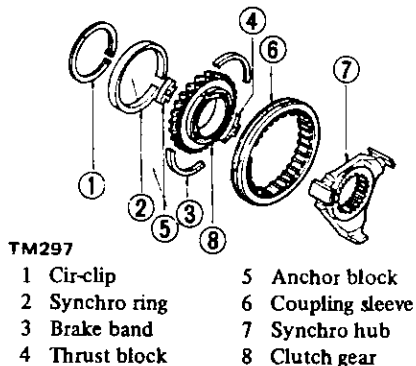
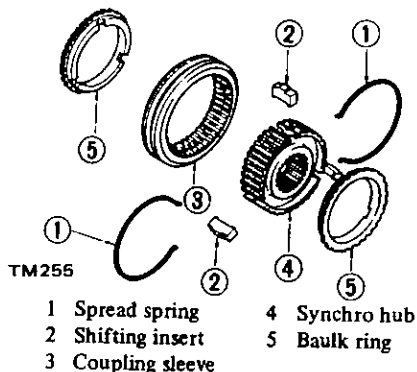


Fig. TM-20 Exploded view of synchromesh assembly

Inspection

Wash clean all parts in an approved solvent, and check for wear or damage.

Transmission case and rear extension housing

Wash clean with an approved solvent and check for any crack which may be the cause of oil leak.

Bearings

1. Wipe clean oil or grease on bearings and dry these parts with compressed air.

2. Check balls, outer race and inner race for wear, burr or damage. Also check for smooth operation. If necessary, replace.

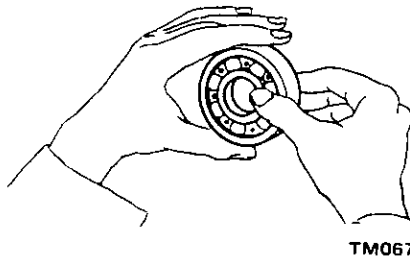


Fig. TM-21 Checking ball bearing

3. Replace needle bearings which are excessively worn or damaged.
4. Replace rear extension bushing if worn or cracked.

Gears and shafts

1. Check gears for wear, crack or damage and, if necessary, replace.
2. Check shafts for wear, crack or bending. If necessary, replace.
3. Check gears for end play
Standard end play (1st, 2nd, 3rd and reverse idler gears): 0.05 to 0.15 mm (0.0020 to 0.0059 in)

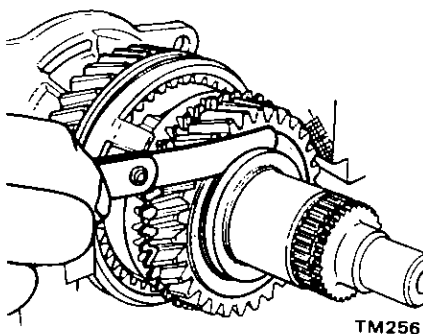


Fig. TM-22 Measuring gear end play

4. Measure backlash in gears.
Standard backlash: 0.05 to 0.14 mm (0.0020 to 0.0055 in)
If the backlash exceeds the specified value, replace drive and driven gears as a set.

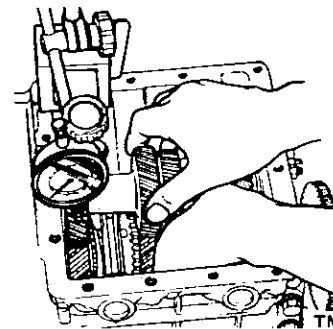


Fig. TM-23 Measuring gear backlash

Baulk rings

1. Replace any baulk ring which is deformed or cracked.
2. Position baulk ring in place on gear cone, and measure the baulk ring-to-gear clearance with baulk ring pushed toward gear. If the clearance is smaller than the specified value, replace baulk ring.

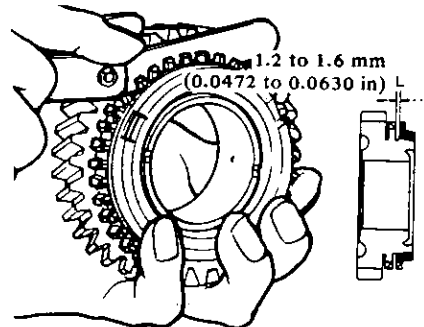


Fig. TM-24 Baulk ring to cone gap

Oil seal

It is advisable not to reuse oil seals that have been removed. Always install new oil seals. If spring used in any oil seal is dislocated or if seal lip is folded, replace that oil seal.

Assembly

Front cover

1. Make sure that seal mating surface is clean. Using a press, drive new seal into place on front cover.
2. Lubricate seal lip with gear oil when installing oil seal.

TRANSMISSION

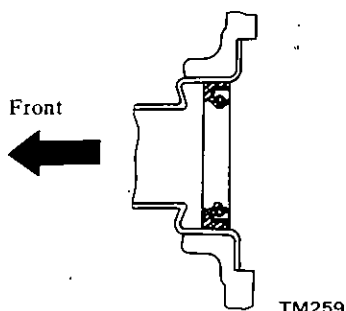


Fig. TM-25 Location of front cover oil seal

Rear extension housing

1. Clean rear extension housing and press oil seal into position. Apply a coating of gear oil to sealing lip when installing oil seal.

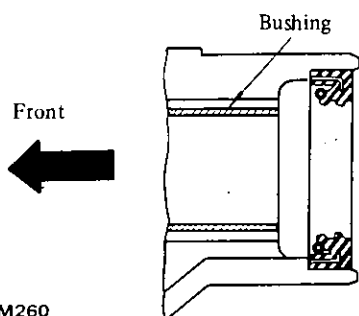


Fig. TM-26 Location of rear extension housing oil seal

2. Install striking rod in place on rear extension housing.

Gear assembly

1. Wash clean all parts and dry with compressed air.
2. Assemble synchromesh assembly.

(F4W63 Transmission)

- (1) Fit shifting inserts in three grooves in synchronizer hub.
- (2) Locate one spread spring on the lower side of shifting inserts to secure them to the inner side of coupling sleeve. Install the other spring on the opposite side of coupling sleeve properly. Make sure that they are installed opposite to each other.

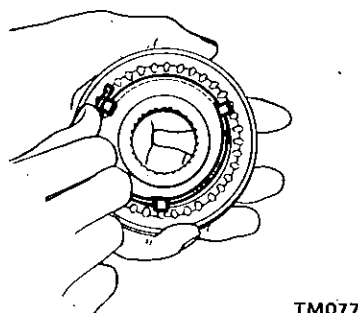


Fig. TM-27 Installing spread spring

(F4C63 Transmission)

- (1) Place gear on a clean, flat surface.
- (2) Install synchronizer ring on the inner side of clutch gear.
- (3) Install thrust block in place as shown in Figure TM-28.
- (4) Install anchor block and brake band in place on gear.
- (5) Fit cir-clip in groove in gear. This cir-clip is used to secure synchromesh assembly in position.

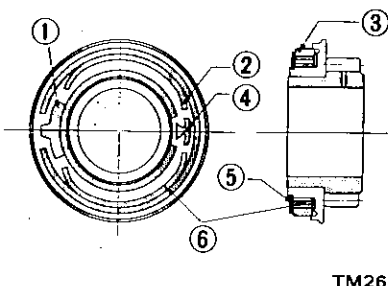


Fig. TM-28 Synchromesh assembly

3. Install the following parts to main shaft in the order listed: 2nd gear needle roller bearing, 2nd gear, 2nd gear baulk ring, 1st and 2nd speed synchromesh assembly. Then fit 1st gear bushing onto main shaft by using a proper brass drift. And install 1st gear baulk ring, needle bearing 1st gear, steel ball and thrust washer.

Note: Apply grease to steel ball when installing.

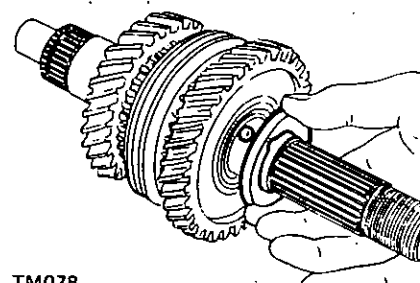


Fig. TM-29 Installing thrust washer

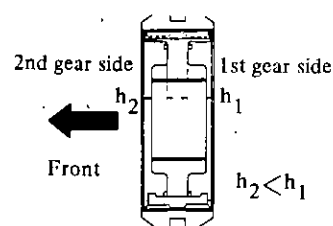
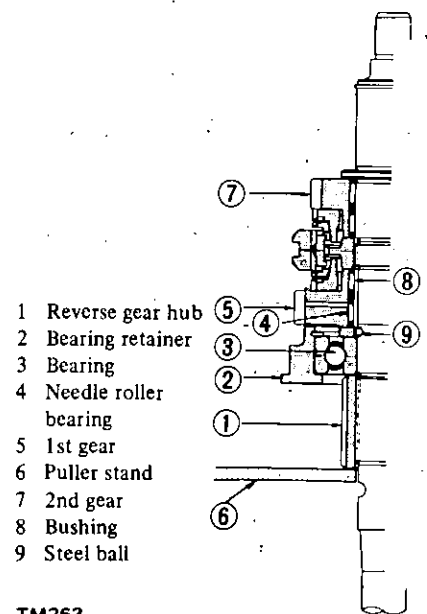


Fig. TM-30 Installing synchro hub

4. Using a suitable puller stand as shown in Figure TM-31, install main shaft bearing together with reverse hub to main shaft.



TM263

Fig. TM-31 Installing main shaft bearing

5. Install 3rd gear needle roller bearing, 3rd gear, baulk ring; 3rd-4th speed synchromesh assembly to main shaft.

TRANSMISSION

6. Fit a suitable snap ring in place so that there exists a minimum clearance between the end face of hub and ring groove. Refer to the following chart as a guide in selecting a suitable snap ring.

Synchro hub snap ring

No.	Thickness mm (in)
1.	1.40 (0.0551)
2.	1.45 (0.0571)
3.	1.50 (0.0591)
4.	1.55 (0.0610)
5.	1.60 (0.0630)

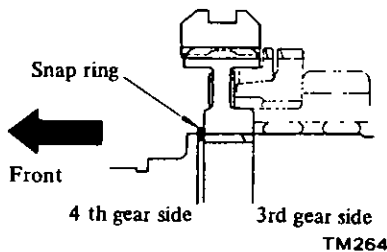


Fig. TM-32 Installing synchro hub snap ring

7. Install reverse gear, speedometer drive gear, lock plate and main shaft nut to main shaft. Insert main shaft assembly into position from the rear side of transmission case, and secure to transmission case with main shaft bearing retainer mounting bolts.

Main shaft bearing retainer

Tightening torque:
0.8 to 1.0 kg-m
(5.8 to 7.2 ft-lb)

Main drive gear assembly

8. Using an ordinary bearing puller, press main drive bearing onto main drive shaft.

9. Install a set of suitable spacer and snap ring into groove so that there exists a minimum clearance between the groove and end face of spacer. Be sure to install pilot bearing in place when installing main drive gear assembly to transmission case.

Chart-Snap ring thickness

No.	Thickness mm (in)
1.	1.49 to 1.53 (0.0587 to 0.0602)
2.	1.55 to 1.63 (0.0610 to 0.0642)
3.	1.63 to 1.68 (0.0642 to 0.0661)
4.	1.68 to 1.74 (0.0661 to 0.0685)
5.	1.74 to 1.80 (0.0685 to 0.0709)
6.	1.80 to 1.86 (0.0709 to 0.0732)
7.	1.86 to 1.92 (0.0732 to 0.0756)

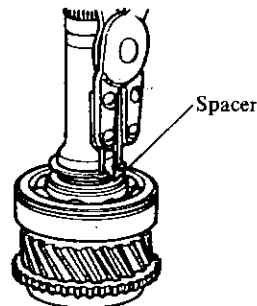


Fig. TM-33 Installing snap ring

Reverse idler gear assembly

10. Before installing reverse idler shaft in transmission case, install spur gear ③ onto shaft ① with the larger groove side, and fit snap ring ② into the groove. With washer ④ placed in its position, insert reverse idler shaft assembly into transmission case from the rear side.

Note: Be sure to align hollow on the surface of this washer with oil groove in the gear.

11. Insert a 0.1 mm (0.0039 in) thickness gauge between spur gear ③ and washer ④. With shaft ① pushed fully toward the front, install washer ⑤ and helical gear ⑥, and then fit a snap ring ⑦ of the suitable thickness into position until a minimum of clearance is obtained.

Standard reverse gear end play:
0.05 to 0.15 mm
(0.0020 to 0.0059 in)

Snap ring

No.	Thickness mm (in)
1.	1.2 (0.0472)
2.	1.4 (0.0551)
3.	1.3 (0.0512)
4.	1.5 (0.0591)
5.	1.1 (0.0433)

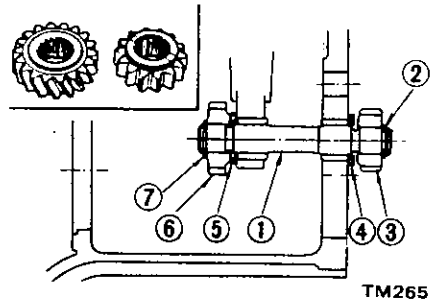


Fig. TM-34 Assembling reverse idler gear

Counter gear assembly

12. To install needle roller bearing ③ in its position, insert the special tool "Counter Shaft Guide ST23100000" in counter gear ①, and then install washer ②, bearing ③ and washer in place.

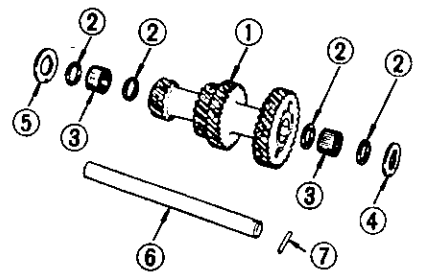


Fig. TM-35 Exploded view of counter gear assembly

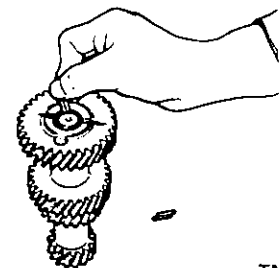


Fig. TM-36 Installing needle roller bearing

13. Install these parts together with washers ④ and ⑤ to the transmission case, and insert countershaft ⑥

TRANSMISSION

into counter gear through the hole of case, and drive pin ⑦ into its hole on the front side of countershaft.

14. Select and install rear thrust washer ⑤ of the suitable thickness until proper counter gear end play is obtained.

Standard counter gear end play:

0.05 to 0.15 mm
(0.0020 to 0.0059 in)

Rear thrust washer

No.	Thickness mm (in)
1.	2.35 to 2.40 (0.0925 to 0.0945)
2.	2.40 to 2.45 (0.0945 to 0.0965)
3.	2.45 to 2.50 (0.0965 to 0.0984)
4.	2.50 to 2.55 (0.0984 to 0.1004)
5.	2.55 to 2.60 (0.1004 to 0.1024)

15. With gears meshed, at two positions, tighten main shaft nut to a torque of 9.0 to 11.0 kg-m (65 to 80 ft-lb), and bend lock plate to secure main shaft nut tightening.

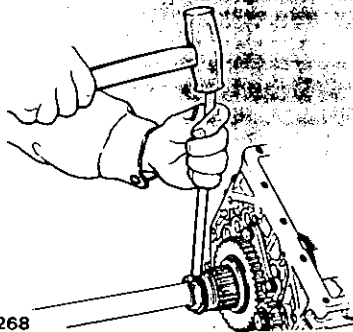


Fig. TM-37 Bending lock plate

16. Align 1st-2nd shift fork ① and 3rd-4th shift fork ② with the grooves on coupling sleeves respectively. Insert 1st-2nd shift rod ③ and drive in pin ⑩ securely. With

1st-2nd shift rod in Neutral position, install interlock plunger ④ and insert 3rd-4th shift rod into position securely.

17. Place 3rd-4th shift rod ⑤ into Neutral position, and install interlock plunger ⑥. Install reverse shift rod ⑨ into reverse shift fork ⑧, and secure with retaining pin ⑩.

18. Install check balls and locking springs at three places in the transmission case, and tighten with plugs.

Before tightening these plugs, apply sealant to plugs.

Plug tightening torque
1.7 to 2.1 kg-m (12 to 15 ft-lb)

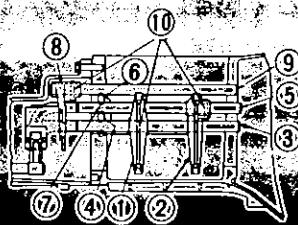


Fig. TM-38 Installing shift rod & shift fork

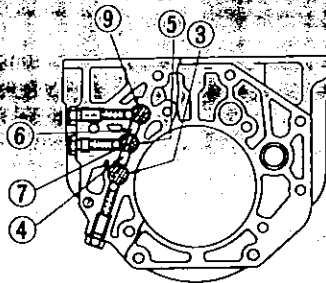


Fig. TM-39 Interlock mechanism

19. Apply gear oil to all sliding parts, and make sure that gears are meshed smoothly in their positions.

20. Make sure that gears are placed into Neutral position, and install extension housing to transmission

case by properly aligning striking lever with shift rod brackets.

Rear extension housing mounting

Note: Apply sealant to each face of gaskets to prevent oil leak.

21. Install front cover on transmission case. Install release bearing, withdrawal lever and dust cover in their positions.

22. Install oil pan to transmission case.

Installation

To install, reverse the order of removal.

Remove filler plug at the inspection hole, and fill the transmission case with gear oil to the level of the filler hole. [Approx. 2.0 liters (½ U.S. gal., ½ Imper. gal.)].

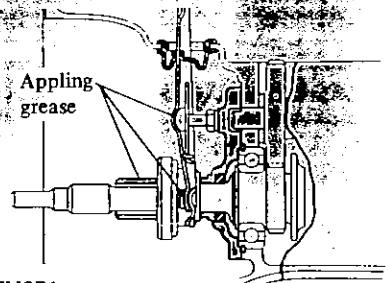


Fig. TM-40 Applying grease

3-SPEED TRANSMISSION

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DESCRIPTION	TM-10.	Inspection	TM-11
REMOVAL	TM-10	Assembly	TM-11
DISASSEMBLY	TM-10	Installation	TM-13

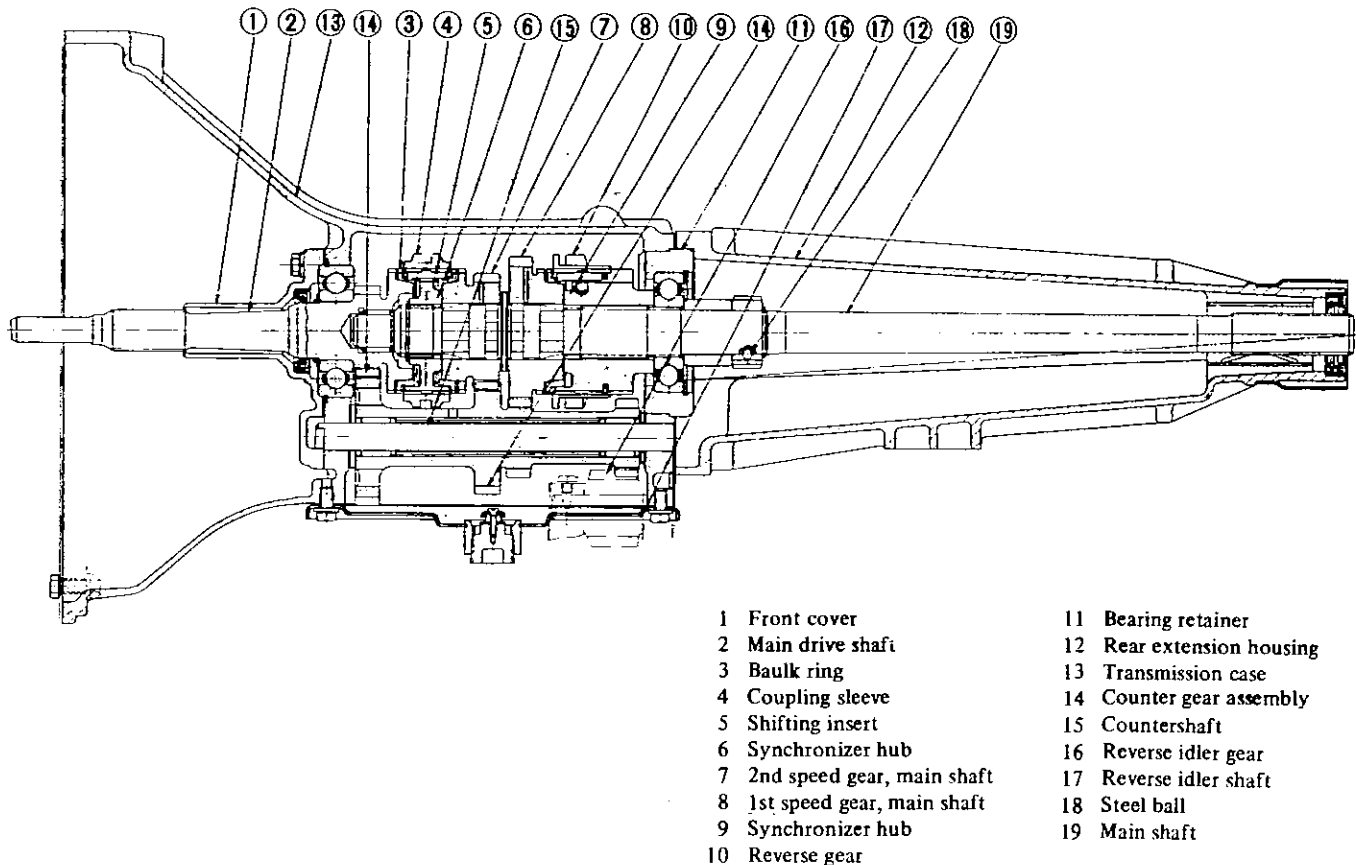
TRANSMISSION

DESCRIPTION

The 3-speed transmission differs from the 4-speed transmission in that the main shaft reverse gear is provided on the outer of 1st-Reverse

coupling sleeve. When the control lever is moved to the reverse position, the coupling sleeve moves to mesh external gear provided on coupling

sleeve with the reverse idler gear. The baulk ring is not used in the reverse gear on the 3-speed transmission.

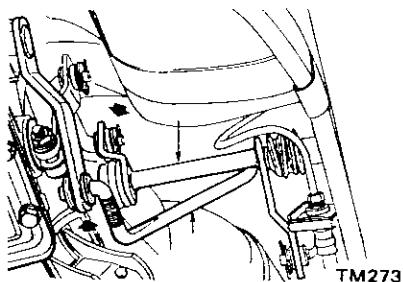


TM272

Fig. TM-41 Sectional view of R3W65 transmission

REMOVAL

Remove shift rods from shift levers and then cross shaft assembly. Hereinafter follow the same procedure of removal as that of the F4W63 transmission.



TM273

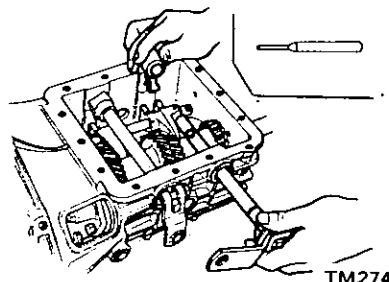
Fig. TM-42 Disconnecting shift rods

DISASSEMBLY

Cross shaft

1. Drive out retaining pin securing cross shaft to operating lever with the use of the special tool "Fork Rod Pin Punch ST23550000."

2. Pry off retaining ring on the change lever side, and withdraw cross shaft and operating lever from transmission case.



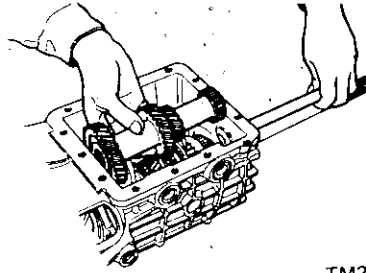
TM274

Fig. TM-43 Drawing out cross shaft

Counter gear and reverse idler gear

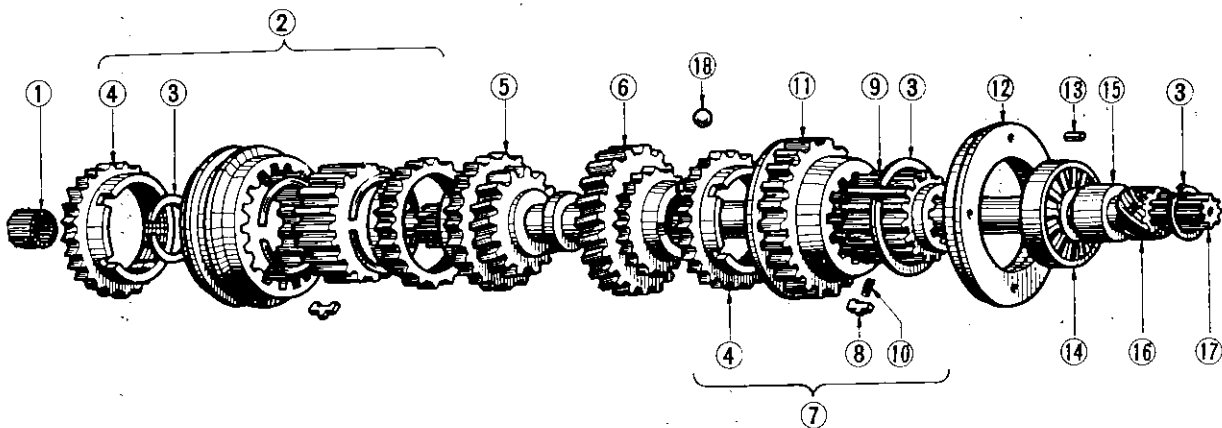
1. Drive out countershaft from the front side of transmission case, and remove counter gear.
2. Remove setscrew from reverse idler shaft, and withdraw idler shaft and take out reverse idler gear.

TRANSMISSION



TM275

Fig. TM-44 Removing counter gear & idler gear



- 1 Pilot bearing
- 2 2nd & 3rd synchromesh assembly
- 3 Snap ring
- 4 Baulk ring
- 5 2nd speed gear, main shaft
- 6 1st speed gear, main shaft

- 7 1st synchromesh assembly
- 8 Shifting insert
- 9 Synchromesh hub
- 10 Synchromesh spring
- 11 Reverse gear
- 12 Bearing retainer

- 13 Locking peg
- 14 Main shaft bearing
- 15 Distance piece
- 16 Speedometer drive gear
- 17 Main shaft
- 18 Steel ball

TM276

Fig. TM-45 Exploded view of main shaft assembly

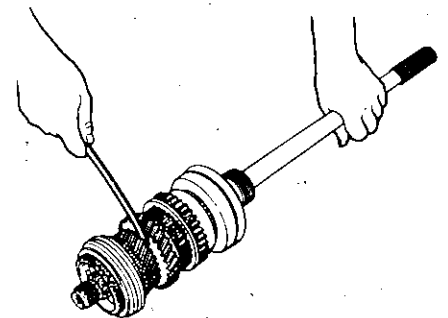
Inspection

1. Check gear end play to insure that it is within the specified limit.
2. If the end play measured is

excessive, disassemble and check the parts for condition. Replace any part which is worn or defective.

Standard end play

	Thickness mm (in)
1st gear	0.05 to 0.22 (0.0217 to 0.0087)
2nd gear	0.10 to 0.22 (0.0039 to 0.0087)
Counter gear	0.04 to 0.12 (0.0016 to 0.0047)
Reverse idler gear	0.20 to 0.40 (0.0079 to 0.0157)



TM277

Fig. TM-46 Measuring end play

Assembly

Synchromesh assembly

1. 1st-Reverse synchromesh assembly.

TRANSMISSION

Fit stopper ring ⑦ into place in synchromesh hub ④, install synchro-springs ⑥ and shifting inserts ③ to the grooves in synchromesh hub, and then assemble reverse gear (1st-Reverse coupling sleeve) in place to synchro hub.

Note: Install reverse gear on synchro hub, paying particular attention to its direction

2. 2nd-3rd synchromesh assembly.

Install coupling sleeve ① to synchro hub ④, insert shifting inserts into grooves in synchro hub, and assemble spread springs to the inner side of shifting inserts pushing them against coupling sleeve on each side of synchro hub.

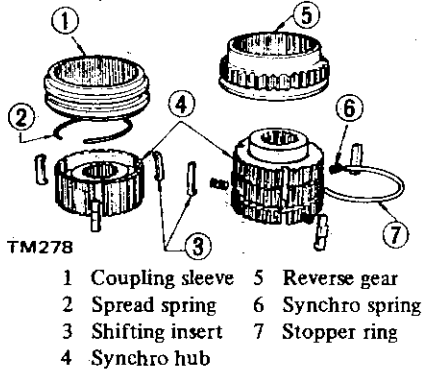


Fig. TM-47 Component parts of synchromesh assembly

Main shaft gear assembly

3. To assemble, reverse the order of disassembly.

4. To secure 2nd-3rd synchro hub to main shaft, use a snap ring of suitable thickness so that there exists a minimum of clearance between synchro hub end face and the groove for snap ring on main shaft.

Available synchro hub snap ring

No.	Thickness mm (in)
1.	1.60 (0.0630)
2.	1.70 (0.0669)
3.	1.80 (0.0709)
4.	1.65 (0.0650)
5.	1.75 (0.0689)

5. To secure speedometer drive gear to main shaft properly, install a snap ring of suitable thickness so that there exists a minimum of clearance between the end face of speedometer drive gear and the groove for snap ring on main shaft.

Available snap ring

No.	Thickness mm (in)
1.	1.30 (0.0512)
2.	1.45 (0.0571)
3.	1.55 (0.0610)
4.	1.65 (0.0650)
5.	1.40 (0.0551)
6.	1.50 (0.0591)
7.	1.60 (0.0630)
8.	1.70 (0.0669)

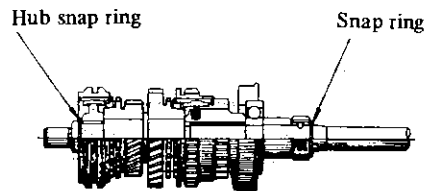


Fig. TM-48 Fitting snap ring

6. Install main shaft assembly to transmission case from the rear side.
7. Install main drive gear to transmission case from the front side.

Reverse idler gear assembly

8. When installing reverse idler gear into transmission case, be sure to align the hole in reverse idler shaft with that in transmission case. Tighten setscrew and lock with lock washer.

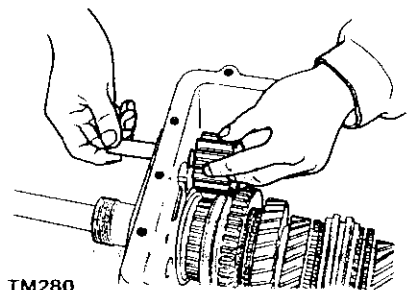


Fig. TM-49 Installing reverse idler gear

Fork rod assembly

9. Install locking spring and check ball in place in transmission case. Refer to Figure TM-50.

10. Install 1st-Reverse fork and 2nd-3rd fork to each groove in coupling sleeves.

11. Insert the special tool "Fork Rod Guide ST23620000" into transmission case.

While holding check ball, push in the tool until lock spring and check ball are positioned in their places.

And install 1st-Reverse fork rod into transmission case driving out Fork Rod Guide with 1st-Reverse fork rod.

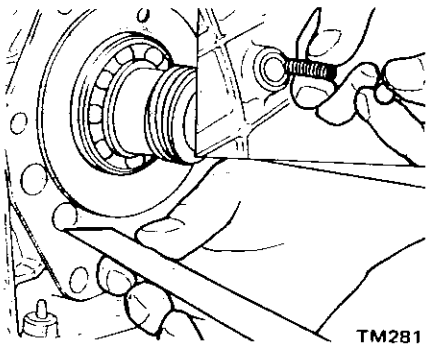


Fig. TM-50 Installing locking spring & check ball

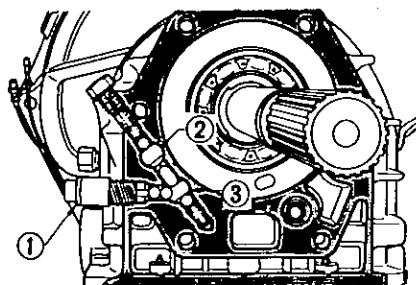
12. Align the holes in shift fork and fork rod, and secure with retaining pin. Place shift fork rod into NEUTRAL position.

13. Place interlock plunger as shown in Figure TM-51, and install 2nd-3rd fork rod in position. Insert check ball and lock spring, and then tighten plug. Insert two check balls and install reverse light switch to transmission case.

Note: Apply sealer to plug and reverse light switch when installing.

14. Align the holes in shift fork and fork rod correctly, drive in retaining pin to lock securely.

TRANSMISSION



TM282

- 1 Reverse light switch
- 2 2nd & 3rd rod
- 3 1st-reverse rod

Fig. TM-51 Interlock mechanism

Counter gear assembly

Refer to the instructions under the topic "4-speed transmission."

Notes:

- a. Install countershaft in place with notch side toward the front.
- b. The washer having a larger outer diameter is the front thrust washer, and that having smaller outer diameter is the rear thrust washer.

15. Standard counter gear end play: 0.04 to 0.12 mm (0.0016 to 0.0047 in)

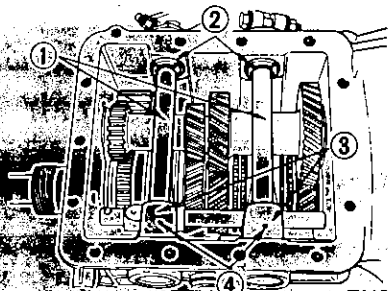
Select rear thrust washer of the proper thickness to obtain a minimum clearance.

Available rear thrust washer

No.	Thickness mm (in)
1.	4.00 to 4.05 (0.1575 to 0.1594)
2.	3.95 to 4.00 (0.1555 to 0.1575)
3.	3.90 to 3.95 (0.1535 to 0.1555)
4.	3.85 to 3.90 (0.1516 to 0.1535)
5.	3.80 to 3.85 (0.1496 to 0.1516)

Cross shaft assembly

16. Install thrust washers ② and operating levers ③ into transmission case while inserting cross shafts ① into transmission case. Lock these parts with retaining rings and lock pins ④.



TM283

Fig. TM-52 Installing cross shaft

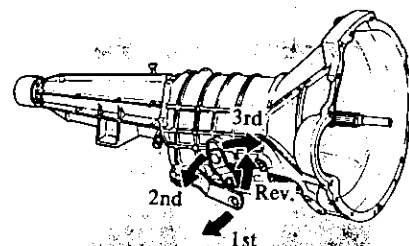
Rear extension assembly

17. Install rear extension housing to transmission case, and then insert

speedometer drive gear into rear extension housing.

Note: Apply sealant on each surface of gasket when installing.

18. Move change lever in the directions as shown in Figure TM-53 to see if gears mesh smoothly.



TM284

Fig. TM-53 Checking change lever operation

Installation

To install, reverse the order of removal.

Notes:

- a. Sufficiently charge grease into the cross shaft boot of control linkage.
- b. Operate hand lever to see if gear shifting is made smoothly.

TRANSMISSION GEAR CONTROL (3-SPEED MANUAL TRANSMISSION)

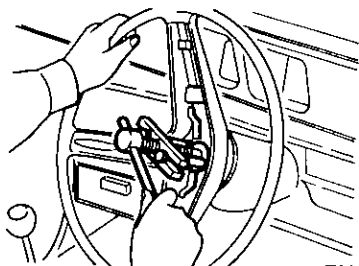
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Inspection and repair TM-14

Installation and adjustment TM-14

Removal

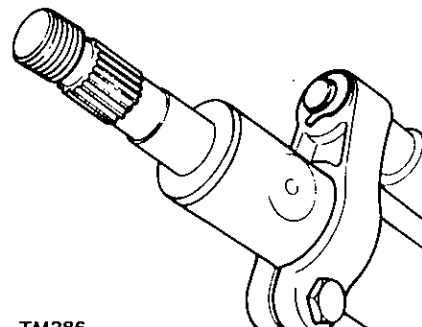
1. Remove steering wheel.



TM285

Fig. TM-54 Removing steering wheel

2. Remove steering column shell, turn signal, lighting switch assembly.
3. Remove "C" washer and washer. Back off locating bolt and upper support bracket securing bolt and remove upper support bracket.

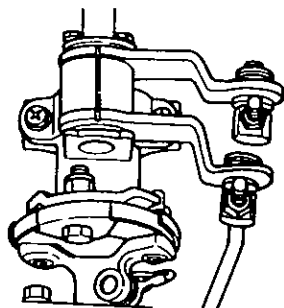


TM286

Fig. TM-55 Removing upper bracket

TRANSMISSION

4. Remove snap ring and control lever pivot pin, and withdraw hand lever.
5. Remove cotter pins, plain washers and spring washers from trunnions at change levers and then separate shift rods from change levers.



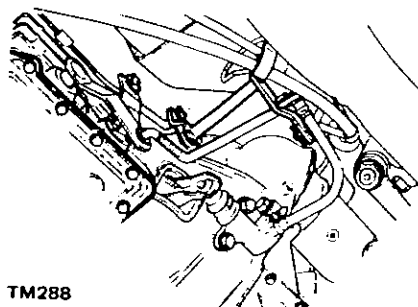
TM287

Fig. TM-56 Removing lower bracket

6. Remove bolts securing lower support bracket to clamp.
7. Remove clamp and change lever retainer.

8. Remove 2nd-3rd change lever, lower support bracket, 1st-reverse change lever from control rod.
9. Withdraw control rod.
10. Pull out cotter pins and remove shift rods at change levers.

Separate cross shaft bracket from side member and remove cross shaft assembly.



TM288

Fig. TM-57 Removing cross shaft assembly

Inspection and repair

Clean parts and check for wear or

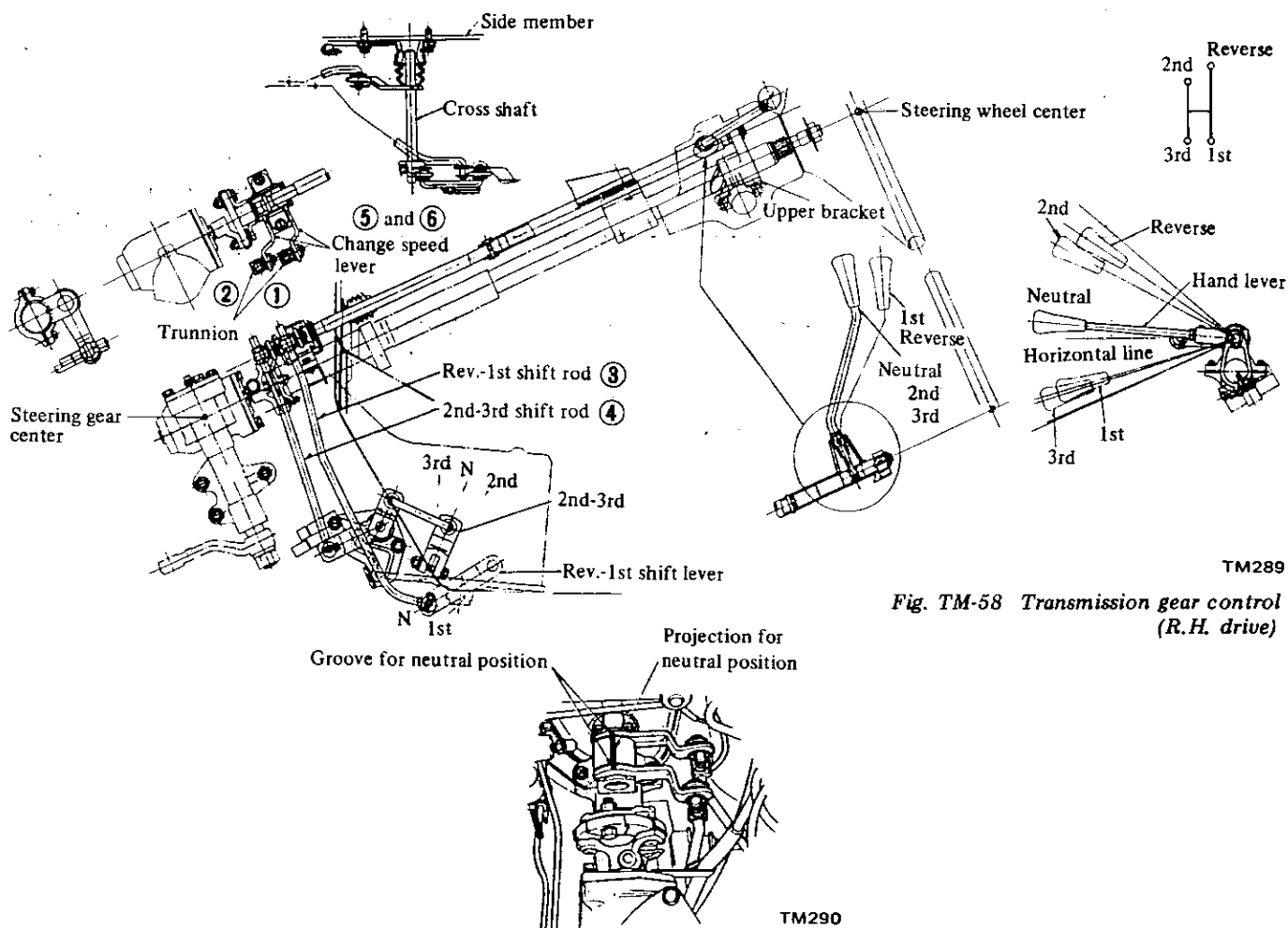
damage. If necessary, replace.

Installation and adjustment

To install, reverse the order of removal.

Adjustment for Neutral Position

1. Install 1st-Reverse shift rod ③ and 2nd-3rd shift rod ④ to respective trunnions ① and ② on the tip of 1st-Reverse change lever and 2nd-3rd change lever. Temporarily tighten these parts.
2. Place 1st-Reverse shift rod ③ and 2nd-3rd shift rod ④ into Neutral position.
3. Adjust screws securing shift rods to trunnions until a projection on lower bracket is aligned with the grooves in change levers ⑤ and ⑥ properly. See Figure TM-59.



TM289

Fig. TM-58 Transmission gear control (R.H. drive)

Fig. TM-59 Adjusting neutral position

TM290

TRANSMISSION

AUTOMATIC TRANSMISSION

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Installation	TM-16		
AUTOMATIC TRANSMISSION GEAR CONTROL	TM-16		

AUTOMATIC TRANSMISSION

For details, refer to the Automatic Transmission Service Manual.

Removal

1. Jack up vehicle and support it with stands.

Use a hydraulic hoist or open pit, if available.

2. Disconnect cables from battery terminals.

3. Disengage torsion shaft from accelerator linkage.

4. Disconnect front exhaust tube.

5. Disconnect select rod from select lever. (Floor shift)

Disconnect lower select rod from cross shaft, and remove cross shaft. (Column shift)

6. Disconnect wiring to inhibitor switch at connections.

7. Disconnect speedometer cable from rear extension housing.

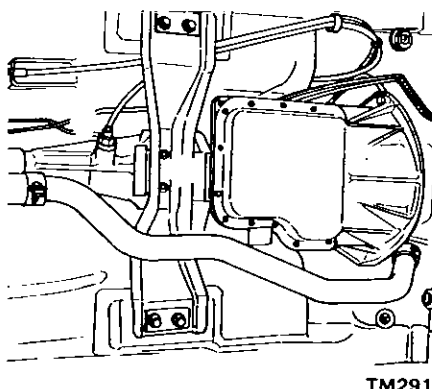


Fig. TM-60 Removing transmission

8. Disconnect oil cooler inlet and outlet tubes.

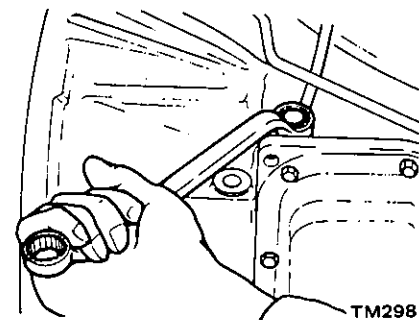
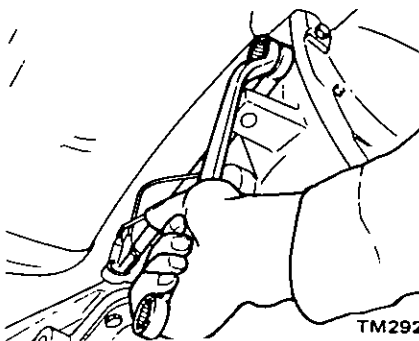


Fig. TM-61 Disconnecting oil cooler tubes

9. Disconnect vacuum tube from vacuum diaphragm, and then at connections wiring shift-down solenoid.

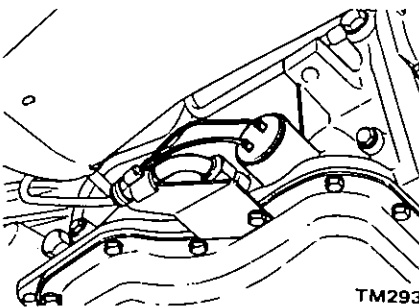


Fig. TM-62 Disconnecting vacuum tube & wiring to solenoid

10. Disengage propeller shaft.

11. Support engine by placing a jack beneath oil pan with a wooden block between oil pan and a jack, being careful not to allow jack striking drain plug.

12. Detach converter housing dust cover. Remove bolts securing torque converter to drive plate.

Note: Before removing torque converter, scribe match marks on two parts so that they may be replaced in their original positions at assembly.

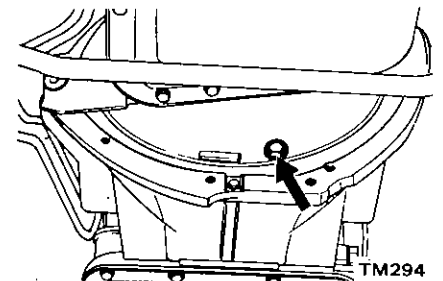


Fig. TM-63 Removing torque converter-to-drive plate bolts

13. Remove two bolts securing transmission case to rear engine mounting insulator. Remove four cross member attaching bolts.

14. Dismount starter motor.

15. Lower the jack just enough to facilitate removal of bolts securing transmission case to engine. Remove these bolts.

16. Lower the jack gradually until transmission can be removed and take out transmission under the vehicle.

17. If necessary, drain out oil in transmission case by removing drain

TRANSMISSION

plug. If the same oil is to be used again, filter the oil through a 100-mesh screen. Do not reuse the oil if it contains sludges, scales, etc. which may be harmful to the working parts.

Installation

To install, reverse the order of removal.

Pour the specified automatic transmission fluid into transmission case. [5.5 liters (1 ½ U.S. gal., 1 ¼ Imper. gal.)]

AUTOMATIC TRANSMISSION GEAR CONTROL

Removal (Column shift)

Disconnect upper select rod from select lever by removing cotter pin,

plain washer and spring washer at trunnion.

2. Remove speed range position plate from lower bracket clamp by backing off two bolts.

3. Remove lower bracket and lower support bracket clamp by unscrewing fixing bolts.

4. Remove indicator arm fixing screw and washer. Remove indicator arm from upper end of control rod.

5. Remove bolt, plain washer, C-washer.

Control rod can then be removed together with control rod insert, return spring etc.

(1) Prior to installing control knob, set the dimension A to 11 to 12 mm (0.433 to 0.472 in).

(2) After installing control knob, make sure that clearances B is 0.1 to 1.1 mm (0.0039 to 0.0433 in) and C is 1.0 mm (0.0394 in) respectively.

2. Adjustment of control linkage.

(1) Set selector lever located on the side face of transmission case at Neutral position.

(2) Set control lever ② at Neutral position on control lever bracket.

(3) Set each lever at Neutral position by turning in or out adjust nut at the trunnion which connects selector rod, and secure with lock nut. After adjusting, make sure that control lever can be set in any position correctly and that selector lever operates properly without any binding. If levers do not operate satisfactorily, readjust or replace parts as necessary.

Installation and adjustment

Floor shift

1. Adjustment of control lever.

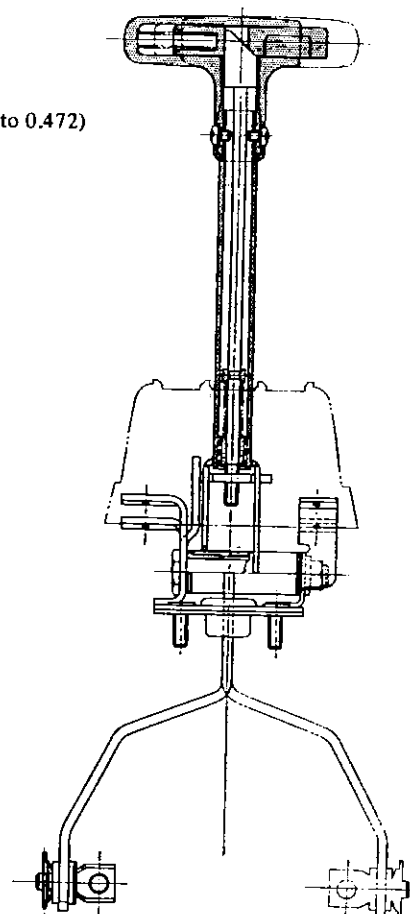
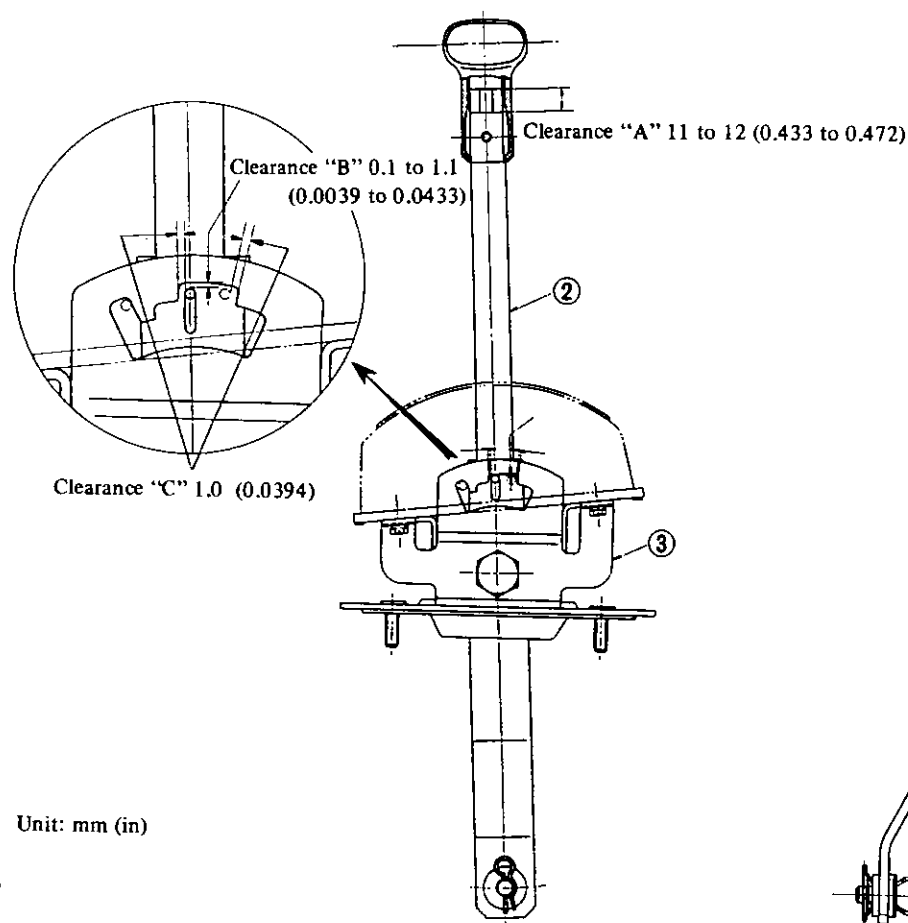


Fig. TM-64 Automatic transmission gear control (floor shift)

TRANSMISSION

Column shift

To install control system, reverse the order of removal, observing the following instructions.

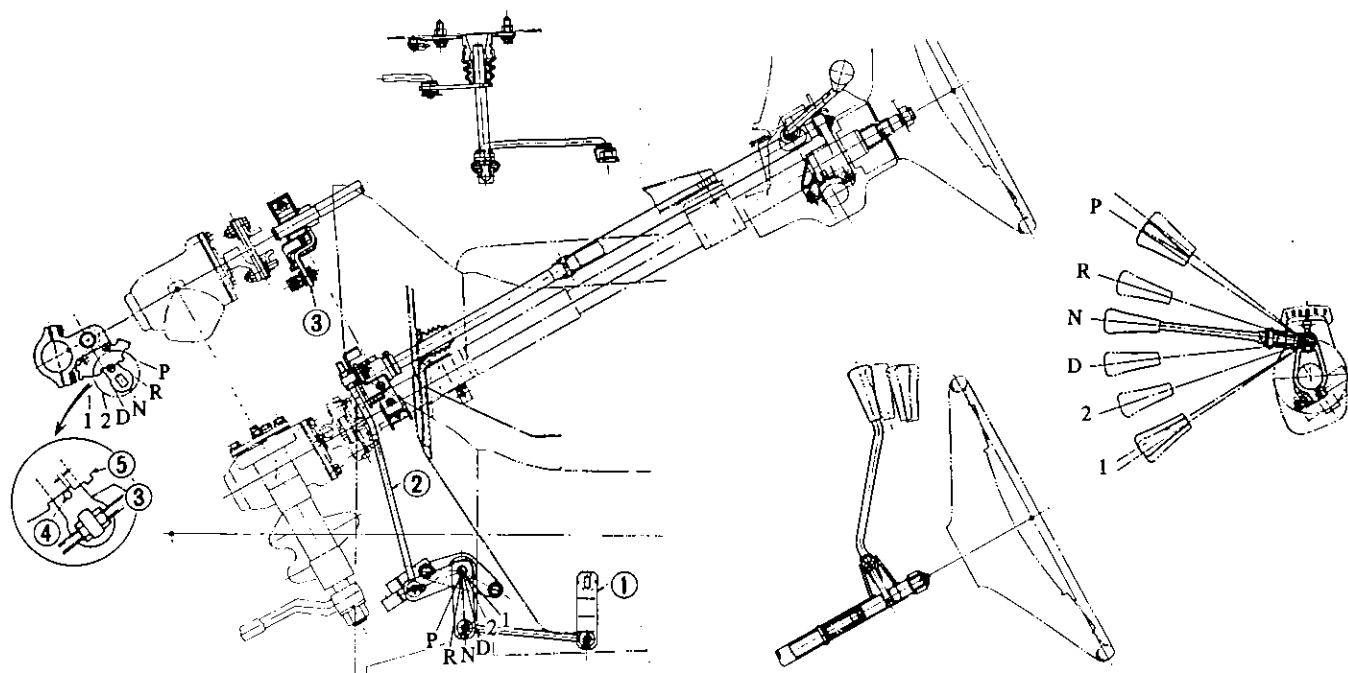
1. Coat sliding surfaces with multi-purpose grease.

2. Set select lever ① (at converter) in Neutral and place hand lever in Neutral.

3. Install upper select rod ② to select lever ③.

Adjust trunnion nuts while push-

ing down upper select rod slightly so that the clearance between select lever stopper pin ④ and speed range position plate ⑤ is 0.5 to 1.0 mm (0.0197 to 0.0394 in).



TM296

Fig. TM-65 Automatic transmission gear control (column shift)

SERVICE DATA AND SPECIFICATIONS

GENERAL SPECIFICATIONS

Type	F4W63	F4C63	R3W65	3N71B
No. of speeds	4-forward, 1-reverse	4-forward, 1-reverse	3-forward, 1-reverse	3-forward, 1-reverse
Synchromesh type	Warner	Servo	Warner	
Gear ratio				
1st	3.382	3.382	3.263	2.458
2nd	2.013	2.013	1.645	1.458
3rd	1.312	1.312	1.000	1.000
4th	1.000	1.000	—	—
Rev.	3.365	3.365	3.355	2.182

* Torque ratio 2.0 : 1

TRANSMISSION

SPEEDOMETER PINION

Automatic transmission

	Models	Numbers of teeth Drive/Driven	Final gear ratio
Sedan	1.8ℓ (except U.S.A. and Canada)	6/19	3.700
	1.8ℓ (U.S.A. and Canada)	6/20	3.900
	1.6ℓ	6/20	3.900
Wagon	1.8ℓ	6/20	3.889

Manual transmission

	Models	Numbers of teeth Drive/Driven	Final gear ratio
Sedan	1.8ℓ	5/16*	3.700
	1.6ℓ	5/16	3.900
Wagon		5/16*	3.889
Van		5/18	4.375

* 5/17 for U.S.A. and Canada

TIGHTENING TORQUE

Manual transmission

Unit: kg-m (ft-lb)

	F4W63 F4C 63	R3W65
Transmission installation bolt (Transmission and engine connecting bolts)	2.5 to 4.0 (18 to 29)	←
Dust cover (Transmission case)	0.3 to 0.4 (8.0 to 13)	0.8 to 1.0 (5.8 to 7.2)
Front cover securing bolt	1.1 to 1.8 (5.8 to 7.2)	1.1 to 1.7 (8.0 to 12)
Rear extension installation bolt	1.6 to 2.5 (12 to 18)	3.3 to 4.4 (24 to 32)
Bottom cover	1.1 to 1.8 (8.0 to 13)	1.1 to 1.7 (8.0 to 12)
Reverse idler shaft set screw	—	0.7 to 1.1 (5.1 to 8.0)
Check ball plug	1.7 to 2.1 (12 to 15)	←
Main shaft nut	7.0 to 12.0 (51 to 87)	—
Main shaft bearing retainer securing bolt	0.8 to 1.0 (5.8 to 7.2)	—
Speedometer pinion sleeve locking plate securing bolt	0.3 to 0.4 (2.2 to 2.9)	—
Reverse lamp switch	2.0 to 3.0 (14 to 22)	←
Control lever installation nut	1.9 to 2.2 (14 to 16)	—
Lower bracket installation bolt	—	0.5 to 0.7 (3.6 to 5.1)
Shift rod installation nut	—	0.8 to 1.1 (5.8 to 8.0)
Cross shaft bracket installation bolt	—	0.8 to 1.1 (5.8 to 8.0)
Change lever installation bolt	—	0.8 to 1.0 (5.8 to 7.2)

TRANSMISSION

Automatic transmission

Unit: kg-m (ft-lb)

Drive plate to crankshaft	14.0 to 16.0 (101 to 116)
Drive plate to torque convertor	4.0 to 5.0 (30 to 36)
Convertor housing to engine	4.0 to 5.0 (30 to 36)
Transmission case to converter housing	4.0 to 5.0 (30 to 36)
Transmission case to rear extension	2.0 to 2.5 (15 to 18)
Oil pan to transmission case	0.5 to 0.7 (3.6 to 5.1)
Servo piston retainer to transmission case	0.5 to 0.7 (3.6 to 5.1)
Piston stem (when adjusting band brake)	*1.2 to 1.5 (87. to 10.8)
Piston stem lock nut	1.5 to 4.0 (11 to 29)
One way clutch inner race to transmission case	1.3 to 1.8 (9.4 to 13)
Control valve body to transmission case	0.55 to 0.75 (4.0 to 5.4)
Lower valve body to upper valve body	0.25 to 0.35 (1.9 to 2.5)
Side plate to control valve body	0.25 to 0.35 (1.9 to 2.5)
Nut for control valve reamer bolt	0.5 to 0.7 (3.6 to 5.1)
Oil strainer to lower valve body	0.25 to 0.35 (1.9 to 2.5)
Governor valve body to oil distributor	0.5 to 0.7 (3.6 to 5.1)
Oil pump housing to oil pump cover	0.6 to 0.8 (4.4 to 5.7)
Inhibitor switch to transmission case	0.5 to 0.7 (3.6 to 5.1)
Manual shaft lock nut	3.0 to 4.0 (22 to 29)
Lock nut for oil cooler pipe connector to transmission case	5.0 to 7.0 (30 to 50)
Test plug (oil pressure inspection hole)	1.4 to 2.1 (10 to 15)
Support actuator (parking rod inserting position) to rear extension	0.8 to 1.1 (4.4 to 7.4)

* Turn back two turns after tightening.

SPECIFICATIONS (Manual transmission)

Unit: mm (in)

	F4W63 F4C 63	R3W65
Gear backlash		
All gears	0.05 to 0.14 (0.0020 to 0.0055)	←
Gear end play		
1st gear	0.05 to 0.15 (0.0020 to 0.0059)	0.05 to 0.22 (0.0020 to 0.0087)
2nd gear	0.05 to 0.15 (0.0020 to 0.0059)	0.10 to 0.22 (0.0039 to 0.0087)
3rd gear	0.05 to 0.15 (0.0020 to 0.0059)	—
Counter gear	0.05 to 0.15 (0.0020 to 0.0059)	0.04 to 0.12 (0.0016 to 0.0047)
Rev. idler gear	0.05 to 0.15 (0.0020 to 0.0059)	0.20 to 0.40 (0.0079 to 0.0157)
Clearance between baulk and clutch gear	1.2 to 1.6 (0.0472 to 0.0630) * F4W63	←

TRANSMISSION

SPECIFICATIONS (Automatic transmission)

General

Torque converter

Type	Symmetrical 3-element 1-stage 2-phase torque converter coupling
Stall torque ratio	2.0 : 1

Transmission

Type	3-speed forward and one-speed reverse with planetary gear train
Control elements:	
Multi-disc clutch	2
Band brake	1
Multi-disc brake	1
One-way clutch	1
Gear ratio	
1st	2.458
2nd	1.458
3rd	1.000
Reverse	2.182
Gear shift positions	
P (Park)	The transmission is placed in neutral. The output shaft is fixed. The engine can be started.
R (Reverse)	Backward running
N (Neutral)	The transmission is in neutral. The engine can be started.
D (Drive)	Up- or downshifts automatically to and from 1st, 2nd, and top.
2 (2nd lock)	Fixed at 2nd
1 (Lock up)	Fixed at low or downshifts from 2nd
Speed selecting control	Floor shift and remote control type

Oil pump

Type	Internally intermeshing involute gear pump
Number of pump	1
Oil	Automatic transmission fluid "Dexron type"
Capacity	5.5 liters (5 7/8 U.S. qt., 4 7/8 Imper. qt.) Approximately 4 liters (4 1/4 U.S. qt., 3 1/2 Imper. qt.) in torque converter

Hydraulic control system	Controlled by detecting the negative pressure of intake manifold and the revolution speed of output shaft.
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Lubrication system	Forced lubrication by an oil pump
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Cooling system	Water-cooled by a circulation-type auxiliary cooler (located at the radiator)
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TRANSMISSION

Specifications and adjustment

Items		T/M model	NL18U	NL18LU
Applied case model	Car model		610 W610	610 W610
	Engine model		L16, L18	L18
	Steering wheel position		L.H. R.H.	L.H.
	Shift lever position		Floor	Column
Front clutch	Drive plate numbers thickness mm (in)		3 1.6 (0.063)	←
	Driven plate numbers		3	←
	Front clutch thrust washer mm (in)		1.5 (0.059) 1.7 (0.067) 1.9 (0.075) 2.1 (0.083) 2.3 (0.091) 2.5 (0.098) 2.7 (0.106)	←
	Retaining plate mm (in)		10.6 (0.417) 10.8 (0.425) 11.0 (0.433) 11.2 (0.441) 11.4 (0.449) 11.6 (0.457)	←
	Front clutch clearance mm (in)		1.6 to 1.8 (0.063 to 0.071)	←
Rear clutch	Drive plate numbers thickness mm (in)		4 1.6 (0.063)	←
	Driven plate numbers		4	←

TRANSMISSION

Items (Section and character No. of parts number)		T/M model	NL18U	NL18LU
Low & Reverse brake	Rear clutch clearance	mm (in)	1.00 to 1.50 (0.039 to 0.059)	←
	Drive plate numbers		4	←
	thickness	mm (in)	2.0 (0.079)	
	Driven plate thickness		4	←
	Retaining plate	mm (in)	15.8 (0.622) 16.0 (0.630) 16.2 (0.638) 16.4 (0.646) 16.6 (0.654) 16.8 (0.661)	←
	Clutch clearance	mm (in)	0.80 to 1.05 (0.031 to 0.041)	←

Engine idling and stall revolution

Engine idling	600 rpm in D range
Stall revolution	1,800 to 2,200 rpm

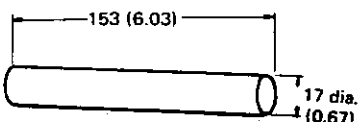
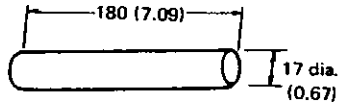
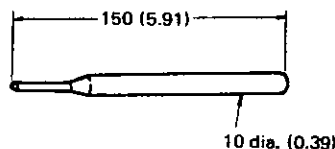
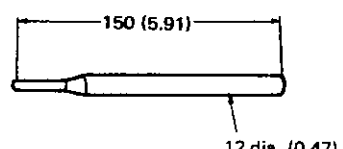
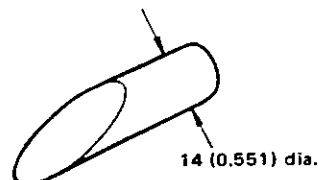
TRANSMISSION

TROUBLE DIAGNOSES AND CORRECTIONS

Condition	Probable cause	Corrective action
Difficult to intermesh gears. (Difficult gear shifting are due to troubles in control system and transmission. When gear shift lever is heavy or it is difficult to shift gears, clutch disengagement may also be unsmooth. First, make sure that clutch operates correctly, and then inspect transmission.)	Worn gears, shaft, and/or bearing. Insufficient operating stroke due to worn or loose sliding part. Defective or damaged synchronizer.	Replace Repair or replace. Replace.
Gear slips out of mesh. (In most cases, this trouble occurs when interlock plunger, check ball, and/or spring is worn or weakened, or when control system is defective. In this case, the trouble cannot be corrected by replacing gears. 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. Worn check ball and/or weakened or broken spring. Worn fork rod ball groove. Worn or damaged bearing. Worn or damaged gear.	Replace. Replace. Replace. Replace. Replace.
Transmission is noisy. When noise occurs with engine idling, and ceases when clutch is disengaged, or when noise occurs while shifting gears, the noise is from transmission.	Insufficient or improper lubricant. Oil leaking due to defective oil seal and gasket, clogged breather, etc. Worn bearing (High humming occurs at a high speed.) Damaged bearing (Cyclic knocking sound occurs also at a low speed.) Worn spline. Worn bushing.	Add oil or replace with designated oil. Clean or replace. Replace. Replace. Replace. Replace.

TRANSMISSION

SPECIAL SERVICE TOOL

No.	Tool number & tool name	Description Unit: mm (in)	For use on	Reference page or figure No.
1.	ST23100000 Countershaft guide		This tool is used to prevent needle bearing from falling off when countershaft is removed from, or inserted into, the transmission case. F4W63 T/M E10	Fig. TM-11
2.	ST23110000 Countershaft guide		Same as above. R3W65 T/M	
3.	ST23540000 Fork rod pin punch		This tool is used to drive out fork rod pin. F4W63 T/M	Fig. TM-10
4.	ST23550000 Cross bar pin punch		This tool is used to drive out cross bar spring pin. (3-speed transmission model only) R3W65 T/M	Fig. TM-43
5.	ST23620000 Interlock ball guide		This tool is used as a guide for inserting interlock balls. R3W65 T/M	Fig. TM-50

SERVICE MANUAL

DATSUN 1800
MODEL 610 SERIES
CHASSIS & BODY



NISSAN MOTOR CO., LTD.
TOKYO, JAPAN

SECTION PD

PROPELLER SHAFT & DIFFERENTIAL CARRIER

PD

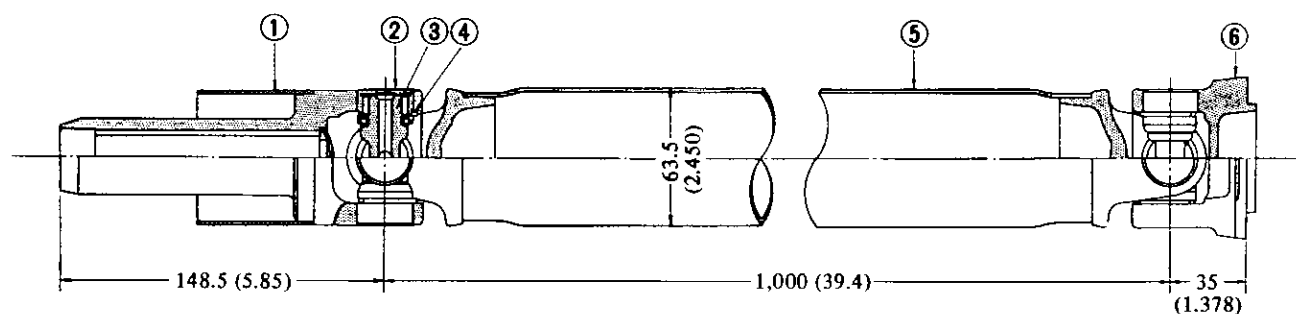
PROPELLER SHAFT AND CENTER BEARING	PD- 2
DIFFERENTIAL CARRIER	PD- 6
SPECIAL SERVICE TOOL	PD-30

PROPELLER SHAFT & DIFFERENTIAL CARRIER

PROPELLER SHAFT AND CENTER BEARING

CONTENTS

DESCRIPTION	PD-3	INSTALLATION	PD-4
REMOVAL	PD-3	SERVICE DATA	PD-4
DISASSEMBLY	PD-3	TROUBLE DIAGNOSES AND	
INSPECTION	PD-3	CORRECTIONS	PD-5
ASSEMBLY	PD-3		

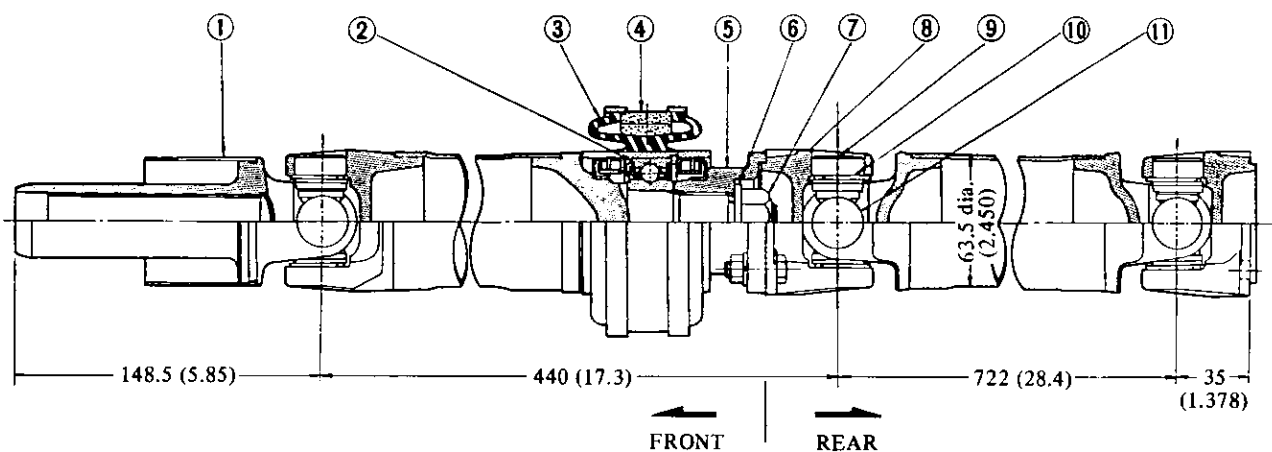


PD169

- | | |
|-------------------------|---------------------------------|
| 1 Sleeve yoke assembly | 4 Snap ring |
| 2 Bearing race assembly | 5 Propeller shaft tube assembly |
| 3 Journal assembly | 6 Flange yoke |

Unit: mm (in)

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



PD170

- | | | |
|----------------------------|--------------------|-------------------------|
| 1 Sleeve yoke assembly | 5 Companion flange | 9 Bearing race assembly |
| 2 Center bearing | 6 Plain washer | 10 Snap ring |
| 3 Center bearing insulator | 7 Self locking nut | 11 Journal assembly |
| 4 Cushion rubber | 8 Flange yoke | |

Unit: mm (in)

Fig. PD-2 Cross-sectional view of propeller shaft for station wagon and van

PROPELLER SHAFT & DIFFERENTIAL CARRIER

DESCRIPTION

On sedan equipped with the independent rear suspension, the propeller shaft is 2-joint type. And on station wagon and van with the rigid axle, the shaft is 3-joint type.

In either design, the propeller shaft and universal joint assembly is carefully balanced during original assembly; that is, the dynamic unbalance is under 15 gr-cm (0.2 in-oz) at 4,000 rpm for 2-joint type, and under 35 gr-cm (0.5 in-oz) at 5,800 rpm for 3-joint type.

If the propeller shaft has to be disassembled, it must be made carefully so that the above limit is not exceeded. Therefore when the vehicle is to be undercoated, cover the propeller shaft and universal joints to prevent application of the undercoating material.

REMOVAL

1. Raise vehicle on hoist. Mark relationship of shaft to companion flange so that shaft can be reinstalled in the same position.
2. Remove bolts connecting shaft to companion flange. Moreover, remove bolts ① retaining center bearing bracket in case of the 3-joint type.

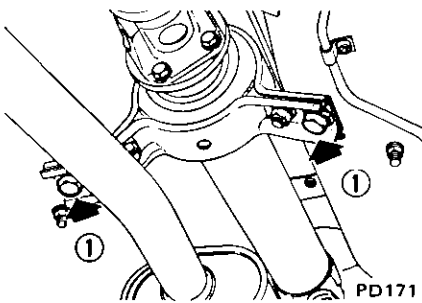


Fig. PD-3 Removing center bearing bracket

3. Withdraw propeller shaft sleeve yoke from transmission by moving shaft rearward, passing it under the rear axle.

Watch for oil leakage from transmission end.

Note: Remove propeller shaft carefully so as not to damage spline, sleeve yoke and rear oil seal.

DISASSEMBLY

Primarily, do not disassemble propeller shaft because it is balanced as an assembly. However, check propeller shaft with journal for movement. When journal does not move smoothly, disassemble.

1. Mark relationship across propeller shaft and journal so that the original combination is restored at assembly.
2. Remove snap ring with a standard screwdriver.
3. Lightly tap base of yoke with a hammer, and withdraw bearing race.

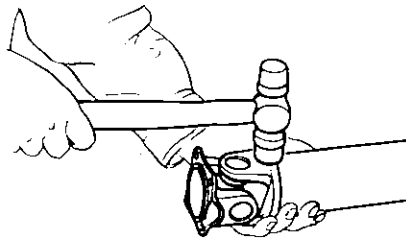
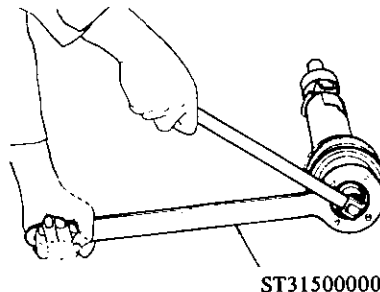


Fig. PD-4 Removing bearing

Note: When removing journal from yoke, be careful not to damage journal and yoke hole.

When disassembling and repairing center bearing are required, the following procedures are applied.

1. Mark relationship across flange and front propeller shaft. Remove bolts connecting flange yoke to companion flange.
2. Applying special tool "Drive Pinion Flange Wrench ST31530000," loosen off locking nut and remove center bearing.



PD172

Fig. PD-5 Removing lock nut

INSPECTION

1. Check journal pin for dent or brinell marks, and yoke hole for sign of wear or damage.

Snap ring, bearing and seal ring should also be inspected to see if these are damaged, worn or deformed. Replace if necessary.

2. Check center bearing by rotating bearing race. If it is rough, noisy or damaged, discard. Cracked bearing insulator cannot be tolerated here.

3. Check propeller shaft tube surface for dent or crack. Change if necessary.

ASSEMBLY

To assemble, reverse the foregoing procedure using reference marks prescribed in "Removal" and "Disassembly" procedure.

New bearing need not be lubricated since it is lubricated for life. Fill joint with grease whenever propeller shaft is overhauled.

Use related snap rings of the same thickness and be sure that play is below 0.02 mm (0.0008 in).

Available snap ring

Thickness mm (in)	Color identification
2.00 (0.0788)	White
2.02 (0.0795)	Yellow
2.04 (0.0803)	Red
2.06 (0.0811)	Green
2.08 (0.0819)	Blue
2.10 (0.0827)	Light brown
2.12 (0.0835)	No paint

PROPELLER SHAFT & DIFFERENTIAL CARRIER

Assembling should also be of such that the joint for freedom of movement is below 15 kg-cm (13 in-lb).

When the above steps are complete, place the shaft in a balancing machine and adjust unbalance to 15 gr-cm (0.2 in-oz) or below at 4,000 rpm for 2-joint type, and 35 gr-cm (0.5 in-oz) or below at 5,800 rpm for 3-joint type.

Center bearing assembly procedures are as follows:

The first step is to install center bearing in center bearing insulator. Then, install center bearing assembly and companion flange on front shaft using reference marks established in "Disassembly" procedure. Install washer and lock nut on front shaft and

torque nut using special tool (ST31530000) to specified torque.

Tightening torque:

20 to 24 kg-m (145 to 174 ft-lb)

Join companion flange of front shaft with flange yoke of rear shaft and tighten connect bolts to specified torque.

Tightening torque:

2.0 to 2.7 kg-m
(14.5 to 19.5 ft-lb)

Install center bearing bracket on center bearing and tighten nuts to specified torque.

Tightening torque:

1.9 to 2.6 kg-m
(13.7 to 18.8 ft-lb)

INSTALLATION

To install, reverse the foregoing removal procedure.

Align propeller shaft with companion flange using reference marks prescribed in "Removal" procedure and assemble with bolts.

Tightening torque:

2.0 to 2.7 kg-m
(14.5 to 19.5 ft-lb)

Insert bolts through the holes of center bearing bracket and torque bolts to retain center bearing on body.

Tightening torque:

3.6 to 4.8 kg-m
(26.0 to 34.7 ft-lb)

SERVICE DATA

Item		Type	
		2-joint type	3-joint type
Permissible dynamic unbalance	gr-cm (in-oz)	15 (0.2) at 4,000 rpm	35 (0.5) at 5,800 rpm
Axial play of spider journal	mm (in)	less than 0.02 (0.0008)	
Journal swinging torque	kg-cm (in-lb)	less than 15 (13.0)	
Propeller shaft (front and rear) out of round	mm (in)	less than 0.6 (0.024)	
Tightening torque Shaft to companion flange (gear carrier) bolts	kg-m (ft-lb)	2.0 to 2.7 (14.5 to 19.5)	
Companion flange fixing nut (front shaft)	kg-m (ft-lb)	—	20 to 24 (144.6 to 173.5)
Flange yoke (rear shaft) to companion flange (front shaft) bolts	kg-m (ft-lb)	—	2.0 to 2.7 (14.5 to 19.5)
Center bearing bracket fixing nuts	kg-m (ft-lb)	—	1.9 to 2.6 (13.7 to 18.8)
Center bearing bracket to body bolts	kg-m (ft-lb)	—	3.6 to 4.8 (26.0 to 34.7)

PROPELLER SHAFT & DIFFERENTIAL CARRIER

TROUBLE DIAGNOSES AND CORRECTIONS

Condition	Probable cause	Corrective action
Vibration during at medium or high speed.	Worn or damaged universal joint needle bearing. Unbalance due to bent or dented propeller shaft. Loose propeller shaft installation. Worn transmission rear extension bushing. Damaged center bearing or insulator. Tight universal joints. Undercoating or mud on the shaft causing unbalance. Tire unbalance. Balance weights missing.	Replace. Replace. Retighten. Replace. Replace. Impact yokes with hammer to free up. Replace joint if unable to free up or if joint feels rough when rotated by hand. Clean up shaft. Balance wheel and tire assembly or replace from known good car. Replace.
Knocking sound during starting or noise during coasting on propeller shaft.	Worn damaged universal joint. Worn sleeve yoke and main shaft spline. Loose propeller shaft installation. Loose joint installation. Damaged center bearing or insulator. Loose or missing bolts at center bearing bracket to body.	Replace. Replace. Retighten. Adjust snap ring. Replace. Replace or tighten bolts.
Scraping noise	Dust cover on sleeve yoke rubbing on transmission rear extension. Dust cover on companion flange rubbing on differential carrier.	Straighten out dust cover to remove interference.
Whine or whistle	Damaged center bearing.	Replace.

PROPELLER SHAFT & DIFFERENTIAL CARRIER

DIFFERENTIAL CARRIER

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DESCRIPTION

The differential carrier on the 610 series is prepared three different types as follows:

- For sedan
- For station wagon
- For van

The differentials should be lubricated with oils meeting requirements of MIL-L-2105B or API GL-5. Renew the oil for the first 1,000 km (600 miles) of operation. The oil should then be changed every 50,000 km

(30,000 miles) maximum.

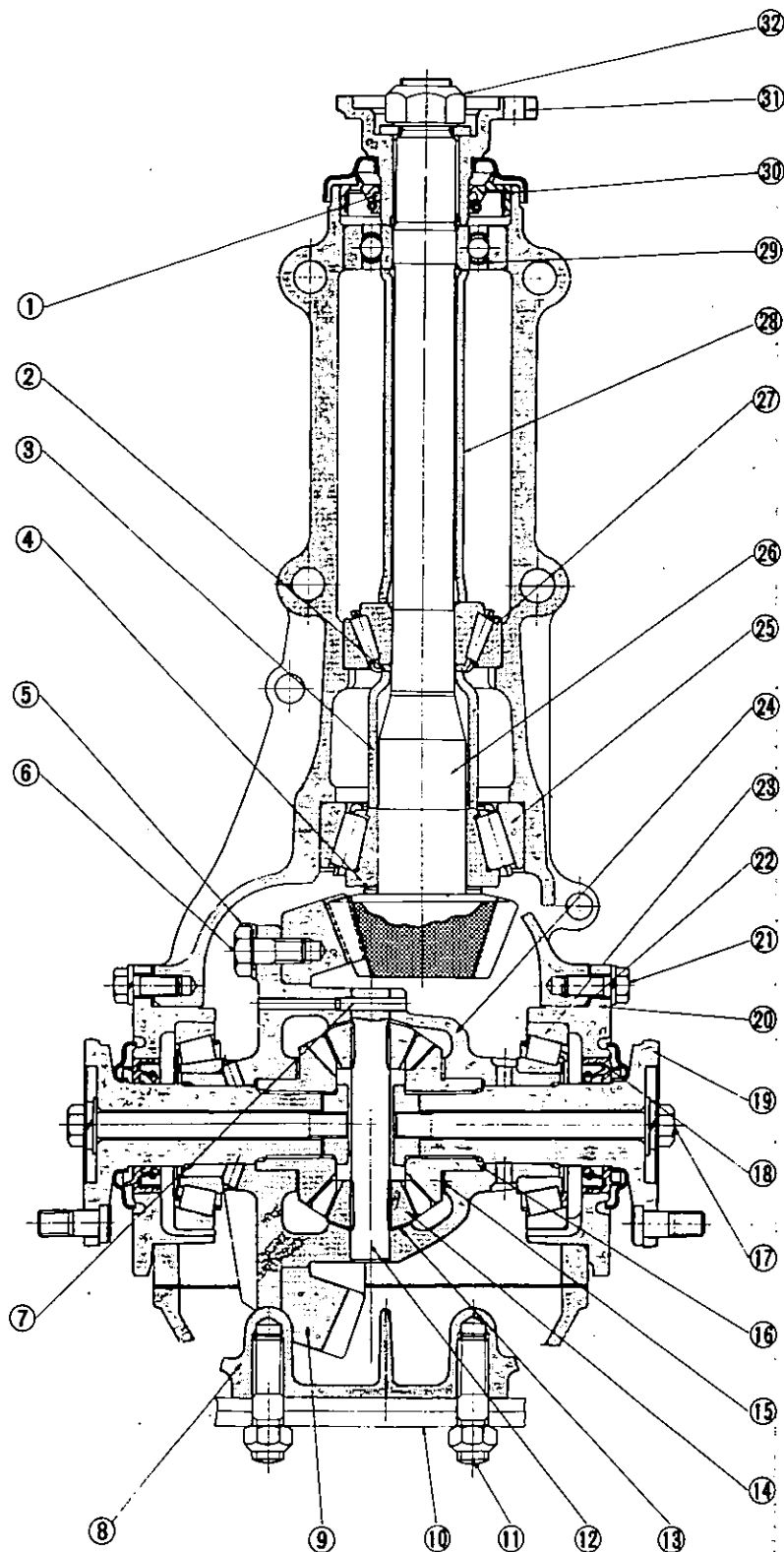
The lubricant should be checked each 5,000 km (3,000 miles) and replenished as necessary.

Comparative specifications

	Sedan	Station wagon	Van
Nominal diameter of ring gear	160	165	190
Gear ratio	1,800 cc models: 3.700 (With A/T models for U.S. and Canada: 3.900 1,600 cc models: 3.900	3.889	4.375
Drive pinion preload adjusted by	Shim	Shim	Collapsible spacer
Oil capacity (about)	0.8 liter ($\frac{3}{8}$ U.S. qt. $\frac{3}{8}$ Imper. qt.)	1.3 liter ($1\frac{1}{8}$ U.S. qts. $1\frac{1}{8}$ Imper. qts.)	1.0 liter (1 U.S. qts. $\frac{3}{8}$ Imper. qt.)

PROPELLER SHAFT & DIFFERENTIAL CARRIER

FOR SEDAN



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

PD173

T: Tightening torque

Fig. PD-6 Sectional view of differential carrier for sedan

PROPELLER SHAFT & DIFFERENTIAL CARRIER

REMOVAL

1. Jack up the rear of vehicle and support on stand.
2. Remove hand brake rear cable ① at its turn buckle, propeller shaft ② and drive shaft ③ at the respective positions in Figure PD-7.
3. With differential carrier jacked up, remove nuts ④ (See Figure PD-7) on both ends of differential member.
4. Loosen off four fitting bolts ⑤ that hold differential carrier onto suspension member.

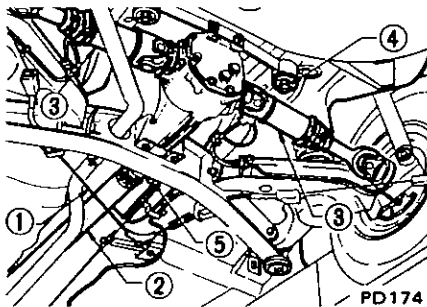


Fig. PD-7 Under view

5. Pull off carrier backward together with jack.

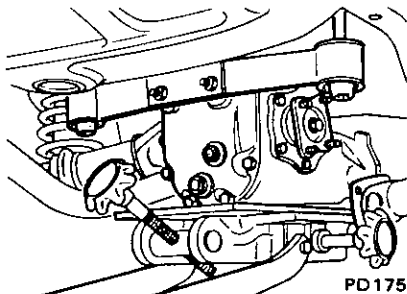


Fig. PD-8 Removing differential carrier

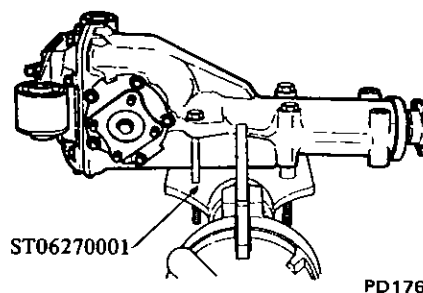
After carrier assembly is removed, support suspension member on a stand to prevent its insulators being twisted or damaged.

Note: Do not place the center of suspension member on the stand before removal operation. Otherwise, difficulty will result when extracting the gear carrier assembly.

PRE-DISASSEMBLY INSPECTION

Differential case or carrier should be inspected before any parts are removed from it. These inspections can help to find the cause of the trouble and to determine the corrections needed.

1. Mount carrier on special tool "Gear Carrier Attachment ST06270001" mounting member and rear cover.



PD176

Fig. PD-9 Holding differential carrier

2. Visually inspect parts for wear or damage.
3. Rotate gears to see if there is any roughness which would indicate damaged bearings or chipped gears. Check the gear teeth for scoring or signs of abnormal wear. Measure preload of drive pinion.
4. Set up a dial indicator and check the backlash at several points around ring gear. Backlash should be within 0.1 to 0.2 mm (0.0039 to 0.0079 in).
5. Check the gear tooth contact with a mixture powdered red lead and oil apply sparingly to all ring gear teeth.

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

6. Check runout of the ring gear at the rear of it if the backlash or the gear tooth contact pattern is found abnormal.

Runout limit 0.05 mm (0.0020 in).

DISASSEMBLY

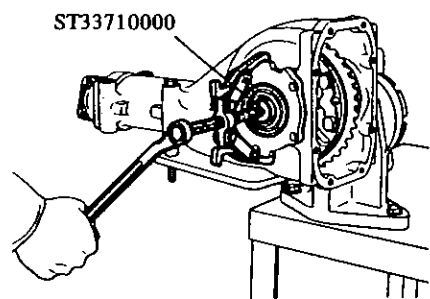
1. Remove side flange fixing bolt,

and extract side flange.

2. Remove side retainers, using special tool "Gear Carrier Side Retainer Attachment ST33710000" and standard puller.

Notes:

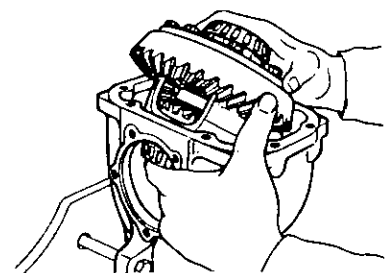
- a. Provide left and right side retainers with identification marking before removal.
- b. Care should be taken not to confuse left and right hand side retainers and shims for proper reassembly.



PD177

Fig. PD-10 Removing side retainer

3. Extract differential case from carrier.



PD075

Fig. PD-11 Removing differential case ass'y

4. When replacing side bearing, extract bearing outer race from side retainer using special tool "Gear Carrier Oil Seal Puller ST33290001."
5. Loosen drive pinion nut, holding companion flange with special tool "Drive Pinion Flange Wrench ST31530000" and pull off companion flange using a standard puller.

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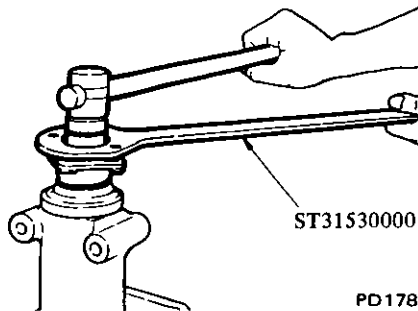


Fig. PD-12 Removing drive pinion nut

6. Extract drive pinion from carrier using a press. Drive pinion can be taken out together with rear bearing cone, bearing spacer and adjusting washers.

7. Remove oil seal.

Note: Reuse of an oil seal must not be allowed.

8. Remove front pilot bearing with special tool "Pilot Bearing Drift ST30650000," and take out front bearing inner race.

9. Hold rear bearing inner race with special tool "Drive Pinion Rear Bearing Inner Race Puller ST30031000" and extract from drive pinion with a press.

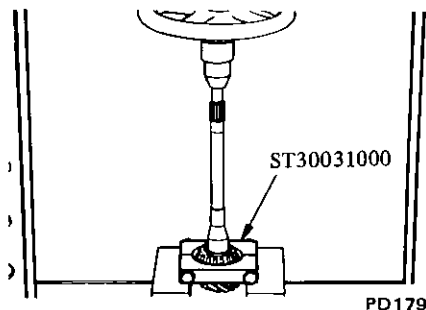


Fig. PD-13 Removing pinion rear bearing inner race

10. To remove front and rear bearing outer races, put a drift to race side surface, and withdraw them by tapping the top of drift with a hammer.

Disassembly of differential case

1. Extract bearing using special tool

"Differential Side Bearing Puller ST3306S000."

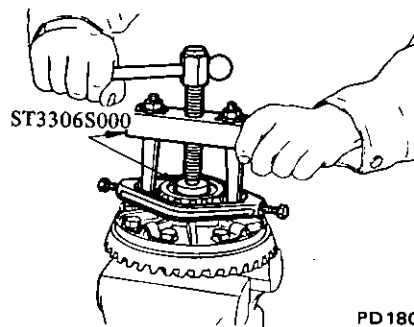


Fig. PD-14 Removing side bearing

Notes:

a. The puller should be handled with care in catching the edge of bearing inner race.

b. Care should be taken not to confuse the left and right hand parts.

2. Remove ring gear by unfolding lock strap and loosening ring gear bolts.

Note: Loosen bolts diagonally.

3. Punch off pinion mate shaft lock pin from ring gear side using special tool "Solid Punch ST23510000."

Note: Lock pin is caulked at pin hole mouth on differential case. Do not punch it off forcibly without checking how it is caulked.

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

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

Replacement of oil seal

Replacement of oil seal with final drive assembly installed on the car.

Procedures are as follows:

1. Drain gear oil.

2. Raise the rear end of vehicle and support it with safety stands.

3. Disconnect left hand rear cable for hand brake.

4. Detach propeller shaft from companion flange of carrier.

5. Remove drive pinion nut, holding companion flange with special tool "Drive Pinion Flange Wrench ST31530000."

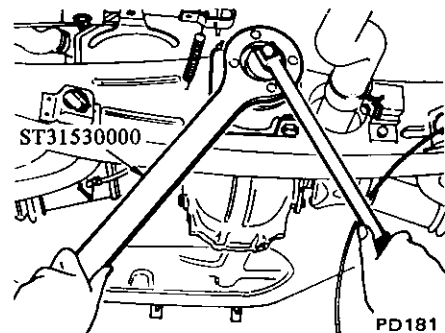


Fig. PD-15 Removing drive pinion nut

6. Extract companion flange using a standard puller.

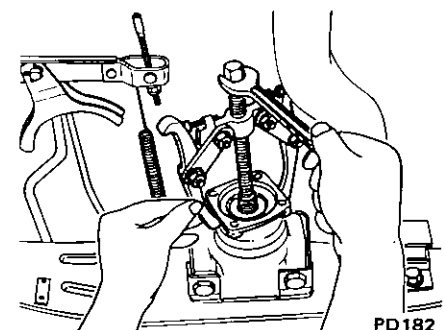


Fig. PD-16 Removing companion flange

7. Remove oil seal using special tool "Gear Carrier Oil Seal Puller ST33290001."

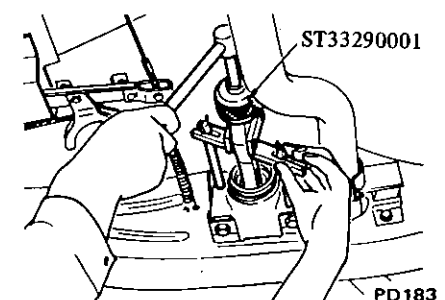


Fig. PD-17 Removing oil seal

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8. Set new oil seal in position using special tool "Gear Carrier Oil seal Drift ST33270000." Apply grease cavity between seal lips.

9. Fit companion flange and flat washer on drive pinion, and secure them in position by tightening nut to specified torque confirming the following preload, using special tool "Drive Pinion Flange Wrench ST31530000."

Tightening torque:

17 to 20 kg-m
(122.9 to 144.6 ft-lb)

**Pinion bearing preload
(with oil seal):**

8 to 11 kg-cm
(6.95 to 9.56 in-lb)

At companion flange bolt hole:

2.3 to 3.2 kg (5.1 to 7.1 lb)

Notes:

- a. The preload of the old bearing is the same value as that of a new bearing.
- b. If the desirable tightening torque of drive pinion nut cannot be obtained, the nut should be renewed and readjustment should be made.

10. Reinstall propeller shaft and brake cable by reversing the foregoing removal procedure. And fill up gear oil.

Side oil seal is replaced by using the following procedures.

1. Detach drive shaft from side flange of carrier.
2. Remove side flange fixing bolt, and extract side flange.
3. Remove oil seal using special tool "Oil Seal Puller ST33290001."
4. Set in new oil seal.

Note: Apply grease cavity between oil seal lips.

5. Reinstall, side flange and other parts in reverse sequence of removal procedure.

Tightening torque of side flange fixing bolt:

1.9 to 2.6 kg-m
(13.7 to 18.8 ft-lb)

Note: Check O-ring of side flange fixing bolt, and replace if necessary.

INSPECTION

Thoroughly clean all disassembled parts, and examine them to see if they are worn, damaged or otherwise defective, and how they are affected. Repair or replace all defective parts, whichever is necessary.

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 ring gear are supplied for replacement as a set, therefore, should either part be damaged, replace as a set.

2. Check pinion gear shaft, and pinion gear for scores and signs of wear, replace as required.

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

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

They should be in tiptop condition such as not worn and with mirror-like surfaces. Replace if there is a shadow of doubt on their efficiency, as an incorrect bearing operation may result in noisiness and gear seizure.

4. Inspect thrust washer faces. Small defects can be corrected with sand paper. In case the backlash in pinion mate and side gear (or the clearance between side gear and thrust washer) exceeds 0.1 to 0.2 mm (0.0039 to 0.0079 in), replace thrust washer. Three kinds of thrust washers are available.

5. Inspect carrier and differential case for cracks or distortion. If either

condition is evident, replace defective parts.

6. As a general rule, oil seal should be replaced at each disassembly.

ASSEMBLY AND ADJUSTMENT

Assembly can be proceeded in the reverse order of disassembly. The following directions as to the adjustment and usage of special tools will make it possible to obtain a perfect differential operation.

Precaution in reassembly

1. Arrange shims, washers and the like in order so that they will be installed correctly.
2. Thoroughly clean the surfaces on which shims, washers, bearings and bearing retainers will be installed.
3. Apply gear oil when installing bearings.
4. Pack grease cavity between lips when fitting oil seal.

Assembly of differential gear case

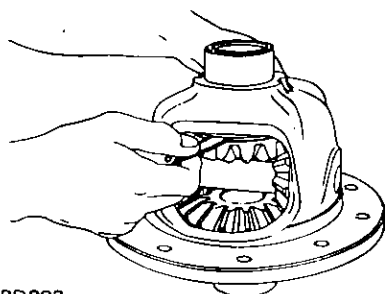
1. Assemble pinion mates, side gears and thrust washers in differential case.
2. Fit pinion shaft to differential case so that it meets lock pin holes.
3. Adjust side gear to pinion mate backlash or adjust the clearance between differential case and rear face of side gear.

If above procedure is not effective with existing washer, try with other washers available for the purpose.

Normal backlash or clearance:

0.1 to 0.2 mm
(0.0039 to 0.0079 in)

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PD023

Fig. PD-18 Measuring clearance

Side gear thrust washer

Thickness mm (in)

0.75 to 0.80 (0.0295 to 0.0315)

0.80 to 0.85 (0.0315 to 0.0335)

0.85 to 0.90 (0.0335 to 0.0354)

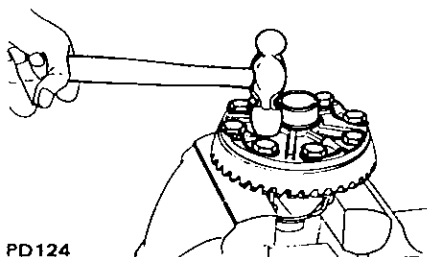
4. Lock pinion shaft lock pin using a punch after it is secured into place.
5. Coat, oil to gear tooth surfaces and thrust surfaces and check if they turn properly.
6. Place ring gear on differential case and install bolts and lock washers. Torque bolts to specification, and bend up lock washers.

Tightening torque:

7 to 8 kg-m (50.6 to 57.8 ft-lb)

Notes:

- a. Only genuine ring gear bolts and new lock washers must be used.
- b. Tighten bolts in diagonal order while lightly tapping around bolt heads with a hammer.

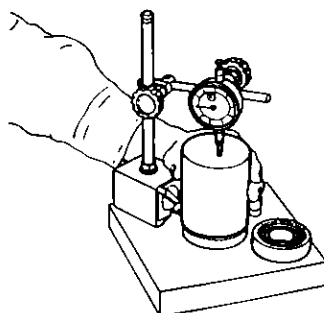


PD124

Fig. PD-19 Tapping bolt head

7. When replacing side bearing, measure bearing width using a about 2.5 kg (5.5 lb) weight block prior to installation.

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



PD086

Fig. PD-20 Measuring bearing width

8. Press fit side bearing cone on differential case using special tool "Gear Carrier Side Bearing Drift ST33230000" and "Adapter ST33061000."

Adjustment of drive pinion preload

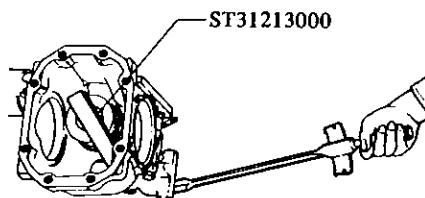
Adjust preload of drive pinion with spacer and washer between front and rear bearing cones, regardless of thickness of pinion height adjusting washer.

This adjustment must be carried out without oil seal inserted.

1. Press fit front and rear bearing outer races into gear carrier using special tool "Drive Pinion Outer Race Drift Set ST30611000, ST30612000 and ST30613000."
2. Insert pinion height adjusting washer and rear bearing inner race into special tool "Dummy Shaft ST31212000" to make convenient to adjust pinion height.

Note: Reuse the old washer if they have been found with normal tooth contact pattern in a pre-disassembly check.

3. Fit drive pinion bearing spacer, washer, special tool "Drive Pinion Dummy Collar ST31214000" and companion flange in this order on dummy shaft and tighten drive pinion nut to the following preload by use of special tool "Stopper ST31213000."



PD184

Fig. PD-21 Tightening drive pinion nut

Measure pinion bearing preload using special tool "Preload Gauge ST31190000," and select washer and spacer that will provide required preload.

Pinion bearing preload

(without oil seal):

7 to 10 kg-cm

(6 to 9 in-lb)

At companion flange bolt hole:

2.0 to 2.9 kg

(4.4 to 6.4 lb)

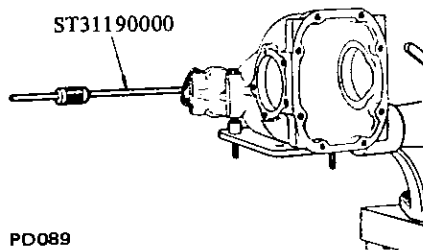
Tightening torque of pinion nut:

17 to 20 kg-m

(122.9 to 144.6 ft-lb)

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

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PD089

Fig. PD-22 Measuring pinion preload

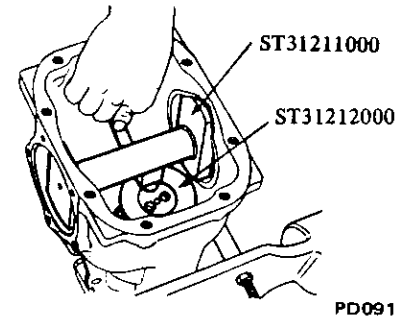
Pinion bearing adjusting spacer

Length mm (in)
56.2 (2.2126)
56.4 (2.2205)
56.6 (2.2283)
56.8 (2.2362)
57.0 (2.2441)
57.2 (2.2520)

Pinion bearing adjusting washer

Thickness mm (in)
2.59 (0.1020)
2.57 (0.1012)
2.55 (0.1004)
2.53 (0.0996)
2.51 (0.0988)
2.49 (0.0980)
2.47 (0.0972)
2.45 (0.0965)
2.43 (0.0957)
2.41 (0.0949)
2.39 (0.0941)
2.37 (0.0933)
2.35 (0.0925)
2.33 (0.0917)
2.31 (0.0909)

2. Measure the clearance (N) between the tip end of height gauge and the end surface of dummy shaft, using a thickness gauge.



PD091

Fig. PD-24 Measuring the clearance

3. The thickness of drive pinion height adjusting washer can be obtained from the following formula:

$$T = W + N - [(H - D' - S) \times 0.01] - 0.2$$

Where,

T = Required thickness of rear bearing adjusting washers (mm)

W = Thickness of washers temporarily inserted (mm).

N = Measured value with thickness gauge (mm)

H = Figure marked on the drive pinion head.

D' = Figure marked on the dummy shaft.

S = Figure marked on the height gauge.

Figures for H, D' and S are dimensional variations in a unit of 1/100 mm against each standard measurement.

Example of calculation

$$W = 3.42 \text{ mm}$$

$$N = 0.21 \text{ mm}$$

$$H = +1, D' = -1, S = 0$$

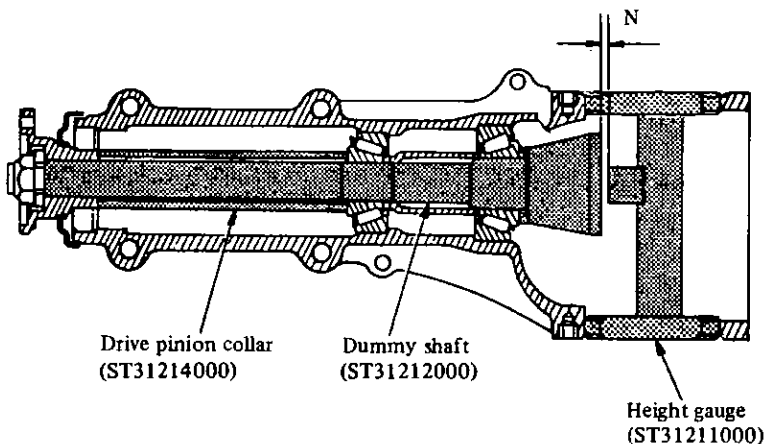
$$T = 3.42 + 0.21 - [(1 + 1 - 0) \times 0.01] - 0.2 = 3.40$$

The correct washer is 3.39 mm thickness.

Adjustment of pinion height

Adjust pinion height with washer provided between rear bearing inner race and back of pinion gear.

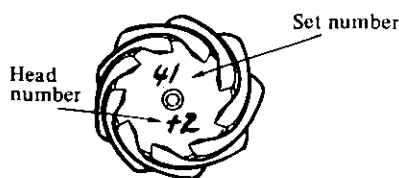
1. Install special tool "Height Gauge ST31211000" on carrier with dummy shaft mounted.



PD185

Fig. PD-23 Adjusting pinion height

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Fig. PD-25 Variation number on drive pinion

Pinion height adjusting washer

Thickness mm (in)
3.09 (0.1217)
3.12 (0.1228)
3.15 (0.1240)
3.18 (0.1252)
3.21 (0.1264)
3.24 (0.1276)
3.27 (0.1287)
3.30 (0.1299)
3.33 (0.1311)
3.36 (0.1323)
3.39 (0.1335)
3.42 (0.1346)
3.45 (0.1358)
3.48 (0.1370)
3.51 (0.1382)
3.54 (0.1394)
3.57 (0.1406)
3.60 (0.1417)
3.63 (0.1429)
3.66 (0.1441)

4. Fit determined pinion height adjusting washer in drive pinion, and press fit rear bearing inner race in it, using special tool "Base ST30032000."

5. Lubricate pinion front and rear bearing.

Install drive pinion in gear carrier into which fit drive pinion bearing

spacer and washer, front bearing inner race and front bearing pilot spacer, moreover, front pilot bearing and oil seal in position.

6. Fit companion flange and flat washer on drive pinion, and secure them in position by tightening nut to specified torque confirming preload.

Tightening torque:

17 to 20 kg-m
(122.9 to 144.6 ft-lb)

Preload (with oil seal):

8 to 11 kg-cm
(6.95 to 9.56 in-lb)

Note: If drive pinion lock nut is found with wear, replace it.

Adjustment of side retainer shims

1. If the hypoid gear set, carrier, differential case, side bearing or side bearing retainer has been replaced with new parts, adjust the side bearing preload with adjusting shim. The required thicknesses of the left and right retainer shims can be obtained from the following formula:

$$T1 = (A + C + G1 - D + H') \times 0.01 + 0.76 - E$$

$$T2 = (B + D + G2 - H') \times 0.01 + 0.76 - F$$

Where

T1 = Required thickness of left side retainer shim (mm).

T2 = Required thickness of right side retainer shim (mm).

A & B = Figure marked on the gear carrier.

C & D = Figure marked on the differential case.

E & F = These are differences in width of left or right side bearing against the standard width 20.0 mm (0.7874 in) (mm).

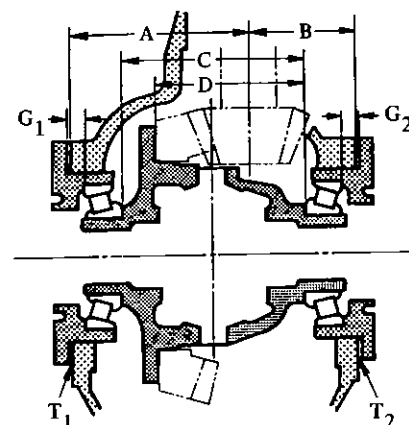
G1 & G2 = Figure marked on the left or right side retainer.

H' = Figure marked on the ring gear.

Figures for A, B, C, D, G1, G2 and H' are dimensional variations in a unit of 1/100 mm against each standard measurement.

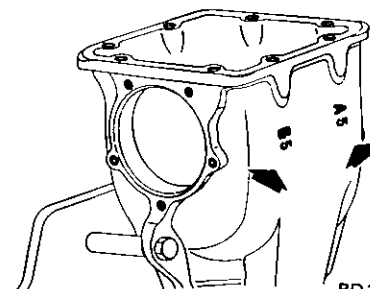
To measure width of side bearing, see differential case assembly procedure.

Note: Preload of the old bearing is to adopt the same value as that of a new bearing.



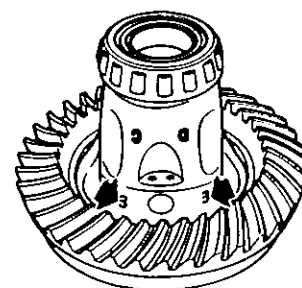
PD093

Fig. PD-26 Thickness of left and right shims



PD187

Fig. PD-27 A & B figures



PD188

Fig. PD-28 C & D figures

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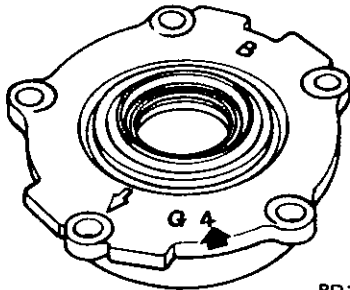


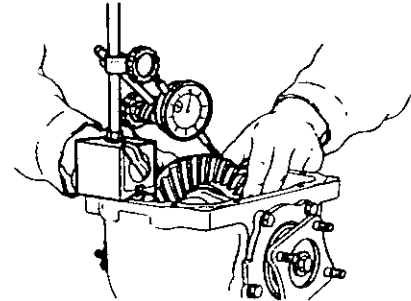
Fig. PD-29 G1 & G2 figures

Side retainer adjusting shim

Thickness mm (in)
0.20 (0.0079)
0.25 (0.0098)
0.30 (0.0118)
0.40 (0.0157)
0.50 (0.0197)

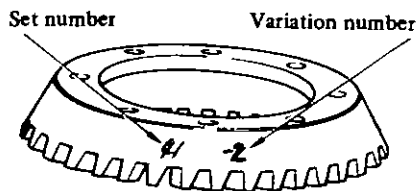
0.20 mm (0.0039 to 0.0079 in)

If it is below the specified value, move shim from right to left. If it is over it, move it inversely.



PD097

Fig. PD-33 Measuring the backlash of ring gear and pinion



PD190

Fig. PD-30 Variation numbers on ring gear

2. Install differential case assembly in gear carrier in reverse order to which it is disassembled.

3. Fit given shims and O-rings in both side retainers, and install retainers in carrier using special tool "Gear Carrier Side Retainer Guide ST33720000," and the arrow mark on retainer positioned as shown in Figure PD-32.

Note: When installing retainers, take care that side bearing outer races are not damaged by roller.

Example of calculation

$$\begin{aligned} A &= 1, B = 2, C = 2, D = 1, \\ G1 &= 3, G2 = 1 \\ E &= -0.01 \text{ mm}, F = +0.02 \text{ mm}, \\ H' &= -2 \end{aligned}$$

Left side

$$\begin{aligned} T1 &= (A + C + G1 - D + H') \\ &\quad \times 0.01 + 0.76 - E \\ &= (1 + 2 + 3 - 1 - 2) \times 0.01 \\ &\quad + 0.76 + 0.01 \\ &= 0.8 \text{ mm} \end{aligned}$$

Right side

$$\begin{aligned} T2 &= (B + D + G2 - H') \times 0.01 \\ &\quad + 0.76 - F \\ &= (2 + 1 + 1 + 2) \times 0.01 + 0.76 \\ &\quad - 0.02 \\ &= 0.8 \text{ mm} \end{aligned}$$

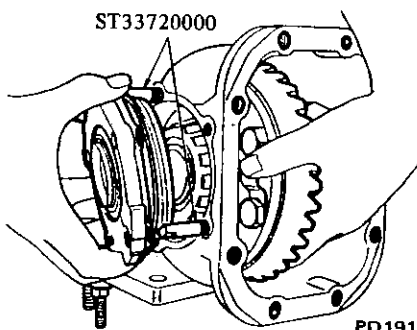


Fig. PD-31 Installing side retainer

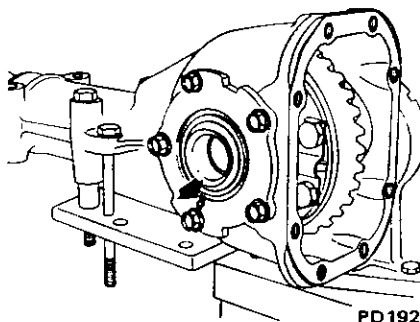


Fig. PD-32 The arrow mark on retainer

4. Measure the backlash of ring gear and drive pinion by using a dial indicator and adjust it to 0.10 to

5. Check runout of ring gear side is within 0.05 mm (0.0020 in).

6. At the same time, check bearing preload. Bearing preload should read 9 to 17 kg-cm (7.8 to 14.8 in-lb) of rotating torque [2.6 to 4.9 kg (5.7 to 10.8 lb) at companion flange bolt hole].

If preload is not according to this specification, adjust it with side retainer shims.

Incidentally, decrease or increase in thickness of shims causes ring gear and pinion to change in backlash.

Thus, check if they have proper backlash.

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

(1) Thoroughly clean ring and pinion gear teeth.

(2) Paint ring gear teeth lightly and evenly with a mixture of powdered red lead and oil of a suitable consistency to produce a contact pattern.

(3) Rotate pinion through several revolutions in the forward and reverse direction until a definite contact pattern is developed on ring gear.

(4) When contact pattern is incorrect, readjust thickness of adjust shim.

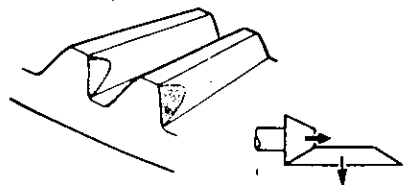
Be sure to wipe out red lead completely upon completion of adjustment.

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(5) Incorrect contact pattern of teeth can be adjusted in the following manner.

a. Heel contact

To correct, increase thickness of drive pinion adjusting washer in order to bring drive pinion close to ring gear.

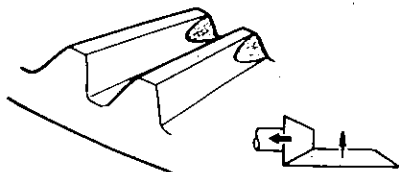


PD193

Fig. PD-34 Heel contact

b. Toe contact

To correct, reduce thickness of drive pinion adjusting washer in order to make drive pinion go away from ring gear.

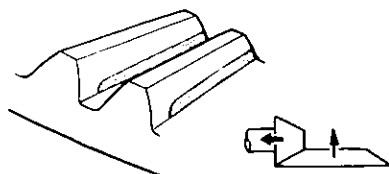


PD194

Fig. PD-35 Toe contact

c. Flank contact

Adjust in manner similar to b.

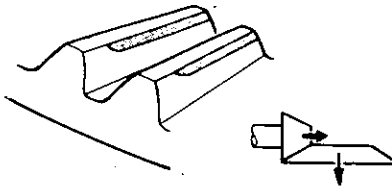


PD195

Fig. PD-36 Flank contact

d. Face contact

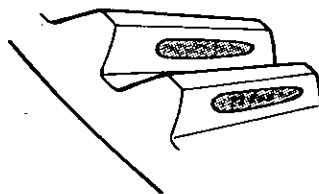
Adjust in manner similar to a.



PD196

Fig. PD-37 Face contact

e. Correct tooth contact.



PD197

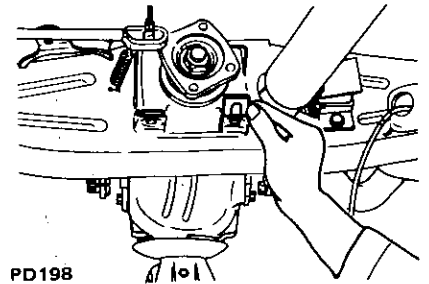
Fig. PD-38 Correct contact

Note: Change in thickness of adjusting washer is accompanied by change in backlash. Check it when installing gear.

8. Fit differential mounting member, and tighten nuts to specified torque 6 to 8 kg-m (43.4 to 57.8 ft-lb).

INSTALLING GEAR CARRIER ASSEMBLY

1. Position gear carrier assembly onto rear suspension member, and temporarily tighten it with four bolts together with spacers.



PD198

Fig. PD-39 Inserting spacer

Thickness mm (in)

4.5 (0.1772)

1.0 (0.0394)

2. Fit differential mounting member of fitting bolts by pushing it forwards, and torque nuts to 7 to 10 kg-m (50.6 to 72.3 ft-lb).
3. Secure gear carrier assembly onto rear suspension member with four bolts.

Tightening torque:

5 to 7 kg-m (36.2 to 50.6 ft-lb)

4. Install other parts in the manner reverse to disassembly.
5. Fill correct gear oil.

Note: Oil quantity 0.8 liter

($\frac{1}{4}$ U.S. qt., $\frac{1}{4}$ Imper. qt.)

TROUBLE DIAGNOSES AND CORRECTIONS

When a gear carrier is suspected of being noisy it is advisable to make a thorough test to determine whether the noise originates in the tires, road surface, exhaust, universal joint, propeller shaft, wheel bearings, engine, transmission, or gear carrier. Noise which originates in other places cannot be corrected by adjustment or replacement of parts in the rear axle assembly.

PROPELLER SHAFT & DIFFERENTIAL CARRIER

TROUBLE DIAGNOSES AND CORRECTIONS

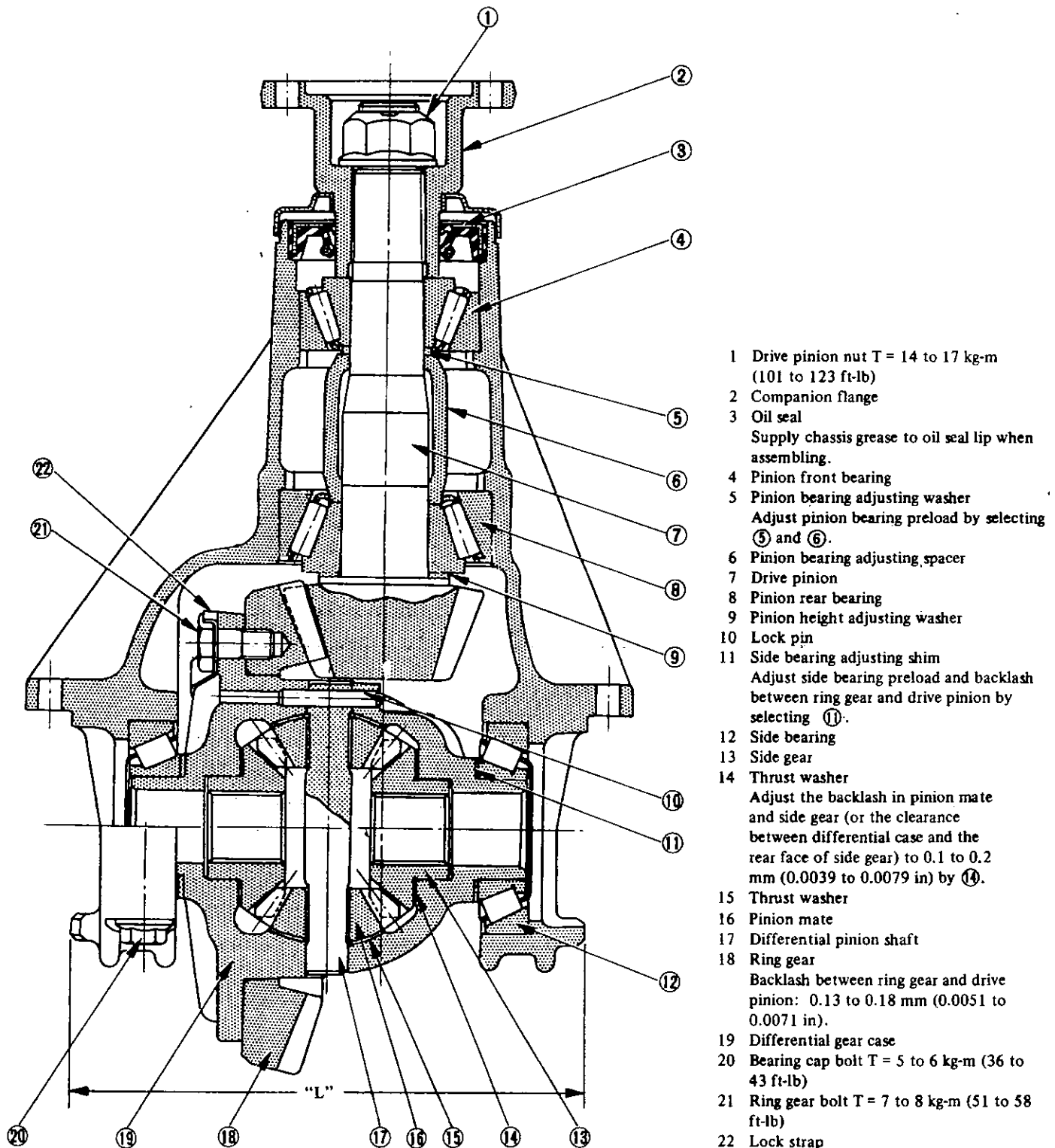
Condition	Probable cause	Corrective action
Noise on drive, coast and float.	Shortage of oil. Incorrect tooth contact between ring gear and drive pinion. Incorrect backlash between ring gear and drive pinion. Seized up or damaged ring gear and drive pinion. Seized up, damaged or broken drive pinion bearing. Seized up, damaged or broken side bearing. Loosen clamp bolts or nuts holding ring gear, side retainers (for sedan), bearing cap (for station wagon and van) etc.	Supply gear oil. Rebuild gear carrier if necessary. Adjust tooth contact or replace the hypoid gear set. Adjust backlash or replace the hypoid gear set if necessary. Replace the hypoid gear set. Replace the pinion bearing and defective parts. Replace the side bearing and defective parts. Clamp them to specified torque, and replace defective parts.
Noise on turn	Seized up, damaged or broken side and pinion gear. Seized up, damaged or broken side gear and pinion thrust washer. Pinion gears too tight on their shaft. Interference between side flange and differential case (for sedan).	Replace defective parts. Replace defective parts. Replace defective parts. Repair the part responsible for interference, or replace the side flange and differential case.
Knocking sound during starting or gear shifting.	Excessive backlash Incorrect backlash between ring gear and drive pinion, or side and pinion gear. Worn gears or case. Worn side flange (or rear axle shaft) and side gear spline. Pinion bearing under preload. Loosened drive pinion nut. Loosen clamp bolts or nuts holding ring gear, side retainers, bearing cap etc.	Adjust backlash. Replace worn parts. Replace worn parts. Adjust preload. Repair or replace. Clamp them or replace if necessary.
Seizure or breakage.	Shortage of oil or use of unsuitable oil. Excessively small backlash. Incorrect adjustment of bearings or gears. Severe service due to an excessive loading, improper use of clutch. Loosened bolts and nuts, such as ring gear clamp bolts.	Replace defective parts. Adjust backlash and replace as required. Replace defective parts. Replace defective parts. Replace defective parts.

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Condition	Probable cause	Corrective action
Oil leakage.	Worn-out, damaged or improperly driven front oil seal, or bruised, dented or abnormally worn slide face of companion flange. Worn, damaged or improperly driven side flange oil seal, or bruised, dented or abnormally worn slide face of side flange. (for sedan) Loosened bolts such as side flange, side retainer or gear carrier. Defective gasket or O-ring. Loose filler or drain plug. Clogged or damaged breather.	Replace the defective oil seal. Ammend the affected flange with sand paper or replace if necessary. Treat as above. Tighten the bolts to specified torque. Replace defective parts with new ones. Tighten the plug. Repair or replace.

PROPELLER SHAFT & DIFFERENTIAL CARRIER

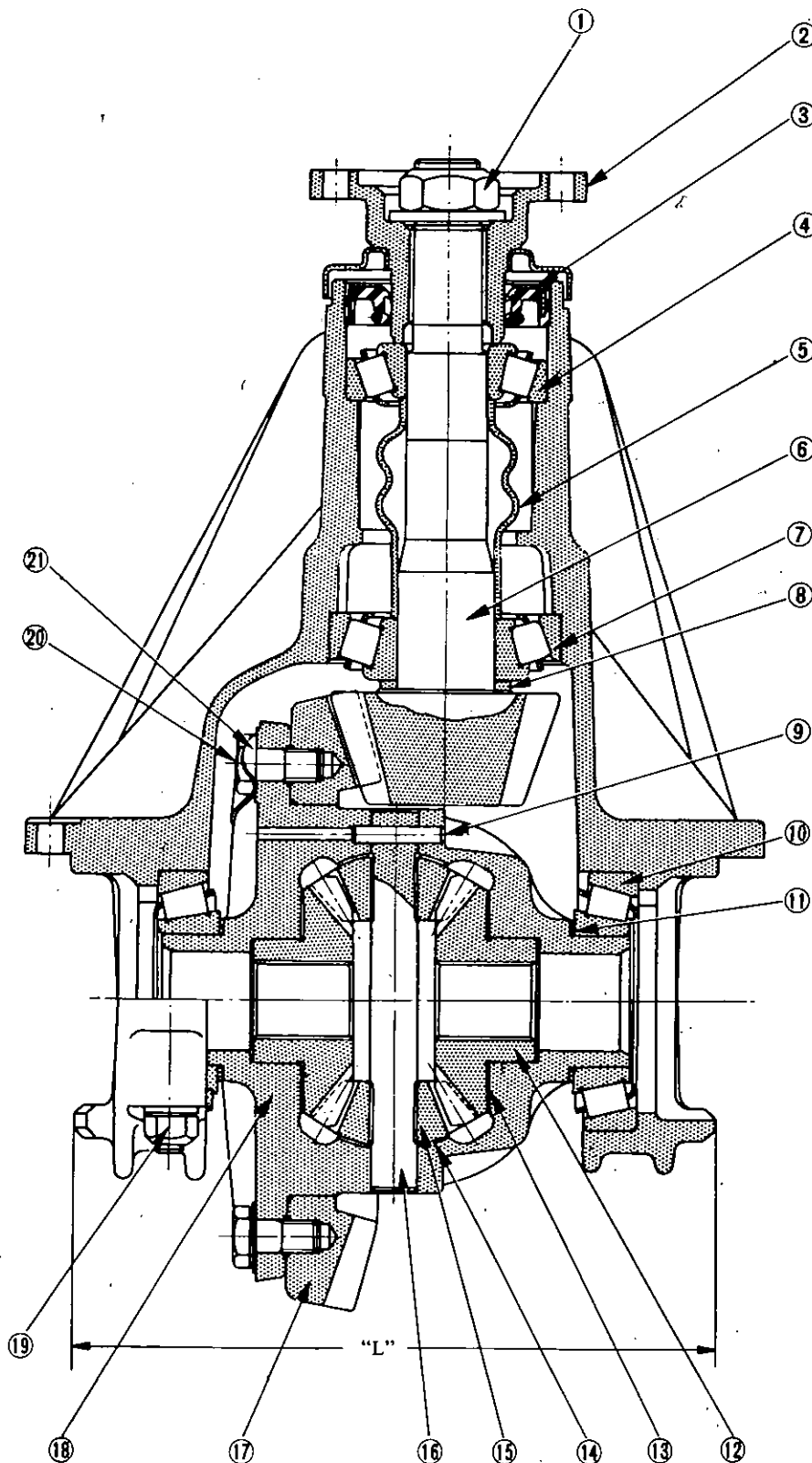
FOR STATION WAGON AND VAN



PD199 T: Tightening torque

Fig. PD-40 Sectional view of differential carrier for station wagon

PROPELLER SHAFT & DIFFERENTIAL CARRIER



- 1 Drive pinion nut T = 13 to 20 kg-m (94 to 145 ft-lb). This nut should be tightened by referring to "Adjustment of drive pinion preload for Van."
- 2 Companion flange
- 3 Oil seal
Supply chassis grease to oil seal lip when assembling
- 4 Pinion front bearing
- 5 Collapsible spacer
Adjust pinion bearing preload by this spacer. Procedure can be accomplished by referring to "Adjustment of drive pinion preload for Van."
- 6 Drive pinion
- 7 Pinion rear bearing
- 8 Pinion height adjusting washer
- 9 Lock pin
- 10 Side bearing
- 11 Side bearing adjusting shim
Adjust side bearing preload and backlash between ring gear and drive pinion by selecting ⑪.
- 12 Side gear
- 13 Thrust washer
Adjust the backlash in pinion mate and side gear (or the clearance between differential case and the rear face of side gear) to 0.1 to 0.2 mm (0.0039 to 0.0079 in) by ⑬.
- 14 Thrust washer
- 15 Pinion mate
- 16 Differential pinion shaft
- 17 Ring gear
Backlash between ring gear and drive pinion: 0.15 to 0.20 mm (0.0059 to 0.0079 in)
- 18 Differential gear case
- 19 Bearing cap nut T = 4.2 to 4.8 kg-m (30 to 35 ft-lb)
- 20 Ring gear bolt T = 7 to 8 kg-m (51 to 58 ft-lb)
- 21 Lock strap

T: Tightening torque

PD200

Fig. PD-41 Sectional view of differential carrier for van

PROPELLER SHAFT & DIFFERENTIAL CARRIER

REMOVAL

1. Jack up the rear of vehicle and support on stand, and drain gear oil.
2. Remove propeller shaft and rear axle shafts. These works can be done by referring to "REAR AXLE."
3. Loosen off nuts securing differential to axle case, and take out differential gear carrier assembly.

PRE-DISASSEMBLY INSPECTION

Mount carrier on special tool "Gear Carrier Attachment ST06360000 (for station wagon) and ST06310000 (for van)."

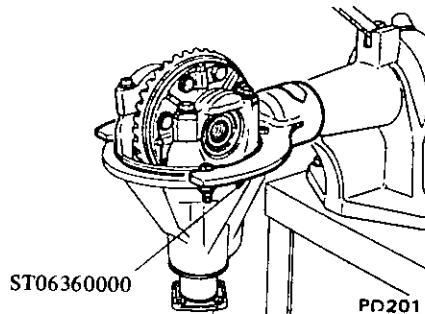


Fig. PD-42 Holding differential carrier (for station wagon)

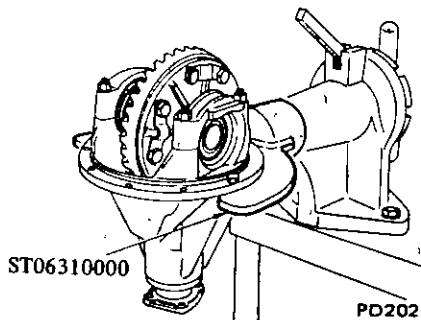


Fig. PD-43 Holding differential carrier (for van)

This procedure can be accomplished by referring to "FOR SEDAN."

DISASSEMBLY

1. Mark relationship of side bearing cap to carrier, and remove side bearing caps and take out differential case assembly.

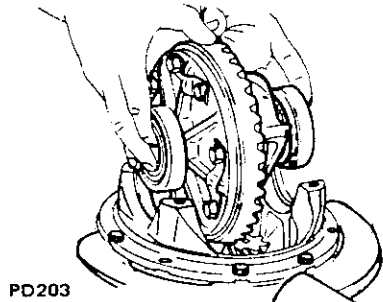


Fig. PD-44 Removing differential case ass'y

Note: Care should be taken not to confuse the left and right hand bearing caps and bearing outer race so that reassembly will be easily carried out with the same parts in the original position.

2. Remove drive pinion nut using special tool "Drive Pinion Flange Wrench ST31530000," and pull off companion flange using a standard puller.

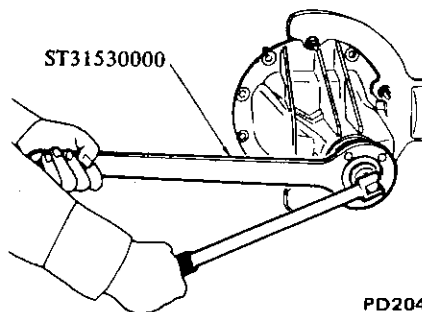


Fig. PD-45 Removing drive pinion nut

3. Extract drive pinion assembly to the rearwards by tapping the front end with a soft hammer. Drive pinion can be taken out together with rear bearing inner race, bearing spacer and washer.

4. Remove oil seal and take out front bearing inner race.

Note: Reuse of a oil seal must not be allowed.

5. Hold rear bearing inner race with special tool "Drive Pinion Rear Bearing Inner Race Puller ST30031000" and extract from drive pinion with a press.

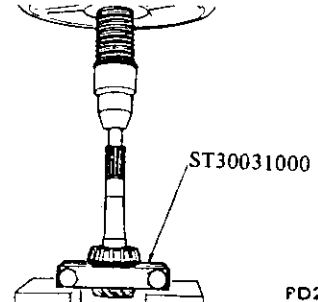


Fig. PD-46 Removing pinion rear bearing inner race

6. To remove outer races of both front and rear bearing, apply a brass drift to race side surface, and withdraw them by tapping the top of drift with a hammer.

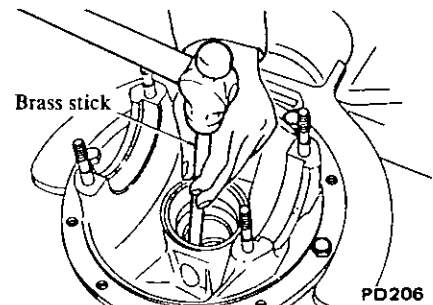


Fig. PD-47 Removing pinion front and rear bearing outer race

Disassembly of differential case

1. When replacing side bearing, using special tool "Gear Carrier Side Bearing Puller ST3305S000 (for station wagon) and ST3306S000 (for van)."

For reference:

ST3305S000: Set of ST33051001 and ST33052000

ST3306S000: Set of ST33051001 and ST33061000

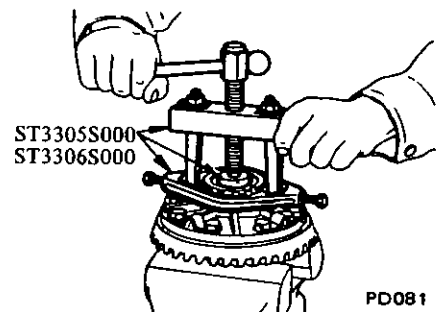


Fig. PD-48 Removing side bearing

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Notes:

- a. Puller should be handled with care in catching the edge of bearing inner race.
- b. Care should be taken not to confuse left and right hand parts.

2. Remove ring gear by spreading out lock strap and loosening ring gear bolts.

Note: Loosen bolts in diagonally.

3. Punch off pinion mate shaft lock pin from ring gear side using special tool "Solid Punch ST23510000."

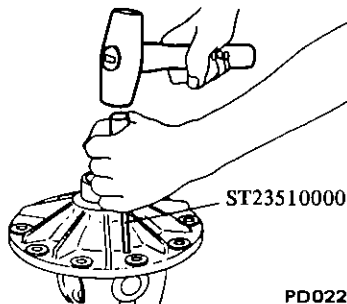


Fig. PD-49 Removing lock pin

Note: Lock pin is caulked at pin hole mouth on differential case. Do not punch it off forcibly without checking how it is caulked.

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

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

Replacement of front oil seal

Replacement of front oil seal with gear carrier assembly installed on the car.

Note: This procedure must not be allowed for van model due to used collapsible spacer on its model.

When replacing front oil seal, carry out the following procedures.

1. Drain gear oil.
2. Raise the rear end of vehicle and support it with safety stands.
3. Detach propeller shaft from companion flange of carrier.
4. Remove drive pinion nut, holding companion flange with special tool "Drive Pinion Flange Wrench ST31530000."

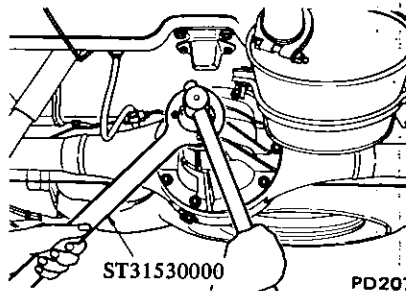


Fig. PD-50 Removing drive pinion nut

5. Extract companion flange using a standard puller.

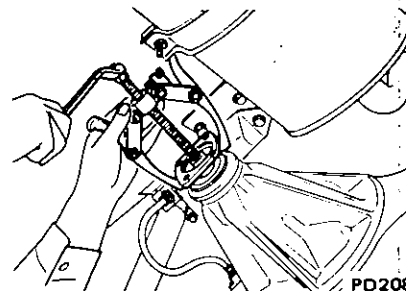


Fig. PD-51 Removing companion flange

6. Remove oil seal using special tool "Gear Carrier Oil Seal Puller ST33290001."

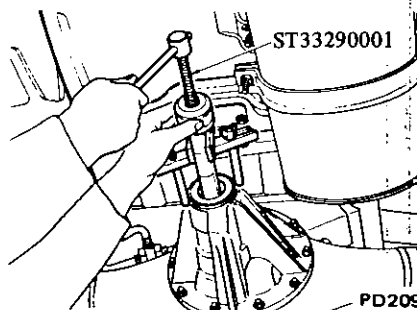


Fig. PD-52 Removing oil seal

7. Set new oil seal in position. Apply grease in between seal lips.
8. Fit companion flange and flat washer on drive pinion, and secure them in position by tightening nut to the given torque confirming specified preload, using special tool "Drive Pinion Flange Wrench ST31530000."

Tightening torque:

14 to 17 kg-m
(101.2 to 122.9 ft-lb)

Pinion bearing preload (with oil seal):

8 to 11 kg-cm
(6.59 to 9.56 in-lb)

At companion flange bolt hole:
2.3 to 3.2 kg (5.07 to 7.05 lb)

Notes:

- a. Preload of old bearing is the same value as that of a new bearing.
- b. If the desired nut tightening torque cannot be obtained, nut should be renewed and readjustment should be made.

9. Re-install, propeller shaft. And fill up gear oil.

INSPECTION

This procedure can be accomplished by referring to "FOR SEDAN."

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

ASSEMBLY AND ADJUSTMENT

Assembly can be proceeded in the reverse order of disassembling. The following directions as to adjustment and usage of special tools will make it possible to obtain a perfect differential operation.

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Precaution in reassembly

1. Arrange shims, washers and the like in order so that they will be installed correctly.
2. Thoroughly clean the surfaces on which shims, washers, bearings and bearing caps will be installed.
3. Apply gear oil when installing bearings.
4. Pack grease cavity between lips when fitting oil seal.

Assembly of differential gear case

1. Assemble pinion mates, side gears and thrust washers in differential case.
2. Fit pinion shaft to differential case so that it meets lock pin holes.
3. Adjust the backlash in pinion mate and side gear (or the clearance between the rear face of side gear and thrust washer) within 0.1 to 0.2 mm (0.0039 to 0.0079 in) by selecting side gear thrust washer.

Side gear thrust washer
[For station wagon]

Thickness mm (in)
0.785 (0.0309)
0.835 (0.0329)
0.885 (0.0348)
1.035 (0.0408)
1.185 (0.0467)

[For van]

Thickness mm (in)
0.75 to 0.80 (0.0295 to 0.0315)
0.80 to 0.85 (0.0315 to 0.0335)
0.85 to 0.90 (0.0335 to 0.0354)
0.90 to 0.95 (0.0354 to 0.0374)

4. Lock pinion shaft lock pin using a punch after it is secured into place.
5. Apply oil to gear tooth surfaces and thrust surfaces and check if they turn properly.
6. Place ring gear on differential case and install bolts and lock washers. Torque bolts to specification, and bend up lock washers.

Tightening torque:

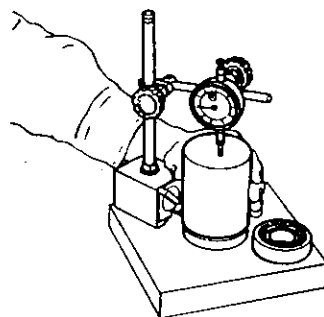
Tightening torque:
7 to 8 kg-m
(50.6 to 57.8 ft-lb)

Notes:

- a. Only genuine drive gear bolts and new lock washers must be used.
- b. Tighten bolts in diagonal order while lightly tapping around bolt heads with a hammer.

7. When replacing side bearing, measure bearing width using a about 2.5 kg (5.5 lb) weight block prior to installation.

Normal bearing width:
[For station wagon]:
18.50 mm (0.7283 in)
[For van]
20.00 mm (0.7874 in)



PD086

Fig. PD-53 Measuring bearing width

inner race and the back of pinion gear.

1. Press fit front and rear bearing outer races into gear carrier using special tool "Drive Pinion Outer Race Drift Set ST30611000, ST30612000 and ST30613000."

Front:

ST30611000 and
ST30612000

Rear:

ST30611000 and
ST30613000

2. Fit rear bearing on carrier, and install special tool "Dummy Shaft" on rear bearing, and place special tool "Height Gauge" on carrier (See Figure PD-48 or PD-49).

[For station wagon]

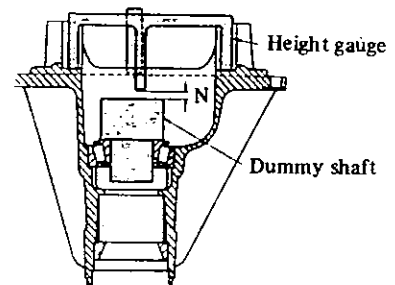
ST31141000
Height gauge
ST31942000
Dummy shaft

[For van]

ST31941000
Height gauge
ST31942000
Dummy shaft

or

ST31101000 (Former
ST31100000) ... Height
gauge for V510 model
ST31102000
Spacer
ST31942000
Dummy shaft



PD210

Fig. PD-54 Adjusting pinion height

Adjustment of pinion height

Adjust the pinion height with washer provided between rear bearing

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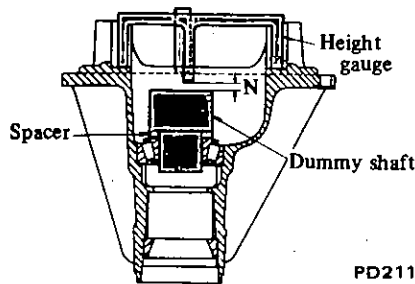


Fig. PD-55 Adjusting pinion height
(Use height gauge
for V510 model)

3. Measure the clearance (N) between the tip end of height gauge and the end surface of dummy shaft, using a thickness gauge.

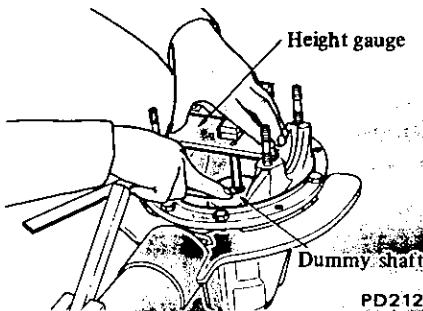


Fig. PD-56 Measuring clearance

4. The thickness of drive pinion height adjusting washers can be obtained from the following formula:

[For station wagon]

$$T = N - [(H - D' - S) \times 0.01] + 0.28$$

[For van]

$$T = N - [(H - D' - S) \times 0.01] + 2.18$$

Where,

T = Required thickness of rear bearing adjusting washers (mm).
 N = Measured value with thickness gauge (mm).
 H = Figure marked on the drive pinion head.
 D' = Figure marked on the dummy shaft.
 S = Figure marked on the height gauge.

Figures for H, D' and S are dimensional variations in a unit of 1/100 mm against each standard measurement.

Example for station wagon,

$$N = 0.30 \text{ mm}$$

$$H = +1, D' = -1, S = 0$$

$$T = 0.30 - [(-2 + 1 - 0) \times 0.01] + 0.28 = 0.59 \text{ mm}$$

The correct washers:
 0.100 and 0.500 mm

Pinion height adjusting washer

[For station wagon]

Thickness mm (in)

0.050 (0.0020)
 0.070 (0.0028)
 0.100 (0.0039)
 0.200 (0.0079)
 0.500 (0.0197)

[For van]

Thickness mm (in)

2.37 (0.0933)
 2.40 (0.0945)
 2.43 (0.0957)
 2.46 (0.0969)
 2.49 (0.0980)
 2.52 (0.0992)
 2.55 (0.1004)
 2.58 (0.1016)
 2.61 (0.1028)
 2.64 (0.1039)
 2.67 (0.1051)
 2.70 (0.1063)
 2.73 (0.1075)
 2.76 (0.1087)
 2.79 (0.1098)
 2.82 (0.1110)
 2.85 (0.1122)
 2.88 (0.1134)
 2.91 (0.1146)
 2.94 (0.1158)
 2.97 (0.1169)

5. Fit determined pinion height adjusting washer in drive pinion, and press fit rear bearing inner race in it, using special tool "Base ST30032000."

Adjustment of drive pinion preload

For station wagon model, adjust the preload of drive pinion with spacer and washer between front and rear bearing inner races. And van model uses collapsible spacer.

This procedure has nothing to do with thickness of pinion height adjusting washer.

[For station wagon]

This adjustment must be carried out without oil seal inserted.

1. Lubricate pinion front and rear bearing. Install drive pinion in gear carrier into which fit spacer, washer, front bearing inner race, companion flange and flat washer on pinion, and tightening nut to specified torque, confirming preload.

Tightening torque

14 to 17 kg-m
 (101.3 to 130.0 ft-lb)

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

2. Measure pinion bearing preload using special tool "Preload Gauge ST31190000," and select washer and spacer that will provide required preload.

Preload (without oil seal):

7 to 10 kg-cm
 (6 to 9 in-lb)

At companion flange bolt hole:

2.0 to 2.9 kg (4.4 to 6.4 lb)

Note: Preload of old bearing is the same value as that of a new bearing.

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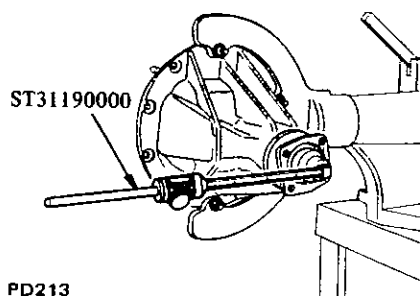


Fig. PD-57 Measuring pinion preload

Pinion bearing adjusting spacer

Thickness mm (in)
48.4 (1.9055)
48.6 (1.9134)
48.8 (1.9213)
49.0 (1.9291)

Pinion bearing adjusting washer

Thickness mm (in)
2.59 (0.1020)
2.57 (0.1012)
2.55 (0.1004)
2.53 (0.0996)
2.51 (0.0988)
2.49 (0.0980)
2.47 (0.0972)
2.45 (0.0965)
2.43 (0.0957)
2.41 (0.0949)
2.39 (0.0941)
2.37 (0.0933)
2.35 (0.0925)
2.33 (0.0917)
2.31 (0.0909)

3. Inspect pinion height again when former adjustment of bearing preload is completed. Unless anything wrong is found, remove drive pinion nut and companion flange and press new oil

seal into gear carrier. Apply grease cavity between seal lips.

4. Again install companion flange and washer, and tighten nut to specified torque 14 to 17 kg-m (101.3 to 130.0 ft-lb)

5. Measure preload again.

Preload (with oil seal):

8 to 11 kg-cm

(6.95 to 9.56 in-lb)

At companion flange bolt hole:

2.3 to 3.2 kg

(5.1 to 7.1 lb)

[For van]

Note: Reuse of a collapsible spacer must not be allowed.

1. After adjusting pinion height, lubricate front bearing with gear oil and place it in carrier.

2. Install a new oil seal in carrier. Lubricate cavity between seal lip with grease when installing.

3. Place a new collapsible spacer on drive pinion and lubricate pinion rear bearing with gear oil.

4. Insert companion flange into oil seal and hold it firmly against pinion front bearing cone. From the rear of the carrier, insert drive pinion into companion flange.

5. Ascertain that threaded portion of drive pinion, a new pinion nut and washer are free from oil or grease.

6. Hold companion flange with special tool "Drive Pinion Flange Wrench ST31530000" and tighten pinion nut. As nut is tightened, drive pinion is pulled into front bearing cone and into flange.

As drive pinion is pulled into front bearing cone, drive pinion end play is reduced. While there is still end play in drive pinion, companion flange and cone will be felt to bottom. This indicates that bearing cone and companion flange have bottomed on collapsible spacer.

From this point, a much greater torque must be applied to turn pinion nut since spacer must be collapsed. From this point, nut should also be tightened very slowly

and drive pinion end play checked often so that pinion bearing preload does not exceed the limits.

When the drive pinion end play is eliminated, the preload specification is being approached. Replace collapsible spacer if this specification is exceeded.

Note: Do not decrease preload by loosening pinion nut.

This will remove compression between pinion front and rear bearing cones and collapsible spacer and may permit front bearing cone to turn on drive pinion, moreover, nut become loose.

6. Turn drive pinion in both directions several times to set bearing rollers. And adjust bearing preload to specifications.

Tightening torque of pinion nut:

13 to 20 kg-m

(94.0 to 144.6 ft-lb)

Preload (with oil seal):

7 to 15 kg-cm

(6.1 to 13.0 in-lb)

At companion flange bolt hole:

2.0 to 4.3 kg (4.5 to 9.5 lb)

Adjustment of the side bearing shims

1. If hypoid gear set, carrier, differential case or side bearing have been replaced with new ones, adjust the side bearing preload with adjusting shim.

The required thickness of adjusting shim can be calculated by the following formula.

[For station wagon]

$$T1 = (A - C + D - H') \times 0.01 + 0.200 + E$$

$$T2 = (B - D + H') \times 0.01 + 0.090 + F$$

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[For van]

$$T1 = (A - C + D - H') \times 0.01 + 0.175 + E$$

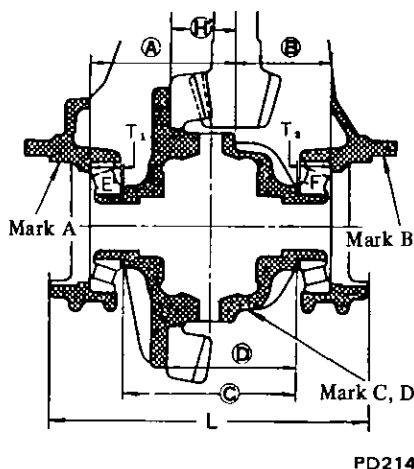
$$T2 = (B - D + H') \times 0.01 + 0.150 + F$$

Where,

T1 = Required thickness of left side bearing adjusting shim (mm).
 T2 = Required thickness of right side bearing adjusting shim (mm).
 A = Figure marked on the left side bearing housing of gear carrier.
 B = Figure marked on the right side bearing housing of gear carrier.
 C & D = Figure marked on the differential case.
 E & F = These are differences in width of left or right side bearing against the standard width (mm).
 H' = Figure marked on the ring gear.

Figures for A, B, C, D and H' are dimensional variations in a unit of 1/100 mm against each standard measurement.

Note: Preload of old bearing is to adopt the same value as that of a new bearing.



PD214

Fig. PD-58 Thickness of shim on left and right side

Example of calculation for van.

A = 1, B = 2, C = 2, D = 3
 E = +0.02 mm, F = -0.01 mm
 H' = +1

Left side

$$T1 = (A - C + D - H') \times 0.01 + 0.175 + E$$

$$= (1 - 2 + 3 - 1) \times 0.01 + 0.175 + 0.02$$

$$= 0.205 \text{ mm}$$

Right side

$$T2 = (B - D + H') \times 0.01 + 0.150 + F$$

$$= (2 - 3 + 1) \times 0.01 + 0.150 - 0.01$$

$$= 0.14 \text{ mm}$$

Side bearing adjusting shim

[For station wagon]

Thickness mm (in)
0.05 (0.0020)
0.07 (0.0028)
0.10 (0.0039)
0.20 (0.0079)
0.50 (0.0197)

[For van]

Thickness mm (in)
0.05 (0.0020)
0.07 (0.0028)
0.10 (0.0039)
0.20 (0.0079)
0.50 (0.0197)

2. Fit determined side bearing adjusting shim on differential case, and press fit left and right side bearing inner races on it, using special tool as follows:

[For station wagon]

"Side Bearing Drift ST33210000" and "Adaptor ST33052000."

[For van]

"Side Bearing Drift ST33230000" and "Adaptor ST33061000."

3. Install differential case assembly into gear carrier, tapping with a rubber mallet.

4. Align mark on bearing cap with that on gear carrier, and install bearing cap on carrier. And tighten bolts or nuts to specified torque.

Tightening torque:

[For station wagon]

5 to 6 kg-m
 (36.2 to 43.4 ft-lb)

[For van]

4.2 to 4.8 kg-m
 (30.4 to 34.7 ft-lb)

5. Measure "L" dimension (between left and right bearing cap edges) by special tool "Side Bearing Cap Gauge ST32150000 (for station wagon) or ST32110001 (for van)" or micrometer.

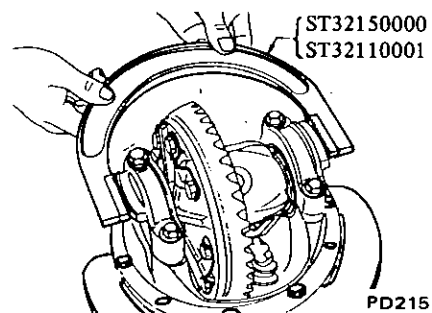
"L" dimension:

[For station wagon]

173.23 to 173.29 mm
 (6.8201 to 6.8224 in)

[For van]

198.40 to 198.55 mm
 (7.8110 to 7.8169 in)



PD215

Fig. PD-59 Measuring "L" dimension

6. Measure backlash in ring gear and drive pinion.

If backlash is too small, remove shims from left side and add them to right side. To reduce backlash, remove shims from right side and add them to left side.

Backlash:

[For station wagon]

0.13 to 0.18 mm (0.0051 to 0.0071 in)

[For van]

0.15 to 0.20 mm (0.0059 to 0.0079 in)

PROPELLER SHAFT & DIFFERENTIAL CARRIER

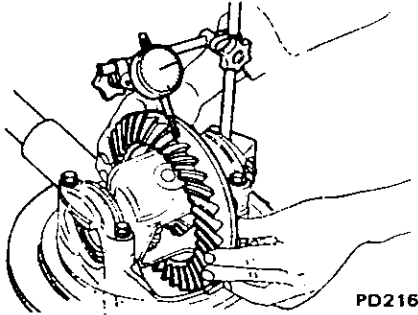


Fig. PD-60 Measuring backlash

7. Check the runout of ring gear side is within 0.05 mm (0.0020 in).

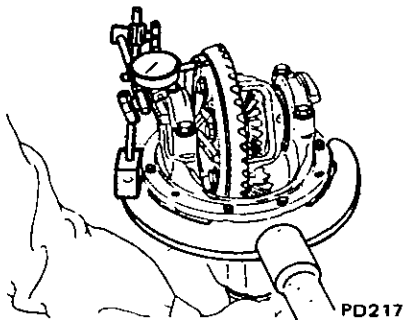


Fig. PD-61 Measuring runout of ring gear

8. At the same time, check bearing preload. Bearing preload should read the following value of rotating torque.

[For station wagon]
9 to 17 kg-cm
(7.8 to 14.8 in-lb)

At companion flange bolt hole:
2.6 to 4.9 kg
(5.7 to 10.8 lb)

[For van]
8 to 21 kg-cm
(7.0 to 18.2 in-lb)

At companion flange bolt hole:
2.3 to 6.0 kg
(5.1 to 13.0 lb)

If preload is not according to this specification, adjust it with side bearing shims.

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

This procedure can be accomplished by referring to "FOR SEDAN."

INSTALLING GEAR CARRIER ASSEMBLY

Installing can be proceeded in the reverse order of "REMOVAL."

Tightening torque (for station wagon and van):

Gear carrier to rear axle case:
2.0 to 2.5 kg-m
(14.5 to 18.1 ft-lb)

Companion flange to propeller shaft:
2.0 to 2.7 kg-m
(14.5 to 19.5 ft-lb)

Drain and filler plug:
4.2 to 6.9 kg-m
(30.4 to 49.9 ft-lb)

Gear oil quantity:

[For station wagon]
1.3 liters
(1 1/4 U.S. qts., 1 1/4 Imper. qts.)

[For van]
1.0 liter
(1 U.S. qts., 3/4 Imper. qt.)

TROUBLE DIAGNOSES AND CORRECTIONS

This procedure can be accomplished by referring to "FOR SEDAN."

PROPELLER SHAFT & DIFFERENTIAL CARRIER

SERVICE DATA AND SPECIFICATIONS

	Sedan	Station wagon	Van
Nominal diameter of ring gear	160	165	190
Gear carrier material	Malleable cast-iron		Aluminum alloy
Gear ratio (number of teeth)	1800 cc model : 3.700 (37/10) [With A/T model for U.S. and Canada : 3.900 (39/10)] 1,600 cc model : 3.900 (39/10)	3.889 (35/9)	4.375 (35/8)
Drive pinion preload adjusted by	Shim		Collapsible spacer
Drive pinion Preload kg-cm (in-lb) (without oil seal) (with oil seal) At companion flange bolt hole kg (lb) (without oil seal) (with oil seal)	7 to 10 (6.1 to 8.7) 8 to 11 (7.0 to 9.6) 20 to 29 (4.4 to 6.4) 23 to 32 (5.1 to 7.1)		7 to 15 (6.1 to 13.0) 2.0 to 4.3 (4.5 to 9.5)
Thickness of pinion height adjusting washer	Thickness mm (in) 3.09 (0.1217) 3.12 (0.1228) 3.15 (0.1240) 3.18 (0.1252) 3.21 (0.1264) 3.24 (0.1276) 3.27 (0.1287) 3.30 (0.1299) 3.33 (0.1311) 3.36 (0.1323) 3.39 (0.1335) 3.42 (0.1346) 3.45 (0.1358) 3.48 (0.1370) 3.51 (0.1382) 3.54 (0.1394) 3.57 (0.1406) 3.60 (0.1417) 3.63 (0.1429) 3.66 (0.1441)	Thickness mm (in) 0.050 (0.0020) 0.070 (0.0028) 0.100 (0.0039) 0.200 (0.0079) 0.500 (0.0197)	Thickness mm (in) 2.37 (0.0933) 2.40 (0.0945) 2.43 (0.0957) 2.46 (0.0969) 2.49 (0.0980) 2.52 (0.0992) 2.55 (0.1004) 2.58 (0.1016) 2.61 (0.1028) 2.64 (0.1039) 2.67 (0.1051) 2.70 (0.1063) 2.73 (0.1075) 2.76 (0.1087) 2.79 (0.1098) 2.82 (0.1110) 2.85 (0.1122) 2.88 (0.1134) 2.91 (0.1146) 2.94 (0.1157) 2.97 (0.1169)

PROPELLER SHAFT & DIFFERENTIAL CARRIER

	Sedan	Station wagon	Van
Thickness of pinion bearing adjusting spacer and washer	[Spacer] Thickness mm (in) 56.2 (2.2126) 56.4 (2.2205) 56.6 (2.2283) 56.8 (2.2362) 57.0 (2.2441) 57.2 (2.2520) [Washer] Thickness mm (in) 2.59 (0.1020) 2.57 (0.1012) 2.55 (0.1004) 2.53 (0.0996) 2.51 (0.0988) 2.49 (0.0980) 2.47 (0.0972) 2.45 (0.0965) 2.43 (0.0957) 2.41 (0.0949) 2.39 (0.0941) 2.37 (0.0933) 2.35 (0.0925) 2.33 (0.0917) 2.31 (0.0909)	[Spacer] Thickness mm (in) 48.4 (1.9055) 48.6 (1.9134) 48.8 (1.9213) 49.0 (1.9291)	Non adjustable collapsible spacer
Side gear and pinion mate Thickness of side gear thrust washer	Thickness mm (in) 0.75 to 0.80 (0.0295 to 0.0315) 0.80 to 0.85 (0.0315 to 0.0335) 0.85 to 0.90 (0.0335 to 0.0354)	Thickness mm (in) 0.785 (0.0309) 0.835 (0.0329) 0.885 (0.0348) 1.035 (0.0407) 1.185 (0.0467)	Thickness mm (in) 0.75 to 0.80 (0.0295 to 0.0315) 0.80 to 0.85 (0.0315 to 0.0335) 0.85 to 0.90 (0.0335 to 0.0354) 0.90 to 0.95 (0.0354 to 0.0374)
Backlash in pinion mate and side gear (or clearance between side gear and thrust washer) mm (in)	0.1 to 0.2 (0.0039 to 0.0079)		
Ring gear Backlash between ring gear and drive pinion mm (in)	0.1 to 0.2 (0.0039 to 0.0079)	0.13 to 0.18 (0.0051 to 0.0071)	0.15 to 0.20 (0.0059 to 0.0079)
Runout of rear side of ring gear mm (in)	Less than 0.05 (0.0020)		

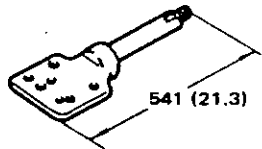
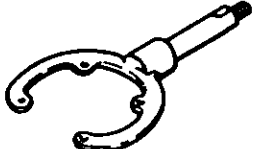
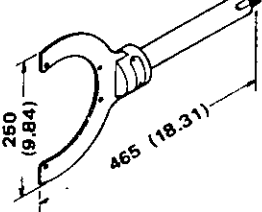
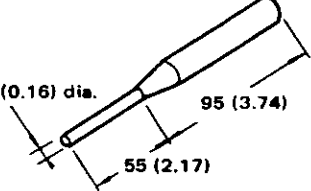
PROPELLER SHAFT & DIFFERENTIAL CARRIER

	Sedan	Station wagon	Van
Thickness of side retainer adjusting shim mm (in)	Thickness mm (in) 0.20 (0.0079) 0.25 (0.0098) 0.30 (0.0118) 0.40 (0.0158) 0.50 (0.0197)		
Thickness of side bearing adjusting shim mm (in)		Thickness mm (in) 0.05 (0.0020) 0.07 (0.0028) 0.10 (0.0039) 0.20 (0.0079) 0.50 (0.0197)	
Side bearing standard with mm (in)	20.0 (0.7874)	18.5 (0.7283)	20.0 (0.7874)
"L" dimension mm (in)	—	173.23 to 173.29 (6.8201 to 6.8224)	198.40 to 198.55 (7.8110 to 7.8169)
Tightening torque kg-m (ft-lb)			
Drive pinion nut	17 to 20 (122.9 to 144.6)	14 to 17 (101.2 to 122.9)	13 to 20 (94.0 to 144.6)
Ring gear bolt	7 to 8 (50.6 to 57.8)	7 to 8 (50.6 to 57.8)	7 to 8 (51 to 58)
Side retainer bolt	0.9 to 1.2 (6.5 to 8.7)	—	—
Side flange fix bolt	1.9 to 2.6 (13.7 to 18.8)	—	—
Rear cover fix bolt	1.9 to 2.6 (13.7 to 18.8)	—	—
Rear cover to mounting member lock nut	6 to 8 (43.4 to 57.8)	—	—
Differential carrier to suspension member fix bolt	5 to 7 (36.2 to 50.6)	—	—
Differential to drive shaft fix bolt	5 to 6 (36.2 to 43.4)	—	—
Differential mounting member self lock nut	7 to 10 (50.6 to 72.3)	—	—
Side bearing cap bolt	—	5 to 6 (36.2 to 46.4)	—
Side bearing cap nut	—	—	4.2 to 4.8 (30.4 to 34.7)
Differential carrier to axle case fix nut	—	2.0 to 2.5 (14.5 to 18.1)	2.0 to 2.5 (14.5 to 18.1)
Companion flange to propeller shaft fix bolt	2.0 to 2.7 (14.5 to 19.5)	2.0 to 2.7 (14.5 to 19.5)	2.0 to 2.7 (14.5 to 19.5)
Oil drain and filler plug	4 to 6 (28.9 to 43.4)	4.2 to 6.9 (30.4 to 49.9)	4.2 to 6.9 (30.4 to 49.9)
Oil capacity (about)	0.8 liter ¾ U.S. qt. ¾ Imper. qt.	1.3 liters 1 ½ U.S. qts. 1 ½ Imper. qts.	1.0 liter 1 U.S. qt. ¾ Imper. qt.
Adjusting methods Variation numbers expressed by	mm (x 0.01)		
Dummy shaft	Use		

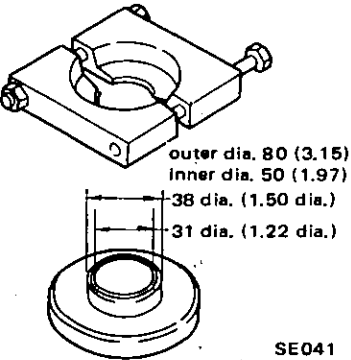
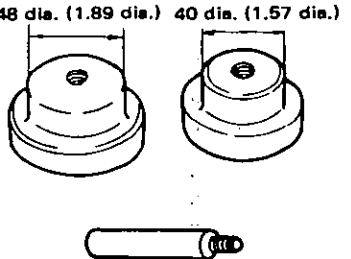
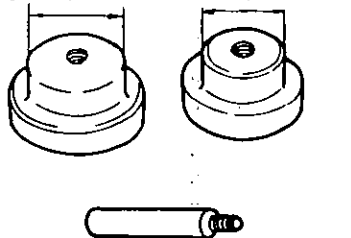
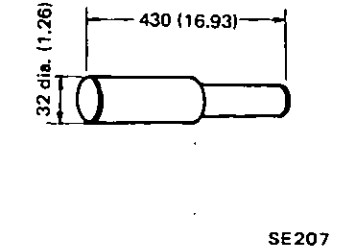
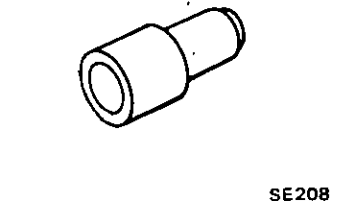
PROPELLER SHAFT & DIFFERENTIAL CARRIER

	Sedan	Station wagon	Van
Drive pinion adjusting formula	$T = W + N - [(H - D' - S) \times 0.01] - 0.2$	$T = N - [(H - D' - S) \times 0.01] + 0.28$	$T = N - [(H - D' - S) \times 0.01] + 2.18$
Side bearing adjusting formula	$T1 = (A + C + G1 - D + H') \times 0.01 + 0.76 - E$ $T2 = (B + D + G2 - H') \times 0.01 + 0.76 - F$	$T1 = (A - C + D - H') \times 0.01 + 0.20 + E$ $T2 = (B - D + H') \times 0.01 + 0.09 + F$	$T1 = (A - C + D - H') \times 0.01 + 0.175 + E$ $T2 = (B - D + H') \times 0.01 + 0.150 + F$

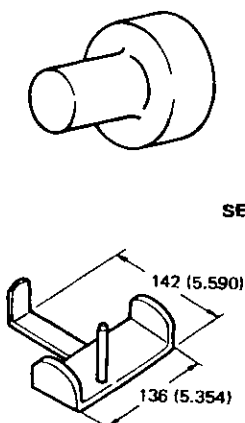
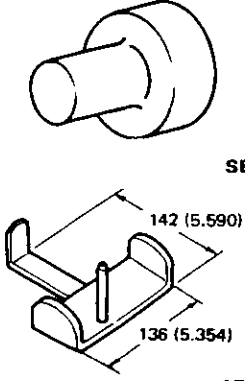
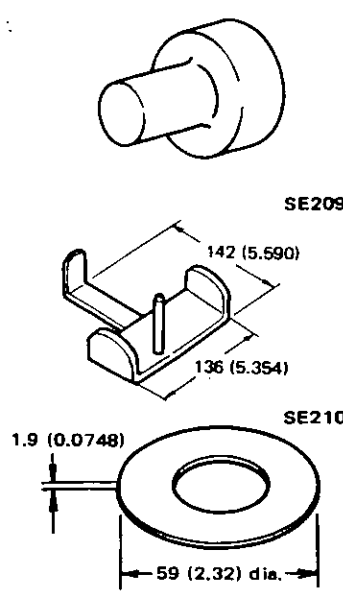
SPECIAL SERVICE TOOL

	Tool number & tool name	Description Unit: mm (in)	For use on	Reference page or figure No.
1.	ST06270001 Diff. attachment (R160)	 SE040	This attachment is used with engine stand (ST0501S000). Strut and steering gear box mounting holes are provided with engraved identification marks. "D" for gear carrier "S" for strut "G" for steering gear box	610 510 S30 C30 GC10 Fig. PD-9
2.	ST06310000 Diff. attachment (H190)	 SE023	This tool is used for attaching gear carrier to ease disassembly or assembly (ST0501S000).	V610 W510 230 521 Fig. PD-43
3.	ST06360000 Diff. attachment (H165)	 SE206	Same as above.	W610 C10 411 Fig. PD-42
4.	ST23510000 Solid punch	 SE058	This tool is used to drive lock pin out of pinion mating shaft.	All models Page PD-9 Fig. PD-49

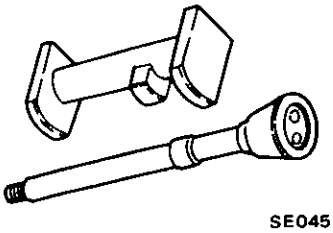
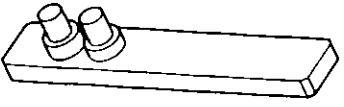
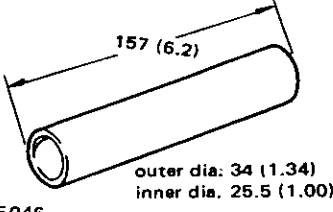
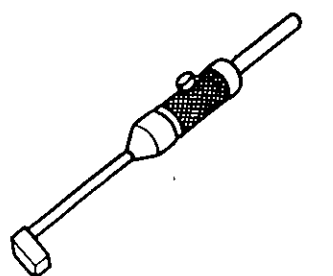
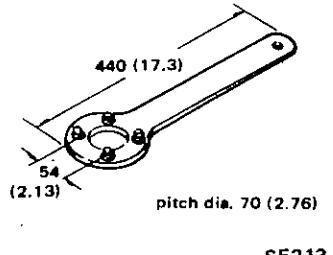
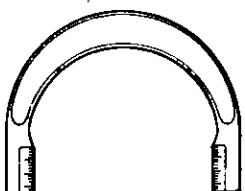
PROPELLER SHAFT & DIFFERENTIAL CARRIER

No.	Tool number & tool name	Description	Unit: mm (in)	For use on	Reference page or figure No.
5.	ST3003S000 Drive pinion rear inner bearing puller assembly ST30031000 Puller ST30032000	 SE041	This assembly clamps rear bearing inner race and pulls it out by a hydraulic press. Before insertion, place another drift facing inner race, and then press-fit.	610 W610 V610 510 B110 C10 521	Fig. PD-13 Fig. PD-46 Page PD-23
6.	ST30611000 Drive pinion outer race drift (bar)		These tools are used when assembling drive pinion outer race. ● Use ST30611000 and ST306112000 for driving in front outer race. ● Use ST30611000 and ST30613000 for driving in rear outer race.	610 W610 V610 510 521	Page PD-11 Page PD-22
7.	ST30612000 Drive pinion outer race drift (adapter)				
8.	ST30613000 Drive pinion outer race drift (adapter)	SE042			
9.	ST30650001 Pilot bearing drift	 SE207	For use when pulling out front pilot bearing. After drive pinion has been pulled, insert this tool from behind the gear carrier case, and apply it onto pinion front bearing inner race, and then press out pinion front bearing inner race, front pilot bearing spacer and pilot bearing.	610 510 S30 GC10 C30	Page PD-9
10.	ST30720000 Gear carrier front oil seal drift	 SE208	This tool is used to drive in gear carrier front oil seal.	W610 V610 W510 C10 230 521	

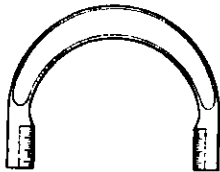
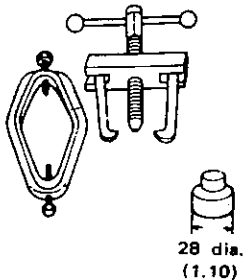
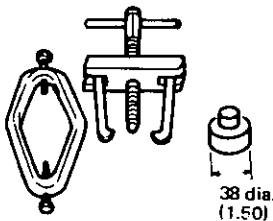
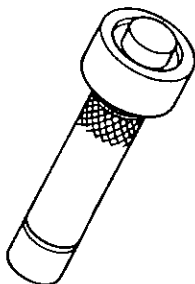
PROPELLER SHAFT & DIFFERENTIAL CARRIER

No.	Tool number & tool name	Description	Unit: mm (in)	For use on	Reference page or figure No.
11.	ST3194S000 Drive pinion setting gauge assembly (H190) ST31942000 Dummy shaft ST31941000 Arrangement gauge	 SE209 SE210	This assembly is used to adjust the pinion height.	V610 521	Page PD-22 Fig. PD-54
12.	ST3114S000 Drive pinion setting gauge assembly (H165) ST31942000 Dummy shaft ST31141000 Arrangement gauge	 SE209 SE210	Same as above.	W610 C10	Page PD-22 Fig. PD-54
13.	ST3110S000 Drive pinion setting gauge assembly (H190) ST31942000 Dummy shaft ST31101000 Arrangement gauge ST31102000 Spacer	 SE209 SE210 SE211	This assembly is used to adjust the pinion height.	V610 521	Page PD-22 Fig. PD-55

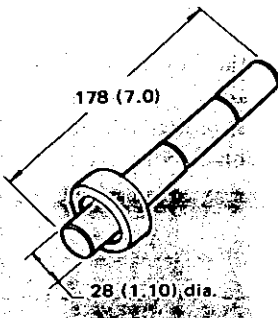
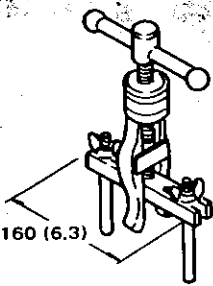
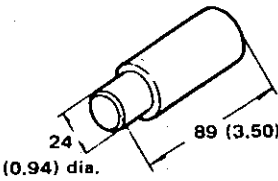
PROPELLER SHAFT & DIFFERENTIAL CARRIER

No.	Tool number & tool name	Description Unit: mm (in)	For use on	Reference page or figure No.
14.	ST3121S000 Height gauge assembly (R160) ST31211000 Height gauge ST31212000 Dummy shaft ST31213000 Stopper ST31214000 Collar	   These tools are used to adjust the pinion height. (Add Dummy Spacer ST31850000 for use on S30, GC10 and C30)	610 510 (S30) (GC10) (C30)	Page PD-11 Fig. PD-21 Fig. PD-23
15.	ST31190000 Preload gauge	 This tool is used to measure whether the specified preload is given to pinion bearing.	All models	Page PD-11 Fig. PD-57
16.	ST31530000 Drive pinion flange wrench	 This tool is used to hold the flange to ease the operation of tightening and drive pinion nut.	610 W610 V610 510 W510 S30 230 C10 521	Fig. PD-5 Fig. PD-12 Fig. PD-15 Page PD-10 Fig. PD-45 Fig. PD-50 Page PD-21 Page PD-24
17.	ST32110001 Diff. side bearing cap gauge (H190)	 This tool is used to measure the width of side bearing cap after it is tightened to specified torque.	V610 W510 230 521	Fig. PD-59

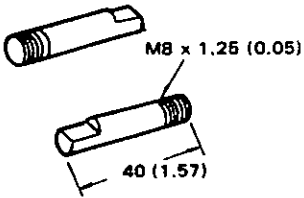
PROPELLER SHAFT & DIFFERENTIAL CARRIER

No.	Tool number & tool name	Description Unit: mm (in)		For use on	Reference page or figure No.
18.	ST32150000 Diff. side bearing cap gauge (H165)		Same as above	W610 C10 411	Page PD-25
		SE215			
19.	ST3305S000 Diff. side bearing puller ST33051001 Body ST33052000 Adapter		This tool is used to pull out side bearing.	W610 C10 B110 411	Fig. PD-48 Page PD-25
		SE216			
20.	ST3306S000 Diff. side bearing puller ST33051001 Body ST33061000 Adapter		This tool is used to pull out side bearing.	610 V610 W510 S30 C30 GC10 230 521	Fig. PD-14 Page PD-11 Fig. PD-48 Page PD-25
		SE049			
21.	ST33210000 Diff. side bearing drift		Use of this tool makes it possible to drive in bearing without damaging it.	W610 C10 411	Page PD-25
		SE217			

PROPELLER SHAFT & DIFFERENTIAL CARRIER

No.	Tool number & tool name	Description Unit: mm (in)	For use on	Reference page or figure No.
22.	ST33230000 Diff. side bearing drift	 SE051	610 V610 510 W510 C30 230 521	Page PD-11 Page PD-25
23.	ST33270000 Gear carrier oil seal drift	 SE053	610 510 S30 C30 GC10	Page PD-10
24.	ST33290001 Gear carrier oil seal puller	 SE054	610 W610 V610 510 W510 S30 C30 GC10 C10	Page PD-8 Fig. PD-17 Page PD-10 Fig. PD-52
25.	ST33710000 Gear carrier side retainer attachment	 SE055	610 510 S30 C30 GC10	Fig. PD-10

PROPELLER SHAFT & DIFFERENTIAL CARRIER

No.	Tool number & tool name	Description Unit: mm (in)		For use on	Reference page or figure No.
26.	ST33720000 Gear carrier side retainer guide	 SE056		610 510 S30 C30 GC10	Fig. PD-31

SERVICE MANUAL

DATSUN 1800
MODEL 610 SERIES
CHASSIS & BODY



NISSAN MOTOR CO., LTD.
TOKYO, JAPAN

SECTION FA

FRONT AXLE & FRONT SUSPENSION

FA

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ADJUSTMENT	FA-14
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FRONT AXLE & FRONT SUSPENSION

FRONT AXLE AND FRONT SUSPENSION

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Removal	FA- 3	Inspection	FA-11
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Wheel bearing adjustment	FA- 8	Installation	FA-14

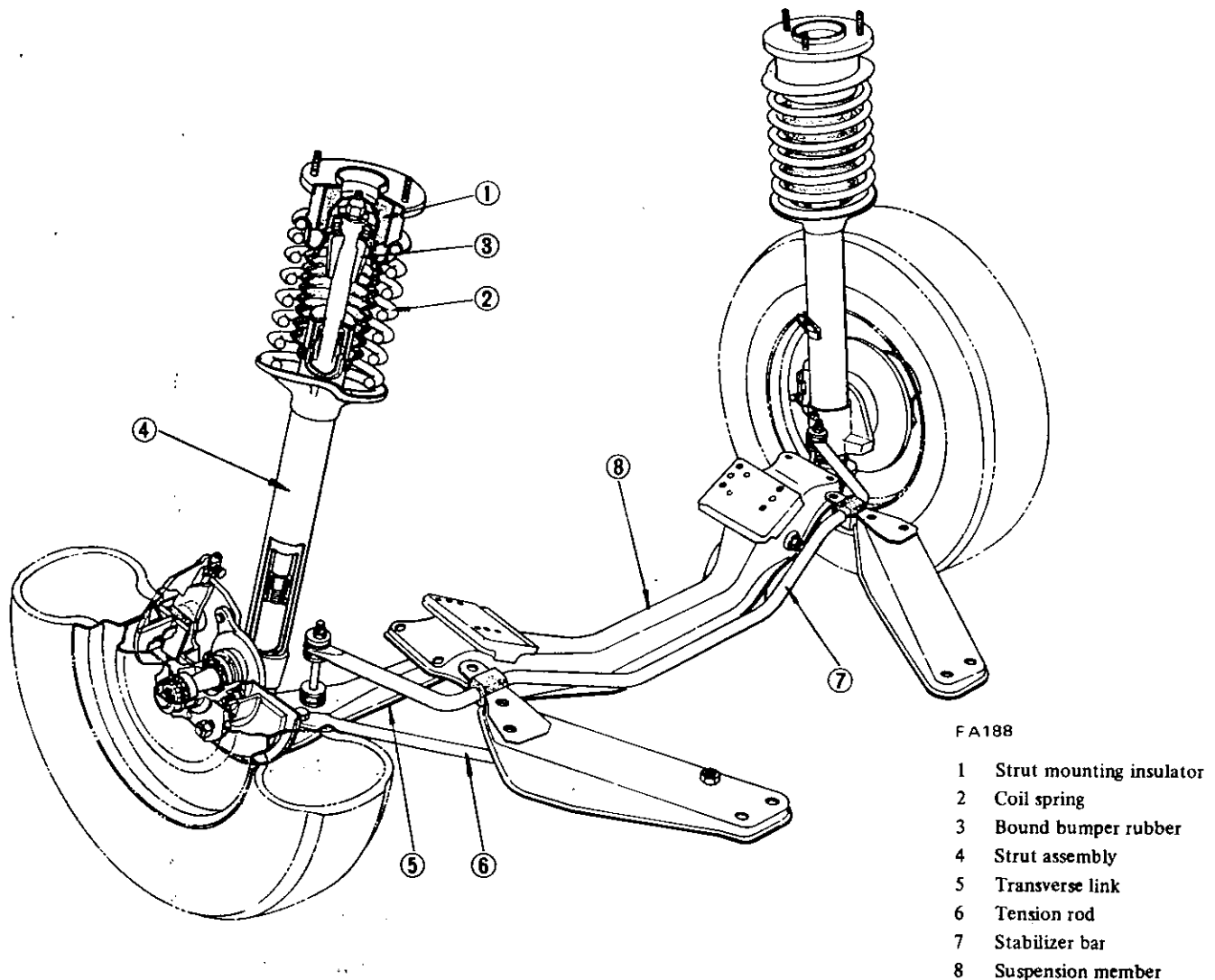


Fig. FA-1 Front axle and suspension assembly

FRONT AXLE AND FRONT SUSPENSION

GENERAL DESCRIPTION

All models employ a strut type front suspension in which the shock absorber and spindle are assembled into a single unit. It is supported by a coil spring at the top and by the transverse link at the bottom.

The spindle and outer casing are of an integral design. The ball joint, located at the outer end of the transverse link, serves as a pivot for the movement of the spindle.

These are assembled on the suspension member through a rubber bushing to avoid metal to metal contact.

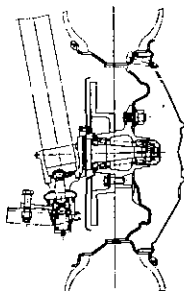
The shock absorber is basically a double-acting hydraulic ram consisting mainly of an outer casing, an inner casing, a piston and a piston rod.

The gland packing and piston guide keep the rod in place as well as preventing leakage.

The coil spring is placed on the piston rod with its seat on the bottom.

The seat is welded to the outer casing. These are mounted on the chassis frame through the thrust bearing at the top. The transverse link, tension rod and rubber bushing take thrusts from front and rear.

The stabilizer uses a torsion bar; it takes thrusts from either side of the vehicle. Thus, the entire suspension handles thrusts from any angle: i.e. those from front and rear by the tension rod, those in vertical direction with the strut, and those from either side of the vehicle by means of the transverse link.



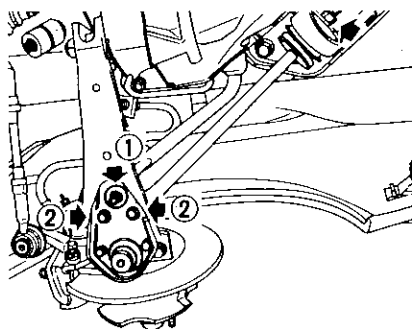
FA189

Fig. FA-2 Sectional view of front axle (disc brake)

FRONT AXLE AND SUSPENSION ASSEMBLY

Removal

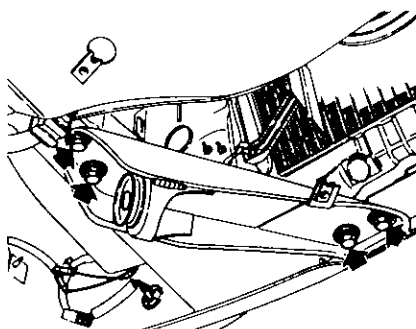
1. Jack up vehicle and support it with safety stands. See relative topic under Section GI.
2. Remove hub nuts; take out wheel.
3. Remove splash board.
4. Remove nut connecting brake tube to vehicle frame; take out brake hose lock spring and brake hose in the order listed.
5. Pry cotter pin off side rod socket ball joint. Remove castle nut and separate side rod socket from knuckle arm.
6. Loosen off nut (1) securing tension rod to bracket. In like manner as above, remove nut (2) which secure tension rod to transverse link. Tension rod can then be taken out.



FA190

Fig. FA-3 Removing tension rod

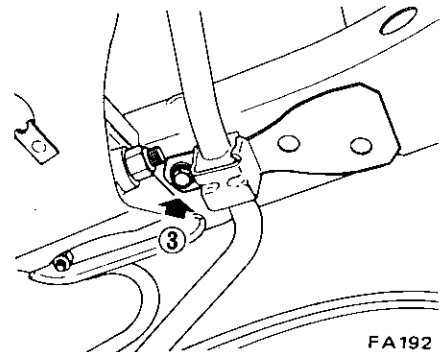
7. Remove bolts retaining tension rod bracket in place; take out tension rod bracket.



FA191

Fig. FA-4 Removing tension rod bracket

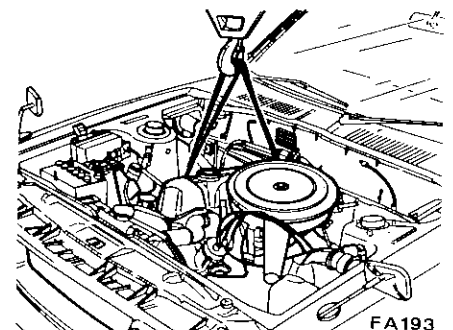
8. Loosen off nut (3), Figure FA-5, and take out bolt securing stabilizer bracket in position. Remove stabilizer from vehicle frame.



FA192

Fig. FA-5 Removing stabilizer bar

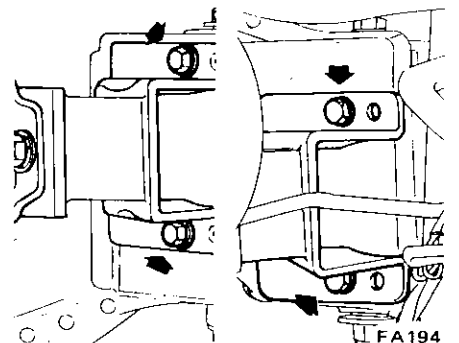
9. With an overhead hoist and lifting cable, support weight of engine to remove loads from mountings.



FA193

Fig. FA-6 Hoisting engine

10. Remove engine mounting bolts indicated by arrows in the sketch below. Separate suspension cross member from engine.



FA194

Fig. FA-7 Removing engine mounting bolts

11. Using floor jack beneath center of suspension cross member, raise vehicle until wheel falls to full down position. Remove bolt, indicated by

FRONT AXLE AND FRONT SUSPENSION

arrow, and separate cross member from vehicle body.

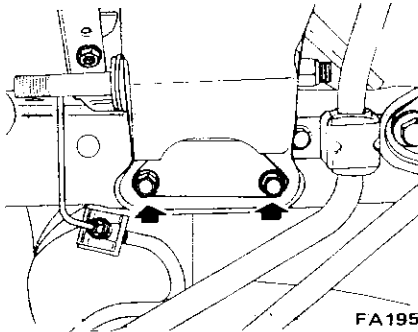


Fig. FA-8 Removing suspension cross member

12. Remove nuts securing strut to vehicle body; dismount suspension as a unit.

Inspection

1. Check tension rod and stabilizer for evidence of deformation and cracking; if necessary, replace.
2. Check rubber parts such as tension rod and stabilizer bushings to be sure they are not deteriorated or cracked.

Installation

To install, reverse removal procedure. However, observe the following installation notes:

1. Ensure that stabilizer is correctly installed to the portion of the left and right sides.
2. Check to be sure that tension rod bushing is properly centered in its seat.
3. Examine if clearance between tension rod and stabilizer bar is equal on both sides.

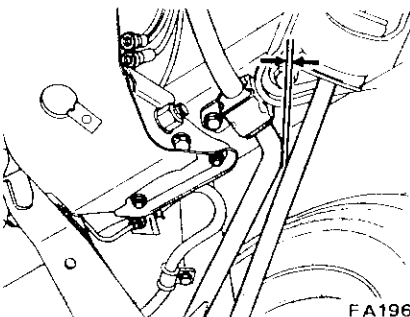


Fig. FA-9 Adjusting clearance between tension rod and stabilizer bar

4. Be sure that bolt attaching tension bracket is correctly tightened.
5. Do not tighten transverse link bolt without first tightening bolt securing tension rod.

Tightening torque:

Stabilizer attaching bolt

1.2 to 1.7 kg-m

(8.7 to 12 ft-lb)

Frame bracket side

1.4 to 1.8 kg-m

(10 to 13 ft-lb)

Tension rod bracket bolt

5.1 to 6.9 kg-m

(37 to 50 ft-lb)

Tension rod installation nut

4.5 to 5.5 kg-m

(33 to 40 ft-lb)

Tension rod to transverse link bolt

4.9 to 6.3 kg-m

(35 to 46 ft-lb)

FRONT AXLE

Removal

1. Jack up vehicle until wheel falls to full down position; remove wheel. Disconnect brake hose at body side bracket. Refer to Removal of Front Axle and Suspension Assembly.
2. Remove bolts retaining brake caliper and take out caliper assembly (disc type brake only).

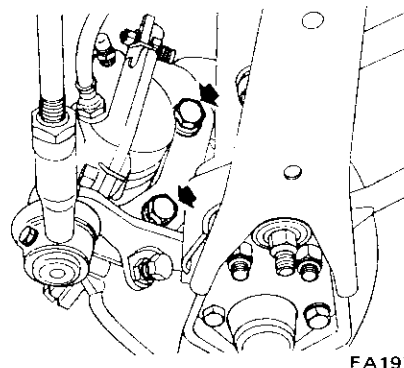
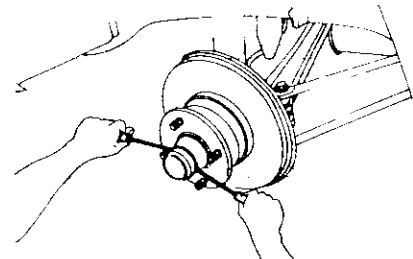


Fig. FA-10 Removing brake caliper installation bolt

3. Remove brake drum (drum brake only).

4. Work off hub cap from end of spindle using thin screwdrivers or any other suitable tool as shown. If necessary, tap around it with a soft hammer while removing cap.

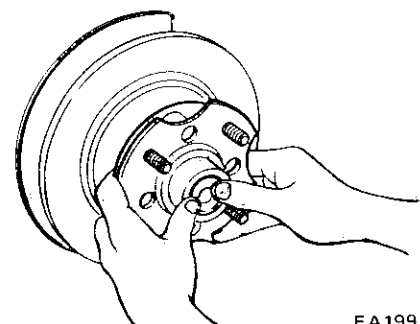


FA038

Fig. FA-11 Removing hub cap

Note: During operation, use care to avoid damaging O-ring.

5. Pry off cotter pin; take out adjusting cap and wheel bearing lock nut.
6. Remove wheel hub from spindle with bearing installed.
7. On vehicles equipped with disc brakes, wheel hub may be removed together with disc rotor.



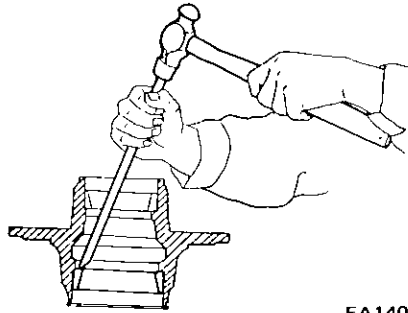
FA199

Fig. FA-12 Removing wheel hub

On vehicles equipped with drum brakes, take out brake shoe return spring, brake shoe, brake disc attaching bolts and brake disc, in this order.

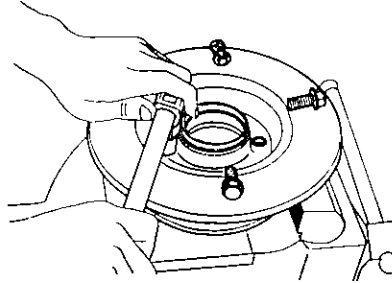
8. Loosen screws securing baffle plate in position; take out baffle plate (disc brake only).
9. Utilizing two grooves inside hub, drive out wheel bearing outer race from hub with a brass drift.

FRONT AXLE AND FRONT SUSPENSION



FA140

Fig. FA-13 Removing wheel bearing outer race



FA042

Fig. FA-14 Removing brake disc rotor

10. Loosen four bolts securing brake disc in position; remove brake disc rotor from wheel hub assembly (disc brake only).

Inspection

1. Grease seal
When leakage is detected during

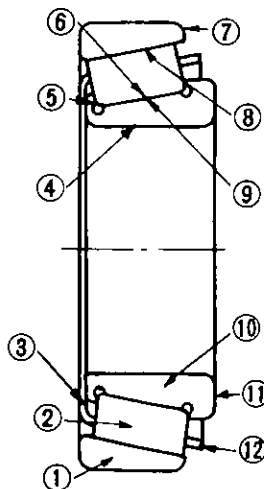
disassembly, replace seal with a new one. It is also necessary to replace new seal whenever brake is disassembled.

2. Wheel bearing

Thoroughly clean bearing in cleaning solvent to remove grease and dirt and dry with compressed air. Check bearing for smooth rotation by spinning it with finger. Also check to be sure that it is free from noise, crack, pitting or wear. At the same time, check outer race for condition. Removal of outer race from wheel hub is not necessary.

Shown below is the chart which furnishes the necessary information on "Visual Serviceability Standard for Wheel Bearing."

Visual serviceability standard for wheel bearing



FA006

- 1 Outer race
- 2 Roller
- 3 Small collar
- 4 Collar surface
- 5 Inner race fitted surface
- 6 Inner race surface
- 7 Outer race fitted surface
- 8 Outer race surface
- 9 Roller rolling surface
- 10 Inner race
- 11 Large collar
- 12 Supporter

FRONT AXLE AND FRONT SUSPENSION

Judgement	× : Unserviceable △ : May be used when minor * : Rust should be removed with #0 emery paper			
	Race and roller		Supporter	Cause
	Rolling surface	Fitted surface		
Flaking (Fig. a, b)	×			Shortened 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 installing.
Crack (Fig. c, d)	×	×	×	• Excessive tightening. • Excessive gap and a considerable shock received from the outside. • Rapid heat generation on the race due to creep. • Bitten supporter with seizing rollers. • Abnormal thrust load. • Tapped with a hammer while removing.
Seizure	×	×	×	In the most cases, seizure occurs as result of grown discoloring or flaking.
Scratch	△	△	△	• Shock is given carelessly during installation. • Bit foreign matter.
Recess or wear made by pressing or striking (Fig. e, f, g)	△	△	△	• Careless installation, removal, or other rough handling (scar due to striking). • Recess made by 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. • The fitted part is discolored to brown or black. • Fretting corrosion (rust on fitted part) means fine relative slip on metal contact surface.

FRONT AXLE AND FRONT SUSPENSION

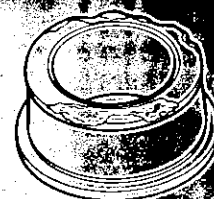
Judgement	X : Unserviceable △ : May be used when minor * : Rust should be removed with # 0 emery paper			
Components	Race and roller		Supporter	Cause
	Rolling surface	Fitted surface		
Rust	△*	△*	△*	- Temperature increase during operation lowers when the bearing stops, moisture inside the bearing is condensed, 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.
(Fig. h)				
Discoloring	The wheel bearing is serviceable if discoloring can be removed with solvent or by polishing.			- Slight discoloring may look like oxidized oil stain due to grease. - In the most cases, this occurs when preliminary pressure is too high.



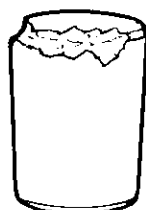
a) Inner race flaking



b) Roller flaking



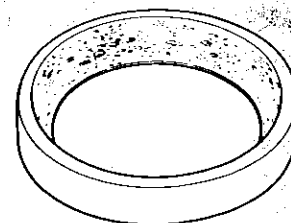
c) Cracked inner race



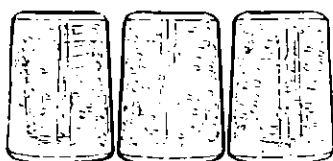
d) Cracked roller



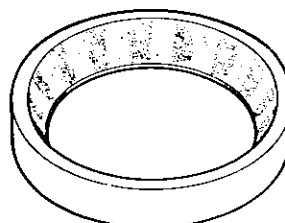
e) Recess on inner race



f) Recess on outer race



g) Recess on roller



h) Rust on outer race

FA007

FRONT AXLE AND FRONT SUSPENSION

3. Wheel hub

Check hub for crack by means of a magnetic exploration or dyeing test, and replace if cracked.

Installation

1. Install wheel bearing in reverse order of removal.
2. Install bearing outer race by tapping it around its outer periphery with a brass drift and a mallet, or by using special tool "Front Hub Drift Set ST3532S000" until it is bottomed in hub.
3. Pack cavities of wheel hub and hub cap with recommended multi-purpose grease.

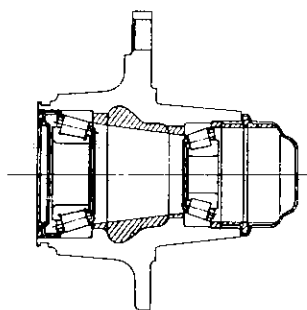
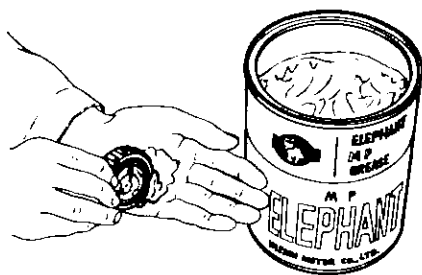


Fig. FA-15 Greasing wheel hub and hub cap

4. Pack cavities of each bearing cone with grease.



FA009

FA009

Fig. FA-16 Filling bearing cone with grease

5. Put inner bearing cone in hub and install a new grease seal. Be sure to lubricate sealing lips of the grease seal before installation.

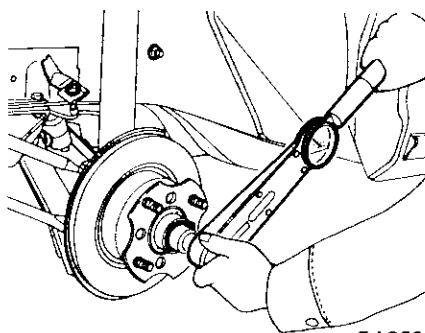
6. Put hub assembly on spindle and then install bearing outer cone.

7. Apply sparingly grease to washer and threaded parts of spindle and spindle nut. Then, install washer and spindle nut. Adjust the installation as outlined under "Wheel Bearing Adjustment."

Note: In order to assure correct bearing preload and to extend service life of wheel bearings, be sure to avoid dirt and foreign particles getting in bearings, grease seal, washer and spindle nut.

Wheel bearing adjustment

1. Sparingly apply grease to threaded parts of spindle shaft, wheel bearing washer and wheel bearing lock nut.
2. Tighten spindle nut to 3.0 to 3.5 kg-m torque (22 to 25 ft-lb), using suitable torque wrench.



FA200

Fig. FA-17 Tightening spindle nut

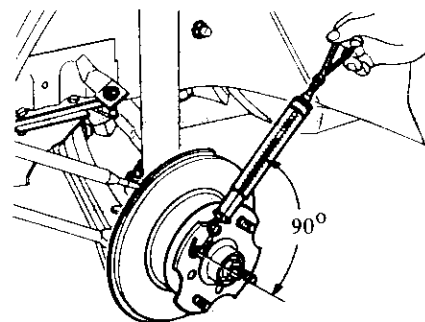
3. Turn wheel hub several times in both directions to seat wheel bearing correctly; again tighten spindle nut to the above torque.

4. Turn back spindle nut 1/4 turns. Install adjusting cap and tighten until any of its grooves aligns with hole in spindle. If the above procedure fails to align hole and groove together, then tighten lock nut as much as 15 degrees.

5. Again turn in wheel hub several times in both directions to see if it rotates freely. Then, measure bearing preload using a spring balance as follows:

New parts

- 7 kg-cm (97 in-oz) or less
- As measured at wheel hub bolt
- 1.22 kg (2.7 lb) or less
- Adjustment with old parts
- 4 kg-cm (56 in-oz)
- As measured at wheel hub bolt
- 0.7 kg (1.5 lb)



FA201

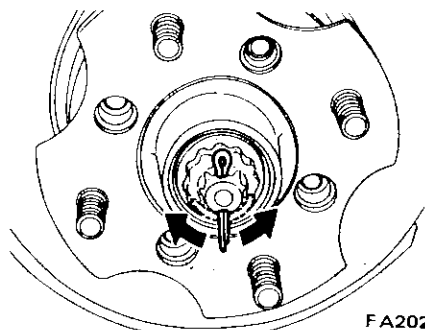
Fig. FA-18 Measuring bearing preload

Repeat above procedures until correct preload is obtained.

Notes:

- a. To measure bearing preload, attach a spring balance to hub bolt and pull it at right angle to a line drawn through center of bearing and hub bolt to which it is attached.
- b. Any slightest shaft play cannot be tolerated here.

6. Insert cotter pin with the legs through these two parts; spread legs away from each other against sides of spindle nut to secure the installation.



FA202

Fig. FA-19 Installing cotter pin

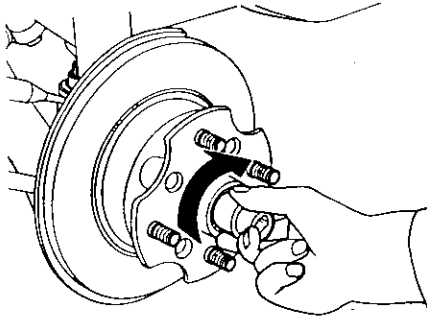
FRONT AXLE AND FRONT SUSPENSION

7. Install hub cap.

Note: If torque wrench is not available for securing spindle nut, carry out the following procedure temporarily.

Then, tighten spindle nut using a torque wrench and spring balance referring to step from "2" to "4."

- (1) Using a spanner, tighten spindle nut to settle wheel bearing down.
- (2) Turn wheel hub several times in both directions, noting if it rotates freely.
- (3) Back off spindle nut until it can be turned out further by hand. Install socket on spindle nut and tighten socket as far as it will go.



FA203

Fig. FA-20 Tightening spindle nut by hand

- (4) Line up hole in spindle with groove in bearing cap. Be sure to turn cap always in tightening direction.

SPRING AND STRUT ASSEMBLY

The front suspension employs struts right and left. Each strut consists of an outer casing, a piston, a piston rod and an inner cylinder.

The cylinder incorporates a piston rod guide at the top and a check valve at the bottom.

The piston rod, piston rod guide, cylinder and bottom valve should be handled as a matched set.

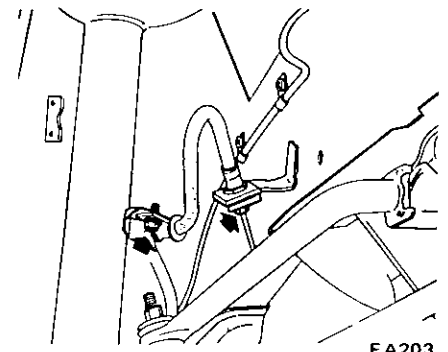
If any of these parts becomes defective, the whole parts must be replaced as a unit.

The spring comes into three types with individual markings on their wire ends; yellow, yellow/orange, and red/orange.

When a spring requires replacement, use the one having the same color identification. If this is neglected, the vehicle may not settle in a normal, level posture.

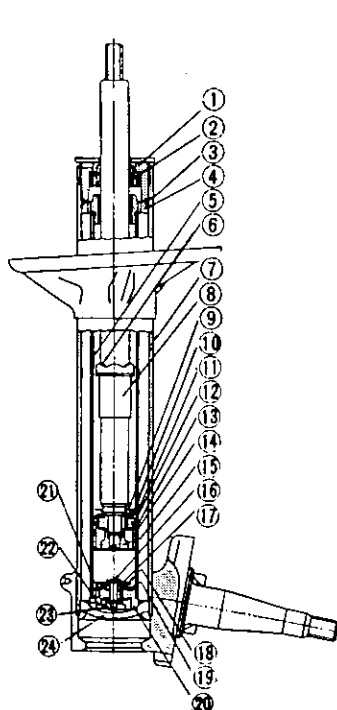
Removal

1. Jack up vehicle and support it with safety stands. Remove wheel. Refer to relative topic under "Removal of Front Axle and Suspension."
2. Loosen nut (1) connecting brake tube to vehicle frame, Figure FA-22. Take out brake hose locking spring and plate. Separate brake hose from brake tube.
3. Loosen nut (2) connecting brake hose to strut bracket; disconnect brake hose from bracket.



FA203

Fig. FA-22 Removing brake hose



FA220

- | | |
|-------------------------------|-----------------------|
| 1 Gland packing assembly | 13 Valve plate |
| 2 Oil seal | 14 Piston body |
| 3 "O" ring | 15 Nut |
| 4 Piston rod guide assembly | 16 Bolt |
| 5 Cylinder | 17 Distance collar |
| 6 Rebound stopper | 18 Spring retainer |
| 7 Strut-outer casing | 19 Check valve spring |
| 8 Piston rod | 20 Bottom valve body |
| 9 Check valve spring retainer | 21 Check valve plate |
| 10 Check valve spring | 22 Valve plate |
| 11 Check valve plate | 23 Nut |
| 12 Piston ring | 24 Bottom plate |

Shock absorber operation

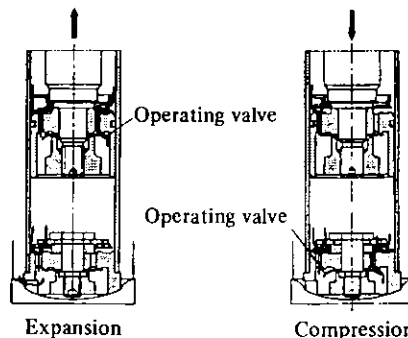
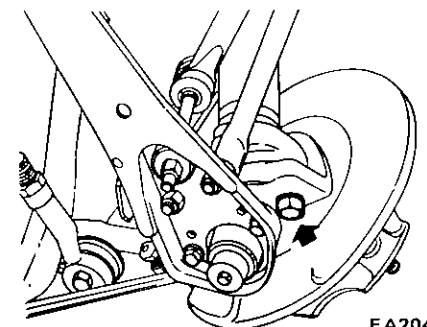


Fig. FA-21 Sectional view of strut assembly

4. Loosen bolt retaining caliper in place; take out caliper as an assembled unit (disc brake only).

5. Remove bolt connecting strut to knuckle arm.



FA204

Fig. FA-23 Removing bolts connecting

FRONT AXLE AND FRONT SUSPENSION

6. Detach knuckle arm from bottom of strut. This can be done by forcing transverse link down with a suitable bar as shown in Figure FA-24.

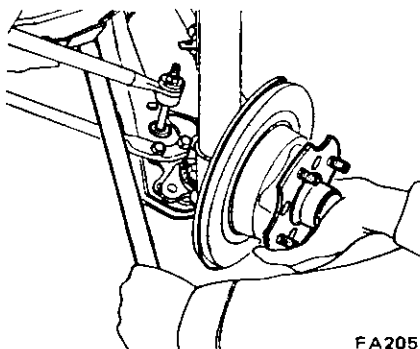


Fig. FA-24 Removing knuckle arm

7. Place jack under strut to receive its weight when nuts are removed.
8. Lift open engine hood to gain access to nuts (1) and (2) holding strut in place on vehicle body.

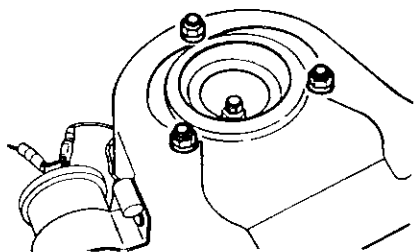


Fig. FA-25 Removing nuts attaching strut

9. With springs attached, lower jack slowly while holding strut by hand; take out strut.

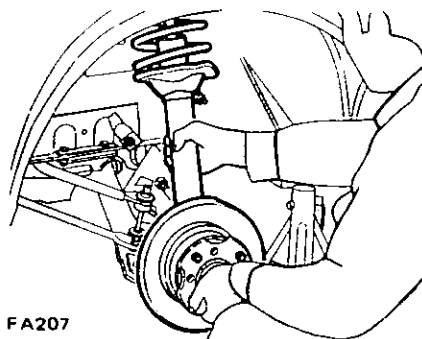


Fig. FA-26 Removing strut

Disassembly

When disassembling a strut, extra caution should be exercised to avoid dirt and dust getting inside strut. This dirt and dust is loaded with abrasive which, if permitted to enter strut, causes internal leak and premature wear of moving parts.

1. Install special tool "Strut & Steering Gear Housing Attachment ST27700001" on bottom of strut; secure above assembly in jaws of a suitable vise.

2. Pry snap ring off dust cover.

3. Set up another tool "Spring Compressor ST3565S001" on spring. Compress spring just far enough to permit turning of strut insulator by hand. Remove self-locking nut.

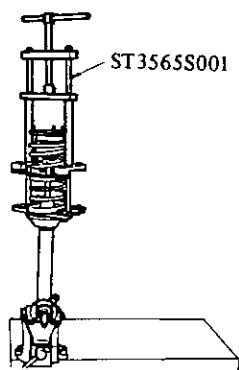


Fig. FA-27 Installing strut in vise

4. Take out strut insulator, strut bearing, oil seal, upper spring seat and bound bumper rubber in the order listed.

5. Remove spring from strut with spring compressor "ST3565S001" left on spring.

6. Retract piston rod by pushing it down until it bottoms. Without disturbing the above setting, remove gland packing with special tool "Gland Packing Wrench ST35500001."

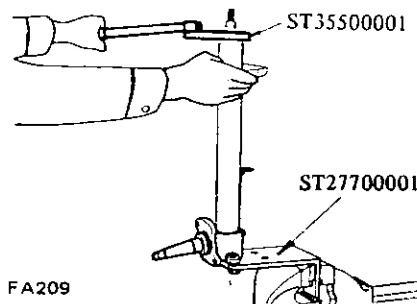


Fig. FA-28 Removing gland packing

Note: Clean gland packing of mud and other foreign particles accumulated.

7. Remove O-ring from top of piston rod guide.

8. Lift out piston rod together with cylinder.

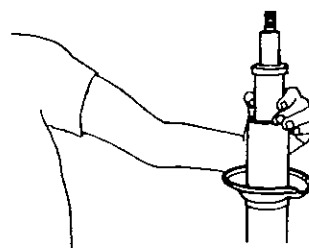


Fig. FA-29 Removing piston rod and cylinder

Note: Under no circumstances should piston and piston rod guide be removed from cylinder since these are adjusted to each other to provide precision mating surfaces and should be handled as a matched set.

9. Drain fluid thoroughly from inner cylinder. Use a suitable container to receive fluid drained.

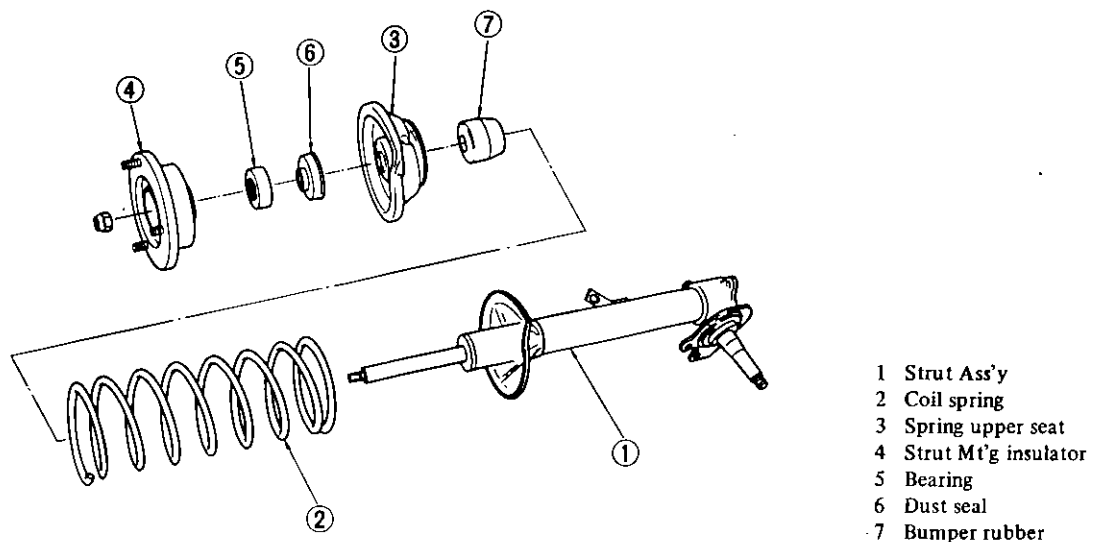
10. Wash all parts in an suitable solvent.

11. Drain fluid thoroughly which collects inside outer casing.

Note: This operation is very important since performance of strut varies with amount of fluid filled within strut.

FRONT AXLE AND FRONT SUSPENSION

Inspection



FA210

Fig. FA-30 Exploded view of spring and strut Assy

1. Replace gland packing, O-ring and fluid with new ones or fresh oil whenever strut is to be disassembled.
2. Wash all parts, except for non-metallic parts, with solvent and dry with compressed air.
3. Blow dirt and dust off of non-metallic parts using compressed air.

(1) Outer casing

Check outer casing for evidences of deformation, cracking or otherwise damage. If necessary, discard.

(2) Spindle

Check spindle for hair cracks on base and damaged threads. Replace strut if found with any of above beyond limits.

(3) Strut mounting insulator

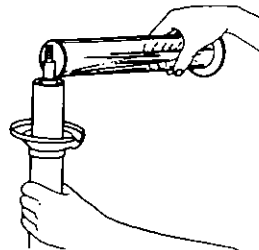
Replace if rubber and metal joint are melted or cracked. Rubber parts should also be replaced with new ones if they are deteriorated.

(4) Strut mounting bearing

Replace if inspection reveals abnormal noise or excessive rattle in axial direction.

not to drop or scratch parts since they are precisely machined to very close tolerances. Before assembly, clean away all dirt to prevent any possible entry of dirt into strut.

1. Set up "Steering Gear Housing Attachment ST27700001" in place on bottom of strut and place attachment in jaws of a suitable vise.
2. Install piston rod and cylinder into place in outer casing.
3. Pour correct amount of fluid into outer casing.



FA065

Fig. FA-31 Filling outer casing with fluid

Notes:

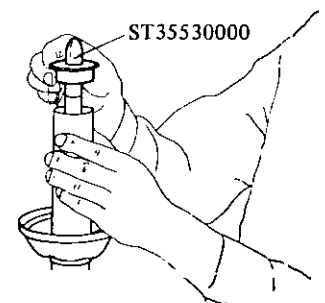
- a. It is important that correct amount of fluid be poured into strut to assure correct damping force of shock absorber.

325 cc (19.83 cu in) for AMPCO (ATSUGI) make
332 cc (20.26 cu in) for K.Y.B. (KAYABA) make

- b. Use Nissan genuine shock absorber oil "NISSAN SHOCK ABSORBER OIL A-2."

4. Place rod guide on top of piston rod guide; install gland packing using special tool "Gland Packing Guide ST35530000."

Lubricate sealing lip, asterisked in Figure FA-33, with recommended multi-purpose grease.



FA066

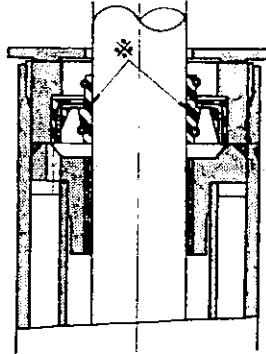
Fig. FA-32 Installing gland packing

Assembly

When assembling strut, be careful

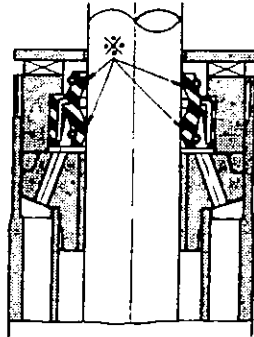
FRONT AXLE AND FRONT SUSPENSION

AMPCO make



FA221

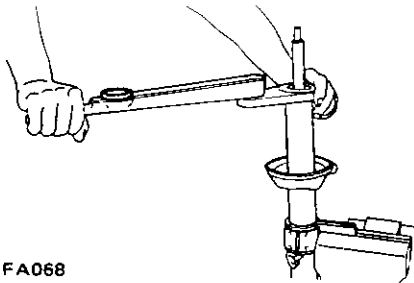
K.Y.B. make



FA222

Fig. FA-33 Sectional views of gland packings

5. Tighten gland packing to 7 to 13 kg-m (51 to 94 ft-lb) torque.



FA068

Fig. FA-34 Tightening gland packing

Notes:

- When tightening gland packing, it is important that piston rod be extended approx. 120 mm (4.724 in) from end of outer casing to expel most of air out of strut.
- Gland packing should be tightened to 7.0 to 13.0 kg-m (51 to 94 ft-lb) torque with the aid of special tool "Gland Packing Wrench." When doing so, the amount of torque to be read beneath wrench needle should be modified according to the following formula:

$$C \text{ kg-m} = 7 \text{ kg-m} \times \left(\frac{l}{l + 0.1} \right) \text{ or}$$

$$C \text{ ft-lb} = 51 \text{ ft-lb} \times \left(\frac{l}{l + 0.33} \right)$$

Where

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

l Effective length of torque wrench [m (ft)]

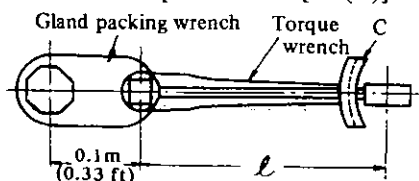
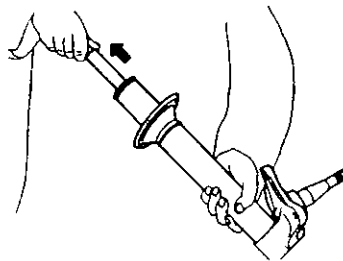


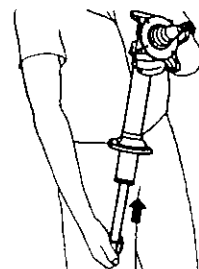
Fig. FA-35 Gland packing wrench

6. After the above steps have been completed, air should be gotten rid of shock absorber system in the following manner:

- (1) Hold strut by hand with its spindle end facing down; without disturbing the above setting, pull out piston rod completely. Then, turn strut upside down so that spindle end is now facing up. Under this condition, retract piston rod all the way in.
- (2) Repeat the above procedure several times so that air will be bled out from strut thoroughly.
- (3) If, during the above step, an equal pressure is felt through the hand gripping piston rod on both strokes, it is an indication that air is expelled from strut thoroughly.



FA070



FA071

Fig. FA-36 Air bleeding strut

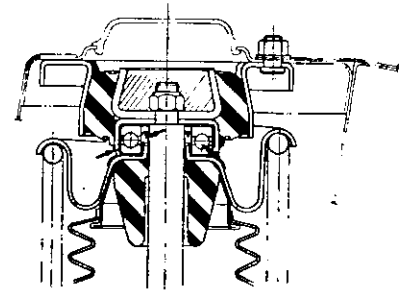
7. Place special tool "Strut & Steering Gear Housing Attachment ST27700001" in jaws of a vise.

8. Before proceeding with further steps, pull piston rod all the way out to the limit of its stroke; install bound bumper rubber in place to prevent piston rod from falling by its own weight.

9. Place front spring on lower spring seat and compress spring with special tool "Spring Compressor ST3565S0001."

Install dust cover, upper spring seat, mounting bearing and insulator in this written order.

10. Lubricate parts, asterisked in Figure FA-37, with multi-purpose grease recommended.



FA211

Fig. FA-37 Greasing thrust bearing and oil seal

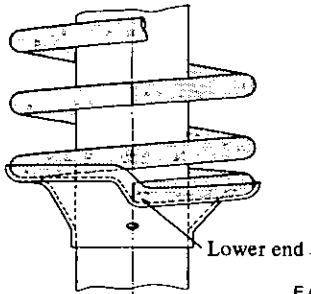
Notes:

- Use care to avoid damaging piston rod during disassembly and assembly. Do not use pliers or the like in an effort to extract piston rod.
- Install thrust bearing so that it points in correct direction, Figure FA-37.

11. Tighten piston rod self-locking nut to 6 to 7.5 kg-m (43 to 54 ft-lb) torque.

12. After placing spring in position between upper and lower spring seats, release compressor gradually.

FRONT AXLE AND FRONT SUSPENSION



FA074

Fig. FA-38 Installing front spring

13. Raise bound bumper rubber to upper spring seat.

Installation

Install strut in reverse order of removal.

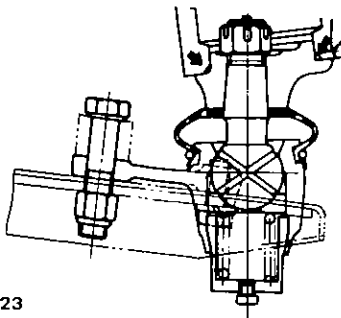
Tightening torque:

Strut to body nut
2.5 to 3.5 kg-m
(18 to 25 ft-lb)

Steering knuckle arm to strut
7.3 to 9.9 kg-m
(53 to 72 ft-lb)

Notes:

- a. Replace self-locking nut whenever strut is disassembled.
- b. Make sure brake hose is secure and not twisted.
- c. When installing steering knuckle arm to the bottom of strut assembly, apply the suitable sealing material to the portion indicated in Figure FA-39 so as to prevent ball stud from rust.



FA223

Fig. FA-39 Applying sealing material

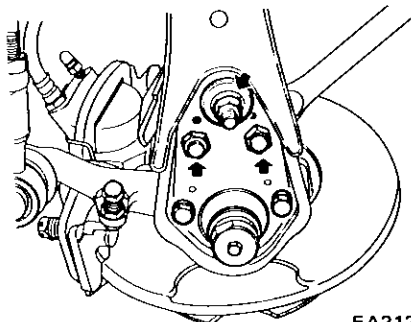
TRANSVERSE LINK AND LOWER BALL JOINT

The transverse link is connected to the suspension member through a rubber bushing and to the strut through a ball joint.

The lower ball joint is assembled at factory and cannot be disassembled. Every 50,000 km (30,000 miles), or two years, whichever occurs first, lubricate ball joints with recommended grease.

Removal

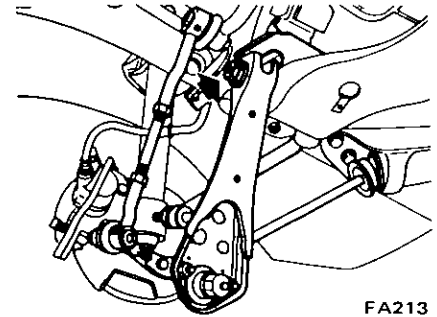
1. Jack up vehicle and support it with safety stands; remove wheel. See "Removal of Front Axle and Suspension Assembly."
2. Loosen bolts holding knuckle arm in place. Separate ball joint from strut. For details, refer to "Removal of Front Axle."
3. Disconnect tension rod and stabilizer from transverse link. For details, refer to "Removal of Front Axle and Suspension Assembly."



FA212

Fig. FA-40 Removing nuts

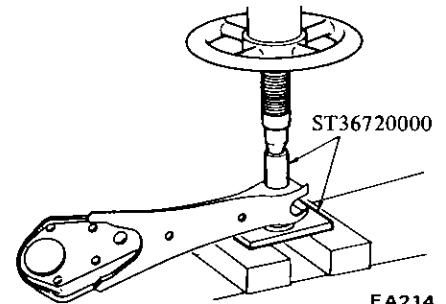
4. Increase space between steering linkage and transverse link to remove transverse link easily; loosen off link nut. Link can now be taken out from suspension member.



FA213

Fig. FA-41 Removing transverse link

5. Pry cotter pin off castle nut on knuckle arm; loosen castle nut. Remove knuckle arm from ball joint.
6. Loosen ball joint attaching nut and remove ball joint from transverse link.
7. Withdraw transverse link bushing from transverse link with special tool "Front Transverse Link Bushing Replacer Set ST36700000" and a press.



FA214

Fig. FA-42 Removing transverse link bushing

Inspection

Transverse link

1. Check for signs of cracks, distortion or otherwise damage. Replace if found with any of above too badly beyond repair.
2. If rubber and inner tube joints are sticky or show evidence of cracking, replace transverse link as an assembled unit.

Ball joint

1. Ball joint is assembled at factory and cannot be disassembled. Measure end play and force required to keep joint turning. If found to be more or less specifications, discard.

FRONT AXLE AND FRONT SUSPENSION

Standard end play:

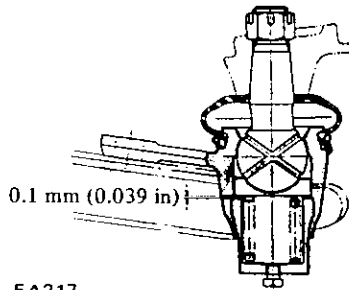
0.1 mm (0.039 in)

Shaking torque:

40 kg-cm (34 in-lb)

At cotter pin hole:

11.3 kg (24.9 lb)



FA217

Fig. FA-43 Sectional view of lower ball joint

2. Check dust cover to determine that it is in good condition. If found to be cracked excessively beyond use, replace ball joint with a new one.
3. Every 50,000 km (30,000 miles), or 48 months, whichever occurs first, lubricate ball joint with recommended multi-purpose grease.

To lubricate, remove plug and install grease nipple in its vacant place.

Pump grease slowly until old grease is forced out thoroughly. After greasing, reinstall plug.

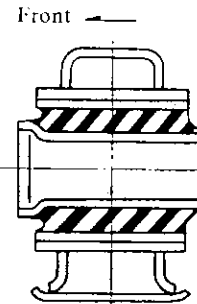
Note: When a high-pressure grease gun is used, operate the grease gun carefully so that grease is injected slowly and new grease does not come out from the clamp portion.

Installation

Install transverse link and lower ball joint in reverse order of removal. In rebushing link, use "Front Transverse Link Replacer Set ST36700000."

It is also necessary to install bushings so that they point in correct direction as shown Figure FA-44.

Rebushing should also be in the manner that outer end of bushing is flush with end of link.



FA218

Fig. FA-44 Cross sectional view of transverse link bushing

To install, first tighten transverse link mounting bolts temporarily. Final tightening should be carried out with vehicle under normal load.

Tightening torque:

Ball joint bolt

1.9 to 2.5 kg-m
(14 to 18 ft-lb)

Ball joint castle nut

5.5 to 7.6 kg-m
(40 to 55 ft-lb)

Transverse link mounting bolts

4.9 to 6.3 kg-m
(35 to 46 ft-lb)

ADJUSTMENT

CONTENTS

ADJUSTMENT OF WHEEL ALIGNMENT	FA-14
Alignment specifications (Vehicle unladen)	FA-15
Vehicle level	FA-16

Toe-in adjustment	FA-16
Front wheel turning angle adjustment	FA-16

ADJUSTMENT OF WHEEL ALIGNMENT

1. Place vehicle on a level, flat surface with all tires inflated to the normal air pressure. Use a turning radius gauge and alignment gauge.

2. Front-end alignment should not be adjusted without first making sure that all steering suspension parts are in good condition.

3. Camber and caster are preset at factory and cannot be adjusted.

Vehicle requires only toe-in and leveling adjustments.

FRONT AXLE AND FRONT SUSPENSION

Alignment specifications (Vehicle unladen)

Wheel alignment (Vehicle unladen)		Applied model	Camber	Caster	Kingpin inclination	Toe-in mm (in)	Side slip mm (in)
R.H. drive Sedan, Hardtop	Standard Suspension		1°05' to 2°35'	50° to 2°20'	6°15' to 7°45'	7 to 10 (0.276 to 0.394)	0 to 3 (0 to 0.118)
	Hard Suspension *2		1°00' to 2°30'	55° to 2°25'	6°20' to 7°50'	6 to 9 (0.236 to 0.354)	0 to 3 (0 to 0.118)
L.H. drive Sedan, Hardtop	Standard Suspension		1°05' to 2°35'	45° to 2°15'	6°15' to 7°45'	7 to 10 (0.276 to 0.394)	0 to 3 (0 to 0.118)
	Hard Suspension *2		1°05' to 2°35'	55° to 2°25'	6°20' to 7°50'	7 to 10 (0.276 to 0.394)	0 to 3 (0 to 0.118)
L.H. drive Sedan, Hardtop *1	Standard Suspension		1°00' to 2°30'	45° to 2°15'	6°20' to 7°50'	6 to 9 (0.236 to 0.354)	0 to 3 (0 to 0.118)
	Hard Suspension *2		55° to 1°25'	55° to 2°25'	6°25' to 7°55'	5 to 8 (0.197 to 0.315)	-1 to 2 (-0.004 to 0.079)
R.H. drive Station Wagon	Standard Suspension		1°00' to 2°30'	45° to 2°15'	6°20' to 7°50'	6 to 9 (0.236 to 0.354)	0 to 3 (0 to 0.118)
	Hard Suspension *2		1°05' to 2°35'	45° to 2°15'	6°15' to 7°45'	7 to 10 (0.276 to 0.394)	0 to 3 (0 to 0.118)
L.H. drive Station Wagon	Standard Suspension		1°10' to 2°40'	55° to 2°25'	6°10' to 7°40'	8 to 11 (0.315 to 0.433)	1 to 4 (0.004 to 0.158)
	Hard Suspension *2		1°05' to 2°35'	45° to 2°15'	6°15' to 7°45'	7 to 10 (0.276 to 0.394)	0 to 4 (0 to 0.158)
R.H. drive Van	Standard Suspension		1°05' to 2°35'	50° to 2°20'	6°15' to 7°45'	8 to 11 (0.315 to 0.433)	1 to 4 (0.004 to 0.158)
L.H. drive Van	Standard Suspension		1°15' to 2°45'	1°00' to 2°15'	6°05' to 7°35'	10 to 13 (0.394 to 0.512)	2 to 5 (0.079 to 0.197)

*1 for U.S.A. & Canada

*2 Optional parts

FRONT AXLE & FRONT SUSPENSION

Wheel turning angle

Inner wheel	37° to 38°
Outer wheel	30°42' to 32°42'

Tire pressure

Vehicle speed km/h (M.P.H.)		0 up to 100 (0 up to 62.5)	Over 100 up to 150 (Over 62.5 up to 94)	Over 150 up to 175 (Over 94 up to 109)	Over 175 up to 180 (Over 109 up to 118)
Tire size					
5.60-13-4PR		1.6 (24)	1.9 (28)		
6.45-13-4PR		1.6 (24)	1.9 (28)		
6.45S-13-4PR		1.6 (24)	1.9 (28)		
165SR-13-4PR		2.0 (28)			
5.50-13-6PRLT	Front	1.8 (26)	2.1 (30)	Unloaded	
	Rear	1.8 (26)	2.1 (30)		
	Front	2.0 (28)	2.3 (34)	Loaded	
	Rear	3.25 (46)			

Vehicle level

1. Adjustment can be made by selecting spring which will keep vehicle in a normal, level position.

Note: Primarily both sides side rod ball joint center to center distances should be balanced.

Standard distance between side rod ball joint sockets: 105.5 mm (4.15 in).

Toe-in adjustment

1. Measurement should be made using a toe-in gauge.
2. The length of side rod (marked with or arrow) should be adjusted to specifications.

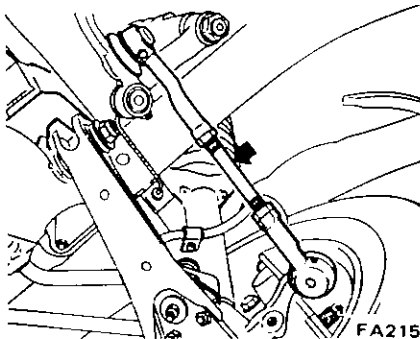
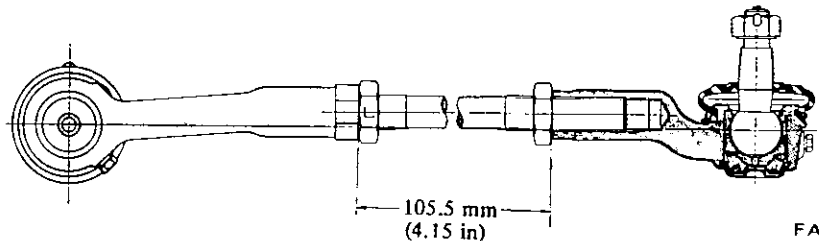


Fig. FA-45 Adjustment of toe-in

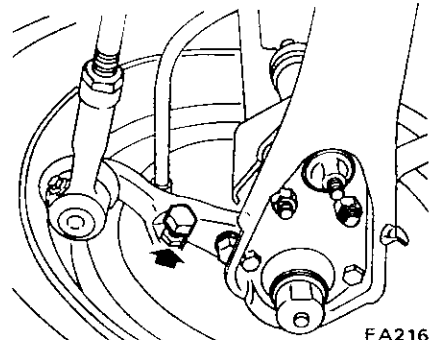


FA251

Fig. FA-46 Standard length of side rod

Front wheel turning angle adjustment

1. Place front wheels on turn table.
2. Turn in or out adjusting bolts as required, indicated by arrow, until correct turning angle is obtained.
3. Put nylon cap on adjusting bolt.



FA216

Fig. FA-47 Adjustment of steering angle

FRONT AXLE & FRONT SUSPENSION

SERVICE DATA AND SPECIFICATIONS

Wheel alignment (Vehicle unladen)

Applied model	Camber	Caster	Kingpin inclination	Toe-in mm (in)	Side slip mm (in)
R.H. drive Sedan, Hardtop	Standard Suspension	1°05' to 2°35'	50' to 2°20'	6°15' to 7°45'	7 to 10 (0.276 to 0.394)
	Hard Suspension *2	1°00' to 2°30'	55' to 2°25'	6°20' to 7°50'	0 to 3 (0 to 0.118)
L.H. drive Sedan, Hardtop	Standard Suspension	1°05' to 2°35'	45' to 2°15'	6°15' to 7°45'	0 to 3 (0 to 0.118)
	Hard Suspension *2	1°05' to 2°35'	55' to 2°25'	6°20' to 7°50'	0 to 3 (0 to 0.118)
L.H. drive Sedan, Hardtop *1	Standard Suspension	1°00' to 2°30'	45' to 2°15'	6°20' to 7°50'	0 to 3 (0 to 0.118)
	Hard Suspension *2	55' to 1°25'	55' to 2°25'	6°25' to 7°55'	0 to 3 (0 to 0.118)
R.H. drive Station Wagon	Standard Suspension	1°00' to 2°30'	45' to 2°15'	6°20' to 7°50'	0 to 3 (0 to 0.118)
	Hard Suspension *2	1°05' to 2°35'	45' to 2°15'	6°15' to 7°45'	0 to 3 (0 to 0.118)
L.H. drive Station Wagon	Standard Suspension	1°10' to 2°40'	55' to 2°25'	6°10' to 7°40'	1 to 4 (0.004 to 0.158)
	Hard Suspension *2	1°05' to 2°35'	45' to 2°15'	6°15' to 7°45'	0 to 4 (0 to 0.158)
R.H. drive Van	Standard Suspension	1°05' to 2°35'	50' to 2°20'	6°15' to 7°45'	1 to 4 (0.004 to 0.158)
L.H. drive Van	Standard Suspension	1°15' to 2°45'	1°00' to 2°15'	6°05' to 7°35'	2 to 5 (0.079 to 0.197)

*1 for U.S.A. & Canada

*2 Optional parts

FRONT AXLE & FRONT SUSPENSION

Wheel turning angle

Inner wheel	37° to 38°
Outer wheel	30°42' to 32°42'

Coil spring

	Left side spring for Van and Wagon.	Both side spring for all Sedan. Right side spring for Van and Wagon.	Both side spring for hard suspension.
Wire diameter mm (in)	12 (0.472)	12 (0.472)	13 (0.512)
Coil diameter mm (in)	130 (5.12)	130 (5.12)	130 (5.12)
No. of coils	8	8	7.75
No. of effective coils	6.5	6.5	6.25
Free length mm (in)	371 (14.61)	386 (15.20)	330 (12.99)
Installed height/load mm/kg (in/lb)	185/270 (7.28/595)	200/270 (7.87/595)	200/270 (7.87/595)
Spring constant kg/mm (lb/in)	1.45 (81)	1.45 (81)	2.00 (112)
Colored mark	Red/Orange	Yellow/Orange	Yellow/Yellow

Strut assembly

	All models	Optional hard suspension
Strut outer diameter mm (in)	50.8 (2.000)	50.8 (2.000)
Piston rod diameter mm (in)	20 (0.787)	20 (0.787)
Piston diameter mm (in)	30 (1.181)	30 (1.181)
Damping force at piston speed 0.3 m/sec.		
Expansion kg (lb)	40 (88)	80 (176)
Compression kg (lb)	25 (55)	40 (88)

FRONT AXLE & FRONT SUSPENSION

Wheel bearing

Rotation starting torque:

In case of new parts	kg-cm (in-oz) Less than 7 (97)
At wheel hub bolt	kg (lb) Less than 1.22 (2.7)
In case of readjustment	kg-cm (in-oz) Less than 4 (56)
At wheel hub bolt	kg (lb) Less than 0.7 (1.5)

Lower ball joint

Stud end play (Standard)	mm (in) 0.1 (0.039)
Turning torque	kg-cm (in-oz) More than 40 (556)

Tightening torque

Stabilizer bar

Connecting rod fixing nut	kg-m (ft-lb) 1.2 to 1.7 (8.7 to 12)
Frame bracket fixing bolt	kg-m (ft-lb) 1.4 to 1.8 (10 to 13)

Tension rod

Tension rod fixing nut	kg-m (ft-lb) 4.5 to 5.5 (33 to 40)
Tension rod to transverse link	kg-m (ft-lb) 4.9 to 6.3 (35 to 46)
Tension rod bracket fixing bolt	kg-m (ft-lb) 5.1 to 6.9 (37 to 50)

Transverse link

Transverse link to body frame	kg-m (ft-lb) 9 to 10 (65 to 72)
-------------------------------	---------------------------------------

Ball joint

Ball joint to transverse link	kg-m (ft-lb) 1.9 to 2.5 (14 to 18)
Ball joint to knuckle arm	kg-m (ft-lb) 5.5 to 7.6 (40 to 55)

Strut assembly

Strut assembly to knuckle arm	kg-m (ft-lb) 7.3 to 9.9 (53 to 72)
Strut assembly to body frame	kg-m (ft-lb) 2.5 to 3.5 (18 to 25)
Piston rod self locking nut	kg-m (ft-lb) 6 to 7.5 (43 to 54)
Gland packing	kg-m (ft-lb) 7 to 13 (51 to 94)

FRONT AXLE & FRONT SUSPENSION

TROUBLE DIAGNOSES AND CORRECTIONS

Condition	Probable cause	Corrective action
Vibration, shock and shimmying of steering wheel. Vibration: Loose connection of the serration parts 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. Unbalance and deformation of roadwheel. Unevenly worn tire or insufficient tightening. Improperly adjusted or worn front wheel bearing. Faulty wheel alignment. Worn fitting transverse link bushings. Insufficiently tightened steering gear housing. Wear of steering linkage. Worn suspension ball-joint. Excessive backlash due to improper adjustment of the retainer parts. Damaged idler arm. Worn column bearing, weakened column bearing spring, or loose clamp. Malfunction of shock absorber (inside the strut) or loose installation bolts. Unbalance of vehicle level.	Adjust. Correct the unbalance or replace. Replace or tighten. Adjust or tighten. Adjust. Replace. Retighten. Replace defective parts. Replace. Adjust correctly. Replace. Check and repair correctly. Replace or retighten. 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. Difference in height of right and left tire treads. Incorrect adjustment or abrasion of front wheel bearing. Collapsed or twisted front spring. Incorrect wheel alignment. Incorrect brake adjustment (binding). Worn rubber bushings for transverse link and tension rod. Deformed of steering linkage and suspension link. Unbalance vehicle level.	Adjust or tighten. Replace tires. Adjust or replace. Replace. Adjust. Adjust. Replace. Replace. Correct the unbalance.

FRONT AXLE & FRONT SUSPENSION

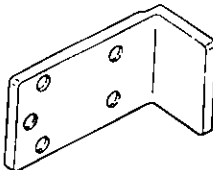
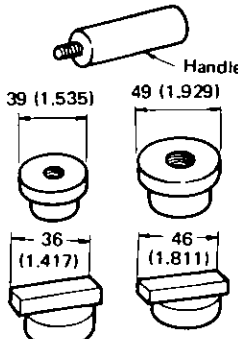
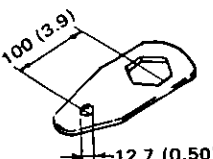
Condition	Probable cause	Corrective action
Instability of vehicle	Improper air pressure of tire. Worn rubber bushings for transverse link and tension rod. Incorrect wheel alignment. Worn or deformed steering linkage and suspension link. Incorrect adjustment of steering gear. Deformed unbalanced wheel.	Adjust. Adjust. Adjust. Replace. Adjust. 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. Insufficient lubricants or mixing impurities in steering linkage or excessively worn steering linkage. Stiff or damaged suspension ball-joint, or lack of grease. Worn or incorrectly adjusted wheel bearing. Worn damaged steering gear and bearing. Incorrectly adjusted steering gear. Deformed steering linkage. Incorrect wheel alignment. Damaged strut upper end bearing. Damaged or stiff piston or shock absorber rod (in the strut). Interference of steering column with turn signal switch.	Adjust. Replenish grease or replace the part. Replace. Replace or adjust. Replace. Adjust. Replace. Adjust. Replace. Replace. Adjust.
Excessive steering wheel play	Incorrectly adjusted steering gear housing. Worn steering linkage. Improperly fitted of gear box. Incorrectly adjusted wheel bearing. Worn transverse link and tension rod fitting bushings.	Adjust. Replace. Retighten. Adjust. Replace.
Noises	Improper air pressure of tire. Insufficient lubricating oil and grease for suspension ball joint and steering linkage, or their breakage. Loose steering gear bolts, linkage and suspension groups. Defective shock absorber (inside the strut). Defective wheel bearing. Worn steering linkage and steering gear. Worn transverse link and tension rod fitting bushings.	Adjust. Replenish lubrication oil and grease, or replace. Retighten. Replace. Replace. Replace. Replace.

FRONT AXLE & FRONT SUSPENSION

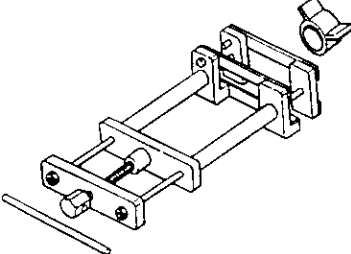
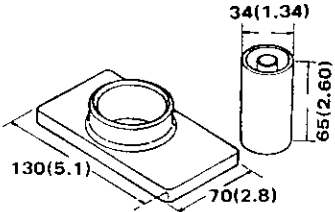
Condition	Probable cause	Corrective action
	Broken collapsed coil spring. Loose strut mounting insulator tightening nuts. Loose stabilizer bolt.	Replace. Retighten. Retighten.
Grating tire noise	Improper air pressure of tire. Incorrect wheel alignment. Deformed knuckle spindle and suspension linkage.	Adjust. Adjust. Replace.
Jumping of disc wheel	Improper air pressure of tire. Unbalanced wheels. Defective shock absorber. Defective tire. Deformed wheel rim.	Adjust. Adjust. Replace. Replace. Replace.
Excessively or partially worn tire.	Improper air pressure of tire. Incorrect wheel alignment. Defective wheel bearing. Incorrect brake adjustment. Improper tire shifting (rotation). Rough and improper driving manner.	Adjust. Adjust. Replace. Adjust. Adjust. Drive more gently.

FRONT AXLE & FRONT SUSPENSION

SPECIAL SERVICE TOOLS

No.	Tool number & tool name	Description	Unit: mm (in)	For use on	Reference page or figure No.
1.	ST27700001 Strut and steering gear housing attachment	 SE218	This tool is used as an attachment to strut or steering gear box when work is performed in a vise. S mark indicates hole for strut. G mark indicates hole for steering gear box.	610 510 C30 C10 GC10	Page FA-10 Page FA-11 Fig. FA-28
2.	ST3532S000 Outer race drift assembly (Front wheel bearing) — ST35321000 Removing adapter (Large) — ST35322000 Removing adapter (Small) — ST35323000 Installing adapter (Large) — ST35324000 Installing adapter (Small) — ST35325000 Bar	 SE219	This tool is used to remove or attach outer race for front wheel bearing.	610 510 C30 C10	Page FA-8
3.	ST35500001 Ground packing wrench	 width across flats; 55 (12.7) SE220	This tool is used to remove or install gland packing at the top end of strut.	610 510 S30 C30 C10	Fig. FA-10

FRONT AXLE & FRONT SUSPENSION

No.	Tool number & tool name	Description Unit: mm (in)	For use on	Reference page or figure No.
4.	ST35530000 Ground packing guide (20 mm dia.)	 SE093	610 510 C30 C10 GC10	Page FA-11 Fig. FA-32
5.	ST3565S001 Coil spring compressor — ST35651001 Body — ST35652001 Clamp	 SE221	610 510 S30 C30 C10 GC10 B110	Page FA-10 Page FA-12 Fig. FA-27
6.	ST36700000 Transverse link bushing replacer	 SE222	610 510	Page FA-14



**DATSUN 1800
MODEL 610 SERIES
CHASSIS & BODY**



NISSAN MOTOR CO., LTD.
TOKYO, JAPAN

SECTION RA

REAR AXLE & REAR SUSPENSION

RA

REAR AXLE AND SUSPENSION RA- 2
—SEDAN—

REAR AXLE AND SUSPENSION RA- 9
—STATION WAGON AND
VAN—

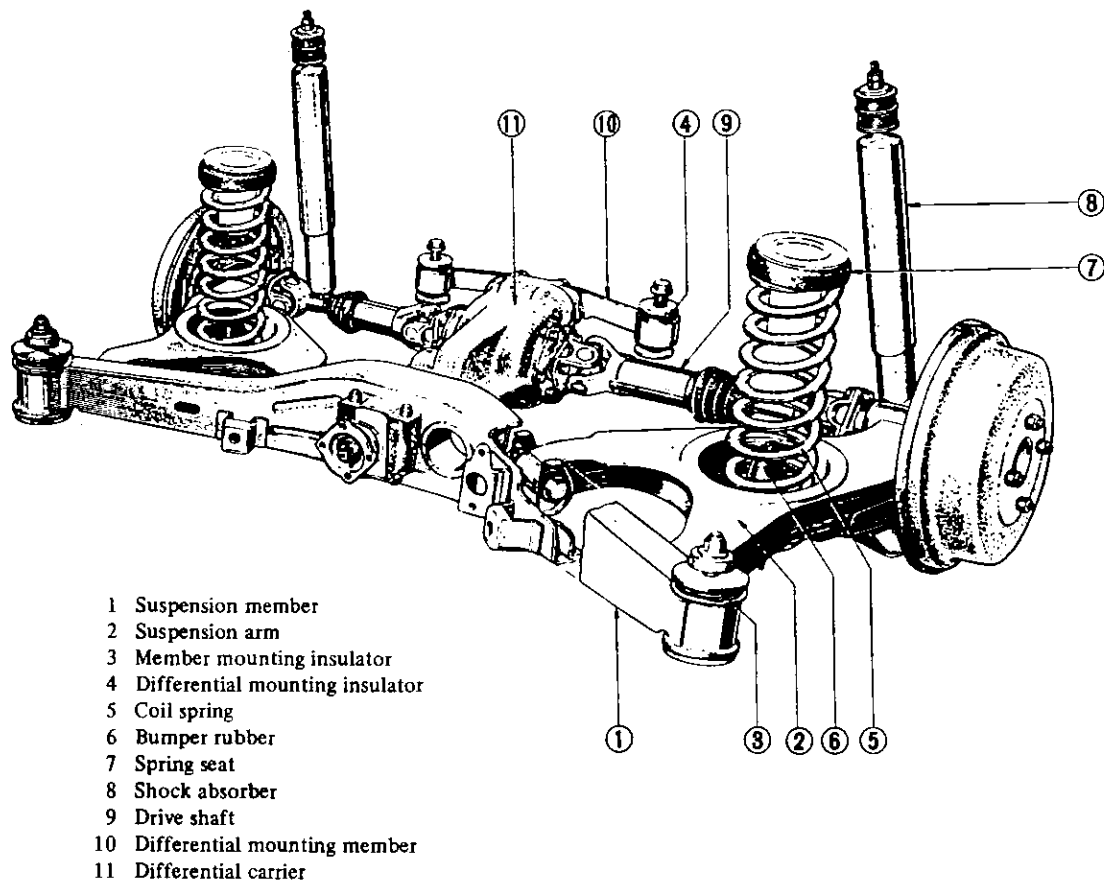
SPECIAL SERVICE TOOLS RA-17

REAR AXLE & REAR SUSPENSION

REAR AXLE AND SUSPENSION —SEDAN—

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RA101

Fig. RA-1 Rear axle and suspension

REAR AXLE & REAR SUSPENSION

DESCRIPTION

The rear suspension is of the semitrailing arm type independent suspension.

Primarily, rear wheel is supported with the coil spring and suspension arm, the differential gear carrier is aligned independently and separately from the suspension, and the gear carrier is installed directly on the body with the suspension member and the differential mounting member through four rubber insulators.

Coil springs are mounted between the suspension arms and body. The upper end of spring is installed on the body through rubber cushion, and the suspension arm is installed on suspension member with rubber cushion.

The rear wheel bearing housing and shock absorber lower bracket are welded to the trailing end of the suspension arm.

Driving power is transmitted to the rear axle shaft with the freely extensible drive shaft through side flanges on both ends of the differential gear carrier. The rear axle shaft is supported with two ball bearings in the rear wheel bearing housing.

The wheel bearing grease should be changed every 50,000 km (30,000 miles).

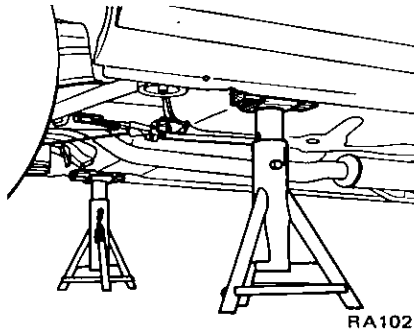


Fig. RA-2 Support points

2. Remove rear wheels.
3. Disconnect hand brake cables by removing adjusting nut at adjuster ①, and return spring ②.

4. Remove rear exhaust tube and muffler ③.
5. Mark rear flange of propeller shaft and pinion flange of differential gear carrier for proper reassembly, then disconnect rear flange from pinion flange by removing four bolts ④.
6. Remove propeller shaft assembly.
6. Disconnect rear brake hoses ⑤ at suspension arms on both sides. Cover brake hoses and pipe openings to prevent entrance of dirt.
7. Position jack under suspension arm and raise jack slightly to relieve tension on shock absorber. Disconnect shock absorbers at lower end ⑥.
- ⑥. Carefully lower jack under suspension arm.

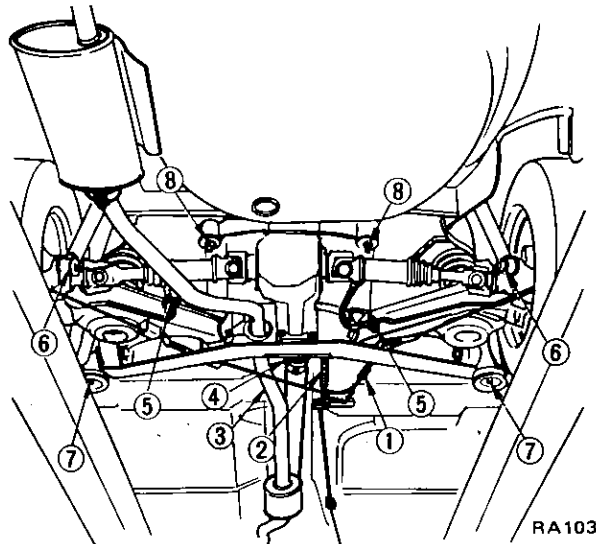


Fig. RA-3 Rear suspension removal points

REAR AXLE & SUSPENSIONS ASSEMBLY

Removal

It is not necessary to remove rear axle and suspension assembly for any normal repairs. However, if the rear suspension member is damaged, the rear axle and the suspension member assembly may be removed and installed using the following procedure.

1. Raise the rear of vehicle high enough to permit working underneath, and support it on stands. Place stands solidly under body member on both sides.

8. Support under center of suspension member and differential gear carrier with a transmission jack.
9. Disconnect suspension member from body by removing two nuts ⑦ at both ends of member.
10. Disconnect differential mounting member by removing two nuts ⑧ at both ends of member.
11. Carefully lower jack with suspension assembly, and it out from under vehicle. Support suspension so that it does not tilt and fall off jack.

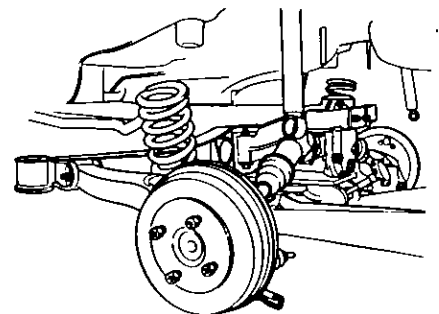


Fig. RA-4 Removing rear axle and suspension assembly

REAR AXLE & REAR SUSPENSION

Inspection and repair

When the rear suspension has been removed, examine all parts for wear or damage. Particular attention should be given to bushing in suspension arms and bound bumper rubbers. Also check the condition of rubber insulators in the suspension member and the differential mounting member.

Any of these components, if worn, can result noisy and vibration to the interior of vehicle.

Replace rubber insulators of the suspension member using special tool "Rear Suspension Member Insulator Replacer ST38290000."

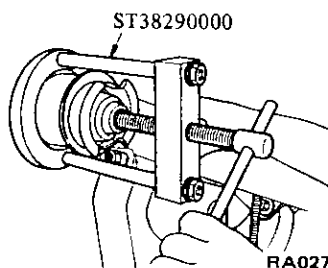


Fig. RA-5 Removing insulator from suspension member

Replace rubber insulators of the differential mounting member using special tool "Differential Mounting Insulator Drift ST33300010 (for remove) and ST33300020 (for install)."

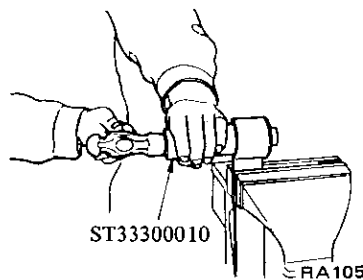


Fig. RA-6 Removing insulator from differential mounting member

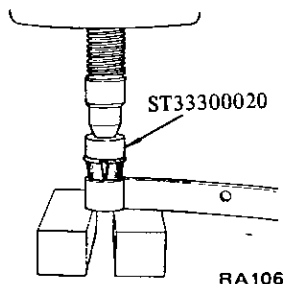
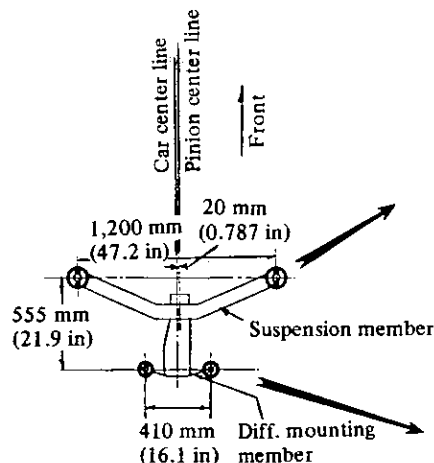


Fig. RA-7 Installing insulator to differential mounting member

Installation

Install the rear axle and the suspension assembly in the reverse order of removal, noting the following points.

1. Ensure suspension member and differential mounting member are correctly lined up.



- Rubber insulators should be correctly lined up as shown in Figure RA-8 and inserted from the underside of member.
- Do not use lesser quality or substitute design parts.
- Tightening torque values must be used as specified during reassembly to assure proper retention of parts.

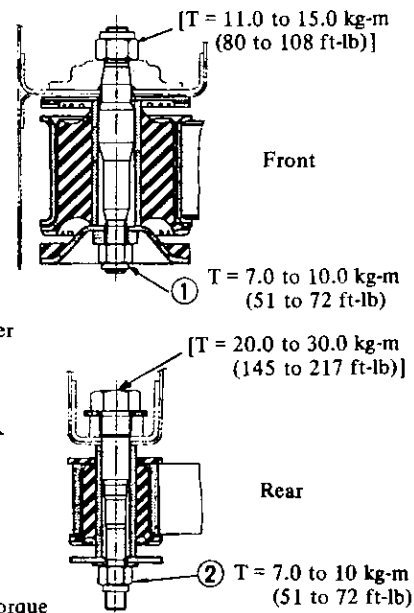


Fig. RA-8 Insulator

Tightening torque:

Suspension member mounting nut ①:
7 to 10 kg-m
(51 to 72 ft-lb)

Differential mounting member mounting nut ②:
7 to 10 kg-m
(51 to 72 ft-lb)

Shock absorber lower end fixing bolt:
1.6 to 2.2 kg-m
(12 to 16 ft-lb)

center of suspension member.

- Disconnect suspension arms by removing suspension arm pins ②.

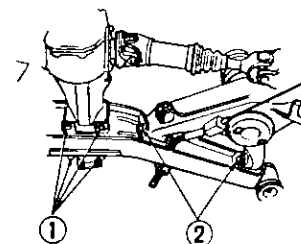


Fig. RA-9 Removing suspension member

SUSPENSION MEMBER

Removal

- Remove rear suspension assembly (See "REAR AXLE & SUSPENSION ASSEMBLY REMOVAL").
- Disconnect differential gear carrier by removing four bolts ① at

Installation

Install the rear suspension member in the reverse order of removal.

Note: Vehicle weight must be on rear wheels when tightening suspension arm pins in order to clamp rubber bushings in a neutral on unloaded position.

REAR AXLE & REAR SUSPENSION

Tightening torque:

Differential gear carrier

fitting bolt: 5 to 7 kg-m
(36 to 51 ft-lb)

Suspension arm pin:

8 to 10 kg-m
(58 to 72 ft-lb)

SUSPENSION COIL SPRING

Removal

1. Raise the rear of vehicle and support it on stands. Place stands solidly under body member on both sides.
2. Remove rear wheels.
3. Disconnect hand brake cables by removing adjusting nut at adjuster ①, and return spring ②.
4. Remove drive shaft flange nuts ③ on the wheel side, and bound rubber fixing nut ④.
5. Disconnect rear brake hose ⑤ at suspension arm.
6. Position jack under suspension arm and raise jack slightly to relieve tension on shock absorber. Disconnect shock absorbers at lower end.
7. Carefully lower jack to fully extend spring after disconnecting shock absorber and remove spring, spring seat and bound rubber.

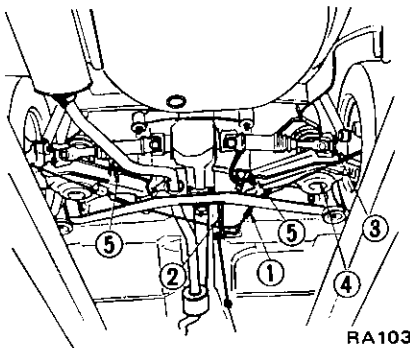


Fig. RA-10 Suspension coil spring removal points

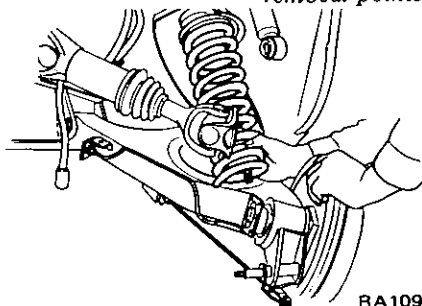
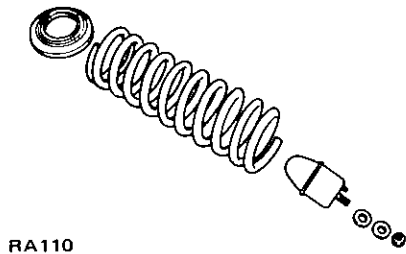


Fig. RA-11 Removing coil spring



RA110

Fig. RA-12 Spring and rubbers

Inspection and repair

1. Check coil spring for yield, deformation or cracks.
2. Test spring and compare with the specifications given in Service Data and Specifications.
3. Check all rubber parts for wear, damage and deformation. Replace if necessary.

Installation

Install coil spring in the reverse order of removal, noting the following points.

1. Install spring seat on top of spring and bound rubber in spring, and ensure that coil spring is correctly in position (flat face of spring is top).
2. Tightening torque values must be used as follows:

Shock absorber lower end fixing bolt:

1.6 to 2.2 kg-m
(12 to 16 ft-lb)

Bound rubber nut:

1.6 to 2.2 kg-m
(12 to 16 ft-lb)

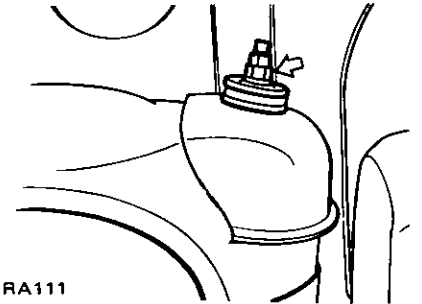
Drive shaft flange bolt:

5 to 6 kg-m (36 to 43 ft-lb)

SHOCK ABSORBER

Removal

1. Open the trunk and remove trunk finisher assembly.
2. Remove double nuts which fasten the upper end of rear shock absorber to body.
3. Disconnect shock absorber by removing bolt at suspension arm.



RA111

Fig. RA-13 Installation of rear shock absorber upper end

Inspection

1. Test shock absorber and compare with the specification given in Service Data and Specifications. Replace if necessary.
2. Check for oil leakage and cracks. Also check shaft for straightness.
3. Inspect rubber bushings for damage, cracks and deformation. Replace parts if necessary.

Installation

Installation of shock absorber is the reverse order of removal.

Note: Vehicle weight must be on rear wheels when tightening shock absorber lower end in order to clamp rubber bushings in a neutral or unloaded position.

REAR SUSPENSION ARM

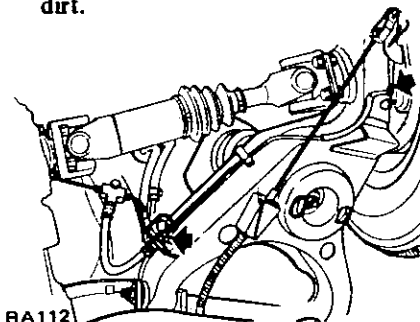
The rear axle shaft housing and shock absorber lower mounting bracket are welded suspension arm.

Removal

1. Raise the rear of vehicle and support under body member on stands.
2. Remove rear wheel and brake drum.
3. Disconnect drive shaft from axle shaft.
4. Disconnect hand brake cable from lever attached to wheel cylinder.
5. Disconnect brake hose from brake tube by removing lock spring and draw out through connector.

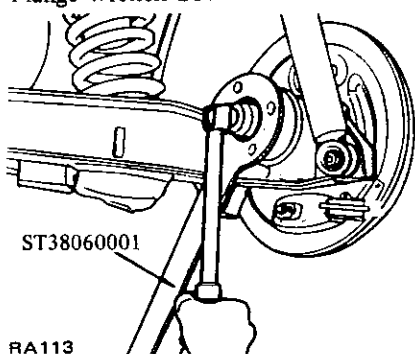
REAR AXLE & REAR SUSPENSION

Note: Cover brake hose and tube opening to prevent entrance of dirt.



RA112
Fig. RA-14 Removing brake hose and tube

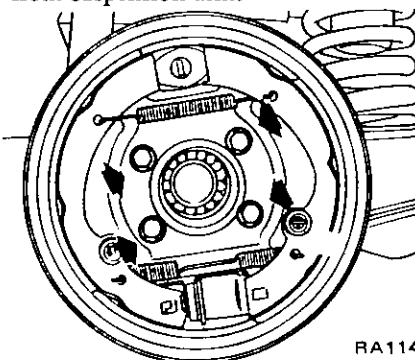
6. Remove wheel bearing lock nut using special tool "Rear Axle Shaft Flange Wrench ST38060001."



RA113
Fig. RA-15 Removing wheel bearing lock nut

7. Remove rear axle shaft, wheel bearings and oil seal.

8. Remove rear brake assembly from suspension arm.



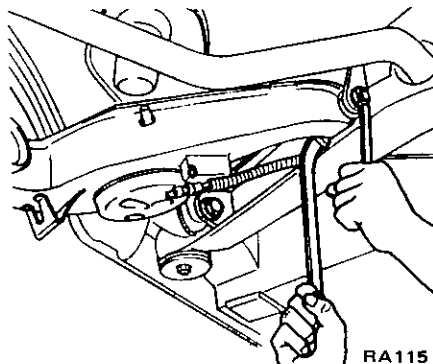
RA114
Fig. RA-16 Removing rear brake assembly

8. After remove bound rubber fixing nut, position jack under suspension arm and raise jack slightly to relieve tension on shock absorber. Disconnect shock absorber at lower end.

9. Carefully lower jack to fully extend spring after disconnecting

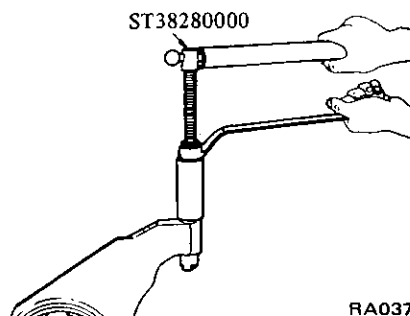
shock absorber and remove spring, spring seat and bound rubber.

10. Disconnect suspension arm by removing suspension arm pins securing suspension arm to suspension member.



RA115
Fig. RA-17 Removing suspension arm

11. Draw out rubber bushings from suspension arm using special tool "Rear Suspension Arm Bush Remover ST38280000."



RA037
Fig. RA-18 Removing rubber bushing

Inspection

1. Examine suspension arms to ensure they are not deformed or cracked.
2. Check rubber bushings for wear, damage and separation. Replace if necessary.

Installation

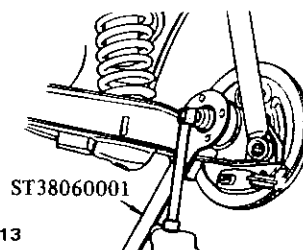
Install in the reverse order of removal, noting the following points.

1. Vehicle weight must be on rear wheels when tightening suspension arm pins in order to clamp rubber bushings in a neutral on unloaded position.
2. Change self locking nuts at each overhaul.

REAR AXLE SHAFT, WHEEL BEARINGS AND SEALS

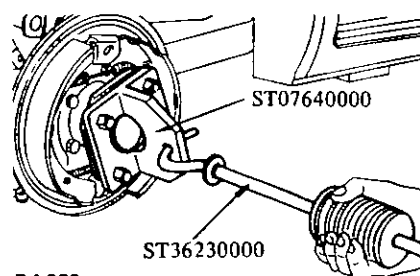
Removal and disassembly

1. Raise the rear of vehicle and support under body member on stands.
2. Remove rear wheel and brake drum.
3. Disconnect drive shaft from axle shaft.
4. Remove wheel bearing lock nut using special tool "Rear Axle Shaft Flange Wrench ST38060001."



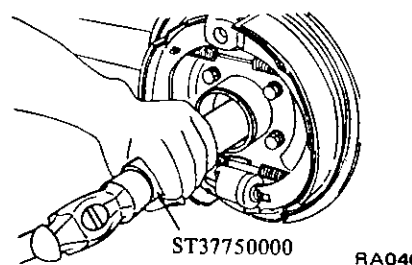
RA113
Fig. RA-19 Removing wheel bearing lock nut

5. Draw out axle shaft assembly using special tools "Rear Axle Stand ST07640000 and Sliding Hammer ST36230000." Remove rear axle flange.



RA039
Fig. RA-20 Removing rear axle shaft

6. Remove oil seal and inner bearing using special tool "Rear Axle Shaft Bearing Drift ST37750000."



RA040
Fig. RA-21 Removing oil seal and inner bearing

REAR AXLE & REAR SUSPENSION

7. Remove grease catcher.
8. Withdraw outer bearing from rear axle shaft using a standard bearing puller.

Note: Do not reuse bearing which has been pulled out.

Inspection

Inspect the following parts for defect. Replace or repair if necessary.

1. Check axle shaft for straightness, cracks, wear and distortion.
2. Check bearing for excessive wear and damage. Replace if necessary.

Assembly and installation

Install in the reverse order of removal, noting the following points.

1. Clean wheel bearings, oil seal and the inside of axle shaft housing.
2. Wheel bearings are sealed type. When installing ensure that the sealed side of outer bearing faces the wheel and that the sealed side of inner bearing faces the differential.

Pack with wheel bearing grease MP2 or MP3 at each overhaul.

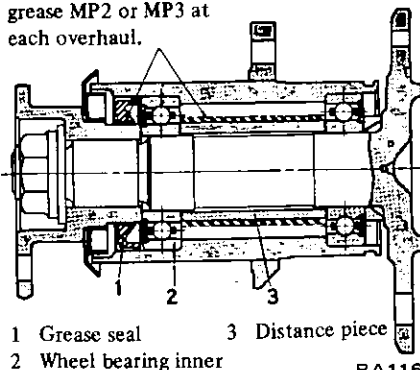


Fig. RA-22 Sectional view of rear axle

3. When replacing suspension arm, measure the dimension L1 and L2 (See Figure RA-23).

The length of distance piece is 0.05 mm (0.002 in) shorter than the length of housing. Example: When an axle housing is coded "B," select "B" coded distance piece.

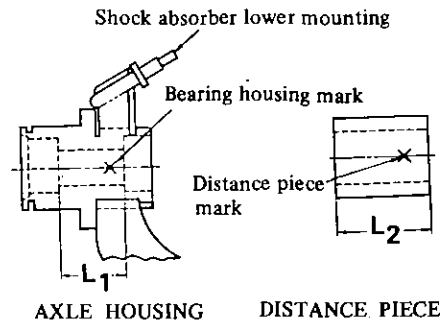


Fig. RA-23

Rear axle shaft housing mm (in)		Rear wheel bearing distance piece mm (in)	
Mark	L ₁ length	Mark	L ₂ length
A	59.05 to 59.15 (2.325 to 2.329)	A	59.02 to 59.08 (2.324 to 2.320)
B	58.59 to 59.05 (2.321 to 2.325)	B	58.92 to 58.98 (2.320 to 2.322)
C	58.85 to 58.95 (2.317 to 2.321)	C	58.82 to 58.88 (2.316 to 2.318)

4. Replace wheel bearing grease every 50,000 km (30,000 miles).

Pack wheel bearings with MP2 or MP3 grease as shown in Figure RA-22. Apply grease to lip seal and wheel bearing.

Notes:

- a. Change lock nut and oil seal at each overhaul.
- b. Reuse of an oil seal must not be allowed. Install oil seal by special tool "Rear Axle Oil Seal Drift ST37710000."

Wheel bearing adjustment

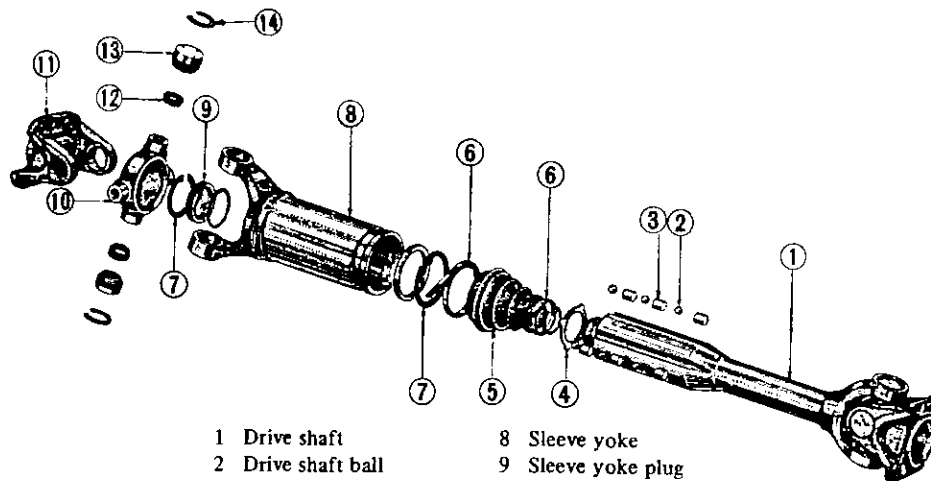
1. After tightening lock nut to

specified torque 25 to 33 kg-m (181 to 239 ft-lb), check the rear axle shaft end play. It should be 0 to 0.15 mm (0 to 0.0059 in) and should have a turning torque less than 4.5 kg-cm (3.9 in-lb) or 0.8 kg (1.8 lb) at hub bolt.

2. Lock nut using a punch.
3. If the correct end play or turning torque cannot be obtained, disassemble again and replace distance piece.

REAR AXLE & REAR SUSPENSION

DRIVE SHAFT



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

RA043

Fig. RA-24 Drive shaft

Removal

Remove drive shaft flange yoke bolts at both ends.

Disassembly

Disassembly should be done only to lubricate ball spline. This will be required every 2 years or 50,000 km (30,000 miles).

1. Remove universal joint spider located at the differential side. Refer to the section covering propeller shaft.
2. Remove snap ring which secures sleeve yoke plug and remove plug. Compress drive shaft and remove snap ring securing stopper (Figure RA-24, ④), using special tool "Snap Ring Pliers ST38300000." Remove stopper.
3. Disconnect boot and split drive shaft taking care not to lose balls and spacers.

Inspection

1. Replace boot and "O" ring of sleeve yoke plug, if damaged.
2. Check drive shaft for straightness, cracks, damage, wear and distortion. Replace drive shaft assembly if necessary.

3. Check steel balls and sleeve yoke for damage, wear and distortion. Replace drive shaft assembly if defective parts are found.
4. If any abnormal condition is found in universal joints, replace joint.
5. Wash out old grease from sleeve yoke, drive shaft ball rolling groove and oil groove.
6. Check the play in drive shaft as shown in Figure RA-25. If the play exceeds 1 mm (0.0394 in) replace drive shaft assembly.

Note: The measurement should be taken with drive shaft fully compressed.

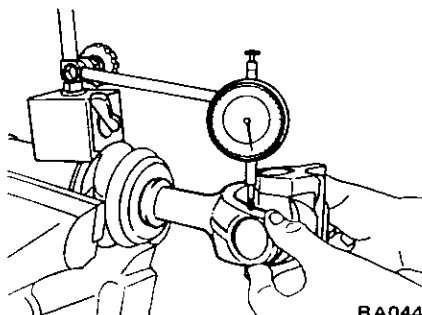


Fig. RA-25 Measuring play in drive shaft

Assembly

Assemble in the reverse order of removal, noting the following points.

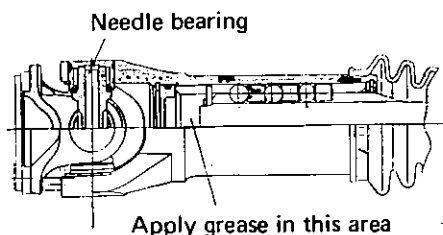
1. Align the yokes and ensure that steel balls and spacers are fitted in the correct sequence.
3. Use related snap rings of the same thickness and be sure that play is below 0.02 mm (0.0008 in). Snap rings are available in four different thickness.

Universal joint snap ring

Thickness mm (in)
1.49 (0.0587)
1.52 (0.0598)
1.55 (0.0610)
1.58 (0.0622)

3. Apply an adequate quantity of multipurpose grease to the ball rolling groove and oil groove, approximately 10 g (0.35 oz). In addition, apply 35 g (1.23 oz) of grease to the area shown in Figure RA-26.

REAR AXLE & REAR SUSPENSION



Note: Component parts of drive shaft are not available except as an assembly. Therefore, if any wear or damage exists in a certain part, drive shaft assembly will have to be replaced.

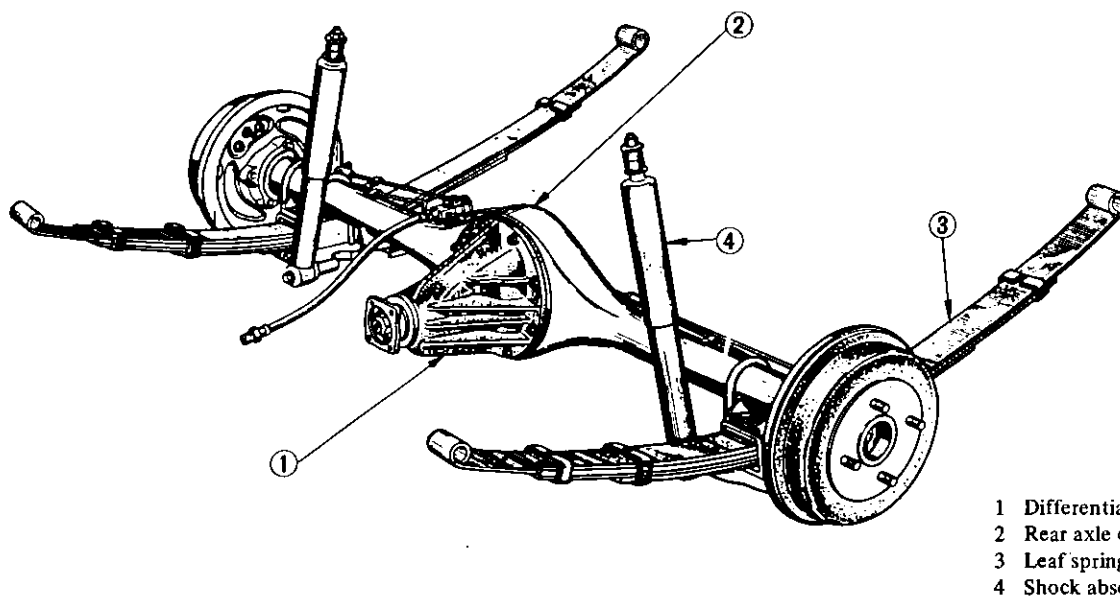
RA045

Fig. RA-26 Sectional view of drive shaft

REAR AXLE AND SUSPENSION —STATION WAGON AND VAN—

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- 1 Differential carrier
- 2 Rear axle case
- 3 Leaf spring
- 4 Shock absorber

RA117

Fig. RA-27 Rear axle and suspension

REAR AXLE & REAR SUSPENSION

DESCRIPTION

Rear suspension for the Station Wagon and the Van are not independently spring, being incorporated in the rear axle assembly.

The rear axle assembly is attached to frame through semi-elliptic leaf springs and telescopic hydraulic shock absorbers.

The rear spring center-pin is off-set toward the front from the center of the spring. This is done to reduce spring wind-up and to decrease the arc the rear wheel swings through. This minimizes the possibility of the rear suspension affecting vehicle stability.

The leaf springs and shock absorbers are mounted on rubber bushings at each end.

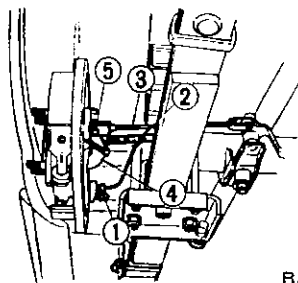
Rear axle is of the semi-floating type. The axle case is a pressed steel "Banjo" type housing.

Rear wheel bearings are of the presealed type, therefore no servicing is necessary. However, on the occasion bearing is replaced new bearing should be packed with an approved grease prior to installation.

REAR AXLE SHAFT AND WHEEL BEARING

Removal

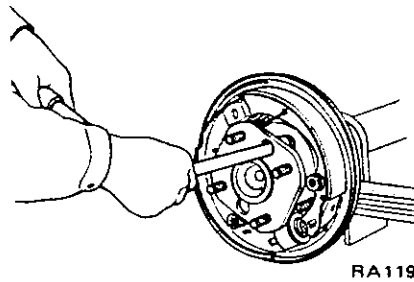
1. Raise the rear of vehicle and support under axle case on stands.
2. Remove rear wheel.
3. Disconnect brake tube connector ① and pull-off spring ②.
4. Disconnect cross rod ③ from lever ④ by removing clevis pin ⑤.



RA118

Fig. RA-28 Removing brake parts

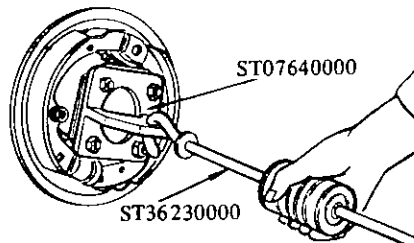
5. Remove brake drum.
6. Remove four nuts securing brake back plate to axle case.



RA119

Fig. RA-29 Removing nuts

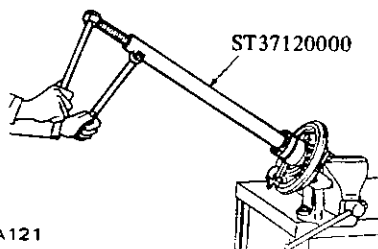
7. Draw out axle shaft assembly together with brake disc using special tools "Rear Axle Stand ST07640000" and "Sliding Hammer ST36230000."



RA120

Fig. RA-30 Removing rear axle shaft assembly

8. Remove oil seal if necessary and install new one.
9. After cut collar with cold chisel remove wheel bearing and collar using special tool "Rear Axle Shaft Bearing Puller ST37120001." Then take out brake disc.



RA121

Fig. RA-31 Removing wheel bearing

Inspection

Inspect the following parts for defects and replace as required.

1. Check axle shaft for straightness, cracks, damage, wear and distortion.
2. Check the lip of oil seal for damage, deformation and wear.
3. Check bearing for wear and damage.

Assembly and installation

Assemble and install in the reverse order of removal, noting the following points.

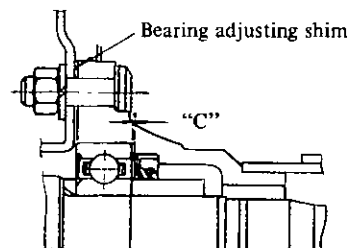
1. Install bearing spacer, bearing and new bearing collar onto axle shaft, and press bearing collar by specified load 3 to 5 tons using special tool "Rear Axle Shaft Bearing Collar Press Stand ST38210000."

Notes:

- a. New collar must be used, and clean collar and axle shaft.
 - b. Clean bearing, and pack with wheel bearing grease.
 - c. Insert wheel bearing with seal side facing wheel.
2. Care should be taken not to damage oil seal when installing oil seal or axle shaft assembly.

Note: Coat the lips of oil seal with wheel bearing grease.

3. Adjust the gap "C" (Figure RA-32) between wheel bearing and axle tube end to within 0.1 mm (0.0039 in) by selecting shim.



RA122

Fig. RA-32 Gap "C"

Rear axle case end shim

Thickness mm (in)
0.075 (0.0030)

4. Measure axial end play of axle shaft by dial indicator, and it should be 0.1 to 0.45 mm (0.0039 to 0.0177 in).

REAR AXLE & REAR SUSPENSION

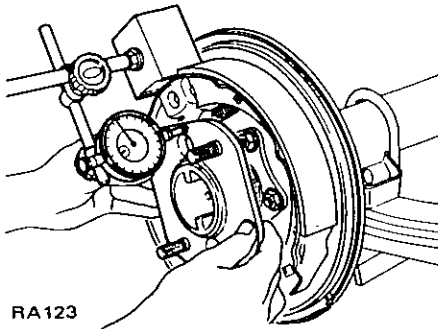


Fig. RA-33 Measuring end play

Tightening torque:

Brake disc fixing nut
[Station wagon]:

2.2 to 2.7 kg-m
(16 to 20 ft-lb)

[Van]:

1.5 to 2.0 kg-m
(11 to 14 ft-lb)

Brake tube:

1.5 to 1.8 kg-m
(11 to 13 ft-lb)

Wheel nut:

8 to 9 kg-m
(58 to 65 ft-lb)

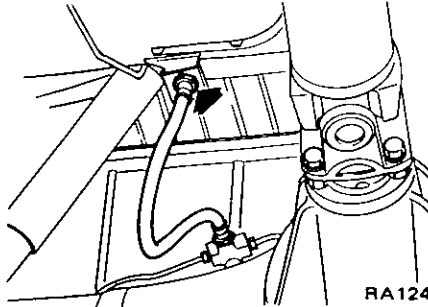


Fig. RA-34 Removing brake hose

7. Disconnect shock absorbers at lower end ①.

8. Remove "U" bolt (spring clip) lock nuts ②. Withdraw rear axle case.

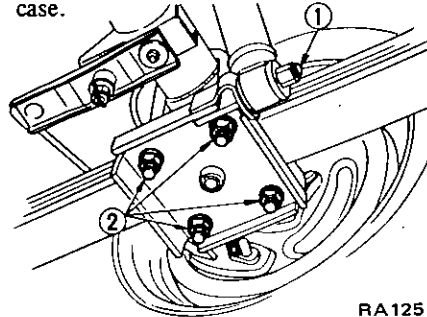


Fig. RA-35 Removing rear axle

Inspection

Check axle case for yield, deformation or cracks and replace if necessary.

Installation

Install the axle case in the reverse order of removal.

Note: Change oil seal and gasket at each overhaul.

Tightening torque:

Differential gear carrier
fixing nut:

2.0 to 2.5 kg-m
(14 to 18 ft-lb)

"U" bolt:

6.0 to 6.5 kg-m
(43 to 47 ft-lb)

Propeller shaft flange bolt:

2.0 to 2.7 kg-m
(14 to 20 ft-lb)

Shock absorber lower
end nut:

3.5 to 4.5 kg-m
(25 to 33 ft-lb)

SHOCK ABSORBER

Removal

1. Disconnect lower end of shock absorber by removing nut at spring seat.

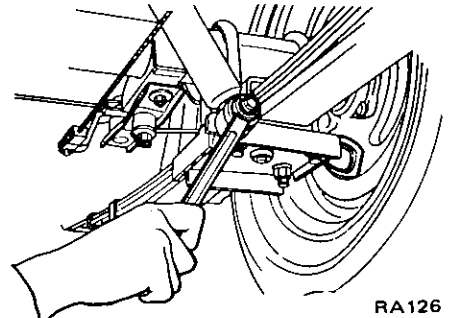


Fig. RA-36 Removing shock absorber lower end

2. Remove two bolts securing upper bracket to body. Remove shock absorber with upper bracket. Separate bracket from shock absorber.

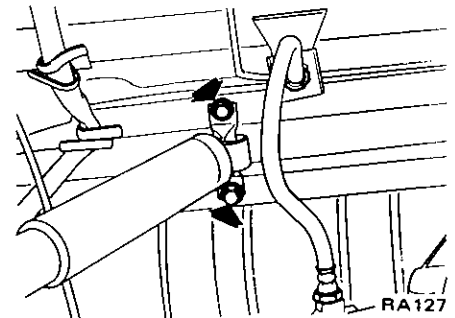


Fig. RA-37 Removing shock absorber upper end

Inspection

1. Test shock absorber and compare with the specification given in Service Data and Specifications. Replace if necessary.

2. Check for oil leakage and cracks. Also check shaft for straightness.

3. Inspect rubber bushings for damage, cracks and deformation. Replace parts if necessary.

Installation

Installation of the shock absorber is the reverse order of removal.

Note: Vehicle weight must be on rear wheels when tightening shock absorber lower end in order to clamp rubber bushings in a neutral or unloaded position.

REAR AXLE CASE

Removal

1. Raise the rear of vehicle and support under body member on stands.

2. Remove rear axle shaft assemblies at both side (See "REAR AXLE SHAFT AND WHEEL BEARING REMOVAL").

3. Disconnect hand brake cable at balance lever.

4. Disconnect propeller shaft by removing four bolts securing propeller shaft flange to pinion flange of differential gear carrier.

5. Remove differential gear carrier assembly from rear axle case.

6. Disconnect brake hose from brake tube at body clamp.

Note: Cover brake hose and tube opening to prevent entrance of dirt.

REAR AXLE & REAR SUSPENSION

REAR SPRING

Removal

1. Raise the rear of vehicle and support under body member on stands. Remove rear wheel.
2. Disconnect shock absorber at lower end ①, and remove "U" bolt lock nuts ②.

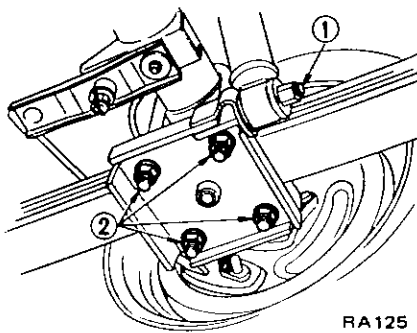


Fig. RA-38 Removing shock absorber lower end and "U" bolts

3. Position jack under rear axle case. Raise jack and float axle case from spring.
4. Disconnect rear spring shackle by removing nuts.

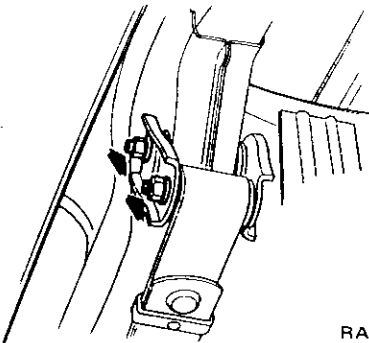


Fig. RA-39 Removing spring shackle

5. Disconnect spring from body by removing pin at front bracket of rear spring.

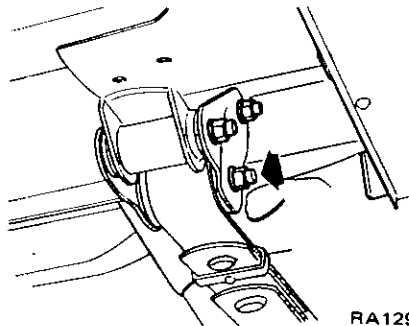


Fig. RA-40 Removing spring

Inspection and repair

Clean all rust and dirt from spring leaves, using a wire brush if necessary.

1. Examine spring leaves for fractures or cracks.
2. Check front bracket and pin, shackle, "U" bolts and spring seat for wear, cracks, straightness and

damaged threads. If defective parts are found, replace with new ones.

3. Inspect all rubber parts for wear, damage, separation and deformation. Replace them if necessary.

Installation

Install rear spring in the reverse order of removal, noting the following points.

1. Coat front pin, shackle and rubber bushing with a soap solution prior to assembly.
2. Vehicle weight must be on rear wheels when tightening front pin, shackle and shock absorber lower end nut in order to clamp rubber bushing in a neutral or unloaded position.

Tightening torque:

Pins of spring front and rear ends:

6.0 to 6.5 kg-m
(43 to 47 ft-lb)

REAR AXLE & REAR SUSPENSION

SERVICE DATA AND SPECIFICATIONS —SEDAN—

Applied model			Wheel alignment		Rear shock absorber		
			Toe-in mm (in)	Camber (degree)	Stroke x Max. length mm (in)	Damping force at 0.3 m/s. kg (lb) Expansion	Compression
Standard suspension	R.H. drive	Laden	-6 to 4 (-0.2362 to 0.1575)	-2°20' to -50'	220 x 595 (8.6 x 23.4)	34 to 56 (75 to 123)	21 to 39 (40 to 86)
		Unladen	3 to 13 (0.1181 to 0.512)	55' to 2°25'			
	L.H. drive (Except U.S.A. and Canada)	Laden	-6 to 4 (-0.2362 to 0.1575)	-2°10' to -45'			
		Unladen	4 to 14 (0.1575 to 0.551)	1°05' to 2°35'			
	L.H. drive (U.S.A. and Canada)	Laden	-6 to 4 (-0.2362 to 0.1575)	-2°25' to -55'		55 to 77 (121 to 170)	33 to 51 (74 to 112)
		Unladen	3 to 13 (0.1181 to 0.512)	45' to 2°15'			
Hard suspension	R.H. drive	Laden	-5 to 5 (-0.1969 to 0.1969)	-2°05' to -35'			
		Unladen	2 to 12 (0.0787 to 0.472)	25' to 1°55'			
	L.H. drive (Except U.S.A. and Canada)	Laden	-5 to 5 (-0.1969 to 0.1969)	-2°05' to -35'			
		Unladen	2 to 12 (0.0787 to 0.472)	25' to 1°55'			
	L.H. drive (U.S.A. and Canada)	Laden	-6 to 4 (-0.2362 to 0.1575)	-2°20' to -50'			
		Unladen	1 to 11 (0.0394 to 0.43)	15' to 1°45'			

Rear coil spring

Items	Applied Models	All models except hard suspension				Hard suspension			
		R.H. drive		L.H. drive		R.H. drive		L.H. drive	
		R/H	L/H	R/H	L/H	R/H	L/H	R/H	L/H
Wire dia.	mm (in)	14.5 (0.571)							
Coil dia.	mm (in)	90 (3.54)							
Coil turns		9.25				9.5			
Free length	mm (in)	321 (12.6)	307 (12.1)	315.5 (12.4)		306 (12.0)	299 (11.8)		
Installed height/load	kg/mm (lb/in)	229/602 (9.02/ 1,327)	215/602 (8.46/ 1,327)	231/602 (9.09/1,327)		229/602 (9.02/ 1,327)	222/602 (8.74/ 1,327)		
Spring constant	kg/mm (lb/in)	6.56 (367)				7.93 (444)			

REAR AXLE & REAR SUSPENSION

All models

Drive shaft and journal

Sliding resistance	kg (lb)	less than 20 (44)
Radial play of ball spline	mm (in)	less than 1 (0.0394)
Axial play of spider journal	mm (in)	less than 0.02 (0.0008)
Journal swinging torque	kg-cm (in-lb)	less than 10 (8.7)

Rear axle shaft

Turning torque	kg-cm (in-lb)	less than 4.5 (3.9) [0.8 kg (1.8 lb) at hub bolt]
End play	mm (in)	less than 0.15 (0.0059)

Tightening torque

Rear wheel bearing lock nut	kg-m (ft-lb)	25 to 33 (181 to 239)
Brake disc back plate fixing bolt	kg-m (ft-lb)	2.7 to 3.7 (20 to 27)
Shock absorber upper end lock nut	kg-m (ft-lb)	1.6 to 2.2 (12 to 16)
Shock absorber lower end bolt	kg-m (ft-lb)	1.6 to 2.2 (12 to 16)
Drive shaft flange bolt	kg-m (ft-lb)	5 to 6 (36 to 43)
Bumper rubber fixing nut	kg-m (ft-lb)	1.6 to 2.2 (12 to 16)
Rear suspension member mounting lock nut	kg-m (ft-lb)	7 to 10 (51 to 72)
Differential mounting member lock nut	kg-m (ft-lb)	7 to 10 (51 to 72)
Suspension arm to suspension member fixing pin	kg-m (ft-lb)	8 to 10 (58 to 72)
Differential to differential mounting member nut	kg-m (ft-lb)	6 to 8 (43 to 58)
Propeller shaft flange nut	kg-m (ft-lb)	2.0 to 2.7 (14 to 20)
Differential to suspension member fixing bolt	kg-m (ft-lb)	5 to 7 (36 to 51)
Rear suspension mounting bolt (Front)	kg-m (ft-lb)	11 to 15 (80 to 108)
Rear suspension mounting bolt (Rear)	kg-m (ft-lb)	20 to 30 (145 to 217)
Wheel nut	kg-m (ft-lb)	8 to 9 (58 to 65)

—STATION WAGON AND VAN—

Applied Models Itmes	Station wagon except hard suspension	Van and station wagon with hard suspension
Rear shock absorber Stroke x Max. length mm (in)	205 x 518 (8.1 x 20.4)	
Damping force at 0.3 m/sec. kg (lb)		
Expansion	63 to 87 (139 to 192)	97 to 131 (214 to 289)
Compression	33 to 43 (73 to 95)	29 to 43 (64 to 95)

REAR AXLE & REAR SUSPENSION

Rear leaf spring		
Dimension (Length x Width x Thickness) mm (in)	#1 1,456 x 60 x 4 (57.3 x 2.362 x 0.1575) #2 1,036 x 60 x 4 (40.8 x 2.362 x 0.1575) #3 780 x 60 x 4 (30.7 x 2.362 x 0.1575) #4 524 x 60 x 4 (20.6 x 2.362 x 0.1575) #5 228 x 50 x 5 (9.0 x 1.969 x 0.1969)	#1 1,461 x 60 x 7 (57.5 x 2.362 x 0.2756) #2 1,074 x 60 x 7 (42.3 x 2.362 x 0.2756) #3 865 x 60 x 6 (34.1 x 2.362 x 0.2362) #4 675 x 60 x 12 (26.6 x 2.362 x 0.4724)
Lader camber mm/kg (in/lb)	15/265 (0.592/584)	15/320 (0.592/705)
Spring constant kg/mm (lb/in)	2.2 (123)	Under 200 kg (441 lb) ... 2.5 (5.5) Over 200 kg (441 lb) ... 5.5 (12)

Rear axle

End play

Thickness of rear axle case end shim

mm (in) 0.1 to 0.45 (0.0039 to 0.0177)
mm (in) 0.075 (0.0030)

Station wagon and Van

Tightening torque

Shock absorber upper bracket bolt	kg-m (ft-lb) 0.9 to 1.2 (6.5 to 8.7)
Shock absorber lower end nut	kg-m (ft-lb) 3.5 to 4.5 (25 to 33)
Rear spring "U" bolt (clip)	kg-m (ft-lb) 6.0 to 6.5 (43 to 47)
Spring shackle	kg-m (ft-lb) 6.0 to 6.5 (43 to 47)
Spring front pin	kg-m (ft-lb) 6.0 to 6.5 (43 to 47)
Spring front bracket fixing bolt	kg-m (ft-lb) 6.0 to 6.5 (43 to 47)
Brake disc (back plate) fixing nut	
— Station wagon —	kg-m (ft-lb) 2.2 to 2.7 (16 to 20)
— Van —	kg-m (ft-lb) 1.5 to 2.0 (11 to 14)
Differential gear carrier to axle case nut	kg-m (ft-lb) 2.0 to 2.5 (14 to 18)
Propeller shaft flange bolt	kg-m (ft-lb) 2.0 to 2.7 (14 to 20)
Bumper rubber fixing nut	kg-m (ft-lb) 0.9 to 1.2 (6.5 to 8.7)
Torque arrester fixing nut	kg-m (ft-lb) 0.9 to 1.2 (6.5 to 8.7)
Wheel nut	kg-m (ft-lb) 8 to 9 (58 to 65)
Drain and filler plug	kg-m (ft-lb) 4.2 to 6.9 (30.4 to 49.9)

REAR AXLE & REAR SUSPENSION

TROUBLE DIAGNOSES AND CORRECTIONS

When rear axle and suspension is suspected of being noisy it is advisable to make thorough test to determine whether the noise originates in the tires, road surface,

exhaust, propeller shaft, engine, transmission, universal joint, wheel bearings or suspension.

Noise which originates in other places cannot be corrected by adjust-

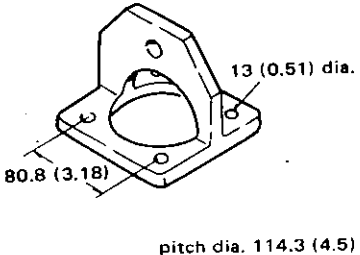
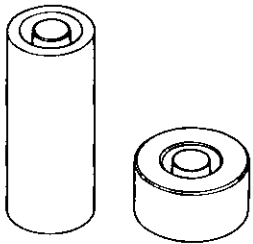
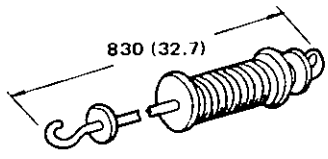
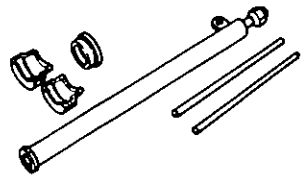
ment or replacement of parts in the rear axle and rear suspension.

In case of oil leak, first check if there is any damage or restriction in breather.

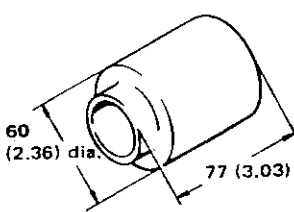
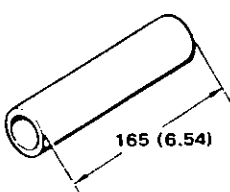
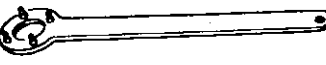
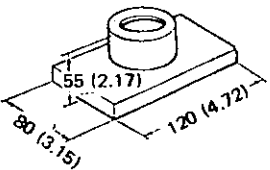
Condition	Probable cause	Corrective action
Noise	Loosening wheel nuts. Loosening of one or more securing bolts. Lack of lubricating oil or grease. Defective shock absorber. Incorrect adjustment of rear axle shaft end play. Damaged or worn wheel bearing. Worn spline portion of rear axle shaft. Breakage of leaf spring. Loosening of journal, connections or so no. Unbalance of wheel and tire. Damage of the rubber parts such as suspension arm bush, shock absorber mounting bush. Deformed differential mounting member. Defective universal joints. Worn or damaged rear suspension member mounting insulator. Worn or seized sliding portion of drive shaft ball spline. Breakage of coil spring.	Tighten the wheel nuts. Tighten the bolts to the specified torque. Lubricate as required. Replace the shock absorber. Adjust the rear axle shaft end play. Replace wheel bearing. Replace if necessary. Replace leaf spring. Tighten to the given torque. Balance wheel and tire. Replace the required parts. Replace. Adjust or replace. Replace the both side suspension member mounting insulator. Replace drive shaft assembly. Replace coil spring.
Instability in driving	Loosening of wheel nuts. Damaged rear suspension arm rubber bushes. Worn shock absorber. Defective wheel alignment. 1) coil spring wear. 2) worn-out spline portion of drive shaft ball spline.	Tighten to the given torque. Replace the rubber bushes. Replace defective shock absorber. Defective wheel alignment Replace coil spring. Replace drive shaft assembly.
Oil leakage	Damaged oil seal on rear axle shaft. Oil leakage from the differential carrier. Damaged dust cover of drive shaft. Damaged grease seal of rear axle shaft.	Replace the defective oil seal. Replace as required. Replace dust cover. Replace grease seal.

REAR AXLE & REAR SUSPENSION

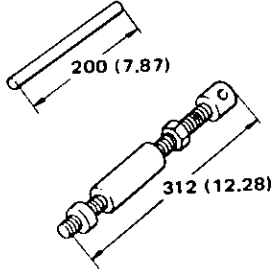
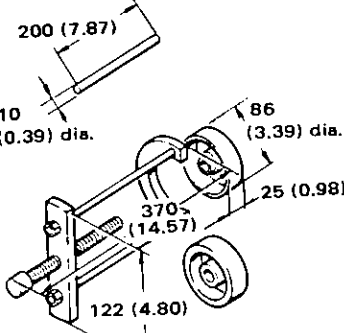
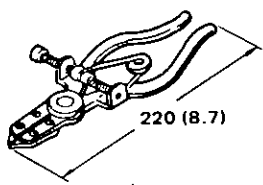
SPECIAL SERVICE TOOLS

No.	Tool number & tool name	Description	Unit: mm (in)	For use on	Reference page or figure No.
1.	ST07640000 Rear axle stand	 pitch dia. 114.3 (4.5) SE063		610 510 S30 C30 C10 GC10 B110	Fig. RA-20 Fig. RA-30
2.	ST33300000 Diff. mounting insulator drift	 SE223	(1) Drift O.D.: 39 mm (ST33300010) To take insulator out of place, use drift. (2) Drift O.D.: 52 mm (ST33300020) To push insulator into place, use this drift together with a press.	610	Fig. RA-6 Fig. RA-7
3.	ST36230000 Sliding hammer	 SE059		All models	Fig. RA-20 Fig. RA-30
4.	ST37120001 Rear axle shaft bearing puller — ST37120010 Body — ST37120020 Ring — ST37120030 Collar	 SE224		W610 V610 W510	Fig. RA-31

REAR AXLE & REAR SUSPENSION

No.	Tool number & tool name	Description Unit: mm (in)	For use on	Reference page or figure No.
5.	ST37710000 Rear axle oil seal drift	 SE065	610 510 C30	Page RA-7
6.	ST37750000 Rear axle shaft bearing drift	 SE066	610 510 C30 GC10	Fig. RA-21
7.	ST38060001 Rear axle shaft flange wrench	 SE225	610 510 C30 GC10	Fig. RA-15 Fig. RA-19
8.	ST38210000 Rear axle shaft bearing collar press stand	 SE226	W610 V610 W510 411	Page RA-10

REAR AXLE & REAR SUSPENSION

No.	Tool number & tool name	Description	Unit: mm (in)	For use on	Reference page or figure No.
9.	ST38280000	Rear suspension arm bush remover	 SE067	610 510 S30 C30 GC10	Fig. RA-18
10.	ST38290000	Rear suspension member insulator replacer	 SE068	610 510 C30 GC10	Fig. RA-5
11.	ST38300000	Snap ring pliers	 SE069	610 510 S30 C30 GC10	Page RA-8

SERVICE MANUAL

**DATSUN 1800
MODEL 610 SERIES
CHASSIS & BODY**



NISSAN MOTOR CO., LTD.
TOKYO, JAPAN

SECTION BR

BRAKE

BR

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BRAKE

BRAKES

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DESCRIPTION

The front wheels use the model SC disc brakes with a rotor of 232 mm (9.134 in) in diameter and a drum brake of 228.6 mm (9 in) in inner diameter and the rear wheels use drum brakes of the same inner diameter as that for the front wheels.

The NP-valve and brake fluid warning lamp are installed on the vehicle equipped with the disc brakes. The brake fluid warning lamps come into two types: one is operated on the amount of the brake fluid in the reservoir of the master cylinder and the other on the line pressure of the brake fluid.

Two types of tandem master cylinder are used on all models; one for the disc brake and the other for the drum brake. The diameter of the master cylinder is 18.38 mm ($\frac{3}{4}$ in).

On the vehicle equipped with the disc brakes, the Master-Vac with a diaphragm of 114.3 mm (4 $\frac{1}{2}$ in) diameter is also installed.

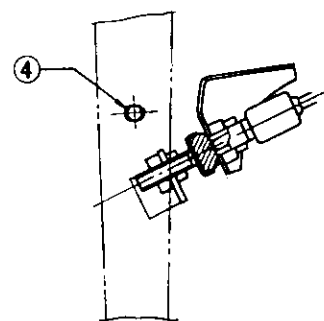
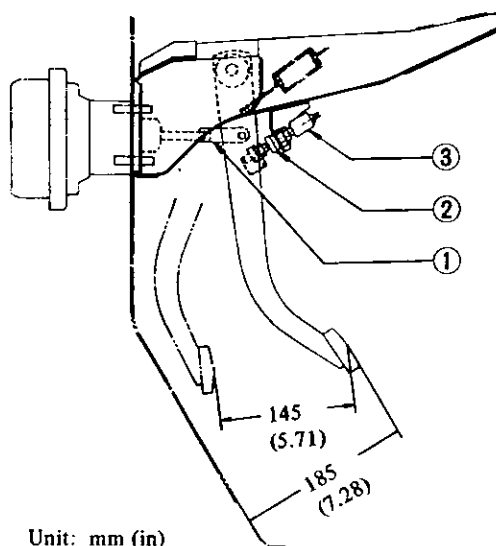
The hand brake is of a mechanical type, which serves to brake the rear wheels. It is applied or released

through the stick-type lever in the driver's compartment. As these brakes are applied, the brake warning lamp,

located on the instrument panel, will come on to indicate that the hand brake is in "applied" condition.

ADJUSTMENT

Brake pedal



- 1 Push rod adjusting screw
- 2 Pedal stopper
- 3 Brake lamp switch
- 4 Clevis pin

BR241

Fig. BR-1 Adjusting brake pedal

BRAKE

1. Adjust brake lamp switch bolt until its end face is flush with the front face (shown by "A" in Figure BR-1) of lock nut. Then, tighten lock nut securely.

Tightening torque:

1.6 to 2.2 kg-m
(11 to 16 ft-lb)

2. Adjust pedal stopper until pedal pad is positioned 185 mm (7.284 in) above the floor. Then, lock pedal stopper with lock nut.

Tightening torque:

0.8 to 1.1 kg-m
(5.8 to 8.0 ft-lb)

3. Adjust the length of push rod until a pedal free play of 1 to 5 mm (0.039 to 0.197 in) is obtained at the pedal pad. Then, tighten lock nut securely.

Tightening torque:

1.6 to 2.2 kg-m
(11 to 16 ft-lb)

Note: Use care not to allow the push rod getting into master cylinder.

4. After adjustment is made, depress and release brake pedal several times to insure that it travels over its entire stroke [145 mm (5.709 in)] smoothly without showing squeak noise, twisting or interference.

Front disc brake

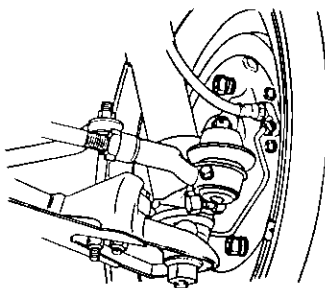
Adjustment is not necessary under normal condition since pad-to-rotor clearance is automatically compensated by elasticity of piston seal.

Front drum brake

1. Prior to making lining to drum gap adjustment, pump brake pedal several times to settle brake shoes in correct positions.

2. Turn upper and bottom cams clockwise for right drum (counter-clockwise for left drum) to move shoes in and away from brake drum.

Note: Shoes expand and brake is locked when cam is turned in same direction as car drives forward.



BR242

Fig. BR-2 Front brake shoe adjust cams

3. Turn a adjusting cam counter-clockwise for right wheel (clockwise for left wheel) until shoes drag against brake drum.

4. Turn out the adjusting cam a little at a time until brake drum is free from shoe grab.

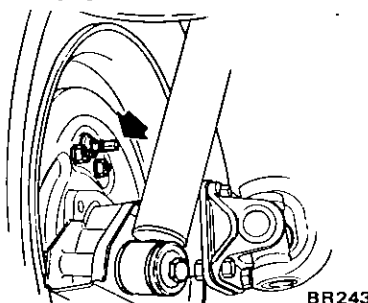
5. Follow steps "3" and "4" on the remaining cams.

Rear brake

1. Make sure that each wheel cylinder lever of parking brake is properly returned to its original position.

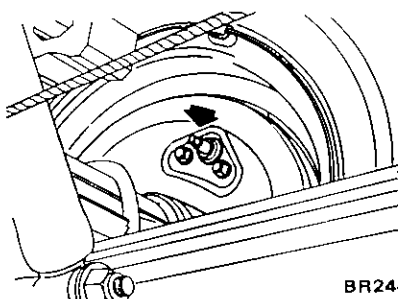
2. Depress brake pedal several times so that brake shoes are settled down in normal positions.

3. Rotate adjusting cam in the same direction as car drives forward until shoes drag against brake drum.



BR243

Fig. BR-3 Rear brake shoe adjust cam (Sedan and Hardtop)



BR244

Fig. BR-4 Rear brake shoe adjust cam (Station Wagon and Van)

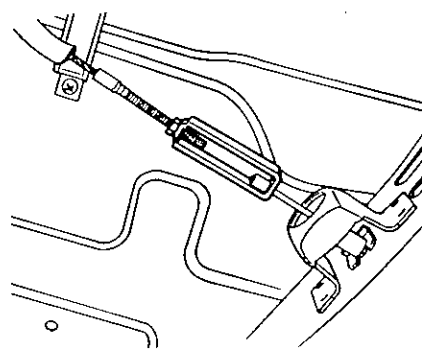
4. Turn out cam a little at a time until brake drum is free from shoe grab.

Hand brake

1. Adjust rear brake shoe to drum clearance before adjusting hand brake.

2. Take up all slack in rear cable; tighten lock nut firmly.

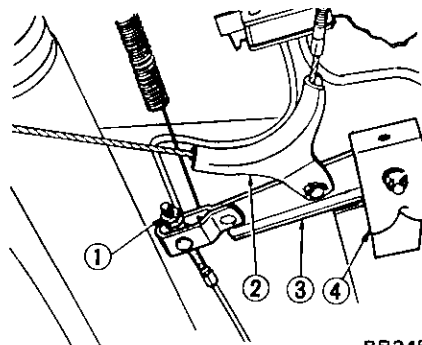
Note: Any slightest pull on wheel cylinder lever cannot be tolerated when adjusted.



BR246

Fig. BR-5 Rear cable adjuster

3. Adjust front cable so that, when hand brake control lever is pulled by a force of 20 kg (44 lb), a lever stroke of 90 to 100 mm (3.543 to 3.937 in) is obtained. Then, tighten lock nut securely.



BR245

- | | |
|--------------|------------------------|
| 1 Adjust nut | 3 Center lever |
| 2 Equalizer | 4 Center lever bracket |

Fig. BR-6 Center lever

4. Ascertain that each wheel cylinder lever (shown by an arrow in Figure BR-7) is returned to its original position with hand brake control lever moved back.

BRAKE

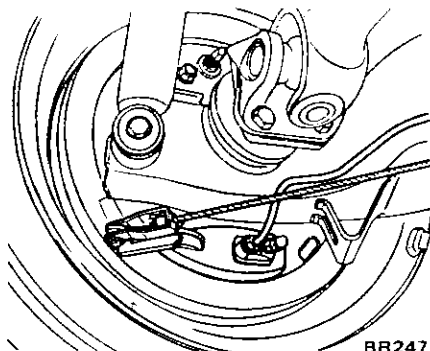


Fig. BR-7 Adjusting hand brake

5. Replace front and rear cables if adjustment is no longer effective on their threaded ends.

After adjustment

1. Make sure that each wheel cylinder lever is returned to its original position as hand brake lever is moved back. Also check to be sure that inner cable is not slackened excessively.
2. Make sure that ratchet is applied positively as hand brake control lever is pulled back. This lever should be released and automatically return to its original position when lever is rotated 60°. It should not show any evidence of bind or noise.

Brake warning light

Bend down hand brake warning lamp switch plate so that brake warning light comes on when ratchet at hand brake control lever is moved back one notch and goes out when returned to original position.

Bleeding hydraulic system

Hydraulic brake system must be bled whenever any line has been disconnected or air has in some way entered this system.

When pedal feeling was "spongy" pedal action, it is an indication that air has entered in the system.

Bleeding hydraulic system deserves much attention as it is an essential factor for regular brake service operation.

1. Clean all dirt around master cylinder reservoir, remove cylinder

cover and top up reservoir with recommended brake fluid.

2. Thoroughly clean mud or dust from bleeder valve so that outlet hole is free from any foreign material. Install a bleeder hose to bleeder valve.

Dip the other end of hose in a container filled with brake fluid.

3. Depress brake pedal two or three times and keep pedal fully depressed.

4. With brake pedal fully depressed, open bleeder valve to exhaust air.

Notes:

- a. Carefully monitor brake fluid level at master cylinder during bleeding operation.
- b. Do not re-use brake fluid drained during bleeding operation.
- c. Bleed air in the following sequence.
Rear wheel - Front wheel
- d. Exercise care not to splash brake fluid on painted portions.

5. Close bleeder valve quickly as brake pedal is on down stroke.

6. Allow brake pedal to return slowly with bleeder screw closed.

7. Repeat bleeding operations until no air bubbles show in hose.

Notes:

- a. Brake fluid containing air is white and contains air bubbles.
 - b. Brake fluid containing no air runs out of bleeder valve in a solid stream free of air bubbles.
8. Repeat above steps on the remaining brake line to expel air.

BRAKE PEDAL

Removal

1. Remove pedal return spring.

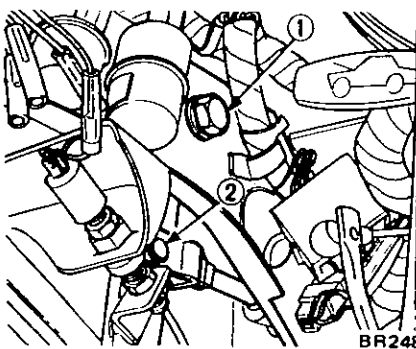


Fig. BR-8 Brake pedal mounting

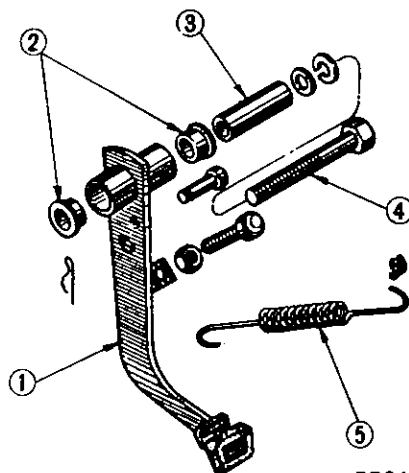
2. Remove cotter pin from clevis pin, and separate pedal from Master-Vac push rod.

3. Remove fulcrum pin and pedal.

Note: Turn fulcrum pin clockwise (R.H. Drive) or counterclockwise (L.H. Drive) to loosen it.

Inspection

Check brake pedal for the following items, servicing as necessary.



- | | |
|----------------------|-----------------|
| 1 Brake pedal | 4 Fulcrum pin |
| 2 Pedal bush | 5 Return spring |
| 3 Pedal shaft sleeve | |

Fig. BR-9 Brake pedal

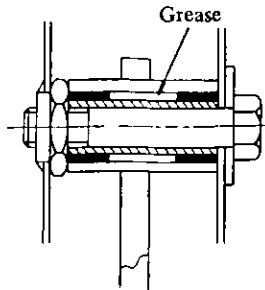
1. Check pedal bushing for wear, deformation or damage.
2. Check pedal shaft sleeve for wear or roughness.
3. Check for bent brake pedal.
4. Check for fatigued return spring.

Installation

Install brake pedal in the reverse sequence of removal, paying attention to the following instructions.

1. Install fulcrum pin from the right side (R.H. Drive) or left side (L.H. Drive).
2. Install clevis pin from the right side.
3. Install return spring with the longer hook toward pedal arm.
4. Apply a coating of recommended multipurpose grease the inner and outer faces of pedal bushing, clevis pin, and hooks of return spring. Charge the clearances in bushings with grease.

BRAKE



BR250

Fig. BR-10 Greasing place

5. Adjust the brake pedal after installation. (Refer to the instructions under "Adjustment.")

Tightening torque:

Fulcrum pin
3.6 to 4.2 kg-m
(26 to 30 ft-lb)

Pedal stopper lock nut
0.8 to 1.1 kg-m
(5.8 to 8.0 ft-lb)

MASTER CYLINDER

The master cylinders are of a tandem type, which actuates on the front and rear brake lines independently.

Braking force is constantly maintained when failure occurs in either the front brake system or the rear brake system. Failure in the front brake system will leave the rear brake still operative or failure in the rear

brake system will leave the front brake system still operative.

The brake fluid level gauge is available as an standard equipment for model SSS.

The brake warning light (BRAKE) located on the indicator panel comes on to indicate that the brake fluid level in the cylinder is lower than the minimum allowable level.

Two types of master cylinder are used; one for disc brake and the other for drum brake. They differ from each other in the reservoir capacity and check valve.

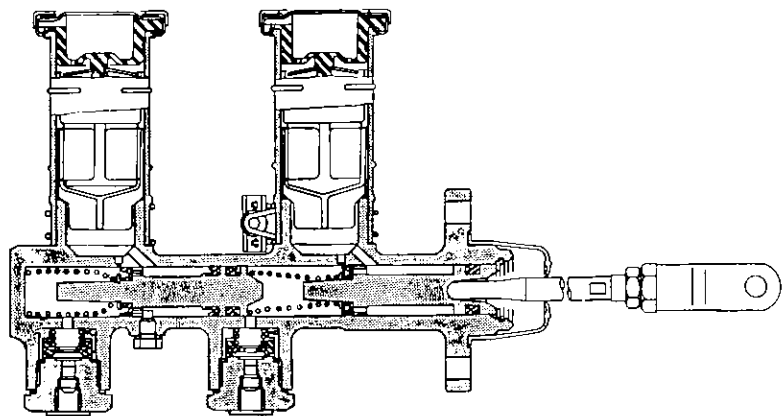
	Drum brake	Disc brake
Reservoir capacity	45 cc (2.75 cu in)	110 cc (6.71 cu in)
Brake warning light goes on when remaining fluid in reservoir reaches the amount of:	29 cc (1.77 cu in)	60 cc (3.66 cu in)

The reservoir is equipped with a retention cap. To remove this cup, proceed as follows:

1. Turn retention ring fully in the REMOVE direction.
2. Pull out retention cap.

To install it, proceed as follows:

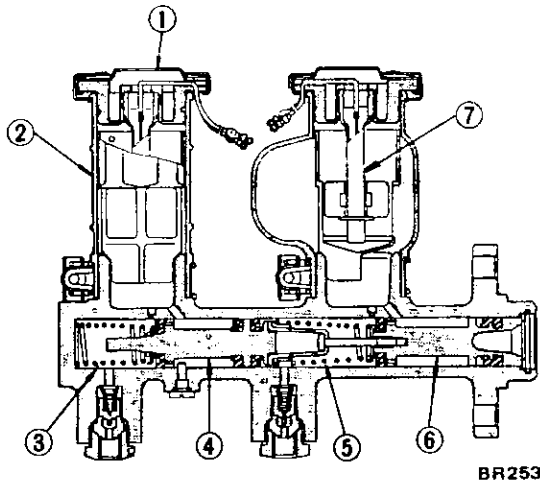
1. Turn retention ring (used in the retention cap) fully in the REMOVE direction.
2. Align the projection in retention ring with the slit in the reservoir tank and push retention cap in the tank.
3. Turn retention ring fully in the TIGHTEN direction.



BR252

Fig. BR-11 Cross-sectional view of drum brake master cylinder
(Made by Tokiko)

BRAKE



- | | |
|----------------------------------|--------------------------------|
| 1 Reservoir cap | 5 Primary piston return spring |
| 2 Reservoir tank | 6 Primary piston |
| 3 Secondary piston return spring | 7 Level gauge |
| 4 Secondary piston | |

Fig. BR-12 Cross-sectional view of disc brake master cylinder with level gauge
(Made by Nabco)

Removal

1. On the vehicle not equipped with the Master-Vac:

Pull out clevis pin, and separate brake pedal from master cylinder push rod.

2. Disconnect brake tube from master cylinder.
3. Remove master cylinder securing

nuts, and withdraw master cylinder from engine room side.

Note: Before disconnecting brake tube, be sure to use a container that receives draining brake fluid. Use of a rag is also suggested to keep adjacent parts and place clean at all times.

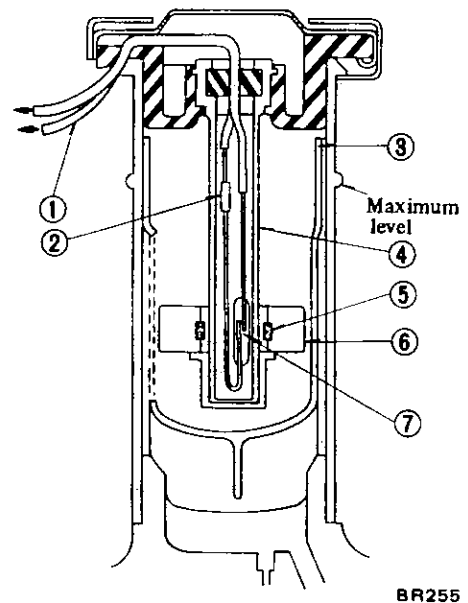
1. Remove reservoir cap and filter and drain out brake fluid.
2. Pry off stopper ring, using a screwdriver.
3. Remove stopper screw and take out stopper, primary piston assembly, spring, and secondary piston assembly, in the order shown.

Note: Discard cup if it is removed from piston assembly and use a new one.

4. Unscrew plug to gain accessibility of check valve for disassembling.

Note: Never detach reservoir tank. If it is removed for any reason, discard it and install a new one. Do not remove or disassemble brake fluid level gauge.

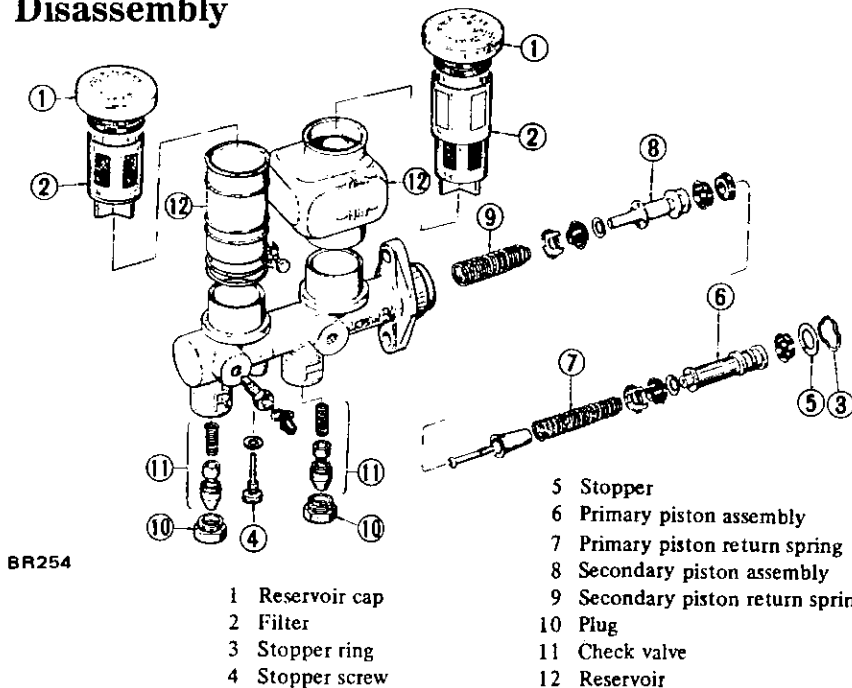
Brake fluid level gauge (Model SSS only)



- | | |
|-------------|---------------|
| 1 Lead wire | 5 Magnet |
| 2 Resistor | 6 Float |
| 3 Filter | 7 Lead switch |
| 4 Case | |

Fig. BR-14 Brake fluid level gauge

Disassembly



BR254

Fig. BR-13 Master cylinder

Operation: The float lowers as level of brake fluid becomes low. As the magnet is close to the lead switch, switch contacts are closed to light the brake warning light.

BRAKE

Checking method: Raise cap, and ascertain that brake warning light goes on when float comes into contact with stopper.

Inspection

Thoroughly clean all parts in a suitable solvent, and check for worn or damaged parts. Replace any part that

is defective.

Note: Do not clean rubber parts with mineral oil, since this will be the sure way of deteriorating parts. Use brake fluid or alcohol. When alcohol is used for cleaning these parts, do not immerse them in it longer than 30 seconds. After parts are cleaned, dry with compressed air.

1. Check cylinder and poiston for evidence of abnormal wear or damage.

Replace if found defective.

2. Check piston-to-cylinder clearance. If it is more than 0.15 mm (0.0059 in), replace either piston or cylinder.

3. Check for weakened, fatigued or damaged springs, replacing as necessary.

Return spring		Primary side		Secondary side	
Maker		Tokico	Nabco	Tokico	Nabco
Free length	mm (in)	55 (2.165)	Do not disassemble	54.5 (2.146)	50.5 (1.988)
Installed load	kg (lb)	1.8 to 2.2 (4.0 to 4.9)		3.6 to 4.4 (7.9 to 9.7)	2.5 to 3.1 (5.5 to 6.8)
Length	mm (in)	35.7 (1.406)		34.5 (1.358)	33.1 (1.303)

4. When master cylinder is disassembled, be sure to discard cups and valves. Replace any other parts which show evidence of deformatin, wear or otherwise damage.

5. Replace damaged oil reservoirs and caps.

Brake tube connector:

1.5 to 1.8 kg-m
(11 to 13 ft-lb)

BRAKE LINE

The brake line is formed into two systems through the use of tandem master cylinder.

On cars equipped with disc brakes,

brake lines come into two types; one with pressure differential warning switch, and the other with brake fluid level gauge (model SSS). They also vary with type of steering, right and left, and with Sedan, Hardtop, Station Wagon and Van.

The disc brake is equipped with a NP-valve on the middle of brake line.

Assembly

Assemble master cylinder in the reverse sequence of disassembly, paying particular attention to the following notes:

Notes:

- Replace gaskets and packings with new ones.
- Apply brake fluid or rubber grease to sliding contact surfaces of parts to facilitate assembly of master cylinder.

Installation

Install master cylinder in the reverse sequence of removal.

Bleed air out of master cylinder after it is installed in its original position.

Tightening torque:

Brake master cylinder
attaching nut:

0.8 to 1.1 kg-m
(5.8 to 8.0 ft-lb)

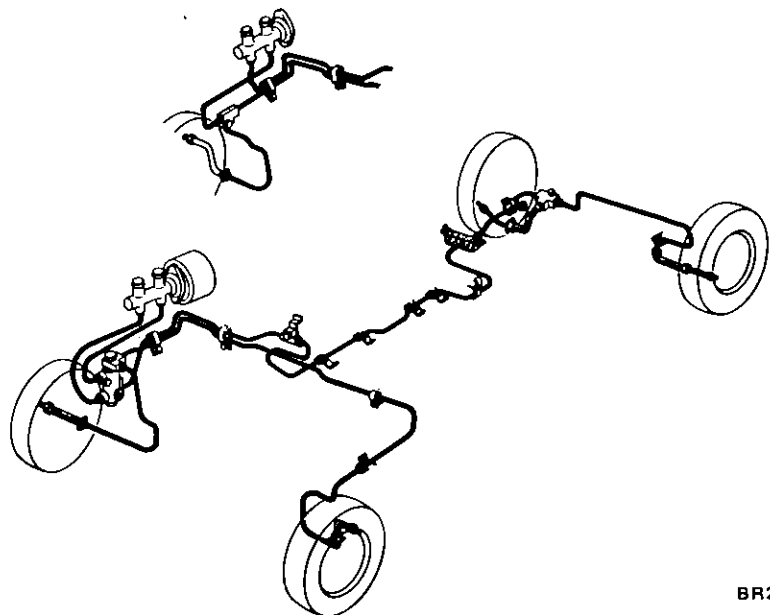


Fig. BR-15 Brake line

BRAKE

Removal

1. Removing flare nuts on both ends and clips effects the removal of brake tube and brake hose.
2. Rear brake hose can be removed by disconnecting the tube and then turning round the hose.

Inspection

Check brake lines (tubes and hoses) for any evidence of crack, deterioration or other damage. Replace parts which are defective.

If leakage occurs at and around joints, retighten or, if necessary, replace defective parts.

Installation

Pay particular attentions to the following instructions when installing brake lines.

1. Leave a sufficient space between brake lines and adjacent parts so that brake lines are completely imparted from vibration during driving.
2. Exercise care not to warp nor twist brake hoses.

Extreme care should be taken of brake hoses so that they are kept away from tires and suspension system components.

3. Using special tool "Brake Pipe Torque Wrench GG94310000," tighten each connector to the specified torque.

Tightening torque:

Brake tube and hose connector:

1.5 to 1.8 kg-m
(11 to 13 ft-lb)

Connector mounting bolt:

6 mm (0.236 in) diameter bolt
0.5 to 0.7 kg-m
(3.6 to 5.1 ft-lb)
8 mm (0.315 in) diameter bolt
0.8 to 1.1 kg-m
(5.8 to 8.0 ft-lb)

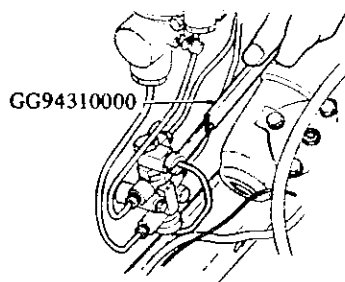


Fig. BR-16 Tightening brake tube

4. Upon completion of installation of brake lines, bleed air out of brake lines.

Front brake hose

Installing the front brake hose requires the following special cares:

Keep the car in straight ahead position, and install in the order of ①, ②, ③ as shown in Figure BR-17. Make sure in this procedure that the installed angle of ② is kept 45° and the arrow-marked portion exceeds 25 mm (0.984 in) in radius with the car placed on plane ground and positioned straight ahead.

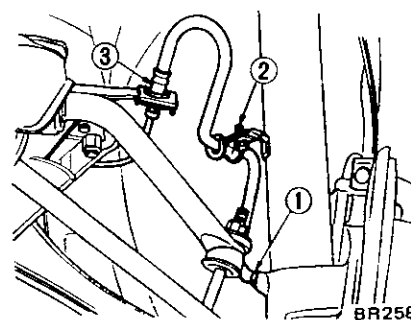


Fig. BR-17 Front brake hose

NP-valve

The NP-valve features a complete separation of rear brake line and front brake line.

This enables the front brake to function normally even when the rear brake line is affected by troubles such as leakage.

Conversely, leakage in front brake line will not affect normal function of rear brake.

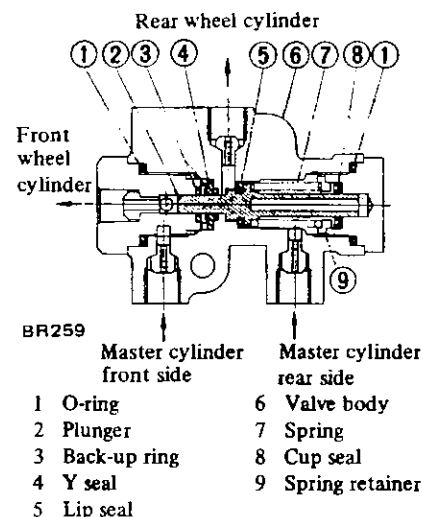


Fig. BR-18 Cross-sectional view of NP-valve

Operating test

Conduct the following periodic test at every 40,000 km (24,000 miles).

At the test, place the car on dry concrete road with no more than a driver laden and apply a sudden brake at 50 km/h (30 miles/h).

1. NP-valve functions normally when rear wheels lock simultaneously with front wheels or when front wheels lock ahead of rear wheels.
2. If the rear, instead of front, wheels has locked in advance, it may be attributable to malfunctioning of NP-valve. Replace NP-valve with a new one as an assembly.

Brake line pressure differential warning light switch (Destined for U.S.A. & Canada)

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 located in the engine compartment. Both front and rear brake systems are connected to this switch assembly.

BRAKE

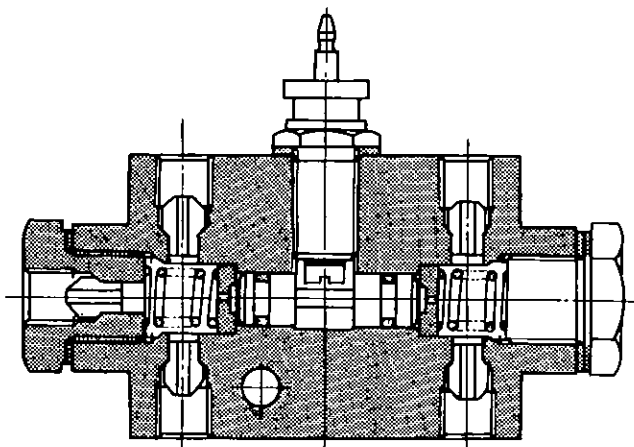
When a pressure difference of 13 to 17 kg/cm² (185 to 242 lb/sq in) occurs between the front and rear brake systems, the valves will shuttle toward the side with the low pressure. The valve contacts with the switch terminal, ground circuit for the warning light is completed, and thus the warning light glows.

In this case, correct the hydraulic

brake problem and bleed the brakes.

Check the warning light switch assembly for a proper operation. Check the switch assembly for fluid leakage.

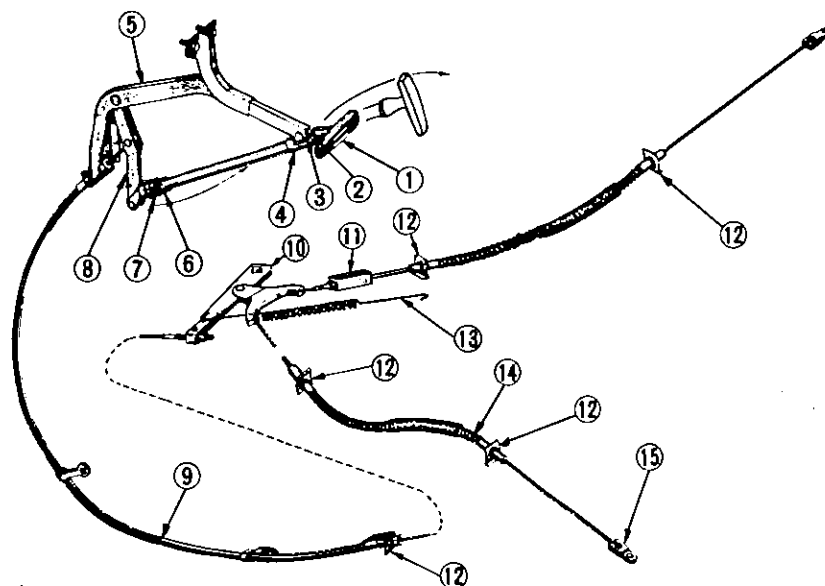
Note: Do not attempt to repair switch for any reason: replace switch assembly as a unit.



BR260

Fig BR-19 Cross-sectional view of warning light switch

HAND BRAKE



BR261

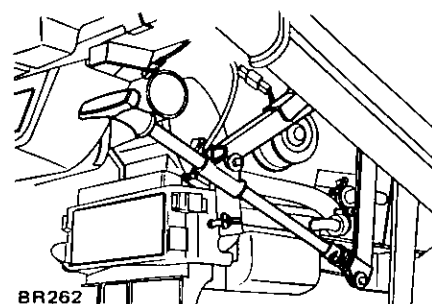
- | | | |
|--------------------------|-----------------|------------------------|
| 1 Control stem | 6 Control yoke | 11 Rear cable adjuster |
| 2 Control ratchet spring | 7 Lever spring | 12 Cable lock plate |
| 3 Control ratchet | 8 Control lever | 13 Return spring |
| 4 Control guide | 9 Front cable | 14 Rear cable |
| 5 Control bracket | 10 Center lever | 15 Clevis |

Fig. BR-20 Hand brake linkage

Removal

Control stem

1. Disconnect terminal from hand brake warning switch.
2. Remove nuts securing control bracket in place on dash panel.
3. Pull out lock pin and cotter pin, and then remove control stem assembly.

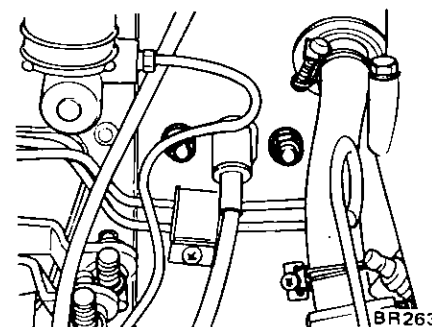


BR262

Fig. BR-21 Control stem

Front cable

1. Remove return spring, and loosen adjuster lock nut. Separate front cable from control stem.
2. Remove nuts securing cable to dash panel, and remove cable from the engine compartment side.

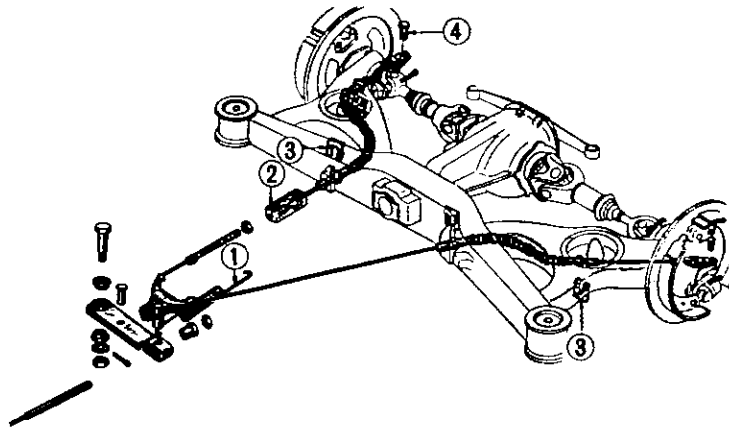


BR263

Fig. BR-22 Front cable attaching nuts

BRAKE

Rear cable (Sedan and Hardtop)



BR264

- 1 Return spring
- 2 Cable adjuster

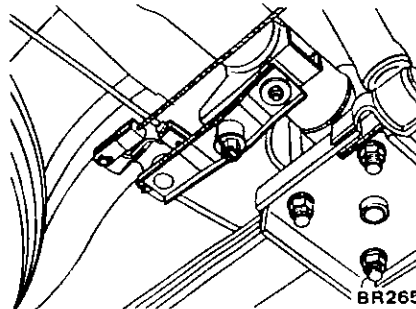
- 3 Lock plate
- 4 Clevis pin

Fig. BR-23 Rear cable

1. Disconnect rear cable at adjuster. Unfasten return spring from center lever.
2. Remove cable lock plates from rear suspension.
3. Remove clevis from wire attaching to rear wheel cylinder.

rod.

2. Remove nut securing cross rod balance lever, and detach balance lever from rear axle housing.



BR265

Fig. BR-24 Balance lever

Rear cable (Station Wagon and Van)

1. Unfasten pull spring. Remove clevis pin on the balance lever side and on the wheel side, and detach cross

Inspection

1. Check control stem and ratchet for evidence of wear or other damages. Replace parts which are defective.
2. Replace worn or fatigued springs.
3. Check wires for evidence of discontinuity or other deterioration. Replace if necessary.
4. Replace defective warning light and/or switch.
5. Check parts at each connection and, if found deformed or damaged, replace.

Installation

Install hand brake assembly in the reverse sequence of removal by closely observing the following instructions.

1. When installing, apply a coating of grease to sliding contact surfaces. Make sure that each sliding part functions smoothly without bind.
2. Upon completion of installation of hand brake assembly, adjust the entire system as per instructions described under topic "ADJUSTMENT."
3. Make sure that each cable is not interfered with by any adjacent parts. Do not apply an undue stress to cables.

FRONT BRAKE

CONTENTS

DRUM BRAKE	BR-10	DISC BRAKE	BR-13
Description	BR-10	Description	BR-13
Removal	BR-11	Replacing pad	BR-13
Disassembly of wheel cylinder	BR-11	Replacing piston seal	BR-14
Inspection	BR-11	Replacing caliper assembly	BR-15
Installation	BR-12	Inspecting rotor	BR-15

DRUM BRAKE

Description

The front drum brakes is of a two leading type. The brake shoes are all common in construction and design to

each other. The wheel cylinders used on each side differ in configuration. The fore-cylinder differs from the

aft-cylinder in that it is equipped with a bleeder.

BRAKE

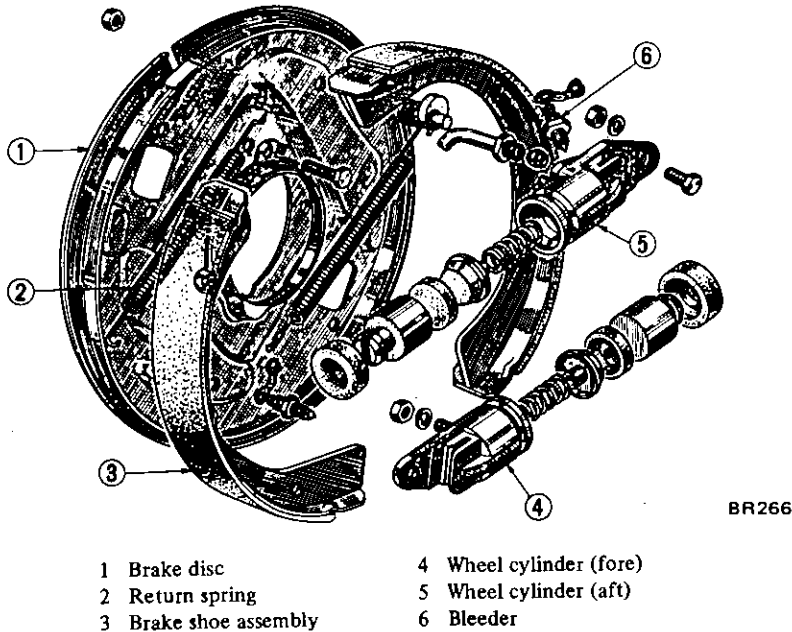


Fig. BR-25 Front drum brake

Removal

1. Jack up front of car just high enough to remove tire, brake drum and hub. If brake drum is hard to remove, screw in bolt (8 mm diameter, 1.25 mm pitch) to drive drum out.

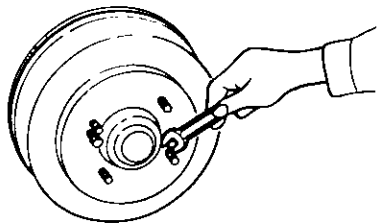


Fig. BR-26 Removing brake drum

2. Remove return springs and brake shoes.
3. Disconnect brake tube and bridge tube.
4. Remove cylinder mounting bolts and detach fore- and aft-wheel cylinders.

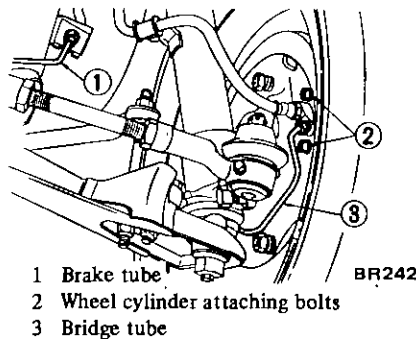


Fig. BR-27 Remove wheel cylinders

5. Remove four bolts securing brake disc in place, and detach brake disc.

Disassembly of wheel cylinder

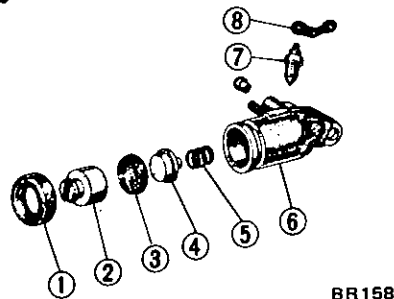


Fig. BR-28 Wheel cylinder

Remove dust cover. Apply air through oil hole, and parts will be disassembled in the order enumerated in Figure BR-28.

Notes:

- a. As the fore-cylinder is equipped with an air bleeder, the bottom configuration of air bleeder mounting screw hole lends difference in shape between fore- and aft-cylinders. Care should be taken not to confuse the one with another.
- b. Exercise care in disassembling these parts not to damage cylinder, piston, and piston cup.
- c. Apply a coating of brake fluid to piston cup at assembly.

Inspection

Brake drum

1. Replace brake drum whose diameter is beyond the limit of 1.4 mm (0.0551 in) with respect to the standard inner diameter of 228.6 mm (9 in).
2. The allowable maximum "out-of-round" of brake drum is 0.02 mm (0.0008 in).

Re-condition or replace brake drum if specified limit is exceeded.

3. Measure for tapered brake drum. If specified limit of 0.02 mm (0.0008 in) is exceeded as measured at a position where the distance of 40 mm (1.575 in) is kept away from inlet, re-condition or replace brake drum.

4. Contact surface with which linings come into contact should be finished to such an extent that it is ground by a No. 120 to 150 sandpaper.

5. Using a drum racer, finish brake drum by machining if it shows any sign of score marks, partial wear or stepped wear on its contact surface.

Note: After brake drum is completely re-conditioned or renewed, check drum and shoes for proper contact pattern.

BRAKE

Brake assembly

1. Replace linings which are cracked, worn or oil-stained.
2. Replace linings if their thick-

nesses are worn down to less than 1.5 mm (0.591 in).

3. Replace shoe return springs which are broken or fatigued.

5. Referring to Figure BR-29 for the location of lubricating points, apply a coating of brake grease to these points. Exercise care not to allow grease coming into contact with linings and adjuster.

Standard dimensions of shoe return springs

Free length mm (in)	Dia. of spring mm (in)	O.D. of coil mm (in)	No. of coils	Installed length/load mm/kg (in/lb)
131.7 (5.185)	3.5 (0.138)	14 (0.551)	21.5	65 to 75/140.2 (2.559 to 2.953/309)

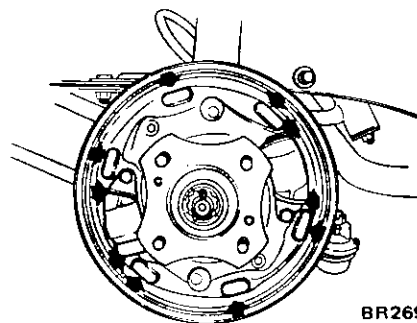


Fig. BR-29 Lubricating points

Wheel cylinder

1. Replace any cylinder or piston which is scratched, scored or worn on its sliding contact surface.
2. Replace worn parts if piston-to-cylinder clearance is beyond 0.15 mm (0.0059 in).
3. Replace piston cup which is worn or otherwise damaged.
4. Replace if contacting face of cylinder and shoe is worn locally or in step.
5. Replace damaged dust cover, fatigued piston spring or defective threaded parts.
6. Replace tube connector which is worn on its threaded portion.

2. After tightening the disc attaching bolts, stake the grease catcher flare to secure bolts from turning.

Tightening torque:

2.7 to 3.7 kg-m
(20 to 28 ft-lb)

3. Make sure not to confuse fore-and aft-cylinders. Avoid reinstalling the air bleeder only after erroneous installation of both cylinders.

4. Install wheel cylinders and tubes in strict record with the specified torque settings.

Tightening torque:

Flare nut

1.5 to 1.8 kg-m
(11 to 13 ft-lb)

Air bleeder

0.7 to 0.9 kg-m
(5.1 to 6.5 ft-lb)

Cylinder attaching nut:

Small

0.5 to 0.7 kg-m
(3.6 to 5.1 ft-lb)

Large

1.5 to 1.8 kg-m
(11 to 13 ft-lb)

6. Use care in installing brake hose not to apply an undue stress to it nor to twist it.

7. Make sure that the entire brake shoe fits in place.

8. After installation is completely done, check and adjust shoe-to-drum clearance. (Refer to the instructions under topic "ADJUSTMENT" in this section.

Installation

Install wheel cylinder in reverse sequence of removal, paying particular attention to the following instructions.

1. When installing disc to spindle, pay due attention not to assemble the disc or the grease catcher upside down.

BRAKE

DISC BRAKE

Description

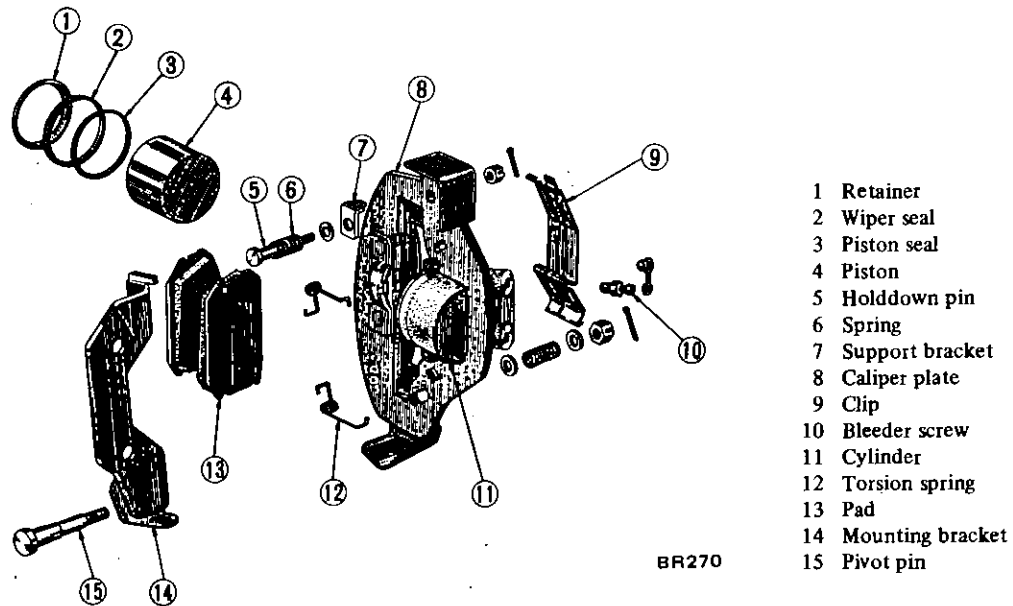


Fig. BR-30 Front disc brake

The disc brake is SC type and comes along with M45 master-Vac and NP-valve equipped.

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, slippage occurs on the piston seal surface, and thus, clearance is adjusted automatically.

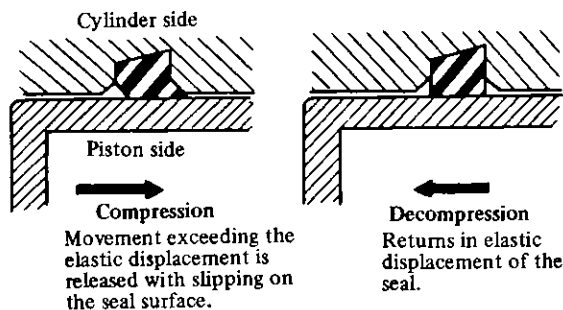


Fig. BR-31 Piston seal automatic adjusting operation

Figure BR-32 shows the relation of force's working. As brake pedal is depressed, hydraulic pressure from the master cylinder forces the piston of wheel cylinder out of the caliper bore and thrusts inner pad forward

until it contacts disc, and simultaneously pushes outer pad by reaction force F2. These forces cause rotating moment, which increases reaction force F2.

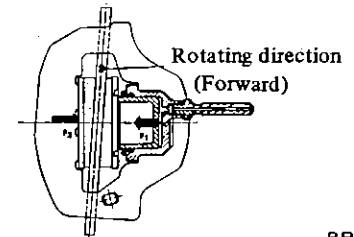


Fig. BR-32 Cross-sectional view of disc brake

Replacing pad

Removal

1. Jack up the front suspension member and remove front wheel.
2. Push upper portion of clip to release clip.

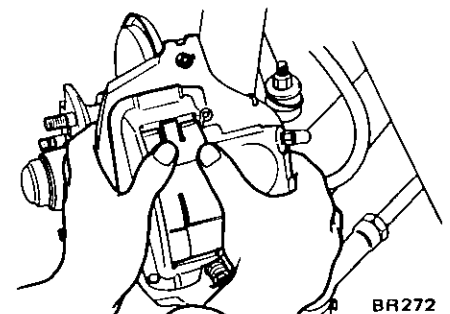


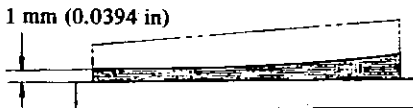
Fig. BR-33 Removing clip

BRAKE

3. Insert screwdriver into the, back of pad installed opposite the piston, and move the caliper plate to outer most place.
4. Remove the pads.

Inspection

1. Clean pad with cleaning solvent.
2. When oil or grease is heavily stuck on pad or when pad is deteriorated or deformed, replace pad with a new one.
3. If pad lining is worn down to the extent that the thinnest part is 1 mm (0.0394 in) in thickness, replace with a new pad lining.



BR273

Fig. BR-34 Pad wear limit

Note: When pad replacement is required, make sure to replace all the four pads as an assembly that is uniform in material.

Installation

1. Clean calipers and piston pad parts.

Note: Do not use mineral oil. Be careful not to apply oil on rotor.

2. Depress piston into cylinder so that new pad can be installed.

Note: Note that brake fluid may overflow from reservoir.
Loosen breather to release brake fluid.

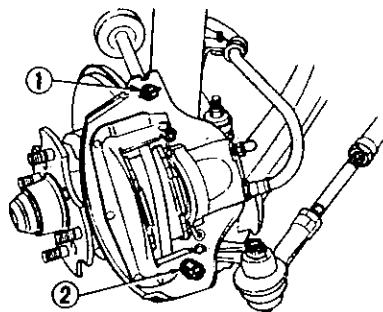
3. Install pad, shim and clip.
4. When pad is installed, depress brake pedal several times so as to settle down pad in its position.

Replacing piston seal

If brake fluid leaks from piston unit or pads does not return properly, replace piston seal with a new one in the manner described below. Keep component parts clean while disassembling.

Removal

1. Remove pads and disconnect brake hose.
2. Pull out cotter pin from hold-down pin and pivot pin and remove nuts.



BR274

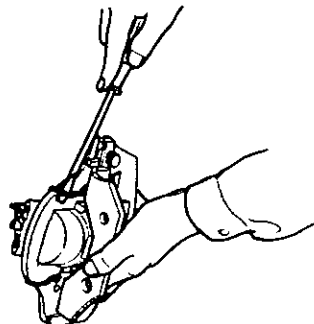
- 1 Hold down pin
- 2 Pivot pin

Fig. BR-35 Removing caliper plate

3. Disengage caliper plate from its mounting bracket.

Disassembly

1. Remove mud and dust from caliper assembly before disassembly.
2. Remove torsion spring, and take out cylinder from caliper plate.



BR275

Fig. BR-36 Removing springs

3. Hold piston with finger, feed air at brake line joint, and remove piston.
4. Remove wiper seal and piston seal retainer.

Inspection

Thoroughly clean all parts, and check them for the following items.

Note: When cleaning rubber parts, use alcohol or brake fluid. Never use mineral oil. Failure to follow this rule may deteriorate rubber parts.

1. Caliper

Replace cylinder that is worn or damaged. If cylinder wall is rusted, carefully polish with fine emery paper. Replace cylinder if roughness or rust is excessive.

2. Pad

Refer to topic "Replacing pad" in this section.

3. Piston

Replace, if unevenly worn, damaged, or rusted.

Note: Piston sliding surface is plated.

Do not polish with emery paper even if rust or foreign matter is stuck on sliding surface.

4. Seals

Replace piston and dust seals whenever they are removed.

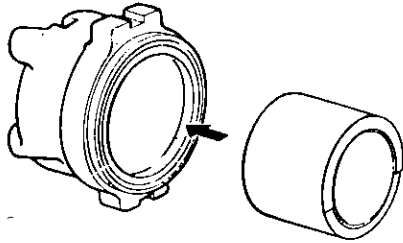
Note: Piston seal affects not only leaking but also piston return. For this reason, replace even when damage is minor.

Assembly

1. Fit seal into groove in cylinder.
2. Evenly apply a thin coating of rubber grease to the inner face of seal and contact surface of piston.

Note: In case when piston is removed from cylinder, apply grease to the surface of piston before installing.

BRAKE



BR276

Fig. BR-37 Piston and cylinder

Installation

1. To install, reverse the sequence of removal.

Notes:

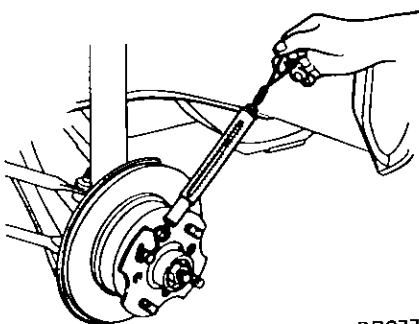
- a. Tighten pivot pin and hold-down pin with cotter pin in place until nut is no longer turned.
- b. After caliper plate is installed to mount bracket, make sure that caliper plate moves smoothly.

2. Bleed air from brake line.
3. After repair or replacement of parts is done, see if there is no leak by depressing brake pedal several times.
4. Using a spring scale, measure rotor turning resistance.

Rotor turning resistance:

New bearing	7 kg-cm (97 in-oz)
Reused bearing	4 kg-cm (56 in-oz)
Use hub bolt	
New bearing	1.2 kg (2.6 lb)
Reused bearing	0.7 kg (1.5 lb)

Note: If specified value is exceeded, reassemble seal.



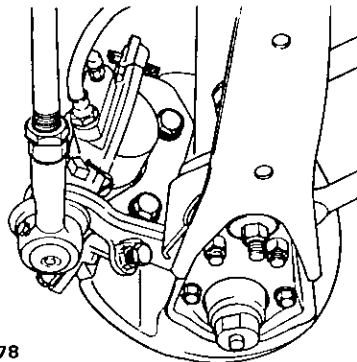
BR277

Fig. BR-38 Measuring rotating resistance

Replacing caliper assembly

Removal

1. Disconnect brake hose from tube.
2. Remove pads. Disengage caliper assembly from knuckle spindle by removing bolts attaching to bracket.



BR278

Fig. BR-39 Detach caliper assembly

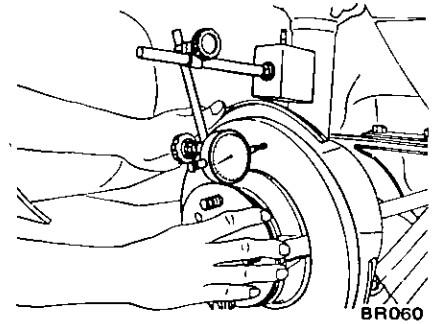
Disassembly

Refer to "Replacing pad" and "Replacing piston seal."

Assembly

To assemble, reverse the sequence of disassembly.

Caliper mounting bolts
tightening torque
7.3 to 9.9 kg-m
(53 to 71 ft-lb)



BR060

Fig. BR-40 Measuring run out

2. Parallelism

Measure thickness toward the entire periphery of rotor, using a micrometer.

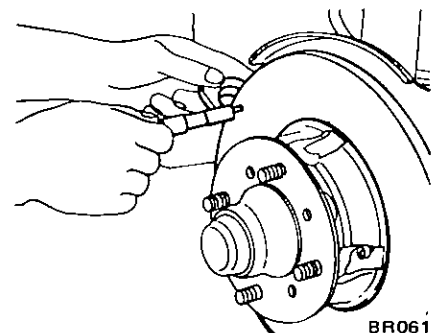
Parallelism (when new)

0.03 mm (0.0012 in), maximum

Service limit:

0.07 mm (0.0028 in)

Note: As this value increases (wear occurs progressively), vibration corresponding to revolution of tire may often be transmitted to interior of car.



BR061

Fig. BR-41 Measuring parallelism

Inspecting rotor

Remove caliper assembly. Check rotor for evidence of runout or other damage and, if necessary, replace.

1. Runout

Adjust wheel bearing correctly. Using a dial gauge, measure runout at the center of rotor pad contact surface.

Runout limit:

0.12 mm (0.0048 in)

Total indicator reading

3. Thickness

If rotor thickness is beyond wear limit, replace rotor. When correcting thickness, be sure that the thickness after correction does not exceed the limit.

Standard thickness:

10.0 mm (0.394 in)

Wear limit:

8.4 mm (0.331 in)

BRAKE

REAR BRAKE

CONTENTS

DESCRIPTION	BR-16	Brake assembly	BR-17
REMOVAL	BR-16	Wheel cylinder	BR-18
Disassembly of wheel cylinder	BR-17	ASSEMBLY AND INSTALLATION	BR-18
INSPECTION	BR-17	Wheel cylinder	BR-18
Brake drum	BR-17	Brake drum	BR-18

DESCRIPTION

The rear brake is of a leading-trailing type. Brake shoe clearance

can be adjusted by turning the end of the adjuster wedge.

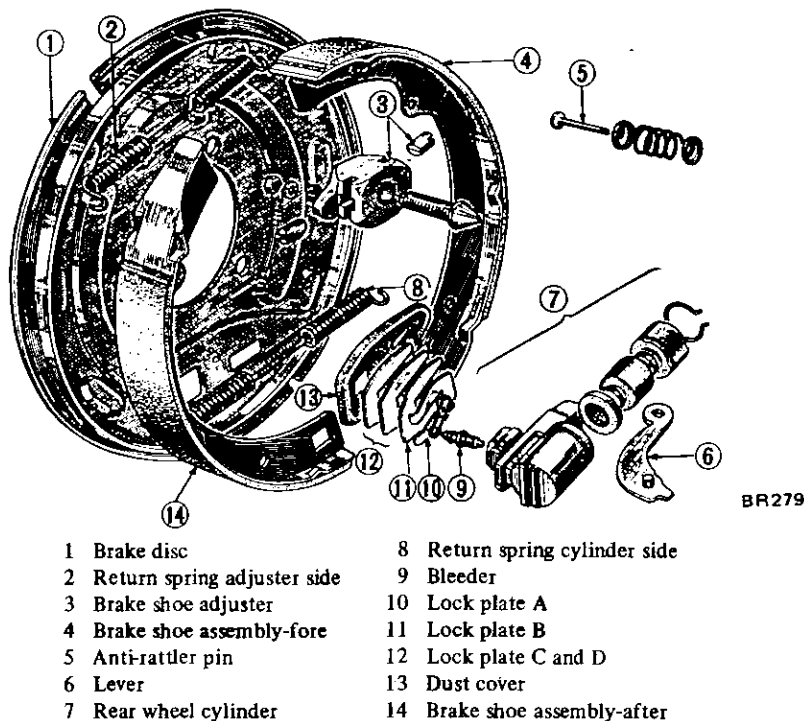


Fig. BR-42 Rear brake

REMOVAL

1. Jack up the rear of car, and remove tire and brake drum. If brake drum is hard to remove, use bolts (8 mm diameter, 1.25 mm pitch) to drive it out.
2. Turn pin 90°, and remove anti-rattler spring.
3. Remove return springs and brake shoes.

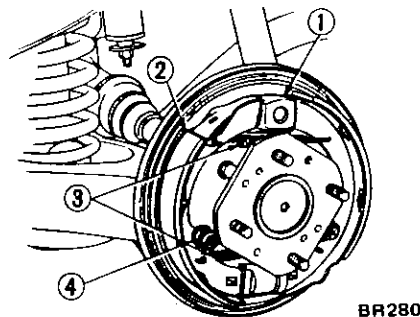


Fig. BR-43 Remove shoe assembly

4. Remove bolts securing adjuster, and detach adjuster.
5. Disconnect brake tube.
6. Pull out clevis pin to separate hand brake cable and lever.
7. Remove dust cover, adjusting shims and lock plates, wheel cylinder can then be removed easily.
8. Remove and reinstall the brake disc as outlined under "REAR AXLE."

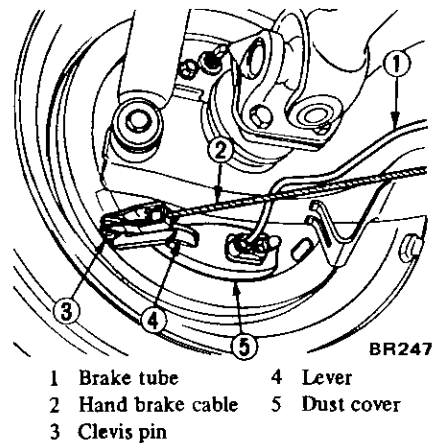
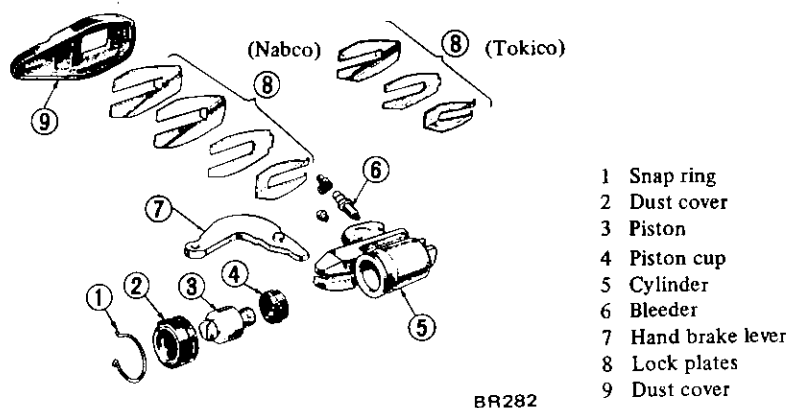


Fig. BR-44 Remove wheel cylinder

BRAKE

Disassembly of wheel cylinder



BR282

Fig. BR-45 Wheel cylinder

1. The wheel cylinder can be disassembled in its mounted condition. Do not remove it unless replacement of the entire master assembly is necessary.

2. To disassemble, remove snap ring, dust cover, piston, and piston cup, in the order enumerated.

Note: Exercise care not to give scratches to sliding contact surfaces of cylinder and piston, and piston cup.

INSPECTION

Brake drum

1. Replace brake drum whose diameter is beyond the limit of 1.4 mm (0.055 in) with respect to the standard inner diameter of 228.6 mm (9 in).

2. The allowable maximum "out-of-round" of brake drum is 0.02 mm (0.0008 in). Re-condition or replace brake drum if specified limit is exceeded.

3. Measure for tapered brake drum.

If specified limit of 0.02 mm (0.0008 in) is exceeded as measured at a position where the distance of 40 mm (1.575 in) is kept away from inlet, re-condition or replace brake drum.

4. Contact surface with which linings come into contact should be finished to such an extent that it is ground by a No. 120 to 150 sandpaper.

5. Using a drum racer, finish brake drum by machining if it shows any sign of score marks, partial or stepped wear on its contact surface.

Note: After brake drum is completely re-conditioned or replaced, check drum and shoes for proper contact pattern.

Brake assembly

1. Replace linings which are cracked, worn or oil-stained.

2. Replace linings if their thicknesses are worn down to less than 1.5 mm (0.0591 in).

3. Replace shoe return springs which are broken or fatigued.

4. Replace fatigued antirattle springs, damaged pins and/or retainers.

Standard dimensions of shoe springs

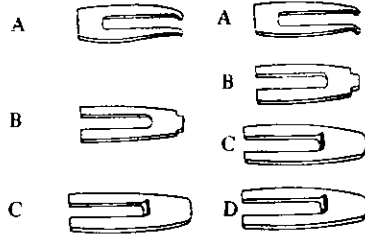
Item	Free length mm (in)	Dia. of spring mm (in)	O.D. of coil mm (in)	No. of coils	Installed length/load mm/kg (in/lb)
Cylinder side	120.7 (4.752)	2 (0.0787)	12 (0.472)	36	131.5/7 to 8 (5.177/15.4 to 17.6)
Adjuster side	120.4 (4.740)	2 (0.0787)	10 (0.394)	32.5	122.4/13.5 to 16.5 (4.819/ 29.7 to 36.4)
Anti-rattle	20.5 (0.807)	2 (0.0787)	18 (0.709)	5	14.9/7 to 8 (0.587/15.4 to 17.6)

BRAKE

Wheel cylinder

1. Replace any cylinder or piston which is scratched, scored or worn on its sliding contact surface.
2. Replace worn parts if piston-to-cylinder clearance is beyond 0.15 mm (0.0059 in).
3. Replace piston cup which is worn or damaged.
4. Replace if contacting face of cylinder and shoe is worn locally or in step.
5. Replace damaged dust cover, fatigued piston spring or defective threaded parts.
6. Replace tube connector which is worn on its threaded portion.

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BR283

Fig. BR-46 Lock plate

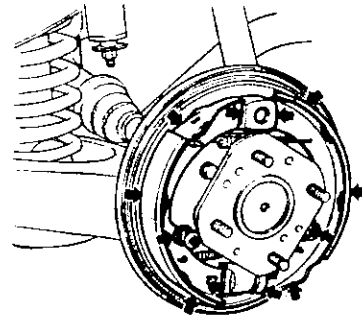


Fig. BR-47 Points requiring grease

ASSEMBLY AND INSTALLATION

Wheel cylinder

1. To assemble, reverse the sequence of disassembly.
2. Apply rubber grease to rubber parts to facilitate the assembly operation.
3. To install wheel cylinder, insert hand brake lever into disc, and fit wheel cylinder into position. Then drive in the parts A, B, C and D, in the order shown, using a hammer.

Brake drum

1. To install, reverse the sequence of removal. Note the following instructions.
2. Apply a coating of brake grease to the parts indicated in Figure BR-47, wheel cylinder-to-disc sliding surfaces, cylinder lever pivot, adjuster wedge surface and periphery of tappet.

Note: Apply a thin coating of grease to shoe-to-disc sliding surfaces (6 places), exercising care not to wet lining with grease.

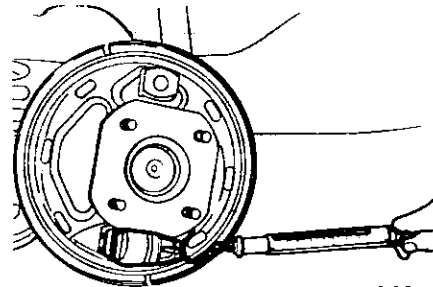
3. Measuring wheel cylinder sliding resistance using a spring scale.

Standard sliding resistance:

2 to 7 kg
(4.4 to 15.4 lb)

Adjuster mounting nut
tightening torque

1.4 to 1.8 kg-m
(10 to 13 ft-lb)



BR284

Fig. BR-48 Measuring wheel cylinder sliding resistance

MASTER-VAC

CONTENTS

DESCRIPTION	BR-18	Front shell-seal assembly	BR-22
Inspecting vacuum pressure	BR-19	INSPECTION	BR-22
Inspecting check valve	BR-20	ASSEMBLY AND ADJUSTMENT	BR-22
Operation test	BR-20	Rear shell-seal assembly	BR-22
REMOVAL	BR-20	Diaphragm plate assembly	BR-22
DISASSEMBLY	BR-21	Front shell-seal assembly	BR-22
Rear shell-seal assembly	BR-21	Final assembly	BR-22
Diaphragm plate assembly	BR-21	INSTALLATION	BR-23

DESCRIPTION

A vacuum suspended Master-Vac is installed behind the master cylinder. As the brake pedal is depressed, fluid is forced under high pressure through the brake pipes to the wheel cyl-

inders to retard or stop the car.

The Master-Vac contains a spring loaded diaphragm of 114 mm (4½ in) in diameter. It operates on negative pressure produced in the engine intake

manifold.

The tandem master cylinder is capable of producing high pressure even if the Master-Vac is defective.

BRAKE

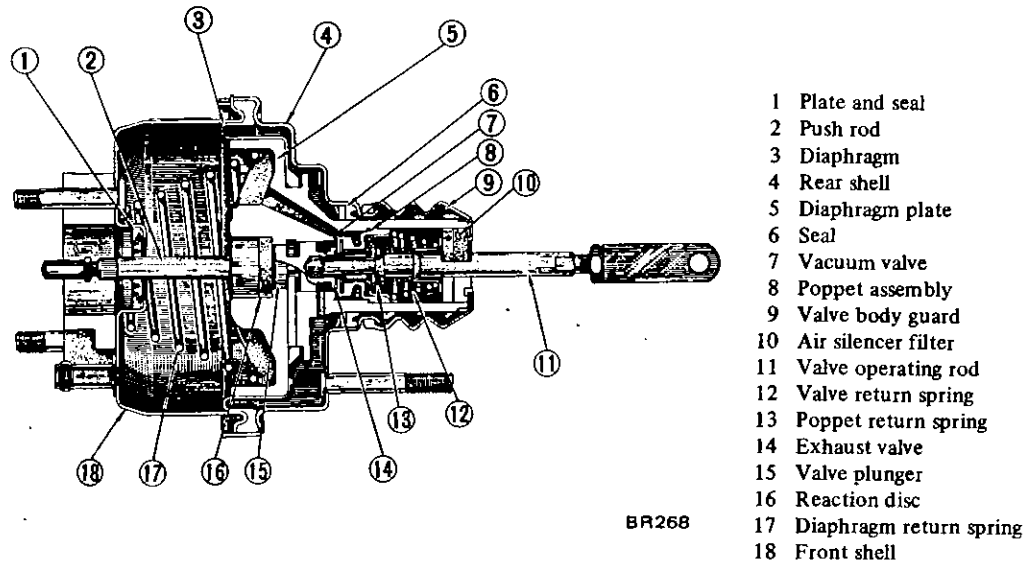


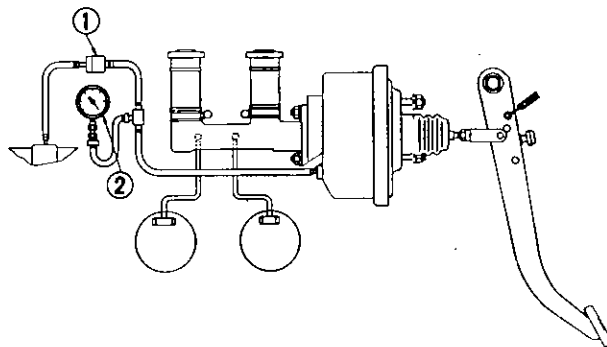
Fig. BR-49 Sectional view of Master-Vac

Inspecting vacuum pressure

1. Connect a vacuum gauge, in the line, between check valve and

Master-Vac, as shown in Figure BR-50.

2. Start engine and increase engine speed. Stop engine when vacuum gauge indicates 500 mmHg (19.7 inHg).



BR169

- 1 Check valve
2 Vacuum gauge

Fig. BR-50 Air-tight test set-up

Air-tight test

1. Fifteen seconds after engine is stopped, observe the rate of drop in air pressure registered by vacuum gauge. If a pressure drop of 25 mmHg (0.984 inHg) is exceeded, refer to the following chart to determine the cause of failure.

Probable cause	Corrective action
1. Air leakage at check valve.	Replace check valve.
2. Air leakage at push rod seal.	Replace seal.
3. Air leakage between valve body and seal.	Repair or replace faulty part(s).
4. Air leakage at valve plunger seat.	Repair or replace seat.
5. Damaged piping or joints.	Repair or replace.

BRAKE

2. Fifteen seconds after engine is stopped and brake fully applied, observe the rate of drop in air pressure registered by vacuum gauge.

If a pressure drop of 25 mmHg (0.984 inHg) is exceeded, refer to the following chart to determine the cause of failure.

Note: Determine as to whether a trouble occurs either in Master-Vac or check valve. Always inspect check valve first.

Probable cause	Corrective action
1. Air leakage at check valve.	Replace check valve.
2. Damaged diaphragm.	Replace.
3. Reaction disc dropped off.	Reinstall and check push rod for proper turn.
4. Air leakage at poppet assembly seat and valve body.	Replace defective part(s).

Note: When replacement of any part is required, be sure to renew Master-Vac as an assembly.

Inspecting check valve

1. Remove clip and disconnect hoses at connections. The check valve can now be removed.

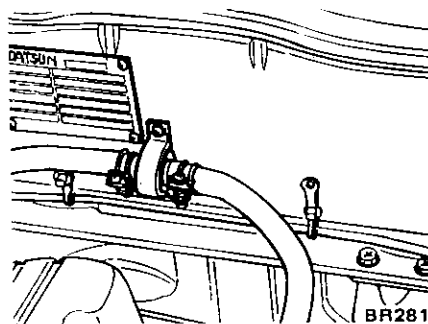


Fig. BR-51 Location of check valve

2. Using a Master-Vac tester, apply a vacuum pressure of 500 mmHg (19.7 inHg) to the port of check valve on the Master-Vac side. If a pressure drop of 10 mmHg (0.394 inHg) is exceeded in 15 seconds, replace check valve with a new one.

3. When pressure is applied to the Master-Vac side of check valve and valve does not open, replace check valve with a new one.

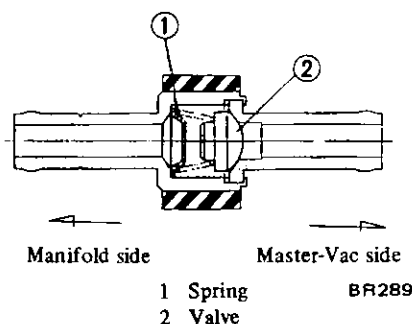


Fig. BR-52 Cross-sectional view of check valve

Operation test

1. Connect an oil pressure gauge, in brake line, at connection on master cylinder.
2. Install a spring scale on brake pedal.
3. Start engine, and increase engine speed until a vacuum pressure of 500 mmHg (19.7 inHg) is registered on vacuum pressure gauge. With a vacuum pressure of 500 mmHg (19.7 inHg) held, measure an oil pressure with respect to each pedal operating force.

Relationship between oil pressure and pedal operating force is illustrated in Figure BR-53. If test results are not as specified in Figure BR-53, check Master-Vac for condition in a manner as described under "Inspection," before removal of this unit.

Also check brake line for evidence of fluid leakage.

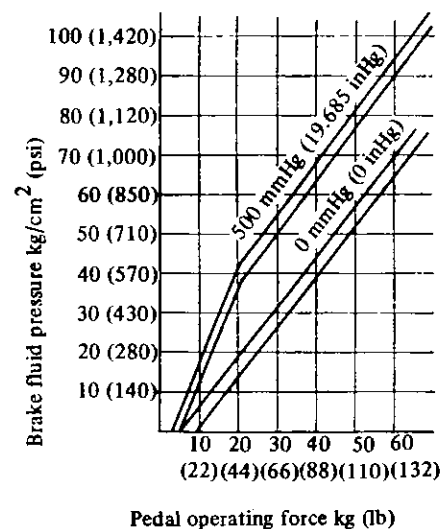
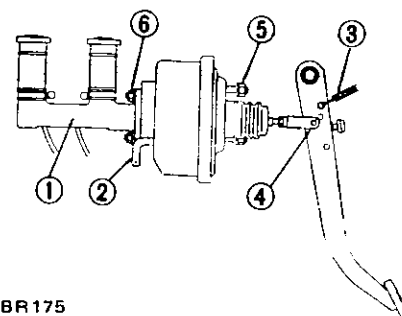


Fig. BR-53 Performance curves of Master-Vac

REMOVAL

Referring to Figure BR-54, remove parts in numerical order enumerated.

Install these parts in the reverse sequence of removal.



BR175

Fig. BR-54 Removal method of Master-Vac

Note: After Master-Vac is properly installed on vehicle, be sure to conduct an air-tight test and operation test described previously in this Section.

DISASSEMBLY

When disassembling Master-Vac, observe the following instructions.

- Thoroughly clean mud or dust from Master-Vac.
- Extreme care should be taken not to allow dirt, dust, water or any other foreign matter getting into any component-parts.
Be sure to select a clean place before disassembly or assembly.
- Mark mating joints so that they may be installed exactly in their original positions.
- Keep all disassembled parts arranged properly so that they may readily be assembled at any time.
- Clean rubber parts and synthetic-resin parts in alcohol.
- After all disassembled parts are cleaned in an approved solvent, place on a clean work bench. Use care not to allow dirt and dust coming into contact these parts.

- Install spacer on rear shell spacer temporarily. Place Master-Vac in a vise. Use of soft jaws is suggested.
- Remove clevis and lock nut. Detach valve body guard.

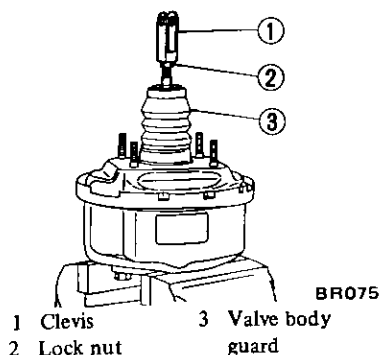


Fig. BR-55 Remove rear shell

- Identify front shell and rear shell clearly so that they may be reassembled in their original positions from which they were withdrawn. (Bolts to be attached on dashboard are not the same in pitch.)
- Using special tool "Master-Vac Wrench ST08080000," remove rear shell-seal assembly, and disassemble diaphragm plate assembly, front shell assembly, diaphragm spring and push rod assembly.

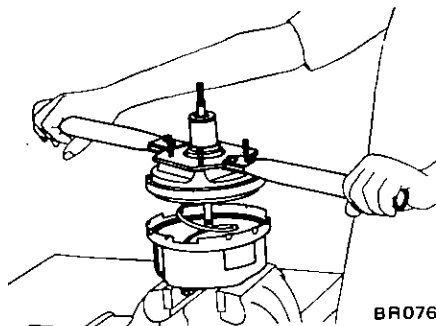


Fig. BR-56 Removing rear shell

Rear shell-seal assembly

Pry off retainer with use of a screwdriver as shown and detach bearing and seal.

Note: Do not disassemble seal assembly unless absolutely necessary. Whenever this is to be removed, use care not to damage it.

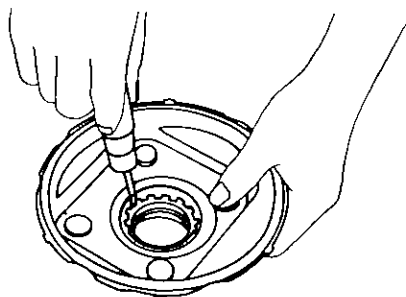


Fig. BR-57 Removing retainer

Diaphragm plate assembly

- Place diaphragm plate assembly on a clean work bench. Detach diaphragm from groove in plate as shown.

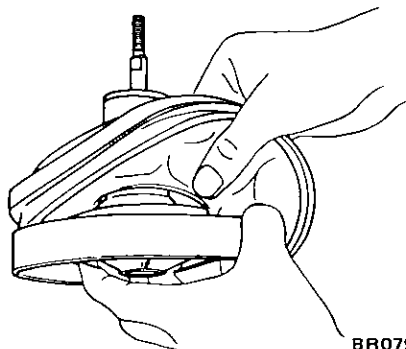


Fig. BR-58 Separating diaphragm

- Using a screwdriver as shown, evenly pry air silencer retainer until it is detached from diaphragm plate assembly.

Note: Never use a hammer to remove this retainer, since this will be the sure way of damaging it.

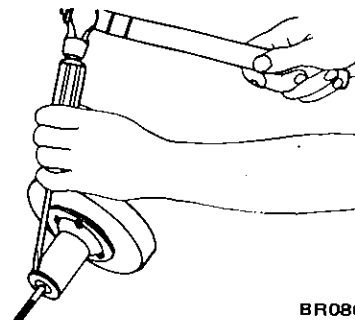


Fig. BR-59 Removing air silencer retainer

- Pull out valve plunger stop key and withdraw silencer and plunger assembly.

Note: To remove valve plunger stop key properly, proceed as follows: With key hole facing down, lightly push valve operating rod simultaneously while applying vibration to it.

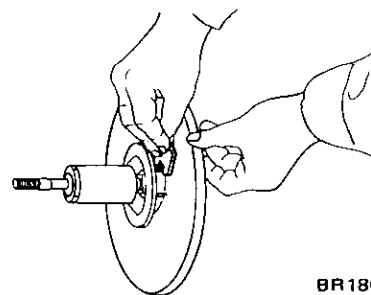


Fig. BR-60 Pulling out stop key

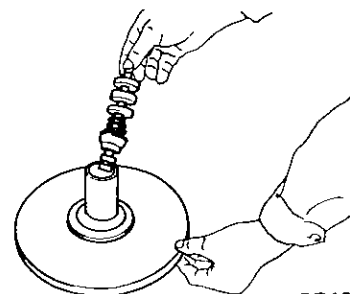
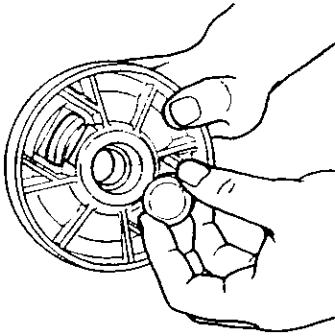


Fig. BR-61 Removing valve operating rod assembly

BRAKE

4. Withdraw reaction disc.

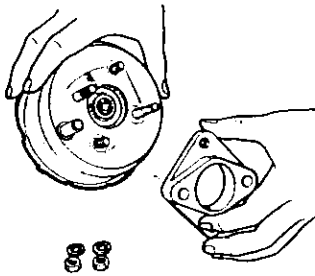


BR286

Fig. BR-62 Removing reaction disc

Front shell-seal assembly

1. Detach flange from front shell assembly.



BR287

Fig. BR-63 Removing flange

2. Withdraw front seal assembly.

INSPECTION

1. Check poppet assembly for condition. If it shows evidence of wear or damage, replace it and valve operating rod assembly.
2. Check other component-parts for condition. If any part shows evidence of wear or damage, replace it with a new one.

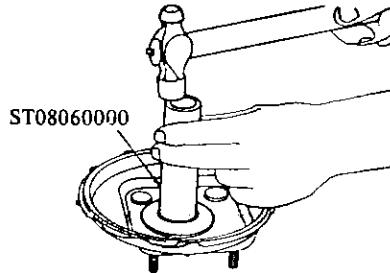
ASSEMBLY AND ADJUSTMENT

Assemble in the reverse sequence of disassembly.

Rear shell-seal assembly

1. Apply a coating of Master-Vac grease to the sealing surface and lip

of seal, and install that seal in rear shell with the use of special tool "Master-Vac Oil Seal Retainer Drift ST08060000."



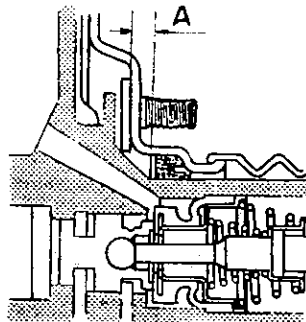
BR084

Fig. BR-64 Installing oil seal

Note: Referring to Figure BR-65, install seal in place by properly aligning the pawl of special tool with seal hole. Adjustment is correct when specified length at "A" is obtained.

Length "A"

6.7 to 7.0 mm
(0.264 to 0.276 in)

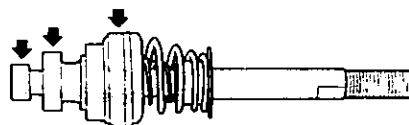


BR185

Fig. BR-65 Length at "A"

Diaphragm plate assembly

1. Apply a thin coating of grease to the sliding contact portion on the periphery of plunger assembly.

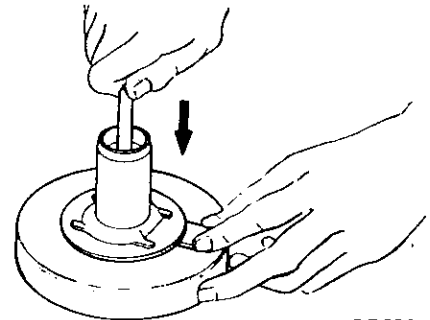


BR186

Fig. BR-66 Requiring grease place

2. Install plunger assembly and silencer in diaphragm plate, and lightly push plunger stop key in place.

Note: Diaphragm plate is made of bakelite. Exercise care in installing plunger assembly not to damage diaphragm plate.



BR083

Fig. BR-67 Inserting stop key

3. Before installing diaphragm into position, apply a thin coating of mica-power to it except outer diameter and seating portion with which shell comes into contact.
4. Before installing reaction disc in place on diaphragm plate, apply a thin coating of Master-Vac grease.

Front shell-seal assembly

Before installing front shell-seal assembly, apply a coating of Master-Vac grease to the inner wall of seal and front shell with which seal comes into contact.

Final assembly

1. Apply a thin coating of Master-Vac grease to the outer edges of diaphragm with which rear and front shells come into contact, before installing diaphragm in position.
2. Before installing push rod assembly in place, apply a coating of Master-Vac grease to the sliding contact surface of diaphragm plate.
3. Align marks scribed in the rear shell and front shell. Carefully turn the special tool "Master-Vac Wrench ST08080000" clockwise until it reaches notch in shell retainer.

BRAKE

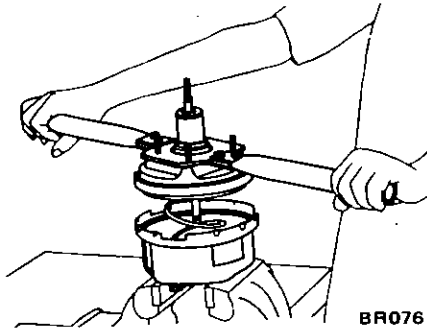


Fig. BR-68 Tightening rear shell

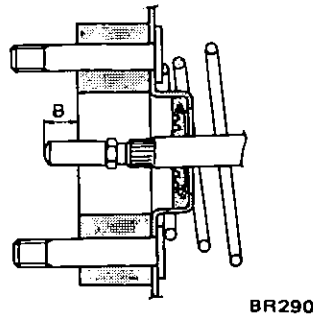


Fig. BR-69 Length at "B"

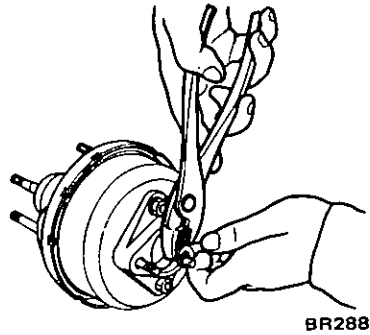


Fig. BR-70 Adjusting push rod length

INSTALLATION

Install in the reverse sequence of removal.

Note: After Master-Vac is properly installed in car, conduct an air-tight and operational tests as previously described.

- After assembly, adjust the length of push rod to less than the specified value indicated below. Length adjustment of push rod is made at the tip of push rod.

Length "B"

9.75 to 10.00 mm

(0.3839 to 0.3937 in)

SERVICE DATA AND SPECIFICATIONS

Brake type:

Front	Model SC disc brake
Rear	Two leading drum brake
Hand brake	Leading-trailing drum brake
	Mechanically-operated on rear wheels

Brake pedal:

Free height	mm (in)	185 (7.28)
Full stroke of pedal head	mm (in)	145 (5.71)

Master cylinder:

Inner diameter	mm (in)	19.05 (¾)
Allowable maximum clearance between cylinder and piston	mm (in)	0.15 (0.0059) max.

Wheel cylinder:

Inner diameter		
Front (disc)	mm (in)	50.8 (2)
Front (drum)	mm (in)	20.6 (1⅜)
Rear	mm (in)	22.2 (⅞)

BRAKE

Allowable maximum clearance between

cylinder and piston	mm (in)	0.15 (0.0059) max.
Rear wheel cylinder sliding resistance	kg (lb)	2 to 7 (4.4 to 15.4)

Brake rotor and drum:

Rotor (disc) outer diameter	mm (in)	232 (9 1/8)
Drum brake inner diameter (front and rear)	mm (in)	228.6 (9)
Rotor (disc) runout	mm (in)	0.12 (0.0048) max.
Drum inside out-of-round	mm (in)	0.02 (0.0008) max.
Repair limit of rotor in thickness	mm (in)	8.4 (0.331)
Repair limit of drum in diameter (front and rear)	mm (in)	230 (9.055)

Lining:

Pad (disc)	Width x thickness x length	mm (in)	39.7 x 9 x 86 (1.563 x 0.354 x 3.386)
Lining (front and rear)		mm (in)	40 x 4.5 x 219.5 (1.575 x 0.177 x 8.642)

Hand brake normal stroke:	mm (in)	90 to 100 (3.543 to 3.937)
---------------------------	---------------	----------------------------

Tightening torque:

Brake master cylinder attaching nut	kg-m (ft-lb)	0.8 to 1.1 (5.8 to 8.0)
Brake tube connection	kg-m (ft-lb)	1.5 to 1.8 (11 to 13)
Brake hose connection	kg-m (ft-lb)	1.7 to 2.0 (12 to 14)
Air bleeder valve	kg-m (ft-lb)	0.7 to 0.9 (5.1 to 6.5)
Fulcrum pin of brake pedal	kg-m (ft-lb)	3.6 to 4.2 (26 to 30)
Pedal stopper lock nut	kg-m (ft-lb)	0.8 to 1.1 (5.8 to 8.0)
Connector mounting bolt		
6 mm (0.2362 in) diameter bolt	kg-m (ft-lb)	0.5 to 0.7 (3.6 to 5.1)
8 mm (0.3150 in) diameter bolt	kg-m (ft-lb)	0.8 to 1.1 (5.8 to 8.0)
Wheel cylinder mounting bolts		
	kg-m (ft-lb)	0.5 to 0.7 (3.6 to 5.1)
	kg-m (ft-lb)	1.5 to 1.8 (11 to 13)
Caliper fixing bolt	kg-m (ft-lb)	7.3 to 9.9 (53 to 71)
Rotor fixing bolt	kg-m (ft-lb)	3.9 to 5.3 (28 to 38)

BRAKE

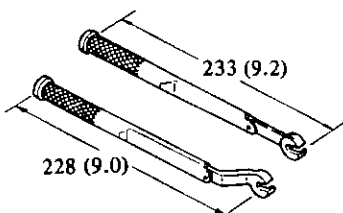
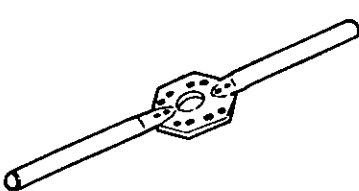
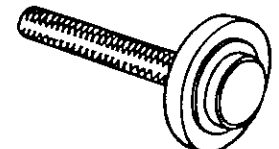
TROUBLE DIAGNOSES AND CORRECTIONS

Condition	Probable cause	Corrective action
Spongy pedal.	Air in brake lines. Swollen hose due to deterioration or use of poor quality hose. Use of a brake fluid of which boiling point is too low. Reservoir filler cap vent hole clogged. (This promotes a vacuum in master cylinder that sucks in air through rear seal.)	Bleed thoroughly. Replace hose and bleed system. Change with specified brake fluid and bleed system. Clean and bleed system.
Pedal yields under slight pressure.	Deteriorated check valve. External leaks. Leakage on master cylinder.	Replace check valve and bleed system. Check master cylinder, piping and wheel cylinder for leaks and repair. Overhaul master cylinder.
Excessive pedal travel.	Air in system. Shoes out of adjustment. Insufficient fluid in master cylinder. Thermal expansion of drums because of excessive overheating.	Bleed system. Adjust shoe-to-drum clearance. Fill up with specified brake fluid and bleed system. Allow drums to cool off. Check brake shoe linings and drums. Replace damaged parts.
All brakes drag.	Insufficient shoe-to-drum clearance. Weak shoe return springs. Brake shoe return no free travel. Seized master cylinder piston.	Adjust clearance. Replace. Adjust pedal height. Disassemble master cylinder and replace piston. Bleed system.
One brake drags.	Loose or damaged wheel bearings. Weak, broken or unhooked brake shoe return springs. Insufficient clearance between brake shoe and drum.	Adjust or replace as required. Replace. Adjust brakes.
Unbalanced brakes.	Grease or oil on linings. Seized piston in wheel cylinder. Improper tire inflation. Loose wheel bearings. Faulty front suspension.	Clean brake mechanism; check cause of trouble. Replace linings. Service wheel cylinder and bleed system. Inflate to correct pressure. Adjust. Check and adjust all front suspension parts.

BRAKE

Condition	Probable cause	Corrective action
Excessive pedal pressure required, poor brakes.	Grease, mud or water on brake shoe linings. Full area of linings not contacting drums. Scored brake drums.	Remove drums and clean and dry linings or replace. Replace shoes. Reface drums and install new linings.
Brake chatter, squeak or squeal.	Dust on drums or oil-stained linings. Weak shoe return springs. Drum out-of-round. Worn linings.	Remove and clean drums. Check and, if necessary, replace springs. Turn drums on lathe. Replace.

SPECIAL SERVICE TOOLS

No.	Tool number & tool name	Description Unit: mm (in)	For use on	Reference page or figure No.
1.	GG94310000 Brake pipe torque wrench	 SE227	This tool is used to tighten and untighten brake tube flared nut. A built-in torque limiting wrench is provided to assure torque accuracy.	All models Figure 16
2.	ST08080000 Master-Vac wrench	 SE073	This tool is used to remove rear shell after aligning rear shell stud bolt with the opening in this tool.	610 W610 V610 510 230 S30 C30 C10 GC10 Figure 56
3.	ST08060000 Master-Vac oil seal retainer drift	 SE115	This tool is used when rear shell seal is driven into position. Note: Make sure that this tool is pushed in until rear guide of this tool touches rear shell.	610 W610 V610 510 230 S30 C30 C10 GC10 Figure 64

SERVICE MANUAL

DATSUN 1800
MODEL 610 SERIES
CHASSIS & BODY



NISSAN MOTOR CO., LTD.
TOKYO, JAPAN

SECTION WT

WHEEL AND TIRE

WT

WHEEL AND TIRE	WT- 2
TROUBLE DIAGNOSES AND CORRECTIONS	WT- 5

WHEEL AND TIRE

WHEEL AND TIRE

CONTENTS

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Wheels	WT-2	Wheel repair	WT-3
Tires	WT-2	Wear	WT-3
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Wheels	WT-2	Tire rotation	WT-4
Tires	WT-2	INSPECTION	WT-4
MAINTENANCE AND SERVICE	WT-3	Wheel balance	WT-4
Tire inflation	WT-3	Wheel and tire	WT-5

DESCRIPTION

Wheels

This model uses 13-in dia. wheels with four bolts securing on 114.3 mm (4.50 in) bolt circle.

Two kinds of the wheel in size are available: 4J-13 with a 40 mm (1.575 in) offset and 4- ½ J-13 with a 30 mm (1.181 in) offset. The rim for the 4- ½ J-13 differs in width from that for the 4J-13. These wheels are mutually interchangeable. However, the 4- ½ J-13 wheels should be installed on the vehicles equipped with disc brakes only.

Tires

The 5.60-13 tires used on this model are the same as those (5.60-13) currently used on the model 510 series. The 6.45-13 and 6.45S-13 tires are newly set up for passenger cars of this model.

The outstanding features of these tires are as follows:

1. The 6.45-13 and 6.45S-13 tires are approximately 20 mm (0.787 in) larger in width than the 5.60-13.
2. The assured maximum speed of the 6.45S-13 tire is 175 km/h (109 MPH), and that of 5.60-13 tire is 150 km/h (94 MPH). Furthermore, for high speed running, the radial tire is newly set up for this model vehicles except for Van.

As for the detailed combination of tires and vehicle models, refer to the "Tire and wheel usage" chart.

SPECIFICATIONS

Wheels

Wheel size	Remarks
4J-13	For the vehicle equipped with drum brakes or disc brakes
4- ½ J-13	For the vehicles equipped with disc brakes

Tires

Tire and wheel usage chart

For common country

Model		Tire size	Wheel size	Remarks
Datsun 160B	Sedan	5.60-13-4PR	4J-13	Std.
		6.45-13-4PR	4- ½ J-13	Opt.
		6.45S-13-4PR		
		165SR13		
	Wagon	6.45-13-4PR	4- ½ J-13	Std.
		6.45S-13-4PR		Opt.
		165SR13		
	Van	5.50-13-6PRLT	4J-13	Std.
Datsun 180B	Sedan Hardtop Wagon	6.45-13-4PR	4- ½ J-13	Std.
		6.45S-13-4PR		Opt.
		165SR13		

For U.S.A. & Canada

Model		Tire size	Wheel size	Remarks
Datsun 1800	Sedan Hardtop Wagon	6.45-13-4PR	4- ½ J-13	Std.
		165SR13		Opt.

WHEEL AND TIRE

VEHICLE CAPACITY WEIGHT	750	SEATING CAPACITY	FRONT 2 PASSENGERS REAR 2 PASSENGERS
RECOMMENDED COLD TIRE INFLATION PRESSURE			
TIRE SIZE	FOR MAXIMUM LOAD (750 ^{lbs}) 4 PASSENGERS + 150 ^{lbs} LUGGAGE OR 2 PASSENGERS + 450 ^{lbs} LUGGAGE	FOR REDUCED LOAD (600 ^{lbs}) 1 TO 4 PASSENGERS OR 1 TO 2 PASS + 300 ^{lbs} LUGGAGE	
185 - 13 6.45 - 13	FRONT	REAR	FRONT REAR
FOR NORMAL SPEED UNDER 70 MPH	28 PSI	32 PSI	24 PSI 28 PSI
FOR HIGH SPEED OVER 70 MPH	28 PSI	32 PSI	28 PSI 32 PSI
165 SR13	28 PSI	28 PSI	28 PSI 28 PSI

MAINTENANCE AND SERVICE

Tire inflation

Correct tire pressure is very important to ease of steering and riding comfort. This also reduces driving sound to a minimum, resulting in longer tire life; that is, overinflation or underinflation promotes wear at center tread or shoulder of tire.

If all tires are inspected frequently and maintained correct tire pressure, it is possible to detect sharp material in the tread. Also, the above check avoids abnormal wear which invites serious trouble. If tires indicate abnormal or uneven wear, the cause of trouble should be detected and eliminated.

After inflating tires, leakage in valve should be checked. Without valve caps, leakage will occur due to dirt and water, resulting in underinflation. Accordingly, whenever tire pressure is checked, be sure to secure valve caps and tighten firmly by hand.

Tubeless tire repair

In order to inspect a leak, apply soapy solution to tire or submerge tire and wheel in the water after inflating

tire to specified pressure. Special inspection for leaks should be carried out around the valve, wheel rim and along the tread. Exercise care to bead and rim where leakage occurs. Wipe out water from area which leaks air bubbles and then mark the place with chalk.

After removing the materials caused puncture, seal the point to avoid damage to the tire due to entrance of dirt and water. When repairing the puncture, use the tire repair kits which are furnished from tire dealers, following the instructions provided with the kits. In case that a puncture becomes large or there is any other damage on the tire fabric, repair must be carried out by authorized tire dealers.

Wheel repair

Inspect wheel rim flange for bend or dents. If any of the above deterioration is detected, repair should be made to secure complete sealing. The flange should be cleaned by a wire brush when rust is found on the flange. Furthermore, if excessive pitting occurs on the rim, eliminate it with a file.

Wear

Misalignment

When the front wheels align in excessive toe-in or toe-out condition, tires scrape the tread rubber off. The wear of tread appears feathered edge.

Center

This wear is caused by overinflation of the tire. The inflation pressure must be kept within the specified limit.

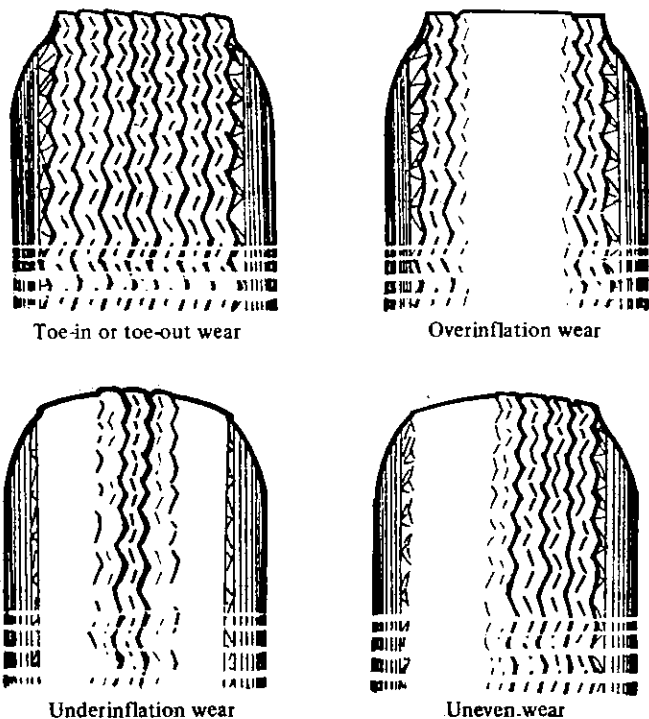
Shoulder

The wear may be caused by underinflation, incorrect wheel camber, or continuous high speed driving on curves. In general, the former two are common. Because underinflation wear appears on both sides of tread, and on the other hand, camber wear causes only one tread side. For cornering tread wear, the driver must operate car slowing down on curves.

Uneven

Uneven wear is caused by incorrect camber or caster, malfunctioning suspension, unbalanced wheel, out-of-round brake drum, or other mechanical conditions. To repair this abnormal wear, correct the above defective parts.

WHEEL AND TIRE

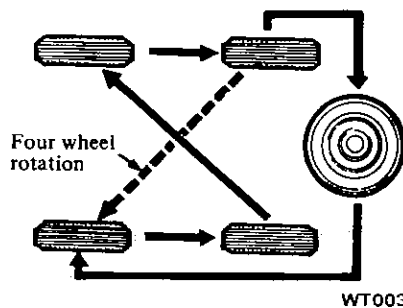


WT004

Fig. WT-1 Abnormal tire wear

the front tires tend to wear unevenly because of front wheel alignment.

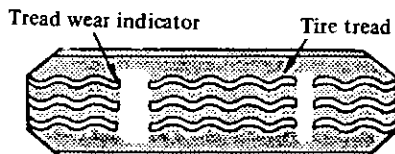
Accordingly, to equalize tire wear, it is necessary to rotate tires every 10,000 km (6,000 miles) of operation.



WT003

Fig. WT-2 Tire rotation

The tires are provided with "tread wear indicator" at six places around tire circumference, indicating 1.6 mm ($\frac{1}{16}$ in) tread depth. When the tires wear and then the marks appear, replace them with new ones.



WH024

Fig. WT-3 Tread wear indicator

To change tire with wheel using a jack in the safe manner, observe the following procedures:

1. Apply parking brake and block front wheels when rear wheel is being changed.
2. Remove wheel cap and loosen wheel nuts.
3. Place jack at jacking point instructed under "General Information" and raise car until wheel clears ground.
4. Remove wheel nuts and wheel from drum.
5. To install wheel, reverse the above steps. Tighten wheel nuts in criss-cross fashion to 8.0 to 9.0 kg-m (58 to 65 ft-lb).

Note: Never get under the car while it is supported only by the jack. Always use safety stands to support the side member of body construction when you must get beneath the car.

Radial tire

Tires of radial ply construction will revolve with less camber thrust force and with greater cornering power on turns. This tends to cause local or rapid wear on the treads with excessive toe-in. Exercise special care for front wheel alignment during the life of tires.

Notes:

- a. Radial ply tires should not be mixed with ordinary tires since their characteristics differ from those of ordinary tires.
- b. The same brand radial ply tires should be installed on all wheels.
- c. The tubes designed for radial tire should be used exclusively.
- d. Snow chain should not be fitted because of damaging side wall.

Tire rotation

Tires wear unevenly and become unbalanced according to running distance. Uneven tire wear often results in tire noise which is attributed to rear axle gears, bearing, etc. Meanwhile,

INSPECTION

Wheel balance

The wheel and tire assembly should be kept balanced statically and dynamically.

Proper tire balance is necessary when driving the car at high speeds. Consequently, the wheel and tire assembly should be properly rebalanced whenever puncture is repaired.

The wheel and tire assembly becomes out of balance according to uneven tire wear. Severe acceleration and braking, or fast cornering is the cause of wear on tire, resulting in unbalance of tire and wheel assembly.

The symptom of unbalance appears as tramp, car shake and steering trouble.

To correct unbalance, use proper wheel balancer.

Maximum allowable unbalance:

165 gr-cm (2.3 in-oz)
at rim circumferences

Balance weight:

10 to 70 gr (0.35 to 2.47 oz)
at 10 gr (0.35 oz) interval

WHEEL AND TIRE

Note: Be sure to place the correct balance weights on the inner edge of rim as shown in Figure WT-4.

with wire brush, emery cloth or paper. Use dial gauge to examine wheel rim for lateral and diametral run-out.

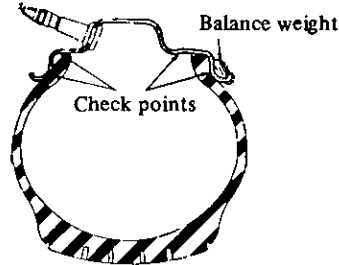
Note: In replacing tire, take extra care not to damage tire bead, rim-flange and bead seat.

Do not use tire irons to force beads away from wheel rim-flange; that is, always use tire replacement device whenever tire is removed.

Wheel and tire

In order to ensure satisfactory steering condition as well as maximum tire life, proceed as follows:

1. Check wheel rim, especially, rim flange and bead seat for rust, distortion, cracks or other defects which might cause air leaks. Function of tubeless tire depends on a good seal between tire bead and wheel rim. Thoroughly remove rust, dust, oxidized rubber or sand from wheel rim



WT005

Fig. WT-4 Wheel rim run-out check points

2. Discard when any of the following trouble occurs:

- (1) Broken or damaged bead wire.
- (2) Ply or tread separation.
- (3) Worn fabric damage on tubeless tire.
- (4) Cracked or damaged side wall, etc.

TROUBLE DIAGNOSES AND CORRECTIONS

Condition	Probable cause	Corrective action
Wheel wobbles.	Improper tire pressure. Damaged tire or distorted wheel rim. Unbalanced wheel. Loose wheel nuts. Worn or damaged wheel bearing, or excessive play of wheel bearing. Improper front wheel alignment. Worn or damaged ball joint. Excessive steering linkage play or worn steering linkage. Loose steering linkage connection. Broken suspension spring. Defective shock absorber.	Measure and adjust. Repair or replace. Balance. Tighten. Correct play or replace wheel bearing. Align. Replace. Adjust or replace. Tighten nuts to rated torque, or replace worn parts if any. Replace. Replace.
Unevenly or excessively worn tire.	Improper tire rotation. Improper tire pressure. Unbalanced wheel. Improperly adjusted brake. Improper wheel alignment. Excessively distorted or improperly installed suspension link. High speed on curves.	Conduct tire rotation periodically. [Standard: every 10,000 km (6,000 miles)]. Measure and adjust. Balance or replace. Adjust. Align. Repair, replace or, if necessary, reinstall. Reduce speed.

WHEEL AND TIRE

Condition	Probable cause	Corrective action
	Sudden start and improper speed due to rapid acceleration or improper brake application.	Follow correct and proper driving manner.
Tire squeals.	Improper tire pressure. Improper front wheel alignment. Distorted knuckle or suspension link.	Measure and adjust. Align. Repair or replace.



**DATSUN 1800
MODEL 610 SERIES
CHASSIS & BODY**



NISSAN MOTOR CO., LTD.
TOKYO, JAPAN

SECTION ST

STEERING

ST

STEERING SYSTEM	ST- 2
SERVICE DATA AND SPECIFICATIONS	ST-10
TROUBLE DIAGNOSES AND CORRECTIONS	ST-11
SPECIAL SERVICE TOOLS	ST-11

STEERING

STEERING SYSTEM

CONTENTS

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Removal	ST- 3	STEERING COLUMN	ST- 6
Disassembly	ST- 3	Removal	ST- 7
Inspection	ST- 4	Disassembly	ST- 8
Assembly and adjustment	ST- 4	Inspection and repair	ST- 8
Installation	ST- 5	Assembly	ST- 9
STEERING LINKAGE	ST- 5	Installation	ST- 9
Removal	ST- 6		

DESCRIPTION

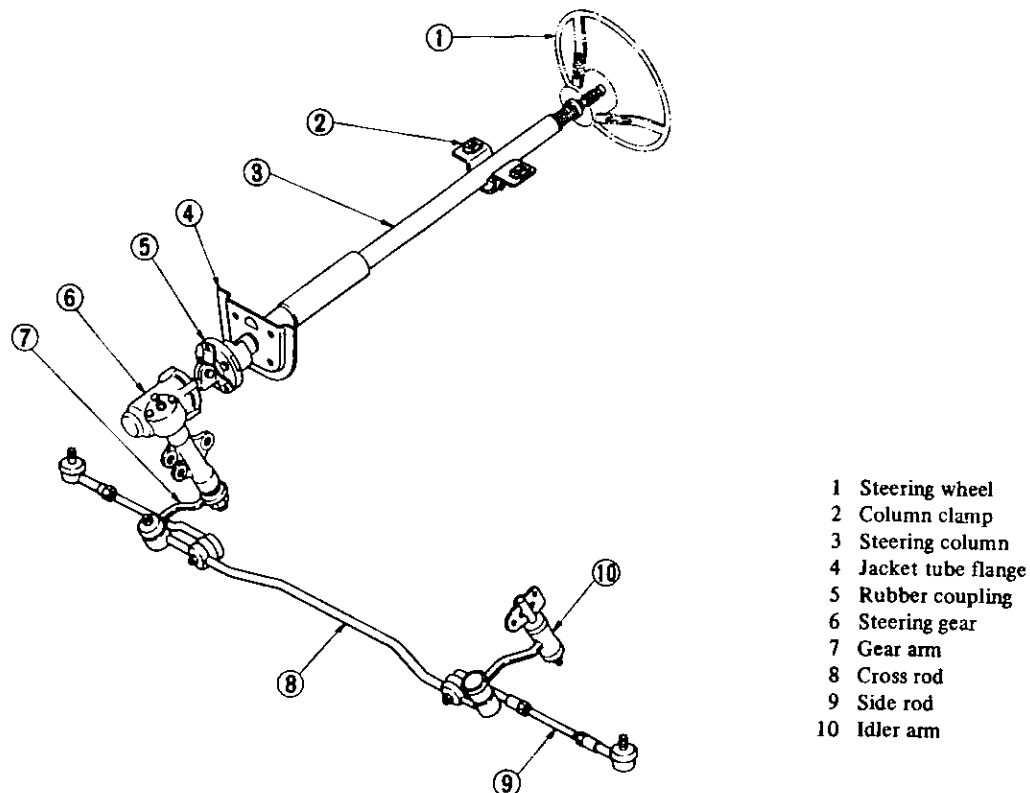
The steering gear is of a recirculating type designed especially for easy operation and high durability. The steering linkage is of a relay design, whose gear arm is connected to one end of the cross-rod. The other end of the cross-rod is linked to the idler arm connecting with the side member located on the opposite side of the steering gear.

The adjustable side rods serve to

connect the cross-rod to the steering knuckle arms. The rubber coupling, located between the steering column and the steering gear box, provides a means of preventing road shocks and linkage vibrations from imparting to the steering wheel during operation.

On the Hardtop and vehicles destined for U.S.A. and Canada, the collapsible steering column is used as a standard equipment. On the other

models, this type of steering column is furnished as an option. This collapsible steering column is of a steel ball type, and collapses upon impact. Thus, if the vehicle should become involved in a front-end collision that throws the driver forward, the steering column will absorb the energy of his forward movement and greatly reduce the possibility of his being injured.

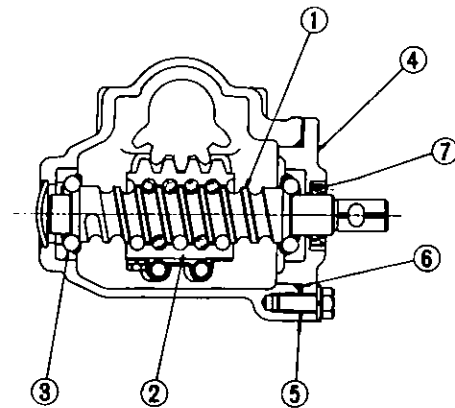
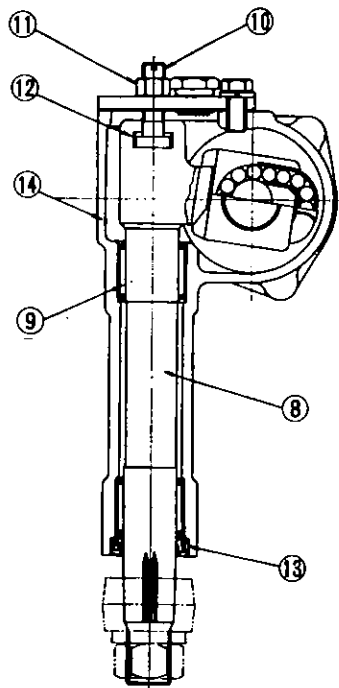


ST164

Fig. ST-1 Structural view of steering system

STEERING

STEERING GEAR



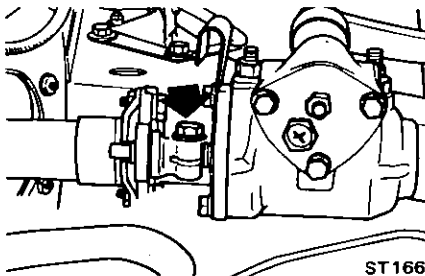
ST165

- | | |
|----------------|--------------------------|
| 1 Worm shaft | 8 Sector shaft |
| 2 Ball nut | 9 Sector shaft bearing |
| 3 Worm bearing | 10 Adjusting screw |
| 4 Rear cover | 11 Lock nut |
| 5 Bearing shim | 12 Adjusting shim |
| 6 O-ring | 13 Oil seal |
| 7 Oil seal | 14 Steering gear housing |

Fig. ST-2 Sectional view of steering gear

Removal

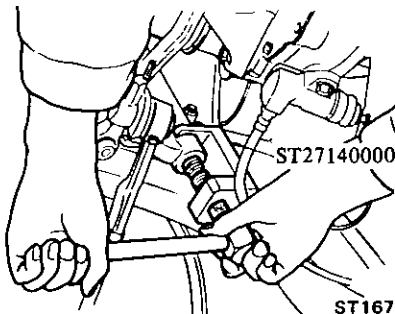
1. Remove bolt connecting worm shaft and rubber coupling.



ST166

Fig. ST-3 Removing rubber coupling securing bolt

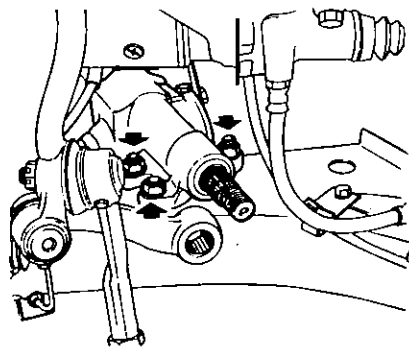
2. Remove nut from sector shaft. Remove gear arm from sector shaft using Special Tool "Steering Gear Arm Puller ST27140000."



ST167

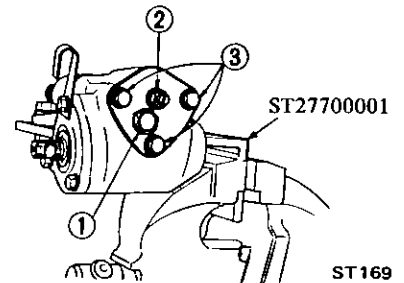
Fig. ST-4 Removing steering gear arm

3. Remove three bolts securing steering gear housing to body side member, and withdraw steering gear housing from engine room.



ST168

Fig. ST-5 Withdrawing steering gear housing



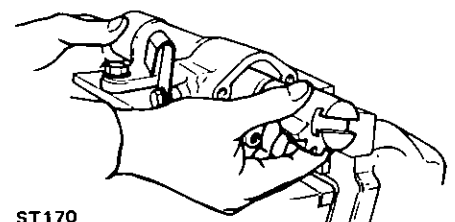
ST169

Fig. ST-6 Mounting steering gear in a vise

3. Turn sector shaft adjusting screw a few turns clockwise and then remove cover and withdraw sector shaft.

Disassembly

1. Thoroughly drain steering gear oil by removing filler plug ①. Place steering gear in a vise with special tool "Steering Gear Attachment ST27700001" in place.
2. Loosen lock nut ② and remove three sector shaft cover attaching bolts ③.



ST170

Fig. ST-7 Drawing out sector shaft

STEERING

4. Remove three rear cover securing bolts and detach rear cover.

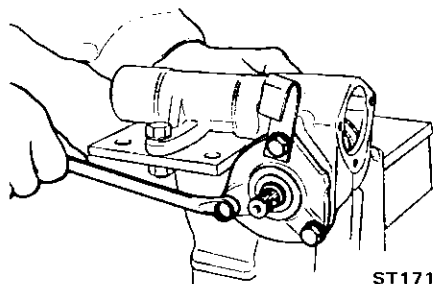


Fig. ST-8 Detaching rear cover

5. Withdraw bearing shims and steering worm assembly.

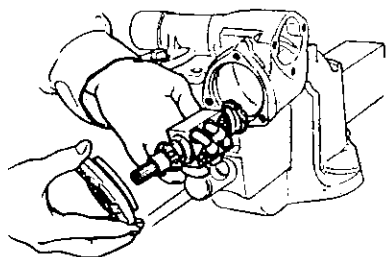


Fig. ST-9 Drawing out steering worm assembly

6. Remove oil seal.

Notes:

- a. Do not remove sector shaft needle bearings from steering gear housing. If necessary, replace as a gear housing assembly.
- b. Do not disassemble ball nut and worm shaft assembly. If necessary, replace them with new ones as a worm shaft assembly.

Inspection

Wash clean all the disassembled parts in solvent and check for condition.

Sector shaft

1. Check gear tooth surface for pitting, burrs, cracks or any other damage, and replace if defective.

2. Check sector shaft for distortion of serration, and if necessary replace. In this case, be sure to disassemble and check gear housing.

Steering worm assembly

1. Inspect ball nut gear tooth surface, and replace if pitting, burrs, wear or any other damage is found.
2. Ball nut must rotate smoothly on worm gear. If found too tight, assembly should be replaced. Check as follows:

Move ball nut to either end of worm gear, and gradually stand worm shaft and ball nut assembly until ball nut moves downward on worm gear under its own weight. In the above test, if ball nut does not move freely over entire stroke, assembly may be damaged. Replace with a new one.

Note: In this inspection, be careful not to damage ball guide tube.

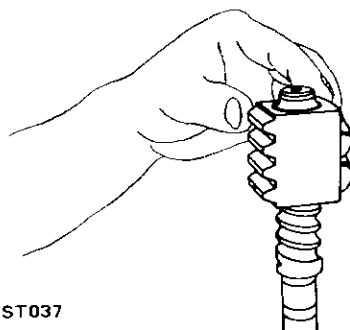


Fig. ST-10 Inspecting worm shaft and ball nut assembly

Bearings

1. Replace worm shaft bearings if pitting, wear or any other damage is found on it.
2. If sector shaft needle bearings are found to be worn or damaged, replace them as an assembly of gear housing and bearings.

Oil seals

Replace oil seal at each disassembly.

Assembly and adjustment

1. Lubricate bearing, gears and other sliding parts with gear oil.

2. Apply recommended multi-purpose grease to oil seal lip and then press seal into rear cover.
3. Install O-ring, worm shaft assembly and worm bearing shims to gear housing.

Tightening torque:

1.5 to 2.5 kg-m
(10.9 to 18.1 ft-lb)

Note: Be sure to install the thicker shims to gear housing side.

Standard shim thickness:
1.5 mm (0.0591 in)

Available worm bearing shim

No.	Thickness mm (in)
1	0.762 (0.0300)
2	0.254 (0.0100)
3	0.127 (0.0050)
4	0.050 (0.0020)

4. Adjust the worm bearing preload by selecting suitable bearing shims so that the initial turning torque is 4.0 to 6.0 kg-cm (56 to 83 in-oz).

Notes:

- a. Rotate worm shaft in both directions a few turns to settle down worm bearing and measure the preload.
- b. In case of readjustment, initial turning torque is 2.0 to 4.0 kg-cm (28 to 56 in-oz).

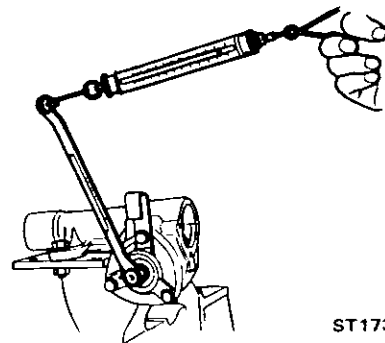


Fig. ST-11 Measuring initial turning torque

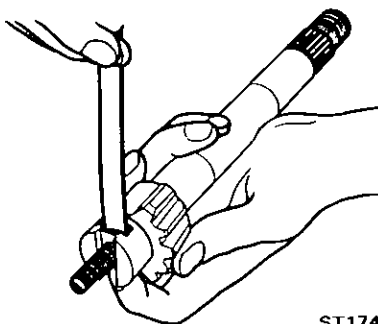
5. Insert adjusting screw into T-shaped groove at sector shaft head, and adjust end play between sector shaft and adjusting screw so as to be

STEERING

within 0.01 to 0.03 mm (0.0004 to 0.0012 in) by choosing suitable adjusting shims.

Available sector shaft adjusting shim

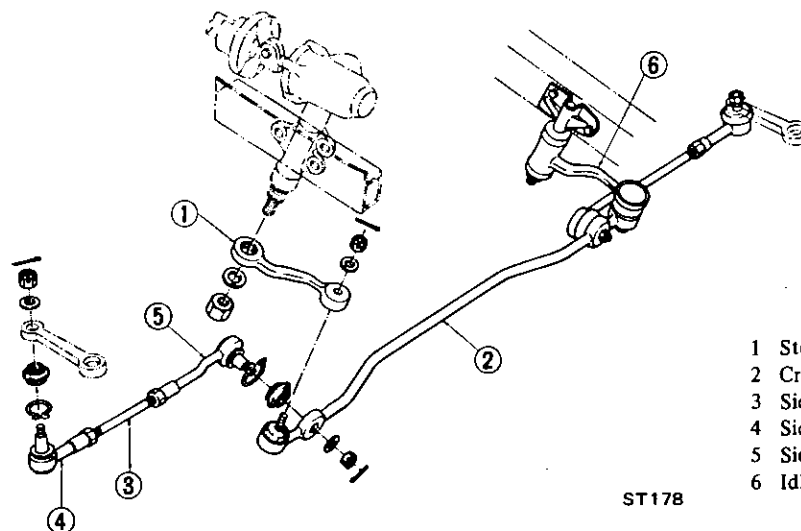
No.	Thickness mm (in)
1	1.57 (0.0618)
2	1.55 (0.0610)
3	1.52 (0.0598)
4	1.50 (0.0591)



ST174
Fig. ST-12 Measuring end play between sector shaft and adjusting screw

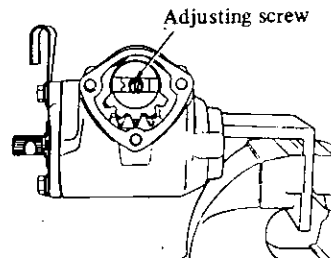
6. Rotate sector shaft by hand until ball nut is in the center of travel, then install sector shaft together with adjusting screw in gear housing, ensuring that center gear of sector shaft engages with the center gear of the ball nut.

STEERING LINKAGE



ST178

Fig. ST-16 Structural view of steering system

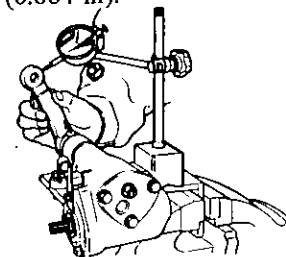


ST175

Fig. ST-13 Installing sector shaft

7. Apply sealant to sector shaft cover attaching face of gear housing, and attach packing. Furthermore apply sealant on packing.
8. By turning adjusting screw counterclockwise, attach sector shaft cover to gear housing and then temporarily secure it.
9. Pull sector shaft toward cover approximately 2 to 3 mm (0.08 to 0.12 in) by screwing adjusting screw counterclockwise and tighten sector shaft cover fixing bolts to 1.5 to 2.5 kg-m (10.9 to 18.1 ft-lb).
10. Push sector shaft against ball nut gear by gradually turning adjusting screw until sector shaft gear lightly meshes with ball nut gear, and temporarily secure adjusting screw with lock nut.
11. Install gear arm to sector shaft and move sector shaft for several times from the side of gear arm and make sure it turns smoothly.
12. Adjust the backlash at the neutral point by turning in or out

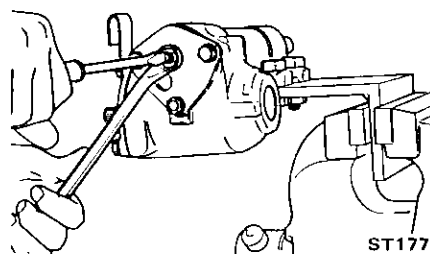
adjusting screw so that the movement of the gear arm top end is less than 0.1 mm (0.004 in).



ST176

Fig. ST-14 Measuring backlash

13. Turn adjusting screw clockwise approximately 1/8 to 1/6 rotation and then tighten lock nut to 2.0 to 2.5 kg-m (14.5 to 18.1 ft-lb) after moving sector shaft several times.



ST177

Fig. ST-15 Tightening lock nut

14. Fill gear oil approximately 0.27 liters (5/8 U.S. pt., 1/2 Imper. pt.) into assembly through filler hole and install filler plug.

Installation

Install steering gear in the reverse order of removal.

STEERING

Removal

1. Jack up the front of vehicle and support it with suitable safety stands.
2. Remove cotter pin and nut fastening side rod ball studs to knuckle arms.
3. Free ball studs from knuckle arms by backing up knuckle arm boss with a large hammer and striking the opposite side with a hammer or using the special tool "Steering Ball Joint Puller ST27850000."

Note: Be careful not to strike the ball studs heads, side rod sockets and side rods.

4. Remove ball stud of cross rod from gear arm and, remove swivel pin of idler assembly from cross rod in the same manner as described in step 3 above.

Cross-rod and side rods can be removed as an assembly.

5. Remove idler assembly from side member by taking off two fixing bolts.

Inspection and repair

Ball joint

When ball stud is worn and axial

play is too excessive, replace with a new one.

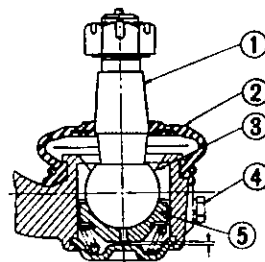
Axial play:

0.1 to 0.5 mm
(0.0039 to 0.0197 in)

Swing torque:

0.5 kg-m (3.62 ft-lb)

Note: At the regular intervals, check grease and renew if necessary. To renew grease, replace plug with a grease nipple and apply recommended multipurpose grease to ball joint through the grease nipple until grease is forced out at grease vent hole.

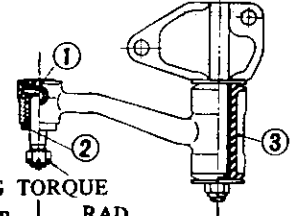


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Fig. ST-17 Sectional view of ball stud (side rod)

Idler arm assembly

Check nylon bushing of cross rod joint and rubber bushing of idler arm for breakage, wear and play, and if necessary replace.



TIGHTENING TORQUE
5.5 to 7.6 kg-m (40 to 55 ft-lb)
140 mm (4.7 in) (SEDAN)
145 mm (5.9 in) (WAGON)

- 1 Nylon bushing
- 2 Dust cover
- 3 Torsion rubber

ST180 Fig. ST-18 Sectional view of idler assembly

Cross rod & side rod

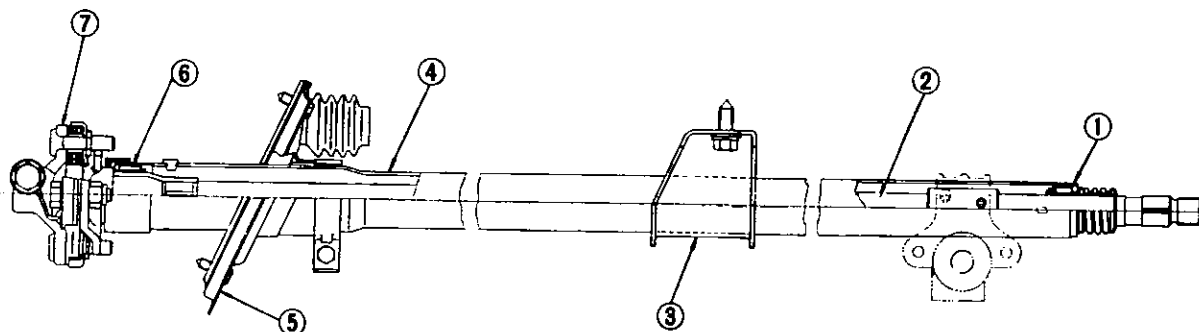
Check side rods and cross rod for breakage, bend or crack, and replace with a new one if necessary.

Installation

Install steering linkage in the reverse order of removal, observing the following instructions.

1. Set the length of each side rod to 313.2 mm (12.331 in). It should be done between ball studs center.
2. Check wheel alignment, and if necessary adjust. See section FA.

STEERING COLUMN

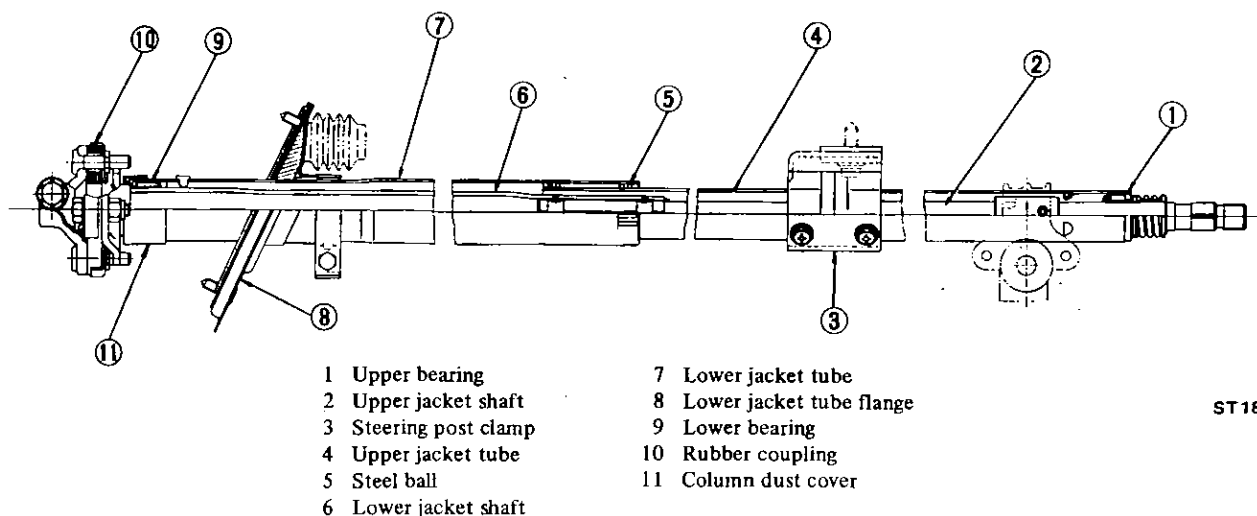


ST181

- 1 Upper bearing
- 2 Steering column shaft
- 3 Steering post clamp
- 4 Jacket tube
- 5 Jacket tube flange
- 6 Lower bearing
- 7 Rubber coupling

Fig. ST-19 Sectional view of ordinary type steering

STEERING



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Fig. ST-20 Sectional view of collapsible type steering

Removal

Steering wheel

1. Disconnect battery ground cable.
2. Disconnect horn wiring and remove horn pad.

Note: Remove horn pad as follows according to their types.

- a. Two spoke type horn pad:
Pull out horn pad.
- b. Three spoke type horn pad:
Horn pad with stamp 
Pull out horn pad.
Horn pad without stamp
Push in and turn counter-clockwise, and then pull out.

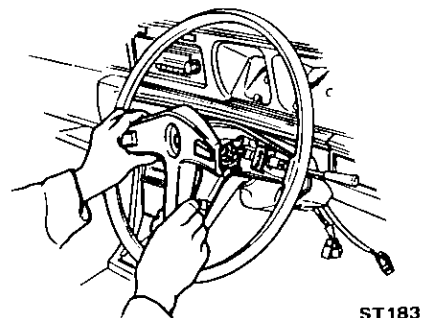


Fig. ST-21 Removing horn pad

3. Remove steering wheel nut.
4. Using the special tool, "Steering Wheel Puller ST27180000" thread puller anchor screws into threaded holes provided in steering wheel. Turn center bolt of the special tool clockwise to remove steering wheel.

Note: Be sure not to hammer on the steering column shaft.

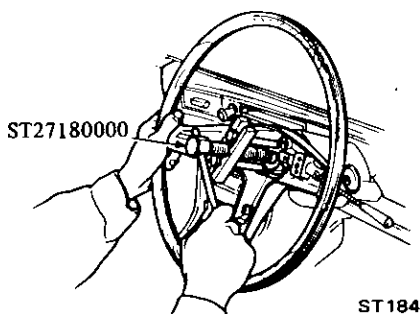


Fig. ST-22 Removing steering wheel

Column shaft

1. Remove bolt securing worm shaft and coupling rubber. See Figure ST-3.
2. Remove remote control device if equipped.

3. Remove steering wheel. Refer to "Steering wheel removal."
4. By loosening four screws, remove upper and lower steering column shell covers.

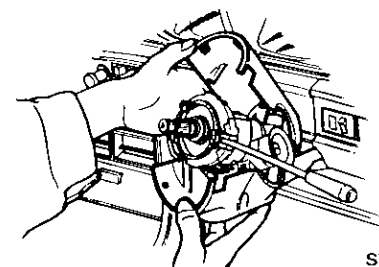


Fig. ST-23 Removing column shell covers

5. Remove turn signal switch assembly by loosening two screws.

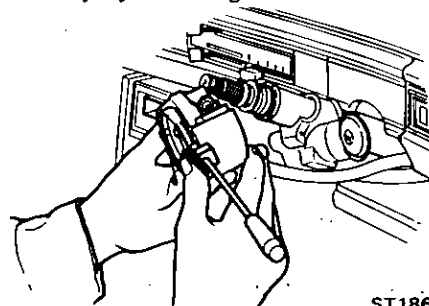


Fig. ST-24 Removing turn signal switch assembly

STEERING

6. Remove package tray.
7. Remove four bolts securing jacket tube flange to dash panel.

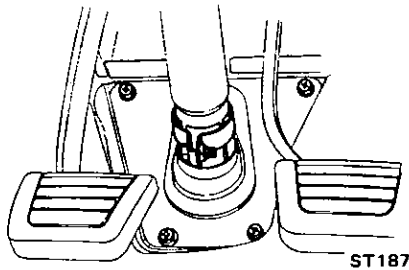


Fig. ST-25 Removing jacket tube flange securing bolts

8. Remove two bolts securing column clamp.

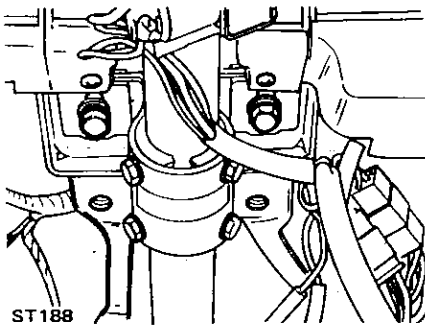


Fig. ST-26 Removing column clamp securing bolts

9. Draw out steering column assembly from the room side.

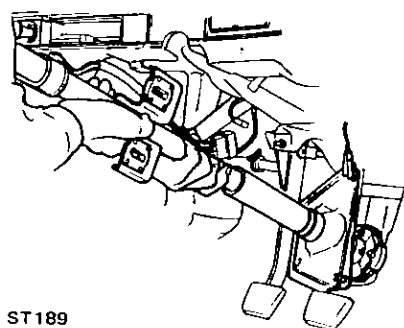


Fig. ST-27 Drawing steering column assembly

Disassembly

When accident (collision) occurs unfortunately and the vehicle, especially its front unit, is damaged, conduct inspection in accordance with the following instructions.

Inspect steering system particularly carefully because it is very important unit for driving.

Collapsible type steering should not be disassembled and, if necessary, replace it as an assembly.

The following procedures is made for ordinary type steering.

1. After removing snap ring at the top end of steering column shaft, remove washers and spring.

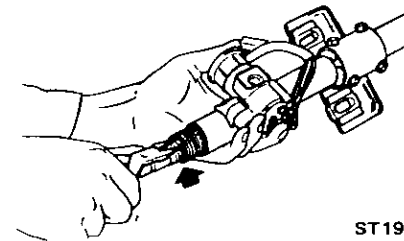


Fig. ST-28 Removing snap ring

2. Draw out column shaft from jacket tube.

Note: Be careful not to damage upper and lower bearings.

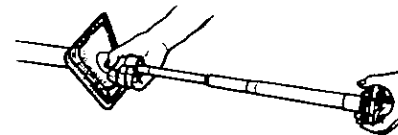


Fig. ST-29 Drawing column shaft

Inspection and repair

1. When steering wheel can not be rotated smoothly and steering gear, steering linkage and suspension system are normal, check the steering system for the following matters and replace effective parts.

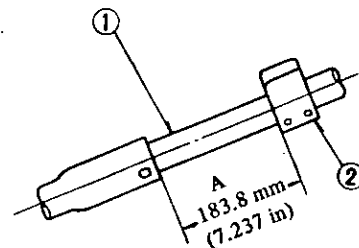
- (1) Check column bearings for damage and unsmoothness. If so, lubricate with recommended multi-purpose grease to column bearing or replace with a new one as jacket tube assembly.
- (2) Check jacket tube for deformation and breakage, and replace if necessary.

- (3) Check column spring, and replace if damaged or weakened.

2. When the vehicle equipped with collapsible steering comes into light collision, check the following parts and replace if necessary.

- (1) Jacket tube

Measure the dimension A as shown in the figure below. Standard installed dimension is 183.8 mm (7.236 in). When jacket tube is crushed, dimension A becomes small.



- 1 Jacket tube
- 2 Column clamp

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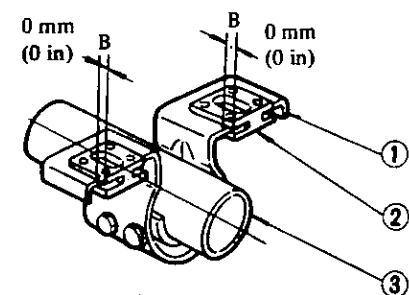
Fig. ST-30 Standard dimension between column clamp and the top end of lower jacket tube

- (2) Column clamp

Measure dimension B as shown below.

Standard B dimension is 0 mm (0 in).

When jacket tube is crushed, dimension B becomes large.



- 1 Column clamp
- 2 Block
- 3 Jacket tube

ST193

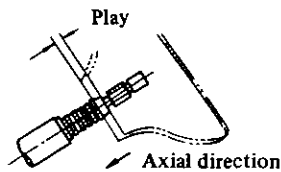
Fig. ST-31 Standard dimension B

- (3) Steering wheel

Check steering wheel for the axial play.

When steering jacket shaft is crushed, axial play arises.

STEERING

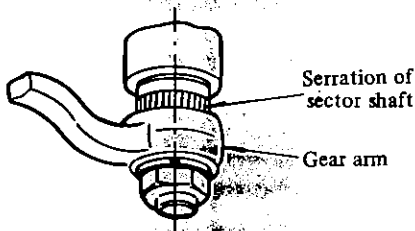


ST194

Fig. ST-32 Inspecting steering wheel for axial play

(4) Sector shaft

When collision occurs, abnormal strength is applied to gear arm. As a result of this, serration of sector shaft is apt to be distorted.



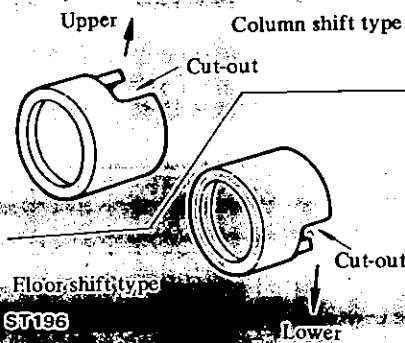
ST195

Fig. ST-33 Inspecting the serration of sector shaft for deformation

Assembly

Assemble steering linkage in the reverse order of disassembly. When assembling, observe the following notes.

1. Lubricate with recommended multipurpose grease to column bearings, spring, dust seal and sliding parts.
2. Install column cover as shown below according to the difference between transmission control device types.



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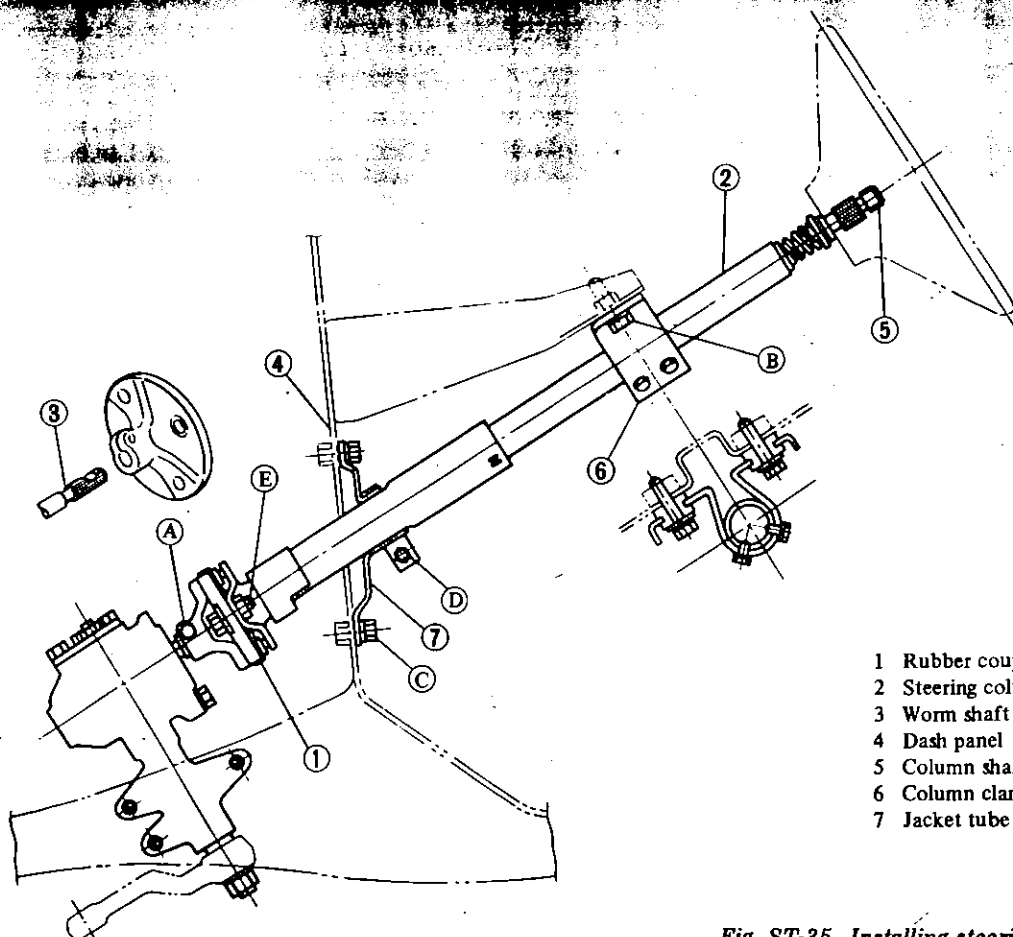
Fig. ST-34 Installing column cover

Note: Be careful not to give impact force or abnormally strong force in axial direction to steering column shaft.

Installation

Install the steering column in the reverse order of removal, observing the following instructions.

1. Set the wheel in a straight ahead position.
2. Fit steering column assembly ② onto worm shaft serration through dash panel ④, and secure bolt ①. Be careful to install so that punch mark at the top end of column shaft is forced upward.
3. Fasten bolts ③ to support the upper of steering column assembly by means of column clamp.
4. Loosen bolt ⑤, and after sliding jacket tube flange to dash panel and tighten four bolts ⑥, and then bolt ⑤.
5. After installation, make sure that steering wheel turns smoothly.



- 1 Rubber coupling
- 2 Steering column assembly
- 3 Worm shaft
- 4 Dash panel
- 5 Column shaft
- 6 Column clamp
- 7 Jacket tube flange

ST197

Fig. ST-35 Installing steering column assembly

SERVICE DATA AND SPECIFICATIONS

Adjusting shim

Adjusting shim

Gear arm nut	kg-m (ft-lb)	14.0 (101.2)
Rear cover bolts	kg-m (ft-lb)	1.5 to 2.5 (10.9 to 18.1)
Sector shaft cover bolts	kg-m (ft-lb)	1.5 to 2.5 (10.9 to 18.1)
Sector shaft adjusting screw lock nut	kg-m (ft-lb)	2.0 to 2.5 (14.5 to 18.1)
Steering gear housing to body bolts	kg-m (ft-lb)	6.0 to 8.0 (43.4 to 57.8)

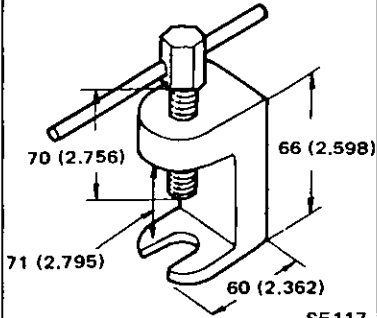
STEERING

Steering linkage			
Idler arm to frame bolts	kg-m (ft-lb)		4.4 to 6.1 (31.8 to 44.1)
Ball stud nuts	kg-m (ft-lb)		5.5 to 7.6 (39.8 to 55.0)
Side rod lock nuts	kg-m (ft-lb)		4.4 to 6.1 (31.8 to 44.1)
Column shaft			
Steering wheel nut	kg-m (ft-lb)		4.0 to 5.0 (28.9 to 36.2)
Column clamp bolts	kg-m (ft-lb)		1.3 to 1.8 (9.40 to 13.0)
Rubber coupling to worm shaft bolt	kg-m (ft-lb)		4.0 to 5.0 (28.9 to 36.2)
Rubber coupling securing bolts	kg-m (ft-lb)		1.5 to 2.2 (10.8 to 15.9)

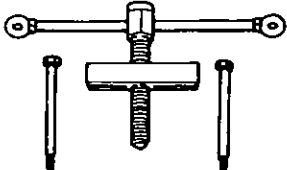
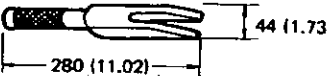
TROUBLE DIAGNOSES AND CORRECTIONS

Condition	Probable cause	Corrective action
Steering wheel moves heavily.	Wheel alignment out of specifications or air pressure in tires too low. Steering linkage out of adjustment. Steering column out of alignment.	Re-align or inflate tires to correct pressure. Re-adjust and see relative topic under Front Suspension. Repair.
Steering wheel returns but sluggishly.	Wheels out of alignment or air pressure in tires too low. Defective steering linkage.	Repair or inflate tires to correct air pressure. Replace and see relative topic under Front Suspension.
Car pulls to one side.	Wheels out of proper alignment. Wheel bearing out of adjustment. Defective steering linkage.	Re-align. Readjust. Replace and see relative topic under Front Suspension.

SPECIAL SERVICE TOOLS

No.	Tool number & tool name	Description	For use on	Reference page or figure No.
		Unit: mm (in)		
1.	ST27140000 Steering gear arm puller	 This tool is used to remove steering gear arm from steering sector shaft. Note: Strike the side of the gear arm with double hammer to ease removal.	610 510 B110 521	Fig. ST-4

STEERING

No.	Tool number & tool name	Description Unit: mm (in)		For use on	Reference page or figure No.
2.	ST27180000 Steering wheel puller	 SE116		610 510 230 B110 780	Fig. ST-22
3.	ST27850000 Steering ball joint puller	 SE089		All models	Page ST-6

SERVICE MANUAL

DATSUN 1800
MODEL 610 SERIES
CHASSIS & BODY



NISSAN MOTOR CO., LTD.
TOKYO, JAPAN

SECTION FE

ENGINE CONTROL, FUEL & EXHAUST SYSTEM

FE

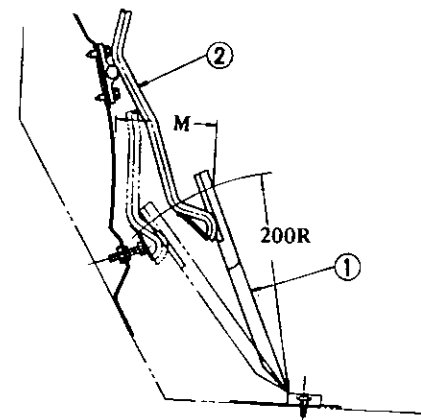
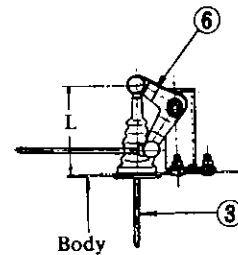
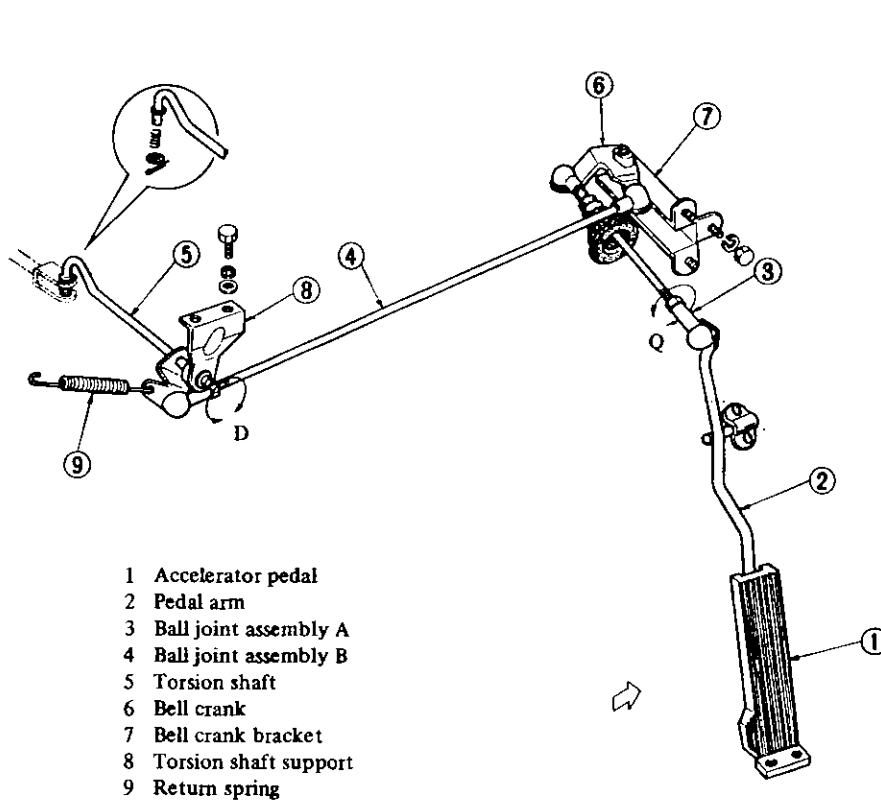
ENGINE CONTROL SYSTEM.....	FE- 2
FUEL SYSTEM	FE- 4
EXHAUST SYSTEM.....	FE- 7

ENGINE CONTROL SYSTEM

CONTENTS

DESCRIPTION	FE-2	INSPECTION	FE-3
REMOVAL	FE-2	INSTALLATION AND ADJUSTMENT	FE-3

DESCRIPTION



FE048

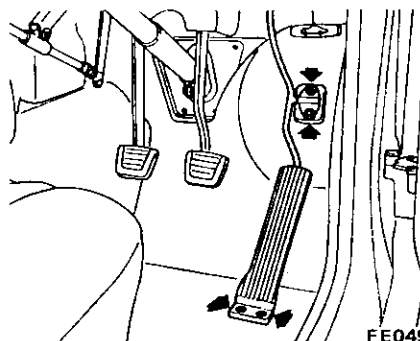
Fig. FE-1 Engine control system

The accelerator system is of a linkage type that uses a bell-crank and tension rod. Smooth and responsive movement of the linkage is accomplished through the use of the ball joint at the jointed section.

On the body side, the support of the torsion shaft, is the oil-wet bearing which is made from polyacetal resin. The adoption of this bearing at this portion assures noiseless operation and prevents engine vibrations from imparting to the car body.

REMOVAL

1. Remove return spring.
2. Remove accelerator pedal and pedal arm.



FE049

Fig. FE-2 Removing accelerator pedal

3. Disconnect each linkage at connection.

Note: Ball jointed sections can be separated from each other by lightly pulling its arm or rod.

4. To disconnect choke control wire, proceed as follows:

- (1) Disconnect choke wire from carburetor.
- (2) Loosen screw on the lower end of choke knob, and detach knob.
- (3) Remove lock nut and take out choke control wire(s) as an assembly.

ENGINE CONTROL, FUEL & EXHAUST SYSTEM

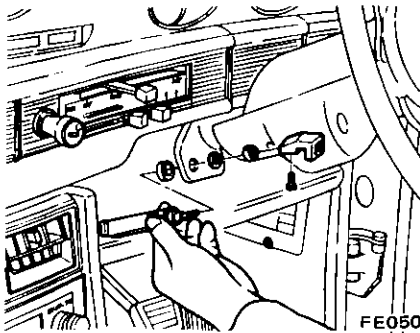


Fig. FE-3 Removing choke control wire

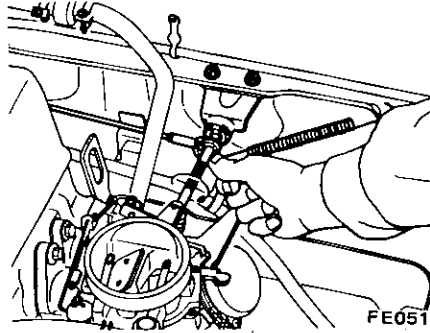


Fig. FE-4 Adjusting accelerator linkage

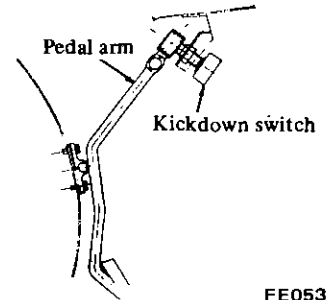


Fig. FE-6 Adjusting kickdown switch

INSPECTION

1. Check accelerator rod for worn areas and make certain that it is not twisted or bent. Also check ball joints for cracks. Repair or, if necessary, replace.
2. Check return spring for weak tension or damage. Replace if the specified tension is not reached.

INSTALLATION AND ADJUSTMENT

To install, reverse the order of removal. Following are general assembly instructions.

1. Install all linkage parts when ball joint assemblies A and B are screwed 13 mm (0.512 in) into ball joint.
2. Adjust the "L" dimension to 82 mm (3.228 in). Adjust the "M" dimension to 94 mm (3.701 in) by turning screw at the "Q" section. Refer to Figure FE-1.
3. With the "L" dimension kept to 82 mm (3.228 in), adjust screw at the "D" section until carburetor throttle shaft is in full close position. Refer to Figure FE-1.
4. Make sure that carburetor throttle valve fully opens as accelerator lever is moved fully in the direction indicated by an arrow.

5. Depress accelerator pedal. With carburetor throttle valve opened fully, tighten stopper bolt until it touches pedal arm closely. From that position, turn stopper bolt one full rotation, and tighten with lock nut securely.

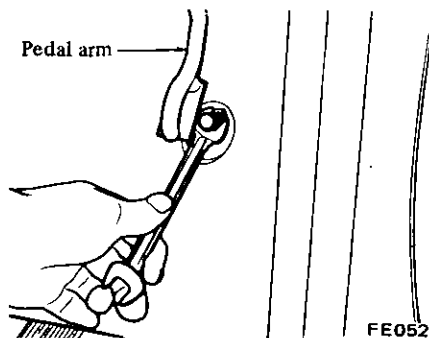


Fig. FE-5 Adjusting stopper bolt

- (2) Dash pot adjustment

With the engine running at 1,800 rpm under no load, adjust dash pot until its stem touches throttle lever closely. After adjustment is properly made, tighten lock nut securely.

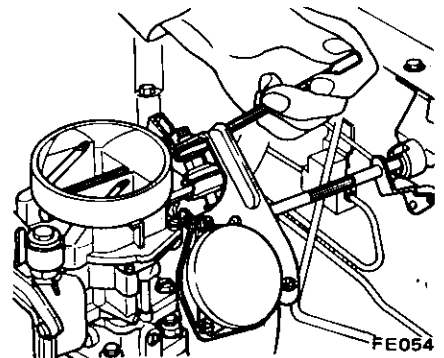


Fig. FE-7 Adjusting dash pot

6. On the automatic transmission model, it is also necessary to adjust kickdown switch and dash pot as described below:

- (1) Kickdown switch adjustment

The kickdown switch adjustment is correct if kickdown switch is actuated by the stopper located on the tip end of pedal arm when accelerator pedal is depressed fully. Always tighten lock nut securely whenever proper kickdown switch adjustment is obtained.

7. The choke control adjustment is correct if carburetor choke valve returns to its original position as choke knob is fully pushed in. The wire should be slack when it is securely connected to carburetor.

8. Apply a light coat of multipurpose grease to all sliding or friction surfaces except for ball joint. Check the entire linkage to ascertain that accelerator pedal returns to its specified height as it is released. This test should be made with the engine "On."

FUEL SYSTEM

CONTENTS

DESCRIPTION	FE-4	Fuel piping	FE-6
REMOVAL	FE-6	Fuel strainer	FE-6
Fuel tank (Sedan and Hardtop)	FE-6	INSPECTION	FE-6
Fuel tank (Wagon and Van)	FE-6	INSTALLATION	FE-6

DESCRIPTION

There are two types of fuel tank. One type is used on Sedan and Hardtop, and the other used on Wagon and Van. On the vehicles destined for Canada and U.S.A., the reservoir tank is also used in the Evaporative Emission Control System.

The fuel tank for the Sedan and Hardtop models is 55 liters (13 $\frac{3}{4}$ U.S.gal., 11 $\frac{1}{2}$ Imper. gal.) in capacity. The tank unit is located to the rear of the seat back and secured in place with

a total of four bolts, two on the front and one on each side of the tank.

The capacity of the fuel tank for the Van and Wagon models is 52 liters (13 $\frac{3}{4}$ U.S.gal., 11 $\frac{1}{2}$ Imper.gal.). This unit is located between the front mounting bracket and the rear cross member and secured in place with four bolts.

The fuel strainer is of nylon, cartridge type, and should be replaced

every 20,000 km (12,000 miles).

The fuel tank unit gauges come into two types — two-terminal (G.E) and three-terminal (S.G.E). The three-terminal unit gauge is used on the SSS model. On the three-terminal unit, when the remaining fuel in the tank reaches 8.5 liters (2 $\frac{1}{4}$ U.S.gal., 1 $\frac{1}{2}$ Imper.gal.), the fuel warning lamp located on the instrument panel goes on.

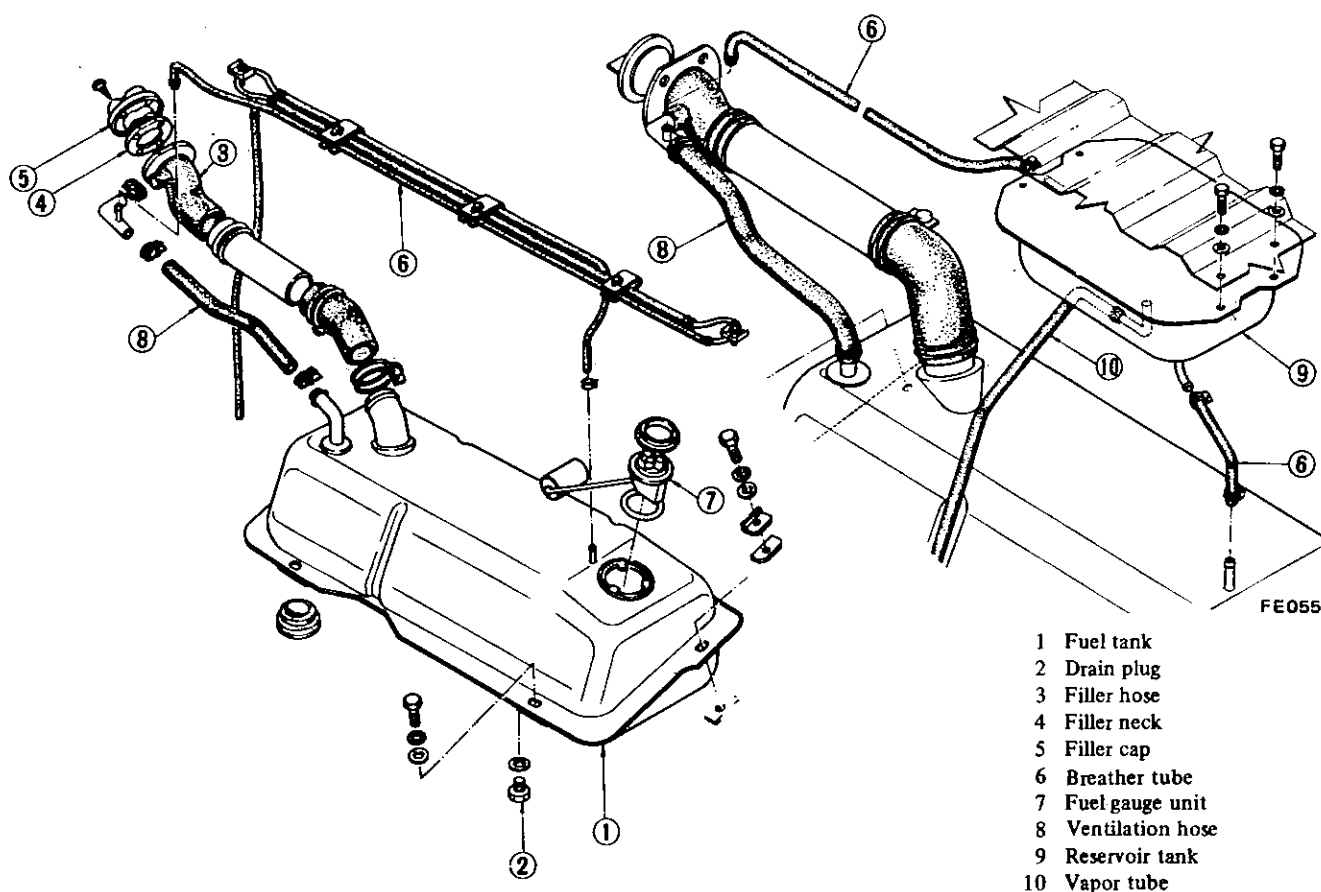
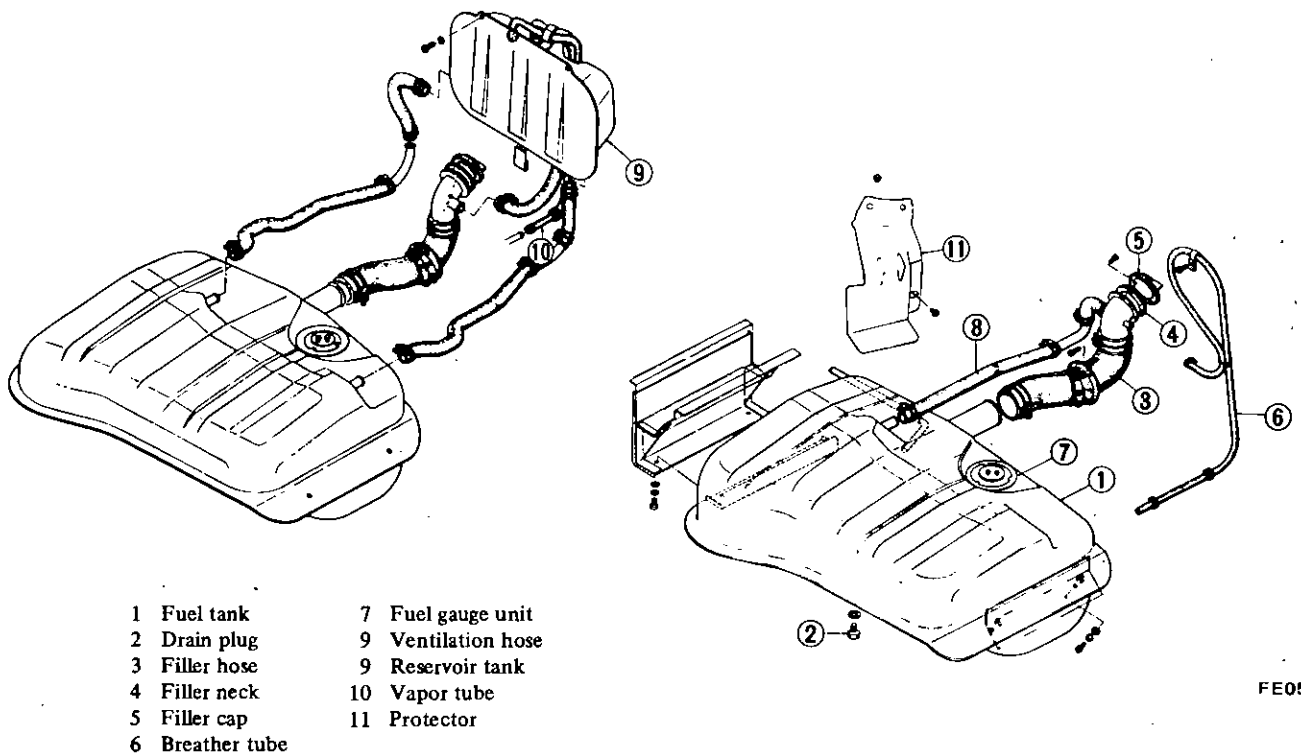


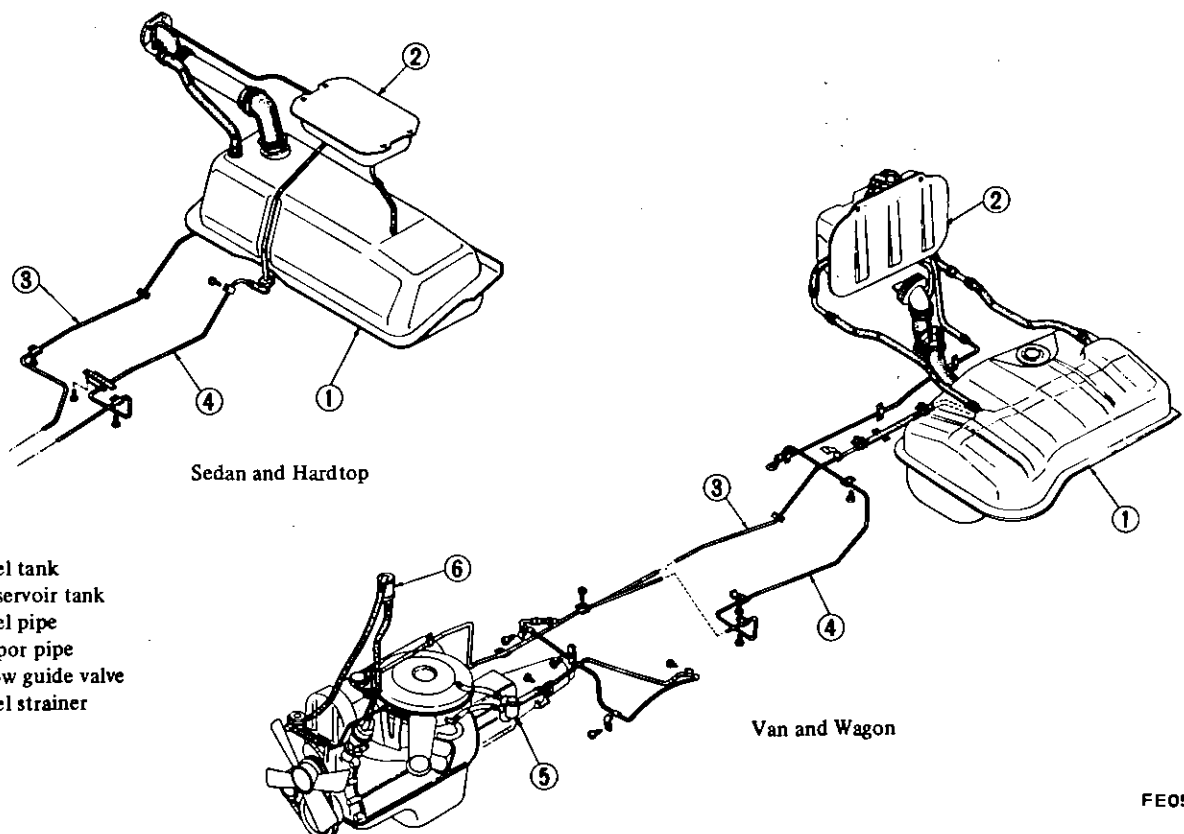
Fig. FE-8 Fuel tank (Sedan and Hardtop)

ENGINE CONTROL, FUEL & EXHAUST SYSTEM



FE056

Fig. FE-9 Fuel tank (Wagon and Van)



FE057

Fig. FE-10 Fuel piping

REMOVAL

Fuel tank (Sedan and Hardtop)

1. Remove trunk front finisher.
2. Take out spare tire. Place a suitable container under fuel tank drain plug to receive the remaining fuel in the tank. Remove the plug and then drain plug to drain fuel into the container.

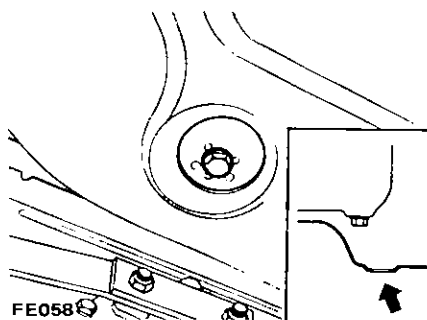


Fig. FE-11 Draining fuel

3. Disconnect filler hose, ventilation hose, breather hose and outlet hose (tank side).
4. Disconnect wires from fuel tank unit gauge.
5. Detach rear seat cushion and seat back. Remove a total of four bolts (two at the front and one on each side) securing fuel tank in place, and take out fuel tank.
6. The unit gauge is of a bayonet type and can be taken out by turning lock plate counterclockwise with a screwdriver.

7. Reservoir tank removal

Unfasten trim clip and detach rear parcel shelf finish. Disconnect three breather tubes.

Loosen four bolts securing reservoir tank, and take out the tank.

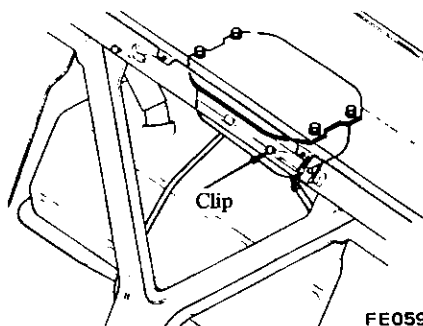


Fig. FE-12 Removing reservoir tank

Fuel tank (Wagon and Van)

1. Remove inspection cover from rear floor. Disconnect wires from unit gauge.

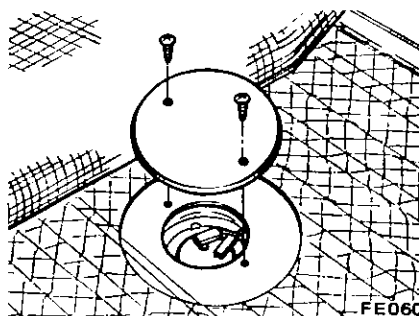


Fig. FE-13 Removing inspection cover

2. Take out spare tire.
3. Loosen drain plug and allow fuel to drain into a suitable container.
4. Disconnect filler hose, ventilation hose and outlet hose (tank side).
5. Remove a total of four bolts from fuel tank, and detach fuel tank.
6. Detach the bayonet-type unit gauge by turning lock plate counterclockwise with a screwdriver.
7. Reservoir tank removal
 - (1) Remove trim board from the right side of rear body.
 - (2) Unfasten three clamps, and disconnect ventilation hoses.
 - (3) Remove grommet from vapor hose, and disconnect hose.
 - (4) Remove two screws on the top face of reservoir tank.
 - (5) Lift up reservoir tank, and unfasten latches at lower flange section. Slide out reservoir tank.

Notes:

- a. Use care not to spill fuel over trunk room floor.
- b. Plug filler opening to prevent entry of dust or dirt.

Fuel piping

All fuel lines can be easily disconnected by unfastening clamps and clips. Do not disconnect any fuel line unless necessary.

Note: Plug hose and tube openings to prevent entry of dust or dirt.

Fuel strainer

Every 20,000 km (12,000 miles), replace fuel strainer with a new one.

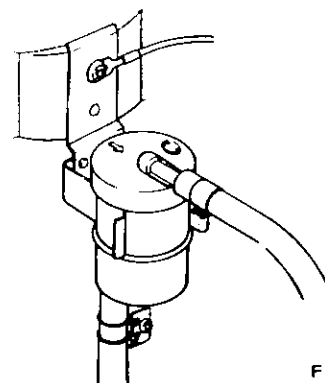


Fig. FE-14 Fuel strainer

INSPECTION

1. Check fuel tank for cracks or distortion. If necessary, replace.
2. Inspect all hoses for cracks, fatigue, sweating or deterioration. Replace any hose that is defective.
3. Replace any fuel tube that is cracked, rusted, collapsed or distorted.

INSTALLATION

To install, reverse the order of removal. Observe the following instructions.

Notes:

- a. Install hose clamps securely. Do not tighten excessively to avoid damaging hose.
- b. Do not kink or twist hoses and tubes when they are routed.
- c. Install fuel gauge unit with O-ring in place.
- d. Install filler hose after fuel tank has been mounted in place. Failure to follow this rule could result in leakage from around hose connections.
- e. Run the engine and check for leakage at connections.

EXHAUST SYSTEM

CONTENTS

DESCRIPTION	FE-7	INSPECTION	FE-7
REMOVAL	FE-7	INSTALLATION	FE-8

DESCRIPTION

The exhaust system consists of front tube, premuffler assembly, rear tube, main muffler assembly, mounting hangers and brackets. The spring

constant of insulator for mounting is low in the vertical direction, so that exhaust system vibration is not transmitted to the body.

On Sedan, a protective heat shield is placed over the muffler to prevent trunk room floor from being heated by the muffler.

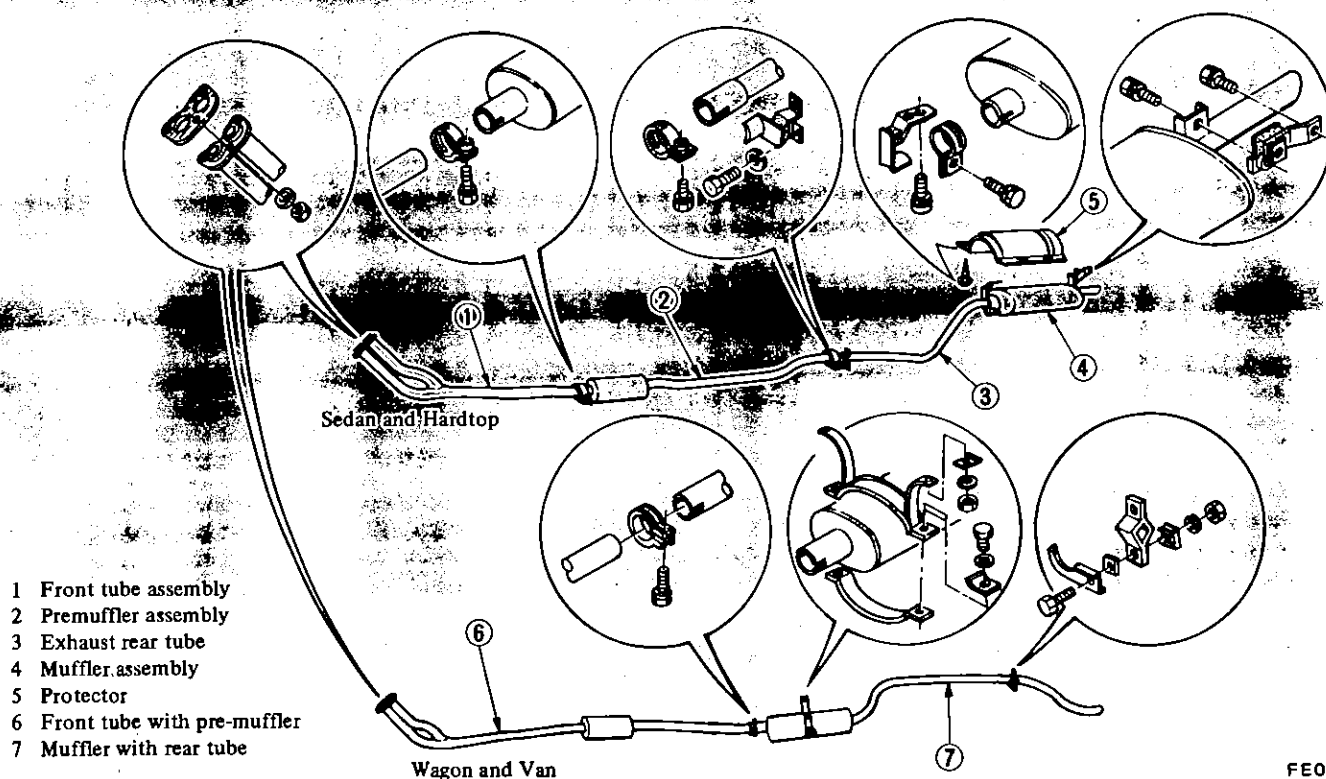


Fig. FE-15 Exhaust system

REMOVAL

1. Remove nuts securing exhaust manifold to front tube.

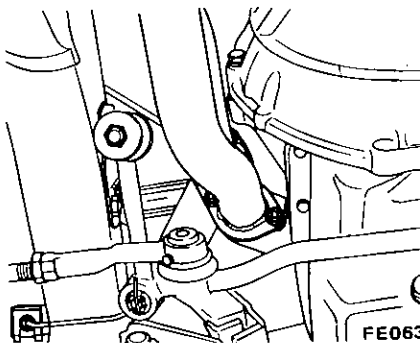


Fig. FE-16 Removing front tube

2. Remove bolts from clamps. The exhaust system can then be taken out easily.

3. If necessary, remove mounting brackets and hangers.

INSPECTION

1. Check muffler and tubes for cracks or damage.

ENGINE CONTROL, FUEL & EXHAUST SYSTEM

Replace any part that is damaged beyond limits.

2. Replace bracket and hanger rubber parts that are cracked, fatigued, or sweated.

INSTALLATION

To install, reverse the order of removal. Observe the following general instructions.

Notes:

- a. Make sure that there is a minimum clearance of 18 mm (0.709 in) between body or frame and exhaust system component parts.
- b. After installation, check to be sure that mounting hangers and brackets are placed without an undue stress. Failure to follow this caution could result in excessive noise or vibration transmitted to car body.
- c. Check all tube connections for

leaks, entire system for unusual noise, etc. with the engine running.

Tightening torque:

Exhaust manifold and front tube nuts

1.9 to 2.5 kg-m
(14 to 18 ft-lb)

Other bolts and nuts

1.0 to 1.5 kg-m
(7.2 to 10.9 ft-lb)

SERVICE MANUAL

DATSUN 1800
MODEL 610 SERIES
CHASSIS & BODY



NISSAN MOTOR CO., LTD.
TOKYO, JAPAN

SECTION BF

BODY

GENERAL DESCRIPTION	BF-2
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BF

BODY

GENERAL DESCRIPTION

The 610 model series has three body types such as Sedan, Hardtop and Station Wagon/Van. Each body is of unitized construction succeeded to the 510 model series, being robust, light, and safe.

The body style has a long nose and short deck. The engine room is wide enough for easy accessibility. On Sedan and Hardtop models, the trunk has a large capacity because of lowered spare tire compartment.

Insulating the floor portion from the shock absorber mounting mem-

ber, it is difficult to transmit directly vibration to the floor panel in construction.

Under coating is applied to the lower surface of the floor. Also, asphalt seats adhere on the upper surface of the floor so that vibration and noise can be reduced in the cabin.

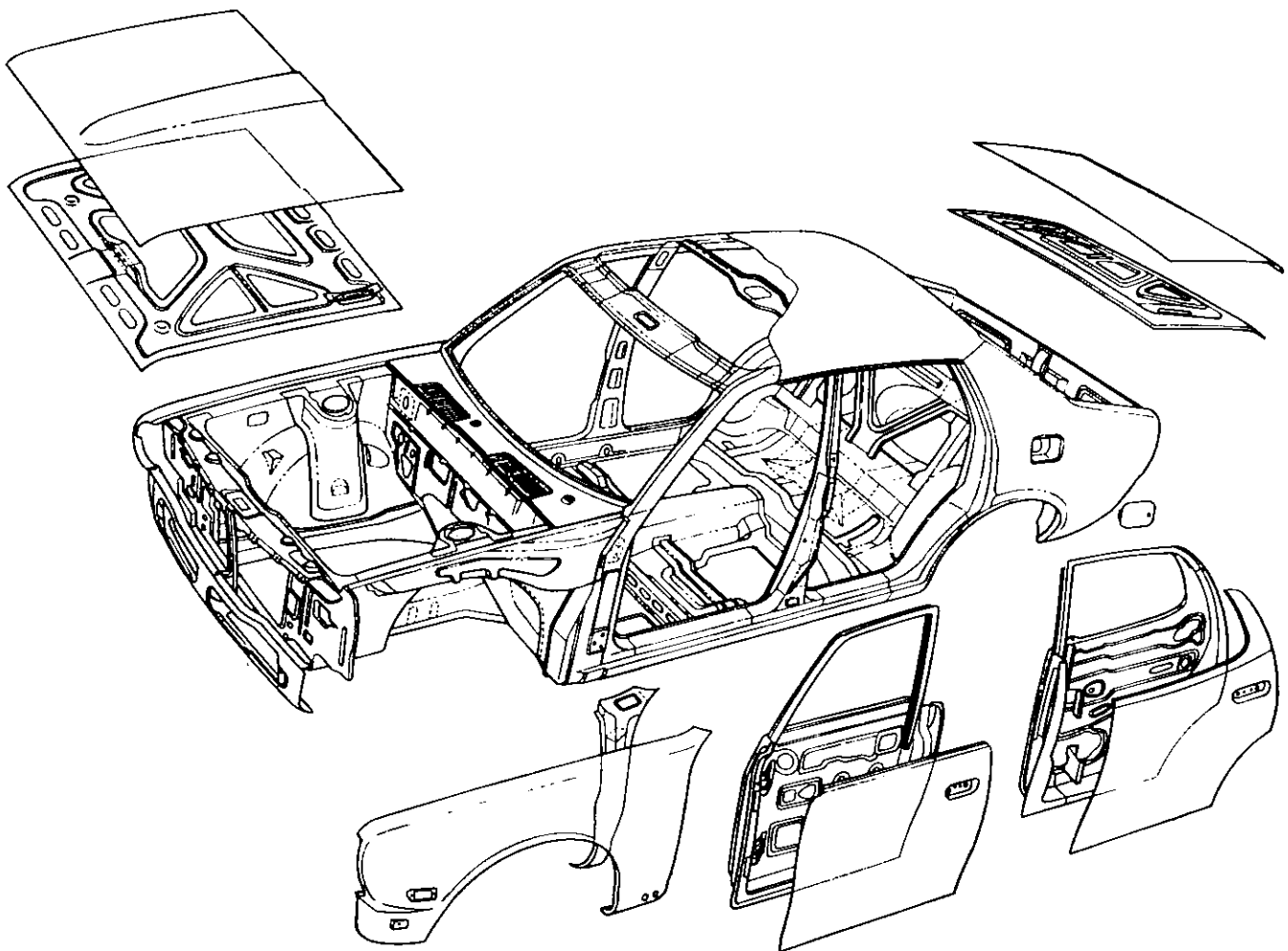
To wash inside, the floor provides with water drain holes.

The front and rear ends of the body are so constructed as to absorb impact energies during a crash.

On Hardtop model, the front pillar, door support, roof rail, and rear quarter are specially reinforced due to a wider door dimension.

The body parts for three models have interchangeability to a great extent. For instance, the hood, front fender, hood ledge, front door, and dash board for Sedan are the exactly same as the ones of Station Wagon/Van.

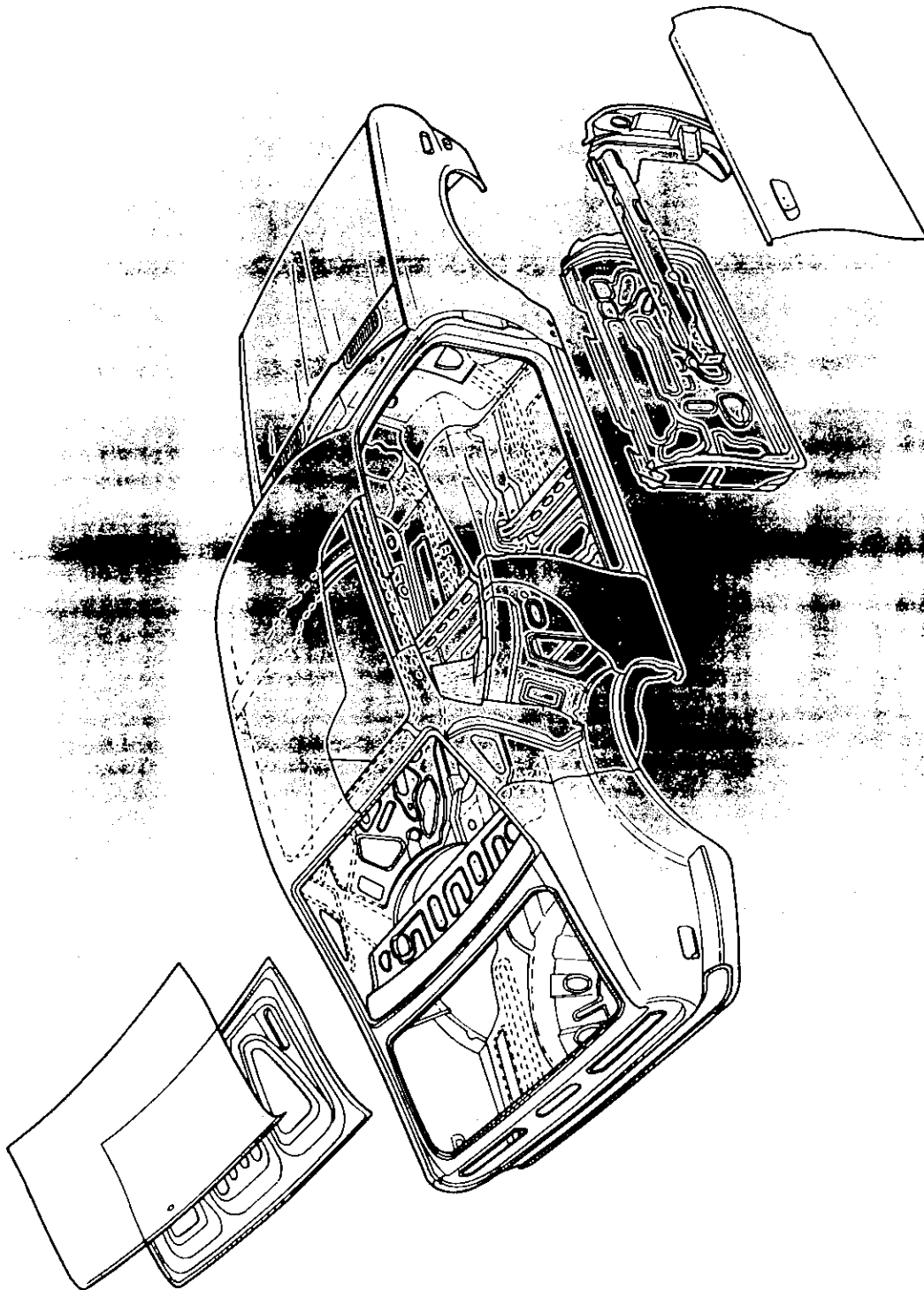
The air and water tightness is more improved on the door, weatherstrips, and welded panel portion.



BF405

Fig. BF-1 Body construction of the Sedan

BODY

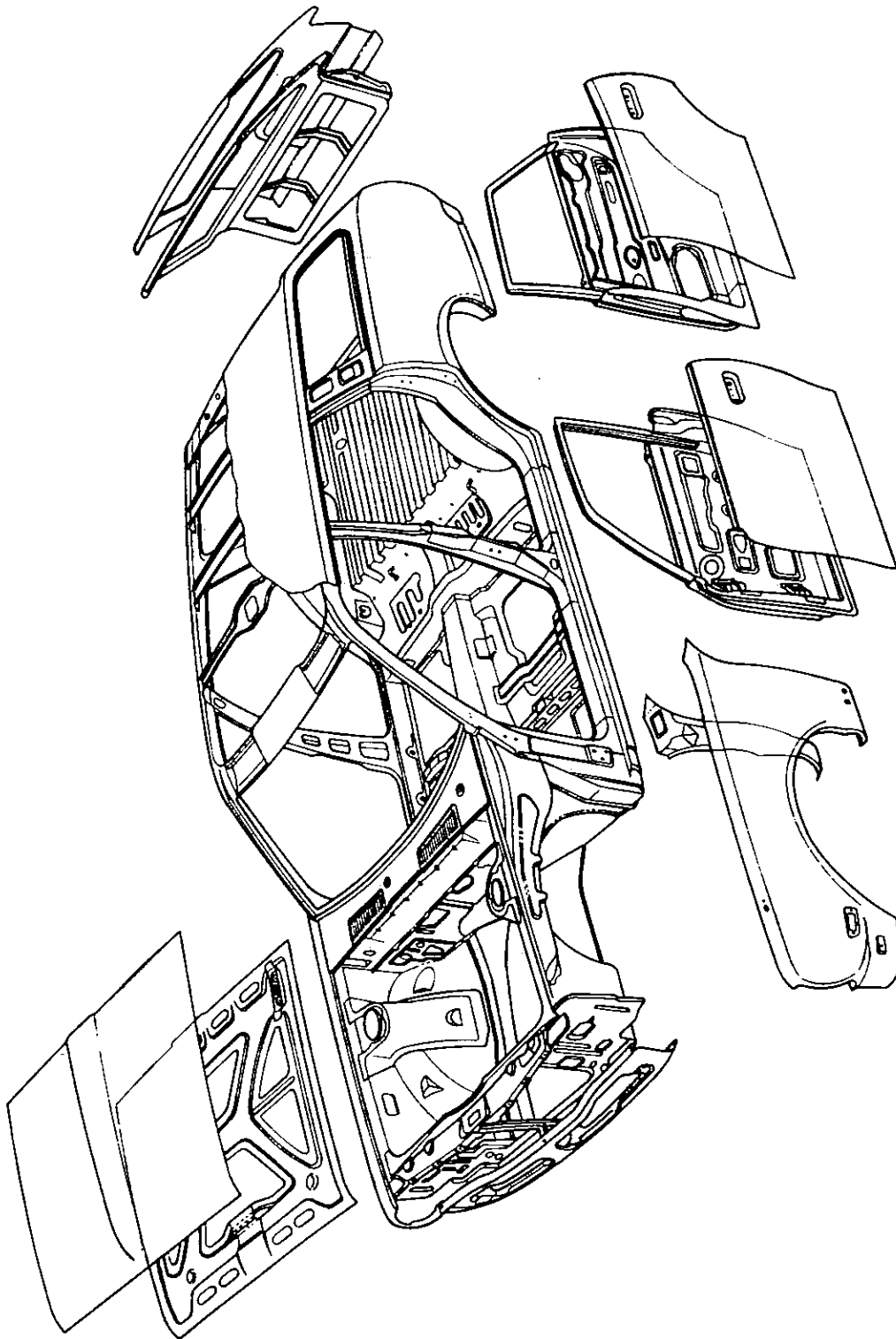


BF406

Fig. BF-2 Body construction of the Hardtop

BF-3

BODY



BF407

Fig. BF-3 Body construction of the Station Wagon and Van

BF-4

UNDERBODY ALIGNMENT

CONTENTS

UNDERBODY GENERAL SERVICE INFORMATION	BF-5	TRAMMING SEQUENCE	BF-5
ALIGNMENT CHECKING PROCEDURE	BF-5	Sedan and Hardtop	BF-6
PRINCIPLES OF TRAMMING	BF-5	Hardtop	BF-7
CAR PREPARATION	BF-5	Station Wagon and Van	BF-8

UNDERBODY GENERAL SERVICE INFORMATION

Since each underbody component directly affects the overall strength of the body, it is essential that proper welding, sealing and rust-proofing techniques be observed during service operations.

Whenever the body is repaired, be sure to provide the repaired body parts with rust-proof.

In the case of a rust-proofing critical underbody component, it is essential that a good quality type air dry primer such as corrosion resistant zinc chromate be used.

Do not use combination type primer surfacers.

ALIGNMENT CHECKING PROCEDURE

Misalignment in the underbody affects the front fender, door, trunk lid and window alignments, and also the tail gate and rear body opening alignments in the case of the Station Wagon and Van. Underbody misalignment particularly affects the suspension system, thereby causing various problems that arise from suspension misalignment. It is essential that underbody components be aligned within the specified dimensions given in Figure BF-4 through BF-6.

In the event of collision, it is important that underbody alignment be thoroughly checked and if necessary, realigned to the specified dimensions.

There are many tools that may be employed to correct collision damage such as frame straightening machines, external pulling equipment, other standard body jacks.

To assist in checking alignment of the underbody components, repairing minor underbody damage or locating replacement parts, the following underbody dimensions and alignment checking information are presented.

PRINCIPLES OF TRAMMING

Figure BF-4 through BF-6 show reference locations required to determine the extent of misalignment present in underbody structure; the reference locations are symmetrical about the center line of the vehicle.

Tramming underbody correctly calls for two measurements; the vertical dimension from the datum line to the points to be measured, and the horizontal distance between any two points of measurement.

Note that precision measurement can be made only when the tramming gauge is parallel to the underbody.

Here we take the distance "L" in Figure BF-6 and BF-7 as an example in which the two reference points to be measured are not on a horizontal plane. That is, the distance line "L"

is 80 mm (3.15 in) in height at the front and 155 mm (6.10 in) at the rear.

It will be seen that the vertical pointer of tram gauge should be extended 75 mm (2.95 in) longer at the rear than at the front, to bring the gauge parallel to the center of the underbody. If one of the two reference points is included in misaligned area, the parallel plane between the body and tram gauge may not exist, indicating the necessity of underbody repair.

CAR PREPARATION

Preparing the vehicle for the underbody alignment, check involves the following.

1. Place the vehicle on a level surface.
2. The weight of the car should be supported at wheel locations.
3. A visual damage inspection should be made to eliminate unnecessary measuring. Obviously damaged or misaligned areas may often be located visually.

TRAMMING SEQUENCE

The tramming sequence will vary depending upon the nature and location of the misaligned area. Prior to performing any tramming operation, the accuracy of reference points to be used must be determined. A measurement that originates

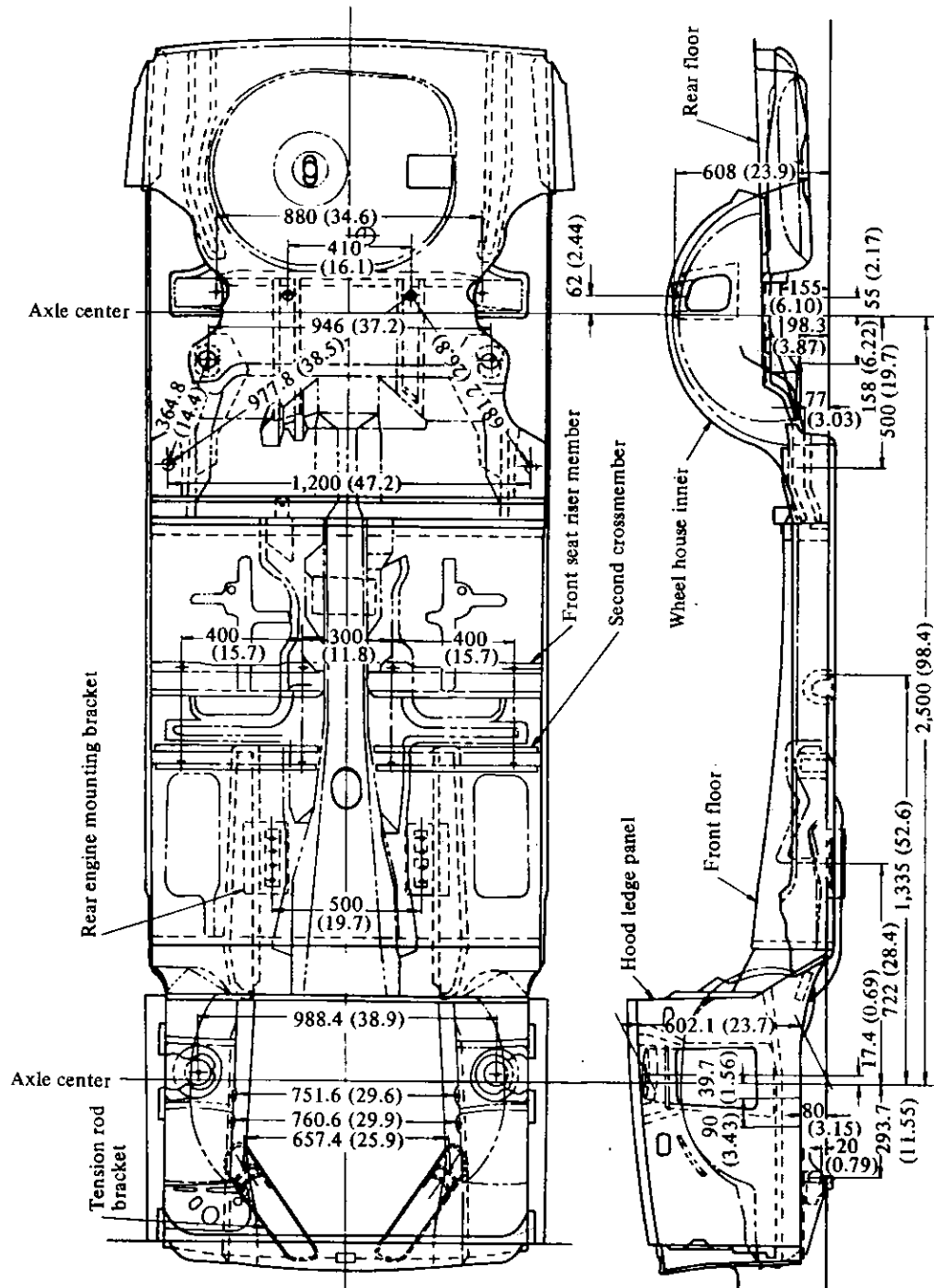
BODY

from a reference point included in a damaged area will produce untrue results and confuse the evaluation of the underbody condition. Unlike the conventional type of frame design, the unitized type of body construction seldom develops the condition of "diamond" in the floor pan area as a

result of front or rear end collision. Therefore, underbody alignment checking can usually originate from the body floor pan area. If inspection indicates that these locations have been disturbed and are not suitable for measuring, one of the undamaged suspension locations should be used

as an initial reference point. If a rare situation should exist where all of these locations are not suitable as reference points, repair operations should begin with the body floor pan area. All other underbody components should be aligned progressively from this area.

Sedan and Hardtop



BF408

Fig. BF-4 Underbody alignment (Sedan and Hardtop)

Unit: mm (in)

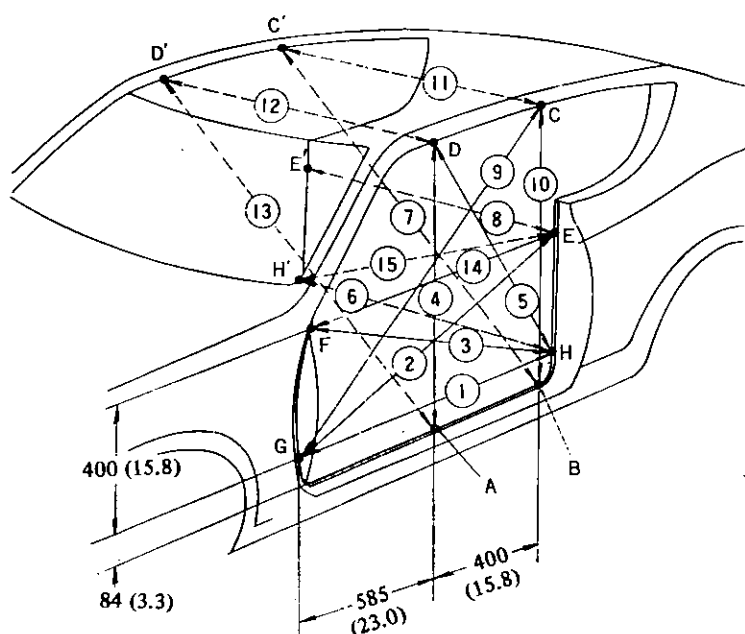
BODY

Hardtop

The door surrounding body should be repaired according to the following

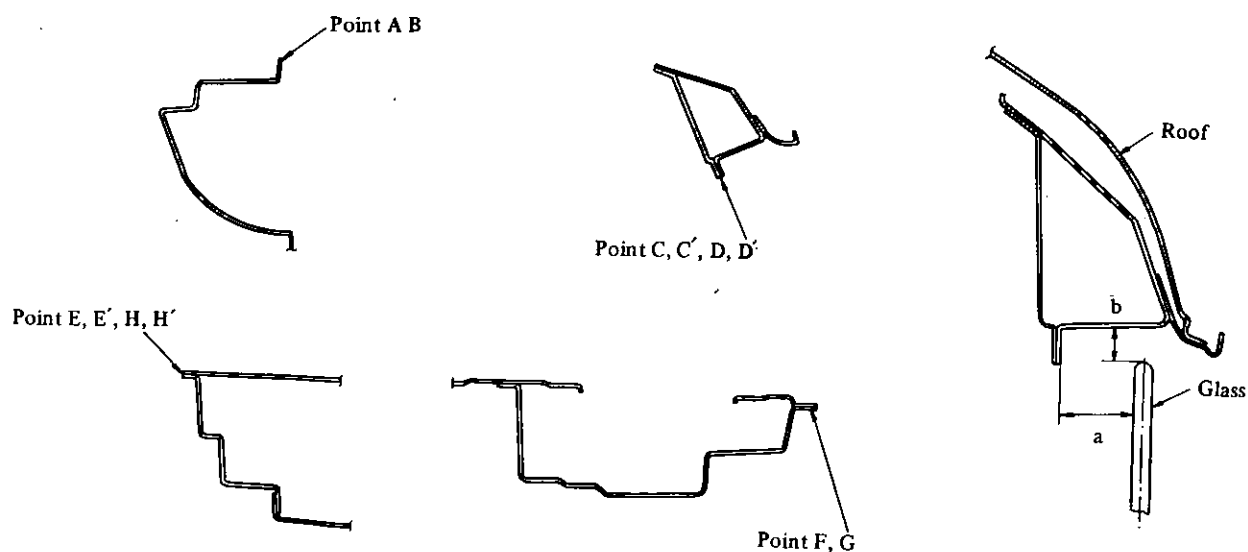
specifications. The body should also be repaired so that the distance

between door glass and the door surrounding panels becomes equal.



No.	Measurement position	Length mm (in)
1	G to H	1046.0 (41.2)
2	G to E	1137.2 (44.8)
3	F to H	1090.5 (42.9)
4	A to D	902.2 (35.5)
5	D to H	939.5 (37.0)
6	H to H'	1336.0 (52.6)
7	B to C	1516.6 (59.7)
8	E to E'	1303.0 (51.3)
9	C to G	1281.5 (50.5)
10	B to C	903.2 (35.6)
11	C to C'	1116.0 (43.9)
12	D to D'	1116.6 (44.0)
13	A to D'	1516.3 (59.7)
14	E to F	1033.0 (40.7)
15	F to H'	1374.1 (54.1)

Tolerance error ± 2 mm (0.0787 in)

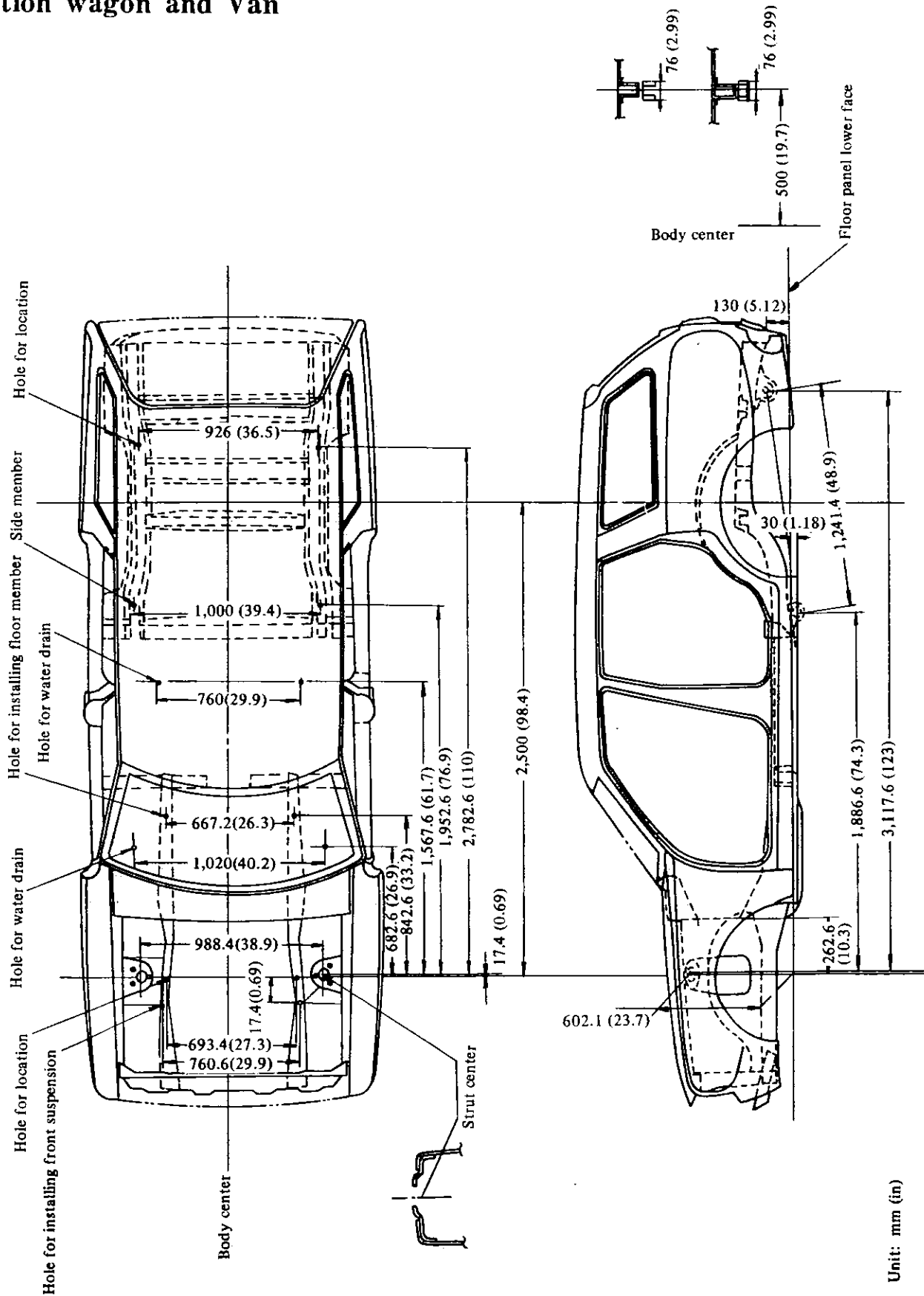


BF409

Fig. BF-5 Side body alignment

BODY

Station wagon and Van



BF410
Fig. BF-6 Underbody alignment (Station wagon and Van)

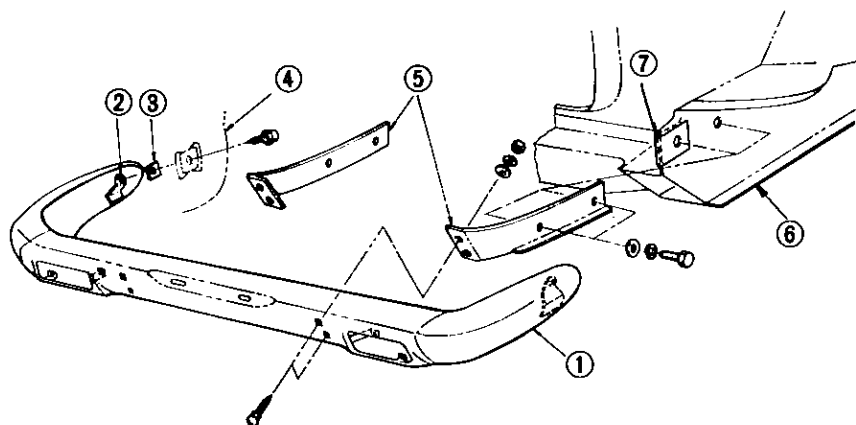
BUMPERS

CONTENTS

FRONT BUMPER	BF- 9	REAR BUMPER	BF- 9
Removal	BF- 9	Removal	BF- 9
Installation	BF- 9	Installation	BF-10

FRONT BUMPER

Removal

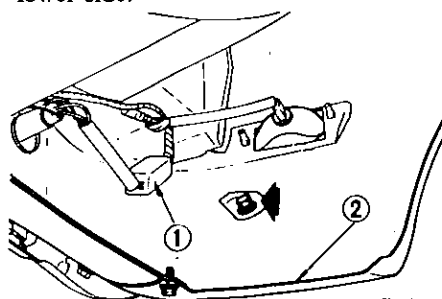


BF411

- | | |
|-----------------------------|---------------------|
| 1 Front bumper | 5 Front bumper stay |
| 2 Front bumper side bracket | 6 Body side member |
| 3 Shim | 7 Spring nut |
| 4 Front fender | |

Fig. BF-7 Exploded view of front bumper

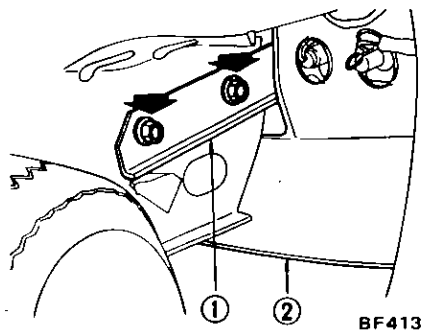
1. Disconnect front turn signal lamp wire connectors.
2. Remove bolts retaining front bumper side bracket to front fender lower side.



- 1 Connector 2 Front fender

Fig. BF-8 Removing front bumper side bracket installation bolt

3. Remove bolts retaining front bumper stay to body side member and draw front bumper out of body.



- 1 Front bumper stay
2 Front apron

Fig. BF-9 Removing front bumper stay installation bolts

Installation

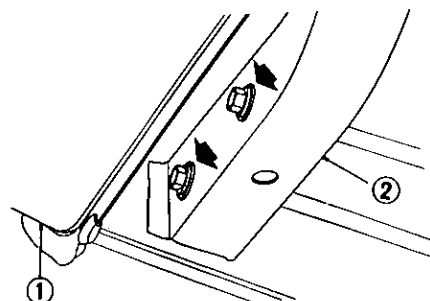
Install front bumper in reverse sequence of removal, noting the following point.

Adjust bumper for proper alignment and tighten bolts securing bumper.

REAR BUMPER

Removal

1. Disconnect wire connectors of lamp for license number plate. It is not necessary to disconnect them for the Station wagon and Van.
2. Remove bolts retaining rear bumper stay to body side member and draw rear bumper out of body.



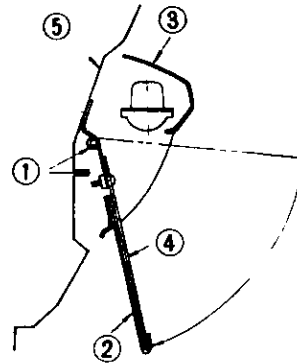
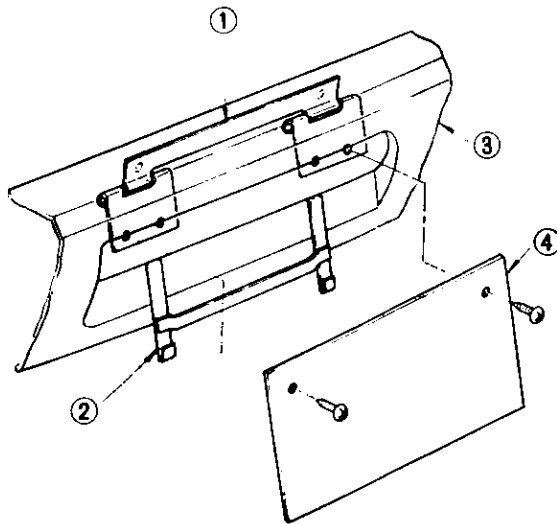
BF414

- 1 Rear fender
2 Body side member

Fig. BF-10 Removing rear bumper stay installation bolts

For the Sedan and Hardtop;

It is not necessary to remove rear license number plate as it is installed to body independently.



BF415

- 1 License number plate holder
- 2 Hook
- 3 Rear bumper
- 4 License number plate
- 5 Rear panel

Fig. BF-11 Exploded view of rear license number plate

Installation

Install rear bumper in reverse sequence of removal.

RADIATOR GRILLE AND FRONT APRON

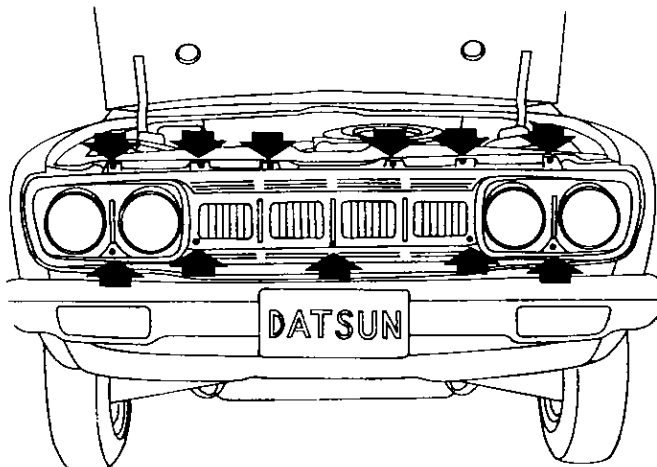
CONTENTS

REMOVAL BF-10

INSTALLATION BF-11

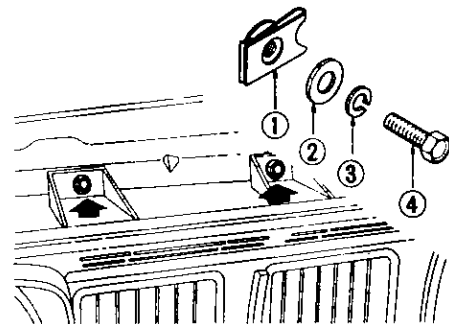
REMOVAL

1. Remove front bumper.
2. Remove radiator grille attaching screws and remove radiator grille.



BF416

Fig. BE-12 Removing screws attaching radiator grille

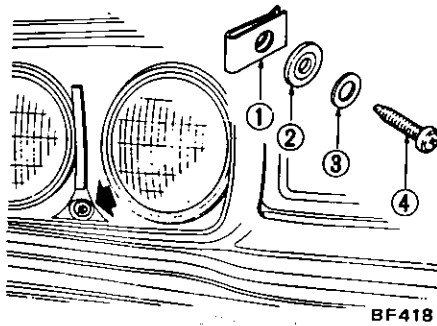


- 1 Spring nut
- 2 Plain washer
- 3 Spring washer
- 4 Screw

BF417

Fig. BF-13 Removing upper attaching screw and spring nut

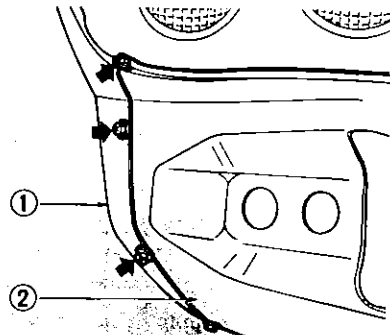
BODY



- 1 Spring washer 3 Washer
2 Vinyl washer 4 Screw

Fig. BF-14 Removing lower attaching screw, washer, vinyl washer and spring nut

3. Remove screws attaching front apron to front fender.

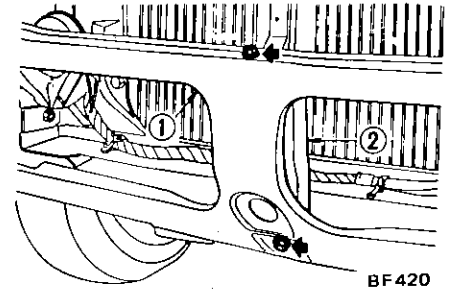


BF419

- 1 Front fender
2 Front apron

Fig. BF-15 Removing screws attaching front apron to fender

4. Remove screws attaching front apron to hood lock stay and remove front apron.



BF420

1 Front apron 2 Hood lock stay
Fig. BF-16 Removing screws attaching front apron to hood lock stay

INSTALLATION

Install radiator grille and front apron in reverse sequence of removal.

When installing radiator grille, proceed the following manners:

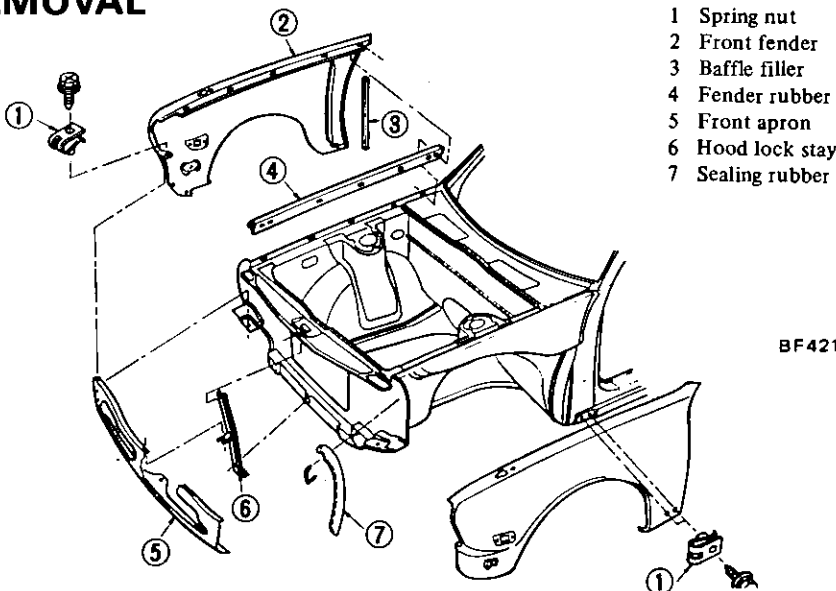
1. Install lower center attaching screw first and then install other screws.
2. Be careful not to spill brake fluid, engine oil and any other chemical fluids on radiator grille to prevent from damage.

FRONT FENDERS

CONTENTS

REMOVAL BF-11 INSTALLATION BF-12

REMOVAL



BF421

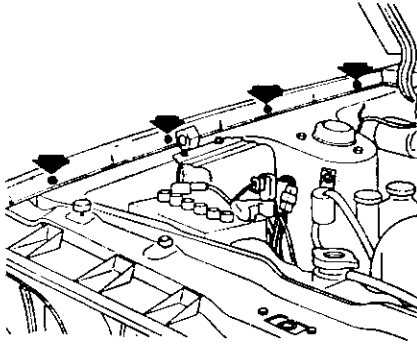
Fig. BF-17 Exploded view of front fenders and apron

1. Open engine hood and support it in open position with a stay.

2. Remove front bumper, radiator grille, front apron, windshield wiper blades, cowl top grille and sill mouldings in the order.

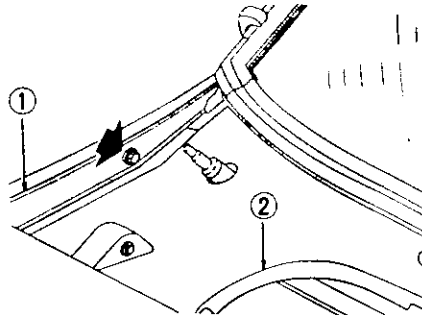
3. Remove fender attaching screws shown in the following illustrations:

BODY



BF422

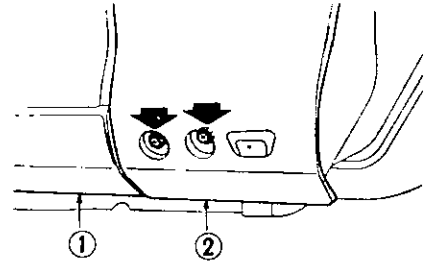
Fig. BF-18 Removing screws attaching hood ledge to front fender



BF423

- 1 Front fender
- 2 Cowl top panel

Fig. BF-19 Removing screw attaching cowl top panel to front fender



BF424

- 1 Body sill
- 2 Front fender

Fig. BF-20 Removing screws attaching body sill to front fender lower end

INSTALLATION

Install front fenders in reverse sequence of removal.

ENGINE HOOD AND COWL TOP GRILLE

CONTENTS

ENGINE HOOD	BF-12	COWL TOP GRILLE AND	
Removal	BF-12	HOOD HINGE	BF-13
Installation	BF-12	Removal	BF-13
HOOD ALIGNMENT	BF-12	Installation	BF-14

ENGINE HOOD

Removal

1. Open engine hood and protect body with covers to prevent scratch to the paint.
2. Mark hood hinge locations on hood for proper reinstallation.
3. Support engine hood with hand and remove bolts securing hood hinge to hood, taking care not to let the hood slip when the bolts are removed.

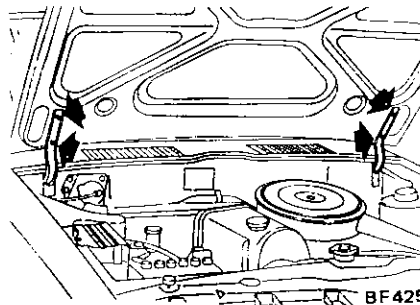


Fig. BF-21 Removing bolts attaching hood

4. Remove hood from vehicle.

Installation

Install hood in reverse sequence of removal.

HOOD ALIGNMENT

Hood can be adjusted by bolts attaching hood to hood hinge, hood lock mechanism and hood bumpers. Adjust hood for an even fit between front fenders and for a flush fit with the front of fenders.

Adjust hood according to the following procedures:

1. Adjust hood fore and aft and from side to side by loosening bolts attaching hood to hinge and repositioning hood.

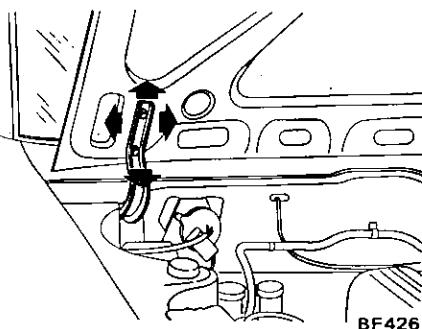


Fig. BF-22 Adjusting bolts attaching hood

2. Loosen hood bumper lock nuts and lower bumpers until those bumpers do not contact with the front of hood when hood is closed.

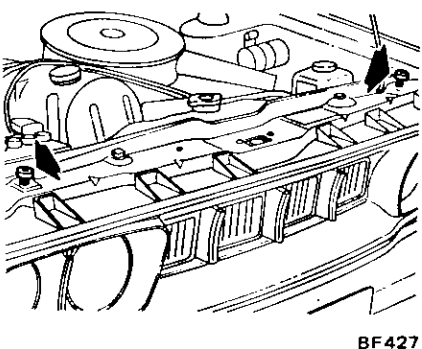


Fig. BF-23 Adjusting hood bumper height

3. Adjust hood lock mechanism after hood has been properly aligned. Hood lock male can be moved fore and aft and from side to side to align it with hood lock female by loosening attaching bolts.

Hood lock male can also be moved up and down.

Loosen lock nut of hood lock male and move hood lock male up and down by turning it clockwise or counterclockwise as required.

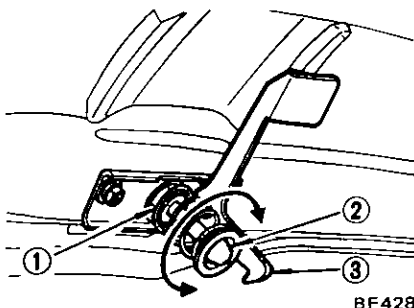


Fig. BF-24 Adjusting hood lock male

4. Lower engine hood 1 to 3 mm (0.039 to 0.12 in) from the top of front fender by adjusting hood lock male.
5. Raise two hood bumpers until engine hood is flush with fenders.
6. Tighten hood lock male lock nut after the proper adjustment has been obtained.
7. Make sure that female lever locks hood lock male securely when hood is closed, and also safety catch retains hood properly when hood lock is released (See Figure BF-26).

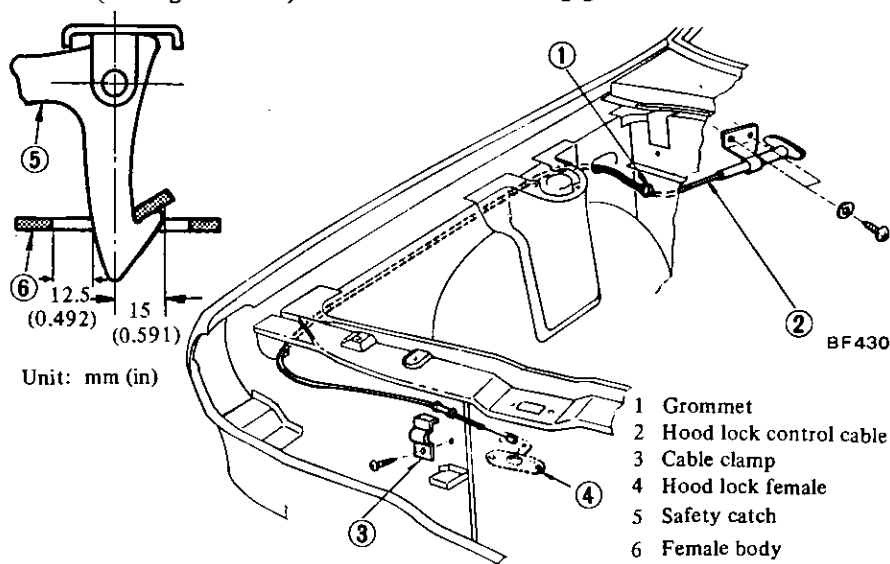


Fig. BF-26 Exploded view of hood lock control

COWL TOP GRILLE AND HOOD HINGE Removal

1. Open engine hood.
2. Mark hood hinge locations on

hood.

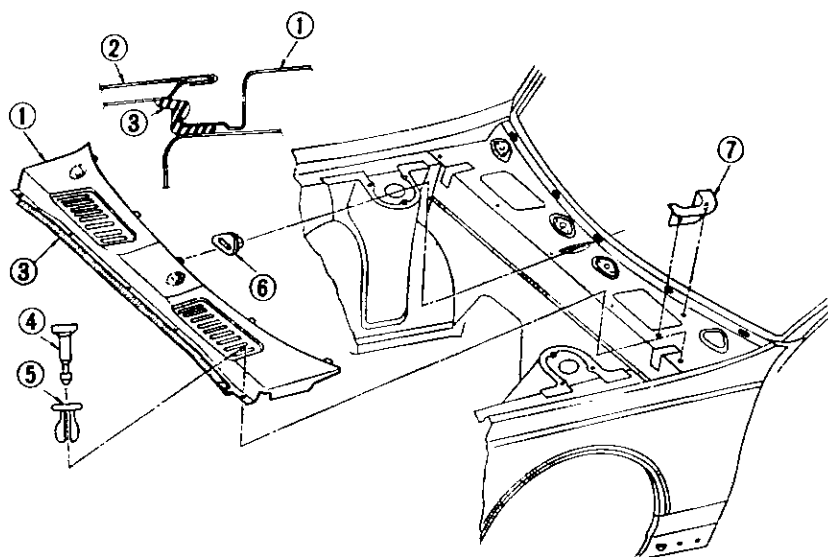
3. Protect body with covers to prevent scratch to the paint.
4. Remove engine hood from hood hinge.
5. Remove windshield wiper blades.

BODY

6. Pull up inner and outer fasteners which retain cowl top grille front end using a flat-headed screwdriver.

7. Draw cowl top grille forwards. Cowl top grille can also be removed without removing engine hood.

8. Remove hood hinge clamp, pull hood hinge pin out of hood hinge bracket and remove hood hinge.



- | | |
|---------------------------|-------------------------|
| 1 Cowl top grille | 5 Outer fastener |
| 2 Engine hood | 6 Cowl top panel cap |
| 3 Cowl top sealing rubber | 7 Cowl top baffle plate |
| 4 Inner fastener | |

BF431

Fig. BF-27 Exploded view of cowl top grille

Installation

Install cowl top grille and hood hinge in reverse sequence of removal.

TRUNK LID (Sedan and Hardtop)

CONTENTS

TRUNK LID	BF-14	Removal and installation	BF-15
Removal and installation	BF-14	TRUNK LID LOCK CYLINDER	BF-16
Adjustment	BF-14	Removal	BF-16
TORSION BAR	BF-15	Installation	BF-16
Removal	BF-15	TRUNK LID WEATHERSTRIP	BF-16
Installation	BF-15	Removal and installation	BF-16
TRUNK LID HINGE	BF-15		

TRUNK LID

Removal and installation

1. Open trunk lid and cover rear fenders.
2. Mark trunk lid hinge locations on trunk lid for proper reinstallation.
3. Support trunk lid by hand and remove bolts attaching trunk lid to hinge and remove trunk lid.

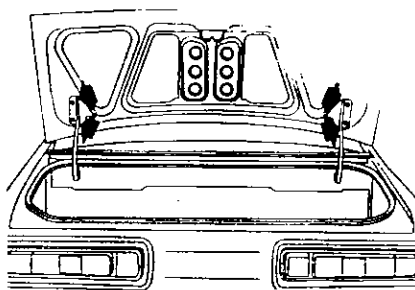
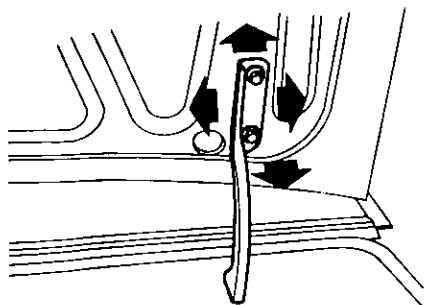


Fig. BF-28 Removing bolts attaching truck lid to hinge

4. Install trunk lid in reverse sequence of removal.

Adjustment

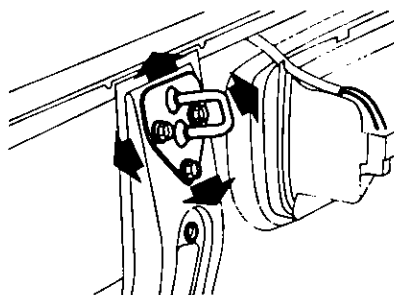
1. Loosen bolts attaching trunk lid to hinge and move trunk lid from side to side and fore and aft to align it with striker located on rear panel.



BF433

Fig. BF-29 Adjusting truck lid

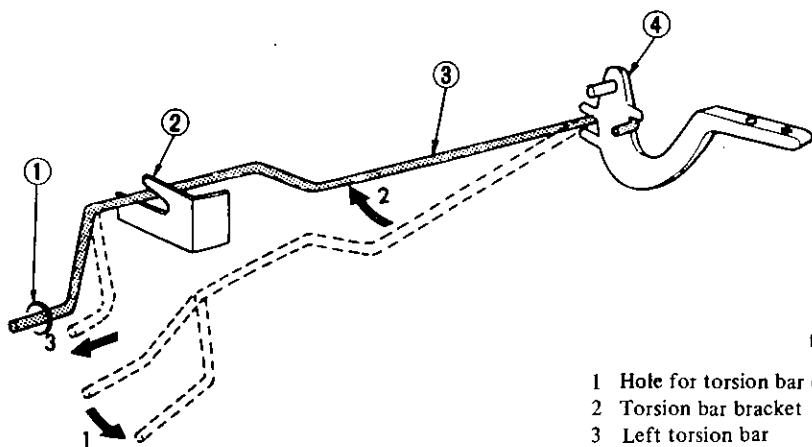
2. To obtain a snug fit between trunk lid and weatherstrip, move striker up or down and from side to side as required.



BF434

Fig. BF-30 Adjusting truck lid lock striker

Installation



BF436

- 1 Hole for torsion bar end
- 2 Torsion bar bracket
- 3 Left torsion bar
- 4 Left trunk lid hinge

Fig. BF-32 Installing left torsion bar

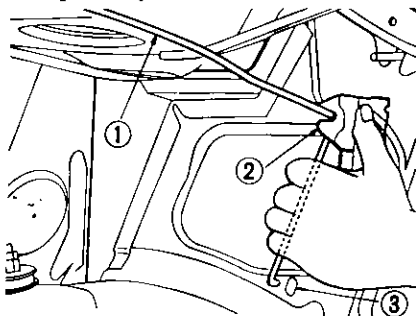
1. Support trunk lid in the open position.

2. Position the end of right torsion bar first to right trunk lid hinge.

TORSION BAR

Removal

1. Open trunk lid.
2. Loosen screws attaching trunk room finisher and remove the finisher from the vehicle.
3. Support trunk lid in the open position and draw the end of left torsion bar out of the hole drilled at side panel by hand.

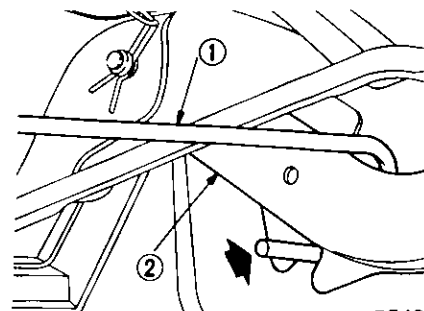


BF435

- 1 Left torsion bar
- 2 Torsion bar bracket
- 3 Hole for torsion bar end

Fig. BF-31 Drawing out torsion bar end

4. Remove torsion bar from torsion bar bracket and hinge.
5. Remove right torsion bar in the same manner above.

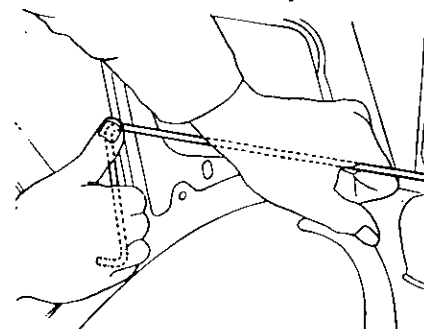


BF437

- 1 Torsion bar
- 2 Trunk lid hinge

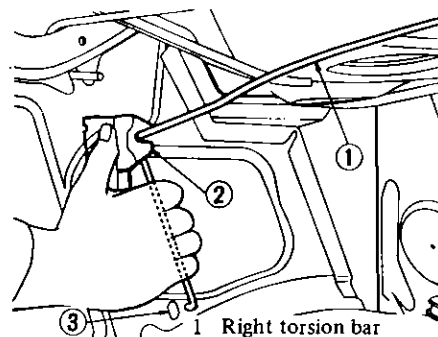
Fig. BF-33 Positioning the end of right torsion bar to hinge

3. Twist torsion bar backwards and engage the bar in torsion bar bracket.
4. Then, insert the end of torsion bar into the hole at side panel.



BF438

Fig. BF-34 Twisting torsion bar



BF439

- 1 Right torsion bar
- 2 Torsion bar bracket
- 3 Hole for torsion bar end

Fig. BF-35 Inserting the end of right torsion bar into the hole

5. Install left torsion bar in the same manner above.

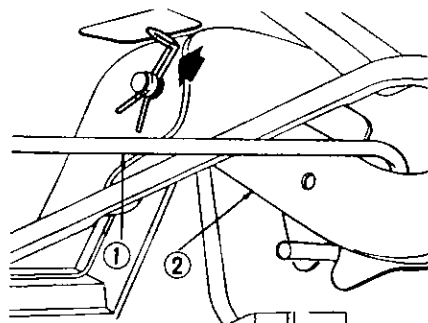
TRUNK LID HINGE

Removal and installation

1. Open trunk lid and protect body with covers.

BODY

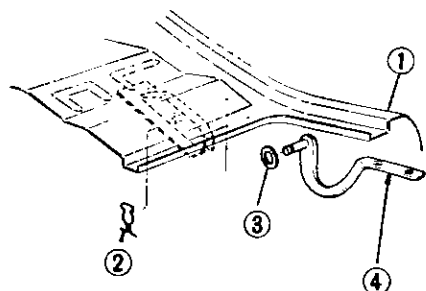
2. Remove trunk lid.
3. Remove torsion bars.
4. Pull hinge clamps out of right and left hinges and remove washers and hinges from the vehicle.



BF440

- 1 Torsion bar
- 2 Trunk lid hinge

Fig. BF-36 Removing truck lid hinge clamp



BF441

- 1 Rear fender
- 2 Hinge clamp
- 3 Washer
- 4 Trunk lid hinge

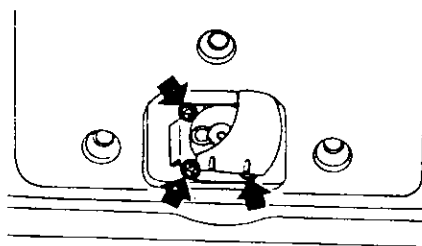
Fig. BF-37 Removing truck lid hinge

5. Install hinges in reverse sequence of removal.

TRUNK LID LOCK CYLINDER

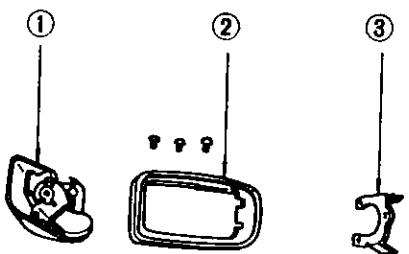
Removal

1. Open trunk lid.
2. Remove trunk lid lock from trunk lid.
3. Loosen screws retaining cylinder and pull cylinder out of trunk lid.



BF442

Fig. BF-38 Removing cylinder attaching screws

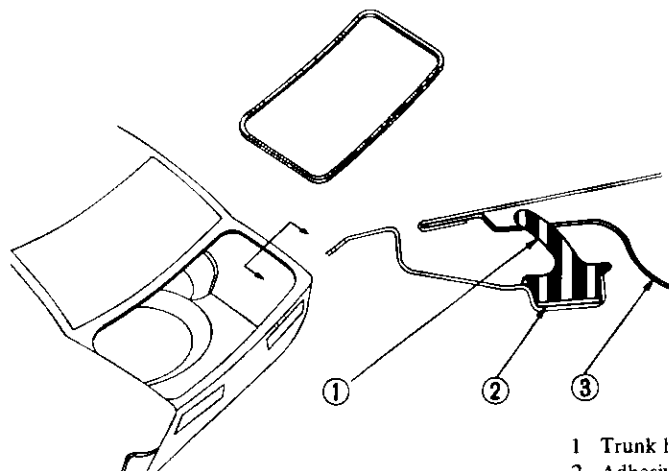


BF443

- 1 Lock cylinder
- 2 Insulator
- 3 Clip

Fig. BF-39 Component parts of lock cylinder

TRUNK LID WEATHERSTRIP



BF445

- 1 Trunk lid weatherstrip
- 2 Adhesive
- 3 Trunk lid

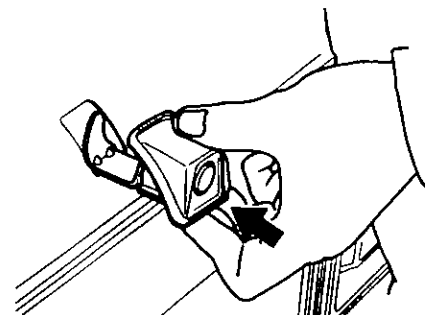
Fig. BF-41 Sectional view of trunk lid weatherstrip

Removal and installation

1. Remove weatherstrip from body and wipe the remaining adhesive away from body with non-lead gasoline and then wash the surface with water.
2. Coat adhesive to body side and

Installation

1. Assemble lock cylinder and insert and push it into position until clip secures lock cylinder.



BF444

Fig. BF-40 Pushing lock cylinder into position

3. After coating adhesive, leave it for drying for a while, install and press the corners first and then press the other parts.

TAIL GATE (Station wagon and Van)

CONTENTS

REMOVAL AND INSTALLATION	BF-17	TAIL GATE LOCK AND	
TAIL GATE ALIGNMENT	BF-17	STRIKER	BF-18
TAIL GATE TORSION BAR	BF-17	Removal and installation	BF-18
Removal and installation	BF-17	Adjustment	BF-18
TAIL GATE HINGE	BF-17	TAIL GATE LOCK CYLINDER	BF-18
Removal and installation	BF-17	Removal	BF-18
		Installation	BF-18

REMOVAL AND INSTALLATION

1. Open tail gate and support it in open position.
2. Remove bolts attaching tail gate to tail gate hinge and remove tail gate from the hinge.

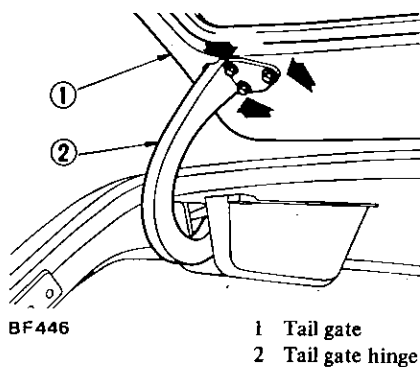


Fig. BF-42 Removing tail gate

3. Install tail gate in reverse sequence of removal.

TAIL GATE ALIGNMENT

Tail gate can be moved up and down and from side to side by loosening bolts attaching tail gate to tail gate hinge. The fore and aft adjustment is obtained by loosening bolts attaching tail gate hinge to body.

Tail gate should be adjusted for an even and parallel fit with the tail gate opening.

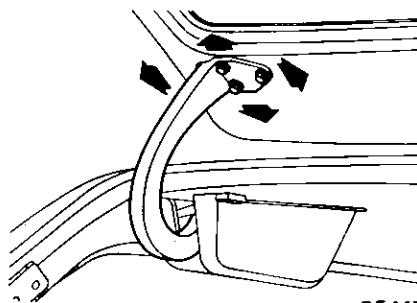


Fig. BF-43 Adjusting tail gate up and down and from side to side

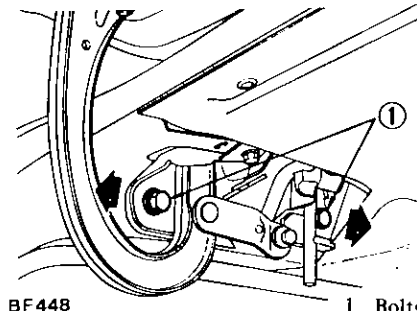


Fig. BF-44 Adjusting tail gate fore and aft

TAIL GATE TORSION BAR

Removal and installation

1. Open tail gate and support it in open position.
2. Loosen screws attaching tail gate hinge cover and remove the cover.

3. Loosen screws attaching head lining rear end and remove head lining rear portion from tail rail panel.

4. Support tail gate and remove left torsion bar painted by a yellow color first from the bracket "D" and "C" using a suitable pipe. See Figure BF-45.

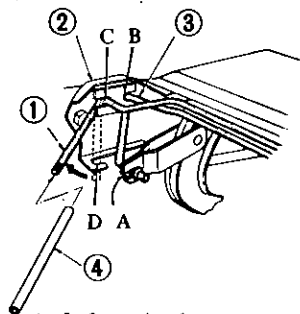


Fig. BF-45 Removing torsion bars

5. Remove right torsion bar in the same manner above.

6. Install torsion bars in reverse sequence of removal.

TAIL GATE HINGE

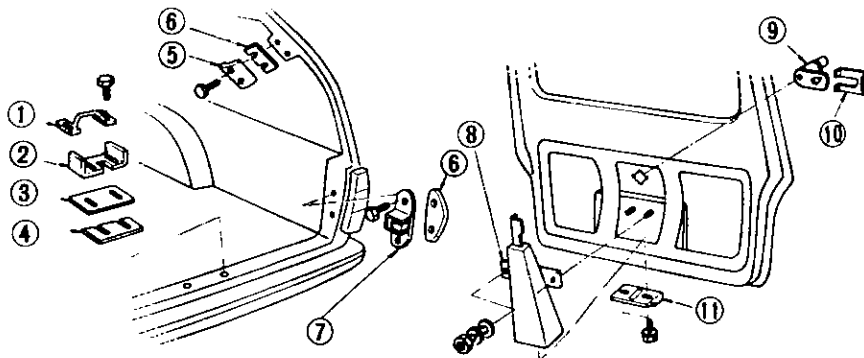
Removal and installation

1. Open tail gate and support it in the open position.
2. Remove tail gate from hinge.

3. Remove tail gate hinge cover.
4. Remove head lining rear portion from tail rail panel.
5. Remove torsion bars.
6. Loosen bolts attaching hinge and remove hinge from the vehicle.
7. Install hinge in reverse sequence of removal.

TAIL GATE LOCK AND STRIKER

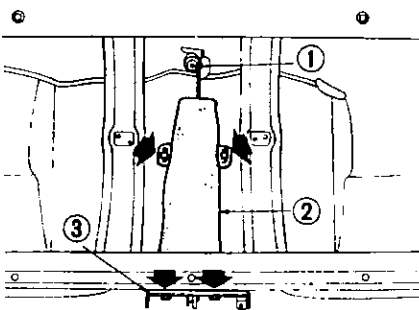
Removal and installation



- BF450
- | | | |
|--------------------|------------------|------------------------------|
| 1 Striker | 5 Bumper rubber | 9 Lock cylinder |
| 2 Tab tail striker | 6 Shim | 10 Clip |
| 3 Friction plate | 7 Down stopper | 11 Tail gate striker catcher |
| 4 Shim | 8 Tail gate lock | |

Fig. BF-46 Exploded view of tail gate lock and striker

1. Open tail gate and support it in the open position.
2. Remove screws attaching tail gate trim and remove trim and sealing screen from tail gate.
3. Loosen bolts attaching tail gate lock and remove the lock and striker catcher from tail gate.
4. Loosen bolts attaching striker and remove striker from the vehicle.
5. Install tail gate lock, striker catcher and striker in reverse sequence of removal.



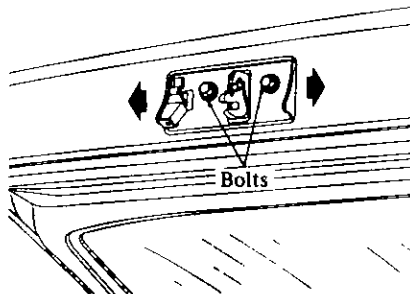
- BF451
- | |
|-------------------|
| 1 Lock cylinder |
| 2 Tail gate lock |
| 3 Striker catcher |

Fig. BF-47 Removing tail gate lock

4. Loosen bolts attaching striker and remove striker from the vehicle.

Adjustment

1. Striker catcher can be adjusted from side to side, and striker can be adjusted fore and aft. Before adjusting tail gate lock, make sure that tail gate is properly aligned.



- BF452
- Fig. BF-48 Adjusting striker catcher from side to side

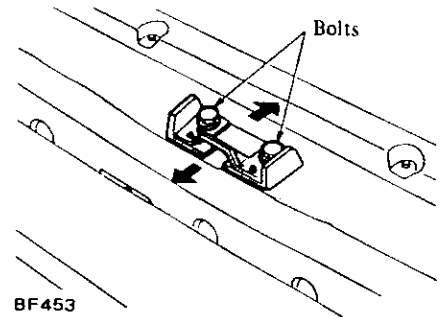


Fig. BF-49 Adjusting striker fore and aft

2. To make good contact striker with catcher, loosen attaching bolts and move them as required.
 3. Loosen down stopper attaching bolts and move down stopper up or down to align it with stopper located on both sides of tail gate.
- Then, tighten attaching bolts.

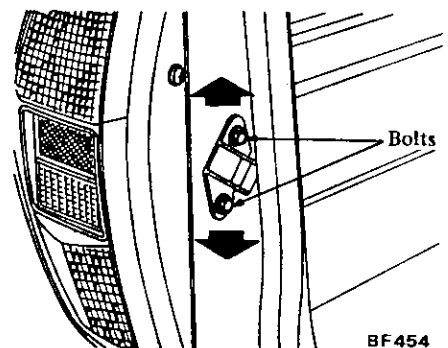


Fig. BF-50 Adjusting down stopper

TAIL GATE LOCK CYLINDER

Removal

1. Open tail gate and support it in open position.
2. Remove tail gate trim and sealing screen from tail gate.
3. Pull out spring washer which secures lock cylinder to tail gate outer panel. Then, remove lock cylinder from tail gate.

Installation

Install lock cylinder in reverse sequence of removal.

After installing lock cylinder, make certain that tail gate lock mechanism and lock cylinder are operated properly.

BODY

DOOR

CONTENTS

REMOVAL AND INSTALLATION	BF-19	Front door (Sedan, Station wagon and Van)	BF-22
Front door	BF-19	Front door (Hardtop)	BF-24
Rear door	BF-19	Rear door (Sedan, Station wagon and Van)	BF-27
DOOR ALIGNMENT	BF-19	REAR SIDE WINDOW	
DOOR TRIMS	BF-20	GLASS (Hardtop)	BF-28
Removal and installation	BF-20	Removal	BF-29
DOOR LOCK AND STRIKER	BF-20	Installation	BF-29
Removal and installation	BF-20	Adjustment	BF-29
Adjustment	BF-21	BODY SIDE WEATHERSTRIPS (Hardtop)	BF-30
DOOR LOCK CYLINDER	BF-21	Removal	BF-30
Removal and installation	BF-21	Installation and adjustment	BF-30
DOOR WINDOW GLASS AND			
REGULATORS	BF-22		

REMOVAL AND INSTALLATION

Front door

1. Remove front bumper, radiator grille, front apron, windshield wiper blades, cowl top grille and sill moulding in the order.
2. Remove front fender from the vehicle.
3. Open front door and place a support under door. Use pads between door and a support to protect door from scar.
4. Loosen bolts attaching door hinge to body and remove front door from the vehicle.

- 1 Front door
2 Support

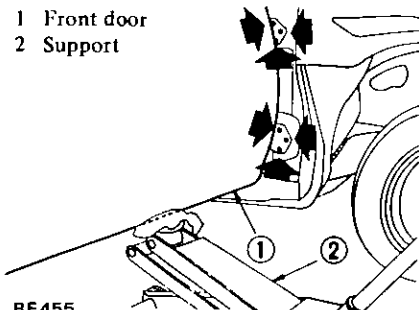


Fig. BF-51 Removing bolts attaching door hinge to body

5. Install front door in reverse sequence of removal.

Rear door

1. Open front door and keep on the door open.
2. Open rear door and place a support under door. Use pads between door and a support to prevent from damage.
3. Loosen bolts attaching rear door hinges to center pillar and remove rear door from body.

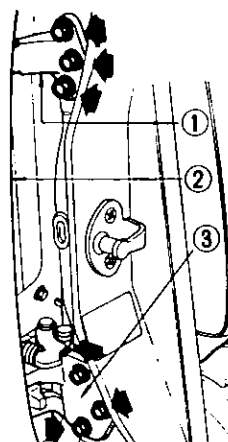


Fig. BF-52 Removing bolts attaching door hinges to center pillar

4. Install rear door in reverse sequence of removal.

DOOR ALIGNMENT

Proper door alignment can be obtained by adjusting the position of door hinge and door lock striker.

Door hinge and striker can be moved up and down and fore and aft in enlarged holes by loosening attaching bolts. Door should be adjusted for an even and parallel fit with the door opening and surrounding body panels.

Care should be taken not to distort or mar door or surrounding body panels.

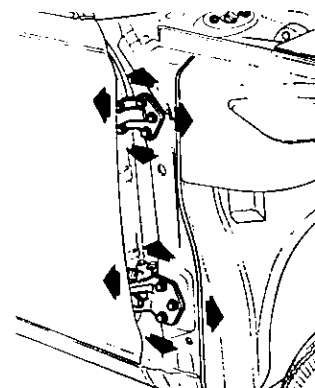
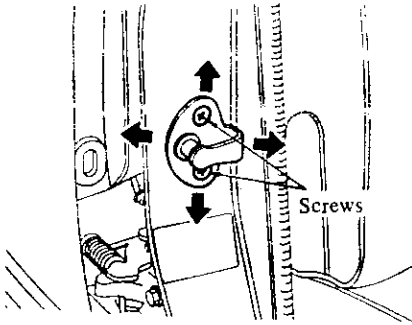


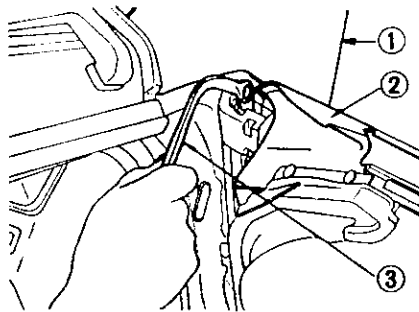
Fig. BF-53 Adjusting door hinge



BF458

Fig. BF-54 Adjusting door lock striker

Even if front fender does not removed, front door hinge can be adjusted using special tool "Door Adjusting Wrench ST08720000."



BF459

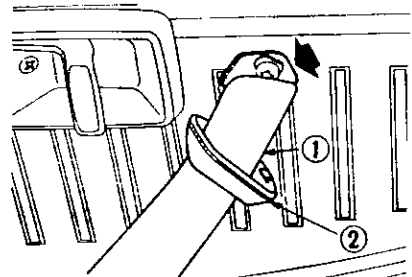
- 1 Front fender
- 2 Front door
- 3 ST08720000

Fig. BF-55 Adjusting door hinge

DOOR TRIMS

Removal

1. Open door and keep it on open.
2. Raise lock knob and turn it counterclockwise and remove lock knob and grommet.
3. Loosen bolts attaching arm rest and remove it from door.

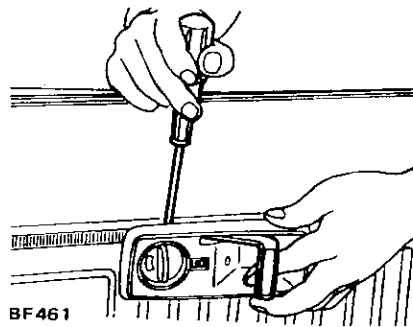


BF460

- 1 Arm rest
- 2 Cover

Fig. BF-56 Removing bolts attaching arm rest (Hardtop)

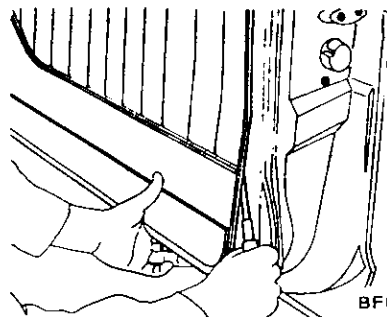
4. Loosen screw attaching inside handle escutcheon and remove door lock dial and escutcheon.



BF461

Fig. BF-57 Removing inside handle escutcheon (Hardtop)

5. Remove spring retaining regulator handle and then remove regulator handle and seating washer.
6. Remove clips retaining door finisher from door inside panel and remove door finisher.



BF086

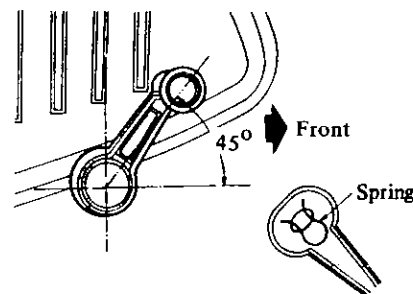
Fig. BF-58 Removing door finisher

7. Remove watertight seal cover from door panel.

Installation

Install door trim in reverse sequence of removal.

With door glass up, regulator handle should be installed as shown in Figure BF-59.



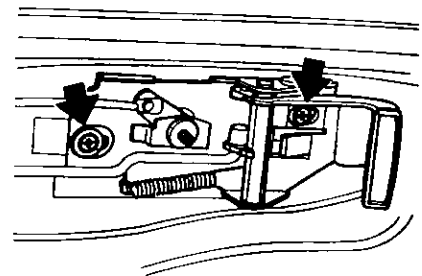
BF462

Fig. BF-59 Installing regulator handle

DOOR LOCK AND STRIKER

Removal and installation

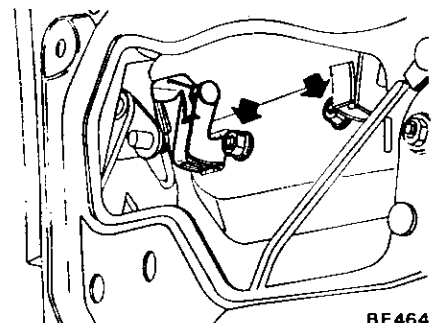
1. Open door and keep it on open.
2. Remove arm rest, inside door handle escutcheon and regulator handle.
3. Remove lock knob and grommet.
4. Remove door finisher and water-shield.
5. Loosen screws attaching inside door handle and remove inside door handle.
6. Loosen screws attaching remote control and lock knob rod and then remove them.



BF463

Fig. BF-60 Removing inside door handle (Hardtop)

7. Loosen nuts attaching outside door handle and remove outside handle.



BF464

Fig. BF-61 Removing nuts attaching outside door handle

8. Removing remote control rod from door lock cylinder.

BODY

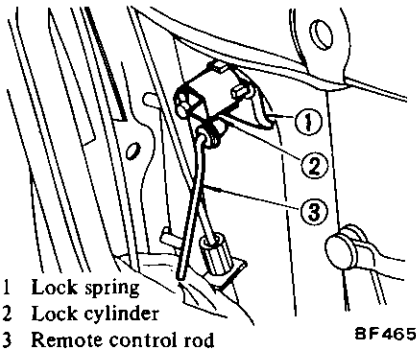


Fig. BF-62 Removing remote control rod from door lock cylinder

9. Loosen screws attaching door lock and remove door lock from door.

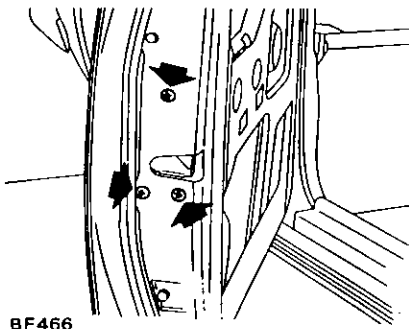


Fig. BF-63 Removing screws attaching door lock

10. Loosen bolts attaching door lock striker and remove striker from body.

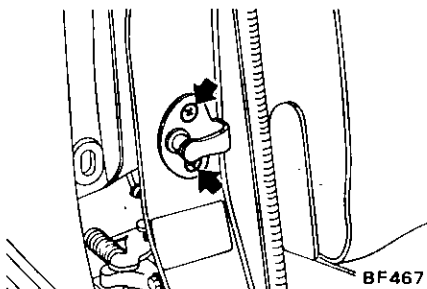


Fig. BF-64 Removing door lock striker

11. Install door lock mechanism in reverse sequence of removal.

Adjustment

Outside door handle

Outside door handle can be adjusted by turning door handle rod nut clockwise or counterclockwise.

The proper clearance "T" between door lock lever and adjusting nut is

below 1.0 mm (0.039 in). See Figure BF-66 and BF-68.

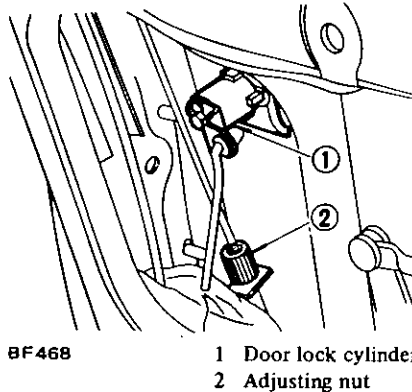


Fig. BF-65 Adjusting handle free play (Front door)

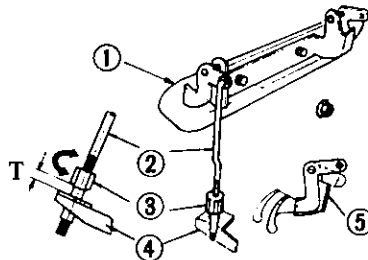


Fig. BF-66 Adjusting handle free play (Front door)

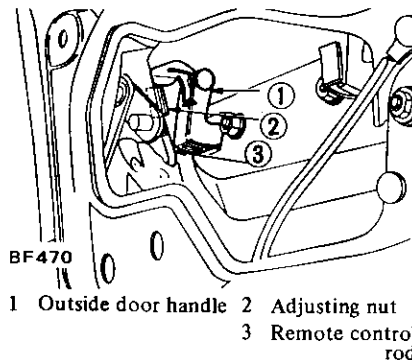


Fig. BF-67 Adjusting handle free play (Rear door)

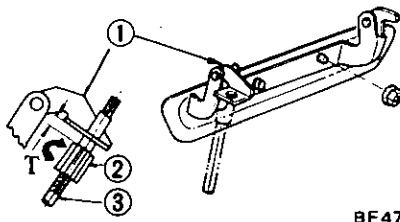


Fig. BF-68 Adjusting handle free play (Rear door)

Inside door handle

To adjust inside door handle free play, move inside door handle base fore and aft in elongated holes as required by loosening attaching screws.

The free play should be adjusted below 1.0 mm (0.039 in).

Do not bend door lock lever connecting to control rod to adjust.

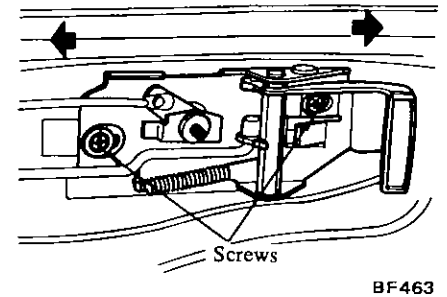


Fig. BF-69 Adjusting inside door handle base fore and aft

Door lock striker

Door lock striker can be moved from side to side and up and down to align with door lock latch.

DOOR LOCK CYLINDER

Removal and installation

1. Remove door finisher and water-tight seal cover.
2. Disconnect control rod from door lock cylinder.
3. Remove lock spring securing door lock cylinder to outside door panel and then remove door lock cylinder from door.
4. Install door lock cylinder in reverse sequence of removal.

DOOR WINDOW GLASS AND REGULATORS

Front door (Sedan, Station wagon and Van)

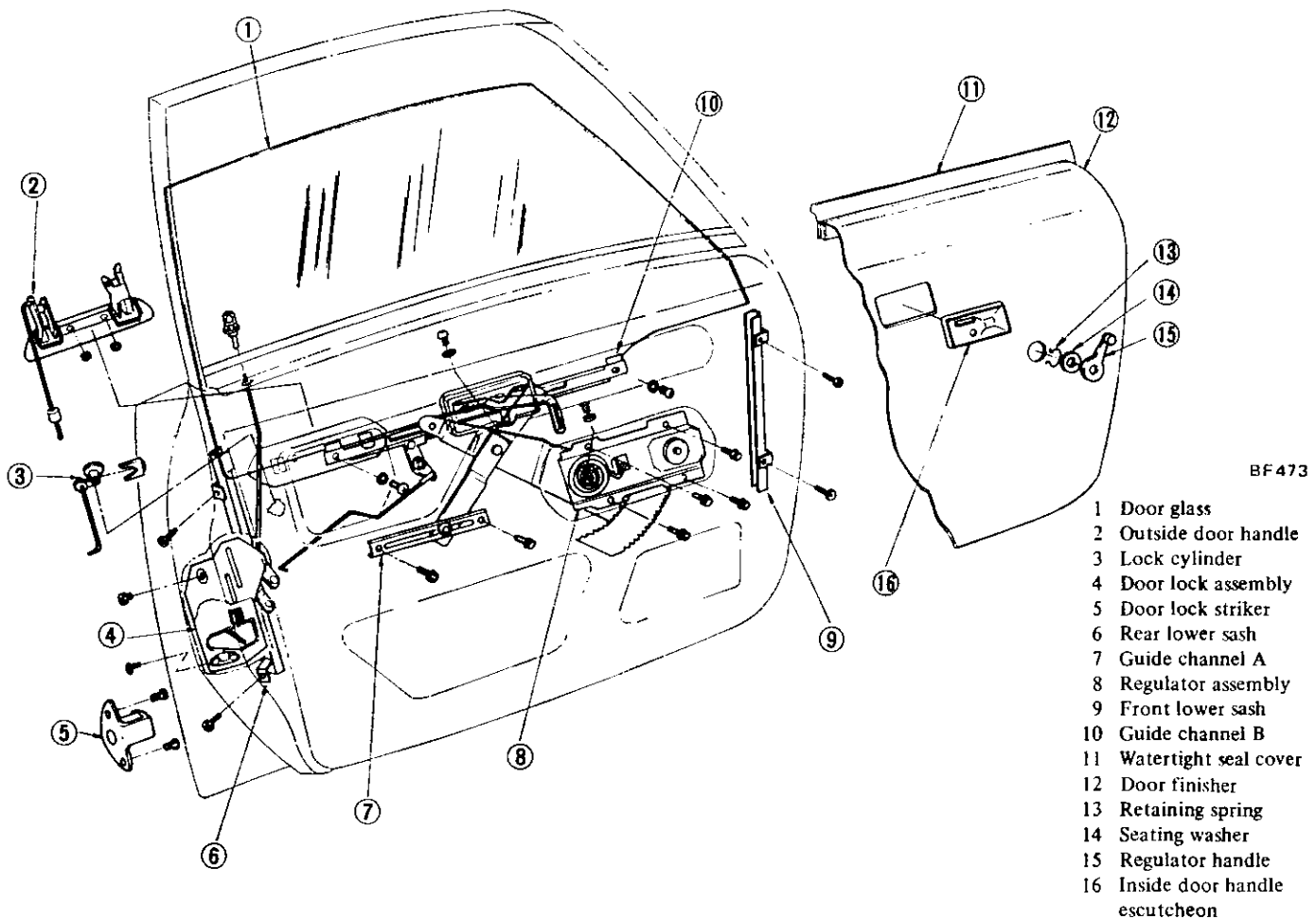


Fig. BF-70 Structural view of front door glass, regulator and door lock mechanism

Removal and installation

1. Lower door glass.
2. Remove arm rest, regulator handle, inside handle escutcheon, door lock knob, door finisher and watertight cover.
3. Remove door outside weather-strip and door lock knob.
4. Remove screws attaching front lower sash and remove front lower sash from door glass. It is not necessary to draw front lower sash out of door before removing door glass.
5. Support door glass and remove screws retaining guide channel B to glass back plate.

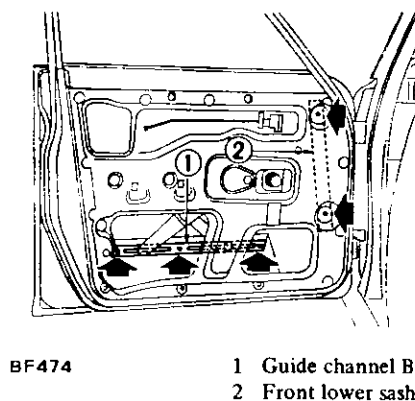


Fig. BF-71 Removing screws retaining guide channel B to glass back plate and front lower sash

6. Draw door glass upwards and remove it from door.

7. Loosen screws attaching guide channel A and regulator base, remove regulator assembly, and draw it through the lower opening of door inside panel.

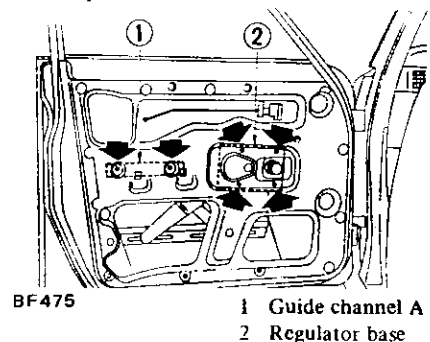


Fig. BF-72 Removing regulator assembly

BODY

8. Loosen screws attaching rear lower sash and remove rear lower sash.

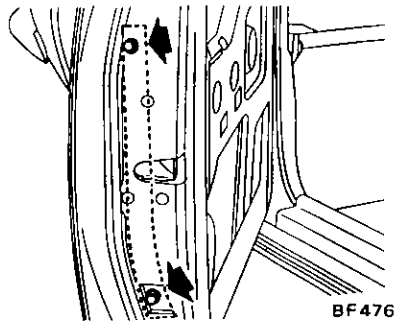


Fig. BF-73 Removing rear lower sash

9. Remove front lower sash.
10. Install door glass and regulator in reverse sequence of removal.

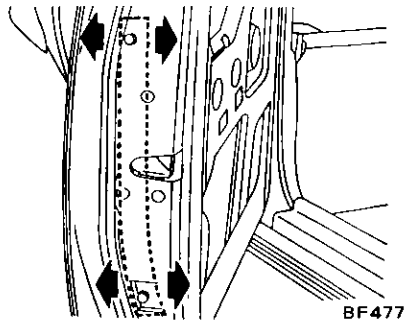


Fig. BF-74 Adjusting rear lower sash

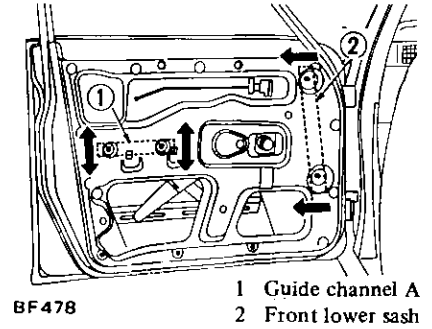


Fig. BF-75 Adjusting front lower sash and guide channel A

3. With glass up, adjust glass in parallel with the top rail of door sash by moving guide channel A up and down. The sideward free play of glass can be adjusted by moving front lower sash fore and aft.

Guide channel A adjustments can be performed by the following procedures: When door glass is in the picture (1) of Figure BF-76, move guide channel A up and move it down for the picture (2).

Adjustment

Door glass alignment can be performed by adjusting front and rear lower sash and guide channel A.

1. To obtain proper alignment of glass, temporarily tighten front and rear lower sashes.
2. With glass in the up position, adjust rear lower sash from side to side to align with glass and front lower sash. Raise and lower glass to assure a good glass fit.

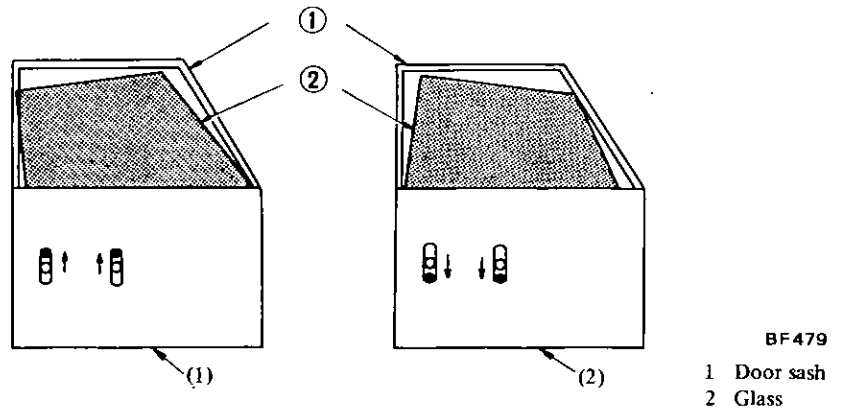
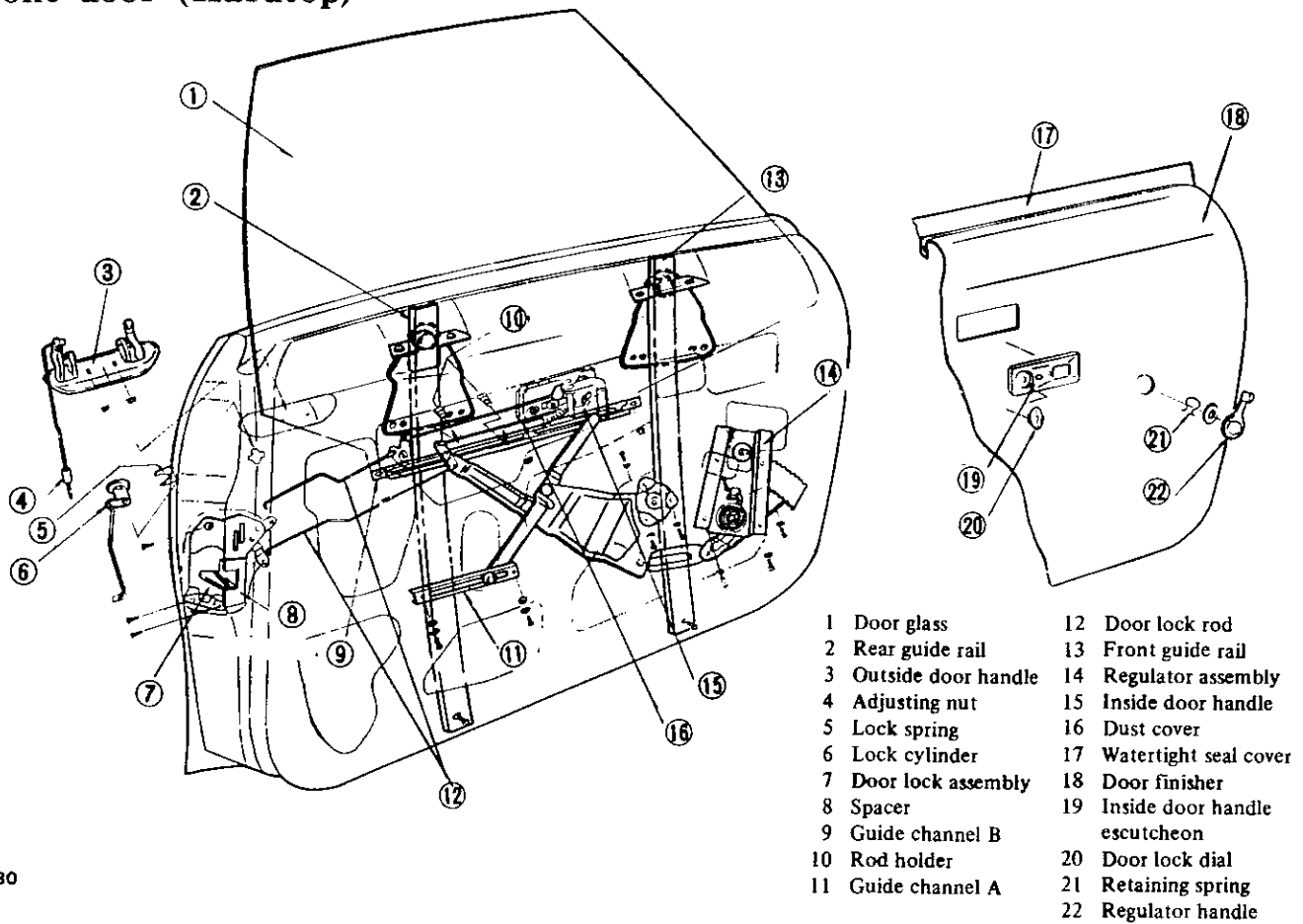


Fig. BF-76 Adjusting guide channel A

Front door (Hardtop)

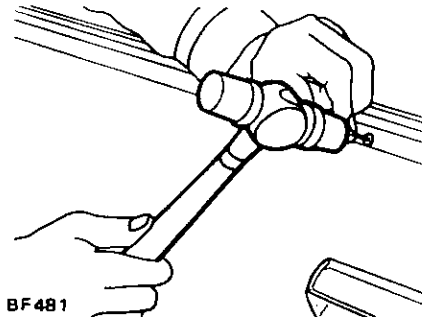


BF480

Fig. BF-77 Structural view of front glass, regulator and door lock mechanism

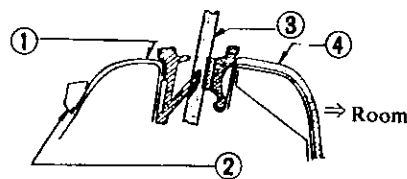
Removal

1. Lower door glass.
2. Remove arm rest, regulator handle, inside door handle escutcheon, door finisher and watertight cover.
3. Remove door outside moulding.
4. Drive out inner pin of clip retaining outside finish and then remove retaining clip, outside finish and outside weatherstrip from door.



BF481

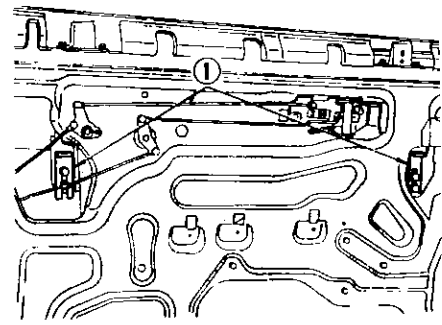
Fig. BF-78 Driving out inner pin of outside finish retaining clip



BF482

- 1 Door outside finish
- 2 Door outside moulding
- 3 Glass
- 4 Door finish

Fig. BF-79 Sectional view of door outside and inside weatherstrips



BF483

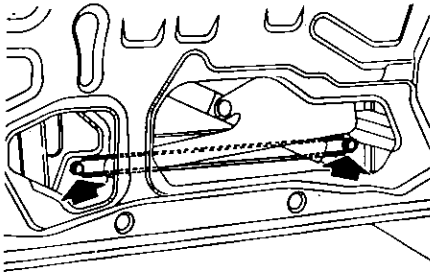
- 1 Glass upper stoppers

Fig. BF-80 Removing glass upper stoppers

5. Raise door glass until glass upper stoppers appear in the upper openings of inside door panel and remove glass upper stoppers.

6. With glass in the full down position, support door glass and remove screws attaching glass back plate to guide channel B.

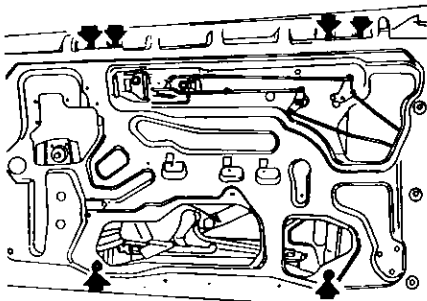
BODY



BF484

Fig. BF-81 Removing screws attaching glass back plate to guide channel B

7. Raise door glass and draw it upwards.
8. Loosen bolts adjusting front and rear guide rail and remove guide rails from door.

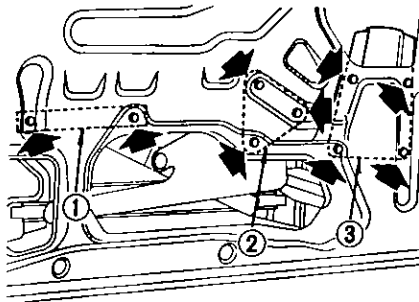


BF485

Fig. BF-82 Removing guide rail adjusting bolts

9. Remove screws attaching guide channel A, regulator arm base and

regulator base and then remove them through the lower opening of inside door panel.



BF486

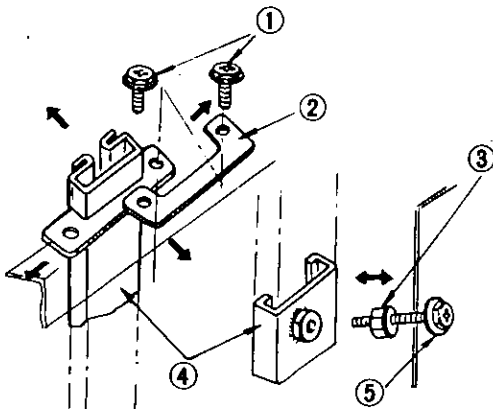
- 1 Guide channel A
- 2 Regulator arm base
- 3 Regulator base

Fig. BF-83 Removing regulator assembly

Installation and adjustment

1. Install regulator assembly, guide rails, door glass and door lock assembly in reverse sequence of removal.
2. With door glass up, temporarily tighten upper and lower bolts adjusting guide rail in the neutral position.

The neutral position for upper adjusting bolts means the center of the elongated holes. For lower adjusting bolt, tighten it all the way and return nine turns and secure lock nut at that position.



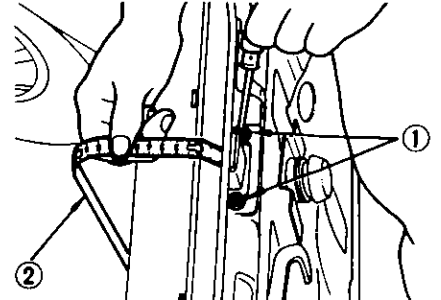
BF487

- 1 Upper adjusting bolts
- 2 Spacer
- 3 Lock nut
- 4 Guide rail
- 5 Lower adjusting bolt

Fig. BF-84 Guide rail adjusting mechanism

3. Adjust guide rail upper adjusting bolts so that the clearance between door outside panel and glass outside

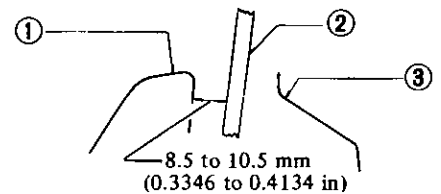
face becomes 8.5 to 10.5 mm (0.3346 to 0.4134 in).



BF488

- 1 Upper adjusting bolts
- 2 Scale

Fig. BF-85 Adjusting guide rail upper adjusting bolts



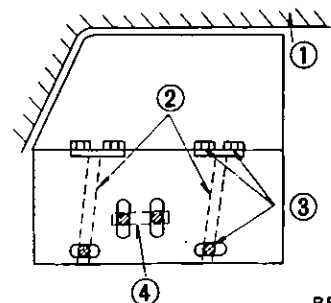
BF489

- 1 Door outside panel
- 2 Glass
- 3 Door inside panel

Fig. BF-86 Proper clearance between door outside panel and glass

4. Install door outside finish in position and make sure that door outside weatherstrip properly contacts with door glass when door glass is raised and lowered.
5. Raise door glass to its full up position and align door glass with body weatherstrip to obtain a water-tight seal.

Proper glass alignment can be obtained by adjusting guide rails and guide channel A as shown in Figure BF-87 through Figure BF-91.



BF490

- 1 Body side weatherstrip
- 2 Guide rail
- 3 Guide rail adjusting bolts
- 4 Guide channel A

Fig. BF-87 Proper glass position

BODY

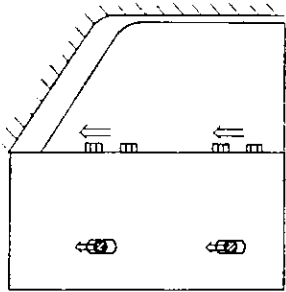


Fig. BF-88 When moving to front

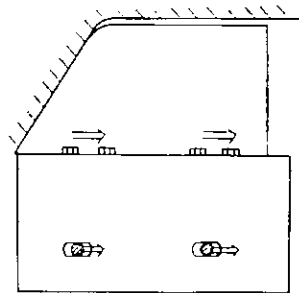


Fig. BF-89 When moving to rear

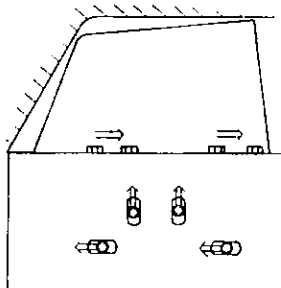


Fig. BF-90 When moving front up

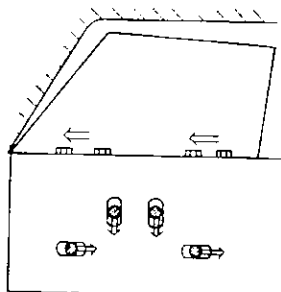


Fig. BF-91 When moving rear up

6. Raise glass to its up position, adjust upper glass stoppers so that the clearance between the top of

glass and body side weatherstrip is 0 to 1.0 mm (0 to 0.0394 in).

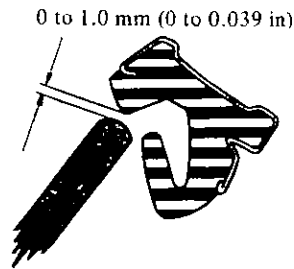


Fig. BF-92 Proper glass clearance when glass stoppers are secured in position

7. With glass up, move the top edge of glass to body side weatherstrip to obtain a tight seal by adjusting guide rail lower adjusting bolts evenly.

Turn lower adjusting bolts clockwise to release the top edge of glass from body side weatherstrip and counterclockwise to tight.

8. Make sure that all top edges of glass maintain a tight fit evenly at the positions shown in Figure BF-93.

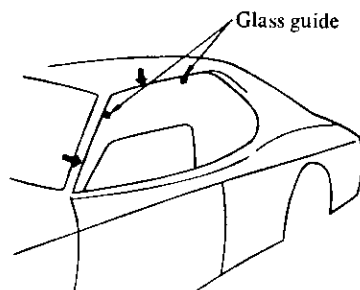


Fig. BF-93 Checking positions for a tight fit

9. Make certain that the clearance between the top of glass and the end of glass guide is 0 to 0.5 mm (0 to 0.0197 in) just before contacting door glass with door side weatherstrip.

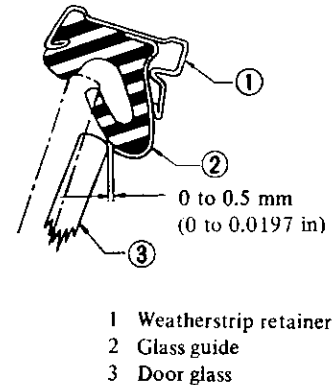


Fig. BF-94 Proper clearance between glass and glass guide

10. Raise and lower door glass to be sure the operation of regulator handle is smooth. The operating force of regulator handle should be performed less than 4 kg (9.1 lbs) at the knob of regulator handle.

If proper operating force is still not obtained, adjust regulator mechanism according to the following procedures:

- (1) Lubricate guide rollers, guide rails and regulator linkage.
- (2) Perform outside and inside door weatherstrip-to-door glass adjustment.
- (3) Adjust guide rails in parallel.



Fig. BF-95 Improper side view of guide rails

11. Make certain that the location of upper glass stoppers is aligned properly. If necessary, adjust them.

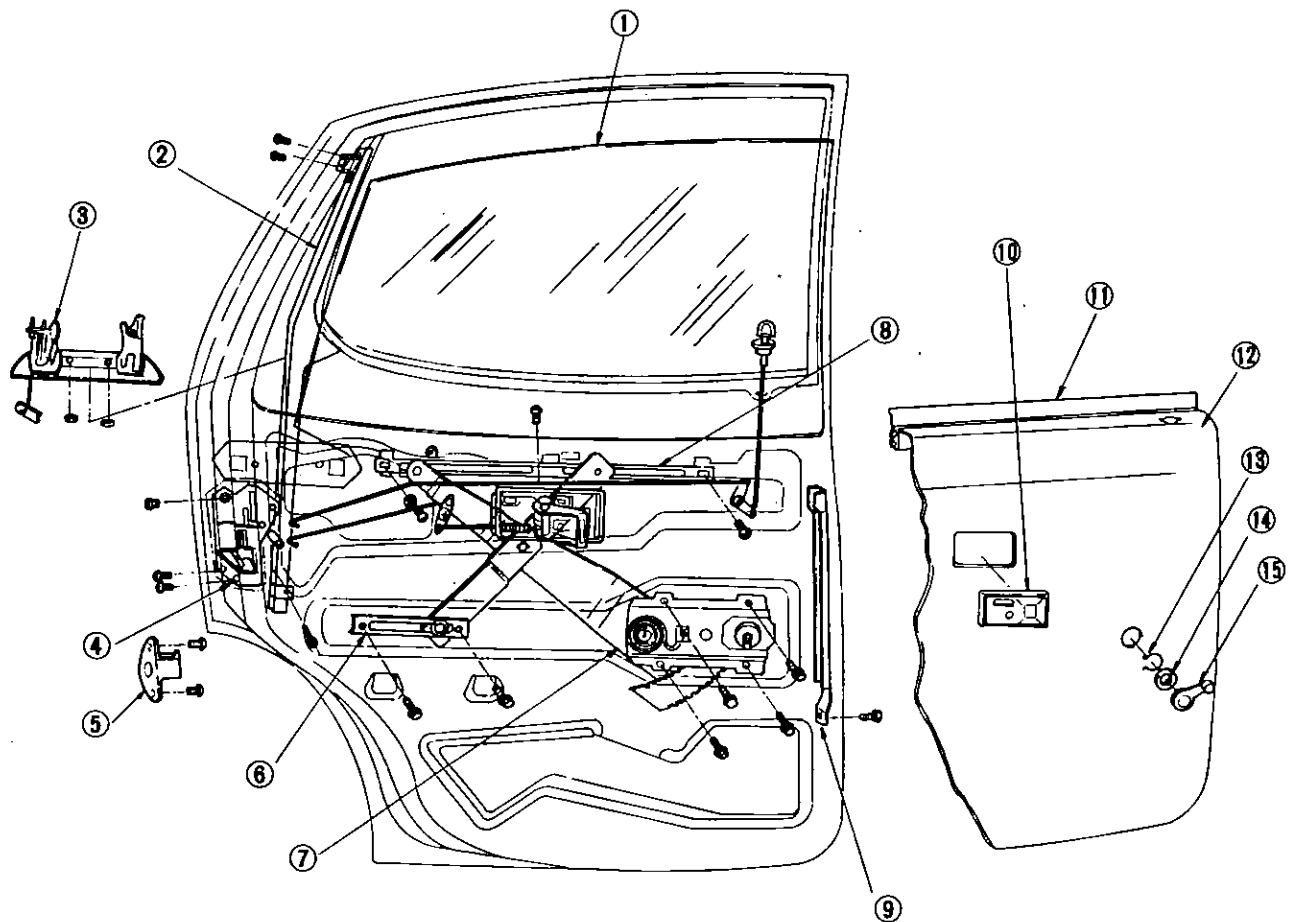
12. Install outside door finish and moulding.

13. Install watertight seal cover and door finisher.

14. Install arm rest and regulator handle in position.

15. With unlock, install door lock dial facing a red mark.

Rear door (Sedan, Station Wagon and Van)



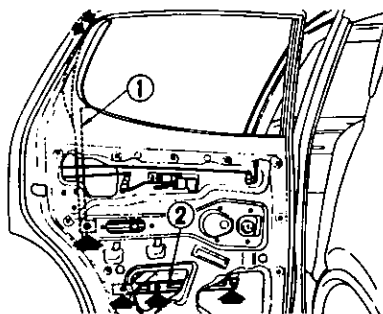
BF499

- | | |
|-----------------------|-----------------------------|
| 1 Door glass | 9 Front lower sash |
| 2 Rear sash | 10 Inside handle escutcheon |
| 3 Outside door handle | 11 Watertight seal cover |
| 4 Door lock assembly | 12 Door finisher |
| 5 Door lock striker | 13 Retaining spring |
| 6 Guide channel A | 14 Seating washer |
| 7 Regulator assembly | 15 Regulator handle |
| 8 Guide channel B | |

Fig. BF-96 Structural view of front door glass, regulator and door lock mechanism

Removal

1. Lower door glass.
2. Remove door lock knob and grommet.
3. Remove arm rest, regulator handle, inside handle escutcheon, door finish and watertight seal cover from door.
4. Remove door outside weather-strip and rear sash.
5. Remove screws attaching guide channel B to glass back plate and draw door glass out of door.



BF500

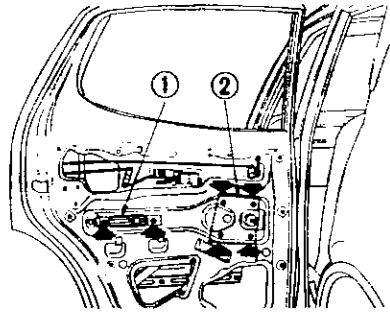
- 1 Rear sash
- 2 Guide channel B

Fig. BF-97 Removing screws attaching rear sash and guide channel B

6. Remove rear sash and front lower sash from door.

7. Loosen screws attaching guide channel A and regulator base, remove regulator assembly, and draw it through the lower opening of door inside panel.

BODY

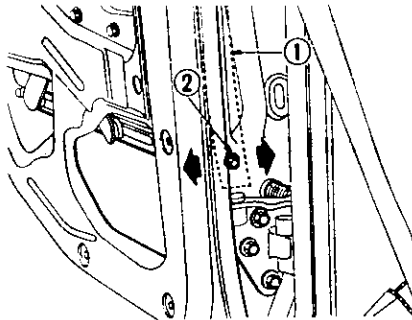


BF501
1 Guide channel A
2 Regulator base
Fig. BF-98 Removing regulator assembly attaching screws

8. Install regulator assembly and door glass in reverse sequence.

Adjustment

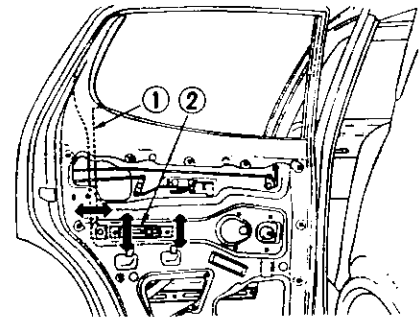
Proper glass alignment can be obtained by adjusting front lower sash, rear sash and guide channel A. Front lower sash must be adjusted in parallel with rear sash by moving from side to side.



BF502
1 Front lower sash
2 Attaching screw
Fig. BF-99 Adjusting front lower sash

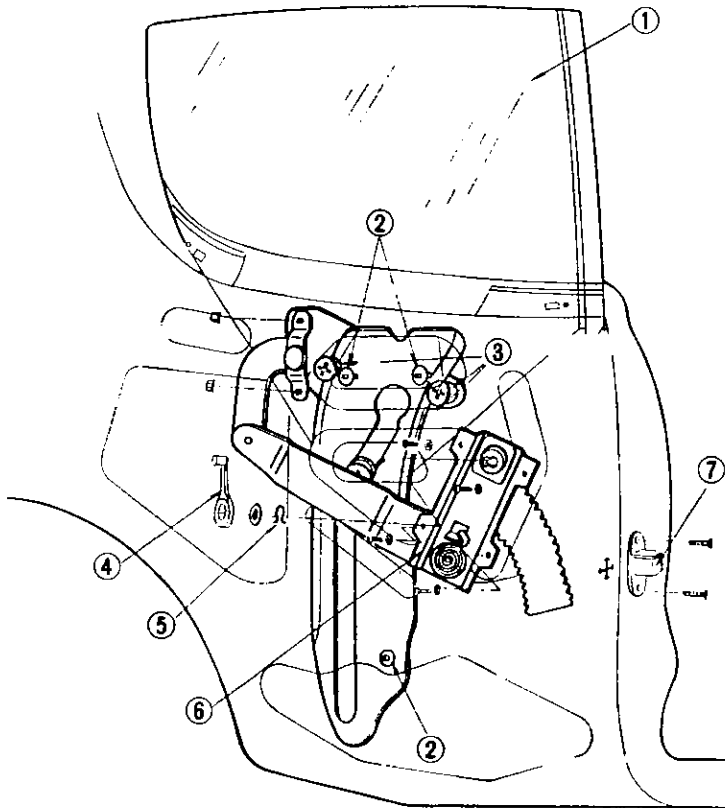
To adjust the sideward free play of door glass, move rear sash fore and aft by loosening lower attaching screw.

Tilt adjustment of glass can be performed by moving guide channel A up and down.



BF503
1 Rear sash
2 Guide channel A
Fig. BF-100 Adjusting rear sash and guide channel A

REAR SIDE WINDOW GLASS (Hardtop)



BF504
1 Side window glass
2 Guide plate adjusting bolts
3 Guide roller
4 Regulator handle
5 Retaining spring
6 Regulator assembly
7 Door lock striker

Fig. BF-101 Structural view of side window glass and regulator

Removal

1. Remove rear seat cushion and rear seat back from body.
2. Remove seat belt anchorage if equipped and kicking plate.
3. Lower side window glass.
4. Remove arm rest, regulator handle.
5. Remove rear side finisher and
6. Remove draughter finisher.
7. Remove seat belt anchorage if equipped on rear quarter panel.
8. Remove clips retaining rear corner finisher and remove rear corner finisher.
9. Remove inner seal and bracket.

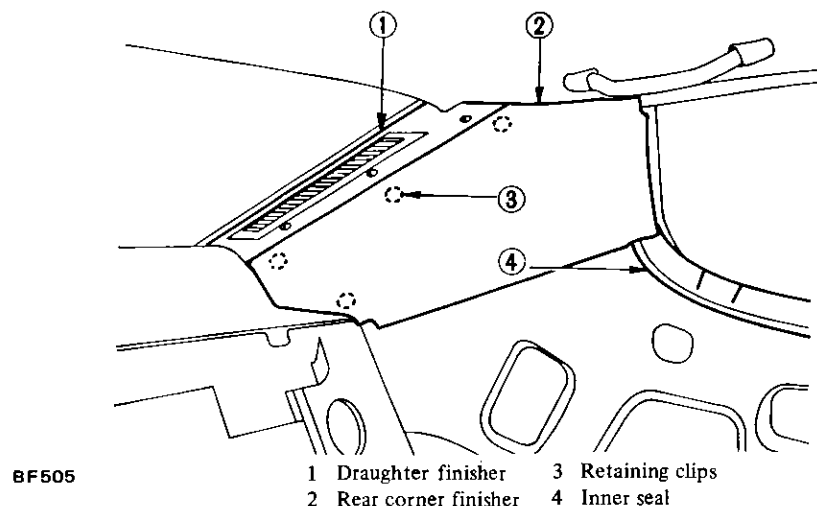


Fig. BF-102 Removing rear quarter panel inside fittings

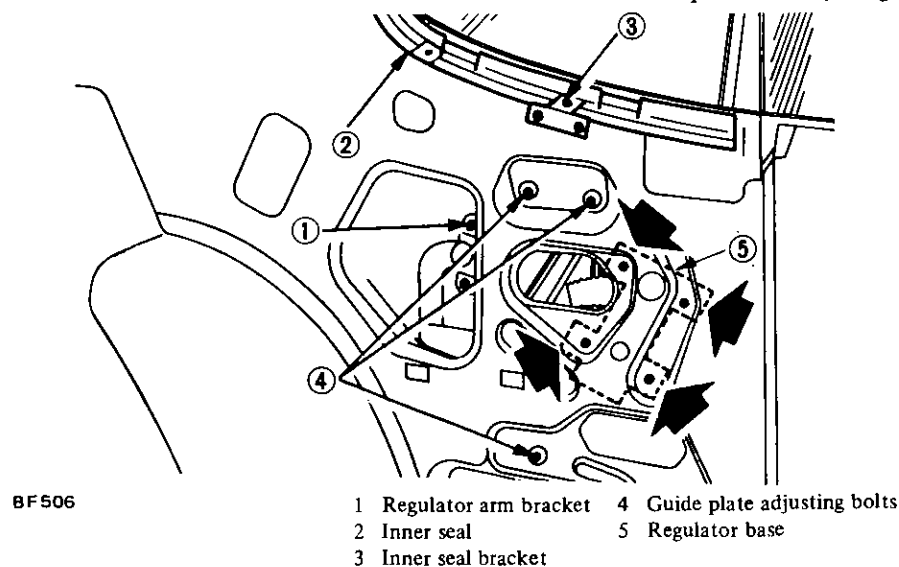


Fig. BF-103 Removing regulator assembly attaching bolts

10. Raise glass until regulator arm bracket appears in the upper opening of inside panel and support glass and remove nuts attaching regulator arm bracket to side window back plate.
11. Loosen lock nuts of guide plate upper and lower adjusting bolts. Remove adjusting bolts from guide

12. Raise window glass with guide panel and remove them toward passenger room.
13. Remove regulator base attaching screws and draw regulator assembly out through the lower opening of inside panel.

Installation and adjustment

1. Install window glass and regulator assembly in reverse sequence of removal.
2. With window glass down, temporarily tighten guide plate adjusting bolts in the neutral position.

The neutral position means the center of the elongated holes.

Tighten these adjusting bolts all the way and return eight turns and secure them at that position.

3. Adjust guide plate upper adjusting bolts to obtain 8.5 to 10.5 mm (0.3346 to 0.4134 in) of the clearance from rear fender to window glass outside face.

4. Install rear fender finish in position and make certain that window glass is properly aligned with weatherstrip when window glass moves up and down.

5. Close front door and raise door glass and side window glass.

6. Align side window glass with door glass and body side weatherstrip by adjusting guide plate adjusting bolts according to the following procedures in Figure BF-104 through Figure BF-107.

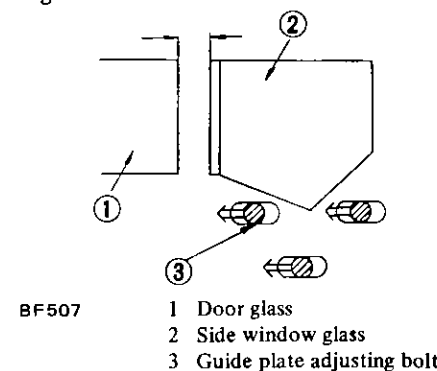


Fig. BF-104 When moving to front

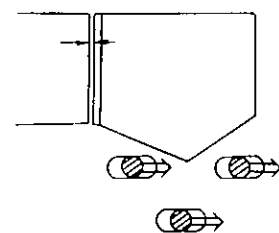
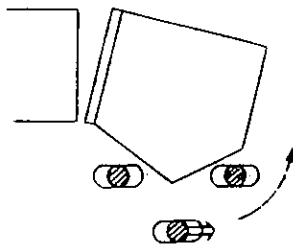


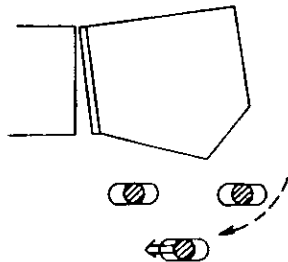
Fig. BF-105 When moving to rear

BODY



BF509

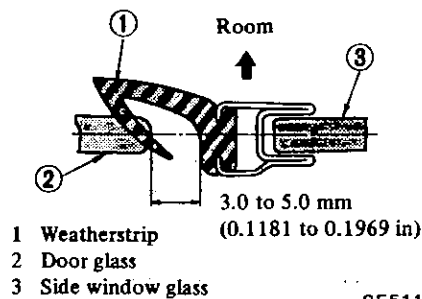
Fig. BF-106 When moving rear up



BF510

Fig. BF-107 When moving rear down

7. With window glass up, adjust guide plate adjusting bolts so that the clearance from window glass to side window weatherstrip is 3.0 to 5.0 mm (0.1181 to 0.1969 in) as shown in Figure BF-108.



BF511

Fig. BF-108 Proper clearance from window glass to weatherstrip

8. Align window glass with body side weatherstrip to obtain a tight seal by adjusting guide plate lower adjusting bolt. See Door glass adjustment for details.

9. Install inner seal and bracket.

10. Install rear fender finish.

11. Install regulator handle and raise and lower window glass to be sure the operation of the handle is smooth. The operating force of the handle should be adjusted less than 3 kg (6.6 lbs) at the knob of the

handle.

See Door glass adjustment for details.

12. Install rear corner finisher and draughter finisher.

13. Install watertight seal cover and door finisher.

14. Install arm rest and regulator handle.

15. Position door outside finish and secure it with retaining clips and install door outside moulding.

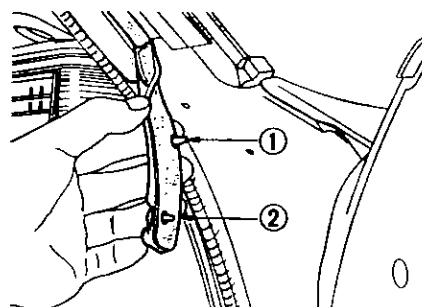
16. Install kicking plate and seat belt anchorage if equipped.

17. Install seat back and cushion.

BODY SIDE WEATHER STRIP (Hardtop)

Removal

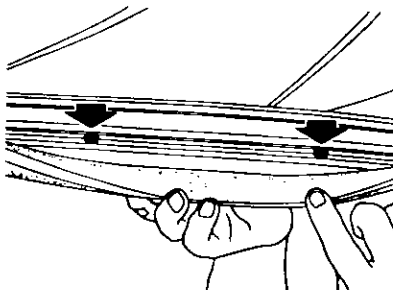
1. Remove rivets retaining body side weatherstrip to front pillar.



BF512

Fig. BF-109 Removing body side weatherstrip retaining rivets

2. Remove screws installing weatherstrip retainer to roof side rail.

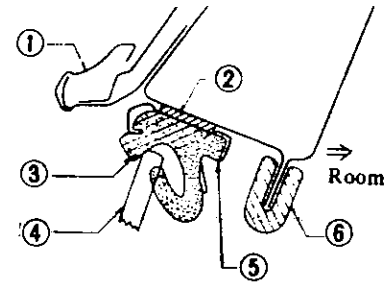


BF513

Fig. BF-110 Removing attaching screws of weatherstrip retainer

3. Remove front pillar garnish and then remove body side welts.

4. Remove weatherstrip retainer and retainer seal.



BF514

Fig. BF-111 Sectional view of body side weatherstrip, retainer seal and body side welt

Installation and adjustment

1. Temporarily attach weatherstrip retainer seal to weatherstrip retainer with an adhesive.

2. Position weatherstrip retainer and retainer seal to body and temporarily tighten attaching screws.

3. Make sure that weatherstrip retainer is installed in the position as shown in Figure BF-112 and measure the clearance from body side flange to weatherstrip retainer at the points of (a) through (d) shown in Figure BF-113. Proper clearance is 13 mm (0.512 in).

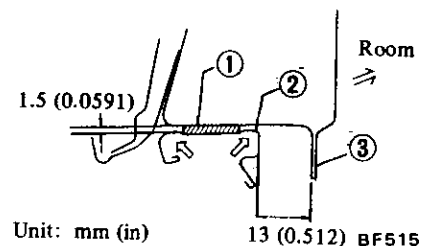
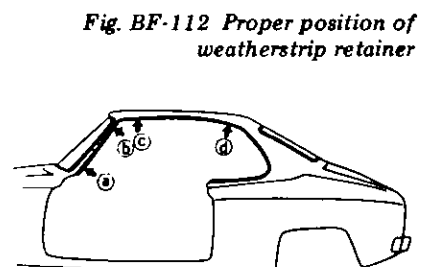


Fig. BF-112 Proper position of weatherstrip retainer



BF516

Fig. BF-113 Measuring points of weatherstrip retainer-to-side flange clearance

BODY

4. Tighten weatherstrip attaching screws evenly until the thickness of retainer seal becomes 1.5 mm (0.0591 in).

Make sure that retainer seal is

centered on weatherstrip retainer.

5. Install body side weatherstrip to retainer.

Weatherstrip should be install evenly without stretching it out

partially.

6. Install front pillar garnish and body side welts.

SEATS

CONTENTS

FRONT SEAT	BF-32	Removal and installation	BF-32
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Inspection	BF-32	Removal and installation	BF-33
REAR SEAT (Sedan and Hardtop)	BF-32	SEAT BELT ANCHORAGES	BF-33

Note: Inconformity with M.V.S.S. No. 302, be sure to remove the thin poly-ethylene covers from seat cushion, seat back, head restraint,

hand brake lever and seat belts at

- a. Pre-delivery service
- b. Parts replacement.

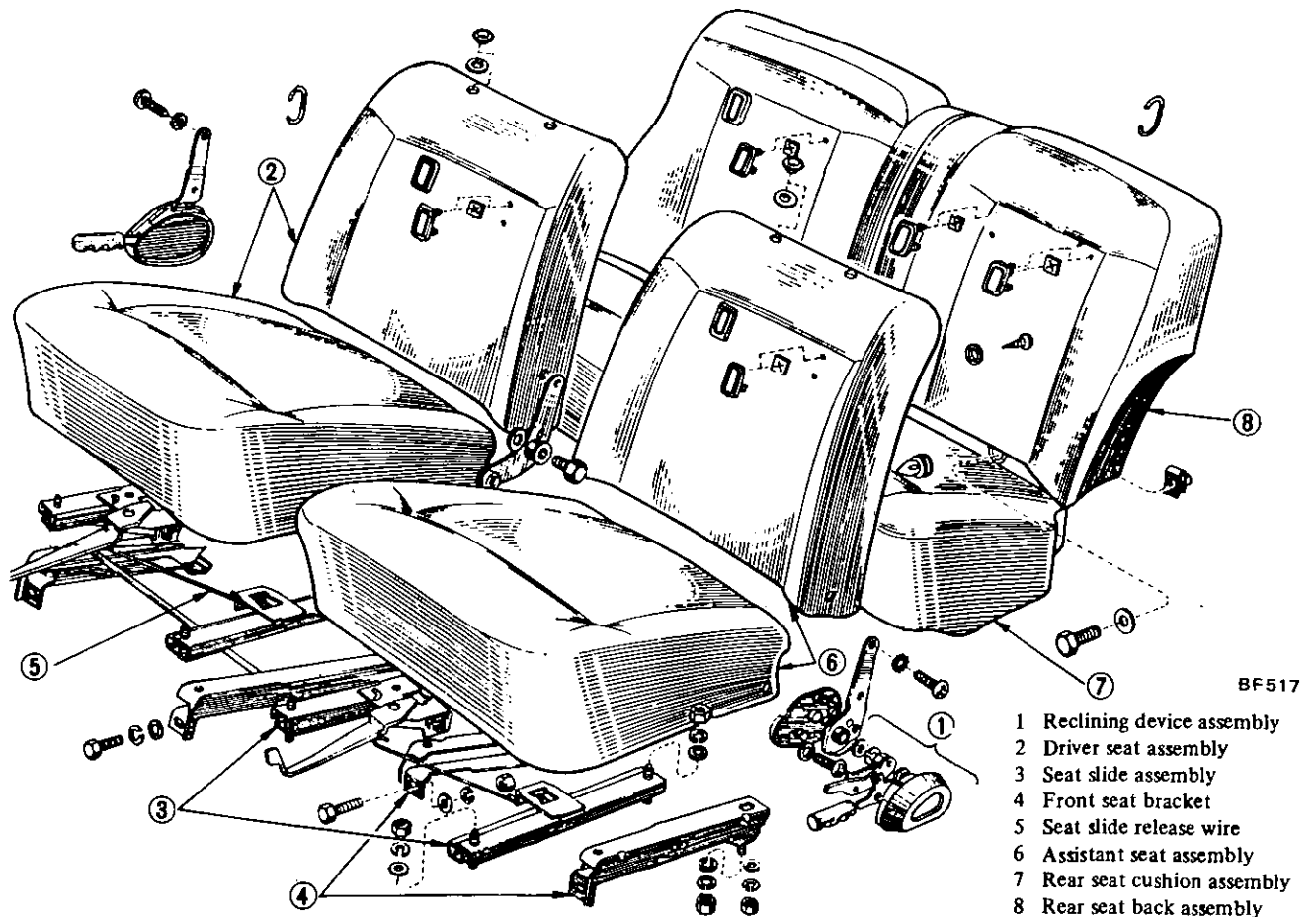


Fig. BF-114 Structural view of front and rear seats

BODY

FRONT SEAT

Removal and installation

1. Remove bolts attaching front seat bracket.

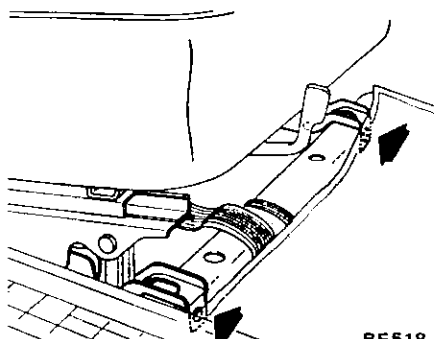


Fig. BF-115 Removing front attaching bolts of front seat bracket

2. Remove rear attaching nuts from beneath the floor.

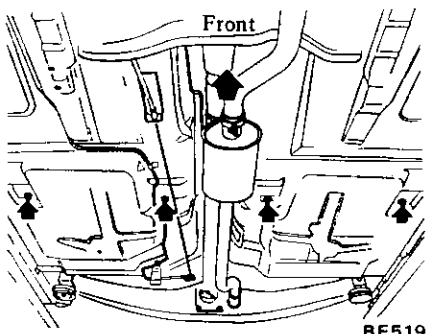


Fig. BF-116 Removing attaching nuts of front seat bracket

3. Reclining device:

Remove reclining device cover and remove screws attaching reclining device to seat and then remove reclining device.

4. Install front seat assembly in reverse sequence of removal.

Inspection

Seat switch should operate accurately. Prior to inspecting seat switch, disconnect harness.

1. Place standard weight on the illustrated position.

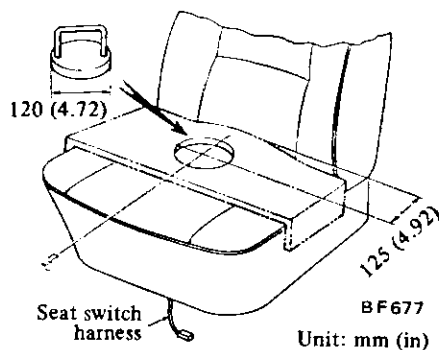


Fig. BF-117 Weight position for separate seat

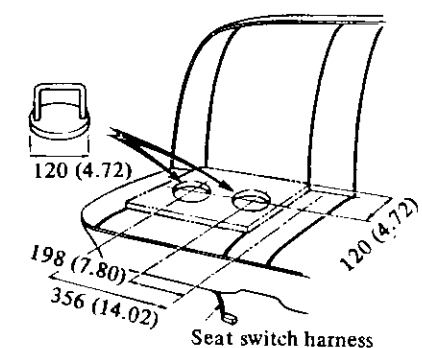


Fig. BF-118 Weight position for bench seat

2. Using test light, check whether light grows when 6.1 kg (13.45 lb) weight is on and light goes out when 1.0 kg (3.21 lb) is on.

3. Seat switch should be installed right position.

See Figure BF-119, BF-120 and BF-121.

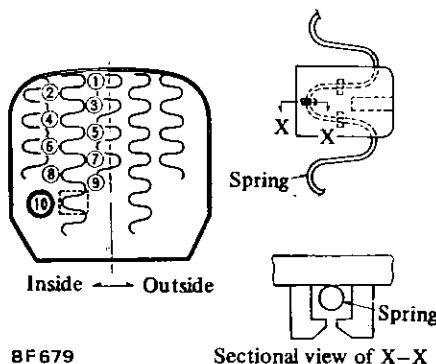


Fig. BF-119 Seat switch location

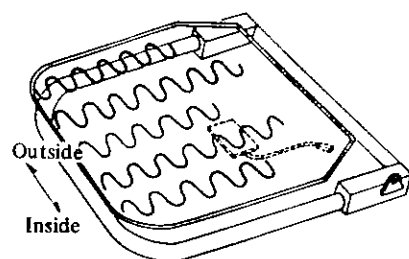


Fig. BF-120 Seat switch installation for separate seat

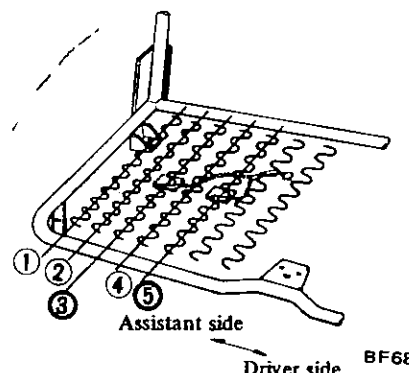


Fig. BF-121 Seat switch installation for bench seat

REAR SEAT (Sedan and Hardtop)

Removal and installation

1. Remove screws attaching rear seat front end and remove rear seat cushion.
2. Remove screws attaching rear seat back and move rear seat back upwards and then remove it from body.
3. Remove screws attaching head restraint and remove head restraints.

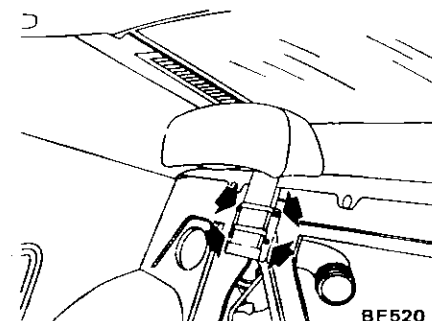


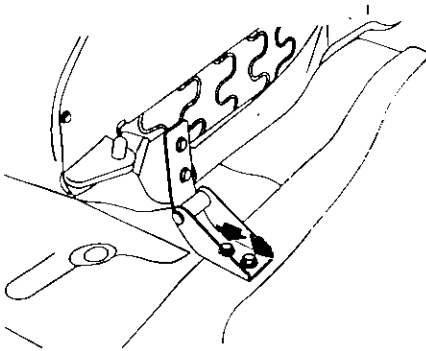
Fig. BF-122 Removing head restraint attaching screws

4. Install rear seat cushion, rear seat back and head restraints in reverse sequence of removal.

REAR SEAT (Station wagon and Van)

Removal and installation

1. Tilt rear seat cushion forwards and remove bolts attaching rear seat hinge and then remove rear seat cushion.



BF521

Fig. BF-123 Removing rear seat hinge attaching bolts

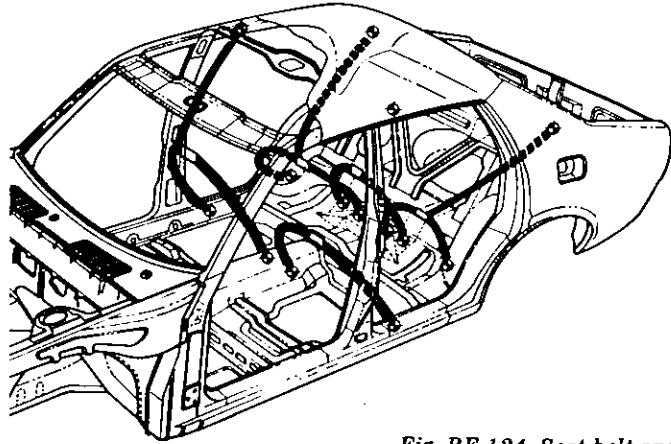
2. Remove rear seat back from catcher and hinge.
3. Remove rear seat back catcher and hinge bracket from body.
4. Install rear seat cushion and rear seat back in reverse sequence of removal.

SEAT BELT ANCHORAGES

The weld nuts for seat belt are located at the floor, rear quarter panel and roof side rail as shown in Figure BF-124 through Figure BF-126.

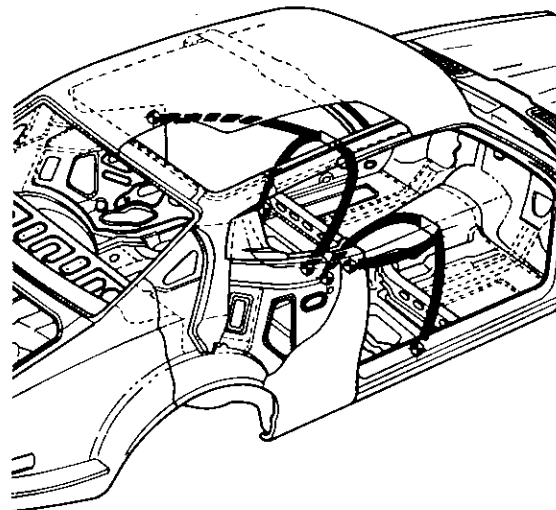
Seat belts must be used the Nissan/Datsun recommended parts and be installed to these weld nuts properly.

Front seat belts with automatic locking retractor have seat belt switch. Seat belt switch is turned on when the belt is not extended 155 mm (6 in) from the stowed position.



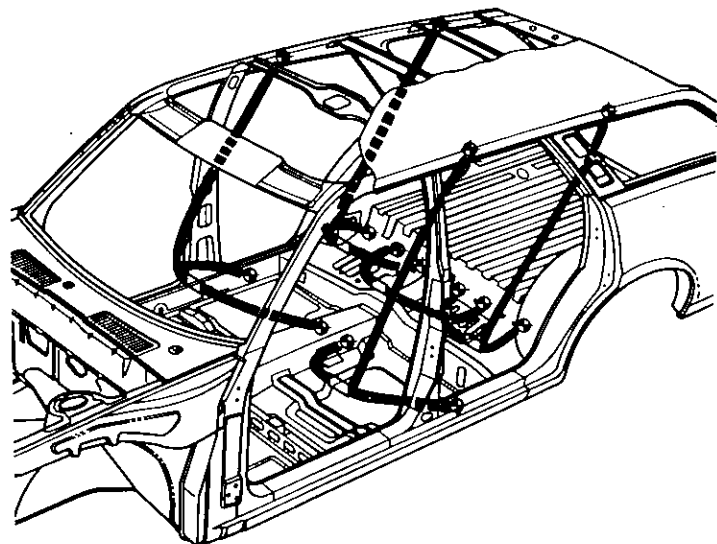
BF522

Fig. BF-124 Seat belt anchorages for the Sedan



BF523

Fig. BF-125 Seat belt anchorages for the Hardtop



BF524

Fig. BF-126 Seat belt anchorages for the Station Wagon and Van

BODY

1. Seat belt retractor assemblies for front seat can be installed as shown in Figure BF-127.

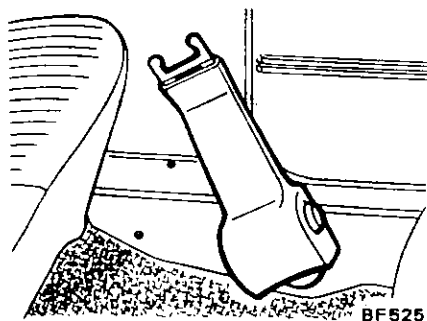
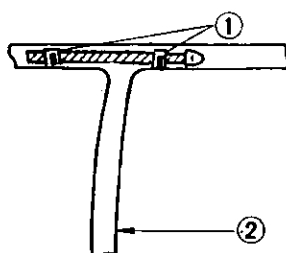


Fig. BF-127 Seat belt retractor assembly

2. Shoulder belt straps can also be installed on the center pillar and roof side rail for stowage as shown in Figure BF-128.



- 1 Strap
- 2 Center pillar
- 3 Seat belt

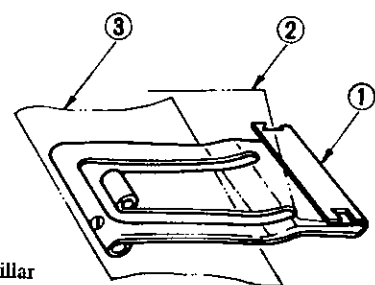


Fig. BF-128 Installing shoulder belt straps

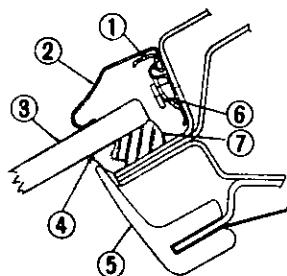
WINDSHIELD GLASS (Adhesive caulked glass)

CONTENTS

DESCRIPTION	BF-34	WATERLEAK CORRECTION	BF-37
REMOVAL AND INSTALLATION	BF-34		

DESCRIPTION

A pre-mixed, one-part sealant is available as service part to cement windshield glass to window opening. After using this sealant, stand vehicle idle for at least 24 hours to allow sealant to cure thoroughly.



BF527

- 1 Fastener
- 2 Windshield moulding
- 3 Windshield glass
- 4 Dam sealant rubber
- 5 Welt
- 6 T-stud
- 7 Sealant

Fig. BF-129 Sectional view of front adhesive caulked windshield glass

REMOVAL AND INSTALLATION

1. Protect hood, front fenders, instrument panel and front seats with covers.
2. Remove windshield wipers, front pillar garnish, instrument garnish and welt. (Front windshield glass) Remove rear corner finisher, rear parcel shelf finish and welt. (Rear window glass)
3. Remove windshield mouldings.
4. Reaching from inside vehicle, strip dam from around window glass.

Note: When pre-mixed, one-part sealant is used, dam need not be re-installed.

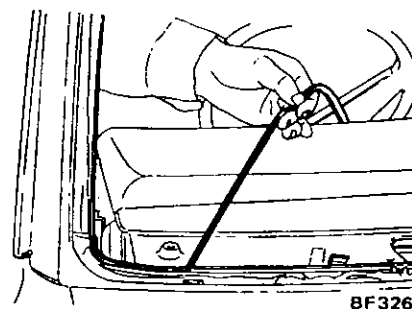
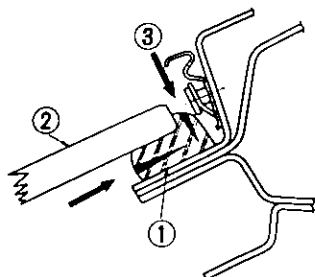


Fig. BF-130 Stripping dam

5. With aid of sharp cutting knife, cut off caulking material along edge of entire window opening.

BODY



BF327
1 Adhesive caulking material
2 Glass
3 Cut by knife

Fig. BF-131 Cutting off adhesive caulking

Note: Plate surfaces need not be exposed.

Note: Do not allow oil, grease and water to get on cleaned surfaces by touching with dirty hand or fouled tool.

Installation

1. Check moulding retainers for missing.
2. Clean body side contacting face with non-lead gasoline.

3. Install five spacers on window opening.

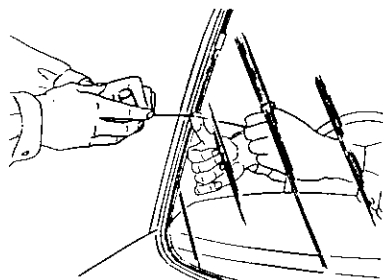
Note: Do not confuse spacer A with B. They differ in shape from each other.

6. The following procedure may also be used in removing rear windshield.

- (1) Using a knife, cut through part of caulking material.
- (2) Secure one end of steel music wire [0.5 mm (0.1969 in) diameter] to a piece of wood that can serve as a handle.

Using long nose pliers, insert other end of wire through caulking material at edge of glass; then, secure that end of wire to another wood handle.

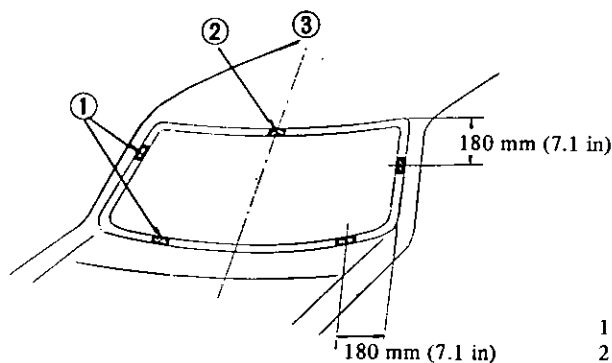
- (3) With the aid of an assistant, carefully cut (pull wire) through caulking material around entire perimeter of window using a sawing motion.



BF328
Fig. BF-132 Cutting sealant

7. Working from inside vehicle, push windshield glass out of window opening.

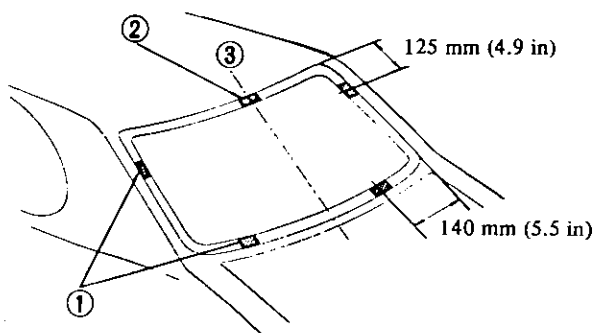
8. Using a razor blade or sharp scraper, remove caulking material along entire edge of window opening, leaving it about 1 to 2 mm (0.0394 to 0.0787 in) thick.



BF528

- 1 Spacer A
- 2 Spacer B
- 3 Body center line

Fig. BF-133 Location of spacers (Front)

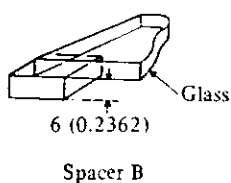


BF529

- 1 Spacer A
- 2 Spacer B
- 3 Body center line

Fig. BF-134 Location of spacers (Rear)

BODY



6 (0.2362)
Spacer A

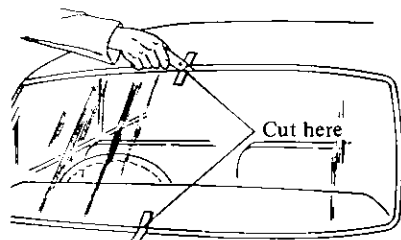
Unit: mm (in)

BF530

Fig. BF-135 Installing spacer A and B

4. There are two water drain holes in bottom edge of body opening. In applying caulking material, use care not to plug these two holes.

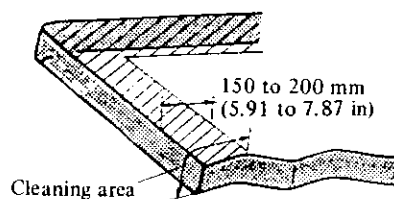
5. When glass is set in proper position in window opening. Paste two pieces of masking tapes at the center top and bottom of glass and panel for alignment.



BF331

Fig. BF-136 Aligning glass in window opening

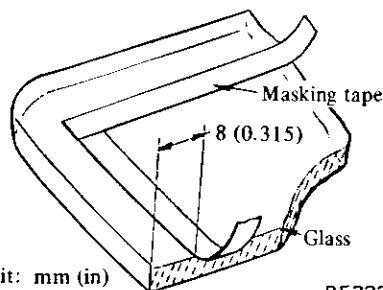
6. Clean glass surface where it will be applied the sealant and tape with non-lead gasoline as shown in Figure BF-137.



BF531

Fig. BF-137 Cleaning area of glass

7. Paste masking tape to inside of windshield glass 8 mm (0.315 in) inboard from edge of glass. Install tape completely around windshield glass and cut off excess amount at its ends.



Unit: mm (in)

BF332

Fig. BF-138 Pasting masking tape

8. Apply primer G to surfaces that will contact windshield glass.

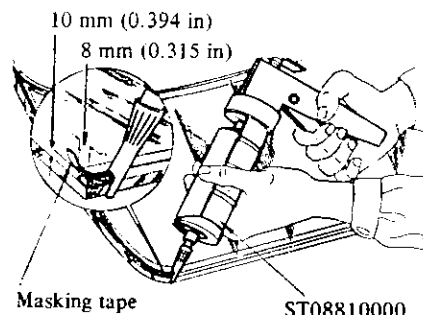
Note: Use absorbent cloth and paint primer G just as cleaning surfaces.

9. In like manner as above, coat welded flanges of window opening with primer M.

a. Apply primer M to original caulking material if left on flanges.

b. Allow primed surfaces to air dry for at least 10 minutes.

10. Insert cartridge in special tool "Caulking Hand Gun ST08810000" and place smooth, continuous bead on glass 10 mm (0.394 in) above glass surfaces.

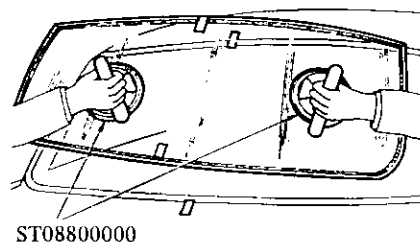


BF333

Fig. BF-139 Applying adhesive caulking

11. Support windshield glass with special tool sucker ST08800000.

12. Position windshield glass in glass opening and align the masking tapes previously made and make sure that glass is properly placed on spacers located at the glass opening flange.



BF334

Fig. BF-140 Installing glass

13. Push on glass to aid in seating on plate.

14. Wipe excess caulking material off T studs, edges of glass and body.

15. Remove protective covers.

16. Water test immediately using a cold water spray.

Do not direct stream of water at fresh adhesive material. Allow water to spill over edges of glass. If waterleaks is encountered, use a flat-blade tool to work-in additional caulking material at leak point.

17. Install all previously removed parts.

18. Remove clean-up masking tapes from inner surface of glass.

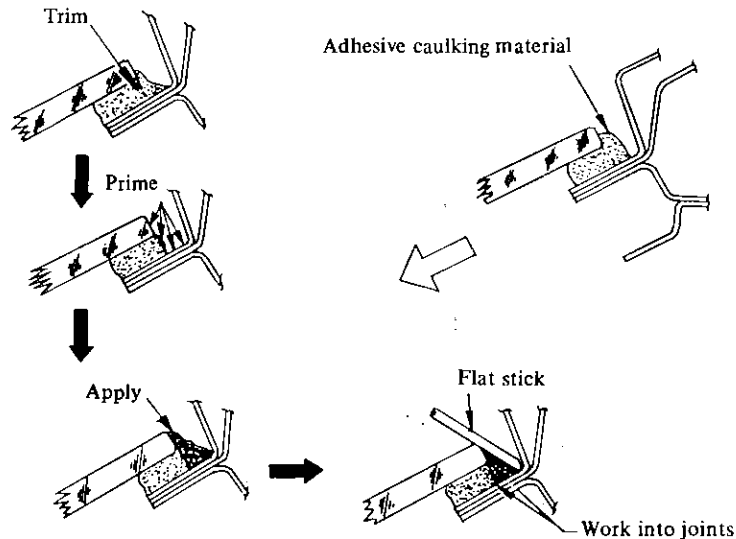
BODY

WATERLEAK CORRECTION

Waterleaks can be repaired without

removing and installing glass as follows:

Note: To repair waterleaks, use adhesive caulking material and primer.



BF335

Fig. BF-141 Adhesive caulked glass waterleak correction

1. To stop waterleaks, first remove mouldings in area of leak. It may be necessary to remove garnish moulding or finishing lace to isolate the cause of trouble.
2. Mark location of leak.

Note: If water is leaking between caulking material and body or between glass and caulking material, determine the extent of leak by pushing on the glass outwards.

Apply water to leak area while pushing on the glass. Mark the extent of leak point.

INTERIOR TRIMS

CONTENTS

FRONT PILLAR	BF-37	Removal and installation (Sedan)	BF-38
Removal and installation	BF-37	Removal and installation (Hardtop)	BF-39
CENTER PILLAR GARNISH	BF-38	REAR PARCEL SHELF	BF-39
Removal and installation	BF-38	Removal and installation	BF-39
REAR DOOR GARNISH	BF-38	HEAD LINING	BF-39
Removal and installation	BF-38	Removal	BF-40
REAR CORNER GARNISH	BF-38	Installation	BF-40

FRONT PILLAR

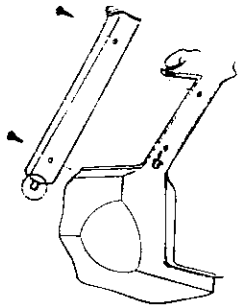
Removal and installation

1. Remove front pillar garnish at-

taching screws and then remove the garnish from front pillar.

Be careful not to bend the lower tip

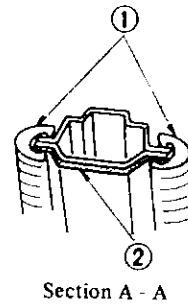
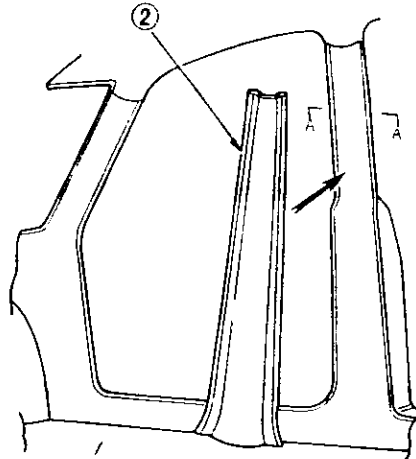
of the garnish shown in Figure BF-142.



BF532

Fig. BF-142 Removing front pillar garnish

2. Install front pillar garnish in reverse sequence of removal.



BF533

Fig. BF-143 Removing center pillar garnish

- 1 Body side welt
- 2 Center pillar garnish

door garnish and remove garnish from door sash.

2. Install rear door garnish in reverse sequence of removal.

CENTER PILLAR GARNISH

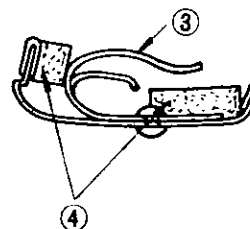
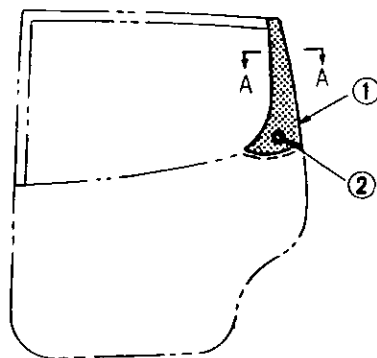
Removal and installation

1. Remove body side welts which are installed to center pillar flange.
2. Remove center pillar garnish from center pillar.

REAR DOOR GARNISH

Removal and installation

1. Remove screws attaching rear



BF534

Fig. BF-144 Removing rear door garnish

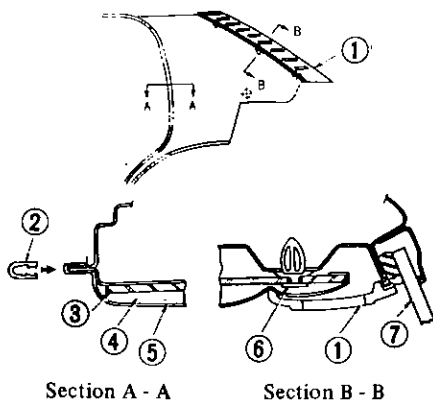
- 1 Rear door garnish
- 2 Attaching screw
- 3 Plate spring
- 4 Urethane form

REAR CORNER GARNISH

Removal and installation (Sedan)

1. Remove body side welt which is installed to rear corner flange.
2. Remove clips retaining rear corner garnish and then remove rear corner garnish.

BODY



BF535

- 1 Draughter finish
- 2 Welt
- 3 Hard board
- 4 Urethane form
- 5 Vinyl leather
- 6 Retaining clip
- 7 Rear window glass

Fig. BF-145 Removing rear corner garnish

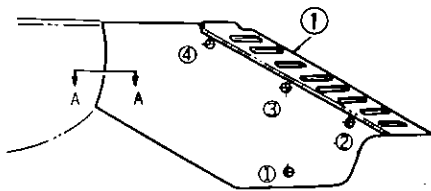
3. Install rear corner garnish in reverse sequence of removal.

ter finish and remove draughter finish.

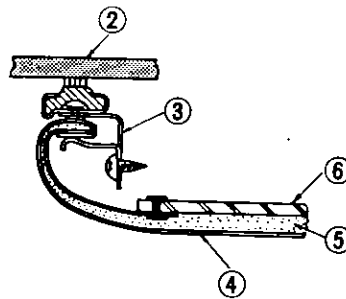
2. Remove clips retaining rear corner garnish and then draw rear corner garnish forwards.

Removal and installation (Hardtop)

1. Remove screws attaching draugh-



- 1 Draughter finish
- 2 Side window glass
- 3 Inner seal
- 4 Vinyl leather
- 5 Urethane form
- 6 Hard board



Section A - A

BF536

Fig. BF-146 Removing rear corner garnish

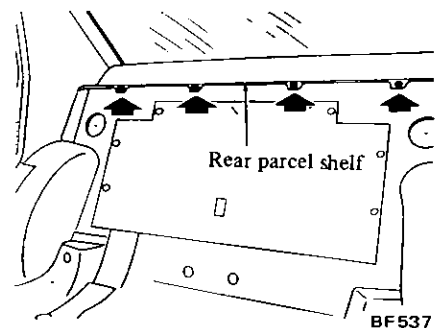
3. Install rear corner garnish in reverse sequence of removal.

REAR PARCEL SHELF

Removal and installation

1. Remove rear seat cushion and rear seat back.

2. Remove clips retaining rear parcel shelf front end and remove rear parcel shelf forwards.

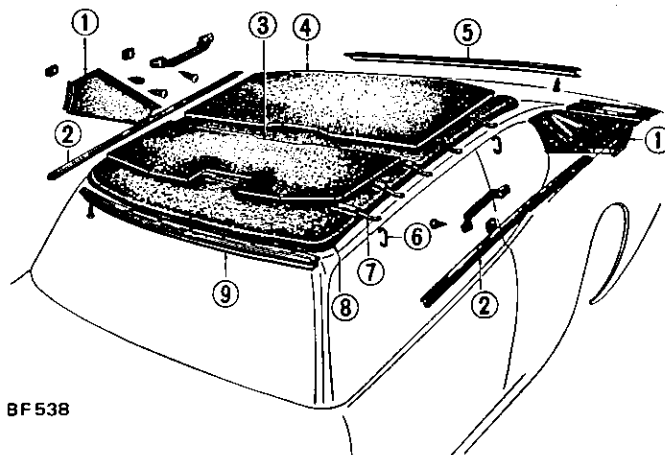


BF537

Fig. BF-147 Removing rear parcel shelf

3. Install rear parcel shelf in reverse sequence of removal.

HEAD LINING



BF538

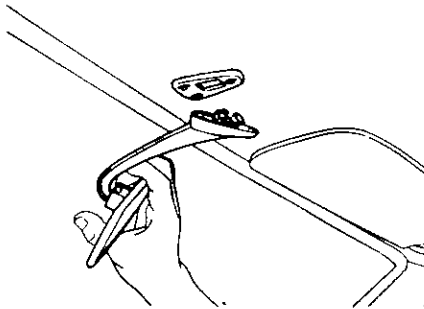
- 1 Rear corner garnish assembly
- 2 Front and rear windshield welt
- 3 Front roof insulator
- 4 Rear roof insulator
- 5 Rear window welt retainer
- 6 Listing wire hook
- 7 Head lining listing wire
- 8 Head lining cloth
- 9 Front window welt retainer

Fig. BF-148 Structural view of head lining (Hardtop)

BODY

Removal

1. Pull break-away type inside back mirror out of bracket and remove inside back mirror bracket.



BF 134

Fig. BF-149 Removing inside back mirror

2. Remove sun visors.
3. Remove room lamp.
4. Remove assist straps.
5. Remove body side welts.

6. Remove front pillar garnishes.
7. Remove center pillar garnishes.
8. Remove rear corner garnishes.
9. Remove the end of head lining cloth from roof rails.
10. Remove head lining listing wires from roof rails and remove head lining from roof.

Installation

1. Apply a trim adhesive to body flange and other body parts before installing head lining.
2. Starting at front and proceeding toward rear, or working toward front, install listing wires.

Notes:

- a. All fullness must be removed by stretching front and rear listing wires.

- b. Wrinkles can be removed by prying lining over along lining wire.

3. Cement the end of head lining to body flange while pulling it down at sides to remove wrinkles.
4. Trim the remaining head lining to proper size.

Note: In trimming at front pillars, center pillars and rear quarter panels, care should be taken to reserve enough end since head lining must be touched at these parts.

5. Cut a hole in the head lining material for room lamp and install room lamp assembly.

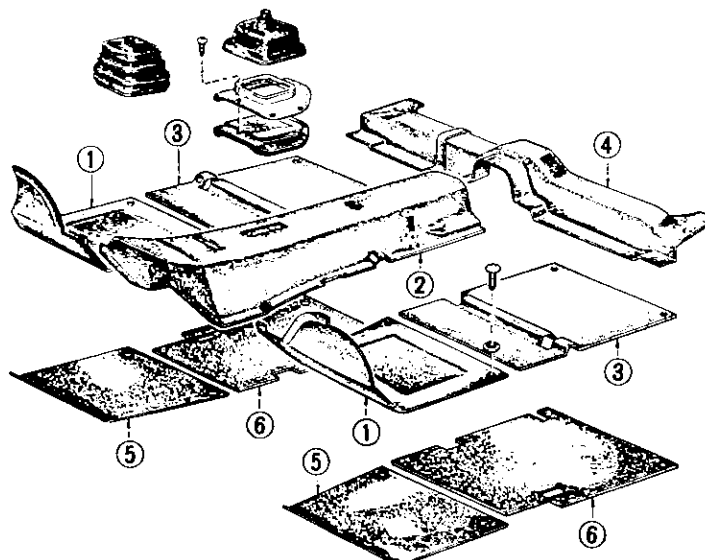
6. Install body side welts to body flanges and other equipments in position.

FLOOR MAT AND CENTER CONSOLE

CONTENTS

FLOOR MAT	BF-40	Removal and installation	BF-41
Removal and installation	BF-41	INSTRUMENT PANEL	BF-41
CENTER CONSOLE	BF-41	Removal and installation	BF-41

FLOOR MAT



BF539

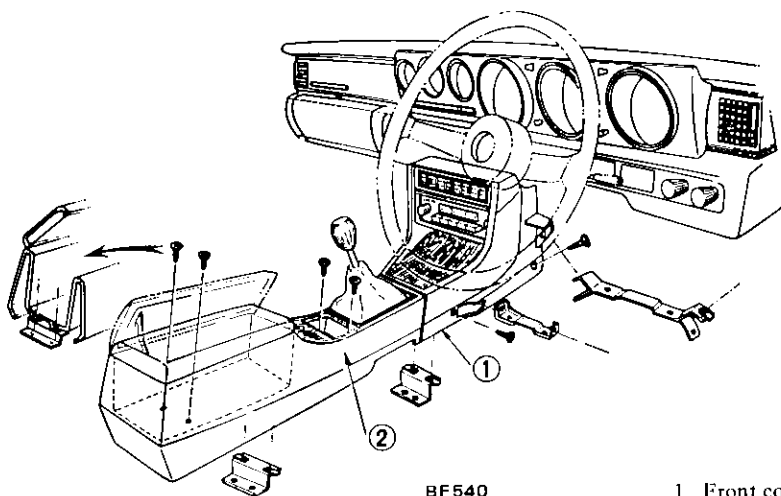
- 1 Front floor mat
- 2 Center floor mat
- 3 Rear floor mat
- 4 Rear seat lower mat
- 5 Front floor felt
- 6 Rear floor felt

Fig. BF-150 Structural view of floor mat

Removal and installation

1. Remove floor mats from retaining hooks and remove floor mats.

CENTER CONSOLE



BF540

- 1 Front console
- 2 Rear console

Fig. BF-151 Structural view of center console and brackets

Removal and installation

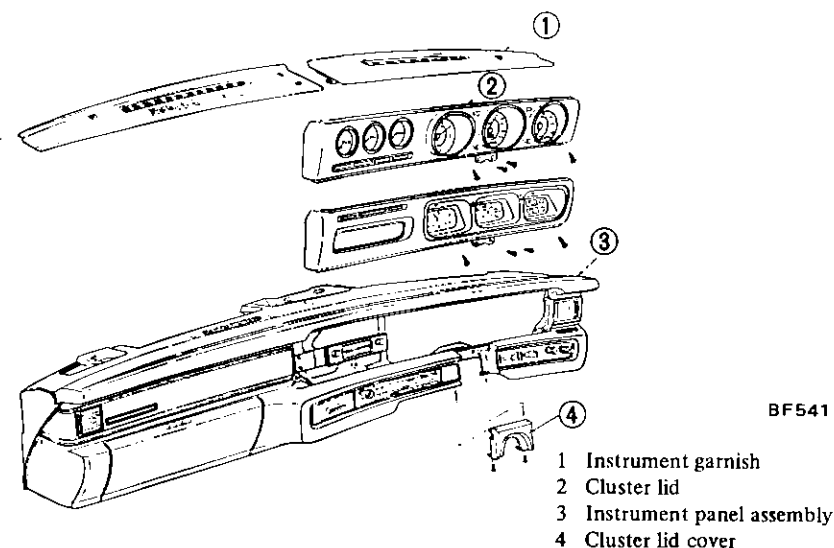
1. Remove transmission shift lever knob.
2. Remove screws attaching rear

console and remove rear console.

3. Remove front console-to-package tray attaching screws and side attaching screws and then remove front console.

4. Install front and rear console in reverse sequence of removal.

INSTRUMENT PANEL



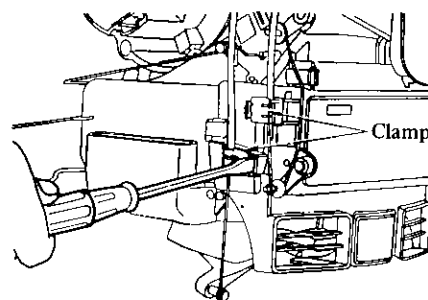
BF541

Fig. BF-152 Structural view of instrument panel

Removal and installation

Instrument panel assembly

1. Disconnect battery cable.
2. Remove horn bar, steering wheel and shell assembly.
3. Remove heater control cable clamps from heater assembly.

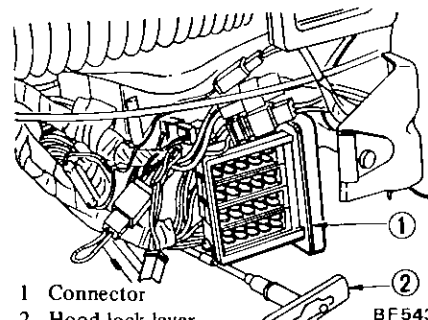


BF542

Fig. BF-153 Removing heater control cable clamps

4. Disconnect speedometer cable behind speedometer.

5. Disconnect body and instrument harnesses at a connector.



- 1 Connector
- 2 Hood lock lever

BF543

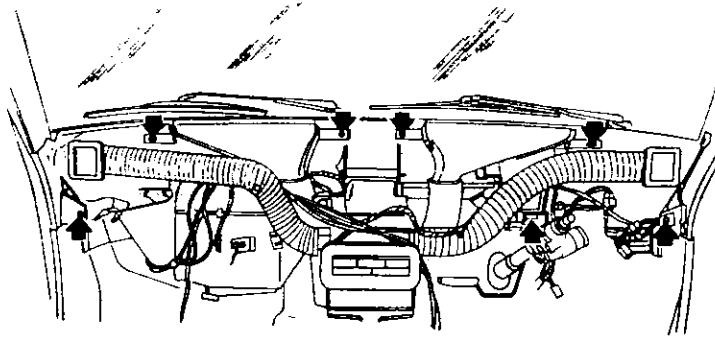
Fig. BF-154 Disconnecting instrument harness connector

6. Remove instrument garnishes from instrument panel.

7. Remove cluster lid cover.

8. Loosen bolts attaching instrument panel shown in Figure BF-150 and draw instrument panel assembly out backwards.

BODY



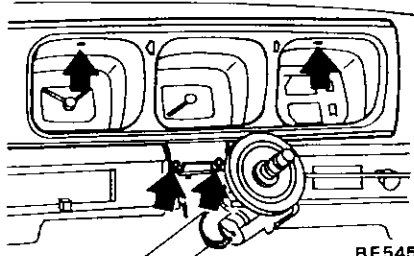
BF544

Fig. BF-155 Removing instrument panel attaching bolts

9. Install instrument panel assembly in reverse sequence of removal.

Cluster lid

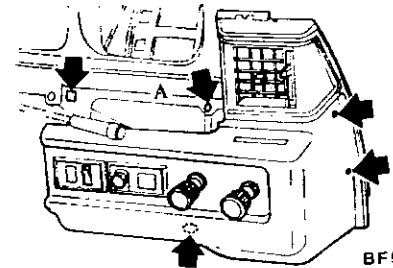
1. Remove steering column shell and cluster lid cover. It is not necessary to remove steering wheel.
2. Remove speedometer cable from speedometer back side.
3. Loosen screws attaching cluster lid and draw cluster lid out backwards.



BF545

Fig. BF-156 Removing cluster lid attaching screws

4. Disconnect related wire harnesses from meters back side.
5. Install cluster lid in reverse sequence of removal.



BF546

Fig. BF-157 Removing cluster lid A retaining screws

3. Install cluster lid A in reverse sequence of removal.

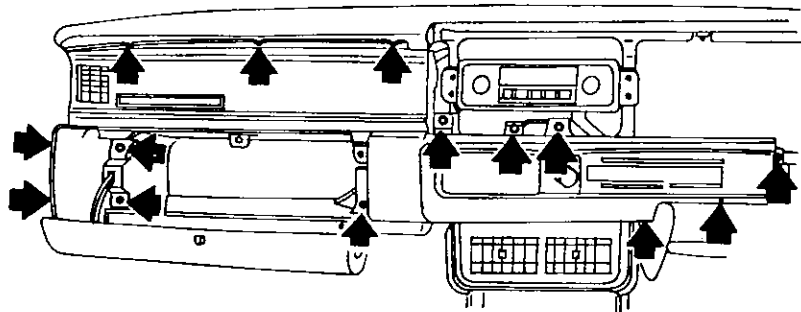
Cluster lid A

1. Remove steering column shell and cluster lid cover.
2. Remove screws retaining cluster lid A and remove cluster lid A from instrument panel.

Retaining screw "A" which secures cluster lid A to instrument panel, can be removed from the inside of cluster lid A. See Figure BF-157.

Cluster lid B

1. Disconnect battery cable.
2. Remove steering column shell assembly, cluster lid cover, cluster lid and heater control knobs.
3. Remove screws attaching heater control assembly to cluster lid B.
4. Remove screws attaching cluster lid B and remove cluster lid B from instrument panel.



BF547

Fig. BF-158 Removing cluster lid B attaching screws

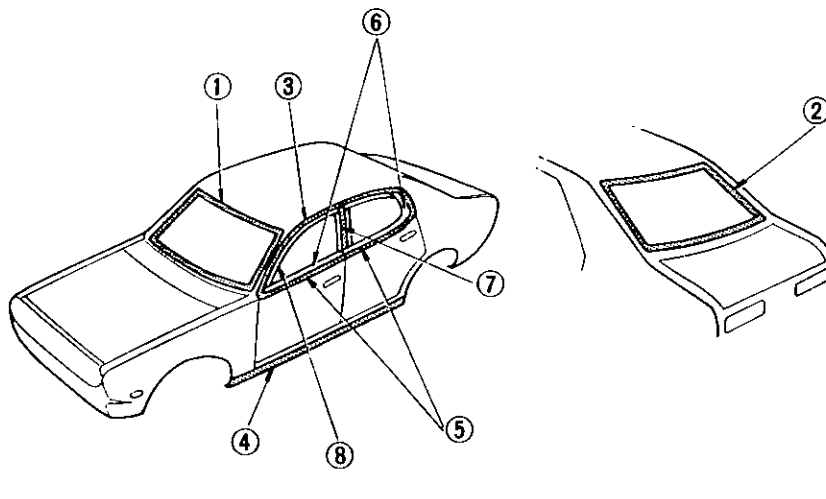
5. Install cluster lid B in reverse sequence of removal.

MOULDING

CONTENTS

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Removal and installation	BF-44	ROOF DRIP MOULDING	BF-46
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Removal and installation	BF-44	COVERS	BF-47
SILL MOULDING	BF-44	REAR PANEL AND TRUNK LID	
Removal and installation	BF-45	MOULDINGS	BF-47
DOOR MOULDING AND FINISH	BF-45	Removal and installation	BF-48

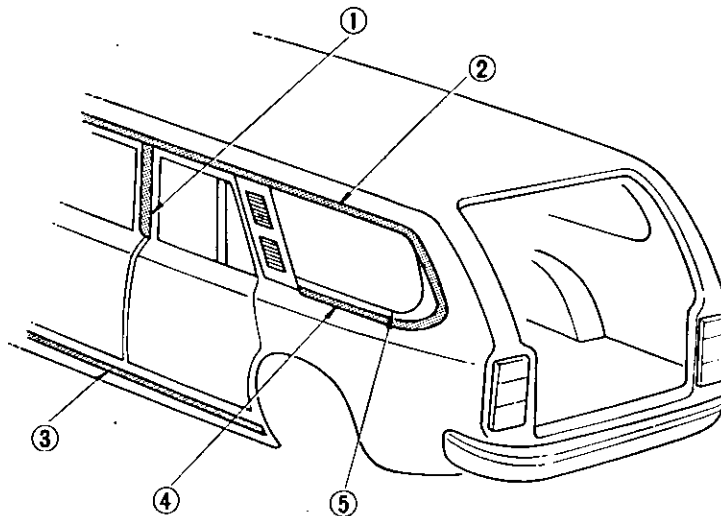
BODY



BF548

- 1 Front windshield moulding
- 2 Rear windshield moulding
- 3 Roof drip moulding
- 4 Sill moulding
- 5 Door outside moulding
- 6 Door outside finisher
- 7 Center pillar cover
- 8 Door sash cover

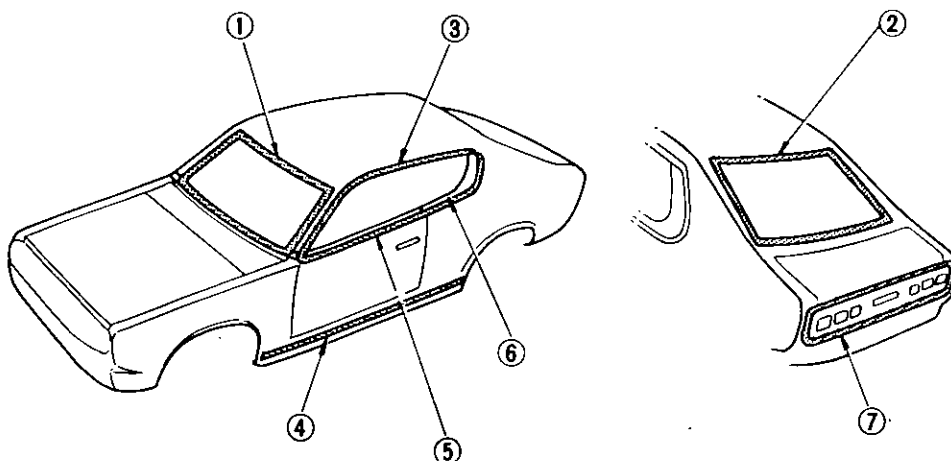
Fig. BF-159 Mouldings of the Sedan



BF549

- 1 Center pillar cover
- 2 Roof drip moulding
- 3 Sill moulding
- 4 Body outside moulding
- 5 Body outside finisher

Fig. BF-160 Mouldings of the Station Wagon and Van



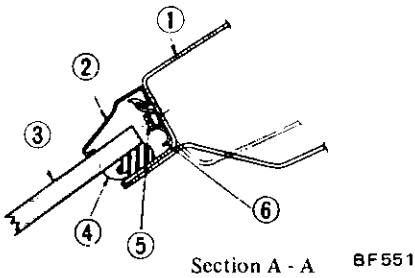
BF 550

- 1 Front windshield moulding
- 2 Rear windshield moulding
- 3 Roof drip moulding
- 4 Sill moulding
- 5 Door and rear fender moulding
- 6 Door and rear fender finisher
- 7 Rear panel moulding

Fig. BF-161 Mouldings of the Hardtop

BODY

FRONT WINDSHIELD MOULDING



- | | |
|-----------------------|------------|
| 1 Roof panel | 4 Dam |
| 2 Windshield moulding | 5 T-stad |
| 3 Windshield glass | 6 Fastener |

Fig. BF-162 Sectional view of front windshield moulding

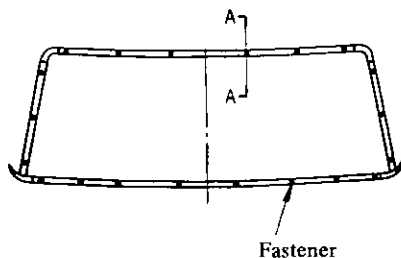
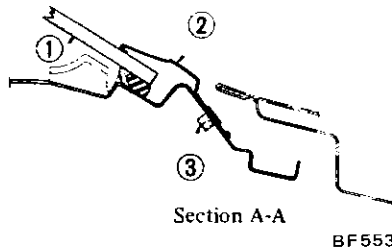


Fig. BF-163 Front windshield moulding fasteners (20 pieces)

REAR WINDSHIELD MOULDING



- | |
|-------------------------------|
| 1 Windshield glass |
| 2 Lower moulding |
| 3 Fastener for lower moulding |

Fig. BF-164 Sectional view of rear windshield moulding

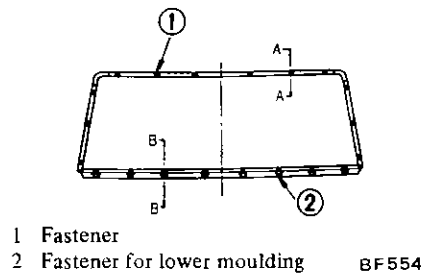


Fig. BF-165 Rear windshield moulding fasteners

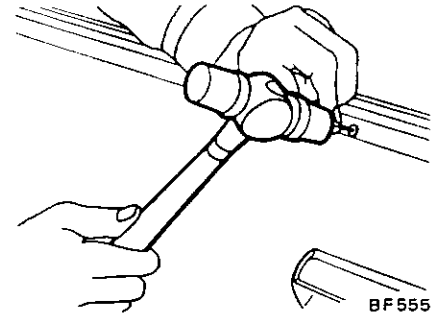


Fig. BF-166 Driving out fastener inner pin

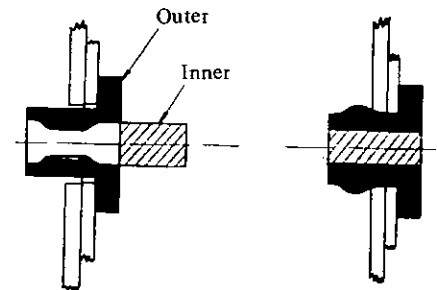


Fig. BF-167 Sectional view of fastener

Removal and installation

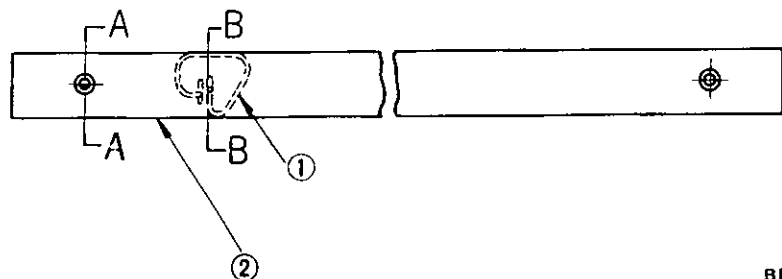
1. Open trunk lid.
2. Drive out inner pin of lower moulding fastener.

3. Move side moulding down until separating from corner moulding and remove corner moulding.
4. Draw side moulding upwards.
5. Draw upper and lower mouldings sideways.
6. Install rear window mouldings in reverse sequence of removal.

Removal and installation

1. Remove front roof drip mouldings.
2. Remove screw attaching side windshield moulding and remove side windshield mouldings.
3. Move side moulding down until separating from corner moulding and remove corner mouldings.
4. Draw side mouldings upwards.
5. Draw upper and lower moulding sideways.
6. Install windshield mouldings in reverse sequence of removal.

SILL MOULDING



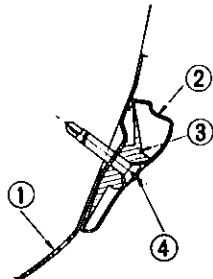
- | |
|-----------------|
| 1 Clip |
| 2 Sill moulding |

Fig. BF-168 Sill moulding

BODY

Removal and installation

1. Remove screws retaining sill moulding.

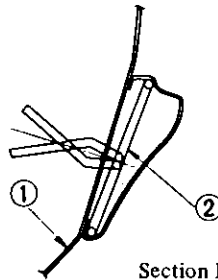


Section A-A BF558

- 1 Front and rear fenders
- 2 Sill moulding
- 3 Spacer
- 4 Retaining screw

Fig. BF-169 Sectional view of retaining screw and spacer

2. Remove retaining clips from body side sill.



Section B-B

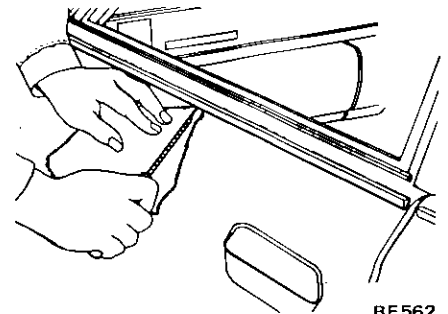
- 1 Body side sill
- 2 Clips (4 pieces)

Fig. BF-170 Sectional view of retaining clip

3. Install sill moulding in reverse sequence of removal.

Removal and installation

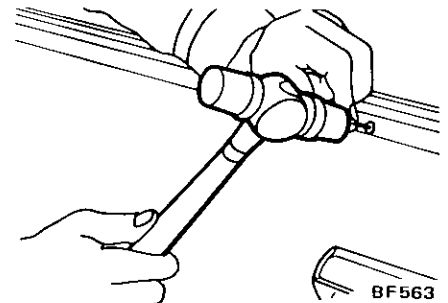
1. Remove door moulding using a flat-headed driver. Insert a pad between a driver and door panel to protect door paint.



BF562

Fig. BF-173 Removing door moulding

2. Remove door - finisher and water-tight seal cover and then drive beading clip inner pins out of clip and remove clips from outside door finish.



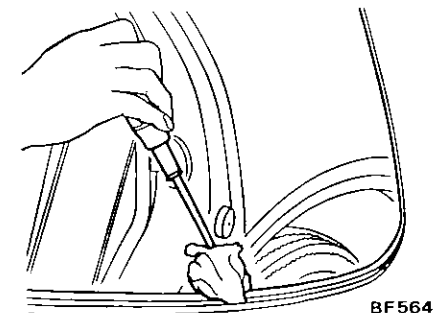
BF563

Fig. BF-174 Driving out beading clip inner pin

3. Push door outside weatherstrip toward door glass and remove outside finisher.

4. Remove door outside weatherstrip anchor clips from door outside panel using a flat-headed driver and then remove outside weatherstrip.

Outside weatherstrip of the Hardtop can be removed together with outside door finish.



BF564

Fig. BF-175 Removing outside weatherstrip

DOOR MOULDING AND FINISH

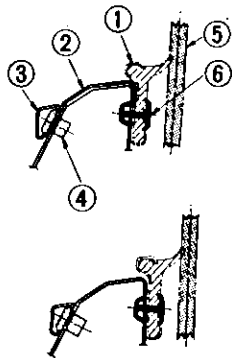
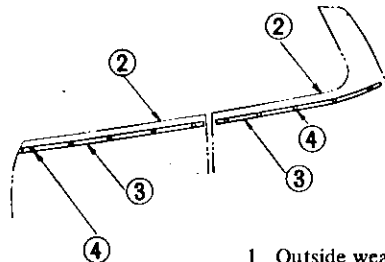
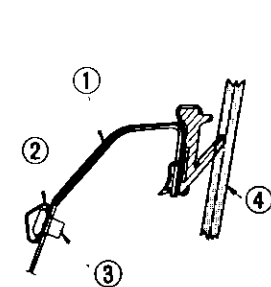


Fig. BF-171 Sectional view of door moulding and finisher (Sedan)



BF560

- 1 Outside weatherstrip
- 2 Finisher
- 3 Moulding
- 4 Clip
- 5 Door glass
- 6 Weatherstrip clip

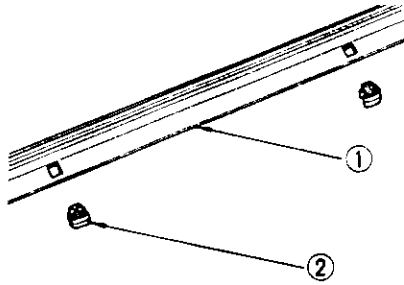


BF561

Fig. BF-172 Sectional view of door moulding and finisher (Hardtop)

- 1 Finisher
- 2 Moulding
- 3 Clip
- 4 Door glass

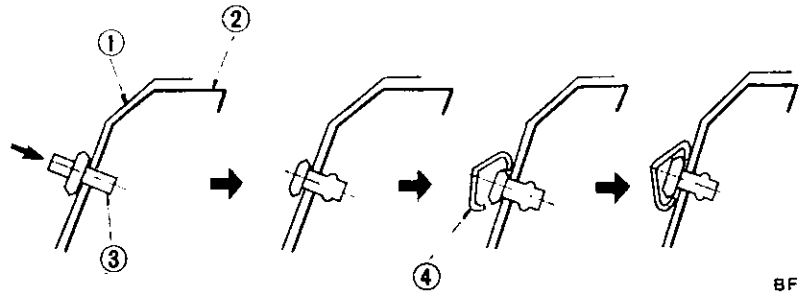
BODY



BF565

- 1 Door outside weatherstrip
- 2 Anchor clip

Fig. BF-176 Anchor clip

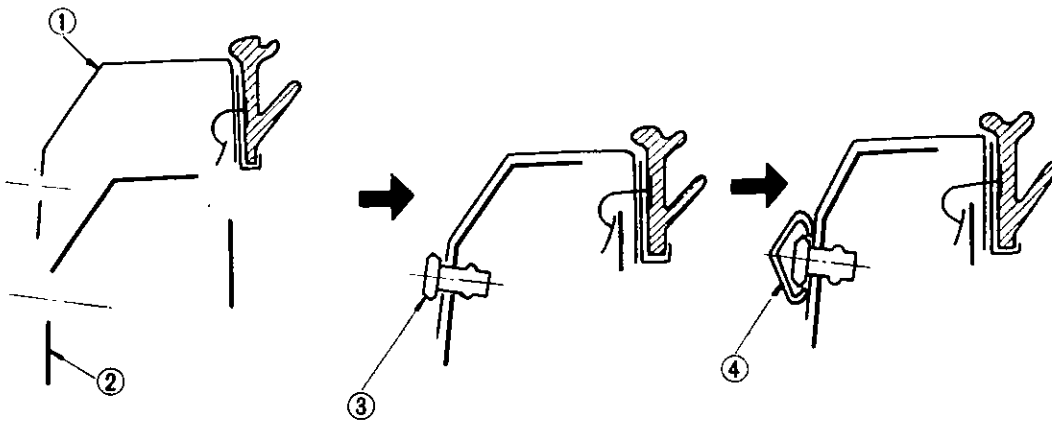


BF566

- 1 Outside finish
- 2 Door panel
- 3 Beading clip

5. Install outside door finish and moulding by the following procedures:

Fig. BF-177 Installing door outside finish and moulding (Sedan, Station Wagon and Van)

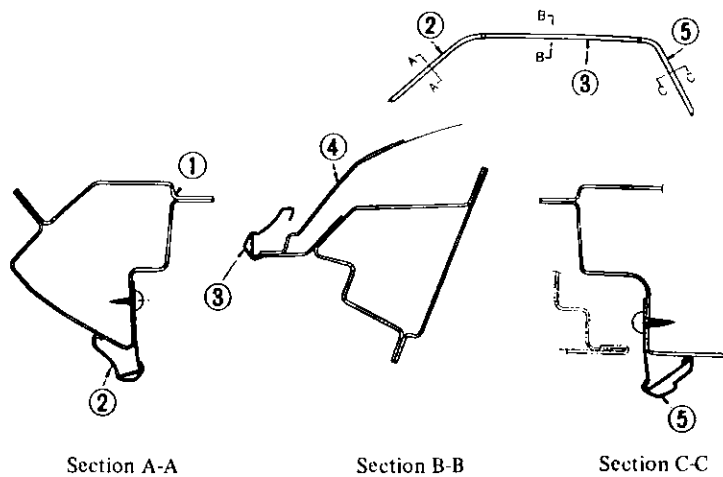


BF567

- 1 Outside finish
- 2 Door panel
- 3 Beading clip
- 4 Moulding

Fig. BF-178 Installing door outside finish and moulding (Hardtop)

ROOF DRIP MOULDING



BF568

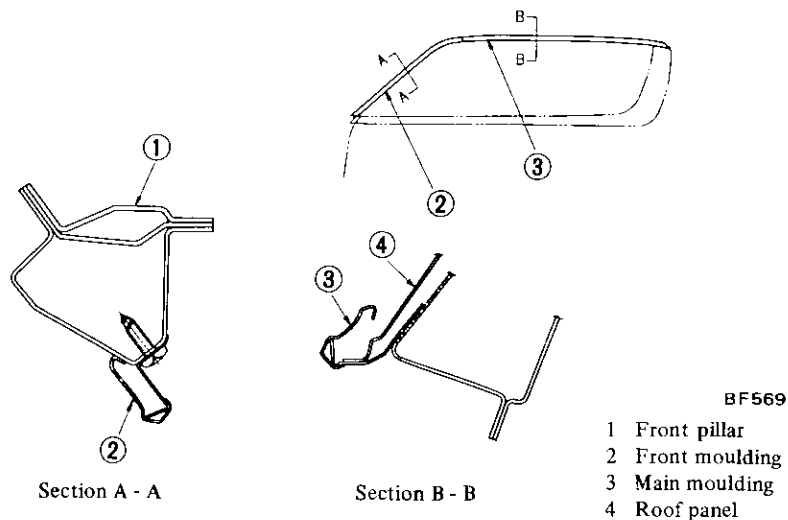
- 1 Front pillar
- 2 Front moulding
- 3 Center moulding
- 4 Roof panel
- 5 Rear moulding

Fig. BF-179 Roof drip moulding (Sedan)

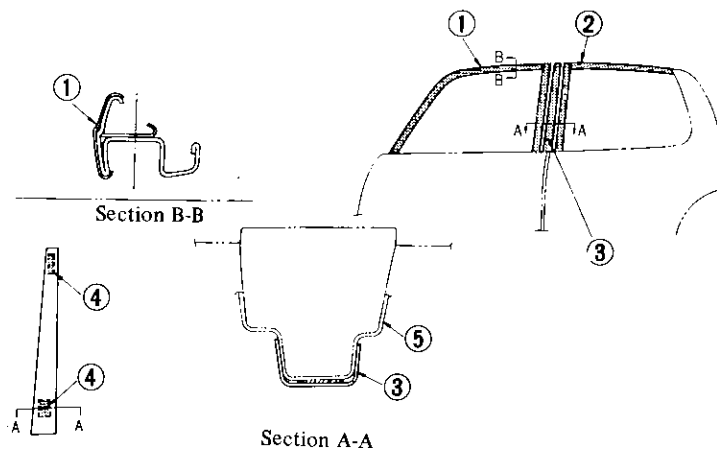
BODY

DOOR SASH AND CENTER PILLAR COVERS

Center pillar cover is attached to center pillar with adhesive tapes as shown in Figure BF-181.

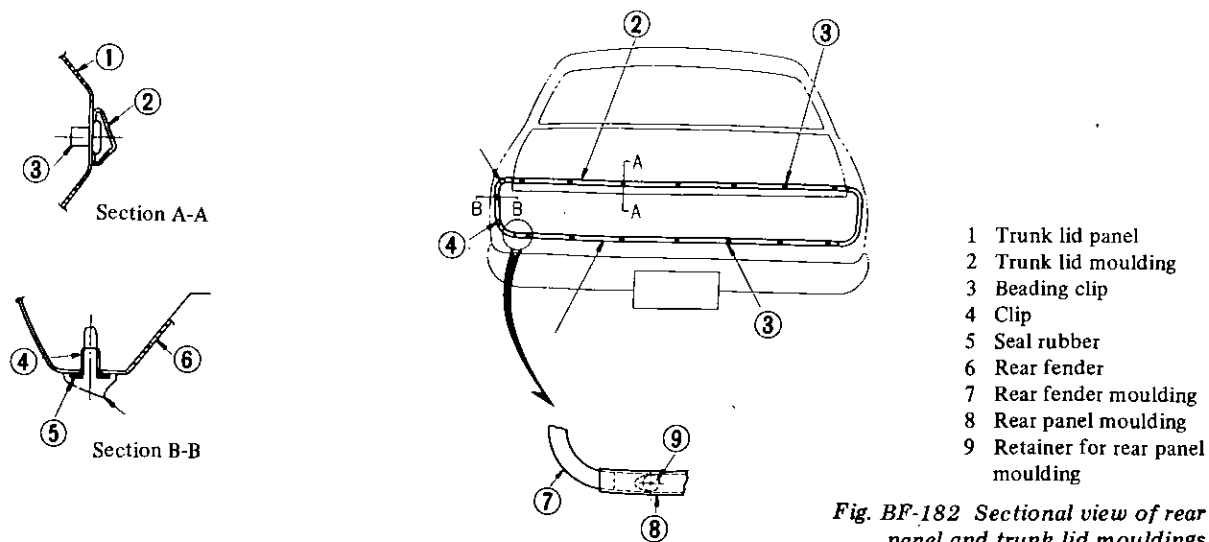


*Fig. BF-180 Roof drip moulding
(Hardtop)*



*Fig. BF-181 Sectional view of door
sash and center pillar cover*

REAR PANEL AND TRUNK LID MOULDING



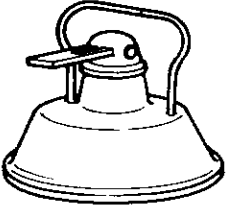
*Fig. BF-182 Sectional view of rear
panel and trunk lid mouldings*

BODY

Removal and installation

1. Remove nuts retaining rear panel moulding and remove rear panel moulding.
2. Remove rear fender mouldings.
3. Remove trunk lid moulding from clips.
4. Install trunk lid, rear fender and rear panel mouldings in reverse sequence of removal.

SPECIAL SERVICE TOOLS

No.	Tool number & tool name	Description Unit: mm (in)		For use on	Reference page or figure No.
1.	ST08800000 Sucker		This tool is used to secure and set the windshield glass panel on the spacer. This tool also serves for the satisfactory adhesion of glass panel to body under its uniform pressure after setting.	610 230	Page BF-36 Fig. BF-140
		SE231			
2.	ST08720000 Door adjusting wrench		This special wrench is used to make door adjustment without dismounting fender.	610	Page BF-20 Fig. BF-55
		SE232			



**DATSUN 1800
MODEL 610 SERIES
CHASSIS & BODY**



NISSAN MOTOR CO., LTD.
TOKYO, JAPAN

SECTION BE

**BODY
ELECTRICAL**

BODY ELECTRICAL WIRING	BE- 2
FUSE AND FUSIBLE LINK	BE- 3
LIGHTING AND SIGNAL SYSTEM	BE- 4
METERS AND GAUGES	BE-17
IGNITION SWITCH AND STEERING LOCK	BE-25
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BE

BODY ELECTRICAL WIRING

CONTENTS

DESCRIPTION	BE-2	Inspection	BE-2
Colors of cables	BE-2	Maintenance instructions	BE-2
WIRING HARNESS	BE-2		

DESCRIPTION

Cables used for body electrical wiring are low tension cables. Their conductors are covered with vinyl of various colors. These various colors are intended to represent use of respective cables. In wiring diagram, these colors are indicated by one or two alphabetical letters. With different colors thus used, such cables gathered together in wiring harness easily reveal their origins and destinations. Basic colors, that is, standard colors and

supplementary colors to standard color, are established for cables of respective systems such as starting and ignition system, lighting system and signal system. By designated colors, therefore, you can easily tell circuit systems and starting points of respective cables.

Colors of cables

The system of colors applied to the covering of cable conductors is as shown in the following table.

Circuit system	Standard color	Supplementary color	Supplementary color to standard color
Starting and ignition system	B (Black)	W, Y	
Charging system	W (White)	B, R, L	Y
Lighting system	R (Red)	W, B, G, Y, L	
Signal system	G (Green)	W, B, R, Y, L	W, Br (Brown)
Instrument system	Y (Yellow)	W, B, G, R, L	
Others	L (Blue)	W, R, Y	Y, Br, Lg (Light green)
Grounding system	B (Black)		

To covering of individual main cable of each system, standard color or supplementary color to standard color is generally applied. Colors are represented respectively by such letters as G, W and Br. Applied to minor item of each circuit's terminal is two-tone

which is composed of standard and supplementary colors. Each of such two-tone colors is indicated with combination of two letters like RW or GY; and first letter of each combination stands for standard color, and second, supplementary color.

WIRING HARNESS

Inspection

Referring to wiring diagrams or circuit diagrams, inspect entire electrical wiring and connections and insure:

1. That each electrical component part or cable is securely fastened to its connector or terminal.
2. That each connection is tight in place and free from rust and dirt.
3. That each cable covering shows no evidence of cracks, deterioration or otherwise damage.
4. That each terminal is securely kept away from any adjacent metal parts.
5. That each cable is fastened to its proper connector or terminal.
6. That each grounding bolt is planted tight.
7. That wiring is securely kept away from any adjacent sharp edges of parts or parts (such as exhaust pipe) having high temperature.
8. That wiring is kept away from any rotating or working parts such as fan pulley, fan belts, etc.
9. That cables between fixed portions and resiliently mounted equipment are long enough to withstand shocks and vibratory forces.

Maintenance instructions

1. Before starting to inspect and repair any part of electrical system or other parts which may lead to a short circuit, be sure to disconnect cables at battery terminals.

BODY ELECTRICAL

Disconnect cables at battery terminals in the following manner:

Disconnect cable at negative $\ominus$ terminal, and then disconnect the other cable at positive $\oplus$ terminal.

Before connecting cables at battery terminals, be sure to clean terminals with a rag. Fasten cable at positive $\oplus$

terminal, and then the other cable at negative $\ominus$ terminal. Apply grease to top of these terminals to prevent rust from developing on them.

2. Never use a screwdriver or service tool to conduct a continuity test. **USE TEST LEADS TO CONDUCT THIS CHECK.**

3. Never ground an open circuit or circuits under no load. Use a test lamp (12-3W) or circuit tester as a load.

4. Never disconnect cables by pulling them. Be sure to loosen terminals before disconnecting them.

FUSE AND FUSIBLE LINK

CONTENTS

DESCRIPTION	BE-3	Fuse	BE-3
MAINTENANCE INSTRUCTIONS	BE-3	Fusible link	BE-3

DESCRIPTION

The fuse and fusible link are protective device used in an electric circuit. When current increases beyond rated amperage, fusible metal melts and circuit is broken, and thus, cable and electrical equipment are protected from burning. Whenever fuse is melted for one reason or another, use systematic procedure to check and eliminate cause of trouble before installing new fuse in position.

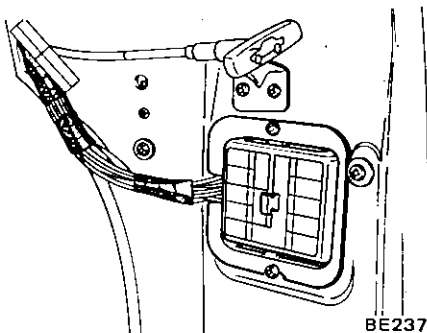


Fig. BE-1 Fuse box

MAINTENANCE INSTRUCTIONS

Fuse

In nearly all cases, visual inspection can reveal defective fuse. If condition of fuse is questionable, conduct continuity test with use of circuit tester or test lamp.

Notes:

- If fuse is blown off, be sure to eliminate the cause before installing new fuse in position.
- Use fuse of specified rating. Do not use fuse of more than specified rating.

- Check fuse holders for condition. If much rust or dirt is found thereon, clean metal parts with fine-grained sandpaper until proper metal-to-metal contact is made. Poor contact of any fuse holder will often lead to voltage drop or heating in the circuit and, in the worst case, may result in improper operation of circuit.

Fusible link

Two types of fusible link are in use. Each type is clearly identified by colored covering of conductors, as shown below:

Color	Size mm ² (sq in)	Continuous current	Max. current (fuse melts within 5 sec.)
Brown	0.3 (0.0005)	11A	Approx. 60A
Red	0.85 (0.0013)	26A	Approx. 250A

Melted fusible link can be detected by either visual inspection or finger-tip feeling. If its condition is questionable, use circuit tester or test lamp, as required, to conduct continuity test. This continuity test can be performed in same manner as for any conventional fuse.

Notes:

- Fusible link carries current as large as 60 or 250 amperes when it melts in period of less than five seconds. Under no circumstances should any larger fusible link than that specified be used.
- Should melting of fusible link occur, it is possible that critical circuit (power supply or large current carrying circuit) is shorted. In

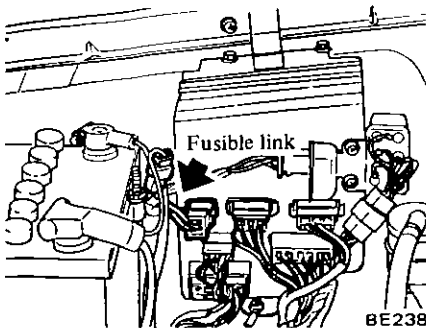


Fig. BE-2 Fusible link

BODY ELECTRICAL

such case, carefully check and eliminate the cause of trouble.
c. Never wrap periphery of fusible

link with vinyl tape. Extreme care should be taken of this link so that it does not come into contact with

any other wiring harness or vinyl or rubber-parts.

LIGHTING AND SIGNAL SYSTEM

CONTENTS

DESCRIPTION	BE- 4	Combination lamp assembly replacement	BE-12
Circuit diagram of lighting system	BE- 4	Bulb replacement	BE-12
Circuit diagram of signal lamp system	BE- 8	LICENSE LAMP	BE-13
HEAD LAMP	BE- 8	License lamp assembly replacement	BE-13
Head lamp beam replacement	BE- 8	Bulb replacement	BE-13
Aiming adjustment	BE- 9	BACK-UP LAMP	BE-14
FRONT COMBINATION LAMP	BE-10	TURN SIGNAL AND LIGHTING SWITCH	BE-14
Bulb replacement	BE-10	Removal	BE-14
Lamp assembly replacement	BE-10	LIGHTING SWITCH	BE-14
SIDE FLASHER LAMP	BE-10	Removal	BE-14
Bulb replacement	BE-10	HAZARD WARNING SWITCH	BE-14
SIDE MARKER LAMP	BE-11	Removal	BE-14
ROOM LAMP	BE-11	BULB SPECIFICATIONS	BE-15
Room lamp	BE-11	TROUBLE DIAGNOSES AND CORRECTIONS	BE-15
Rear room lamp	BE-11	Head lamp system	BE-15
REAR COMBINATION LAMP	BE-12	Signal lamp system	BE-16

DESCRIPTION

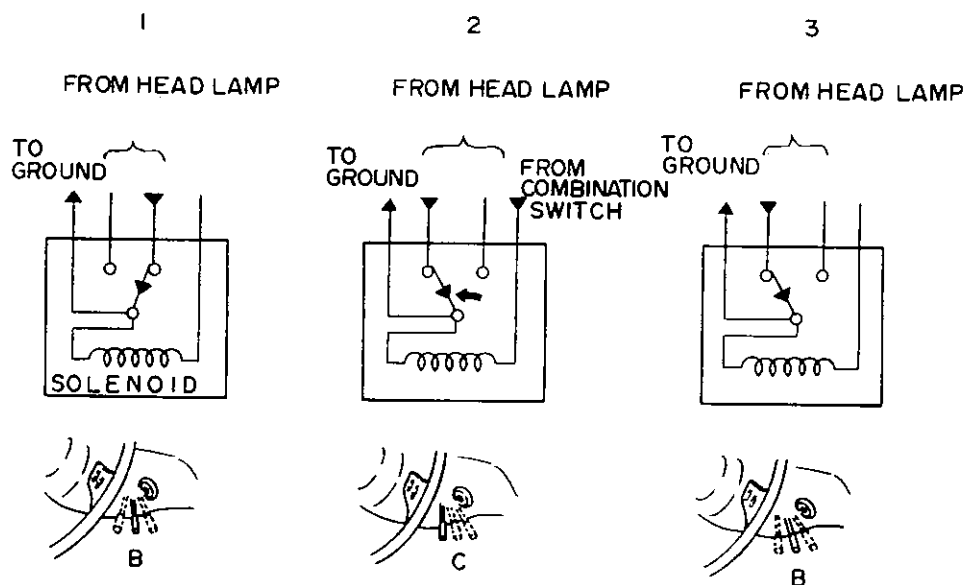
Circuit diagram of lighting system

Head lamp system, isolated from other lighting system, has its own circuit. Power circuits of both right

and left head lamps are independent so that melting of fuse for one head lamp causes neither head lamp to go out; light with fuse melted is dimly lit by dint of electric current flowing in from circuit of the other lamp, which has no

trouble and is, of course, normally lit.

Figure BE-3-1 shows that combination switch lever is in position B, and contact of lighting relay is on one side. Once lever is switched to position C, as shown in Figure BE-3-2, contact trans-



BE239

Fig. BE-3 Lighting relay

BODY ELECTRICAL

fers to the other side. Even when shifted to position C, lever automatically returns to position B (See Figure BE-3-3.).

This movement of relay contact is caused by magnet force which is produced on solenoid of relay. When lever of combination switch is set in posi-

tion C, electric current flows to solenoid of relay, and produces magnet force, which transfers contact to the opposite side.

Lighting switch	Combination switch	Lighting relay	Head lamp	Remarks
Switch position. (See Figure BE-4 or 5.)	Lever position.	Relay contact position.		
R.H.D – OFF L.H.D – OFF, 1	A	——	Head lamp is not lit.	Circuit after light switch is not supplied with current.
	B	——	Head lamp is not lit.	Circuit after light switch is not supplied with current.
	Keep lever in position C.	Relay contact transfers.	Either high or low beam is lit according to relay's contact.	When current is supplied to circuit after lighting switch, contact transfers at the same time. By operating lever C → B → C → B, beam repeats flashing and shifting, and may serve as passing light.
R.H.D – ON L.H.D – 2	A	Contact point stays at either side as it is.	Neither high or low beam is lit.	Tail lamp, parking lamp, etc., other than head lamp, are lit. Head lamp is not supplied with power source.
	B	Contact point stays at either side as it is.	Either high or low beam is lit according to relay's contact.	
	Shift lever to position C. Lever automatically returns to position B.	Relay contact transfers.	Beam shifts to opposite beam.	Beams of driving light and passing light can be selected by operating lever between B and C.

BODY ELECTRICAL

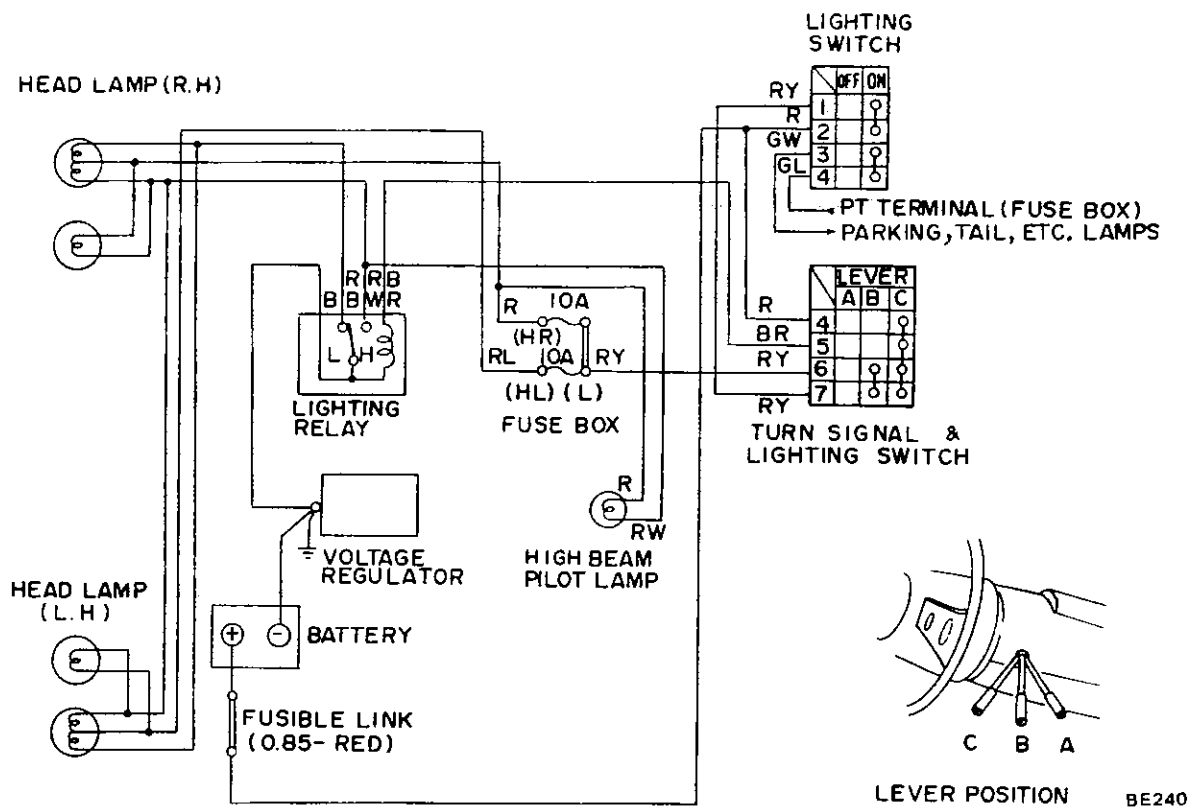


Fig. BE-4 Circuit diagram for lighting system (R.H. drive vehicle)

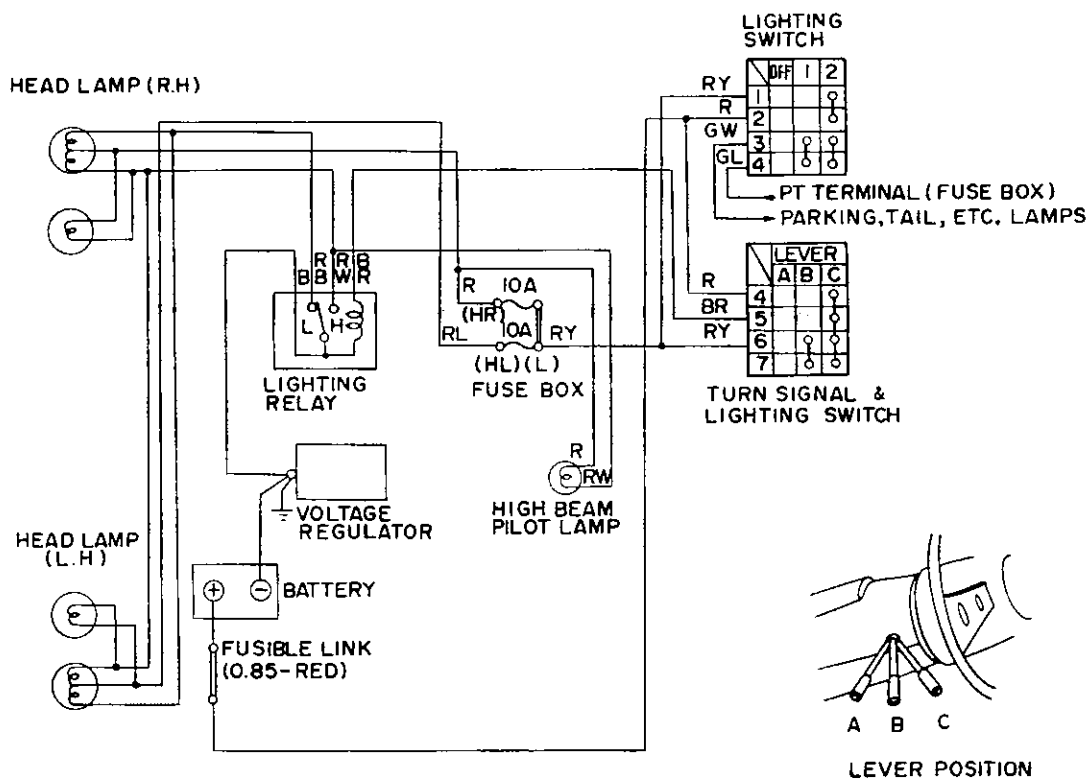
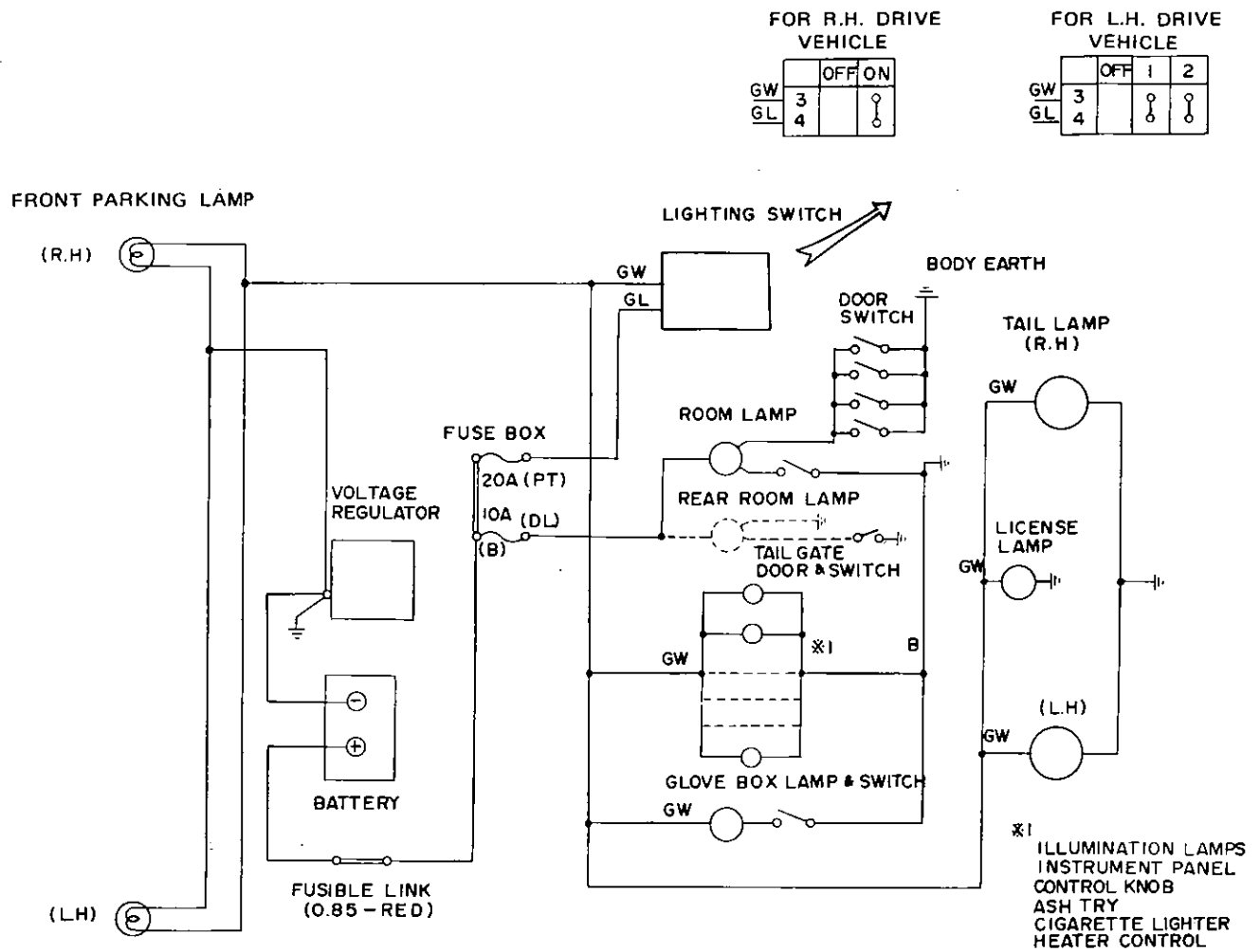


Fig. BE-5 Circuit diagram for lighting system (L.H. drive vehicle)

BODY ELECTRICAL



BE242

Fig. BE-6 Circuit diagram for lighting system (R.H. & L.H. drive vehicle)

BODY ELECTRICAL

Aiming adjustment

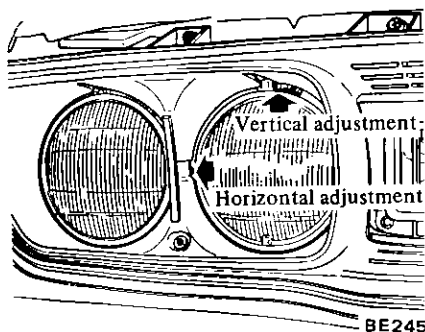


Fig. BE-9 Aiming adjustment

To adjust vertical aim, use adjusting screw on upper side of head lamp; and to adjust horizontal aim, use adjusting screw on side of head lamp.

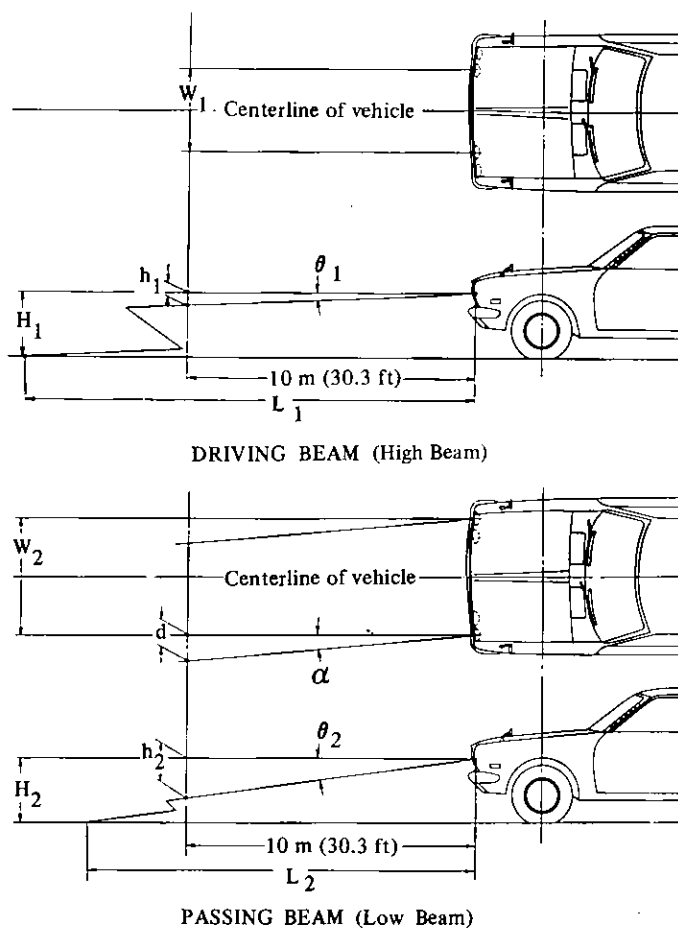
Notes: Before making head lamp aiming adjustment, observe the following instructions.

- Keep all tires inflated to correct pressures.
- Place car and tester on one and same flat surface.

c. See that there is no load in car.

- Gasoline, radiator and engine oil pan filled up to correct levels.
- Without passenger

When performing head lamp aiming adjustment, use an aiming machine, aiming wall screen or headlight tester. For operating instructions of any aimer, refer to respective operation manuals supplied with the unit.

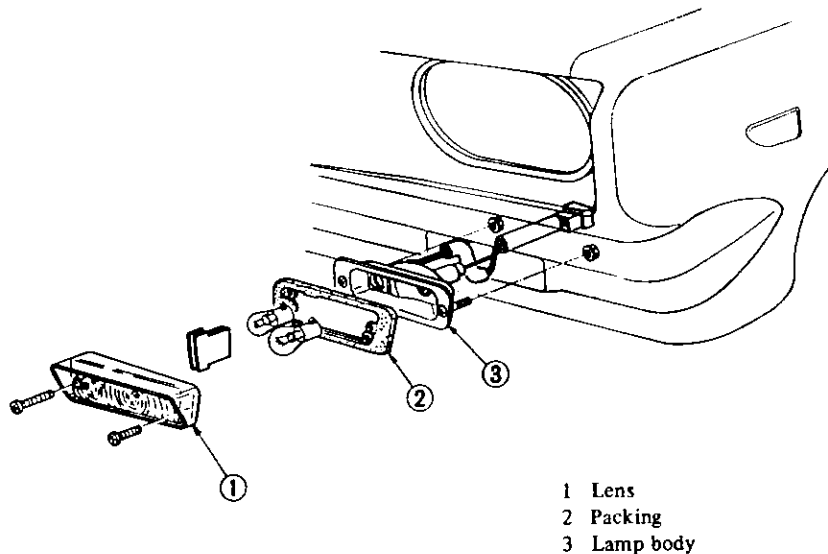


BE246

Item	Driving beam (High beam)					Passing beam (Low beam)					d mm (in)	α ($^{\circ}$)
	H_1 mm (in)	W_1 mm (in)	θ_1 ($^{\circ}$)	h_1 mm (in)	L_1 m (ft)	H_2 mm (in)	W_2 mm (in)	θ_2 ($^{\circ}$)	h_2 mm (in)	L_2 m (ft)		
610, K610	655 (25.8)	830 (32.7)	44'	128 (5.0)	51 (2.0)	655 (25.8)	1,180 (46.5)	2° 14'	390 (15.4)	17 (0.67)	349 (13.7)	2°
V. W610	680 (26.8)	830 (32.7)	44'	128 (5.0)	53 (2.1)	680 (26.8)	1,180 (46.5)	2° 14'	390 (15.4)	17.5 (0.69)	349 (13.7)	2°

Fig. BE-10 Aiming adjustment

FRONT COMBINATION LAMP



BE247

Fig. BE-11 Front combination lamp

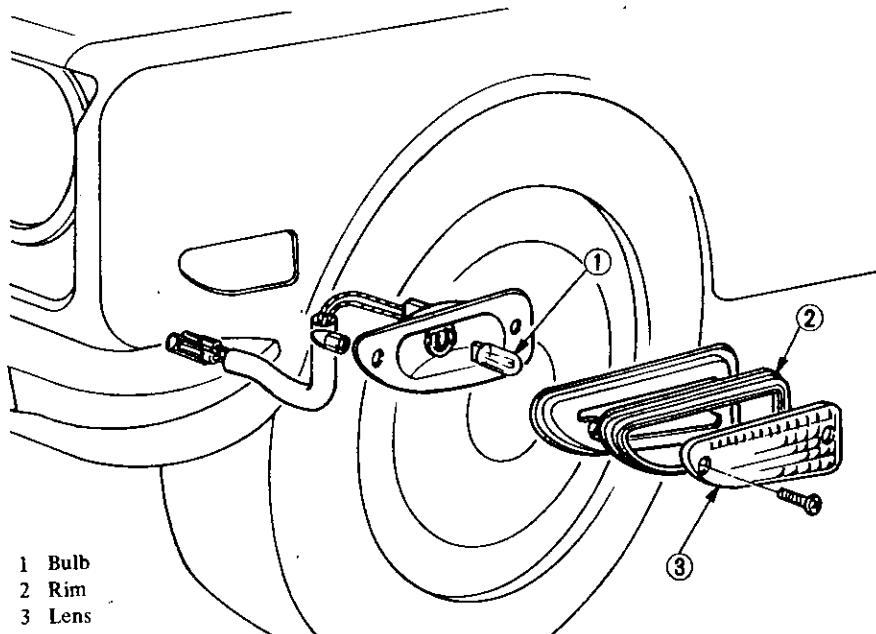
Bulb replacement

1. Remove two lens retaining screws and detach lens and packing.
2. Push in on bulb, turn it counter-clockwise and remove it from socket.
3. Insert new bulb into socket, making certain that locking pins in base of bulb is in the proper position of socket. Press bulb inward, rotate it clockwise, and lock bulb in socket.

Lamp assembly replacement

1. Remove two lens retaining screws and detach lens and packing.
2. Disconnect lead wires at connector.
3. Remove flange nuts from two mounting studs on back of bumper and dismount lamp assembly.
4. Install new assembly in reverse sequence of removal.

SIDE FLASHER LAMP



BE248

Fig. BE-12 Side flasher lamp

Bulb replacement

1. Remove two screws from front of lens and remove lens and rim.
2. Pull bulb forward to remove bulb from socket.
3. Install new bulb by pressing it inward.
4. Install packing, lens and rim.

BODY ELECTRICAL

SIDE MARKER LAMP

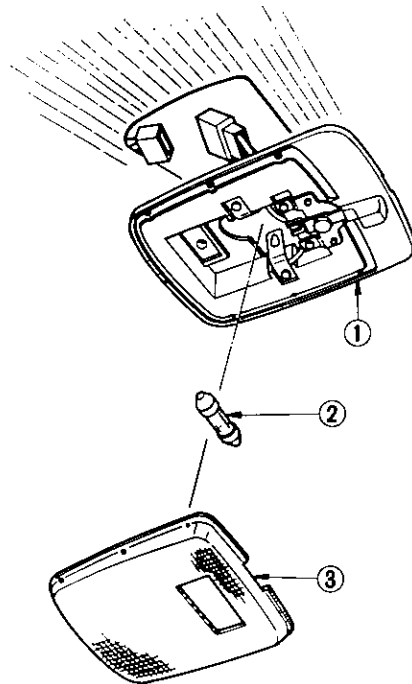
Side marker lamp is fixed on fender

with two screws. Replacement of lamp assembly can be done by removing

two screws from front of lens and disconnecting wires from connector.

ROOM LAMP

Room lamp



- 1 Lamp body
- 2 Bulb
- 3 Lens

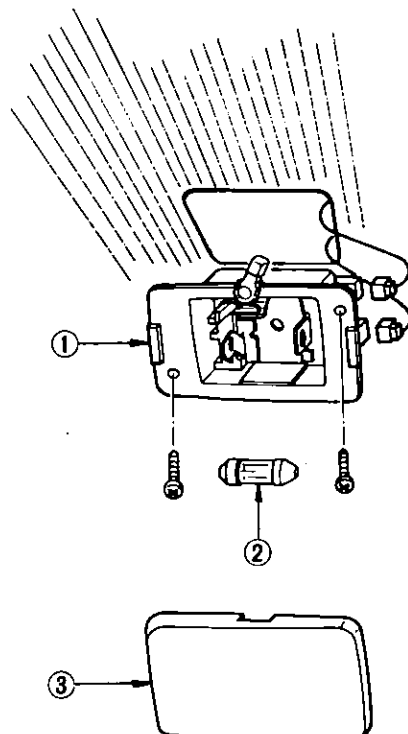
BE249

Fig. BE-13 Room lamp

To replace bulb, remove lens and change bulb.

To remove lamp body, pull out lamp body from roof and disconnect room lamp wires at connector. Room lamp is held by spring pressure against roof.

Rear room lamp



- 1 Lamp body
- 2 Bulb
- 3 Lens

BE250

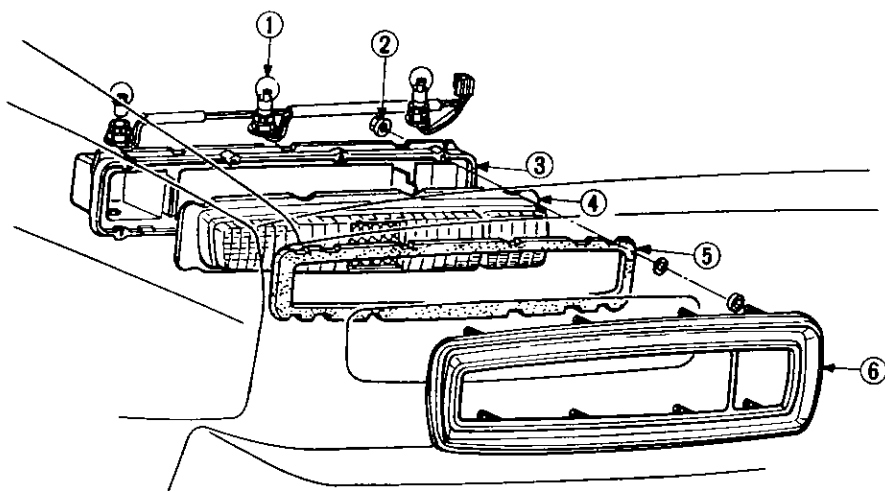
Fig. BE-14 Rear room lamp

To replace bulb, remove lens and change bulb.

To remove lamp body, remove two retaining screws, disconnect lead wires from each connector and withdraw lamp body.

REAR COMBINATION LAMP

Combination lamp assembly replacement



- | | |
|----------------|------------|
| 1 Bulb | 4 Lens |
| 2 Flange nut | 5 Packing |
| 3 Lamp housing | 6 Lens rim |

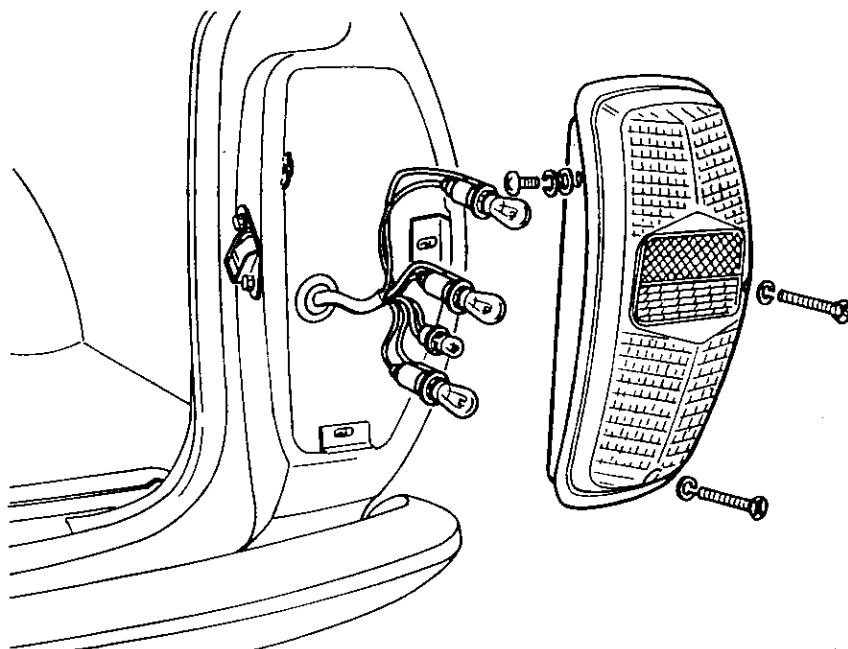
BE251

Fig. BE-15 Rear combination lamp

1. Remove three screws securing lamp assembly to rear fender.
2. Remove bulb socket from lamp housing (shade) and then remove lamp assembly.
3. Install new assembly in reverse sequence of removal.

Bulb replacement

1. Turn bulb socket counterclockwise and remove socket from lamp housing (shade).
2. Push in on bulb, turn it counterclockwise, and remove it from socket.
3. Insert new bulb into socket making certain that locking pins in base of bulb is in position. Press bulb inward, rotate it clockwise, and lock it in socket.
4. Insert socket into lamp housing with locking tab in proper position. Rotate socket clockwise to lock it in housing (shade).



BE252

Fig. BE-16 Rear combination lamp
(Station Wagon & Van)

LICENSE LAMP

License lamp assembly replacement

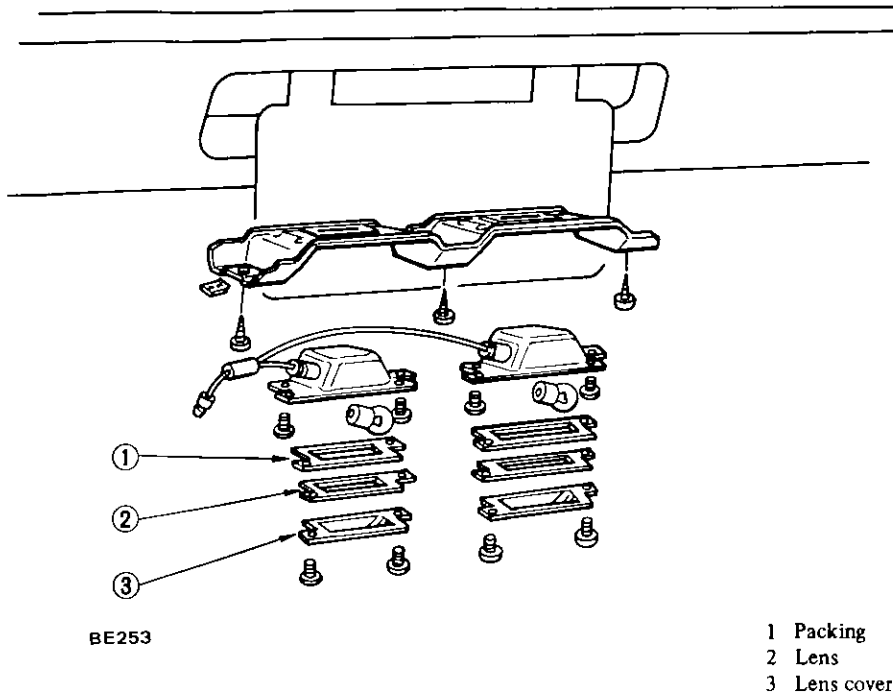


Fig. BE-17 License lamp (Sedan, Hardtop)

1. Remove three license lamp retaining screws and remove lamp assembly from bumper.
2. Disconnect lead wire at connector.
3. Install new license lamp assembly in reverse sequence of removal.

Bulb replacement

1. Remove two lens cover retaining screws.
2. Remove lens cover, lens and packing.
3. Replace bulb with new one.
4. Install cover, lens and packing in reverse sequence of removal.

License lamp assembly replacement

1. Remove tailgate trim.
2. Remove two tailgate handle retaining nuts.
3. Disconnect lead wire at connector.
4. Dismount lamp assembly from vehicle.

Bulb replacement

1. Remove two lens retaining screws.
2. Remove lens and packing.
3. Replace bulb with a new one.
4. Install packing and lens in reverse sequence of removal.

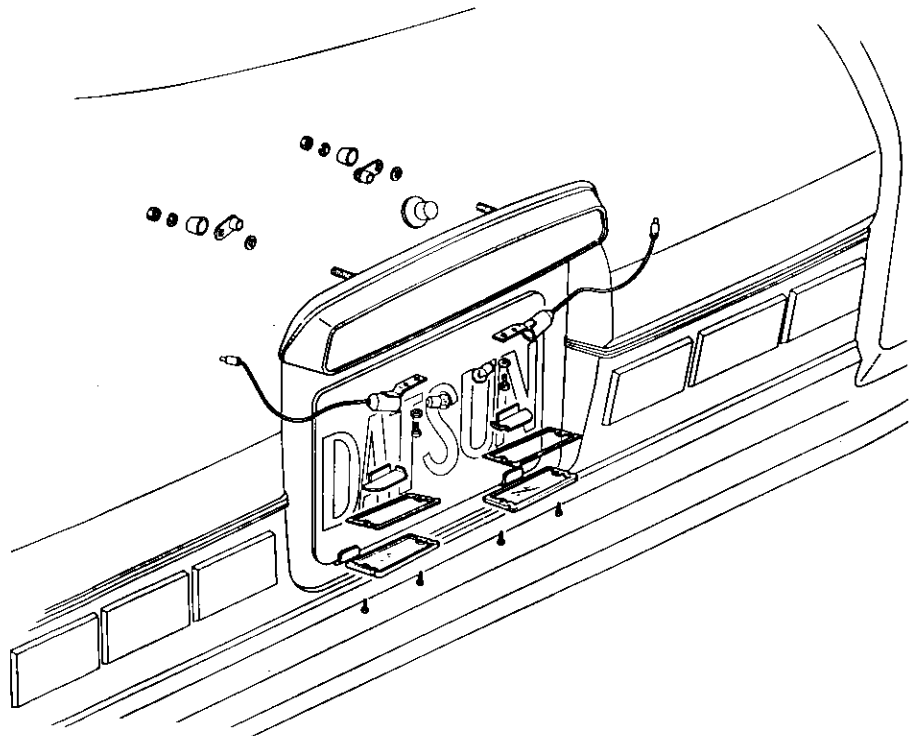
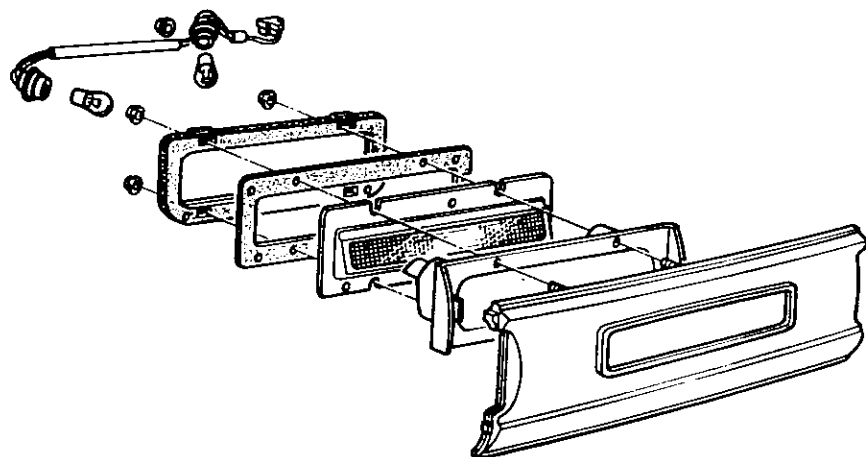


Fig. BE-18 License lamp (Station Wagon & Van)

BACK-UP LAMP



BE255

Fig. BE-19 Back-up lamp

1. Disconnect wires at connector.
2. Remove right and left rear combination lamp assemblies.
3. Remove four flange nuts.
4. Remove lamp assembly from rear panel.
5. Install new assembly in reverse sequence of removal.

TURN SIGNAL AND LIGHTING SWITCH

Removal

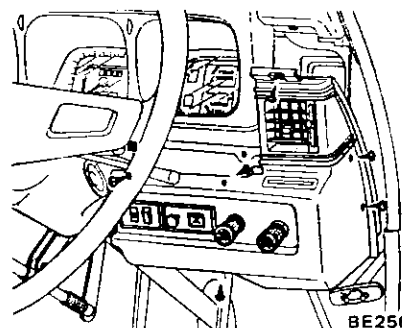
1. Remove horn ring.
2. Remove steering wheel securing nut and steering wheel.
3. Remove four shell cover retaining screws and remove upper and lower shell covers.
4. Disconnect combination switch wires at connectors.

5. Loosen two retaining screws and remove combination switch assembly.

LIGHTING SWITCH

Removal

1. Remove upper and lower shell covers from steering column by loosening four screws.
2. Loosen two cluster lid cover retaining screws and remove cluster lid cover.
3. Remove five screws from front of cluster A, and remove one screw holding cluster A to instrument panel from behind. Thus cluster A is detached.
4. Remove switch knob by depressing it and turning it counterclockwise.
5. Remove lighting switch.



BE256

Fig. BE-20 Removing cluster A

HAZARD WARNING SWITCH

Removal

1. Remove cluster lid A, following the same procedures as "Removal" procedures 1 through 3 for "LIGHTING SWITCH."
2. Remove connector from instrument harness.
3. Remove switch from cluster lid A, to which switch is attached by means of spring tension. From rear of cluster lid, push switch out forward.

BODY ELECTRICAL

BULB SPECIFICATIONS

Item	General areas	U.S.A. & Canada	
	Wattage	Wattage (Candelepower)	SAE trade number
Head lamp	50/37.5 37.5	50/37.5 37.5	4002 4001
Front combination lamp			
Turn signal/Parking lamp	—	27/8.3 (32/3)	1157
Turn signal lamp & Parking lamp	21 & 5	—	—
Side flasher lamp	5	—	—
Side marker lamp	—	8 (4)	67
Rear combination lamp			
Stop/Tail lamp	21/5	27/8.3 (32/3)	1157
Turn signal lamp	21	27 (32)	1156
Back-up lamp	21	27 (32)*	1156
License lamp	7.5	7.5 (6)	89
License lamp (Europe)	5	—	—
Room lamp			
Room lamp	10	10 (—)	—
Rear room lamp	10	10 (—)	—
Trunk room lamp	6	6 (—)	—

* In case of Hardtop, the back-up lamp is independently located in the center of rear panel.

TROUBLE DIAGNOSES AND CORRECTIONS

Head lamp system

Condition	Probable cause	Corrective action
Head lamps (both of high beam and low beam) do not light. Neither high beam nor low beam is lit. 1) Even when lighting switch is set to "OFF," and lighting lever switch is switched to operate passing light, it will not do.	Fusible link blown off.	When fused, detect and eliminate the cause, and replace with new one.
	Faulty lighting relay terminal connector.	Check connector for contact and repair as required.
	Defective lighting relay.	Conduct continuity test. If relay is defective, replace.
	Both fuses (right and left side beams) blown off.	When fused, detect and eliminate the cause, and replace with new ones.
	Faulty terminal connectors (lighting switch and lever switch).	Check connectors for contact and repair as required.
	Defective lighting switch and lever switch.	Conduct continuity test. If both switches are defective, replace.

BODY ELECTRICAL

Condition	Probable cause	Corrective action
2) Passing light is in normal workable condition.	Faulty lighting switch terminal connector. Defective lighting switch.	Check connector for contact and repair as required. Conduct continuity test. If switch is defective, replace.
Either high or low beam is lit normally. (High and low beams are not switched to each other.).	Faulty terminal connectors (lighting relay and/or lighting lever switch). Defective lighting relay and/or lighting lever switch.	Check connectors for contact and repair as required. Conduct continuity test. If any switch is defective, replace.
Only one head lamp is lit. 1) Head lamp on left side is normal, and that on right side is only dimly lit; or vice versa.	Either of two fuses for head lamps is melted. Faulty head lamp terminal connector.	When fused, detect and eliminate the cause, and replace with a new one. Check connector for contact and repair as required.
2) Head lamp on left side is normal, and that on right side does not light.	Defective lamp. Faulty head lamp terminal connector.	Replace with a new one. Check connector for contact and repair as required.
Head lamps dim.	Defective head lamp circuit.	Check head lamp circuit for cable about to break or in faulty contact, or check fuse for faulty contact. Repair, or replace if required.
1) Head lamps dim when the engine is stopped or idling.	Battery partly discharged. Defective battery.	Measure specific gravity of electrolyte. Charge battery if required. Replace battery.
2) Head lamps still dim with engine running faster than idling.	Voltage at head lamp terminals is 12.8 volts or higher. Faulty sealed beam unit. Voltage less than 12.8 volts. Faulty charging system.	Replace sealed beam units. Check the alternator, regulator, and head lamp circuit.

Signal lamp system

Condition	Probable cause	Corrective action
Turn signal lamps fail to operate properly.	When turn signal lever is moved to left, left turn signal lamp will not go on and off regularly. (But, when this lever is moved to right, right turn signal lamp will operate properly.). o Defective L.H. turn signal lamp. o Trouble in L.H. turn signal circuit. Both turn signal lamps fail to operate properly. o Defective flasher unit.	Replace bulb. Check and correct. Replace.

BODY ELECTRICAL

Condition	Probable cause	Corrective action
Turn signal lamps will not be on.	Both turn signal lamps fail to light when turn signal lever is moved to left and right. - When stop lamp switch is operated stop lamp will go on properly. - Defective "F" fuse. - Defective hazard lamp switch. - Defective flasher unit. - Defective turn signal switch. - When stop lamp switch is operated, stop lamp will not go on. - Discharged battery. - Trouble in power supply.	Replace. Replace. Replace. Check and correct. Re-charge. Check and correct.
Hazard warning lamps will not operate properly.	Turn signal lamps will operate properly, but hazard warning lamp will not light. - Defective "C" fuse. - Defective hazard flasher unit. - Defective hazard switch. Turn signal lamps operate properly, but L.H. hazard warning lamp will not. - Defective hazard warning lamp switch contacts (left side). Turn signal lamps operate properly, but hazard warning lamps will not operate properly. (Flashing cycle is too low or high). - Defective flasher unit.	Replace. Replace. Replace. Replace switch. Replace.

METERS AND GAUGES

CONTENTS

DESCRIPTION	BE-17	HAND BRAKE WARNING LAMP	BE-21
CLUSTER LID	BE-19	TACHOMETER	BE-21
Removal	BE-19	Installation	BE-21
SPEEDOMETER	BE-19	CLOCK	BE-22
Removal	BE-19	Installation	BE-22
FUEL METER AND WATER		TROUBLE DIAGNOSES AND	
TEMPERATURE METER	BE-19	CORRECTIONS	BE-22
Replacement	BE-20	Speedometer	BE-22
OIL PRESSURE WARNING LAMP	BE-20	Water temperature meter and fuel meter	BE-23
GENERATOR WARNING LAMP	BE-20	Oil pressure and generator warning lamps	BE-24

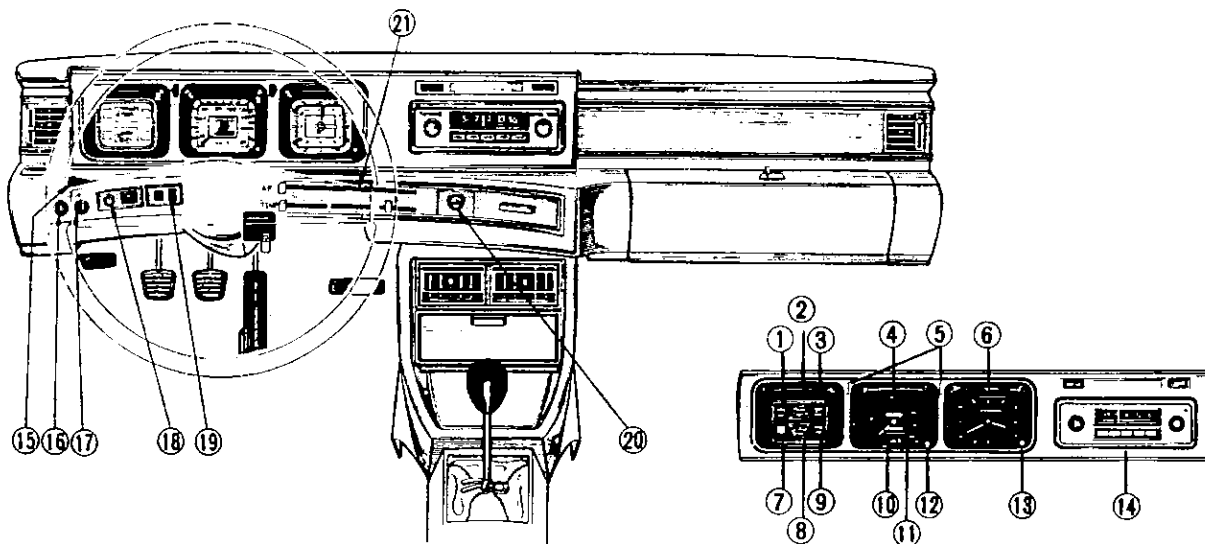
DESCRIPTION

Two types of cluster lid are provided: one with three square meters, and the other consisting of three

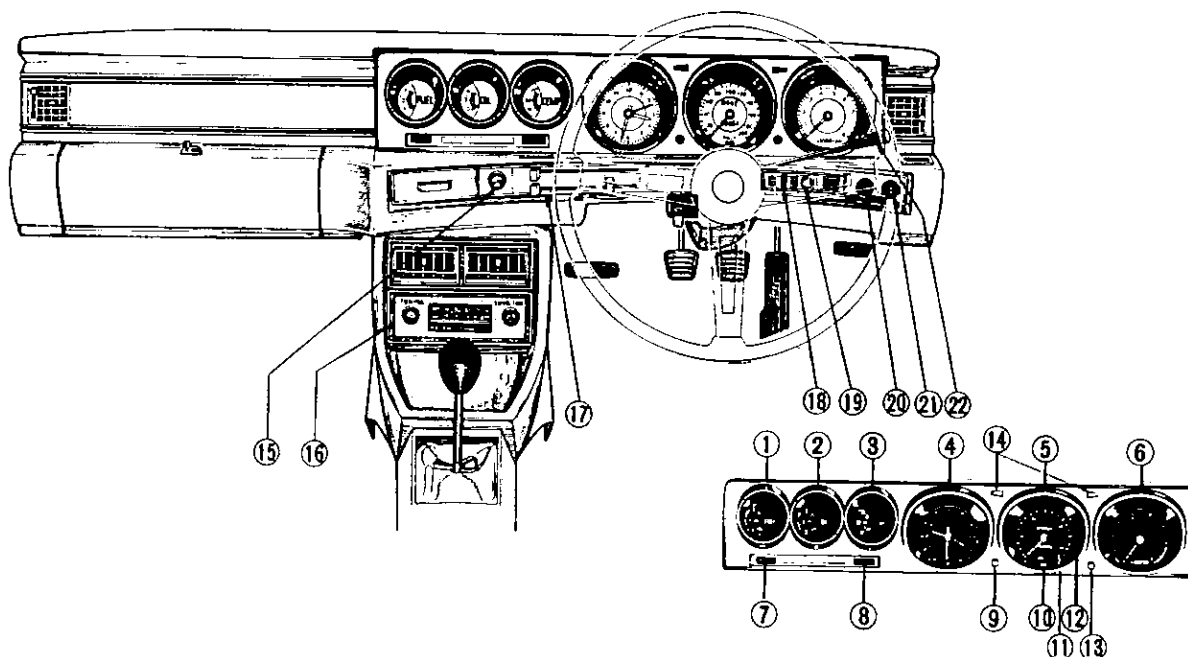
round meters and three small meters. Both types are installed in the same

manner. Here, explanation is given about square type.

BODY ELECTRICAL



- | | | |
|---------------------------|------------------------------|--|
| 1 Hand brake warning lamp | 8 Fuel meter | 15 Turn signal & lighting combination switch |
| 2 Water temperature meter | 9 Oil pressure warning lamp | 16 Wiper & washer switch |
| 3 Generator warning lamp | 10 Odometer | 17 Lighting switch |
| 4 Speedometer | 11 Trip meter | 18 Hazard switch |
| 5 Turn signal pilot lamp | 12 Trip meter re-set control | 19 Rear window defroster switch |
| 6 Clock | 13 Clock control | 20 Cigar lighter |
| 7 High beam pilot lamp | 14 Radio | 21 Heater control |



- | | | |
|---------------------------|------------------------------|----------------------------------|
| 1 Fuel meter | 9 Clock control | 16 Radio |
| 2 Oil pressure meter | 10 High beam pilot lamp | 17 Heater control |
| 3 Water temperature meter | 11 Odometer | 18 Rear window defroster switch |
| 4 Clock | 12 Trip meter | 19 Hazard switch |
| 5 Speedometer | 13 Trip meter re-set control | 20 Lighting switch |
| 6 Tachometer | 14 Turn signal pilot lamp | 21 Wiper & washer switch |
| 7 Hand brake warning lamp | 15 Cigar lighter | 22 Turn signal & lighting switch |
| 8 Generator warning lamp | | |

BE257

Fig. BE-21 Cluster lid and meters

CLUSTER LID

Removal

1. Disconnect battery terminals.
2. Remove shell covers from steering column by loosening four screws.
3. Remove two cluster lid cover retaining screws and remove cluster lid cover.
4. Remove two retaining screws as shown in Figure BE-22 and BE-23.

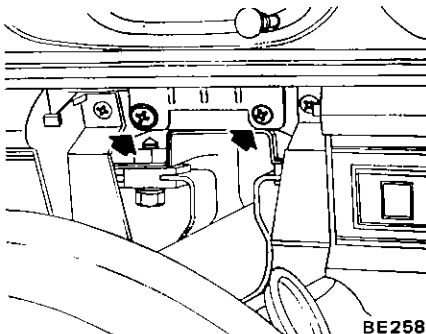


Fig. BE-22 Removal of cluster lid

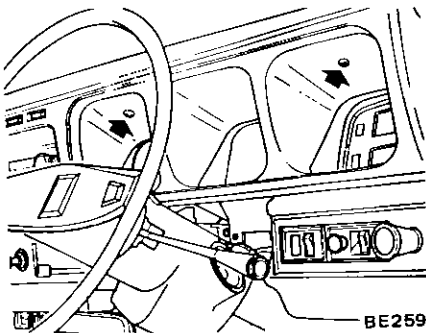


Fig. BE-23 Removal of cluster lid

5. Pull instrument panel forward.
6. From behind instrument panel, disconnect connector plug (multi-pole) from printed circuit housing.
7. Disconnect speedometer cable from speedometer head.
8. Disconnect other wires at terminals on printed circuit housing if so equipped.
9. Remove cluster lid assembly from instrument panel.

SPEEDOMETER

Removal

1. Remove cluster lid.
2. Remove odometer knob if so equipped.

3. Remove six attaching screws and remove printed circuit housing together with speedometer, water temperature meter and fuel meter.
4. Loosen two speedometer retaining screws and remove speedometer from printed circuit housing.
5. Install new speedometer in the reverse sequence of removal.

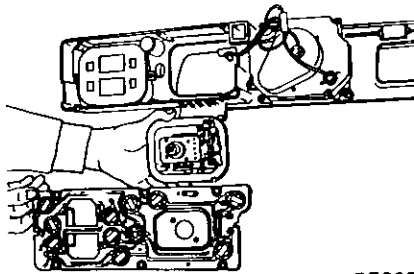


Fig. BE-24 Removing speedometer

FUEL METER AND WATER TEMPERATURE METER

The fuel meter consists of a tank unit located in the fuel tank and fuel meter. The tank unit detects fuel level with its float, converts fuel level variation to a resistance of slide resistor installed on the float base, and thus, controls current flowing to the fuel meter.

The water temperature meter consists of a meter and thermaltransmitter located in the engine block. The ther-

maltransmitter is equipped with a thermistor element which converts cooling water temperature variation to a resistance, and thus, the thermaltransmitter controls current flowing to the meter.

The fuel meter and water temperature meter are provided with a bimetal arm and heater coil. When the ignition switch is set to "ON," current flows to the heat coil, and the heat coil is heated. With this heat, the bimetal arm is bent, and thus, the pointer connected to the bimetal arm is operated. The characteristics of both meters are the same.

A tolerance may occur on the water temperature meter or fuel meter due to source voltage fluctuation. The voltage regulator is used to supply a constant voltage so that the water temperature meter and fuel meter operate correctly.

The operating part of the regulator consists of a bimetal arm and a heater coil. When the ignition switch is turned on, the bimetal arm is heated and bent by the coil, opening the contact. Consequently, current to the coil is interrupted. As the bimetal arm cools, the contact closes. The repetition of this operation produces a pulsating voltage of 8 volts which is applied to the temperature and fuel gauges.

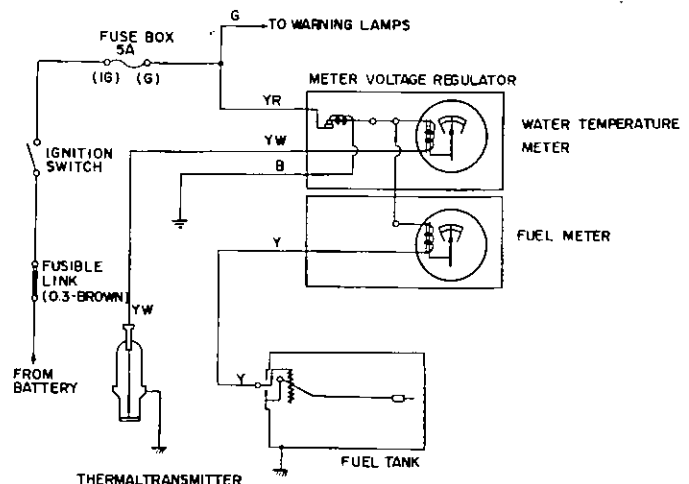


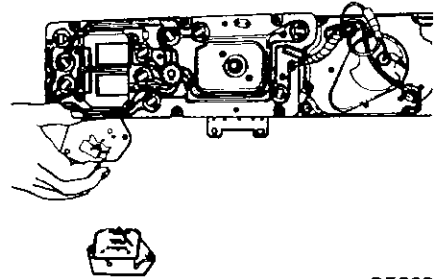
Fig. BE-25 Circuit diagram for fuel meter, temperature meter and voltage regulator

BODY ELECTRICAL

If both the water temperature meter and fuel meter become defective at the same time, this may be attributable to trouble in the voltage regulator.

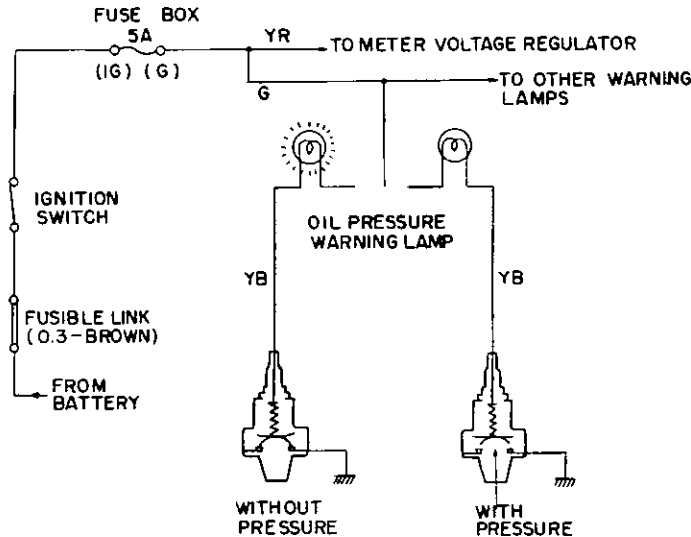
Replacement

1. Remove cluster lid.
2. Remove two meter retaining screws and remove meter from printed circuit housing.
3. Install new meter in the reverse sequence of removal.



BE262

Fig. BE-26 Removing meter



BE263

Fig. BE-27 Circuit of oil pressure warning system

OIL PRESSURE WARNING LAMP

The engine lubricating system incorporates an oil pressure warning lamp which glows whenever engine oil pressure falls below 0.4 to 0.6 kg/cm² (5.7 to 8.5 psi). Under normal operation, when the engine is stationary, the light glows with the ignition switch turned on. When the engine is running and oil pressure reaches the above range, the circuit opens and the light goes out.

GENERATOR WARNING LAMP

The generator warning lamp glows when the ignition switch is set to "ON" with the engine shut down, or when the generator fails to charge with the engine operated.

When the ignition switch is set to "ON," the generator warning circuit is

closed and current flows from the ignition switch to the warning lamp and grounds through the regulator (Fig. BE-28-1). When the engine is started and the generator comes into operation, the generator output current from N terminal opposes the

current flowing from the warning lamp; as the current from N terminal increases, the solenoid is more energized and the warning lamp relay contacts are opened, in effect it breaks the warning circuit ground connection, and the lamp goes out (Fig. BE-28-2).

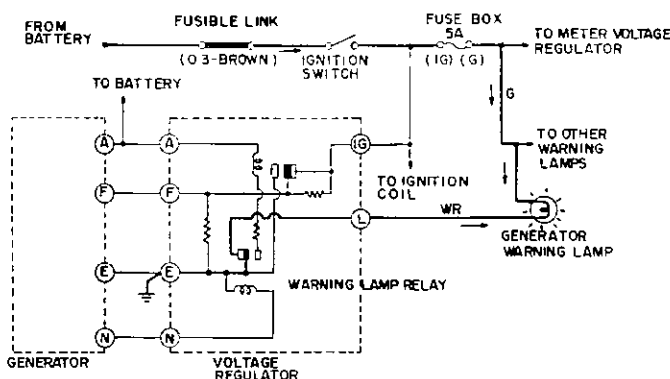


Fig. BE-28-1 Circuit of generator warning system

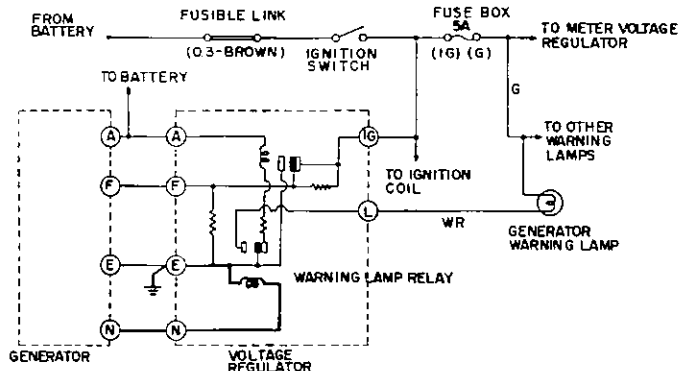


Fig. BE-28-2 Circuit of generator warning system

BE264

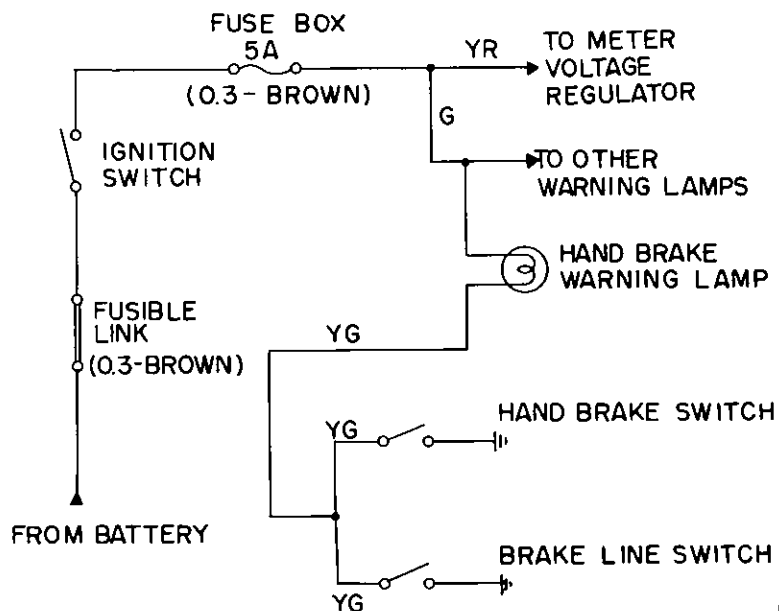
BODY ELECTRICAL

HAND BRAKE WARNING LAMP

The hand brake warning lamp glows when the hand brake is applied.

When the ignition switch is set to "ON," current flows from the ignition switch to the warning lamp. When the hand brake is applied, hand brake warning switch is closed and warning lamp glows.

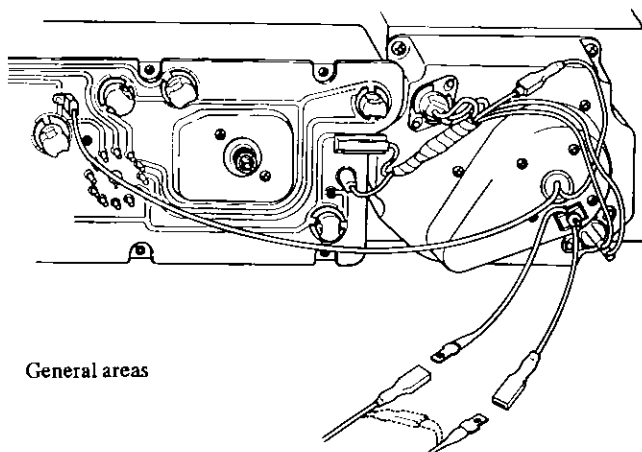
On some vehicles, this lamp is also used as a warning lamp to indicate that there is a leak in the service brake line. When a pressure difference between the front and rear brake lines reaches the limit, the switch in the brake line is actuated by line pressure and the contacts close. As the contacts close, the lamp glows.



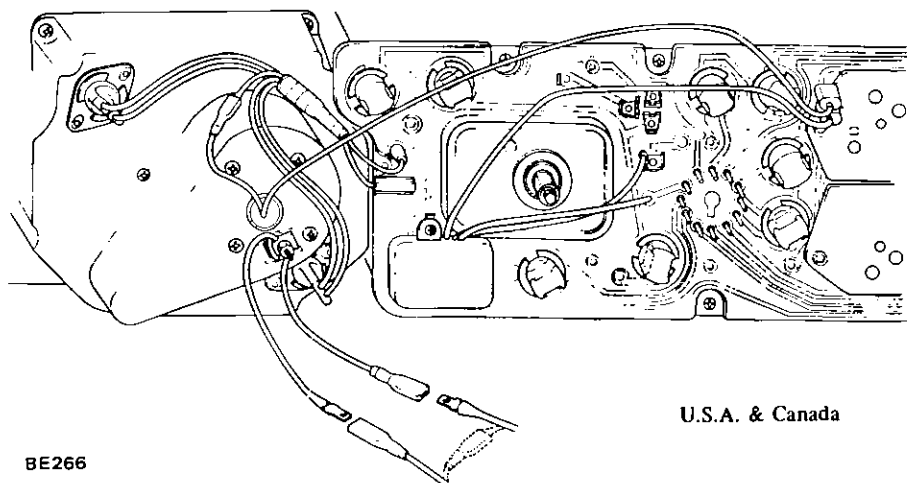
BE265

Fig. BE-29 Circuit diagram for brake warning system

TACHOMETER



General areas



U.S.A. & Canada

BE266

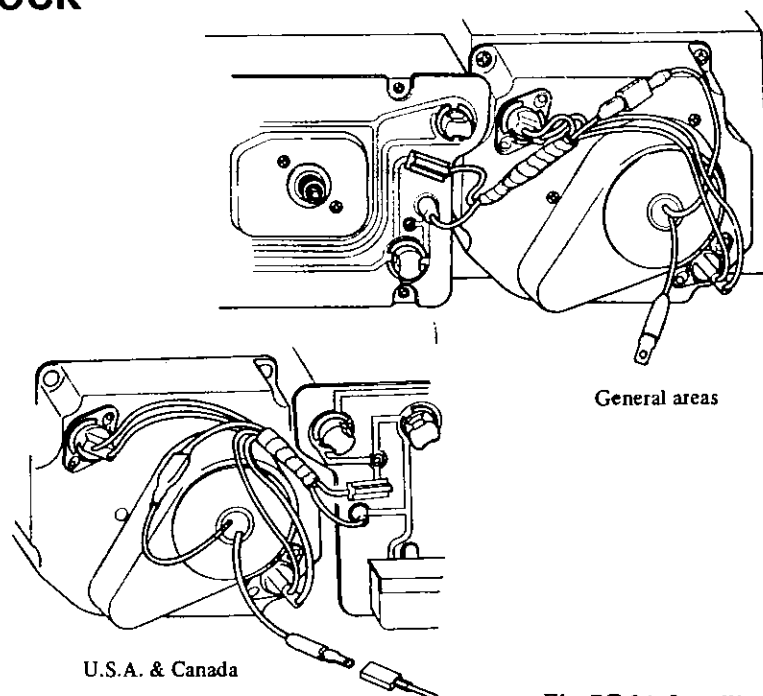
Fig. BE-30 Installing tachometer

Installation

1. Remove cluster lid.
2. Remove mask and install tachometer in place of mask.
3. Disconnect black/white-black/green wire (laid along the lower portion of instrument panel) at connector plug.
4. Connect tachometer lead wires to disconnected plug ends in series.
5. Connect other lead wires of tachometer to combination meter printed circuit terminals.
6. Install cluster lid.

BODY ELECTRICAL

CLOCK



BE267

Fig. BE-31 Installing clock

Installation

1. Remove cluster lid.
2. Remove mask and install clock in place of mask.
3. Connect lead wire coming out from clock to blue/white wire laid along the lower portion of instrument panel.
4. Connect other clock lead wires to terminals on combination meter printed circuit.
5. Install cluster lid.

TROUBLE DIAGNOSES AND CORRECTIONS

Speedometer

Condition	Probable cause	Corrective action
Speedometer pointer and odometer do not operate.	Improperly tightened speedometer cable union nut. Broken speedometer cable. Damaged speedometer drive pinion gear. Defective speedometer.	Retighten. Replace. Replace. Replace.
Speedometer pointer deflects excessively.	Rapidly bent speedometer cable. Damaged speedometer drive pinion gear. Defective speedometer.	Correct or replace. Replace. Replace.
Unstable speedometer pointer.	Improperly tightened speedometer cable union nut. Defective speedometer cable. Defective speedometer.	Retighten. Replace. Replace.
Unusual sound occurs in response to increase of driving speed.	Excessively bent or twisted speedometer cable inner wire or lack of lubrication. Defective speedometer.	Replace or lubricate. Replace.

BODY ELECTRICAL

Condition	Probable cause	Corrective action
Inaccurate speedometer indication.	Defective speedometer.	Replace.
Inaccurate odometer operation.	Improperly meshed second and third gear worm gears.	Replace speedometer.
	Faulty feeding due to deformed odometer and pinion carrier.	Replace speedometer.

Water temperature meter and fuel meter

Condition	Probable cause	Corrective action
Both water temperature meter and fuel meter do not operate.	Blown off fuse, or improper connection.	Check fuse for fusing and improper contact. Replace after correcting cause, if fused. Correct contact.
	Defective voltage regulator (damaged, fused, or open contact).	Replace.
Both water temperature meter and fuel meter indicate inaccurately.	Defective voltage regulator (broken heat wire, seized contact and/or improper grounding).	(In this case meter pointer fluctuates excessively.) Replace.
	Improper cable contact.	(In this case, meter pointer fluctuates slightly.) Check cable for improper contact, and repair if required.
Water temperature meter Water temperature meter does not operate.	Defective thermaltransmitter.	Replace thermaltransmitter if pointer deflects when thermaltransmitter yellow/white cable is grounded.
	Defective water temperature meter.	Replace meter if pointer does not deflect when thermaltransmitter yellow/white cable is grounded.
Pointer indicates maximum temperature.	Defective thermaltransmitter.	Pointer moves to low limit when ignition switch is turned off. In this case, replace thermaltransmitter.
	Defective water temperature meter.	Pointer indicates maximum temperature even after ignition switch is turned off. In this case, replace meter.
Water temperature meter does not operate accurately.	Defective water temperature meter.	Meter is serviceable when a 40Ω resistance is applied between thermaltransmitter yellow/white cable and ground, and meter indicates approximately 80°C (176°F).
	Defective thermaltransmitter.	If meter is normal through the above inspection replace thermaltransmitter.

BODY ELECTRICAL

Condition	Probable cause	Corrective action
	Improper cable contact.	If meter indicates a temperature slightly lower than the actual temperature, check cable from meter to thermaltransmitter for cable being about to break, poor contact, and faulty grounding, and repair if necessary.
Fuel meter Fuel meter does not operate.	Defective tank unit. Defective fuel meter.	Replace tank unit if pointer deflects when tank unit yellow cable is grounded. Replace fuel meter with a new one if pointer does not deflect through the above inspection.
Pointer indicates "F" position	Defective tank unit. Defective fuel meter.	Replace tank unit if pointer lowers below empty limit when ignition switch is turned off. Replace fuel meter if pointer still indicates "F" position through the above inspection.
Fuel meter functions improperly.	Defective tank unit. Defective fuel meter. Improper cable contact.	Replace tank unit if pointer indicates a half level when a 32Ω resistance is applied between tank unit yellow cable and ground. Replace fuel meter if pointer does not indicate a half level through the above inspection. If fuel meter indicates a level slightly lower than actual level, check cable from fuel meter to tank unit for cable being about to break, poor contact, and faulty grounding, and repair as necessary.

Oil pressure and generator warning lamps

Condition	Probable cause	Corrective action
Oil pressure warning lamp Lamp does not light when ignition switch is set to "ON."	Blown off fuse or faulty contact. Defective bulb or faulty cable contact.	Check fuse for fusing and faulty contact. Replace after correcting cause or repair as necessary. If oil pressure switch yellow/black cable is grounded and warning lamp does not light check bulb for burnt out filament, and replace as necessary.

BODY ELECTRICAL

Condition	Probable cause	Corrective action
Lamp does not go out while engine is being operated.	Defective oil pressure switch.	If warning lamp lights through the above inspection, replace oil pressure switch.
	Lack of engine oil.	Check oil level and add oil as required.
	Oil pressure too low. Defective oil pressure switch.	Inspect engine oil pressure system. Continuity exists on oil pressure switch when engine is being operated. Replace oil pressure switch.
Generator warning lamp Lamp does not light when ignition switch is set to "ON."	Blown off fuse or faulty contact. Defective bulb or faulty cable contact.	Check fuse for fusing and faulty contact. Repair or replace if necessary. Pilot lamp does not light when white/red cable in voltage regulator wiring connector is grounded, and ignition switch is set to "ON." Check bulb for burnt out filament, and replace if necessary.
Lamp does not go out when engine is started.	Faulty charging system.	Inspect charging sysytem.

IGNITION SWITCH AND STEERING LOCK

CONTENTS

IGNITION AND STARTER SWITCH	BE-25	Steering lock replacement	BE-26
Removal	BE-25	Ignition switch replacement	BE-26
IGNITION SWITCH WITH STEERING LOCK ..	BE-26		

IGNITION AND STARTER SWITCH

Key position Terminal (wire color)	OFF	ON	START	ACC
Battery (WR)		○	○	○
Accessory (L)		○	○	○
Starter (BY)		○	○	
Ignition (BW)		○	○	
Resistance (BL)			○	

Removal

1. Remove four screws and remove shell covers.
2. Disconnect lead wires at connector.
3. Remove two screws securing switch assembly to switch clamp.
4. Remove switch assembly from switch clamp.

BODY ELECTRICAL

IGNITION SWITCH WITH STEERING LOCK

Key position Terminal (wire color)	LOCK	GARAGE or OFF	ACC	ON	START
Battery (WR)			○	○	○
Ignition (BW)			○	○	○
Starter (BY)			○	○	○
Accessory (L)			○	○	
Resistance (BG)					○

Steering lock replacement

For the purpose of tamper-proof, the self-shear type screws are used, and their heads are sheared off when installed so that the steering lock system cannot be removed easily. Replace the steering lock in accordance with the following instructions when required.

Break two self-shear type screws with a drill or other proper tool. Now, remove the steering lock from the steering lock clamp.

When installing a new steering lock, be sure to tighten two new self-shear type screws to shear off their heads.

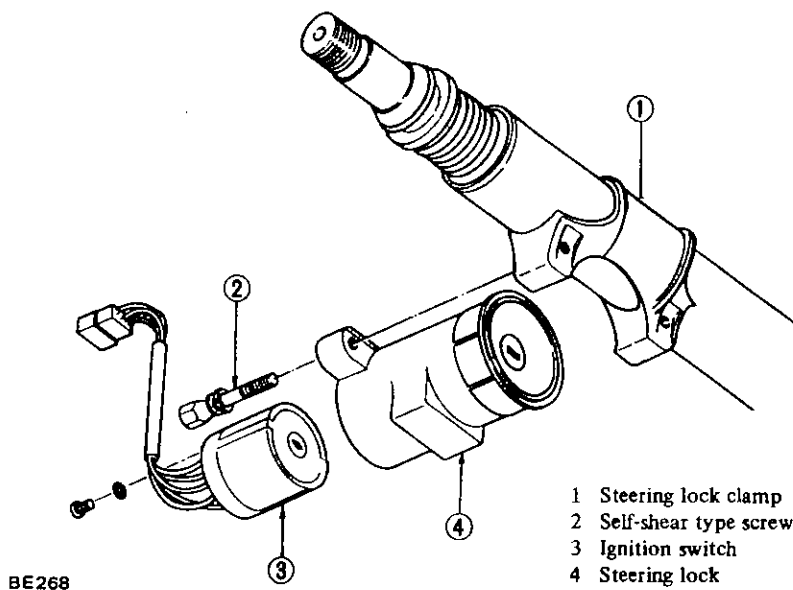


Fig. BE-32 Steering lock installation

Ignition switch replacement

To replace ignition switch from steering lock device, remove shell covers, disconnect ignition switch wires at connector, and remove one retaining screw from back of steering device. Install new switch in reverse sequence of removal.

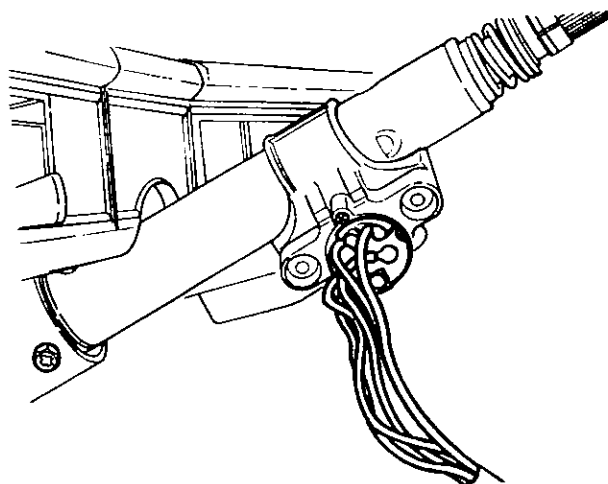


Fig. BE-33 Ignition switch

BODY ELECTRICAL

TROUBLE DIAGNOSES AND CORRECTIONS

Condition	Probable cause	Corrective action
Horn does not operate.	Excessively discharged battery. Blown off fuse. Improper horn button contact. Defective horn relay. Defective horn.	Measure specific gravity of electrolyte. Charge if required. Check fuse for fusing and improper contact. Replace or repair if required. In this case horn sounds when horn relay terminal (S) is grounded. Check and repair horn button. Horn sounds when horn relay terminals (B) and (H) are short-circuited. Replace horn relay. Horn does not sound though horn relay terminals (B) and (H) are short-circuited, and horn does not sound though battery (+) terminal is connected to horn terminal directly. Replace horn.
Horn sound continuously.	Defective horn relay. Short-circuited horn button and horn relay terminal (S).	Horn does not stop though horn relay (S) terminal is disconnected. Replace horn relay. When horn stops through above disconnection, check horn button unit particularly carefully. Repair horn relay terminal (S). Replace horn button.
Reduced volume and/or tone quality.	Improper fuse contact and loose connection. Broken cable. Improper horn button contact.	Correct. Repair or replace if required. Repair.

WINDSHIELD WIPER AND WASHER

CONTENTS

DESCRIPTION	BE-28	Washer nozzle	BE-30
REMOVAL AND INSTALLATION	BE-29	INSPECTION	BE-31
Wiper motor and wiper linkage	BE-29	TRouble DIAGNOSES AND CORRECTIONS .	BE-31

DESCRIPTION

The windshield wipers consist of wiper motor, link mechanism, wiper arms and blades, and the wiper motor unit consists of a motor and auto-stop mechanism. The wiper motor is of a 2-speed type.

When the wiper switch knob is pulled to the 1st step, the windshield

wipers operate at low speed, and when pulled to the 2nd step, operate at high speed.

The wiper motor unit is located on the cowl top panel in the engine compartment, and the link mechanism is located under the cowl top panel.

The electrically operated wind-

shield washer consists of washing fluid tank (with motor and pump), washer nozzles, and vinyl tube used to connect those components.

The windshield washer switch is combined with the windshield wiper switch to a single unit. When operating the washer, twist the switch knob.

BODY ELECTRICAL

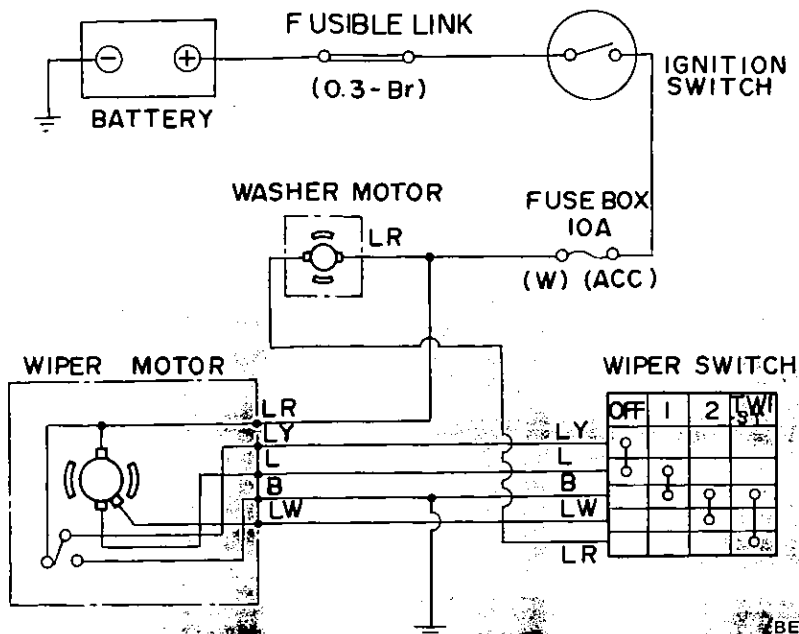


Fig. BE-37 Circuit diagram for windshield wiper-washer system

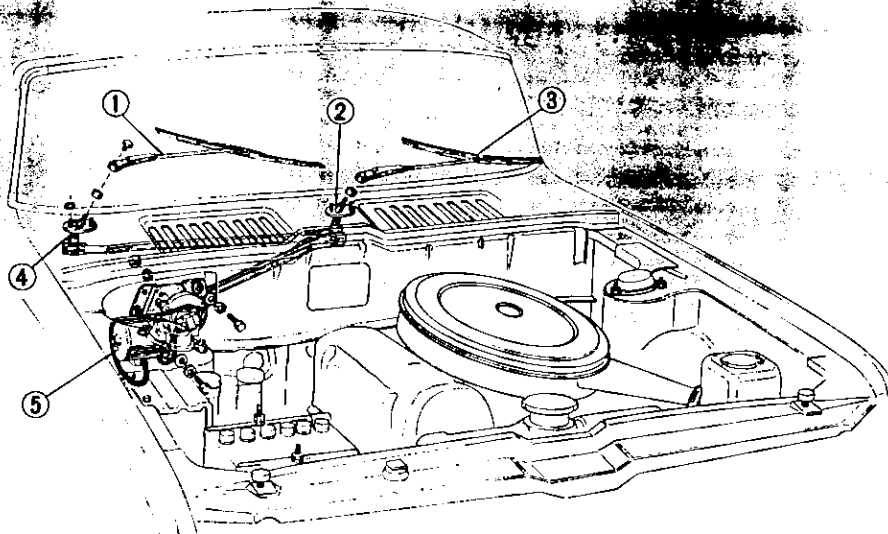
Caution for windshield washer operation

1. Be sure to use only washing solution.

Never use mix powder soap or detergent with solution.

2. Do not operate windshield washer continuously more than 30 seconds or without washer fluid. This often causes improper windshield washer operation. Normally, windshield washer should be operated 10 seconds or less at one time.

REMOVAL AND INSTALLATION



BE272

- 1 Wiper arm (R.H.)
- 2 Pivot (L.H.)
- 3 Wiper arm (L.H.)
- 4 Pivot (R.H.)
- 5 Wiper motor

Fig. BE-38 Wiper motor and wiper linkage

Wiper motor and wiper linkage

1. Disconnect wiper motor wire connector from wiper motor.
2. When removing wiper arm from pivot shaft, raise wiper blade from

windshield glass and then remove the base of wiper arm from pivot shaft by loosening attaching nut.

3. Remove cowl top grille by re-

moving six nylon clips.

4. Remove three wiper motor attaching bolts.

5. Remove nut connecting motor

BODY ELECTRICAL

shaft to wiper link.

6. Remove wiper motor from cowl top panel.

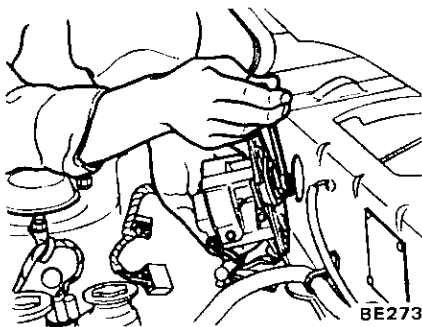


Fig. BE-39 Removing motor shaft connecting nut

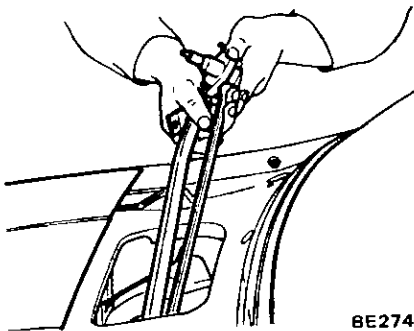
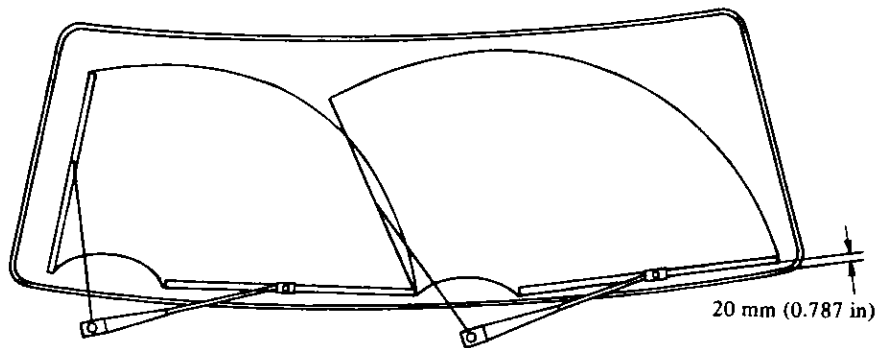


Fig. BE-40 Removing link assembly

7. Remove two flange nuts attaching pivot to cowl top panel and remove link assembly.

8. Install wiper linkage and wiper motor in the reverse sequence of removal.

Install wiper blade in correct installation angle to obtain correct sweeping zones.



BE275

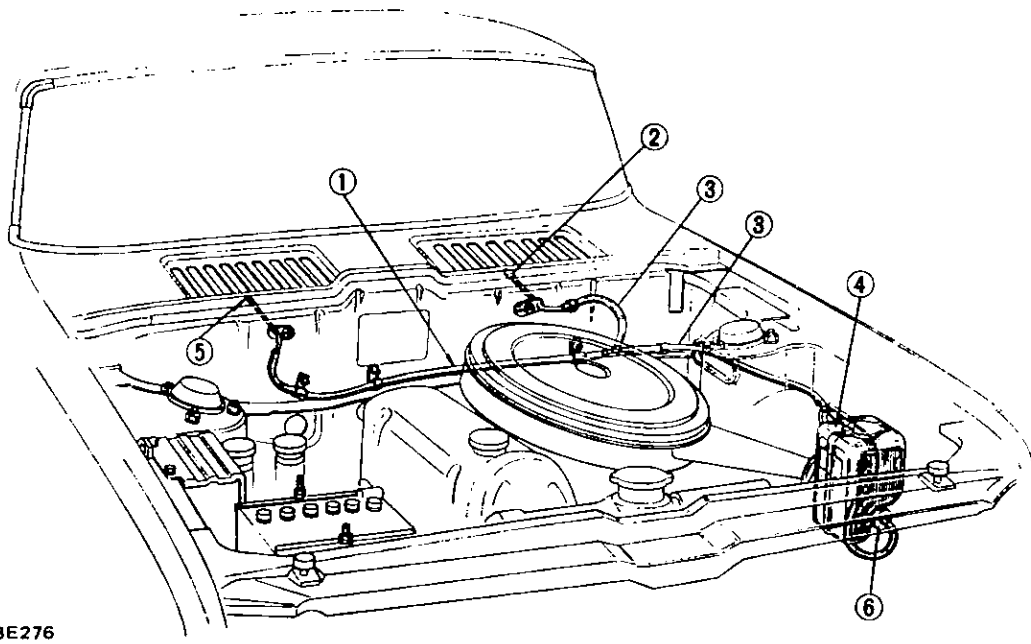
Fig. BE-41 Wiper arm installation

Washer nozzle

1. Remove washer nozzle fixing screw from cowl top panel.
2. Remove washer nozzle.
3. Install washer nozzle in the re-

verse sequence of removal.

4. Adjust nozzle direction so that fluid is sprayed in proper range as shown in Figure BE-43.



BE276

- 1 Washer tube
- 2 Washer nozzle
- 3 Washer tube
- 4 Washer tank
- 5 Washer nozzle (R.H.)
- 6 Washer motor

Fig. BE-42 Windshield washer

BODY ELECTRICAL

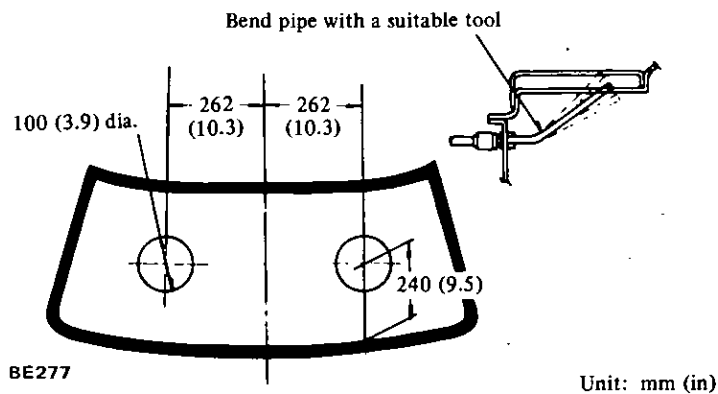


Fig. BE-43 Nozzle adjustment

INSPECTION

1. Disconnect wiring connector from wiper motor.
2. Connect test lead between blue/red wire terminal in wiring connector

and its corresponding terminal on motor side connector plug.

3. To check wiper low speed operation, connect blue wire terminal on motor side connector plug to ground; make sure that wipers sweep at low speed.

4. To check wiper high speed operation, connect blue/white wire terminal on motor side connector plug to ground in the same manner as in step 3 above; make sure that wipers sweep at high speed.

5. During low speed operation, connect black wire terminal on motor side connector to ground and connect test lead between blue and blue/yellow wire terminals on motor side connector; make sure that, at this time, auto-stop mechanism actuates to stop wiper blade at the specified position.

6. Wiper is in good condition if above tests have been made as indicated.

TROUBLE DIAGNOSES AND CORRECTIONS

Condition	Probable cause		Corrective action
Windshield wiper does not operate.	Motor	No current flows to motor due to: Broken armature. Worn motor brush. Motor is overheated due to seized motor shaft. Windshield wiper fuse (10A) is easily fused due to short-circuit, rare short-circuit, or motor inside component burnt.	Replace motor. Replace motor. Replace motor. Replace motor or repair short-circuited part.
	Power supply and cable.	Blown off fuse due to trouble of other part in windshield wiper circuit. Loose, open or broken wiring. Erroneous wiring. Improper grounding.	Check other part for operation and correct trouble. Check wiring near motor and connector for connection. Correct if necessary. Check each wire for color code, and correct if necessary.
	Switch.	Improper switch contact.	Correct.
			Correct if necessary.

BODY ELECTRICAL

Condition		Probable cause	Corrective action
Windshield wiper operating speed is too slow.	Link	Foreign materials interrupts the movement of link mechanism. Disconnected link rod. Seized or rusted arm shaft.	Correct. Correct. Lubricate or replace arm shaft.
	Motor	With arm raised, still excessive current flows due to rare short-circuit of motor armature. Windshield wiper stops only by lightly holding with hand due to worn motor brush. With arm raised, still excessive current flows (3 to 5A) due to seized motor shaft.	Replace motor. Replace motor. Replace motor or lubricate bearing with engine oil.
	Power supply and cable.	Low source voltage.	Measure voltage, check other electrical parts for operation, and take corrective action for power supply if necessary.
	Link	Humming occurs on motor in arm operating cycle due to seized arm shaft.	Lubricate or replace.
	Switch	Improper switch contact.	Conduct continuity test, and replace if necessary.
Windshield wiper speed cannot be changed correctly.	Windshield wiper blade.	Windshield wiper blade sticks on windshield glass.	Raise arm and operate windshield wiper without applying load. Clean windshield glass and/or replace wiper blade.
	Motor	Motor brush for either low or high speed is worn.	Replace motor.
	Motor	Contaminated auto-stop relay contacts or improper contact due to foreign matter.	Remove auto-stop device cover, and clean contacts carefully so as not to deform relay plate.
Windshield wiper does not stop correctly.	Stops anywhere.	Cable and switch.	Improper connection between 1st and 2nd switch steps. Remove switch, and make sure that 1st and 2nd steps are not connected at "OFF" position. If connected, replace switch.
	Does not stop.	Motor	Incomplete auto-stop operation (Contact is not interrupted.). Remove auto-stop device cover, and correct relay plate bending.

BODY ELECTRICAL

RADIO

CONTENTS

INSTALLATION	BE-33	TROUBLE DIAGNOSES AND	
Radio receiver	BE-33	CORRECTIONS	BE-35
Radio antenna	BE-33	Noise prevention chart	BE-35
ADJUSTING ANTENNA TRIMMER	BE-33		

INSTALLATION

Radio receiver

1. Remove instrument panel.
2. Position speaker to instrument panel and install two flange nuts. (See Figure BE-44.)
3. Install radio receiver to instrument panel.
4. Connect speaker wires to instrument harness at connector.
5. Connect radio wires to instrument harness at connector.
6. Install antenna. Follow procedure given in "Radio Antenna" in this section.
7. Install instrument panel.
8. Connect antenna feeder to radio receiver cable.

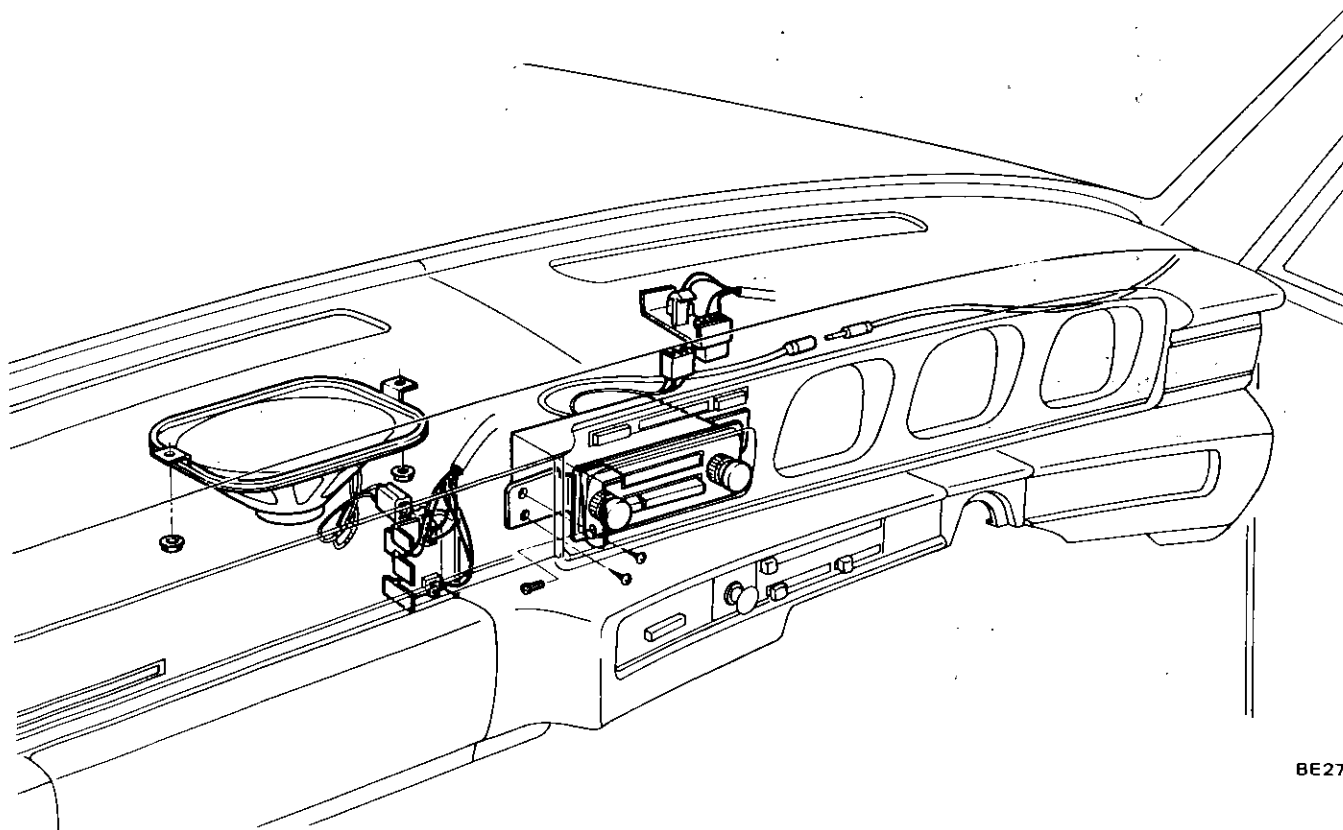
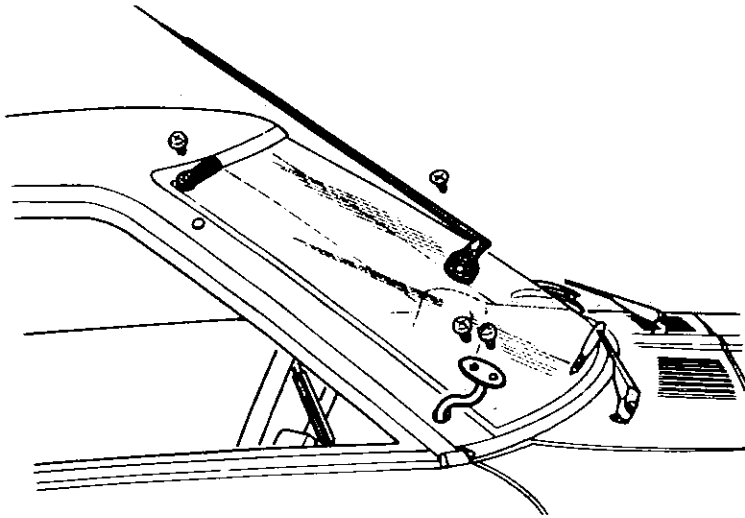


Fig. BE-44 Radio

Radio antenna



BE279

Fig. BE-45 Radio antenna

1. Insert antenna feeder into antenna mounting opening in front pillar

and route it through dash side panel to radio receiver.

2. Install two retaining screws and install antenna feeder base to front pillar.
3. Position antenna support to front pillar in position and install retaining screw.
4. Install antenna rod assembly.

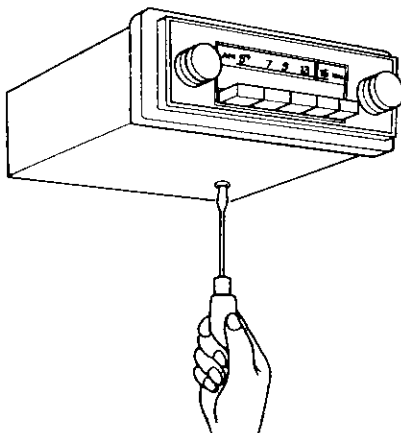
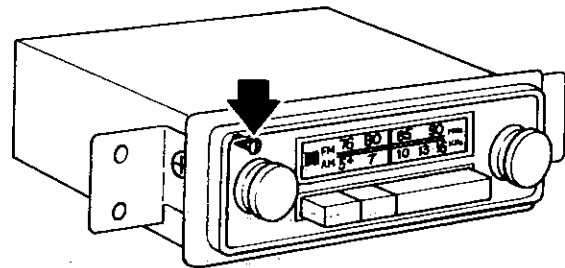
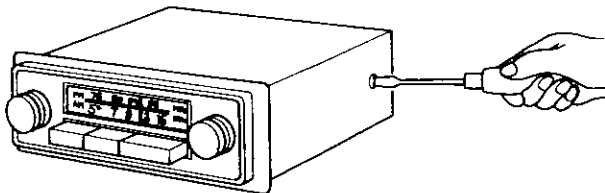
ADJUSTING ANTENNA TRIMMER

When a new radio receiver, antenna or antenna feeder is installed, antenna trimmer should be adjusted.

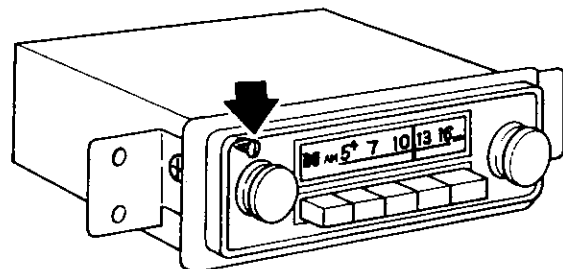
1. Extend antenna completely.
2. Tune in the weakest station between 12 and 16 (1,200 to 1,600 KC) on dial.

Noise may be generated but disregard it.

3. Turn antenna trimmer to left and right slowly and set it at a position where receiving sensitivity is highest.



-- HITACHI MAKE --



-- MATUSHITA MAKE --

BE280

Fig. BE-46 Adjusting antenna trimmer

BODY ELECTRICAL

TROUBLE DIAGNOSES AND CORRECTIONS

Noise prevention chart

Position vehicle in an open area away from steel buildings, run engine, extend antenna to its maximum length, set volume control to maximum and set dial at a medium point without catching broadcasting wave.

Condition	Probable cause	Corrective action
Ignition system Noise occurs when engine is operated.	High tension cable.	Install new high tension cable.
	Ignition coil.	Keep choke wire away from ignition coil. Install a 0.5 μ F capacitor to primary side + terminal of ignition coil. Note: Be careful not to install capacitor to secondary or primary breaker side, otherwise engine becomes improper. Connect wire between engine and ignition coil locating area of body. Secure ground of ignition coil.
	Distributor.	Secure contact of carbon electric pole and rotor. Eliminate sharp tip on rotor pole or cap pole by scrubbing with a screwdriver. Check stagger between rotor and stator.
Charging system Sound of alternating current presents. When accelerator pedal is depressed or released, noise presents.	Alternator.	Install a 0.5 μ F capacitor to charging terminal A. Note: Do not use a larger capacitor. If capacitor is installed to terminal F, alternator coil will be damaged.
	Regulator.	Install a 0.5 μ F capacitor to "A" terminal of voltage regulator.
Supplement equipment When engine starts, noise presents. Noise still presents even after stopping engine. Noise presents when horn is blown. Noise presents when turn signal lamps are operated.	Operative noise of water temperature and fuel meters.	Install 0.1 μ F capacitor between terminal and ground wire. Note: If a capacitor having a larger capacity is used, indication of meter will be deviated.
	Horn.	Install a 0.5 μ F capacitor to horn relay terminal or horn switch.
	Flasher unit.	Install a 0.5 μ F capacitor.

Notes:

a. Be sure to locate capacitor as close as to noise source and connect in parallel.

b. Cut lead wire as short as possible.
 c. Ground wire should be attached on the body completely.
 d. Make installation and connection

securely.

e. Carefully identify "+," "-", "IN" or "OUT" marks.

BODY ELECTRICAL

HEATER

CONTENTS

DESCRIPTION	BE-36	Heater core	BE-39
Air flow	BE-37	ADJUSTMENT	BE-39
REMOVAL AND INSTALLATION	BE-38	Control assembly	BE-39
Heater unit	BE-38	INSPECTION	BE-39
Heater control	BE-39	Fan motor power supply	BE-39
Air intake box	BE-39	Fan motor	BE-39
Heater motor	BE-39	TROUBLE DIAGNOSES AND CORRECTIONS ..	BE-41

DESCRIPTION

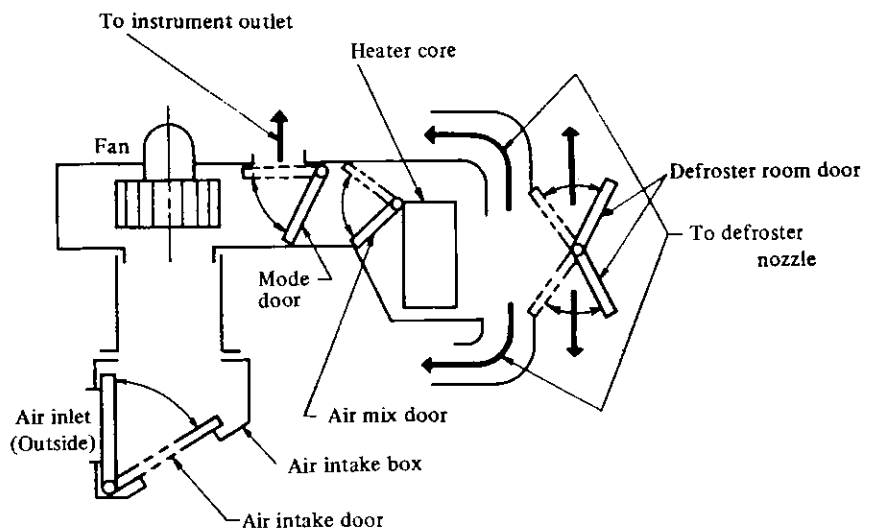
The heater is controlled by three levers — AIR, TEMP and FAN.

The AIR lever controls air discharge by means of three doors (air intake, mode and defroster room doors).

- o The air intake door is used to let either outside- or inside-air flow into the heater unit. The outside air is drawn from the cowl top grille and delivered to the air intake box.
- o The mode door serves to supply air flow to the outlet in the instrument panel. This door has three detent positions — open, close, middle.
- o The defroster room door controls air flow discharged from heater unit. When the door is open, air is discharged to the floor area with a small amount going to the defroster nozzle. When it is closed, all air is discharged from the defroster nozzle.

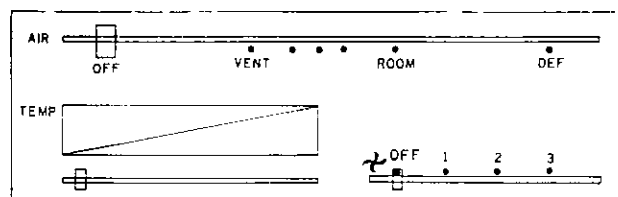
The TEMP lever controls the air mix door and mixes heated air with air bypassing the heater core to obtain the desired air temperature. In this manner, the temperature of air is effectively controlled.

The FAN lever controls switch that is located on the control lever assembly, providing three blower speeds.



BE281

Fig. BE-47 Sectional view of heater



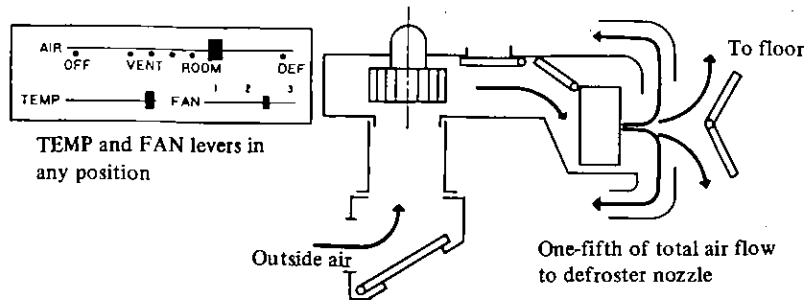
BE282

Fig. BE-48 Control lever

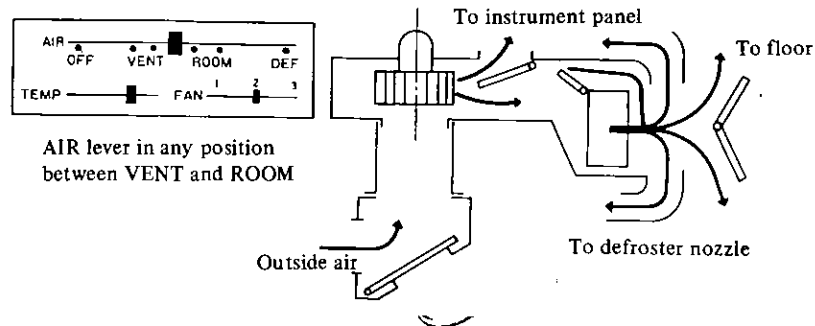
BODY ELECTRICAL

Air flow

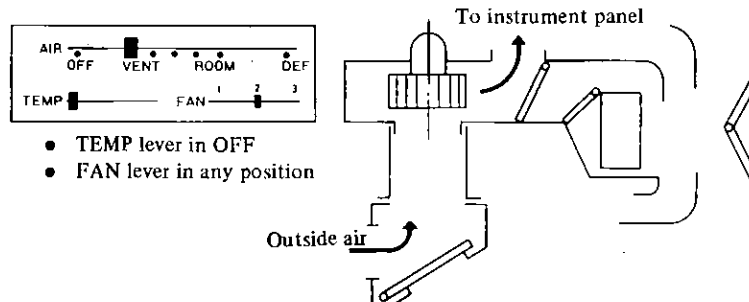
Heating



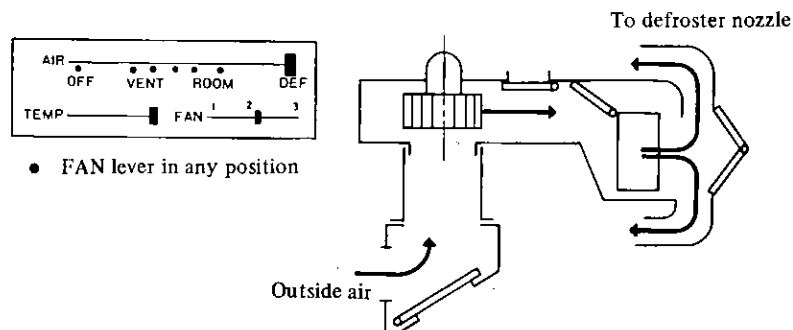
Heating and air ventilating



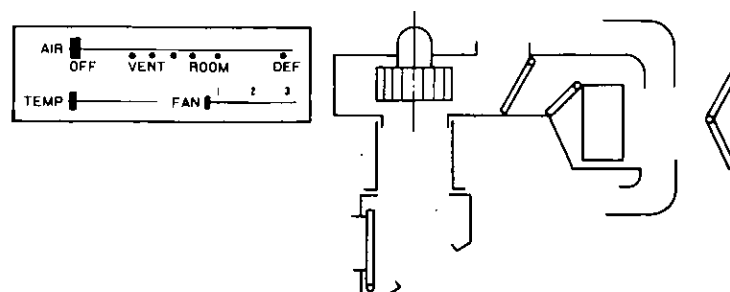
Air ventilating



Defrosting



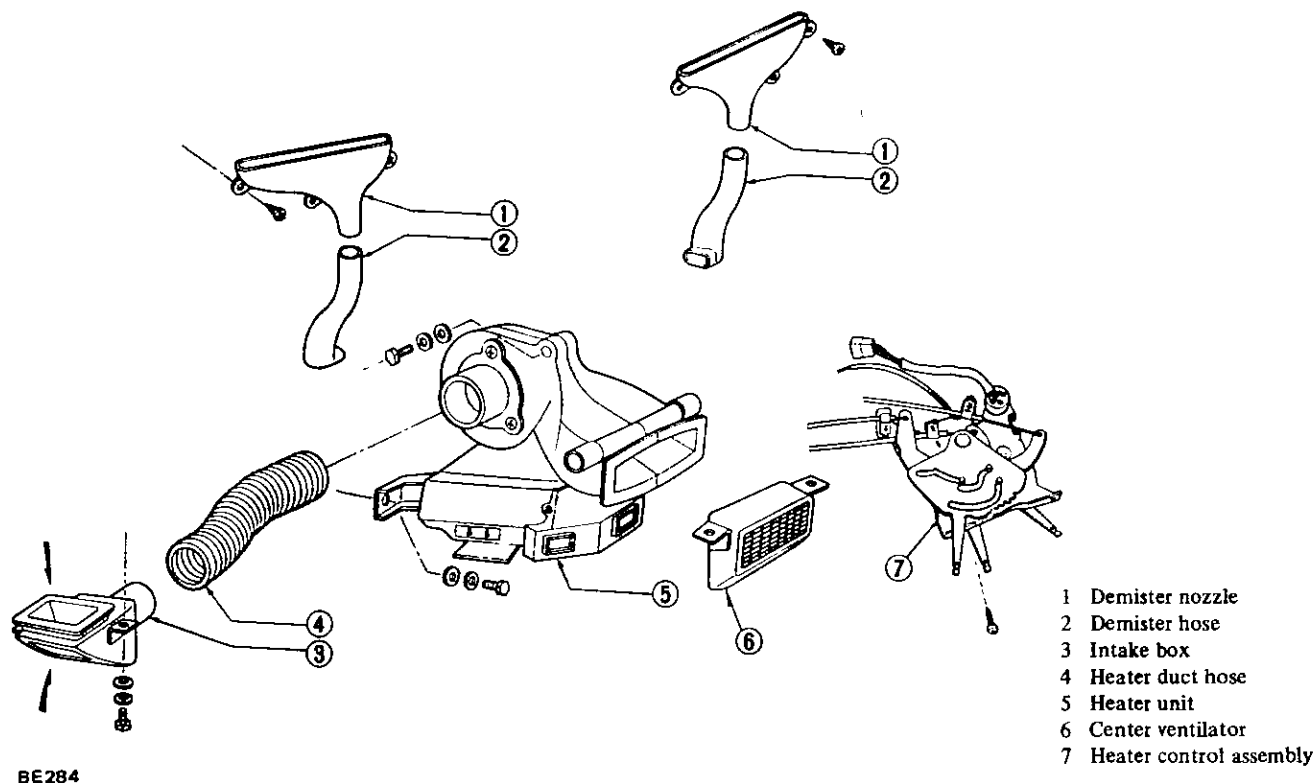
Air conditioning not in use



BE283

Fig. BE-49 Air flow

REMOVAL AND INSTALLATION



BE284

Fig. BE-50 Exploded view of heater unit

Heater unit

1. Disconnect battery ground cable.
2. Drain engine coolant.
3. Remove hose clamps and disconnect inlet and outlet hoses.
4. Perform the following operations in the driver's compartment side.
5. Remove center ventilator (and center console box if so equipped).
6. Remove heater duct hose.

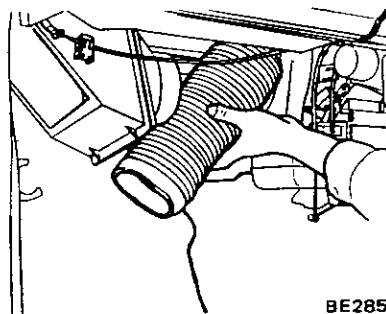


Fig. BE-51 Removing heater duct hose

8. Remove cable retaining clamps for the air mix door, mode door and defroster room door. Disconnect cables from door control levers.

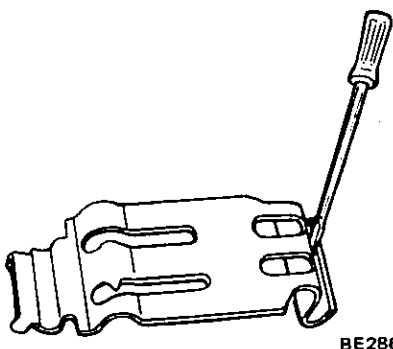


Fig. BE-52 Removing cable retaining clamp

9. Disconnect lead wires at two connectors.
10. Remove three bolts (two on each side of heater unit as shown Figure BE-53, and one on the top of this unit as shown Figure BE-54).
11. Remove heater unit.

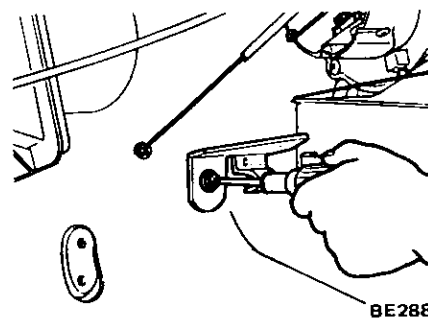


Fig. BE-53 Removing unit securing bolt

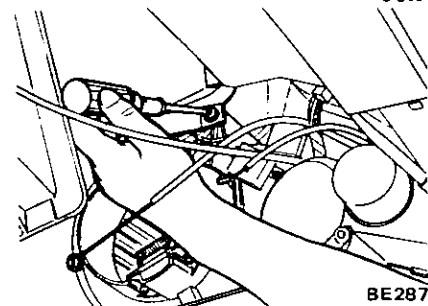


Fig. BE-54 Removing unit securing bolt

12. To install heater unit, reverse the sequence of removal.

Heater control

1. Remove heater unit. Refer to the "Heater Unit."
2. Pull out finisher forward. Note that finisher is latched in position.
3. Remove two retaining screws and remove heater control assembly.
4. To install, reverse the sequence of removal.

Air intake box

1. Remove heater duct hose.
2. Disconnect control cable from air intake door.
3. Remove screw securing air intake box in place.
4. Remove air intake box.
5. To install, reverse the sequence of removal.

Heater motor

1. Remove heater unit by referring to the "Heater Unit."
2. Remove three screws and remove heater motor.
3. To install, reverse the sequence of removal.

Heater core

1. Drain engine coolant.
2. Remove hose clamps and disconnect inlet and outlet hose from heater unit.
3. Disconnect two control cables on the sides of heater unit.
4. Remove clips and remove grille heater box.
5. Pull out heater core.
6. To install, reverse the sequence of removal.

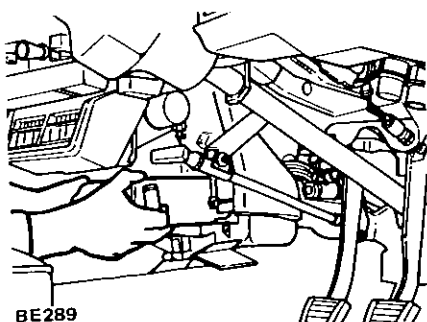


Fig. BE-55 Removing heater core

ADJUSTMENT

Control assembly

Whenever a new or re-conditioned heater unit is to be installed, adjust control assembly as follows:

1. Move AIR lever to OFF position.
 - o Fit cable to door lever of air intake box, and fasten with a cable retaining clamp while pulling outer case of cable with a force of 1 to 2 kg (2.2 to 4.4 lb).
2. Move AIR lever to DEF position
 - o Fit cable to defroster room door lever, and fasten with a cable retaining clamp while pulling outer case with a force of 1 to 2 kg (2.2 to 4.4 lb).
 - o Fit cable to mode door lever, and fasten with a cable retaining clamp while pulling outer case with a force of 1 to 2 kg (2.2 to 4.4 lb).
3. Move TEMP lever to left stop.
 - o Fit cable to air mix door lever, and fasten with a cable retaining clamp while pulling outer case with a force of 1 to 2 kg (2.2 to 4.4 lb).

Note: Make sure that each control lever moves smoothly over its entire stroke.

Control lever	Operating force kg (lb)
AIR Lever	0.3 (0.66), min.
TEMP lever	0.3 (0.66), min.
FAN lever	1.5 (3.3), min.

INSPECTION

Check the following items if fan motor fails to rotate.

1. Fuse and fusible link
2. To check for burned out fuse, use the same procedure as that for ordinary fuses with the use of a circuit tester or test lamp.
3. Loose wire connection

Fan motor power supply

1. Disconnect lead wires at connector.
2. Move ignition switch to ACC position.
3. Connect test lamp lead wire to blue/white wire terminal in connector plug on instrument harness side and the other to the ground.
4. Make sure that test lamp goes on.

Fan motor

1. Disconnect lead wires at connector.
2. Move ignition switch to ACC position.
3. Connect test lead to positive side of fuse block power supply and the other to blue/white wire terminal in connector plug on fan motor side.
4. Make sure that fan motor operates at each position of fan lever.

BODY ELECTRICAL

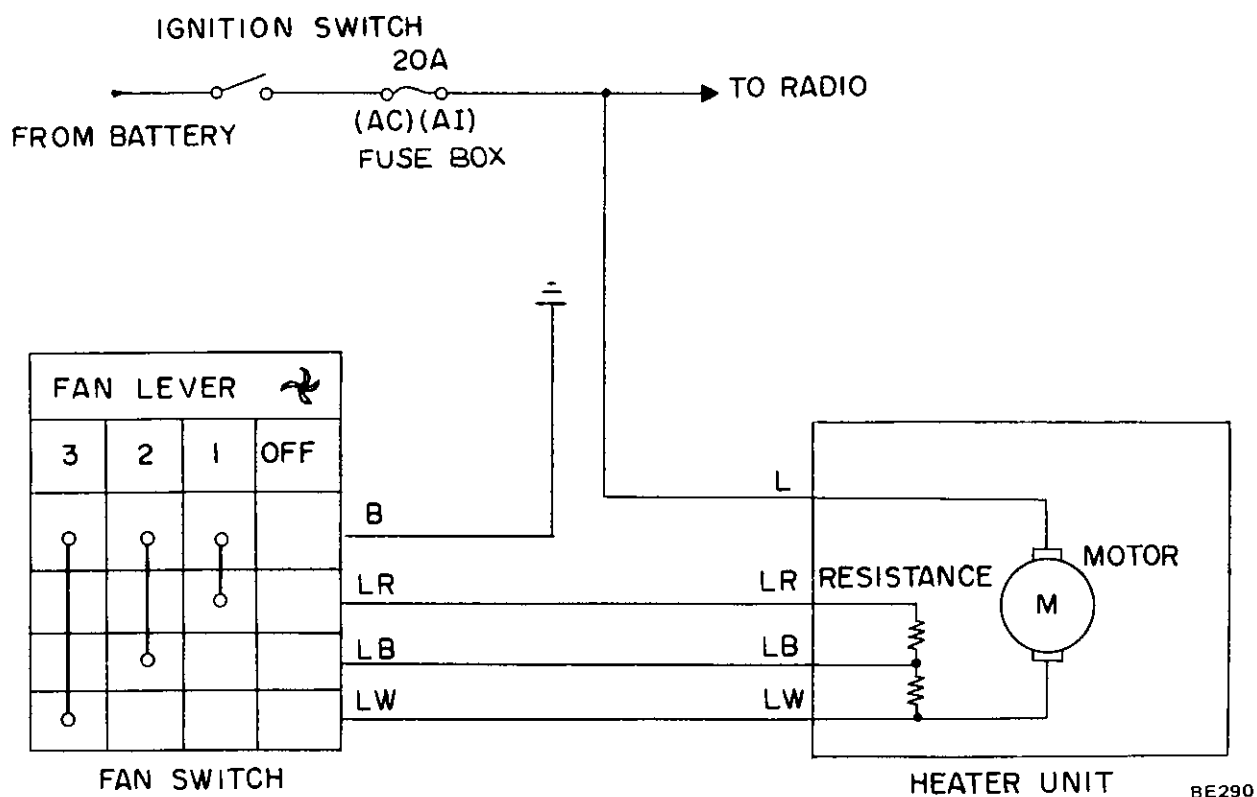


Fig. BE-56 Circuit diagram for heater

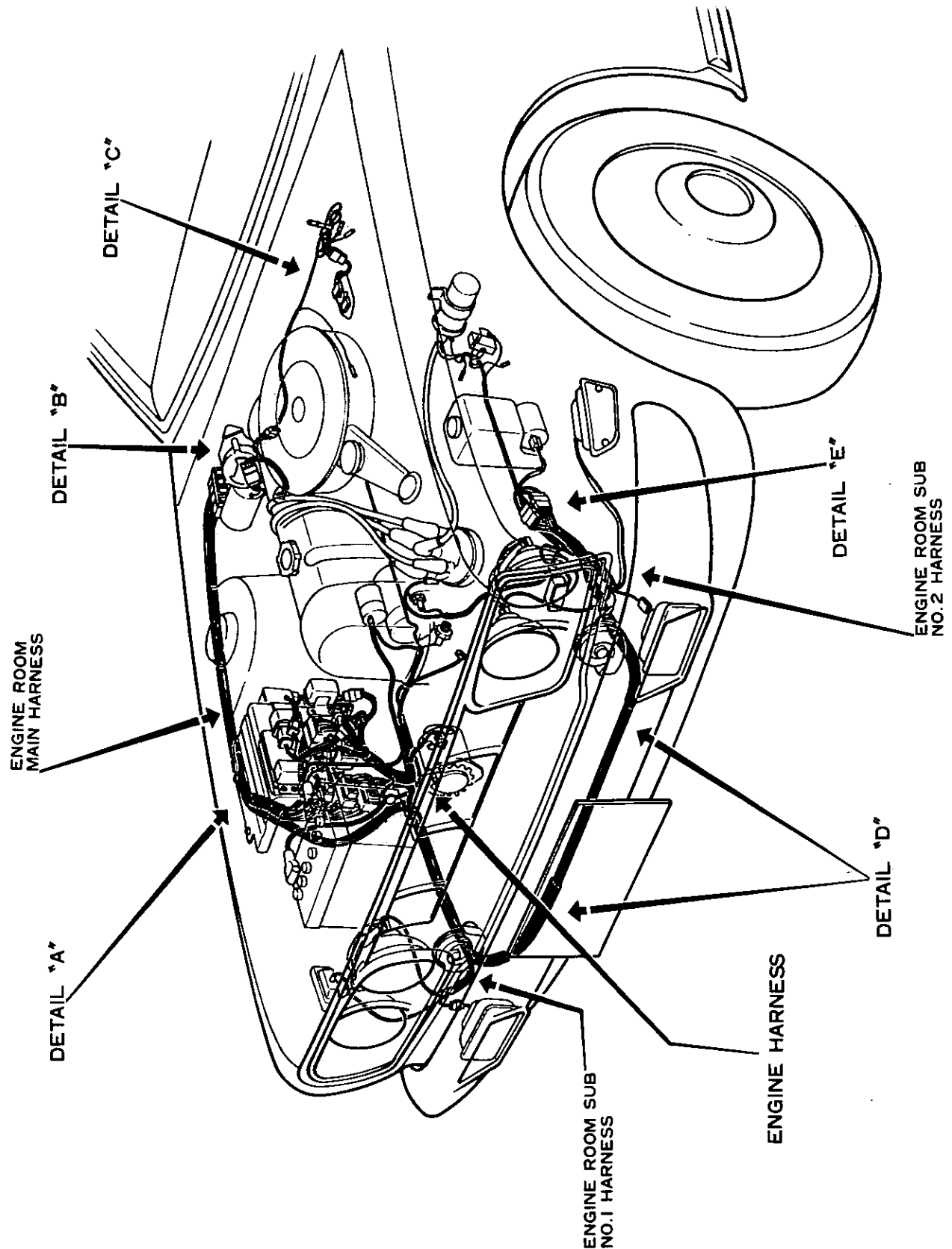
TROUBLE DIAGNOSES AND CORRECTIONS

Condition	Probable cause	Corrective action
Insufficient heating performance. No heated air discharged.	Cooling water temperature too low. Heater core plugged. Insufficient cooling water level. Water cock out of proper operation. Air mix door out of proper operation.	Check thermostat. Replace as necessary. Clean. Refill. Adjust control cable.
Insufficient air flow to floor.	Fan motor speed too low. Defroster room door out of proper operation.	Adjust control cable. Check for motor terminal voltage. Repair poor connection and discontinuity. Replace motor if necessary. Adjust control cable.

BODY ELECTRICAL

Condition	Probable cause	Corrective action
Insufficient defrosting performance. Cold air discharged. Insufficient air flow to defroster.	Refer to "No heated air discharged." Defroster room door out of proper operation (or seal defective). Demister nozzle plugged. Leak at demister hose-to-nozzle connection.	Adjust control cable. Clean. Correct.
Heated air discharged with lever in VENT.	Mode door out of proper operation.	Adjust control cable.
No heated air discharged with lever in between VENT and ROOM.	Mode door out of proper operation.	Adjust control cable. Make sure that AIR lever moves smoothly over its entire range.
Failure of fan to run.	Fuse melted. Motor wire connector disconnected. Switch defective. Motor defective.	Replace. Correct. Replace. Check and correct.
Control lever drags.	Inner wire rubbing against outer case end. Control cable bent excessively. Doors, door levers, etc. out of proper operation.	Adjust control cable. Correct. Check and correct.
Outside air comes in with fan in OFF.	Air intake door out of proper operation. Control cable out of adjustment.	Repair or replace. Adjust control cable.
Noise from fan motor.	Unusual noise from fan motor.	Check and tighten loose bolts.

BODY ELECTRICAL



BE345
Fig. BE-57 Engine compartment

BODY ELECTRICAL

AUTOMATIC TRANSMISSION

NO. PART NAME

- ① ENGINE ROOM MAIN HARNESS
- ② ENGINE HARNESS
- ③ ENGINE HARNESS (TO LIGHTING RELAY)
- ④ ENGINE ROOM MAIN HARNESS
- ⑤ ENGINE HARNESS
- ⑥ ENGINE ROOM MAIN HARNESS
- ⑦ ENGINE ROOM HARNESS SUB NO. 1
- ⑧ ENGINE ROOM MAIN HARNESS (TO AUTO CHOKE RELAY)
- ⑨ ENGINE ROOM MAIN HARNESS SUB NO. 1
- ⑩ ENGINE ROOM MAIN HARNESS
- ⑪ ENGINE ROOM MAIN HARNESS (TO FUSIBLE LINK)
- ⑫ ENGINE HARNESS (TO REGULATOR)
- ⑬ ENGINE ROOM MAIN HARNESS (TO HORN RELAY)

MANUAL TRANSMISSION

NO. PART NAME

- ① ENGINE ROOM MAIN HARNESS
- ② ENGINE HARNESS
- ③ ENGINE HARNESS (TO LIGHTING RELAY)
- ④ ENGINE ROOM MAIN HARNESS
- ⑤ ENGINE HARNESS
- ⑥ ENGINE ROOM MAIN HARNESS
- ⑦ ENGINE ROOM HARNESS SUB NO. 1
- ⑧ ENGINE ROOM MAIN HARNESS (TO AUTO CHOKE RELAY)
- ⑨ ENGINE ROOM HARNESS SUB NO. 1
- ⑩ ENGINE ROOM MAIN HARNESS
- ⑪ ENGINE ROOM MAIN HARNESS (TO FUSIBLE LINK)
- ⑫ ENGINE HARNESS (TO REGULATOR)
- ⑬ ENGINE ROOM MAIN HARNESS (TO HORN RELAY)
- ⑭ NEUTRAL SWITCH
- ⑮ ENGINE ROOM MAIN HARNESS
- ⑯ TO RELAY

COLOR CODE	
B	Black
W	White
R	Red
Y	Yellow
G	Green
L	Blue
Br	Brown
Lg	Light green

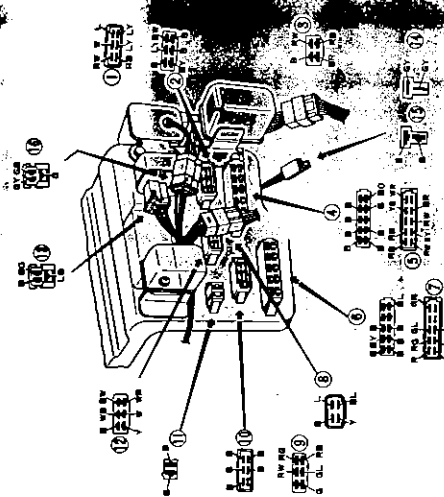
NO. PART NAME

- ⑰ ENGINE HARNESS (TO SEAT BELT & STARTER RELAY)
- ⑱ TO DASH HARNESS SUB NO. 1

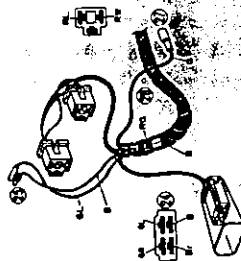
BE346

MANUAL TRANSMISSION

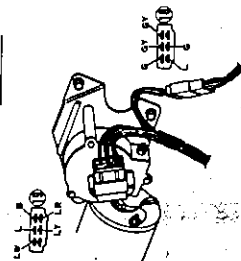
DETAIL "A"



DETAIL "D"



DETAIL "B"



DETAIL "C"



NO. PART NAME

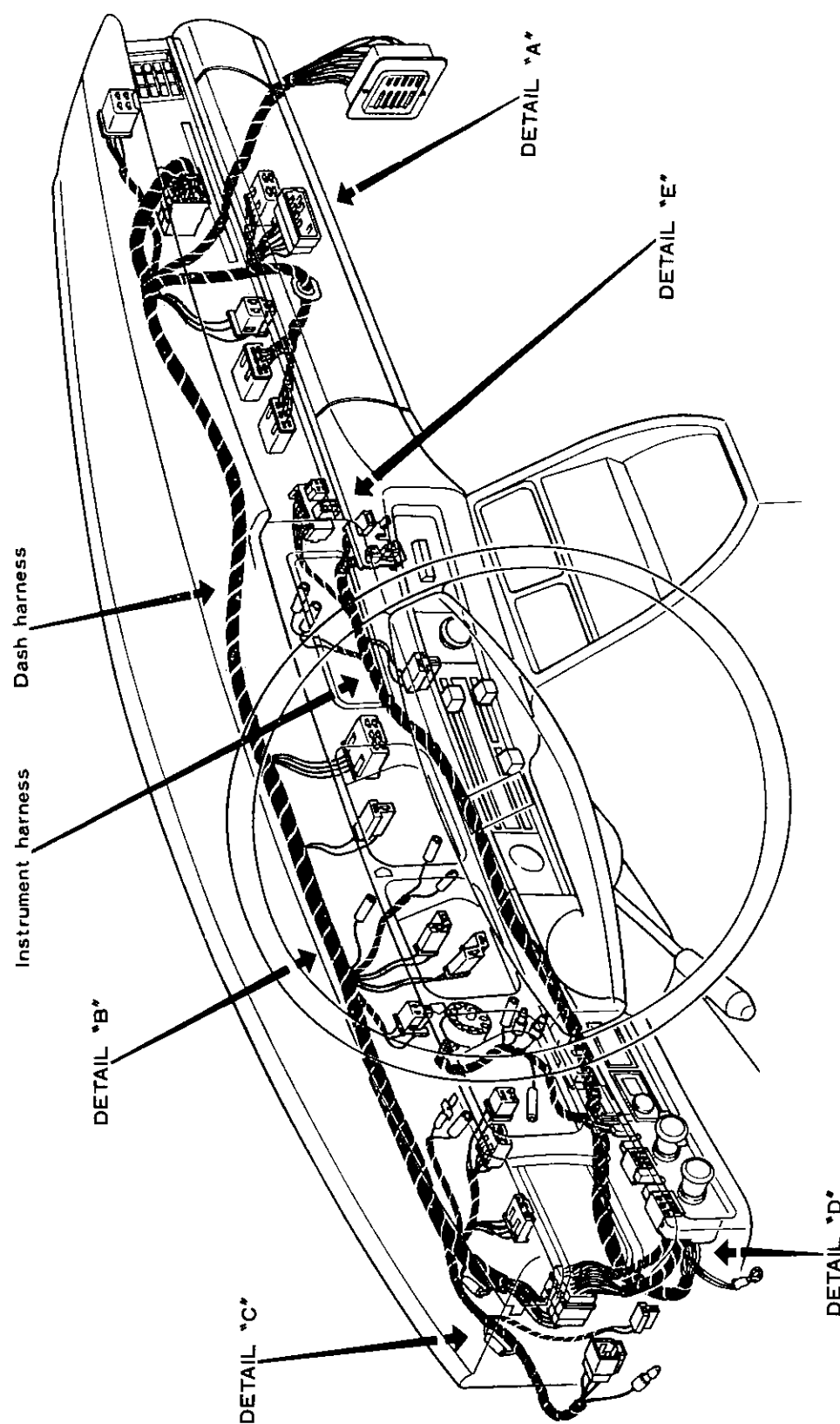
- ⑰ TO WIPER MOTOR
- ⑱ TO VACUUM CONTROL SOLENOID
- ⑲ TO THROTTLE SWITCH
- ⑲ TO ANTI-DIESELING SOLENOID
- ⑲ TO AUTO CHOKE HEATER
- ⑲ TO FRONT COMBINATION LAMP
- ⑲ TO SIDE MARKER LAMP
- ⑲ TO HEADLAMP
- ⑲ TO HORN
- ⑲ TO FOG LAMP
- ⑲ ENGINE ROOM HARNESS SUB NO. 2
- ⑲ ENGINE ROOM MAIN HARNESS

NO. PART NAME

- ⑲ TO THERMAL TRANSMITTER
- ⑲ TO DISTRIBUTOR
- ⑲ TO RELAY
- ⑲ ENGINE ROOM HARNESS SUB NO. 2
- ⑲ ENGINE ROOM MAIN HARNESS
- ⑲ TO WASHER TANK
- ⑲ BODY EARTH
- ⑲ TO RESISTANCE
- ⑲ TO BRAKE SYSTEM SWITCH
- ⑲ TO MAGNETIC CLUTCH
- ⑲ TO IGNITION COIL

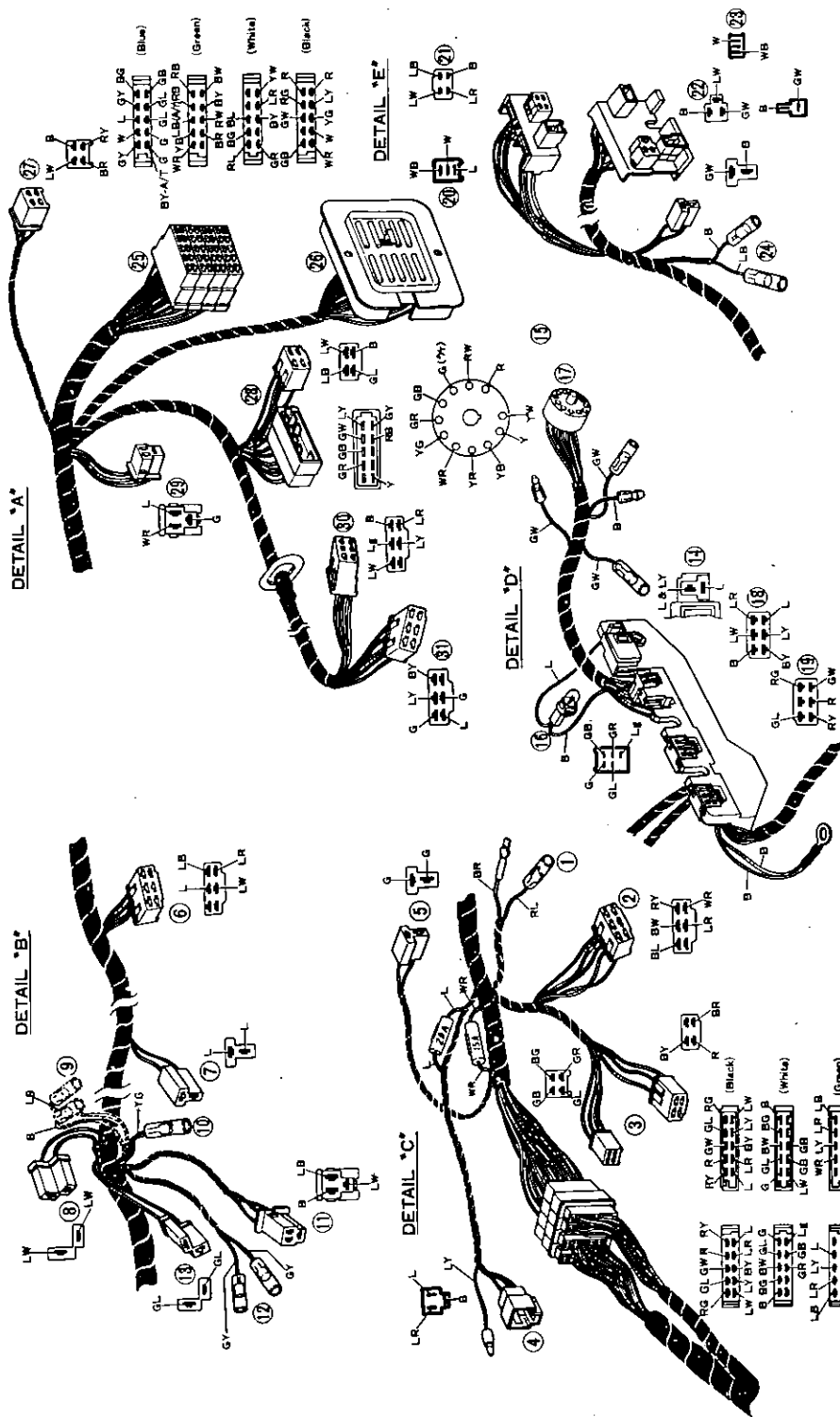
Fig. BE-58 Engine compartment

BODY ELECTRICAL



BE347
Fig. BE-59 Instrument

BODY ELECTRICAL



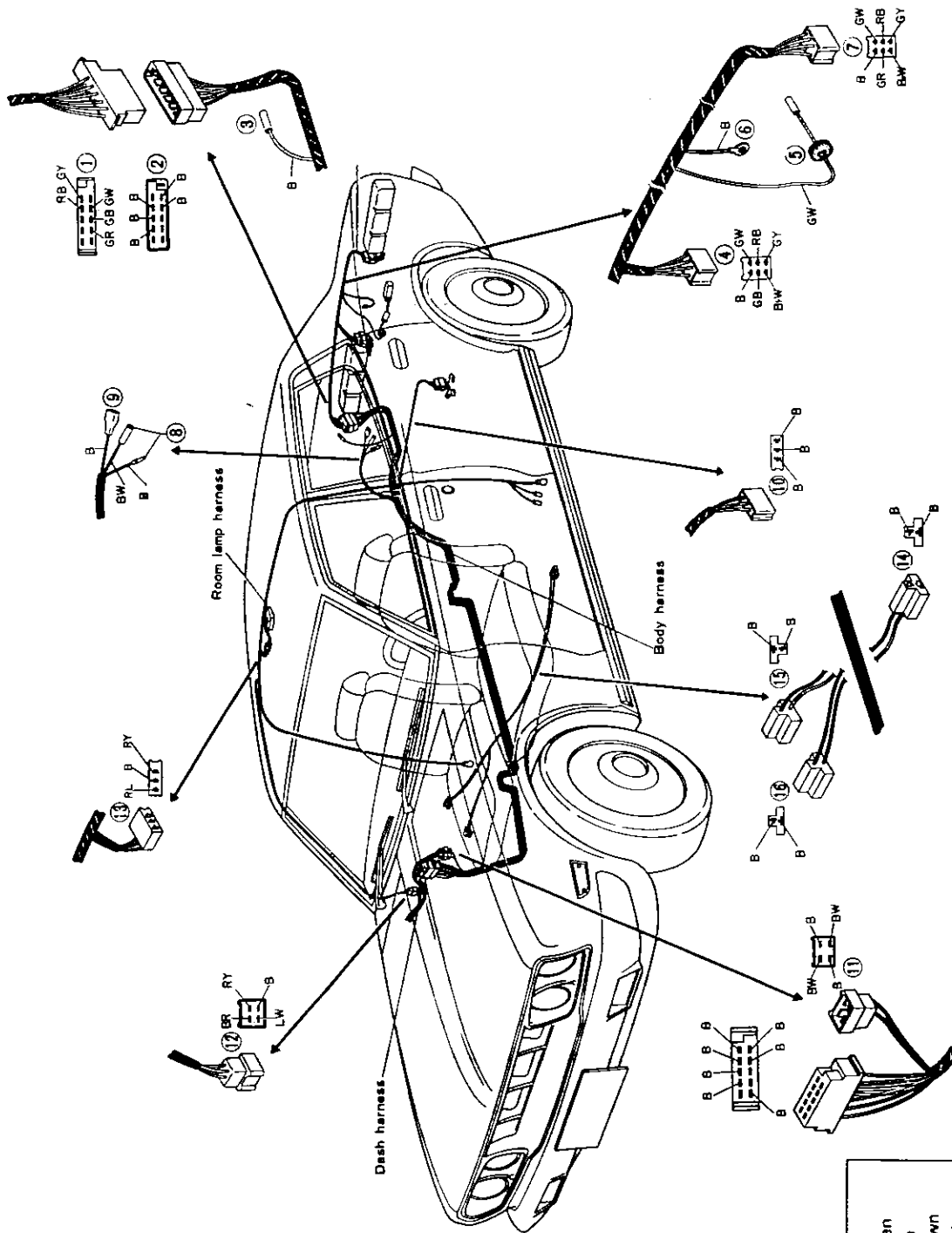
COLOR CODE	
B	 Black
W	 White
R	 Red
Y	 Yellow
G	 Green
L	 Blue
Br	 Brown
Lg	 Light green

- NO. PART NAME
- 21 TO HEATER SWITCH
 - 22 TO CIGER LIGHTER
 - 23 TO RADIO SPEAKER
 - 24 TO SEAT BELT WARNING LAMP
 - 25 ENGINE HARNESS
 - 26 FUSE BLOCK
 - 27 TO ROOM LAMP HARNESS
 - 28 TO BODY HARNESS
 - 29 TO REAR WINDOW ELECTRIC DEFROSTER SWITCH (OPTIONAL)
 - 30 TO WIPER MOTOR
 - 31 TO DASH HARNESS SUB NO. 1

- NO. PART NAME
- 10 TO PARKING BRAKE SWITCH
 - 11 TO BUZZER
 - 12 TO STOP LAMP SWITCH
 - 13 TO T/S FLASHER UNIT
 - 14 TO DEFROSTER SWITCH
 - 15 TO HAZARD FLASHER UNIT
 - 16 TO DEFROSTER PILOT LAMP (OPTIONAL)
 - 17 TO COMBINATION METER
 - 18 TO WIPER SWITCH
 - 19 TO LIGHT SWITCH
 - 20 TO RADIO UNIT (OPTIONAL)

- NO. PART NAME
- 1 TO STEERING LOCK SWITCH
 - 2 TO IGNITION SWITCH
 - 3 TO TURN SIGNAL SWITCH
 - 4 TO AIRCON HARNESS
 - 5 TO THERMO SWITCH
 - 6 TO HEATER UNIT
 - 7 TO HEATER MOTOR
 - 8 TO HAZARD FLASHER UNIT
 - 9 TO KICK DOWN SWITCH

BODY ELECTRICAL



COLOR CODE	
B	Black
W	White
R	Red
Y	Yellow
G	Green
L	Blue
Br	Brown
Lg	Light green

NO. PART NAME

- ① TRUNK ROOM HARNESS
- ② BODY HARNESS
- ③ TO REAR DEFOGGER
- ④ TO REAR COMBINATION LAMP R.H.
- ⑤ TO LISENSE LAMP
- ⑥ TO BODY EARTH

NO. PART NAME

- ⑦ TO REAR COMBINATION LAMP L.H.
- ⑧ TO TRUNK ROOM LAMP
- ⑨ TO TRUNK ROOM LAMP SWITCH
- ⑩ TO FUEL TANK UNIT
- ⑪ TO DASH HARNESS

NO. PART NAME

- ⑫ TO DASH HARNESS
- ⑬ TO ROOM LAMP
- ⑭ TO SEAT BELT SWITCH L.H.
- ⑮ TO SEAT BELT SWITCH R.H.
- ⑯ TO SEAT SWITCH

BE349

Fig. BE-61 Body and rear lighting

SERVICE MANUAL

DATSUN 1800
MODEL 610 SERIES
CHASSIS & BODY



NISSAN MOTOR CO., LTD.
TOKYO, JAPAN

SECTION SE

SERVICE EQUIPMENT

SERVICE EQUIPMENT SE- 2

SE

SERVICE EQUIPMENT

SERVICE EQUIPMENT

CONTENTS

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SPECIAL TOOL SETS AND TOOL KIT (SEE ATTACHED TOOL LIST)

The tools included in Set A are classified into four major categories:

Set "A"-ST09050000

The tools included in Set A are offered for the 610 models without regard to their destination except there shipped to specific territories. The set covers Sedan and Station Wagon and is available for new and other dealers who must go through initial preparation without those of the 510 models.

Set "B"-ST09060000

This set is designed for the 610 models without regard to their destination.

The sets cover Sedan and Van models and are available for new and other dealers who must go through initial preparation without those of the 510 models.

Kit "C"-ST09070000

This kit is designed for all dealers include U.S.A. and Canada who already have the special tool sets for the 510 models.

Set "D"-ST09040000

This set is designed for the 610 models shipped to the U.S.A. and Canada. It is essentially the same as Set "A" (less four items).

CLASSIFICATION OF SPECIAL TOOL

	Classification	
	Important	General
I. Inspection and minor repair	1	4
II. General disassembly and assembly	2	5
III. Special disassembly and assembly	3	6

A. Important

- Exclusive with no alternative
- Parts likely will be damaged if repaired without special tool.
- Gauges

B. General

- To facilitate servicing

I. Inspection and minor repair

- Inspection and maintenance
- Unit replacement
- Minor unit disassembly

II. General disassembly and assembly

- General disassembly such as engine, differential, and transmission.

III. Special disassembly and assembly

- Disassembly of exclusive parts such as automatic transmission and electrical accessories
- Special work such as boring, etc.
- Work very rarely required

SERVICE EQUIPMENT

Tool list

No.	Tool Number	Tool Name	ST0905 0000				ST0907 0000		ST0904 0000	Class	Reference
			Set A	Set B	Kit C	Set D					
1.	Engine										
	ST0501S000	Engine stand Ass'y								5	
	ST05011000	Engine stand									
	ST05012000	Base									
	ST05260001	Engine attachment								5	
	ST10120000	Cylinder head bolt wrench	X	X				X		2	
	ST10640001	Pivot adjuster	X	X				X		1	
	ST1103S000	Valve guide reamer set								3	
	ST11031000	Reamer [12.2 mm (0.480 in) dia.]									
	ST11032000	Reamer [8.0 mm (0.315 in) dia.]									
	ST11033000	Drift									
	ST11650001	Valve seat cutter set								2	
	ST12070000	Valve lifter								5	
	ST13030001	Piston pin press stand	X	X				X		2	
	ST15310000	Crankshaft rear oil seal drift	X	X				X		2	
	ST1651S000	Crankshaft main bearing cap puller	X	X				X		2	
	ST16511000	Body									
	ST16520001	Adaptor									
	ST16610001	Pilot bush puller	X	X				X		3	
	ST17420001	Chain stopper	X	X				X		2	
	ST19200000	Float level gauge	X	X						2	
	ST19320000	Oil filter wrench	X	X						1	
	EG16700000	Flow meter	X	X						1	
	EM03470000	Piston ring compressor								2	
2.	Clutch										
	ST2050S000	Clutch Ass'y tool set								4	
	ST20500010	Plate									
	ST20500020	Center pole									
	ST20500100	Distance piece [7.8 mm (0.307 in) dia.]									
	ST20500210	Height gauge									
	ST20500240	Adjusting wrench									
	ST20600000	Clutch aligning bar	X	X				X		2	
	ST20400000	Clutch release checker								4	

X Included in each set or kit.
O Optional tool.

SERVICE EQUIPMENT

No.	Tool Number	Tool Name	ST0905	ST0906	ST0907	ST0904	Class	Reference
			0000	0000	0000	0000		
3.	Transmission							
	ST23100000	Countershaft guide [17 mm (0.669 in) dia.]	X	X	X	X	2	for F4W63 T/M
	ST23110000	Countershaft guide [17 mm (0.669 in) dia.]	O	O	O	O	2	for R3W65 T/M
	ST23340000	Fork rod pin punch [4 mm (0.157 in) dia.]	X	X	X	X	2	for F4W63 T/M
	ST23550000	Cross bar pin punch [4.5 mm (0.177 in) dia.]	O	O	O	O	2	for R3W65 T/M
	ST23620000	Interlock ball guide [14 mm (0.551 in) dia.]	O	O	O	O	2	for R3W65 T/M
4.	Axle & Suspension							
	ST27700001	Strut and steering gear housing attachment	X	X		X	5	
	ST3532S000	Outer race drift Assy (Front wheel bearing)					3	
	ST35321000	Removing adaptor (Large)						
	ST35322000	Removing adaptor (Small)						
	ST35323000	Installing adaptor (Large)						
	ST35324000	Installing adaptor (Small)						
	ST35325000	Bar						
	ST35500001	Grand packing wrench	X	X		X	2	
	ST35530000	Grand packing guide [20 mm (0.787 in) dia.]	X	X		X	2	
	ST3565S000	Coil spring compressor	X	X		X	2	
	ST35651001	Body						
	ST35652001	Clamp						
	ST36700000	Transverse link replacer	X	X	X	X	3	
	ST07640000	Rear axle stand	X	X		X	2	
	ST36230000	Sliding hammer					5	
	ST33300000	Diff. mounting insulator drift	X	X	X	X	3	
	ST37120001	Rear axle shaft bearing puller	X	X		X	2	
	ST37120010	Body						
	ST37120020	Ring						
	ST37120030	Collar						
	ST37710000	Rear axle oil seal drift					2	
	ST37750000	Rear axle shaft bearing drift	X	X		X	2	
	ST38060001	Rear axle shaft flange wrench	X	X		X	2	
	ST38210000	Rear axle shaft bearing collar press stand	X	X		X	2	
	ST38280000	Rear suspension arm bush remover	X	X		X	3	
	ST38290000	Rear suspension member insulator replacer	X	X		X	3	
	ST38300000	Snap ring pliers					5	

SERVICE EQUIPMENT

No.	Tool Number	Tool Name	ST0905 0000	ST0906 0000	ST0907 0000	ST0904 0000	Class	Reference		
								R160	H165	H190
5.	Gear Carrier									
	ST06270001	Diff. attachment					5	X		
	ST06310000	Diff. attachment					5		X	
	ST06360000	Diff. attachment					5		X	
	ST23510000	Solid punch					2	X		
	ST3003S000	Drive pinion rear inner bearing pulser assembly					2	X	X	
	ST30031000	Puller								
	ST30032000	Base								
	ST30611000	Drive pinion outer race drift (bar)					2	X		
	ST30612000	Drive pinion outer race drift (adaptor)					2	X		
	ST30613000	Drive pinion outer race drift (adaptor)					2	X		
	ST30650001	Pilot bearing drift					2	X		
	ST30720000	Gear carrier front oil seal drift					2	X	X	
	ST3194S000	Drive pinion setting gauge assembly (H190)					2		X	
	ST3114S000	Drive pinion setting gauge assembly (H165)					2		X	
	ST3110S000	Drive pinion setting gauge assembly (H190)							X	
	ST31942000	Dummy shaft								
	ST31141000	Arrangement gauge (H165)								
	ST31101000	Arrangement gauge								
	ST31941000	Arrangement gauge (H190)								
	ST31102000	Spacer								
	ST3121S000	Height gauge assembly (R160)					2	X		
	ST31211000	Height gauge								
	ST31212000	Dummy shaft								
	ST31213000	Stopper								
	ST31214000	Collar								
	ST31190000	Preload gauge					5	X	X	
	ST31530000	Drive pinion flange wrench					2	X	X	
	ST32110001	Diff. side bearing cap gauge (H190)					5		X	
	ST32150000	Diff. side bearing cap gauge (H165)					5		X	
	ST3303S000	Diff. side bearing pulser					2		X	
	ST33031001	Body								
	ST33032000	Adaptor [28 mm (1.102 in) dia.]								

SERVICE EQUIPMENT

No.	Tool Number	Tool Name	ST0905	ST0906	ST0907	ST0904	Class	Reference		
			0000	0000	0000	0000		R160	H165	H190
	Gear Carrier									
	ST33065000	Diff. side bearing puller					2	X		X
	— ST33061000	Adaptor [38 mm (1.496 in) dia.]	X	X		X				
	— ST33051001	Body								
	ST33210000	Diff. side bearing drift	X	X	X	X	2		X	
	ST33230000	Diff. side bearing drift	X	X		X	2	X		X
	ST33270000	Gear carrier oil seal drift	X	X		X	2	X		
	ST33290001	Gear carrier oil seal puller	X	X		X	2	X	X	X
	ST33710000	Gear carrier side retainer attachment	X	X		X	2	X		
	ST33720000	Gear carrier side retainer guide	X	X		X	5	X		
6.	Brake									
	GG94310000	Brake pipe torque wrench					2			
	ST08060000	Master-vac oil seal press-fit tool					3			
	ST08080000	Master-vac wrench					3			
7.	Body									
	ST08800000	Sucker					5			
	ST08720000	Door adjusting wrench	X	X	X	X	1			
8.	Steering									
	ST2714000	Steering gear arm puller	X	X		X	2			
	ST2718000	Steering wheel puller	X	X	X	X	2			
	ST2785000	Steering ball joint remover	X	X	X	X	2			

SERVICE EQUIPMENT

GENERAL DESCRIPTION

1. The special tool "Differential Pinion Setting Gauge Assembly" comes in three types. The information which follows will aid in selecting the right tool for the job:

The model 610 series have three types of differential carriers, that is, the R160 for Sedan, H165 for Station Wagon and H190 for Van.

(1) R160

This tool is designed for Sedan use. It is the same as that offered for the 510 model.

(2) H165

This tool is intended for Station Wagon models. It is the same as those available for the C10 and B120 models.

(3) H190

This tool is for the Van model. It is essentially the same as those offered for the W510, 521 and 230 models. The exceptions to this occurs in the fact that a dummy shaft is included because

surface of the pinion head is not ground.

For the W510 models built before 1971, September, the dummy shaft has been eliminated since the pinion has a machined end.

The tools coming into this category are thus divided into four types according to the types of the vehicles for which they have to serve:

1. For the V610 and W510 (built after October, 1971)

ST3194S000

└ ST31942000 Dummy shaft
└ ST31941000 Arrangement gauge

2. For the W610

ST31145000

└ ST31942000 Dummy shaft
└ ST31141000 Arrangement gauge

3. For the W510 (built before September, 1971)

ST31101000

Arrangement gauge (dummy shaft not included due to machined head of the pinion)

4. For the V610 and W510 (built after October, 1971)

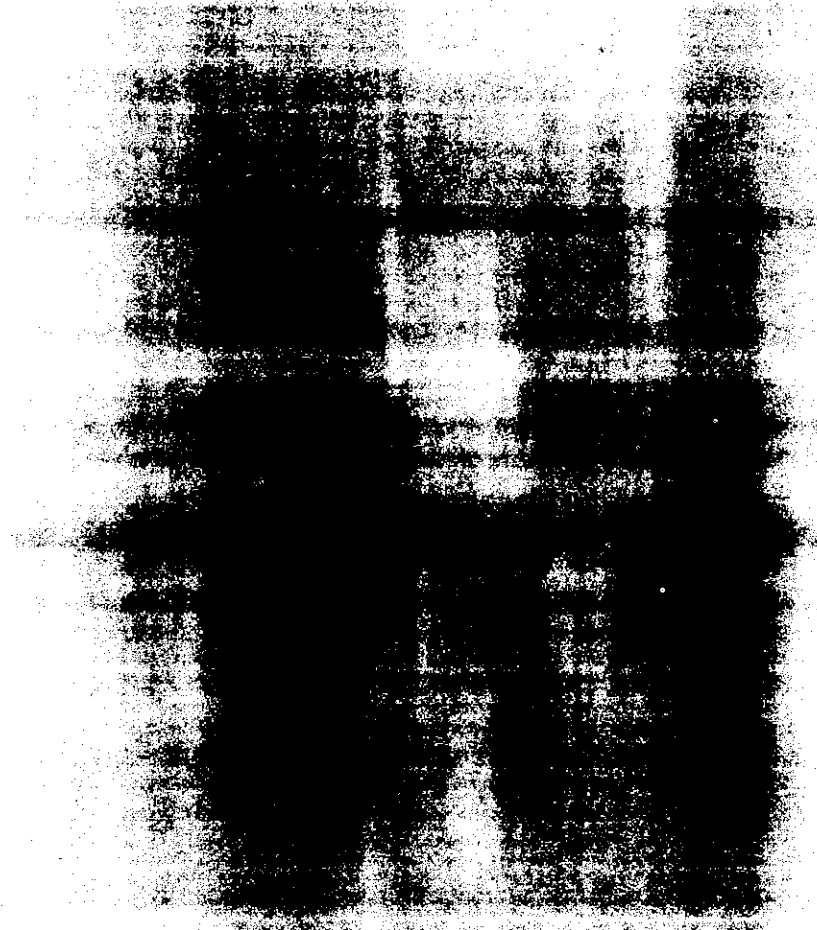
ST31105000

└ ST31942000 Dummy shaft
└ ST31101000 Arrangement gauge
└ ST31102000 Spacer

This kit includes a spacer. The purpose of this spacer is to supplement the operation of the arrangement gauge already owned by dealers for the 510. With this new spacer included, the gauge can be used for the 610 models.

Special tools for R3W65 transmission

Since vehicles equipped with the R3W65 transmission have been shipped only to specific territories, the special tools, ST23110000, ST23550000 and ST23620000, are made available as optional parts. The tools must therefore be ordered separately from our Parts Department when these are required.





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