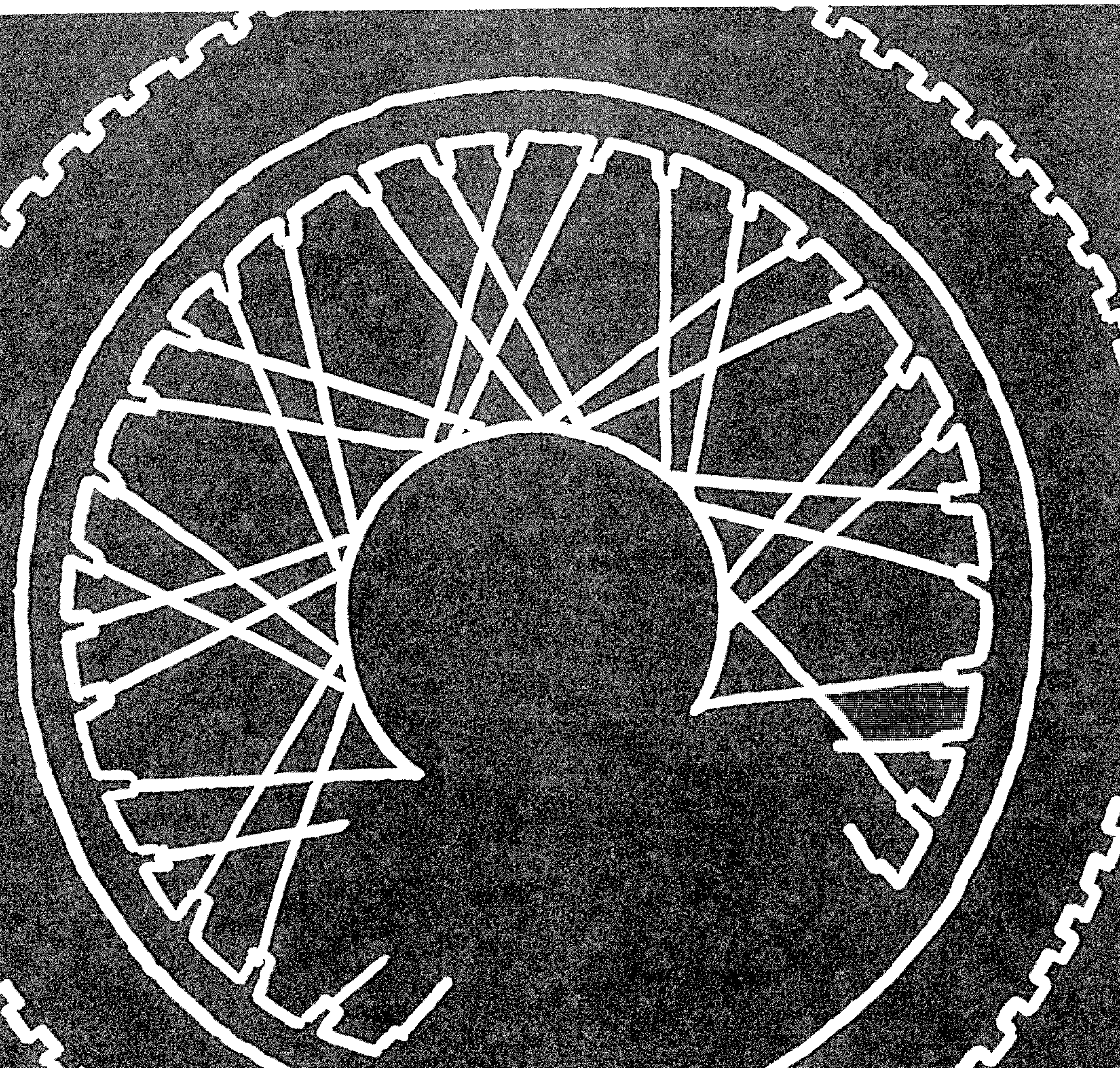
SHOP MANUAL

HONDA
CB125·160



PREFACE

This manual has been complied as a guide for disassembly and assembly of Honda Models CB 125 and 160

The manual is divided into six sections, each of which gives details of construction, disassembly, and assembly. Required inspection and maintenance procedures are also included.

To further clarify the details contained herein, as many illustrations as possible were used.

This manual, if read carefully, will supply the techniques of correct maintenance and the fundamental technical knowledge required of both mechanics and sales staff.

SERVICE DEPARTMENT
FOREIGN SALES DIVISION
HONDA MOTOR CO., LTD.

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VI INSPECTION AND ADJUSTMENT

I FEATURES

Features of CB 125 and 160

A. Engine

1. This engine is a parallel two cylinder engine, and each cylinder has special carburetor. The intake pipe is quite smooth, with low resistance, for high intake efficiency, and has an overhead cam for high rotation and high output.
2. The camshaft drive is by chain, and is between the right and left cylinders ; and steady performance and durability maintain low cylinder temperature.
3. Lubricating oil is filtering by both filtering mesh and a centrifugal filter. It is forcefed by a plunger pump to the crankshaft, camshaft, and transmission shaft. Care has been given to wear and seizure resistance of each unit.
4. For power transmission from the crankshaft to the transmission shaft, double spur gears and shock absorbers reduce gear noise and increase durability by increasing the practical effective engagement ratio.

B. Frame

1. The frame has two sub-tubes which are horizontally extended from the head pipe and have high twist rigidity, in addition to strength required for a sports vehicle.
2. The front wheel suspension is telescopic and the rear wheel is of swinging arm type, with hydraulic shock absorbers. Superb riding comfort, steering, and stability is obtained.
3. The brake unit is a " front two leading " type and rear leading, and trailing type. Due to the semimetallic lining used for brake lining, brake performance is high.
4. The handlebar of semi-raised type, which together with the large speedometer, enables the rider maintain a natural posture while cruising.

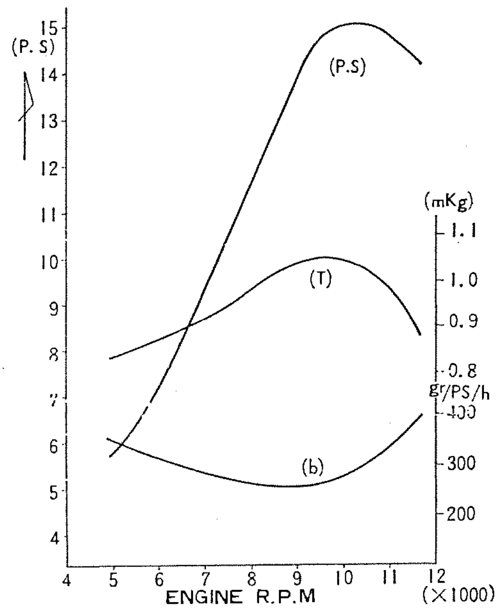
II SPECIFICATIONS

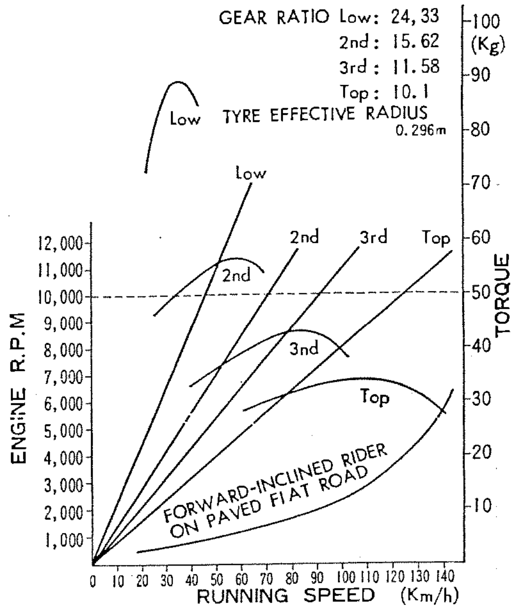
MODEL	CB 125	CB 160
ENGINE		
Fuel	Gasoline (petrol)	
Cooling system and cycles	Air-cooled, 4-stroke	Air-cooled. 4-stroke
Number of cylinders and mounting angle	2 cylinders, parallel 30° up from horizontal	2 cylinders, parallel 30° up from horizontal
Valves	Overhead type	Overhead type
Combustion chamber	Semi-spherical	Semi-spherical
Cylinder capacity	0.1246 lit (7.6 cu in)	0.161 lit (9.84 cu in)
Bore × Stroke	44 × 41 mm (1.73 × 1.61 in)	50 × 41 mm (1.97 × 1.61 in)
Compression ratio	9.0	8.5
Compression	10 kg/sq cm (141.9 psi)	10 kg/sq cm (141.9 psi)
Max. output	15 hp/10500 rpm	16.5 hp/10,000 rpm
Max. torque	1.07 mkg (7.7 ft lb)/9200 rpm	1.24 (9 ft. lb)/8 500 rpm
Min. fuel consumption at full load	250 gr (8.8 oz)/hp/h	250 gr (8.8 oz)/hp/h
Starting	Electric motor and kick systems combined	Electric motor and kick systems combined
Ignition	Battery spark	Battery spark
Spark timing	5° to 45° before top dead center	5° to 45° before top dead center
Spark coil		
Model	R 208 29700-097 CM 12	R 208 29700-097 CM 12
Manufacturer	Kokusan Denki, Nihon Denso, Hitachi Seisakusho	Kokusan Denki, Nihon Denso, Hitachi Seisakusho
Spark plug		
Type	D-8 H	D-8 H
Manufacturer	Nihon Tokushu Togyo	Nihon Tokushu Togyo
Carburetor		
Type and number	Piston valve type, 2 each	Piston valve type, 2 each
Manufacturer	TK Kikaki (K.K.) Keihin Seiki (K.K.)	TK Kikaki (K. K.) Keihin Seiki (K. K.)
Air cleaner		
Type	Filter paper	Filter paper
Manufacturer	Tokyo Roki (K. K.)	Tokyo Roki (K. K.)
Fuel tank capacity	10.5 lit (2.8 US gal, 2.3 Imp gal)	10.5 lit (2.8 US gal, 2.3 Imp gal)
Lubrication system	Pump and splash system combined	Pump and splash system combined
Type of oil pump	Plunger	Plunger
Type of oil filter	Wire mesh and centrifugal system combined	Wire mesh and centrifugal system combined
Lubricating oil capacity	1.0 lit (.27 US gal .22 Imp gal)	1.0 lit (.27 US gal .22 Imp gal
Battery		
Model and number	MBW 3-12 C, 1 each	MBW 3-12 C, 1 each
Voltage/capacity	12 V 9 AH	12 V 9 AH

MODEL	CB 125	CB 160
Charging generotor		
Model	EG 19 37000-024 K 107	EG 19 37000-024 K 107
Manufacturer	Kokusan Denki, Nihon Denso, Hitachi Seisakusho	Kokusan Denki, Nihon Denso, Hitachi Seisakusho
Starting mortor		
Model	CC 03 28000-111 S 106	CC 03 28000-111 S 106
Manufacturer	Kokusan Denki, Nihon Denso, Hitachi Seisakusho	Kokusan Denki, Nihon Denso, Hitachi Seisakusho
Power transmission device		
Mechanism from engine to gear shifting	Gear system	Gear system
Reduction ratio	3.700	3.700
Model of clutch	Wet multi-plate	Wet multi-plate
Transmission		
Model	Constant engaged gear system	Constant engaged gear system
Shifting	Left foot system	Left foot system
Transmission gear ratio		
first	2.769	2.769
second	1.778	1.778
third	1.318	1.318
fourth	1.040	1.040
Mechanism from transmission device to rear axle	Chain	Chain
Reduction ratio	2.625	2.625
CHASSIS		
Dimensions		
Overall length	1.947 m (6.39 ft)	1.947 m (6.39 ft)
Overall width	0.745 m (2.45 ft)	0.745 m (2.45 ft)
Overall height	0.990 m (3.25 ft)	0.990 m (3.25 ft)
Wheelbase	1.277 m (5.08 ft)	1.277 m (5.08 ft)
Ground clearance	0.145 m (0.48 ft)	0.145 m (0.48 ft)
Weight		
Weight unloaded	127.0 kg (279 lb)	127.0 kg (279 lb)
Number of riders	2	2
Weight distribution at no load, Front	60.5 kg (133 lb)	60.5 kg (133 lb)
Rear	66.5 kg (146 lb)	66.5 kg (146 lb)
Performance		
Max. speed	130 km/h (81 mile/hr)	135 km/h (85 mile/hr)
Fuel consumption ratio on paved road	65 km/lit (40 mile/gal)	55 km/lit (35 mile/gal)
Climbing ability	18°30′	18°30′
Min turning radius	2,120 mm (7 ft)	2,120 mm (7 ft)
Braking distance	7 m (at 35 km/h) 23 ft (at 22 miles/hr)	7 m (at 35 km/h) 23 ft (at 22 miles/hr)
Steering		
Steering angle	40° (right and left)	40° (right and left)
Length of handlebar	0.678 m	0.678 m
Running		
Caster	64°	64°
Trail	0.086 m (0.25 ft)	0.086 m (0.25 ft)
Tire size		
Front	2.50-18 (4 ply)	2.50-18 (4 Ply)
Rear	2.75-18 (4 Ply)	2.75-18 (4 Ply)

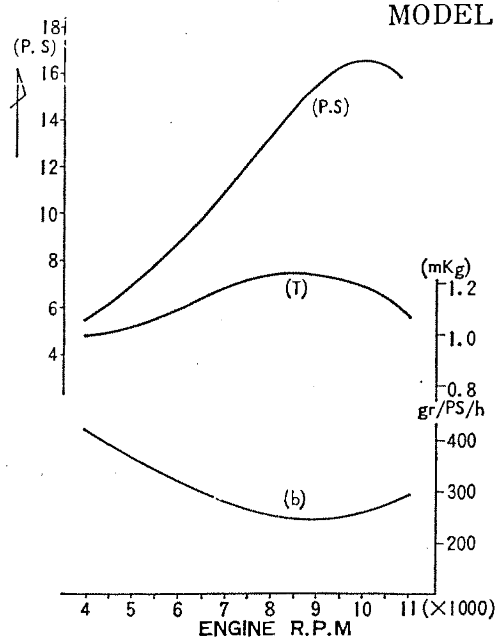
MODEL	CB 125	CB 160
Brake		
Types		
Front	" Two leading " internal expansion	" Two leading " internal expansion
Rear	Leading, trailing internal expansion	Leading, trailing internal expansion
Operation		
Front	Right grip manual	Right grip manual
Rear	Right foot	Right foot
Suspension		
Front	Telescopic	Telescopic
Rear	Swinging arm	Swinging arm
Shock absober		
Front	Coil spring with oil absorber	Coil spring with oil absorber
Rear	Coil spring with oil absorber	Coil spring with oil absorber
Type of frame	Tubular	Tubular
Lamps		
Head lamp		
Model	ASS 13	ASS 13
Manufacturer	Stanley Electric	Stanley Electric
V–W	12 V, 30 W/30 W (white)	12 V, 30 W/30 W (white)
Tail lamp		
V–W	12 V, 8 W (red)	12 V, 8 W (red)
Other use	License lamp	License lamp
License lamp		
V–W	12 V, 8 W	12 V, 8 W
Brake lamp		
V–W color	12 V, 25 W (red)	12 V, 25 W (red)

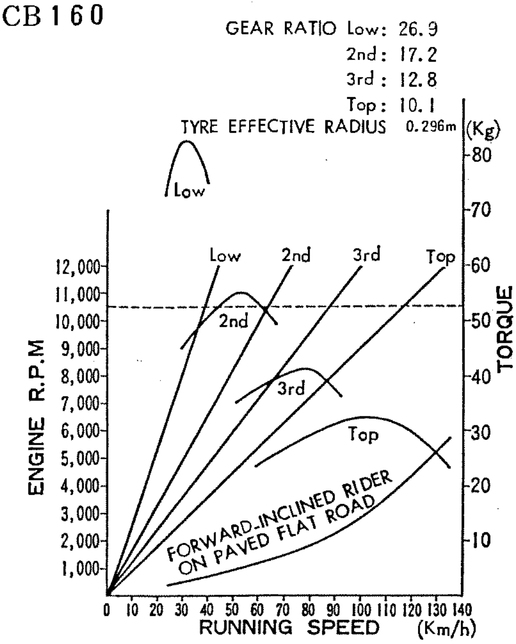
MODEL CB125



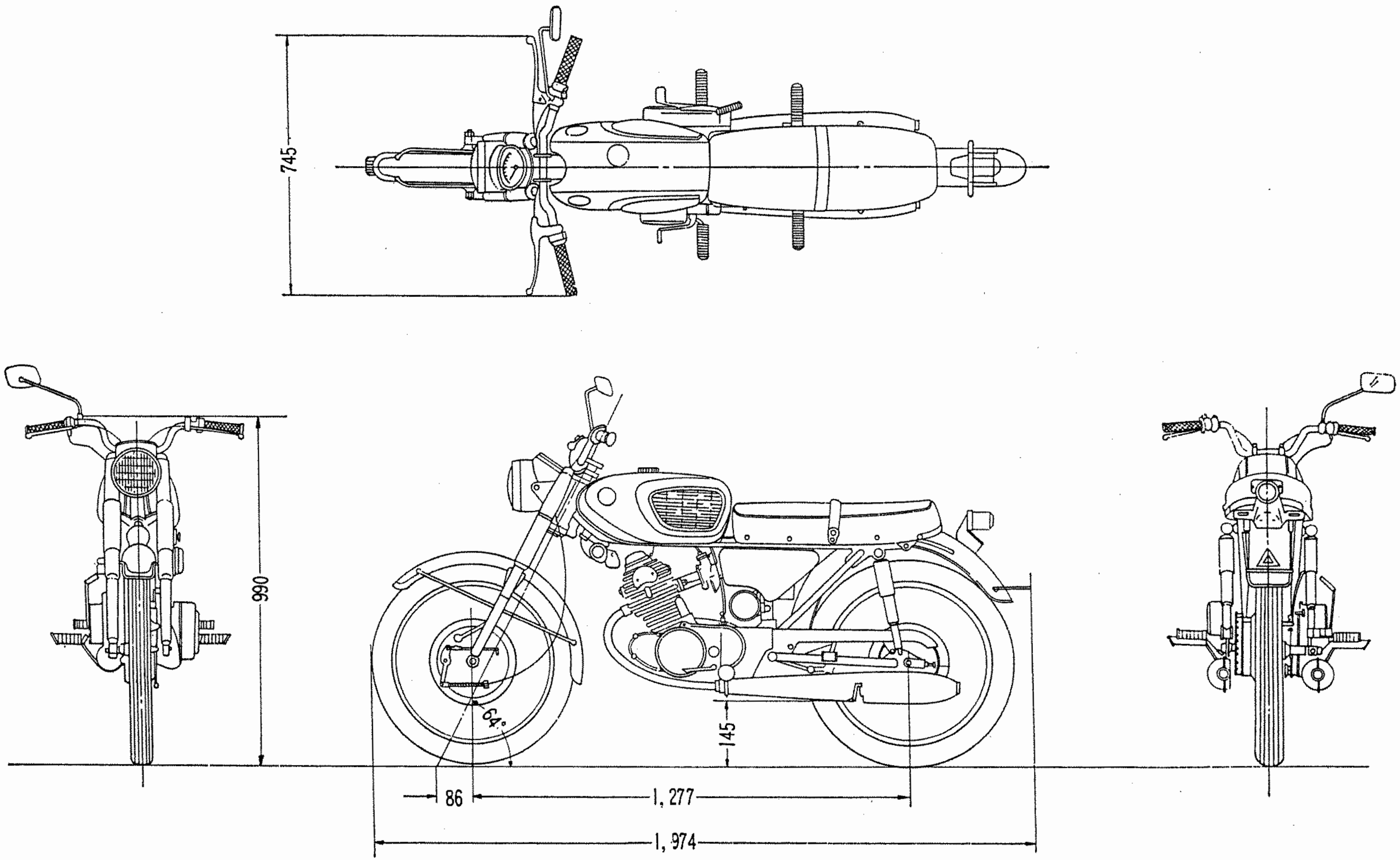


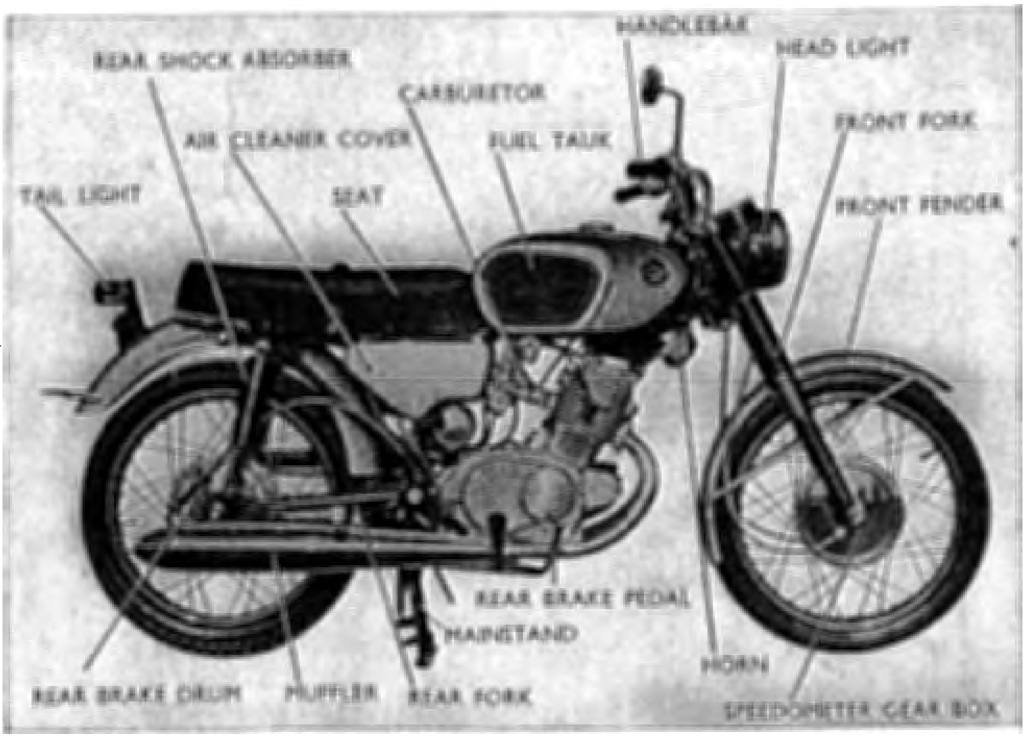
MODEL CB160

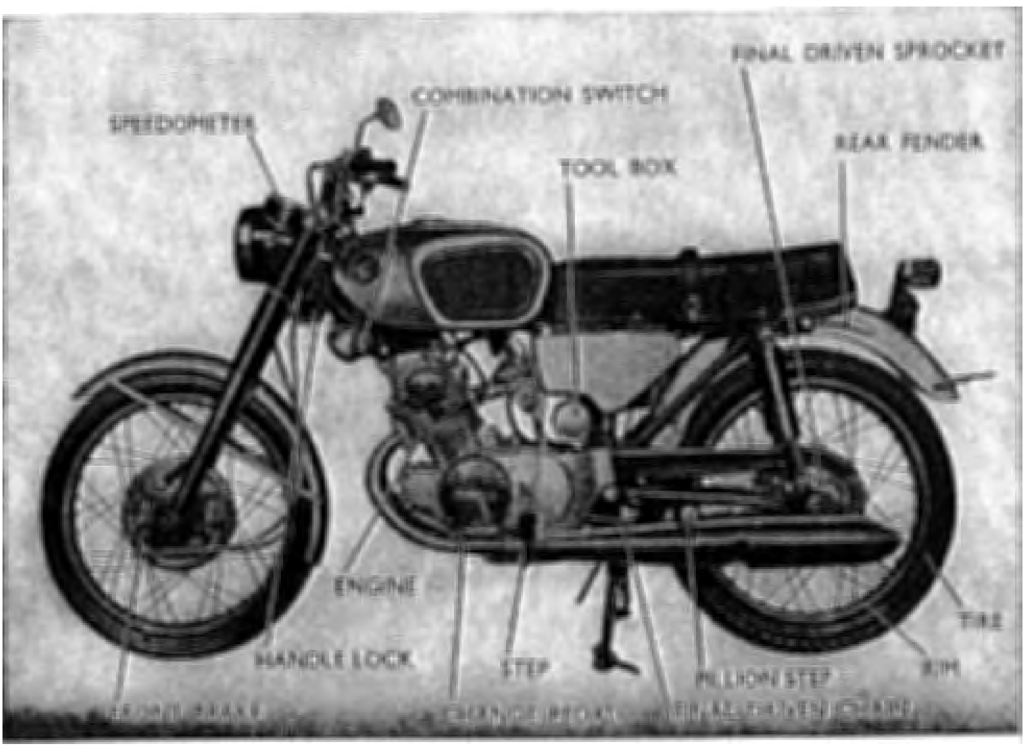




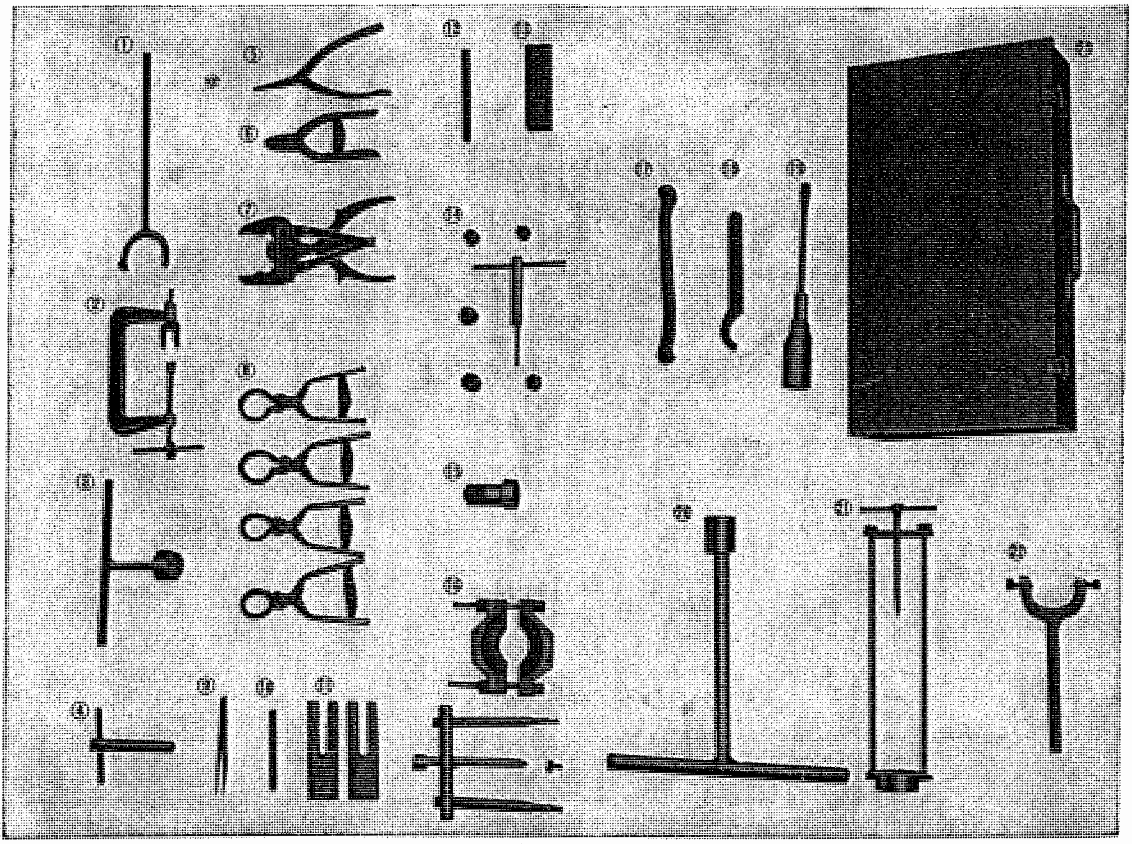
Exterior Views-Front, Top, Side and Rear




HANDLEBAR
HEAD LIGHT
REAR SHOCK ABSORBER
CARBURETOR
FRONT FORK
AIR CLEANER COVER
FUEL TAUK
TAIL LIGHT
SEAT
FRONT FENDER
REAR BRAKE PEDAL
MAINSTAND
HORN
REAR BRAKE DRUM
MUFFLER
REAR FORK
SPEEDOMETER GEAR BOX

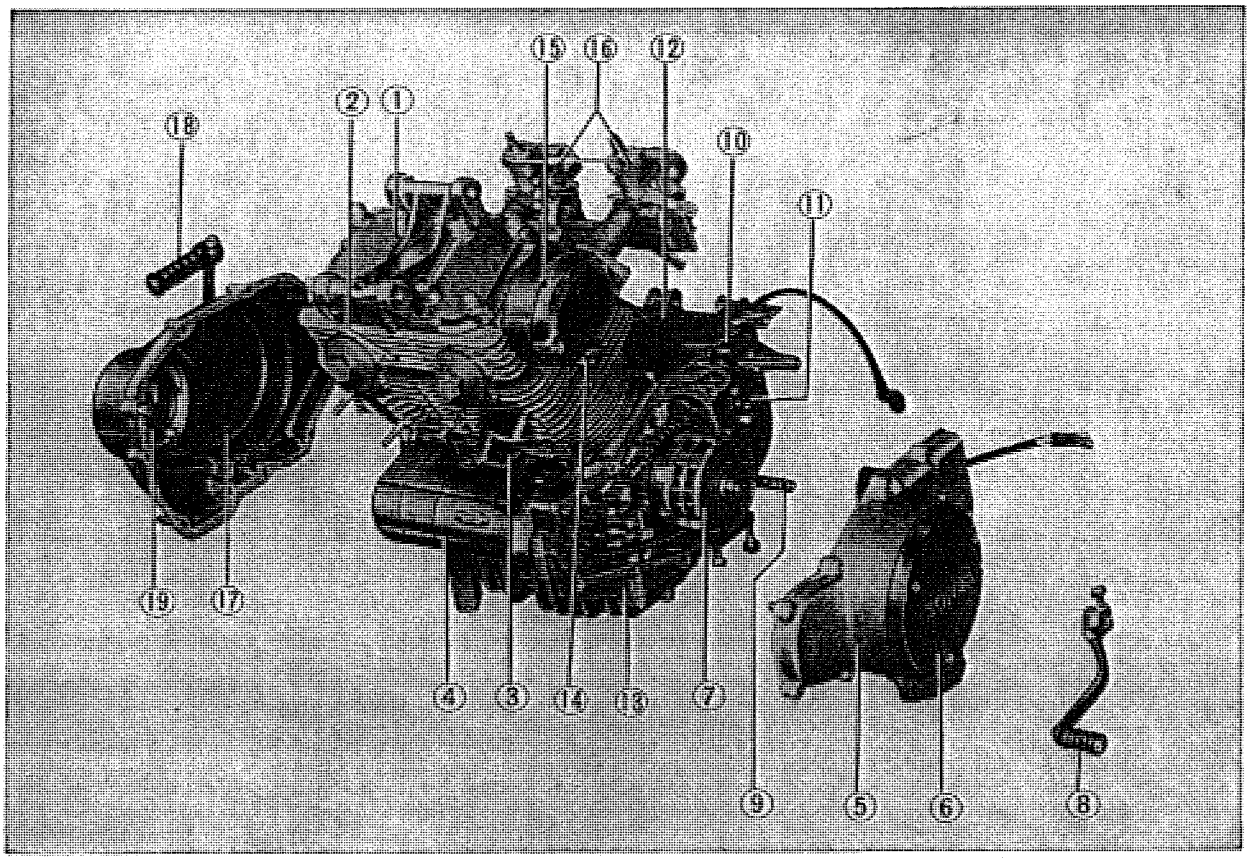

FINAL DRIVEN SPROCKET
COMBINATION SWITCH
SPEEDOMETER
REAR FENDER
TOOL BOX
ENGINE
TIRE
HANDLE LOCK
STEP
PILLION STEP
RIM

SPECIAL TOOLS FOR CB 125/160



① Drive sprocket holder
② Valve lifter
③ 16 ϕ lock nut socke.
④ Rotor puller
⑤ Snap ring pliers
⑥ Snap ring pliers
⑦ Piston ring tool
⑧ Piston slider
⑨ Pin set
⑩ Valve guide
⑪ Piston base
⑫ Rear fork pivot balt
⑬ Oil stone
⑭ Valve sheet cutter set
⑮ Tool for bearing puller
⑯ Bearing puller
⑰ 14×17 wrench
⑱ Main switch socker
⑲ ⊖ wooden special driver
⑳ 29 mm stem nut box
㉑ Rear cushion
㉒ Front fork
㉓ Tool box

III ENGINE



① Cylinder head cover
② Cylinder head
③ Cylinder
④ Starting motor
⑤ Left crankcase cover
⑥ Generator
⑦ AC generator
⑧ Gear shift pedal
⑨ Gear shift spindle
⑩ Neutral switch
⑪ Drive sprocket
⑫ Upper crankcase
⑬ Lower crankcase
⑭ Spark plug
⑮ Contact breaker
⑯ Carburetor
⑰ Right crankcase cover
⑱ Kick starter
⑲ Clutch
⑳ Oil pump
㉑ Oil filter
㉒ Oil filter cover

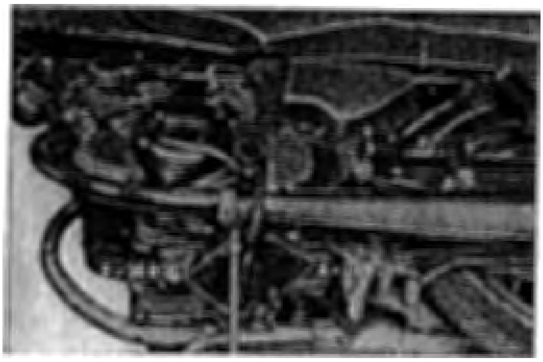


Fig. 3. 1 Footrest arm bolts

3. 1 Disassembling and assembling engine

A. Disassembling engine

1. Close the fuel cock.
2. Remove the right and left exhaust pipe joints and remove the four 8×28 bolts holding the muffler (together with the fortrest arm) and 8×38 bolts holding the footrest pinion. Separate the parts from the engine. **(Refer to Fig. 3. 1 and 3. 2)**
3. Remove the air cleaner cover and the tool box.

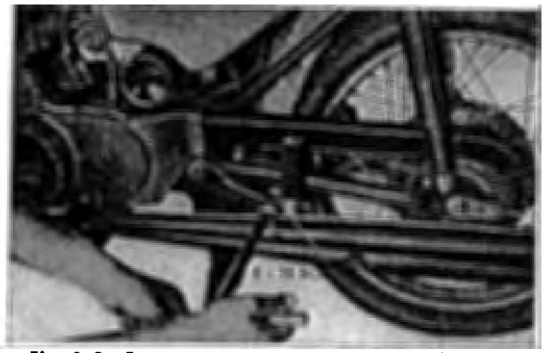


Fig. 3. 2 Footrest pinion

Fig. 3. 3 All wiring

4. Remove the high tension terminals from the spark plug and disconnect all leads. **(Refer to Fig. 3. 3)**

Fig. 3. 4 Air cleaner connecting tube

5. Remove the air cleaner coupling and the carburetor at the point of the set plate stop. **(Refer to Fig. 3. 4)**

6. Remove the left crankcase rear cover and sparate the cable end together with the clutch cable joint from the cable core. **(Refer to Fig. 3.5)**

Fig. 3.5 Clutch cable core

7. Rotate the rear wheel and remove the clip at the chain joint and the drive chain joint. **(Refer to Fig. 3.6)**

Fig. 3.6 Removing the drive chain joint

8. Remove the starting motor cable from the switch connecting section. **(Refer to Fig. 3.7)**

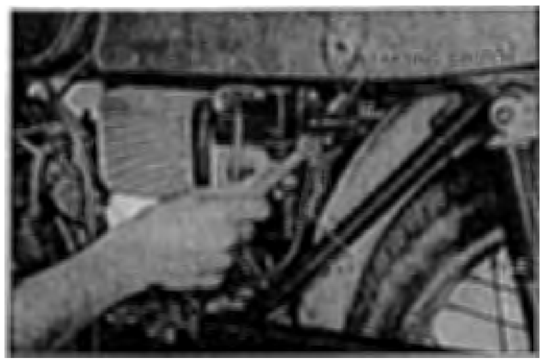


Fig. 3.7 Removing the starting motor cable

9. Separate the carburetor from the insulator section at the engine head side. **(Refer to Fig. 3.8)**

(CAUTON)

Be careful not to bend the choke rod.

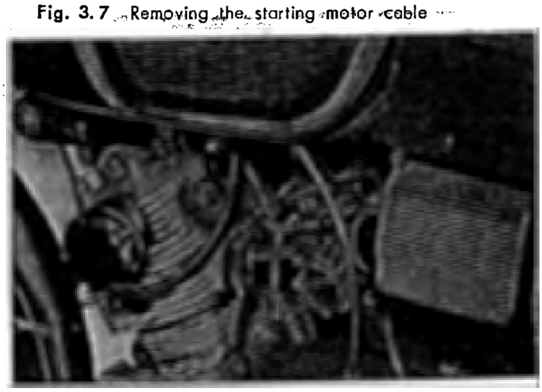


Fig. 3.8 Removing carburetor

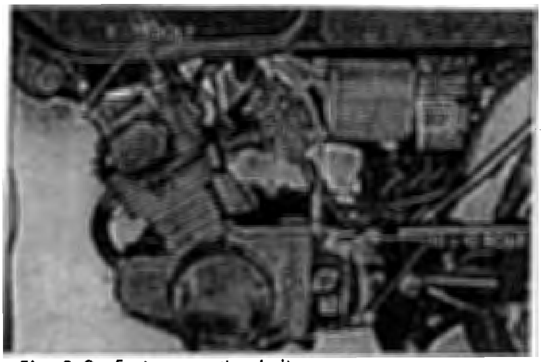


Fig. 3.9 Engine mounting bolt

10. Remove the engine mounting bolts and separate the engine from the frame. (Refer to Fig. 3.9)

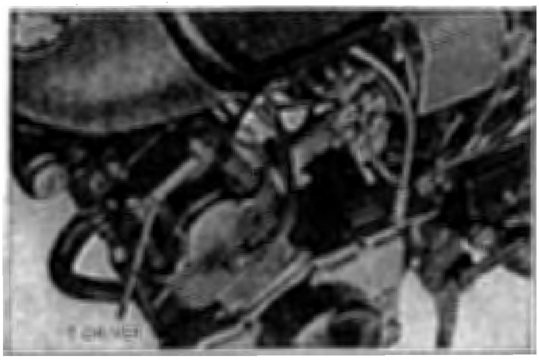


Fig. 3.10 Installation of engine

B. Assembling engine

1. Installation of the engine should be made in the reverse order of Section 3. 1 A.
2. When installing the engine mounting bolts operation is easily performed if a T-driver is employed. **(Refer to Fig. 3.10)**

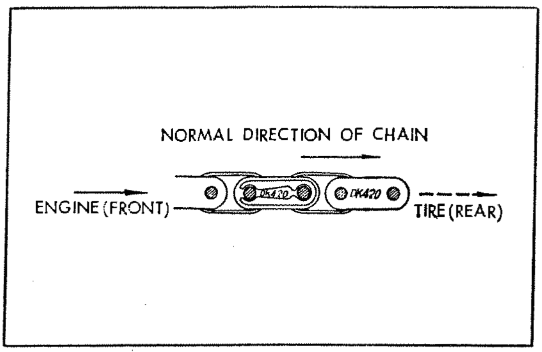


Fig. 3.11 Direction of drive chain joint

(CAUTION)

When coupling the drive chain joint, the joint should be set with the split of the joint clip facing the reverse side of the rotating direction of the drive sprocket. **(Refer to Fig. 3.11)**

3.2 Cylinder head and cylinder

A. Disassembly

The head of the parallel twin cylinders of the four stroke 360° crank type is equipped with the camshaft. The combustion chamber is dome shaped and the cam chain is located on the right and left hand sides for good combustion efficiency. For cooling, consideration is made for obtaining the same conditions on both the right and left cylinders.

In addition, a contact breaker is installed at the left end of the camshaft. The cylinder head is fitted with the breather chamber and provides engine mounting. **(Refer to Fig. 3.12)**

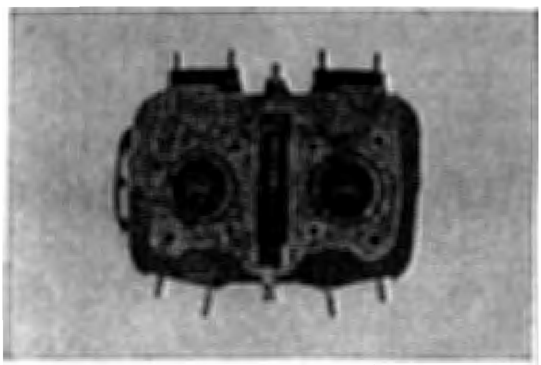


Fig. 3.12 Cylinder head combustion chomber

I. Disassembly

Caution required during disassembly and assembly

a. The work area should be arranged orderly and the following items should be prepared.

- One set of general standard tools.
- One set of CB 125 and 160 special tools.
- Cleaning solvent, gasoline, and oil.
- Measuring instruments.
- Gaskets and packing for the particular engine.

b. Disassembly should be performed in a systematic manner.

c. A complete vehicle inspection must be made.

1. Remove the cylinder head cover. **(Refer to Fig. 3. 13)**
2. Remove the generator cover.

(CAUTION)

In the 6×18 x-point screw for securing the generator cover, a 5.5×1.50 ring is inserted. (If the ring is not used, oil leakage results).

3. By turning the A.C. generator rotor, locate the cam chain joint and remove it near top dead center. **(Refer to Fig. 3. 14)**

If a thin string or wire is attached to the cam chain at this time, later operation becomes easier.

4. By removing the cam chain, the cylinder head can be removed from the stud bolts. **(Refer to Fig. 3. 15)**

5. The spark plug should be disconnected from the the high tension terminal.

(CAUTION)

(a) After removal of the cylinder head, the gasket surface should be inspected.

(b) Carbon in the combusion chamber should be removed. **(Refer to Fig. 3. 16)**

(c) Usually, gaskets and packing are used only once. When disassembled, they should be thoroughly inspected; if any scar is found, replacement should be made.

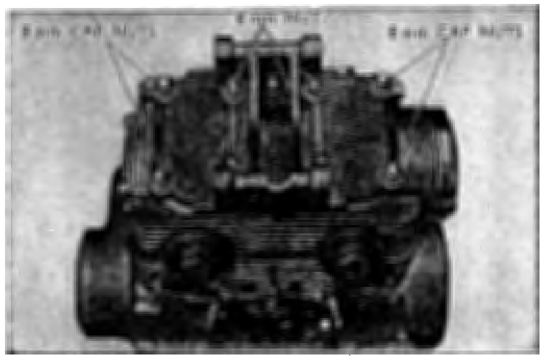


Fig. 3. 13 Cylinder head cover nuts and bolts

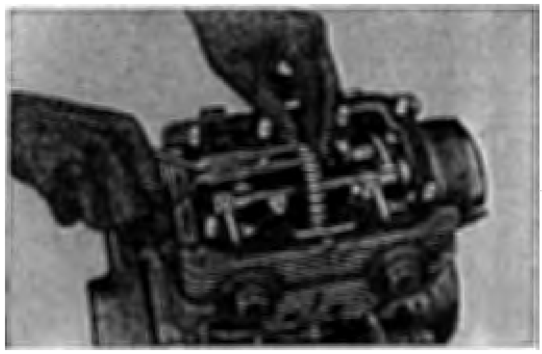


Fig. 3. 14 Removing cam chain

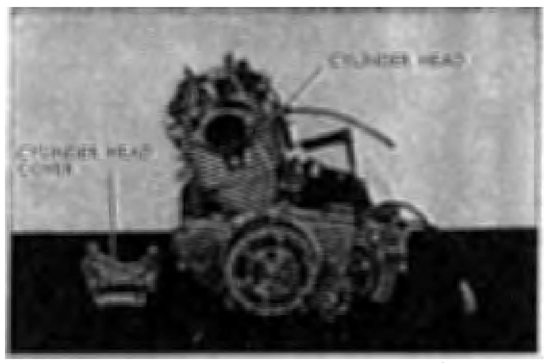


Fig. 3. 15 Removing cylinder head

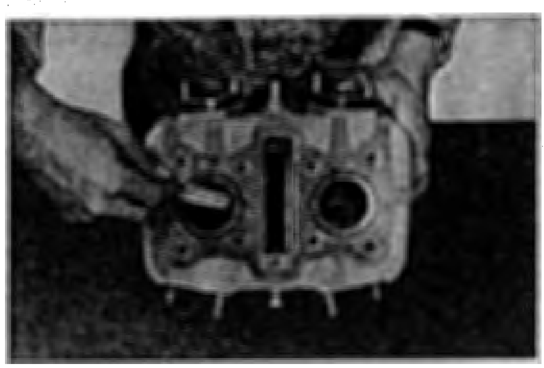


Fig. 3. 16 Removing carbon

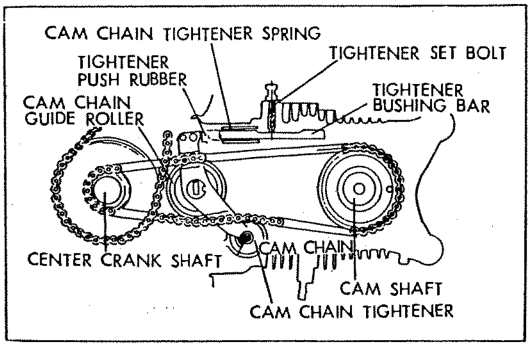


Fig. 3. 17 Installing cam chain

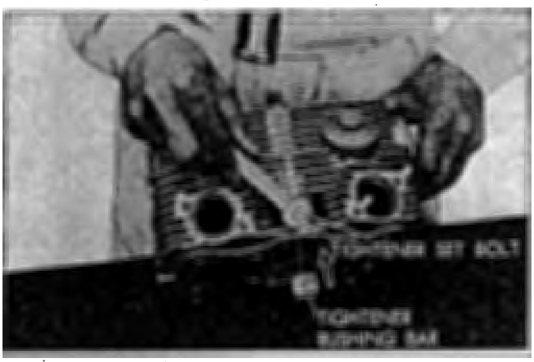


Fig. 3. 18 Handling cam tightener

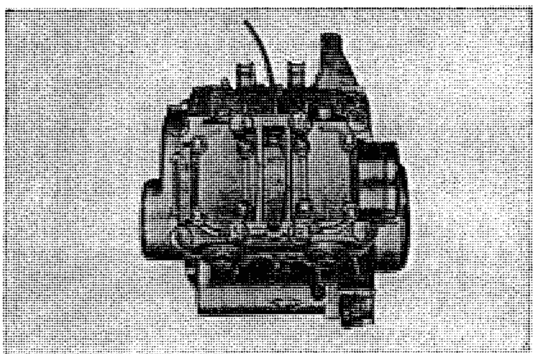


Fig. 3. 19 Tightening sequence of cylinder head

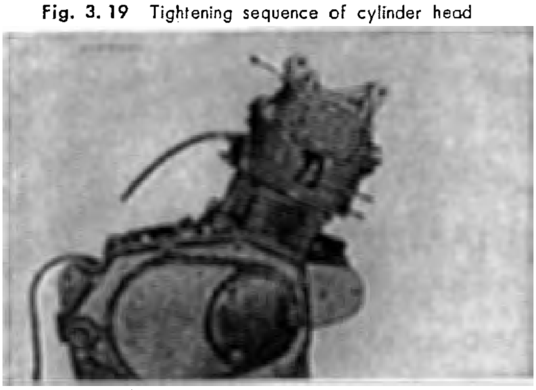


Fig. 3. 20 Cylinder head cover and breather chamber passage

II. Assembly

1. A proper inspection of the cylinder head gasket, status of valves, and the interior should be made: after confirmation of their correct status, assembly should be conducted in the reverse order of disassembly.
2. When assembling the cylinder head, installation of the cam chain should be made as shown in the figure with attention directed to avoiding deviation in timing. **(Refer to Fig. 3. 17)**
3. The direction of the cam chain joint clip at installation should be the same as the joint clip of the final drive chain, with the split facing in the reverse direction of rotation.
4. At this time, if the cam tightener is not pushed in completely, the cam chain becomes stretched and the joint cannot be fitted. The cam tightener should be handled properly before assembly. **(Refer to 3. 18)**
5. Tightening of the cylinder head should be made in the order shown in the figure, using a torque wrench. **(Refer to Fig. 3. 19)**

B. Description of cylinder head cover and breather

The cylinder head cover mounted on the engine, provides a breather chamber in the head cover and keeps the interior pressure in the crankcase constant. Oil is separated simultaneously and generated gas is exhausted. **(Refer to Fig. 3. 20)**

By sudden change of direction of the forced gas stream, the breather separates (by difference of gravity) oil in a gaseous state when the gas strikes the breather wall through centrifugal force. Passing the interior pressure of the crankcase to the head vaporizes moisture by subjecting the gas to high temperature. **(Refer to Fig. 3.20 and Fig. 3.21)**

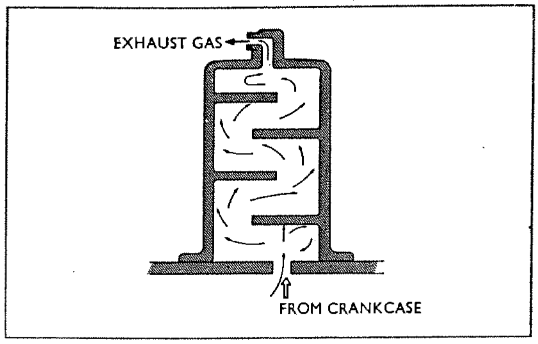


Fig. 3. 21 Principle of breather

I. Disassembly and assembly

The cylinder head includes the head cover, breaker camshaft, valves, and side cover, in this section, sub-disassembly of the breather and breaker is simply treated.

1. Disassembly and assembly of the breather separator

   When the nuts of the cylinder and cylinder head are removed, the head cover can be separated.

2. Disassembly and assembly of breaker advancer

(a) By removing the point cover, separate the breaker points base plate. **(Refer to Fig. 3. 22)**

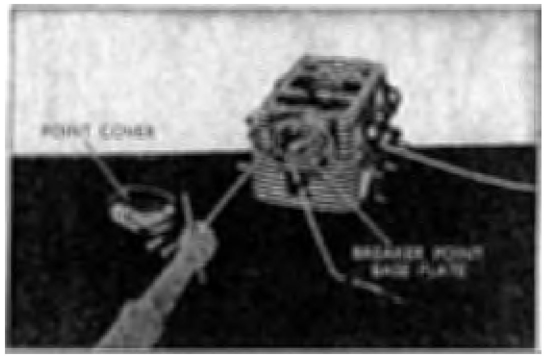


Fig. 3. 22 Removal of breaker point base plate

(b) Remove the spark advancer assembly from the cam shaft. **(Refer to Fig. 3. 23)**

※ Before operation, a rotation stop should be applied to the cam sprocket.

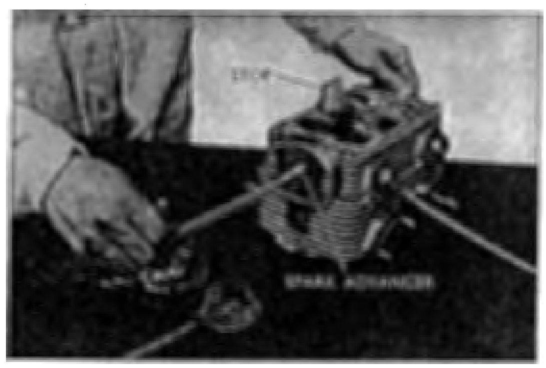


Fig. 3. 23 Disassembly of spark advance

(c) By removing the four 6×18 screws, the point base is separated. **(Refer to Fig. 3. 24)**

※ The point base serves as the bearing of the camshaft without a bushing. With oil grooves cut in the sliding portion, this unit is residually lubricated by oil from cam lubrication.

(d) Assembly is the reverse order of disassembly.

(e) During assembly, attention should be directed to the cut on the contact breaker base plate showing upward.

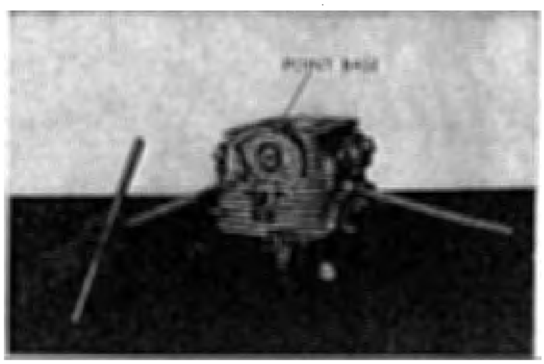


Fig. 2. 24 Removing point base

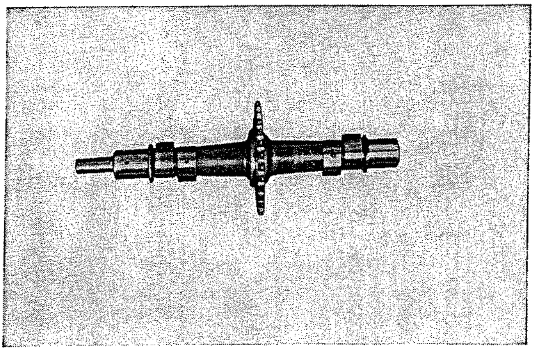


Fig. 3. 25 Camshaft

C. Description of camshaft

The camshaft of this engine has a cam sprocket at the center and polished cam sections at the right and left sides. The bearing sections are a logical type which, are supported by the side cover and point base.

The cam sprocket is driven by the cam chain from the gear shift at 1/2 transmission gear ratio. **(Refer to Fig. 25)**

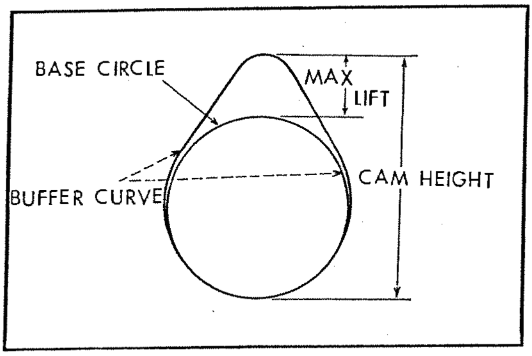


Fig. 3. 26 Names of cam parts

The cam provides a damping curve over a fairly large range between the base circle and the cam unit, and damps the shock generated when the rocker hits the lift curve ; this prevents noise. **(Refer to Fig. 3. 26)**

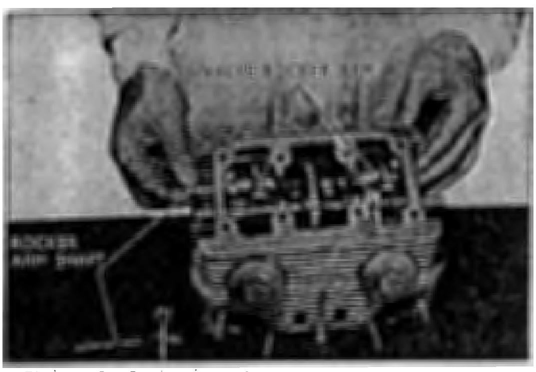


Fig. 3. 27 Removing rocker arm

Fig. 3. 28 Removing camshoft

I. Disassembly

1. Remove the cylinder head. **(Refer to Fig. 3. 2A)**
2. After the point base and the right side cover are removed, remove the tappet adjusting hole cap. Remove the rocker arm to the right and left on the base circle and the camshaft can be separated from the cylinder head. **(Refer to Fig. 3. 27** and **3. 28)**

II. Assembly

1. When the adjusting screw of the rocker arm is turned back fully, set it to the rocker arm pin and assemble it in reverse order of disassembly.
2. The stanard tappet clearance is 0.03 to 0.05 mm (0.012 to 0.020 in) when the engine is cold.

(CAUTION)

Correct or replace the unit when the cam is scored or worn unevenly.

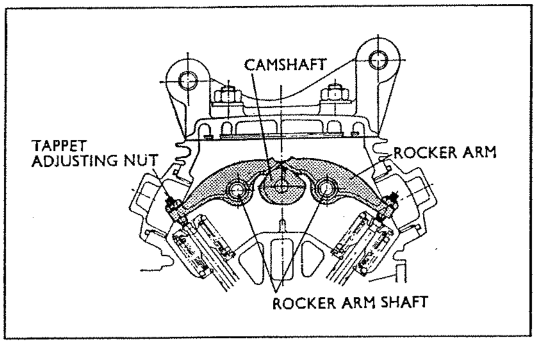


Fig. 3. 29 Valve rocker arm

D. Description of rocker arm

The rocker arm is an important unit which changes the rotating motion of the camshaft to reciprocating motion for the valve.

The rocker arm contact surface is finish treated after hardening. The tappet adjusting screw is coupled at the other end and pushes up the valve at the tip of the screw.

I. Dissassembly

1. Refer to section C above. When the right and left covers are removed, removal can be made. **(Refer to Fig. 3. 30)**

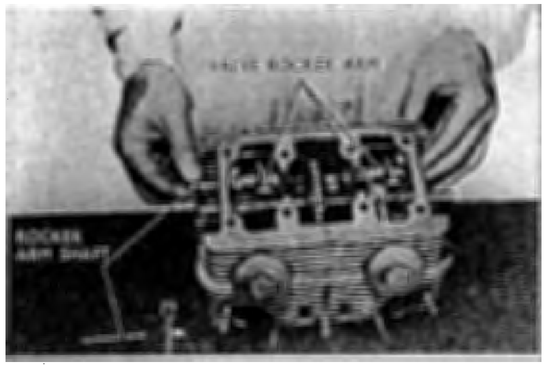


Fig. 3. 30 Removing valve rocker arm

II. Assembly

1. Inspect the rocker arm contact surface and replace the unit if there is scoring.
2. When the rocker arm shaft is being assembled, the rocker arm should be matched to the oil pool groove. **(Refer to Fig. 3. 31)**

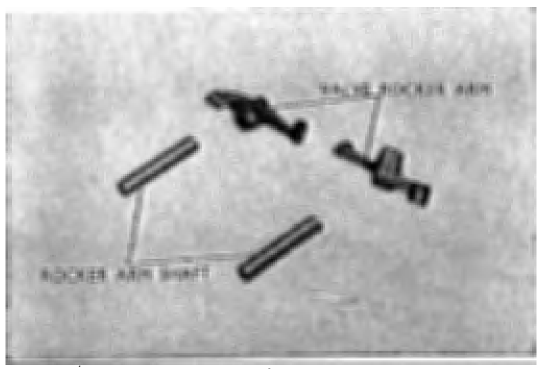


Fig. 3. 31 Rocker arm shaft

3. When the rocker arm has been disassembled and reassembled the tappet clearance (valve clearance) should be measured and adjusted. Adjustment should be performed at the position where the T mark of the A.C. generator rotor and the arrow mark of the stator are matched. (Compression top dead center). **(Refer to Fig. 3. 32)**

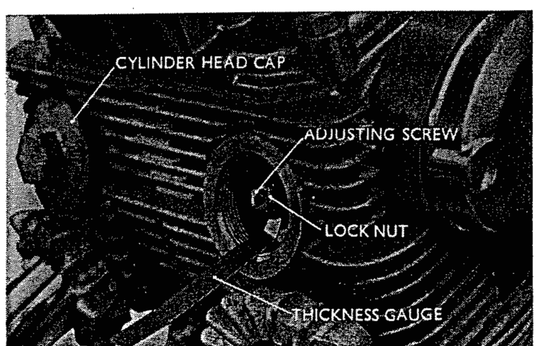


Fig. 3. 32 Adjustment of tappet clearance

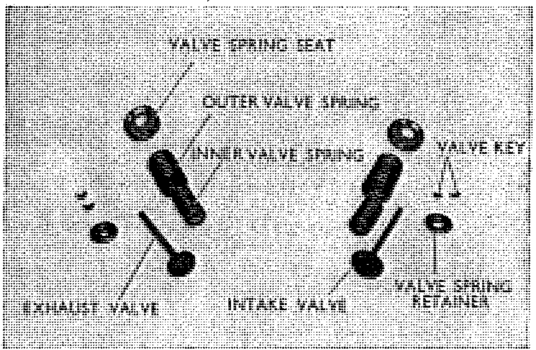


Fig. 3.33 Valve

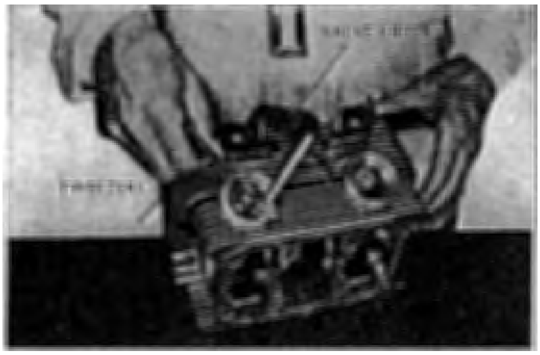


Fig. 3.34 Removing valve

Fig. 3.35 Oiling the valve stem

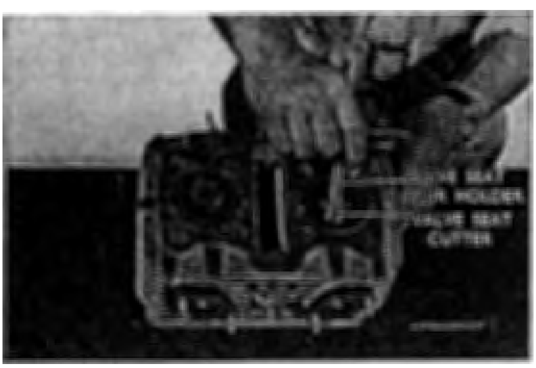


Fig. 3.36 Dressing valve seat

E. Description of valve

The valve performs the important role of air tightness in the cylinder, of intake and exhaust for compression and combustion, and extensively influences the engine output.

At the exhaust valve, the camber is small, for obtaining better heat radiation and the clearance between the stem and cylinder is made large. At the inlet valve, it is large for increasing the intake efficiency and the clearance between the stem and the cylinder is made small for satisfying various conditions concerning valve.

A double spring system is employed for the valve. **(Refer to Fig. 3.33)**

I. Disassembly

1. Remove the cylinder head according to Section 3.2.1.
2. Depress the valve lifter spring and remove the two valve cotter pins with long nose pliers or tweezers, the retainer valve spring from the head cover, and the valve from the combustion chamber. **(Refer to Fig. 3.34)**

II. Installation

1. Before the valve is assembled, the valve contact surface should be inspected for wear, pitting, or carbon. After cleaning, oil the valve stem, and the valve should be inserted from the combution chamber side. **(Refer to Fig. 3.35)**
2. The valve spring outer and inner retainers should be fitted from the cap hole of the tappet adjusting hole and be compressed by using the valve lifter. Secure with the valve cotter pin.

III. Valve seating

1. Dressing of a valve seat is made by using three cutters (such as a 90° plane cutter, INTAKE and EXHAUST plane cutter, and INTAKE and EXHAUST interior surface cutter.
2. The position of a seat is determined by the INTAKE and EXHAUST plane cutter and the width of a contact surface is determined by using an INTAKE and EXHAUST interior surface cutter.
3. When a seat surface is excessively burned, dresssing should be performed by using a 90° cutter so that the seat surface becomes even. **(Refer to Fig. 3.36)**

(CAUTION)

(a) When the valve stem is greatly worn, the valve guide is usually also worn. Hence, when a valve is replaced, it also is desirable to replace the valve guide. As the guide was press-inserted, it is better to replace the guide after heating the head to 300°C in a furnace.

(b) When the valve is assembled, the compound which was used during lapping should be completely removed.

Valve Timing models CB 125/160	
IN opens (at 1.1 mm lift)	5° (B. T. D. C.)
In closes (//)	30° (A. B. D. C.)
EX opens (//)	30° (B. B. D. C.)
EX closes (//)	5° (A. T. D. C.)

F. Description of cylinder

A cylinder sleeve of special alloy is press-inserted in a cylinder of lightweight cast aluminium alloy. At the center of the cylinder, a clearance for the operational range of the cam chain tightener and cam chain is established.

The lubrication oil fed from the oil pump passes through the stud holes at the rear right and left of the cylinder head at the gasket surface. Fitting of cylinder is determined by two guide keys. **(Refer to Fig. 3. 37)**

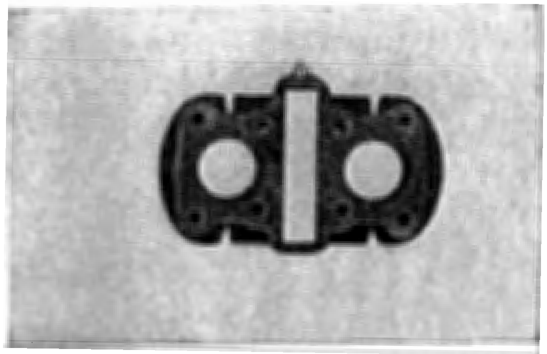


Fig. 3. 37 Cylinder

I. Disassembly

1. Remove the cylinder as in Section 3. 2. 1 and the 6×22 bolt retaining the cylinder; the cylinder can be removed from the stud bolt. **(Refer to Fig. 3. 38)**

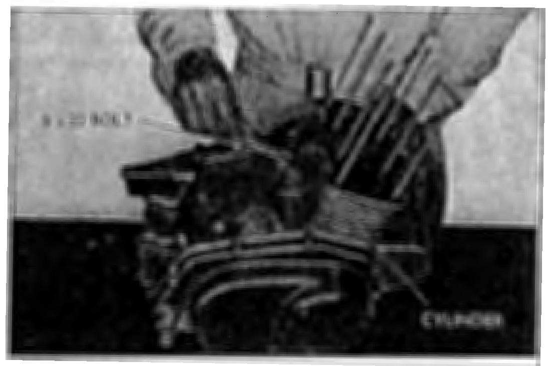


Fig. 3. 38 Inspection cylinder

II. Assembly

1. Inspect the cylinder and after confirmation of no abnomality such as ground wear or scars, remount it.
2. Place packing at the contact surface with the crankcase and insert the cylinder.
3. When a piston is inserted into a cylinder, use a piston " slider ". Applying a base between the piston and case, insert the cylinder. **(Refer to Fig. 3. 39)**
4. Assemble the cylinder head and head cover unit.

(CAUTION)

Inspect to determine if the crankcase packing has slipped from the cylinder lapping surface. (For air tighteness)

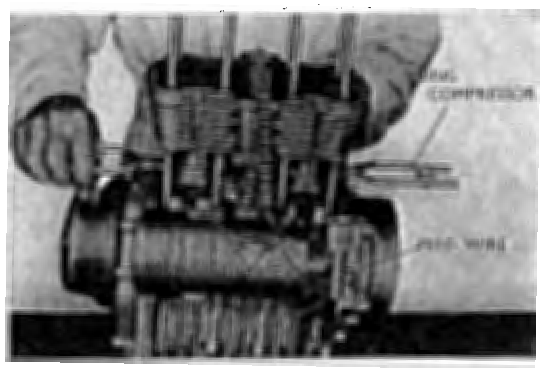


Fig. 3. 39 Coupling piston to cylinder

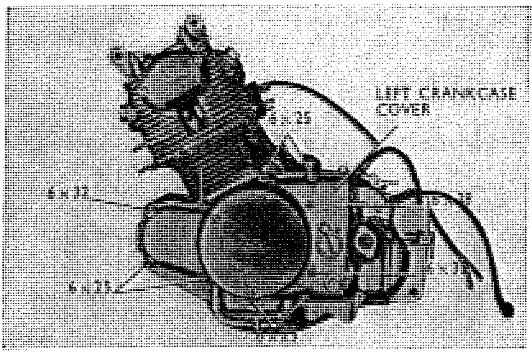


Fig. 3.40 Left crankcase cover

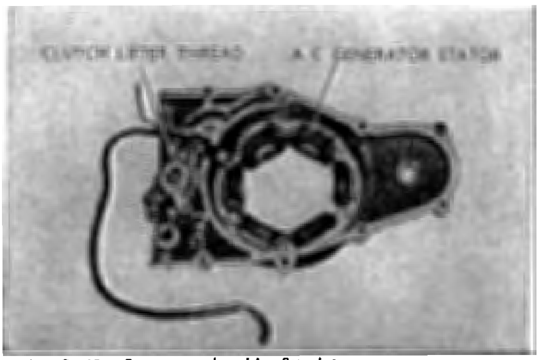


Fig. 3.41 Starter and cable fitted in case cover

Fig. 3.42 Adiusting clutch

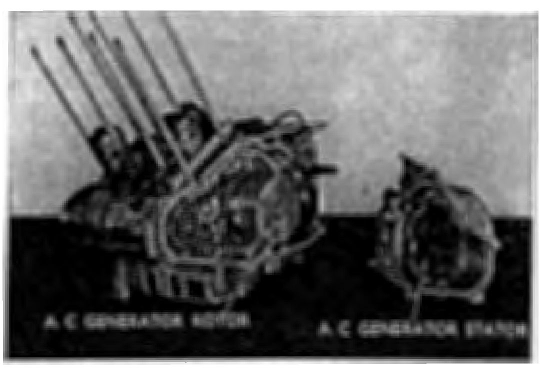


Fig. 3.43 AC generator and stator

3.3 Left crankcase cover

A. Construction of left crankcase cover

The left crankcase cover, as well as the crankcase, performs the role of formation and protection and is of lightweight alloy for protecting the A.C. generator against water, sand, etc.

For the purpose of making inspection and adjustment easy, the A.C, generator cover is fitted at the center of the case cover and the stator assembly of the A.C. generator at the back side. The clutch cable is connected at the rear. **(Refer to Fig. 3.40 and 3.41)**

I. Disassembly

1. Drain the engine oil (or lay the engine on its side).
2. Remove the gear shift and the neutral cord from the switch.
3. When the cross-point screws that retain the case cover are removed, the left crankcase cover can be separated from the crankcase.

II. Installation

1. Assembly should be performed with attention directed to the following points.
   - Breakage of left crankcase cover gasket.
   - Action of clutch cable.
2. After complete vehicle assembly and inspection, adjustment of the clutch should be made with the clutch cable **(Refer to Fig. 3.42)**

B. AC generator

A description of the AC generatar. is given in Electrical Parts (5).

In CB 125 and 160, in order to have the performance displayed by narrowing the width of the crankcase to the minimum, a logical design is employed with the AC generator located near the crankshaft and the stator coupled in the left crankcase cover. **(Refer to Fig. 3.43)**

I. Disassembly

1. Disassembly of AC generator

(a) The AC generator at the left crankcase can be removed or mounted without dismounting the engine. In this section, operation is explained when the engine is dismounted and the cylinder head and cylinder are disassembled.
(b) The piston is safely secured by the piston base.
(c) By removing the generator rotor bolt, dismount the rotor from the crankshaft by use of a generator rotor puller. **(Refer to Fig. 3. 44)**

2. Removal of AC generator rotor.

(a) Remove the left crankcase cover. **(Refer to Fig. 3. 30)**
(b) AC generator stator coupled in the left crankcase cover can be separated by removing the three 6×28 bolts. **(Refer to Fig. 3. 46)**
※ At the back of the AC generator rotor, the starting clutch is coupled (by the three 6×20 pan screws).

II. Installation

1. Installation of the AC generator rotor can be made by matching the groove at the the rotor side to the key set at the crankshaft side. Secure by rotor setting bolt.

(CAUTION)

When the key is dislocated from the crankshaft, it should be fitted by light tapping on the side of the key and slightly pressing to the set groove.

2. Following the reverse order of disassembly, assembly should be made followed by coupling of the left crankcase cover.

C. Starter sprocket and clutch

I. Operation of starter clutch

During transmission of rotation of the starting motor to the crankshaft, rotation from the motor can be transmitted to the crankshaft; conversely, rotation of the crankshaft cannot be transmitted to the motor. (For detail, refer to Electrical Parts (Chapter 5) **(Refer to Fig. 3. 47)**

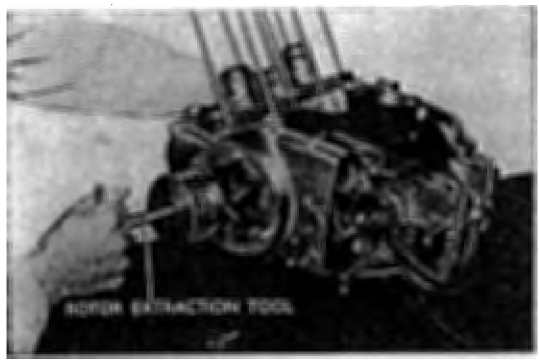


Fig. 3. 44 Removing AC generator rotor

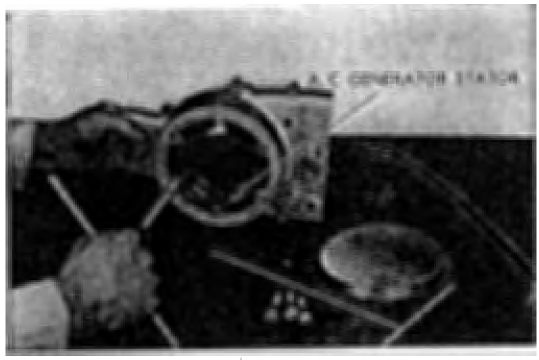


Fig. 3. 45 Removing generator stator

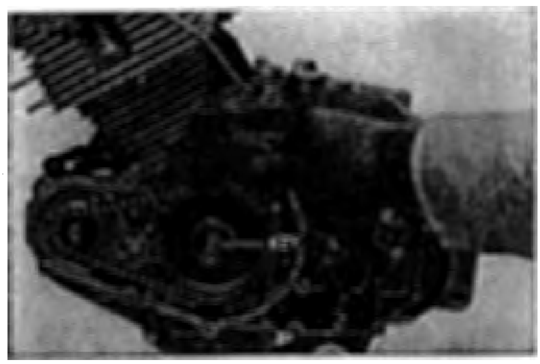


Fig. 3. 46 Example of rotor locating key set operation

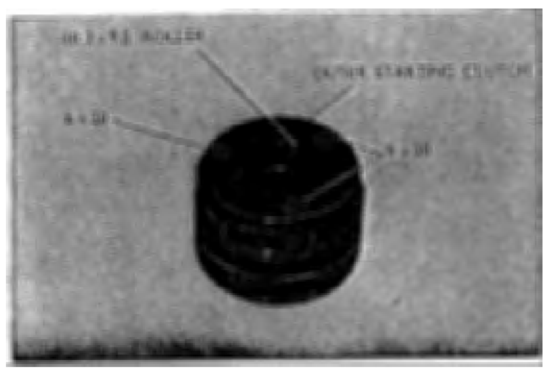


Fig. 3. 47 Starter clutch

Fig. 3.48 Setting operation of starter clutch roller spring

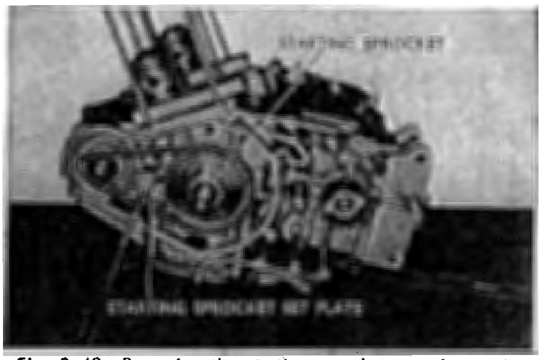


Fig. 3.49 Removing the starting sprocket set plate

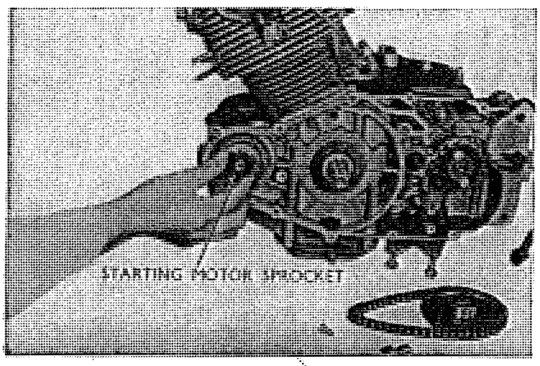


Fig. 3.50 Starting motor sprocket

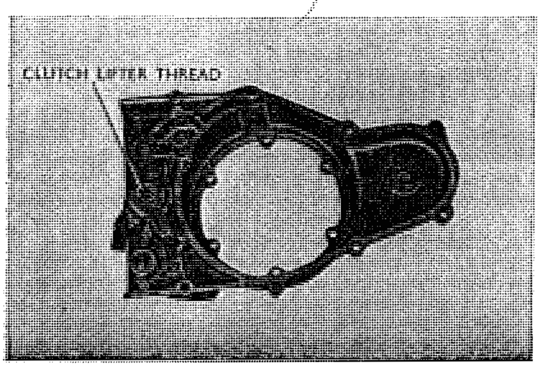


Fig. 3.51 Clutch adjuster

II. Disassembly and installation of clutch

1. Following Section 2.3 B, the AC generator rotor is separated from the left crankcase cover.
2. As the starter clutch is installed at the back of the AC generator rotor by using three 6 × 20 pan screws, it can be separated by removing the screws.
3. When installation is being performed, attention should be directed to the following points.
   - Smooth roller operation.
   - Starter clutch side plate and guide.
   - Weak clutch roller spring (replace).

III. Disassembly and installation of starter sprocket

1. After separation of the AC generator and the left crankcase following the previous section, the starting chain is disconnected at the joint section.
2. By removing the starting sprocket set plate (6 × 12 screws) coupled in the lower crankcase, the sprocket can be separated from the crankshaft. **(Refer to Fig. 3.49)**
3. The starting motor sprocket is coupled only by serration and can be extracted quite easily. **(Refer to Fig. 3.50)**

(CAUTION)

The joint clip slot of the starting chain should face opposite the direction of rotation.

D. Clutch adjuster and neutral switch rotor

I. Operation of clutch adjuster

For transmitting operation of the clutch cable to the clutch through the clutch rod, the clutch adjuster pushes the clutch rod and indicates relationship in direct start, transmission gear shifting, and stop. That is, adjustment of the clutch is generally made at the clutch adjuster adjustment ; affects the vehicle performance. **(Refer to Fig. 3.51)**

II. Disassembly and assembly of clutch adjuster

1. Following Section 3. 3 B, remove the left crankcase cover.
2. By removing the 6×35 bolts holding the adjuster fixing plate and clutch lever spring, the clutch adjuster can be separated. **(Refer to Fig. 3. 53)**
3. When assembly is performed, grease should be applied to the clutch adjuster (Grease Type HD Multipurpose NLGI No. 2)

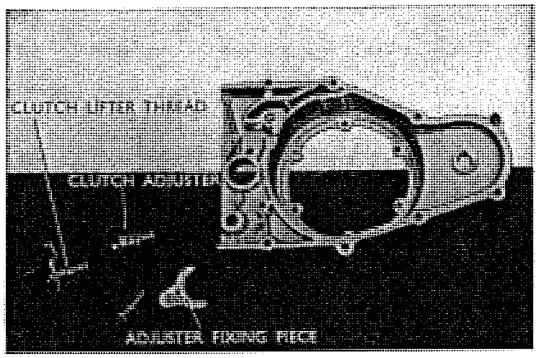


Fig. 3. 52 Disassembling clutch adjuster

III. Disassembly and installation of neutral switch rotor

1. Remove the left crankcase cover.
2. By pulling out the 6×12 screw holding the neutral switch stator, remove the stator.
3. By removing the 6×20 screw, the neutral switch rotor is separated from the gear shift drum. **(Refer to Fig. 3. 54)**
4. After the groove of the neutral switch rotor is matched to the key of the gear shift drum, assembly should be performed in reverse order of disassembly.

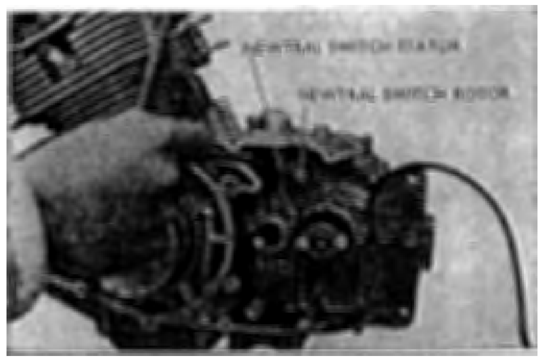


Fig. 3. 53 Disassembly of neutral switch rotor

3. 4 Crankcase cover assembly, right

A. Description of the right crankcase cover

The right crankcase cover, as well es the left crankcase cover, performs the role protection. The oil filter cover is fitted to the case cover and provides for passage of lubricating oil in both directions. **(Refer to Fig. 3. 54)**

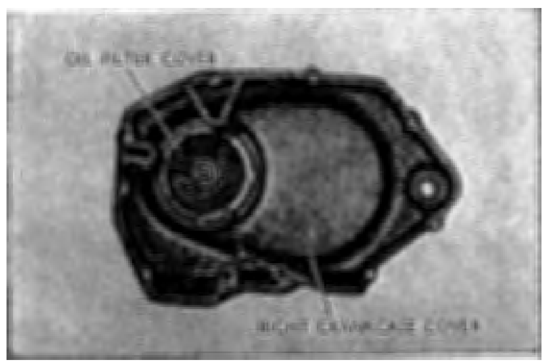


Fig. 3. 54 Right crankcase cover

I. Disassembly

1. Remove the kick starter arm from the kick pinion shaft.
2. By pulling out the ten cross-point screws securing the case cover, the right crankcase cover is removed. **(Refer to Fig. 3. 55)**
4. After pulling out the three 6×40 cross-point screws, the filter cover is removed.

(CAUTION)

During operation, attention should be directed to the two 74.5×3 "O" rings fitted to the oil filter cover.

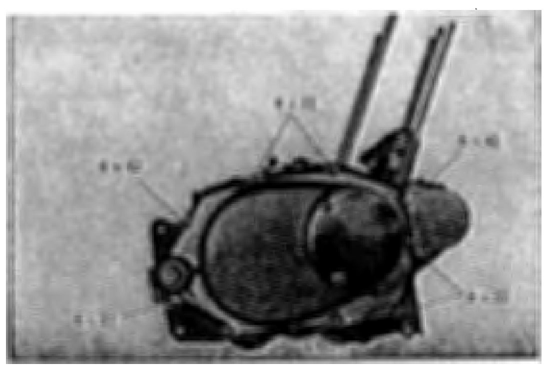


Fig. 3. 55 Right crankcase cover screws

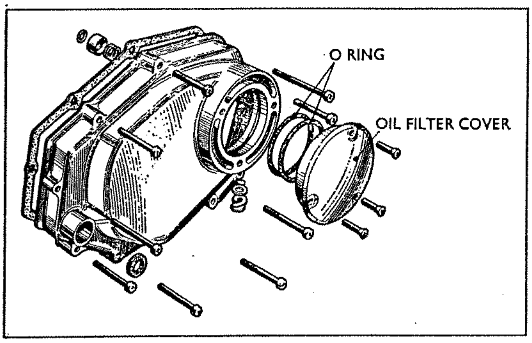
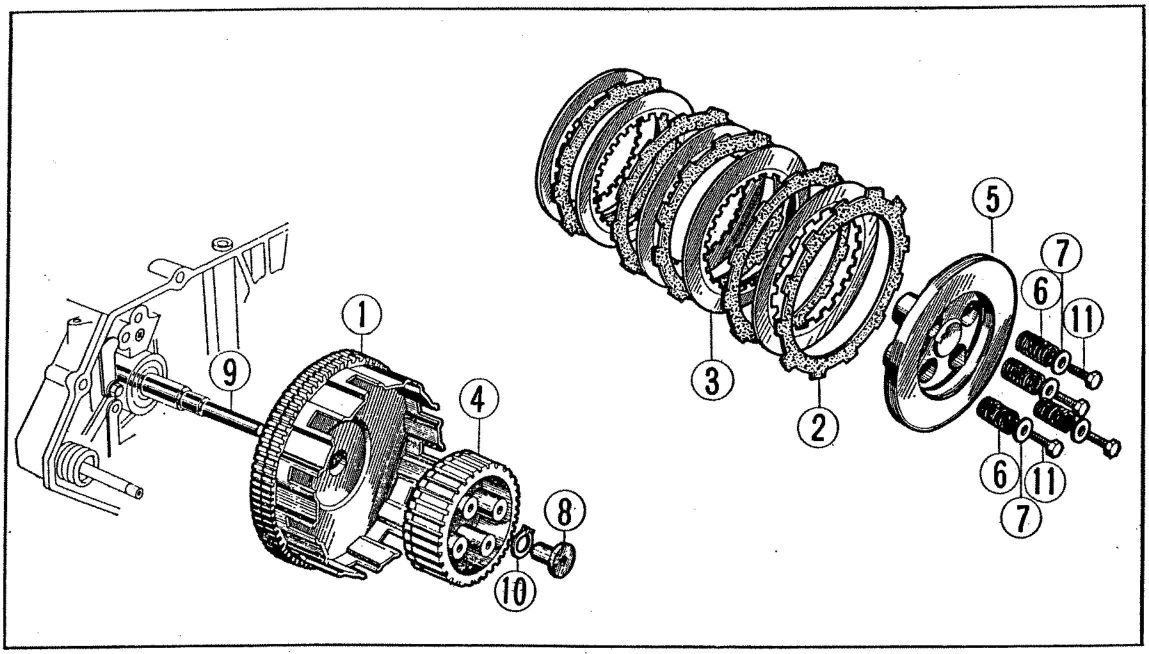


Fig. 3. 56 "O" ring on oil filter cover

II. Installation

1. Before installation, inspection and confirmation should be conducted to determine that the right crankcase cover is not broken, since a break causes oil leak.
2. After sufficiently washed, the oil filter cover should be installed with attention directed so that the 74.5×3 "O" ring is not broken. **(Refer to Fig. 3. 56)**
3. While installation is performed, all tightening screws should be tightened repeatedly and evenly.

3.5 Clutch



① Outer clutch complete
② Clutch friction disc
③ Clutch plate
④ Clutch center
⑤ Clutch pressure plate
⑦ Clutch plate retaining plate
⑧ Clutch joint
⑨ Clutch rod
⑩ 20 mm set ring
⑪ 6×18 hex bolt

A. Description and operation of clutch

As shown in the previous figure, the clutch is a wet multi-plate type and consists of the outer clutch, pressure plate, friction disc, clutch plate, and clutch center etc.

For transmitting rotation from the crankshaft to the transmission, the clutch has the role to engage or disengage power. It also provides for starts and stops which do not unreasonably load the engine. **(Refer to Fig. 3.57)**

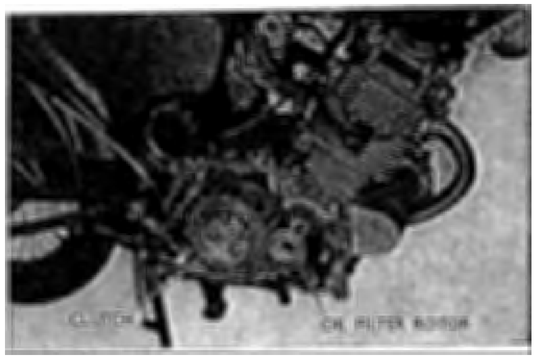


Fig. 3.57 Clutch installed (complete vehicle)

When the right crankcase cover is removed, the outer clutch complete, is exposed. To the outer clutch complete, the clutch spring driving the clutch pressure plate is installed. The clutch plate is installed with the clutch friction disc between the clutch center with four 6×18 hex bolts.

The clutch plate has teeth cut on the inside. These teeth are engaged with teeth cut on the outside of the clutch center. The clutch center is coupled to the transmission main shaft by spline. Hence, it and the transmission main shaft are essentially a single unit. The clutch plate, clutch center, and clutch pressure plate rotate.

On the other hand, to the groove cut on the exterior circumference of the outer clutch, the clutch friction disc is coupled by the collar entering the groove; freewheeling rotation with the transmission main shaft is obtained. Hence, while the clutch is connected, the outer clutch center, five clutch plates, five clutch friction discs, and clutch pressure plate are essentially a single unit through friction exerted by the clutch spring; rotation of the crankshaft is transmitted to transmission system.

Inside the outer clutch, the primary driven gear. **(Refer to Fig. 3.58)**

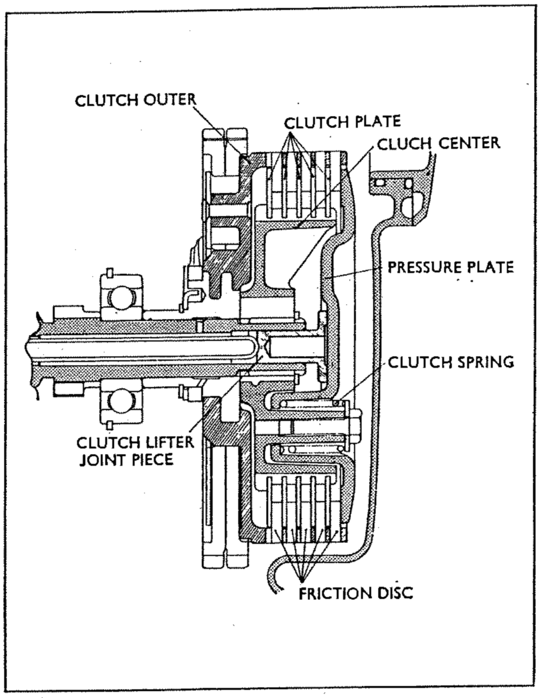


Fig. 3.58 Sectional view of clutch

When the clutch lever is gripped, the clutch adjuster rotates clockwise, the adjustment thread is pushed out by the square-headed thread in the clutch adjuster fitted to the left crankcase cover; this is pushed out by the clutch joint through the clutch rod. The clutch spring is compressed and the five clutch friction discs and five clutch plates become disengaged. Hence, the rotary motion of five outer clutches and five clutch discs is not transmitted to the clutch center. **(Refer to Fig. 3.58 and 59)**

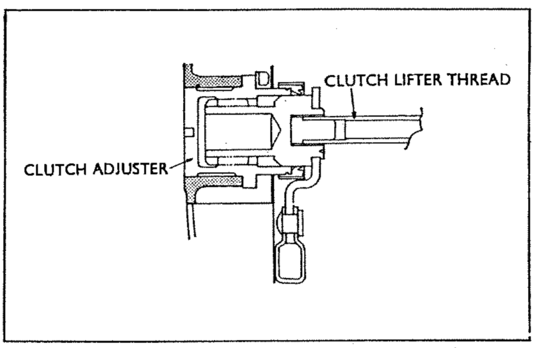


Fig. 3.59 Sectional view of clutch adjustment thread

Fig. 3. 60 Removing set ring

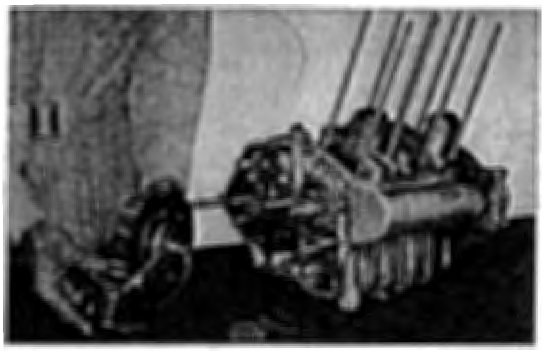


Fig. 3. 61 Removing outer clutch and pump body

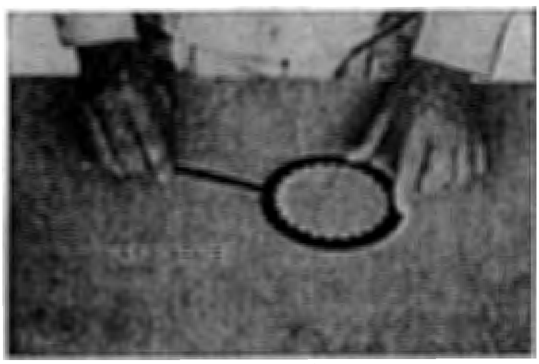


Fig. 3. 62 Inspecting distortion of clutch plate

Fig. 3. 63 Measuring thickness of clutch friction disc

I. Disassembly

1. Remove the right crankcase cover.
2. By removing the four 6×18 bolts for securing the clutch pressure plate, separate the clutch friction disc and the clutch plate.
3. By removing the 20 mm set ring, remove the clutch center.
4. By removing the oil filter cap and the 16 mm lock nut securing the oil filter rotor, extract the oil filter rotor.
5. Remove the right primary drive gear.
6. By pulling up the turn stop, remove the 6 mm nut securing the oil pump.
7. Remove the outer clutch (complete) together with the oil pump (complete). **(Refer to Fig. 3. 61)**

(CAUTION)

This is removed at a right angle facing the transmission shaft. Attention should be directed so that the transmission shaft is not scarred by pinching.

II. Inspection

1. Clearance between the clutch center and the main transmission shaft.

	Standard value	Correction limit
Clearance	From 0.03 to 0.078 mm (0.0012 to 0.003")	When above 0.12 mm (0.004"), replace.

2. Damage, wear, and distortion of clutch plate teeth.

	Standard value	Correction limit
Distortion	Within 0.2 mm (0.008")	When above 0.5 mm (0.02"), correct or replace

3. Measurement of damage, thickness, distortion and one-sides contact of the notch of the clutch friction disc.

	Standard value	Correction limit
Thickness		
Distortion	Within 0.2 mm (0.008")	When above 0.5 mm (0.02"), replace.
Width of notch		

4. Fatigue of clutch spring

	Standard value	Correction limit
Free length		
Tension (mm/h)		

5. Measurement of clearance of the outer clutch notch and the clutch friction disc

	Standard value	Correction limit
Clearance	Within 0.2 mm (0.008″)	When above 0.8 mm (0.03″), replace

III. Assembly

1. The outer clutch and the oil pump should be coupled by the pump plunger and the unit should be coupled at a right angle to the main transmission shaft and the pump fitting stud bolt. **(Refer to Fig. 3. 65)**
2. Tighten the oil pump nuts.
3. Install the right primary drive gear.
4. Install the oil filter rotor.
5. Couple the clutch center to the spline of the main transmission shaft and set by the 20 mm set ring.
6. Five clutch plates and five clutch friction discs should be placed alternately. Fit the clutch pressure plate and place the clutch spring ; tighten them by the four 6×18 bolts.

(CAUTION)

When the clutch pressure plate is installed, the clutch joint should not be neglected.

7. When the tightening screws of the right crankcase cover have been tightened, assembly of the clutch has been completed.

3. 6 Oil pump, filter, and separator

A. Description of oil pump

The pump is a plunger type. It repeats the function of sucking and pumping oil by the length of stroke of the plunger through mutual relation of reciprocating motion of the pump plunger and the suction valve (steel ball). **(Refer to Fig. 3. 67)**

Fig. 3. 64 Measuring clutch spring

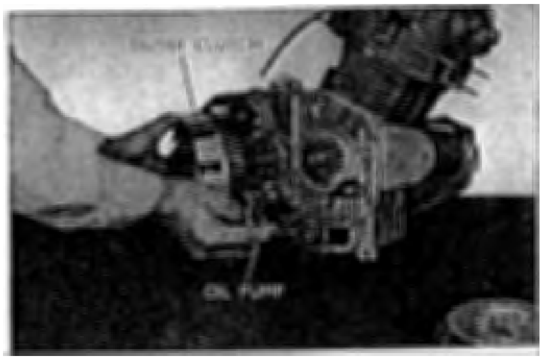


Fig. 3. 65 Coupling outer clutch

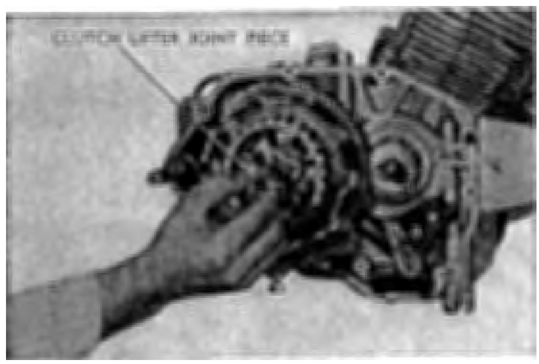


Fig. 3. 66 Coupling clutch spring

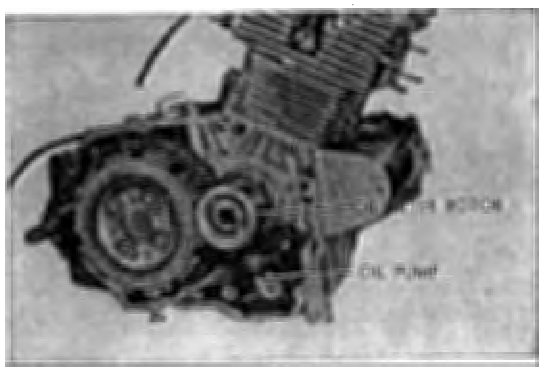
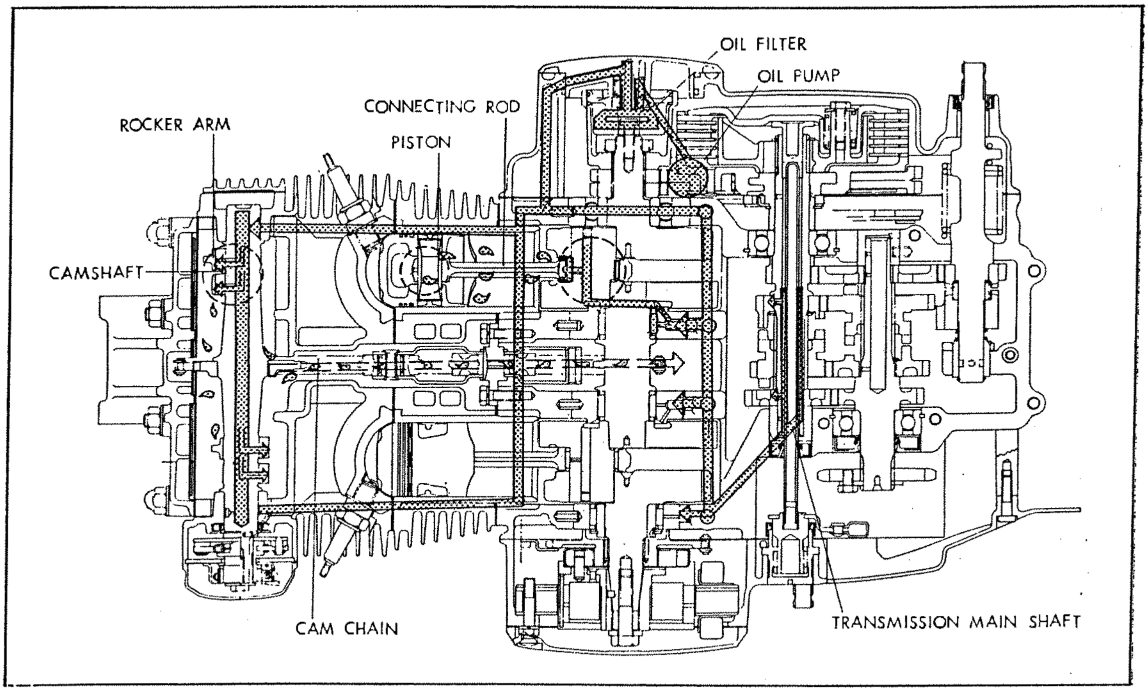


Fig. 3. 67 Oil pump and centrifugal filter

I. Lubrication circuit



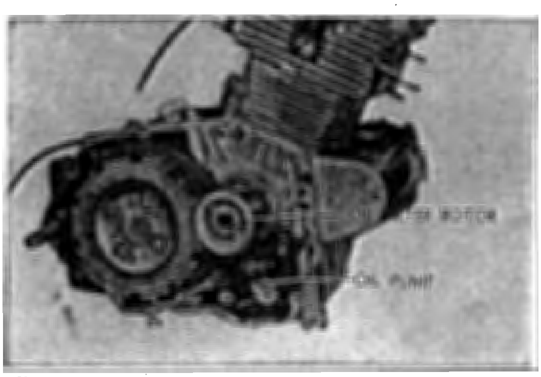


Fig. 3.68 Oil pump

Oil stored in the crankcase chamber is drawn up by the oil pump and fed from the lower crankcase to the upper case through the oil passage of the oil filter cover to the oil filter. Impurities in the oil are separated by centrifugal force at the oil filter. Clean oil is fed from the upper crankcase to all crankshaft bearings for lubrication. When oil enters the right and left crankshaft outer rings, it is divided into two parts; one is fed to the roller bearing and the other enters the crankshaft for force lubricating the crank end of connecting rod; the piston ends of connecting rods are lubricated by splashing.

Oil from the oil passage in the upper crankcase is divided into two in the right and left at the rear of the cylinder stud bolt and is fed to the cylinder and cylinder head. At the right side, from the right cylinder head cover (at the left side from the point base), oil is fed to the camshaft and lubricates the camshaft rocker arm; it then falls from the clearance around the cam chain at the center into the crankcase.

Oil from one side which was divided into two at the left side of the upper case follows the oil passage in the crankcase, enters the main transmission.

This action lubricates all free gears and the oil falls into the crankcase.

For other gears and bearings, oil film formed by oil drops and mist performs lubrication.

II. Disassembly

1. Remove the right crankcase.
2. Remove the oil filter.
3. Remove the right primary drive gear.
4. Separate the pump body together with the clutch. **(Refer to Fig. 3.51)**
5. By removing the 26 mm retainer, remove the pump rod coupled in the outer clutch. **(Refer to Fig. 3.69)**
6. Extract the pump plunger pin and remove the plunger at the tip of the pump rod. **(Refer to Fig. 3.70)**

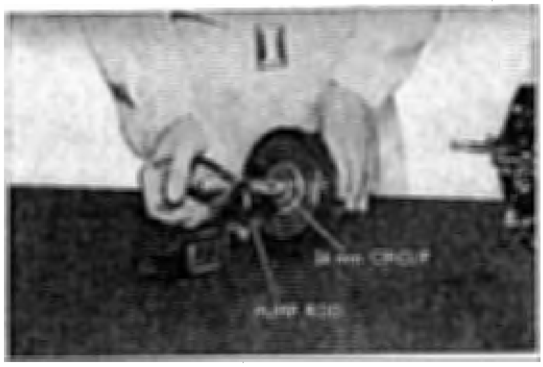


Fig. 3.69 Removing pump rod

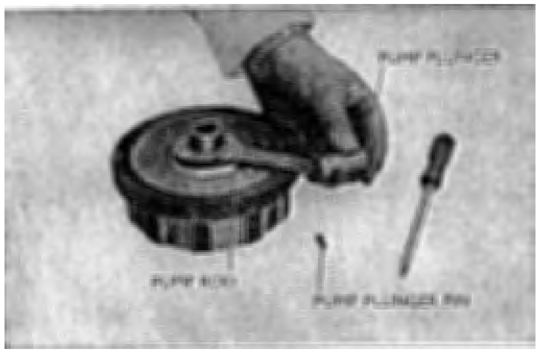


Fig. 3.70 Removing plunger

7. The following are included in the pump. **(Refer to Fig. 3.71)**

Intake side

- Outlet valve guide (complete) ....1 each
- 11.5×2 "O" ring........................1 each
- Suction valve spring........................1 each
- ♯10 steel ball..............................1 each

Exhaust side

- Suction valve bolt..........................1 each
- Suction valve bolt packing..................1 each
- ♯10 steel ball..............................1 each
- Pump filter screen..........................1 each
- Pump gasket.................................1 each

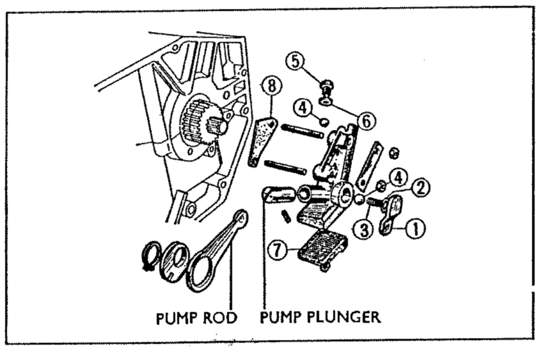


Fig. 3.71 Pump parts

III. Assembly

1. Assembly is the reverse order of diassembly.

(CAUTION)

(a) Whether or not the oil pump is operating securely is confirmed by loosening the cap nuts holding the cylinder head cover at the right and left sides and rear. (If oil is visible, the condition is acceptable.) **(Refer to Fig. 3.72)**

(b) When oil circulation is not favorable, inspect the following points:

(1) Tightness of oil pump.

(2) Pump gasket (broken).

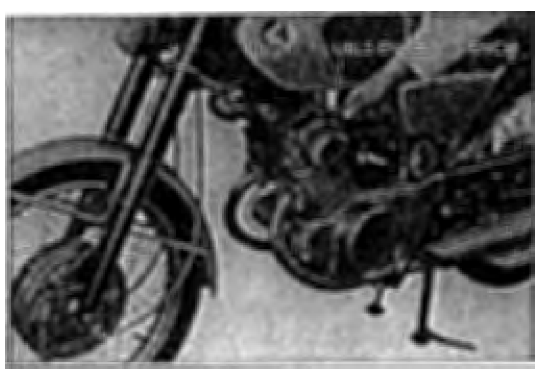


Fig. 3.72 Confirming oil circulation

(3) Clearance between the pump and plunger. (Play by wear)
(4) Steel ball (broken or seized.)
(5) Mesh of pump filter screen (blocked).
(6) Oil filter or oil passage (blocked).

(c) Inspection should be performed with sufficient attention because wrong lubrication decreases performance of the engine, and causes seizure, noise and other trouble.

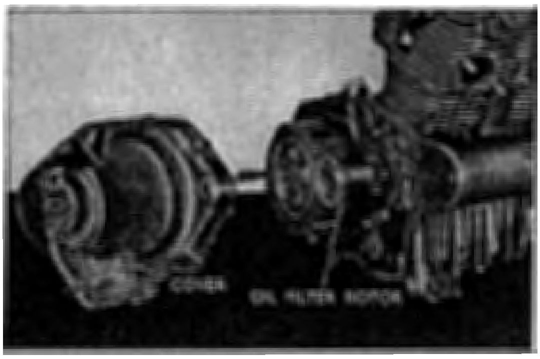


Fig. 3.73 Oil filter

B. Operation of oil filter

In CB 125 and 160, trouble concerning the engine oil is prevented by double filtering, wire mesh and filter. **(Refer to Fig. 3.73)**

Before being sucked up by the pump, oil is filtered by the filter screen and oil impurities are eliminated by separation filtering using centrifugal force.

This oil filter at the same time collects oil impurities at the ribs of the oil filter cap by gravity, gives collective flow to oil, and supplies clean oil to each unit.

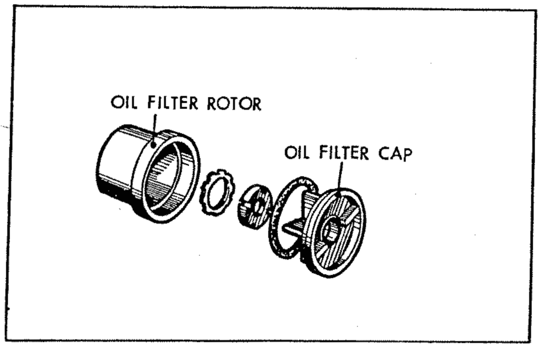


Fig. 3.74 Oil filter parts

I. Disassembly

For the operation conducted when the crankcase cover is removed, refer to Section 3. 5. 1. The following section describes the operation conducted when the crankcase cover is not removed.

1. Remove the oil filter cover.
2. By using plier, clip the rib of the oil filter cap and pull out in parallel. **(Refer to Fig. 3.75)**
3. By using a screw driver, bend the 16 mm lock washer from the groove of the lock nut.
4. Pull out the lock nut by using the 16 mm lock nut tool and remove the lock washer from the crankshaft.
5. Next, pull out the oil filter rotor.

Fig. 3.75 Removing the oil filter cap

II. Assembly

1. After cleaning all parts of the filter and oil filter cover guide, the disassembly order is reversed for assembly. **(Refer to Fig. 3.76)**
2. Proper tightening of the 16 mm lock nut and lock washer securing the oil filter should be made.
3. Assembly of the oil filter cap should be performed flatly.

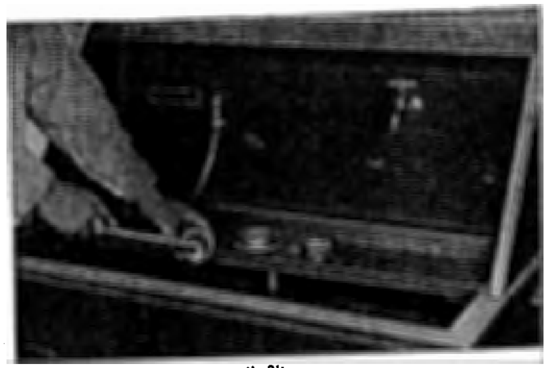


Fig. 3.76 Cleaning oil filter

C. Operation of oil separator

The oil separator is installed in the front section of the lower crankcase, by the right and left cylinder bores and just under the crankshaft. It reduces the amount of oil splashed by rotation of the counterweight of the crankshaft, prevents oil penetration, and controls the oil temperature rise. **(Refer to Fig. 3.77)**

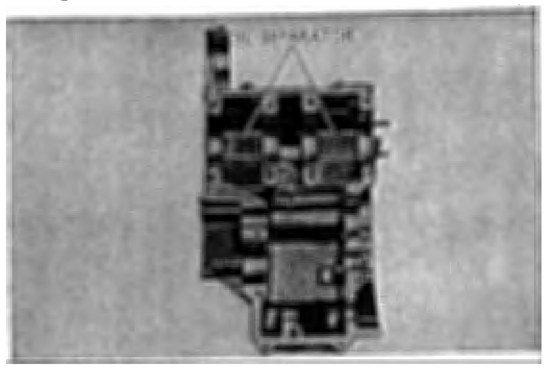


Fig. 3.77 Lower crankcase in which oil separator is installed

3.7 Crankcase

A. Description

The upper and lower crankcases are of lightweight alloy and can be separated at the surface which includes center lines of the crankshaft, transmission shaft, and the kick starter spindle.

In addition, at the left front section of the CB 125 and 160 crankcase, the starting motor is supported.

In the upper surface of the upper crankcase, the cylinder stud bolts are inserted. At the contact surface with the lower crankcase, nine 8 mm stud bolts are inserted. In the lower crankcase, 8 mm and 6 mm studbolts (one each) are inserted. **(Refer to Fig. 3.78)**

The lower crankcase is equipped with the oil separator, lower crankcase cover, and two drain plugs. **(Refer to Fig. 3.79)**

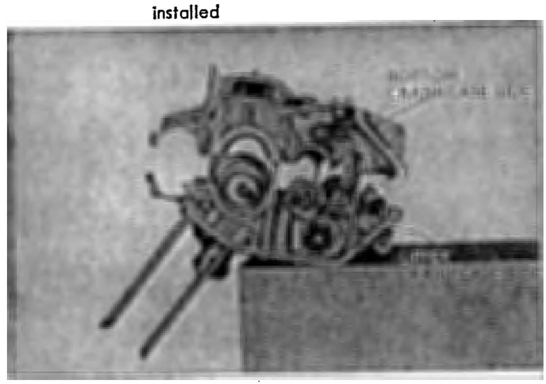


Fig. 3.78 Upper and lower crankcase

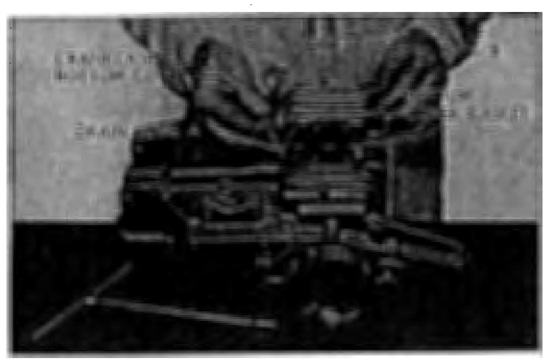


Fig. 3.79 Drain plugs

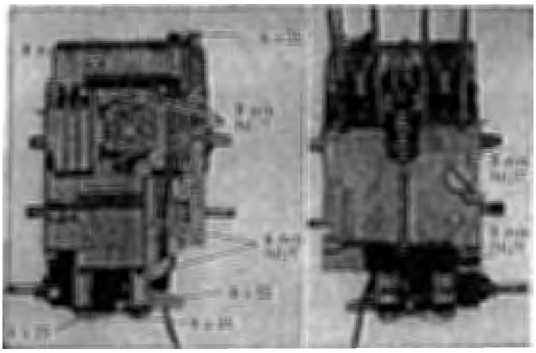


Fig. 3.80 Crankcase bolts

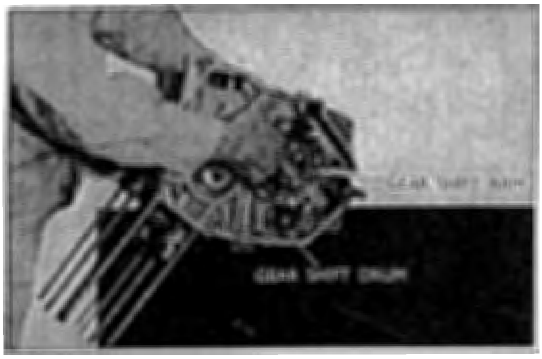


Fig. 3.81 Releasing key from shift drum

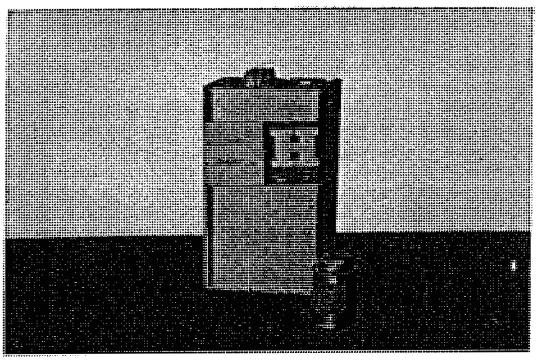


Fig. 3.82 Liquid packing products

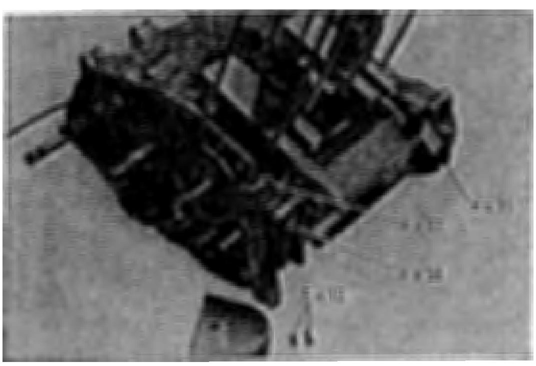


Fig. 3.83 Disassembling starting mortor side cover

I. Disassembly

1. Drain oil in the crankcase.
2. Remove the cylinder head and cylinder.
3. Separate the left crankcase cover and AC generator.
4. Separate the right crankcase cover, oil filter, and clutch oil pump.
5. Remove one 8 mm nut and one 6 mm nut from the stud bolts at the upper part of the upper crankcase.
6. Remove seven 8 mm nuts, two 6 mm nuts, three 6×35 bolts, and two 6×55 bolts from the lower crankcase.
7. After removing the starting motor side cover, remove the 6×22 and 6×28 bolts on the right hand side of the crankcase which mount the starting motor.
8. By removing the 6×35 bolt on the left hand side at the starting motor which is supported by the crankcase, the starting motor may be removed.
9. While the key on the gear shift arm is released from the shift drum, dismount the motor. **(Refer to Fig. 3.81)**

II. Assembly

1. Assembly should be performed with attention paid to the following points:
   - Inspect the contact surface of the crankcase for leaks, scars, or other damage and adequately clean the crankcase.
   - Apply liquid packing to the contact surface of the case; after this is dry, assembly should be performed.

III. Disassembly and installation of starting motor

1. When the starting motor is disassembled and installed without disassembling the crankcase, attention should be directed to determine if the case is damaged.
2. For disassembly, drain engine oil and remove the left crankcase cover; disconnect the starting chain at the joint section.
3. Remove the starting motor cable.
4. Remove two 5×12 pan screws securing the starting motor side cover. **(Refer to Fig. 3.83)**
5. Remove the 6×22 bolt of the upper case and the 6×28 bolt of the lower case at the right of the starting motor.

6. Remove the 6×35 bolt at the lower crankcase front section.
7. Pull out gently and in line with the crankcase.
8. Assembly is the reverse order of disassembly.

3. 8 Crankshaft, connecting rods, and pistons

A. Description of crankshaft

The right and left crankshafts are of carbon steel and the counterweights are of nickel-chrome molybdenum steel. Each crankshaft is constructed by press inserting the counterweight into the crankshaft. The center crankshaft is press inserted and coupled. The crankshaft is supported at four points, one ball bearing and three roller bearings. The sprocket of the cam chain is cut in the crankshaft and drives the cam shaft. **(Refer to Fig. 3. 84)**

All bearings are secured to the crankcase by guide pins. In the center crank outer ring, an oil hole which matches the oil hole of the upper crankcase is the guide; the guide is in the form of a pipe.

Oil pumped by the oil pump is divided at the center crank outer ring oil hole; one supply lubricates the roller bearing and the other is stored in the cutaway of the counterweight side surface for feeding from the weight cutaway groove to the interior of the crank pin by centrifugal force. This lubricates the crankshaft end of the connecting rod. **(Refer to Fig. 3. 85)**

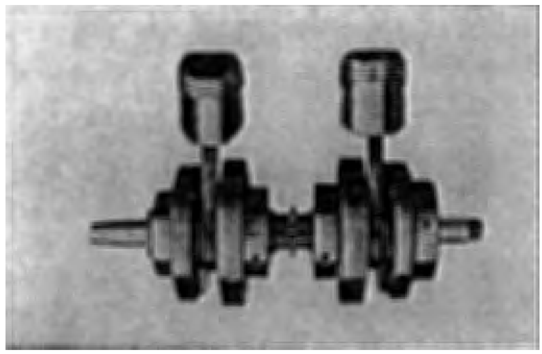


Fig. 3. 84 Crankshaft

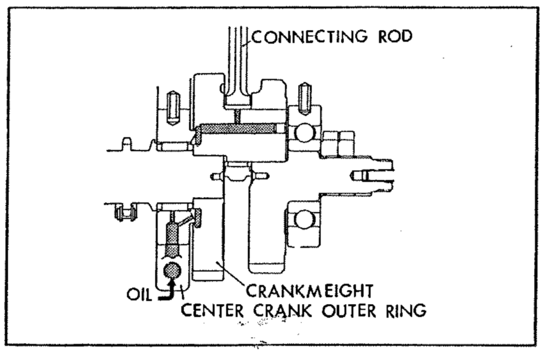


Fig. 3. 85 Crankshaft lubricating passage

I. Disassembly

1. Drain oil from the crankcase.
2. Separate the cylinder head and cylinder.
3. Separate the left and right crankcase cover.
4. Separate the AC generator and clutch oil pump.
5. Hence, disassembly of the crankcase is performed by following Section 3. 5 E.

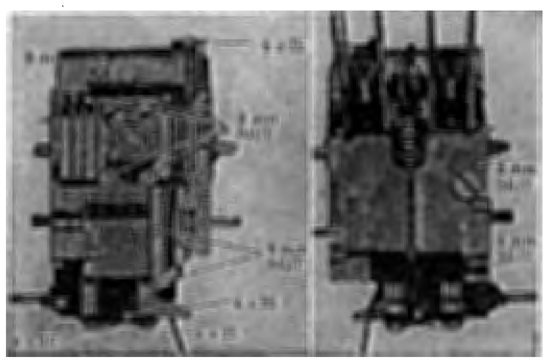


Fig. 3. 86 Cranlcase 'bolts ard nuts

Fig. 3. 87 Measurement of axial clearance

Fig. 3. 88 Measurement of radial clearance

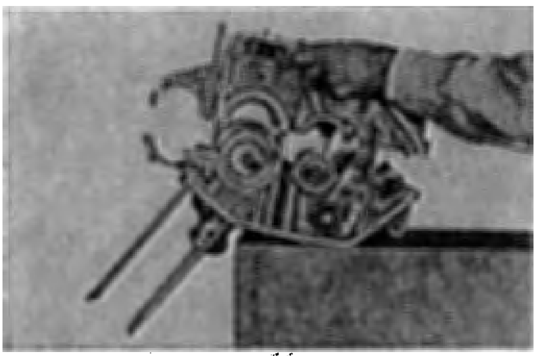


Fig. 3. 89 Matching lower crankcase

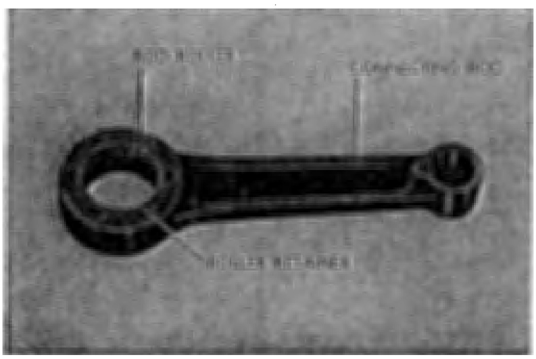


Fig. 3. 90 Part of connecting rod

II. Inspection

1. Clearance of the crankshaft 6305 special ball bearing should be measured at the value obtained when the crankshaft is set on V-shaped blocks and the bearing is moved up and down and to the right and left.

	Standard value	Correction limit
Axial clearance	Less than 0.05 mm (.002")	When over 0.1 mm (.003"), replacement should be made.
Radial clearance	Within 0.01 to 0.025 mm (.0004"—.001")	When over 0.05 mm (.002"), replacement should be made.

2. Measurement of crank outer ring and left main bearing clearance.

	Standard value	Correction limit
Axial clearance	Within 0.006 to 0.014 mm (.0002"—.0005")	When over 0.05 mm (.002"), replacement should be made.

III. Installation

1. The upper crankcase should be inverted and the crankshaft complete should be placed on it. Guide holes of bearings should be matched and the lower crankcase should be set on the assembly is the reverse order of disassembly. **(Refer to Fig. 3. 89)**

B. Description of connecting rods

The connecting rods are of molybdenum steel and have an H-shaped section; bushings are not at both the crank-shaft and piston ends. The crankshaft is polished after case hardening and mounts the roller without race. The roller (4 × 13) is held by the roller retainer made of special aluminum alloy. Staggered rollers are used in order to increase the load capacity. **(Refer to Fig. 3. 90)**

Inspection

1. Measurement of deflection at the piston end of the connecting rod. **(Refer to Fig. 3.91)**

	Standard value	Correction limit
Deflection		When over 3.0 mm, replacement should be made

2. Measurement to determine if the connecting rod ends are correctly aligned and parallel is obtained by measuring the difference of inclination of points 50 mm (2. 0″) away from the center when a 100 mm (4.0″) bar with the same thickness as the piston pin diameter is inserted into the bore of the piston end and twisted to the right and left, and when the bar is rotated 90° and again twisted to the right and left. **(Refer to Fig. 3.92)**

	Standard value	Correction limit
Level of parallel	Less than than 0.02 mm (.0006″)	When over 0.1 mm (.04″), replacement shouid be made.
Twist	Less than 0.02 mm (.0006″)	When over 0.1 mm, replacement should be made.

C. Description of pistons

The piston is an oval type which is heat treated and worked after casting with aluminium alloy. The piston, under high temperature, swells in the pin direction and clearance with the cylinder is decreased. When the piston and cylinder are fitted, close attention should be paid to the clearance. In addition, in the CB 125 and 160, for increasing the compression ratio, the piston head is cut for avoiding interference between the valve and piston. **(Refer to Fig. 3.93)**

▽ When clearance between the piston and cylinder is too large :

1. When the piston reverses direction at the top and bottom dead centers, shock is intense and a slapping noise results.
2. Oil penetration to the combustion chamber occurs.

▽ When the clearance is too small :

1. Formation of oil film inside the cylinder does not occur and seizure results.
2. Even when seizure does not occur, the output is decreased since friction loss is increased.

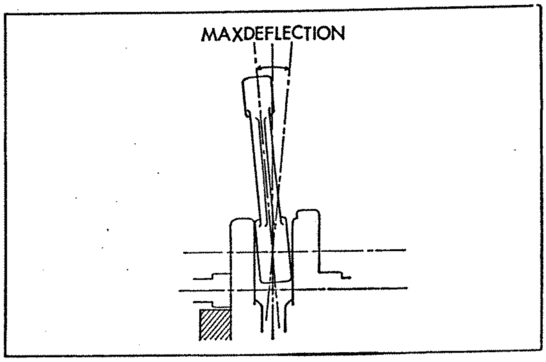


Fig. 3.91 Measurement of maximum deflection at the piston end of connecting rod

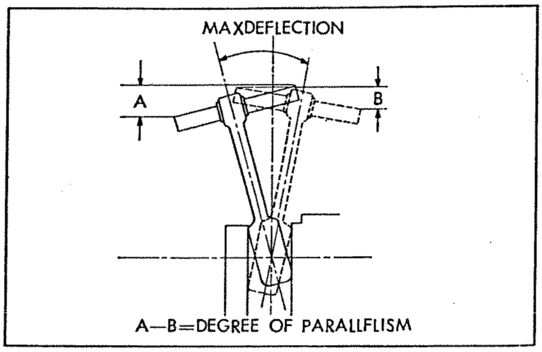


Fig. 3.92 Measurement of parallel condition at the piston end of the connecting rod

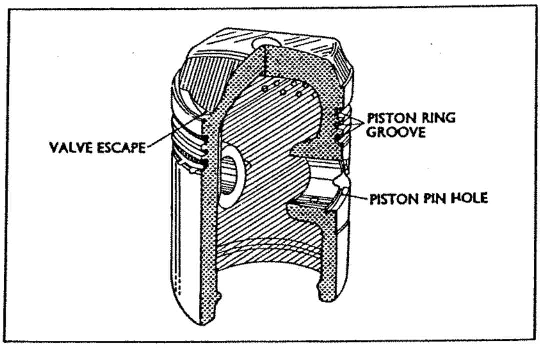


Fig. 3.93 Sectional view of piston

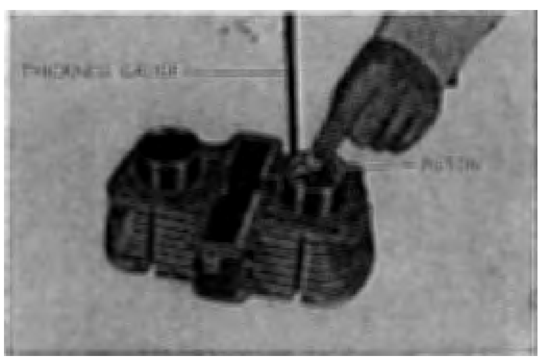


Fig. 3.94 Measuring clearance between piston and cylinder


Fig. 3.95 Removing piston pin retainer


Fig. 3.96 1 D 2 D

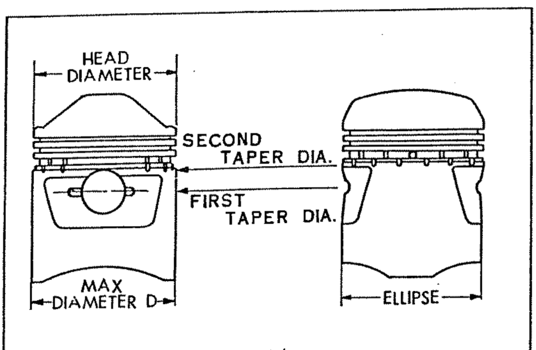


Fig. 3.97 Measuring piston outside diameter

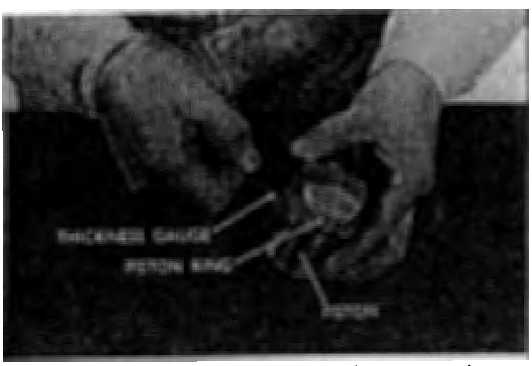


Fig. 3.98 Measuring ring groove when a new piston ring is fitted.

I. Disassembly

1. Remove the piston pin retainer from the removed crankshaft and remove the piston pin. **(Refer to 3.95)**
2. When the piston pin is removed, attention should be directed so that the ring is not twisted. (Employment of the piston ring tool is recommended. **(Refer to Fig. 3.96)**

II. Inspection

1. Before cleaning, carbon adhering to the piston head or sing groove shauld be removed with out the piston being scarred.

(CAUTION)

Sandpaper should not be used for removing.

2. Measurement of outside diameter of the piston. **(Refer to Fig. 3.97)**

	Standard value	Correction limit
Head diameter	mm	
	mm	
Maximum diameter	Dmm	
	Dmm	

(CB 125, 160)

3. Measurement of the ring groove clearance when a new piston ring is fitted. **(Refer to Fig. 3.98)**

	Standard value	Correction limit
Top ring	0.04 to 0.07 mm (.0016″ to .0028″)	When over 0.15 mm (.0060″), replacement should be made.
2nd ring	0.01 to 0.04 mm (.0004″ to .0016″)	Same as above
Oil ring	0.01 to 0.04 mm (.0004″ to .0016″)	Same as above

(CB 125, 160)

4. Measurement of piston pin hole **(Refer to Fig. 3. 99).**

	Standard value	Correction limit
Bore		When above mm, replacement shoud be made.

5. For oversize pistons, there are three at intervals of 0.25 mm.
6. Measurement of the piston outside diameter.

	Standard value	Correction limit
Outside diameter		

(CB 125, 160)

III. Assembly

1. At installation, the arrow mark at the piston head should be faced in the forward direction. **(Refer to Fig. 3. 100)**

(CAUTION)

Care should be taken since reversal of direction causes the piston head to contact the valves.

2. For fitting of the piston pin, piston, and piston end of the connecting rod, a normal temperature float system is employed. Hence, fitting should be such that light manual pressure at normal temperature is sufficient for insertion. **(Refer to Fig. 101)**
3. Avoid the use of piston rings which have lost their temper ; use new piston rings.

D. Description of piston rings

Of the steel rings, hard chrome plating is applied to the top and second, and parkerizing is applied to the oil ring. The top and second rings are compression rings and the oil ring is for scraping down oil on the cylinder wall. All transmit piston heat to the cylinder wall.

(1) As the top ring is especially apt to wear due to high temperature, hard chrome plating is applied for increasing wear resistance.

(2) At the second ring, the contact surface with the cylinder is reduced for increasing the tension per unit area ; smooth fitting is obtained in a short period.

(3) The oil ring has an indented shape suitable for scraping oil down.

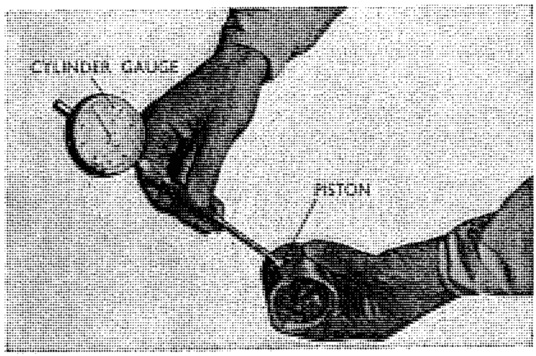


Fig. 3. 99 Measuring piston pin hole

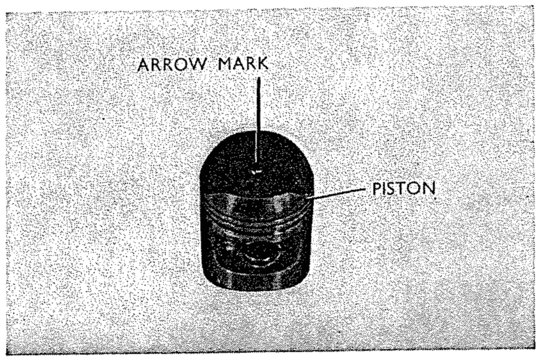


Fig. 3. 100 Mark on piston head

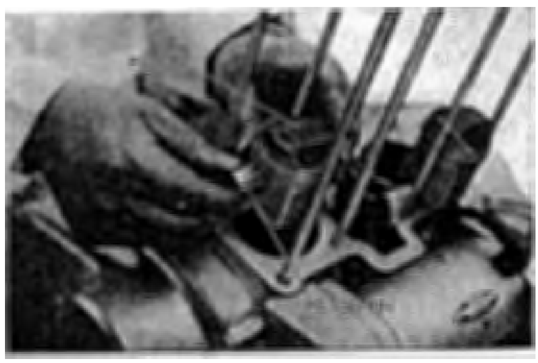


Fig. 3. 101 Fitting piston pin

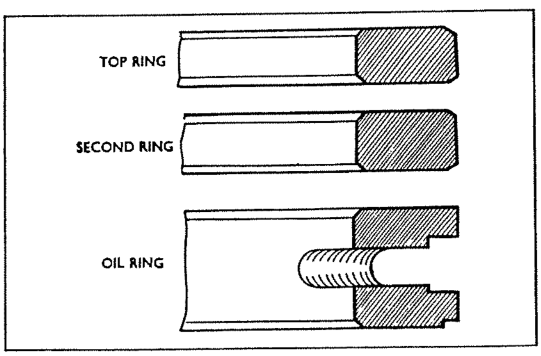


Fig. 3. 102 Sectional view of piston rings

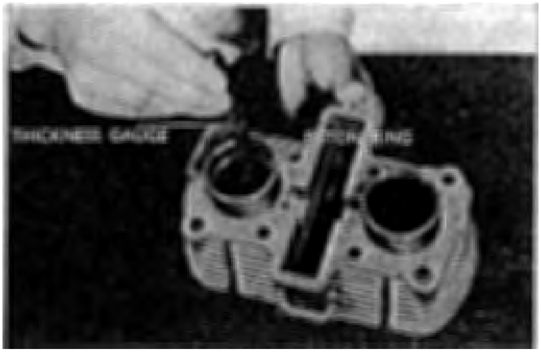


Fig. 3.103 Measuring piston ring gap

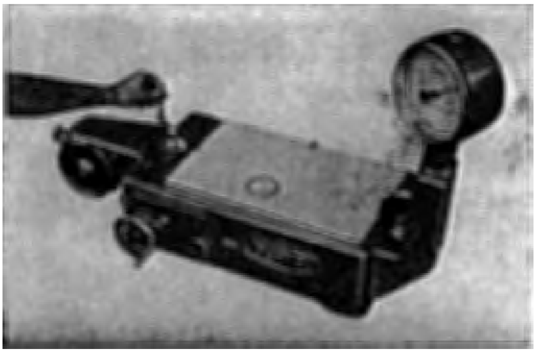


Fig. 3.104 Ring tension measurement

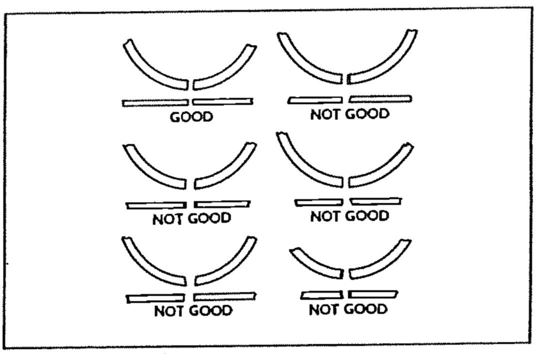


Fig. 3.105 Profile of piston ring gap

I. Inspection

1. When the piston ring has been removed, it should be fitted with the gap approximately 15 mm (.6″) from skirt of the cylinder at a right angle to the center line. Measurement of the gap should be made with a thickness gauge. **(Refer to Fig. 3.105)**

	Standard value	Correction limit
Top ring	0.15 to 0.35 mm (.006″ to .014″)	When over 0.8 mm (.03″), replacement should be made.
2nd ring	0.15 to 0.35 mm (.006″ to .014″)	Same as above
Oil ring	0.10 to 0.30 mm (.0039″ to .011″)	Same as above

2. Tension of the piston ring is measured with a tension measuring instrument as shown in the figure. **(Refer to Fig. 3.104)**

	Standard value	Correction limit
Top ring	0.55±0.12 kg (1.2 lb±.3 lb)	When over 0.8 kg, replacement should be made.
2nd ring	0.55±0.12 kg (1.2 lb±.3 lb)	Same as above
Oil ring	0.75±0.15 kg (1.65 lb±.33 lb)	Some as above

II. Replacing piston rings

1. When a piston ring is reassembled, it should be fitted to the cylinder. Inspection should be made to determine if the gaps of the top and second rings are between 0 and 0.30 mm (.011″) and of the oil ring between 0.10 (.0039) to 0.30 mm (.011″). If the gaps are somewhat less, they should be dressed with a file.

(CAUTION)

(a) When a gap is dressed with a file, adjustment should be made at a right angle due to right angle fitting.

(b) If the piston ring gap is too small, seizure between the ring and cylinder occurs due to thermal expansion; if the gap is too large, oil penetration or gas leakage occurs. **(Refer to Fig. 3.105)**

2. When piston ring is set on the piston, any catch between the ring and the groove may prevent smooth operation. It is necessary to inspect the status, when the ring is fitted to the groove, by rotating the ring around the circumference. **(Refer to Fig. 3. 106)**

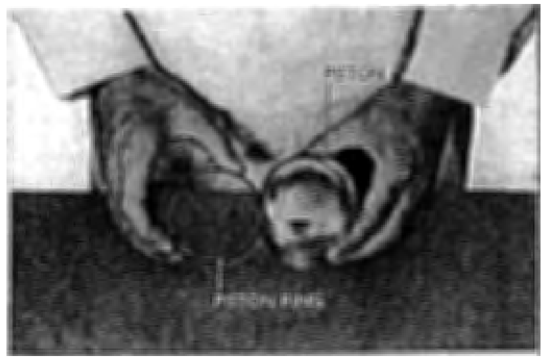


Fig. 3. 106 Inspecting piston ring by rotating around the ring groove

3. When the piston ring is assembled, attention should be directed so that the upper and lower surface of the ring are proper.

   The manufacturer's mark is usually stamped on the ring. **(Refer to Fig. 3. 107)**

   If assembly is performed with the upper and lower surfaces improper, oil may be sucked up.

4. When the piston rings is being installed, employment of a piston ring tool helps obtain proper and simple operation. **(Refer to Section 3. 8 CI)**

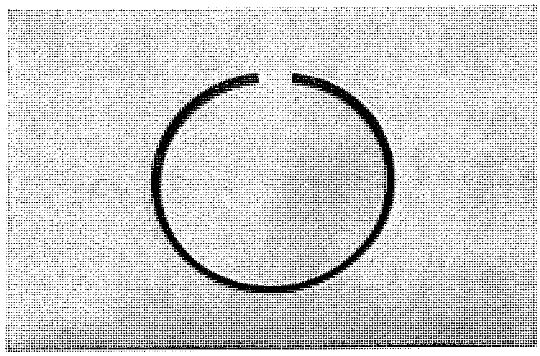


Fig. 3. 107 Confirming upper and lower surface of the piston ring

3. 9 Cam chain tightener and cam chain guide roller

A. Operation of cam chain tightener

The cam chain tightener is used to tighten the cam chain from the outer side with the cam chain guide roller in between.

As shown in the figure, the tightener push bar is automatically pushed out by the cam chain tightener spring and supports one end of the tightener which performs a see-saw motion (with the cam chain guide roller pin as a supporting point).

On the other hand, the tightener roller is pressing the cam chain. When the tightener set balt is loosened, the tightener push bar automatically stretches the cam chain by tension of the spring. **(Refer to Fig. 3. 108)**

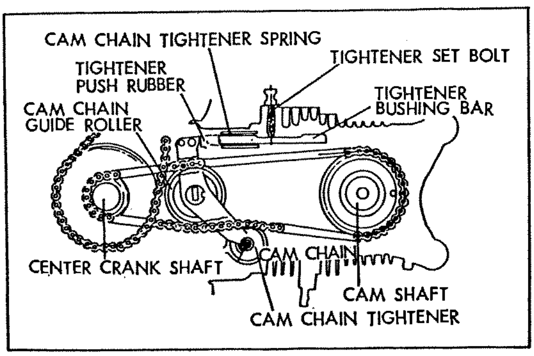


Fig. 3. 108 Cam chain tightener

I. Disassembly

1. Separate the cylinder head and cylinder.
2. Apply a thin wire guide to the cam chain.
3. Remove the two 6×18 bolts mounting the cam chain guide roller and separate the cam chain tightener from the crankcase. **(Refer to Fig. 3. 109)**

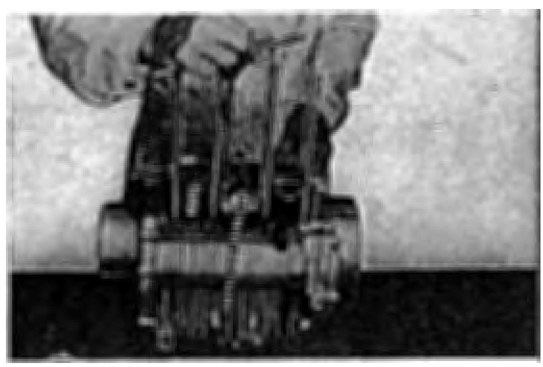


Fig. 3. 109 Removing cam chain tightener

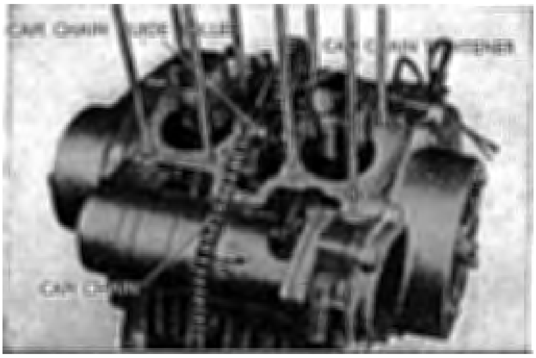


Fig. 3. 110 Cam chain guide raller

Fig. 3. 111 Tightener push bar fully inserted

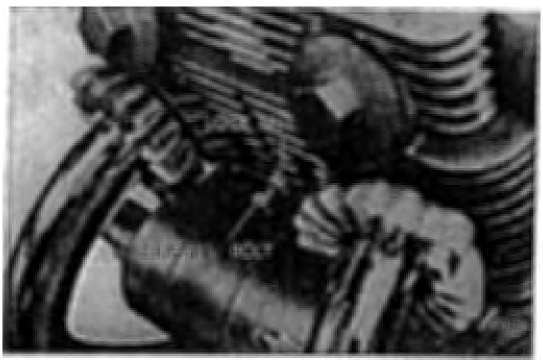


Fig. 3. 112 Adjusting cam chain

4. The cam chain guid eroller is coupled to the cam chain tightener. **(Refer to Fig. 110)**
   - Cam chain guide roller
   - Cam chain guide roller pin
   - 12 mm set ring
5. When the 6 mm thin nut is loosened and the tightener set bolt is removed, the tightener push bar coupled to the cylinder is separated together with the tightener spring from the cylinder.

II. Installation

1. Inspect while installing and assemble in a reverse order of disassembly.

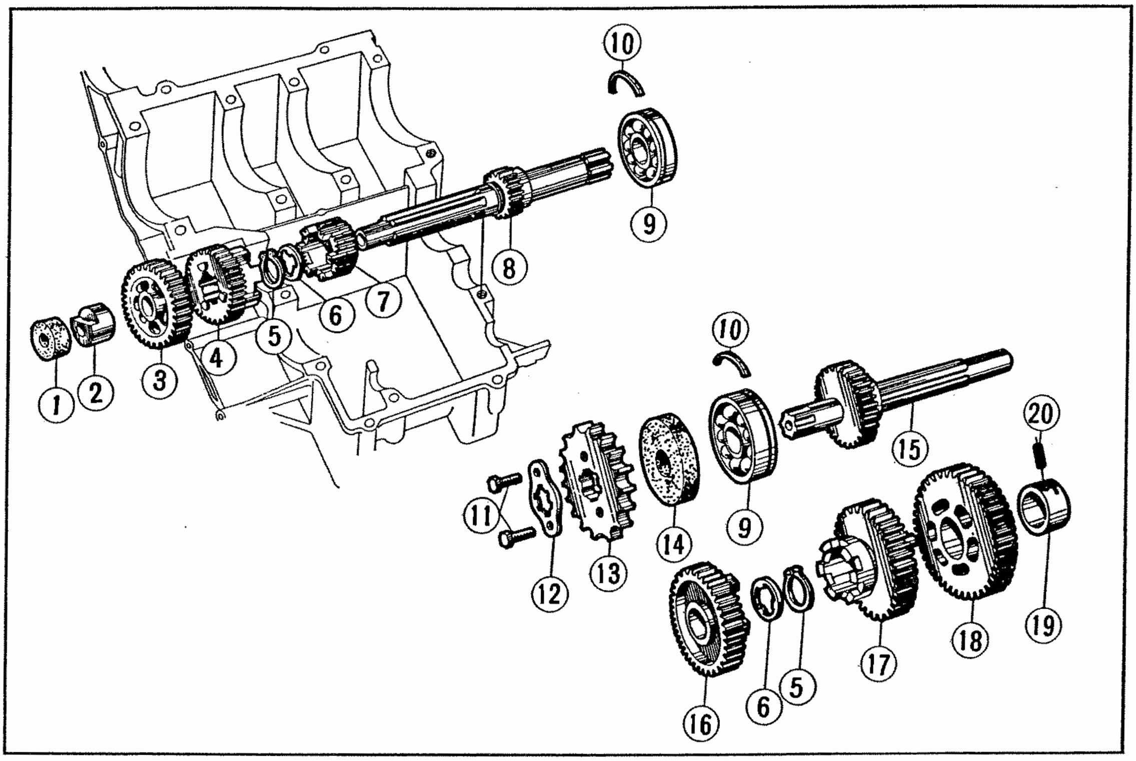
(a) Damage and deformation on the cam chain guide roller and the cam chain tightener roller.

2. The tightener push'bar should be inserted together with the tightener spring fully into the cylinder and tightened by the tightener bolt. If the tightener push bar protrudes excessively, the cam chain is stretched and joining of the chain becomes difficult. **(Refer to Fig. 3. 111)**

III. Cam chain adjustment

1. The T mark of the AC generator rotor should be matched to the arrow mark of the stator at compression top dead center.
2. When the 6 mm nut and the tightener set bolt are loosened, the cam chain is automatically stretched.
3. The tightener set bolt should be turned in and secured by the nut. **(Refer to Fig. 3. 112)**

3. 10 Transmission



① 8×25×8 oil seal	⑪ 6×10 hex bolt
② 15 mm bearing bushing A	⑫ Drive plate fixing plate
③ Main shaft fourth gear	⑬ 16 T drive sprocket
④ Main shaft third gear	⑭ 20×52×9 Model TC oil seal
⑤ 20 mm set ring ··················2 each	⑮ Transmission countershaft
⑥ 20 mm thrust washer A·········2 each	⑯ Countershaft third gear (complete)
⑦ Main shaft second gear	⑰ Countershaft second gear
⑧ Transmission main shaft	⑱ Countershaft low gear (complete)
⑨ 6304 ball bearing	⑲ 15 mm bearing bushing B
⑩ Ball bearing set ring A·········2 each	⑳ 6 mm guide pin

A. Description of transmission

The transmission of the constant mesh type, four-speed forward, employs the limit type reciprocating system.

The performance of the transmission is very important as it transmits power from the crankshaft through the clutch, with the relationship between the required torque and speed corresponding to the load condition.

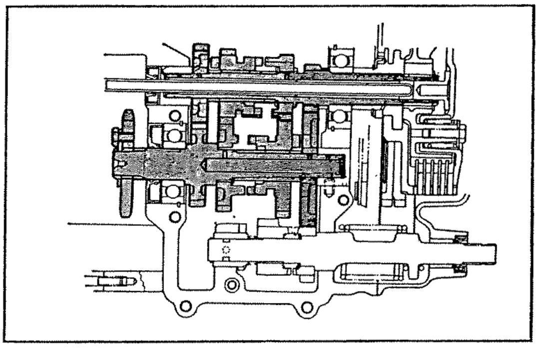


Fig. 3. 113 Gears at neutral position

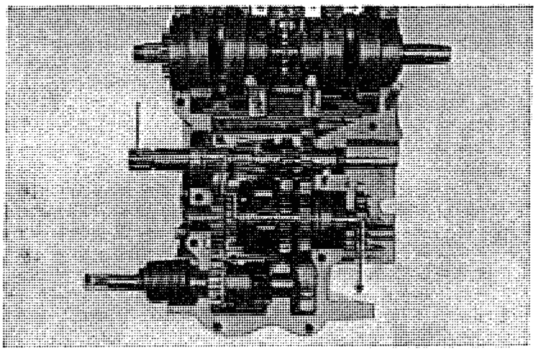


Fig. 3. 114 Transmission of the first speed (low)

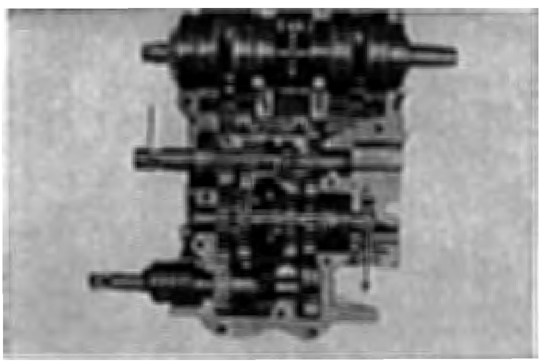


Fig. 3. 115 Transmission of the second speed

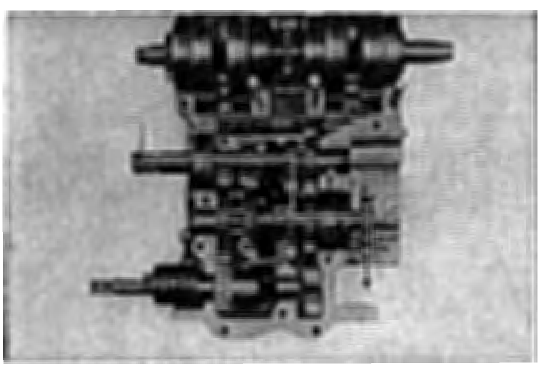


Fig. 3. 116 Transmission of the third speed

B. Transmission system

1. For neutral

C 1 gear and C 3 gear on the countershaft and M 2 gear and M 4 gear on the transmission main shaft are all free in the direction of rotation.

Rotation transmitted from the clutch center to the transmission is transmitted by the main shaft and M 3 gear to the C 1 gear and C 3 gear, free at the counter shaft side. However, C 2 and C 4 gears transmitting rotation of the countershaft side are not coupled by dowels; rotation is not transmitted to them. Hence, the countershaft does not rotate and power is not transmitted to the drive sprocket. **(Refer to Fig. 3. 114)**

2. For low (first speed)

By shifting operation, the shift fork of the gear shift drum couples the C 2 gear on the countershaft to the C 1 gear by dowel. Power is transmitted to the C 1 gear from the transmission main shaft and by dowel through the countershaft; the drive sprocket is driven. **(Refer to Fig. 3. 114)**

3. For second speed

M 3 gear on the main shaft is connected, by operation of the shift fork in shifting, to the free M 2 gear by dowel and drive is transmitted from the main shaft through the M 3 gear, M 2 gear, and the countershaft to the drive sprocket. **(Refer to Fig. 3. 115)**

4. For third speed

The C 2 gear on the countershaft is dowel connected to the free C 3 gear by operation of the shift fork in shifting; drive is transmitted from the main shaft through the order: M 3 gear, C 3 gear, countershaft. **(Refer to Fig. 3. 116)**

5. For the fourth speed

The M 3 gear on the main shaft is, by operation of the shift fork in shifting, dowel connected with the free M 4 gear and drive is transmitted from the main shaft through M 3 and M 4 gears to the coupled countershaft (C 4 gear omitted). **(Refer to Fig. 3.117)**

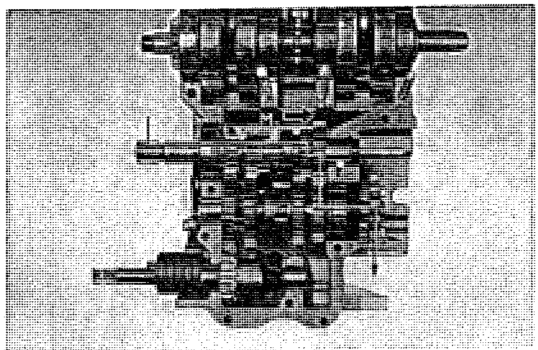


Fig. 3.117 Transmission of the fourth speed

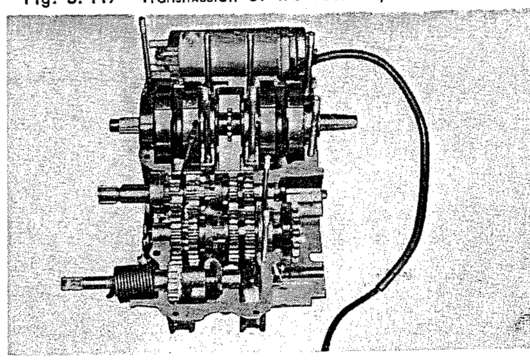


Fig. 3.118 View of transmission with lower crankcase separated.

I. Disassembly

1. Following the same order as for the crankshaft (Refer to Section 3.11), separate the upper and the lower crankcase and remove the transmission unit. **(Refer to Fig. 118)**

II. Inspection

1. Measurement of clearance in the axial and radial directions for the transmission main shaft and countershaft bearing. **(Refer to Fig. 3.119)**

	Standard value	Correction limit
Axial clearance	Less than 0.05 mm (.002")	When over 0.1 mm (.004"), replacement should be made.
Radial clearance	0.01 to 0.025 mm (.0004" to .001")	When over 0.05 mm (.002"), replacement should be made.

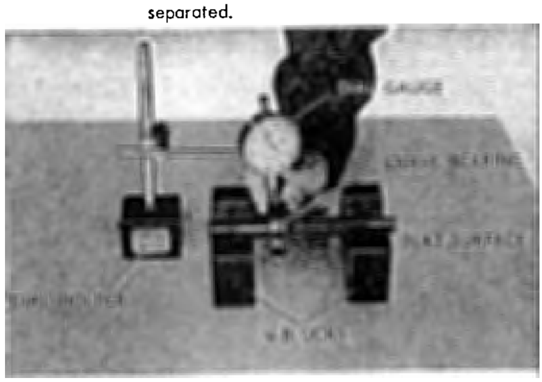


Fig. 3.119 Measuring clearance of the transmission unit bearing

2. Measuring play on the gear teeth surface of the transmission unit. **(Refer to Fig. 3.120)**

	Standard value	Correction limit
Play	0.089 to 0.178 mm (.0034" to .007")	When over 0.2 mm (.0078"), replacement should be made.

Fig. 3.120 After the transmission and crankshaft are coupled, the lower crankcase should be matched

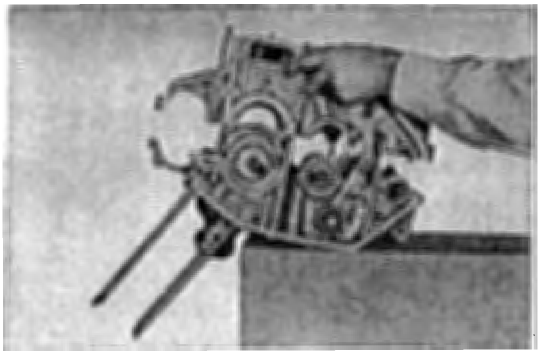


Fig. 3. 121 After the transmission and crankshaft are coupled, the lower crankcase should be matched

III. Assembly

1. Clean all transmission gears and inspect for damage or scars. Sub-assemble. **(Refer to Fig. 3. 121)**

3. 11 Gear shift

A. Operation of gear shift

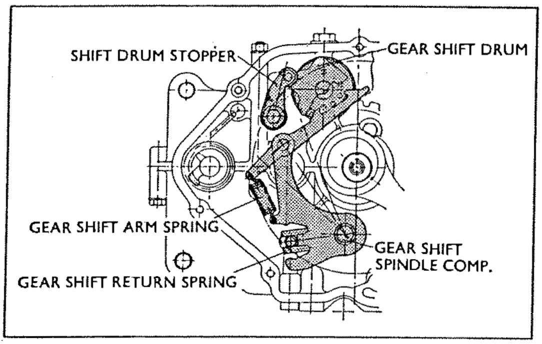


Fig. 3. 122 Gear shift arm

When the gear shift pedal is depressed, the gear shift spindle is turned and the gear shift arm presses the gear shift drum pin at the right end of the gear shift drum by the tip of the notch ; the drum rotates.

A groove is cut at the center of this shift drum and the shift fork guide pin fitted to the gear shift fork is inserted in this groove. Hence, according to rotation of the drum, the gear shift fork moves to the right and left along the shape of the groove for moving the shift gear.

The gear shift spring functions to return the shift pedal to the original position and prepares the pedal for the following operation. **(Refer to Fig. 3. 122)**

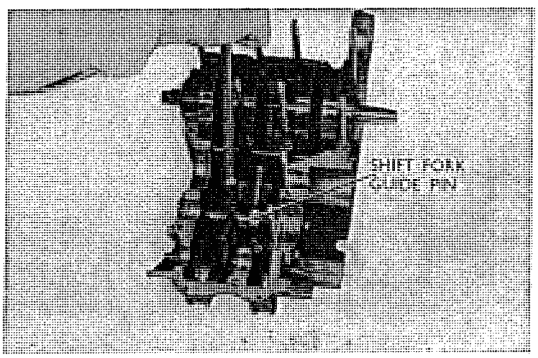


Fig. 3. 123 Removing shift fork guide pin

I. Disassembly

1. Following the same operation as that of transmission disassembly, divide the crankcase into the upper and lower parts.
2. Pull up the ear of the lock washer of the gear shift coupled to the upper crankcase and remove the shift fork guide pin. **(Refer to Fig. 3. 123)**
3. Remove the shift drum guide screw and the shift drum guide collar at the upper surface of the upper crankcase. **(Refer to Fig. 3. 124)**
4. Remove the neutral switch rotor and stator coupled to the left end of the shift drum.

Fig. 3. 124 Removing shift drum guide screw

5. Remove the 6×18 bolt of the shift drumltmi pressing the shift drum limit stop plate and remove the limit. **(Refer to Fig. 3. 125)**
6. Remove the shift drum in the direction of the right crankcase cover side.
   (The gear shift drum limit plate is secured by 6×14 pan screws.)

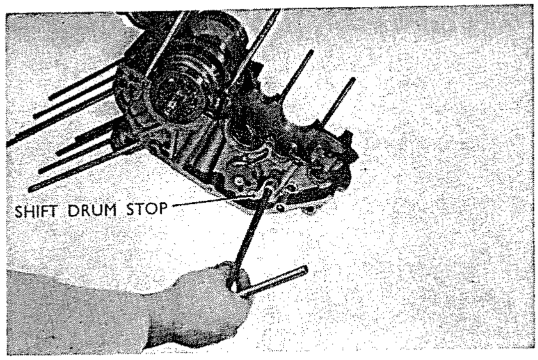


Fig. 3. 125 Removing shift drum limit

7. At the lower crankcase, the gear shift spindle together with the gear shift return spring and the gear shift spindle side limit are coupled. Hence, by removing the set ring with snap ring pliers, it can be removed toward the right side of the case. **(Refer to Fig. 3. 126)**
8. For removing the gear shift return spring, a wrench or a deep box wrench should be employed.

Fig. 3. 126 Removing gear shift spindle

II. Assembly

1. Insert the gear shift drum at the right side of the upper crankcase and assemble the gear shift fork in the crankcase with attention directed to the division. **(Refer to Fig. 3. 127)**
2. Mount the drum with the shift guide collar and screw.

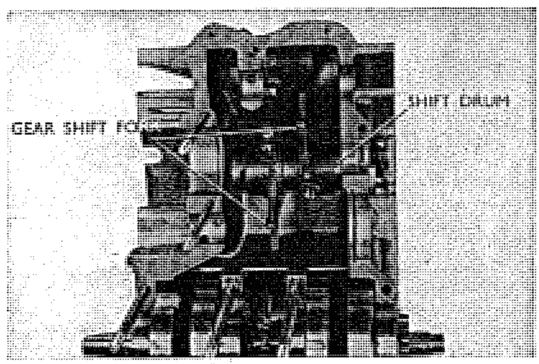


Fig. 3. 127 Division of gear shift fork

3. Assemble the shift fork with the gear shift fork guide pin and position the ear of the lock washer. **(Refer to Fig. 3. 128)**
4. Assemble the neutral switch rotor. and the starter.
5. Assemble the shift drum limit ; this completes upper case assembly.
6. Assemble the gear shift return spring in the lower crankcase.
7. The gear shift spindle should be inserted together with the return spring at the right side of the lower crankcase. The gear shift spindle side limit should be inserted at the left side and the 12 mm set ring should be employed for securing.

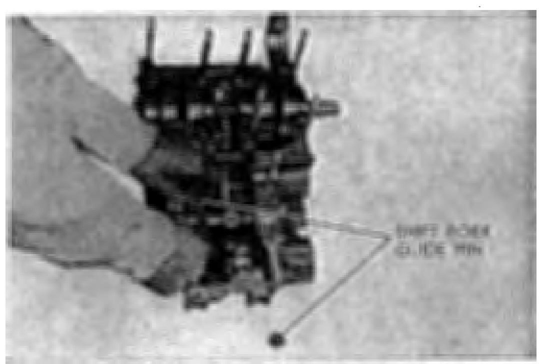


Fig. 3. 128 Assembling of shift fork guide pin

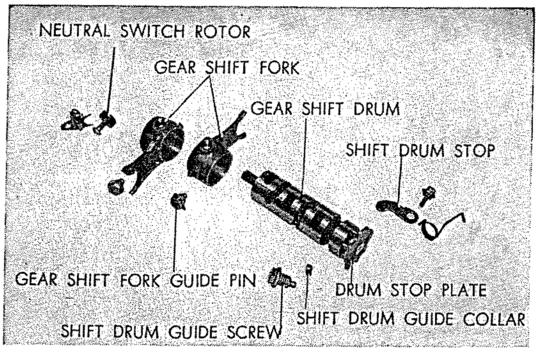


Fig. 3. 129 Gear shift drum fork limit

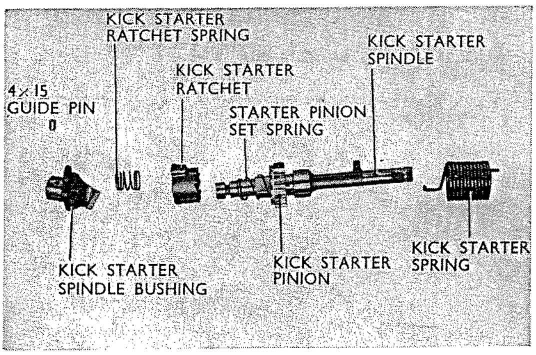


Fig. 3. 130 Kick starter

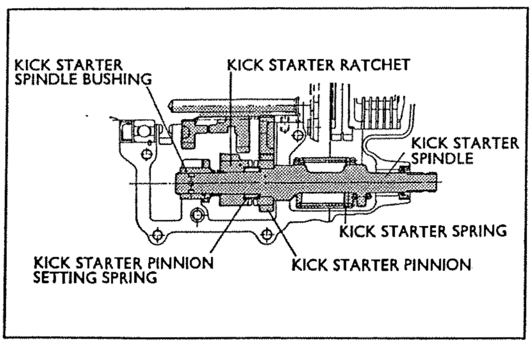


Fig. 3. 131 Kick starter assembly

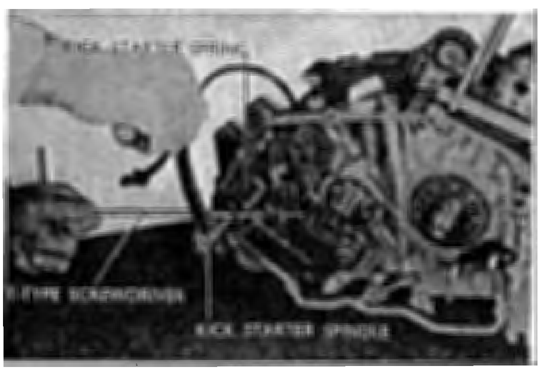


Fig. 3. 132 Assembling kick starter spring

8. Assemble the crankshaft with transmission gears in the upper case and tighten the lower crankcase.
9. Hence, assembly can be made according to the assembly order of the crankshaft.

(CHECK THE FOLLOWING)

- Bent gear shift
- Uneven wear shift guide pin
- Wear and play of shift guide roller
- Fatigue of gear shift spindle return spring
- Tightness of return spring pin

3. 12 Kick starter

A. Operation of kick starter

As shown in Fig. 3. 130 and 3. 131, the starter uses a pinion ratchet system which engages the pinion with the gear and drives through the kick starter ratchet. **(Refer to Fig. 3. 130 and 3. 131)**

When the foot is released from the kick starter, the kick stater ratchet returns by the force of the kick starter pinion set spring and is stopped by the kick starter spindle bushing; the pinion rotates regardless of the kick starter spindle.

I. Disassembly and assembly

1. When the upper and the lower crankcase are separated by following the disassembly order of the transmission, the kick starter spindle is exposed.
2. At assembling, especially of the kick starter spring, operation is easily performed if reference is made to the figure. **(Refer to Fig. 3. 132)**

3. 13 Carburetor

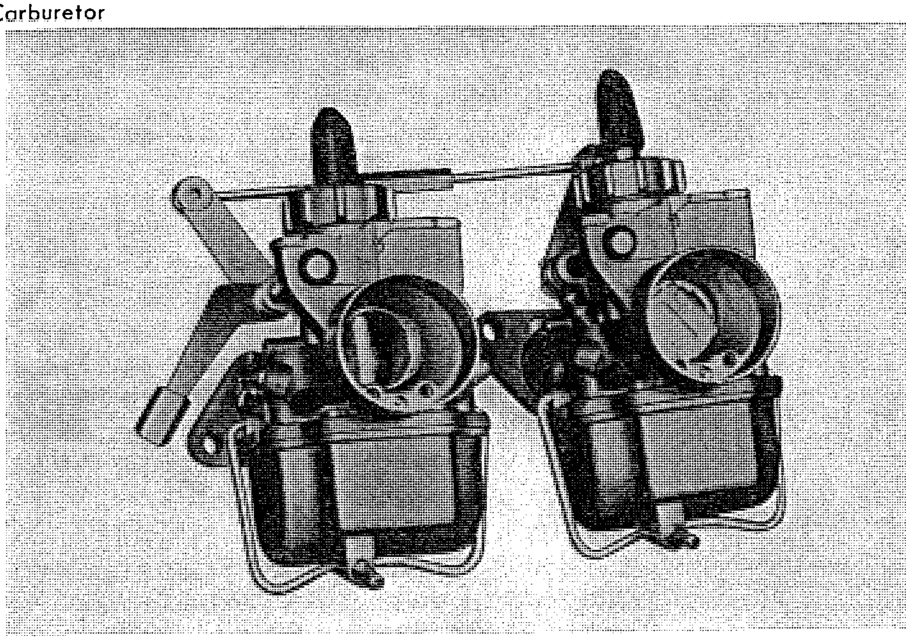


Fig. 3. 133 Sectional view of carburetor

A. Description of carburetor

1. Main system

Air from the air cleaner is fed from the intake through the throttle valve and main bore, and is sucked into the engine. By this air flow, a negative pressure is produced at the needle jet and the fuel of the float chamber passes through the main jet and enters the needle jet holder. It then passes through the air jet and is mixed with the air entering through the hole around the needle jet holder, passing through the clearance between the needle jet and the needle, and under the throttle valve. Here it is mixed with the air and turned into vapor for engine intake. **(Refer to Fig. 3. 134)**

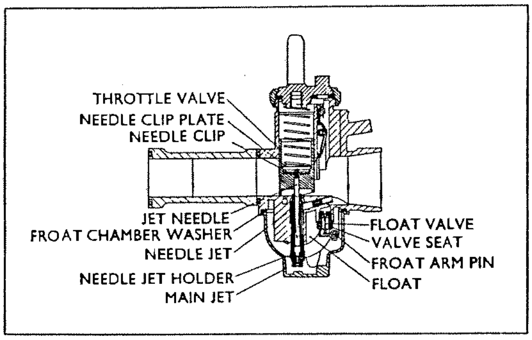


Fig. 3. 134 Main system

2. Slow speed system (Pilot system)

The air from the intake passes outside the air screw ; it is adjusted by the air screw. It enters the slow speed jet from the hole of the slow speed jet and is mixed with fuel coming from the fuel hole at the lower part of the slow speed jet, becoming a densely mixed gas. The mixture passes to the bottom of the throttle valve and is mixed with the main air from the intake for engine intake. Adjustment of the the mixture ratio of the slow speed system is generally obtained by adjusting the air screw (a heavy mixture by turning clockwise and a thin mixture by turning counter-clockwise). When a wide range adjustment is required, the slow speed jet should be changed, obtaining a heavy mixture by a larger number and a thin mixture by a smaller number. **(Refer to Fig. 3. 135)**

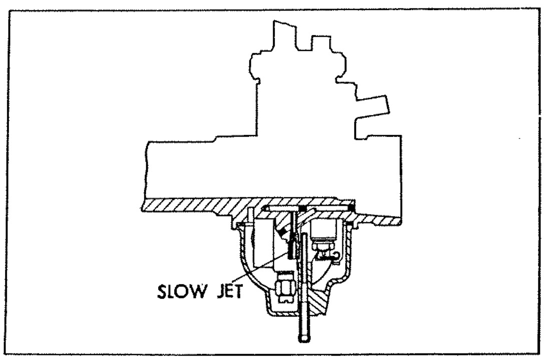


Fig. 3. 135 Slow speed system

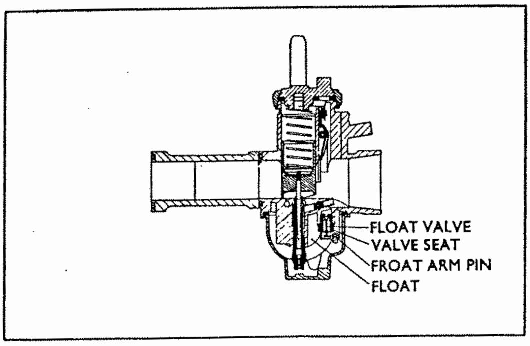


Fig. 3. 136 Float chamber

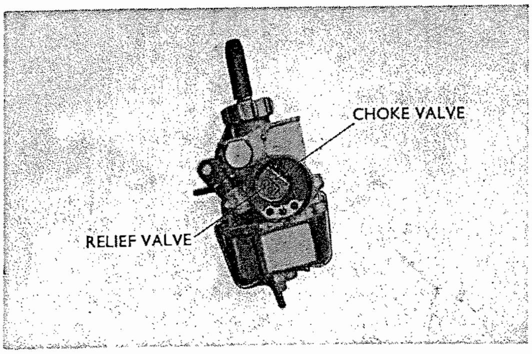


Fig. 3. 137 Choke

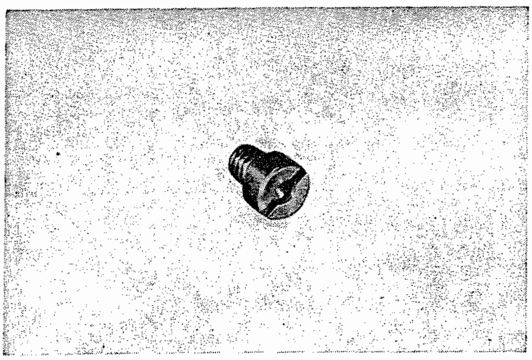


Fig. 3. 138 Main jet

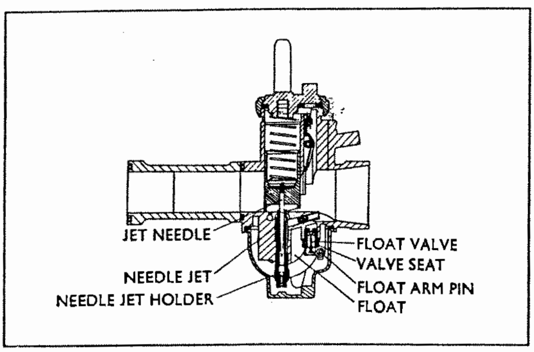


Fig. 3. 139 Needle jet

3. Float chamber

As previously stated, the carburetor produces mixed gas suitable by opening and closing the throttle for all speeds of the engine. Hence, it is necessary to keep the fuel level constant ; the float chamber plays this role. Fuel fed from the tank passes through the passage between valve and enters the float chamber. The float becomes buoyant as fuel enters and pushes up the valve through the float arm ; when the valve contacts the valve seat, the flow of fuel stops. When the level decreases due to consumption of fuel, the float drops corresponding to the change and the valve opens for allowing fuel to enter the float chamber. By repeating this operation, the fuel level is held constant. **(Refer to Fig. 3. 136)**

4. Choke

As shown in the figure, the choke valve closes at the position where the choke lever is pushed up and opens at the position where the choke lever is lowered. **(Refer to Fig. 3. 137)**

B. Operation of component parts

1. Main jet

The main purpose of this unit allows adjustment of the mixture ratio by controlling the flow of fuel with the throttle fully opened. However, the jet influences the mixture ratio, not only at full throttle, but also at other points. **(Refer to Fig. 3. 138)**

2. Air jet

For insuring that the mixed gas does not become excessively heavy at fully throttle and high speed, and that it does not become excessively thin at reduced throttle and low speed, bleeding air is fed into the needle jet holder. The air jet controls this amount of air. At a certain throttlle opening, a larger air jet produces a smaller difference of fuel flow between high and low speed; the flow decreases.

3. Needle jet

This unit readjusts the adjusted fuel by the main jet at full throttle and medium speed. Adjustment is simultaneously performed with that of the needle jet. The hole diameter is highly precise. **(Refer to Fig. 3. 139)**

4. Jet needle

The jet needle, with the needle jet, adjusts the mixture ratio at mid-throttle. The jet needle with a long taper section is float fitted at the center hole of the throttle valve and the taper at the tip enters the needle jet. According to the position of the throttle valve, the flow amount fuel is increased or decreased through the taper and a suitable flow amount (a suitable mixture) is obtained. The jet needle has five grooves for positioning. Lowering the position from the first step to the fifth, density of the mixture becomes heavier. **(Refer to Fig. 3. 140)**

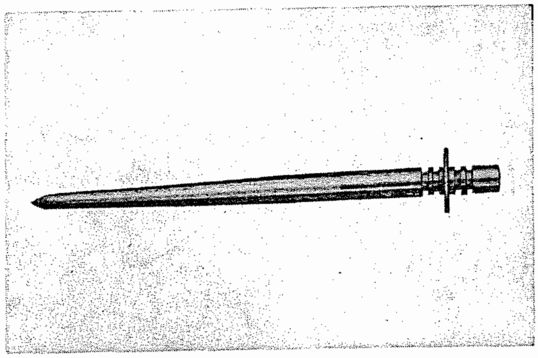


Fig. 3. 140 Jet needle

5. Throttle valve

The throttle valve adjusts the air fed to the engine for setting speed and output. In addition, it also adjusts the mixture. There is a cutaway at the air intake side of the throttle valve and by changing the size of the cutaway (number) the negative pressure is changed the fuel flow and mixture ratio is changed. However, the cutaway range covers mainly from idling to around 1/4 throttle, with little influence above 1/2 throttle. **(Refer to Fig. 3. 141)**

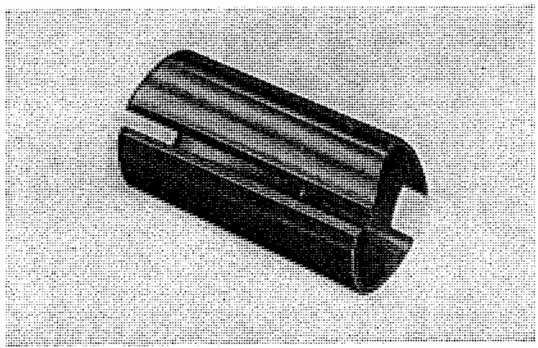


Fig. 3. 141 Throttle valve

6. Slow speed jet

The slow speed jet controls the fuel flow at idling and low throttle, and produces a mixture with the air coming from the air breeding hole ; it vaporizes the fuel. **(Refer to Fig. 3. 142)**

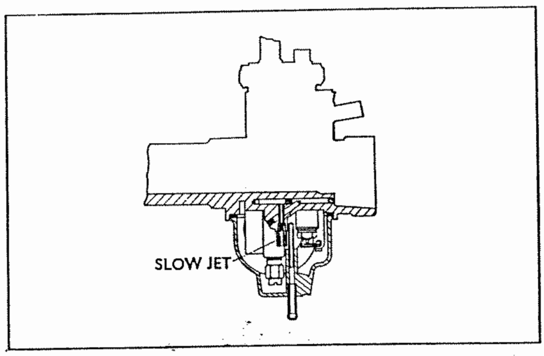


Fig. 3. 142 Slow speed jet

7. Air screw

The air screw controls the air flow entering the slow speed system. By adjusting air mixed in fuel coming from the slow speed jet, it produces a proper mixture and ejects the mixture from the tip of the slow speed jet. **(Refer to Fig. 3. 143)**

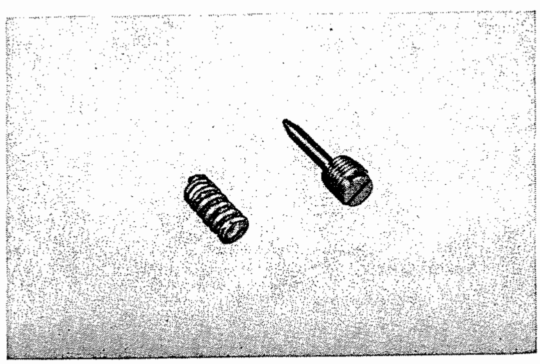


Fig. 3. 143 Air screw

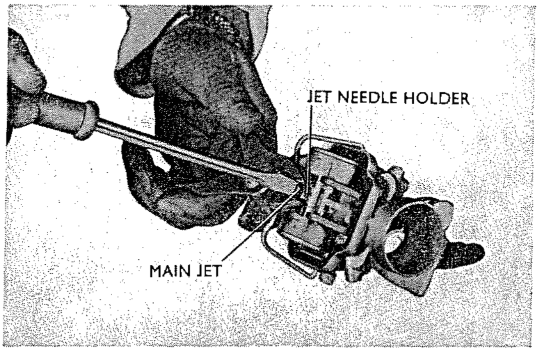


Fig. 3. 144 Replacing of main jet

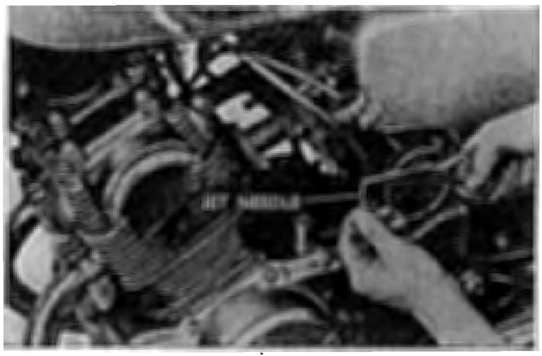
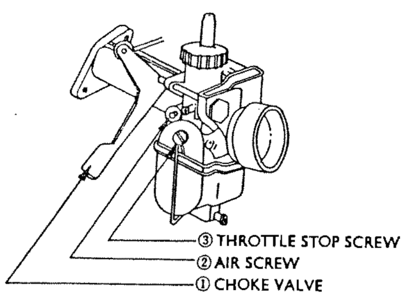


Fig. 3. 145 Chcnging step of jet needle



C. Adjustment

1. Adjustment at high speed

In the range from full throttle to 1/2 throttle, adjustment of the mixture ratio is made by the main jet. **(Refer to Fig. 3. 144)**

Determination of mixture density is obtained by the following methods.

a. At fuel throttle, if the speed is reduced by slightly closing the choke, the mixed gas is too thin. In such case, the main jet should be replaced with a larger one and a condition check made.

b. If speed is reduced by closing the choke, the main jet is suitable or is too large. Determination is made by the following methods.

(1) When the main jet is suitable: When a smaller main jet is employed and speed decreases, and when the choke is slightly closed and speed increases, the new main jet (smaller one) is too small. Hence, the original one is suitable.

(2) When the main jet is too large: Gradually smaller main jets should be employed in replacement until the status described in section (1) results.

2. Adjustment at mid-throttle

Adjustment of the mixture in a range from 1/8 to 1/2 throttle is mainly obtained by the jet needle steps and the cutaway of the throttle valve. However, as the cutway of the throttle valve influences the range below 1/8 throttle misadjustment is apt to occur.

For medium speed adjustment, as long as acceleration characteristics are maintained, employment of a smaller jet needle is more practical. **(Refer to Fig. 3. 145)**

a. Jet needle

(1) If abnormal black smoke is ejected during operation at medium speed, the mixture is too heavy; the jet needle should be pulled up one step.

(2) During engine braking after accelerating or cruising when the engine sounds rough, the jet needle clip should be lowered by one step.

b. Cutaway of throttle valve

When the throttle cutaway with a larger number is employed, the mixture becomes thinner and vice versa. The throttle vavle covers not only medium speed, but also low speed in the range of adjustment: taken while adjusting.

(1) Except for special cases such as racing, replacement of the cutaway is not required.

3. Adjustment at low speed

The mixture covers the range from 1/8 throttle to idling. Adjustment is made by the air screw cutaway and the throttle valve. **(Refer to Fig. 3. 146)**

a. Air screw

Adjustment of the mixture at idling is made by the air screw. If the screw is turned clockwise, the mixture becomes heavier ; if the screw is turned counter-clockwise, the mixture becomes thinner. However, the adjustment of the air screw should be made with attention directed not only to idling but also to starting and acceleration. Also observe running performance in relation to density of the mixture at the point where the throttly open.

b. Throttle valve cutaway

Near 1/8 throttle, the density of the mixture sometimes cannot be compensated by only the air screw. In such case, if the mixture is too heavy, a valve with a large cutaway number should be employed (or vice versa). Thus adjustment of the air screw is obtained.

- In CB 125 and 160, replacement of the screw valve is not required since the cutaway is completely adjusted.

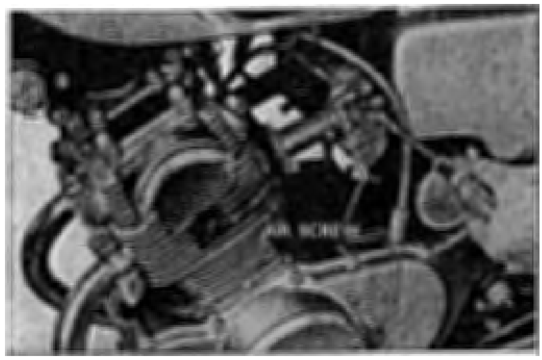


Fig. 3. 146 Adjusting air screw

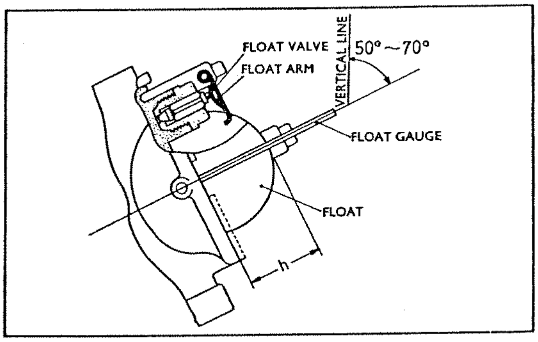


Fig. 3. 147 Measuring standard fuel level

4. Adjustment of standard fuel level

As shown in Fig. 3. 145, the fuel level is established at height (h) from the main bore bottom ; it is different for every engine.

It is rather difficult to measure the actual fuel level. Hence, this is determined by the float height. Adjustment of float. **(Refer to Fig. 3. 147)**

a. The carburetor should be turned upside down and slid horizontally.

b. By pushing the float vertically and lightly with the tip of a finger, find the position where the tip of the float valve and the float arm contact slightly.

c. The difference between the height of the tip of the float and that of the carburetor body is equal to h. If this height is not acceptable, adjustment should be obtained by carefully bending the float arm.

h of Pw 22 19.5 mm (.78″)

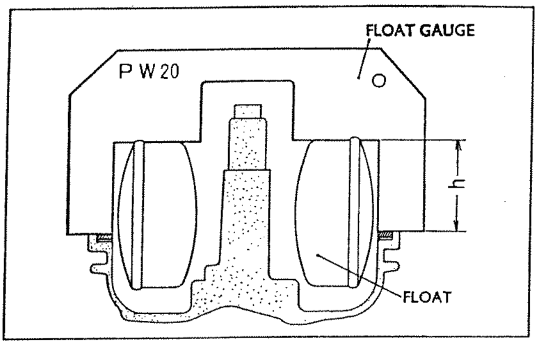


Fig. 3. 148 Adjusting throttle valve opening

Fig. 3. 149

(CAUTION)

The spring set at the tip of the float valve is depressed easily into the valve by pushing. This obscures the position where the valve essentially closes. Hence, careful attention should be paid when observing the contact point of the float orm and the float valve.

5. Adjustment of the throttle opening of the right and left carburetors

Two carburtors are employed. The adjustments of both must be the same, Adjustment should be made at a point somewhat above full close (approximately 1 mm). Hence, the openings of both the right and left carburetor become the same.

Adjustment should be obtained, after the carburetor is removed from the engine, with the slow speed jet screws on the right and left sides. **(Refer to Fig. 4. 148)**

IV FRAME

4.1 Handlebar

A. Construction of handlebar

The complete handlebar is made of pipe and is installed on the front fork top bridge by the pipe holder. The fork top bridge is mounted on the front cushion by two front fork bolts. In adition, every wire unit is exposed for making handlebar replacement easy. **(Refer to Fig. 4.1)**

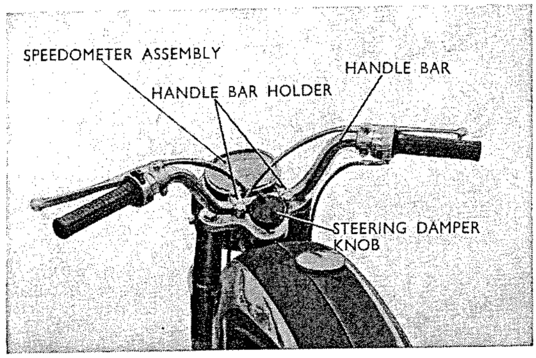


Fig. 4.1 Turning the handlebar

B. Disassembly

1. Tools required for disassembly and assembly of the handlebar. **(Refer to Fig. 4.2)**

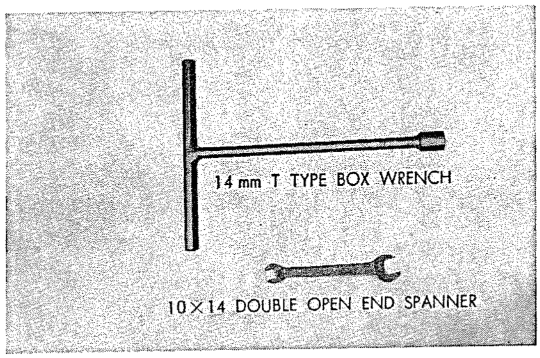


Fig. 4.2 Tools required for disassembly and assembly

2. For disassembling the front brake cable, turn the front brake arm counterclockwise (where the brake is effective), and remove the end of the cable. **(Refer to Fig. 4.3)**

Fig. 4.3 Removing brake cable

3. For disassembling the clutch cable, loosen the three small cross point screws of the drive chain cover and remove the end of the cable from the clutch adjustment thread.

4. For disassembling the throttle cable, loosen and remove the carburetor cap : the throttle valve can be pulled out. Remove the cable end from the throttle valve. **(Refer to Fig. 4.4)**

Fig. 4.4 Removing cable end from the throttle valve

Fig. 4. 5 Removing handlebar

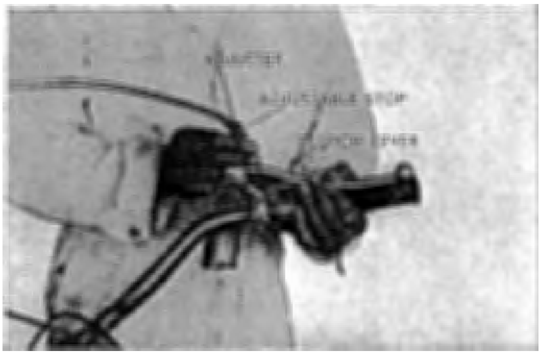


Fig. 4. 6 Removing clutch, brake cable

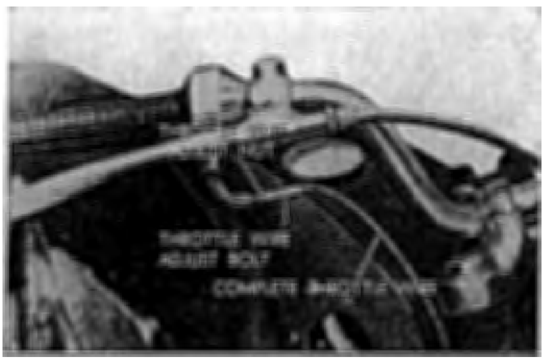


Fig. 4. 7 Adjustment of throttle cable play

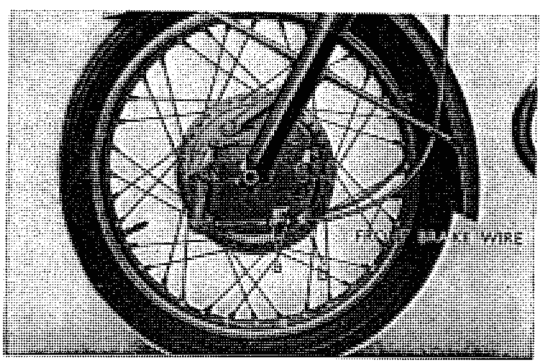


Fig. 4. 8 Adjustment of brake cable play

5. For disassembling lead wires of the horn and dimmer, remove the head lamp assembly and disconnect the connector, with the wire harness, in the lamp case.
6. Remove the clip under the steering stem and the steering damper knob.
7. When four 8×32 hex bolts are loosened and the handlebar holder is removed, the complete handlebar can be removed from the fork top bridge. Then remove the wires together with it. **(Refer to Fig. 4. 5)**

8. For disassembling the clutch cable and brake cable from the handlebar, loosen the clutch cable adjuster and remove it from the handlebar lever. Also remove the cable from the handle lever. **(Refer to Fig. 4. 6)**
9. For disassembling the throttle cable, loosen the 5×14 and 5×22 small cross-point screws and remove the flasher switch case; remove the wire from the handlebar grip.

C. Inspection

1. Inspect condition and operation of the throttle cable, clutch cable, and inner and outer cable of the front brake.
2. Inspect the operation of the throttle grip.
3. Inspect the operation of the handlebar lever.
4. Inspect the handlebar for straightness.

D. Assembly

1. Install the throttle cable, clutch cable, and front brake cable on the throttle grip and hand levers.
2. Pass every cable and lead wire through the handlebar holder by 8×32 hex bolt.
3. Install the steering damper knob.
4. Connect all cable ends to the front brake arm, throttle valve, and clutch adjustment thread.
5. After installation, adjust the play of each cable. **(Refer to Fig. 4.7 and 4.9)**

   Throttle cable (twist grip angle)
   9 to 10 degrees

   Front brake cable (lever end)
   30 to 10 mm (1. 17" to .39")

   Clutch cable (lever end)
   20 to 30 mm (78" to 1. 17")

6. Clamp coupling of all lead wires **(Refer to Fig. 4. 10)**

(CAUTION)

When all wires are placed in the designated positions, the handlebar should be free to turn to the right or left. When the handlebar is installed, the wire should not be clamped by it.

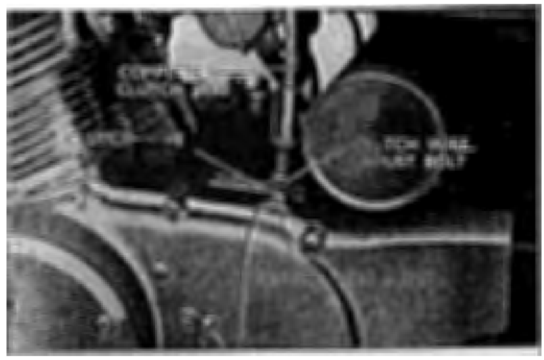


Fig. 4. 9 Adjustment of clutch wire play

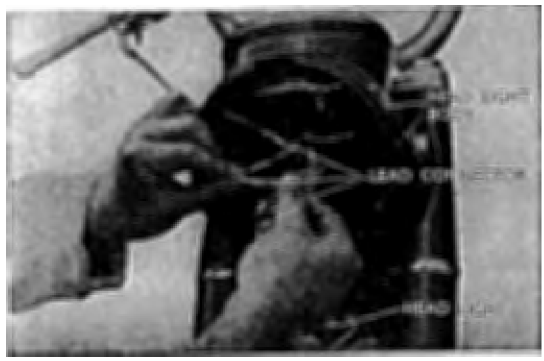


Fig. 4. 10 Lead wire clamp

4. 2 Construction of front cushion

A. Description

The front cushion and rear cushion should not be separated. The status of this suspension and damping device gives direct influence to the steering performance and stability of the vehicle. The front fork, in addition to damping vertical vibration of the front wheel, should maintain strength during operation, supporting the front wheel and enabling steering.

The front cushion spring employs the spring with uneven pitch. The oil shock absorber contains 170 cc (.04 US gal., .037 Imp.gal.) of No. 3 operation oil (Idemitsu Kosan) and its maximum stroke is 94 mm (3.76"). **(Refer to Fig. 4. 11)**

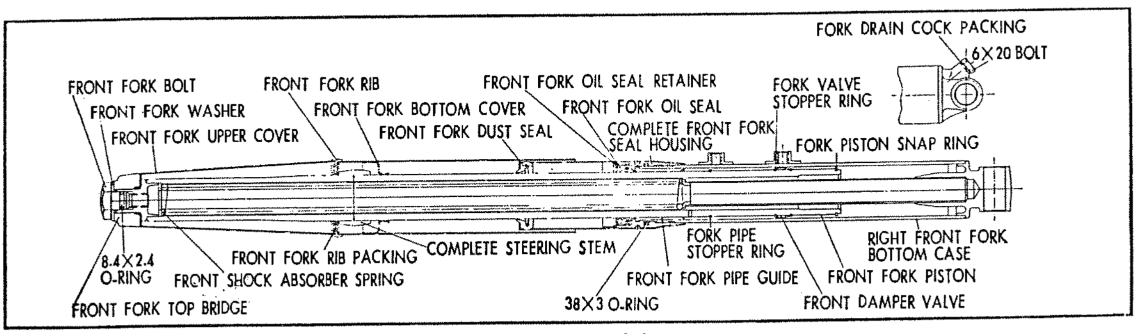


Fig. 4. 11 Disassembling of front cushion

B. Disassembly

1. Tools required for disassembly and assembly of the front cushion. **(Refer to Fig. 4. 12)**
2. Remove the handlebar according to Section 4.1 B.

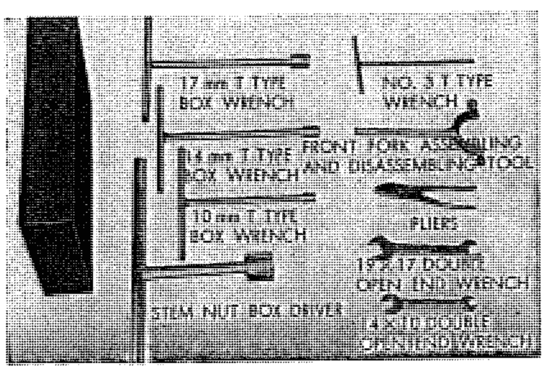


Fig. 4. 12 Tools used of disassembly and assembly of front cushion

Fig. 4.13 Removing front wheel

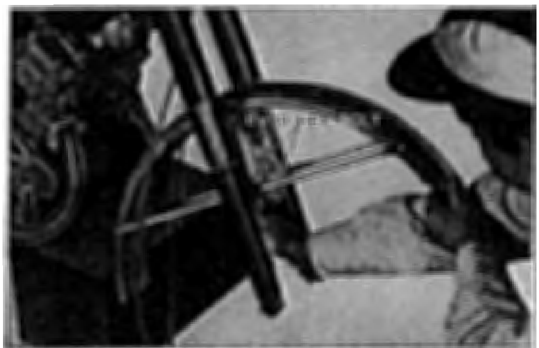


Fig. 4.14 Removing front fender

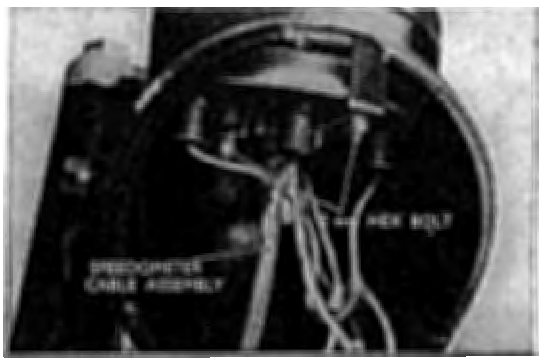


Fig. 4.15 Removing speedometer

3. Loosen the speedometer cable cap and remove it from the gear box.

(CAUTION)

At disassembly of the speedometer, insure that, when the cap is loosened and removed, the inner portion is not dropped. When only the wheel is removed, the gear box can be removed as fitted to the speedometer cable.

4. When a proper bench is placed under the engine, the front brake torque bolt is removed, the 3×28 spring cotter pin is straigtened and removed, the front wheel axle nut is loosened, and the front wheel axle is pulled out ; the front wheel can be removed. **(Refer to Fig. 4.13)**
5. Loosen four 8×10 hex bolts and remove the front fender. **(Refer to Fig. 4.14)**
6. Remove the head lamp rim, the head lamp sealed beam unit, and two 5 mm hex nuts ; remove the speedometer assembly. **(Refer to Fig. 4.15)**
7. Loosen two 8×20 hex bolts and remove the head lamp body.

8. Loosen the steering head stem nut. **(Refer to Fig. 4. 16)**
9. Loosen two front fork bolts and remove the top bridge and the front fork upper cover.
10. Loosen two 8×32 hex bolts and remove the front cushion in a downward direction. **(Refer to Fig. 4. 17)**
11. Loosen the front fork seal housing and remove the front bottom case. Remove the front cushion spring as well as the oil in the bottom case.
12. Disassemble the front pipe limit ring, front fork piston, and front absorber valve from the front fork pipe (complete). **(Refer to Fig. 3. 18)**

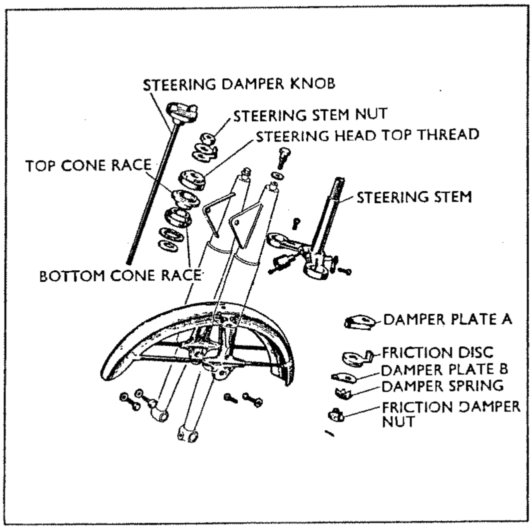


Fig. 4. 16 Sectional view of steering

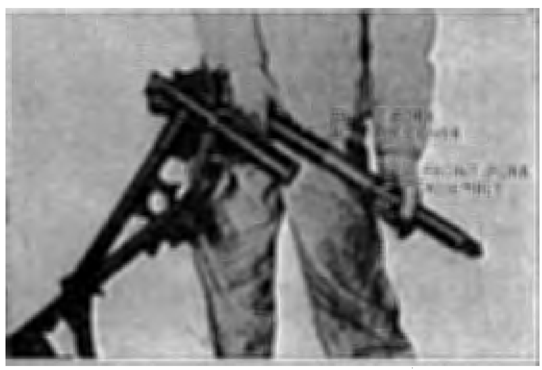


Fig. 4. 17 Removing front cushion downward

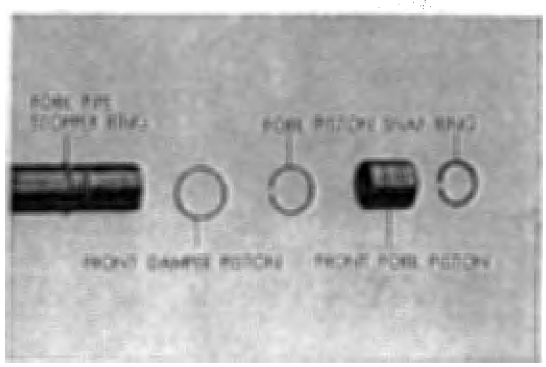


Fig. 4. 18 Removing piston

C. Inspection

1. Measurement of the front cushion spring.

	Standard value			Correction limit
	Permanent deformation test	Installation period	Characteristic	
Load	Height 294.4 mm (11.8")	374.5 mm (14.98")	376.5 344.8 311.8 20±1.2 kg (44 lb±2.6 lb) 40±2.4 kg (88 lb±5.3 lb) 70±4.2 kg (154 lb±9.2 lb)	
Free length	407.3 to 409.3 (16.29" to 16.37")			
Depression	Below 0.5 (.019")			

2. Measurement of the outside diameter and bend of the front fork pipe.

	Standard value	Correction limit
Outside diameter	31.5 to 32.0 mm (1.26" to 1.28")	
Oval	Below 0.2	
Toper	Below 0.2	
Deflection	Below 0.2	

3. Measurement of the front fork piston

	Standard value	Correction limit
Outside diameter	31.450 to 35.475 mm (1.4") (1.42")	
Oval	Below 0.02	
Toper	Below 0.02	

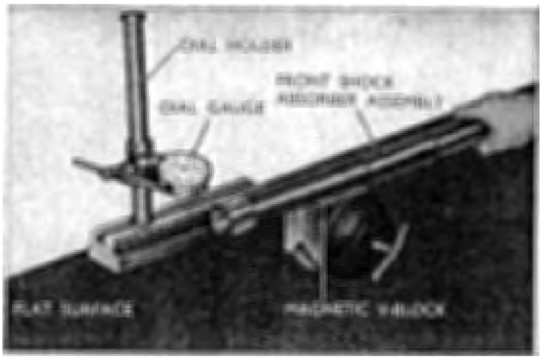


Fig. 4. 19 Bend of front fork pipe

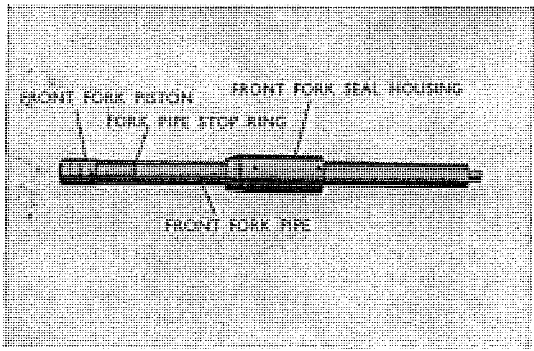


Fig. 4. 20 Front fork pipe assembly

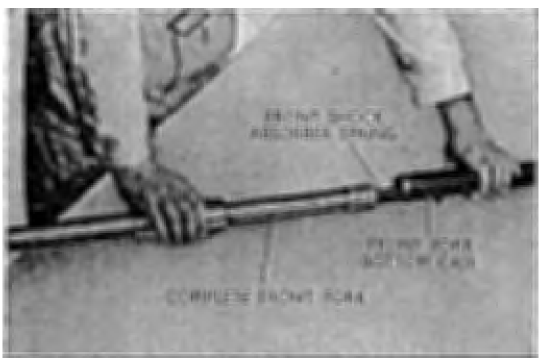


Fig. 4. 21 Assembling of front cushion

Fig. 4. 22 Installing front cushion

	Standard value	Correction limit
Outer diameter	35.5 to 35.539 mm (1.4″) to (1.42″)	
Oval	Below 0.2	
Taper	Below 0.2	

D. Assembly

1. Couple the front absorber valve and front fork piston and install it on the front fork pipe (complete) by the front pipe limit ring. **(Refer to Fig. 4. 20)**
2. Apply 170 cc of No. 3 operation oil (Idemitsu Kosan) in the front fork bottom case.
3. Put the front cushion spring with the shorter pitch in the bottom case and insert the front fork pipe (complete). Tighten the front fork seal housing. **(Refer to Fig. 4. 21)**
4. After the coupling of the front cushion is finished, insert it in the designated position of the steering stem together with the front fork lower cover. Tighten by the 8 × 32 hex bolt. **(Refer to Fig. 4. 21)**
5. Secure the front fork top bridge.
6. Following Section 4. 1 D, install the complete handlebar on the front fork.
7. Install the head lamp body and install the sealed beam unit on the body.
8. Install the front fender.
9. Install the front wheel on the front cushion and adjust the brake.
10. Adjust the throttle and the clutch cables.

4.3 Steering stem and handlebar lock

A. Construction of the steering stem

The steering stem is supported by 8×32 hex bolts on the front cushion. The stem, with the cone race inside, is an important unit for steeing since it is a rotation axis with the frame head pipe as the center. To the steering stem, the steering absorber is installed allowing for adjustment according to the status of road operation, and load.

When the steering absorber knob is turned clockwise, the steering absorber spring nut goes up and the steering absorber plate A and B tighten the steering absorber friction disc; handlebar operation becomes stiff. If the steering absorber knob is turned counterclockwise, the steering damper spring nut comes down, producing gaps between the steering plate A, steering absorber plate B, and the friction disc; handlebar operation becomes free. The handlebar lock consists of the support unit which is a single unit consisting of the steering arm and the steering stem.

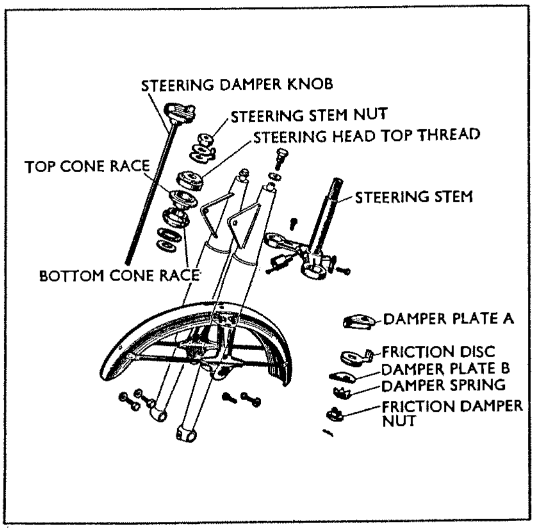


Fig. 4.23 Sectional view of steering

B. Disassembly

1. Tools required for disassembly and assembly of the steering stem and handlebar lock. **(Refer to Fig. 4.24)**

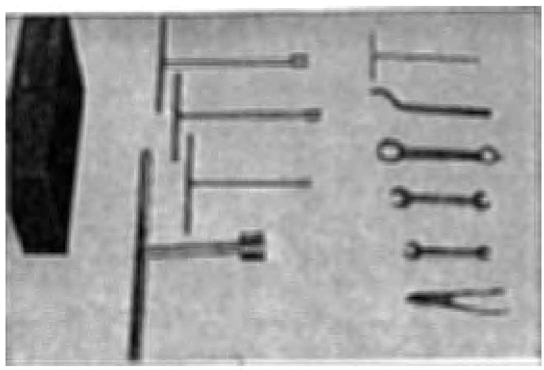


Fig. 4.24 Tools required for disassembly and assembly of steering stem and handlebar lock

2. Following Section 4.1 B, separate the handlebar.
3. Following Section 4.2 B, separate the front cushion.
4. Loosen the steering head top thread (complete) by spanner and remove the steering stem in a downward direction. **(Refer to Fig. 4.25)**
5. When the 3×8 small cross-point screw is removed, the cap of the handlebar lock can be separated. When the engine key is inserted and turned counterclockwise, the lock piston is separated from the steering stem.

(CAUTION)

When the steering stem is removed, care should be taken so that the 1/4 steel balls are not dropped or lost.

Fig. 4.25 Removing steering stem in downward direction

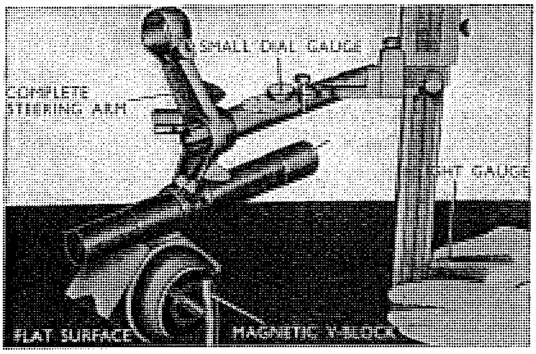


Fig. 4. 26 Measurement of steering stem bending

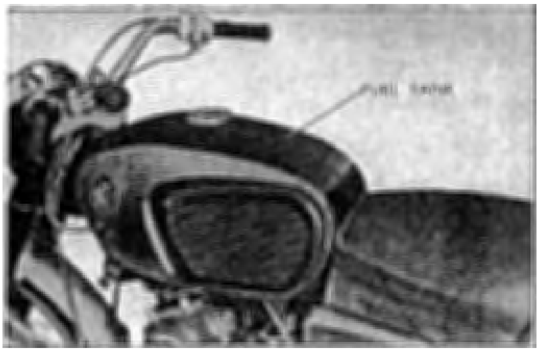


Fig. 4. 27 Fuei tank

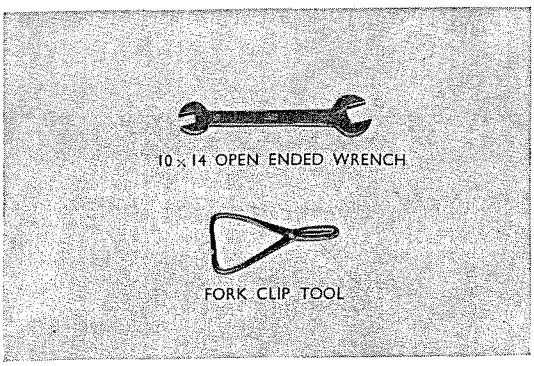


Fig. 4. 28 Tools required for disassembly and assembly of fuel tank

Fig. 4. 29 Position cock lever at STOP and remove tubes, A and B from the carburetor

C. Inspection

1. Inspect the 36 1/4 steel balls for damage and wear.
1. Inspect the contact surface of the steering top cone or race and steering bottom cone race for scars, wear, and scratches.
3. Inspect the steering head dust seal for wear and breakage.
4. Measurement of bending and twisting of the steering stem. **(Refer to Fig. 4. 26)**

	Standard value	Correction limit
Bend	Below 0.05 (.0019")	
Twist		

5. Measurement of steering absorber friction disc.
6. Inspection of other threaded sections for damage, breakage, and deformation.
7. Inspection of handlebar lock return spring.

D. Assembly

1. Mount the handlebar lock on the steering stem.
2. Insert the 1/4 steel balls into the ball race by using grease and insert the steering stem from the bottom. Insert the top cone race and tighten the head top thread (complete).

(CAUTION)

a. When the steering stem is being inserted by using new grease, insure that the steel balls are not dropped.

b. Special experience and skill is required for tightening the head top thread (complete).

When the steering stem is slightly tightened and the front cusion, fender, and wheel are installed, the fork top bridge is tightened by the front fork bolt and head stem nut. The top thread is fully returned and the stem should be tightened to the extent that there is no play, but is not stiff. The weight of the steering stem should be such that, when the front wheel is suspended in air, the wheel falls by its own weight when a slight force is exerted. When the front wheel is moved forward, backward, laterally, and vertically, there should be no play at the race section.

3. Install the front cushion and front wheel.
4. Install the handlebar.

4.4 Fuel tank

A. Construction of fuel tank

The fuel tank is placed on the frame body immediately above the engine and is installed on the frame body through the fuel tank cusion. The knee grip rubber, as well as the tank mark, fitted with the tank side cover, are installed on the fuel tank. The knee grip rubber can be gripped by the knees during operation. **(Refer to Fig. 4.27)**

B. Disassembly

1. Tools required for disassmbly and assembly of the fuel tank. **(Refer to Fig. 4.28)**
2. Loosen the seat setting bolt and remove it.

3. Place the lever of the fuel cock STOP and remove fuel lines A and B from the carburetor. **(Refer to Fig. 4.29)**
4. Loosen the 6 mm hex nut and remove the fuel tank rear brace : then the tank may be removed.

5. Set the hose clip at one end of the reserve line and extract it backward with care. **(Refer to Fig. 4.30)**
6. When the tank side cover is removed, the hex bolt is loosened, and the side cover is moved backward, the side cover can be removed.

Fig. 4.30 Remove the tank by using the hose clip

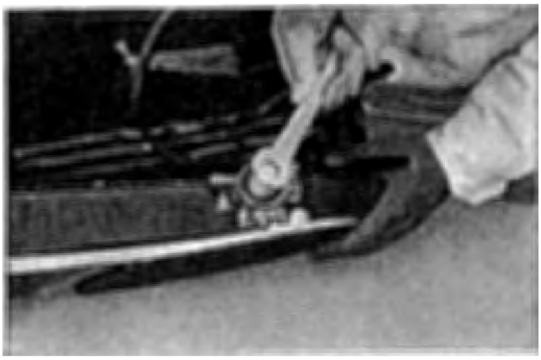


Fig. 4.31 Removing of fuel cock

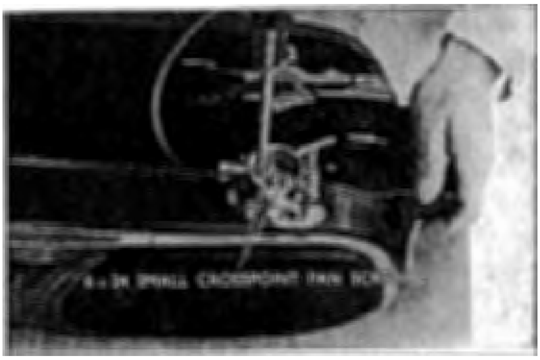


Fig. 4.32 Removing cock body

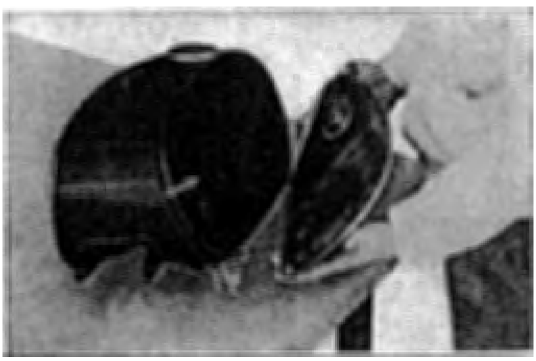


Fig. 4.33 Installing side cover

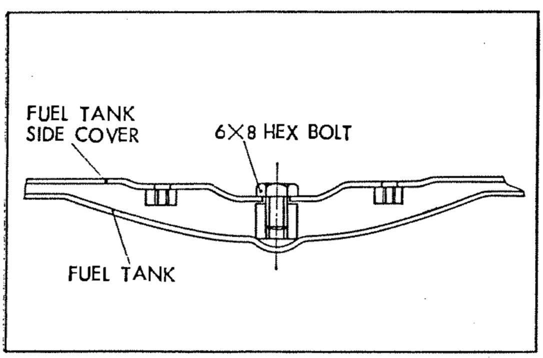


Fig. 4.34 Sectional view of side cover retaining screw

7. By loosening the joint nut, the cock assembly is separated from the tank. **(Refer to Fig. 4.31)**

8. When the fuel strainer cap packing and the fuel strainer screen are removed, along with two 6× 24 small cross point screws, the fuel cock body is separated from the fuel tank (complete). **(Refer to Fig. 4.32)**

C. Inspection

1. Inspection of gas leakage at fuel tank.

(CAUTION)

Generally, a water pressure test is made. However, high pressure may damage the tight contact section.

2. Inspection of blocking of the fuel filler cap hole.
3. Inspection of fatique and breakage of the front and rear cushion rubbers.
4. Inspection of fatigue and breakage of the cock valve packing A, and strainer cap packing, and filler cap packing.
5. Inspection of aging and breakage of fuel lines A and B and the reserve line.

D. Assembly

1. Install the cock assembly.
2. Install the side cover. **(Refer to Fig. 4.33)**

(CAUTION)

As the side cover is hooked to the tank body at its rear section and is secured by the inner side of the emblem, the designated 6×10 6 mm bolt should be used. **(Refer to Fig. 3.34)**

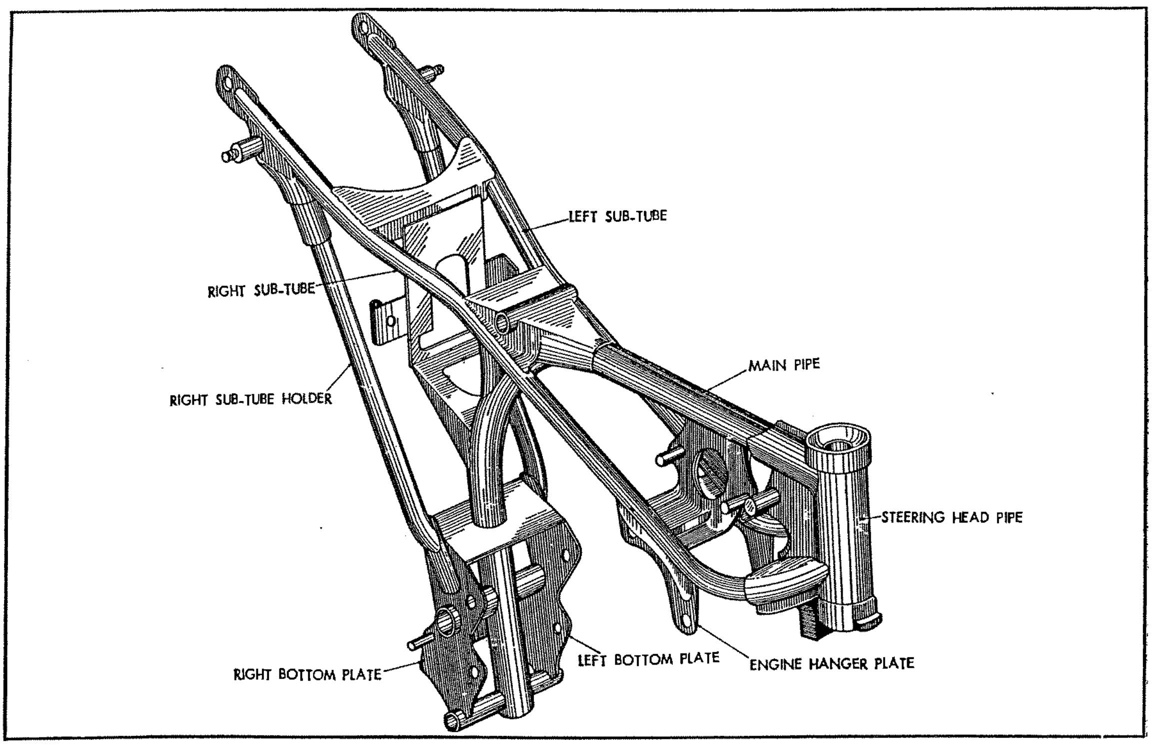
3. Fit the front and rear cushions to the frame body. The front cushion should be inserted by pushing the fuel tank from the rear. The nut of the rear brace should be tightened for securing the cushion. **(Refer to Fig. 4. 35)**
4. Fit the fuel lines A and B and the reserve line and secure them by the clips.
5. Fit the seat and tighten it with the seat mounting bolt.

Fig. 4. 35 Pushing fuel tank from the rear side

4. 5 Frame body

A. Construction of frame body

As the frame supports the engine and contacts the ground through the front and rear wheels, it is all-important. In addition, it is an important element in determining the design. The main function of the frame is maintaining strength of the body for supporting the engine, passengers, and carrier load. Another function allows for absorbing shocks through the wheels. Sufficient rigidity is required for steering performance and lightness weight is desired for running performance.



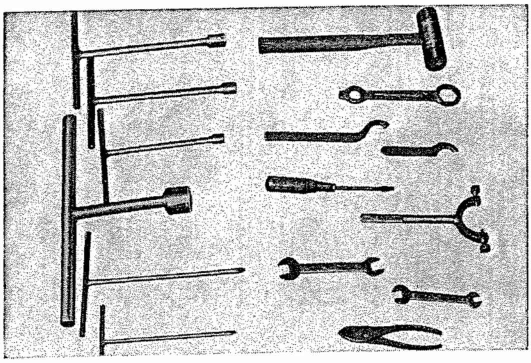


Fig. 4.36 Tools required for disassembly and assembly of frame body

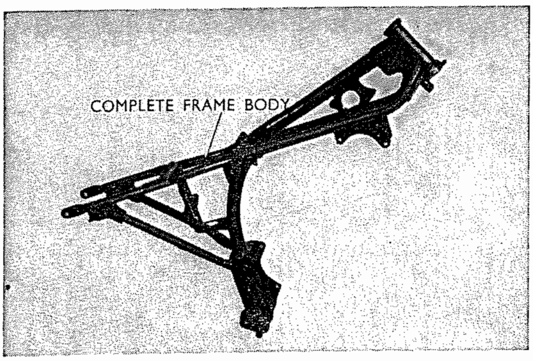


Fig. 4.37 Frame body

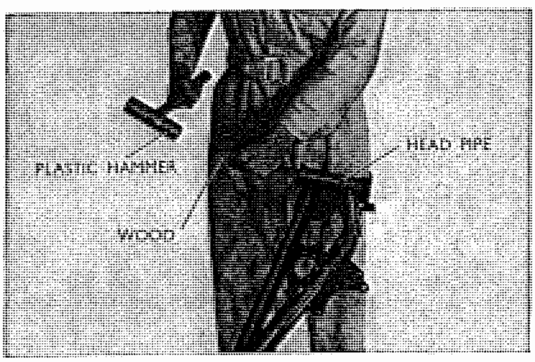


Fig. 4.38 Removing ball race

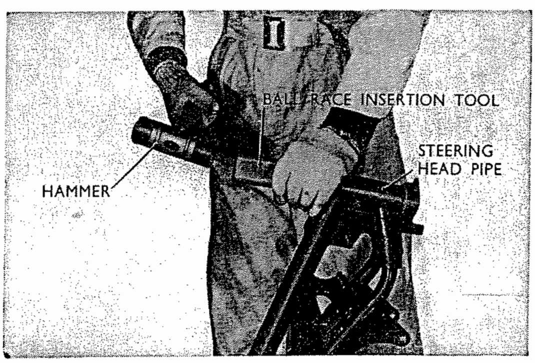


Fig. 4.39 Driving in ba llrace

B. Disassembly

1. Tools required for disassembly and assembly of the frame. **(Refer to Fig. 4.36)**
2. Following Section 3.1 B, separate the engine from the frame.
3. Following Section 4.1 B, separate the handlebar.
4. Following Section 4.2 B, separate the front cushion.
5. Following Section 4.3 B, separate the steering stem.
6. Following Section 4.4 B, separate the seat and the fuel tank.
7. Following Section 4.13 B, separate the rear wheel.
8. Following Section 4.11 B, separate the rear cushion.
9. Following Section 4.12 B, separate the rear fork and rear fender.
10. Following Section 4.9 B, separate the air cleaner. and tool box.
11. Remove the electrical parts from the frame body.
12. Following Section 4.7 B, (when the stand is removed) disassembly of the frame is completed. **(Refer to Fig. 4.37)**

C. Inspection

1. Measurement of the stem head bushing bore.

	Standard value	Correction limit
Bore	13.98 to 14.010 (.56" to 56.04")	

2. Inspection of flaking at welded section and pipe breakage and damage.
3. Inspection of angles and deformation of stem head
4. Inspection of the top ball race and bottom ball race for scars, wear, and scratches.

(CAUTION)

The interference of the ball race with the stem head is approximately 0.01 to 0.05 mm (.00039" to .0019"), and can be removed by lightly driving from the inner side with a wooden patch applied. When the ball race is driven in, it should be done so that the ball race is not atilt. Drive to the bottom evenly. **(Refer to Fig. 4.38 and 4.39)**

5. Inspection of frame coating.

D. Assembly

Assembly is the reverse order of disassembly

4.6 Air cleaner case and seat

A. Construction of air cleaner case and seat

The air cleaner case is a stamped metal plate and protects the air cleaner, an important in construction of the vehicle. **(Refer to Fig. 4.40)**

A double seat is employed, the front section hooked to the frame and the rear section bolted to the frame. The cushion consists of coil springs vertically placed. sponge placed on the springs, and leather wrapping. At the center, the hand grip is fitted with leather. **(Refer to Fig. 4.41)**

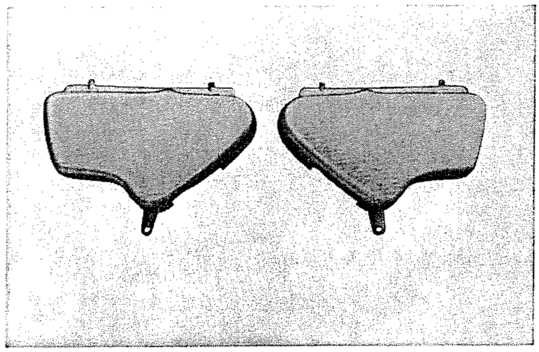


Fig. 4.40 Air cleaner case

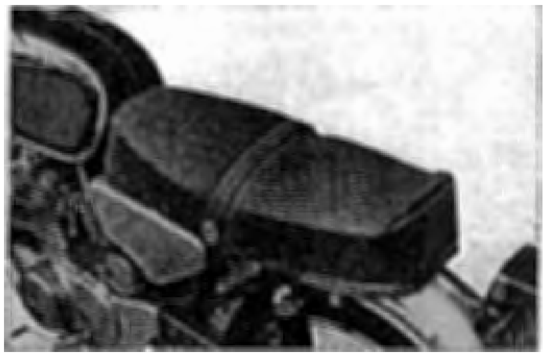


Fig. 4.41 Seat

B. Disassembly

1. Tools required for disassembly and assembly of the air cleaner case and seat. **(Refer to Fig. 4.42)**
2. By removing the 6 mm hex bolt, the case is removed from the frame body.

(CAUTION)

When the air cleaner case is disassembled, as there is a long hole cut on the upper side of the case used for hooking to the frame, it should be pushed up a little after the nut is removed.

3. Loosen the two 8×16 seat mounting bolts then separate the seat from the frame by pulling it backward. **(Refer to Fig. 4.43)**

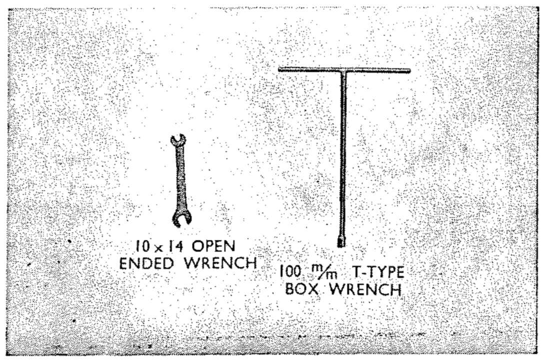


Fig. 4.42 Tools required for disassembly and assembly of air cleaner case seat

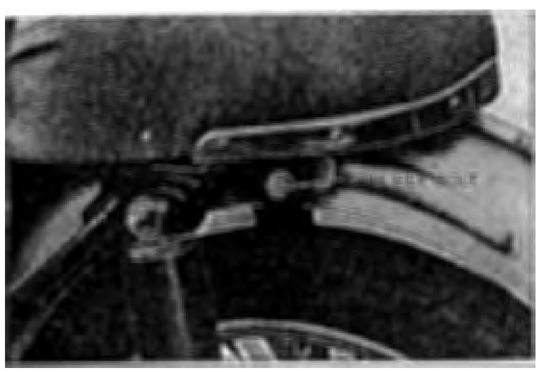


Fig. 4.43 Seat mounting bolt

C. Inspection

1. Inspect the air cleaner case for deformation and coating.
2. Inspect the seat leather for wear.

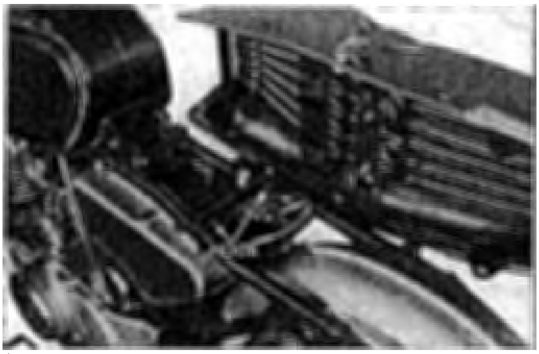


Fig. 4.44 Fitting seat

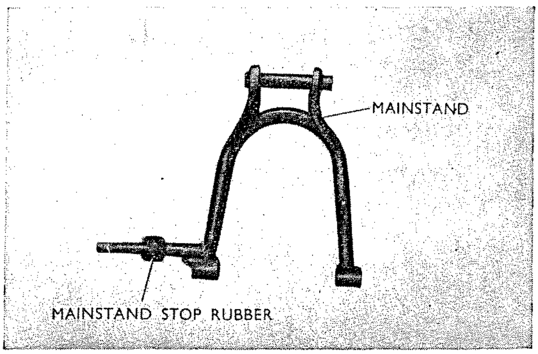


Fig. 4.45 Stand

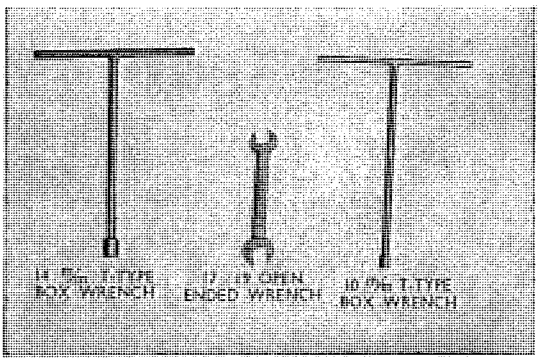


Fig. 4.46 Tools required for disassembly and assembly of stand

Fig. 4.47 Removing stand

D. Assembly

1. When the seat is fitted, after confirmation of secure hooking at the front section, the seat mounting bolt should be tightened. **(Refer to Fig. 4.44)**

4.7 STAND

A. Construction of stand

For reducing weight, a bent pipe is employed for the stand. The section which contacts the ground when the stand is erected has an oval plate fitted by welding for increasing the contact area. At the left side of the stand, a bar is fitted for making erection easy. **(Refer to Fig. 4.45)**

The step is mounted under the crankcase with four of 8×25 hex bolts.

B. Disassembly

1. Tools required for disassembly and assembly of the stand. **(Refer to Fig. 4.46)**
2. Following Section 3.1 B when the single unit of the exhaust pipe and the muffler is removed from the frame, the step which is secured to the muffler can be removed.
3. Remove the nut and loosen the adjuster. Separate the brake cable and the stop switch ring from the rear brake pedal.
4. Remove the 20×25 split cotter pins and washers on the rear brake spindle (complete), and separate simultaneously the brake cable from the rear brake cable mount and the rear brake pedal from the rear brake spindle.
5. Place a bench under the engine and loosen the 10 mm hex nut; remove the stand mounting bolt and the stand. **(Refer to Fig. 4.47)**

C. Inspection

1. Inspection of the stand spring

	Standard value	Correction limit
Tension	At 176 mm/h 59.6 kg (7″ @ 131.1 lb)	
	At 158 mm/h 31.4±3 kg (6.3″ @69.0 lb±6.6 lb)	

2. Measurement of the outside diameter of the stand mounting bolt.

	Standard value	Correction limit
Outside diameter	10 ϕ 1.25 2nd class by JIS	.

3. Measurement of the stand mounting hole.

	Standard value	Correction limit
Bore	14.4 to 14.6 mm (.57″ to .58″)	

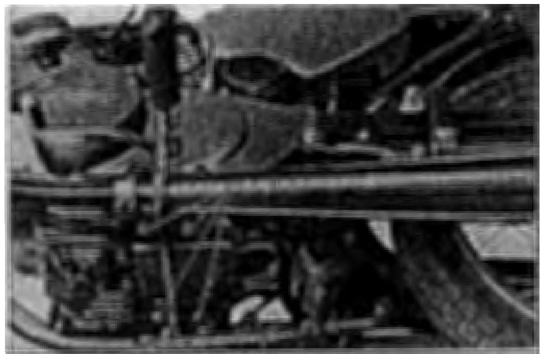


Fig. 4. 48 Even tightening of muffler steps

D. Assembly

1. Tighten the main stand with the 10 mm bolt and nut.
2. The rear brake cable assembly is the reverse of disassembly.
3. Evenly tighten the muffler with four 8×25 hex bolts to the underside of the crankcase. **(Refer to Fig. 4. 48)**

4. 8 Exhaust pipe and muffler

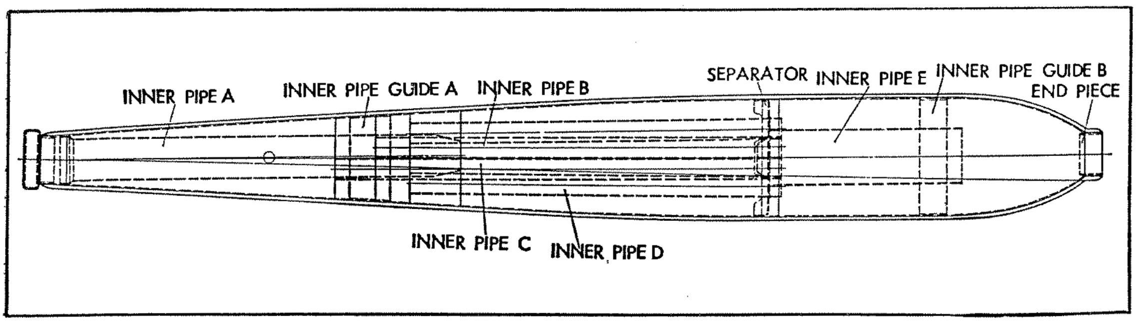


Fig. 4. 49 Sectional view of muffler

A. Construction of the exhaust pipe and muffler

The exhaust pipe passes the exhaust gas from the cylinder head to the muffler; if bent, the horsepower is reduced. For exhaust gas the passage is throttled in the muffler and noise is reduced. In addition, noise is diffused by the diffuser pipe which also reduces noise.

B. Disassembly

1. Tools required for disassembly and assembly of the exhaust pipe and muffler. **(Refer to Fig. 4. 50)**

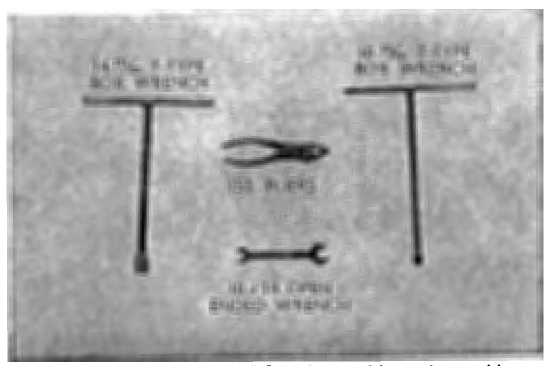


Fig. 4. 50 Tools required for disassembly and assembly of the exhaust pipe and muffler

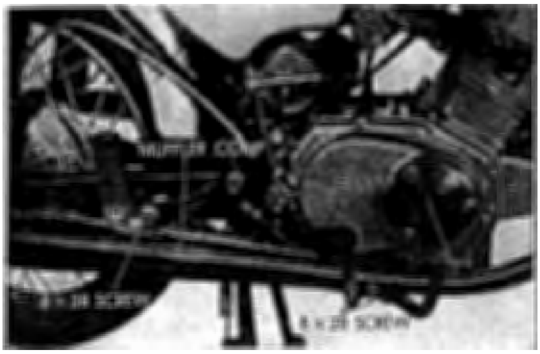


Fig. 4. 51 Muffler mounting bolt

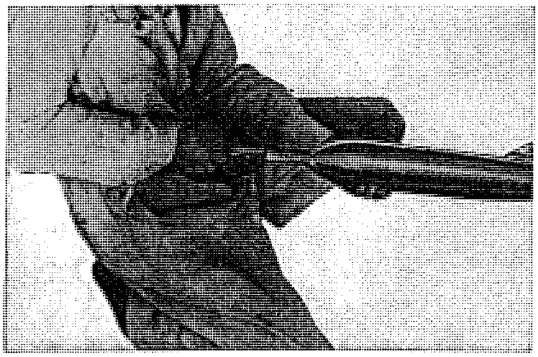


Fig. 4. 52 Removing diffuser pipe

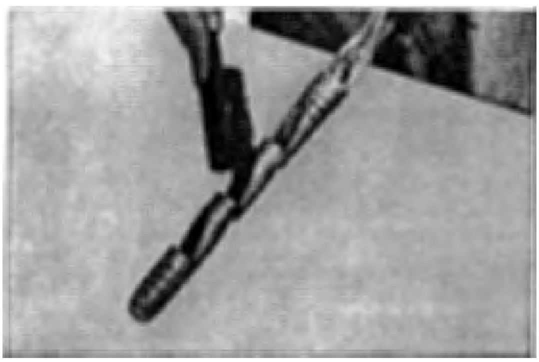


Fig. 4. 53 Removing carbon with wire brush

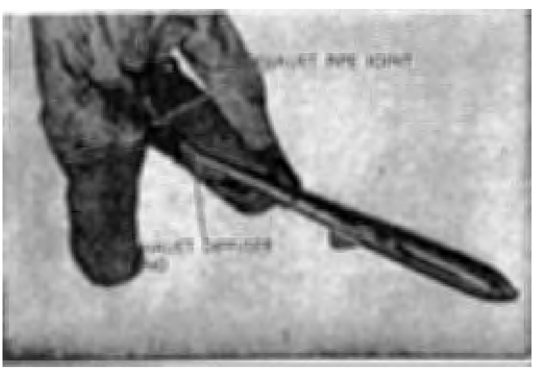


Fig. 4. 54 Coupling exhaust pipe and muffler

2. Loosen the two exhaust pipe joint nuts and remove them.
3. Loosen four 8 × 25 hex bolts and remove the footrest bar complete.
4. The muffler is secured together with the footrest. By loosening the 2 × 58 hex bolts, the exhaust pipe and muffler are separated as a unit from the frame. **(Refer to Fig. 4. 51)**
5. The exhaust pipe and the muffler are removed by twisting in the reverse direction.
6. By loosening the 6 × 8 hex bolt, the diffuser pipe is removed from the muffler. **(Refer to Fig. 4. 52)**

C. Inspection

1. Wash the diffuser pipe after carbon is removed by brushing. **(Refer to Fig. 4. 54)**
2. Inspection of cranks and damage of the muffler packing
3. Inspection of the exhaust pipe and muffler for scars and scratches.

D. Assembly

1. Insert the exhaust pipe into the muffler. **(Refer to Fig. 4. 55)**
2. Lightly tighten the exhaust pipe joint nut and tighten the 8 × 25 and 12 × 58 hex bolts.

(CAUTION)

(a) If the exhaust pipe joints nut is sufficiently tightened first, it cannot enter the muffler hole. Hence, it should first be tightened lightly ; after the muffler is securely tightened, the joint nut should be tightened firmly.

(b) The diffuser pipe can be installed either prior to or after the muffler is installed.

(c) Do not forget that the 12 × 58 footrest and 8 × 25 hex bolt are tightened together with the footrest bar (complete).

4.9 Air cleaner and tool case

A. Construction of the air cleaner

Filter paper is employed in the air cleaner for increasing the filter performance by enlarging the surface area. As two carburetors are employed, air cleaners are employed on both the right and left sides. **(Refer to Fig. 4.55)**

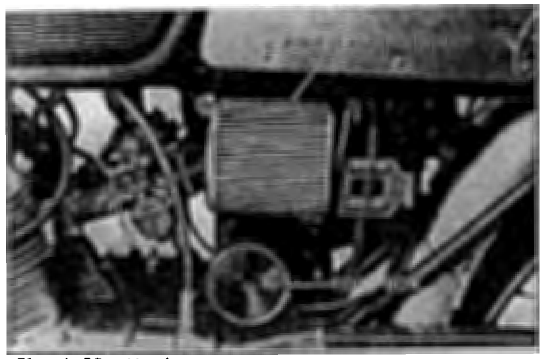


Fig. 4.55 Air cleaner

B. Disassembly

1. Tools required for disassembly and air cleaner and tool case. **(Refer to Fig. 4.56)**
2. By removing the 6 mm hex nut at the bottom, the right and left air cleaners are removed from the frame.
3. Remove the air cleaner connecting tube from the carburetor.
4. When the 6 mm tool box mounting bolt, nut, and 6×12 hex bolt are removed, the air cleaner can be removed from the frame.
5. Remove the air vent tube from air cleaner.
6. By removing the 6 mm hex nut and 6×70 hex bolt, the tool box complete is separated from the frame. **(Refer to Fig. 4.57)**

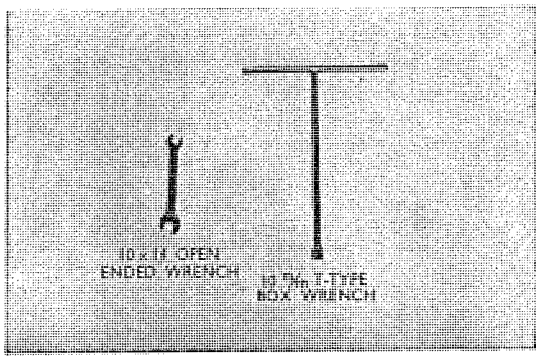


Fig. 4.56 Tools required for disassembly and assembly of air cleaner tool case

C. Inspection

1. Dust on the air cleaner can be eliminated by wiping. When the filter paper is blocked, compressed air or gasoline should be employed.
2. Inspection of torn or stained filter paper.

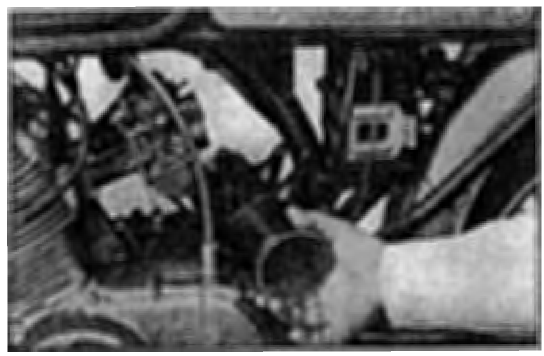


Fig. 4.57 Removing tool box from frame

D. Assembly

1. Mount the tool box (complete) on the frame and secure by 6 mm hex nut.
2. Mount the air cleaner and secure by the 6 mm tool box mounting bolt, nut, and 6×12 hex bolt.
3. Insert the air vent tube into the air cleaner.
4. Insert the air cleaner connecting tube into the carburetor.
5. Install the air cleaner case.

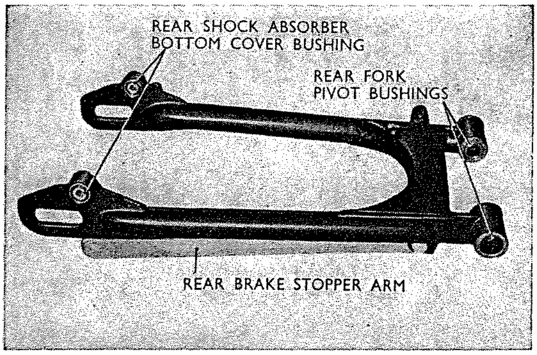


Fig. 4. 58 Rear fork

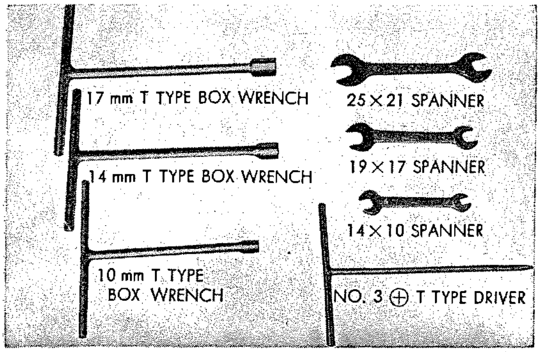


Fig. 4. 59 Tools required for disassembly and assembly of rear fork and rear fender

Fig. 4. 60 Removing rear fork

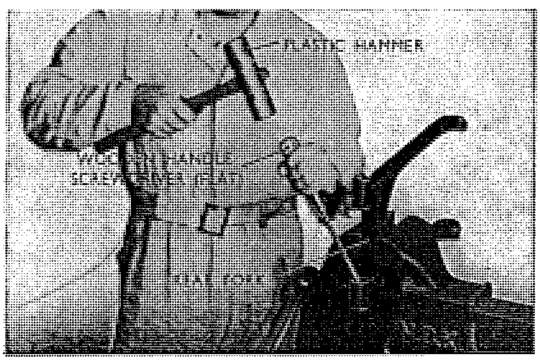


Fig. 4. 61 Removing rear fork pivot bushing

4. 10 Rear fork and rear fender

A. Construction of the rear fork

One end of the rear fork is fitted to a section of the frame and the other end is fitted to the frame through the rear cushion. When the rear wheel bounces, the section which is fitted to the frame becomes the rotation axis and the rear wheel bounces in an arc. Influence on the chain is quite small. **(Refer to Fig. 4. 58)**

B. Disassembly

1. Tools required for disassembly and assembly of the rear fork and fender. **(Refer to Fig. 4. 59)**
2. Following Section 4.13 B, separate the rear wheel.
3. When two 6×10 hex bolts and one 6×12 hex bolt are removed, the chain case is removed from the frame.
4. Following Section 4.11 B, separate the rear cushion.
5. When the 14 mm self locking nut is removed and the rear fork pivot bolt is removed, the rear fork can be separated from the frame. **(Refer to Fig. 4. 60)**
6. Remove the rear fork center collar and the rear fork pivot bushing by light tapping. **(Refer to Fig. 4. 61)**
7. By loosening two 6×12 and 12×18 hex bolts, the rear fender can be removed from the frame. **(Refer to Fig. 4. 62)**
8. By removing the 8×20 hex bolt and rear fork pivot bolt, the footrest bracket can be removed. Disassembly of the rear fork is easily made if the footrest bracket is removed.

C. Inspection

1. Measurement of the rear fork center collar.

	Standard value	Correction limit
Outside diameter	19.972 to 19.993 mm (.799″ to .7997″)	
Bore	13.980 to 14.010 mm (.559″ to .560″)	
Overall length	47.3 to 47.4 mm (1.89″ to 1.896″)	

2. Measurement of rear pivot bushing bore.

	Standard value	Correction limit
Bore	20.05 to 20.08 mm (.802″ to .803″)	

3. Measurement of rear fork pivot bolt

	Standard value	Correction limit
Outside diameter	13.925 to 13.968 mm (.557" to .558")	
Bend	Below 0102	

4. Measurement of twist of the rear fork. **(Refer to Fig. 4.63)**

	Standard value	Correction limit
Twist	Below ±0.1 (.0039")	

(CAUTION)

Measurement should be made when the rear fork pivot bushing and the center collar are inserted into the rear fork.

5. Inspect the rear fender and the drive chain case for stains and dents.
6. Inspection of elongation of the drive chain should be made by the same method as for same method as for cam chain inspection.

D. Assembly

1. Install the rear fender.
2. Drive in the pivot bushing and the center collar. Insert the rear fork seal cap.
3. By inserting the pivot bolt through the side bracket, couple the rear fork and the frame. Tighten by the 14 mm lock nut.
4. Install the rear cusion.
5. Install the rear wheel.
6. Install the drive chain.
7. When the assembly is finished, adjust the rear brake pedal and tension of the chain.
8. Install the drive chain case. **(Refer to Fig. 4. 64)**
9. Insert grease in the grease fitting. **(Refer to Fig. 4.65)**

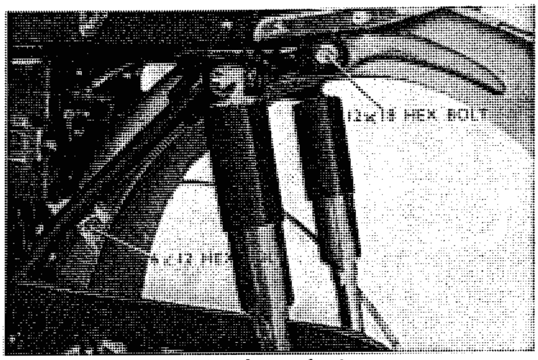


Fig. 4.62 Disassembly of rear fender

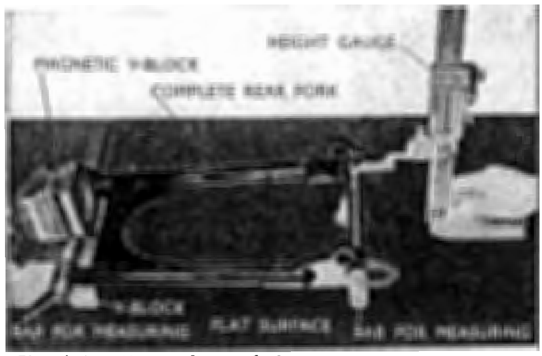


Fig. 4.63 Twist of rear fork

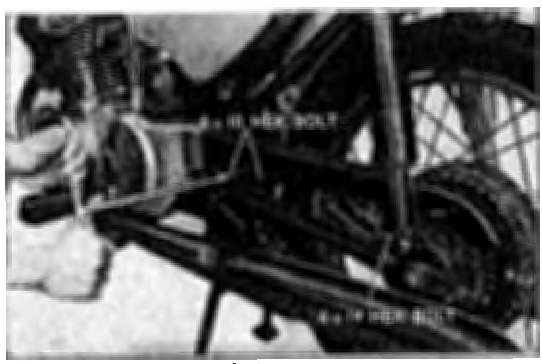


Fig. 4.64 Installation of chain case

Fig. 4.65 Inserting grease

4.11 Rear cushion

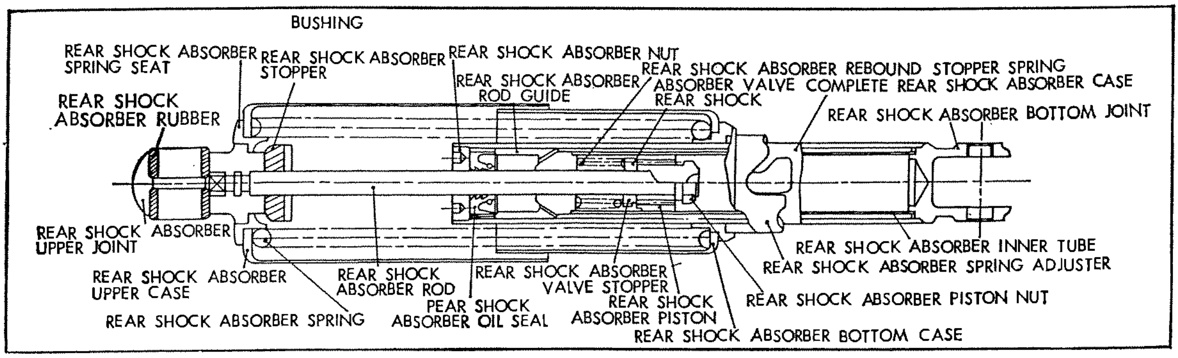


Fig. 4.66 Rear cushion

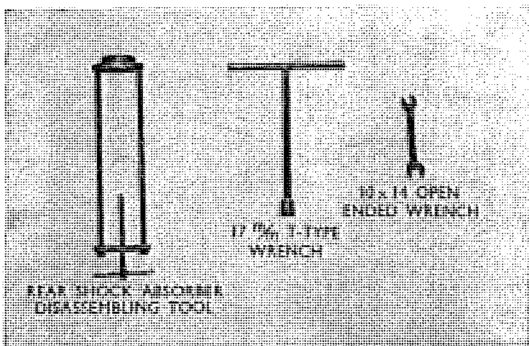


Fig. 4.67 Tools required for disassembly and assembly of rear cushion

A. Construction of the rear cushion

The rear cushion consists of spring and double cylinder system oil shock absorbers. The compressing load is absorbed by the spring and elongation is absorbed by shock absorber.

The oil shock absorber contains 52 cc (.013 US gal., .011 Imp gal.) of #60 white spindle oil is included. If this amount is not suitable, reduced cushion stroke, oil leakage, or noise occurs. Adjustment can be made in three steps according to road and running conditions **(Refer to Fig. 4.66)**

B. Disassembly

1. By loosening the 10 mm hex-cap nut (using 14×17 double-ended wrench) and the 8×28 rear cushion lower bolt, remove the rear cusion assembly.
2. Compress the rear cushion upper case, remove the rear cushion spring seat limit, pull out the upper case in an upward direction, and remove the rear cushion spring.

C. Inspection

1. Measurement of the rear cushion spring.

	Standard value	Correction limit
Free length	194 mm (7.76″)	
Tension	152.9 mm/h (6.12″/h) 60 kg±3.6 (132 lb±8 lb)	
	123.9 mm/h 110 kg±6.6 (242 lb±14.5 lb)	
	107.7 mm/h 150 kg±9.0 (330 lb±19.8 lb)	
Right angle	Below 1.0 mm (.039″)	

2. Inspection of oil leakage at the cushion absorber.
3. Inspection of breakage deformation of the rear cushion limit.

D. Assembly

1. Couple the rear cushion spring and upper case, push up the upper case, and install with the spring seat limit. **(Refer to Fig. 4. 68)**

(CAUTION)

(a) When the spring seat limit is mounted, the upper joint should be up. If it is not, mounting becomes very difficult.

(b) The rear cusion spring has uneven pitch and installation should be made with the small pitch facing down.

3. Install the rear cushion assembly to the rear fork and frame by the 8×28 rear cushion bolt and 10 mm hex-cap nut.

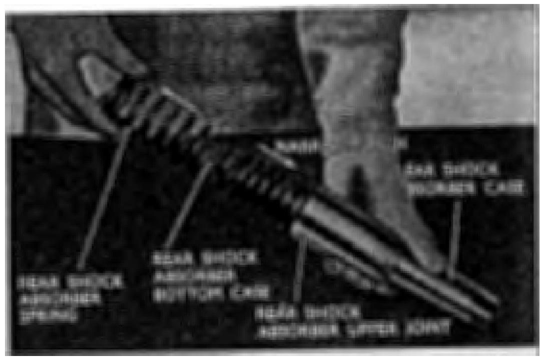


Fig. 4. 68 Coupling rear cushion

4. 12 Front wheel

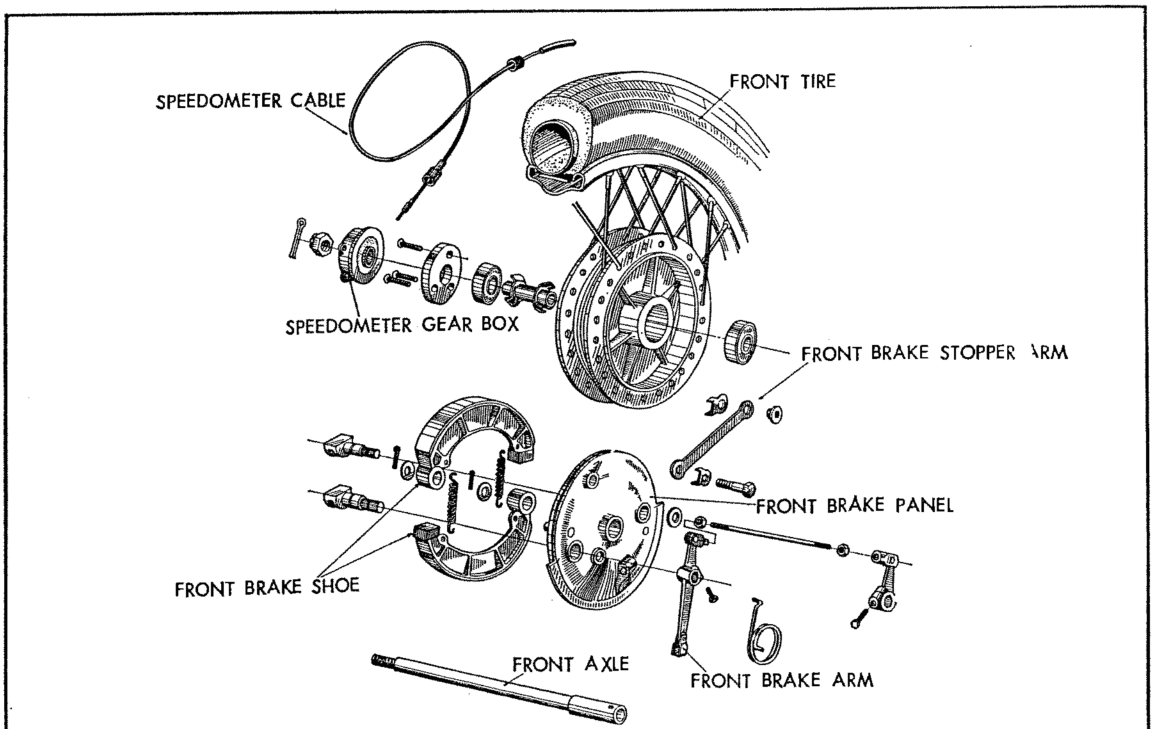


Fig. 4. 69 Front wheel

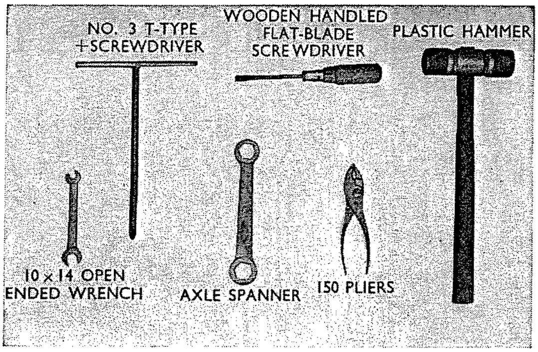


Fig. 4.70 Tools required for disassembly and assembly of the front wheel

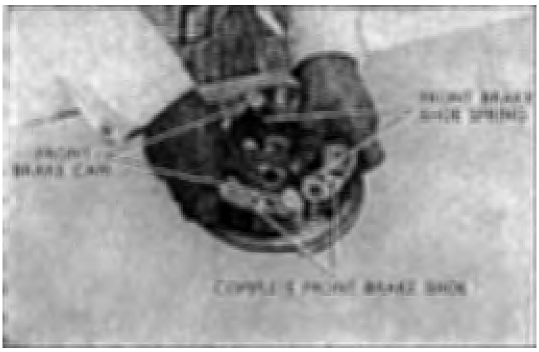


Fig. 4.71 Removing front brake shoe

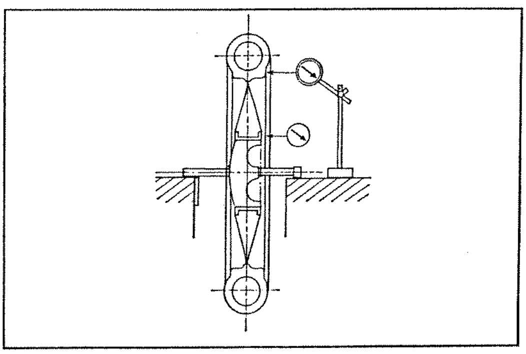


Fig. 4.72 Measurement of deflection of rim

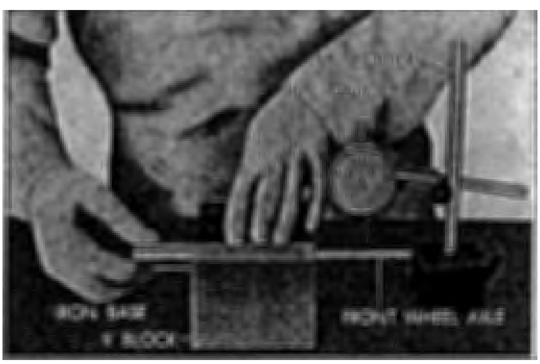


Fig. 4.73 Measuring front axle bend

A. Description of the front wheel

The 6392 R ball bearings and the aluminium cast fullwidth hub inside the brake drum, the brake panel, and the speedometer gear box are coupled by the front wheel axle and the front wheel axle nut.

Return rotation force generated at the damping period is absorbed by the left hand axle through the limit arm of the brake panel. **(Refer to Fig. 4.69)**

B. Disassembly

1. Place a suitable bench under the engine.
2. Remove the front brake wire.
3. Remove the speedometer cable from the gear box assembly.
4. Loosen the front brake torque bolt and remove the front brake limit arm.
5. Straighten the 3×28 cotter pin and remove it from the front wheel axle.
6. Loosen the front wheel axle nut. When the front wheel axle is pulled out, the front wheel can be removed.

(CAUTION)

Insure that, when the front wheel axle is removed, the gear box is not dropped.

7. Remove the panel from the front wheel and loosen the 9×16 small cross-point screws. Remove the bearing retainer, two 6302 R ball bearings, and the front axle spacing collar.
8. By removing two 2×25 cotter pins and the anchor pin mounting washer, remove the brake shoe from the panel. **(Refer to Fig. 4.71)**
9. By separating the tire and tube from the rim with the tire iron, pull out the tube.

C. Inspection

1. Measurement of deflction and eccentricity of the rim. **(Refer to Fig. 4.72)**

	Standard value	Correction limit
Sideward deflection	Within 0.5 mm (0.195″)	
Eccentricity		

2. Measuring outside diameter bend of the front axle. **(Refer to Fig. 4.73)**

	Standard value	Correction limit
Outside diameter	14.957 to 14.984 mm (.598" to 599")	
Bend	Below 0.01 (.0004")	

3. Measurement of the clearance in the axial and radial directions of the 6302 R ball bearings.

	Standard value	Correction limit
Axial clearance		
Radial clearance		

4. Measurement of brake shoe spring.

	Standard value	Correction limit
Tension	8 kg at 64 mm (17.6 lb @ 2.56")	
Free length	55 mm (2.2")	

5. Measurement of the outside diameter and thickness of the front brake shoe.

	Standard value	Correction limit
Outside diameter	170 mm (6.8")	
Thickness		

6. Measurement of thickness of the front brake cam.

	Standard value	Correction limit
Thickness		

7. Inspect and tighten any loose spokes.
8. Air leaks of the tube should be checked by submerging the tube in water.
9. For tire wear or puncture, not only the outside but also the inside should be checked.

D. Assembly

1. The tube can be easily inserted by putting it inside the tire and applying a small amount of air. Insert into the bead unit in the rim. **(Refer to Fig. 4.74)**

(CAUTION)

(a) When the tire is on the rim, apply air to 1/3 the designated pressure and lightly strike around the tire with a wooden wallet in order to prevent the tube from being pinched. **(Refer to Fig. 4.75)**

(b) The valve stem of the tube should be placed pointing toward the axle. If not, air leakage occurs. **(Refer to Fig. 4.76)**

Fig. 4.74 Installing tire

Fig. 4.75 Tapping tire circumference lightly

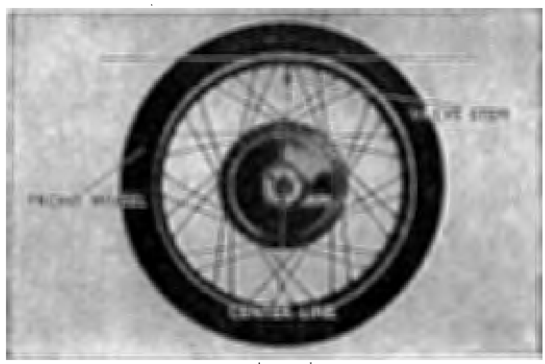


Fig. 4.76 Angle of valve stem

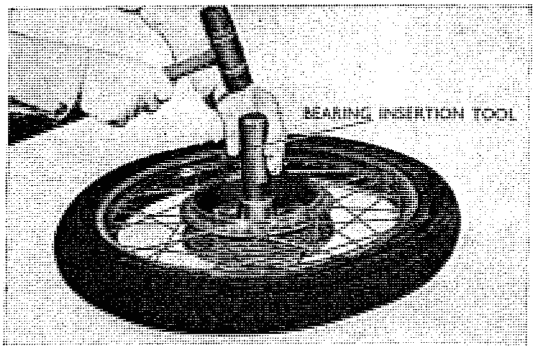


Fig. 4.77 Insertion of bearing

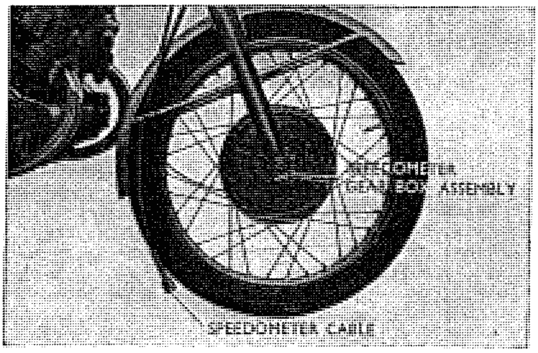


Fig. 4.78 Angle of gear box installation

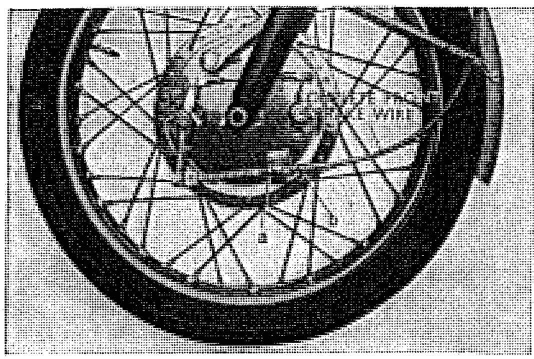


Fig. 4.79 Front brake wire adjuster

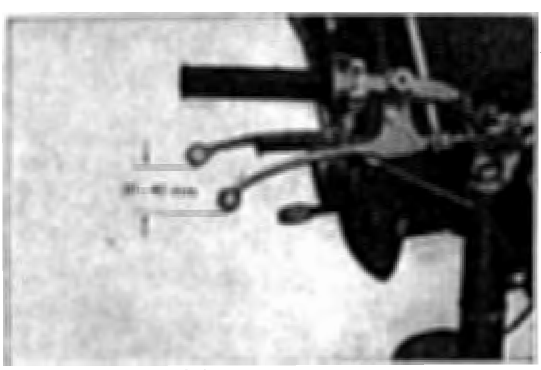


Fig. 4.80 Play of front brake lever

2. Grease the 6302 R ball bearing and the inside of the front wheel hub and insert the spacing collar. Drive in the 6302 R ball bearing. **(Refer to Fig. 4.77)**

(CAUTION)

As the 6302 R ball bearing provides the dust seal, insure that correct use of the outside and inside exists.

3. Tighten the front wheel bearing retainer.
4. Hook the spring to the front brake shoe and install the two anchor pins and brake cams. Fit the unit to the front brake panel and tighten with the anchor pin mounting washer and 2×25 cotter pin.
5. Couple the panel to the front wheel and the gear box to the bearing retainer side. Secure them by the front wheel axle to the front fork.

(CAUTION)

The gear box joint section should be in line with the axles of the front and rear wheels. If not, due to excessive bend, the speedometer cable may break. **(Refer to Fig. 4.78)**

6. Install the front brake limit arm on the front brake panel.
7. Connect the speedometer cable to the gear box.
8. Connect the front brake cable to the brake arm and adjust the play. For adjustment, loosen the nut (a) ; if the adjuster (b) is turned clockwise, the play increases and vice versa. The designated play ranges from 30 (1.17″) to 40 mm (1.56″). **(Refer to Fig. 4.79 and 4.80)**

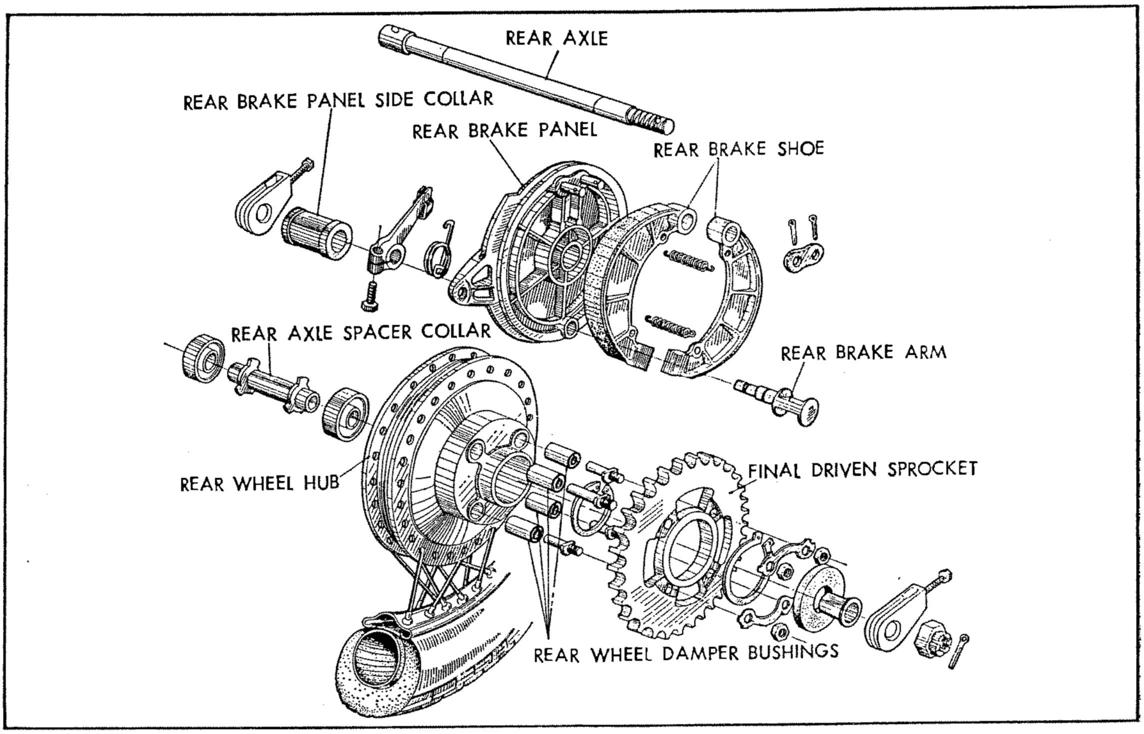


Fig. 4. 81 Disassembling rear wheel

4. 13 Rear wheel

A. Description of rear wheel

The rear wheel consists of the 6302 R ball bearing, aluminum cast rear wheel hub with brake drum, and the brake panel. It is equipped with the single cam rear brake panel through the panel side collar on the right side. At the left side of the wheel hub, the hub and the final driven sprocket are held with the sprocket mounting nut. This unit is mounted on the rear fork through the rear side coller at the rear axle. **(Refer to Fig. 4. 81)**

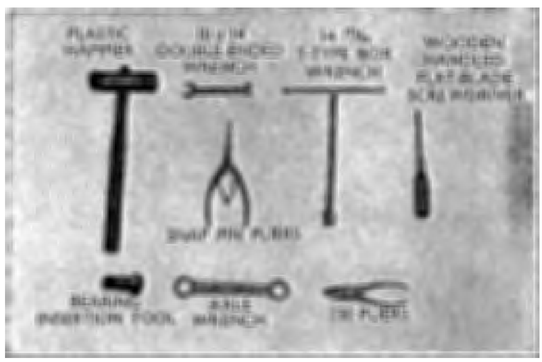


Fig. 4. 82 Tools required for disassembly and assembly of rear wheel

B. Disassembly

1. Tools required for disassembly and assembly of the rear wheel. **(Refer to Fig. 4. 82)**
2. Following Section 4. 7 B, remove the rear brake cable.
3. By removing the drive chain joint, separate the chain. **(Refer to Fig. 4. 83)**
4. Loosen the rear brake panel limit bolt, and remove the rear brake limit arm from the panel.
5. Straighten the 30×34 cotter pin and remove it from the axle.
6. Loosen the rear wheel axle nut and extract the rear wheel axle.

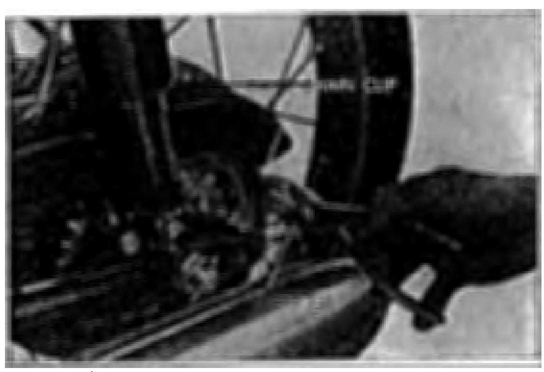


Fig. 4. 83 Removing drive chain

Fig. 4. 84 Rear wheel

Fig. 4. 85 Removing brake shoe

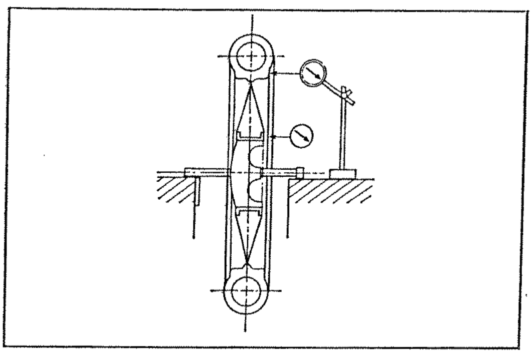


Fig. 4. 86 Deflection of rim

Fig. 4. 87 Measurement of rear wheel axle bend

7. Tilt and extract the rear wheel. **(Refer to Fig. 4. 84)**
8. Straighten the 8 mm look washer and remove the 55 mm retainer. Loosen the thin 8 mm nut and remove the final driven sprocket.
9. Remove the oil seal internal retainer, two 6303 R ball bearings, and the rear axle spacing collers.
10. For disassembling the rear brake shoe, remove the brake arm complete from the panel, two 2.0 × 25 cotter pin, the anchor pin mounting washer, and the brake shoe complete. **(Refer to Fig. 4. 85)**
11. By using the tire iron, remove the tire and tube.

C. Inspection

1. Measurement of deflection and eccentricity of the rim. **(Refer to Fig. 4. 87)**

	Standard value	Correction limit
Sideward deflection	Within 0.5 mm (.02″)	
Eccentricity	Within 0.5 mm (.02″)	

2. Measurement of the outside diameter bend of the rear wheel axle. **(Refer to Fig. 4. 87)**

	Standard value	Correction limit
Outside diameter	16.957 to 16.984mm (.67 to 68″)	
Bend	Below 0.01 (.0004″)	

3. Measurement of the tooth bottom diameter of the final driven sprocket.

	Standard value	Correction limit
Tooth bottom diameter	161.18 to 161.33mm (6.45″ to 6.453″)	

4. Measurement of the axial and radial clearance of the 6303 R ball bearing.

	Standard value	Correction limit
Axial clearance		
Radial clearance		

5. Measurement of rear brake shoe spring.

	Standard value	Correction limit
Tension	16 kg at 64 mm (3.52 lb @ 2.5″)	
Free length	56.4 mm (2.26″)	

6. Measurement of cam unit thickeness of rear brake cam.

	Standard value	Correction limit
Thickness	9.85 to 10.15 (.39" to 41")	

7. Outside diameter and thickness measurement of the rear brake shoe. **(Refer to Fig. 4. 88)**

	Standard value	Correction limit
Outer diameter	170 mm (6.6")	
Thickness	4.5 to 4.8 mm (.18 to 19")	

8. Inspect and tighten all loose spokes.
9. Inspect for air leakage by applying air to the tube and placing it in water.
10. Inspect the inner and outer portion of tires for any abnomality. **(Refer to Fig. 4. 89)**

D. Assembly

1. Place the inner tube between the rim and the tire, and apply a small amount of air and fix the bead section to the rim.

(CAUTION)

(a) When the tire is coupled, apply 1/3 the amount of air designated, and lightly hit the tire with a wooden mallet to prevent inner tube protrusion.

(b) The valve of the tube should point toward the axle.

2. Apply grease to ball bearing 6303 R, and the rear wheel hub. Insert the spacer and hit 6303 R ball bearing into position **(Refer to Fig. 4. 90)**

(CAUTION)

As ball bearing 6303 R employs ball bearing with dust seat, check the difference of the external and internal sides. **(Refer to Fig. 4. 90)**

3. After the oil seal is installed, the sprocket retaining bolt should be inserted into the drive flange and the final driven sprocket tightened by the 8 mm tongued washer and 8 mm thin nut. **(Refer to Fig. 4. 91)**

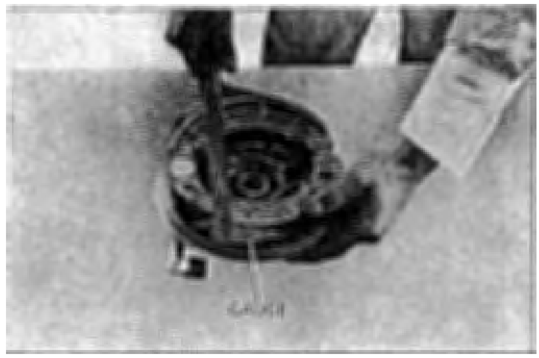


Fig. 4. 88 Rear brake shoe measurement

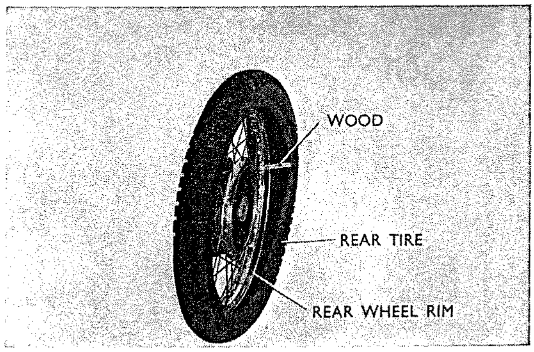


Fig. 4. 89 Tire inspection

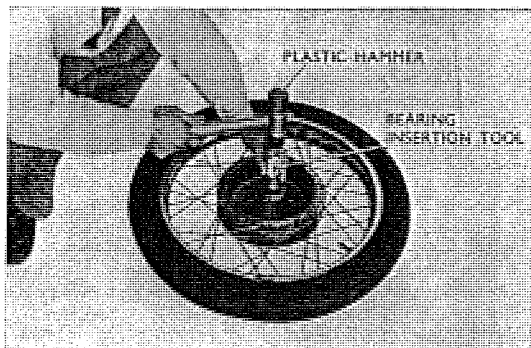


Fig. 4. 90 Ball bearing positioning

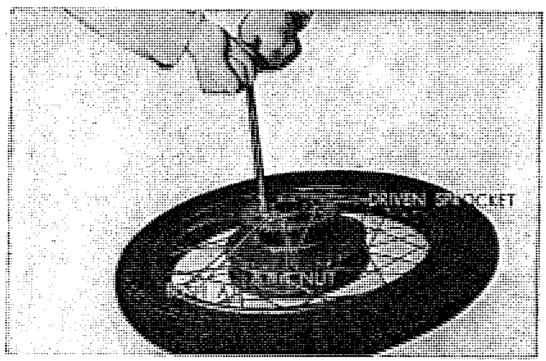


Fig. 4. 91 Tightening the final driven sprocket

Fig. 4.92 Rear brake coupling

4. Fix the spring to the rear brake shoe, and fit the anchor pin, and cam to the shoe; install these parts to the brake pedal. Fit the 20×25 cotter pin, anchor pin setting washer and brake arm, and fix them with the 6×22 hex bolt. **(Refer to Fig. 4.92)**

Fig. 4.93 Chain tension

5. The panel should be coupled to the rear wheel, and it should be contained in the frame and be tightened by the rear axle. However, the chain should be fitted, prior to this and set by the clip; tension of the chain should be adjusted by the drive chain adjuster.

(NOTE)

When chain tension is adjusted by the chain adjuster, left chain adjuster and that of the rear fork should be set at the same position. In addition, slack of the chain ranges from 10 to 20 mm. (.39 to .78″) **(Refer to Fig. 4.93)**

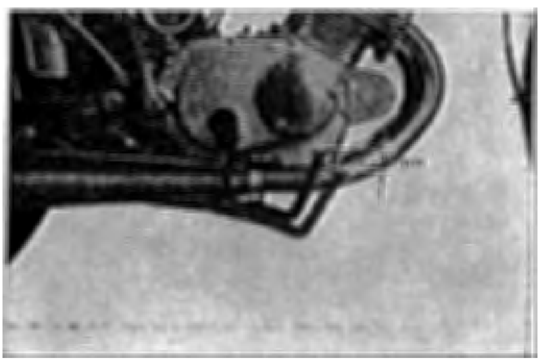


Fig. 4.94 Rear brake pedal play

6. Install the rear brake limit arm to the rear brake panel.

7. Install the rear brake wire to the brake arm. Set the rear brake panel on its side and adjust rear brake play. **(Refer to Fig. 4.94)**

(NOTE)

Rear brake pedal play ranges from 20 to 30 mm. (.78 to 1.17″)

V ELECTRIC EQUIPMENT

5. 1 General of electrical parts

The electrical system of a vehicle is of vital imoprtance. If the ignition system, lamps, or alarm do not function properly, vehicle operation is impaired. Hence, these parts require periodical maintenance and repair.

The parts are manufactured and conform to JIS the Japanese land transportation vehicle law, safety and other standards designated by manufacturers.

Electrical parts of Model CB 125, and CB 160 are divided as follows:

1. Generator (AC Generator)
2. Ignition (IG coil, contact breaker, and spark plug)
3. Rectifier (Silicon)
4. Battery
5. Load (features full lamp, horn, and motor capacity).

5. 2 Electrical system

Electrical system vary according to type, method of installation, and wiring. InModel CB 125 and CB 160 the battery ignition system is employed, and due to employment of an AC generator and ignition coil, quick starts are obtained (even during battery discharge).

A compact and efficient AC generator is employed, which performes discharge under various loads while at the same time charging the battery through the rectifier **(Refer to Fig. 5. 3)**

5. 3 Ignition circuit

Refer to the electrical parts wiring drawing.

A. Ignition system

In Model CB 125 and CB 160, the high pressure battery ignition system is employed.

Battery current is employed as the primary current. A high voltage is generated through the breaker at the secondary of the ignition coil, obtaining spark. **(Refer to Fig. 5. 4)**

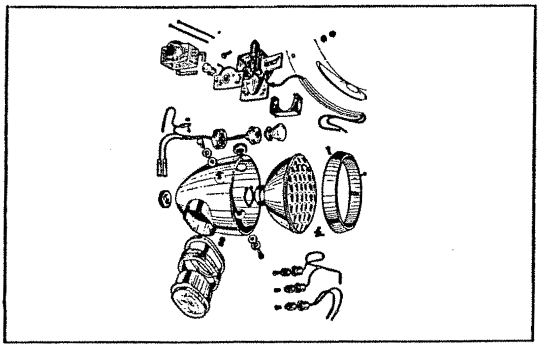


Fig. 5. 1 Main electrical parts (A)

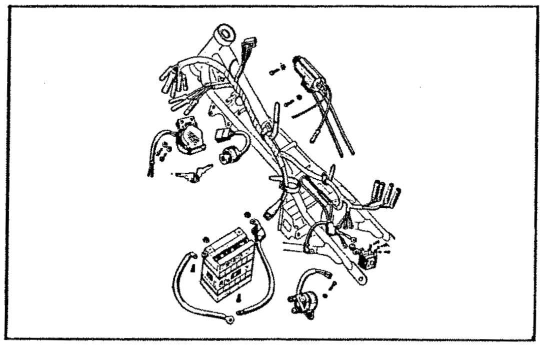


Fig. 5. 2 Main electrical parts (B)

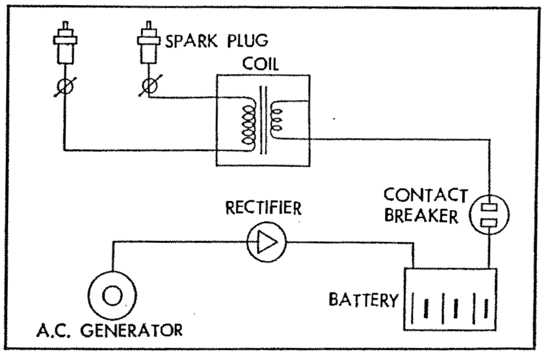


Fig. 5. 3 Ignition system

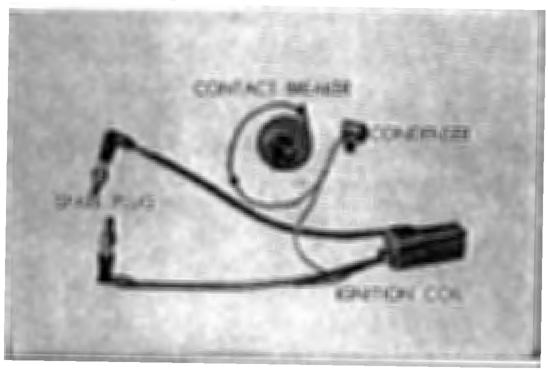


Fig. 5. 4 Ignition system

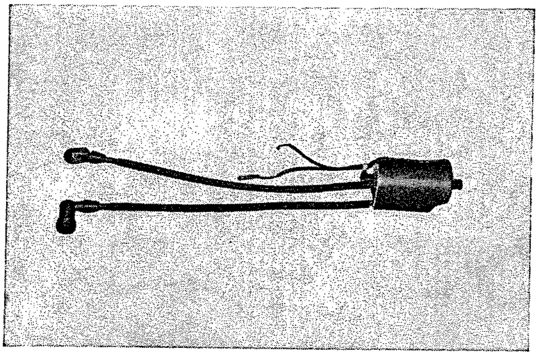


Fig. 5. 5 Ignition coil

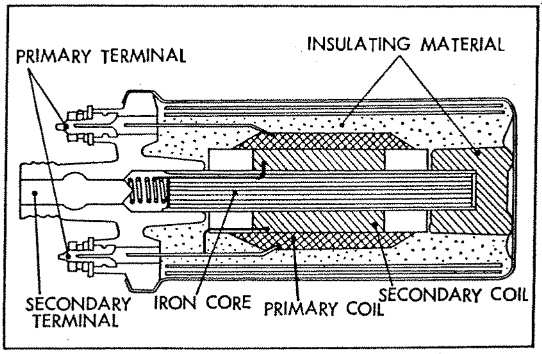


Fig. 5. 6 Dual side view of ignition coil (General)

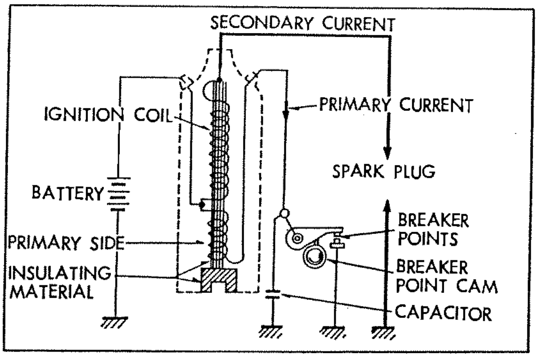


Fig. 5. 7 Battery operation coil (General)

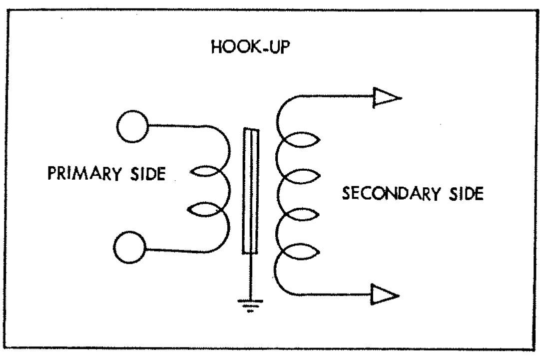


Fig. 5. 8

B. Ignition coil

The ignition coil employed in Model CB 125 and CB 160 (provided with 360° alternative combustion) is of simultaneous ignition system which is employed in vehicles manufactured by our company, and while ignition and combustion takes place in one side, the other is not utilized. **(Refer to Fig. 5. 5)**

1. Construction of the ignition coil

As shown in the figure, the ignition coil is manufactured in such a way that the secondary coil, with a thin enamel wire 0.08 mm wound around the iron core from 10,000 to 20,000 times, at the primary coil with a thicker wire (0.6 mm) wound several hundred times, are put in a water proof case after insulation treatment is performed; pitch or other is employed for filling the space. **(Refer to Fig. 5. 6)**

2. Performance of ignition coil

The principle of the ignition coil is the same as that of the induction coil. Connection is generally made as shown in the left figure when the cam axis and the crankshaft axis are rotated at a high voltage, generated at the secondary coil by the following process: **(Refer to Fig. 5. 7)**

a. When the breaker points are closed, primary current flows in the direction of the arrow mark and magnetic flux is the iron core.
b. When the breaker points are opened the cam, the magnetic flux generated by the primary current is rapidly reduced.
c. High voltage is generated at the secondary by the change of magnetic flux and difference between the number of rotation. (Self and mutual induction operation)
d. The high voltage fills the distributed static capacity of the secondary coil first and upon the voltage increase the high tension cord, and the distributed static capacity in the plug are charged simultaneously and voltage gradually increases.
e. When voltage is sufficient, the spark is discharged. Upon the start of discharge, discharge voltage drops rapidly with the load of the distributed static capacity released (capacitive sparks); discharge is continued due to energy stored in the windings by the decrease of magnetic flux (inductive sparks).

f. As magnetic flux rapidly nears zero, the voltage level for spark discharge is not maintained and is stopped.

g. The energy in the windings due to the small residual flux generates an attenuation vibration in the secondary and primary windings and diminishes as a resistance loss in the circuit.

h. Then, through the circuit period determined by the cam circuit angle, it again repeats the above process.

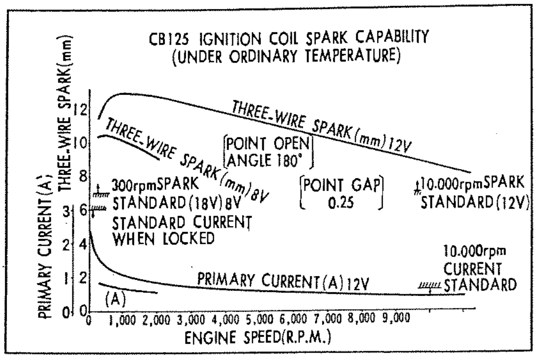


Fig. 5.9 Spark performance graph

SPECIFICATIONS

1.	Rotation and speed	Counterclockwise 300~11,000 rpm (maximum guaranteed, 15,000 rpm)
2.	Voltage system	12 V Battery
3.	Normal load	Battery (Capacity 9AH 10HR) Ignition coil (One revolution to one spark, cam closed angle 180°)
4.	Night load	In addition to the above, 30W×1 and 3W ×2 lamps.
5.	Charging characteristic	Beginning point of daytime charging (below 1400 rpm) to 5000 rpm, 2±0.5 amperes. Beginning point of night time charging (below 1700 rpm) to 5000 rpm, 2±0.5 amperes.
6.	Color code for electrical wiring	Day coil : Yellow. Night coil : Pink. Common : Brown Neutral : Light green with red spiral
7.	Ignition timing mark	"F" and its stamped line and the stamped line of the stator indicator are black.

Fig. 5. 10 Ignition coil specification

3. Ignition coil handling

a. Unless the ignition coil is damaged or the insulation is affected by oily residue adhering around the terminal, ignition performance will not deteriorate.

b. The quantitative judgment of performance coil testing can be conducted by employment of the service tester. The test can be performed by allowing spark generation between needles (3) while the interrupter is in operation. **(Refer to Fig. 5. 11)**

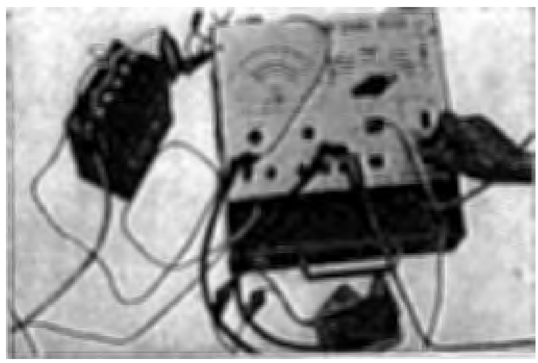


Fig. 5. 11 Ignition coil measurement

c. The rubber cap attached to the connecting terminal avoids insulator induction objects. **(Refer to Fig. 5. 12)**

Fig. 5. 12 Terminal unit covering

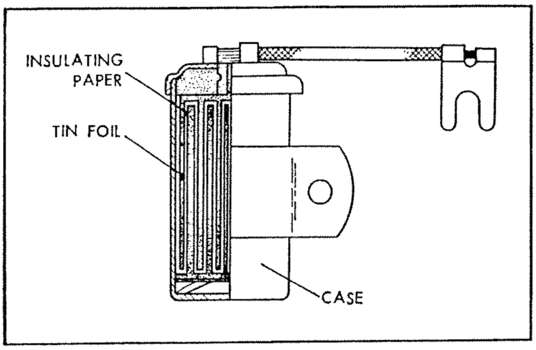


Fig. 5. 13 Capacitor construction

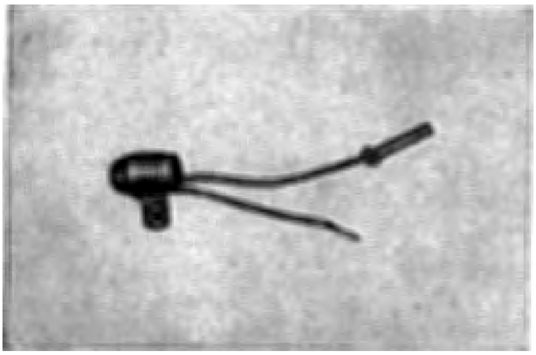


Fig. 5. 14 Capacitor

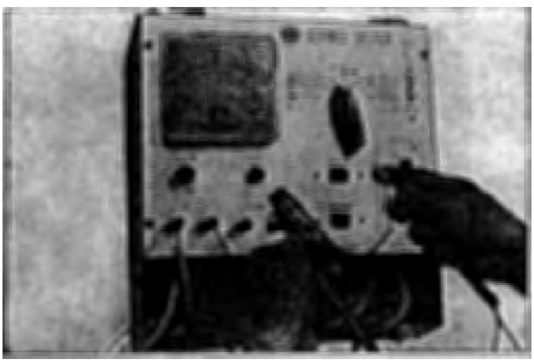


Fig. 5. 15 Capacitor testing

Fig. 5. 16 Breaker point

C. Capacitor

The capacitor avoids generation of harmful sparks between points. That is, when high voltage is generated at the secondary coil of the ignition coil by switching the points, additional voltage is generated at the primary coil. (Self induction voltage). When the primary current is disconnected, self-induction voltages tends to continue current transmission and cause sparks between points. This results in burnt points, a reduction of secondary coil, week voltage ignition sparks, or causes fire. The capacitor absorbs self-induction voltage quickly.

The capacitor employed in automotive vehicles usually consists of a belt-shaped, thin metallic foil, and insulation which are alternatively folded and rolled. Electricity is stored in the capacitor when voltage is applied to the metallic fold. The larger the metallic foil and the thinner the insulator, the greater will be the capacity. When electrical capacity is excessively large, spark performance is hindered. The correct electrical value is generally between 0.1 to 0.35 F.

High voltage is applied to the capacitor when the point is opened. In accordance to JIS the specified voltage distribution value is : 30 minutes after heating at 80°C, the insulation resistance should be more than 5 MΩ and should remain at this value in excess of one minute at 700 VAC (50 to 60 cps). **(Refer to Fig. 5. 13 and 5. 14)**

To test the capacitor, both capacitor terminals are separated from the megger while the megger is rotating and then both terminals are shorted. If sufficient sparks are generated, capacity value is considered normal. A capacity change rarely occurs. Correct capacity and insulation value can be obtained by employing a service tester. **(Refer to Fig. 5. 15)**

D. Breaker points

The breaker point interrupts the primary circuit of the ignition coil or magnetic ignition coil. Generally, in the case of the rotating magnet type, the contact breaker is included in the body. In the coupled type, the breaker point is coupled the stator, and in the case of the separate type flywheel generator and battery ignition system, the single unti type breaker system is employed. In Models CB 125 and CB 160, the breaker point is installed to the right end of the camshaft together with the spark advance mechanism. **(Refer to Fig. 5. 16)**

The breaker point consists of the breaker arm, points (movable contact point and fixed contact point), primary connecting terminal, spring, and oil felt coupled on the base. The breaker arm is of bakelite including rag. (In some cases, thin iron sheet, press-worked products with a bakelite contact point (cam follow) at an end are employed). To either type, movable contact point and other contact points are applied at the ends and are insulated at the base. **(Refer to Fig. 5. 17)**

The breaker arm performs light motion, and in order to decrease inertia it must be compact, lightweight, and rigid.

In order to prevent chattering at the time of breaker point shorting, spring pressure must be sufficient. However, in order to prevent deviation of spark time to sliding-section wear of the contactor, spring force must be limited to some extent. Spring force generally ranges from 700 to 900 g at the contact point. **(Refer to Fig. 5. 18)** (1.5 to 1.98 lb)

In order to prevent wear at the sliding section of the breaker arm, grease is applied to the oil felt on the base, the axis oil groove, and the arm lubricator. Inspection and lubrication is required, upon disassembly. **(Refer to Fig. 5. 19)**

Lubricant to employ :

For the contact point of general automotive vehicles tungsten material is widely used, and for the race, soft platinum with superior conductivity is occasionally employed. **(Refer to Fig. 5. 20)**

- Contact point requirements

1. It should be wear resistant.
2. It should be heat conductive.
3. It should have 2 sufficient melting points.
4. It should provide oxidation resistance.
5. It should not be easily influenced by water or oil
6. It should possess sufficient hardness.

The point cams of Model CB 125 and CB 160 are set to the left of the camshaft. Both cams are coupled to the profile, spark advancer, and simultaneous spark system by the employment of one breaker point, which means that one of the two cylinders is released in a nonfunctional status.

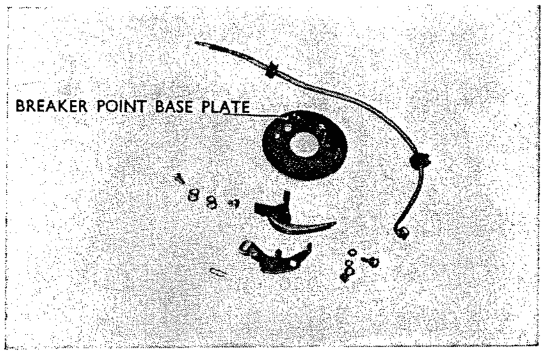


Fig. 5. 17 Parts of breaker point

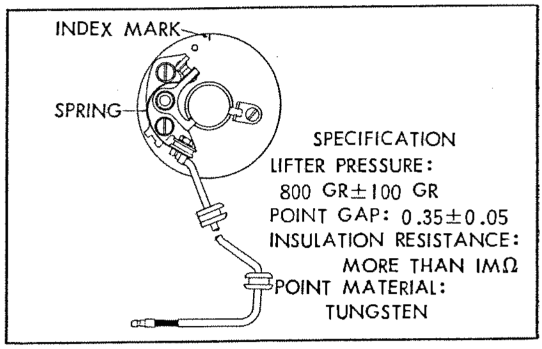


Fig. 5. 18 Breaker arm and spring

Service Values	
Point pressure	When less than 600g at lowest value.
Point gap	When impossible to adjust the gap in the range of 0.25 to 0.4 after using the spark advancer to correct the timing.
Insulation resistance	When less than 1 MΩ with a 500 V (or more) megger.

Fig. 5. 19 Value for maintenance and replacement of breaker point

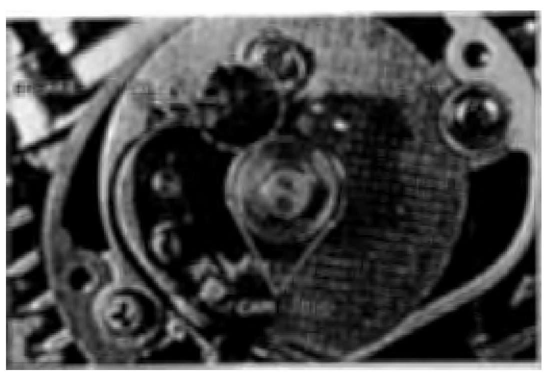


Fig. 5. 20 Breaker point

Fig. 5. 21 Contact point cam

Fig. 5. 22 Using sandpaper

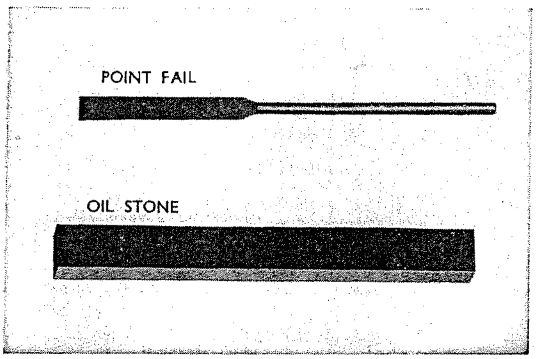


Fig. 5. 23 Pointed file and oilstone

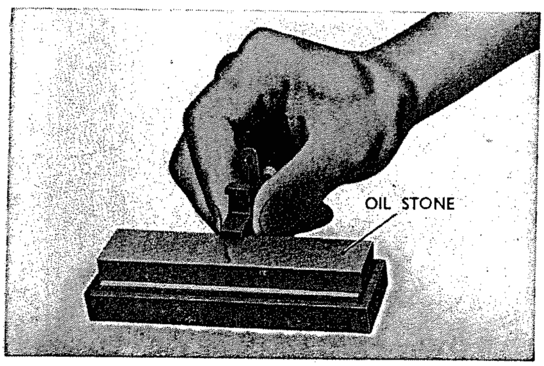


Fig. 5. 24 Correction by oilstone

(NOTE)

1. The smoothness of the point surface diminishes with prolonged use (especially when the surface is oil stained) ; when this occurs the surface becomes black and abnomal wear exists.
2. If oil adhering to the surface is not removed, oil film on the point surface is produced due to oil hardening and spark capabilities are obstructed. Periodic inspection and maintenance shoud be performed.
3. Correction of point surface

(a) In case of minor roughness

- Correct by grinding with a fine file or sandpaper.

(b) In case of severe roughness

- Remove the breaker arm from the breaker point base and correct by polishing both contact surfaces with an oilstone.
- When taking corrective action insure that unbalanced wear or insufficient contact is not caused. After installation, balance adjustment is obtained by matching them at the center of the contact surface.
- Insufficient contact of the contact point causes resistance loss and has influence on normal operation of the engine, as well as the breaker. Hence, the center aligning and breaker balance adjustment should be performed.

E. Spark advancer

The angle advancing mechanism automatically accelerates ignition timing in accordance to an increase of engine rotation. This is performed by a device fixed by a screw and adjusted by a wire. In the latter case, adjustment is performed by changing the position of the breaker arm. When the positions of the cam and breaker arm are changed, adjustment is obtained. That is when the breaker arm is fixed, the cam moves correspondingly to the number of rotations. In the CB 125 and CB 160 spark, the cam is moved by utilizing centrifugal force. **(Refer to Fig. 5. 25)**

As shown in Fig. 5. 26, the spark advance mechanism is fixed by a spring at a position of 0 angle advance (5° prior to top dead center). However, corresponding to rotation, the weight opens outward resisting the tension of the spring by centrifugal force, thereby rotating the cam. (The rotating direction accelerated by the spark time.)

The dotted line in Fig. 5. 26 illustrates the full advanced position. The advance angle of the spark advance mechanism opens at 1600 r.p.m. and is released at approximately 4200 r.p.m. The angle advanced is from 5° to 45°. **(Refer to Fig. 5. 26)**

In Model CB 125 and CB 160, the spark advance mechanism is included in the camshaft. Only the point cam is exposed at the point section which makes visual inspection of the advance mechanism difficult. However, it is necessary to inspect and insure correct operation of the weight by turning the point cam rotor.

Angle advance starts......crank r.p.m.
......1600 r.p.m.
Angle advance ends ......crank r.p.m.
......4200 r.p.m.
Advanced angle......40°

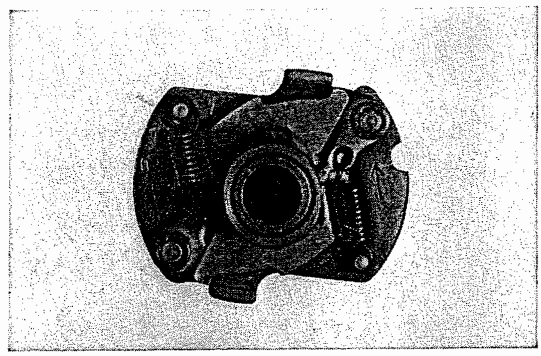


Fig. 5. 25 Spark advancer

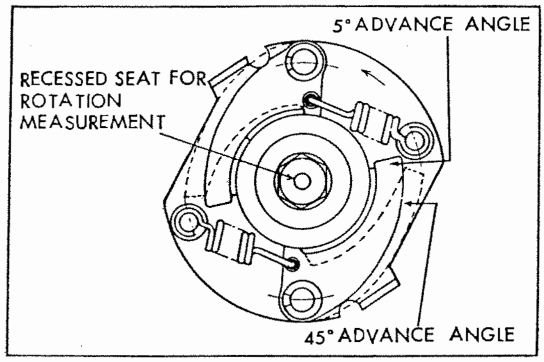


Fig. 5. 26 Graph of spark advancer

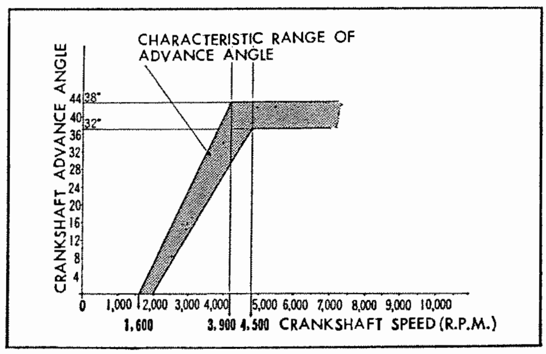


Fig. 5. 27 Graph of advanced angle of spark advancer

1. Maintenance and replacement

In the spark advance mechanism, the centrifugal piece, spring hook hole, and the coupling section of the cam are worn after prolonged use, causing increased play. These are indicated in a totally combined status, an advance characteristic. The spark advance mechanism should be replaced if the following is noted :

* A range deviation.
* Generation of noise.
* Rough advance curve.

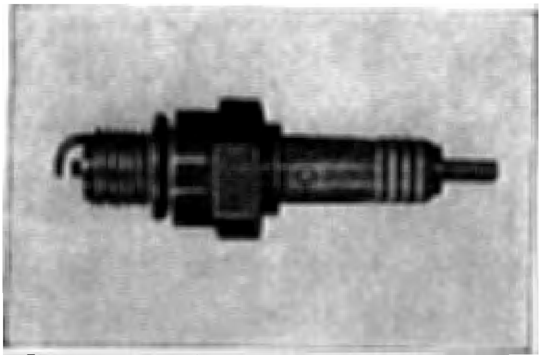


Fig. 5. 28 Spark plug

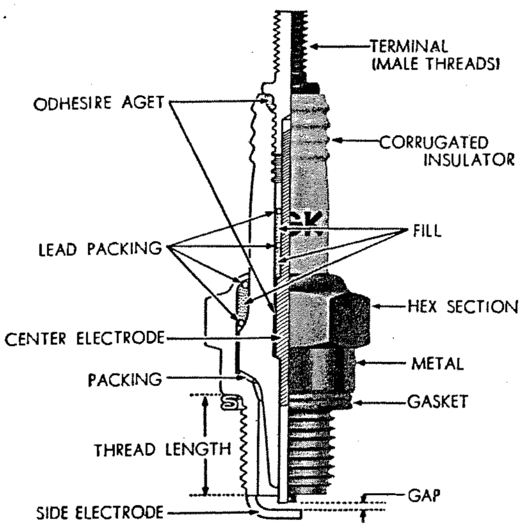


Fig. 5. 29 Construction of spark plug

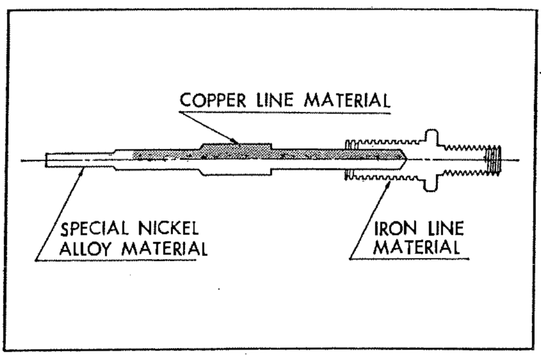


Fig. 5. 30 Electrode construction

F. Spark plug

The spark plug plays the most important role in the ignition system of a engine. That is, it receives the high voltage generated in the magneto or ignition coil and generates sparks between the center electrode and side electrode in the engine combustion chamber, igniting the mixed compressed gas in the combustion chamber, accelerating combustion, and applying combustion pressure to the piston.

Spark plugs operate under severe conditions ; hence, high strength and reliability are required. **(Refer to Fig. 5. 28)**

1. Spark plug requirements

To function properly, a spark plug should overcome the following conditions :

a. Current

Current takes the path of least resistance, in prefence to a spark gap. At normal temperatures, the insulation quality of an insulator is high, but at high temperatures the insulation quality is reduced. Hence, an insulator in which the insulation quality does not deteriorate at high temperature is required.

b. Combustion

Combustion pressure in the cylinder is between 35° to 45° at atmospheric pressure. Combustion pressure also takes the path of least resistance. If the airtightness is insufficient, high temperature combustion gas enters the plug, the plug overheats and its performance is decreased. Therefore, sufficient mechanical strength is required for high temperature, high pressure, vibration, and shock.

c. Combustion temperature

Combustion temperatures of mixed compressed gas attain 2,000°C. If temperature is not dissipated quickly the plug overheats and causes early ignition or burn loss of the electrode, reducing performance of the engine. Therefore, the spark plug should provide suitable heat characteristics, withstand sudden temperature changes, and dissipate heat generated by combustion gas and spark discharge.

d. Deposit due to imperfect combustion

When the ignition section of the insulation is stained, part of the high voltage is loss, resulting in a poorer spark.

e. Lead alloy

In gasoline, tetraethylene lead is mixed as combustion retarding agent, lead oxide being generated by combustion. If lead oxide adheres to the ignition section, it becomes a conductor, and consumes a part of the voltage. The phenomenon described in the previous section is generated. The spark plug should be constracted in such a manner that it will reduce such phenomenon as much as possible, and the insulation and electrodes should not be subjected to the effects of chemicals.

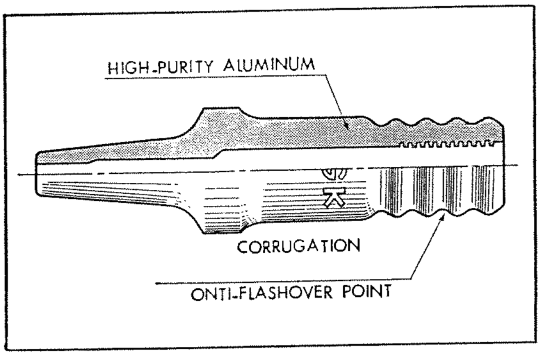


Fig. 5. 31 Insulator construction

2. Spark plug construction

The general construction of spark plugs employed in automotive vehicles is shown in Fig. 5. 29. The center electrode **(Fig. 5. 30)** is wrapped by an insulator **(Fig. 5. 31)** and the exterior surface is wrapped by metallic tube. **(Refer to Fig. 5. 28 thru 5. 31)**

Fig. 5. 32 Favorable status of plug

3. Heat characteristics of spark plugs

The heat characteristics of a spark plug and quality will determine the performance of the plugs as well as the performance of the engine.

(a) Spark plug performance

The ignition section of the plug fitted to the cylinder head is hindered by residue generated from combustion gas or oil entering the combustion chamber during operation of the engine. This adhesion acts as conduction on the insulation and provides a shorting passage for high voltage current, resulting in a weakened spark and lowered output of the engine or complete stoppage of the engine. To prevent such occurrences, the surface of the ignition section should be heated to an extent that the temperature burns the residue (approximately 450 to 600°C).

Fig. 5. 33 Overheated plug

However, temperature differs in accordance to the engine condition. Such temperature is termed "Selfcleaning temperature"

However, if the ignition section of the plug is overheated, the ignition section becomes an ignition point, resulting in pre-ignition and inducing knocks which lower engine output. Hence, it is necessary to keep the temperature of the ignition section below the pre-ignition temperature which is approximately 800°C. However, this varies according to engine conditions.

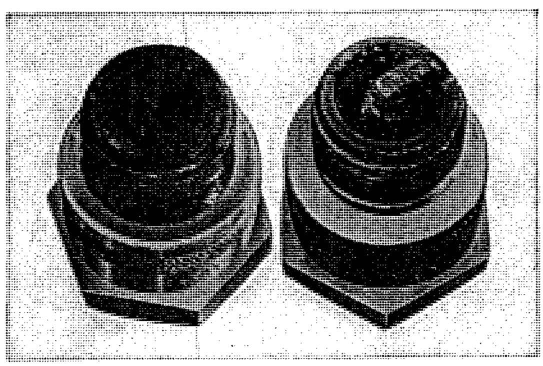


Fig. 5. 34 Smoke plug (Wet, left) (Dry, right)

"The ignition section of a plug should not be over heated or overcooled."

(b) Heat reduction

The plug is heated by combustion due to rotation of the engine being transmitted as shown by arrow in Fig. 5. 35. By regulating the heat dissipated and heat transmitted from the combustion gas, the ignition section maintains a certain constant temperature. **(Refer to Fig. 3. 35)**

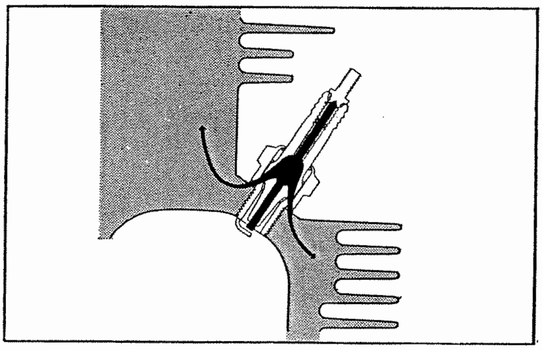


Fig. 5. 35 Temperature dissipation

4. Necessity of spark plugs with different heat values

(Quantitative difference of heat received by plugs)

The quantity of heat the plug receives from the engine differs extensively due to engine type (air cooled, water-cooled, 2-cycle, or 4-cycle engine), design (compression ratio, combustion chamber profile, or position of plug installation), and operational status (speed, load, difference of fuel, rough or smooth road conditions). Hence, for efficient performance under such varied conditions, several types of plugs with different heat dissipation ratios are required. The ratio of dissipation is termed " Plug heat value " The heat value is determined by construction, profile, and dimentions. The plug with a superior dissipation ratio is termed " cold type " (for high temperatures); conversely, the one well heated without dissipating is termed "Hot type" (for low temperatures). **(Refer to Fig. 5. 36)**

In Model CB 125/CB 160, a standard NGK D-8 H, 12 mm plug is employed. However, selection of plugs with suitable heat values must be in accordance with climatic conditions. **(Refer to Fig. 5. 37)**

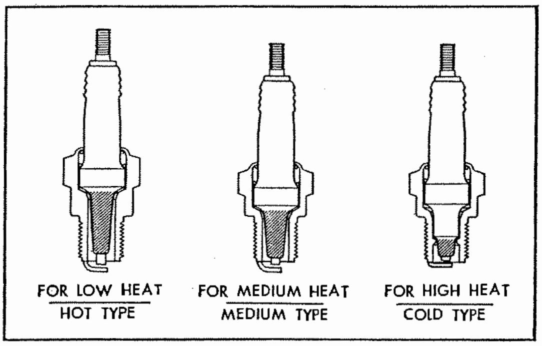


Fig. 5. 36 Sectional view of plug characteristics

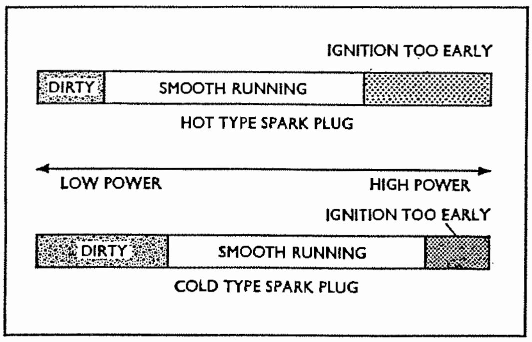


Fig. 5. 37 Plug comparison (by operation status)

When the plug gap is incorrect, adjustment should be performed by striking the side electrode. When adjustment cannot be obtained due to electrode wear, the plug should be replaced. **(Refer to Fig. 5. 38)**

	Spark plug (NGK)
Standard value	Spark gap 0.7 mm (.027")
Maintenance value	Spark gap Below 0.5 mm (.019") " Above 0.9 mm (.035")
When rising is intense	D-6H is employed
With rising tendency	D-9H is employed

Fig. 5. 38

5.4 Power source circuit

A. AC generator

The generating principle of an AC generator is the same as that of the generator coil of the flyweel magneto. By one turn of the magnetic steel, the flux in the iron core changes the direction as many times as the number of magnetic poles. That is, at one rotation of the magnetic steel, the flux in the coil iron core changes as many times as the number of (magnetic poles/2) cycles. Therefore, in accordance to this change, AC voltage is generated at the generating coil. Magnetic force changes correspondingly with the direction of flux in the iron core (the greater the number of magnetic rotations the number of poles, or the number of coil windings, the greater will be the amount of generated voltage). If the magnetic force, number of magnetic poles, or the number of coil windings is increased, a reduction must also exist. **(Refer to Fig. 5. 39)**

A merit of the AC generator is that malfunction rarely occurs due to the fact that simple construction parts, subject to wear, are not employed. The feature of coupling the AC generator and ignition coil is for emergency start; this is impossible with a DC generator. As batteries with low capacity are employed in motorcycles, battery power is occasionally completely discharged due to carelessness in handling. In the battery ignition system, sparking is not obtained until the battery is re-charged or replaced. However, with AC generators, a large, induced voltage is obtained during a lightly loaded period and by feeding this voltage to the ignition coil through a rectifier, sparks are obtained at the plug even when the battery is completely discharged, by using the kick starting system. This system is called an emergency start system with circuit switching being performed by the combination switch.

On the other hand, demerits of the AC generator (flywheel magneto, generating coil of magneto) is that voltage regulation is insufficient and when a load exceeding the designated value exists, an excessive increase or decrease of voltage is generated.

Attenuation of magnetic force does not occur during normal use. Hence, the vehicle will not be rendered unusable due to such attenuation. Even if magnetic force is attenuated due to accident, design allows for re-magnetizing. **(Refer to Fig. 5)**

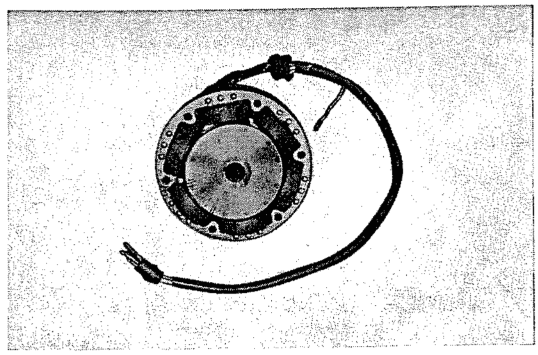


Fig. 5. 39 AC generator

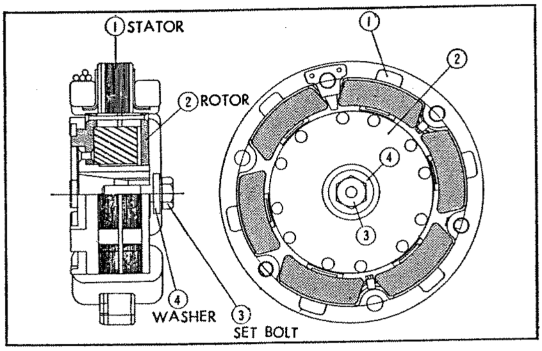


Fig. 5. 40 AC generator construction

SPECIFICATIONS	
Primary current:	Locked under normal temperature, less than 3 A at 12 V.
	Crankshaft at 10,000 rpm, less than 0.6 A at 12V.
Spark capability:	More than 7 mm at 300 rpm (Battery, 8 V), ⊕spark.
	More than 7 mm at 10,000 rpm (Battery, 12 V), ⊕ spark.
	For measurement, the high tension lead on one side is grounded through a 1 mm gap and the high tension lead of the other side is connected to a 3 gap.
Note:	Use the high tension lead, black and white ③, on the ⊖ spark side and connect to the left cylinder plug.

Fig. 5. 41 Specifications of AC generator

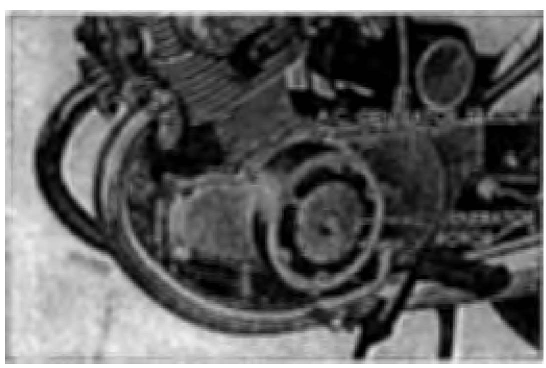


Fig. 5. 42 AC generator installed on engine

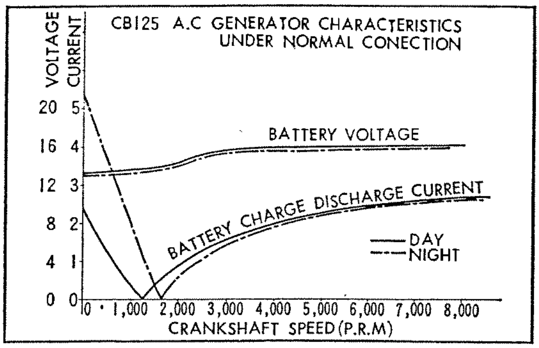


Fig. 5. 43 Performance of AC generator

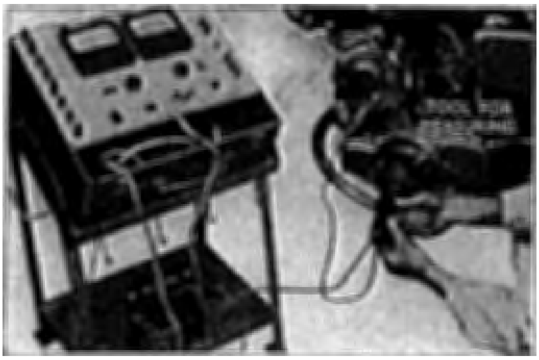


Fig. 5. 44 Measurement of timing

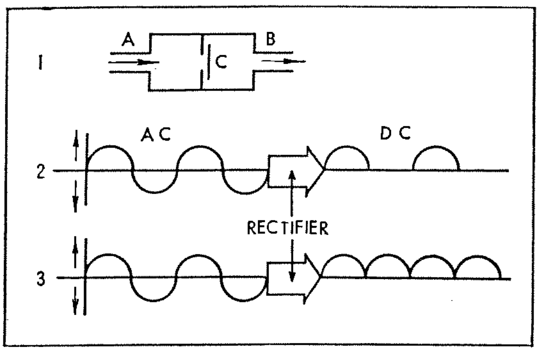


Fig. 5. 45 Rectifying operation

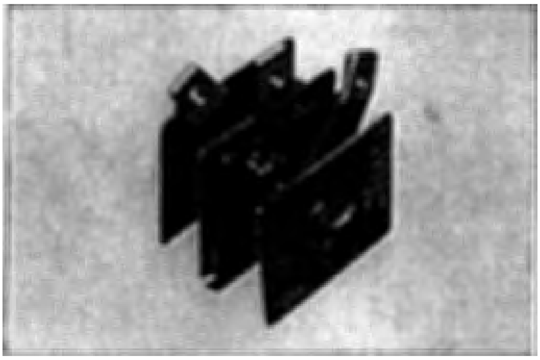


Fig. 5. 46 Silicon rectifier

1. Performance of AC generator

The charging characteristics of the AC generator employed in Model CB 125 and CB 160 (due to a nomal electrical load) are shown in the figure. However, when any load parts such as flasher lamps (in addition to designated load) are employed, the discharged current correspondingly increases and the start of change is shifted toward the high speed rotation side; charging current is reduced. **(Refer to Fig. 5. 43)**

- Confirmation of electrical position, as shown in Fig. 5.44, remove the generator cover, measure and confirm the stamped positions of the stator and rotor by using the measurement cover (tool) and a timing lamp. **(Refer to Fig. 5. 44)**

(CAUTION)

This type of AC generator is rotated in oil mist. When an extreme value is obtained when measuring output, or charging and discharging current by the service tester, inspection of stain between the rotor and stator should be performed.

B. Silicon rectifier

The rectifier converts AC current to DC current. A battery which is coupled and employed in the AC generator or AC generating coil requires a charge by DC current. Therefore, when generated current is AC current, it must be changed into DC current by rectifying.

Rectifying changes the direction of electric current which flows alternatively and periodically in opposite directions into a constant direction. This may be explained in terms of water flow as shown in Fig. 5.45 ①. When water pressure is applied alternatively from both side A and side B, water flow from B to A is stopped by a reverse limit valve and only flow from A to B occurs. The device performing the operation electrically is the rectifier. In methods for rectifying, there are, as shown in figures, halfwave rectification ② which allows one side of the alternating current to flow (the other being stopped), and full-wave rectification ③ in which currents of different directions are arranged in the same direction **(Refer to Fig. 5. 45)**

The rectifying performance of the silicon rectifier is as shown in the figure and is conducted by the silicon rectifying element (arrow marked section) coupled to the terminal plate. The fact that the terminal plate is large in comparison to the rectifying element is due to the increase in heat dissipation and cooling, in order to protect the rectifying element. The terminal plates coupled to the rectifying elements are arranged in shape in the rectifying circuits of various systems. **(Refer to Fig. 5.47)**

In the silicon rectifier, as shown in the figure, high melting point solder is used to position the silicon rectifier body through a base plate on the cooling plate (a). Additional high melting point solder (b) and conduction terminal (f) are coupled by low melting point solder (c) and wrapped by enclosure resin (h) and a protective ring (i). A protective coating is applied to the exterior surface. **(Refer to Fig. 5.48)**

The silicon rectifying element consists of three layers, N+, N, and P+, N+ consists of pure silicon with an extremely small impurity (such as boron aluminum and gallium) added. P+ consists of one layer mixed with an extremely small quantity of phosphorus, arsenic and antimony.

Due to the electrical characteristic of the impurities in each layer of N+ and P+, larger current flows from N+ to P+. Due to this, current flow from P+ to N+ is difficult. This characteristic causes rectifying performance. **(Refer to Fig. 5.49)**

In order to remove the rectified current by utilizing the rectifying performance of the silicon rectifying element, both surfaces of the silicon rectifying element are employed as electrodes. Hence, if the ambient conditions of the silicon rectifying element are not satisfactory, rectifier defects (reduced life, etc.) occur. Therefore, both surfaces of the rectifying element require protection, the electrode surface which is wrapped by solder with a high melting point and the cut surface of the circumference which is covered by a protective coating for added performance.

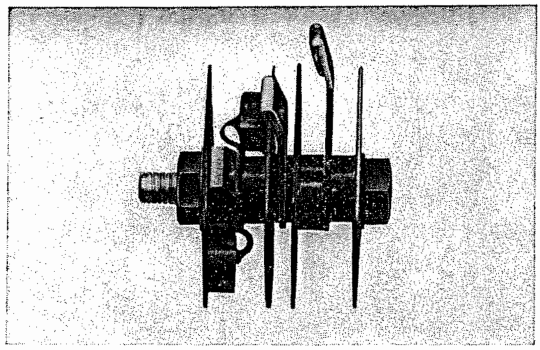


Fig. 5.47 Silicon rectifier

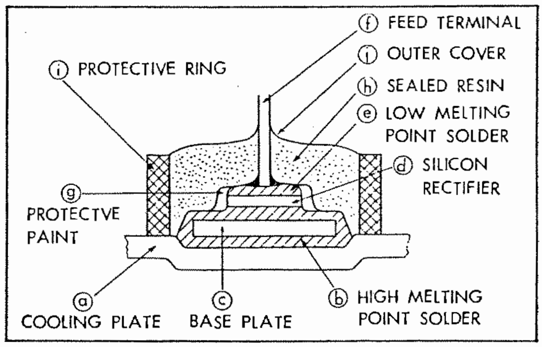


Fig. 5.48 Silicon rectifying element

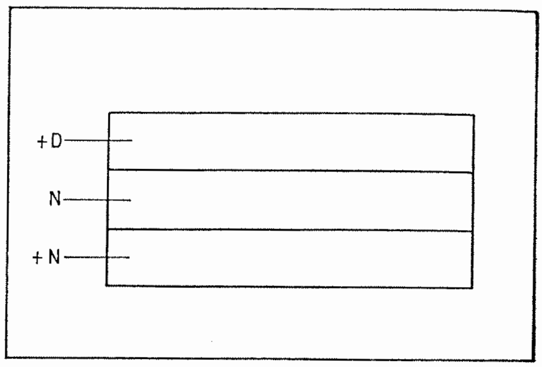


Fig. 5.49 Rectifier of silcon wafer.

Fig. 5. 50 Silcon rectifier mounting section

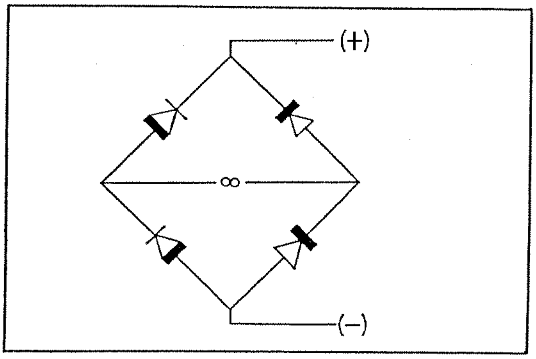


Fig. 5. 51 Connection

Items	Selenium	Silicon
Terminal Voltage /Cell	100V	800V
Direct Current /Cell	Less than 30V	150−250V
Admittance Temperature Contineous / Instant	−10∼+80°C / −20∼+150°C	−55∼+175°C / −55∼+200°C
Eddy Current	Max. 30 times /sec, 4 times /min	Min. 5.5 times /sec, 1.5 times /min
Efficiency (Rectifier)	Max. 90%	Max. 99%
Voltage fluctuation (Rectifier)	8∼12%	2∼3%

Fig. 5. 52 Comparison of silicon and selenium rectifiers

When current is applied to the silicon rectifying element, due to the characteristics of voltage drop in the positive direction, intense heat is generated at the rectifying element section. As the rectifying element section is small and easily damaged by intense heat, the rectifying element must be fitted tightly to the cooling plate. Thus, protection in the form of heat dissipation (due to the cooling plate) is provided. **(Refer to Fig. 5. 50)**

There are two types of rectifying elements employed in the silicon rectifiers, one of which has the P+ layer fitted on the upper surface of the cooling plate (+element). The other has the N+ layer also fitted on the upper surface of the cooling plate (−element). These are coupled **(Refer to Fig. 5. 51)** and employed in construction. **(Refer to Fig. 5. 51)**

1. Feature comparison of silicon and selenium rectifiers

(1) As forward resistance is low and back resistance is high, the front-to-back ratio is large. In the selenium rectifier the ratio is 92% and in the silicon rectifier the ratio is 98.

(2) In the selenium rectifier employed in two-wheel vehicles, weather resistance, especially moisture resistance, presents a problem. However, the silicon rectifier is not affected by moisture.

(3) In the range of permitted operational temperature of selenium rectifiers, the maximum temperature of the rectifier plate is 70°. In comparison, the temperature range of the silicon rectifier is from −55°C to 150°C. Especially at high temperatures, this unit is suitable.

(4) As current in the back direction is low, self-discharge of the battery, due to reverse current flow, is also low (even when the vehicle is not in use). 1 to 10 ma of reverse current flow existing in the selenium rectifier is less than 0.1 ma in the silicon rectifier. **(Refer to Fig. 5. 52)**

II. Caution concerning wiring

(1) Fitting

Red terminal........................DC current + side
Yellow and brown terminals...AC current terminals
Shaft (Bracket)....................DC current — side
(If the rectifier with incorrect wiring is employed, the rectifier capabilities of the rectifier are immediately destroyed.

(2) Caution concerning voltage

At temperatures as high as 150°C, the voltage insulation in the reverse direction of the silicon rectifier is not lowered. However, when the momentum value over the reverse voltage insulation is applied to the rectifier at low temperatures, the current increases suddenly and the rectifying layer is rendered unserviceable. As the value of voltage insulation in the reverse direction is 100 V at all times, one silicon rectifier should not be applied to voltage exceeding 100 V.

If the silicon rectifier is used with no load at the output side or with battery terminals disconnected, the maximum voltage value of the AC generator becomes 200 V. If this occurs, damage to the recifying layer is caused at once. Acceleration should be avoided during repair.

(3) Concerning current

If current of more than 5 A per rectifying element exists, intense heat is generated which renders the rectifier unserviceable. Therefore, excessive current due to measurement or heat in the electrical circuit should be avoided.

(4) Caution concerning assembly

- With the cooling plates assembled, the two electrodes of the AC current and the + and — terminals of DC current have different characteristics; shorting these with tools such as a screwdriver must be avoided. Upon installing the equipment to the body, the cooling plate should not contact the body.
- If the cooling plate is bent, or receives severe shock, the connecting wire may be cut or the protective ring may be damaged. If this occurs, rectifying performance is stopped.

No	NAME
1	SILICON RECTIFIER
2	LEAD PLATE
3	BASE PLATE
4	TERMINAL PLATE
5	8×48 HEXBOLT
6	8mm WASHER
7	8mm LOCK WASHER
8	THIN 8mm NUT
9	SMALL 4×8 ⊕ PAN SCREW
10	4mm LOCK WASHER
11	4mm WASHER

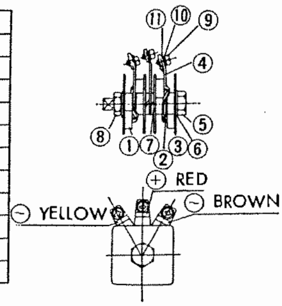


Fig. 5. 53 Silicon rectifier

Specifications

1. Rectiying characteristic
   When AC terminals are connected and 30 A between + and — terminals flow in the forward direction, voltage drop is less than 2 V between + and — terminals. When 100 V in the reverse direction, the reverse current flow should be below 0.1 ma.
2. Rated output current 8 A.
3. Double vibration performance. When normal instal-lation, it should endure the vibration, vertical 3600/minute, and maximum amplitude of 1.1 mm (.04″) for 100 hours.

Specifications of the silicon rectifier

C. Battery

1. Battery construction

The batteries employed in automotive vehicles at present are generally lead types **(Fig. 5.54)**, in which an anode group and cathode group (negative plates over anodes in numerical order with separators intervening) are put in an electrical container (constructed of ebonite or suterin) and immersed in an electroyte (dilute sulfuric acid).

As shown in the figure, one unit is called a cell. The cell generates approximately 2.1 V of electromotive force (during complete charge, more than 2.5 V). **(Refer ta Fig. 5.55)**

For Model CB 125 and CB 160, the same type battery as for Model CB 72 is employed. **(Refer to Fig. 5.56)**

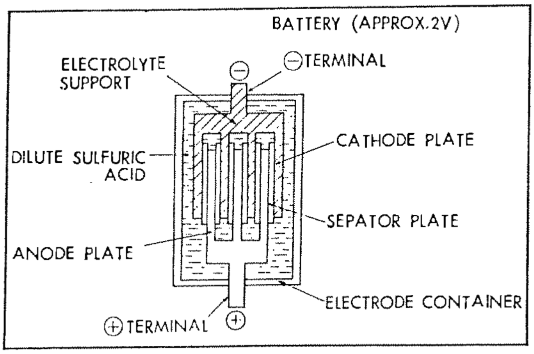


Fig. 5.55 Battery construction

Fig. 5.56 Battery (Model CB 125)

For the plates, to the grid which is constructed of antimony alloy, powdered hydrochlorinate is added in paste form. This is then dried and formed into the plate system. For anodes, hard lead peroxide (brown) is used, and for the negative plate, soft porous sponge lead (gray) is employed with an inflating agent to prevent compression and hardening. **(Refer to Fig. 5.57)**

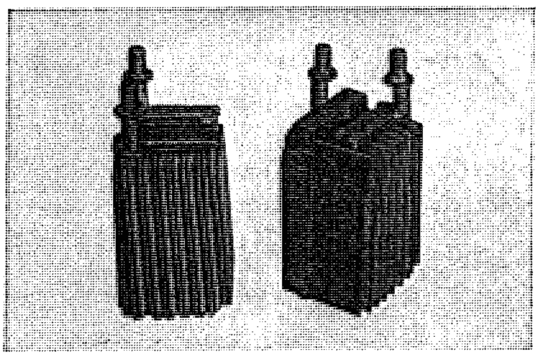


Fig. 5.57 Coupled plate group

For the separator, a thin cypress plate with rib, fine hole rubber plate, and synthetic resin plate are employed. Glass mat is inserted between the anode and separator to prevent displacement of anode material and oxidation of the separator. **(Refer to Fig. 5.58)**

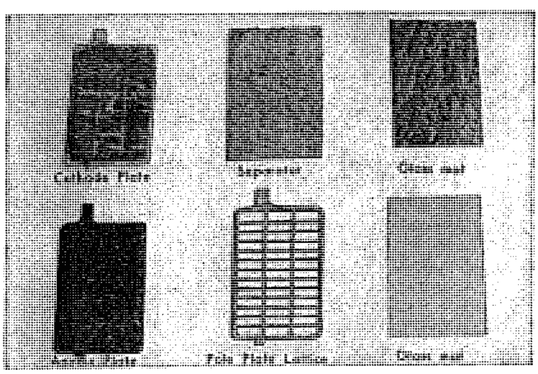


Fig. 5.58 Separator

Electrical

An electrical container constructed of suterin is employed. Hence, it is difficult to inspect the plates or electrolyte from the exterior portion of the container.

After the coupled electrode plate group is inserted into the electrical container, the container cover is fitted and tightly sealed with a synthetic resin adhesive. To the electrode plote which protrudes from the container cover, an electrode connector is fitted with pitch and synthetic resin applied to the electrode plates to prevent vibration and electrolyte leakage. **(Refer to Fig. 5. 59)**

When additional loads, such as lamps, etc., are connected to the battery terminals, discharge occurs. As discharge takes place, the elements of the electrode plates (lead peroxide, sponge lead, etc.) are gradually transformed to sulfate. The specific gravity of the electrolyte (dilute sulfuric acid) is gradually reduced and terminal voltage drops. Since reduction of specific gravity corresponds to the degree of discharge, if the initial specific gravity is known (specific gravity upon complete charge is 1.260 and that at complete discharge is 1.10), the extent of discharge and amount of remaining electricity is determined by the difference in specific gravity. **(Refer to Fig. 5. 60)**

The specific gravity of dilute sulfuric acid changes according to temperature. It also changes in accordance to battery type; however, dilute sulfuric acid with a specific gravity of 1.260 upon conversion at a standard temperature of 20°C is employed. If reverse current is applied to a battery from which discharge occurred, the battery is charged and, as charging occurs, lead sulfate produced by discharging returns to its original state (lead peroxide, sponge lead, etc.) and the specific gravity of the dilute sulfuric acid gradually increases; terminal voltage correspondingly increases. **(Refer to Fig. 5. 61)**

II. Battery charging, discharging ratio and capacity (charging ratio)

Battery capacity is the amount of electricity which is discharged from a completely charged battery until terminal voltage drops to a specified voltage (which is designated by JIS as an average 1.75 V per cell). To express this, the ampere-hour (AH) is used and discharged current is multiplied by discharge hours.

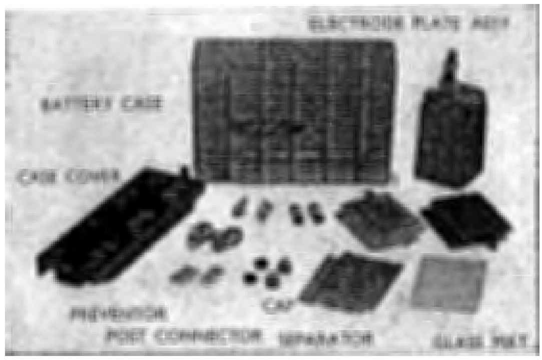


Fig. 5. 59 Battery components

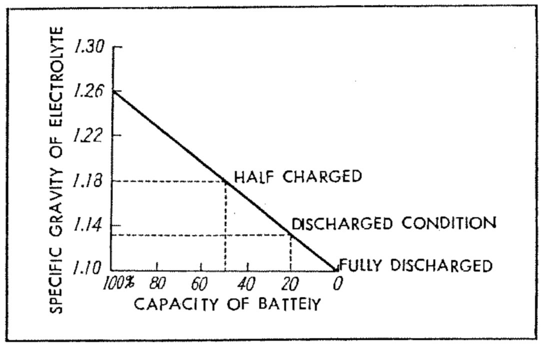


Fig. 5. 60 Graph of specific gravity and electrical capacity

POSITIVE — ELECTROLYTE — NEGATIVE

LEAD DI-OXIDE — DILUTE SULPHULIC ACID — SPONGY LEAD

$$PbO_2 + 2H_2SO_4 + Pb$$

DISCHARGE ↓ ↑ CHARGE

$$PbSO_4 + 2H_2O + PbSO_4$$

Fig. 5. 61 Reversible reaction

Fig. 5. 62 Battery without electrolyte

Fig. 5. 63 Caution required for initial charging

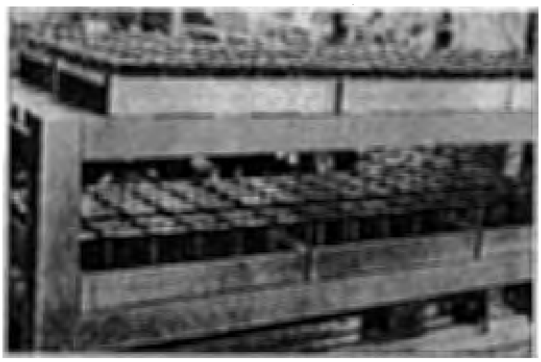


Fig. 5. 64 Initial charging plant (Y. S. B.)

However, the battery capacity changes in accordance to discharge current, temperature, and specific gravity. Hence, JIS standards for batteries employed in two-wheel and three-wheel vehicles (for capacity testing, the specific gravity of the electrolyte prior to discharge is designated as being 1.260 ± 0.005 when converted to the value at 20°C), indicate that current discharge for 10 hours results in an electrolyte temperature, upon discharge, of 25 ± 2°C. **(Refer to Fig. 5. 62)**

Discharge rate (charge rate)

Discharge a completely charged battery at X amperes and continue until the discharged voltage is attained. T hours discharge rate capacity of this battery is TX ampere hours, (AH), X amperes is the current of T hours discharge rate. For a battery with a 10-hour rated capacity, 9 AH means that the battery has the capacity of supplying current at 0.9 A (9/10) for 10-hour (to the discharged voltage). The current of a 10-hour discharge rate is 0.9 A.

Charge current is the same, a 10 hour current (charge) rate. The amount of battery charge or discharge current, and number of hours required for discharging at a certain current, prior to attaining the discharged voltage, is utilized.

Initial charge

Following assembly, if electrolyte is not added and the vents are closed, the battery remains fresh for a long time. Hence, for storage, this method is employed. When a new battery, which is not charged; is employed, initial charging is performed by applying electrolyte to the battery and charging (continuously) for 70 hours at the designated initial charge current.

Initial charging must be complete. If not, the battery will not display full capabilities and battery life will be shortened.

When initial charging is performed, the attached cautionary data should be read and carefully observed during initial charging. **(Refer to Fig. 5. 63 and 5. 64)**

Caution required during starting

When a battery to which initial charging has been performed is used, the following inspection should be performed :

(1) Inspection should be conducted with attention paid to damage or abnormalties caused during transportation (especially liquid leakage due to cracks in the electrical container.

(2) Inspect the liquid level by removing the vent cap. If any cell has a low liquid level, inspect for breaks in the electrical container. If there are no breaks, apply dilute sulfuric acid with the same specific gravity as that of other cells.

(3) When more than two weeks have elapsed after the inital charging, a supplementary charge should be made to compensate for the self-discharged electricity during the discharge period. It is desirable that inspection be performed during supplementary charge, level of cells and adjustment be given to obtain equal levels ; and records of voltage, specific gravities, and temperatures of cells be taken upon completion of charging for reference at a later date.

Caution required during use

(1) Periodical inspection should be performed. For batteries employed in vehicles, inspection should be performed weekly, twice a month, or every 1000 to 2000 km (620 to 1340 mi).

(2) Special attention is required during maintenance concerning the liquid level surface. When the liquid level is insufficient, distilled water should be added so that the electrode plates and separators are not exposed to air. On the transparent container, the liquid level is indicated. Generally, the liquid level should be from 10 to 13 mm (.39″ to .51″) above the separators. When the level is lower and the electrode plates are expased, the exposed section is subject to oxidation ; white lead sulfate is produced, capacity is decreased, and the expased section of the separators deteriorates in performance causing internal shorts. This occurs frequently and is the major cause of short battery life.

(3) Proper charge should always be maintained. If a battery is extensively used in a " low-charge " state, sulfation results (sulfate cannot be returned to its original properties). In such case, electrode plates become curved and tend to cause shorts. If a battery contains thin liquid at low specific gravity due to over-discharge, the separators are damaged. Therefore, it is necessary to discontinue

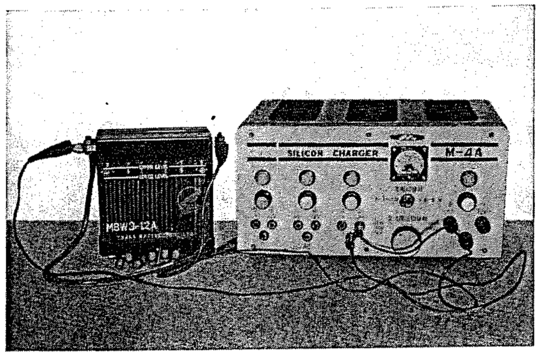


Fig. 5.65 Supplementary charge of battery

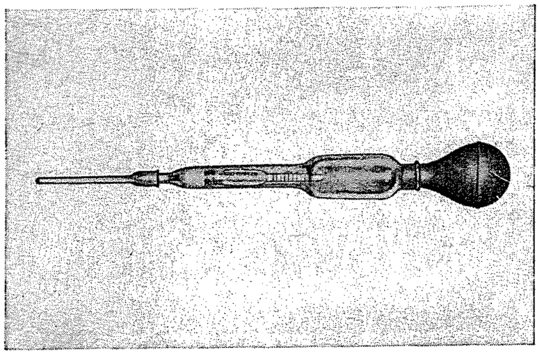


Fig. 5.66 Specific gravity

Fig. 5.67 Indication of electrolyte level

discharge prior to attaining the limit voltage (avoid over-discharging).

When the operational period of a vehicle is short during the day, but low speed operation for long periods is required at night, or when larger lamps (other than those designated) are used, the extent of discharge exceeds that of charge. Hence, the battery should be dismounted from the vehicle and a supplemontary charge made.

(4) The exterior portion of a battery, especially around terminals or electrode connectors, should always be kept clean. Due to dust and residue, electrical current leaks and over-dischange may result. **(Refer to Fig. 5.65 thru 5.68)**

III. Battery trouble

1) Anode plate (Refer to Fig. 5.69)

a. Causes of cranks or breaks
   - a. Aging due to prolonged use.
   - b. Excessive specific gravity of electrolyte.
   - c. Excessive battery temperature.
   - d. Over-charged battery.
   - e. Impurities mixed with electrolyte.

b. Cause of internal short by curve
   Over-charge (Especially when over-charge is per-performed following over-discharge.)

2) Negative plate (Refer to Fig. 5.70)

Cause of sulfation (" non-return " white lead sulfate)
   - a. Prolonged battery use without charging.
   - b. Over-discharge.
   - c. Excessive specific gravity.
   - d. Internal short.
   - e. Electrode plates exposed to air.
   - f. Impurity mixed with electrolyte.

3) Separators (Refer to Fig. 5.71)

Battery repair

Cause for deterioration (Black) (Increase of self-discharge)
   - a. Repeatedly used at high temperatures.
   - b. Excessive specific gravity of electrolyte.

Cause for deterioration (Loss of insulation quality)
   - a. Prolonged use following discharge without being charged.
   - b. Repeated excessive short-discharge.
   - c. Separator exposed to air.

Cause of breaks
   - a. Excessive dip of electrode plate curve

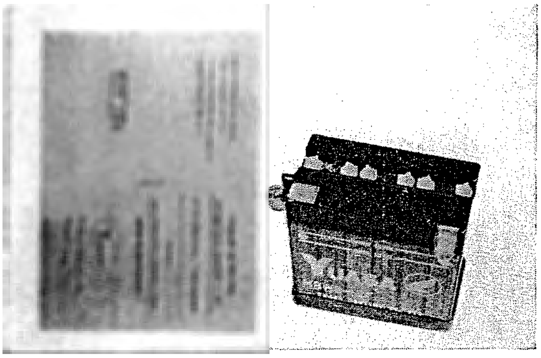


Fig. 5.68 Caution in battery use

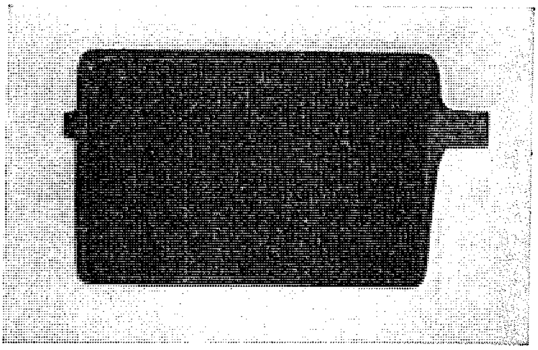


Fig. 5.69 Positive plates

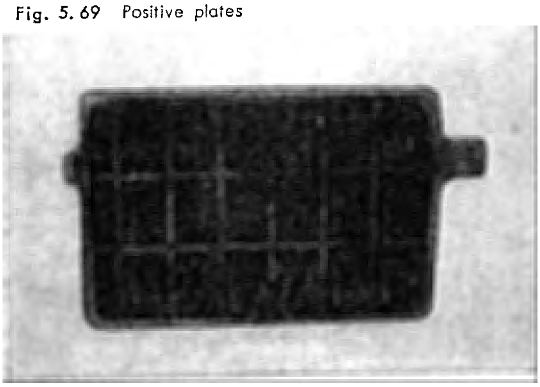


Fig. 5.70 Negative plates

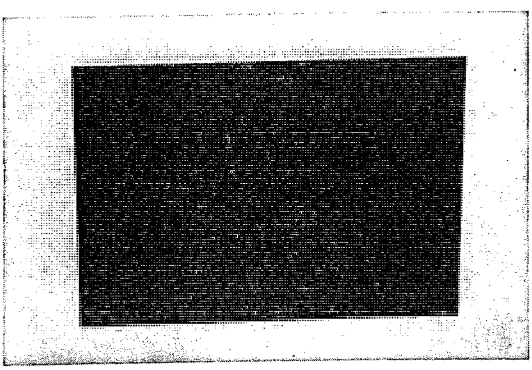


Fig. 5.71 Separators

Battery repair should be performed by a specialist. At early periods of sulfation, with the exception of severe damage, such as internal short, repair can be made by performing over-charge following supplementary charge at approximately 1/2 of the regular charge current (10-hour rate). If results cannot be obtained by this method, it is necessary to repeat charge and discharge several times. However, if the extent of sulfation has surpassed the early stage, repair is difficult. **(Refer to Fig. 5.72)**

When parts of the electrode plates flake off due to repeated over-charge and when an internal short results, partial repair can be made by cleaning the interior of the electrical container. However, in this case, it is difficult to clean the interior perfectly, due to the fact that the sediment is not easily removed.

5.5 Self-starter

A. Starting circuit

A pushbutton starter switch is installed on the right side of the handlebar and, by this switch, the starter magnetic switch operates. Approximately 60 A is transmitted from the battery which rotates the starting motor.

The starting motor is installed on the front section of the crankcase through the overrun clutch and by the starting chain. It rotates the crankshaft from the generator side. **(Refer to Fig. 5.73 and 5.74)**

I. Motor performance

The starting motor is a series type which is widely employed for automotive uses. It provides 12 V 0.3 kW and is capable of starting at temperatures below freezing.

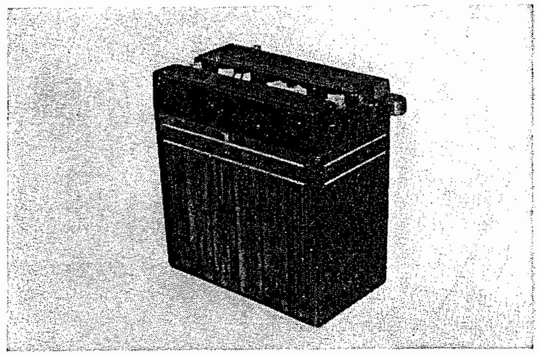


Fig. 5.72 Sulfation caused prolby onged discharge

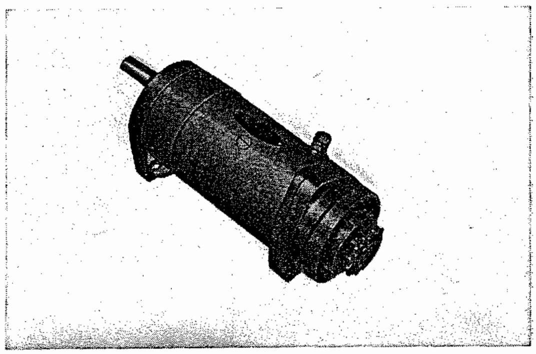


Fig. 5.73 Starting motor

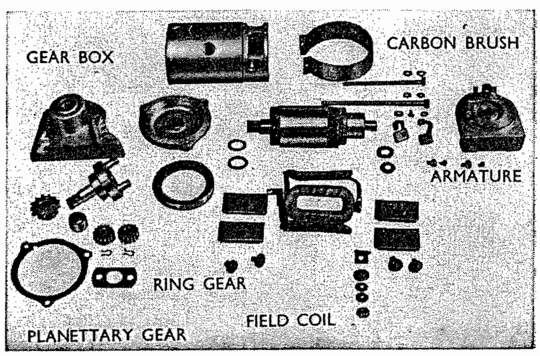


Fig. 5.74 Starting motor components

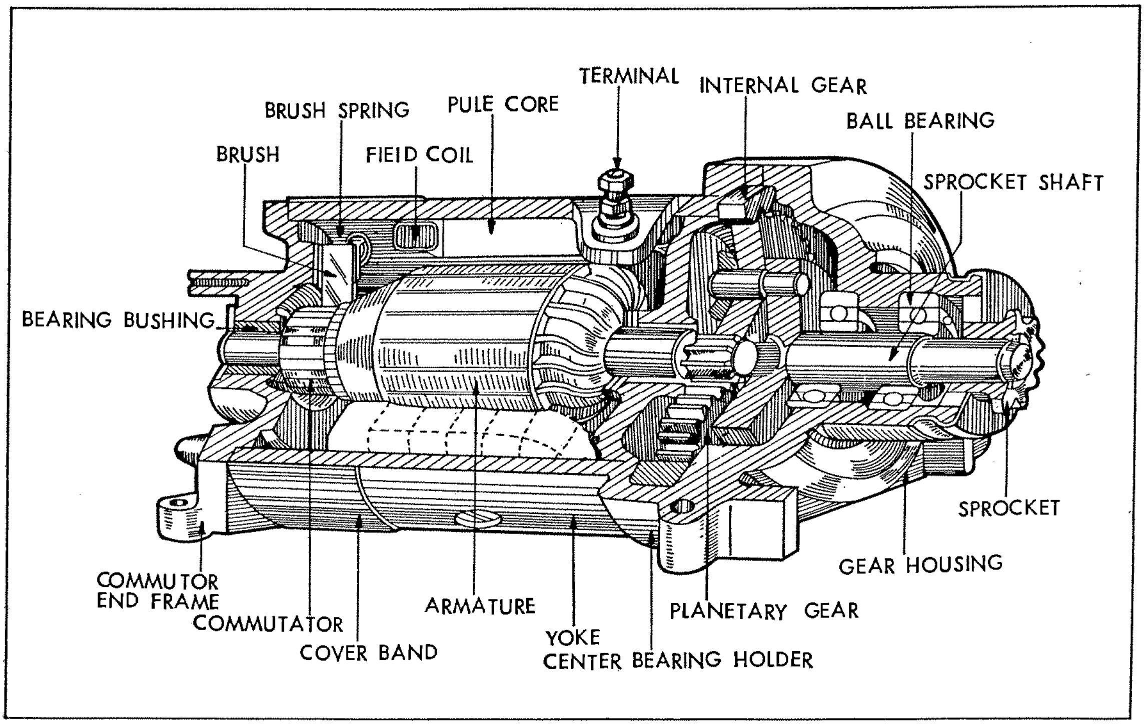


Fig. 5.74 Starting motor

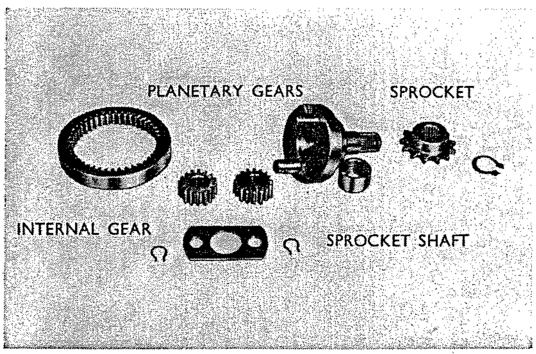


Fig. 5.75 Parts of starting motor reduction mechanism

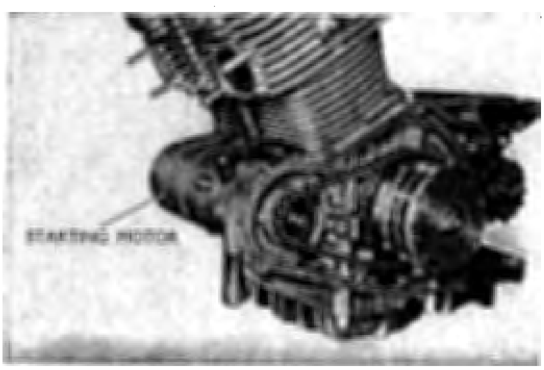


Fig. 5.76 Starting motor mounted on engine

11. Starter reduction

In order to obtain the required crankshaft torque and rotation by reduction of motor rotation, mechanical reduction is made. For this, primary reduction is performed by the planetary gear, and secondary reduction is made by the starting chain.

Primary reduction rate
(Planetary gear) ....5.78 : 1
Secondary reduction rate
(Chain) ....2.77 : 1
Total reduction rate ....16.1 : 1

The starting motor, which is tightly covered for waterproof qualities, is not in continuous rotation. Hence, attention should be directed to the following points which concern wear, every 5000 to 10,000 km (3100 to 6200 mi.) :

① Commutator and carbon brush wear.
② Removal of dust and carbon (by applying compressed air).
③ Gear case lubrication.

When the starting chain is removed, the starting sprocket should not be removed from the motor. If the starting sprocket is removed, it should be disassembled with the planetary gear and, prior to reassembly of the starting sprocket should be assembled. If the sprocket is forced in without disassembling the starting motor, the planetary gear contacts the case and rotation cannot be obtained. **(Refer to Fig. 5.75 to 5.77)**

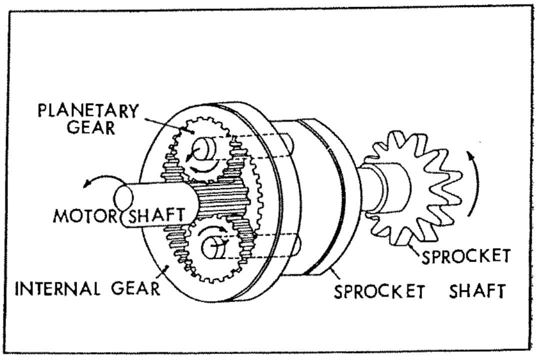


Fig. 5.77 Reduction mechanism

III. Removing starting motor

a. Remove the starting motor cable from the terminal.
b. Loosen the two 5 mm screws from the starting motor cover and remove the cover.
c. Remove engine oil.
d. Remove the crankcase cover and loosen the cylinder, cylinder head, and retaining nut. Remove the disassembled crankcase from the engine.

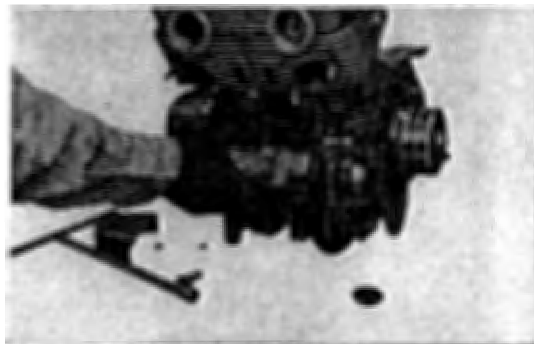


Fig. 5.78 Removing the starter

IV. Maintenance starting motor

1. Removing the carbon brush

a. Remove the cover band from the commutator.
b. Remove the carbon brush and remove the spring. Loosen the screw connecting the field coil and carbon brush and pull out carbon brush.

2. Commutator

The commutator is shown in the figure (A) on the left. During use, it becomes as shown in the figure (B) with the copper section worn. In this case repair should be made as shown in A. As this operation requires technical skill, it should be performed by a specialist.

(Mica undercut)

Standard value	12.5 mm (.49″)
Replacement limit	6,5 mm (.25″)

(Refer to Fig. 5.79)

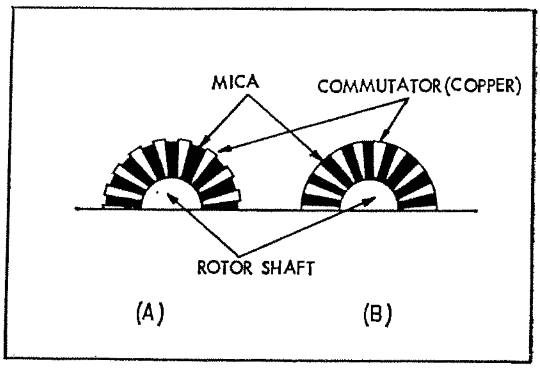


Fig. 5.79 Sectional view of commutator

B. Starting clutch

Rotation of the starting motor is transmitted to the crankshaft. However, rotation of the crankshaft is not transmitted to the starting motor. **(Refer to Fig. 5.80)**

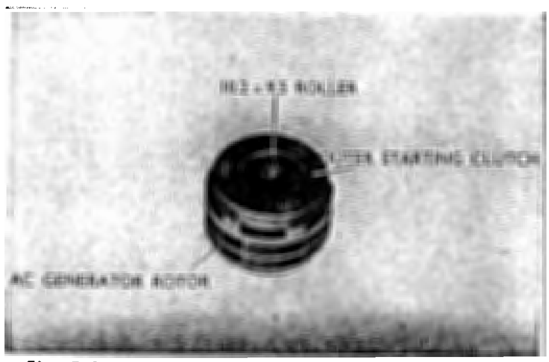


Fig. 5.80 Generator rotor and starting clutch

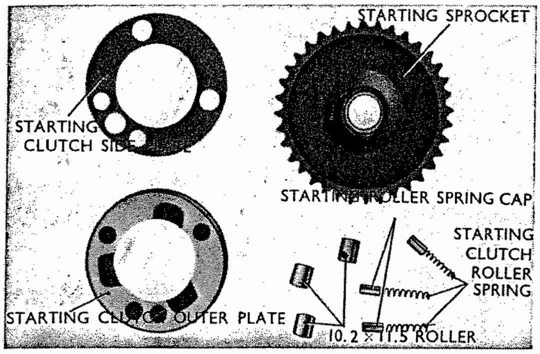


Fig. 5. 81 Parts of starting clutch

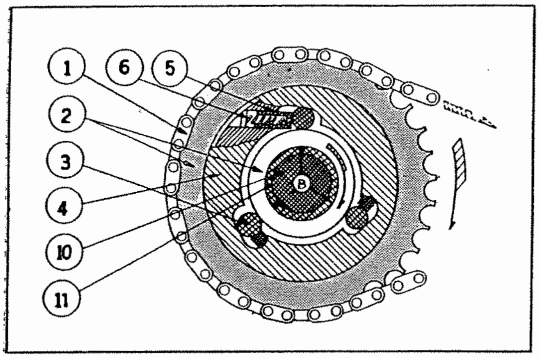


Fig. 5. 82 (A) Principle of starting clutch operation

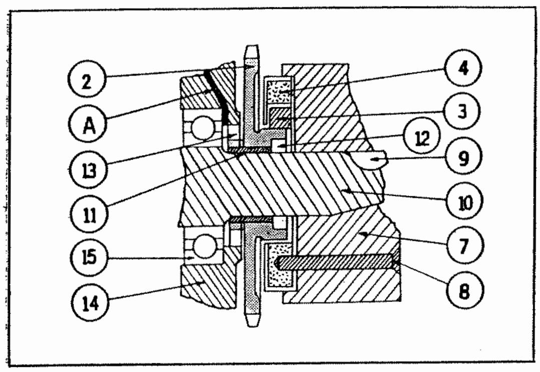


Fig. 5. 83 (B) Principle of starting clutch operation

No.	Part name	Q'ty	No.	Part name	Q'ty
1	Starting chain	1	9	Woodruff key	1
2	Starting sprocket	1	10	Right crankshaft	1
3	Rollers	3	11	20 mm bushing	1
4	Clutch center	1	12	20305 oil seal	1
5	Starting clutch roller spring cap	3	13	326275 oil seal	1
6	Starting clutch roller spring	3	14	Z bearing	1
7	A.C. dynamo rotor	1	15	Right crankshaft bearing housing	1
8	Pan head screw	3			

Fig. 5. 84 Principle of starting clutch operation

1. When the starting motor rotates:

a. When the starting chain is drawn in the direction of the arrow (dotted line).

b. When the sprocket rotates and the roller moves to the starting sprocket, the narrow section of the outer clutch is engaged and the outer clutch rotates. Therefore, the generator rotor, coupled with the outer as a unit, rotates.

c. As the rotor is fixed to the crankshaft by a 4 mm (.16"/.04") key, rotation of the outer clutch is transmitted to the crankshaft.

d. The starting clutch roller spring is employed for smooth operation of the roller and to insure correct engagement. For additional smoothness of the roller spring and roller, a spring cap is employed.

2. When the engine starts:

a. Rotation of the crankshaft exceeds that of the sprocket.

b. By centrifugal force and friction, the roller depresses the spring and moves to the wide section of the outer clutch; transmission of the starting motor is disconnected.

3. Lubrication

In lubrication of the overrun clutch, oil applied at the position shown in Fig. 5. 75 (A) passes the three grooves shown in Fig. 5. 74 (B) and is applied to the interior of the oil seal, which prevents seizure. Therefore, lubricating positions (A) and (B) must be cleaned by employing compressed air upon disassembly. **(Refer to Figs. 5. 82 and 5. 83)**

4. Caution required during maintenance

Life of the starting clutch depends on operation of the roller. Hence, the starting clutch should be handled with care.

When a new coupling is installed:

a. Special grease for the roller (Part number: 719111 silicon grease) should be applied. The designated grease provides features such as high cold and heat resistance (−40°C to 200°C) and small deviation of the friction coefficient (at the applied metallic surface) due to temperature, etc. Clean all parts with gasoline and apply a thin coat of lubricant to the roller.

In reassembly, this application is not necessary.

b. Attention is directed to magnetic force: Insure that the roller spring and other parts around the clutch are not magnetized, as roller movement is affected by even small resistance.

c. At assembly, insure that small parts (the spring cap, etc.) are assembled as they are drawn toward the rotor by magnetic force; AC generation may be destroyed by movement of the rotor.

C. Starter solenoid

As the current for rotation of the starting motor attains 100 A, heavy wire is required to reduce the resistance. The contact section of the switch employed for interruption of this current should also be large.

It is difficult to install the switch when applying DC current to starting motor.

In such a case, a switch employing an electromagnet is installed at the most convenient position (between the battery and starting motor) with another switch installed at a different location for remote-control which operates the electromagnet by a small current. **(Refer to Fig. 5.85)**

1. Principle of operation

a. When current is applied to the primary side, the electromagnet operates, and attracts the iron core which resists spring force.

b. The contact point at the tip of the iron core connects the secondary circuit. **(Refer to Fig. 5.86)**

2. Caution

a. When 12 V current is applied between terminals of the secondary circuit, and if a "click" sound is heard, the contact points of the secondary circuit are closed.

b. During prolonged use, the contact sections are burned due to large current and, resistance increases to block the current (in many cases, even when the click is heard, the starting motor does not turn).

In such a case, by disassembly, the contact sections should be polished with a file or sandpaper to obtain favorable contact. Disassembly should be performed with the switch removed from the body.

c. The current at the primary side should be below 12 V, 3.5 A **(Refer to Fig. 5.87 and 5.88)**

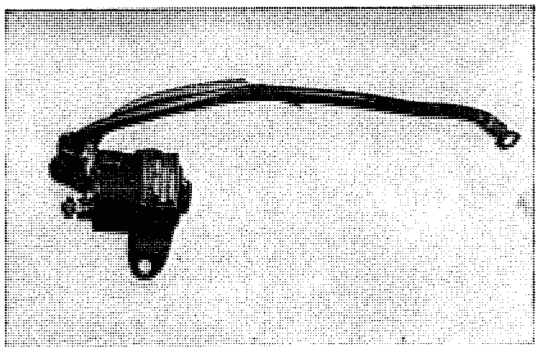


Fig. 5. 85 Starter solenoid

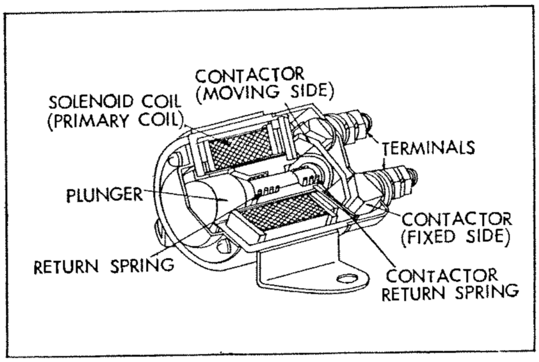


Fig. 5. 86 Construction of starter solenoid

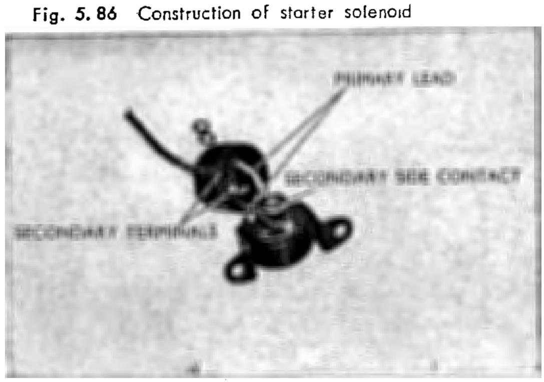


Fig. 5. 87 Disassembly of solenoid (when the cover is opened)

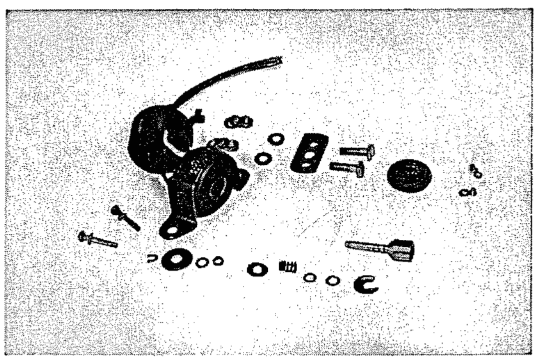


Fig. 5. 88 Disassembly of solenoid (components)

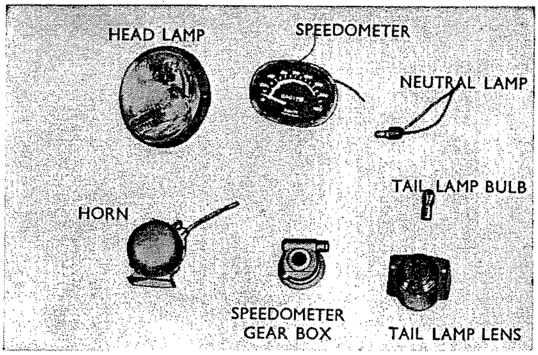


Fig. 5. 89 Parts of main safety units

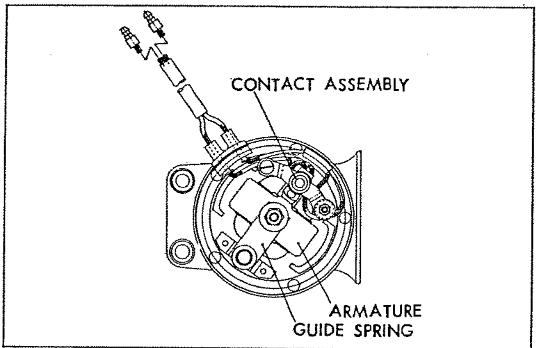


Fig. 5. 90 Spiral horn

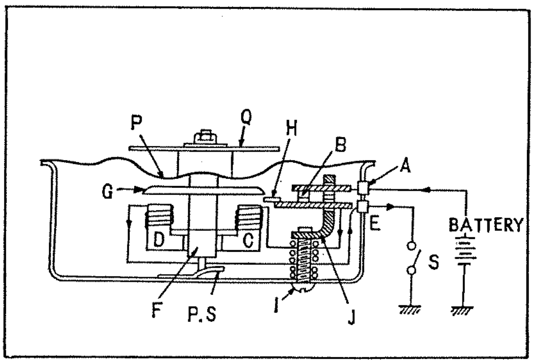


Fig. 5. 91 Horn construction

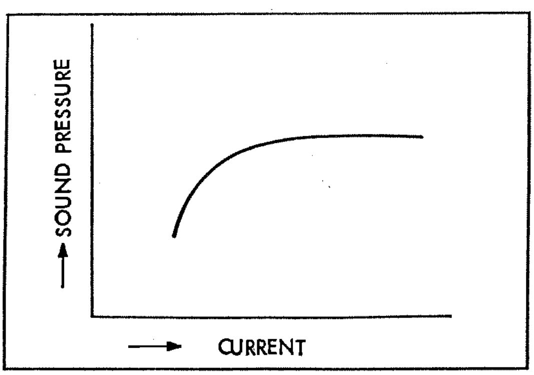


Fig. 5. 92 Relation between voltage and current

d. In case of improper contact (described in section B), confirmation of O-ring damage should be made. It is advisable to employ liquid sealer together with the O-ring after cleaning the interior.

5. 6 Safety parts

A. Circuit

For the circuit, refer to the section on electric distribution. **(Fig. 5. 89)**

B. Horn

There are three types of electrical diaphragm horns, flat, spiral, and long pipe types. The principle is the same in each horn. In Model CB 125 and CB 160, the spiral type horn is employed. **(Refer to Fig. 5. 91)**

Construction and principle of horn

As shown in the figure, if the horn button switch (S) is closed, current is fed from terminal A to contact point B which excites electromagnet C and D and comes out at terminal E. Thus, it draws armature G and depresses insulator H by tripping contact point B and disconnecting at current C and D. Then, axis rod F to which G is installed is pushed up by plate spring P, and S closes again; current is fed......the operation mentioned above is then repeated. As the result, diaphram P and resonator Q, which support F vibrate and generate sound. Screw I adjusts volume. By turning the screw I the position of J supporting the contact points is vertically changed and the distance in which G moves is changed prior to the opening of contact point B. The amplitude of P and Q is changed and the sound volume is controlled **(Refer to Fig. 5. 91)**

The spark suppressor at contact point B is not employed in the small type horns of two-wheel vehicles.

The volume of sound (sound pressure) does not change corresponding to current, shown in the figure on the left. Hence, even if the adjustment is performed in the direction in which the current is increased, at a certain point, only current is increased and sound quality is lessened. However, the volume of sound does not increase. Hence, it is desirable to limit the volume and maintain a small current. When sufficient sound is generated, proper adjustment has been performed. When horn volume is natural, the current will match the standard value. **(Refer to Fig. 5. 92)**

If the cover screw is loose, the sound quality of the horn is lessened. If the packing between the diaphragm and the cover is not replaced upon assembly, and if a section of the fitting leg is loose, sound quality is lessened. Hence, upon disassembly and assembly, these factors should be noted. **(Refer to Fig. 5. 93)**

◆ The sound of the horn should meet JIS requirements. At a distance of two meters from the front of the vehicle, the volume is from 85 to 115 phons and the current is less than that required for all types of horns. Standard frequency should be from 100 to 600 cycles.

C. Tail lamp and stop lamp

The tail and stop lamp are not designed as single bulbs but as a composite bulb.

Ratings of these are 12 V, 25/8 W. The tail lamp rating is 8 W and the stop lamp rating is 25 W. Insure that the profile of the glass section is convex and different from that of types (oval type) generally sold at service centers. The oval type bulb can also be employed: however, deformation of the lamp cover occurs due to lens temperature at a short distance from the cover. If possible, these type lamps should not be employed. **(Refer to Fig. 5. 94 and 5. 95)**

Tail lamp operation is performed by the lighting switch interlocked with the head lamp.

The stop lamp is operated by the stop lamp switch. Operation of the stop lamp switch is described in another section.

D. Neutral pilot lamp

The neutral pilot lamp indicates that the change position is neutral. Hence, when gear engagement is disconnected by mean of transmission, neutral is obtained and operation of the lamp is not performed. **(Refer to Fig 5. 96)**

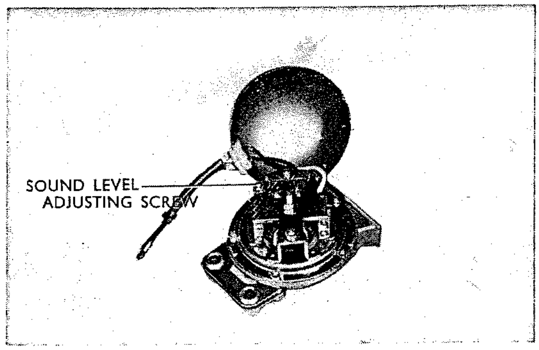


Fig. 5. 93 Horn adjustment (when the cover is opened)

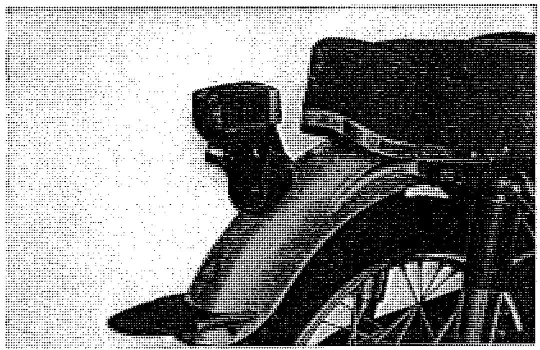


Fig. 5. 94 Tail lamp

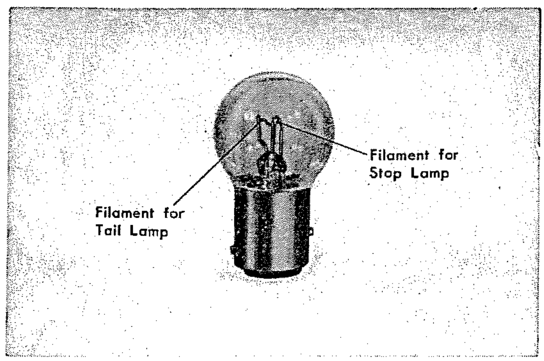


Fig. 5. 95 Composition lamp for tail lamp

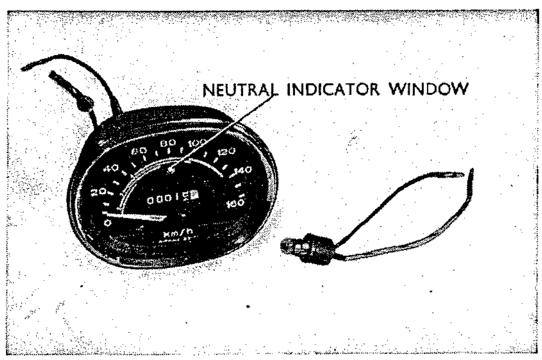


Fig. 5. 96 Neutral lamp

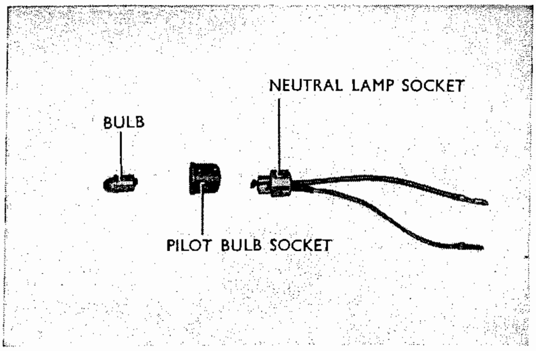


Fig. 5.97 Components of the neutral lamp

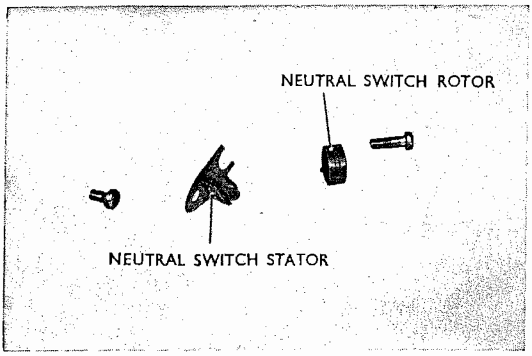


Fig. 5.98 Neutral switch

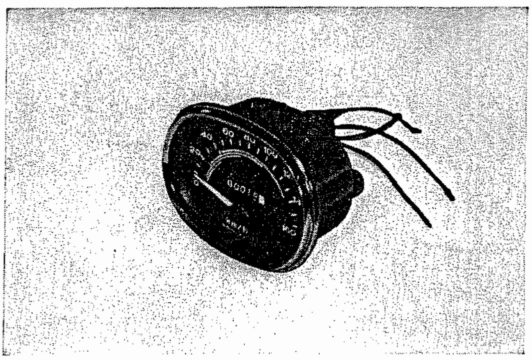


Fig. 5.99 Speedometer assembly

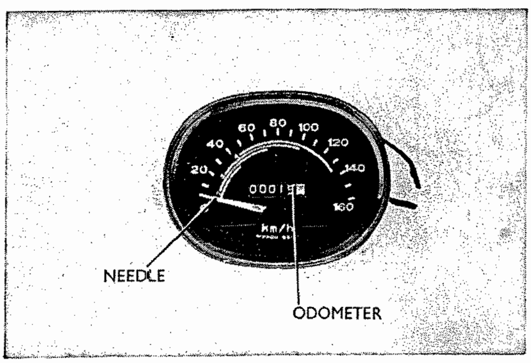


Fig. 5.100 Speedometer scale

The neutral pilot lamp employs a 12 V, 3 W bulb in addition to the speedometer lamp.

The switch socket is connected through the connecting point of the socket to the IG terminal of the combination switch. In general lamp units, the socket body of the bulb is grounded. However, the pilot lamp socket is insulated by the rubber cap combined as a body and coupler.

The wire connected to the socket is lead to the neutral switch unit coupled at the right side of the upper crankcase and forms a ground circuit according to switch selection. Therefore, insure that, if the socket contacts the frame, the bulb will light even if not at neutral. **(Refer to Fig. 5.97)**

The neutral switch is connected to the terminal section of the shift drum at the right side of the crankcase and performs interruption of the contact point in accordance to the rotatation angle of the shift drum. **(Refer to Fig. 5.98)**

E. Speedometer

The speedometer employs a magnetic needle system speed gauge and rotates corresponding to the number of rotations of the wheel which are transmitted through the speedometer cable to the speedometer. **(Refer to Fig. 5.99)**

- Maximum indication...............160 km/h (99 mph.)
- The speed indication (Driving axis)...60 km/h (36 mph.) at 1400 r.p.m.

The speedometer pointer employed in Model CB 125 and CB 160 indicates km/h and mph. **(Refer to Fig. 5.100)**

Construction of the speedometer is shown in Fig. 5. 101. Magnet rotation corresponds to the number of rotations of the inner cable. The induction plate (constructed of aluminum or copper) moves together with the pointer; the magnetic shield plate is employed for generating the magnetic field which causes the rotating magnet to produce eddy currents at the induction plate. It is moved by the rotation force corresponding to the magnet by the eddy currents, and the indication on the point of the seal at which it balances the reaction force of the correctly adjusted hair spring is read. When the vehicle stops (at the rotation gauge, operation stops), the pointer and the induction plate are returned to zero by force of the hair spring. **(Refer to Fig. 5. 101)**

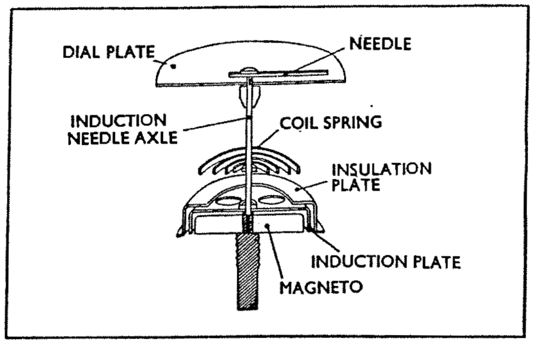


Fig. 5. 101 Principle of speedometer

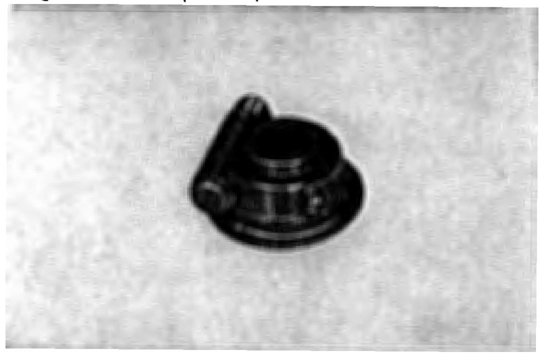


Fig. 5. 102 Gear box (complete)

Gear box

The gear box is a single unit with the front wheel hub cover and is installed at the right side of the front wheel hub. It drives the speedometer through the inner portion of the speedometer cable. The gear ratio is designated so that, when the vehicle runs 1 km, the inner portion of the speedometer cable performs 1,400 rotations. The ratio should change according to tire size. **(Refer to Fig. 5. 102)**

- Speedometer for Model CB 125 and CB 160

  Counter integration......at 1,400 rotation per 1 km

In order to remove the speedometer assembly from the body, after removing the head lamp, remove the joint of the meter cable and then remove the meter fitting spring from the speedometer bulb socket or coupling section.

- Inspection and assembly
  a. When glass is broken, the interior stained, or the pointer damaged, the meter should be replaced.

Speedometer Service Values

Dial km/h	20	40	60	(80)	100	120	(140)
Tolerance	+25	+30	+35	+45	+50	+55	+60
	−0	−0	−0	−0	−0	−0	−0

Fig. 5. 103 Replacement values for speedometer repair

(Standard for operating safety)

- Speedometer error should be less than 15% positive and 10% negative.
- Speedometer deflection should be below 3 km. (1.86 mi.) both in positive and negative directions.

(CAUTION)

a. Instrument lamp 12 V, 3 W, 2-each

b. Do not strike or drop the speedometer when handling.

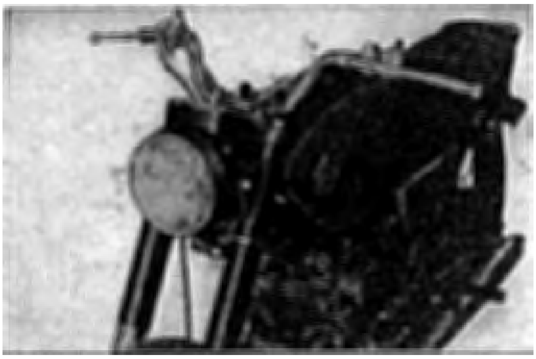


Fig. 5.104 Head lamp

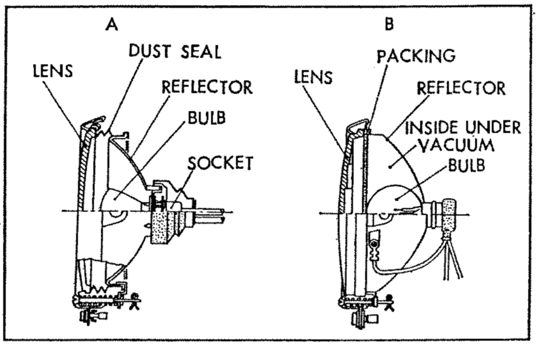


Fig. 5.105 Construction of head lamp

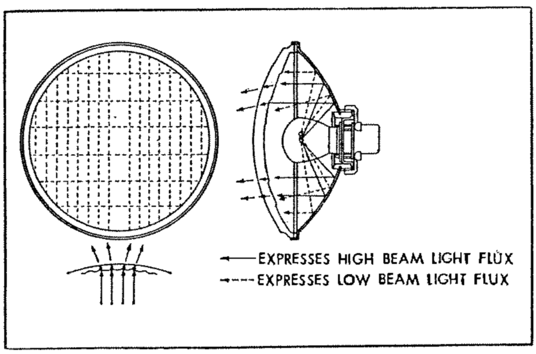


Fig. 5.106 Principle of the head lamp (light beam)

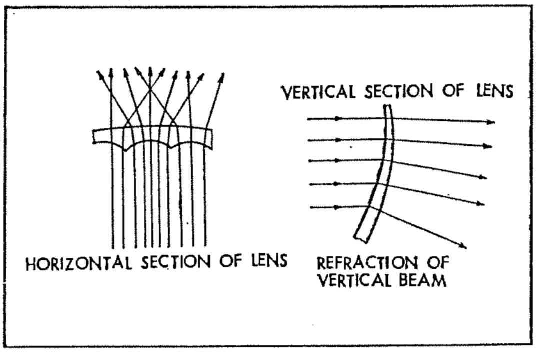


Fig. 5.107 Principle of head lamp (lens)

F. Head lamp

The head lamp is one of the most important items of equipment for safe night driving. The following conditions should be considered carefully. **(Refer to Fig. 5.104)**

1. The beam should be of sufficient intensity and should distribute the light over a sufficiently wide area.
2. The head lamp should be able to resist vibration and shock.
3. It should be of dust and waterproof construction.
4. When passing oncoming traffic, it should not blind the other driver.

Head lamp construction is classified by the following types:

1. Type in which disassembly is possible. **(Refer to Fig. 74 A)**
2. Semi-sealed. **(Refer to Fig. 5.74 B)**
3. Sealed.

Reflector lens, and bulb determine the performance of the head lamp. All are equally important. The reflector positions the bulb filament at the focus on the rotating parabolic surface and the reflected beam is level. If the position of the filament does not match the focus when the bulb is fitted to the reflector, the intensity of the beam is greatly decreased. The shape and size of the filament affects the light distribution. Specified bulbs should be used for the head lamp. **(Refer to Fig. 5.106)**

As shown in Fig. 5.107, the cross-section of the head lamp is wave-shaped and the lower part is thicker. The light is spread horizontally, and refracted downward to illuminate the road surface. When the bulb is installed, the extensions in the base of the bulb should be inserted in the depression of the reflector rib. If this is not done, the center of the fillament does not match the focus of the reflector and in a bulb with a double filament the difference between high and low beams is lost. (Disassembly and semi-sealed type) **(Refer to Fig. 5.107)**

High beam		Low beam	
Measured point	Intensity (LX)	Measured point	Intensity (LX)
H—V	More than 100	2 D—V	More than 40
1/2 D—V	〃 200	1/2 U—2 R	Less than 25
1/2 D—3 L 3 R	〃 40	1/2 U—4 R	〃 20
1/2 D—6 L 6 R	〃 10	3 D—4 R	More than 20
1 D—V	〃 150	3 D—6 R	〃 10
2 D—V	〃 50	1/2 V—2 L	Less than 25
3 D—V	〃 25	1/2 V—4 L	〃 20
3 D—6 L 6 R	〃 5	3 D—4 L	More than 20
40—V	Less than 50	3 D—6 L	〃 10
Maximum value	〃 450		

(Test Voltage, 13.5 V)

To avoid blinding an oncoming driver, a light reduction and directional change system is used. In one type of light reduction system, another less powerful bulb is used and in the other, a smaller filament in the same bulb is used. With a double filament, the upper is usually switched from the focal position of the reflector. Different light reduction can be made by changing the size of the filament.

To determine intensity and illumination, a screen is placed 10 meters in front of the lighted head lamp and the light measured at every point on the screen. **(Refer to Fig. 5. 108)**

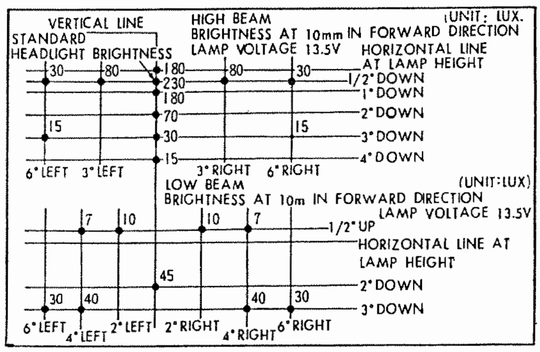


Fig. 5. 108 Inspection of lamps distribution

The head lamp capacity of Models CB 125/CB 160 is 12 V 30/30 W and the center intensity of illumination (High beam) is more than 230 luces 10 m. away. This is sufficient to comply with the law.

Automotive vehicle bulbs

For automotive vehicle bulbs, a large wattage, tungsten filament is enclosed in a small glass tube. Although the bulb's life is shortened somewhat, better lumen-watt efficiency is sought for in design. JIS shows the life to be 100 hours.

The variance in light intensity and life of the tungsten bulb as caused by the change of applied voltage, is quite wide. The light intensity is increased or decreased by 35% with a change of 10%, more or less, in the voltage. The life is decreased to one-third with a voltage change of more than 10% and increased by 3. 5 times with a voltage of less than 10%. To keep the voltage constant to maintain perfect connections at all head lamp circuit and switch

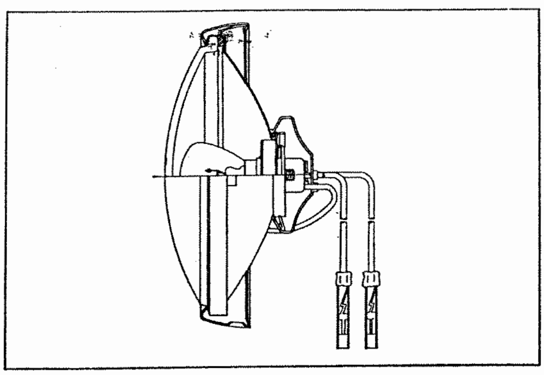


Fig. 5. 109 Construction of head lamp

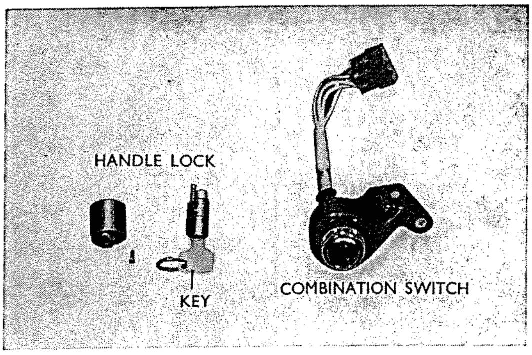
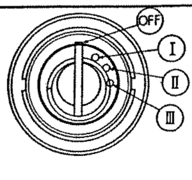


Fig. 5. 110 Combination switch and hand lock



	BAT	IG	HL	TL	DY	SE	KEY
OFF							Cannot be rcmoved
I	O	O					Cam be removed
II	O	O	O	O	O	O	Cam be removed
III	O			O			Cannot be removed

Fig. 5. 111 Operation and connection of combination switch

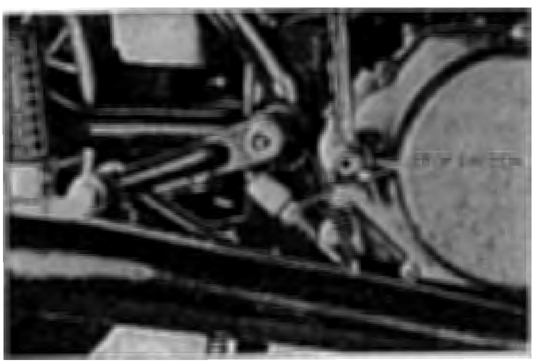


Fig. 5. 112 Stop switch

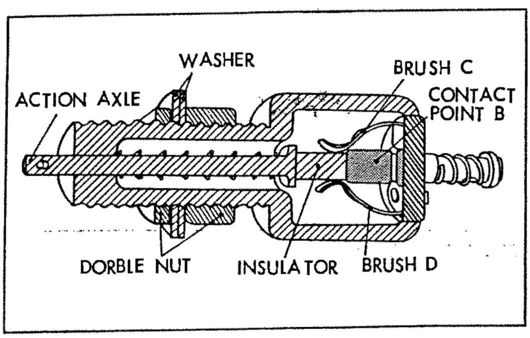


Fig. 5. 113 Construction of stop switch

connections. This will prevent the light intensity from dropping. Connections between lamp socket and ground are often faulty. It is advisable to attach a ground wire to the lamp socket and fix the wire to the head lamp housing or to the vehicle. **(Refer to Fig. 5. 102)**

5.7 Switch

A. Combination switches

This switch is operated by a special cylinder key. It performs general functions required by vehicle operation. In Model C-240 a combination switch is used with the day and night driving switch circuits, the generator charging circuit and the starting circuit. When the key is turned, the inner contact points slide to connect or disconnect the selected circuit. **(Refer to Fig. 5. 110)**

The key is used for both the combination switch and hand lock. It is operated in three steps, as shown in Fig. 5. 111.

Position 0 The key may be inserted and removed. Engine is off and no electrical units can operate.

Position I The key cannot be removed. Daytime operating circuit. Certain electrical units can operate.

Position II The key cannot be removed. Nighttime operating circuit. All electrical units may be operated. **(Refer to Fig. 5. 111)**

B. Stop switch

This switch is interlocked and operates with the brake pedal. There are two types, reciprocating motion and rotational. **(Refer to Fig. 5. 112)**

Models CB 125 and 160 use the reciprocating motion type stop switch. As seen in the sectional view on the left, when axis A performs reciprocating motion interlocked with the brake pedal, the metal contact point B (coupled to axis A) also performs reciprocating motion by flashing on and off as the contactors C and D are closed.

Disassembly and Assembly

A double nut is used for adjustment. To position. loosen the upper and lower nuts.

When disassembling, dismount by loosening the two nuts. The interior cannot be disassembled because the housing is sealed. **(Refer to Fig. 5. 113)**

C. Horn button and dimmer switch

The dimmer switch is installed on the left handlebar grip. It is a double-step change switch and dims or changes the head lamp beam direction during night operation of the vehicle. It is joined to the horn pushbutton switch. **(Refer to Fig. 5. 114)**

5. 8 Wire Harness

The wire harness of automotive vehicles is the artery which serves the electrical parts and is a very important unit. Troubles in the system cause not only operating difficulties, but sometimes fire as well. It is wise to refrain from patching the wiring system. The wire system consists of harness, supplementary leads, terminals, terminal sleeves, wire nipples, instrument connection and instruments using small units as connectors. **(Refer to Fig. 5. 115)**

The wires which make up the wiring system are gathered together to facilitate wiring. They are contained in the wire harness, and branches are provided wherever required. For protection and insulation, cotton knitting, lacquered or waxed cotton net or vinyl sleeves are used.

When an unfamiliar wiring system must be inspected and faulty wiring traced, the merits of the wire harness become clear. In the above example, the one faulty branch can not be replaced, but repair must made by using new wiring.

The wires of the wire harness and other supplementary wires are marked in a color code or tags of identification are attached to the ends of the wires. **(Refer to Fig. 5. 116)**

A fuse is installed on the top of the negative terminal of the battery. This fuse prevents over-discharge of the battery or fire resulting from faulty electrical parts and ground shorts. However, when an AC generating coil and selenium rectifier are coupled for power source, the selenium rectifying plate is sometimes broken by high reverse current if the engine is operated without a fuse, or if the fuse is burned out.

Breakage of the selenium rectifier can be prevented by connecting its output terminal directly to the battery. **(Refer to Fig. 5. 117)**

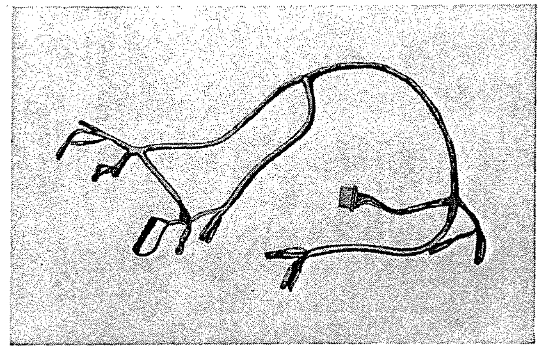


Fig. 5. 114 Horn button and dimmer switch

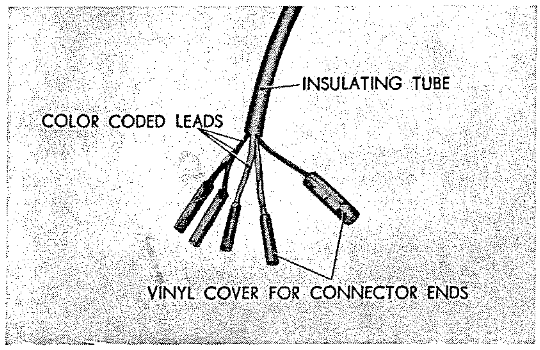


Fig. 5. 115 Wire harness

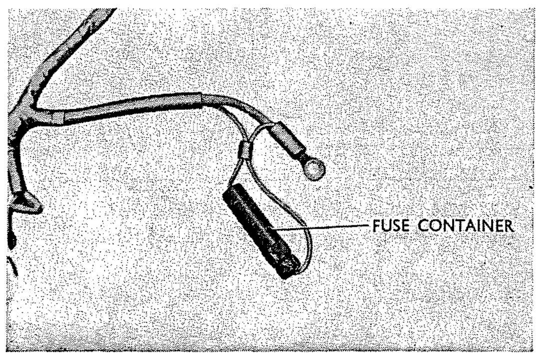


Fig. 5. 116 Tips of wires in wire harness

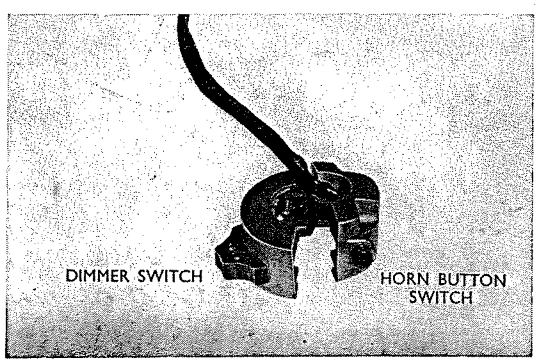


Fig. 5. 117 Fuse box installed on wire harness

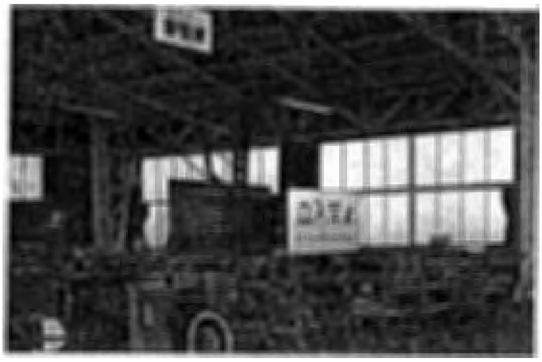


Fig. 6. 1 Maintenance Shop

Fig. 6. 2 Maintenance Shop

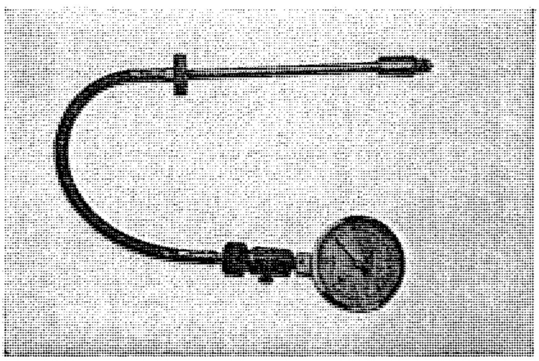


Fig. 6. 3 Tools required for checking engine compression

Fig. 6. 4 Checking Compression

VI INSPECTION AND ADJUSTMENT

6. 1 Maintenance

Thus far, maintenance and adjustment have been defined as related to an individual system or unit. However, inspection, repair and adjustment are sometimes performed to many systems and parts, collectively and periodically. This is for the sake of convenience and is also referred to as preventive maintenance. Maintenance is performed on each group in sequence for the purpose of keeping the vehicle in good operating condition at all times. **(Refer to Fig. 6. 1** and **6. 2)**

A. Engine adjustment

Engine adjustment is to guarantee normal engine operation. It is a corrective operation and different from mere inspection. Engine operation is dependent upon the function of the following systems. By inspecting and adjusting in the below sequence, normal operation of the engine is guaranteed.

Compression system
Ignition system
Intake system
Combustion system
Fuel system

Inspection should be performed on the above five systems. When completed, normal engine operation should be regained. Corrective action will be explained below.

1. Compression

If the compression is faulty, the engine output decreases. If compression leaks exist, the engine trouble is generated in operation or the engine stalls at low speeds.

a. Tools required for checking engine compression. **(Refer to Fig. 6. 3)**

b. Disconnect the spark plug leads and remove the plugs with a socket wrench.

c. Place the tip of the compression gauge in the cylinder head opening and press firmly into place so that the seal is tight.

d. Open the throttle and choke wide, and operate the kick starter several times. The pedal should be kicked vigorously. **(Refer to Fig. 6. 4)**

(CAUTION)

(1) If the throttle and choke are not wide open, the amount of pressure registered on the gauge will be small and not representative.

(2) The registered pressure will increase with every kick of the starter. The pedal should be kicked until the compression gauge registers a maximum reading.

(3) Make sure that the engine is warm when gauging the compression, otherwise the indicated pressure will not be true compression.

e. The compression pressure should be from (128 to 149 psi) 9.0 to 10.5 kg/sq.cm. **(Refer to Fig. 6.5)**

f. When the pressure is more than the above, carbon accumulates in the combustion chamber and on the piston face. The cylinder head should be removed, piston and cylinder assembled and the carbon removed.

g. When the pressure is less than the above, either the piston rings are not making a good seal or the head gasket is defective. Piston rings and head gasket should be inspected, and the tappets should be adjusted or disassembled.

2. Tappet Adjustment

Tappet clearance is affected by the open and close period of the valve closure is insufficient the tappet will be raised when there is no compression. If the clearance is excessive the tappet will knock. Tappet clearance affects engine power, performance at slow speeds and silence of engine operation.

a. Remove the four cylinder head caps.

b. Remove the generator cover.

c. When the mark of the stator and the generator rotor are aligned, tappet clearance should be adjusted at compression top dead center.

d. Rotate the crankshaft through 360 deg. and adjust the clearance of the opposite tappet.

e. Standard tappet clearance should be from 0.03 to 0.05 mm.

Fig. 6.5 Correct compression pressure

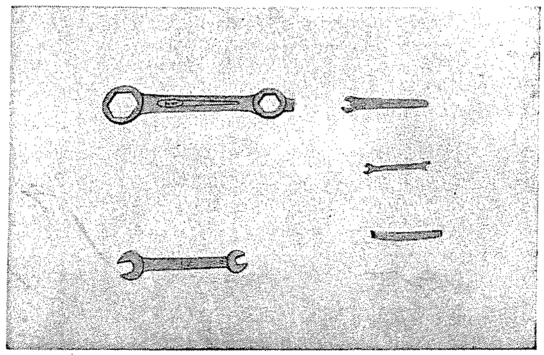


Fig. 6.6 Troolsequired for tappet clearance adjustment

Fig. 6.7 Alignment of the stator

Fig. 6.8 Tightening the odjusting nut

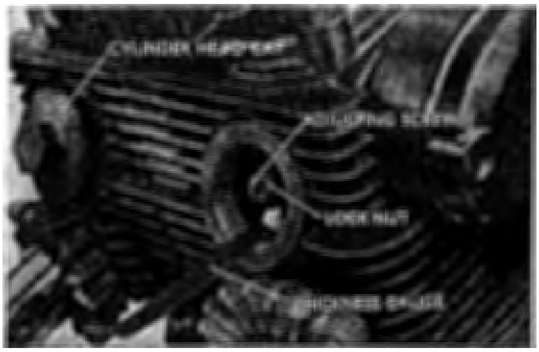


Fig. 6. 9 Checking clearance with a thickness gauge

(CAUTION)

Adjust the tappets when the engine is cold. A thickness gauge of 0.03 mm (.0012 mm") should pass, while that of 0.05 mm (.00195") cannot.

When the adjusting nut is tightened, the clearance will change slightly. Hold the adjusting screw with the special clearance adjusting tool, while tightening the nut.

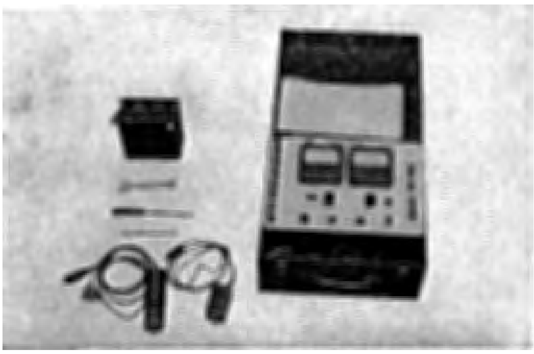


Fig. 6. 10 Tools required for adjusting the spark timing

3. Ignition Timing

Even though compression and valve timing are satisfactory, if the spark timing is not correct the engine will not operate smoothly. If the timing is too bad, overheating or backfire may result, both of which are detrimental to the condition of the engine.

Tools required for adjusting the spark timing. **(Refer to Fig. 6. 10)**

a. Remove the distributor point cover.

b. Remove the generator cover and check clearance.

c. Check the points for pitting, burning or protrusions. If necessary, remove and correct by honing with an oilstone.

d. Rotate the crankshaft and align the highest part of the point cam with the breaker arm sleeve.

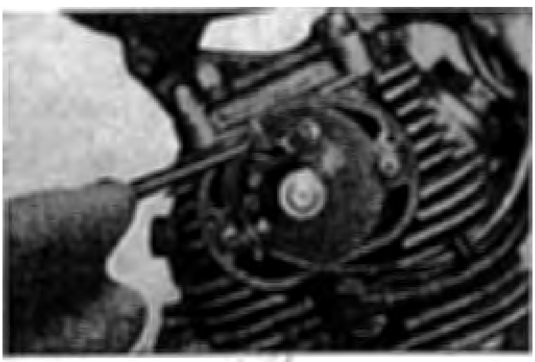


Fig. 6. 11 Adjustment of points

(NOTE)

There are two cams on the distributor point shaft. Either cam may be used.

e. To adjust point clearance, loosen the two breaker arm retaining screws and adjust (b) with a screwdriver. When (b) is turned to the right the clearance decreases. **(Refer to Fig. 6. 12)**

f. Standard clearance is from 0.05 (.00195") mm to 0.35 (.0136) mm.

g. When the mark on the generator is aligned with the mark on the stator, the contact points should open. This is the correct timing adjustment.

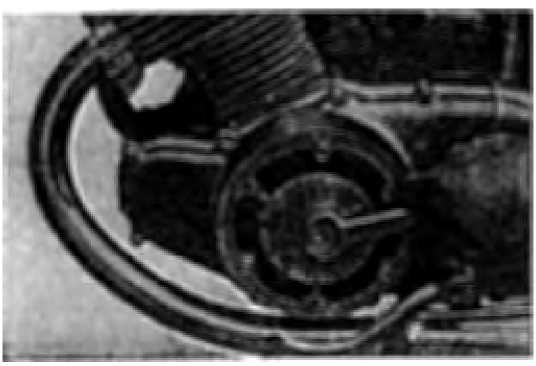


Fig. 6. 12 Adjustment of timing

(NOTE)

Either of the two cams may be used.

h. Loosen the two breaker retaining screws and adjust (b) with a screwdriver. When (b) is rotated in a clockwise direction, the sparking occurs later. If rotated to the left the sparking occurs sooner. **(Refer to Fig. 6. 13)**

i. To adjust the point clearance, use a timing light to check the spark. **(Refer to Fig. 6. 13)**

(NOTE)

Since the shaft turns through 360 deg for one cycle, sparking occurring at the time the mark on the stator is 40 deg beyond that of the generator rotor, is acceptable.

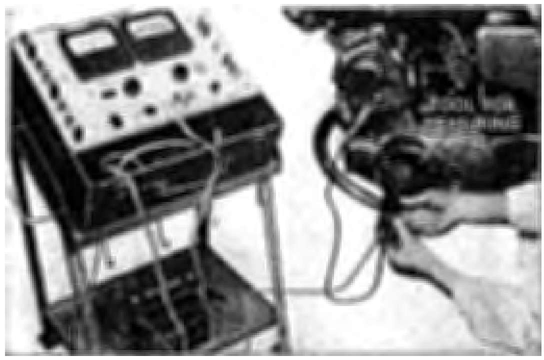


Fig. 6. 13 Spark advance arm

4. Adjusting the spark plugs

When a spark plug is worn or the points pitted and burned, the best spark is not obtained. Plugs must be cleaned and adjusted periodically.

a. Tools required for spark plug adjusting. **(Refer to Fig. 6. 14)**

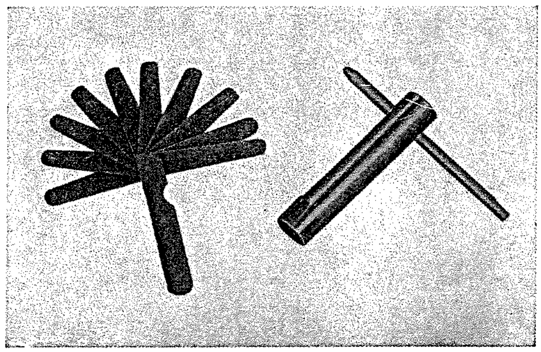


Fig. 6. 14 Tools required for spark plug adjustment

b. Remove the spark plugs.

c. Clean with a wire brush. **(Refer to Fig. 6. 15)**

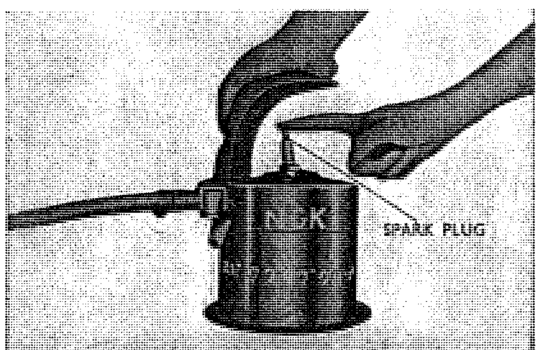


Fig. 6. 15 Cleaning the spark plugs

d. After cleaning, wipe the plug. If highly carboned, scrape the points clean.

(CAUTION)

Never use flame to burn carbon off.

e. The clearance of the spark plug points should be 0.6 mm (.023″). Squeeze or bend the points gently to adjust. **(Refer to Fig. 6. 16)**

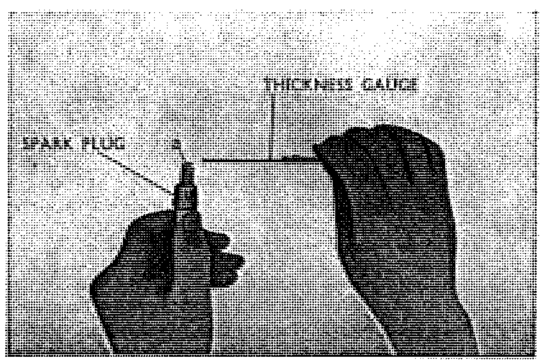


Fig. 6. 16 Checking spark plug clearance

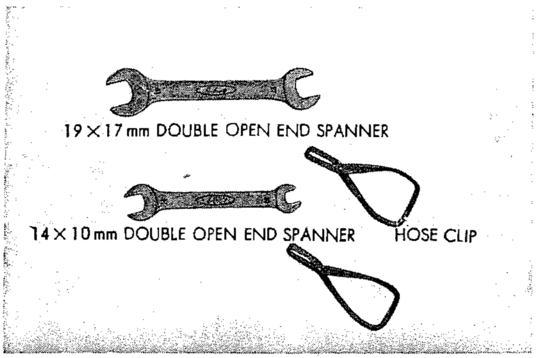


Fig. 6. 17 Tools required to inspect the fuel system

Fig. 6. 18 ON and RES positions of fuel tank pet cock

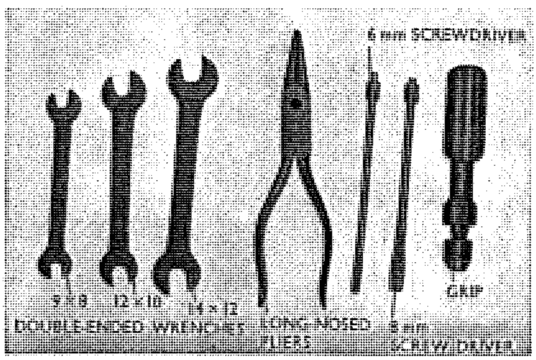


Fig. 6. 19 Tools required for cleaning and adjustment of the carburetor

Fig. 6. 20 Carburetor

f. The plug is next tested with a spark plug tester. Sparking may be observed by using operating voltage.

5. Fuel Supply

If the fuel system is plugged, or the carburetor does not function, the engine will stall when accelerated.

a. Tools required. **(Refer to Fig. 6. 17)**
b. Remove the fuel line from the carburetor and examine the flow when the fuel pet cock is turned on. **(Refer to Fig. 6. 18)**
c. Check the tank.
d. If the flow of fuel was slow, dismount the tank and clean. If fuel flow is still slow, disassemble the pet cock and clean.

(NOTE)

(1) Check the tank cap. There is a small air vent which sometimes becomes plugged. If this vent is plugged, it will cause the flow of gas to be slow.

(2) The fuel reserve may be used during vehicle operation when the regular fuel supply becomes exhausted. There is enough fuel in the reserve tank for about 100 km. Turn the switch from ON to RES to operate.

6. Carburetor Cleaning and Adjustment

If the carburetor is dirty or not functioning correctly the engine performance will decrease. Periodical cleaning and adjustment are necessary.

a. Tools required for cleaning and adjustment of carburetor. **(Refer to Fig. 6. 19)**
b. Remove the throttle cable, air cleaner line and fuel line.
c. Remove any other connection of the carburetor.
d. Remove the 6 mm nuts which mount the carburetor.
e. Disassemble and clean with gasoline.
f. Clean all jets with compressed air. Dry and reassemble all parts. Remount the carburetor.
g. Idling adjustment.

(1) Turn the limit screw until the strength of both exhausts becomes the same. Speed of the engine should be 1000 to 1200 r.p.m **(Refer to Fig. 6. 20)**

(2) There are two adjustment screws. These should be turned in or out 1/4 to 1/2 of a turn. When the highest rpm is reached, return the screw by 1/8 of a turn to where the best exhaust sound is produced.

(3) Engine speed and exhaust intensity are adjusted by turning the limit screw and idling screw until the idling speed is from 1000 to 1200 r.p.m.

h. Throttle adjustment

Open the throttle slightly and adjust so that both left and right throttle valves operate together. To do this, remove the air cleaner line and place a mirror in front of the opening. If the valve opening of the right and left valves is not the same, adjust the throttle wire in the carburetor cap until they are. **(Refer to Fig. 6. 21)**

i. Adjusting full open

Open the throttle wide. If the throttle valves are not full open, turn the throttle wire adjuster at the bottom of the throttle wire control. **(Refer to Fig. 6. 22)**

j. After adjustment is completed, check with a test run. If acceleration is defective, readjust as outlined in section 3. 13.

7. Air Cleaner

If the air cleaner is dirty, the vehicle will not operate correctly. It should be cleaned periodically.

a. Tools required for cleaning the air cleaner. **(Refer to Fig. 6. 23)**

b. Remove the air cleaner cover. Dismount the air cleaner from the vehicle.

c. Clean with a brush or with compressed air. **(Refer to Fig. 6. 24)**

(NOTE)

The cleaner element is paper. If the element is wet or torn, it should be replaced.

Fig. 6. 21 Inspecting the throttle valve openings with a mirror

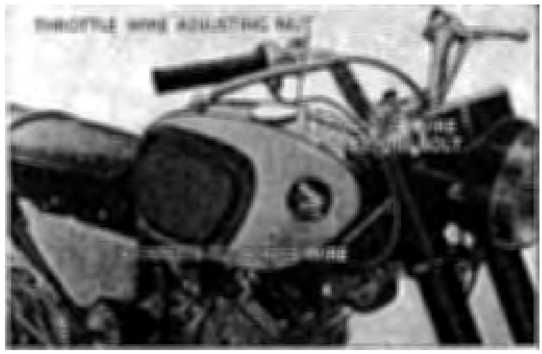


Fig. 6. 22 Cable adjuster

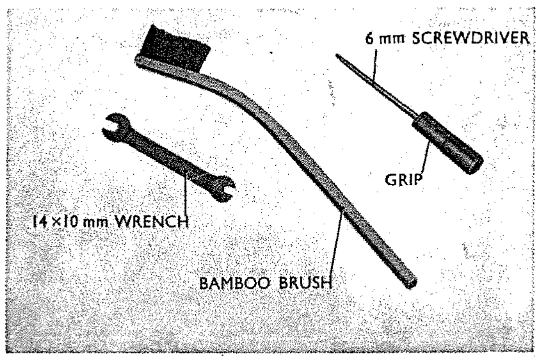


Fig. 6. 23 Tools required for cleaning the air cleaner

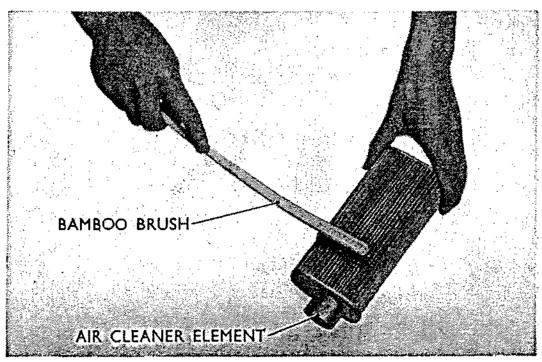


Fig. 6. 24 Cleaning the air cleaner

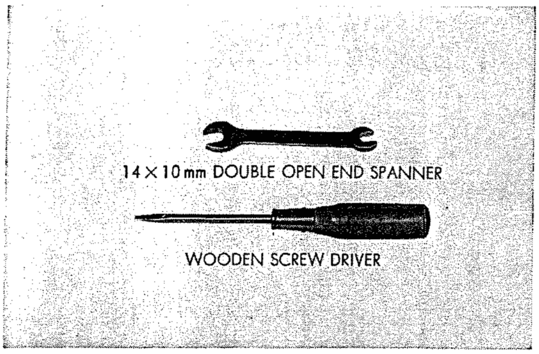


Fig. 6. 25 Tools required for adjustment of clutch

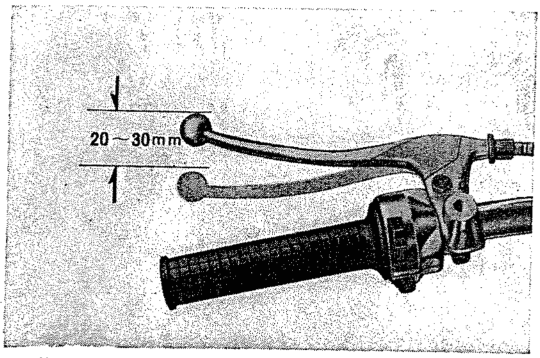


Fig. 6. 26 Clutch lever play

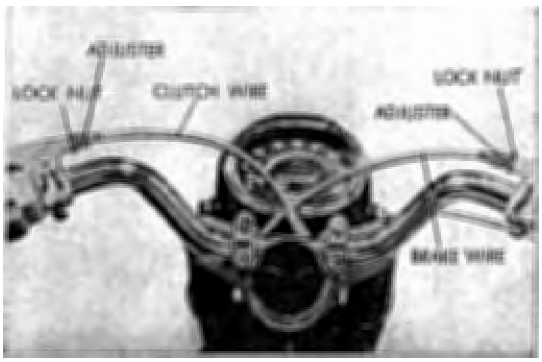


Fig. 6. 27 Clutch cable adjuster

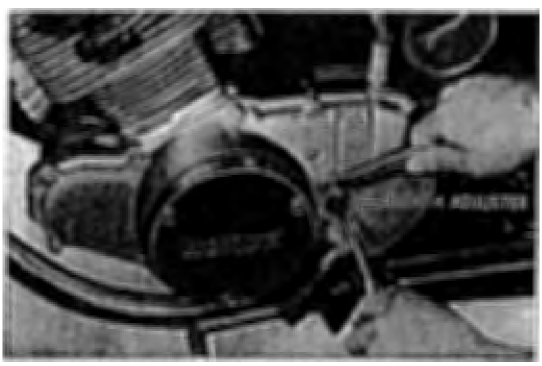


Fig. 6. 28 Clutch adjustment

A. Clutch adjustment

Improper clutch adjustment will impair the efficiency and performance of the vehicle. If the clutch does not engage or disengage completely, the vehicle may start moving of its own accord or the engine may stall. If the clutch is slipping, acceleration will be faulty.

a. Tools required for adjustment of clutch. **(Refer to Fig. 6. 25)**

b. The amount of movement of the tip of the clutch lever is called play, from (a) to (b). The movement should be from 20 to 30 mm. (.78″ to 1.17″) **(Refer to Fig. 6. 26)**

c. Turn the clutch cable adjuster to obtain the correct amount of play. **(Refer to Fig. 6. 27)**

d. If correct adjustment cannot be made by the above, remove the 6×45 mm hex-head bolt and turn the clutch adjuster. If turned to the right, the clutch will become loose, and if to the left, tight. **(Refer to Fig. 6. 28)**

(NOTE)

Check play and engagement of the clutch by the operating.

B. Drive Chain Adjustment

Looseness will cause the chain to hit the vehicle, If too tight, power transmission is hindered.

a. Tools required for drive chain adjustment. **(Refer to Fig. 6.29)**

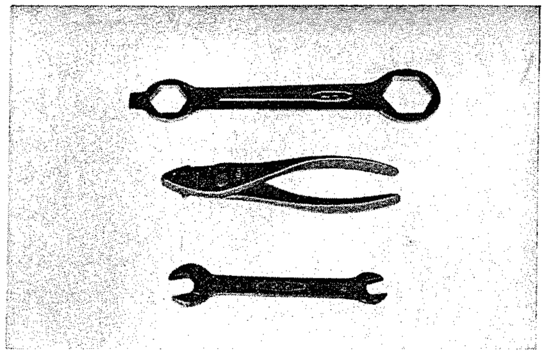


Fig. 6.29 Tools required for drive chain adjustment

b. Loosen the hex-head bolt. Remove the cotter pin and loosen the rear wheel axle nut. Adjust with the drive chain adjuster so that the slack in the chain is from 10 to 20 mm (.39″ to .78″). When the adjuster is turned to the right, the chain will become tight. **(Refer to Fig. 6.30 and 6.31)**

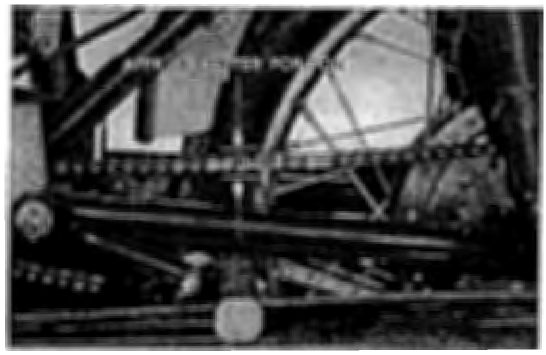


Fig. 6.30 Drive chain slack

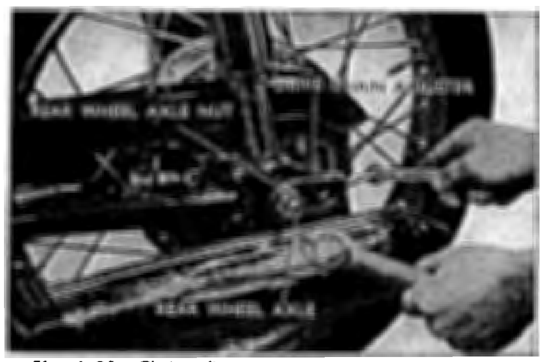


Fig. 6.31 Chain adjuster

(NOTE)

(1) The adjuster positions in the rear fork should be the same on both sides of the wheel.

(2) After completing adjustment and tightening the axle nut, look the hex-head adjuster nut.

C. Brake Adjustment

The brake should be inspected daily before use, as well as periodically.

1. Front brake adjustment

a. Tools required for front brake adjustment. **(Refer to Fig. 6.32)**

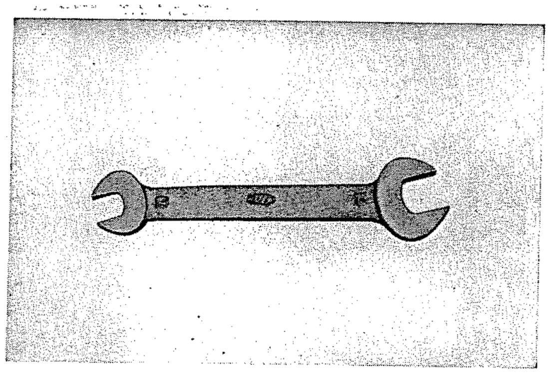


Fig. 6.32 Tools required for adjustment of front brake

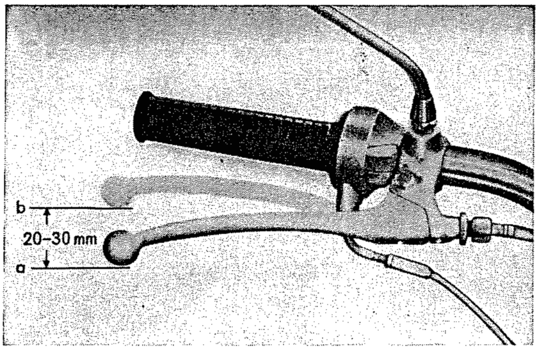


Fig. 6. 33 Play of the front brake lever

Fig. 6. 34 Adjustment of play of front brake lever

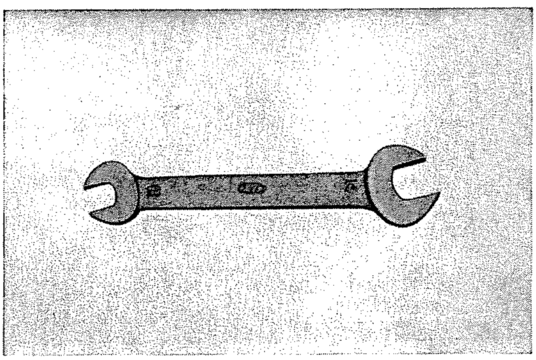


Fig. 6. 35 Tools required for adjusting rear brake

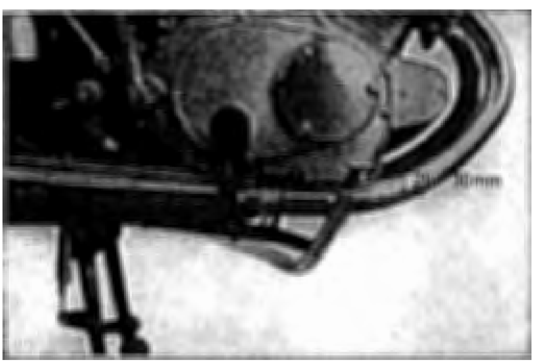


Fig. 6. 36 Play of rear brake pedal

b. The play of the front brake lever is from (a) to (b). It should be from 20 to 30 mm (.78" to 1.17"). **(Refer to Fig. 6. 33)**

To adjust, loosen nut (a) and turn adjuster, (b). For greater play, turn the adjuster to the right. **(Refer to Fig. 6. 34)**

2. Rear Brake Adjustment

a. Tools required for rear brake adjustment. **(Refer to Fig. 6. 35)**

b. The play of the rear brake pedal is the same as that of front lever. **(Refer to Fig. 6. 36)**

c. Adjust by loosening (a) and turn the adjuster (b). If the adjuster is turned to the right, the play will become greater. **(Refer to Fig. 6. 37)**

Fig. 6. 37 Adjustment of play of rear brake pedal

D. Battery Inspection

The battery electrolyte must be replenished periodically. The level should always be kept up. Exposing the plate to air causes discharge.

a. Tools required. **(Refer to Fig. 6. 38)**
b. Remove the left air cleaner cover.
c. Loosen the battery retainer bolts and remove the battery from the frame. **(Refer to Fig. 6. 39)**
d. The level of the battery fluid should always be above the minimum line. Fill with distilled water.
e. Remove the battery cap to fill. As observed from the side, all six cell levels should be the same when filled.

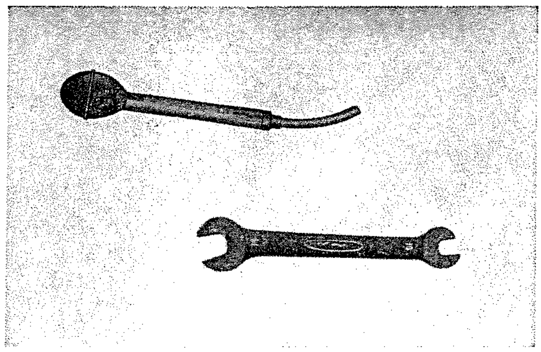


Fig. 6. 38 Required tools

(CAUTION)

(1) Do not use dilute sulphuric acid.
(2) Caps should be off. (Cap vent should be clean)
(3) If the liquid decreases quickly, check the battery charge.

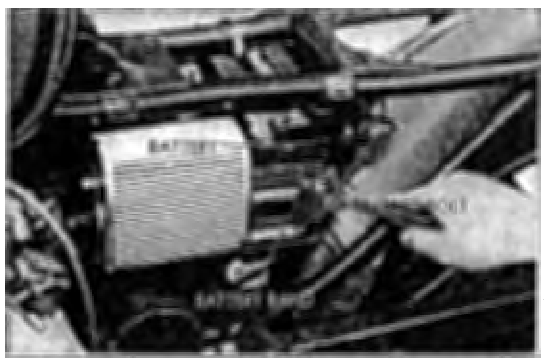


Fig. 6. 39 Lifting the battery from the frame

E. Lubrication

Lubrication is needed to reduce the wear and friction of moving parts, and to aid in cooling those parts which operate under high temperatures.

1. Engine Oil

Engine oil should be changed every 500 km. (310 mi.)

a. Tools required. **(Refer to Fig. 6. 40)**

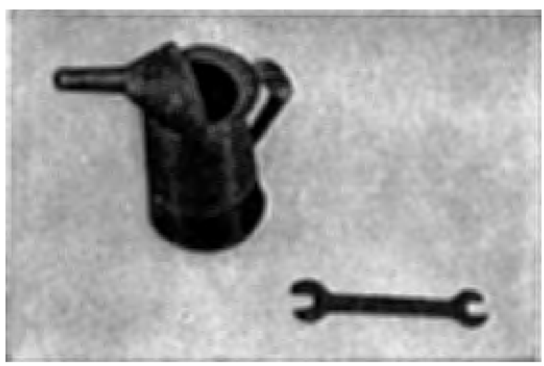


Fig. 6. 40 Tools required to change oil

b. Prop the vehicle on a stand and run the engine to warm it. Remove the drain plug and drain the oil. **(Refer to Fig. 6.41)**

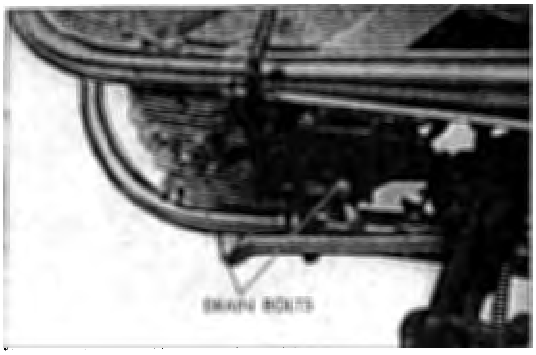


Fig. 6.41 Drain plug

c. Replace the drain plug and fill with oil.

d. After pouring 1.5 liters (.39 US gal., .33 Imp gal.), check level with dip stick attached to filler cap. **(Refer to Fig. 6.42)**

Fig. 6.42 Oil gauge (dip stick)

e. Name and weight of oil :

Honda Ultra Oil

above	15 deg. C.	# 30
below	15 deg. C.	# 20 W
below	0 deg. C.	# 10 W

(CAUTION)

(1) Do not exceed the oil level indicated on the gauge.

(2) Change periodically as the oil becomes dirty after use.

(3) Oil of doubtful quality should not be used.

(4) Do not use oil which has been contaminated by water or direct.

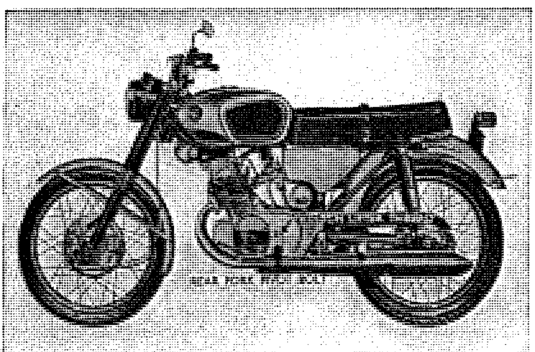


Fig. 6.43 Grease fittings on left

2. Parts not requiring periodical lubrication

Some parts do not require periodical lubrication, but need be lubricated only when disassembled for some reason.

Steering bearing cone race } grease
Throttle }

3. Grease

a. Greasing

Use a grease pump to lubricate those sections which are provided with grease fittings. When greasing, allow surplus to appear around the fitting. Fiber grease should be used. **(Refer to Figs. 6.43 and 6.44)**

Fig. 6.44 Greasa fittings on right

(NOTE)

If the grease cannot enter the fitting, fitting is wrong and should be replaced.

Grease the front and rear axle bearings.

Front and rear wheel bearings should be greased every 5000 km. (3100 mi)

(1) Tools required for greasing bearings. **(Refer to Fig. 6. 45)**

(2) Dismount front and rear wheels, and remove the bearings.

(3) Remove old grease and wash bearings with gasoline.

(4) Thoroughly grease the balls, put some grease in the hubs, and replace the bearings. **(Refer to Fig. 6. 46)**

(4) Fiber grease should be used.

4. Oiling the Drive Chain

The chain should be oiled during the monthly adjustment and after every 5000 km. (3100 mi)

a. Tools for chain lubrication. **(Refer to Fig. 6. 47)**

b. Unlink the drive chain.

c. Wash with gasoline.

d. After the grease has been warmed, immerse the chain in the grease.

e. Take the chain out of the grease and wipe off the surplus. Reinstall.

f. Gear oil may be used, but chain grease is preferable.

F. Tightening Parts

1. Critical Connections

Over long periods of operation, some nuts and bolts will become loose due to constant shock and vibration. These should be tightened with a torque wrench.

a. Tools required. **(Refer to Fig. 6. 48)**

b. Connections and torque. **(Refer 6. 49 and 6. 50)**

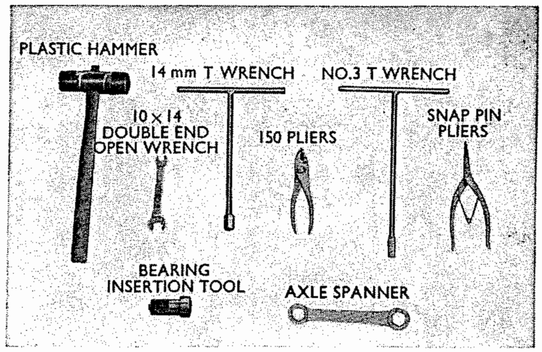


Fig. 6. 45 Tools required for greasing bearings

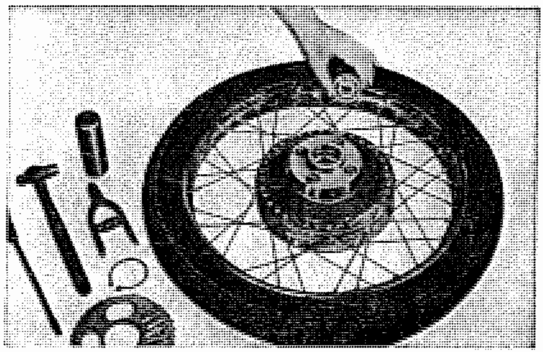


Fig. 6. 46 After greasing, replace bearings in hub

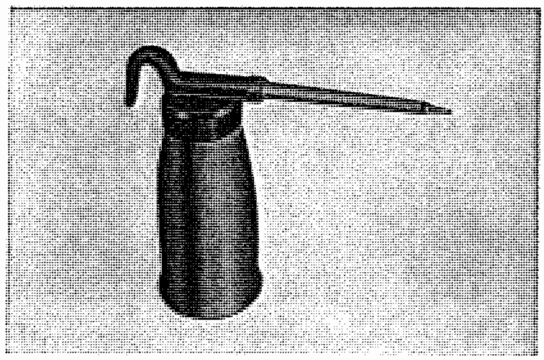


Fig. 6. 47 Tools for chain lubrication

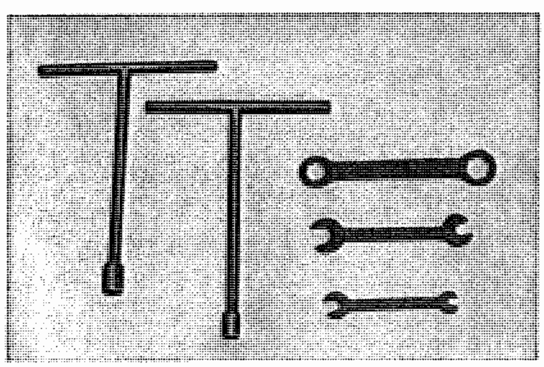


Fig. 6. 48 Tools required

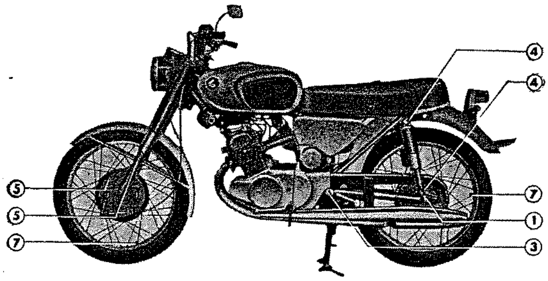


Fig. 6. 49 Left side connections

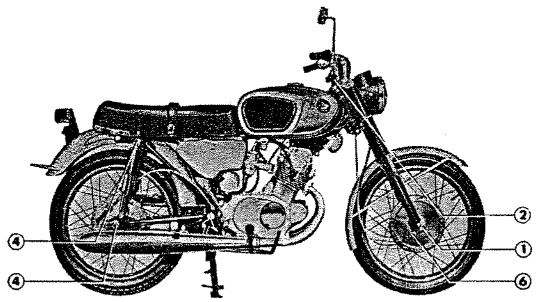


Fig. 6. 50 Right side connections

Fig. 6. 51 Tightening the spokes

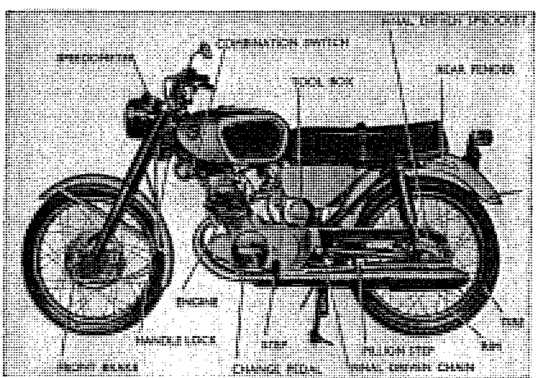


Fig. 6. 52 Left side of the vehicle

	Part	Torque m-kg
①	Front axle nut	12.6 (89.9 ft. lb.)
②	Front brake torque bolt	4.4 (31.7 ft. lb.)
③	Steering stem, front fork bolt (8×32)	1.7 to 2.0 (12.2 to 14.4 ft. lb.)
④	Head lamp retaining bolt (8×20)	1.7 to 2.0 (12.2 to 14.4 ft. lb.)
⑤	Engine mounting bolts (8×40)·(10×48)	4.4 (31.7 ft. lb.) 6.0
⑥	Footrest arm mounting bolt	(4.3 ft. lb.) 3.3 to 4.8
⑦	Rear fork pivot bolt	(23.8 to 34.6 ft. lb.) 7.6 (54.8 ft. lb.)
⑧	Upper rear spring retaining nut & lower bolt	7.6 (54.8 ft. lb.)
⑨	Rear wheel axle nut	19.4 (140.0 ft. lb.)
⑩	Drive chain adjusting nut	0.8 (5.8 ft. lb.)
⑪	Rear brake panel limit bolt	4.4 (31.8 ft. lb.)

2. Wheel Spokes

Wheel spokes should be checked every 5000 km (3100 mi) by the method shown below. If the spokes are loose, they are apt to damage other spokes or the rim. With the wheel suspended in air, turn and check each spoke by hand. Using a nipple wrench, tighten all nippes equally. **(Refer to Fig. 6. 51)**

6. 2 Periodic Inspection and Repair

To prevent accidents and keep the vehicle in the best possible operating condition, periodic inspection should be made. There are two kinds of periodic inspection, daily and that which is performed as scheduled by owner or service agent.

A. Daily Inspection

The owner should form the habit of inspecting the following every day :

1. Does the handlebar deflect abnormally or is it very heavy ?
2. Is the play of the front brake lever 3 to 4 cm ? (1.2″ to 1.6″)
3. Is the play of the rear brake pedal from 2 to 3 cm ? (.78″ to 1.2″)
4. Clutch disengagement ?
5. Do the springs rattle and does oil leak ?
6. Do the head, tail and stop lamps light ?
7. Does the horn sound ?
8. Does the turn indicate work ?

9. Is the oil level correct ? (1.0 liter) (.26 gal., 22 Imp gal.
10. Is the fuel level up ?
11. Front tire air pressure ?
    Normal operation 1.8 kg/sq.cm. (25.5 psi)
    Loaded/high-speed 2.1 kg/sq.cm. (29.8 psi)
12. Rear tire pressure ?
    Normal operation 1.9 kg/sq.cm. (27 psi)
    Loaded/high-speed 2.2 kg/sq.cm. (31.2 psi)
13. Is the color of exhaust smoke normal ?

(NOTE)

1. When operation is constantly over short distances. The oil should be changed more often. Every 500 km. (310 mi) in the winter.
2. Battery fluid should be checked every week. but more often when :
   a. traveling more than 50 km. (31 mi) daily
   b. using vehicle in mountainous regions
   c. operating always at high speeds

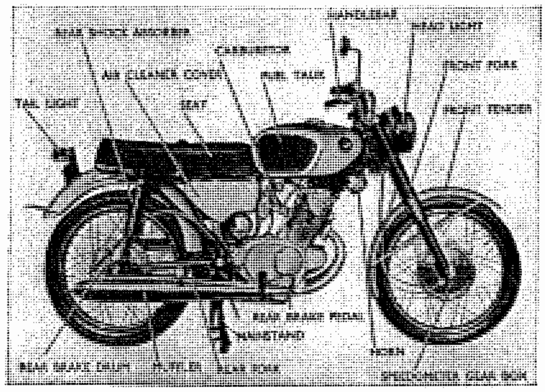


Fig. 6. 53 Right side of the vehicle

B. Periodical Inspection and Repair

Items and times of periodical inspection and repair as shown in the following table :

◆ Inspection to be made by dealer.
◇ Inspection which the user can make.

Items \ Distance km (miles)	300 (180)	1,000 (620)	2,000 (1,240	3,000 (1,860)	4,000 (2,480)	5,000 (3,100)	6,000 (3,720)	7,000 (4,340)	8,000 (4,960)	9,000 (5,580)	10,000 (6,200)	11,000 (6,820)	12,000 (7,440)
Change engine oil	◆	◇	◇	◆	◇	◇	◆	◇	◇	◆	◇	◇	◆
Greasing				◆			◆			◆			◆
Adjust ignition timing				◆			◆			◆			◆
Adjust valve clearance	◆			◆			◆			◆			◆
Adjust cam chain	◆			◆			◆			◆			◆
Adjust clutch	◆			◆			◆			◆			◆
Adjust carburetor				◆			◆			◆			◆
Adjust drive chain	◆	◇	◇	◆	◇	◇	◆	◇	◇	◆	◇	◇	◆
Adjust front brake	◆	◇	◇	◆	◇	◇	◆	◇	◇	◆	◇	◇	◆
Adjust rear brake	◆	◇	◇	◆	◇	◇	◆	◇	◇	◆	◇	◇	◆
Clean spark plug				◆			◆			◆			◆
Clean oil filter	◆						◆						◆
Clean air cleaner				◆			◆			◆			◆
Clean fuel strainer							◆						◆
Clean muffler				◆			◆			◆			◆
Inspect tightness of nuts and bolts	◆						◆			◆			◆
Inspect suspensions				◆			◆						◆
Inspect lights, horn and speedometer				◆			◆			◆			◆

HONDA Models CB 125 & CB 160 Maintenance Specifications

Part	Item		Model CB 125	Model CB 160
Cylinder head	Height	mm	119 (4.64″)	same
	Distortion limit	mm		
Head bolt	O.D. × pitch	mm	8×1.15/m (.31″×.04″/3.28′)	same
	Tightening torque	m-kg		
Gasket	Material		Stainless asbestos	same
	Thickness (new)	mm	1 to 1.1 (.39 to .042″)	same
Cylinder	With or without liner		with	same
	Bore	mm	44 (1.72″)	50 (1.95″)
	Error of vertical bore	mm		
	Error between cylinders	mm		
	Expansion limit	mm		
	Wear limit	mm		
Piston	Clearance	mm	0.0 to 0.1 (0.0″ to .004″)	0.1 to 0.2 (.004 to .008″)
	Center of pin to head	mm	29.7 (1.16″)	25.8 (.99″)
	Pin hole offset	mm	1.5 (.06″)	same
	Cylinder clearance (Min.)	mm	0.2, 0.50 (.009″, .02″)	0.25, 0.50 (.01″, .02″)
	Oversize		0.75 (.029″)	same
	Direction of installation		Direction of arrow	same
Piston rings	Outside finish (Campression)		Chrome plate	same
	Outside finish (Compression)		Chrome plate	same
	Outside finish (Oil seal)		Oil chrome plate	same
	Tension (Compression)	kg	0.38 to 0.62 (.84 lb to 1.4 lb)	0.43 to 0.67 (.94 lb to 1.4 lb)
	Tension (Oil seal)	kg	0.5 to 0.8 (1.1 lb to 1.8 lb)	same
	Groove clearance (Compression)	mm	0.015 to 0.045 (.0006″ to .0018″)	same
	Groove clearance (Oil ring)	mm	0.010 to 0.045 (.0004″ to .018″)	same
	Contact clearance		0.15 to 0.35 (.0058″ to .0136″)	same
	Angle of contact surface (avoiding side pressure)		120°	same
Piston Pin	Installation system		Floating	same
	O.D. × length	mm	14×35.6 (.55″×1.39″)	14×41.6 (.55″×1.62″)
	Weight	kg	0.0179 (.0394″)	0.022 (.0008″)
	Installation in piston		cold press	same
Connecting rod	Clearance with small end piston boss	mm	3 (.12″)	same
	Deflection of small end	mm		
	Dimension of oil vent	mm	2.5 (.10″)	same
Large end of connecting rod	Construction		Single unit	same
	Play in axial direction	mm	0.1 to 0.4 (.004″ to .016″)	same
	Needle collar-number		#24 2 ea.	same
	Needle collar dia. × length	mm	2.5×10 (.08″×0.39″)	same
Crankshaft	Construction		Assembly	same

Part	Item	Model CB 125	Model CB 160
Crankshaft	Deflection-interference of crankshaft and arm mm	0.048 to 0.083 (.002" to .003")	same
	Pin true-round (within mm)	0.003 (.0001")	same
	Limit of crankshaft play		
Timing Gears & Chain	Pitch of chain	7.774	same
	Number of chain links	82	same
	Tension of chain kg	3.5 (7.7 lb)	same
Camshaft	Cam height (intake) mm		
	Cam height (exhaust) mm		
	Bearing clearance mm	0.020 to 0.054 (.001" to .0021")	same
Valves	Construction (intake)	Monobody	same
	Construction (exhaust)	Monobody	same
	Clearance (intake) mm	0.03 to 0.05 (.0011" to .002")	same
	Clearance (exhaust) mm	0.03 to 0.05 (.0011" to .002")	same
	Valve stem dia. (intake) mm	5.5 (.21")	same
	Valve stem dia. (exhaust) mm	5.5 (.21")	same
	Undersize limit (valve stem) mm		
Valve seat	Facing		
	Limit of depression		
Valve springs	Free height mm	Outer 36.2 (1.4") Inner 28.6 (1.1")	same same
	Installed load/height kg/mm	O 9.5/29.5 (20.9 lb/1.15") I 4.7/25.5 (10.3 lb/.99")	same same
	Limit of free height %	of standard	same
	Plumb tolerance mm	mm/100 mm (.039"/3.9")	same
Valve guide	Bore (intake & exhaust) mm	5.5 (.21")	same
	Length of inserted section of cylinder mm	In. 0.040 to 0.065 (.0016" to .0025")	same
		Ex. 0.020 to 0.045 (.0048" to .0018")	same
		In. 0.010 to .0035 (.0004" to .0014")	same
	Valve stem clearance mm	Ex. 0.035 to 0.145 (.0014" to .0027")	same
Oil pump	Kind	Plunger type	same
	Capacity rating-liters/min-rpm	3.78/2450 (.98 US gal, 83 Imp. gal)	same
Oil filter	Centrifugal wire mesh	Centrifugal wire mesh	same
Lubrication	SAE # (winter)	10 or 20	same
	SAE # (summer)	30 or 40	same
Carburetor	Type & Manufacture	Piston valve (TK)	same (Keihin)
	Diameter mm		
	Diameter of venturi mm	18 (.7")	20 (.78")
	Main jet	#78	#90
	Air jet	#1.2	#150
	Idle jet	0.35–0.6×9	#38 (0.7φ×2×3)
	Needle jet	2.59–0.6×8	2.6×3.5
	Jet needle	T-188 3/5 step	18331-3 step
	Air screw	1/8 return	1-1/4±1/8
	Height of float	26 mm (1.01")	19.5 mm (.76")
	Throttle valve cutaway		

Part	Item		Model CB 125	Model CB 160
Clutch spring	Limit of free height			
	Plumb tolerance			
	Loaded tension/limit of height			
Clutch plate	Distortion limit	mm		
	Clutch drive plate		S.P.C.	same
	Thickness & number	mm	1.6 5-ea. (.06 in)	same
	Friction discs		Resin mold	same
	Thickness & number	mm	3.5 5-ea. (.14 in)	same
Transmission Gears	Backlash			
	Ratio 1		2.769	same
	Ratio 2		1.779	1.778
	Ratio 3		1.318	same
	Ratio 4		1.040	same
Main shaft	Bearing		6204H S	same
Countershaft	Bearing		6204H S	same
Drive chain	Manufacturer		Daido	same
	No. of links (secondary drive)		110	same
Front suspension	Type		Telescoping	same
	Stroke	mm		
	Brake cylinder cap.	cc	170	same
	Free length of spring	mm		
	Spring tension	kg		
	Spring Mfgr.		Showa Seisakusho	same
	Steel ball diameter	mm	6.35 36-ea. (.25 in)	same
Rear suspension	Type		Pivoting	same
	Stroke	mm		
	Brake cylinder cap.	cc	38 (.08 US pt)	same
	Free length of spring	mm		
	Spring tension	kg		
	Spring Mfgr.		Showa Seisakusho	same
Front wheel	Axle diameter	mm	15 (.58 in)	same
	Bearings		Ball (6302)	same
	Rim deflection	mm		
	Brake drum I.D.	mm	180 (7 in)	same
	Brake shoes O.D.	mm		
	Thickness of brake cam	mm		
	Thickness of brake lining	mm	4.5 (.18 in)	same
	Shoe spring free length	mm		
	Play of brake lever	mm	10 to 20 (.39 to .78 in)	same
Rear wheel	Axle diameter	mm	17 (.66 in)	same
	Bearings		Ball (6303)	same
	Rim deflection	mm		
	Brake drum I.D.	mm	180 (7 in)	same
	Brake shoes O.D.	mm		

Part	Item	Model CB 125	Model CB 160
Rear wheel	Thickness of brake cam mm		
	Thickness of brake lining mm	4.5 (0.18 in)	same
	Shoe spring free length mm		
	Play of brake lever mm	20 to 30 (.78″ to 1.17″)	same
Battery	Type & number	MBW3-12C 1 ea.	same
	Capacity (10-hour rate)	9AH	same
	Ground pole	Negative	same
	Level of electrolyte above plates mm	10 to 13 (0.39″ to 0.50″)	same
Ignition coil	Type	SR208 (Kokusan) 29700-097 (Denso) CM12 (Hitachi)	same same same
	Rated voltage	12	same
	Test spark clearance mm	8 (0.31 in)	same
	Insulation resitance (MΩ)		
Advance angle device	Starting rpm	1800	same
	Maximum rpm	40-4200	same
Contact breaker	Point gap	0.3 to 0.4 (0.01 to 0.02 in)	same
	Spring tension-arm gm	700 to 900	same
Capacitor	Capacity μF	0.3	same
	Insulation resistance (MΩ)	50	same
Spark plugs	Type	D-8H	same
	Point clearance mm	0.6 to 0.7 (.023″ to .027″)	same
	Heat range	High temperature	same
Generator	Type	EG19 (Kokusan) 37000-024 (Denso) K107 (Hitachi)	same same same
	Output voltage V-W	14-70	same
Rectifier	Type	Silicon	same
	Positive resistance Ω		same
	Negative resistance Ω		same
Starter	Type & Mfgr.	CC03 (Kokusan) 28000-111 (Denso) S106 (Hitachi)	same same same
	Voltage and output V, HP	12, 0.45	same
	Starting current A		
	Armature & pole core clearance mm	0.45 (.018″)	same
	Commutator diameter mm		
	Insulation resistance MΩ	0.05	same
	Brush dimensions (with) mm	12×6×14.5 (.48″×.23′×.58′)	same
	Brush spiring tension gm	580 (1.28 lb)	same
	Undersize limit of brush	1/3 standard	same
Lamps	Type	Semi-sealed beam	sealed beam
	Head lamp bulb capacity (W)	30/30	same
	Stop lamp bulb capacity (W)	25	same
	Tail lamp bulb capacity (W)	8	same
		(used for license plate lighting also)	
	Instrument lamp (W)	3 2-ea	same
Clutch	Type	Wet multi-plate	same
	Control system	Manual cable	same
Clutch spring	Free height mm	34.9	same
	Loaded tension kg/mm (lbs/in)	15/22.5 (33.1 lb/.9″)	same

CB125 AND 160 EXPLODED VIEW