

HONDA

S800

SHOP MANUAL



HONDA MOTOR CO., LTD.

HONDA S800

SHOP MANUAL



FOREWORD

This shop manual provides the service man with complete information on the maintenance and repair of the Honda S800.

An effort has been made to produce a manual that will not only serve as a ready reference book for the experienced servicemen but also cover step-by-step procedures for the guidance of those with lesser experience.

The information are grouped according to the type of work being performed, such as diagnosis and testing, frequently performed adjustments and repairs, in-vehicle adjustments, and etc. Specifications and recommended special tools are also included.

This manual should be kept in a handy place for ready reference. If properly used, it will enable the service shops to better serve the Honda S800 owners and will also enjoy a reputation of providing reliable service.

All information, illustrations and specifications contained in this literature are based on the latest product information available at the time of publication. The right is reserved to make changes at any time without notice.

**Foreign Service Dept.
HONDA MOTOR CO., LTD.**



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HONDA S800 CONVERTIBLE



HONDA S800 COUPE

PHANTOM VIEW OF HONDA S800

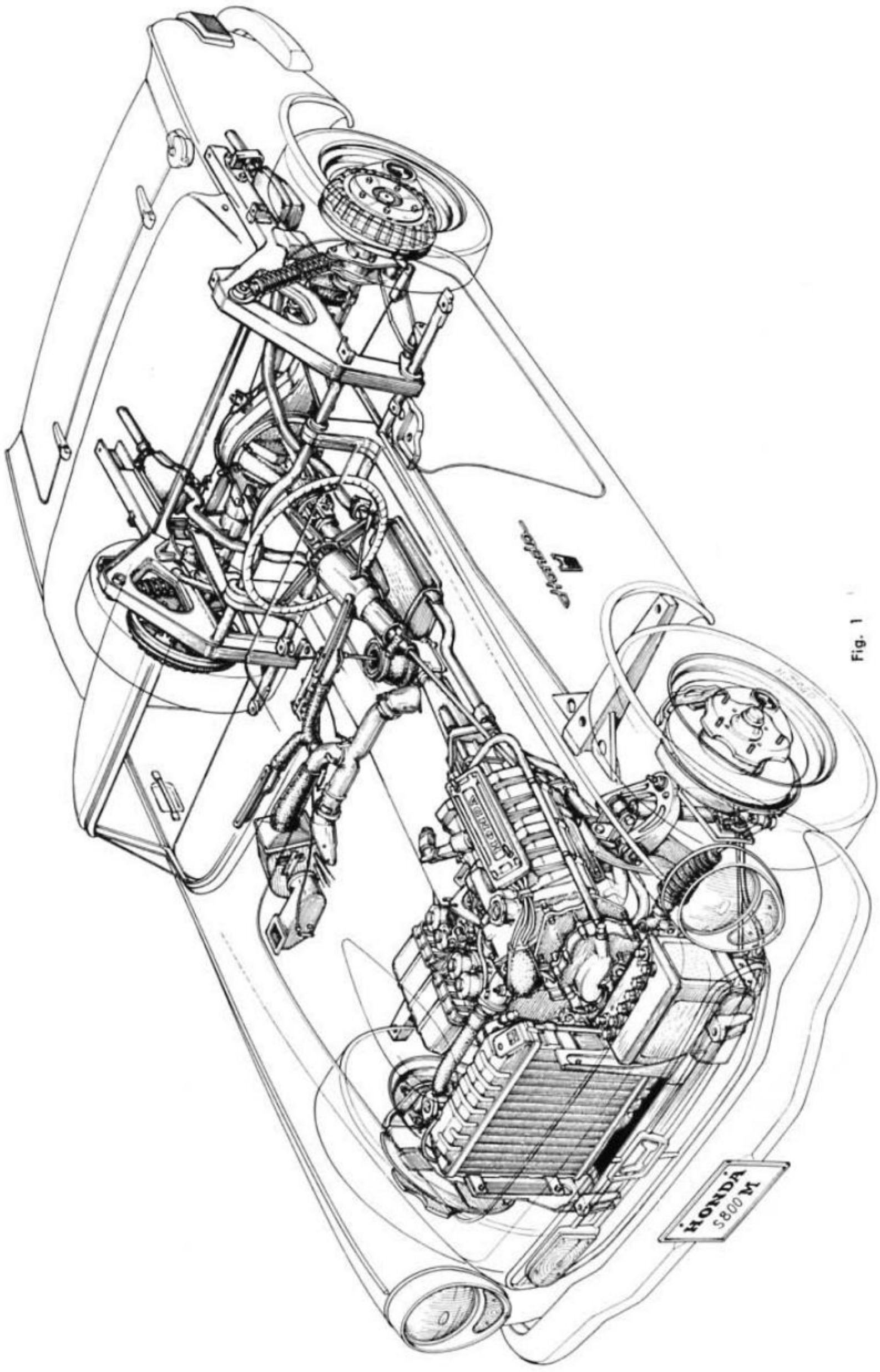


Fig. 1

PHYSICAL DIMENSIONS HONDA S800 CONVERTIBLE

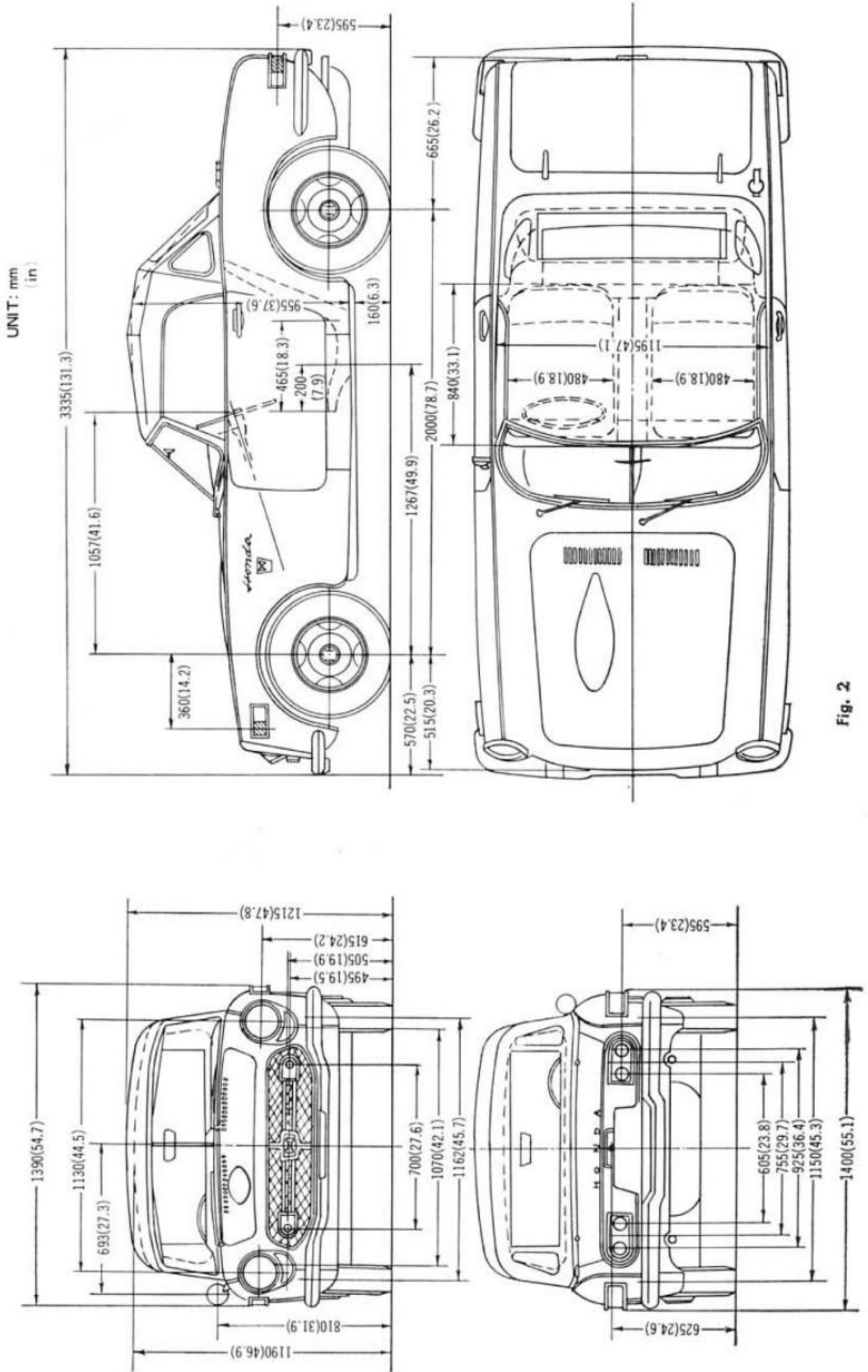


Fig. 2

PHYSICAL DIMENSIONS HONDA S800 COUPE

UNIT: mm
(in)

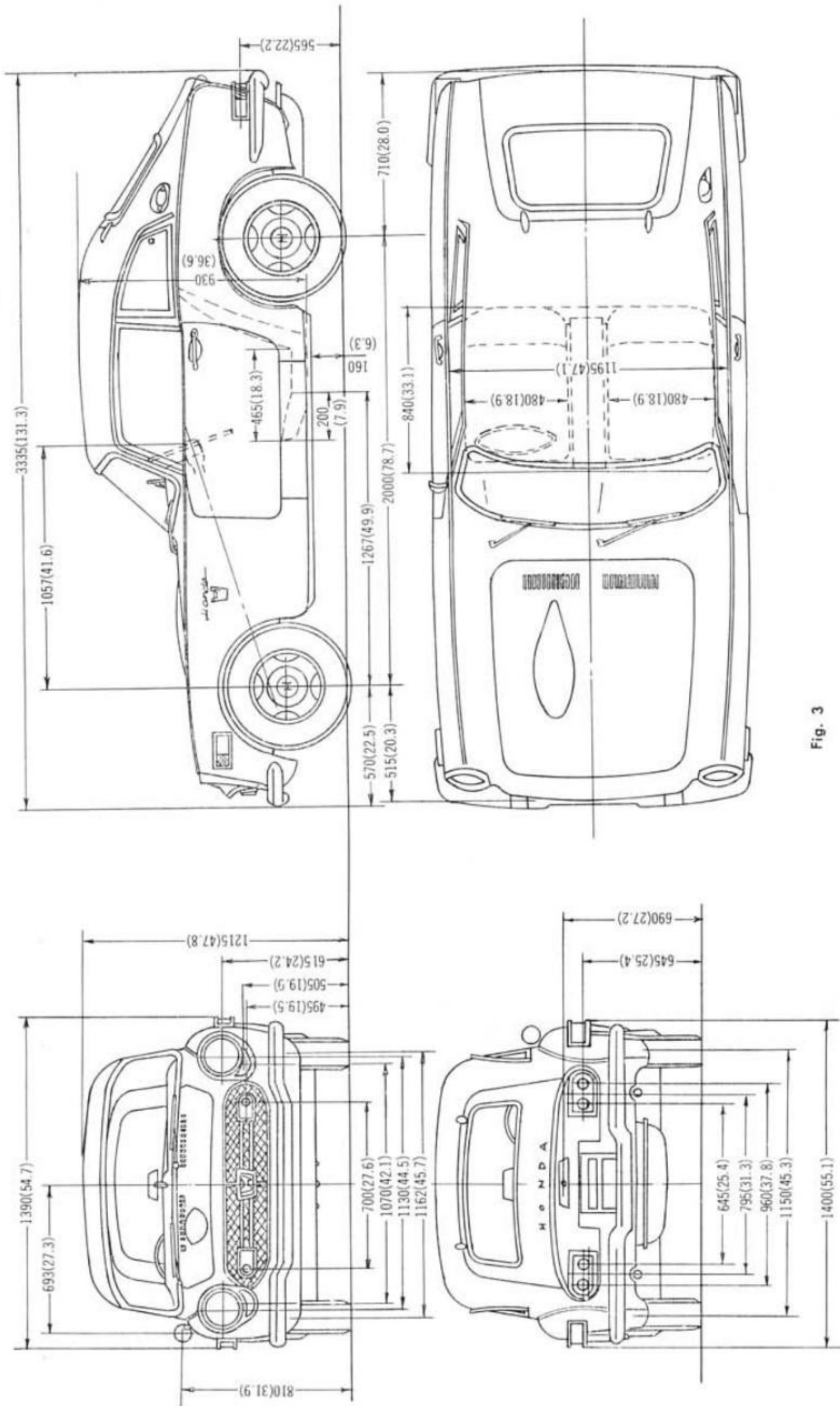


Fig. 3

GENERAL DATA AND SPECIFICATIONS

■ Dimensions

Overall Dimensions	
Length	3.335 m (131.3 in.)
Width	1.400 m (55.1 in.)
Height	1.215 m (47.8 in.)
Wheelbase	2.000 m (78.7 in.)
Tread (front and rear)	1.15 m (45.3 in.)
Ground Clearance	0.16 m (6.3 in.)
Weight Complete (including fuel, oil and water)	
Convertible	750 ± 20 kg (1653.8 ± 44.1 lbs)...Hawaii 755 ± 20 kg (1664.8 ± 44.1 lbs)...Belgium, Canada, England, France, Germany, Switzerland, U.S.A. (except Hawaii)
Coupe	760 ± 20 kg (1675.8 ± 44.1 lbs)...Hawaii 765 ± 20 kg (1686.8 ± 44.1 lbs)...Belgium, Canada, England, France, Germany, Switzerland, U.S.A. (except Hawaii)

■ Engine

Type	Water cooled, double overhead camshaft, 4 cycle
Cylinder and Arrangement	Straight 4 cylinders tilted to the left 45°
Valve Arrangement	Overhead valves
Bore and Stroke	60 × 70 mm (2.36 × 2.76 in.)
Cubic Displacement	791 cc (37.2 cu. in.)
Compression Ratio	9.2 : 1
Compression Pressure	11.5 kg/cm ² (163.6 lbs/in ²) at 1000 r.p.m.
Valve Timing at 1 mm (0.04 in.) lift	
Inlet opening angle	B.T.D.C. 20°
Inlet closing angle	A.B.D.C. 40°
Exhaust opening angle	B.B.D.C. 40°
Exhaust closing angle	A.T.D.C. 20°
Valve Clearance (cold)	
Inlet and exhaust	0.18 ~ 0.22 mm (0.007 ~ 0.009 in.)
Starting Method	Electric starter

■ Performance

Maximum Power Output	70 HP at 8000 r.p.m.
Maximum Speed	160 km/h (100 m.p.h.)
Maximum Torque	6.7 kg-m (48.5 lb-ft) at 6000 r.p.m.
Climbing Ability	21.2°
Minimum Turning Radius	4.40 m (14.4 ft)
Braking Efficiency	Stopping from 50 km/h (31 m.p.h.) in 12.5 m (41.1 ft)
Fuel Consumption (on level road)	15 km/ℓ (42 miles / Imp. gal., 32 miles/U.S.gal.)
Maximum Incline Stability (left and right)	51°

■ Ignition System

Ignition Method	Battery ignition
Ignition Timing	B.T.D.C. 15° at 1500 r.p.m., 40° at 4030 r.p.m.
Ignition Sequence	1-2-4-3
Spark Advance Method	Mechanical governor advance
Spark Plug	Type N.G.K. D-8ES (standard), D-10E, D-11E, D-12E (option)
	Size 12 mm (0.472 in.), p1.25 mm (0.049 in.)
	Gap 0.7 mm (0.0028 in.)
Battery	12V, 40AH
Generating System	A.C. Dynamo (alternator)
Generating Capacity	12V-300W
Voltage Regulator	Tirril type
Regulating Voltage	13.5V~14.5V

■ Lubrication System

Engine	
Lubrication Method	Pump pressure
Type of Pump	Trochoid
Capacity	11.5 ℓ/min. (16.1 Imp. pt./min., 24.3 U.S. pt./min.) at 2250 r.p.m. (pump R.P.M.)
Pressure	1.0 kg/cm ² (14.2 lbs/in ²) at 2250 r.p.m. (pump R.P.M.)
Oil Filter	Paper element and centrifugal type

■ Fuel System

Carburetor	
Type and Quantity	Side draught variable venturi, 4 each
Fuel Pump	
Type	Solenoid Pump
Rated voltage	12 V
Current (average)	1A max.
Discharge pressure (full closed)	0.11~0.15 kg/cm ² (1.565~2.133 lbs/in ²)
Discharge volume at 12V, 1m (39.4") head	0.6 ℓ/min. (1.06 Imp. pt./min., 1.27 U.S. pt./min.)
Discharge volume at 12V, 0 m head	1 ℓ/min. (1.76 Imp. pt./min., 2.11 U.S. pt./min.)
Air Cleaner	
Type and Quantity	Paper filter element, 1 each

■ Cooling System

Cooling Method	Water cooled
Type of Radiator	Tube and corrugated fin core
Type of Water Pump	Centrifugal pump
Capacity	78 ℓ/min. (105.6 Imp. pt./min., 126.6 U.S. pt./min.) at pump 3000 r.p.m.
Pressure	0.35 kg/cm ² (5 lbs/in ²) at 4500 r.p.m. (pump R.P.M.)
Thermostat	
Type	Wax type
Start of opening	78~82°C (172~180°F)
Full open	88~92°C (190~198°F)
Valve opening	7 mm (0.275 in.)

■ Power Transmission

Clutch	
Type	Single plate, diaphragm spring, dry disc
Dimension of clutch plate	(O.D. × I.D. × thickness) : 165 × 110 × 6.8 mm (6.50 × 4.34 × 0.27 in.)
Friction surface	118.79 cm ² (18.41 in ²)

Gearbox		
Type		Full synchromesh
Gear change method		Floor shift lever
Gear ratios	1st gear	3.950
	2nd gear	2.410
	3rd gear	1.615
	Top gear	1.143
	Reverse	4.520

■ Propeller Shaft

Universal Joint (front and rear)	Cross and roller type
-------------------------------------	-----------------------

■ Reduction Gear

Type	Hypoid gear
Ratio	4.714

■ Steering System

Gear	
Type	Rack and pinion
Ratio	17.4 : 1
Steering Angle	
Inside	33°
Outside	29°
Steering Wheel Diameter	380 mm (15.0 in.)

■ Suspension

Front Axle	Wishbone with ball jointed swivel
Toe-in	3 mm (0.12 in.)
Camber	1.5°
Caster	3°
Trail	26.0 mm (1.02 in.)
Kingpin Inclination	10.8°
Rear Axle	Live axle, radius rod

■ Brake System

Type	
Front	Disc brake
Rear	Leading and trailing shoes
Foot brake	Hydraulically operated
Handbrake	Mechanically operated on rear wheels
Dimension of Brake Lining (length × width × thickness)	
Front	53.1 × 42.5 × 10.3 mm (2.09 × 1.67 × 0.41 in.)
Rear	263 × 34 × 5 mm (103.54 × 1.34 × 0.20 in.)
Contact Surface	
Front	90 cm ² (19.35 in ²)
Rear	357 cm ² (55.32 in ²)
Brake Drum Diameter	
Front	235 mm (9.25 in.)
Rear	212 mm (8.35 in.)
Maximum Hydraulic Pressure	75 kg/cm ² (1066 lbs/in ²) at 50 kg (110 lbs) Foot Force

■ Damper System

Type	
Front wheel	Independent torsion bar suspension and telescopic hydraulic damper
Rear wheel	Coil spring incorporating telescopic hydraulic damper

■ Tires

Size (front and rear)	145 SR13
Tire Pressure (front and rear)	1.4 kg/cm ² (20 lbs/in ²) 1.7 kg/cm ² (24 lbs/in ²)...over 90 km/in. (60 m.p.h.)

■ Capacities

Engine (crankcase)	3.7 ℓ (6.5 Imp. pt., 7.8 U.S. pt.)
Transmission Case	2.2 ℓ (3.9 Imp. pt., 4.7 U.S. pt.)
Differential Gear Case	1.3 ℓ (2.29 Imp. pt., 2.75 U.S. pt.)
Cooling System (radiator)	5.2 ℓ (9.2 Imp. pt., 11.0 U.S. pt.)
Fuel Tank	5.7 ℓ (10.0 Imp. pt., 12.0 U.S. pt.) with car heater 35 ℓ (7.7 Imp. gal., 9.2 U.S. gal.).....Convertible 30 ℓ (6.6 Imp. gal., 7.9 U.S. gal.).....Coupe

■ Electric Equipments

Headlights	12V-50/40W (Standard, U.K. and U.S.A. : SAE 6012) 12V-36/45W (France and Belgium : BNA R136-02), 12V-35/35W (Ger. : DIN 72601)
Parking Lights	12V-4cp (Standard and U.S.A. : SAE 67), 12V-6W (U.K. : BS 207) 12V-8W (France, Belgium and Ger.)
Front Turn Signal Lights	12V-32cp (Standard and U.S.A. : SAE 1073), 12V-21W (U.K. : BS 382) 12V-18W (France, Belgium and Ger. : BNA 623, DIN 72601R)
Side Turn Signal Lights	12V-6W (U.K. : BS 207...front and rear, 12V-5W (France and Belgium)...front
Side Marker Lights	12V-4cp (Standard and U.S.A. : SAE 67) front and rear 12V-5W (France and Belgium).....rear
Taillights	12V-4cp (Standard and U.S.A. : SAE 67) 12V-5W (France, Belgium and Ger. : DIN 72601G)
Stop/Taillights	12V-18/5W.....combination
Stop/Rear Turn Signal Lights	12V-32cp (Standard and U.S.A. : SAE 1073) 12V-18W (France, Belgium and Ger. : BNA 628, DIN 72601R)
Rear Turn Signal Lights	12V-21W (U.K. : BS 382)
License Plate Lights	12V-4cp (Standard and U.S.A. : SAE 67) 12V-5W (France, Belgium, U.K. and Ger. : DIN 72601G)
Back-up Lights	12V-15cp (Standard and U.S.A. : SAE 1003), 12V-6W (U.K. : BS 207) 12V-10W (France, Belgium and Ger. : DIN 72601G)
Courtesy Light	12V-5W
Warning and Indicator Lights	12V-3W
A.C. Dynamo	300W

S800, S800C PERFORMANCE CURVE

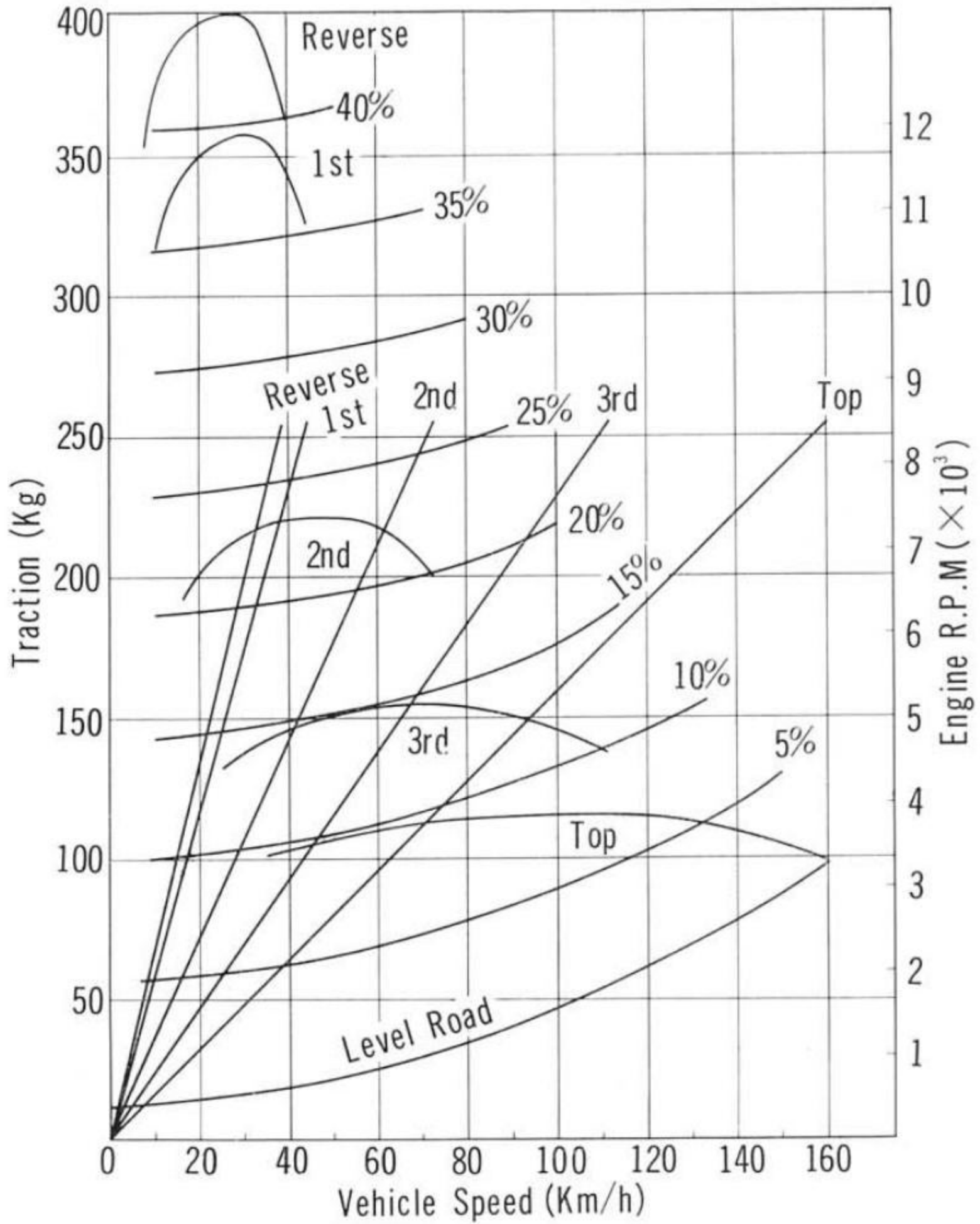


Fig. 4

ENGINE PERFORMANCE AND ACCELERATION CURVE

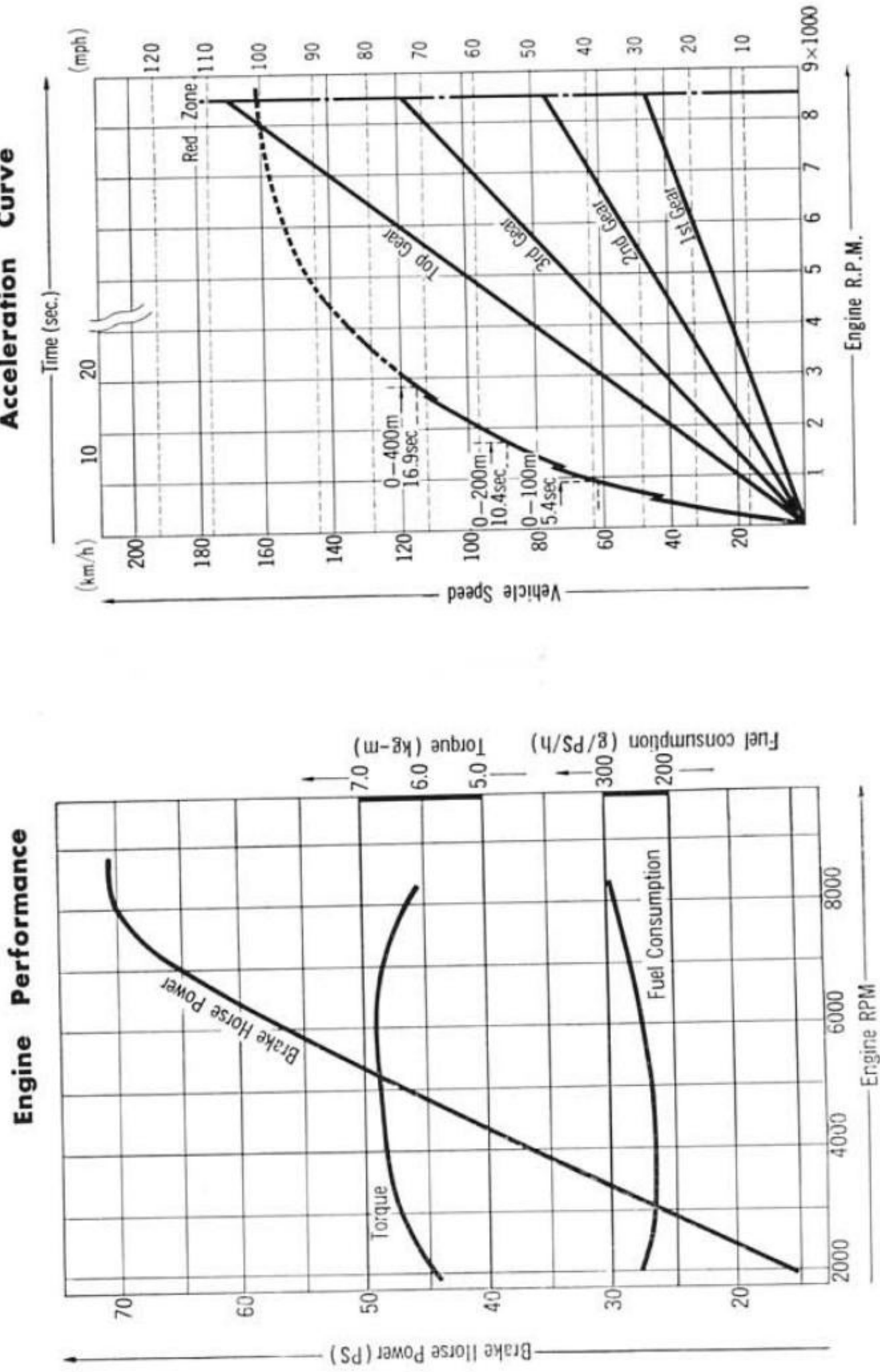
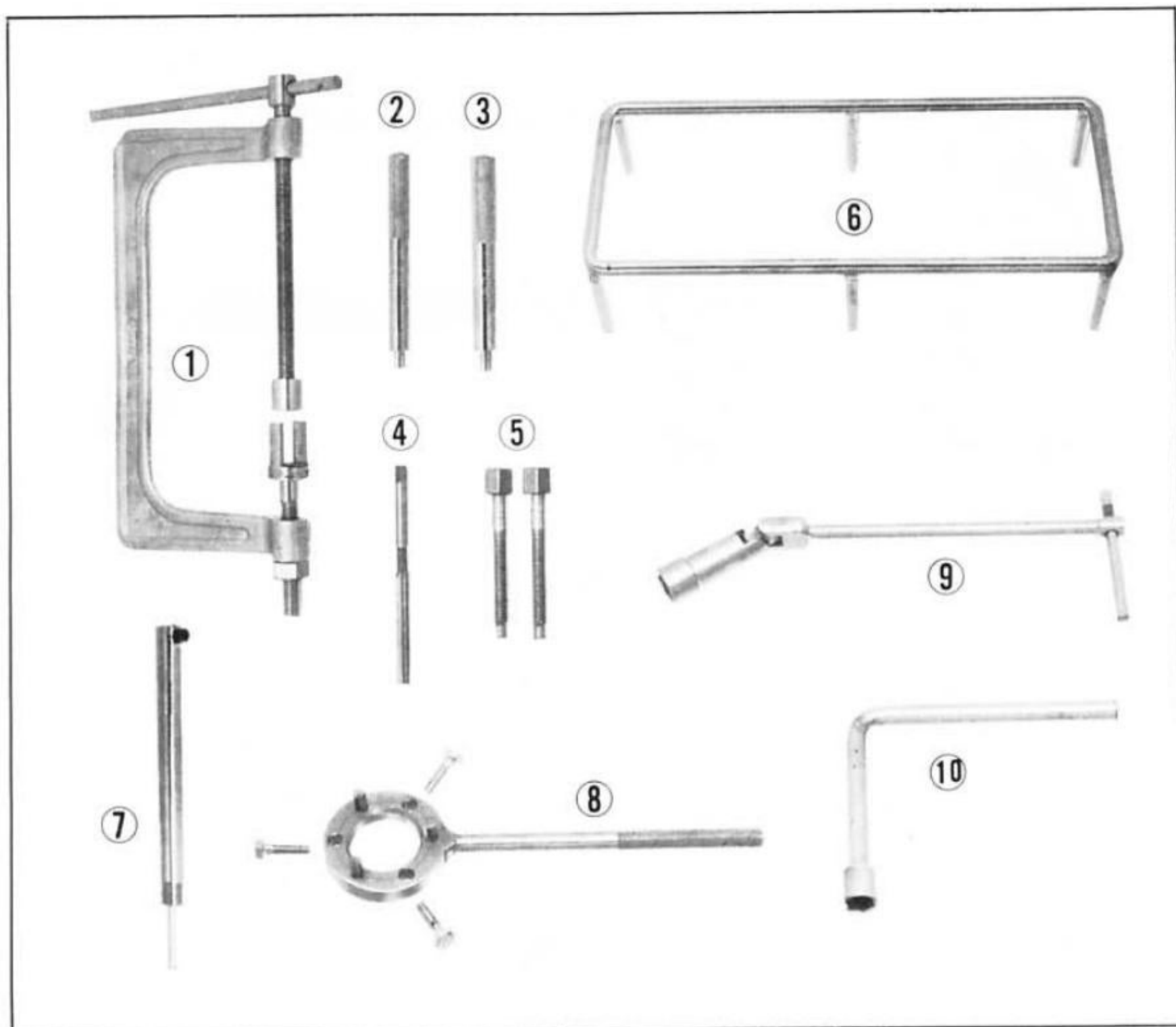


Fig. 5

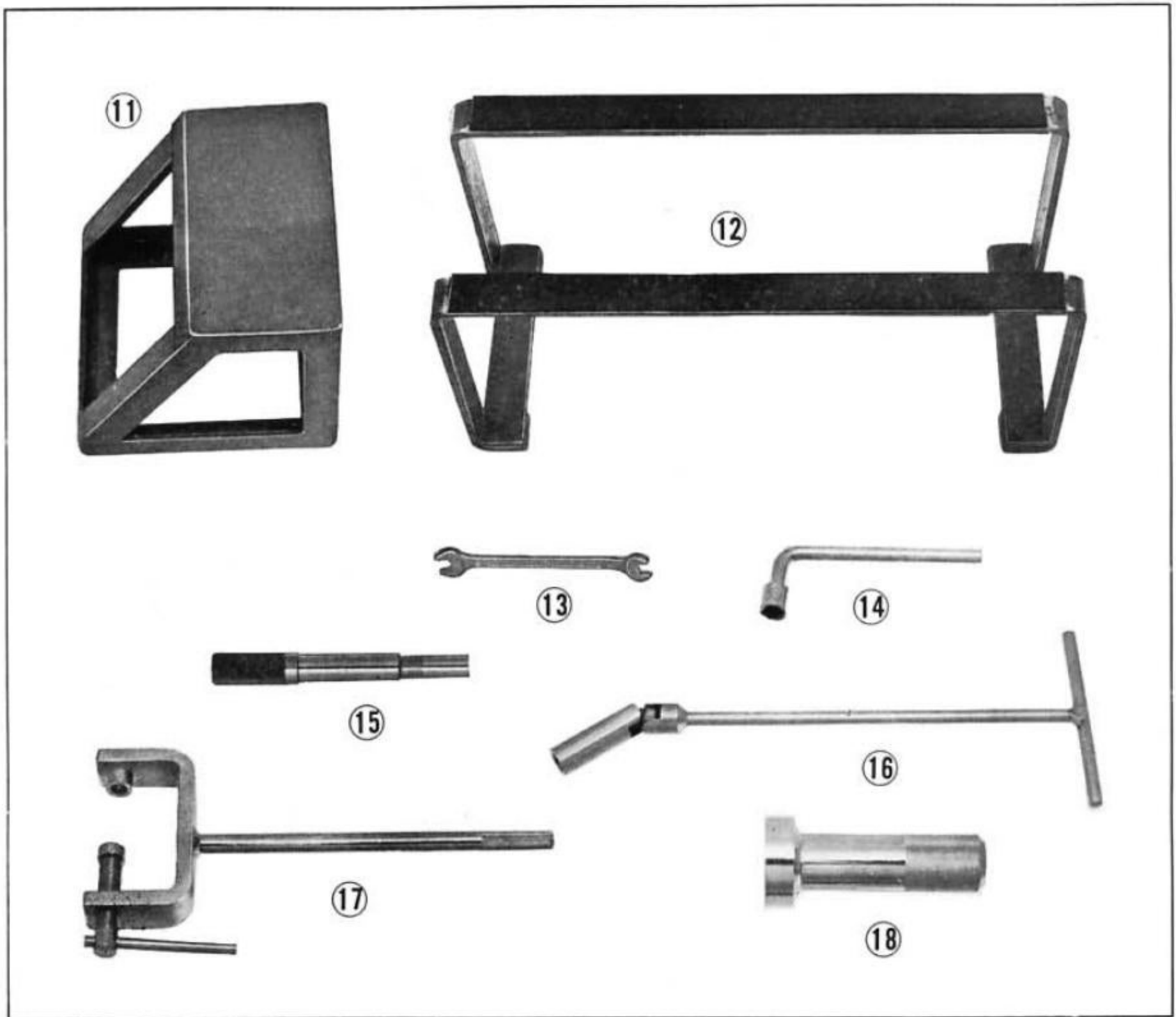
Fig. 6

SPECIAL TOOLS

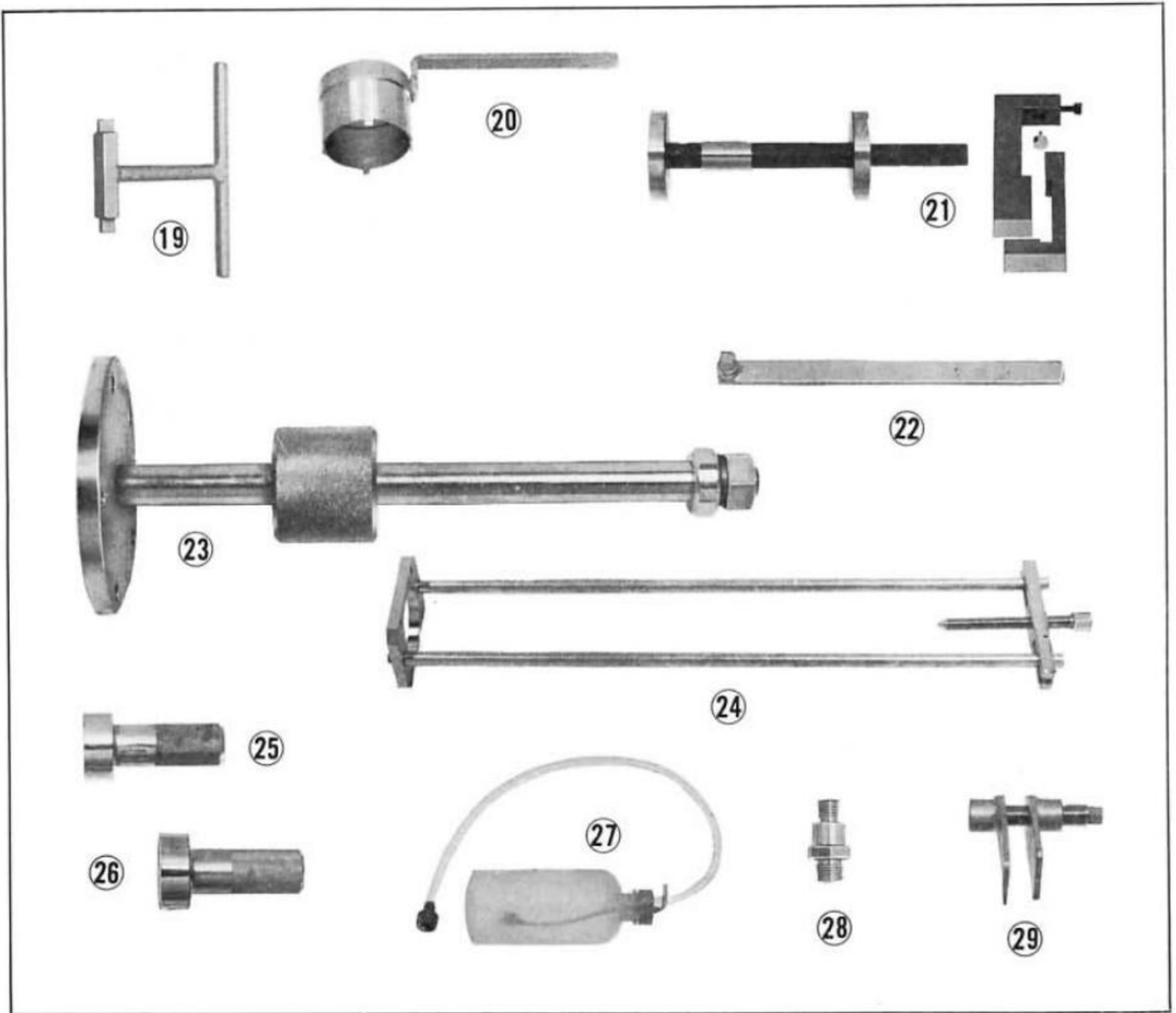


Ref. No.	Tool No.	Description
1	07031-25001	Valve lifter
2	07047-54201	Valve guide remover
3	07046-54201	Valve guide driver
4	07008-54201	Valve guide reamer
5	07055-50001	Cylinder sleeve pullers
6	07063-54201	Crankshaft setting holder
7	07069-50001	Piston top-dead-center indicator (dial gauge adapter)
8	07029-54202	Crankshaft pulley holder
9	07094-50001	Spark plug flex joint wrench
10	07085-50001	L-handle socket wrench

12 SPECIAL TOOLS

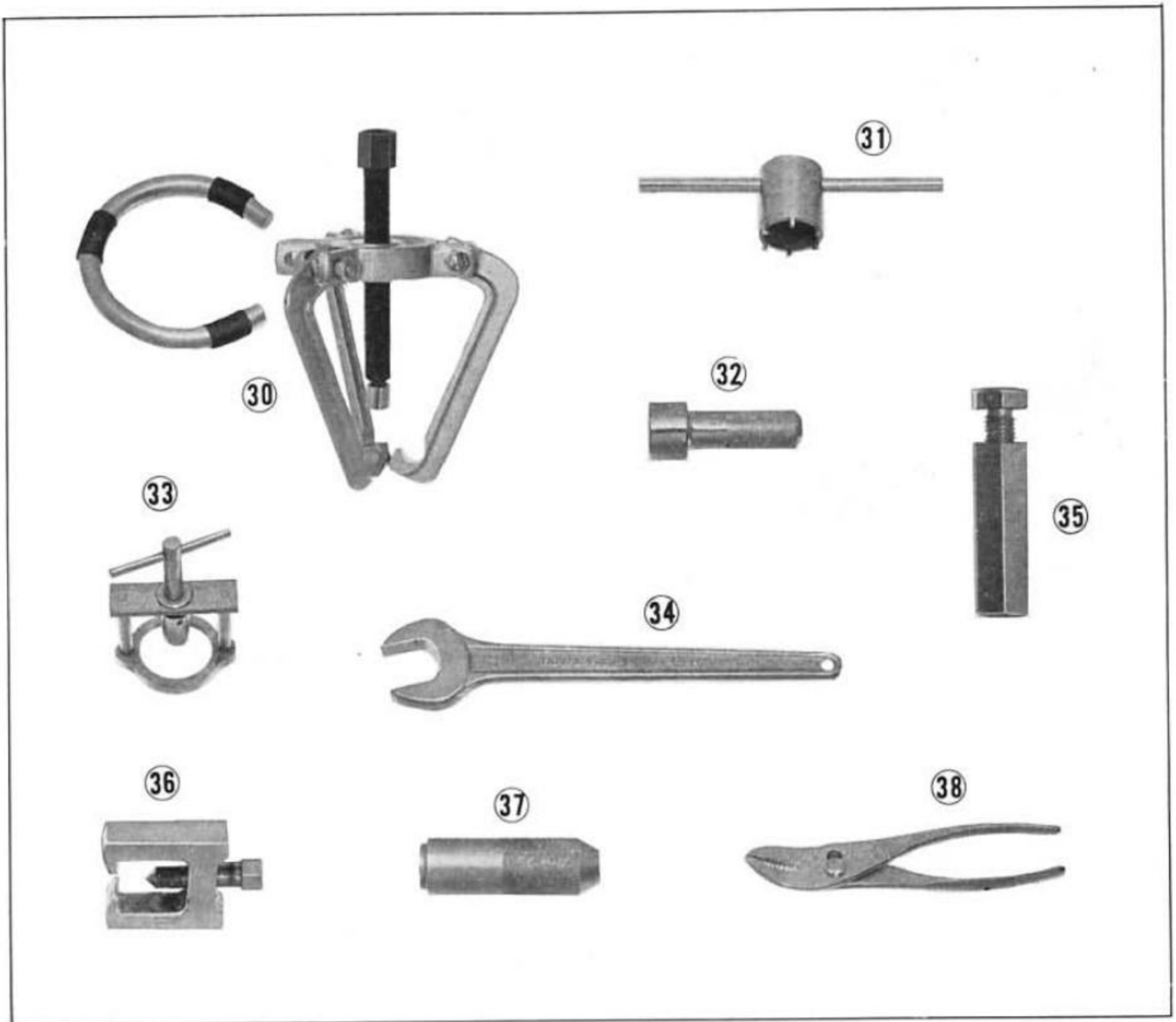


Ref. No.	Tool No.	Description
11	07044-50401	Engine stand
12	07042-50001	Cylinder block stand
13	07783-50401	Carburettor adjusting wrench
14	07095-50001	Carburettor socket wrench
15	07037-54201	Clutch aligning guide
16	07078-54201	T-handle flex joint socket wrench, 14 mm
17	07043-54201	Joint yoke setting tool
18	07048-54201	Drive pinion bearing driver

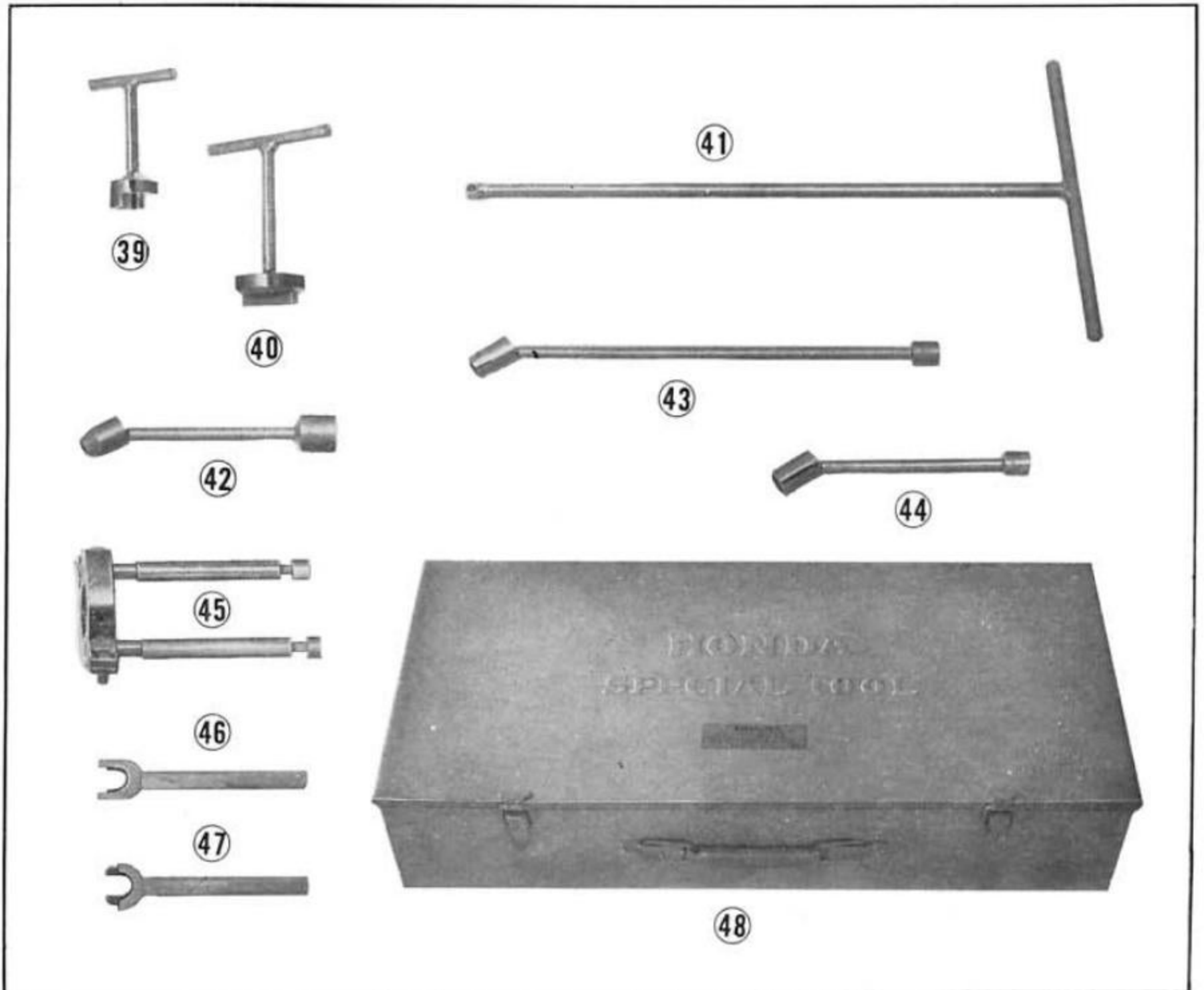


Ref. No.	Tool No.	Description
19	07088-54202	Ring gear adjusting wrench
20	07096-54202	Pinion height adjusting wrench
21	07068-54202	Pinion height adjust gauge
22	07028-54201	Drain plug wrench
23	07009-54201	Rear axle shaft puller
24	07017-54201	Rear axle shaft bearing puller
25	07052-50401	Front hub outer bearing driver
26	07053-50401	Front hub inner bearing driver
27	07059-50401	Brake line bleeder jar
28	07039-54201	Disc brake piston remover adapters
29	07030-54201	Disc brake piston push-back tool

14 SPECIAL TOOLS



Ref. No.	Tool No.	Description
30	07010-54201	Steering wheel puller
31	07096-50401	Steering gear box bearing adjusting wrench
32	07048-50401	Steering gear box bearing driver
33	07009-54251	Steering pinion shaft puller
34	07079-50601	Single head spanner, 35 mm
35	07092-50001	Front suspension ball housing puller
36	07056-50401	Tie-rod end ball stud puller
37	07048-50001	Front wheel bearing driver
38	07782-99924	Thin bent nose pliers



Ref. No.	Tool No.	Description
39	07071-50401	Main switch wrench
40	07028-50401	Fuel filler wrench
41	07777-99934	Long socket wrench joint, W/T-handle
42	07777-99931	Long socket wrench joint, 10 mm
43	07777-99932	Long socket wrench joint, 12 mm
44	07777-99933	Long socket wrench joint, 14 mm
45	07020-54201	Knuckle bearing puller adapter
46	07055-54211	Prop. shaft circlip remover
47	07058-54212	Prop. shaft circlip driver
48	07790-54201	Tool case

M E M O

1. ENGINE

- The high output, four cylinder in-line engine incorporating both the OHV and twin overhead camshaft develops a flat torque characteristic over a wide range.
- Needle roller bearings are used at the main crankshaft and connecting rod journals, and at the primary rotating points in the gearbox to minimize friction losses.
- The carburation system consists of an independent carburetor for each of the four cylinders which is of a specially designed vacuum-servo operated inlet secondary valves.

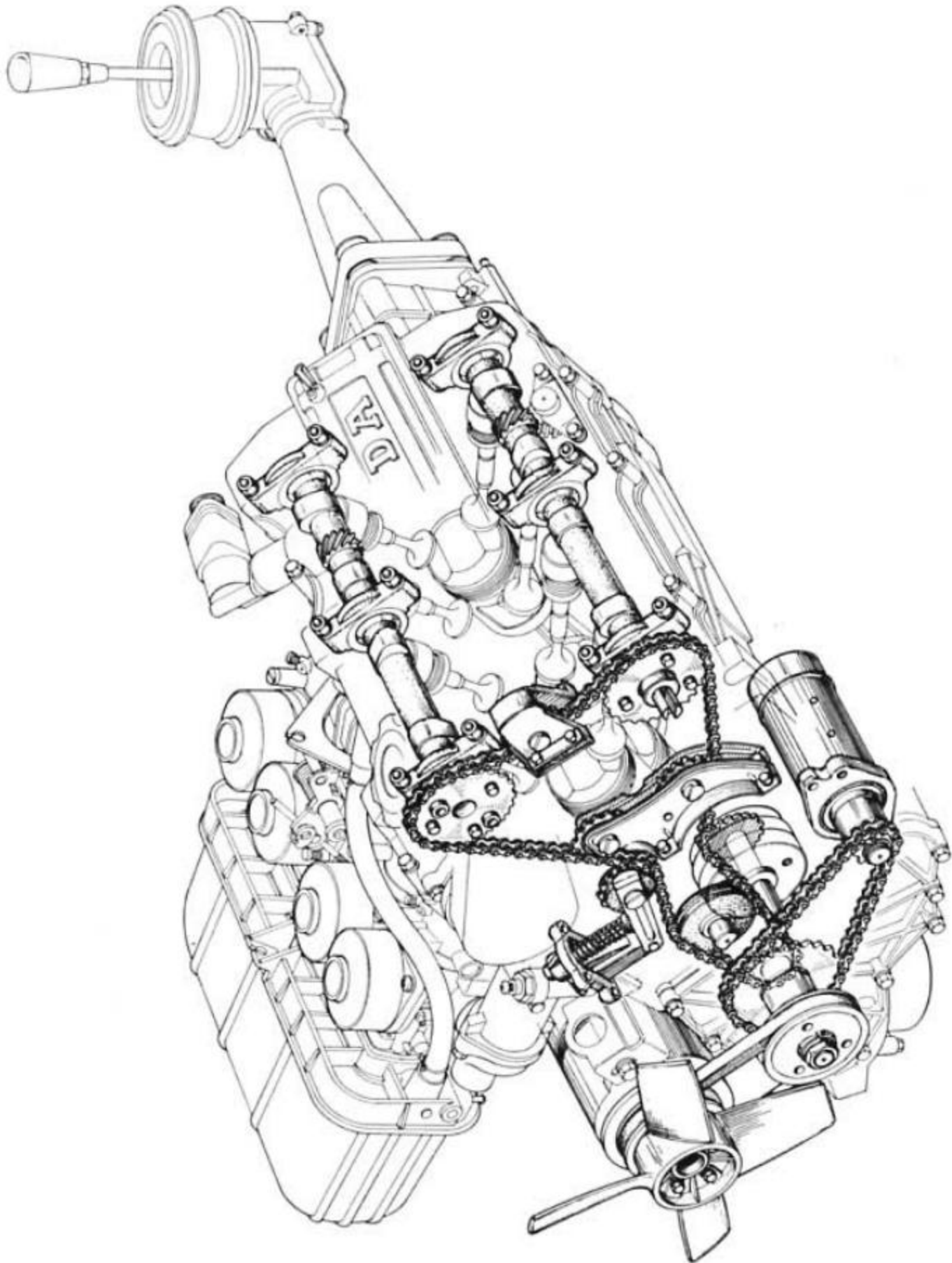


Fig. 1-7

A. ENGINE EXPLODED VIEW

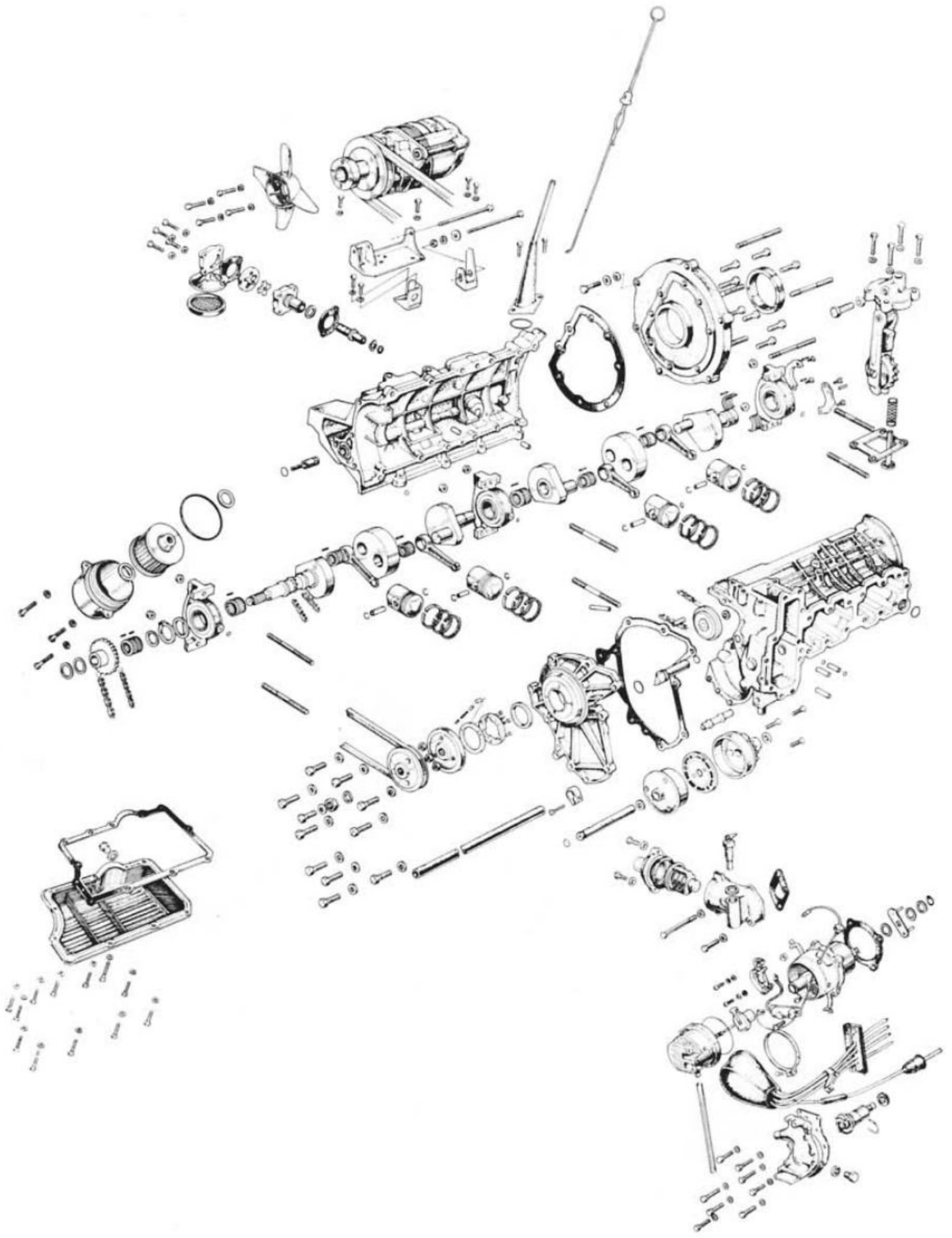
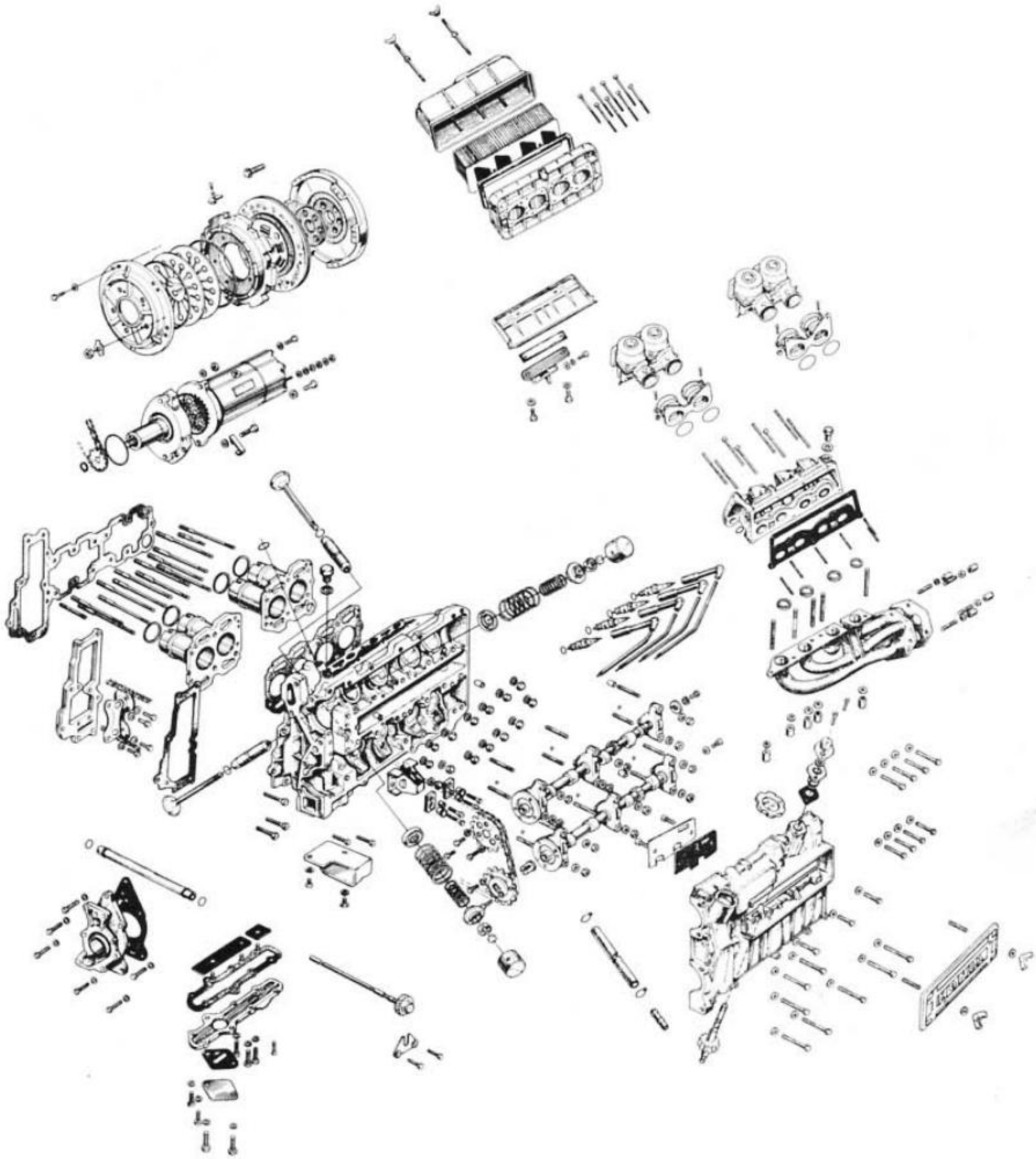


Fig. 1-8



B. LUBRICATION SYSTEM

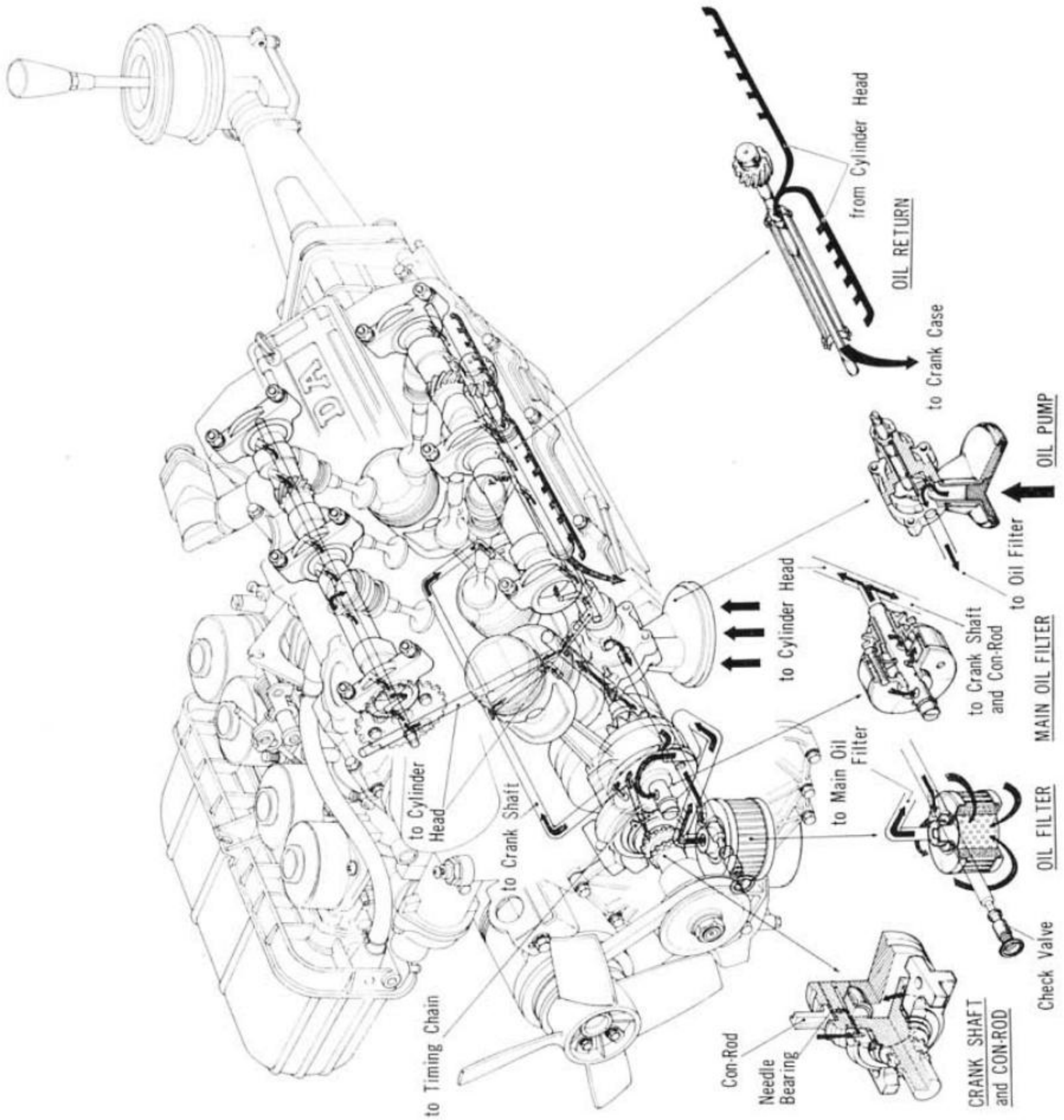


Fig. 1-9

C. EXHAUST SYSTEM

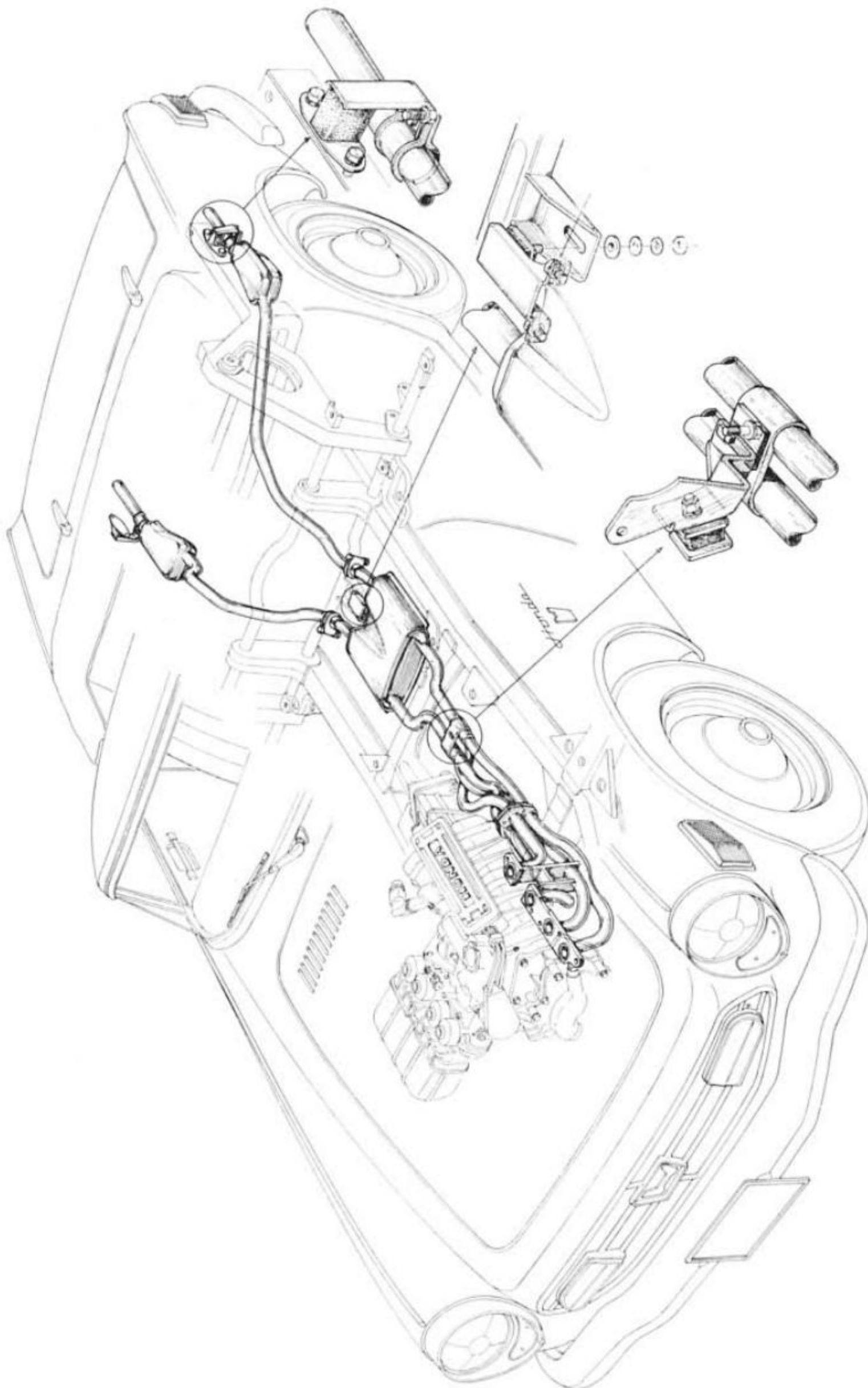


Fig. 1-10

D. SECTIONAL VIEW OF ENGINE

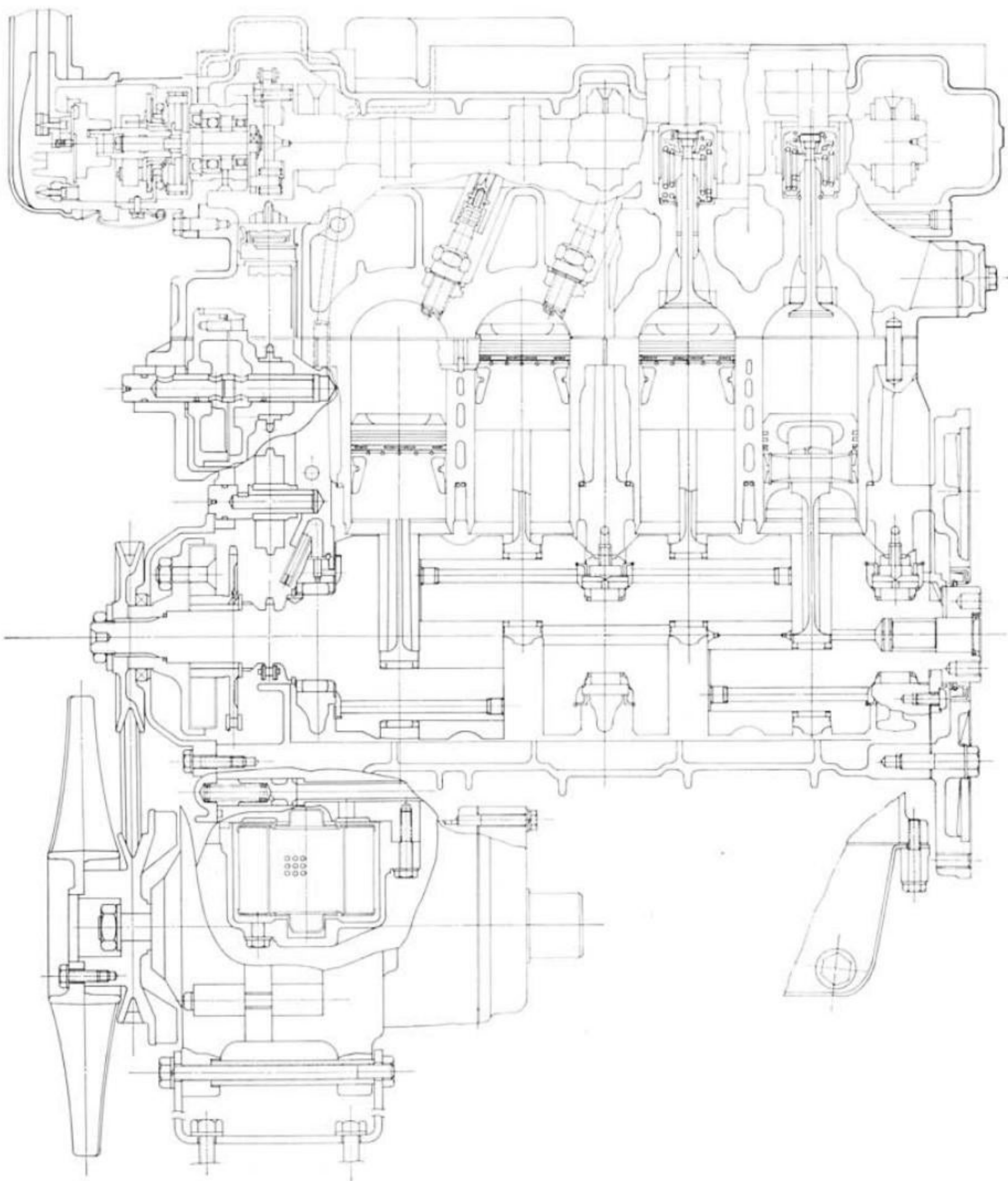


Fig. 1-11

E. ENGINE HANDLING**a. Removal**

1. Remove the bonnet cover by extracting the hinge pins (Fig. 1E-1).

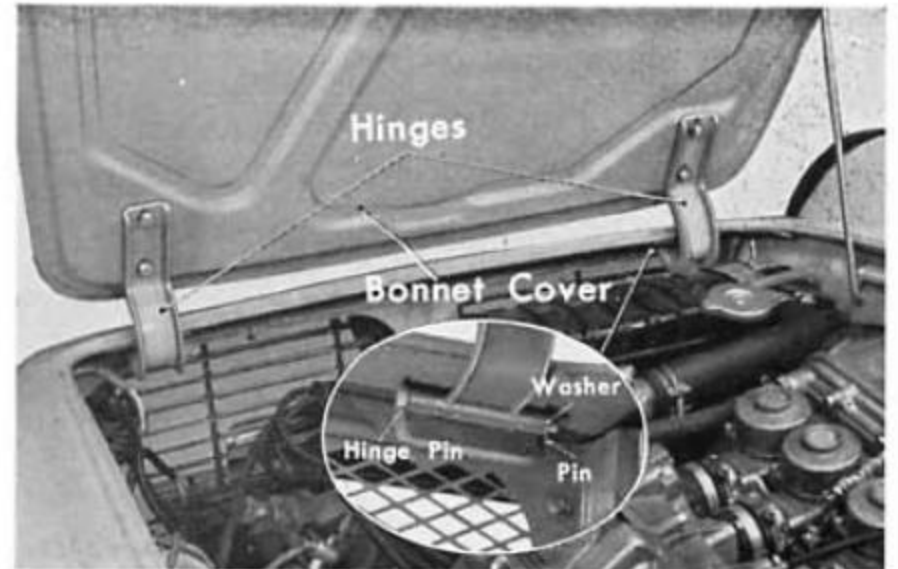


Fig. 1E-1

2. Remove battery cables and battery setting bolts, and remove the battery from chassis (Fig. 1E-2).

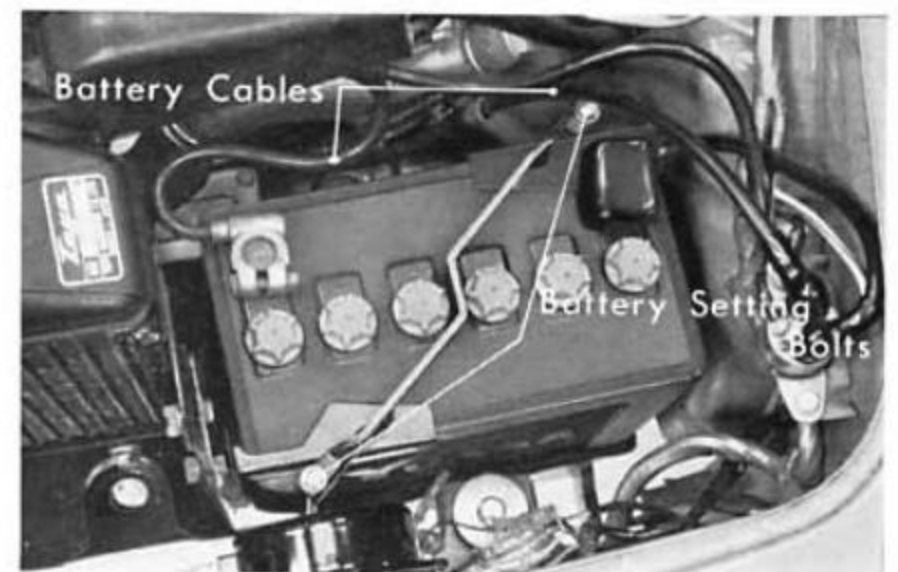


Fig. 1E-2

3. Remove the fuel pump to prevent it from being damaged before removing the radiator (Fig. 1E-3).

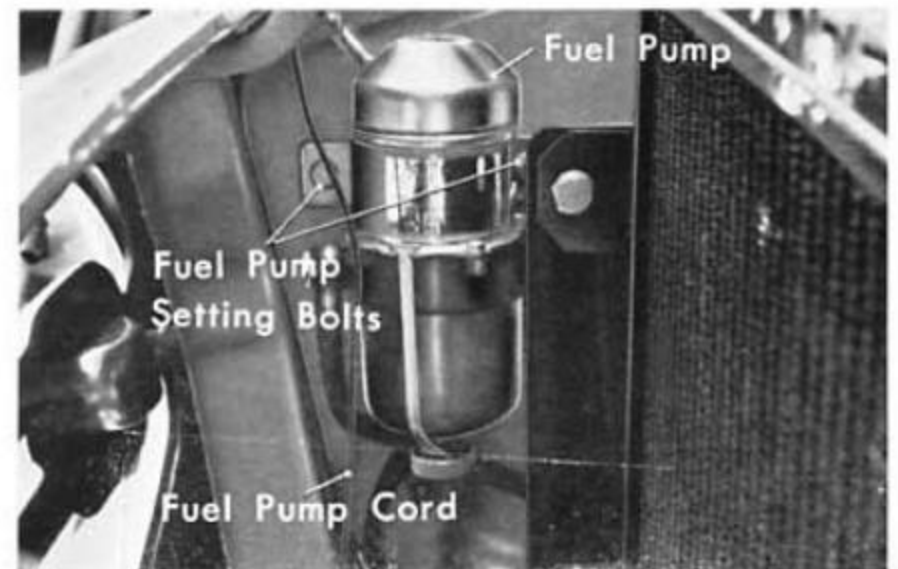


Fig. 1E-3

4. Drain the cooling water by removing the drain plug; also loosen the filler cap.

Note :

Radiator coolant capacity :

5.2 l (9.2 Imp. pt., 11.0 U.S. pt.).

5.7 l (10.0 Imp. pt., 12.0 U.S. pt.) with car heater.

5. Remove drain pipe clamp and disconnect the water drain pipe at the radiator (Fig. 1E-4).
6. Loosen clamps on water pipe A and B, and disconnect from the radiator.
7. Remove the bolts attaching the radiator to the frame and separate the radiator from the frame.
To remove the radiator, pull forward approximately 50 mm (2") and then lift out.

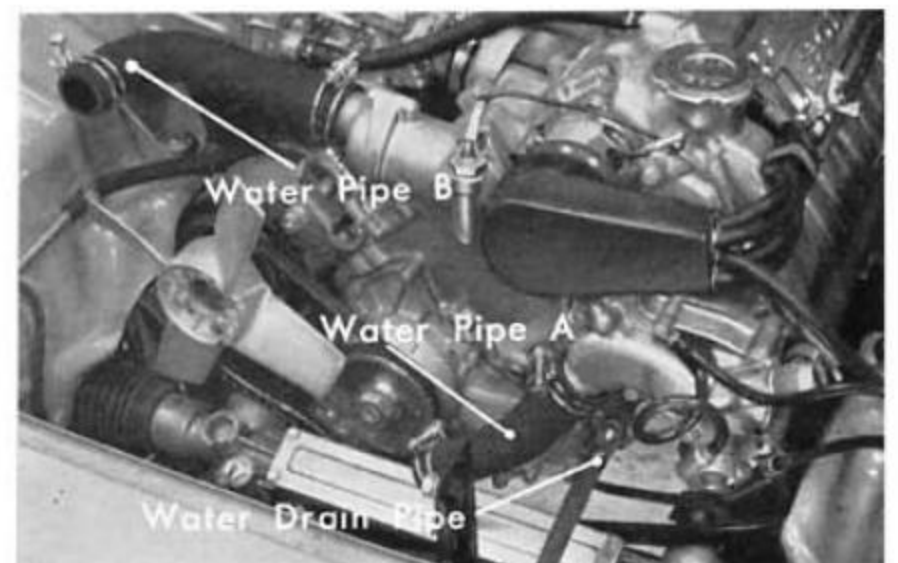


Fig. 1E-4

1-8 ENGINE

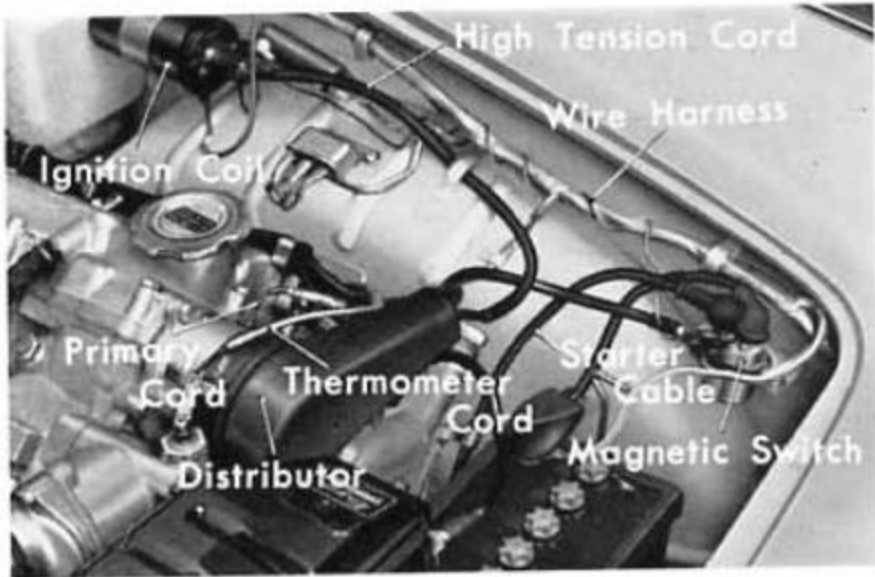


Fig. 1E-5

8. Disconnect the following wires within the engine compartment ;

- High tension cord ←→ Ignition coil (Fig. 1E-5)
- Primary cord ←→ Distributor (Fig. 1E-5)
- Starter cable ←→ Magnetic switch (Fig. 1E-5)
- Thermometer cord ←→ Thermometer unit (Fig. 1E-5)
- Back-up light switch cord ←→ Wire harness (Fig. 1E-6)
- A.C. Dynamo cord ←→ Wire harness (Fig. 1E-7)

9. Disengage the following items ;

- Speedometer cable from the transmission case (Fig. 1E-6)
- Oil filler pipe from the transmission case (Fig. 1E-6)
- Throttle cable from the carburetor (Fig. 1E-7)
- Choke cable from the carburetor (Fig. 1E-7)
- Fuel feed pipe from the carburetor (Fig. 1E-7)
- Tachometer cable from the engine (Fig. 1E-7)
- Clutch hose from the transmission case (Fig. 1E-7)

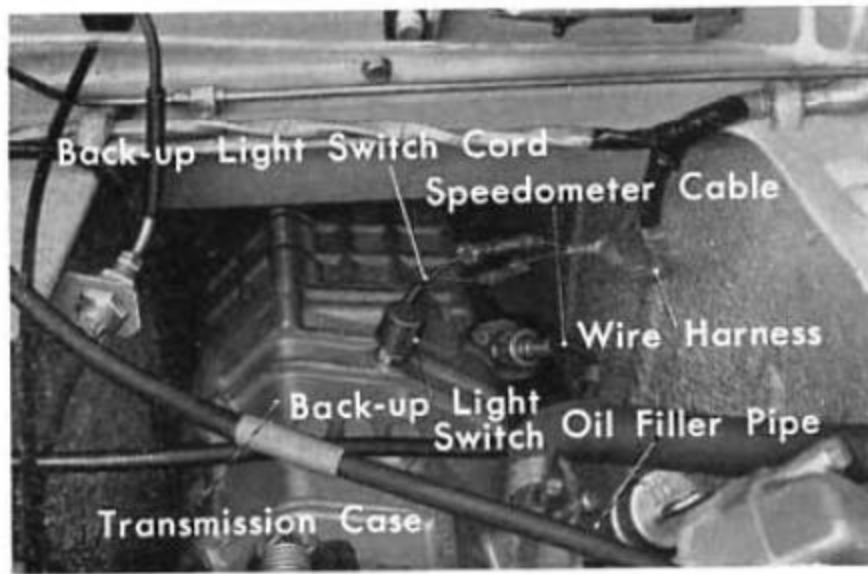


Fig. 1E-6

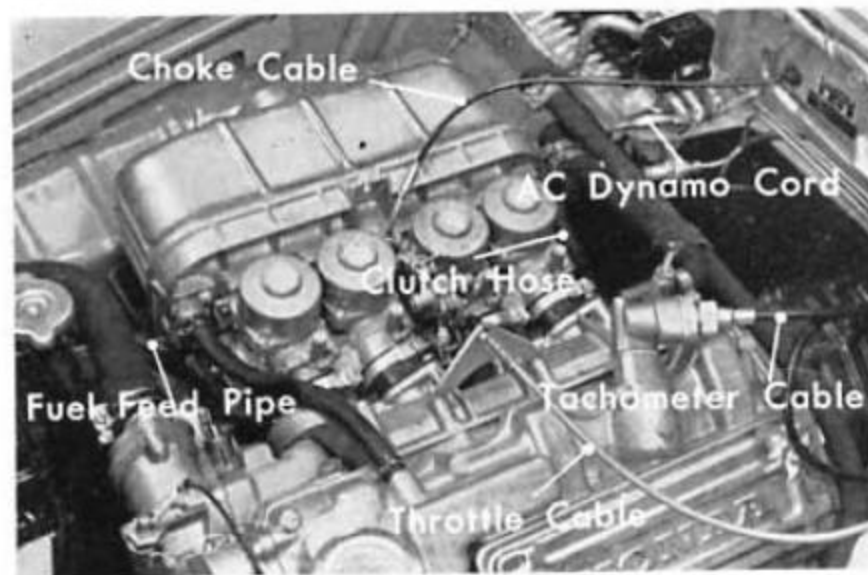


Fig. 1E-7



Fig. 1E-8

10. Remove the engine mounting nuts at the front engine mounts (Fig. 1E-8). Torque to 4.5 kg-m (33 ft-lbs) during assembly. RH nut is removed from the wheel house side.

11. Loosen the lock nut and remove gear shift lever grip and then the boot at the base of the lever (Fig. 1E-9).

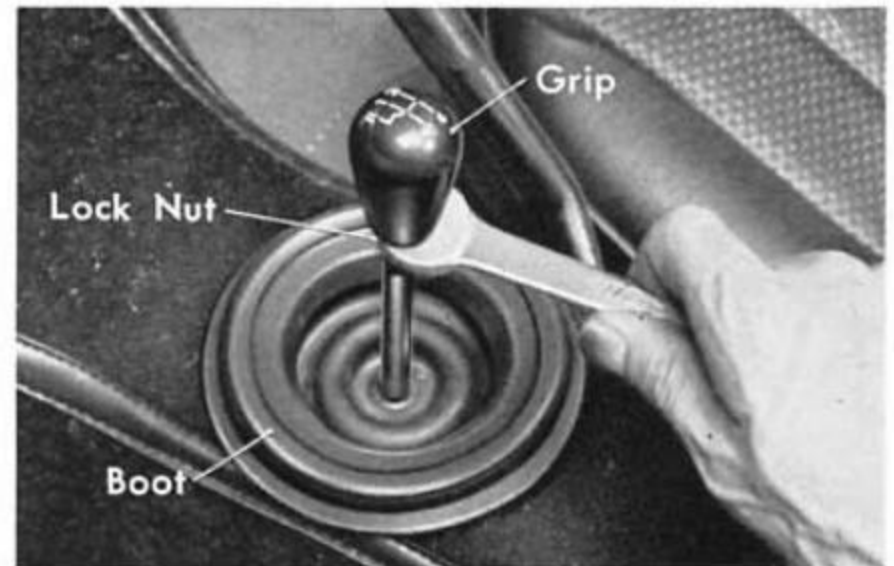


Fig. 1E-9

12. Disassemble shift lever shaft together with the ball holder and spring (Fig. 1E-10).

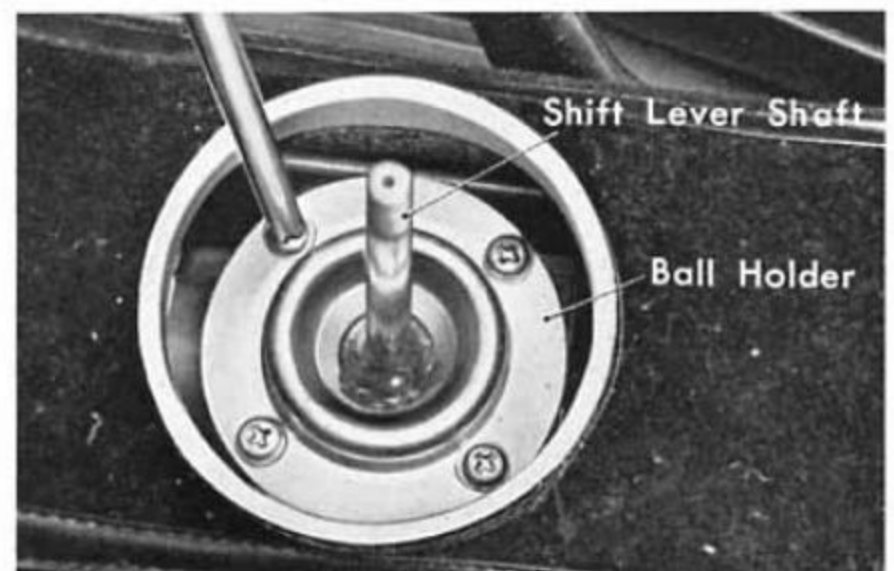


Fig. 1E-10

Note :

When using rigid racks to support the vehicle, place the front racks under the mount beam floor on both sides and the rear racks under the bulkhead on both sides (Fig. 1E-11).

To raise the front, place the jack under the center of the mount beam floor, jack up the rear by placing the jack under the center of the rear axle housing (Fig. 1E-12).

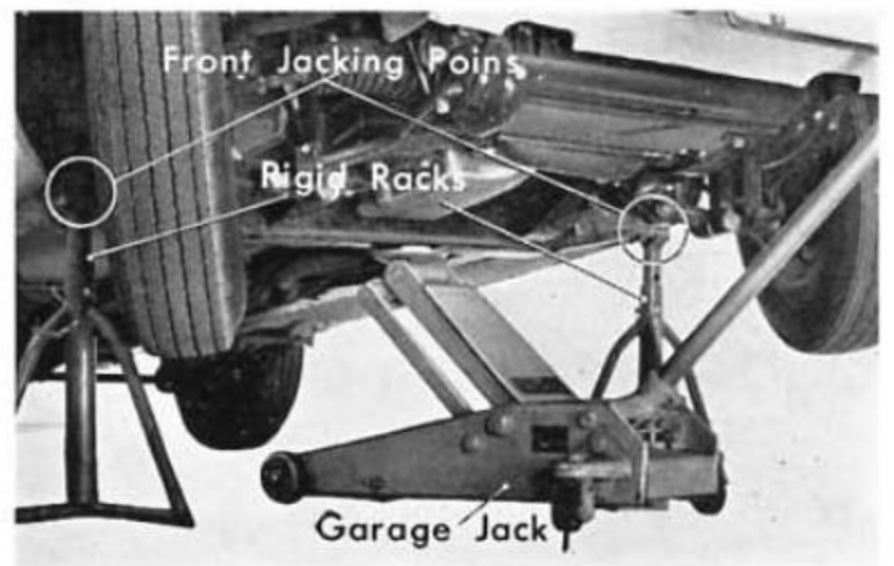


Fig. 1E-11

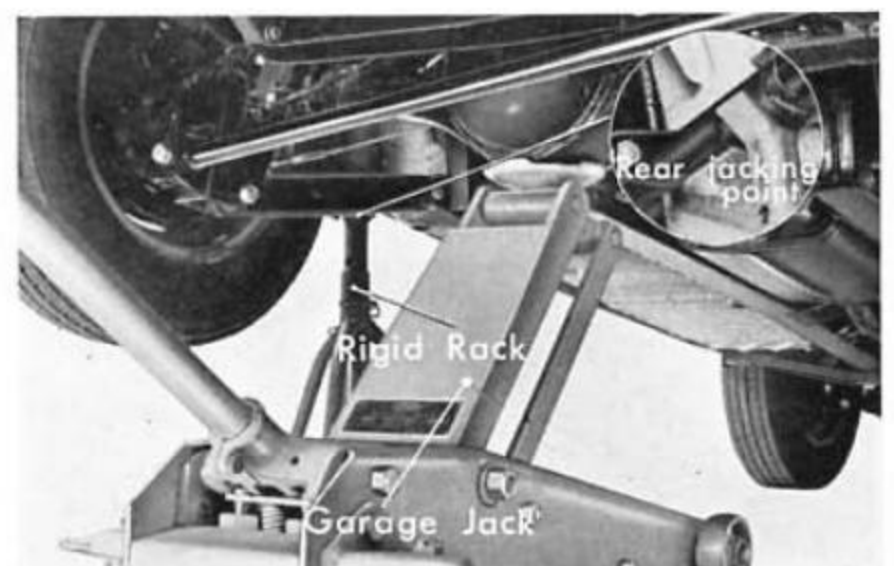


Fig. 1E-12

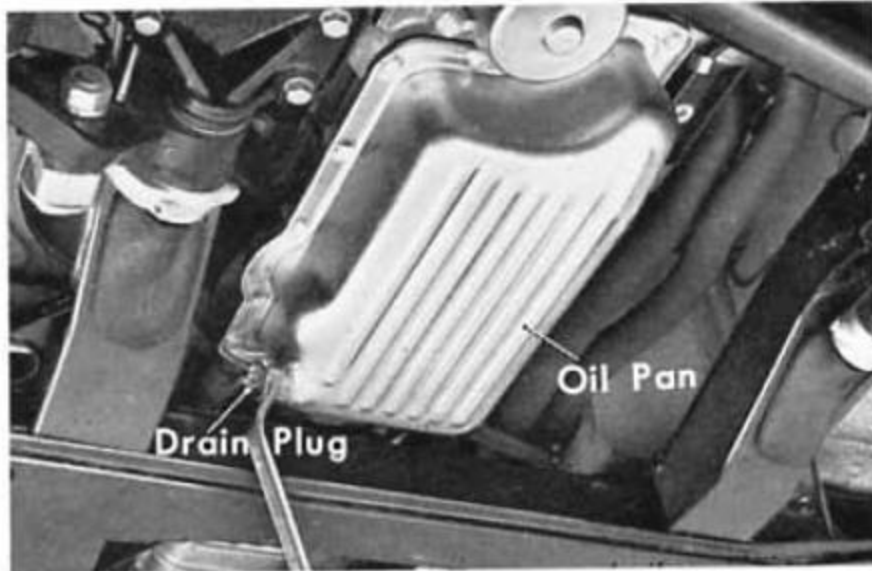


Fig. 1E-13

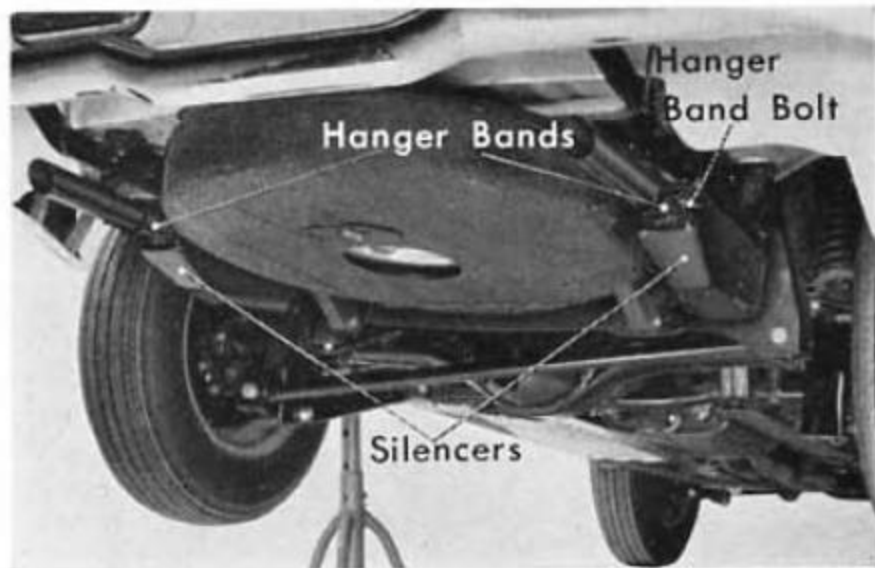


Fig. 1E-14

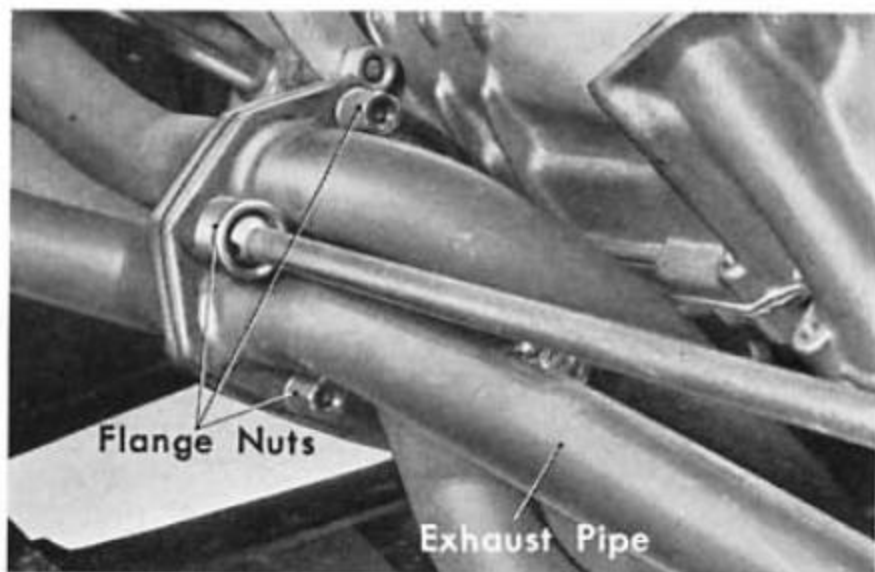


Fig. 1E-15

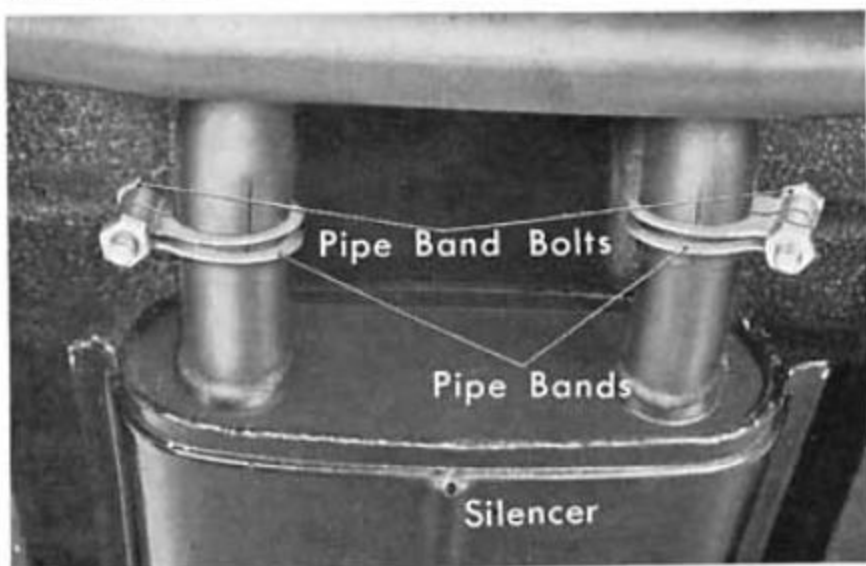


Fig. 1E-16

13. Remove the engine oil drain plug and drain the oil (Fig. 1E-13).

Note :

Engine oil capacity :
3.7 l (6.5 Imp. pt., 7.8 U.S. pt.)

14. Remove the rear silencers by unscrewing the pipe bands and hanger band bolts (Fig. 1E-14).

15. Remove the exhaust pipe by removing the flange nuts (Fig. 1E-15).

16. Remove the pipe band bolts (Fig. 1E-16).

17. Remove the exhaust pipe mounting bolt (Fig. 1E-17).

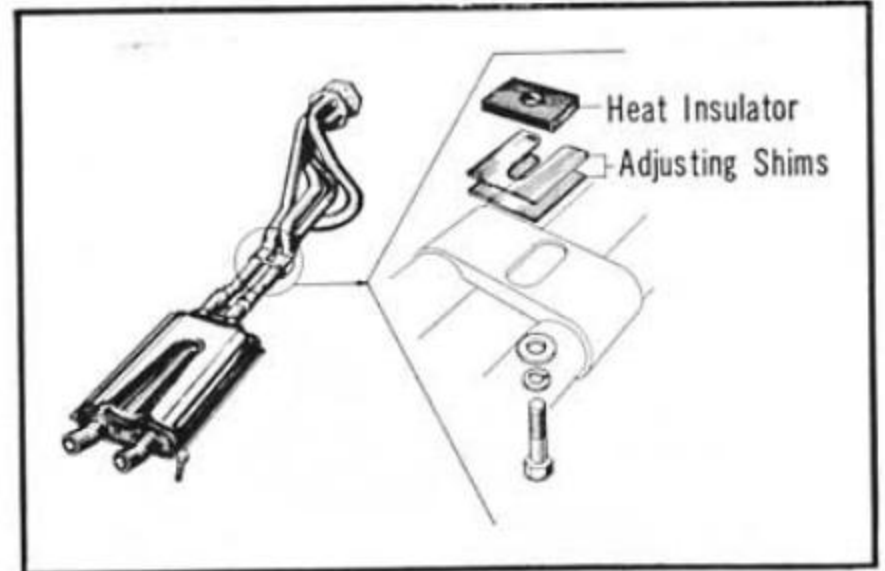


Fig. 1E-17

18. Remove the engine mounting nuts at the rear engine mounts (Fig. 1E-18).

Note :

Torque to 4.5 kg-m (33 ft-lbs) during assembly.

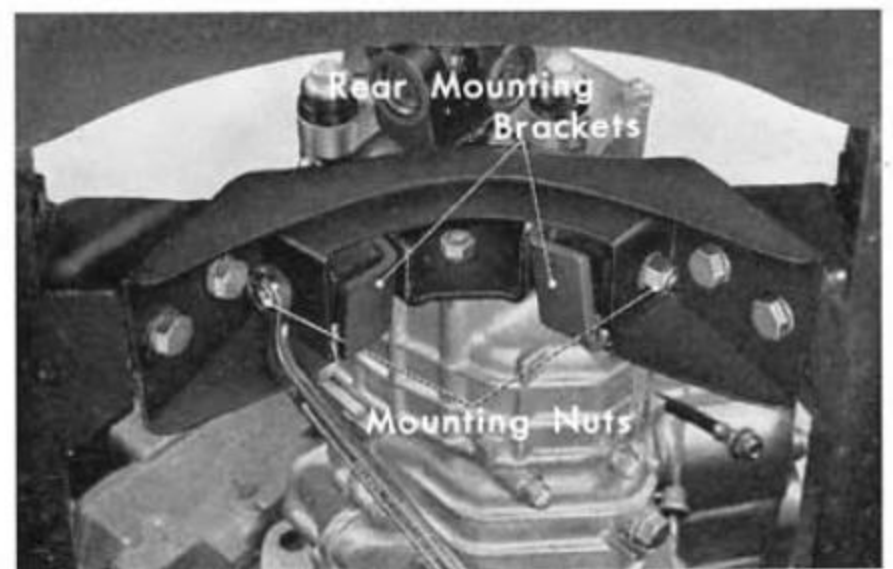


Fig. 1E-18

19. To raise the engine, hook a hoist hook to the front and rear engine hangers (Fig. 1E-19, 20).

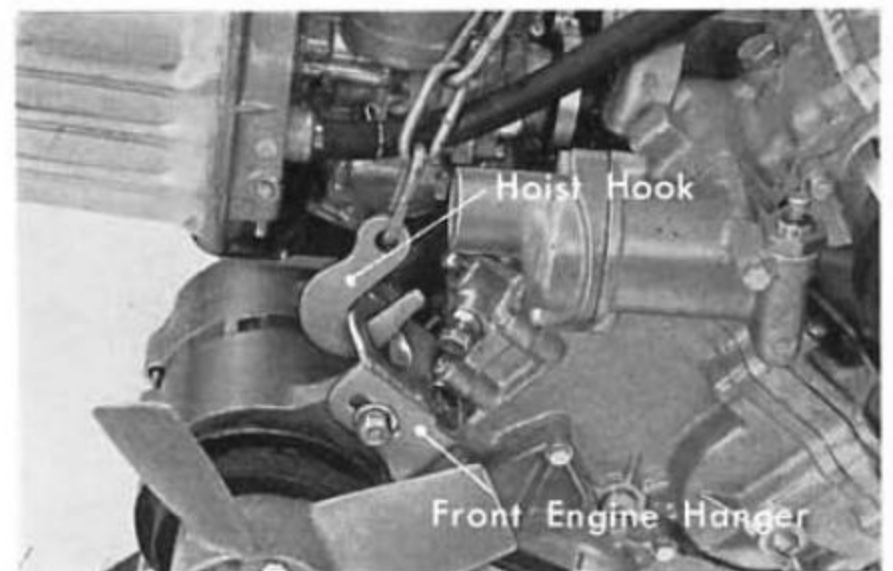


Fig. 1E-19

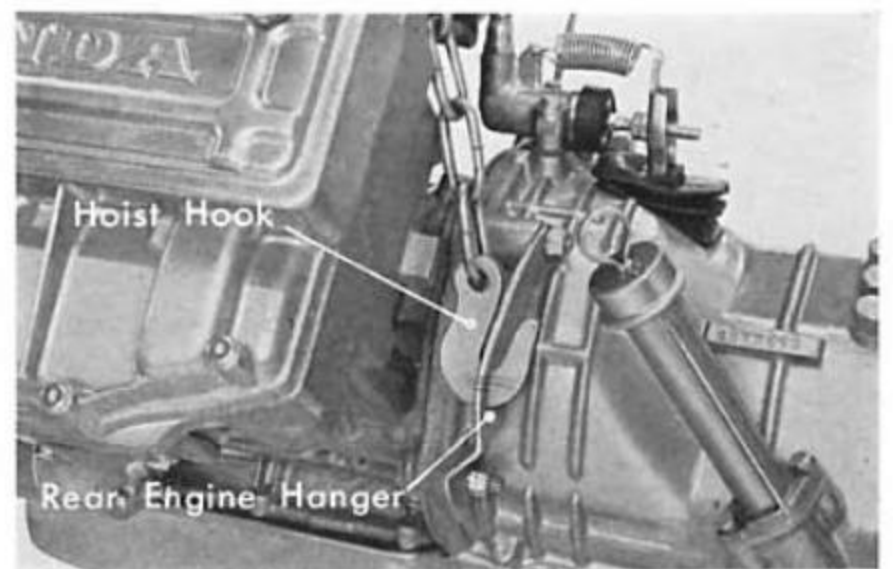


Fig. 1E-20



Fig. 1E-21

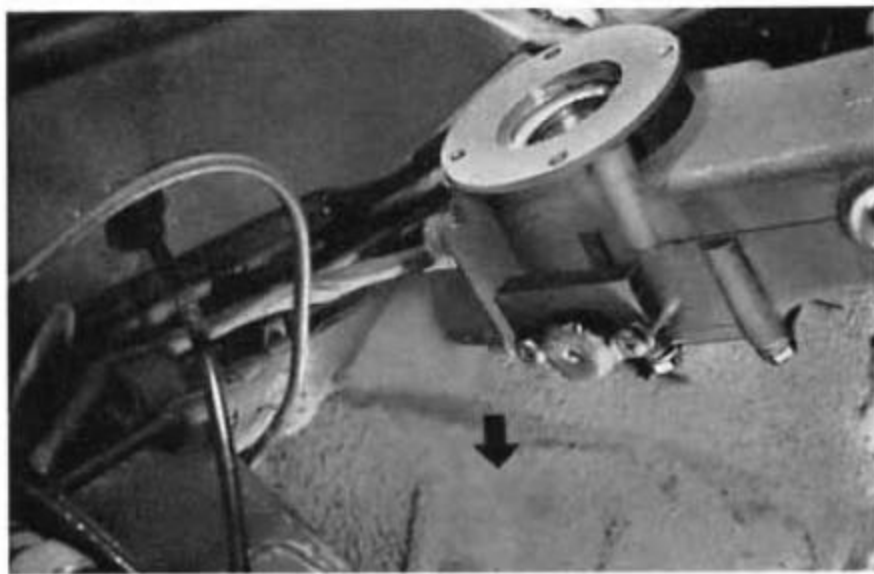


Fig. 1E-22

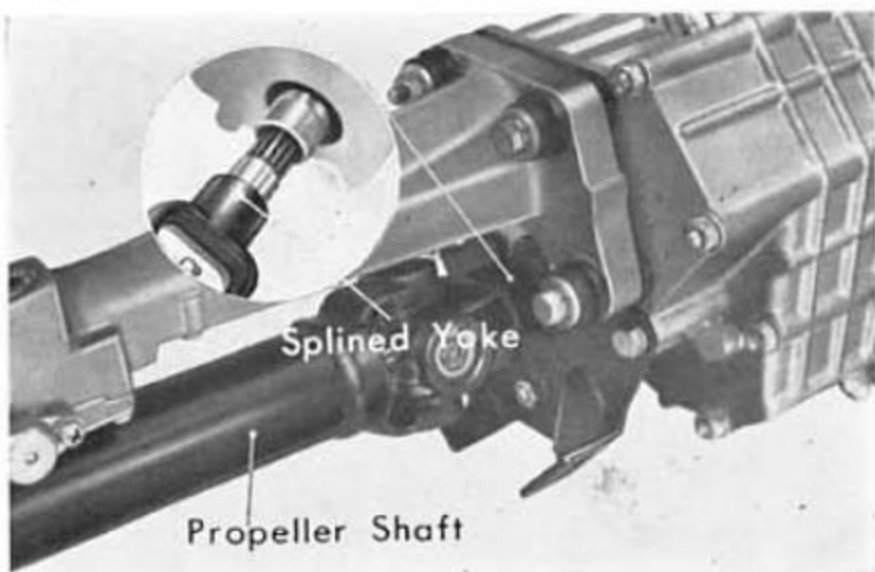


Fig. 1E-23

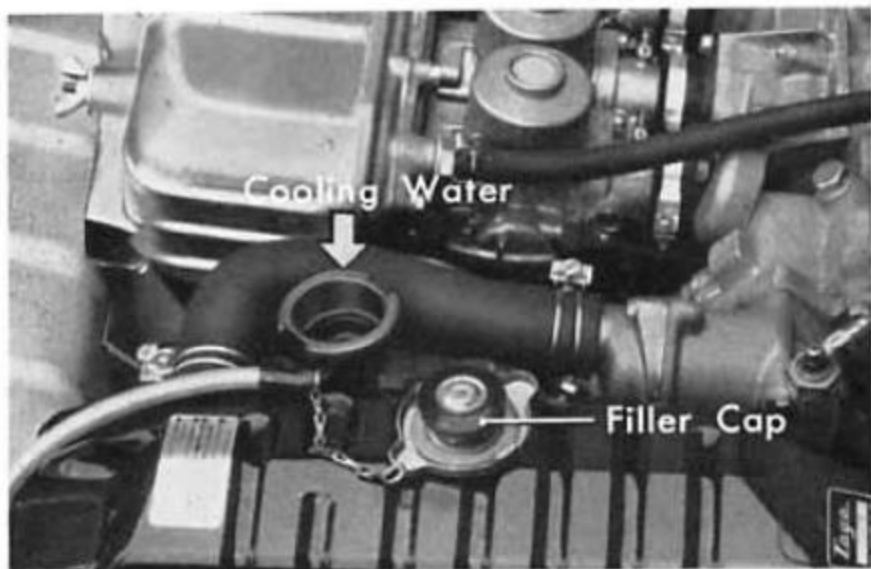


Fig. 1E-24

20. Raise the engine just enough to take the load off the engine mounts, rock the vehicle back and forth until the engine uncouples at the splined yoke, and then slowly raise the engine, being careful not to damage any items in the process (Fig. 1E-21). If the rigid racks are used, the vehicle should be taken off the racks and set on the floor for this operation.

b. Engine Installation

1. Lower the engine together with transmission into the engine compartment carefully, making certain that the cords, cables, tubings are not binding (Fig. 1E-22).

2. Lower the engine enough to enable the splined yoke and the propeller shaft to engage (Fig. 1E-23). And then install the engine on the engine mounts carefully, install and tighten the nuts. Torque to 4.5 kg-m (33 ft-lbs).

3. Reassemble the parts in the reverse order of removal. Connect all of the components which were disconnected in the engine removal process.

c. Inspection

1. Inspect for proper amount of cooling water (Fig. 1E-24).
 - 5.2 l (9.2 Imp. pt., 11.0 U.S. pt.).
 - 5.7 l (10.0 Imp. pt., 12.0 U.S. pt.) with car heater.

2. Inspect for proper amount of engine oil (Fig. 1E-25).
3.7 ℓ (6.5 Imp. pt., 7.8 U.S. pt.)
3. Inspect for proper action and operation of all units.



Fig. 1E-25

F. ENGINE PRE-DISASSEMBLY

a. Removal

1. Remove the transmission from the engine (Fig. 1F-1).

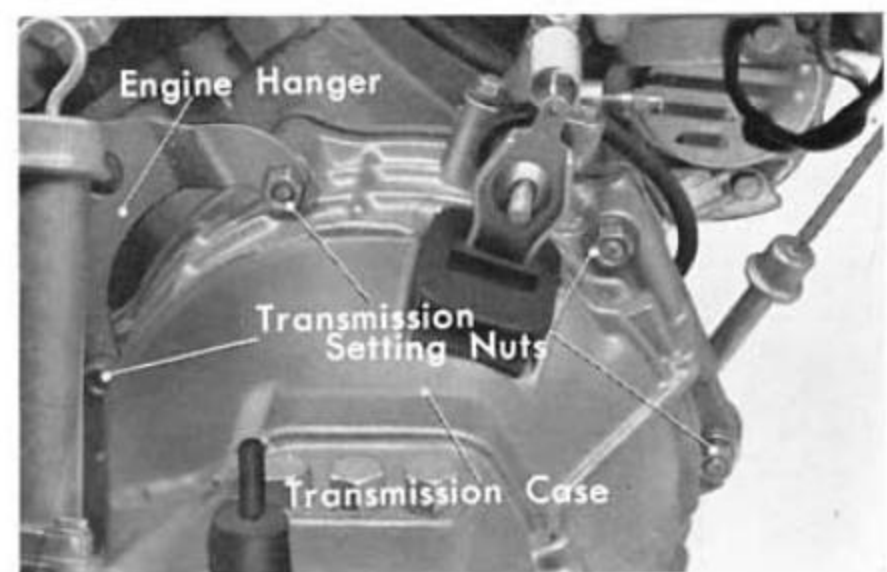


Fig. 1F-1

2. Place the engine on the work stand (Fig. 1F-2).

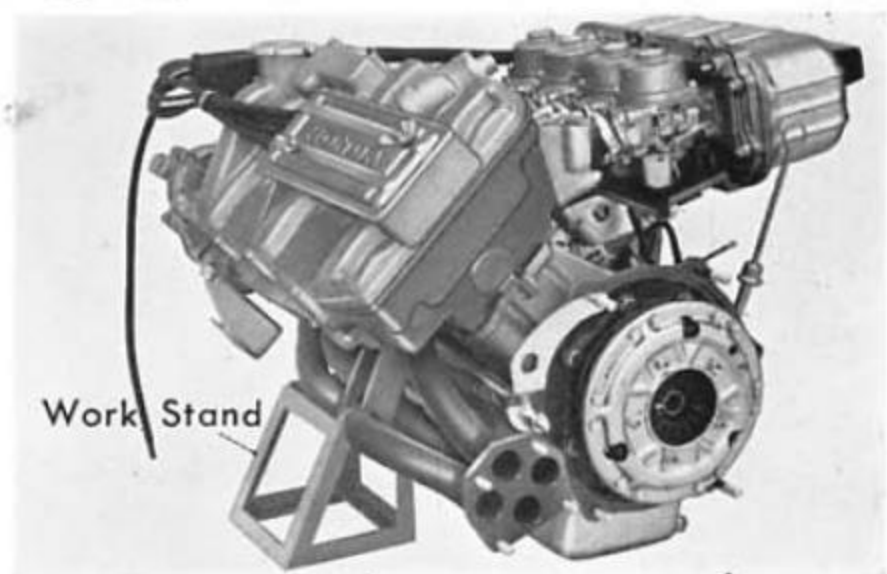


Fig. 1F-2

3. Remove the carburetor assembly together with the air cleaner base as a unit (Fig. 1F-3).

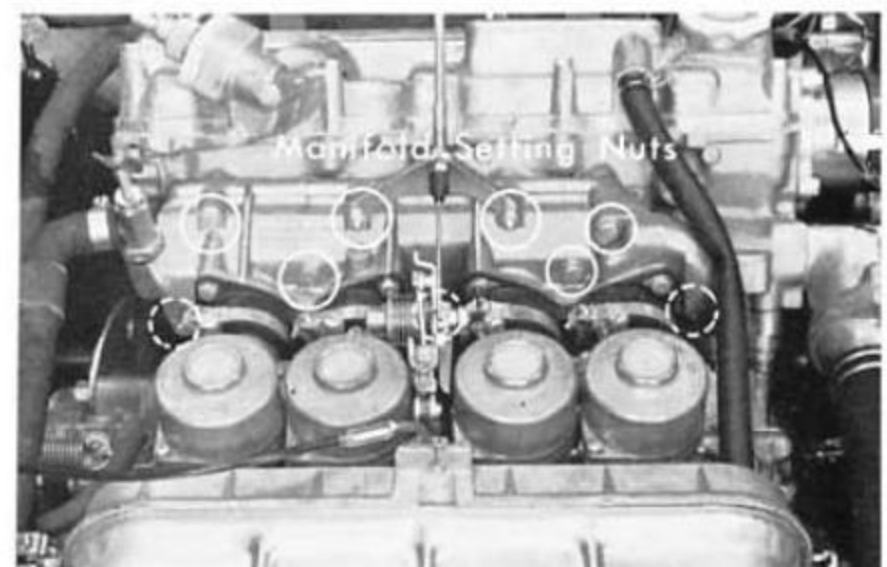


Fig. 1F-3

1-14 ENGINE

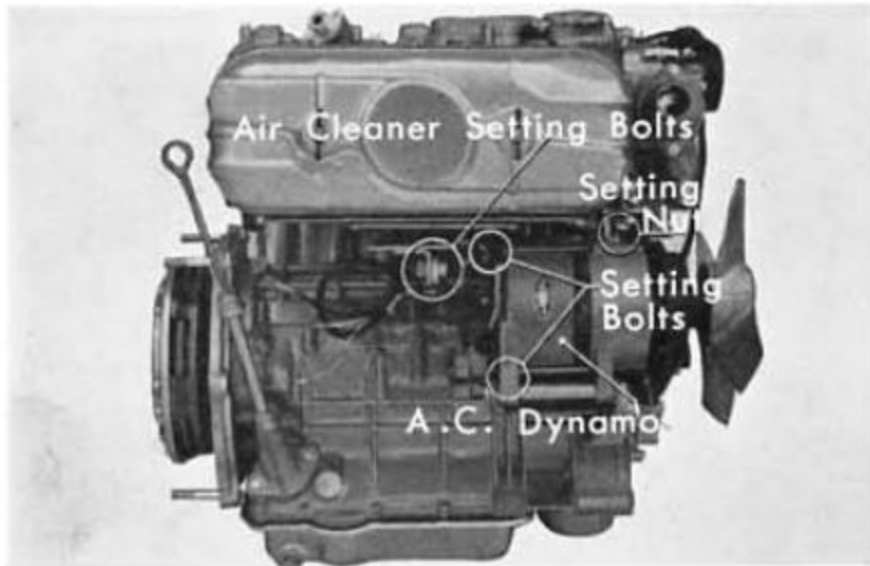


Fig. 1F-4



Fig. 1F-5

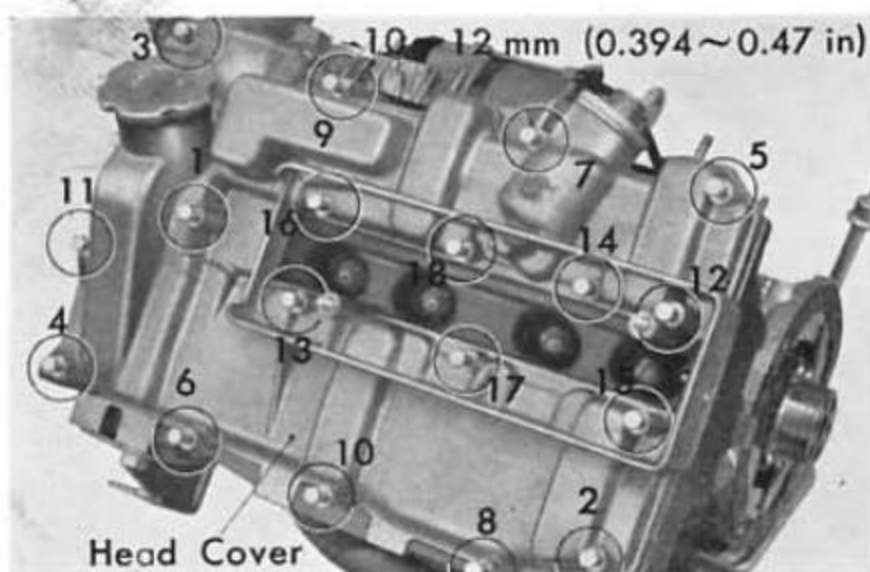


Fig. 1F-6

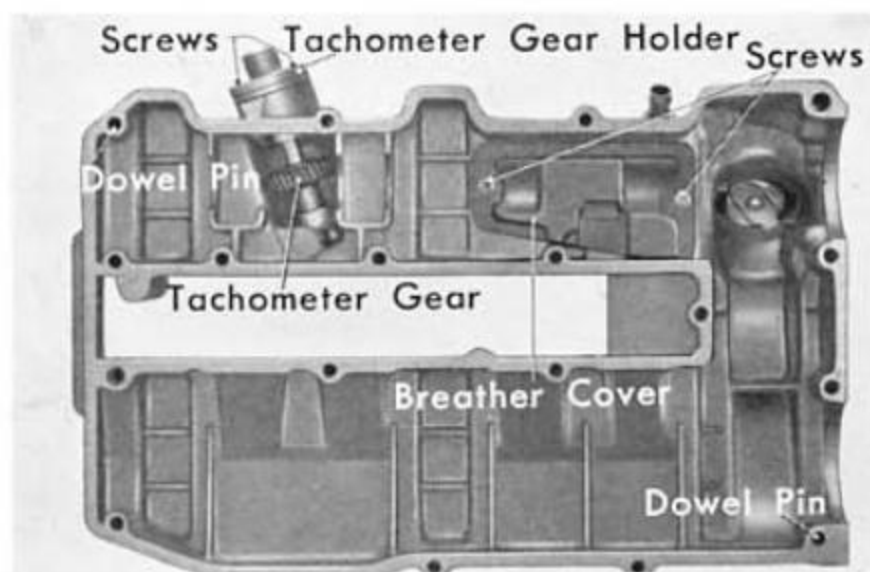


Fig. 1F-7

4. Detach the A.C. dynamo from the engine by removing the setting bolts (Fig. 1F-4).

5. Unscrew the wing nuts and remove the spark plug cover (Fig. 1F-5).

6. Remove high tension cord clip from the head cover and detach the distributor cap by unlocking the cap setting springs.

7. Remove distributor and water pump attaching bolts A, B and remove the distributor and water pump.

8. Remove the bolts from the head cover and separate the head cover from the cylinder head (Fig. 1F-6). Loosen nuts starting from the outside and work diagonally.

Note:

When assembling, tighten the bolts in the reverse order of removal.

9. Remove the breather cover setting screws and disassemble the breather cover and gasket (Fig. 1F-7).

10. Remove the tachometer gear holder setting screws and disassemble the gear holder and holder gasket from the outside of head cover and remove tachometer gear from the inside of the cover.

b. Installation

1. Remove any oil from the head cover mating surface, apply liquid gasket and install the two dowel pins after the gasket has dried (Fig. 1F-7). Apply 0.05~0.08 mm (0.002~0.003") thickness of liquid gasket on the mating surface.

2. Install head cover on the cylinder head, exercise precaution not to damage the water pump or distributor gaskets.

Several different length and size bolts are used, make certain that the proper bolts are installed, therefore, the bolts head should extend approximately 10~12 mm (0.39~0.47") before installation (Fig. 1F-6).

Torque to 1.0 kg-m (7.2 ft-lbs).

G. CYLINDER HEAD**a. Removal**

1. After removing the head cover, distributor and water pump, remove the plate setting bolts and lift out the pump drive shaft from the cylinder head (Fig. 1G-1).

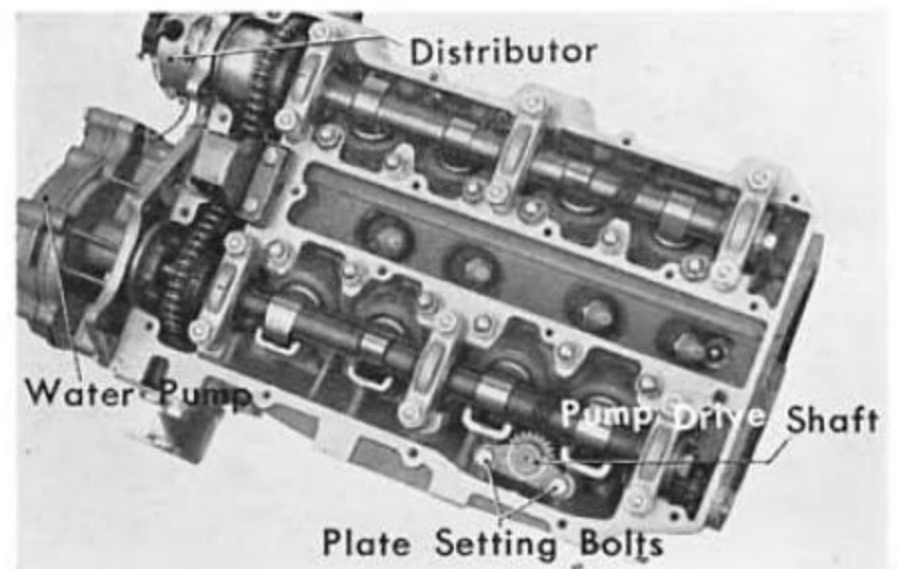


Fig. 1G-1

2. Turn the crankshaft so that the marks on the sprockets corresponding to the T.D.C. of the No. 1 cylinder are aligned to the valve timing mark on the front camshaft bearing holders. This is done to assure that the valves are in a safe position and prevent possible damages to the valves during disassembly (Fig. 1G-2).

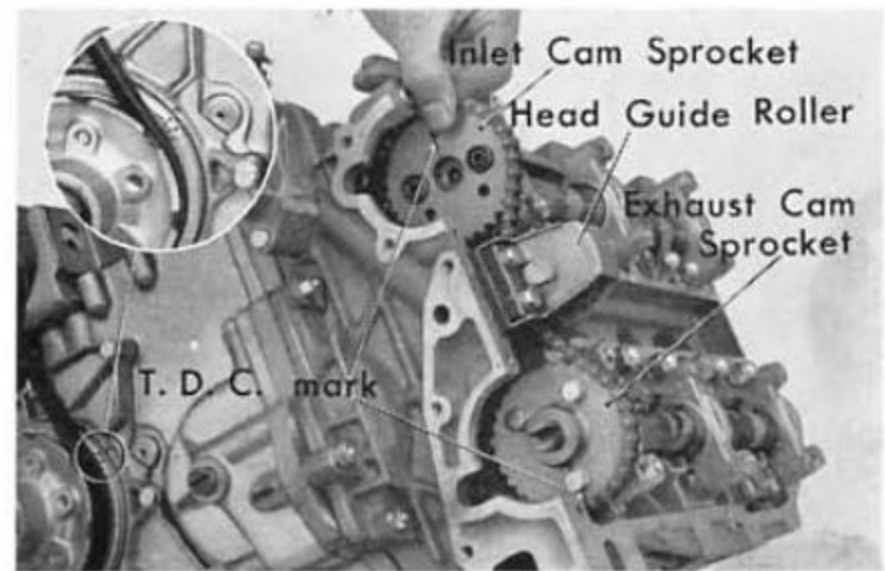


Fig. 1G-2

3. Loosen the attaching bolts of both cam sprockets.

4. Remove the bolts and detach the chain tensioner assembly and gasket from the upper crankcase (Fig. 1G-3).

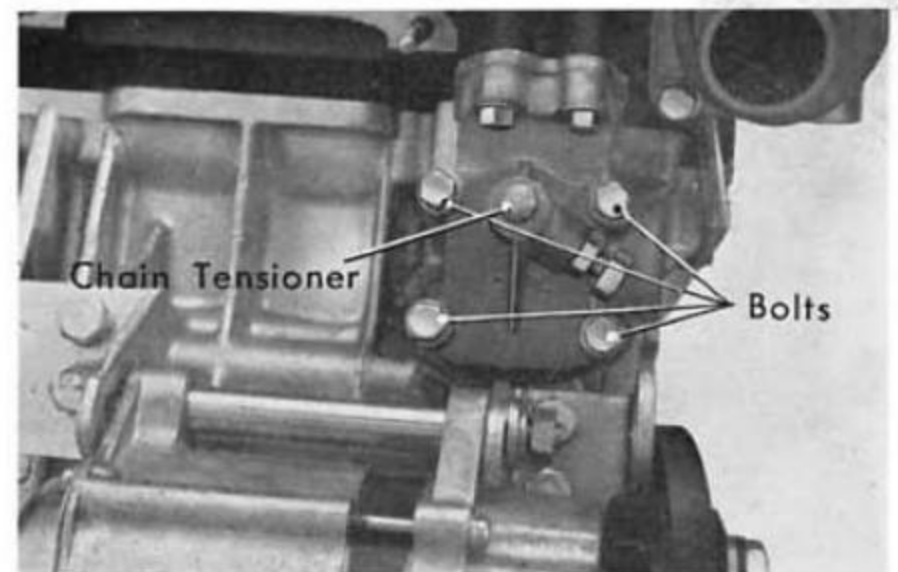


Fig. 1G-3

5. Remove the guide roller setting bolts and remove the guide roller assembly (Fig. 1G-2).

6. Remove the sprocket setting bolts, spring washers and sprockets. Do not move the camshafts from the T.D.C. position. Damage to the valves may result due to the valve heads clashing.

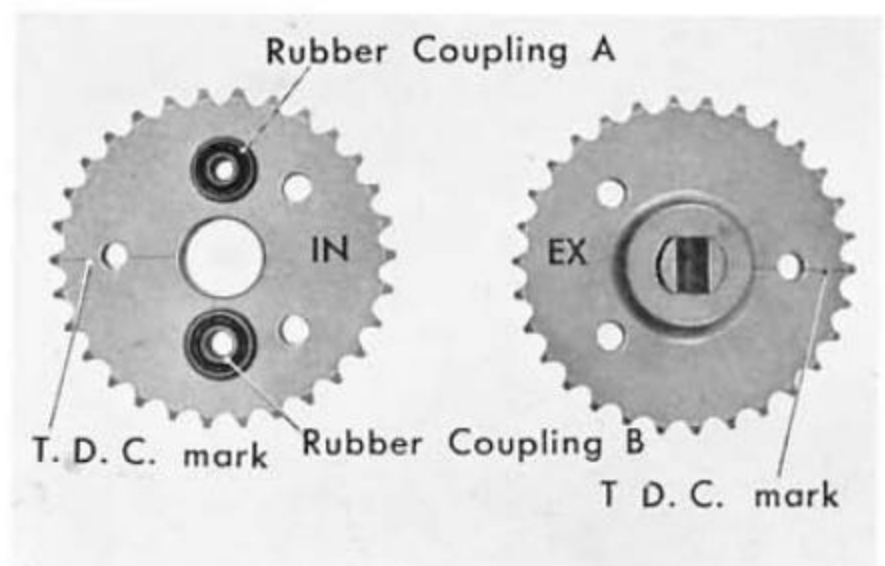


Fig. 1G-4

1-16 ENGINE

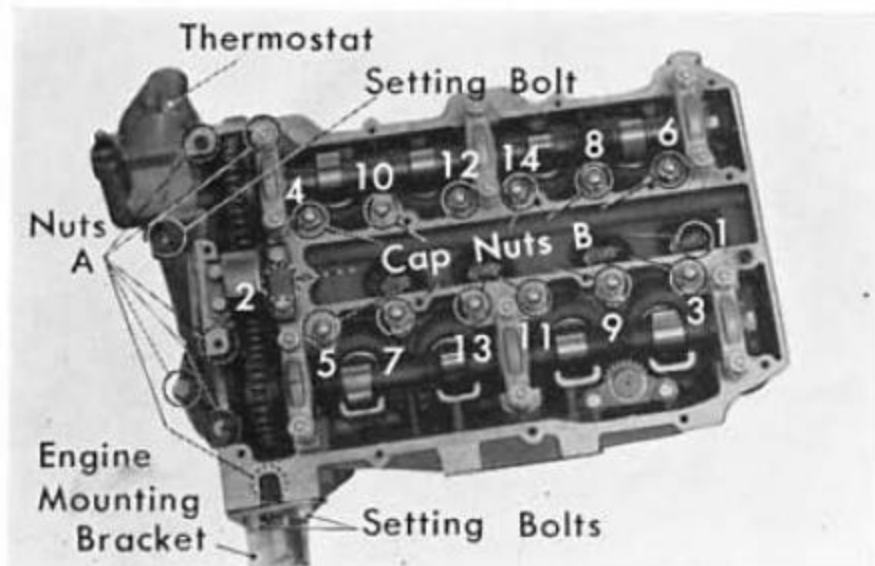


Fig. 1G-5

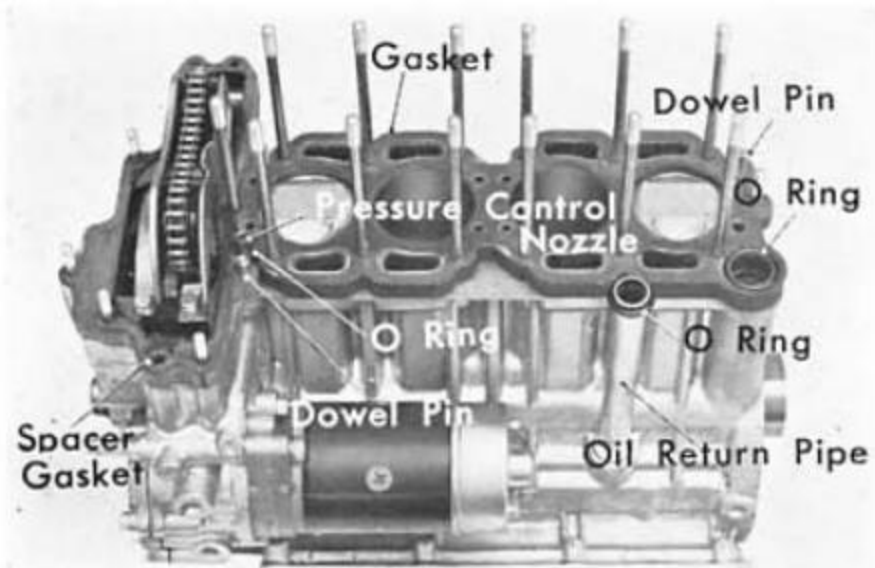


Fig. 1G-6

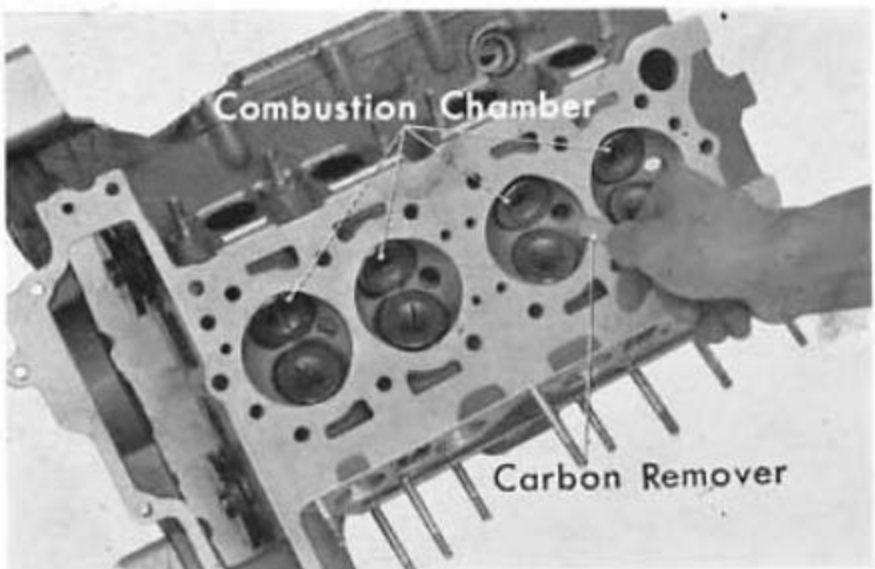


Fig. 1G-7

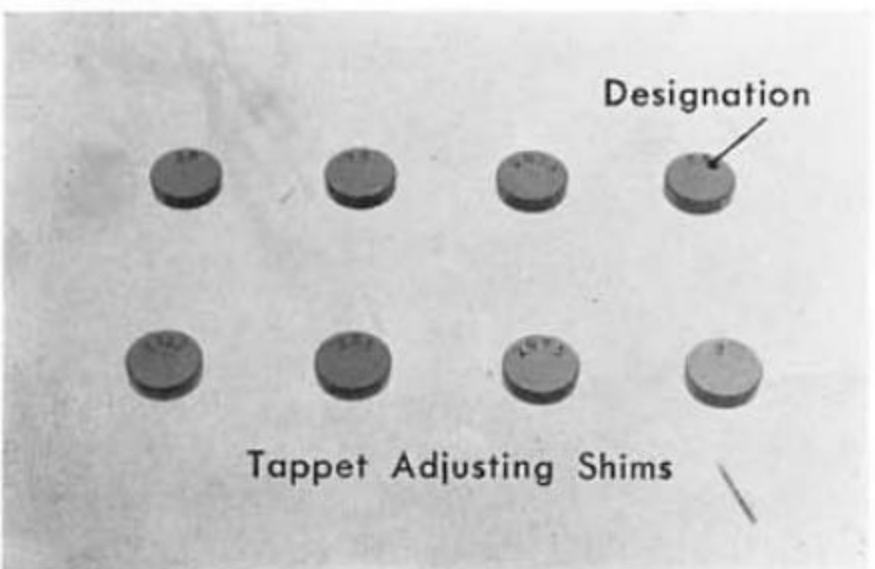


Fig. 1G-8

7. Remove the engine mounting bracket by removing the bolts and washers (Fig. 1G-5).

8. Remove the nuts A, cap nuts B and washers starting from the outside and work diagonally by the numbers in Fig. 1G-5.

Torque to 1.0 kg-m (7 ft-lbs) . . . Nuts A
2.5 kg-m (18 ft-lbs) . . . Nuts B
during installation.

Note :

When installing, tighten the nuts in the reverse order of removal.

9. Remove the thermostat assembly by removing the thermostat body setting bolts.

10. After removing the cylinder head, remove O rings, dowel pins, pressure control nozzle, cylinder head gasket and oil return pipe with O rings (Fig. 1G-6).

11. Remove the spark plugs with plug wrench.

12. After removing the cylinder head, inspect the mating surfaces for any blow-by, scratches or damage. Remove and clean the carbon deposits from the combustion chamber (Fig. 1G-7).

13. Record the tappet clearances before disassembling the cylinder head as this will facilitate the tappet adjustment process during assembly. Proper clearance is 0.2 ± 0.02 mm (0.008 ± 0.0008 ").

After disassembly of the tappets also record the respective tappet shim thickness (Fig. 1G-8).

14. Disassemble the camshafts from the cylinder head by removing nuts and washers attaching the camshaft bearing holders to the cylinder head (Fig. 1G-5, 9). If any bearing holders are seated tightly on the cylinder head, tap the holder lightly to loosen and then remove.
The inlet and exhaust camshafts are not interchangeable.

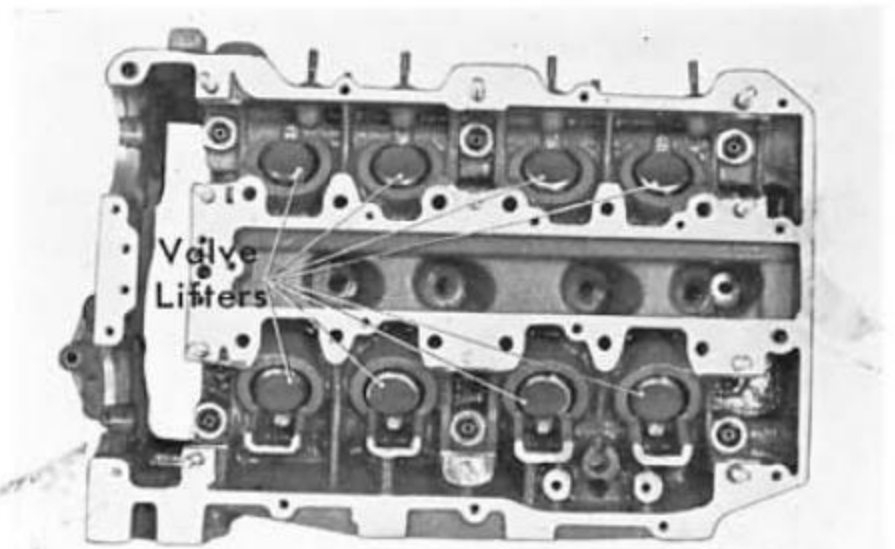


Fig. 1G-9

15. Remove valve lifters and tappet adjusting shims. (Fig. 1G-9, 10).

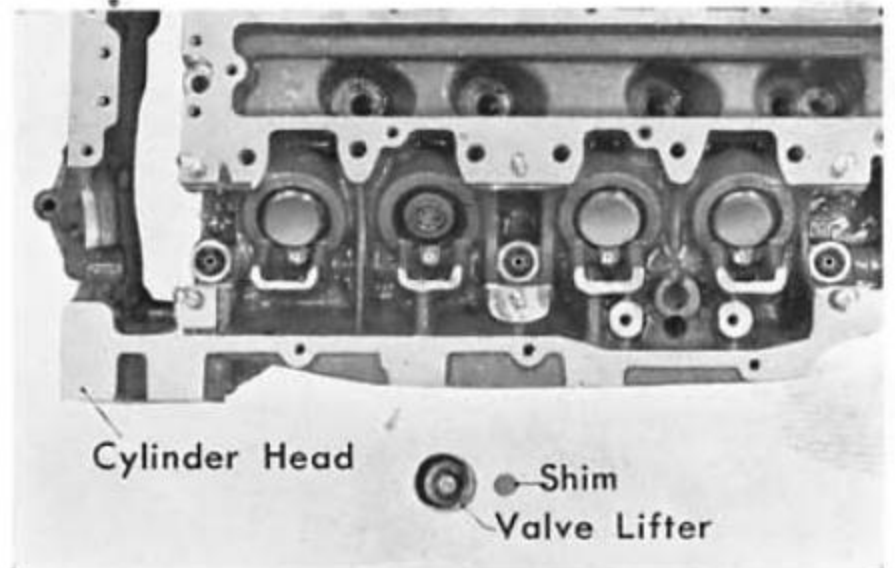


Fig. 1G-10

16. Disassemble the valve assembly by first removing the cotters with a special cotter remover tool, and then the valve retainers, springs and spring seats (Fig. 1G-11).

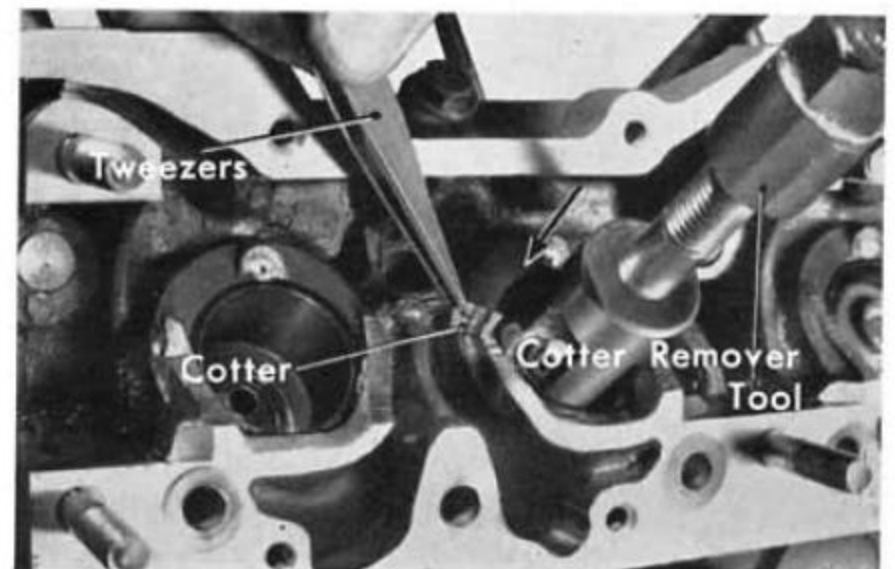


Fig. 1G-11

17. Remove screws attaching the cylinder head lower cover to the cylinder head and disassemble the cover (Fig. 1G-12).
18. After removing the cylinder head lower cover, remove the screws and the water choke plates A and B.

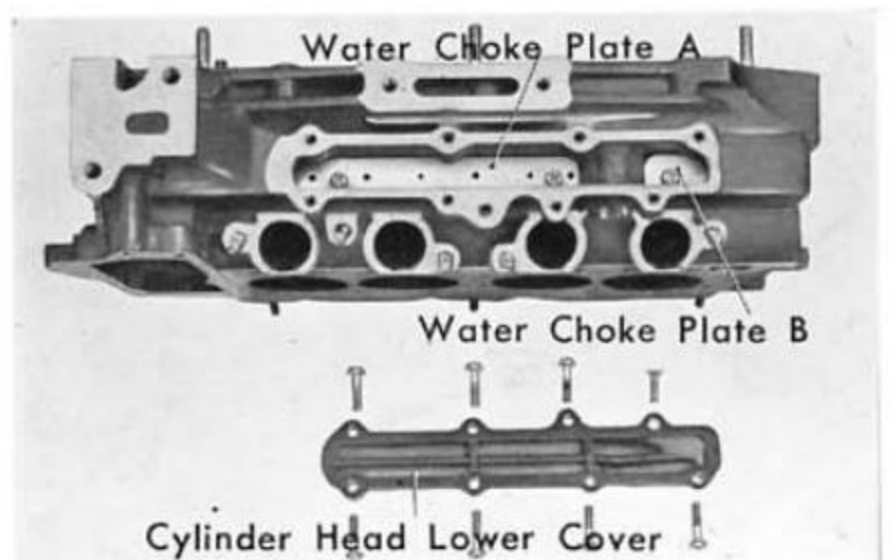


Fig. 1G-12

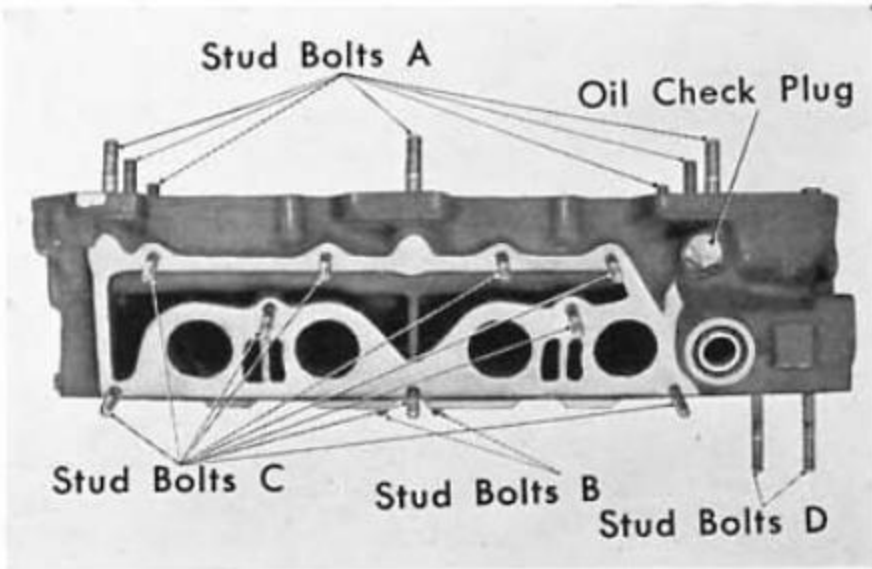


Fig. 1G-13

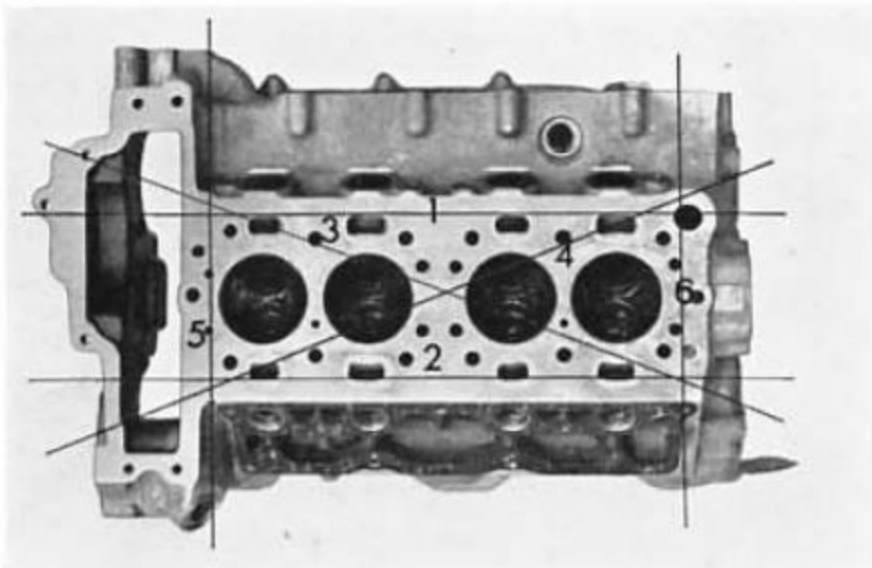


Fig. 1G-14

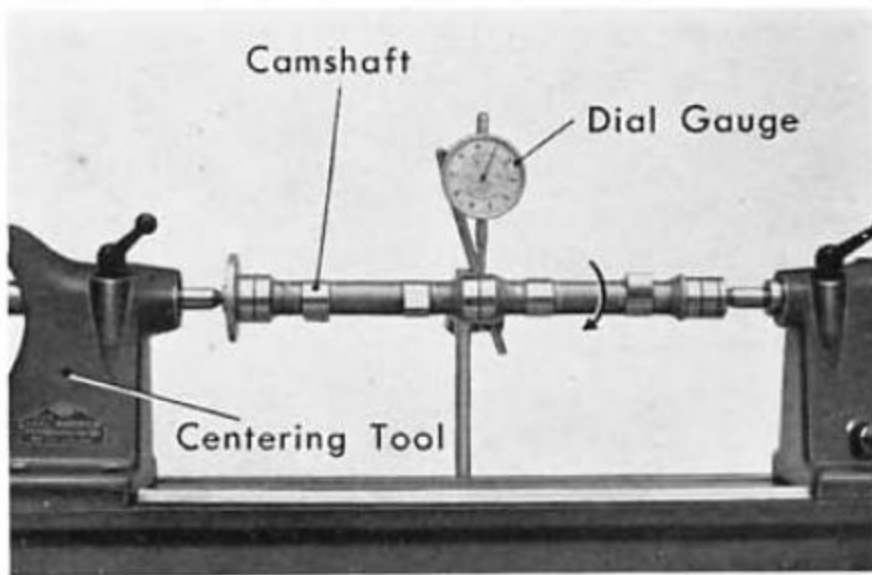


Fig. 1G-15

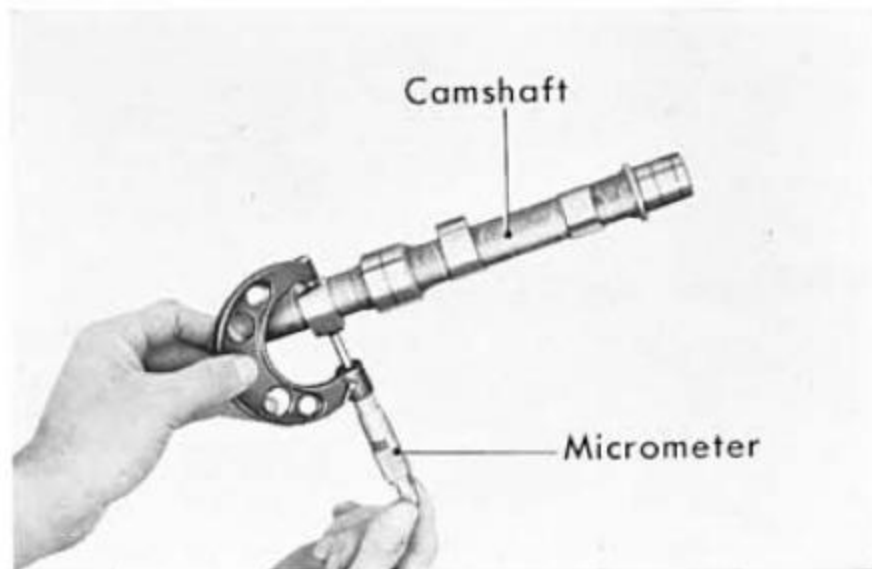


Fig. 1G-16

19. Remove the oil check plug and gasket from the cylinder head (Fig. 1G-13).
20. Remove the following stud bolts from the cylinder head;

Camshaft bearing holder	Stud bolts A
Exhaust manifold attaching	Stud bolts B
Intake manifold attaching	Stud bolts C
Chain case spacer	Stud bolts D

b. Cylinder Head Inspection

1. Inspect the cylinder head for any sign of warpage or distortion. Set a straight edge on the cylinder head as shown in the figure 1G-14, (from 1 to 6) and check with a thickness gauge.

	Standard Tolerance	Serviceable Limit
Twist or Warpage	0.03 mm (0.0012") max.	Repair if beyond 0.06 mm (0.002")

2. Camshaft Bend
Set the camshaft on centers and check the center bearing surface with a dial gauge. The bend is $\frac{1}{2}$ of the T.I.R. (Fig. 1G-15).

	Standard Tolerance	Serviceable Limit
Bend	0.01 mm (0.0004")	Replace if beyond 0.05 mm (0.002")

3. Cam Height Inspection (Fig. 1G-16)

	Standard Tolerance	Serviceable Limit
Inlet	32.12~32.28 mm (1.265~1.271")	Replace if beyond 32.05 mm (1.262")
Exhaust	31.62~31.78 mm (1.245~1.251")	Replace if beyond 31.50 mm (1.240")

4. Camshaft Bearing Holder

Use micrometer for measuring camshafts and cylinders, and gauge for bearings (Fig. 1G-17).

	Standard Tolerance	Serviceable Limit
Clearance	0.030~0.075 mm (0.0012~0.0030")	Replace if beyond 0.200 mm (0.008")

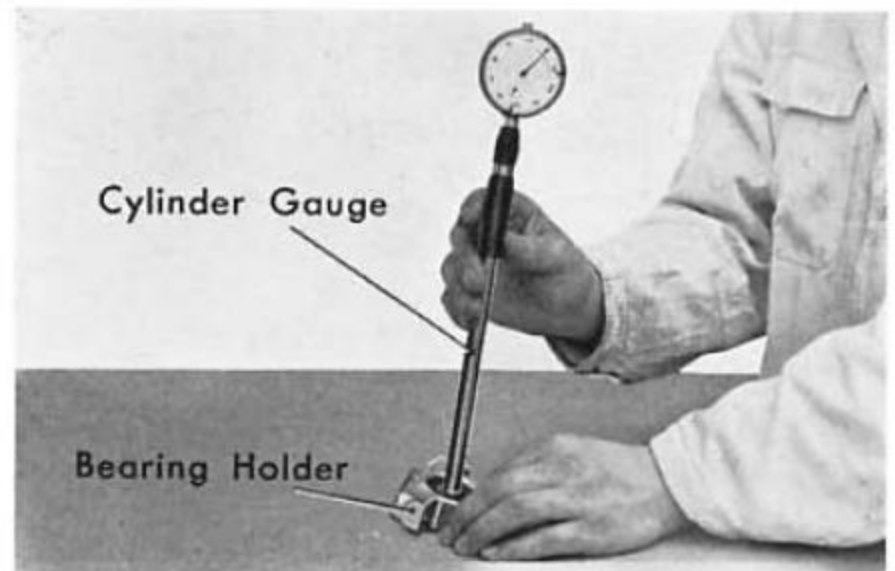


Fig. 1G-17

5. Cam Sprocket (Fig. 1G-18)

	Standard Tolerance	Serviceable Limit
Outside Diameter	77.50 mm (3.051")	Replace if beyond 76.15 mm (2.998")

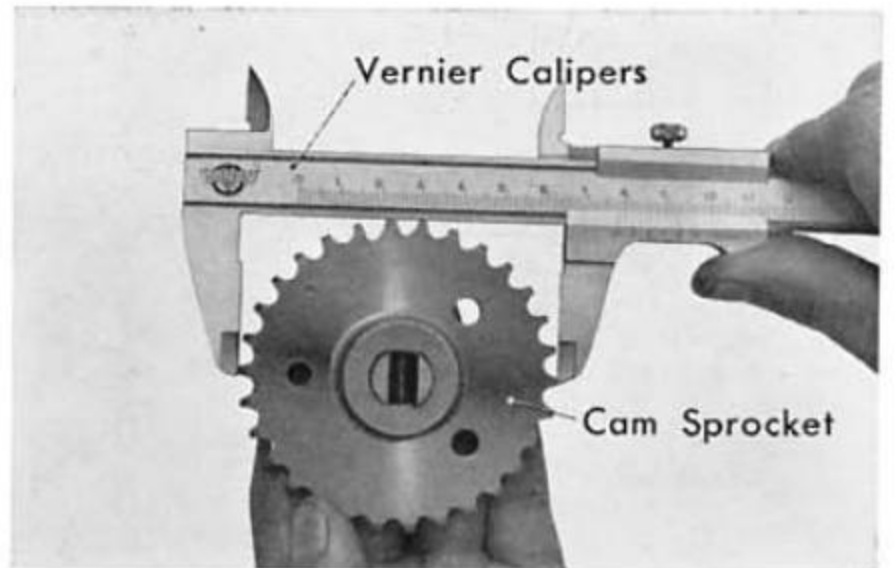


Fig. 1G-18

6. Valve Guide Clearance (Fig. 1G-19)

Inspect the clearance between the valve stem and valve guide.

	Standard Tolerance	Serviceable Limit
Inlet	0.02~0.03 mm (0.0008~0.001")	Replace if beyond 0.09 mm (0.0035")
Exhaust	0.05~0.06 mm (0.002")	Replace if beyond 0.11 mm (0.004")

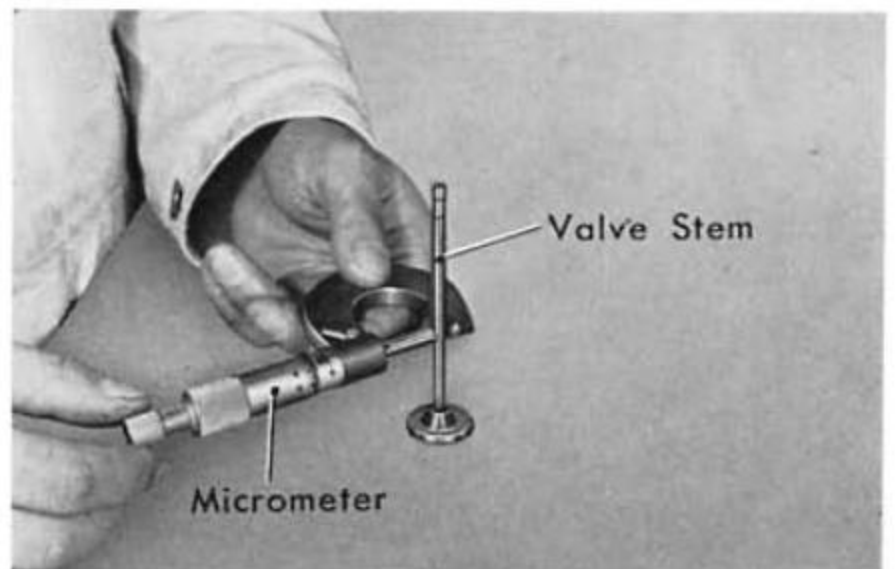


Fig. 1G-19

7. Valve Spring Height and Trueness (Fig. 1G-20)

	Standard Tolerance	Serviceable Limit
Free Height (inner)	35.3 mm (1.39")	Replace if beyond 34.0 mm (1.34")
Free Height (outer)	37.9 mm (1.49")	Replace if beyond 36.5 mm (1.44")
Trueness (inner)	0~1°30'	Replace if beyond 2°30'
Trueness (outer)	0~1°30'	Replace if beyond 2°30'

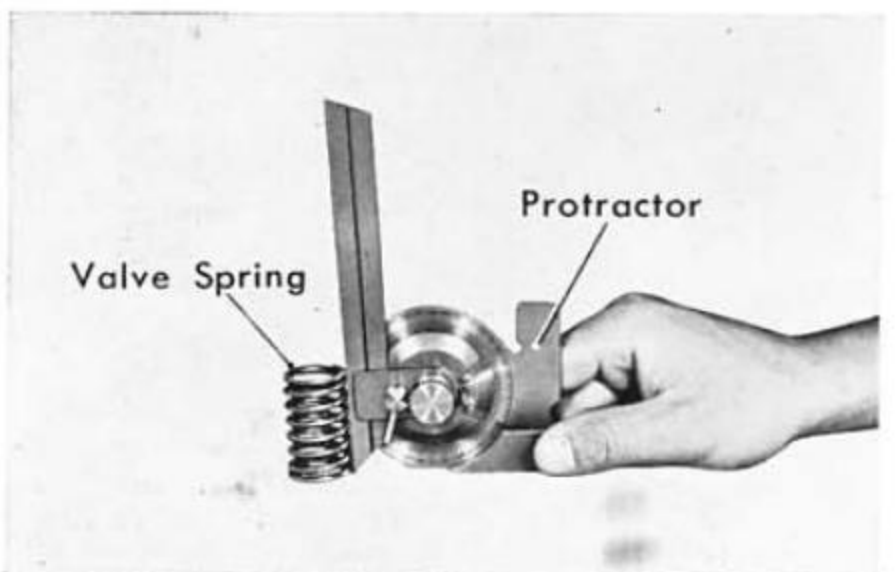


Fig. 1G-20

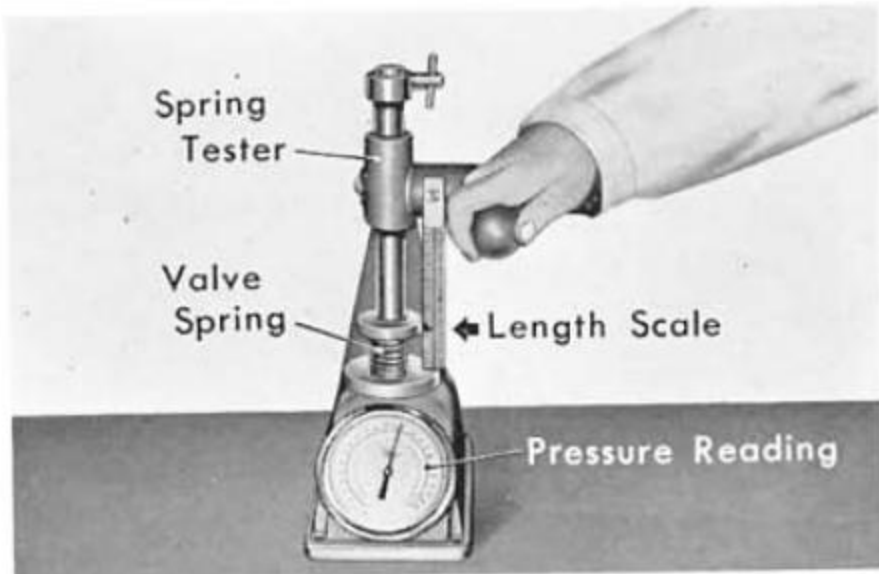


Fig. 1G-21

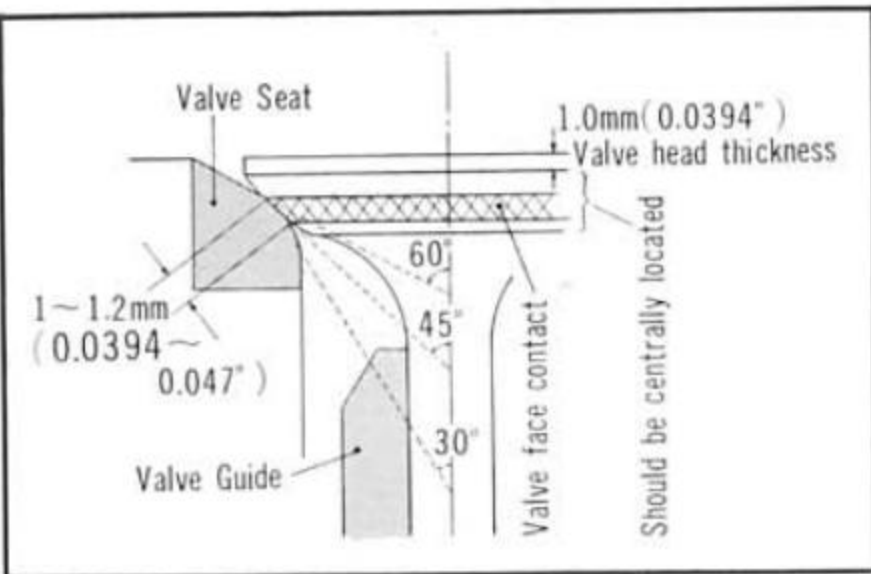


Fig. 1G-22

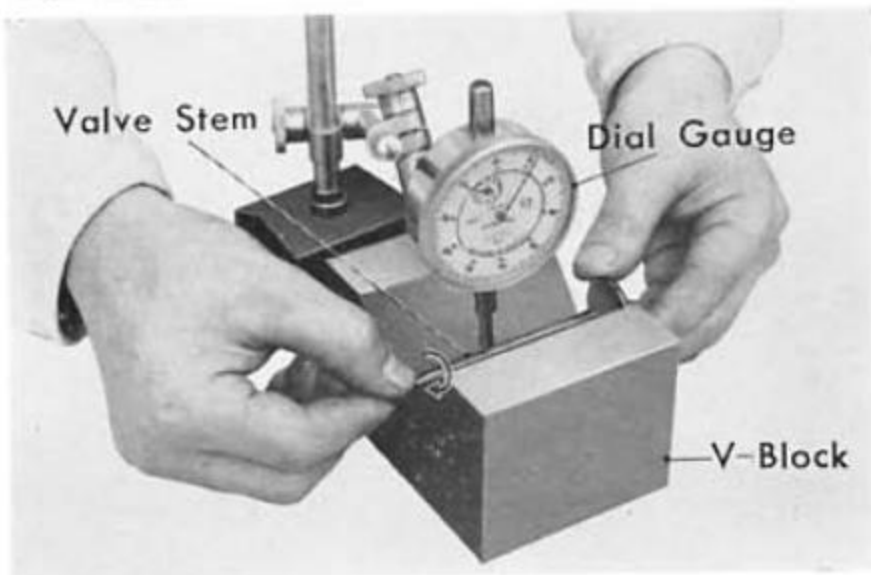


Fig. 1G-23

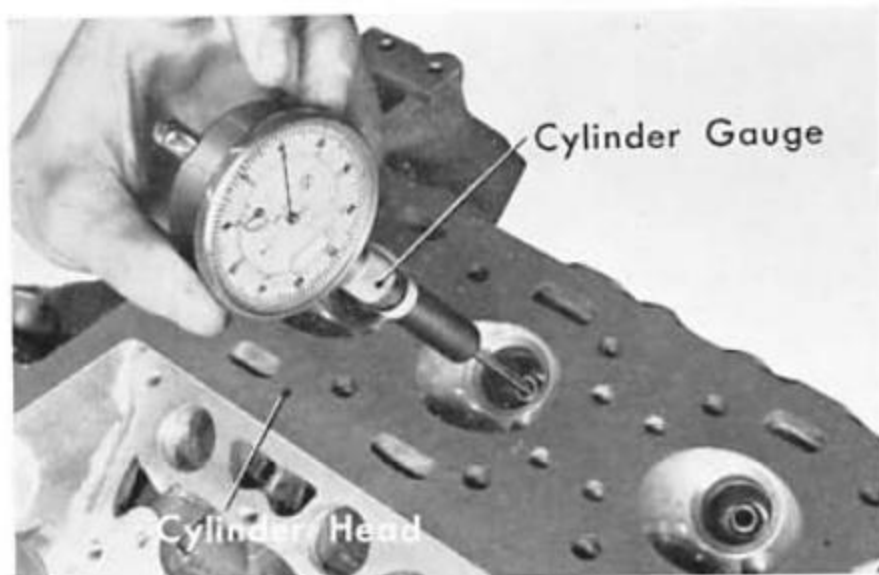


Fig. 1G-24

8. Valve Spring Pressure (Fig. 1G-21)

Valve Spring	Standard Tolerance	Serviceable Limit
Installed Load/Length (inner)	6.0~6.6 kg/30.5 mm (13.2~14.6 lbs /1.201")	Replace if beyond 5.0 kg/30.5 mm (11.03 lbs/1,200")
Installed Load/Length (outer)	12.6~13.8kg/32.5mm (27.78~30.43 lbs /1.280")	Replace if beyond 11.5 kg/32.5 mm (25.36 lbs/1.280")

9. Valve Seat (Fig. 1G-22)

Contact Width	Standard Tolerance	Serviceable Limit
	1.0~1.2 mm (0.039~0.047")	Rework if beyond 1.7 mm (0.066")

Inspect the valve seat for any pits, burns, blow-by or wear. Reface the seat with a valve seat facing tool. Replace the head assembly if the valve seat cannot be corrected by reworking.

10. Valve Stem

Inspect the diameter of the valve stem. (Fig. 1G-19)

	Standard Tolerance	Serviceable Limit
Inlet	6.38~6.39 mm (0.251~0.252")	Replace if beyond 6.36 mm (0.250")
Exhaust	6.35~6.36 mm (2.500~2.504")	Replace if beyond 6.33 mm (0.249")

To inspect for bent valve stem, use V-block and dial gauge. Replace valve if stem is beyond 0.02 mm (0.0008") T.I.R. (Fig. 1G-23)

11. Valve Guide (Fig. 1G-24)

Inside Diameter	Standard Tolerance	Serviceable Limit
	6.40~6.41 mm (0.252")	Replace if beyond 6.44 mm (0.254")

Whenever valve is replaced due to wear, valve guide is also worn, therefore, recommend that guide also be replaced.

c. Cylinder Head Assembly

1. Install the water choke plates, caution not to invert (Fig. 1G-25).
2. Wash off the valve grinding compound completely before installing the valve. Check the valve for any binding.

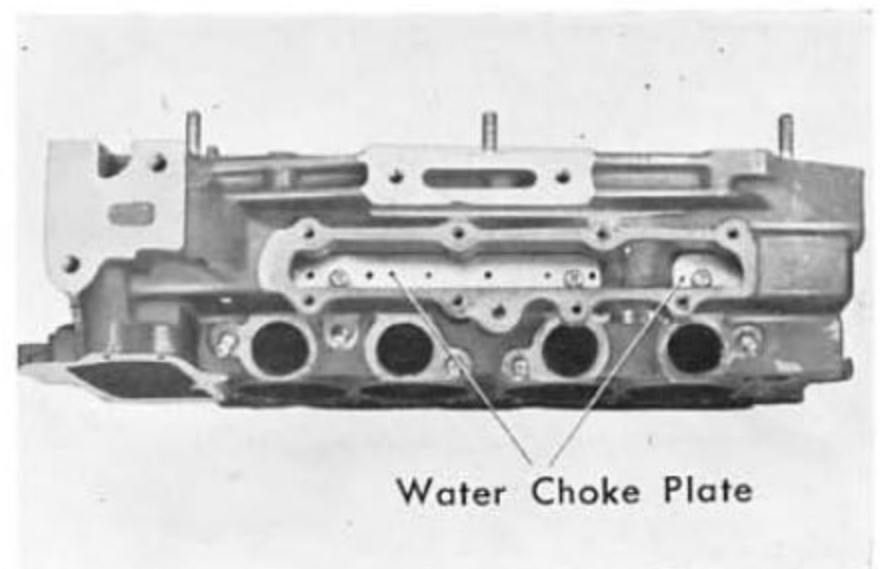


Fig. 1G-25

3. Assemble the valve and using the recorded data of the tappet clearances and tappet adjusting shims, calculate and install the proper size shim so that the standard tappet clearance of 0.2 ± 0.02 mm (0.008 ± 0.0008 ") may be obtained. Assemble the camshafts and bearing holders on the cylinder head, caution not to forget the O rings on the bearing oil holes Fig. 1G-26).

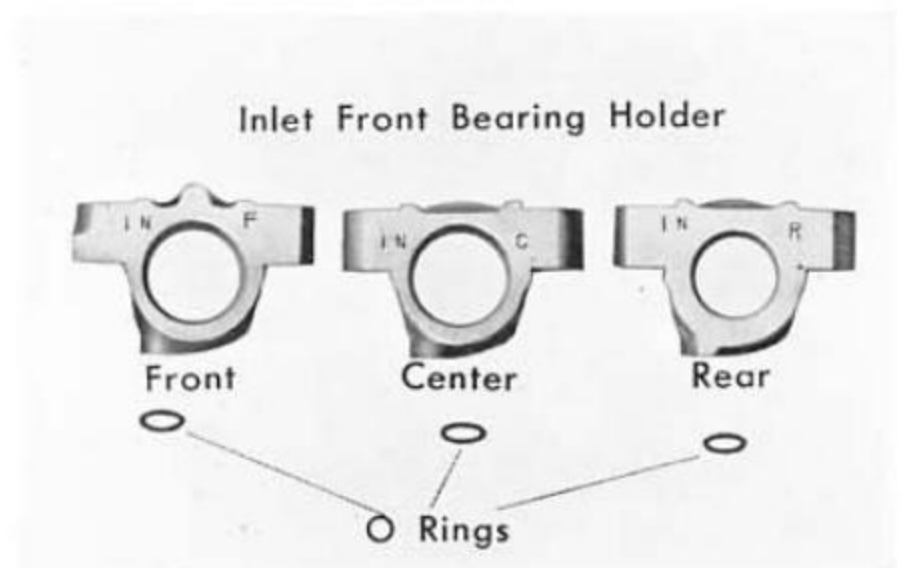


Fig. 1G-26

4. Torque the camshaft bearing holders to the proper value, 2.5 kg-m (18.1 ft-lbs) (Fig. 1G-27).

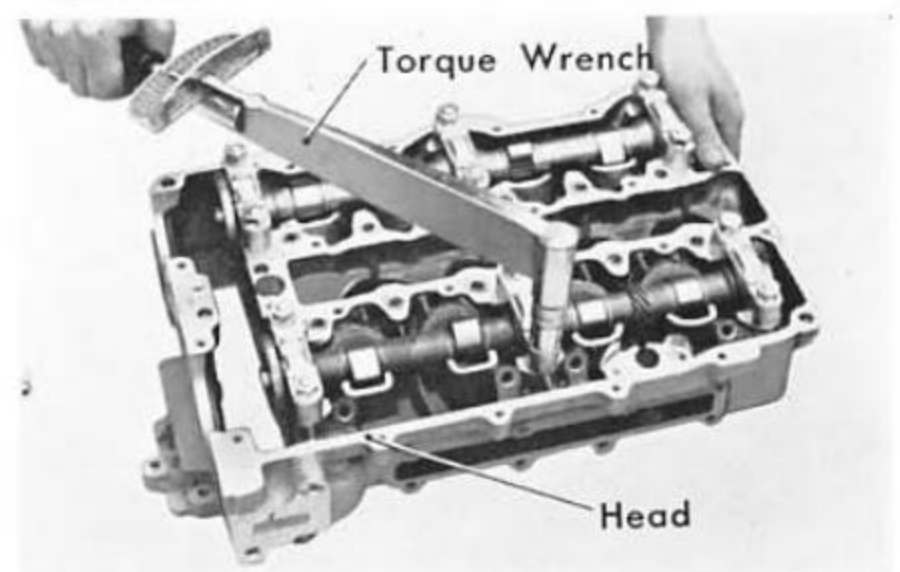


Fig. 1G-27

5. Check the end play of the camshafts (Fig. 1G-28). Set the dial gauge against the end of the camshaft and check the amount of play by moving the camshaft in the direction of the shaft axis. The standard play is from 0.10~0.55mm (0.004~0.022"), excessive play can be adjusted by the installation of thrust washers.



Fig. 1G-28

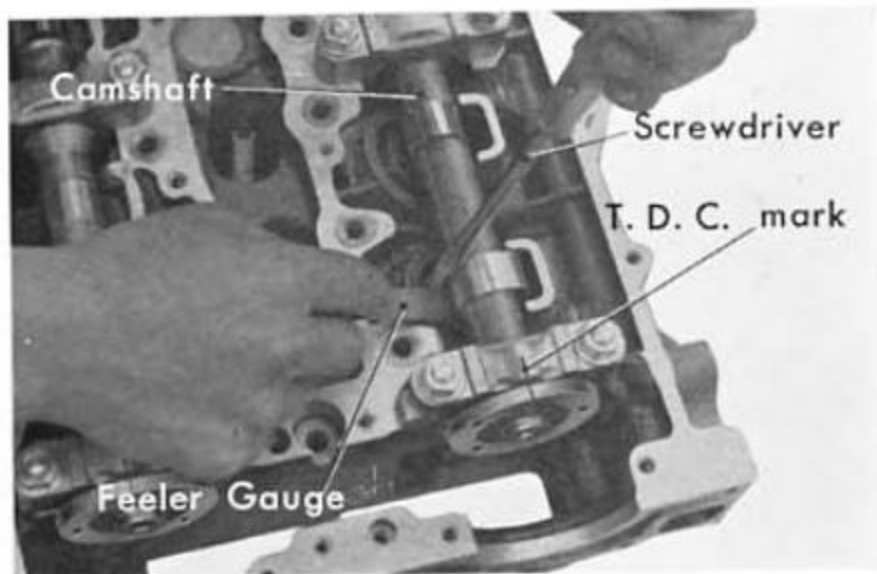


Fig. 1G-29

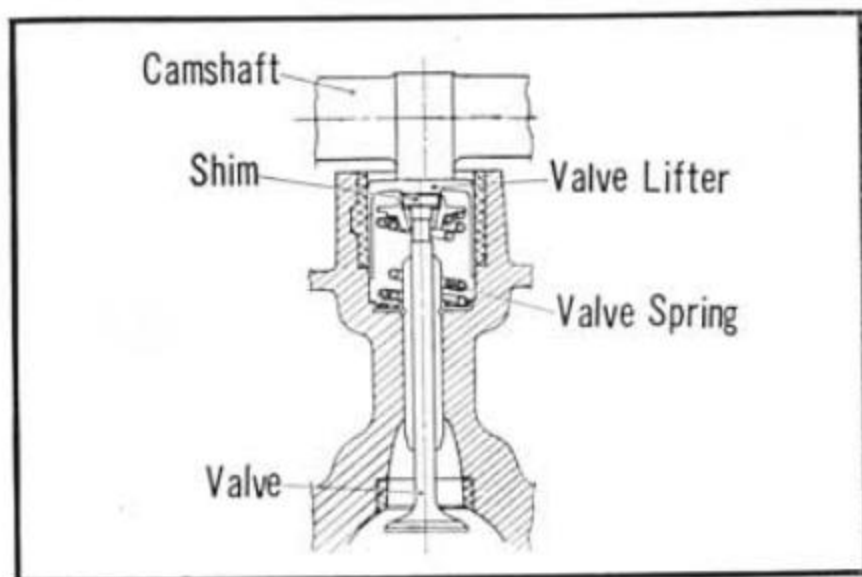


Fig. 1G-30

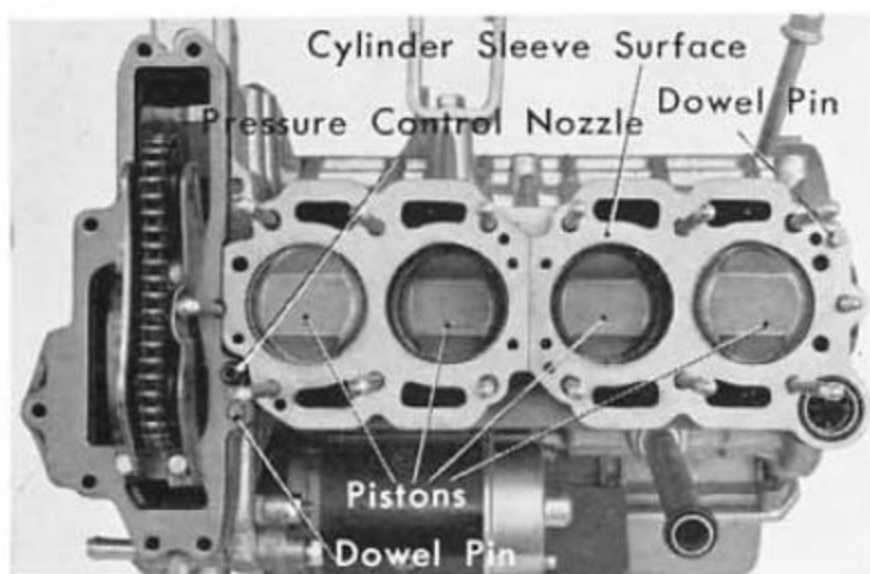


Fig. 1G-31

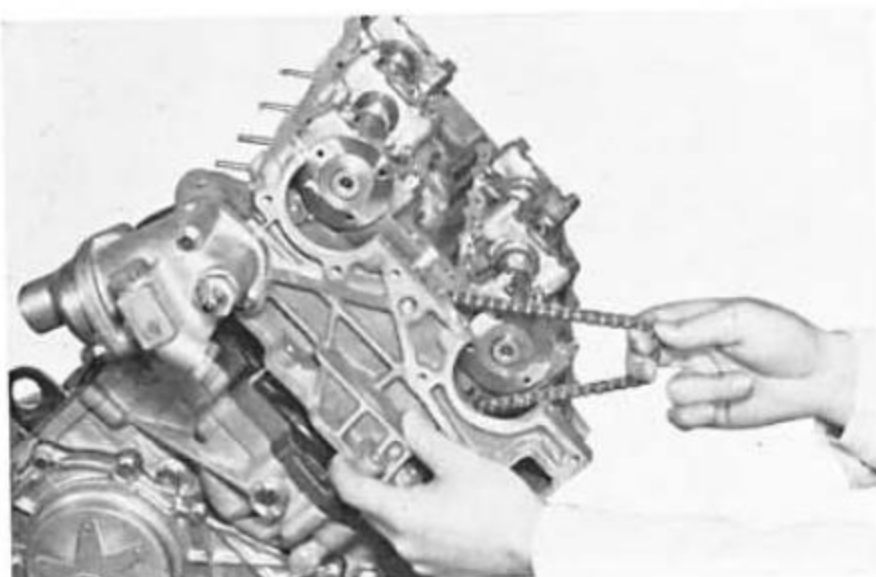


Fig. 1G-32

6. Check and adjust the tappet clearance. Position the camshafts to T.D.C. of the compression stroke, and make adjustments at both the inlet and exhaust cams for all the cylinders in the same manner (Fig. 1G-29)

Make the proper adjustment by calculating the thickness of the shim initially installed and the tappet clearance, and then replace the shim with that of the proper thickness to obtain a tappet clearance of 0.2 ± 0.02 mm (0.008 ± 0.0008 ").

Tappet adjusting shims are available from 2.300 ~ 4.100 mm (0.091 ~ 0.162") in 0.05 mm (0.002") intervals.

Tighten the camshaft bearing holders to the specified torque, recheck the clearance to assure that all the tappets are at the proper clearance.

After checking the clearance, align camshaft to T.D.C. of No. 1 cylinder.

d. Installation and Inspection

1. Lower the piston below the surface of sleeve (Fig. 1G-31).
2. Do not make a mistake and interchange the pressure control nozzle with the dowel pin. The pressure control nozzle can be identified by chamfered ends.
3. Install O rings and gasket. Assemble the O ring to the oil return pipe and then install into the upper crankcase.
4. Align the cylinder head to the stud bolts, and with the stud bolts as guide, assemble the cylinder head to the crankcase, making sure that the oil return pipe is fitted properly (Fig. 1G-32).
5. After torquing the cylinder head, rotate the crank shaft so that it is in the T.D.C. position of the No. 1 cylinder.

6. Insert the pump drive shaft into the cylinder head, assemble the oil pump shaft to the drive shaft by aligning the shaft groove (Fig. 1G-33, 34).

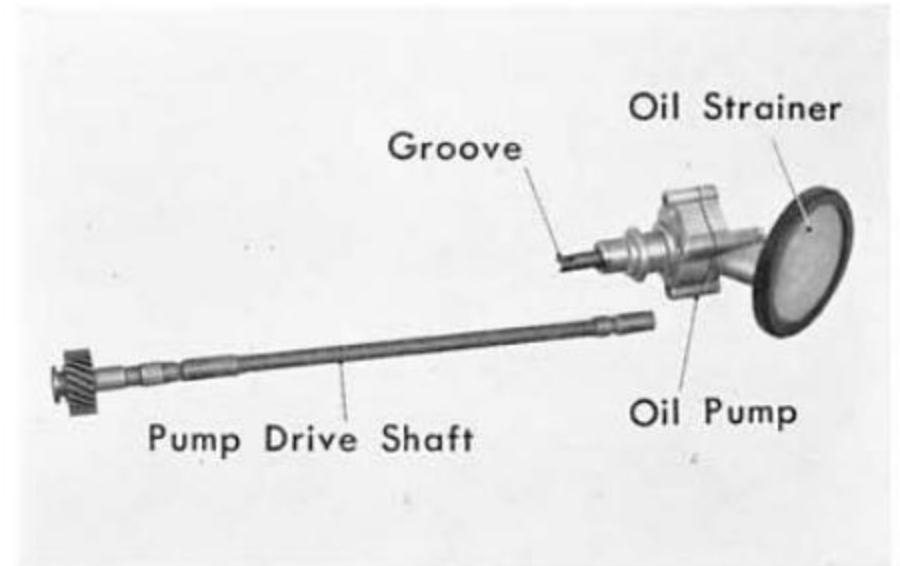


Fig. 1G-33

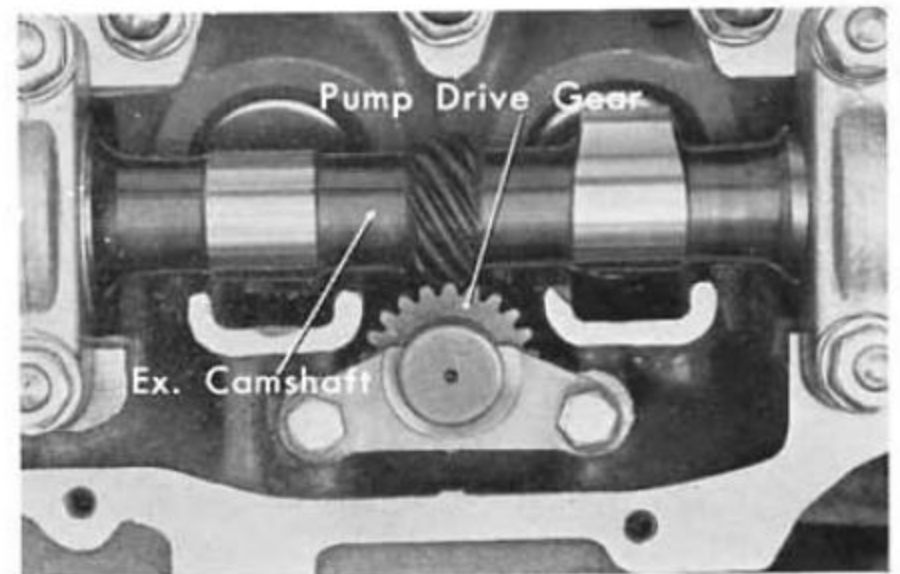


Fig. 1G-34

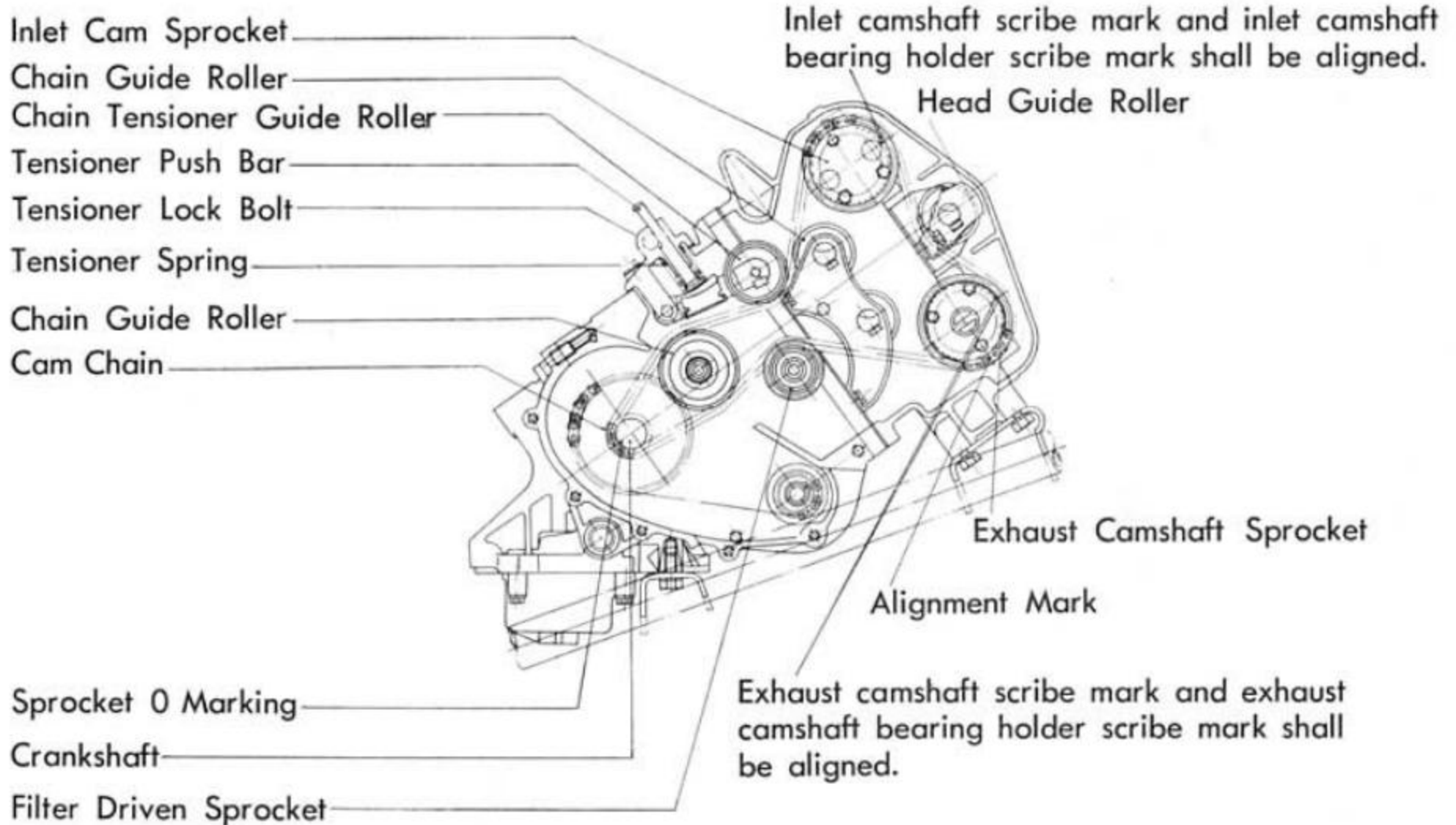


Fig. 1G-35

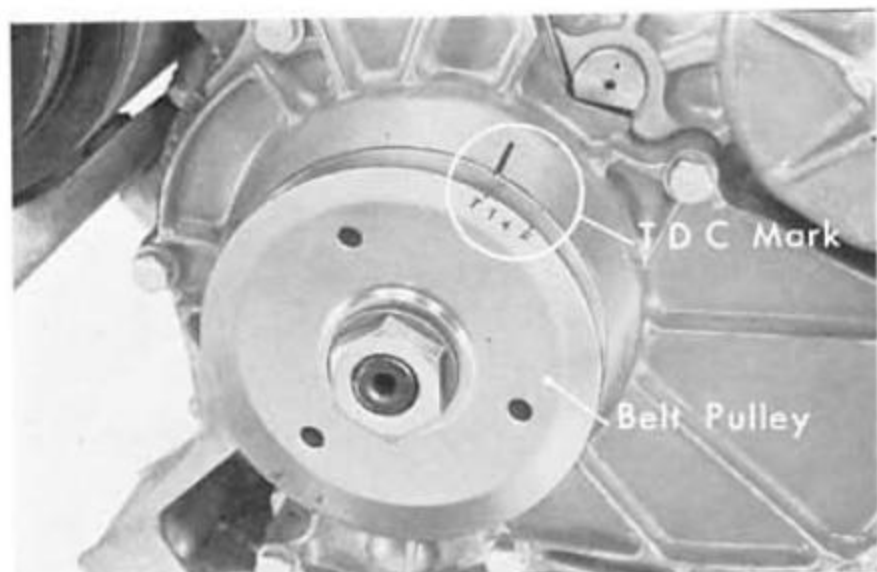


Fig. 1G-36

7. Align T.D.C. mark on the belt pulley to the marking on the case and also the alignment mark on the camshaft sprocket flanges to the marking on the front bearing holders (Fig. 1G-36, 37).

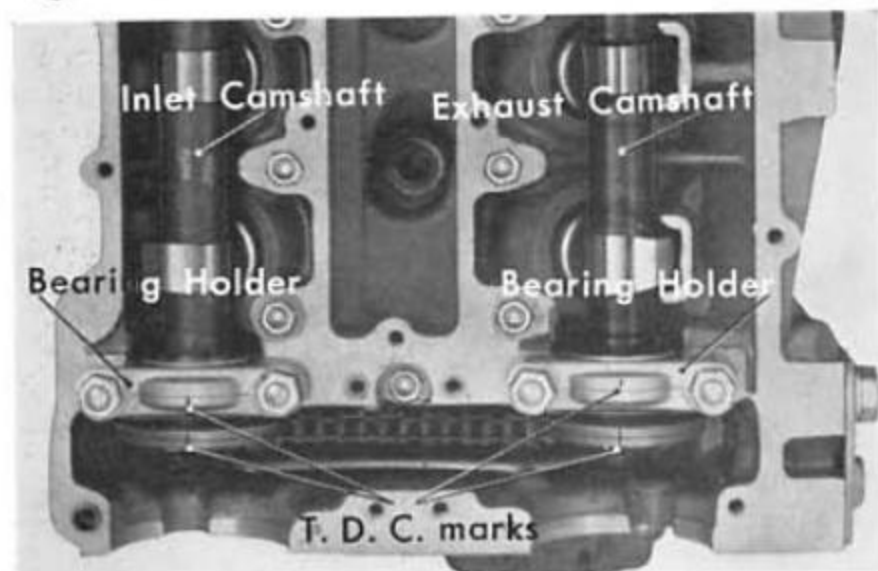


Fig. 1G-37

8. Pull the cam chain on the tension side (opposite to the chain tensioner), check the cam chain to make sure that it is properly assembled on the crankshaft drive gear and to the guide rollers, align the T.D.C. mark on the exhaust cam sprocket to the crankcase mating surface as shown in Fig. 1G-38 and tighten the bolts temporarily.

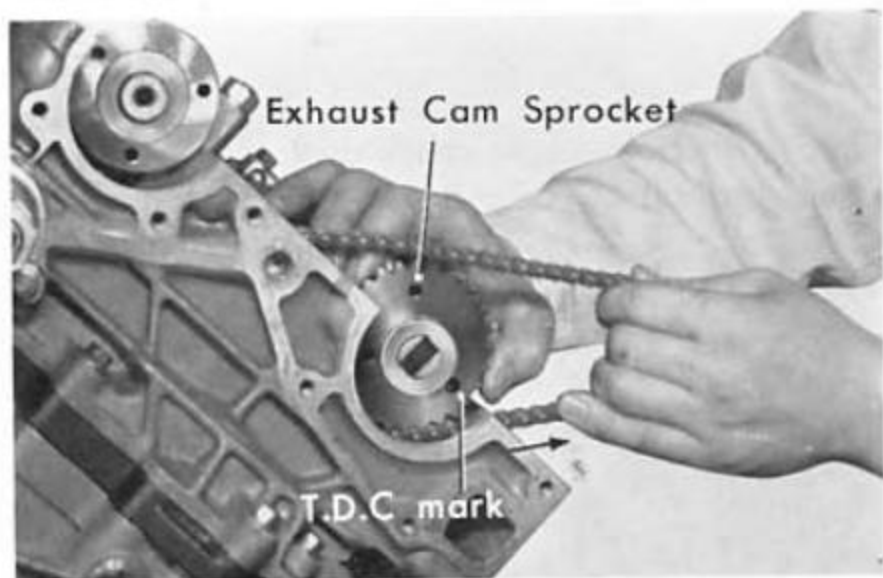


Fig. 1G-38

9. Pull the cam chain in the direction of inlet camshaft (Fig. 1G-39), align the T.D.C. mark on the inlet cam sprocket to the crankcase mating surface as shown in Fig. 1G-40 and tighten the bolts temporarily.

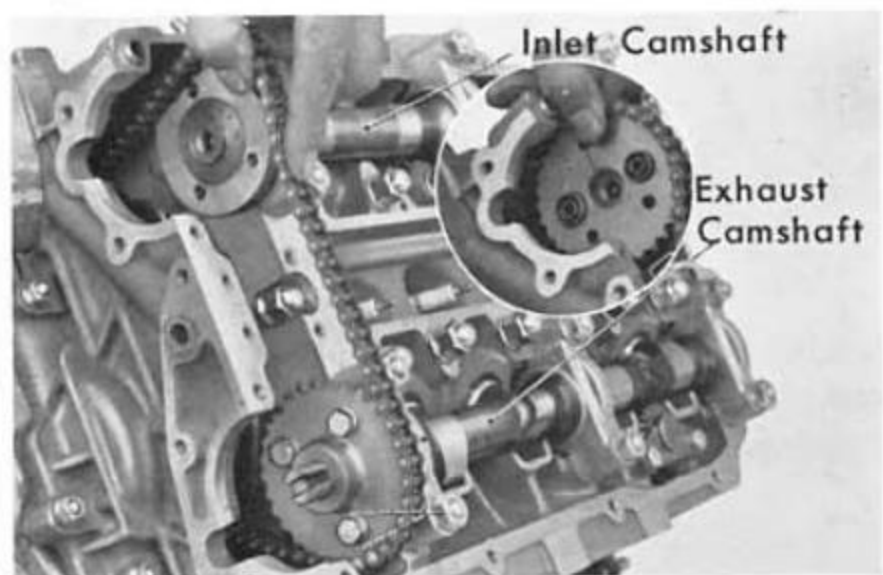


Fig. 1G-39

10. Install the head guide roller (Fig. 1G-41) and tensioner with the roller fitted on the chain.
11. After making sure that the T.D.C. marks of the belt pulley, camshafts and cam sprockets, are aligned, tighten the cam sprocket setting bolts.

12. Next, adjust the chain tensioner by loosening the tensioner bolt, the action of the spring will automatically tighten the chain to the proper tension (Fig. 1G-42). Do not forget to retighten the bolt.

H. CAM CHAIN

a. Removal

1. Align T.D.C. mark on the belt pulley to the marking on the case (Fig. 1H-1) and then remove head cover and cylinder head from the engine.

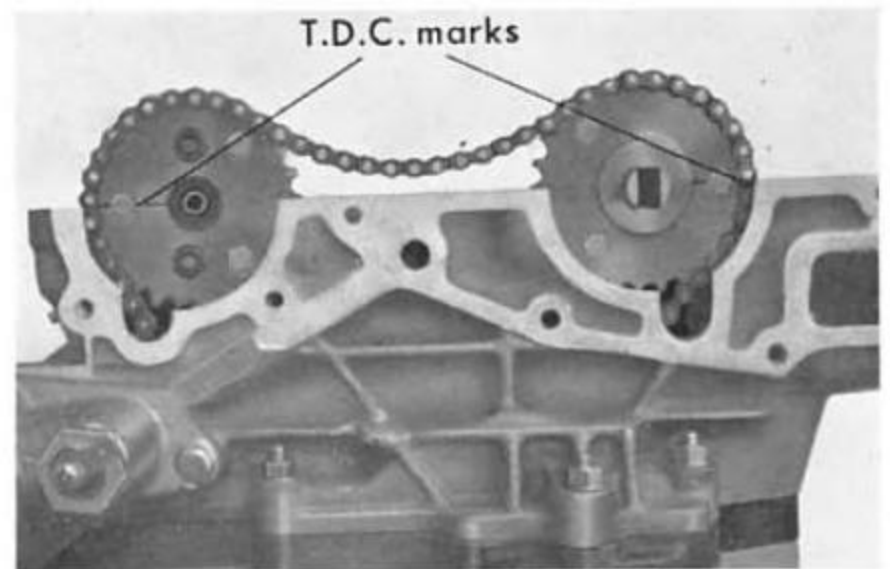


Fig. 1G-40

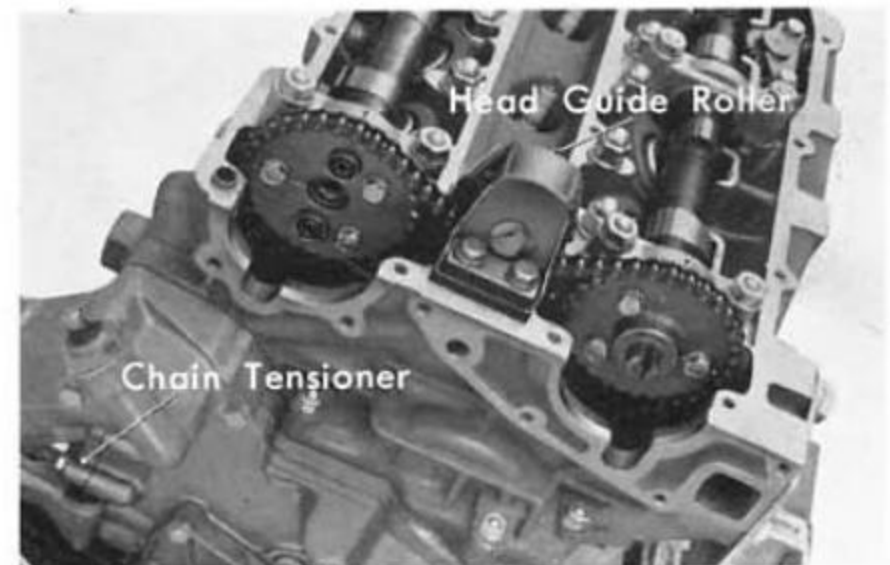


Fig. 1G-41

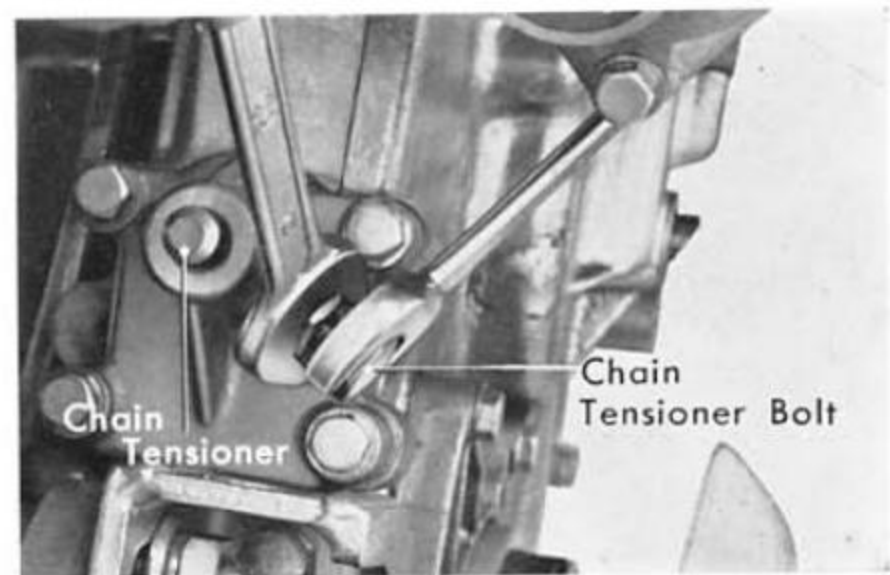


Fig. 1G-42

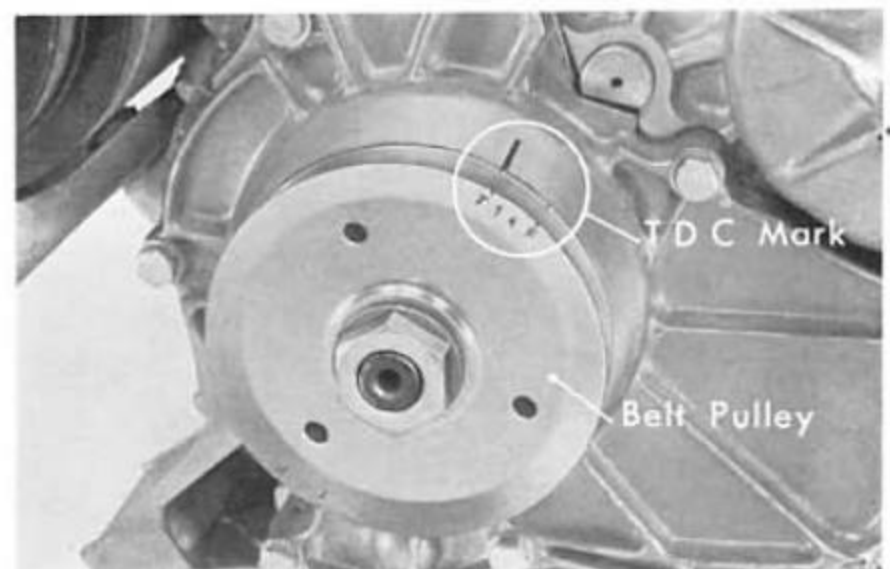


Fig. 1H-1

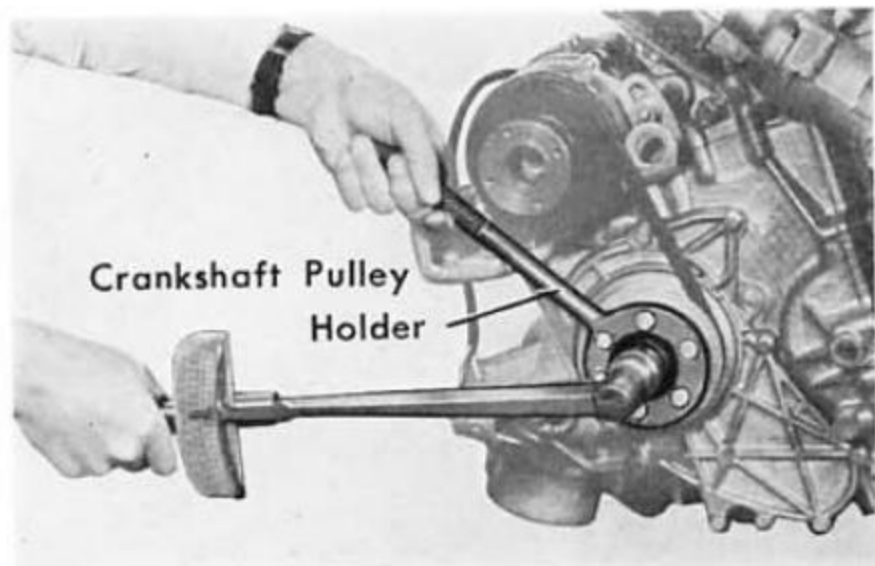


Fig. 1H-2

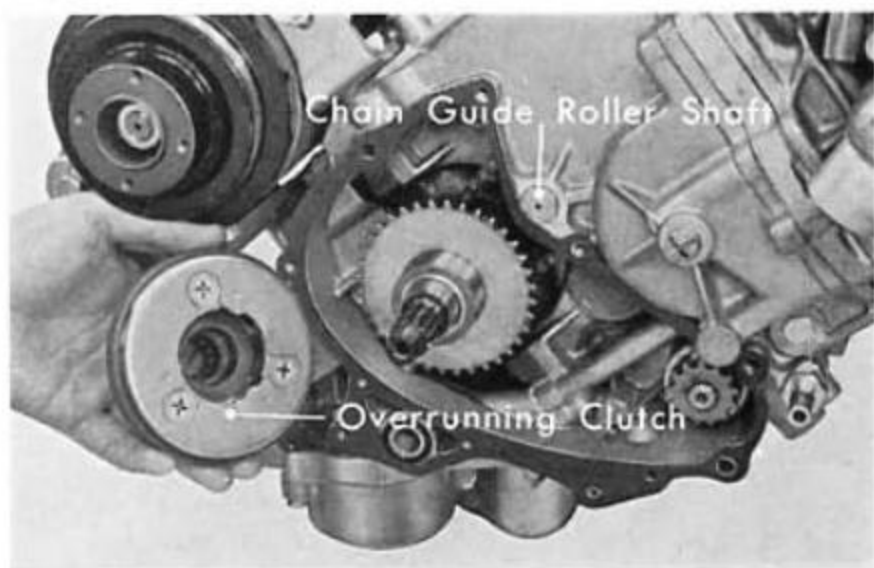


Fig. 1H-3

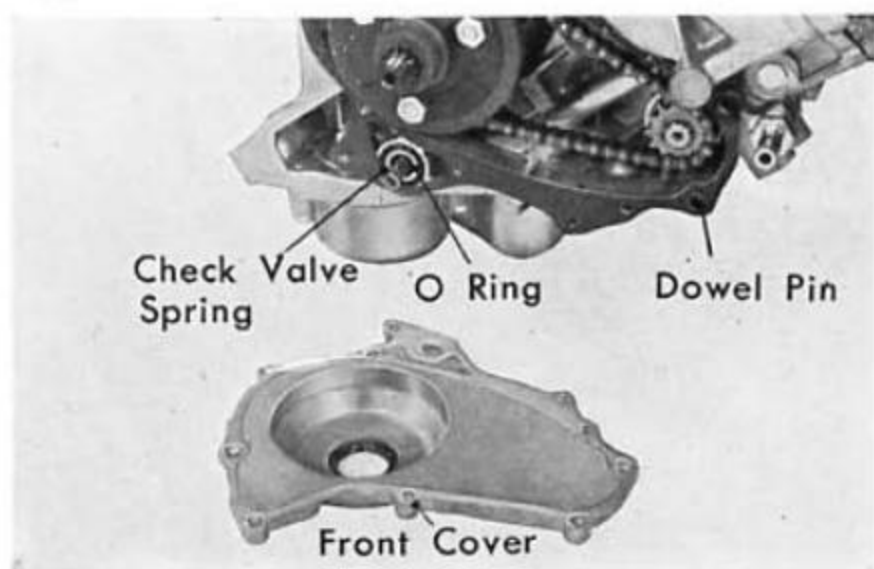


Fig. 1H-4

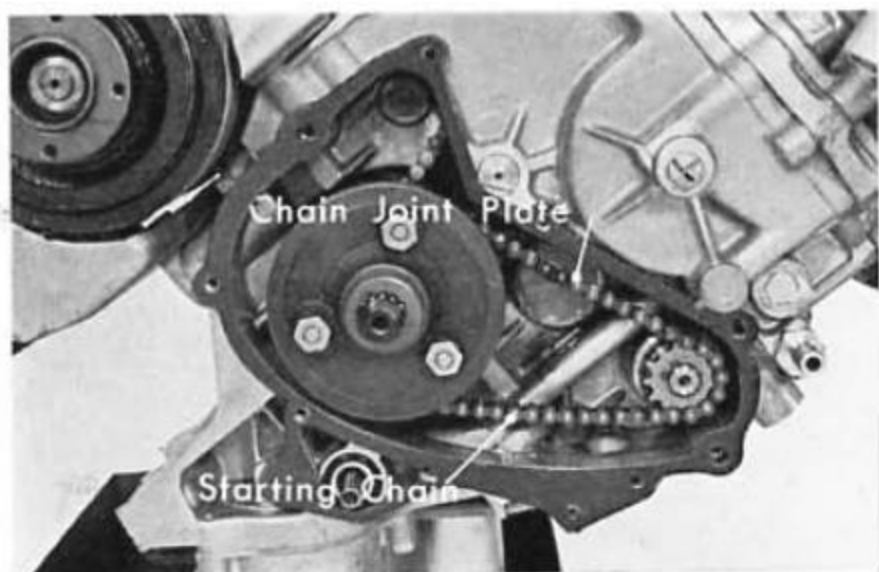


Fig. 1H-5

2. Remove the lock nut by using special tool, a crankshaft pulley holder with three 8mm bolts (Fig. 1H-2). Torque the lock nut to 13kg-m (94ft-lbs) during assembly.

3. Remove the belt pulley and the thrust washer from the crankshaft (Fig. 1H-3).

4. Remove the front cover setting bolts and washers and disassemble the front cover, front cover gasket, O ring and dowel pins from the crankcase (Fig. 1H-4). The check valve and valve spring will drop out.

5. Remove the starting chain joint plate with pliers and then disconnect the starting chain (Fig. 1H-5).

6. Disassemble the starting driven sprocket, needle bearing and the thrust washer.
7. Pull out the chain guide roller shaft and disassemble the guide roller and thrust washer (Fig. 1H-6).

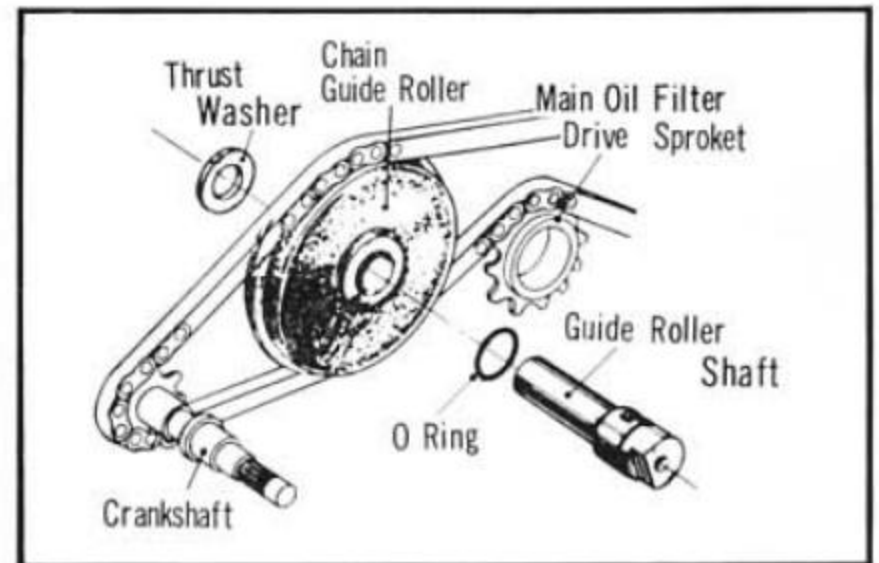


Fig. 1H-6

8. Pull off the cam chain from the crankshaft (Fig. 1H-7).

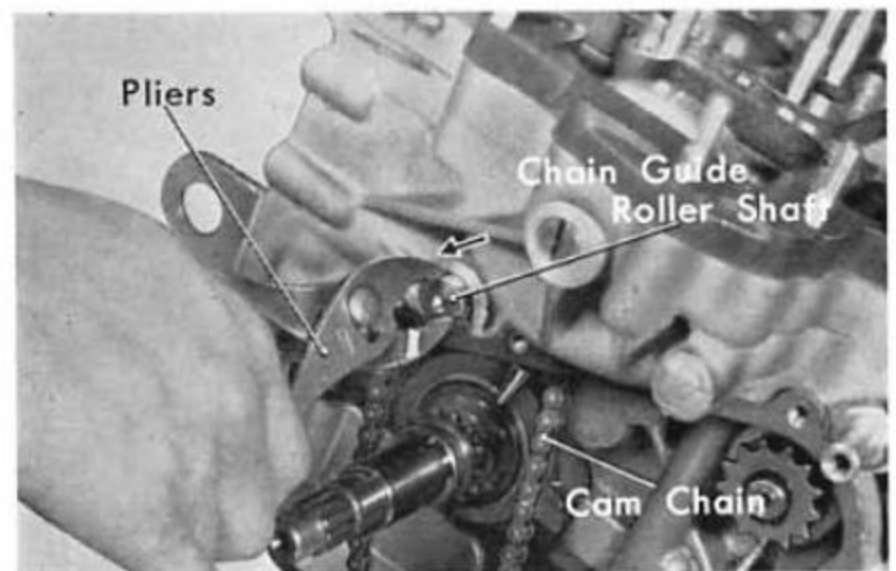


Fig. 1H-7

b. Installation and Inspection

1. Inspect the stretch in the cam chain (Fig. 1H-8). Replace the chain if sprocket center distance is beyond 424 mm (16.69").

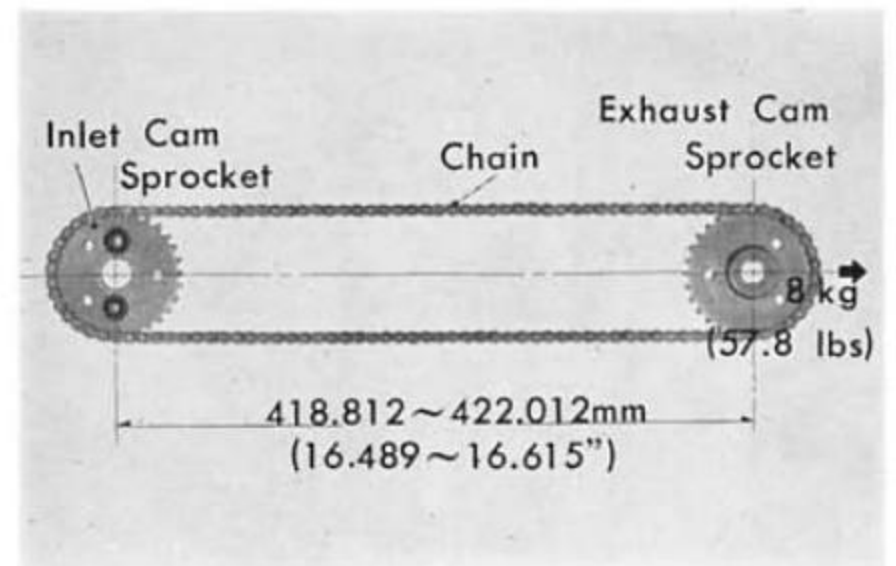


Fig. 1H-8

2. Before assembling the starting sprocket, align the red colored link in the cam chain to the punch mark on the cam drive sprocket of the crankshaft (Fig. 1H-9).

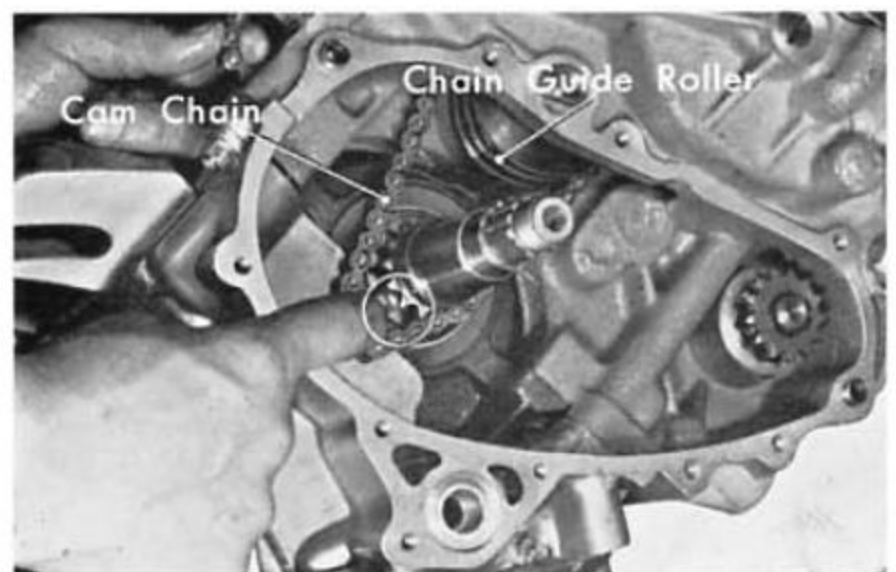


Fig. 1H-9

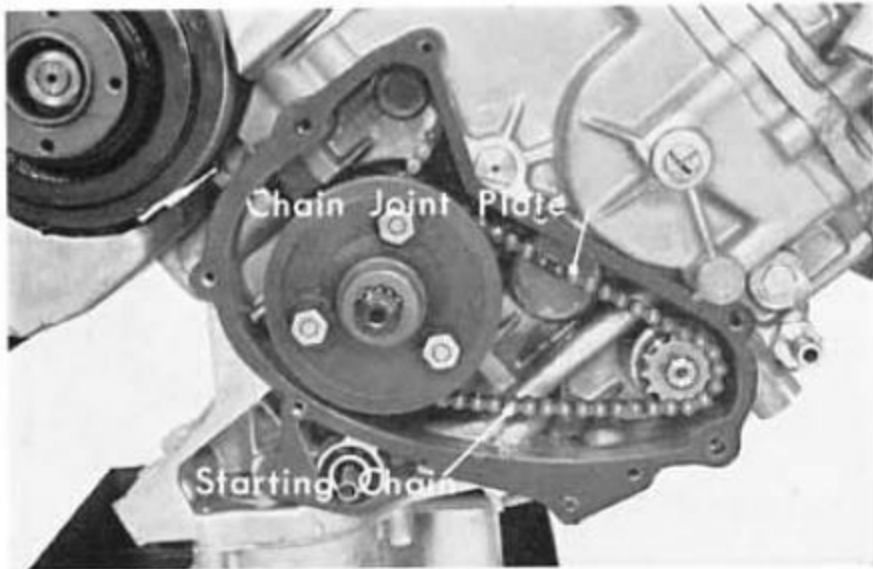


Fig. 1H-10

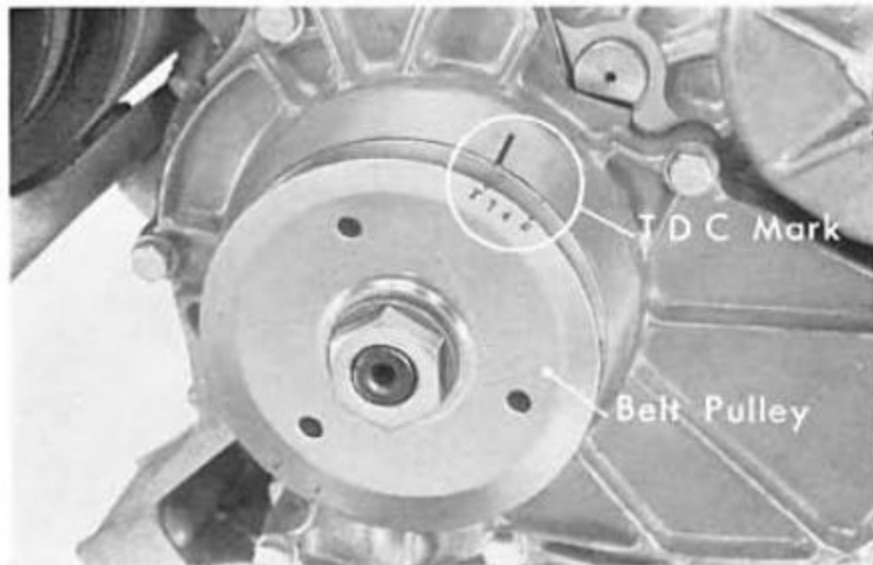


Fig. 1H-11

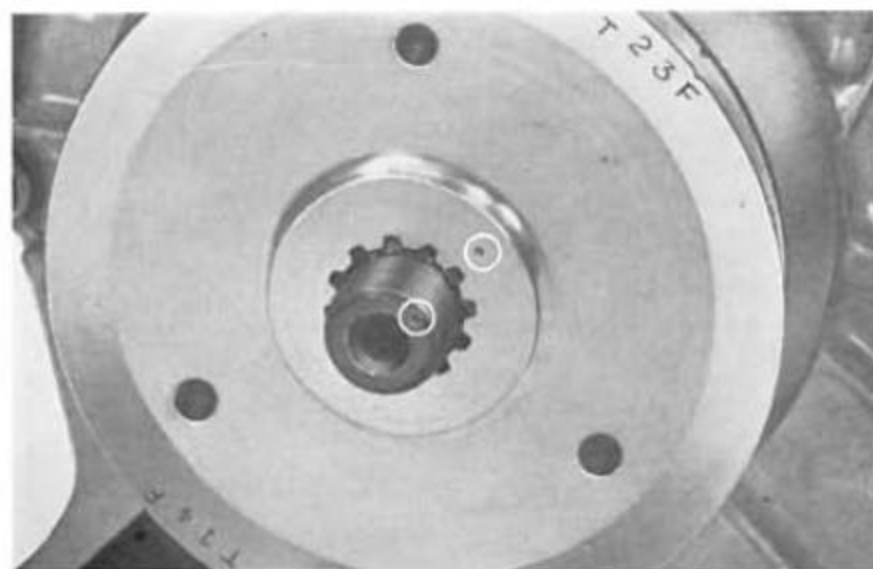


Fig. 1H-12

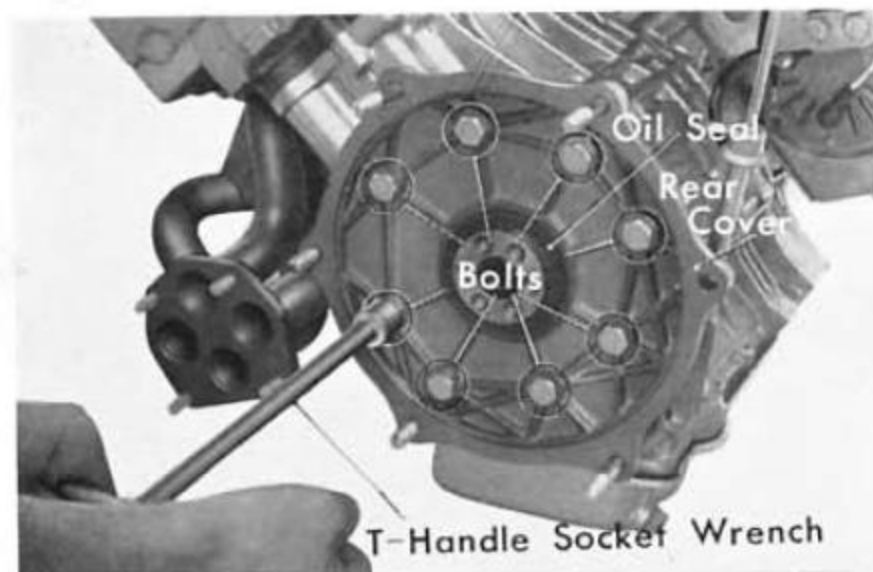


Fig. 1I-1

3. Install the starting chain joint plate so that opening is opposite to the direction of rotation (Fig. 1H-10).

4. Assemble the check valve, check valve spring, O ring and align the spring to the hole in the front cover before installing the cover.

5. Position the No. 1 cylinder to top-dead-center and insert the belt pulley over the spline on the crankshaft. Make sure that the T.D.C. mark on the pulley is aligned to the index mark on the case (Fig. 1H-11).

6. Install the cylinder head cover on the cylinder head.

7. Assemble cam chain on the cam sprockets.

8. Perform the adjustment of the chain tension.

9. Install the pulley by applying force while the pulley is rotated in the direction opposite to normal direction (Fig. 1H-12).

Install lock washer, torque the nut to 13 kg-m (94 ft-lbs) and lock the washer after torquing.

Before installing the pulley, make sure that the rollers are assembled.

I. REAR COVER

a. Removal

1. Separate the clutch unit from the engine.
2. Remove the rear cover setting bolts and detach the rear cover from the engine (Fig. 1I-1).

3. Remove the oil seal from the rear cover (Fig. 11-2).

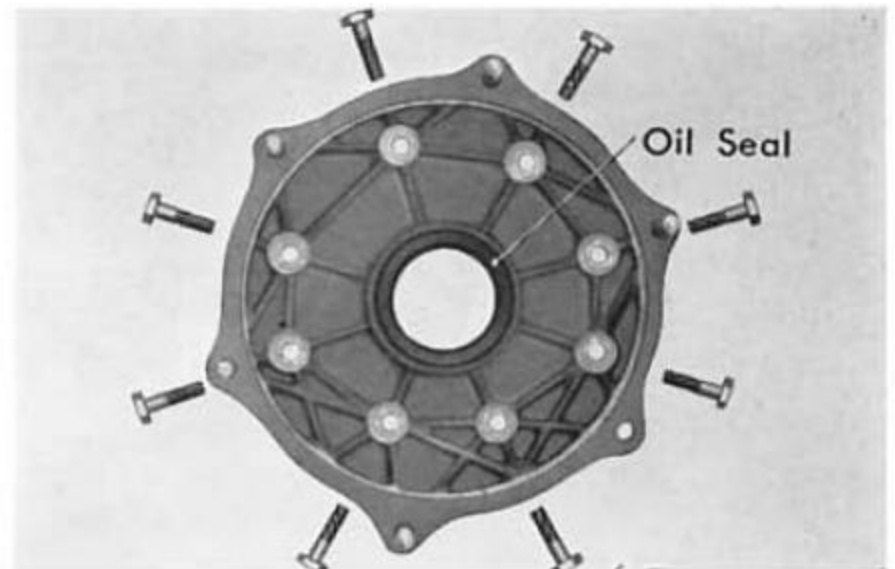


Fig. 11-2

b. Installation

1. Align the rear cover on the crankshaft bearing support and assemble on the engine with the bolts and washers.
2. Assemble the clutch to the engine.

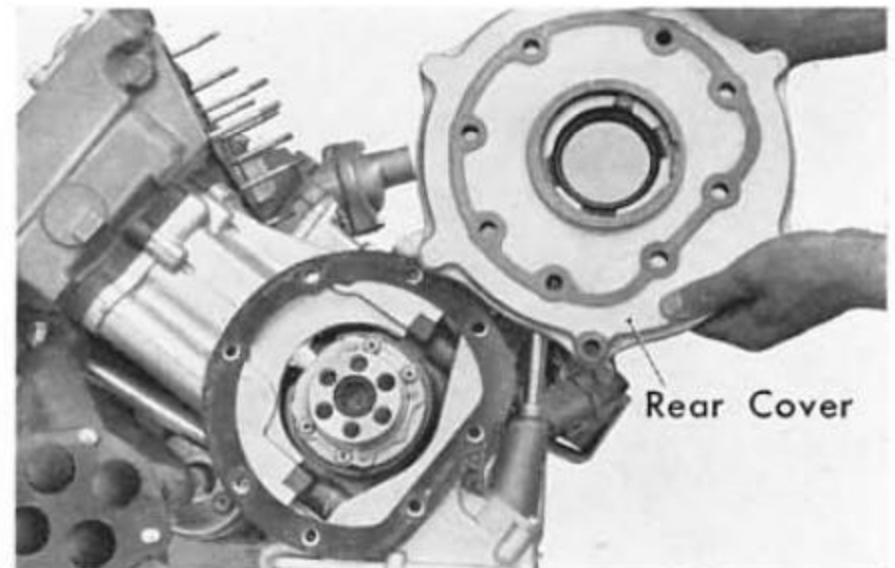


Fig. 11-3

J. OIL PUMP

a. Removal

1. Invert the engine and set on the engine stand (Fig. 1J-1).
2. Remove the bolts, washers, and disassemble the oil pan and gasket from the lower crankcase (Fig. 1J-2).

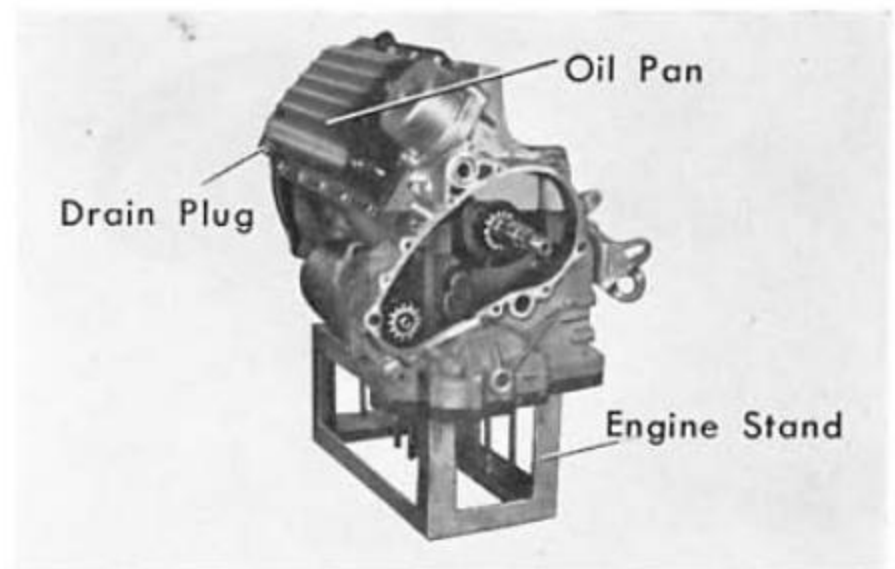


Fig. 1J-1

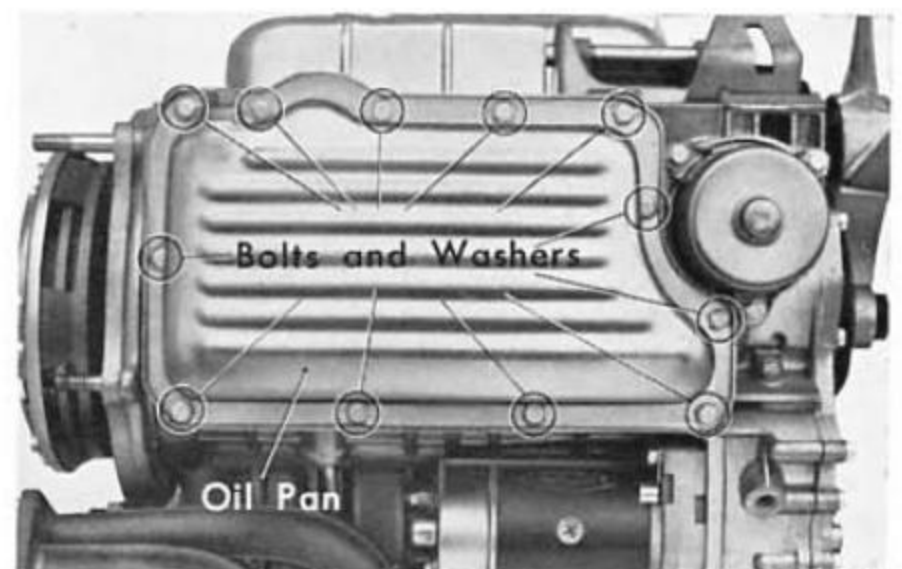


Fig. 1J-2

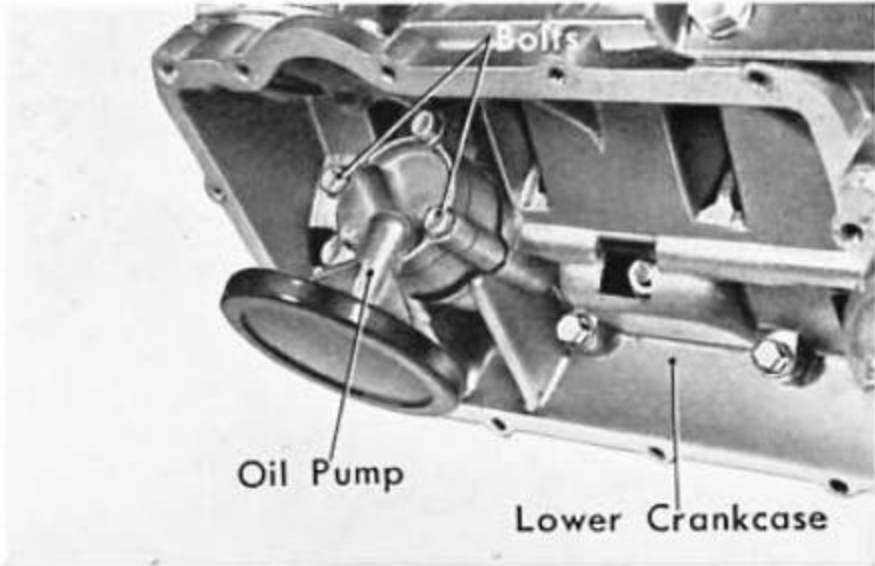


Fig. 1J-3

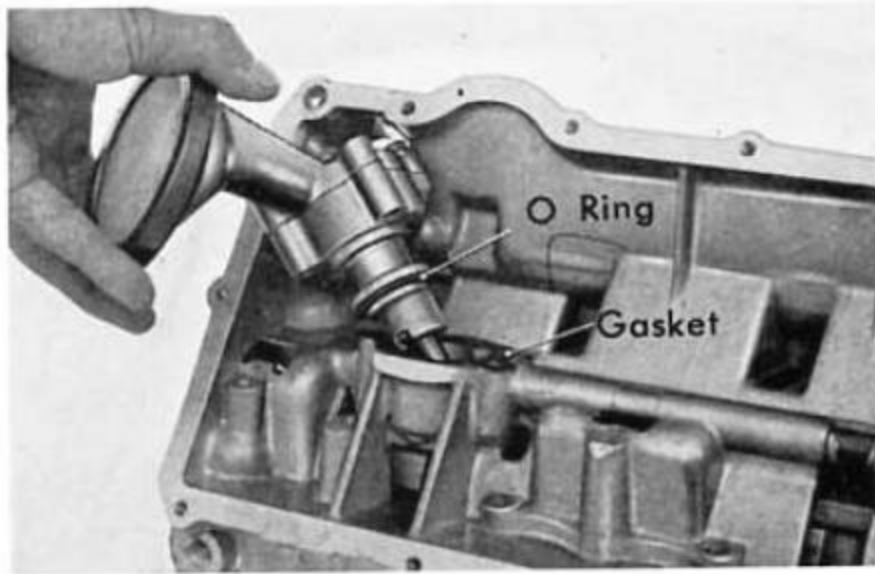


Fig. 1J-4

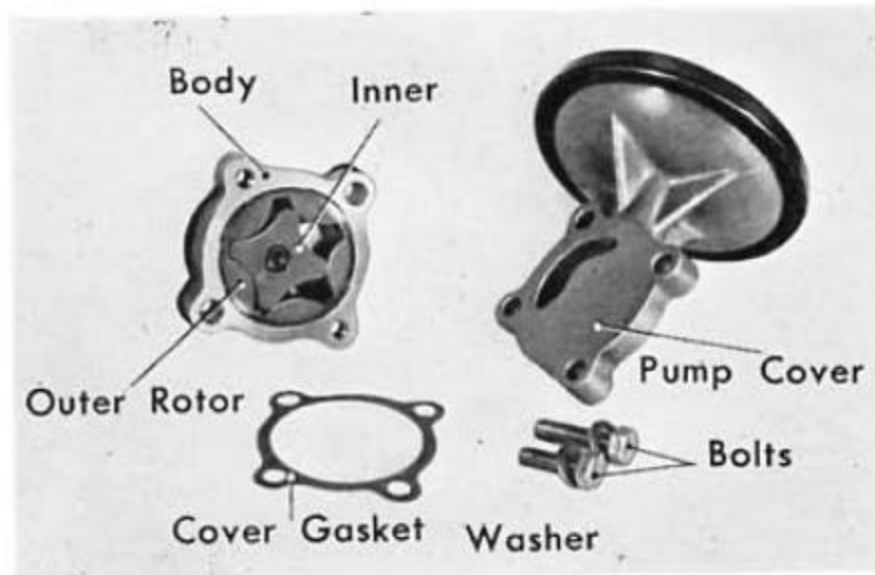


Fig. 1J-5

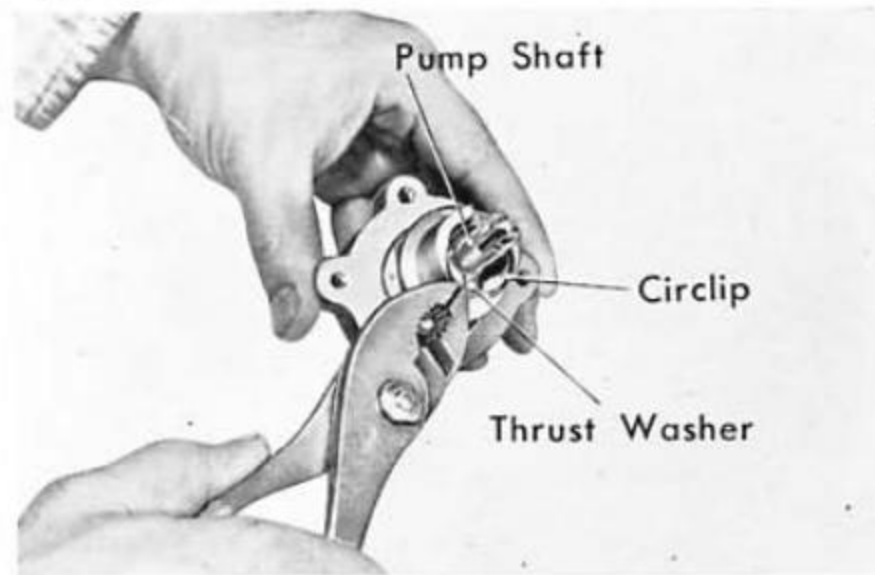


Fig. 1J-6

3. Remove the oil pump setting bolts and washers (Fig. 1J-3).

4. Pull out the oil pump, O ring and gasket from the lower crankcase (Fig. 1J-4).

b. Oil Pump Disassembly

1. Remove the bolts and washers, disassemble the oil pump cover and gasket (Fig. 1J-5).

2. Disassemble the pump inner and outer rotors.

3. Remove the circlip, thrust washer and draw out the shaft from the opposite side (Fig. 1J-6).

c. Oil Pump Assembly and Inspection

1. Inspect pump inner rotor tip clearance (Fig. 1J-7).

	Standard Value	Serviceable Limit
Tip Clearance	0.08 ~ 0.12 mm (0.0032 ~ 0.0047")	Replace if beyond 0.25 mm (0.010")

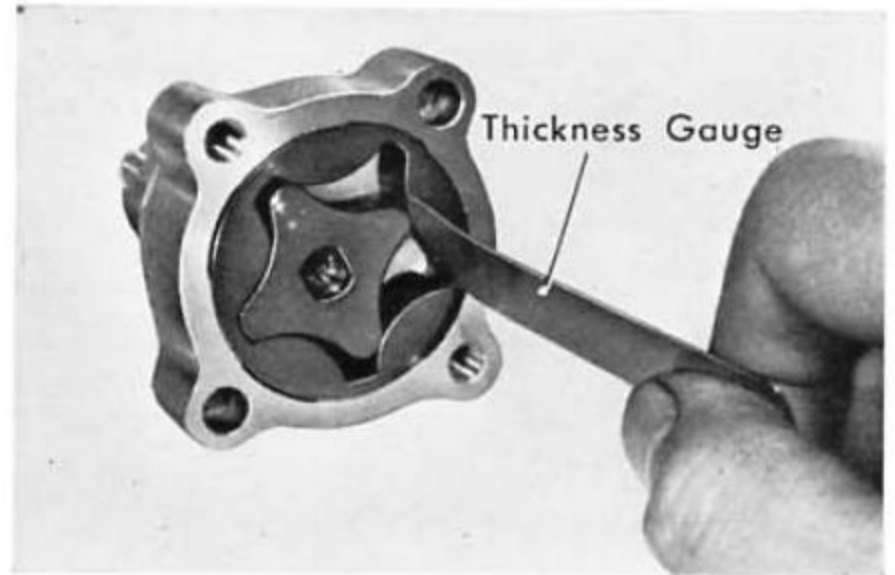


Fig. 1J-7

2. Inspect outer rotor to body clearance and side clearance (Fig. 1J-8).

	Standard Value	Serviceable Limit
Body Clearance	0.080 ~ 0.145 mm (0.0032 ~ 0.0055")	Replace if beyond 0.250 mm (0.0098")
End Clearance	0.02 ~ 0.05 mm (0.0008 ~ 0.0020")	Replace if beyond 0.15 mm (0.0059")

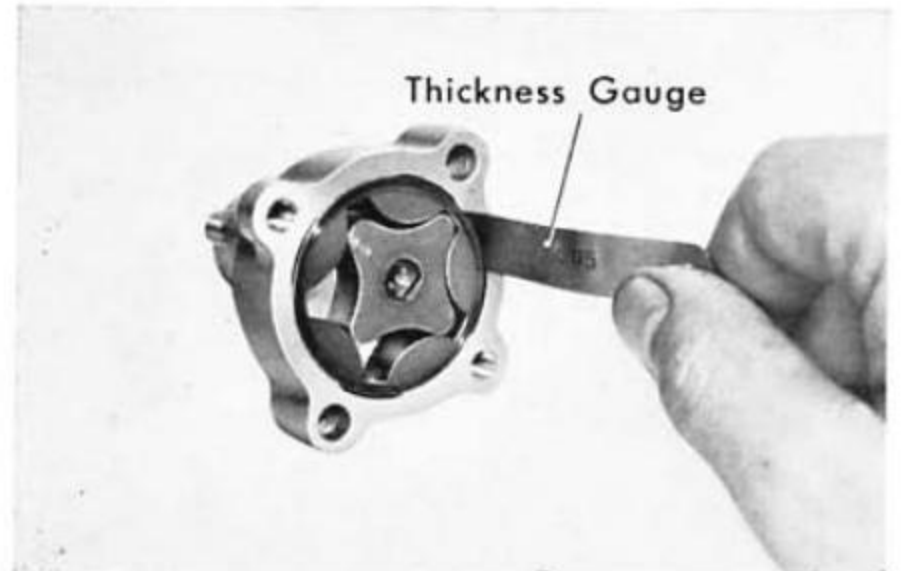


Fig. 1J-8

3. Assemble the pump so that the outer rotor with the chamfered corner is toward the inside and then insert the inner rotor on the pump shaft (Fig. 1J-9).
4. Check the rotation of the shaft while tightening the cover to make sure that the pump shaft turns lightly.

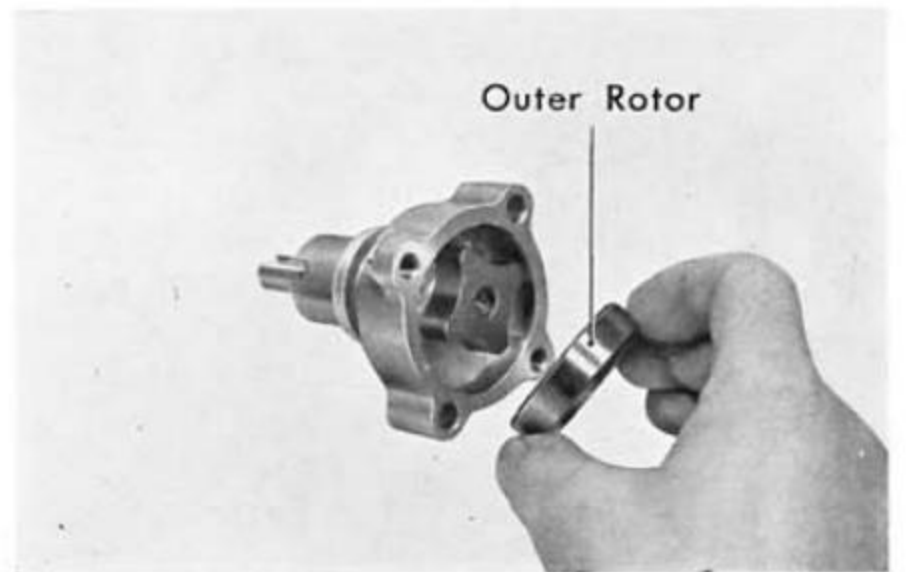


Fig. 1J-9

5. Assemble O ring and gasket on the pump and install the pump on the lower crankcase so that the slot in the pump shaft fits the drive shaft (Fig. 1J-10).

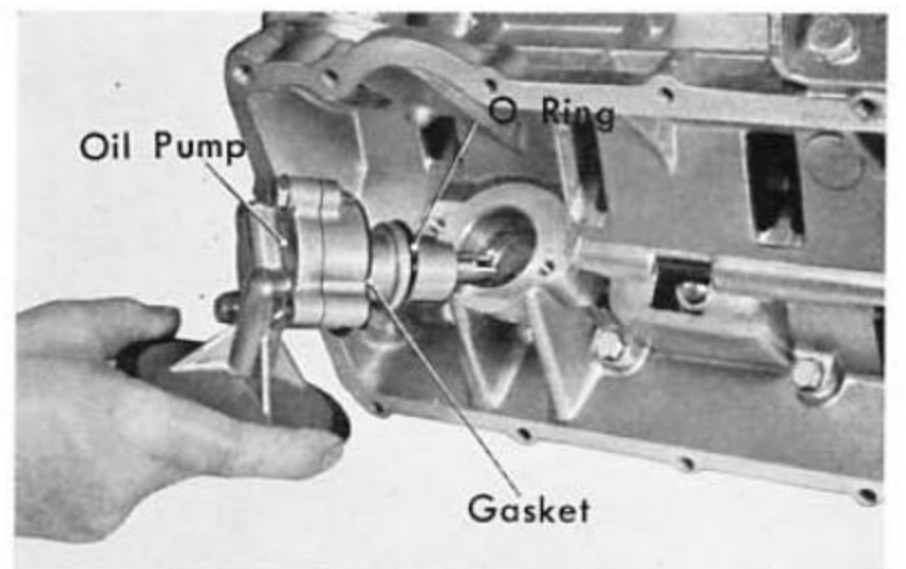


Fig. 1J-10

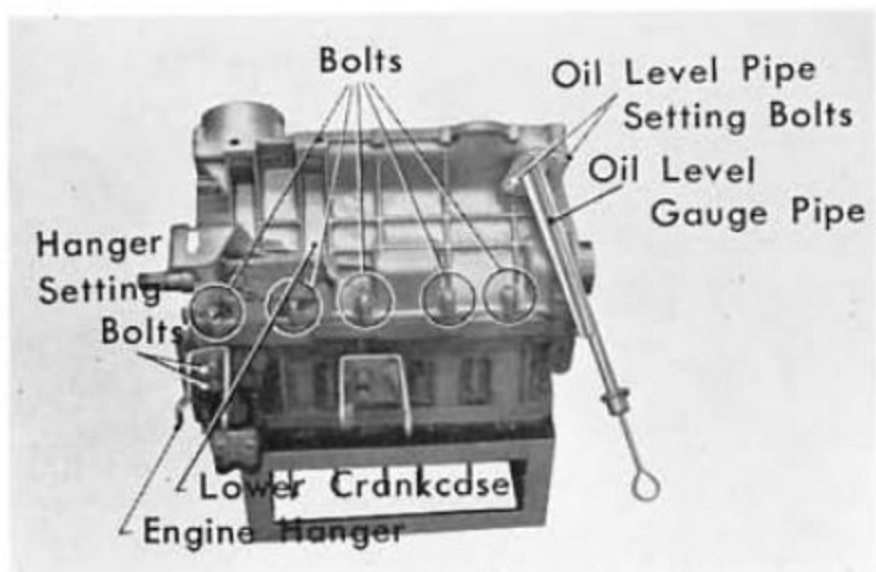


Fig. 1K-1

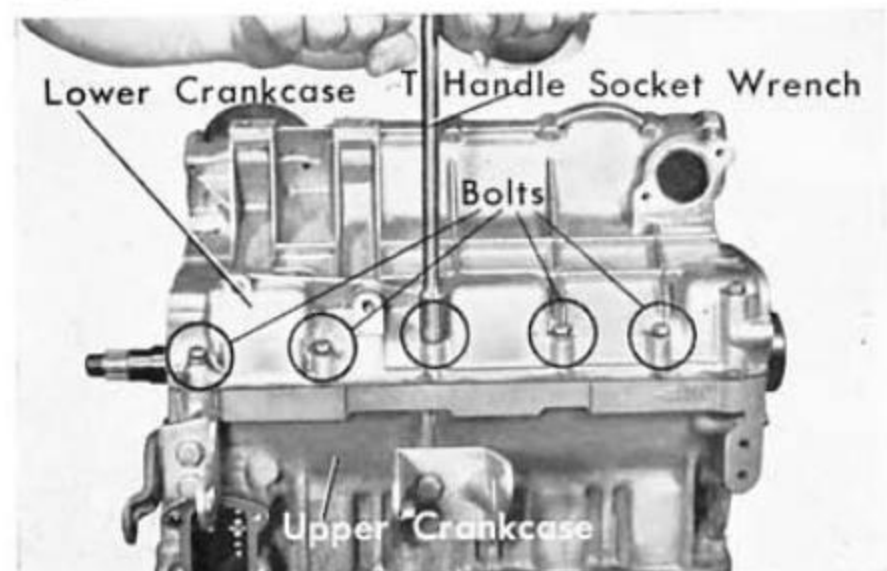


Fig. 1K-2

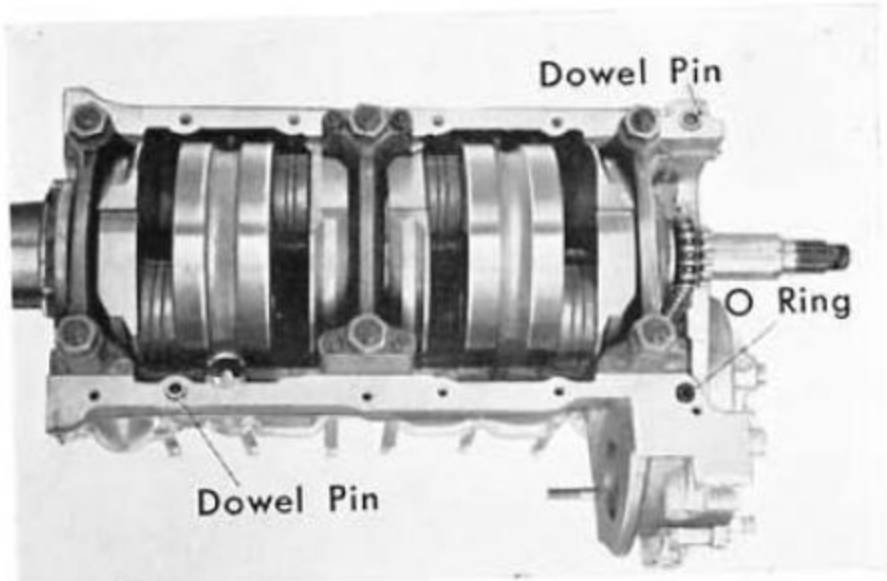


Fig. 1K-3

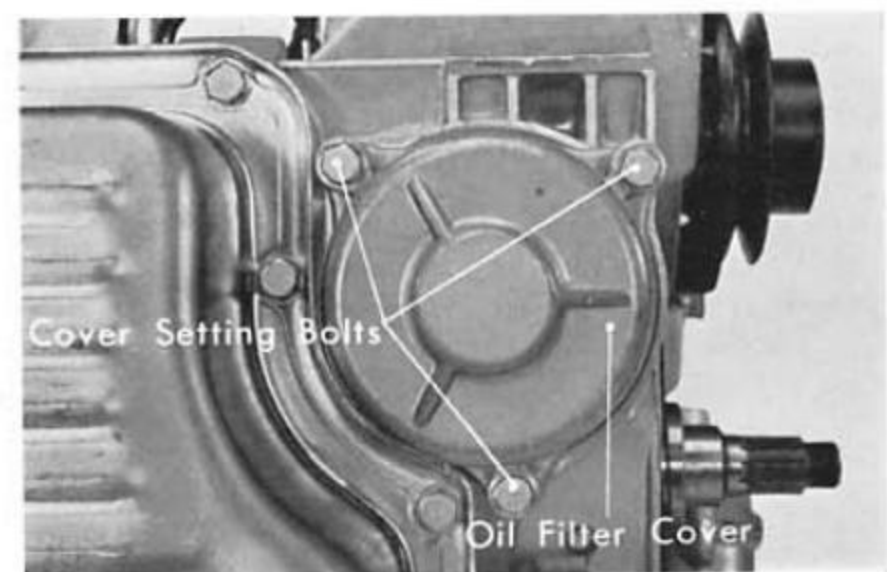


Fig. 1K-4

K. LOWER CRANKCASE

a. Removal

1. Remove rear cover, front cover and cylinder head.
2. Detach engine hanger from the lower crankcase by removing the hanger setting bolts and spring washers (Fig. 1K-1).
3. Remove the oil level pipe setting bolts and washers and then remove the oil level pipe and O ring from the lower crankcase (Fig. 1K-2).
4. Remove the crankcase setting bolts and washers and then separate the lower crankcase from the upper crankcase (Fig. 1K-2).
5. After separating the upper and lower crankcase, remove two dowel pins and O ring from the upper crankcase (Fig. 1K-3).
6. Remove the oil filter cover setting bolts and washers and then separate the oil filter cover and O ring from the lower crankcase (Fig. 1K-4).

7. Dismantle the filter element O ring and filter element from within the filter cover (Fig. 1K-5).

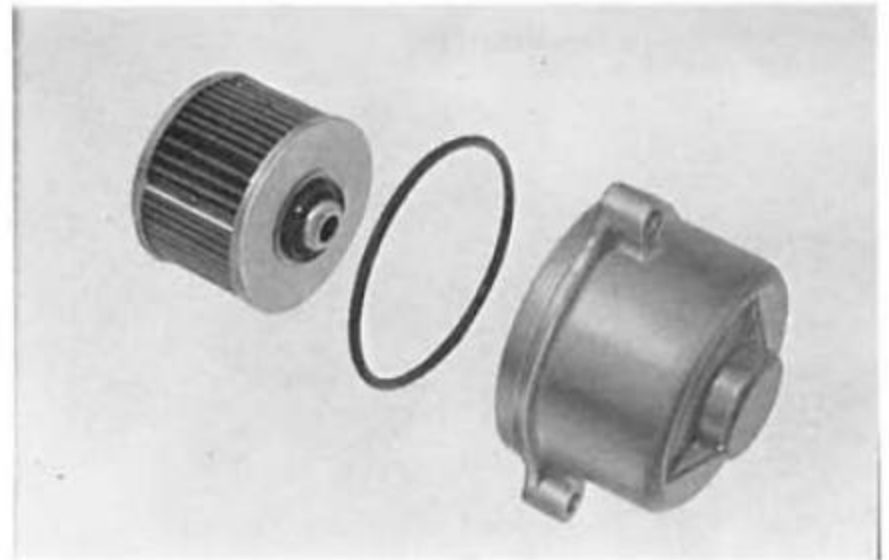


Fig. 1K-5

b. Assembly and Inspection

1. Wipe off the case mating surface free of oil and apply liquid gasket to thickness of 0.05~0.08 mm (0.0020~0.0030") and allow to dry before installation.
2. Wipe off any oil from the mating surface of the upper crankcase before installing the lower crankcase.
Tighten the nuts diagonally starting from the inside and working out (Fig. 1K-6).
Torque to 1.2 kg-m (8.7 ft-lbs).

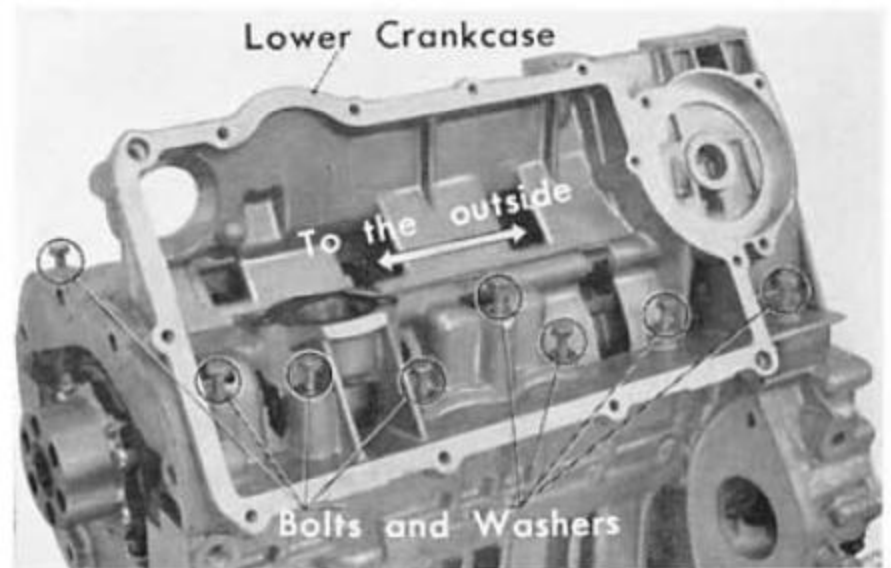


Fig. 1K-6

L. CRANKSHAFT

a. Removal

1. Disassemble the cam chain and lower crankcase from the engine and remove the bearing holder nuts (torque to 12kg-m, 86.7 ft-lbs during assembly) and lift off the crankshaft by using the special tool (crankshaft setting holder) (Fig. 1L-1).
2. Remove the pistons by removing end rings and piston pins by using pliers (Fig. 1L-2).

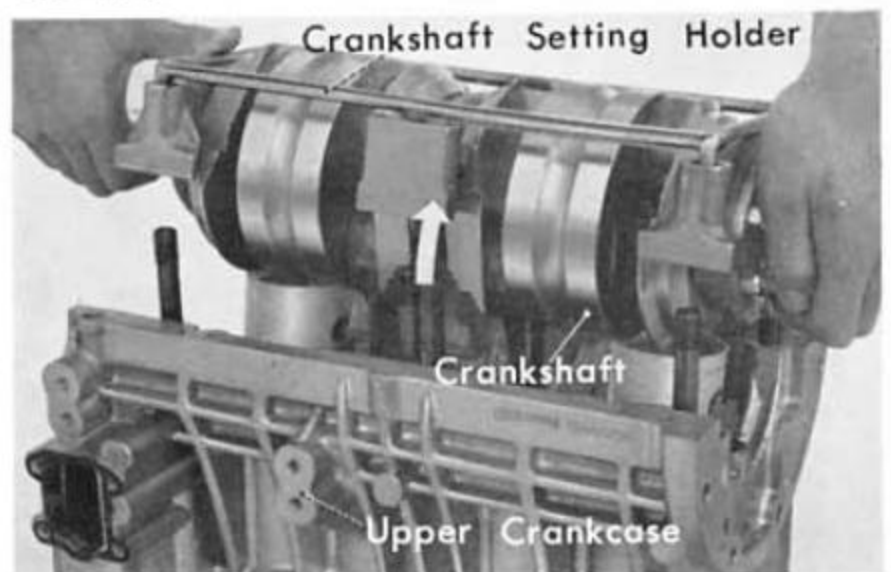


Fig. 1L-1

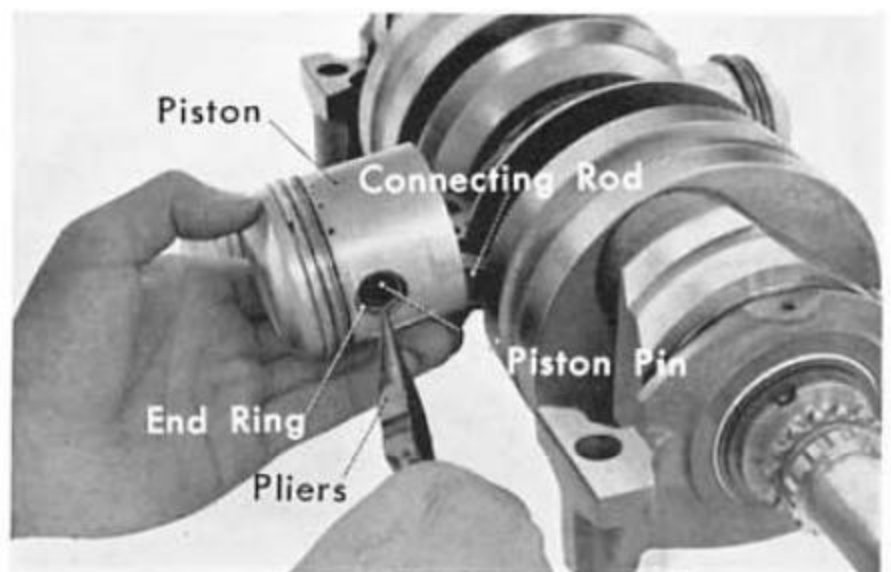


Fig. 1L-2

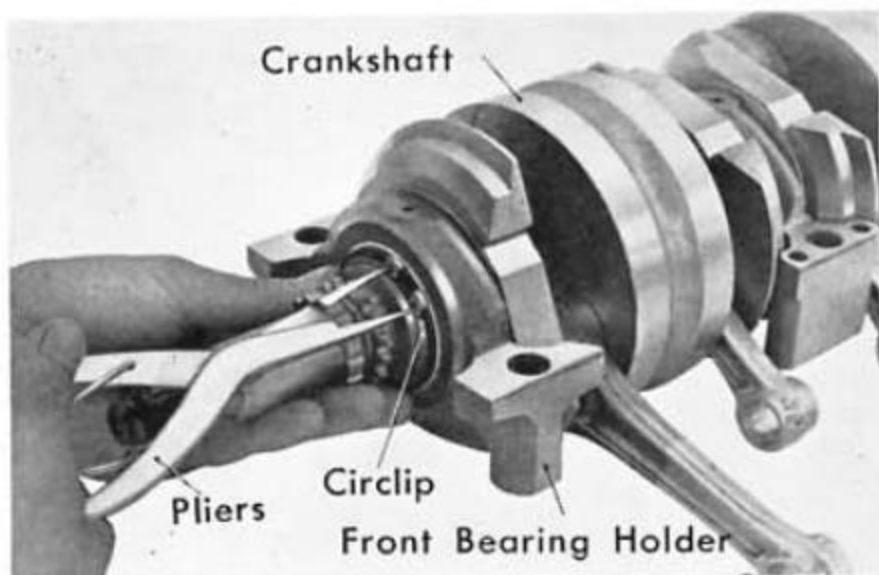


Fig. 1L-3

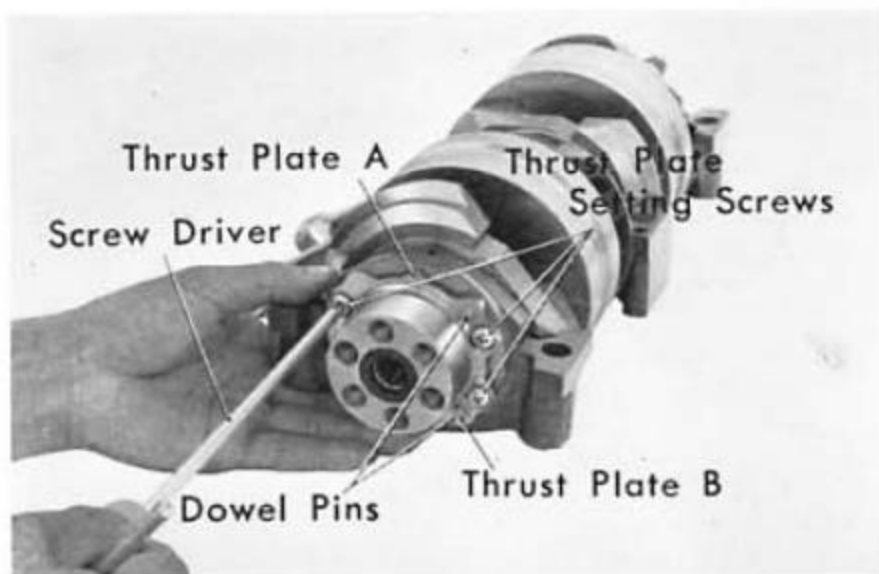


Fig. 1L-4

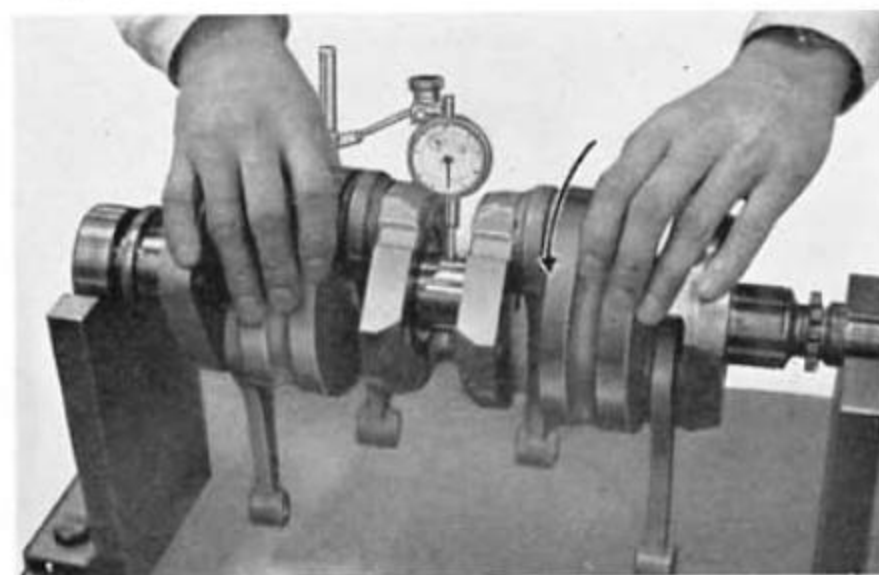


Fig. 1L-5

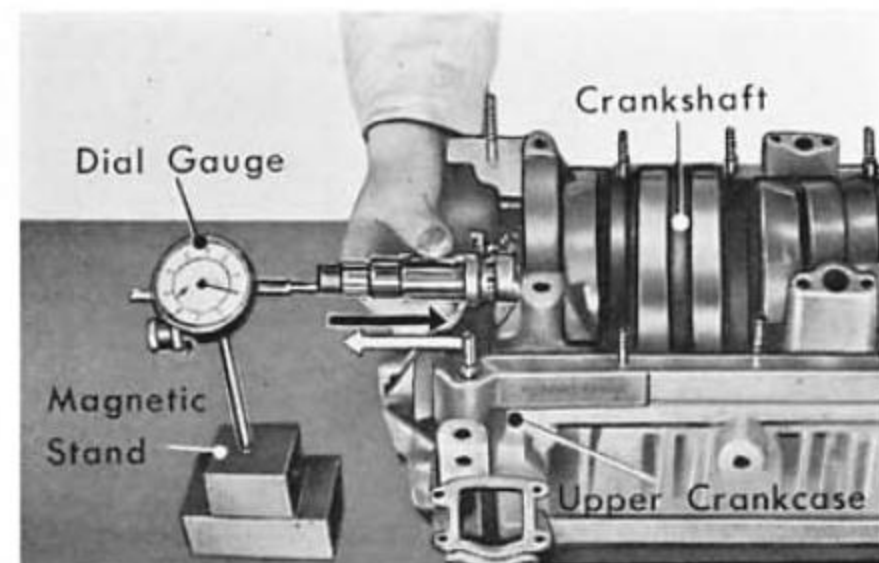


Fig. 1L-6

3. Disassemble front bearing by removing circlip, washer, bearing holder, bearing retainer and rollers (Fig. 1L-3).
The center bearing holder cannot be disassembled.

4. Remove the thrust plate setting screws, thrust plates A (upper) and B (lower) and remove the dowel pins (Fig. 1L-4).
Disassemble rear bearing holder, bearing retainer and rollers.

5. Remove oil seal from the rear of the crankshaft.

b. Crankshaft Inspection

1. Check the distortion in the crankshaft (Fig. 1L-5).

	Standard Value	Serviceable Limit
Distortion	0.01 mm (0.0004")	Replace if beyond 0.05 mm (0.0016")

2. Check crankshaft play parallel to shaft axis (Fig. 1L-6).
If the play is beyond serviceable limit, adjust at the thrust plate.

	Standard Value	Serviceable Limit
Play (parallel)	0.10~0.18 mm (0.004~0.0071")	Repair if beyond 0.35 mm (0.0138")

3. Check crankshaft play normal to shaft axis (Fig. 1L-7).

	Standard Value	Serviceable Limit
Play (normal)	0.008~0.016 mm (0.00032~0.00063")	Replace if beyond 0.5 mm (0.020")

Note :

Take measurement close to the respective holder.

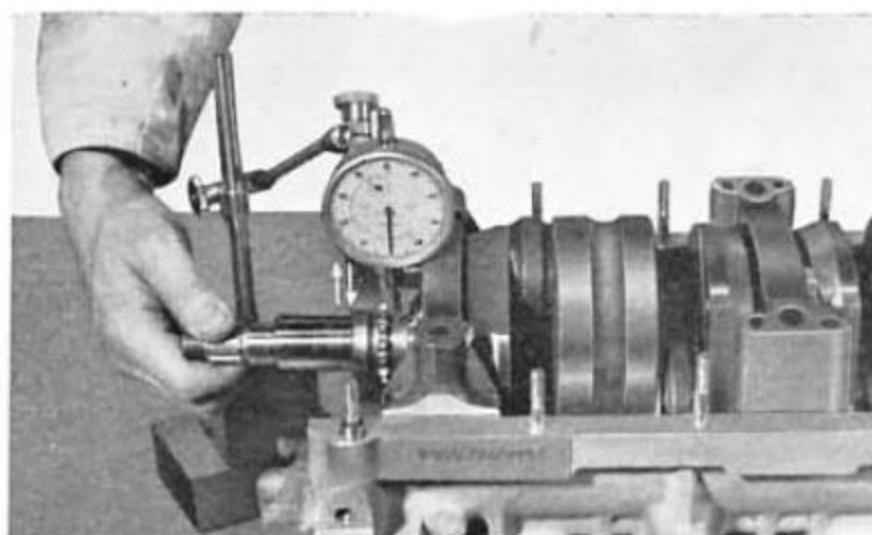


Fig. 1L-7

4. Check connecting rod small end inside diameter (Fig. L-8).

Con-rod small end

	Standard Value	Serviceable Limit
I. D.	18.010~18.025 mm (0.709~0.710")	18.055 mm (0.711")

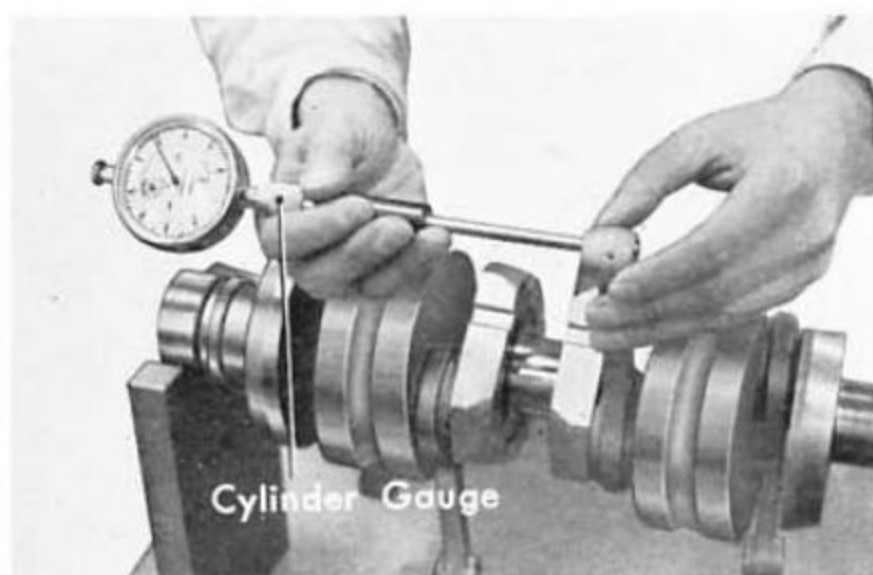


Fig. 1L-8

5. Check the twist and tilt of connecting rod (Fig. 1L-9, 10).

Insert a bar of 100 mm length and the same diameter (17.994~18.000 mm, 0.7084~0.7087") as the piston pin into the connecting rod small end.

To determine the amount of twist in the connecting rod, support the rod horizontally and measure the difference in position at the ends of the bar when twisted to the right and to the left.

	Standard Value	Serviceable Limit
Twist	0.05 mm/50 mm (0.0020"/2")	0.5 mm/50 mm (0.20"/2") max.

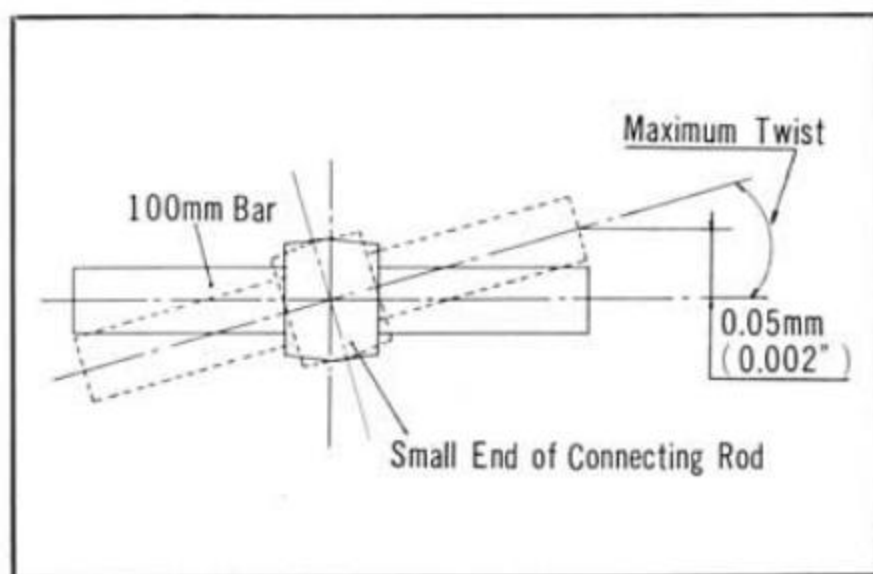


Fig. 1L-9

To determine the parallelism, hold the connecting rod in a vertical position and tilt the rod to both side and measure the difference in height at the ends of the bar when tilted to the right and to the left (Fig. 1L-10).

	Standard Value	Serviceable Limit
Tilt	0~0.03 mm (0~0.012")	2.0 mm (0.079") max.

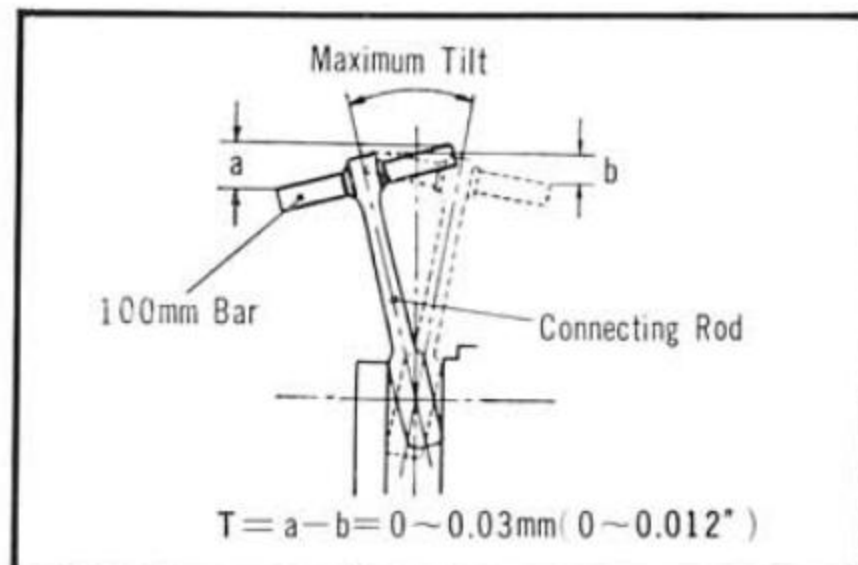


Fig. 1L-10

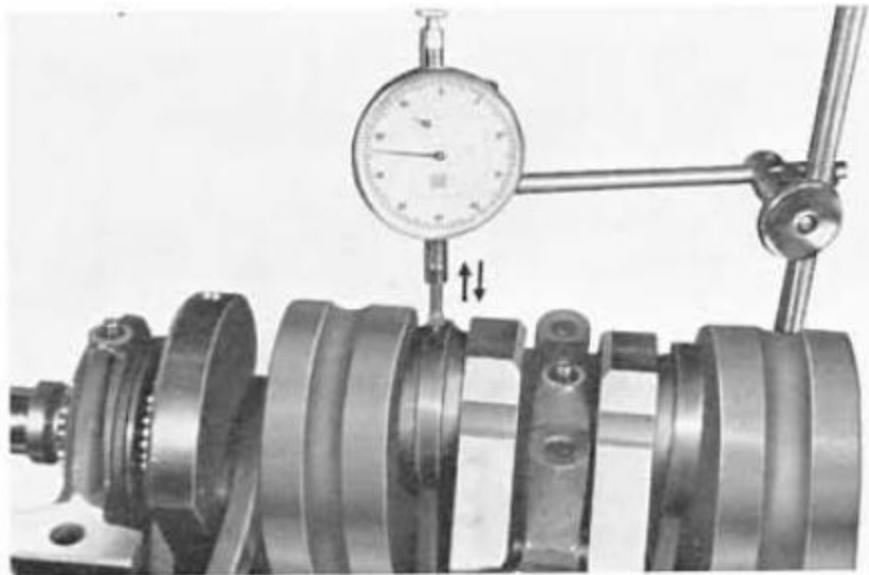


Fig. 1L-11

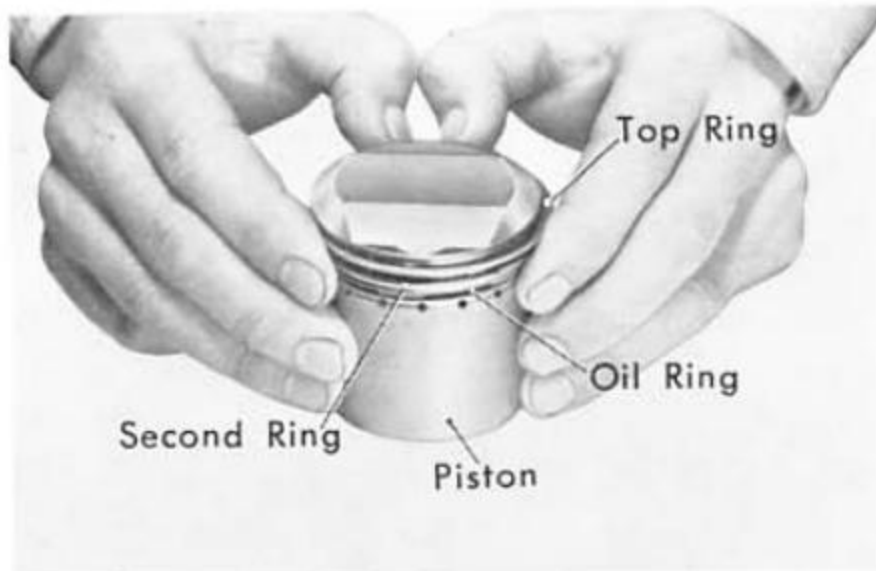


Fig. 1L-12

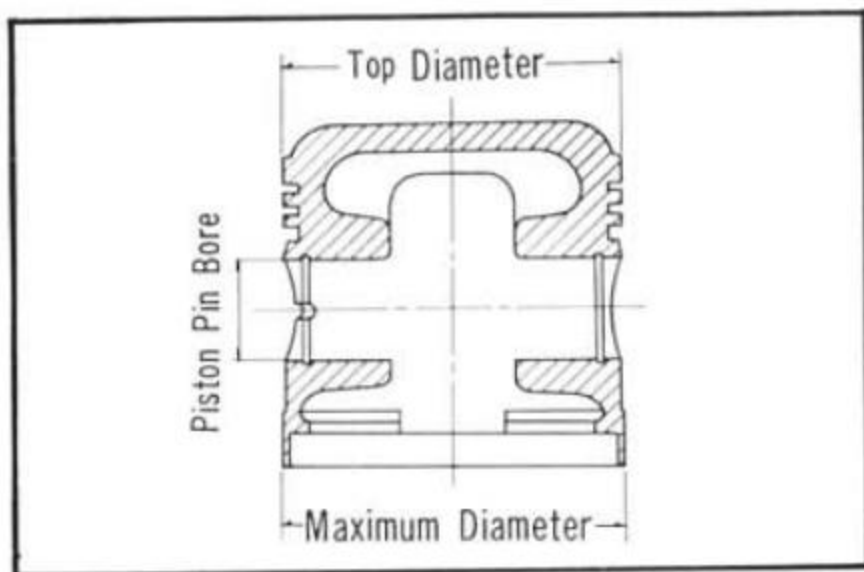


Fig. 1L-13



Fig. 1L-14

- Check the clearance at the connecting rod large end (Fig. 1L-11). Support the crankshaft to prevent it from moving and with a dial gauge, measure the looseness when the connecting rod is moved horizontally and vertically.

	Standard Value	Serviceable Limit
Parallel Clearance	0.15 ~ 0.35 mm (0.0059 ~ 0.0138")	0.5 mm (0.020") max.
Normal Clearance	0 ~ 0.008 mm (0 ~ 0.0003")	0.05 mm (0.002") max.

c. Piston Inspection

- Remove the rings from the piston (Fig. 1L-11).

- Inspection piston diameter (Fig. 1L-13).

Diameter	Standard Value	Serviceable Limit
Top	59.40 ~ 59.45 mm (2.339 ~ 2.341")	Replace if below 59.3 mm (2.335")
Maximum	59.98 ~ 60.00 mm (2.361 ~ 2.362")	Replace if below 59.9 mm (2.360")

Over size pistons

Part No.	Diameter
13102-516-050	Standard + 0.25 mm (0.01")
13103-516-050	Standard + 0.50 mm (0.02")
13104-516-050	Standard + 0.75 mm (0.03")
13105-516-050	Standard + 1.00 mm (0.04")

- Inspect piston pin bore and pin diameter (Fig. 1L-14).

	Standard Value	Serviceable Limit
Piston Pin Bore	18.002 ~ 18.008 mm (0.7087 ~ 0.7089")	Replace if beyond 18.05 mm (0.7106")
Pin Diameter	17.994 ~ 18.000 mm (0.7084 ~ 0.7087")	Replace if under 17.98 mm (0.708")

Remove carbon deposit from top of piston and from the groove without causing damage to the piston; wash off loose deposits.

Do not use sandpaper to remove deposits.

Over size piston pins

Part No.	Diameter
13112-516-000	Standard + 0.1 mm (0.004")
13113-516-000	Standard + 0.2 mm (0.008")
13114-516-000	Standard + 0.3 mm (0.012")

4. Inspect the piston ring side clearance (Fig. 1L-15).

	Standard Value	Serviceable Limit
Rings (compression and oil)	0.015~0.045 mm (0.0006~0.0018")	Replace if beyond 0.1 mm (0.0040")

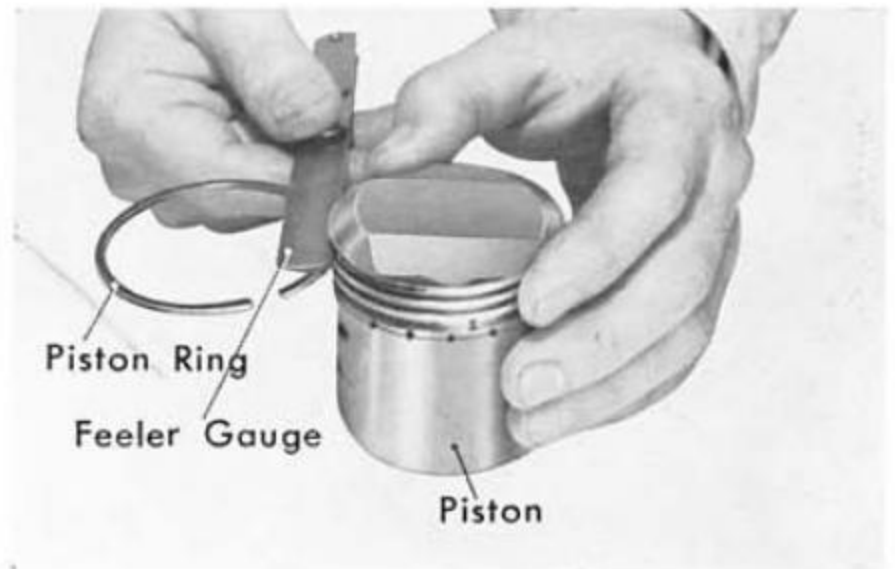


Fig. 1L-15

5. Inspect piston ring tension.

Check ring tension (Fig. 1L-16) with the clearance of ring ends at:

Top & 2nd ring: 0.15~0.30 mm (0.006~0.012")
 Oil ring: 0.1~0.3 mm (0.004~0.012")

Ring Tension	Standard Value	Serviceable Limit
Top	0.95~1.25 kg (2.09~2.75 lbs)	Replace if below 0.82 kg (1.80 lbs)
2nd	0.43~0.75 kg (0.95~1.65 lbs)	Replace if below 0.35 kg (0.77 lbs)
Oil	1.6~2.0 kg (3.52~4.40 lbs)	Replace if below 1.4 kg (3.08 lbs)

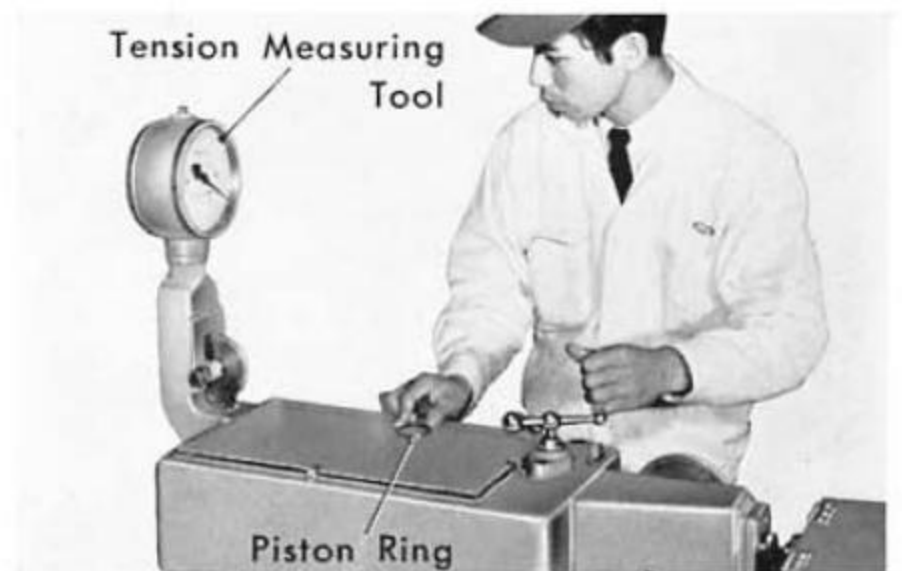


Fig. 1L-16

6. Inspect piston ring end clearance.

Measure the end clearance of the ring with ring inserted normal to the cylinder axis and at a point 15 mm (0.60") from the cylinder skirt. Use a feeler gauge (Fig. 1L-17).

Clearance	Standard Value	Serviceable Limit
Top and 2nd	0.15~0.30 mm (0.006~0.012")	Replace if beyond 0.60 mm (0.024")
Oil	0.1~0.3 mm (0.004~0.012")	Replace if beyond 0.75 mm (0.030")

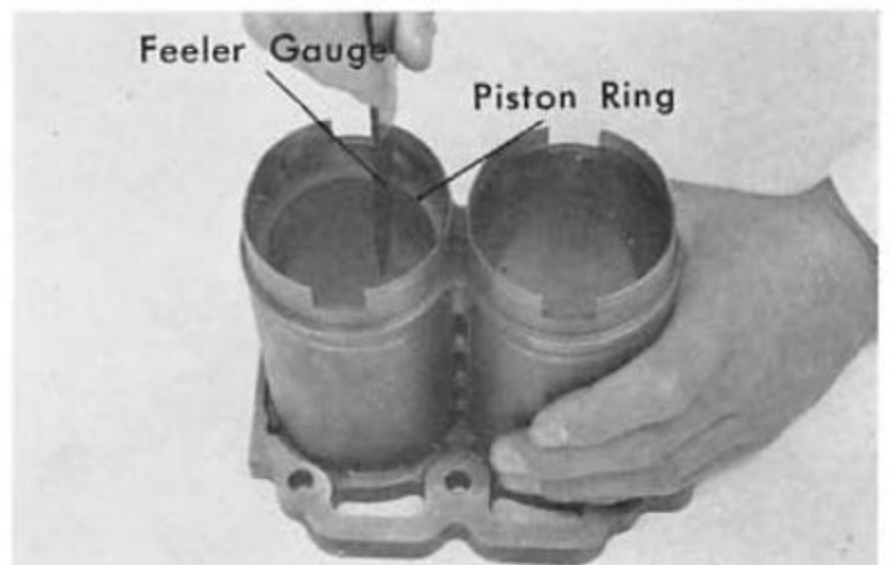


Fig. 1L-17

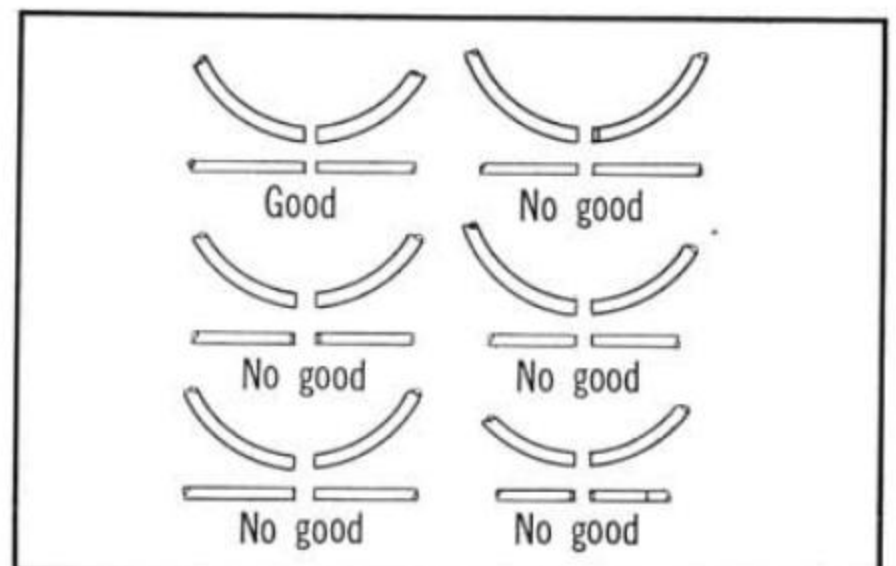


Fig. 1L-18

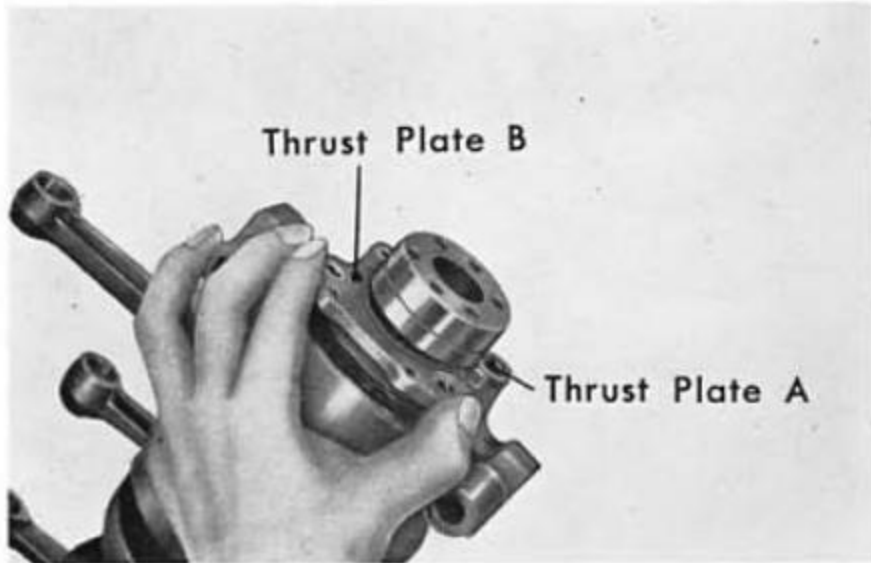


Fig. 1L-19

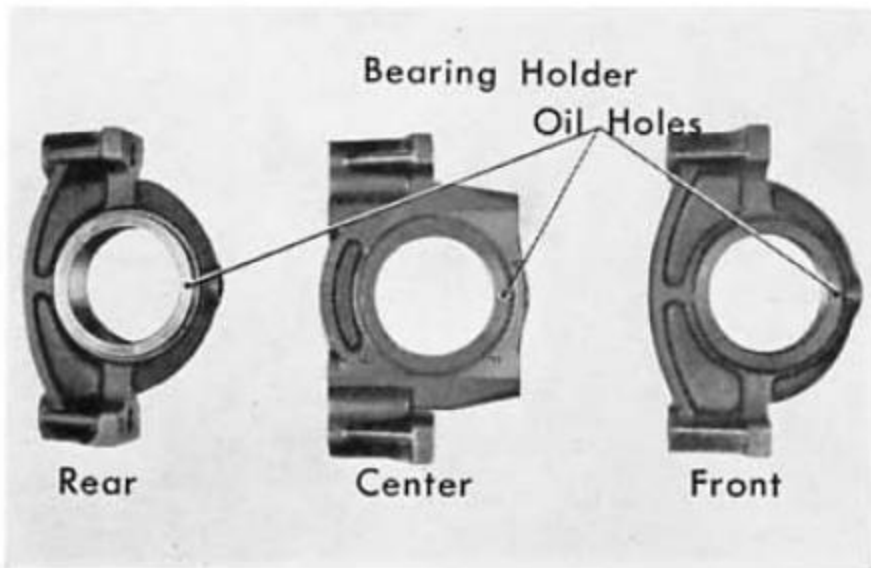


Fig. 1L-20



Fig. 1L-21

d. Crankshaft Assembly and Inspection

1. Position the rear bearing holder with the threaded hole outboard, fit the thrust plates A, B to the crankshaft groove (Fig. 1L-19).

2. Position the front and rear bearing holder oil holes toward the inside and assemble (Fig. 1L-20). The center bearing holder can not be disassembled.

3. Assemble the pistons with the E mark on the piston head toward the direction of rotation and install the piston pins and end rings (Fig. 1L-21). Assemble the piston rings with the manufacture marking toward the top.

4. Inspect the rotation of the crankshaft for smoothness. Position the piston ring ends as shown in the Fig. 1L-22. Keep away the position of ends from the both inlet and exhaust sides.

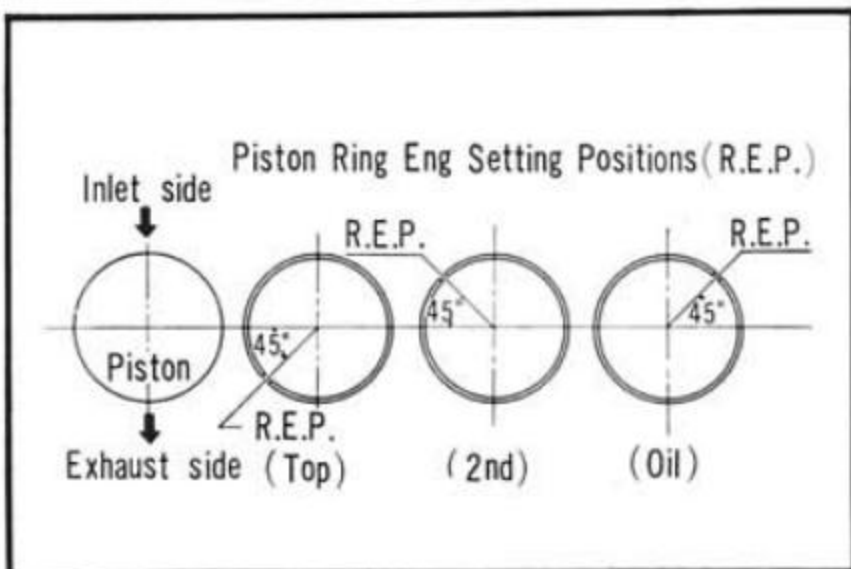


Fig. 1L-22

5. Install the O rings on the three crankshaft bearing holder oil nozzles and the rear bearing holder dowel pin (Fig. 1L-23).

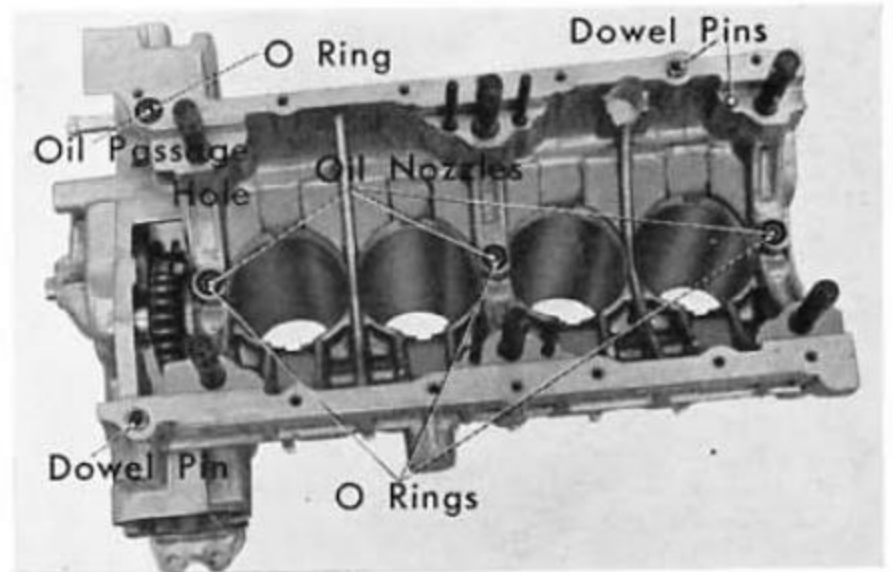


Fig. 1L-23

6. Apply a light coating of oil on the cylinder sleeves and pistons. Gently install the crankshaft assembly into the upper crankcase by using crankshaft setting holder tool (Fig. 1L-24).

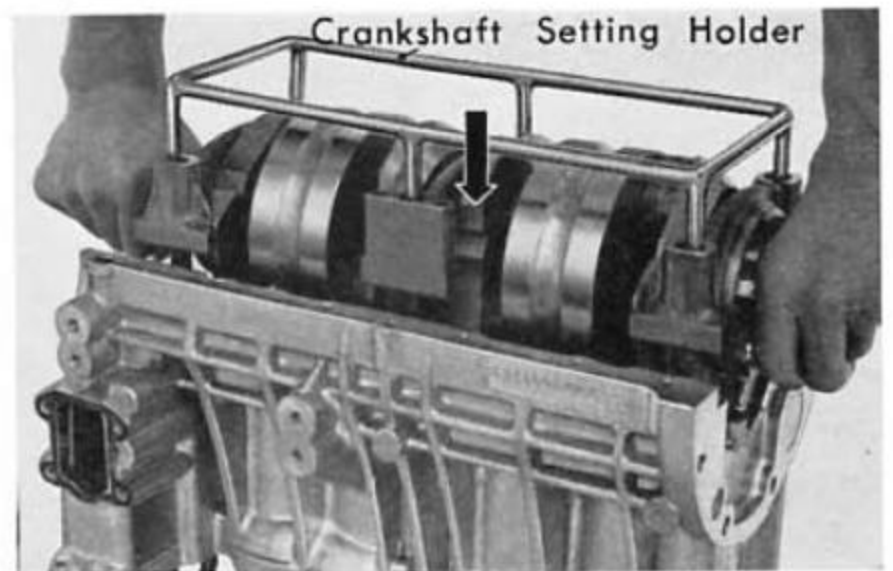


Fig. 1L-24

7. Initially install the crankshaft temporarily, and then follow by final torquing (Fig. 1L-25). Check the rotation of the crankshaft to make sure that the rotation is smooth without any binding in the holders.
8. Make the installation in the reverse order of removal.

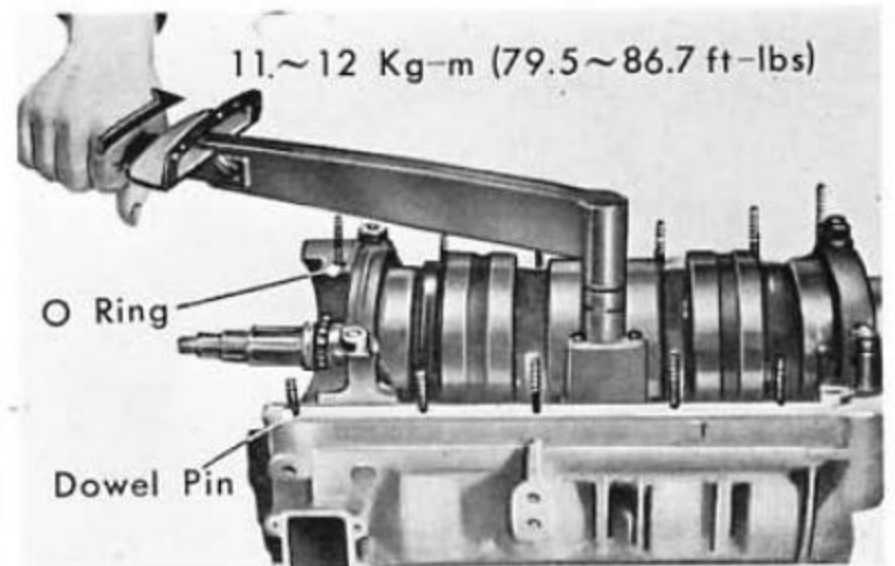


Fig. 1L-25

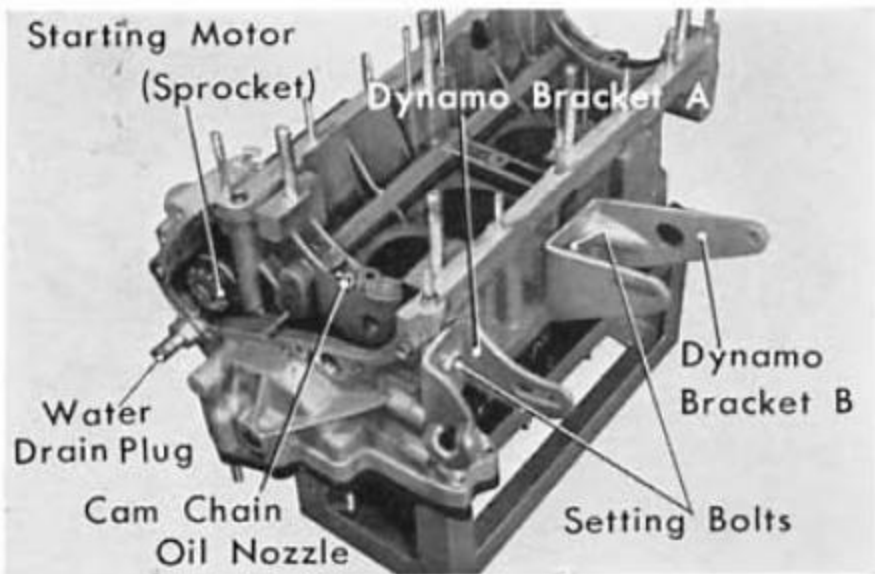


Fig. 1M-1

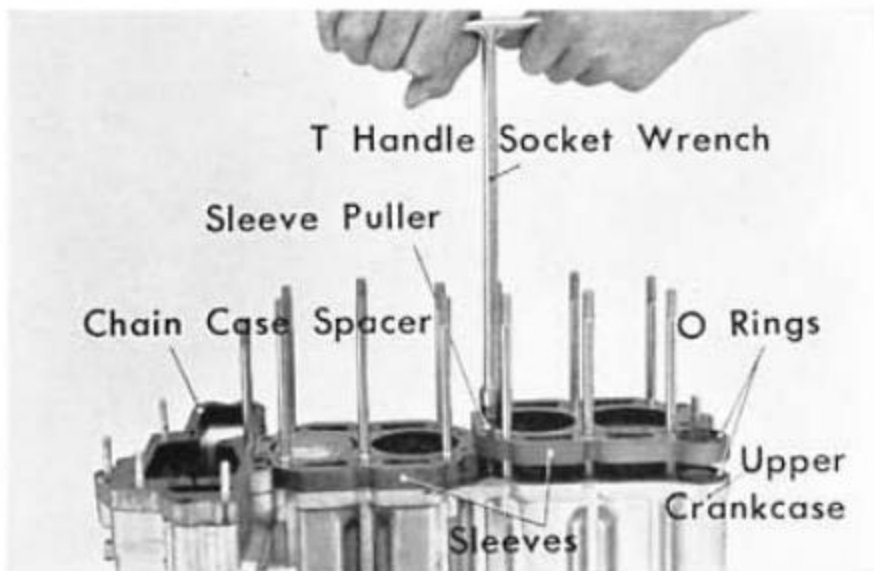


Fig. 1M-2

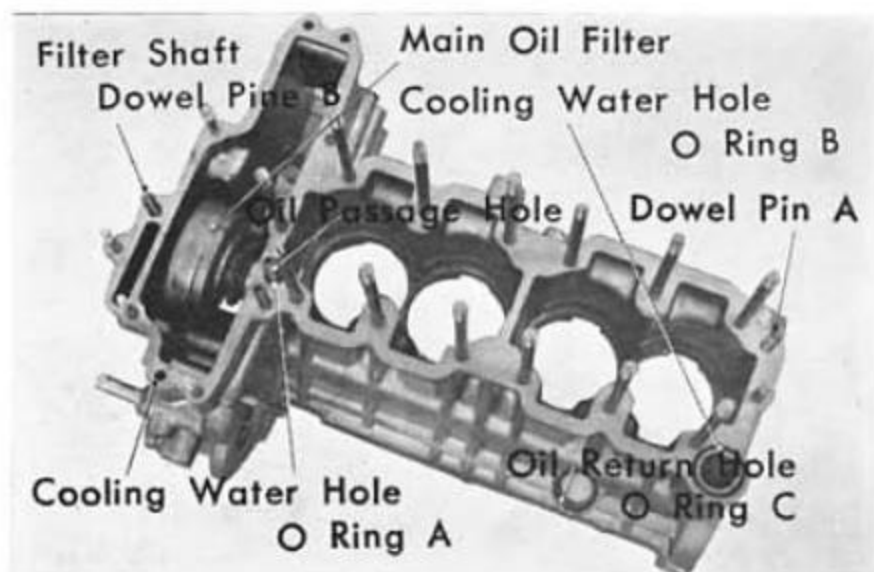


Fig. 1M-3

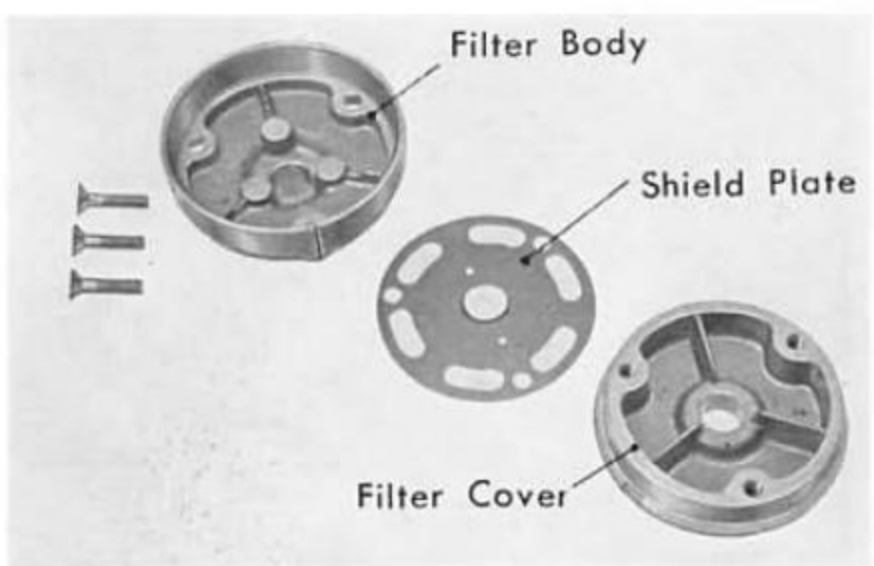


Fig. 1M-4

M. UPPER CRANKCASE

a. Upper Crankcase Disassembly

1. After disassembly of the crankshaft from the upper crankcase, remove the dynamo bracket setting bolts and washers and then remove the dynamo brackets A, B from the upper crankcase (Fig. 1M-1).
2. Remove the starting motor setting bolts and washers and then disassemble the starting motor and O ring.
3. Invert the upper crankcase and install the sleeve puller into the cylinder sleeve threaded hole (Fig. 1M-2).
4. Disassemble the chain case spacer, remove O ring A from the oil passage, O ring B from cooling water hole and the sleeve packing, O ring C from oil return hole (Fig. 1M-3).
5. Remove filter shaft dowel pin with pliers, remove main oil filter shaft, thrust washers and oil filter. Remove screws, insert a screw driver into the groove in the filter cover and disassemble filter cover and shield plate (Fig. 1M-4).

b. Cylinder Sleeve Inspection

1. Inspect the inside diameter, taper and the out-of-roundness of the cylinder sleeve. Take the measurements with a cylinder gauge (Fig. 1M-5).

	Standard Value	Serviceable Limit
Sleeve I.D.	60.02~60.03 mm (0.2363")	Repair if beyond 60.12 mm (0.2367")
Sleeve I.D. (taper and out-of- roundness)	0~0.005 mm (0~0.0002")	Repair if beyond 0.05 mm (0.002")

- (1) At area C, take the measurement in both D_1 and D_2 direction to determine the maximum valve (Fig. 1M-6).
- (2) At area A and C, take the measurement in both D_1 and D_2 direction for the maximum difference to determine the taper.
- (3) At area A, B and C, take the measurement in both D_1 and D_2 direction for the maximum difference to determine the out-of-roundness.

When performing boring, honing should follow the boring with a finish of 1S - 1.5S.

The honing depth should be approximately 0.02 mm (0.0008").

When a replacement piston is installed without boring the sleeve, the ridge should be removed with a ridge reamer.

Cylinders can be made oversize to 1.0mm (0.0394") at intervals of 0.25 mm (0.010"), beyond this, the sleeve should be replaced with one of standard size.

2. Inspect the chain case spacer height (Fig. 1M-7).

	Standard Value	Serviceable Limit
Height	13.985~14.015 mm (0.5506~0.5518")	Replace if beyond 13.9 mm (0.5507")

3. Inspect the flatness of both the cylinder sleeve and chain case spacer. (Fig. 1M-8)

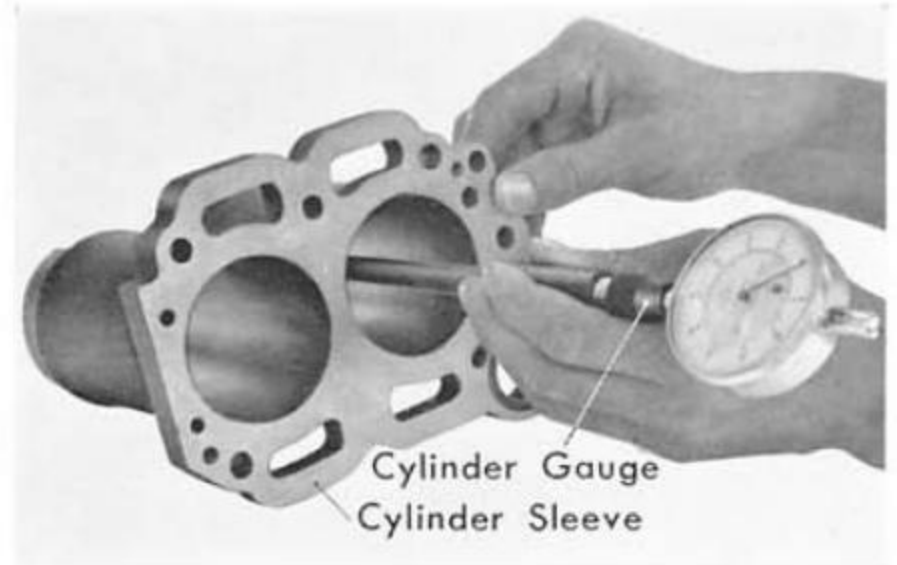


Fig. 1M-5

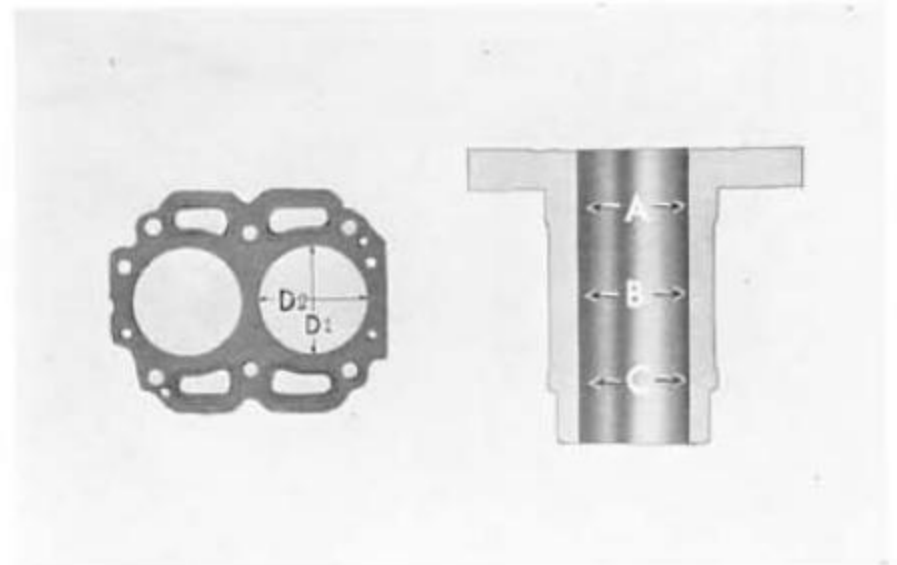


Fig. 1M-6

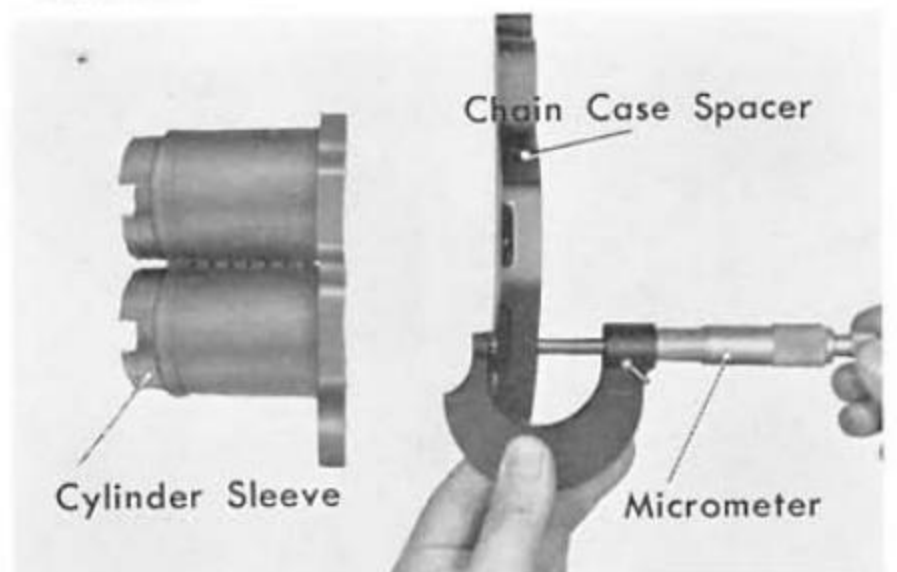


Fig. 1M-7

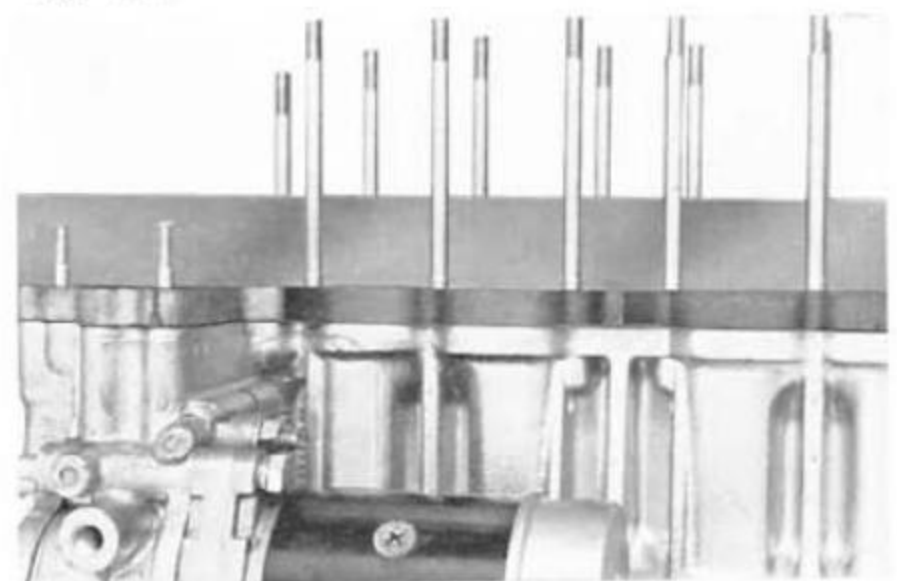


Fig. 1M-8

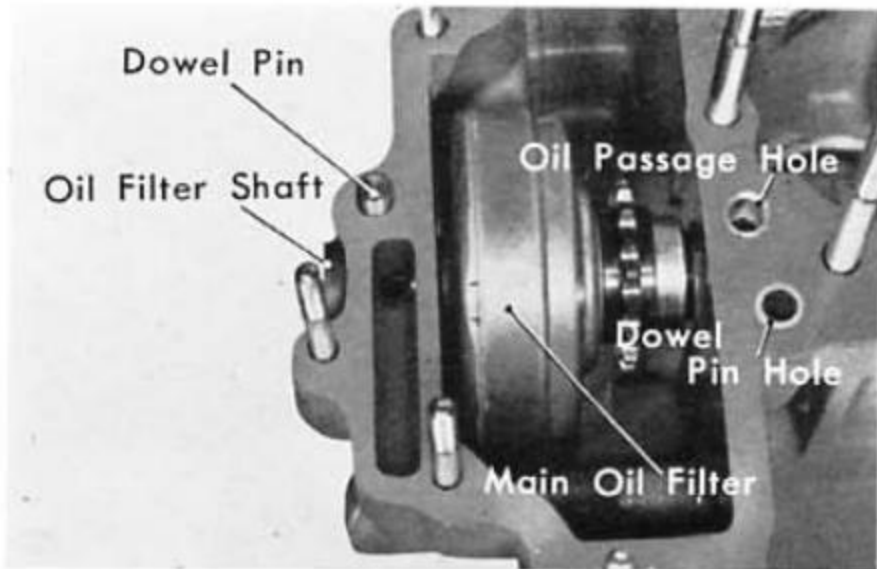


Fig. 1M-9

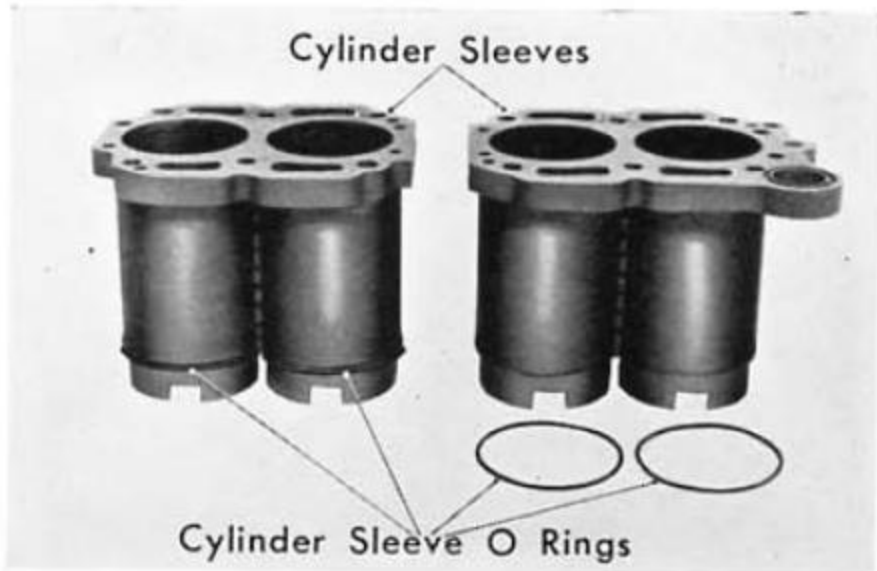


Fig. 1M-10

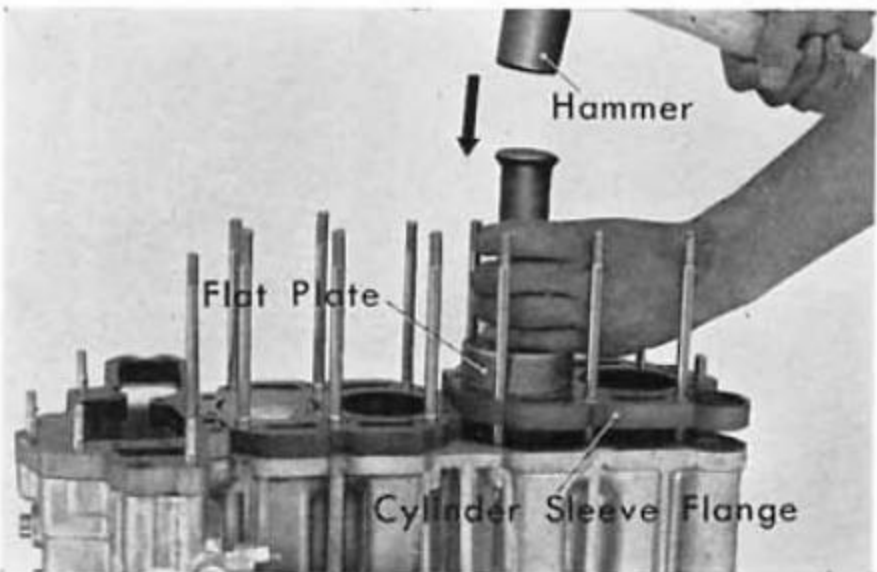


Fig. 1M-11

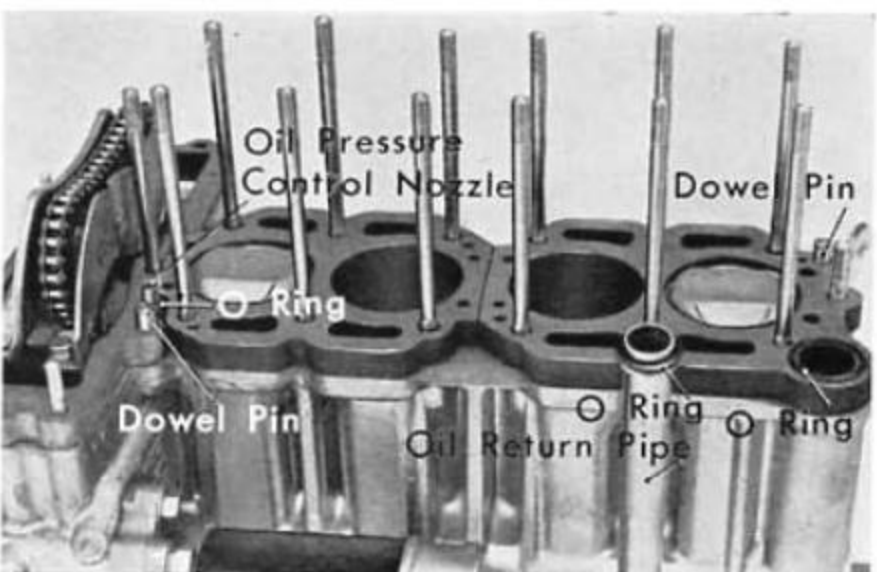


Fig. 1M-12

c. Upper Crankcase Assembly

1. Install the thrust washers at both ends of the oil filter and insert the assembly. Install a dowel pin into the shaft cutout (Fig. 1M-9). Do not install the dowel pin into the oil hole.

2. Install the O rings on the outside of the cylinder sleeve (Fig. 1M-10) and insert into the upper crankcase. Place a flat plate over the cylinder sleeve flange and drive with a hammer (Fig. 1M-10). Do not forget to install the sleeve gasket.

3. Do not forget the O rings, dowel pins and oil pressure control nozzle (Fig. 1M-12).

N. ENGINE FINAL INSPECTION AND ADJUSTMENT

a. Chain Tensioner Adjustment

1. Turn the crankshaft belt pulley in the clockwise direction and position the No. 1 cylinder to the top-dead-center (Fig. 1N-2).

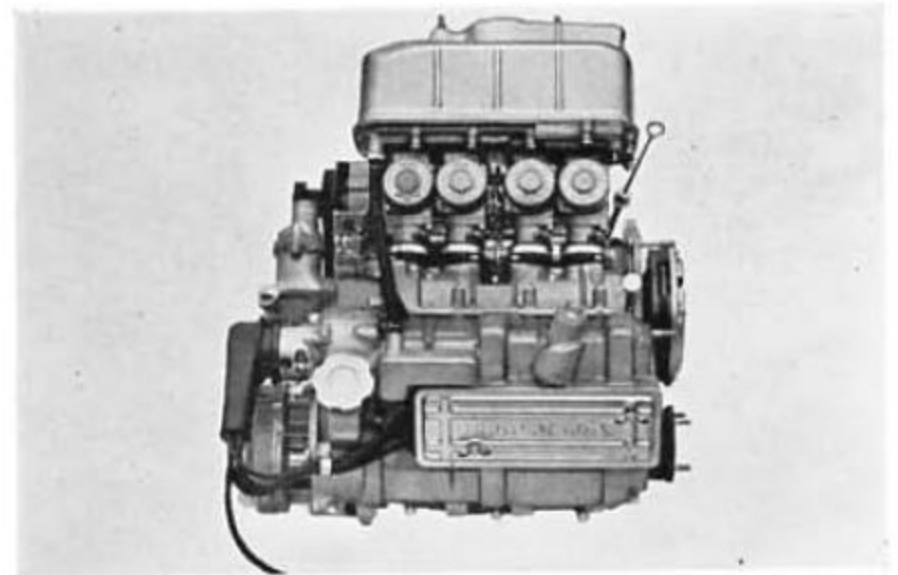


Fig. 1N-1

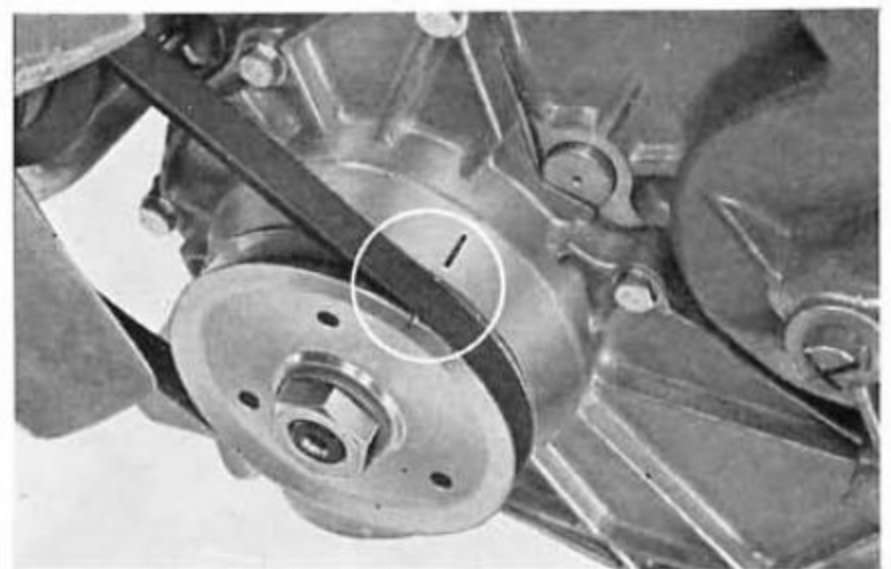


Fig. 1N-2

2. Loosen the chain tensioner lock bolt at least three turns, tap the top of the tensioner pushbar gently with a soft hammer and then tighten the lock bolt (Fig. 1N-3).

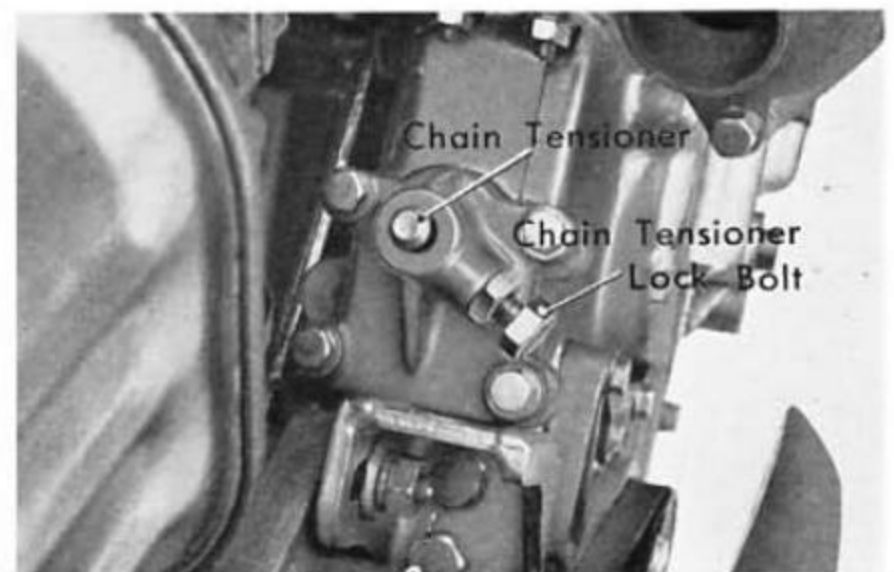


Fig. 1N-3

b. Inspection of Oil Circulation

Start the engine and loosen the oil check plug (Fig. 1N-4).

The proper lubrication can be determined by the seepage of the oil.

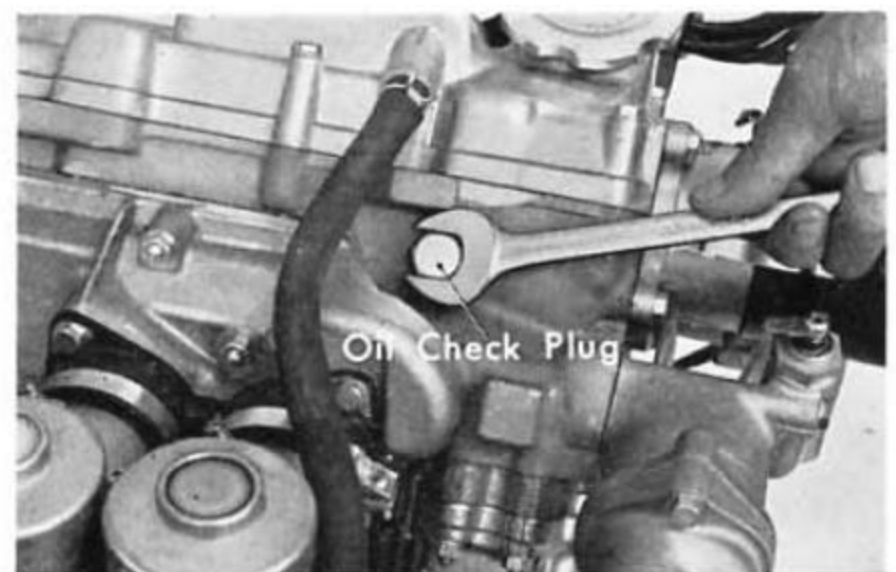


Fig. 1N-4



Fig. 1N-5

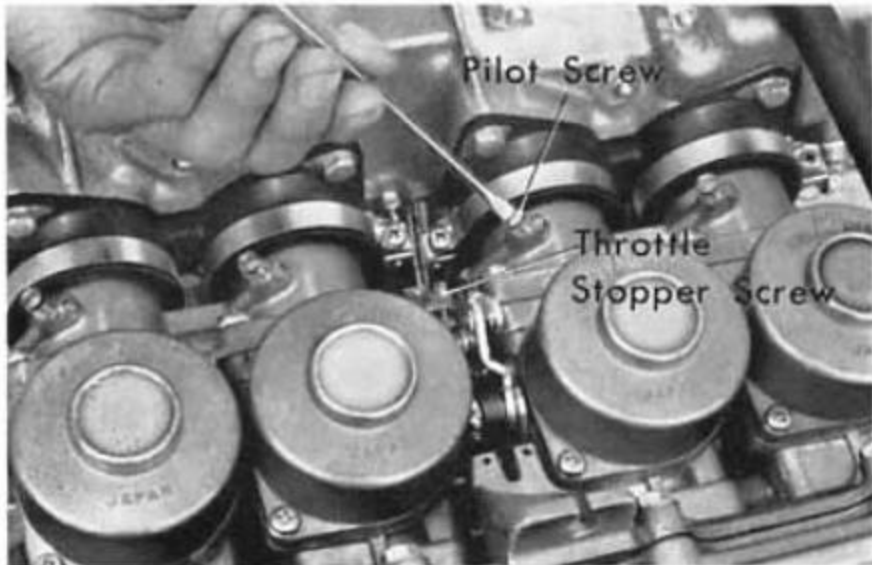


Fig. 1N-6

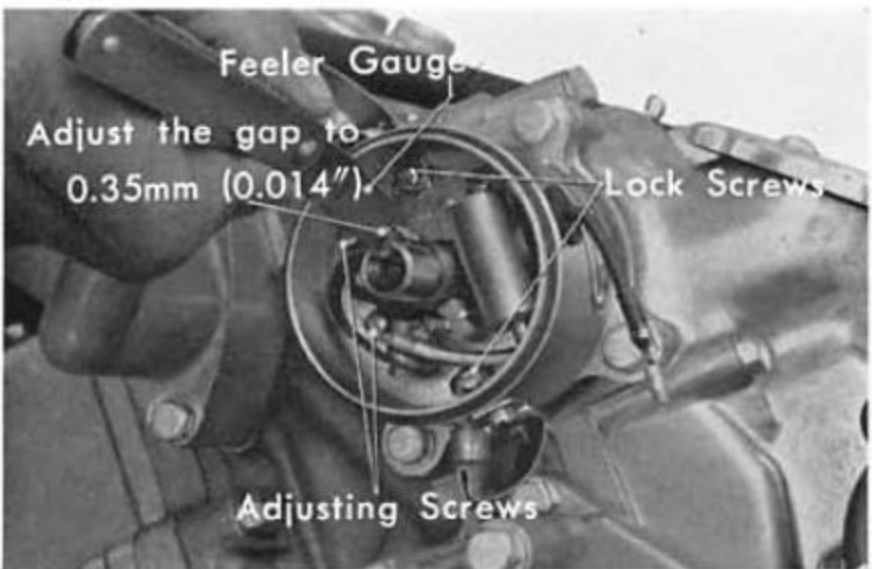


Fig. 1N-7

c. Inspect Cylinder Compression Pressure

Remove spark plug and install compression gauge in the spark plug hole (Fig. 1N-5).

With the accelerator depressed fully, engage the starting motor and record the indication on the compression gauge.

The compression pressure should be over 11.5kg/cm² (163.6 lb_s/in²) at 1,000 r.p.m.

Perform fan belt and ignition timing adjustment.

d. Adjustment of Carburetor

1. A single throttle stop screw is provided to uniformly adjust the slow speed (idling) of all four carburetors.

The normal idling speed is 1,200 ~ 1,300 r.p.m. Always adjust the carburetors after the engine has attained normal operating temperature.

2. The standard idling adjustment of air pilot screw is $\frac{3}{4}$ turn open from full close, however, disregard the standard setting and adjust the carburetors to the maximum RPM by the pilot screws indicated in the Fig. 1N-6 and then back off $\frac{1}{8}$ turn.

By tightening the pilot screw, the fuel mixture becomes lean; loosening the screw will richen the mixture.

Perform the adjustment to all four carburetors in the same manner.

e. Distributor Point Gap Adjustment

Remove the distributor cap, turn the crankshaft pulley so that the point gap is at its maximum, and in this position, adjust the gap to 0.3~0.4 mm (0.01 ~ 0.016"). Make the adjustment by loosening two adjusting screws shown on the Fig. 1N-7 and adjust the point gap by the slot in the point arm. Tighten the lock screws upon completing adjustment.

2. CARBURETOR

A. DESCRIPTION

The S800 has an engine of broad operating speed range with a specially high power output and, therefore, the carburetor mounted on this engine is a two stage multiple unit type designed to provide the necessary performance.

Consistent with the increase in horsepower of the engine, greater air intake volume is required. This means a gradual increase in the bore of the carburetor is required. To meet with this requirements, four unit constant vacuum, two stage multiple carburetor has been developed for the S800. The slow speed, intermediate speed with light loading range is performed by the primary stage; the high speed and heavy loading range is performed by the secondary stage.

The CV carburetor is designed with a single large venturi (equivalent to these secondary venturi) to which a vacuum piston protrudes to restrict the opening and causes it to function as a primary venturi (Fig. 2C-1). The increase in engine suction pressure causes the vacuum piston to automatically raise, controlling the air flow into the cylinder at a constant volume. During the maximum power output, the vacuum piston rises completely to the top to permit the secondary venturi to fully operate. As the secondary venturi starts to operate, the venturi area changes gradually and functions as a variable venturi, the air flow which passes through the venturi does not drop but rather increases slightly in velocity as shown in Fig. 2A-5.

In order to satisfy the requirements of the engine, the volume of air taken into the engine must increase in relation to the RPM (N) of the engine, shown as Q in Fig. 2A-1. This is true with any type of carburetor used.

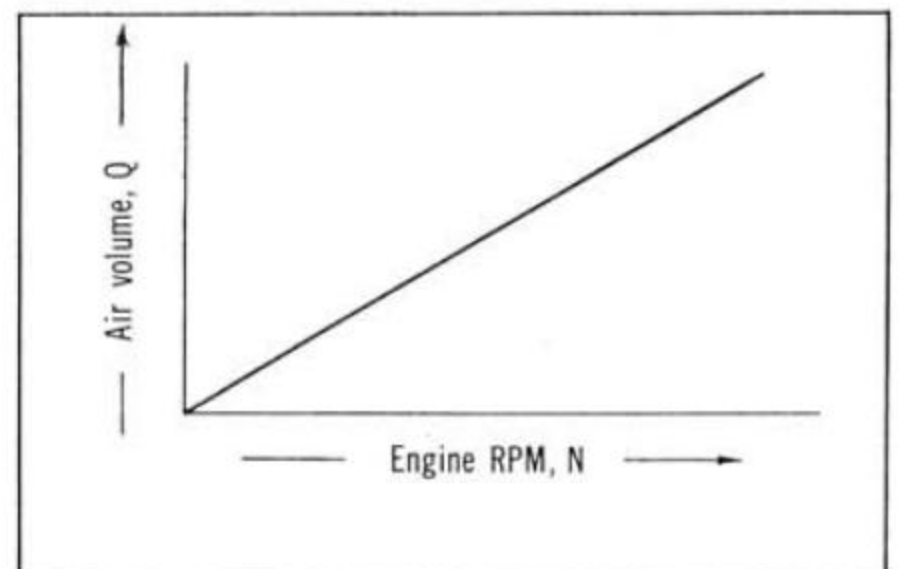


Fig. 2A-1

Disregarding the other components of the carburetor for the present and considering only the venturi, the volume of air flowing through the venturi at the air velocity V is as shown in Fig. 2A-2. In other words, the amount of air taken into the cylinder is expressed as Q in the equation below.

$$Q = A \times V$$

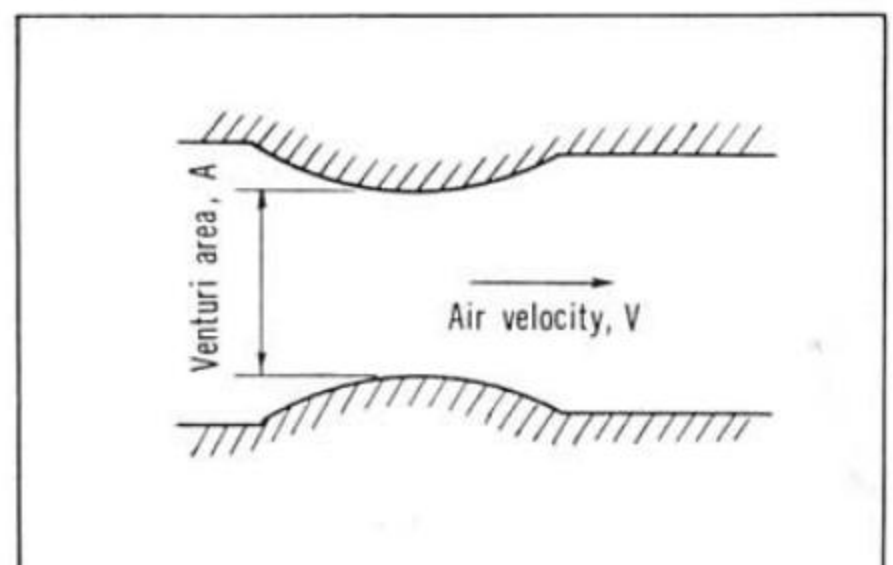


Fig. 2A-2

2-2 CARBURETOR

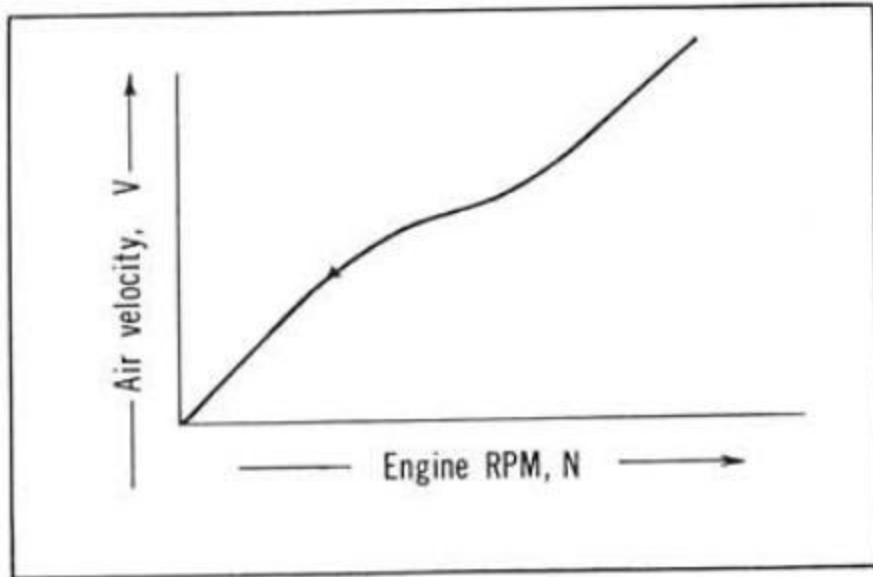


Fig. 2A-3

With the existing fixed venturi carburetor, the venturi area A remains constant and the air velocity increases in relation to the increase in engine RPM. In the case of a high speed, high performance engine, a light lag in air velocity will develop in the region of intermediate speed as shown in Fig. 2A-3.

Fig. 2A-4, 5, 6 show the CV carburetor performance including the venturi area, air velocity, and the flow volume. It indicates that at range ①, prior to the opening of the vacuum piston with the piston still all the way at the bottom and functioning as a primary venturi, area remains constant. The operation of the carburetor in this range is identical to that of the fixed venturi carburetor explained above, the air velocity changing in relation to the RPM of the engine and the air volume Q also increases with the RPM.

When the engine speed is in the range ②, the vacuum piston starts to open and the venturi area begins to vary in relation to the RPM of the engine.

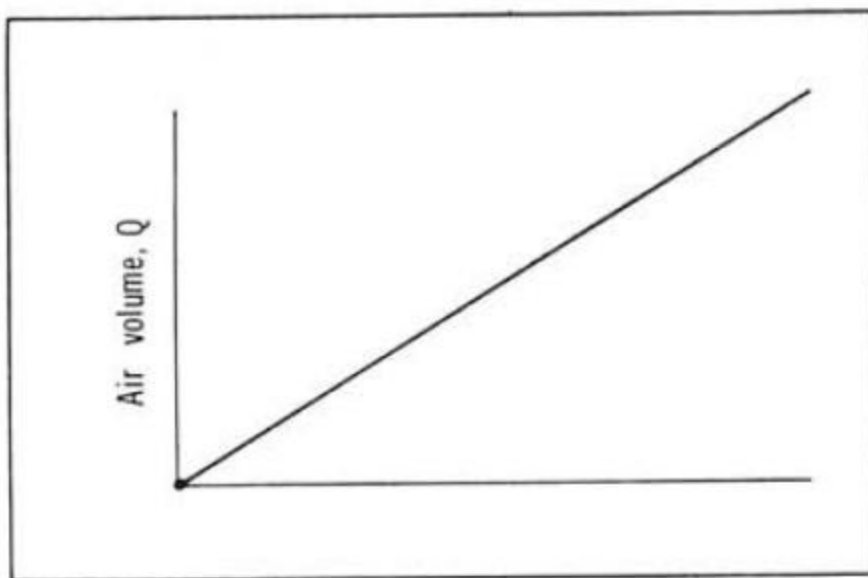


Fig. 2A-4

The air flow velocity does not increase but is maintained constant and as a result, only the flow volume increases in relation to the rise in engine RPM. Finally when the piston is fully raised as indicated in range ③, it is now functioning as a secondary venturi and the carburetor operation is similar to a fixed venturi carburetor having the same venturi area. It performs identical to the range ① where the air velocity varies and the air flow volume increases with respect to the increase in the RPM of the engine.

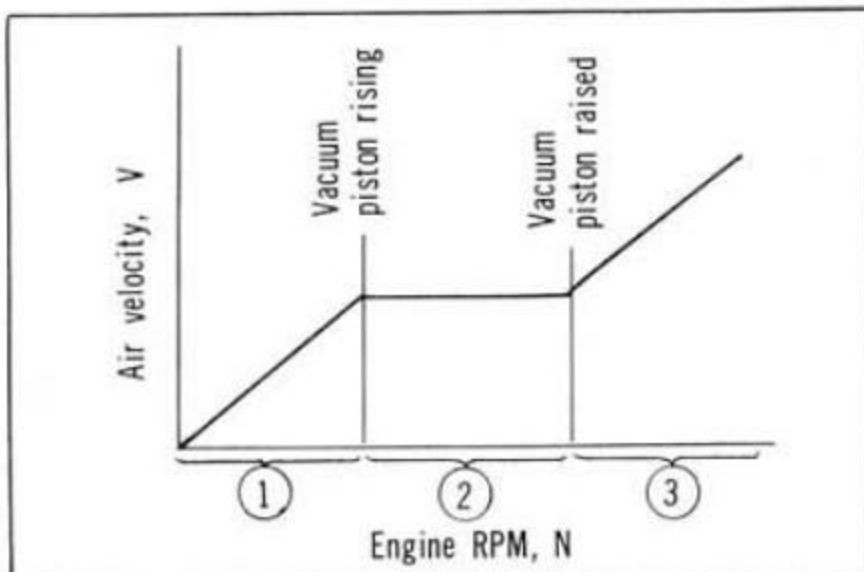


Fig. 2A-5

As a result, the air inlet volume Q to the engine will increase or decrease, corresponding to the RPM of the engine regardless of whether the venturi is fixed or in the state of changing. This performance is shown in Fig. 2A-4.

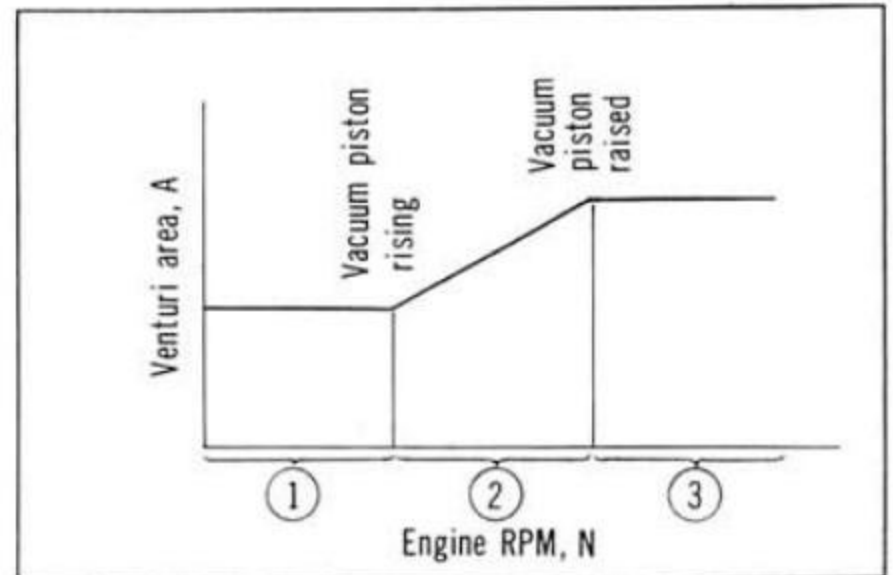


Fig. 2A-6

B. SPECIFICATIONS

Engine Type	S800E			
Carburetor Type	1000-338-00			
Bore	17 mm (0.669 in) nominal (Secondary=30 mm (1.181 in)			
Main Jet	Primary # 80		Secondary # 115	
Air Jet	Primary # 60		Secondary # 80	
Air Bleed	① 0.6×2	④ 0.6×2	①	④ 0.7×2
	②	⑤ 0.6×2	②	⑤ 0.7×2
	③ 0.6×2	⑥ 0.6×2	③ 0.7×2	⑥
Needle Jet	R3.2 mm (0.126 in) - 2.6 mm (0.102 in) - 3 mm (0.118 in) exposed			
Jet Needle	174002 (4°00', 2.55φ)			
Slow Jet	# 38 (0.6 mm (0.024 in) × 2 × 3)			
Slow Air Jet	Off-idle (# 70 equivalent)			
Bypass	① 0.9 mm (0.035 in)	② 0.9 mm (0.035 in)	③ 0.9 mm (0.035 in)	
Pilot Outlet	1.0 mm (0.039 in)			
Pilot Screw	1 1/8 ± 1/8			
Throttle Valve	9°-0.9 t			
Fuel Level	19 mm (0.748 in) ± 1 mm (0.039 in)			
Valve Seat	1.0 mm (0.039 in)			
Vacuum Piston Spring	ℓ = 53 mm (2.087 in), n = 18d = 0.7 mm (0.028 in) Labyrinth			
Setting Mark	30-J			

C. CONSTRUCTION AND OPERATION

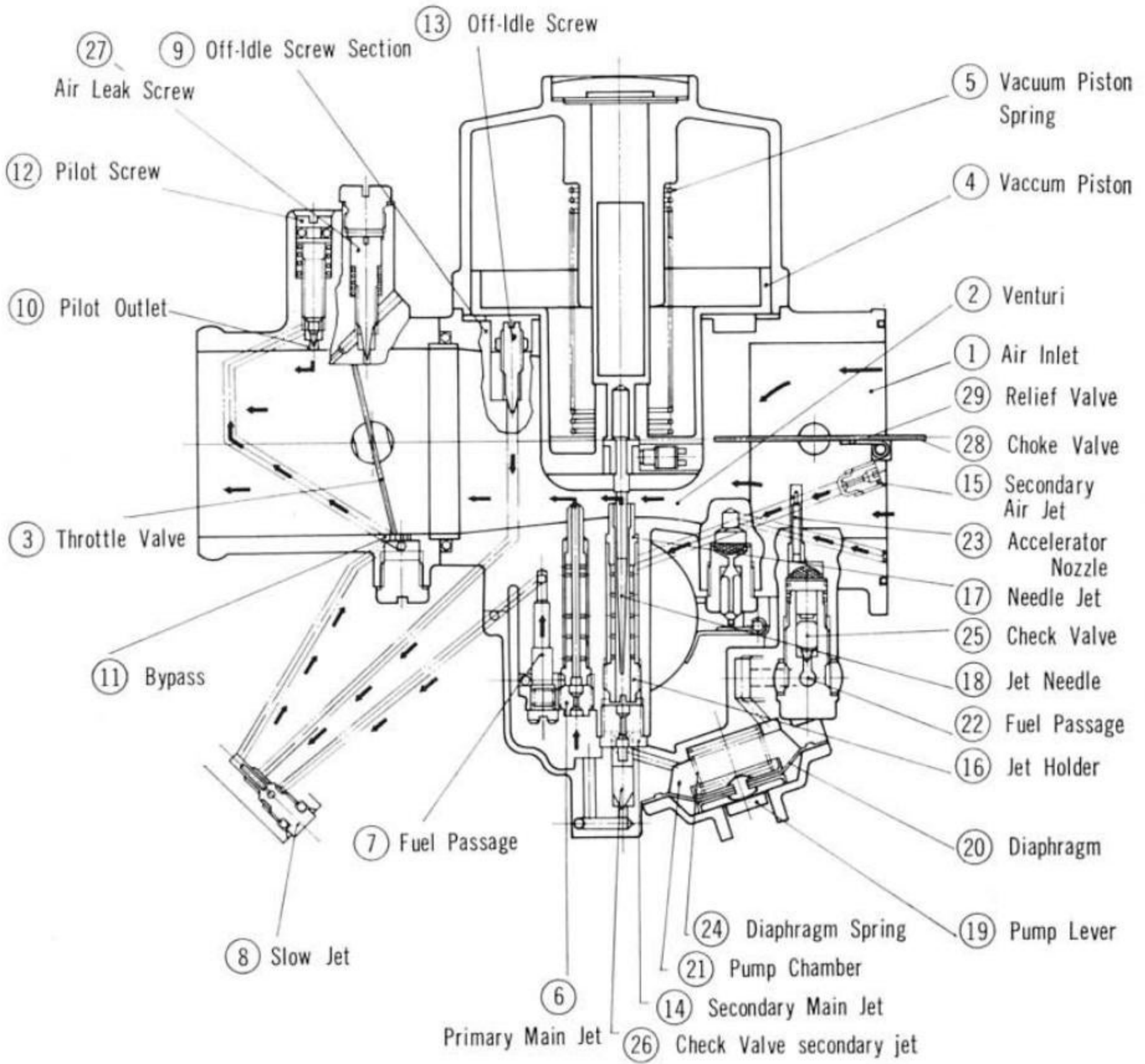


Fig. 2C-1

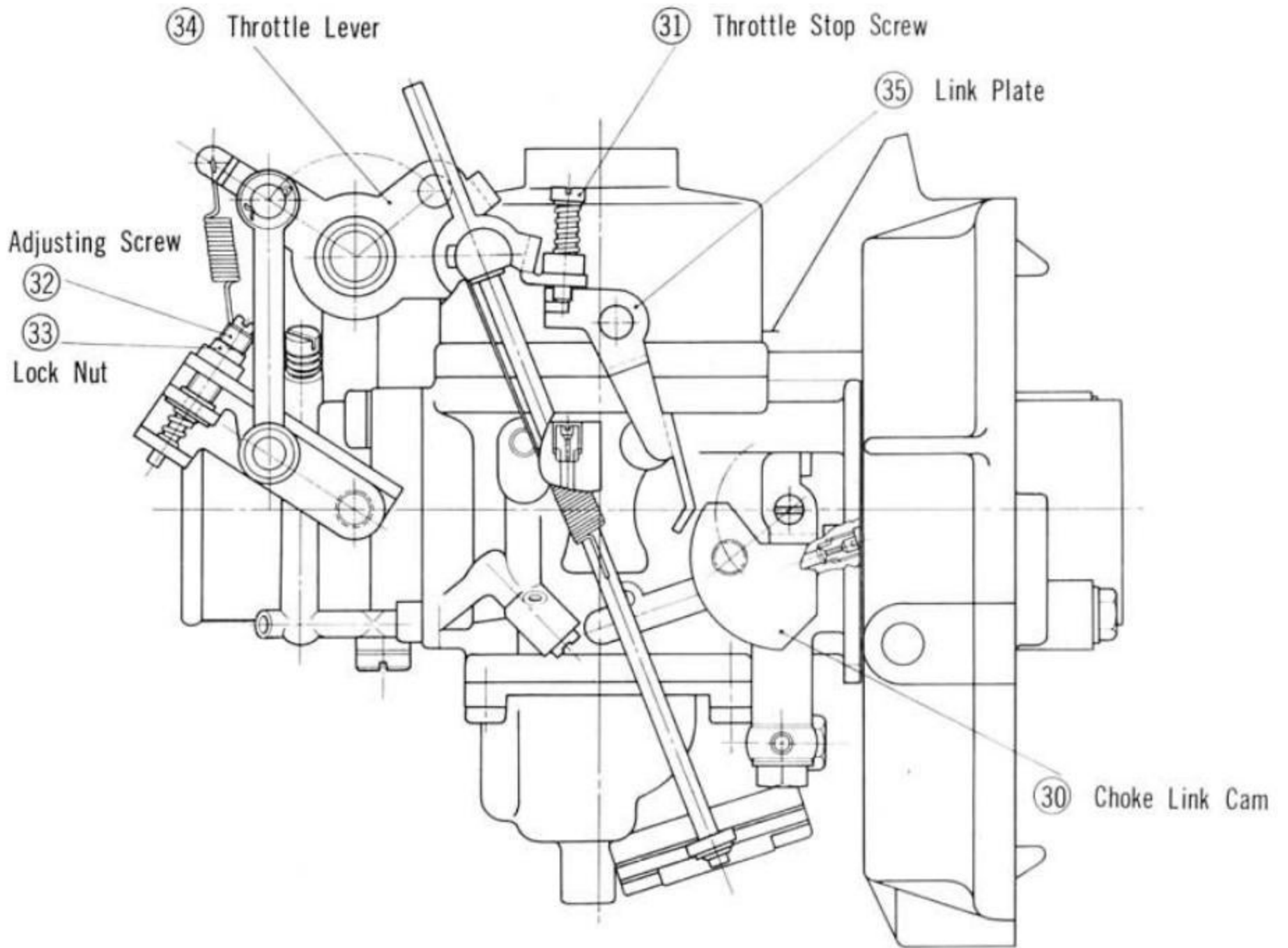


Fig. 2C-2

2-6 CARBURETOR

1. Air Flow System (Fig. 2C-1)

The air which is filtered by the air cleaner flows through the air inlet ①, venturi section ②, throttle valve ③ and enters the cylinder through the inlet port. The vacuum piston ④ protrudes into the venturi section by the action of the vacuum piston spring ⑤ and the venturi is held toward the closing side. When there is only a small amount of air being taken into the engine, the vacuum piston is in the lowest position, forming the primary venturi. The air flow through the venturi section is maintained at a constant velocity. With an increase in the air flow, the vacuum pressure in the venturi rises, causing the vacuum piston to rise due to the greater negative pressure applied to the top of the piston and the venturi area increases by the amount of the rise of the piston. This is in proportion to the vacuum pressure and in this way a constant flow of air is maintained. When the engine approaches maximum RPM, the vacuum piston is at the highest point and forms the secondary venturi to provide sufficient venturi area for maximum power output.

2. Fuel Flow System

The fuel flow system is divided into the main and slow systems with the main system being further divided into the primary system and secondary system. This is generally referred to as the double nozzle system.

a. Slow System (Fig. 2C-1)

The fuel which enters the primary main jet ⑥ passes through fuel passage ⑦ to the slow jet ⑧ where it is metered and at the same time mixes with the air from the off-idle screw section ⑨ (equivalent to the slow air jet). This fuel mixture is then discharged from the pilot outlet ⑩ and bypass ⑪ located in the vicinity of the throttle valve.

The pilot screw ⑫ is installed within the pilot outlet to regulate the fuel mixture. Further, to provide a uniform fuel mixture discharge at the nozzle, an off-idle screw ⑬ is installed in the off-idle screw section to regulate the air sent to the slow jet. The regulating system which adjusts the slow air is normally referred to as off-idle design. The off-idle screw is properly adjusted at the carburetor manufacturer and does not normally require adjustment.

b. Primary System

Part of the fuel which enters the primary main jet enters the slow speed system described above, but the major portion of the fuel is mixed with the air from the primary air jet within the main nozzle and is discharged from the main nozzle within the venturi section.

c. Secondary System (Fig. 2C-1)

The fuel which enters the secondary main jet ⑭ is mixed with the air from the secondary air jet ⑮, within the needle jet holder ⑯ and is discharged from the needle jet ⑰, however, while the vacuum piston is operating, the air flow hardly changes, as shown in Fig. 2A-5 and therefore, the pressure in the vicinity of all the jets are constant. The result is that fuel flow does not increase in the same proportion to the air volume. To correct this condition, a jet needle ⑱ is installed in the secondary system to regulate the fuel and provide proper fuel flow.

3. Float System

The carburetor must provide a proper mixture of fuel and air at different throttle openings and engine speeds. In order to accomplish this, the fuel in the carburetor must be maintained at a constant level. This function is performed by the float chamber.

4. Accelerator Pump (Fig. 2C-1)

During acceleration, there is a tendency for a momentary decrease in the amount of fuel in proportion to the intake of air. In order to compensate this condition and to enrich the fuel mixture for this short period of time so that good acceleration can be obtained, an accelerator pump is incorporated in the carburetor. When the accelerator is stepped on, the pump lever ⑲ is actuated, pushing against a diaphragm ⑳, forcing the fuel out of the pump chamber ㉑ and through passage ㉒ to discharge the fuel out of the respective nozzles ㉓. Letting up on the accelerator pedal allows the pump lever to return, the diaphragm forced back by the action of the diaphragm spring ㉔ and the pump chamber refilled with fuel from the float chamber. The inlet and outlet sides of the pump chamber incorporates their respective check valves ㉕ and ㉖ to control the fuel.

5. Air Leak Screw (Fig. 2C-1)

The CV carburetor used on this S800 is a multiple carburetor incorporating four units. During slow speed operation there are differences in the volume of air taken into the respective cylinders, this is due to the difference in accumulated tolerances of the different carburetors. The air leak screw (27) functions to correct this variance in air flow by controlling the amount of air flow. By tightening the air leak screw, the amount of air taken into the cylinder will be reduced, and when the screw is loosened, the amount of air taken into the cylinder will increase. This adjustment has been set by the manufacturer to the best condition, therefore, adjustment is normally not required.

6. Choke (Fig. 2C-1, 2)

For starting in cold weather, a rich fuel mixture is momentarily required; to serve this purpose, a choke valve (28) and a fast idling feature are incorporated in the carburetor. A relief valve (29) is included in the choke valve and is held closed by the spring. By pulling out the choke button on the instrument panel, the choke link cam (30) opens the throttle valve by the proper amount and also closes the choke valve.

The air entering the inlet opening is restricted, causing an increase in the vacuum pressure within the main bore and resulting in fuel to be discharged out of the needle jet, bypass, and the pilot outlet. At the same time, suction pressure will open the choke relief valve by the proper amount to permit the necessary amount of air to enter to produce an ideal fuel-air mixture ratio for starting.

Pushing the choke button IN will open the choke valve and at the same time allow the throttle valve to return to the normal idling position.

7. Idling Speed (Fig. 2C-1, 2)

The throttle valve (3) is positioned so that it is practically closed and the fuel is being discharged mainly from the pilot outlet (10). Fuel mixture adjustment is made by turning the pilot screw (12); turning the screw in will give a lean fuel mixture and turning the screw out will richen the mixture. The pilot screw on all carburetors must be adjusted identically. Normally, turn the screws all the way in and back off by the same amount. When making the adjustment stay within 1/8~1/4 turn of the specified setting. The idling speed is adjusted by the throttle stop screw (31).

8. Slow and cruising speeds (Fig. 2C-1)

The throttle valve is slightly opened and the main fuel discharge is from the bypass (11). Fuel mixture adjustment is made with the slow jet (8).

9. Intermediate speed (Fig. 2C-1)

The opening of the throttle valve becomes larger, but the vacuum piston (4) has only barely started to move and the fuel is being mostly discharged from the main nozzle. Fuel mixture adjustment is made at the primary main jet (6). However, as shown in the figure, since a certain amount of fuel is also being discharged out of the needle jet (17). The jet needle (18) will then also have an effect on the adjustment, it must be made in conjunction with the following condition.

10. High speed (Fig. 2C-1)

The position of the throttle valve is at a larger opening than in the previous condition. Vacuum piston is starting to rise and the fuel is discharged from both the main nozzle, and needle jet (17).

With the further rise in the vacuum piston, the fuel discharge from the needle jet increases correspondingly.

11. Maximum speed

Both the throttle valve (3) and the vacuum piston (4) are in the full open position with the fuel being discharged from both the main nozzle and the needle jet (17). The fuel mixture is adjusted by the secondary main jet (14).

The functional ranges of the respective jets are overlapping at their extreme limits, therefore, care should be exercised when making the adjustments described in the preceding paragraphs 7 through 11.

Further, before making the final reassembly, the vacuum piston should be checked to assure that it is operating smoothly and also check to verify the proper operation of the accelerator pump system.

D. ADJUSTMENTS

1. Throttle Valve

This controls the amount of air entering the engine. In other words, it controls the speed and the power output of the engine.

2. Pilot Screw

Primarily the pilot screw regulates the amount of fuel mixture during idling speed. Turning the pilot screw clockwise will decrease the discharge of the fuel, providing a lean condition, while turning the screw counter-clockwise will increase the fuel discharge providing a rich mixture.

Adjusting Procedure

- a. Perform the adjustment by backing off the pilot screw $1\frac{1}{8}$ turns from the full closed position. Backing off the screw makes the mixture rich.
- b. Start the engine and set the engine idle to the specified speed using the throttle stop screw.
- c. In this condition adjust the pilot screw in both direction within the range of approximately $\frac{1}{8}$ turns and find the point where the engine RPM is the highest. Perform this for each of the carburetors.
- d. Readjust the throttle stop screw so that the engine speed is back to the specified RPM.
- e. Turn the pilot screw back and forth over a small range to make sure that the pilot screw is adjusted to the point of maximum RPM.

Note :

Always perform the adjustment after the engine has attained operating temperature.

3. Throttle Stop Screw

This screw is used to set the engine idling speed. Turning the screw in the clockwise direction will increase the idling speed and turning in the counter clockwise direction will decrease the idling speed.

Note :

This adjustment must also be performed after the engine has attained operating temperature.

4. Slow Jet

The slow jet meters the fuel flow at slow speeds by producing a fuel-air mixture with the air entering from the air bleed and assists in the atomization of the fuel.

5. Primary Main Jet

This jet meters the fuel flow at the intermediate speed.

6. Secondary Main Jet

Meters the fuel flow at high speed and also at maximum speed.

Note : Main Jets

The main jets meter the fuel flow to the engine. Main jets come in different sizes and are numbered so that the larger the jet number the greater will be the fuel flow, providing a richer fuel mixture to the engine.

The jets are numbered in accordance with its diameter. Jets numbered above 100 are in increments of 5 and the jet numbered below 100 are in increments of 2 or 3 (last digit is either 0, 2, 5 or 8).

7. Primary Air Jet

This air jet regulates the amount of bleed air entering the primary system to control the fuel mixture not to become too rich and also to assist in atomizing the fuel which was metered by the primary main jet and discharged from the main nozzle.

8. Secondary Air Jet

This air jet regulates the amount of bleed air and controls the fuel mixture not to become too rich and it also assists in atomizing the fuel metered by the secondary main jet and which is discharged from the needle jet holder.

Note : Air Jets

Air Jets regulate the air which mixes with the fuel. The larger the jet number size, the greater will be the bleed air, providing a lean fuel mixture and performing the function which would be directly in reverse of the main jets.

9. Off Idle Screw

The off-idle screw adjusts the clearance at the off-idle area (equivalent to the slow air jet), and controls the air flow to the slow jet. By turning the off-idle screw IN, clearance at the off-idle area is decreased, the air flow is also reduced and the fuel mixture will become rich. If the screw is turned OUT, the clearance will be increased allowing greater air to flow resulting in making the fuel mixture lean. The off-idle screw has been adjusted by the manufacturer to provide a uniform fuel ratio and therefore, adjustment is not normally required.

Note :

If adjustment of this screw becomes necessary, perform the adjustment where a carbon monoxide emission test equipment is available and make the adjustment at the proper setting. This is necessary since the carbon monoxide emission adjustment will also be affected.

10. Needle Jet

The fuel which has been metered by the secondary main jet during the intermediate and high speed range is metered once again. This adjustment is performed in conjunction with the jet needle described in the next section.

11. Jet Needle

The jet needle is adjusted in conjunction with the needle jet mentioned above for intermediate and the high speed range by providing a proper clearance between the needle jet and the jet needle. A larger clearance will produce a richer fuel mixture and a small clearance will produce a lean fuel mixture.

12. Main Nozzle

The fuel mixture produced with the fuel which has been metered by the primary main jet and mixed with the air regulated by the primary air jet is controlled by the main nozzle to supply the fuel mixture for the intermediate speed range.

13. Needle Jet Holder

Its function is to mix the fuel metered by the secondary main jet with the air which has been regulated by the secondary air jet. The fuel mixture is controlled by the opening between the needle jet and the jet needle and is discharged within the carburetor bore during the high speed operation.

14. Fuel level (Fig. 2D-1)

- a. Remove the float chamber and set up the body.
- b. With the finger, move the float slightly and locate the point where the tip of the float valve and the float arm lip is just barely touching or a clearance of 0.1 mm exists. In this condition take the measurement of H. Standard setting; $H = 19 \pm 1 \text{ mm}$ ($0.748 \pm 0.039''$).
- c. Care should be exercised when making this check since the tip of the float valve is spring loaded and if pressed, the tip will submerge and will not provide the proper measurement.
- d. When making the fuel level adjustment, bend the lip so that the float valve and lip are perpendicular to each other.

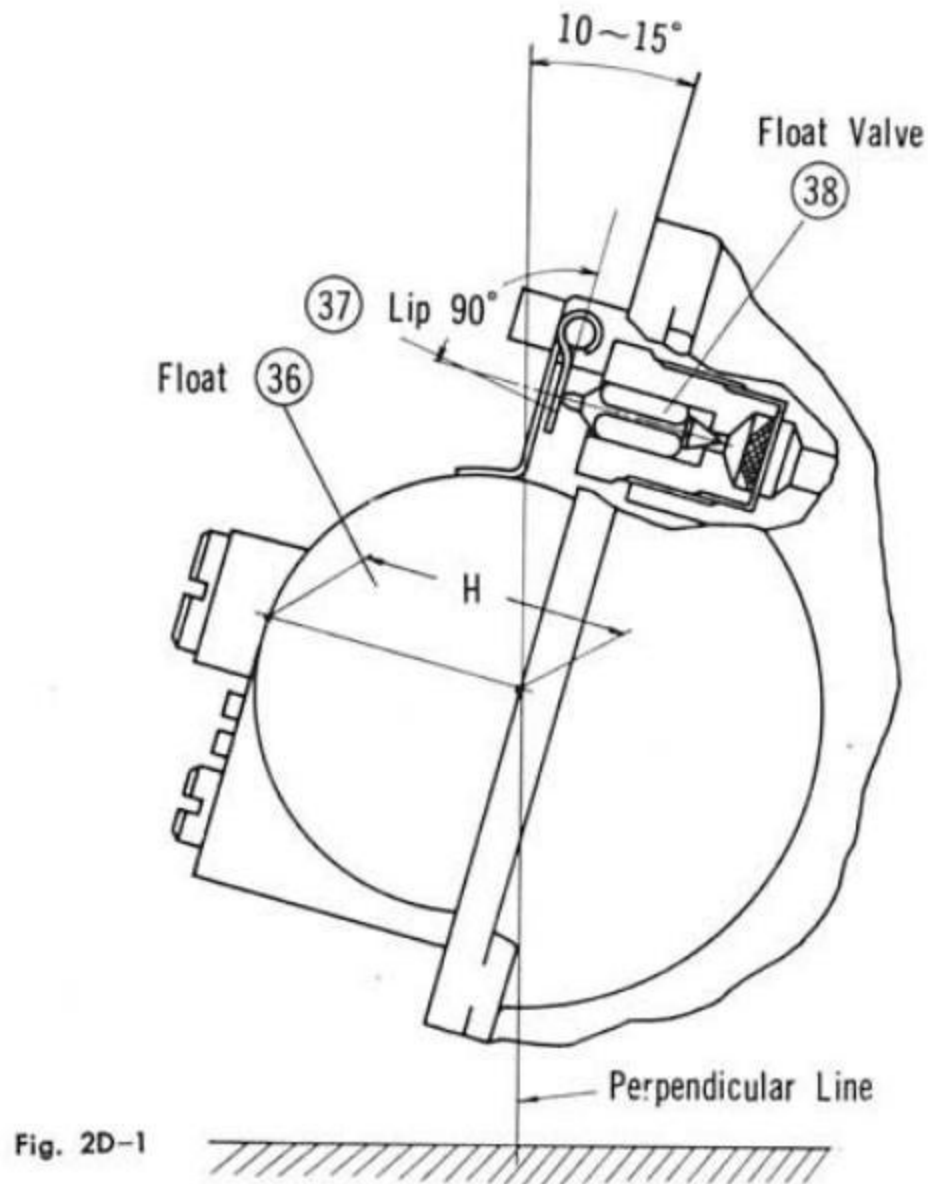


Fig. 2D-1

15. Synchronizing the throttle valves (Fig. 2C-1, 2)

Remove the plugs from the two inboard carburetor (No. 2 and 3), observe the positions of the throttle valve (3) through the by-pass (11) and if necessary, make the adjustment with the adjusting screw (32). After completing the adjustment, tighten the lock nut (33) securely.

16. Fast idle adjustment

For most effective engine warming up, at the proper choke valve opening, the engine should idle at 4000 ± 500 r.p.m. max.

a. Position the choke to full open.

b. Back off on the throttle stop screw so that the throttle valve is fully closed.

c. In this condition, adjust the clearance between the throttle lever and the link plate to 2.0~2.5 mm (0.079~0.098") by deforming width "l" in Fig. 2D-2, the point of the link plate.

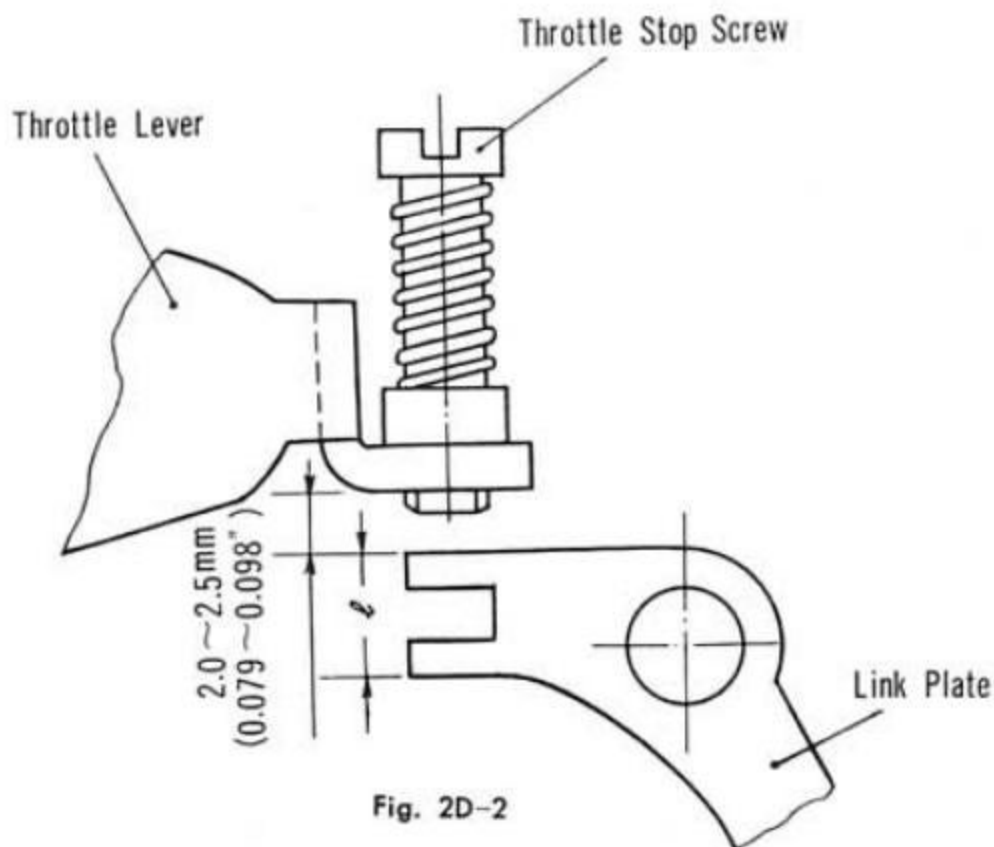


Fig. 2D-2

17. Accelerator Pump Adjustment (Fig. 2D-3)

The discharge from the accelerator pump will vary with the setting.

- a. Position the throttle stop screw to the full back-off condition (throttle valve fully closed).
- b. Loosen the adjusting nut and position the adjusting screw to the proper dimension and then lock the adjusting nut.

Setting	Volume discharge/stroke	L
30-J	0.45 cc \pm 0.05	3.3 mm \pm 0.5 (0.130 \pm 0.020")

Note :

Measurement of the accelerator pump discharge volume and the adjustment of the L dimension must be performed with the throttle valve fully closed.

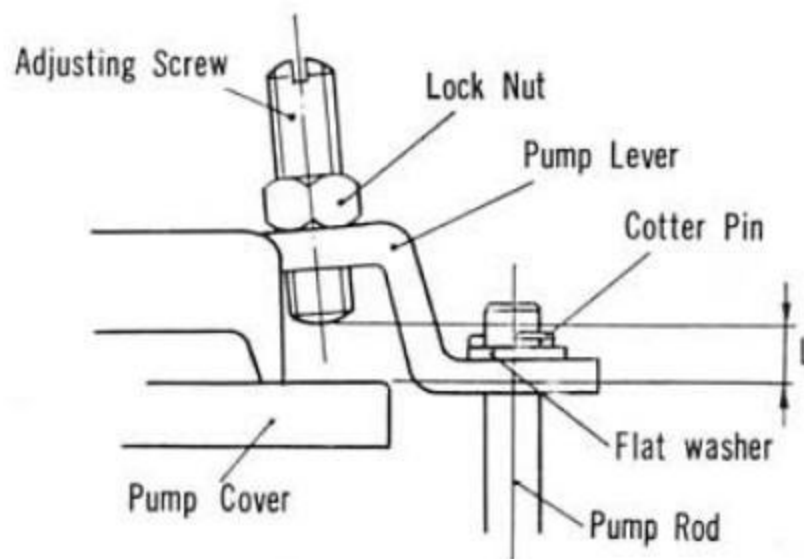


Fig. 2D-3

2-12 CARBURETOR



Fig. 2E-1

E. REMOVAL

1. Open the bonnet cover.
2. Remove the two wing nuts, washers and detach the air cleaner cover.
3. Loosen the adjuster nut, remove the adjuster and disconnect the throttle cable from the carburetor.
4. Pull out the choke cable clip, remove the choke cable from the choke-throttle cable bracket and disconnect from the carburetor.
5. Disconnect the fuel feed tube from the carburetor.
6. Disconnect the breather tube from the carburetor (Fig. 2E-2).

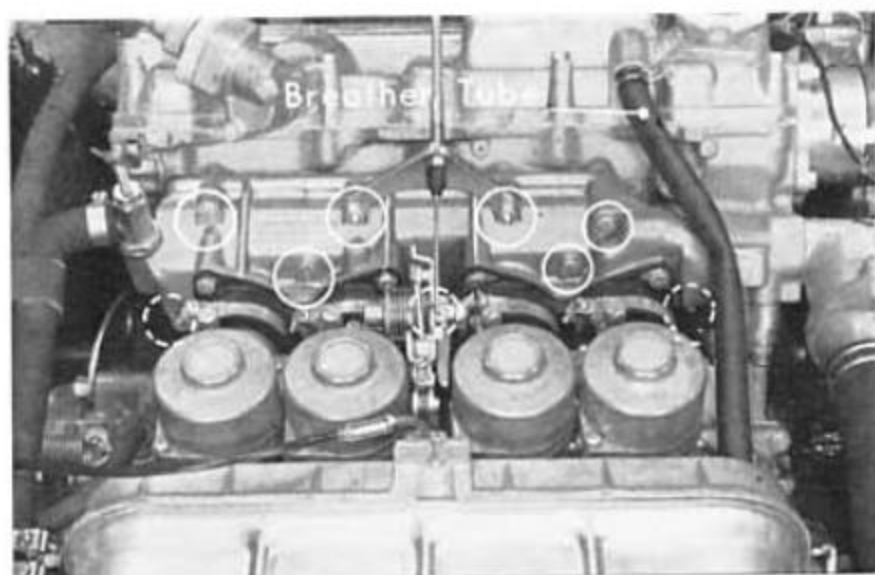


Fig. 2E-2

7. Remove the intake manifold setting nuts, washers, bolt (at the generator bracket) and remove the carburetor assembly with the intake manifold from the engine (Fig. 2E-2, 3).

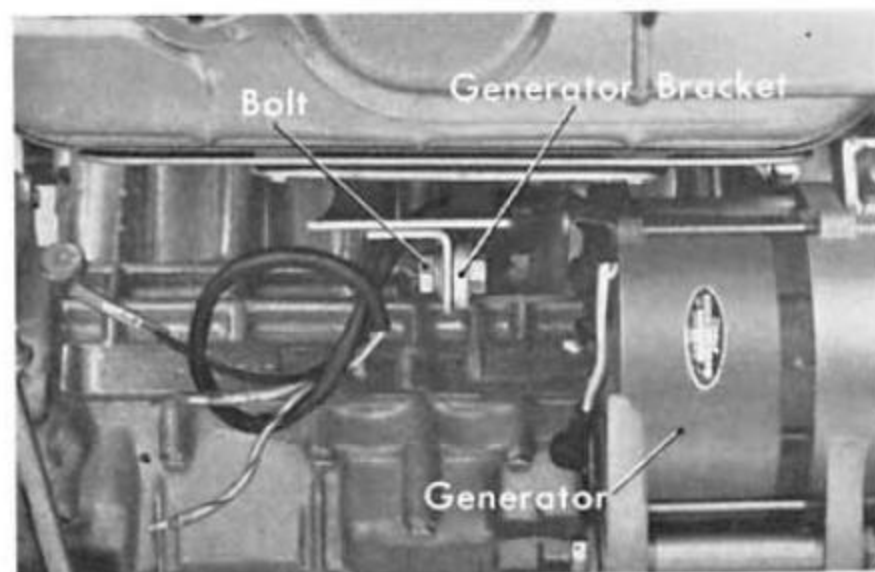


Fig. 2E-3

8. Remove the vacuum cylinder setting screws, washers and disassemble the vacuum cylinder, vacuum piston spring, vacuum piston from the carburetor assembly (Fig. 2E-4).

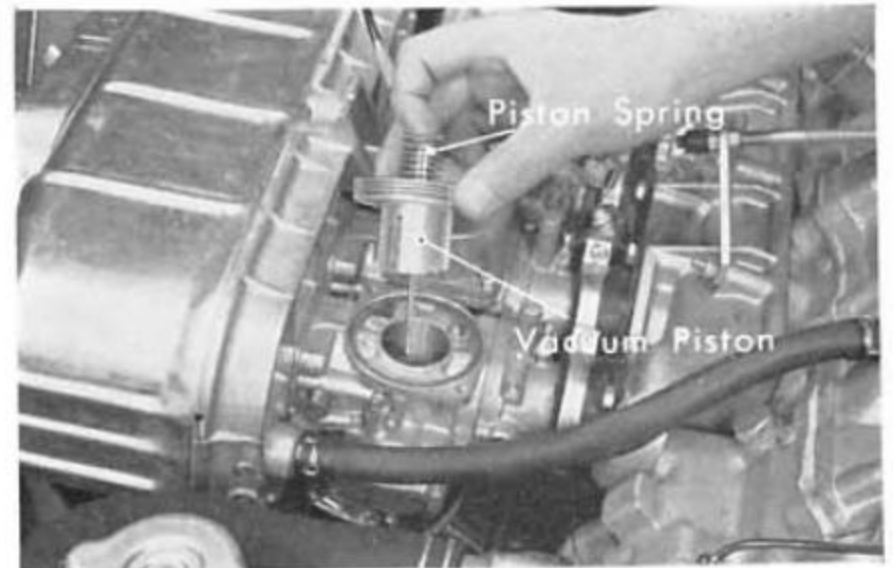


Fig. 2E-4

9. Loosen the screw on the side of the vacuum piston and remove the jet needle from the vacuum piston (Fig. 2E-5).

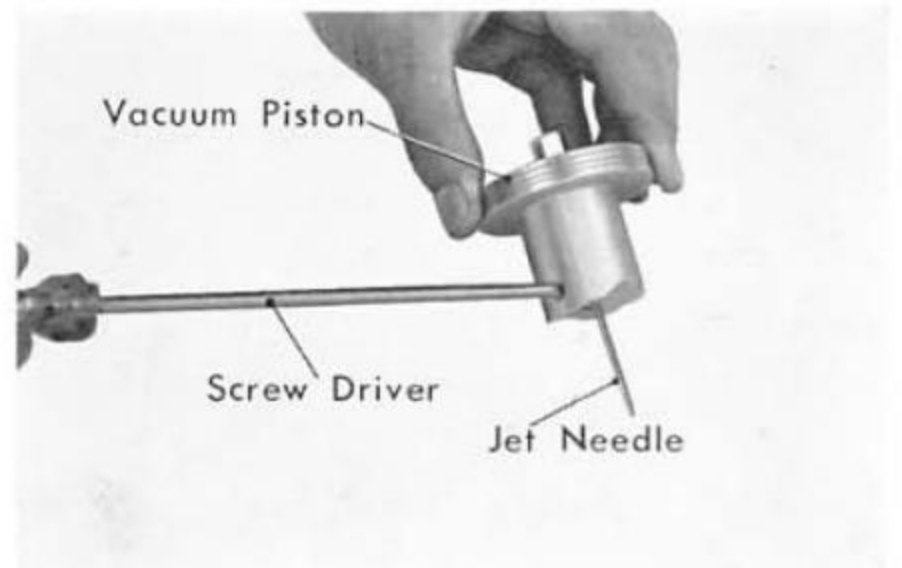


Fig. 2E-5

10. Remove the air cleaner base setting bolts, washers and disassemble the air cleaner base and base gasket from the carburetor assembly (Fig. 2E-6).

Note :

When assembling, tighten the air cleaner base setting bolts in the reverse order of removal.

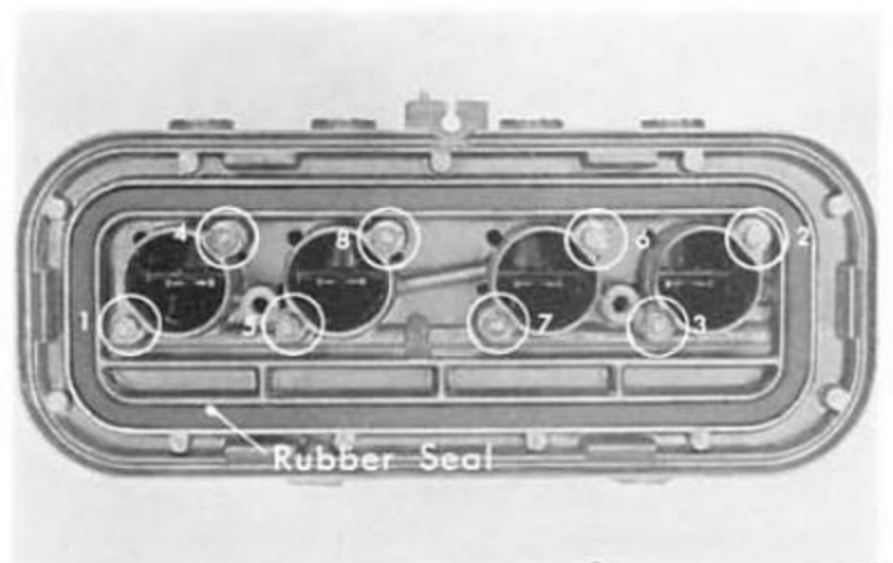


Fig. 2E-6

11. Unscrew the air jet (Fig. 2E-7).

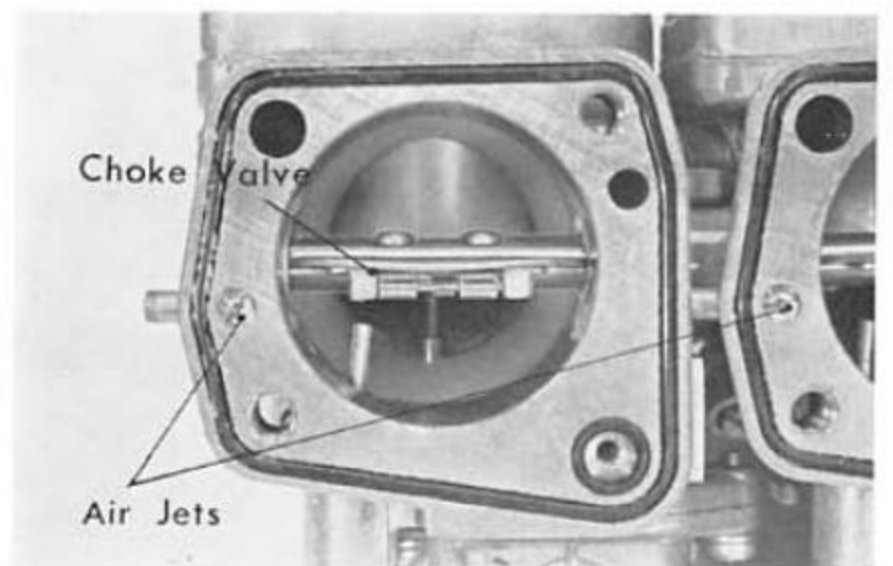


Fig. 2E-7

2-16 CARBURETOR

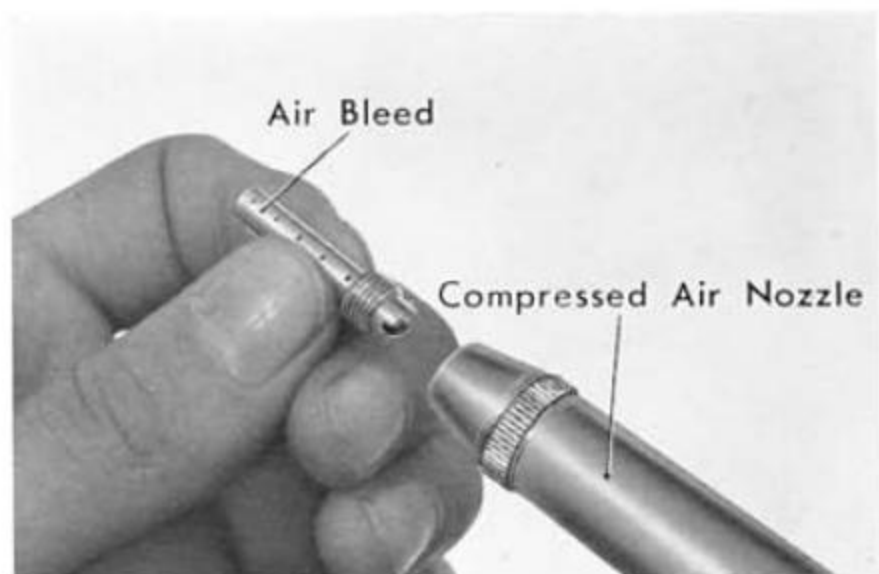


Fig. 2F-3

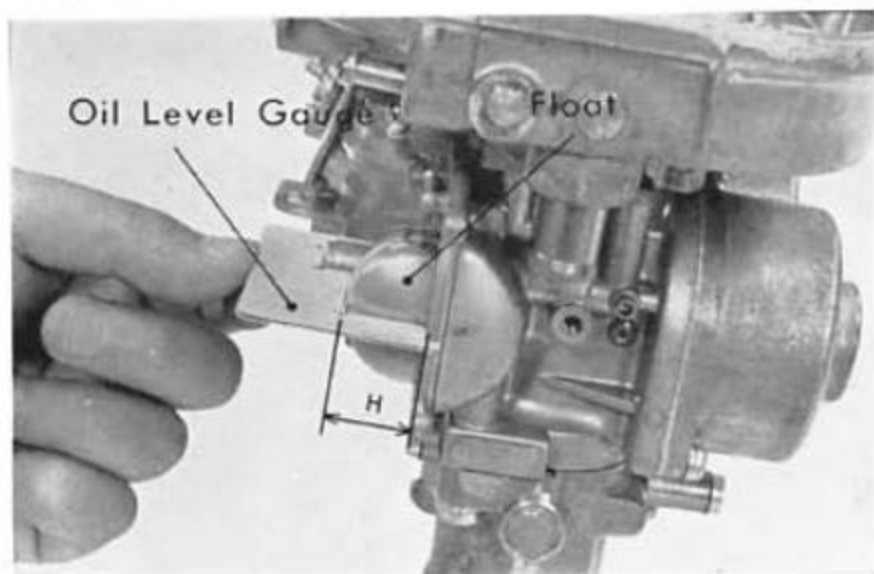


Fig. 2F-4

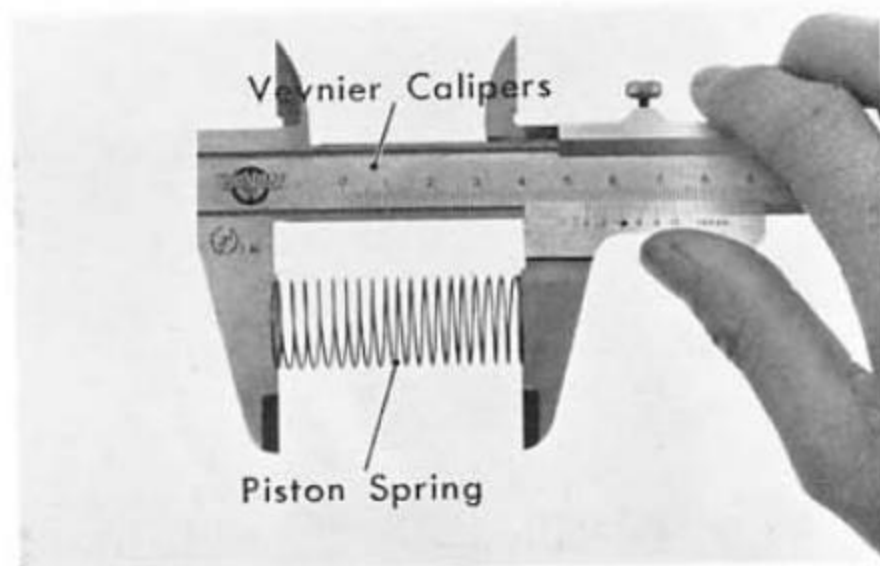


Fig. 2F-5

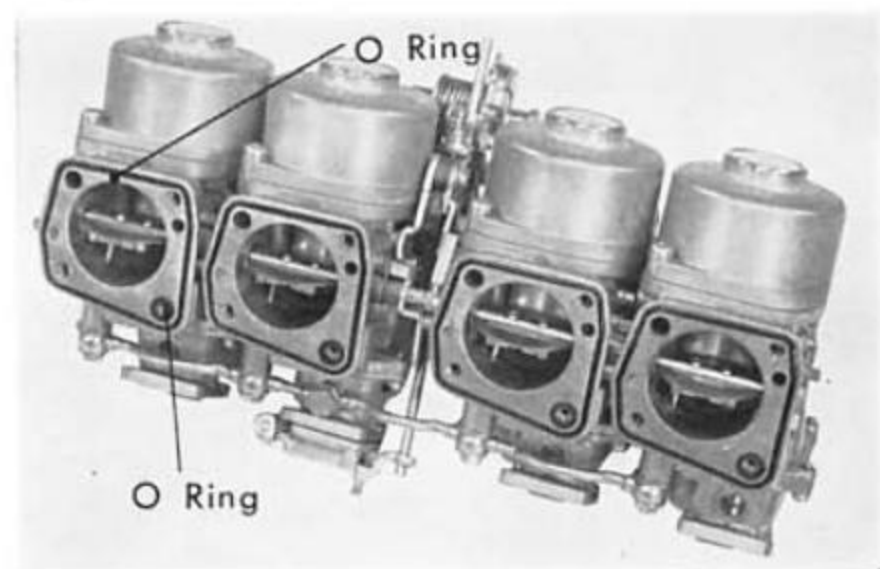


Fig. 2F-6

3. Cleans the jets with compressed air and install securely in their proper location; use care not to block the jets with air cleaner base gasket during installation (Fig. 2F-3).

4. Assemble the float, check the float level (Fig. 2F-4). The standard H dimension in the Fig. 2F-4 is 19 ± 1 mm (0.748 ± 0.039 "). Make any necessary adjustment by bending the stopper arm.

5. Inspect the length of the vacuum piston spring (Fig. 2F-5).
 $l = 53$ mm (2.087")

6. Properly install the O rings, and install the carburetor assembly to engine (Fig. 2F-6). After completion of assembly, fill the engine cooling system with water and inspect for any leaks.

- Remove the cotter pin of accelerator pump lever, unscrew the screws and remove the pump cover.

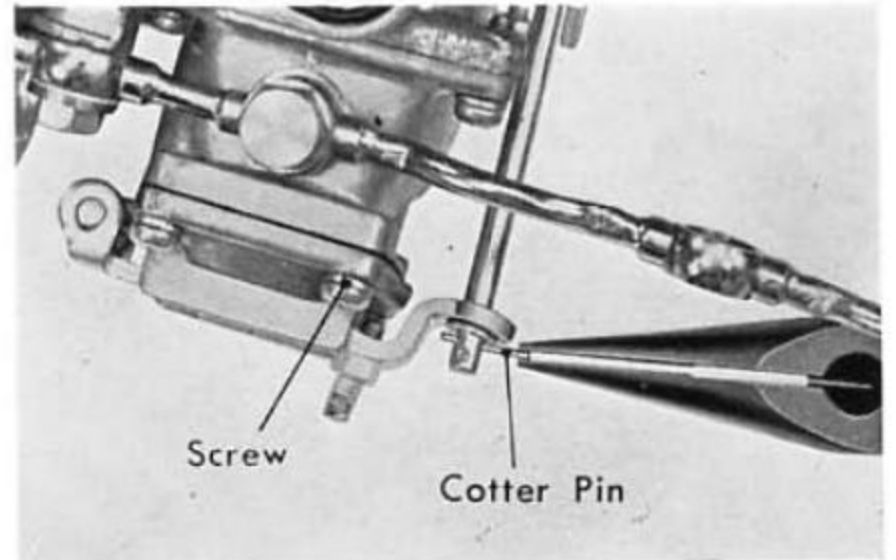


Fig. 2E-12

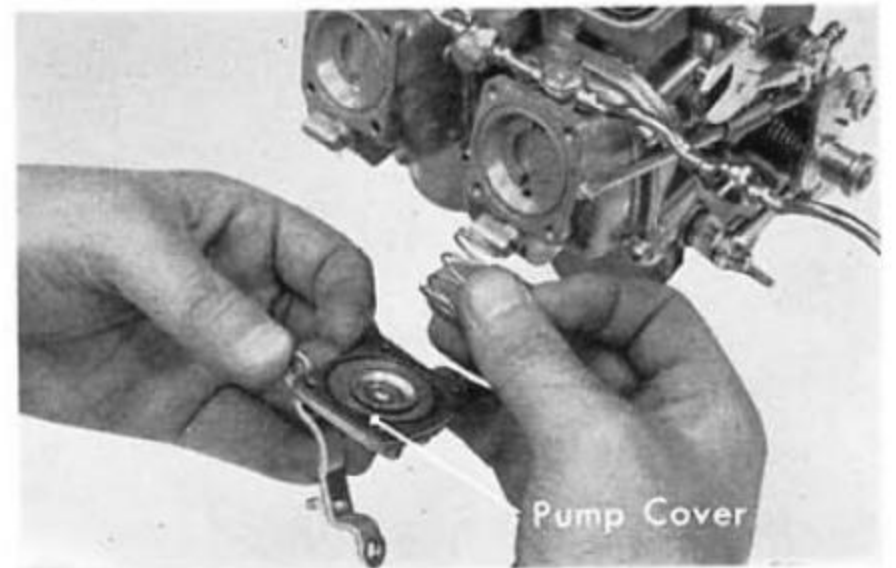


Fig. 2E-13

F. CARBURETOR ASSEMBLY AND INSPECTION

- Inspect valve seat (Fig. 2F-1).

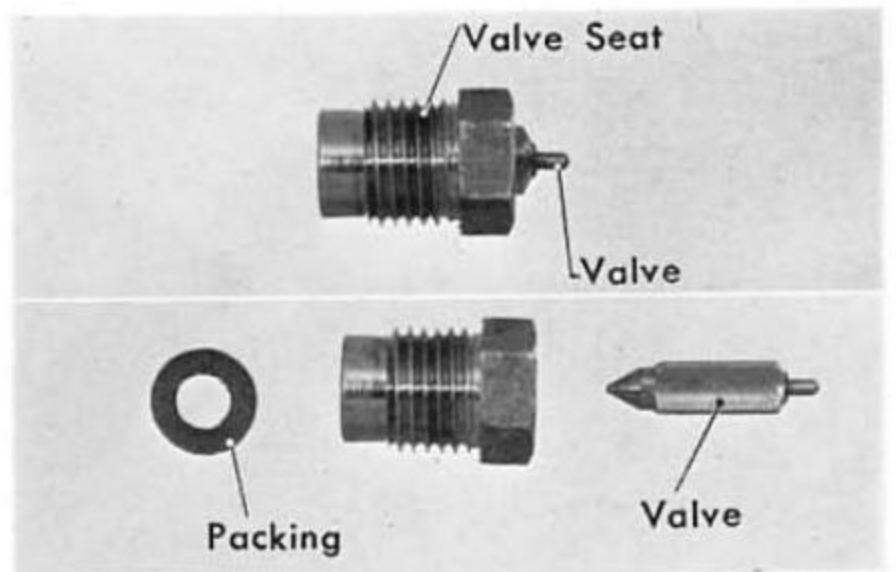


Fig. 2F-1

- Check the full open position of both the choke and throttle valve. Set the difference of A and B to less than 2 mm (0.0787") by adjusting the choke lever stopper (Fig. 2F-2).

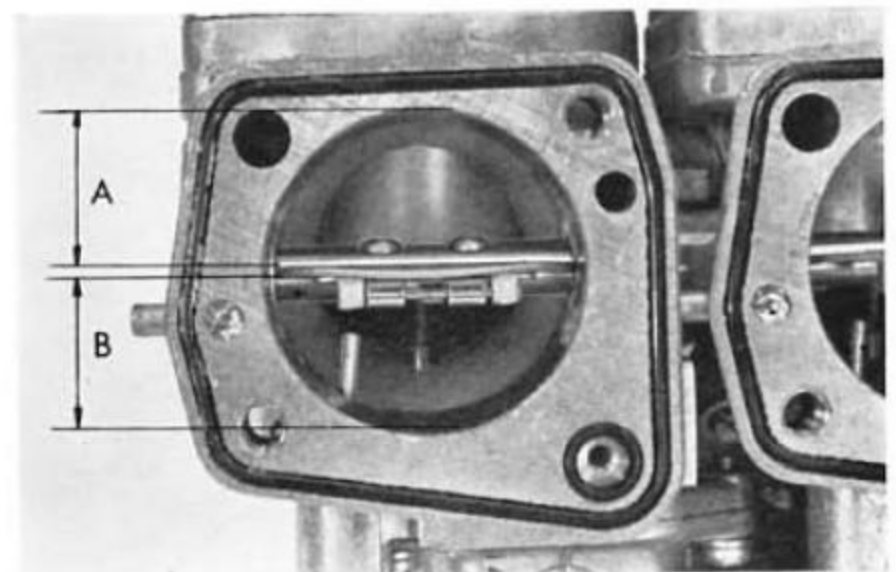


Fig. 2F-2

2-14 CARBURETOR

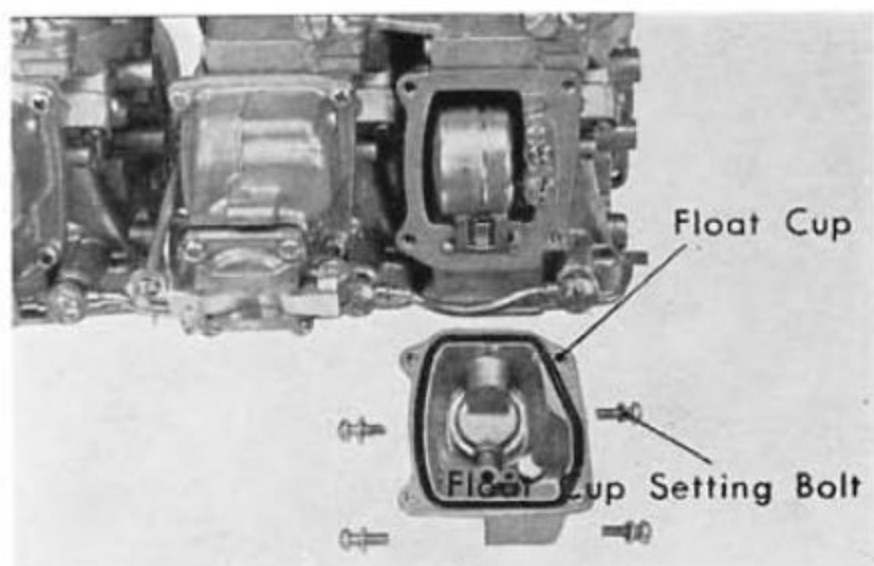


Fig. 2E-8

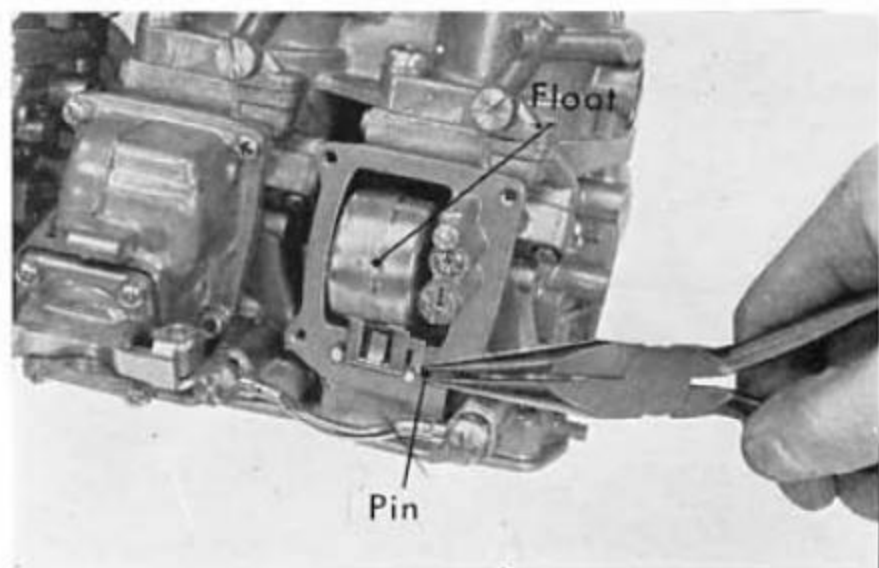


Fig. 2E-9

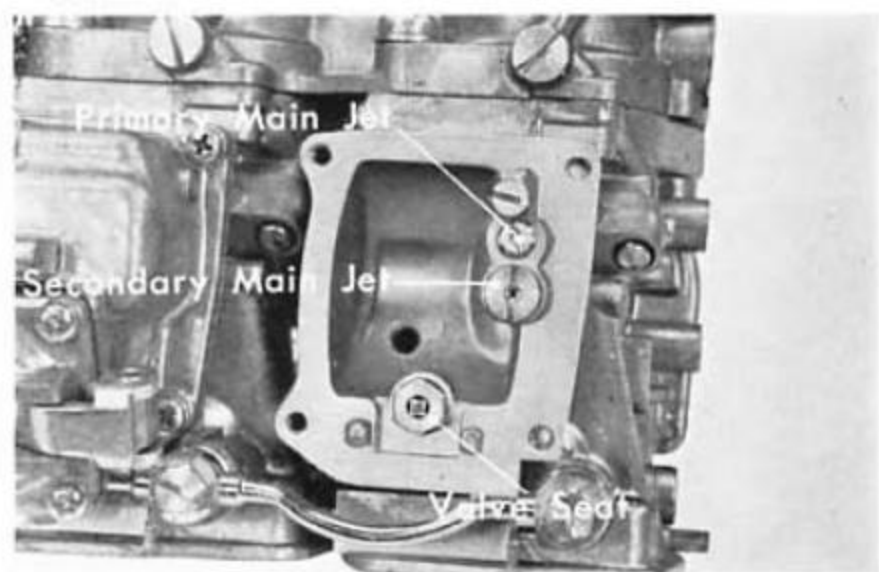


Fig. 2E-10

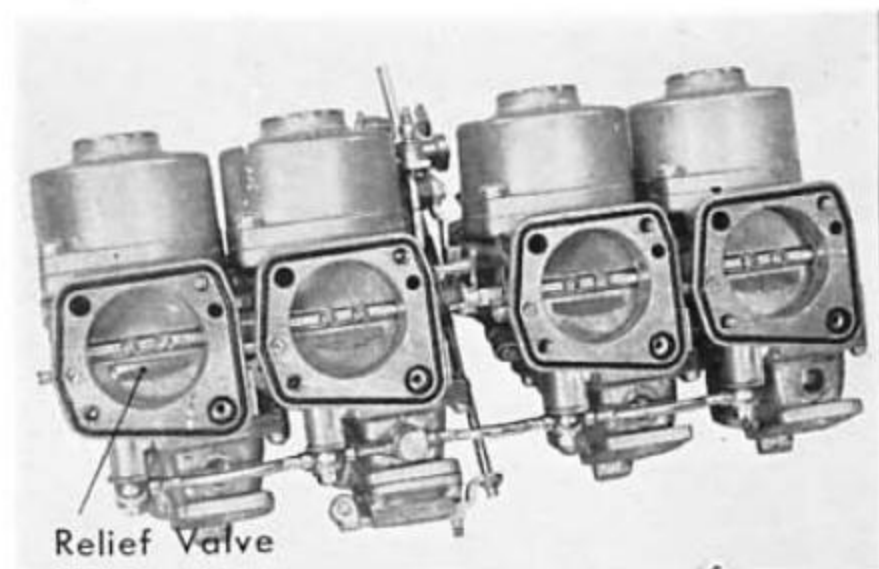


Fig. 2E-11

12. Unscrew the float cup setting screws, remove the float cup and pull out the float hinge pin and disassemble the float from the carburetor (Fig. 2E-9).

13. Unscrew the valve seat, needle jet holder and main jets from the carburetor body (Fig. 2E-10).

14. Remove the screws and disassemble the choke valve from the carburetor (Fig. 2E-11).

4. COOLING SYSTEM

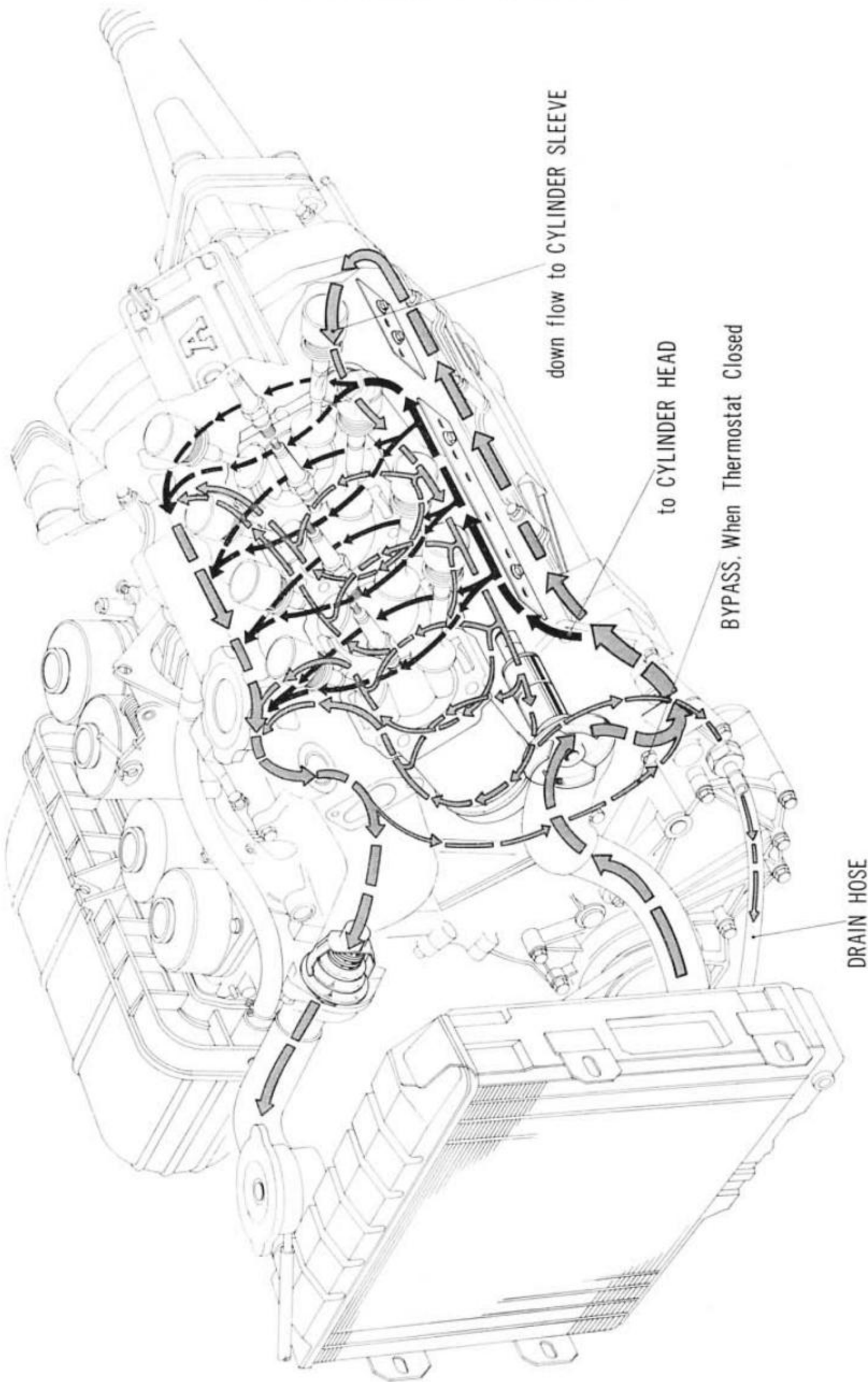


Fig. 4-1

4-2 COOLING SYSTEM

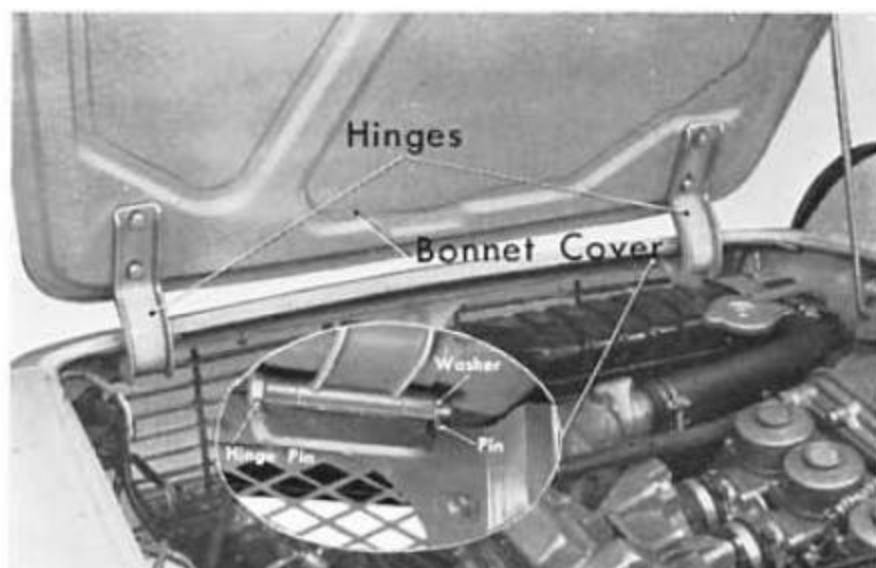


Fig. 4A-1

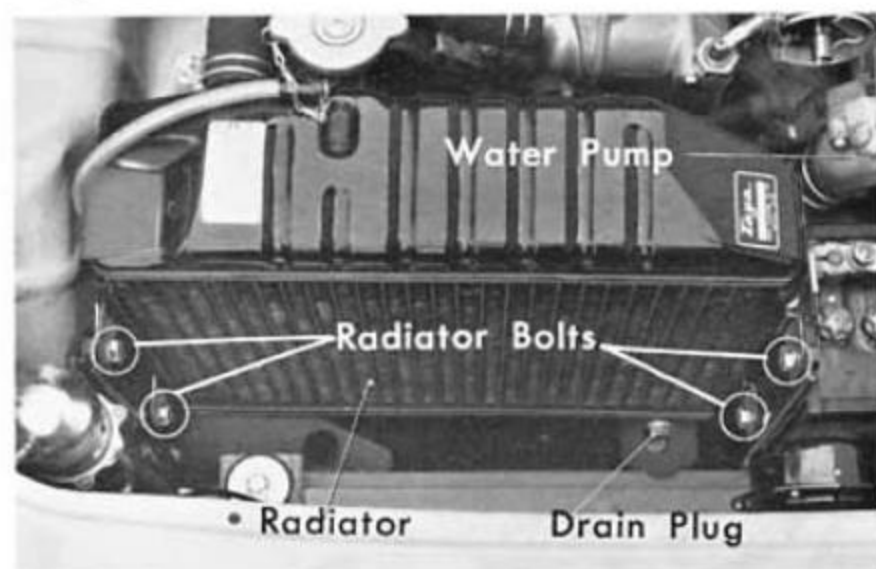


Fig. 4A-2

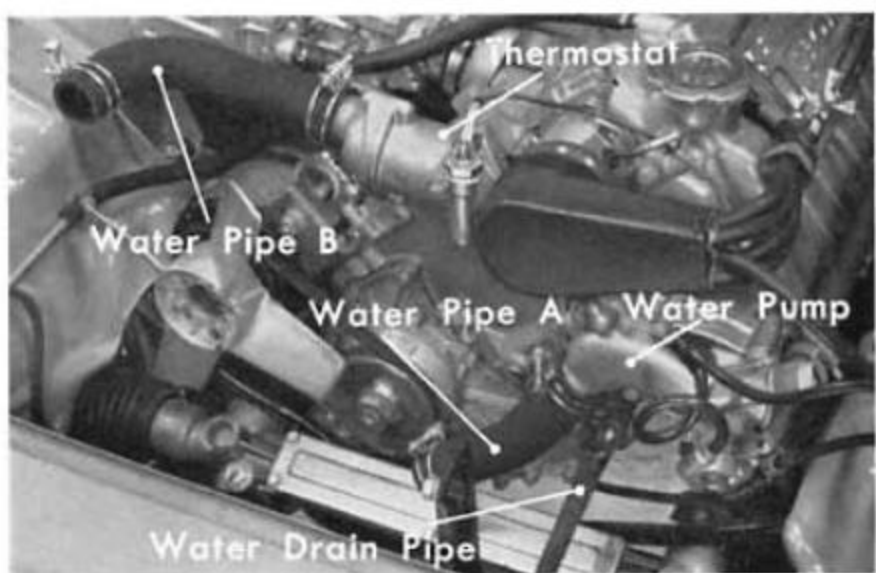


Fig. 4A-3

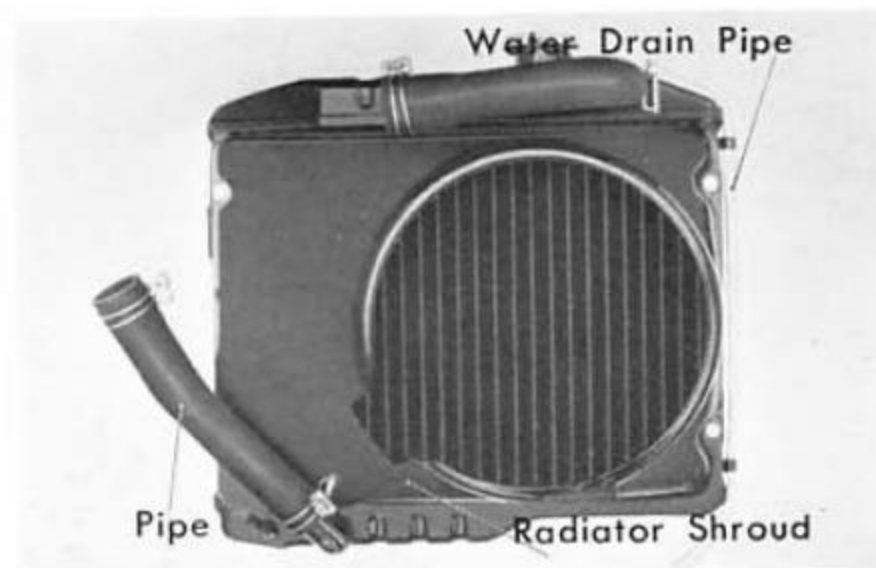


Fig. 4A-4

A. RADIATOR

a. Removal and Installation

1. Remove the bonnet cover by extracting the hinge pins (Fig. 4A-1).
2. Drain the coolant from the system by removing the drain plug at the lower left front of the radiator; also loosen the filler cap (Fig. 4A-2).
3. Disconnect and remove the battery.
4. Remove drain pipe clamp and disconnect pipe at the radiator (Fig. 4A-3).
5. Loosen upper pipe clamp and disconnect water pipe B at the radiator.
6. Loosen lower pipe clamp and disconnect water pipe A at the radiator.
7. Remove the bolts attaching the radiator to the frame and separate the radiator from the frame. Be careful not to damage the fuel line when removing. To remove the radiator, pull forward approximately 5 cm (2") and then lift out.
8. Loosen pipe clamp from water pipe and remove the pipe.
9. Remove the bolts attaching the shroud to the radiator and separate the shroud and the cemented sponge rubber mountings from the radiator.
10. Assemble and install the radiator in the reverse order of the removal procedure; after completing, tighten the drain plug and fill radiator with water. Cooling system capacity is 5.2 l (9.2 imp. pt., 11.0 U.S. pt.) and 5.7 l (10.0 imp. pt., 12.0 U.S. pt.) with car heater.

B. WATER PUMP

Removal and Assembly

1. After removing the radiator from the frame, remove the water pump attaching bolts and separate the pump assembly from the engine (Fig. 4B-1).

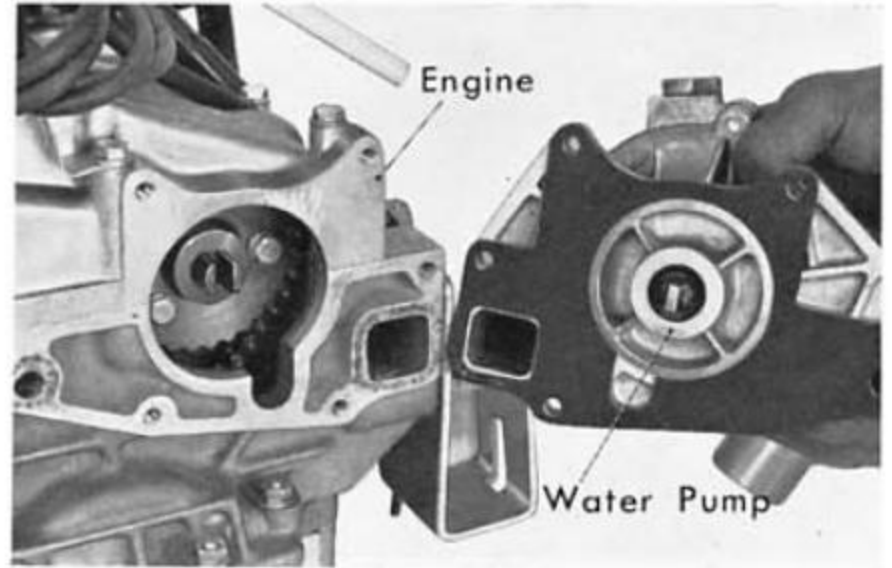


Fig. 4B-1

2. Remove the bolts and dismantle the pump cover and gasket from the pump body. Remove drain plug and gasket from the pump cover (Fig. 4B-2).

Note :

The impeller assembly cannot be disassembled from the pump body.

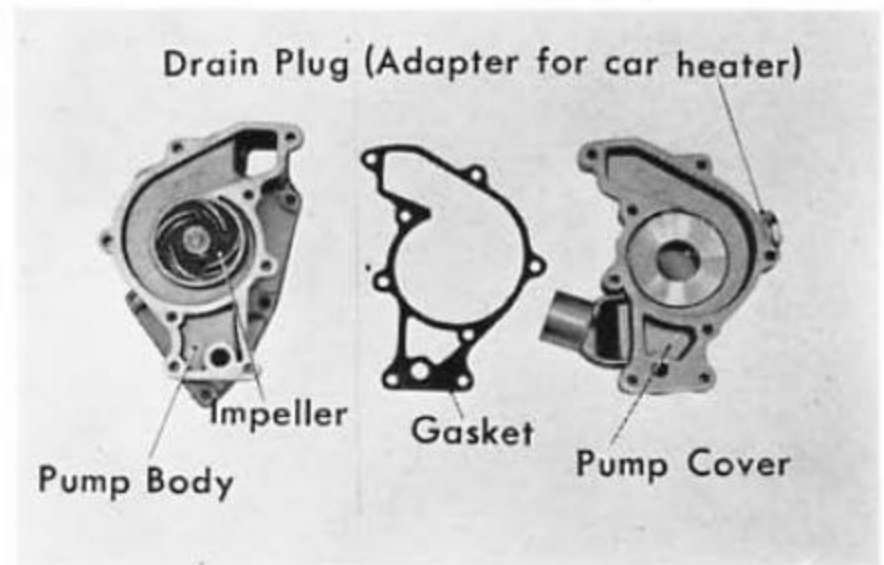


Fig. 4B-2

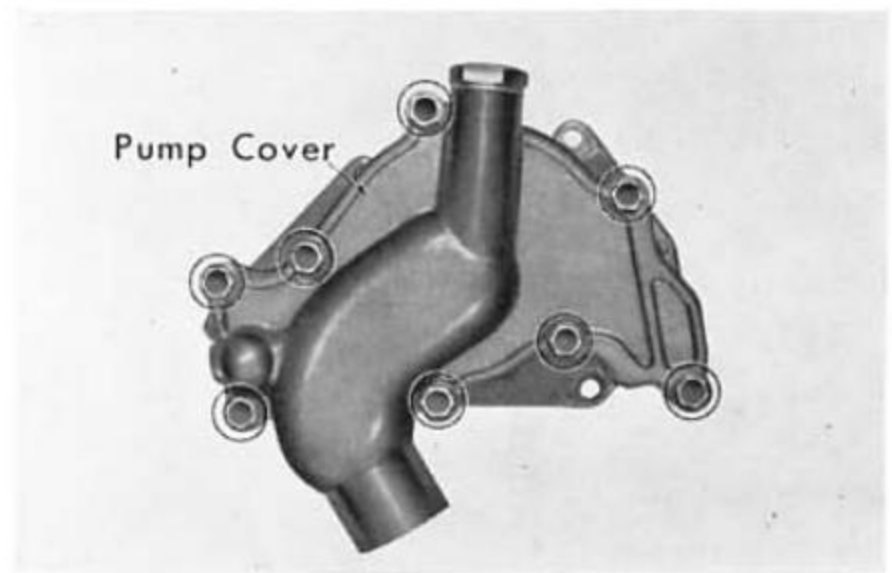


Fig. 4B-3

3. Install the pump on the engine by placing the gasket between the mounting flanges, aligning the milled end of the pump shaft into the exhaust cam sprocket center slot and fit the pump guide area into the engine block (Fig. 4B-4).
4. Fill the radiator with water.



Fig. 4B-4

4-4 COOLING SYSTEM

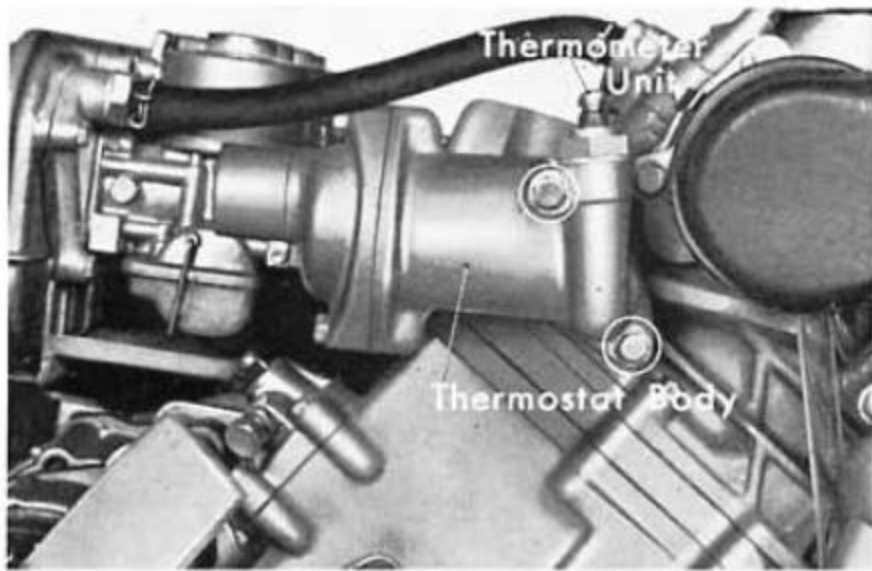


Fig. 4C-1

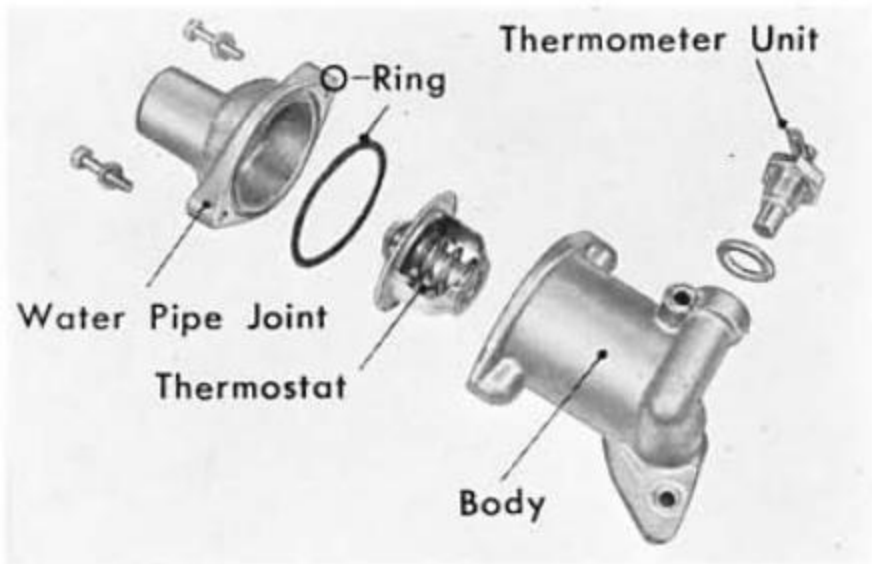


Fig. 4C-2

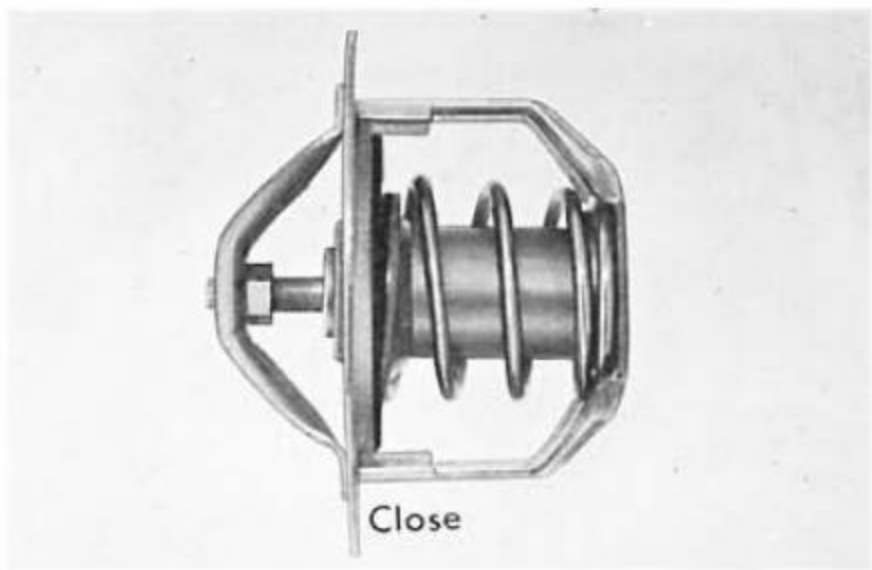


Fig. 4C-3

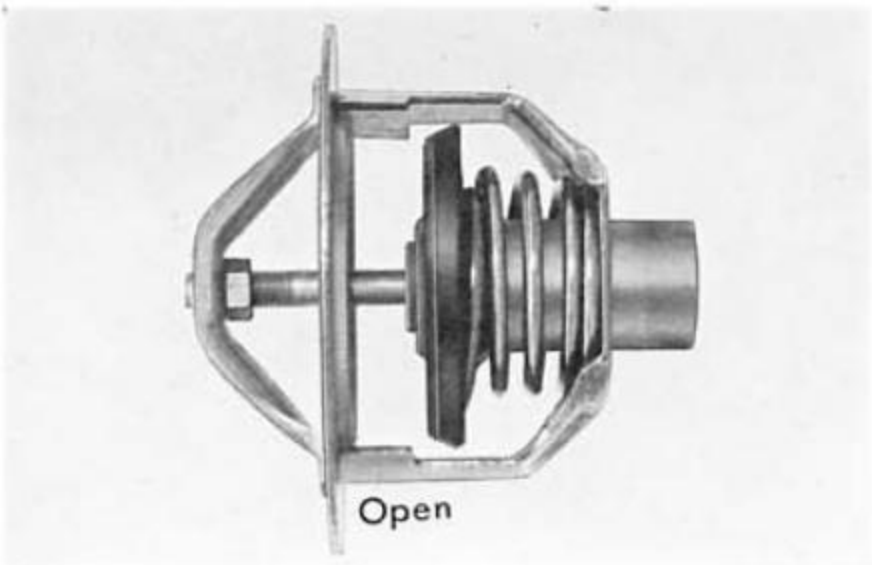


Fig. 4C-4

C. THERMOSTAT

a. Removal and Inspection

1. Disconnect the thermometer cord from the thermometer unit.
2. Remove the water pipe joint setting bolts and disassemble the water pipe joint, water rubber seal, the thermostat and thermometer unit from the thermostat body.
3. Remove the bolts and separate the thermostat body and gasket from the engine block (Fig. 4C-1).

4. The thermostat should start to open between $78\sim 82^{\circ}\text{C}$ ($172\sim 180^{\circ}\text{F}$) and become fully open between $88\sim 92^{\circ}\text{C}$ ($190\sim 198^{\circ}\text{F}$). Test the thermostat by placing the unit in water and heating. By the use of the thermometer, observe the operating temperatures of the thermostat (Fig. 4C-3, 4).

b. Assembly

1. Install the thermostat into the body by aligning the key on the flange to the groove in the body (Fig. 4C-5).
2. Assemble the water pipe joint to the thermostat body so that the opening is above the center line of the thermostat when installed on the engine (Fig. 4C-6).
3. After completing the installation, fill the radiator with water.



Fig. 4C-5

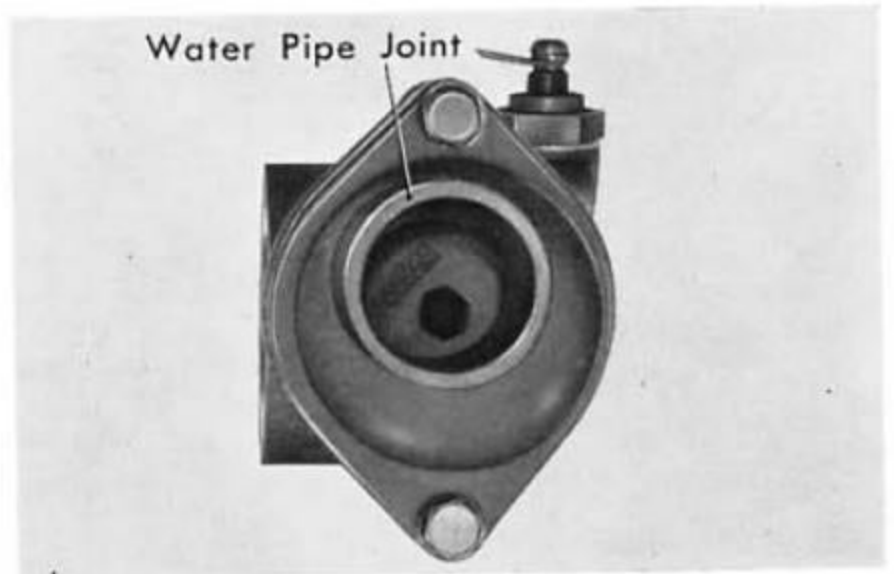


Fig. 4C-6

M E M O

5. CLUTCH

This is a diaphragm type clutch with 1 friction plate. The dimension of the friction plate, i.e., outer diameter \times inner diameter \times thickness, is 165mm \times 110mm \times 6.8mm (6.496" \times 4.331" \times 0.268"). The control system is of hydraulic type. The diaphragm type spring transmits the force evenly, and at the same time, the pushing force for the clutch pedal is reduced.

CLUTCH SECTIONAL VIEW

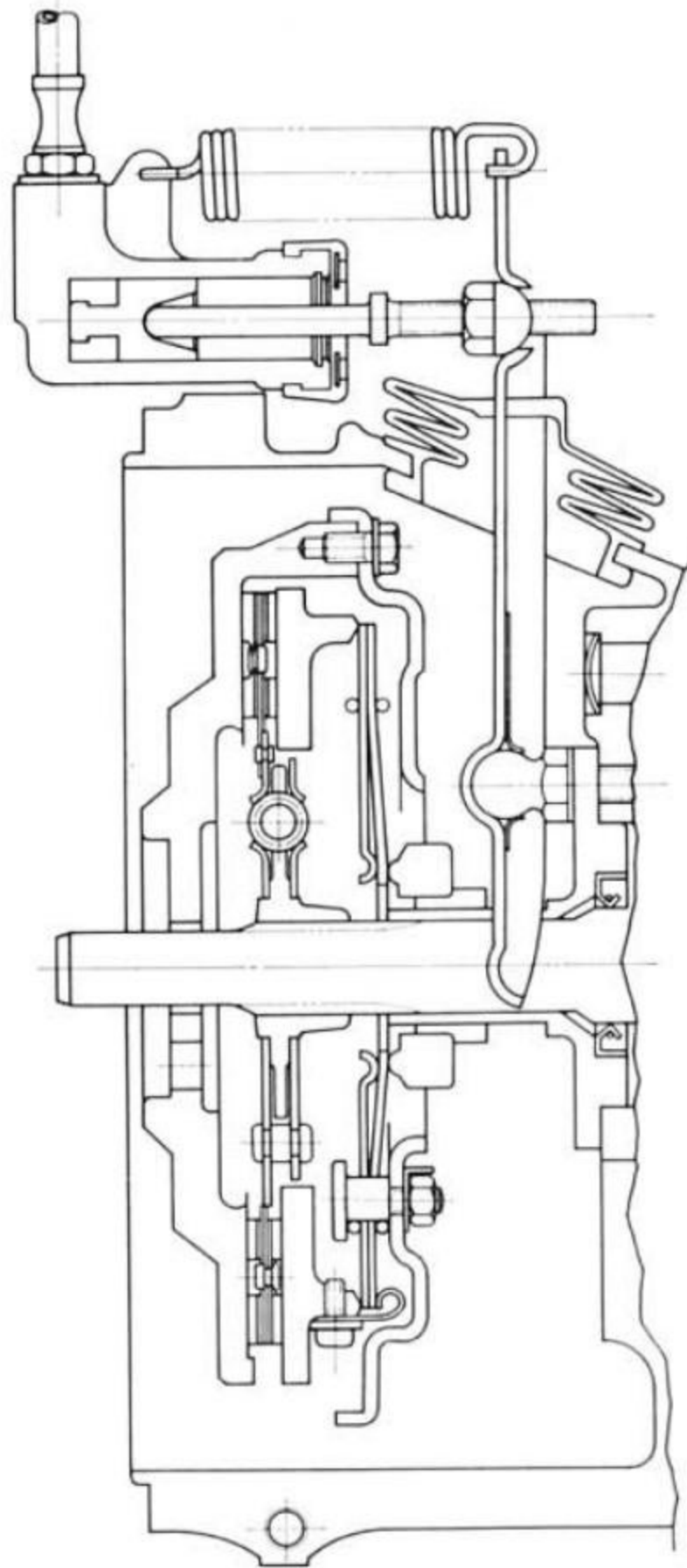


Fig. 5-1

CLUTCH EXPLODED VIEW

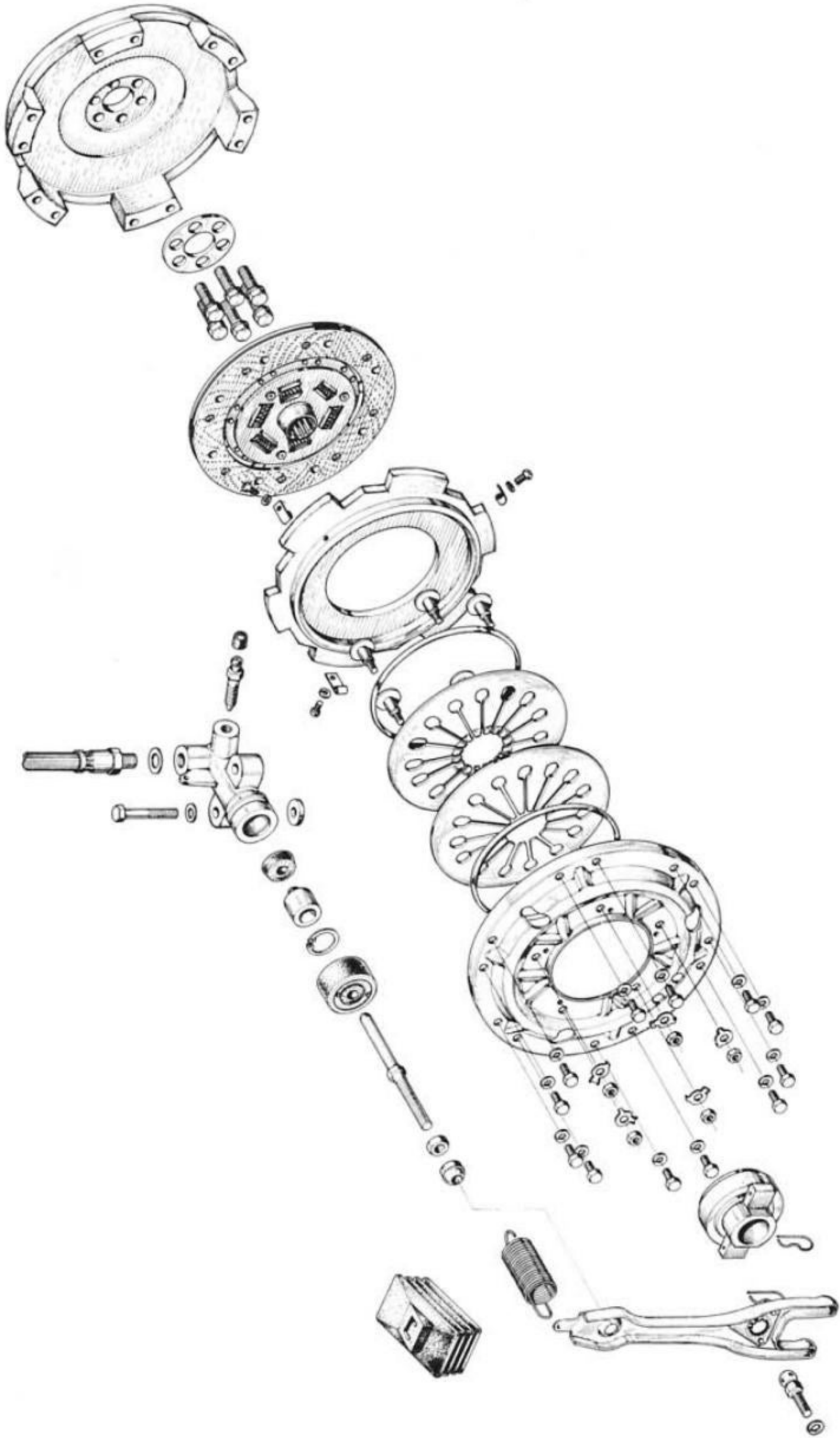


Fig. 5-2

A. REMOVAL

1. After removing the transmission with the engine from the chassis, remove the slave cylinder setting bolts, washers and remove the slave cylinder by pulling off the release arm return spring (Fig. 5A-1).

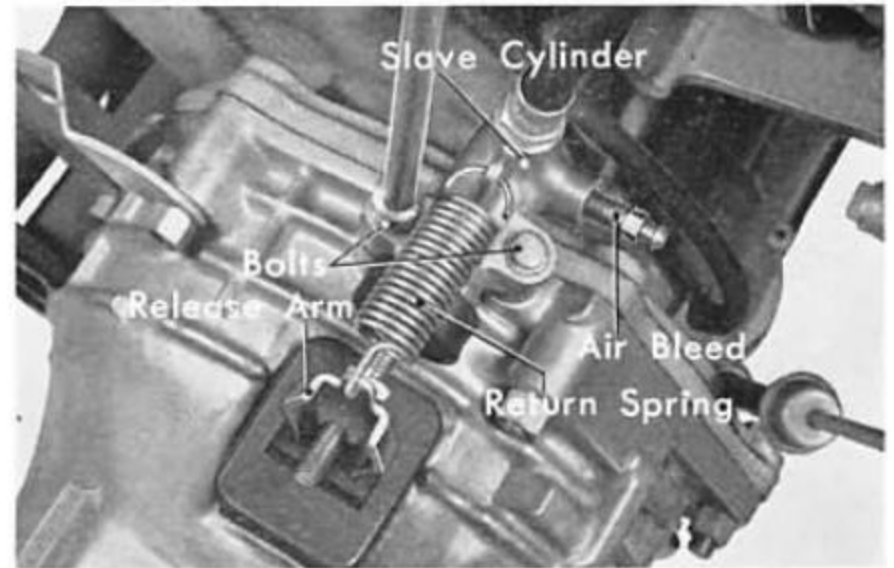


Fig. 5A-1

2. Unscrew the clutch hose from the slave cylinder, remove the air bleed screw, and disassemble the piston from the cylinder (Fig. 5A-2).

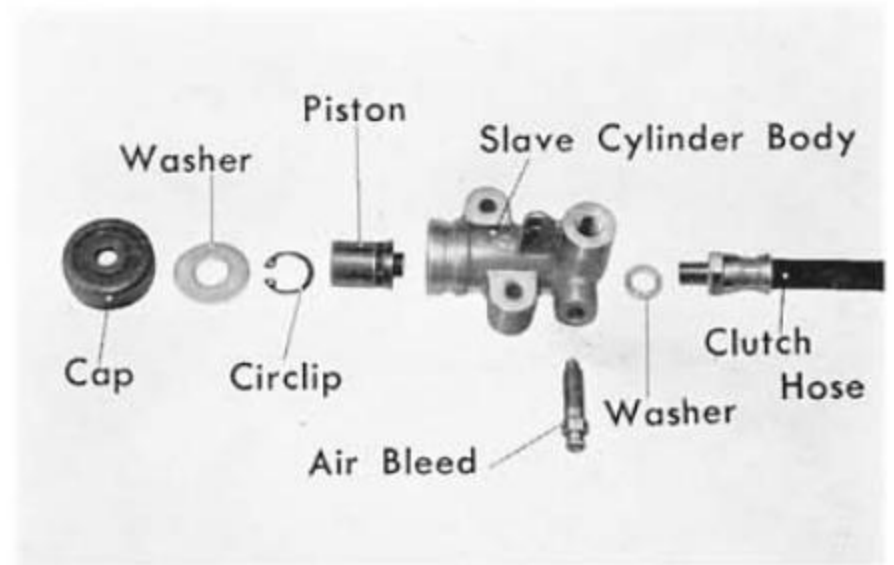


Fig. 5A-2

3. Inspect the condition of the piston, cylinder and measure the piston to cylinder clearance (Fig. 5A-3).

	Standard Value	Serviceable Limit
Clearance	0.020~0.086 mm (0.0008~0.0033")	Replace if beyond 0.100 mm (0.0039")

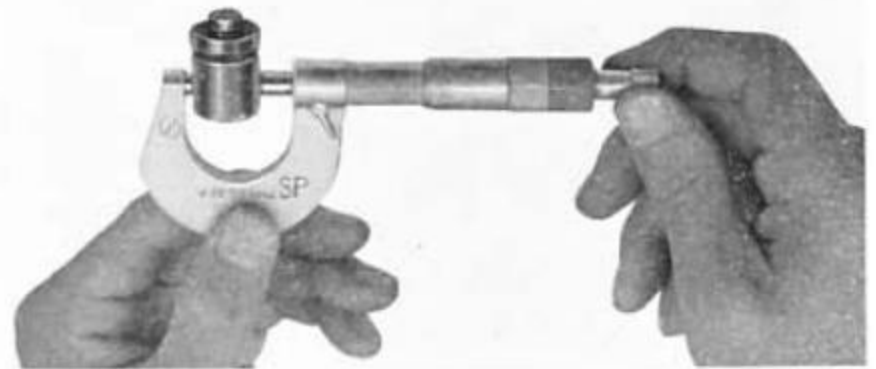


Fig. 5A-3

4. After separating the transmission from the engine, remove the bolts and washers attaching the cover to the flywheel and separate the clutch cover and friction disc from the flywheel (Fig. 5A-4).

Note :

When assembling, torque the cover attaching bolts to 1.2 kg-m (8.6 ft-lbs).

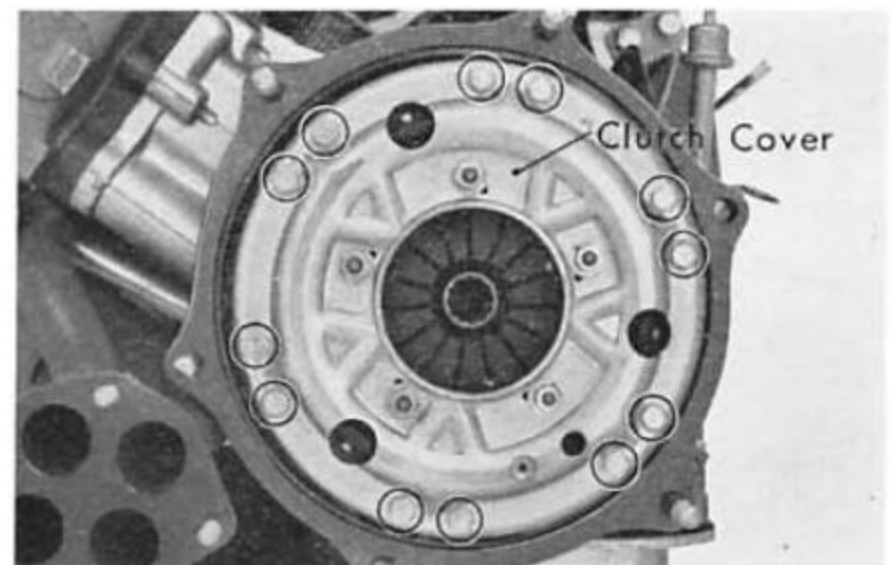


Fig. 5A-4

5-4 CLUTCH

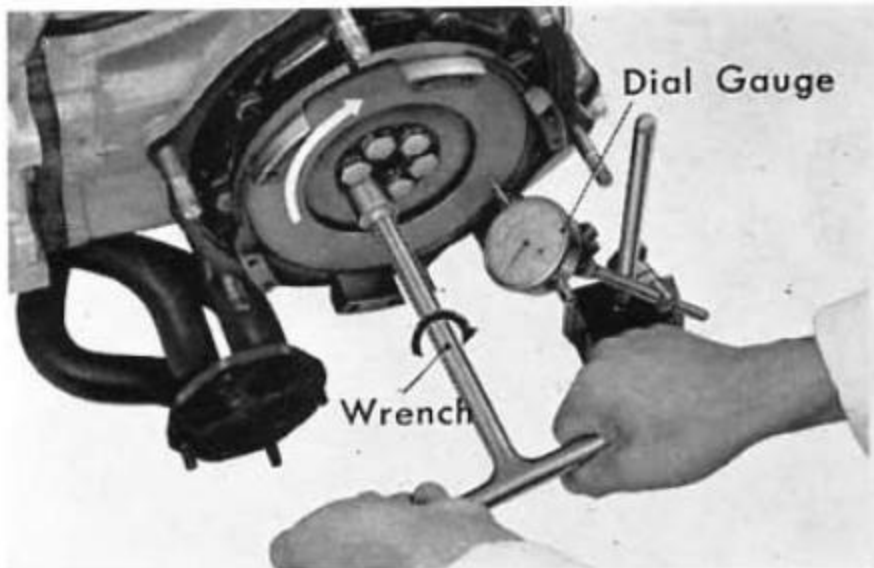


Fig. 5A-5

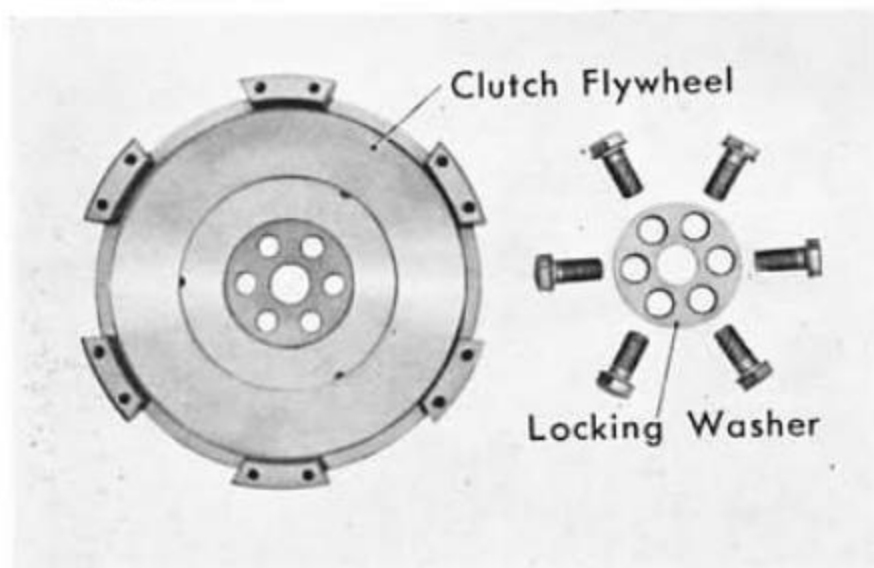


Fig. 5A-6



Fig. 5A-7

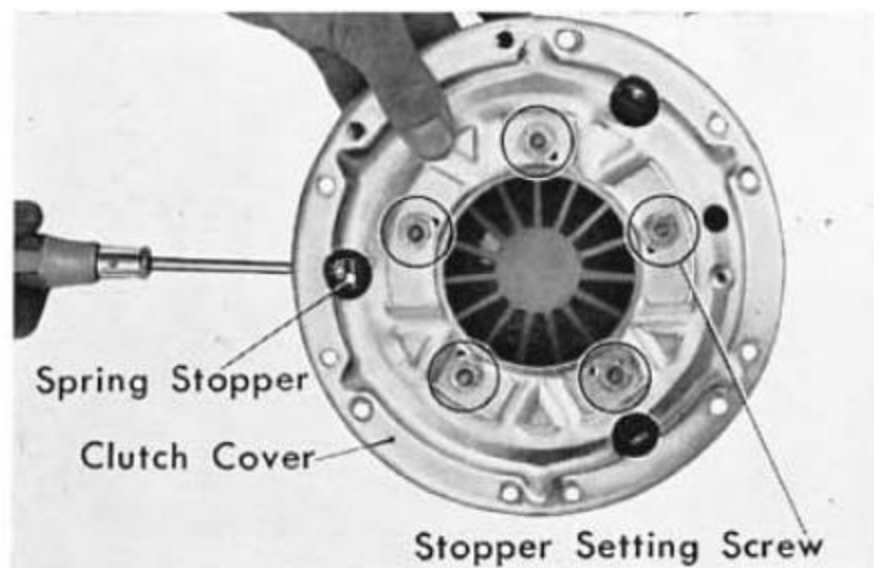


Fig. 5A-8

5. Inspect the run-out of the flywheel by revolving the flywheel with a wrench and measuring with the dial gauge (Fig. 5A-5).

	Standard Value	Serviceable Limit
Face Run-Out	0~0.05 mm (0~0.002")	Replace if beyond 0.3 mm (0.0118")

6. Remove the flywheel attaching bolts, locking washer and separate the flywheel from the crankshaft (Fig. 5A-6).
Torque the bolts to 10 kg-m (72.3 ft-lbs) during installation.

7. Inspect tension of the clutch diaphragm spring (Fig. 5A-7).
The pressure required to make diaphragm spring flat is as follows;

	Standard Value	Serviceable Limit
Pressure	250~310 kg (550~682 lbs)	Replace if less than 250 kg (550 lbs)

8. Remove the stopper setting screws, spring washers and clutch spring stoppers. Separate the clutch pressure plate from the clutch cover (Fig. 5A-8).

9. Inspect the backlash of the clutch friction disc (Fig. 5A-9).

Install the clutch disc on the transmission main drive shaft and measure the backlash by placing the dial gauge pointer in the rivet hole.

	Standard Value	Serviceable Limit
Backlash	0.020~0.135 mm (0.0008~0.0053")	Replace if beyond 0.200 mm (0.008")

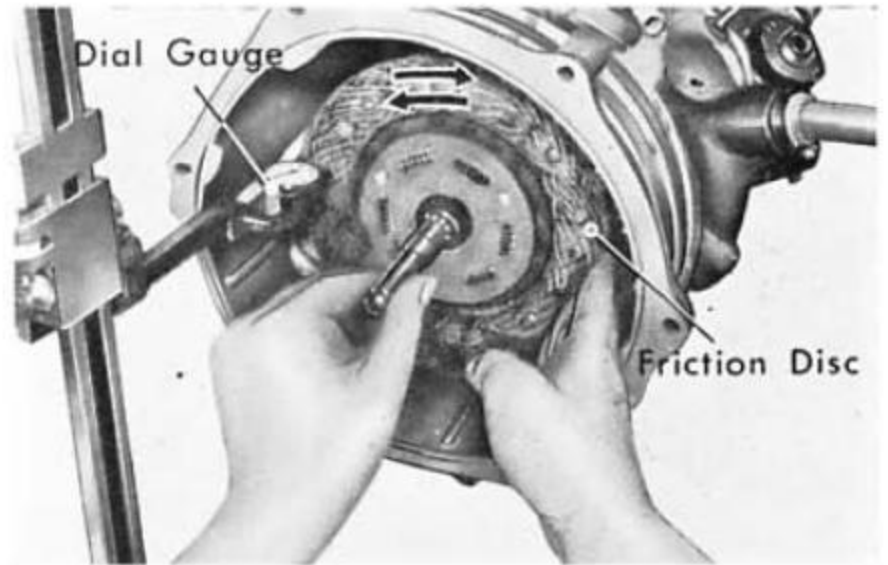


Fig. 5A-9

10. Inspect the clutch friction disc run-out and the wear of the lining (Fig. 5A-10).

Install the friction disc on the transmission main drive shaft and make the measurement on the lathe center with a dial gauge.

	Standard Value	Serviceable Limit
Face Run-Out	0~0.8 mm (0~0.031")	Replace if beyond 1.0 mm (0.039")
Facing Wear	—	Replace if facing is less than 0.7 mm (0.028") thick

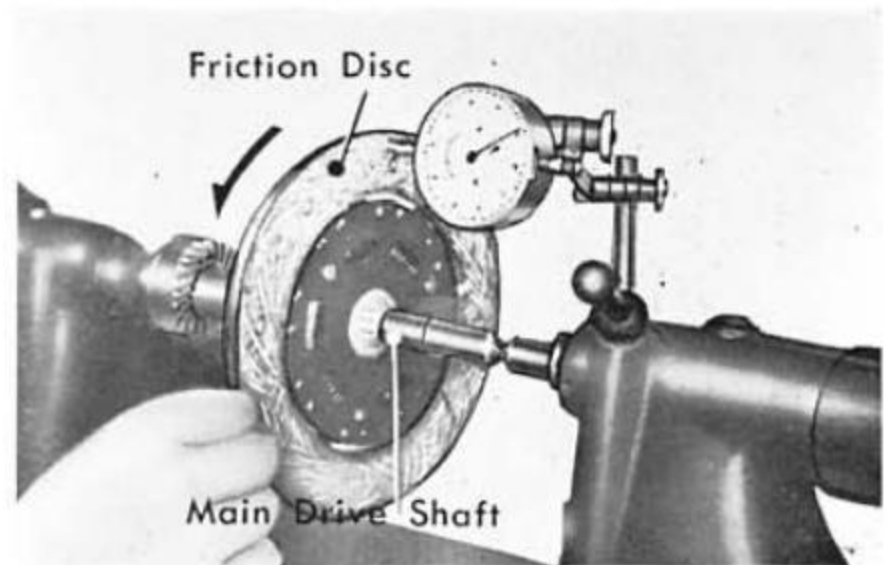


Fig. 5A-10

B. INSTALLATION

1. Install the clutch flywheel on the crankshaft with the attaching bolts and locking washer (Fig. 5B-1). Torque the bolts to 10 kg-m (72.3 ft-lbs) during installation.

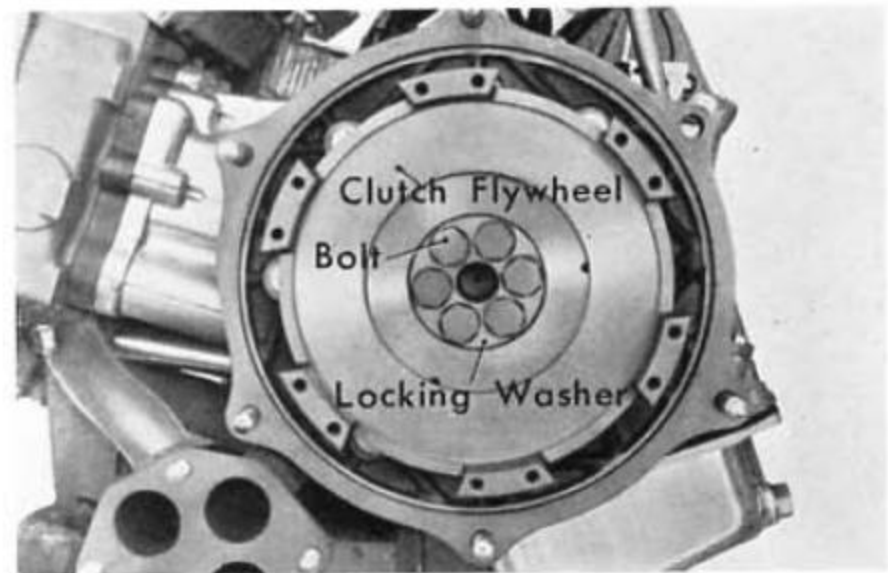


Fig. 5B-1

2. Install the clutch spring stoppers by screwing the setting screws and washers (Fig. 5B-2).

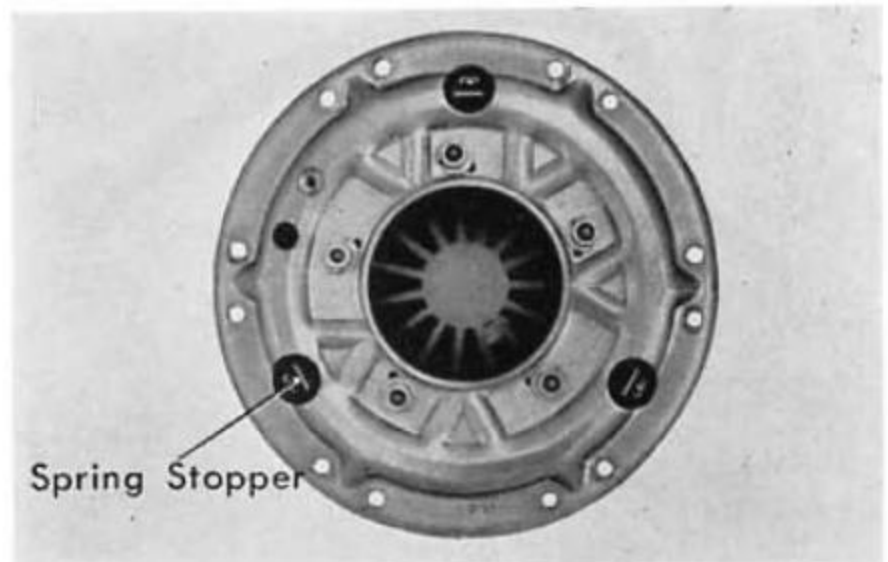


Fig. 5B-2

5-6 CLUTCH

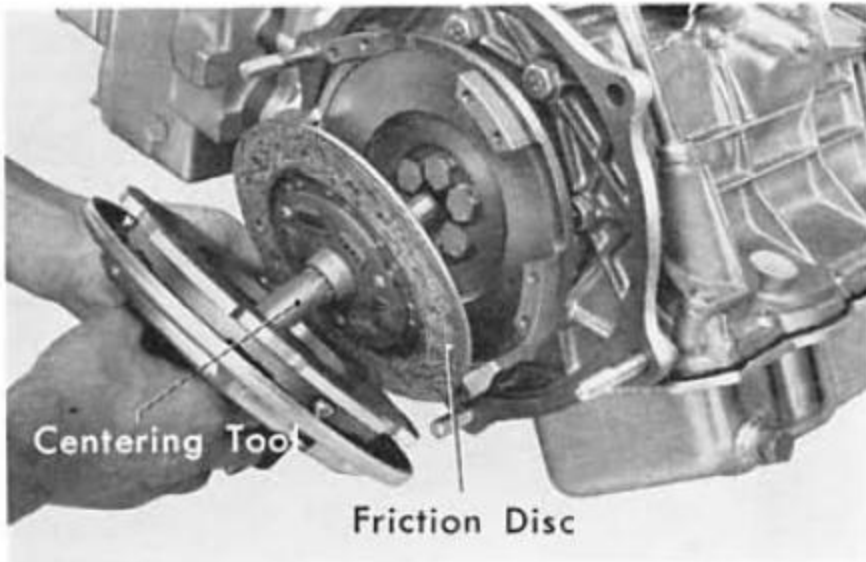


Fig. 5B-3

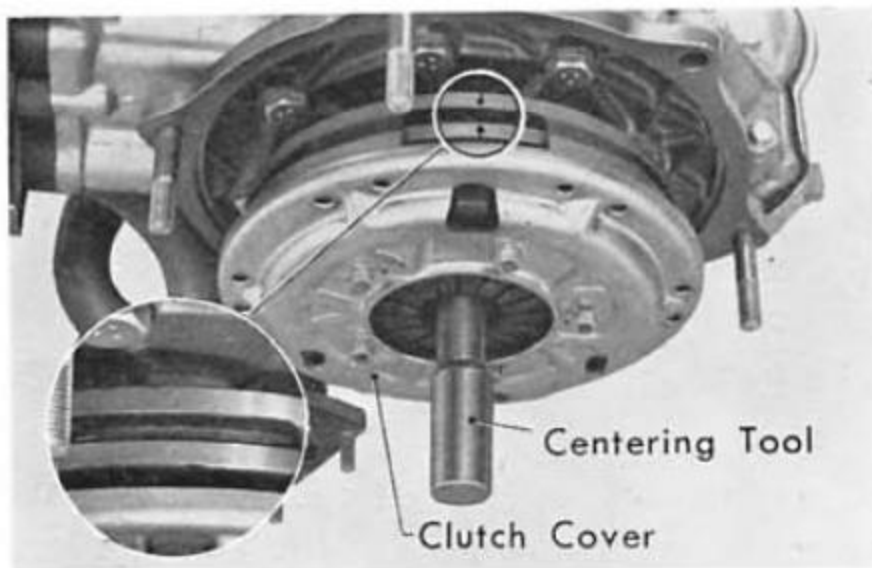


Fig. 5B-4

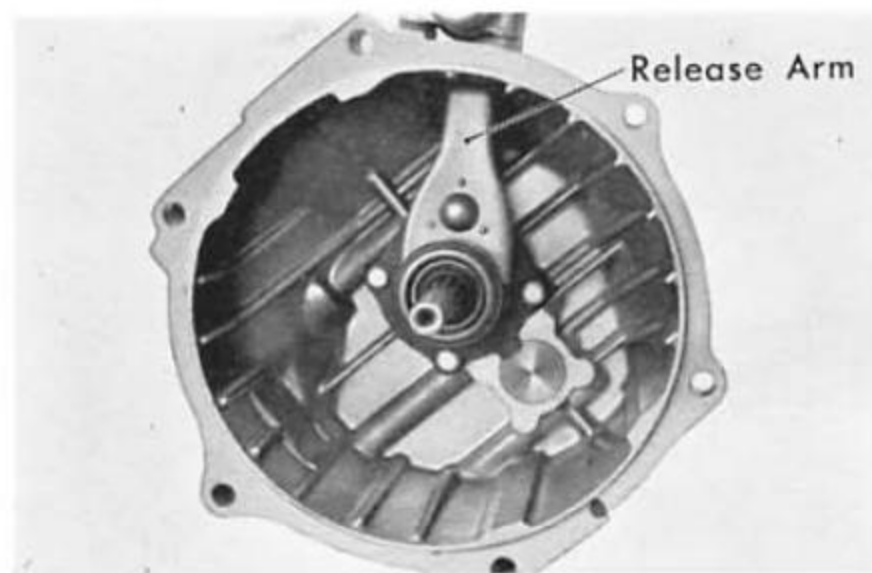


Fig. 5B-5

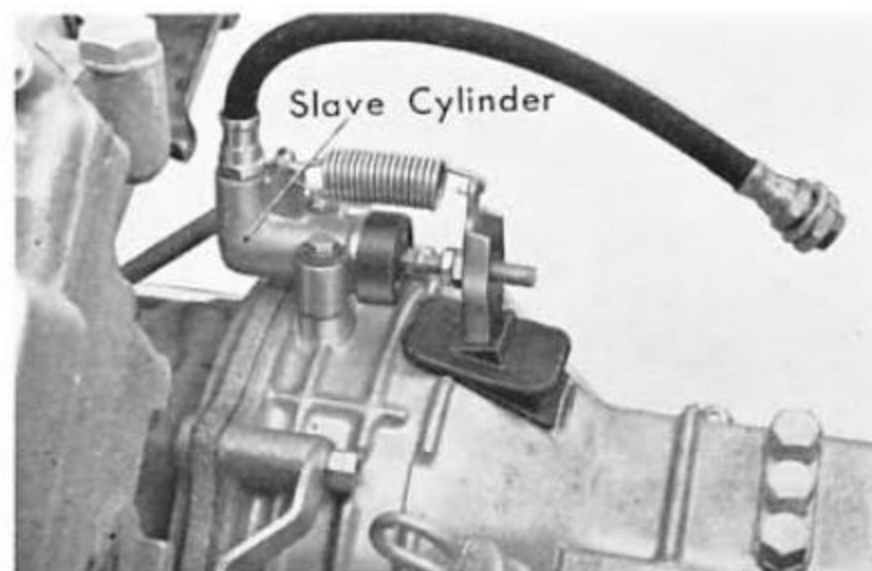


Fig. 5B-6

3. Align and bolt the flywheel to the crankshaft with the chamfered side of the locking washer against the flywheel.
4. First, locate the alignment mark on the flywheel and then assemble the friction disc and the clutch cover to the flywheel by using the splined centering tool to centrally align the friction disc. Make sure that the friction disc is assembled with the short center boss toward the flywheel (Fig. 5B-3).

5. Bolt and lock the clutch cover to the flywheel after aligning the marks on the flywheel and the clutch cover. Remove the centering tool (Fig. 5B-4).

Note :

Torque the bolts to 1.2kg-m (8.6 ft-lbs).

6. Assemble the clutch release arm and the slave cylinder to the clutch housing in the reverse order of removal.

C. ADJUSTMENT AND INSPECTION

1. Air Bleeding (Fig. 5C-1)

Perform the air bleeding, starting with the most remote cylinder. Attention should be paid to the level of the hydraulic fluid in the master cylinder reservoir during the bleeding operation.

Attach a bleeder hose to the bleeder screw and have an assistant pump the pedal 3~4 times, and hold the pedal depressed. Loosen the bleeder screw to exhaust any air bubbles and quickly retighten. Perform this cycle several times until the air bubbles are completely eliminated.

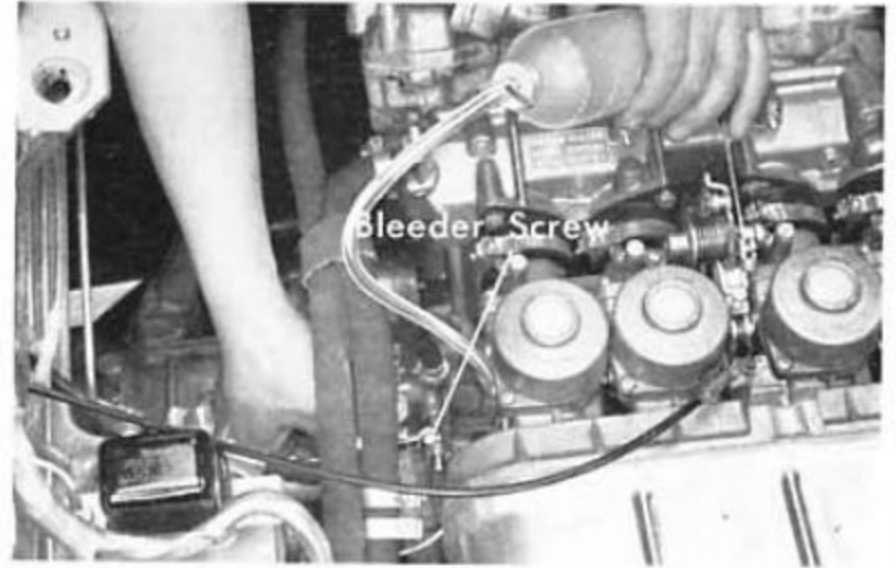


Fig. 5C-1

2. Clutch Pedal

Adjust clutch pedal travel by loosening the locknut on the slave cylinder pushrod and turning the adjuster nut. Moving the release arm in the direction of "F" shown in Fig. 5C-2 will decrease the pedal travel and moving the release arm in the "R" direction will increase the pedal travel.

The pedal travel and play is determined by the clearance of the release bearing and clutch spring.

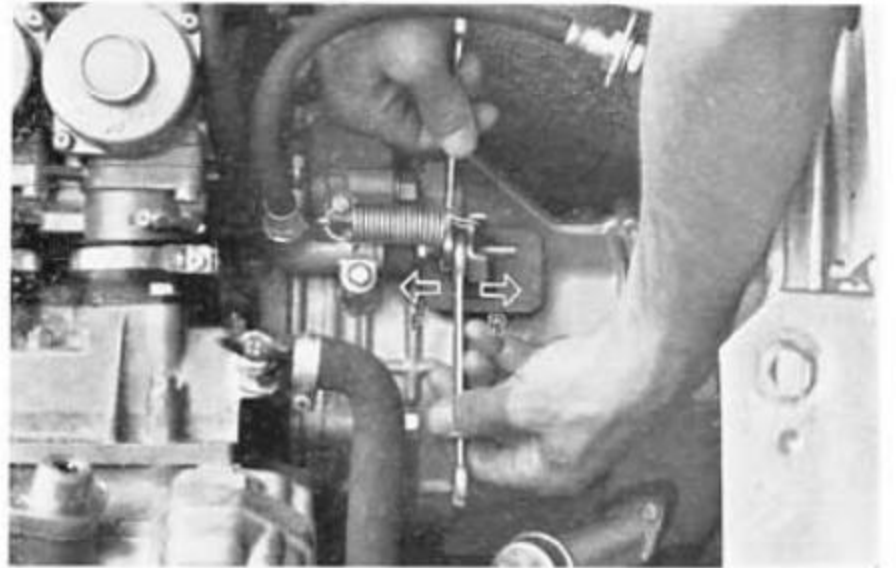


Fig. 5C-2

Pedal play :	10~20 mm (0.394~0.787")
Clearance between clutch release bearing and clutch return spring :	1.2mm (0.047") or 3.2mm (0.126") measured at the end of the release arm.

The pedal travel and play are both adjusted at the slave cylinder.

6. TRANSMISSION

TRANSMISSION EXPLODED VIEW

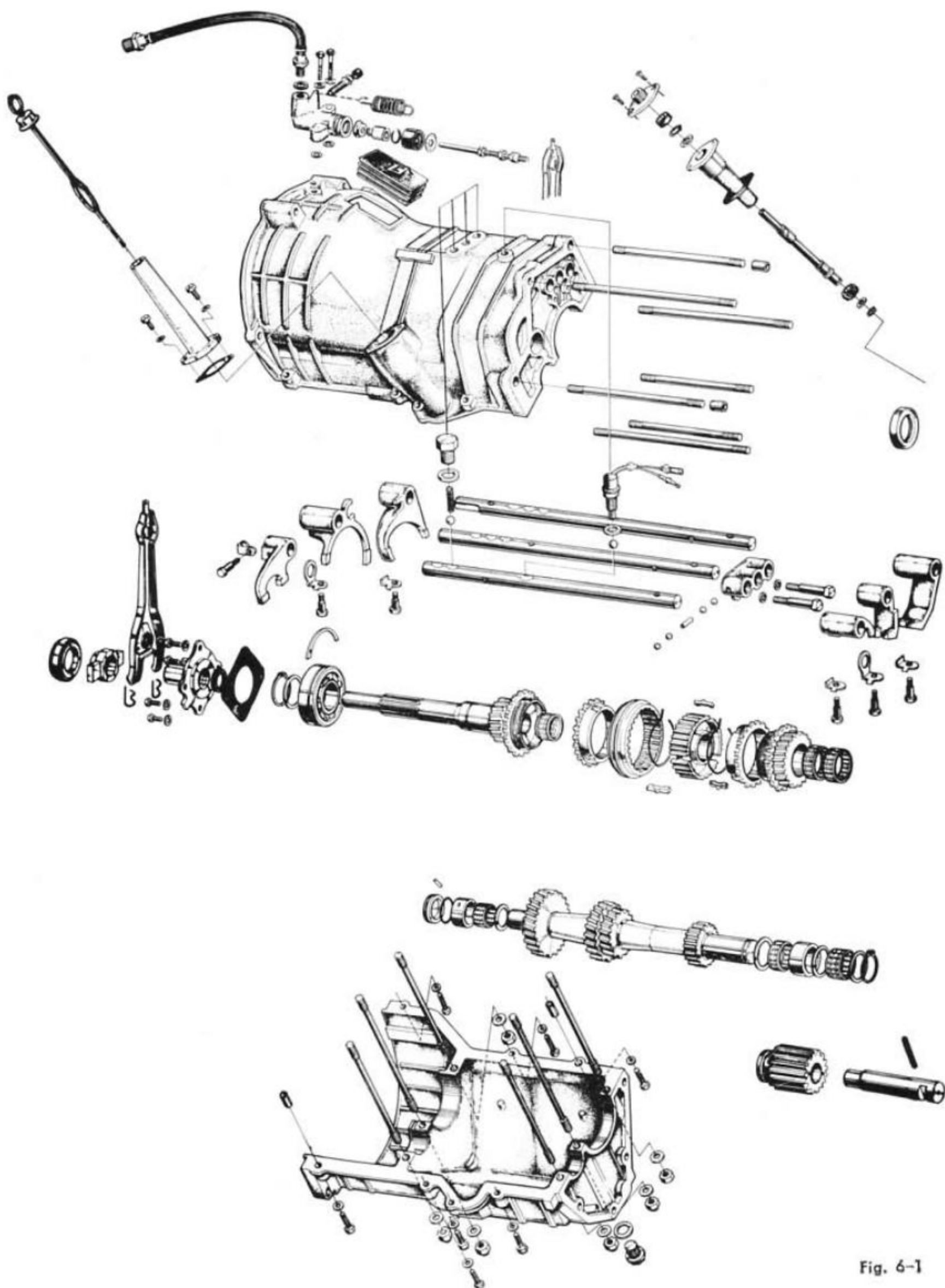
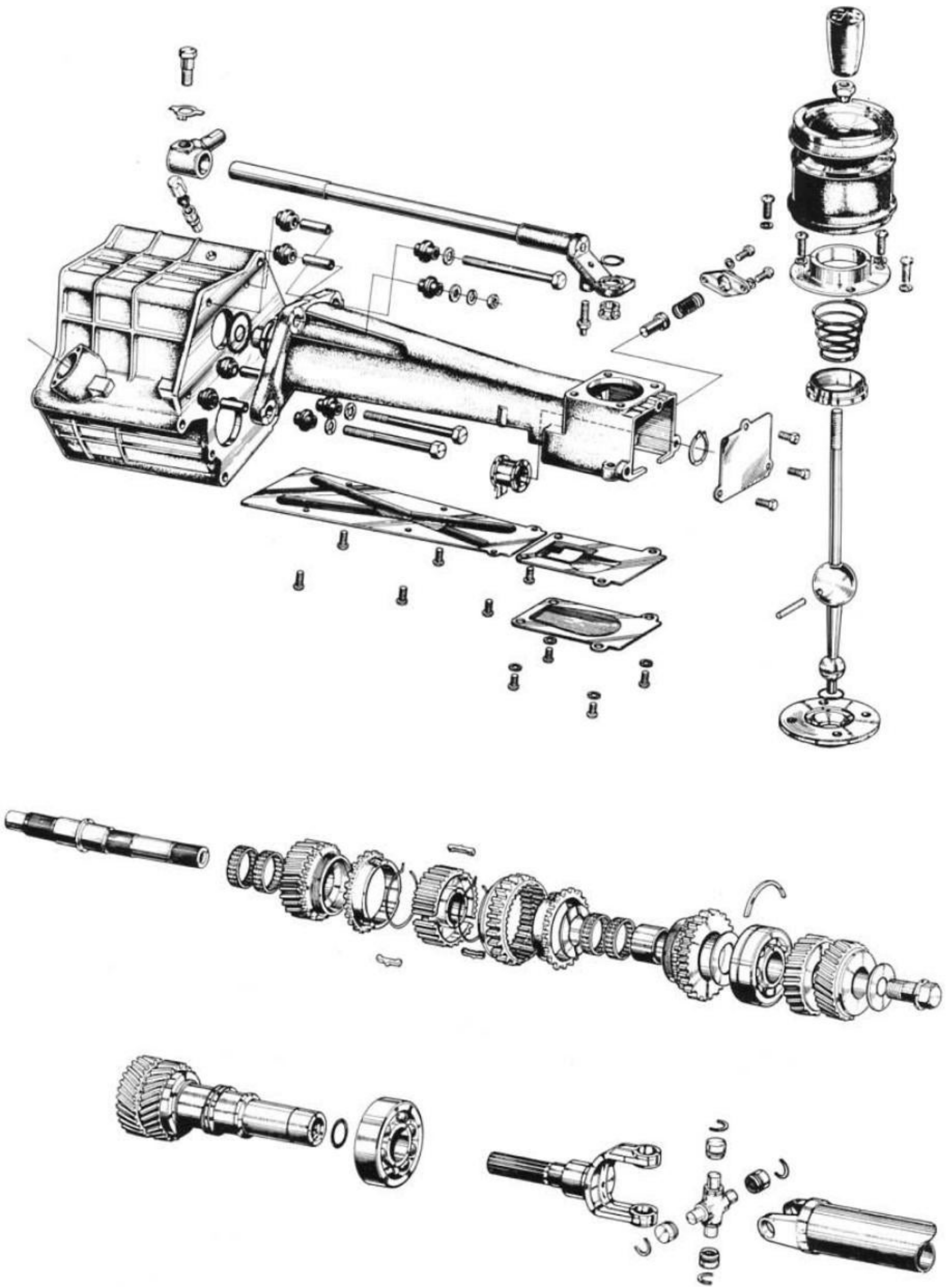


Fig. 6-1



SECTIONAL VIEW OF TRANSMISSION

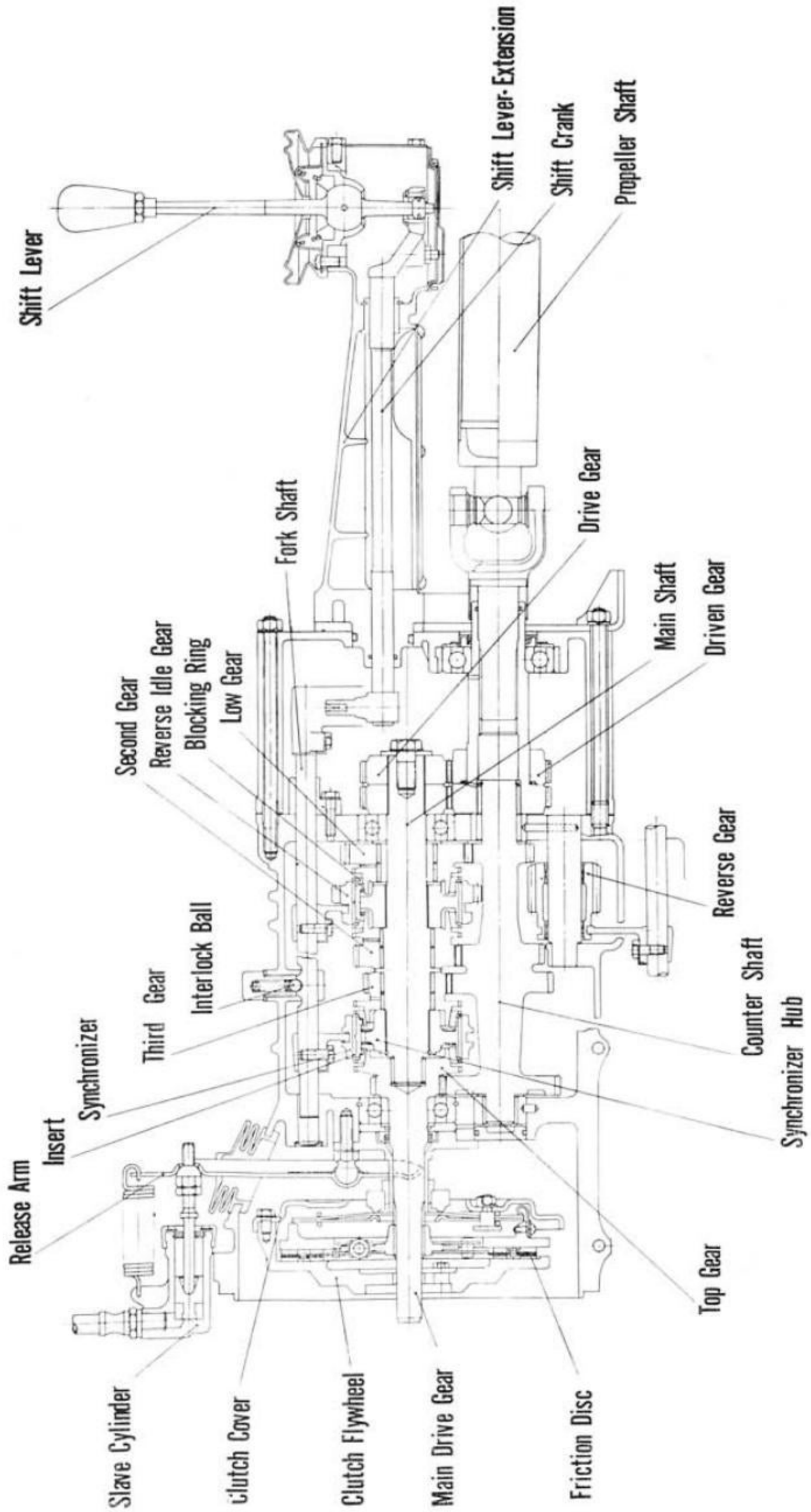


Fig. 6-2

4 forward speeds all synchromeshed and 1 reverse speed. The gear ratio is: 1st : 3.950, 2nd : 2.410, 3rd : 1.615, top : 1.143, and reverse : 4.520

For every gear, needle bearings are used to minimize the friction loss during high speed driving and to secure a long service life.

A. REMOVAL AND ASSEMBLY

1. Remove the drain plug and drain the oil (Fig. 6A-1). Oil capacity : 2.2 ℓ (3.9 Imp. pt., 4.7 U.S. pt.)
2. Transmission shall be removed complete with the engine (Fig. 6A-2) from the vehicle.

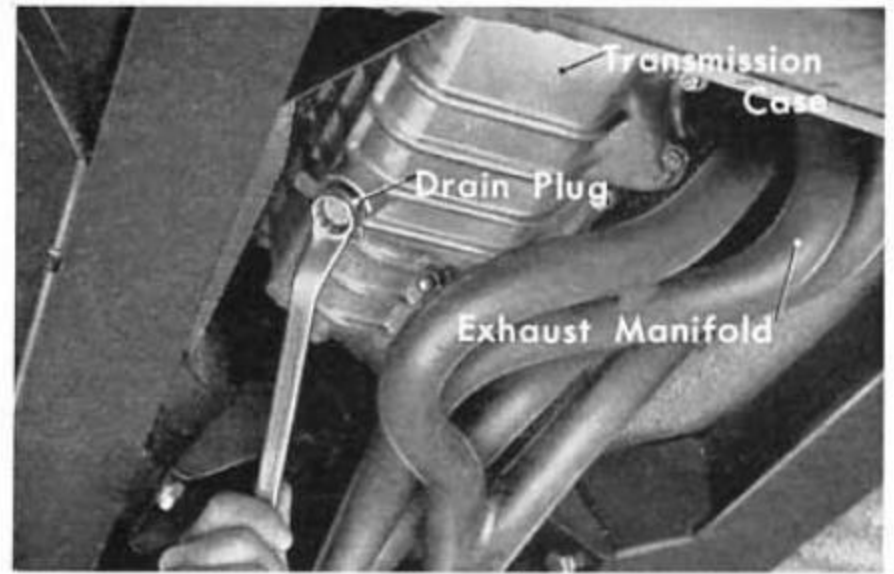


Fig. 6A-1

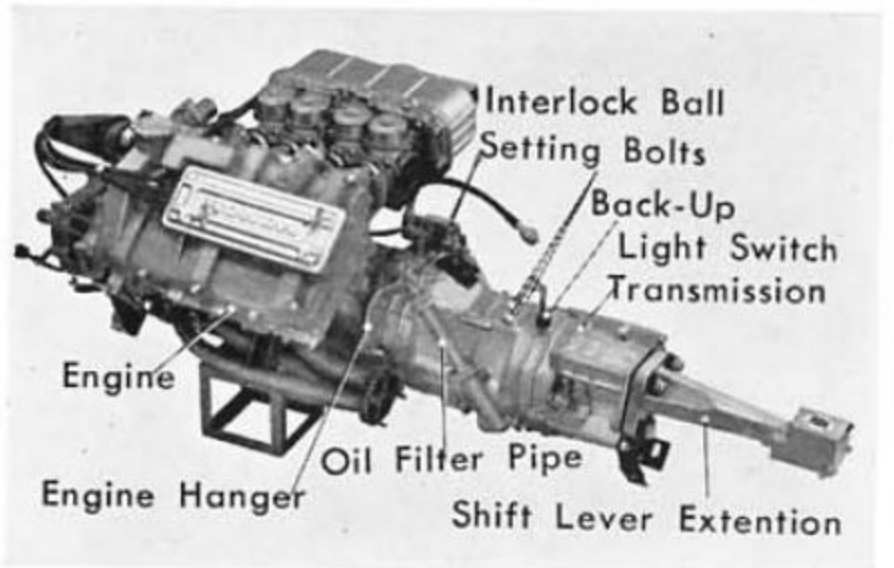


Fig. 6A-2

3. Separate the transmission from the engine by removing the attaching nuts (Fig. 6A-3). No washer is used at the engine hanger.
4. To assemble, place the transmission in gear and join with the engine while turning the splined yoke.

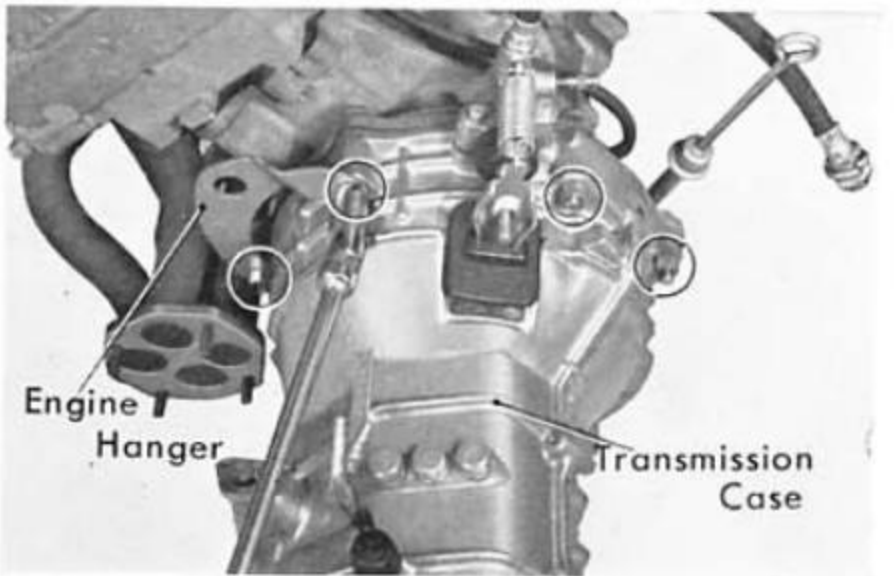


Fig. 6A-3

B. CLUTCH RELEASE ARM

Removal and Assembly

1. Remove the release arm return spring and slave cylinder setting bolts and then remove slave cylinder (Fig. 6B-1).

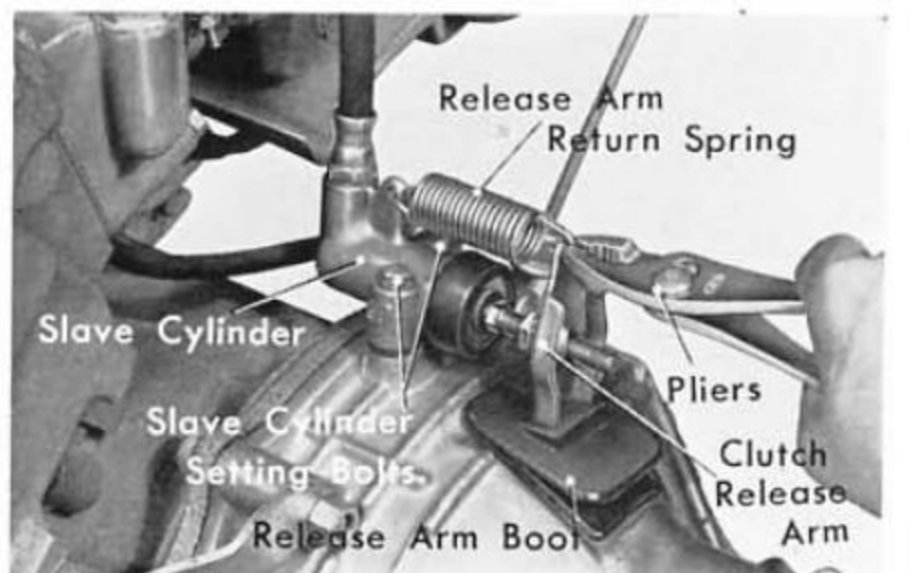


Fig. 6B-1

6-5 TRANSMISSION

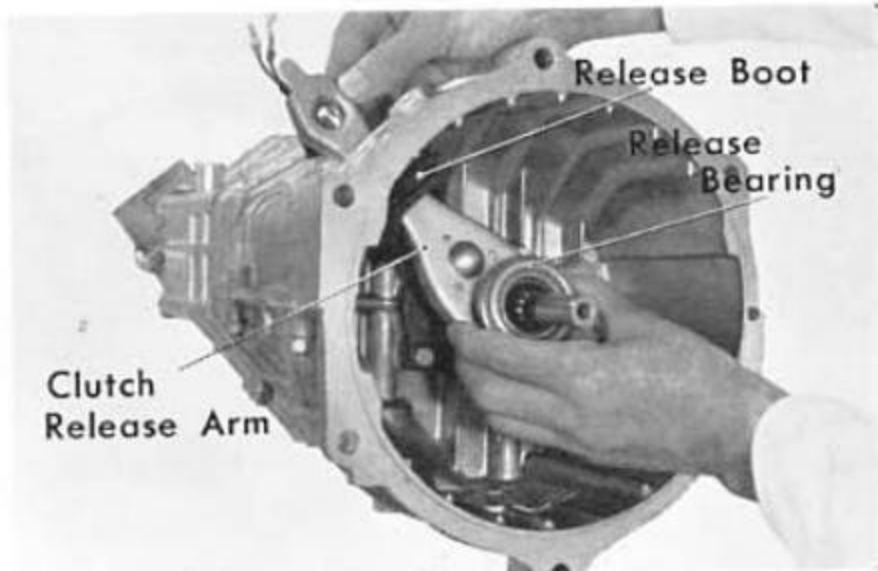


Fig. 6B-2

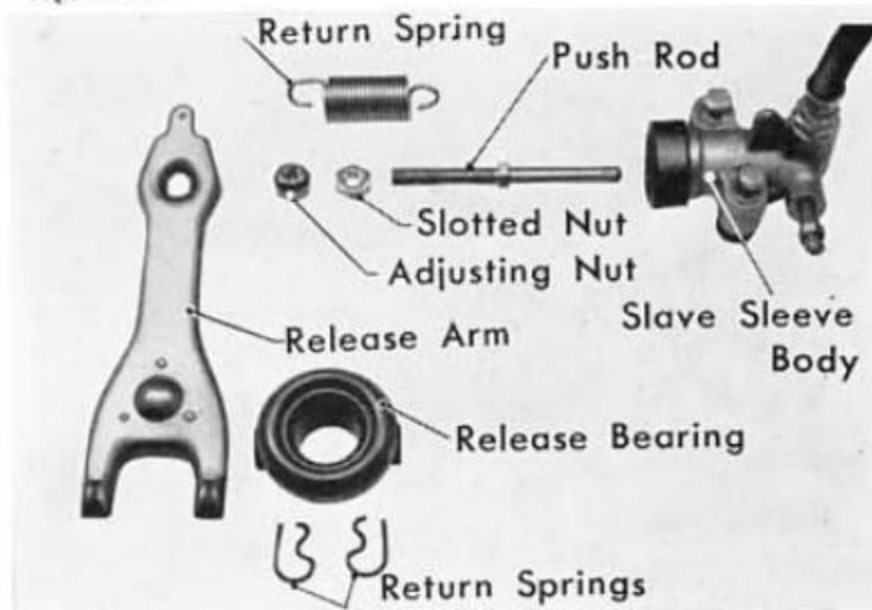


Fig. 6B-3

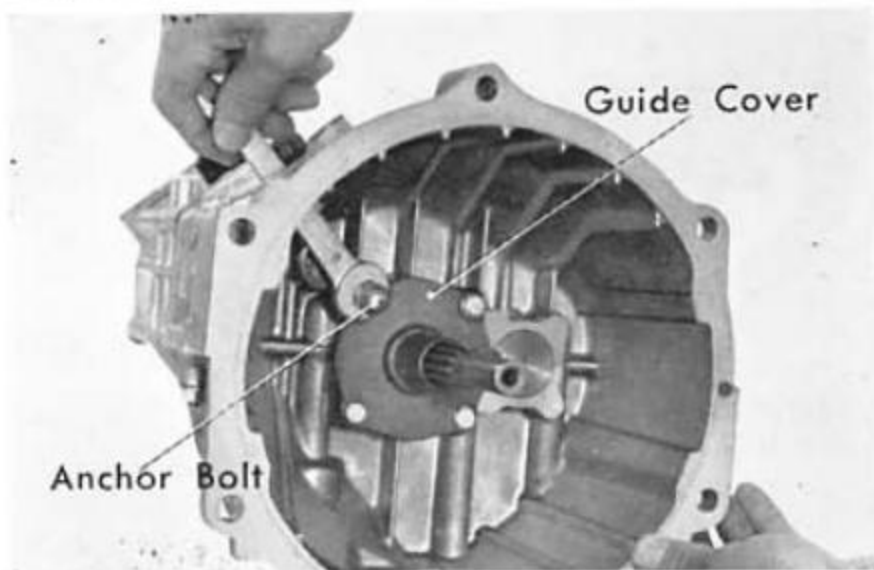


Fig. 6B-4

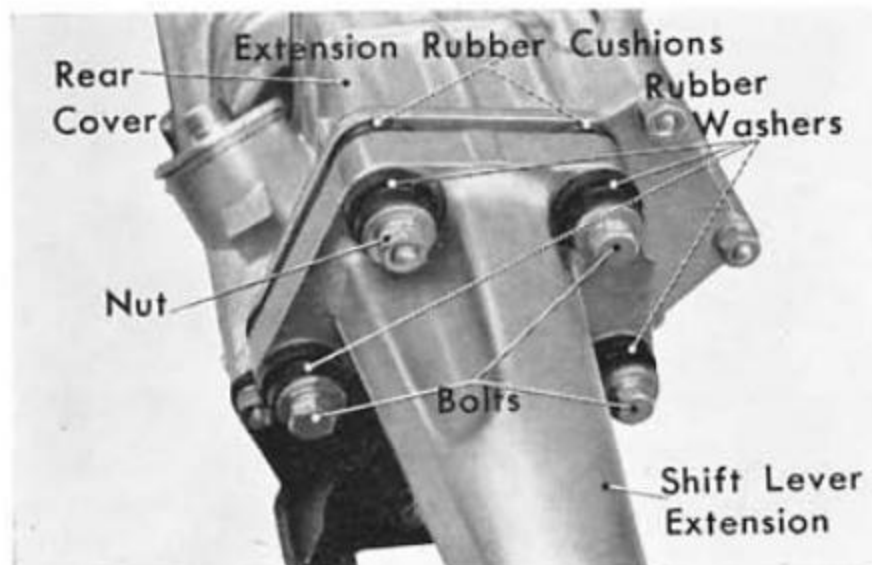


Fig. 6C-1

2. Disassemble the release bearing, clutch release arm and release boot (Fig. 6B-2).

3. Remove the guide cover setting bolts and an anchor bolt and then remove the guide cover (Fig. 6B-4).
4. Perform the assembly in the reverse order of disassembly.

C. SHIFT LEVER EXTENSION

a. Removal

1. Remove the nut and bolts together with spring washers, plain washers, rubber washers and collars. Remove the extension rubber cushion from the rear cover (Fig. 6C-1).
The change lever crank is fitted to the shift piece, therefore, use care in disassembly.

2. Remove the guide plate cover setting screws and disassemble the guide plate cover, guide plate from the shift lever extension (Fig. 6C-2, 3).

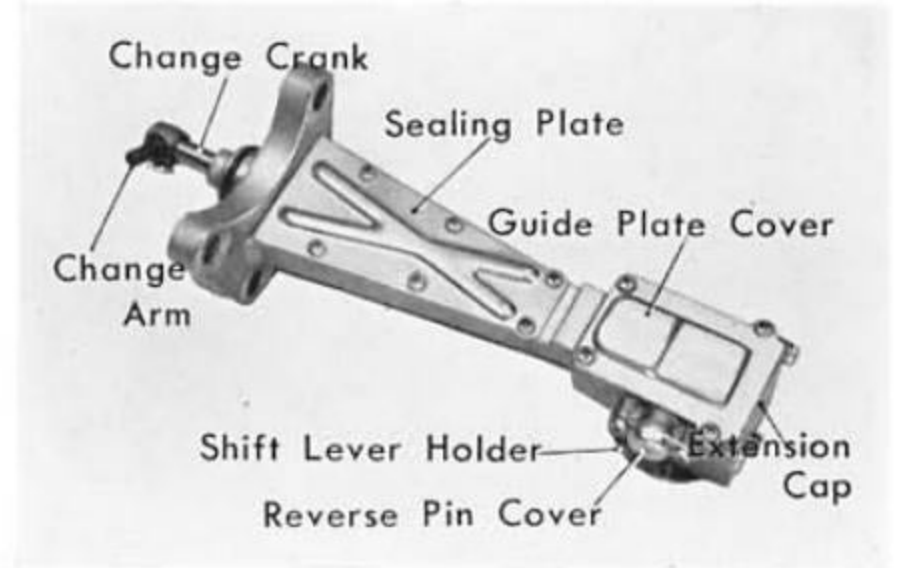


Fig. 6C-2

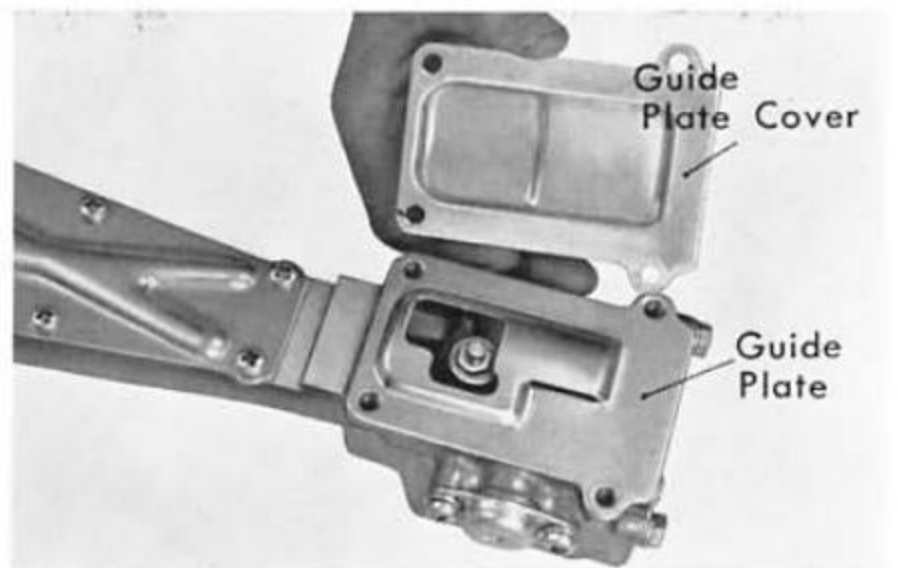


Fig. 6C-3

3. After removing the shift lever holder, remove the reverse pin cover setting bolts and disassemble the reverse pin cover, return spring and reverse pin from the extension (Fig. 6C-4).

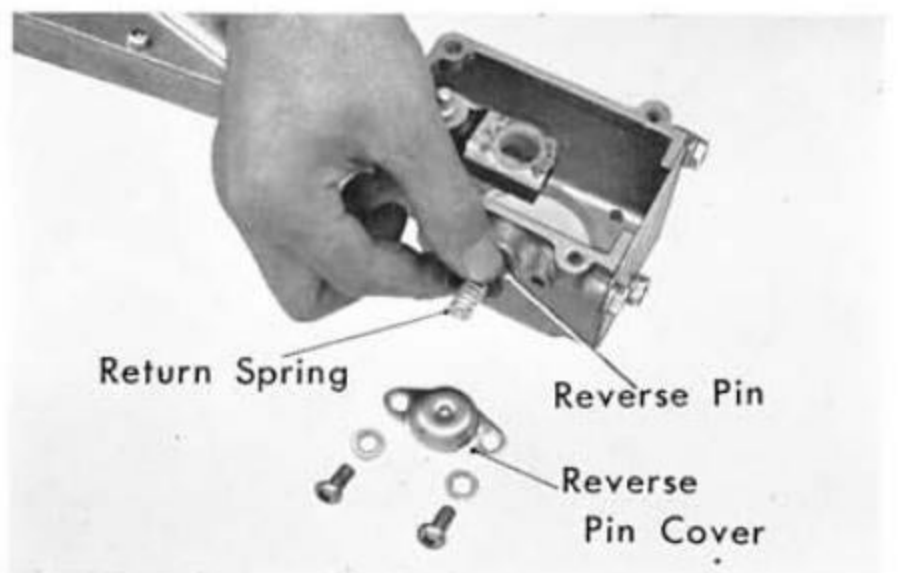


Fig. 6C-4

4. Remove the lock washer, set screw and disengage the change arm from the change crank (Fig. 6C-5).

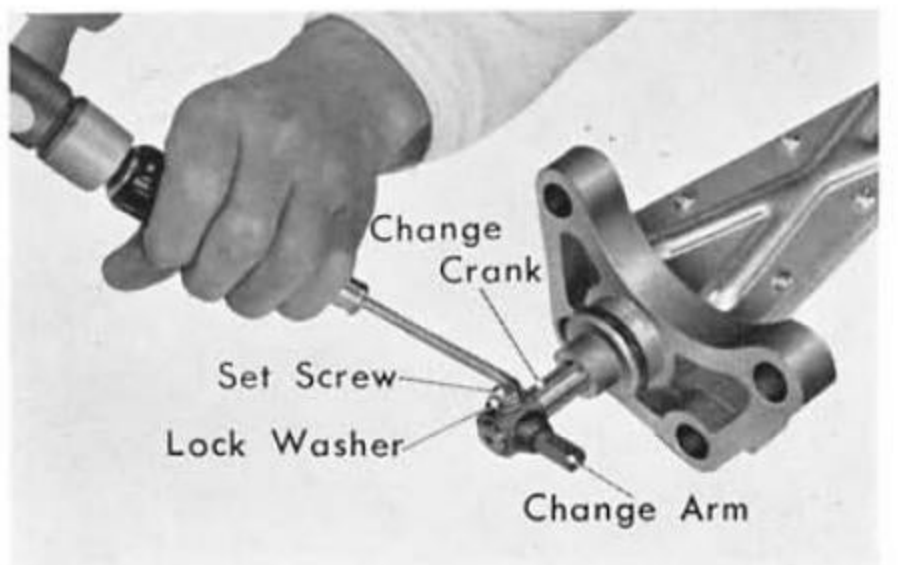


Fig. 6C-5

6-7 TRANSMISSION

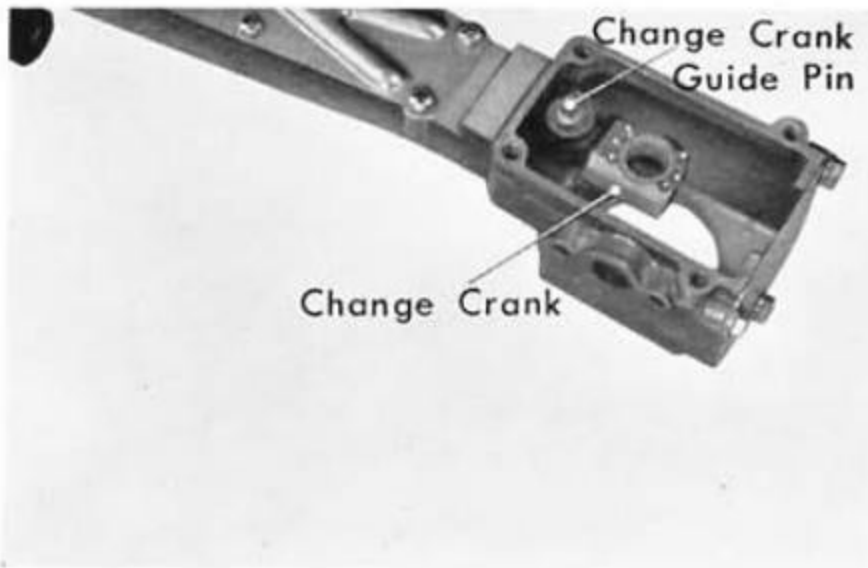


Fig. 6C-6

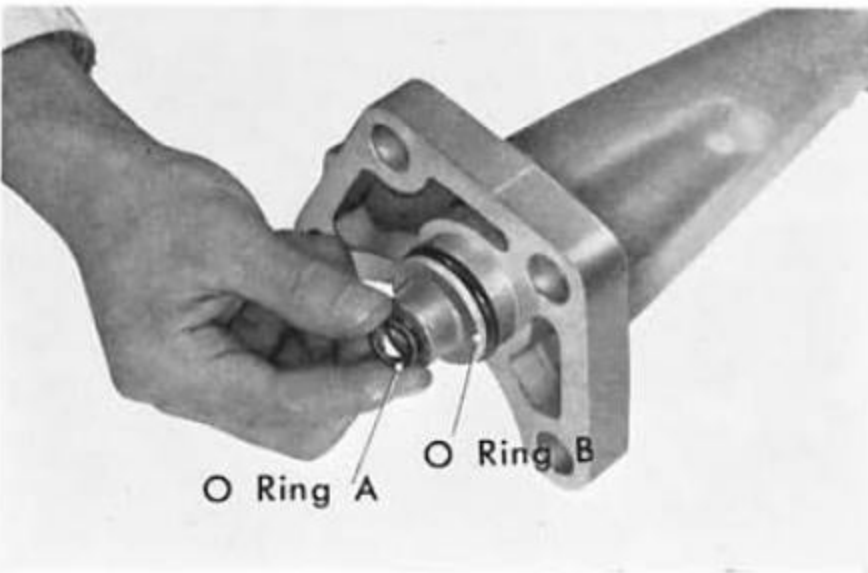


Fig. 6C-7

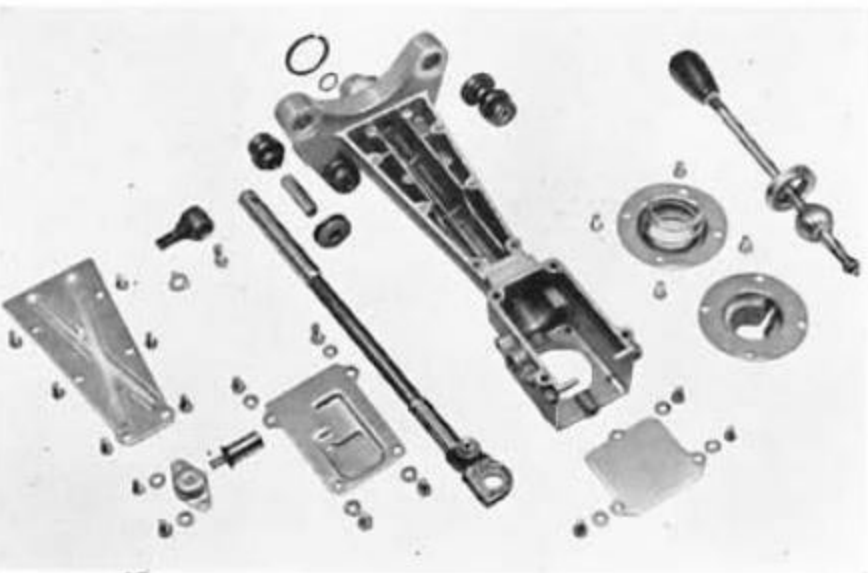


Fig. 6C-8

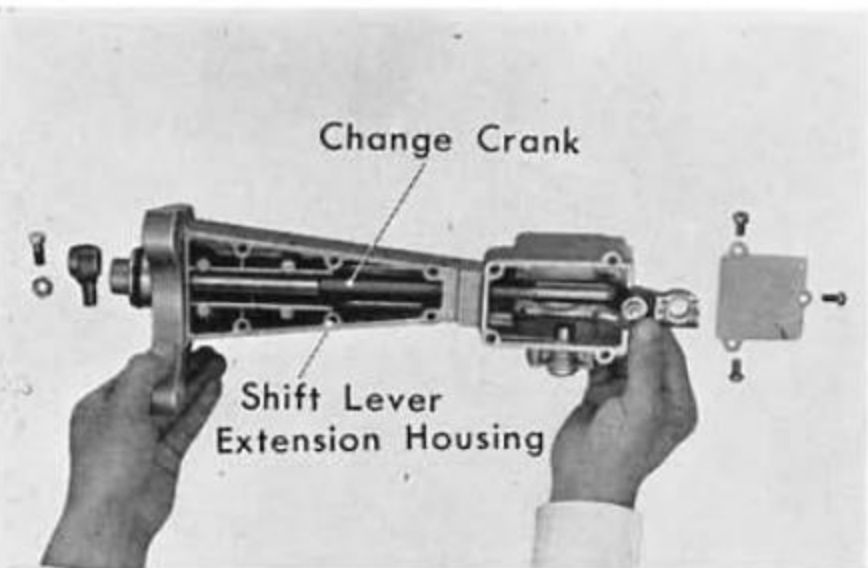


Fig. 6C-9

5. Remove the guide pin and disassemble the crank from the extension (Fig. 6C-6).

6. Remove the O rings A and B (Fig. 6C-7)

b. Shift Lever Extension Assembly

1. After installing the O rings, grease the change crank and assemble into the shift lever extension housing (Fig. 6C-9, 10).

2. Check to make sure that it operates smoothly before installing the guide pin into the change crank (Fig. 6C-10).

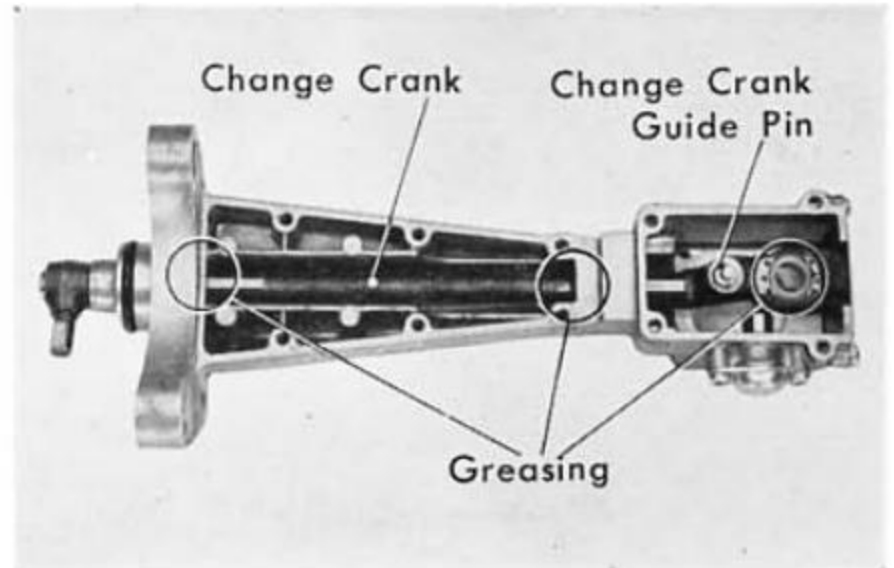


Fig. 6C-10

3. Install the change arm on the forward end of the crank with the arm toward the right, lock with set screw and lock washer (Fig. 6C-11).

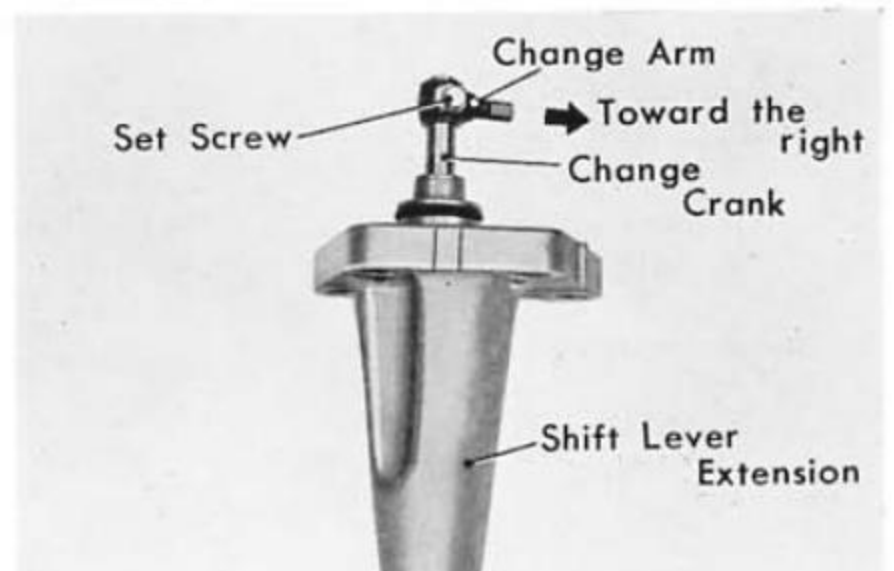


Fig. 6C-11

4. After assembling the guide plate and guide plate cover, install the shift lever holder (Fig. 6C-12). Apply grease to all friction surface.
5. Check the change crank for proper operation.

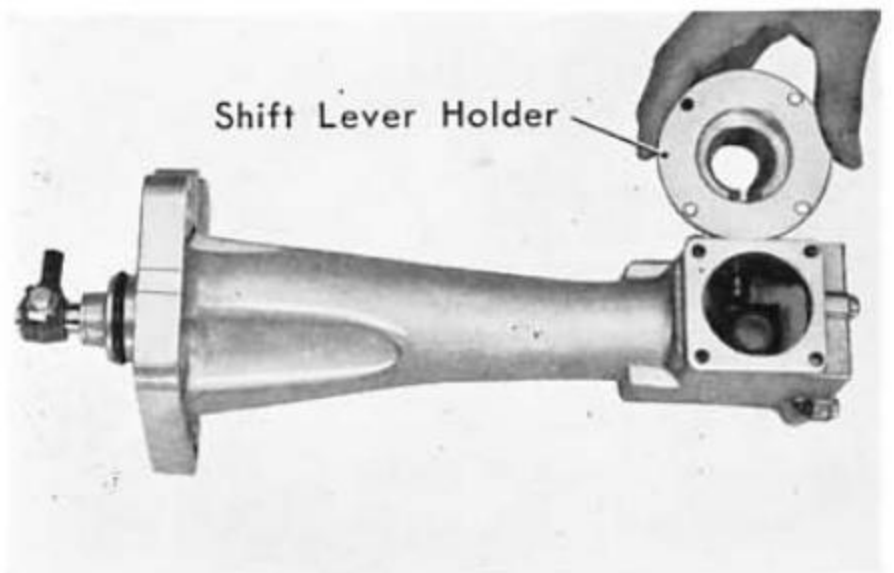


Fig. 6C-12

c. Installation

Pull out the change arm as far as possible and insert into the hole in the rear cover. Insert the end of the change arm into the groove in the shift piece and assemble in the reverse order of disassembly (Fig. 6C-13).

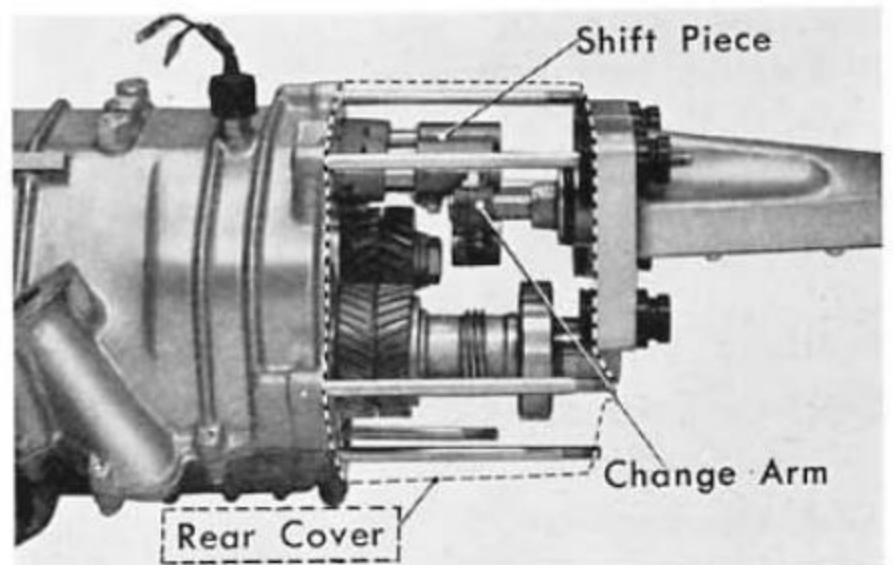


Fig. 6C-13

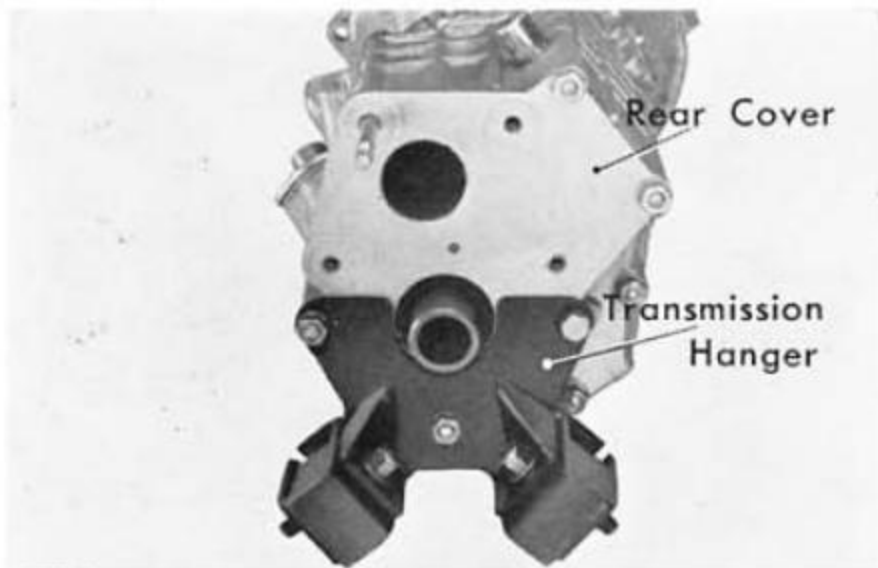


Fig. 6D-1

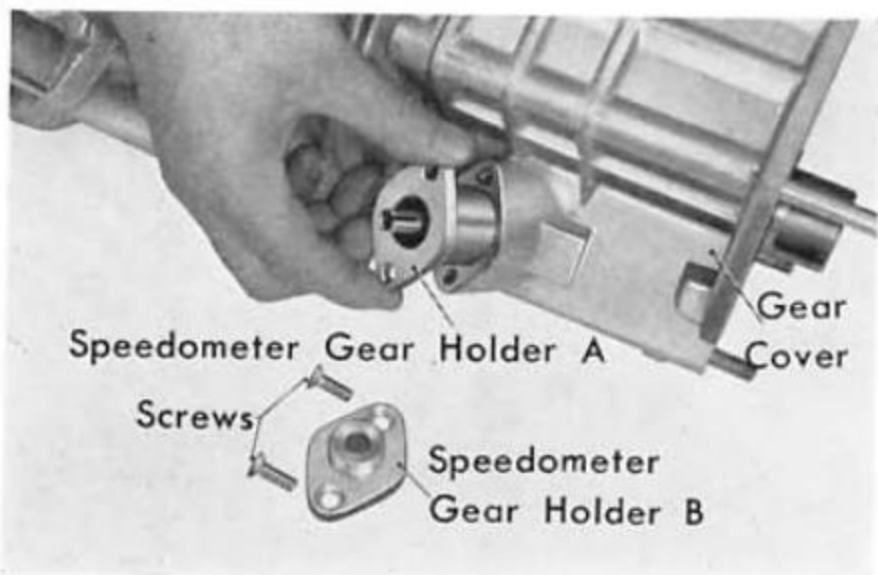


Fig. 6D-2

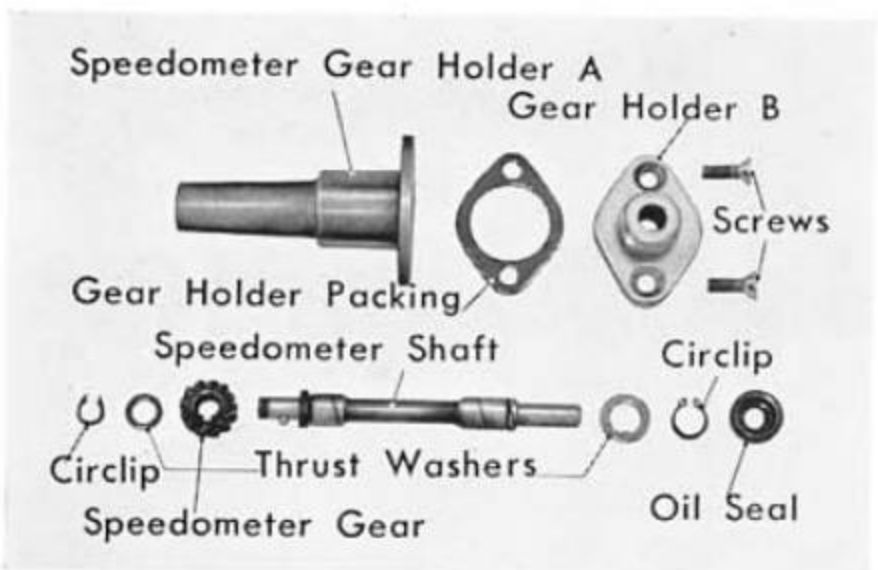


Fig. 6D-3

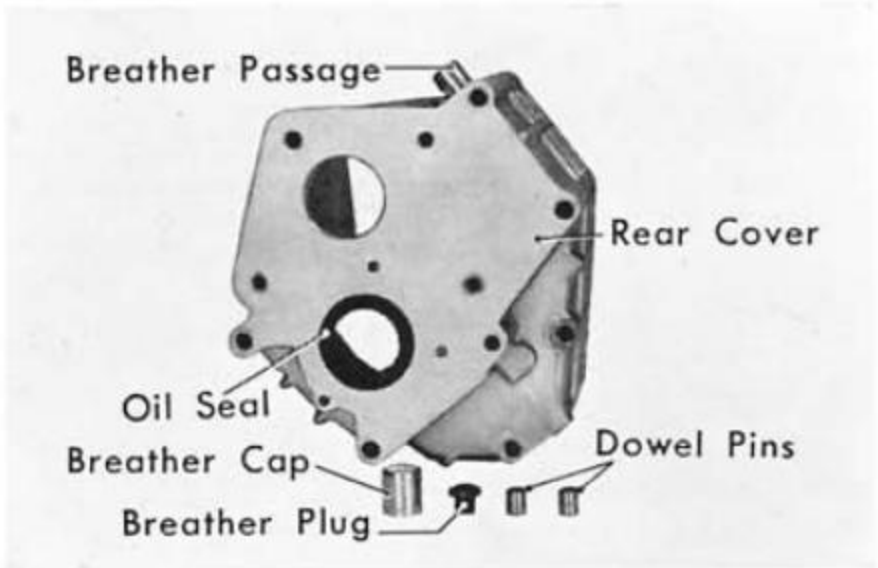


Fig. 6D-4

D. REAR COVER

Removal and Assembly

1. After the removal of the shift lever extension case, remove the flange yoke from the joint yoke.
2. Disassemble the transmission hanger from the rear cover by removing nuts, bolt and washers (Fig. 6D-1).

3. Remove the speedometer gear assembly by removing the screws.

Disassemble the gear holder by removing the oil seal, circlip and thrust washer (Fig. 6D-2, 3).

4. Remove the rear cover and gasket from the transmission case. Remove the oil seal, breather plug, breather cap and dowel pins (Fig. 6D-4).

5. Perform the assembly in the reverse order of disassembly. When assembling the rear cover, be careful not to damage the oil seal.

E. DRIVE AND DRIVEN GEARS

Removal and Installation

1. After removal of the rear cover, remove the bolt and washer with a impact wrench and pull off drive gears from the main shaft. At the same time, remove the driven gear with ball bearing from the counter-shaft (Fig. 6E-1, 2). Torque the bolt to 12 kg-m (86.7 ft-lbs) during assembly.

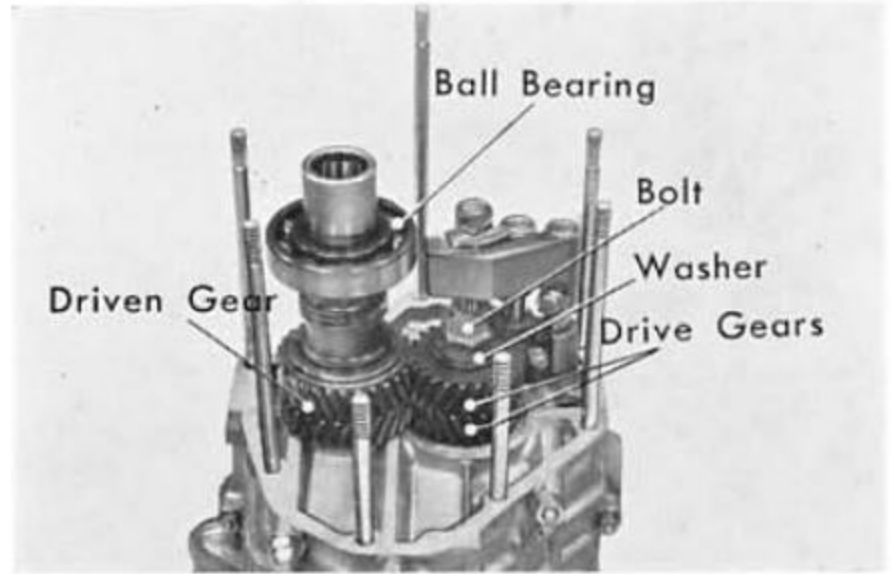


Fig. 6E-1

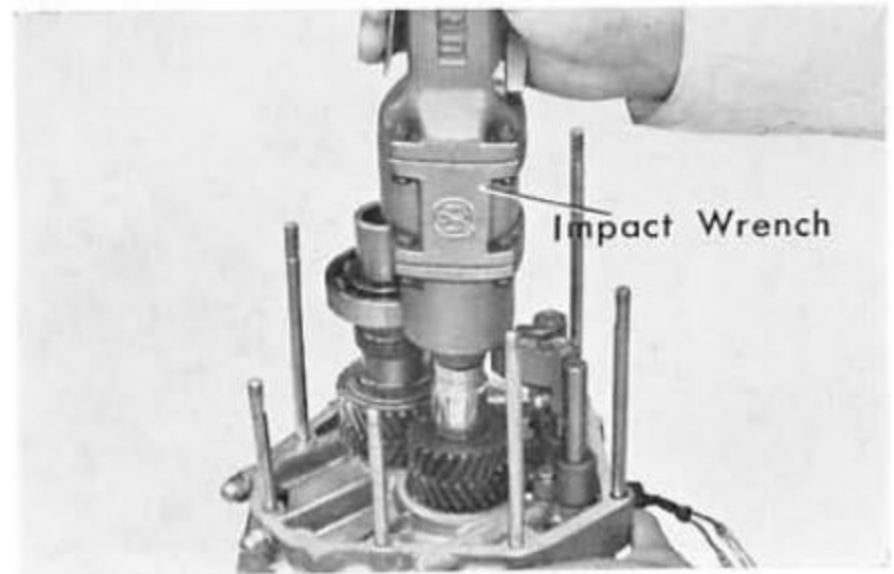


Fig. 6E-2

2. Remove the ball bearing from the driven gear shaft by using a ball bearing puller (Fig. 6E-3).

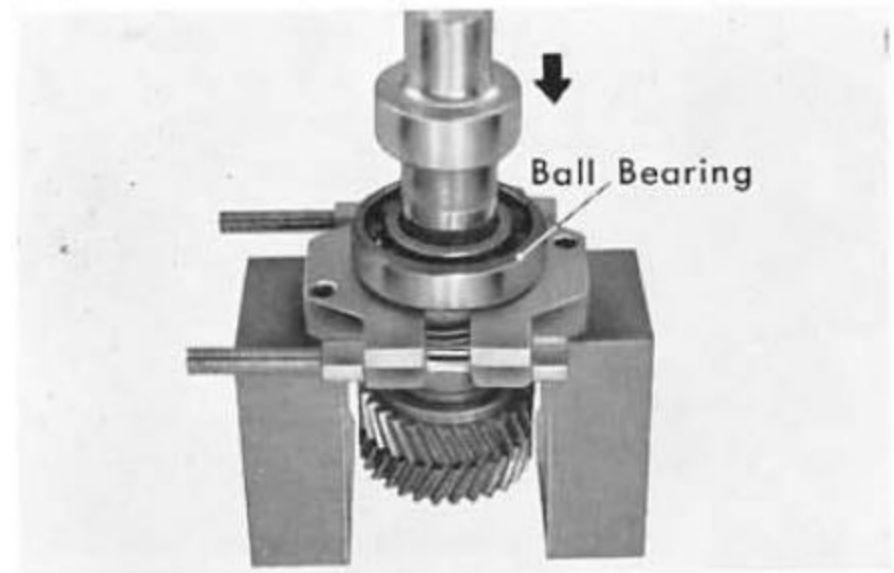


Fig. 6E-3

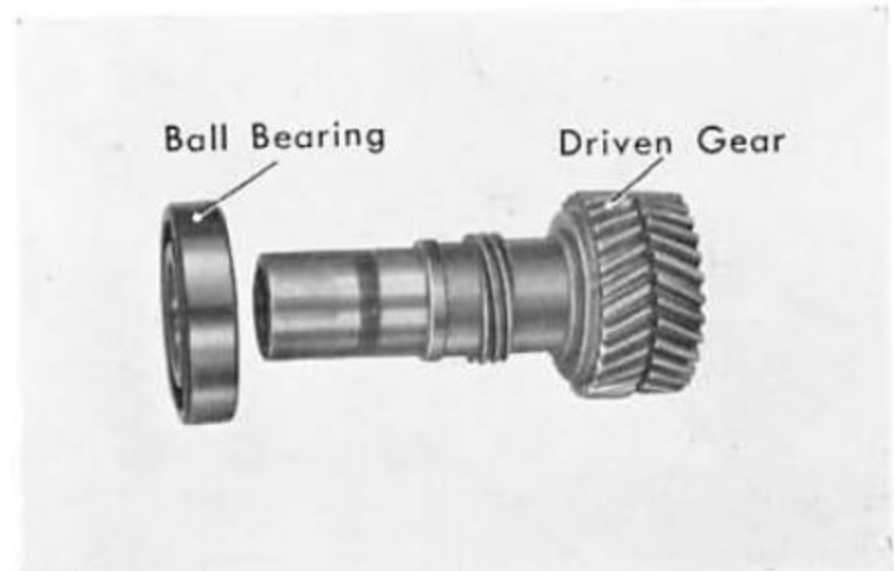


Fig. 6E-4

6-11 TRANSMISSION



Fig. 6E-5

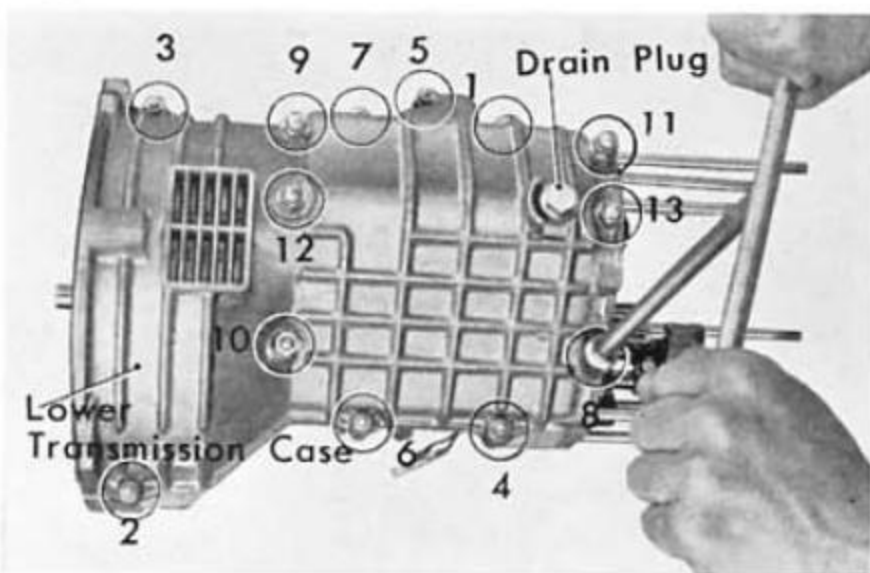


Fig. 6F-1

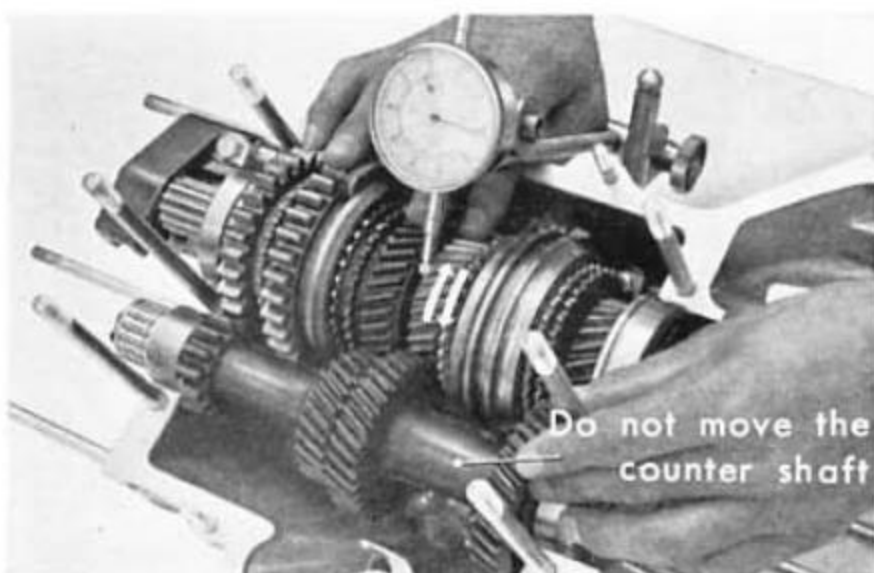


Fig. 6F-2

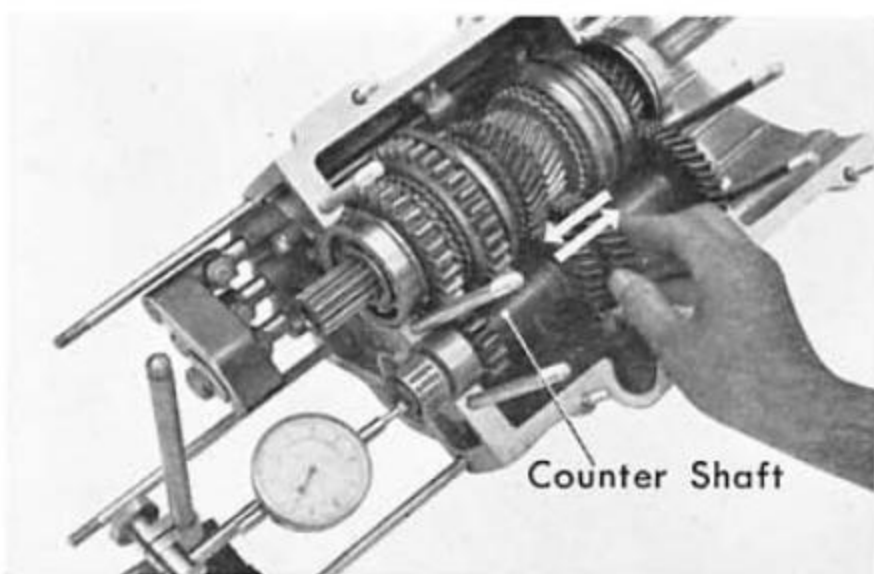


Fig. 6F-3

3. Perform the assembly in the reverse order of disassembly.

When assembling the drive gears, align the mark on the gear A to marking on the gear B for the gear position (Fig. 6E-5).

F. TRANSMISSION CASE AND GEAR

a. Removal

1. Separate the upper and lower transmission case by removing the nuts and washers (Fig. 6F-1). The transmission gear and the counter gear are assembled in the upper transmission case.

Note:

When assembling, tighten the nuts in the reverse order of removal.

Torque the nuts to

1.0 kg-m (7.2 ft-lbs) nuts 1~7

2.5kg-m (18.1 ft-lbs)..... nuts 8~13

2. Inspect backlash of the gears (Fig. 6F-2).

	Standard Value	Serviceable Limit
Backlash	0.046~0.094 mm (0.002~0.004")	Replace if beyond 0.1 mm (0.004")

3. Inspect counter shaft end play (Fig. 6F-3).

	Standard Value	Serviceable Limit
End Play	0.08~0.25 mm (0.0031~0.0098")	Replace if beyond 0.7 mm (0.0276")

4. Raise the main shaft slightly and remove the ball bearing setting rings at the ball bearing holders in the case by turning the ball bearing (Fig. 6F-4).

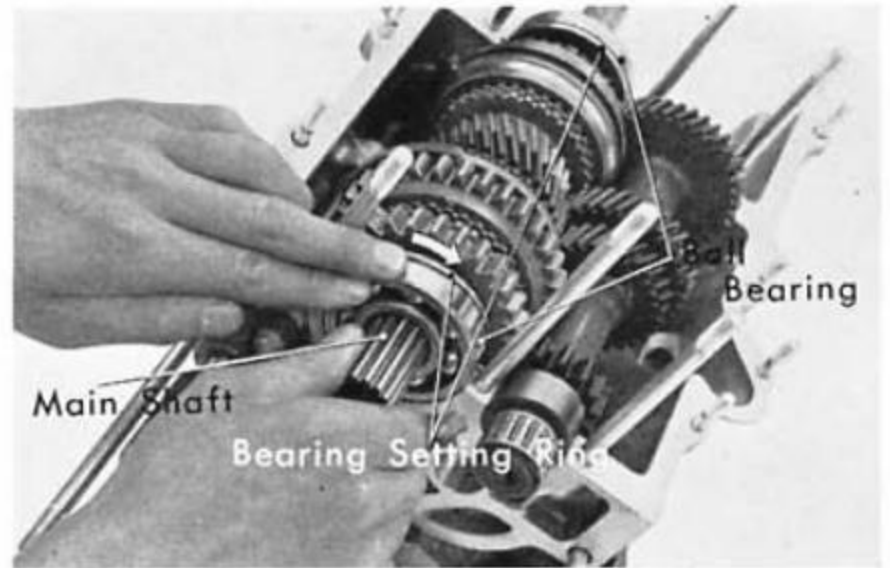


Fig. 6F-4

5. Remove the counter shaft and the ball bearing at output side from the main shaft (Fig. 6F-5).

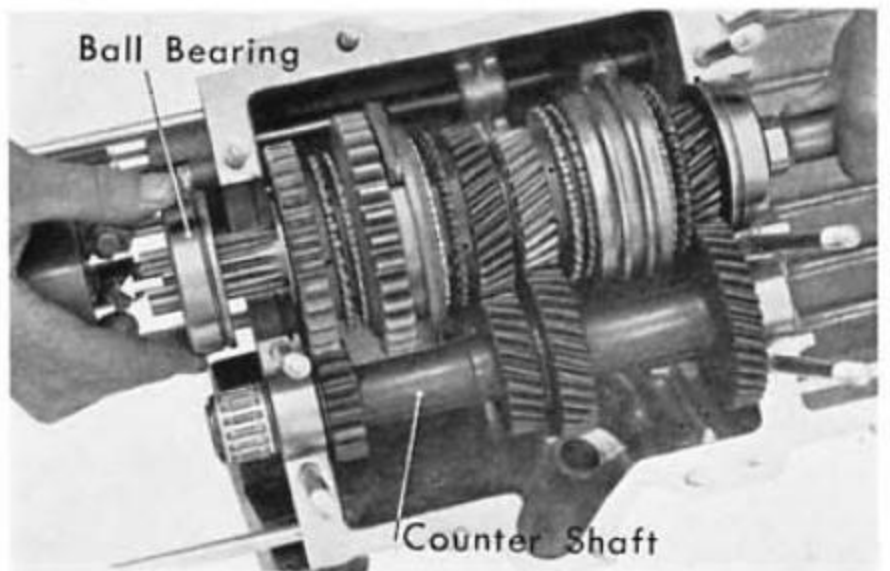


Fig. 6F-5

6. Raise slightly the main drive gear and pull out the gear and then remove the main shaft with gears (Fig. 6F-6).

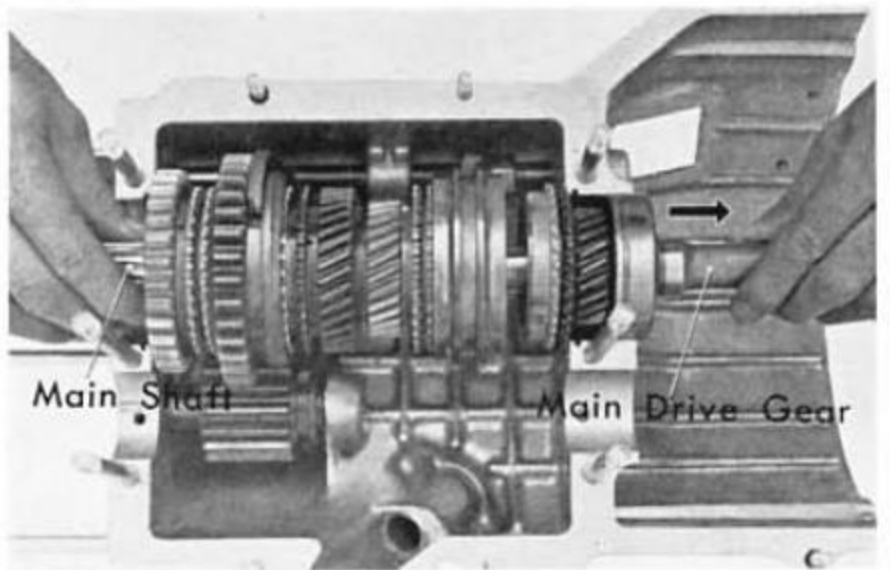


Fig. 6F-6

7. Disassemble the main drive gear, needle bearing and blocking ring from the transmission gear assembly, followed by the removal of the circlip, thrust washer and ball bearing from the main drive gear (Fig. 6F-7, 8).

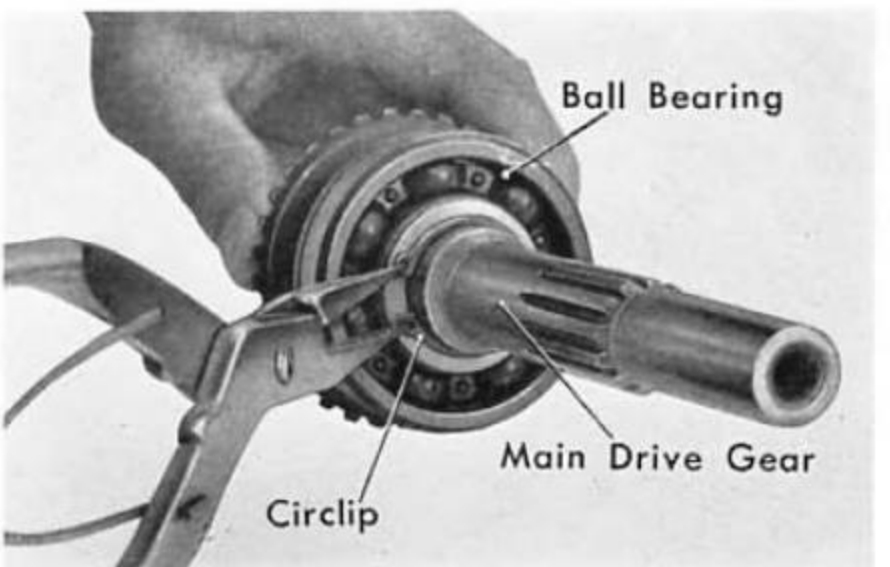


Fig. 6F-7

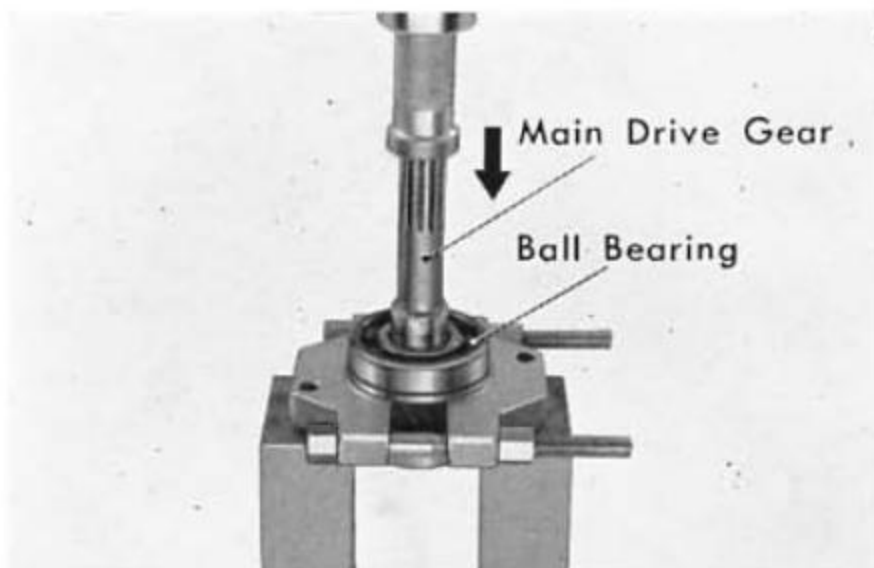


Fig. 6F-8

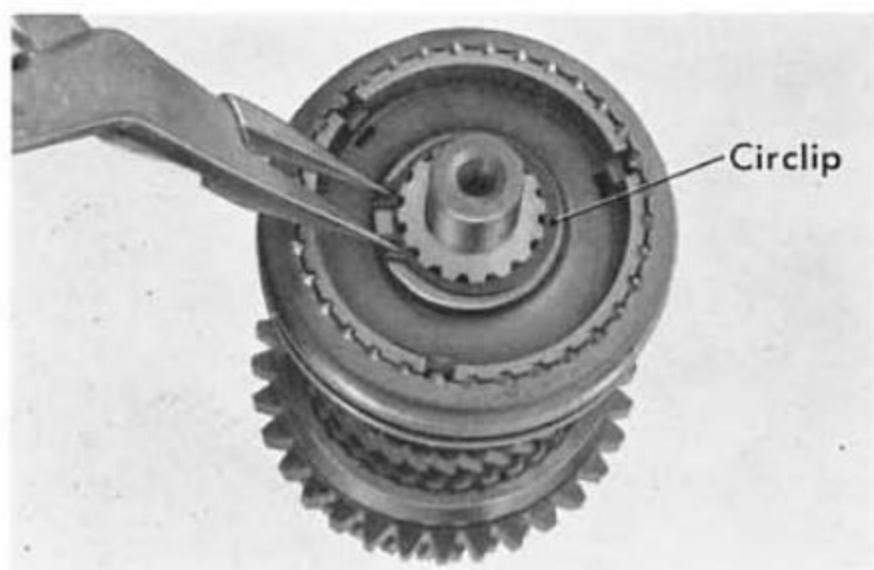


Fig. 6F-9

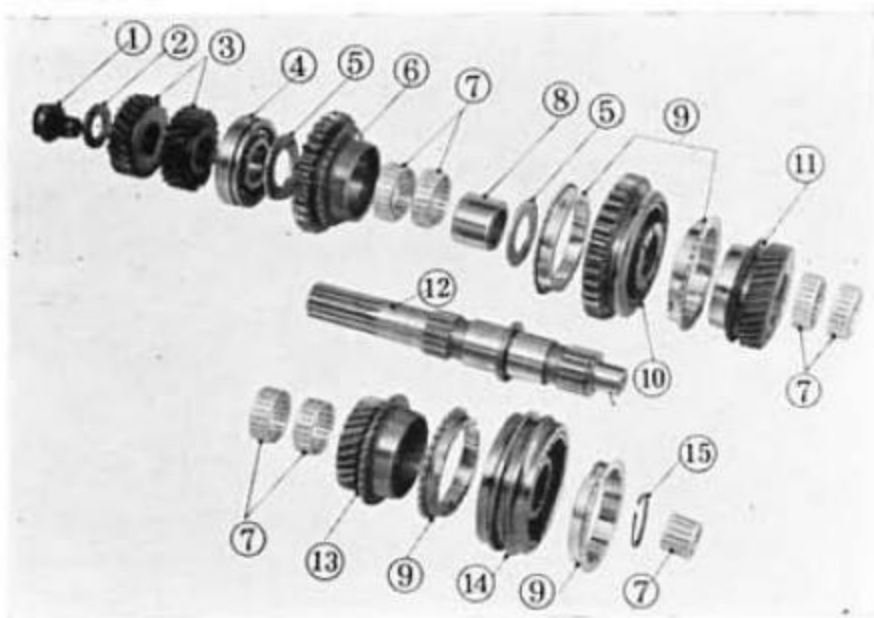


Fig. 6F-10

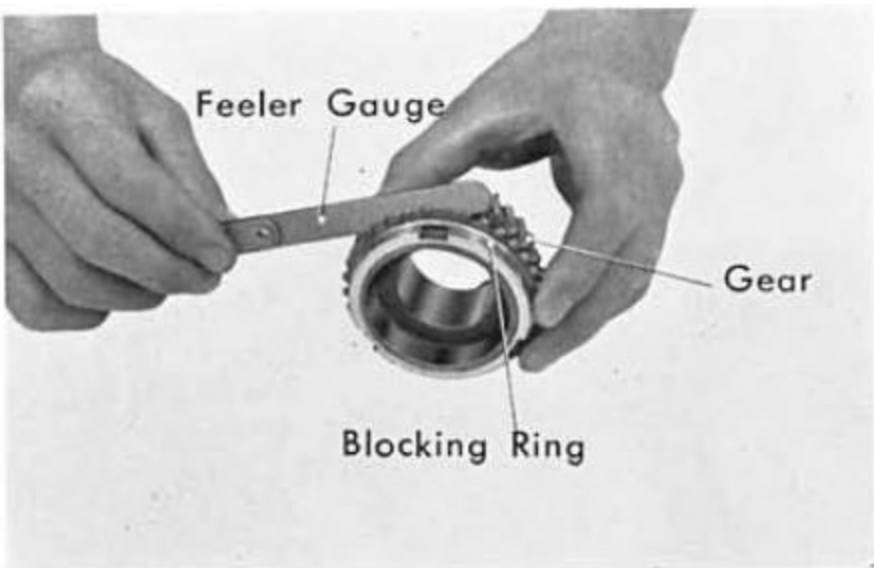


Fig. 6F-11

8. Disassemble the circlip, synchronizers, gears, gear blocking rings and washers from the main shaft (Fig. 6F-9, 10).

Fig. 6F-10

- | | |
|-------------------|-----------------------|
| ① Lock bolt | ⑨ Blocking rings |
| ② Lock washer | ⑩ Reverse idle gear |
| ③ Drive gears | ⑪ Second gear |
| ④ Ball bearing | ⑫ Main shaft |
| ⑤ Spacers | ⑬ Third gear |
| ⑥ Low gear | ⑭ Synchronizer sleeve |
| ⑦ Needle bearings | ⑮ Circlip |
| ⑧ Spline collar | |

9. Inspect the clearance between the blocking rings and the gears. Hold the blocking ring against the cone in the gear and measure the clearance between the gear and the ring at several places with a feeler gauge (Fig. 6F-11).

	Serviceable Limit
Clearance	Replace if less than 1.5 mm (0.059")

10. Remove the insert ring from one side, and pull out the synchronizer sleeve from the side that the insert was removed. Disassemble the insert and the insert ring synchronizer hub (Fig. 6F-12).

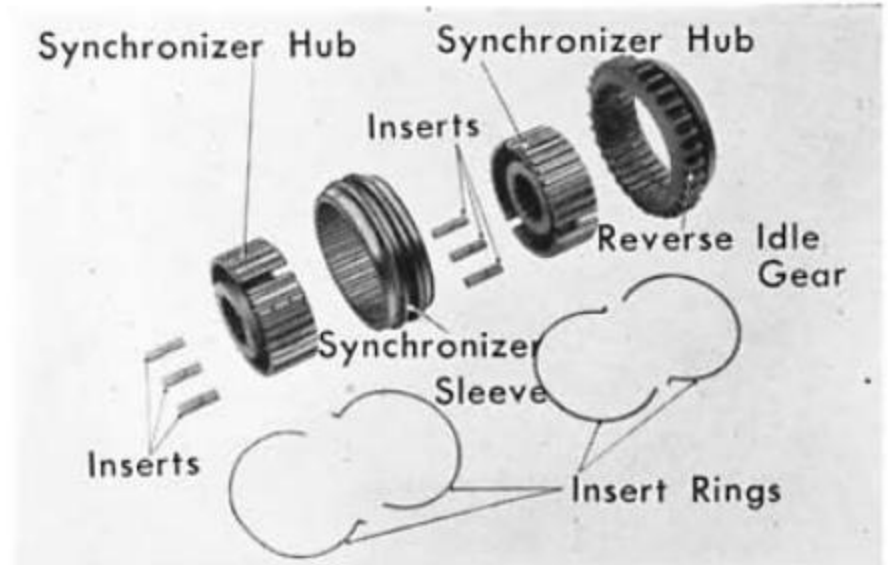


Fig. 6F-12

11. Remove the reverse gear shaft lock pin with pliers (Fig. 6F-13).

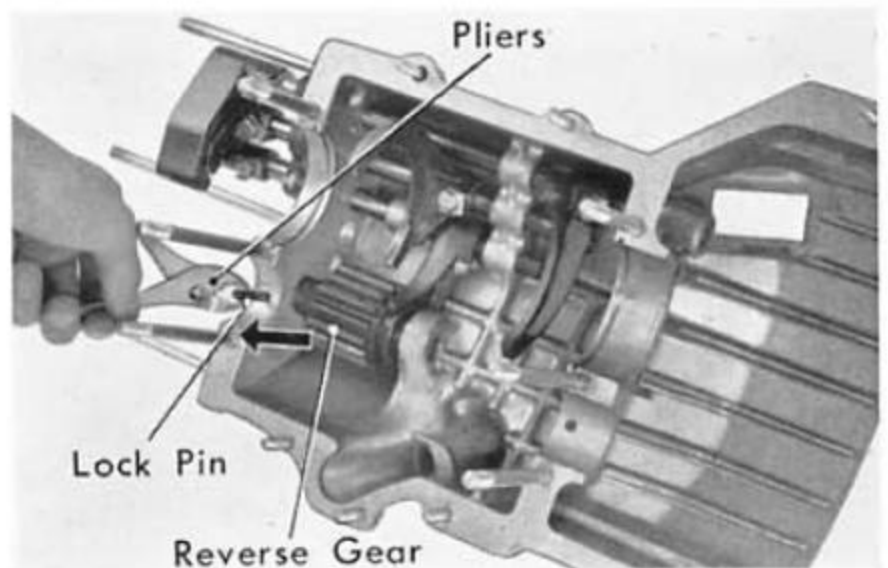


Fig. 6F-13

12. Pull out the reverse gear shaft and then disassemble the reverse gear (Fig. 6F-14).

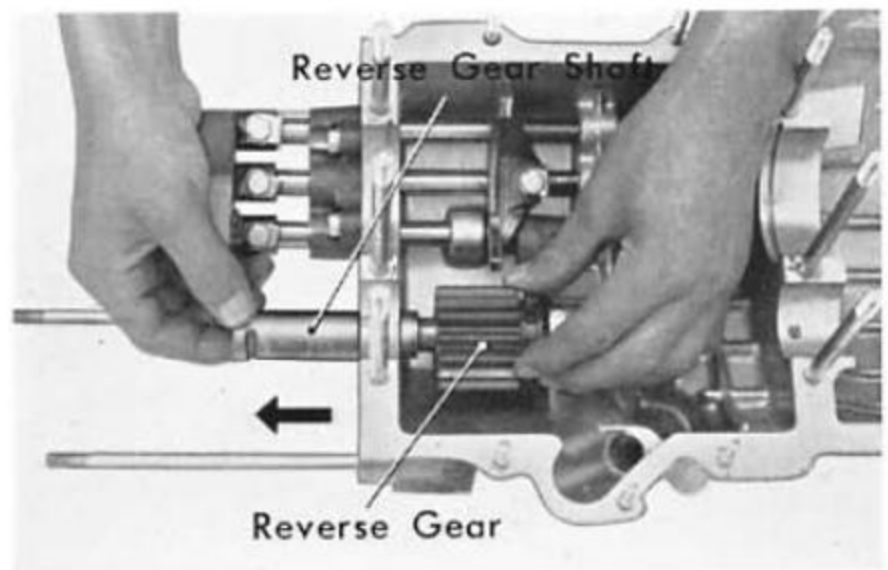


Fig. 6F-14

b. Assembly

1. Make sure to position each one of ball and needle bearings at the proper location before reassembling transmission gears (Fig. 6F-15).

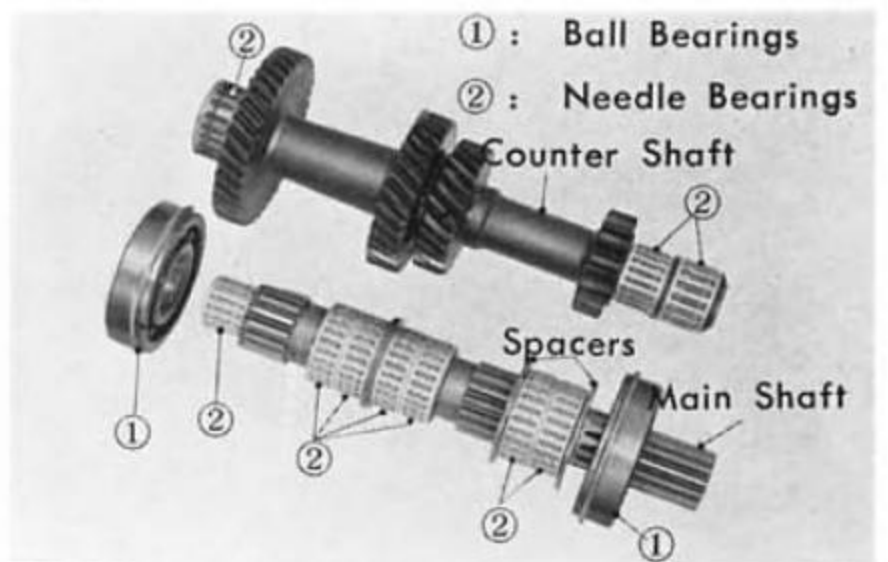


Fig. 6F-15

6-15 TRANSMISSION

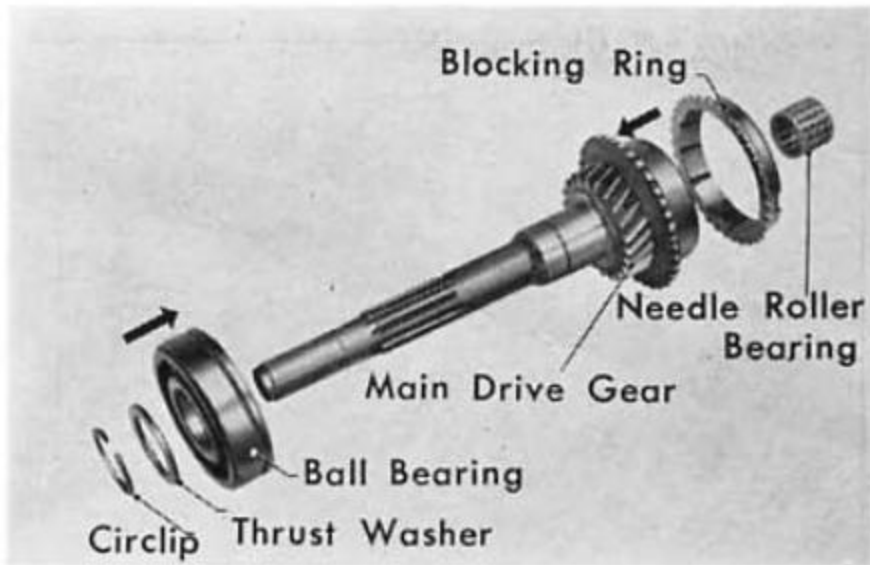


Fig. 6F-16



Fig. 6F-17

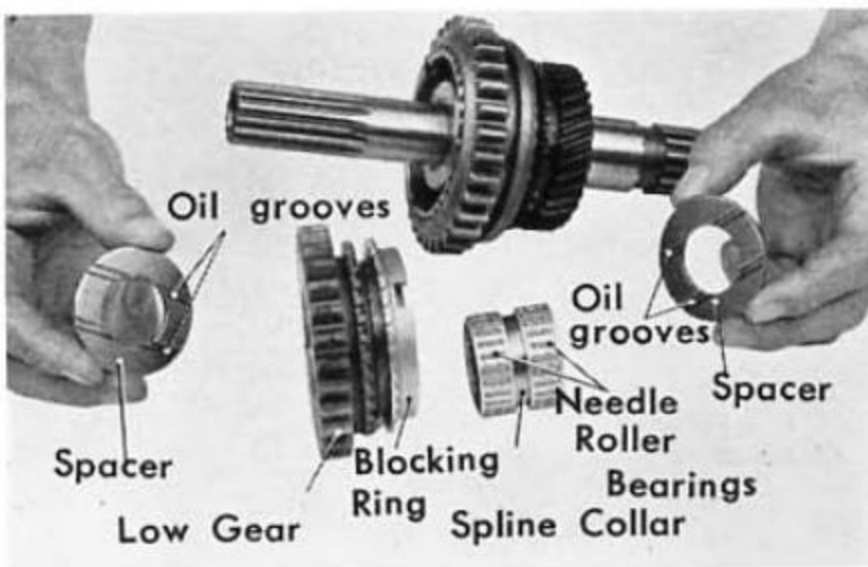


Fig. 6F-18

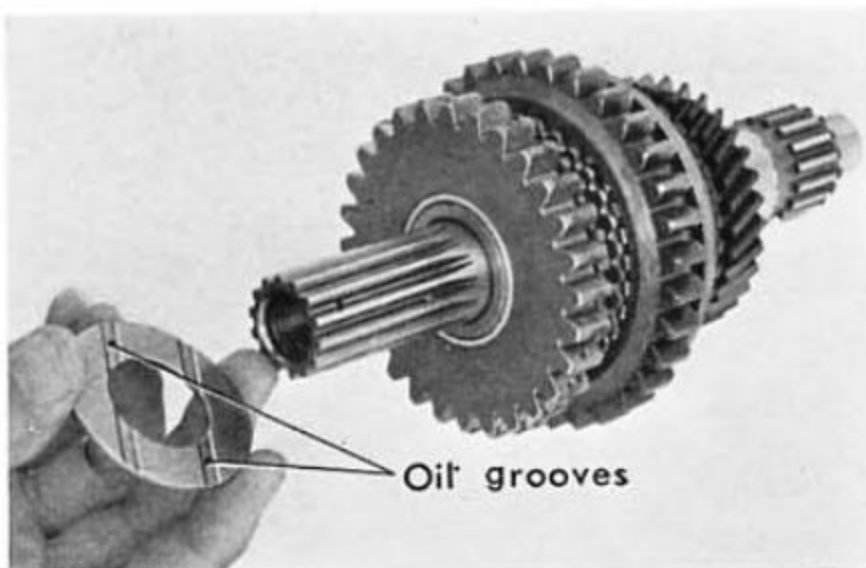


Fig. 6F-19

2. Install the ball bearing, thrust washer, circlip, blocking ring and needle bearing on the main drive gear (Fig. 6F-16).

3. Assemble the second gear, blocking ring and reverse idle gear on the main shaft (Fig. 6F-17).

4. And then assemble the spaces, spline collar, needle bearings, blocking ring and low gear (Fig. 6F-18, 19).

Note :

Position the spacers so that grooved sides face each other.

5. Assemble the inserts, and sleeve ring synchronizer hub and then set the insert rings (Fig. 6F-20).

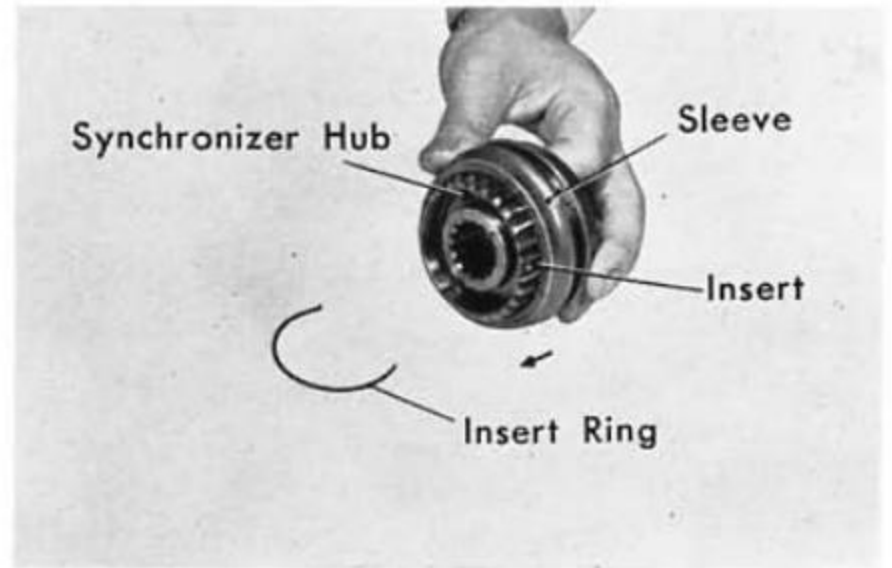


Fig. 6F-20

6. Install the needle bearings, third gear and blocking ring (Fig. 6F-21).

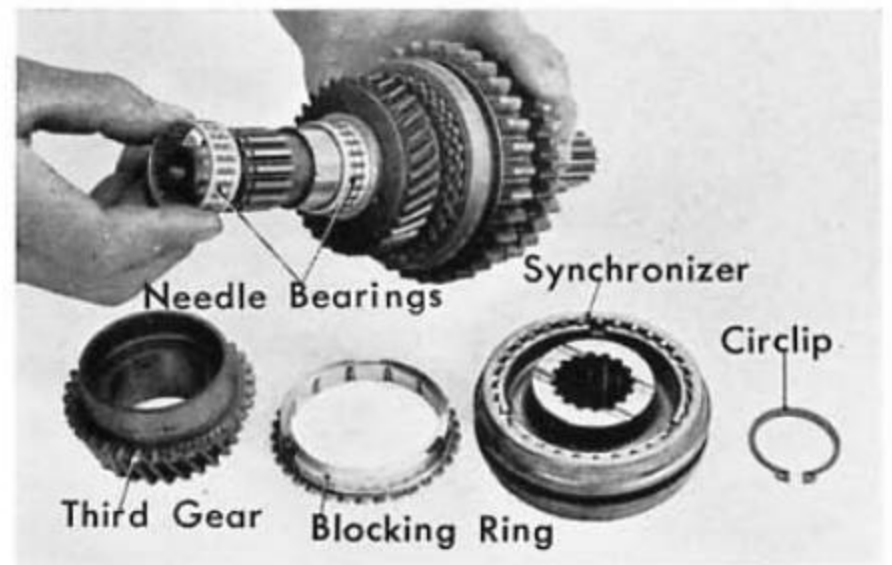


Fig. 6F-21

7. Assemble the synchronizer and set the circlip (Fig. 6F-22).

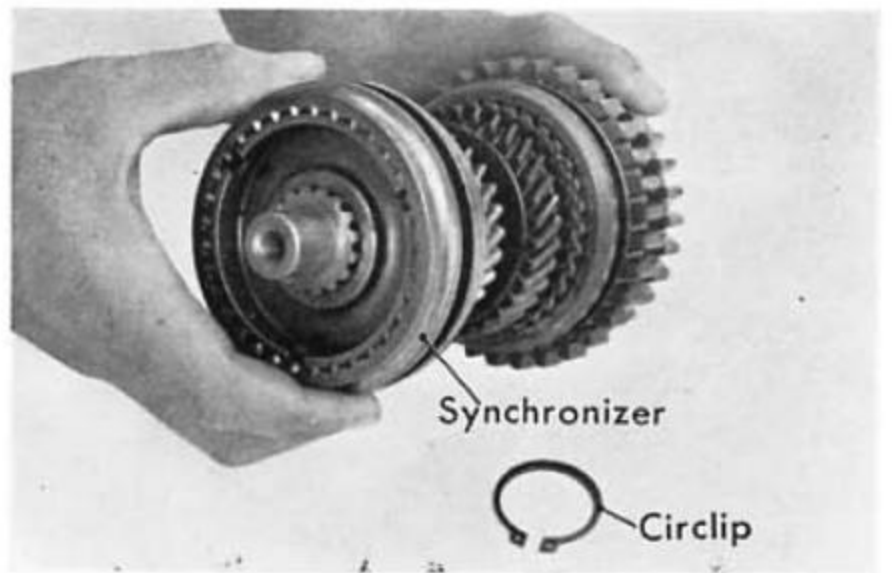


Fig. 6F-22

8. Install the thrust washers, needle bearings and retainer on the counter shaft and then set the circlip (Fig. 6F-23).

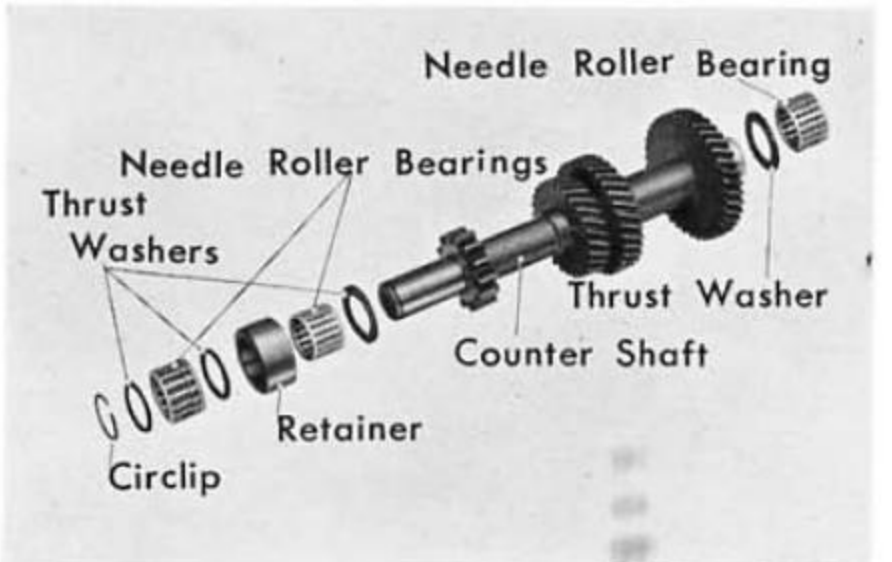


Fig. 6F-23

6-17 TRANSMISSION

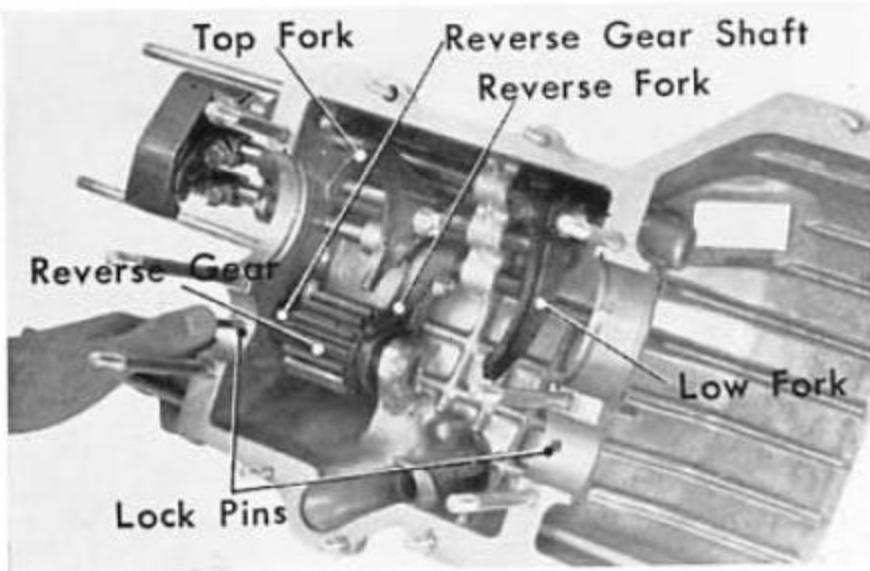


Fig. 6F-24

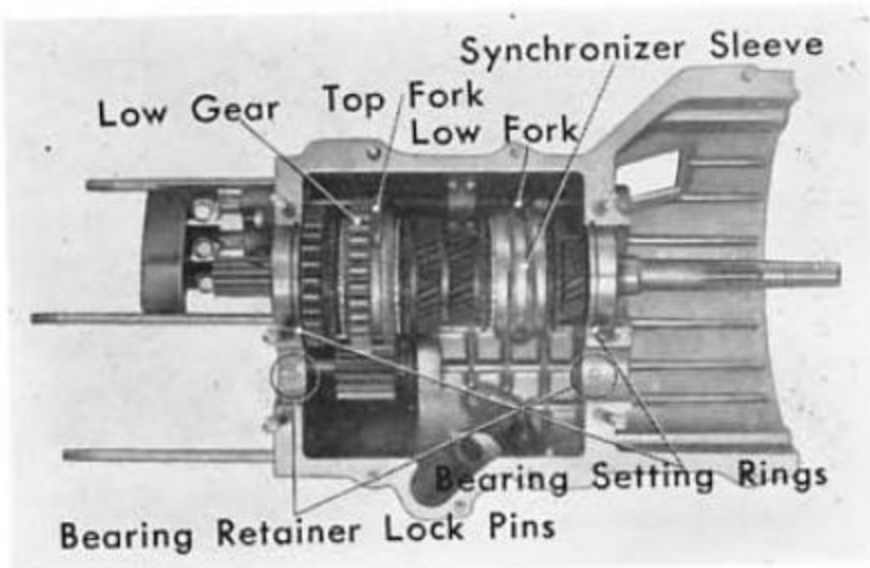


Fig. 6F-25

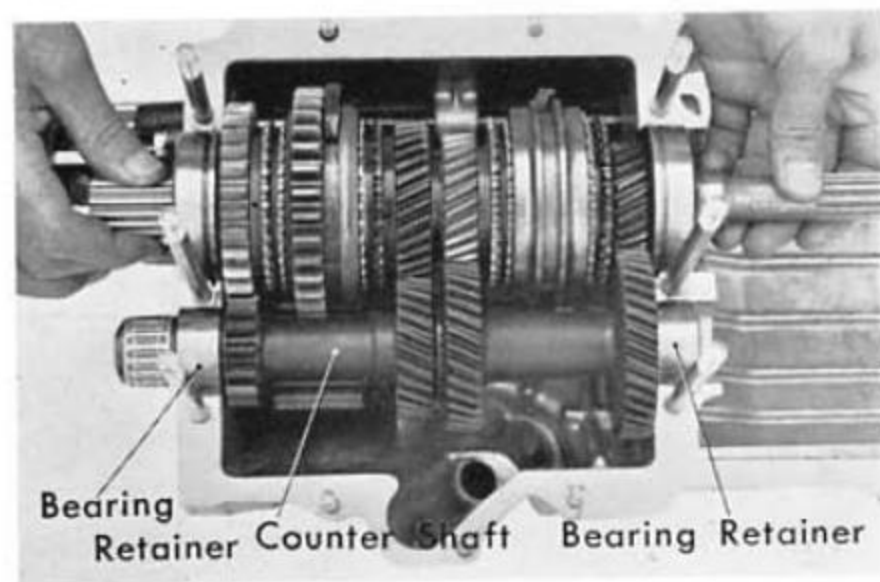


Fig. 6F-26



Fig. 6F-27

9. Assemble the reverse fork into the reverse gear groove and slide into the reverse shaft from the small end. Turn the shaft so that the lock pin hole aligns with the case hole and insert the lock pin into the hole (Fig. 6F-24).

10. Assemble the shift forks into the groove of synchronizer sleeve and low gear. Install the ball bearings into the grooves of the case and set the bearing setting rings (Fig. 6F-25).

11. Assemble the counter shaft by aligning the lock pin to the retainer hole (Fig. 6F-26).

12. Inspect end play in the gears.

13. After completing the installation, rotate the main drive gear and inspect to assure smooth operation.

14. After the inspection, install the sealing cap (Fig. 6F-27).

c. Transmission Operation

In first speed, the first speed synchronizer sleeve is moved rearward by the shift fork.

The sleeve engages the first speed blocking ring, which acts as a clutch.

Further movement of the sleeve locks the first speed synchronizer hub to the first speed gear by means of internal splines. On engagement of the clutch, power flows through the input shaft (main drive gear shaft) and gear to the meshed counter shaft gear and thence to the first gear. This gear transmits the power through the locked synchronizer hub to the transmission output shaft (main shaft).

All the other forward-speed gears are in idle motion, as they are all driven by the counter shaft gear, but they do not transmit power because they are not locked to the output shaft (main shaft).

All the forward-speed shifts are made in the same manner as the first-speed shift, due to the constant-mesh features.

Reverse gear is engaged by moving the reverse sliding gear rearward on the reverse gear shaft until it meshes with the reverse rear idler gear, with all forward-speed synchronizer sleeve in neutral, power flow in reverse is through the input shaft (main drive gear shaft) to the constant-mesh counter-shaft gear, thence to the constant mesh reverse gear front idler. As the sliding reverse gear is meshed with the reverse gear rear idler, power is transmitted to the output shaft (main shaft), rotating it in a reverse direction.

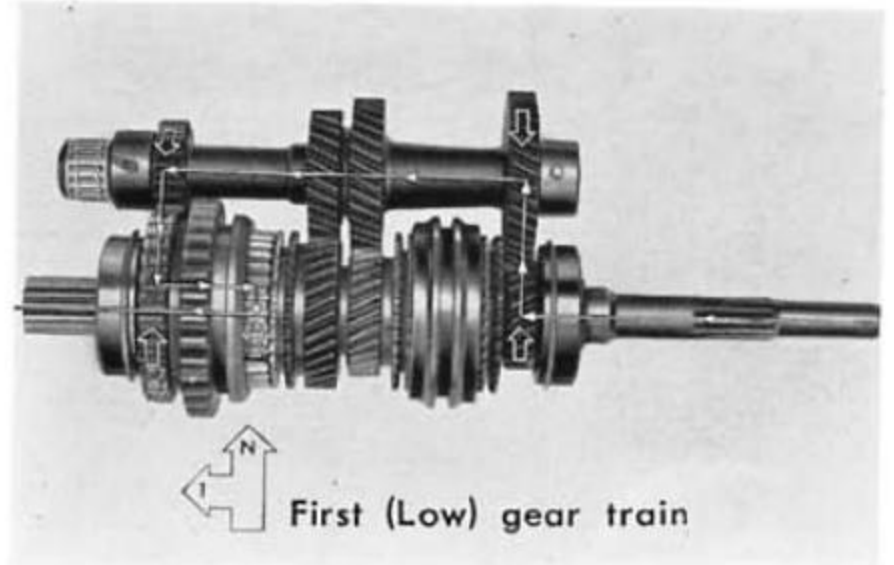


Fig. 6F-29

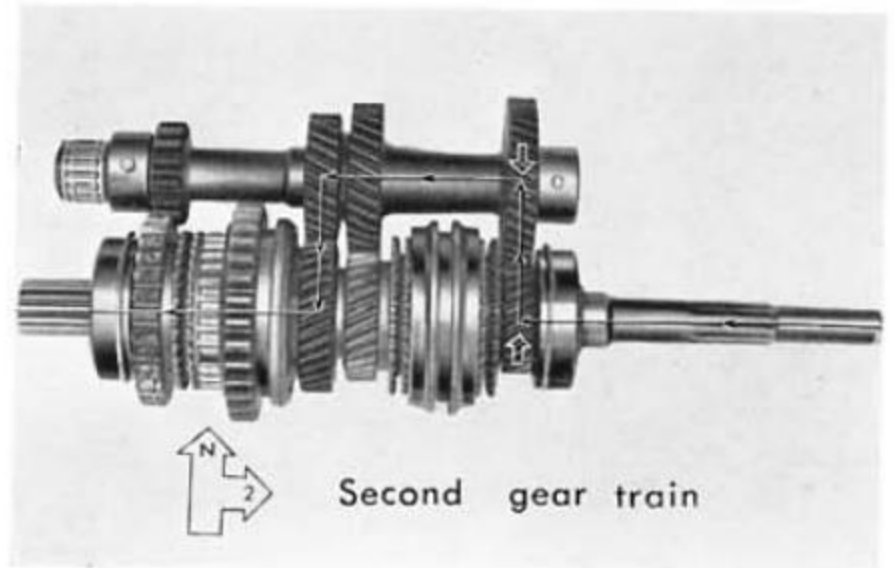


Fig. 6F-30

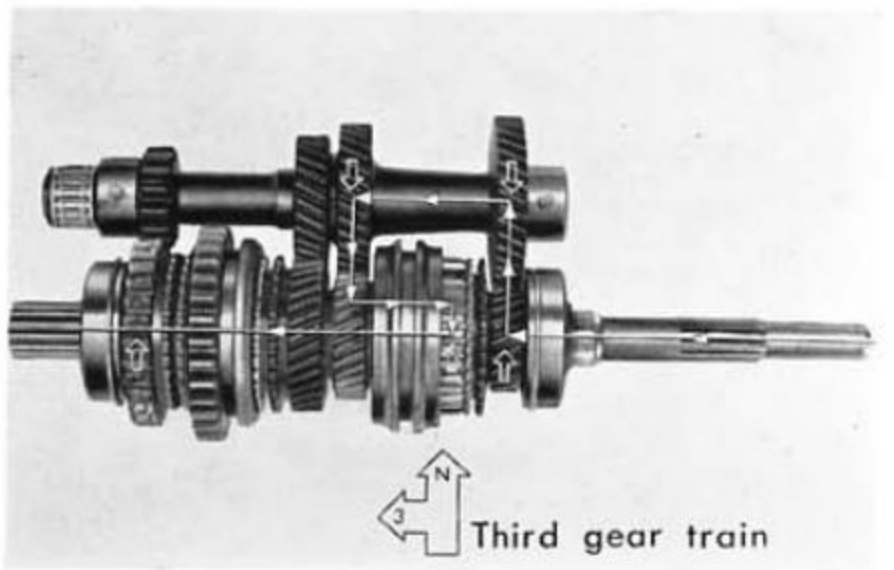


Fig. 6F-31

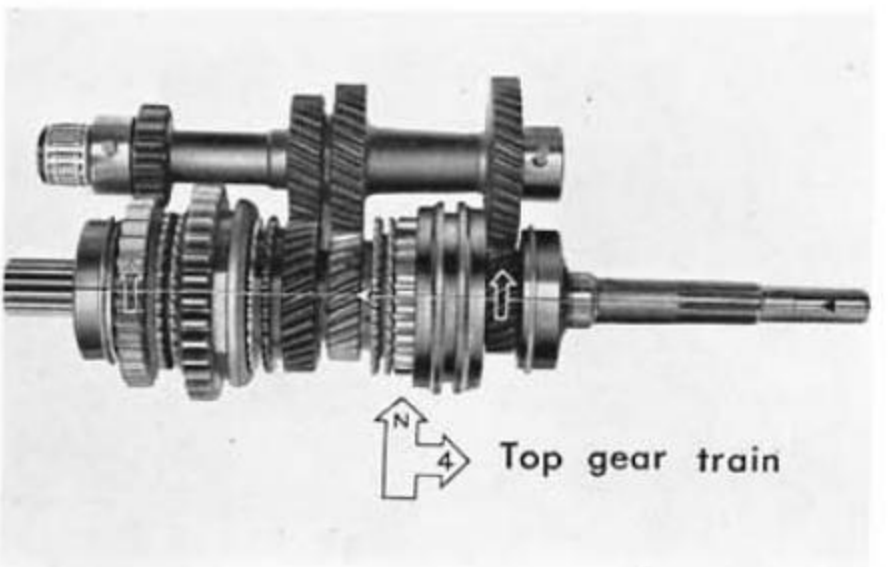


Fig. 6F-32

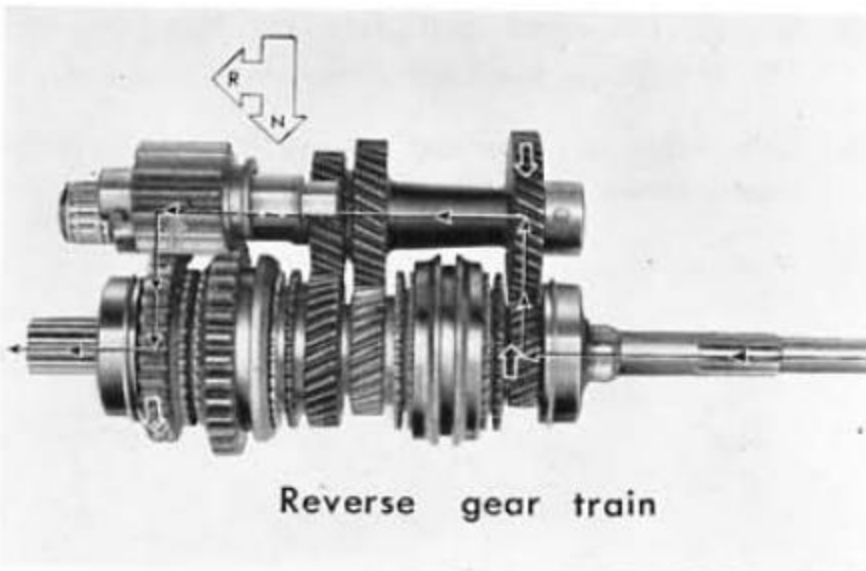


Fig. 6F-28

Reverse gear train

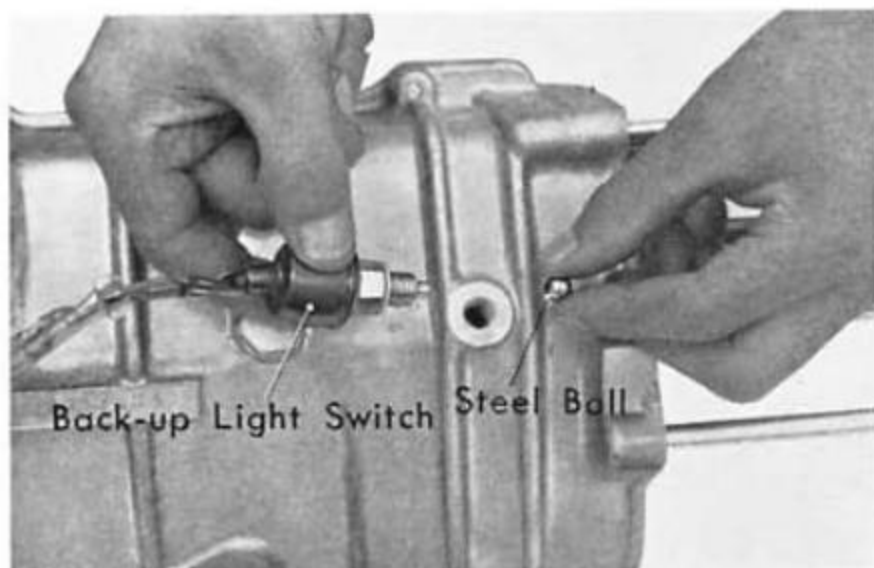


Fig. 6G-1

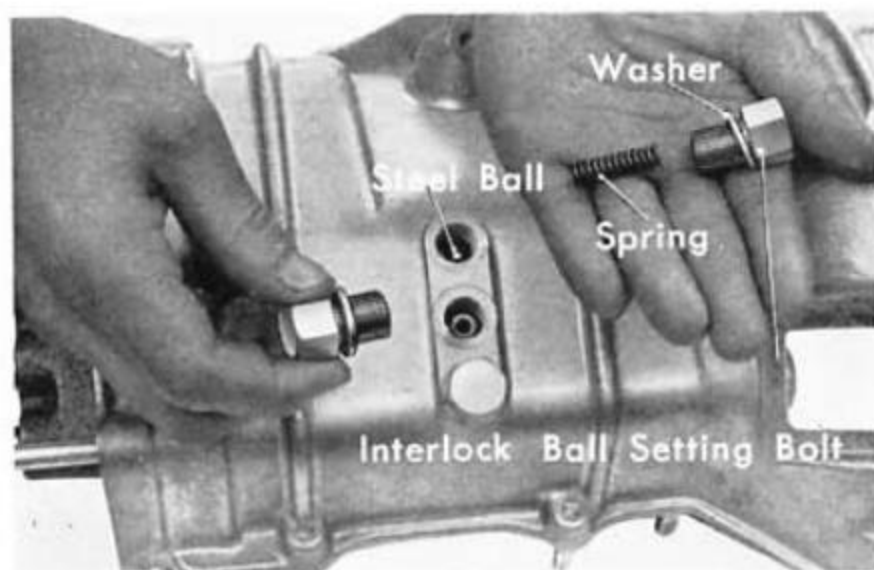


Fig. 6G-2

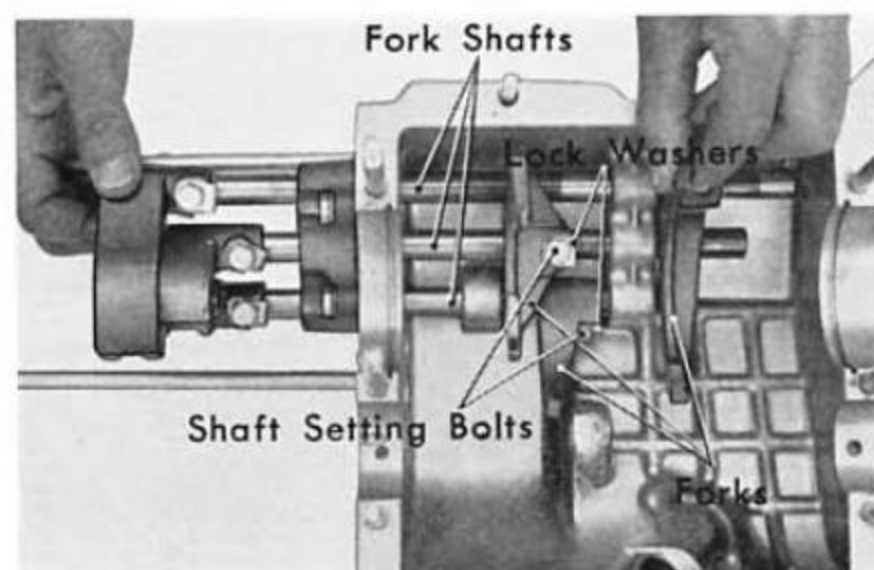


Fig. 6G-3

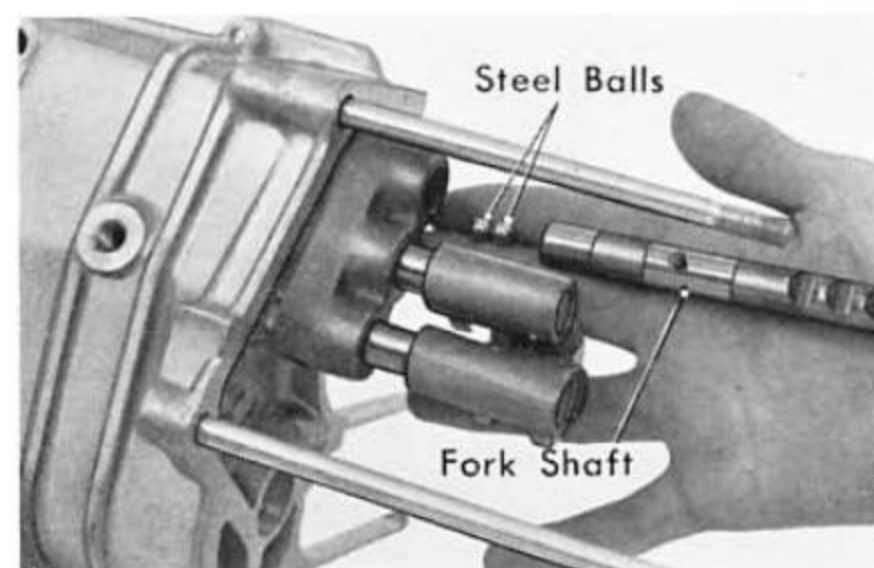


Fig. 6G-4

G. GEAR SHIFT SHAFT UNIT

a. Removal

1. Disassemble the transmission gear, counter gear and the reverse gear from the upper transmission case.
2. Remove the back-up light switch with steel ball (Fig. 6G-1).
3. Remove the interlock ball setting bolts and then disassemble the washers, springs and steel balls (Fig. 6G-2).
4. Remove the fork shaft setting bolt and lock washer, and pull out the top fork shaft to disassemble the top fork (Fig. 6G-3).
Torque the setting screw to 1.5 kg-m (10.8 ft-lbs) during assembly.
5. Remove two steel ball from the fork-shaft hole (Fig. 6G-4).
6. Disassemble the low and reverse fork shafts in the same manner as in the preceding operation.

- After removing the fork shafts, remove the interlock ball guide setting bolts and disassemble the interlock ball guide (Fig. 6G-5).

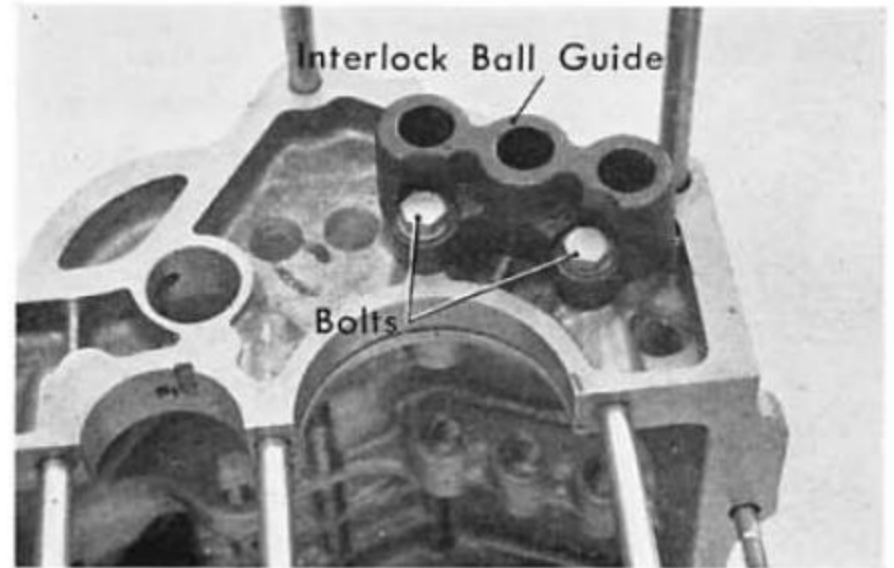


Fig. 6G-5

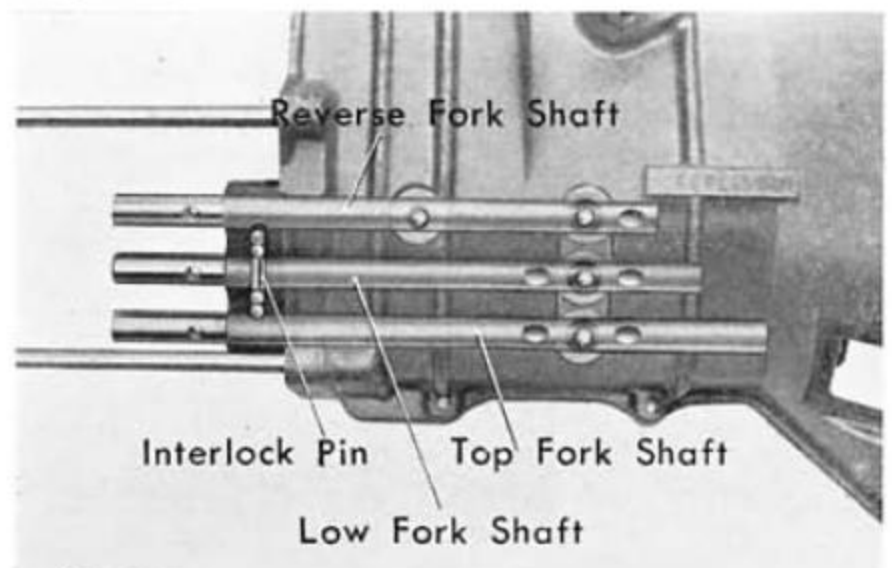


Fig. 6G-6

b. Installation and Inspection

- After aligning and assembling the interlock ball guide, insert the reverse fork shaft into the upper transmission case with the notches facing inboard. Slide the reverse fork on the reverse fork shaft and then push the shaft all the way in. Install the steel balls into the holes in the interlock ball guide (Fig. 6G-7).
- Insert the interlock pin into the low fork shaft hole and assemble in the same manner as the reverse fork shaft. Install two steel balls into the holes in the interlock ball guide and slide in the top fork shaft. The purpose of above is to prevent double gear engagement. Likewise the stopper ball set springs and steel balls serve the same purpose.
- Inspect the operation of the fork shaft.

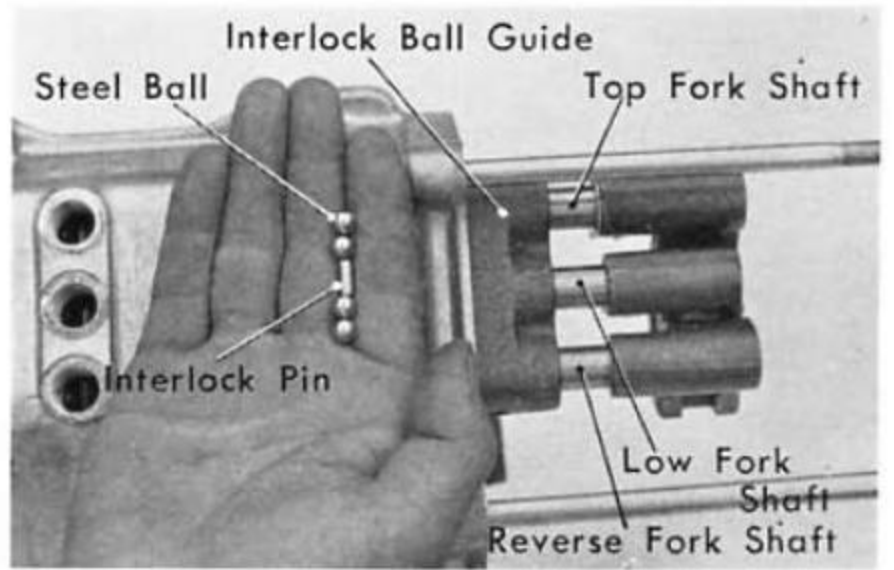


Fig. 6G-7

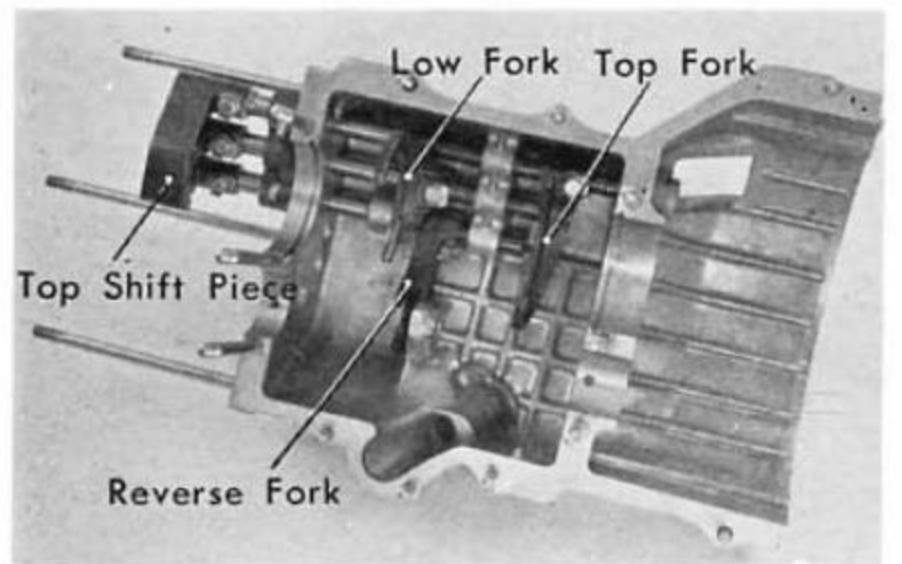


Fig. 6G-8

6-21 TRANSMISSION

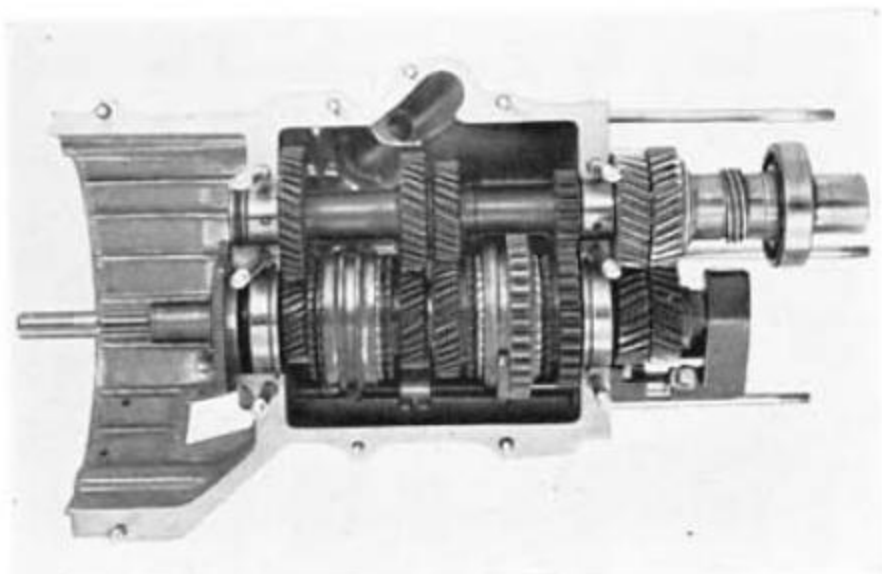


Fig. 6G-9

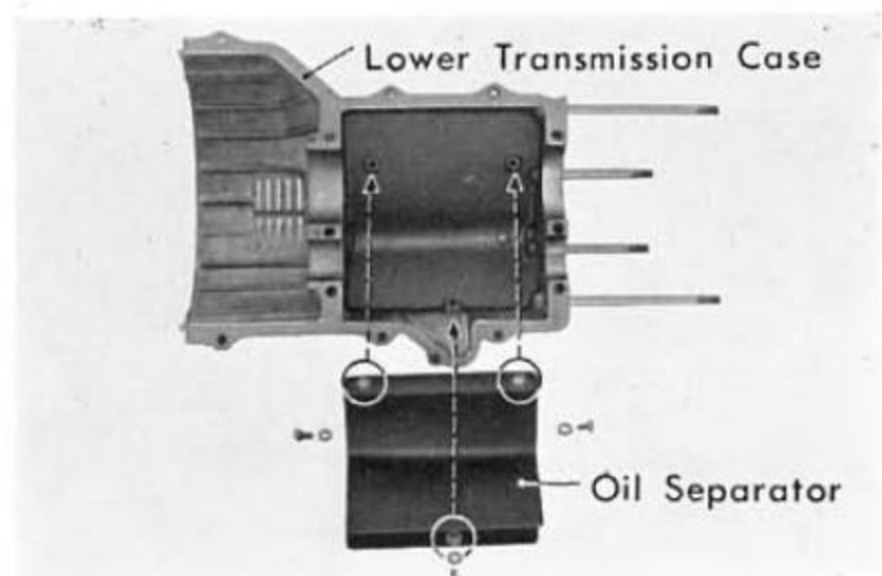


Fig. 6G-10

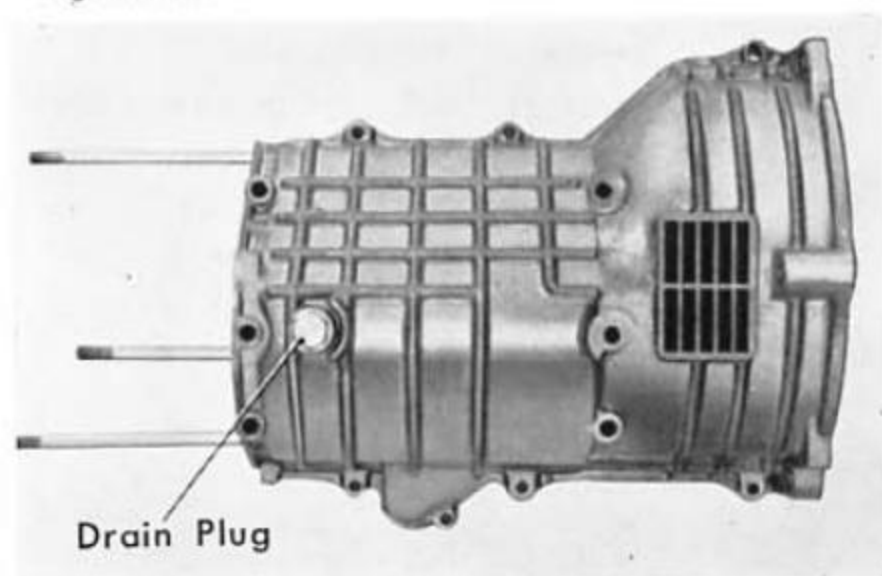


Fig. 6G-11

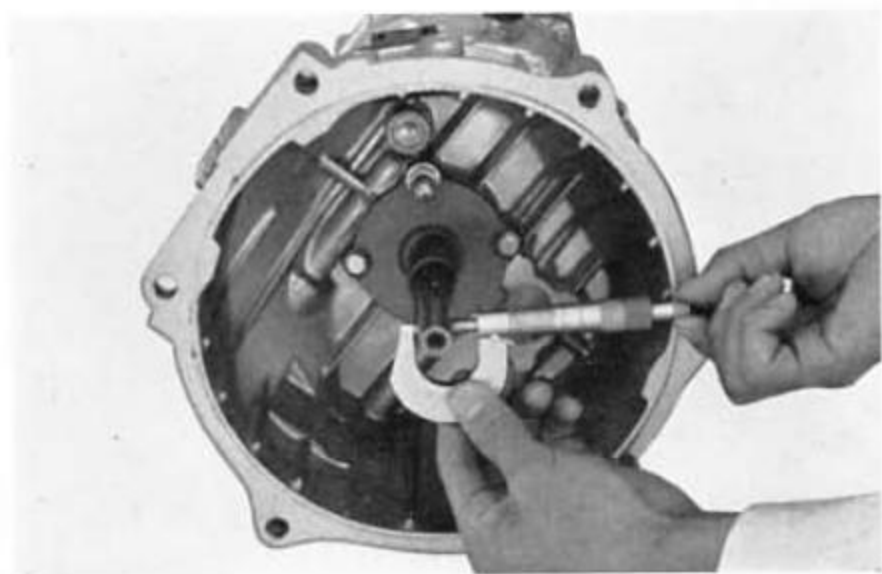


Fig. 6G-12

4. After completing the installation, rotate the shafts and inspect to assure smooth operation (Fig. 6G-9).

5. Install the oil separator on the lower transmission case (Fig. 6G-10).

6. Install the oil drain plug on the lower transmission case (Fig. 6G-11).

7. Wipe the upper and lower mounting flanges to remove all oil and apply liquid gasket to the lower transmission case.

When the gasket has dried, assemble the upper and lower transmission cases.

The thickness of the liquid gasket should be 0.05 ~ 0.08 mm (0.002 ~ 0.003").

8. Install the guide cover and release bearing holder so that the return spring installation hole is toward the lower transmission case.

9. Measure the clearance between the main drive shaft (clutch shaft) and the end bearing. (within the crankshaft) (Fig. 6G-12).

	Standard Value	Serviceable Limit
Clearance	0.026 ~ 0.094 mm (0.00102 ~ 0.00370")	Replace if beyond 0.3 mm (0.012")

H. INSTALLATION OF TRANSMISSION ON THE CHASSIS AND INSPECTION

1. After tightening the rear cover setting nuts, install the transmission hanger and gear shift extension (Fig. 6H-1, 2).

Note :

Torque the nuts to 2.5 kg-m (18.1 ft-lbs).

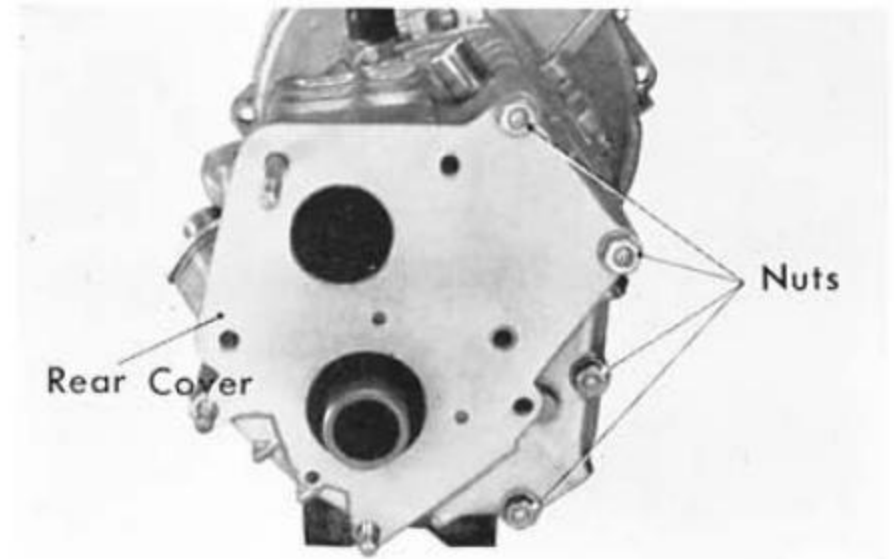


Fig. 6H-1

2. After installing to the engine, install the transmission with the engine on the chassis by aligning the splined joint yoke of propeller shaft with the output shaft (main driven gear) (Fig. 6H-2, 3).
3. Check for proper operation and inspect to make sure that there is no oil leaks or unusual noises. Adjust the travel of clutch pedal.

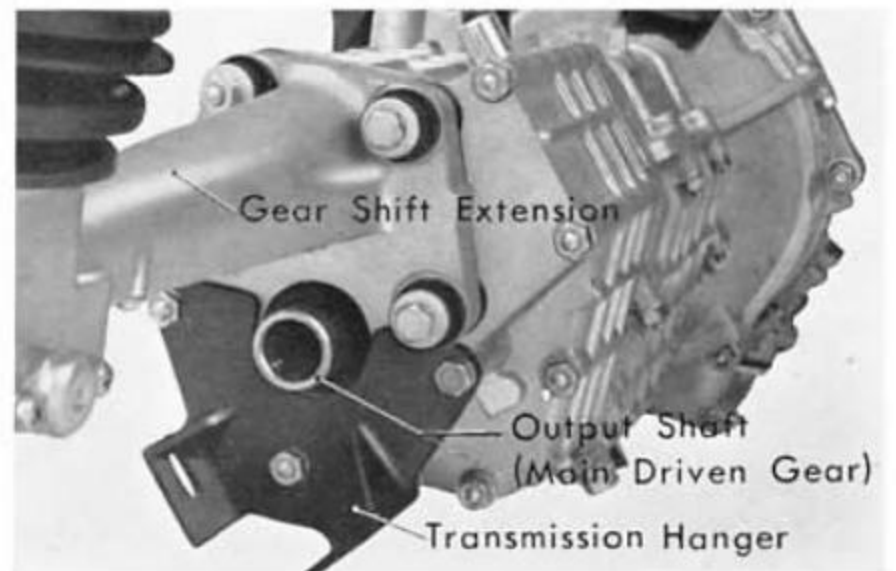


Fig. 6H-2

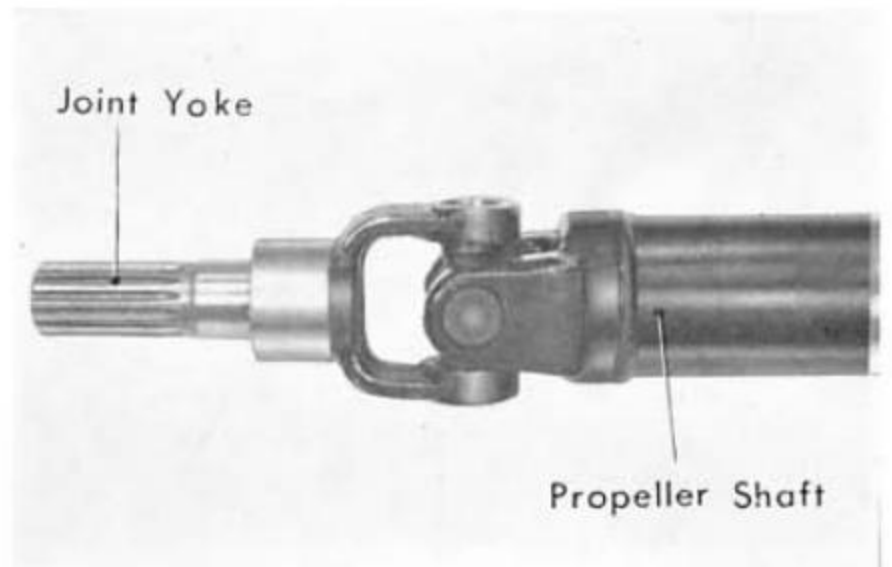


Fig. 6H-3

4. Fill oil to the marking on the level gauge, 2.2 l (3.9 Imp.pt., 4.6 U.S. pt.) (Fig. 6H-4).

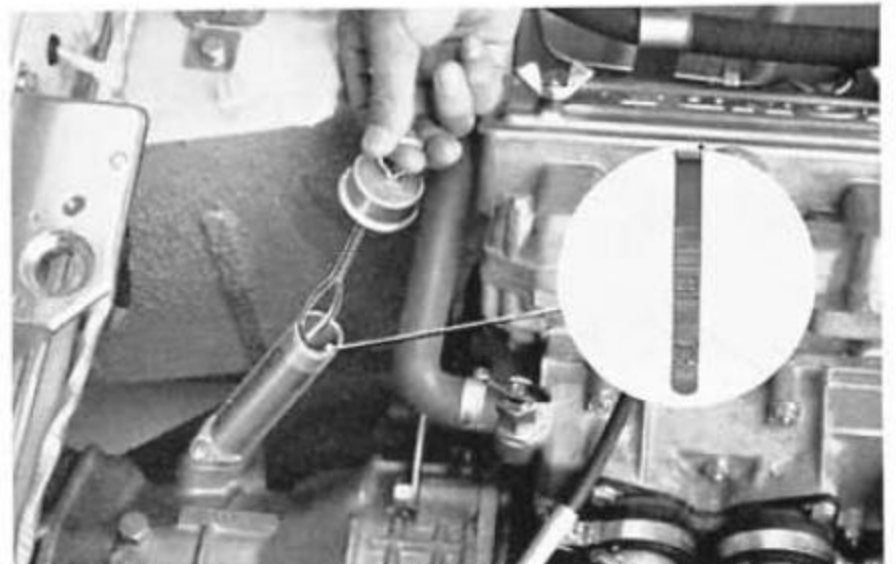


Fig. 6H-4

6-23 TRANSMISSION

M E M O

7. PROPELLER SHAFT

A. REMOVAL

1. Set the vehicle on the rigid rack and disconnect and drop the exhaust pipe.
2. Remove the differential joint yoke setting bolts and then remove the propeller shaft.
3. Remove the cross shaft circlips with the circlip remover. Refer to the items 46 and 47 on the page 15, Special Tools.
4. Tap the propeller shaft flange lightly to remove the needle bearing cases (Fig. 7A-3).
5. Remove the needle bearing cases of the front joint yoke in the same manner (Fig. 7A-4).



Fig. 7A-1



Fig. 7A-2



Fig. 7A-3

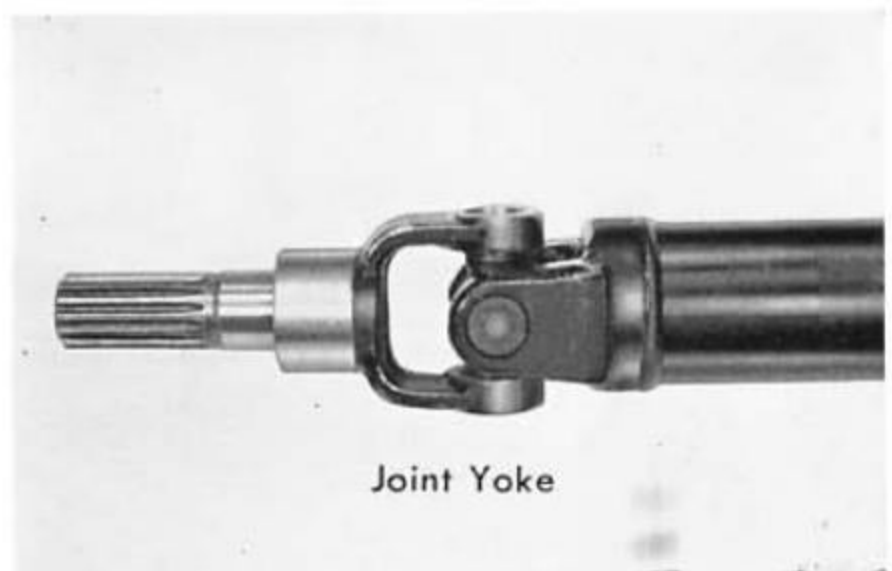


Fig. 7A-4

7-2 PROPELLER SHAFT

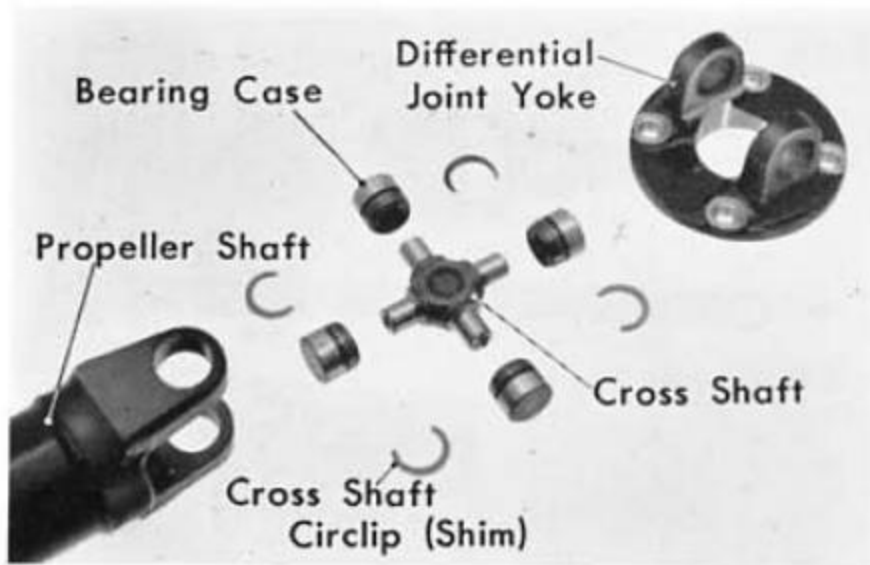


Fig. 7B-1

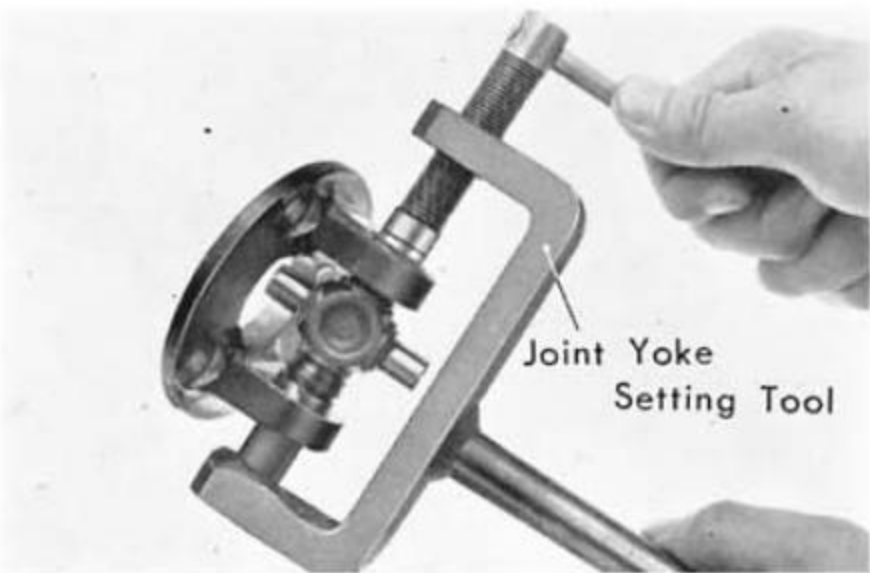


Fig. 7B-2



Fig. 7B-3

B. INSTALLATION AND INSPECTION

1. Apply grease to the needle bearings, assemble into the bearing case and install the dust seal (Fig. 7B-1).

2. Align the cross shaft to the needle bearing cases after inserting the bearing cases into the joint yoke. Check to make sure that the cross shaft is inserted into the bearing case at least half way to prevent the bearing from falling out of position and becoming damage. By over-driving the initial bearing, the installation of opposite bearing will be facilitated.

Press in the bearing cases with the joint yoke setting tool (Fig. 7B-2).

3. After driving in the bearing cases, install the cross shaft circlips on both sides.

When the circlip cannot be installed, check the bearing for damage.

4. Upon completing the installation of the bearings, tap the cross shaft so that the bearing cases are in contact with the circlip, and providing the proper amount of clearance between the bearing cases and the cross shaft.

5. Inspect the propeller shaft dynamic balance (Fig. 7B-3).

The standard value is 0~3gr-cm (0~0.00022 ft-lbs). If beyond the allowable limits, replace the cross shaft circlips (shims) which are available as follows:

Thickness	
1.20 ± 0.005 mm	(0.0473 ± 0.0002")
1.22 ± 0.005 mm	(0.0481 ± 0.0002")
1.24 ± 0.005 mm	(0.0488 ± 0.0002")
1.26 ± 0.005 mm	(0.0496 ± 0.0002")



Fig. 7B-4

8. DIFFERENTIAL

A. DESCRIPTION

The hypoid gear ratio is 4.714 : 1.

The differential gear mechanism is so designed that the axial load and radial load which act on the pinion gear and ring gear are born separately by using needle bearings in each direction. Besides, by using needle bearings instead of tapere roller bearings, the friction loss during high speed driving is much reduced, and this prevents the change of gear tooth contact conditions when a heavy load is applied.

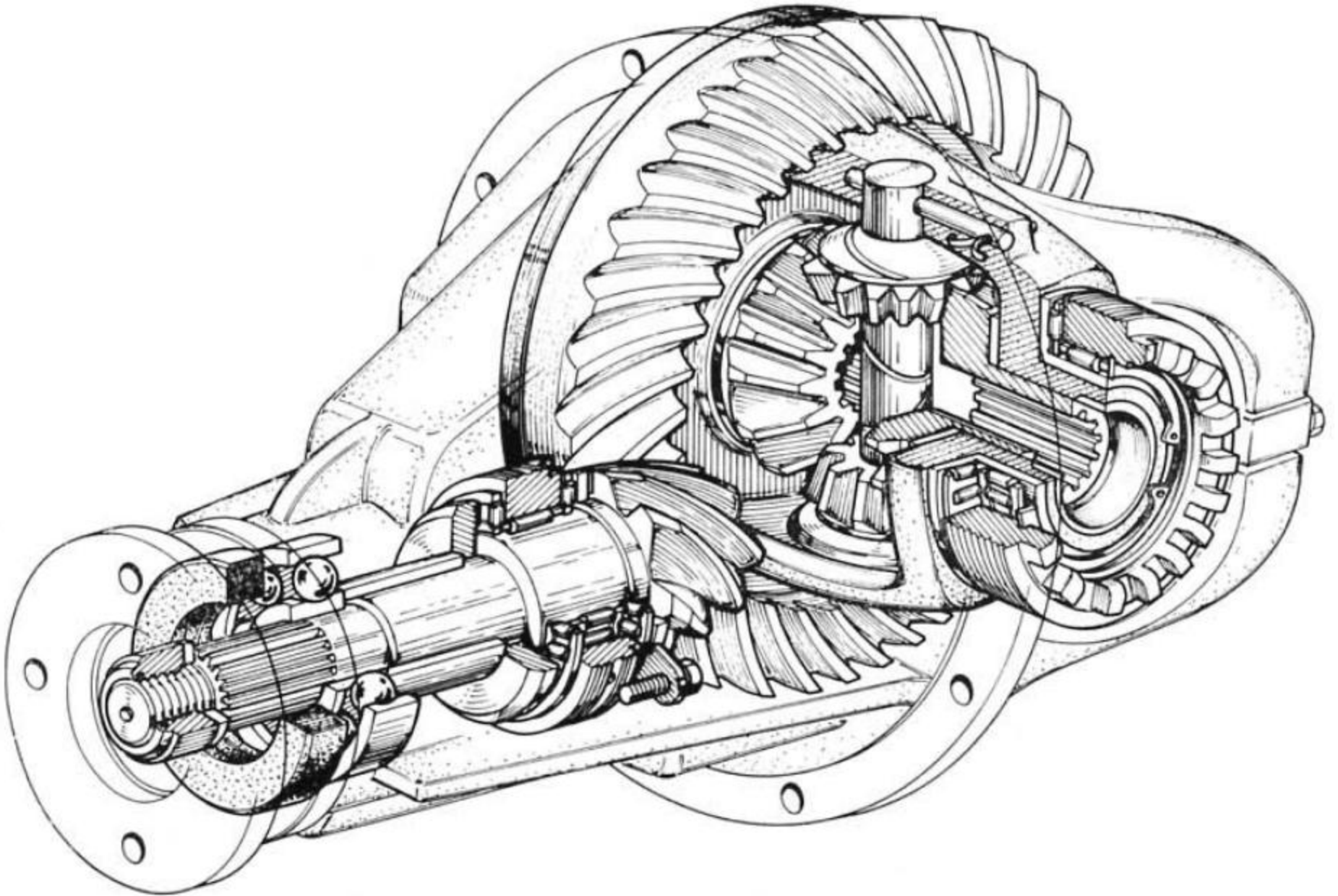


Fig. 8-1

DIFFERENTIAL EXPLODED VIEW

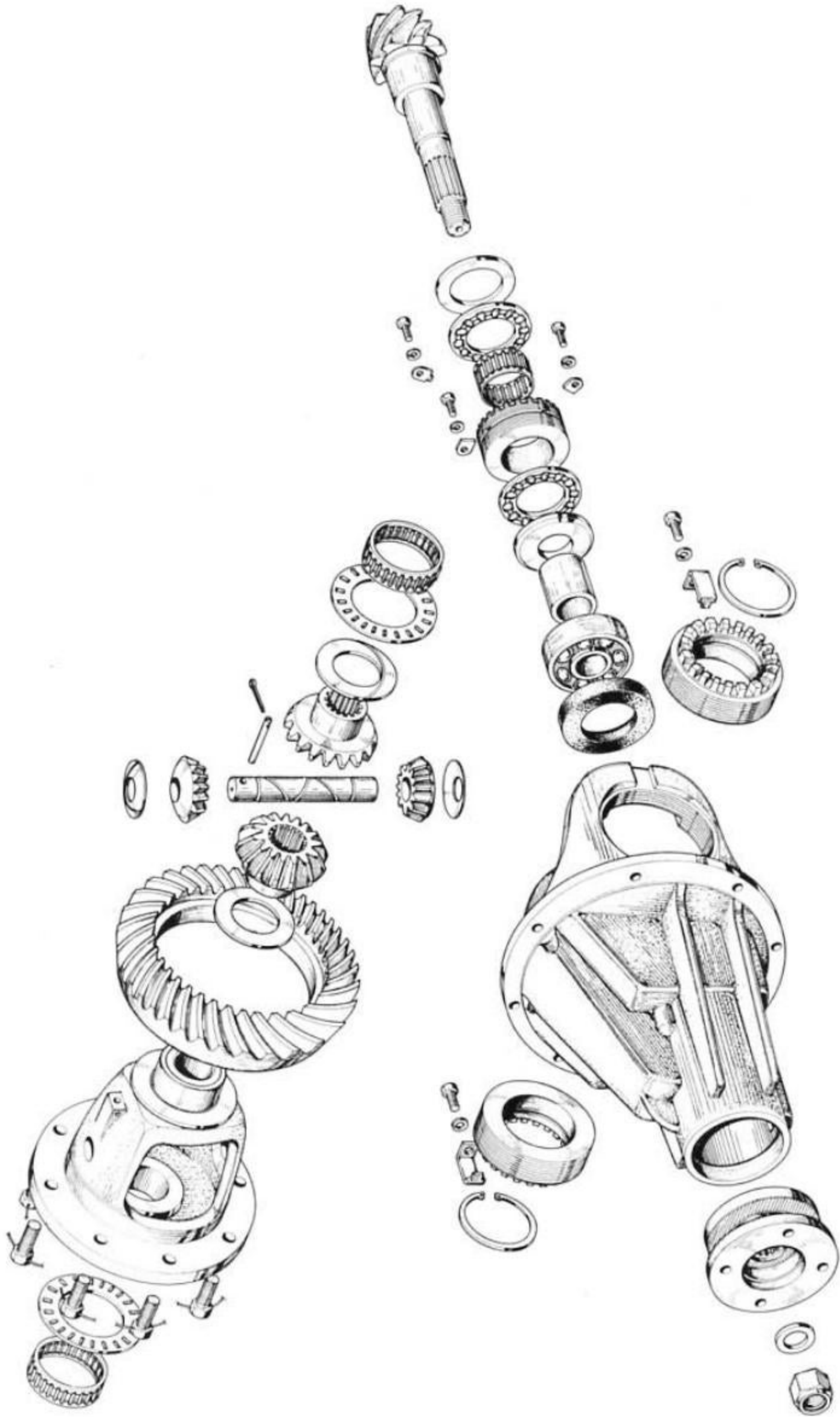


Fig. 8-2

DIFFERENTIAL SECTIONAL VIEW

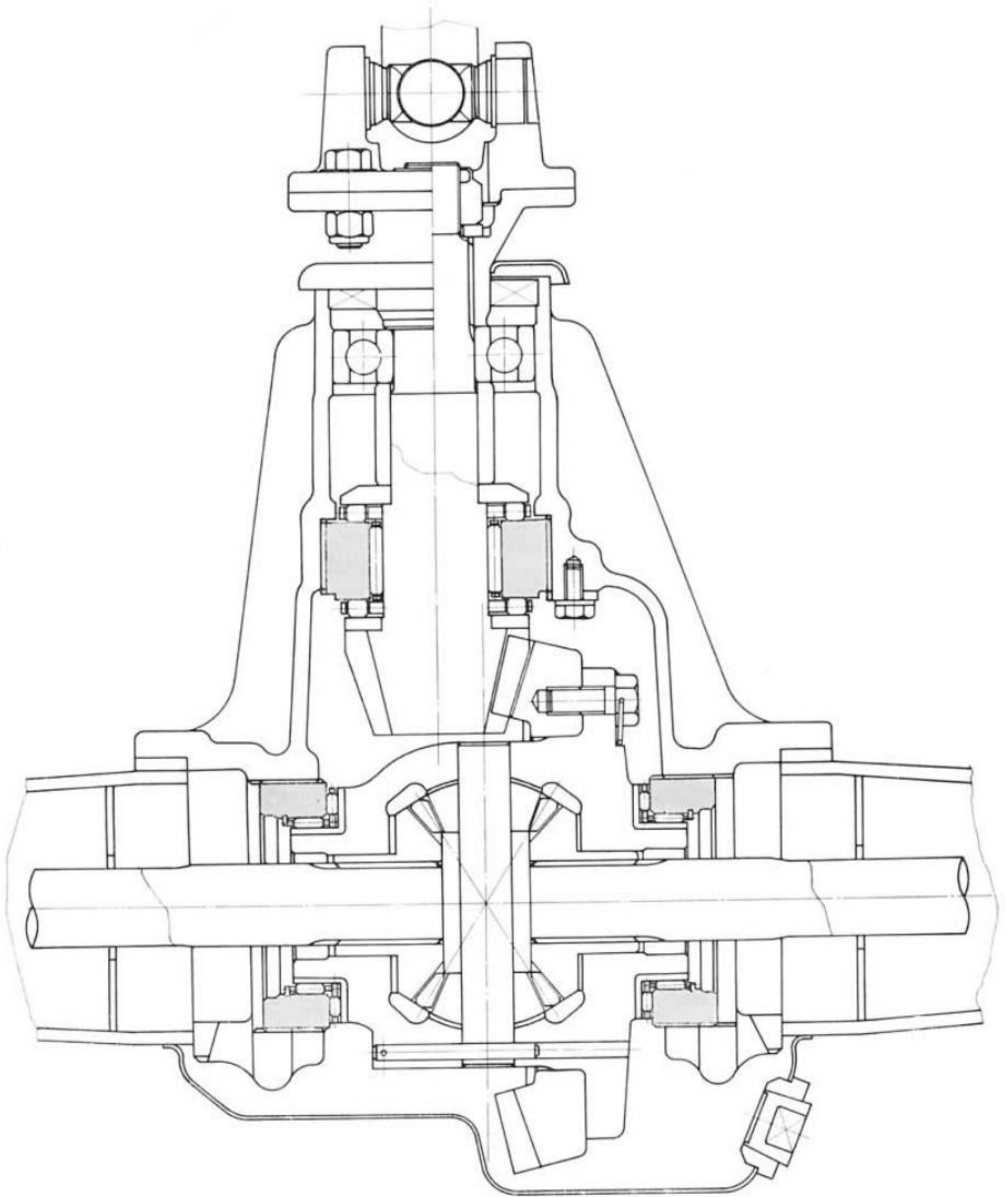


Fig. 8-3

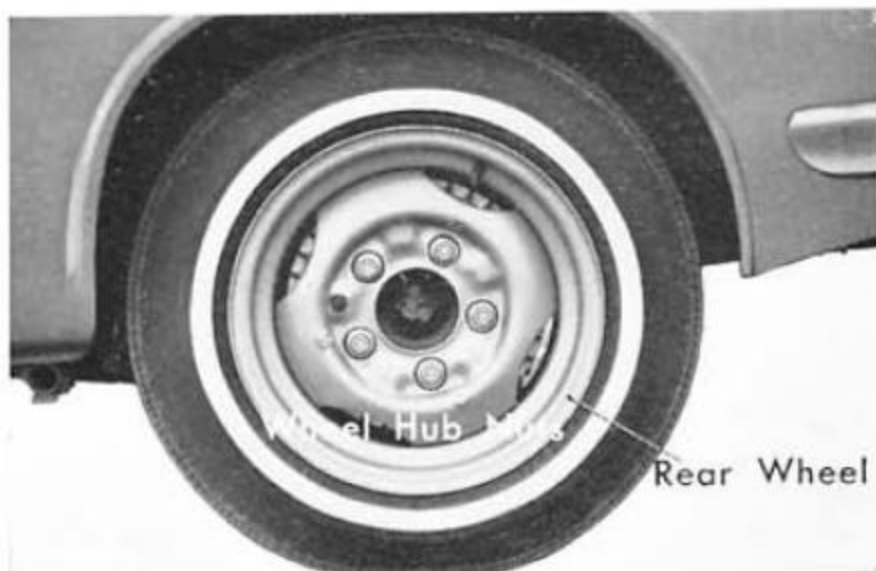


Fig. 8B-1

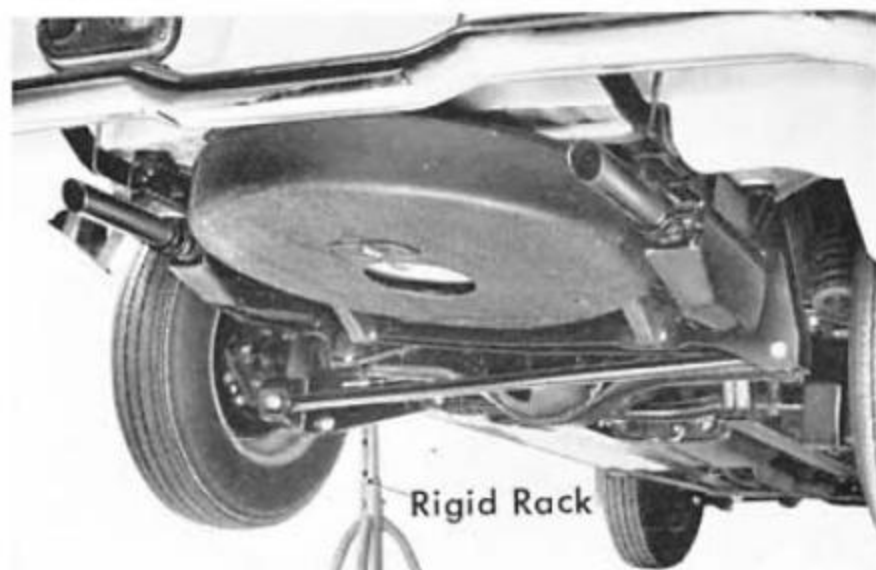


Fig. 8B-2

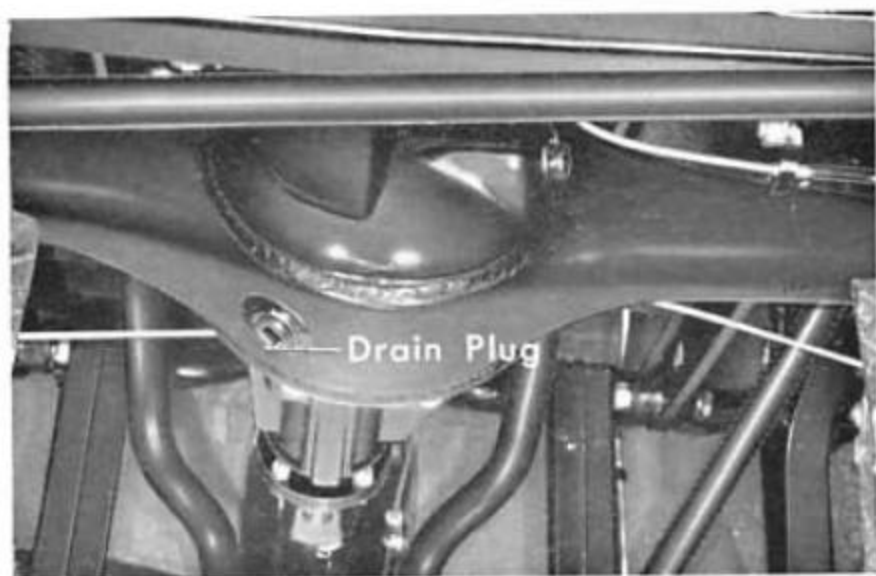


Fig. 8B-3

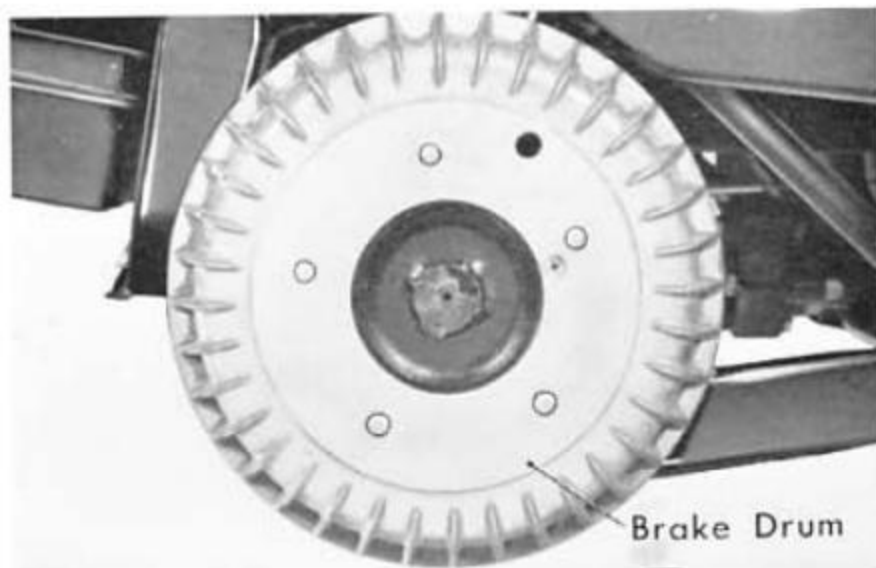


Fig. 8B-4

B. REMOVAL

1. After removing the rear wheel cap, loosen the wheel hub nuts (Fig. 8B-1).
2. Raise the vehicle on the rigid racks (Fig. 8B-2).
3. Remove the drain plug from the rear axle housing and drain oil (Fig. 8B-3).
4. Remove the rear wheel from the brake drum (Fig. 8B-4).

5. Remove the brake wire by loosening the lock nut and brake wire adjuster (Fig. 8B-5).
6. Remove the brake hose by loosening the nut and lock nut.
7. Disengage the propeller shaft at the rear joint yoke by removing the setting bolts and nuts.

Note :

When assembling, torque the nuts to 2.5 kg-m (18.1 ft-lbs).

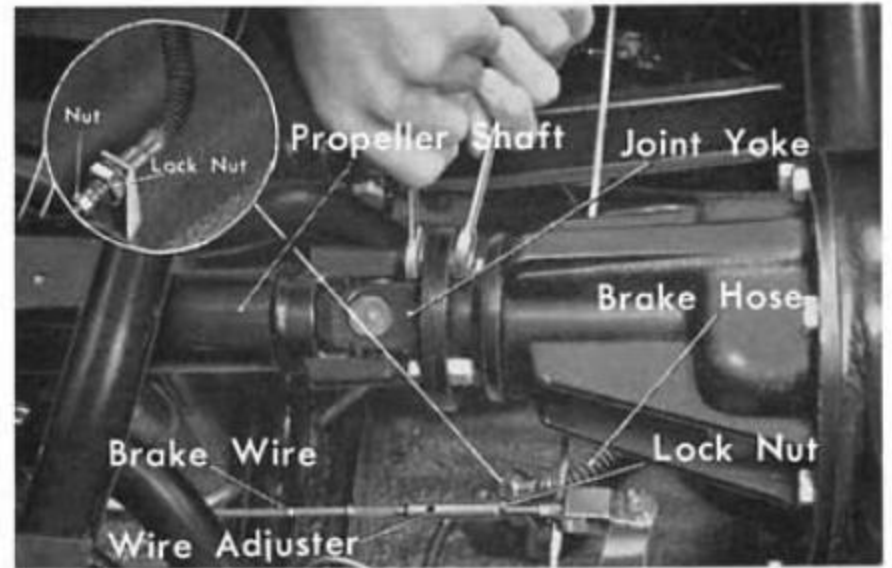


Fig. 8B-5

8. Remove the torque rod setting bolts, nuts and washers at the right side and then disassemble the torque rod (Fig. 8B-6).

Note :

When assembling, torque the nuts to 7.2 kg-m (51.8 ft-lbs).

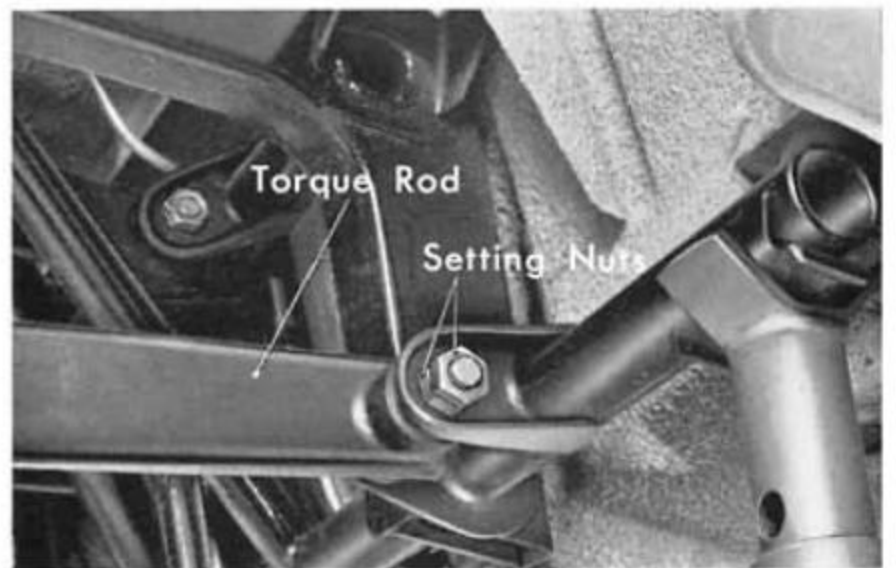


Fig. 8B-6

9. Remove the parnal rod setting bolts, nuts and washers and then disassemble the parnal rod (Fig. 8B-7).

Note :

When assembling, torque the bolts to 7.2 kg-m (51.8 ft-lbs).

10. Remove the rear axle housing by detaching both rear cushions at the axle housing.

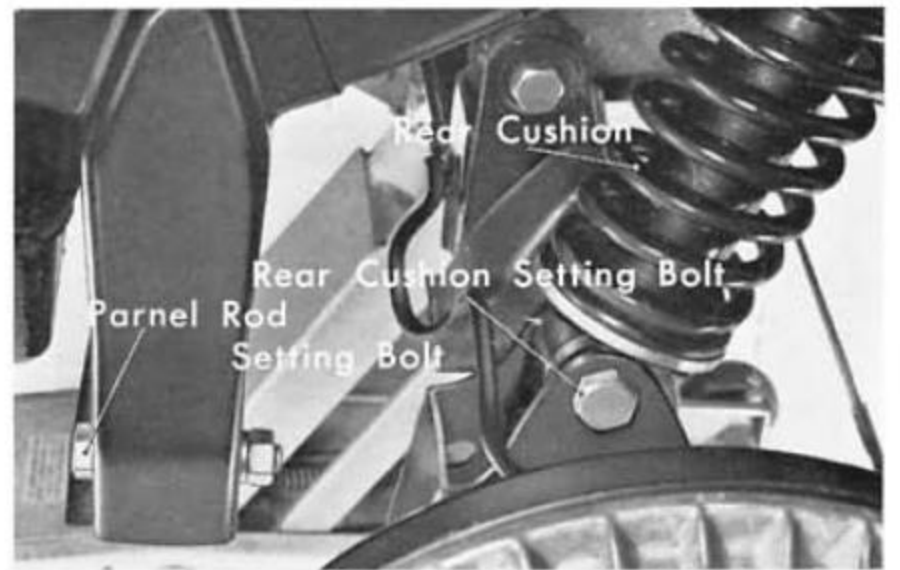


Fig. 8B-7

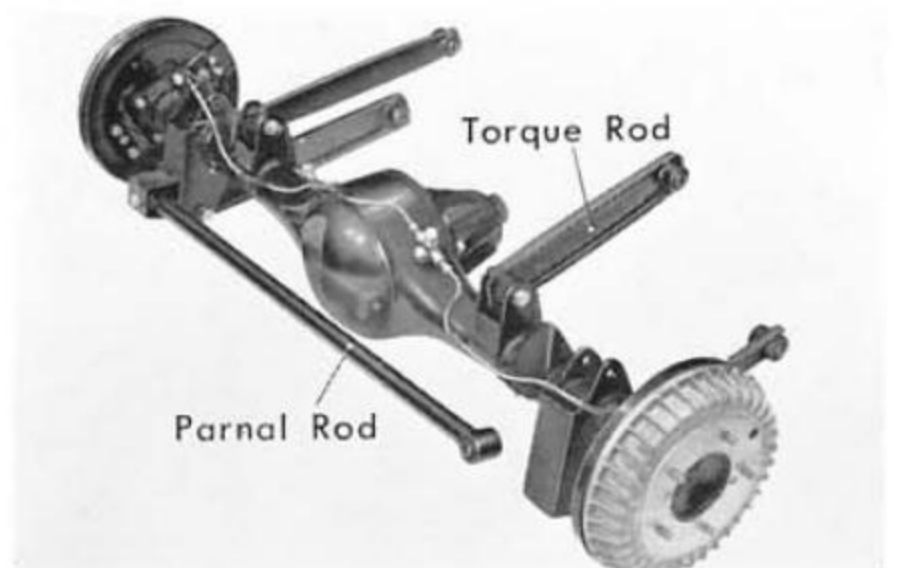


Fig. 8B-8

8-6 DIFFERENTIAL

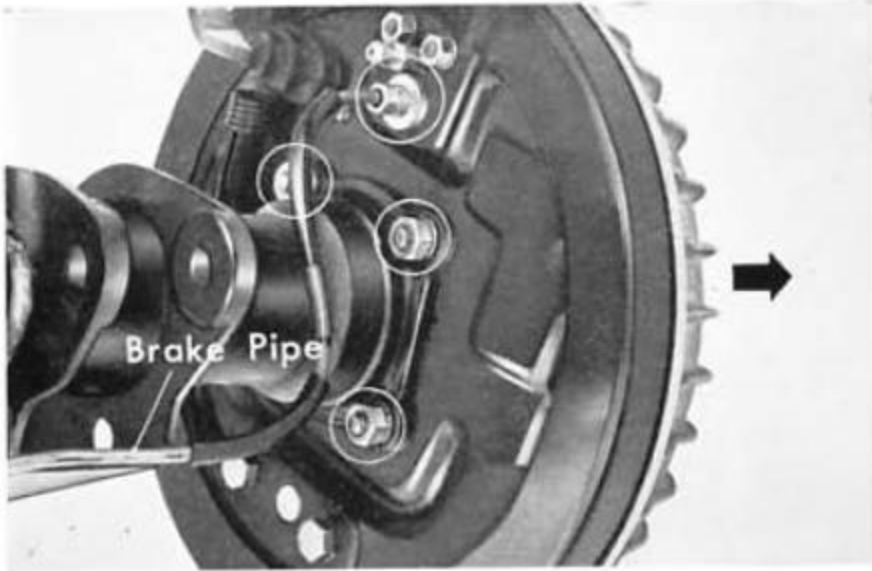


Fig. 8B-9

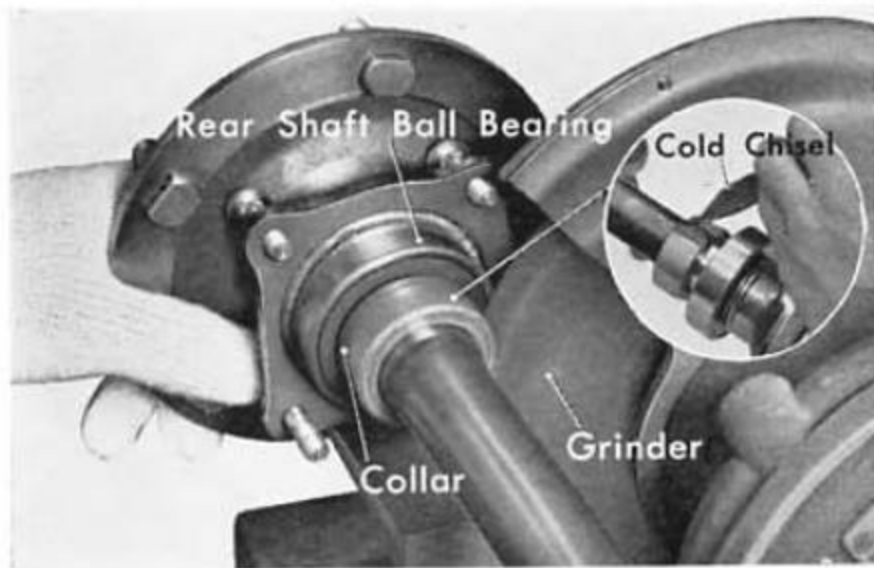


Fig. 8B-10

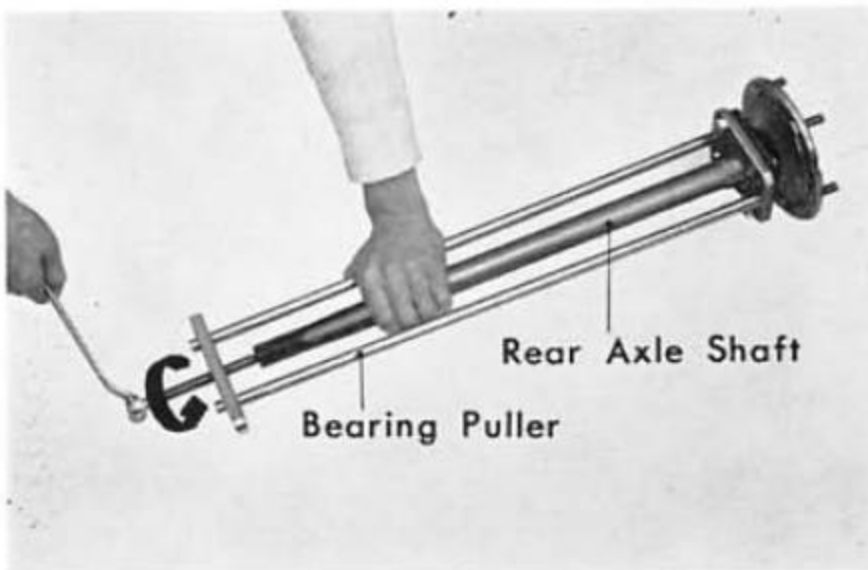


Fig. 8B-11



Fig. 8B-12

11. Extract the axle shaft by disconnecting the brake pipe fitting nut and the shaft flange nuts from the brake panel (Fig. 8B-9).

12. When it is necessary to replace the rear shaft ball bearing, first grind the collar by using a grinder and cutting off with a cold chisel (Fig. 8B-10).

13. Pull off the ball bearing using the ball bearing puller (Fig. 8B-11).

14. Remove the drive gear carrier setting nuts and separate the carrier assemble from the rear axle housing (Fig. 8B-12).

15. Remove the bearing nut stopper by loosening the bolt (Fig. 8B-13).



Fig. 8B-13

16. Remove the needle roller circlip with the pliers (Fig. 8B-14).

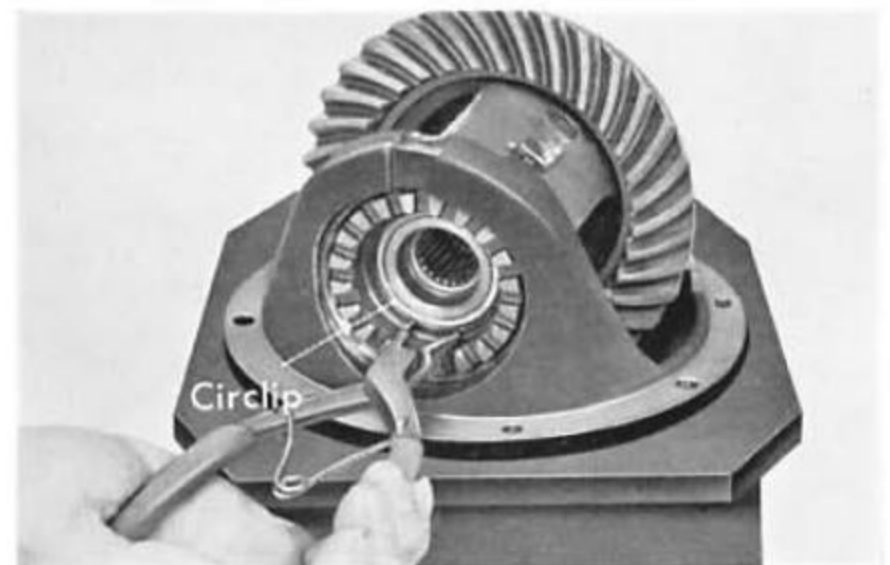


Fig. 8B-14

17. Remove the needle roller bearing (Fig. 8B-15).



Fig. 8B-15

18. Disassemble the drive gear adjuster from the drive gear carrier using an adjuster wrench and then remove the ring gear assembly (Fig. 8B-16).

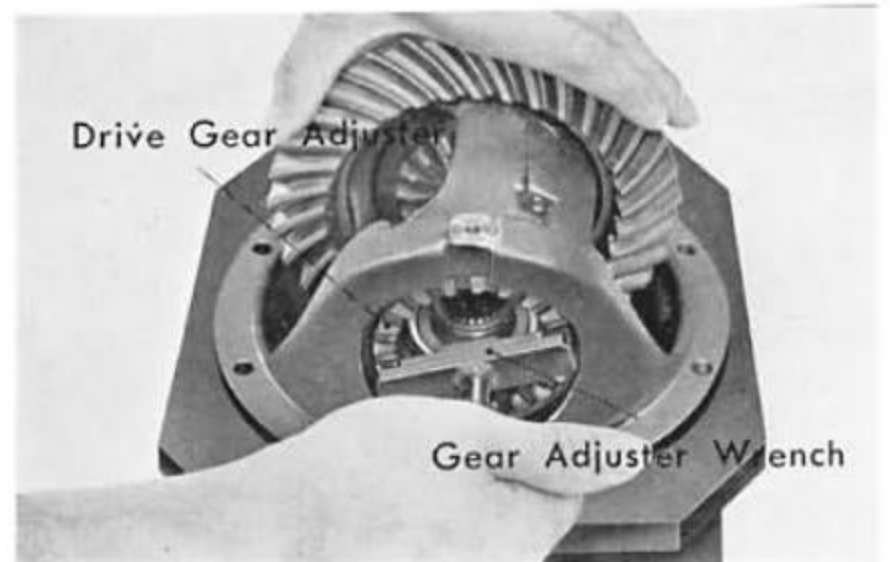


Fig. 8B-16

8-8 DIFFERENTIAL

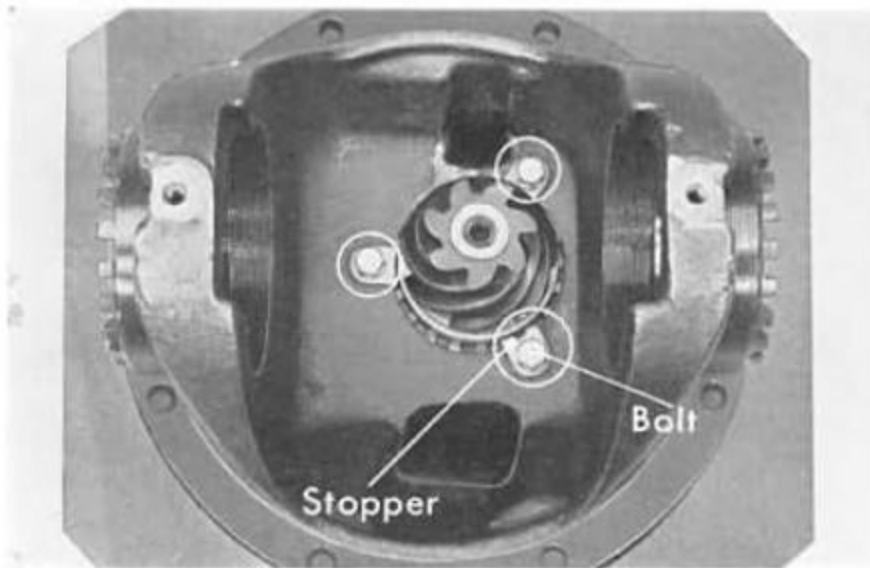


Fig. 8B-17

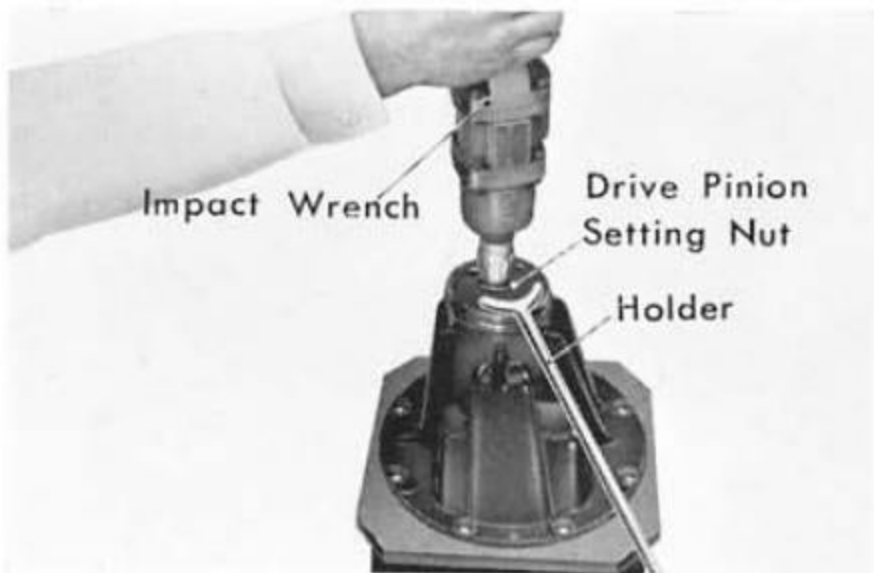


Fig. 8B-18



Fig. 8B-19



Fig. 8B-20

19. Remove the pinion bearing outer race stopper by loosening the bolts (Fig. 8B-17).

20. Remove the drive pinion setting nut (Fig. 8B-18).

Note :

When assembling, torque the nut to 21kg-m (151ft-lbs).

21. Tap the drive pinion lightly with a copper hammer and remove from the carrier (Fig. 8B-19).
Disassemble the needle roller bearings, drive pinion thrust washer, spacer washer (shim), collar and ball bearing with a bearing puller.

22. Remove the lock wire and the ring gear attaching bolts. Separate the ring gear from the differential gear case (Fig. 8B-20).

Note :

When assembling, torque the bolts to 4.1 kg-m (29.5 ft-lbs).

- Remove the cotter pin, pull off the knock pin, and disassemble the pinion shaft (Fig. 8B-21).

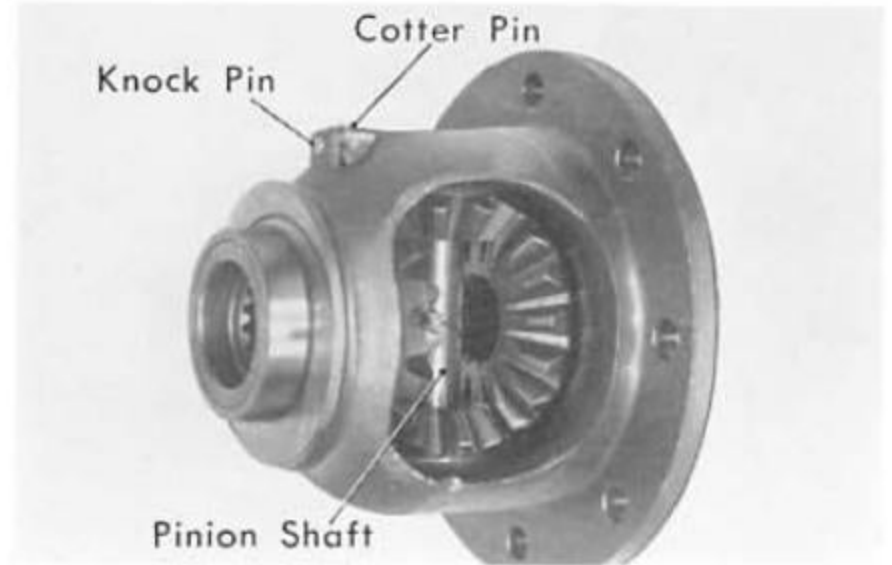


Fig. 8B-21

- Remove the differential gear thrust washers, differential pinion and gears (Fig. 8B-22).

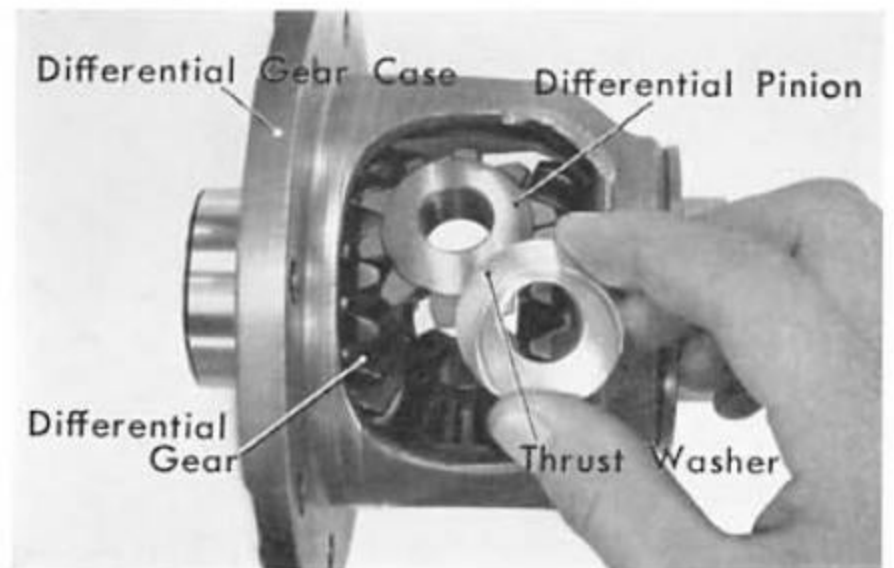


Fig. 8B-22

C. ASSEMBLY AND INSPECTION

- Install the thrust washers in the differential gear and assemble the differential gear case (Fig. 8C-1, 2). Rotate the differential gear to make sure that there are no binding between the differential gear and the case.

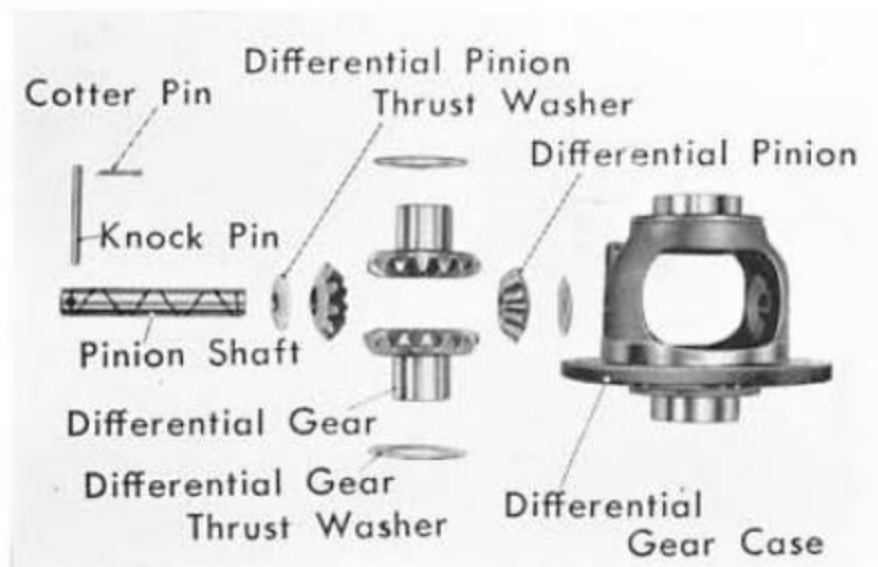


Fig. 8C-1



Fig. 8C-2

8-10 DIFFERENTIAL



Fig. 8C-3



Fig. 8C-4

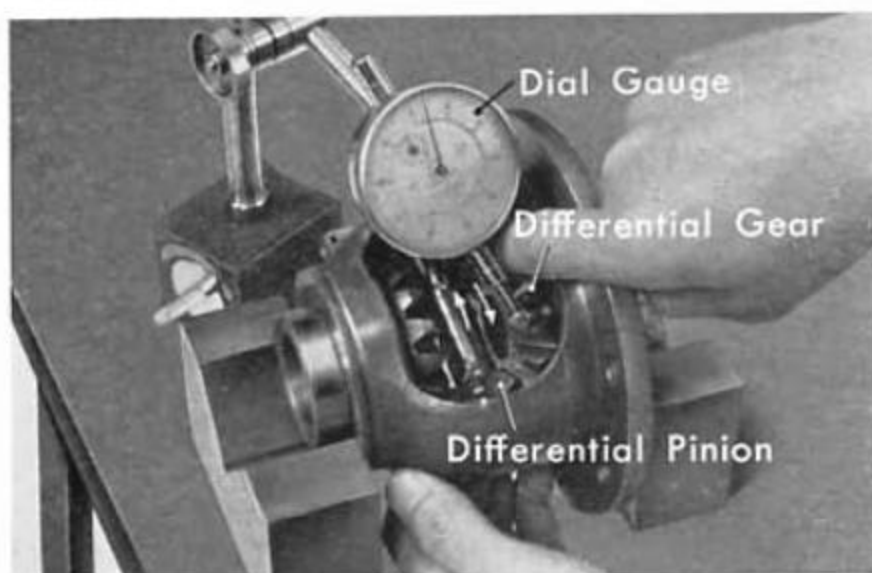


Fig. 8C-5

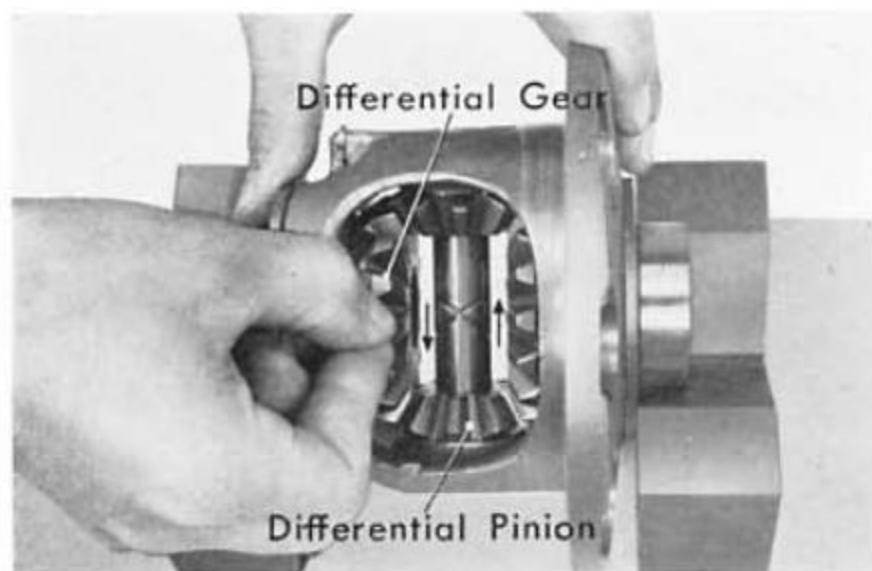


Fig. 8C-6

2. Mesh the differential pinion to the differential gear and turn 90° , assemble pinion thrust washer (Fig. 8C-3).
3. Assemble the pinion shaft and align the knock pin holes in both the pinion shaft and knock pin.

4. Insert the pinion shaft and set the cotter pin (Fig. 8C-4).

5. Measure the backlash
Place a dial gauge against the differential gear and lock the opposite differential pinion and gear. Measure the backlash with the dial gauge at least 4 places diagonally (Fig. 8C-5).

6. Inspect the teeth contact of the differential and pinion gears. Perform the inspection by applying red lead to the gear teeth contact surface and after drying, rotate several times and observe the pattern of the red lead. Inspect at least 4 places diagonally (Fig. 8C-6).

7. Inspect backlash and teeth contact pattern.
After taking measurement and if found to be beyond the allowable tolerance, adjust with the differential gear thrust washer and the differential pinion thrust washer so that the teeth contacts are at the center of the teeth and the backlash is within the standard tolerance.

Backlash standard tolerance :
0.08 ~ 0.15 mm (0.0032 ~ 0.0060")

Types of thrust washers available ;

Differential gear :
1.3 ~ 1.7 mm (0.051 ~ 0.067")
0.1 mm (0.004") intervals

Differential pinion :
0.9 ~ 1.5 mm (0.035 ~ 0.059")
0.1 mm (0.004") intervals.

8. Check the matching Nos. on both the ring gear and the drive pinion.
The ring and drive pinion gears should have corresponding Nos. . When making replacement, replace the gears in sets (Fig. 8C-7).
Record the P dimension and the + dimension marked on the drive pinion (example : P0, P+20, P+40, . . .). Refer to the item 19 of page 8-13.

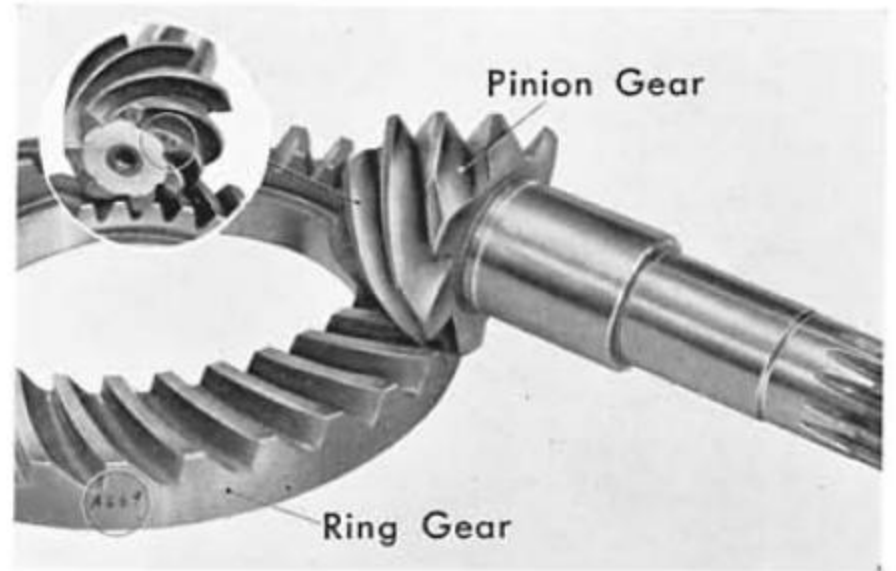


Fig. 8C-7

9. Align the bolt holes in the ring gear to the differential gear case and install the bolts and tighten in a diagonal pattern (Fig. 8C-8).
Torquing valve : 4.0kg-m (29 ft-lbs).

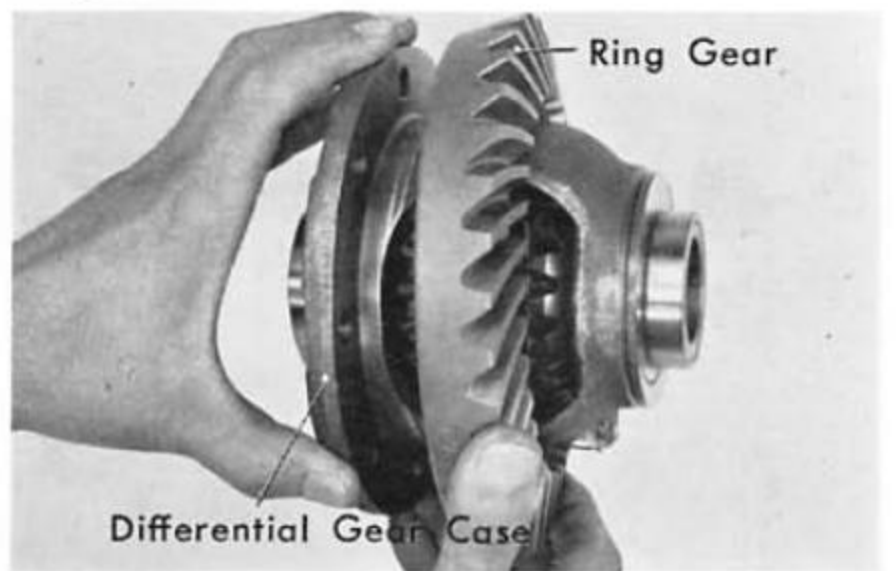


Fig. 8C-8

10. Install lock-wire (1.2 mm wire) through the attaching bolt heads so that the wire is installed in the tightening direction.
Twist the ends together and bend down against the bolt head (Fig. 8C-9).
The length of the twisted end should be 7~10 mm (0.27~0.39").

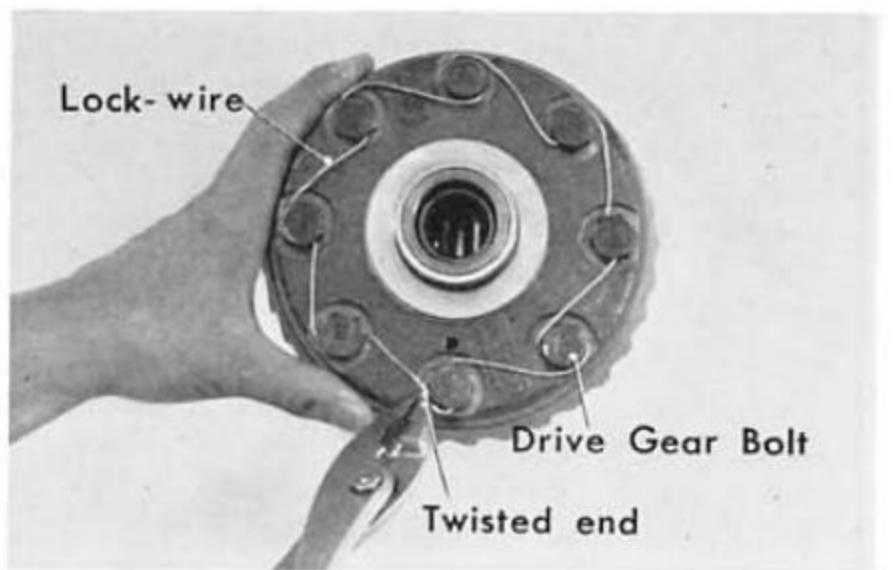


Fig. 8C-9

11. When assembling the differential gear case, it is necessary to prepare the special tools, pinion bearing adjuster wrench, side bearing adjuster wrench and differential gear setting jig set (Fig. 8C-10)

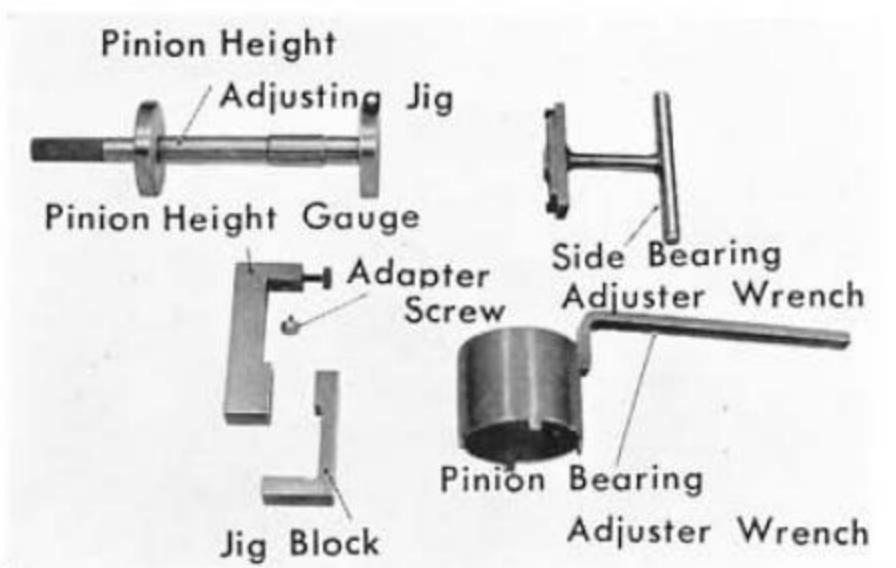


Fig. 8C-10

8-12 DIFFERENTIAL

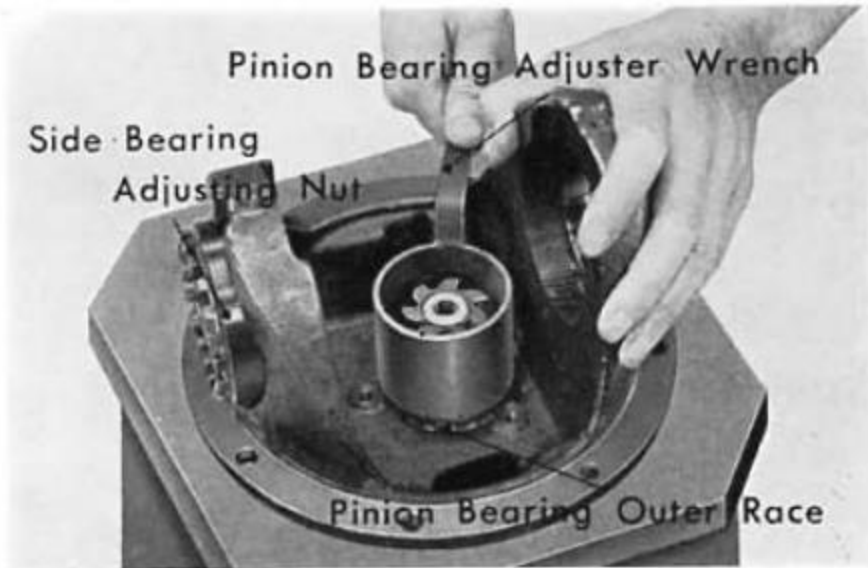


Fig. 8C-11

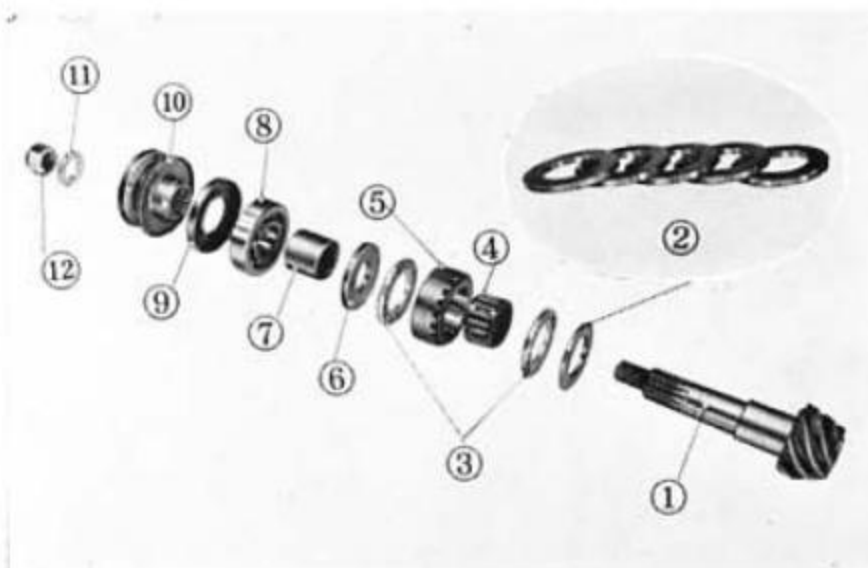


Fig. 8C-12

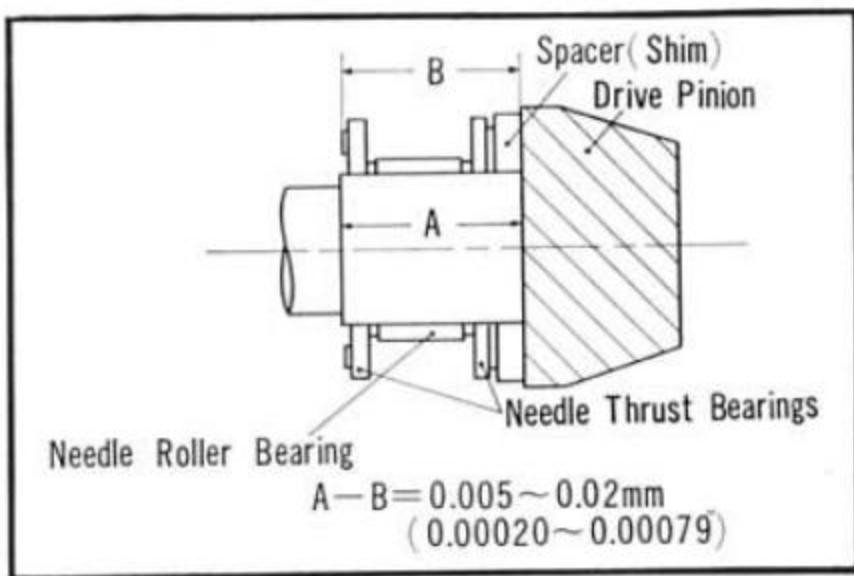


Fig. 8C-13

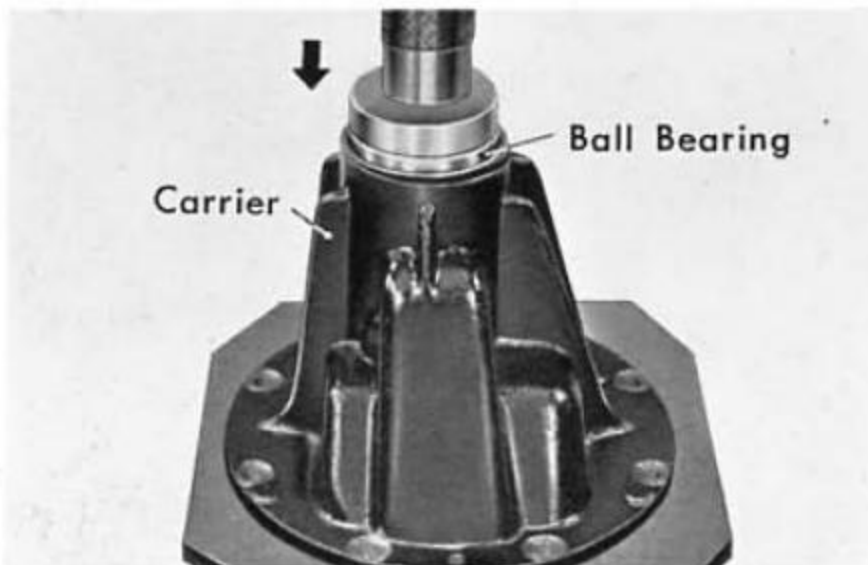


Fig. 8C-14

12. Install the side bearing adjusting nuts on the carrier, torque the adjuster with the side bearing adjuster wrench (Fig. 8C-11).

13. Install the pinion bearing outer race on the carrier, torque the race with the pinion bearing adjuster wrench.

14. When assembling the pinion gear, make sure the assembling order of parts is as shown in the figure 8C-12.

Fig. 8C-12

- ① Drive pinion
- ② Spacer (Shim)
- ③ Needle thrust bearings
- ④ Needle roller bearing
- ⑤ Outer race
- ⑥ Thrust washer
- ⑦ Thrust collar
- ⑧ Roller bearing
- ⑨ Oil seal
- ⑩ Joint yoke flange
- ⑪ Washer
- ⑫ Nut

The spacer shims are available in different sizes as follows,

No.	Thickness
1.	4.98 mm (0.1961")
2.	5.00 mm (0.1969")
3.	5.02 mm (0.1976")
4.	5.04 mm (0.1984")
5.	5.06 mm (0.1992")

15. Install the spacer shim on the drive pinion so that the polished surface is facing toward the needle thrust bearing, and insert the pinion into the carrier.

16. After inserting the thrust collar, press the ball bearing into the carrier (Fig. 8C-14).

17. After installing in the oil-seal into the carrier, and tighten the nut with washer, torque to 21kg-m (152 ft-lbs) (Fig. 8C-15).



Fig. 8C-15

18. Measure the location of the pinion. Attach the dial gauge on the pinion height gauge jig and set the gauge reading to "0" (Fig. 8C-16).

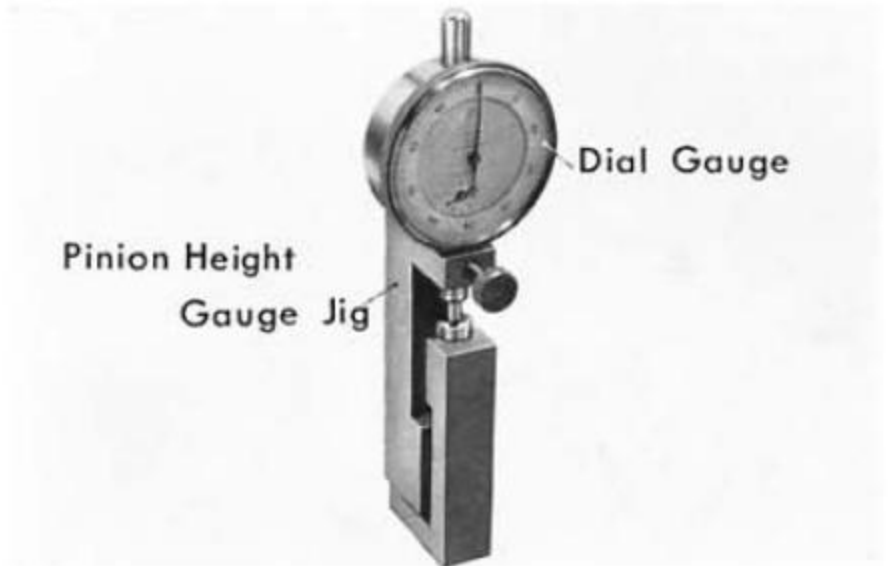


Fig. 8C-16

19. Set the dial gauge and jig on the top face of pinion gear, lightly rotate the adjuster wrench to set the gauge reading to "0" (marked P0) or "0.02" (marked P+20) (Fig. 8C-17).

Marks	Pinion Height	Gauge
P 0	52.45 mm (2.0650")	0
P+20	52.45 mm (2.0650") + 0.02 mm (0.0008")	+0.02
P+40	52.45 mm (2.0650") + 0.04 mm (0.0158")	+0.04
P+60	52.45 mm (2.0650") + 0.06 mm (0.0236")	+0.06
P+80	52.45 mm (2.0650") + 0.08 mm (0.0315")	+0.08

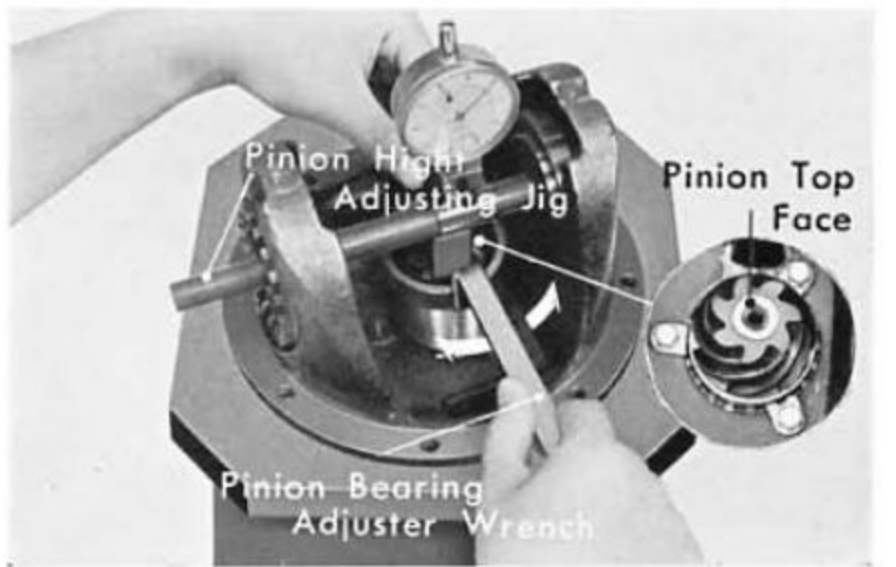


Fig. 8C-17

20. Install the pinion bearing outer race stoppers, spring washers and bolts. Make sure that the stoppers are not touching the retainer of needle thrust bearing (Fig. 8C-18).

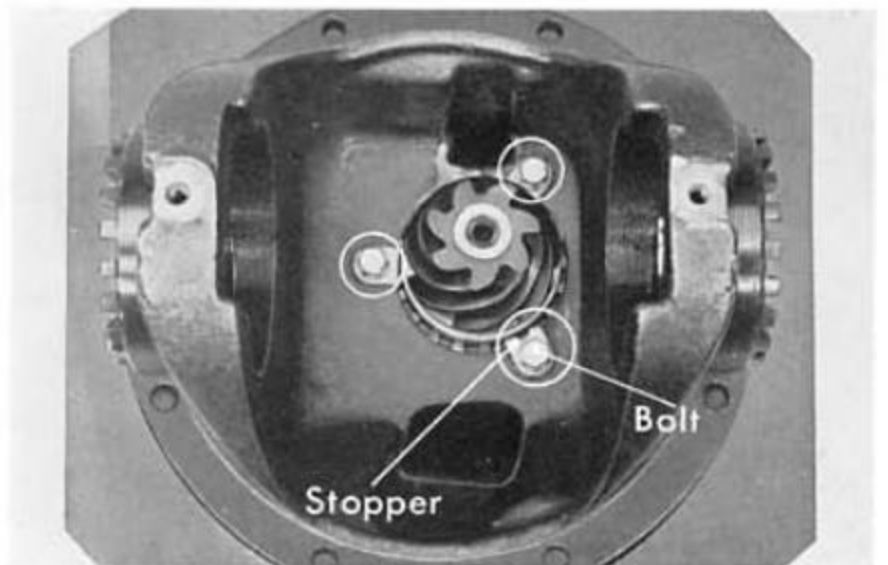


Fig. 8C-18

8-14 DIFFERENTIAL



Fig. 8C-19



Fig. 8C-20



Fig. 8C-21

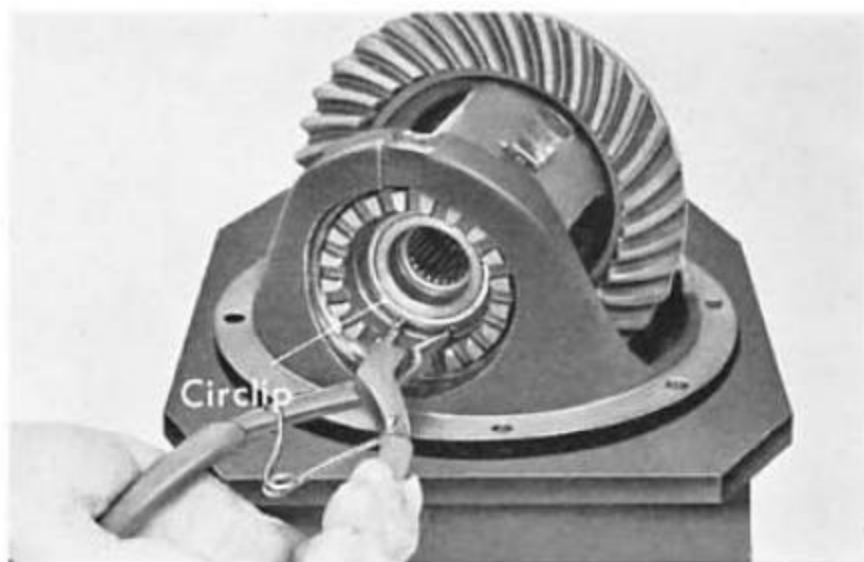


Fig. 8C-22

21. Before installing the differential gear assembly to the carrier, make sure the assembling order of parts is as shown in the Fig. 8C-19.

22. After installing the needle thrust bearings to the differential gear, assemble the differential gear assembly to the carrier, and temporarily screw the bearing adjusting nuts with the adjuster wrench to prevent from dropping (Fig. 8C-20).

23. Assemble the needle roller bearings from the both sides (Fig. 8C-21).

24. Set the needle roller bearing stopper circlips at both sides.

25. Inspect and measure the backlash. Setup the dial gauge perpendicular to the ring gear, lock the drive pinion, move the ring gear lightly to the right and left and record the indication on the gauge (Fig. 8C-23). The standard value for the backlash is 0.10~0.15 mm (0.0039~0.0059"). To obtain the proper backlash, move the ring gear side adjusting nut with the adjuster wrench.

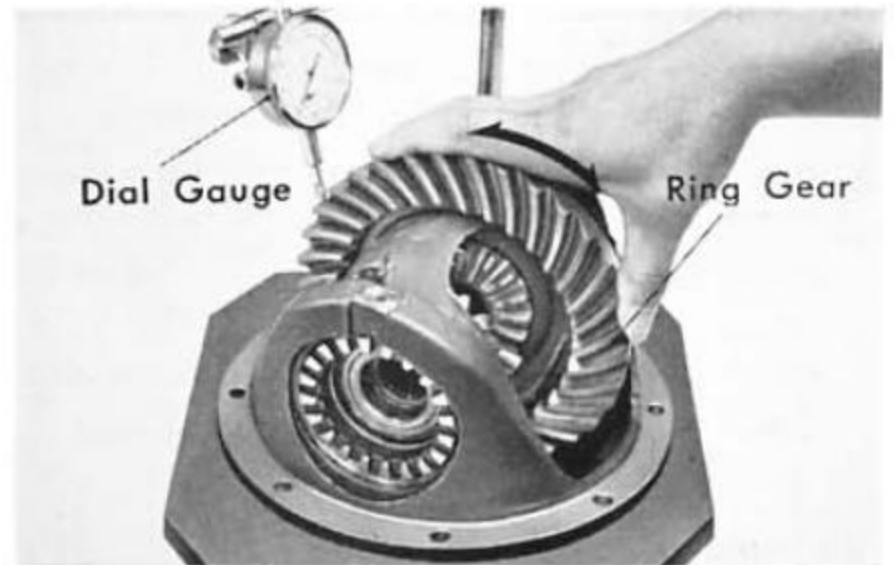


Fig. 8C-23

26. Carefully screw the bearing adjusting nut (opposite side of the ring gear) with the adjuster wrench while rotating the ring gear back and forth until the both sides clearances of the needle thrust bearing come to the minimum, that is, the load is about to be felt by the hand holding the ring gear.



Fig. 8C-24

27. Install the bearing adjusting nut locks at both sides and tighten the bolts with washers. The lock has three different types, and by the proper use of these respectively, precise side clearance adjustment can be made.

It is important to make sure that the needle thrust bearing is not preloaded more than the tightening tolerance and also that there are no clearances between the assembled parts.

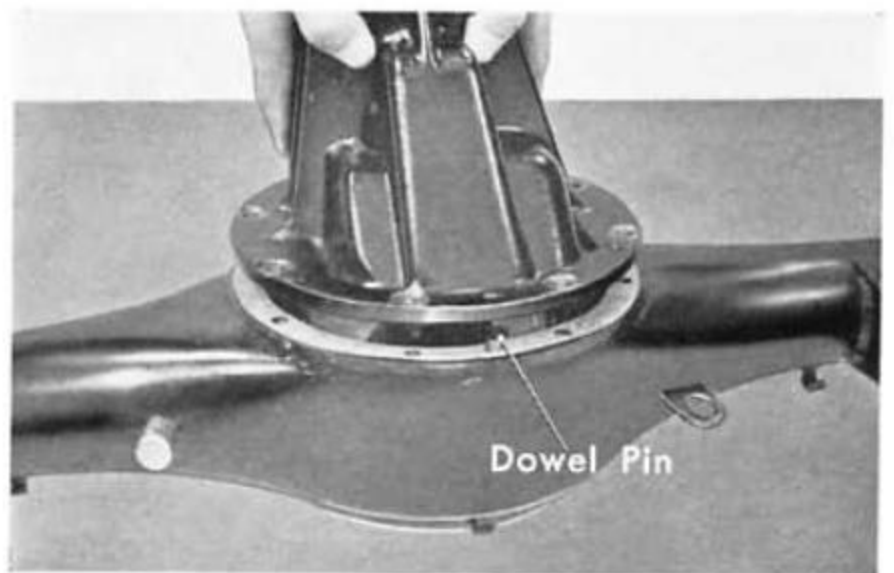


Fig. 8C-25

28. Assemble the gasket on the rear axle housing, align the drive gear carrier hole to the carrier pin and assemble. Install the washers, nuts, and torque the bolts in a diagonal pattern (Fig. 8C-25).

Note :

Torque the nuts to 2.5 kg-m (18.1 ft-lbs).

D. GEAR TOOTH CONTACT CHECK AND ADJUSTMENT

When the backlash adjustment is finished, and the differential gears are assembled completely, the final inspection of the tooth contact pattern should be carried out.

Apply the gear marking compound on the surface of gear teeth and take the gear tooth contact pattern by turning the pinion giving a resistance to the gear to some extent.

When the gear contact is not proper, make adjustment to obtain the proper gear contact as follows.

Adjust the pinion in the axial direction by turning the outer race below the pinion head. Adjust the axial movement of the gear by turning the bearing adjusting nuts on both sides of the differential gear case.

When the above adjustment is finished, readjust the backlash.

[1] IDEAL TOOTH CONTACT

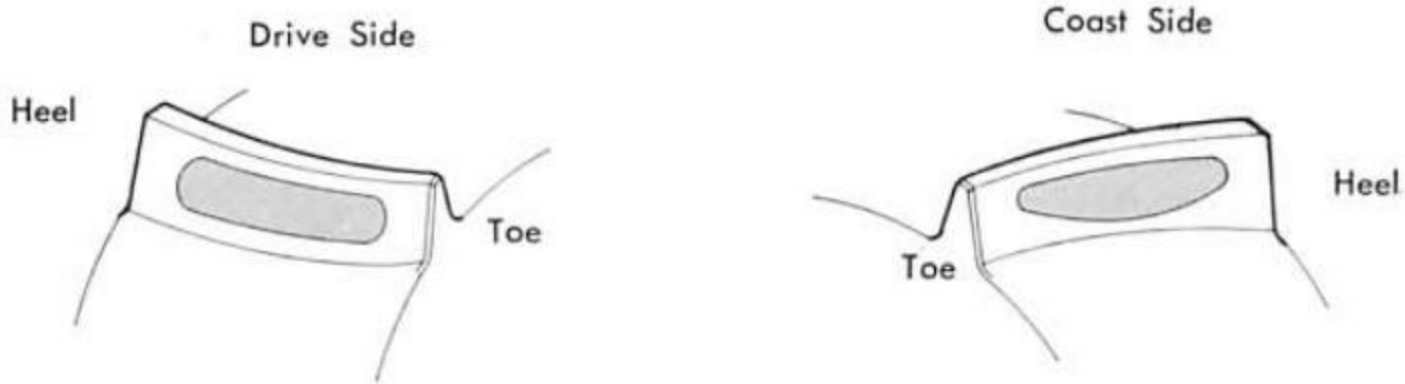


Fig. 8D-1

[2]

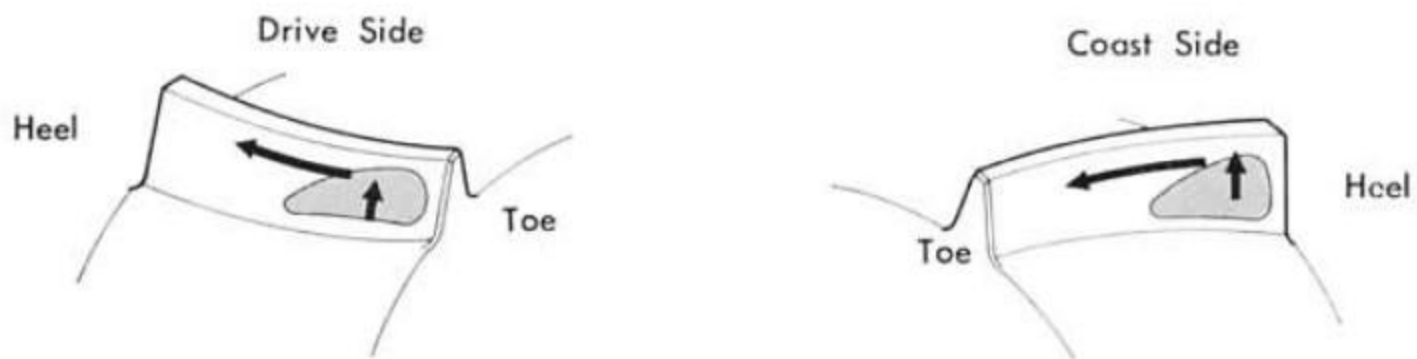


Fig. 8D-2

Adjusting method: (In the case of Fig. 8D-2)

Turn the outer race of the pinion and move the pinion in the opposite direction to the gear (Fig. 8D-3). Thus, the tooth contact position moves in the direction of arrow heads on the tooth surface. (Fig. 8D-2)

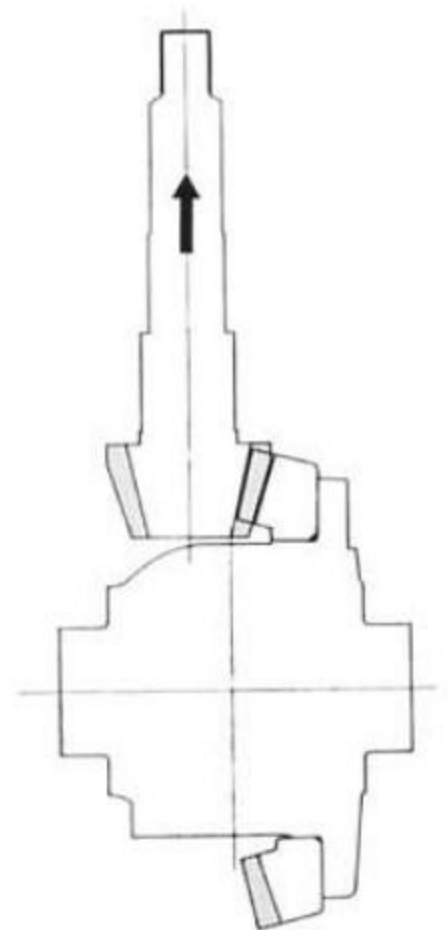


Fig. 8D-3

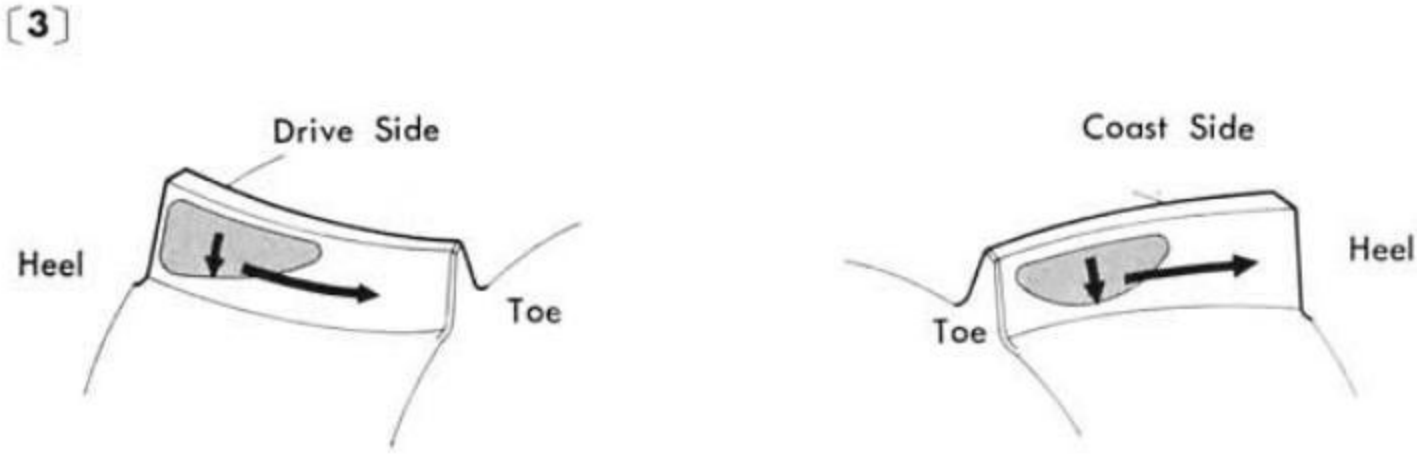


Fig. 8D-4

Adjusting method: (In the case of Fig. 8D-4)

Turn the outer race of the pinion and move the pinion toward the gear (Fig. 8D-5). The tooth contact position moves in the direction of arrow heads on the tooth surface (Fig. 8D-4).

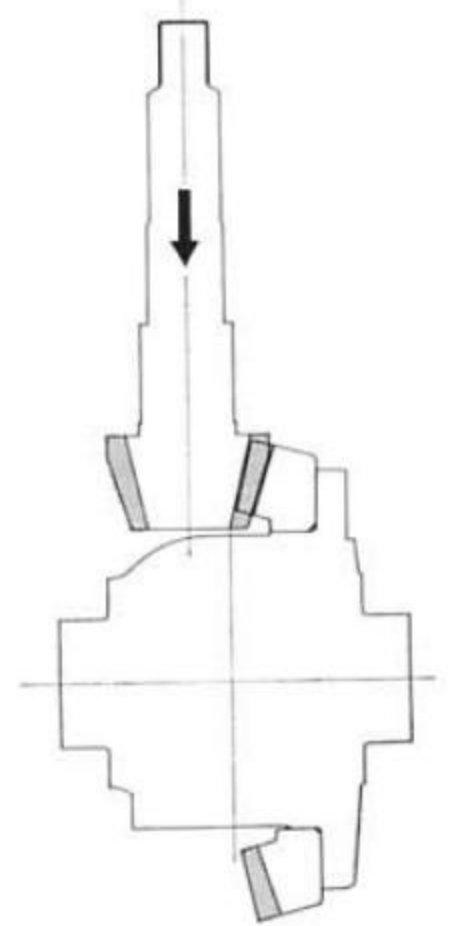


Fig. 8D-5

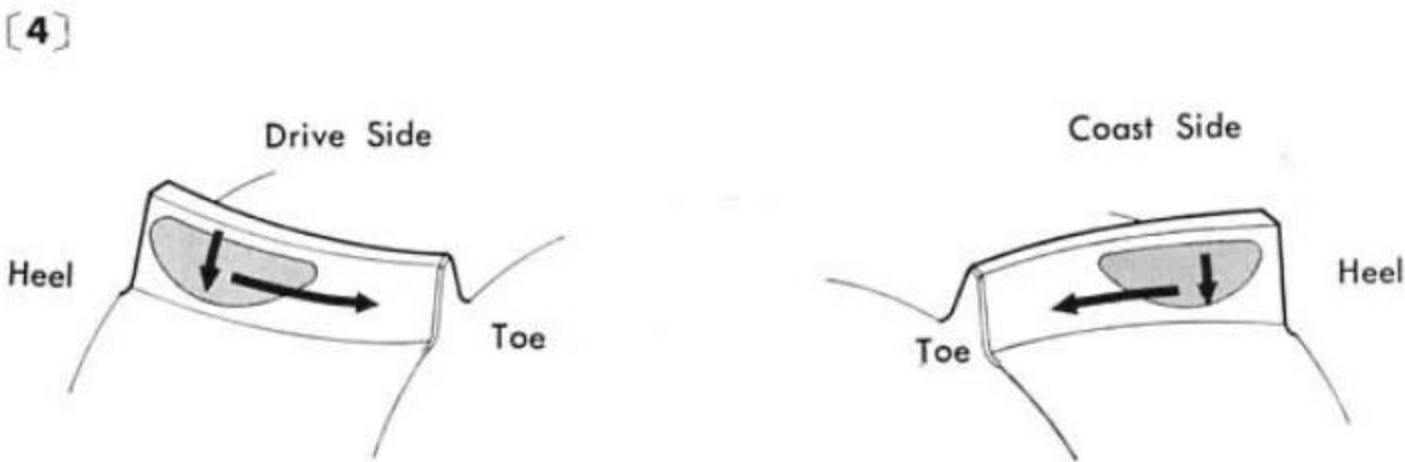


Fig. 8D-6

Adjusting method: (In the case of Fig. 8D-6)

Turn the bearing adjusting nuts and reduce the backlash (Fig. 8D-7). The tooth contact position moves in the direction of arrow heads on the tooth surface (Fig. 8D-6).

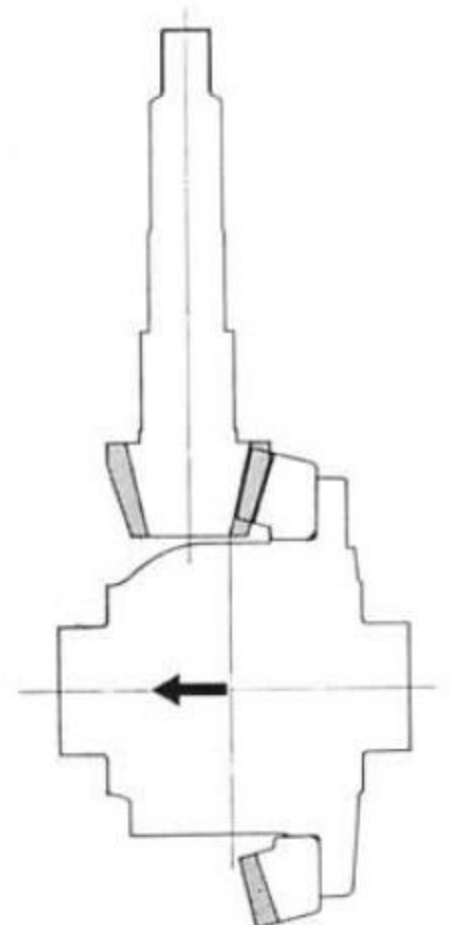


Fig. 8D-7

[5]

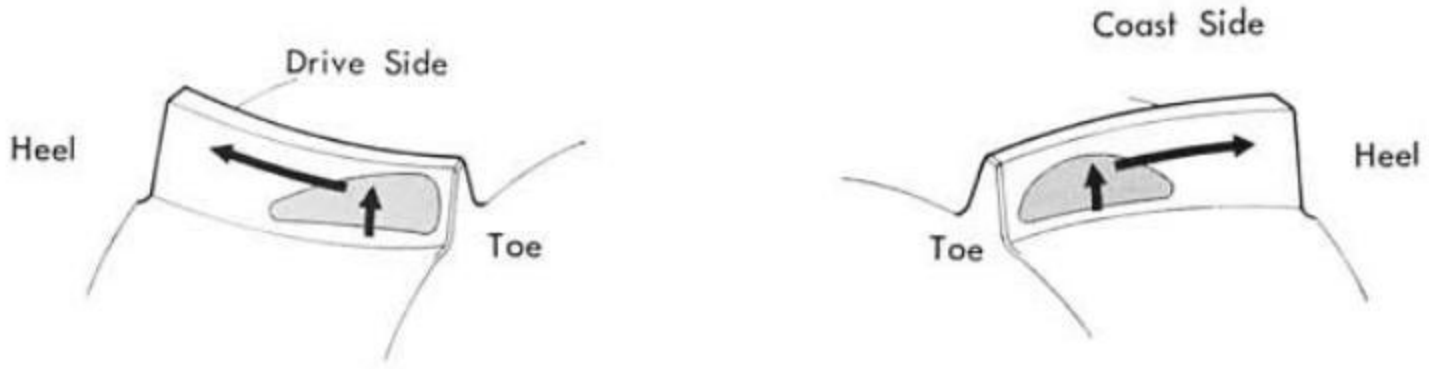


Fig. 8D-8

Adjusting method: (In the case of Fig. 8D-8)

Turn the bearing adjusting nuts and increase the backlash (Fig. 8D-9). The tooth contact position moves in the direction of arrow heads on the tooth surface. (Fig. 8D-8).

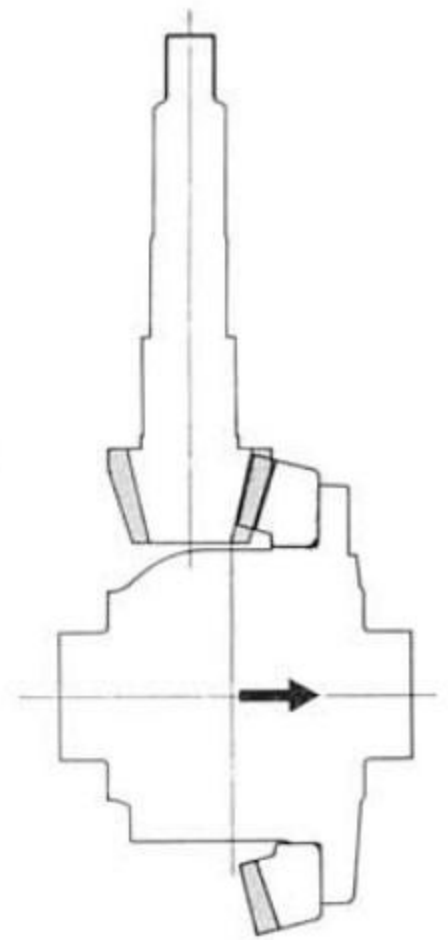


Fig. 8D-9

9. REAR AXLE

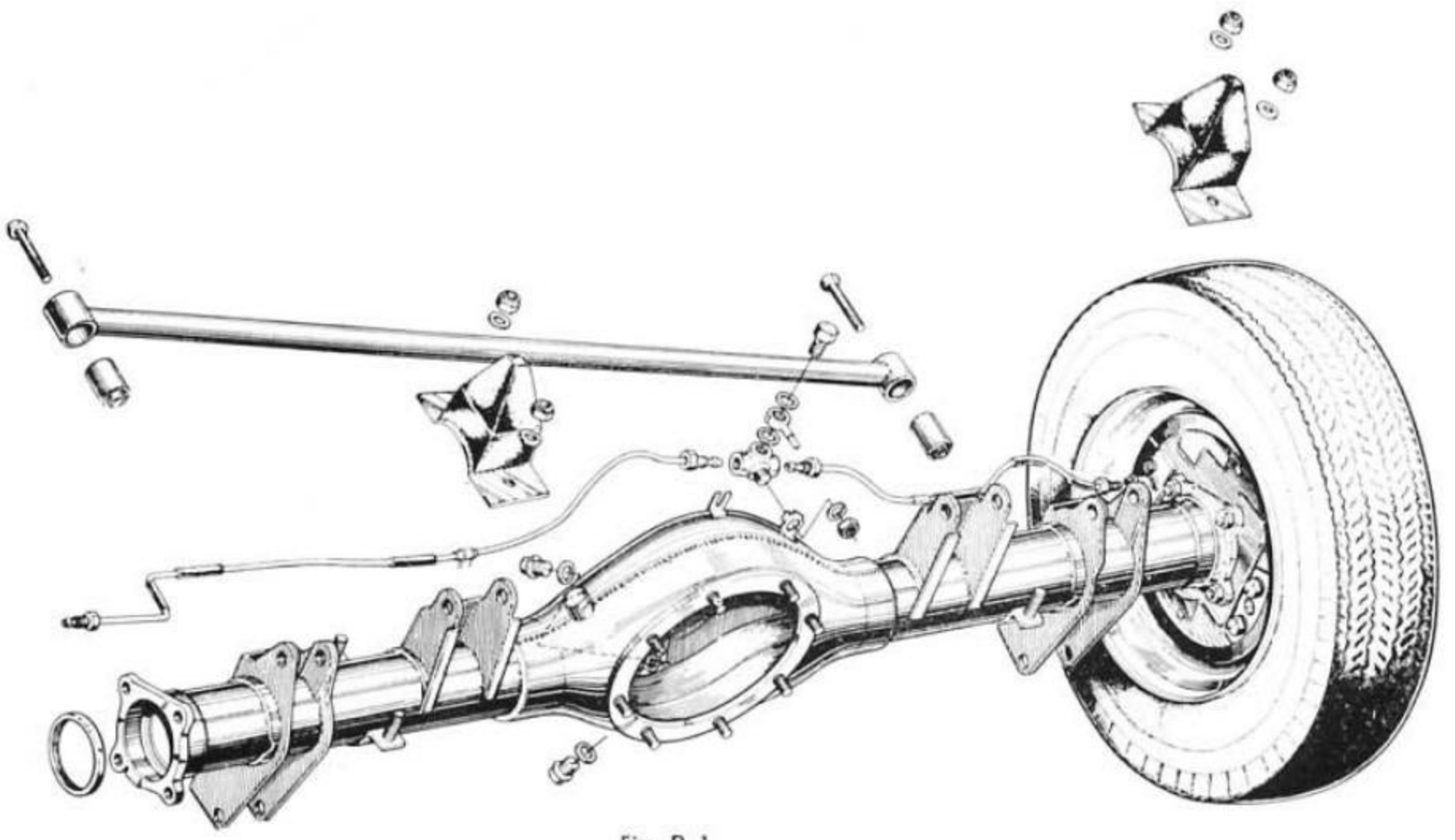


Fig. 9-1

REAR HUB BEARING

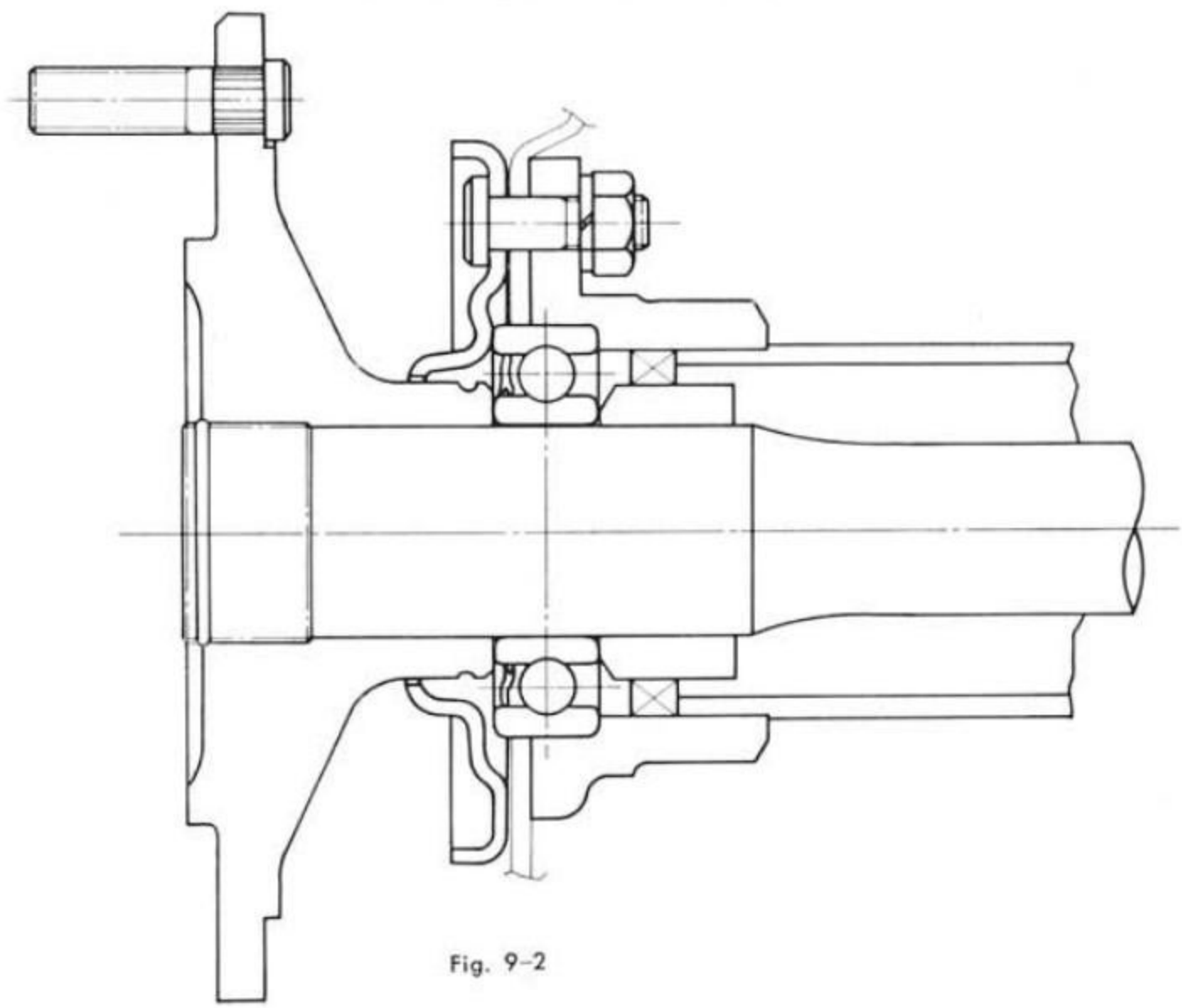


Fig. 9-2

9-2 REAR AXLE

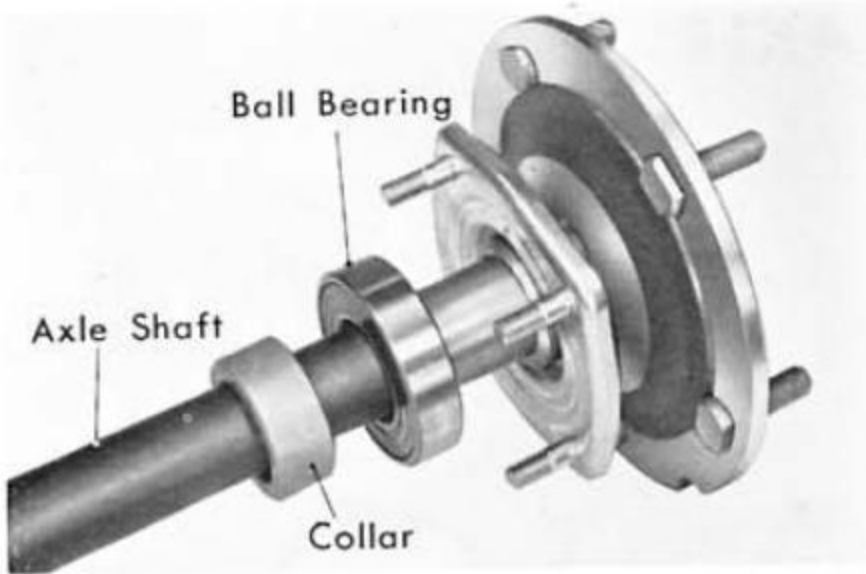


Fig. 9B-1

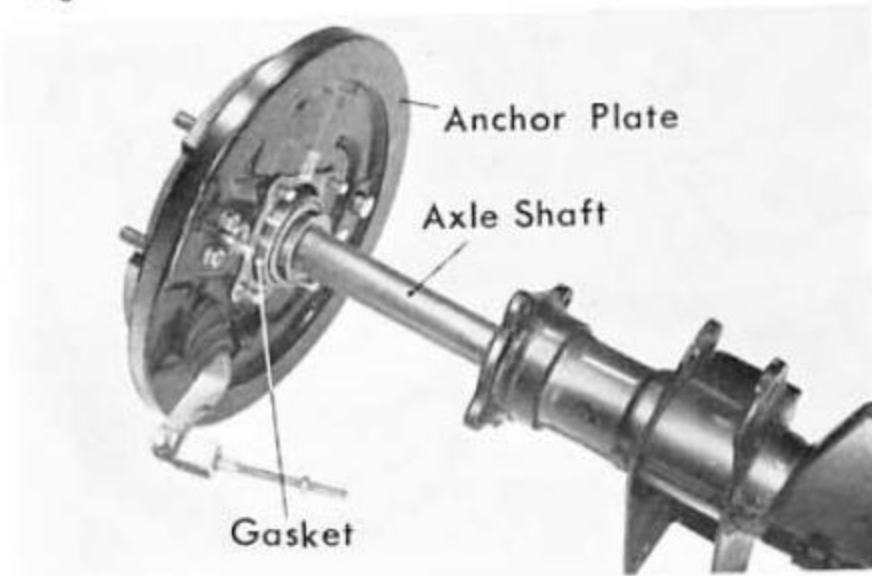


Fig. 9B-2

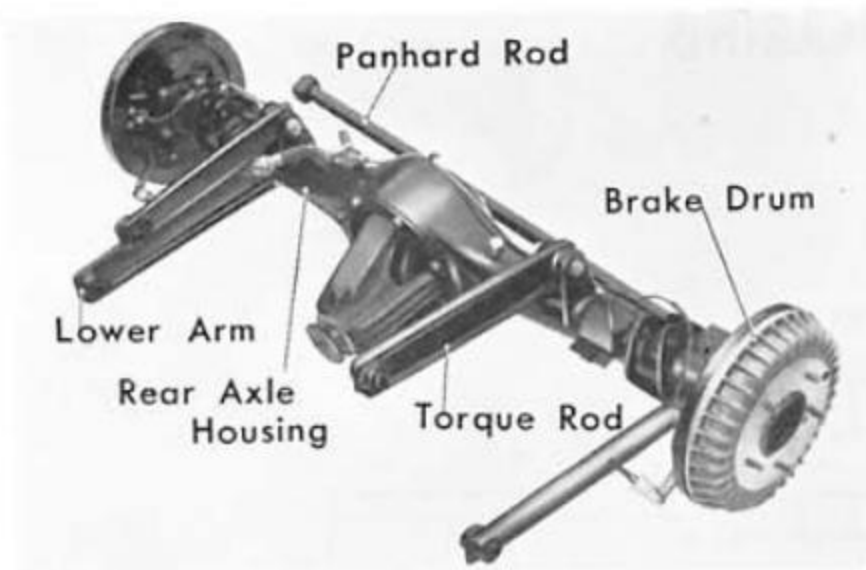


Fig. 9B-3

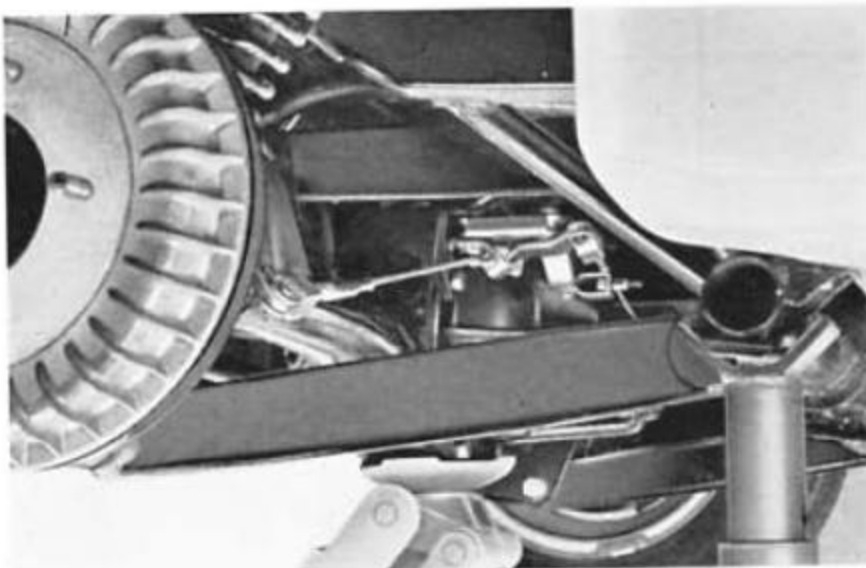


Fig. 9B-4

A. REMOVAL

Disassembling procedure will be referred to the items, B, 1 through 13, Differential Gear Removal of page 8-4, 5, 6.

B. ASSEMBLY

1. Press fit the ball bearing and collar on the axle shaft (Fig. 9B-1).

2. After installing the oil seal into the axle housing, install the anchor plate and gasket on the axle shaft, and insert the axle shaft into the axle housing.

Torque the anchor plate setting nuts (Fig. 9B-2).

3. Assemble the Panhard rod, torque rods lower arms and brake drum on the rear axle housing (Fig. 9B-3).

4. Assemble the rear axle housing assembly on the frame in the reverse order of disassembly.

10. STEERING SYSTEM

The rack and pinion type steering system is adopted. The ratio is 17.4 : 1. With this, a sharp steering effect is obtained, and smooth operation can be achieved with the minimum force.

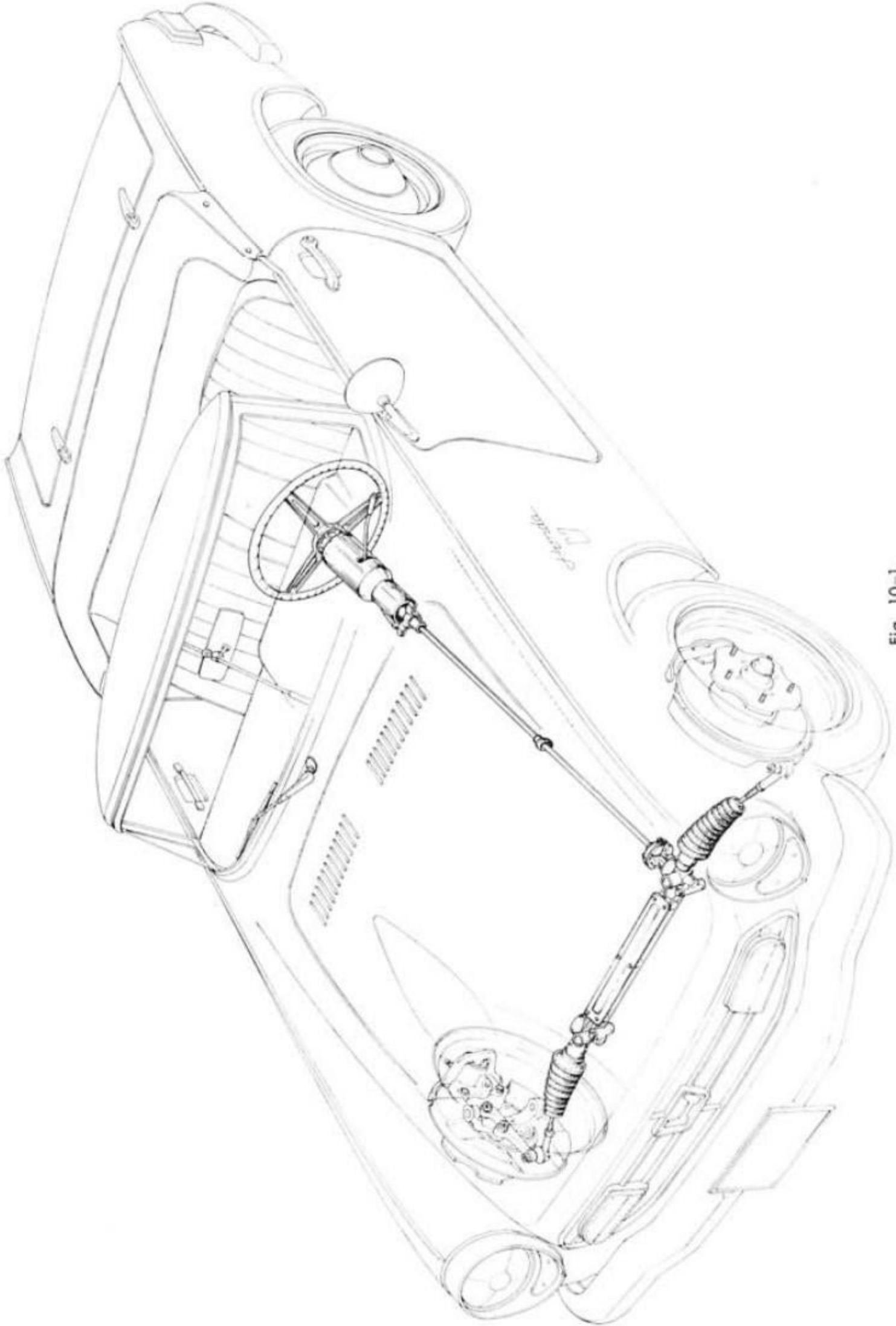


Fig. 10-1

STEERING SYSTEM CUTAWAY VIEW

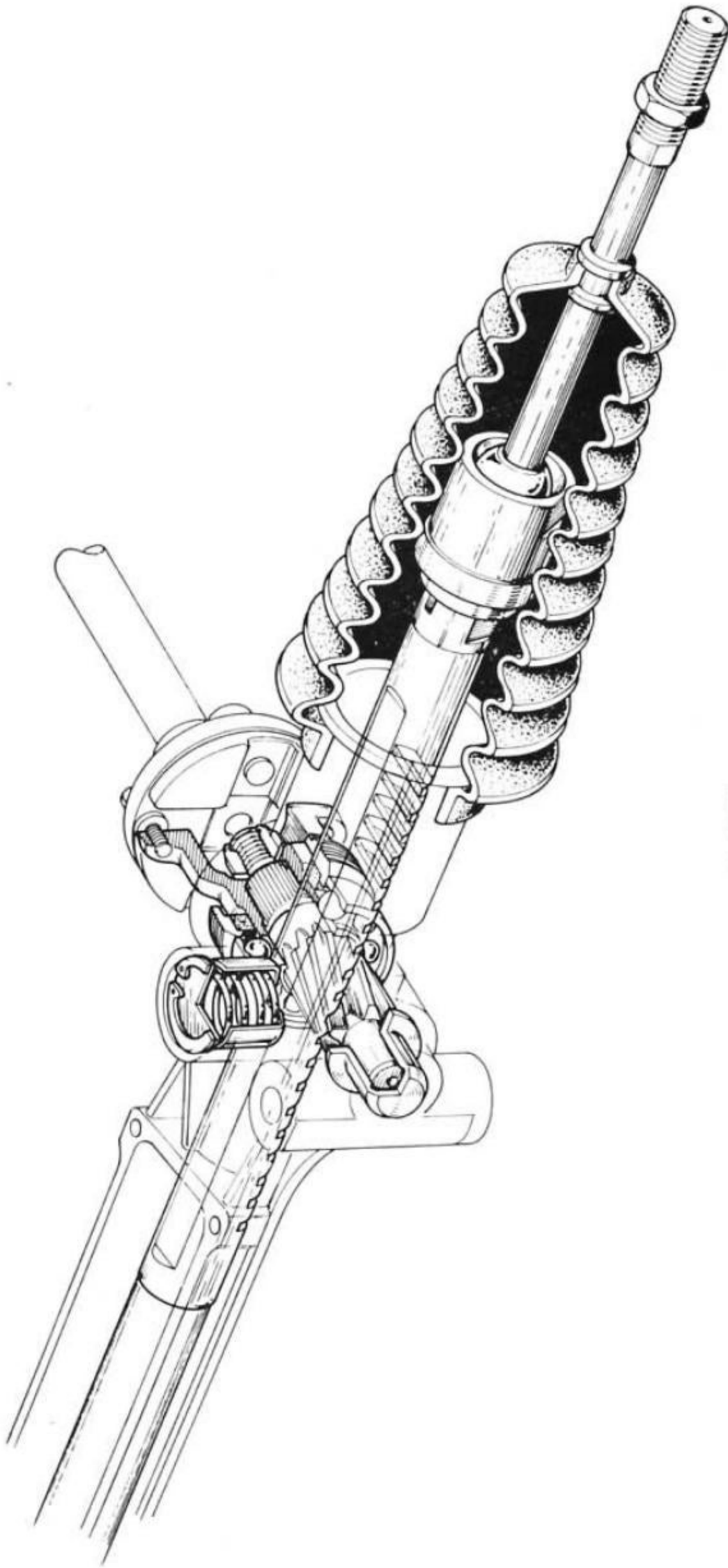


Fig. 10-2

TIE ROD MOVEMENT

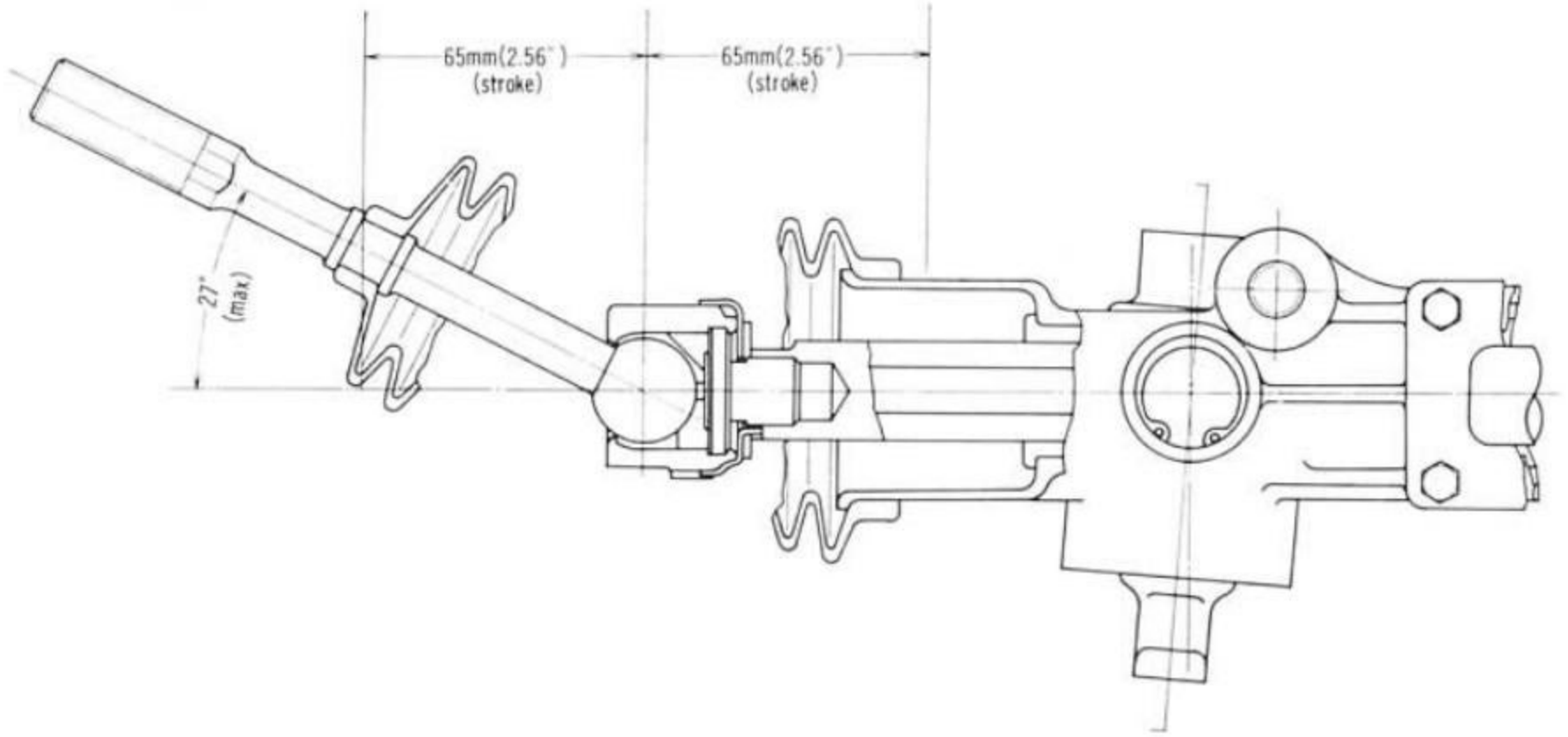


Fig. 10-3

PINION and BEARING SECTION

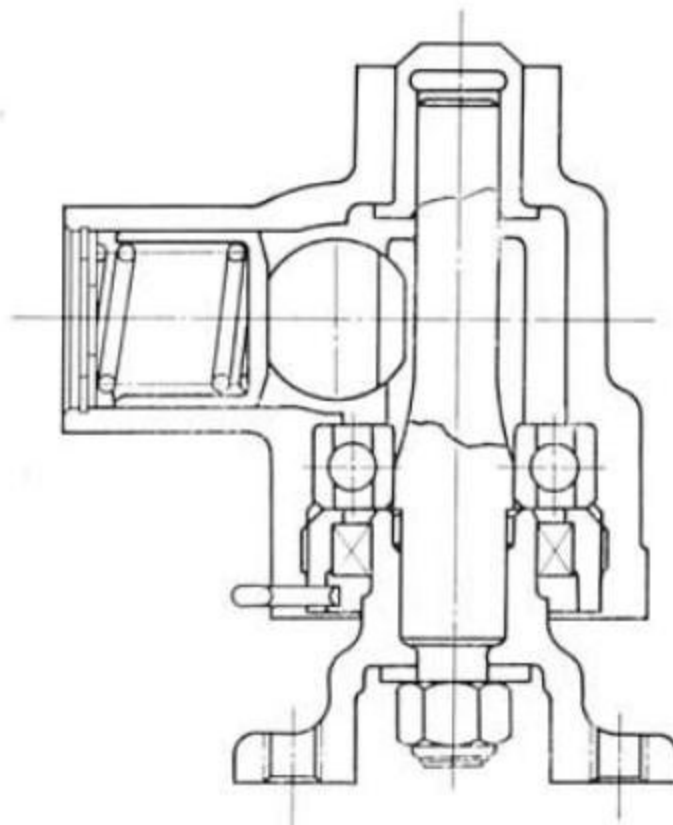


Fig. 10-4

10-4 STEERING SYSTEM

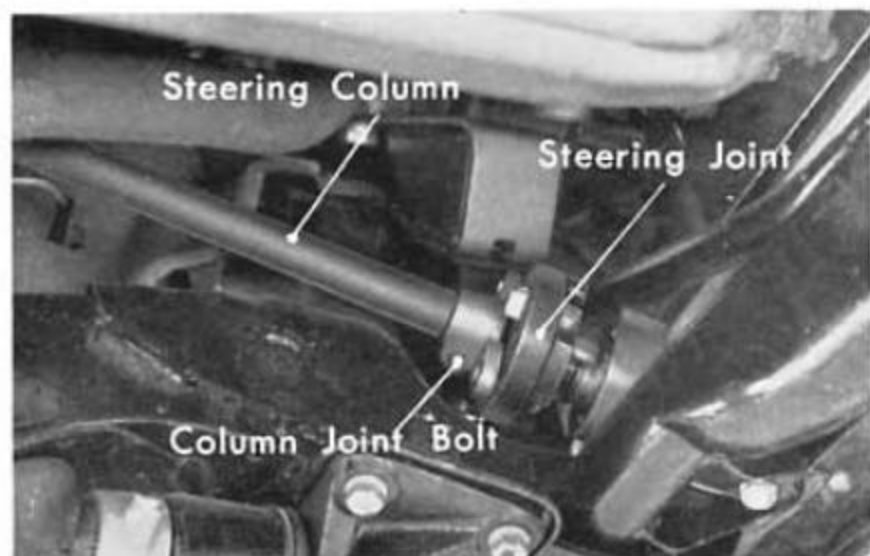


Fig. 10A-1

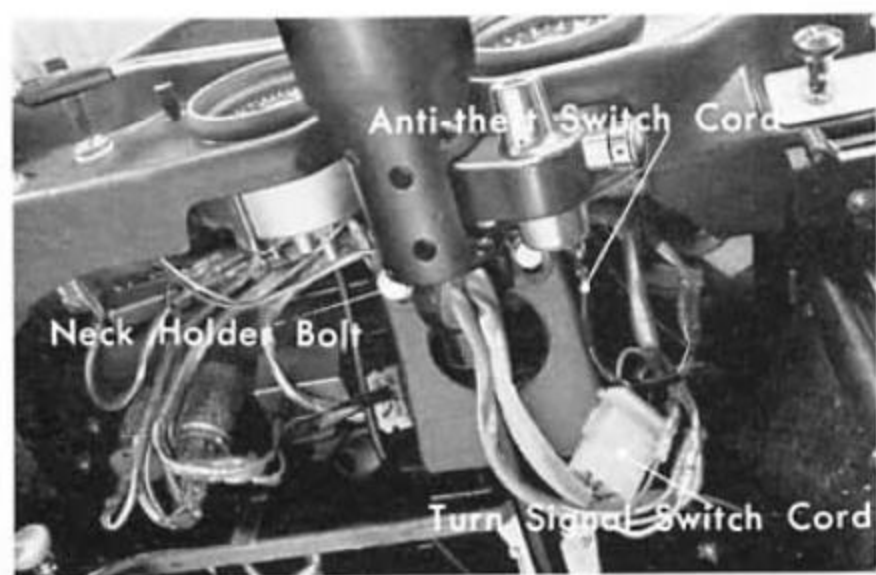


Fig. 10A-2

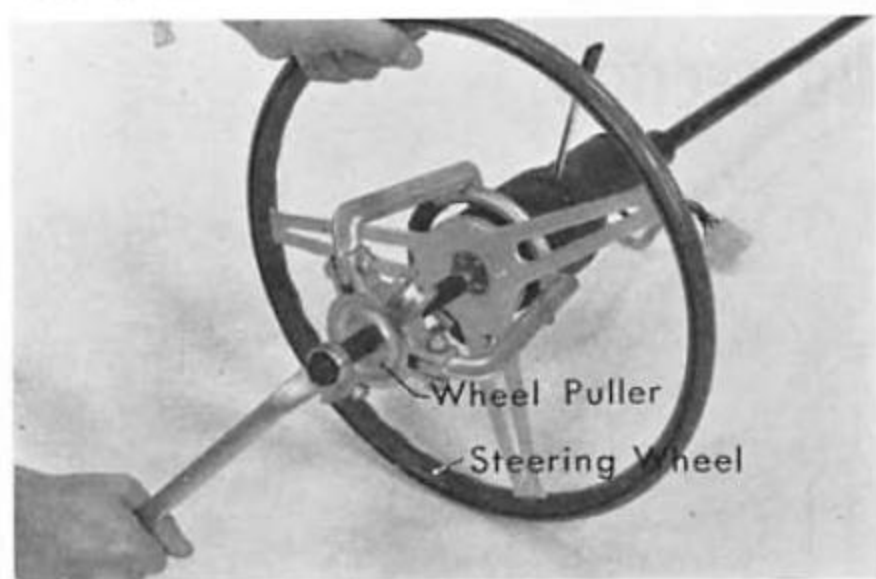


Fig. 10A-3

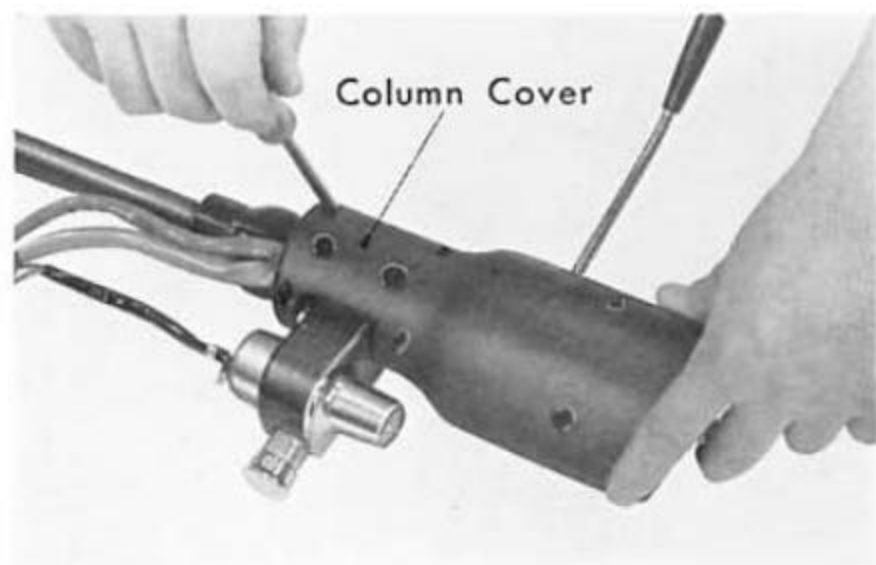


Fig. 10A-4

A. STEERING COLUMN

a. Removal

1. Disengage the steering column at the steering column joint by removing the column joint bolt (Fig. 10A-1).

Note:

When assembling, torque the bolt to 2.8 kg-m (20.3 ft-lbs).

2. Disconnect the turn signal switch cord from the wire harness (Fig. 10A-2).
3. Disconnect the anti-theft switch cord from the wire harness.
4. Disassemble the steering column support seat plate and neck holder by removing the bolts.

Note:

When assembling, torque the bolts to 2.6 kg-m (18.8 ft-lbs).

5. Loosen the serration at the steering column joint and slide out the steering column assembly from the cockpit.
6. Remove the steering wheel emblem, unscrew the steering wheel lock nut and separate the steering wheel from the steering column (Fig. 10A-3).

Note:

When assembling, torque the nut to 5.5 kg-m (39.8 ft-lbs).

7. After removing the steering wheel, disassemble the cancel claw spring, cancel claw, steering wheel key and the column pipe from the steering column.
8. Separate the column covers from the steering column by removing setting screws (Fig. 10A-4).

9. Remove the cancel claw spring, cancel claw and woodruff key from the steering column. And then pull out the steering column (Fig. 10A-5).

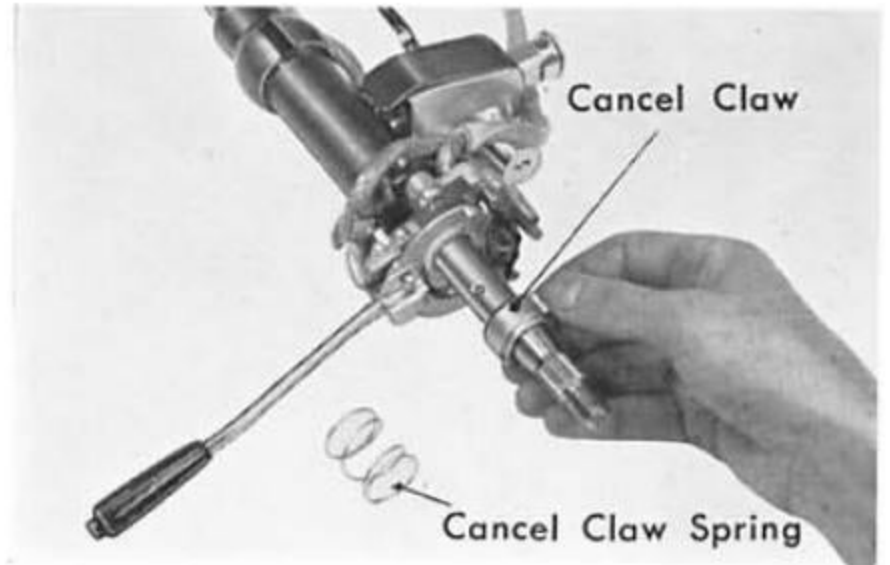


Fig. 10A-5

10. Remove the turn signal switch by loosening the attaching screw (Fig. 10A-6).

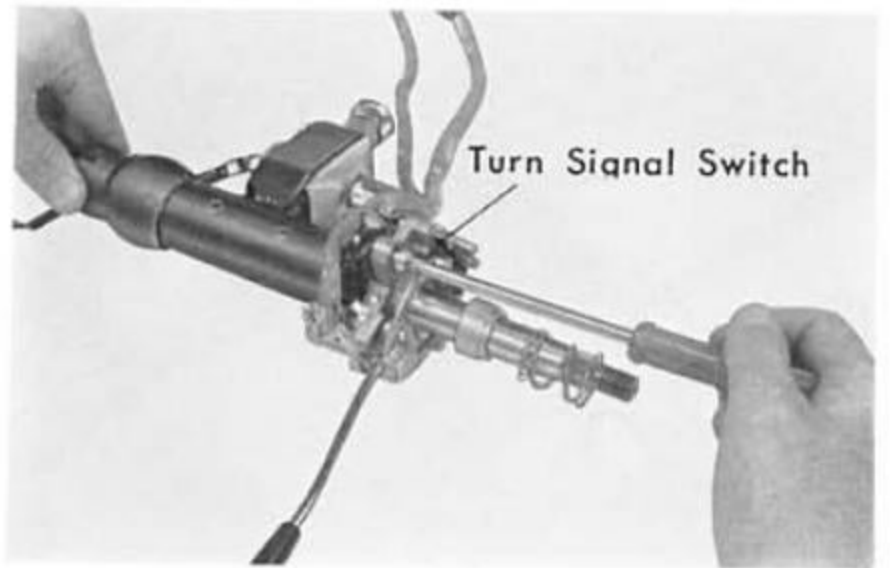


Fig. 10A-6

11. Remove the anti-theft switch by removing the attaching bolts (Fig. 10A-7).

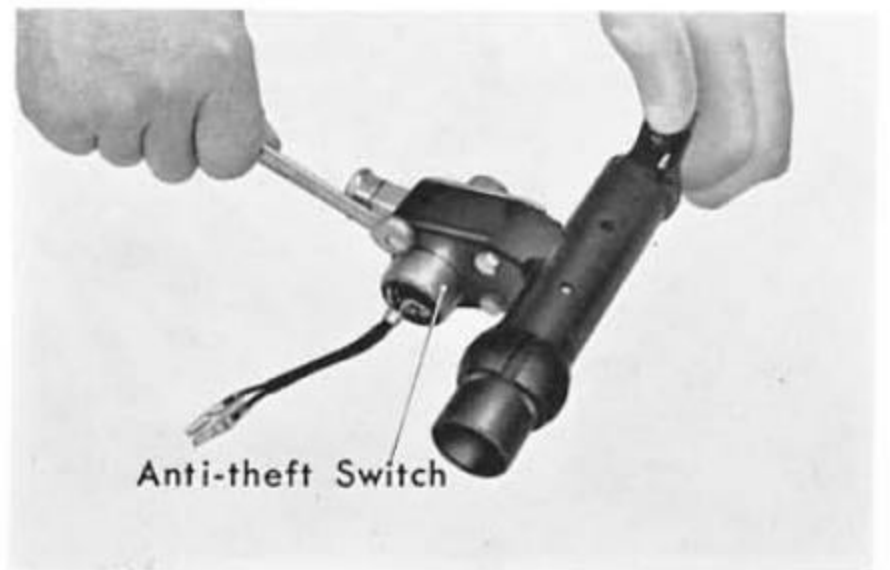


Fig. 10A-7

12. Remove the circlip and separate the column lock stopper (Fig. 10A-8).

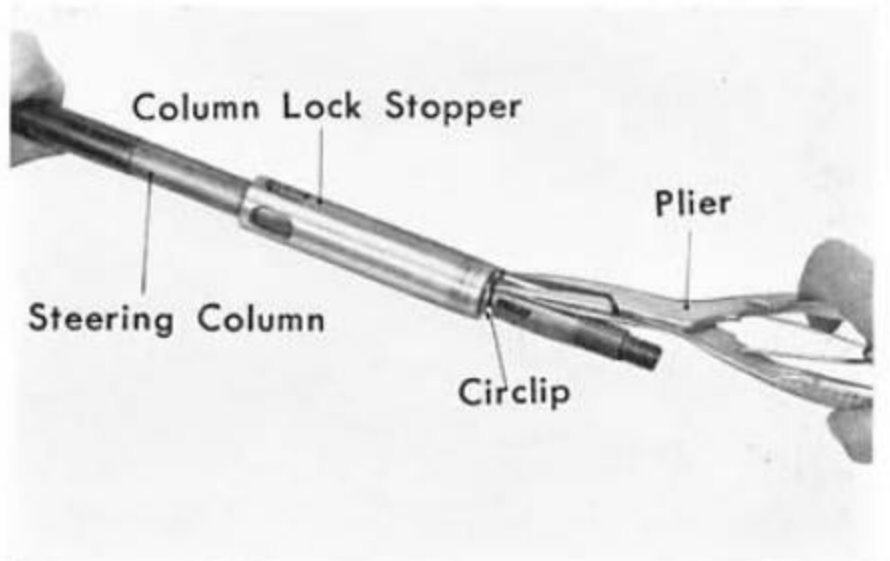


Fig. 10A-8

10-6 STEERING SYSTEM



Fig. 10A-9

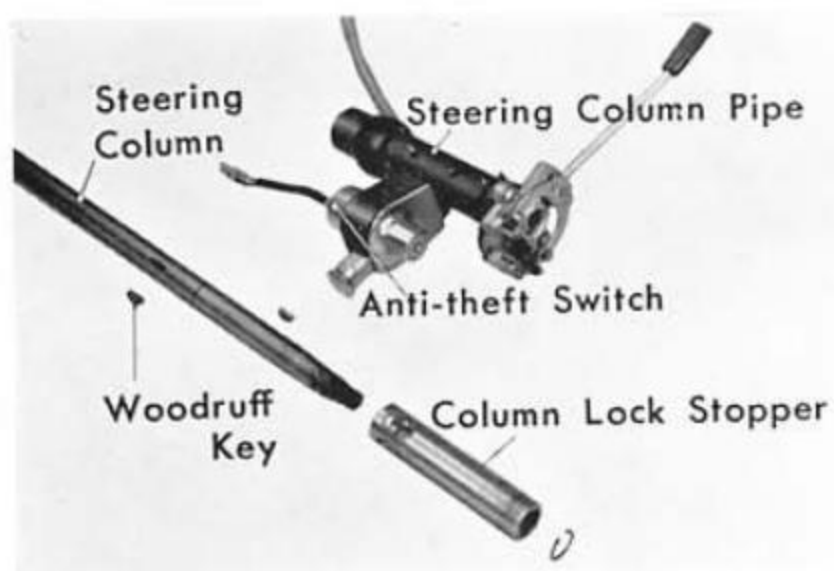


Fig. 10A-10

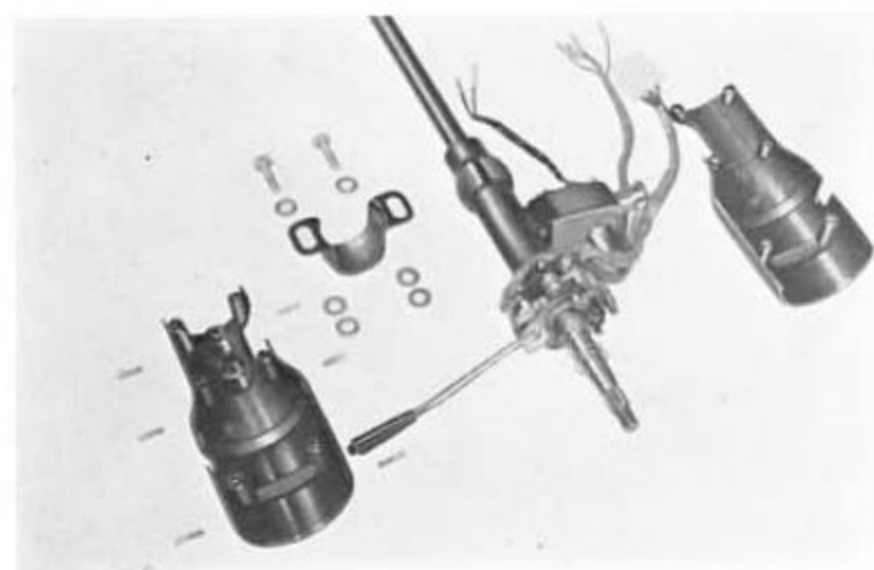


Fig. 10A-11

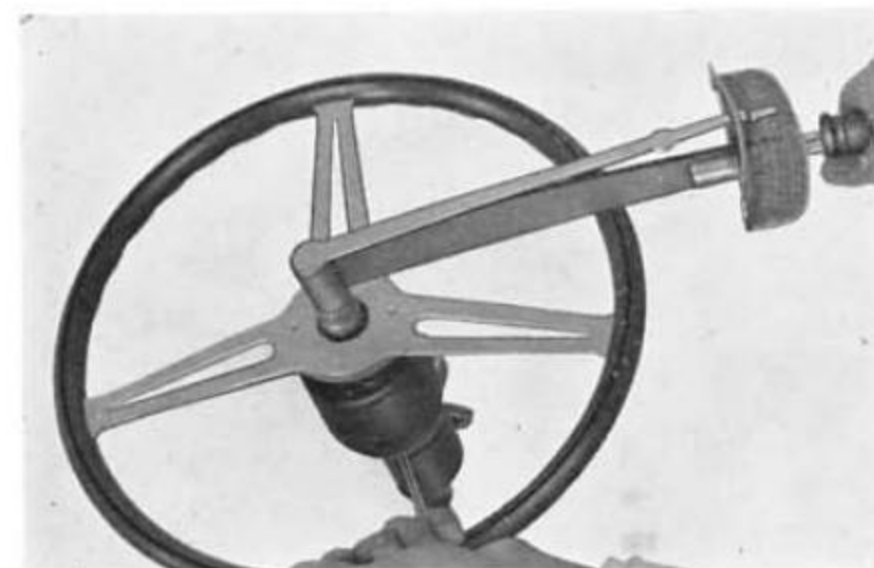


Fig. 10A-12

b. Assembly and Inspection

1. After installing the anti-theft switch, assemble the turn signal switch by tightening the attaching bolts (Fig. 10A-9).
2. After inserting the steering column into the steering column pipe, align the column lock stopper groove to the woodruff key and assemble (Fig. 10A-10).
3. Apply a small amount of grease to the internal surface of the turn signal switch plastic bushing and the column lock stopper, and also to the contact surface of the column stopper and column pipe.
4. After assembling the column pipe, engage the steering lock to prevent the steering wheel key from dropping out.
5. After assembling the cancel claw and cancel claw spring, set the turn signal switch cord and align the protrusion of the column cover into the column pipe and assemble (Fig. 10A-11).
6. Assemble the steering wheel by tightening the setting nut.
Torque to 5.5 kg-m (39.8 ft-lbs) during assembly.
7. Set the front wheel pointing forward and with the steering wheel in a normal position (emblem in the upright position), insert the steering column into the column joint.
8. After completing the installation, check the operations of the turn signal switch and the steering lock.

B. STEERING GEARBOX

a. Removal

1. Disengage the steering column at the steering column joint by removing the column joint bolt. (Fig. 10B-1)

Note :

When assembling, torque the bolt to 2.8 kg-m (20.3 ft-lbs).

2. Disconnect the steering joint.
3. Remove the tierod lock nuts of both sides.

Note :

When assembling torque the lock nuts to 5.0 kg-m (32.2 ft-lbs).

4. Remove the steering gear box setting bolts and nuts.

Note :

When assembling, torque the nut to 4.5 kg-m (32.5 ft-lbs).

- a) Move the steering gear box in the direction of arrow head after removing the setting bolts of the gear box. (Fig. 10B-3)
- b) Turn the gear box in the direction of arrow head. (Fig. 10B-4) And remove the gear box. (Fig. 10B-5)

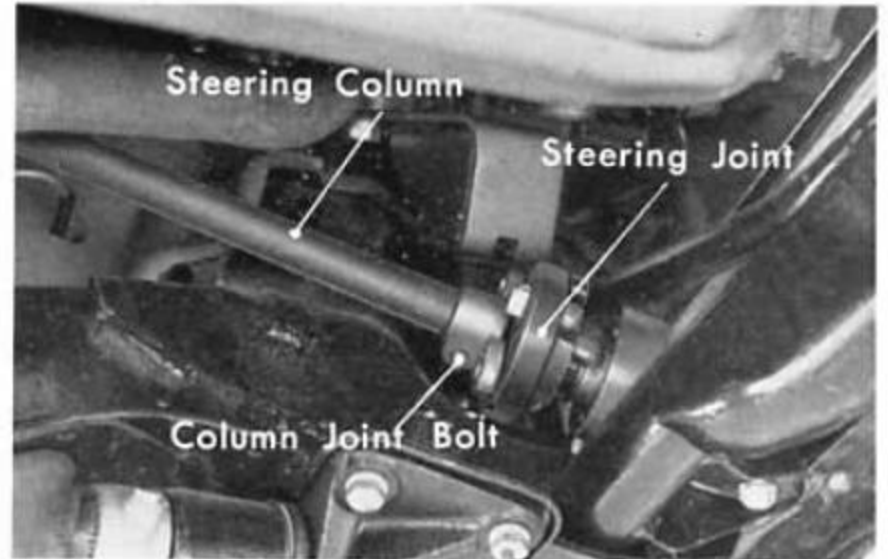


Fig. 10B-1

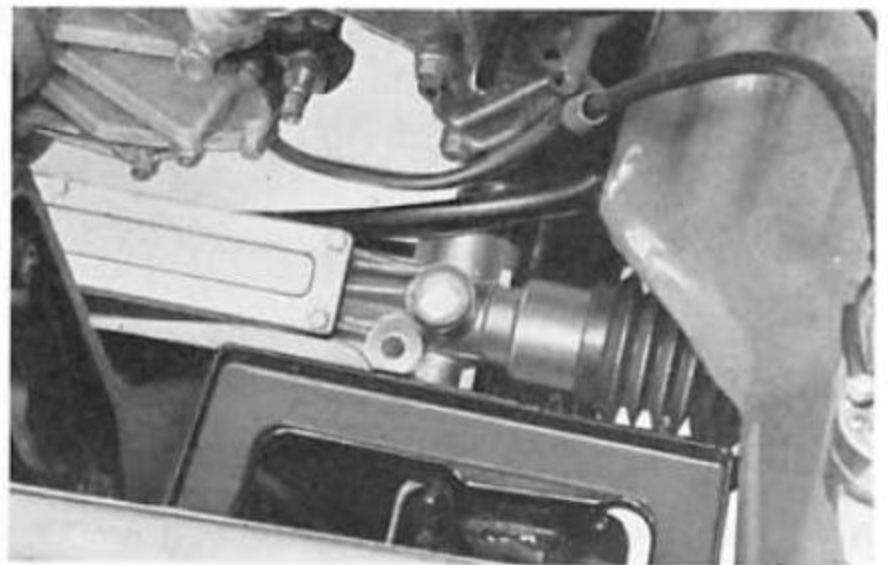


Fig. 10B-2

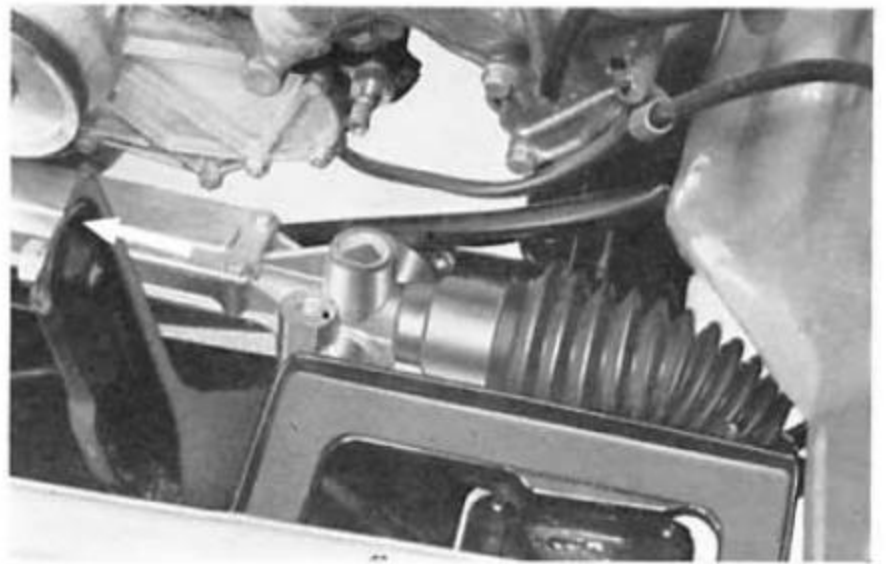


Fig. 10B-3



Fig. 10B-4

10-8 STEERING SYSTEM

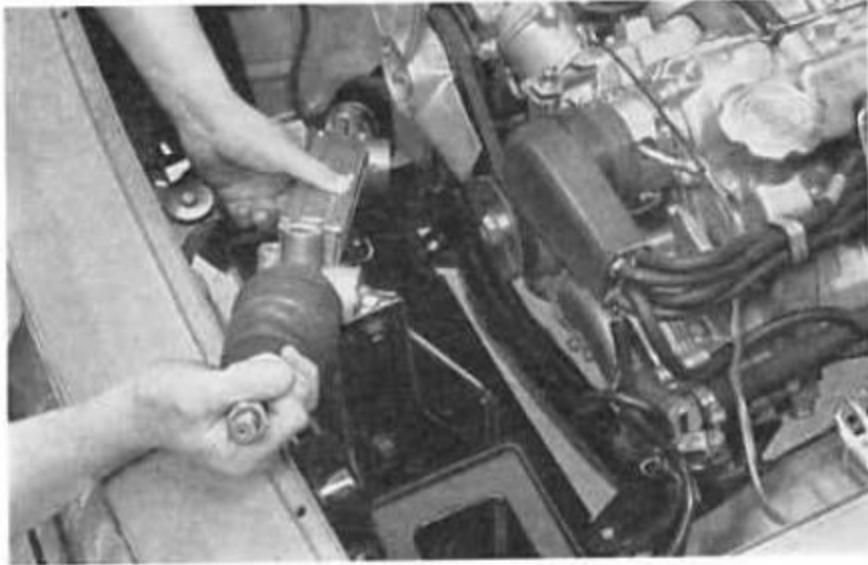


Fig. 10B-5

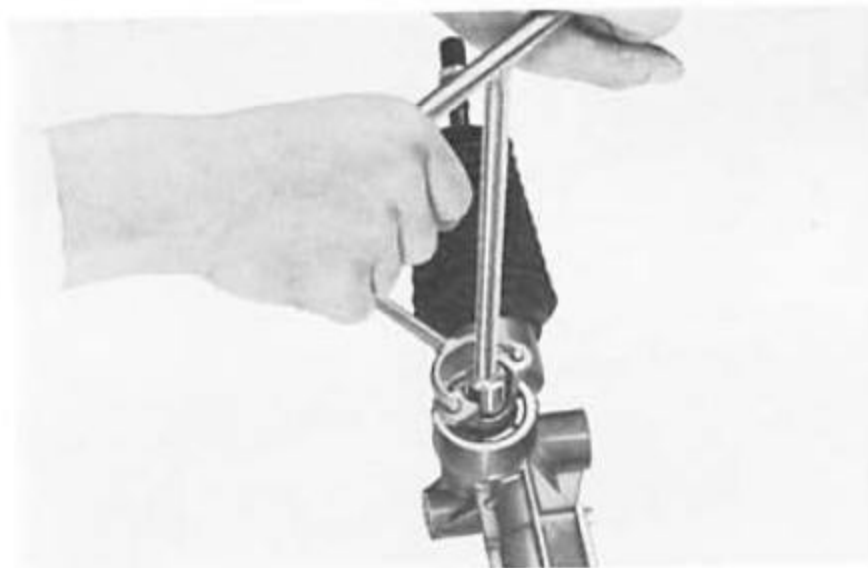


Fig. 10B-6

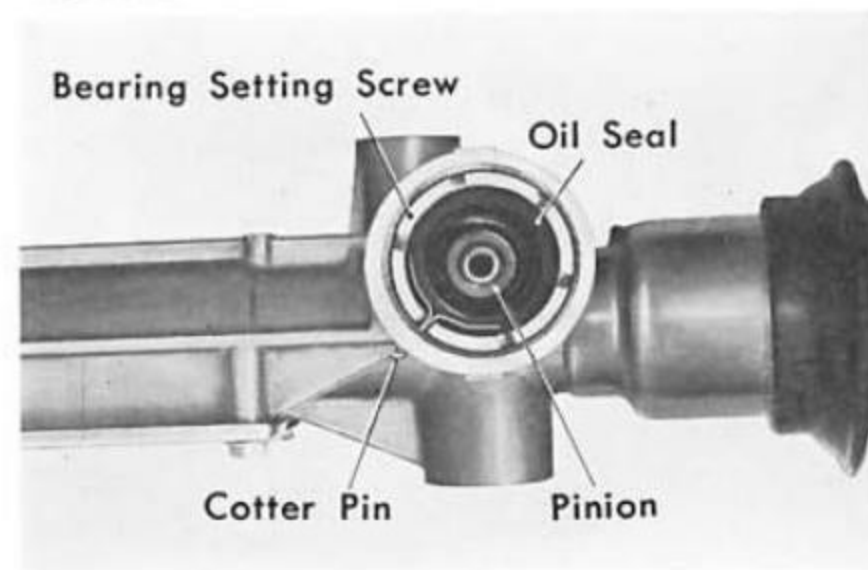


Fig. 10B-7

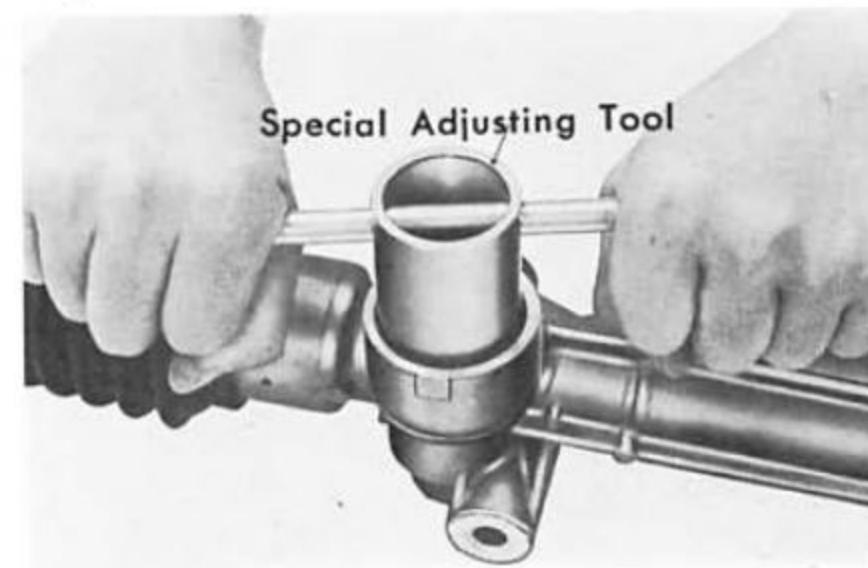


Fig. 10B-8

5. Remove the self-locking nut and disassemble the joint flange from the steering pinion (Fig. 10B-6). Torque to 4.6kg-m (33.3ft-lbs) during assembly.

6. Remove cotter pin and disassemble the bearing setting screw and oil seal from the steering gear case with the pinion shaft adjuster wrench (Fig. 10B-7, 8).

- Remove the steering pinion from the gear case with the pinion shaft puller (Fig. 10B-9).

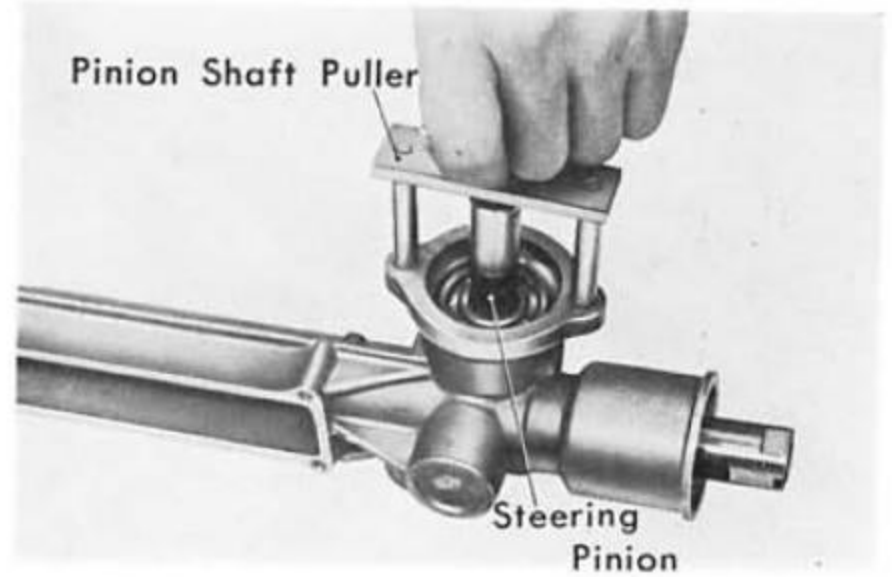


Fig. 10B-9

- Remove the ball bearing from the gear case with the ball bearing puller (Fig. 10B-10).

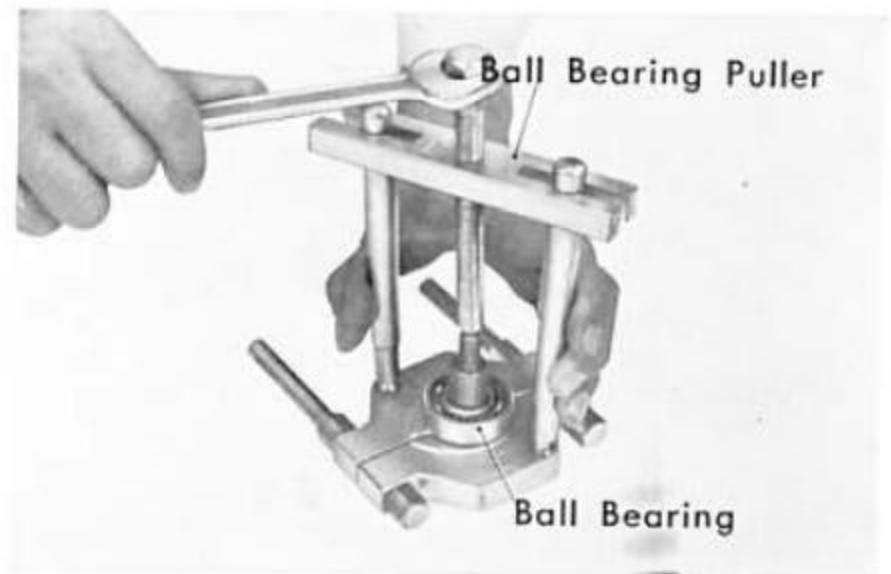


Fig. 10B-10

- Remove the steering rack dust seal, and pull out the steering rack. Disassemble the tie-rod ball housing, lock washer and end washer from the steering rack (Fig. 10B-11). Torque to 9.0 kg-m (65.1 ft-lbs) during assembly.

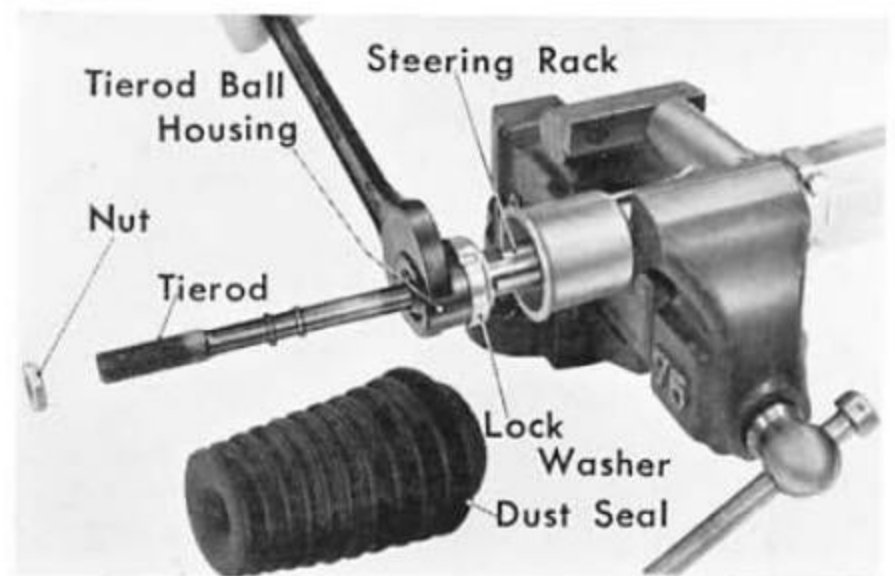


Fig. 10B-11

- Remove the tie-rod joint bolt from the ball housing and disassemble the thrust spring, thrust seat, tie-rod and ball housing.

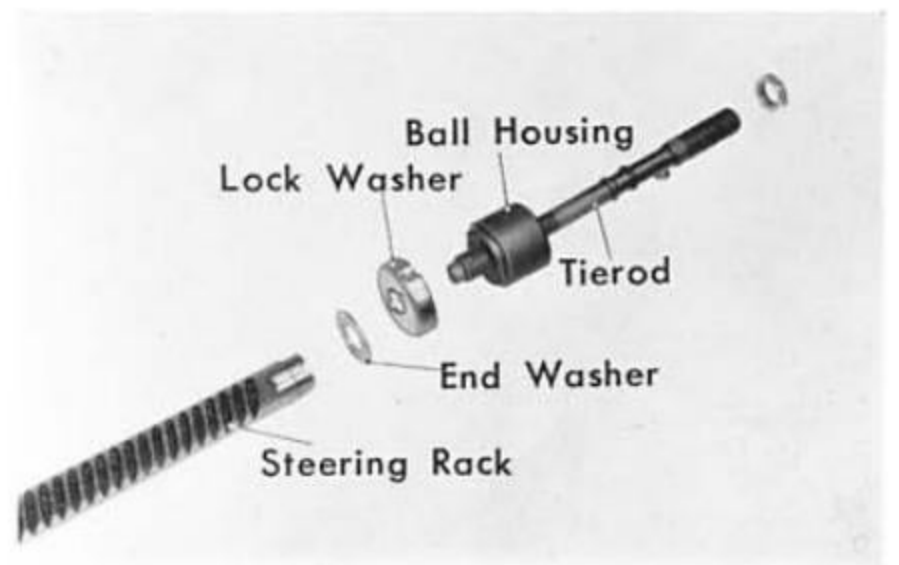


Fig. 10B-12

10-10 STEERING SYSTEM



Fig. 10B-13

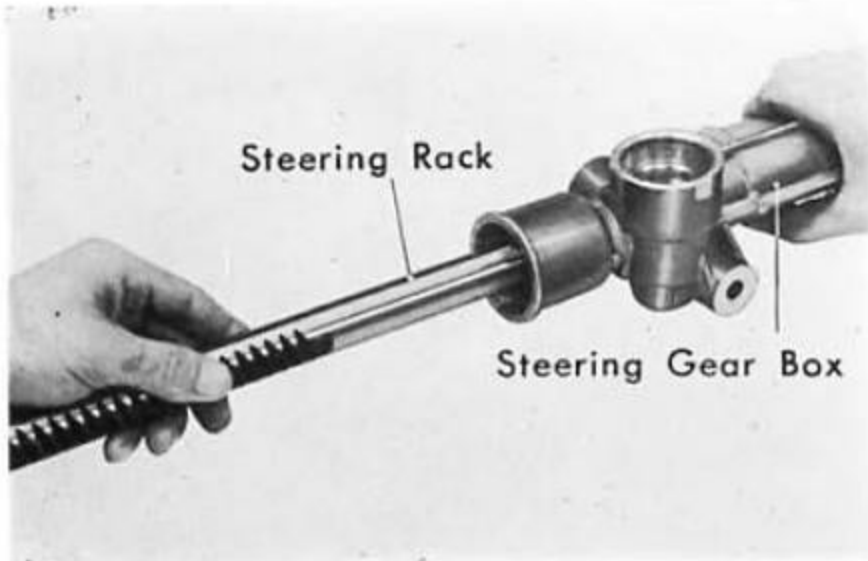


Fig. 10B-14

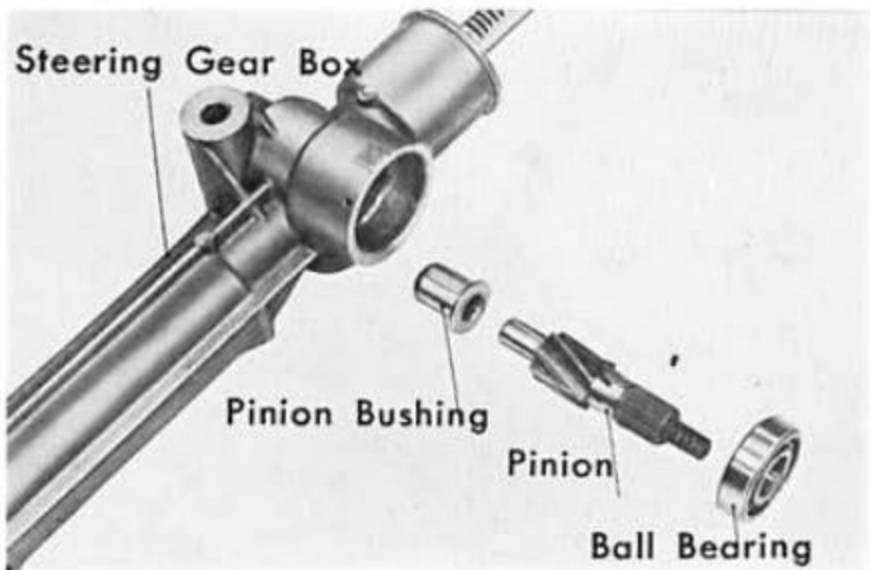


Fig. 10B-15



Fig. 10B-16

11. Remove the internal circlip, and disassemble the washer, rack guide spring and rack guide from the steering gear case (Fig. 10B-13).

b. Assembly and Inspection

1. Wash all the parts in solvents and inspect for wear, corrosion, damages and cracks.
2. Pack the steering gear case approximately 80% full of grease.
3. Install the steering rack on the steering gearbox. (Fig. 10B-14).
4. Drive in the pinion and ball bearing completely (Fig. 10B-15, 16).

- After the installation of the oil seal, install and tighten the set screw with the adjuster wrench and then lock with a cotter pin (Fig. 10B-17). Open the ends of the cotter pin in both directions.

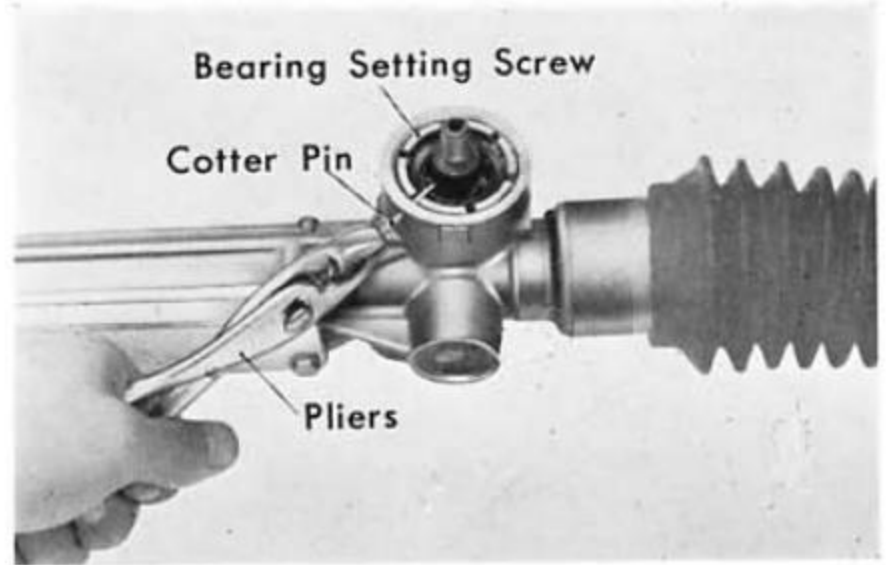


Fig. 10B-17

- After assembling the rack and the rack guide, check the backlash between the rack and pinion by locking the rack and checking with the pinion. There should be no backlash (Fig. 10B-18).
- Measure the pre-load of the rack. Apply a torque wrench to the steering joint flange nut and make the check. The pre-load should be 0.1 kg-m (0.723 ft-lbs) max. If the pre-load is beyond the specification, check the rack guide, guide spring and the gear fit between the rack and pinion.

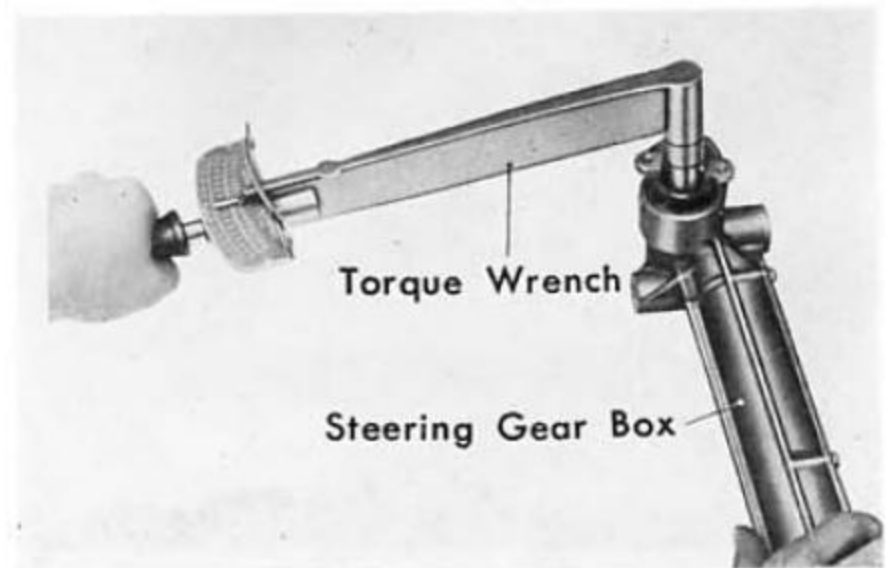


Fig. 10B-18

- Assemble the steering joint to the flange and bend over both sides of the washer (Fig. 10B-19).

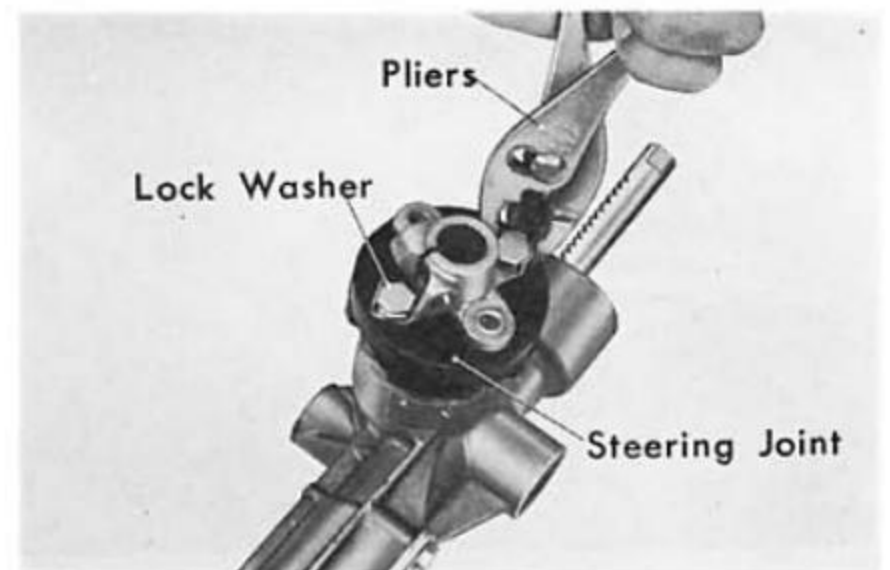


Fig. 10B-19

- Apply grease to the tie-rod ball housing, assemble the tie-rod, thrust spring and install the joint bolts but do not tighten (Fig. 10B-20).

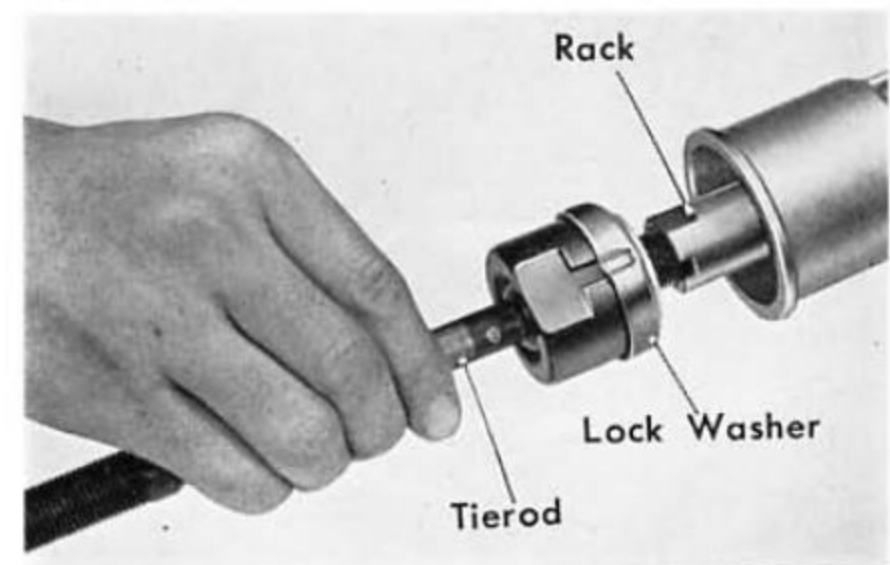


Fig. 10B-20

10-12 STEERING SYSTEM

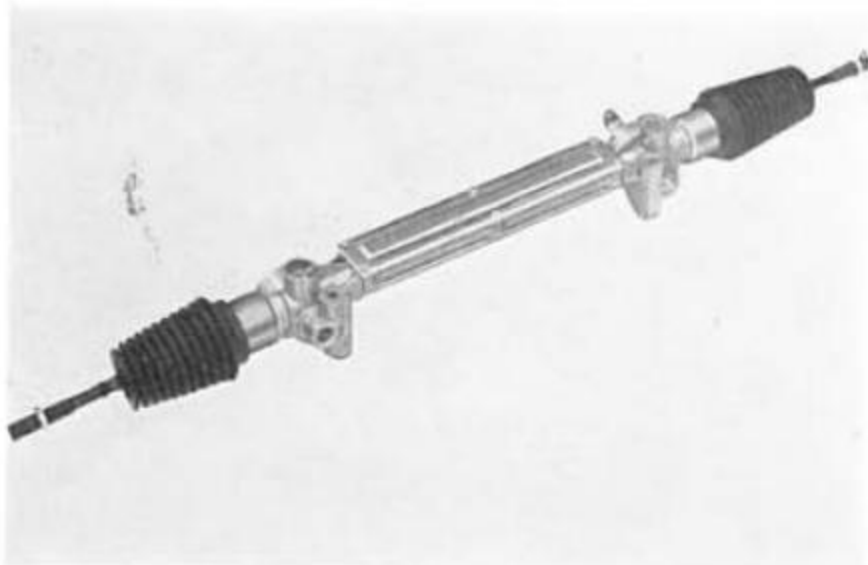


Fig. 10B-21

10. Align the torque of the tie-rod lock washer to the rack and plate and rack groove, and drive the lock washer into the groove of the ball housing.
11. Assemble the rack dust seal and hose nut to the tie-rod and check to make sure that the tie-rod operates smoothly (Fig. 10B-21).

12. Install the gear box on the chassis in the reverse order of removal (Fig. 10B-22).

Note:

Torque to 4.5 kg-m (32.5 ft-lbs) during assembly.

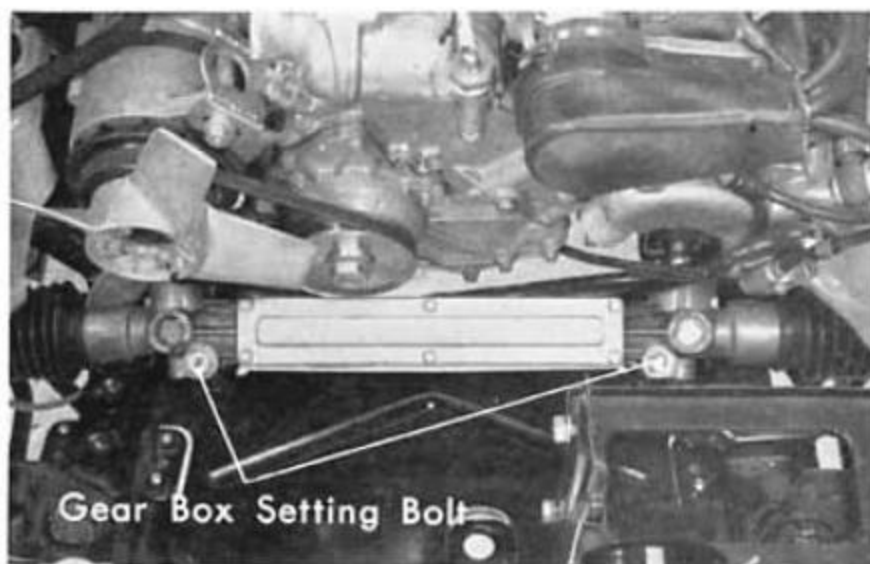


Fig. 10B-22

13. Check the steering angles, toe-in and adjust.

14. Measure the pre-load of the steering wheel by raising the front wheels off the floor and applying the spring scale on the steering wheel. The standard pre-load is 1.5 kg (3.3lbs) max. (Fig. 10B-23).



Fig. 10B-23

15. Check the looseness of the steering wheel. Grasp the steering wheel and check for any looseness in the direction of the steering column, also check in the radial direction. There should be no looseness in the direction of the steering column, 3 mm (0.12") max. in the radial direction (Fig. 10B-24).



Fig. 10B-24

11. BRAKE PIPING SYSTEM

The dual master cylinder type braking circuit is adopted. The hydraulic circuits for the front wheels and rear wheels are independent from each other. With this dual circuit system, safer braking effect is achieved.

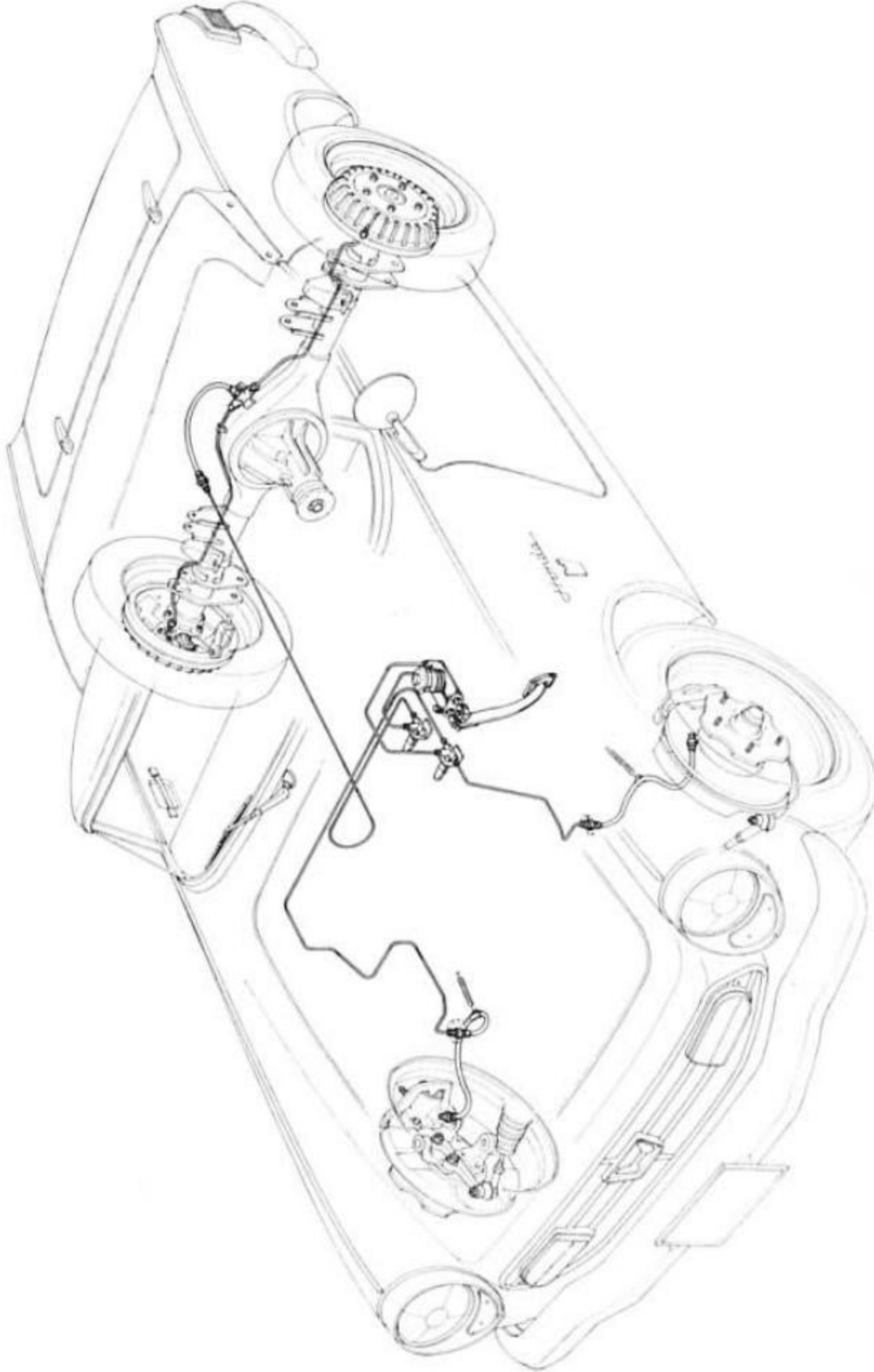


Fig. 11-1.

11-2 BRAKE PIPING SYSTEM

A. BRAKE MASTER CYLINDER

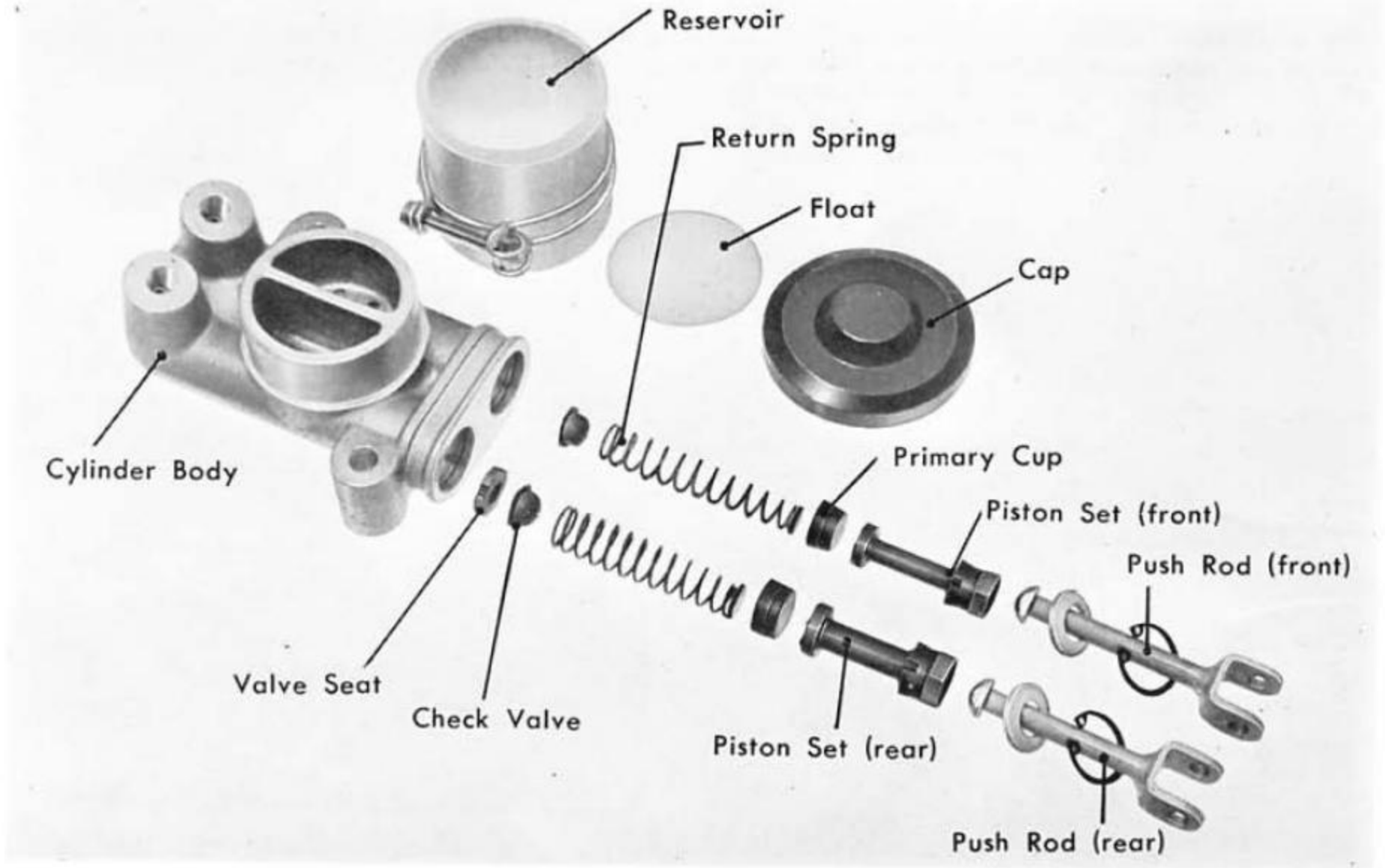


Fig. 11A-1

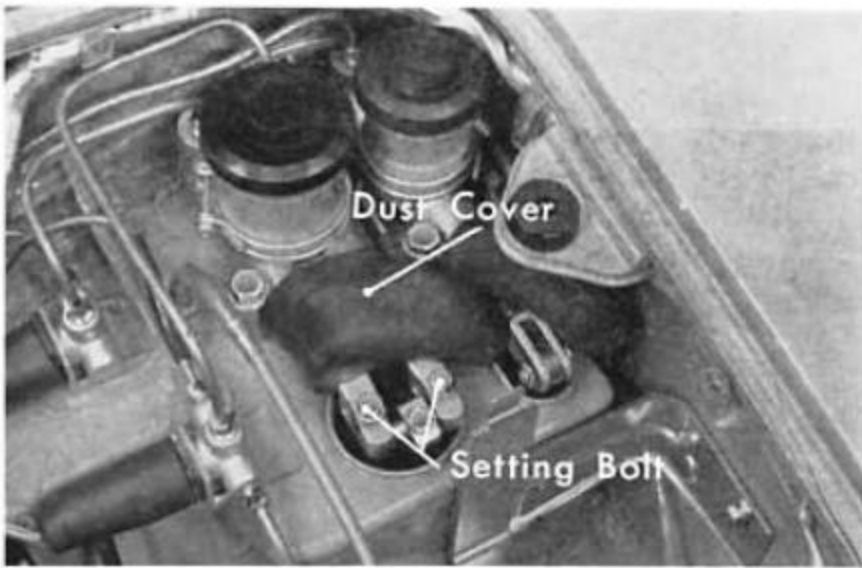


Fig. 11A-2.

a. Removal

1. Drain brake fluid

Attach vinyl pipes to the front and rear brake cylinders, open the bleeder screws one at a time and drain the hydraulic system by pumping the brake pedal. Tighten the bleeder screws after the bleeding operation.

Hydraulic fluid will have a damaging effect on painted surface, therefore, thoroughly wipe off any spilled fluid.

- Slide the pedal link dust cover to one side, remove the setting bolts and separate the brake master cylinder piston rods from the pedal (Fig. 11A-2).

3. Disconnect brake pipes from the master cylinder (Fig. 11A-3).
4. Remove the master cylinder setting bolts, spring washers, plain washers and disassemble the master cylinder from the engine compartment.
5. Remove the master cylinder circlip and then disassemble the return stop plate, master cylinder piston, primary cap, return spring, check valve and check valve seat (Fig. 11A-1).

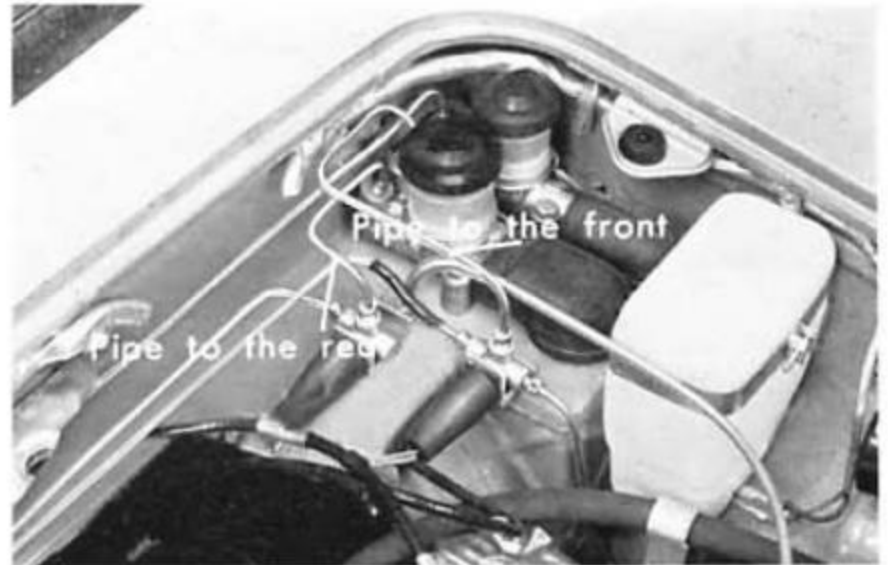


Fig. 11A-3

b. Assembly and Inspection

1. Inspect the clearance of the master cylinder and piston. Measure the cylinder inside diameter with a cylinder gauge and the outside diameter of the piston with a micrometer (Fig. 11A-4).

	Standard Value	Serviceable Limit
Clearance (front & rear)	0.016~0.086 (0.006~0.0034")	Replace if beyond 0.096 mm (0.0036")

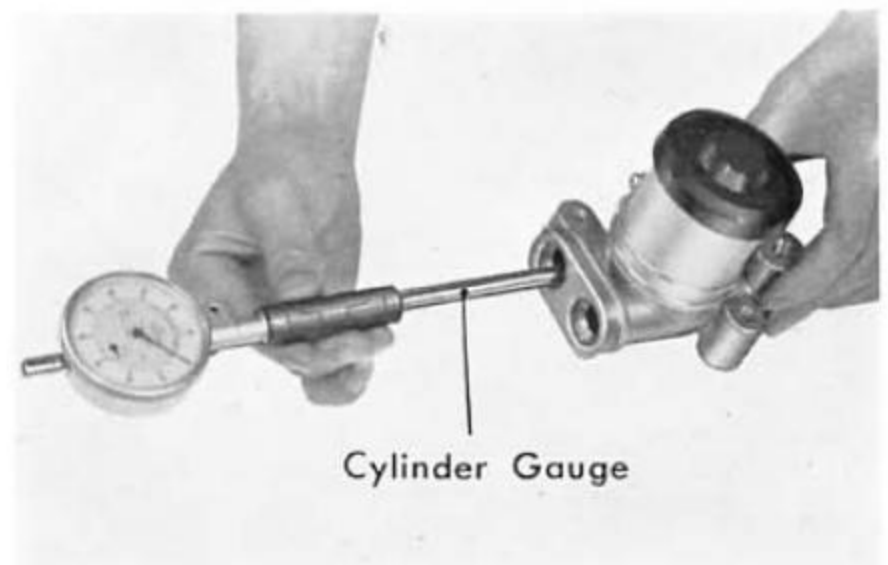


Fig. 11A-4

1. Disconnect both the accelerator and brake pedal return springs (Fig. 11A-5).

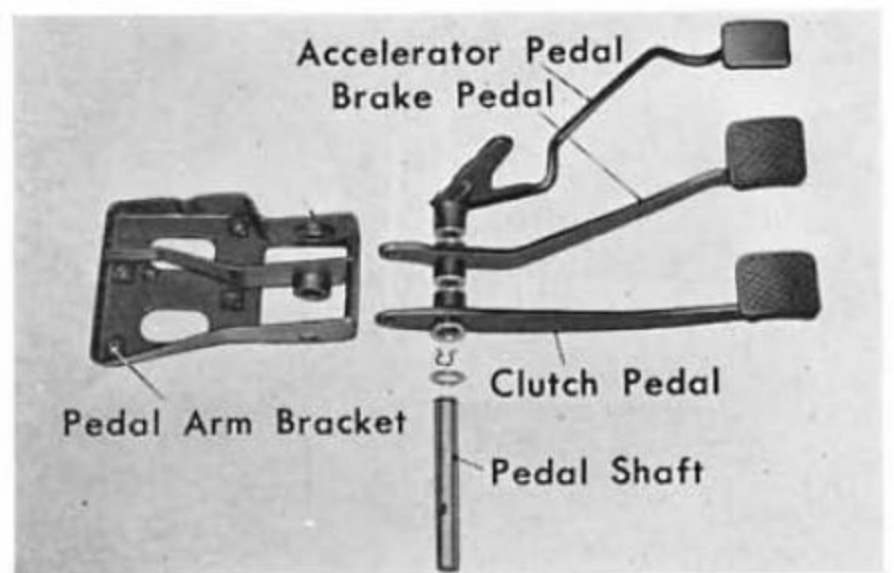


Fig. 11A-5

2. Remove the shaft clamp bolt, pull out the pedal shaft and disassemble the clutch pedal, brake pedal and the accelerator pedal from the pedal arm bracket. After disassembly, the pedal shaft clip and the end washer can be removed from the shaft (Fig. 11A-6).

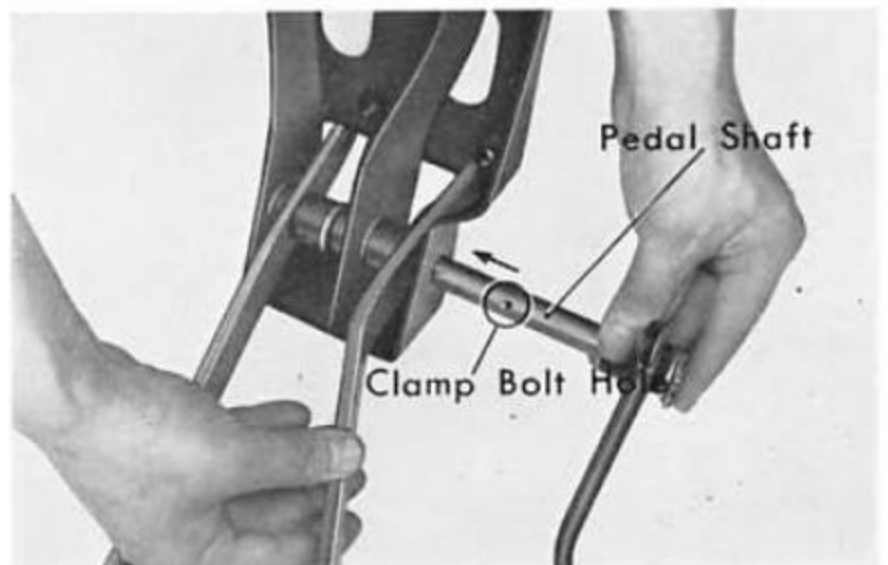


Fig. 11A-6

M E M O

12. FRONT BRAKE

A. DESCRIPTION

The disc brake is adopted. With this, the fading at the time of braking during high speed driving or continuous and repeated braking can be eliminated, and the brake will show its proper performance even after water is splashed to the car.

In the disc brake, caliper body of cast steel is guided by the yoke of pressed steel with the groove on each side of caliper body, mounted on the spindle-knuckle. Cylinder body of caliper houses two pistons, within the hollow of the yoke are the two pads (outer pad and inner pad) installed, facing each other, by being held in place with retaining pins. The disc which revolves with the wheel fits in between the two pads.

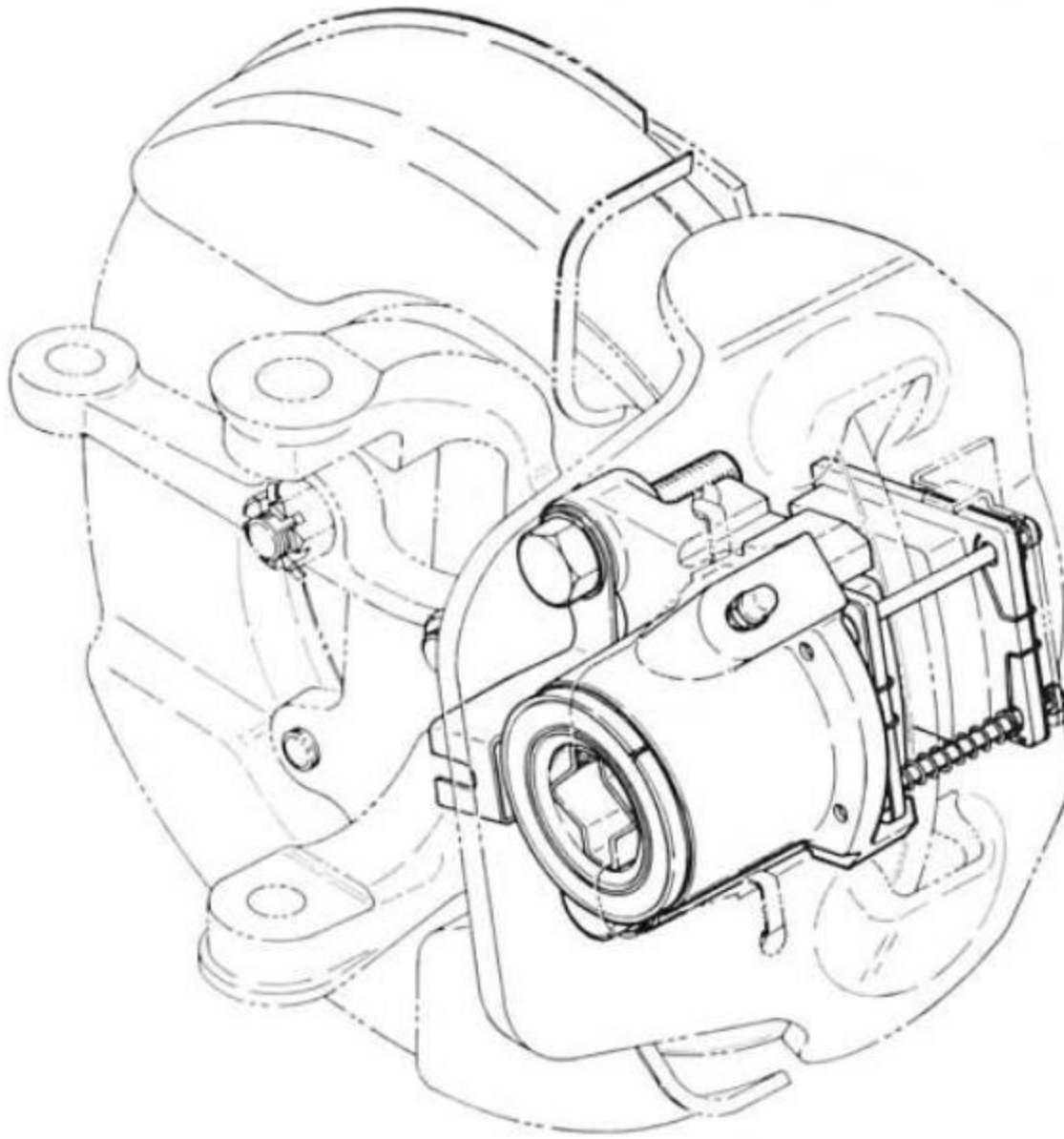


Fig. 12A-1

12-2 FRONT BRAKE

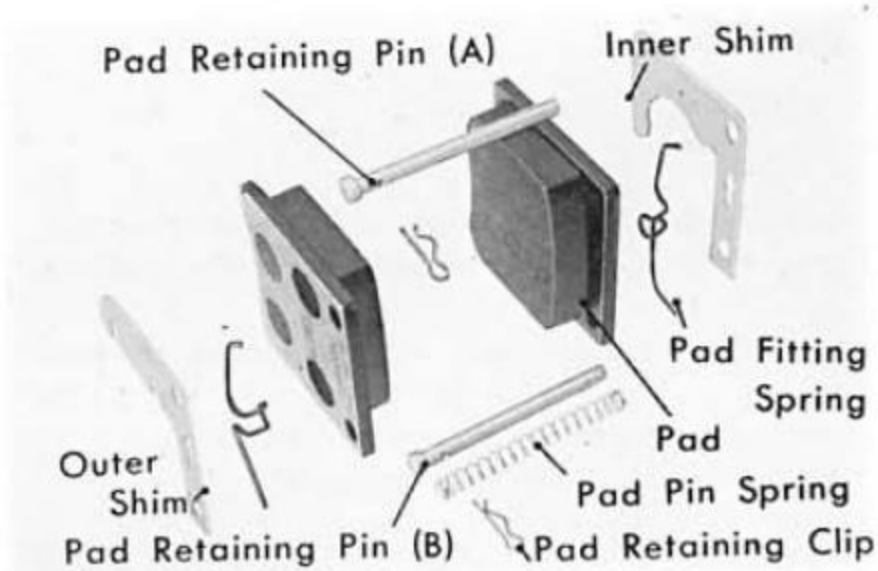


Fig. 12B-1

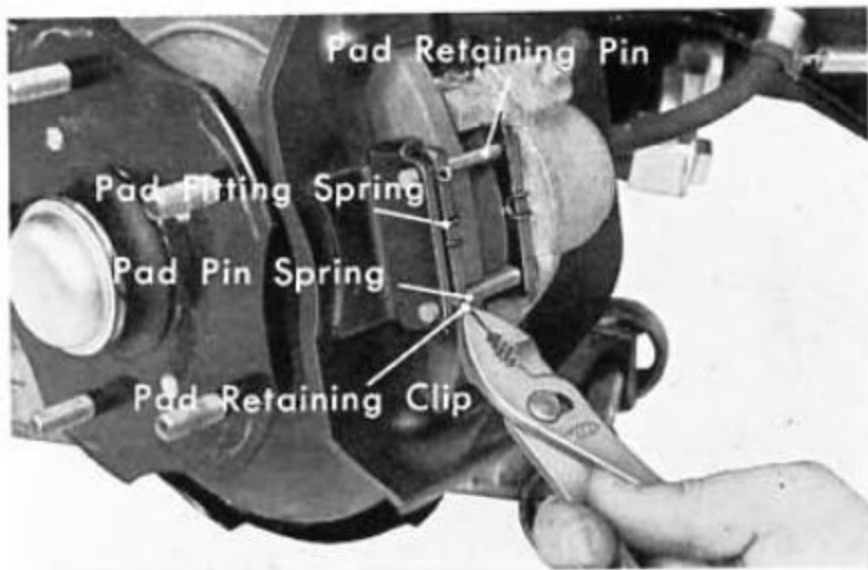


Fig. 12B-2

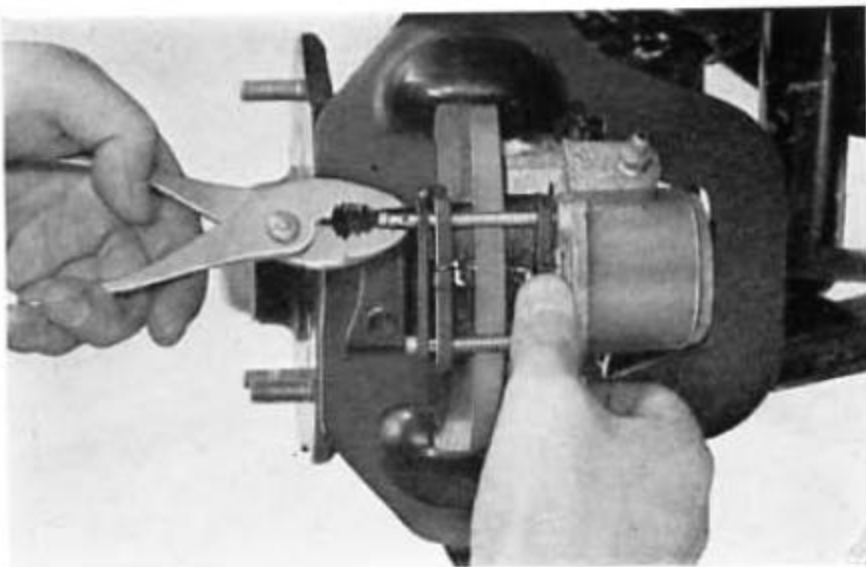


Fig. 12B-3

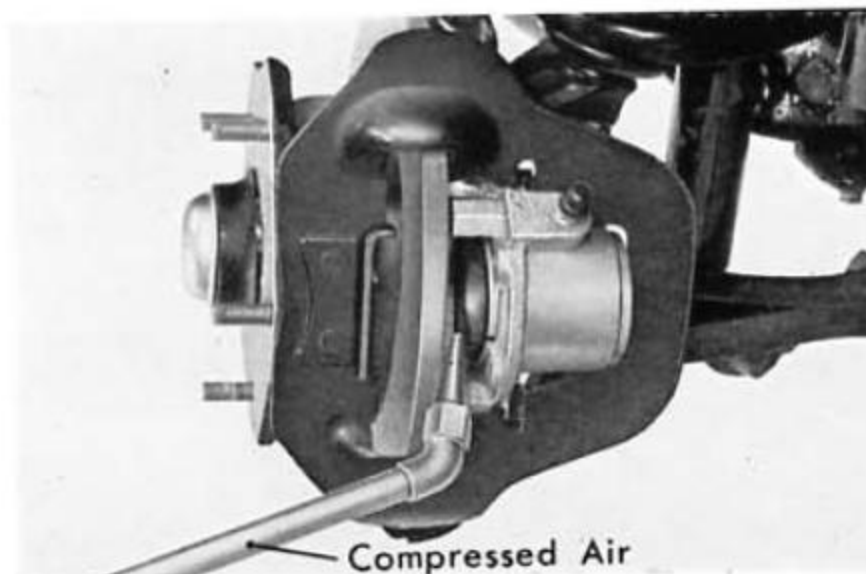


Fig. 12B-4

B. PAD REMOVAL

The pad consists of a friction material molded on a steel plate. When the pad is worn to 1.6 mm (0.063") or less, it should be replaced. Always use a genuine replacement part since lining of a different type will cause uneven braking.

1. Jack up the vehicle and remove the wheel.
2. Remove the clip from the pad retaining pin and support the pad while extracting the pin (also remove the pad fitting spring and the pad pin spring at the same time) (Fig. 12B-2).
3. In this attitude the pad can be removed toward the outside. After the pad is removed, do not touch the brake pedal (Fig. 12B-3).
4. When the pad is removed, clean the caliper, cylinder, pistons and pad supports which are located adjacent to the pad; however, mineral oil should not be used on the dust seals (Fig. 12B-4).

C. PAD INSPECTION AND INSTALLATION

1. The pad measures 10.3 mm (0.406") thick when it is new, and should be replaced with new one when it is worn to 1.6 mm (0.063") or less. (Fig. 12C-1). Time of pad replacement can be determined by checking the gap between the retaining plate and the lug of pad backing plate.

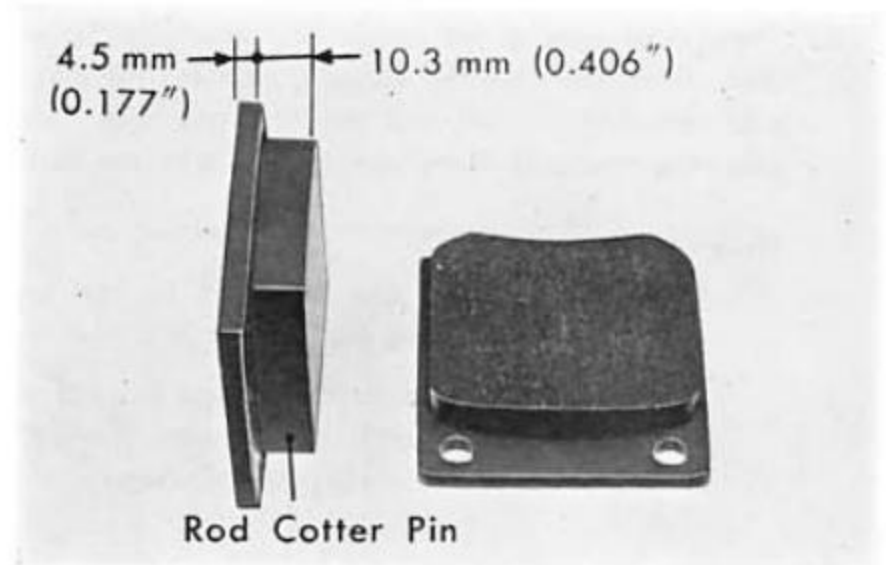


Fig. 12C-1

2. Clean the pad guide area, top of the piston, yoke friction surface free from any dirt. If possible clean the surfaces with undiluted alcohol.

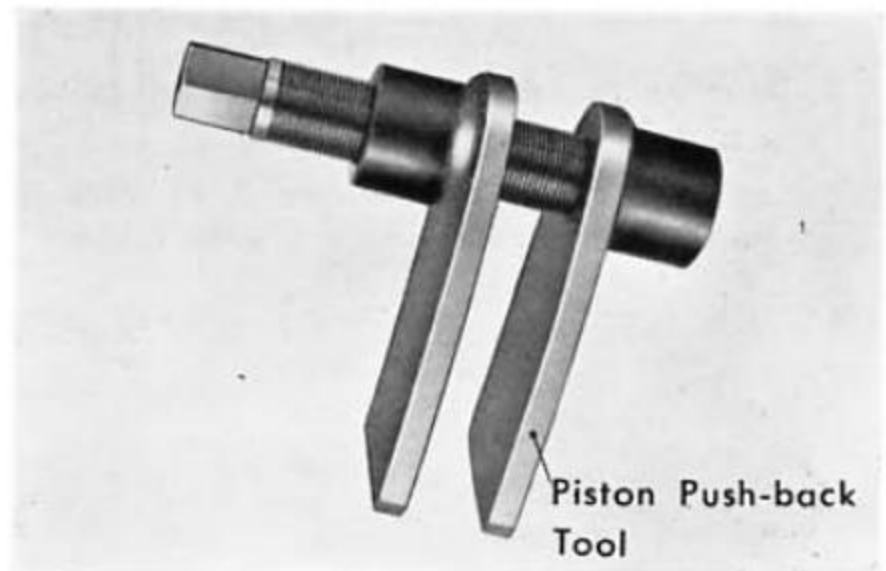


Fig. 12C-2

3. Install the piston push-back tool (Fig. 12C-3) over the disc, and push the pistons back into the cylinder by turning the hexagonal head of the tool using a wrench (Fig. 12C-3).

During this operation, the plate of the piston pushback tool should be placed against and guided by the pad supports, so that the pistons are not cocked in the cylinder.

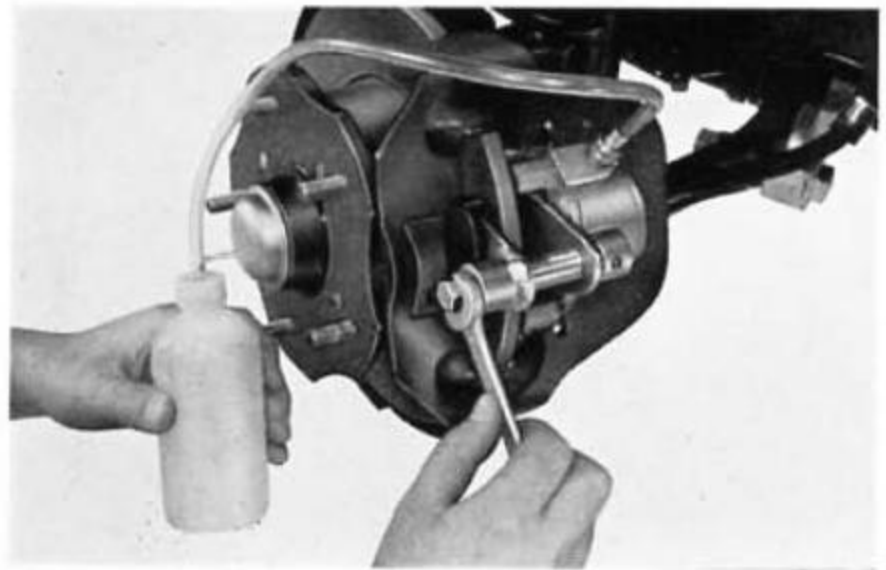


Fig. 12C-3

4. When performing the piston push-back operation, the bleed screw should be loose so that the old brake fluid in the cylinder will drain. Draining of the old brake fluid is performed in accordance with the steps described in the air bleeding operation. Tighten the bleed screw after making sure that brake fluid coming out from the bleed screw is no longer opaque in color.

12-4 FRONT BRAKE

5. Thus, after making the space for mounting the new pads into the pad guide portion on the both sides of the disc, close the bleeder valve, assemble the inner and outer shims together with the brake pad and insert the pad retaining pin (A) into the pad pin hole. Insert pad retaining pin (B) into the other pad pin hole and then assemble the pad fitting spring and pad pin spring. Install the clip on both pad retaining pins.

Note :

Pad fitting springs are mounted to the vehicles for eliminating the squeal of front disc brake but outer and inner shims, pad pin springs are not accomplished on standard production vehicles.

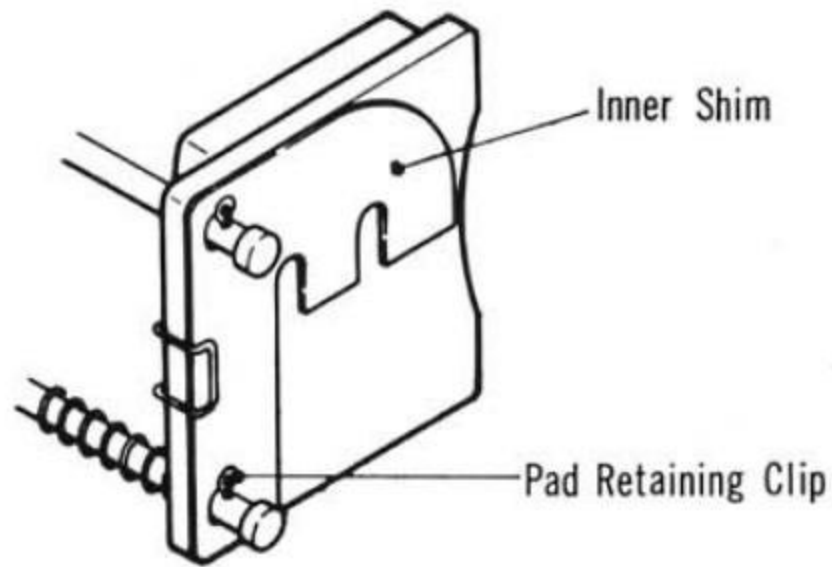
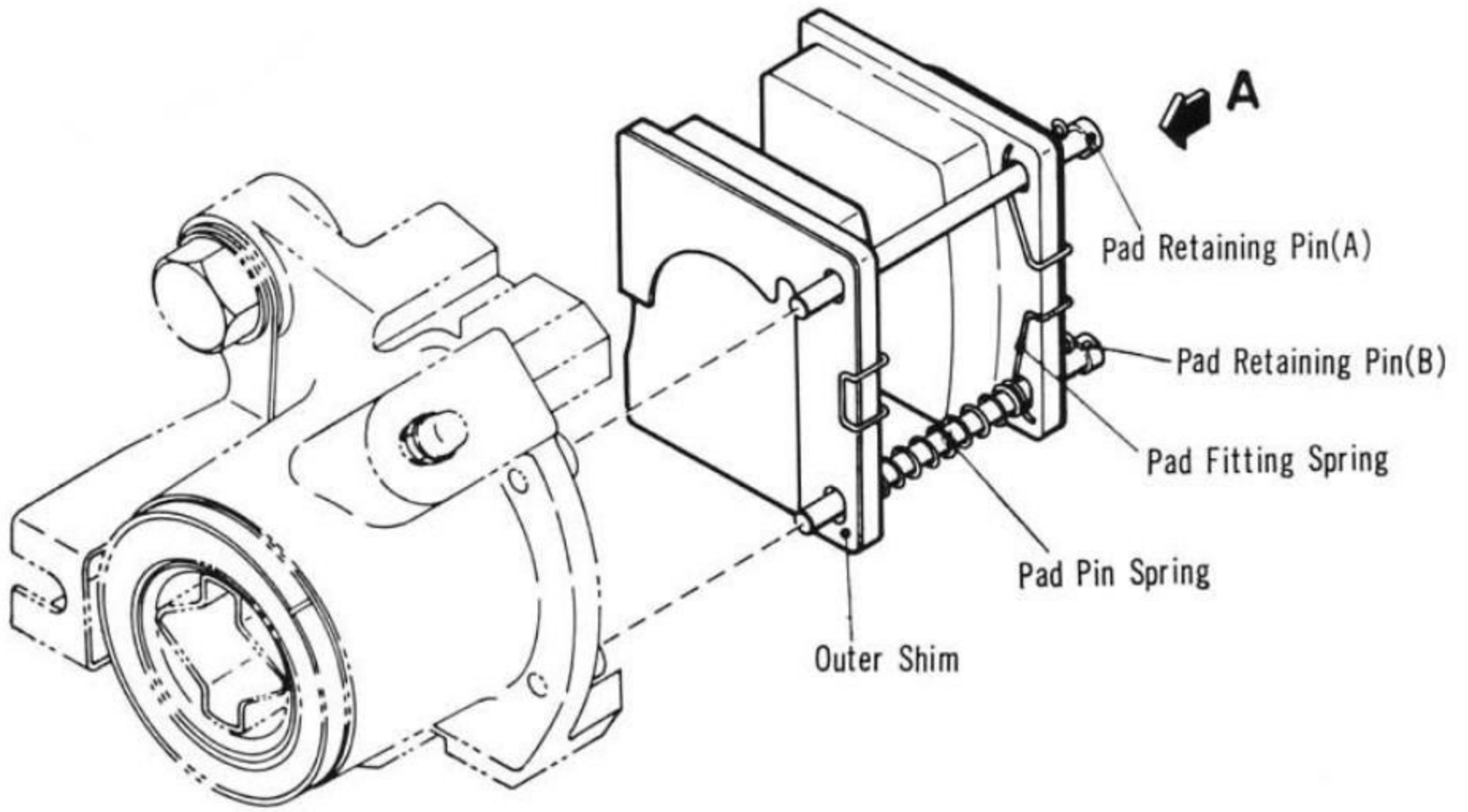
Further, if the pad fitting springs do not eliminate the noise, install both the pad fitting springs and pad pin spring (coil spring) on the support side of the disc rotation. In other words, install them on the bottom side of the two pad retaining pins installed on the caliper. (Fig. 12C-4)

6. Depress the brake pedal and check to make sure that the relative position between the lining and the disc is proper and also check the pedal travel.

If the pedal travel is excessive, perform the air bleeding of the brake.

7. After installing the wheel, spin the wheel by hand to make sure that it is turning freely without dragging.

If the wheel bearing is worn or if the disc is slightly misaligned, the disc will wobble axially at every revolution and may rub the pad, therefore, if the wheel is turning heavy, remove the wheel and check the wobble of the disc to make sure that it is within 0.15 mm (0.006 in.); also check the condition of the bearing.



VIEW A

Fig. 12C-4

D. CALIPER

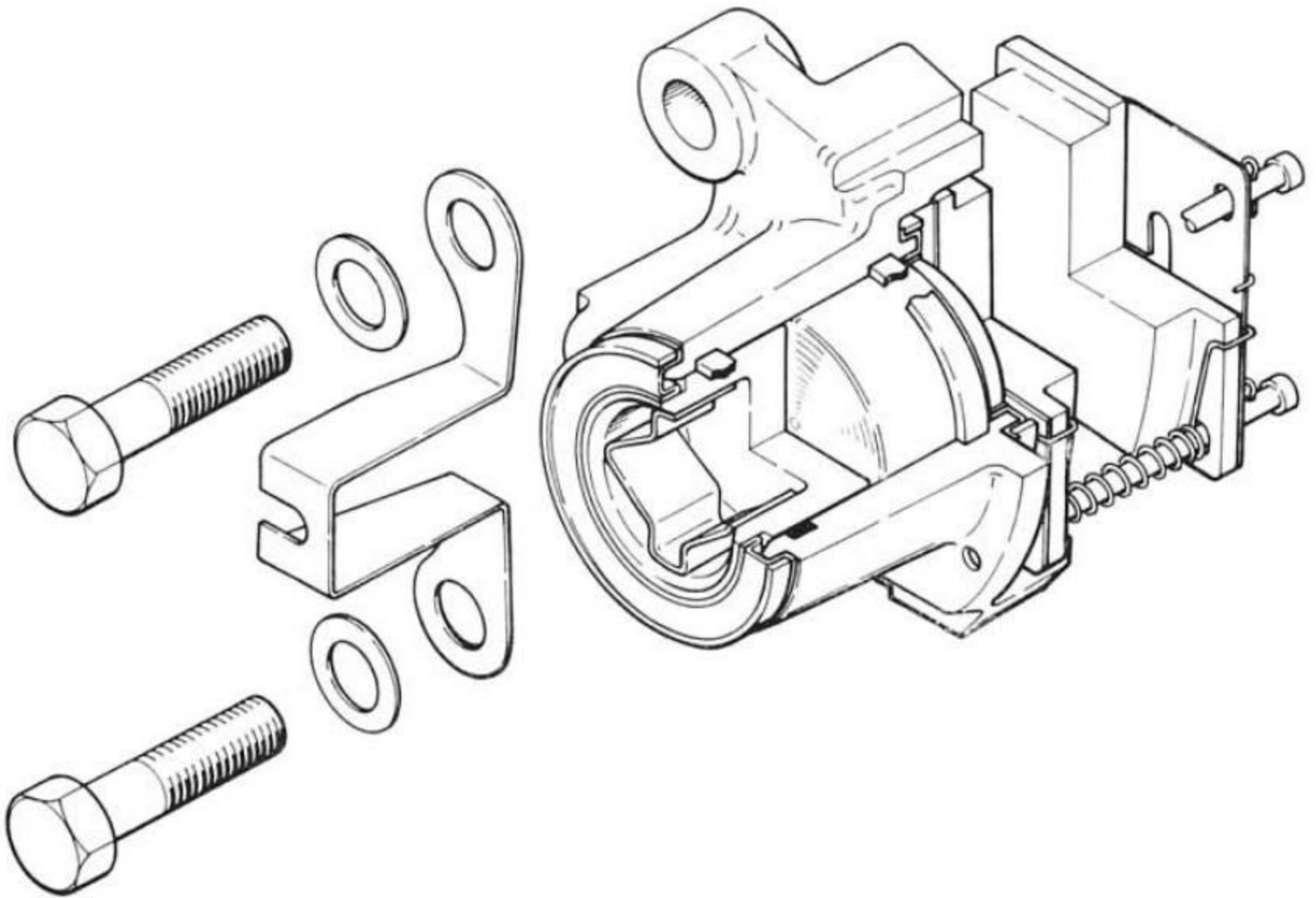


Fig. 12D-1

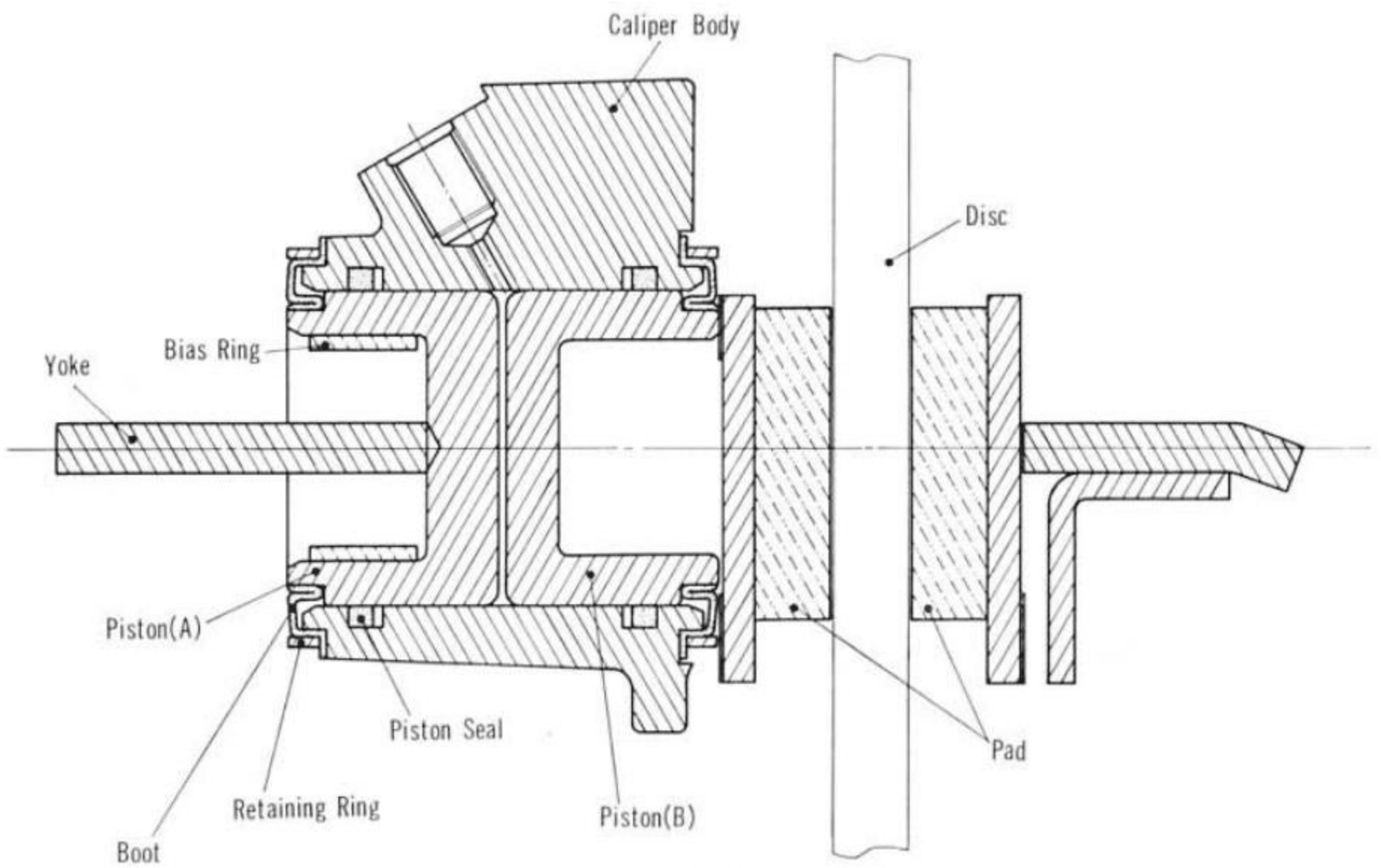


Fig. 12D-2

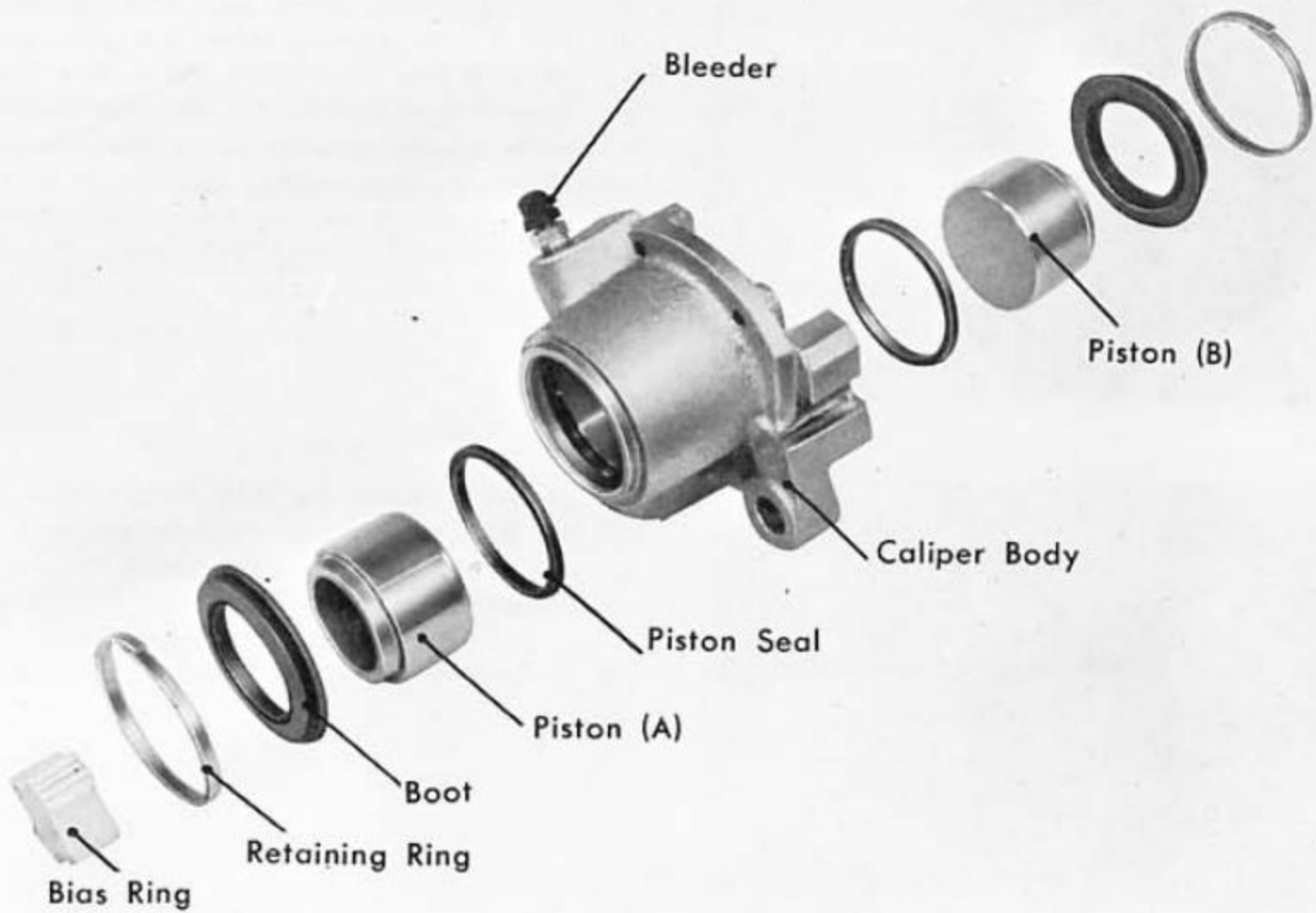


Fig 12D-3

a. Caliper Disassembly

1. Remove the pad by following the pad removing procedure.
2. Loosen the oil bolt between flexible hose and the caliper body (Fig. 12D-4).

Note :

When assembling, torque to 2.8 kg-m (20.3 ft-lbs).

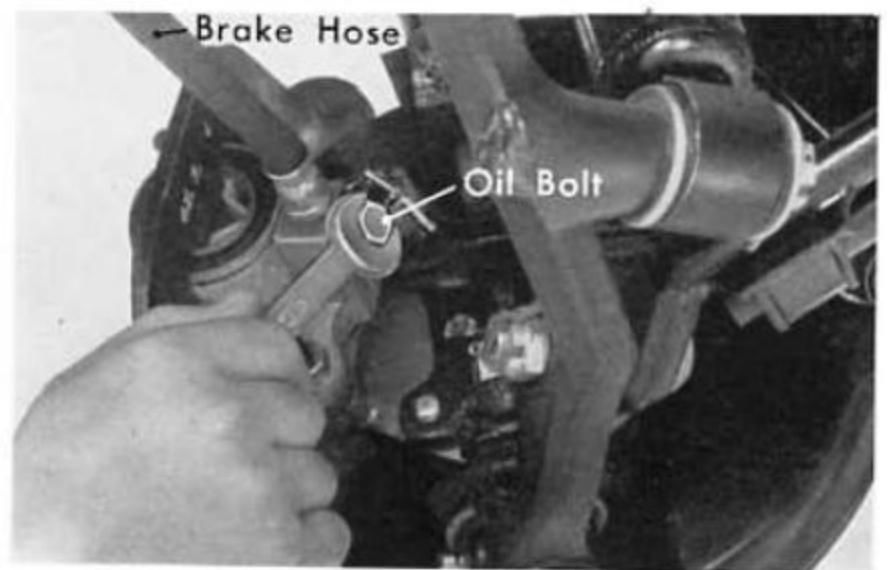


Fig. 12D-4

3. Remove the mounting bolts and separate the caliper assembly from the mounting bracket (Fig. 12D-5).
4. Hold the caliper assembly and remove the flexible hose.

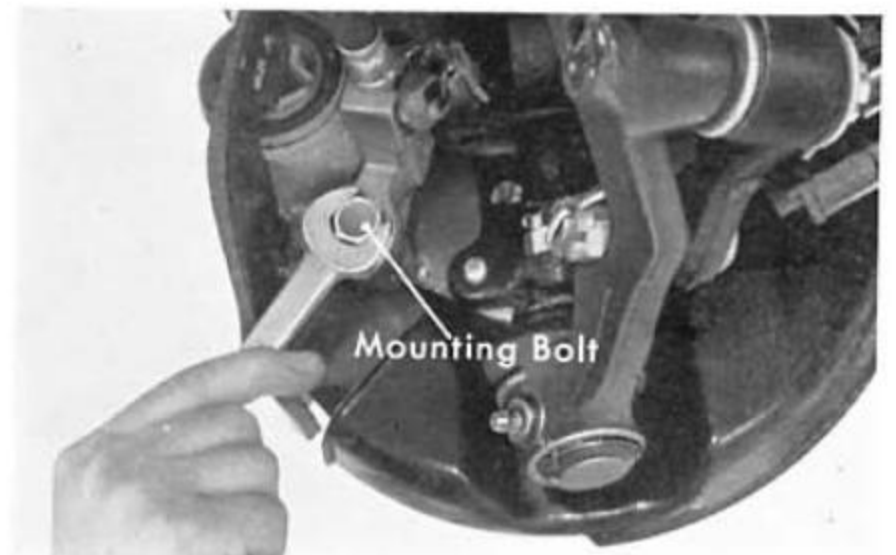


Fig. 12D-5

12-8 FRONT BRAKE

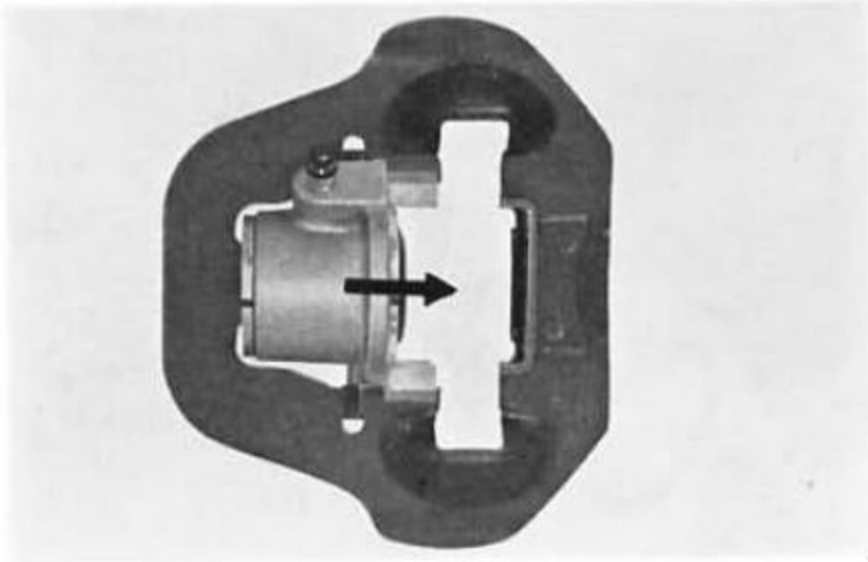


Fig. 12D-6

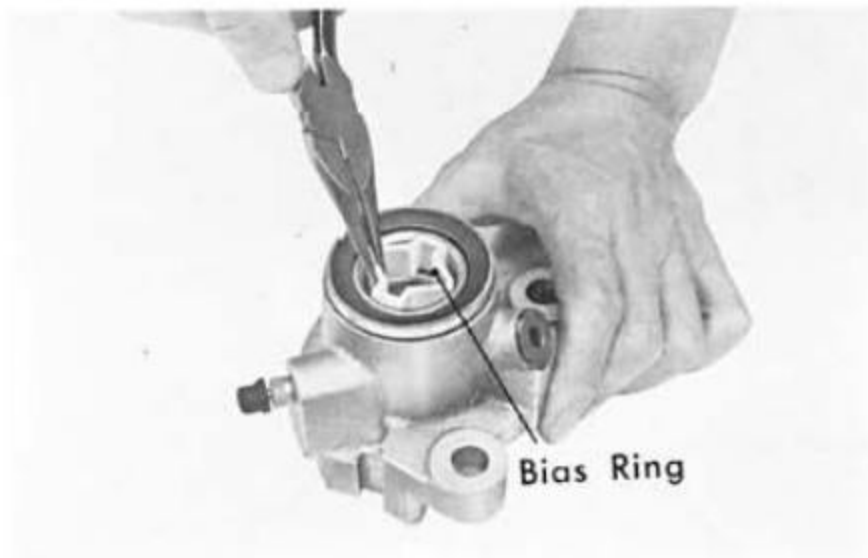


Fig. 12D-7

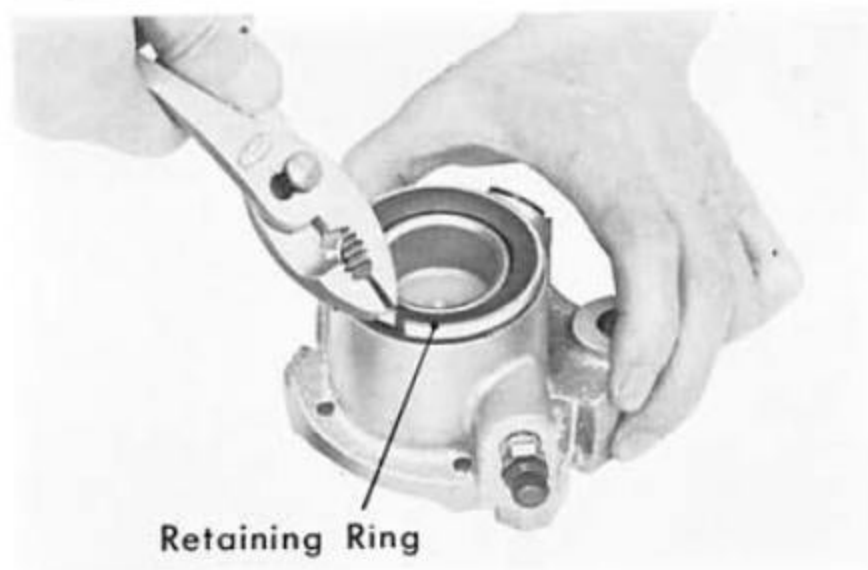


Fig. 12D-8



Fig. 12D-9

5. Clean the exterior of the caliper assembly.
6. Unscrew the bleeder valve, after pushing the piston (B) back into the cylinder, move the caliper body toward the outside (in the direction of arrow head) while supporting piston (A) so that it does not come out of the cylinder (Fig. 12D-6).
7. In this condition the yoke friction guide surface of the body will protrude from the cutout in the yoke, therefore, turn the yoke slightly to facilitate the removal.
8. Remove the bias ring and the yoke spring (Fig. 12D-7).
9. Handle the pistons with care to prevent scratching.
10. Push out the pistons from the caliper body carefully.

11. Remove the seal using a flat metal blade with a rounded tip. Exercise care not to scratch the cylinder wall or the seal grooves.
12. Use undiluted alcohol or brake fluid to clean the body, yoke, and piston. Particularly clean around the inside of the seal groove, yoke friction surface guide. Apply a small amount of rubber lubricating grease around the seal groove and the cylinder wall. Also apply a light coating of rubber grease to facilitate installation.

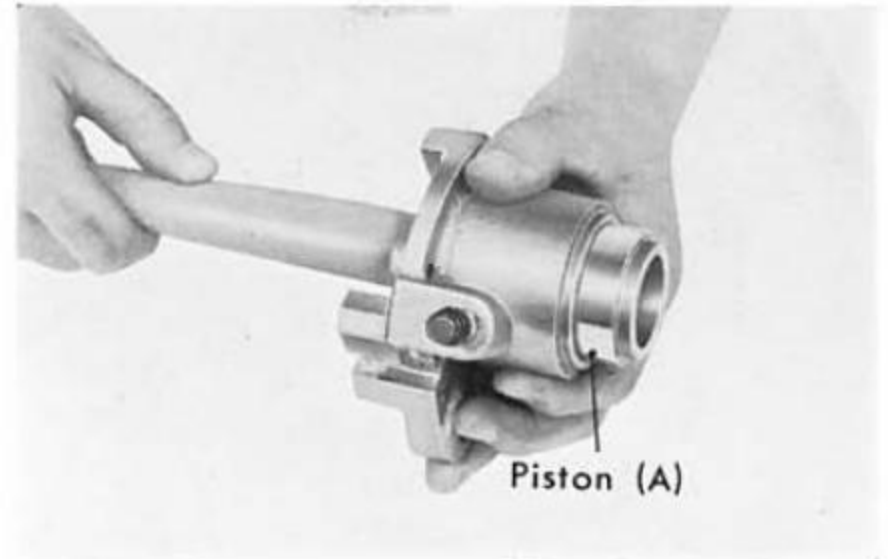


Fig. 12D-10

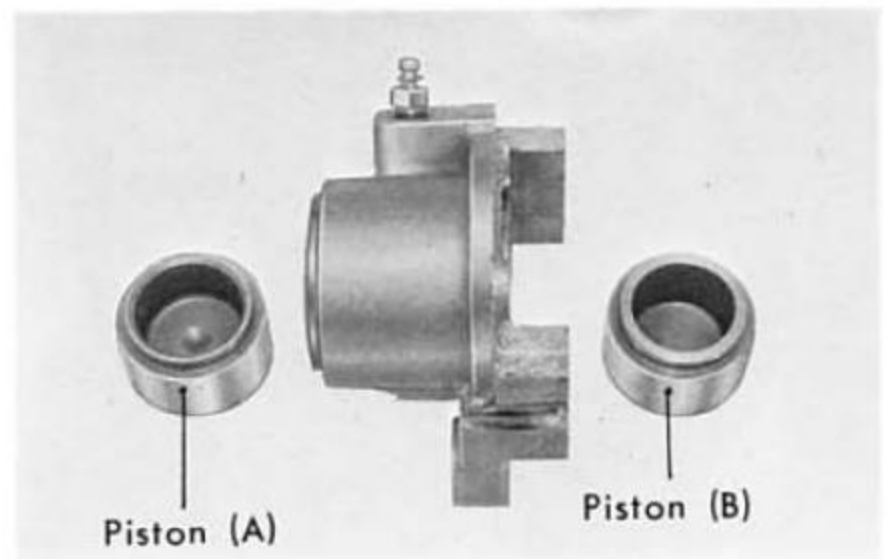


Fig. 12D-11

b. Caliper Assembly

1. Apply a coating of castor oil or rubber grease to the piston and fit gently into the cylinder. The groove on the inside of the piston shall face the cylinder outer surface. The inside diameter of piston (A) is slightly larger than piston (B) but make the assembly by previously installing a new bias ring on the inside of piston (A) so that yoke groove is aligned to the yoke guide groove.

2. Clean the top of the piston and the stepped area of the body, install the new boot and positively fix in place with a retaining ring.

3. Apply rubber grease to the yoke guide groove in the body and temporarily install the yoke and spring assembly in the reverse order of removal. At this time the yoke end should be fitted well into the bias ring.

Check to make sure that yoke spring is properly supporting the yoke in the body groove.

4. Install the bleeder valve and flexible hose.
5. Install the caliper assembly on the mounting bracket, straddling the disc.

Note :

Torque to 4.5 kg-m (32.5 ft-lbs)

6. Assemble the pads being careful not to contaminate and then perform air bleeding.



Fig. 12D-12

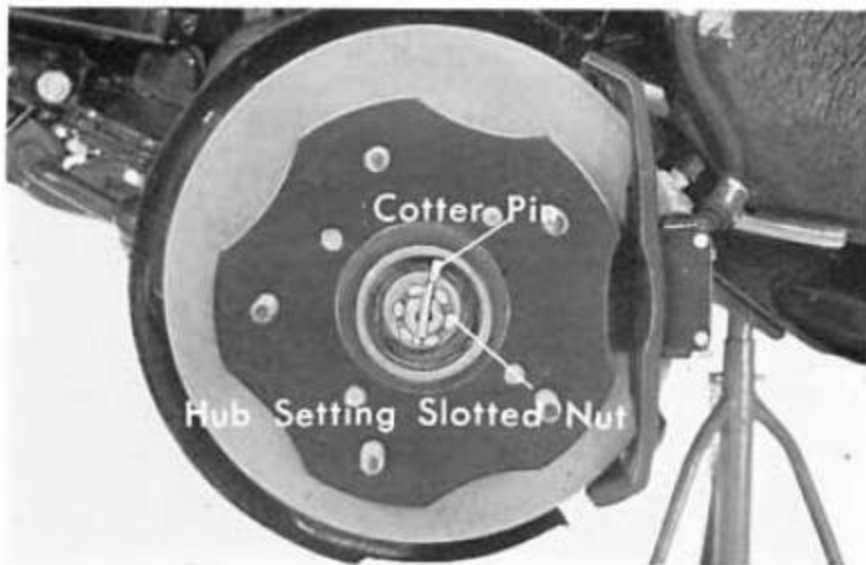


Fig. 12E-1

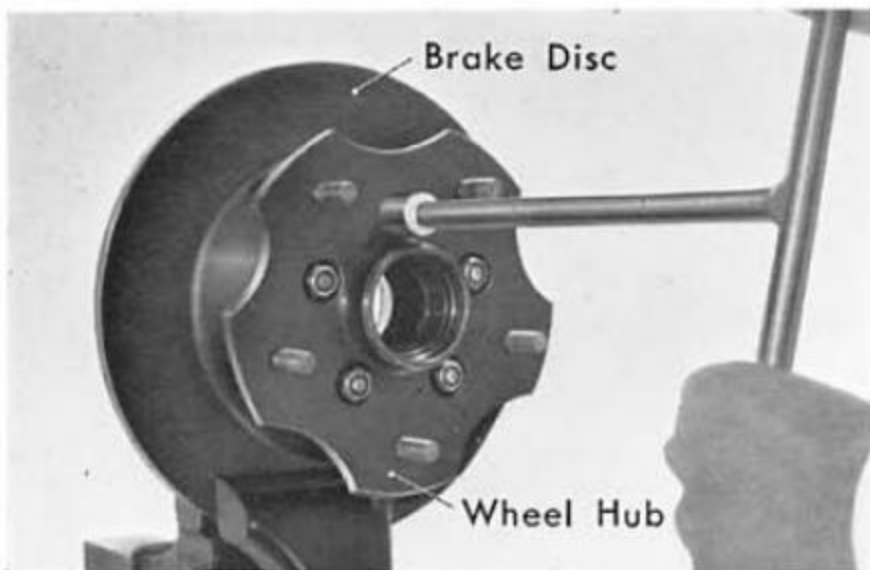


Fig. 12E-2

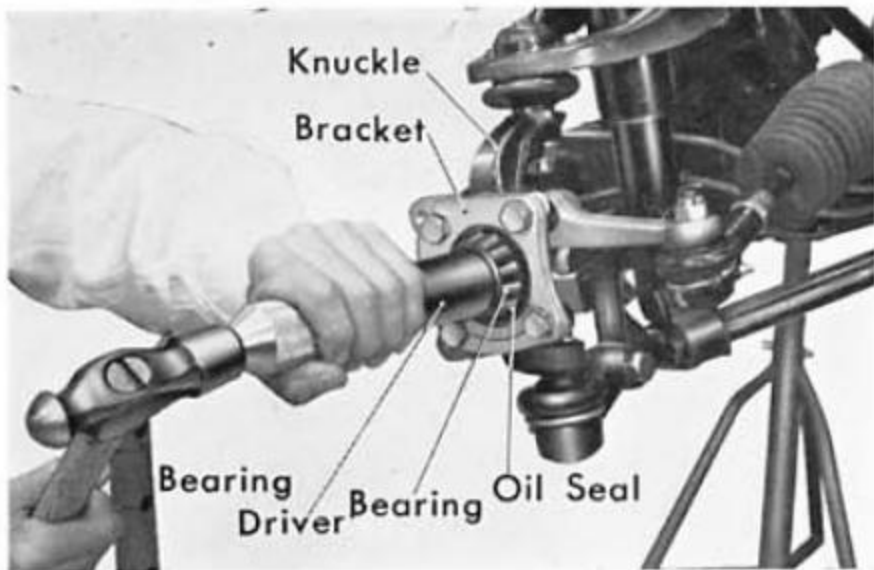


Fig. 12E-3

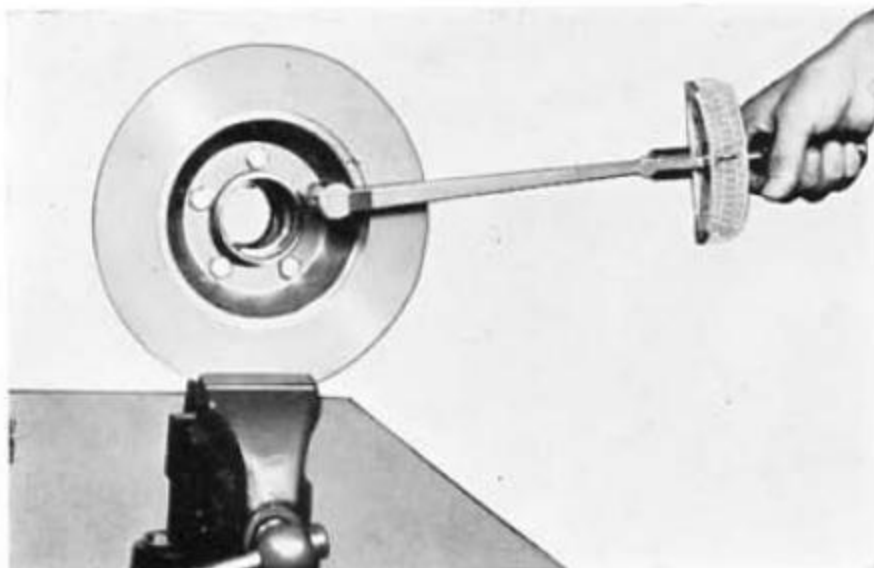


Fig. 12E-4

E. BRAKE DISC

a. Disc Disassembly

1. After removing the caliper assembly, remove the hub cap, cotter pin and loosen the hub setting slotted nut (Fig. 12E-1).
2. Pull off the hub together with brake disc from the knuckle and separate the disc from hub by removing the brake disc bolts (Fig. 12E-2).

b. Disc Assembly

1. After mounting the bracket on the knuckle, insert oil seal. Then install the front wheel bearing with bearing driver (Fig. 12E-3).

Note :
Be careful not to deform the retainer with the driver and not to drop the rollers.
2. Clean the surfaces of disc and hub, install the disc on the hub and fix in place with disc bolts and spring washers (Fig. 12E-4).

Note :
Torque to 2.5 kg-m (18.1 ft-lbs).

3. Install this disc-hub assembly on the knuckle by tapping, and fix in place with a spindle nut.

After the spindle nut is tightened with the torque of 2.5 kg-m (18.1 ft-lbs) temporarily, turn the hub two or three times in both directions to steady the bearing rollers (Fig. 12E-5).

After that, loosen the nut, and retighten the nut with the torque of 0.6~0.8 kg-m (4.34~5.79 ft-lbs).

Note :

$F=1\sim1.5$ kg (2.21~3.31 ft-lbs) under the proper tightening torque when the hub starts to rotate. (Fig. 12E-6)

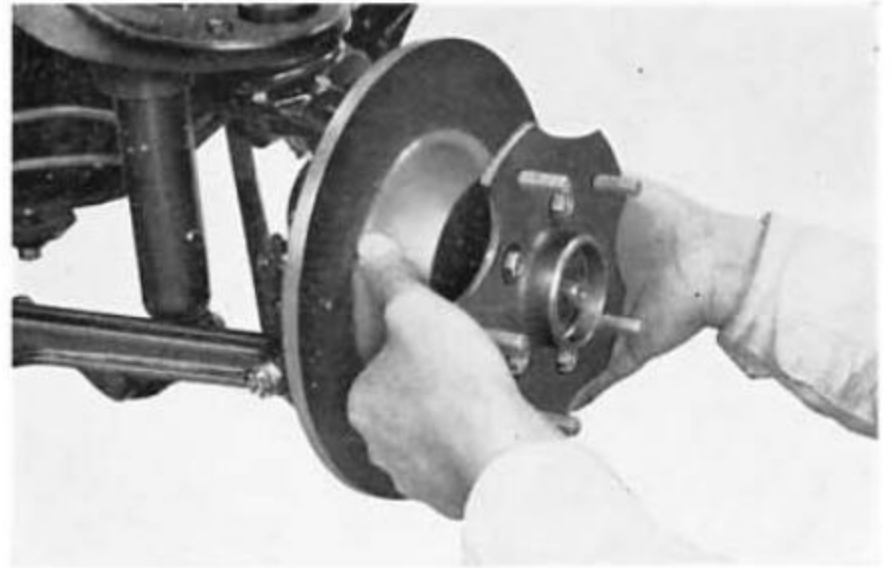


Fig. 12E-5

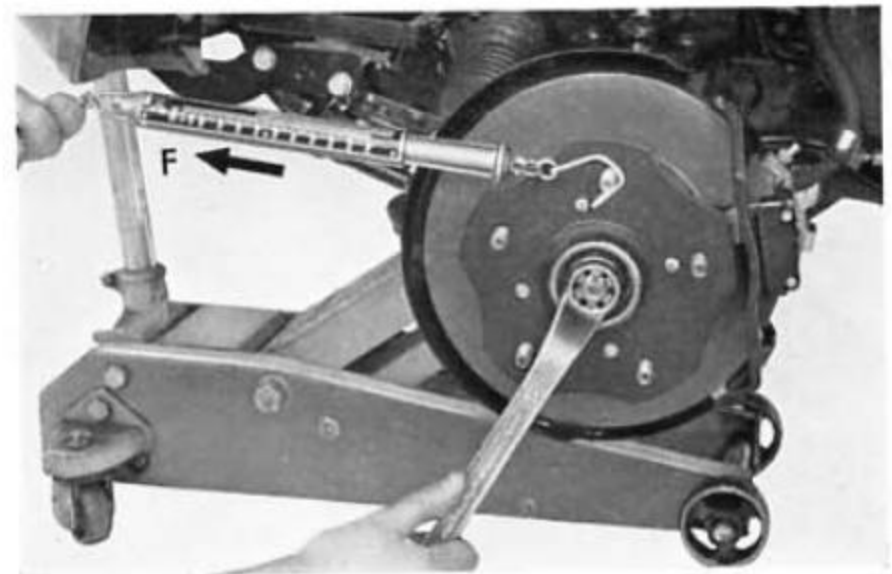


Fig. 12E-6

4. With the hub so positioned, check to make sure that the hub play parallel to the axis should be within 0.08 mm (0.003") and the face runout of the disc should be within 0.15 mm (0.006") at the outer circumference (Fig. 12E-7).

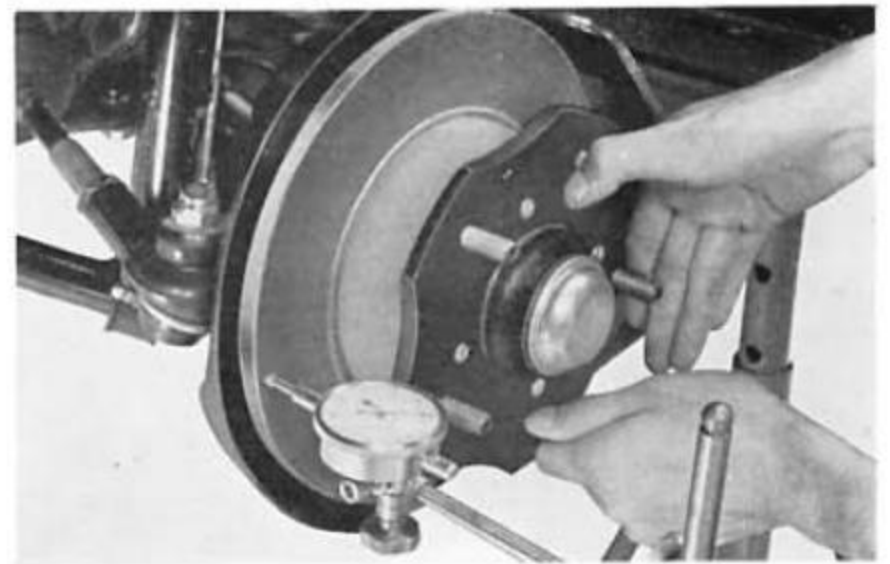


Fig. 12E-7

5. With the disc installed on the knuckle spindle, install disc brake on the brake installation seat of the knuckle spindle (Fig. 12E-8).

Note :

Torque to 4.5kg-m (32.5 ft-lbs).



Fig. 12E-8

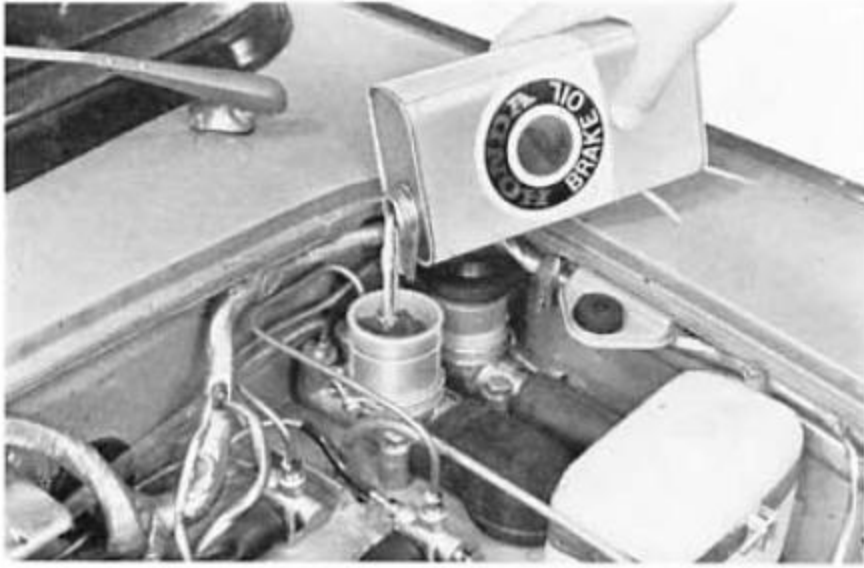


Fig. 12F-1

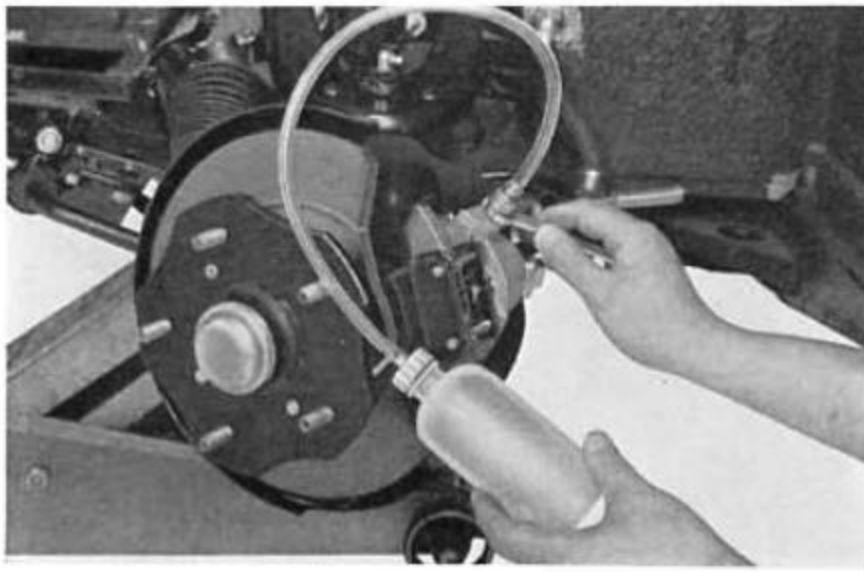


Fig. 12F-2

F. AIR BLEEDING OF BRAKE SYSTEM

1. Fill up the reservoir with brake fluid. Install a small hose on the bleed screw of the brake assembly (Fig. 12F-1).
2. Operate the brake pedal back and forth, so that all bubbles are completely exhausted through the hose, then with the brake pedal fully depressed, tighten the bleed screw (Fig. 12F-2).
During the operation, check to make sure that there is sufficient brake fluid left in the reservoir and add brake fluid if necessary.
3. Air bleeding is performed for each brake; however, to make air bleeding efficient, start with the farthest wheel cylinder from the master cylinder and proceed with air bleeding on other cylinders in order of distance. While performing air bleeding, care should be exercised not to get brake fluid on the pads and disc.
4. When air bleeding is completed for all the cylinders, adjust the brake fluid level in the reserve tank to the specification, and finish the operation by checking the entire oil hydraulic system for brake fluid leak while the brake pedal is being depressed with relatively heavy force for 2~3 minutes.
And install a cap on the bleed screw, after the completion of air bleeding, to prevent foreign objects from entering.

13. REAR BRAKE

The rear brake is of leading-trailing shoe type. With the Al-fin drum, the cooling effect is improved, as well as the stability of the braking performance.

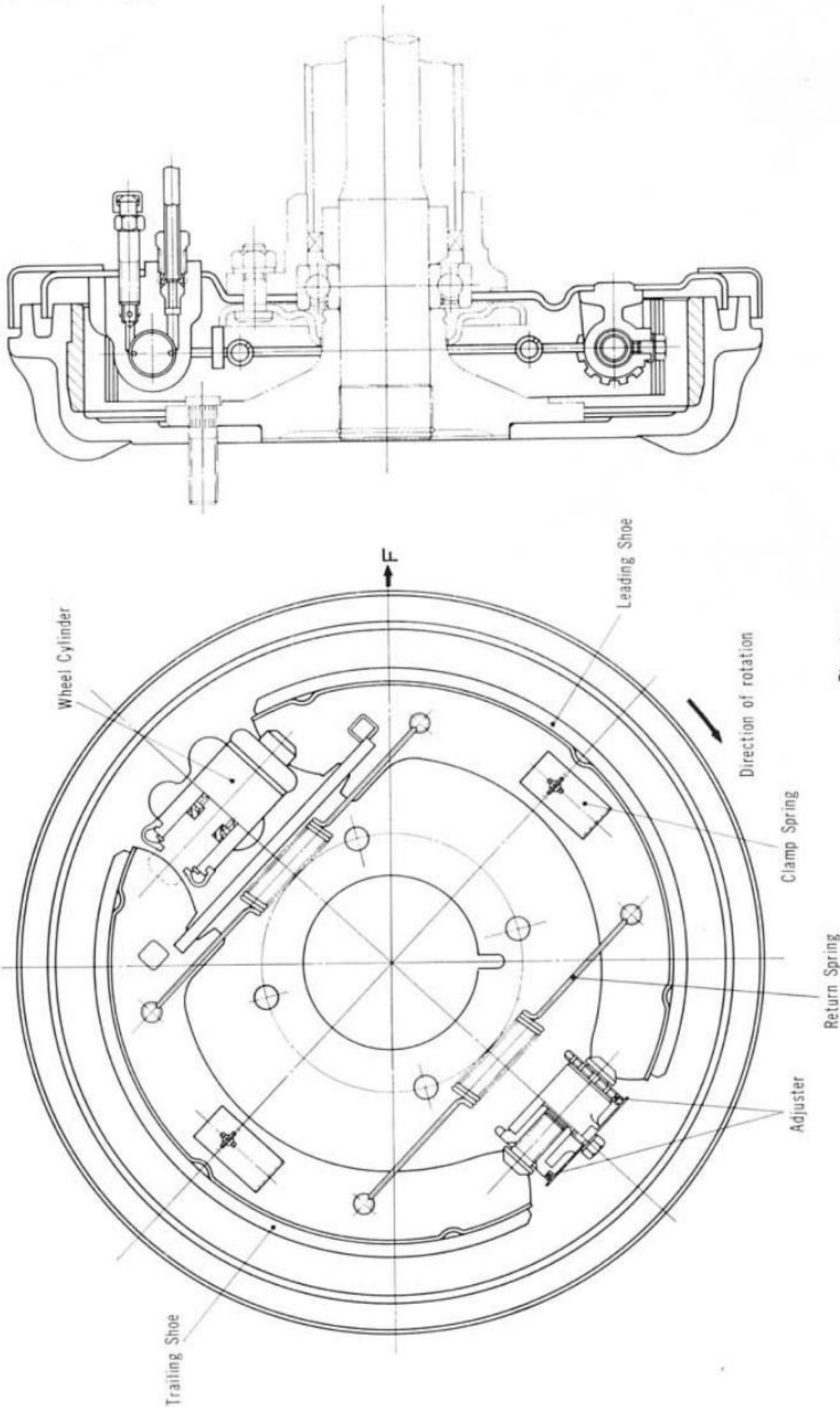


Fig. 13-1

13-2 REAR BRAKE

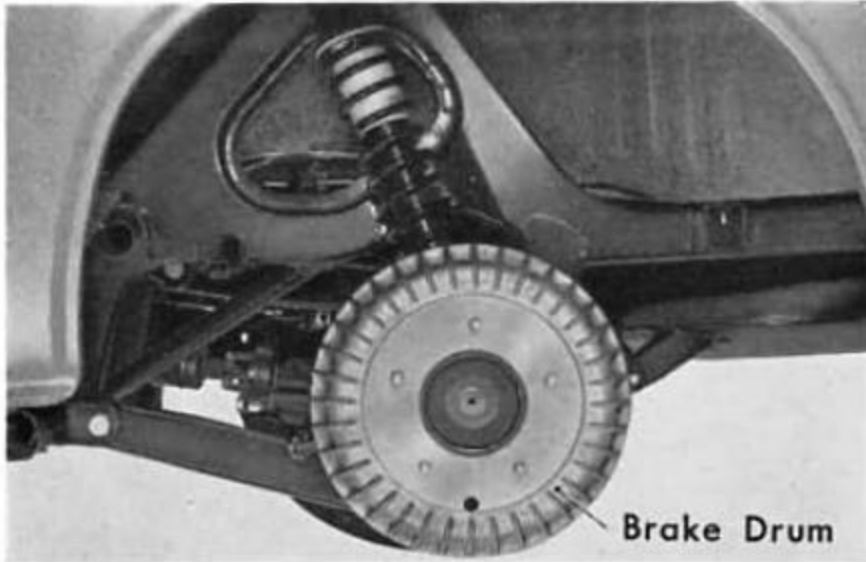


Fig. 13A-1

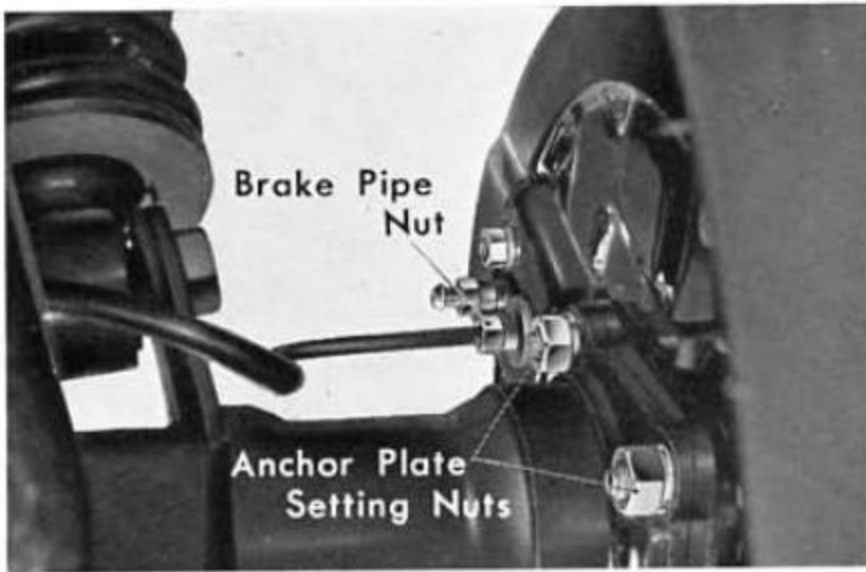


Fig. 13A-2

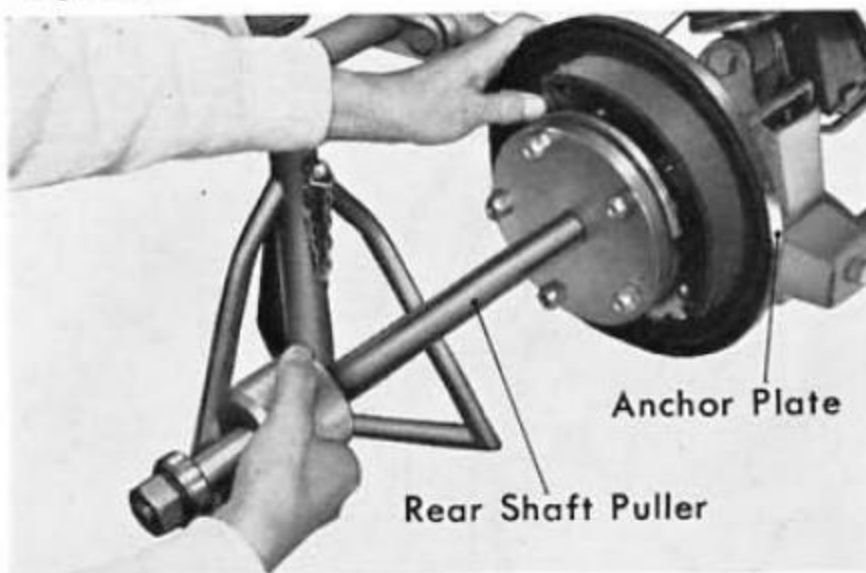


Fig. 13A-3

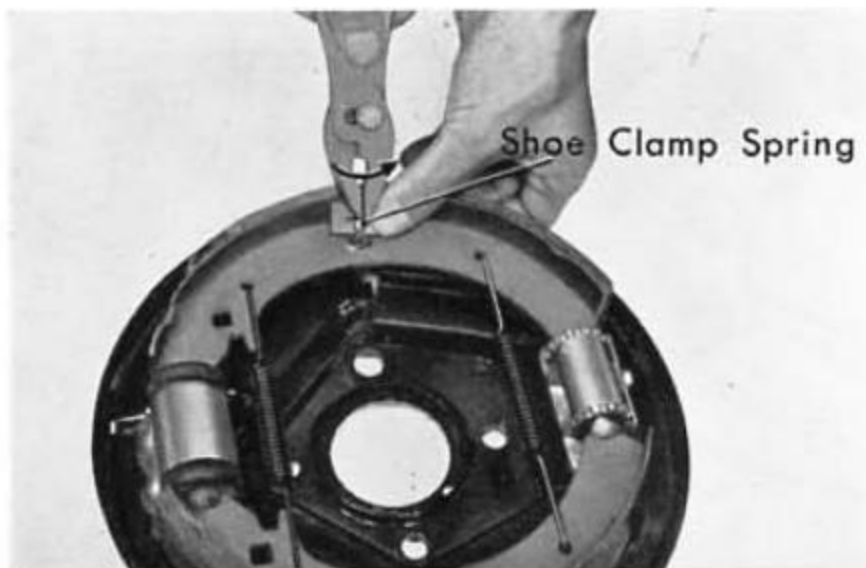


Fig. 13A-4

A. REMOVAL

1. Remove the rear wheel and wheel cap.
2. Remove the brake drum (Fig. 13A-1).
3. Disconnect the brake pipe from the wheel cylinder and remove the anchor plate setting nuts (Fig. 13A-2).
4. Install the rear shaft puller on the wheel setting bolts as shown in the Fig. 13A-3 and remove the anchor plate together with the brake shoes.
5. Turn the shoe fixing pin with pliers; the shoe clamp spring, and the fixing pin can be disassembled from the anchor plate (Fig. 13A-4).

- Spread the brake shoes apart and remove the brake shoes from the anchor plate together with the return springs (Fig. 13A-5).

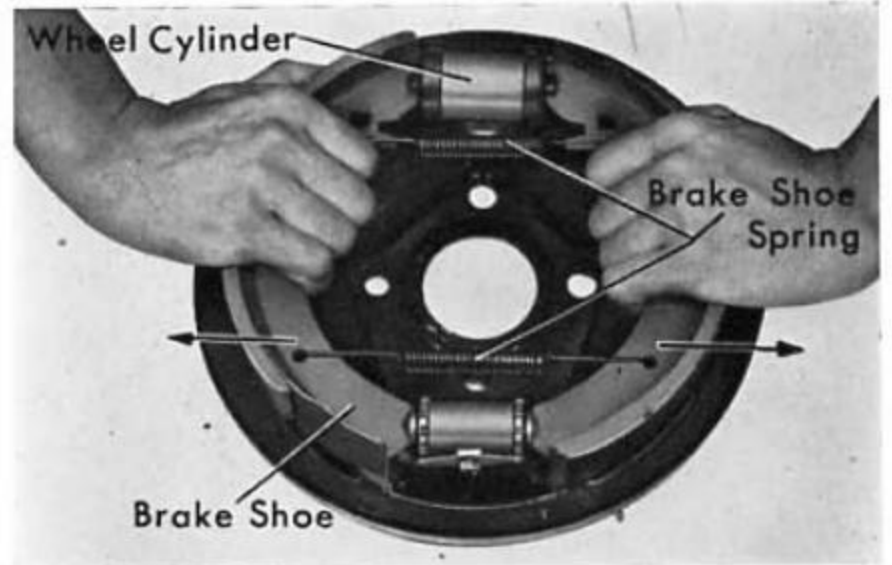


Fig. 13A-5

- Remove the wheel cylinder setting nuts, washer and disassemble the wheel cylinder from the anchor plate, (Fig. 13A-6).

Note :

When assembling, torque the nuts to 1.2 kg-m (8.7 ft-lbs).



Fig. 13A-6

- The wheel cylinder dust cover, shoe piston set, piston cap and bleed screw can be disassembled from the wheel cylinder. The stop ring can be disassembled from the shoe piston (Fig. 13A-7).

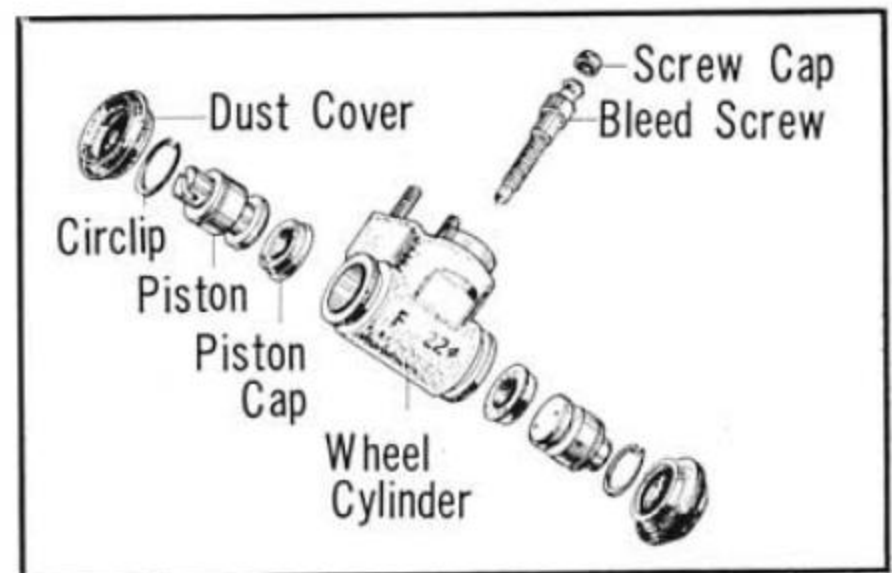


Fig. 13A-7

- Remove the brake anchor bracket setting bolts, washers and disassemble the brake anchor bracket from the anchor plate (Fig. 13A-8).

Note :

When assembling, torque the bolts to 3.5 kg-m (25.3 ft-lbs).

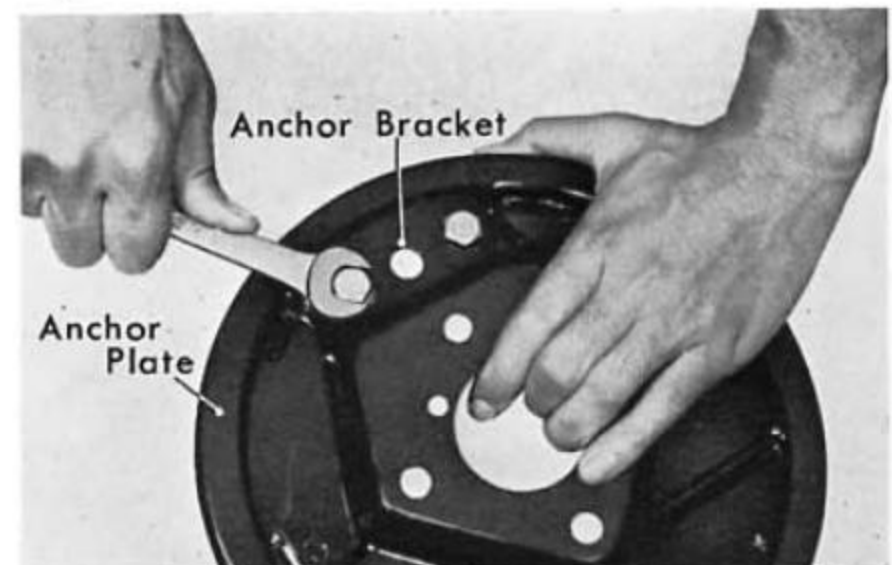


Fig. 13A-8

13-4 REAR BRAKE

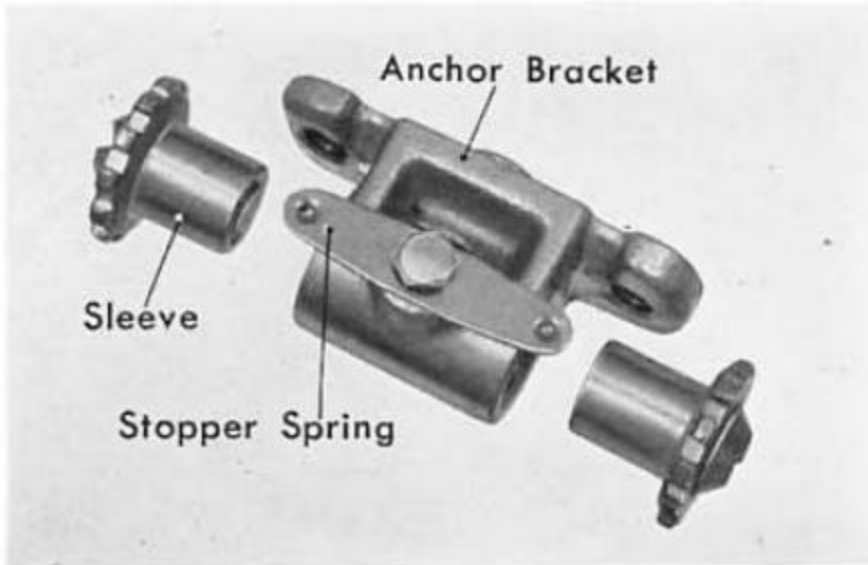


Fig. 13A-9

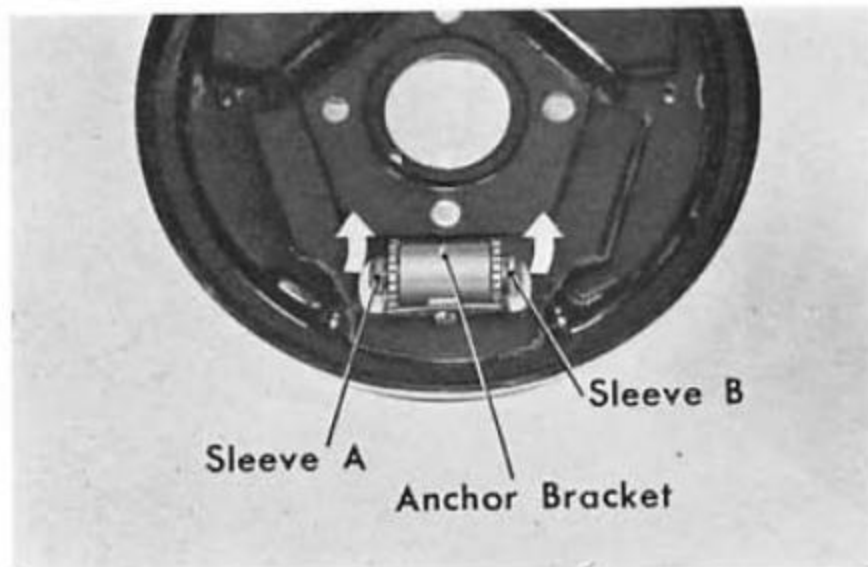


Fig. 13B-1

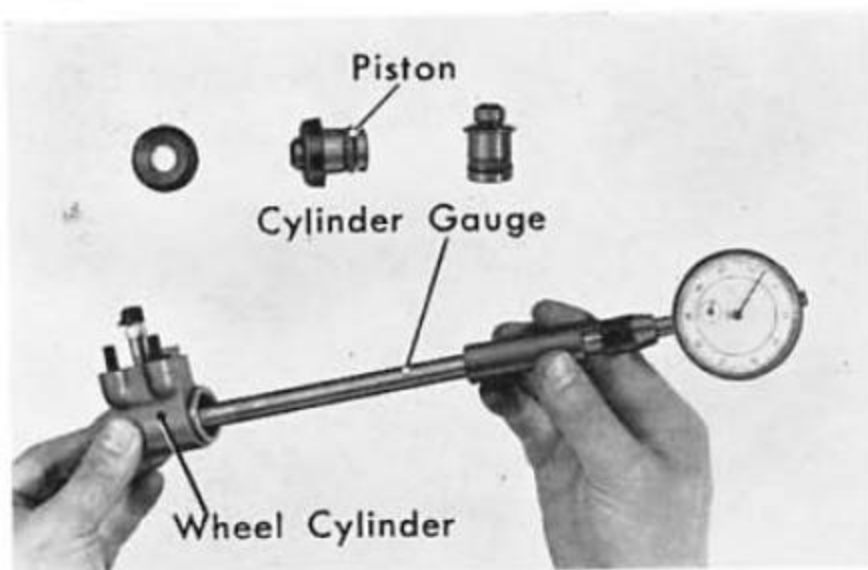


Fig. 13B-2

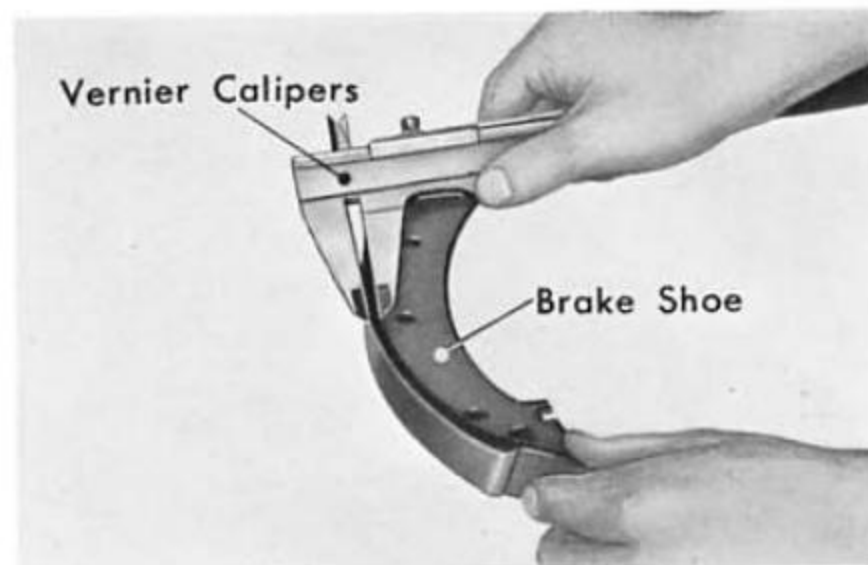


Fig. 13B-3

- Shoe adjusting sleeves A and B, shoe adjusting bolts and stopper spring can be disassembled from the anchor bracket (Fig. 13A-9).

B. INSPECTION AND ASSEMBLY

- Assemble the shoe adjusting sleeves A and B to the anchor bracket. Turn in the direction of the arrow, both sleeves A and B should move outward. (Fig. 13B-1)

- Measure the clearance between the cylinder and the piston with the cylinder gauge and micrometer (Fig. 13B-2).

	Standard Value	Serviceable Limit
Clearance	0.016 ~ 0.086 mm (0.0006 ~ 0.0034")	Replace if beyond 0.10 mm (0.0039")

- Measure the brake shoe lining at the thinnest section with a vernier calipers (Fig. 13B-3).

	Standard Value	Serviceable Limit
Thickness	5.0 mm (0.197")	Replace if under 2.0 mm (0.079")

4. Measure the inside diameter of the brake drum at several points to inspect the distortion of the drum (Fig. 13B-4).

	Standard Value	Serviceable Limit
I.D.	212.0~212.2 mm (8.347~8.353")	Replace if beyond 214 mm (8.425")

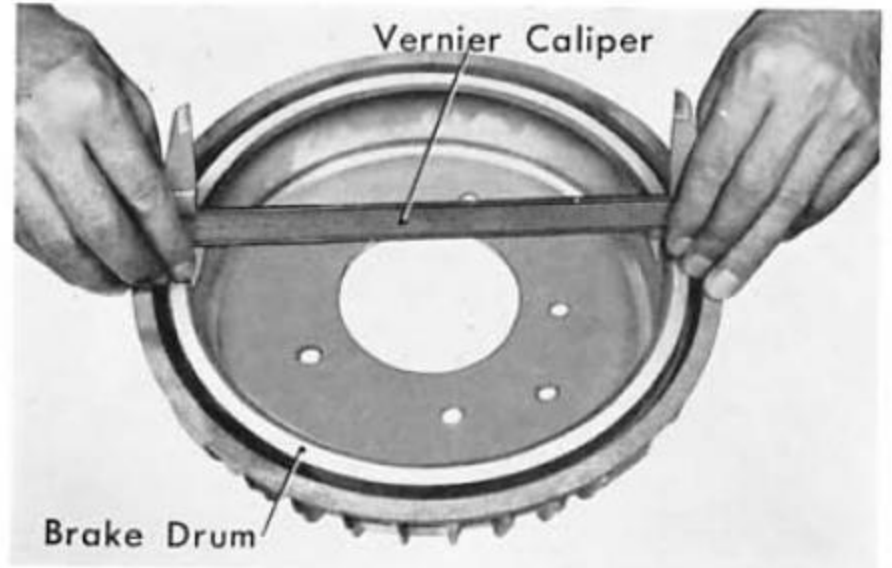


Fig. 13B-4

5. Assemble the brake in the reverse order of the removal procedure.
6. After completing the installation, perform air bleeding in the same manner as front brake (Fig. 13B-5).

Refer to item F. Air Bleeding of Brake System on page 12-12.



Fig. 13B-5

7. Brake Pedal Travel Adjustment

Pump the brake pedal several times before jacking the vehicle. Remove wheel cap, adjusting hole plug on the wheel disc and align the adjusting hole to the front adjusting sleeve of the wheel cylinder. Insert the screwdriver in the hole and turn the sleeve in the downward direction until the wheel becomes locked, and then reverse the sleeve 3~4 notches until the brake releases and the scraping of the shoe against the drum no longer exists. In the same manner, adjust the rear cylinder sleeve. Upon completion, pump the brake pedals several times and recheck to make sure that the brakes are not dragging.

There are 2 adjusting sleeves to each wheel cylinder, make sure that both sleeves are adjusted.

Finally, inspect for uniform braking effectiveness of the right and left wheels.

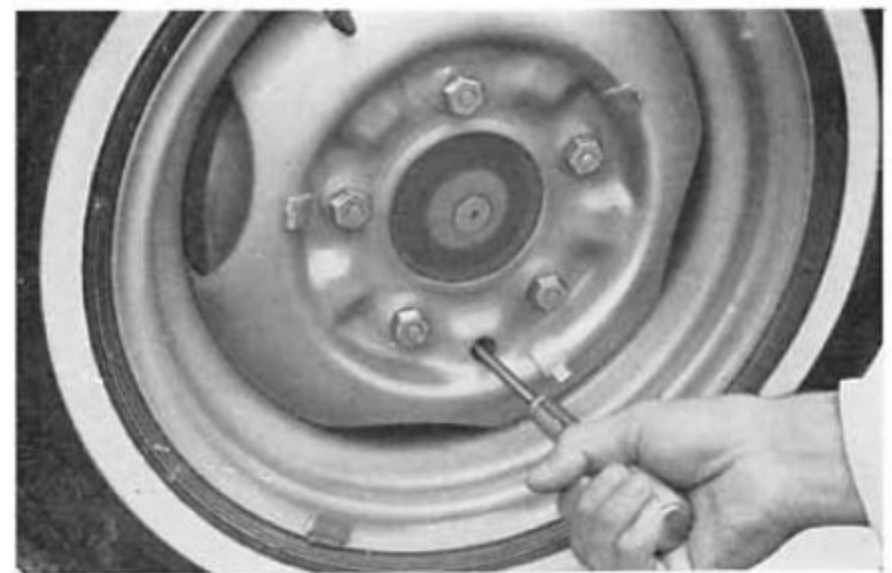


Fig. 13B-6

Sleeve reversing from locked position :	3~4 notches
Play in the brake pedal :	15~20mm (0.06~0.08")
Brake pedal travel :	30~35mm (1.2~1.4")
Clearance between drum and brake shoe :	0.3 mm (0.011")
Floor clearance with pedal depressed fully :	50 mm (2") min.

Note :

The pedal play can be adjusted with the cylinder sleeve, however, do not permit the brake to drag.



Fig. 13B-7

13-6 REAR BRAKE

M E M O

14. HANDBRAKE

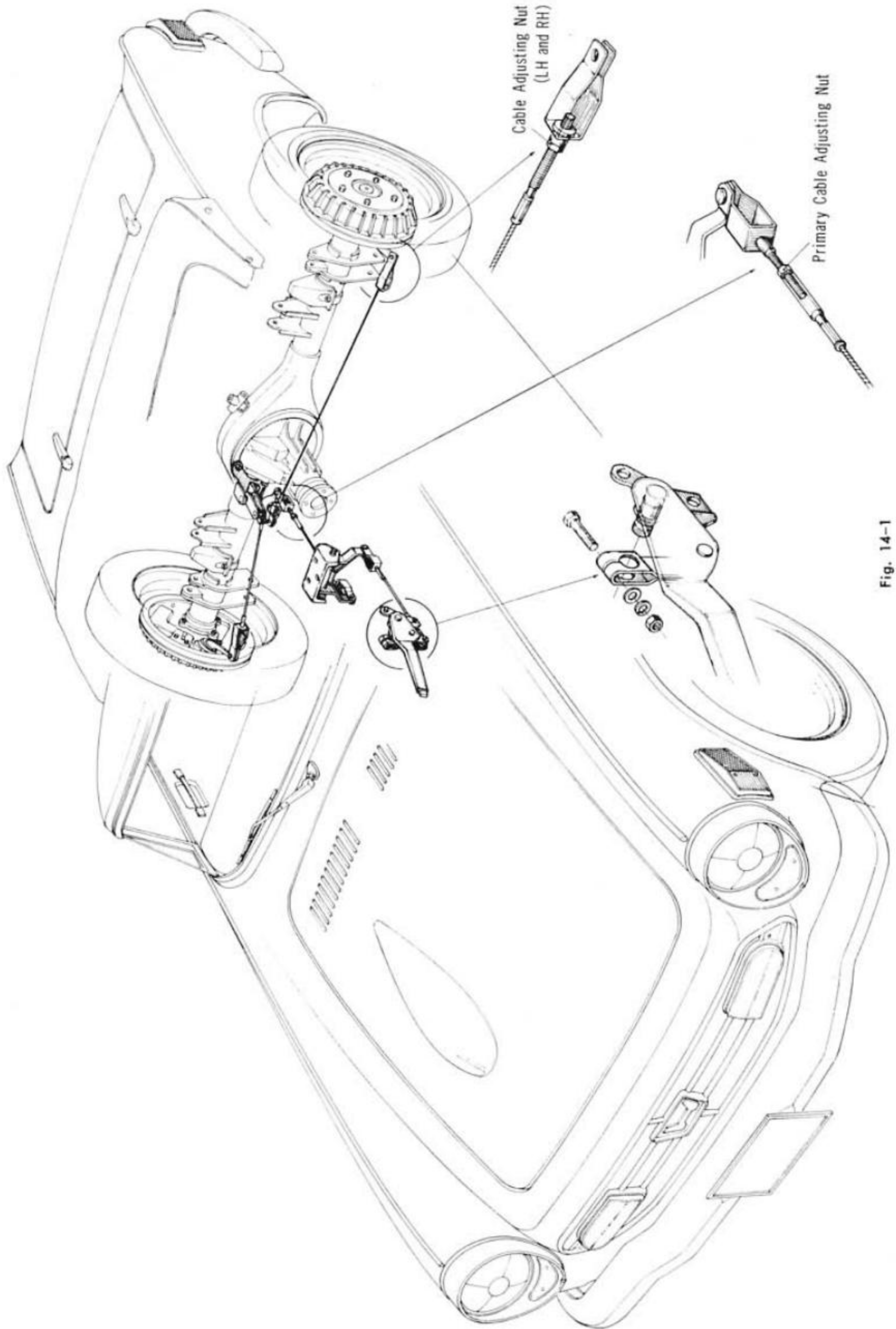


Fig. 14-1

14-2 HANDBRAKE

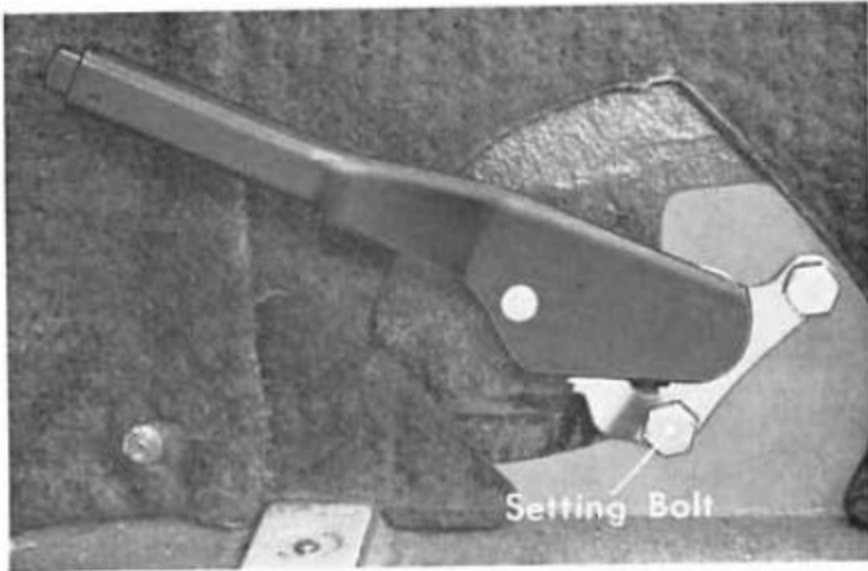


Fig. 14A-1



Fig. 14A-2

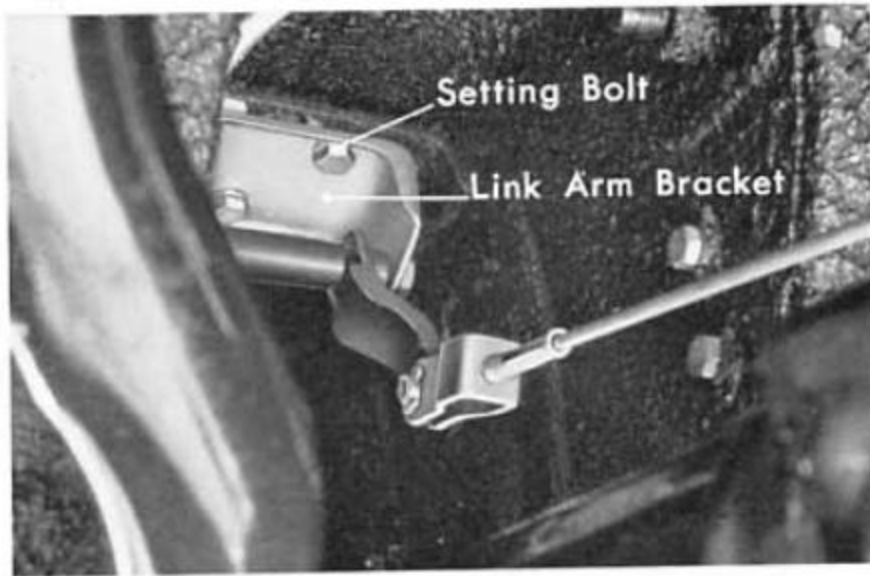


Fig. 14A-3

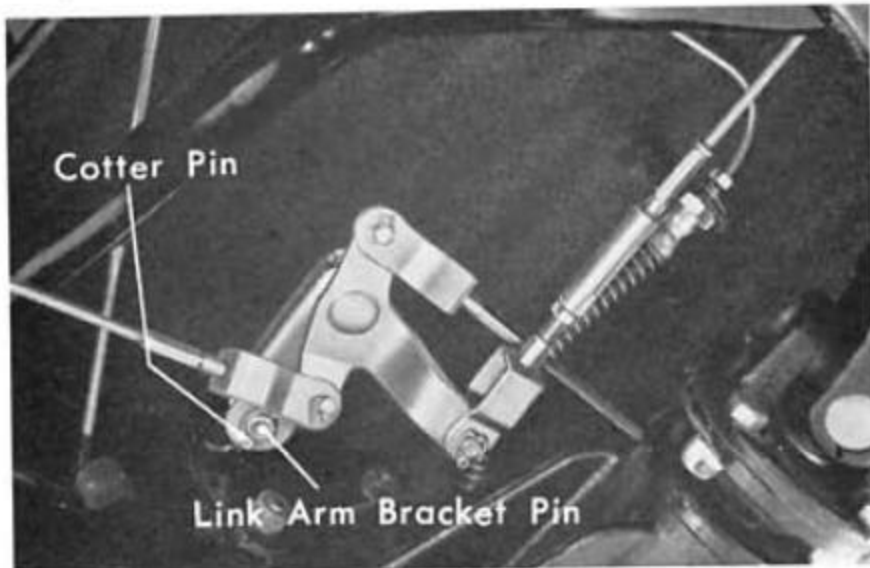


Fig. 14A-4

A. REMOVAL

1. Remove the exhaust pipe from the frame.
2. Remove the handbrake lever setting bolts and disassemble the handbrake lever from chassis (Fig. 14A-1).
3. Remove the lever setting bolt and the push rod lever. (Fig. 14A-2)
4. Remove the setting bolts and link arm bracket. (Fig. 14A-3)
5. Remove the cotter pin and link arm bracket pin (Fig. 14A-4)

B. ASSEMBLY AND ADJUSTMENT

1. Assemble in the reverse order of disassembly.
Apply grease to the pivot points return the handbrake completely, and adjust the pushrod lever so that the handbrake pilot lamp switch is completely depressed except for the final 1mm (0.04"), and then set the serration.

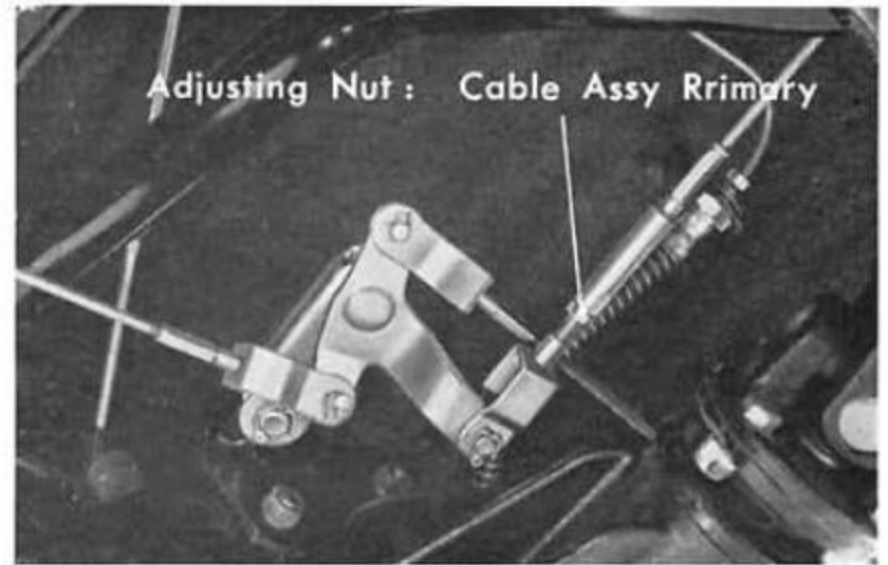


Fig. 14B-1

2. Adjust the travel of the handbrake lever.
Adjustment can be made by adjusting the nut of primary cable assy. and the nuts of cable assy., RH and LH. (Fig. 14B-2)

Make the adjustment so that the handbrake becomes engaged between 5~7 notches on the ratchet.



Fig. 14B-2

14-4 HANDBRAKE

M E M O

15. FRONT SUSPENSION

The independent, wishbone type suspension system is adopted with the use of the torsion bar stabilizer and cylindrical shock absorber. The knuckle is a ball joint type connected directly to the upper and lower links.

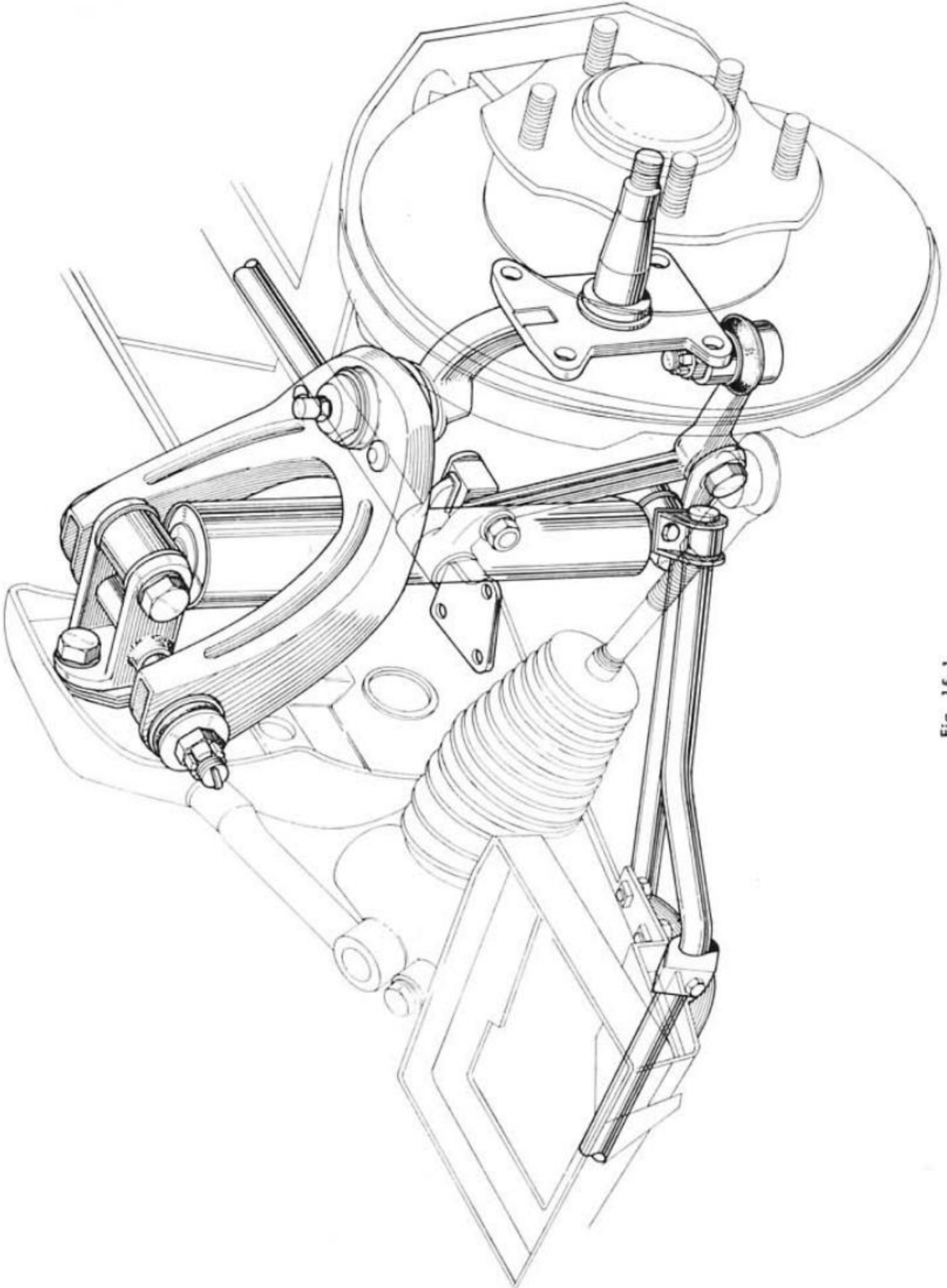


Fig. 15-1.

15-2 FRONT SUSPENSION

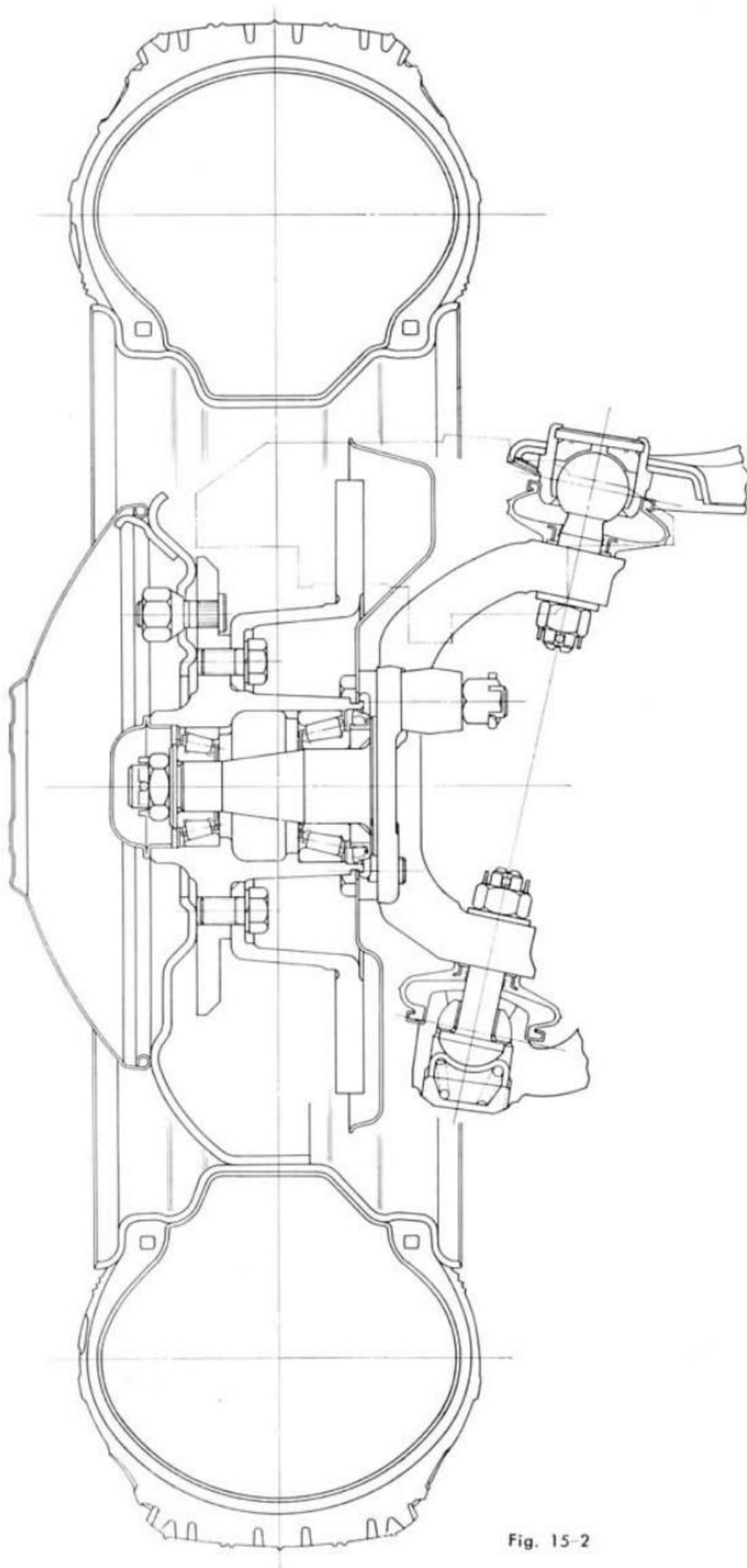


Fig. 15-2

A. REMOVAL

1. Remove the wheel cap and the wheel.
2. Remove the front hub and the bearing from the knuckle with the bearing puller (Fig. 15A-1, 6).

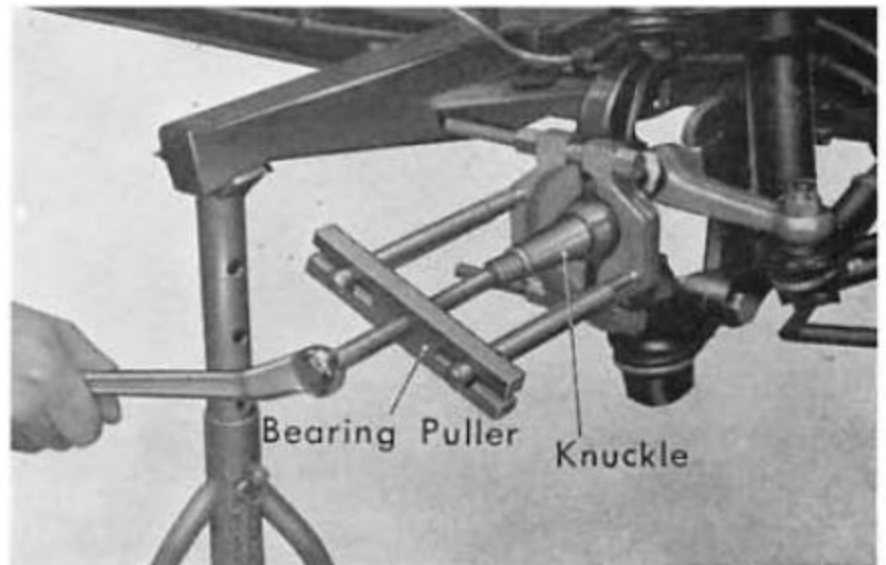


Fig. 15A-1

3. Remove the knuckle nuts, bracket bolts and disassemble the bracket from the knuckle (Fig. 15A-2).

Note :

When assembling, torque the knuckle nuts to 5.5 kg-m (39.8 ft-lbs) and bracket bolts to 7.2 kg-m (52.1 ft-lbs).

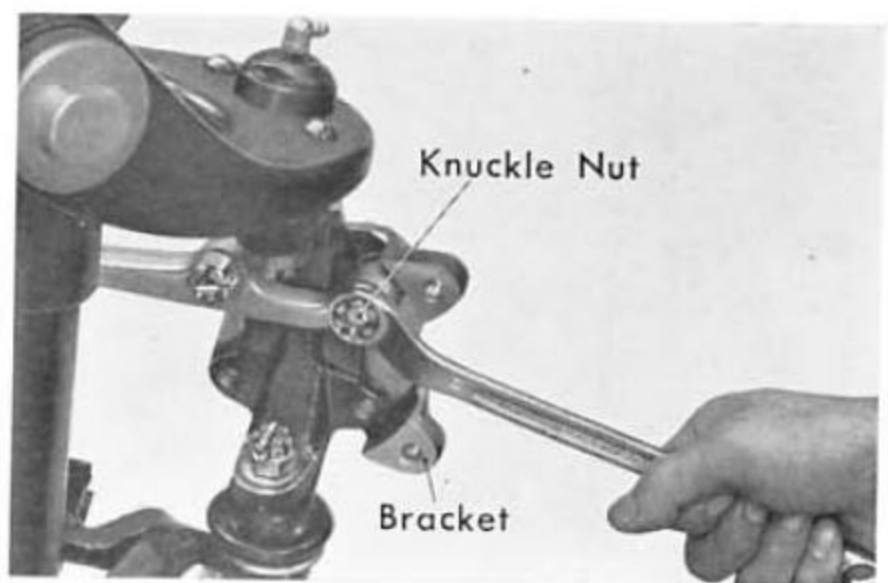


Fig. 15A-2

4. Remove the cotter pins and loosen the upper and lower arm nuts using a knuckle supporter to prevent turning (Fig. 15A-3).

Note :

When assembling, torque to 6.5 kg-m (47.0 ft-lbs).

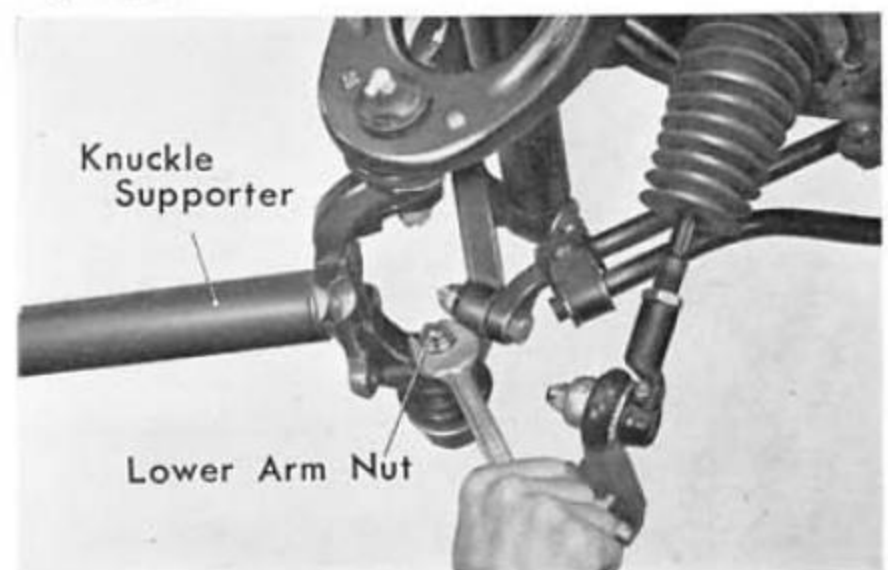


Fig. 15A-3

5. To disassemble the knuckle, install the front suspension ball housing remover between the upper and lower ball housing bolts and then extend the remover by turning the bolt and body in the opposite directions using two wrenches. After both housing bolts have been loosened, remove the nuts and disassemble (Fig. 15A-4).



Fig. 15A-4

15-4 FRONT SUSPENSION

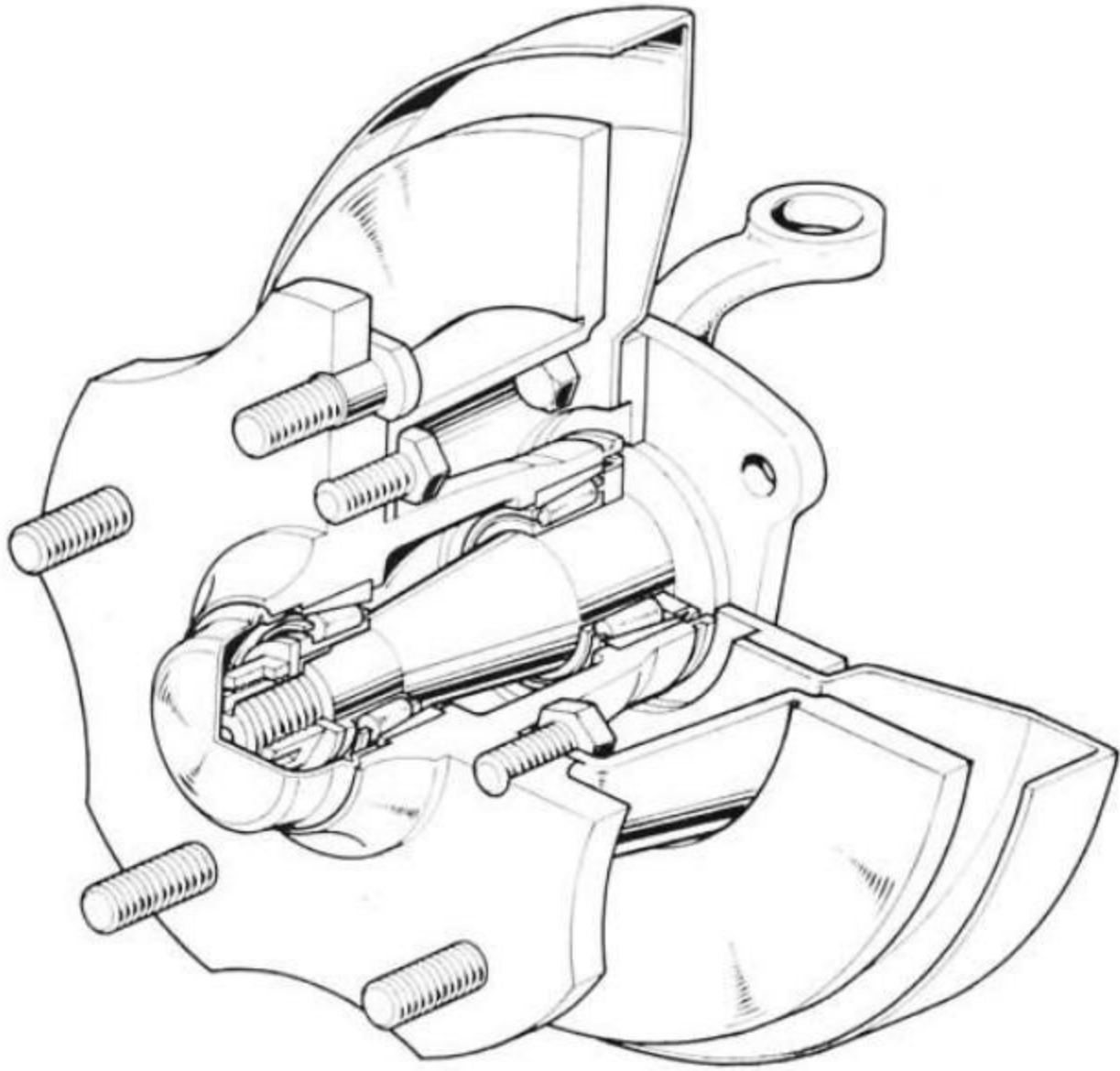


Fig. 15A-5

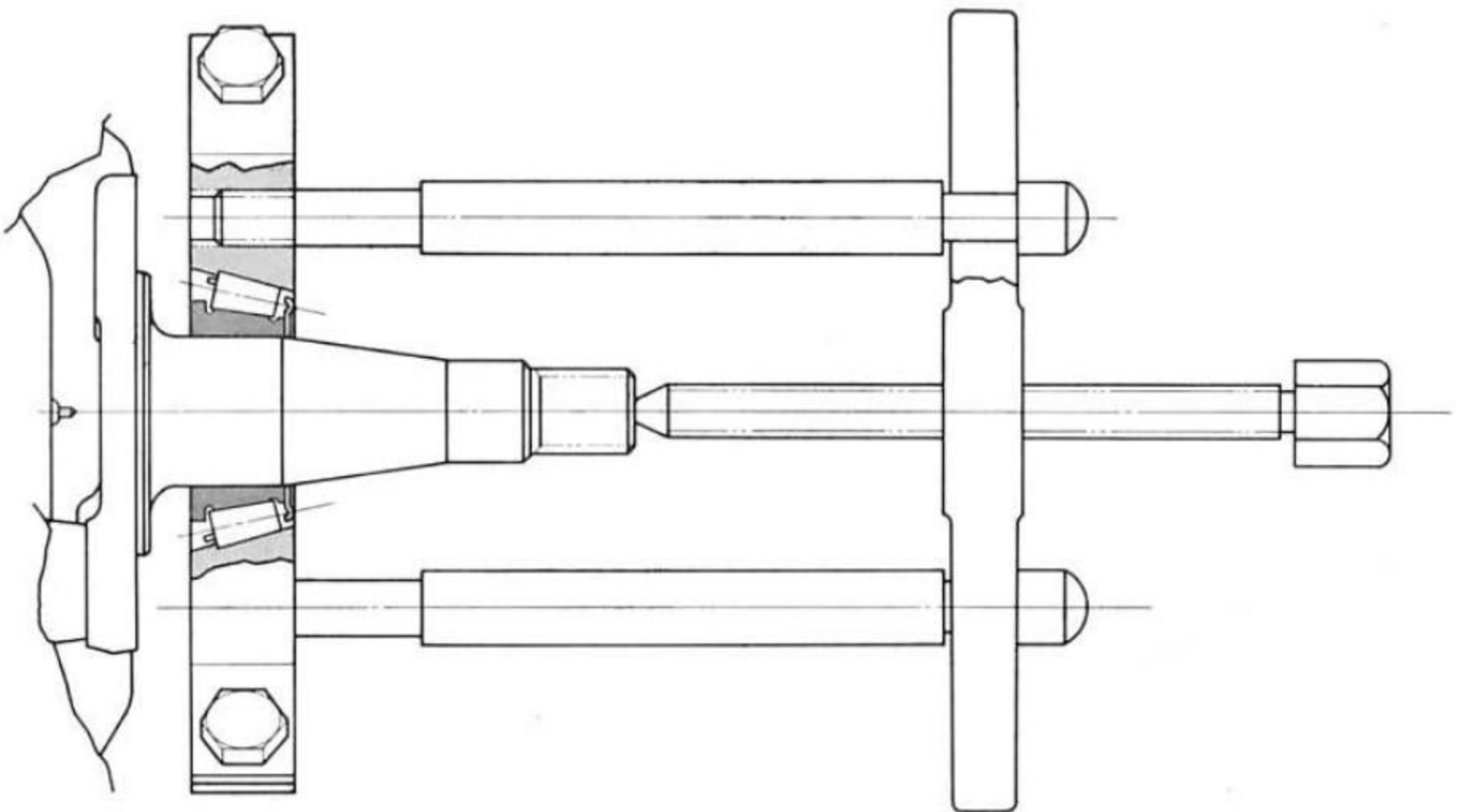


Fig. 15A-6

- Remove the bolt, washer, stabilizer holder and disassemble the stabilizer bar from the radius rod (Fig. 15A-7).

Note :

When assembling, torque the bolts to 1.2 kg-m (8.7 ft-lbs).

- Remove radius rod nut, spring washer, bolt and disassemble the radius rod from the lower arm.

Note :

When assembling, torque the bolt 6.7 kg-m (48.5 ft-lbs)

- Remove the bolts, spring washers and disassemble the radius arm bracket protector from the frame (Fig. 15A-8).

- Remove bolt, spring washer, stabilizer holder and disassemble the stabilizer from the frame.

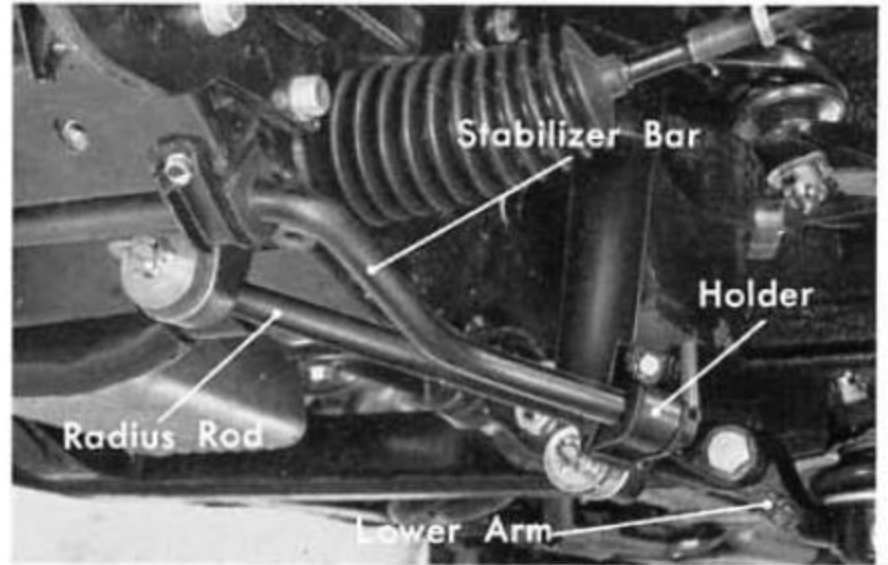


Fig. 15A-7

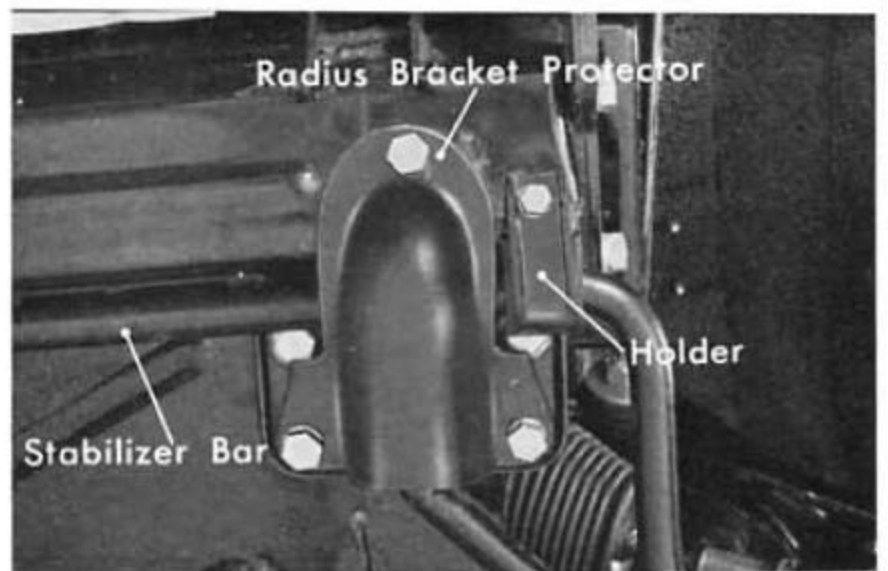


Fig. 15A-8

- Remove bolts, spring washers and disassemble the radius rod bracket from the frame.

- After removal, disassemble further by removing the cotter pin, nut and bracket from the radius rod. Radius bushing is pressed into the bracket (Fig. 15A-9).

Note :

When assembling, torque the nut to 2.4 kg-m (17.4 ft-lbs).

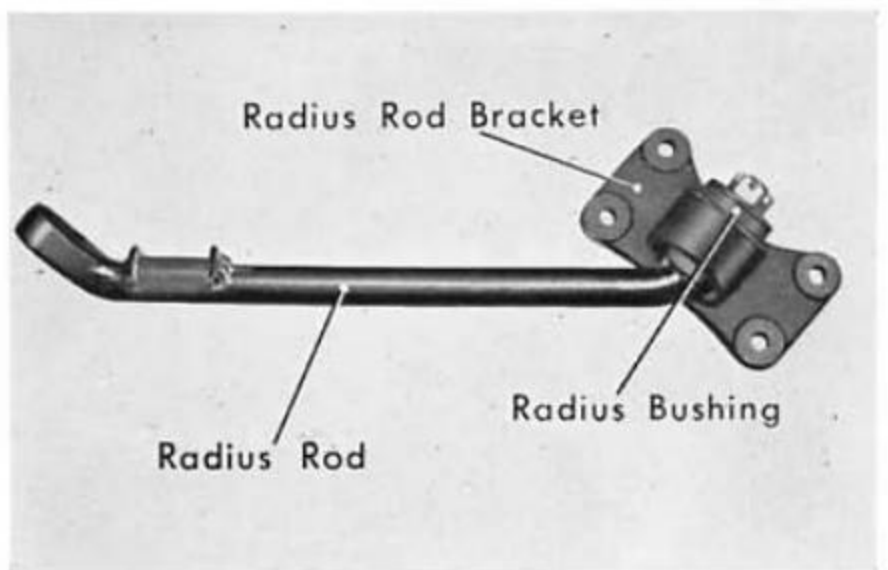


Fig. 15A-9

- Remove the cotter pin, nut, damper washer and disassemble the front damper from the lower arm (Fig. 15A-10).

- Remove nut, damper washer, damper upper bolt, damper washer and disassemble the front damper from the upper arm bracket.

Note :

Torque to 7.7kg-m (55.7 ft-lbs) during installation.

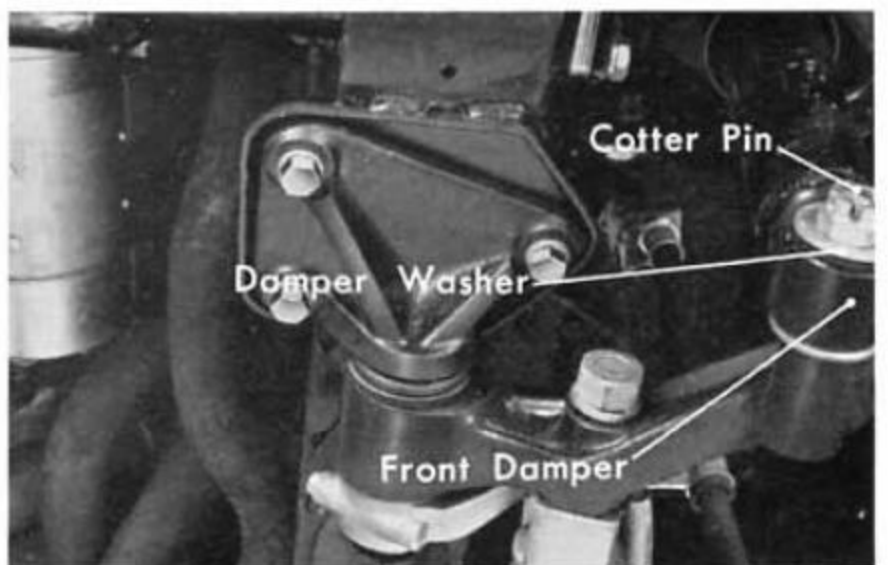


Fig. 15A-10

15-6 FRONT SUSPENSION

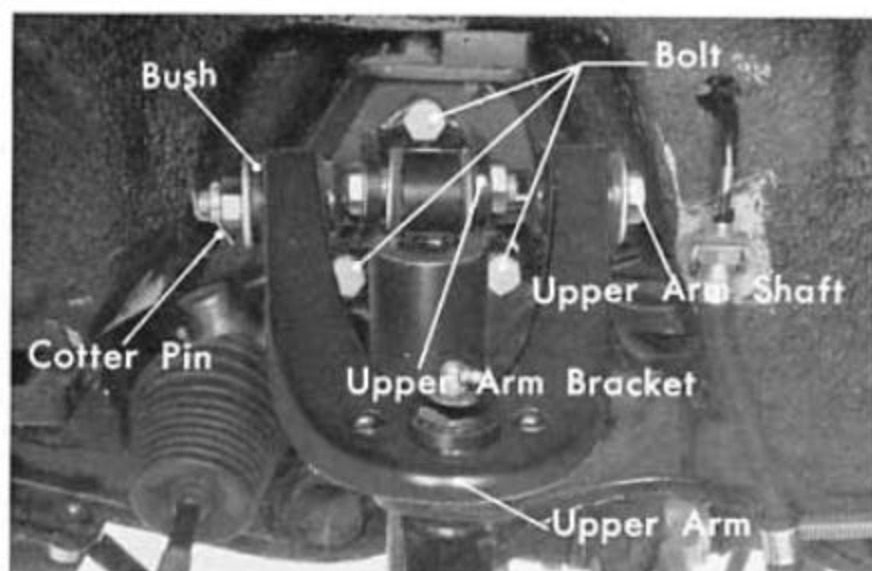


Fig. 15A-11

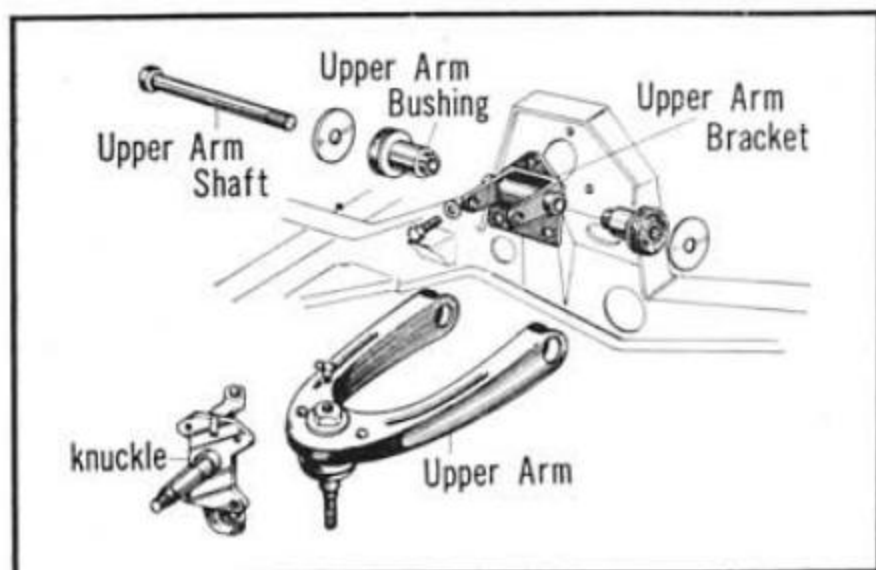


Fig. 15A-12

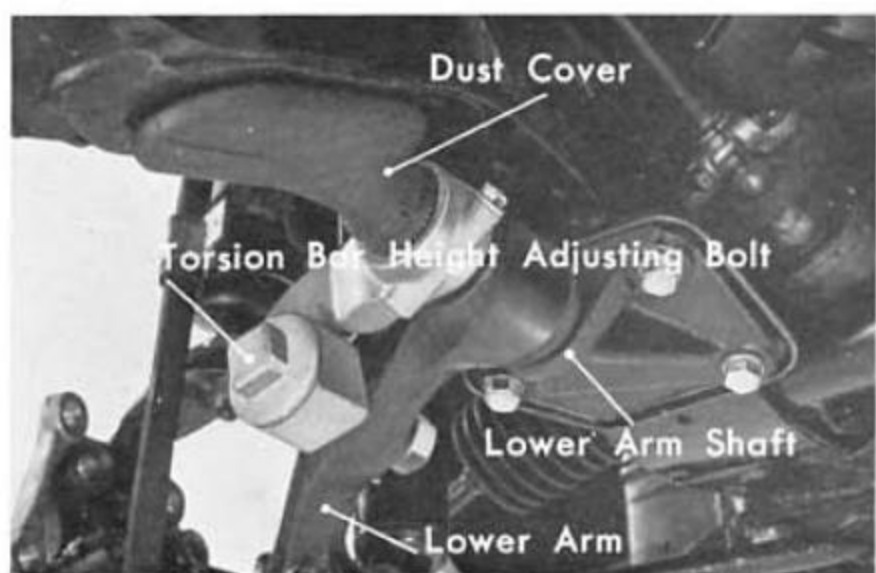


Fig. 15A-13

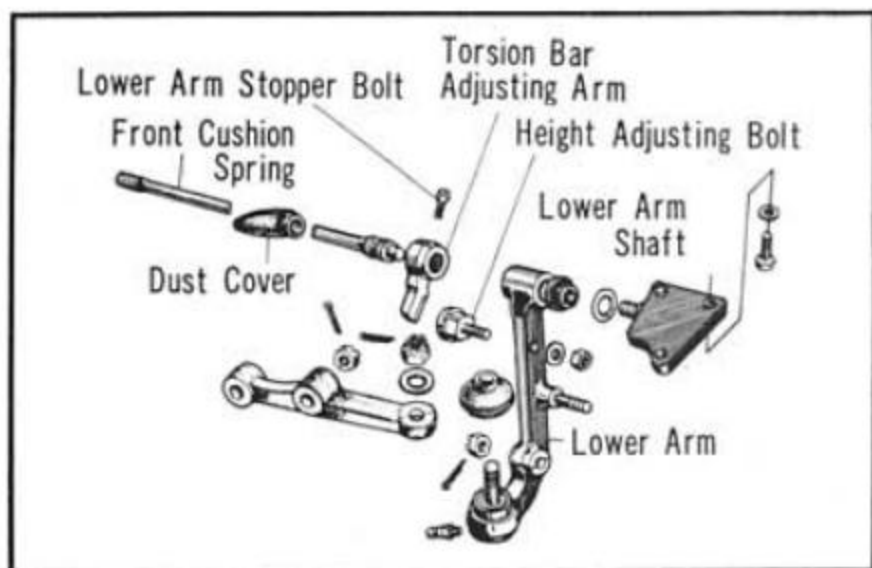


Fig. 15A-14

14. Remove cotter pin, nut, washers, upper arm bushing and upper arm shaft and then remove the upper arm from the upper arm bracket (Fig. 15A-11).
15. Remove the bracket setting bolts, spring washers and disassemble upper arm bracket and camber shims from the frame.

Note :

When assembling, torque the bolts to 5.2 kg m (37.6 ft-lbs).

16. Remove the lower arm shaft setting bolts, spring washers and disassemble lower arm shaft, lower arm, torsion bar adjusting arm, torsion bar dust cover and front cushion spring from the frame (Fig. 15A-13).

17. Disassemble front cushion spring from the lower arm shaft and lower arm stopper bolt (Fig. 15A-14). Disassemble the torsion bar adjusting arm and dust cover from the front cushion spring. Disassemble lower arm shaft, shaft seal, height adjusting bolt from the lower arm.

Note :

When assembling, torque the adjusting bolt to 7.5 kg-m (54.2 ft-lbs).

B. INSTALLATION

1. Install the torsion bar by inserting into the frame with the bar positioned so that the one missing tooth of the serration is toward the bottom. Be sure marks "R" and "L" are for the right and left sides.
2. Assemble the torsion bar adjusting arm on the torsion bar with the punch mark on the arm aligned to the one missing tooth of the serration.
3. Assemble the lower arm and arm shaft and then assemble to the torsion bar. The lower arm shaft is screwed into the lower arm.
4. Set the height adjusting bolt by using the h_2 dimension (Fig. 15B-4), tighten the nut temporarily and then make sure that the position of the lower arm is at the **H** dimension, (Fig. 15B-3)

If the above procedure does not produce the standard setting, make the adjustment by repositioning the adjusting arm on the serrated shaft, however, if the adjusting arm does not provide sufficient range of adjustment, readjust with the height adjusting bolt by turning 90° at a time until the **H** dimension is obtained. Turning the adjusting bolt 90° will provide 6 mm (0.236 in.) of adjustment at the tire position.

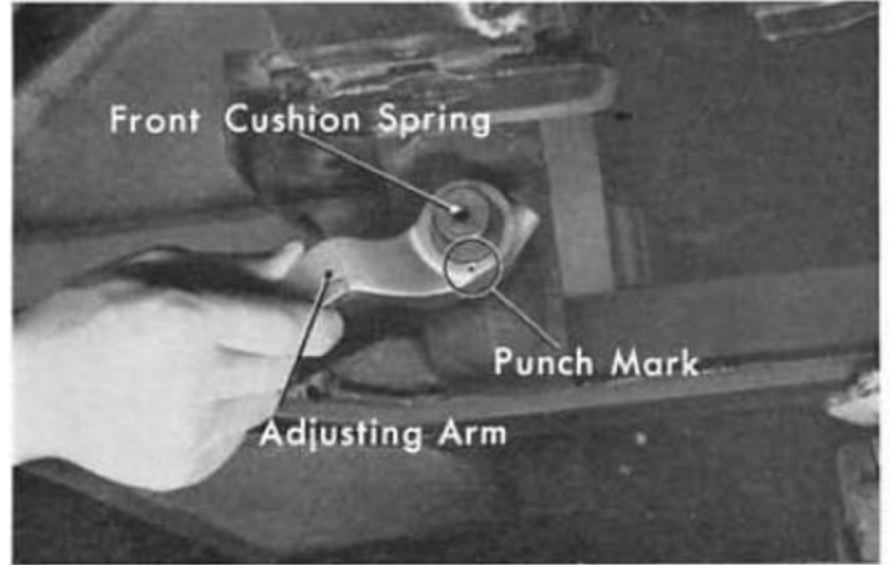


Fig. 15B-1

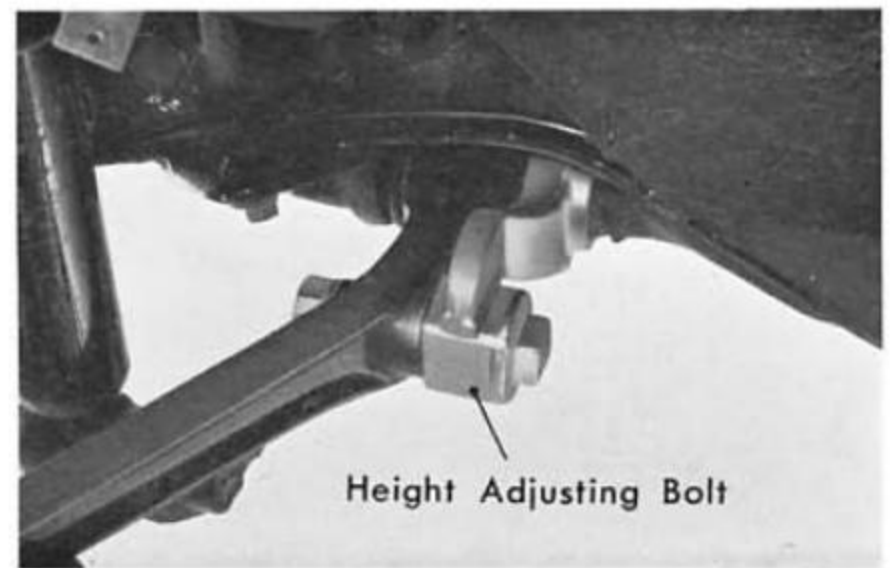


Fig. 15B-2

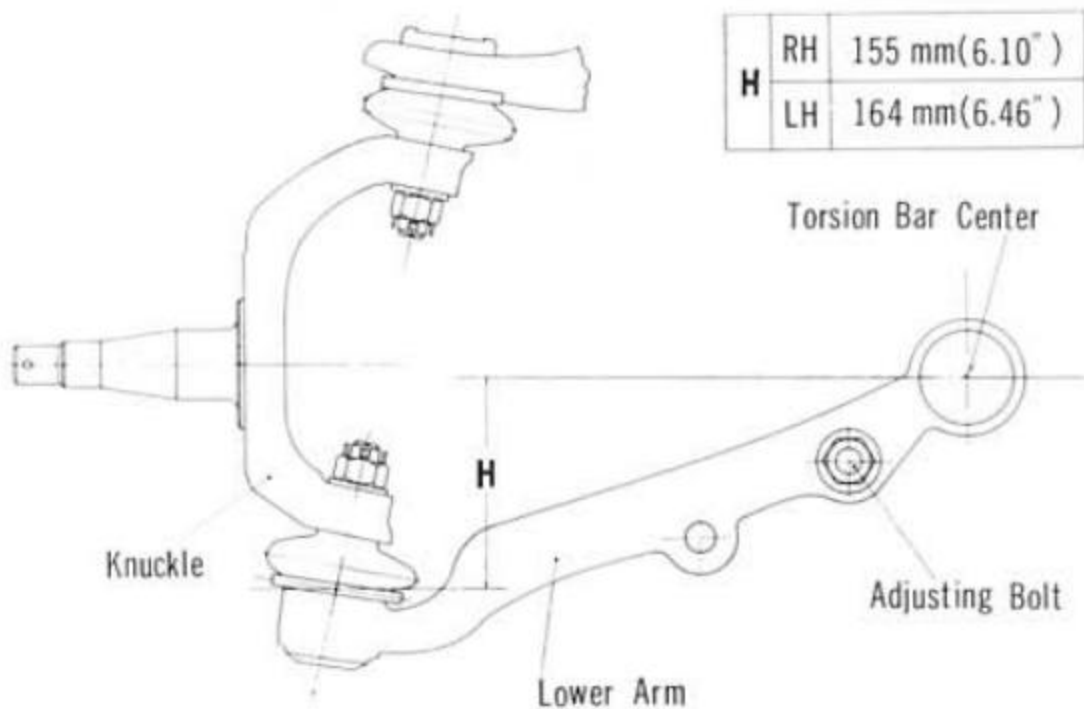


Fig. 15B-3

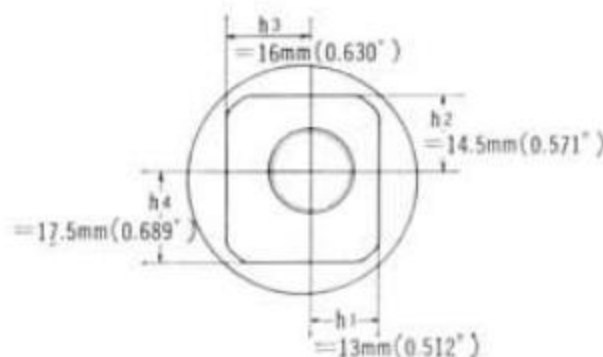


Fig. 15B-4

15-8 FRONT SUSPENSION

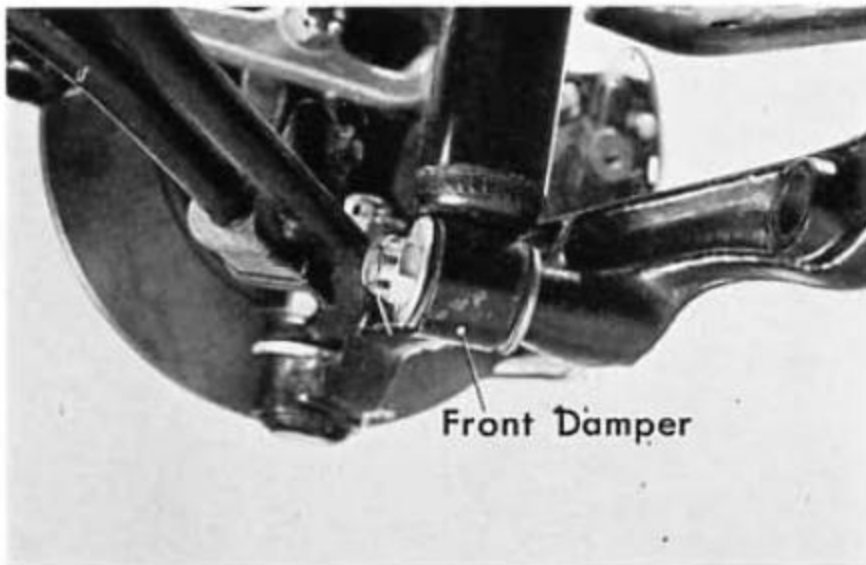


Fig. 15B-5

5. Assemble the front damper on the lower arm by installing the damper washer, nut and cotter pin (Fig. 15B-5).
Torque to 7.7 kg-m (55.7 ft-lbs) during installation.

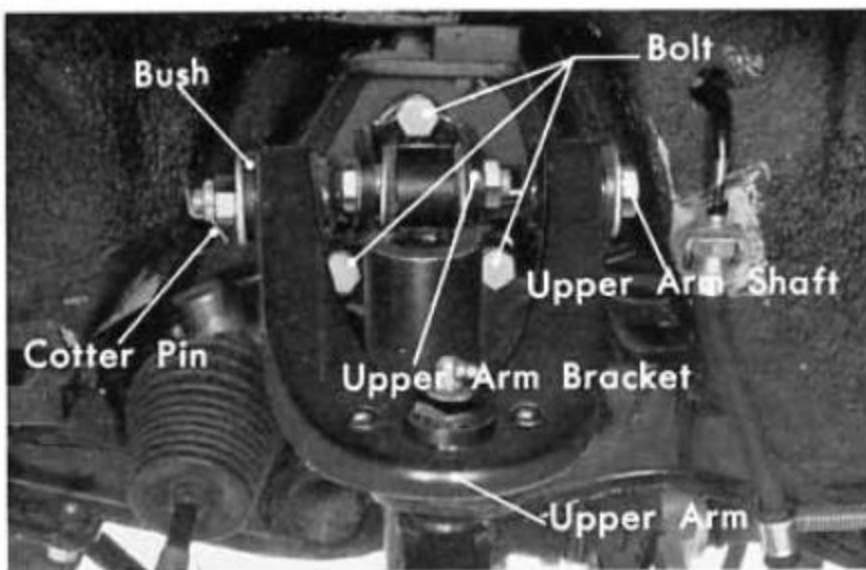


Fig. 15B-6

6. Assemble the upper arm bracket on the frame by tightening the bracket setting bolts (Fig. 15B-6).

Note :

Torque to 5.2 kg-m (37.6 ft-lbs).

7. After installation, further assemble the upper arm (Torque to 2.4 kg-m, 18 ft-lbs) and front damper on the bracket in the reverse order of disassembly.

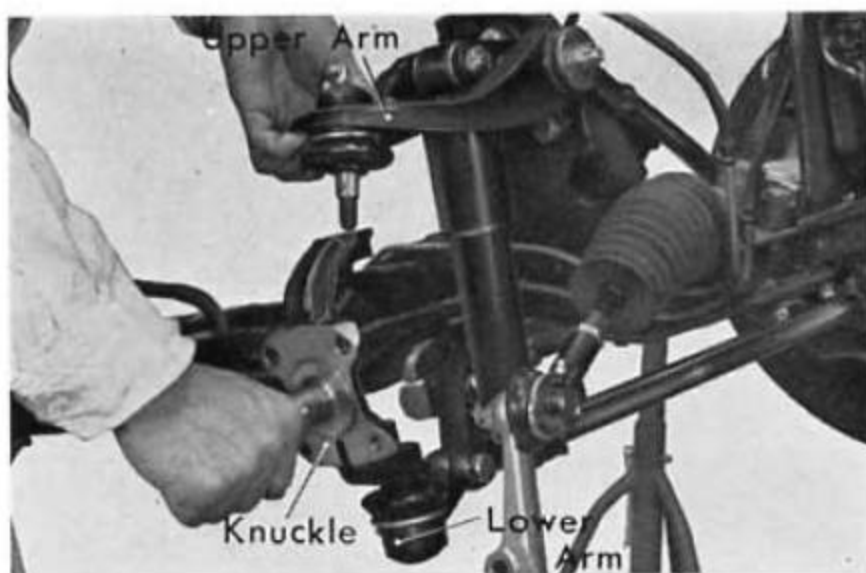


Fig. 15B-7

8. Install the knuckle on the upper arm and lower arm by tightening the slotted nuts and installing the cotter pins (Fig. 15B-7, 8).

When tightening the nuts, use the knuckle supporter to hold the knuckle as shown in the Fig. 15B-7. Torque to 6.5 kg-m (47.0 ft-lbs) during installation.

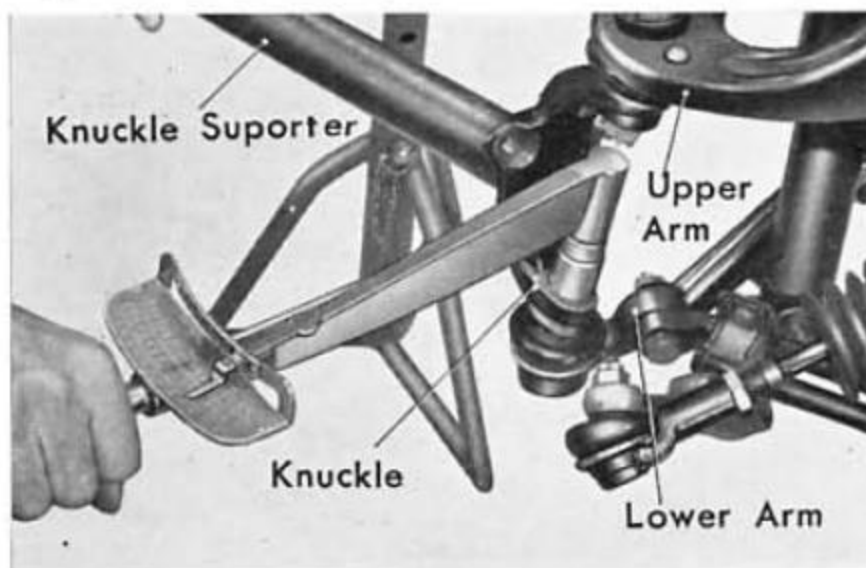


Fig. 15B-8

9. Install the knuckle arm on the knuckle with bolts, nuts and cotter pins.
Torque knuckle nuts to 5.5 kg-m (39.8 ft-lbs) and bracket bolts to 7.2 kg-m (52.1 ft-lbs) during installation (Fig. 15B-9, 10).

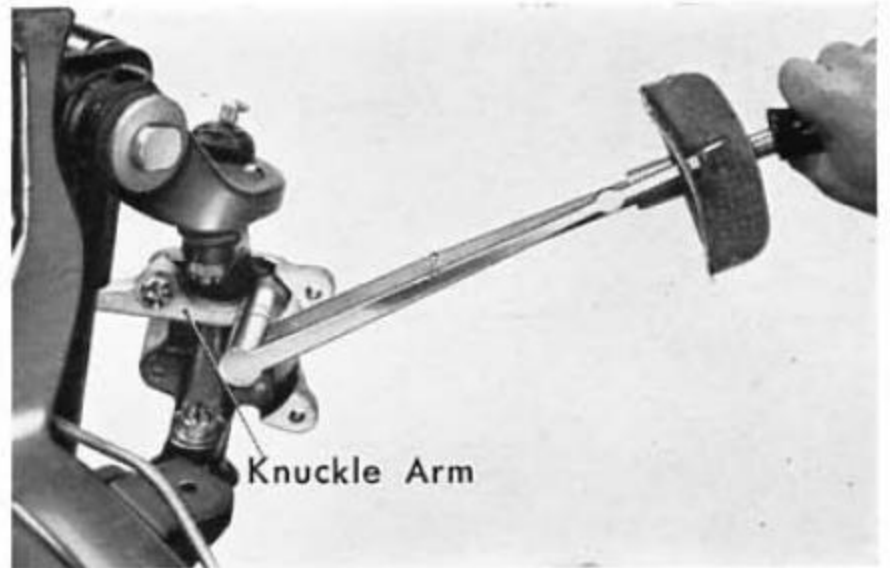


Fig. 15B-9

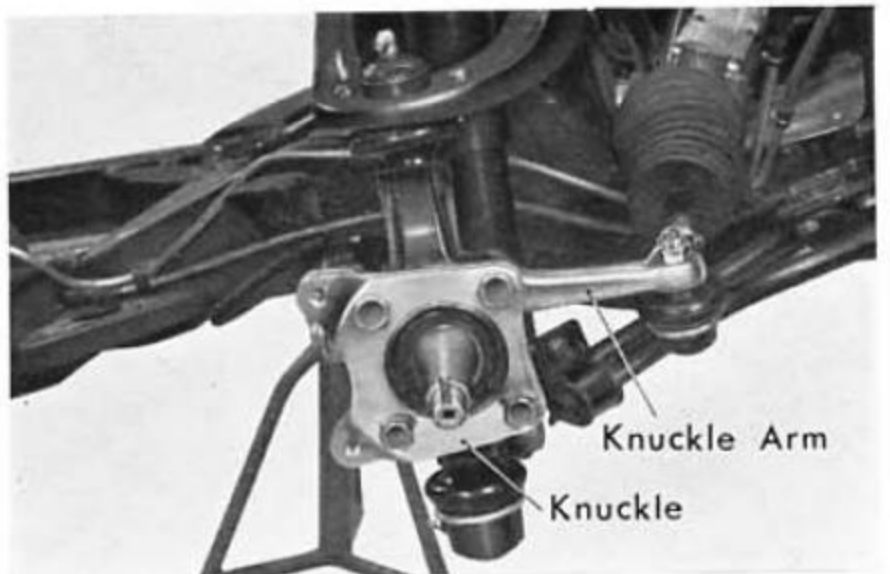


Fig. 15B-10

C. INSPECTION AND ADJUSTMENT

1. Toe-in

Perform the toe-in inspection in the following manner. Set up the toe-in gauge and mark the center of the wheel with a chalk from the front, turn the wheel 180° and measure the location of the chalk mark with toe-in gauge (Fig. 15C-1).



Fig. 15C-1

If there is a difference between the measurement of the chalk mark at the front and rear in the toe-in value, perform the adjustment by loosening the tie-rod lock nut and screwing the tie-rod into the tie-rod end to increase the toe-in and screwing the tie-rod out to decrease the toe-in (Fig. 15C-2). In the same manner, adjust both the right and left tie-rods.

Standard value: 2~4 mm (0.114~0.122").

Note :

The Fig. 15C-2 shows tie-rod adjustment for the right wheel, the left wheel is performed in the similar but opposite manner.

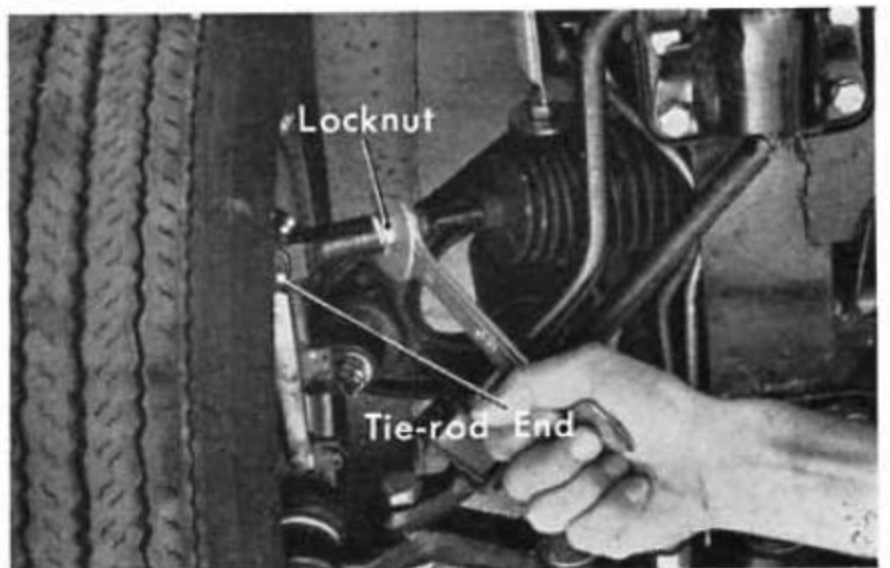


Fig. 15C-2



Fig. 15C-3

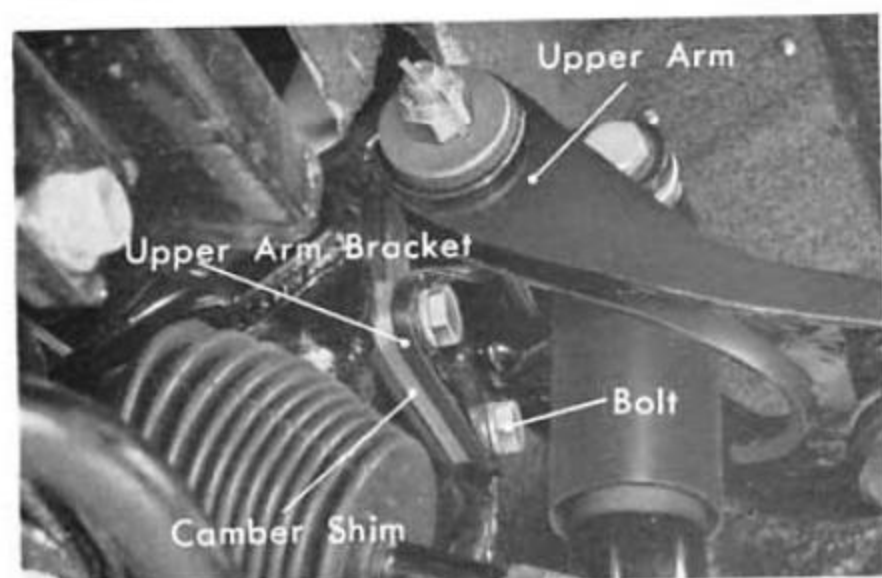


Fig. 15C-4

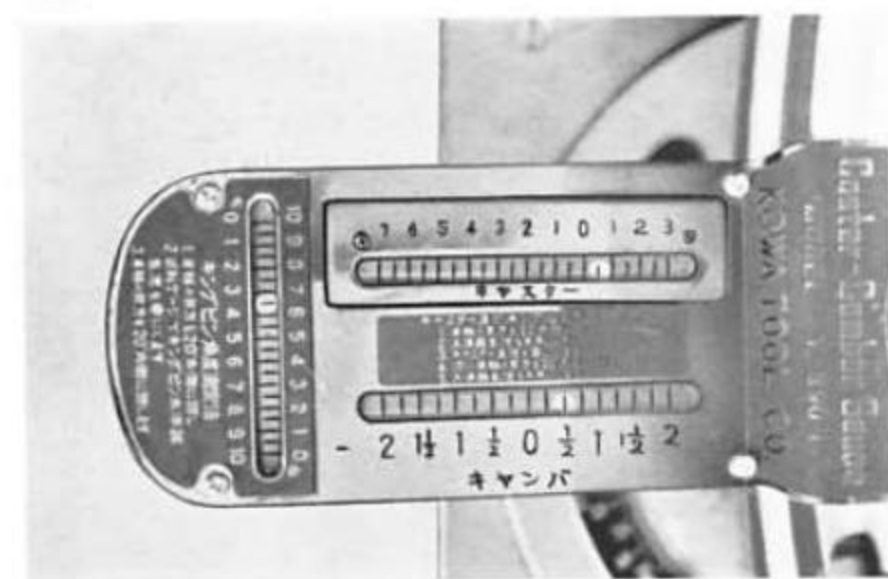


Fig. 15C-5

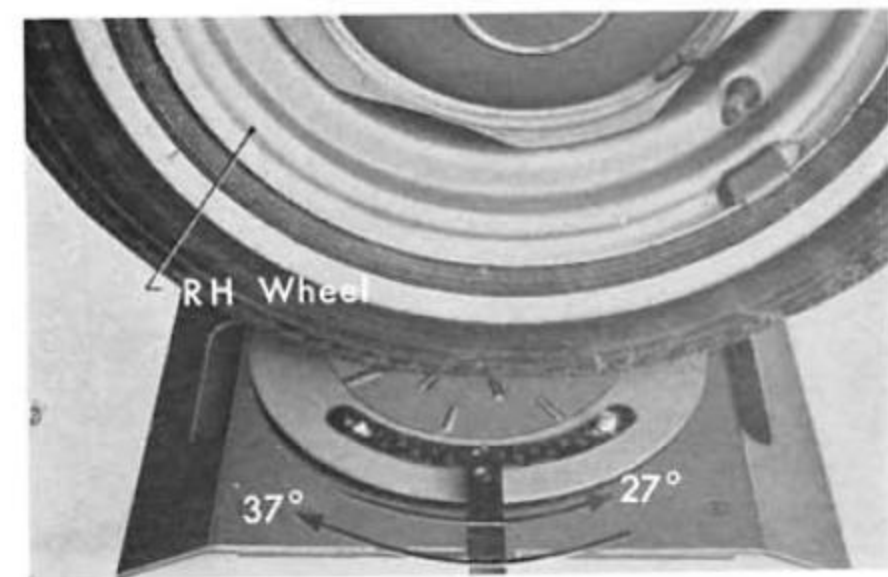


Fig. 15C-6

2. Camber

Perform the camber inspection by setting up in the same manner as for the caster inspection.

Level the alignment gauge in the fore and aft direction and set the bubble in the gauge to "O" (Fig. 15C-3).

Record the indication on the camber gauge.

Perform the adjustment by loosening upper arm bracket setting bolts and installing or removing shims from behind the upper arm bracket (Fig. 15C-4).

Inserting the shim will increase the camber and removing the shim will decrease the camber.

Standard value: $1^{\circ}25' \sim 1^{\circ}35'$.

3. Kingpin Inclination

Perform the inspection in the same manner as for the caster inspection, except the inclination is read off the bubble on the kingpin inclination scale.

The adjustment is performed in the same manner as for the caster adjustment (Fig. 15C-5).

Standard value: $6^{\circ} \sim 7^{\circ}$

4. Steering Angle

To perform the steering angle inspection, make the set-up as for the caster inspection.

Record the indications on the radius turning gauge when the steering wheel is turned completely to the right and to the left locks (Fig. 15C-6).

The total steering angle cannot be adjusted, however, the uniform distribution of the steering angle to both right and left can be made by changing the locking position of the steering gear box, adjustment can be made at the tie-rod.

Standard value are:

$34^{\circ} \sim 36^{\circ}$ Inner wheel (right)
 $26^{\circ} \sim 28^{\circ}$ Outer wheel (left)

When steering wheel is turned to the right.

Note:

When the steering wheel is turned to the left, the values are the same but changed between right and left.

5. Side Slip

Perform the inspection in the following manner after completion of the alignment test. Position the wheels straight forward and set the side slip tester in parallel. Pass the wheel over the center of the tester and record the indication of tester (Fig. 15C-7, 8).

Only one person shall ride in the vehicle during the test.

If the result of the test is not within specified limits, reperform the alignment.

Standard value : 5 m/1000 m or 5 mm/1 m

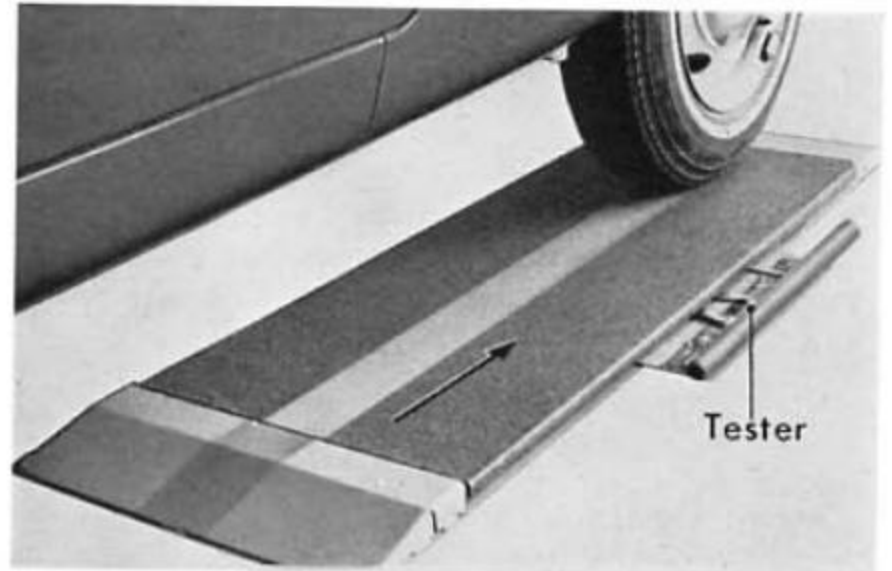


Fig. 15C-7

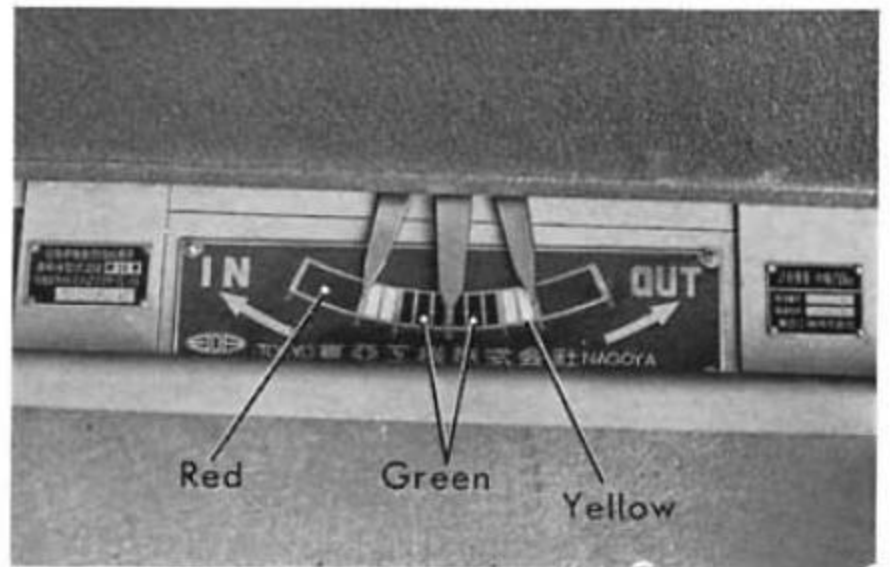


Fig. 15C-8

6. Wheel Run-Out

Check the run-out of the wheel by placing a dial gauge against the side of the rim (Fig. 15C-9).

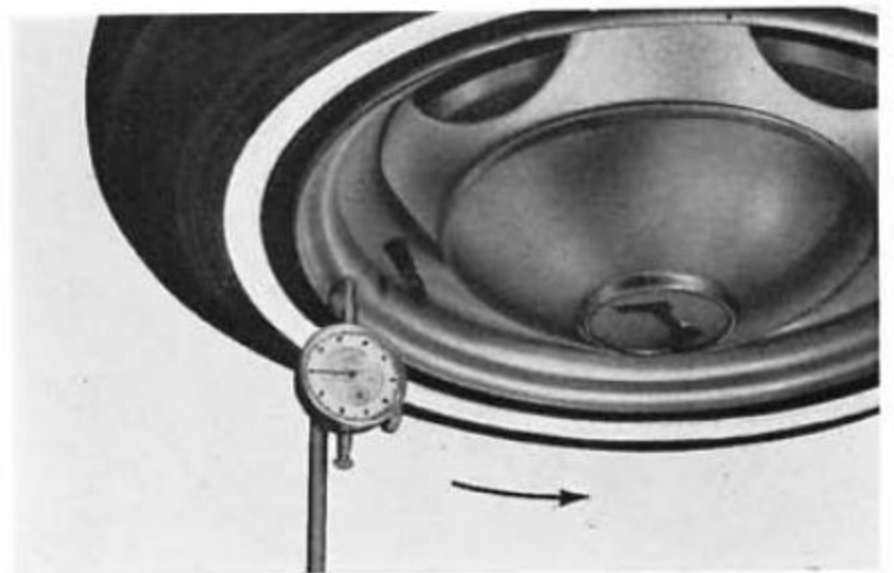


Fig. 15C-9

7. Wheel Balancing

Check the wheel dynamic balance with wheel balance. When the wheel is out of balance, attach and adjust the weights on both sides of the chalk mark so that the wheel will stop in any position when rotated (Fig. 15C-10).

Dynamic balancing weight at the wheel rim should be less than 30 g (1.05 oz.).



Fig. 15C-10

15-12 FRONT SUSPENSION

M E M O

16. REAR SUSPENSION

For the semi-floating, banjo type axle, the coil spring containing the cylindrical shock absorber is used. The axle movement in longitudinal direction is controlled by 2 radius rods, one each on right and left. The lateral movement of the axle is controlled by Panhard rod provided between the frame and axle. Thus, high stability in driving is achieved for quick speed reduction and acceleration, slalom driving, cornering, etc.

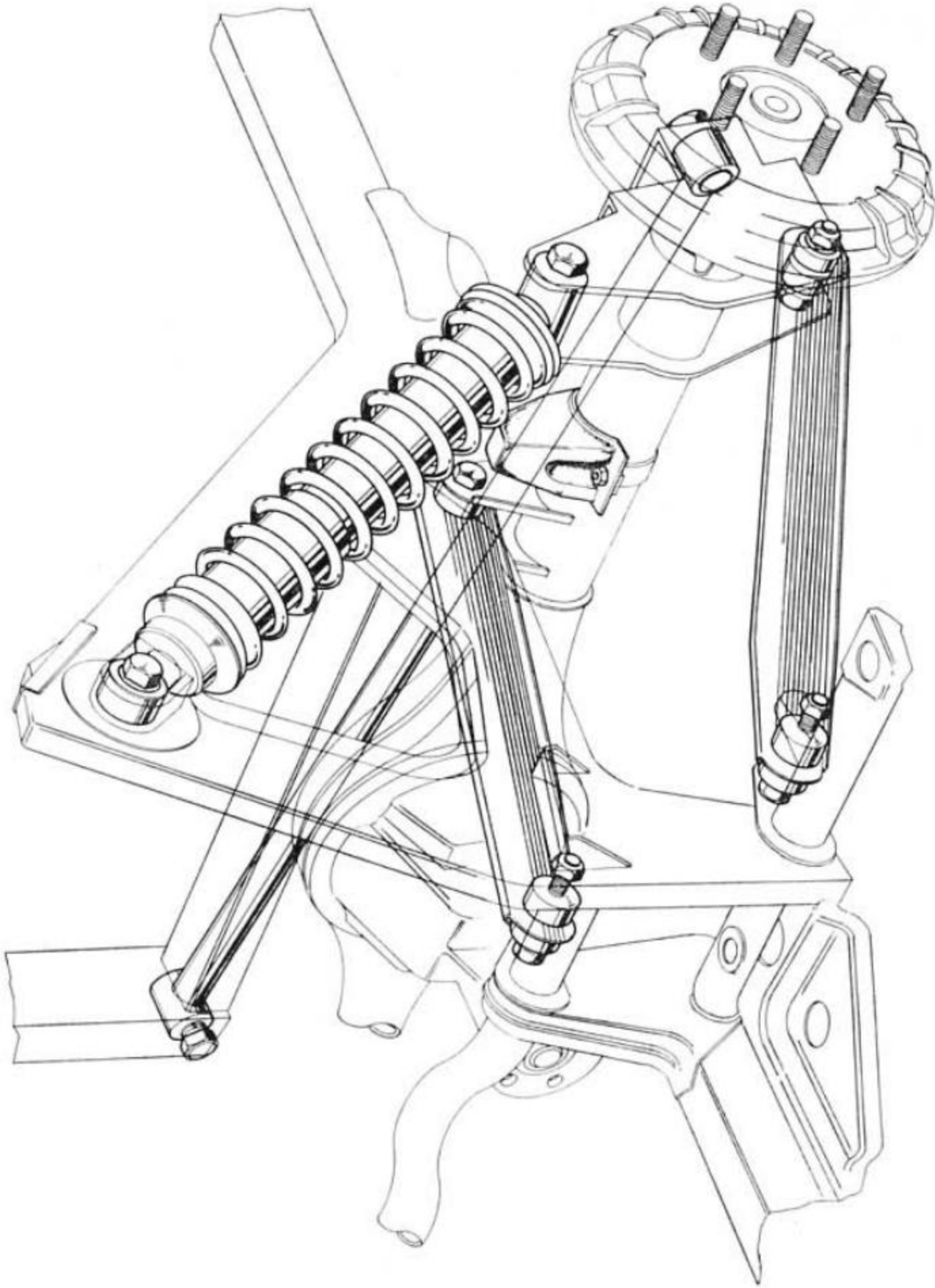


Fig. 16-1

16-2 REAR SUSPENSION

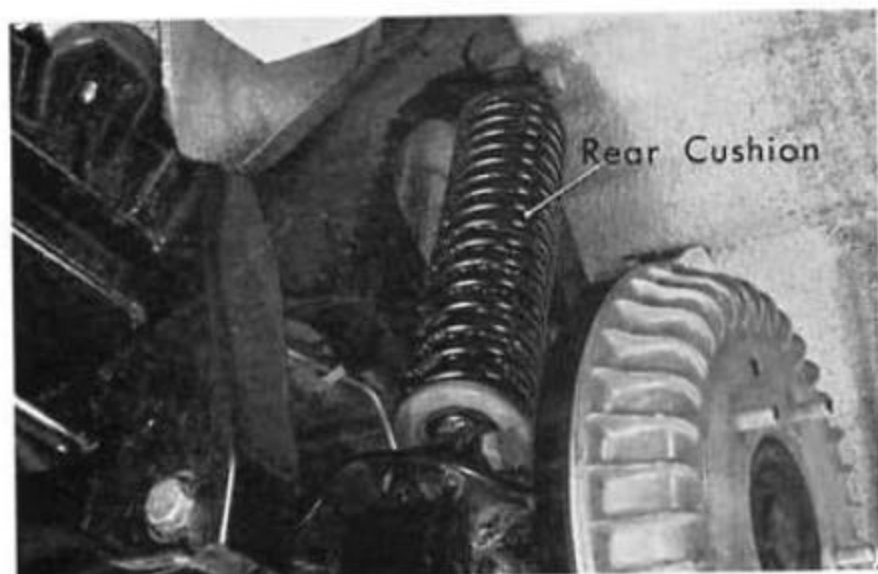


Fig. 16A-1

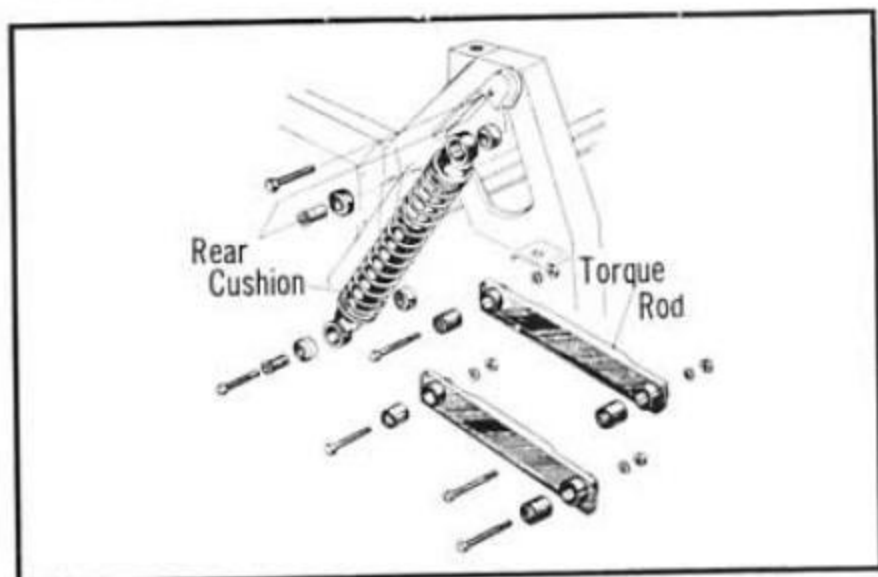


Fig. 16A-2

A. REMOVAL AND INSTALLATION

1. Remove wheel cap and hub nuts.
2. Support the vehicle on the rigid racks.
3. Remove the rear wheel from the brake drum.
4. Disconnect brake pipe from the connecting rod.
5. Remove the rear cushion from the frame (Fig. 16A-1).

Note :

Support the rear axle housing before removing the bolts.

6. Remove the torque rods and Panhard rod by removing the setting bolts, refer to the item 8-B. **Differential Removal** on page 8-4.
7. Install the rear suspension in the reverse order of the disassembly.

8. Rear Suspension Mounting Bolts

Torque the bolts to 7.2 kg-m (51.8 ft-lbs).

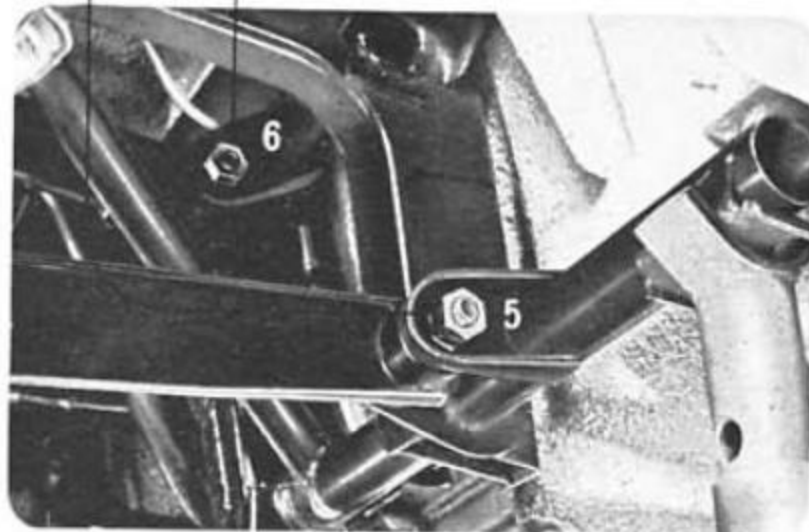
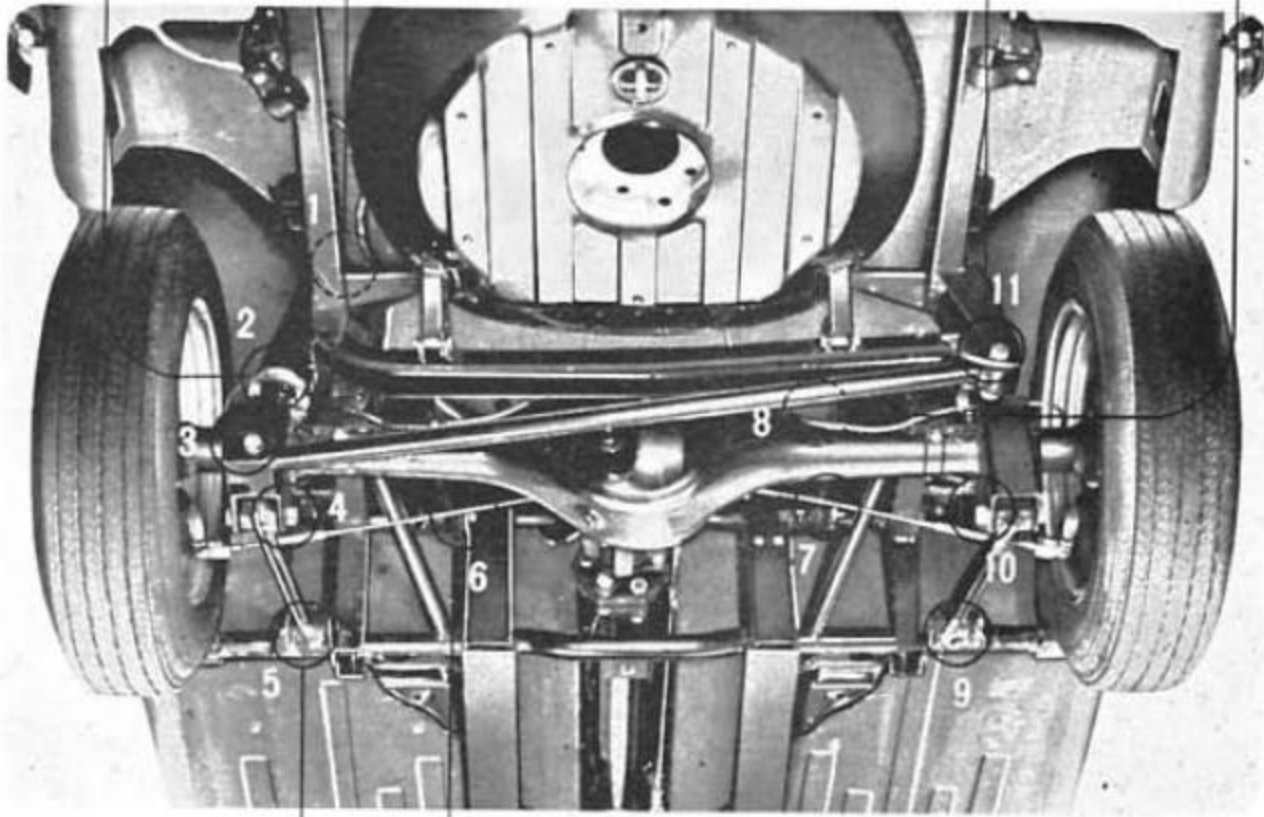
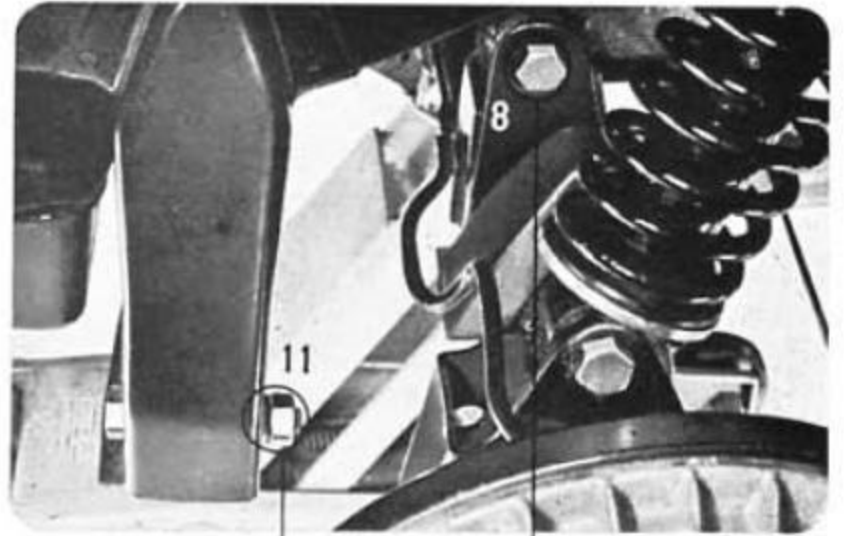
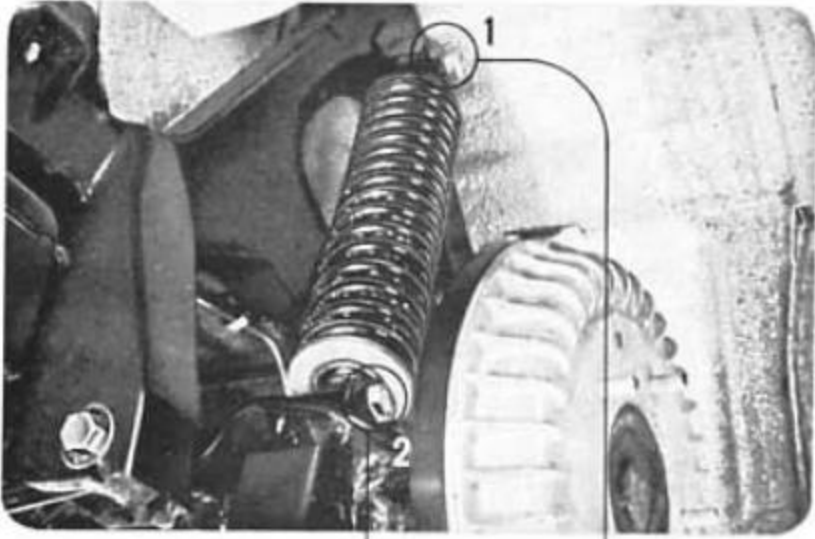


Fig. 16A-3

16-4 REAR SUSPENSION

M E M O

17. BODY

A. REMOVAL BODY

1. Detach the bonnet cover at the hinge by removing the hinge pins (Fig. 17A-1).
2. Disconnect the cables, loosen the and tie-downs and remove the battery (Fig. 17A-2).
3. Drain both brake and clutch fluid.
4. Disconnect the starter cable at the magnetic switch (Fig. 17A-3).
5. Disconnect the primary coil cord at the distributor.
6. Disconnect the temperature gauge cord at the gauge unit.
7. Disengage the high tension cord at the ignition coil.
8. Disassemble the tachometer cable at the engine (Fig. 17A-4.)
9. Disconnect the fuel feed pipe at the fuel pump.
10. Disengage the choke and throttle cable, and remove air cleaner cover from the carburettor.
11. Disconnect fuel feed pipe from the carburettor.
12. Detach the radiator from the frame.
13. Remove the air cleaner element from the air cleaner unit.
14. Disengage the A. C. dynamo leads from the wire harness.
15. Disengage the speedometer cable at the transmission.
16. Separate the oil gauge and filter pipe from the body.
17. Detach the clutch hydraulic hose from the body.

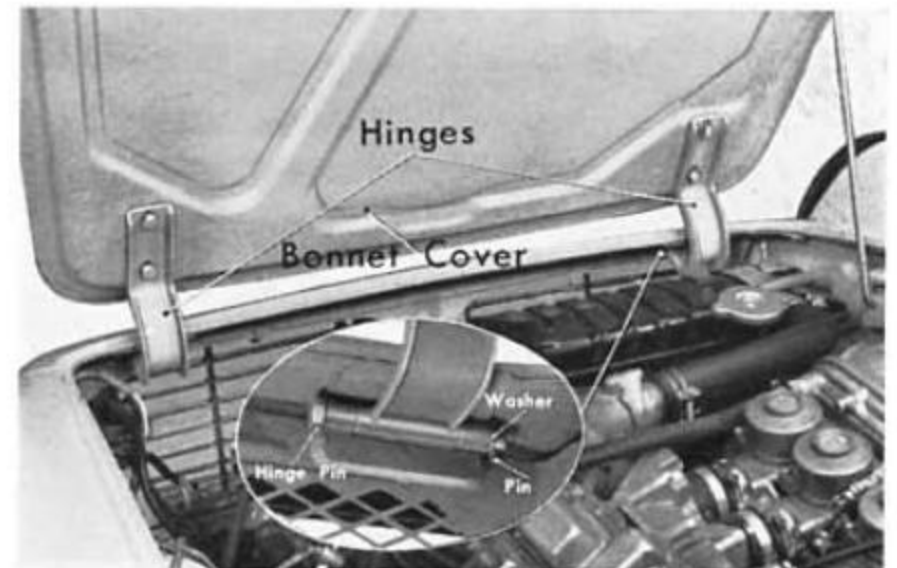


Fig. 17A-1.

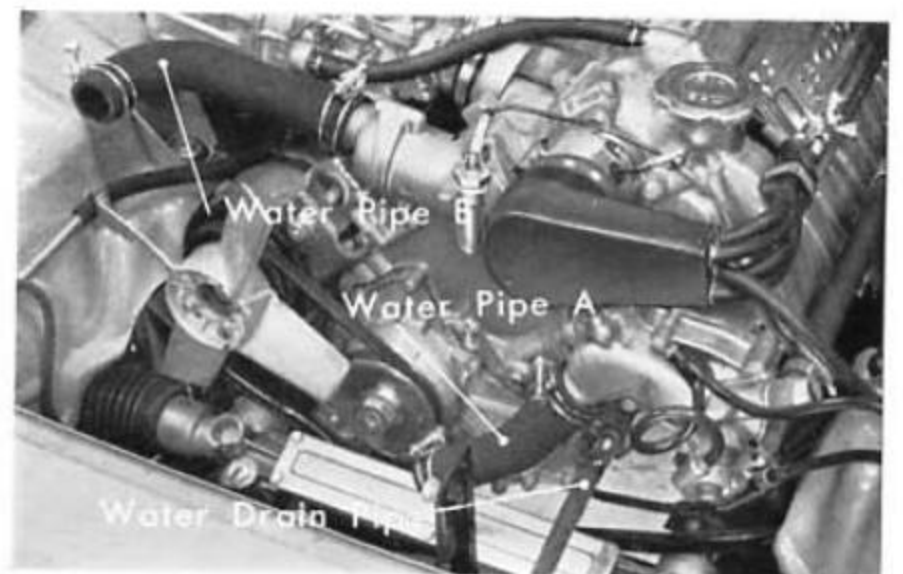


Fig. 17A-2

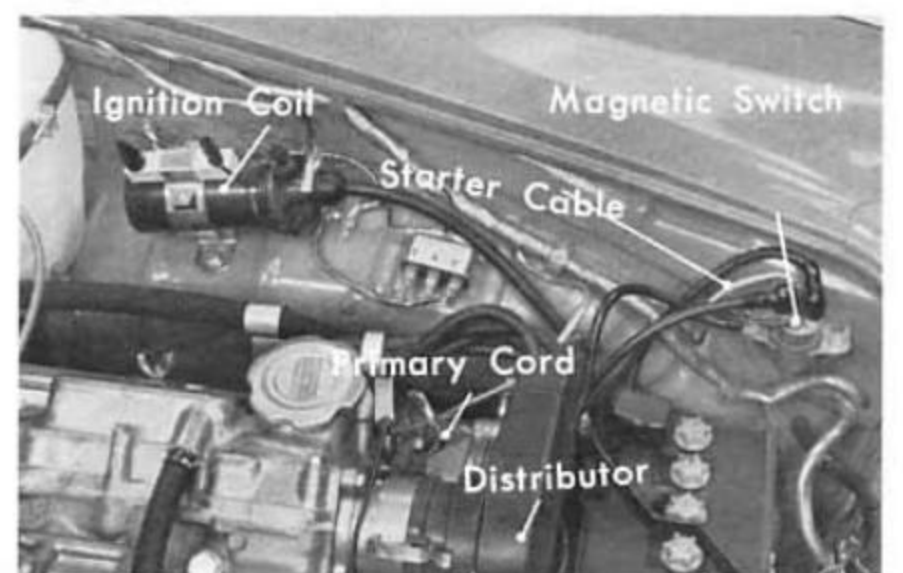


Fig. 17A-3.

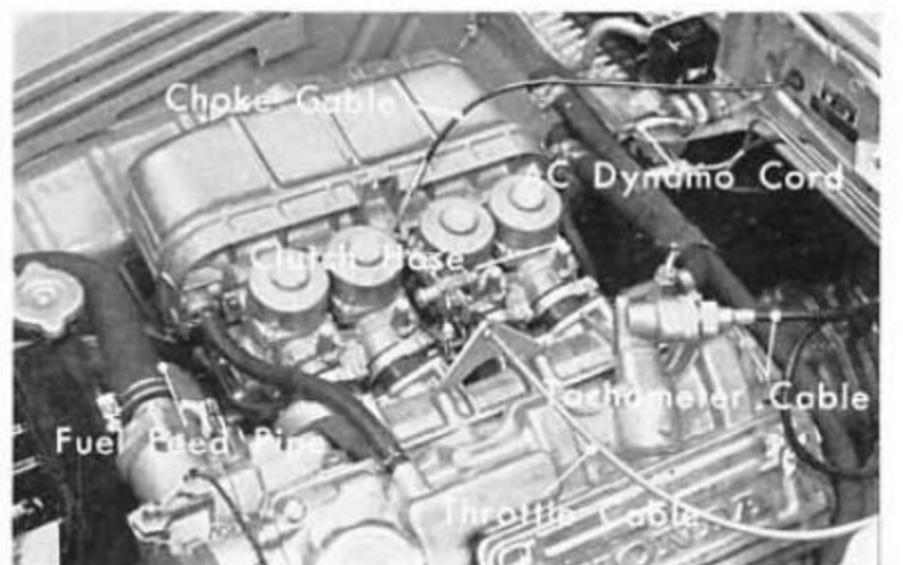


Fig. 17A-4.

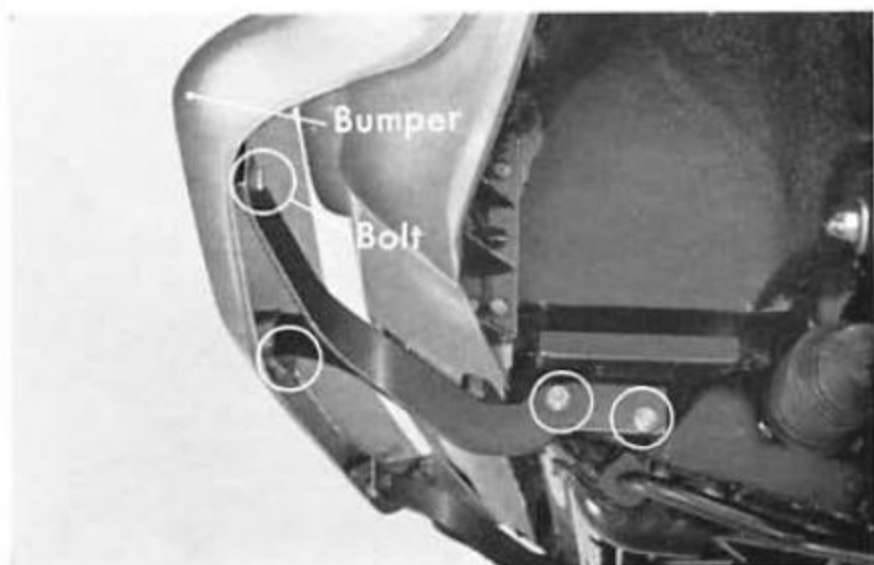


Fig. 17A-5

18. Remove the front bumper setting nuts, washers and separate the front bumper from the bumper bracket. Further disassembly of the front bumper can be made by removing the bolts to separate each bracket from the front bumper (Fig. 17A-5).

19. Remove the bolts to separate the front bumper bracket from the frame.



Fig. 17A-6

20. Detach and remove the steering column from the body (Fig. 17A-6).

21. Detach the exhaust pipe from the frame.

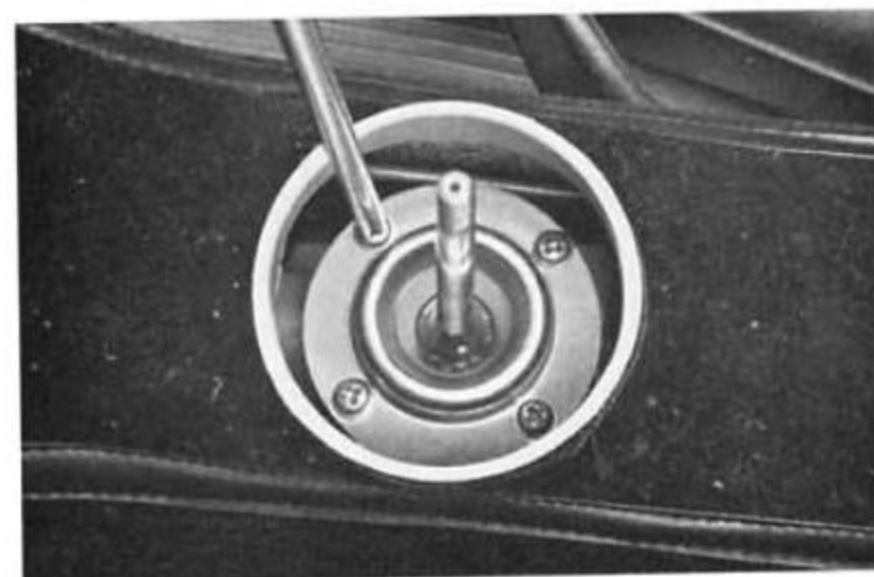


Fig. 17A-7

22. Unscrew gear shift lever knob, remove shift lever boot and disassemble the change lever from the body (Fig. 17A-7).

23. Remove the bolts A and B in the trunk (Fig. 17A-8).

Note :

Torque to 2.4 kg-m (17.4 ft-lbs) during assembly.

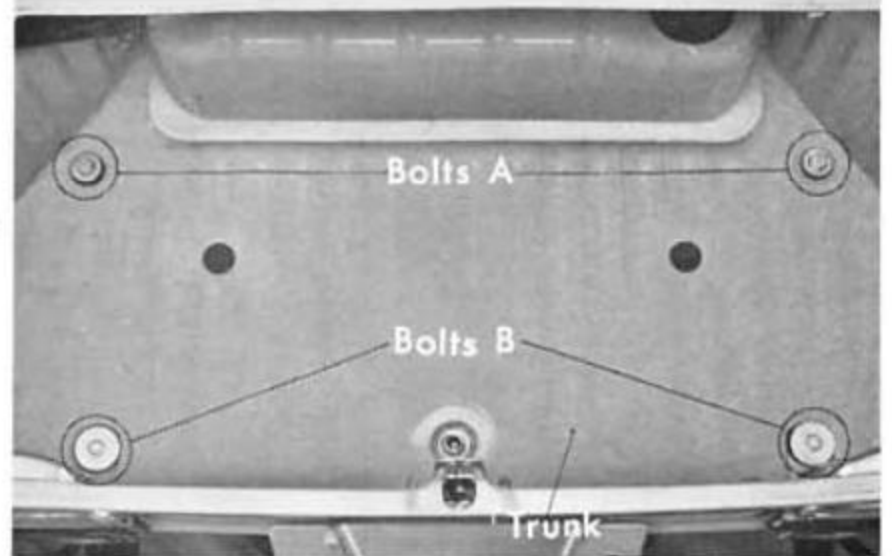


Fig. 17A-8.

24. Remove the cotter pins and pull out the hinge pins from the spare tire pan hinge. (Fig. 17A-9)

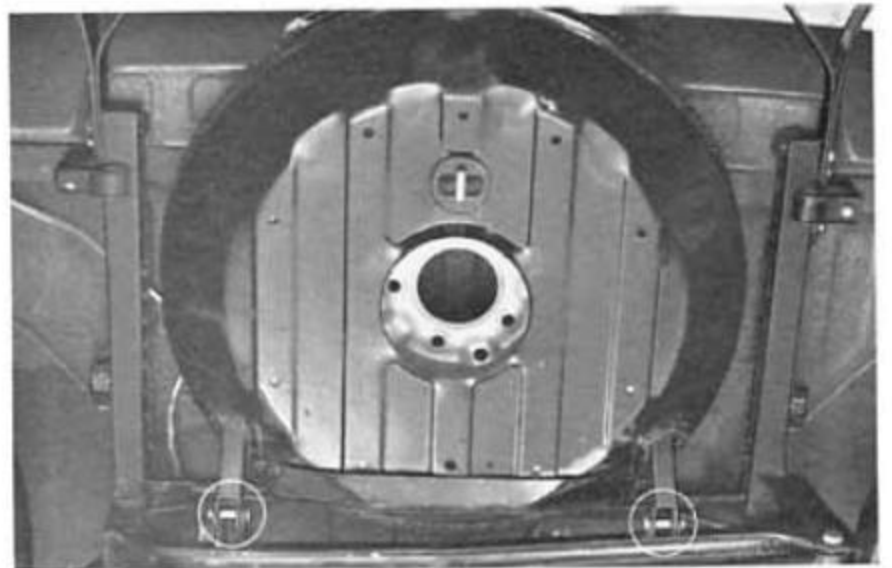


Fig. 17A-9

25. Separate the handbrake wire and brake hose by removing the lock nut and brake hose nut. (Fig. 17A-10)

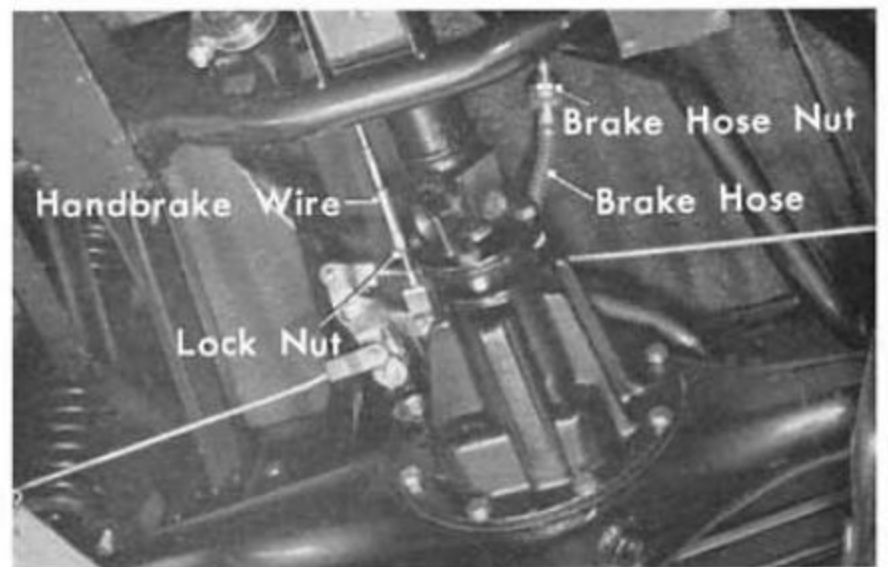


Fig. 17A-10.

26. Drain fuel by removing the fuel drain plug and separate the fuel pipe from the fuel tank by removing the fuel pipe bolt (Fig. 17A-11).

27. Remove the fuel tank from the cockpit.
Refer to the item 3. FUEL SYSTEM on page 3-1.

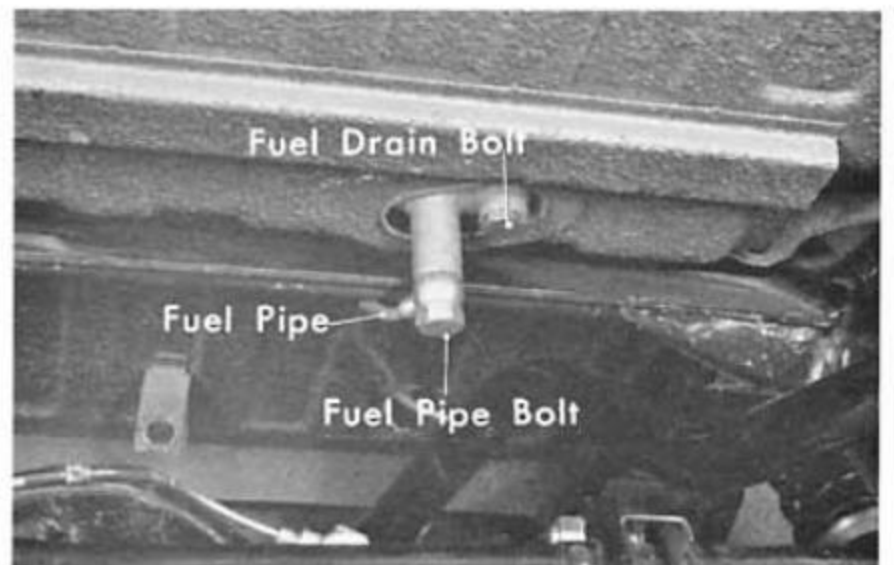


Fig. 17A-11.

17-4 BODY

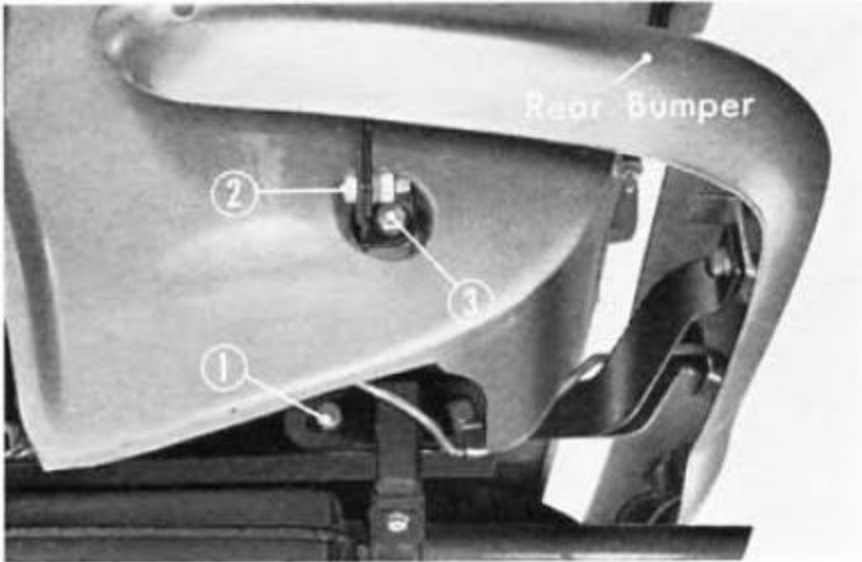


Fig. 17A-12

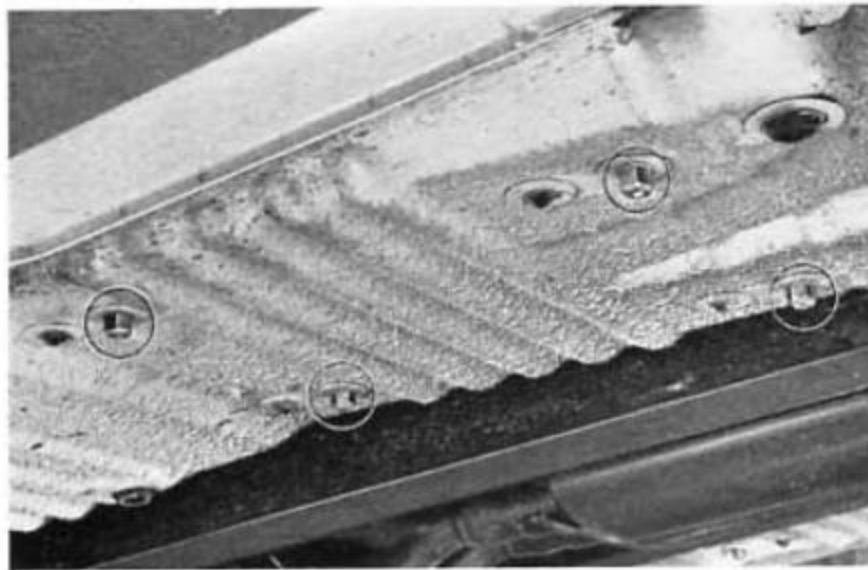


Fig. 17A-13

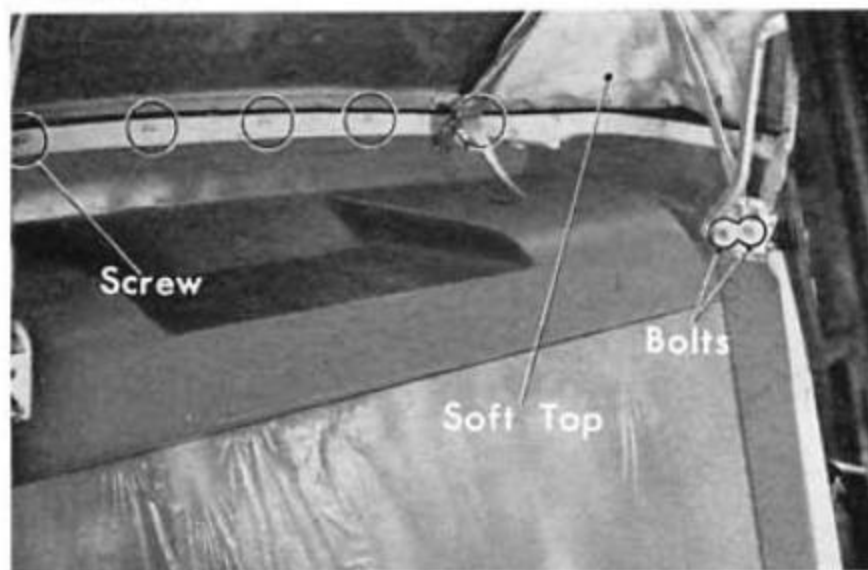


Fig. 17A-14

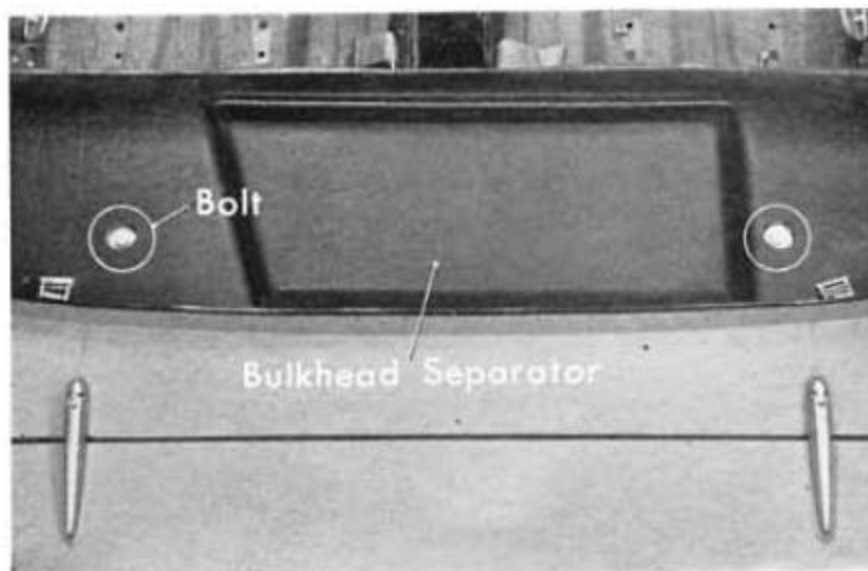


Fig. 17A-15

28. Disassemble the rear bumper by removing the bolts ①, ②, ③ in the numbered sequence (Fig. 17A-12).

29. Disassemble the seats by remove the seat fitting nuts and washers (Fig. 17A-13).

30. Disassemble the soft top by removing the screws and bolts (Fig. 17A-14).

31. Disassemble the bulkhead separator by removing the bolts (Fig. 17A-15).

32. Remove the body mounting bolts A, B, and then remove the body rubber mounts. (Fig. 17A-16)

Note :

Torque bolts A to 2.5 kg-m (18.1 ft-lbs) and B to 4.5 kg-m (32.5 ft-lbs).

33. Work can be facilitated by the use of the rigid racks.

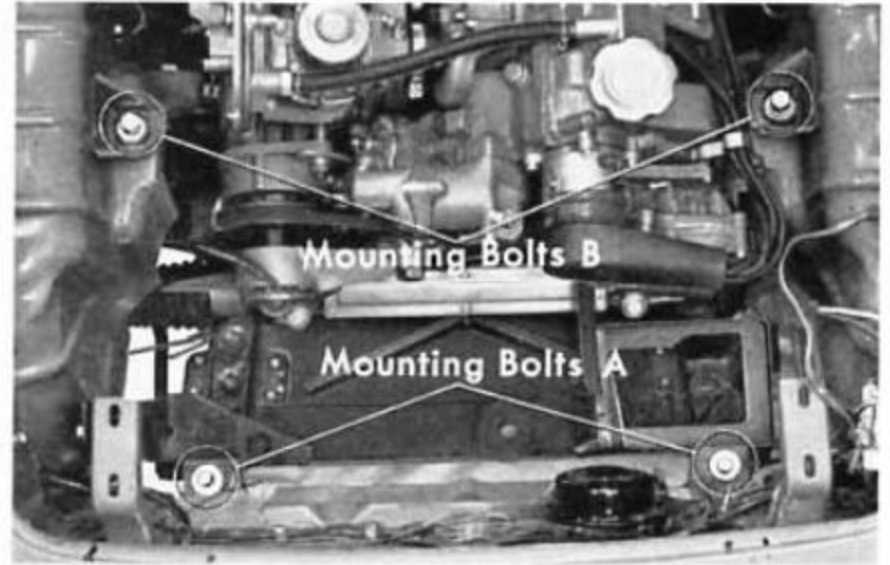


Fig. 17A-16

34. Remove the body mounting bolts, washers and rubber body mounts (Fig. 17A-17).

Note :

Torque to 4.5 kg-m (32.5 ft-lbs) during assembly.

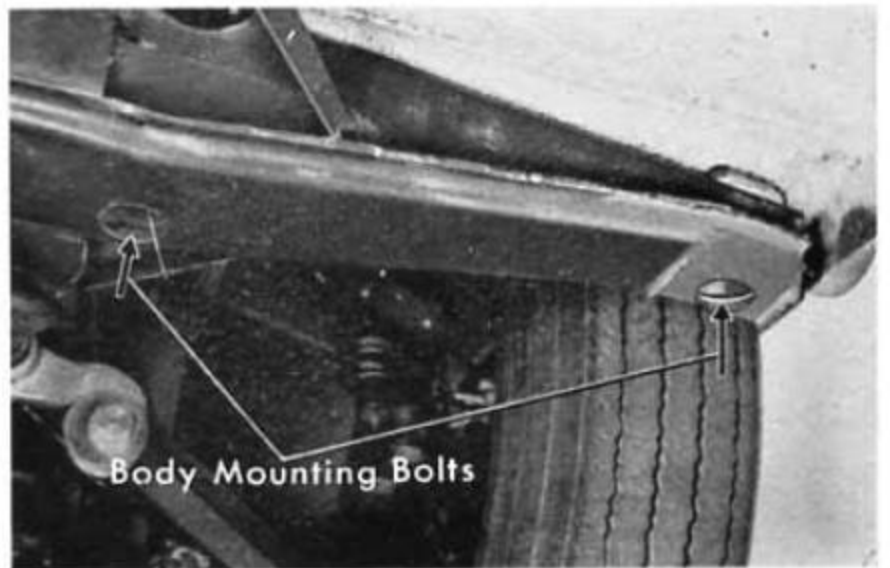


Fig. 17A-17

35. Remove the body mounting bolts, washers and rubber body mounts (Fig. 17A-18).

Note :

Torque to 2.5 kg-m (18.1 ft-lbs) during assembly.

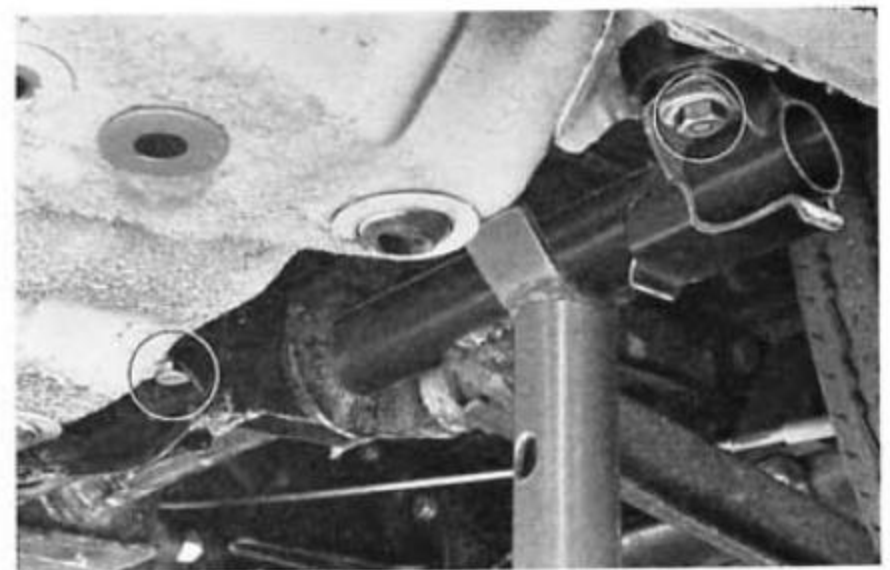


Fig. 17A-18

36. Remove the nuts, body mounting bolts, washers and rubber mounts (Fig. 17A-19).

Note :

Torque to 4.5 kg-m (32.5 ft-lbs) during assembly.

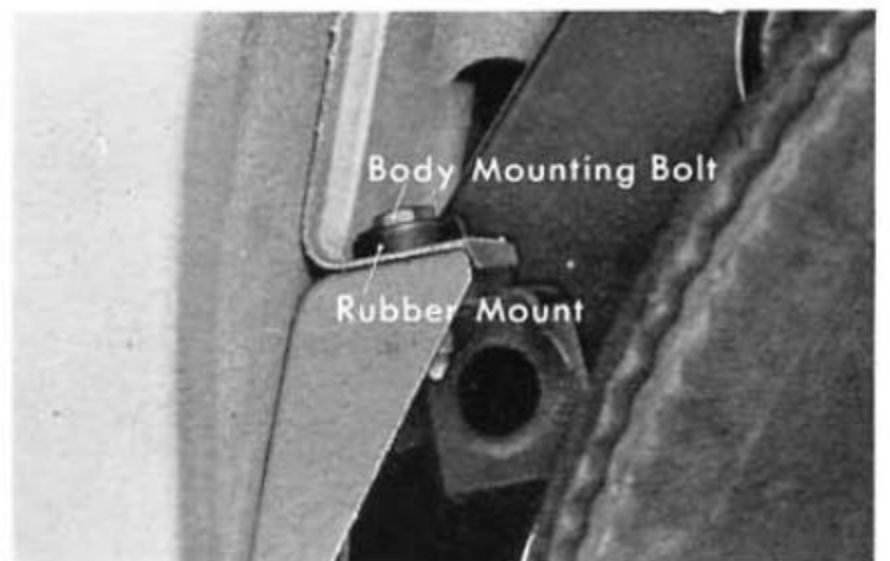


Fig. 17A-19



Fig. 17A-20

37. Use a rope as a sling and attach it to the front end and the hood bracket, and lift up with a hoist.

After the body is suspended, check under the body to make sure that the body is completely separated from the frame and that no parts are being overstressed. (Fig. 17A-20)

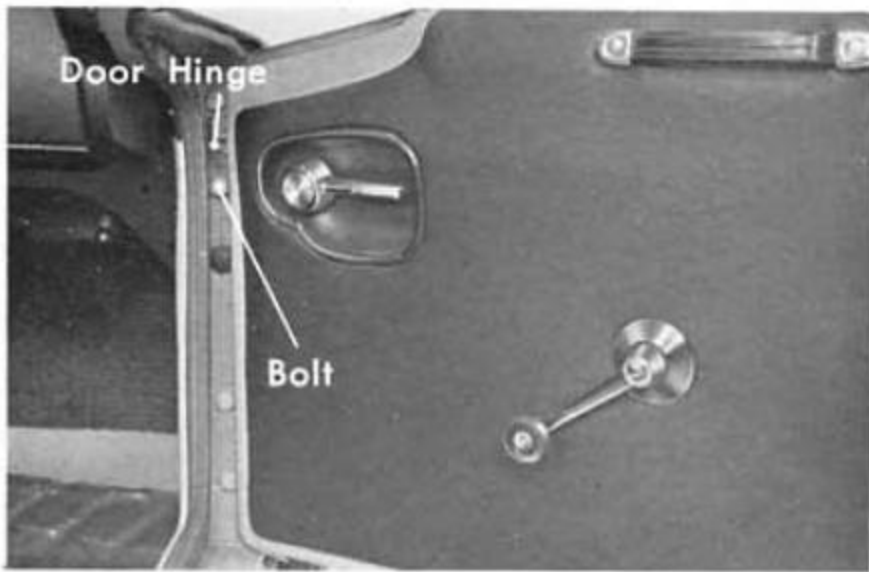


Fig. 17B-1

B. DOOR REMOVAL

1. Separate the door from the body by removing the bolts (Fig. 17B-1).

Note: Support the door during removal.

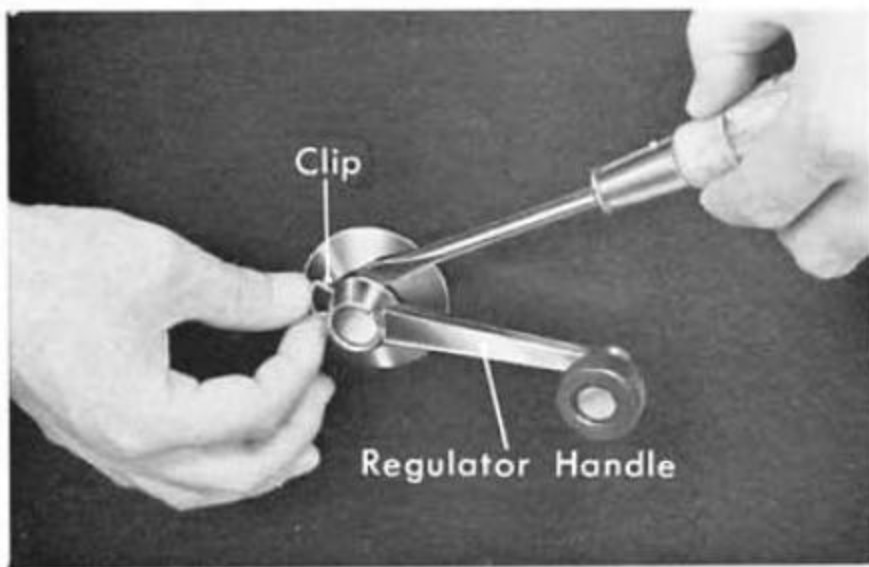


Fig. 17B-2

2. To remove the regulator handle, push back the escutcheon and pull out the clip, regulator handle and escutcheon from the door assembly (Fig. 17B-2).
3. Remove the inside door handle in the same manner as the regulator handle.
4. Remove the pull handle by removing the mounting screws.

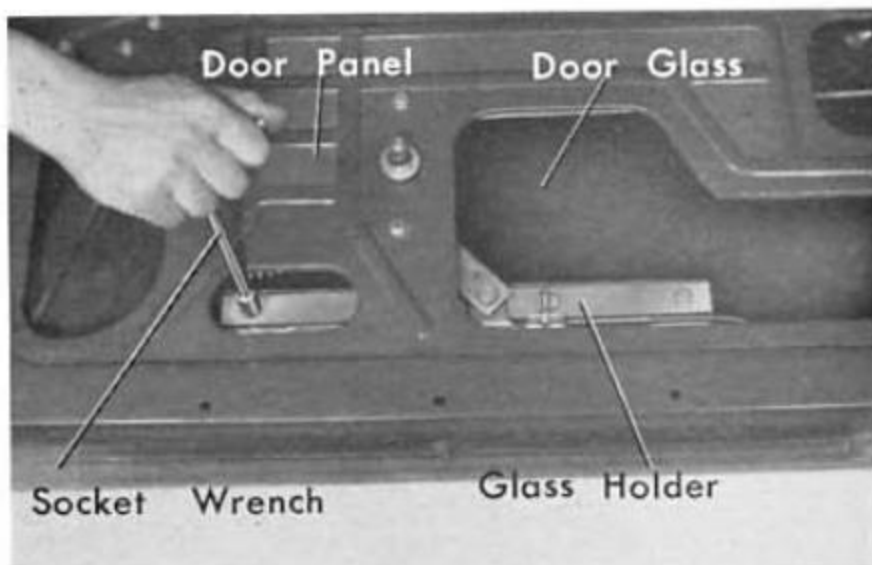


Fig. 17B-3

5. Insert a screwdriver between the door panel and the door lining and separate the lining together with the door weather strip inner by prying loose the lining clips from the door panel.
6. Pull the door glass out the top after removing the bolts attaching the door glass holder from the door glass (Fig. 17B-3).

7. Remove the door mold from the door outer panel by unscrewing the nut at the rear of the mold (Fig. 17B-4).
8. Remove the weather strip outer from the door panel.

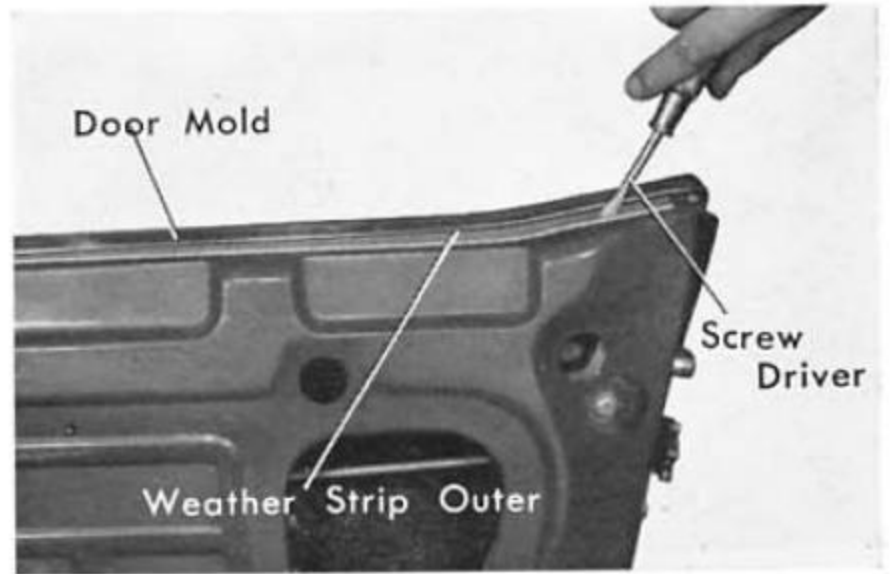


Fig. 17B-4

9. Remove the front door sash by unscrewing the bolts (Fig. 17B-5).
10. Remove the rear door sash in the same manner as the front door sash.
11. Remove the bolts attaching the regulator assembly to the door panel and slide out the window regulator.

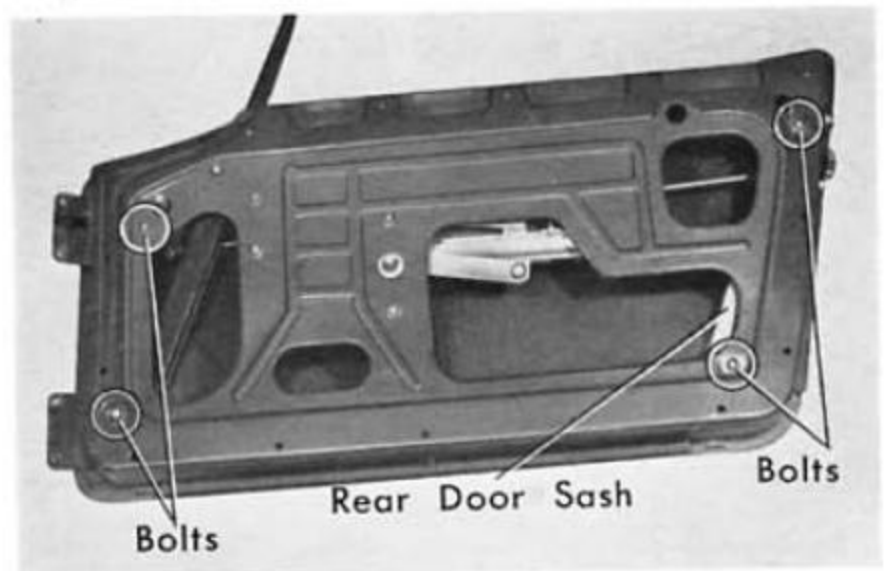


Fig. 17B-5

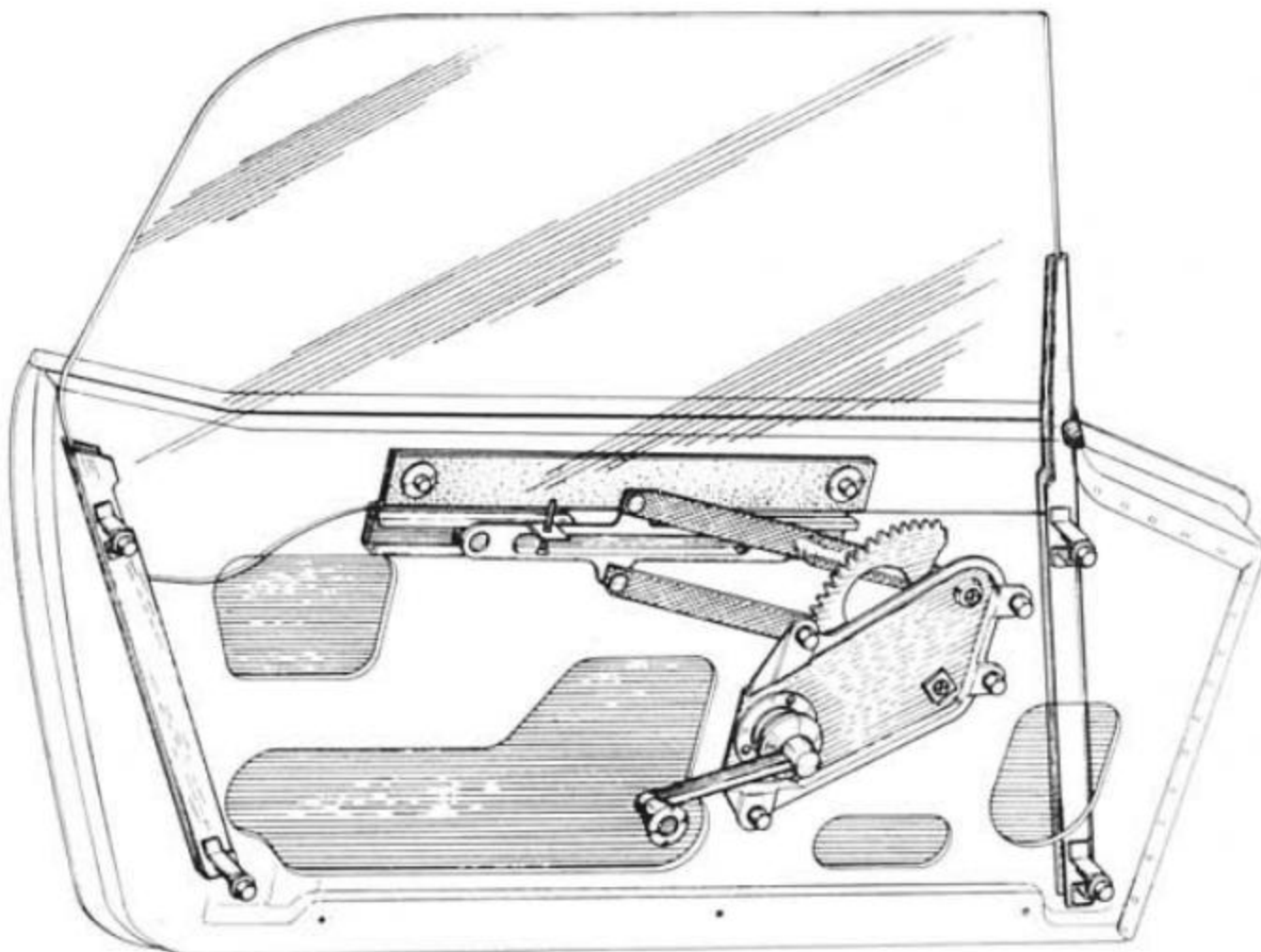


Fig. 17B-6

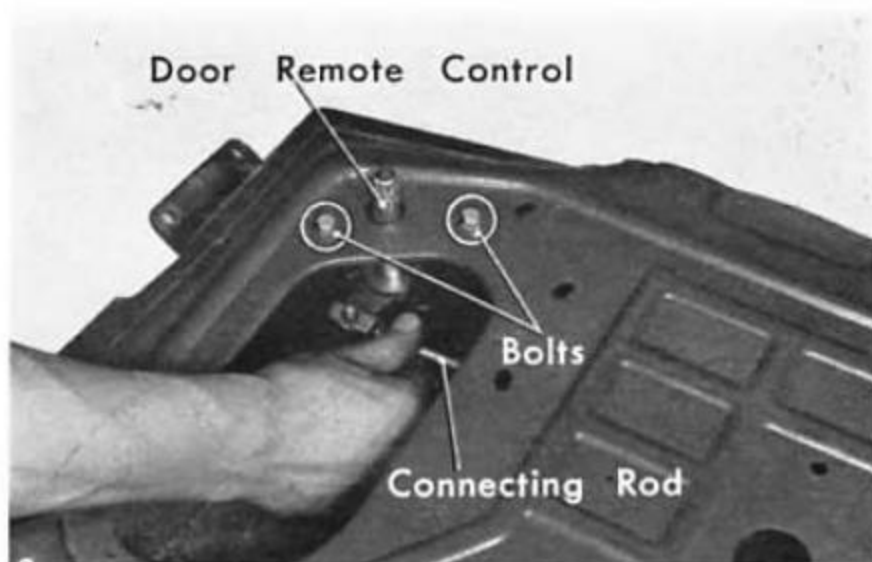


Fig. 17B-7

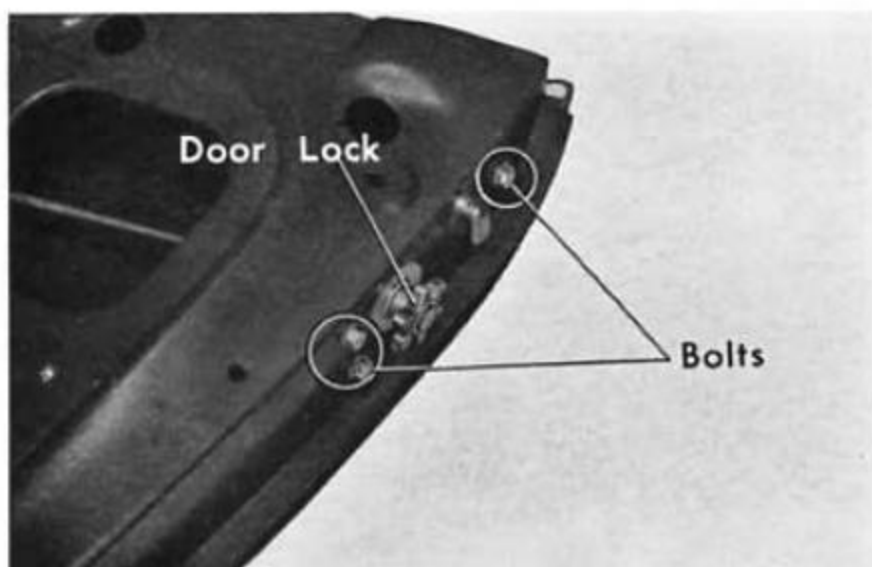


Fig. 17B-8

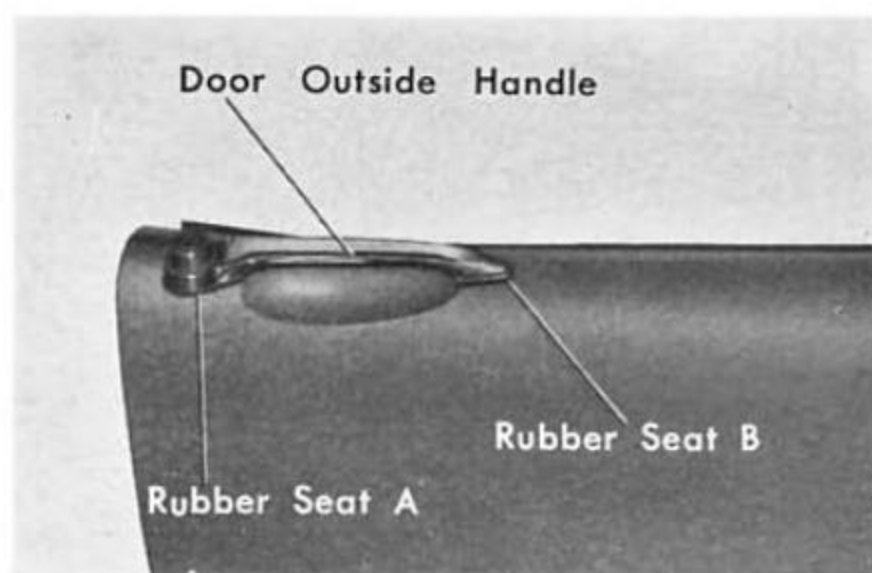


Fig. 17B-9

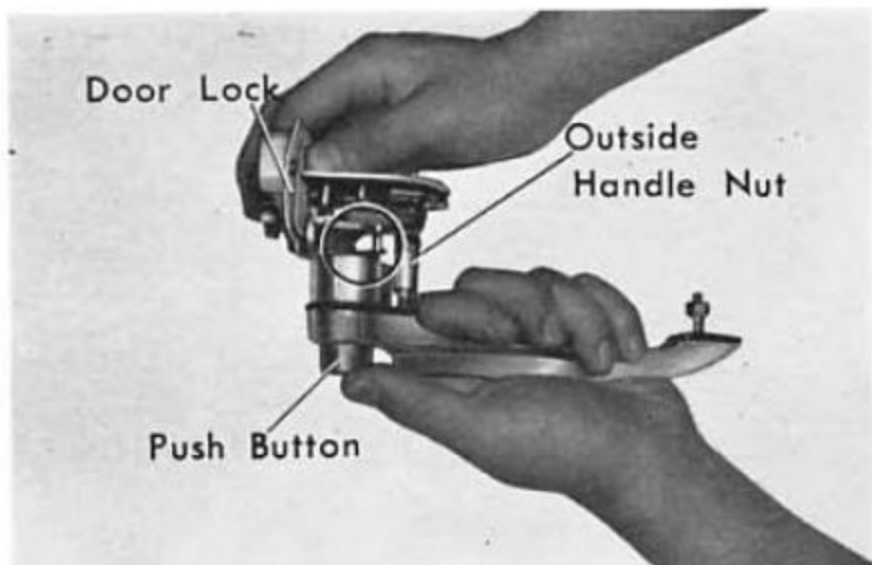


Fig. 17C-1

12. Push the door remote connecting rod and remove the connecting rod snap. Remove the door remote control attaching screws and slide out the remote control unit from the door panel (Fig. 17B-7).

13. Remove the connecting rod from the door lock in the same manner as above. Remove the door lock attaching screws and slide out the door lock assembly from the door panel (Fig. 17B-8).

14. Remove the nut attaching the outside door handle to the door panel from inside and pull off the handle (Fig. 17B-9).

15. Remove the door glass rubber stopper from the door panel.

16. Remove the door hinge attaching screws and detach the door assembly from the hinge.

17. Peel off the door rubber seal B.

C. DOOR ASSEMBLY AND INSPECTION

1. Temporarily assemble all or the related parts on the door panel. Perform an operational check of the units and make any adjustments as necessary by realigning within the elongated holes and then perform final tightening (Fig. 17C-1).
2. Apply grease to all moving and rubbing parts.
3. After installation of the door lock, assemble the door lock button and the outside handle. Adjust the lock push button so that there is approximately 2 mm (0.08 in.) of play.

4. Slide the door glass between the door panel and fasten the door glass to the holder by inserting the bushings of the rubber strip into the holes in the glass and installing the screws (Fig. 17C-2).

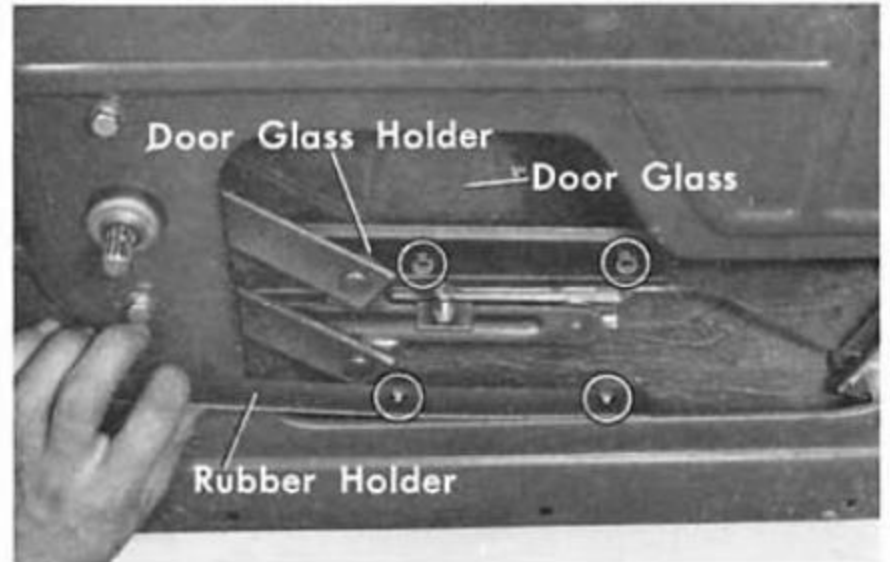


Fig. 17C-2

5. Install the door by raising the outboard end of the door panel and pulling slightly outward (Fig. 17C-3).
6. When the clearance between the door panel and the body is not uniform or if the door does not open and close properly, adjust the door installation by adding door hinge shims between the door hinge and the body or adding shims between door down stopper and the body.
7. With the door glass in the full raised position, adjust the fit between the glass and the top with the adjusting bolt.

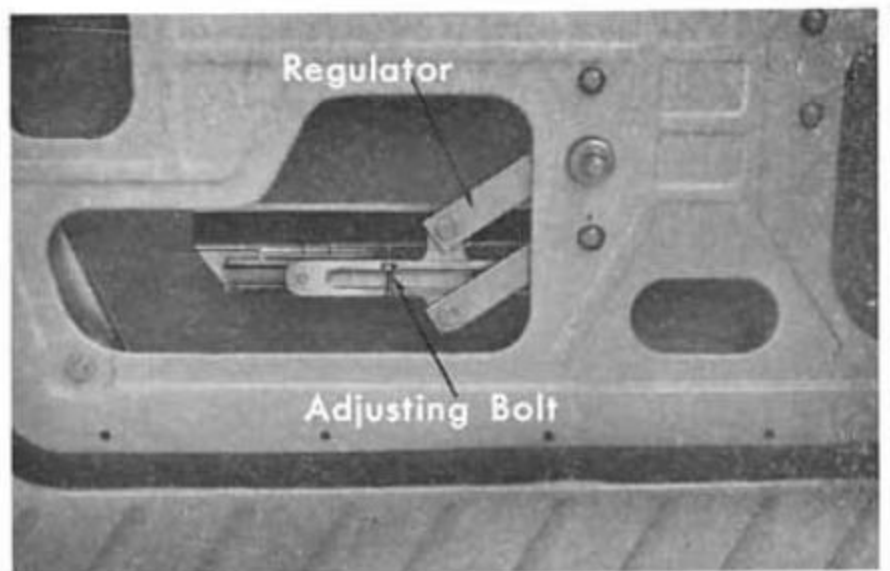


Fig. 17C-3

8. Position the door glass level with the door panel before tightening the regulator (Fig. 17C-4).
9. Tighten the door sash while elevating the door glass. The sash is installed on an elongated hole to provide adjustment.

Note:

If the glass does not operate smoothly, check to see if the front and rear sashes are parallel and adjust by adding shims between the sash and door panel.

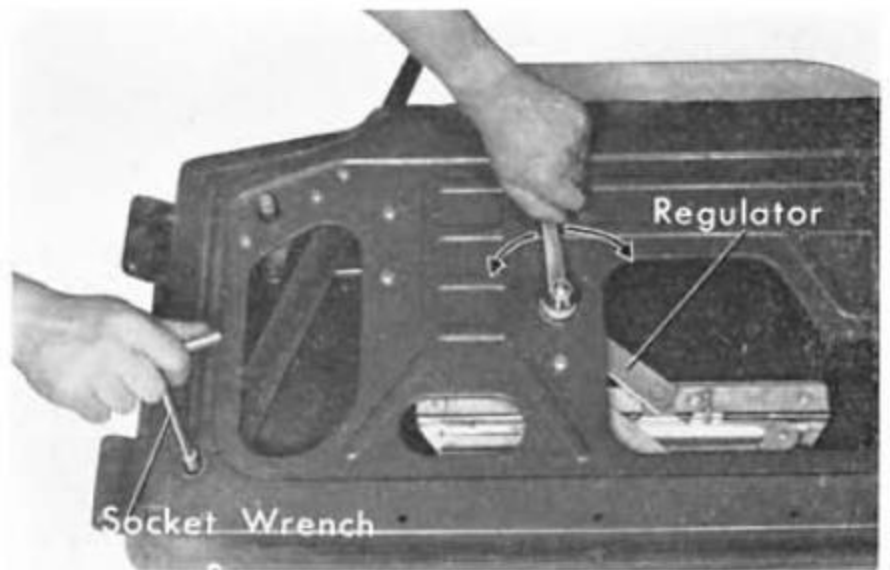


Fig. 17C-4

10. After the installation of the door lining, install the inner door handle so that it points forward and at one serration below horizontal. Install the regulator handle in a downward position and at one serration forward of vertical with the window lowered all the way (Fig. 17C-5).

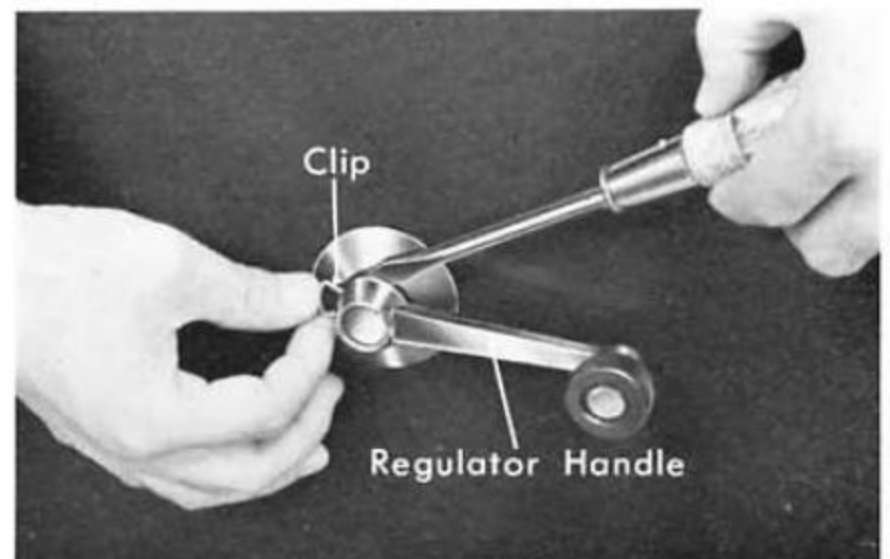


Fig. 17C-5

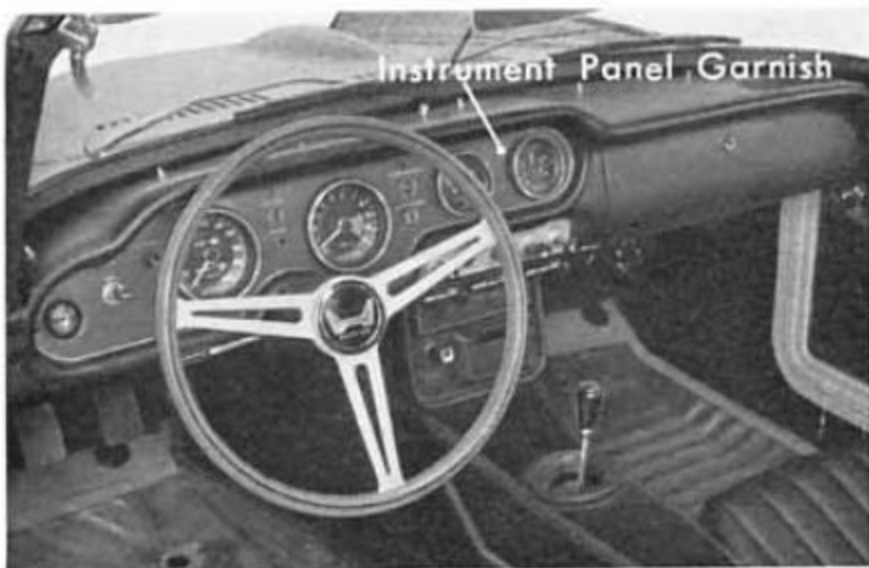


Fig. 17D-1

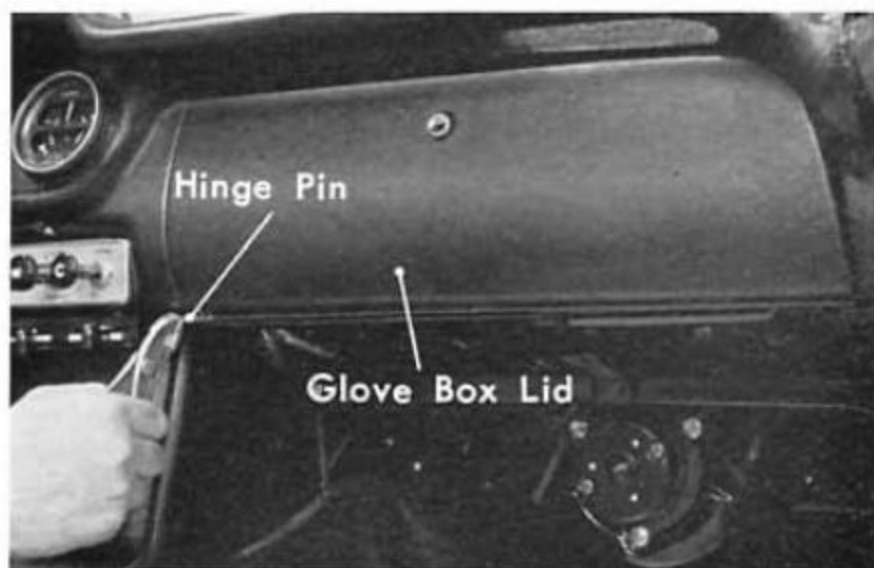


Fig. 17D-2

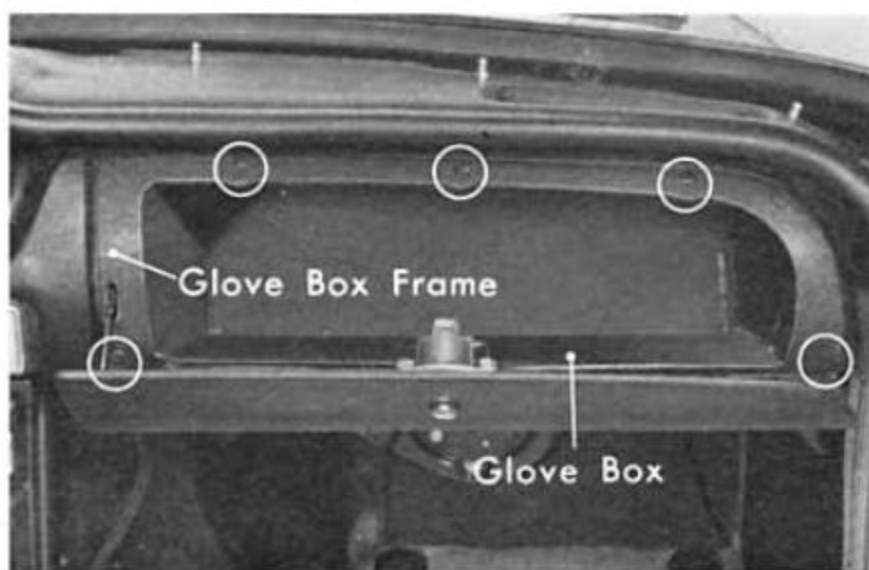


Fig. 17D-3

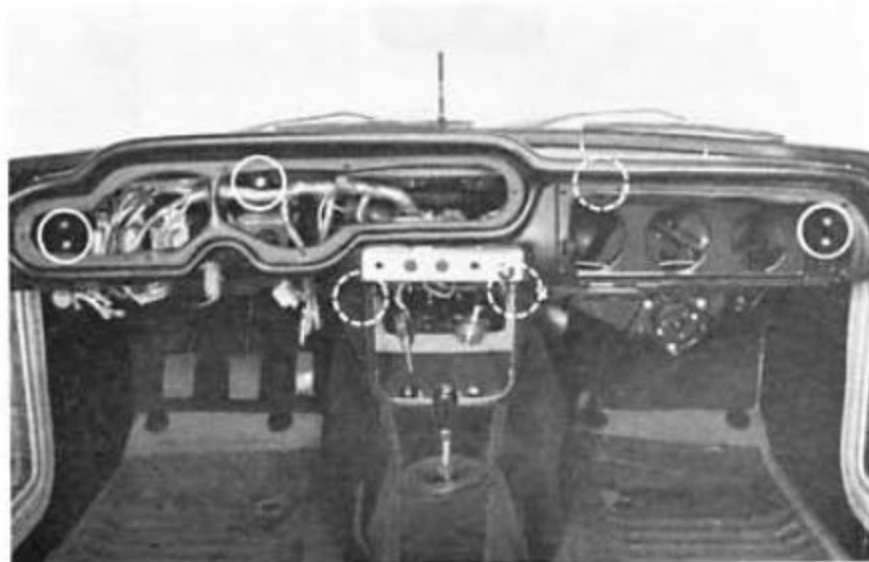


Fig. 17D-4

D. FRONT WINDOW REMOVAL

1. First, remove the steering column.
2. Remove the right instrument panel garnish from the foundation instrument panel (Fig. 17D-1).
3. Pull out the glove box lid hinge pin and remove glove box lid. Remove the nuts and detach the lid lock (Fig. 17D-2).
4. Remove the screws and nuts and glove box fitting nut from the glove box (Fig. 17D-3).
5. Remove the screws and separate the glove box frame from the foundation instrument panel.
6. Remove the glove box setting bolts and separate the glove box from the foundation instrument panel.
7. Disconnect the garnish center wiring at the wire harness.
8. Disconnect the room light cord at the wire harness.
9. Remove the bolts, spring washers and separate the foundation instrument from the body (Fig. 17D-4).

10. Disassemble the garnish center, defroster nozzle and gasket, and snap fasteners from the foundation instrument panel (Fig. 17D-5).



Fig. 17D-5

11. Remove the screws and separate the door rubber seal from the front window (Fig. 17D-6).
12. Loosen the tension bar nut and remove the tension bar and rear view mirror from the front window.
13. Remove the window frame hold-down nuts and the setting bolt at the center. Separate the front windshield assembly.

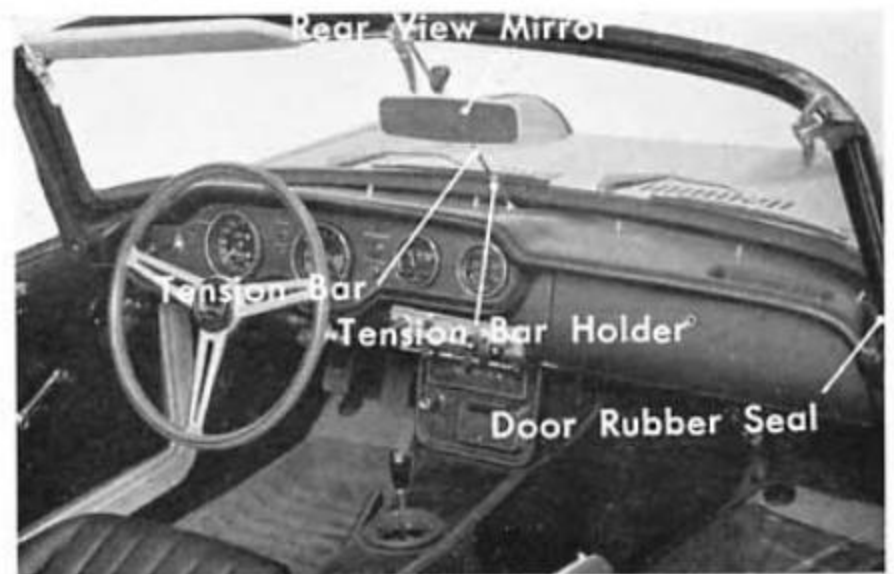


Fig. 17D-6

14. Remove the screws and disassemble door rubber seal upper clamping plate and front windshield side drip from the windshield frame (Fig. 17D-7).
15. Remove the screws and disassemble hood lock and sun visor from the windshield frame.

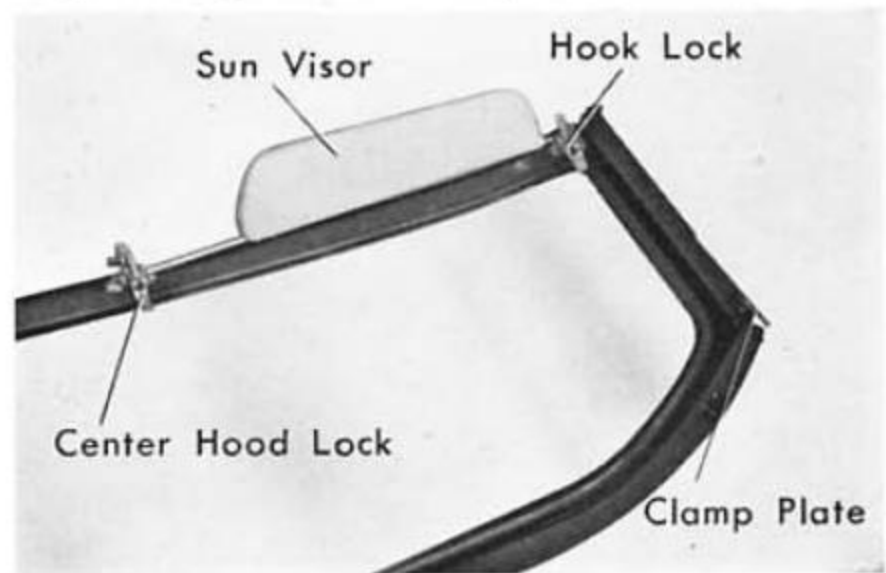


Fig. 17D-7

16. Remove the screws and disassemble the center hood lock from the windshield frame.
17. Remove the front windshield glass, weather strip and windshield frame mold, from the windshield assembly (Fig. 17D-8).

Note :

1. Remove the window frame mold by pushing inward to release the clamp and then remove the weather strip clamp by sliding.
2. The windshield glass can be removed without disassembling the windshield from the body. Loosen the center bolt and push out the glass.

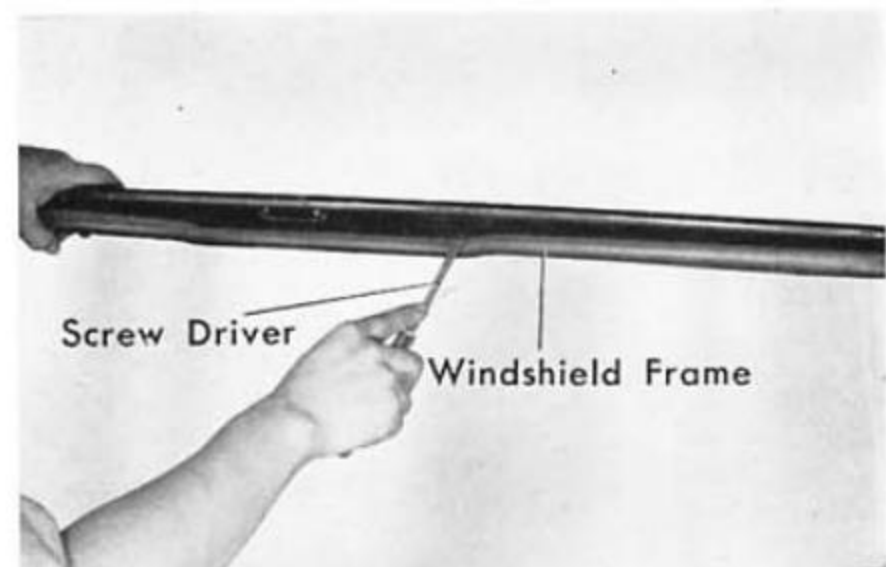


Fig. 17D-8

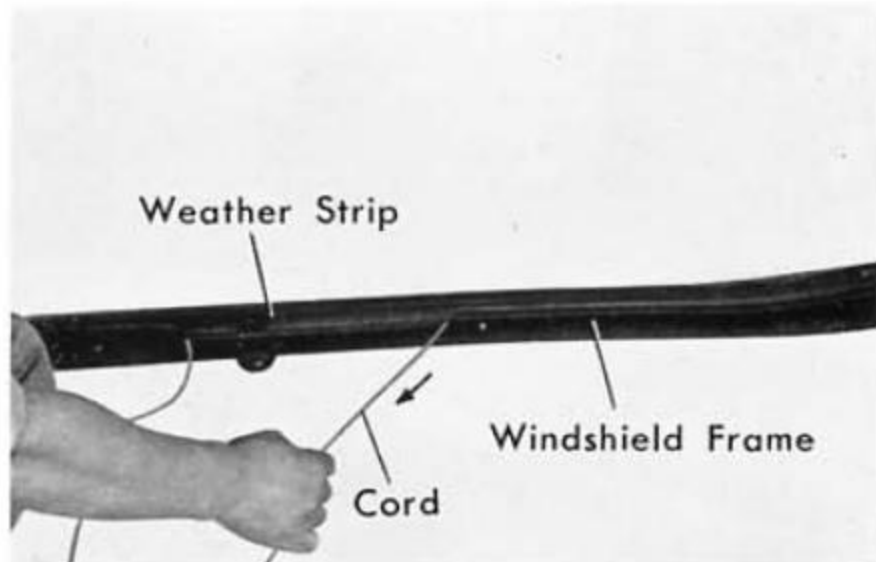


Fig. 17E-1

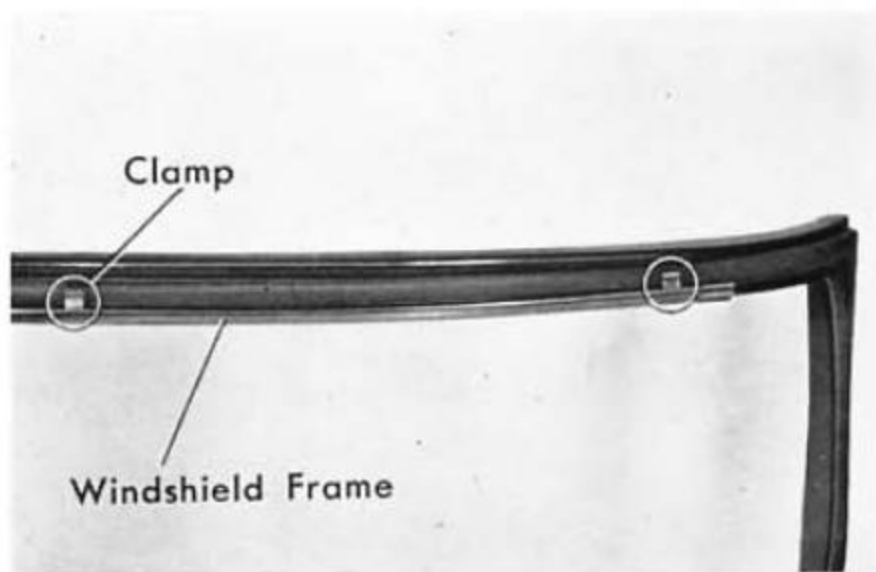


Fig. 17E-2

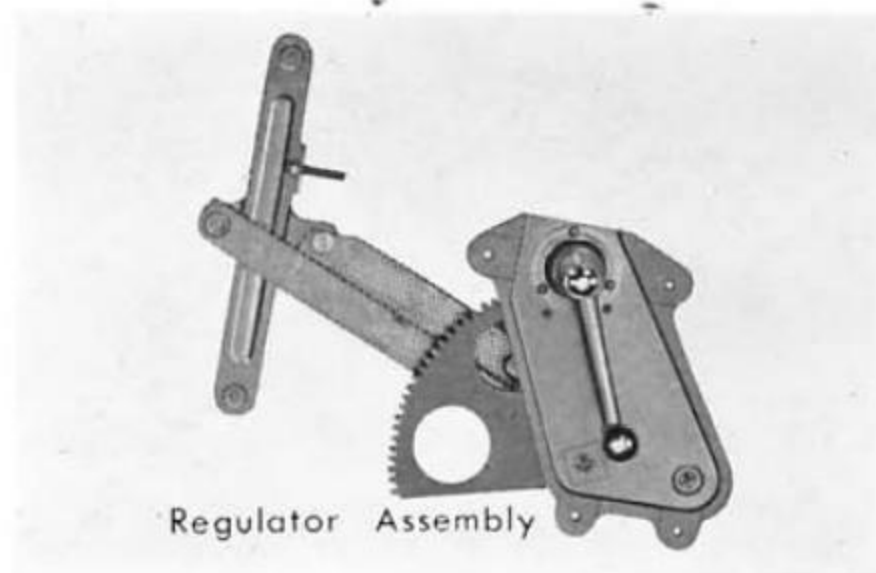


Fig. 17E-3

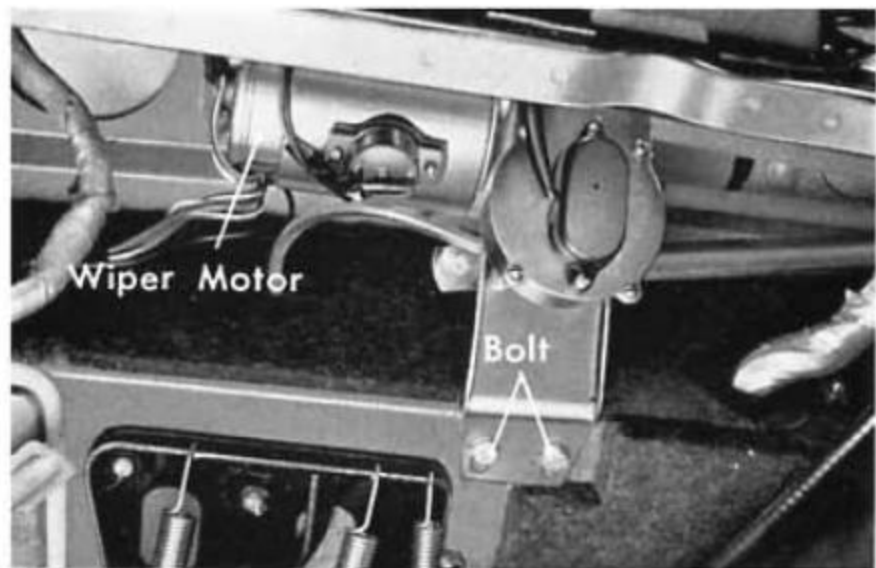


Fig. 17F-1

E. WINDSHIELD ASSEMBLY AND INSPECTION

1. Install weather strip on the edge of the glass and then insert a cord approximately 4 mm (0.2") diameter the complete length of the weather strip outer groove. Hold the glass against the windshield frame from the outside while pulling the cord out of the groove slowly. This will cause the sealing strip to envelop the frame (Fig. 17E-1).

2. After completing the installation of the windshield glass, apply a good grade of weather sealant between the glass and the weather strip from the outside.

Note :

Install the weather strip clamp in the hole in the frame.

3. Insert the windshield mold clamp into the holes in the weather strip and clamp to the frame.

Note :

While making the final clamping, tap the mold so that it will fit into the groove of the weather strip.

4. Install the windshield assembly on the body, placing a steel wire (1 mm dia.) or a cord between the weather strip and the body and tighten the windshield frame setting bolt. Install the foundation instrument panel in the cockpit and pull out the steel wire or the cord so that panel fits under the weather strip (Fig. 7E-3).

5. The installation angle of the windshield assembly is adjusted by using shims under the setting bolts.

6. Perform the installation in the reverse procedure as the removal. After installation, check the fits of the respective parts.

F. BODY DISASSEMBLY

1. Detach the doors from the body.
2. Remove the windshield assembly and windshield wiper motor (Fig. 17F-1).

3. Remove the headlights.
4. Disconnect the front turn signal light cords at the wire harness.
Detach the radiator grill by removing screws.
(Fig. 17F-2)
Disassemble the turn signal light assemblies from the grill.

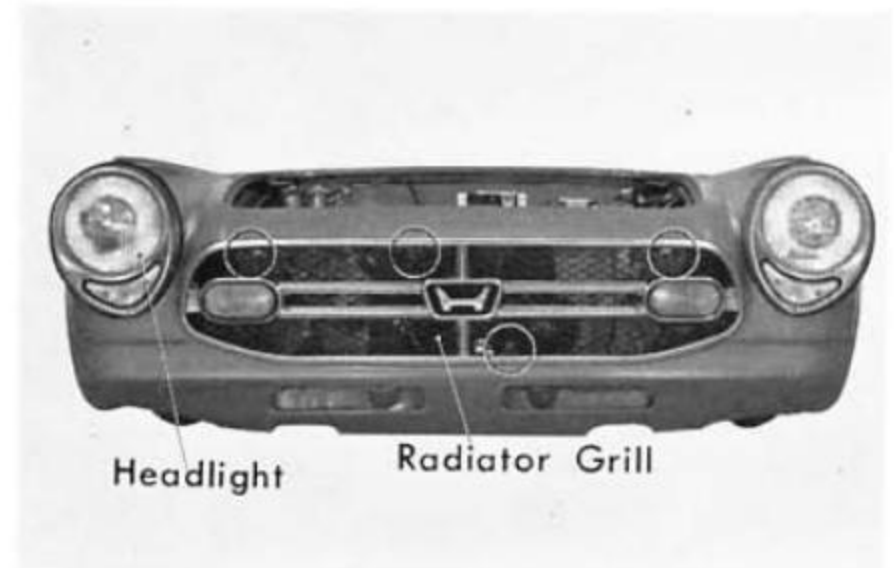


Fig. 17F-2

5. Remove the starter magnetic switch, resistor ignition coil and regulator from the engine compartment (Fig. 17F-3).
6. Disconnect the fuse box wiring at the wire harness and remove the screws to separate the fuse box.
7. Disconnect the horn cord at the wire harness, remove the bolts and separate the horn from the body.

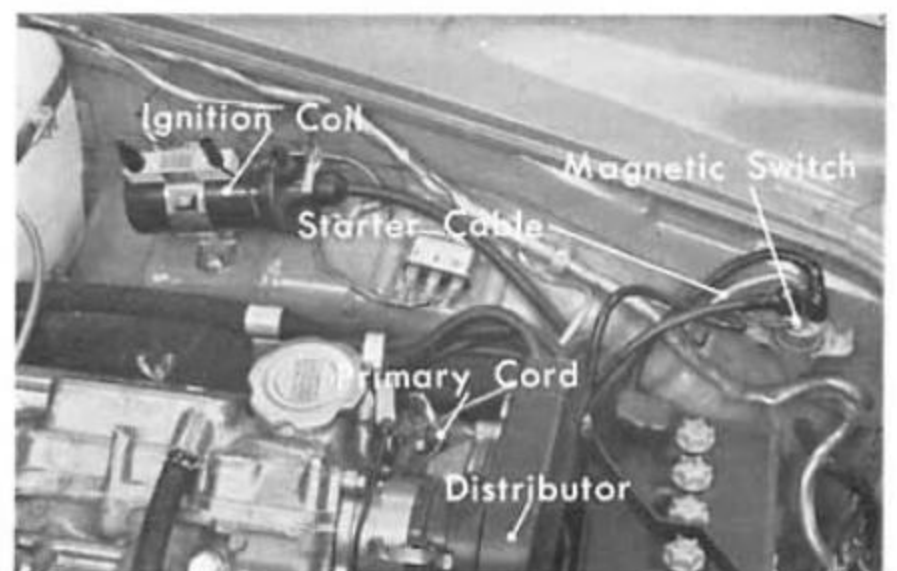


Fig. 17F-3

8. Remove both the brake and clutch master cylinder assemblies (Fig. 17F-4).
9. Disconnect the stop switch cord at the wire harness and remove the stop switch from the 5-way joint fitting.
10. Disconnect the brake pipings A, B, C, D from the 5-way joint fitting.
11. Remove brake pipe assemblies and 5-way joint fitting from the body.



Fig. 17F-4

12. Remove the bolts and washers, loosen nut, disconnect bonnet cover latch release cable and separate the bonnet cover latch assembly (Fig. 17F-5).

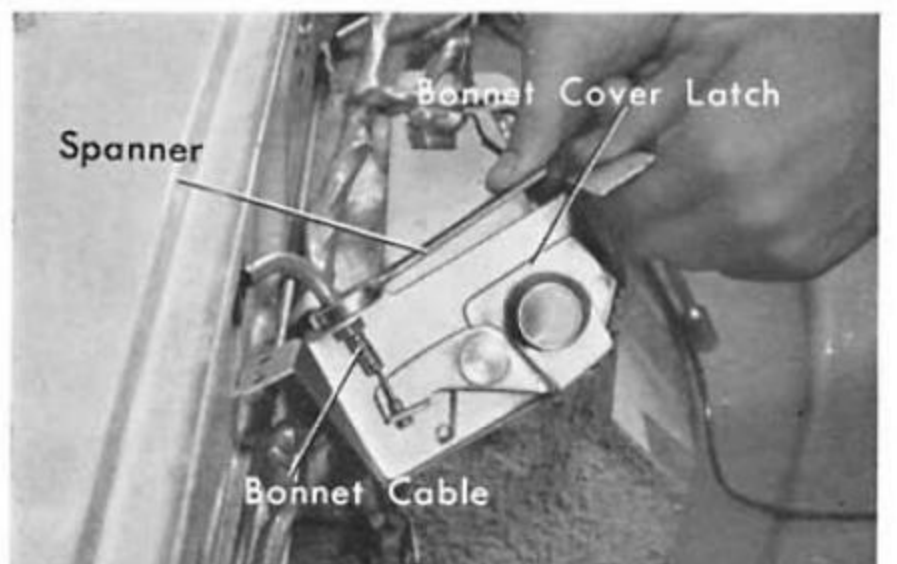


Fig. 17F-5

17-14 BODY

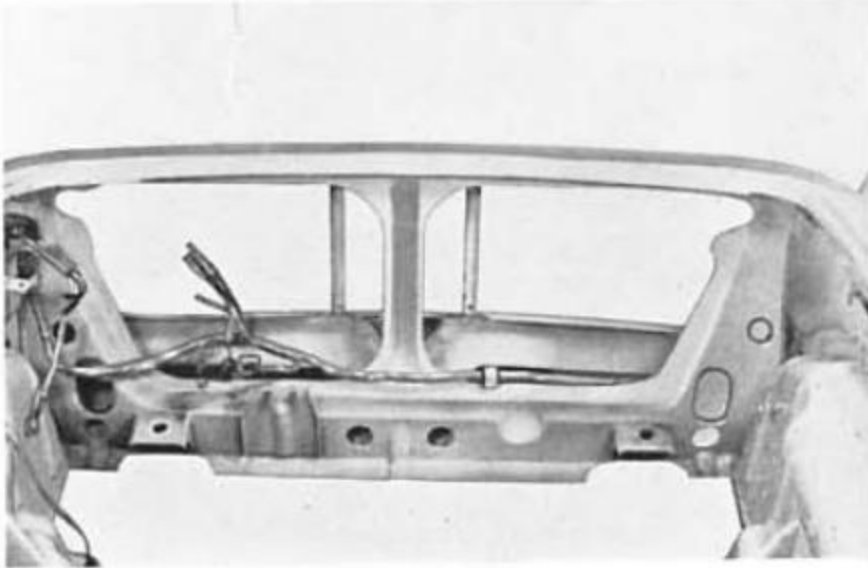


Fig. 17F-6

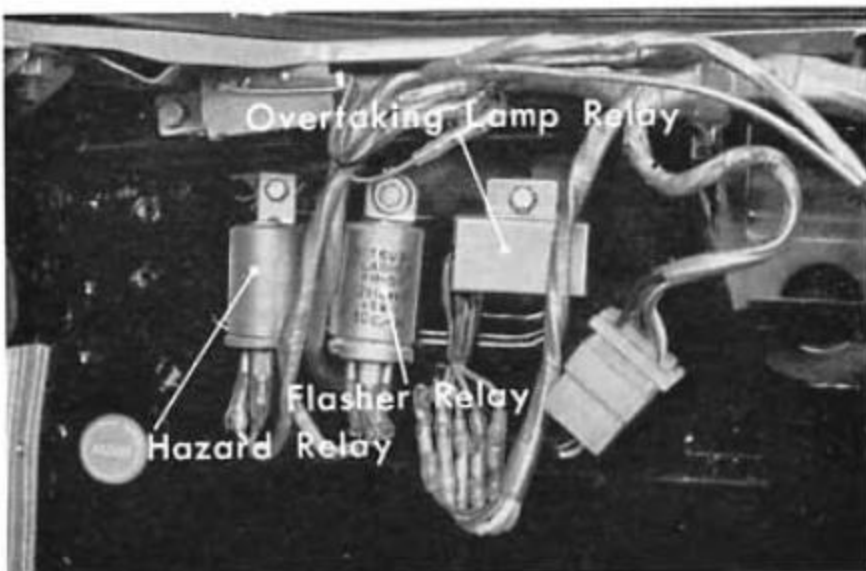


Fig. 17F-7

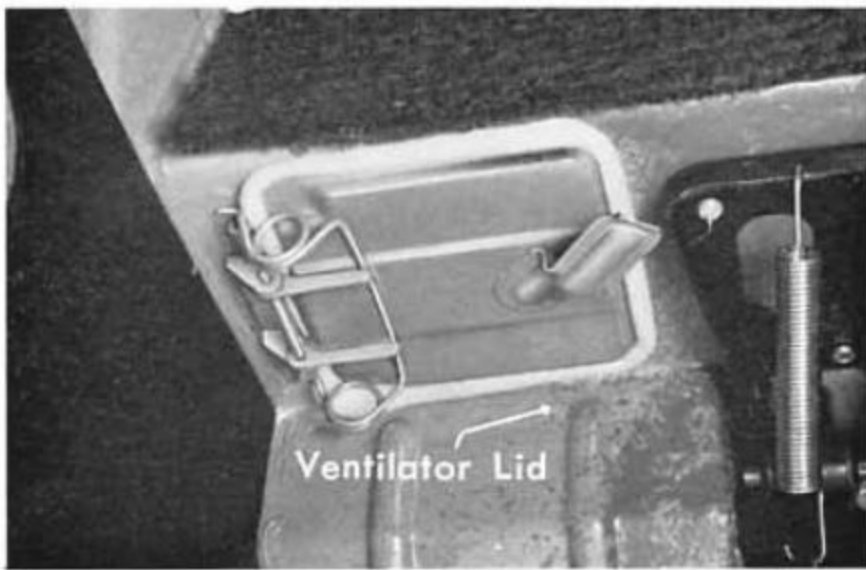


Fig. 17F-8

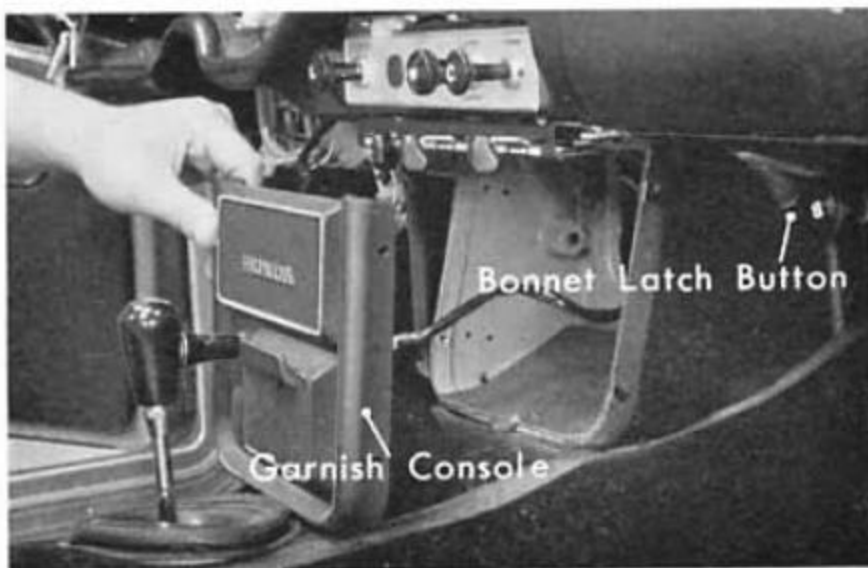


Fig. 17F-9

13. Remove the nuts at both bonnet hinge pins, pull out hinge pins and separate the bonnet at the hinge.

14. Disconnect the combination switch cord at the wire harness (Fig 17F-7).

15. Disconnect the flasher relay from the wire harness and separate the flasher relay by removing the bolt.

16. Remove the speedometer and tachometer cable assembly from the engine compartment.

17. Separate the pedal arm bracket from the body.

18. Remove ventilator lid spring, open the stay on the inside and remove the ventilator lid (Fig. 17F-8).

19. Remove the bonnet cover latch release cable assembly.

20. Remove the screws and detach garnish console. Remove ashtray, car heater switch hole plug and dust seal water hose hole plug from the garnish console (Fig. 17F-9).

21. Remove handbrake lever.
22. Remove seat belt attaching bolts, seat belt carpet links, seat belt carpet link bushings. (Fig. 17F-10, 11).



Fig. 17F-10

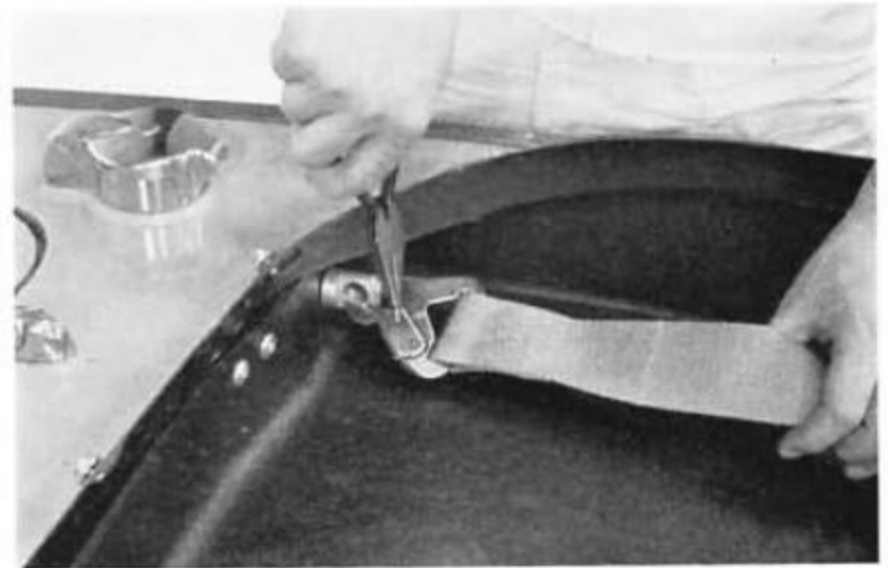


Fig. 17F-11

23. Remove the snap fasteners and hood setting bolts (Fig. 17F-12).



Fig. 17F-12

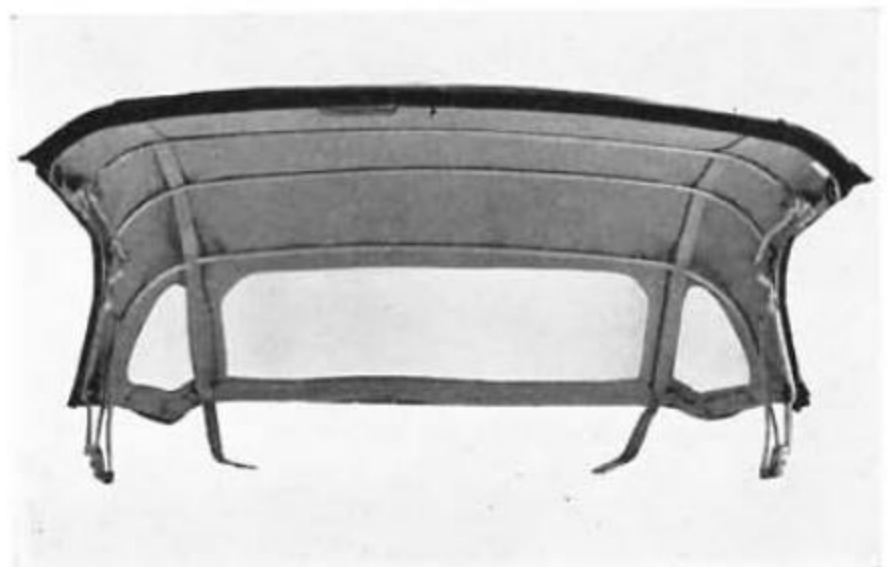


Fig. 17F-13

17-16 BODY

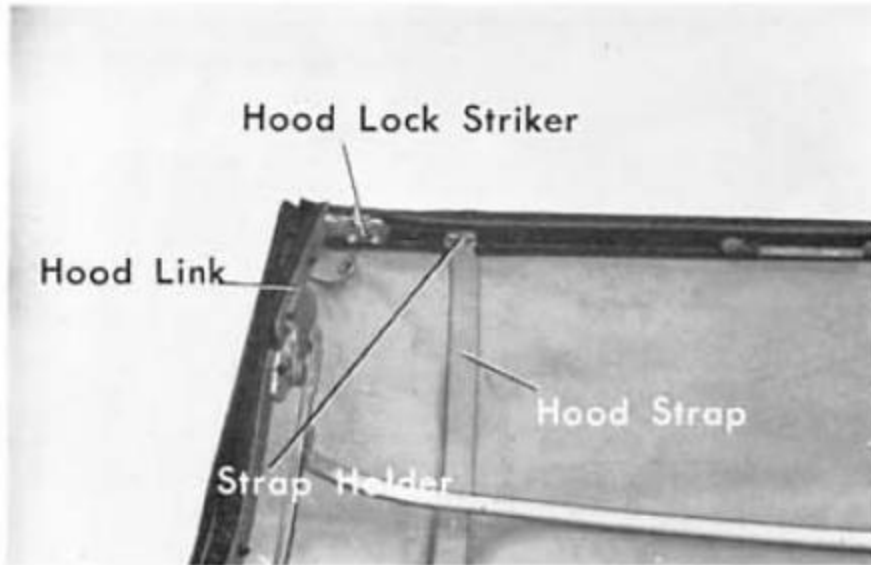


Fig. 17F-14

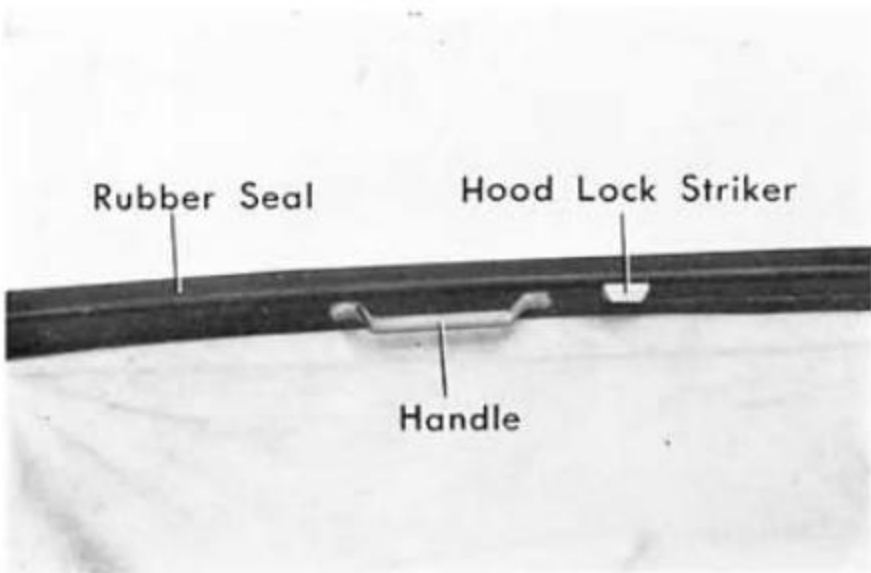


Fig. 17F-15

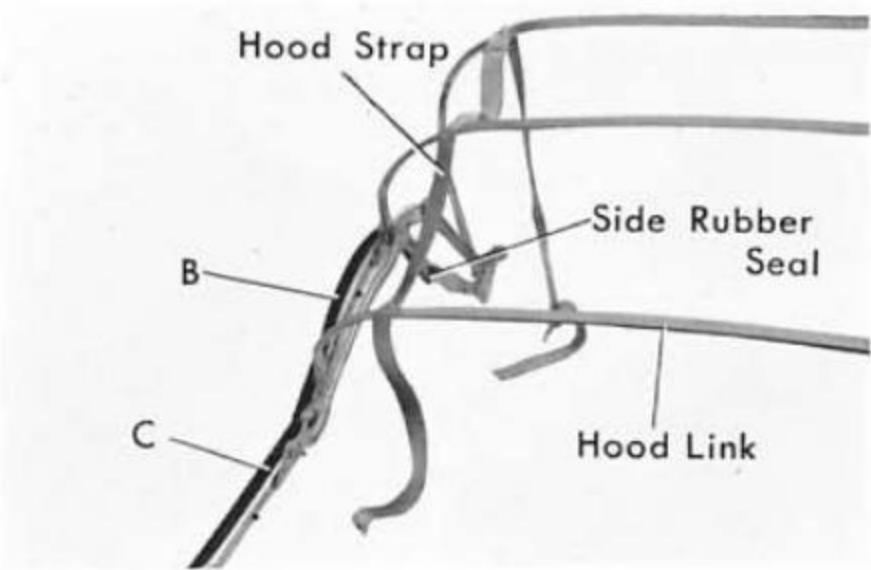


Fig. 17F-16

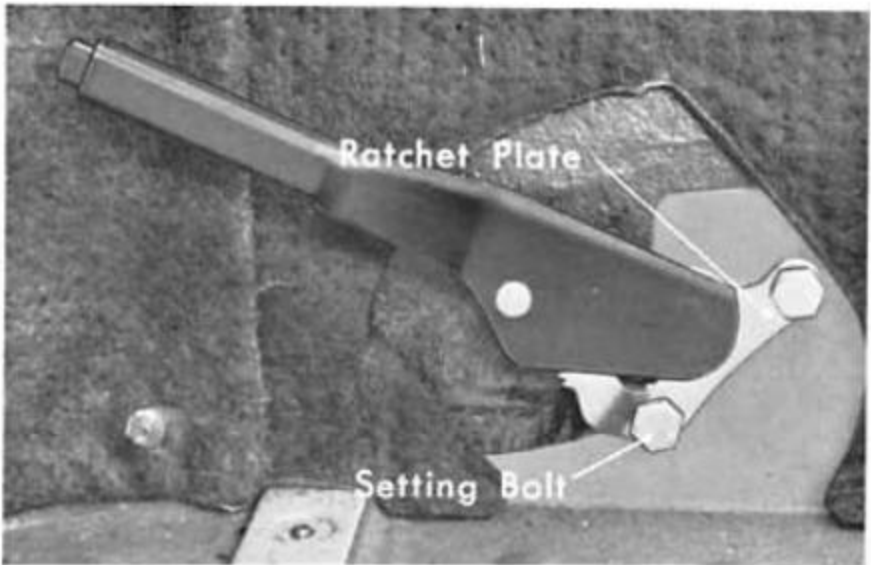


Fig. 17F-17

24. Remove the bolts and disassemble hood lock striker and hook link (Fig. 17F-14).

25. Remove the screws and separate the hood strap from the hood assembly.

26. Remove the screws and remove the hood grab handle from the hood (Fig. 17F-15).

27. Remove the screws and remove the hood lock striker.

28. Remove the rubber seal from the hood.

Note :

Apply a good adhesive to the rubber seal during installation.

29. Remove the screws and separate the straps from the hood links (Fig. 17F-16).

30. Remove side rubber seal A, B, C from the hood links.

31. Remove the snap fasteners from the hood links.

32. Assemble in the reverse order of removal. Temporarily install the hood lock strikers and make final tightening after completing adjustment with the hood installed.

33. Remove the floor and transmission cover mats.

Note :

Attached with snap fasteners.

34. Remove the bolts and detach the ratchet plate. (Fig. 17F-17)

35. Remove the screws to unfasten the rubber seal (Fig. 17F-18).
36. Remove the screws, washers and detach door rubber seal end plate.
37. Unhook the snap fastener and remove the door rubber seal stay.
38. Remove the screws and detach the support stay and setting plate.

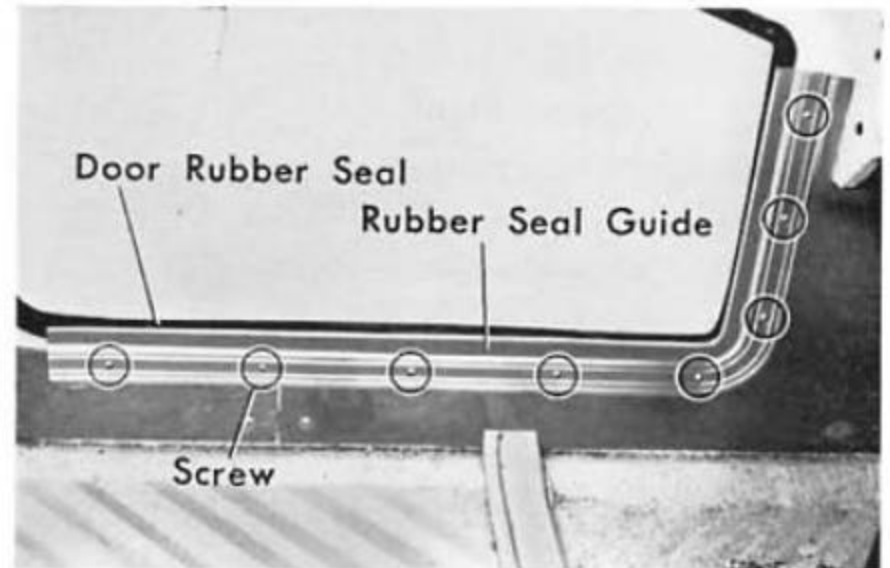


Fig. 17F-18

39. Strip off the door rubber seal (Fig. 17F-19).

Note :

Apply a good adhesive to the rubber during installation.

40. Remove the screws and washers and unfasten the bulkhead lining plate.
41. Remove the screws and washers and unfasten both the right and left cowl inner linings and rear pillar inner linings.

Note :

The snap fasteners are attached to the pillar inner liners.

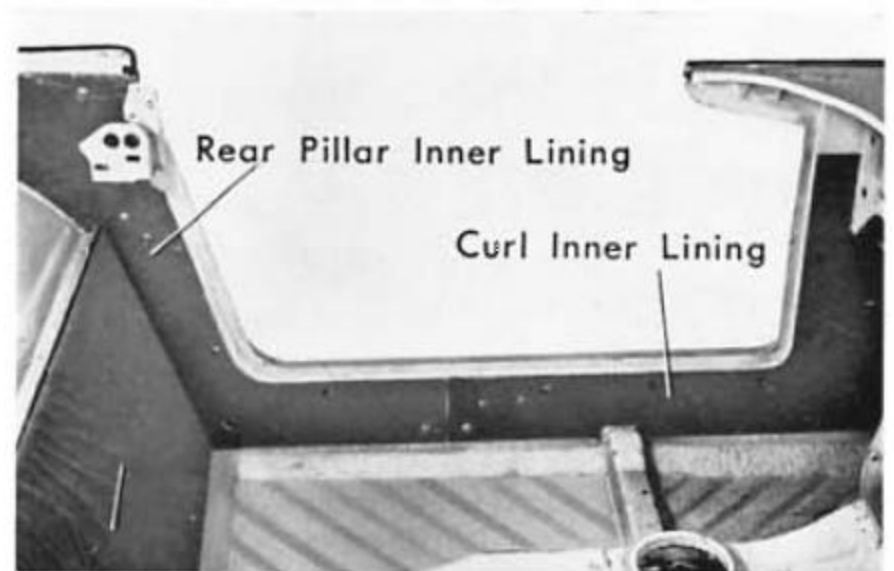


Fig. 17F-19

42. Separate the trunk compartment lid from the body by removing the nuts attaching the lid to the hinge. After removing the trunk lid from the body, detach the trunk lock striker, trunk lid stay, ornaments, and the trunk lid seal from the trunk lid (Fig. 17F-20, 21).

Note :

Apply a good adhesive to the rubber molds during installation.



Fig. 17F-20

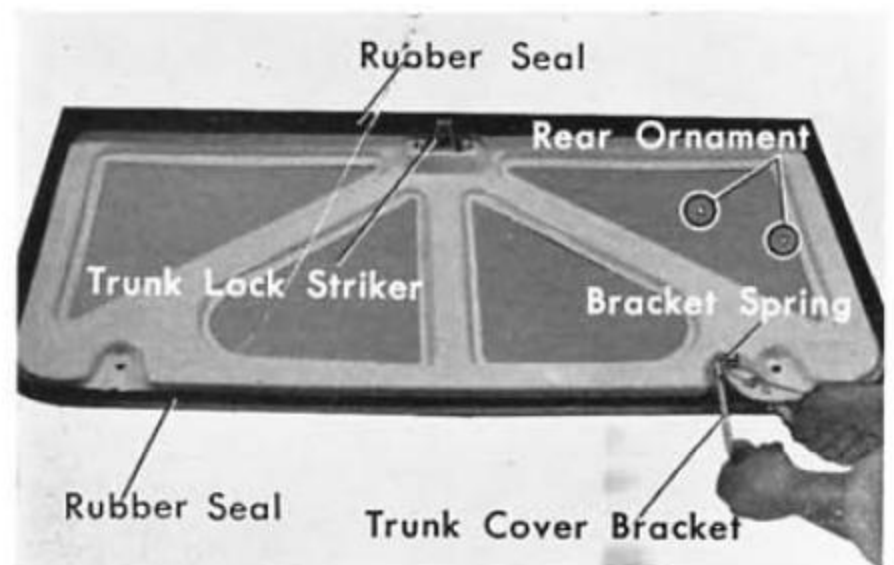


Fig. 17F-21

17-18 BODY

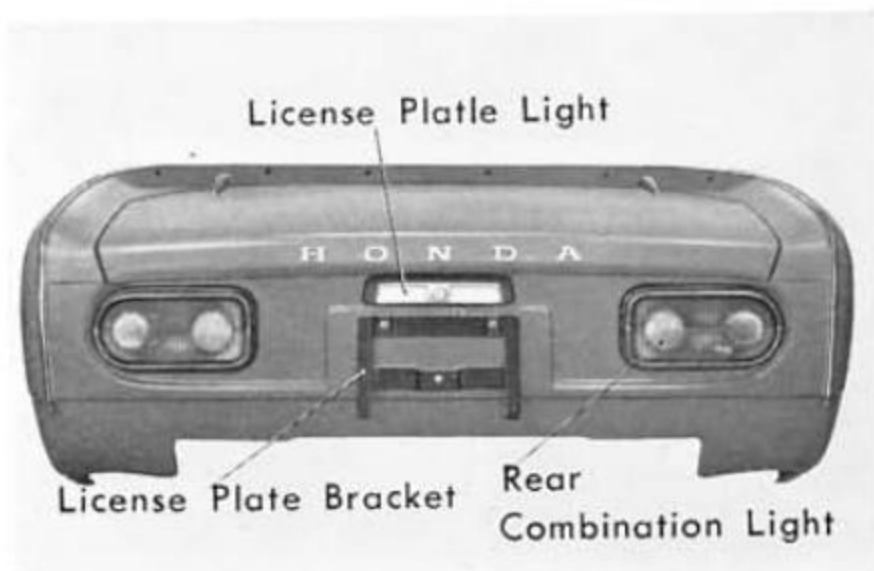


Fig. 17F-22

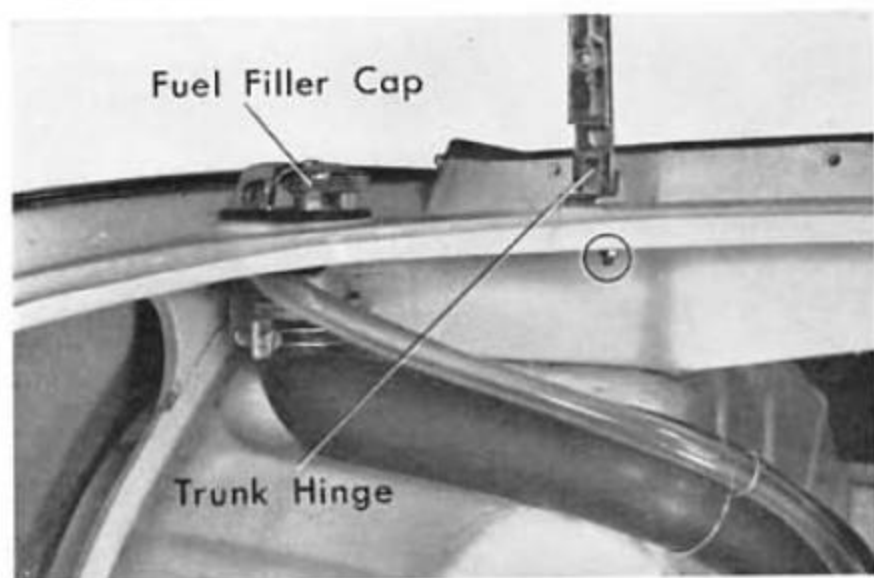


Fig. 17F-23

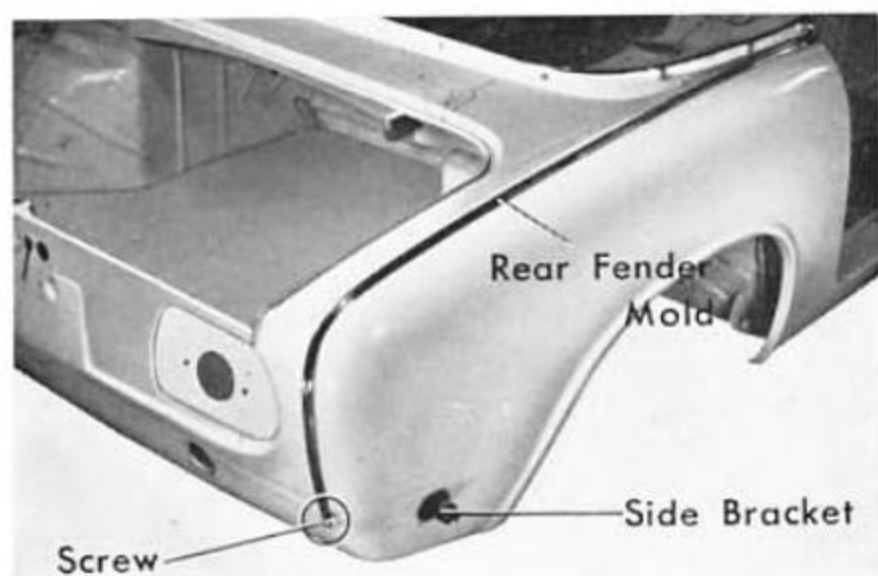


Fig. 17F-24

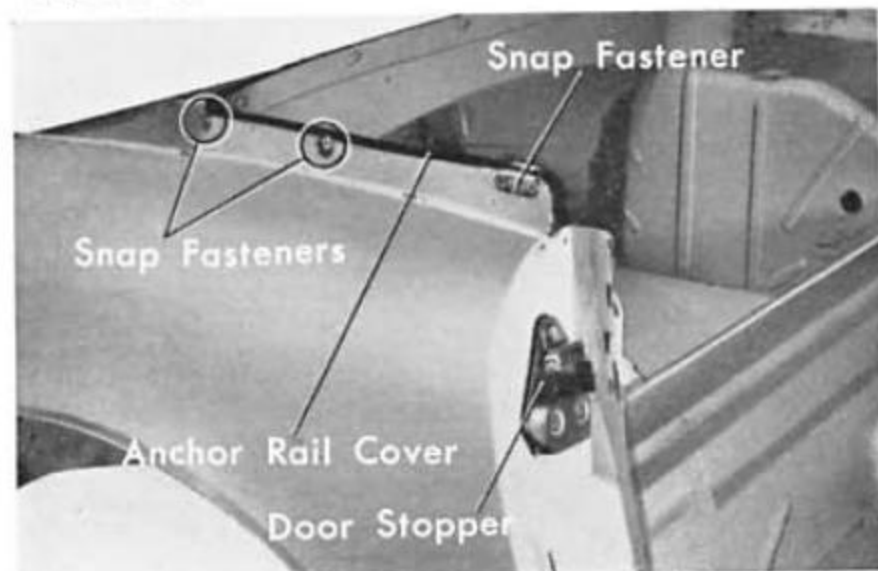


Fig. 17F-25

43. Detach the rear combination lights and license plate light (Fig. 17F-22).

44. Remove the screws and detach the number plate bracket.

45. Remove the fuel filler cap from the body (Fig. 17F-23).

46. Remove the nuts and the screws to detach the hinge from the body.

47. Remove the nuts, screws and remove the rear fender molds (Fig. 17F-24).

48. Remove the bolts, washers and detach the rear bumper side stay.

49. Remove the screws and detach the door stopper and shim from the rear pillar (Fig. 17F-25).

50. Remove the screws and remove the post snap fastener.

51. Remove the snap fasteners.

52. Remove anchor rail cover.

Note:

Apply a good adhesive to the rubber molds during installation.

53. Remove the screws from the rear end of the fender top molding and detach the molding (Fig. 17F-26).
54. Remove the nuts from each side and detach the ornament.

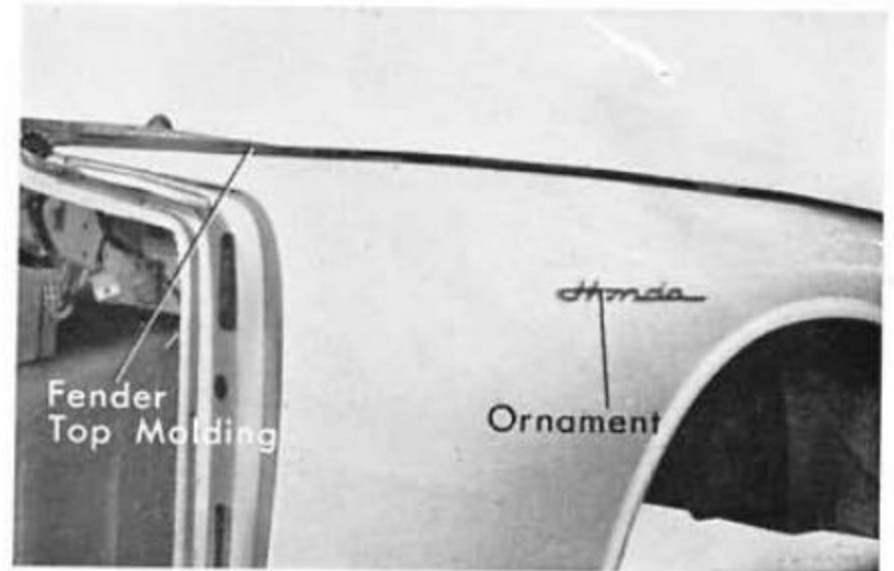


Fig. 17F-26

55. Remove the nut and detach the throttle cable.
56. Remove stopper bolt.
57. Remove the front brake pipe clamps.
58. Remove brake hose nuts and washers; remove the front brake hoses.

59. Detach brake pipes and clutch pipe from the body.

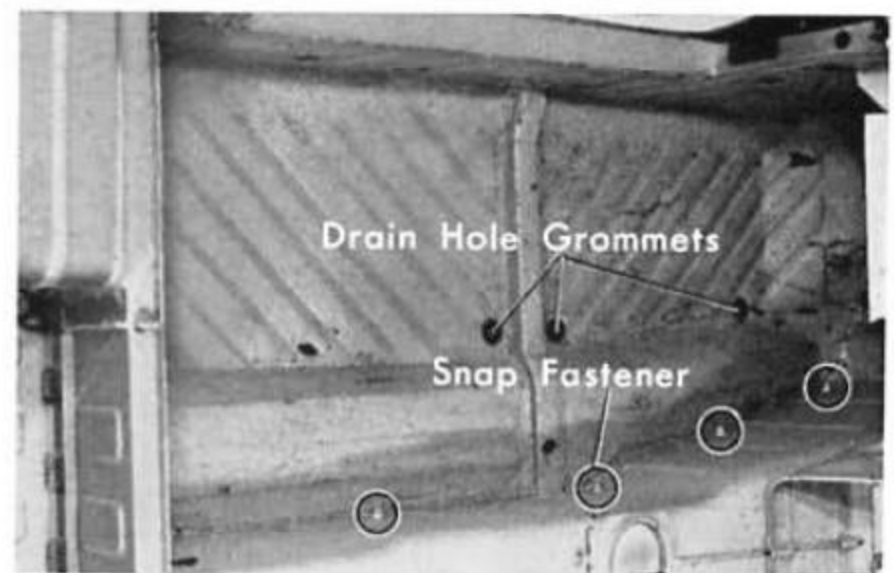


Fig. 17F-27.

60. Remove the drain hole grommet from the floor (Fig. 17F-27).
61. Remove the snap fasteners.

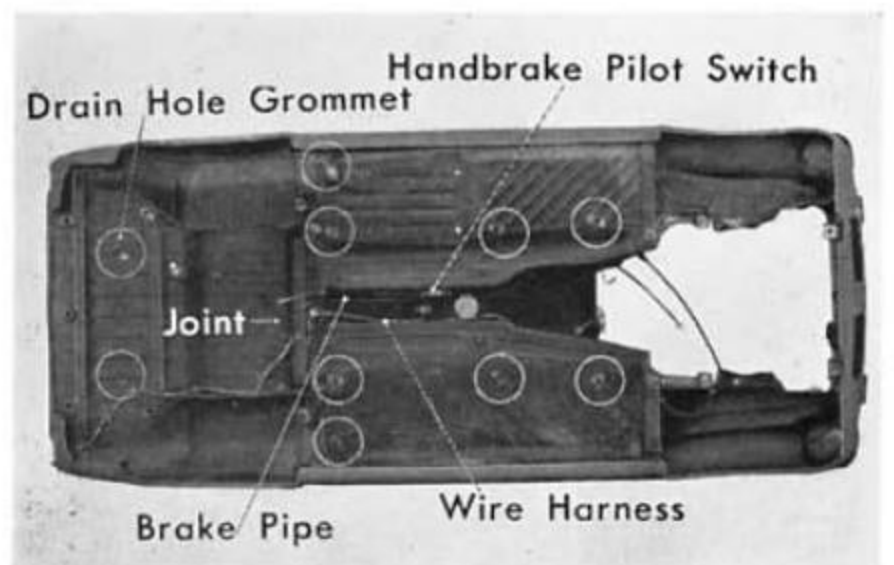


Fig. 17F-28.

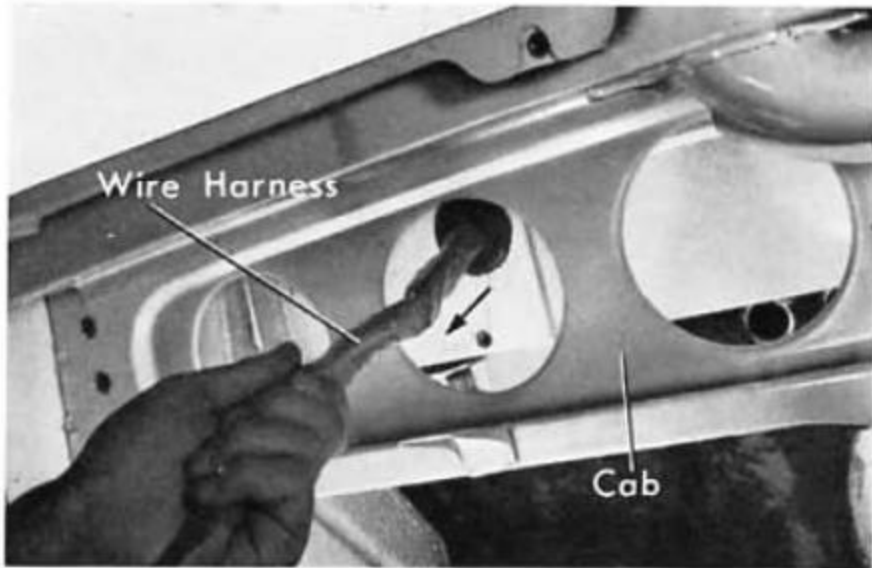


Fig. 17F-29



Fig. 17G-1

62. Disconnect the handbrake pilot switch cord at the wire harness and remove the pilot switch. (17F-28).
63. Disconnect brake pipes from the two-way joint fitting.
64. Disconnect brake pipe from the 3-way joint fitting.
65. Remove brake hose nut and washer and detach the joint fitting.
66. Detach brake pipes from clips and remove from the body.
67. Remove the drain hole grommet
68. Detach wire harness clamp and draw out the wire harness from the inside through the grommet hole (Fig. 12F-29).

G. BODY ASSEMBLY AND INSPECTION

1. Check to make certain that all of the rubber mounts are installed on the frame.
Lower the body onto the frame with a chain hoist, being careful not to pinch the wires, cables, pipes and cords. Clamp all brake pipes and wire harness securely.
Align the fuel feed pipes, shift lever to their respective holes in the cockpit floor and then lower the body on the frame, aligning the body bolt holes to the frame bolt holes.
2. After installing the stud snap fasteners, apply grease to the door stopper and assemble.
3. The height of the bonnet cover can be adjusted with the stopper.
4. Align the top hood lock strikers and attaching bolts to the windshield and then tighten (Fig. 17G-1).

H. Heater

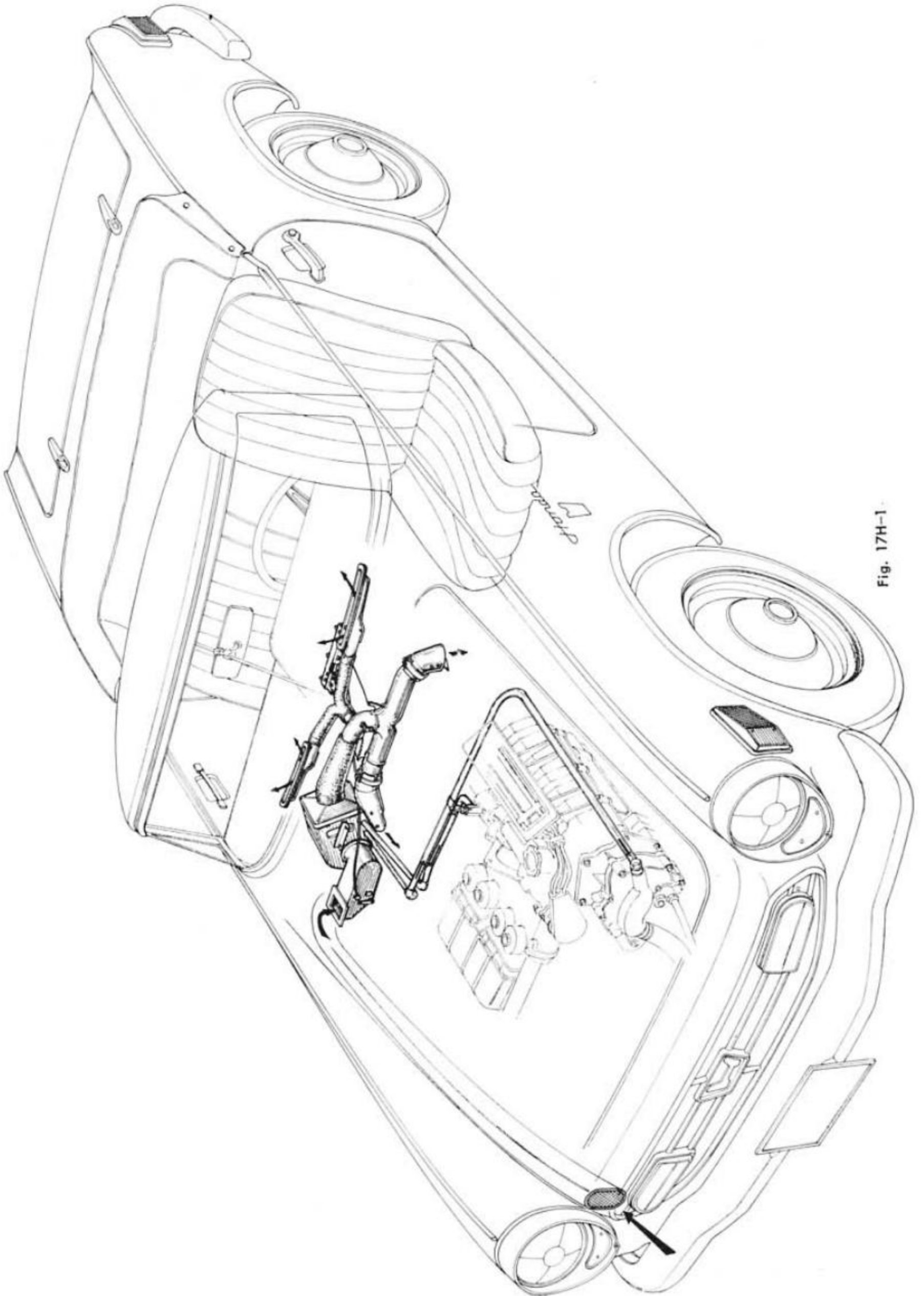


Fig. 17H-1

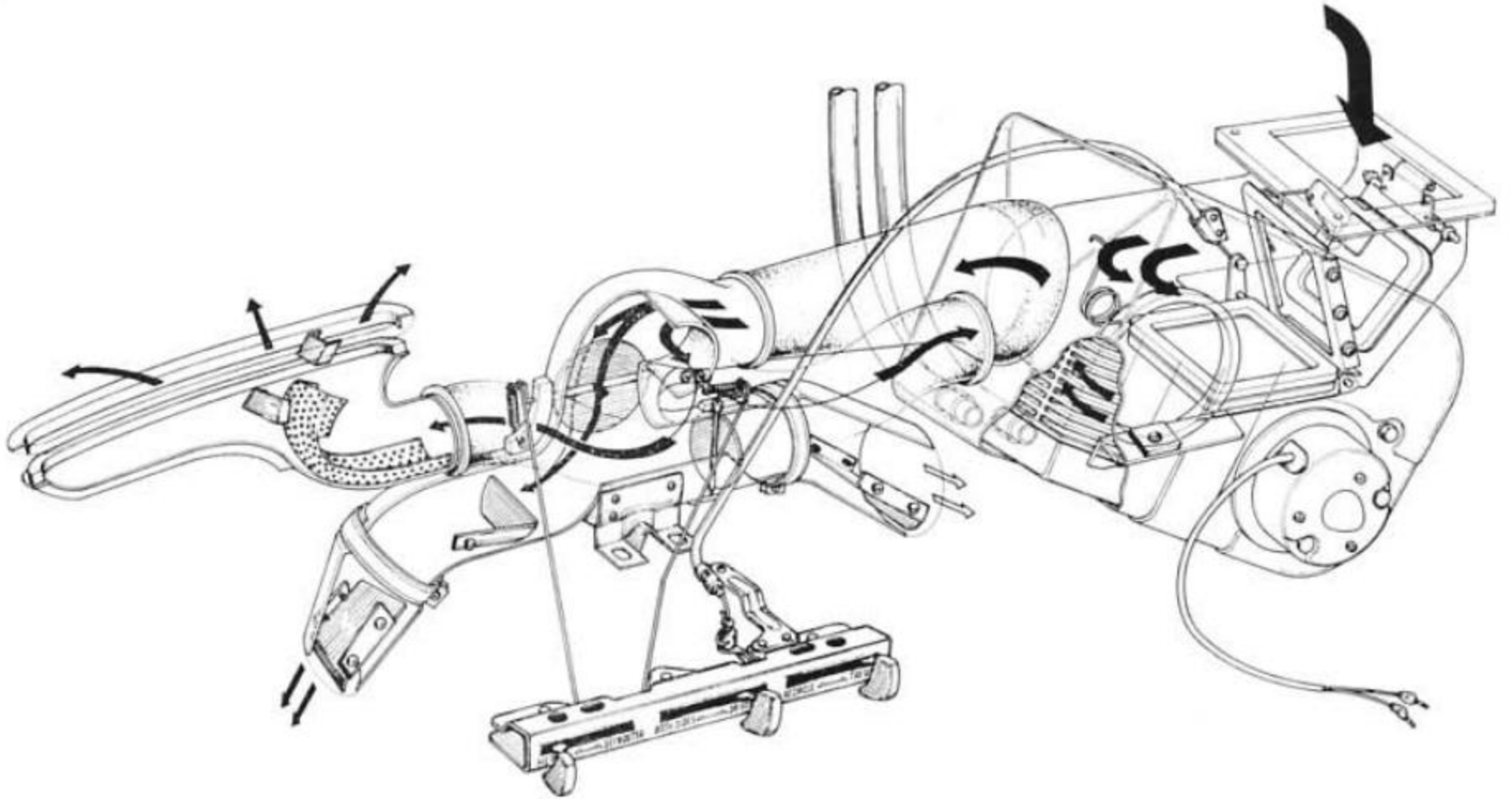


Fig. 17H-2

a. Heater Unit Disassembly.

1. Pull out the cotter pin which connects the air duct and body. (Fig. 17H-3)
2. Unscrew 2 bolts which mounts the air duct and body. (Fig. 17H-4, 5)

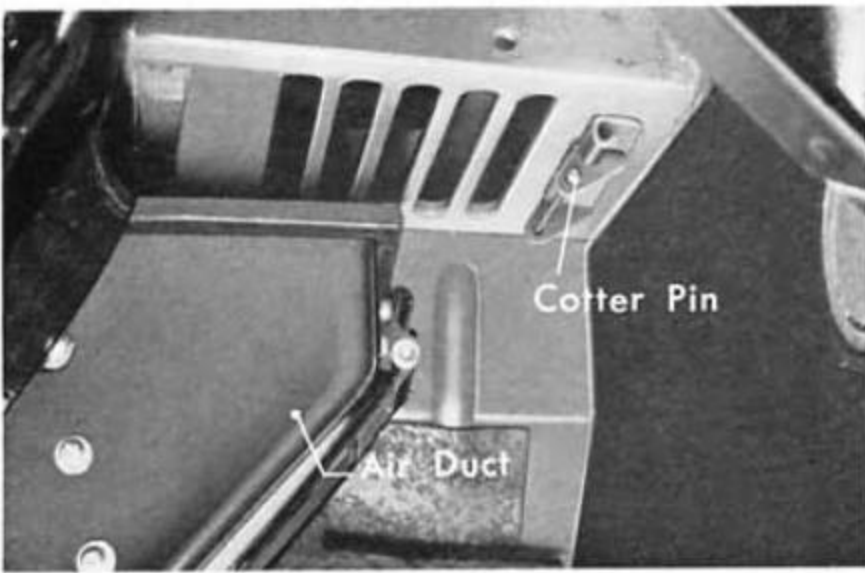


Fig. 17H-3

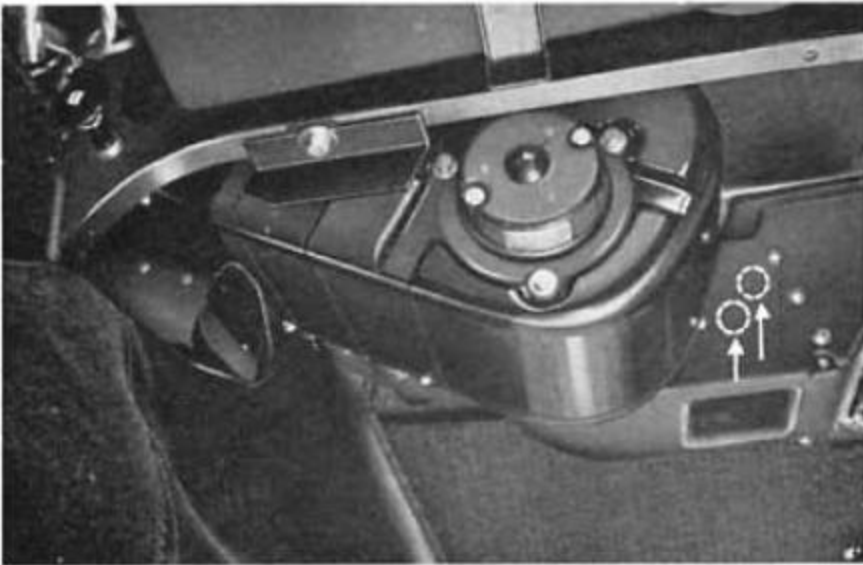


Fig. 17H-4.

3. Remove the heater hose from the heater unit. (Fig. 17H-6)
4. Unscrew 3 bolts which join the heater unit and body. (Fig. 17H-7, 8)
5. Disengage the bonnet latch, wire from the bonnet latch, loosen it under the foundation instrument panel, and take out the air duct.

Note :

Unless the wire is loosened, the air duct cannot be taken out.

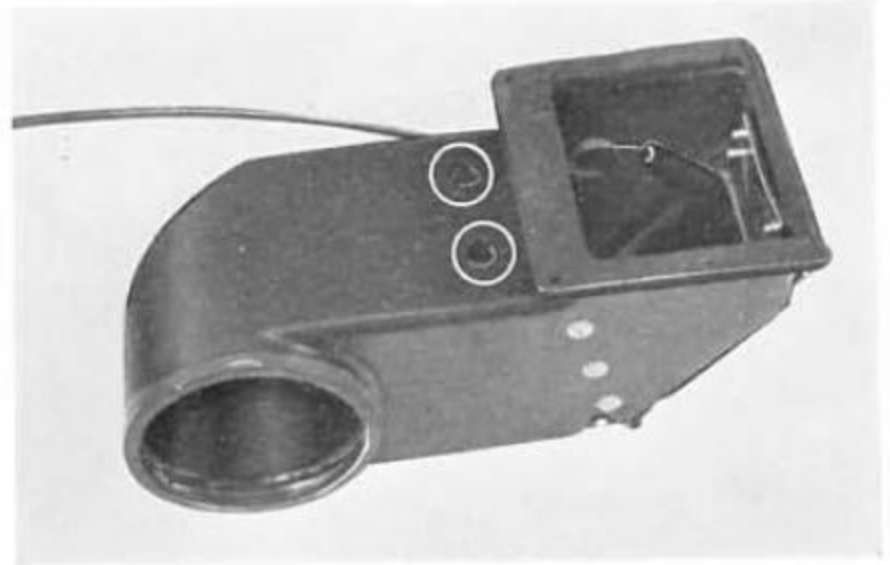


Fig. 17H-5

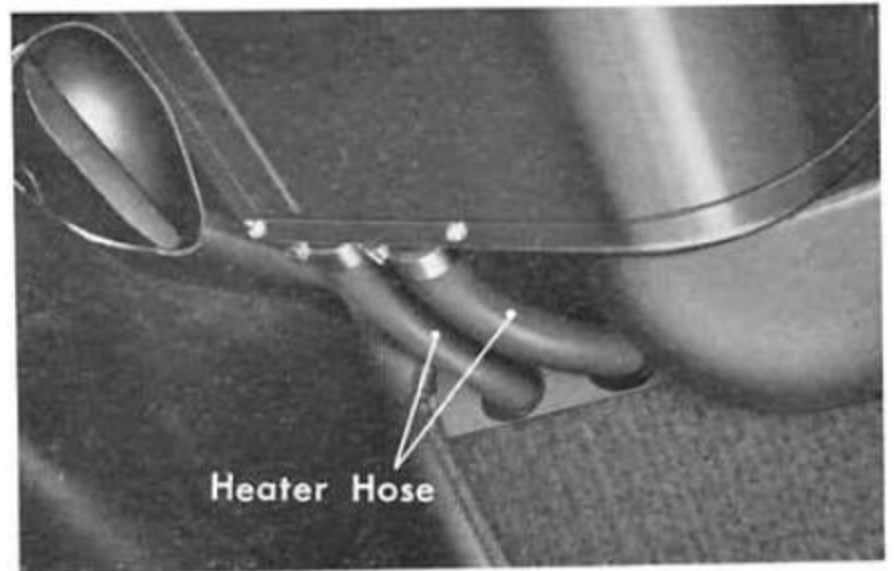


Fig. 17H-6

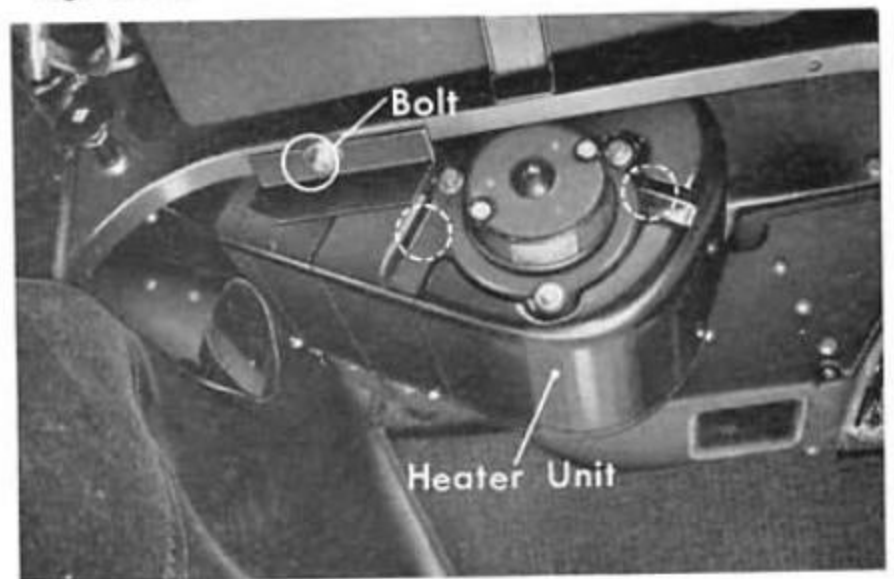


Fig. 17H-7



Fig. 17H-8

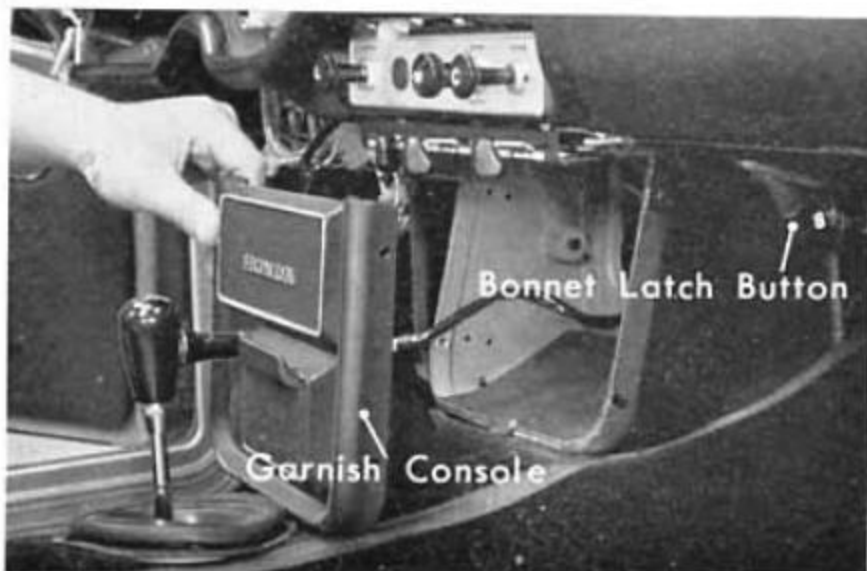


Fig. 17H-9

6. Unscrew 4 bolts and remove the garnish console. (Fig. 17H-9)
7. Dismount the control rod and wire from the heater remote control lever. (Fig. 17H-10)
8. Unscrew 2 bolts from the driver's seat side and a bolt from engine room side, and dismount the air duct. At that time, disconnect the nozzle and the air duct, the defroster and the air duct. (Fig. 17H-11, 12)

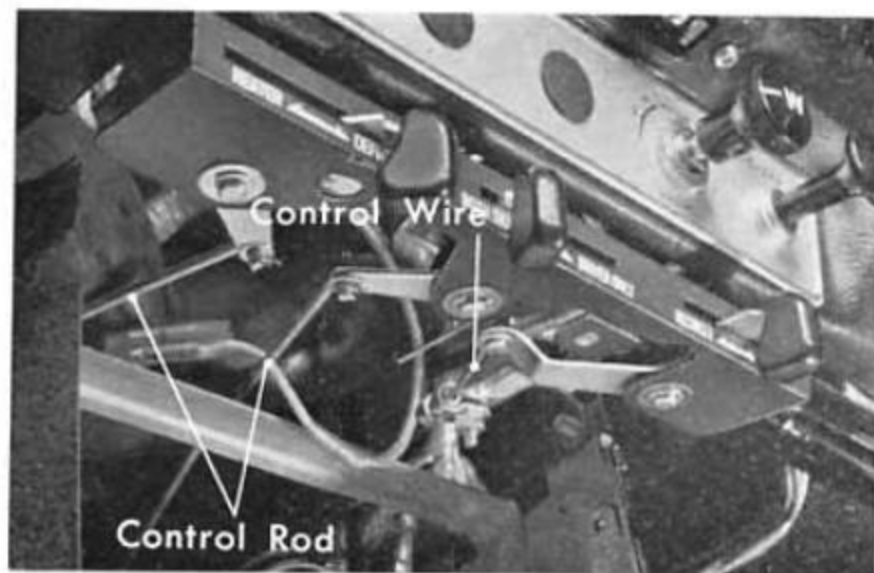


Fig. 17H-10

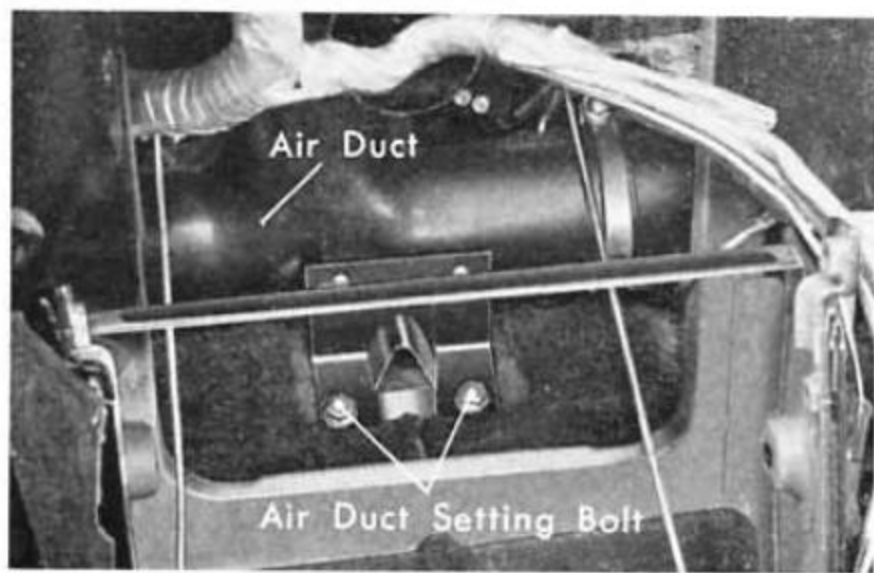


Fig. 17H-11

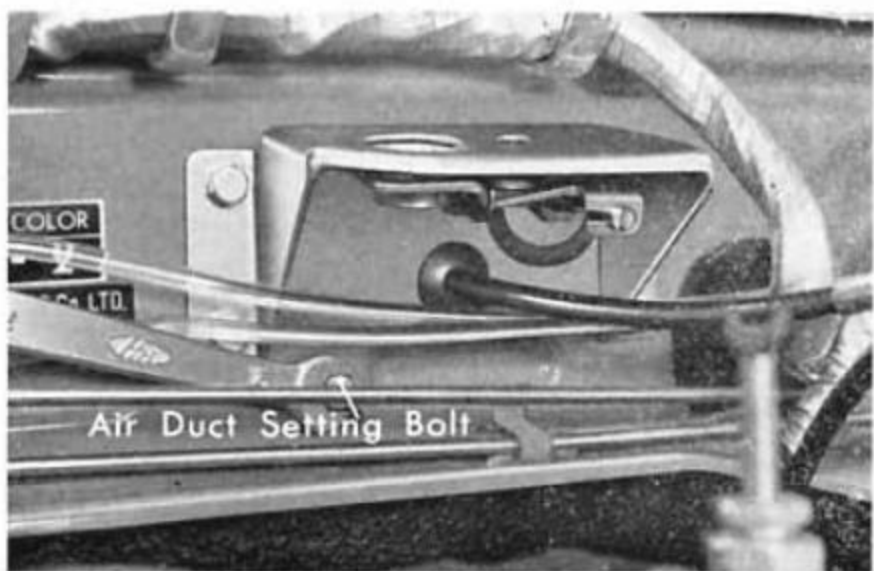


Fig. 17H-12

18. FRAME

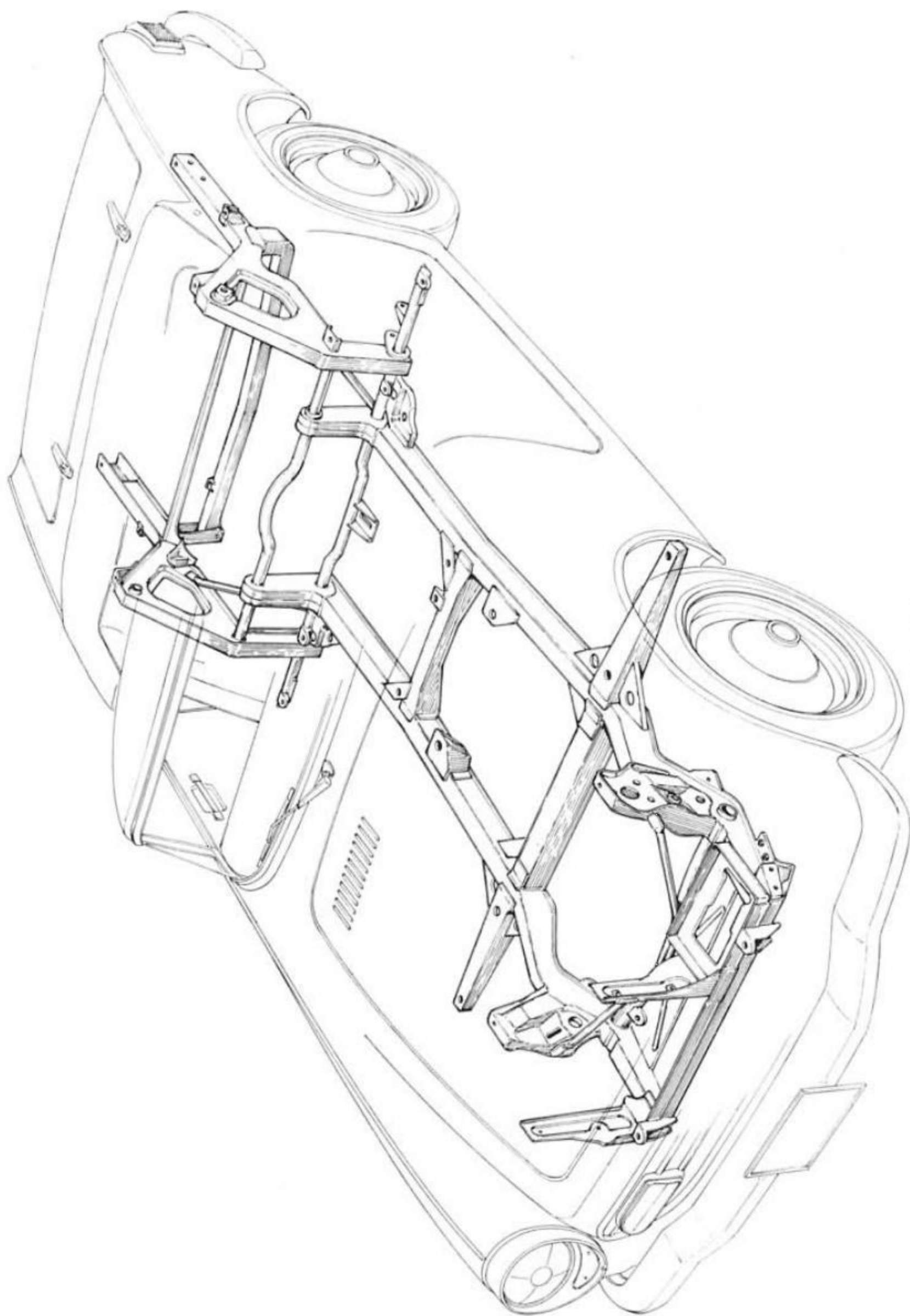


Fig. 18-1

FRAME PHYSICAL DIMENSIONS

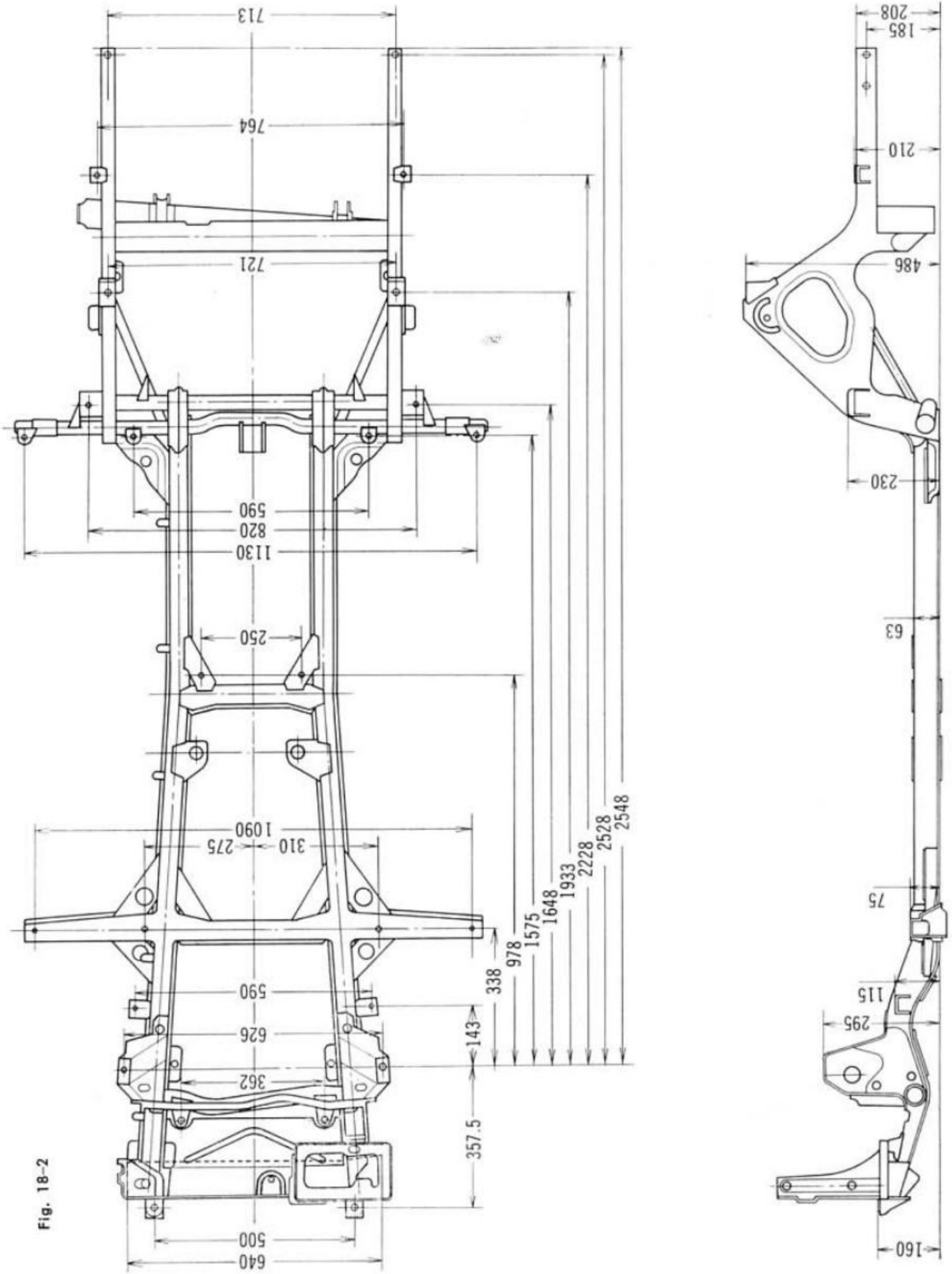


Fig. 18-2

A. DISASSEMBLY AND ASSEMBLY

1. Remove the body from the frame.
2. Support the vehicle on the rigid racks.
3. Remove the engine (Fig. 18A-1).
4. Remove the steering gear box.
5. Disassemble the front suspension (Fig. 18A-2).

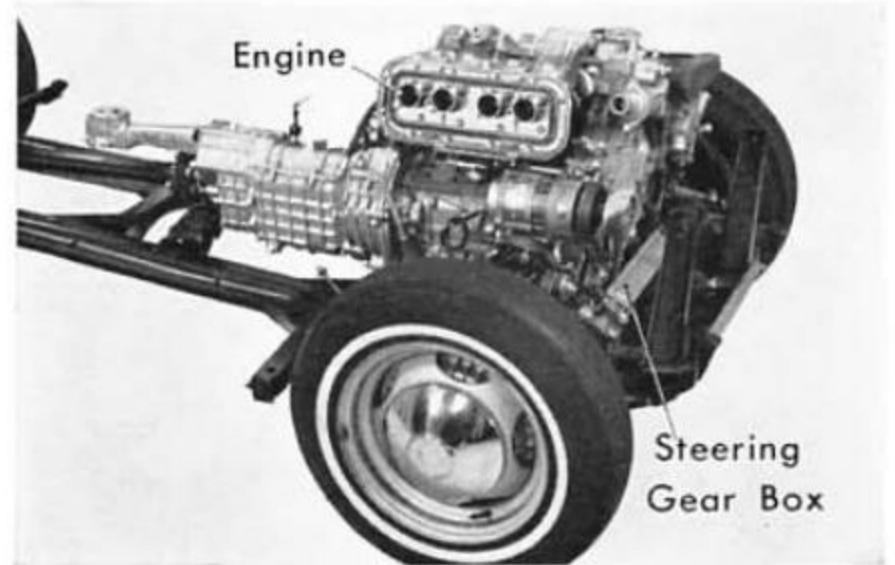


Fig. 18A-1

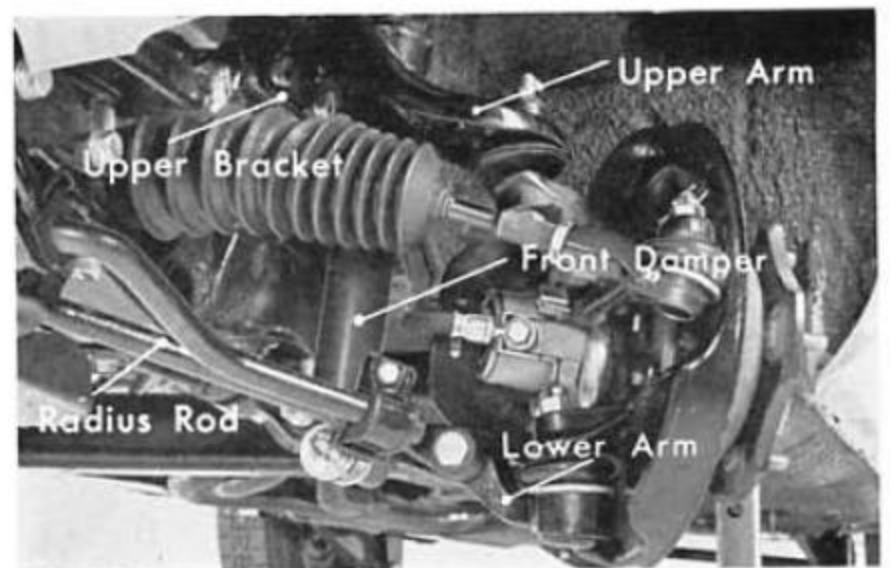


Fig. 18A-2

6. Remove the rear dampers (Fig. 18A-3).
7. Disconnect the handbrake cable from the equalizer arm and remove the equalizer arm.
8. Remove the rear axle housing.

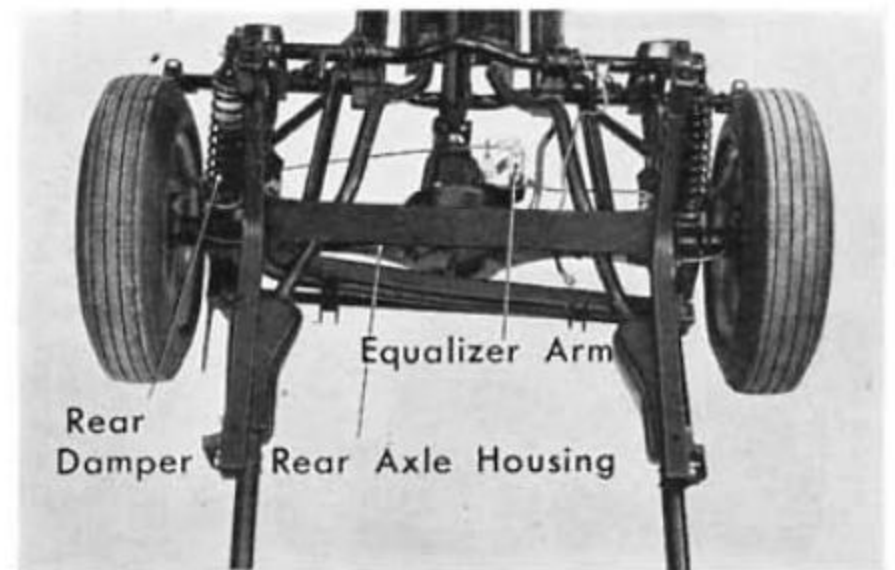


Fig. 18A-3

9. Remove the clamps and remove the fuel pipe (Fig. 18A-4).
10. Remove the body mountings (rubber) from the frame.

Note :

Apply a good adhesive to the rubber mounts during installation.

When replacing the frame, transfer the old frame number to the new frame and perform the assembly in the reverse order of disassembly.

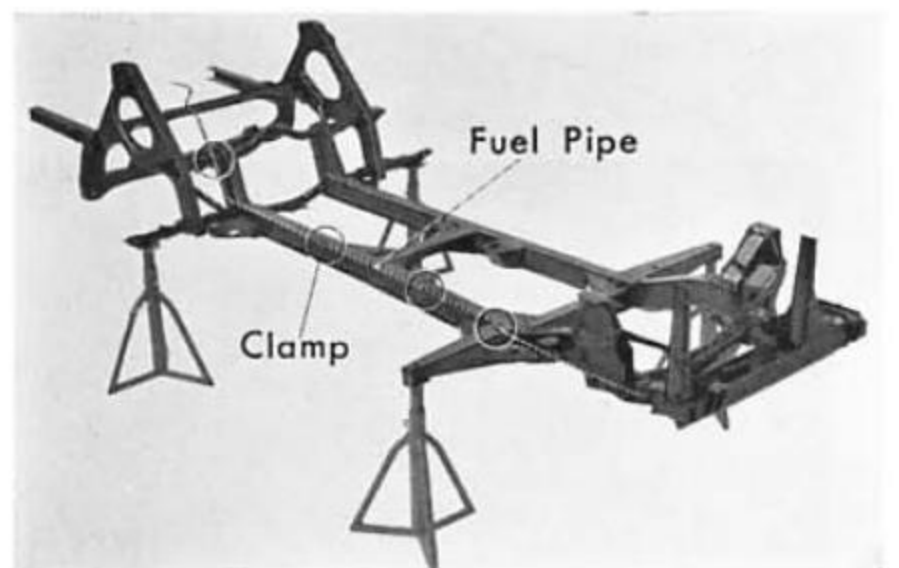


Fig. 18A-4

18-4 FRAME

11. Torque the body mounting bolts to 2.5 kg-m or 4.5 kg-m.

Note:

○ 2.5 kg-m (18.1 ft-lbs)...1, 2, 5, 6, 7 10, 11 ⊙ 4.5 kg-m (32.5 ft-lbs)...3, 4, 8

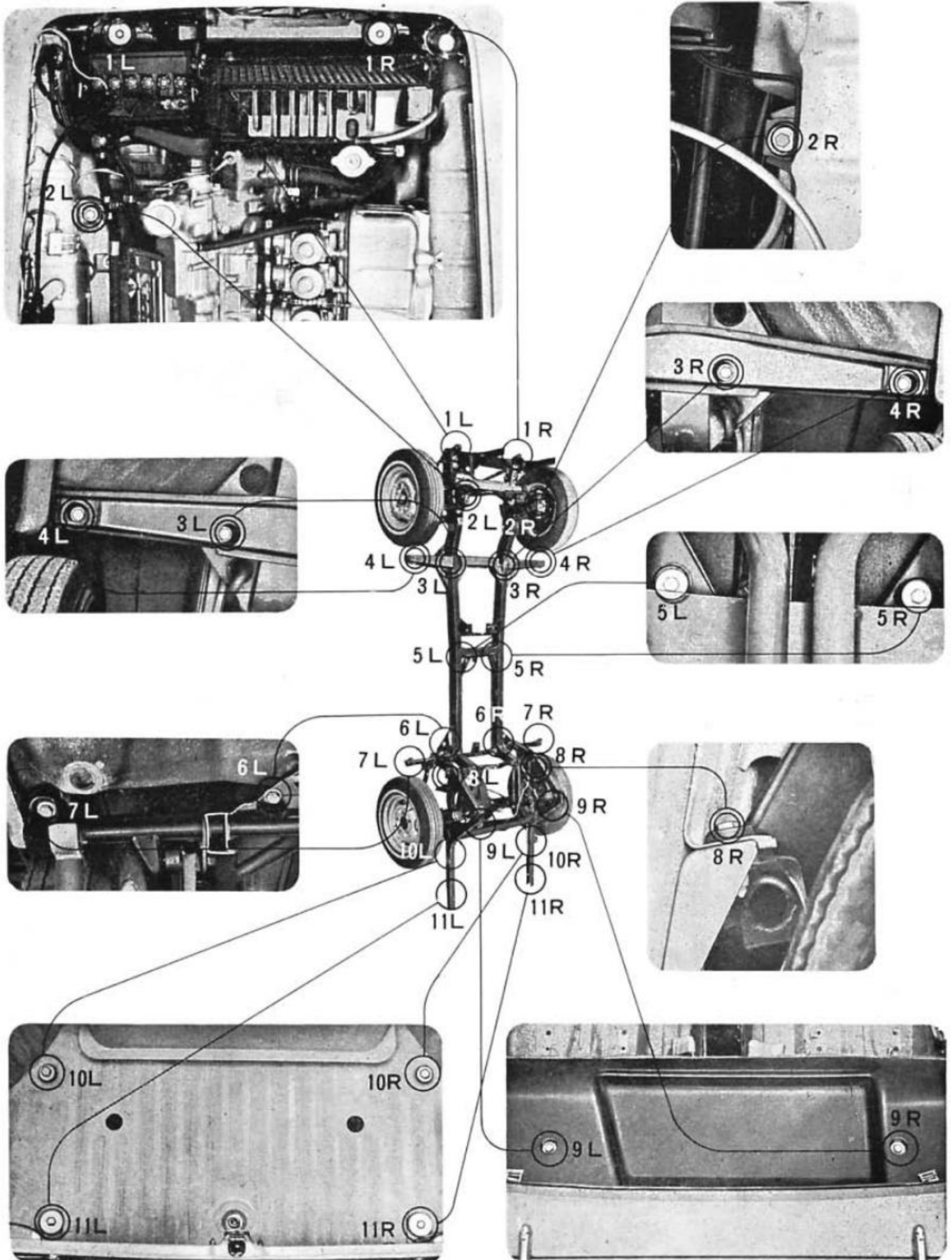
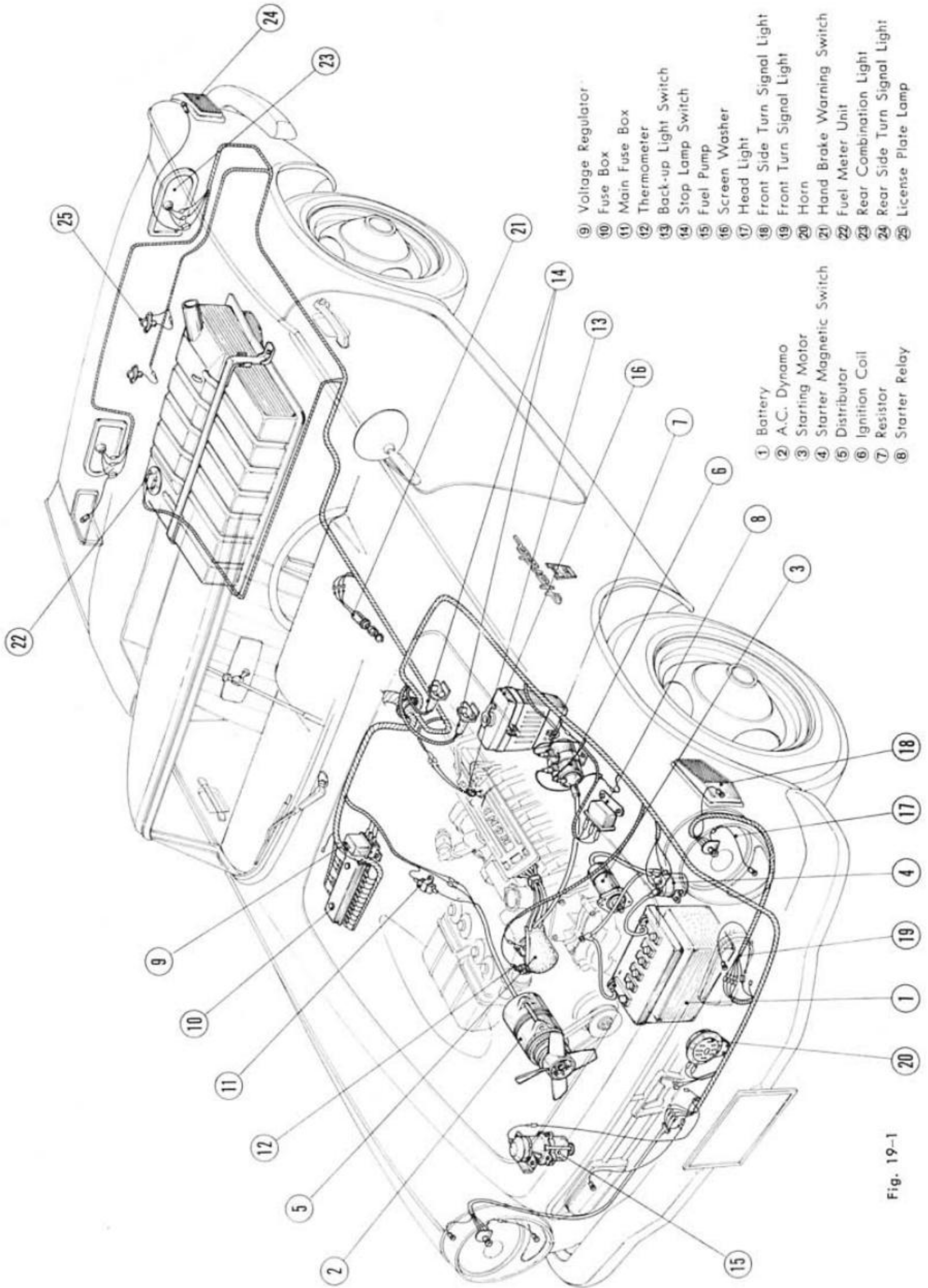


Fig. 18A-5

19. ELECTRICAL SYSTEM



- ① Battery
- ② A.C. Dynamo
- ③ Starting Motor
- ④ Starter Magnetic Switch
- ⑤ Distributor
- ⑥ Ignition Coil
- ⑦ Resistor
- ⑧ Starter Relay
- ⑨ Voltage Regulator
- ⑩ Fuse Box
- ⑪ Main Fuse Box
- ⑫ Thermometer
- ⑬ Back-up Light Switch
- ⑭ Stop Lamp Switch
- ⑮ Fuel Pump
- ⑯ Screen Washer
- ⑰ Head Light
- ⑱ Front Side Turn Signal Light
- ⑲ Front Turn Signal Light
- ⑳ Horn
- ㉑ Hand Brake Warning Switch
- ㉒ Fuel Meter Unit
- ㉓ Rear Combination Light
- ㉔ Rear Side Turn Signal Light
- ㉕ License Plate Lamp

Fig. 19-1

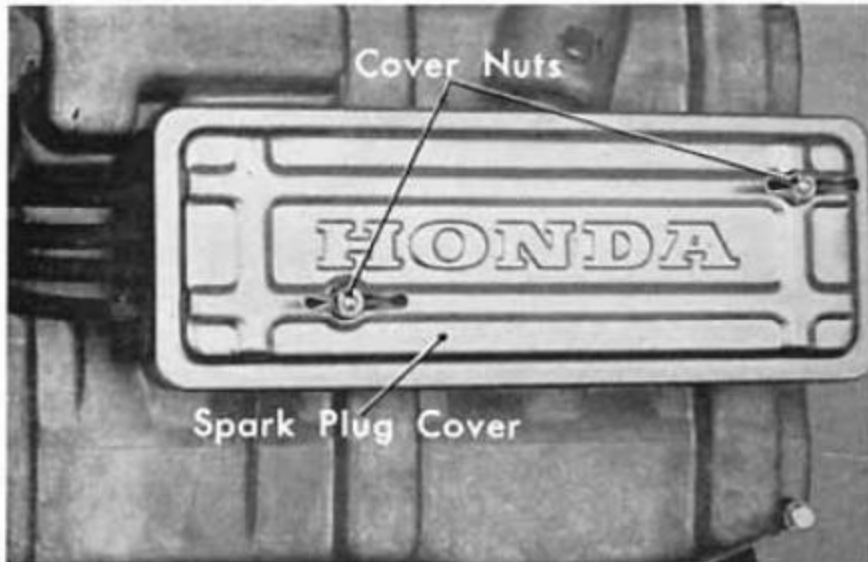


Fig. 19A-1

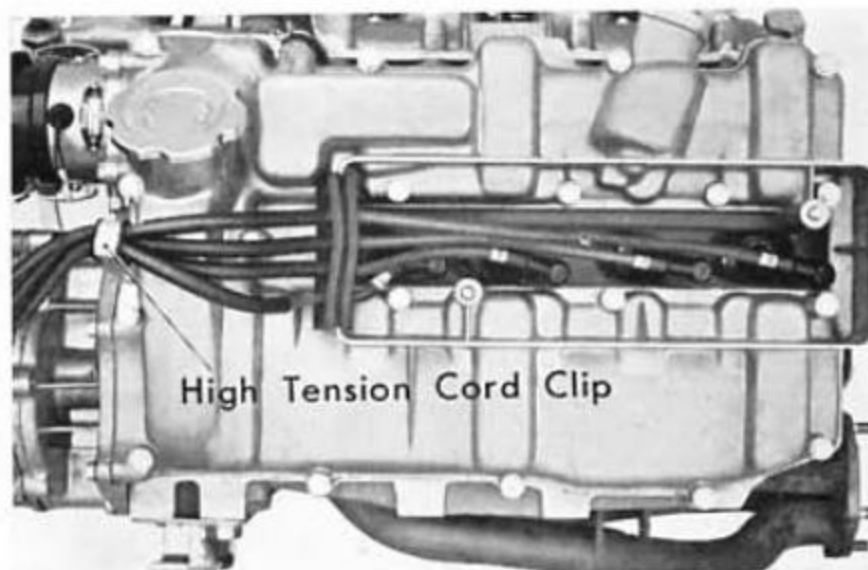


Fig. 19A-2

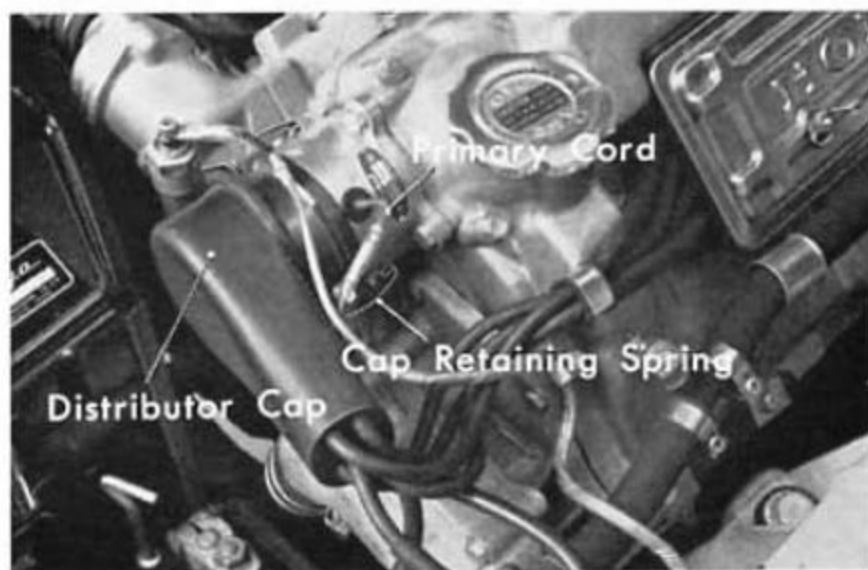


Fig. 19A-3

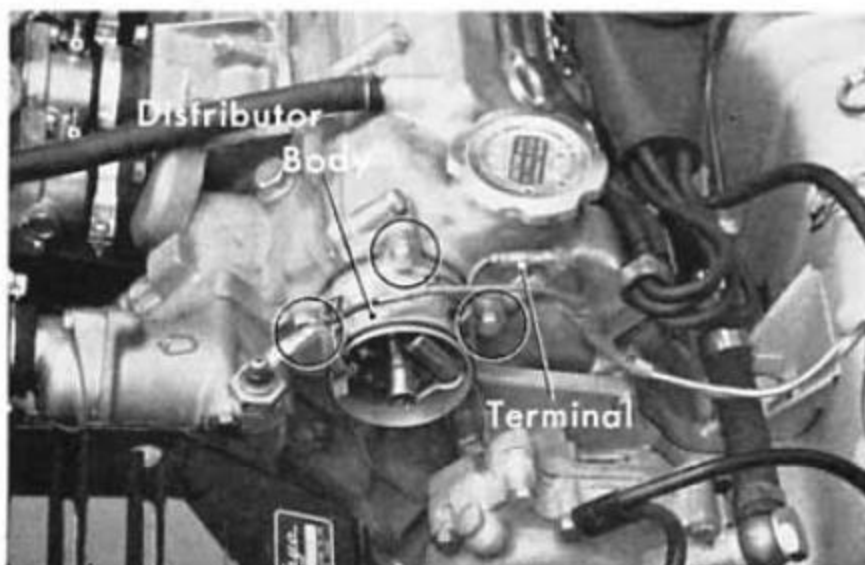


Fig. 19A-4

A. DISTRIBUTOR

a. Removal

1. Remove two spark plug cover nuts and seal washers, take off the cover and disconnect the high tension terminals from the spark plugs (Fig. 19A-1).
2. Remove the clip mounting bolt and detach the high tension cord clip from the engine (Fig. 19A-2).
3. Disconnect the high tension cord from the ignition coil.
4. Unfasten the distributor cap retaining lock springs and remove the distributor cap and the O ring from the distributor body (Fig. 19A-3).
5. Disconnect the primary cord at the terminal closest to the distributor body (Fig. 19A-4).
6. Remove distributor mounting bolts and washers, and remove the distributor body and gasket from the engine.

Note :

When disassembling the distributor body only, unfasten the cap retaining springs and remove the cap from the body.

b. Distributor Cap Disassembly

1. Remove screws and disassemble the distributor cap cover and high tension cord from the distributor cap (Fig. 19A-5).
2. Remove the high tension terminals from the high tension cords.
3. Remove the carbon piece.

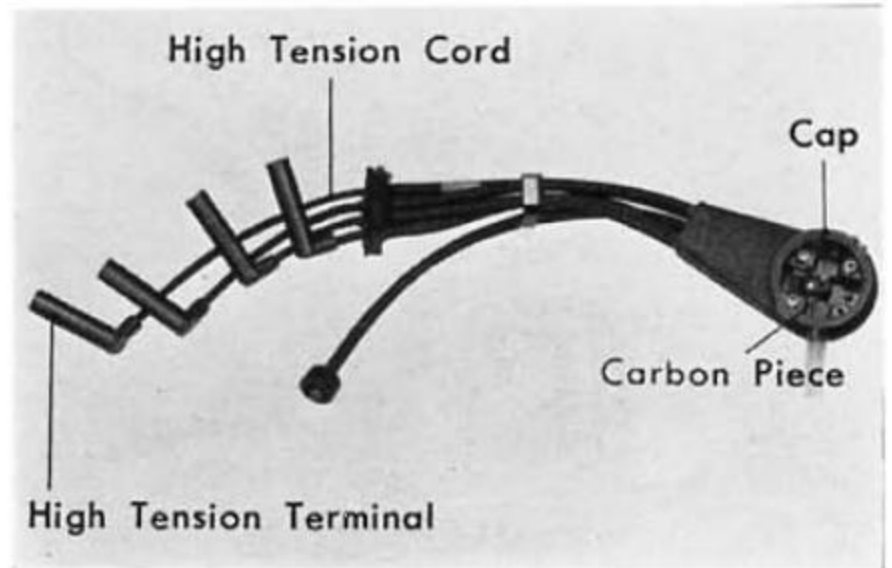


Fig. 19A-5

c. Distributor Cap Assembly

1. Insert the high tension cords into the cap completely before tightening.
2. The high tension cords shall be assembled in the cap as shown in the Fig. 19A-6.

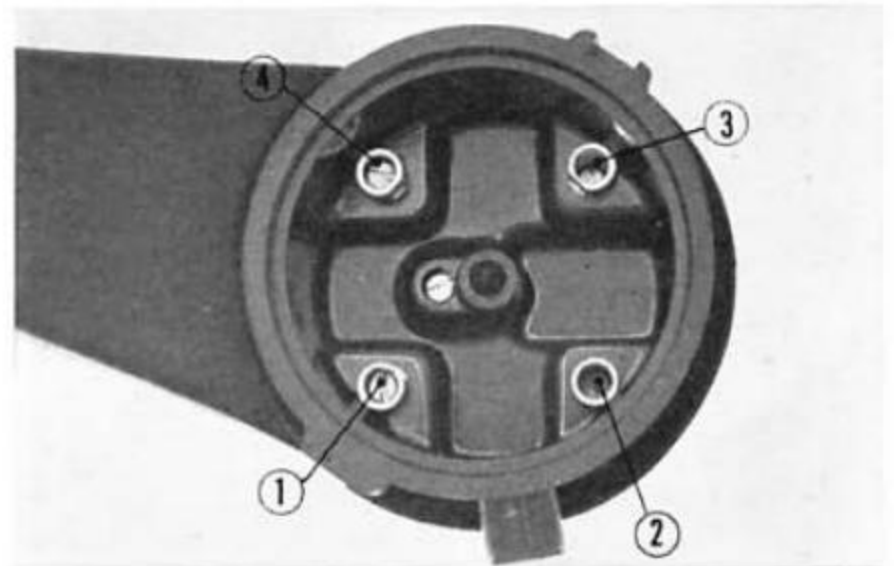


Fig. 19A-6

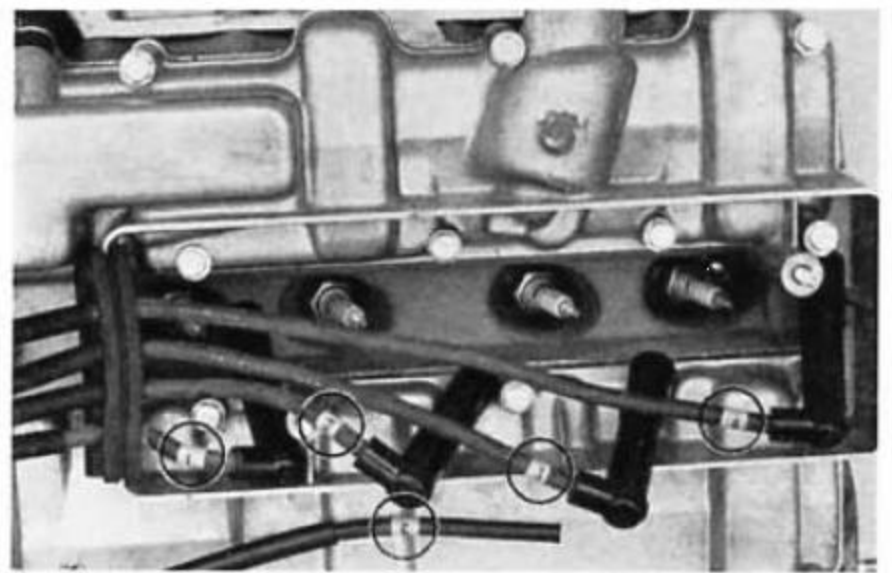


Fig. 19A-7

d. Distributor Body Disassembly

1. Remove the rotor head from the distributor camshaft (Fig. 19A-8).

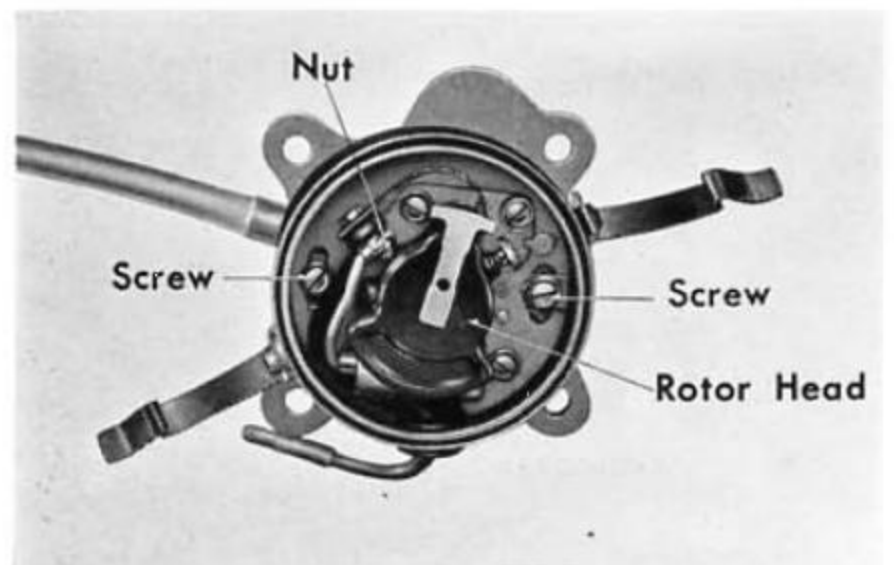


Fig. 19A-8

19-4 ELECTRICAL SYSTEM

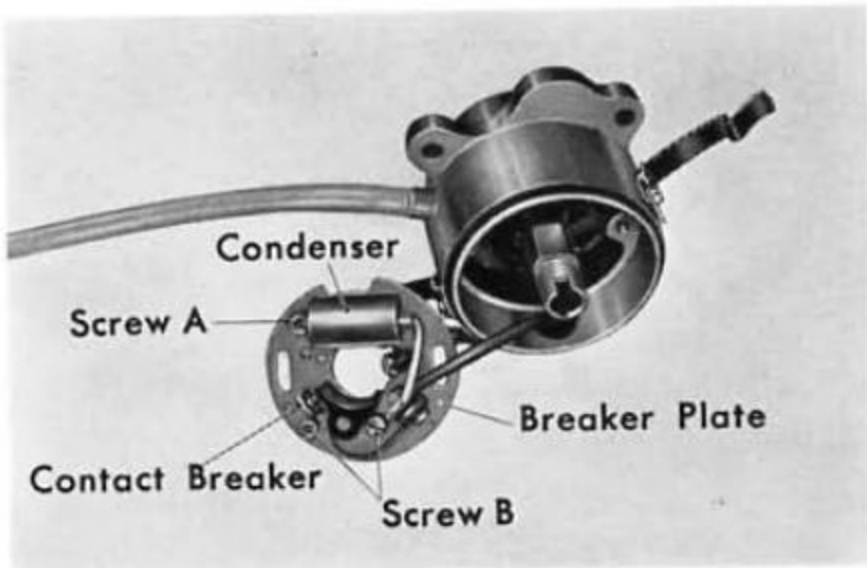


Fig. 19A-9

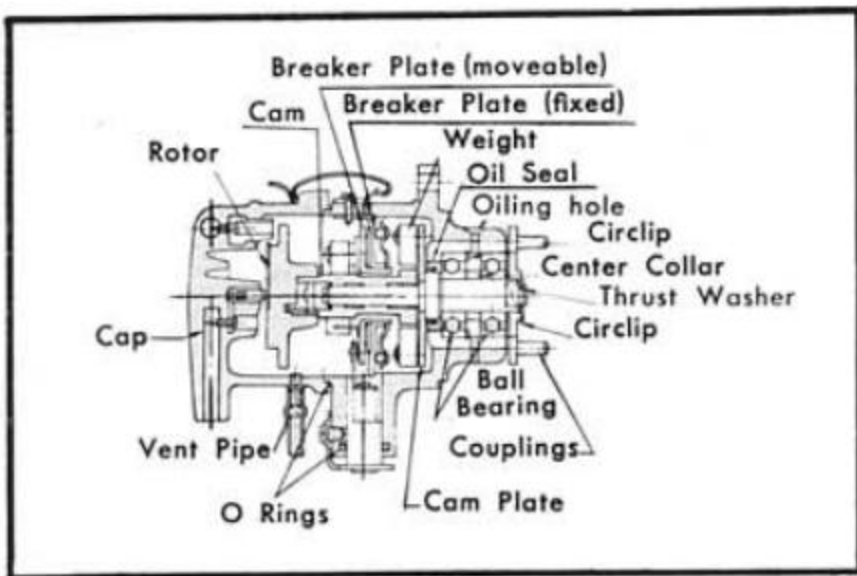


Fig. 19A-10

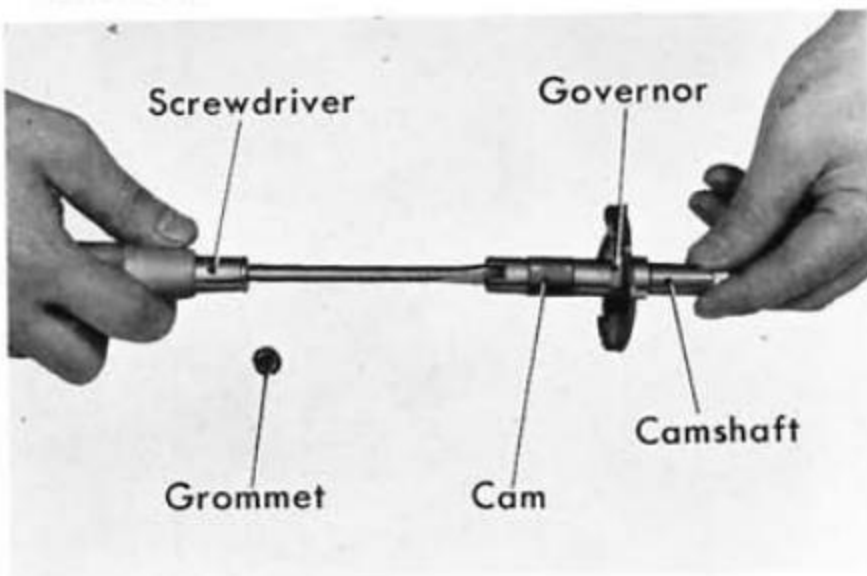


Fig. 19A-11

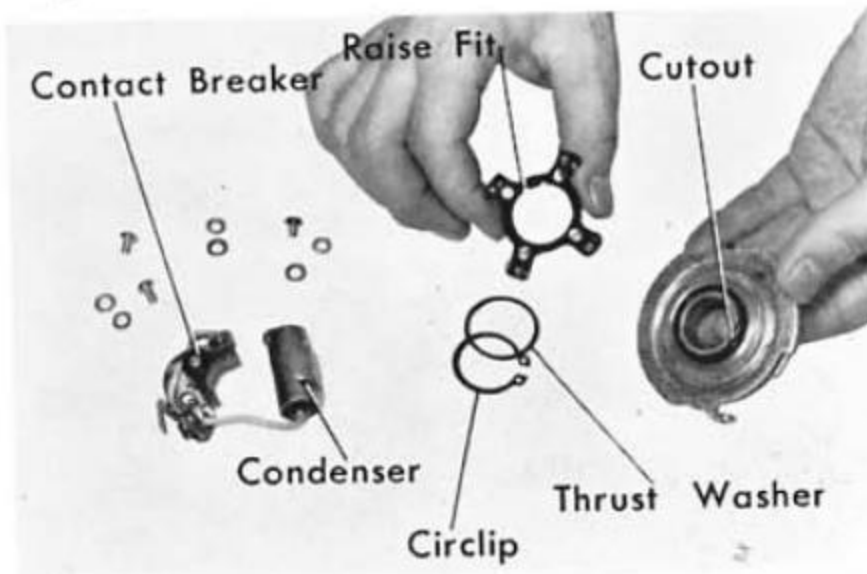


Fig. 19A-12

2. Remove the circlip and disassemble the thrust washer A, coupling plate, and thrust washer B from the distributor shaft (Fig. 19A-10).
3. Disassemble the ball bearings, bushing, center collar from the distributor body.
4. Remove oil seal, and circlip, and then remove the ball bearing from the body.
5. Remove the grommet screw and washer from the end of the shaft, and remove the cam (Fig. 19A-11).

e. Distributor Body Assembly

1. The distributor shall be assembled in the reverse order of disassembly, exercising caution on the following points.
2. Apply a small amount of grease on the cam and install grommet before assembly.
3. Apply grease to the friction areas of the breaker plate and steel balls before assembly.

- Inspect the breaker points for any pits or burns, dress smoothly with a file or an oil stone. Also rework the points which are not making parallel contacting.
- Assemble the contact breaker and condenser on the breaker plate.

Note :

Inspect the breaker arm tension and condenser capacity.

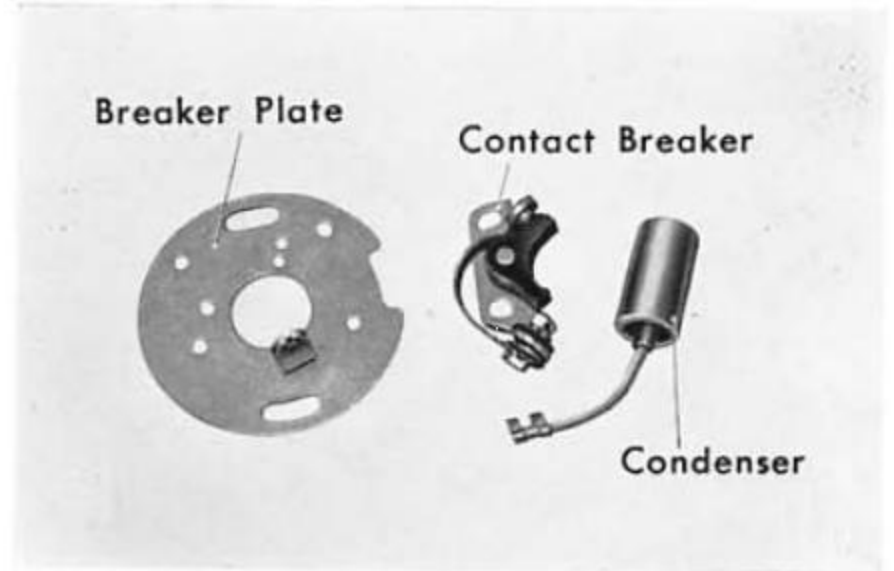


Fig. 19A-13

- Wash the ball bearings in clean solvent or gasoline, apply grease and press into the body; followed by assembling the circlip and oil seal.

Note :

Press in the oil seal so that it is flush with the end of the housing, exercising care that the seal is not distorted during installation.

- Press the shaft into the body and check to make sure that the governor and the shaft are operating freely.

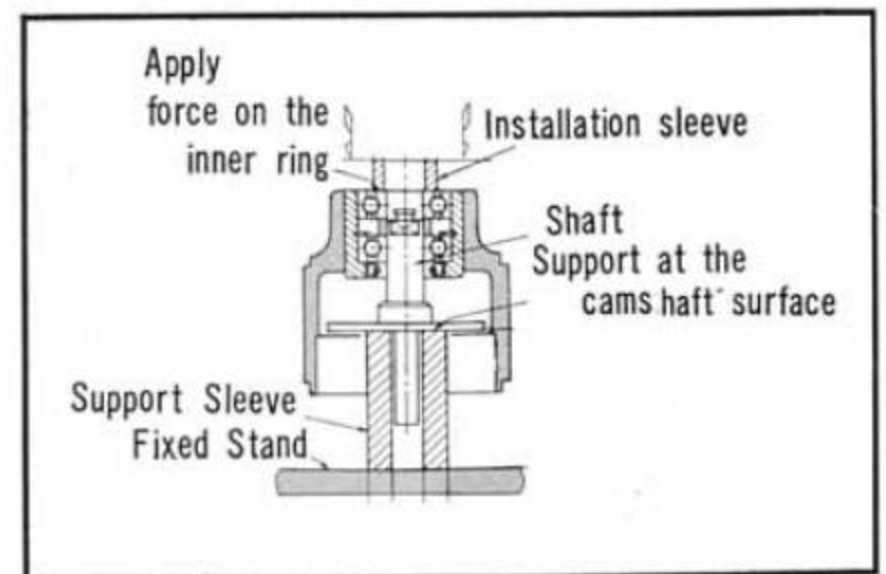


Fig. 19A-14

- Apply grease to the bearing and bushing; assemble the center collar, needle bearing and bushing in that order; followed by thrust washer, coupling plate and lock with the circlip.

Note :

Install the coupling plate with the shaft cutout groove toward the top and the large diameter area to the right. The clearance between the housing is adjusted by the thrust washer.

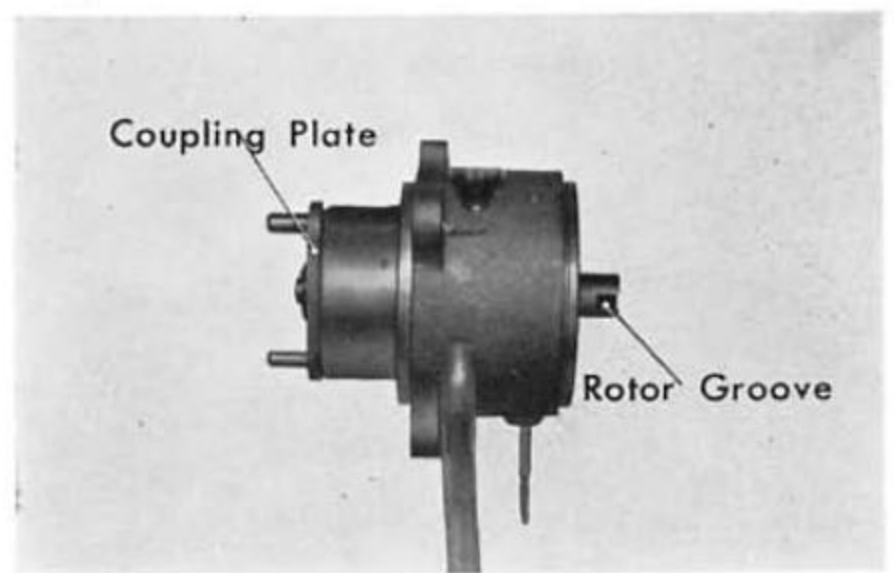


Fig. 19A-15

- Shaft runout inspection.

	Standard Value	Serviceable Limit
Runout	0~0.03 mm (0~0.0012")	Replace if beyond 0.1 mm (0.0040")

Note :

The runout may be the cause of either the shaft itself or the bearings.

Excessive runout of the shaft will cause difference in point gap opening which would give uneven ignition characteristics to the respective cylinders, resulting in malfunction of the engine. The inspection, therefore, should be performed every 20,000 km (12,500 miles).

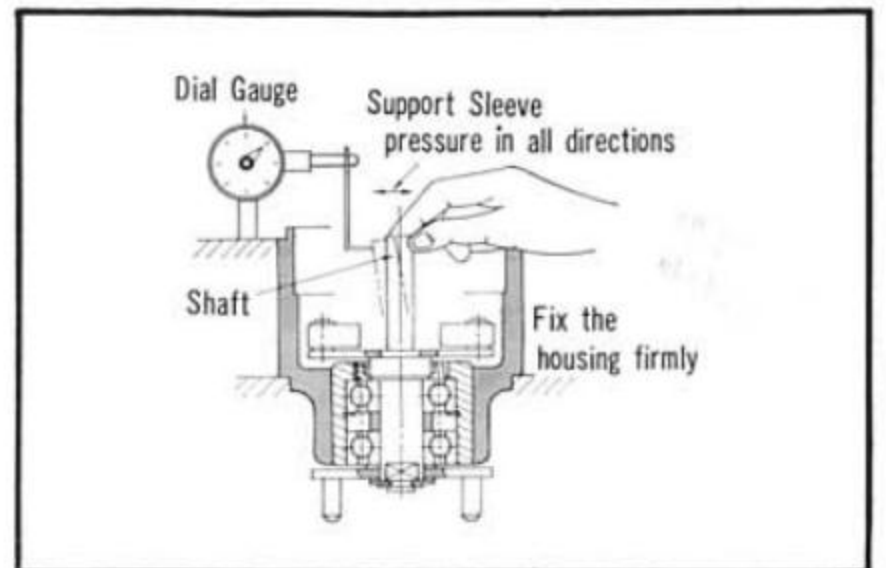


Fig. 19A-16

19-6 ELECTRICAL SYSTEM

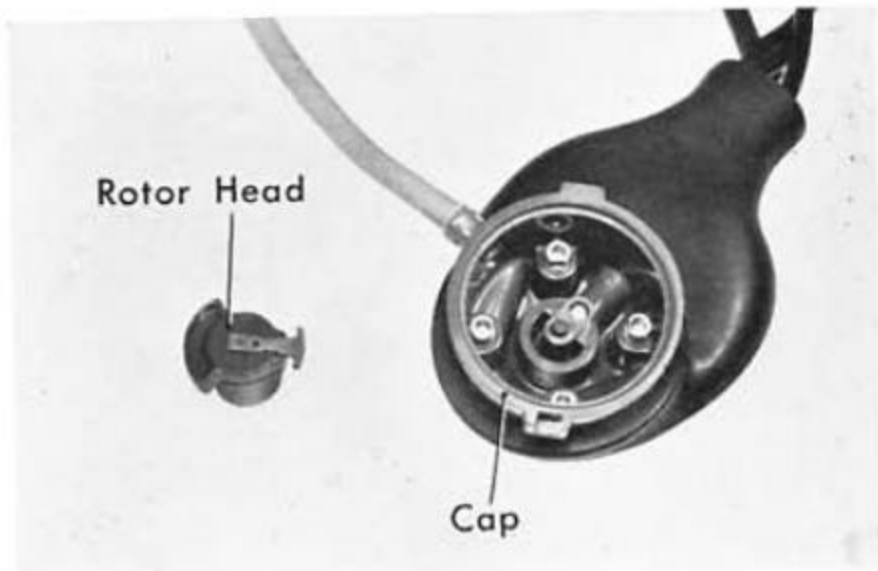


Fig. 19A-17

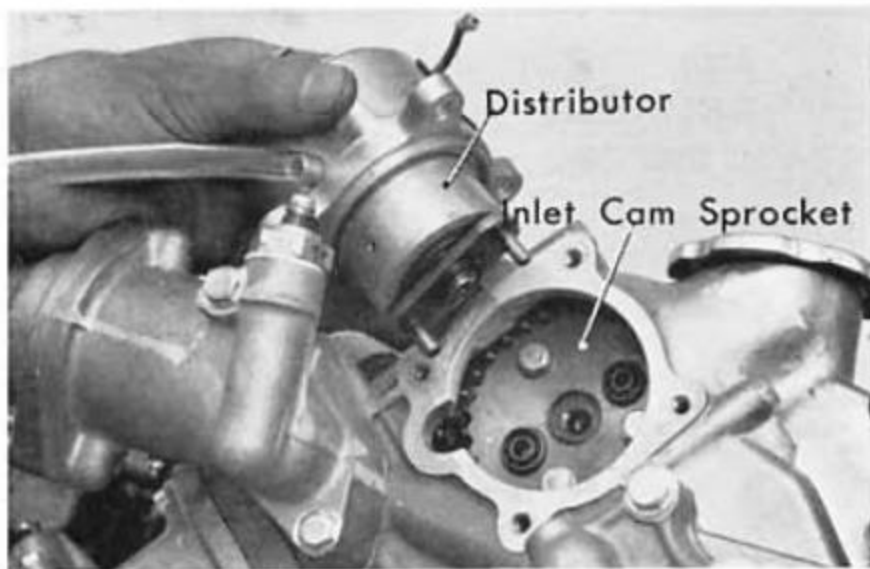


Fig. 19A-18

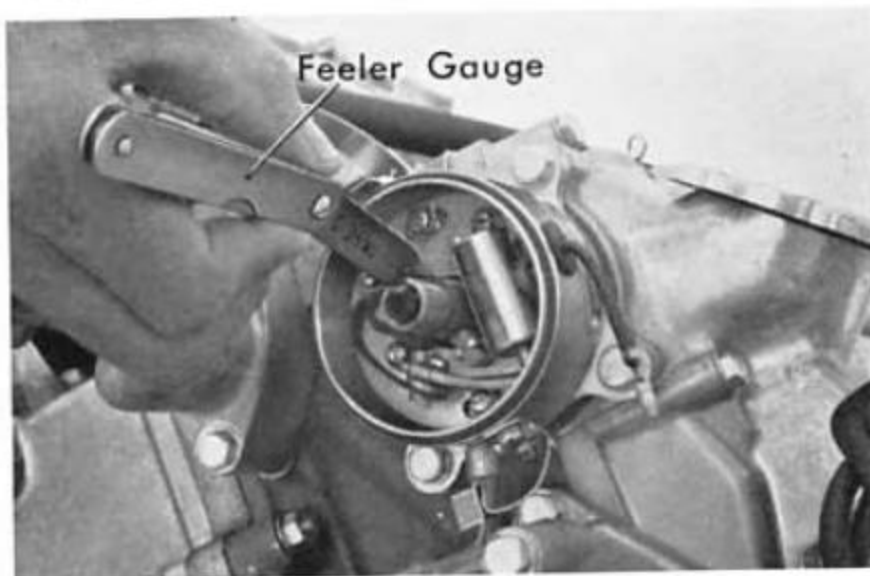


Fig. 19A-19.

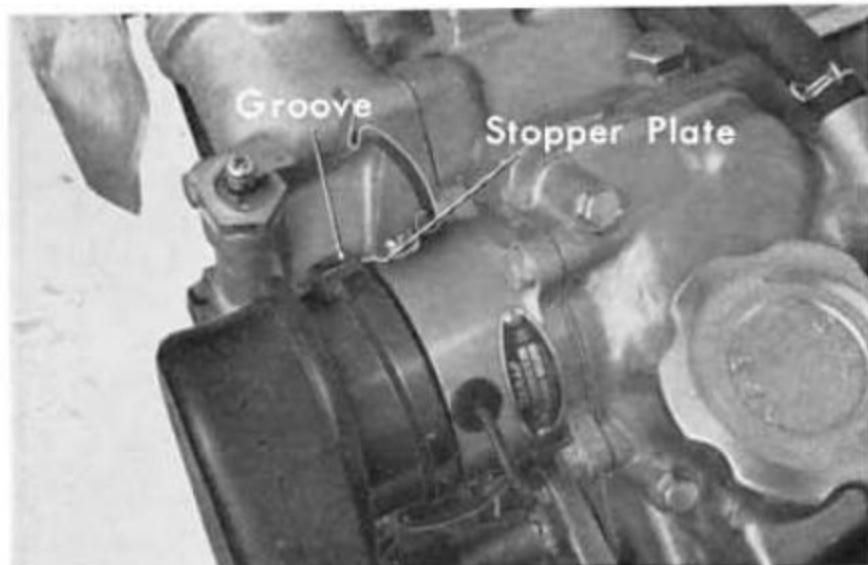


Fig. 19A-20

10. Assemble the breaker plate into the housing, apply liquid thread-lock to the screws and tighten. Connect the primary cord to the terminal.
11. Assemble the timing controller and the rotor head.

Note :

If there are any cracks or indication of electrical leakage in the cap or rotor head, it should be replaced.

f. Installation and Inspection

1. Install gasket on the distributor body and install the coupling plate onto the inlet cam sprocket.

Note :

The two pins on the coupling plate are of different diameters, therefore, it will fit in only one direction. If difficulty is encountered in making the installing, do not force but inspect the following areas :

1. Inspect the alignment of the couplings to the mounting flange.
 2. Inspect the alignment of the distributor mounting hole of the cylinder head cover to the couplings on the engine camshaft sprocket.
- If the above inspection is neglected, it may result in damage to the camshaft sprocket coupling or the distributor coupling; it may also result in damage to bearings.
2. Adjust the breaker point gap to 0.3~0.4 mm (0.012~0.016 in.) (Fig. 19A-19).

3. Install the distributor to the engine and perform the ignition timing.
4. Install the O ring on the distributor body, place the distributor cap on the body with the stopper aligned to the groove and lock the cap on the body with the spring lock clips hinged to the body.
5. Inspect the operation of the governor spark advancer.

B. A.C. DYNAMO**a. Removal**

1. Remove the radiator.
2. Remove the carburetor assembly from the engine.
3. Disconnect the wiring at the wire harness and remove the fuse at the fuse case.
4. Remove the nut, washer and special mounting bolt from the upper mounting bracket (Fig. 19B-1).
5. Remove the bolt and washer from the lower mounting and remove the A.C. dynamo from the engine (Fig. 19B-1).

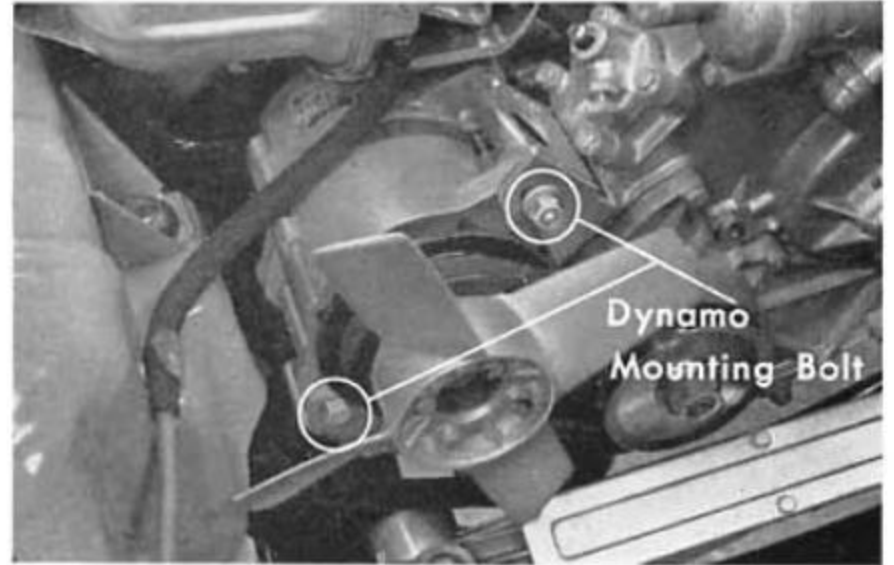


Fig. 19B-1

b. A.C. Dynamo Disassembly

1. Remove the bolts and washers attaching the cooling fan to the A.C. dynamo and disassemble the fan (Fig. 19B-2).
2. Remove the 12 mm thin nut, washer and disassemble the pulley, key and distance collar.
3. Remove four screws attaching the brush cap, and disassemble the brush cap and rubber sheet. Remove the brush attaching screws, and disassemble the brushes (Fig. 19B-3).

Note :

The A.C. dynamo is equipped with 2 brushes and may be disassembled without removing the dynamo from the engine.

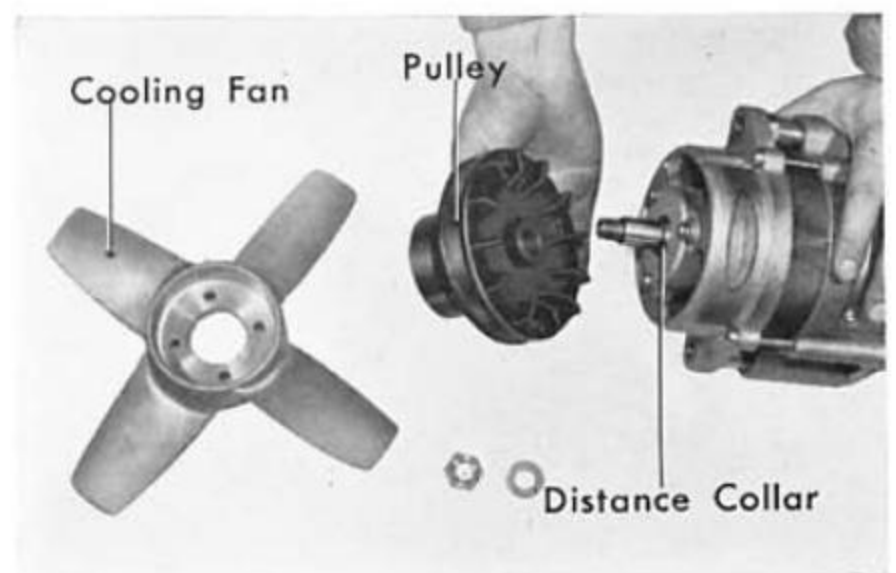


Fig. 19B-2

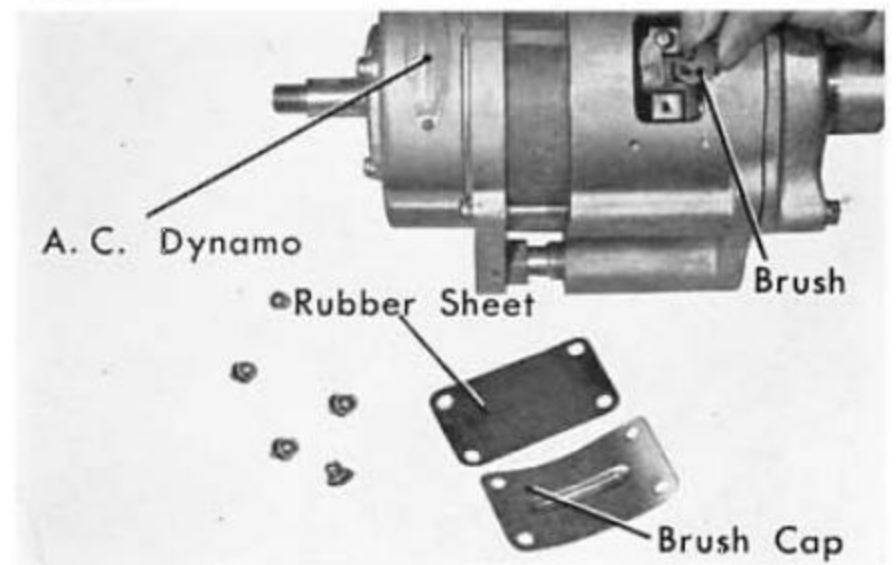


Fig. 19B-3

19-8 ELECTRICAL SYSTEM

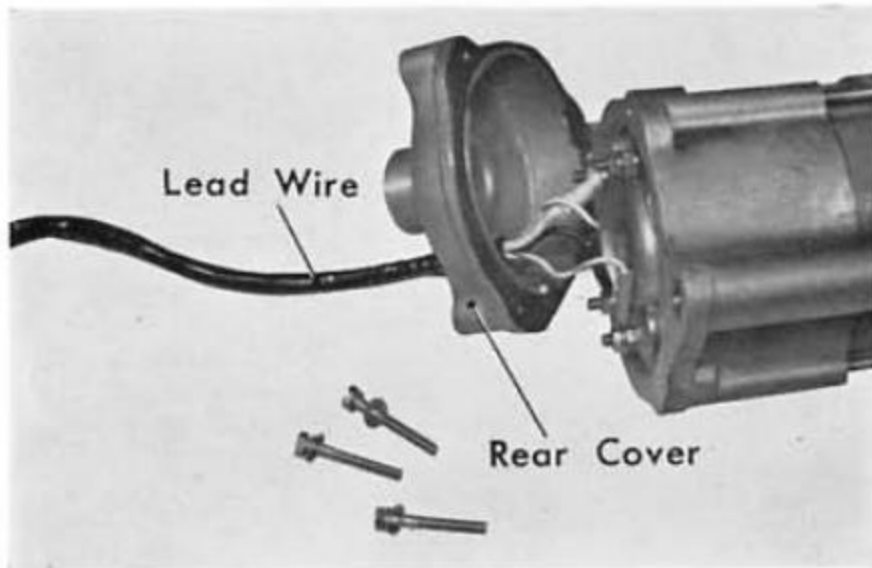


Fig. 19B-4.

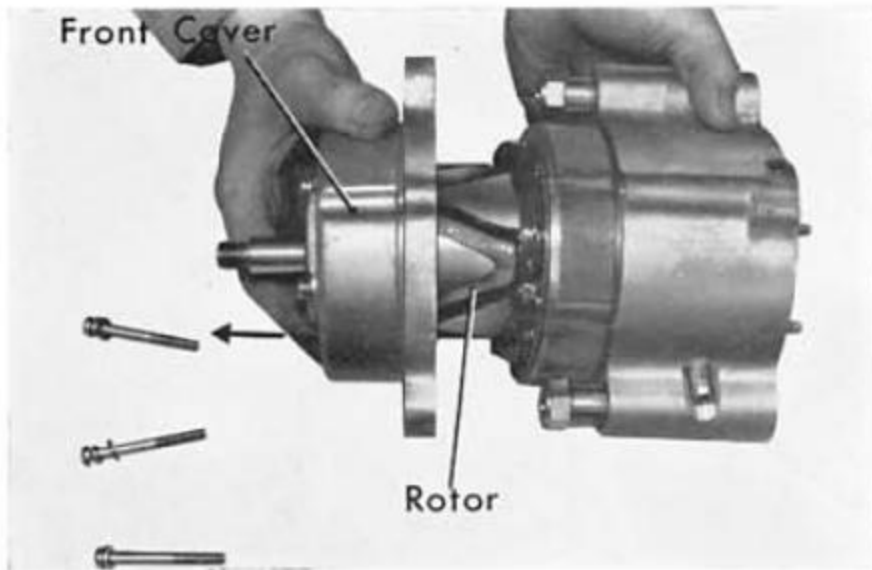


Fig. 19B-5.

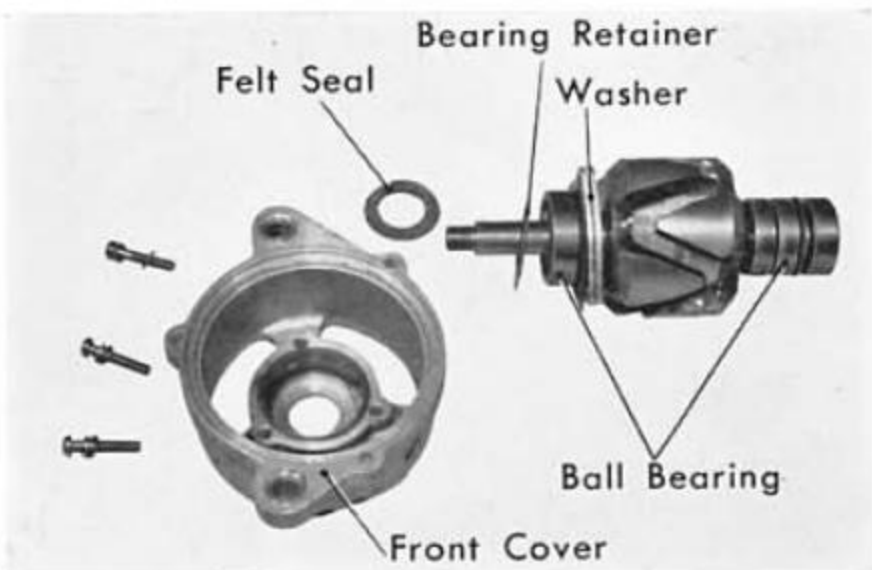


Fig. 19B-6.

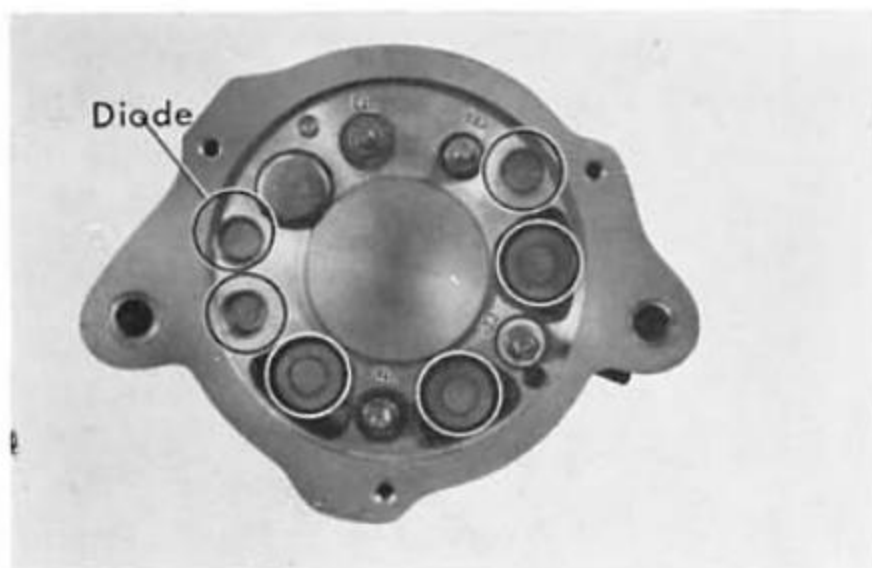


Fig. 19B-7.

4. Remove three bolts, washers, and disassemble cover and cover gasket from the rear cover. Remove the nuts, washers, and disconnect the lead wires (Fig. 19B-4).

5. Remove the front cover attaching screws, washers and loosen the spacer bolts to disassemble the front cover, rotor and ball bearing from the rear cover.

Note:

Exercise caution not to damage the coil.

6. After removing the front cover, remove screws and washers on the front cover to disassemble the rotor, retainer, ball bearing, side washer and felt seal.

7. The diodes should be handled with care when removing since applying excess shock may damage the diodes.

c. A.C. Dynamo Assembly

1. After assembling the diodes to the rear cover, test the diodes.

Note:

Do not make an error by installing the diodes in the terminal holes.

2. After testing the stator and the rotor, apply bearing grease to the bearings and assemble to the front cover, and then assemble the front assembly to the rear cover.
3. Match the color of the lead wires to the corresponding colored terminals and assemble the cover to the rear cover.

Note :

After connecting the lead wires, apply sealing and waterproofing compound to the terminals and the mating surfaces of the rear cover, front cover and stator.

4. Inspect the wear of the brushes and the compression of the brush springs.
5. Assemble the brush after inspection and install the brush cap and rubber seal so that the inside is completely waterproof.
6. Tighten the spacer bolts lightly.
7. Perform A.C. dynamo test.

d. Installation and Inspection

1. Make the installation in the reverse order of removal and adjust the tension of the fan belt.
2. Connect the identical color cords using the wiring diagram as a guide and install the fuse in the fuse case.

C. STARTING MOTOR**a. Removal**

1. Remove the nut and washer, disconnect the starting cable from the starting motor.



Fig. 19B-8

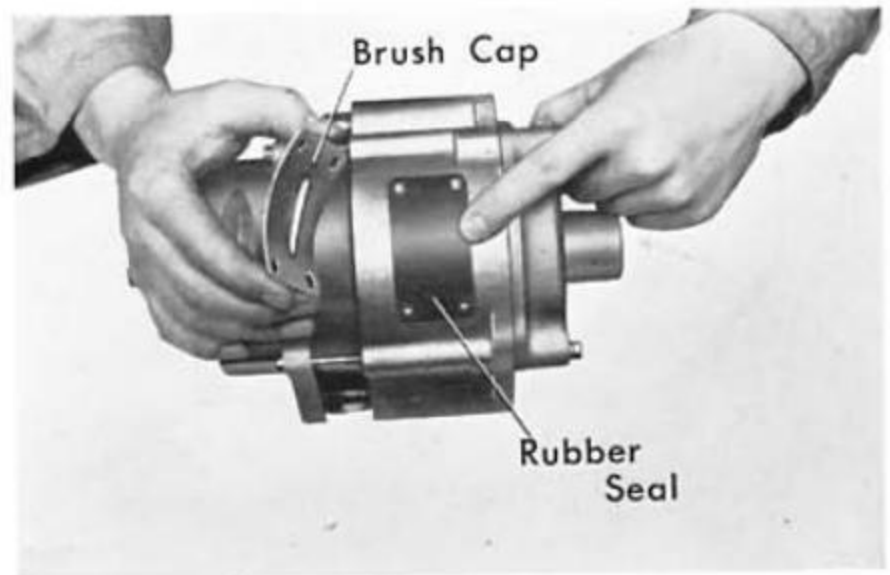


Fig. 19B-9

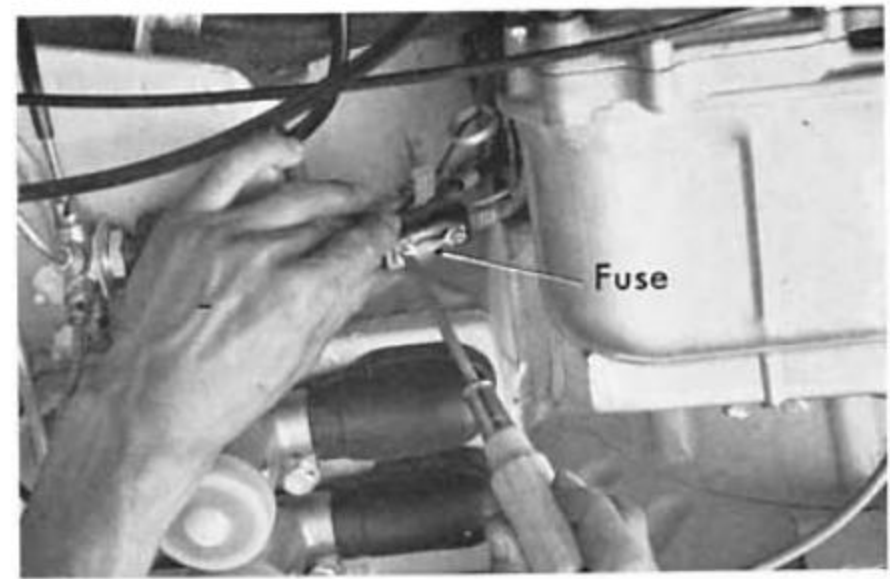


Fig. 19B-10

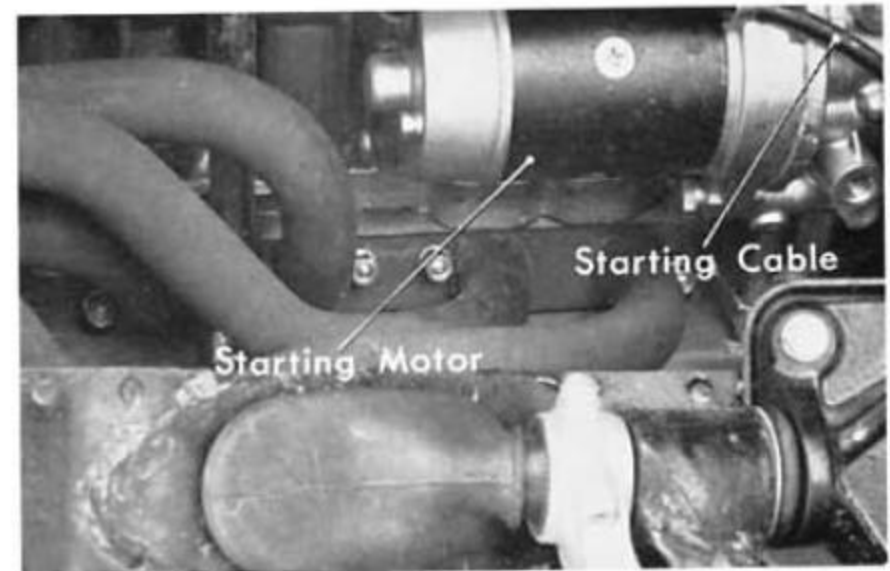


Fig. 19C-1

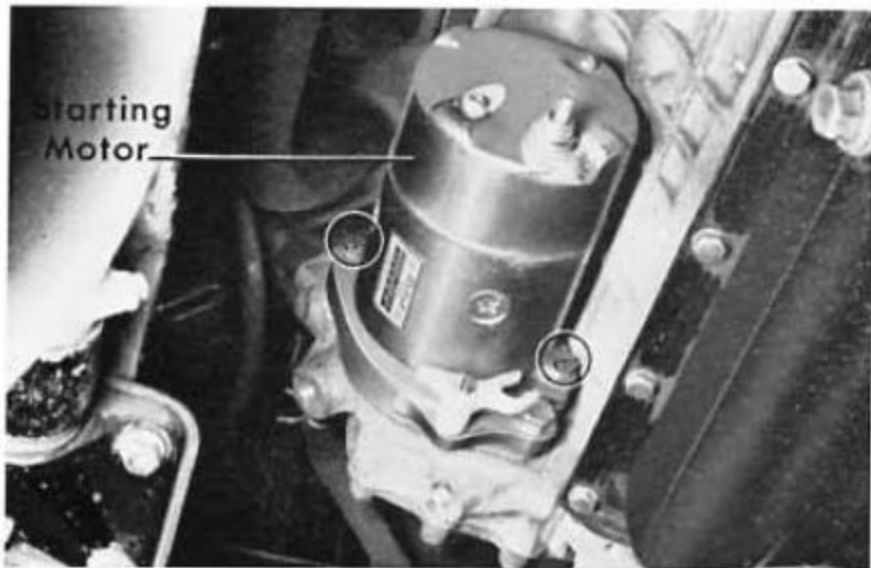


Fig. 19C-2

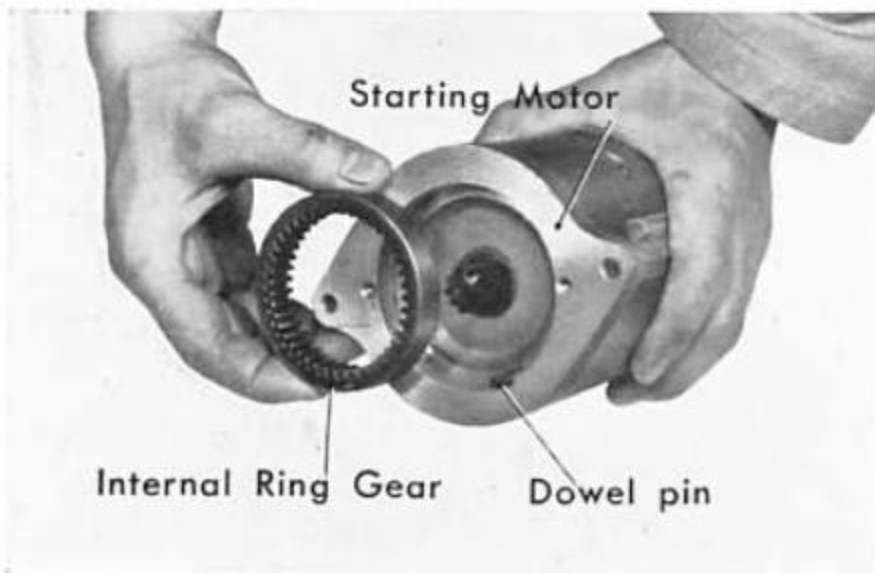


Fig. 19C-3

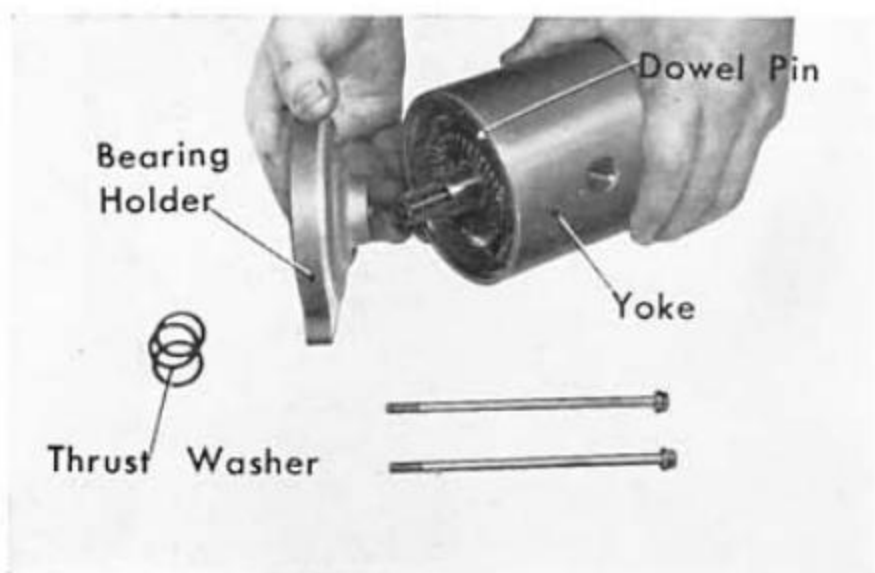


Fig. 19C-4

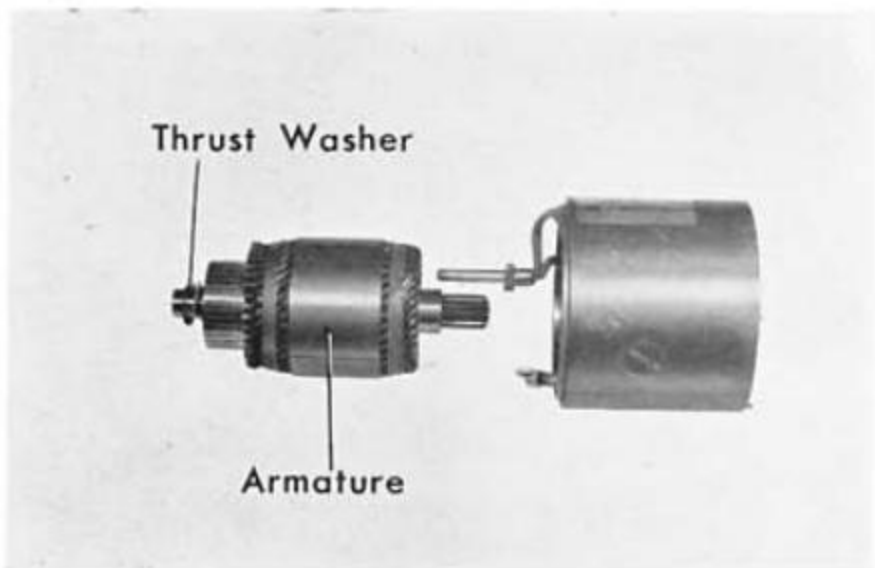


Fig. 19C-5

2. Remove bolts and washers and separate the starting motor from the engine.

b. Starting Motor Disassembly

1. Disassemble dowel pin and internal ring gear from the starting motor.
2. Remove the brush cover screws to disassemble the cover and rubber seal. Remove the brush terminal screw and lift out the brush by raising the brush hold-down spring.

Note :

The brushes can be replaced without removing the starting motor from the engine.

3. Remove the bolts and washers, and disassemble the center bearing holder by tapping lightly with a plastic hammer.

Note :

Be careful of the dowel pin.

4. Disassemble the commutator end plate by removing the cable terminal nut, washer and bakelite washer.

5. Remove thrust washers from both ends of the armature.

6. Remove four setting screws and disassemble the field coils.

Note :

The setting screws are locked with cement.

c. Starting Motor Assembly and Inspection

1. Apply liquid thread lock cement to the setting screws and assemble the field coil into the yoke.
2. Inspect the commutator diameter A and the depth of the mica insulation B.

		Standard Value	Serviceable Limit
Outside Diameter	Nippon Denso	38.8 mm (1.527")	Replace if under 36 mm (1.417")
	Hitachi	33.0 mm (1.299")	Replace if under 31 mm (1.220")
Mica Depth	Nippon Denso	0.5~0.8 mm (0.0196~0.0315")	Replace if under 0.2 mm (0.0078")
	Hitachi	0.5~0.8 mm (0.0196~0.0315")	Replace if under 0.2 mm (0.0078")

3. Inspect armature shaft and bushing clearance.

		Standard Value	Serviceable Limit
Clearance		0~0.1 mm (0~0.0039")	Replace if beyond 0.2 mm (0.0078")

4. Inspect the wear of the brush and the tension of the brush spring (Fig. 19C-8).

	Nippon Denso	Hitachi
Installed brush spring tension	Replace if outside 722.5~977.7 g range (25.3~34.2 oz.)	Replace if outside 680~920 g range (23.8~32.2 oz.)

Brush length

	Standard Value	Serviceable Limit
Nippon Denso	20.5 mm (0.807")	Replace if under 11.5 mm (0.452")
Hitachi	14.0 mm (0.551")	Replace if under 4.5 mm (0.177")

5. After inspection, assemble the thrust washer on the armature shaft and insert into the armature yoke (Fig. 19C-9).

Note :

Apply a small amount of grease on the shaft before assembly.

6. Assemble the nylon collar on the inside of the end frame, align the yoke starter cable terminal and armature shaft to the end frame and assemble so that dowel pin in the yoke matches the hole in the end frame.
7. Assemble the center bearing holder on the yoke. Measure the end play of the armature and adjust to 0.05~0.35 mm (0.00196~0.0137") with the thrust washer.
8. Assemble the brushes, install the internal gear with dowel pin alignment and apply grease to the gear.
9. Assemble the rubber band seal so that the starting motor is completely water tight, and then assemble the cover band to the alignment mark on the cover.
10. Test the starting motor after completing assembly.
11. Apply locking and sealing compound to various areas to prevent parts from loosening and assure waterproofing.

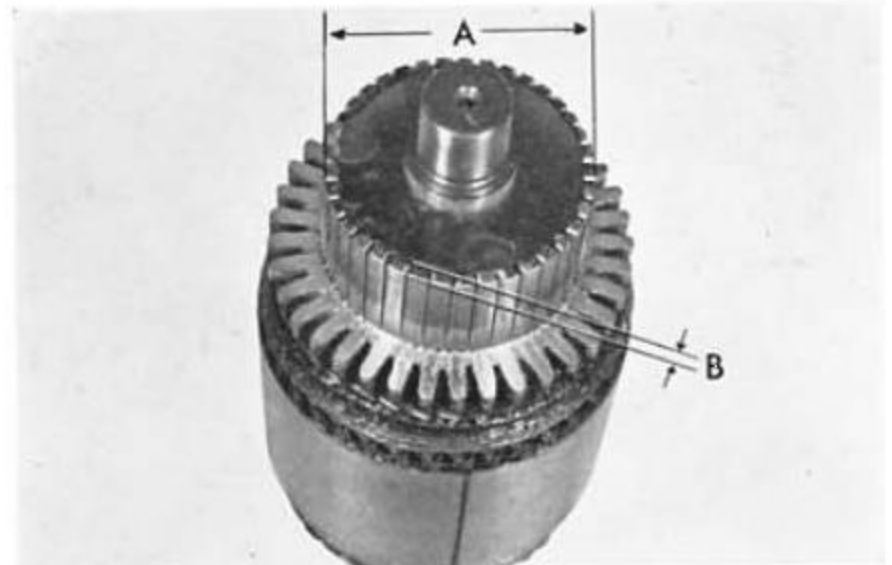


Fig. 19C-6

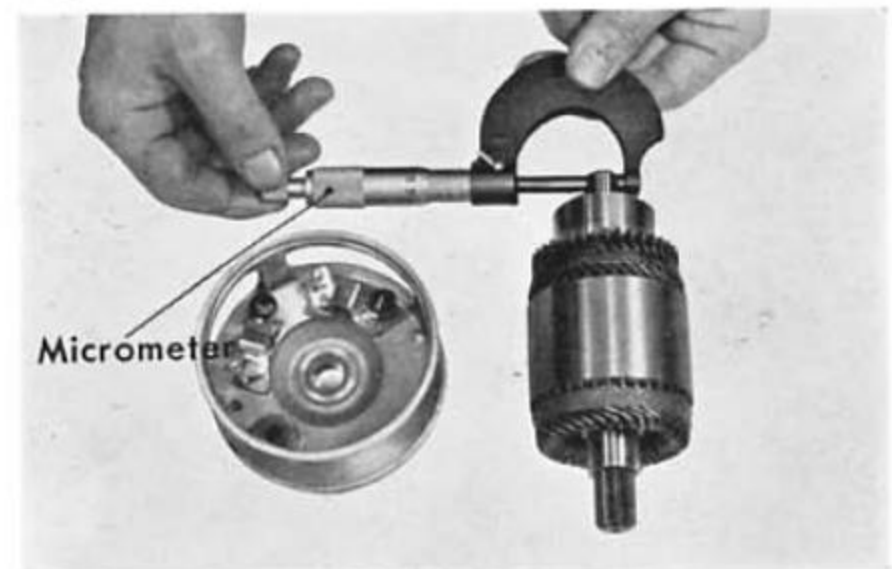


Fig. 19C-7

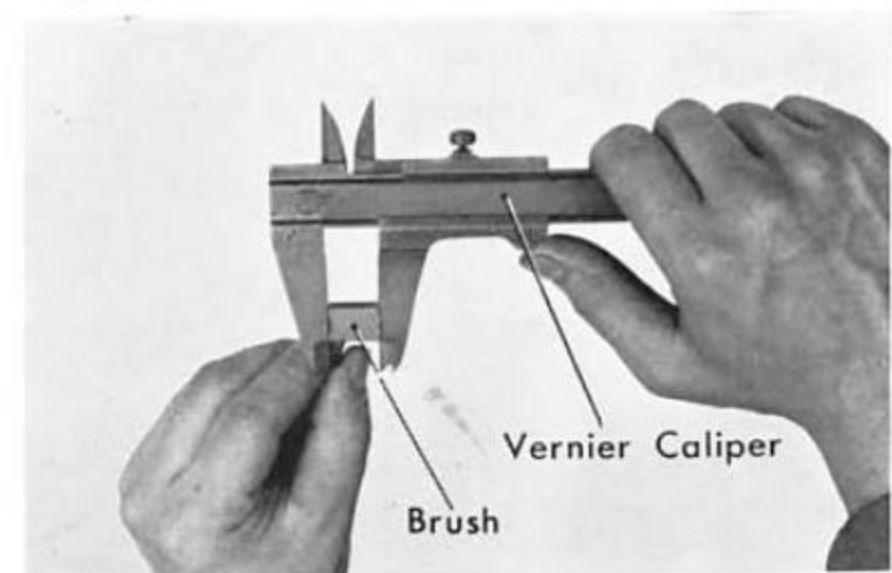


Fig. 19C-8

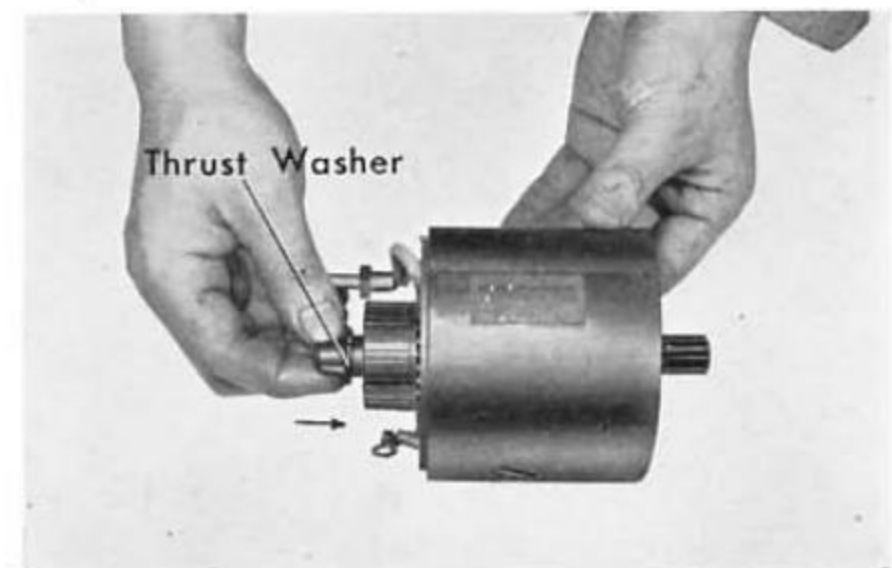


Fig. 19C-9

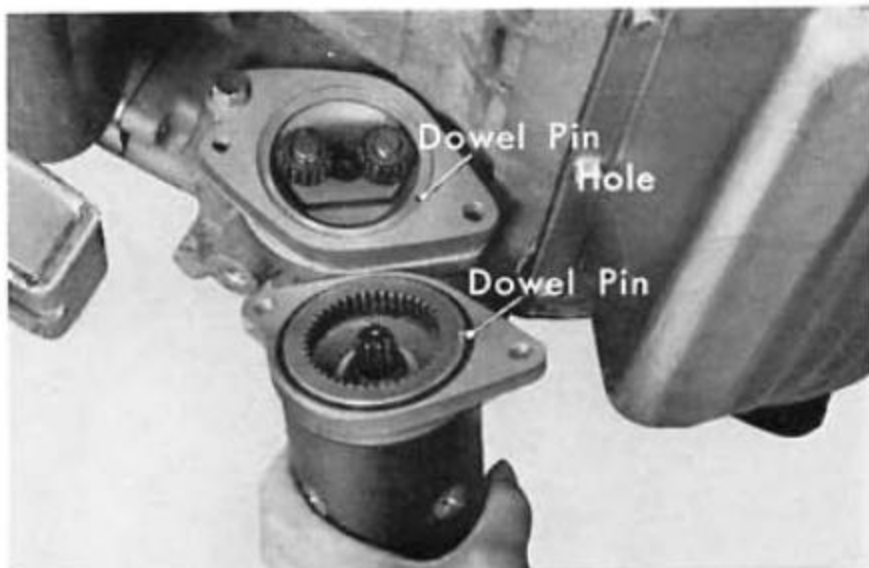


Fig. 19C-10

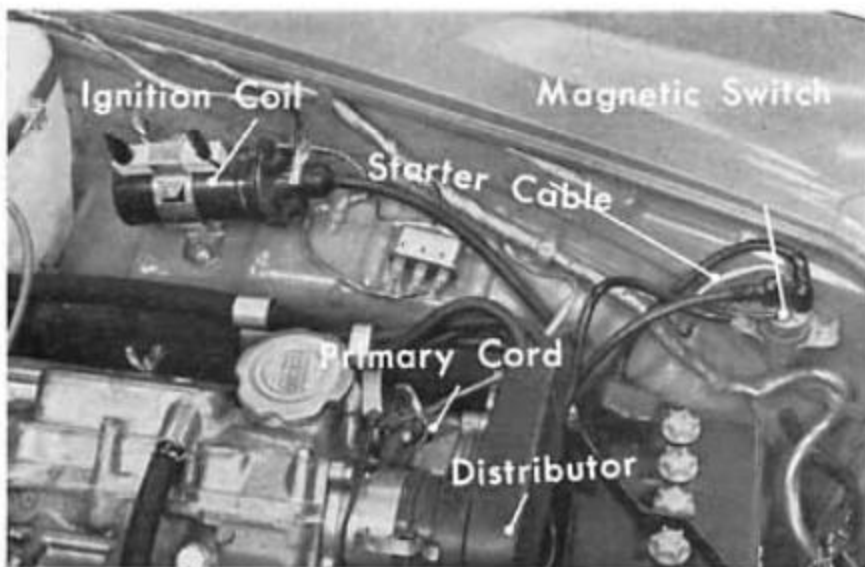


Fig. 19D-1

d. Installation and Inspection

1. Align the dowel pin in the starting motor to the hole in the mounting plate and make the installation by engaging the gears while turning the fan belt slowly.
2. After the gears have been properly engaged, securely bolt the starting motor to the engine and connect the starter cable to the terminal.

D. IGNITION COIL

Removal and Installation

1. Remove the screw to disconnect the high tension cord from the coil.
2. Disconnect the primary cord from the primary terminal of the ignition coil.
3. Remove the bolts and washers and detach the ignition coil from the compartment panel.
4. Install the ignition coil in the reverse order of the removal.

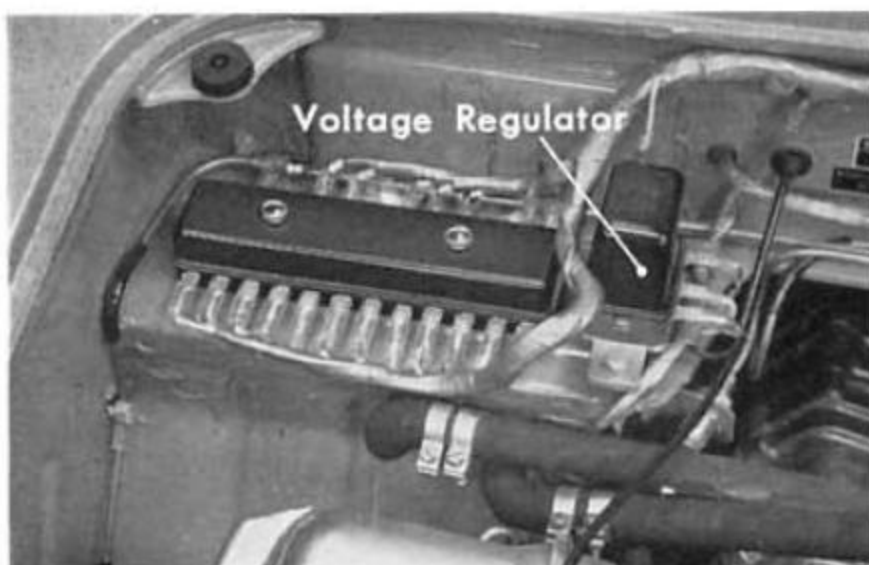


Fig. 19E-1

E. REGULATOR

Removal and Installation

1. Disconnect the regulator from the wire harness and remove the bolts to detach the regulator from the compartment panel.
2. Install the regulator in the reverse order of removal. Inspect the regulator for proper operation after installation.

F. STARTER MAGNETIC SWITCH**a. Removal**

1. Remove the nuts and washers and detach starter cable and body wire harness. Remove screw and disconnect the body wire harness from the starter magnetic switch.

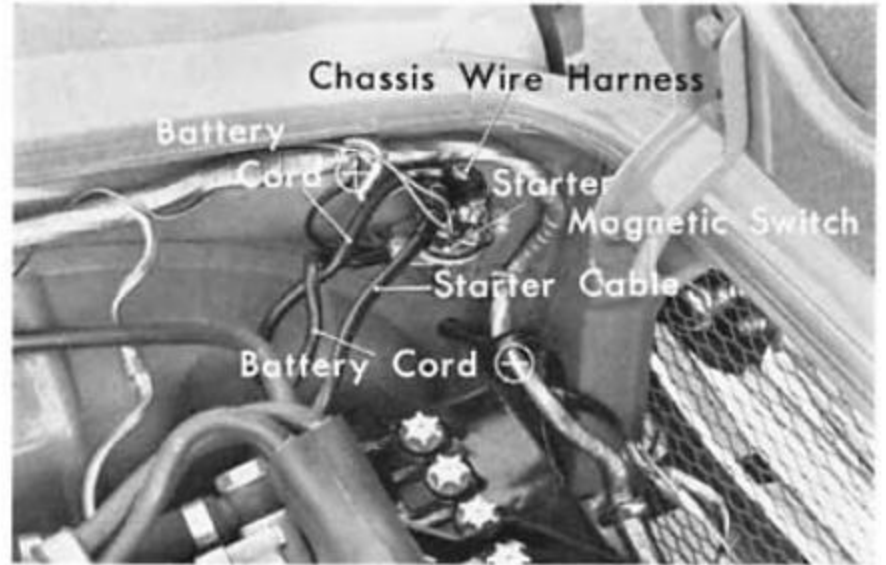


Fig. 19F-1

2. Remove the bolts and washers and detach the starter magnetic switch from the engine compartment panel.

b. Installation and Inspection

1. Perform the electrical connections in accordance with the wiring diagram.
2. Install the terminal caps.
3. After completing installation, conduct starter operational test.

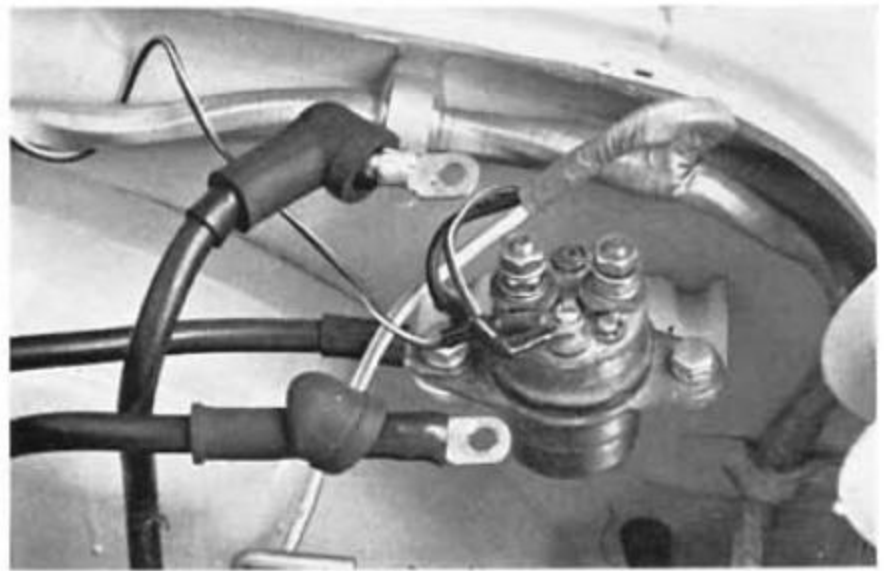


Fig. 19F-2

G. BODY WIRE HARNESS**Removal and Installation**

1. Disconnect the battery cables at the battery terminals.
2. Disconnect the wiring from the horn, turn signal light, headlight, thermometer unit, distributor and the starter magnetic switch.



Fig. 19G-1

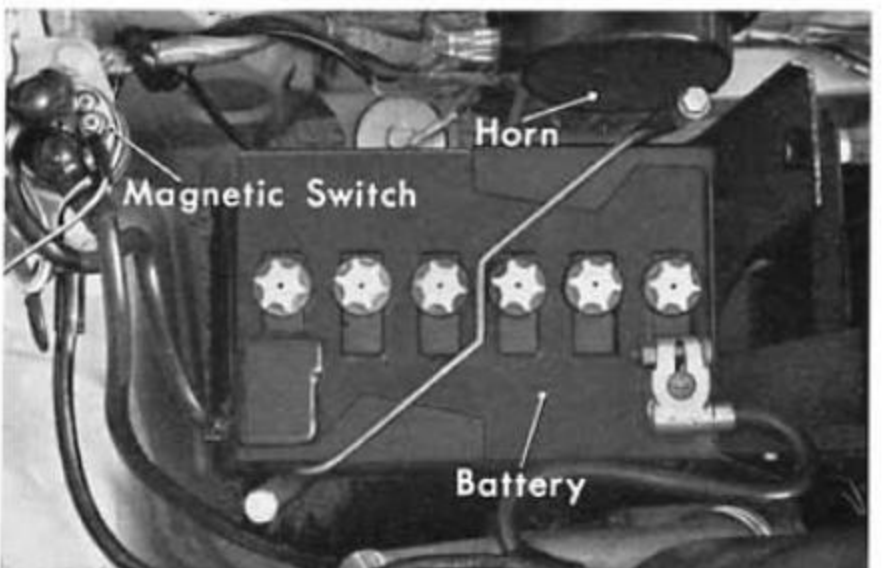


Fig. 19G-2

19-14 ELECTRICAL SYSTEM

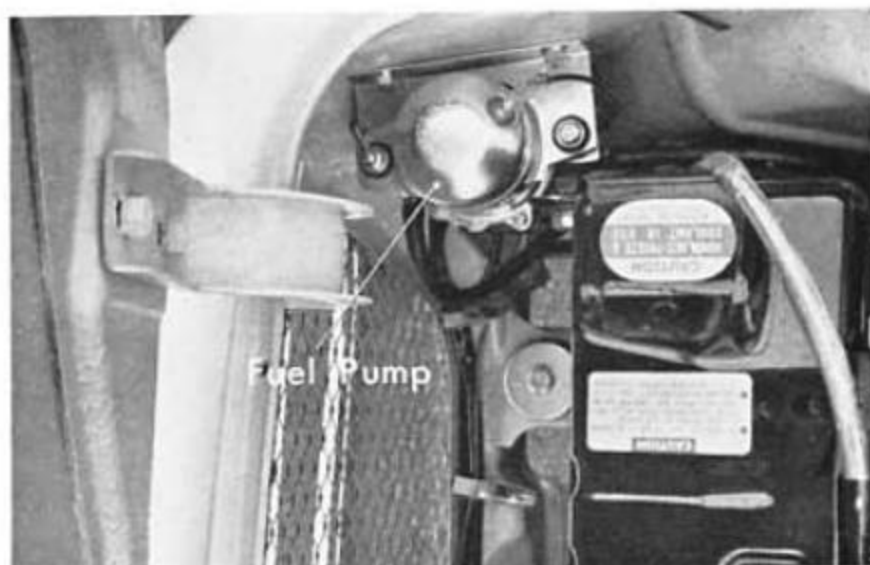


Fig. 19G-3.

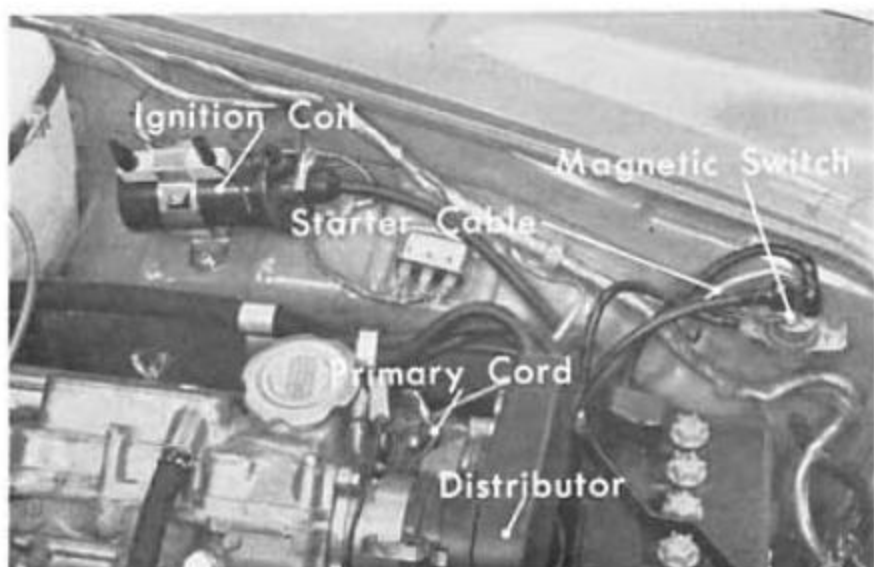


Fig. 19G-4.

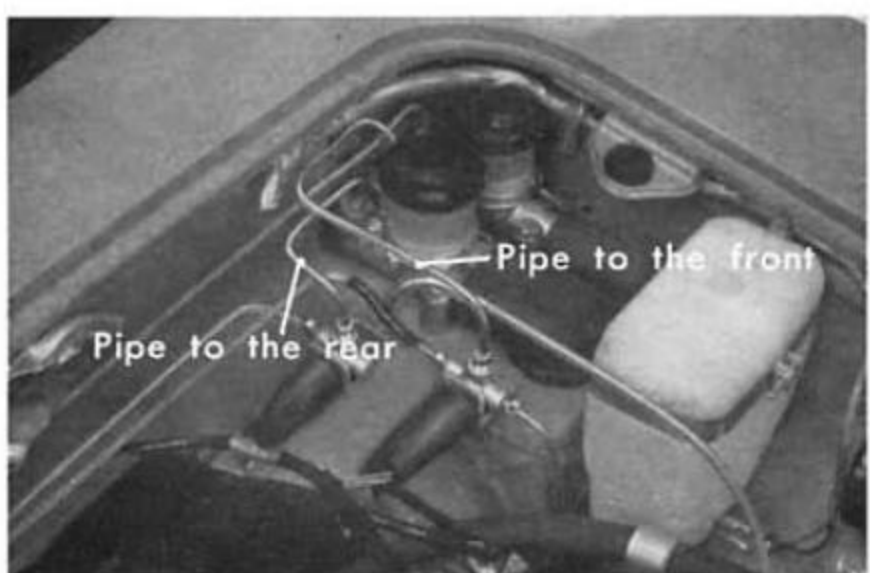


Fig. 19G-5

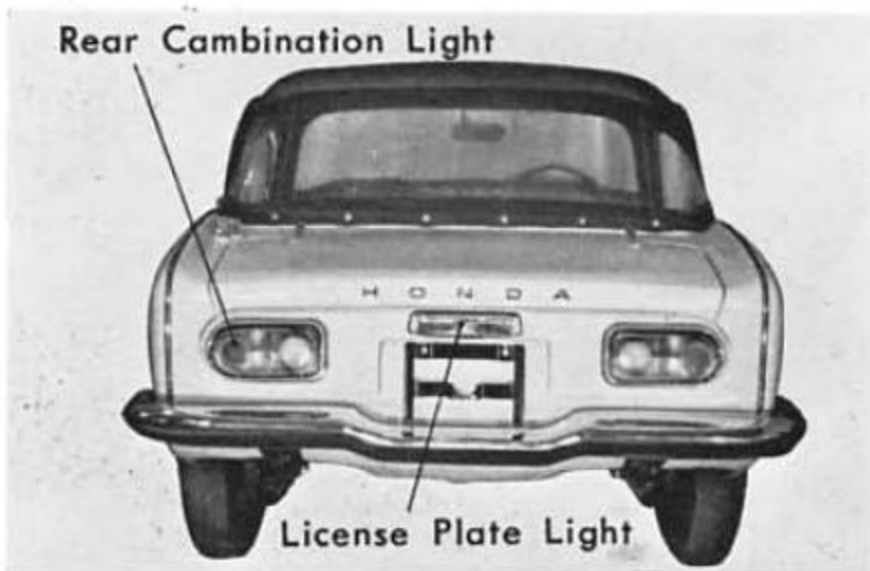


Fig. 19G-6

3. Disconnect the wiring to the right headlight and turn signal light.

4. Disconnect the wiring to the fuel pump.

5. Disconnect the wiring to the ignition coil.

6. Disconnect the wiring to the fuse box.

7. Disconnect the wiring to the regulator.

8. Disconnect the wiring to the stop switch.

9. Disconnect the wiring to the A.C. dynamo.

10. Open all of the wire harness clamps.

11. Disconnect the wiring to the rear combination light

12. Disconnect the wiring to the license plate light.

13. Disconnect the wiring to the fuel gauge unit.

14. After removing the exhaust pipe, disassemble the propeller shaft.
15. Disconnect the wiring to the back-up light switch.
16. Open all of the wire harness clamps.
17. Remove the steering column from the body.
18. Remove the instrument panel garnish from the foundation instrument panel.
19. Disconnect the wiring to the combination switch and the instrument panel garnish.
20. Make the installation in the reverse order of removal.
Refer to the wiring diagram for the wiring connection.

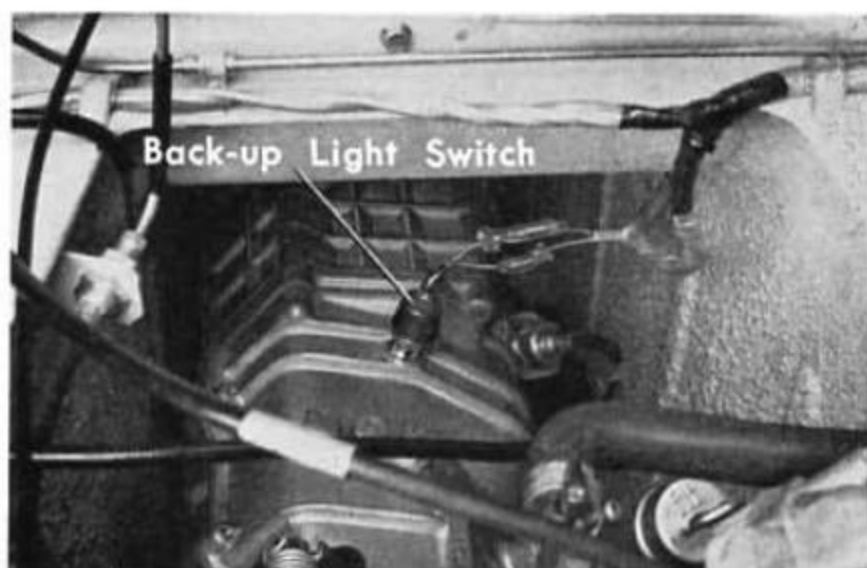


Fig. 19G-7

H. INSTRUMENT PANEL GARNISH

INSTRUMENT PANEL WIRING

Bl.	Black	Br. R.	Brown & Red Line	Y.	Yellow	G.	Green	R.	Red
Bl. W.	Black & White Line	Bu.	Blue	Y. Bl.	Yellow & Black Line	G. Bl.	Green & Black Line	R. Bl.	Red & Black Line
Bl. Y.	Black & Yellow Line	Bu. W.	Blue & White Line	Y. W.	Yellow & White Line	G. R.	Green & Red Line	R. Bu.	Red & Blue Line
W.	White	Bu. R.	Blue & Red Line	Y. R.	Yellow & Red Line	G. Y.	Green & Yellow Line	R. W.	Red & White Line
W. R.	White & Red Line	Bu. Y.	Blue & Yellow Line	Y. G.	Yellow & Green Line	G. Bu.	Green & Blue Line	R. G.	Red & Green Line
W. Bu.	White & Blue Line			Y. Bu.	Yellow & Blue Line			R. Y.	Red & Yellow Line

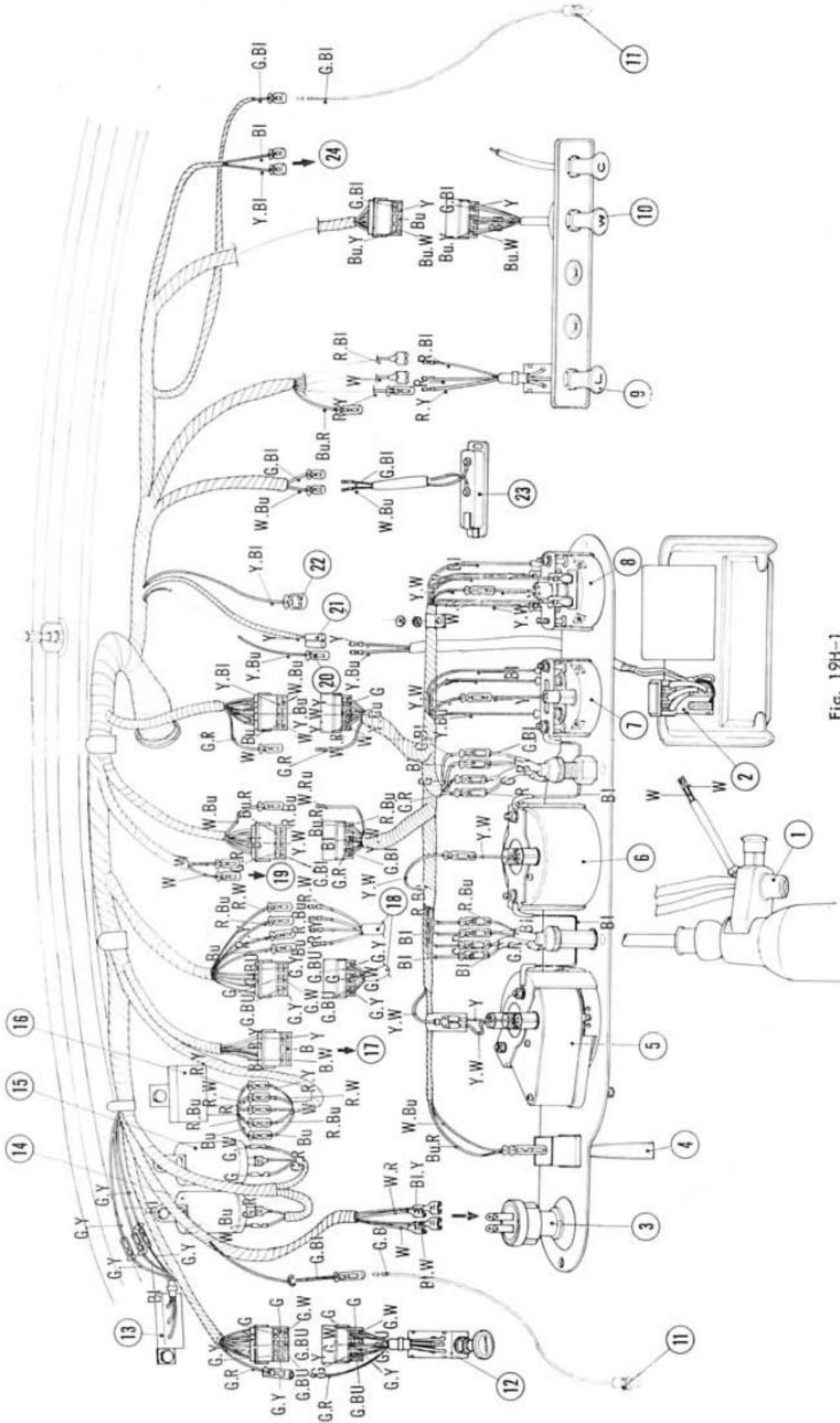


Fig. 19H-1

- ① Steering Lock
- ② Heater Switch
- ③ Combination Switch
- ④ Horn Switch
- ⑤ Speedometer
- ⑥ Tachometer
- ⑦ Thermometer
- ⑧ Ampere, Fuel Gauge
- ⑨ Lighting Switch
- ⑩ Wiper Switch
- ⑪ Door Switch
- ⑫ Hazard Switch
- ⑬ Timing Relay
- ⑭ Hazard Warning Relay
- ⑮ Turn Signal Relay
- ⑯ Overtaking Relay
- ⑰ To Wiper Motor
- ⑱ To Steering Column
- ⑲ To Heater Lock
- ⑳ To Steering Switch
- ㉑ To Cigar Lighter
- ㉒ (Spare)
- ㉓ Courtesy Lamp
- ㉔ To Heater Unit

a. Removal

1. Remove the steering column from the body.
2. Disconnect the ground cable at the battery terminal.
3. Remove the combination switch from the foundation instrument panel with the switch removing tool.
4. Disconnect the tachometer and speedometer cables from the tachometer and speedometer respectively.



Fig. 19H-2

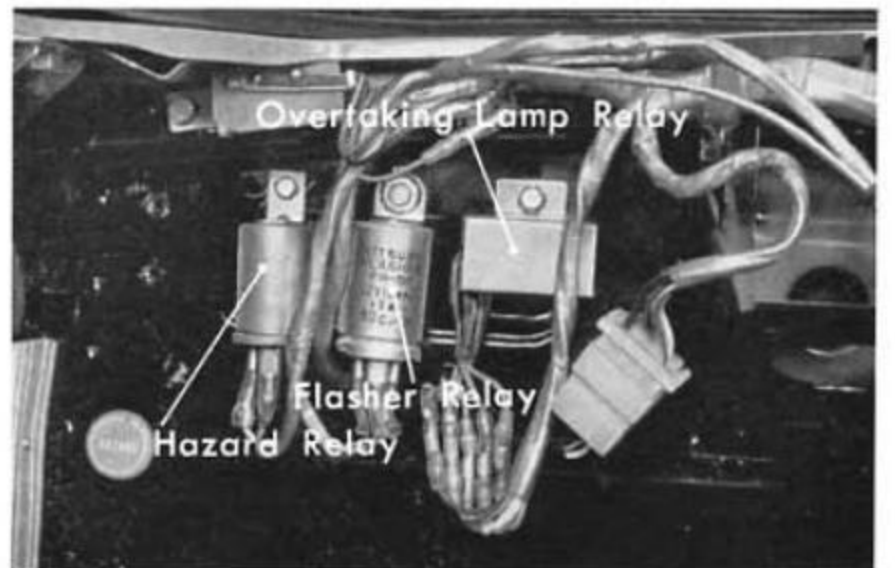


Fig. 19H-3

6. Disconnect the wiring at the wire harness.



Fig. 19H-4

7. Disconnect the choke wire at the carburetor.
8. Remove lock nut and gasket, disassemble the wiper switch and lighting switch from the center of the garnish.
9. Disconnect the choke wire from the back of the instrument panel and remove from the body.
10. Loosen the screw on the side of the wiper switch knob and remove knob from the wiper and washer switch. Remove the wiper switch from the garnish center. Separate the garnish center from the foundation instrument panel.

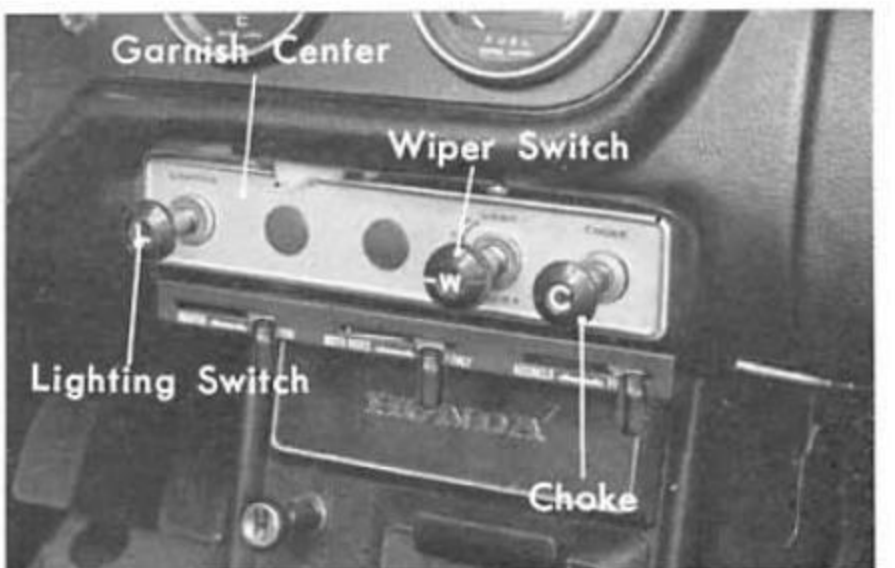


Fig. 19H-5

11. Disconnect the wiring and remove the lighting switch wiper switch.

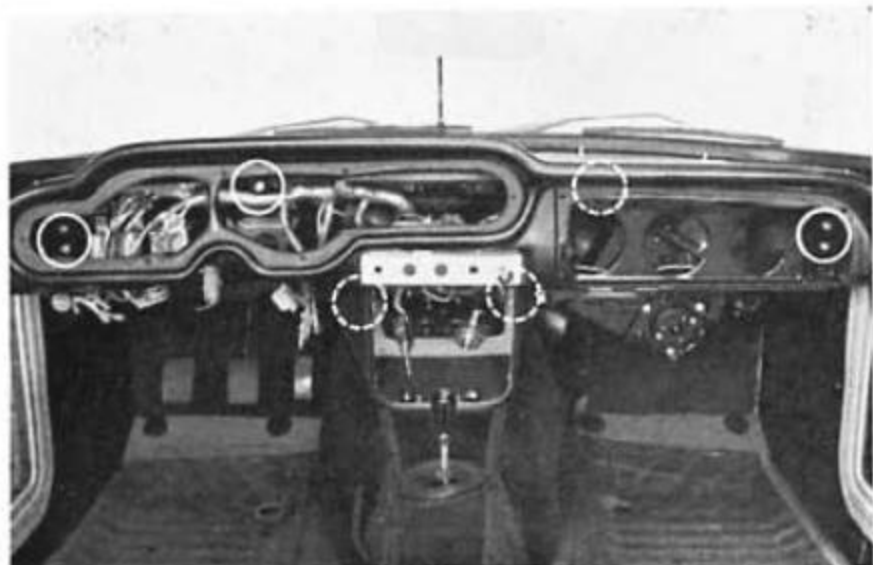


Fig. 19H-6

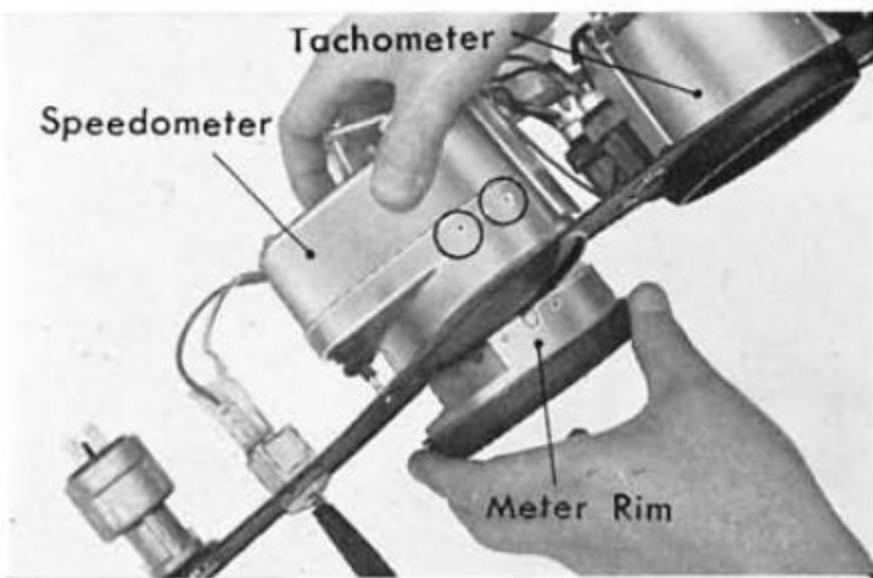


Fig. 19H-7

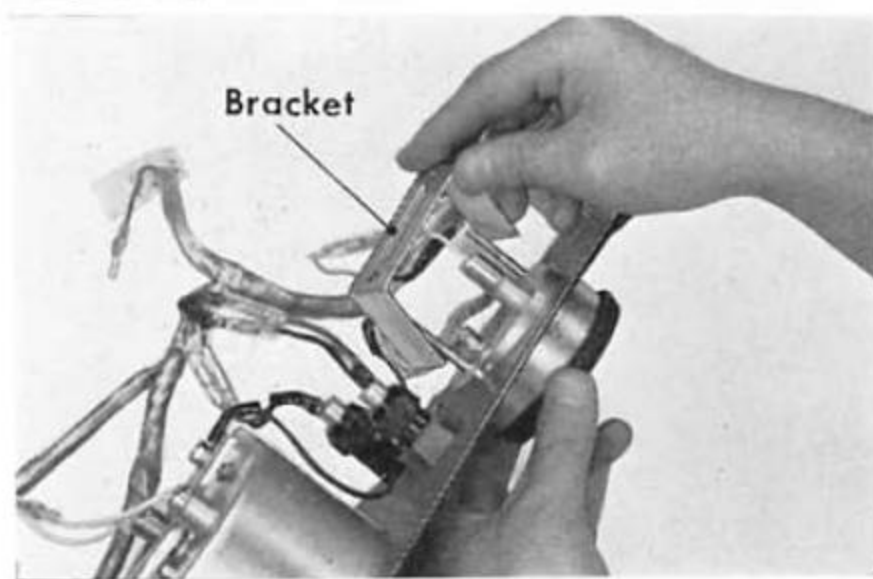


Fig. 19H-8

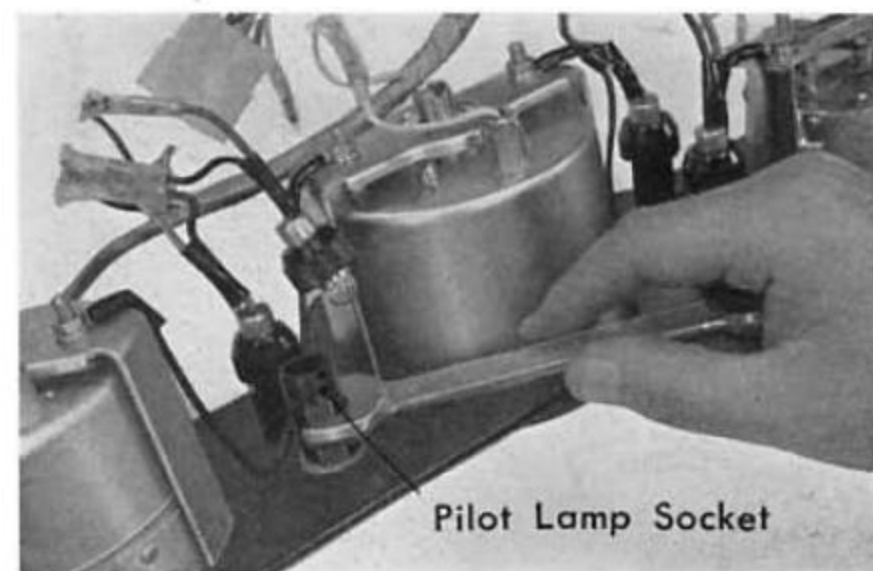


Fig. 19H-9

b. Instrument Panel Garnish Disassembly and Assembly

1. Loosen the nuts and disconnect the two ground cords from the gauge.
2. Remove the instrument panel garnish wire harness from the gauges and switches.
3. Loosen the screw on the side of the knob and remove the trip counter knob. Remove four screws and disassemble the meter rim and body.
4. Remove the nuts, washers, and disassemble the speedometer and bracket from the instrument panel garnish.
5. Remove the nuts, washers and disassemble the tachometer, tachometer gasket and bracket from the instrument panel garnish.
6. Remove the nuts and disassemble the thermometer unit, bracket and gasket from the instrument panel garnish.
7. In the same manner, disassemble the ammeter-fuel gauge unit.
8. Disassemble the horn switch.
9. Disassemble the parking, turn signal and high beam pilot lamp socket from the instrument panel garnish.
10. Perform the assembly in the reverse order of disassembly, install gaskets and align the gauge tabs to the corresponding cutout in the panel.
11. Perform the wiring in accordance with the wiring diagram.
12. Perform the installation in the reverse order of removal and conduct functional test and inspection upon completion.

I. HEADLIGHT

a. Removal

1. Disconnect the electrical wiring in the engine compartment.
2. Remove the screw and disassemble the headlight rim from the headlight case.
3. Remove two (+) screws A and remove the headlight case assembly from the body.

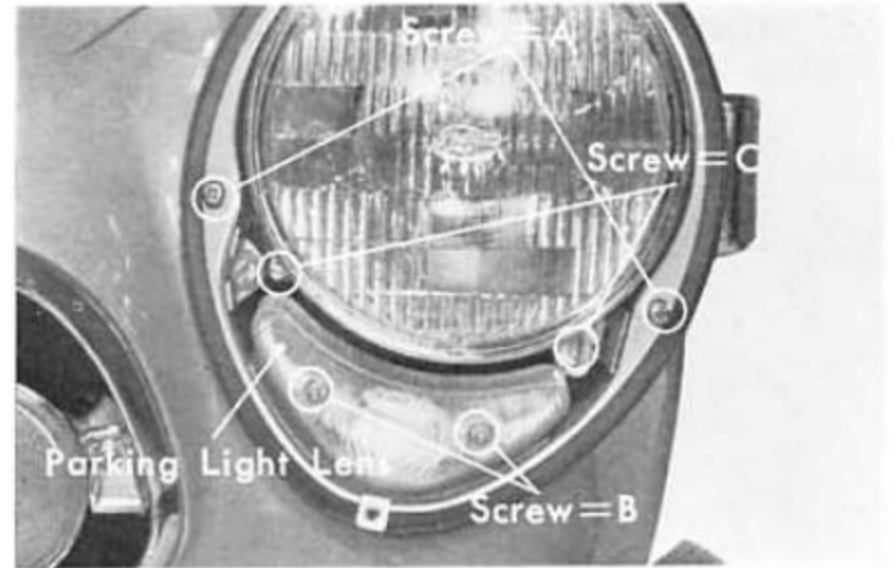


Fig. 191-1

b. Headlight Disassembly

1. Disassemble the base gasket from the headlight case.
2. Remove two screws B, washer, and disassemble the parking light lens from the parking light socket.
3. Remove the screws, and separate support ring and headlight unit. Disconnect wiring and disassemble from mounting ring.
4. After disconnecting the wiring, remove two screws and disassemble the parking light socket from the headlight case. The parking light bulb can be removed from the socket.
5. Remove two adjusting screws and springs, and disassemble the mounting ring from the headlight case.
6. Detach the socket cord from the headlight case.

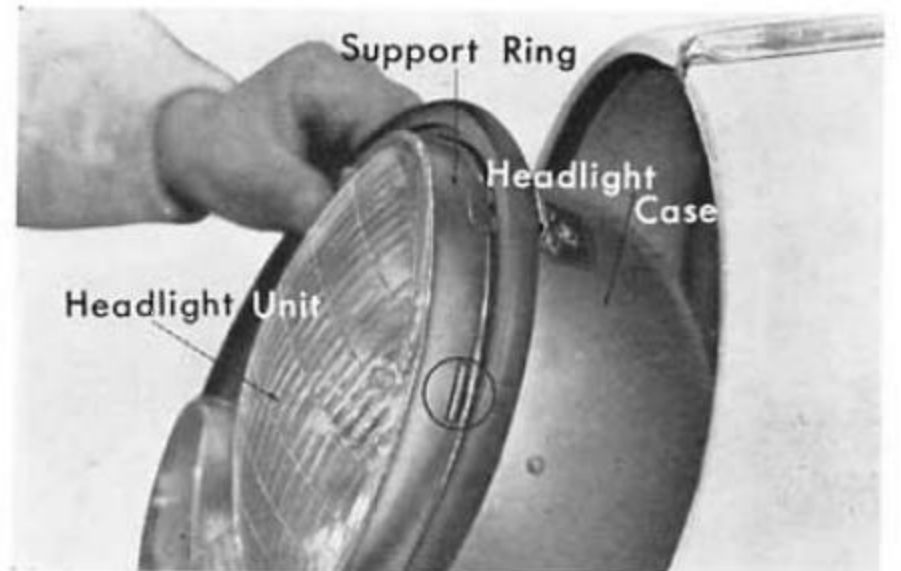


Fig. 191-2

c. Headlight Assembly

1. After assembling the mounting ring, connect the headlight unit wiring, assemble the headlight unit and support ring, and fit the tab on the mounting ring into the groove of the headlight rim and complete the assembly.

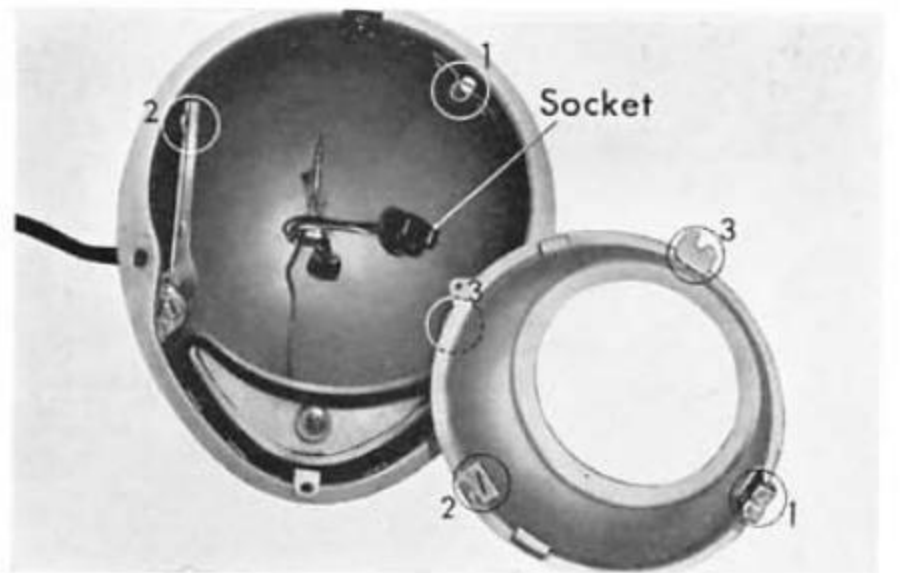


Fig. 191-3.

d. Installation and Inspection

1. Install the headlight assembly to the body and connect the cords in accordance with the wiring diagram.
2. Assemble the rim on the headlight case with the matching tab and assemble the rim to the case with a rubber gasket installed in between.
3. After completion of installation, adjust the headlight beam setting.



Fig. 191-4

J. WINDSHIELD WIPER MOTOR

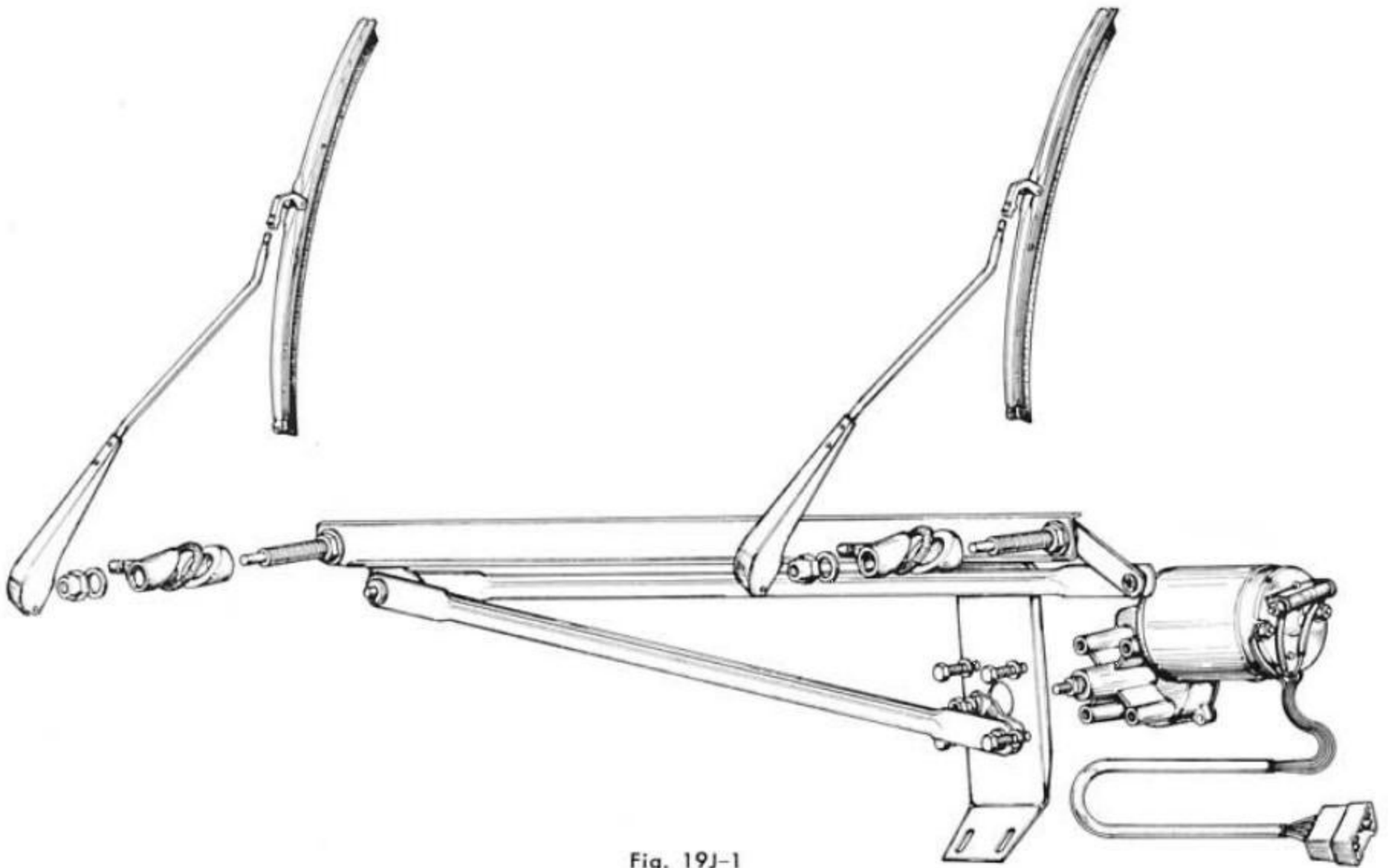


Fig. 19J-1

WIPER MOTOR EXPLODED VIEW

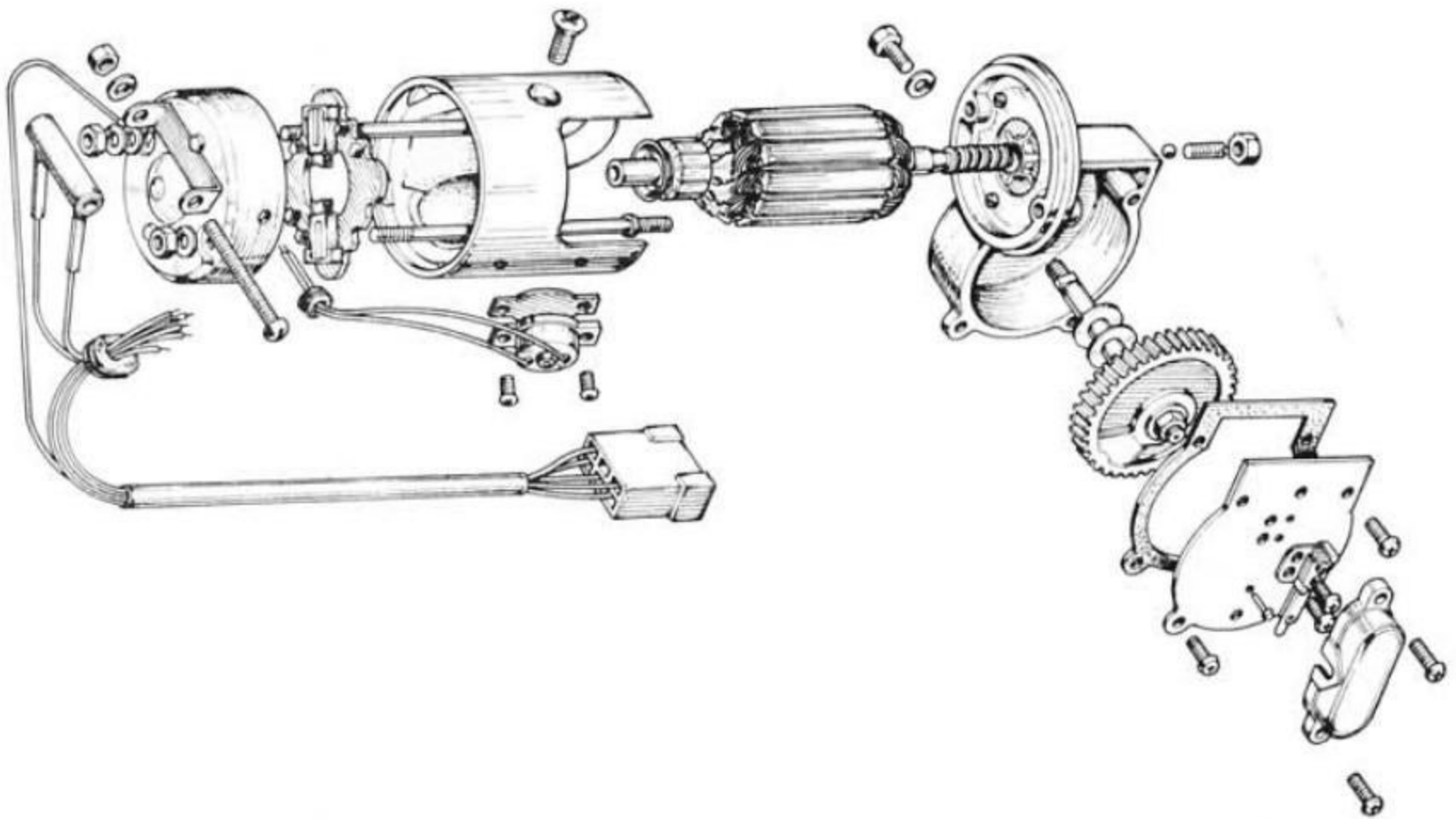


Fig. 19J-2

a. Removal

1. Remove wiper arm from the wiper shaft (Fig. 19J-3).
2. Disconnect the battery cable from the negative terminal.

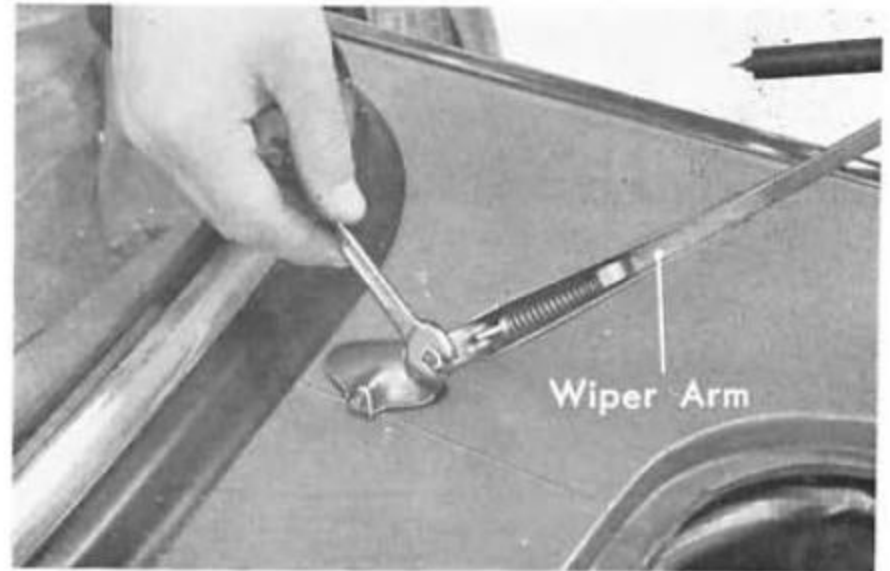


Fig. 19J-3

3. Remove two nuts and remove the wiper shaft bushing outer and outer gasket from the wiper shaft (Fig. 19J-4).

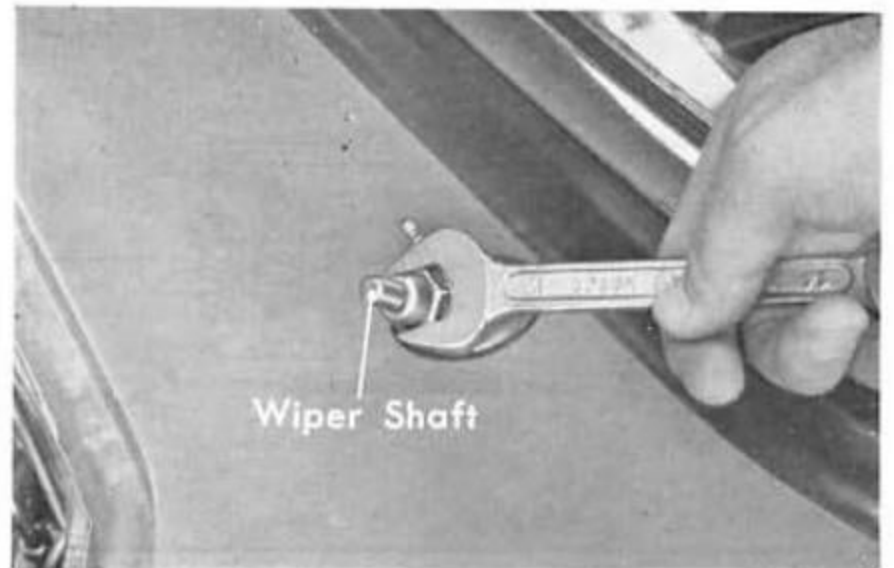


Fig. 19J-4

4. Remove the speedometer cable from the speedometer.
5. Disconnect the wires from the wire harness.
6. Remove the bolts, washers and pull out the wiper motor from the left side of the body (Fig. 19J-5).

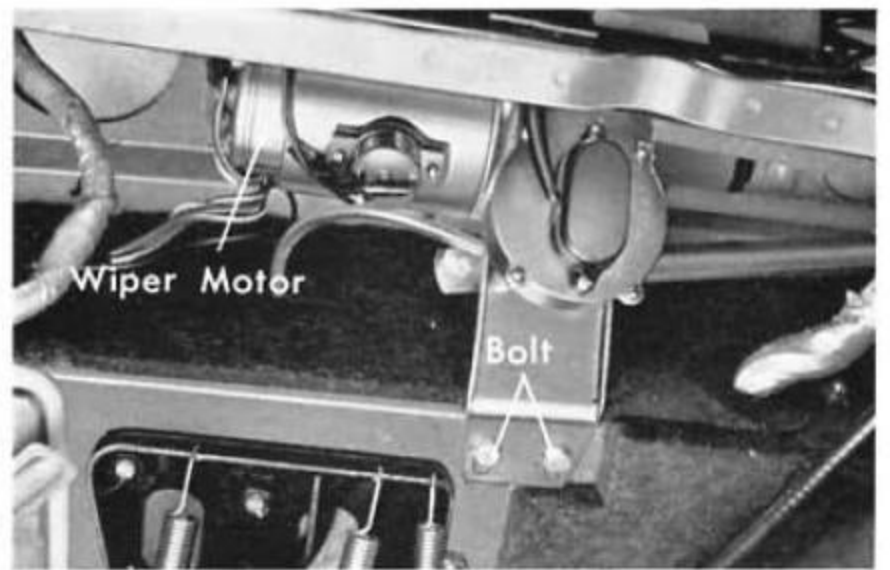


Fig. 19J-5

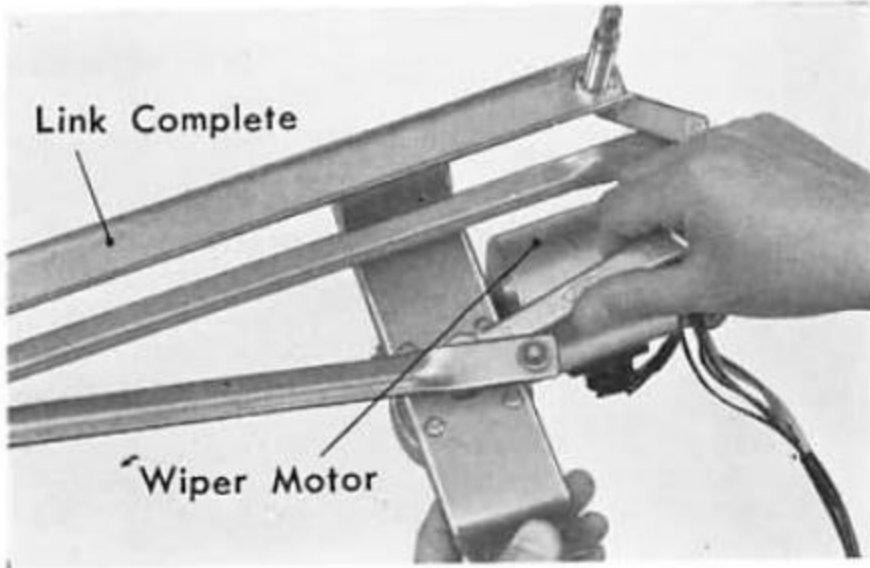


Fig. 19J-6

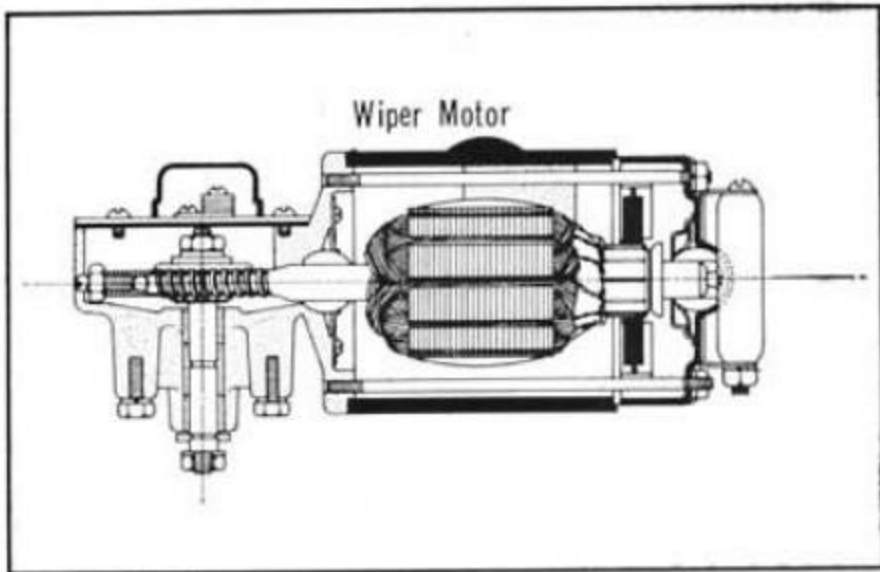


Fig. 19J-7

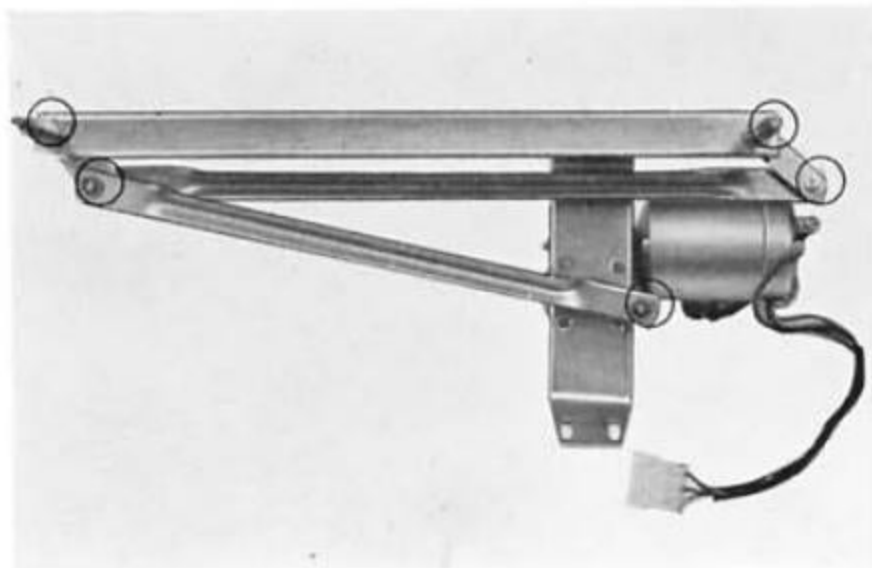


Fig. 19J-8

b. Wiper Motor Disassembly and Assembly

1. Remove the nut, washer, and disassemble the linkage assembly from the wiper motor.
The nut is loosened by turning clockwise.

2. Remove the bolts, washers, and disassemble the motor bracket from the wiper motor.
3. Remove two screws, washers, and disassemble condenser and rear cover from the wiper motor.
4. Remove two screws, washers, and disassemble field coil and armature.

Note :

The steel balls are assembled into the ends of the armature shaft.

5. Disassemble thrust washers from the armature shaft.
6. Disassemble inner bushing from the linkage assembly.

c. Installation

1. Apply grease to the pivot driver area and install the wiper motor to the body from the right hand side.
2. Upon completing installation, test the wiper for proper operation.

K. FRONT TURN SIGNAL LIGHT

Removal and Installation

1. Disconnect the electrical wiring.
2. Remove four screws and disassemble the radiator grille from the body.
3. Remove the nuts, washers, and remove the front turn signal light assembly from the radiator grille.
4. Remove two screws and disassemble the lens and gasket from the housing.
5. Remove the bulb from the housing.
6. Make the installation in the reverse order of removal and upon completion, check the flashing operation.



Fig. 19K-1

L. REAR COMBINATION LIGHT

Removal and Installation

1. Remove the screws, raise the rim and disassemble from the housing.
2. Remove the bulb from the housing.

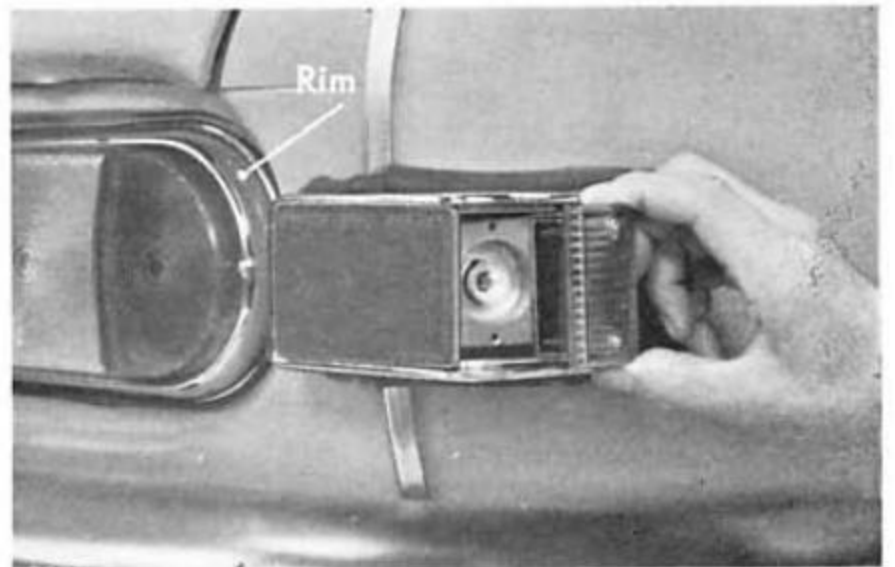


Fig. 19L-1

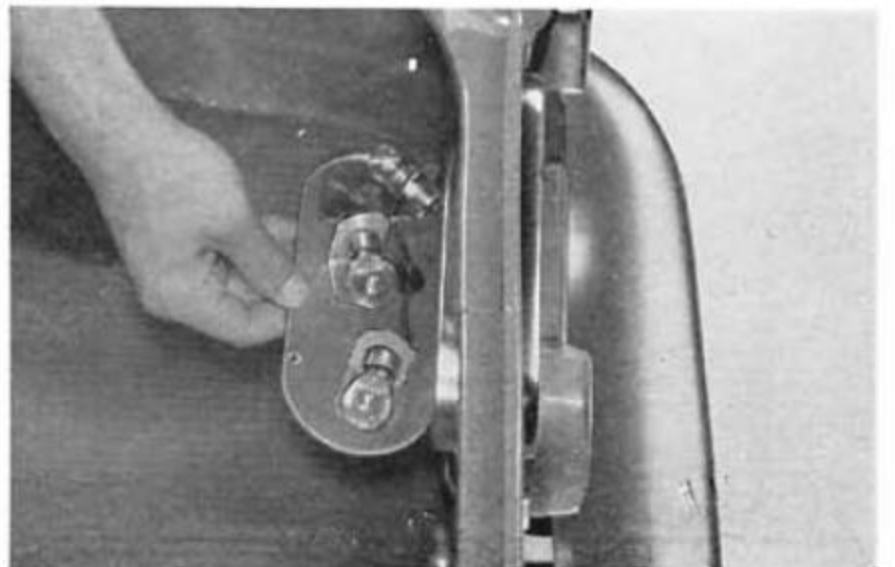


Fig. 19L-2

3. Remove two nuts, washers from the inside of the trunk.
Remove the housing, base gasket, and disconnect the electrical wiring.
4. Make the installation in the reverse order of removal. Upon completion, check the flashing operation.

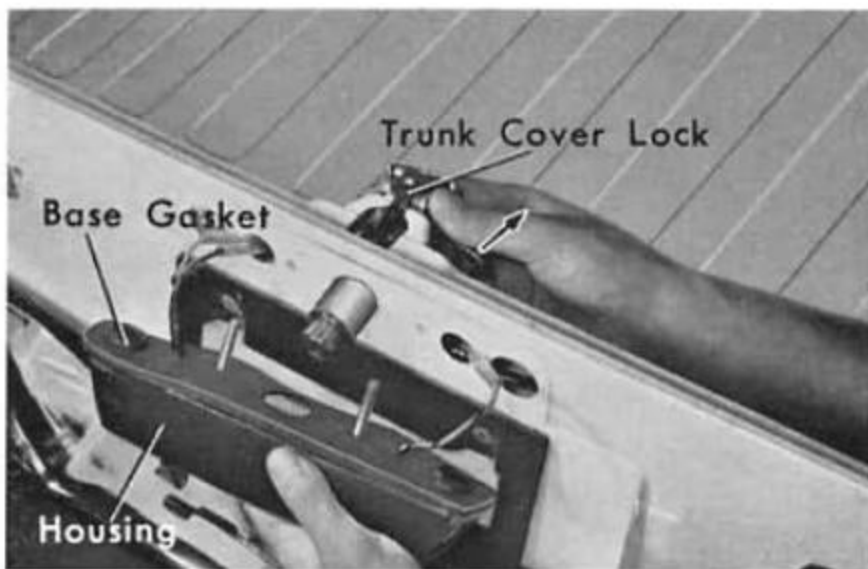


Fig. 19M-1

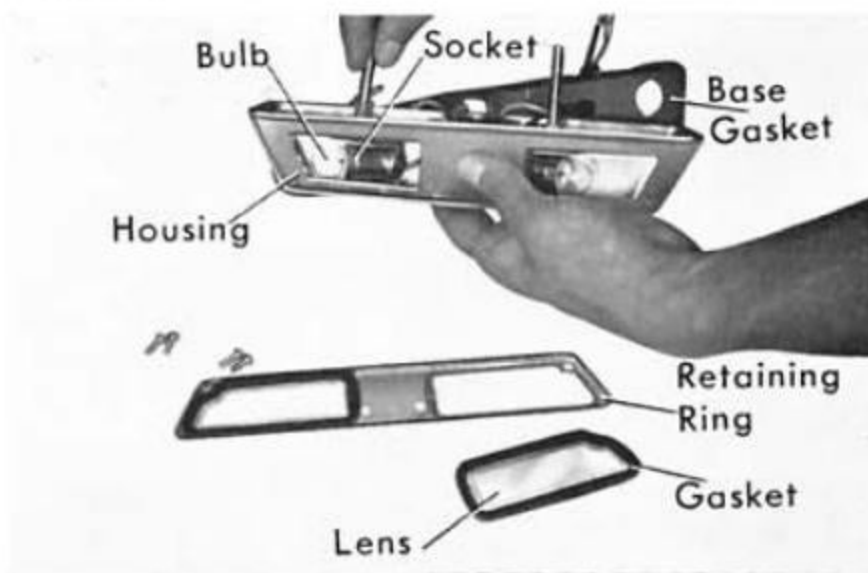


Fig. 19M-2

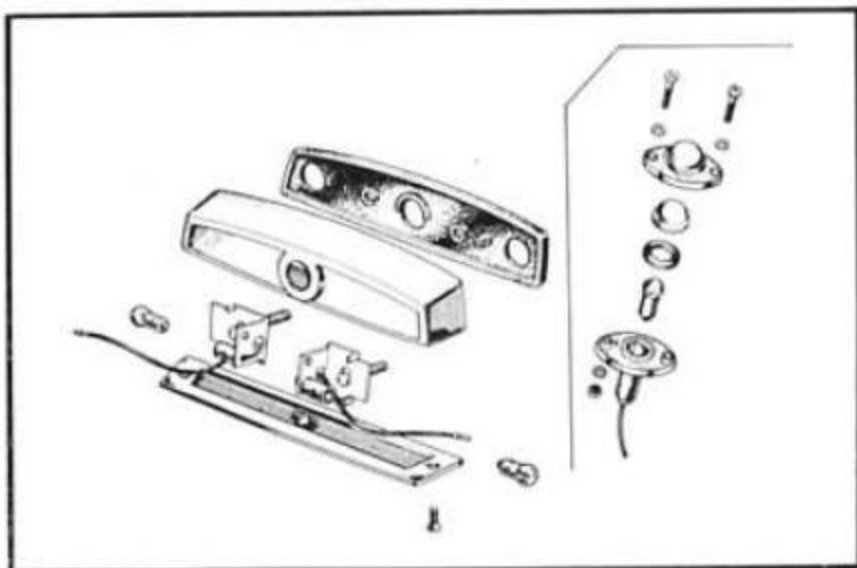


Fig. 19M-3

M. LICENSE PLATE LAMP

Removal and Installation

1. Remove two nuts, washers from the inside of the trunk, and disassemble the trunk cover lock.
Remove the housing, base gasket and disconnect the electrical wiring.
2. After removal, remove four screws and disassemble the retaining ring, lens and gasket from the housing.
3. Loosen the nut, remove socket and bulb from the housing.
4. Make the installation in the reverse order of removal and stow the wire harness in a safe location.
5. Upon completion of installation, check the lighting and also make sure that the trunk lock is operating properly.

N. INSPECTION OF ELECTRICAL COMPONENTS

— CHARGING SYSTEM —

The ammeter is located on the right side of the instrument panel garnish to indicate whether the A.C. dynamo is functioning properly. When the ammeter indicator needle is pointing toward (+), it is an indication that the dynamo is charging.

a. Inspection of the A.C. Dynamo in the Vehicle

Inspecting Procedure

- (1) Exercise particular caution to see that the battery terminals (+) (-), are not connected in reverse. Damage to dynamo, and wire harness will result if improperly connected.
 - (2) Do not run the engine at high speed with the dynamo terminal circuit disconnected. Damage to diodes will result.
 - (3) Whenever performing quick-charge to the battery from an outside source, disconnect the terminal **B** of the dynamo.
1. Remove the white colored cord from the A.C. dynamo terminal **B** and connect a D.C. ammeter (30A) in the circuit as shown in Fig. 19N-1. Connect the (+) terminal of the ammeter to the dynamo and the (-) terminal to the wire harness side.

Note :

Make the connections secure to prevent loosening during the running of the engine.

2. Connect a D.C. voltmeter (20V) across the regulator terminal **IG** and the terminal **E** (ground terminal).
3. Start the engine and turn on the headlight and all of the other current drawing load. Raise the engine speed from idling through 4000r.p.m. and if there is a flow of 25A, the A.C. dynamo is functioning properly (night operation load).

Note :

Use a battery which is fully charged.

4. Perform the test again with only the battery and ignition coil load connected to the circuit and vary the engine speed from 2000~4000 r.p.m. During this period if the voltmeter registers between 13.5~14.5V, the regulator and A.C. dynamo is functioning properly (day operating load).

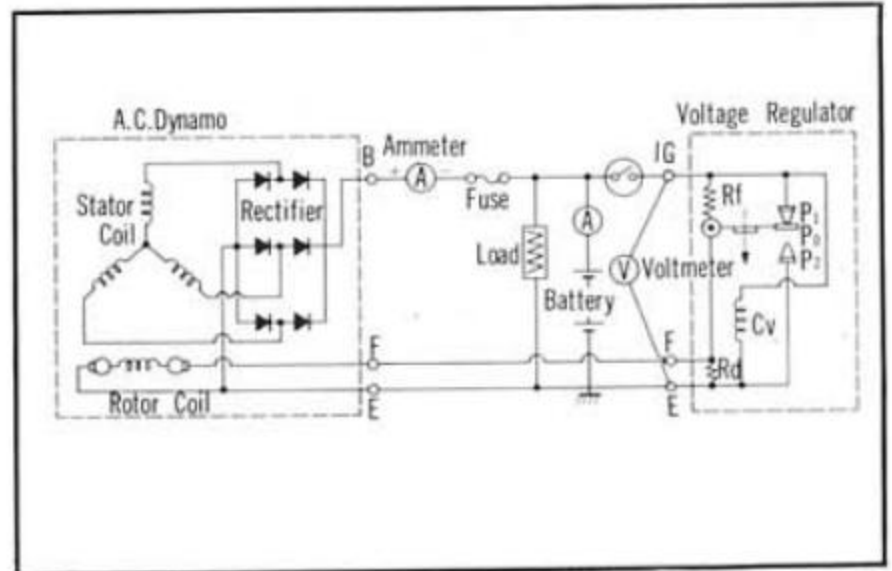


Fig. 19N-1

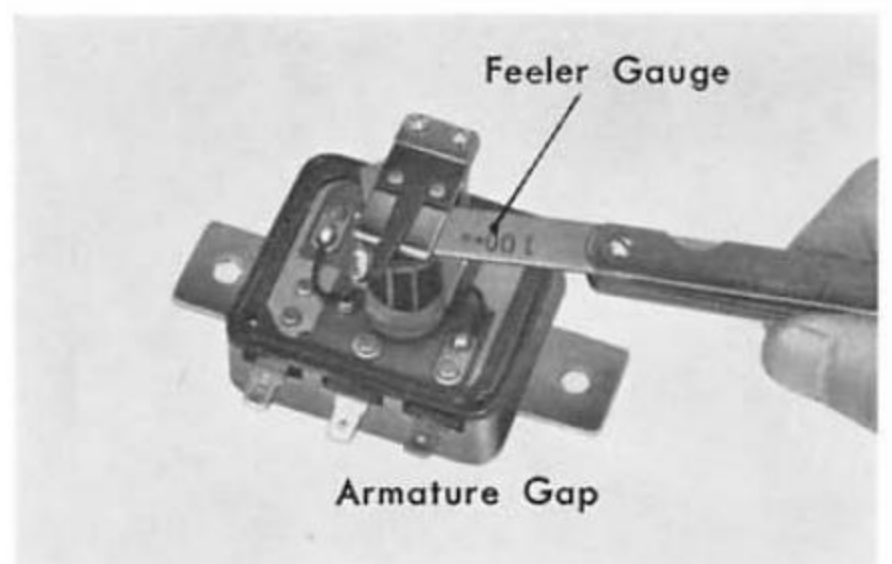


Fig. 19N-2

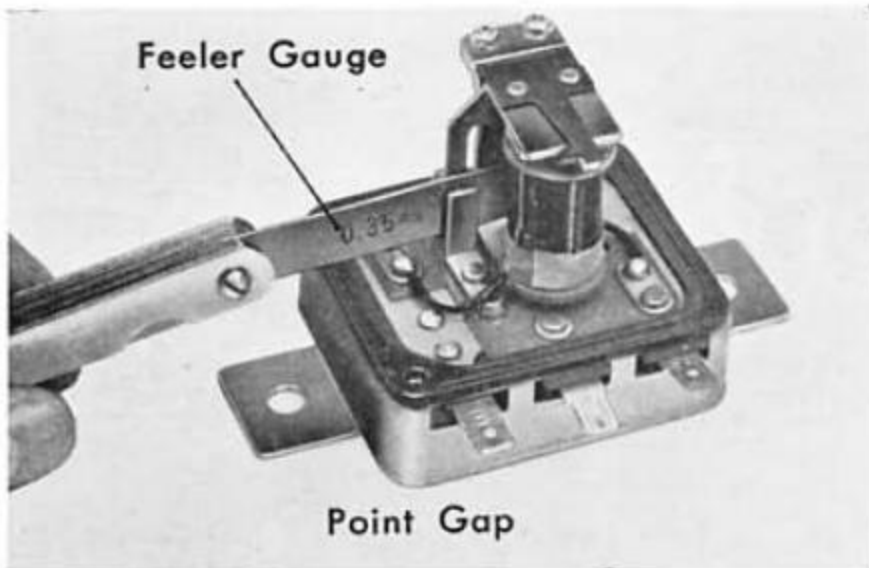


Fig. 19N-3

Note:

In case the re-charging rate is found to be low by the above mentioned inspection, it shall be traced by the following procedure:

The regulator armature gap, point gap and point spring tension are as shown below.

	Nippon Denso	Hitachi
Armature Gap	0.8~1.3 mm (0.0315~0.0511")	0.9~1.0 mm (0.0354~0.0393")
Point Gap	0.25~0.45 mm (0.0098~0.0177")	0.4~0.5 mm (0.0157~0.0196")
Point Spring Tension	180 g (6.3 oz.) min.	200 g (7.0 oz.) min.

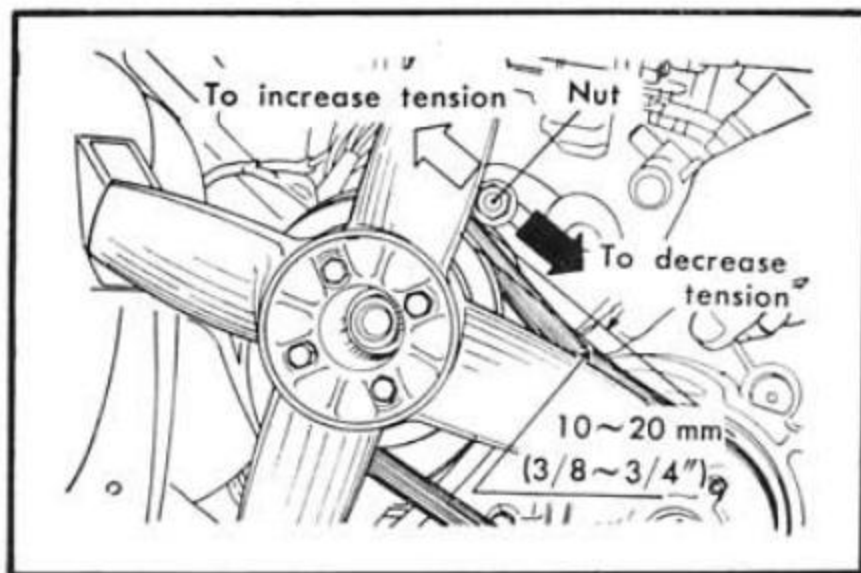


Fig. 19N-4

b. A.C. Dynamo Charging Circuit Inspection

1. Whenever checking for faulty charging operation, always check the tension of the fan belt first to make sure that it is properly tightened.
2. If the ammeter indicator is registering (-) with the engine running over 1500 r.p.m., it is an indication that dynamo is not generating or that the charging is not being accomplished. Initially check to make sure that the ammeter is functioning properly.

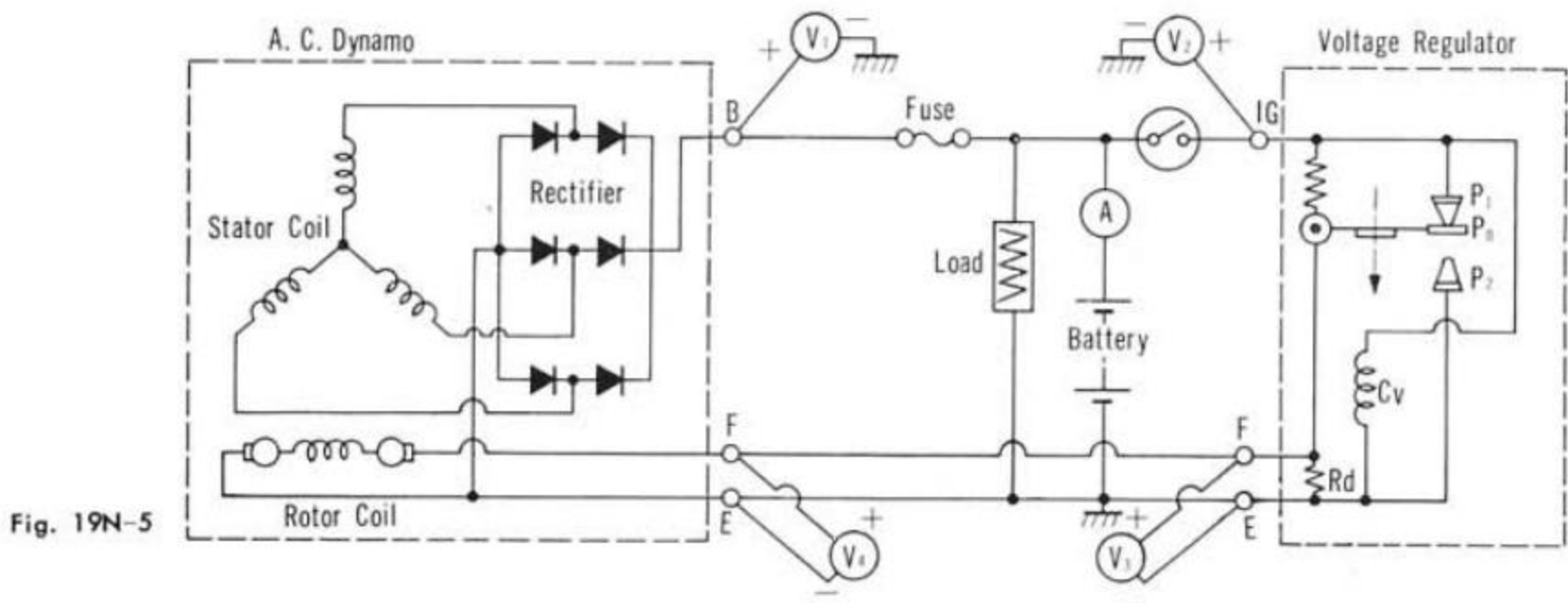


Fig. 19N-5

Then check to see if the battery power is available at the terminal B of the dynamo when the key switch is in the OFF position (Fig. 19N-5).

If the power is not available due to faulty contact in the circuit, charging will not be possible. Further, it cannot be remedied by replacing the ammeter

Next, place the key switch to the ignition position and check to see if there is power at the regulator terminal IG, and at the terminal F of the A.C. dynamo. If power is available at the regulator terminal F but no power at the dynamo terminal F it is an indication that there is an open circuit between the two points.

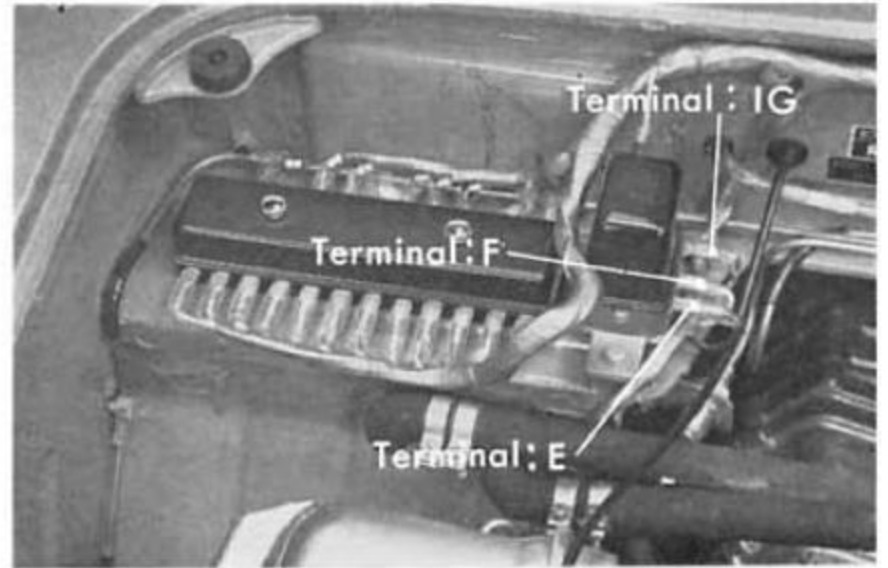


Fig. 19N-6.

Remove the cord at the regulator terminal F and connect a D.C. ammeter in the circuit (Fig. 19N-5), there should be approximately 2.5A current flow. If there is no current flow but a battery voltage exists at the terminal F of the dynamo, the probable cause is in the poor contact between the brush and slip ring within the dynamo, or an open circuit within the rotor coil.

- Whenever the engine speed is over 1500 r.p.m. and the ammeter indicator shows (-), check the key switch, point within regulator, wiring between the regulator and F terminal of the A.C. dynamo and the A.C. dynamo brush to ring connect condition.

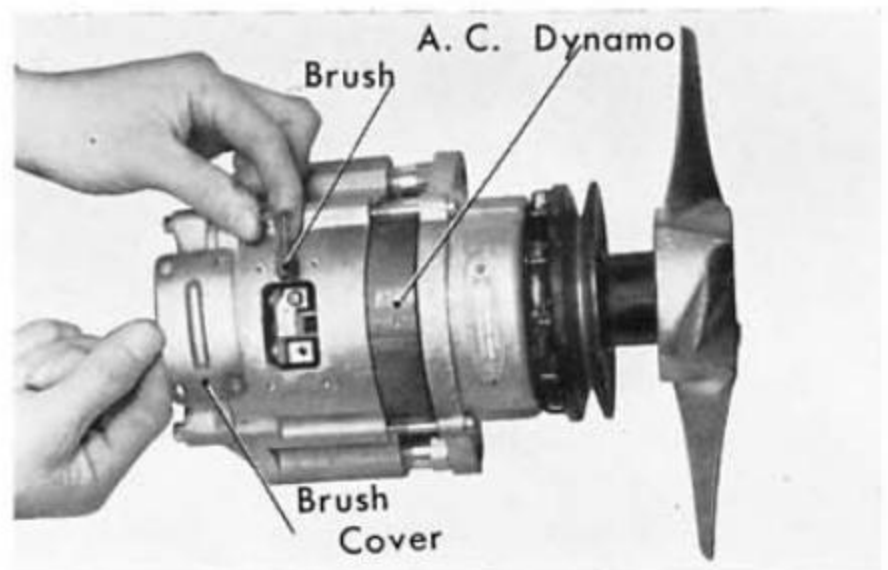


Fig. 19N-7.

c. A.C. Dynamo Complete Test

- Perform stator coil leak test in accordance with Fig. 19N-8. There should be no short between the respective stator coil terminal (soldered end) and the stator core.



Fig. 19N-8

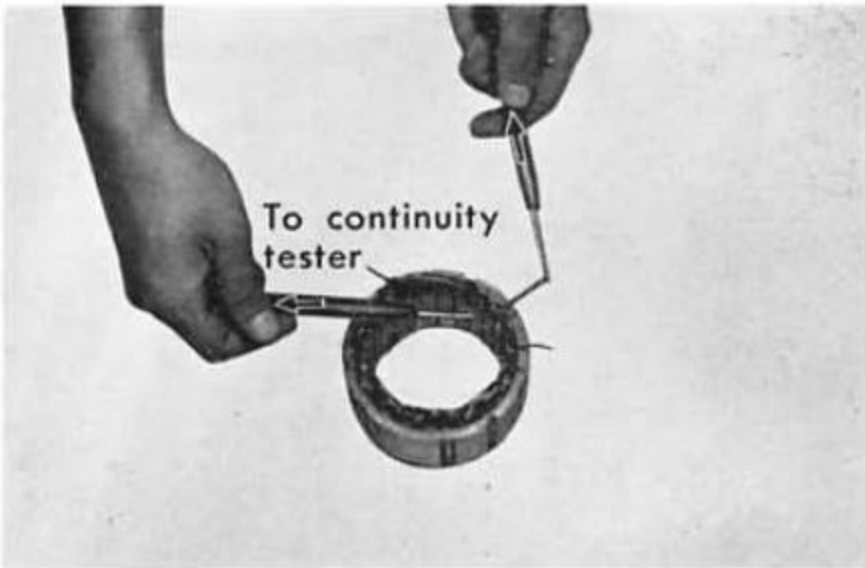


Fig. 19N-9

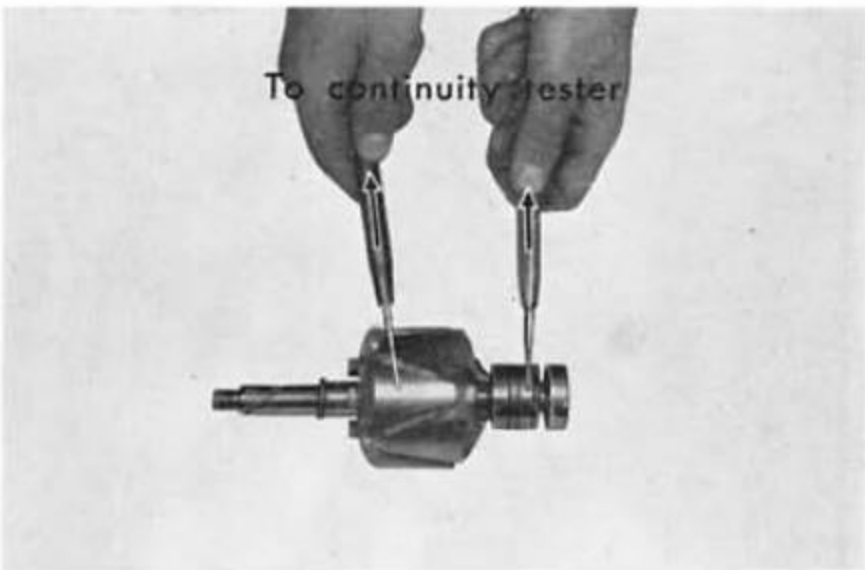


Fig. 19N-10

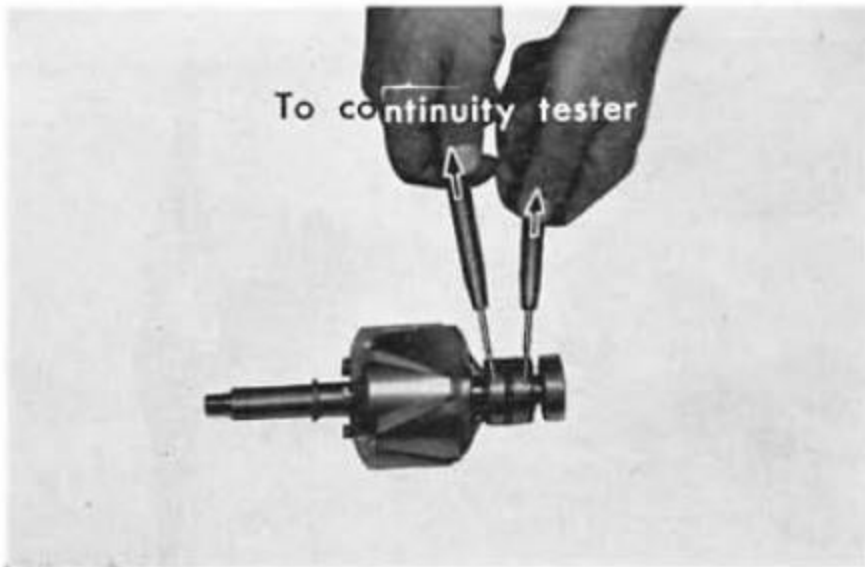


Fig. 19N-11

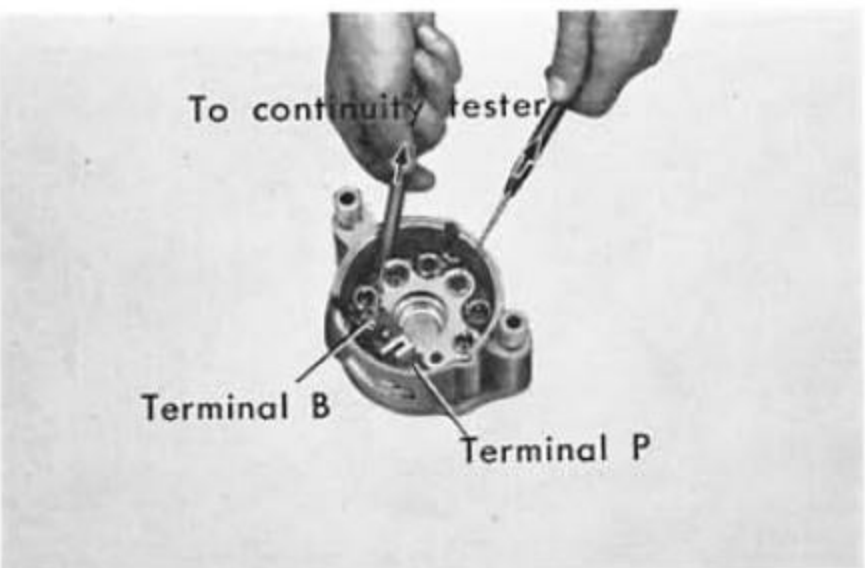


Fig. 19N-12

2. Measure the resistance between the stator coil and the respective terminals or between the common terminal (common connection of the 3 coils) and the ends of the respective coils. The resistance of each coil should be approximately 0.3Ω .

3. There should be no short between the slip ring and the core of the slip ring and shaft.

4. To test for open circuit in the rotor coil, check the resistance between the two slip rings. The proper value is approximately 4Ω .

5. Check for shorts between the terminal screws and frame with the diode terminals disconnected. The respective diodes should pass the current in one direction only when operating properly.

When testing the (+) side of the diodes (red marking) with a continuity tester, contact the (+) probe (black shaft) to the diode terminal. A full swing of the tester needle indicates a continuity.

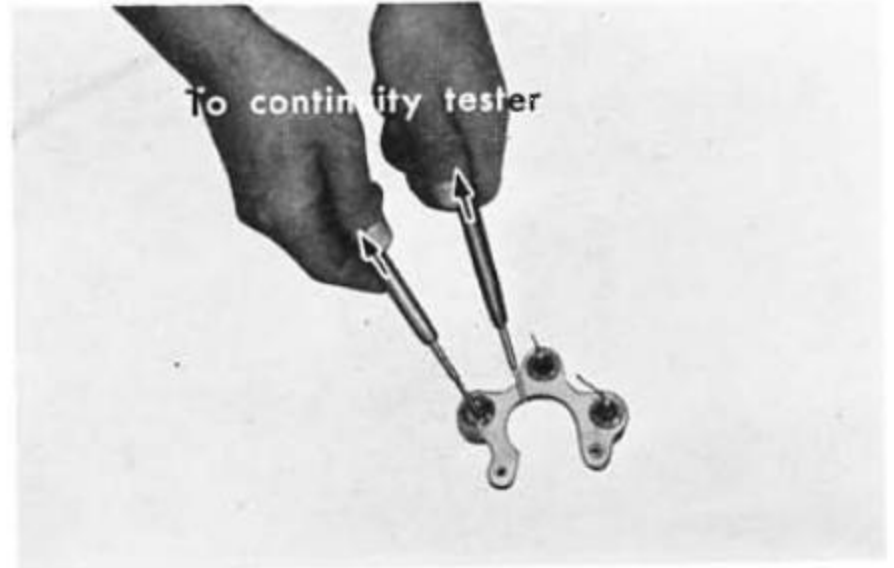


Fig. 19N-13

When the probes are reversed, and indicating only a slight movement of the tester needle, the diodes are satisfactory.

When testing the diodes marked with black, (3 installed into the end frame) the test procedure is reversed. The (+) probe of the tester is contacted to the diode terminal and the (-) probe to the frame. The tester needle should swing fully and when the probes are reversed, the tester should indicate resistance.



Fig. 19N-14

Note :

Whenever the diodes indicates either continuity or resistance in both directions, the diodes are faulty.

6. Perform the condenser test between the terminal with the **B** terminal and the frame.

Note :

The capacity of the condenser is 0.22 μ F (Hitachi) or 0.24 μ F (Nippon Denso).

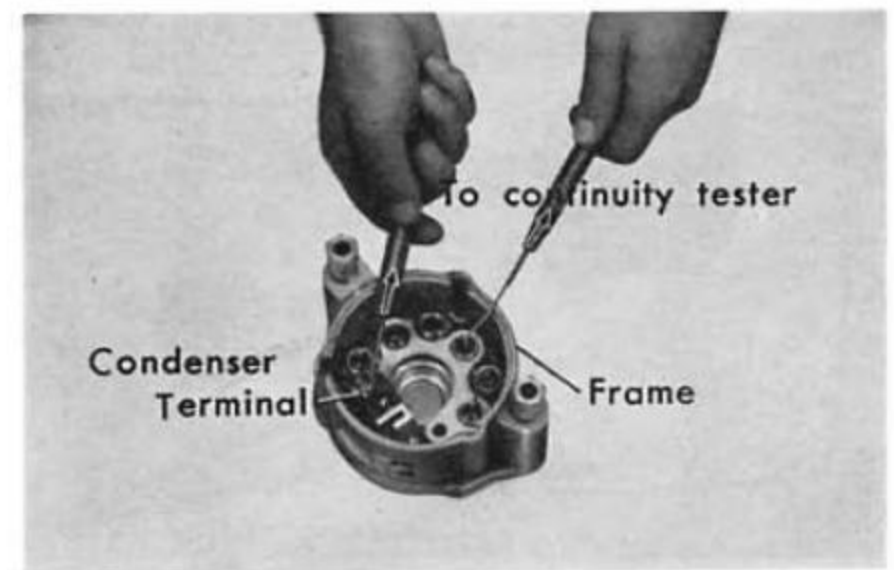


Fig. 19N-15

A.C. dynamo brush inspection

	Standard Value	Serviceable Limit
Nippon Denso	18.5 mm (0.728")	Replace if under 10 mm (0.393")
Hitachi	14.5 mm (0.571")	Replace if under 5 mm (0.197")

The installed brush spring force is 270~330 g (9.4~11.5 oz.).

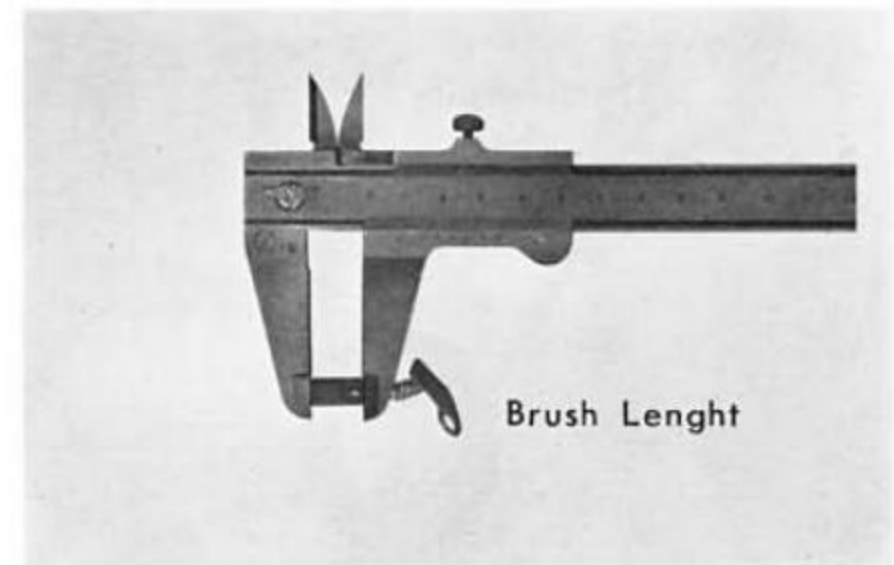
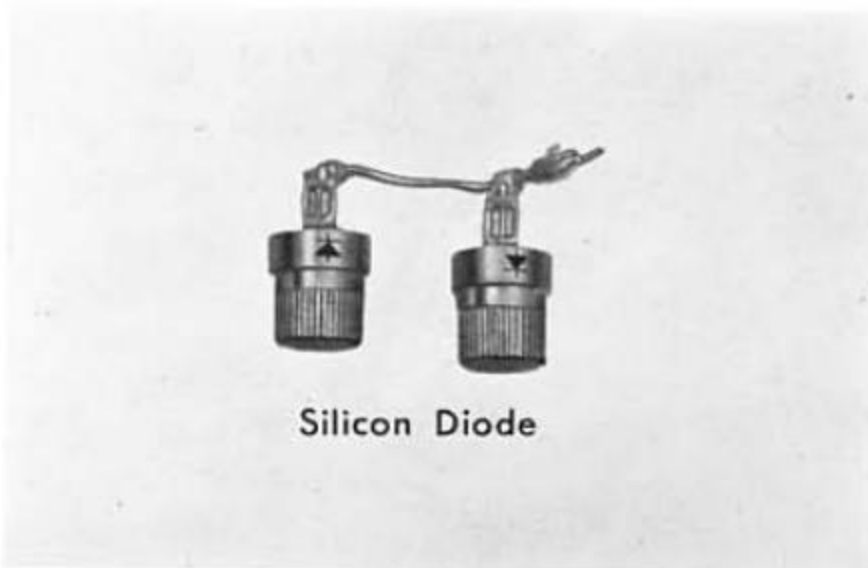


Fig. 19N-16



Silicon Diode

Fig. 19N-17

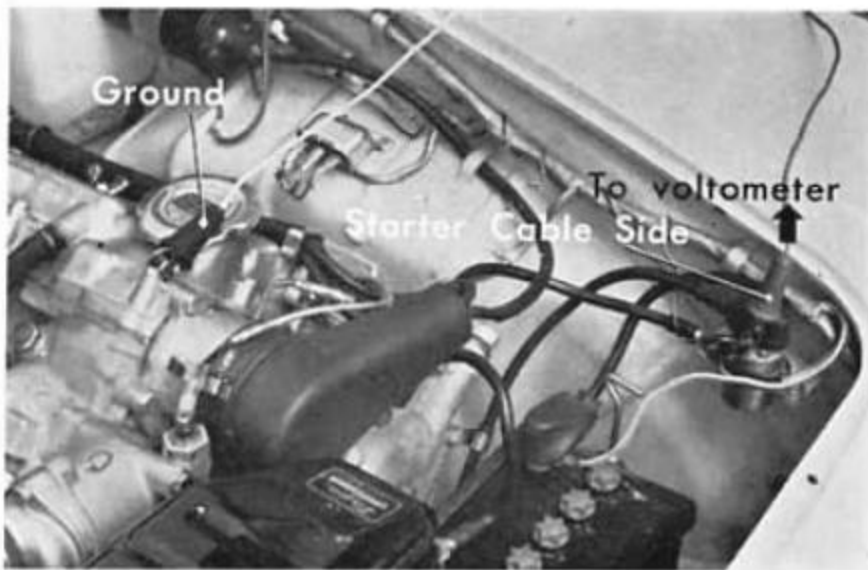


Fig. 19N-18

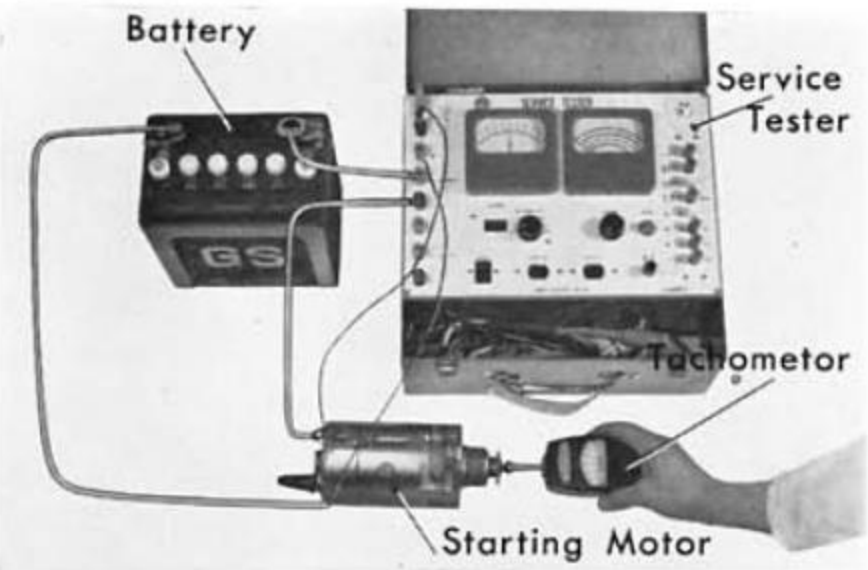


Fig. 19N-19



Fig. 19N-20

Approximately 2.5A of current should flow through point A in figure 19N-5 (with the key turned on only to engage the ignition circuit). If the current is low, the dynamo will not generate full capacity. There are two types of diode trouble, the open circuit and shorted circuit. In either case, it will result in low dynamo output and a noticeably high dynamo noise.

7. When the key switch is turned off but the ammeter is still indicating, the probable cause is that one of the 3 positive diodes is shorted. If any of the negative diodes is shorted, the ammeter will not be indicating. However, by connecting a continuity tester into the ammeter circuit (white/green cord), a short will be indicated.

— STARTING SYSTEM —

a. Inspection of the Starting System

1. The starting system is in proper operation if the engine is rotated between 150~300 r.p.m. Whenever the engine does not start at this speed, the probable cause is in the ignition system, carburation system or in the fuel system. If the starter does not operate or the rotation speed of the starter is slow, initially check the voltage across the starter terminal and the engine.

2. During starting (without load), if there are not at least 8 volts, the battery is faulty.

b. Starting Motor Free Running Check

1. Use a fully charged battery and make the hook-up in accordance with Fig. 19N-19. The starter is in good condition if the starter armature speed is at least 8,500 r.p.m.

Note :

Fig. 19N-19 indicates service tester being used as voltmeter and ammeter.

c. Starter Inspection Check

1. There should be no shorts between the ends of the field coils and the yoke.

2. Measure the resistance of the field coil between the terminal screw and the brush terminal. There should only be negligible resistance.



Fig. 19N-21

3. Measure the continuity between the commutator and the core or shaft, there should not be any continuity.

Note :

Inspect to make sure that there are no separation of the soldered joints of the armature coil and the commutator.

4. Perform the resistance test of the positive (+) brush holder. There should not be any continuity between brush holder and the frame.



Fig. 19N-22

d. Magnetic Switch Operational Test

1. Measure the minimum operating voltage.

Connect the magnetic switch in the circuit shown in Fig. 19N-23. Connect the terminal of the magnetic switch to the 8V or the 6V terminal of the battery, the switch will be energized and if the continuity tester indicates in the proximity of 0Ω , the magnetic switch is in good condition.

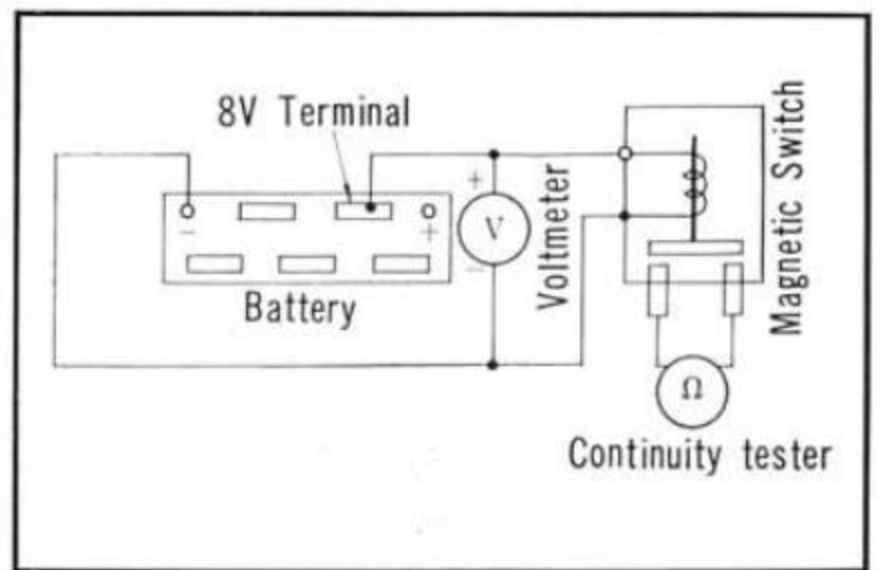


Fig. 19N-23

2. Coil continuity test and current measurement.

Apply the points of the tester to the terminal S of the magnetic switch and the body to test for continuity. If the resistance measured is approximately 3Ω , the coil is in good condition.

Further, when testing by the current flow, connect the ammeter across the terminals of the engine switch and the magnetic switch. The current reading should be less than 4A (at 12V) to indicate good condition.

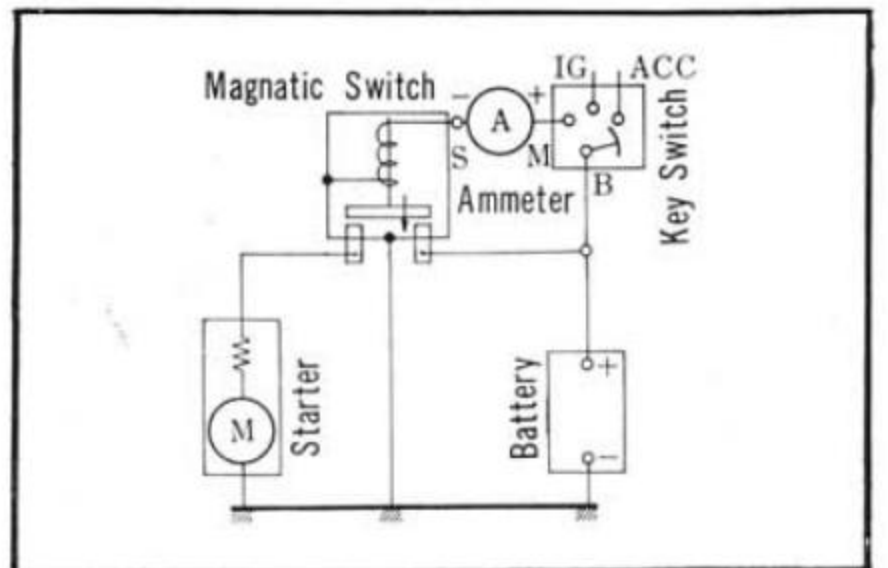


Fig. 19N-24

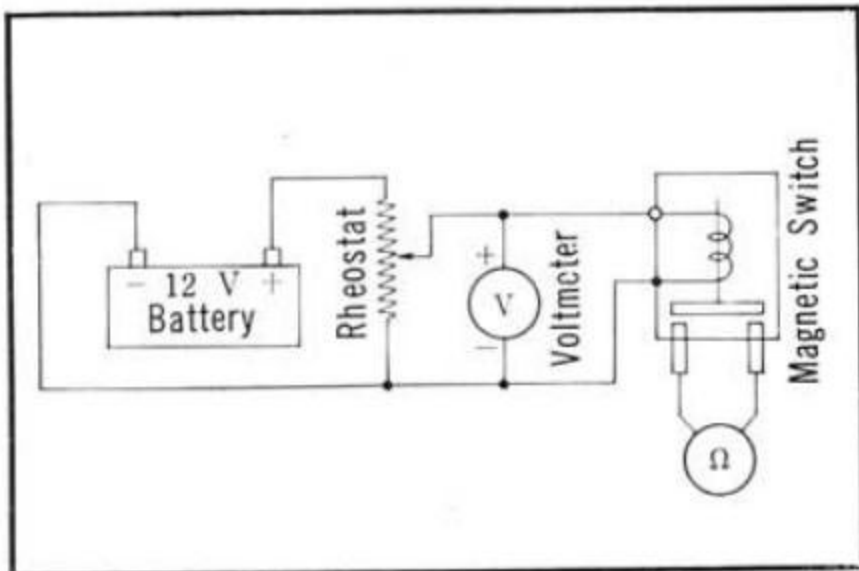


Fig. 19N-25

3. Holding Voltage

Apply 12V to the terminal S and energize the magnetic switch, gradually reduce the voltage until the contact points are separated. If the points are separated at less than 4V, the magnetic switch is in good condition.

- IGNITION SYSTEM -

Trouble Diagnosis

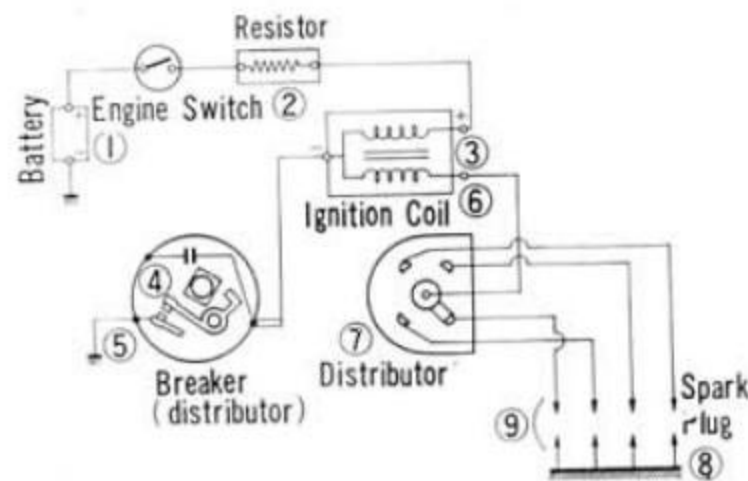


Fig. 19N-26

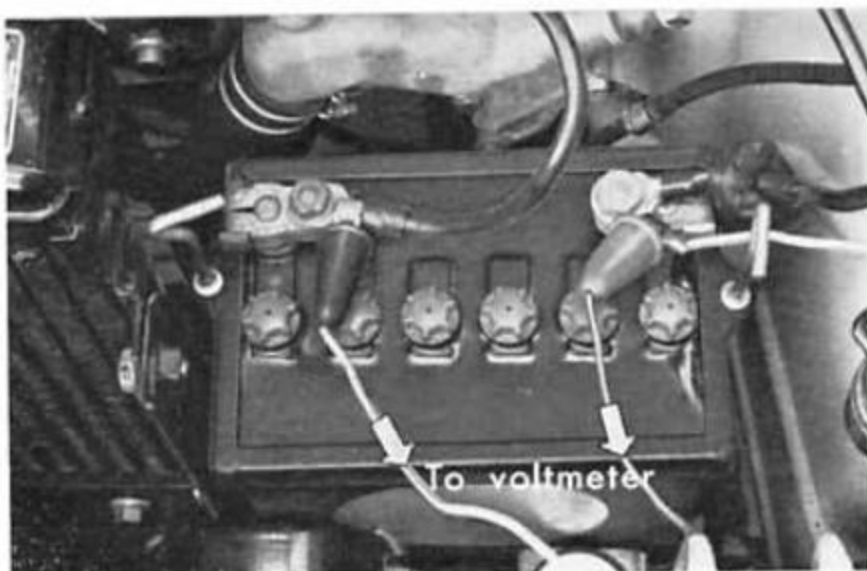


Fig. 19N-27

a. Battery Voltage

If the starter rotation speed is proper, there would be no problem. The ignition is a 12V type and the ignition producing voltage is 8V minimum.

b. Resistor

After disconnecting the connector of resistor, measure the resistance of the resistor, the standard value is $1.5\Omega \pm 10\%$. The resistor may heat up while the engine is running, however, this is normal.

c. Ignition Coil**1. Resistance**

Place an ohmmeter across the (+) and (-) terminals of the primary coil and measure the resistance, $1.35 \sim 1.5\Omega$ is normal.

Place an ohmmeter across the high tension terminal of the secondary coil and the (-) terminal of the primary coil and measure the resistance of the secondary coil, $9.5 \sim 10.5K\Omega$ is normal.

Note :

To check the quality of ignition coil, connect coil tester as shown in Fig. 19N-29.

2. High Tension Terminal

When the high tension terminal area where the high tension cord is inserted is blackened, clean the area well and make sure that the high tension cord is inserted to the full depth.

3. Performance

Remove the high tension cord from the distributor end and hold it approximately 5 mm (0.2 in.) from the engine block while cranking the engine with the starter and check to see that a good strong spark is being produced.

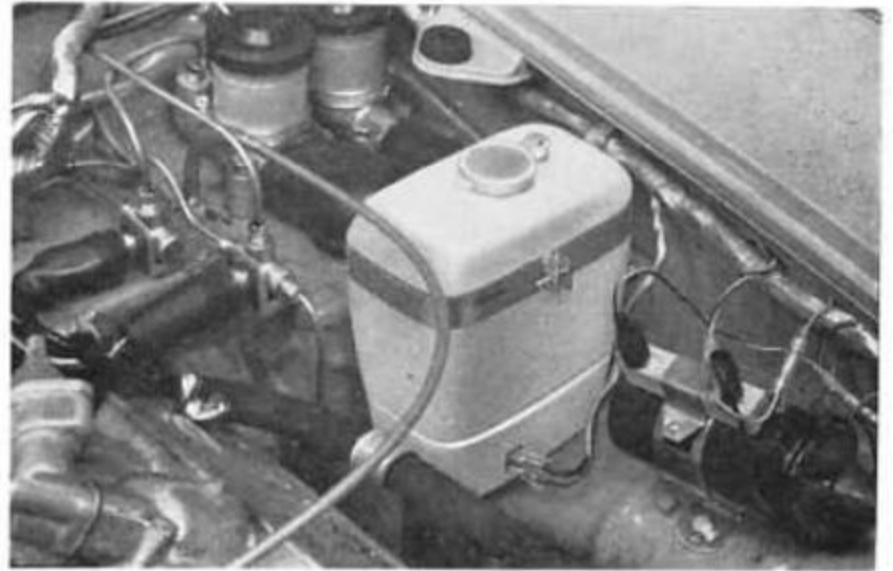


Fig. 19N-28

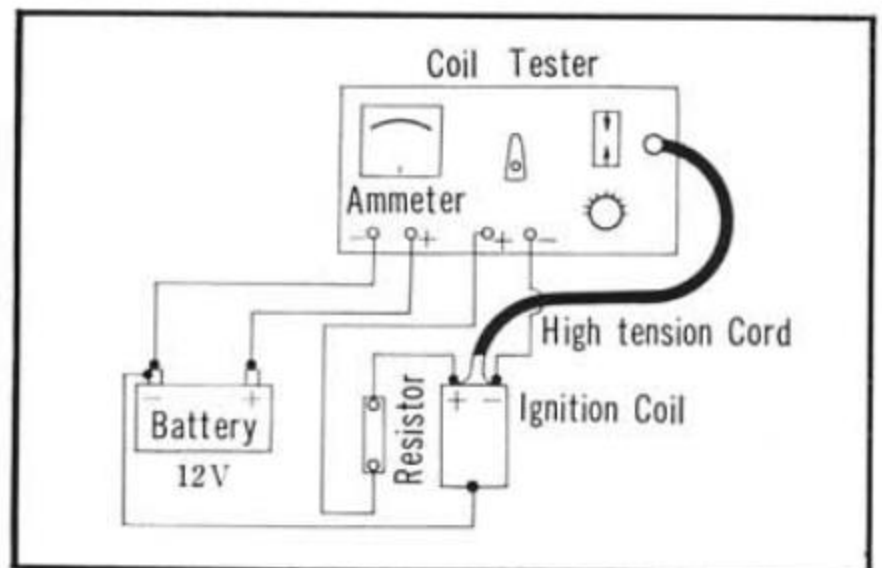


Fig. 19N-29

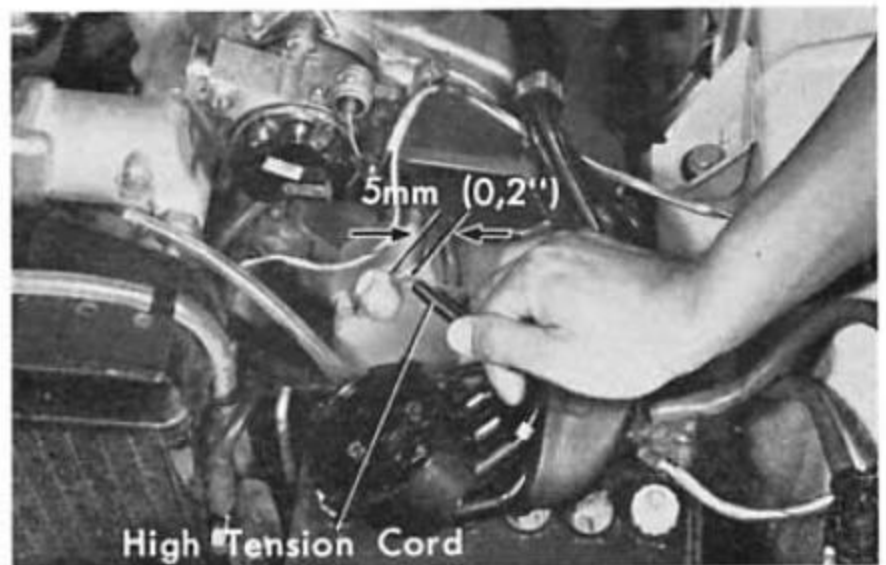


Fig. 19N-30

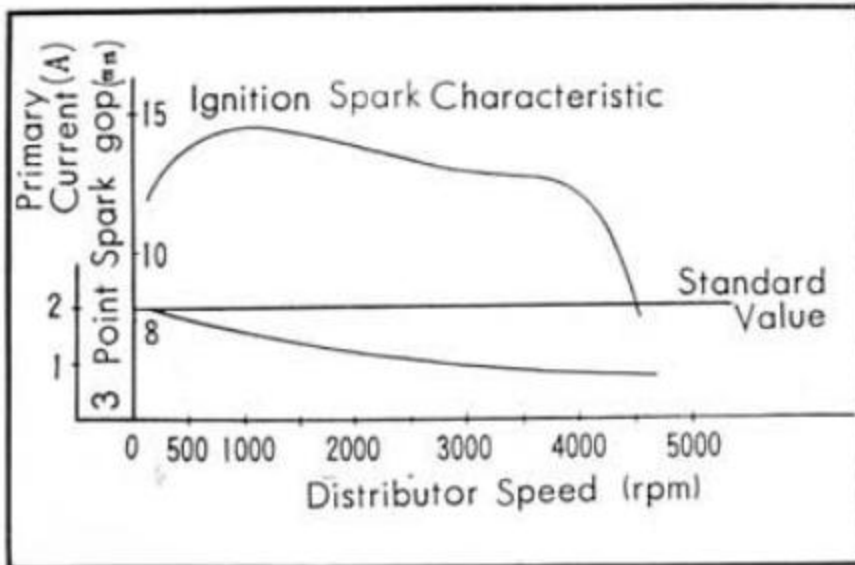


Fig. 19N-31

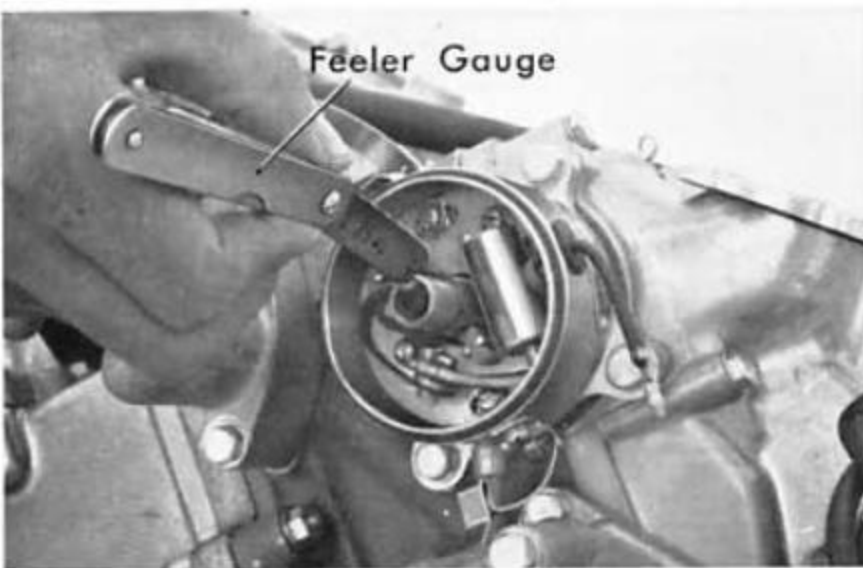


Fig. 19N-32



Fig. 19N-33

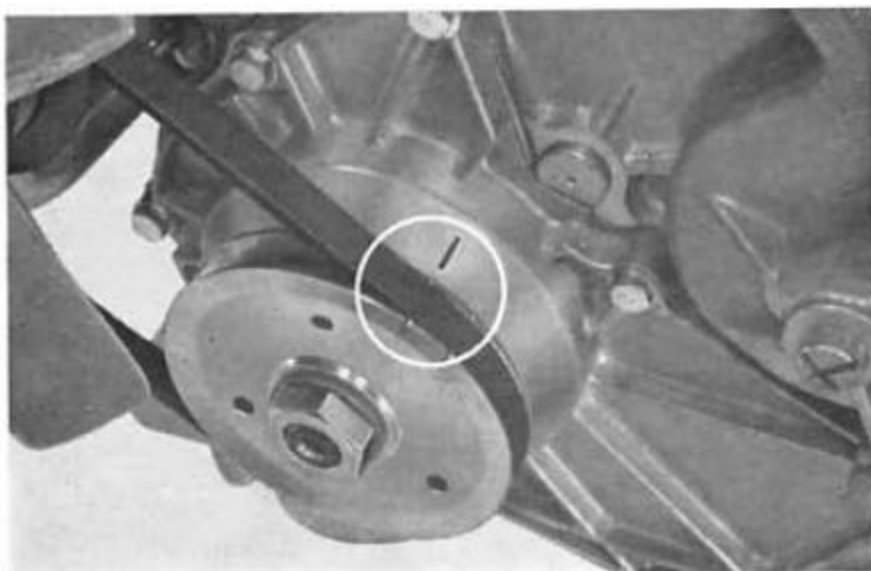


Fig. 19N-34

Slow Speed

Primary Voltage, 8V

Distributor speed at 150 r.p.m. (engine 300 r.p.m.)

Gap, 3 point spark gap tester, 8 mm (0.315") min. (resistor equipped).

High Speed

Primary voltage, 12V

Distributor speed at 4500 r.p.m. (engine 9000 r.p.m.)

Gap, 3 point spark gap tester, 8 mm (0.315") min. (resistor equipped).

d. Distributor

1. Breaker Inspection

Point gap	0.3~0.4 mm (0.012~0.016")	
Condenser capacity	0.24 μ F \pm 10% (Nippon Denso)	0.22 μ F \pm 10% (Hitachi)
Point spring tension	Nippon Denso	500~700 g (17.5~24.5 oz)
	Hitachi	550~750 g (19.1~26.3 oz)

Note :

Remove the distributor cap, rotate the engine with the starter and observe the spark across the points.

- (1) A large spark indicates an open condenser or high resistance across the points.
- (2) Absence of spark is an indication of shorted condenser or the grounding of the (+) point.
- (3) With the proper conditions, the high tension spark may not be produced if the point gap is less than 0.2 mm (0.0078") or greater than 0.8 mm (0.0315").

2. Distributor Ground

The distributor body must be properly grounded otherwise, the primary electrical circuit will not be complete. Oil film between the distributor points will also cause incomplete circuit.

3. Ignition Timing

- (1) Initially set the maximum point opening to between 0.3~0.4 mm (0.012~0.016in.). Turn the crankshaft pulley in the normal direction by manually pulling the fan belt and aligning the F marking on the pulley with the timing mark on the front cover. At this point, adjust the breaker points so that it is just starting to open (the ignition timing at this point is 15° BTDC).

- (2) Checking the ignition timing with the timing tester. Check the timing mark and the position of the points to see if the ignition is properly timed.

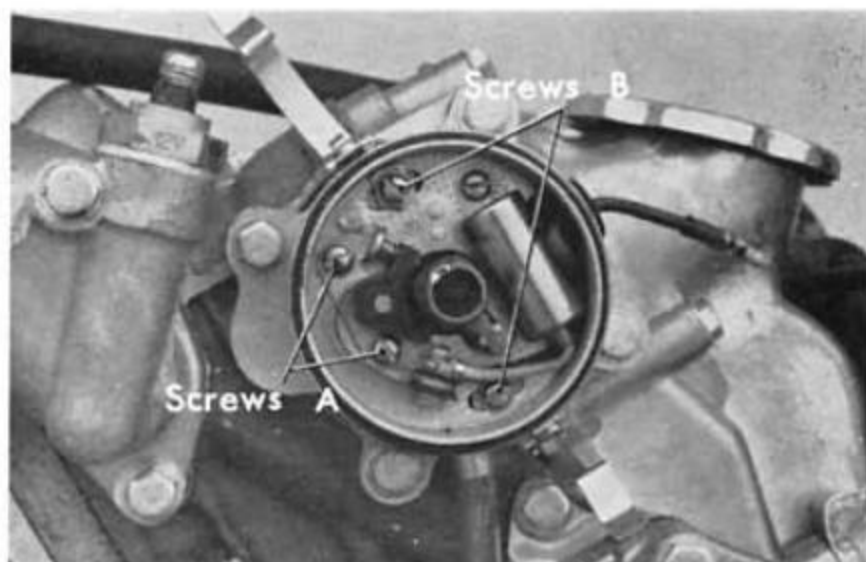


Fig. 19N-35

e. Spark plug

While the engine is running, remove the spark plug cap one at a time, if the spark plug is firing properly, the engine will run erratically when the plug cap is removed. If there is no noticeable change in the engine operation when the plug cap is removed, it is an indication that the spark plug is misfiring.

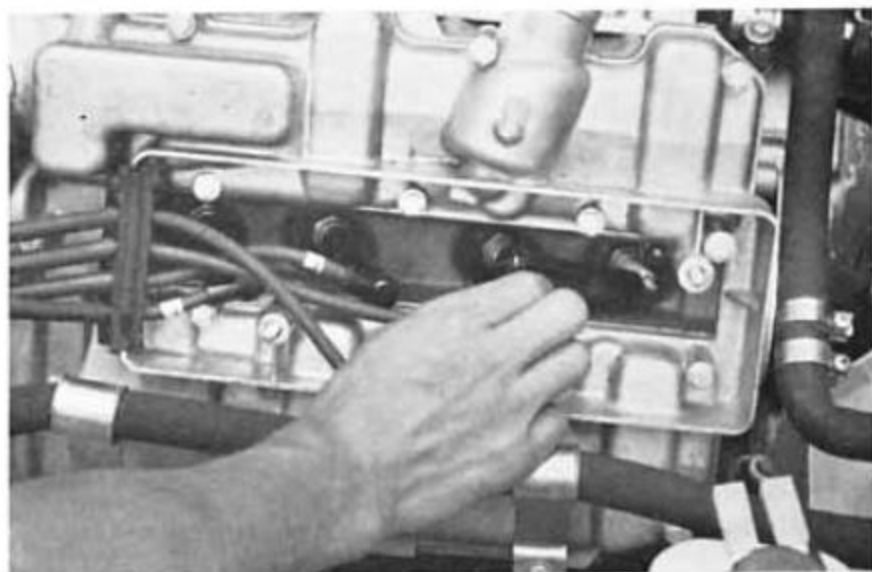


Fig. 19N-36

1. Spark Plug Point Gap

Measure the gap with feeler gauge and make sure that it is at the standard clearance of 0.7 mm (0.027").

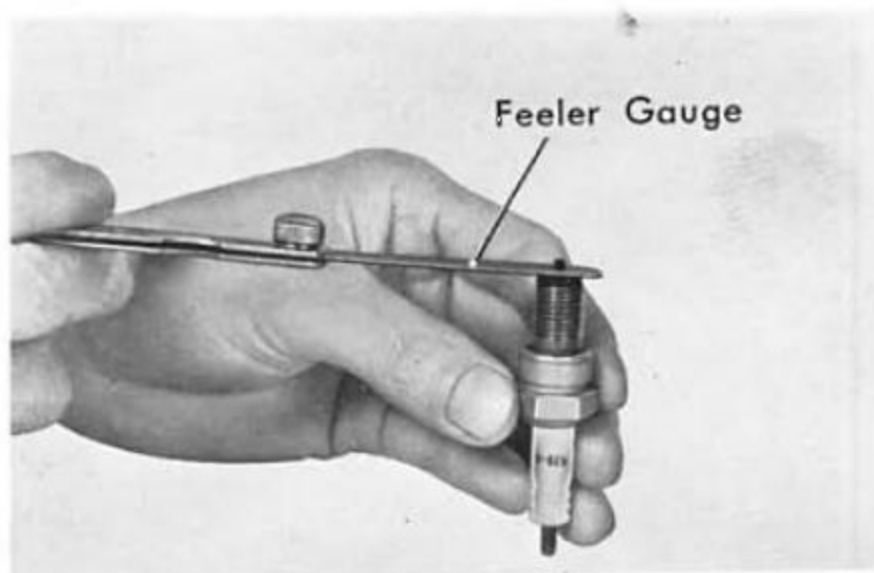


Fig. 19N-37

2. Resistance Check

The check should indicate at least 100M Ω when measured with 500V megger.

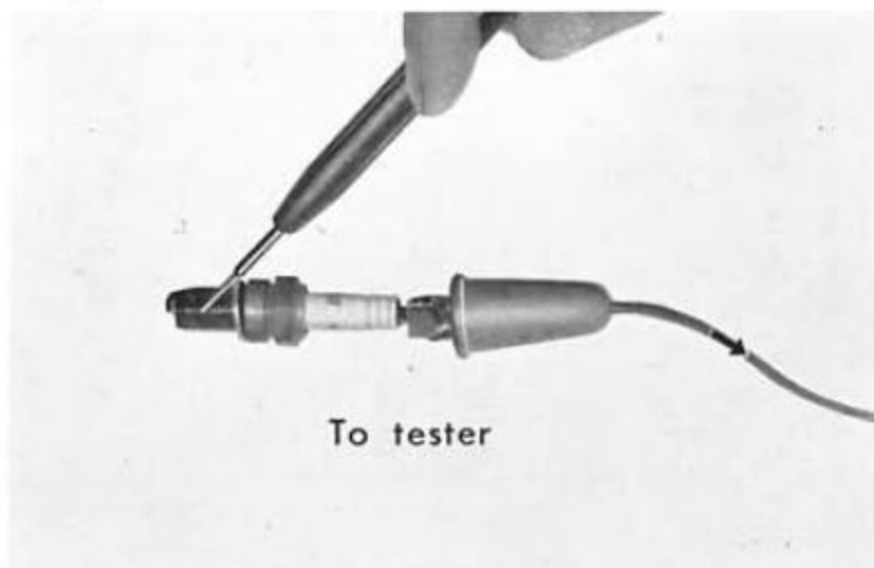


Fig. 19N-38



Spark Plug Tester

Fig. 19N-39

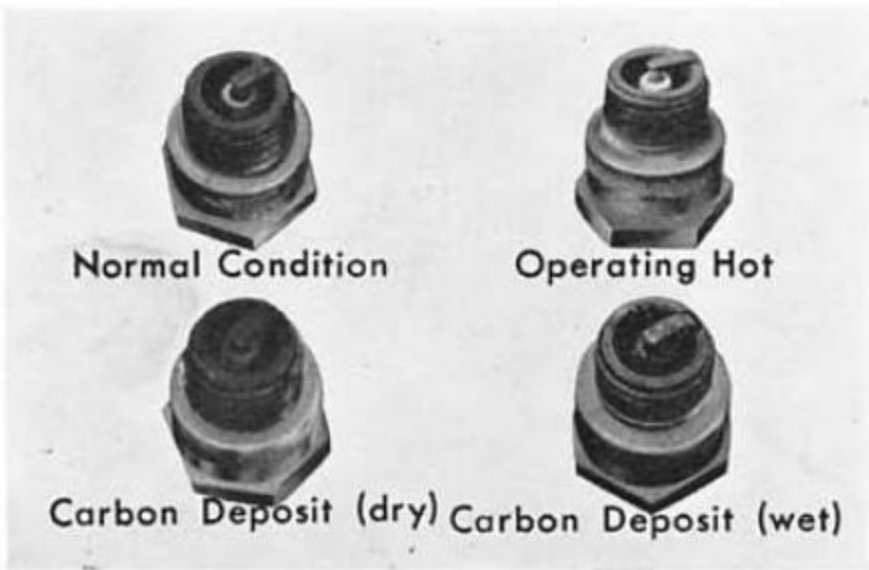


Fig. 19N-40

3. Spark Characteristics

Gap opening		0.6 mm (0.024")	0.5 mm (0.019")
Test Pressure	kg/cm ²	6	5
	lbs/in ²	85	70

Perform the test on the spark plug tester. The test pressure will depend on the gap opening shown above. Observe that the proper spark is firing across the points.

Conducting the spark performance test above is important, however, it is just as important to inspect the spark plug when it is removed from the engine for such condition as the firing condition of the points, chips or crack to the porcelain, wear of the electrodes, color of the deposit, condition of the gasket. The condition of the plugs will give a very good indication as to how the spark plugs had been operating.

- SAFETY ITEMS -

a. Flasher

1. Disconnect the L terminal of the flasher unit and connect two 12V/25W bulbs in the manner shown in Fig. 19N-41. If the flashing rate is 60~110 cycles per minutes, the flasher unit is normal.

2. Always use the bulbs which has been specified. Use of bulbs other than those specified will change the flashing rate.

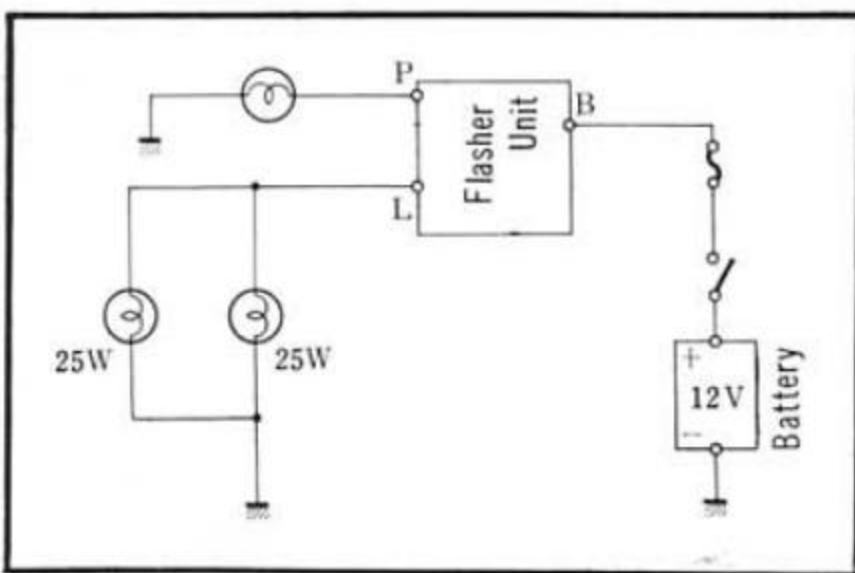


Fig. 19N-41



Fig. 19N-42

b. Instrument Cluster

1. Speedometer

The speedometer unit check is conducted on the speedometer tester. The speedometer indicating needle will register 60 km/h (37 mph) at 637 r.p.m. of the shaft. The counter will add 1km (0.62miles) for every 637 r.p.m.

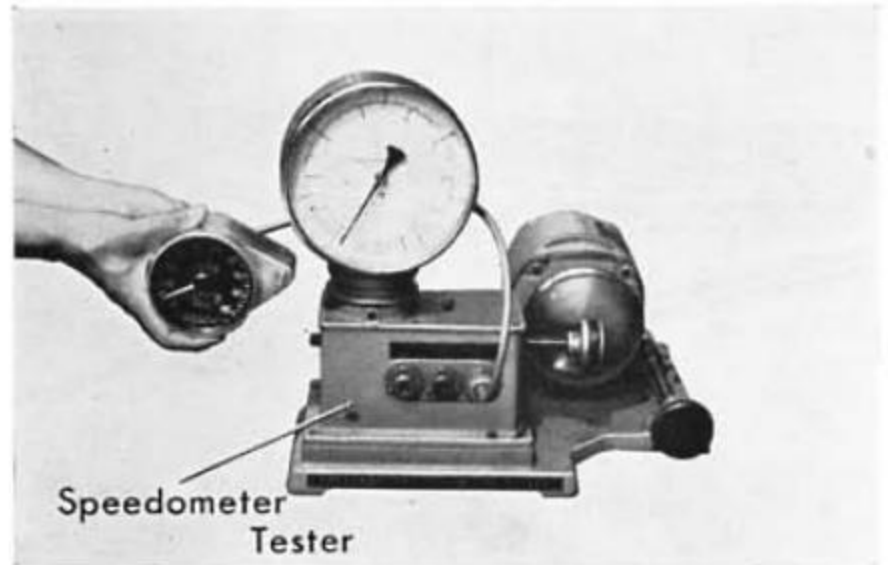


Fig. 19N-43

2. Fuel and Temperature Gauge Unit

The fuel and temperature gauges are connected in series and built as a unit. 6 volts each are applied to the respective gauges and it is designed to prevent the flow of 12 volts.

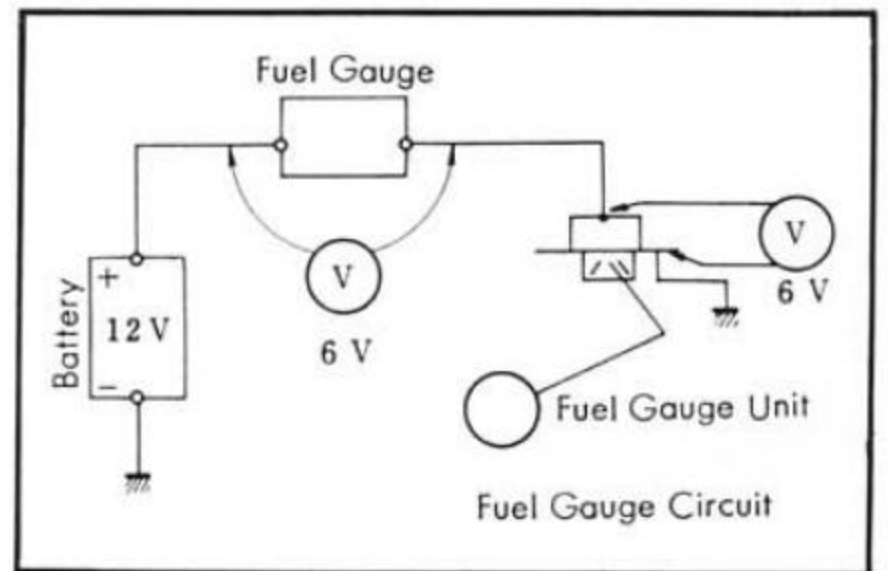


Fig. 19N-44

3. Gauge and Unit Test

The open heater, circuit short, and points are tested by continuity test. The result of the test will determine whether the unit is serviceable. In conducting the test, utilize voltmeter and ammeter or indicating lamps on the gauge.

- (1) Connect a lamp across the terminal B and the ground to check whether there is a flow of 12V.
- (2) Apply 12V from the battery (do not make an error) as shown in Fig. 19N-45. across the terminals B and U of the gauge. Ground the terminal U and at which time if there is a slight indication on the gauge, the condition is normal. If there is a short or an open circuit, there will be no indication (perform the test rapidly).

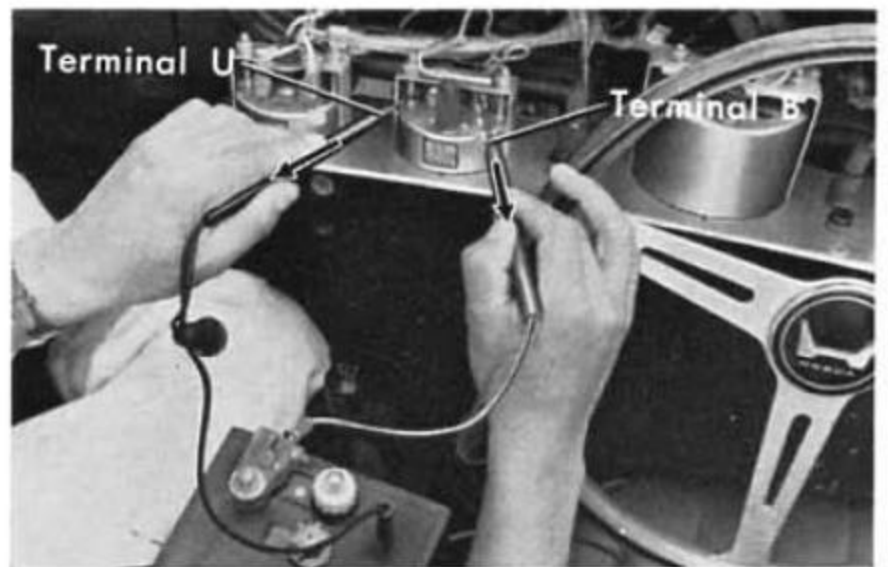


Fig. 19N-45

c. Wiper Motor

1. When the wiper motor is to be bench tested, make the connection in accordance with Fig. 19N-46 and when the switch is turned on and the motor operated without any load, the speed should be 45 r.p.m. and the current at least 3A. Whenever the switch is turned off, the motor should stop at a specified position.

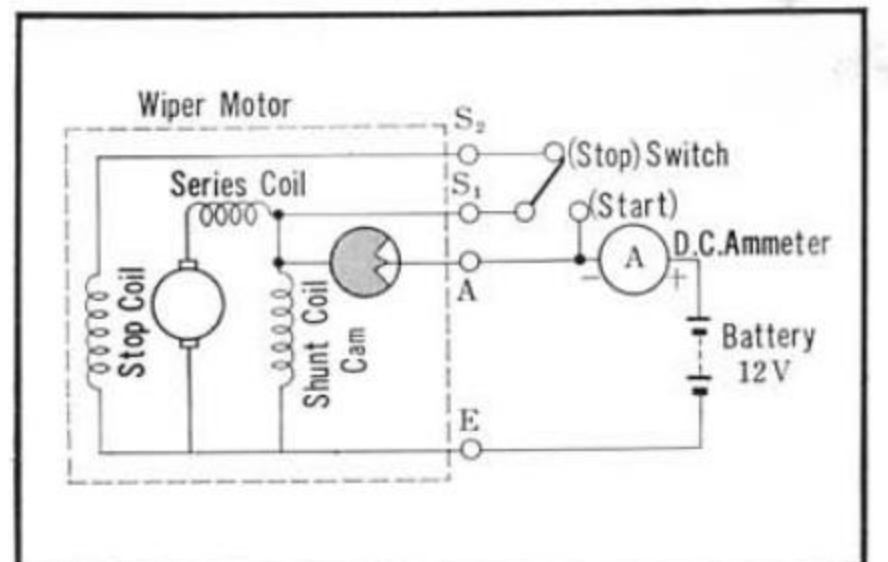


Fig. 19N-46

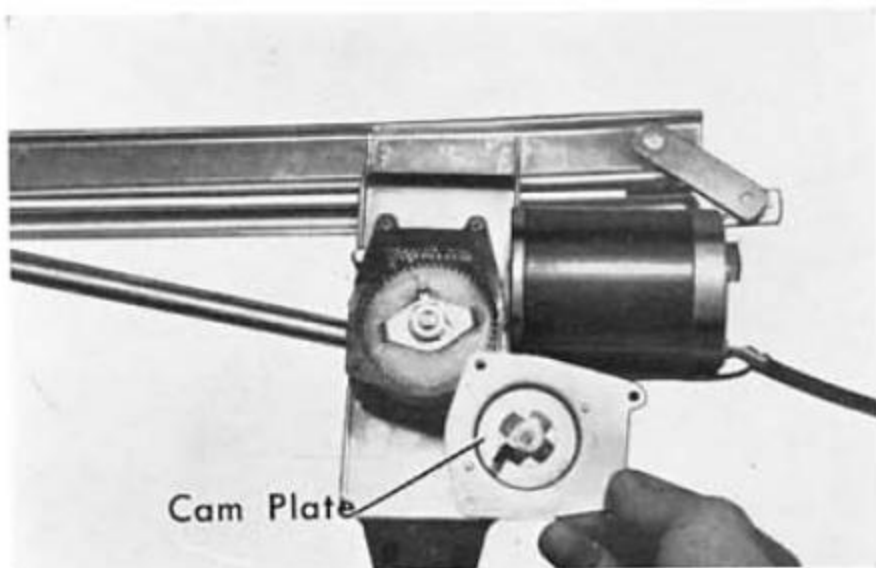


Fig. 19N-47

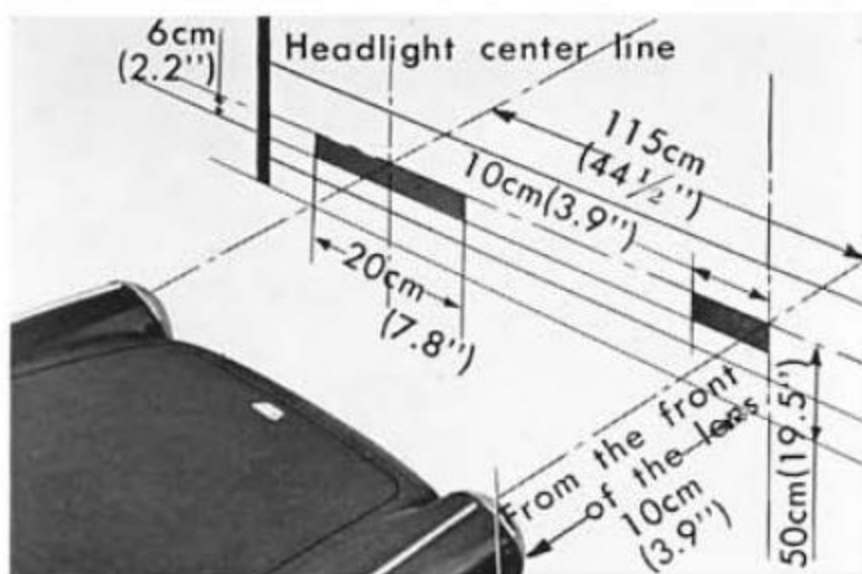


Fig. 19N-48

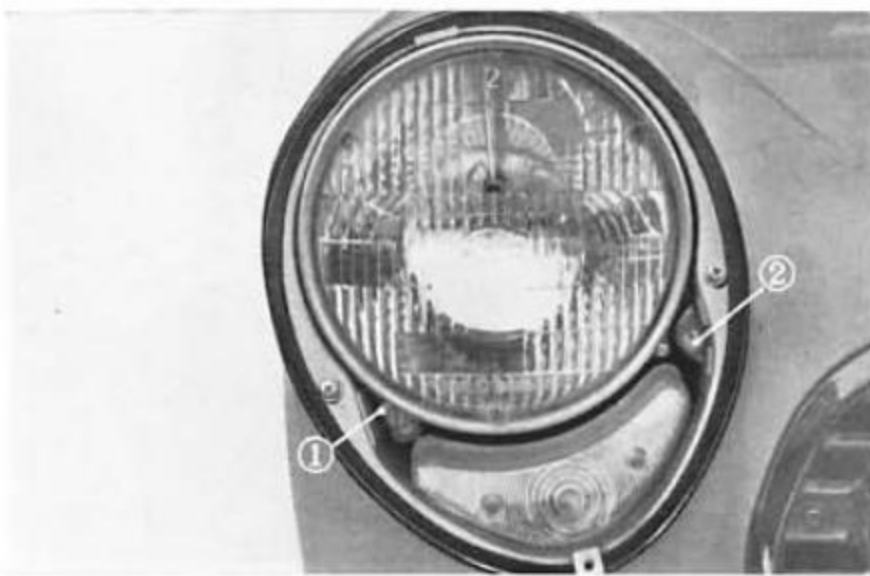


Fig. 19N-49

2. Wiper motor fails to operate.

- (A) Check for blown fuse, and if the replaced fuse is immediately blown, the trouble is a short within the wiper motor.
- (B) Poor connection in the wiring or an open circuit due to poor wiper switch contact, no power to the terminal S_1 .
- (C) Faulty wiper motor.

3. Self-returning operation

When there is no power to the terminal A and whenever there is a poor contact between the contact point and the cam plate within the motor. The motor will stop when the switch is turned off.

d. Inspect and Adjust Headlight Beam

Remove the headlight rims, and adjust with the screws so that beams are within the range shown in the Fig. 19N-48.

Screw ① for vertical adjustment (screw in to lower the beam).

Screw ② for horizontal adjustment (screw in to focus the beam toward the center).

Adjustment should be performed with the high beam. The beams should be adjusted by screws ① and ② so that they will be focused as shown in the Fig. 19N-49.

O. WIRING DIAGRAMS

CONVERTIBLE WIRING DIAGRAM (STD. MODEL)

COUPE WIRING DIAGRAM (STD. MODEL)

CONVERTIBLE WIRING DIAGRAM (MODEL FOR U. K.)

COUPE WIRING DIAGRAM (MODEL FOR U. K.)

CONVERTIBLE WIRING DIAGRAM (MODEL FOR U. S. A.)

COUPE WIRING DIAGRAM (MODEL FOR U. S. A.)

CONVERTIBLE WIRING DIAGRAM (MODEL FOR GERMANY)

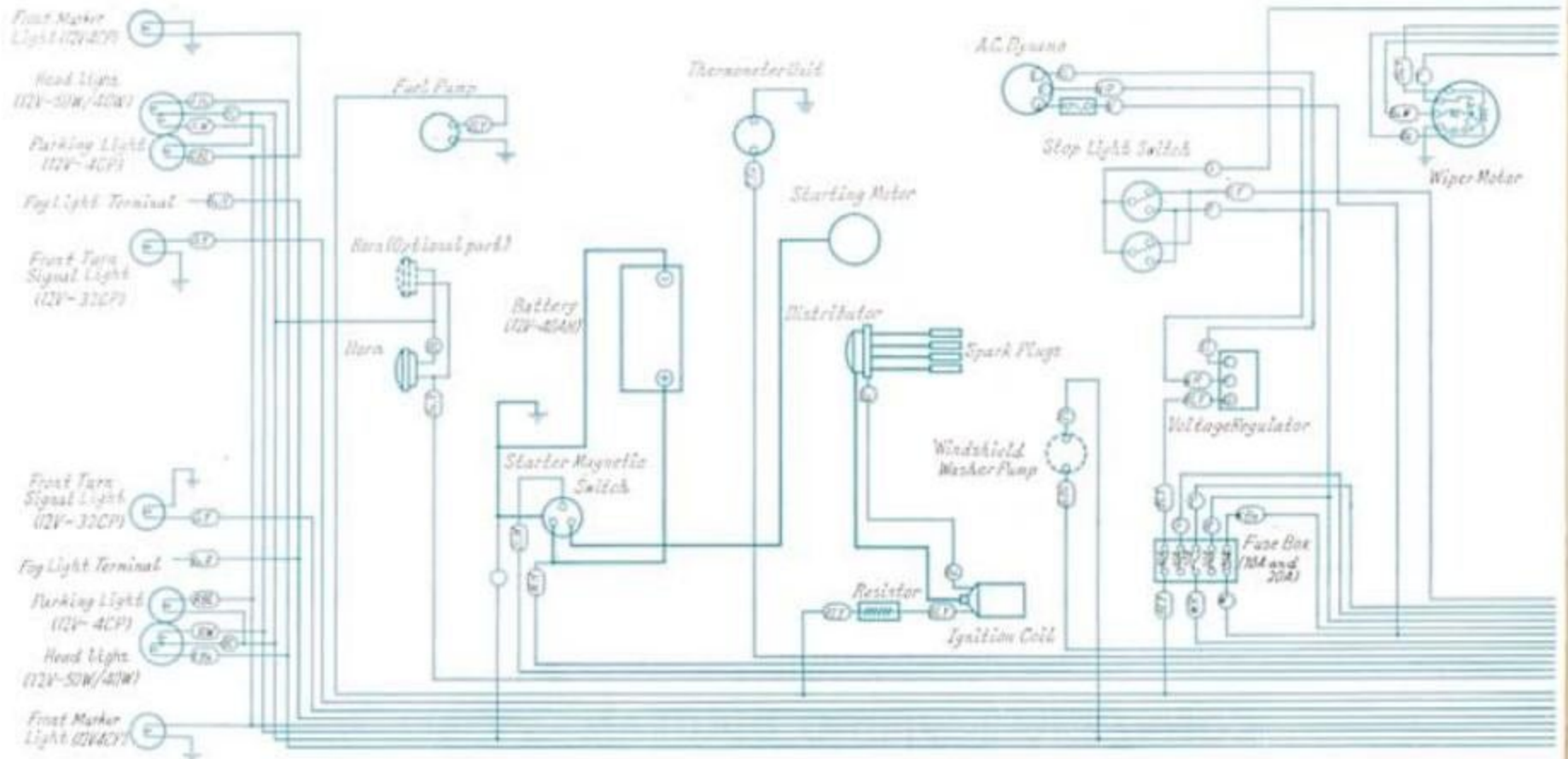
COUPE WIRING DIAGRAM (MODEL FOR GERMANY)

CONVERTIBLE WIRING DIAGRAM (MODEL FOR FRANCE)

COUPE WIRING DIAGRAM (MODEL FOR FRANCE)

19-40 ELECTRICAL SYSTEM

CONVERTIBLE WIRING DIAGRAM (STD. model)

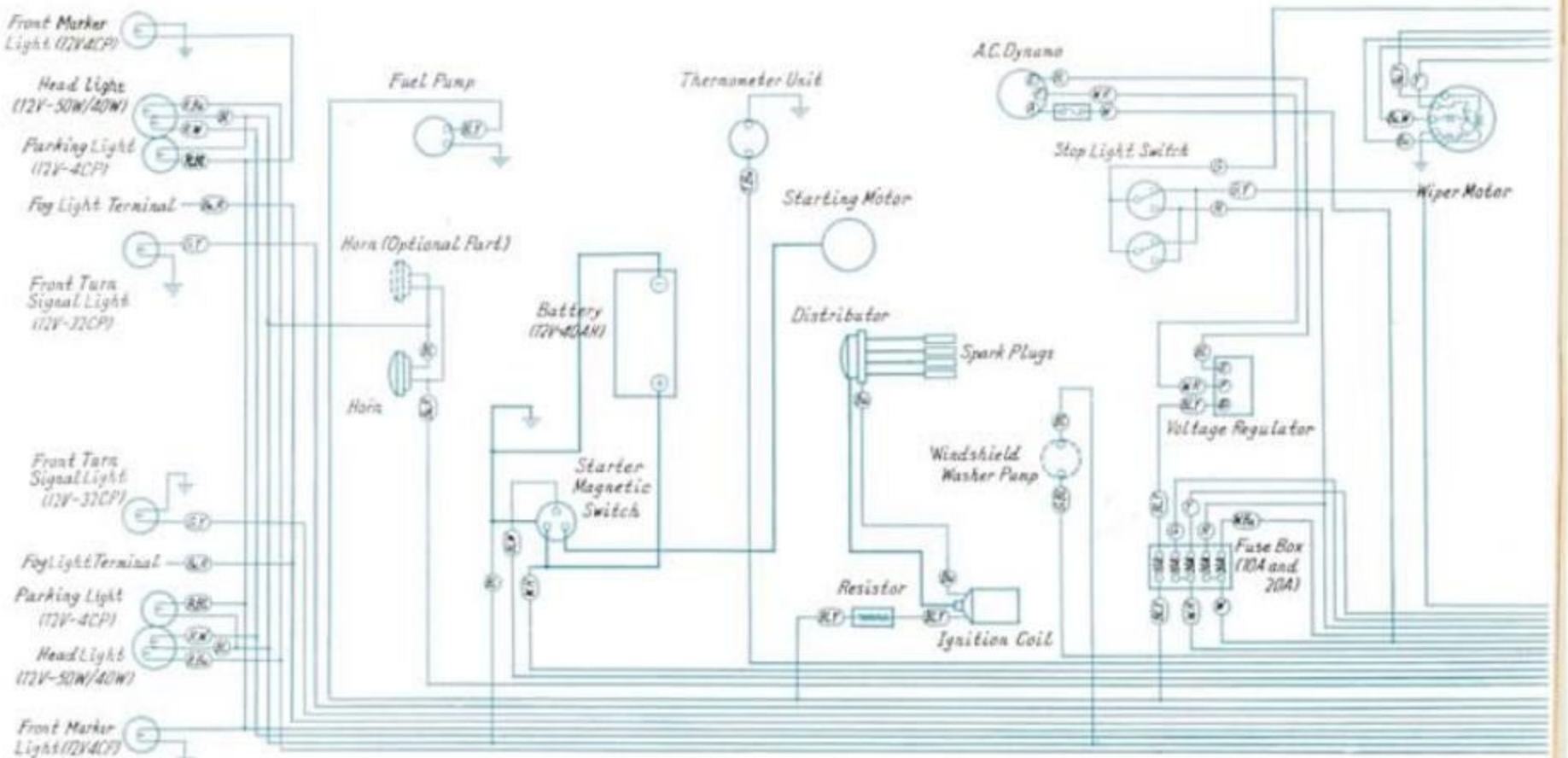


Bl.....Black
 Bl.W.....Black & White Line
 Bl.Y.....Black & Yellow Line
 W.....White
 W.R.....White & Red Line
 W.Bu.....White & Blue Line

Br.R.....Brown & Red Line
 Bu.....Blue
 Bu.W.....Blue & White Line
 Bu.R.....Blue & Red Line
 Bu.Y.....Blue & Yellow Line
 Y.....Yellow

Y.Bl.....Yellow & Black Line
 Y.W.....Yellow & White Line
 Y.R.....Yellow & Red Line
 Y.G.....Yellow & Green Line
 Y.Bu.....Yellow & Blue Line
 G.....Green

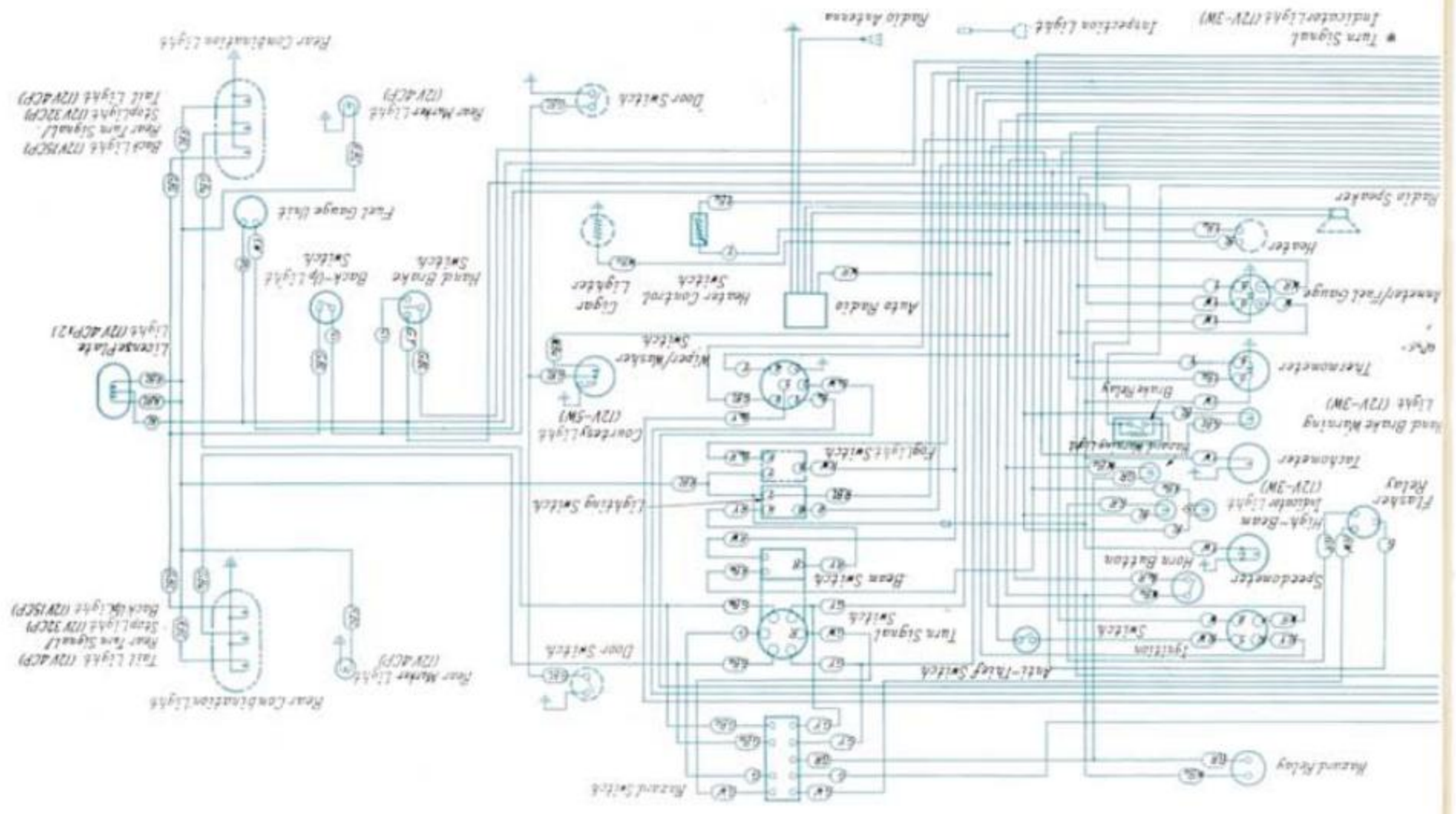
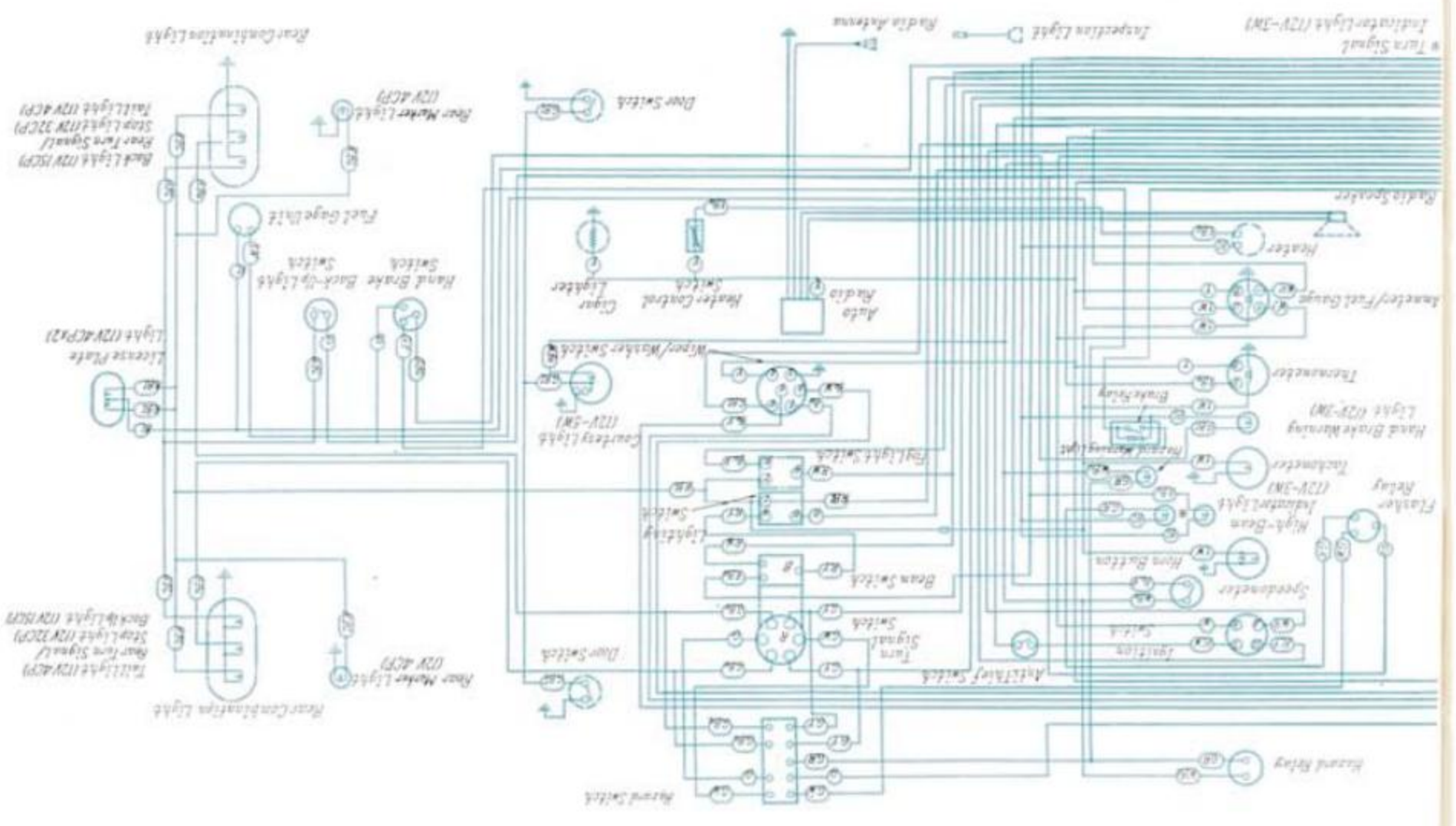
COUPE WIRING DIAGRAM (STD. model)



Bl.....Black
 Bl.W.....Black & White Line
 Bl.Y.....Black & Yellow Line
 W.....White
 W.R.....White & Red Line
 W.Bu.....White & Blue Line

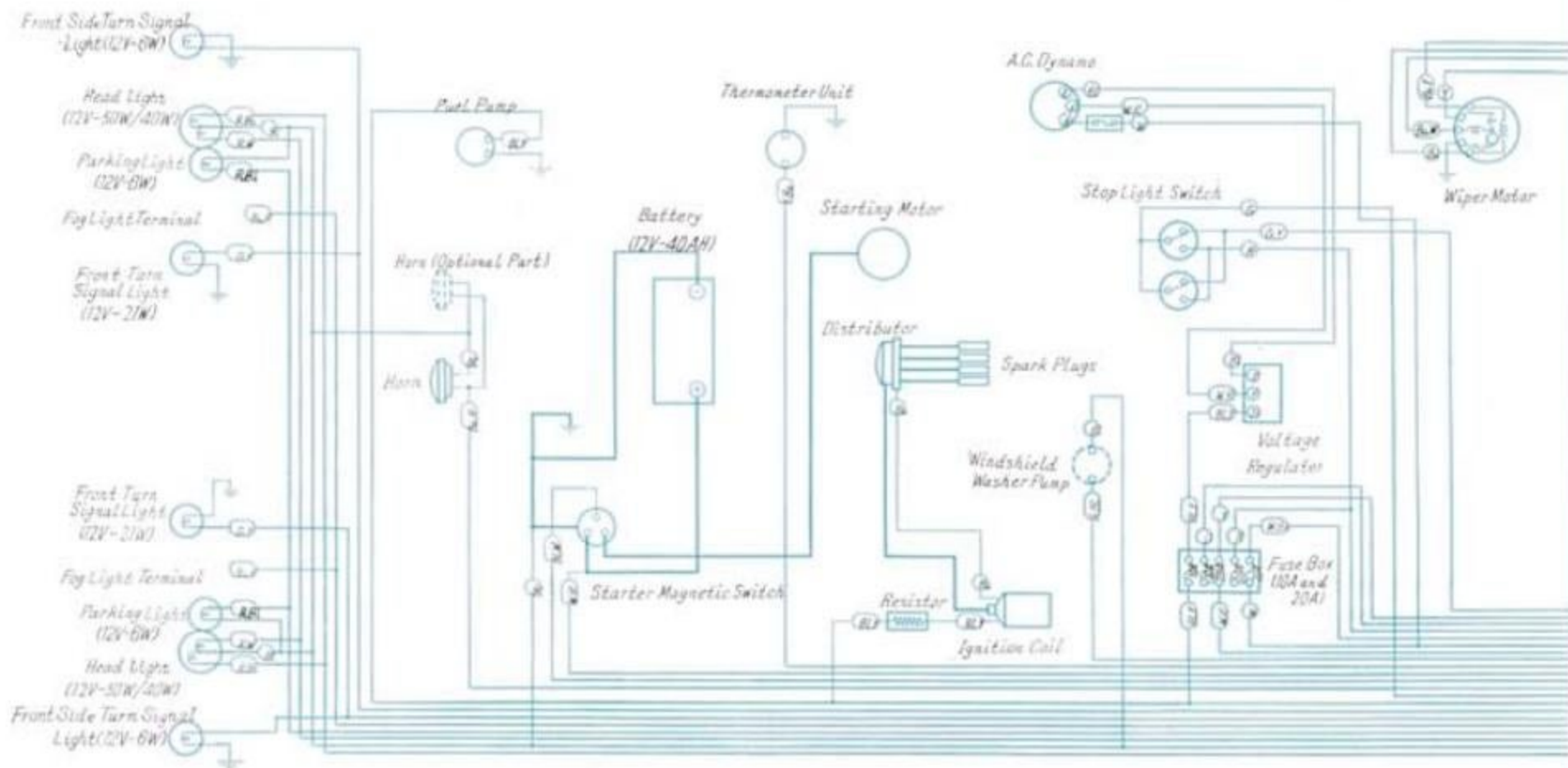
Br.R.....Brown & Red Line
 Bu.....Blue
 Bu.W.....Blue & White Line
 Bu.R.....Blue & Red Line
 Bu.Y.....Blue & Yellow Line
 Y.....Yellow

Y.Bl.....Yellow & Black Line
 Y.W.....Yellow & White Line
 Y.R.....Yellow & Red Line
 Y.G.....Yellow & Green Line
 Y.Bu.....Yellow & Blue Line
 G.....Green



19-42 ELECTRICAL SYSTEM

CONVERTIBLE WIRING DIAGRAM (model for U. K.)



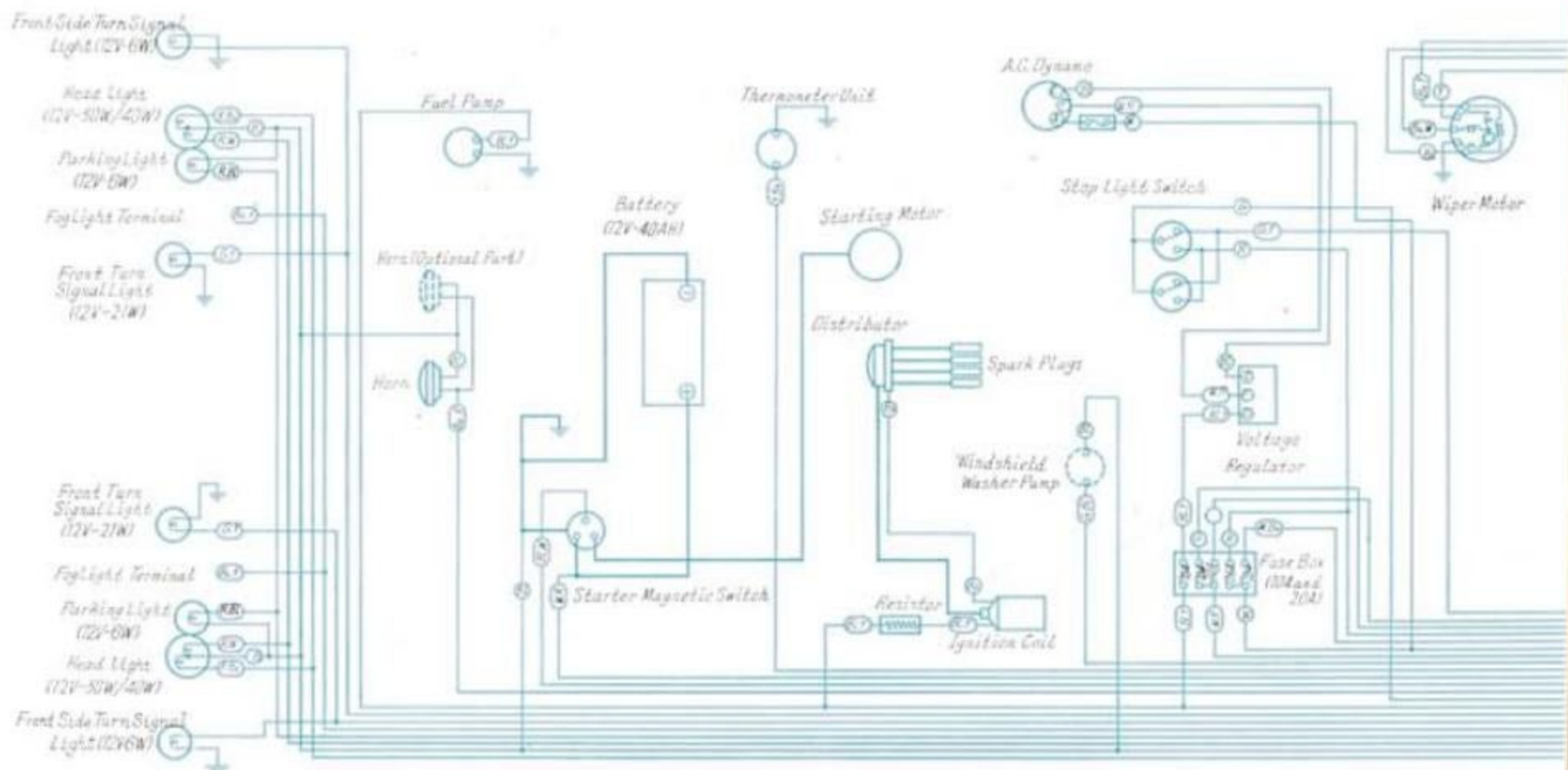
Bl.....Black
 Bl.W.....Black & White Line
 Bl.Y.....Black & Yellow Line
 W.....White
 W.R.....White & Red Line
 W.Bu.....White & Blue Line

Br.R.....Brown & Red Line
 Bu.....Blue
 Bu.W.....Blue & White Line
 Bu.R.....Blue & Red Line
 Bu.Y.....Blue & Yellow Line
 Y.....Yellow

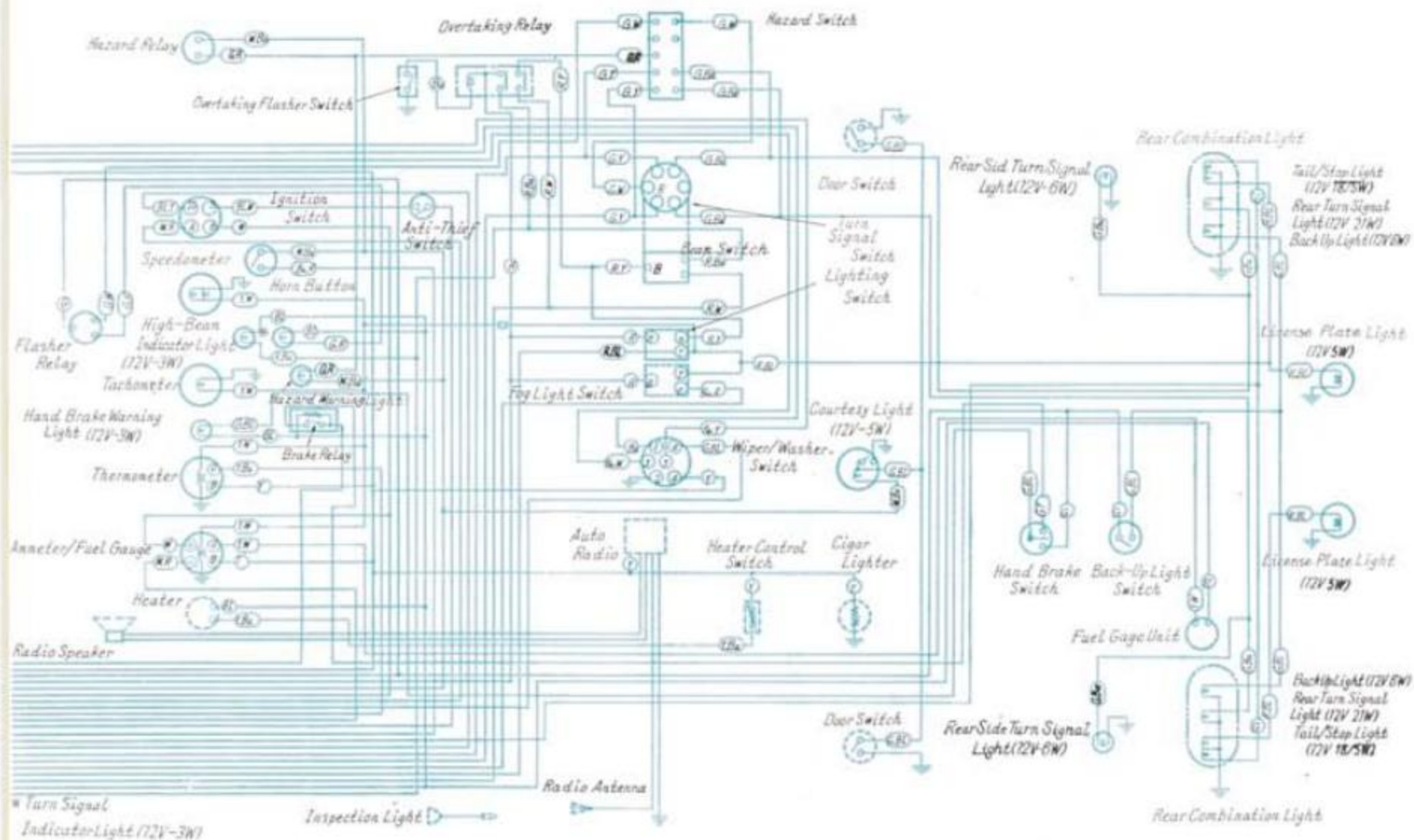
Y.Bl.....Yellow & Black Line
 Y.W.....Yellow & White Line
 Y.R.....Yellow & Red Line
 Y.G.....Yellow & Green Line
 Y.Bu.....Yellow & Blue Line
 G.....Green

G.Bl.....
 G.R.....
 G.Y.....
 G.Bu.....
 R.....
 R.Bl.....

COUPE WIRING DIAGRAM (model for U. K.)



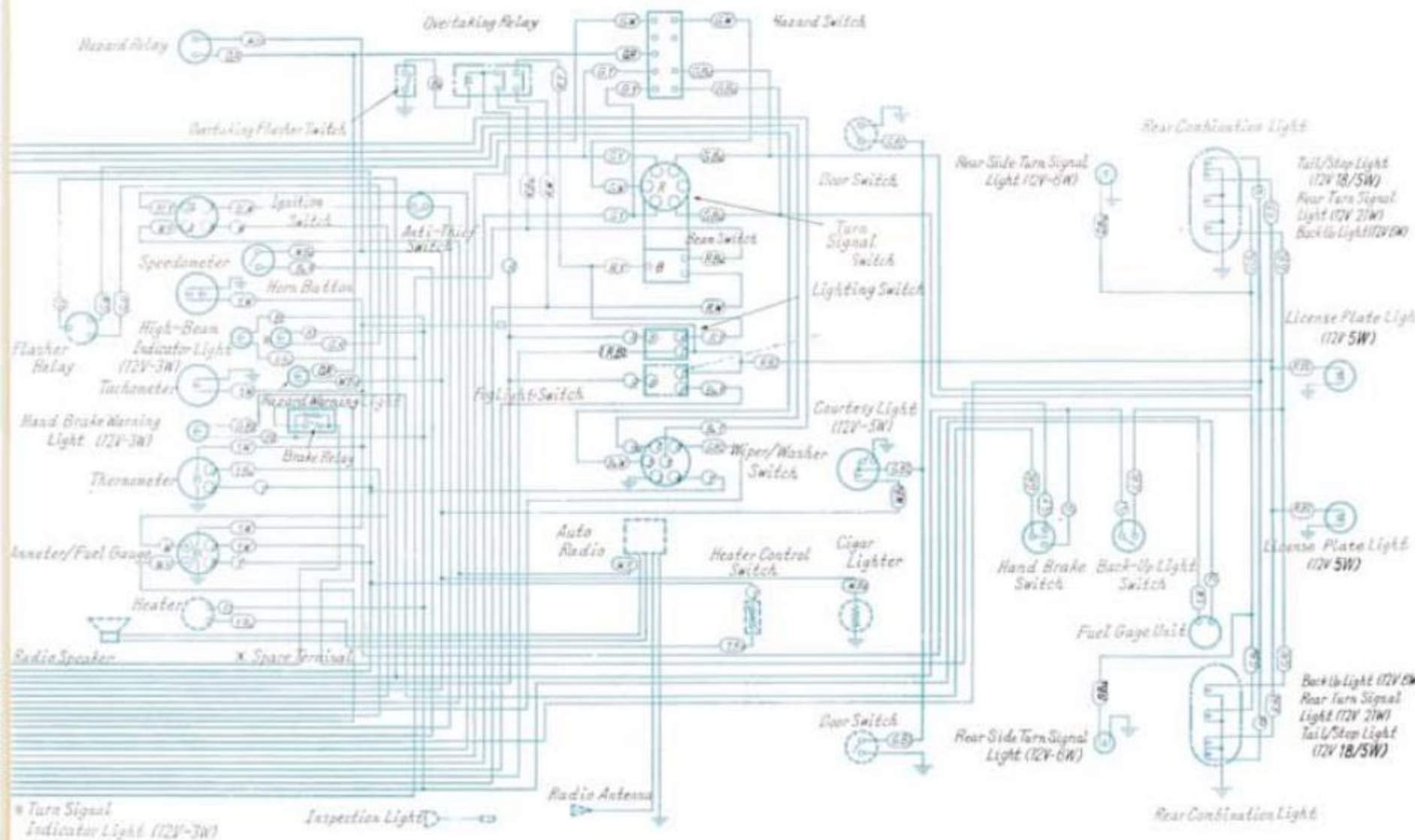
Flasher Relay
 Hand Brake Light
 Ammeter/Fuel
 Radio Speaker
 Turn Signal Indicator



- Black Line
 - White Line
 - Red Line
 - Green Line
 - Blue Line
- | | |
|------------|---------------------|
| G.B.I..... | Green & Black Line |
| G.R..... | Green & Red Line |
| G.Y..... | Green & Yellow Line |
| G.Bu..... | Green & Blue Line |
| R..... | Red |
| R.B.I..... | Red & Black Line |

- | | |
|-------------|--------------------------|
| R.Bu..... | Red & Blue Line |
| R.W..... | Red & White Line |
| R.G..... | Red & Green Line |
| R.Y..... | Red & Yellow Line |
| Lg..... | Light Green |
| Lg.B.I..... | Light Green & Black Line |

- | | |
|-----------|--------------------------|
| Lg.W..... | Light Green & White Line |
| Lg.R..... | Light Green & Red Line |



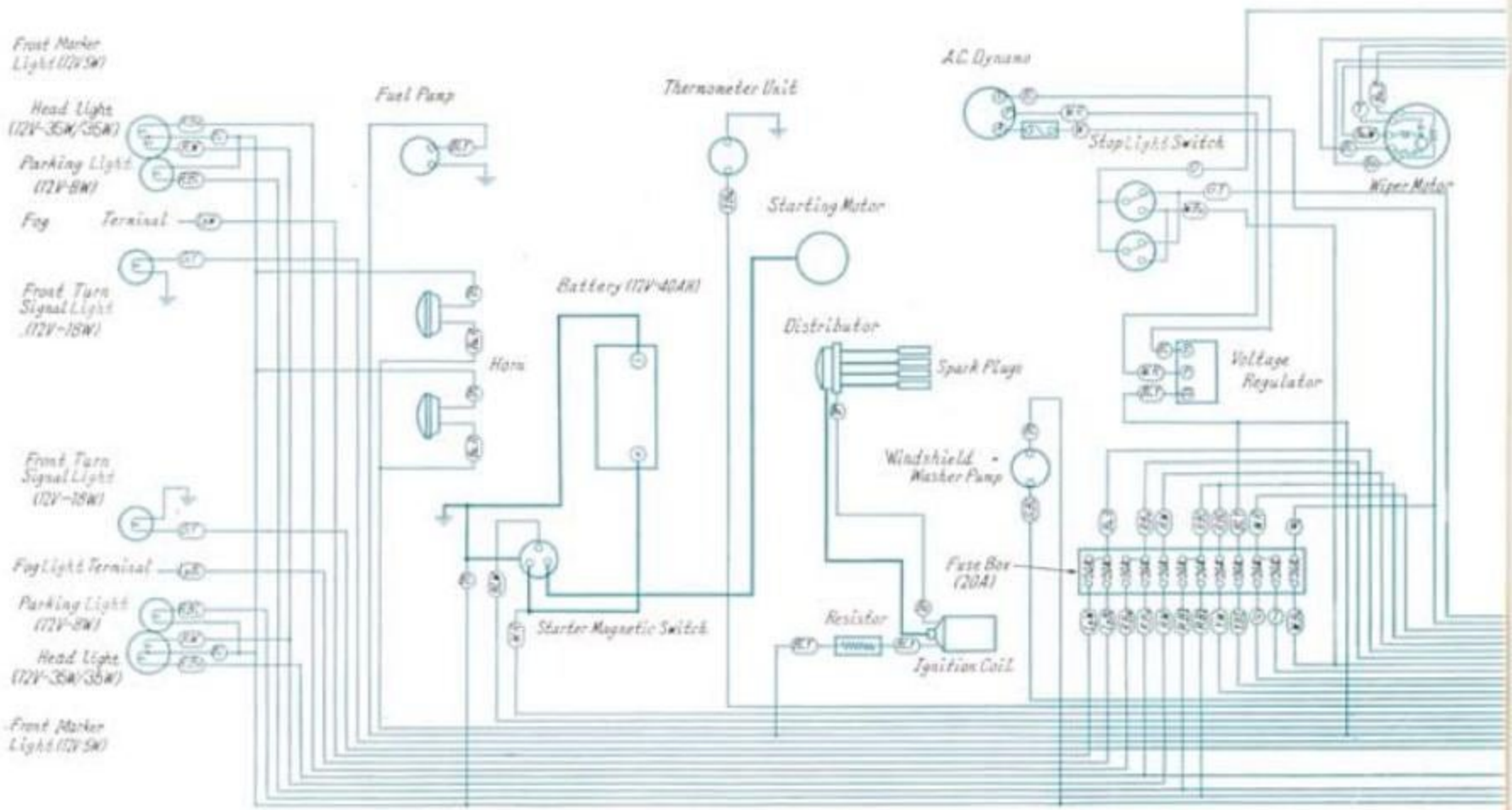
- Black Line
 - White Line
 - Red Line
 - Green Line
 - Blue Line
- | | |
|------------|---------------------|
| G.B.I..... | Green & Black Line |
| G.R..... | Green & Red Line |
| G.Y..... | Green & Yellow Line |
| G.Bu..... | Green & Blue Line |
| R..... | Red |
| R.B.I..... | Red & Black Line |

- | | |
|-------------|--------------------------|
| R.Bu..... | Red & Blue Line |
| R.W..... | Red & White Line |
| R.G..... | Red & Green Line |
| R.Y..... | Red & Yellow Line |
| Lg..... | Light Green |
| Lg.B.I..... | Light Green & Black Line |

- | | |
|-----------|--------------------------|
| Lg.W..... | Light Green & White Line |
| Lg.R..... | Light Green & Red Line |

19-44 ELECTRICAL SYSTEM

CONVERTIBLE WIRING DIAGRAM (model for Germany)

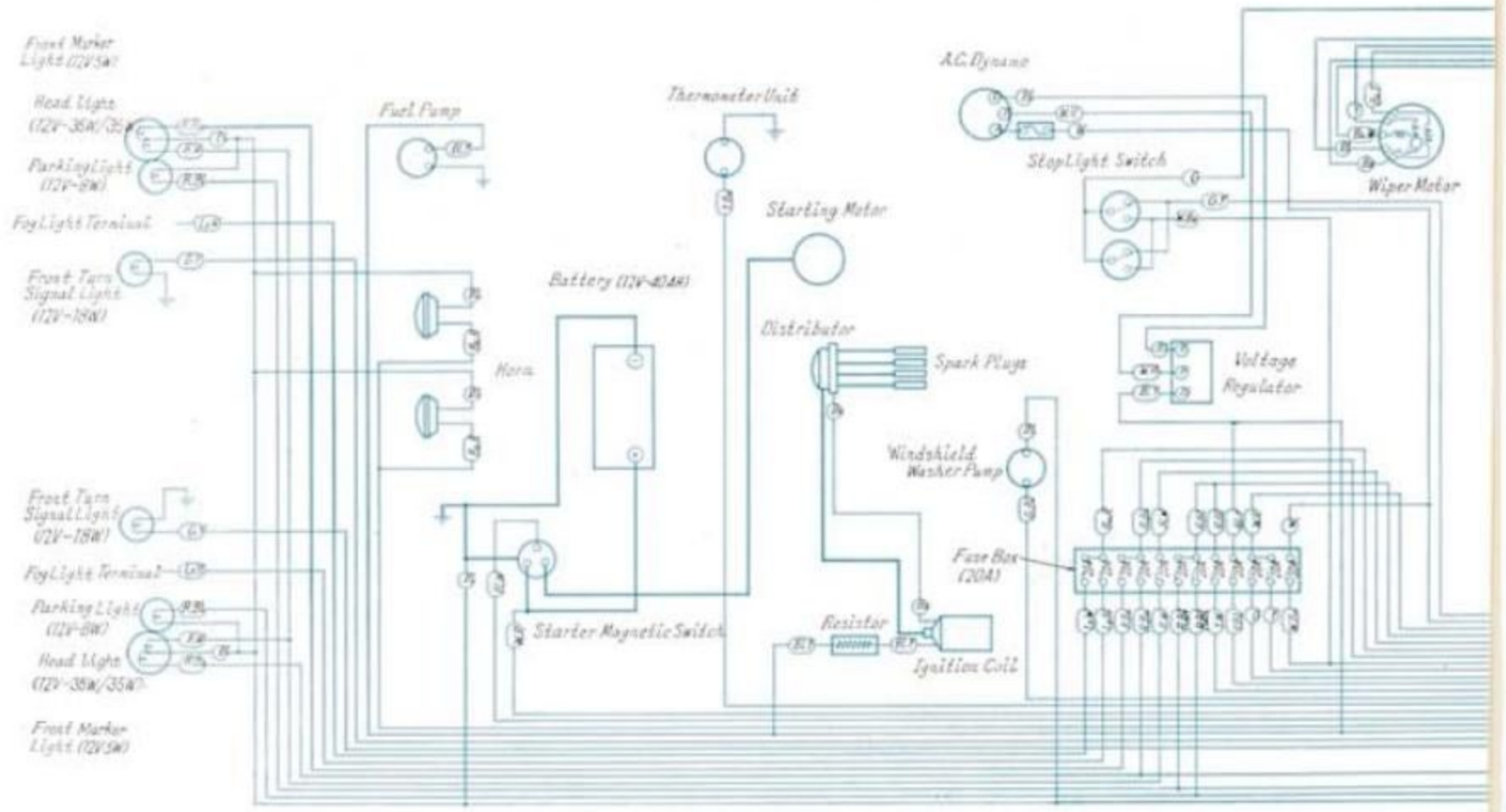


- Bl.....Black
- Bl.W.....Black & White Line
- Bl.Y.....Black & Yellow Line
- W.....White
- W.R.....White & Red Line
- W.Bu.....White & Blue Line

- Br.R.....Brown & Red Line
- Bu.....Blue
- Bu.W.....Blue & White Line
- Bu.R.....Blue & Red Line
- Bu.Y.....Blue & Yellow Line
- Y.....Yellow

- Y.Bl.....Yellow & Black Line
- Y.W.....Yellow & White Line
- Y.R.....Yellow & Red Line
- Y.G.....Yellow & Green Line
- Y.Bu.....Yellow & Blue Line
- G.....Green

COUPE WIRING DIAGRAM (model for Germany)

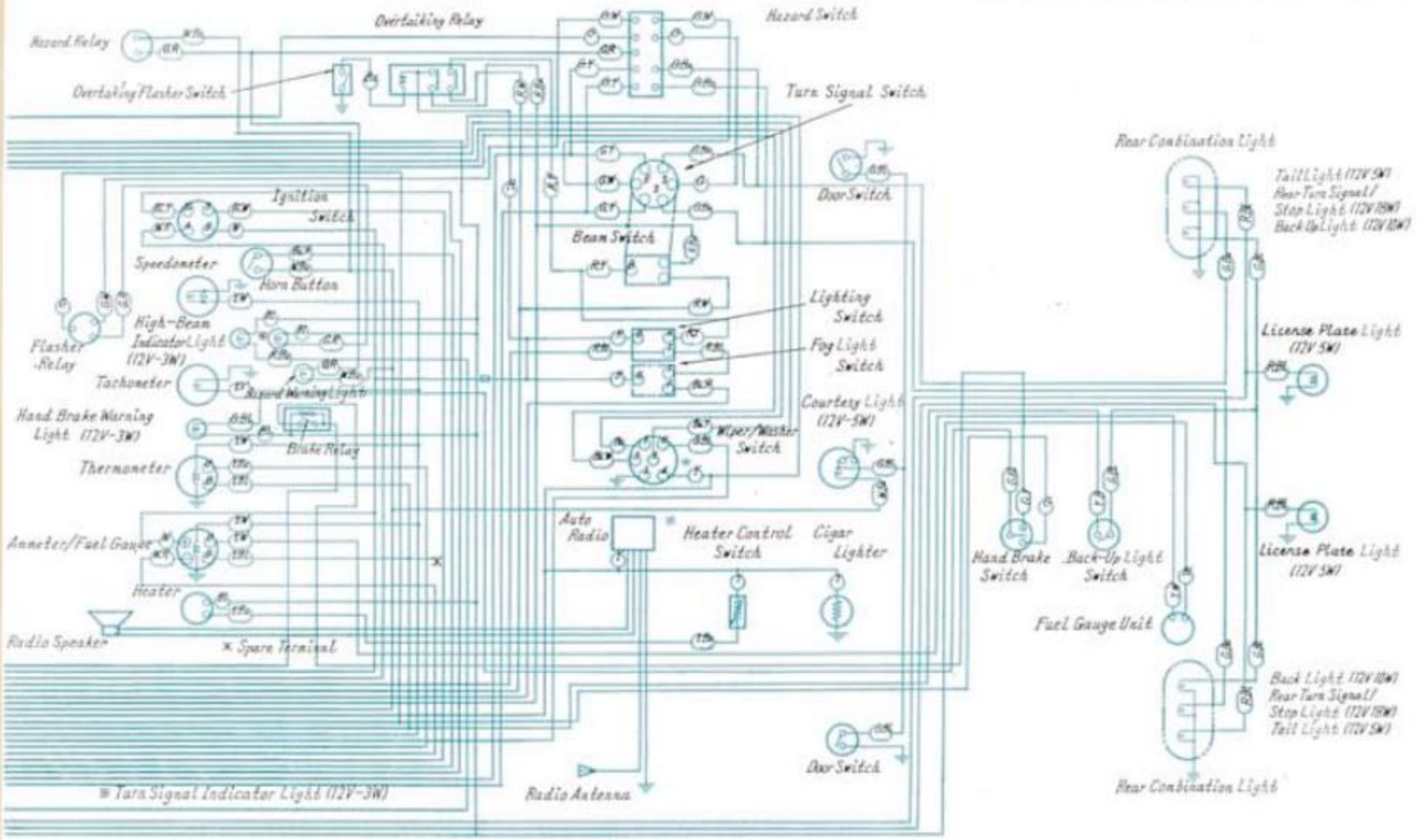


- Bl.....Black
- Bl.W.....Black & White Line
- Bl.Y.....Black & Yellow Line
- W.....White
- W.R.....White & Red Line
- W.Bu.....White & Blue Line

- Br.R.....Brown & Red Line
- Bu.....Blue
- Bu.W.....Blue & White Line
- Bu.R.....Blue & Red Line
- Bu.Y.....Blue & Yellow Line
- Y.....Yellow

- Y.Bl.....Yellow & Black Line
- Y.W.....Yellow & White Line
- Y.R.....Yellow & Red Line
- Y.G.....Yellow & Green Line
- Y.Bu.....Yellow & Blue Line
- G.....Green

ELECTRICAL SYSTEM 19-45

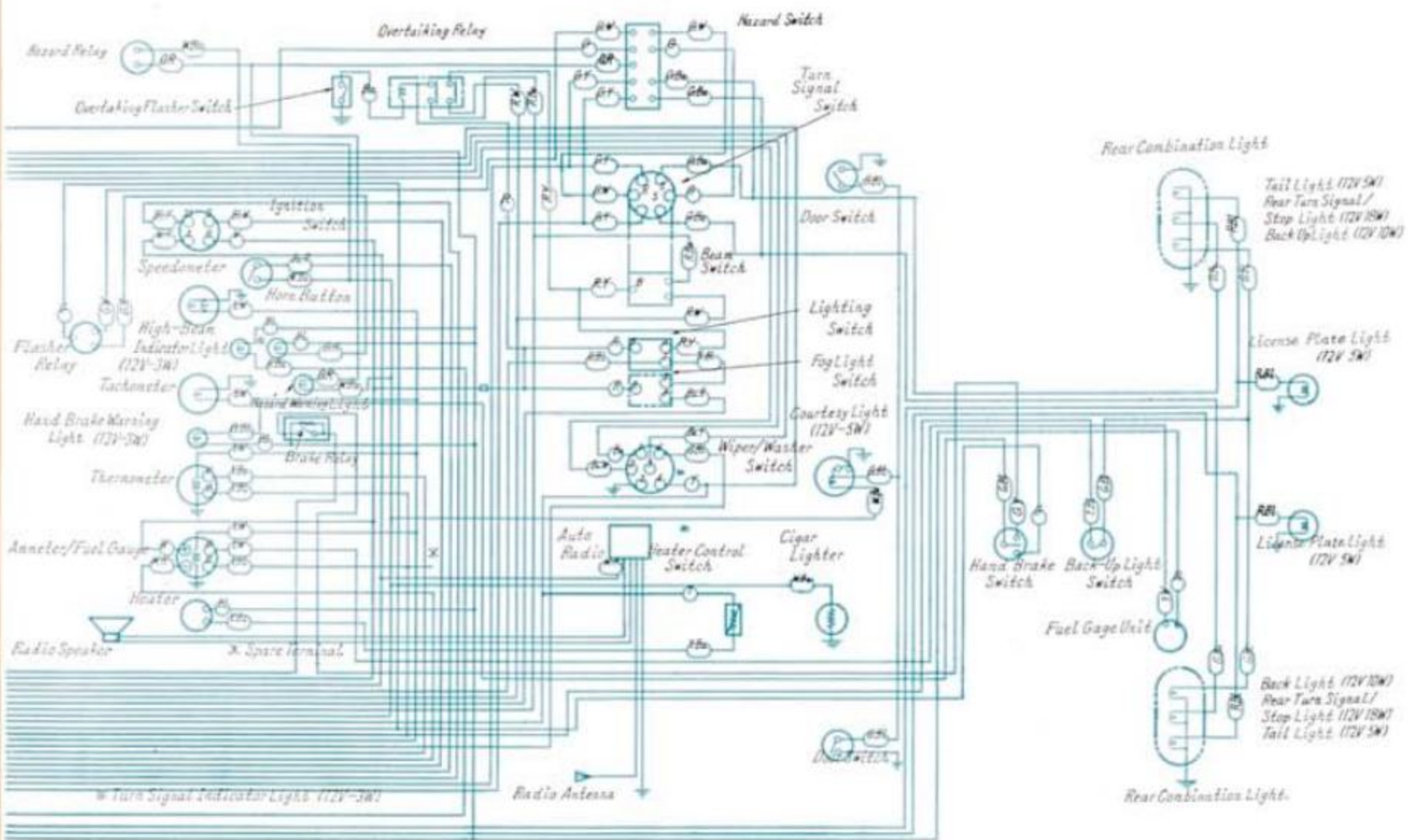


Black Line
White Line
Red Line
Green Line
Blue Line

G.BI.....Green & Black Line
G.R.....Green & Red Line
G.Y.....Green & Yellow Line
G.Bu.....Green & Blue Line
R.....Red
R.BI.....Red & Black Line

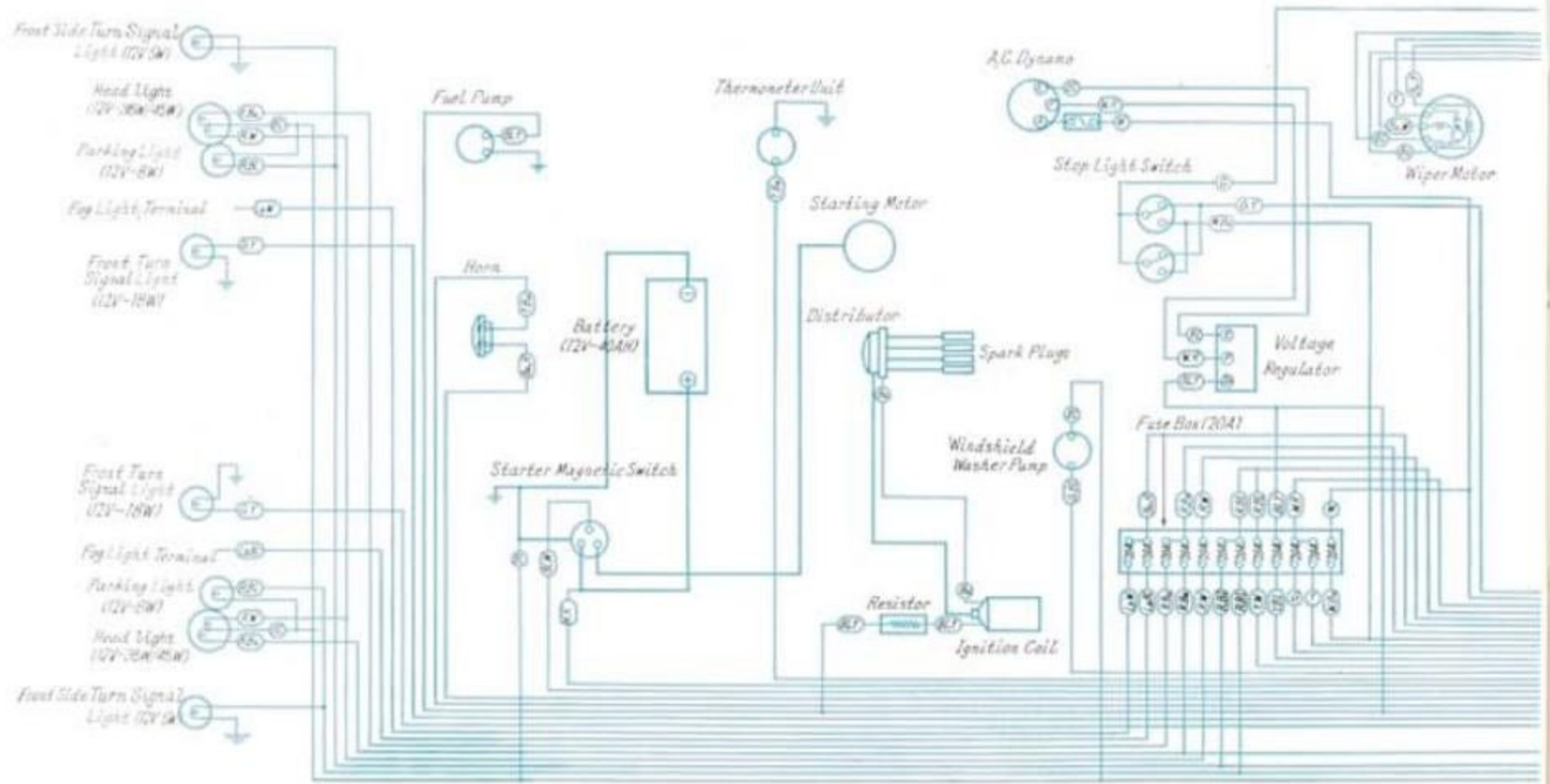
R.Bu.....Red & Blue Line
R.W.....Red & White Line
R.G.....Red & Green Line
R.Y.....Red & Yellow Line
Lg.....Light Green
Lg.BI.....Light Green & Black Line

Lg.W.....Light Green & White Line
Lg.R.....Light Green & Red Line



19-46 ELECTRICAL SYSTEM

CONVERTIBLE WIRING DIAGRAM (model for France)

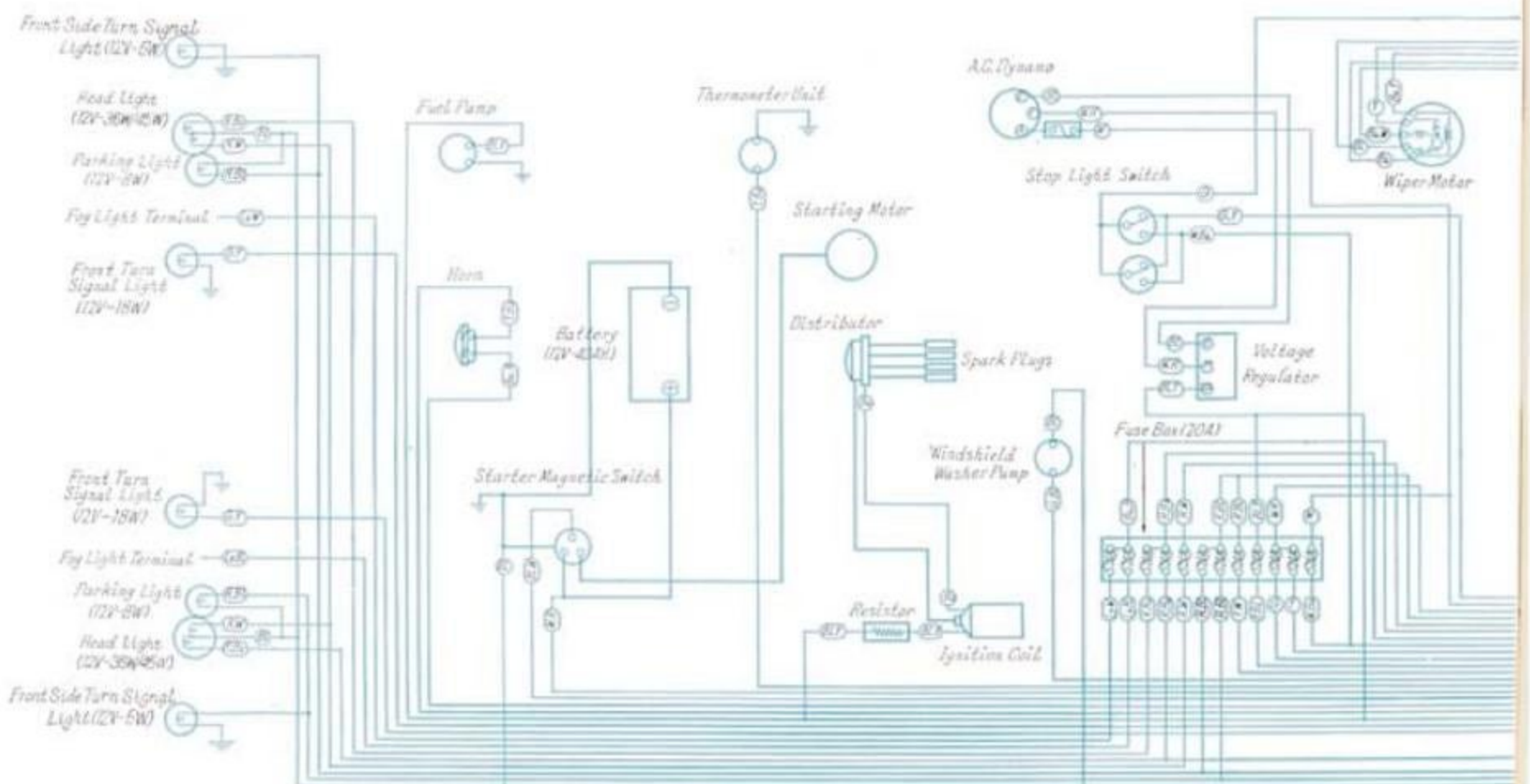


BI.....Black
 BI.W.....Black & White Line
 BLY.....Black & Yellow Line
 W.....White
 W.R.....White & Red Line
 W.Bu.....White & Blue Line

Br.R.....Brown & Red Line
 Bu.....Blue
 Bu.W.....Blue & White Line
 Bu.R.....Blue & Red Line
 Bu.Y.....Blue & Yellow Line
 Y.....Yellow

Y.BI.....Yellow & Black Line
 Y.W.....Yellow & White Line
 Y.R.....Yellow & Red Line
 Y.G.....Yellow & Green Line
 Y.Bu.....Yellow & Blue Line
 G.....Green

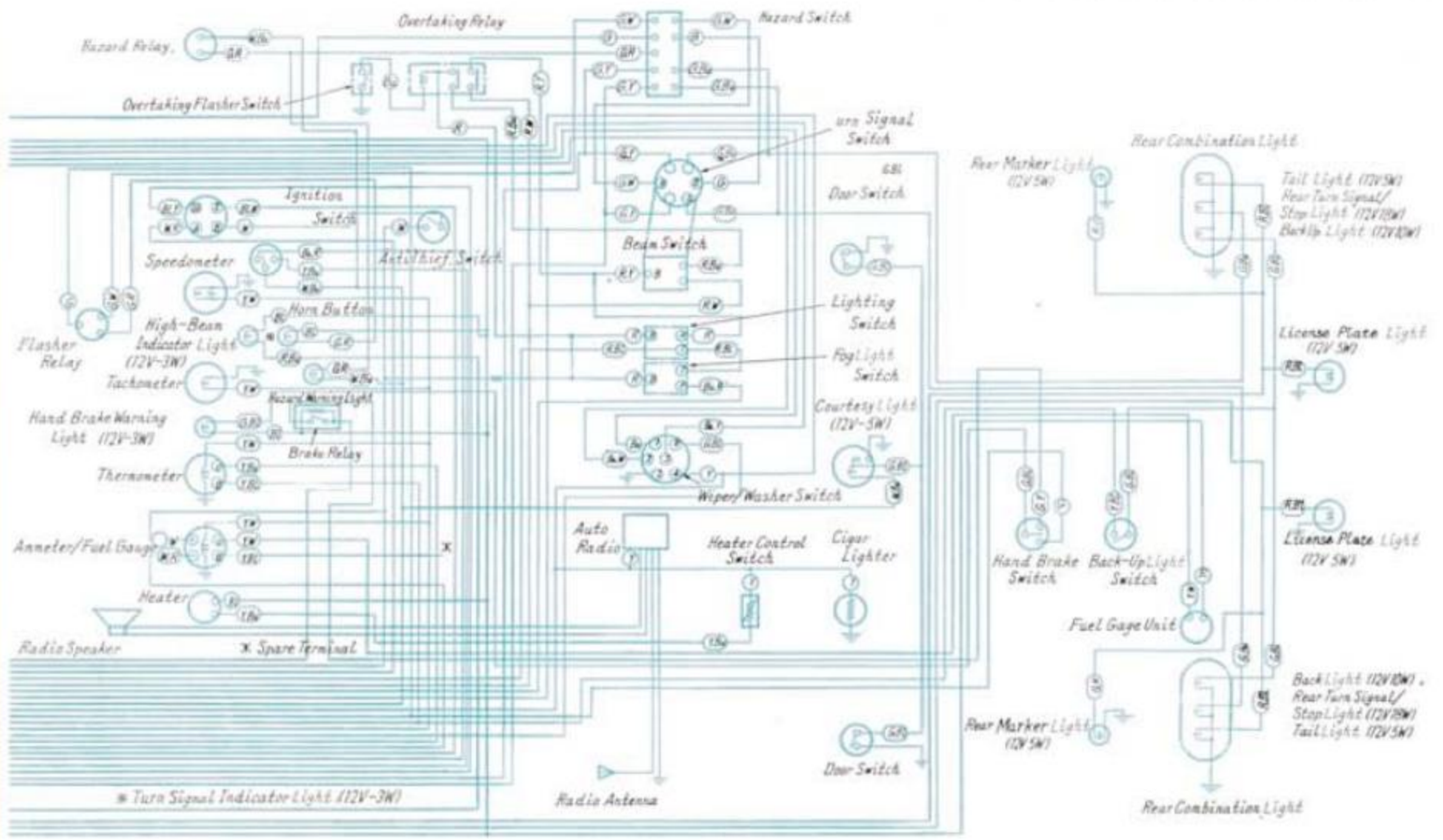
COUPE WIRING DIAGRAM (model for France)



BI.....Black
 BI.W.....Black & White Line
 BLY.....Black & Yellow Line
 W.....White
 W.R.....White & Red Line
 W.Bu.....White & Blue Line

Br.R.....Brown & Red Line
 Bu.....Blue
 Bu.W.....Blue & White Line
 Bu.R.....Blue & Red Line
 Bu.Y.....Blue & Yellow Line
 Y.....Yellow

Y.BI.....Yellow & Black Line
 Y.W.....Yellow & White Line
 Y.R.....Yellow & Red Line
 Y.G.....Yellow & Green Line
 Y.Bu.....Yellow & Blue Line
 G.....Green

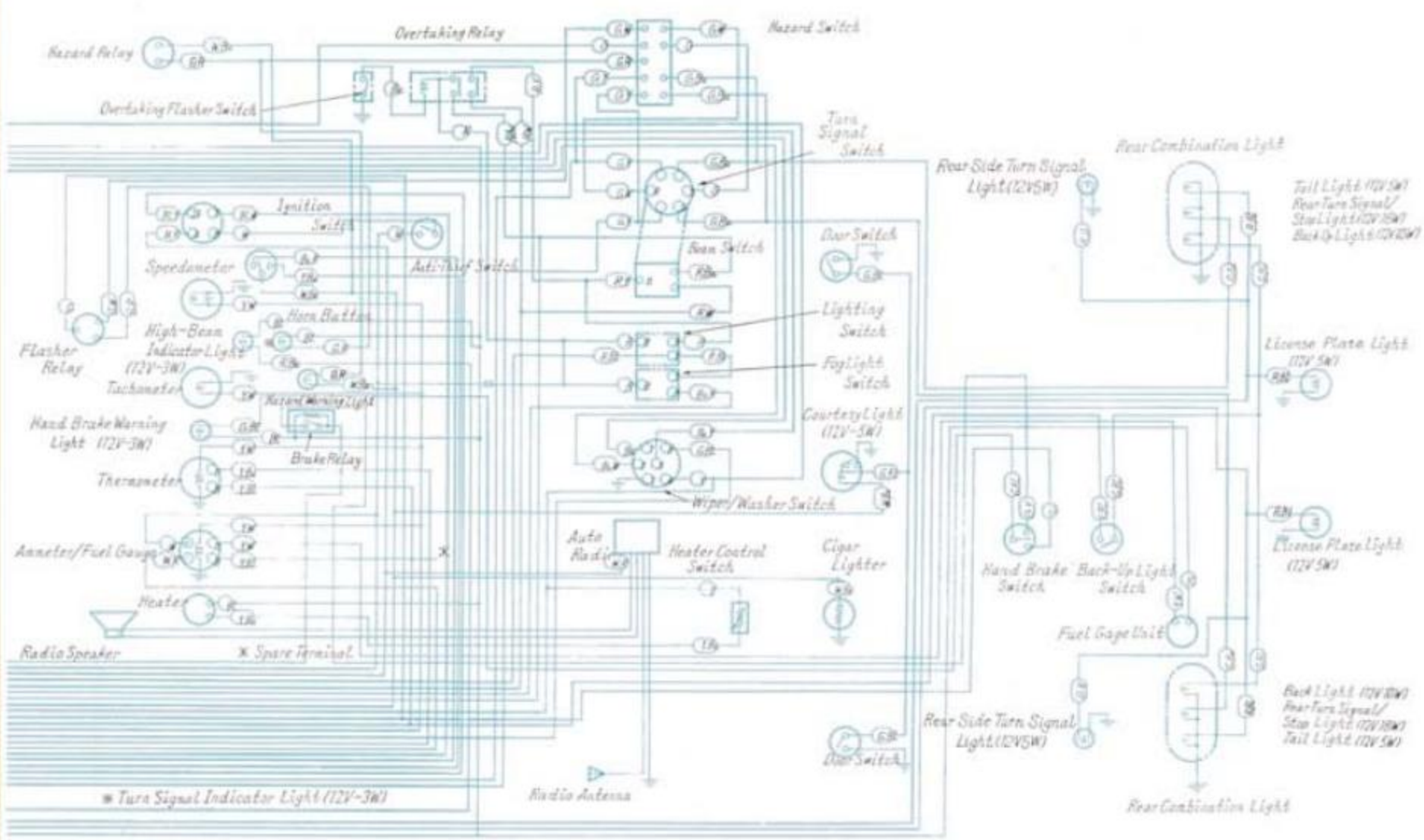


Black Line
White Line
Red Line
Green Line
Blue Line

G.BI.....Green & Black Line
G.R.....Green & Red Line
G.Y.....Green & Yellow Line
G.Bu.....Green & Blue Line
R.....Red
R.BI.....Red & Black Line

R.Bu.....Red & Blue Line
R.W.....Red & White Line
R.G.....Red & Green Line
R.Y.....Red & Yellow Line
Lg.....Light Green
Lg.BI.....Light Green & Black Line

Lg.W.....Light Green & White Line
Lg.R.....Light Green & Red Line



Black Line
White Line
Red Line
Green Line
Blue Line

G.BI.....Green & Black Line
G.R.....Green & Red Line
G.Y.....Green & Yellow Line
G.Bu.....Green & Blue Line
R.....Red
R.BI.....Red & Black Line

R.Bu.....Red & Blue Line
R.W.....Red & White Line
R.G.....Red & Green Line
R.Y.....Red & Yellow Line
Lg.....Light Green
Lg.BI.....Light Green & Black Line

Lg.W.....Light Green & White Line
Lg.R.....Light Green & Red Line

19-48 ELECTRICAL SYSTEM

M E M O

20. TROUBLE SHOOTING

ENGINE

Phenomenon	Possible Causes	
a) Engine does not start	<input type="radio"/> Discharged battery <input type="radio"/> Defective startor motor <input type="radio"/> Loose cable connection at battery or starter motor <input type="radio"/> Defective magnetic switch <input type="radio"/> Defective overrunning clutch <input type="radio"/> Defective ignition switch	
b) Starter operates but the engine does not start	<input type="radio"/> Absence of fuel flow	<input type="radio"/> No fuel <input type="radio"/> Clogged fuel line <input type="radio"/> Defective fuel pump <input type="radio"/> Clogged fuel passage in carburetor <input type="radio"/> Air leakage in fuel pipe system
	<input type="radio"/> Spark pulgs wet from excessive fuel intake <input type="radio"/> Fuel contaminated with water or impurities <input type="radio"/> Air leakage in carburetor manifold	
	<input type="radio"/> Defective electrical system	<input type="radio"/> Damaged ignition coil <input type="radio"/> Broken or loose wires in ignition system <input type="radio"/> Cracked distributor cap <input type="radio"/> Defective distributor contact point <input type="radio"/> Defective condenser <input type="radio"/> Defective spark plug <input type="radio"/> Improper ignition timing
	<input type="radio"/> Improper valve timing <input type="radio"/> Compression leak	
c) Engine starts, but soon stalls	<input type="radio"/> Erratic fuel flow because of dirt, etc. <input type="radio"/> Engine idling speed too low <input type="radio"/> Improper choke control <input type="radio"/> Improper carburetor float setting <input type="radio"/> Icing of carburetor <input type="radio"/> Defective fuel pump <input type="radio"/> Electrical leak in high tension cord	
d) Idling is irregular	<input type="radio"/> One of the cylinders is not firing	<input type="radio"/> Defective spark plug <input type="radio"/> Defective high tension cord <input type="radio"/> Defective distributor rotor or cap <input type="radio"/> Leakage of gasket of intake manifold <input type="radio"/> Leakage of mixture during compression
	<input type="radio"/> Improper adjustment of distributor contact point <input type="radio"/> Defective coil, condenser, low tension cord, or high tension cord <input type="radio"/> Improper ignition timing <input type="radio"/> Improper setting of carburetor float <input type="radio"/> Clogged fuel line	

20-2 TROUBLE SHOOTING

ENGINE

Phenomenon	Possible Causes
	<ul style="list-style-type: none"> <input type="radio"/> Improper adjustment of carburetor idling <input type="radio"/> Incorrect idle air-fuel mixture <input type="radio"/> Clogged exhaust line <input type="radio"/> Air leakage between carburetor and intake manifold <input type="radio"/> Abrasion of timing chain <input type="radio"/> Engine overheated
<p>e) Compression is low</p>	<ul style="list-style-type: none"> <input type="radio"/> Sticking valve <input type="radio"/> Poor valve seating <input type="radio"/> Broken or weak valve spring <input type="radio"/> Incorrect valve timing <input type="radio"/> Improperly installed spark plug <input type="radio"/> Defective cylinder gasket <input type="radio"/> Cracked cylinder <input type="radio"/> Worn cylinder and piston <input type="radio"/> Defective piston rings
<p>f) Acceleration is poor</p>	<ul style="list-style-type: none"> <input type="radio"/> Improper ignition timing <input type="radio"/> Defective spark plug <input type="radio"/> Improper adjustment of distributor contact point <input type="radio"/> Defective coil or condenser <input type="radio"/> Weak contact point spring <input type="radio"/> Abrasion of distributor cam <input type="radio"/> Defective accelerator pump for carburetor <input type="radio"/> Improper adjustment of carburetor float level <input type="radio"/> Improper fuel quality <input type="radio"/> Improper fuel-air mixture <input type="radio"/> Malfunction of vacuum piston <input type="radio"/> Improper adjustment of throttle control <input type="radio"/> Improper operation of centrifugal advance <input type="radio"/> Weak valve spring <input type="radio"/> Abrasion or seizure of valve <input type="radio"/> Improper valve timing <input type="radio"/> Inadequate tappet clearance <input type="radio"/> Leakage of mixture during compression <input type="radio"/> Engine overheated
<p>g) Speed increase is poor</p>	<ul style="list-style-type: none"> <input type="radio"/> Clogged air cleaner <input type="radio"/> Clogged fuel line <input type="radio"/> Clogged carburetor (jet, etc.) <input type="radio"/> Improper adjustment of carburetor float level <input type="radio"/> Defective fuel pump <input type="radio"/> Improper ignition timing <input type="radio"/> Improper follow of distributor advance angle to the engine revolution <input type="radio"/> Defective coil, condenser or rotor <input type="radio"/> Too narrow a spark plug gap

ENGINE

Phenomenon	Possible Causes	
	<ul style="list-style-type: none"> <input type="radio"/> Excessive play of distributor cam <input type="radio"/> Improper selection of spark plug heat range <input type="radio"/> Improper gap of contact point <input type="radio"/> Leakage of mixture during compression caused by abrasion of valve or piston ring <input type="radio"/> Improper valve timing <input type="radio"/> Weak valve spring <input type="radio"/> Overheating 	
h) Fuel consumption is excessive	<ul style="list-style-type: none"> <input type="radio"/> Improper pressure of fuel pump <input type="radio"/> Improper engine idling speed <input type="radio"/> Improper adjustment of carburetor, needles and jets <input type="radio"/> Improper stroke adjustment of accelerator pump <input type="radio"/> Improper adjustment of carburetor float level <input type="radio"/> Clogged air cleaner <input type="radio"/> Improper ignition timing <input type="radio"/> Fouled spark plug <input type="radio"/> Improper ignition timing <input type="radio"/> Improper operation of advance angle mechanism 	
i) Engine overheats	<ul style="list-style-type: none"> <input type="radio"/> Coolant level too low <input type="radio"/> Fan belt too loose or slipping <input type="radio"/> Water pump defective <input type="radio"/> Rust and scale formation in the cooling system <input type="radio"/> Malfunctioning of thermostat <input type="radio"/> Ignition timing too late <input type="radio"/> Too rich a fuel mixture (may cause loss of power and emit black smoke) <input type="radio"/> Too lean a fuel mixture (may cause loss of power and backfire) <input type="radio"/> Excessive carbon deposit in cylinder <input type="radio"/> Insufficient lubricating oil or poor grade of oil used <input type="radio"/> Extended use of low speed gear <input type="radio"/> Dragging brakes 	
j) Backfire occurs	<ul style="list-style-type: none"> <input type="radio"/> Malfunctioning of carburetor <input type="radio"/> Insufficient fuel feed <input type="radio"/> Air leakage into manifold <input type="radio"/> Incorrectly adjusted ignition timing <input type="radio"/> Too wide a spark plug gap <input type="radio"/> Improper seating of inlet valve <input type="radio"/> Incorrect valve timing <input type="radio"/> Engine cold (during initial starting) 	

20-4 TROUBLE SHOOTING

ENGINE

Phenomenon	Possible Causes			
k) Smoky exhaust	<input type="radio"/> Heavy smoke gray or white in color	<ul style="list-style-type: none"> ◦ Oil overfilled ◦ Oil pressure too high ◦ Poor grade oil used ◦ Excessively worn oil rings ◦ Excessively worn valve guide 		
	<input type="radio"/> Exhaust smoke dark or black in color	<ul style="list-style-type: none"> ◦ Too rich a mixture ◦ Erratic combustion 		
	<input type="radio"/> Exhaust smoke light brown or light yellow in color	<ul style="list-style-type: none"> ◦ Lean fuel mixture or poor grade of fuel 		
Phenomenon	Possible Cause			
l) Engine noise diagnosis	<input type="radio"/> Knocking noise	<input type="radio"/> Dull, heavy	<ul style="list-style-type: none"> ◦ Crankshaft out of balance 	
		<input type="radio"/> Pounding noise	<ul style="list-style-type: none"> ◦ Piston knocks 	
		<input type="radio"/> Light tapping or clattering noise	<ul style="list-style-type: none"> ◦ Connecting rod small end noise (the noise is most noticeable when the throttle is closed suddenly or by shorting out each of the spark plugs) 	
		<input type="radio"/> Pinging noise	<ul style="list-style-type: none"> ◦ Piston noise (the noise is most audible when accelerated rapidly) 	
		<input type="radio"/> Clattering sound	<ul style="list-style-type: none"> ◦ Camshaft thrust washer noise 	
		<input type="radio"/> Rattling sound	<ul style="list-style-type: none"> ◦ Improper cam chain tension 	
		<input type="radio"/> Slapping noise	<ul style="list-style-type: none"> ◦ Loose cam sprocket (noise occurs around distributor) ◦ Piston slapping noise (noise occurs in cylinder head) ◦ Tachometer gear noise (noise occurs in head cover) 	
	<input type="radio"/> Grinding noise	<input type="radio"/> Hissing noise	<ul style="list-style-type: none"> ◦ Clearance between crankshaft journal and holder too narrow 	
		<input type="radio"/> Grinding noise	<ul style="list-style-type: none"> ◦ Deformed crankshaft holder 	
		<input type="radio"/> Rubbing noise	<ul style="list-style-type: none"> ◦ Starter pulley and front cover rubbing 	
		<input type="radio"/> Rolling noise	<ul style="list-style-type: none"> ◦ Crankshaft center bearing clearance too large 	
	<input type="radio"/> Air leaking noise	<input type="radio"/> Air escaping noise	<ul style="list-style-type: none"> ◦ Loose spark plug ◦ Air leaking into intake manifold 	
		<input type="radio"/> Popping noise	<ul style="list-style-type: none"> ◦ Loose air cleaner ◦ Leak at exhaust port joint 	
	<input type="radio"/> Backfire noise	<input type="radio"/> Explosion	<ul style="list-style-type: none"> ◦ Backfire in exhaust port 	

CLUTCH

Phenomenon	Possible Causes	
a) Clutch drags or does not completely disengage	<input type="radio"/> Excessive clutch pedal play <input type="radio"/> Adjustment incorrect at slave cylinder push rod <input type="radio"/> Warped clutch disc or excessive runout <input type="radio"/> Clutch facing too thick or partially raised <input type="radio"/> Loose rivet in clutch facing <input type="radio"/> Binding of clutch disc hub on splined clutch shaft <input type="radio"/> Warped clutch pressure plate <input type="radio"/> Bent clutch shaft (main drive gear shaft) <input type="radio"/> Unevenly worn flywheel	
b) Clutch slips	<input type="radio"/> Resting of foot on clutch pedal while running <input type="radio"/> No clutch pedal play <input type="radio"/> Weak clutch diaphragm spring <input type="radio"/> Uneven clutch diaphragm spring tension <input type="radio"/> Worn or hardened clutch facing <input type="radio"/> Grease or oil on clutch facing <input type="radio"/> Malfunctioning of clutch pressure plate <input type="radio"/> Air leakage in slave cylinder	
c) Clutch engagement is improper (Clutch engages suddenly)	<input type="radio"/> Weak clutch disc damper spring <input type="radio"/> Too stiff a clutch diaphragm spring <input type="radio"/> Exposed clutch facing rivet head	
d) Noise develops from clutch	<input type="radio"/> Chattering of clutch when engaging	<input type="radio"/> Wet clutch facing <input type="radio"/> Broken or cracked clutch pressure plate
	<input type="radio"/> Rattling of engine when idling	<input type="radio"/> Slipped off release lever or bearing return spring
	<input type="radio"/> Emission of noise when depressing clutch pedal	<input type="radio"/> Worn release bearing or insufficient lubrication
	<input type="radio"/> Development of noise when releasing clutch pedal	<input type="radio"/> Loose clutch in disc spline (main drive gear shaft spline) <input type="radio"/> Weak or broken clutch disc spring <input type="radio"/> No clutch pedal play <input type="radio"/> Weak or broken clutch pedal return spring <input type="radio"/> Sticking of piston in clutch slave cylinder

TRANSMISSION

Phenomenon	Possible Causes	
<p>a) Shifting is hard</p>	<ul style="list-style-type: none"> <input type="radio"/> Incomplete disengagement of clutch <input type="radio"/> Binding of fork shaft due to being bent <input type="radio"/> Binding of shift crank <input type="radio"/> Inadequate lubrication of shift linkage <input type="radio"/> Improper parallel alignment of mainshaft and counter shaft <input type="radio"/> Too heavy grade oil <input type="radio"/> Binding of interlock ball <input type="radio"/> Binding of needle bearing on mainshaft <input type="radio"/> Overloading of synchronizer blocking ring (under capacity) <input type="radio"/> Binding between synchronizer and synchronizer hub <input type="radio"/> Catching of burrs and upsets on the synchronizer teeth against the synchronizer <input type="radio"/> Stuck blocking ring on the gear cone surface causing the synchronizer to shift unsmoothly (feels as if shifting in two stages) <input type="radio"/> Unsmooth movement between blocking ring teeth and synchronizer, causing the synchronizer to shift erratically <input type="radio"/> Binding between synchronizer and hub causing rough movement 	
<p>b) Noise develops</p>	<ul style="list-style-type: none"> <input type="radio"/> Noisy in neutral or while running 	<ul style="list-style-type: none"> ◦ Insufficient lubrication ◦ Worn or broken mainshaft ball bearing ◦ Excessive backlash in constant mesh gears ◦ Bent or worn countershaft ◦ Worn bearing or bushing on mainshaft, countershaft or reverse gear shaft ◦ Improperly aligned transmission in relation to engine ◦ Replacement of only one gear in a set of constant meshed gears
<p>c) Noise develops when shifting gear</p>	<ul style="list-style-type: none"> <input type="radio"/> Incomplete disengagement of clutch <input type="radio"/> Damaged blocking ring <input type="radio"/> Worn threads on blocking ring <input type="radio"/> Worn teeth on blocking ring <input type="radio"/> Excessively worn gear cone surface <input type="radio"/> Excessive wear of synchronizer around blocking ring contact surface <input type="radio"/> Worn inserts <input type="radio"/> Fatigued insert springs 	
<p>d) Gear slips out of engagement</p>	<ul style="list-style-type: none"> <input type="radio"/> Slip out of gear in 2nd and top 	<ul style="list-style-type: none"> ◦ Worn or broken fork shaft lock ball ◦ Weakened or broken fork shaft lock ball spring ◦ Worn main drive shaft and mainshaft bearing ◦ Worn shift fork ◦ Worn mainshaft spline ◦ Worn blocking ring gear ◦ Worn main drive gear clutch teeth

TRANSMISSION

Phenomenon	Possible Causes	
	<input type="radio"/> Slip out of gear in low and reverse	<ul style="list-style-type: none"> ◦ Worn or broken shift lock ball ◦ Weak or broken shift lock ball spring ◦ Worn fork shaft ball notch ◦ Worn or deformed shift fork ◦ Worn gear ◦ Worn shaft bearings ◦ Worn shaft spline
e) Shift lever cannot be shifted out	<input type="radio"/> Bent shift fork <input type="radio"/> Improperly adjusted shift fork movement	
f) Oil leaks	<input type="radio"/> Excessive oil level <input type="radio"/> Too low an oil viscosity <input type="radio"/> Defective seal <input type="radio"/> Incorrectly installed gasket <input type="radio"/> Cracks or blowholes in crankcase	

FRONT AXLE AND STEERING SYSTEM

Phenomenon	Possible Causes
<p>a) Steering wheel shimmies or wanders</p>	<ul style="list-style-type: none"> <input type="radio"/> Uneven or improper caster <input type="radio"/> Improper toe-in <input type="radio"/> Excessive steering wheel play <input type="radio"/> Weakened torsion bar <input type="radio"/> Loose steering wheel linkage <input type="radio"/> Loose wheel bearing <input type="radio"/> Loose front suspension ball stud <input type="radio"/> Bent steering knuckle <input type="radio"/> Loose creep nut <input type="radio"/> Weakened shock absorber <input type="radio"/> Malfunctioning of stabilizer <input type="radio"/> Deformed or unbalanced wheel or tire <input type="radio"/> Uneven or insufficient tire pressure
<p>b) Steering is hard</p>	<ul style="list-style-type: none"> <input type="radio"/> Low tire pressure <input type="radio"/> Poor grade or insufficient oil in steering system <input type="radio"/> Too tight an adjustment steering gear and linkage <input type="radio"/> Misaligned wheels <input type="radio"/> Weakened torsion bar <input type="radio"/> Misaligned frame <input type="radio"/> Too tight a front suspension ball stud <input type="radio"/> Bent steering knuckle
<p>c) Car pulls to one side</p>	<ul style="list-style-type: none"> <input type="radio"/> Uneven tire pressure <input type="radio"/> Misaligned wheels <input type="radio"/> Uneven torsion bar spring tension <input type="radio"/> Improper tightening wheel bearing <input type="radio"/> Bent or improperly installed front axle <input type="radio"/> Misaligned frame <input type="radio"/> Malfunctioning of shock absorber <input type="radio"/> Improper parallel alignment of front axle with rear axle
<p>d) Poor recovery of the steering wheel to the center position</p>	<ul style="list-style-type: none"> <input type="radio"/> Insufficient tire pressure <input type="radio"/> Misaligned wheels <input type="radio"/> Improper adjustment of toe steering gear and linkage <input type="radio"/> Bent steering knuckle <input type="radio"/> Insufficient lubrication of the steering system

BRAKE

Phenomenon	Possible Causes
a) Poor braking	<ul style="list-style-type: none"> <input type="radio"/> Excessively worn brake linings <input type="radio"/> Water or oil on brake lining surface <input type="radio"/> Insufficient amount of brake fluid <input type="radio"/> Air bubbles in the brake fluid <input type="radio"/> Fluid leak in the fluid pressure system <input type="radio"/> Leaking of fluid from the seal of the master cylinder or caliper body <input type="radio"/> Change to the brake lining surface, uneven shoe contact <input type="radio"/> Malfunctioning of the caliper yoke <input type="radio"/> Clogged fluid pressure system
b) Uneven brake performance	<ul style="list-style-type: none"> <input type="radio"/> Maladjustment of tire pressure <input type="radio"/> Water or oil on the surface of the brake lining, the disc brake, or the drum with <input type="radio"/> Worn or damaged (warped, rusted, etc.) disc or drum <input type="radio"/> Hardened brake lining <input type="radio"/> Uneven brake lining surface contact <input type="radio"/> Carbonized or damaged brake lining <input type="radio"/> Loose caliper mounting bolts <input type="radio"/> Malfunctioning of the brake cylinder <input type="radio"/> Improper mounting of wheel bearing <input type="radio"/> Use of pad linings made of different material for the left and right wheels <input type="radio"/> Improper alignment of the front wheels <input type="radio"/> Clogged pressure system <input type="radio"/> Difference in the left and right sides of the road condition <input type="radio"/> Malfunctioning of the caliper yoke
c) Wheels are dragging	<ul style="list-style-type: none"> <input type="radio"/> Improper shoe/drum clearance of the rear brake <input type="radio"/> Improper returning action of the parking brake <input type="radio"/> Insufficient play of the brake pedal <input type="radio"/> Broken or weakened brake pedal return spring <input type="radio"/> Malfunctioning of the pedal linkage <input type="radio"/> Clogged master cylinder return port <input type="radio"/> Malfunctioning of the rear brake and shoe or weakened spring <input type="radio"/> Malfunctioning of the brake cylinder <input type="radio"/> Malfunctioning of the caliper yoke <input type="radio"/> Loose wheel bearings <input type="radio"/> Clogging fluid pressure system
d) Pedal stroke changes or becomes larger	<ul style="list-style-type: none"> <input type="radio"/> Maladjustment of the rear brake <input type="radio"/> Air bubbles in the brake fluid <input type="radio"/> Fluid leakage in the fluid pressure system <input type="radio"/> Worn or defective piston, cup and/or seal <input type="radio"/> Insufficient amount of brake fluid

BRAKE

Phenomenon	Possible Causes
	<ul style="list-style-type: none"> <input type="radio"/> Worn front and rear brake linings <input type="radio"/> Unevenly worn front and rear brake lining <input type="radio"/> Malfunctioning of the pedal linkage <input type="radio"/> Excessive runout of the disc <input type="radio"/> Tilting of the rear brake shoe or malfunctioning of its returning action
<p>e) Squealing noise develops</p>	<ul style="list-style-type: none"> <input type="radio"/> Dragging of the brake shoe <input type="radio"/> Worn brake lining <input type="radio"/> Change to the surface of lining <input type="radio"/> Lodging of foreign objects on the disc or the drum <input type="radio"/> Runout or damage on the sliding surface of the disc or the drum <input type="radio"/> Unevenly worn disc surface <input type="radio"/> Dirt or dust inside of the brake
<p>f) Pedal reaches floorboard when fully depressed</p>	<ul style="list-style-type: none"> <input type="radio"/> Excessively worn brake lining <input type="radio"/> Excessive clearance between brake drum and lining <input type="radio"/> Insufficient fluid in master cylinder <input type="radio"/> Leaking hydraulic lines or cylinders <input type="radio"/> Air in brake line <input type="radio"/> Damaged master cylinder rubber cap <input type="radio"/> Worn master cylinder piston or piston cup <input type="radio"/> Defective master cylinder check valve <input type="radio"/> Defective wheel cylinder piston cup <input type="radio"/> Clogged brake line
<p>g) Brakes lock up, not released properly</p>	<ul style="list-style-type: none"> <input type="radio"/> Clogged brake line <input type="radio"/> Clogged master cylinder return port <input type="radio"/> Malfunctioning of master cylinder check valve <input type="radio"/> Poor return action of wheel cylinder
<p>h) Parking brake action is poor</p>	<ul style="list-style-type: none"> <input type="radio"/> Excessive brake lever stroke <input type="radio"/> Too heavy the function of brake cable or rod <input type="radio"/> Maladjustment of clearance between brake shoe and drum <input type="radio"/> Oil on brake shoe

PROPELLER SHAFT AND REAR AXLE

Phenomenon	Possible Causes	
a) Noise develops	<input type="radio"/> Noise with vibration	<ul style="list-style-type: none"> ◦ Worn universal joint ◦ Worn universal joint bearing ◦ Loose universal joint nut ◦ Excessively worn propeller shaft spline
	<input type="radio"/> Noise without vibration	<ul style="list-style-type: none"> ◦ Insufficient lubrication ◦ Worn or broken differential gear ◦ Worn drive pinion bearing ◦ Worn differential carrier bearing ◦ Improper backlash adjustment
b) Differential heats up	<input type="radio"/> Insufficient oil in case <input type="radio"/> Insufficient backlash	
c) Oil leaks out	<input type="radio"/> Excessive oil in case <input type="radio"/> Too low an oil viscosity <input type="radio"/> Worn or damaged seal <input type="radio"/> Cracks in rear axle and axle housing <input type="radio"/> Damaged gasket	

SHOCK ABSORBING SYSTEM

Phenomenon	Possible Causes	
a) Noise develops from front shock absorber	<input type="radio"/> Worn joint cushion <input type="radio"/> Malfunctioning of shock absorber	

20-12 TROUBLE SHOOTING

ELECTRICAL SYSTEM

Phenomenon	Possibel Causes	
a) Battery discharges frequently	<input type="radio"/> Low charging rate	<ul style="list-style-type: none"> ◦ Malfunctioning of generator ◦ Improper adjustment of voltage regulator ◦ Sulfated battery ◦ Corroded battery terminals ◦ Improper grounding of voltage regulator
	<input type="radio"/> Too high a starting current	<ul style="list-style-type: none"> ◦ Excessive use of starter motor ◦ Defective starter motor ◦ Too high a resistance in engine
	<input type="radio"/> Quick discharge of battery	<ul style="list-style-type: none"> ◦ Insufficient or improper electrolyte ◦ Sulfated battery ◦ Defective separator
b) Light does not glow	<input type="radio"/> Defective bulb <input type="radio"/> Defective switch <input type="radio"/> Improper connection in circuit <input type="radio"/> Blown fuse <input type="radio"/> Short circuited <input type="radio"/> Improper grounding	
c) Light flickers	<input type="radio"/> Improper grounding <input type="radio"/> Improper connection in light circuit <input type="radio"/> Broken filament <input type="radio"/> Circuit on the verge of shorting	
d) Turn signal indicator lights do not glow or one light only operating, flashing rate uneven	<input type="radio"/> Improper connection in circuit <input type="radio"/> Defective bulb <input type="radio"/> Defective turn signal switch <input type="radio"/> Defective flasher relay <input type="radio"/> Use of improper bulb	

M E M O

21. PERIODIC MAINTENANCE

All vehicles require periodic maintenance to keep them in good operating condition. The higher the performance of the vehicle the greater the importance of providing proper maintenance to keep the vehicle in peak condition.

The Honda S 800 is a high performance vehicle equipped with a high speed engine and, therefore, it is of utmost importance that the proper servicing be performed at the specified servicing periods.

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PERIODIC MAINTENANCE SCHEDULE

Servicing Items	Mileage Covered													Km (Miles)					
	1,000 (600)	3,000 (1,900)	6,000 (3,700)	9,000 (5,600)	12,000 (7,500)	15,000 (9,300)	18,000 (11,200)	21,000 (13,000)	24,000 (14,900)	27,000 (16,800)	30,000 (18,600)	33,000 (20,500)	36,000 (22,400)	39,000 (24,200)	42,000 (26,100)	45,000 (28,000)	48,000 (29,800)	51,000 (31,700)	54,000 (33,800)
Engine			●		●						●				●		●		
Clean air cleaner element			●		●						●				●		●		
Change air cleaner element								●				●							●
Change oil filter element			●				●				●				●				●
Clean fuel filter element			●					●							●				●
Change engine oil	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Check cam chain tension, adjust if necessary			●						●						●				
Check contact breaker point gap, adjust if necessary					●				●				●				●		
Clean spark plug and adjust plug gap, if necessary				●						●						●			
Change spark plug, if necessary							●						●						●
Check ignition timing, adjust if necessary					●				●				●				●		
Check cooling fan belt, adjust if necessary					●				●				●				●		
Radiator																			
Check radiator coolant, add if necessary	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Battery																			
Check battery distilled water, add if necessary	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Clutch																			
Check clutch pedal, adjust if necessary							●						●						●
Check control fluid, add if necessary	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Transmission																			
Change gear oil		●												●					
Check gear oil, add if necessary					●											●			
Differential																			
Change gear oil		●																	
Check gear oil, add if necessary					●												●		
Steering																			
Check tie-rod end grease, apply if necessary					●				●				●				●		
Suspension																			
Check upper and lower ball joints grease, apply if necessary					●				●				●				●		
Check rear suspension mounting bolts, retighten if necessary			●						●						●				
Brakes																			
Check parking brake system adjust if necessary			●		●		●		●		●		●		●		●		●
Check foot brake system, adjust if necessary			●		●		●		●		●		●		●		●		●
Check pads (front) and shoes (rear), change if necessary			●		●		●		●		●		●		●		●		●
Check brake fluid, add if necessary	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Wheels (Tires)																			
Check wheel balance, (if tire had been changed)	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Check tire pressure, adjust if necessary	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Rotate tires			●		●		●		●		●		●		●		●		●
Body																			
Check body mounting bolts and nuts, retighten if necessary			●						●						●				

LUBRICATION

A. LUBRICATING INTERVALS

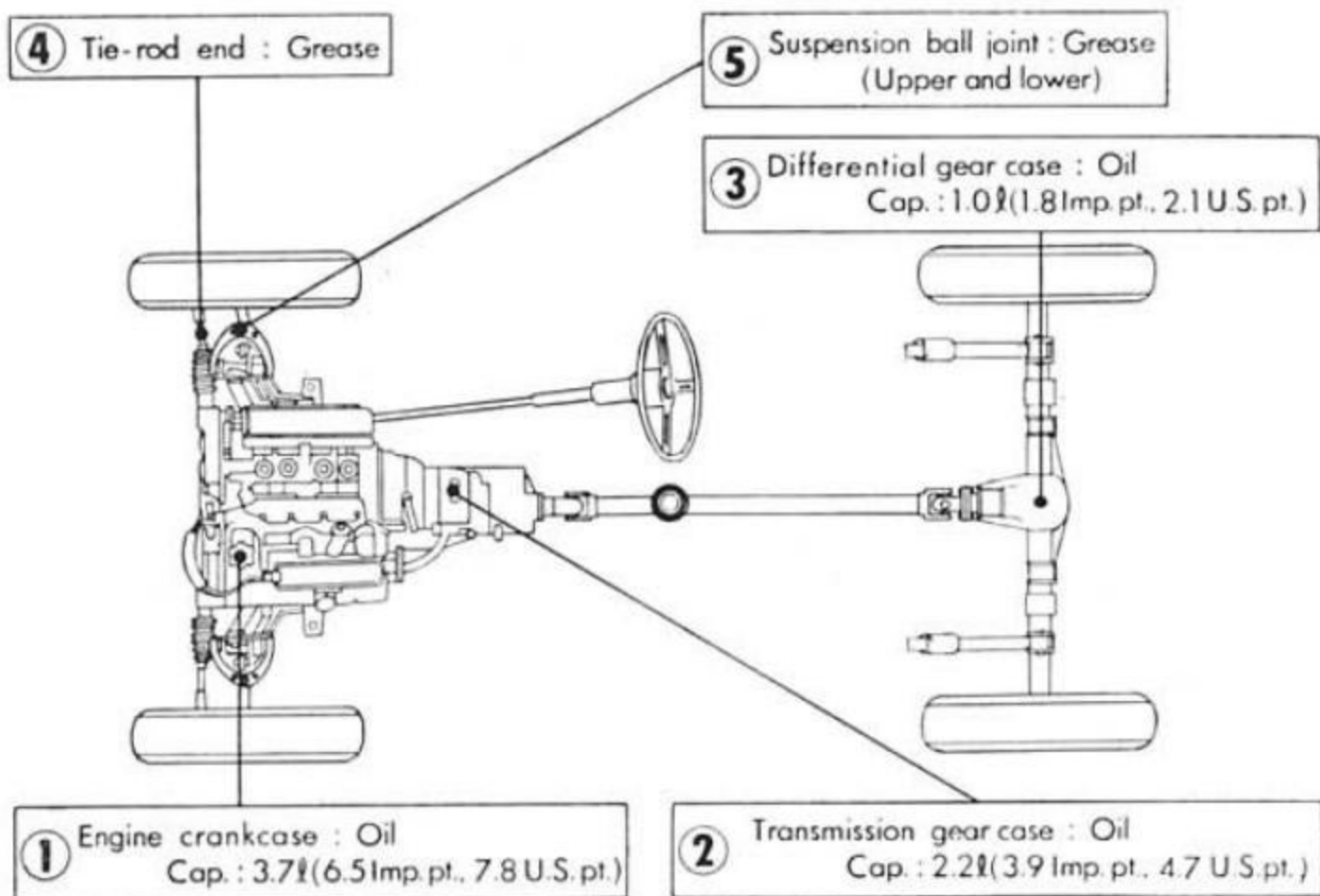
The table below shows the lubricating schedule and the lubrication points.

Km (miles)	1,000 (600)	3,000 (1,900)	6,000 (3,700)	9,000 (5,600)	12,000 (7,500)	15,000 (9,300)	18,000 (11,200)	21,000 (13,000)
① Engine oil	●	●	●	●	●	●	●	●
② Transmission gear oil		●			△			●
③ Differential gear oil		●			△			●
④ Tie-rod end grease					△			
⑤ Suspension ball joint grease					△			

24,000 (14,900)	27,000 (16,800)	30,000 (18,000)	33,000 (20,500)	36,000 (22,000)	39,000 (24,200)	42,000 (26,100)	45,000 (28,000)	48,000 (29,800)	51,000 (31,700)	54,000 (33,000)
●	●	●	●	●	●	●	●	●	●	●
		△			●			△		
		△			●			△		
△				△				△		
△				△				△		

Note: The above item numbers correspond to the numbers in the figure below.

● : Oil change
△ : Replenish oil or grease



B. RECOMMENDED GRADES OF OIL AND GREASE

	Temperature	Grade
Engine Oil	General purpose except extremely hot or cold climates	SAE 10W/30
	General purpose except extremely cold climate	SAE 20W/40
	Below 0°C (32°F)	SAE 10W
	0°C~15°C (32°F~59°F)	SAE 20W, 20
	Above 15°C (59°F)	SAE 30
	Extremely hot climate	SAE 40
Gear Oil	Below 0°C (32°F)	SAE 80
	Above 0°C (32°F)	SAE 90
Grease	General purpose	NLGI No. 2 Multi-purpose type

C. SERVICING

a. Engine

1) Engine oil check

Pull out the engine oil level gauge, wipe off oil and reinsert all the way for the oil level inspection. If the oil level is below the lower limit marked on the gauge, add oil through the filler opening to the upper limit mark (Fig. 21-1).



Fig. 21-1

2) Engine oil change

Perform oil change at the first 1,000 km (600 miles) followed by changes at 3,000 km (1,800 miles) intervals thereafter. Always use recommended grade engine oil of good quality.

Drain the oil thoroughly by loosening the drain plug (Fig. 21-2). After tightening the drain plug, fill new oil through the filler opening to the upper limit marked on the oil level gauge (3.7 ℓ, 6.5 Imp. pt., 7.8 U.S. pt.).

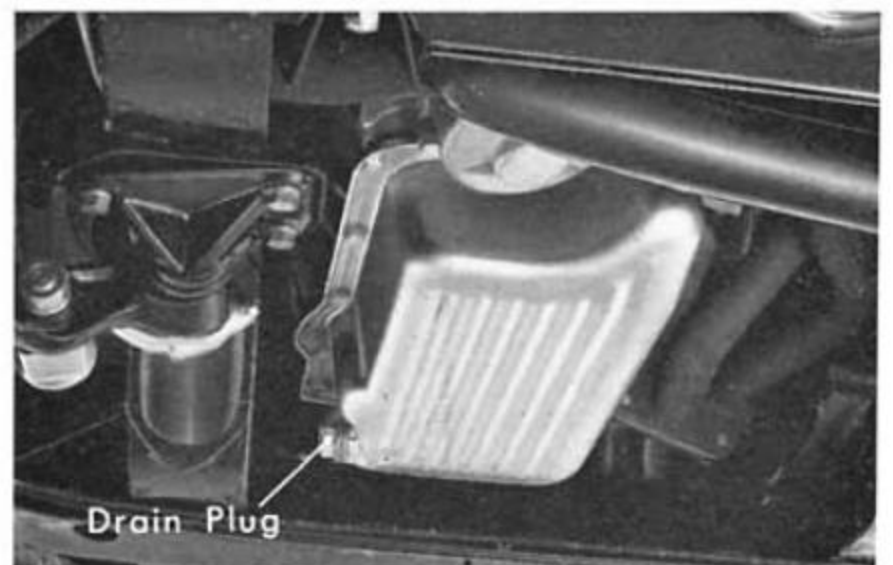


Fig. 21-2

Note: If aluminum washer is found to be damaged, replace it to prevent oil from leaking.

21-5 PERIODIC MAINTENANCE

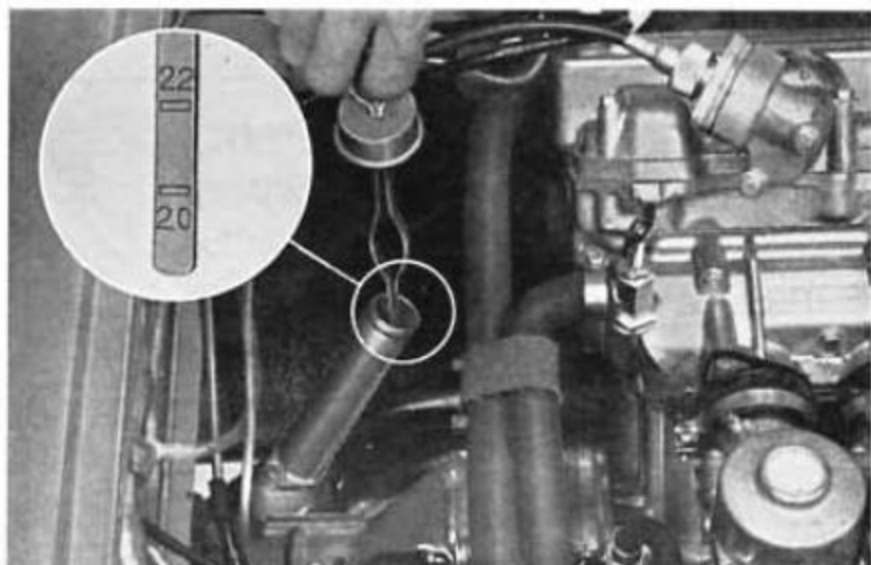


Fig. 21-3

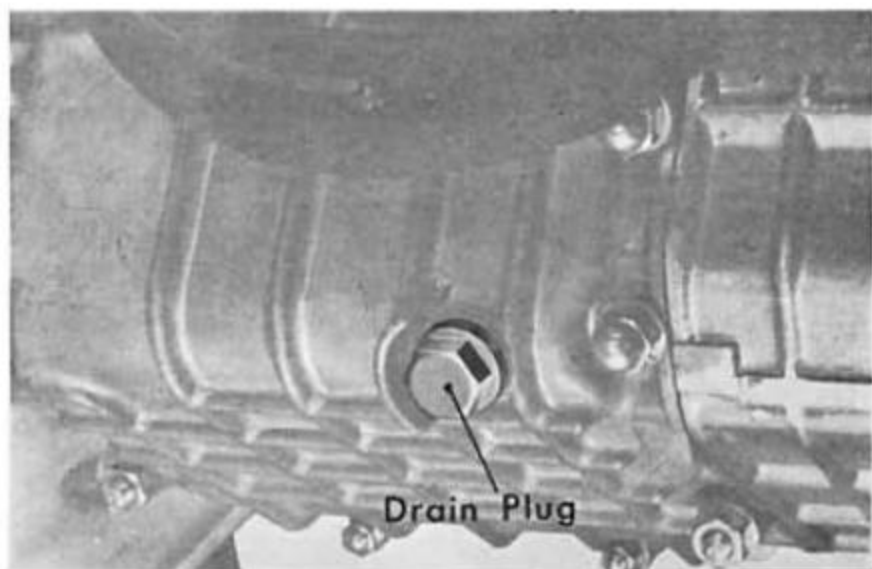


Fig. 21-4



Fig. 21-5



Fig. 21-6

b. Transmission Case

1) Replenish transmission oil

Pull out the transmission oil level gauge, wipe off oil and reinsert all the way for the oil level inspection. If the oil level is below the lower limit marked on the gauge (Fig. 21-3), add oil through the filler pipe to bring the oil level to the upper limit mark.

2) Gear oil change

Remove the drain plug and drain the oil completely (Fig. 21-4), and fill new oil through the filler pipe to the upper limit marked on the oil level gauge. Capacity: 2.2 ℓ (3.9 Imp. pt., 4.6 U.S. pt.).

c. Rear Axle Housing

1) Differential gear oil replenishment

Remove the oil filler plug and add oil through the filler opening up to the level of the hole (Fig. 21-5).

2) Differential gear oil change

Remove both drain and filler plugs and drain the oil completely. After tightening the drain plug, fill oil through the filler opening up to the level of the hole (Fig. 21-6).

Capacity: 1.0 ℓ (1.8 Imp. pt., 2.1 U.S. pt.).

d. Tie-Rod End Greasing

Apply grease to the tie-rod ends (R/L) with a grease gun after cleaning the grease nipples (Fig. 21-7).



Fig. 21-7

e. Suspension Ball Joint Greasing

Apply grease to the suspension ball joints (upper and lower R/L) with a grease gun after cleaning the grease nipples (Fig. 21-8, 9).

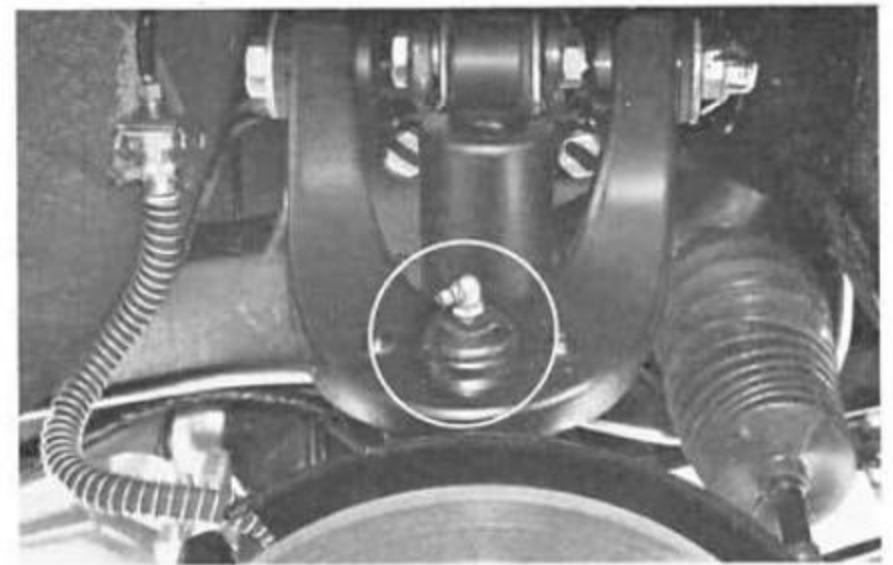


Fig. 21-8

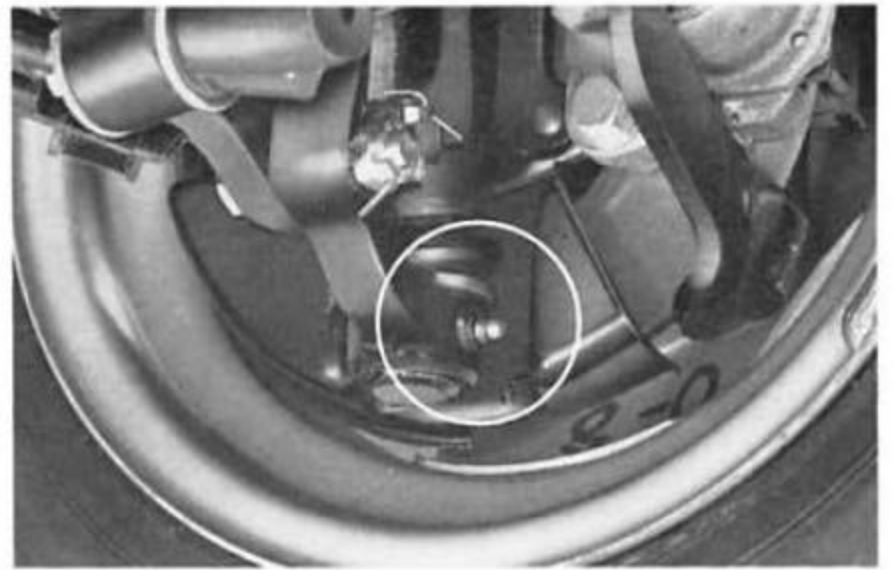


Fig. 21-9

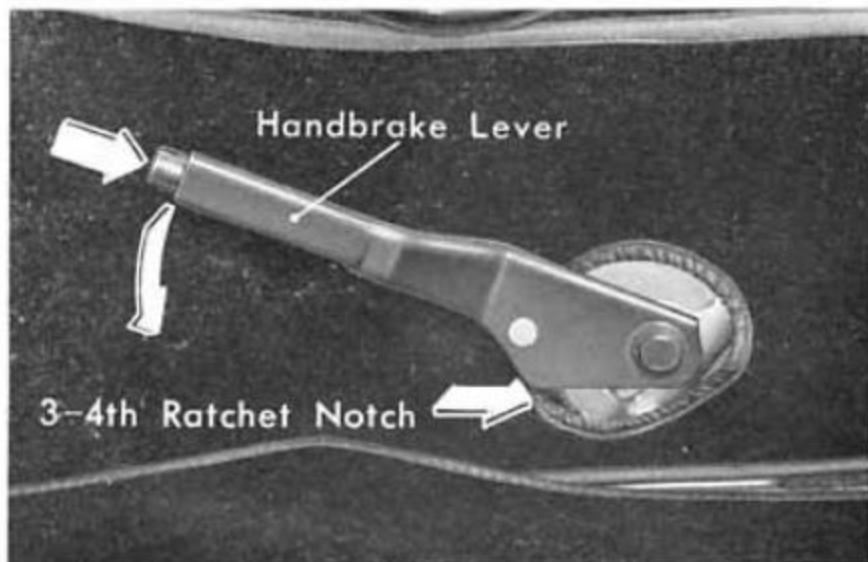


Fig. 21-10

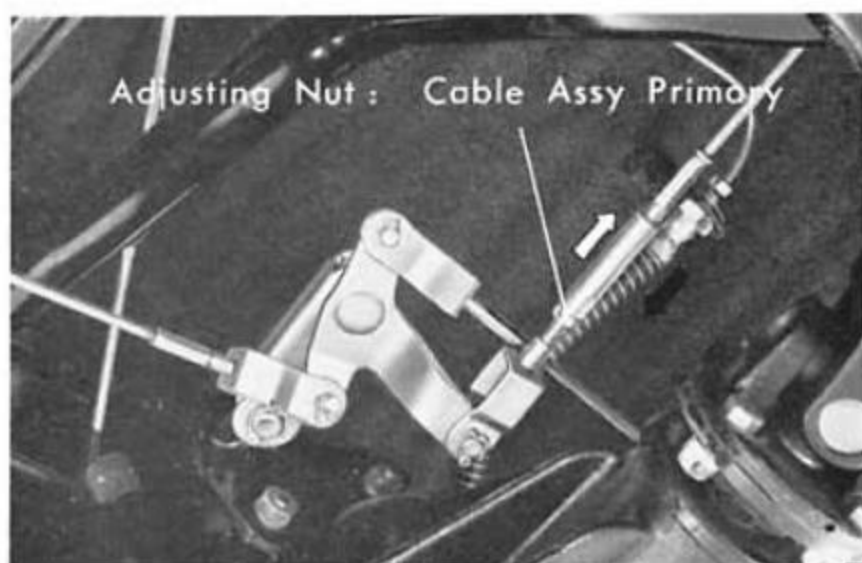


Fig. 21-11

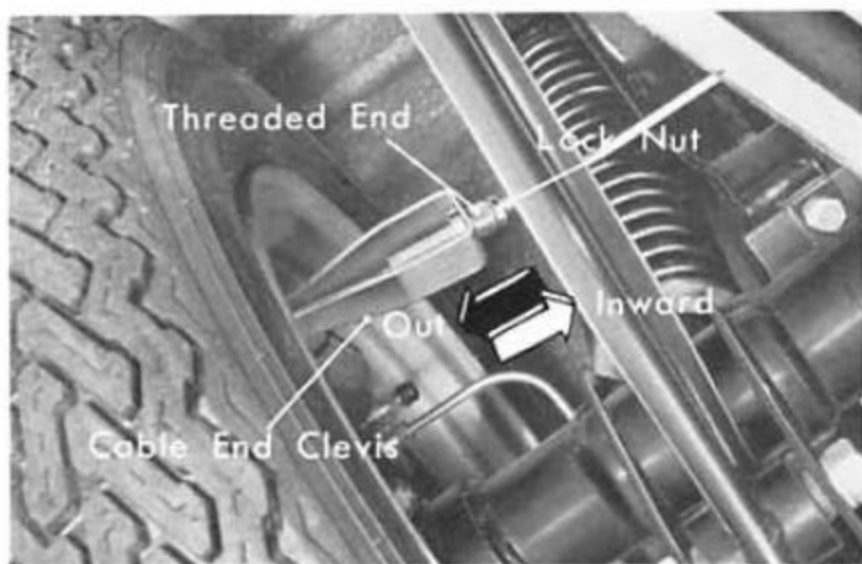


Fig. 21-12

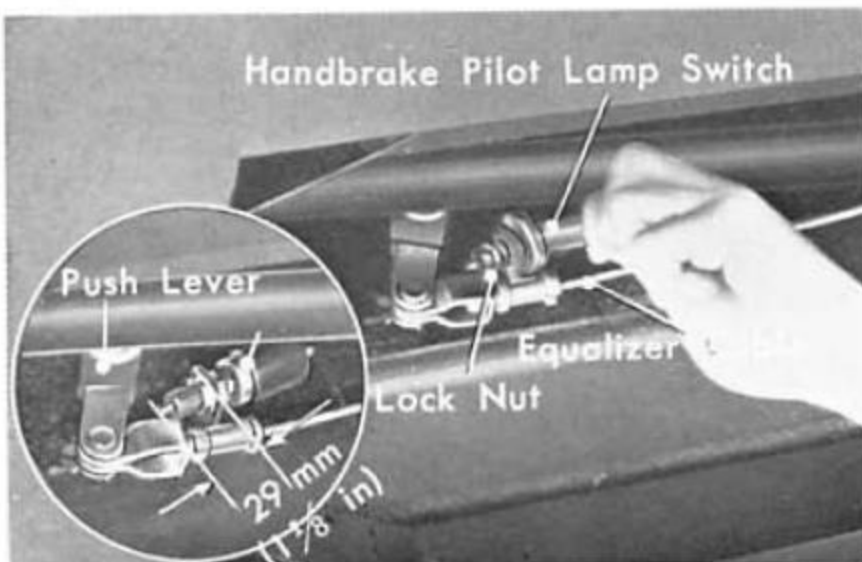


Fig. 21-13

BRAKES

A. HANDBRAKE

Inspection: Pull the handbrake lever until the brakes are locked and check to assure that the locking pawl is located within 3~4 notches from the bottom of sector (Fig. 21-10).

a. Equalizer Arm

Loosen the lock nut and turn the threaded end to move the equalizer arm forward or backward (Fig. 21-11).

Equalizer Arm Movement

- ⇒ (Forward): Decreases the handbrake lever movement on the ratchet.
- ← (Backward): Increases the handbrake lever movement on the ratchet.

b. Cable End Clevis

Loosen the lock nut and turn the threaded end to lengthen or shorten the cable (Fig. 21-12).

Cable end clevis movement

- ⇒ (Inward): Increases the handbrake lever travel.
- ← (Out): Decreases the handbrake lever travel.

c. Handbrake Pilot Lamp Switch

Loosen the lock nut and adjust the pilot lamp switch so that the tip of the switch plunger is 29 mm (1 1/8 in) (Fig. 21-13) from the mounting bracket.

B. FOOTBRAKE

Inspection: Check action of the brake pedal to assure that the free play is within 15~20 mm (0.6~0.8") and the pedal travel approximately 30~35 mm (1.2~1.4") (Fig. 21-14).

It is very dangerous to drive with brakes not uniformly adjusted since sudden braking will cause brake to grab on one side with consequent lose of control. Always make certain that brakes are properly and uniformly adjusted.

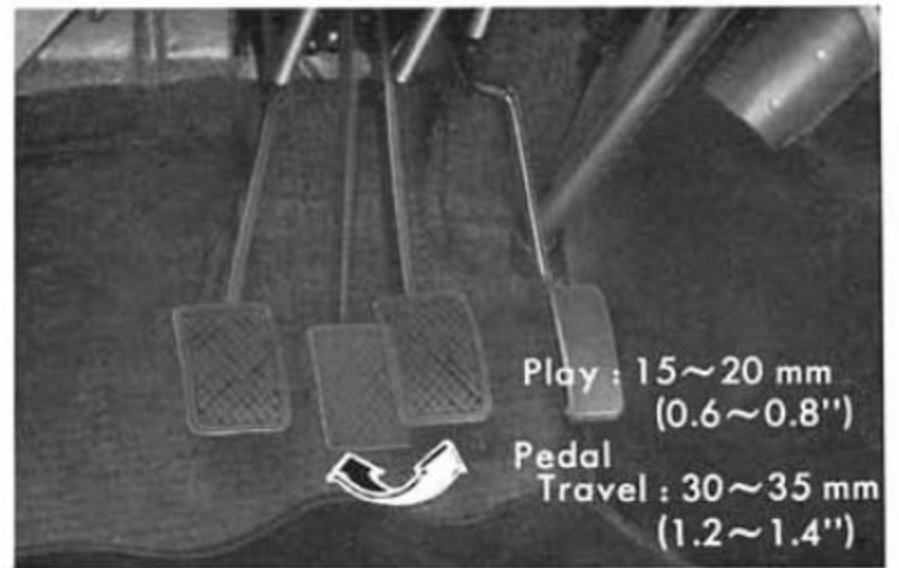


Fig. 21-14

a. Front Disc Brakes

Brake pad check and replacement: Set the vehicle on rigid racks and remove front wheels.

Pull out "L" rings and remove retaining pins and plate (Fig. 21-15).

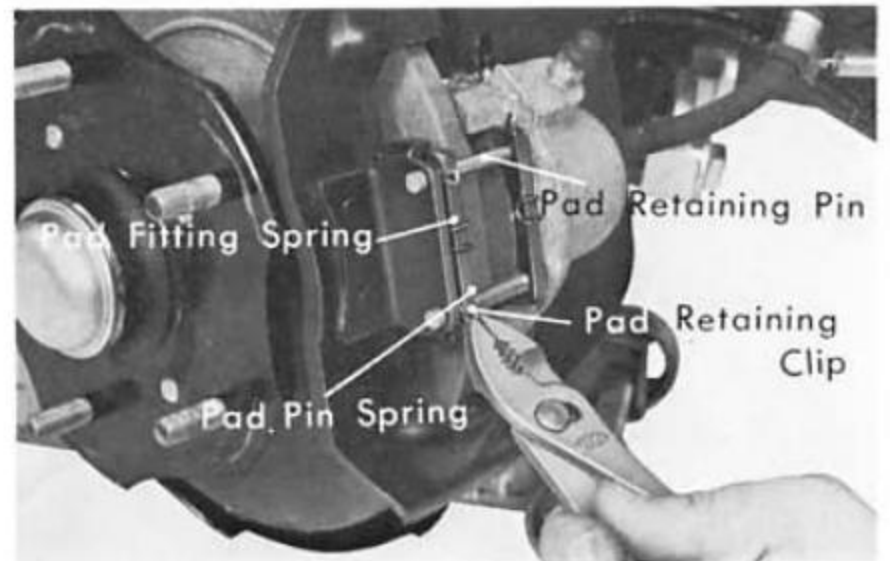


Fig. 21-15

Pull out the pads after removing the retaining pins (Fig. 21-16).

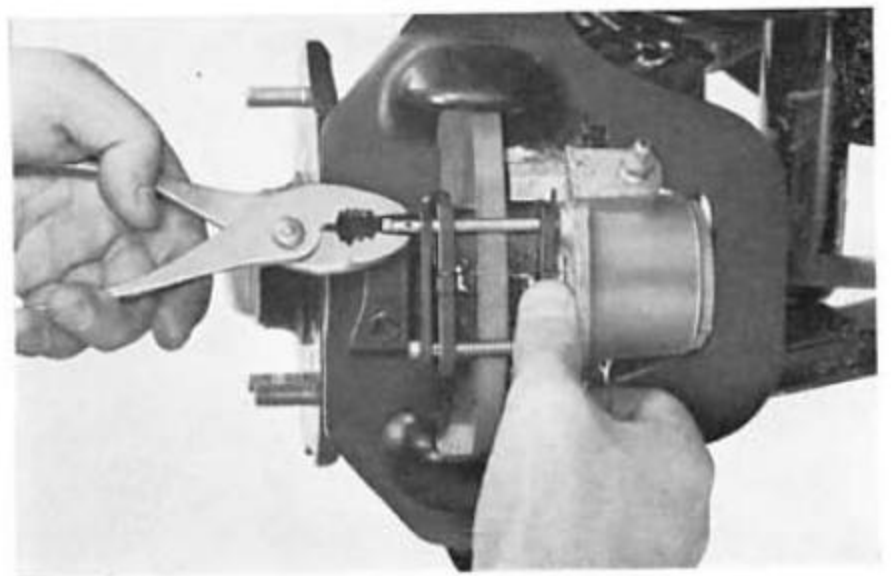


Fig. 21-16

After removing the pads, clean the caliper, cylinders, pistons and pad supports which are adjacent to the pads (Fig. 21-17).

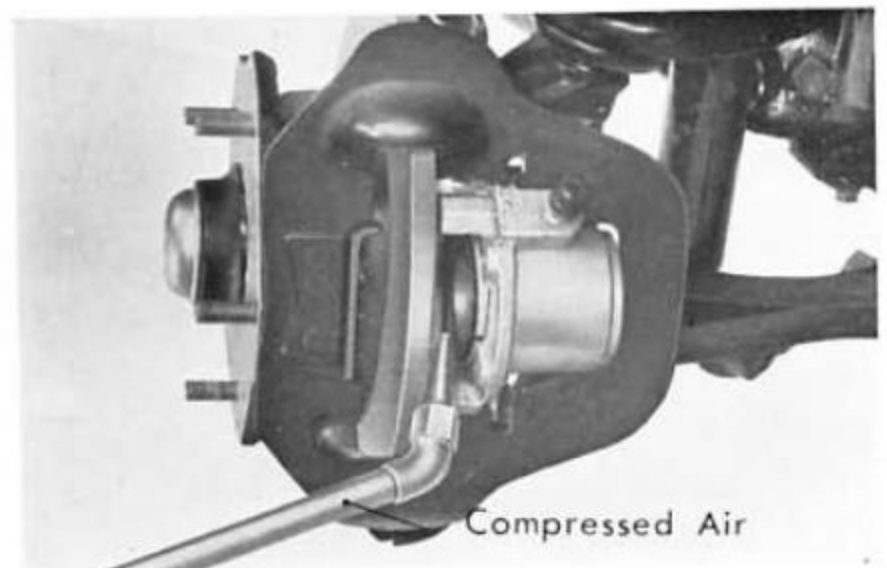


Fig. 21-17

21-9 PERIODIC MAINTENANCE

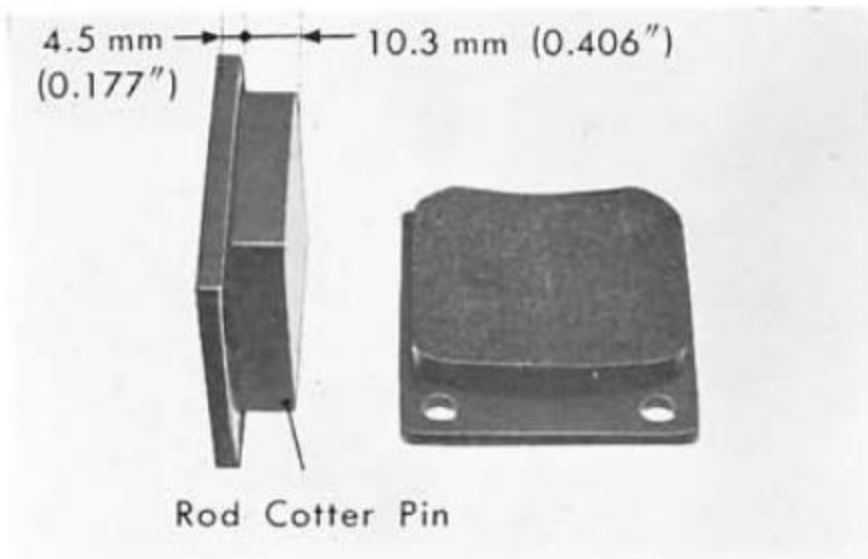


Fig. 21-18

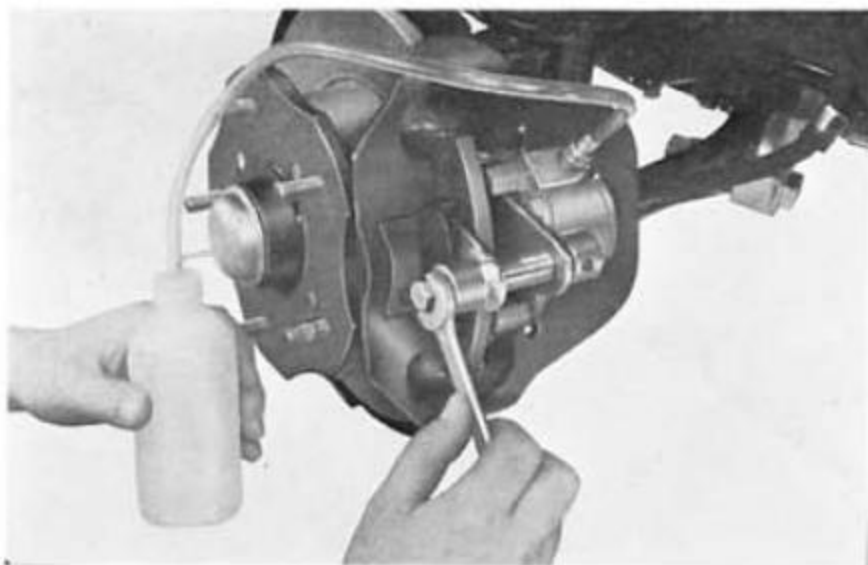


Fig. 21-19

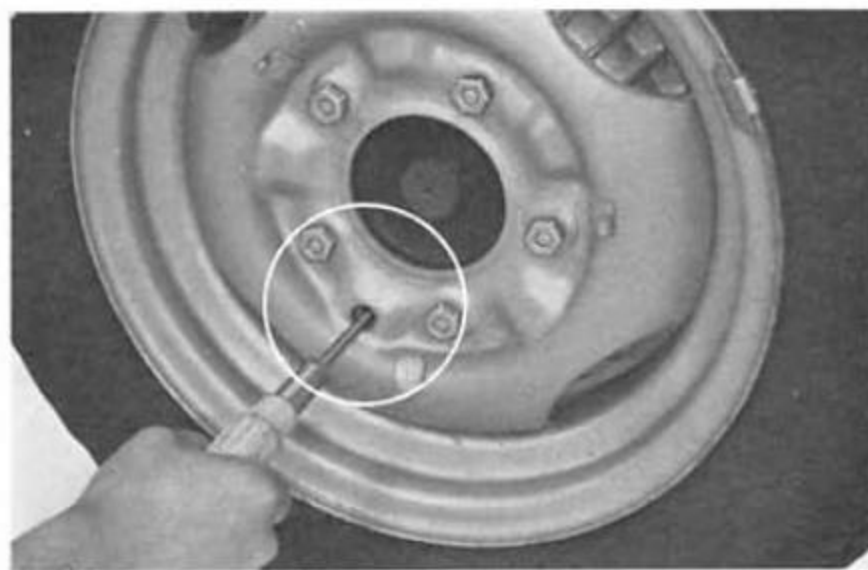


Fig. 21-20

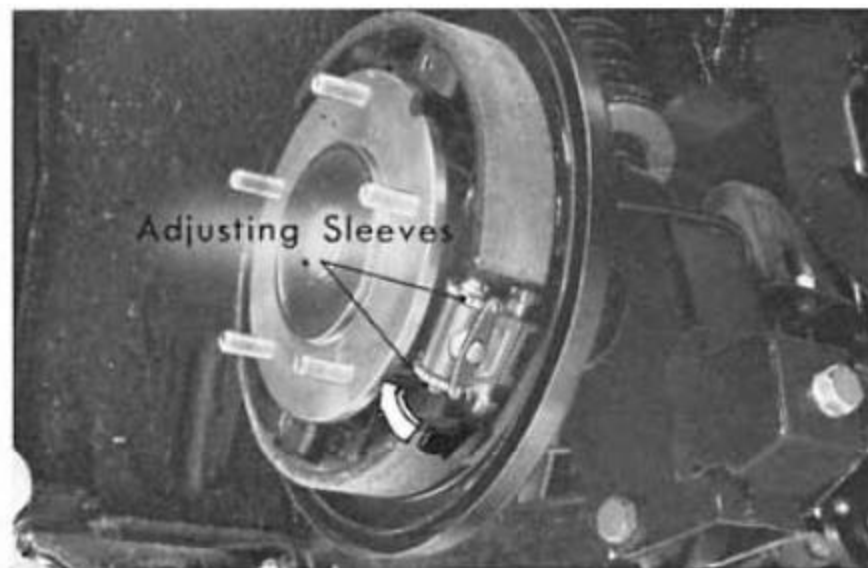


Fig. 21-21

New pad (including backing plate) measures 14.5 mm (0.571") thick. If the pad thickness is less than 7 mm (0.28 m), it should be replaced with a new one (Fig. 21-18).

When installing the pads, use the piston pushback special tool as a pry. Install the tool over the disc with the plates placed between both sides of the pistons and push the pistons back into the cylinders by turning the expander screw of the tool with a wrench (Fig. 21-19).

b. Rear Shoe Brakes

1) Brake adjustment

Remove the wheel cap and adjusting hole plug.

Align the wheel adjusting hole to the brake adjusting sleeve and then turn the adjusting sleeve with a screwdriver in the direction of the arrow ↓ until the wheel becomes locked. Back off ↑ on the sleeve until the dragging of the brake against the drum is no longer noticeable (3~4 notches). There are two adjusting sleeves on each adjuster; make certain that both sleeves in each of the brake assemblies are adjusted in the same manner (Fig. 21-20).

2) **Brake shoe and drum inspection**

After removing the rear wheel and wheel cap, remove the brake drum (Fig. 21-22).

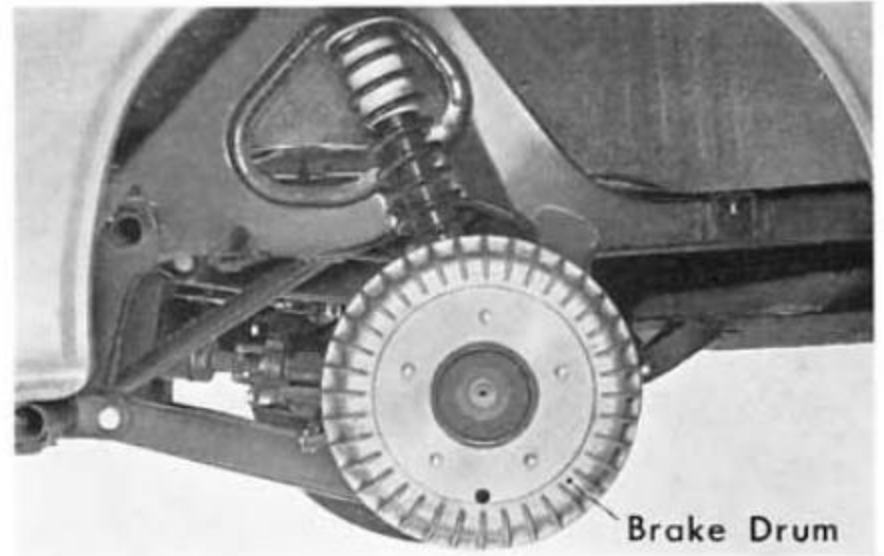


Fig. 21-22

Measure the thickness of shoe linings (Fig. 21-23). If shoe lining thickness is less than 2 mm (0.08 in), it should be replaced with a new one.

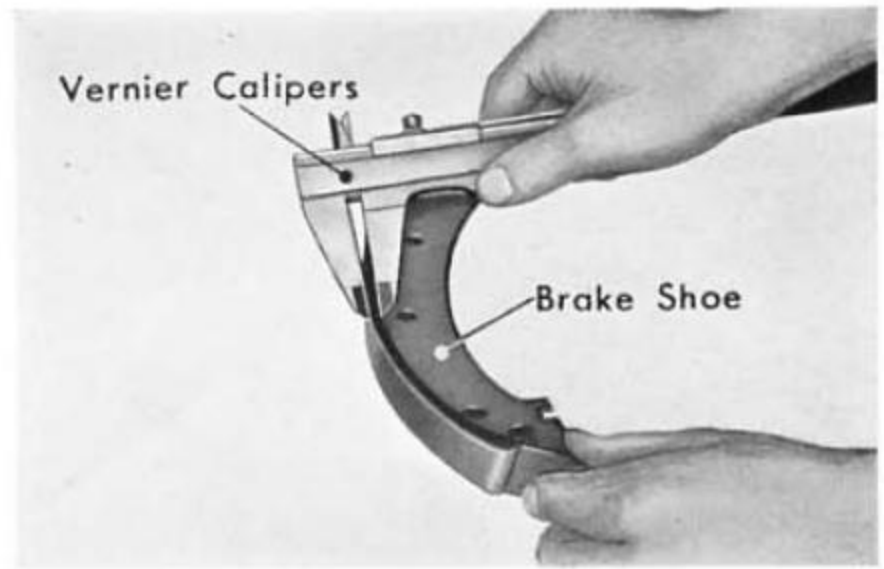


Fig. 21-23

To remove the shoes; unhook the shoe clamp springs and brake shoe springs, turn the shoe fixing pin with pliers (Fig. 21-24). The shoe clamp spring and the pin can be disassembled from the anchor plate.

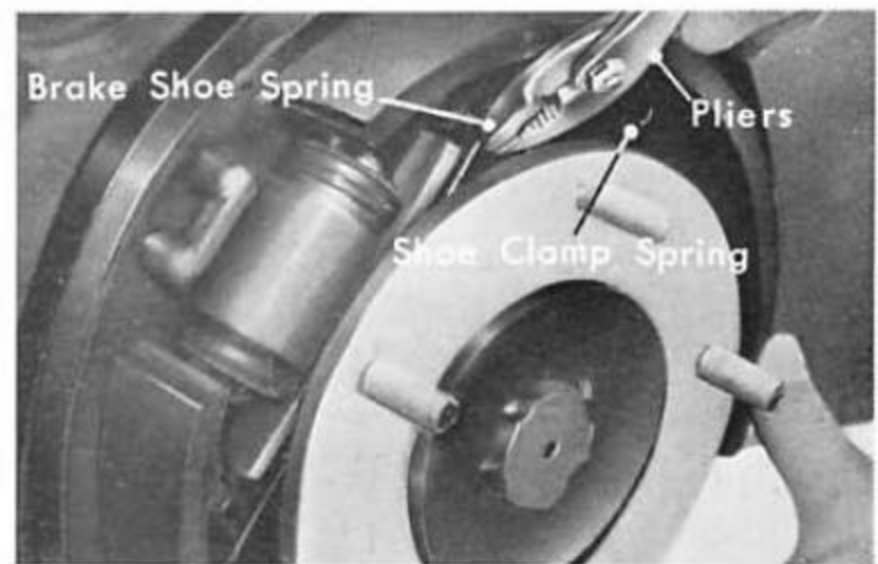


Fig. 21-24

Measure inside diameter of brake drum (Fig. 21-25), if the inside diameter of the drum is more than 214 mm (8.40 in.), it should be replaced with a new one.

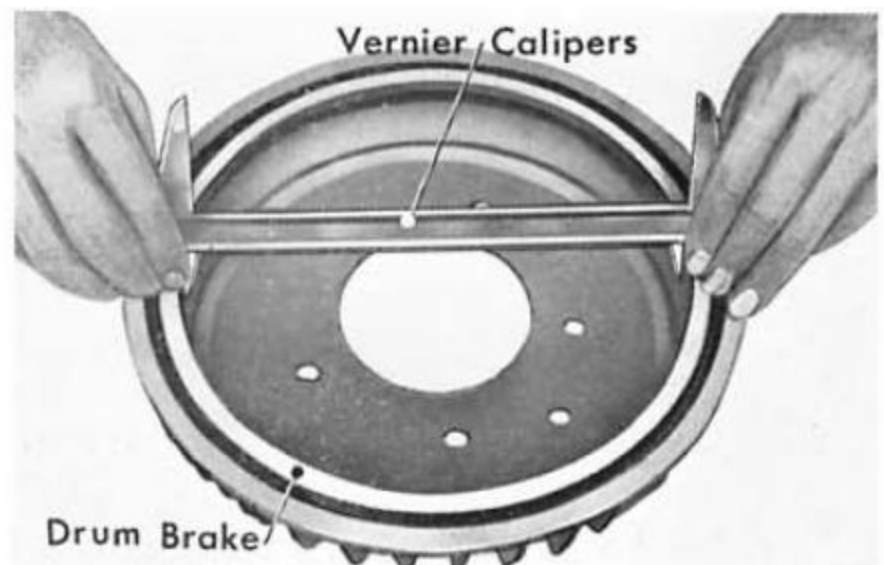


Fig. 21-25

21-11 PERIODIC MAINTENANCE

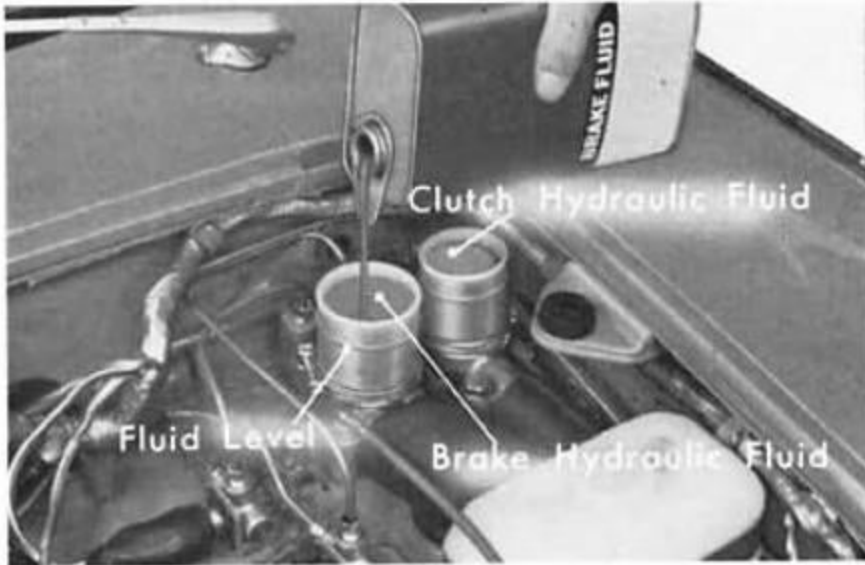


Fig. 21-26

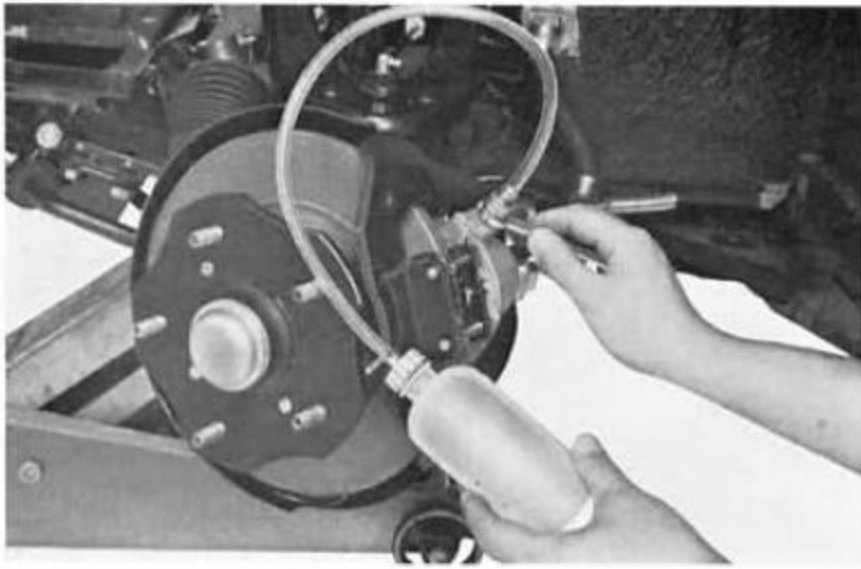


Fig. 21-27

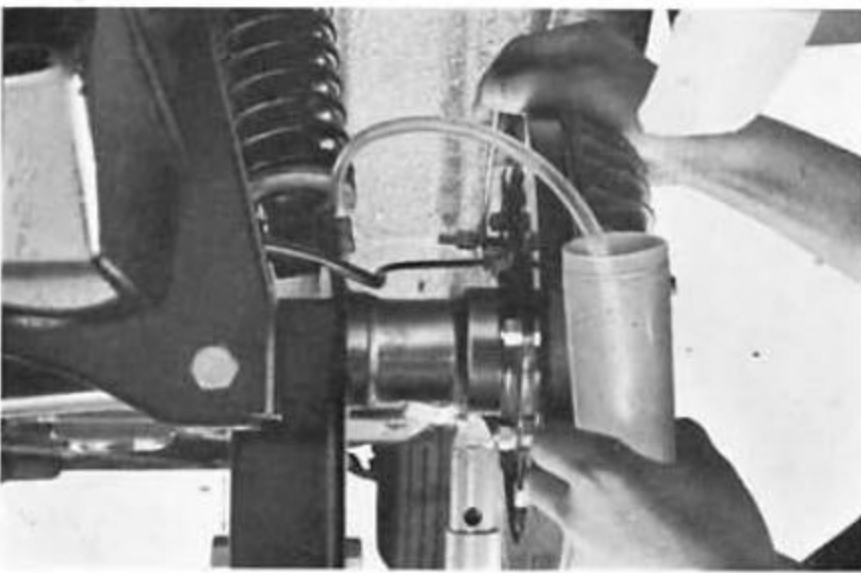


Fig. 21-28

3) Air bleeding

Fill the reserve tank with SAE 70R-3 type (heavy duty, non-mineral oil type) brake fluid of good quality (Fig. 21-26).

Install a small hose on the wheel cylinder bleed screw Fig. 21-27...front, Fig. 21-28...rear). Pump the brake pedal until the bubbles are no longer flowing out of the tube. Open the bleed screw by loosening only when depressing the pedal and close before releasing the pedal.

ENGINE

A. CAM CHAIN TENSION ADJUSTMENT

A loose cam chain will cause excessive chain noise and result in power loss. To adjust the tension, turn the crankshaft pulley in the normal direction (clockwise) and align the piston of the No. 1 cylinder to the top-dead-center (to have adequate chain tension, align "T" mark on the pulley to the index marking on the case). Loosen the 8 mm chain tensioner bolt at least 3 turns and then retighten (Fig. 21-29).

Note: Do not attempt to align the top-dead-center by turning in the reverse direction (Fig. 21-30).

By loosening the chain tensioner bolt, the action of the spring force automatically tightens the chain. If the top-dead-center is passed while making the alignment, continue for another revolution to make the alignment.

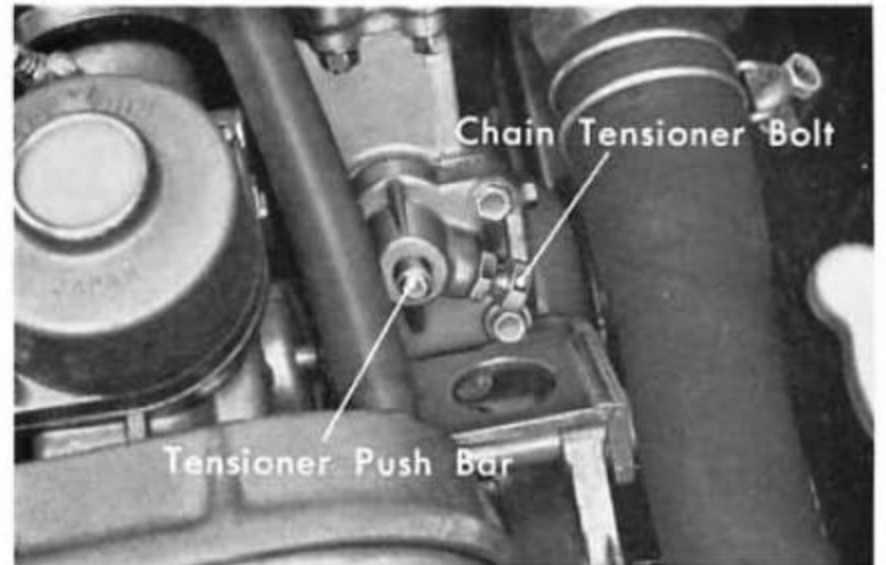


Fig. 21-29

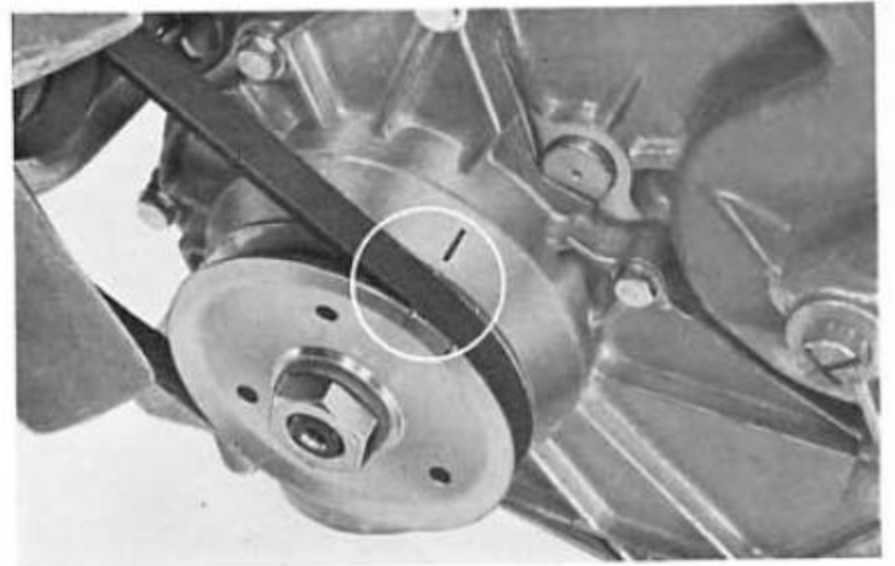


Fig. 21-30

B. AIR CLEANER ELEMENT SERVICING

The air is filtered through a cellulose filter; when this filter becomes clogged, it will cause a drop in the engine power output. To clean the filter, remove the air cleaner cover (Fig. 21-31) and unscrew the two nuts to lift out the cleaner element and tap the element lightly or blow out the dust by compressed air (Fig. 21-32). Do not permit water or oil to get on the element as it will prevent the air from passing through, therefore, handle the element with care.

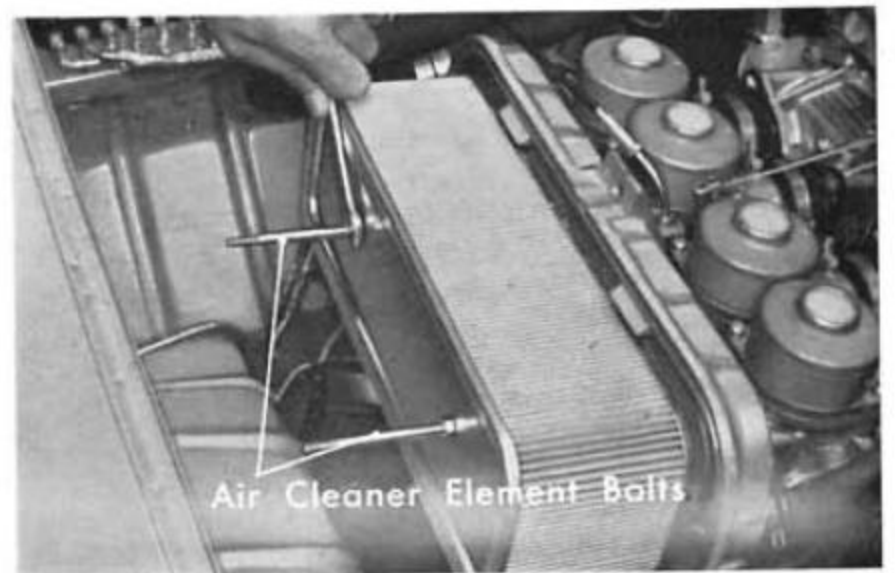


Fig. 21-31

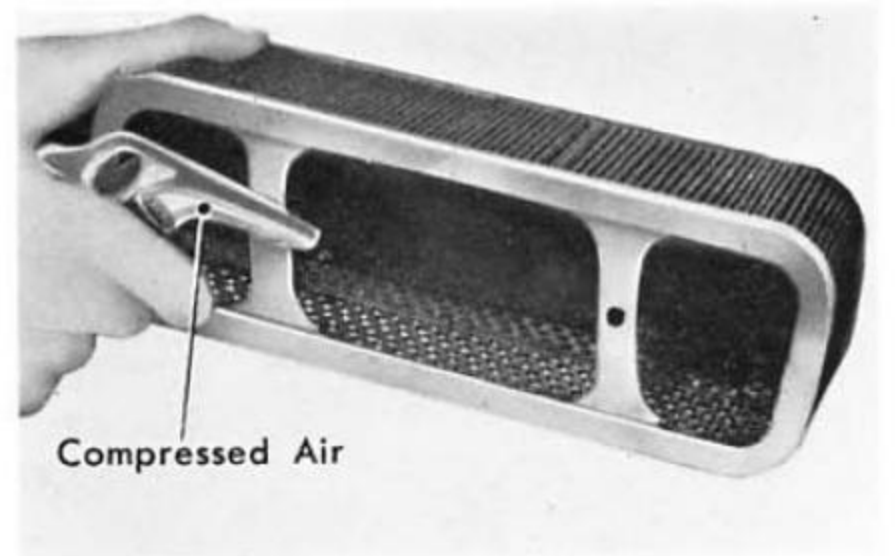


Fig. 21-32

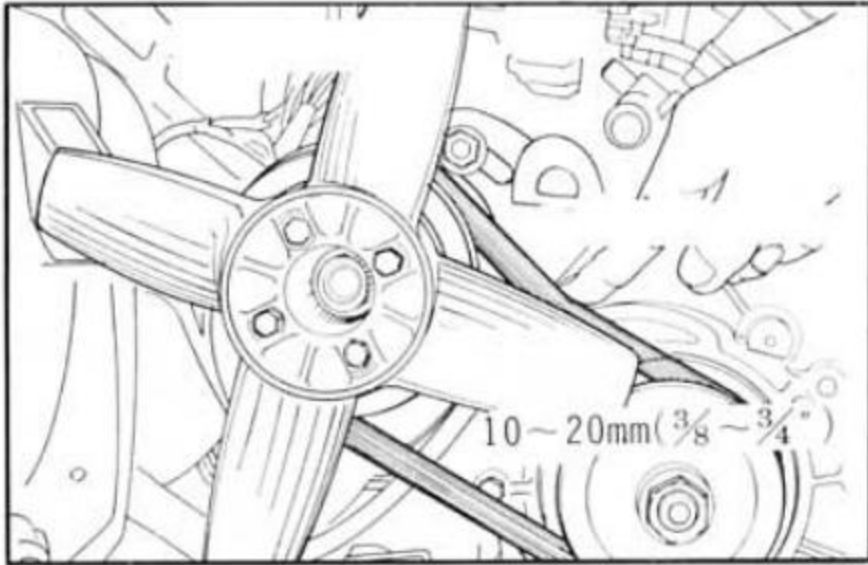


Fig. 21-33

C. FAN BELT TENSION ADJUSTMENT

A loose fan belt may be a cause of engine overheating and insufficient battery charging. To adjust, loosen the locking nut and move the A.C. dynamo to obtain the specified belt tension (Fig. 21-33).

Also inspect the belt for excessive wear or damage.

D. FUEL STRAINER SERVICING

Accumulation of water and dirt in the strainer may be a cause of hard starting.

The fuel strainer is located in the front of the engine compartment adjacent to the fuel pump (Fig. 21-34).

To clean, loosen the thumb nut, remove the strainer cup and wash in clean gasoline (petrol).



Fig. 21-34

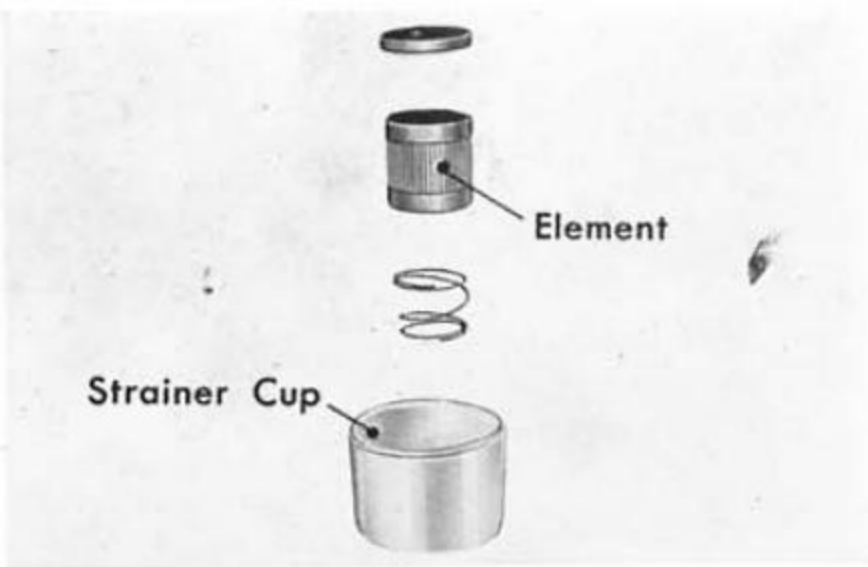


Fig. 21-35

E. OIL FILTER SERVICING

The oil filter is attached to the lower crankcase, adjacent to the oil pan (Fig. 21-36). The filter can easily be taken out by removing three filter mounting screws. Wash in clean gasoline (petrol).

When the oil filter becomes clogged, the check valve opens due to pressure built-up, permitting the dirty oil to by-pass the filter and flow directly to the moving parts, however, this results in increased wear of the parts since the oil is not being filtered.

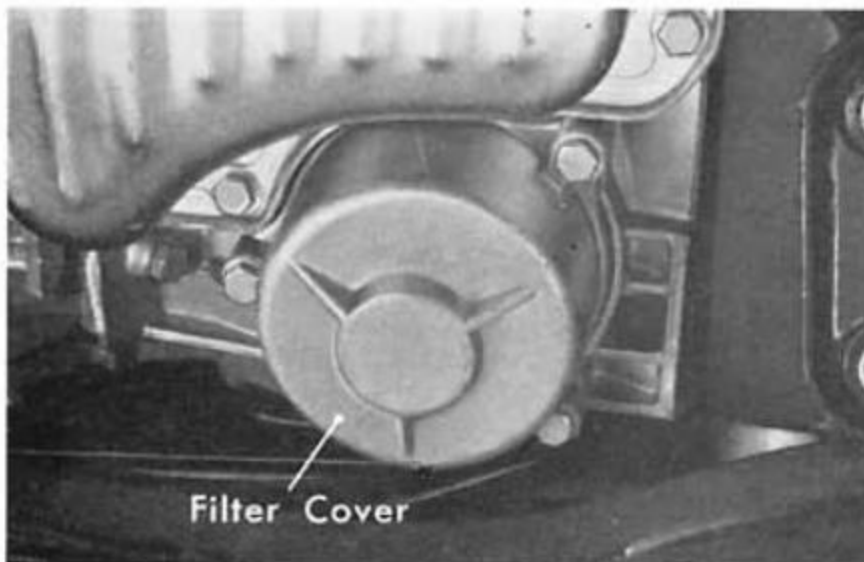


Fig. 21-36

F. DISTRIBUTOR POINT GAP AND IGNITION TIMING ADJUSTMENT

a. Point gap

Remove the distributor cap and rotor, turn the crankshaft pulley so that the point gap is at its maximum, and in this position, adjust the gap to 0.35 mm (0.014 in.) (Fig. 21-37).

Make the adjustment by loosening two lock screws A (Fig. 21-38) and adjust the point gap by inserting a screwdriver into the slot in the point arm. Tighten the lock screws upon completing the adjustment.

If the surface of the contact points are pitted, they should be replaced with new one.

b. Ignition timing

Adjust the distributor so that contact breaker is beginning to open, when the "F" mark on the pulley is aligned to the timing mark index on the crankcase (Fig. 21-39). Loosen the two lock screws (B) (Fig. 21-38) and move the contact breaker base plate in the desired direction as indicated by the arrows on the figure 21-38.

← To advance the ignition timing

⇒ To retard the ignition timing

Instead of visually determining the point opening, a recommended and more accurate method is to connect a 12V lamp across the primary wiring and the ground. The lamp will come on when the points are open; the ignition switch must be in the ON position.

G. SPARK PLUG CLEANING AND ADJUSTMENT

A dirty or carboned electrode will not produce a good strong spark across the plug gap.

The best method of cleaning the plugs is with a plug cleaner, however, a needle and wire brush may also be used to clean the electrodes, followed by washing in clean gasoline (petrol) and drying with compressed air or rag. Adjust the electrodes to the specified gap clearance (0.7 mm, 0.028 in.) (Fig. 21-40).



Fig. 21-37

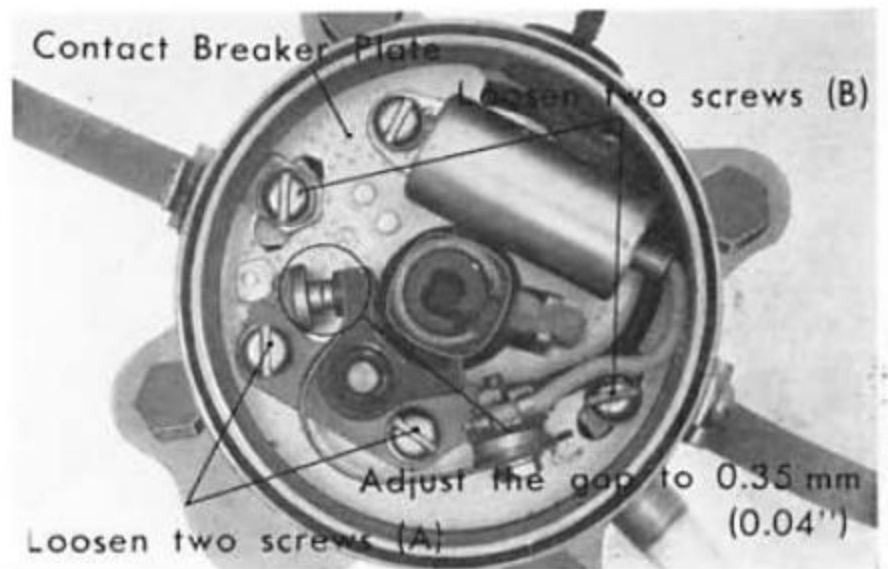


Fig. 21-38

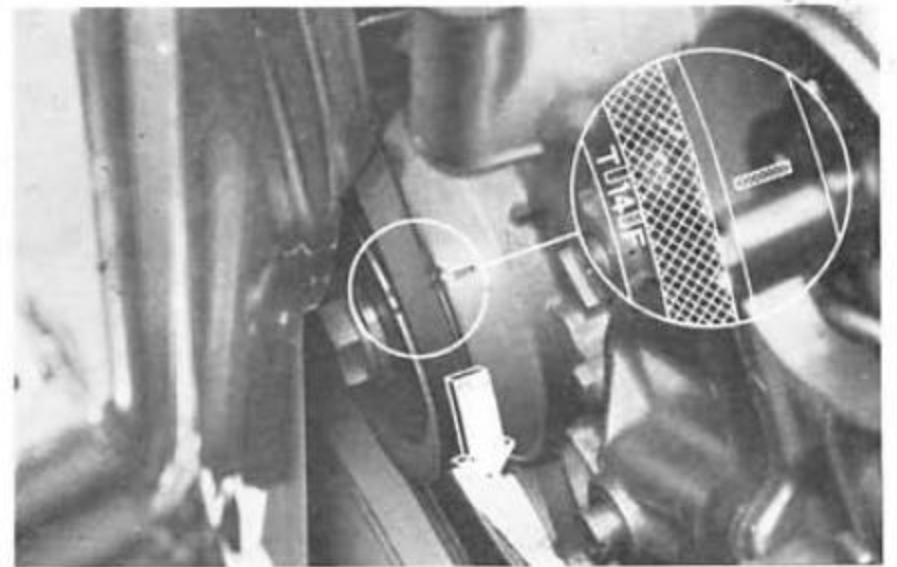


Fig. 21-39



Fig. 21-40

21-15 PERIODIC MAINTENANCE

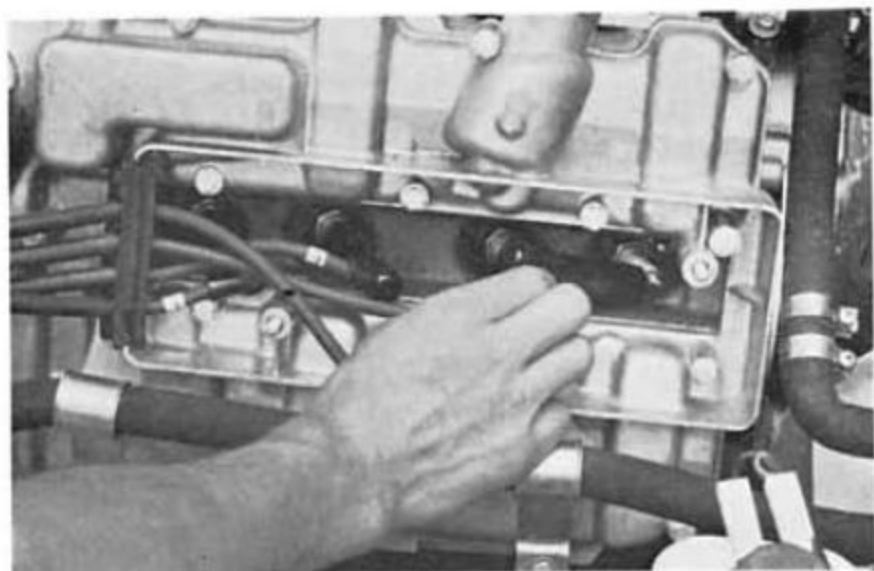


Fig. 21-41

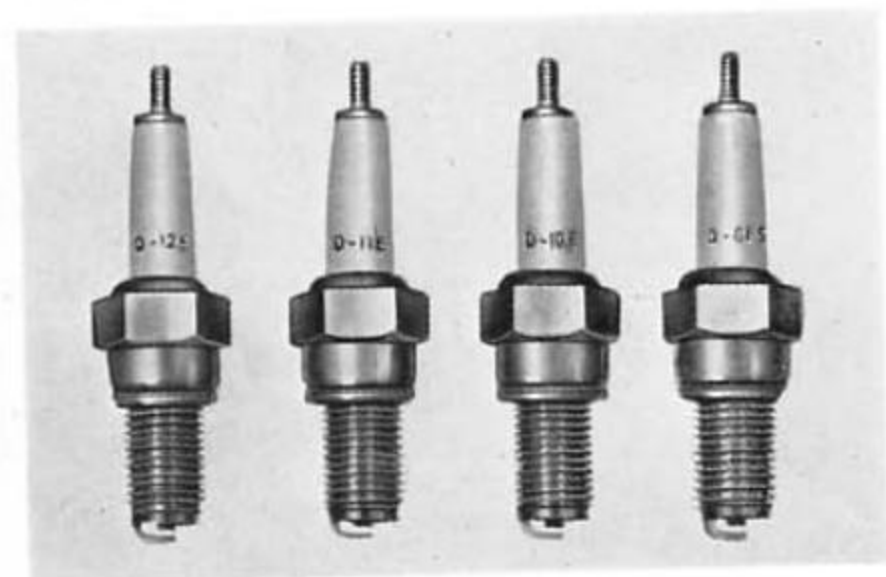


Fig. 21-42



Fig. 21-43

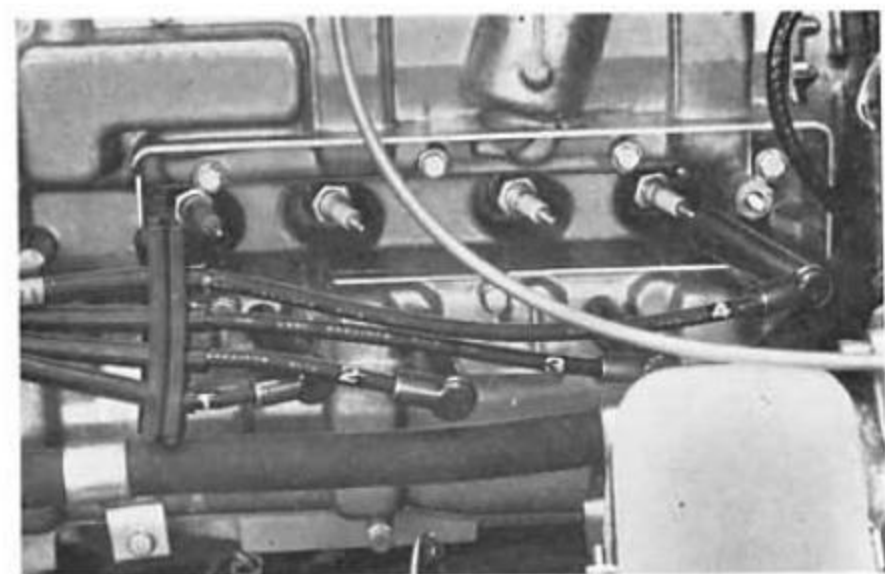


Fig. 21-44

To inspect the plug sparking condition, remove the plug and with the high tension terminal installed, ground to the engine case as shown in the figure 21-41 and crank the engine with the ignition switch ON. The spark produced will give an indication of the plug condition.

Specified spark plug is D-8ES (NGK) for the engine running at low to normal engine temperature. For continuous high speed driving, use D-10E, D-11E or D-12E (Optional) (Fig. 21-42).

When installing spark plugs, initially screw the plugs in by hand and then tighten and torque to 2.1~2.6 kg-m (15.1~18.7 ft-lbs). This procedure is recommended to prevent damage to threads in the cylinder head in case of cross-threading.

When removing the spark plug cap, do not grasp by the high tension cord (Fig. 21-44). Install the plug cap in the proper location as numbered on the cap.

RADIATOR

Insufficient cooling water will cause over-heating of the engine, therefore, always keep the radiator filled to the top of the filler neck. When the radiator water level has dropped due to evaporation, add water only.

If the water temperature is high, caution should be exercised when removing the filler cap. Loosen the cap slowly and allow pressure to escape before completely removing the cap, this will prevent hot water from gushing out (Fig. 21-45).



Fig. 21-45

Anti-Freeze

Use recommended Anti-Freeze since unsuited products will cause rapid corrosion of the aluminum components. Refer to the recommended anti-freeze table for making selection.

Recommended Anti-freeze Table

Brand Name	Manufacture	Effective Use	Type
HONDA Anti-Freeze and Coolant	Chuo Kagaku Co., Ltd.	One year	Ethylene glycol base, permanent type
PENTALUBE Long Life and Anti-Rust Coolant	Pentalube Co., Ltd.	One year	Ethylene glycol base
EELAR Anti-Freeze and Summer Coolant	Du Pont Co., Ltd.	Color check : replace when solution changes from red to yellow	Ethylene glycol base
PRESTONE Anti-Freeze and Coolant	Union Carbide Co., Ltd.	All winter	Ethylene glycol base
ROTUNDA Permanent Anti-Freeze	Ford Motor Company	All winter	Ethylene glycol base
MOBIL GEL Permazone	Socony Mobil Oil Co.	Permanent	Ethylene glycol base, corrosion and rust inhibited
HOLTS GLYCOL MASTER Anti-Freeze	Holts Product Ltd.	Color check : replace when solution changes from red to yellow	Ethylene glycol and menthol base, corrosion and rust inhibited
GULF Anti-Freeze and Summer Coolant	Gulf Oil Co.	One year	Ethylene glycol base, corrosion and rust inhibited
ATLAS-Perma-Guard Antivries and Antigel	Esso Belgium N.V.	Permanent	Ethylene glycol base corrosion and rust inhibited
TOTAL Antivries and Antigel	Total Oil Co.	_____	_____
SHELL Anti-Freeze	Belgium Shell Co.	_____	_____

21-17 PERIODIC MAINTENANCE

Radiator Servicing

Accumulation of water scale in the radiator will cause engine overheating, therefore, drain the radiator and flush out cooling system periodically.

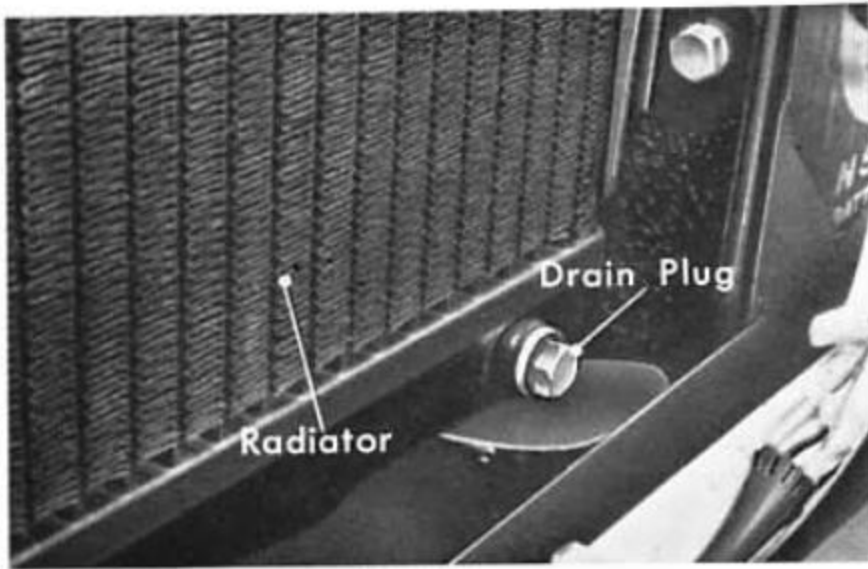


Fig. 21-46

1. Drain the radiator water by loosening the drain plug (Fig. 21-46), refill with clean water and operate the engine for about five minutes and then drain, repeating this operation several times. If the water temperature is high, caution should be taken when removing the radiator filler cap, loosen the filler cap slowly and allow pressure to escape before removing the cap, otherwise, hot water will gush out.

2. Use only good grade radiator flushing compound specified for aluminum engine. Cooling system capacity: 5.2 l (9.2 Imp. pt., 11.0 U.S. pt.) or 5.7 l (11.0 Imp. pt., 12.0 U.S. pt.) with car heater.
3. Run engine continuously for an hour after the engine has reached normal operating temperature of 80~100°C (176~212°F) and then drain the flushing compound completely. Do not operate the engine at a temperature below 80°C (176°F) because it will not permit the thermostat to open, thus preventing the flushing of the entire cooling system.
4. Fill the radiator with clean water, operate the engine for five minutes to ensure complete circulation of water through the passages and drain it again.
5. When filling the radiator, do not use plain washer alone as this has a tendency to corrode the various aluminum components of the engine. Always add Anti-Rust compound (corrosion inhibitor) specified for aluminum engine.




Recommended Anti-Rust Table

Brand Name & Manufacture	Type
Hydrotone (Socony Mobil Oil Co.)	Water soluble
Rootes, Coolant Inhibitor (Rootes Group Ltd.)	Water soluble
Radiatol, B. 61 (Fina Co.)	Water soluble
Radiatortex (Belgium Caltex Petroleum Co.)	Emulsion
Esso Anti-Rust (S.A. Esso Belgium N.V.)	Emulsion
Donax C (Belgium Shell Co.)	Emulsion
Gulf Oil (Gulf Oil Corp.)	Emulsion

6. When replacing the filler cap, make certain that the cap is screwed down firmly, otherwise, the pressurized system will be ineffective.

BATTERY

Fill and replenish distilled water by observing the level indicator device in the filler holes, to the level shown in the figure below :

- | | | | |
|--|----------------|------------------|---|
| a) (Electrolyte level even with indicator) | Correct level | (See Fig. 21-47) |  |
| b) (Electrolyte level below indicator) | Level too low | (See Fig. 21-48) |  |
| c) (Electrolyte level above indicator) | Level too high | (See Fig. 21-49) |  |

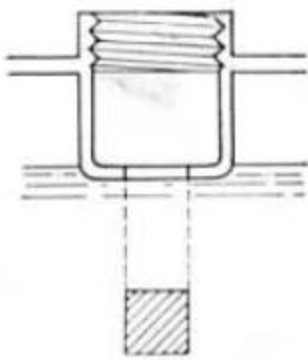


Fig. 21-47

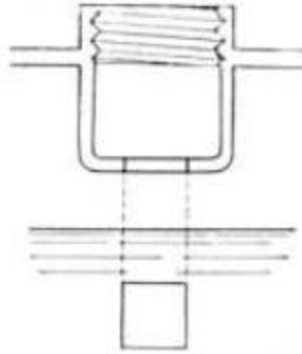


Fig. 21-48

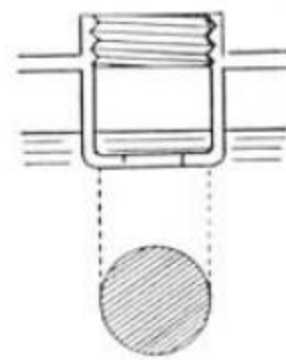


Fig. 21-49

After filling, allow the battery to stand for two to three hours, and adjust the electrolyte level.

In order to assure satisfactory service from a battery the following instructions must be strictly followed :

1. Mount the battery firmly on the vehicle and make sure that the terminals are properly connected and tightened. Battery terminals should be protected by covering with a coating of vase line or grease to prevent corrosion.
2. If the battery seems ineffective, or if the electrolyte specific gravity is found to be lower than 1,200, the battery should be recharged as soon as possible. Over-discharging of a battery will greatly shorten its life.

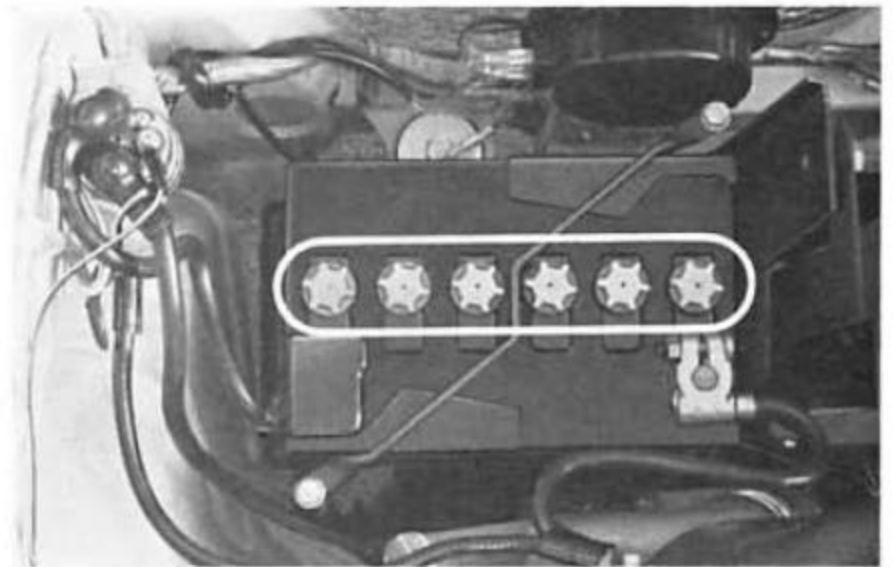


Fig. 21-50

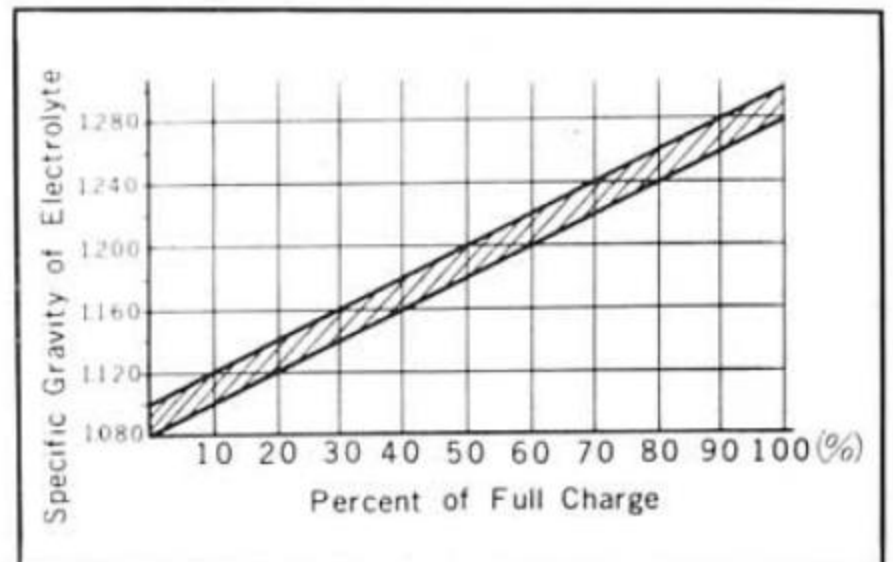


Fig. 21-51

21-19 PERIODIC MAINTENANCE

3. When recharging, charge with the current specified in Fig. 21-52-1.

Type Battery	Voltage (V)	Capacity at 10-hr rate (AH)	Charging current (A)	Volume of electrolyte required for filling	Specific gravity of electrolyte when fully charged at 20°C (68°F)
NS 40Z	12	35	3.5	2.4 ℓ (4.24 Imp. pt., 5.04 U.S. pt.)	1.280 ± 0.01
N 40	12	40	4.0	2.5 ℓ (4.40 Imp. pt., 5.28 U.S. pt.)	1.280 ± 0.01

Fig. 21-52 (1)

The specific gravity of the battery electrolyte will vary inversely according to the temperature. 1°C (1.8°F) rise in temperature will cause a 0.0007 unit decrease in specific gravity and in case of a drop in temperature; a rise in specific gravity will result (Fig. 21-52-2).

Temperature		Specific Gravity
°C	°F	
50°	(122°)	1.259
40°	(104°)	1.266
30°	(86°)	1.273
20°	(68°)	1.280
10°	(50°)	1.287
0°	(32°)	1.294
-10°	(24°)	1.301
-20°	(26°)	1.308

Fig. 21-52 (2)

It is important that this condition be understood to prevent starting difficulties in cold weather and damage to the battery in hot weather.

A fully charged battery at standard temperature should be 1,280; for the tropic 1,260 and for extremely cold weather, it should be 1,300.

As the battery charges, it will begin to produce gas, continue charging until:

- The battery voltage rises above 15 volts.
- The electrolyte specific gravity rises to about 1,280
- The voltage remains constant for one or two hours.

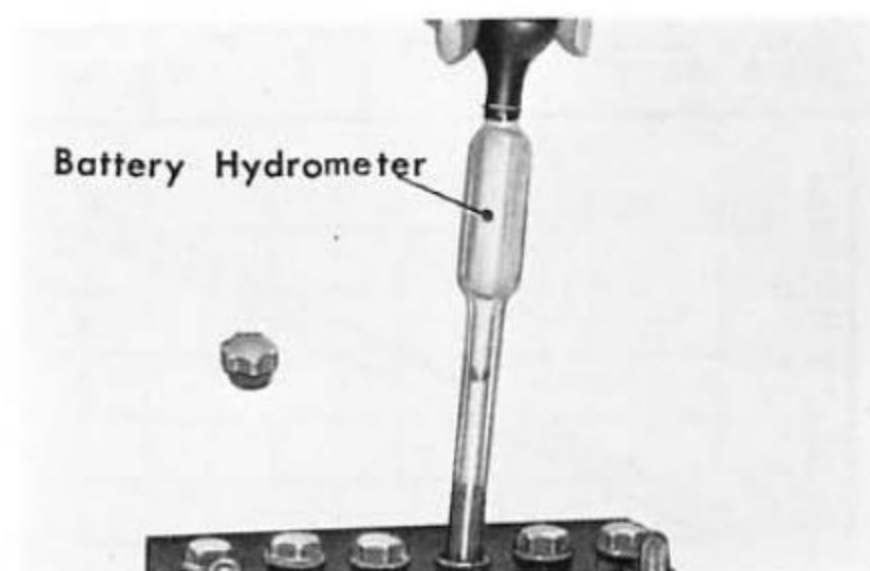


Fig. 21-53

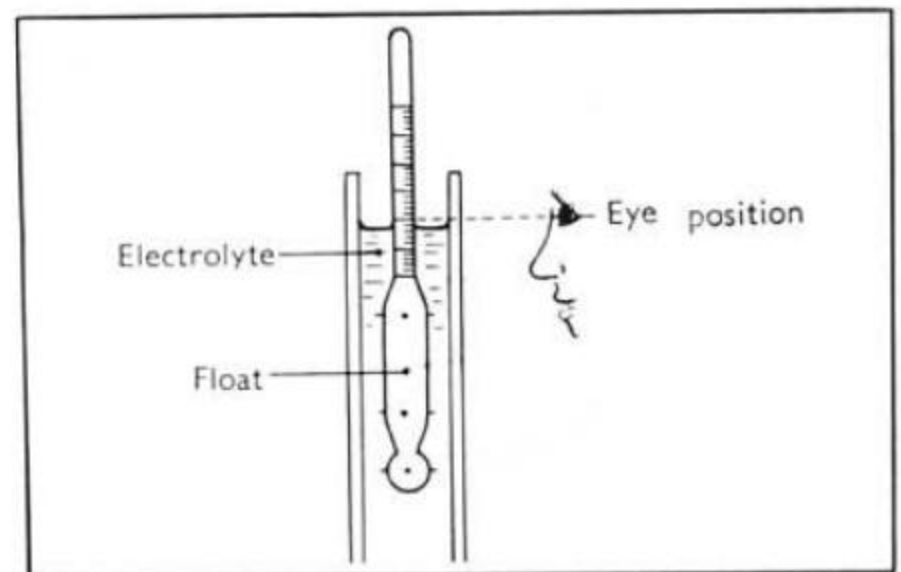


Fig. 21-54

4. If a battery mounted in a vehicle is always in an under-charged or in over-charged condition accompanied by a constant drop in electrolyte level, inspect the generator regulator and check the entire electrical system for short circuits or open circuits. Over-charging and under-charging are both harmful to the battery.

CLUTCH

1. Clutch pedal

Inspect the clutch pedal movement at the top of the pedal. Locate the point of clutch engagement and also the pedal clearance from the floor when depressed completely. Make adjustment if they are not within the specified tolerances (Fig. 21-55).

- Pedal play : 15~20 mm (0.6~0.8")
- Pedal travel : 30~35 mm (1.2~1.4")

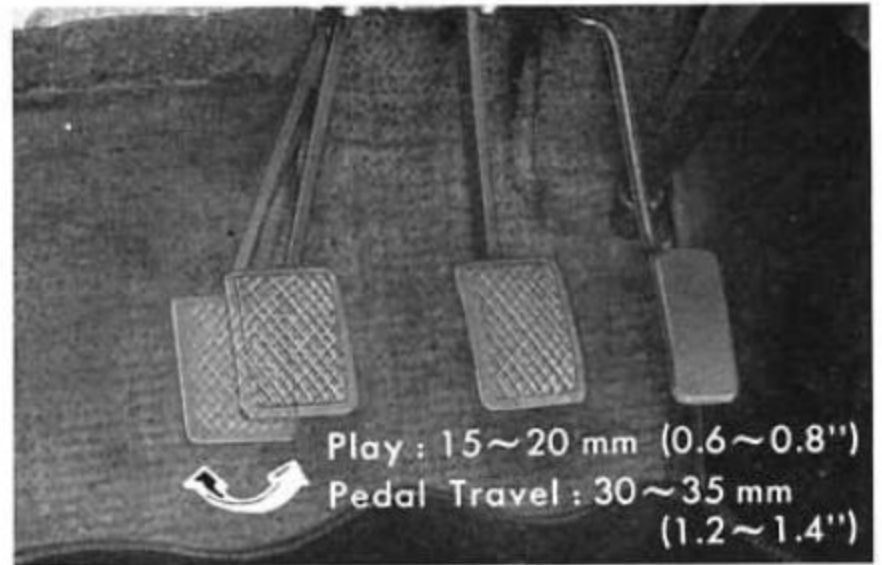


Fig. 21-55

2. Clutch Adjustment

Adjust the clutch pedal travel by loosening the locknut on the slave cylinder pushrod and turning the adjuster nut. Moving the release arm in the direction of "F" shown in Fig. 21-56 will decrease the pedal travel and moving the release arm in the "R" direction will increase the pedal travel (Fig. 21-56).

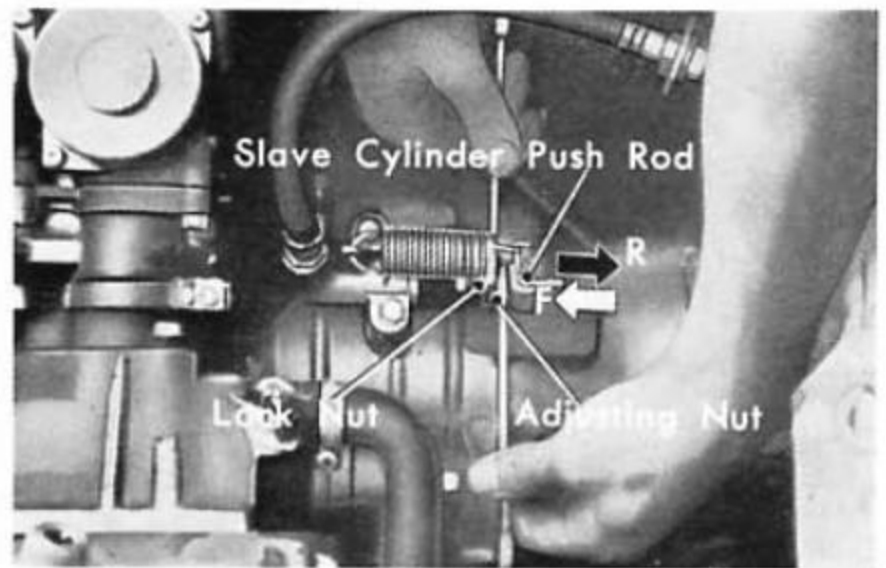


Fig. 21-56

3. Clutch Hydraulic Fluid

Check the hydraulic fluid level in the reservoir; if the level is low, replenish with SAE 70R-3 H.D. type hydraulic fluid of good quality to bring the level up to the mark on the reservoir (Fig. 21-57).

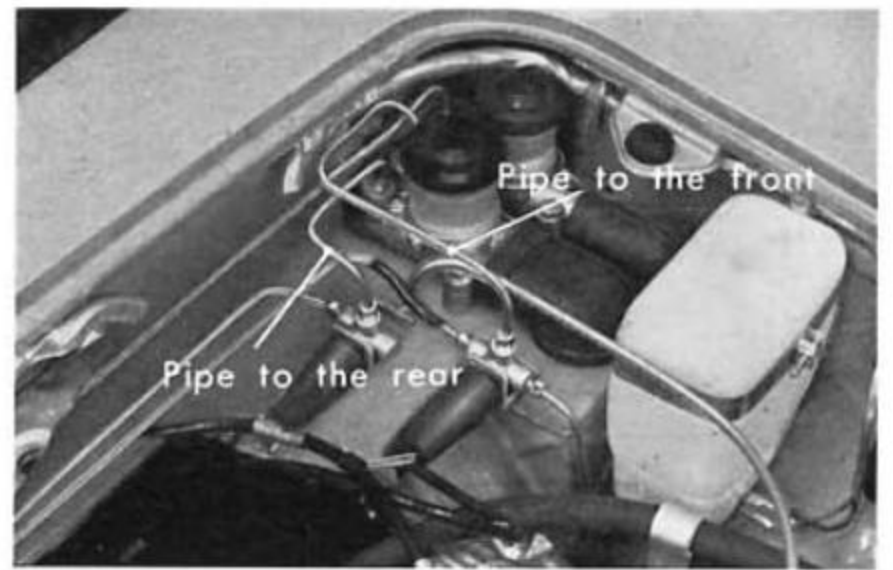


Fig. 21-57

4. Air Bleeding

Perform the air bleeding, starting with the most remote cylinder. Attention should be paid to the level of the hydraulic fluid in the master cylinder reservoir during the bleeding operation.

Attach a bleeder hose to the bleeder screw (Fig. 21-58) and have a helper pump the pedal 3~4 times, and keep the pedal depressed. Loosen the bleeder screw to exhaust any air bubbles and quickly retighten. Perform this cycle several times until the air bubbles are completely eliminated.

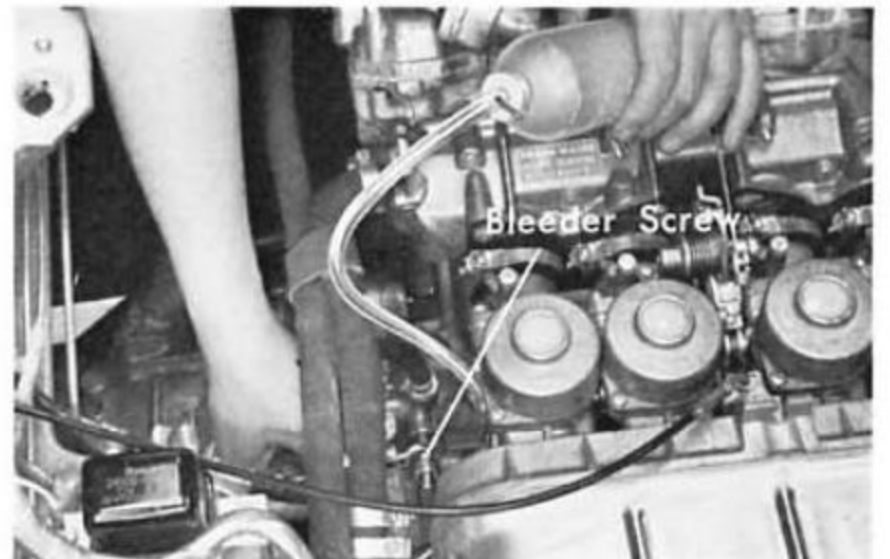


Fig. 21-58

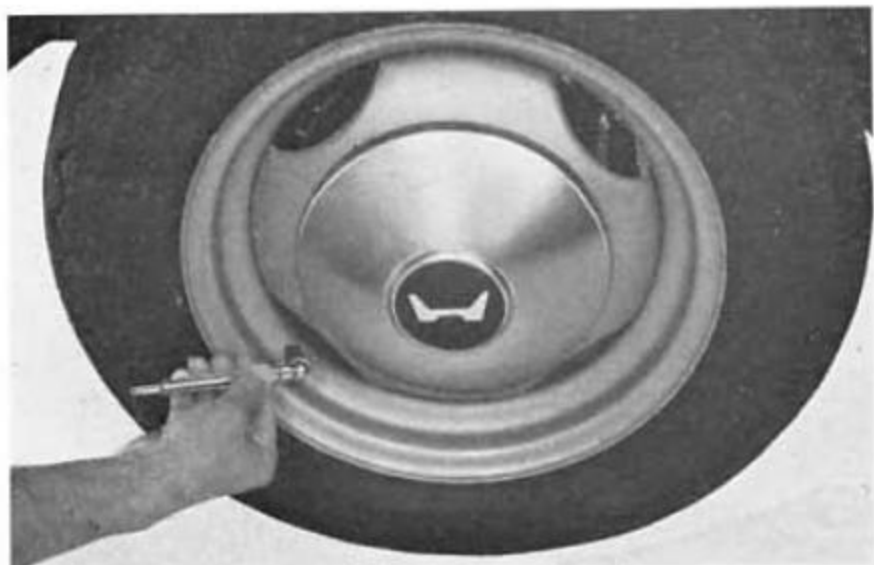


Fig. 21-59

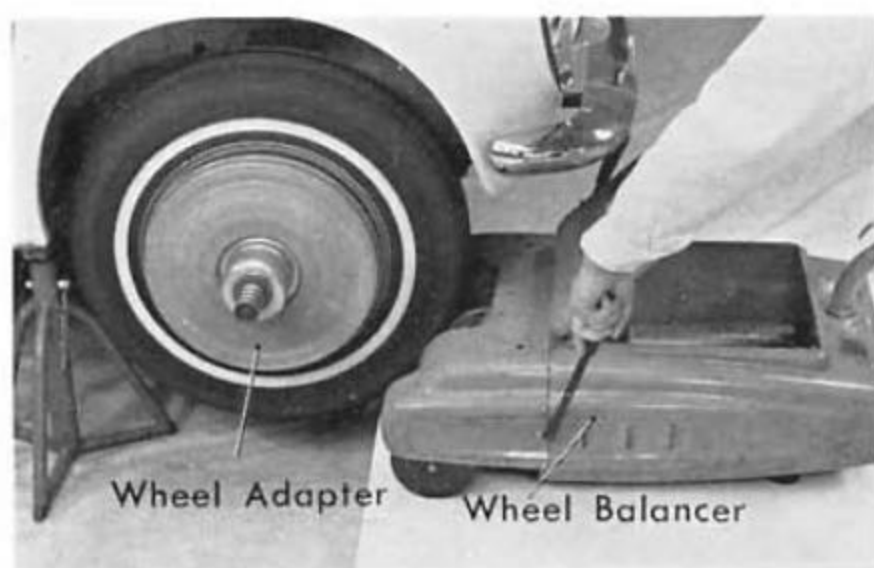


Fig. 21-60

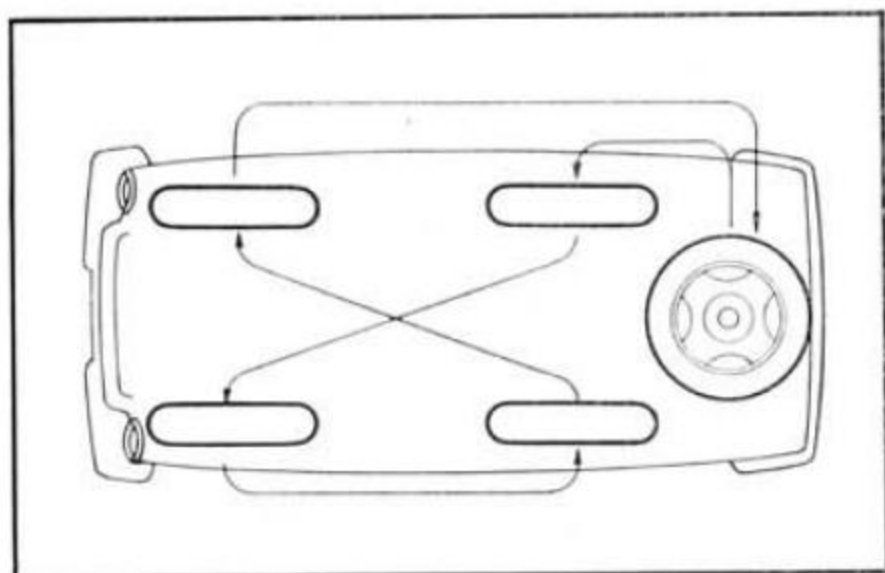


Fig. 21-61



Fig. 21-52

WHEELS · TIRES

1. Tire Air Pressure

Tires with improper air pressure will cause uncomfortable riding, excessive tire wear and poor brake performance. Front and rear tire air pressure shall be 1.4 kg/cm² (20 psi) (Fig. 21-59).

Do not move the wheel balance weights as it will cause unbalance of the wheel.

2. Wheel Rebalancing

If the tires had been changed, it should be re-balanced with a wheel balancer (Fig. 21-60). The balancing weight and dynamic setting should be less than 30 g (1 oz.) at the wheel rim.

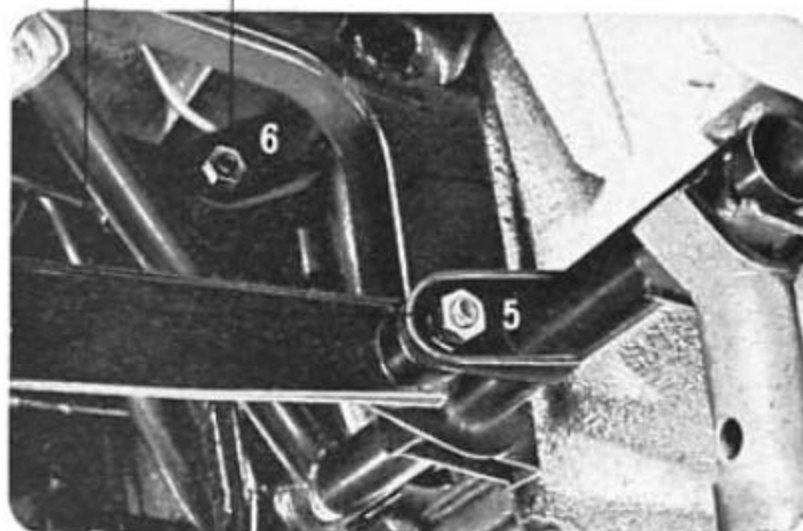
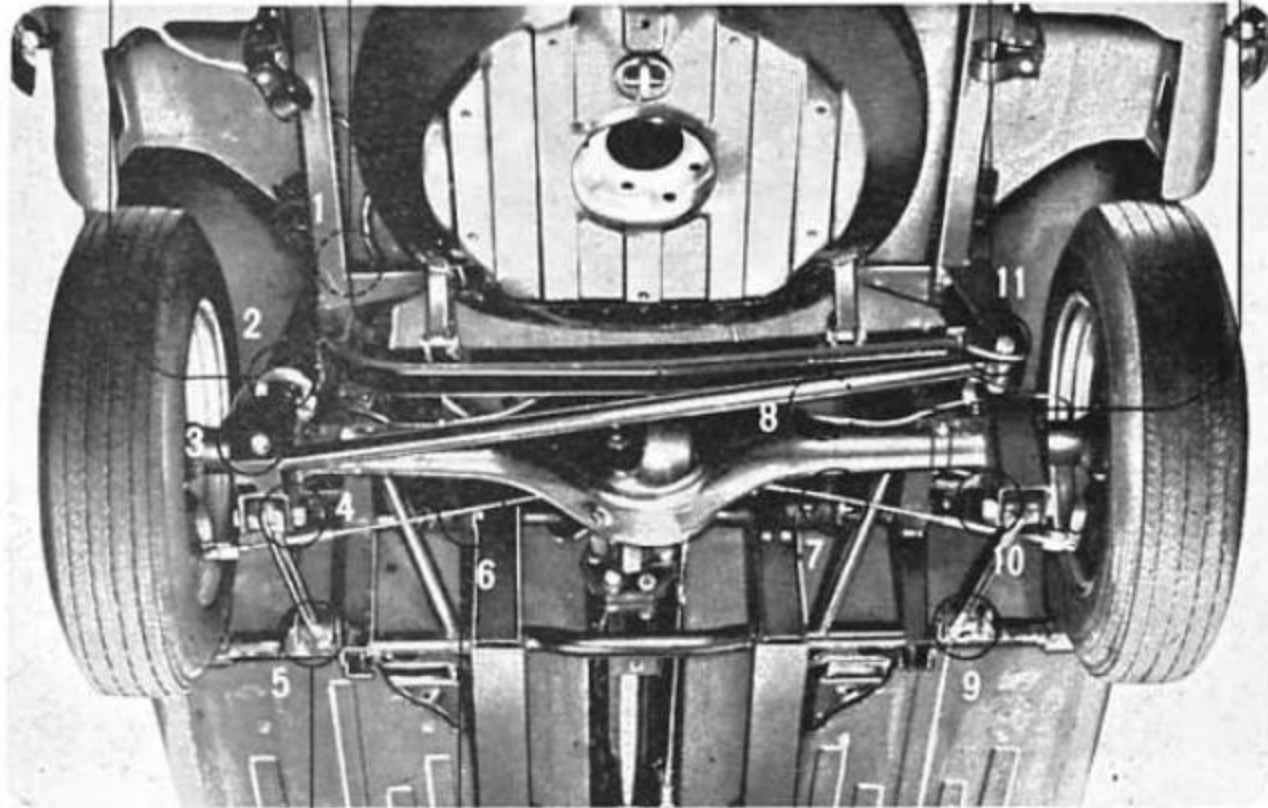
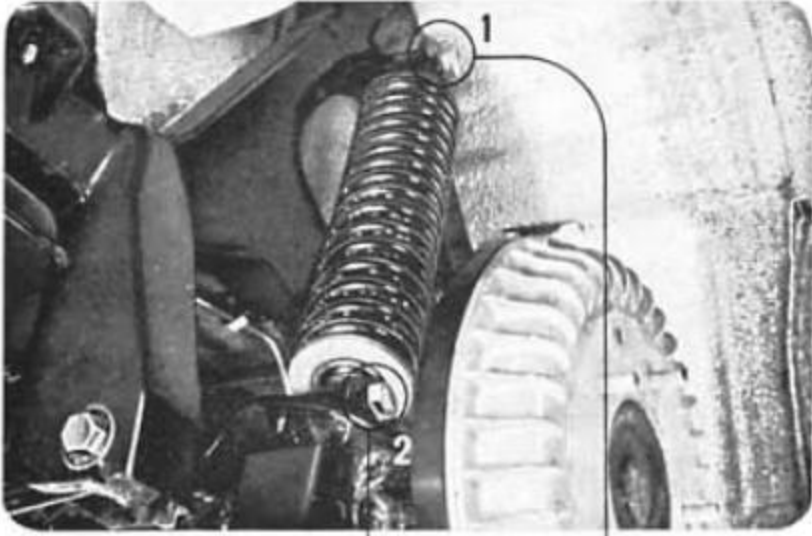
3. Tire Rotation

Tires will wear unevenly when used for a long period of time at the same location, therefore, the locations of tires should be rotated periodically every 6,000 km (3,700 miles) in the sequence as shown in the Fig. 21-61.

When removing or installing the wheels, loosen or tighten the nuts in the sequence shown in the Fig. 21-62.

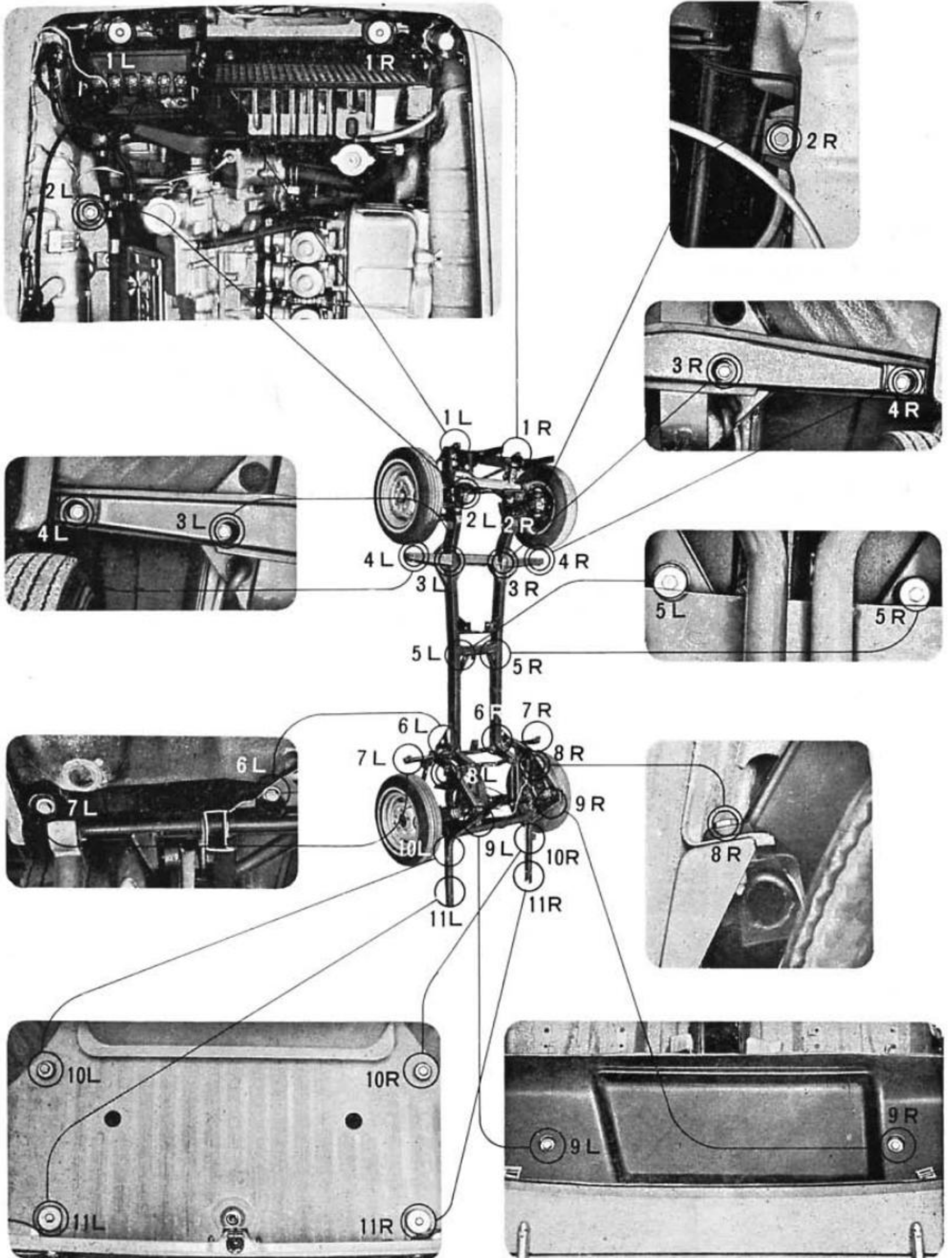
CHASSIS MOUNTING BOLTS

A. REAR SUSPENSION MOUNTING BOLTS



Note: Torque the bolts to 7.2 kg-m (52.1 ft-lbs)

B. BODY MOUNTING BOLTS



- Note:** Torque the bolts to 2.5 kg-m
- 2.5 kg-m (18.1 ft-lbs).....1, 5, 6, 7, 9, 10, 11
 - ⊙ 4.5 kg-m (32.5 ft-lbs).....2, 3, 4, 8

22. SERVICEABLE LIMIT

Unit: mm with equivalent inch values shown in () except when noted otherwise.

Section	No.	Part Name	Inspecting Item	Standard Value	Serviceable Limit	Remarks
E N G I N E	1	Cylinder Head Cover	Warpage	0.03 (0.0012)	0.06 (0.0024)	
	2	Cylinder Head	Cylinder head cover mating flange warpage	0.03 (0.0012)	0.06 (0.0024)	
	3	Cylinder Sleeve	Cylinder flange mating surface warpage	0.03 (0.0012)	0.06 (0.0024)	
			Intake manifold distortion	0.03 (0.0012)	0.06 (0.0024)	
			Tightening torque	2.5~3.0kg-m (18.1~21.7ft-lbs.)	—	
			Inside diameter	60.02~60.03 (2.3629~2.363)	60.12 (2.367)	
			Difference in max. and min. ID	0~0.005 (0~0.0002)	0.05 (0.002)	
			Out-of-roundness	0~0.005 (0~0.0002)	0.05 (0.002)	
			Outside diameter	68.4~70.4 (2.693~2.772)	—	
	4	Chain Case Spacer	Flange height	13.985~14.015 (0.551~0.552)	—	
			Flange parallelism	0~0.01 (0~0.0004)	—	
	5	Piston	Head diameter	59.40~59.45 (2.339~2.341)	59.3 (2.335)	
			Skirt diameter	59.98~60.00 (2.361~2.362)	59.9 (2.360)	
			Taper (One stage)	59.79~59.81 (2.354~2.355)	—	
			Cam ground	59.74~59.76 (2.353~2.353)	—	
			Ring groove width Top	1.505~1.520 (0.0592~0.0598)	1.550 (0.0610)	
			" Second	1.505~1.520 (0.0592~0.0598)	1.550 (0.0610)	
			" Oil	2.505~2.52 (0.0987~0.0993)	2.55 (0.228)	
			Ring groove diameter	53.9~54.0 (2.124~2.128)	53.5 (2.108)	
	6	Piston Ring	Min. piston clearance	0.02 (0.0008)	0.05 (0.002)	
			Piston oversize	0.25, 0.50, 0.75, 1.00 (0.01, 0.02, 0.03, 0.04)	—	
			Top Thickness	1.475~1.490 (0.0581~0.0587)	1.40 (0.0551)	
			Width	2.5~2.7 (0.096~0.106)	—	
Tension			0.95~1.25kg (2.09~2.75lb.)	0.82kg max. (1.80 lbs.)		
End gap			0.15~0.30 (0.006~0.012)	0.60		

22-2 SERVICEABLE LIMIT

Section	No.	Part Name	Inspecting Item	Standard Value	Serviceable Limit	Remarks
E Z - O Z E	7	Piston Pin	Second	Thickness 1.475~1.490 (0.058~0.059)		
			Width 2.5~2.7 (0.099~0.106)	—		
			Tension 0.43~0.75 kg (0.946~1.65 lbs.)	0.35kg (0.77 lbs.)		
			End gap 0.15~0.30 (0.006~0.012)	0.60 (0.024)		
			Oil	Thickness 2.475~2.490 (0.097~0.098)	2.45 (0.097)	
			Width 2.6~2.8 (0.102~0.110)	—		
			Tension 1.6~2.0 kg (3.52~4.411 lbs.)	1.4kg max. (3.08lbs)		
			End gap 0.1~0.3 (0.004~0.012)	0.75 (0.030)		
			Piston ring side clearance	Top 0.015~0.045 (0.0006~0.0018)	0.1 (0.004)	
			Second 0.015~0.045 (0.001~0.002)	0.1 (0.004)		
			Oil 0.015~0.045 (0.001~0.002)	0.1 (0.004)		
			Piston ring oversize interval 0.25, 0.50, 0.75, 1.00 (0.01, 0.02, 0.03, 0.04)	—		
			Outside diameter 17.994~18.000 (0.7084~0.7087)	17.98 max. (0.708)		
			Overall length 50.9~51.1 (2.004~2.013)	—		
	8	Connecting Rod	Small end ID 18.010~18.025 (0.709~0.710)	18.055 max. (0.711)		
			Distorsion 0~0.03 (0~0.0012)	2.0 (0.079)		
			Large end Thickness 19.95~20.00 (0.786~0.788)	19.85max. (0.782)		
			Large end ID 44.048~44.068 (1.734~1.735)	44.08 (1.736)		
			Clearance parallel to axis 0.15~0.35 (0.006~0.0014)	0.50 (0.019)		
			Clearance normal to axis 0~0.008 (0~0.0003)	0.050 (0.0020)		
			Small end to large end parallelism 0.08/100 (0.003/4)	0.15/100 max. (0.006/4)		
			Small end to large end distorsion 0.1/100 (0.004/4)	0.20/100 (0.008/4)		
			9	Connecting Rod Roller	Outside diameter 2.994~3.009 (0.118~0.119)	—
Length 13.25~13.4 (0.522~0.528)					—	
10	Crankshaft	Quantity 22 each	—			
		Distorsion 0.01 (0.0004)	0.05 (0.0016)	At the center		
		Clearance parallel to crank axis 0.1~0.18 (0.004~0.007)	0.35 (0.014)			
11	Thrust Plate A & B	Thrust plate installation groove width 6.00~6.05 (0.236~0.238)	6.10 (0.240)			
		Thickness 5.87~5.90 (0.231~0.232)	5.75 (0.226)			
12	Crank Wheel	Crank pin bore 35.905~35.920 (1.414~1.415)	—			
13	Front, Center & Rear Crankshaft Section	Rod bearing journal 36.030~36.058 (1.420~1.421)	—			
		Main bearing journal 43.99~44.00 (1.733~1.734)	43.960 max. (1.732)			

Section	No.	Part Name	Inspecting Item	Standard Value	Serviceable Limit	Remarks
E N G I N E	14	Crankshaft Bearing Holder	Inside diameter Front and Center Rear	56.00 ~ 56.01 (2.206 ~ 2.207) 59.00 ~ 59.01 (2.325 ~ 2.325)	56.04 (2.208) 57.04 (2.247)	
			Bearing clearance	0.008 ~ 0.016 (0.0003 ~ 0.0006)	0.050 (0.0020)	
	15	Main Bearing Roller	Diameter	5.996 ~ 6.002 (0.2361 ~ 0.2363)	5.982 (0.235)	
			Length Front and Rear	12.9 ~ 13.0 (0.508 ~ 0.512)	—	
			Center	14.9 ~ 15.0 (0.578 ~ 0.591)	—	
			Quantity Front and Center Rear	21 18	—	
	16	Front Crankshaft Section	Cam chain drive sprocket No. of teeth Root diameter	15 32.59 ~ 32.67 (1.284 ~ 1.287)	— 32.3max. (1.273)	
			Starting sprocket shaft diameter	26.99 ~ 27.00 (1.063 ~ 1.064)	26.97 max. (1.063)	
	17	Starting Sprocket	No. of teeth Root diameter	36 84.34 ~ 84.54 (3.320 ~ 3.328)	— 84.2 (3.315)	
			Hub bore	33.01 ~ 33.02 (1.301 ~ 1.301)	—	
			Starting clutch shaft diameter	42.175 ~ 42.200 (1.6604 ~ 1.6604)	42.100 (1.6575)	
	18	Starting Clutch Roller Spring	Free length	37.7 (1.485)	—	
	19	Cap	Inside diameter	4.6 ~ 4.75 (0.181 ~ 0.187)	—	
			Outside diameter	6.25 ~ 6.33 (0.246 ~ 0.248)	5.20 (0.205)	
	20	Roller	Diameter	14.99 ~ 15.005 (0.590 ~ 0.591)	—	
	21	Starting Chain	Type Length	60 link w/joint 458.666 ~ 459.566 (18.058 ~ 18.093)	— 463.000 (18.228)	
			Pitch	7.774 (0.306)	—	
			Bush Dia	4.55 ~ 4.59 (0.179 ~ 0.180)	—	
	22	Camshaft	Bend	0 ~ 0.01 (0 ~ 0.0004)	0.05 (0.0020)	
			End play	0.10 ~ 0.55 (0.004 ~ 0.022)	0.70 (0.028)	
			Shaft journal diameter Front & center Rear	32.95 ~ 32.97 (1.297 ~ 1.298) 24.95 ~ 24.97 (0.982 ~ 0.983)	32.90 (1.295) 24.90 (0.980)	
			Lift Inlet Exhaust	7.2 (0.284) 6.7 (0.264)	7.0 (0.276) 6.6 (0.260)	
			Overall height Inlet Exhaust	44.70 (1.760) 44.2 (1.740)	44.45 (1.750) 44.0 (1.732)	
23	Cam Bearing Holder	Bore Front & Center Rear	33.000 ~ 33.025 (1.299 ~ 1.300) 25.000 ~ 25.021 (0.984 ~ 0.985)	33.100 (1.303) 25.100 (0.988)		

22-4 SERVICEABLE LIMIT

Section	No.	Part Name	Inspecting Item	Standard Value	Serviceable Limit	Remarks
E N G I N E			Bearing clearance Front & Center	0.030~0.075 (0.0012~0.0030)	0.200 (0.008)	
			Rear	0.030~0.071 (0.0012~0.0030)	0.200 (0.008)	
	24	Inlet & Exhaust Cam Sprocket	No. of teeth	30	—	
			Root diameter	69.81 (2.749)	69.5 (2.738)	
	25	Cam Chain	Type	Endless	—	
			Length	956.202 (37.674)	961.000 (37.863)	
	26	Exhaust Valve	Thickness	1.35~1.65 (0.053~0.065)	1.0 (0.039)	
			Stem diameter	6.350~6.360 (0.250~0.251)	6.33 max. (0.249)	
			Face angle	90~91°	—	
			Overall length	84.9 (3.345)	—	
	27	Inlet Valve	Thickness	0.85~1.15 (0.033~0.045)	0.55 (0.022)	
			Stem diameter	6.38~6.39 (0.251~0.252)	6.36 (0.251)	
			Face angle	90~91°	—	
			Overall length	81.15 (3.197)	—	
	28	Valve Spring (Inner)	Free length	35.3 (1.391)	34.0 max. (1.340)	
			Trueness	0~1°30'	2°30'	
			Installed load/length	6.0~6.6kg/30.5 (13.2~14.5 lbs/1.202)	5.0kg/30.5 (11 lbs./1.202)	
	29	Valve Spring (Outer)	Free length	37.9 (1.493)	36.5 max. (1.438)	
			Trueness	0~1°30'	2°30'	
			Installed load/length	12.6~13.8kg/32.5 (27.78~30.43 lbs/ 1.280)	11.5kg/32.5 max. (25.3 lbs/1.281)	
	30	Inlet Valve Guide	Inside diameter	6.40~6.41 (0.25~0.253)	6.44 (0.648)	
	31	Exhaust Valve Guide	Inside diameter	6.40~6.41 (0.252~0.253)	6.44 (0.648)	
	32	Valve Lifter	Outside diameter	29.92~29.95 (1.178~1.179)	29.90 (1.177)	
	33	Tappet Adjusting Shim	Thickness	2.3~4.1, 0.05 interval (0.091~0.160 0.002 interval)	—	72 kinds
	34	Tappet Clearance	Inlet & Exhaust	0.18~0.22 (0.007~0.009)	—	
	35	Valve Timing (Inlet)	Opening angle	20°, 1.2 (0.05) lift	—	
			Closing angle	40°, 1.2 (0.05) lift	—	
		(Exhaust)	Opening angle	40°, 1.2 (0.05) lift	—	
			Closing angle	20°, 1.2 (0.05) lift	—	
	36	Chain Guide Roller	Outside diameter	① 60 (2.362) ② 52 (2.047)	—	
			Inside diameter	12.000~12.018 (0.472~0.473)	—	
	37	Chain Guide Roller Pin	Shaft OD	11.966~11.984 (0.471~0.472)	11.930 (0.470)	
	38	Chain Case Guide Roller	Outside diameter	① 46 (1.811) ② 42 (1.654)	—	
	39	Head Guide Roller	Outside diameter	① 49.8~50.0 (1.961~1.969) ② 46 (1.811)	—	
	40	Chain Tensioner	Roller OD	① 49.8~50.0 (1.961~1.969) ② 46 (1.811)	—	
			Tensioner spring free length	56.1 (2.209)	—	

SERVICEABLE LIMIT 22-5

Section	No.	Part Name	Inspecting Item	Standard Value	Serviceable Limit	Remarks
E N G I N E	41	Main Oil Filter	Sprocket root diameter	37.46~37.56 (1.475~1.479)	37.20 (1.465)	
			Bushing ID	14.006~14.024 (0.551~0.552)	—	
	42	Oil Filter Shaft	Outside diameter	13.967~13.994 (0.550~0.551)	13.940 (0.594)	
	43	Oil Pump	Pumping capacity	9.6 ℓ /2250pump rpm (14.08Imp. pt.)	—	
			Tip clearance	0.08~0.12 (0.003~0.005)	0.25 (0.010)	
			End clearance	0.02~0.05 (0.001~0.002)	0.15 (0.006)	
			Body clearance	0.080~0.145 (0.003~0.006)	0.250 (0.010)	
	44	Oil Pump Shaft	Shaft OD	8.972~8.987 (0.3534~0.3538)	8.950 (3.524)	
	45	Oil Pump Body	Shaft ID	9.000~9.015 (0.3543~0.3549)	9.050 (0.3545)	
	46	Water Pump	Water feed capacity	70 ℓ /4000 (148US pt/min)pump rpm (123 Imp.pt/min)	—	
	47	Fan Belt	Slack	10~20 (0.394~0.787)	—	
	48	Thermostat	Start of opening	78~82°C (172~180°F)	—	
			Fully opened	88~92°C (190~198°F)	—	
	49	Fuel Pump	Pumping capacity	0.6 ℓ /min—(H:100) 1 ℓ min (H: 0)	—	
	50	Carburetor	Manufacturer	Keihin Seiki	—	
		Type	1000-338-00	—		
		Venturi diameter, Primary	17 mm (0.669)	—		
		Secondary	30 mm (1.181)	—		
		Main jet Primary	# 80	—		
		Secondary	#115	—		
		Air jet Primary	# 60	—		
		Secondary	# 80	—		
		Slow air jet	off Idle	—		
		Neele valve height from valve seat	2.5 (0.098)	2.0 (0.079)		
		Vacuum piston spring free length	53 (2.087)	—		
		Clearance between carb- uretor body and throttle valve stem	Min. 0.025 (0.001) Max. 0.055 (0.002)	—		
C L U T C H	51	Flywheel	Disc installation surface ID	d ₁ 104 (4.095)	—	
			Disc installation surface OD	d ₁ 207.939~ 207.985 (8.185~8.189)	—	
		Runout	Surface X & Y 0.05 (0.002)	0.30 (0.012)		
	52	Clutch Diaphragm Spring	Tightening torque	10kg-m (50.61ft.lb)	—	
		Free height (h)	13.56 (0.534)	—		
		Installed load	300~340kg (661.5~749.7 lbs.) 320kg (704lbs.) (when h ₁ = 1.5 (0.06)	—		

22-6 SERVICEABLE LIMIT

Section	No.	Part Name	Inspecting Item	Standard Value	Serviceable Limit	Remarks
CLUTCH	53	Pressure Disc	Disc installation area thickness	14.3~14.4 (0.563~0.567)	—	
			Distorsion	0.03 (0.001)	0.15 (0.006)	
			Warpage	0.05max. (0.002)	0.15 (0.006)	
	54	Release Arm Shaft	Outside diameter	13.935~13.950 (0.5486~0.5492)	13.900 (0.547)	
	55	Clutch Friction Disc	Depth to facing rivet head	1.4 (0.055)	0.3 (0.012)	
			Facing OD	165 (6.496)	—	
			ID	110 (4.331)	—	
			Runout Face	0.8 80R (0.031 3.15R)	1.0 (0.039)	
			Radial	0.6 (0.024)	1.0 (0.039)	
			Spline backlash	0.020~0.135 (0.0008~0.0053)	0.200 (0.008)	On the cycle of 160φ (6.299)
	56	Bushing at Clutch End	Inside diameter	16.01~16.06 (0.631~0.633)	16.15 (0.636)	
			Outside diameter	21.028~21.049 (0.829~0.829)	—	
			Fit allowance	0.007~0.049 (0.0003~0.002)	—	
			Looseness with main drive shaft	0.026~0.094 (0.001~0.004)	0.15 min. (0.006)	
	57	Clutch Pedal	Play	10~20 (0.394~0.787)	—	
		Clearance between pedal and floor when clutch is released	60~70 (2.362~2.756)	—		
58	Clutch Master Cylinder	Shaft ID	14.00 (0.551)	14.15 (0.557)		
		Cylinder ID	19.00 (0.748)	19.08 (0.751)		
		Piston OD	19.00 (0.748)	18.90 (0.744)		
		Clearance between cylinder and piston	0.020~0.086 (0.0008~0.003)	0.100 (0.004)		
		Primary cup max. OD	20.00 (0.787)	19.70 (0.776)		
		Secondary cup max. OD	20.21 (0.796)	20.00 (0.787)		
		Return spring free length	62.6 (2.465)	58.5 (2.303)		
59	Clutch Slave Cylinder	Cylinder ID	18.26~18.312 (0.719~0.721)	18.40 (0.725)		
		Piston OD	18.207~18.240 (0.717~0.719)	18.10 (0.713)		
		Clearance between cylinder and piston	0.02~0.105 (0.001~0.004)	0.11 (0.004)		
		Cup max. OD	19.2~19.6 (0.749~0.751)	19.1 (0.753)		
TRANSMISSION	60	Main Drive Gear	Looseness parallel to axis	0.035 (0~0.014)	0.40 (0.016)	
			Ball bearing installation	24.996~25.009 (0.984~0.985)	—	
			Needle bearing installation area ID	22.000~22.013 (0.787~0.788)	22.030 (0.789)	
			Shaft end OD	15.966~15.984 (0.629~0.630)	15.950 (0.628)	
	61	Main Drive Gear Needle Bearing	Roller OD	1.992~1.998 (0.078~0.079)	1.987 (0.078)	
			Length	13.8 (0.544)	—	
		Quantity	15 each	—		
62	Third Gear	Overall length	24.95~25.00 (0.983~0.985)	24.9 (0.981)		
		Inside diameter	34.2~34.216 (1.347~1.348)	34.23 (1.349)		
		Distance between chordal measurement	21.697~21.721 (0.855~0.856)	—	4 Teeth	

SERVICEABLE LIMIT 22-7

Section	No.	Part Name	Inspecting Item	Standard Value	Serviceable Limit	Remarks
T R A N S M I S S I O N	63	Second Gear	Looseness parallel to axis	0.15~0.25 (0.006~0.010)	0.4 (0.016)	Selection fit
			Overall length	24.95~25.00 (0.983~0.985)	24.90 (0.981)	
			Inside diameter	34.2~34.216 (1.347~1.348)	34.23 (1.349)	
	64	Low Gear	Looseness parallel to axis	0.15~0.25 (0.06~0.010)	0.4 (0.016)	Selection fit
			Overall length	35.75~35.85 (1.408~1.410)	—	
	65	Ball Bearing with Retaining Ring	Distance between chordal measurement	30.217~30.264 (1.191~1.192)	—	4 Teeth
	66	Mainshaft	Inside diameter	24.99~25.00 (0.9839~0.9843)	—	
	67	Counter Gear	Looseness in direction of spline rotation	0.020~0.086 (0.001~0.003)	0.1 (0.004)	
			Looseness parallel to axis	0.08~0.25 (0.003~0.010)	0.7 (0.03)	
	68	Countershaft Retainer A	Shaft OD at countershaft A side	21.987~22.000 (0.866~0.867)	21.97 (0.866)	
			Shaft OD at countershaft B side	17.989~18.0000 (0.7082~0.7087)	17.970 (0.7075)	
			Countershaft installation area ID	26.000~26.013 (1.0236~1.0241)	26.03 (1.026)	
	69	Countershaft Retainer B	Inside diameter	22.000~22.013 (0.866~0.867)	22.030 (0.878)	
	70	Countershaft Needle Bearing	Roller OD	1.992~1.998 (0.0784~0.0787)	1.982 (0.0780)	
			Length	13.8 (0.544)	—	
			Quantity	18 (0.709) 15 (0.591)	—	
	71	6305 Ball Bearing	Inside diameter	24.99~25.00 (0.985~0.985)	—	
			Outside diameter	61.987~62.00 (2.442~2.443)	—	
	72	Reverse Gear	Overall length	48 (1.891)	—	
			Distance between chordal measurement	21.548~21.591 (0.849~0.851)	—	
	73	Reverse Gear Bushing	Inside diameter	22.007~22.028 (0.866~0.867)	22.06 (0.868)	
			Outside diameter	25.075~25.125 (0.988~0.990)	—	
			Fit allowance	0.054~0.1125 (0.002~0.004)	—	
74	Reverse Gear Shaft	Outside diameter	21.959~21.935 (0.865~0.864)	—		
75	Each Gear Mesh	Backlash	0.046~0.094 (0.002~0.004)	—		
76	Gear Ratio	1st speed	3.950	—		
		2nd speed	2.410	—		
		3rd speed	1.615			
		4th speed	1.143			
		Reverse	4.520			

22-8 SERVICEABLE LIMIT

Section	No.	Part Name	Inspecting Item	Standard Value	Serviceable Limit	Remarks
PROPELLER SHAFT	77	Propeller Shaft	Looseness in direction of spline rotation	0.03 (0.0012)	0.20 (0.008)	
	78	Universal Joint	Needle bearing case installation hole ID	25 (0.984)	—	
			Cross shaft OD	12.784~12.800 (0.5033~0.5039)	0.050 (0.002)	
			Needle bearing case ID	16.80 (0.6614)	0.05 (0.002)	
			OD	25 (0.984)	—	
			Roller OD	2 (0.079)	—	
			Length	10.8 (0.425)	—	
		Quantity	23 each	—	8 places	
DIFFERENTIAL	79	Drive Pinion Gear	No. of teeth	7	—	
			Tooth form	Gleason duplex helical	—	
			Backlash	0.10~0.15 (0.0039~0.0059)	—	
			Spacer	4.98~5.06 (0.1961~0.1992)	—	Interval 0.02 (0.0008)
	80	Ring Gear	No. of teeth	33	—	
			Tooth form	Gleason duplex helical	—	
	81	Differential Gear Case	Pinion shaft hole	31.00 (1.220)	0.15 (0.006)	
	82	Differential Pinion Gear	Bearing hub diameter	48 (1.891)	—	
No. of teeth			10	—		
Tooth form			Gleason straight lever cycle	—		
		Bore	16 (0.630)	0.1 (0.004)		
		Backlash	0.08~0.15 (0.003~0.006)	—		
		Adjusting shim	0.9~1.5 (0.035~0.059)	—		
83	Differential Side Gear	No. of teeth	16	—	Interval 0.1 (0.004)	
		Tooth form	Gleason straight lever cycle	—		
		Differential gear hub OD	31.0 (1.220)	0.1 (0.004)		
		Spline backlash	—	0.2 (0.0079)		
		Backlash adjusting shim	1.3~1.7 (0.051~0.067)	—	Interval 0.1 (0.004)	
SUSPENSION	84	Front Damper	Oil capacity	85~89cc (0.18~0.19US.pt.) (0.15~0.16Imp.pt.)	—	
			Stroke	63 (1.480)	—	
			Damping capacity (kg) Ext.	45kg (99.2lbs.)	30kg (66.2lbs.)	
			Retract.	135kg (297.7lbs.)	100kg (220.5lbs.)	
			m/sec	0.25m/sec (0.82ft/sec)	—	
	85	Rear Damper	Oil capacity	95~100cc (0.201~2.113USpt.) (0.167~0.176Imp.pt.)	—	
			Stroke	109 (4.295)	—	
			Damping capacity (kg) Ext.	60kg (132.3lbs.)	45kg (99.2lbs.)	
			Retract.	120kg (264.6lbs.)	90kg (198.5lbs.)	
			m/sec	0.5m/sec (1.64ft/sec)	—	
86	Rear Cushion Spring	Free length	300 (11.811)	—		

SERVICEABLE LIMIT 22-9

Section	No.	Part Name	Inspecting Item	Standard Value	Serviceable Limit	Remarks	
FRONT AXLE	87	Knuckle	Front wheel bearing A shaft OD	19.05 (0.751)	—		
			Front wheel bearing B shaft OD	28.575 (1.126)	—		
			Ball stud (upper) installation ID × taper	16 × 1/10 (0.630 × 1/10)	—		
			Ball stud (lower) installation ID × taper	14 × 1/10 (0.552 × 1/10)	—		
	88	Front Wheel Bearing A	Bore	19.05 (0.751)	—		
89	Front Wheel Bearing B	Bore	28.575 (1.126)	—			
REAR AXLE	90	Axle Shaft	Bend	0.5 (0.020)	0.8 (0.032)		
			Spline backlash	—	0.2 (0.008)		
B R A K E	91	Brake Drum	Inside diameter	212.0 (8.346)	2.0 (0.079)		
	92	Brake Lining	Thickness Front	Pad 10.3 (0.406)	1.6 (0.063)		
			Rear	5 (0.197)	2.0 (0.079)		
	93	Brake Spring	Clearance between disc and lining	Disc 0.1 ~ 0.15 (0.0039 ~ 0.0059)	—		
			Free length	122.5 (4.823)	—		
			Installed length/Installed load (kgs)	135/9-11kg (5.315/19.8 ~ 24.2 lbs.)	135/7kg (5.315/15.4 lbs.)		
	94	Brake Anchor Bracket	Inside diameter	14 ~ 14.043 (0.5512 ~ 0.5529)	—		
	95	Shoe Adjusting Sleeve	Outside diameter	13.925 ~ 13.968 (0.548 ~ 0.550)	—		
	96	Brake Master Cylinder (Dual type)	Front cylinder ID	14.00 ~ 14.043 (0.5512 ~ 0.5529)	14.09 (0.554)		
			Rear cylinder ID	15.87 ~ 15.913 (0.6248 ~ 0.6265)	15.96 (0.6283)		
			Front piston OD	13.957 ~ 13.984 (0.5495 ~ 0.5506)	13.91 (0.5476)		
			Rear piston OD	15.827 ~ 15.854 (0.6231 ~ 0.6242)	15.78 (0.6213)		
			Clearance between Cylinder & piston	Front	0.016 ~ 0.086 (0.0006 ~ 0.0036)	0.096 (0.0036)	
				Rear	0.016 ~ 0.086 (0.0006 ~ 0.0034)	—	
			Primary cup max. OD	Front	14.9 (0.587)	—	
				Rear	16.7 (0.657)	—	
			Secondary cup max. OD	F.	14.9 (0.587)	—	
				Rear	16.7 (0.657)	—	
	Return spring free length	Front	62.7 (2.468)	60 (2.362)			
		Rear	55.5 (2.185)	54 (2.126)			
	97	Wheel Cylinder	Cylinder ID	Front	42.85 ~ 42.90 (1.6870 ~ 1.6890)	43.05 (1.695)	
				Rear	14.29 ~ 14.33 (0.5626 ~ 0.5643)	14.38 (0.566)	
			Piston OD	Front	42.77 ~ 42.85 (1.6839 ~ 1.6870)	42.70 (1.681)	
Rear				14.247 ~ 14.274 (0.5609 ~ 0.5620)	14.19 (0.559)		
Clearance between cylinder and piston			Front	0 ~ 0.13 (0 ~ 0.0051)	0.15 (0.0059)		
			Rear	0.016 ~ 0.086 (0.0006 ~ 0.0034)	0.100 (0.004)		
Cup min. ID			Front	43.122 (1.698)	—		
Cup max. OD			Rear	15.6 (0.614)	0.4 (0.016)		

22-10 SERVICEABLE LIMIT

Section	No.	Part Name	Inspecting Item	Standard Value	Serviceable Limit	Remarks
BRAKE	98	Brake Pedal	Play	10~20 (0.394~0.787)	—	
			Clearance between pedal and toe board when brake is applied	60~70 (2.362~2.756)	—	
			Bushing ID	14.032~14.059 (0.552~0.554)	14.150 (0.557)	
			Pedal shaft OD	13.973~14.000 (0.550~0.551)	13.800 (0.543)	
	99	Side Brake	Operating range	50~70%	—	
STEERING SYSTEM	100	Steering Wheel	Steering angle	Inside 33° Outside 29°	—	
			Play	3 (0.118)	—	
	101	Steering Gearbox	Type	Rack-Pinion	—	
			Rack OD	23.00 (0.906)	0.10 (0.004)	
			Gear case (Shaft ID)	23.00 (0.906)	0.15 (0.006)	
			Backlash	0~0.050 (0~0.002)	—	
	102	Knuckle Arm	Ball stud installation area ID×taper	13.967-14×1/10 (0.550~0.551×1/10)	—	
			Knuckle installation	12.2 (0.480)	—	
	103	Wheel	Rim runout	1 (0.039)	3 (0.118)	
			Tire runout	3 (0.118)	5 (0.197)	
			Balancing (dynamic)	300g-cm (0.2592in-lb)	350g-cm (0.304 in-lb)	
ELECTRICAL EQUIPMENT	104	AC Dynamo	Voltage-Output	25A/12V	—	
			Spec with load connected	14V/OA, 1100rpm max.	—	
			Spec with load connected	14V/23A, 2500rpm max.	—	
	105	Regulator	Regulating voltage	13.5~14.5V	13.5~14.5V3000rpm	
			Armature gap	0.8~1.3 (0.031~0.051)	—	
			Angle gap	0.25~0.45 (0.010~0.018)	—	
			Contact point gap	0.25~0.45 (0.010~0.018)	—	
			Breaker arm tension	180g (5.8 oz)	—	
	106	Starting Motor	Voltage-Output	0.5kw/12V	—	
			Free running spec.	10.4V50A, 1500rpm	—	
			Stall torque spec.	5.4V 350A, 3.5kg-m (21.805ft-lb)	—	
			Brush length	20.5 (0.807)	11.5 (0.453)	
			Brush spring tension	850g±15% (27.3 oz±15%)	400g (0.882lbs.)	
		Commutator OD	38.8 (1.528)	36.0 (1.417)		
		Out-of-round	0.04 (0.0016)	0.30 (0.012)		
		Mica depth	0.2 (0.008)	0.2 (0.008)		
		Armature shaft Front	18.920~18.955 (0.7449~0.7463)	18.840 (0.742)		
		Rear	12.420~12.450 (0.4890~0.4902)	12.340 (0.486)		
		Bearing bushing Front	18.965~19.005 (0.747~0.748)	19.150 (0.754)		
		Bearing bushing Rear	12.455~12.500 (0.491~0.492)	12.650 (0.498)		

Section	No.	Part Name	Inspecting Item	Standard Value	Serviceable Limit	Remarks
ELECTRICAL EQUIPMENT	107	Distributor	Shaft clearance Front	0.045~0.085 (0.02~0.03)	0.200 (0.079)	
			Rear	0.005~0.080 (0.0002~0.003)	0.200 (0.079)	
			Shaft bend	0~0.08 (0~0.003)	0.10 (0.004)	
			Sprocket thrust gap	0~0.2 (0~0.008)	—	
			Armature shaft thrust gap	0.05~0.40 (0.002~0.016)	—	
			Point gap	0.3~0.4 (0.012~0.016)	—	
			Breaker arm tension	500~700g (1.103~1.154 lbs.)	—	
			Condenser capacity	0.28 μ F \pm 10%	—	
			Cap center carbon length	12 (0.473)	3.0 (0.118)	
			Governor advance Start	0° at 650~850rpm	—	
	Max.	1950~2080rpm 11°~14°	—			
	108	Ignition Coil	Cam closing angle	48°	—	
			Voltage	12V	—	
			Resistor (Resistance)	1.5 Ω	—	
			Primary coil resistance	1.35~1.50 Ω	—	
			Secondary coil resistance	9.50~10.50K Ω	—	
			Spark spec. (3 point spark gap test)	8V150rpm, 8mm (0.315)	8V 150rpm: 6mm (0.236)	
	109	Spark Plug	Low speed	12V4500rpm, 8mm (0.315)	12V 4500 rpm 7mm (0.275)	
			High speed			
	110	Speedometer	Gap	0.7 (0.0276)	0.4 (0.0158)	
	110	Speedometer	Speedometer indication	200km/h (125miles/h)	—	Odometer within 1% accuracy
			10km/h (6.214miles/h)	—	—	
			20km/h (12.428 miles/h)	+3.0, +0.8 (+1.9, +0.5miles/h)	—	
40km/h (24.856 miles/h)			+5.5, +2.0 (+3.4, +1.3miles/h)	—		
60km/h (37.284 miles/h)			+6.5, +3.0 (+4.1, +1.9miles/h)	—		
80km/h (49.712 miles/h)			+8.0, +3.5 (+5.0, +2.2miles/h)	—		
100km/h (62.14 miles/h)			+9.1, +4.1 (+5.7, +2.6miles/h)	—		
120km/h (75.00 miles/h)			+11.4, +5.4 (+7.1, +3.4miles/h)	—		
140km/h (87.00 miles/h)			+14, +7 (+8.8, +4.4miles/h)	—		
111			Windshield Wiper	Sweep angle	96~104°	—
	Blade pressure	360~400g (0.794~0.882 lbs.)		340g (0.750lbs.)		
	Revolutions without load	H 57~67rpm, L 37~47rpm		—		
	Stall torque	H 30rpm, 32kg-cm (2.3ft-lb) L 20rpm 52kg-cm (3.8ft-lb)		—		
	Motor operating voltage	8V		—		
112	Flasher	Motor brush size, (H×W×L)	5×5×7.5 (0.2×0.2×0.3)	—		
		Flashing rate	60~110/min.	—		
113	Battery	Specific gravity	1.25~1.27	1.21		

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