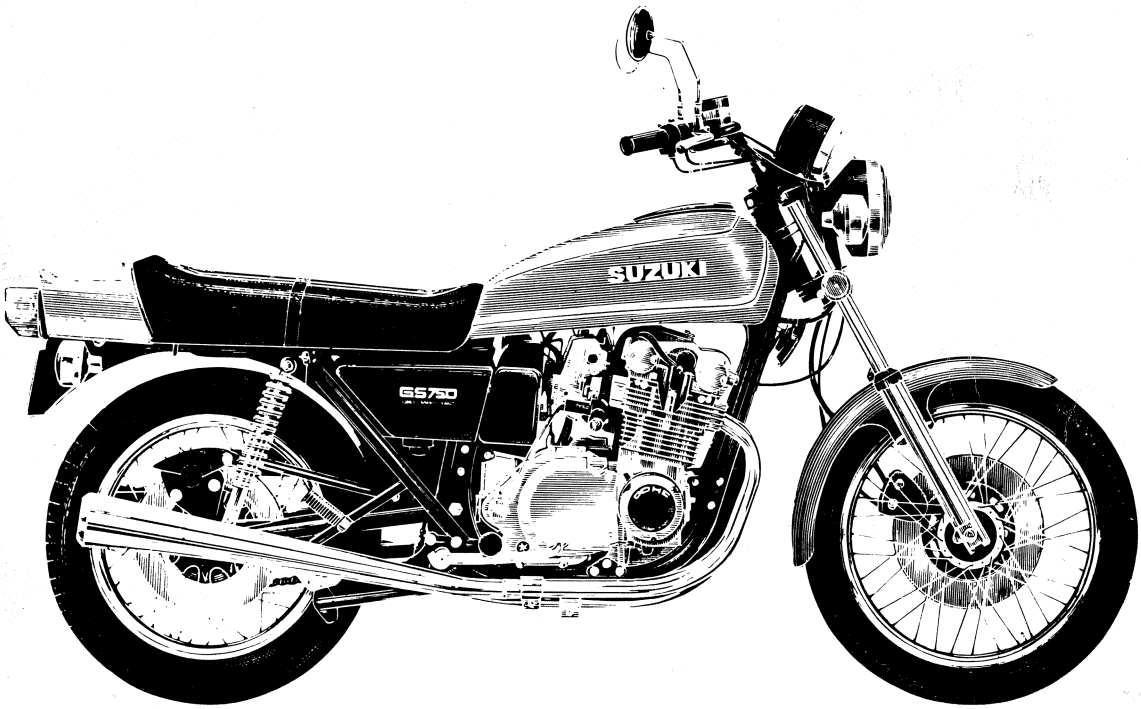
SUZUKI

GS750

SERVICE MANUAL



SUZUKI
DOHC
4
FOUR STROKE

SUZUKI GS750 SERVICE MANUAL

FOREWORD

The 4-stroke-cycle GS750, powered by a thoroughly designed engine with many new features including a double-overhead-camshaft valve mechanism, is the latest challenge of SUZUKI to cement its place of fame and distinction in the large-size category of motorcycles.

Developed through years of painstaking research work and inheriting the best reliability and durability features of world-renowned SUZUKI two-stroke machines, this ambitious 750-cc machine has its chassis designed anew to equal the enormous power available from its engine.

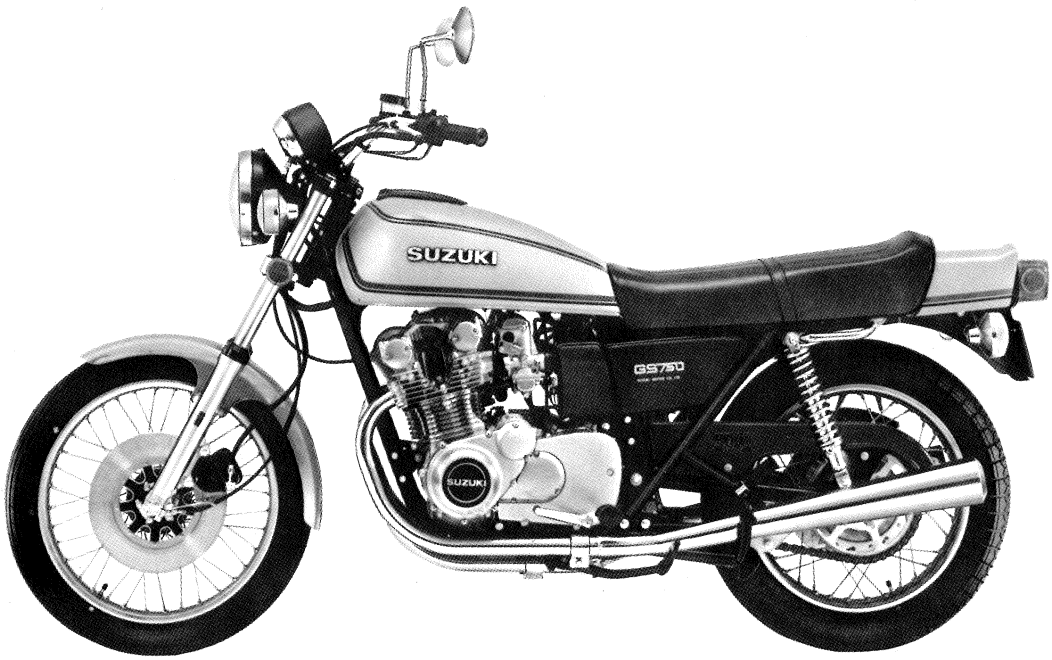
How well the user can make use of the great capability built into this machine depends largely on the way you assist him and take care of it in your shop. We hope you will study this manual carefully to get all the information vital to the successful servicing of GS750 motorcycles.

The Model GS750 made to standard specifications is taken up in the text, whereas it is possible that GS750 machines that may come to your attention should be slightly modified to meet the statutory requirements of your country; even if modified, they should present no problem to you as your skill and experience in attending to SUZUKI machines will naturally lead you to cope with those points of minor difference.

This manual came out of the first printing for Model GS750 and does not cover modifications yet to be made, but we assure you that each future printing will turn out an updated manual.

FIRST EDITION JULY 1976
REVISED DECEMBER 1976
SERVICE DEPARTMENT
SUZUKI MOTOR CO., LTD.

VIEW OF SUZUKI GS750



Left Side

Right Side

GROUP INDEX

GENERAL INFORMATION

GROU
1

CONTENTS

SPECIFICATIONS

DIMENSIONS AND WEIGHT	
Overall length	2,225 mm (87.6 in)
Overall width	870 mm (34.3 in)
Overall height	1,170 mm (46.1 in)
Wheelbase	1,490 mm (58.7 in)
Ground clearance	150 mm (5.9 in)
Dry weight	223 kg (492 lbs)
ENGINE	
Type	Four-stroke cycle, air-cooled, DOHC
Number of cylinders	4
Bore	65.0 mm (2.56 in)
Stroke	56.4 mm (2.22 in)
Piston displacement	748 cc (45.6 cu.in)
Compression ratio	8.7 : 1
Carburetor	MIKUNI VM26SS, four
Air cleaner	Polyurethane foam element
Starter system	Electric and kick
Lubrication system	Wet sump
TRANSMISSION	
Clutch	Wet multi-plate type
Transmission	5-speed constant mesh
Gearshift pattern	1-down 4-up
Primary reduction	2.152 (99/46)
Final reduction	2.733 (41/15)
Gear ratios, Low	2.571 (36/14)
2nd	1.777 (32/18)
3rd	1.380 (29/21)
4th	1.125 (27/24)
Top	0.961 (25/26)
Drive chain	TAKASAGO #630SO, 96 links
CHASSIS	
Front suspension	Telescopic, oil dampened
Rear suspension	Swinging arm, oil dampened, spring 5-way adjustable
Steering angle	40°(right & left)
Caster	63°00'
Trail	107 mm (4.21 in)
Turning radius	2.6 m (8.5 ft)
Front brake	Disc brake
Rear brake	Disc brake
Front tire size	3.25H19-4PR
Rear tire size	4.00H18-4PR
Front tire pressure	1.75 kg/cm^2 (25 psi) (Normal solo riding)
Rear tire pressure	2.0 kg/cm^2 (28 psi) (Normal solo riding)
ELECTRICAL	
Ignition type	Battery ignition
Ignition timing	17° B.T.D.C. below 1,500 rpm and 37° B.T.D.C. above 2,500 rpm
Spark plug	NGK B-8ES or NIPPON DENSO W24ES
Battery	12V 14AH/10 Hours
Generator	Three-phase A.C. generator
Fuse	15A
CAPACITIES	
Fuel tank including reserve	18 lit (4.8/4.0 US/Imp gal)
reserve	2.0 lit (2.1/1.8 US/Imp qt)
Engine oil, when changing	3.4 lit (3.6/3.2 US/Imp qt)
Front fork oil	180 cc (6.08/6.34 US/Imp oz)

FUEL AND OILS

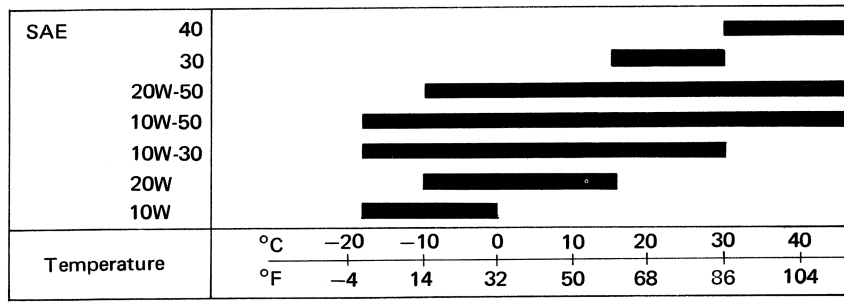
Be sure to use the specified fuel and oils. The following are the specifications:

FUEL

Gasoline used should be graded 90 octane or higher in Research Method, preferably unleaded or low-lead.

ENGINE OIL (for engine and transmission)

Be sure that the engine oil you use comes under API classification of SE or SD and that its viscosity rating is SAE 10w-40 (for the General, all temperatures).
If the SAE 10w-40 motor oil is not available, select the oil viscosity according to following chart:



BRAKE OIL (for front and rear brakes)

Specification and Classification	Remarks
DOT3 DOT4	In USA and Canada
SAE J1703a SAE J1703b SAE J1703c	Elsewhere
SAE 70R3 (obsolete spec.)	

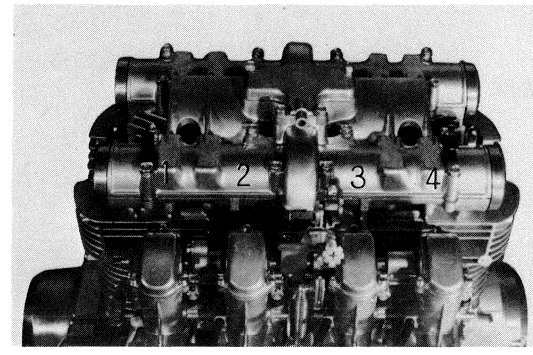
NOTE: 1. Since the brake system of this motorcycle is filled with a glycol-based brake fluid in the manufacturer, do not use or mix different types of fluid such as silicone-based and petroleum-based fluid for refilling the system, otherwise the serious damage will be caused.
2. Do not use any brake fluid taken from old or used or unsealed containers.
3. Never re-use the brake fluid that left over from the last servicing and stored for long periods.

FRONT FORK OIL

Mixture of SAE 10W/30 motor oil and ATF (Automatic Transmission Fluid), the ratio being 50-to-50 percent.

CYLINDER IDENTIFICATION

The four cylinders of this engine are identified as No. 1, No. 2, No. 3 and No. 4 cylinder, as counted from left to right (as viewed by the rider on the seat).



ENGINE

GROU
2

DESCRIPTION

DOHC (Double-Overhead-camshaft) Valve Mechanism

In the DOHC engine, two camshafts are mounted on the cylinder head, one for intake valves and one for exhaust valves. Those pushrods and rocker arms commonly found in conventional OHV or SOHC engines are absent in this engine: specifically, the cams are in direct contact with valve tappets to operate the valves through a shorter path of actuating drive.

This design assures the high responsiveness of valve in high-speed operation to account for the unmatched performance of the GS750 and provides an easy-to-maintenance valve mechanism.

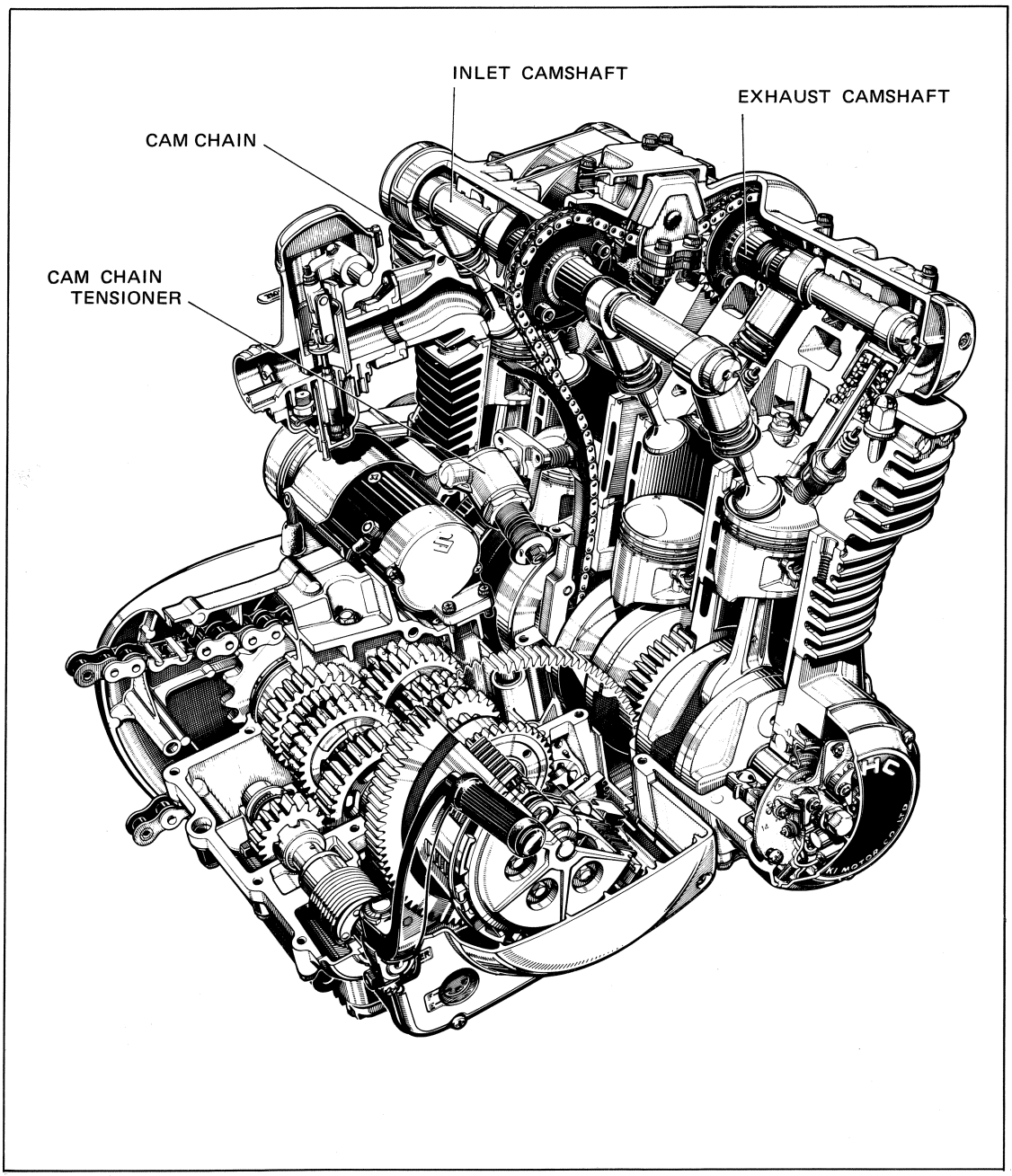


Fig. 1-1

LUBRICATION

The running parts of the engine proper and transmission are lubricated with oil pressure-fed from a trocoid pump driven from the clutch through gears. The large-capacity oil pump, located on the inner side of the clutch, lifts oil from the sump through a metal-screen strainer and forces it through an oil filter and a pressure switch toward engine and transmission.

In the transmission, the oil is guided into the oilways provided in countershaft and drive shaft, and is sprayed out through oil holes to lubricate the gears and bearings.

In the engine, the oil flows first into a gallery drilled out in the crankcase wall, from which it is distributed to crankshaft and, through upward oilways, to cylinder head for valve mechanism lubrication.

All the paths of this pressure-fed oil are in the form of drilled holes and cast-out pockets.

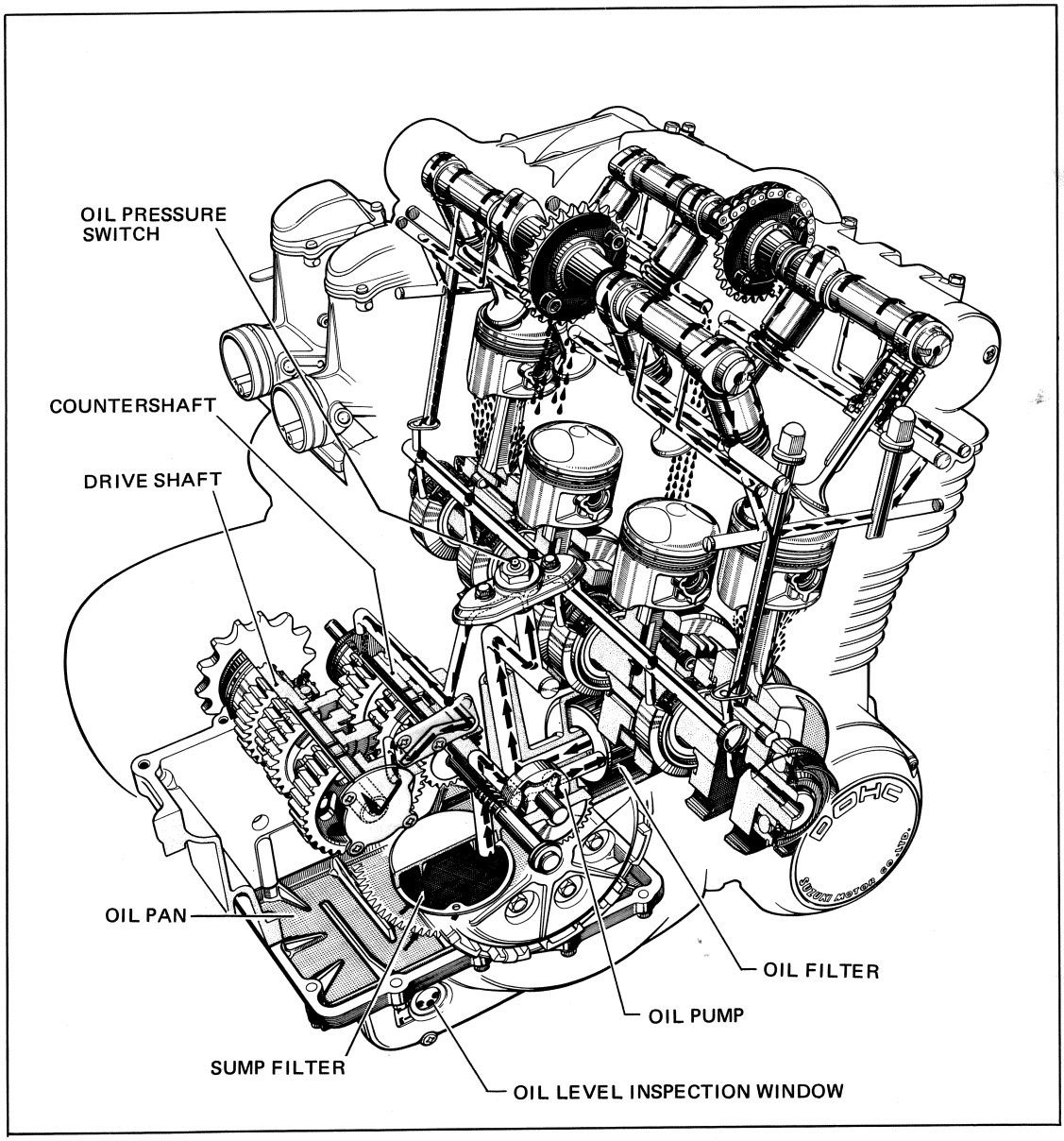


Fig. 1-2

BLOWBY GAS RECYCLING

Blowby gases in the crank case are constantly drawn into the chain chamber provided in the middle section of the cylinder block. The top section of this chamber is communicated to the air cleaner assembly through a rubber tube. In the cleaner, the gases merge with incoming air and thus are recycled to the engine through the normal intake system.

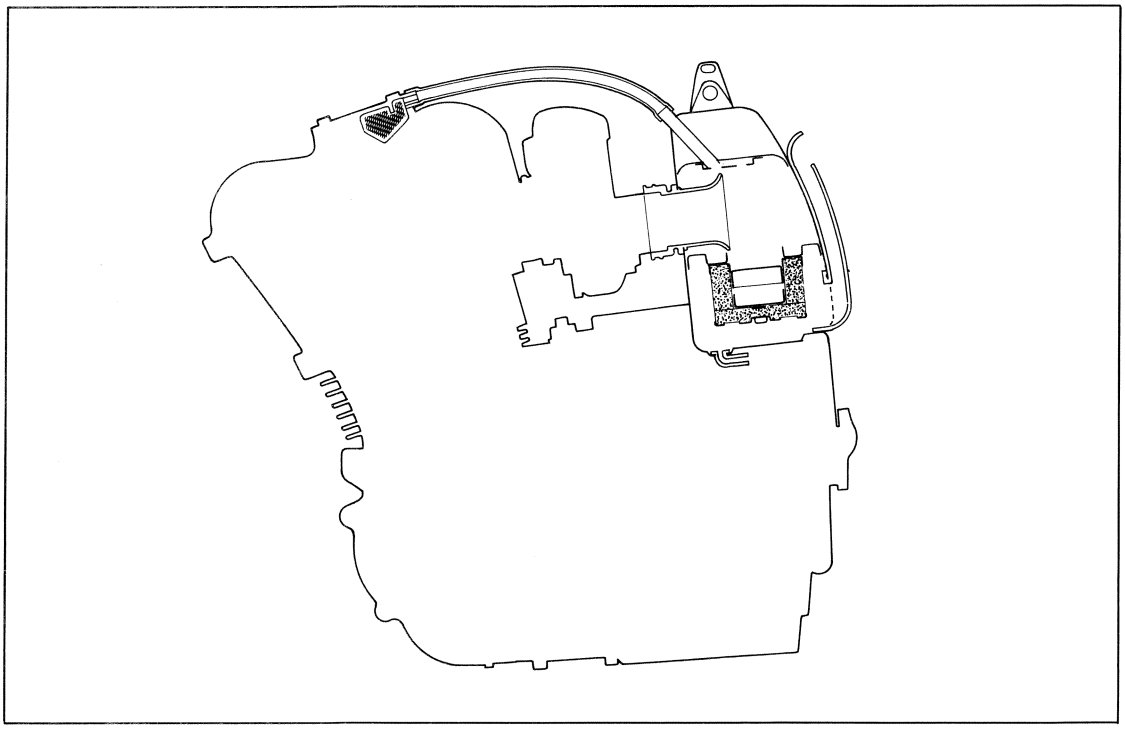
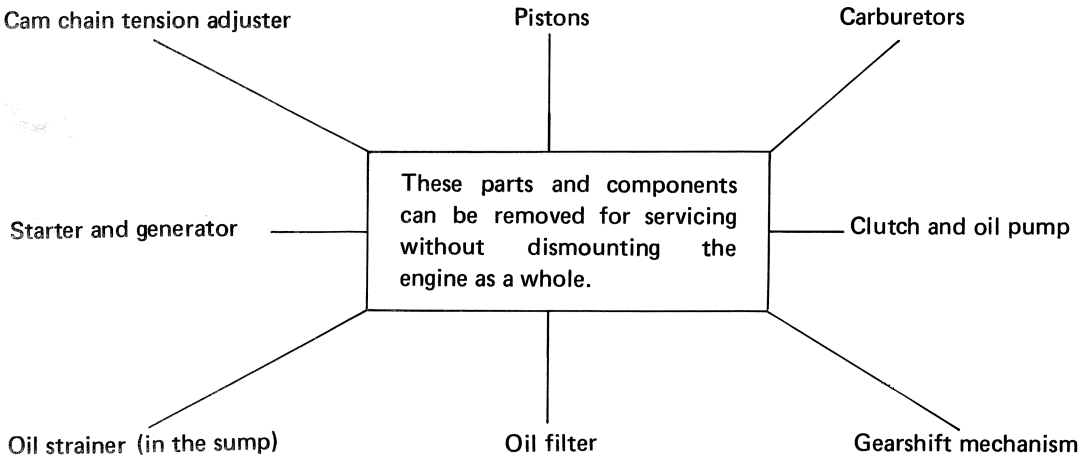


Fig. 1-3

ENGINE COMPONENTS REMOVABLE FROM THE ENGINE IN PLACE



ENGINE REMOVAL AND DISMANTLING

ENGINE REMOVAL

1. Drain out engine oil.
   ①: Drain plug

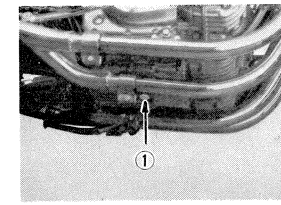


Fig. 1-4

2. Remove fuel tank.

NOTE: Leave fuel cock lever in "ON" or "RES" position.

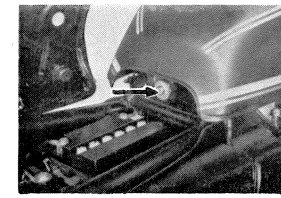


Fig. 1-5

3. Disconnect lead wires and high-tension cords.
   ①: battery (–) terminal
   ②: starter relay (–) terminal
   ③: alternator lead wire
   ④: contact-point lead wire
   ⑤: plug cords

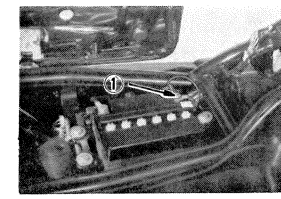


Fig. 1-6

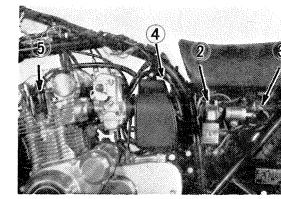


Fig. 1-7

4. Remove air cleaner and carburetors.

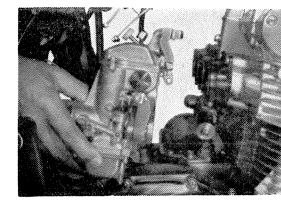


Fig. 1-8

5. Disconnect exhaust pipes and tachometer drive cable.

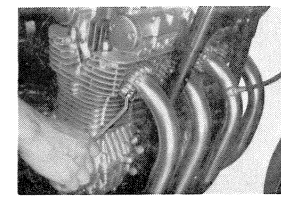


Fig. 1-9

6. Remove left step and left (sprocket) cover.

NOTE: The lid must be removed first to expose the clutch lever and to gain access to two screws Ⓐ. Remove these screws, too.

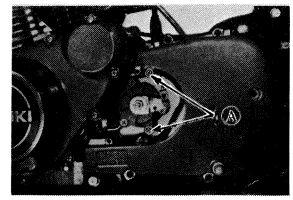


Fig. 1-10

7. Remove engine sprocket.
8. Remove right step and foot brake lever.
9. Remove the engine mount bolts.

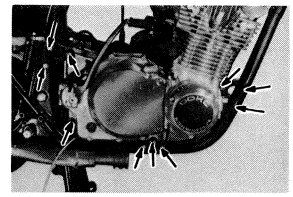


Fig. 1-11

10. The engine is now ready for removal. Use both hands, and carry it off the chassis, taking it out from the right-hand side.

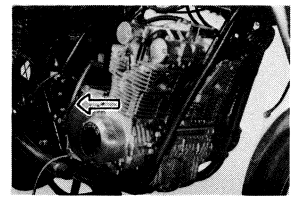


Fig. 1-12

ENGINE DISASSEMBLY

1. Remove cylinder head cover.

NOTE: Breather cover need not be removed.

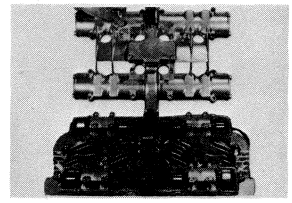


Fig. 1-13

2. Remove chain tension adjuster. This is accomplished by first loosening lock nut Ⓐ and tightening screw Ⓑ and then by removing three mounting bolts Ⓒ

NOTE: Tightening screw Ⓑ locks the spring-loaded tensioner pushrod inside.

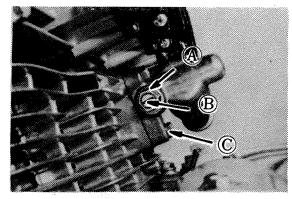


Fig. 1-14

3. Remove chain idler.

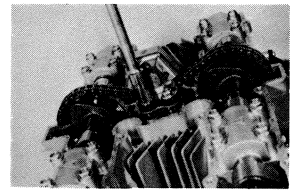


Fig. 1-15

4. Remove tachometer drive gear by pulling it off after removing its stopper (secured by a cross-recessed screw).

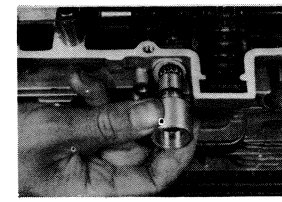


Fig. 1-16

5. Remove the two camshafts, intake and exhaust.

NOTE 1: Be sure to loosen the four cap bolts evenly by shifting the wrench diagonally after cracking a bolt loose.
NOTE 2: Hold down each camshaft with vice pliers Ⓐ, and remove the bolts securing the bearing caps, two on each camshaft. Then, remove the pliers and take off the camshaft.

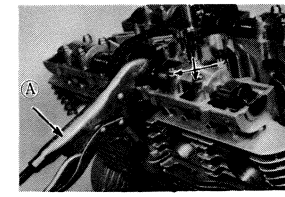


Fig. 1-17

6. Remove cylinder head
The cylinder head becomes free for removal when its two 6-mm bolts Ⓐ, one at each end, and twelve 8-mm nuts are removed.

NOTE: Be sure to use the special tool ("T" wrench) sized to enter the pockets formed of the head and reach the nuts down below to loosen the 8-mm nuts, and to shift the tool sequentially in the descending order of numbers assigned to these nuts in order to ease the pressure equally and evenly.

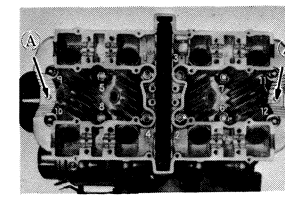


Fig. 1-18

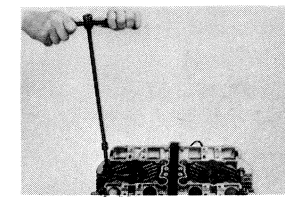


Fig. 1-19

7. Remove cylinder block.
After removing cylinder head, take a firm grip on the cylinder block at both ends, and lift it straight up. If the block will not come off, lightly tap on the non-fin portions of the block with a plastic mallet to shake the gasketed joint loose.

NOTE: Be careful not to damage the fins when removing or handling the cylinder block. This precaution applies to the cylinder head, too.

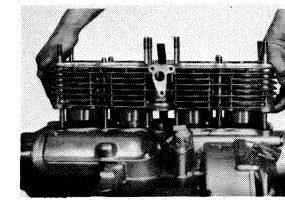


Fig. 1-20

8. Remove No. 1 and No. 4 pistons.

NOTE: Using a quick-drying wick pen, write the I.D. number on crown of each piston. Use the piston pin puller (special tool) to force the pin out to disconnect the piston from its connecting rod.

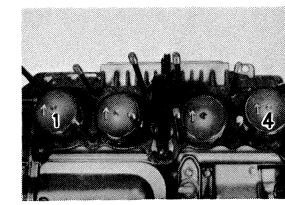


Fig. 1-21

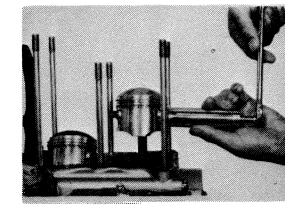


Fig. 1-22

9. Remove governor center bolt and rotor center bolt. To loosen these bolts, the crankshaft in place must be locked by installing the rotor holder (special tool) shown as Ⓐ

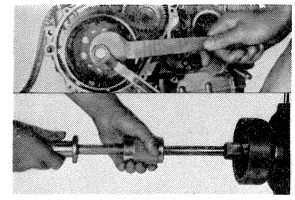


Fig. 1-23

10. Remove clutch plates.
Remove the 6 bolts securing the pressure plate to the hub, and pull out the plate. When loosening these bolts, be sure to shift the wrench from one bolt to another in such a way as to ease the pressure evenly. Pick out drivie and driven plates.

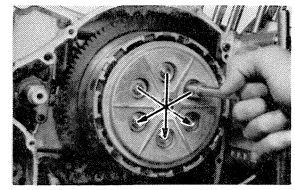


Fig. 1-24

11. Bend down the lock washer tongue to unlock the center nut securing the clutch hub to countershaft; remove the nut, using the clutch hub holder (special tool) and a 32-mm socket wrench; and draw out the clutch hub.

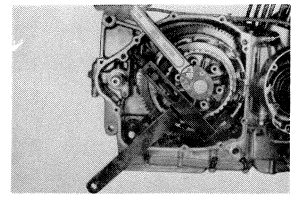


Fig. 1-25

12. Remove primary driven gear.
Run two 6-mm bolts into the primary driven gear spacer to ease out spacer by jacking. With the spacer removed, the primary driven gear (integral with the clutch housing) is free to disengage from the primary drive gear.

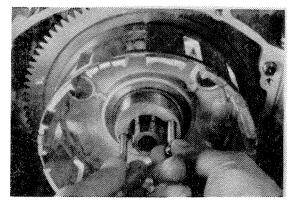


Fig. 1-26

13. Remove the two bearing retainers: one for countershaft and the other drive shaft.

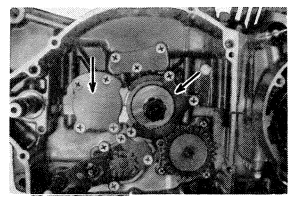


Fig. 1-27

14. Remove the 11 bolts fastening the upper crankcase to the lower half.

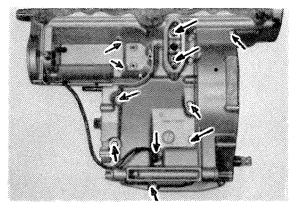


Fig. 1-28

15. Remove eleven 6-mm bolts and twelve 8-mm bolts securing the lower crankcase to the upper crankcase. Be sure to loosen the 8-mm bolts sequentially in the descending order of numbers given them. Separate the lower crankcase from the upper one.

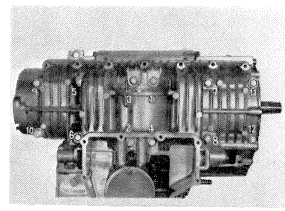


Fig. 1-29

16. Draw out the two gearshift fork shafts and take out the forks.

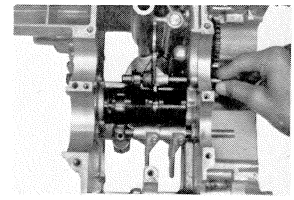


Fig. 1-30

17. Remove cam stopper spring holder Ⓐ , and take out the pin and spring. Draw out gearshift cam.

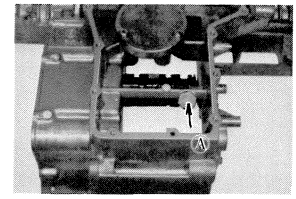


Fig. 1-31

DISASSEMBLING ENGINE COMPONENTS

Cylinder head disassembly

1. Remove tappet shims, using forceps to pick each shim up.
   Ⓐ : tappet shim

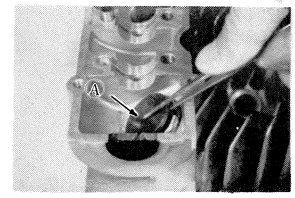


Fig. 1-32

2. Pull out tappets by picking each with fingers.

NOTE: Exercise caution in removing tappets so as not to nick them.

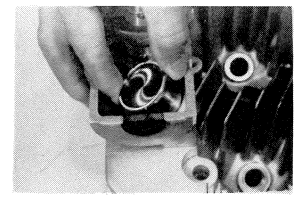


Fig. 1-33

3. Remove each valve in the following manner:
   ①Using the valve lifter (special tool), compress the spring.

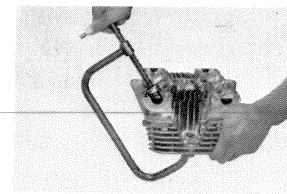


Fig. 1-34

   ②Take off the two cotter halves from valve stem, using forceps.

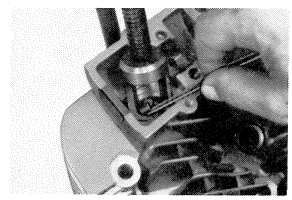


Fig. 1-35

③Take out the valve upper seat, inner spring and outer spring.

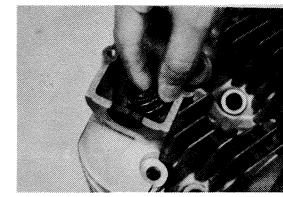


Fig. 1-36

④From the other side, pull out the valve.

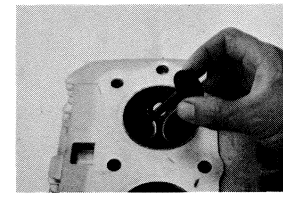


Fig. 1-37

4. Remove each valve guide as follows:
   ①Remove oil seal, using long-nose pliers. Pick out valve lower seat.

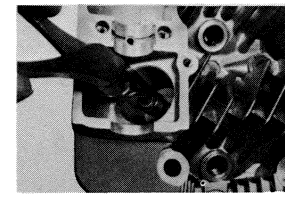


Fig. 1-38

   ②Using the valve guide remover (special tool), drive the guide out toward cylinder head side.

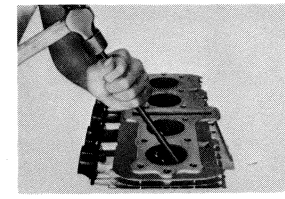


Fig. 1-39

NOTE: Discard the removed valve guide sub-assemblies. In reassembly, use replacement sub-assemblies, each consisting of guide ring and oil seal.

Carburetor disassembly

1. Remove the cover from each carburetor.

2. At the middle section of the carburetor assembly, unhook the throttle return spring from the pin.

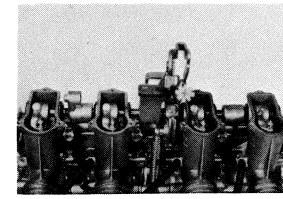


Fig. 1-40

3. Remove five bolts to free the throttle shaft.

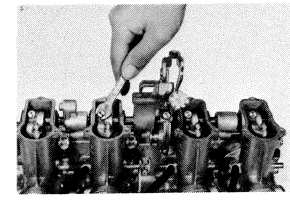


Fig. 1-41

4. Remove stopper plate and pull out the shaft.

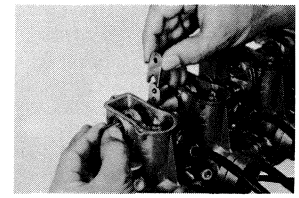


Fig. 1-42

5. Loosen four cross-recessed screws and also the screw in the slot. Draw out choke shaft.

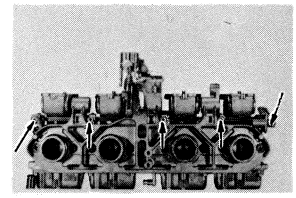


Fig. 1-43

6. Remove the plate. A total of 8 screws must be removed to free this plate for removal.

The foregoing procedure permits the rest of the carburetor assembly to be disassembled further in the usual manner.

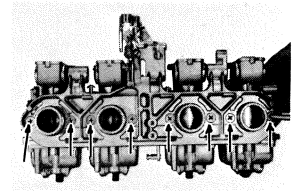


Fig. 1-44

Oil pump disassembly

1. Remove circlip and pull off the gear.

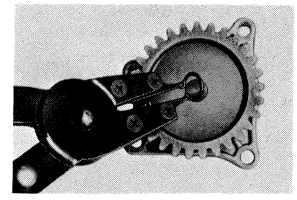


Fig. 1-45

2. Drive out the two pins to transmission side. Separate the two halves of the pump case to take out the internals.

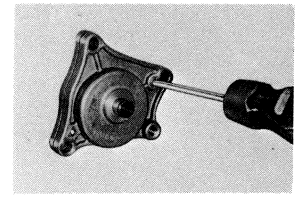


Fig. 1-46

INSPECTION AND SERVICING

AIR CLEANER

If the air cleaner is clogged with dust, intake resistance will be increased with a resultant decrease in output and an increase in fuel consumption.
Check and clean the cleaner according to the following procedures.

1. Take out the air cleaner element Ⓐ from the air cleaner case by unscrewing a screw Ⓑ.

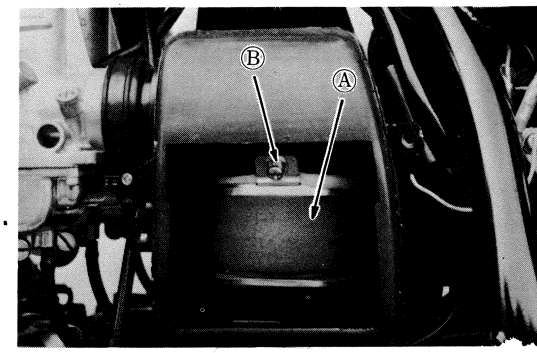


Fig. 1-47

2. Take the polyurethane filter out of the element by unscrewing 2 screws and wash it with gasoline.
3. After squeeze gasoline out of the filter, soak it into MOTOR OIL.
4. Wring oil out of the filter and then fit it to the element.

CAUTION: Do not wring the element to squeeze off gasoline or oil.


Fig. 1-48 CORRECT

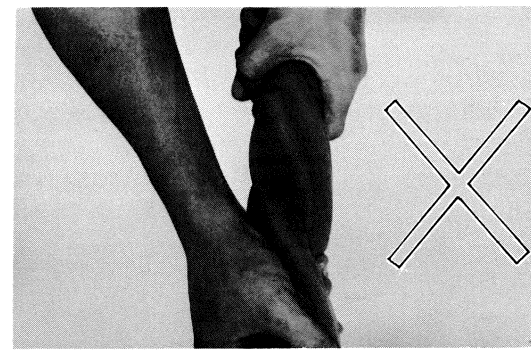


Fig. 1-49 INCORRECT

CARBURETOR

Carburetor jetting specification

Type	Main jet	Air jet	Needle jet	Jet neelde	Pilot jet	Pilot air jet	Cutaway	Air screw
VM26SS	100	0.7	O-6	5F21-3	15	1.6	1.5	1 turn back

Carburetor cleaning

Clean and inspect the carburetors by referring to the circuit diagram:

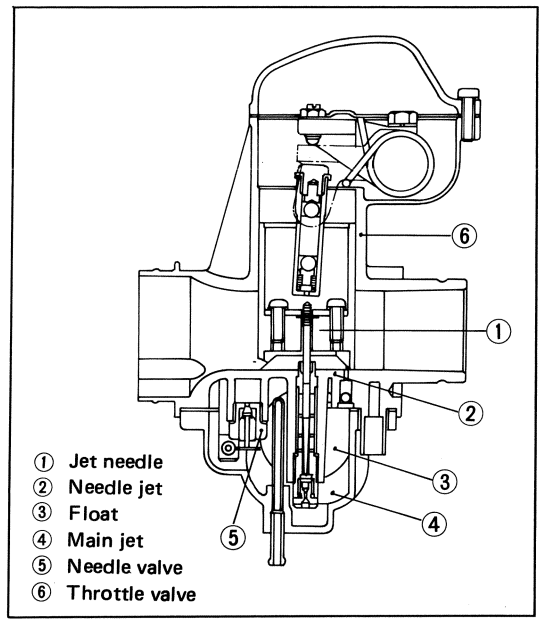


Fig. 1-50

Note: Do not disturb the screw shown in the photo.

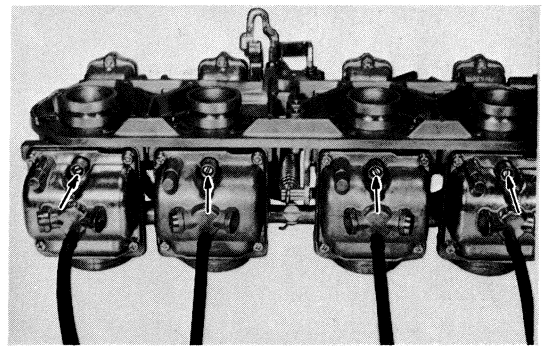


Fig. 1-51

Checking fuel level in each float chamber

1. Leave fuel cock lever in "ON" or "RES" position.
2. Remove float chamber screw and install the fuel level gauge (special tool).
3. Move fuel cock lever to "PRI" position to admit fuel into float chamber.
4. With the float chamber filled with fuel, turn the cock lever back to "ON" position, and start up the engine.

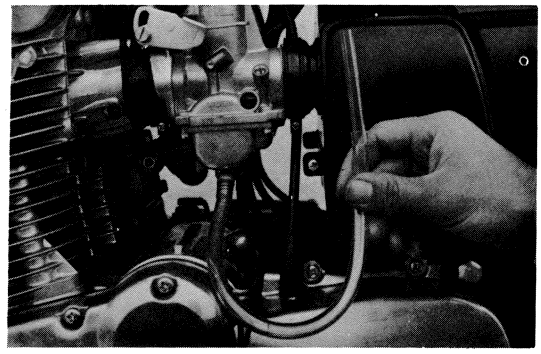


Fig. 1-52

5. Run the engine at the idling speed (1,000 - 1,100 rpm), and measure the distance Ⓐ with the middle line of the level gauge aligned with the mating surface of float bowl as shown in photo. Ⓐ should be within the range specified here.

Distance Ⓐ :	2.5 - 3.5 mm (0.098 - 0.138 in)

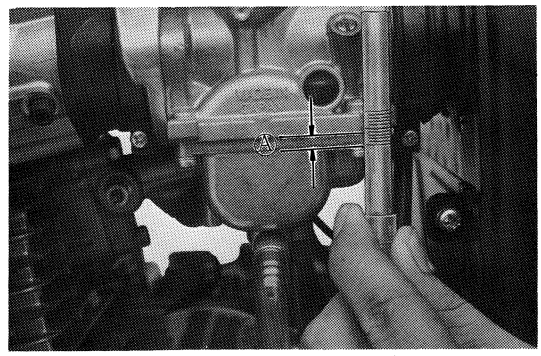


Fig. 1-53

Note: When refitting the screw, be sure to use the "O" ring.

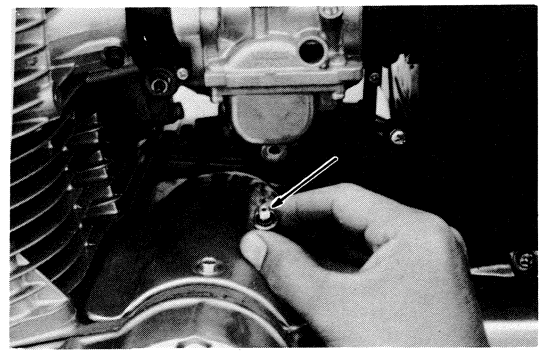


Fig. 1-54

Fuel level adjustment

If the distance Ⓐ measured is not within the specified range, it means that the float height Ⓗ is off the specification. To adjust this height, proceed as follows:

Remove float bowl, and bend the float arm to increase or decrease the height to this value:

Float height Ⓗ :	25 - 27 mm (0.984 - 1.063 in)

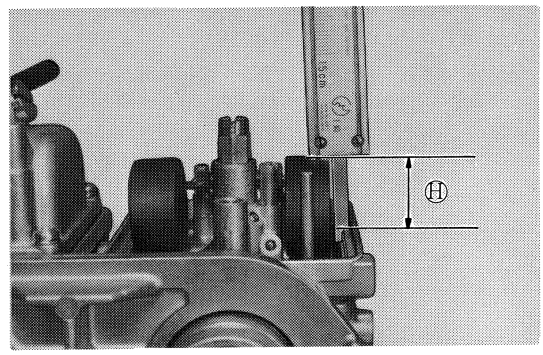


Fig. 1-55

IMPORTANT: Be sure to have the gasket removed before measuring the height.

Bending the arm upward Ⓐ raises the level; being it downward Ⓑ lowers the level (in the inverted condition of the carburetor).

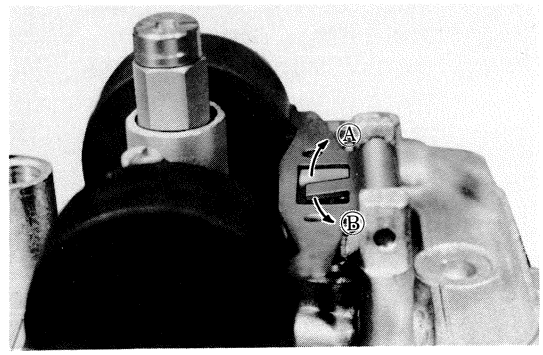


Fig. 1-56

CAMSHAFT

One camshaft is meant for intake valves and the other for exhaust valves. Be sure to discriminate the two. The camsafts should be checked for deflection and also for the wear of cams and journals if the engine has been noted to give abnormal noise or vibration or to lack output power. Any of these malconditions could be caused by camshafts worn down or distorted to the service limit.

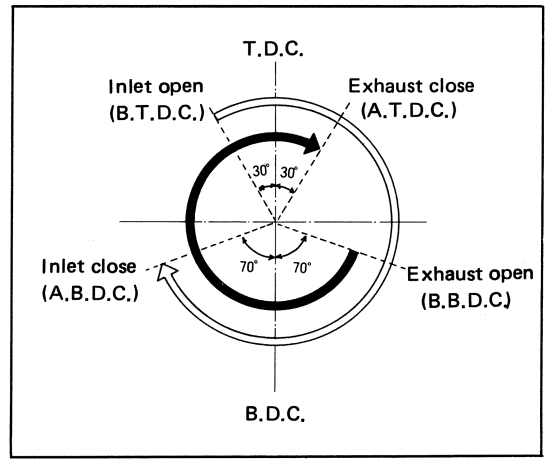


Fig. 1-57

Cam wear

Worn-down cams are often the cause of mistimed valve operation resulting in reduced output power. The limit of cam wear is specified for both intake and exhaust cams in terms of cam height Ⓗ . which is to be measured with a micrometer. Replace camshafts if found worn down to the limit.

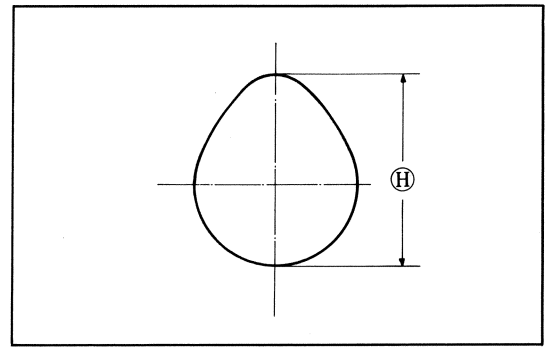


Fig. 1-58

Cam height specification

Height (H)	Standard	Service limit
Intake cams	36.265 - 36.295 mm (1.4278 - 1.4289 in)	36.15 mm (1.4232 in)
Exhaust cams	35.735 - 35.765 mm (1.4069 - 1.4081 in)	35.60 mm (1.4016 in)

Journal wear

Determine whether each journal is worn down to the limit or not by measuring the running clearance with the camshaft installed in place. Use plastigage to read the clearance, which is specified as follows:

Clearance specification (for both camshafts)

Standard	Service limit
0.020 - 0.054 mm (0.0008 - 0.0021 in)	0.15 mm (0.0059 in)

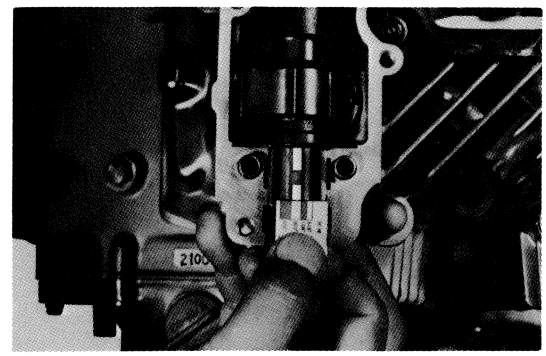


Fig. 1-59

Be sure to have each camshaft fastened down in place by its bearing caps. Have the cap bolts tightened to this torque value:

Cap bolt torque	0.8-1.2 kg-m (5.8-8.7 lb-ft)

Camshaft deflection

Measure the deflection with a dial gauge. Replace the camshaft if the deflection read exceeds the limit.

Deflection specification

Standard	Service limit
0.03 mm (0.0012 in)	0.1 mm (0.00394 in)

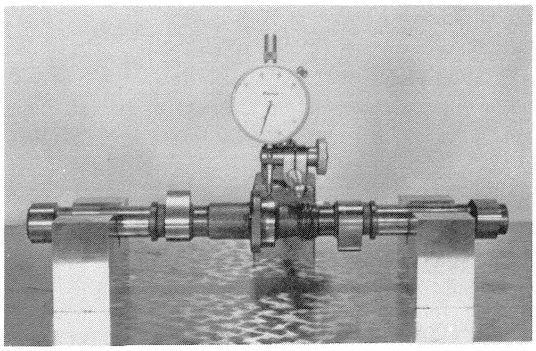


Fig. 1-60

CAMCHAIN TENSION ADJUSTOR

Move the pushrod back and forth with fingers to see if it moves smoothly as it should. If the pushrod sticks or otherwise moves erratically, replace it.

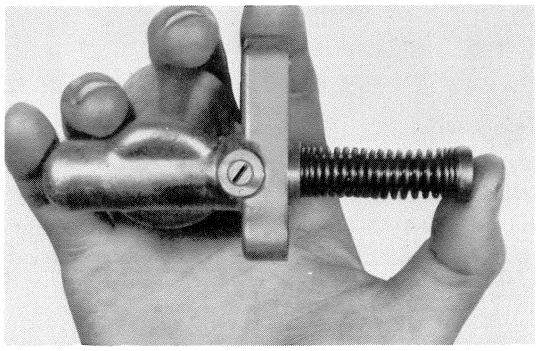


Fig. 1-61

CYLINDER HEAD

1. Decarbon combustion chambers.
2. Check the gasketed surface of the cylinder head for flatness with a straightedge and feeler gauge, taking a clearance reading at several places indicated. If the largest reading at any position of the straightedge exceeds the limit, replace the cylinder head.

Cylinder head flatness specification

Standard	Service limit
0.03 mm (0.0012 in)	0.25 mm (0.0098 in)

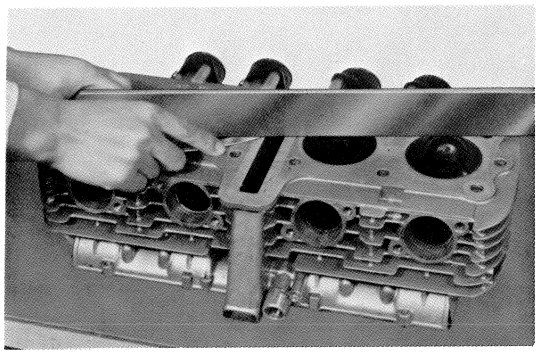


Fig. 1-62

VALVE

Valve face wear

Visually inspect each valve for wear of its seating face. Replace valve if found with an abnormally worn face.

The thickness Ⓣ decreases as the wear of the face advances. Measure the thickness and, if the thickness is found to have decreased to the limit, replace it.

Valve thickness specification

Standard	Service limit
0.8 - 1.2 mm (0.0315 - 0.0472 in)	0.5 mm (0.0197 in)

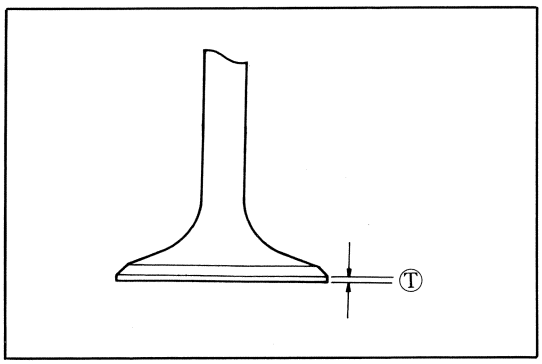


Fig. 1-63

Valve stem deflection

Support the valve with "V" blocks, as shown, and check its deflection with a dial gauge. The valve must be replaced if it exhibits a deflection exceeding the limit.

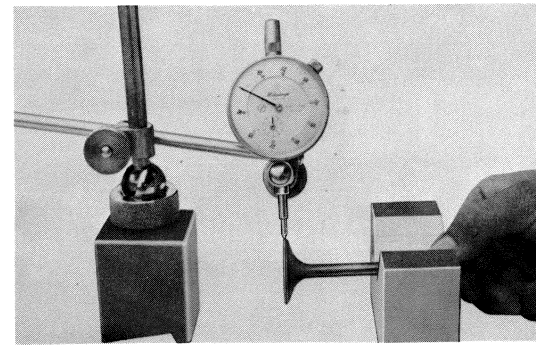


Fig. 1-64

Valve stem deflection specification

Service limit
0.05 mm (0.0019 in)

Valve-to-guide clearance

Measure the clearance in two directions, "X" and "Y", perpendicular to each other, by rigging up the dial gauge as shown. If the clearance measured exceeds the limit, specified below, then determine whether the valve or the guide should be replaced to reduce the clearance to the standard range:

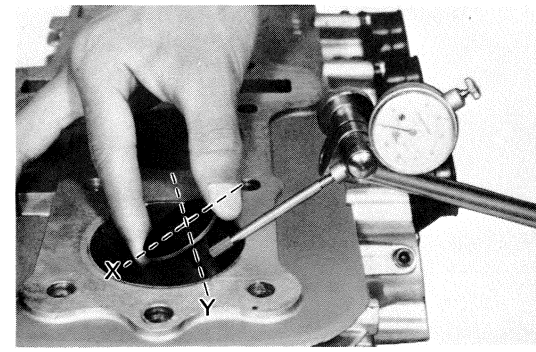


Fig. 1-65

Valve-to-guide clearance specification

Valve	Standard	Service limit
Intake valves	0.02 - 0.05 mm (0.0008 - 0.0019 in)	0.09 mm (0.0035 in)
Exhaust valves	0.03 - 0.06 mm (0.0012 - 0.0024 in)	0.10 mm (0.0039 in)

If the valve stem is worn down to the limit, as measured with a micrometer, where the clearance is found to be in excess of the limit indicated above, replace the valve; if the stem is within the limit, then replace the guide. After replacing valve or guide, be sure to recheck the clearance.

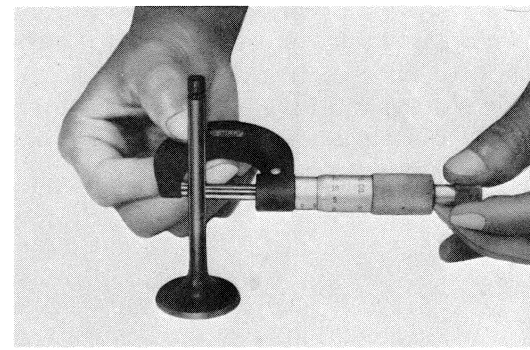


Fig. 1-66

Valve stem diameter specification

Valve	Standard	Service limit
Intake valves	6.965 - 6.980 mm (0.2742 - 0.2748 in)	6.90 mm (0.2716 in)
Exhaust valves	6.955 - 6.970 mm (0.2738 - 0.2744 in)	6.805 mm (0.2679 in)

VALVE SEATS

IMPORTANT: Before checking the seats for seat width and, as necessary, refacing the seats, make sure the valves and valve guides are in good condition.

Seat width measurement

Coat the valve seat with a paste of red lead uniformly. Fit the valve and tap the coated seat with the valve face in a rotating manner, in order to get a clear impression of the seating contact. In this operation, use the valve lapper to hold the valve head.

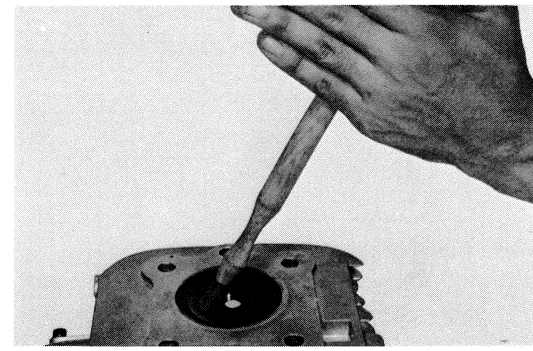


Fig. 1-67

The ring-like red lead impression left on the valve face must be continuous – without any break – and, in addition to this requirement, the width of the red-lead ring, which is the visualized seat "width", must be within the limit:

Valve seat with specification

Seat width	Standard	Wear limit
Ⓦ	1.0 - 1.2 mm (0.04 - 0.05 in)	1.5 mm (0.06 in)

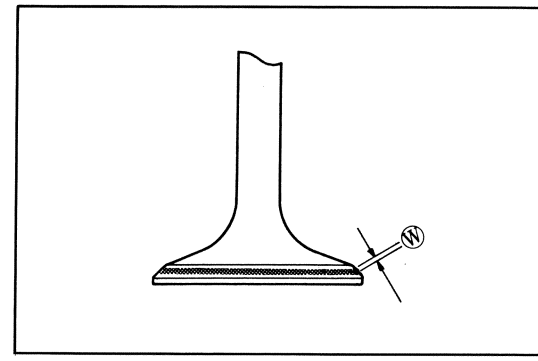


Fig. 1-68

If either requirement is not met, correct the seat by servicing it as follows:

Valve seat servicing

The valve seats for both intake and exhaust valves are angled to present three bevels, 15° (inner), 45° (middle) and 75° (outer). To reface the seat, proceed as follows:

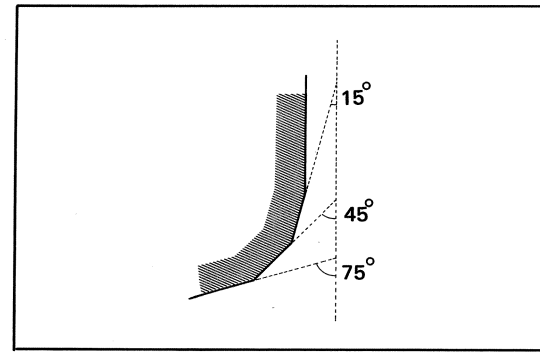


Fig. 1-69

1. Make cuts at 15° and 75° first, removing a minimum of stock at each.
2. Make a cut at 45°, producing a width of 1.0 to 1.2 mm (0.04 - 0.05 in). The amount of stock removed in this cutting directly affects the valve position in regard to tappet clearance.

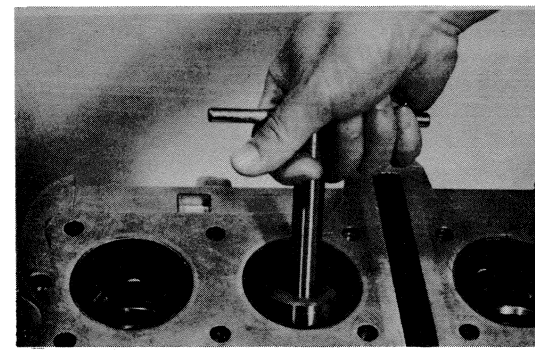


Fig. 1-70

NOTE: This is a delicate machining operation, and must be carried out cautiously, bearing in mind the possibility of raising the valve so much toward the camshaft as to render the tappet clearance unadjustable even with the thinnest shim fitted to the tappet.

3. Lap the seat with two or three sizes of lapping compound. Use the coarse compound to produce contacting width by operating the valve lapper in the usual manner. Finish the seat width with the fine compound.

Fig. 1-71

4. Clean the seat after lapping. Check the seat width with the valve in the manner outlined above, with the red-lead paste applied uniformly to the seat.

NOTE: After servicing the valve seats, be sure to adjust the tappet clearance when the cylinder head has been installed in reassembly.

5. If, by any chance, too much stock was removed from the seat in refacing work, resulting in loss of the specified tappet clearance even with the thinnest shim disc, then the only remedy is to grind off the stem end face of the valve with a valve refacer, thereby shortening the overall length of the valve.

IMPORTANT: This remedy is permissible where the length Ⓐ will not be reduced to less than 4.0 mm. If this length becomes shorter than 4.0 mm, then the valve must be replaced.

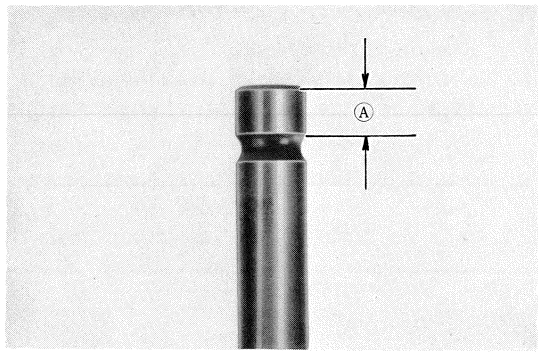


Fig. 1-72

IMPORTANT: After installing the valve whose stem end has been ground off as above, check to be sure that the face Ⓑ of valve stem end is above cotter pin Ⓒ.

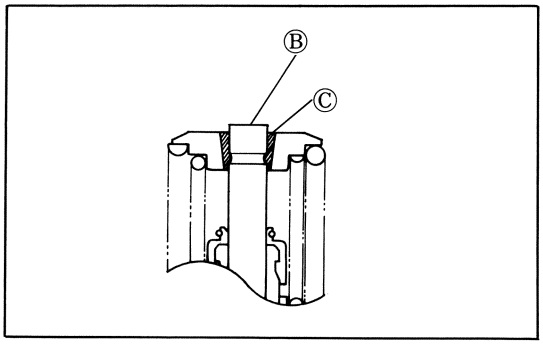


Fig. 1-73

VALVE SPRING

It is the force of the two coil springs by which the valve seats tight. Weakened springs result in reduced engine power output, and often account for the chattering noise coming from the valve mechanism.

Check the springs for strength by measuring their free lengths and also the force required to compress them. If the limit indicated below is exceeded by the free length reading or if the measured force does not fall within the range specified, replace the spring by replacement one of SUZUKI supply.

NOTE: Replace two springs at a time, outer and inner, if any one of these is found to be beyond the limit.

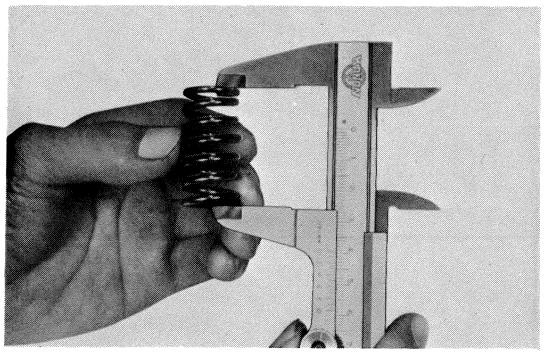


Fig. 1-74

Free length specification

Spring	Standard	Limit
INNER	35.3 - 37.0 mm (1.39 - 1.46 in)	33.8 mm (1.33 in)
OUTER	43.0 - 43.25 mm (1.69 - 1.703 in)	41.5 mm (1.63 in)

Spring rate specification

INNER	29.3 - 34 kg/23 mm (64.59 - 74.96 lb/0.91 in)
OUTER	50.4 - 58.3 kg/27 mm (111.11 - 128.53 lb/1.06 in)

IMPORTANT: Inner and outer valve springs are obtained from two sources of outside supply. So, when replacing the valve springs, be sure to satisfy these two requirements: 1) Inner and outer valve springs shall be of the same make (coming from the same manufacturer); and 2) the inner and outer springs for each valve shall be treated as a pair: replacing only the inner or the outer spring is not permitted.

CYLINDER

To check the cylinders for wear, take I.D. readings on each and determine whether the cylinder needs reworking to the next oversize. For this purpose, use the cylinder gauge (special tool) and take a total of 6 readings at three elevations in longitudinal and transverse directions, two readings at each elevation.

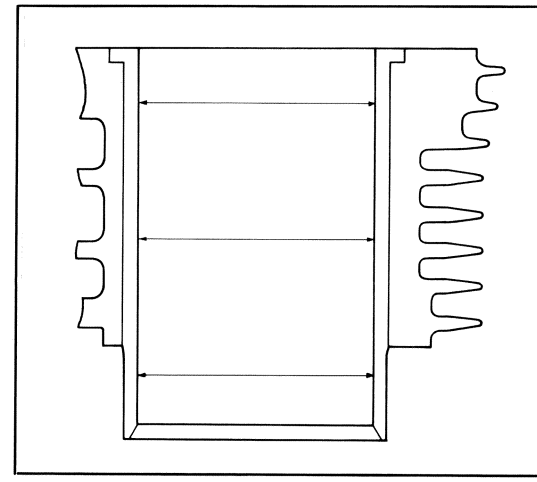


Fig. 1-75

If any of the readings exceeds the I.D. limit or if the difference between the maximum and the minimum reading exceeds the limit on difference or, further, if the bore surface is found badly burned or scored, rebore the cylinder to the size determined by the oversize piston available.

Limit on difference between maximum and minimum readings (max. allow able difference)	0.1 mm (0.0039 in)

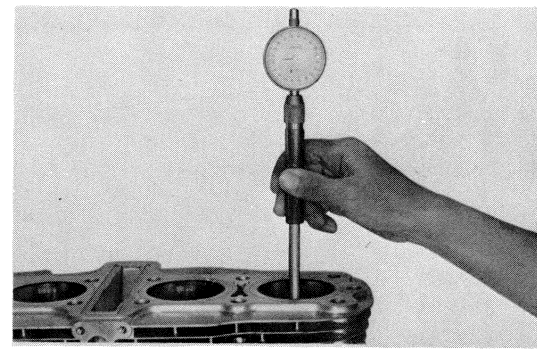


Fig. 1-76

Cylinder I.D. specification

Standard I.D.	I.D. limit
65.000 - 65.015 mm (2.5591 - 2.5596 in)	65.100 mm (2.5629 in)

Oversize piston	0,5 mm, 1.0 mm

Piston-to-cylinder clearance	0.050 - 0.060 mm (0.0020 - 0.0024 in)

PISTON AND PISTON RING

Piston wear determination

Mike the piston at the places and in the directions indicated. If the service limit is reached, replace the piston.

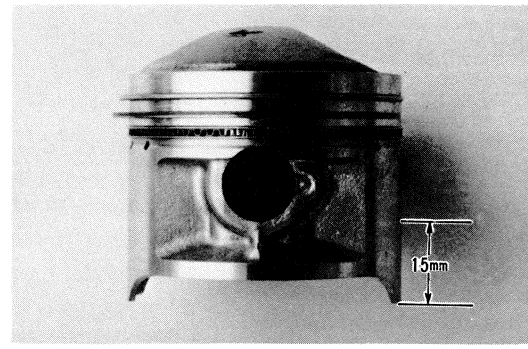


Fig. 1-77

Piston diameter specification

Standard	Service limit
64.945 - 64.960 mm (2.5569 - 2.5575 in)	64.80 mm (2.5512 in)

Decarboning

Using a soft-metal scraper, decarbon the crown of the piston. Clean the ring grooves similarly.

Piston ring clearance in the groove

Check on each ring with a thickness gauge. If the limit on clearance is exceeded by any of the three rings, determined whether the ring or the piston should be replaced by measuring the ring thickness and the groove width. Limits are specified for the width and thickness.

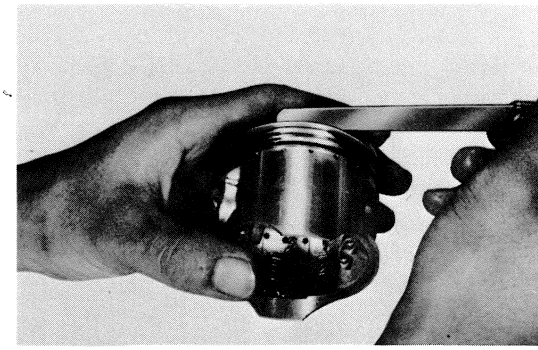


Fig. 1-78

Ring-to-groove clearance specification

Piston ring	Standard	Limit
TOP	0.020 - 0.055 mm (0.0008 - 0.0022 in)	0.18 mm (0.007 in)
MIDDLE	0.020 - 0.060 mm (0.0008 - 0.0024 in)	0.18 mm (0.007 in)
OIL	———	0.15 mm (0.006 in)

Ring thickness specification

Piston ring	Standard	Limit
TOP	1.175 - 1.190 mm (0.0463 - 0.0469 in)	1.10 mm (0.043 in)
MIDDLE	1.170 - 1.190 mm (0.0460 - 0.0469 in)	1.10 mm (0.043 in)

Ring groove width specification

Ring groove	Standard	Limit
TOP	1.21 - 1.23 mm (0.0476 - 0.0484 in)	1.30 mm (0.051 in)
MIDDLE	1.21 - 1.23 mm (0.0476 - 0.0484 in)	1.30 mm (0.051 in)
BOTTOM	2.51 - 2.53 mm (0.0988 - 0.0996 in)	2.60 mm (0.102 in)

Piston ring gap

Each piston ring, with the exception of oil rings, is required to have its ring gap within the specified range and must be replaced if the limit is exceeded. To measure the gap, fit the ring to the cylinder at its skirt portion near the end and measure the gap. The specification values indicated here refer to the gap measured in this condition.

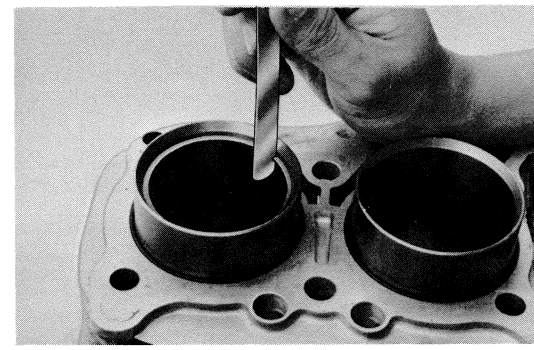


Fig. 1-79

Ring gap specification

Piston ring	Standard	Limit
TOP and MIDDLE	0.1 - 0.3 mm (0.004 - 0.012 in)	0.6 mm (0.024 in)

A piston ring with its elastic strength reduced to a critical value must be replaced. For this reason, the limit is specified on free-state ring gap, as follows.

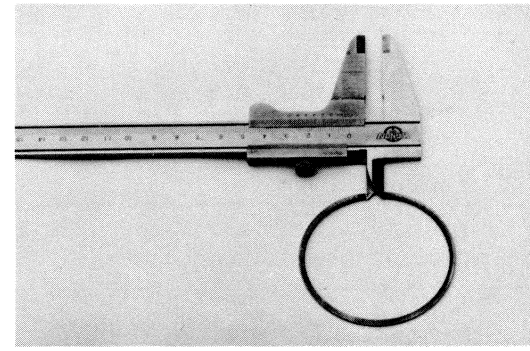


Fig. 1-80

Free-state ring gap specification

Piston ring	Standard	Limit
TOP	8 mm (0.31 in)	6 mm (0.24 in)
MIDDLE	8 mm (0.31 in)	6 mm (0.24 in)

CRANKSHAFT

Crankpin wear and big end side clearance

Check the wear of each crankpin in terms of connecting rod movement by using a dial gauge as shown.

Deflection service limit	3 mm (0.11 in)

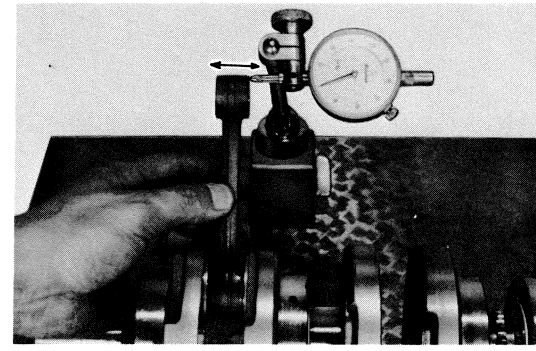


Fig. 1-81

Push the big end of the connecting rod to one side and measure its side clearance with a thickness gauge.

Big end side clearance specification

Standard	Limit
0.1-0.65 mm (0.0039-0.0256 in)	1.0 mm (0.04 in)

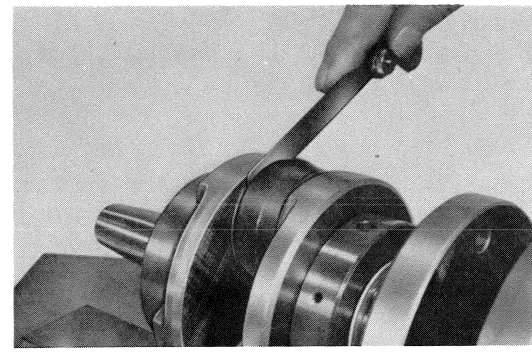


Fig. 1-82

Where the limit is exceeded, replace crankshaft assembly or reduce the deflection and the side clearance within the limit by replacing the worn parts — connecting rod, big end bearing, crankpin and thrust washer etc.

Crankshaft deflection

Support the crankshaft with "V" blocks as shown, with the two end bearings resting on the blocks. Rig up the dial gauge, as shown, and rotate the crankshaft slowly to read the deflection.

Replace the crankshaft if the deflection is greater than the limit.

Crankshaft deflection specification

Standard	Service limit
0 - 0.03 mm (0 - 0.0012 in)	0.06 mm (0.002 in)

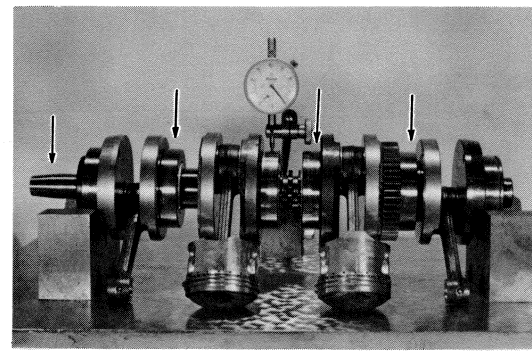


Fig. 1-83

OIL SUMP STRAINER

Wash the strainer clean, as necessary. Check to be sure that the strainer screen is free of any sign of rupture.

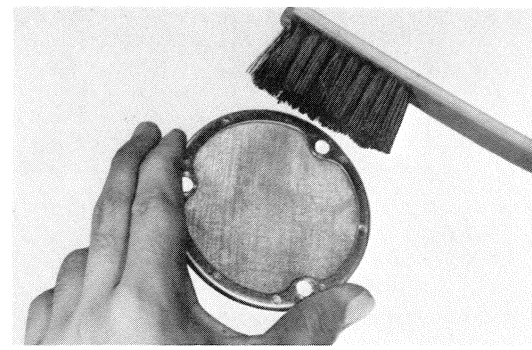


Fig. 1-84

OIL FILTER

Inspect the filter element for cleanliness. Replace the element if it is found dirty. Prescribed periodical replacement for this filter does not mean that the element should be replaced only at the end of each interval.

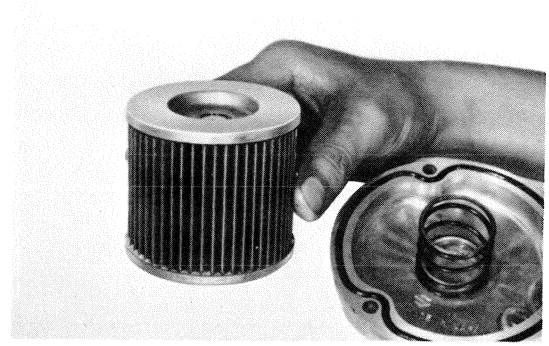


Fig. 1-85

OIL PUMP

There are three clearances to be checked in order to determine whether the oil pump should be replaced or not.

Tip clearance

This is the clearance between inner rotor and outer rotor. Use a thickness gauge.

Tip clearance limit	0.2 mm (0.008 in)

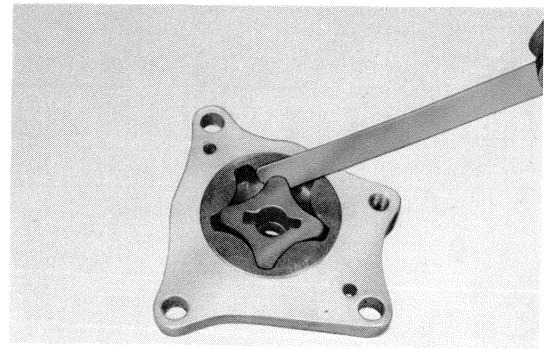


Fig. 1-86

Outer rotor clearance in the body

Use a thickness gauge.

Outer rotor clearance limit	0.25 mm (0.0098 in)

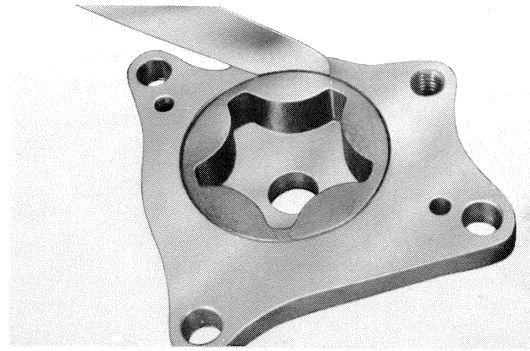


Fig. 1-87

Side clearance

Put a straightedge to the pump and measure the clearance under the straightedge, as shown.

Side clearance limit	0.15 mm (0.0059 in)

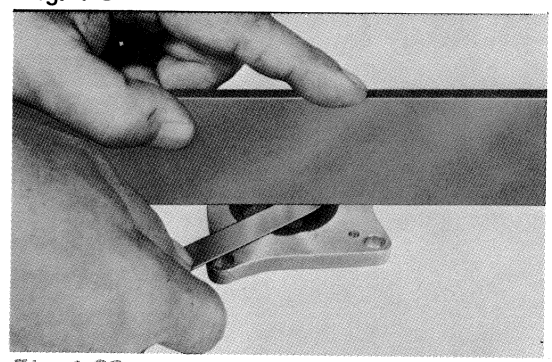


Fig. 1-88

The oil pump must be replaced where any of these limits is exceeded.

CLUTCH

Free length of clutch springs

Measure the free length of each coil spring with a caliper rule, and evaluate the elastic strength of each as against the specified limit. Replace any spring not within the limit.

Clutch spring free length specification

Standard (when new)	Limit
40.4 mm (1.59 in)	39.0 mm (1.54 in)

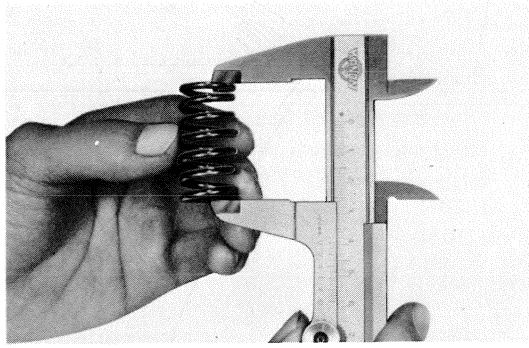


Fig. 1-89

Clutch drive plate wear

Measure the thickness of each drive plate with a caliper rule. Replace drive plates found to have worn down to the limit.

Drive plate thickness specification

Standard (when new)	Limit
2.9 - 3.1 mm (0.114 - 0.122 in)	2.7 mm (0.106 in)

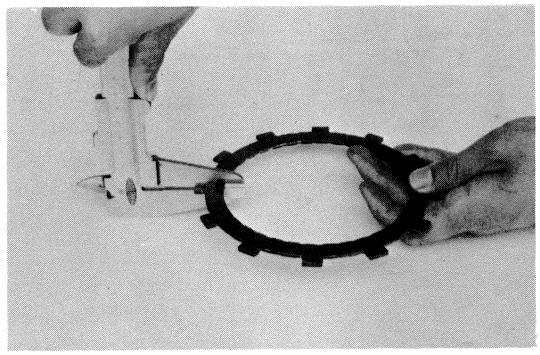


Fig. 1-90

Clutch plate distortion

Check each plate for distortion by placing it on a surface plate and by inserting a thickness gauge into under the clutch plate at several places. The limit on distortion in terms of clearance is the same for drive plates and driven plates, and is specified as follows:

Clutch plate distortion limit	0.3 mm (0.12 in)

Be sure to replace those plates, if any, exceeding this limit.

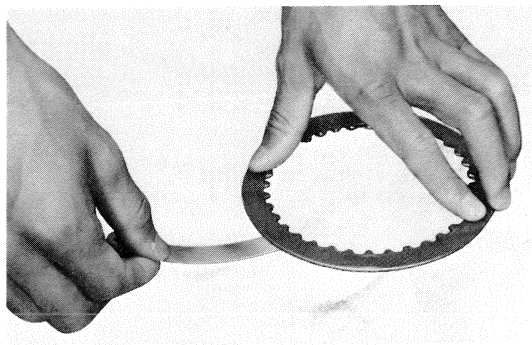


Fig. 1-91

TRANSMISSION

Gear backlash

Use a dial gauge to check the backlash. Drive gear and driven gear must be replaced if their backlash exceeds the limiting backlash.

Transmission gear backlash specification

Gears	Standard	Limit
1st, 2nd and 3rd	0 - 0.04 mm (0 - 0.002 in)	0.1 mm (0.004 in)
4th and 5th	0.05 - 0.1 mm (0.0019 - 0.004 in)	0.15 mm (0.006 in)

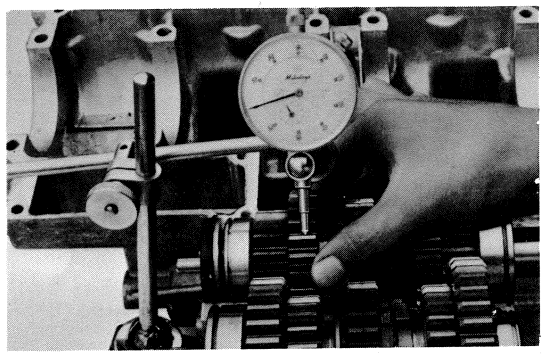


Fig. 1-92

Shift forks

"Gear slipping" is often due to excessively worn shift forks. Mike each shift fork thickness and, if the limit is reached, replace it.

Fork thickness specification

Standard	Limit
4.95 - 5.05 mm (0.195 - 0.199 in)	4.85 mm (0.191 in)

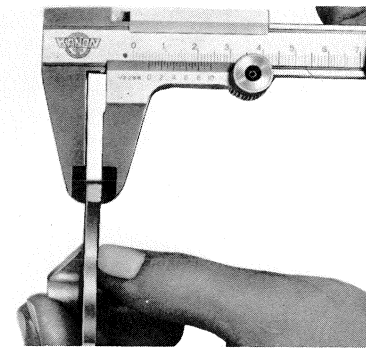


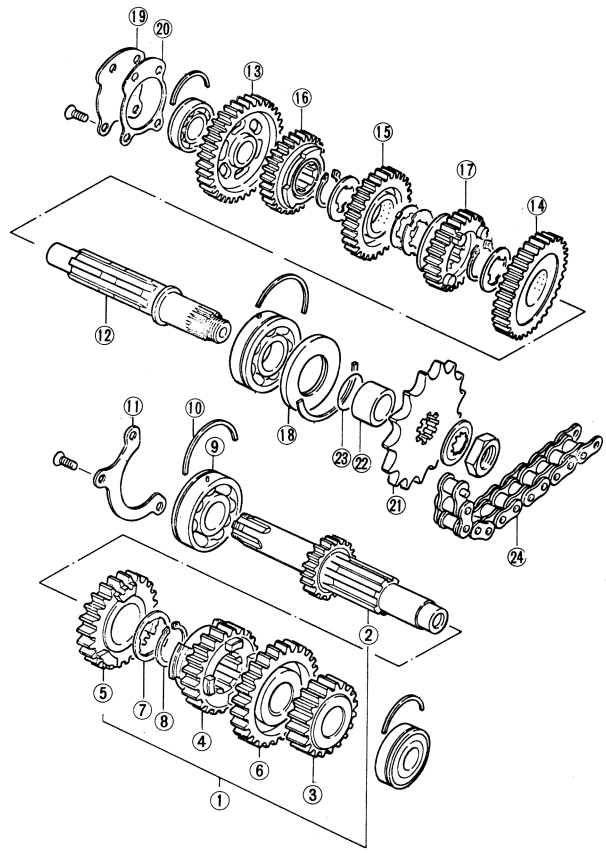
Fig. 1-93

ENGINE REASSEMBLY

The engine is reassembled by carrying out the steps of disassembly in the reversed order, but there are a number of steps which demand special descriptions or precautionary measures. Only those steps will be set forth on the components of the power unit.

NOTE: Apply engine oil to each running and sliding part before installing it in reassemblying.

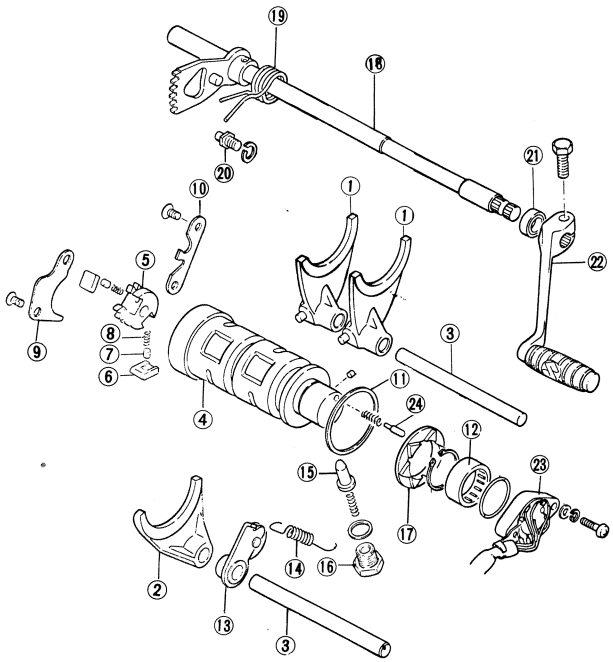
TRANSMISSION AND KICK STARTER



① Countershaft ass'y
② Countershaft
③ 2nd drive gear
④ 3rd drive gear
⑤ 4th drive gear
⑥ 5th drive gear
⑦ Washer
⑧ Circlip
⑨ RH bearing
⑩ C ring
⑪ Bearing holder
⑫ Driveshaft
⑬ 1st driven gear
⑭ 2nd driven gear
⑮ 3rd driven gear
⑯ 4th driven gear
⑰ 5th driven gear
⑱ Oil seal
⑲ Plate
⑳ Gasket
㉑ Engine sprocket
㉒ Spacer
㉓ O ring
㉔ Drive chain

Fig. 1-94

1. Mounting the gearshift forks



① 4th & 5th driven gear shifting fork
② 3rd drive gear shifting fork
③ Gear shifting fork shaft
④ Gear shifting cam
⑤ Cam driven gear
⑥ No. 1 pawl
⑦ Pin
⑧ Spring
⑨ Pawl lifter
⑩ Cam guide
⑪ Washer
⑫ Bearing
⑬ Cam stopper
⑭ Spring
⑮ Cam stopper
⑯ Stopper holder
⑰ Stopper plate
⑱ Gear shifting shaft
⑲ Spring
⑳ Arm stopper
㉑ Oil seal
㉒ Gear shifting lever assembly
㉓ Gear shifting switch body
㉔ Gear shifting contact switch

Fig. 1-95

Refer to the illustration in regard to the correct positions and orientations of the forks when installing these parts.

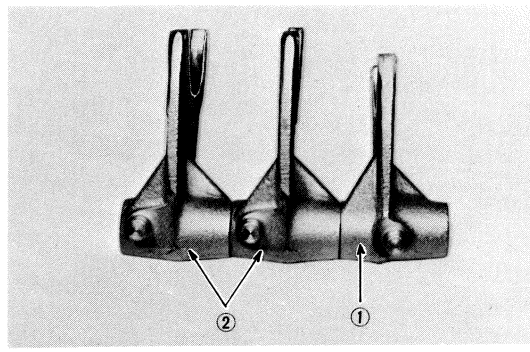


Fig. 1-96

① gearhisft fork for 3rd drive gear
② gearshift forks for 4th and 5th driven gears

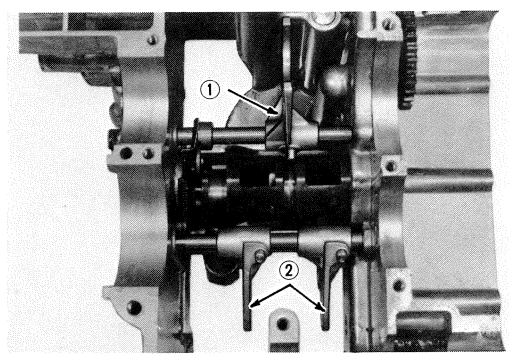


Fig. 1-97

2. Mounting 3rd gear on the drive shaft

Fit lock washer ① to the groove indicated.

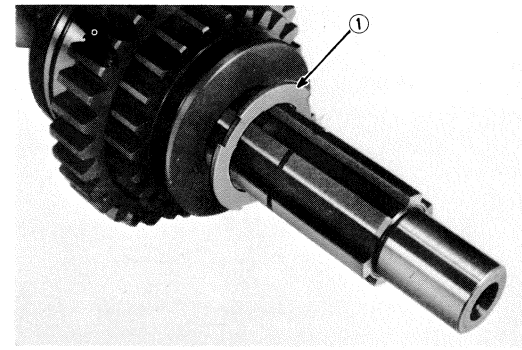


Fig. 1-98

Install lock washer ② as shown.

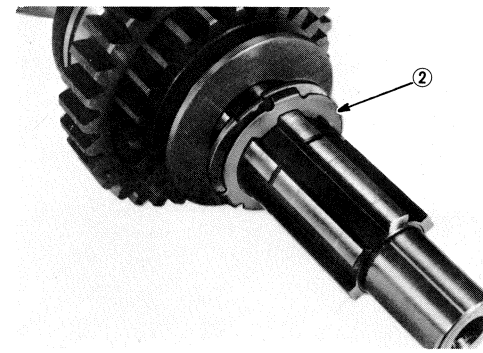


Fig. 1-99

Turn lock washer ① to fit the protrusion of ② into groove of ①, thus matching the two lock washer.

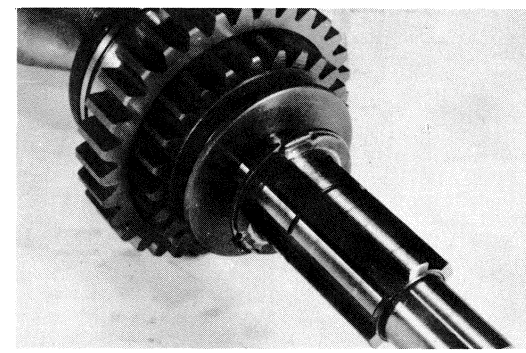


Fig. 1-100

Mount 3rd gear, and retain it in place by installing the washer and circlip.

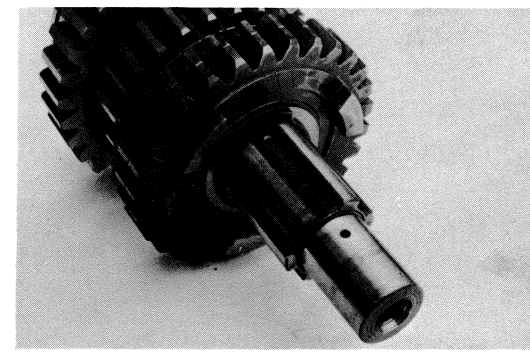


Fig. 1-101

3. Mounting 2nd drive gear on the countershaft
   Force-fit 2nd drive gear to a position where the distance between this drive gear and the 1st drive gear will take the value indicated:

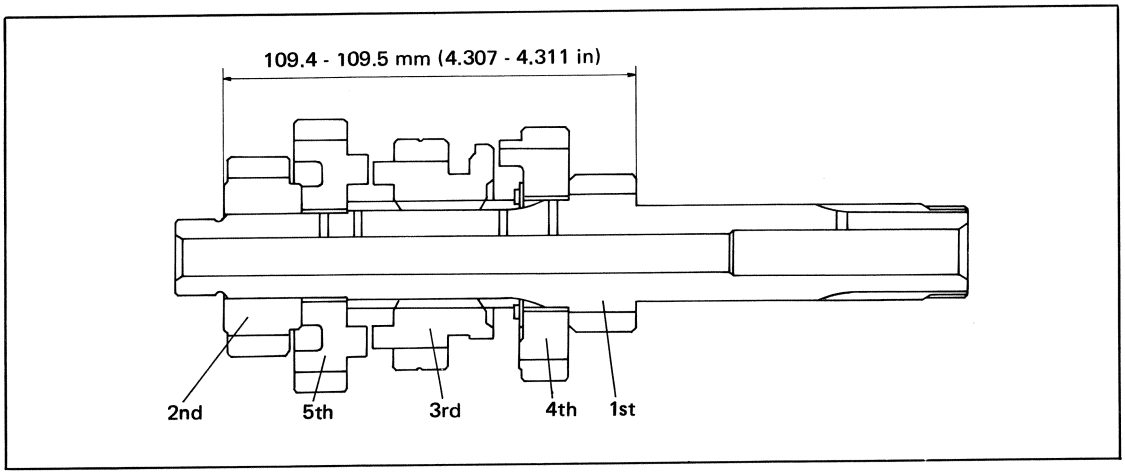


Fig. 1-102

NOTE: 1. Before mounting 2nd drive gear, apply "THREAD LOCK SUPER 103K" (99000-32020) to its bore, taking care not to smear 5th drive gear with "SUPER 103K".
2. After mounting the 2nd drive gear, check to be sure that 5th drive gear will spin smoothly by moving it with fingers.

4. Refer to the following illustration and photo in locating and positioning the other gears, washers and circlips.

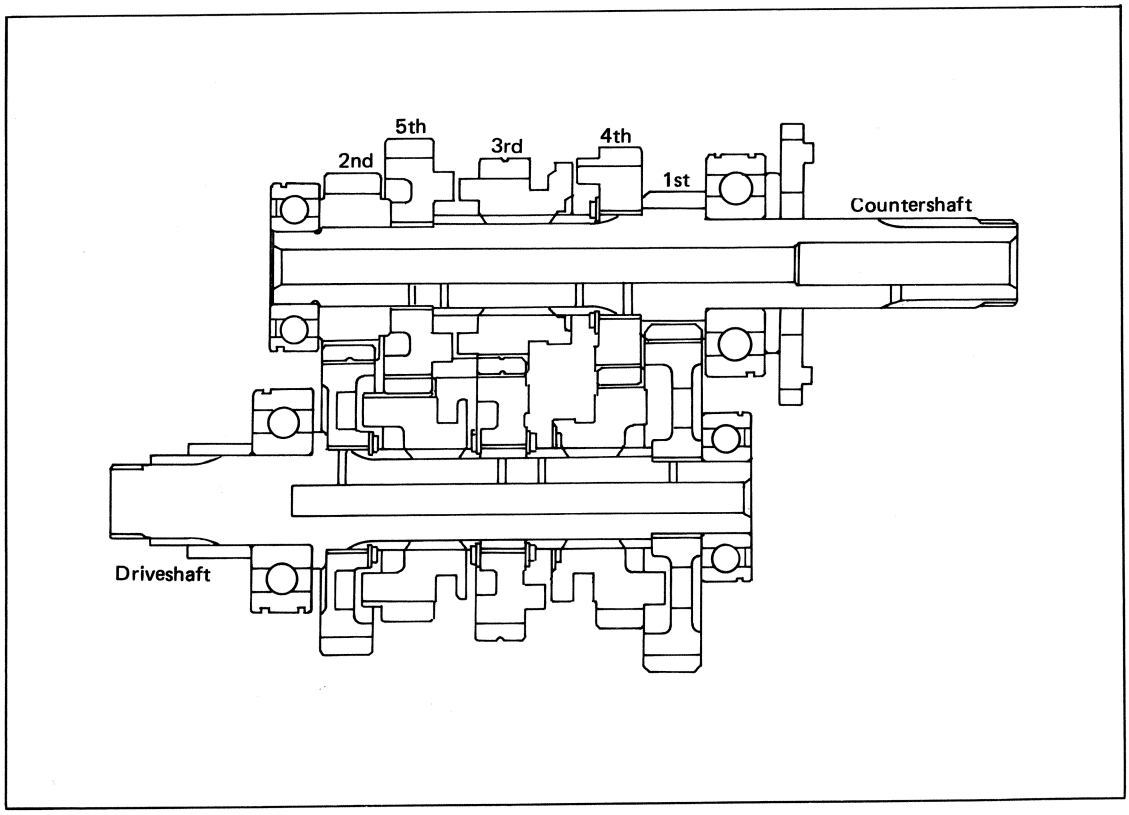


Fig. 1-103

5. Be sure to fit the "O" ring to the drive shaft at its portion indicated.

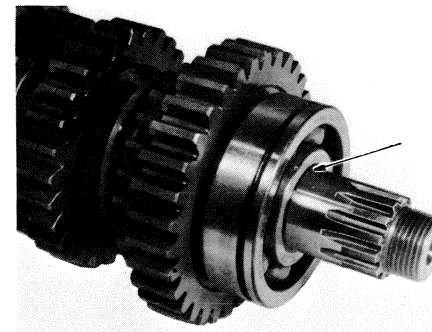


Fig. 1-104

6. When positioning the left-end bearing of countershaft and the right-end bearing of drive shaft, be sure to bring the oil seal side of the bearing to outer side.

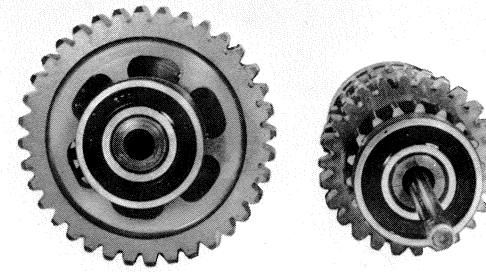


Fig. 1-105

7. Be sure to install the bearing dowel pins in the locations indicated.

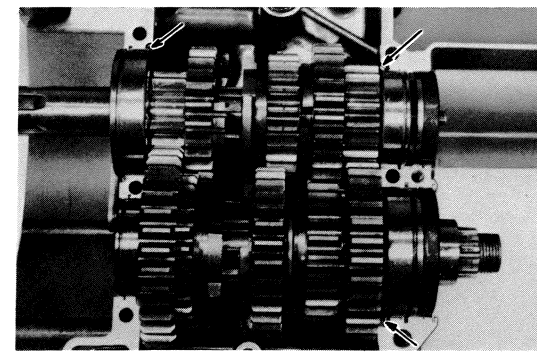


Fig. 1-106

8. Install the kick shaft and associated parts by referring to the illustration. When mounting kick drive gear on the shaft, be sure to match the punch mark on the gear to that on the shaft.

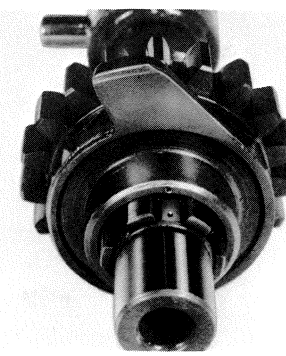
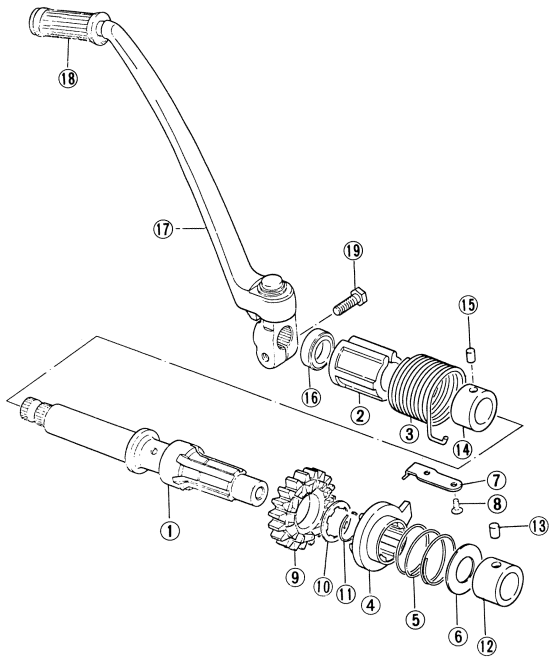


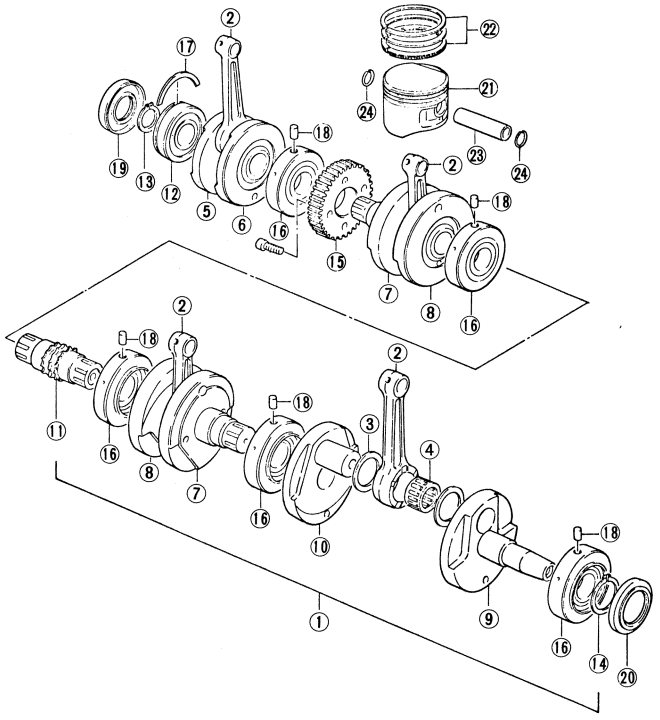
Fig. 1-107



① Kick starter shaft
② Spring guide
③ Spring
④ Kick starter
⑤ Spring
⑥ Plate
⑦ Starter guide
⑧ Screw
⑨ Kick starter drive gear
⑩ Washer
⑪ Circlip
⑫ LH bushing
⑬ Dowel pin
⑭ RH bushing
⑮ Dowel pin
⑯ Oil seal
⑰ Kick starter lever assy
⑱ Cover
⑲ Bolt

Fig. 1-108

CRANKSHAFT AND CRANKCASE



① Crankshaft ass'y
② Connecting rod
③ Washer
④ Bearing
⑤ RH crankshaft
⑥ RH crankshaft web
⑦ Middle crankshaft
⑧ Middle crankshaft web
⑨ LH crankshaft
⑩ LH crankshaft web
⑪ Timing chain drive shaft
⑫ RH bearing
⑬ Circlip
⑭ Circlip
⑮ Primary drive gear
⑯ Bearing
⑰ RH bearing C ring
⑱ Pin
⑲ RH oil seal
⑳ Starter clutch gear oil seal
㉑ Piston
㉒ Piston ring set
㉓ Piston pin
㉔ Circlip

Fig. 1-109

1. Position the lower crankcase chain guide as shown.

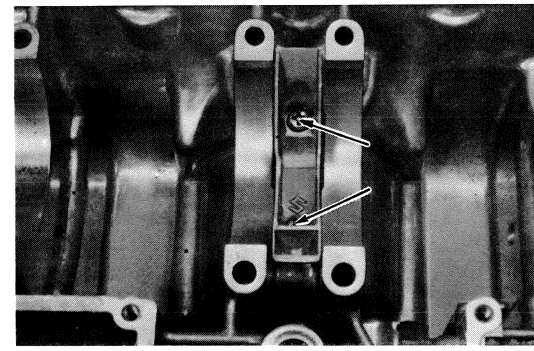


Fig. 1-110

2. Refer to the illustration as to the orientation of the right oil seal on crankshaft. Apply engine oil to the oil seal lip.

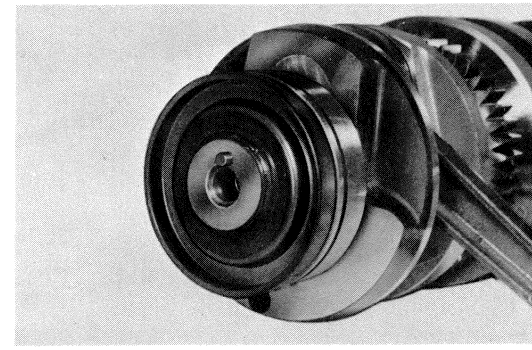


Fig. 1-111 CORRECT

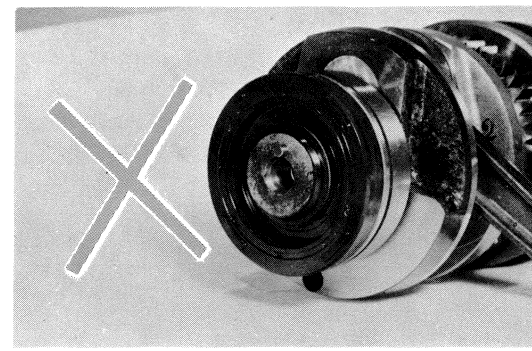


Fig. 1-112 INCORRECT

3. Install dowel pin Ⓐ in the hole Ⓑ for the crank bearing. For the right bearing, install dowel pin Ⓒ in groove Ⓓ.

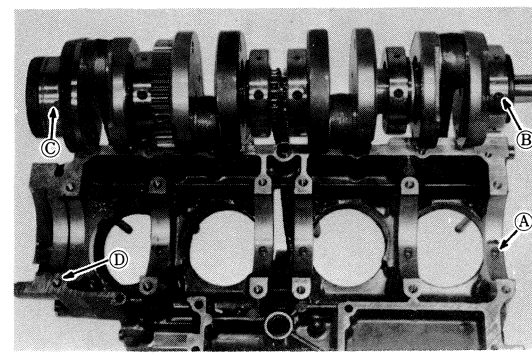


Fig. 1-113

4. Before fitting the lower crankcase to the upper one, be sure to apply "SUZUKI BOND No. 4" (99000-31030) to the mating face of the lower crankcase.

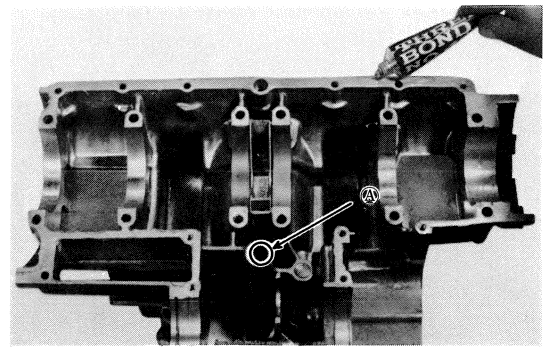


Fig. 1-114

- Be careful not to leave out "O" ring Ⓐ .
- When securing the lower crankcase, tighten the twelve 8-mm bolts in the ascending order of numbers assigned to these bolts, tightening each bolt a little at a time to equalize the pressure. Tighten all the securing bolts to the specified torque values.

Tightening torque for 8-mm bolts	2.0 kg-m (14.5 lb-ft)
Tightening torque for 6-mm bolts	1.0 kg-m (7.2 lb-ft)

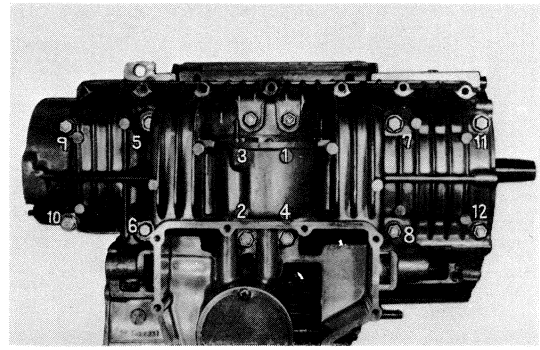


Fig. 1-115

5. Oil filter installation
   * This package contains a rubber seal ring in addition to the oil filter. When replacing the oil filter, be sure to also replace the seal ring for thorough oil-tight.
   * In fitting the seal ring to the filter chamber cap, lightly coat grease on the seal ring groove to avoid any chance of dropping or mislocating the ring during the installation work.

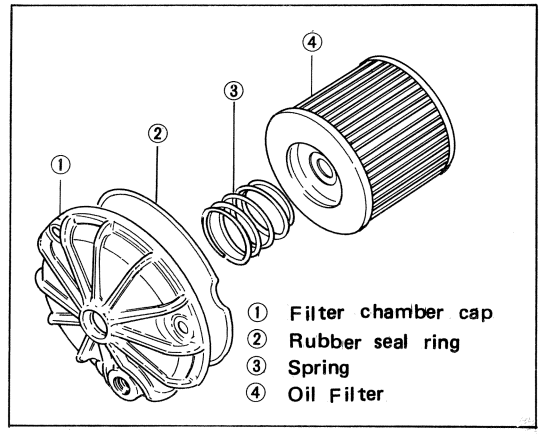
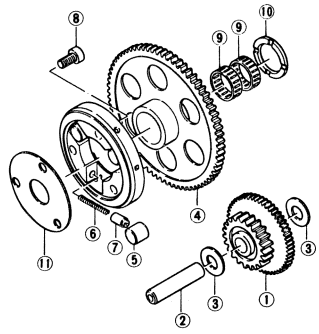


Fig. 1-116

STARTER AND GENERATOR ROTOR



① Starter idle gear
② Pin
③ Washer
④ Starter clutch gear
⑤ Roller
⑥ Spring
⑦ Push piece
⑧ Bolt
⑨ Bearing
⑩ Washer
⑪ Shim

Fig. 1-117

1. Be sure to position the copper washer ① for starter clutch gear as shown. The chamfered side ② of this washer faces the crank bearing.

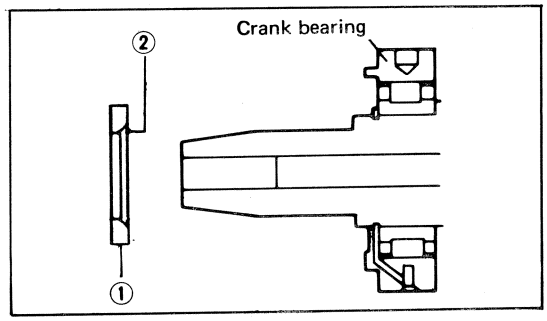


Fig. 1-118

2. Fit washers to idle gear, one washer to each side.

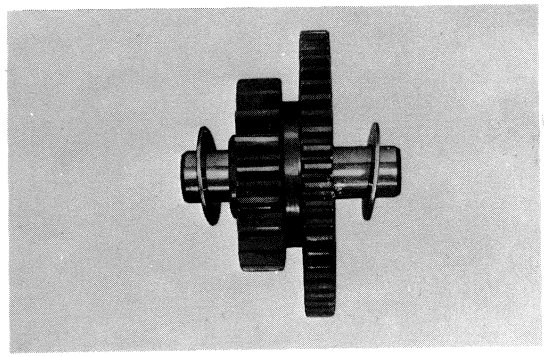


Fig. 1-119

3. Install the rotor, as follows:
   1) Degrease the tapered portion of the rotor and also the crankshaft. Use gasoline or similar solvent to wipe off the oily or greasy matter to make these surfaces completely dry.
   2) After mounting the rotor, secure the rotor by tightening the center bolt to the specified torque value.

Center bolt tightening torque	6.0 - 7.0 kg-m (43.4 - 50.6 lb-ft)

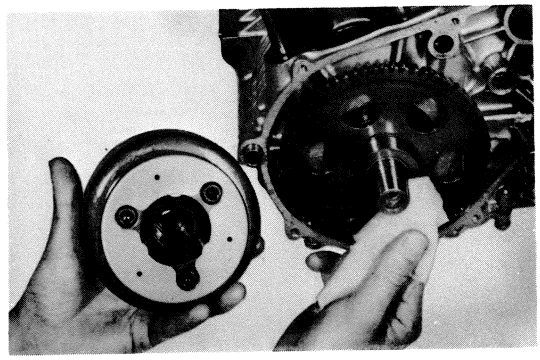


Fig. 1-120

4. Wire the starter, generator and gear positioning switch as shown in the photo.

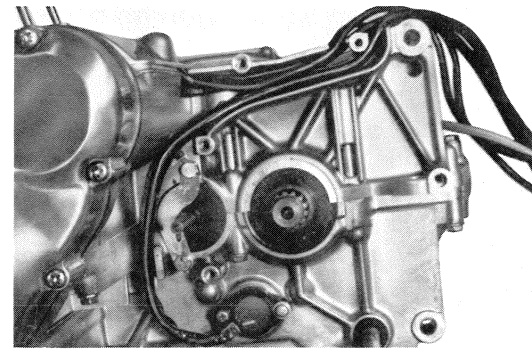


Fig. 1-121

GEARSHIFT MECHANISM

1. Of the two gearshift pawls, the narrow one Ⓐ takes its position to face the gear shift drum. Be sure to install these pawls correctly.

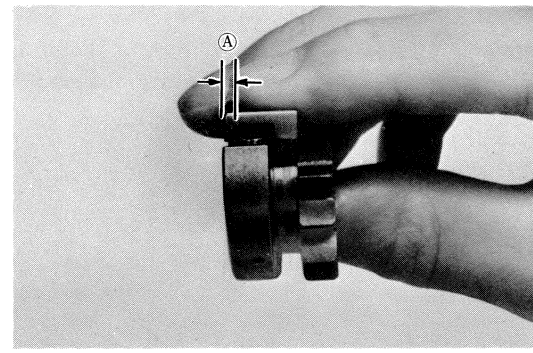


Fig. 1-122

2. There are 17 screws. Apply THREAD LOCK to these screws before running them in.

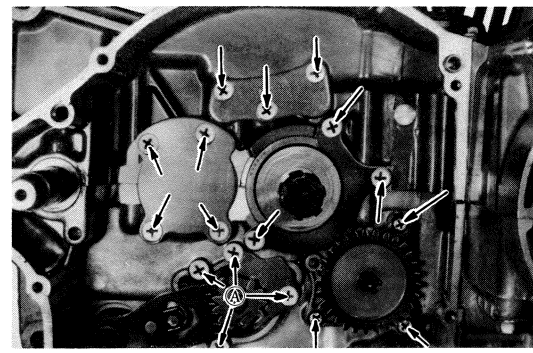


Fig. 1-123

NOTE: Four screws Ⓐ are shorter than the others in length.

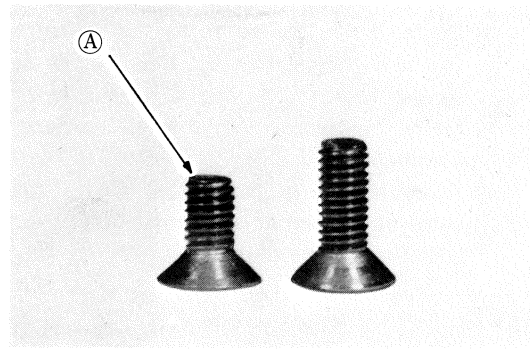


Fig. 1-124

3. Install the gearshift shafts, with the center of the gear on shaft side matched to the center of gearshift cam driven gear.

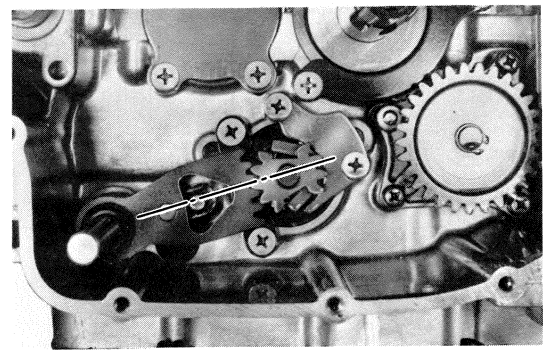


Fig. 1-125

OIL PUMP

Before starting to assemble the oil pump, apply engine oil to the sliding surfaces of the case, outer rotor, inner rotor and shaft; and proceed as follows:

1. Position the inner rotor as shown.

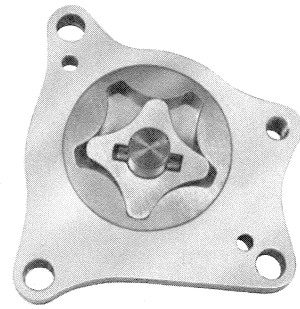


Fig. 1-126

2. Apply THREAD LOCK to the securing screw.

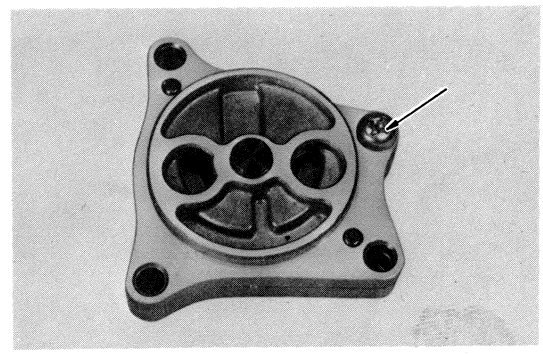


Fig. 1-127

3. Be careful not to leave out the two "O" rings.

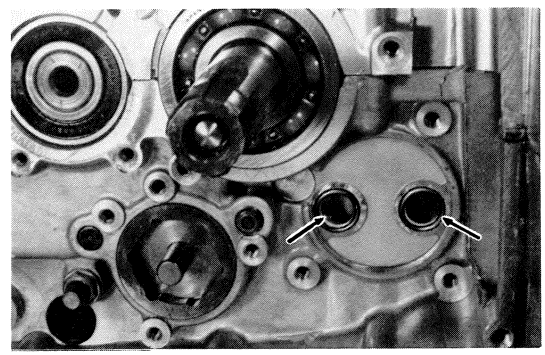


Fig. 1-128

CLUTCH , KICK STARTER SPRING AND ADVANCE GOVERNOR

1. Refer to the illustration for the correct positions of the clutch parts in their respective locations, paying particular attention to the orientation of each.

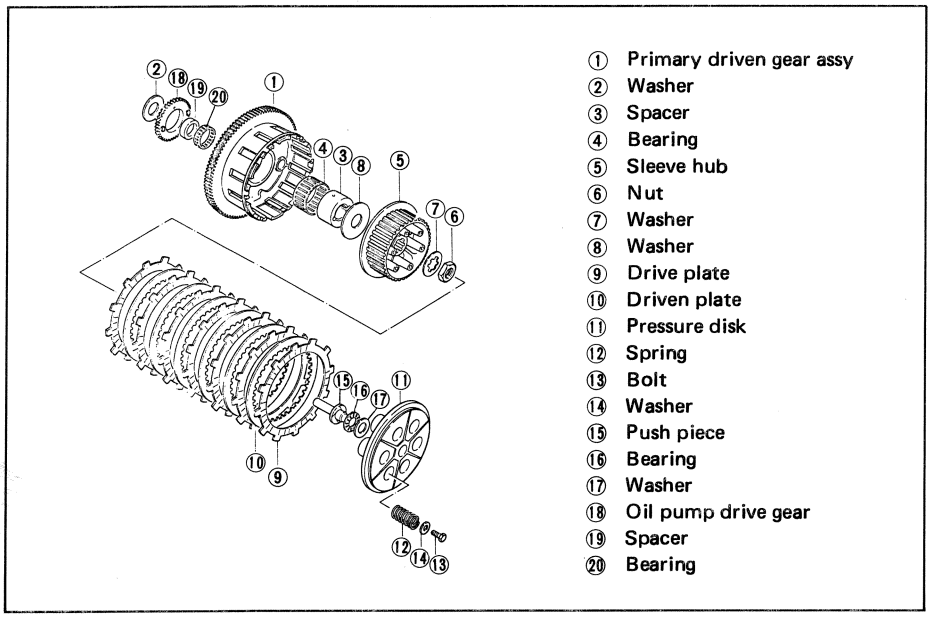


Fig. 1-129

2. When mounting the oil pump drive gear, be sure to fit its protrusion to the groove provided in primary driven gear.

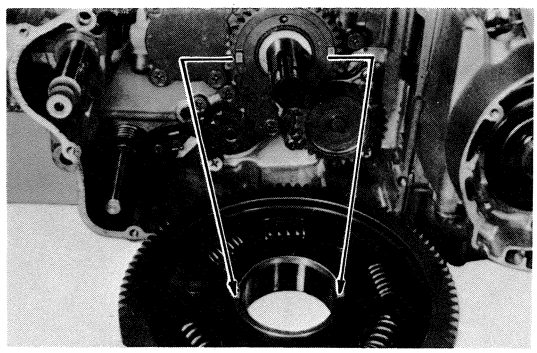


Fig. 1-130

3. Install the spacer as shown.

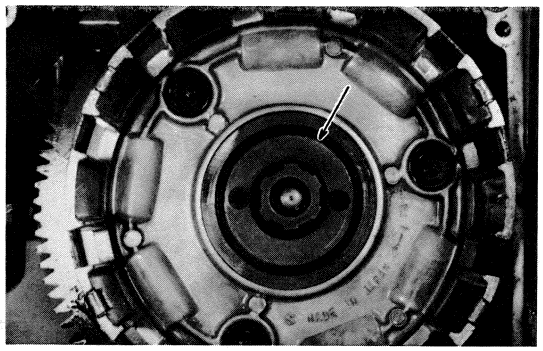


Fig. 1-131

4. Bear in mind that the thrust washer for clutch sleeve hub takes but one position in place.

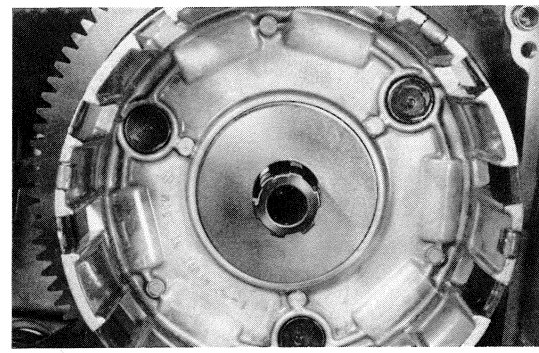


Fig. 1-132 CORRECT

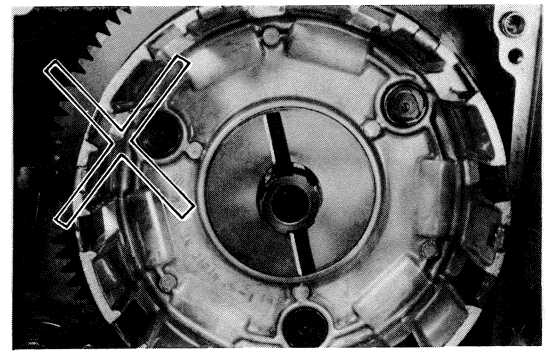


Fig. 1-133 INCORRECT

5. After tightening the clutch sleeve hub nut, be sure to lock the nut by positively bending the tongue of the washer. Tightening torque for the nut is specified.

Clutch sleeve hub nut tightening torque
4.0 - 6.0 kg-m (29.0 - 43.4 lb-ft)

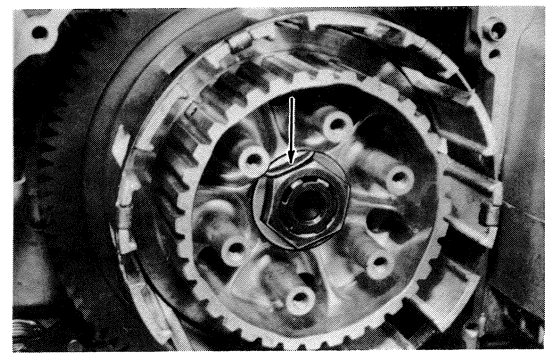


Fig. 1-134

NOTE: Tighten the clutch spring set bolts in the indicated manner, making sure that they are tightened just a little at a time to the same final tightness.

Clutch spring set bolt tightening torque
0.4 - 0.6 kg-m (2.9 - 4.3 lb-ft)

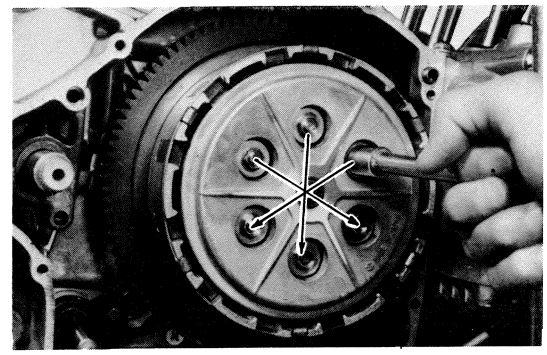


Fig. 1-135

6. Refer to the photo as to the method of installing the kick starter spring.

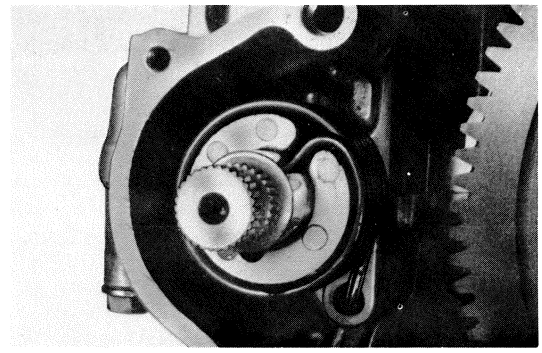


Fig. 1-136

7. When installing the advance governor, be sure that its protrusion fits snugly to the groove. Secure the governor by tightening its center bolt to this torque value:

Governor center bolt tightening torque
1.8 - 2.8 kg-m (13.0 - 20.3 lb-ft)

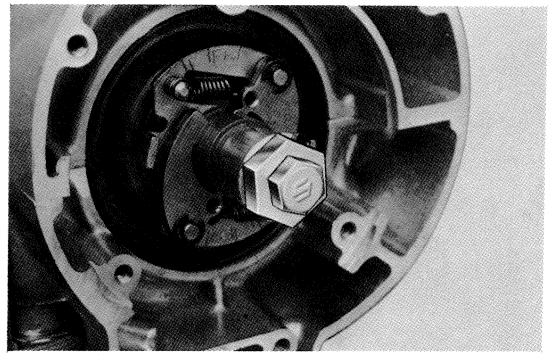


Fig. 1-137

PISTONS

Adhere to the following reminders when installing the pistons:

1. The piston is in correct position when its arrow (on the crown) points forward.
2. Discriminate the four pistons by referring to the cylinder numbers marked on their crowns at the time of disassembly.
3. Have each piston oiled lightly before installing it.
4. Be sure to use new circlips.

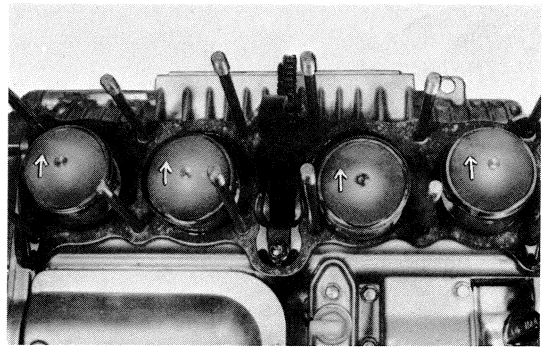


Fig. 1-138

PISTON RINGS

1. **Installing Top and 2nd Rings**
   Top ring and middle (2nd) ring differ in the shape of ring face and the face of top ring is chrome-plated whereas that of 2nd ring is not. The color of 2nd ring appears darker than that of the top one.

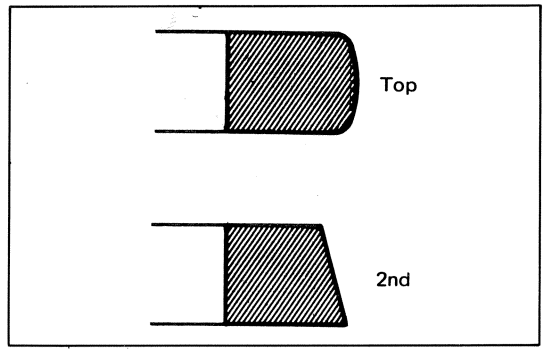


Fig. 1-139

Top and 2nd (middle) rings have letter "N" or "R" marked on the side. Be sure to bring the marked side to top when fitting them to the piston.
The spacer of bottom ring (oil ring) is either of "N" type or of "R" type. Be sure that the three rings (top, 2nd, and oil) for a piston are all "N" rings or "R" rings: use of one or two "N" rings and two or one "R" rings on a piston is not permitted.

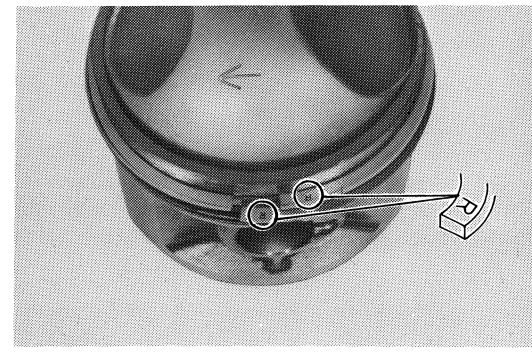


Fig. 1-140

2. **Installing oil Ring**
   The first member to go into the ring groove is spacer①. After placing spacer, fit the two side rails②. Side designations, top and bottom, are not applied to the spacer and side rails: you can position each either way.

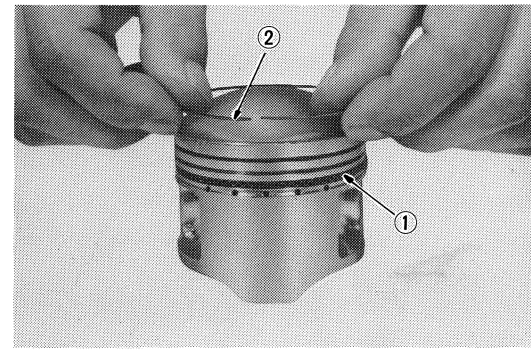


Fig. 1-141

CAUTION: If the spacer is of "N" type, be careful not allow its two ends to overlap in the groove.

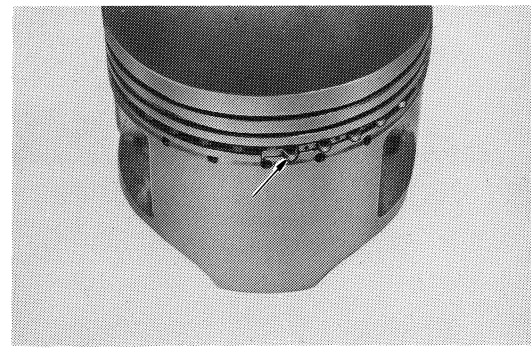


Fig. 1-142

3. Distribute the gaps of the three rings as shown. Before inserting each piston into the cylinder, check to be sure that the gaps are located as shown.

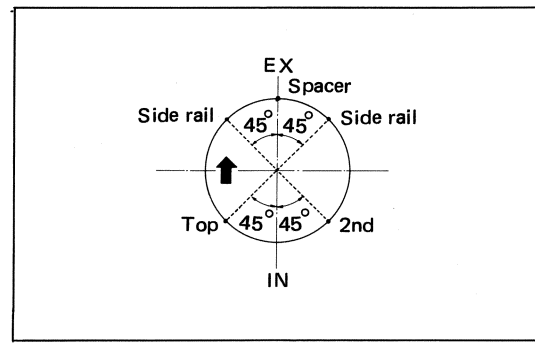


Fig. 1-143

CYLINDER BLOCK

1. Before putting on the cylinder block, oil the big and small ends of each connecting rod and also the sliding surface of each piston. Check to be sure that the "O" rings Ⓐ and Ⓑ are accurately positioned in the groove.

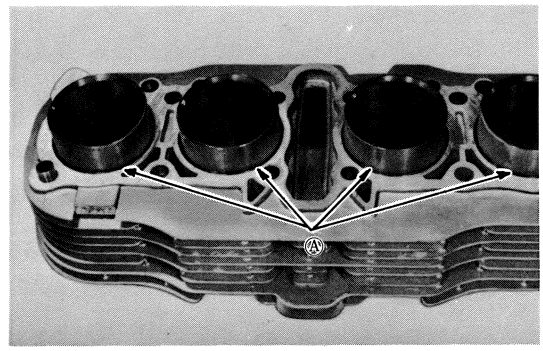


Fig. 1-144

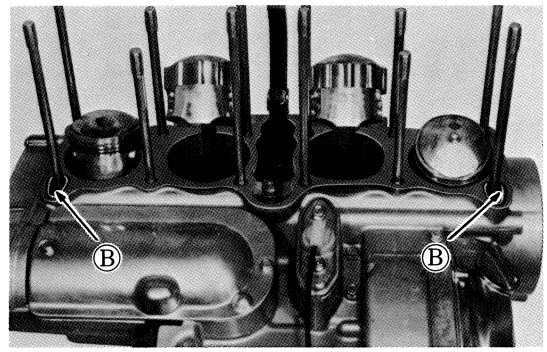


Fig. 1-145

2. Have the ring gaps set as shown in Fig. 1-143 on No. 2 and No. 3 pistons, and then install piston ring compressor (special tool) in the indicated manner. Some light resistance must be overcome to lower the cylinder block.

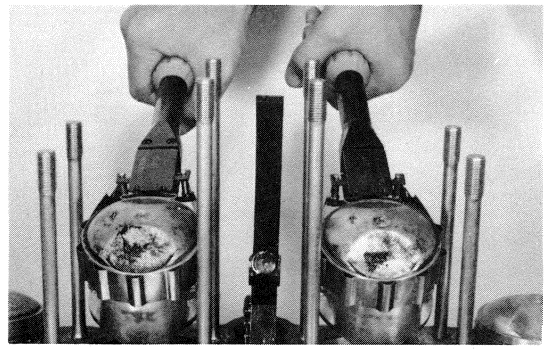


Fig. 1-146

NOTE: 1. Do not overtighten the special tool bands or the cylinders will resist to admit the pistons.
2. Each band has a number punch-marked on it. The number refers to a particular range of piston sizes.

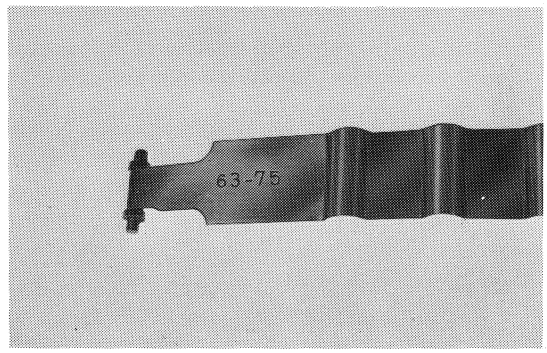


Fig. 1-147

3. With No. 2 and No. 3 pistons in place, install No. 1 and No. 4 pistons and insert them into the cylinders.

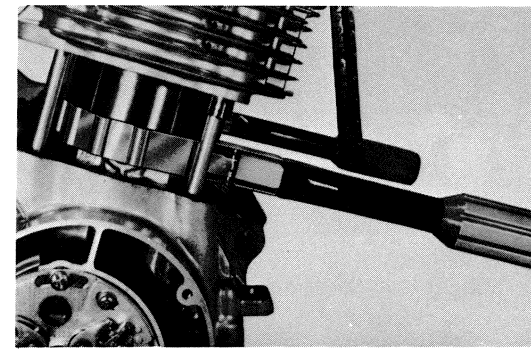


Fig. 1-148

NOTE: To rotate the crankshaft, hold down the timing chain with one hand and torque the shaft in normal running direction with the other hand, using a 19-mm wrench.

CYLINDER HEAD

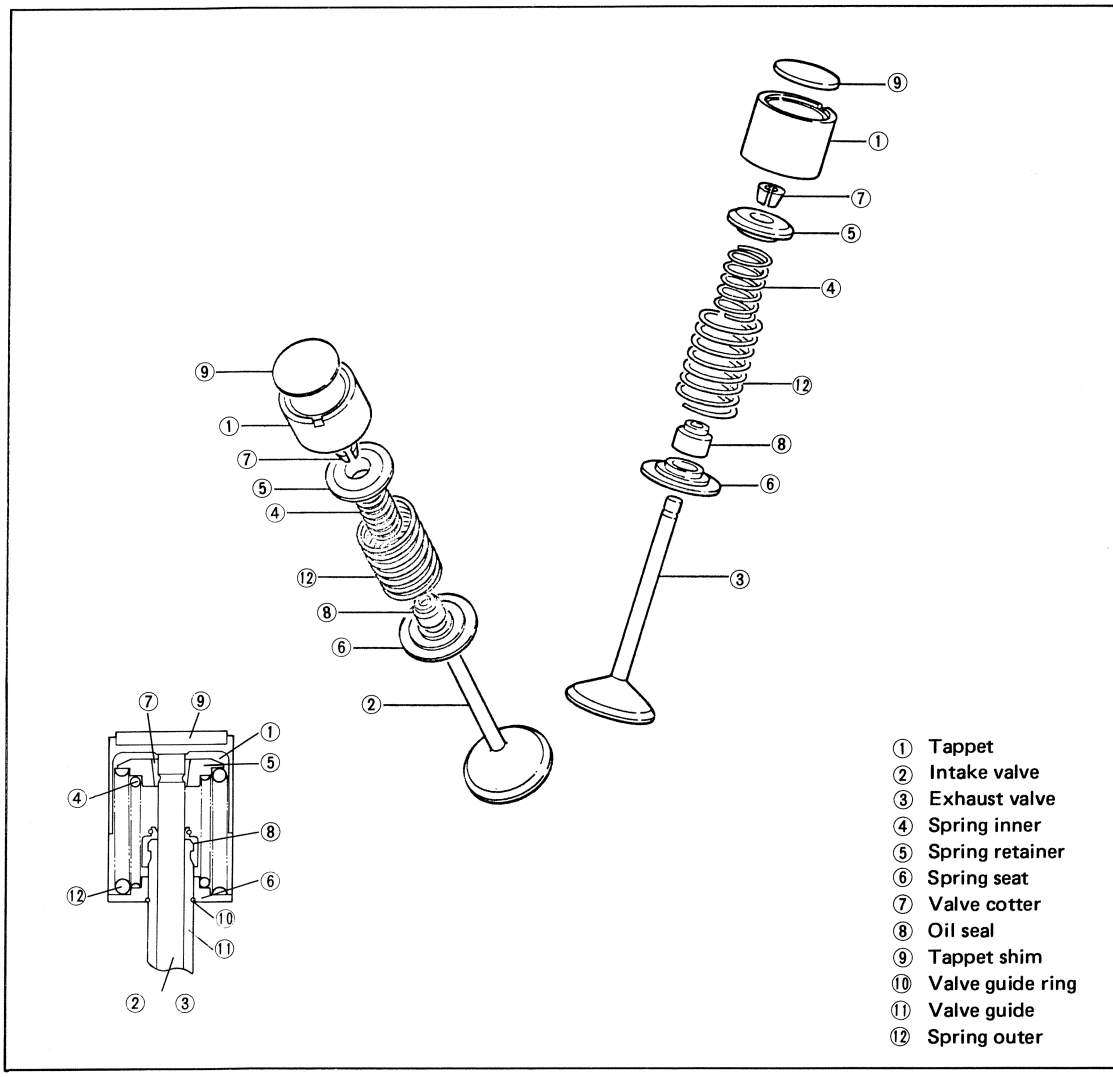


Fig. 1-149

The reassembling procedure is as follows:

NOTE: When re-using the removed parts of valve mechanism, be sure to restore each to the position from which it was removed in disassembly.

1. Fit a ring to each valve guide. Be sure to use new rings and valve guides. Use of rings and valve guides removed in disassembly is prohibited. Bear in mind that the guide for **intake valve** differs in shape from that for **exhaust** valve.

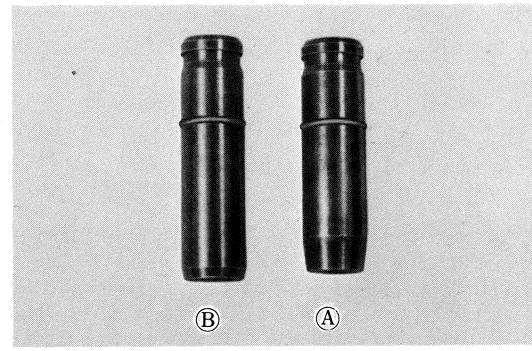


Fig. 1-150 Ⓐ Intake valve guide
Ⓑ Exhaust valve guide

2. Re-finish the valve guide holes on cylinder head with a 12.2-mm reamer (special tool).

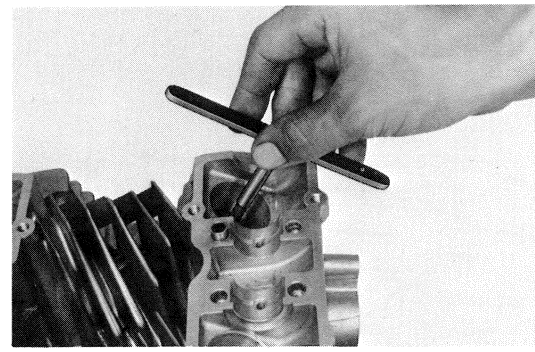


Fig. 1-151

3. Oil the stem hole, too, of each valve guide and drive it into the guide hole with the valve guide installer (special tool). Carry out this job at normal temperature.

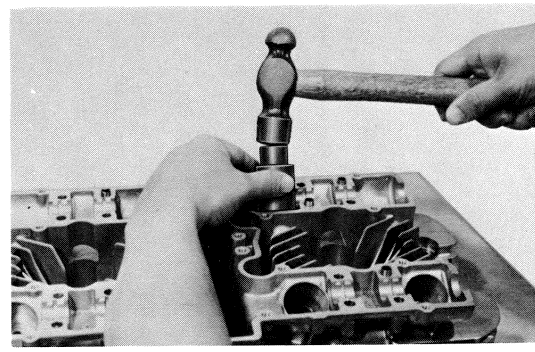


Fig. 1-152

4. After fitting all valve guides, re-finish their guiding bores with a 7-mm reamer (special tool). Be sure to clean and oil the guides after reaming.

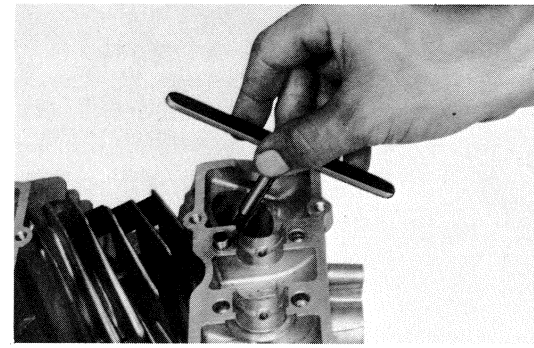


Fig. 1-153

5. Install valve spring lower seats. Be careful not to confuse the lower seats with the upper ones.

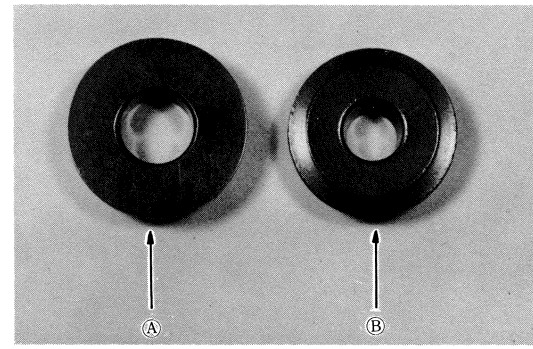


Fig. 1-154 Ⓐ Lower Ⓑ Upper

6. Oil each stem seal, and install it by using the stem seal installer (special tool).

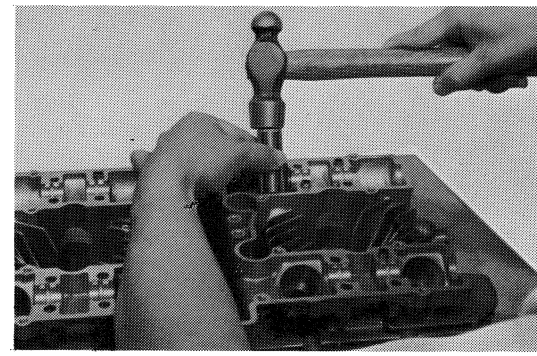


Fig. 1-155

7. Insert the valves, with their stems coated with a high quality molybdenum disulfide lubricant (SUZUKI MOLY PASTE) all around and along the full stem length without any break. Have the lip (of stem seal) similarly oiled.

CAUTION: When inserting each valve, take care not to damage the lip of its stem seal.

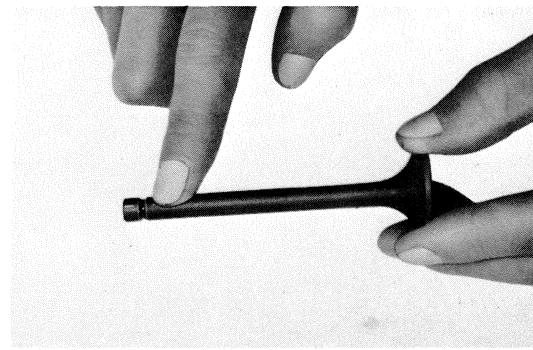


Fig. 1-156

8. Install valve springs, making sure that the close-pitch end Ⓐ of each spring goes in foremost to rest on the head. Both inner spring and outer spring have their coil pitch varied: coil turns are increasingly crowded from one end to the other, as shown.

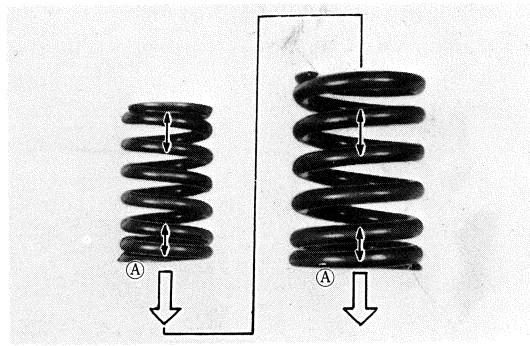


Fig. 1-157

9. Fit two half cotters Ⓐ to each valve stem.

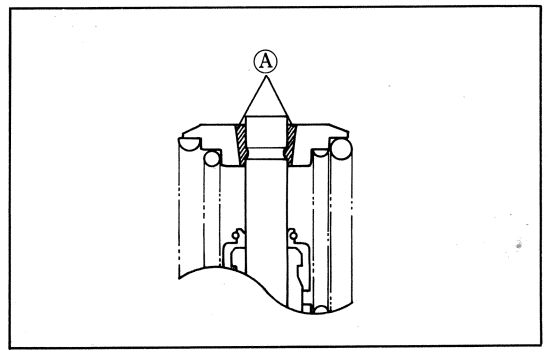


Fig. 1-158

10. Oil each valve tappet and the bore in which it slides. Push the tappet into the bore with fingertips. Only a light force is required to push it in.

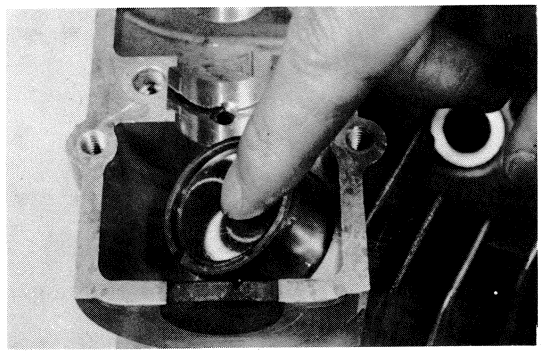


Fig. 1-159

Having thus installed the intake and exhaust valves in the cylinder head, mount the head on the cylinder block as follows:

1. Install the four crown nuts and copper washers in the positions Ⓐ (oil passages) indicated.

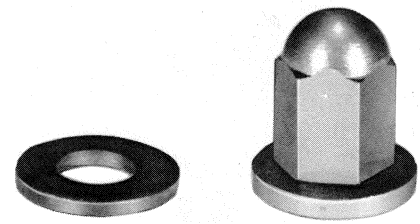


Fig. 1-160

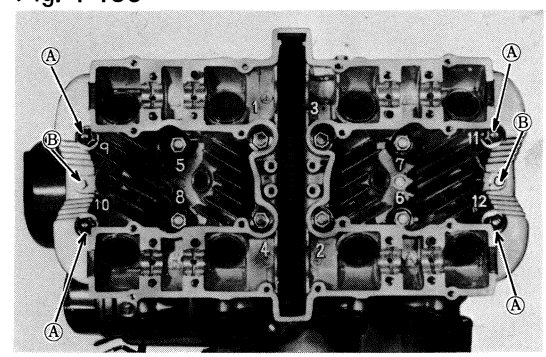


Fig. 1-161

2. With the head snugly seated on the cylinder block, secure it by tightening the 12 nuts sequentially in the ascending order of numbers. Tighten each nut just a little at a time and shift the wrench in the indicated order to reach the same final torque value specified.

Cylinder head nut tightening torque	3.5 - 4.0 kg-m (25.3 - 29.0 lb-ft)

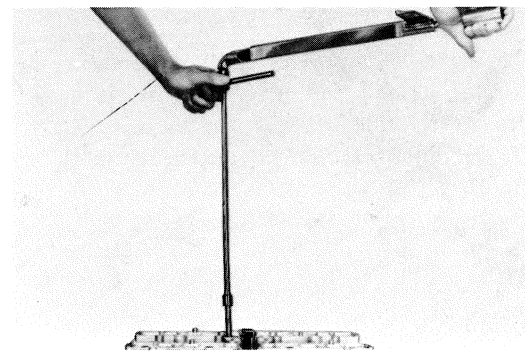


Fig. 1-162

After tightening the 12 nuts good and hard, run in two 6-mm bolts (indicated as Ⓑ) and tighten them to this torque value:

Head bolt tightening torque	0.7 - 1.1 kg-m (5.1 - 8.0 lb-ft)

CAMSHAFTS

Mount the sprockets on camshafts.

1. Exhaust camshaft takes its own sprocket, and intake camshaft does similarly. Do not confuse the two sprockets.

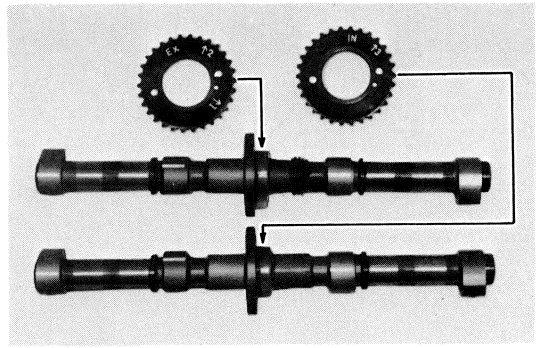


Fig. 1-163

2. Mount and secure the sprocket to its camshaft by referring to the illustration.

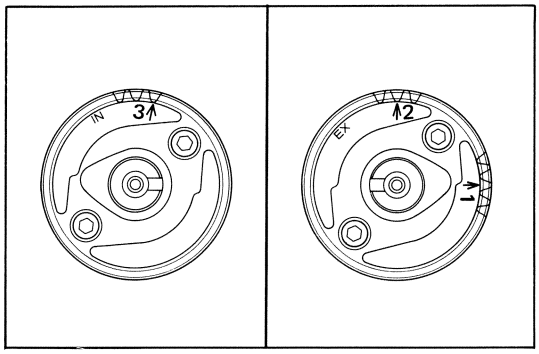


Fig. 1-164

3. Apply THREAD LOCK to the threads of Allen-head bolts, and tighten them to this torque value:

Sprocket bolt tightening torque	1.0 kg-m (7.2 lb-ft)

Install the camshafts as follows:

Tell exhaust camshaft from intake one by the cast-out letters "EX" (for exhaust) as against letters "IN" (for intake). Also tell the right end "R" from the left end "L" of each camshaft.

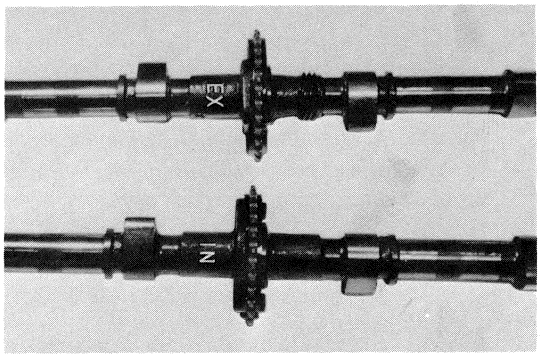


Fig. 1-165

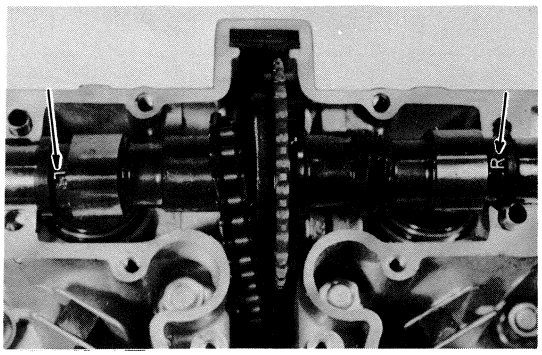


Fig. 1-166

IMPORTANT: **Just before placing the camshaft on the cylinder head, apply a high quality molybdenum disulfide lubricant (SUZUKI MOLY PASTE) to its journals, coating each journal with the paste fully without leaving any dry spot. Apply engine oil to the journal bearings.**

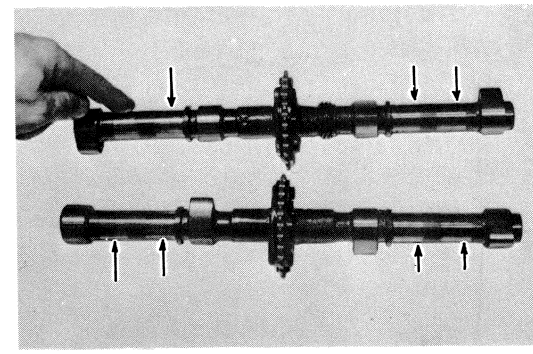


Fig. 1-167

1. With the two camshafts properly resting in place and the timing chain reeved around the sprockets, adjust the positions of components associated with valve timing, thereby timing the valve mechanism. Under this condition, put on the bearing caps, orienting each cap correctly. The method of valve timing adjustment will be explained subsequently.

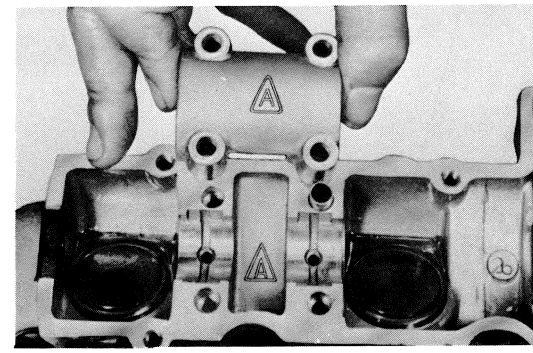


Fig. 1-168

2. Secure the four bearing caps uniformly by tightening cap bolts sequentially in the manner illustrated. Try to equalize the securing pressure by moving the wrench diagonally from one bolt to another and from one bearing cap to another. (It is assumed here that the **vice pliers** are used for each camshaft to hold down the tappet interfering with a cam.)
   Tighten the cap bolts to this torque value:

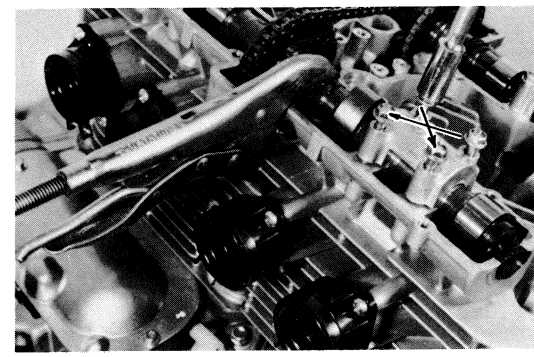


Fig. 1-169

Cam shaft holder bolt tightening torque	0.8 - 1.2 kg-m (5.8 - 8.7 lb-ft)

VALVE TIMING ADJUSTMENT

1. While holding down the timing chain, rotate the crankshaft in normal running direction to bring the "T" mark on Nos. 1 and 4 side (of the advance governor) to the timing mark. Use a 19-mm wrench to turn the crankshaft.

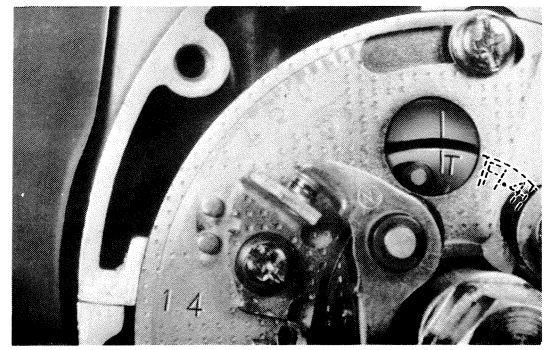


Fig. 1-170

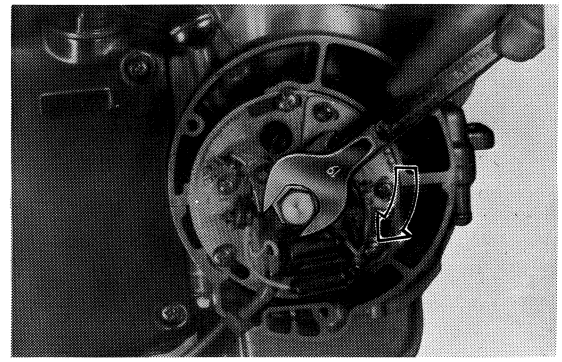


Fig. 1-171

2. With the crankshaft held in that position (with the "T" mark aligned to the timing mark at the governor), pull up the chain on the front side to take up its sag.

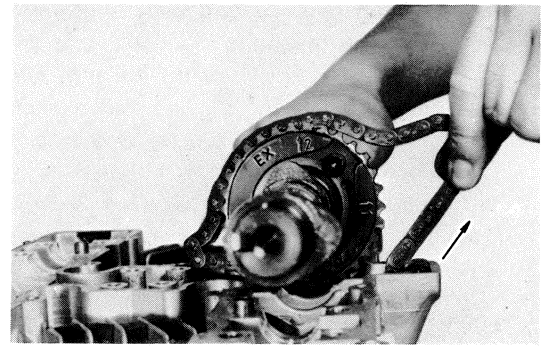


Fig. 1-172

3. Exhaust sprocket has an arrow mark "1" indicated as Ⓐ. Turn over exhaust camshaft to point this arrow flush with the joint surface of the cylinder head. Engage the timing chain with this sprocket.

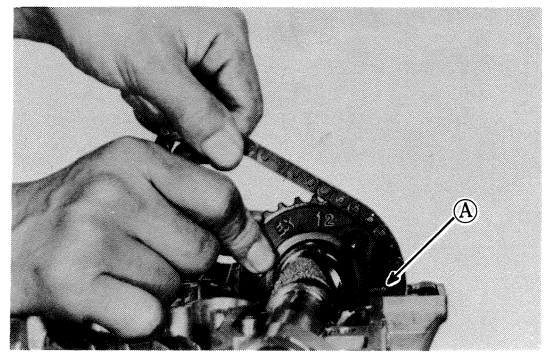


Fig. 1-173

4. The other arrow mark "2" is now pointing straight upward. Count the chain roller pins toward intake camshaft, starting from the roller pin right **above** this arrow mark "2" and ending with the **20th roller pin.** Engage the chain with intake sprocket, locating the 20th pin **at** and **above** the arrow mark "3" on intake sprocket.

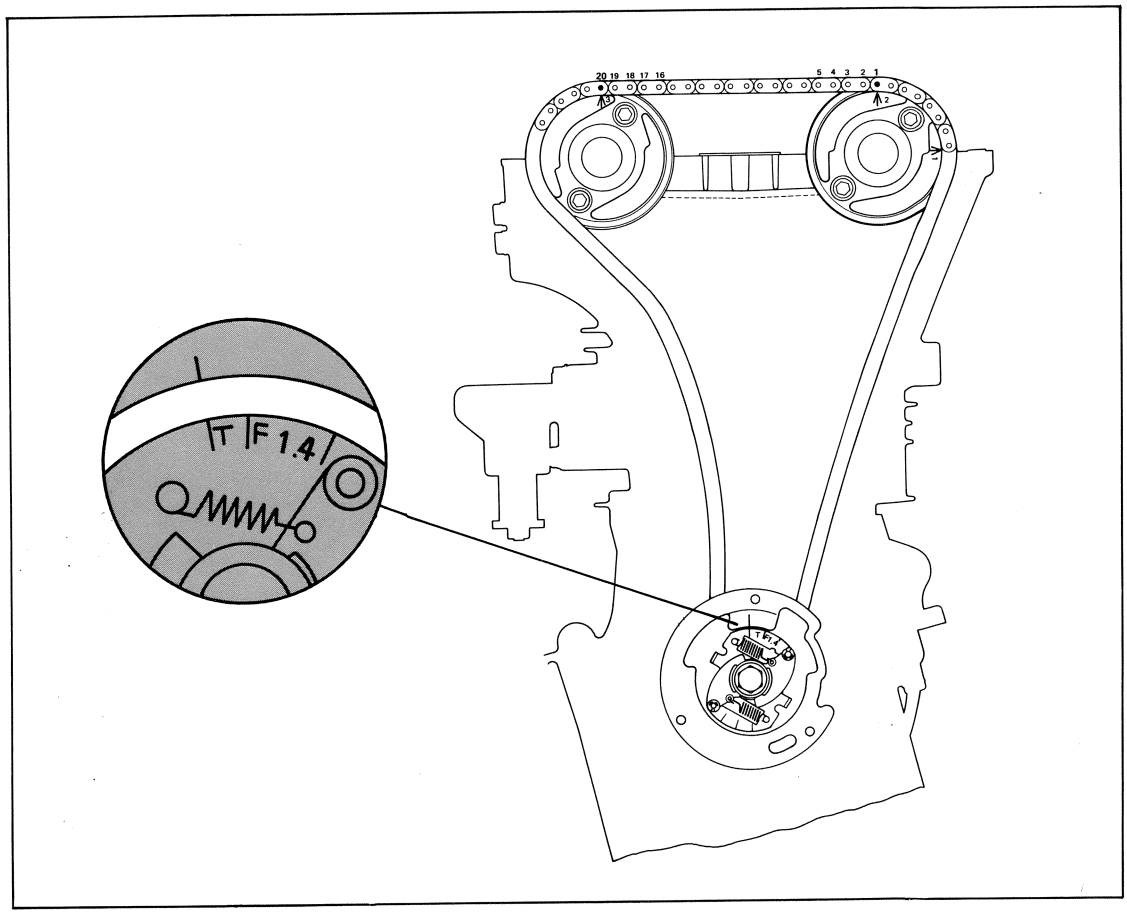


Fig. 1-174

IMPORTANT: The timing chain is now riding on all three sprockets. Be careful not to disturb the crankshaft until four bearing caps are secured.

TACHOMETER DRIVE GEAR.

Install the tachometer drive gear. This is to be effected **after** installing the exhaust camshaft. Installing this gear before installing the camshaft may cause the teeth of gear and worm to break as the camshaft is lowered and fitted to the cylinder head.

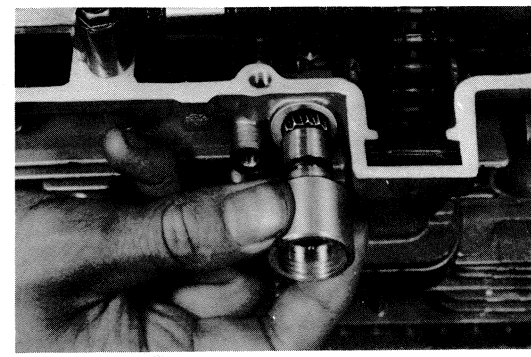


Fig. 1-175

TIMING CHAIN IDLER

Install the timing chain idler, securing it by tightening to this torque value:

Chain idler tightening torque	0.6 - 0.8 kg-m (4.3 - 5.8 lb-ft)

The performance of the rubber damper in this idler presupposes that the idler is tightened correctly.

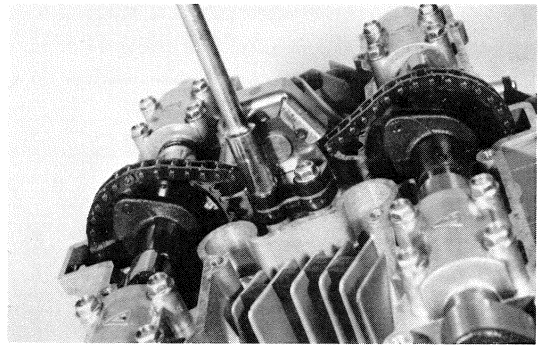


Fig. 1-176

TIMING CHAIN TENSION ADJUSTOR

The tension adjustor used in the Model GS750 is of automatic type in that it adjusts itself to apply a constant tensioning force to the chain by compensating for the stretch of the chain.

In operation, its spring-loaded pushrod keeps on pushing the timing chain. As the chain stretches, it yields to this push and remains in tensioned state. Once the adjustor is set after installation, there is no need of making any adjustment.

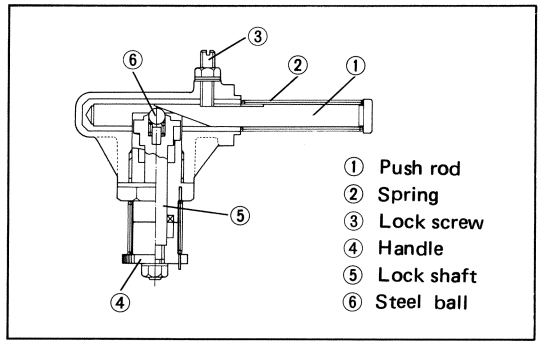


Fig. 1-177

The pushrod is prevented from backing away. By this feature, the pushrod effectively contends with the tendency of the timing chain to shake or vibrate during rough driving condition."

Reassembling

1. Apply a high quality molybdenum disulfide lubricant (SUZUKI MOLY PASTE) to the pushrod and engine oil to the pushrod guide hole. Match the lock screw to the long groove in the pushrod, as shown, and insert the pushrod by pushing it to the indicated position.

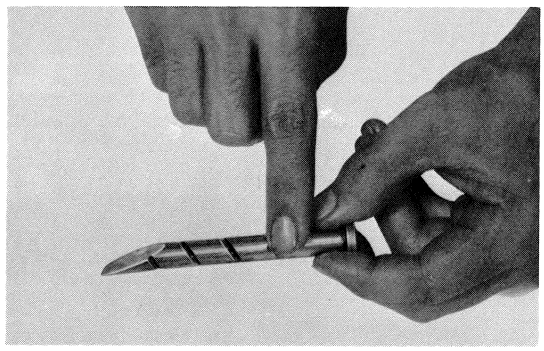


Fig. 1-178

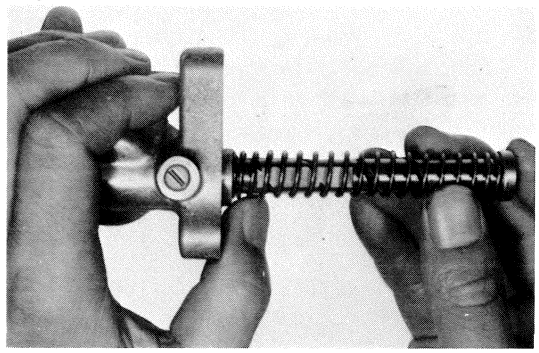


Fig. 1-179

2. Move the pushrod back and forth with fingers to see if it moves smoothly as it should.

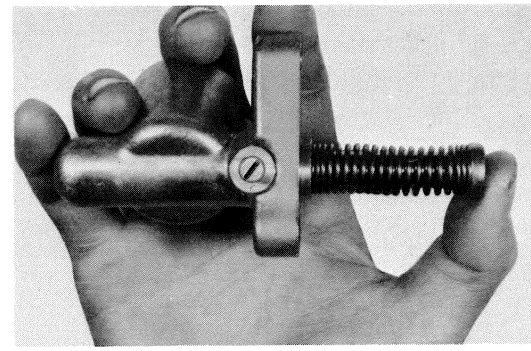


Fig. 1-180

3. With the pushrod inserted, run in the lock screw until its tip bears against the push-rod. From that position of the screw, back it away by one-quarter rotation.

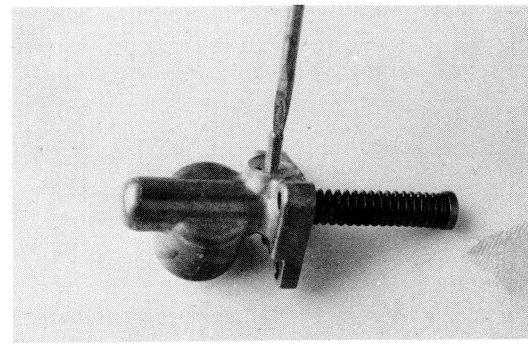


Fig. 1-181

4. Apply engine oil to the lock shaft. Insert the shaft into the holder and bring the two into the relative position indicated.

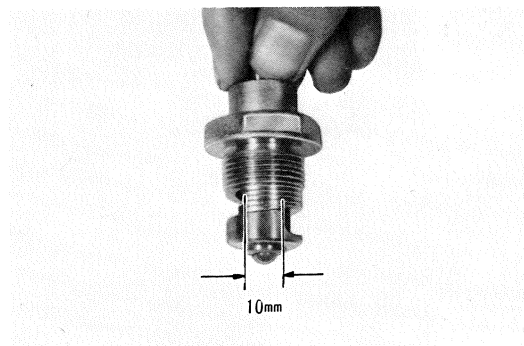


Fig. 1-182

5. Hook the spring onto the holder and handle, twist the spring by one complete rotation counterclockwise, and fit the handle onto the shaft.

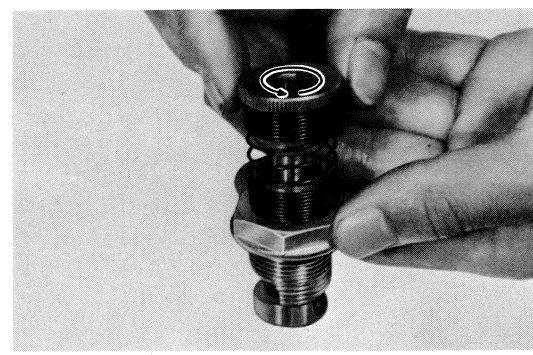


Fig. 1-183

6. After tightening the lock shaft nut, install the lock shaft assembly on the adjustor body. Be sure to adhere to the following torque specifications:

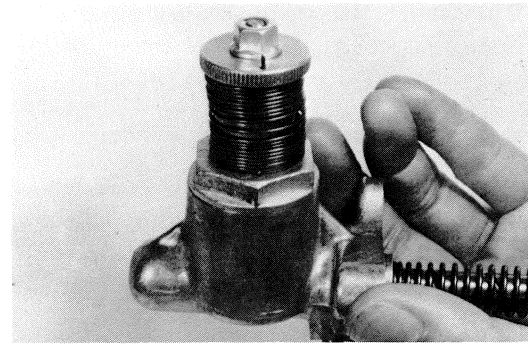


Fig. 1-184

Lock shaft nut tightening torque	0.8 - 1.0 kg-m (5.8 - 7.2 lb-ft)
Shaft assembly tightening torque	3.1 - 3.5 kg-m (22.3 - 25.3 lb-ft)

Installing the adjustor

Removal of the tension adjustor is necessitated by engine disassembly and also by removal of camshafts. In either case, re-install the adjustor on the cylinder block after the camshafts have been installed. The procedure follows:

1. While turning lock shaft handle **counter-clockwise,** push in the pushrod all the way. Keep on turning the handle until it refuses to turn further.

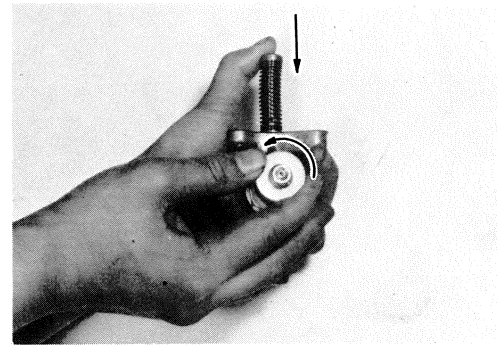


Fig. 1-185

2. Tighten the lock screw to lock the pushrod, so that the pushrod will not plunge out.

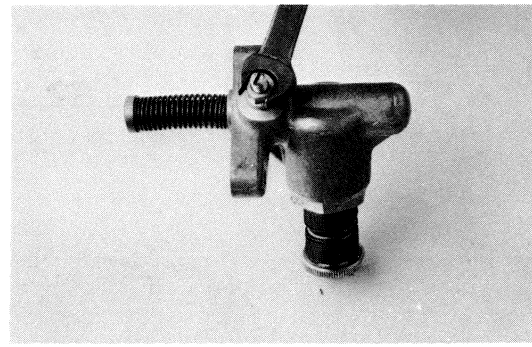


Fig. 1-186

3. Secure the adjustor to the cylinder block.

4. Back away the lock screw by one-quarter to half rotation: this separates the tip of this screw from the pushrod, thereby allowing the pushrod to advance under spring force and press the tensioner against the timing chain.

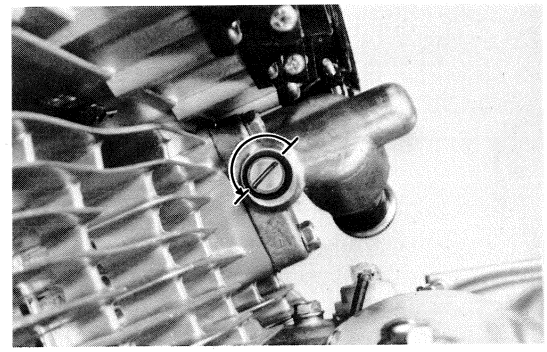


Fig. 1-187

5. Fit the packing, and tighten the lock nut.

NOTE: When tightening the lock nut, be careful not to allow the lock screw to turn.

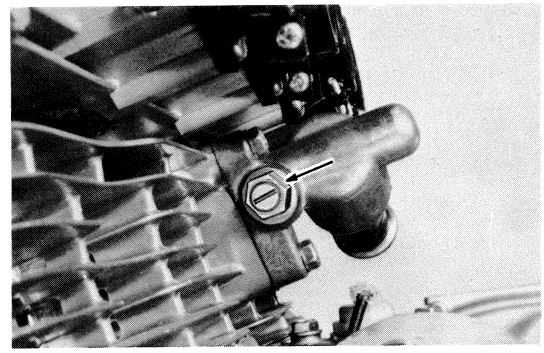


Fig. 1-188

The method of checking to see whether the adjustor is functioning correctly or not after initially setting the adjustor in place is as follows:

1. While turning the handle counterclockwise, slowly rotate the crankshaft in **reverse** direction (thus causing the chain to push back the tensioner).

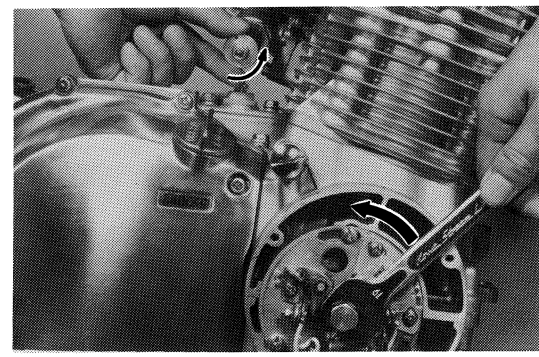


Fig. 1-189

2. Release the handle and slowly turn back the crankshaft in **normal running direction** (to slacken that portion of the chain extending along the tensioner). See if the handle rotates by itself as the chain becomes increasingly slackened; if it does, then the pushrod inside is obviously moving forward under spring force as it should, thus signifying that the adjustor is in good operable condition. If the handle rotates but sluggishly, it means that the pushrod or lock shaft is sticking and, in such a case, remove the adjustor and service the pushrod and lock shaft to make them move smoothly.

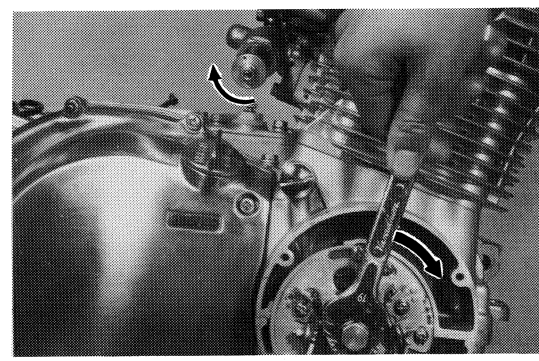


Fig. 1-190

CAUTION: After installing the adjustor and checking it in initially set condition for operation, do not attempt to turn the handle in either direction until the next overhaul.

CHECKING AND ADJUSTING THE TAPPET CLEARANCE

The tappet clearance specification is the same for both intake and exhaust valves. Too small a tappet clearance could reduce the ability of the engine to develop power; too large a tappet clearance increases valve noise and promotes the wear of valve and seat. An engine running with not much noise coming from the valve mechanism and delivering full power has its tappets set to the specified clearance. In the present engine, the tappet clearance is increased or decreased by replacing the shim disc, made of a special wear-resistant material, fitted to the top of the tappet. The shim discs are easy to remove and refit. Tappet clearance adjustment must be checked and adjusted **1) at the time of periodical inspection, 2) when the valve mechanism is serviced, and 3) when the camshafts are disturbed** by removing them for servicing.

Checking the tappet clearance

Tappet clearance specification (for both intake and exhaust valves)	0.03 - 0.08 mm (0.0012 - 0.0031 in)

IMPORTANT: 1. The cam must be at the position Ⓐ or Ⓑ in order to check the tappet clearance or to remove the shim disc. A clearance reading taken with the cam in any other position off these two positions is false.
2. The clearance specification is for COLD state.

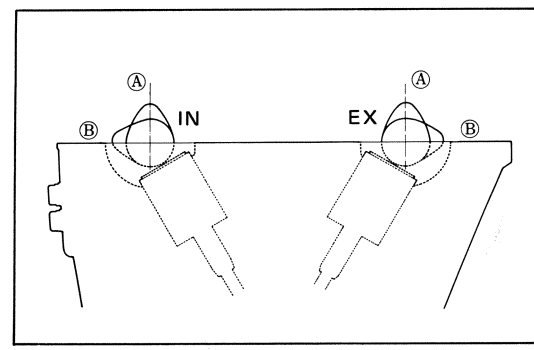


Fig. 1-191

3. To turn the crankshaft for clearance checking, be sure to use a 19-mm wrench and to rotate in normal running direction.

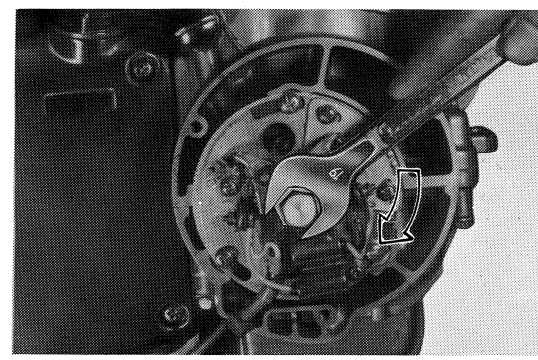


Fig. 1-192

1. Turn crankshaft to bring the exhaust cam of No. 1 cylinder to this position. Under this condition, read the clearance at the exhaust tappets of Nos. 1 and 2 cylinders. Use the thickness gauge (special tool) on all tappets.

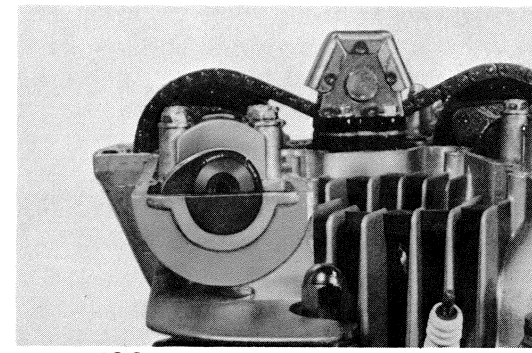


Fig. 1-193

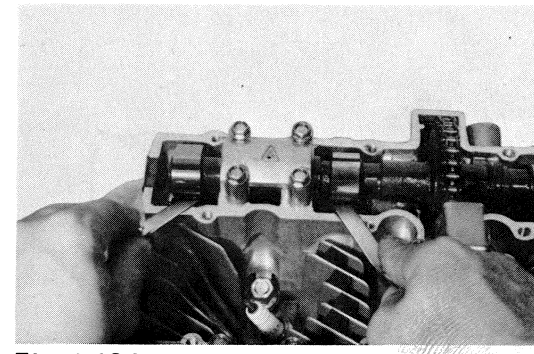


Fig. 1-194

If clearance checked is off the specification, bring it into the specified range (0.03 - 0.08 mm) by replacing the shim discs. The method of changing the discs will be explained in the next section.

2. The clearance having been set to the specification at the exhaust tappets of Nos. 1 and 2 cylinders, turn crankshaft by 180° (half rotation) to bring the intake cam of No. 1 cylinder to the position indicated. Read the clearance at the intake tappets of Nos. 1 and 2 cylinders and, as necessary, adjust the clearance to the specification at each.

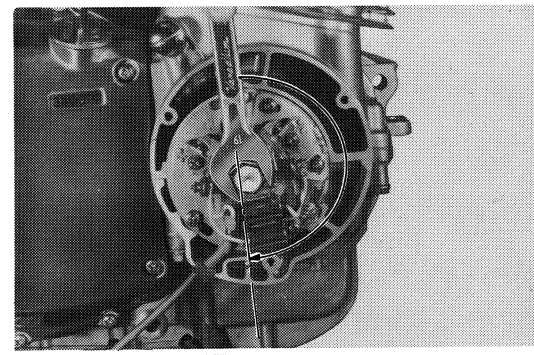


Fig. 1-195

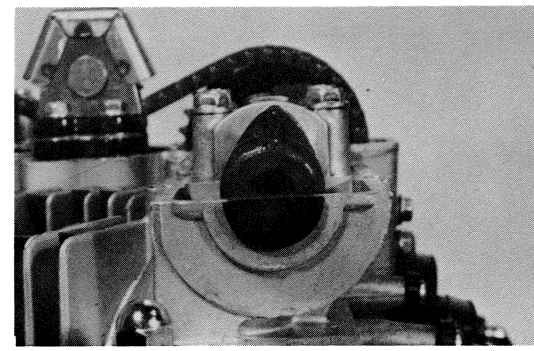


Fig. 1-196

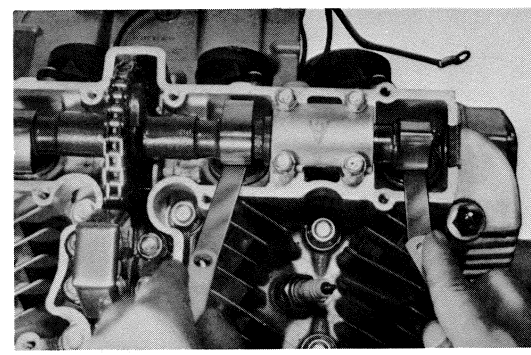


Fig. 1-197

3. Turn over crankshaft another 180°, bringing the exhaust cam of No. 4 cylinder to the position indicated. Under this condition, repeat the checking and adjusting process outlined in step "1" at the exhaust tappets of Nos. 3 and 4 cylinders.

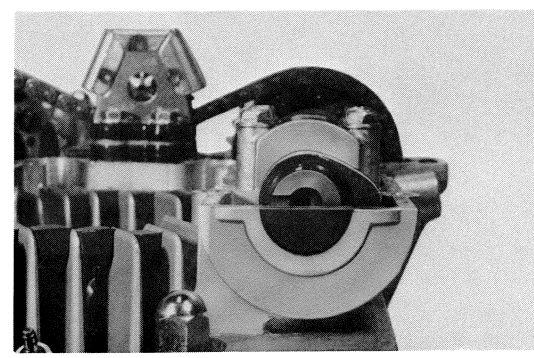


Fig. 1-198

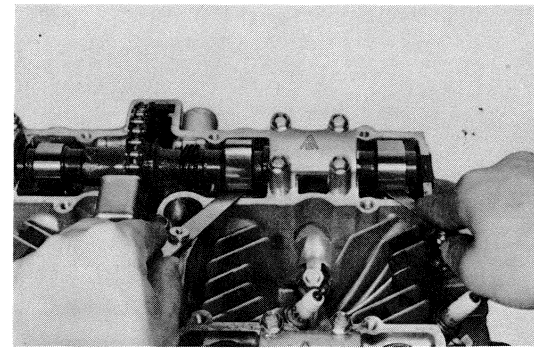


Fig. 1-199

4. Again turn over crankshaft another 180°, bringing the intake cam of No. 4 cylinder to the position indicated. Similarly check and adjust the clearance at the intake tappets of Nos. 3 and 4 cylinders.

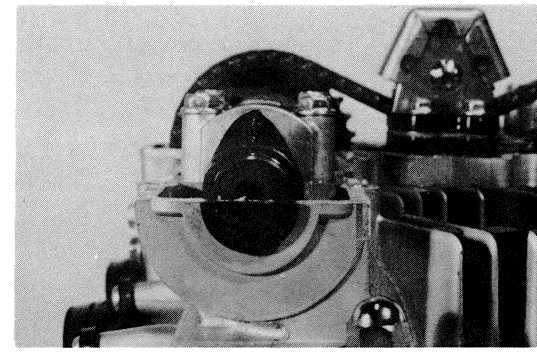


Fig. 1-200

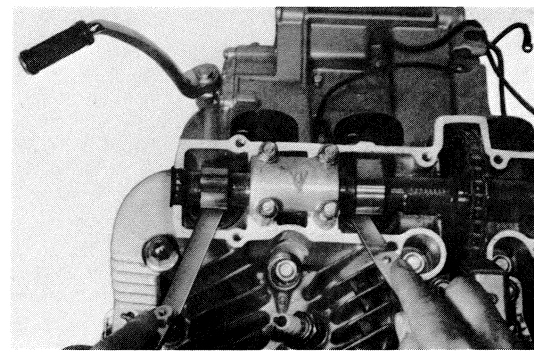


Fig. 1-201

Tappet clearance adjustment

The clearance is adjusted by replacing the existing tappet shim by a thicker or thinner disc.

1. Put your fingertips to the tappet, and turn it in place to bring its notch to the position indicated.

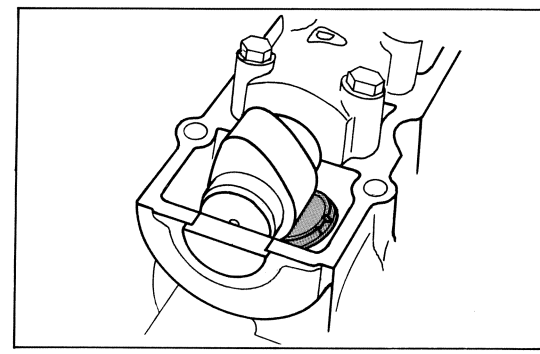


Fig. 1-202

2. Using the tappet depressor (special tool), push down the tappet.

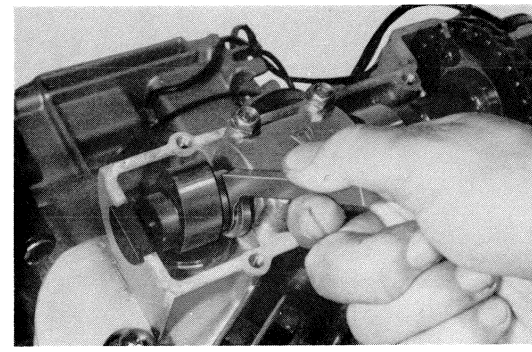


Fig. 1-203

NOTE: Be sure to make the tool bear on the tappet correctly, as shown, with its tip hitched securely.

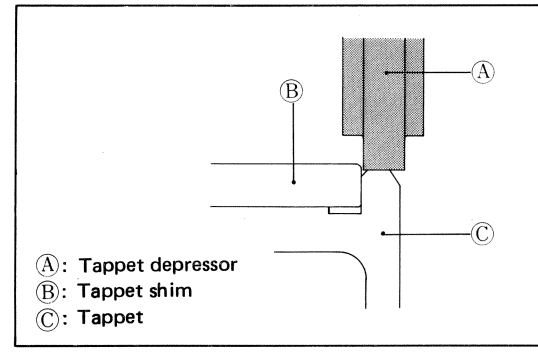


Fig. 1-204

3. Pick out the tappet shim from the tappet, using a pair of forceps.

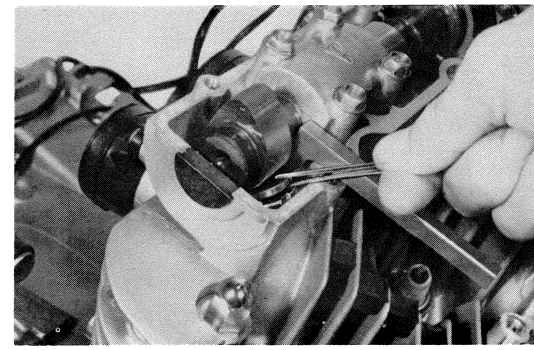


Fig. 1-205

4. Check the figures punched on the shim. These figures tell the thickness of the shim, as illustrated.

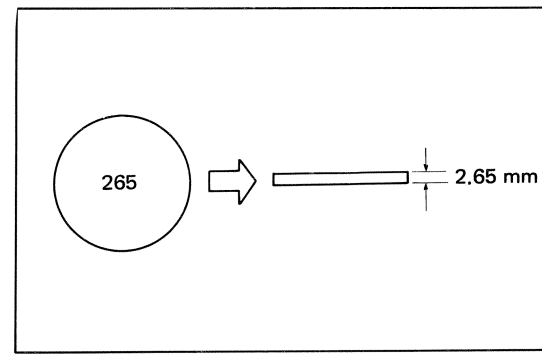


Fig. 1-206

5. Select such a replacement shim as will provide a clearance coming within the specified range (0.03 - 0.08 mm). For the purpose of this adjustment, a total of 20 sizes of tappet shim are available, ranging from 2.15 to 3.10 mm in steps of 0.05 mm each. Put the selected shim to the tappet.

Tappet shim size chart

No.	Thickness (mm)	Part No.	No.	Thickness	Part No.
1	2.15	12892-45000	11	2.65	12892-45010
2	2.20	12892-45001	12	2.70	12892-45011
3	2.25	12892-45002	13	2.75	12892-45012
4	2.30	12892-45003	14	2.80	12892-45013
5	2.35	12892-45004	15	2.85	12892-45014
6	2.40	12892-45005	16	2.90	12892-45015
7	2.45	12892-45006	17	2.95	12892-45016
8	2.50	12892-45007	18	3.00	12892-45017
9	2.55	12892-45008	19	3.05	12892-45018
10	2.60	12892-45009	20	3.10	12892-45019

NOTE: Before fitting the tappet shim to the tappet, be sure to oil its top and bottom faces with engine oil.

6. After replacing the tappet shim, check the clearance again to be sure that it is within the specified range.

CYLINDER HEAD COVER

Install four oil separators at the locations indicated.

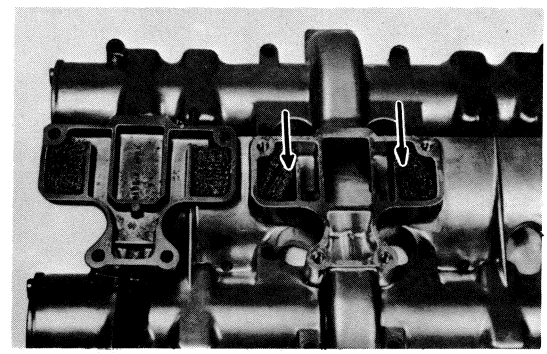


Fig. 1-207

There are 16 bolts for securing the cover to the head. Tighten these bolts in the ascending order of numbers as shown, so as to make sure that it will be fastened down with evenly distributed pressure.

Tighten the bolts to this torque value:

Head cover bolt tightening torque	0.7 - 1.1 kg-m (5.1 - 8.0 lb-ft)

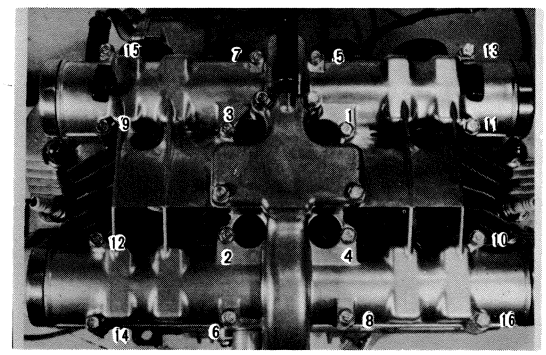
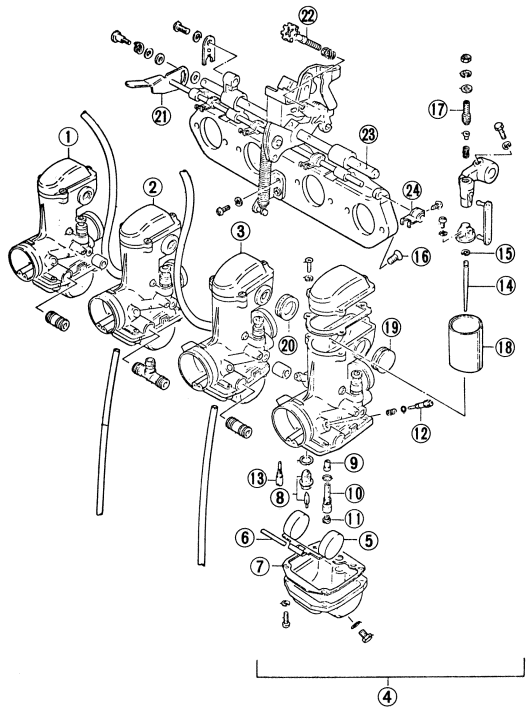


Fig. 1-208

CARBURETORS



① No. 1 carburetor ass'y
② No. 2 carburetor ass'y
③ No. 3 carburetor ass'y
④ No. 4 carburetor ass'y
⑤ Float
⑥ Float pin
⑦ Gasket
⑧ Needle valve
⑨ Needle jet
⑩ Breader pipe
⑪ Main jet
⑫ Adjuster
⑬ Pilot jet
⑭ Jet needle
⑮ Needle clip
⑯ Bracket
⑰ Adjuster
⑱ Throttle valve
⑲ Cap
⑳ Seal
㉑ Starter shaft
㉒ Throttle stop adjuster
㉓ Throttle shaft
㉔ Starter lever

Fig. 1-209

1. Carburetor identification
   Be sure to identify each carburetor for the cylinder which it serves, and to mount each in the correct position indicated:

No. 1 carburetor

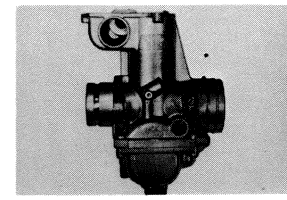


Fig. 1-210

No. 2 carburetor

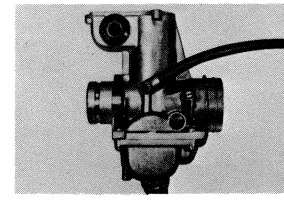


Fig. 1-211

No. 3 carburetor

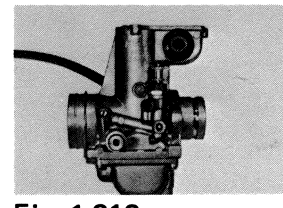


Fig. 1-212

No. 4 carburetor

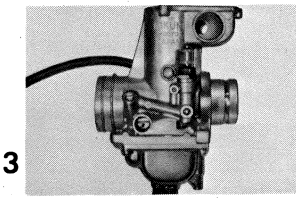


Fig. 1-213

NOTE: Each carburetor used in the Model GS750 has a punched marking 45013 at the indicated location.

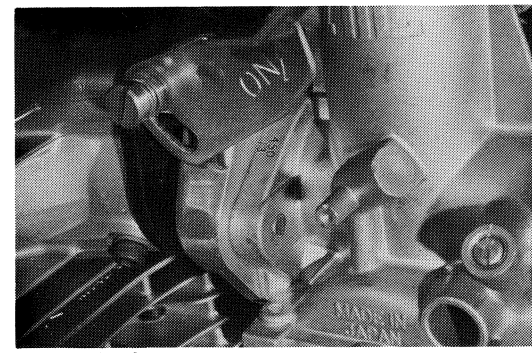


Fig. 1-214

2. Secure the plate by tightening 8 screws. Be sure to apply THREAD LOCK to these screws before running them in.

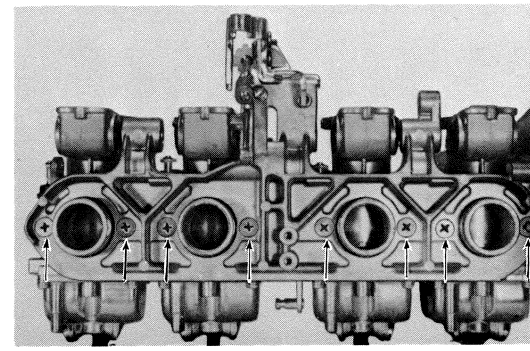


Fig. 1-215

3. Installing the throttle shaft
   Be sure to grease the lip of the oil seal and shaft before installing the shaft. Tighten the bolt Ⓐ to this torque value:

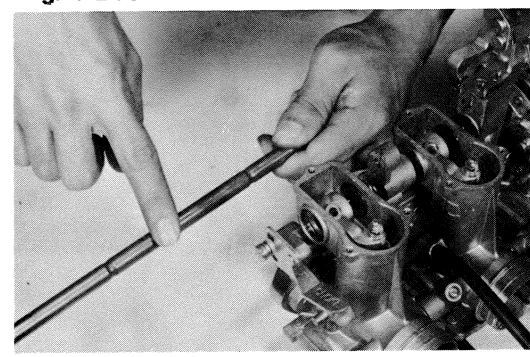


Fig. 1-216

Bolt Ⓐ tightening torque	0.35 kg-m (2.52 lb-ft)

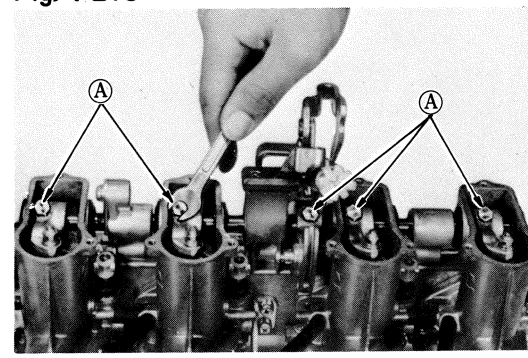


Fig. 1-217

4. Adjust the full-open and full-closed positions of throttle valves, as follows:

①Run back the throttle stop screw to produce a clearance between the screw and pulley.

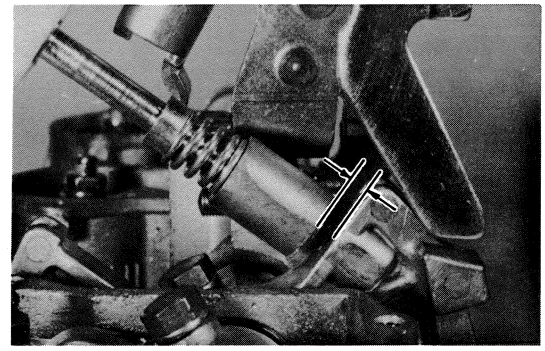


Fig. 1-218

②Loosen lock nut. Turn throttle adjusting screw Ⓐ to close the throttle valve fully, and tighten the lock nut to secure the screw in that position. Carry out this step equally on all four carburetors.

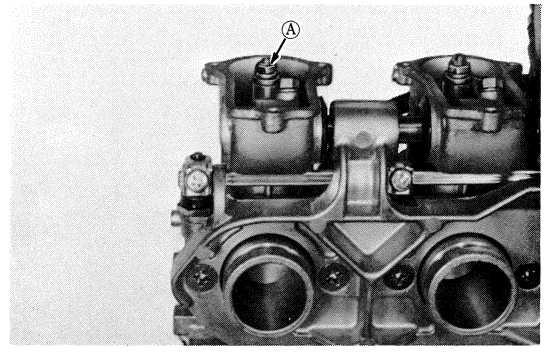


Fig. 1-219

③Adjust the full-throttle stopper Ⓑ in such a way that, when the throttle valve is turned to its full-open position, the valve will come to the position indicated.

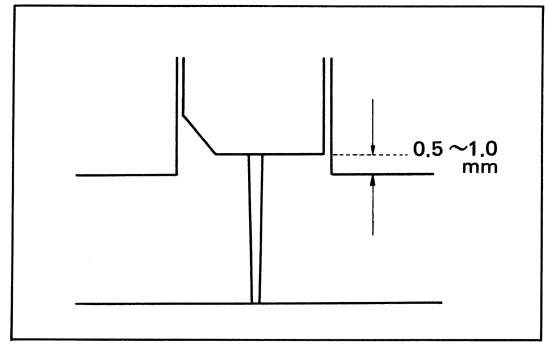


Fig. 1-220

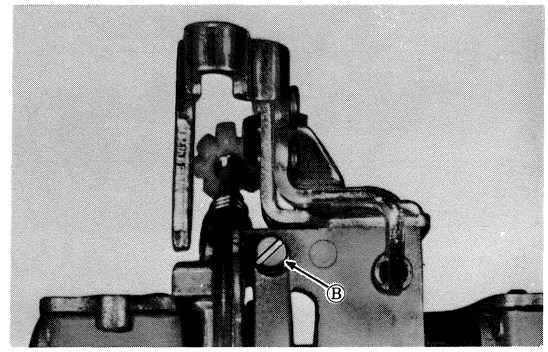


Fig. 1-221

ENGINE REMOUNTING

The sequence of remounting steps is generally the reverse of the removal sequence, but there are several important steps which need comments, explanations or emphasis. Those steps will be outlined in the following:

ENGINE MOUNTING BOLTS AND NUTS

The three long mounting bolts are to be inserted from the left side of the engine. Be sure to adhere to the torque specification for mounting bolts and nuts.

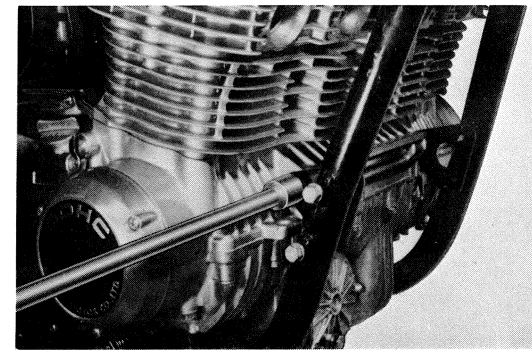


Fig. 1-222

Mounting bolt tightening torque	Three long bolts	4.0 kg-m (29.0 lb-ft)
	Short bolts	2.0 kg-m (14.5 lb-ft)

CONTACT-POINT LEAD WIRES

Route the wire and stay it by clamping at the place shown.

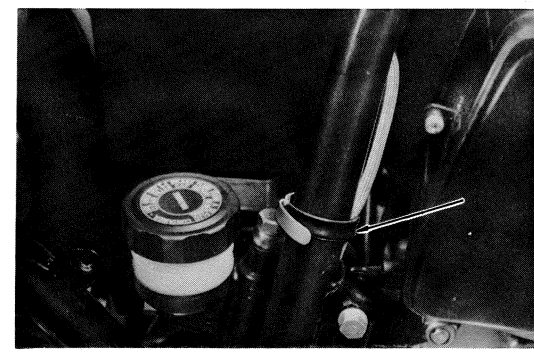


Fig. 1-223

HIGH-TENSION CORDS

Each high-tension cord is labeled to indicate the cylinder it serves. If these labels are missing, be guided by the photos to connect the respective cords.

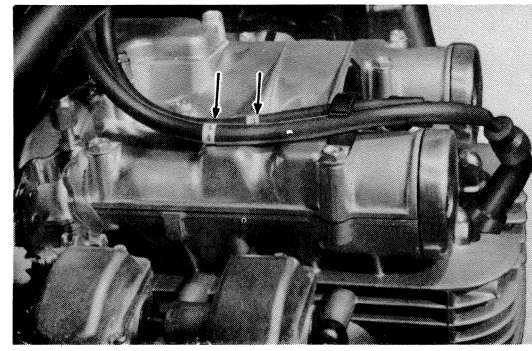


Fig. 1-224

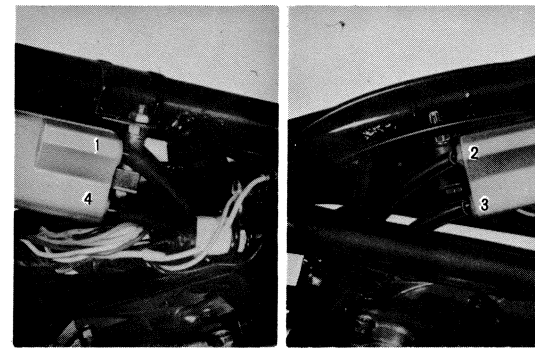


Fig. 1-225

CARBURETOR AIR VENT PIPE AND OVERFLOW PIPE

1. The two air vent pipes extending from Nos. 2 and 4 carburetors should be clamped at the indicated place.

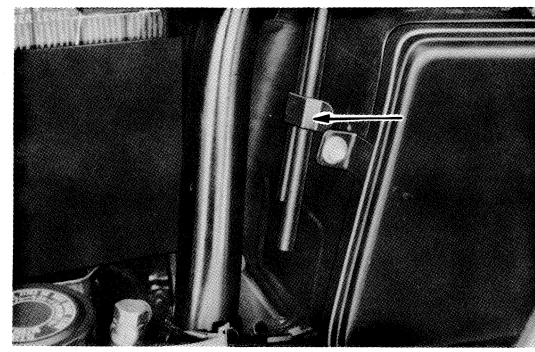


Fig. 1-226

2. The four overflow pipes should be clamped at the indicated place. After so clamping them, pass them through the clearance between swing arm and transmission.

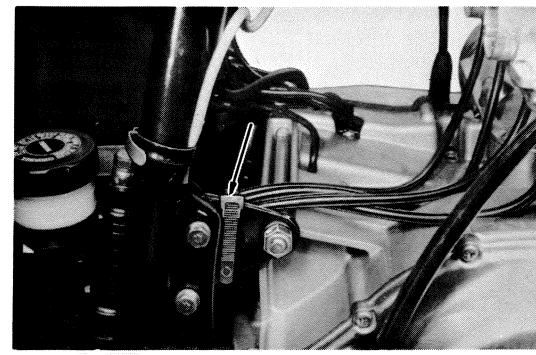


Fig. 1-227

OIL DRAIN PIPE FOR AIR CLEANER

Pass this pipe through the clearance between swing arm and transmission.

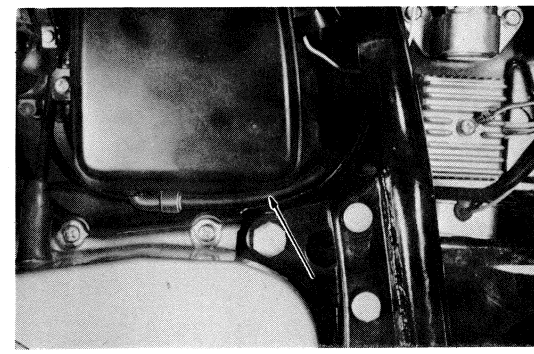


Fig. 1-228

BREATHER PIPE FOR CRANKCASE

Install this pipe, connecting it to the air cleaner case and to the cylinder head, as shown.

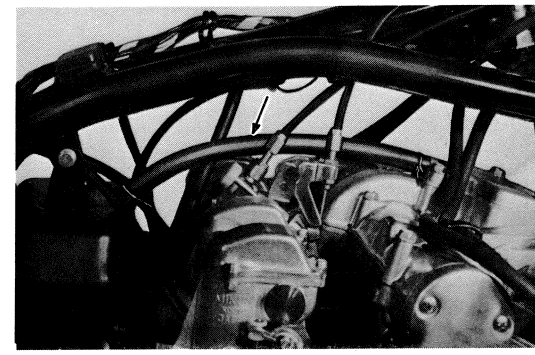


Fig. 1-229

THROTTLE WIRE

After installing the throttle wires, set the two adjusters, to obtain a play of 1 to 1.5 mm as measured at the indicated place.

Ⓐ : pull-side wire
Ⓑ : return-side wire

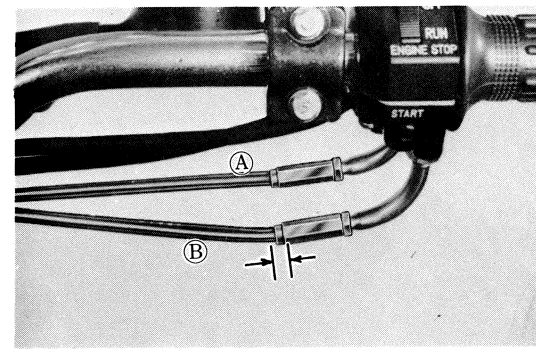


Fig. 1-230

DRIVE CHAIN

After installing the engine sprocket, check the drive chain for tension and, as necessary, adjust the tension according to the method outlined in page 106.

EXHAUST PIPES

The three exhaust pipes are identified by a punched letter: "L" for No. 1 cylinder, "C" for Nos. 2 and 3 cylinders, and "R" for No. 4 cylinder. Be sure to discriminate the pipes correctly at the time of installing them.

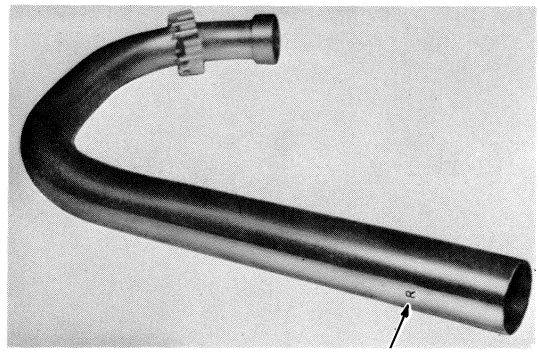


Fig. 1-231

ENGINE OIL

"Oil filling" is an operation consisting of the following steps:

1. Fill in 3.4 litres (3.6/3.2 US/Imp qt) of the specified engine oil and start up the engine to run it for about 10 seconds in idling condition.
2. Stop the engine and, after one minute of stopping, check oil level.
3. Add oil, as necessary, to raise the level to "F" mark.

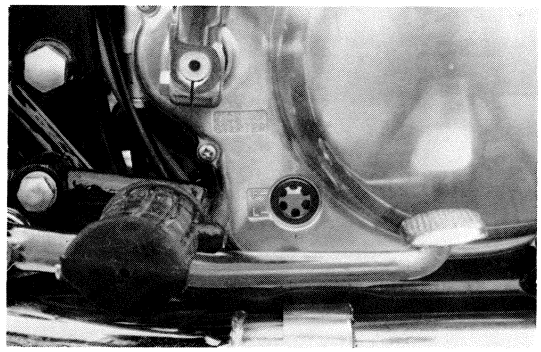


Fig. 1-232

IMPORTANT: Be sure to keep the level at or below "F" mark. Have the machine in self-supporting condition, supporting itself by center stand, when checking oil level.

ENGINE TUNE-UP

COMPRESSION PRESSURE TEST

The compression pressure of a cylinder is a good indicator of its internal conditions. The decision to overhaul the cylinders is often based on the results of a compression pressure test, and many a cautious rider conducts this test himself at regular intervals and log his readings to form a case history to which he may refer later to tell when to overhaul his engine.

The tuning up of an engine is meaningful only when its cylinders, among others, are internally up to standard capable of producing as much power as is reasonably expected. For this reason, this test will be taken up the first topic of engine tune-up. Along the same line of reasoning, the oil pump pressure test will be taken up to follow as the second topic.

The lowest allowable compression pressure for this engine is:

7 kg-cm^2(approximately 100 psi)

A low compression pressure means any of the following malconditions:

- Excessively worn cylinder wall
- Worn-down piston or piston rings
- Piston rings frozen in the grooves
- Poor seating contact of valves

When the compression pressure noted is down to or below the value indicated above, the remedy is to overhaul the engine, with the these four malconditions in mind. Before trying to tune up an overhauled engine, check its cylinders for compression pressure to make sure that the engine has been overhauled correctly.

Here's the compression pressure test procedure:

1. Remove all spark plugs.
2. Fit the compression gauge (special tool) to one of the plug holes, taking care to make the connection absolutely tight.
3. Twist the throttle grip into wide-open position.
4. Crank the engine a few seconds with the starter, and read the highest gauge indication as the compression of that cylinder. Repeat this process at each cylinder.

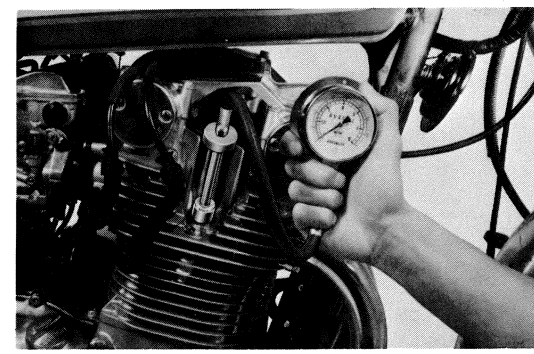


Fig. 1-233

OIL PUMP PRESSURE TEST

The oil pump and oil pressure lamp circuit are designed so that, when the engine is idling with the throttle grip turned down, an oil pressure high enough to put out the lamp will occur in the pump discharge line. If there is any reason to suspect that the pump is not developing enough discharge pressure, test the pump as follows:

1. Have the oil level standing between "F" and "L" mark in the inspection window, and check to be sure that there is no sign of oil leakage at any part of the lubrication oil circuit and that both oil strainer (in the sump) and oil filter (in the pump discharge line) are clean.

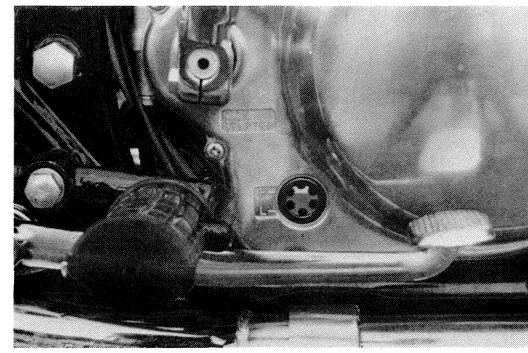


Fig. 1-234

2. Install the oil pressure gauge (special tool) at the location indicated. Make sure that the gauge connection is tight.

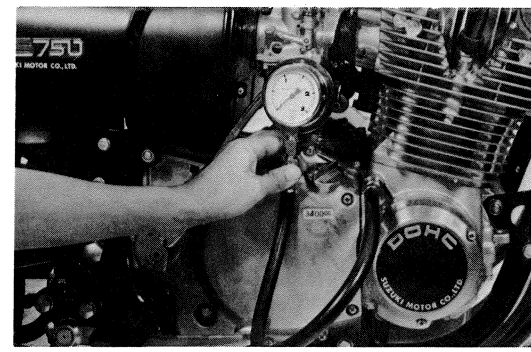


Fig. 1-235

3. Start up the engine and run it in the intermediate speed range to raise the oil temperature to about 60°C. Stop the engine each time to check the oil temperature.

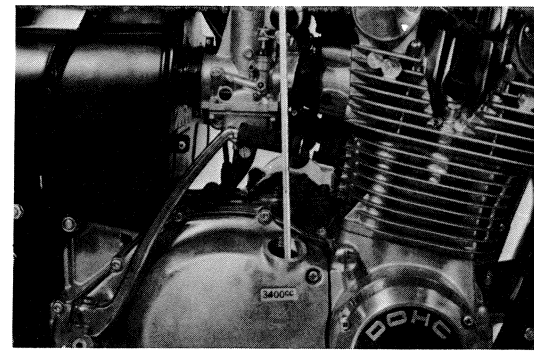


Fig. 1-236

4. With the oil at 60°C, pick up speed to about 3,000 rpm and, at this engine speed, read the pressure gauge indication. This pressure should be as follow.

Oil pump discharge pressure	over 0.1 kg/cm ^{2} (1.42 psi) @ 3,000 rpm

If not, it is very likely that the oil pump is internally worn down to require replacement of its running part: the pump should be opened and inspected to see if the various running clearances are within the limit.

CAUTION: After removing the oil pressure gauge, be sure to apply THREAD LOCK to the screw plug and close the hole by tightening this plug good and hard.

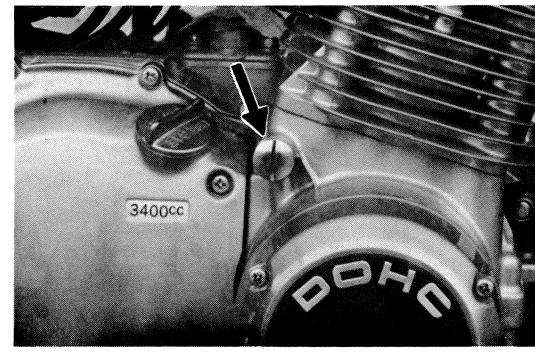


Fig. 1-237

CLUTCH ADJUSTMENT

1. Loosen lock nut Ⓐ , and back adjusting screw Ⓑ away two to three rotations.

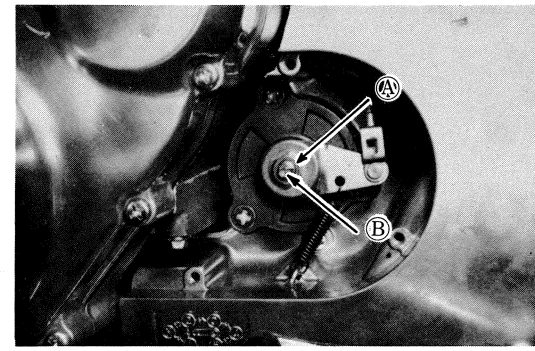


Fig. 1-238

2. From that position of adjusting screw, slowly run it in until it begins to offer high resistance to turning. From this position, back it away one-quarter rotation, and secure it by tightening lock nut.

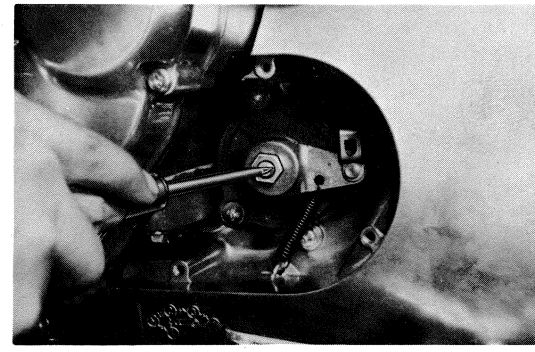


Fig. 1-239

3. Set the adjustor to provide a clutch lever play Ⓐ of 4 mm (0.16 in).

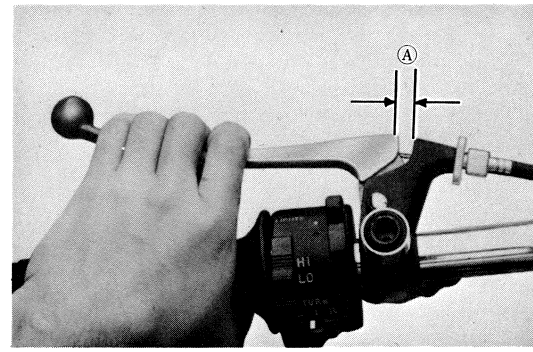


Fig. 1-240

IGNITION TIMING ADJUSTMENT

Ignition timing specifications

Point gap	0.35 mm (0.018 in)
Spark plug gap	0.6 - 0.7 mm (0.024 - 0.028 in)
Ignition timing	17° B.T.D.C. below 1,500 rpm and 37° B.T.D.C. above 2,500 rpm

IMPORTANT:
1. **Be sure to use a 19-mm wrench to turn over crankshaft in the direction shown.**
2. **Have all four plugs removed until the adjustment is completed.**

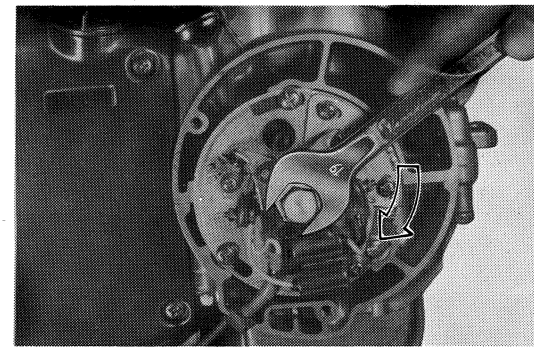


Fig. 1-241

Timing adjustment for Nos.1 and 4 cylinders

1. Set the contact point gap Ⓐ to 0.35 mm (0.018 in) in the Nos. 1-4 breaker.

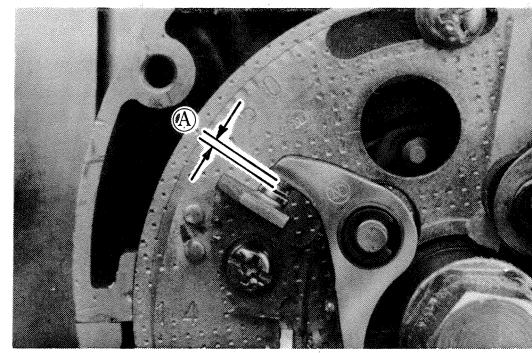


Fig. 1-242

2. Connect the timing tester between the (+) terminal of the same breaker and ground. Use the tester, 09900-27003, for this purpose.

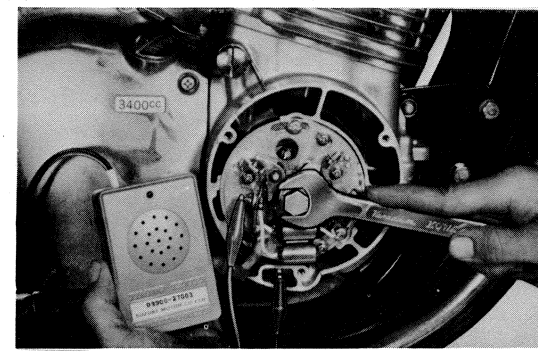


Fig. 1-243

3. Turn over crankshaft in normal running direction to index mark Ⓑ (on the Nos. 1-4 side of the advance governor) to timing mark Ⓓ .

Ⓐ : corresponding to T.D.C. of Nos. 1-4 pistons
Ⓑ : timing index mark
Ⓒ : ignition advance timing mark

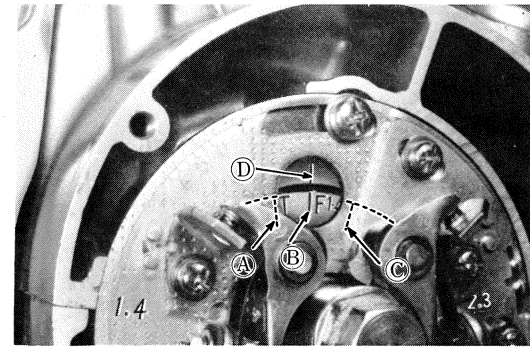


Fig. 1-244

4. With the pistons brought to the specified B.T.D.C. position in Nos. 1 and 4 cylinder, as above, loosen 3 screws Ⓔ securing the breaker plate and turn the plate slowly until the contact points begin to separate. Secure the plate in that position by tightening the screws Ⓔ .

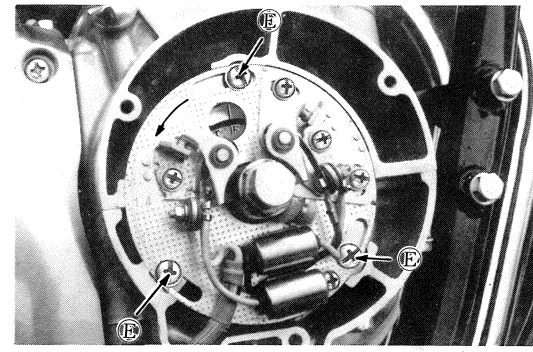


Fig. 1-245

5. To check, turn over crankshaft slowly while paying attention to the timing tester. If the breaker begins to open its contact just when mark Ⓑ comes into register with mark Ⓓ , then it means that the adjustment is correct and that the ignition is timed as specified for Nos. 1 and 4 cylinders.

Timing adjustment for Nos. 2 and 3 cylinders

The procedure is identical to the foregoing one except for two points:

1. Bring mark "F" (on Nos. 2-3 side in the advance governor) into register with the timing mark.

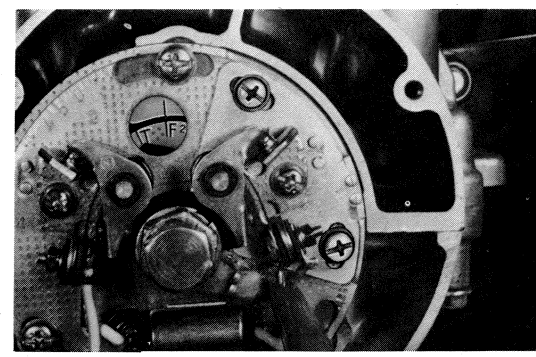


Fig. 1-246

2. Loosen two screws Ⓐ and move plate Ⓑ counterclockwise to determine its position for the beginning of opening action.

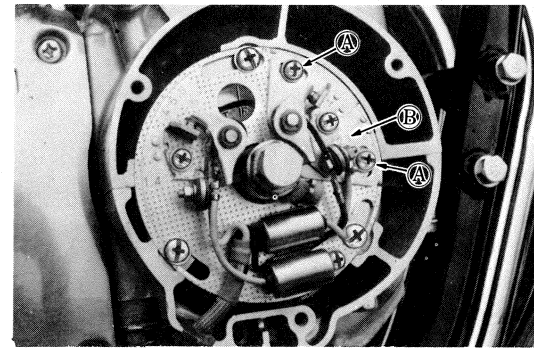


Fig. 1-247

Checking the ignition timing with the timing light

After setting the contact points of the twin breaker by adjusting in the above-described manner, check the performance of the timing mechanism by using the electro tester (09900-28104). Illuminate the advance governor with the timing light of this tester and vary the engine speed to see if the ignition is correctly timed or not. Here's the procedure:

1. Run the engine in the speed range not exceeding 1,500 rpm. Under this condition, "F" mark Ⓐ and timing mark Ⓑ should be in perfect alignment: if not, readjust the twin breaker in reference to these marks in the advance governor.

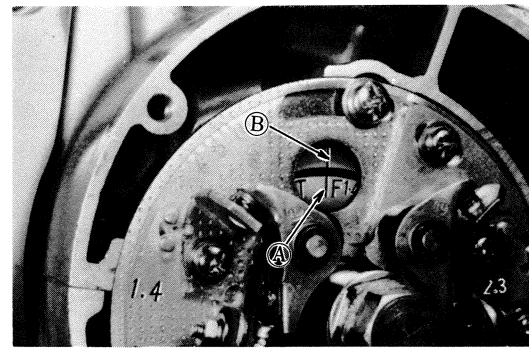


Fig. 1-248

2. Run the engine in the speed range above 2,500 rpm; and similarly observe the position of mark Ⓒ relative to mark Ⓓ . If the two marks are in register, it means that the ignition is properly advanced.

3. Carry out the above steps 1. 2. for Nos. 2 and 3 cylinders.

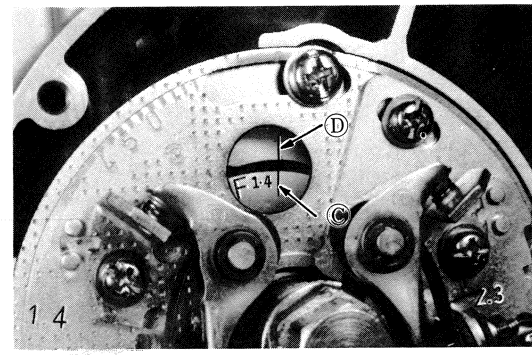


Fig. 1-249

CARBURETOR ADJUSTMENT

Idling adjustment

Idling speed	1,000 rpm
Air screw setting	Back off 1¼ turns from fully run-in position.

NOTE: Make this adjustment when the engine is hot.

1. Run in the air screw of each carburetor all the way, taking care not to strip the screw threads by overtorquing it, and back it off one and a quarter (1¼) turns.

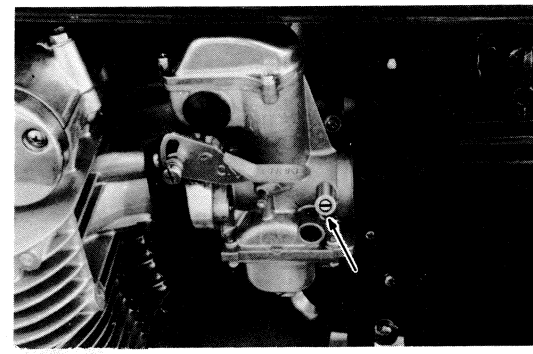


Fig. 1-250

2. Restart the engine, and raise or lower the engine speed to 1,000 rpm by turning the throttle stop screw.

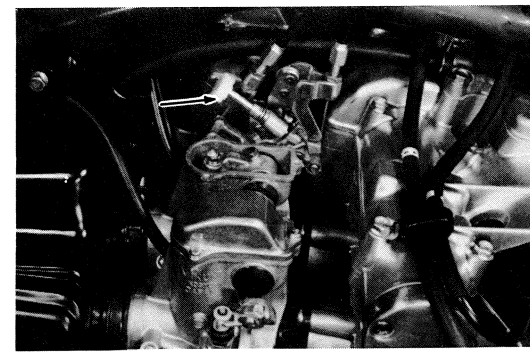


Fig. 1-251

Balancing the carburetors

The four carburetors must be balanced after disassembling the engine or the carburetors. As the first step, calibrate the carburetor balancer gauge (special tool), as follows:

1. Remove the vacuum inlet screw (allen bolt) on No. 4 carburetor intake pipe by using 4 mm hexagon wrench (special tool), and install the adaptor (special tool) in the screw hole.

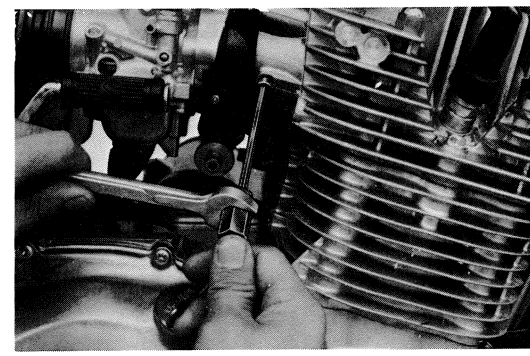


Fig. 1-252

2. Tie one of the four rubber hoses of the balancer gauge to this adaptor.

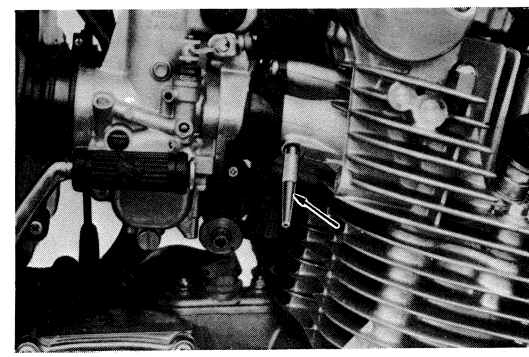


Fig. 1-253

3. Start up the engine, and keep it running at 1,500 rpm.

4. Turn the air screw of the gauge so that the vacuum acting on the tube of that hose will bring the steel ball in the tube to the center line.

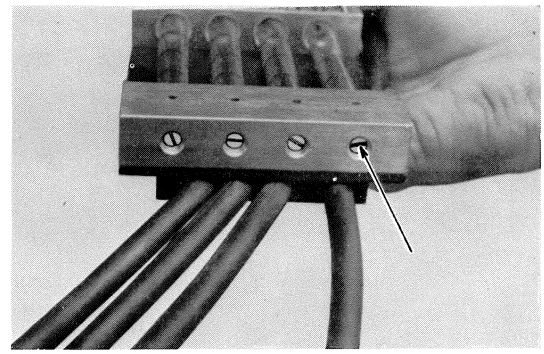


Fig. 1-254

5. Replace the hose by the next hose and, by adjusting the next air screw, bring the steel ball in the next tube to the center line.

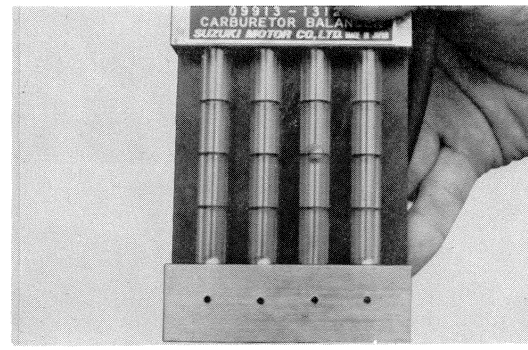


Fig. 1-255

6. Repeat the process on the third and fourth tubes. The balancer gauge is now ready for use in balancing the carburetors.

Remove the respective vacuum inlet screws and install the adaptors in the screw holes. Tie the balancer gauge hoses to these adaptors, one hose to one adaptor, and balance the four carburetors as follows:

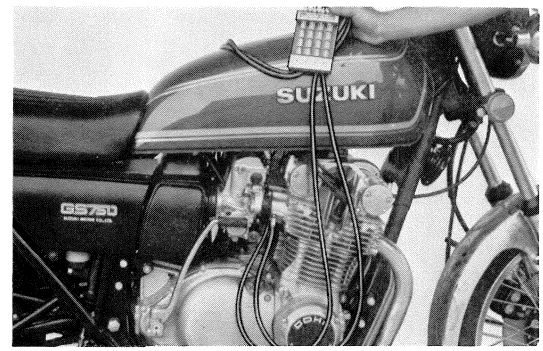


Fig. 1-256

1. Start up the engine, and keep it running at 1,500 rpm.

2. Check to be sure that the ball in No. 4 tube is up at the center line, and that the other three balls are lined up to this reference steel ball, when engine is running at 1,500 rpm.

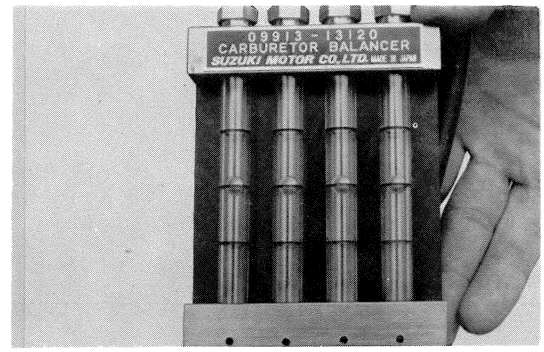


Fig. 1-257

3. If any of the three balls happened to be off the center line, adjust its throttle valve to bring the ball to the center line.

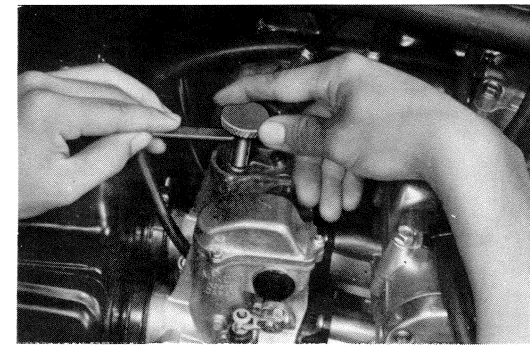


Fig. 1-258

The procedure is as follows: Remove carburetor cover, and loosen the throttle valve adjusting screw lock nut by using the adjusting tool (special tool). Turn the adjusting screw to bring the steel ball abreast of the ball of No. 4 tube.

With the three balls lined up equally to that of No. 4 tube, reposition the throttle stop screw, as necessary, to bring the engine speed to the specified idling level.

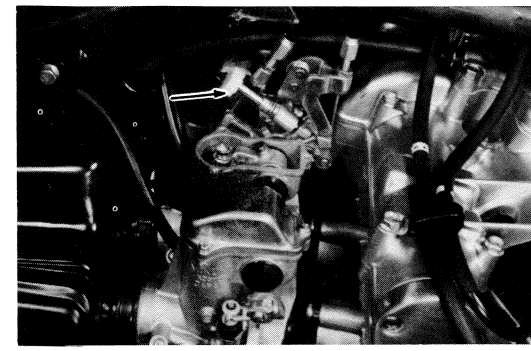


Fig. 1-259

4. Disconnect the balancer gauge hoses and adaptors, and restore the vacuum inlet screws. Be sure to use a packing on each inlet screw.

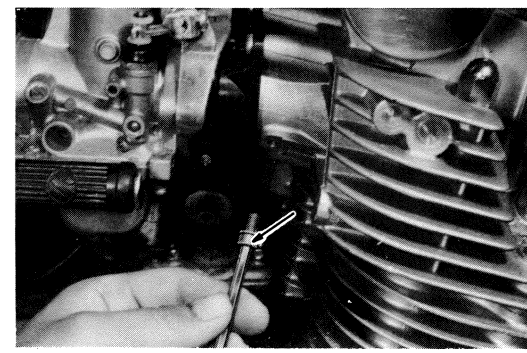


Fig. 1-260

CHASSIS

GROU
3

CONTENTS

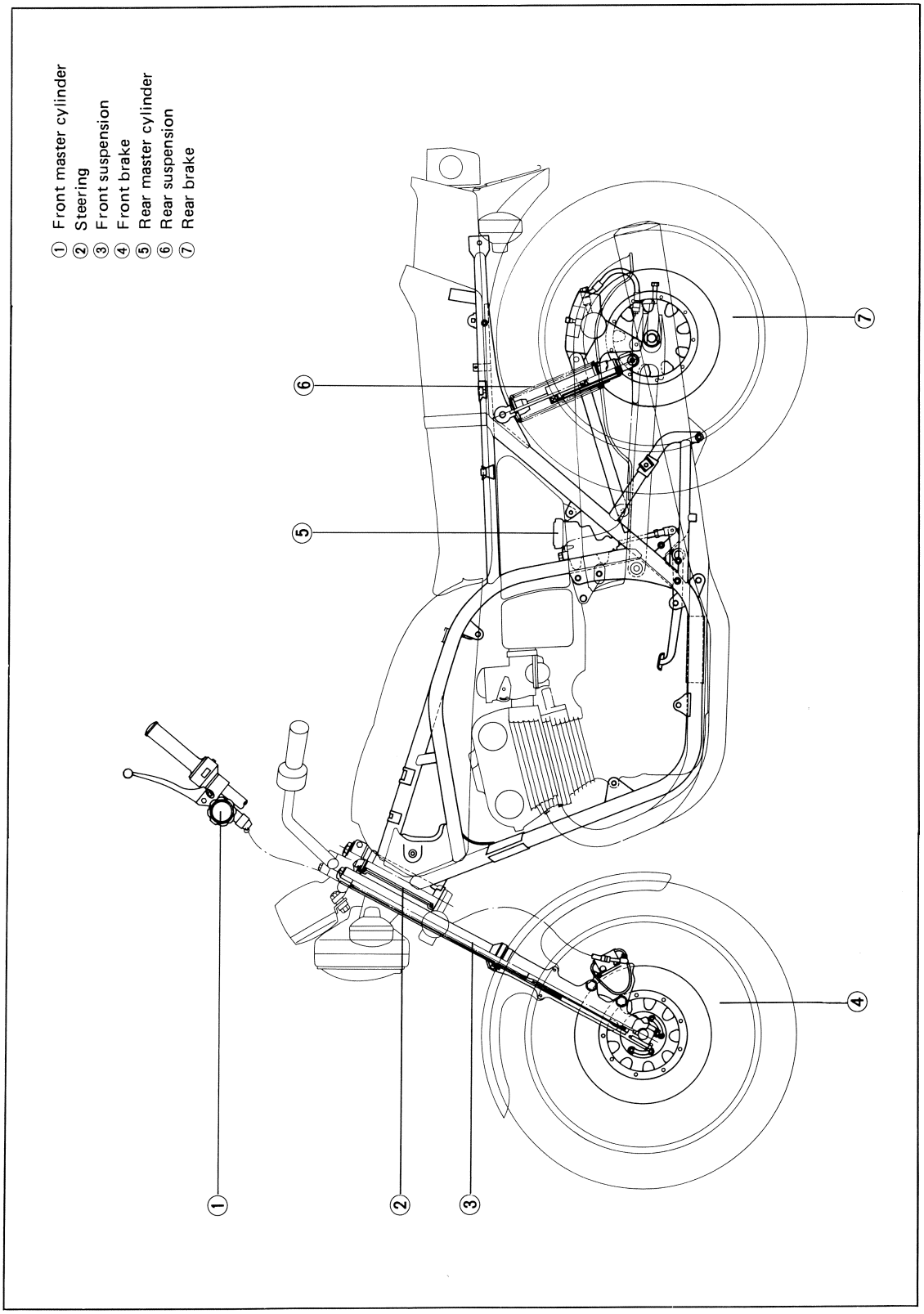

① Front master cylinder
② Steering
③ Front suspension
④ Front brake
⑤ Rear master cylinder
⑥ Rear suspension
⑦ Rear brake

Fig. 2-1

STEERING

The steering stem is held by the frame head pipe. The top and bottom ends of the head pipe have an inner and an outer race, with a circular row of steel balls between the two races.

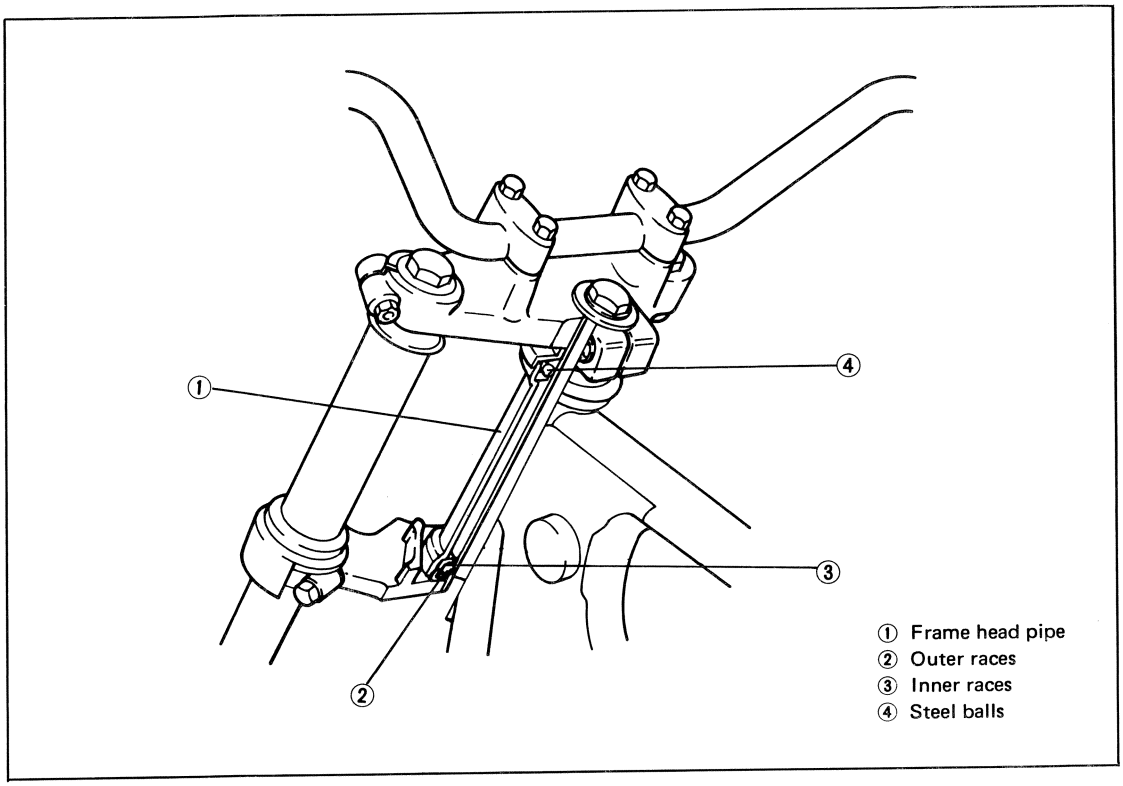


Fig. 2-2

DISASSEMBLY

Place a block under the engine to keep the front wheel lifted off the floor by at least 10 cm (3.9 in.), with the center stand firmly resting on the floor. This posture of the machine is necessary for avoiding hazards.

1. Disconnect the clutch cable at the handle.
2. Disconnect tachometer cable and speedometer cable from the lower part of the meters.

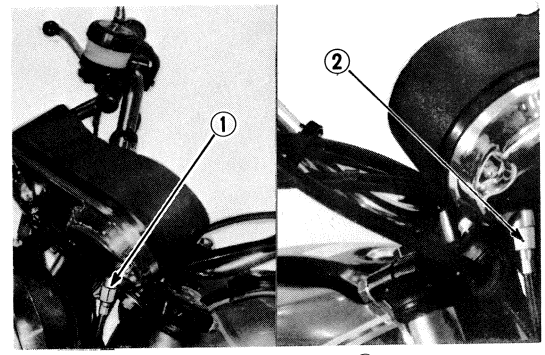


Fig. 2-3 ①Speedometer cable ②Tachometer cable

3. Remove the headlamp unit, and disconnect their wires.
4. Remove the headlamp housing.

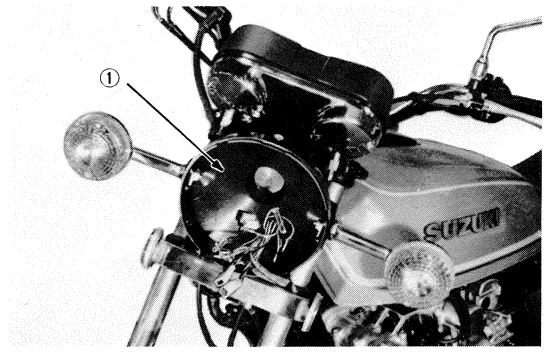


Fig. 2-4 ① Headlamp housing

5. Remove the two mounting bolts and take down the master cylinder.
6. Remove the brake hose guide, which is secured to the right-hand part of steering upper bracket.

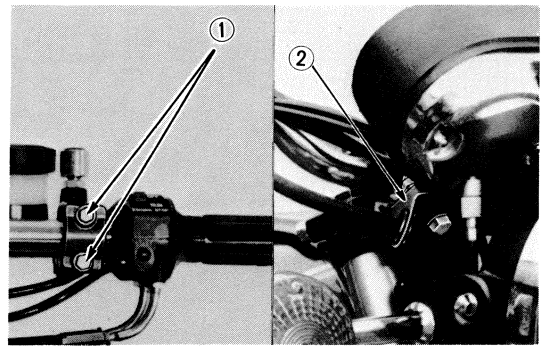


Fig. 2-5 ① Bolt ② Brake hose guide

7. Remove the bolts securing the two-way joint to the lower section of steering stem.
8. Remove the two mounting bolts on front disc caliper assembly, and take down the whole assembly, master cylinder and others.

CAUTION: Be careful not to bend the brake hose.

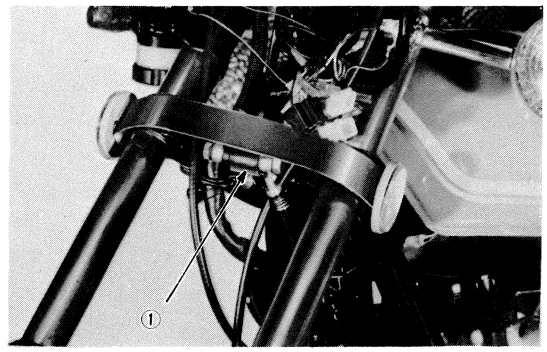


Fig. 2-6 ① 2 way joint

9. Undo the coupler of the meter assembly. Remove the two mounting bolts of this assembly, and take it down.

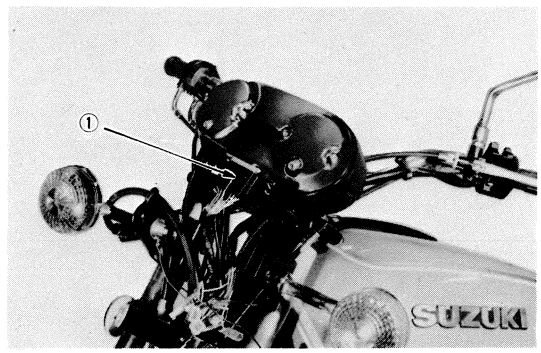


Fig. 2-7 ① Coupler

10. The handlebar is secured by four bolts. Remove these bolts and take down the handlebar.

Tightening torque	1.2 - 2.0 kg-m (8.7 - 14.5 lb-ft)

11. Remove two axle holders, right and left, and take down the front wheel.

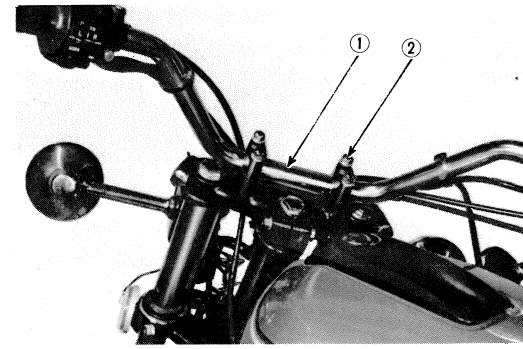


Fig. 2-8 ① Handle bar ② Bolt

12. Remove the upper pinch bolts of the upper fork and also the steering stem bolt. Separate the front fork assembly, complete with the front fender, from the frame.

Tightening torque:

Upper pinch bolt	2.0 - 3.0 kg-m (14.5 - 21.7 lb-ft)
Steering stem bolt	1.5 - 2.5 kg-m (10.8 - 18.1 lb-ft)

CAUTION: When taking off the front fork assembly, exercise care to let the fork cleaner the headlamp stays.

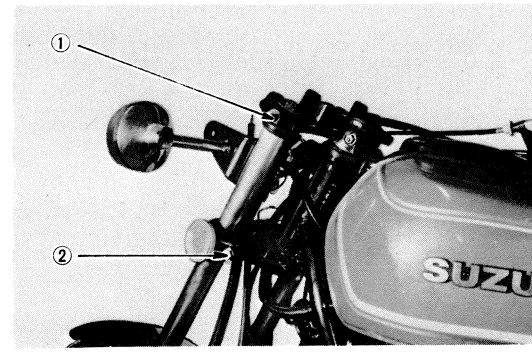


Fig. 2-9 ① Front fork tube upper pinch bolt
② Steering stem bolt

13. Remove the upper braket. Remove the steering stem nut, and slide off the stem. Be careful not to let the steel balls fall off.

Special tool	Steering stem lock nut wrench 09940-10122

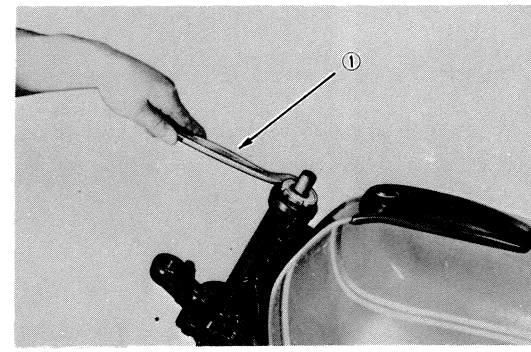


Fig. 2-10 ① Special tool

INSPECTION

Inspect and check the removed parts for the following malconditions:

1. Handlebar distortion
2. Handle holder wear at the surface in contact with the handlebar
3. Broken cables and lead wires
4. Race wear and brinelling
5. Worn or damaged steel balls
6. Distortion of steering stem and handle stoppers, right and left

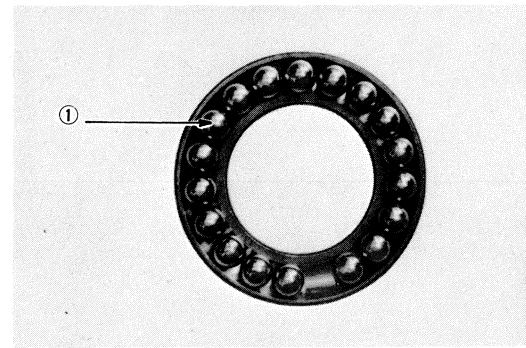


Fig. 2-11 ① Steel balls

REASSEMBLY

Reassembly is generally the reverse of disassembly, but the following additional steps must be taken:

1. Grease the inner race before fitting the steel balls.

Number of steel balls	
TOP	BOTTOM
18	18

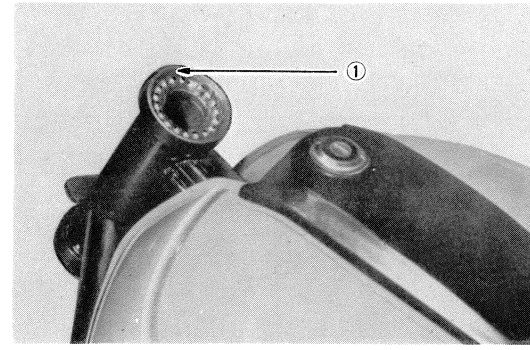


Fig. 2-12 ① Grease

2. Use the special tool to tighten the stem nut to secure the stem after passing it through the frame head pipe and fitting the outer race.

Special tool	Steering stem lock nut wrench 09940-10122

NOTE: While tightening the stem nut with the special tool, turn the stem back and forth to feel its "heaviness" and stop tightening before it becomes too heavy.

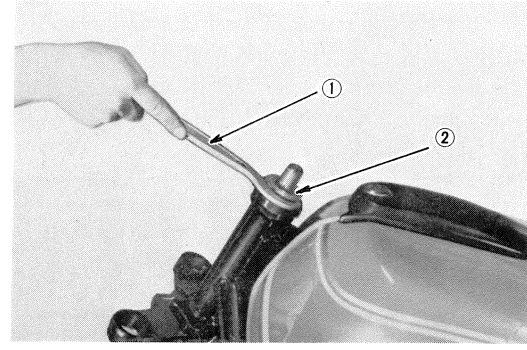


Fig. 2-13 ① Special tool ② Steering stem nut

3. Install the front fork assembly, upper bracket and handlebar, in that order. Set the handlebar to match its punched mark to the mating face of the holder.

NOTE: With the handlebar set in place, check to be sure that there is no visible clearance on the front part of the handle holder.

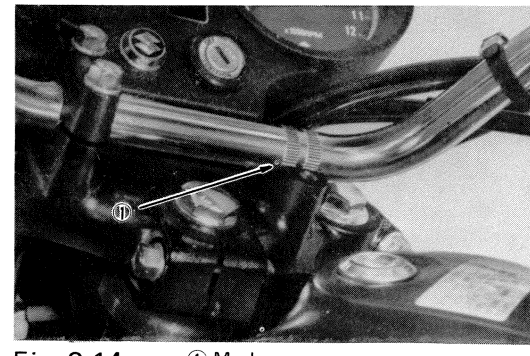


Fig. 2-14 ① Mark

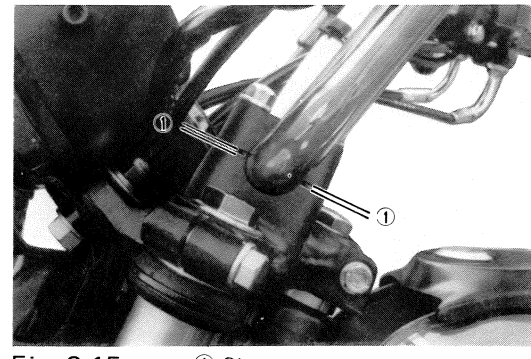


Fig. 2-15 ① Clearance

4. Be particularly careful in reconnecting the lead wires inside the headlamp unit. The lead wires for both winker lamps, right and left, are black, whereas the lead wires on the wire harness side to be connected to these black wires are **light green** (for right-hand winker) and **black** (for left-hand winker).

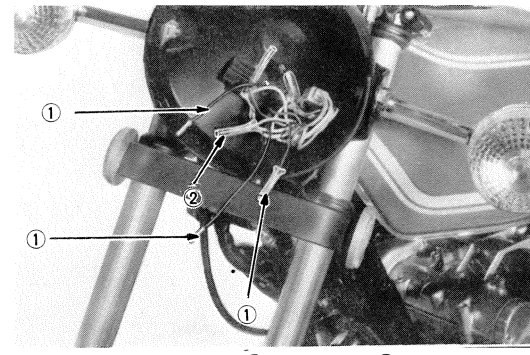


Fig. 2-16 ① Black ② Light green

REPLACEMENT OF STEERING STEM RACES

Disassembly

1. Remove the steering stem.
2. Remove the two inner races fitted to the top and bottom ends of head pipe.

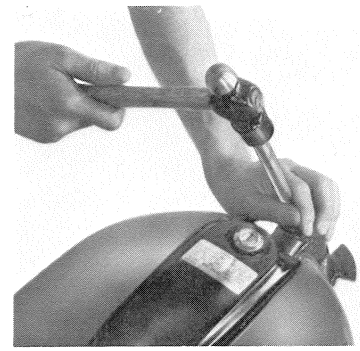


Fig. 2-17

Installing the races

1. Oil the replacement inner races and force each inner race into the head pipe with the use of the special tool. Be sure to push the race all the way into the pipe, that is, until the jacking bolt of the special tool refuses to turn any further.
2. Reassemble by reversing the disassembly sequence, with the replacement outer races properly fitted. Load the races with steel balls as outlined already.

Special tool	Steering inner race and swing arm bearing installer 09941-34510

Operate the special tool in the manner illustrated:

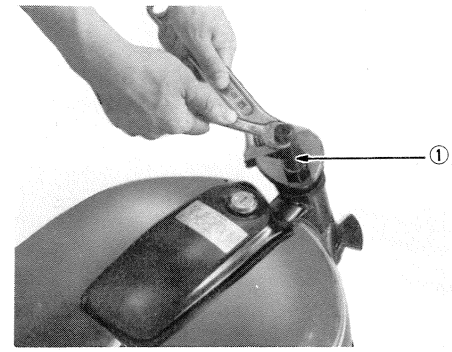
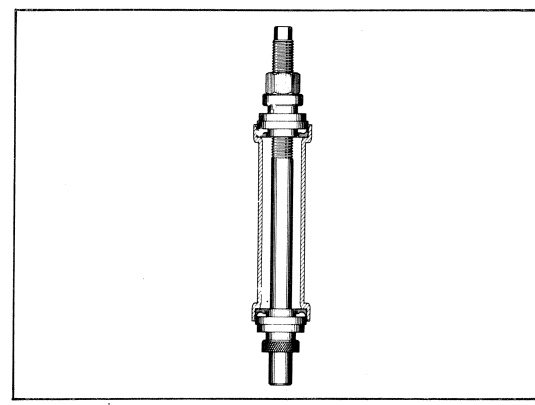
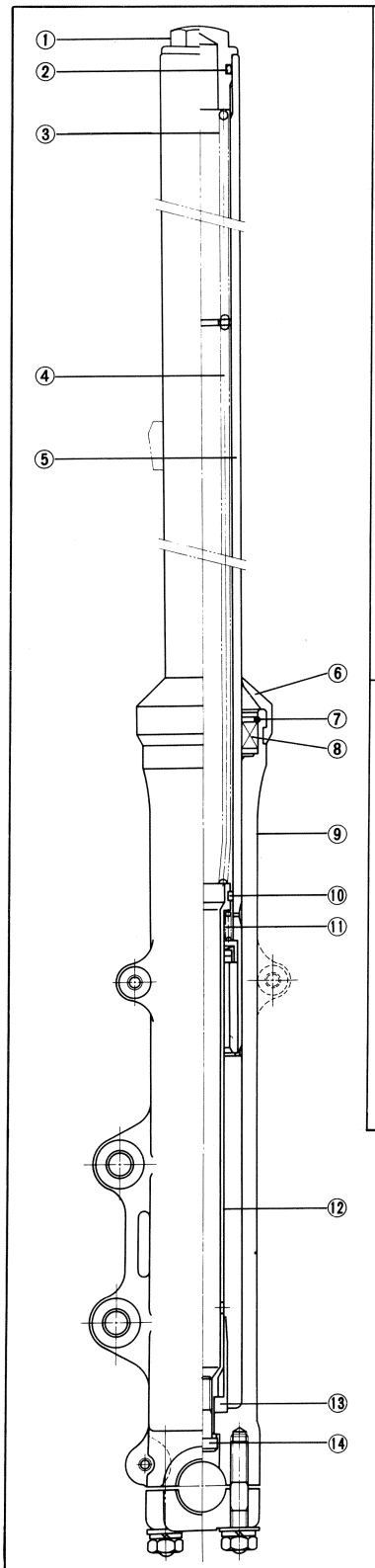
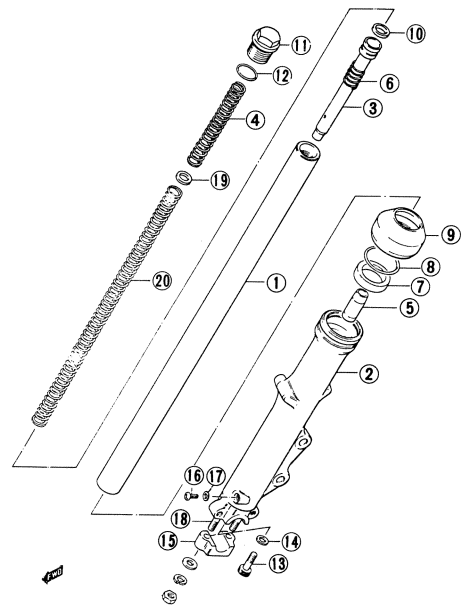


Fig. 2-18 ① Special tool

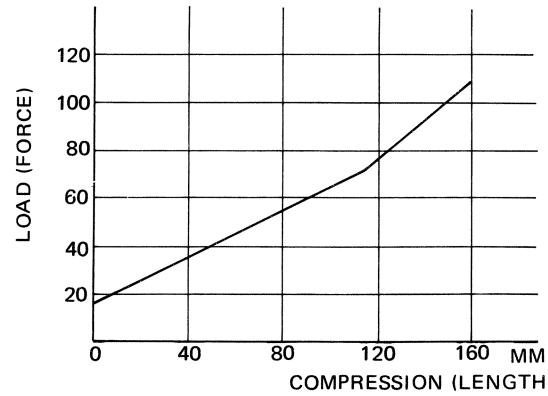


FRONT SUSPENSION





① Inner tube
② Outer tube
③ Seat pipe
④ Short spring
⑤ Oil lock piece
⑥ Rebound spring
⑦ Oil seal
⑧ Oil seal stopper ring
⑨ Dust seal
⑩ Piston ring
⑪ Cap bolt
⑫ "O" ring
⑬ Bolt
⑭ Gasket
⑮ Axle holder
⑯ Screw
⑰ Gasket
⑱ Stud bolt
⑲ Washer
⑳ Long spring



① Cap bolt
② "O" ring
③ Short spring
④ Long spring
⑤ Inner tube
⑥ Dust seal
⑦ Stopper ring
⑧ Oil seal
⑨ Outer tube
⑩ Piston ring
⑪ Rebound spring
⑫ Seat pipe
⑬ Oil lock piece
⑭ Bolt

Fig. 2-19

DISASSEMBLY

Keep the machine standing erect, with the front wheel lifted off the floor and the engine blocked up as in "STEERING."

1. Remove the front wheel and fender. This is accomplished by first loosening fork upper pinch bolts and then backing away fork cap bolts. Have the pinch bolts loosened fully without allowing the front fork to fall off.

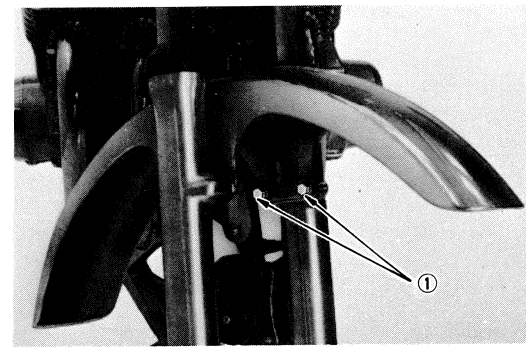


Fig. 2-20 ① Bolt

2. Remove two caliper set bolts, and take off the caliper assembly, taking care not to bend the brake hose.

Tightening torque	2.5 - 4.0 kg-m (18.1 - 29.0 lb-ft)

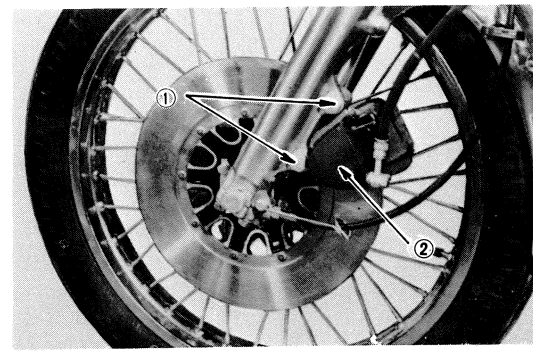


Fig. 2-21 ① Caliper mounting bole ② Caliper ass'y

3. With the upper and lower pinch bolts of the fork sufficiently loosened, remove the front fork by drawing it out.

Tightening torque:

Upper pinch bolt	2.0 - 3.0 kg-m (14.5 - 21.7 lb-ft)
Lower pinch bolt	**2.0-3.0 kg-m** **(14.5-21.7 lb-ft)**

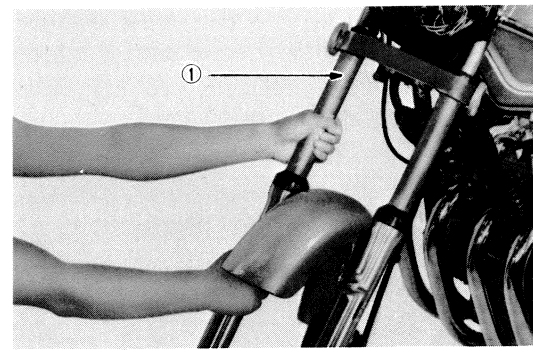


Fig. 2-22 ① Front fork

4. Remove drain plugs on front fork, and remove the fork oil completely. Make a proper provision to avoid oil spillage.

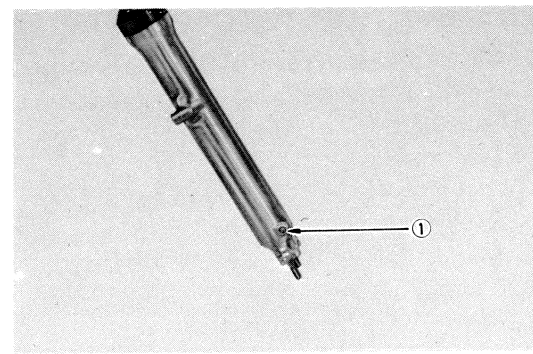


Fig. 2-23 ① Drain plug

5. Remove the dust covers and Ring.

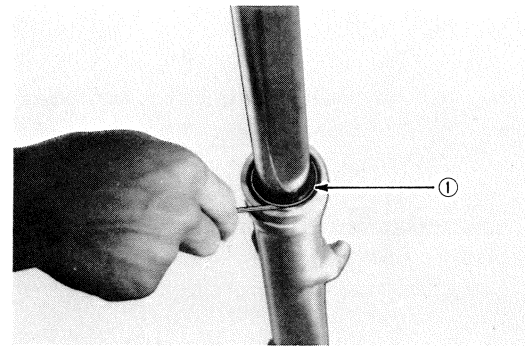


Fig. 2-24 ① ring

6. Remove the cross-recessed head bolt in each fork bottom end by loosening it with an Allen wrench (special tool), thus allowing the front fork to be disassembled into parts.

Special tool:

"T" hexagon wrench	09914-25811
Front fork assembling tool	09940-34510

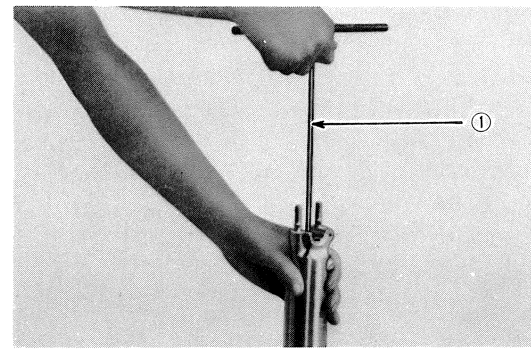


Fig. 2-25 ① Special tool

INSPECTION

Oil seals

Replace oil seals found in damaged condition: inspect the sliding surface of each seal for scratch marks. If oil leakage was noted at the time of removing the front fork, the oil seal there should be replaced.

Inner tubes

Inspect the sliding surface of each inner tube for wear or damage. A tube in badly worn or damaged condition must be replaced.

REASSEMBLY

1. Build up each front fork leg by putting together its parts in this sequential order:
- Inner tube
- Short spring
- Seat pipe
- Long spring
2. Use the special tool to fit oil seals.

Special tool	Front fork oil seal installing tool 09940-53111

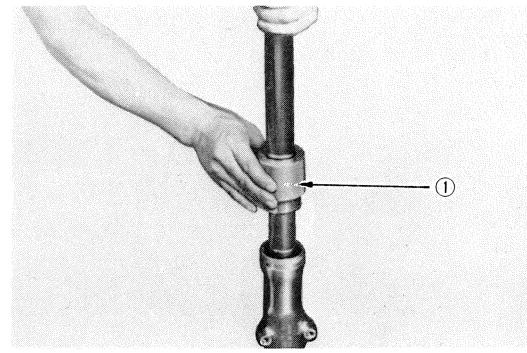


Fig. 2-26 ① Special tool

3. For the fork oil, use a half-and-half mixture of motor oil (SAE #10W/30) and ATF. The amount of this mixture needed to fill up each leg is:

Fork leg oil capacity (one leg):
180 cc (6.08/6.34 US/Imp oz)

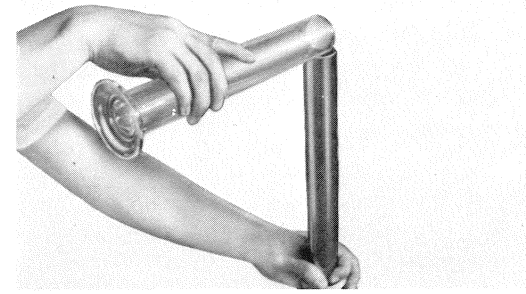


Fig. 2-27

4. When securing the front axle holders, check to be sure to equalize the clearances, front and back, on each holder. In order to make sure that the two legs, right and left, are parallel, check as follows: Fasten the two axle holders tentatively and loosen the four mounting bolts of front fender; under this condition, stroke the fork up and down several times to make the two legs parallel. Tighten the bolts on axle holders and fender fully after checking in this manner.

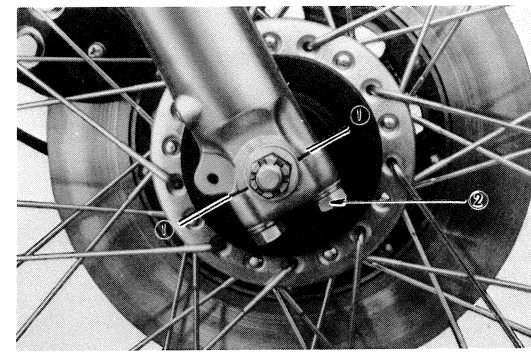


Fig. 2-28 ① Clearance ② Axle holder nut

REAR SUSPENSION

Hydraulic dampers, each fitted with a coil spring, absorb road shocks in the rear suspension. The spring preload can be varied in five steps. The total damping stroke is 85 mm (3.35 in).

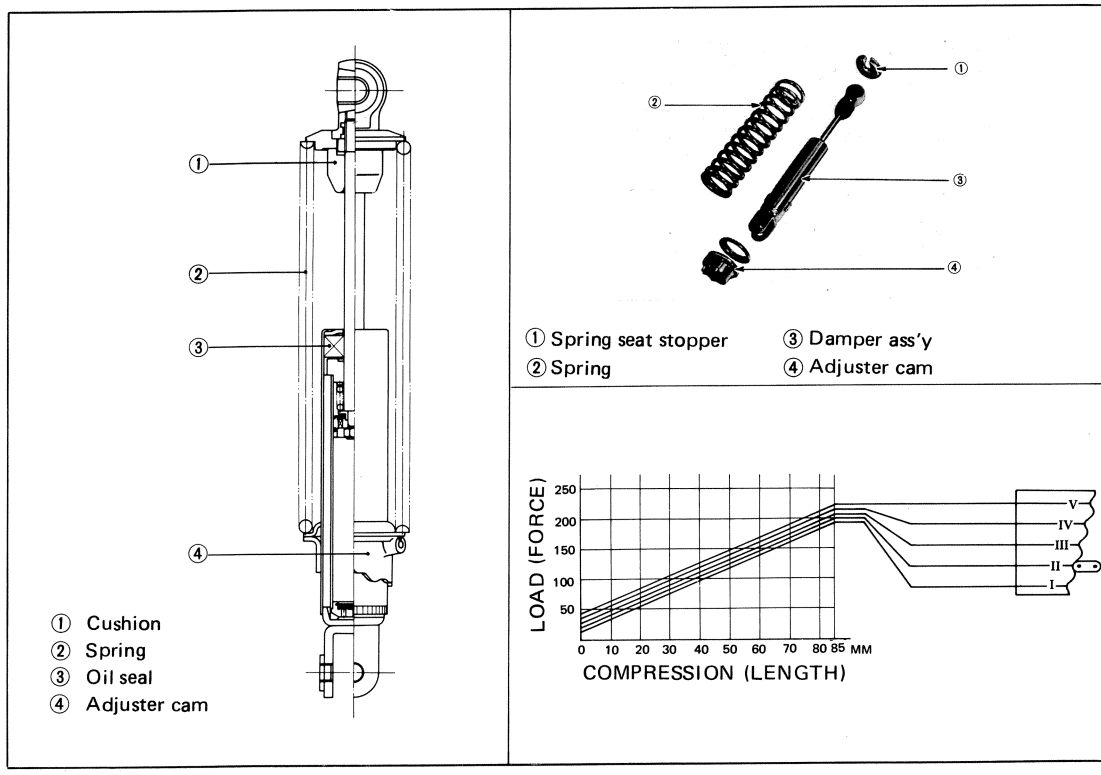


Fig. 2-29

DISASSEMBLY

1. Each rear shock unit — damper and coil spring combination — is connected by a nut at its top end and by a bolt at its bottom end. Remove these nuts and bolts and take down the two units.
2. To disassemble the rear shock unit, compress the spring and take out the upper spring seat: this permits the unit to be broken apart into parts.

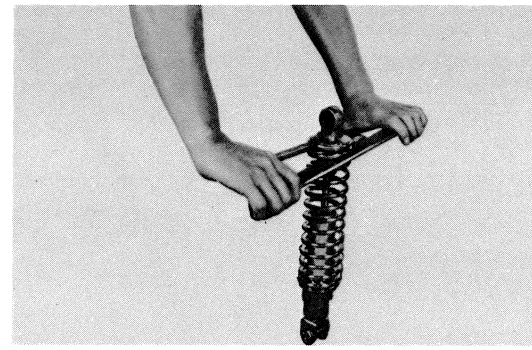


Fig. 2-30

INSPECTION

1. Inspect the hydraulic damper for evidence of oil leakage.
2. Check the piston rod for distortion. Visually inspect the other internals for damage — cracks, dents, galling, etc.

IMPORTANT: There must be a good balance in shock absorbing performance between the two units, right and left. If one unit is so poor in performance as to require replacement, then the two should be replaced at the same time. Always treat the two as an inseparable pair.

REASSEMBLY

1. Reassemble by reversing the sequential order of removal and disassembly.
2. Adhere to the tightening torque specification:

Bolt (bottom end)	2.0 - 3.0 kg-m (14.5 - 21.7 lb-ft)
Nut (top end)	2.0 - 3.0 kg-m (14.5 - 21.7 lb-ft)

FRONT WHEEL

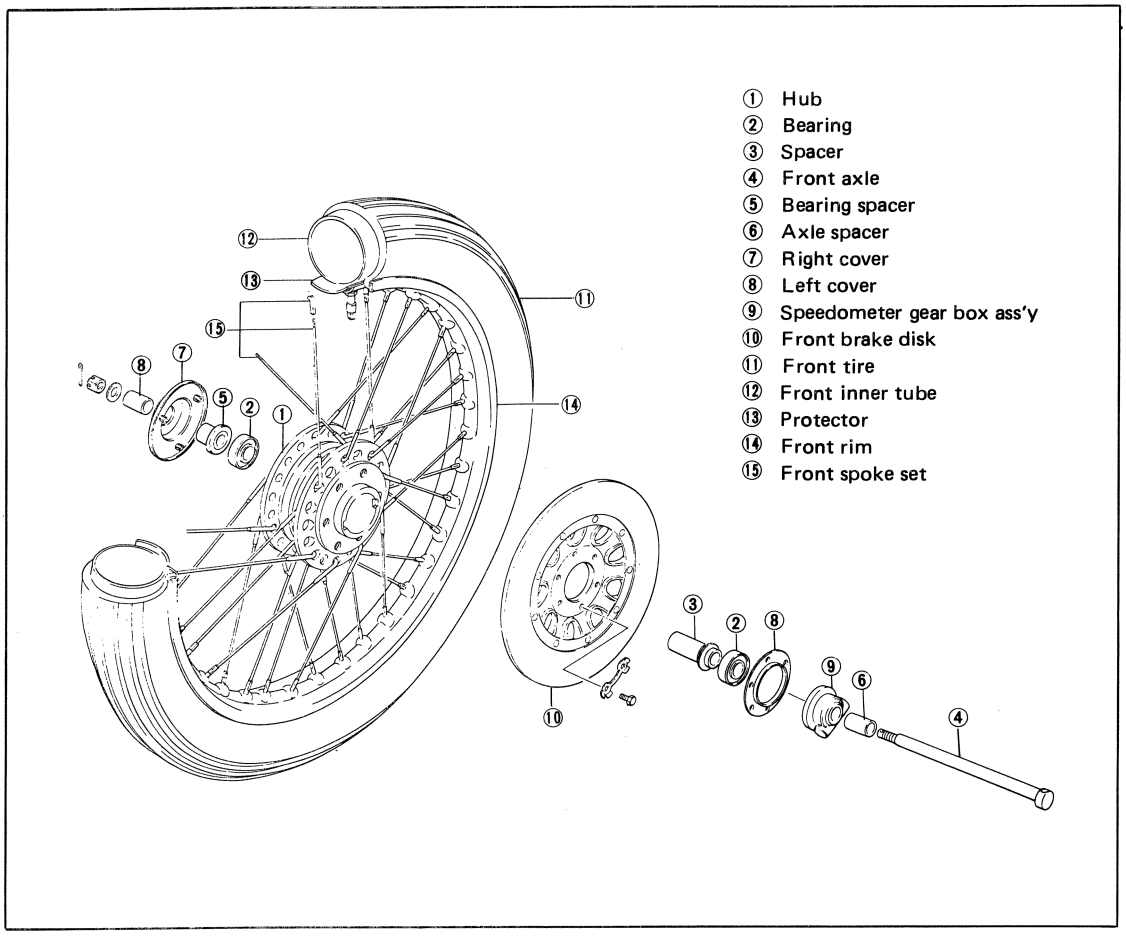


Fig. 2-31

DISASSEMBLY

1. Have the front wheel lifted off the floor by blocking up the engine, with the center stand resting firmly on the floor.
2. Disconnect speedometer cable at the wheel.
3. Pull off split pin from the axle nut; and have this nut loosened. Remove the axle holders, right and left, and take off the wheel.

CAUTION: After removing the front wheel, do not squeeze the front brake lever or the brake pads will move inside the caliper. The pads should be left where they were at the time of wheel removal· otherwise a difficulty will be encountered in reinstalling.

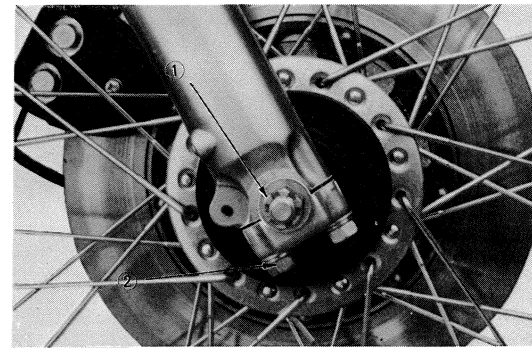


Fig. 2-32 ① Axle nut ② Axle holder nut

4. Unlock the 6 bolts securing the disc to the wheel hub by bending up the lock washers. Remove the bolts and separate the disc from the wheel.

Tightening torque	1.5 - 2.5 kg-m (10.8 - 18.1 lb-ft)

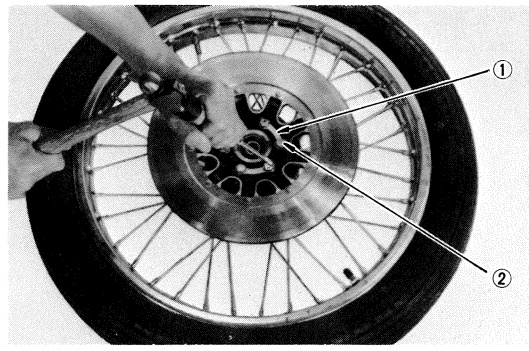


Fig. 2-33 ① Washer ② Bolt

5. Draw out front wheel bearings by operating the special tool.

Special tool	Bearing and oil seal installing tool 09913-70122

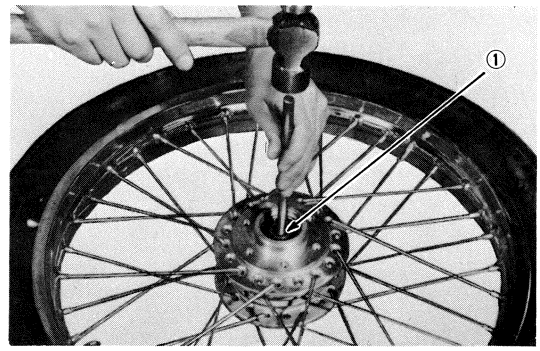


Fig. 2-34 ① Bearing

INSPECTION

1. Mike the disc to check its thickness for wear. This thickness can be checked with the disc and wheel in place. The service limit is specified for the thickness of this disc:

Front disc thickness	
Standard	Service limit
6.7 mm (0.264 in)	Under 6.00 mm (0.236 in)

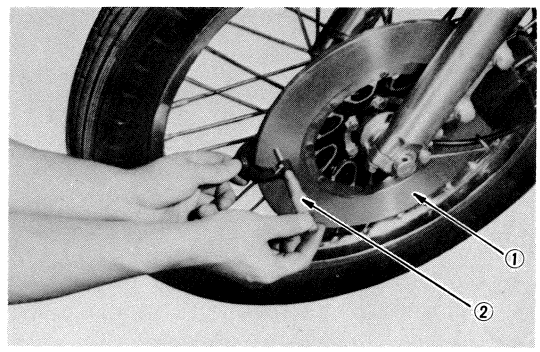


Fig. 2-35 ① Brake disc ② Micrometer

2. With the disc mounted on the wheel, check the disc for face runout with a dial gauge, as shown.

Front disc face runout	
Standard	Service limit
0.1 mm (0.004 in)	0.3 mm (0.012 in)

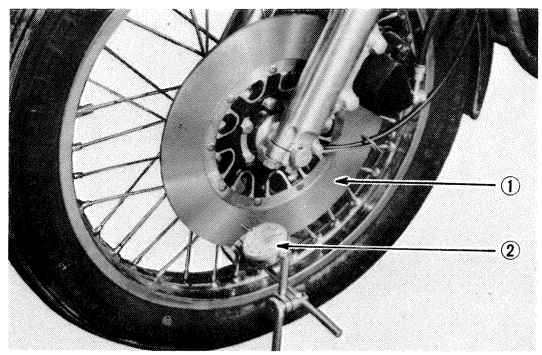


Fig. 2-36 ① Brake Disc ② Dial gauge

3. Visually inspect the wheel hub bore, from which the bearings have been extracted, for evidence of abnormal wear caused possibly by the creeping, if any, of bearing outer races.

4. Check the wheel bearings in the usual manner after cleaning them by washing. Make sure that the bearings spin smoothly without any noise or hitch: spin them **with fingers. Never use an air gun for this purpose.**

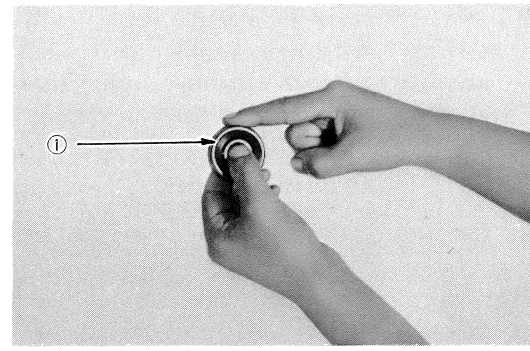


Fig. 2-37 ① Wheel bearing

5. Check the axle shaft for deflection and replace it if it exhibits a deflection, as measured with a dial gauge, in excess of the limit.

Front axle shaft deflection	
Standard	Service limit
0.15 mm (0.006 in)	0.25 mm (0.010 in)

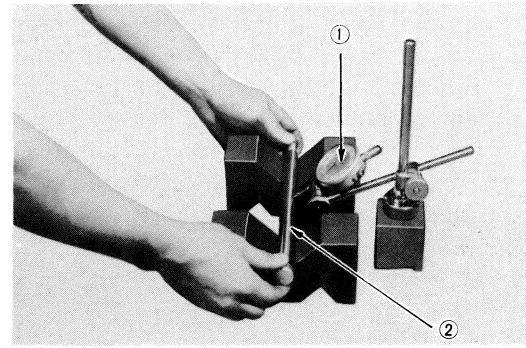


Fig. 2-38 ① Dial gauge ② Axle shaft

6. Check the spokes for tightness, distortion and damage.

7. Inspect the tire for wear and damage; and check the tire tread depth as shown. Replace a badly worn or damaged tire. A tire with its tread worn down to the limit (in terms of tread depth) must be replaced.

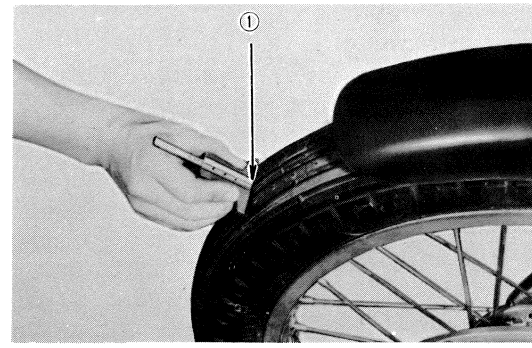


Fig. 2-39 ① Depth gauge

8. Check the tire inflating pressure, and examine the valve for evidence of air leakage.

Front wheel tread depth	
Service limit	1.6 mm (0.06 in)

TIRE INFLATION PRESSURE MODEL GS750		SOLO RIDING		DUAL RIDING	
		KG CM²	LB IN²	KG CM²	LB IN²
NORMAL RIDING	FRONT	1.75	25	1.75	25
	REAR	2.0	28	2.25	32
CONTINUOUS HIGH SPEED RIDING	FRONT	2.0	28	2.0	28
	REAR	2.25	32	2.5	36
TIRE SIZE FRONT 3.25H19-4PR REAR 4.00H18-4PR					
* TIRE PRESSURE SHOULD BE MEASURED WHEN TIRE IS IN COLD CONDITION					

Fig. 2-40

9. Check the wheel for side runout and radial runout. For the former runout, put the dial gauge spindle horizontally to the rim; for the latter, point the spindle radially to the inner surface of the rim.

Front wheel rim runout

Runout	Service limit
SIDE	2.0 mm (0.079 in)

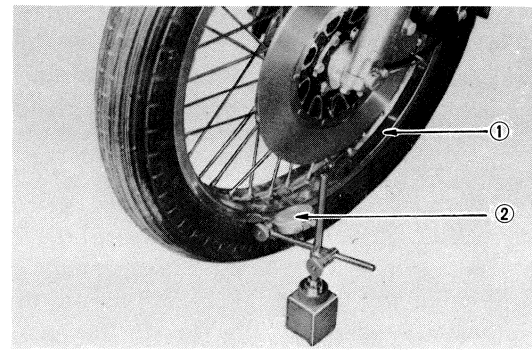


Fig. 2-41 ①Rim ②Dial gauge

10. Spin the wheel (complete with the brake disc) in free state to check its dynamic balance. Use a 20-gram or 30-gram balancing piece, as necessary. Be sure that the wheel comes to its natural halt **not** in a particular position but in **any position through several trials.**

Wheel balancer	
Weight	Part Number
20 grams (0.04 lbs)	55411-11000
30 grams (0.07 lbs)	55412-11000

IMPORTANT: Remember, the dynamic balance breaks when the tire is replaced or repaired after flattening: the wheel must be rebalanced each time its mass is altered.

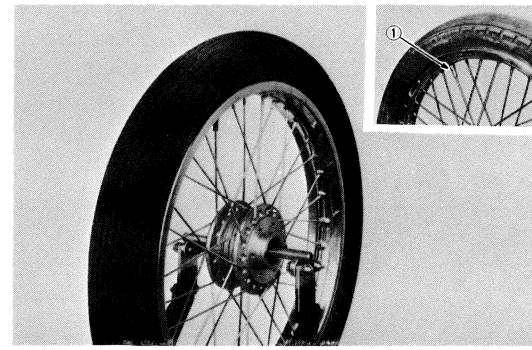


Fig. 2-42 ① Balancer

REASSEMBLY

1. Reassemble and remount the front wheel by reversing the sequential order of removal and disassembly and also by carrying out the following steps:

2. Use the special tool to install the wheel bearings. These bearings are to be driven into the hub bore.

Special tool	Bearing and oil seal installing tool 09913-80111

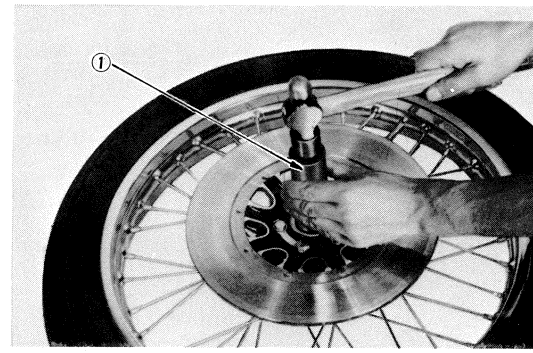


Fig. 2-43 ①Special tool

3. Make sure that the brake disc is clean and free of any greasy matter. After securing it in place by tightening its bolts, be sure to lock each bolt by bending down the lock washer tongue positively.

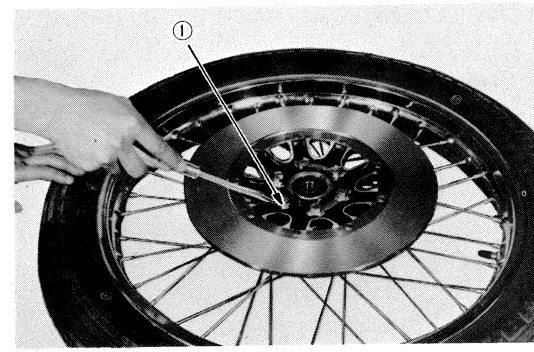


Fig. 2-44 ① Washer

4. Before installing the speedometer gear box, grease it and aim its groove (for fitting to the hub of two drive pawls) to the hub to insert the gear box to the wheel side.

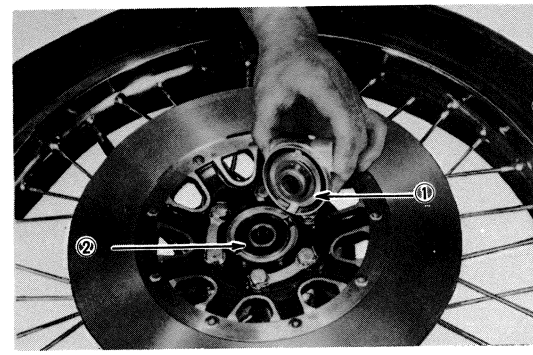


Fig. 2-45 ① Speedometer gear box ② Groove

5. When mounting the wheel, check to be sure that the speedometer gear box is in the position shown. Secure the gear box in the indicated position.

6. Be careful not to leave out the split pin for locking the axle nut. As to the method of securing the axle holders after mounting the wheel, refer to the illustration given in page 93.

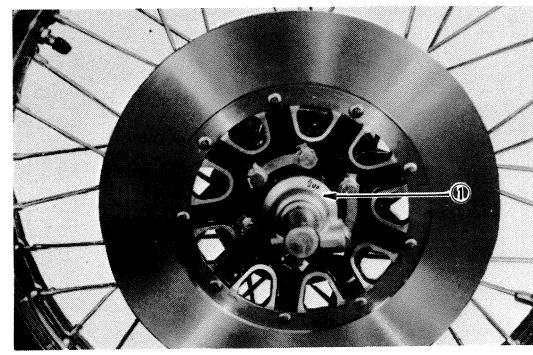


Fig. 2-46 ① Speedometer gear box

REAR WHEEL

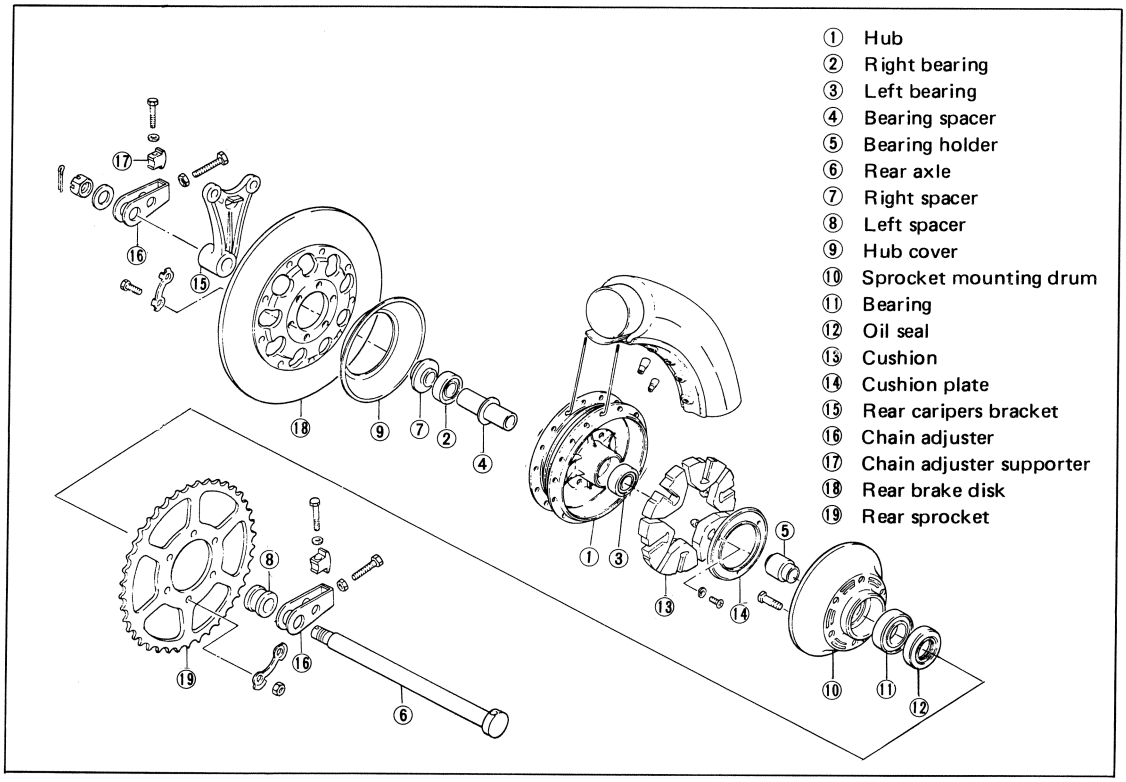


Fig. 2-47

DISASSEMBLY

1. Remove the two bolts securing the chain case, and take off the case.

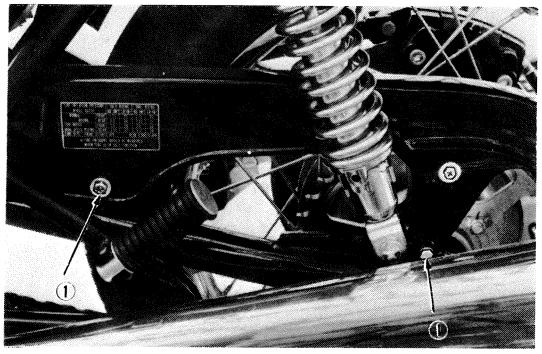


Fig. 2-48 ① Bolt

2. Pull the split pin off the axle nut, loosen the nut, and remove the two chain adjustor support bolts, right and left.

Tightening torque	
Axle nut	8.5 - 11.5 kg-m (61.5 - 83.1 lb-ft)

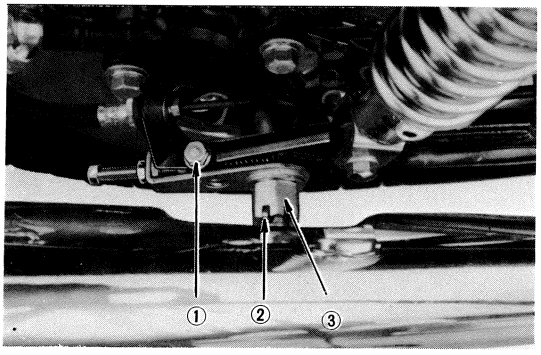


Fig. 2-49 ① Chain adjuster support bolt
② Cotter pin ③ Axle nut

3. Remove the two bolts securing the caliper, and also the torque link rear nut.

Tightening torque	
Caliper bolts	2.0 - 3.0 kg-m (14.5 - 21.7 lb-ft)
Torque link rear bolts	2.0 - 3.0 kg-m (14.5 - 21.7 lb-ft)

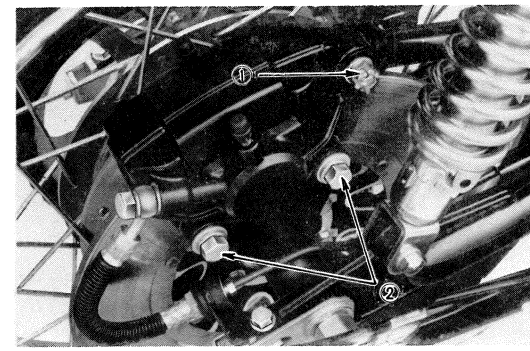


Fig. 2-50 ① Torque link nut ② Caliper bolt

4. Separate the caliper assembly from the disc, and take it off the machine.

NOTE:
- **This removal will be greatly facilitated if the caliper assembly is suspended with a sling, as shown, at the time of loosening its securing bolts for removal.**
- **Be careful not to bend the brake hose when taking the caliper assembly out.**

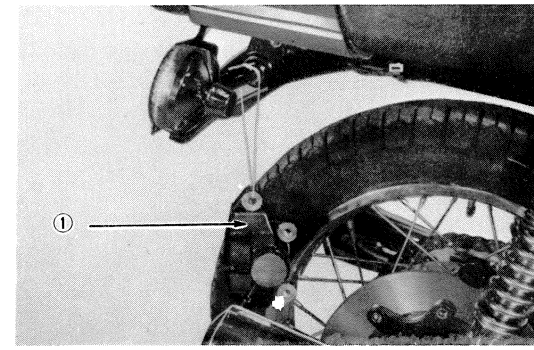


Fig. 2-51 ① Rear caliper

5. Loosen the two chain adjustor bolts, right and left. Turn down both adjustors; push the wheel forward; and disengage the drive chain from the sprocket, displacing the chain toward outer side.

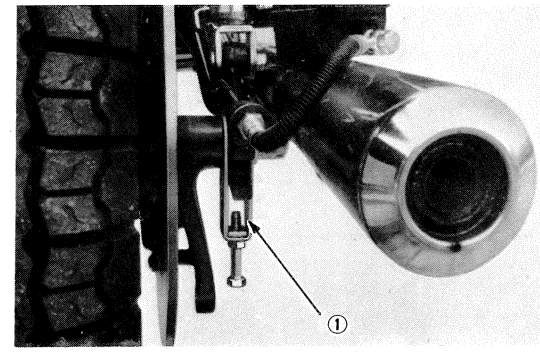


Fig. 2-52 ① Chain adjuster

6. Tilt the wheel and withdraw it from the chassis.

7. Remove the axle nut, and draw the axle off the wheel.

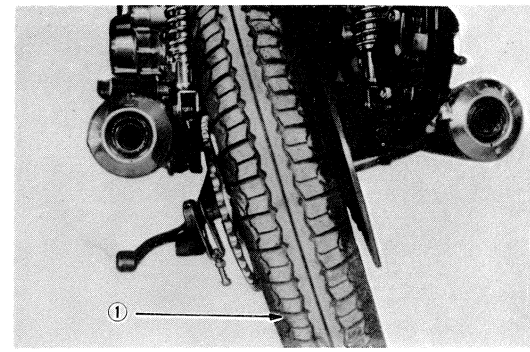


Fig. 2-53 ① Rear wheel

8. The brake disc is secured to the wheel hub by 6 bolts, each being locked with a washer. Bend up the lock washers, remove the bolts and separate the disc from wheel.

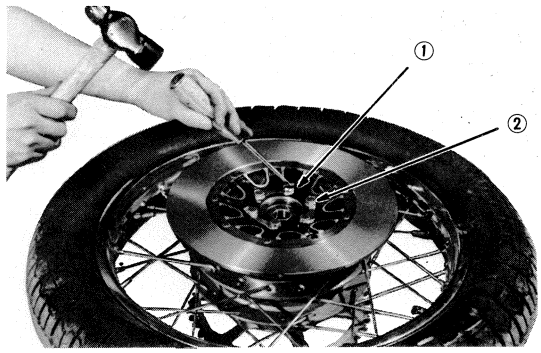


Fig. 2-54 ①Washer ②Bolt

9. Remove the sprocket. This is accomplished by unlocking its 6 securing nuts, and removing the bolts and nuts to free the sprocket.

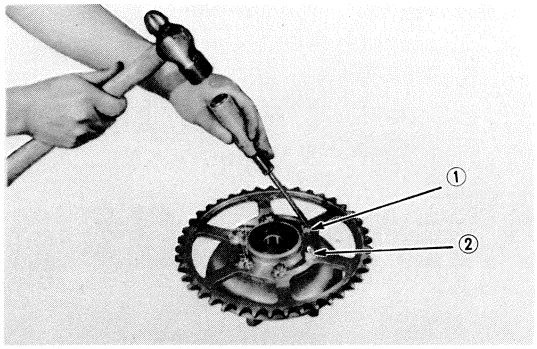


Fig. 2-55 ①Washer ②Nut

10. Using the pullers (special tools), remove oil seals and bearings from the sprocket drum.

Special tool	Part Number
Oil seal remover	09913-50110
Bearing puller	09913-80111

NOTE: Do not re-use the oil seals removed: use replacement oil seals in reassembly.

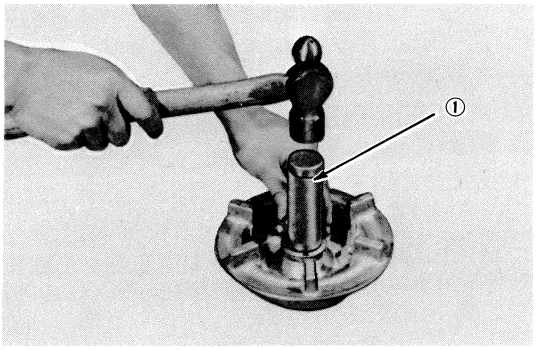


Fig. 2-56 ①Special tool

INSPECTION

There is practically no difference between front wheel and rear wheel as far as the items of inspection and checking as concerned. As to the methods and inspection criteria, refer to "**INSPECTION, FRONT WHEEL.**" Items are as follows:

- Brake disc thickness
- Spoke tightness, distortion and damage
- Wheel tire tread depth
- Wheel rim runouts, side and radial
- Wheel bearing wear
- Axle shaft deflection
- Tire inflating pressure
- Wheel dynamic balance
- Wheel hub wear

1. Inspect the wheel hub cushion for cracks or any other damage.
2. Examine the teeth of rear sprocket for wear and damage.
3. Inspect the sprocket drum oil seal for distortion, wear and damage.

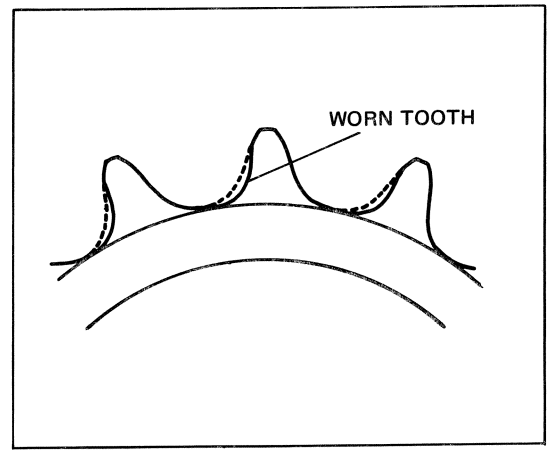


Fig. 2-57

Drive chain

The drive chain used in the Model GS750 is of high-durability endless type with bushes hermetically containing grease. It is a 96-link chain of TAKASAGO-make type RK630-SO, designed to retain the highest stainable reliability demanded of this critical component.

CAUTION: This long-life chain should be treated as an expendable item. Never attempt to shorten its length by removing one or more links. If the chain is found to have stretched abnormally or beyond the limit (indicated below), replace it by a new one.

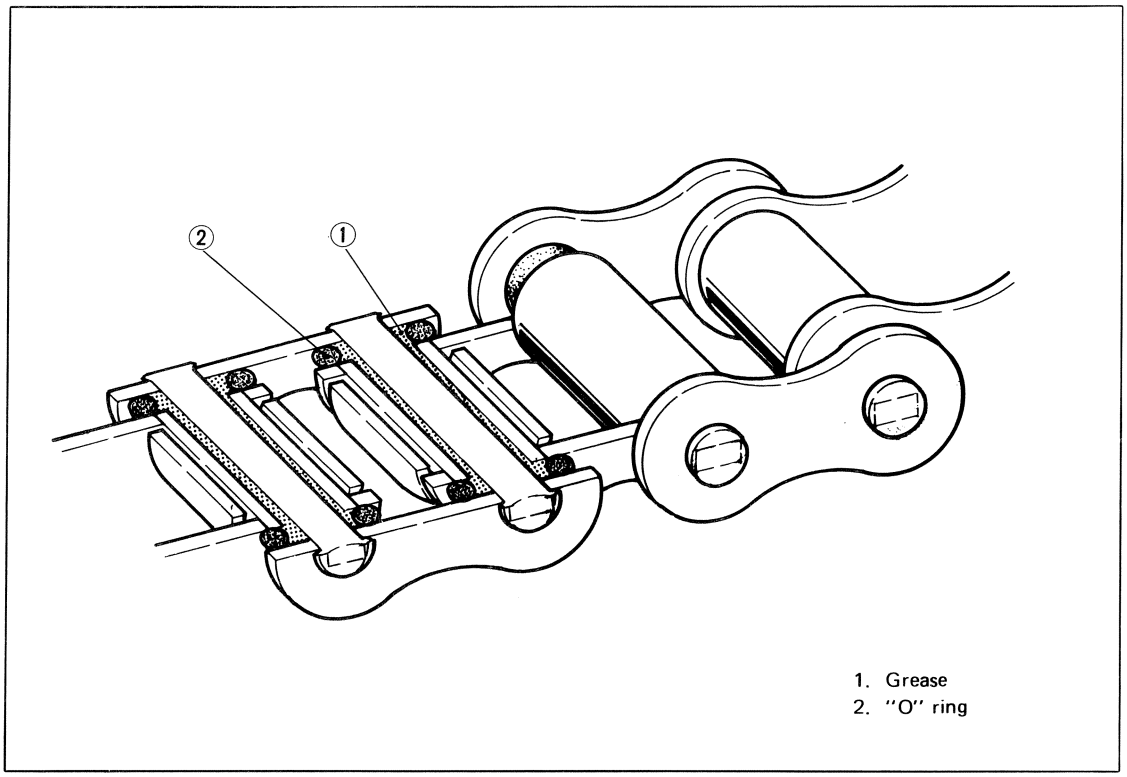


Fig. 2-58

1. Visually inspect the engine sprocket, rear sprocket and drive chain for wear and also for signs of abnormal condition. These are safety components and should be promptly replaced if any flaw is noted.

   The service limit on the chain in terms of elongation is specified. Check the chain as follows:
   ① Tension the drive chain in place fully by tightening the adjustors.
   ② Using a caliper rule, measure the center-to-center distance between two pins 20 pitches apart (including 19 pins in between the two).

20-pitch length of drive chain	
Standard	Service limit
381.0 mm (14.9 in)	384.8 mm (15.1 in) 1% on STD

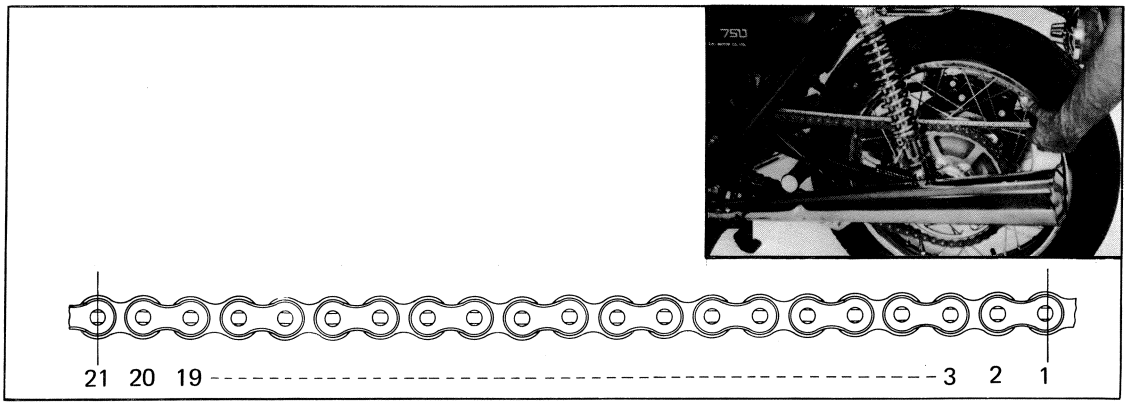


Fig. 2-59

2. Clean and lubricate the drive chain as follows:

NOTE: The bushes do not require relubrication as they contain grease hermetically. The chain rollers, however, must be greased at regular intervals to minimize their wear due to their sliding contact with sprocket teeth.

※ Washing

At intervals of 1,000 km (600 miles), wash the chain clean with kerosene. Do not use gasoline or any similar solvent or the grease in the bushes will become adversely affected. Washing should be effected at shorter intervals if the chain is noted to rust sooner than is anticipated.

NOTE: Remember, the "O" rings fitted to the bushes of the chain are vulnerable to any high-power solvent, including gasoline, benzene and trichlene.

※ Relubrication

After washing and drying the chain, apply a high-viscosity motor oil to the chain rollers. A so-called "chain lube oil" commonly sold in gas stations should not be used since it could be harmful to the "O" rings.

REASSEMBLY

Reassemble and remount the rear wheel by reversing the sequential order of removal and disassembly, and by carrying out the following additional steps:

1. Before fitting the oil seals to the sprocket drum, be sure to oil the seals.

2. Deposit the chain on the inner side of the sprocket before inserting the axle shaft.

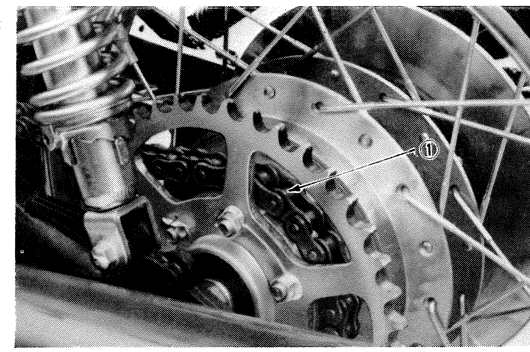


Fig. 2-60 ① Drive chain

3. After positioning the wheel in place, with the axle inserted, make the axle nut just finger-tight. Make sure that each chain adjustor is in place with its graduated scale coming on the outer side: correctly tell the right-hand adjustor from the left-hand adjustor.

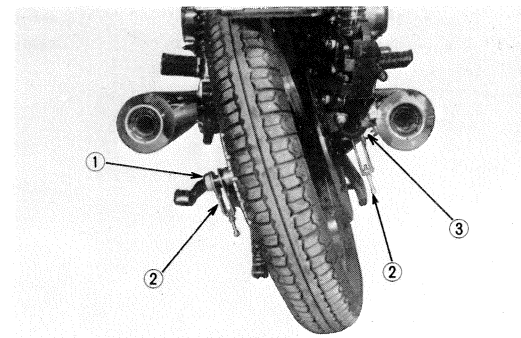


Fig. 2-61 ① Axle shaft ② Chain adjuster ③ Axle nut

4. After resting the wheel on the swing arm, engage the drive chain with the sprocket, and then insert the chain adjustor supports.

5. After setting the chain adjustors in place, fit the torque link rear bolts and nuts and leave them snug-tight.

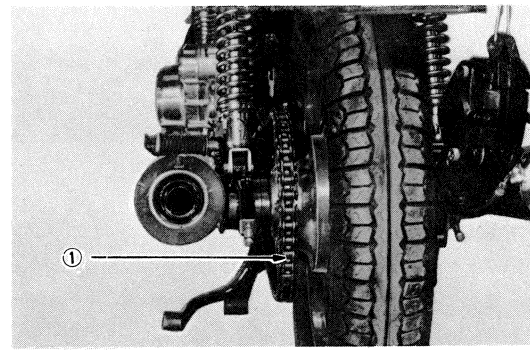


Fig. 2-62 ① Drive chain

6. Install the caliper assembly, making its securing bolts snug-tight, and then tighten the chain adjustor support bolts good and hard. Now the drive chain is ready to be tensioned to provide the specified amount of sag.

Drive chain sag:	20 - 30 mm (0.8 - 1.2 in.)

NOTE: Align the front and rear wheels as outlined in page 132.

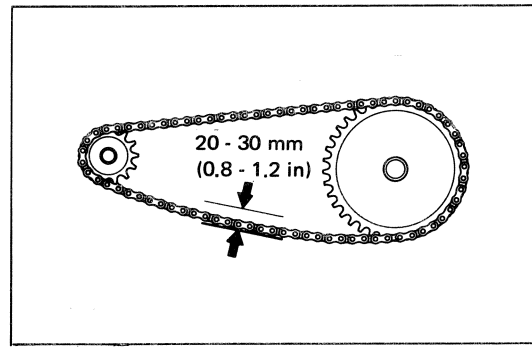


Fig. 2-63

7. After tightening the axle nut good and hard and locking it by inserting the split pin, spin the rear wheel by hand and apply brake lightly to "feel" the drag of brake pads. Adjust the caliper assembly in place so that its pads will exert a minimum of drag, if any, to the disc. With the caliper adjusted to that position, tighten its securing bolts good and hard to the specified torque value indicated above.

8. Tighten the torque link rear nuts good and hard to the torque specification, and lock each nut by inserting a split pin.

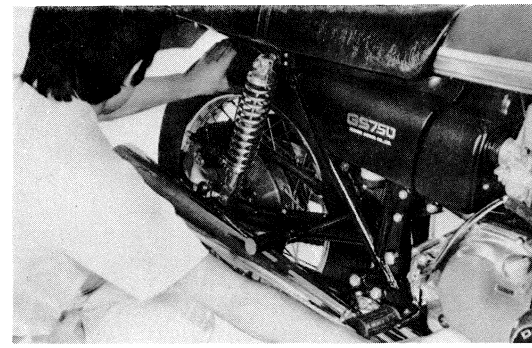


Fig. 2-64

SWINGING ARM

DISASSEMBLY

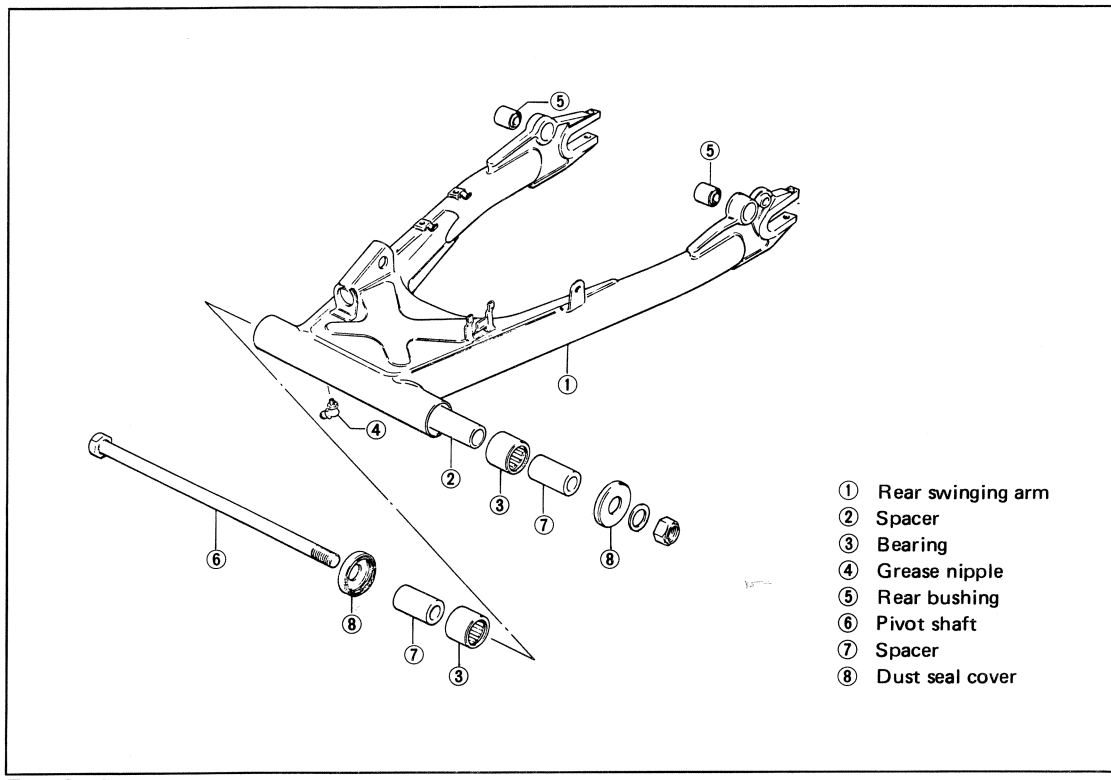


Fig. 2-65

1. Remove the rear wheel as outlined previously.
2. Remove the front step, and take down the rear brake.

Tightening torque	
Front step	2.7 - 4.3 kg-m (19.5 - 31.1 lb-ft)

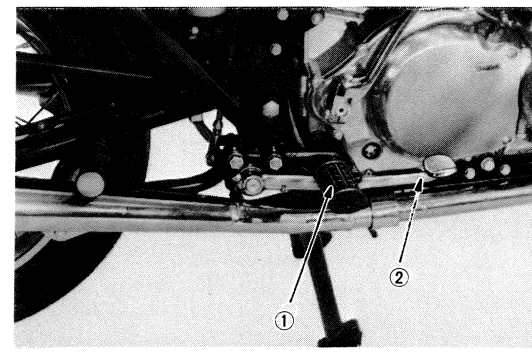


Fig. 2-66 ①Front step ②Rear brake

3. Pull off the split pin from the master cylinder pushrod.

Fig. 2-67 ①Master cylinder push rod

4. By wielding a "T" wrench from the left side of the machine, remove the two mounting bolts on master cylinder, and take off the cylinder.

Tightening torque	1.5 - 2.5 kg-m (10.8 - 18.1 lb-ft)

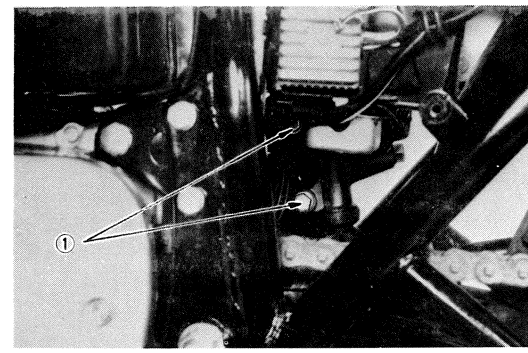


Fig. 2-68 ① Bolt

5. Remove the nut and bolt connecting each rear shock unit. This removal will be facilitated by removing the nut (connecting the top end of the unit to the frame) first.

Tightening torque	
Nut	2.0 - 3.0 kg-m (14.5 - 21.7 lb-ft)
Bolt	2.0 - 3.0 kg-m (14.5 - 21.7 lb-ft)

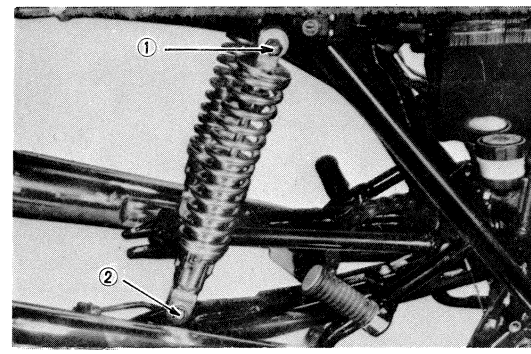


Fig. 2-69 ① Nut ② Bolt

6. Draw out the pivot shaft, and remove the swinging arm.

Tightening torque	5.0 - 8.0 kg-m (36.2 - 57.8 lb-ft)

NOTE: The swinging arm at this time is complete with the master cylinder and brake caliper. Be careful not to bend or twist the brake hose.

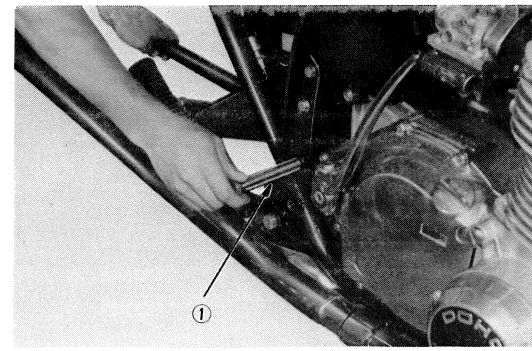


Fig. 2-70 ① Pivot shaft

7. From the removed swinging arm, disconnect the torque links, free the brake oil line secured to the arm, and take off the caliper and master cylinder together with the brake oil line.

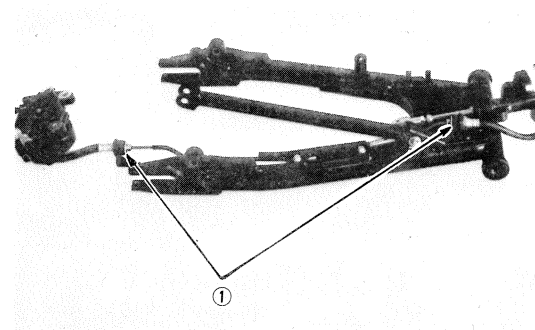


Fig. 2-71 ① Clip

8. Using the special tool, remove the needle roller bearings from the pivoting part of the arm.

Special tool	Swinging arm bearing remover 09941-44510

NOTE: Scrap the removed bearings. Use replacement bearings in reassembly.

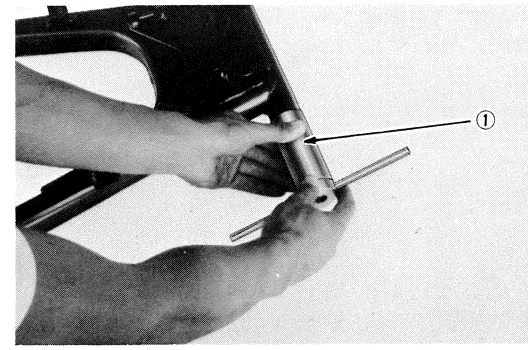


Fig. 2-72 ① Special tool

INSPECTION

Inspect and check for these items:

1. Swinging arm for distortion and damage.
2. Bearings for rattle (due to excessive wear of inner race).
3. Pivot shaft for distortion and wear.
4. Bearing dust seal cap for distortion.

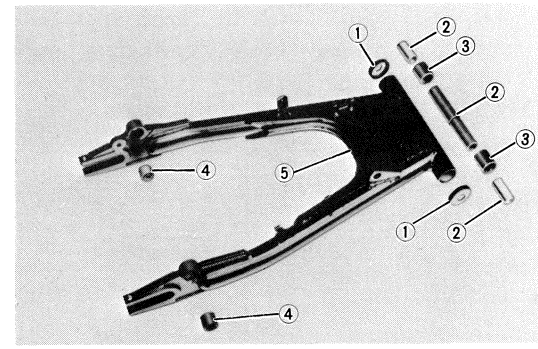


Fig. 2-73 ① Dust seal cover ② Spacer ③ Bearing ④ Bush ⑤ Swinging arm

REASSEMBLY

Reassembly is the reverse of disassembly, but the following additional steps must be taken:

1. The bearings are to be forced into the pivoting part of the arm. Be sure to use the special tool and, before fitting the bearings, to oil them liberally.
2. When installing the bearings, be sure to grease the spacer and dust seal caps.

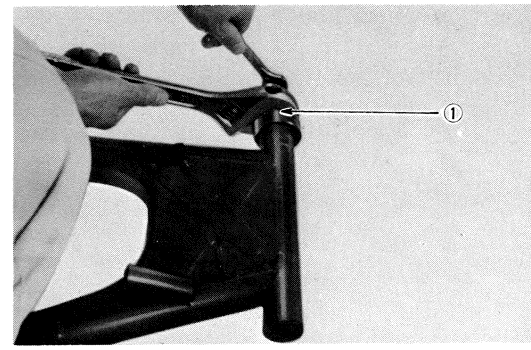
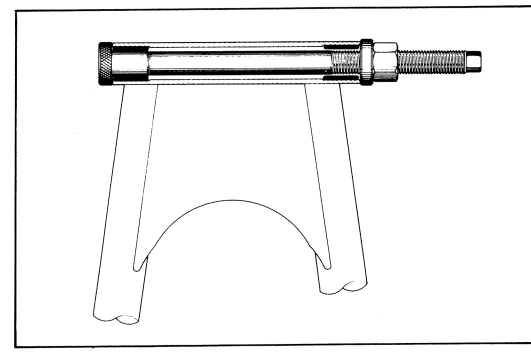


Fig. 2-74 ① Special tool

3. Use the special tool as illustrated.



4. Insert the pivot shaft from left side.

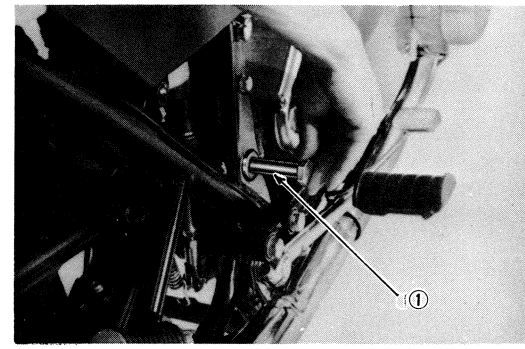


Fig. 2-75 ① Pivot shaft

5. After assembling the pivot, pump in grease with a grease gun through the nipple provided there.

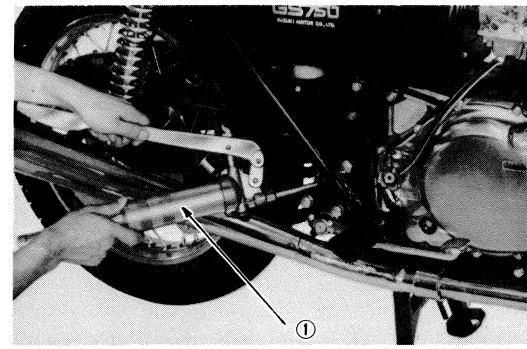


Fig. 2-76 ① Grease gun

6. The brake pedal has a punched mark. Position it on the pedal shaft, with its mark matched to the mark provided on the end face of this shaft.

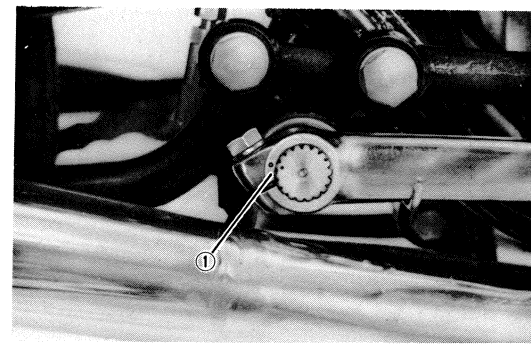


Fig. 2-77 ① Mark

FRONT-BRAKE CALIPER

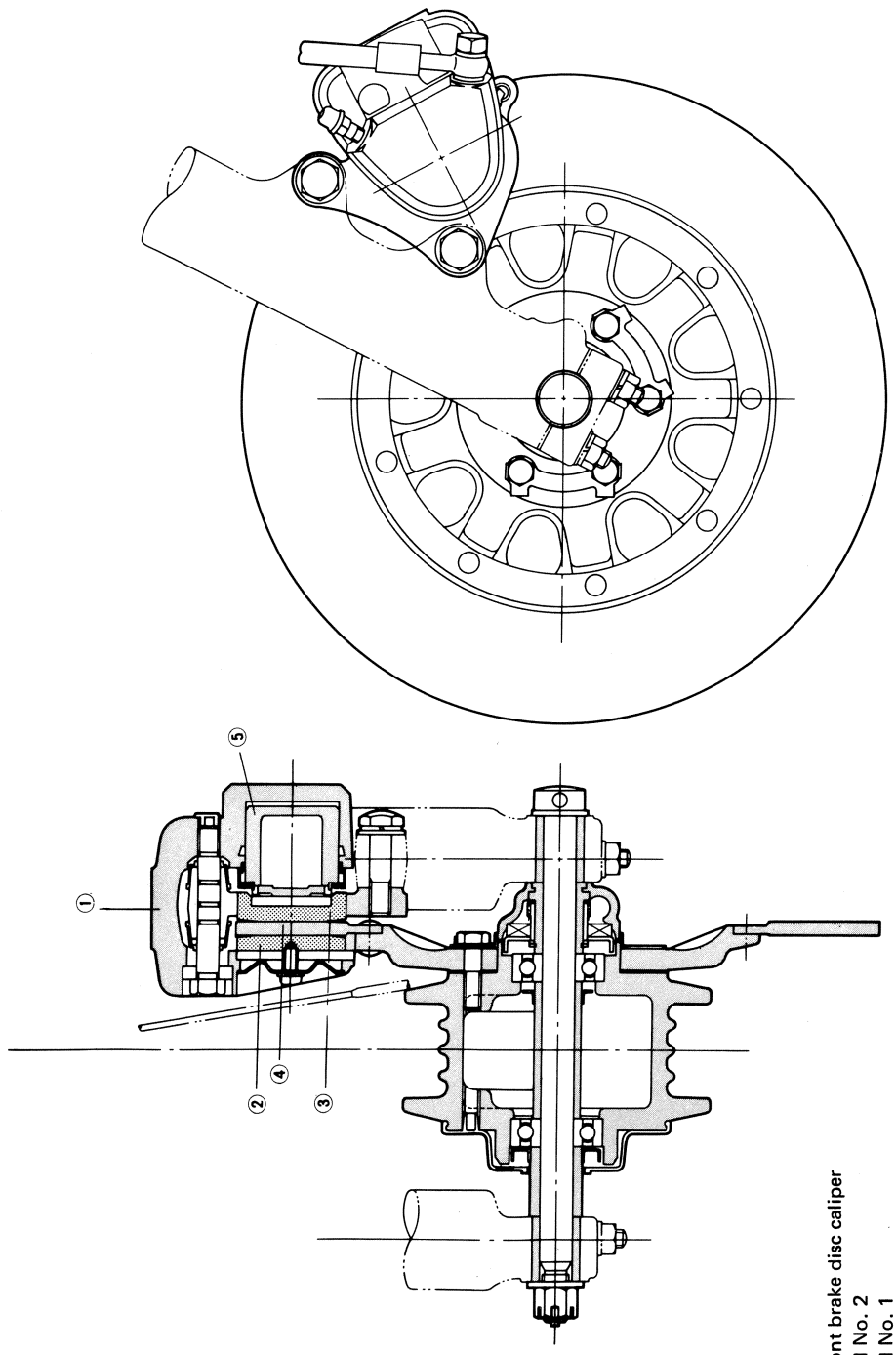


Fig. 2-78

CALIPER

DISASSEMBLY

1. Disconnect brake hose No. 2 from the caliper, and catch the brake fluid with a proper receptacle. Squeeze the brake lever to let out the fluid.

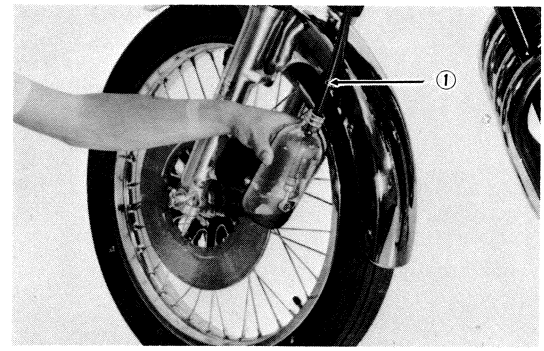


Fig. 2-79 ① Brake hose No. 2

2. Remove the two bolts securing the caliper to the fork. Take off the caliper assembly.

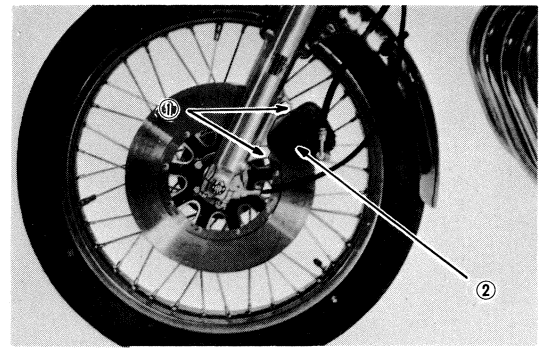


Fig. 2-80 ① Bolt ② Caliper

3. Loosen and remove the two caliper axle bolts.

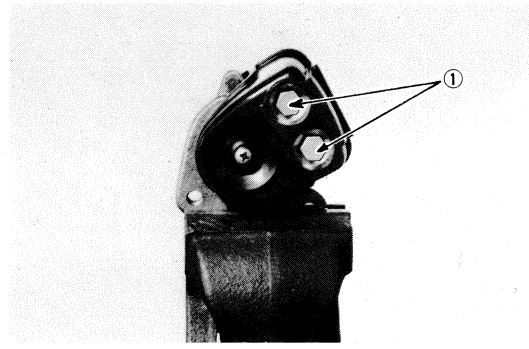


Fig. 2-81 ① Caliper axle bolt

4. Remove the screw fastening No. 2 pad (stationary) to the caliper body, and take out the pad. Separate the caliper holder from the body.

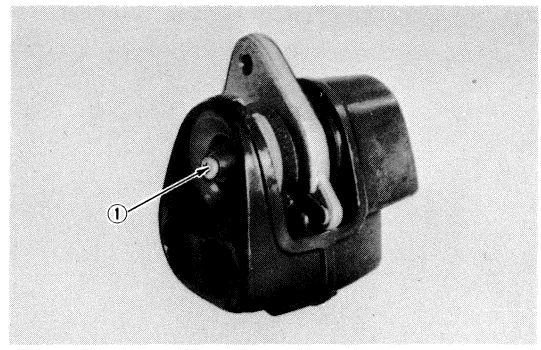


Fig. 2-82 ① Screw

5. Apply compressed air to the oil hose connection to push out the piston for removal.

NOTE: Have the piston boot removed to facilitate piston removal.

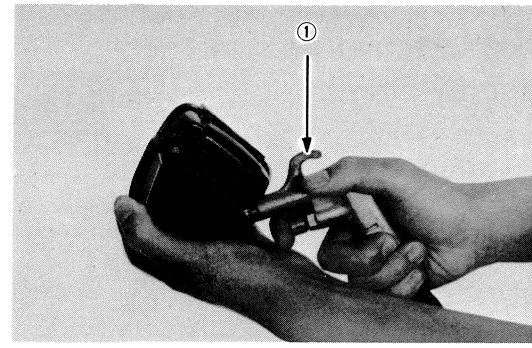


Fig. 2-83 ① Air gun

6. The caliper holder having been removed, take out piston seal, dust seal, piston boot and "O" ring. Wash the piston seal and piston boot clean with fresh brake fluid. Discard the removed dust seal and "O" ring: be sure to use replacement seal and "O" ring in reassembly.

CAUTION: Do not use such a cleaning fluid as trichlene or even gasoline to wash the piston seal and boot.

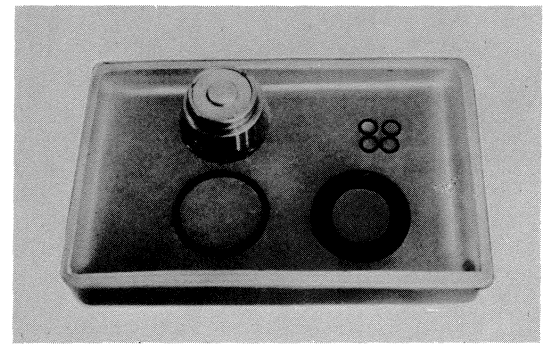


Fig. 2-84

INSPECTION

1. Check brake pads for wear. A pad worn down to the limit (which is the red groove provided on the edge) must be replaced.

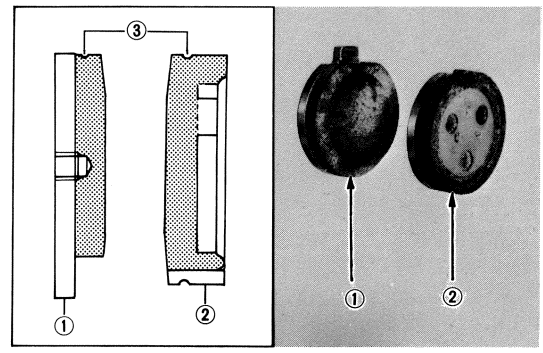


Fig. 2-85 ① Pad no. 2 ② Pad no. 1 ③ Red line

2. Mike the piston and bore to make sure that their diameters are within the limits. Use a cylinder gauge to take the reading on the bore.

Diameter	Standard	Service limit
Bore	42.85 mm (1.687 in)	Over 42.89 mm (1.689 in)
Piston	42.82 mm (1.686 in)	Under 42.77 mm (1.684 in)

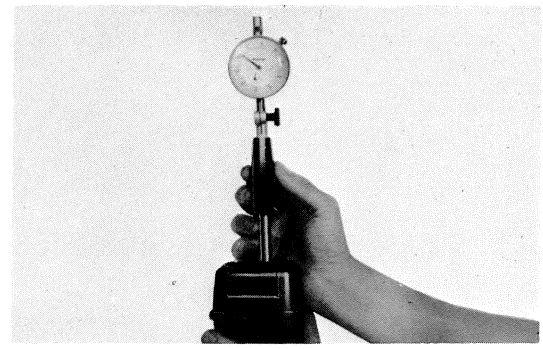


Fig. 2-86

3. Inspect the piston seal and boot for wear and damage.
4. Examine the caliper body for damage.

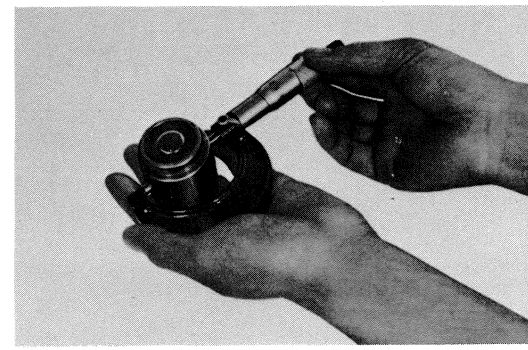


Fig. 2-87

REASSEMBLY

1. Apply brake fluid to the piston seal, and fit it into the caliper body.

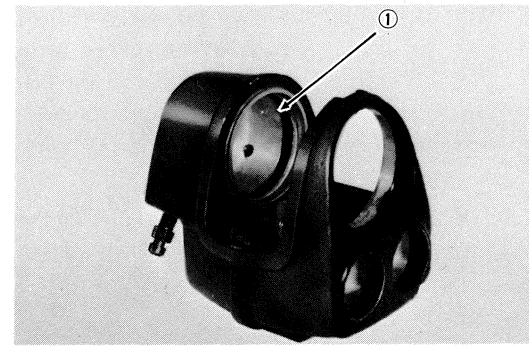


Fig. 2-88 ① Piston seal

2. Fit the caliper holder to the body, taking care not to damage the dust seal.
3. Apply brake fluid to the piston, and insert it into the bore.

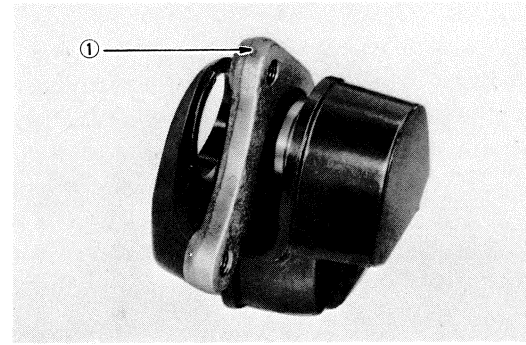


Fig. 2-89 ① Caliper holder

4. Lightly coat the back and sliding peripheral edge of No. 1 pad with SUZUKI pad grease.

NOTES:
- **Do not apply SUZUKI pad grease or any other grease to No. 2 pad.**
- **Be careful not to smear the friction faces of brake pads with grease.**

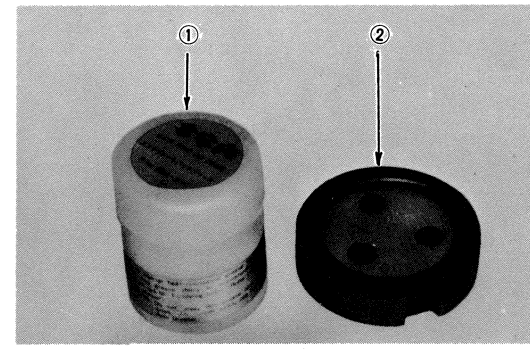


Fig. 2-90 ① Pad grease ② Pad No. 1

5. Coat the caliper axle bolts with SUZUKI caliper axle grease, and install the bolts. Tighten these bolts to this torque value:

Tightening torque	2.5 - 3.5 kg-m (18.1 - 25.3 lb-ft)

6. Mount the caliper assembly, securing it to the front fork. Check to be sure that the pads are not in an abnormal dragging condition – dragging excessively on the disc.

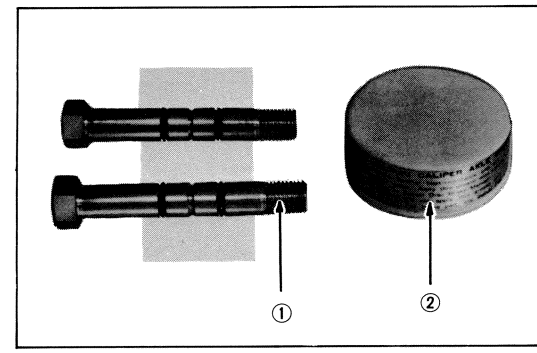


Fig. 2-91 ① Axle shaft ② Axle grease

Air bleeding of the brake fluid circuit

Air trapped in the fluid circuit acts like a cushion to absorb a large proportion of the pressure developed by the master cylinder and thus interferes with the full braking performance of the caliper brake. Such air is evidenced by the "sponginess" of the brake lever and also by lack of braking force.

Considering the extent of hazard to which the trapped air subjects the machine and rider, it is highly essential that, after remounting the brake and restoring the brake system to the normal condition, the brake fluid circuit be purged of air in the following manner:

1. Fill up the master cylinder reservoir to "LOW" level line. Put on the reservoir cap to prevent entry of dirt.

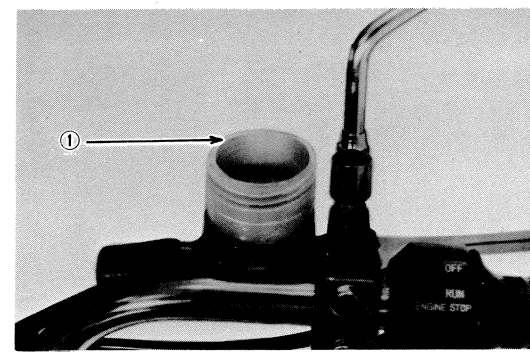


Fig. 2-92 ① Reservoir

2. Tie a pipe to the caliper bleeder valve. Insert the free end of the pipe into a receptacle.

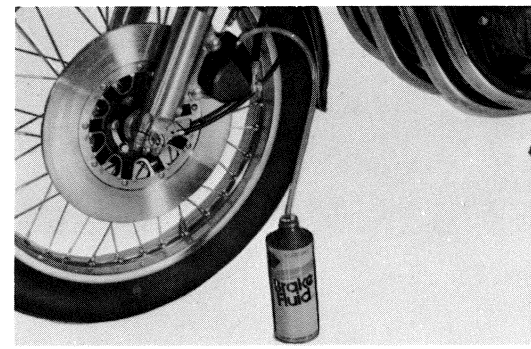


Fig. 2-93

3. Squeeze and release the brake lever several times in rapid succession, and squeeze the lever fully without releasing it. Loosen the bleeder valve by turning it one-quarter rotation or so, spilling the brake fluid into the receptacle; this will cause the brake lever to yield and touch the handle grip. Then, close the valve, pump and squeeze the lever, and open the valve. Repeat this process until the oil flowing into the receptacle ceases to carry air bubbles.

NOTE: Replenish the brake fluid reservoir as necessary while carrying out this bleeding step. Be sure that there always is some fluid visible in the reservoir.

4. Close the bleeder valve, disconnect the pipe. Fill up the reservoir to "HIGH" level line.

CAUTION: Handle the brake fluid with care: the fluid is chemically active to the paint coat, plastics, rubbery substances and the like.

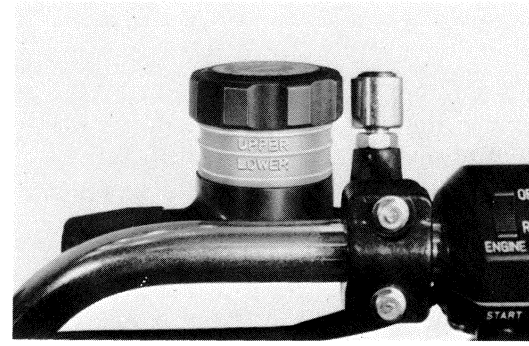


Fig. 2-94

5. Check to be sure that the brake lever has a play of 15 to 25 mm (0.59 to 0.98 in) as measured as its tip.

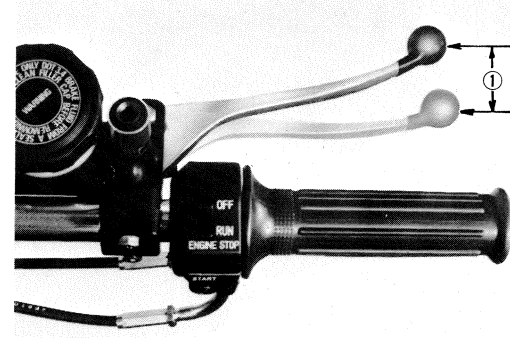


Fig. 2-95 ①15 ~ 25 mm (0.59 ~ 0.98 in.)

MASTER CYLINDER ASSEMBLY

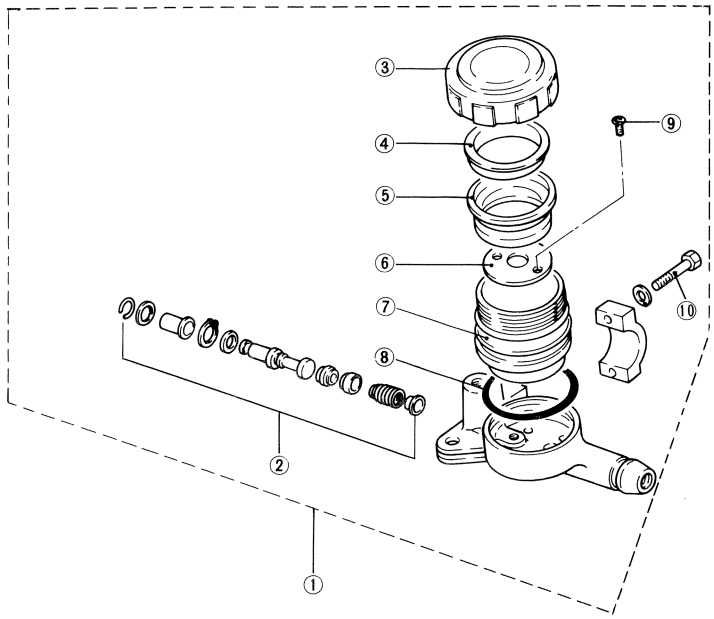


Fig. 2-96

DISASSEMBLY

1. Remove the front brake lever: pull off the split pin and remove the nut to free the lever for removal.
2. Remove the boot. Pick out the circlip from the bore of master cylinder with the special tool.

Special tool	Special circlip opener 09920-73110

NOTE: Scrap the removed boot. Use a replacement boot in reassembly.

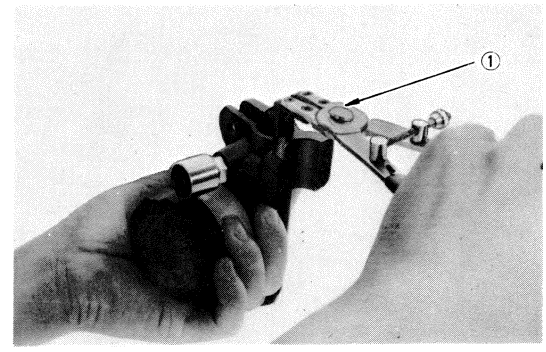


Fig. 2-97 ① Special tool

3. Take out piston, check valve, coil spring and primary cup from the bore.

NOTE: Using a wood or soft-metal stick, push out the check valve, coil spring and primary cup. Be careful not to scratch the bore wall.

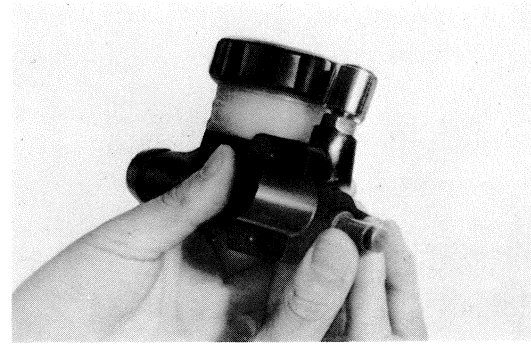


Fig. 2-98

4. Remove the two screws securing the reservoir to the master cylinder body, and take off the "O" ring from the body.

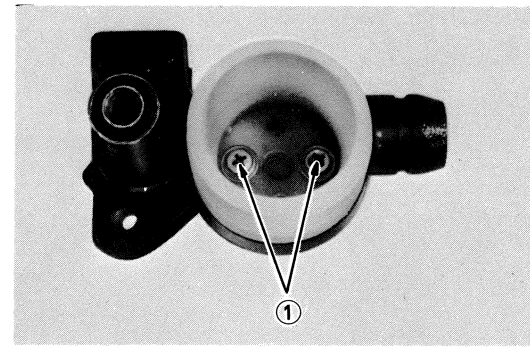


Fig. 2-99 ① Screw

INSPECTION

1. Mike the cylinder bore and piston to see whether these diameters are within the limits. Replace the cylinder or piston or both if the limit is exceeded.

Diameter	Standard	Service limit
Bore	14.00 mm (0.551 in)	Over 14.05 mm (0.553 in)
Piston	13.96 mm (0.550 in)	Under 13.94 mm (0.549 in)

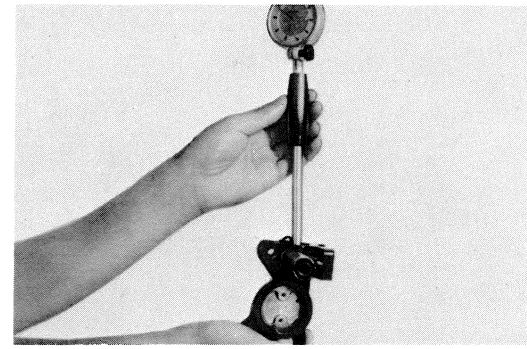


Fig. 2-100

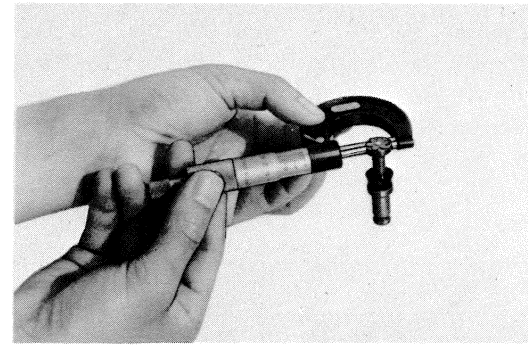


Fig. 2-101

2. Check the fit of the reservoir with the cylinder body. If signs of fluid was noted at the time of disassembly, replace the "O" ring by which this fit is sealed.

3. Inspect the primary cup for wear and damage, and replace it by a new one as necessary.

Fig. 2-102

REASSEMBLY

Reassemble the master cylinder by reversing the sequential steps of disassembly and by taking the following additional steps:

1. Apply brake fluid to the cylinder bore and all the internals to be inserted into the bore.
2. Do not attempt to insert one internal after another into the bore; assemble the primary cup, coil spring and check valve together, and insert this combination into the bore, taking care not to allow the check valve to become cocked or to unseat the coil spring as it goes into the bore.
3. It is a good practice, though not mandatory, to use a replacement primary cup in re-assembly.
4. After fitting the circlip, try to turn it in place to make sure it is snugly seated in the groove. Use of a replacement circlip is preferred to re-using the circlip removed in disassembly.
5. Reconnect the brake lever to the master cylinder before mounting the master cylinder on the handle.

NOTE: Be sure to secure a clearance of about 2 mm (0.08 in) between the right-hand handle switch and the master cylinder.

6. Refer to the illustration to reconnect the brake hose to the master cylinder.
7. After filling up the brake fluid reservoir, be sure to carry out an air bleeding operation as outlined in FRONT-BRAKE CALIPER ASSEMBLY.

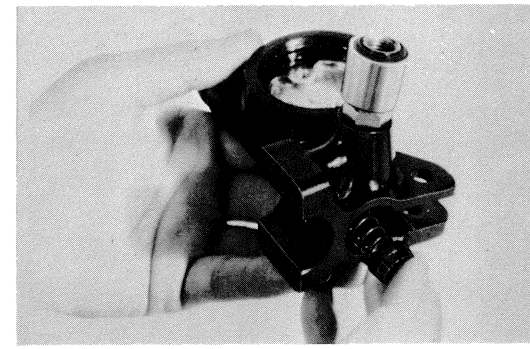


Fig. 2-103

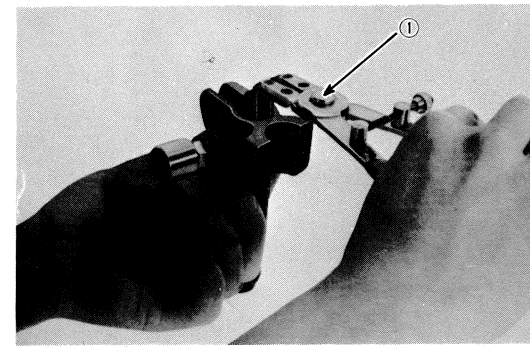


Fig. 2-104 ① Special tool

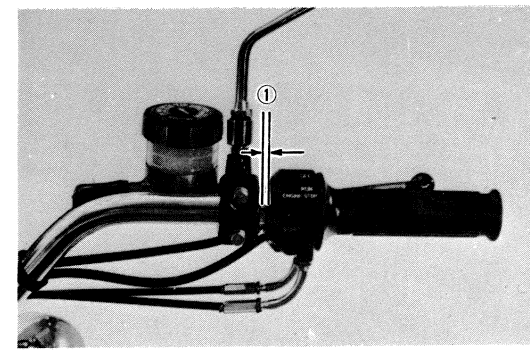


Fig. 2-105 ① 2mm (0.08 in.)

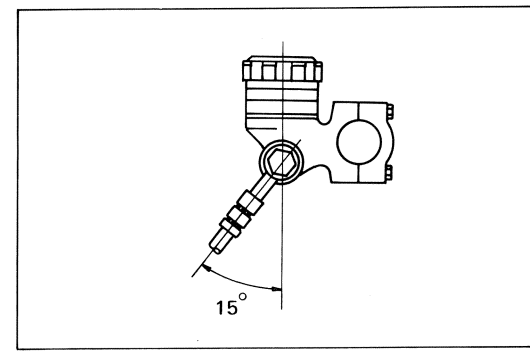


Fig. 2-106

REAR-BRAKE CALIPER

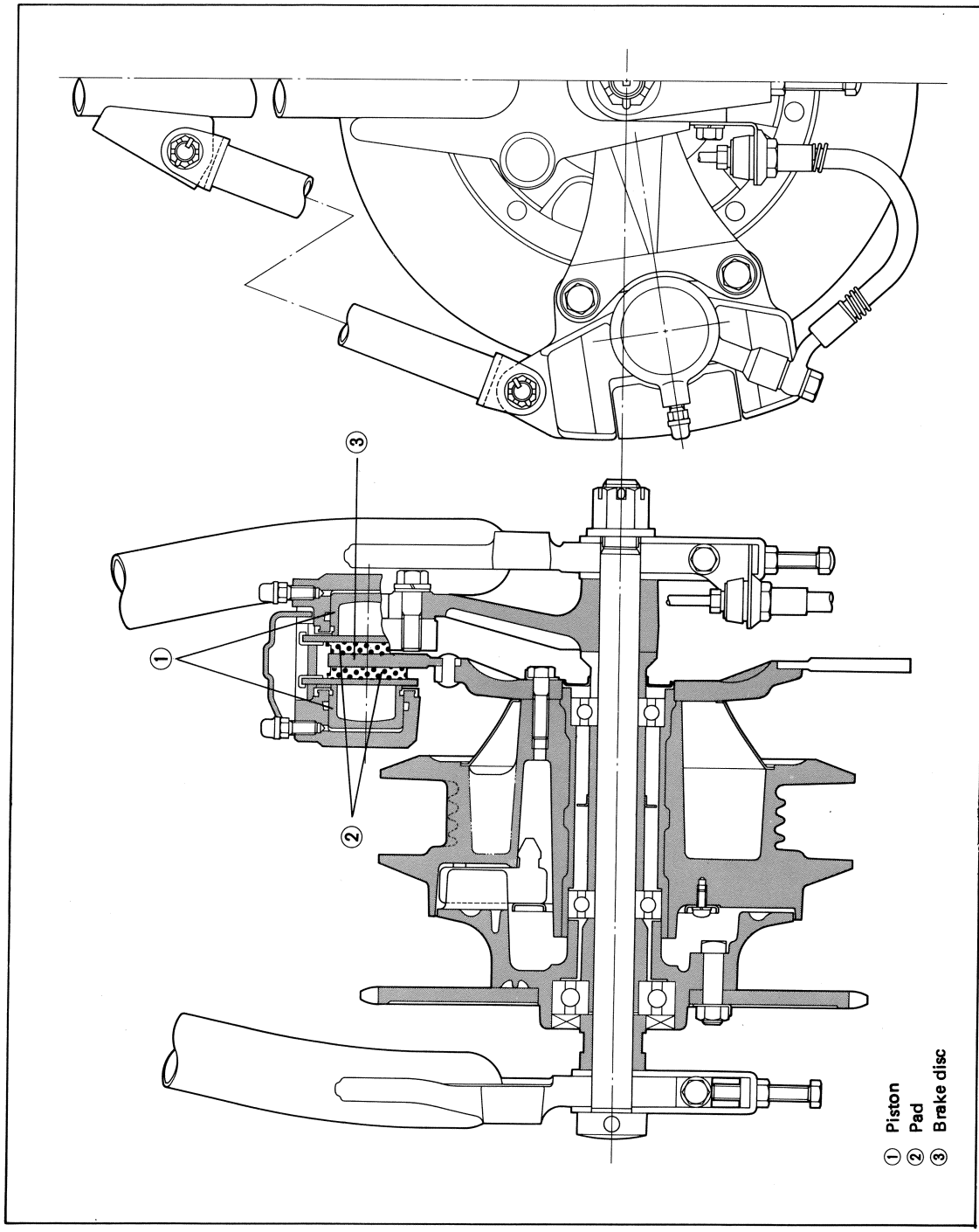


Fig. 2-107

This caliper assembly is of double-piston type. Its two pistons are in opposition across the disc; operating pressure is admitted into the caliper body from a single line and divided, inside the body, into two paths leading to the respective pistons. The other features are similar to those of the front-brake caliper assembly.

CALIPER

DISASSEMBLY

1. Remove torque link rear nuts. Remove the two bolts securing the caliper assembly in place.

2. Disconnect the brake hose from the caliper assembly by removing the union bolt. Take down the caliper assembly.

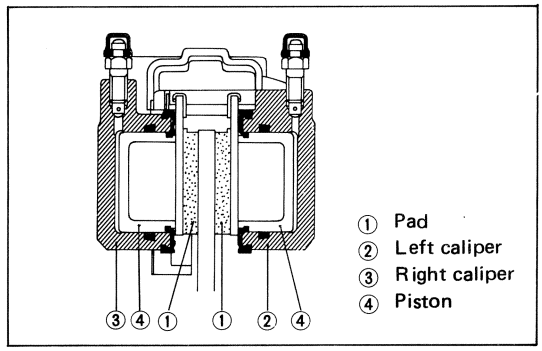


Fig. 2-108

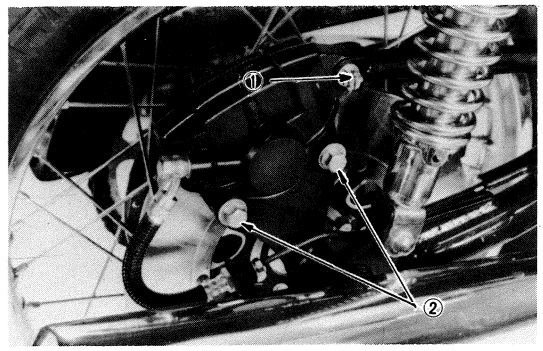


Fig. 2-109 ① Torque link nut
② Caliper bolt

3. Remove the pad inspection cap. Draw out the two pins supporting each pad: a stop pin must be pulled off first from the end of each pin. At the same time, remove two springs

NOTE: Be careful not to misplace the removed springs.

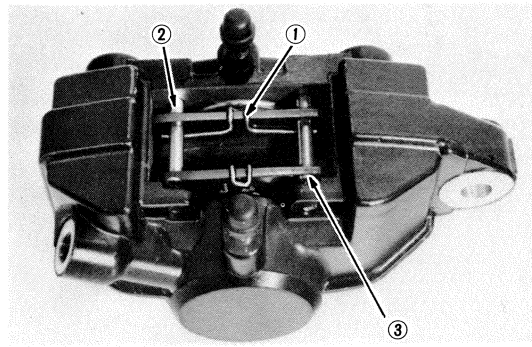


Fig. 2-110 ① Spring ② Pin ③ Stop pin

4. Remove the two bolts fastening the two caliper body halves together, and separate the two halves.

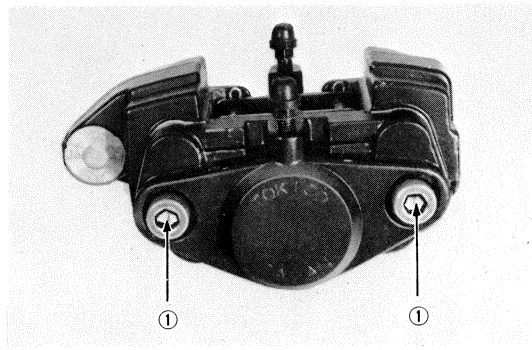


Fig. 2-111 ① Bolt

5. Remove the boot from each piston. Apply compressed air to the internal fluid passage to force each piston out of its bore.

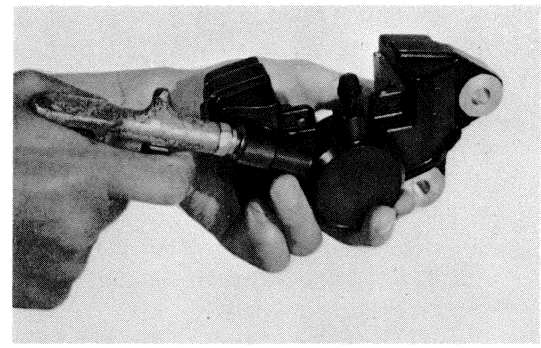


Fig. 2-112

INSPECTION

1. Mike the cylinder bore and piston to see whether these diameters are within the limits. Replacement is necessary where the limits are exceeded.

Diameter	Standard	Service limit
Bore	38.18 mm (1.503 in)	Over 38.19 mm (1.504 in)
Piston	38.15 mm (1.502 in)	Under 38.18 mm (1.501 in)

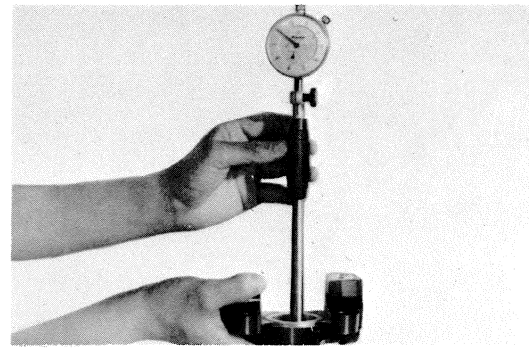


Fig. 2-113

2. Inspect the piston boot and seal of each piston for wear and damage.

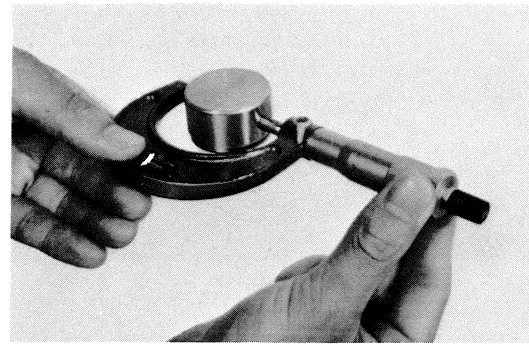


Fig. 2-114

3. Check brake pads for wear. Each pad is stepped at its edge to present two edge faces, one being painted red and the other being 1.5 mm (0.06 in) thick. The pad may be kept in service until this 1.5 mm (0.06 in) face disappears due to wear.

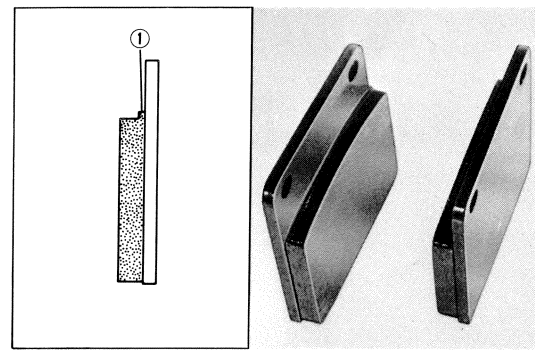


Fig. 2-115 ① Red line

REASSEMBLY

Be sure to take the following measures:

1. Wash the pistons, piston boots, "O" rings and caliper body halves with fresh brake fluid just before using each in reassembly: reassemble while washing.

2. To fasten together the two body halves, tighten the two bolts to this torque value:

Tightening torque	2.5 - 3.5 kg-m (18.1 - 25.3 lb-ft)

3. Fit the two pads sequentially: the one on the outboard side goes in first.

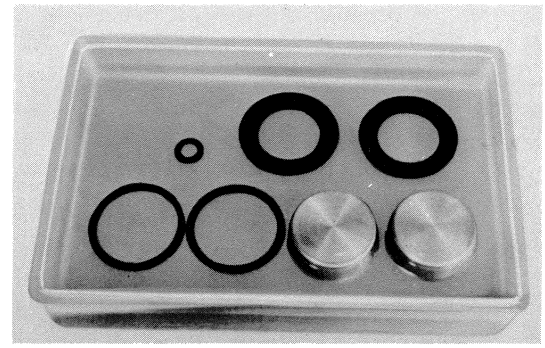


Fig. 2-116

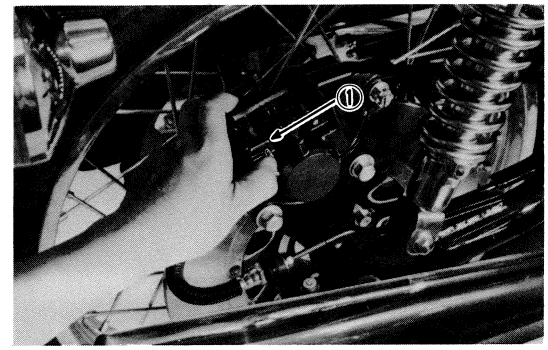


Fig. 2-117 ① Pin

4. When reconnecting the brake hose to the caliper body, be sure to point the hose in the direction shown.

IMPORTANT: Most of the steps enumerated for reassembly of the front-brake caliper assembly are applicable to this rear-brake caliper assembly. Be sure to carry out those applicable ones.

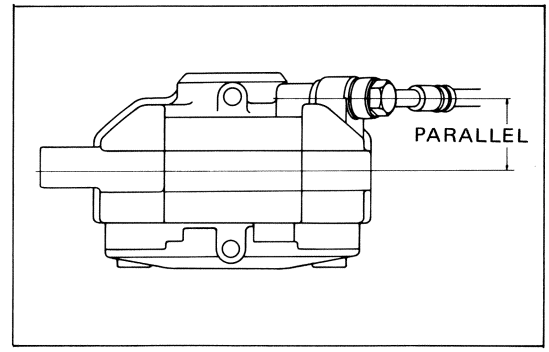


Fig. 2-118

Air bleeding of the brake fluid circuit

Refer to the procedure outlined in FRONT-BRAKE ASSEMBLY; the underlying principles are the same. Differences, however, are due to the fact that the master cylinder is actuated by a pedal and that there are two bleeder valves. **Bleed air out from the inboard valve first,** and **then from the outboard valve.**

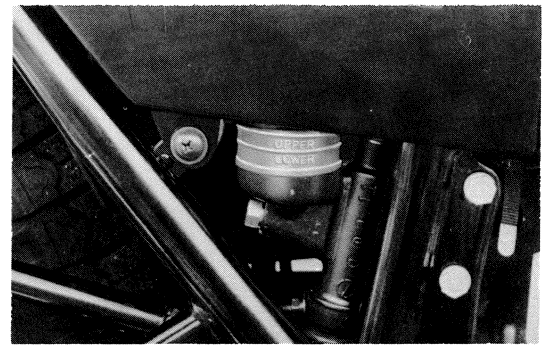


Fig. 2-119

Operate the pedal in the way the brake lever is operated to drive air out. The pedal being depressed will yield and go down as the fluid is spilled into the receptacle; in the case of the front brake, the lever touches the handle. When the pedal comes within 10 mm (0.39 in) from the step in so yielding, close the bleeder valve and release the pedal. Repeat the process of pumping and depressing the pedal fully to spill more fluid until air bubbles disappear in the fluid being spilled into the receptacle.

CAUTION: As in the case of front-brake caliper assembly, it is highly important that the air bleeding operation be carried out after restoring the rear brake system to the original condition.

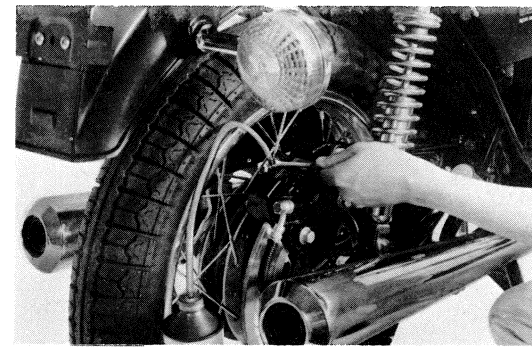


Fig. 2-120

Fig. 2-121

Brake pedal adjustment

Adjust the pedal height in the following manner:

1. Loosen lock nut "B". Loosen the return stopper bolt on the step.

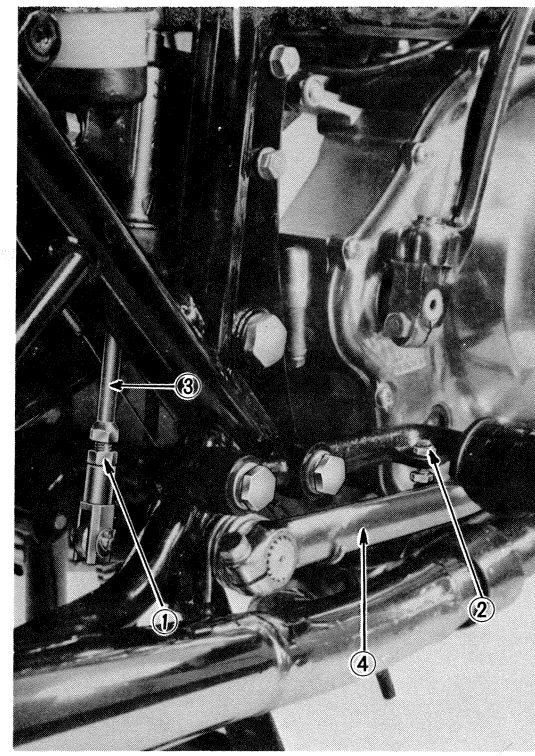


Fig. 2-122 ① Lock nut "A" ② Lock nut "B" ③ Push rod ④ Brake pedal

2. Loosen lock nut "A". Rotate the pushrod to bring the pedal to the elevation 10 mm (0.39 in) below the top face of the footrest; and secure the pedal there by tightening the nut "A".

3. Adjust the clearance between pedal arm and return stopper to 0.5 mm (0.02 in), and tighten lock nut "B".

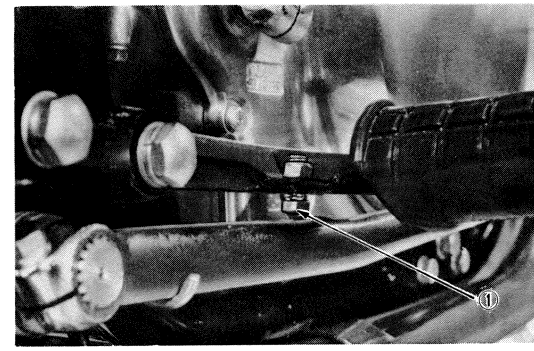


Fig. 2-123 ① Return stopper

4. Make sure that the brake pedal has a play of anywhere between 9 mm (0.35 in) and 26 mm (1.02 in).

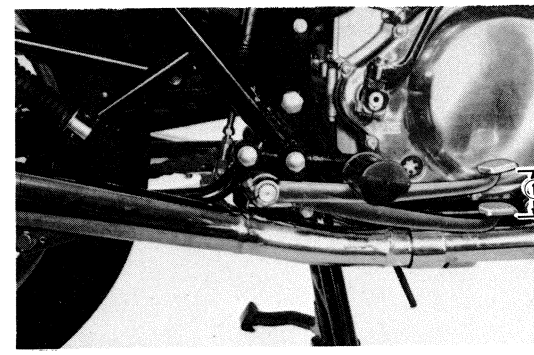


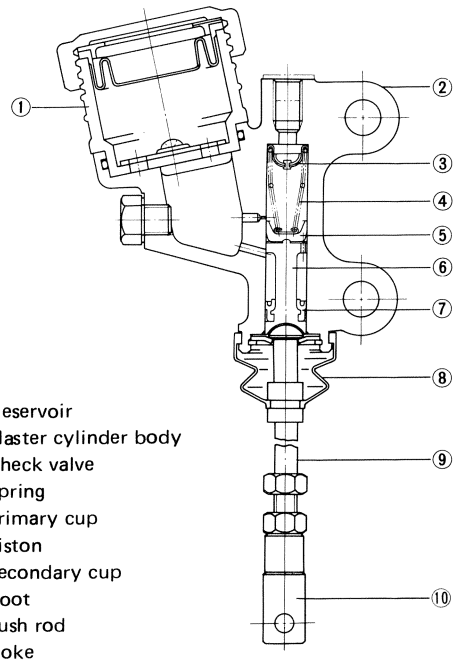
Fig. 2-124 ① 9 ~ 26 mm (0.35 ~ 1.02 in.)

Pad replacement

The pads can be replaced from the caliper assembly in place, by removing the pins supporting the pads and their stop pins and springs, but this method is not recommendable because the piston boots too might come off: it is almost impossible to accurately refit the boot when the assembly is in place.

The reliable and accurate replacement is ensured by removing the caliper assembly and by installing the replacement pads in the assembly off the machine.

MASTER CYLINDER ASSEMBLY



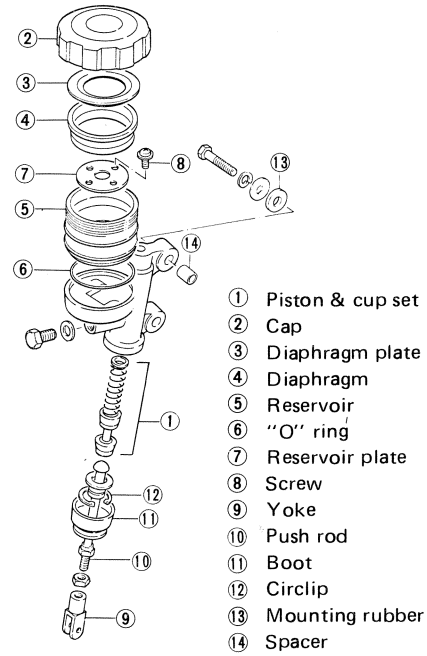


Fig. 2-125

DISASSEMBLY

1. Remove the right-hand front step, and take down the rear brake pedal.

2. Pull off the split pin from the lower end of pushrod, and disconnect the master cylinder rod from the brake pedal arm.

3. Remove the oil bolt on the master cylinder, and disconnect the brake hose.

4. Remove the two bolts securing the master cylinder to the frame, and take down the cylinder.

Tightening torque	1.5 - 2.5 kg-m (10.8 - 18.1 in)

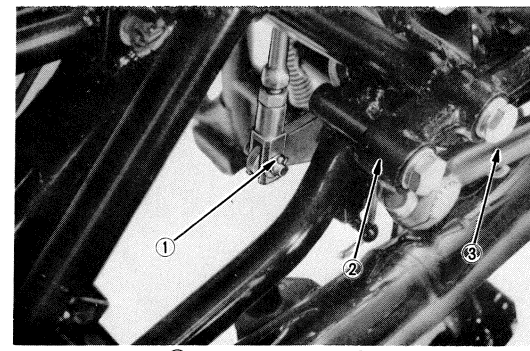


Fig. 2-126 ① Cotter pin ② Front step ③ Brake pedal

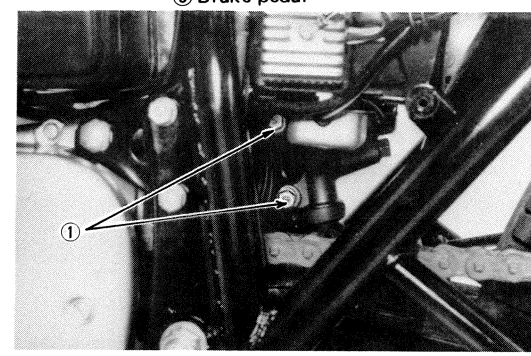


Fig. 2-127 ① Bolt

5. Take off the boot, and pick out the circlip by using the special tool.

Special tool	Special circlip opener 09920-73110

6. Take out piston, check valve, coil spring and primary cup from the cylinder.

NOTE: Using a wood or soft-metal stick, push these internals out of the cylinder bore, so as not to nick or mar the bore wall. Be careful, too, not to damage them.

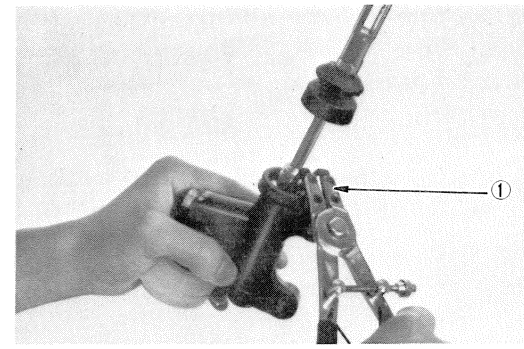


Fig. 2-128 ① Special tool

7. Remove the two screws and separate the reservoir from the cylinder. Pick out the "O"ring.

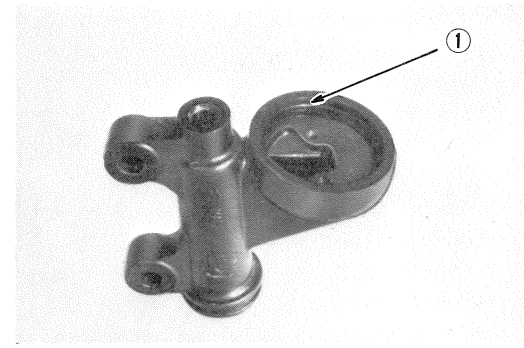


Fig. 2-129 ① "O" ring

INSPECTION

1. Mike the cylinder bore and piston to see whether these diameters are within the limits; if not, replace the cylinder or piston or both.

Diameter	Standard	Service limit
Bore	14.00 mm (0.551 in)	Over 14.05 mm (0.553 in)
Piston	13.96 mm (0.550 in)	Under 13.94 mm (0.549 in)

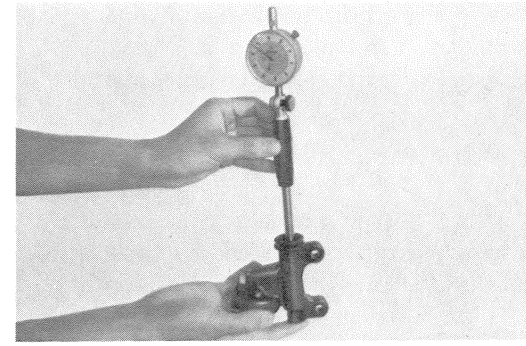


Fig. 2-130

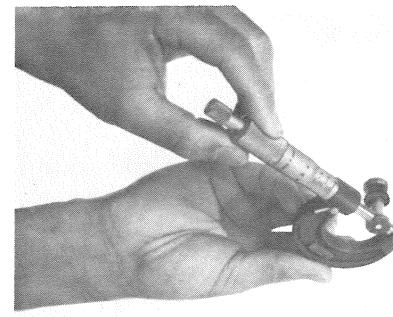


Fig. 2-131

2. Check the fit of the reservoir with the cylinder body. If signs of fluid leakage was noted at the time of disassembly, replace the "O" ring.

3. Inspect the primary cup and boot for wear and damage and, as necessary, replace them.

Fig. 2-132

REASSEMBLY

Reassemble the master cylinder by reversing the sequential steps of disassembly and by taking the following additional steps:

1. Be sure to apply brake fluid to the cylinder bore and all the internals to be inserted into the bore.
2. Combine the check valve, coil spring and primary cup outside the cylinder, and insert the combination into the bore, taking care not to unseat the coil spring off the check valve. Remember, the spring could readily come off the valve. Be careful not to allow the primary cup to cock inside the bore.
3. It is a good practice to use a replacement primary cup unless the cup removed in disassembly is perfectly in good condition.

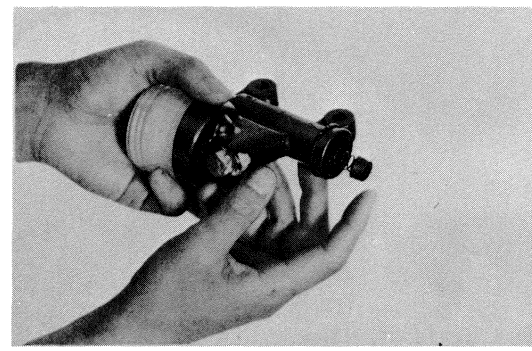


Fig. 2-133

4. After fitting the circlip, try to turn it in place to make sure it is snugly seated in the groove. Use of a replacement circlip is preferred to re-using the one removed in disassembly.
5. Before installing the reservoir on the cylinder body, check to be sure that the "O" ring there is in good condition.
6. Mount the master cylinder on the frame first and make up the connection between its push rod and the brake pedal next. Be sure to lock the link pin by bending the legs of split pin apart and around the link pin.
7. When installing the brake pedal, be sure to align the match marks at the pviot part, thereby positioning the pedal correctly. After securing the pedal, install the steps.
8. Carry out an air bleeding operation as outlined previously.
9. Adjust the brake pedal height as outlined below:

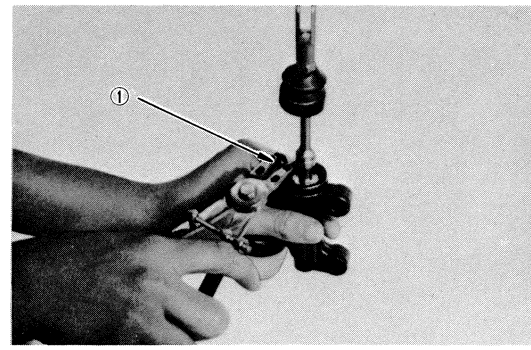


Fig. 2-134 ① Special tool

BRAKE PARTS TO BE PERIODICALLY REPLACED

Brakes are critical safety components and must be maintained in best operable condition at all times. In keeping with this view, the following brake parts of the Model GS750 are prescribed to be renewed periodically (at intervals of two years), all at the same time, by replacement.

The parts named are subject to wear or deterioration but may continue to work satisfactorily much longer beyond the two-year interval. Experience, however, tells that replacement after each two years is justified from standpoints of safety and economy. Adherence to this rule is strongly recommended.

Replacement interval: Two years

1. Components of master cylinder assembly (Use Suzuki Genuine parts: Master cylinder cup set)

① Boot stopper	⑤ Check valve
② Circlip	⑥ Spring
③ Boot plate	⑦ Primary cup
④ Boot	⑧ Piston

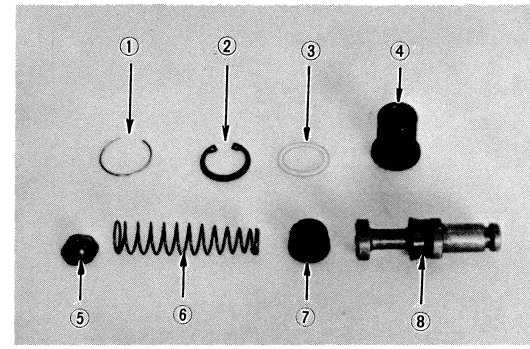


Fig. 2-135

2. Component of caliper assembly (Use Suzuki Genuine parts: Pad and piston set)

① Piston boot	⑤ Piston
② Piston seal	⑥ "O" ring
③ "O" ring	⑦ Pad No. 1
④ Axle shaft dust cover	⑧ Pad No. 2
	⑨ Caliper axle grease
	⑩ Brake pad grease

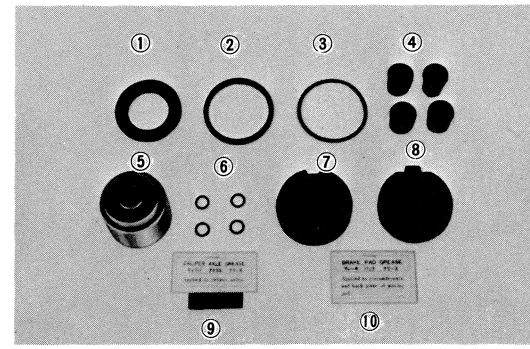


Fig. 2-136

NOTE: Pad and piston set includes two kinds of grease packed in pouch. Grease in the pouch printed "Caliper Axle Grease" should be used for the caliper axle and printed "Brake Pad Grease" for the pad No. 1.

CAUTION: Be sure to wash all component parts in the above sets with clean brake fluid before installing them into the master cylinder or caliper.

TIGHTENING TORQUE SPECIFICATIONS

FRONT

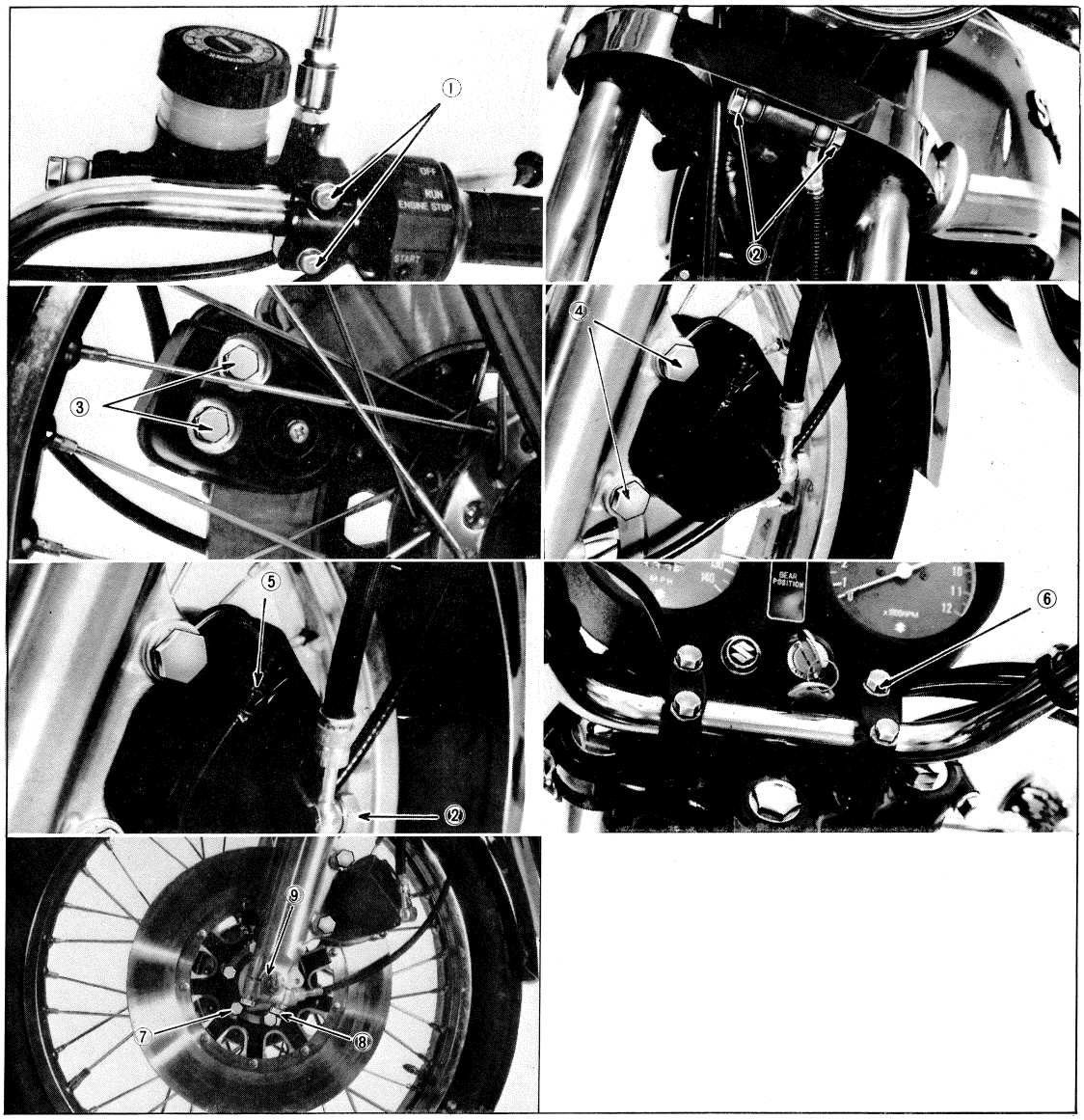


Fig. 2-137

Ref. No.	Bolt or nut	Diameter (mm)	Tightening torque	
			(kg-m)	(lb-ft)
①	Master cylinder clamp bolt	6	0.5 - 0.8	3.6 - 5.8
②	Oil hose bolt	10	1.5 - 2.5	10.8 - 18.1
③	Caliper axle bolt	10	2.5 - 3.5	18.1 - 25.3
④	Caliper bolt	10	2.5 - 4.0	18.1 - 28.9
⑤	Bleeder bolt	7	0.6 - 0.9	4.3 - 6.5
⑥	Handle clamp bolt	8	1.2 - 2.0	8.7 - 14.5
⑦	Brake disc bolt	8	1.5 - 2.5	10.8 - 18.1
⑧	Front axle holder nut	8	1.5 - 2.5	10.8 - 18.1
⑨	Front axle nut	12	3.6 - 5.2	26.0 - 37.6

REAR

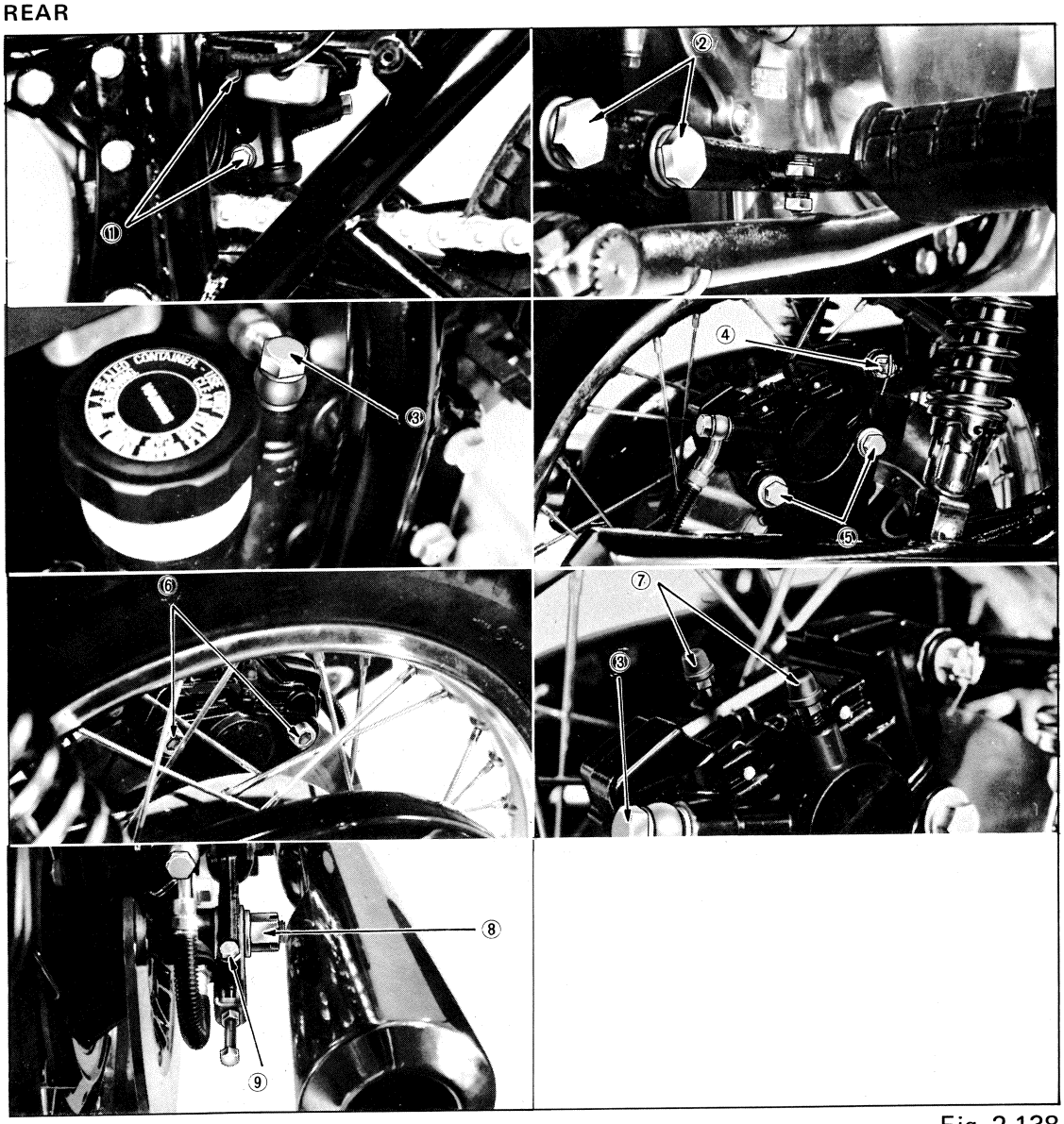


Fig. 2-138

Ref. No.	Bolt or nut	Diameter (mm)	Tightening torque (kg-m)	Tightening torque (lb-ft)
①	Master cylinder bolt	8	1.5 - 2.0	10.8 - 14.5
②	Front step bolt	10	2.7 - 4.3	19.5 - 31.1
③	Oil hose bolt	10	1.5 - 2.5	10.8 - 18.1
④	Torque link nut (F, R)	10	2.0 - 3.0	14.5 - 21.7
⑤	Caliper bolt	10	2.5 - 4.0	18.1 - 28.9
⑥	Caliper axle bolt	10	2.5 - 3.5	18.1 - 25.3
⑦	Bleeder bolt	7	0.6 - 0.9	4.3 - 6.5
⑧	Rear axle nut	16	5.0 - 8.0	36.2 - 57.9
⑨	Chain adjustor support bolt	8	1.5 - 2.0	10.8 - 14.5

RIDING-SAFETY INSPECTION GUIDE

The cardinal concern of one servicing the GS750 machines is of course the safety of the rider, pedestrians and other traffic on the road. This truism attaches special importance to some of the inspection and check items prescribed for the periodic inspection and servicing work. Here's a list of those safety-oriented check items and points:

ITEM	CHECK POINTS	WHAT TO DO
WHEEL TIRE	Uneven wear and damage. Wear limit: F . . . . 1.6 mm (0.06 in) R . . . . 2.0 mm (0.079 in) Tire pressure: Refer to page 97. .	For tire replacement, use tires of SUZUKI supply.
WHEEL RIM	Distortion. Runout limits: Side runout . . . . 2.0 mm (0.079 in)	Replace defective rims. Reduce the runouts to within the limits by repair or replacement.
WHEEL SPOKES	Tightness; distortion and breakage.	Retighten loose spokes. Replace badly distorted or broken spokes.
WHEEL BALANCE	Refer to the method outlined in page 98. .	Use balancer weights, available in two kinds: 20 grams (0.04 lbs) 55411-11000 30 grams (0.07 lbs) 55412-11000
WHEEL ALIGNMENT	Alignment of front and rear wheels. Limit: 3 mm (0.1 in) Check with four alignment gauges (09827-00001), two on each rim.	Stretch a twine. Reduce misalignment to within 3 mm (0.1 in) by means of chain adjustors.

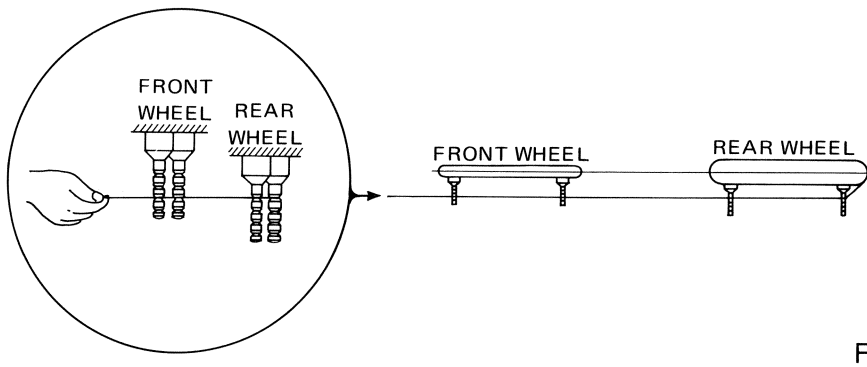
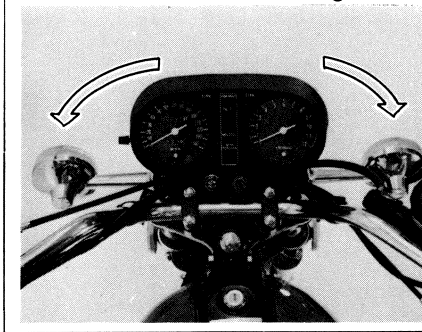


Fig. 2-139

SWINGING ARM	Rattle in the pivot.	Check and, as necessary, retighten.

ITEM	CHECK POINTS	WHAT TO DO
STEERING	Check for rattle with machine supported by main stand to keep front wheel off floor. Adjust steering lock nut so that the handle turned to either side from center will lean by its own weight and will lightly recoil upon meeting the stopper.	Replace brinelled or damaged ball races. Adjust the tightness of steering lock nut. Fig. 2-140 
ENGINE MOUNT BOLTS AND NUTS	Tightness of bolts and nuts.	Refer to TIGHTENING TORQUE SPECIFICATIONS, and retighten as necessary.
FRONT FORK BOLTS	Tightness.	Refer to TIGHTENING TORQUE SPECIFICATIONS, and retighten as necessary.
FRONT AND REAR WHEELS	Bearing rattle. Wheel hub wear.	Replace bearings rattling excessively. Replace hubs badly or excessively worn down.
AXLES	Tightness.	Refer to TIGHTENING TORQUE SPECIFICATIONS, and retighten as necessary.
FRONT AND REAR SUSPENSIONS	Shock absorbing performance.	Replace shock absorbing parts as necessary.

ELECTRICAL EQUIPMENT

GROU 4

CONTENTS

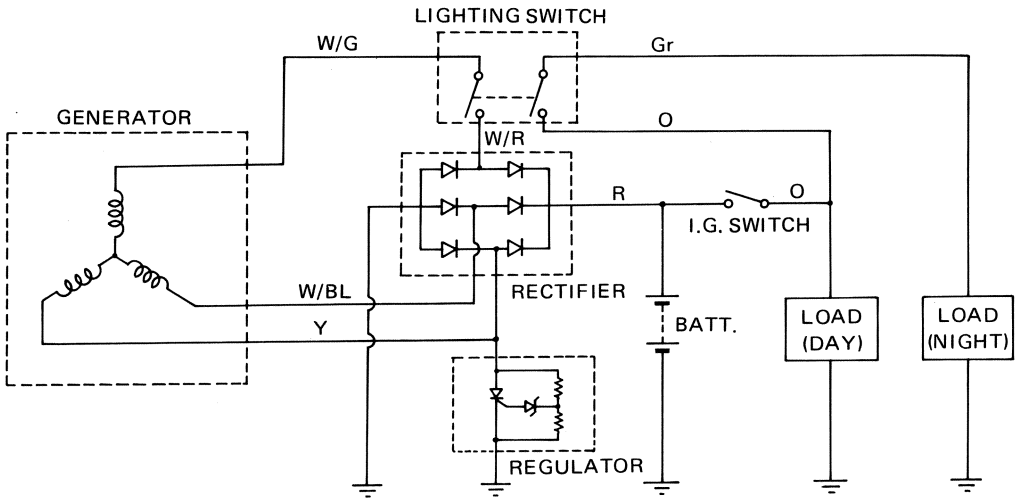
CHARGING SYSTEM

The major components of the charging system are a three-phase alternator, a full-wave rectifier and an SCR voltage regulator. A remotely actuated switch is provided in one of the three-phase output wires of the alternator; this switch closes and opens according as the lighting switch is turned on and off by the rider.

Thus, one of the three phases remains out of service when the lighting switch is off as in daytime driving: it is during nighttime driving that the rectifier receives the three-phase output and converts it into a DC output for all electrical loads. With the lighting switch turned off, the rectifier receives a two-phase output.

The voltage regulator is connected between ground and one of the two other output wires and holds down the rectifier output voltage to a predetermined level by passing excess electricity direct to ground.

Charging system diagram



Y : Yellow
O : Orange
R : Red
Gr : Gray
W/G : White with Green tracer
W/Bl: White with Blue tracer

Fig. 3-1

CHARGING SYSTEM INSPECTION

No-load test

Whether or not the alternator-rectifier combination is capable of satisfactory power generation can be told by checking the rectifier output voltage (line voltage) while the alternator is run in no-load condition, with the voltage regulator taken out of service. The method is as follows:

1. Check to be sure that all circuit connections, including ground connections, are tight.
2. Make sure that the battery is in fully charged state.
3. Raise the seat to gain access to the wire harness inside. Modify the three-phase circuit in this manner:
   - Undo the coupler of YELLOW wire from the regulator. (This cuts out the regulator.) Refer to the circuit diagram above.
   - Connect WHITE/GREEN phase wire (from the alternator) direct to WHITE/RED phase wire (to the rectifier) by undoing the respective couplers. (This bypasses the switch.)
4. Turn off the lighting switch. Disconnect any other electrical loads. Start up the engine and run it at steady 5,000 rpm. Under this condition, check the voltage of the RED output line of the rectifier, and diagnose according to this chart:

Engine speed	DC line voltage	Electrical condition of alternator and rectifier
5,000 rpm	16.5 V or over	Both are satisfactory.
	16.5V or under	Either alternator or rectifier or both are faulty.

If too low a voltage reading is obtained, check the alternator and rectifier in the manner to be described subsequently.

5. Next,check the regulator for performance, as follows:
   - Stop the engine, and restore the three-phase circuit to the normal hook-up, placing the switch and regulator back in service. Restart the engine and run it in no-load condition, this time with the lighting switch turned off to cut out one of the three phases.
   - Run the engine at 5,000 rpm and check the DC line voltage. Diagnose the regulator according to this chart:

Engine speed	DC line voltage	Electrical condition of voltage regulator
5,000 rpm	14V – 15.5V or over	Regulator is satisfac tory.
	14V under , 15.5V over	Regulator is faulty.

If the regulator is found faulty by this method, check once again to be sure that the circuit connections are good, and again test the regulator as above before deciding to replace it.

NOTE: For those Model GS750 machines supplied to the U.S.A. and Canada, in which the lighting switch is locked closed, carry out the test by removing the switch knob and opening the switch.

INSPECTION OF CHARGING SYSTEM COMPONENTS

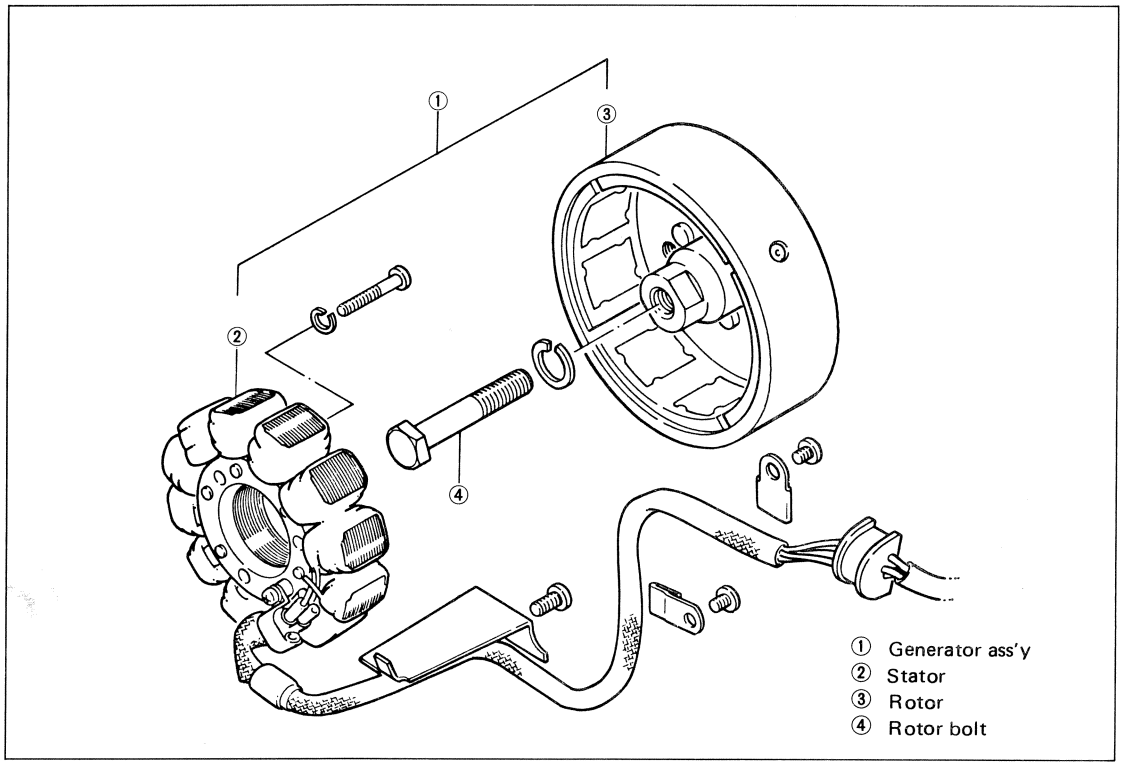


Fig. 3-2

Alternator

The rotor is a pot-like mass surrounding the stator. A number of permanent magnets are imbedded in the inside wall of the rotor. A number of coils are circularly disposed on and around the stator; these coils are connected to form a three-phase armature. As the rotor revolves, its revolving magnetic fields induce electromotive force in the stator coils to deliver 14 amperes, 14V, at 8,000 rpm.

Check to be sure that there is **continuity**, when checked as shown, between each two of the three lead wires extending from the alternator, and there is **no continuity** between each lead wire and the stator core.

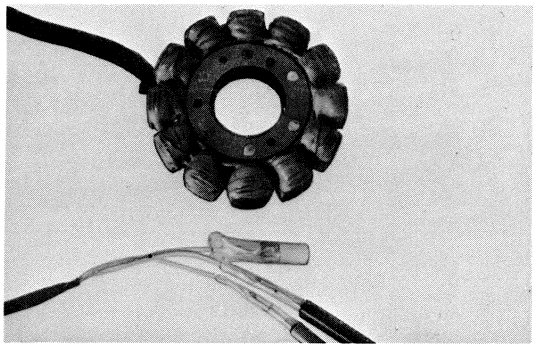


Fig. 3-3

When checking the lead-to-lead continuity, take a resistance reading, which should be 0.65 ohms ±0.05. A stator found to have no continuity between any two lead wires or to have continuity between the core and any of the three wires must be replaced.

Too large or too small a resistance reading taken means that there is a nearly open-circuit or short-circuited part in the stator winding. Such a stator, too, must be replaced, for continued use of it will result in a run-down battery.

NOTE: Inspect also the insulation coating of the lead wires for evidence of stripping. Stripped wires must be repaired or replaced.
The alternator is of either DENSO make or KOKUSAN make. When replacing the stator, be sure that the rotor and the replacement stator are of the same make.

Rectifier

A total of 6 semi-conductor elements are connected as shown, for full-wave rectification. They are encapsulated by molding and contained in a compact case. Each element is conductive in forward direction and non-conductive in reverse direction. Check each element for this property of directionality with a tester, as follows:

1. Undo all the terminal connections on the rectifier, disconnecting lead wires coming from the alternator (YELLOW, WHITE/RED and WHITE/BLUE), from the battery (RED) and from ground (BLACK/WHITE).
2. Put minus (–) probe pin of the tester to ground terminal (BLACK/WHITE), and positive (+) pin to YELLOW, WHITE/RED and RED/BLUE, sequentially in that order. The tester **should** indicate continuity for each.
   Repeat this process with minus (–) pin and plus (+) pin swapped: the tester should not indicate continuity.
3. You have just checked three rectifier elements. Check the other three similarly by putting one probe pin to the output terminal (RED).

   If any of the elements is found to be **non-conductive** in forward direction or **conductive** in reverse direction, replace the rectifier unit.

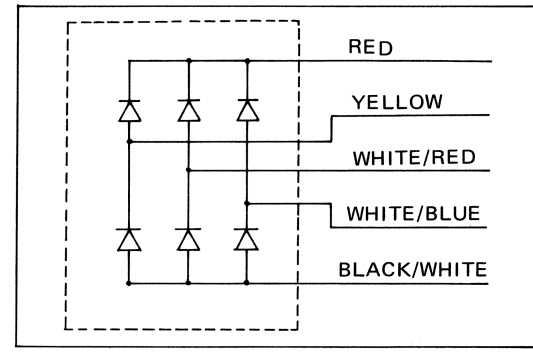


Fig. 3-4

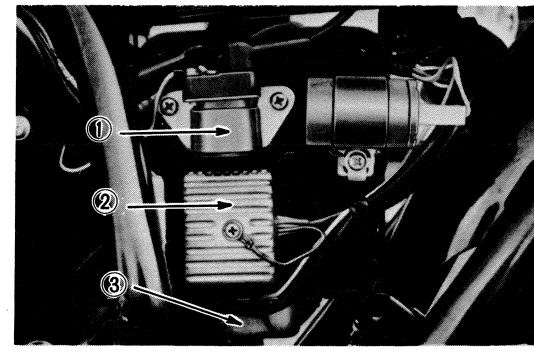


Fig. 3-5 ① Starting motor relay ② Rectifier ③ Regurator

CAUTION:
1. **Be sure to have the output lead wire disconnected to sever the rectifier from the battery side. Checking the rectifier with this lead wire connected may cause the element to get burned due to possible grounding.**
2. **Never use a megger type instrument to check for continuity: Be sure to use a circuit tester. A megger could rupture the rectifier element.**
3. **Never pick up engine speed when the output lead wire (RED) has been disconnected or the rectifier elements will suffer damage due to burning.**

It should be borne in mind that, when the circuit tester is used for checking ohmic resistance or continuity, its internally contained battery becomes connected to the probe pins: plus (+) polarity appears on negative (–) pin and minus (–) polarity on positive (+) pin.

Voltage regulator

The regulator comprises a silicon-controlled rectifier element, a constant-voltage diode and resistances, connected as shown. It is located between ground and one of the three phase wires and, during operation, is subjected to an alternating voltage

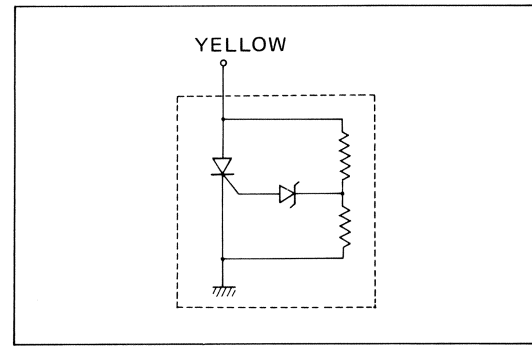


Fig. 3-6

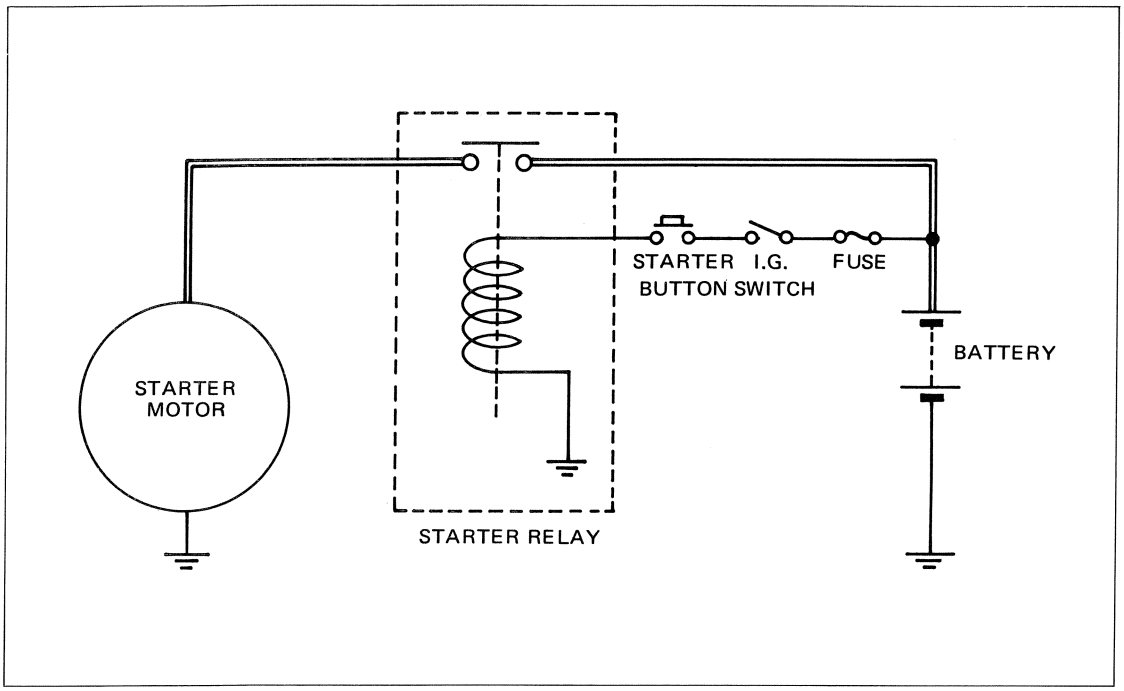
In the internal circuit diagram given here, a P-type SCR is shown. To its gate is connected the constant-voltage diode. In normal operation, an alternating current flows through the resistances. As the alternator picks up speed, its output voltage rises and, if it rises to a certain level, the diode becomes conductive in reverse direction for the positive half wave, thereby applying a half-wave positive voltage to the SCR gate and thus making the SCR conductive. In this manner, the regulator passes excess electricity to ground so as to prevent the DC output voltage of the rectifier from rising above the predetermined level.

A regulator found to be at fault through the test outlined in 5 NO-LOAD TEST, must be replaced by a new one. Be sure to use a replacement regulator of the same maker as that of the alternator.

STARTING SYSTEM

The starting system is composed of the devices shown in the diagram given below; namely, the starting motor, relay, starter switch and battery. Depressing the starter button (on the right handle) energizes the relay to close its contact points, thereby connecting the starting motor to the battery. The motor draws about 80 amperes to crank the engine for starting.

Starting system diagram



Fi.g 3-7

STARTING SYSTEM INSPECTION

Inspect the components to be sure that wiring connections are all tight and that the circuit wires are in good condition. Make sure, too, that each component is securely grounded.

When the system is in sound condition, the starter relay will make a single audible clatter as the starter button is depressed and immediately the motor will crank the engine. Absence of the clatter, and consequent refusal of the motor to crank the engine mean that the relay is not getting energized possibly because the battery is in run-down condition or there is an open in the coil of the relay.

If the relay "clatters" but the motor will not crank, then it is likely that the relay contact points are defective or the motor is internally open-circuited.

Starting motor specifications

The motor is mounted on top of the crankcase behind the cylinder block, and drives the engine crankshaft through a train of gear and a one-way clutch mounted on the alternator rotor. It is either of DENSO make or of MITSUBA make, and is made to the following electrical specifications:

DENSO-make motor

Item	No-load data	Locked-rotor data
Voltage	11 volts	5.2 volts
Current	45 amperes max.	320 amperes max.
Torque	————	0.4 kg-m min.
Speed	8,000 rpm min.	————

MITSUBA-make motor

Item	No-load data	Locked-rotor data
Voltage	11 volts	5.5 volts
Current	50 amperes max.	280 amperes max.
Torque	————	0.35 kg-m min.
Speed	4,500 rpm over	————

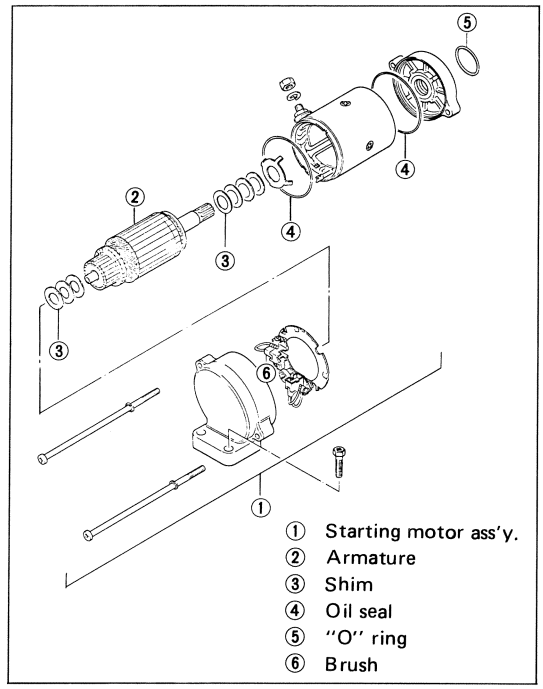


Fig. 3-8

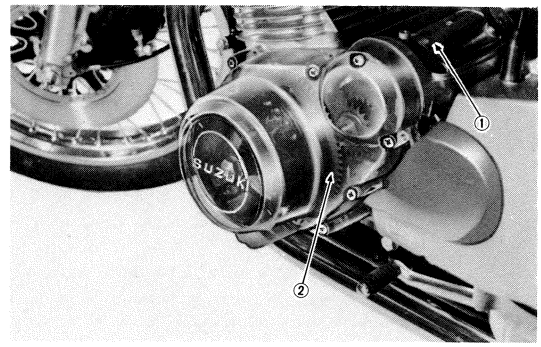


Fig. 3-9 ① Starting motor ② Starter gear

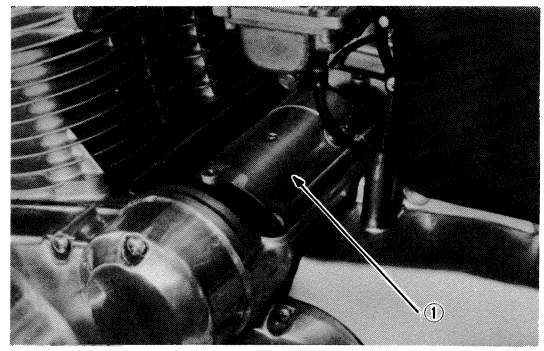


Fig. 3-10 ① Starting motor

INSPECTION OF COMPONENTS AND PARTS

Carbon brushes

With its brushes excessively worn down, the motor is unable to draw full current and, consequently, cranks the engine poorly. Measure the length of each brush; replace brushes whose length has shortened to the limit.

Brush length specification		
Make	Standard	Service limit
MITSUBA	12 - 13 mm (0.47 - 0.51 in)	6 mm (0.24 in)
DENSO	14 mm (0.55 in)	9 mm (0.35 in)

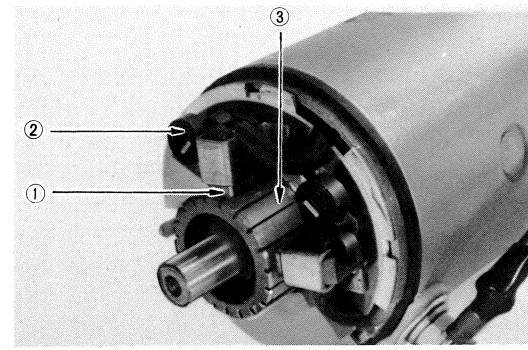


Fig. 3-11 ①Brush ②Brush spring Commutator

Commutator

Inspect the commutator surface for wear, "high mica," and burn or grooving. Smoothen the surface by grinding with sandpaper. Undercut the mica to the depth specified.

Standard undercut	0.6 mm (0.02 in)
Limit on undercut	0.2 mm (0.008 in)

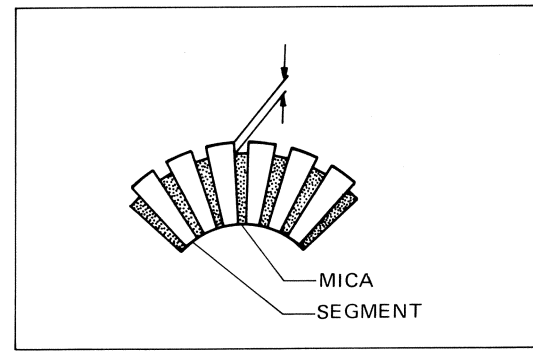


Fig. 3-12

Armature coil

Using a circuit tester, check the coil for open and ground by putting the probe pins to each commutator segments and rotor core (to test for ground) and to two segments at several places (to test for open), with the brushes lifted off the commutator surface.

If the coil is found open-circuited or grounded, replace the armature. Continued use of such an armature is sure to end up with a sudden failure of the starting motor.

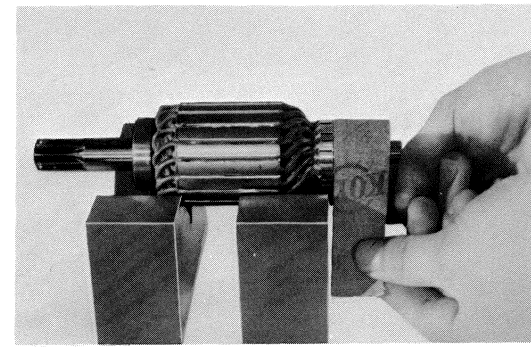


Fig. 3-13

Starting motor relay

This relay is substantially a solenoid switch and, as such, is required to have its coil, contact plunger and contact points in sound condition. It should be borne in mind that its contact points have to pass a very large current drawn by the starting motor.

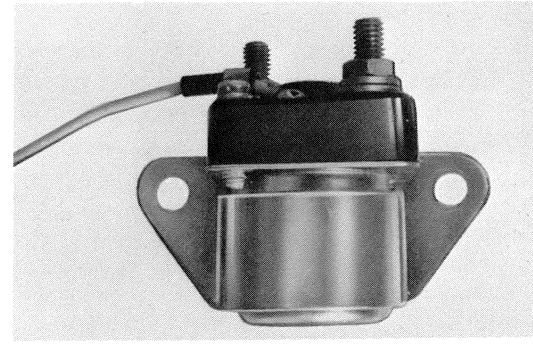


Fig. 3-14

Check the coil for "open," "ground" and ohmic resistance. The coil is in sound condition if its resistance is checked to be 3.5 ohms ± 0.5.

To see whether the contact points are closing fully to pass the large load current, operate it in the usual manner (by depressing the button on the right handle) to connect the battery to the motor and measure the voltage between the positive (+) terminal of motor and ground and also between the positive (+) terminal of battery and ground. If the two readings are equal, it means that the relay contact points are satisfactory.
If the difference between the two is large or if no voltage shows up on the motor side, replace the relay for its contact points are satisfactory.

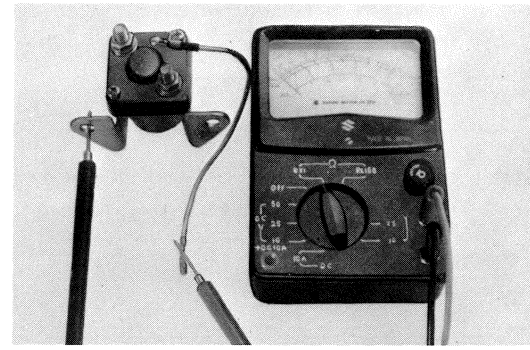


Fig. 3-15

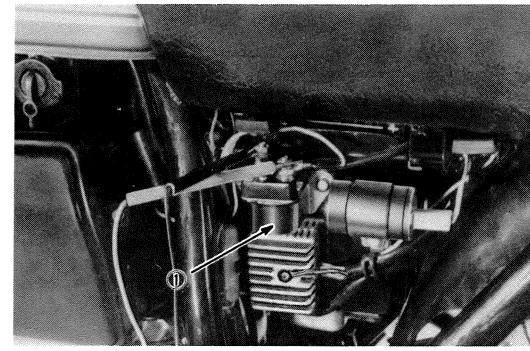


Fig. 3-16 ① Starting motor relay

The battery

Battery specifications	
Type	12N14-3A lead storage battery
Capacity	12V, 14 Ah
Voltage	12V
Electrolyte S.G.	1.280 at 20°C

1. Check to be sure that the vent pipe is secured tight, free of any damage, and is routed as shown.
2. Add distilled water, as necessary, to keep the surface of the electrolyte above the LOW level line but not above the HIGH level line.
3. If the electrolyte surface falls rapidly to require frequent addition of distilled water, check the charging system for the cause of low charging rate.
4. Periodically, check the electrolyte for specific gravity by using a hydrometer to tell the state of charge. After adding distilled water, be sure to run the machine to recharge the battery.

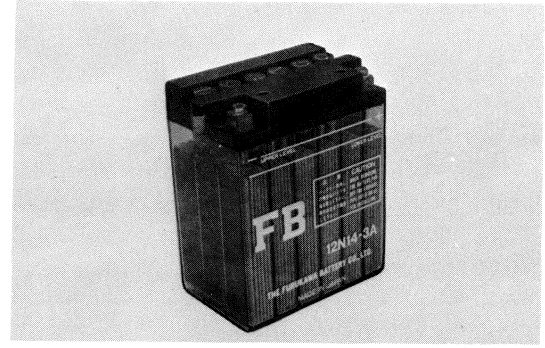


Fig. 3-17

Fig. 3-18

IMPORTANT: An S.G. reading of 1.20 (at 20°C) or under means that the battery needs recharging off the machine: take it down and charge it from a recharger. Charging the battery in place from the recharger could promote rusting or even rupture the rectifier.

COUTIONS:
- Be careful not to position the battery the other way around in place after mounting it on the machine. Misconnection of lead wires to its terminals is sure to burn or damage some components.
- Any lead storage battery develops hydrogen gas. Never allow any flame to cme closer to the battery.

IGNITION SYSTEM

There are two ignition coils, two contact breakers and two condensers to produce sparking energy for the four spark plugs. No. 1 breaker is for Nos. 1 and 4 spark plugs; and No.2 breaker is for Nos. 2 and 3 spark plugs. Each ignition coil is connected to the plugs as shown.

When No. 1 piston is up on compression stroke, No. 4 piston too is up but on exhaust stroke. Sparks occurring at the same time in Nos. 1 and 4 cylinders present no problem, and the same reasoning applies to Nos. 2 and 3 cylinders. Ignition order is 1-2-4-3, as counted from left to right by the rider mounting the machine. It should be noted that Nos. 1 and 2 breakers operate 180 degrees apart in term of crank angle.

Schematic diagram of ignition system

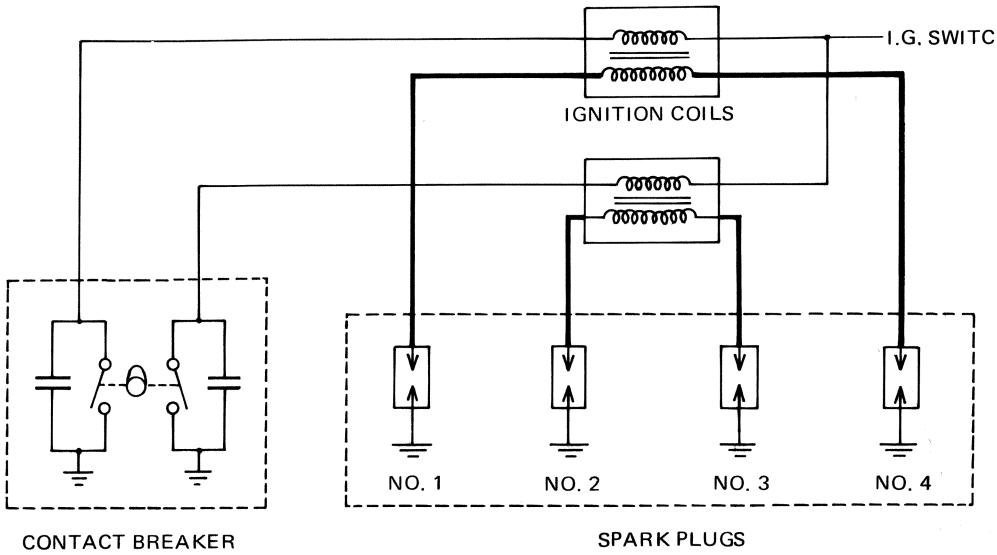


Fig. 3-19

Ignition system data

SPARK PLUGS: Type Gap	NGK B-8ES or DENSO W24ES 0.6 - 0.7 mm (0.02 - 0.03 in)
THREE-NEEDLE SPARKING DISTANCE OF IGNITION COIL	7 mm (0.28 in) minimum
CONTACT POINT GAP	0.3 - 0.4 mm (0.01 - 0.02 in)
CONDENSER CAPACITANCE: KOKUSAN DENSO	0.25 μF 0.18 μF
SPARK ADVANCER: Advance angle Beginning of advance End of advance	20° 1,400 - 1,600 rpm 2,250 - 2,450 rpm

INSPECTION

Ignition coils

Using the electro tester, test each ignition coil for sparking performance. Test connection is as indicated. Make sure that the three-needle sparking distance is at lead 7 mm (0.28 in).

Electro tester (special tool)	09900-28104

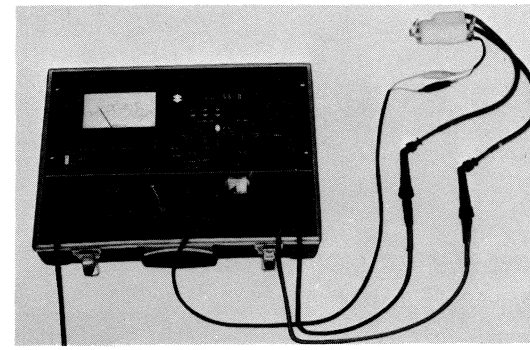


Fig. 3-20

Spark plugs

Clean the plugs in a plug cleaner or by using a wire brush and pin. Use the pin to prick out carbon, taking care not to damage the porcelain.

Check the gap with a thickness gauge, and adjust it, as necessary, to this value:

Plug gap specification	0.6 - 0.7 mm (0.02 - 0.03 in)

The standard plug is either of NGK make or of DENSO make.

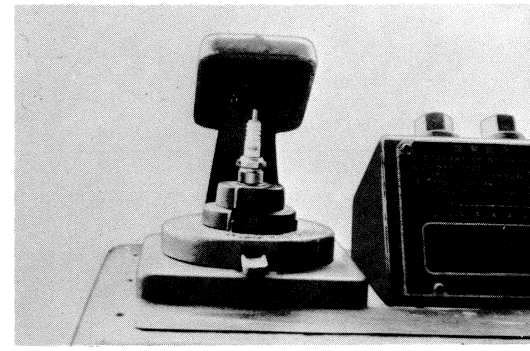


Fig. 3-21

Contact breakers

Check and adjust the contact points as outlined in page 76.

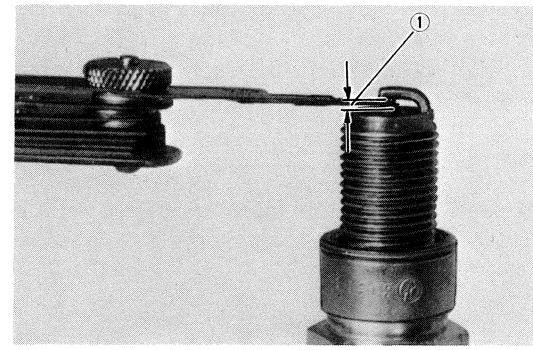


Fig. 3-22 ① Spark plug gap

Condensers

Use the electro tester to check each condenser for capacitance. When checking, be sure to lift the condenser off the breaker base plate by removing the screws securing it to the base.

Electro tester (special tool) 09900-28104

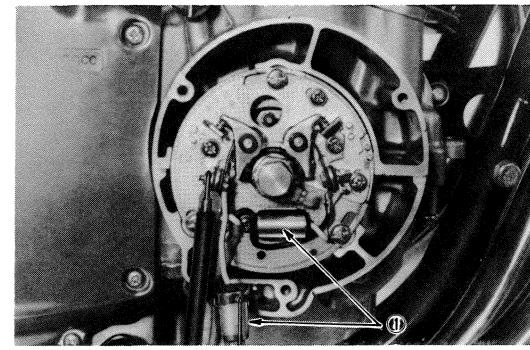


Fig. 3-23 ① Condenser

UTILITY SWITCHES AND DEVICES

Ignition switch

Be sure that the ignition switch, when checked with a circuit tester, show internal continuity as indicated in the chart below, and replace it if any continuity or non-continuity not indicated in the chart is noted:

Ignition switch continuity chart

Switch position	Terminals			
	RED	AMBER	GRAY	BROWN
OFF				
ON	O——	——O	O——	——O
P	O——			——O

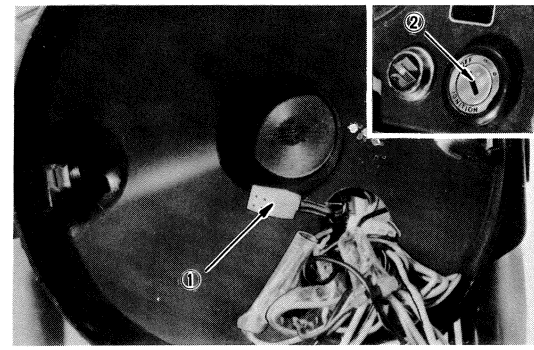


Fig. 3-24 ① Coupler ② Ignition key switch

Front brake lamp switch

See if this switch shows continuity when the front brake lever is squeezed: put the tester probe pins to the WHITE and AMBER lead wires of this lamp switch.

NOTE: To advance or retard the action of this switch for the purpose of adjustment, reposition it in place: this is accomplished by loosening the 2 screws securing the switch to the body.

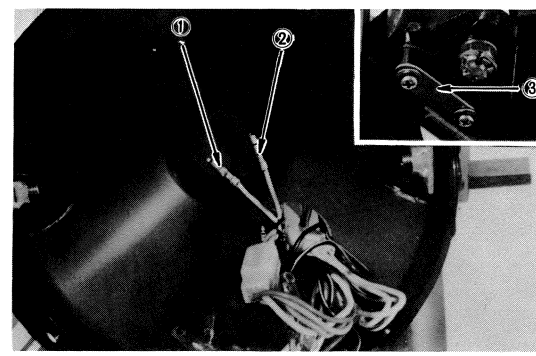


Fig. 3-25 ① White ② Amber
③ Front brake lamp switch

Rear brake lamp switch

Check this lamp in the same way that the front lamp switch is tested for internal continuity. Its lead wires are WHITE and AMBER. Depress the brake pedal, and the continuity will be noted.

NOTE: To make the switch close earlier (to turn on the lamp upon depressing the brake pedal), reposition the switch body upward. Lowering this body retards the action'

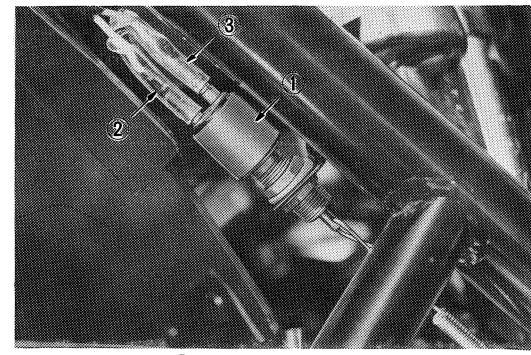


Fig. 3-26 ① Rear brake lamp switch ② White ③ Amber

Horn

The horn is to be checked for internal continuity and for sounding. Use the circuit tester for the former check, and a 12-volt battery for the latter. See if the horn sounds off fully when its lead wires are put to the battery terminals; if not, replace it.

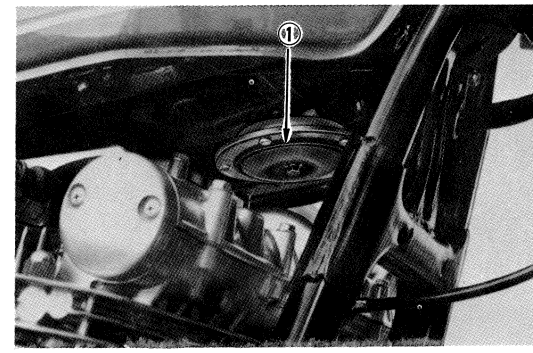


Fig. 3-27 ① Horn

Winker switch unit

Disconnect the lead wires from the winker switch, and check for internal continuity by putting the probe pins of the tester to LIGHT GREEN and BLACK leads (for right-hand switch) and to BLACK and BLACK leads (for left-hand switch).

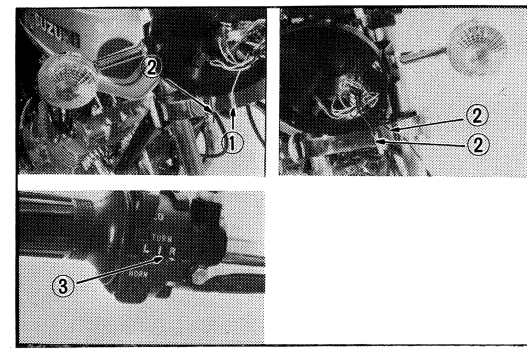


Fig. 3-28 ① Light green ② Black ③ Winker switch

Lighting switch

The lighting switch should exhibit continuity, when checked with the circuit tester, according to this chart:

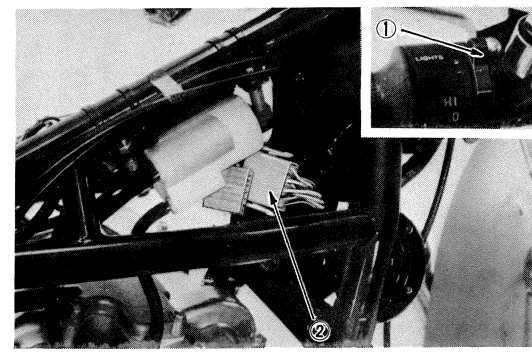


Fig. 3-29 ① Lighting switch ② Coupler

Lighting switch continuity chart

Switch Position	AMBER	GRAY	YELLOW /WHITE	BLUE /WHITE	WHITE	WHITE /GREEN	WHITE/RED
OFF	O			O			
ON	O	O	O	O	O	O	O

If any abnormally high resistance is noted to accompany the continuity indication, it probably means that the contact points in the switch are in faulty condition and need repair.

Kill switch and starter switch

Check these switches in the same way that the lighting switch is checked.

(Kill switch)

Switch Position	AMBER	AMBER/WHITE
OFF		
ON	O	O

(Starter switch)

Switch Position	YELLOW/GREEN	AMBER/WHITE
OFF		
ON	O	O

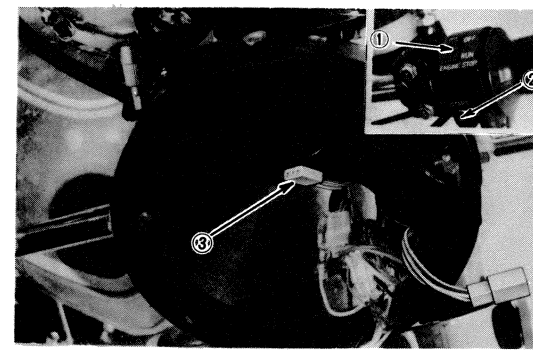


Fig. 3-30 ① Kill switch ② Starter button ③ Coupler

Passing

Check the switch for internal continuity:

Passing switch continuity chart

Switch Position	YELLOW/WHITE	BLUE/WHITE
OFF		
ON	O	O

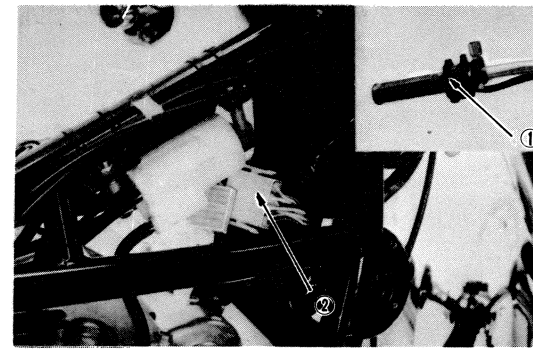


Fig. 3-31 ① Passing switch ② Coupler

Oil pressure switch

This switch is located on the discharge side of the lube oil pump to close and open in response to the discharge pressure and thus to turn the warning lamp on and off.

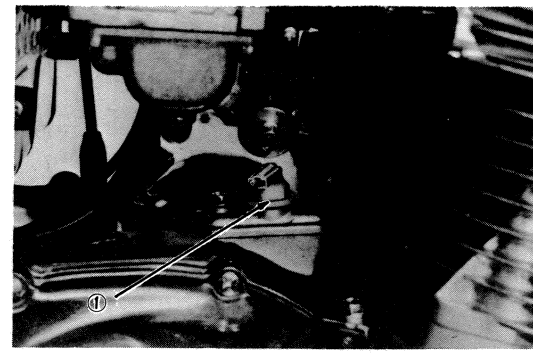


Fig. 3-32 ① Oil pressure switch

The normal function of this switch and its lamp is such that, when the engine is down, turning on the ignition switch will light up the lamp (oil pressure indicating lamp), but the lamp will go out immediately as the engine is started, thus signifying that the oil pump is delivering enough lube oil.

Two possibilities must be taken into consideration when the switch and lamp do not operate as stated above. One is that the switch is internally faulted in the form of open-circuit or grounding: this can be checked with the circuit tester. The other is the mechanical malfunctioning – the inability of the switch to respond to the pressure: this can be checked by measuring the oil pressure when the engine is running. If the pressure is low, the oil pump is to blame; if high, the switch is mechanically defective and needs replacement.

Gearshifting switch and gear position indicator

If the neutral lamp and digital-display indicator do not light up partially or totally, check the switch (removed from the transmission but remaining wired) by manually grounding each of its terminals to see whether or not the right indication comes up each time; if it does, then the switch is defective and requires replacement. Otherwise, the cause could be in the wiring.

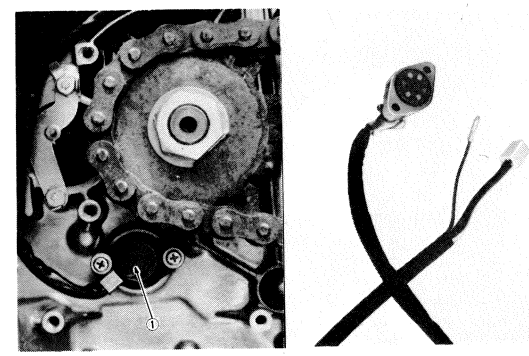


Fig. 3-33 ① Gearshifting switch

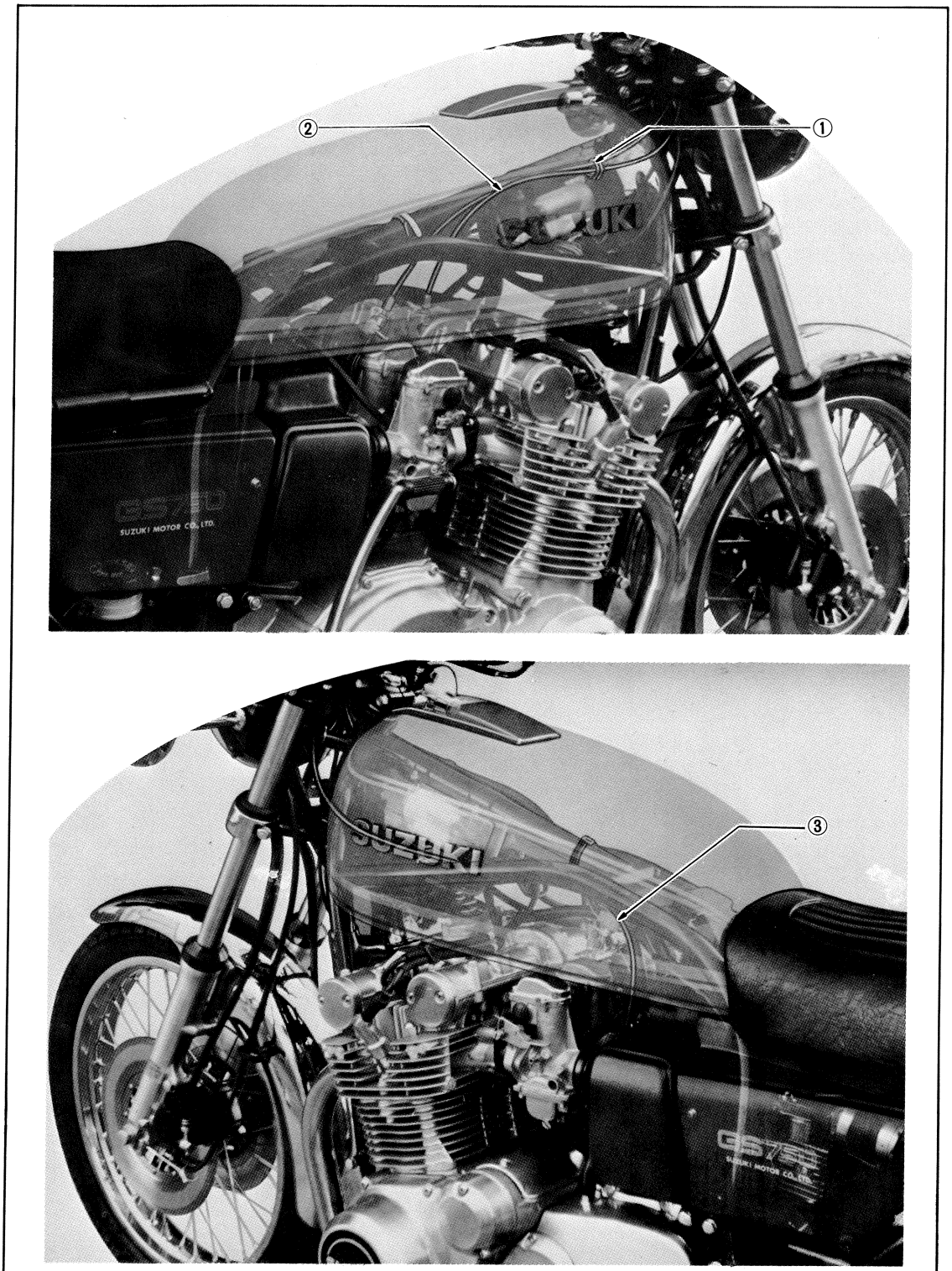
If the indicator displays an abnormal digit, such as "8", it is likely that there is a short between lead wires. The circuit tester will quickly reveal and locate such a fault.

Lamp wattage data

The lighting system of Model GS750 uses the lamps with the following rated wattage:

Lamp	Watt (W)
Headlamp: High beam	50
Low beam	40
Meter lamp	3.4
Winker pilot lamp	3.4
High-beam indicator lamp	3.4
Oil pressure lamp	3.4
Neutral lamp	3.4
Turn signal lamp	23
Rear combination lamp: Tail & parking	8 (3 cp)
Stop	23 (32 cp)

NOTE: In the machines supplied to the U.S.A. and Canada, the headlamp of 50/35 watts is used.



① Clamp
② Throttle cable
③ Clutch cable

Fig. 3-34

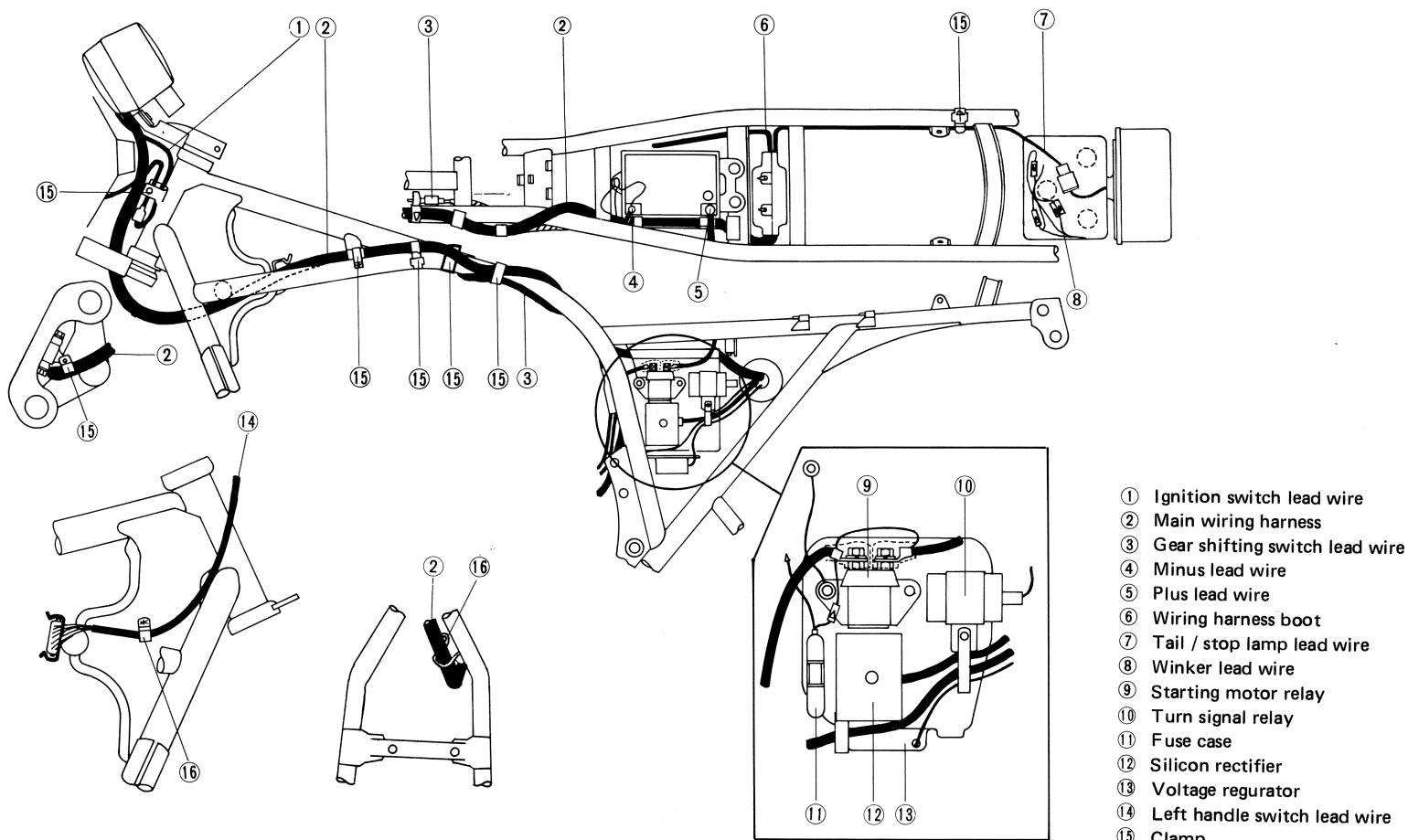

① Ignition switch lead wire
② Main wiring harness
③ Gear shifting switch lead wire
④ Minus lead wire
⑤ Plus lead wire
⑥ Wiring harness boot
⑦ Tail / stop lamp lead wire
⑧ Winker lead wire
⑨ Starting motor relay
⑩ Turn signal relay
⑪ Fuse case
⑫ Silicon rectifier
⑬ Voltage regurator
⑭ Left handle switch lead wire
⑮ Clamp
⑯ Clip

Fig. 2-25

SPECIAL TOOIS

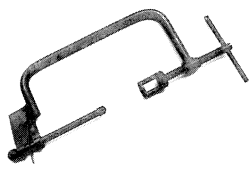
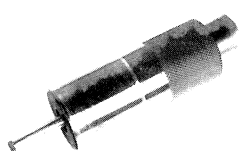
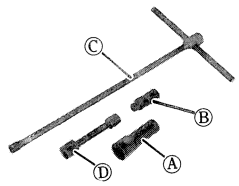
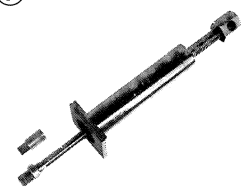
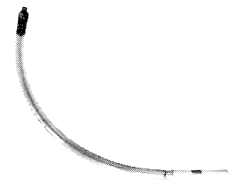
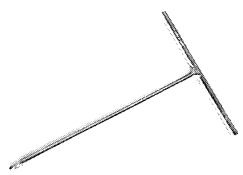
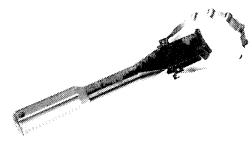
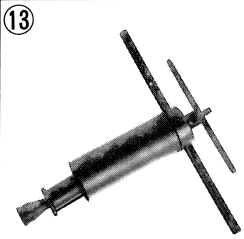
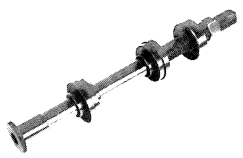
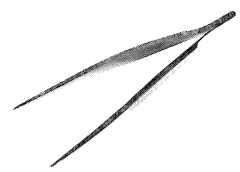
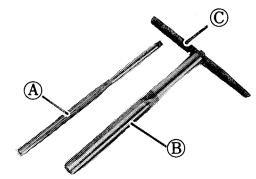
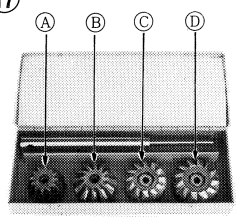
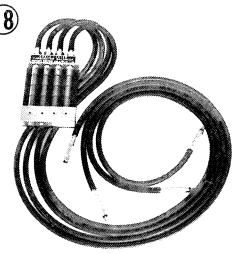
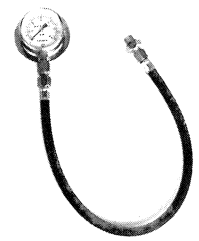
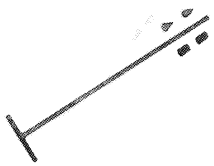
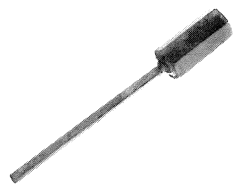
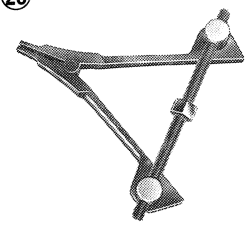
GROU 5

The tools listed hereunder are special ones, designed to facilitate maintenance work—disassembly, reassembly, servicing, checking, etc—on the GS750, and protect the parts and components of the motorcycle against damage. Each shop is advised to have these special tools as standard stop equipment.

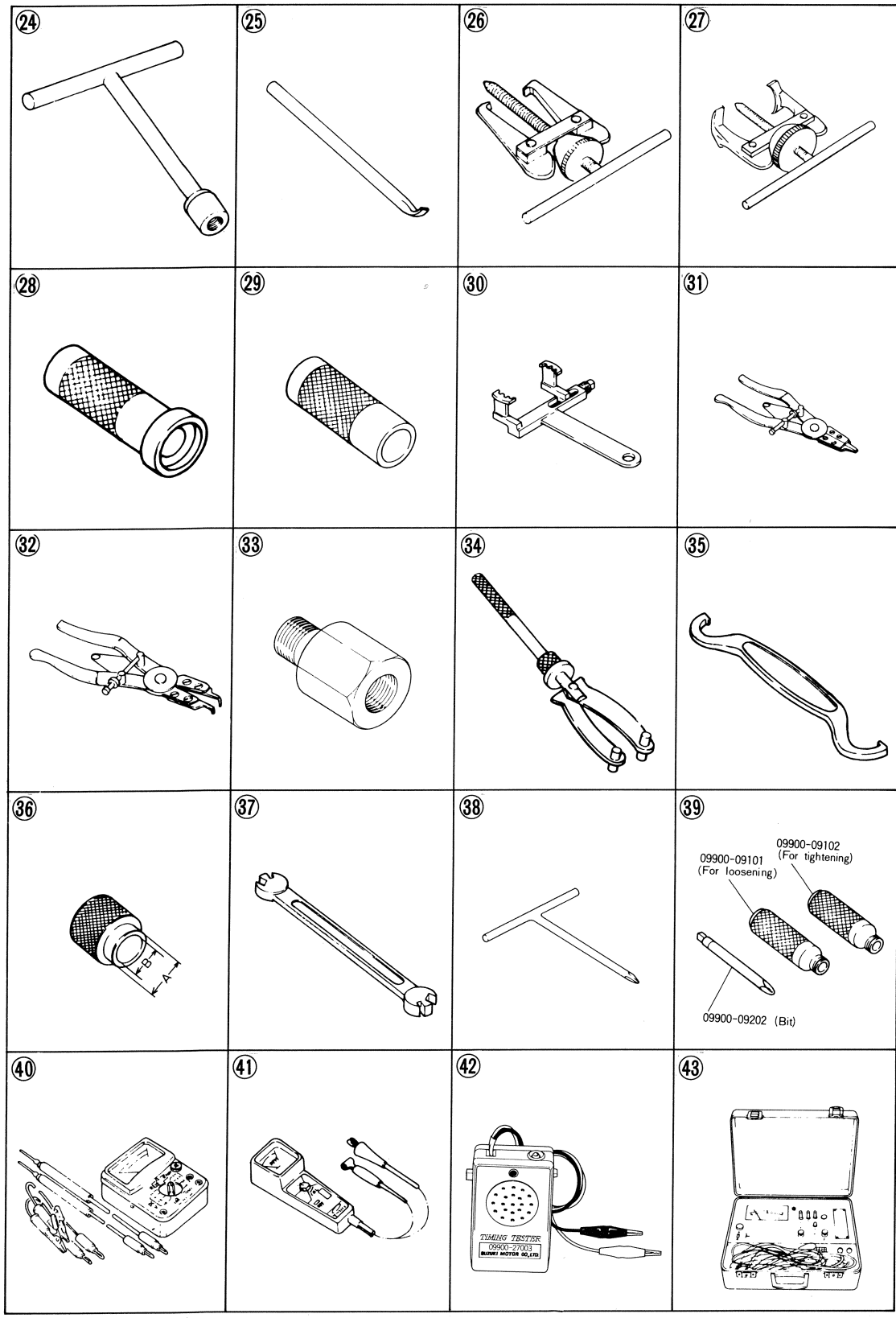
Tools from 1 to 23 are for exclusive use on the GS750

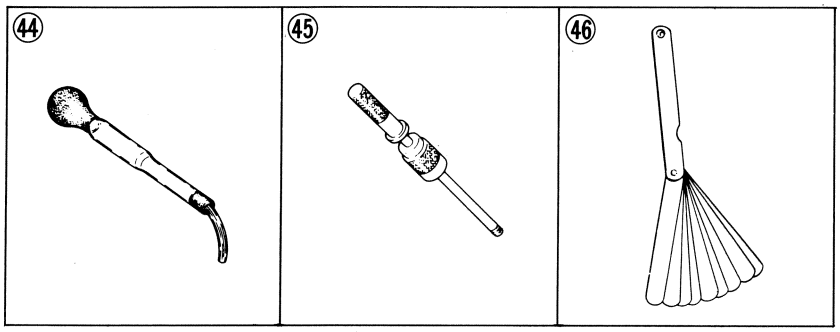
Ref. No.	Tool number	Description
1	09916-14510	Valve lifter
2	09916-54510	Valve guide installer
3	09916-44510	Valve guide remover
4	09916-64510	Tappet depressor
5	09911-94510	Valve stem seal installer
6	09930-14510	Cylinder head nut and spark plug wrench set
	09930-14520	(A) Plug wrench
	09930-14530	(B) Universal joint
	09914-24510	(C) "T" handle
	09911-74510	(D) 14-mm socket wrench
7	09910-34510	Piston pin puller
8	09913-14510	Fuel level gauge
9	09930-44510	Rotor holder
10	09914-25811	"T" hexagon wrench (6 mm)
11	09916-74510	Piston ring holder
12	09913-14520	Throttle valve adjust wrench
13	09941-44510	Swing arm bearing remover
14	09941-34510	Steering inner race and swing arm bearing installer
15	09916-84510	Forceps
16	09916-34510	Valve guide reamer set
	09916-34520	(A) 7 mm dia.
	09916-34530	(B) 12.2 mm dia.
	09916-35540	(C) Handle
17	09916-24510	Valve seat cutter set
	09916-24520	(A) 45°
	09916-24530	(B) 15°
	09916-24540	(C) 75° IN
	09916-24550	(D) 75° EX
18	09913-13121	Carburetor balancer
19	09915-74510	Oil pressure gauge
20	09915-64510	Compression gauge
21	09940-34510	Front fork assembling tool set
22	09911-70130	Hexagon wrench (4 mm)
23	09912-34510	Cylinder disassembling tool
24	09910-11510	10 mm stud installing tool
25	09913-50110	Oil seal remover
26	09913-60910	Bearing puller
27	09913-61110	Bearing puller
28	09913-70122	Bearing and oil seal installing tool
29	09913-80111	Bearing and oil seal installing tool
30	09920-53710	Clutch sleeve hub holder
31	09920-70111	Snap ring opener
32	09920-73110	Special circlip opener
33	09930-33710	Rotor remover attachment
34	09930-40113	Engine sprocket and flywheel holder
35	09940-10122	Steering stem lock nut wrench
36	09940-53111	Front fork oil seal installing tool
37	09940-60112	Spoke nipple wrench
38	09900-07403	6 mm T type cross head screw wrench
39	09900-09002	Shock driver set
40	09900-25001	Pocket tester
41	09900-26002	Engine tachometer
42	09900-27003	Timing tester
43	09900-28104	Electro tester
44	09900-28401	Hydrometer
45	09930-30101	Rotor remover shaft set
46	09900-20803	Thickness gauge

Tools for exclusive use on GS750.

① 	② 	③ 	④ 
⑤ 	⑥ 	⑦ 	⑧ 
⑨ 	⑩ 	⑪ 	⑫ 
⑬ 	⑭ 	⑮ 	⑯ 
⑰ 	⑱ 	⑲ 	⑳ 
㉑ 	㉒ 	㉓ 	

Tools for common use on other models.

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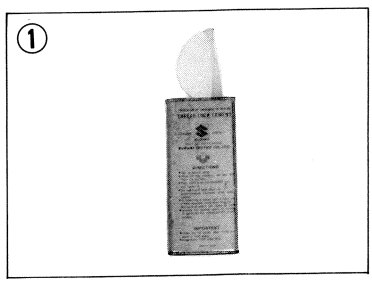
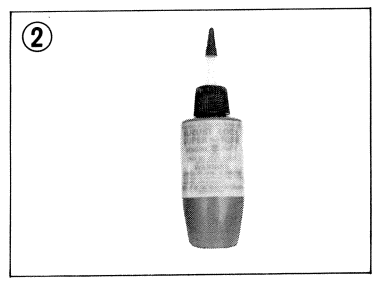
NECESSARY MATERIALS

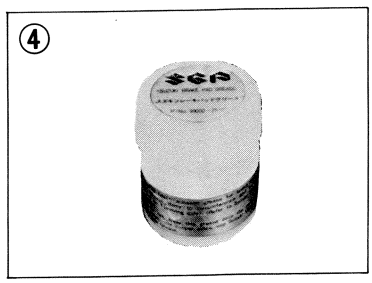
GROU
6

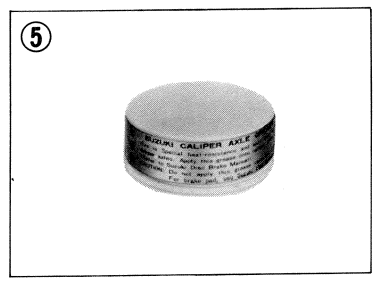
The materials listed below are needed for maintenance work on the GS750, and should be kept on hand for ready use. They are additions to such standard materials as cleaning fluids, lubricants, emery cloth and the like. How to use them and where to use them are described in the text of this manual.

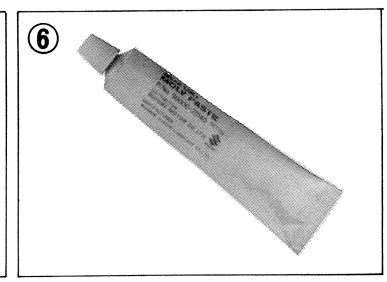
Ref. No.	Part number	Description or name
1	99000-32040	THREAD LOCK CEMENT
2	99000-32030	SUZUKI LOCK SUPER "103K"
3	99000-31030	SUZUKI BOND No. 4
4	99000-25100	SUZUKI BRAKE PAD GREASE
5	99000-25110	SUZUKI CALIPER AXLE GREASE
6	99000-25140	SUZUKI MOLY PASTE











TIGHTENING TORQUE

Engine

	Bolt Dia. (mm)	kg-m	lb-ft
Clutch sleeve hub nut	24	4.0 – 6.0	29.0 – 43.4
Drive sprocket nut	20	4.0 – 6.0	29.0 – 43.4
Starter clutch bolt	8	1.5 – 2.0	10.8 – 14.5
Contact breaker cam bolt	10	1.8 – 2.8	13.0 – 20.3
Cam chain tensioner sleeve bolt	24	3.0 – 3.5	21.7 – 25.3
Cam chain tensioner lock nut	6	1.0 – 1.2	7.2 – 8.7
Camshaft sprocket bolt	6	1.0	7.2
Cylinder head bolt	6	0.7 – 1.1	5.1 – 8.0
Cylinder Head nut	10	3.5 – 4.0	25.3 – 29.0
Cylinder head cover bolt	6	0.7 – 1.1	5.1 – 8.0
Camshaft holder bolt	6	0.8 – 1.2	5.8 – 8.7
Cam chain idler sprocket bolt	6	0.6 – 1.0	4.3 – 7.2
Oil filter cover nut	6	0.6 – 0.8	4.3 – 5.8
Oil pan bolt	6	1.0	7.2
Crankcase bolt	6	1.0	7.2
Crankcase bolt	8	2.0	14.5
Engine mounting bolt	10	4.0	29.0
Engine mounting plate bolt	8	2.0	14.5
AC generator rotor bolt	12	6.0 – 7.0	43.4 – 50.6

Chassis

	Bolt Dia. (mm)	kg-m	lb-ft
Handlebar holder bolt	8	1.2 – 2.0	8.7 – 14.5
Steering stem pinch bolt	8	1.5 –2.5	10.8 – 18.1
Front fork tube upper pinch bolt (R.L)	10	2.0 – 3.0	14.5 – 21.7
Front fork tube lower pinch bolt (R.L)	10	2.0 – 3.0	14.5 – 21.7
Front axle nut	12	3.6 – 5.2	26.0 – 37.6
Front axle holder nut	8	1.5 – 2.5	10.8 – 18.1
Swinging arm pivot shaft nut	14	5.0 – 8.0	36.2 – 57.8
Rear torque link nut	10	2.0 – 3.0	14.5 – 21.7
Rear axle nut	18	8.5 – 11.5	61.5 – 83.1
Rear shock absorber bolt	10	2.0 – 3.0	14.5 – 21.7
Rear shock absorber nut	10	2.0 – 3.0	14.5 – 21.7
Front step bolt	10	2.7 – 4.3	19.5 – 31.1
Steering stem bolt	12	3.6 – 5.2	26.0 – 37.6
Front brake caliper mounting bolt	10	2.5 – 4.0	18.1 – 29.0
Rear brake caliper mounting bolt	10	2.0 – 3.0	14.5 – 21.7

	Bolt Dia. (mm)	kg-m	lb-ft
Brake disc bolt	8	1.5 – 2.5	10.8 – 18.1
Front brake caliper axle bolt	10	2.5 – 3.5	18.1 – 25.3
Rear brake caliper axle bolt	10	2.5 – 3.5	18.1 – 25.3
Front brake master cylinder mounting bolt	6	0.6 – 1.0	4.3 – 7.2
Rear brake master cylinder mounting bolt	8	1.5 – 2.5	10.8 – 18.1
Brake hose union bolt	10	1.5 – 2.5	10.8 – 18.1
Brake oil bleeder bolt	7	0.6 – 0.9	4.3 – 6.5
Brake hose Coupler	10	1.3 – 1.8	9.4 – 13.0
Chain adjuster support bolt	8	1.5 – 2.0	10.8 – 14.5

For other bolts and nuts not listed above, refer to this chart:

Bolt Diameter	Conventional bolt		"S" marked bolt	
mm	kg-m	lb-ft	kg-m	lb-ft
4	0.1 – 0.15	0.7 – 1.9	0.15 – 0.25	1.1 – 1.8
5	0.2 – 0.3	1.4 – 2.2	0.3 – 0.5	2.2 – 3.6
6	0.4 – 0.6	2.9 – 4.3	0.6 – 0.9	4.3 – 6.5
8	0.9 – 1.2	6.5 – 8.7	1.5 – 2.0	10.8 – 14.5
10	2.0 – 2.5	14.5 – 18.1	3.0 – 3.7	21.7 – 26.8
12	3.5 – 4.0	25.3 – 29.0	5.0 – 6.5	36.2 – 47.0
14	6.0 – 7.0	43.4 – 50.6	9.0 – 10	65.1 – 72.3
16	9.0 – 11	65.1 – 79.6	14 – 17	101.3 – 123.0
18	14 – 16	101.3 – 115.7	21 – 25	151.9 – 180.8

TROUBLE SHOOTING

GROUP 8

ENGINE AND CHASSIS

Complaint	Symptom and possible causes	Remedy
Engine will not start, or is hard to start.	**"Compression pressure" too low.**	
	1. Tappet clearance out of adjustment.	Adjust.
	2. Worn valve guides or valves seating poorly.	Repair, or replace.
	3. Valves mistimed.	Adjust.
	4. Piston rings excessively worn.	Replace.
	5. Worn-down cylinder bores.	Replace.
	6. Starter motor cranks but too slowly.	Consult "electrical complaints."
	No sparking on plugs.	
	1. Fouled spark plugs.	Clean.
	2. Wet spark plugs.	Clean and dry.
	3. Contact points dirty.	Clean.
	4. Contact points improperly gapped.	Adjust.
	5. Ignition timing out of adjustment.	Adjust.
	6. Defective ignition coil.	Replace.
	7. Open or short in high-tension cords.	Replace.
	8. Ruptured condenser.	Replace.
	No fuel reaching the carburetors.	
	1. Clogged hole in the fuel tank cap.	Clean.
	2. Clogged or defective fuel cock.	Clean or replace.
	3. Defective carburetor float valve.	Replace.
	4. Clogged fuel pipe or suction cock pipe.	Clean.
Engine stalls easily.	1. Fouled spark plugs.	Clean.
	2. Dirty contact points.	Clean.
	3. Ignition timing out of adjustment.	Adjust.
	4. Clogged fuel pipe.	Clean.
	5. Clogged jets in carburetors.	Clean.
	6. Tappet clearance out of adjustment.	Adjust.
Noisy engine	**Excessive tappet clatter.**	
	1. Tappet clearance too large.	Adjust.
	2. Weakened or broken valve springs.	Replace.
	Noise appears to come from pistons.	
	1. Pistons or cylinders worn down.	Replace.
	2. Combustion chambers fouled with carbon.	Clean.
	3. Piston pins or small-end bushes worn.	Replace.

Complaint	Symptom and possible causes	Remedy
	Noise seems to come from timing chain.	
	1. Stretched chain.	Replace.
	2. Worn sprockets.	Replace.
	3. Tension adjustor not working.	Repair or replace.
	Noise seems to come from clutch.	
	1. Worn splines of countershaft or hub.	Replace.
	2. Worn teeth of clutch discs.	Replace.
	3. Distorted clutch discs, driven and drive.	Repair or replace.
	Noise seems to come from crankshaft.	
	1. Rattling bearings due to wear.	Replace.
	2. Big-end bearings worn and rapping.	Replace.
	Noise seems to come from transmission.	
	1. Gears worn or rubbing.	Replace.
	2. Badly worn splines.	Replace.
	3. Primary gears worn or rubbing.	Replace.
Slipping clutch	1. Clutch control out of adjustment or loss of play.	Adjust.
	2. Weakened clutch springs.	Replace.
	3. Worn or distored pressure plate.	Replace.
	4. Distorted clutch discs, driven and drive.	Replace.
Dragging clutch	1. Clutch control out of adjustment or too much play.	Adjust.
	2. Some clutch springs weakened while the others are not.	Replace.
	3. Distorted pressure plate or clutch discs.	Replace.
Transmission will not shift.	1. Broken gearshift cam.	Replace.
	2. Distorted gearshift forks.	Replace.
Transmission will not shift back.	1. Broken return spring on shift shaft.	Replace.
	2. Shift shafts are rubbing or sticky.	Repair.
Transmission jumps out of gear.	1. Worn shifting gears on drive shaft or countershaft.	Replace.
	2. Distorted or worn gearshift forks.	Replace.
	3. Weaked stopper spring on gearshift cam.	Replace.
Engine idles poorly.	1. Tappet clearance out of adjustment.	Adjust.
	2. Poorly seating valves.	Replace.
	3. Defective valve guides.	Replace.

Complaint	Symptom and possible causes	Remedy
	4. Ignition timing out of adjustment	Adjust.
	5. Contact points improperly gapped.	Adjust.
	6. Spark plugs gapped too wide.	Repair.
	7. Defective ignition coil or condenser resulting in weak sparking.	Replace.
	8. Float-chamber fuel level out of adjustment in carburetors.	Adjust.
	9. Carburetor air screws improperly set.	Adjust.
Engine runs poorly in high-speed range.	1. Valve springs are weakened.	Replace.
	2. Valve timing out of adjustment.	Adjust.
	3. Spark plugs gapped too narrow.	Repair.
	4. Ignition not advanced sufficiently due to poorly working advancer.	Repair.
	5. Weakened springs on breaker arms.	Replace.
	6. Defective ignition coil.	Replace.
	7. Float-chamber fuel level too low.	Adjust
	8. Clogged element in air cleaner.	Clean.
	9. Clogged fuel pipe, resulting in inadequate fuel supply to carburetors.	Clean, and prime.
	10. Clogged suction cock pipe.	Clean.
Dirty or heavy exhaust smoke.	1. Too much lube oil in the engine.	Check with level gauge; drain out excess oil.
	2. Worn piston rings or cylinders.	Replace.
	3. Worn valve guides.	Replace.
	4. Cylinder walls are scored or scuffed.	Replace.
	5. Worn valve stems.	Replace.
Engine lacks power.	1. Loss of tappet clearance.	Adjust.
	2. Weakened valve springs.	Replace.
	3. Valve timing out of adjustment.	Adjust.
	4. Worn piston rings or cylinders.	Replace.
	5. Poorly seating valves.	Repair.
	6. Ignition timing out of adjustment.	Adjust.
	7. Contact points improperly gapped.	Adjust.
	8. Spark plugs improperly gapped.	Repair.
	9. Clogged jets in carburetors.	Clean.
	10. Float-chamber fuel level out of adjustment.	Adjust.
	11. Clogged element in air cleaner.	Clean.
	12. Carburetor balancing screw loose.	Retighten.
	13. Too much engine lube oil.	Drain out excess oil.
Engine overheats.	1. Heavy carbon deposit on piston crowns	Clean

Complaint	Symptom and possible causes	Remedy
	2. Not enough oil in the engine. 3. Defective oil pump or clogged oil circuit. 4. Fuel level too low in float chambers. 5. Ignition timing excessively retarded, accompanied by pinging.	Add oil. Repair or clean. Adjust. Adjust.
Handle feels too heavy.	1. Steering stem overtightened. 2. Broken steel balls on steering stem. 3. Distorted steering stem. 4. Not enough pressure in wheel tires. 5. Overtightened steering ball races.	Adjust. Replace. Replace. Adjust. Adjust.
Wobbly handle	1. Loss of balance between right and left cushions. 2. Distorted front fork. 3. Distorted front axle or cocked tire.	Replace. Repair or replace. Replace.
Wobbly front wheel	1. Distorted wheel rim. 2. Worn-down front wheel bearings. 3. Loose wheel spokes. 4. Defective or improper tire. 5. Loose nut on axle.	Replace. Replace. Retighten. Replace. Retighten.
Front cushions too soft	1. Weakened springs. 2. Not enough damper oil.	Replace. Refill.
Front cushions too stiff	1. Damper oil too viscous. 2. Too much damper oil.	Replace. Remove excess oil.
Noisy front cushions	1. Not enough damper oil. 2. Loose nuts on cushions.	Refill. Retighten.
Wobbly rear wheel	1. Distorted wheel rim. 2. Worn-down rear wheel bearings. 3. Loose wheel spokes. 4. Defective or improper tire.	Replace. Replace. Retighten. Replace.
Rear cushions too soft.	1. Weakened springs. 2. Rear cushion adjustors set improperly.	Replace. Adjust.
Rear cushions too stiff	Rear cushion adjustors set improperly.	Adjust.

Complaint	Symptom and possible causes	Remedy
Noisy rear cushions	Loose nuts on cushions.	Retighten.
Poor braking (FRONT & REAR)	1. Not enough brake fluid in the reservoir. 2. Air trapped in brake fluid circuit. 3. Pads worn down.	Refill to level mark. Bleed air out. Replace

ELECTRICAL

Complaint	Possible causes	Remedy
No sparking or poor sparking	1. Defective ignition coil. 2. Defective spark plugs.	Replace. Replace.
Contact points burn or pits prematurely.	Defective condenser.	Replace.
Spark plugs soon become fouled with carbon.	1. Mixture too rich. 2. Idling speed set too high. 3. Improper gasoline. 4. Dirty element in air cleaner. 5. Spark plugs too cold.	Adjust carburetors. Adjust carburetors. Change. Clean. Replace by hot type plugs.
Spark plugs become fouled too soon.	1. Worn piston rings. 2. Pistons or cylinders worn. 3. Too much clearance of valve stems in valve guides.	Replace. Replace. Replace.
Spark plug electrodes overheat or burn.	1. Spark plugs are too hot. 2. The engine overheats. 3. Ignition timing out of adjustment. 4. Spark plugs loose in place. 5. Mixture too lean.	Replace by cold type plugs. Tune up. Adjust. Retighten. Adjust carburetors.
Generator does not charge.	1. Open or short in lead wires, or loose lead connections. 2. Shorted, grounded or open generator coils. 3. Silicon diodes punctured. 4. Shorted regulator lead wire.	Repair or replace or retighten. Replace. Replace. Repair or replace.
Generator does charge, but charging rate is below the specification.	1. Lead wires tending to get shorted or open-circuited or loosely connected at terminals. 2. Grounded or open-circuited stator coils of generator.	Repair, or retighten. Replace.

Complaint	Possible causes	Remedy
	3. Defective silicon diodes. 4. Defective regulator. 5. Not enough electrode in the battery. 6. Defective cell plates in the battery.	Replace. Replace. Add distilled water to raise its level. Replace the battery.
Generator overcharges.	1. Internal short-circuit in the battery 2. Coil element in the regulator damaged or defective. 3. The regulator poorly grounded.	Replace the battery. Replace the regulator. Clean and tighten ground connection.
Unstable charging	1. Lead wire insulation frayed due to vibration, presenting condition of intermittent short. 2. Generator internally shorted. 3. Defective regulator.	Repair or replace. Replace. Replace.
Starter button is not effective.	1. Battery run down. 2. Defective switch contacts. 3. Brushes not seating properly on commutator in starter motor.	Recharge or replace. Replace. Repair or replace.
Battery "sulfation"	1. Charging rate too low or too high. (A battery out of use should be recharged at least once a month to avoid sulfation.) 2. Battery electrolyte too much or too little, or its specific gravity too high or too low. 3. The battery left out of use too long in cold climinate.	Replace the battery. Keep the electrolyte up to the prescribed level, or adjust the S.G. by consulting the battery maker's directions. Replace the battery. if badly sulfated.
Battery discharges itself rapidly.	1. Dirty container top and sides. 2. Impurities in the electrolyte or electrolyte S.G. is too high.	Clean . Change the electrolyte by consulting the battery maker's directions.

SERVICE DATA

GROU 9

ENGINE

ITEM	STANDARD	SERVICE LIMIT
Cam height (Base circle + lift) IN.	36.265 - 36.295 mm (1.4278 - 1.4289 in)	36.150 mm (1.4232 in)
EX.	35.735 - 35.765 mm (1.4069 - 1.4081 in)	35.600 mm (1.4016 in)
Camshaft / journal clearance	0.020 - 0.054 mm (0.0008 - 0.0021 in)	0.150 mm (0.0059 in)
Camshaft journal holder inside diameter	21.959 - 21.980 mm (0.8645 - 0.8654 in)	———
Camshaft deflection	0.03 mm (0.0012 in)	0.1 mm (0.04 in)
Cam chain tensioner guide roller wear	———	2.5 mm (0.098 in)
Cylinder head surface warpage	0.03 mm (0.0012 in)	0.25 mm (0.0098 in)
Thickness of valve head periphery	0.8 - 1.2 mm (0.031 - 0.047 in)	0.5 mm (0.020 in)
Valve stem axis runout	———	0.05 mm (0.0020 in)
Valve stem diameter IN.	6.965 - 6.980 mm (0.2742 - 0.2748 in)	6.90 mm (0.2717 in)
EX.	6.955 - 6.970 mm (0.2738 - 0.2744 in)	6.805 mm(0.2679 in)
Valve guide inside diameter	7.000 - 7.015 mm (0.2756 - 0.2762 in)	IN. 7.09 mm (0.2891 in) EX. 7.10 mm (0.2795 in)
Valve / Valve guide clearance IN.	0.02 - 0.05 mm (0.0008 - 0.0020 in)	0.09 mm (0.0035 in)
EX.	0.03 - 0.06 mm (0.0012 - 0.0024 in)	0.10 mm (0.0039 in)
Contact width of valve and valve seat	1.0 - 1.2 mm (0.039 - 0.047 in)	1.5 mm (0.059 in)
Valve spring free length		
NIHON HATSUJO Make, Inner	37.00 mm (1.457 in)	33.8 mm (1.331 in)
Outer	43.25 mm (1.703 in)	41.5 mm (1.634 in)
CHUOH HATSUJO Make, Inner	35.30 mm (1.390 in)	33.8 mm (1.331 in)
Outer	43.00 mm (1.693 in)	41.5 mm (1.634 in)
Valve spring tension Outer	50.4 - 58.3 kg (111 - 129 lbs) for fitting length 27 mm (1.06 in)	———
Inner	29.3 - 34.0 kg (65 - 75 lbs) for fitting length 23 mm (0.91 in)	———
Compression pressure	9 -12 kg/cm^2 (128 - 171 psi)	7 kg/cm^2 (100 psi)
Oil pump discharge pressure	over 0.1 kg/cm^2 (1.42 psi) at 3,000 rpm	———
Cylinder bore	65.000 - 65.015 mm (2.5591 - 2.5596 in)	65.100 mm (2.5630 in)
Piston diameter	64.945 - 64.960 mm (2.5569 - 2.5575 in)	64.800 mm (2.5512 in)
Cylinder / Piston clearance	0.050 - 0.060 mm (0.0020 - 0.0024 in)	———
Piston ring thickness Top ring	1.175 - 1.190 mm (0.0463 - 0.0469 in)	1.100 mm (0.0433 in)
2nd ring	1.170 - 1.190 mm (0.0461 - 0.0469 in)	1.100 mm (0.0433 in)
Oil ring	2.50 mm (0.098 in)	———
Piston ring groove width Top ring	1.21 - 1.23 mm (0.0476 - 0.0484 in)	1.30 mm (0.0512 in)
2nd ring	1.21 - 1.23 mm (0.0476 - 0.0484 in)	1.30 mm (0.0512 in)
Oil ring	2.51 - 2.53 mm (0.0988 - 0.0996 in)	2.60 mm (0.1024 in)

ITEM		STANDARD	SERVICE LIMIT
Piston ring / Ring groove clearance			
	Top ring	0.020 - 0.055 mm (0.0008 - 0.0022 in)	0.18 mm (0.0071 in)
	2nd ring	0.020 - 0.060 mm (0.0008 - 0.0024 in)	0.18 mm (0.0071 in)
	Oil ring	———	0.15 mm (0.0059 in)
Piston ring end gap	Top ring	0.1 - 0.3 mm (0.004 - 0.012 in)	0.6 mm (0.024 in)
	2nd ring	0.1 - 0.3 mm (0.004 - 0.012 in)	0.6 mm (0.024 in)
Piston ring free end gap	Top ring	8 mm (0.31 in)	6 mm (0.24 in)
	2nd ring	8 mm (0.31 in)	6 mm (0.24 in)
Piston pin diameter		15.995 - 16.000 mm (0.6297 - 0.6299 in)	15.96 mm (0.6283 in)
Piston pin bore		16.002 - 16.008 mm (0.6300 - 0.6302 in)	16.08 mm (0.6331 in)
Connecting rod small end bore		16.006 - 16.014 mm (0.6302 - 0.6305 in)	16.05 mm (0.6319 in)
Connecting rod deflection		———	3 mm (0.12 in)
Crankshaft bearing diametral clearance		0.015 - 0.040 mm (0.0006 - 0.0016 in)	0.08 mm (0.0031 in)
Connecting rod side clearance		0.10 - 0.65 mm (0.004 - 0.026 in)	1.0 mm (0.04 in)
Crankshaft runout		Below 0.03 mm (0.0012 in)	0.06 mm (0.0024 in)
Tappet clearance		0.03 - 0.08 mm (0.001 - 0.003 in)	———

CHASSIS

ITEM		STANDARD	SERVICE LIMIT
Brake disc thickness		6.7 mm (0.264 in)	Under 6.00 mm (0.236 in)
Brake disc face runout		0.1 mm (0.004 in)	0.3 mm (0.012 in)
Axle runout		0.15 mm (0.006 in)	0.25 mm (0.010 in)
Tire tread depth	Front		1.6 mm (0.06 in)
	Rear		2.0 mm (0.079 in)
Wheel rim face runout			2.0 mm (0.079 in)
Brake caliper piston diameter			
	Front	42.82 mm (1.686 in)	Under 42.77 mm (1.684 in)
	Rear	38.18 mm (1.503 in)	Under 38.13 mm (1.501 in)
Brake caliper cylinder diameter			
	Front	42.85 mm (1.687 in)	Over 42.89 mm (1.687 in)
	Rear	38.15 mm (1.502 in)	Over 38.19 mm (1.504 in)
Brake master cylinder piston diameter			
	Front	13.96 mm (0.550 in)	Under 13.94 mm (0.549 in)
	Rear	13.96 mm (0.550 in)	Under 13.94 mm (0.549 in)
Brake master cylinder diameter			
	Front	14.00 mm (0.551 in)	Over 14.05 mm (0.553 in)
	Rear	14.00 mm (0.551 in)	Over 14.05 mm (0.553 in)

PERIODIC MAINTENANCE

GROU 10

LUBRICATION

The maintenance schedule, which follows, is based on this philosophy. It is timed by odometer indication, and is calculated to achieve the ultimate goal of motorcycle maintenance in the most economical manner.

Item \ Distance	Initial 1,000 Km (600 miles)	Initial and every 2,500 Km (1,500 miles)	Initial and every 5,000 Km (3,000 miles)	Initial and every 10,000 Km (6,000 miles)
Drive chain	Every 1,000 Km (600 miles)			
Throttle cable			Motor oil	Motor oil
Throttle grip				Grease
Contact breaker cam oil felt			Motor oil	Motor oil
Wheel bearings	Grease every 2 years or 20,000 Km (12,000 miles)			
Speedometer gear housing				
Steering stem bearings				
Swinging arm				
Engine oil	Change	Change	Change	Change
Front fork oil	Change			Change
Clutch cable			Motor oil	Motor oil
Brake pedal			Grease or oil	Grease or oil

INSPECTION

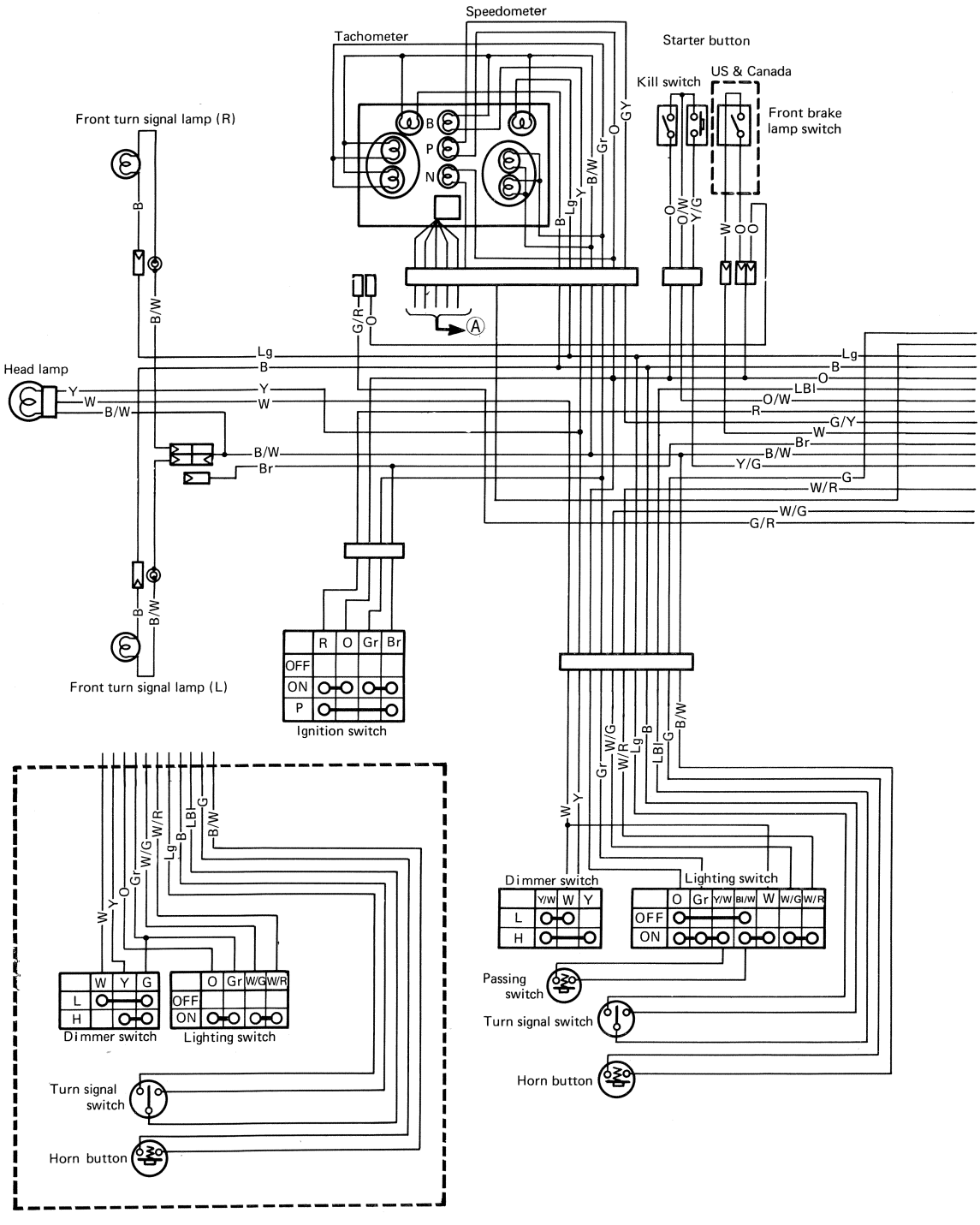
Item \ Distance	Initial 1,000 Km (600 miles)	Initial and every 5,000 Km (3,000 miles)	Initial and every 10,000 Km (6,000 miles)
Oil filter	Change	Change	Change
Carburetor	Adjust	Adjust	Adjust
Contact breaker point and timing	Check and adjust	Check and adjust	Check and adjust
Spark plug	Clean and adjust gap	Clean and adjust gap	Replace
Air cleaner element		Clean	Clean
Clutch	Adjust	Adjust	Adjust
Exhaust pipe and muffler	Retighten	Retighten	Retighten
Compression	Check	Check	Check
Oil pressure		Check	Check
Oil sump filter			Clean
Tappet clearance	Check	Check	Check
Drive chain	Adjust every 1,000 Km (600 miles)		
Battery	Check	Check	Check
Brake system (front and rear)	Check	Check	Check
Throttle cable	Adjust	Adjust	Adjust
Tire		Check	Check
Fuel hose	Change every 2 years		
Brake hose			
Steering	Check	Check	Check
All nuts and bolts (Engine and body)	Retighten	Retighten	Retighten

WIRING DIAGRAM

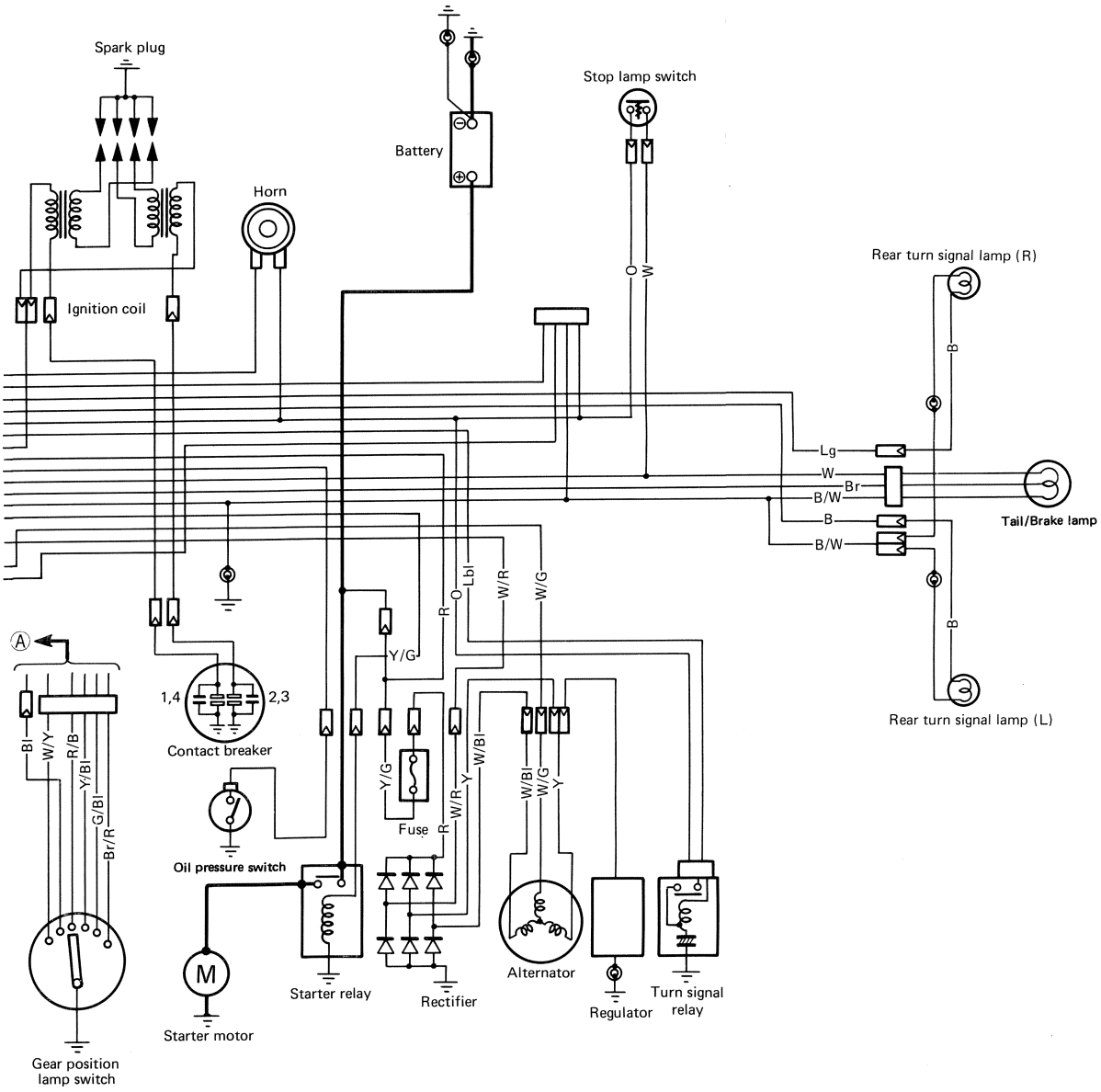
GROUP 11

WIRE COLOR

B	Black	B/W	Black with white tracer
W	White	G/R	Green with Red tracer
Y	Yellow	G/Y	Green with Yellow tracer
R	Red	O/W	Orange with White tracer
O	Orange	Y/G	Yellow with Green tracer
G	Green	Y/R	Yellow with Red tracer
Lg	Light green	W/R	White with Red tracer
Br	Brown	W/G	White with Green tracer
Gr	Gray	W/Y	White with Yellow tracer
Bl	Blue	R/B	Red with Black tracer
Lbl	Light blue	G/Bl	Green with Blue tracer
		Y/Bl	Yellow with Blue tracer
		Br/R	Brown with Red tracer
		W/Bl	White with Blue tracer



FOR U.S.A. & CANADA MARKETS

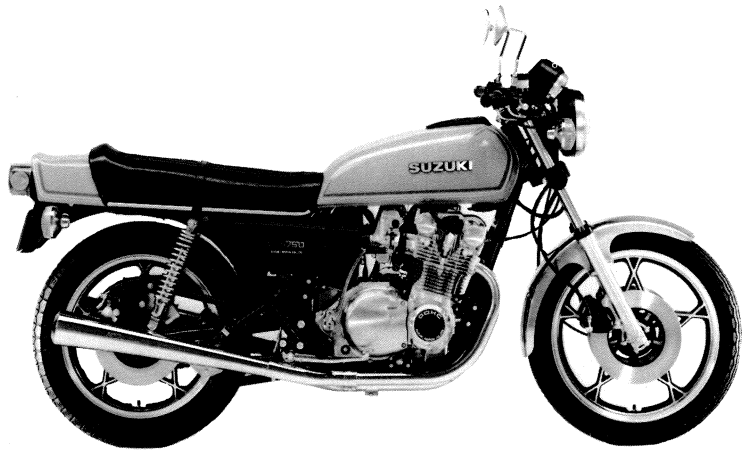

Spark plug
Battery
Stop lamp switch
Horn
Ignition coil
Rear turn signal lamp (R)
Lg
W
Br
B/W
B
B/W
Tail/Brake lamp
B
Rear turn signal lamp (L)
Y/G
R
O
Lbl
W/R
W/G
Ⓐ
1,4
2,3
Contact breaker
Bl
W/Y
R/B
Y/Bl
G/Bl
Br/R
Y/G
Fuse
R
W/R
Y
W/Bl
W/Bl
W/G
Y
Oil pressure switch
M
Starter motor
Starter relay
Rectifier
Alternator
Regulator
Turn signal relay
Gear position lamp switch

SUPPLEMENT FOR MODEL GS750E

The information contained here supplements the GS750 Service Manual to render this Manual entirely applicable to the GS750E, and deals with the differences between the GS750 (built to the single-disc specifications) and the subject model—GS750E.

Model GS750E incorporates changes in contrast to the single-disc GS750; the changes fall under three headings, as follows:

1. Front brake. . . . . .From single disc to double disc
2. Wheels (FRONT and REAR). . . . . .From spoke wheel to single-piece casting wheel
3. Suspension (FRONT and REAR) . . . .Spring characteristic altered



FRONT BRAKE

The master cylinder and caliper differ from those of the single-disc front brake in regard only to the diameters of piston and cylinder bore. This difference is due to the change in brake operating pressure.

MASTER CYLINDER

Inspection

The only difference is that the bore diameter is larger. Thus, the servicing instructions (on disassembly, reassembly and inspection) set forth in the GS750 Service Manual already in issue (which is originally for single-disc machines) with respect to the master cylinder are applicable to the subject model.

DIAMETER	STANDARD	SERVICE LIMIT
Bore	15.870 - 15.913 mm (0.6248 - 0.6265 in.)	15.925 mm (0.6270 in.)
Piston	15.811 - 15.838 mm (0.6225 - 0.6235 in.)	15.799 mm (0.6220 in.)

CALIPER

Inspection

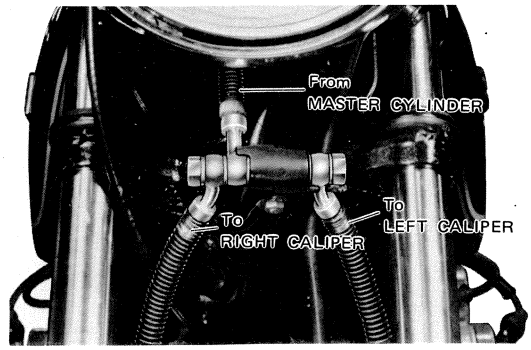
The bore diameter is smaller, there being no other difference as in the case of master cylinder.

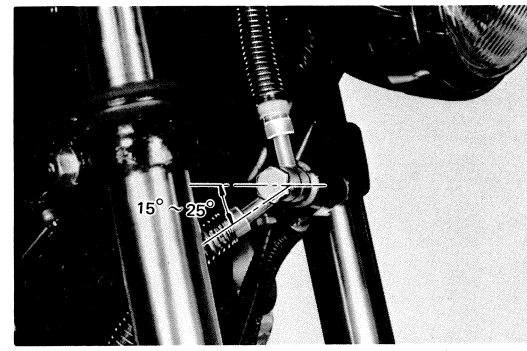
DIAMETER	STANDARD	SERVICE LIMIT
Bore	38.180 - 38.219 mm (1.5031 - 1.5047 in.)	38.230 mm (1.5051 in.)
Piston	38.116 - 38.148 mm (1.5006 - 1.5019 in.)	38.105 mm (1.5002 in.)

Reassembly

Three brake hoses are tied into the hose joint. One is from master cylinder; one is to the left caliper; and one is to the right caliper.

When connecting the hoses to the joint, be sure to make connections as shown.

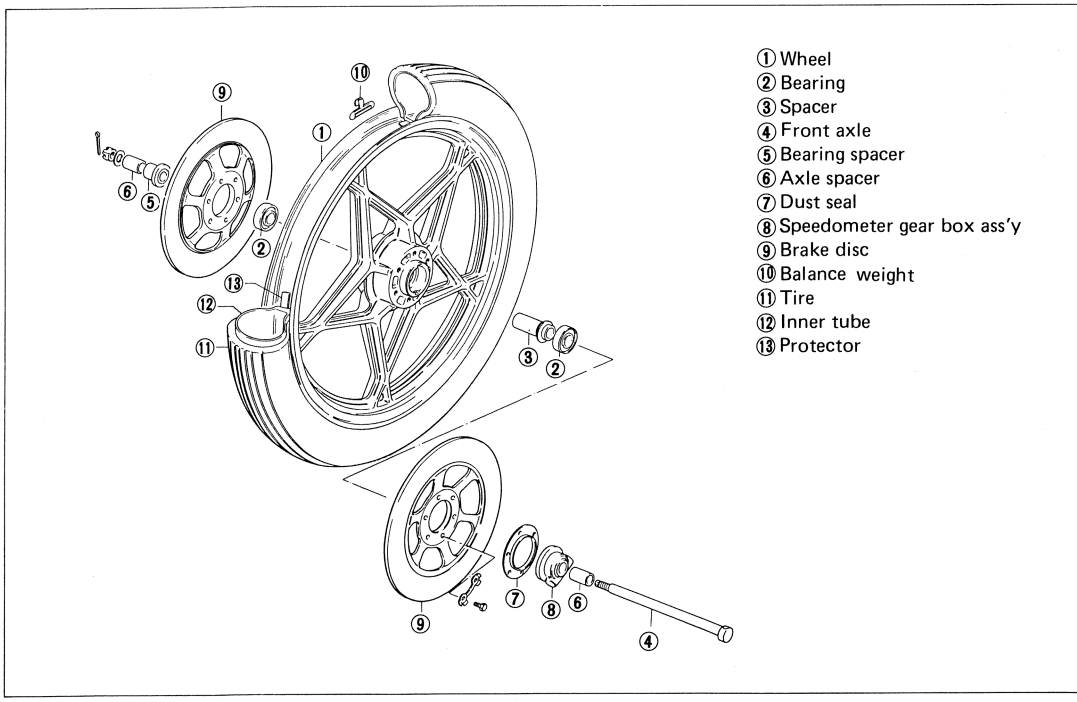




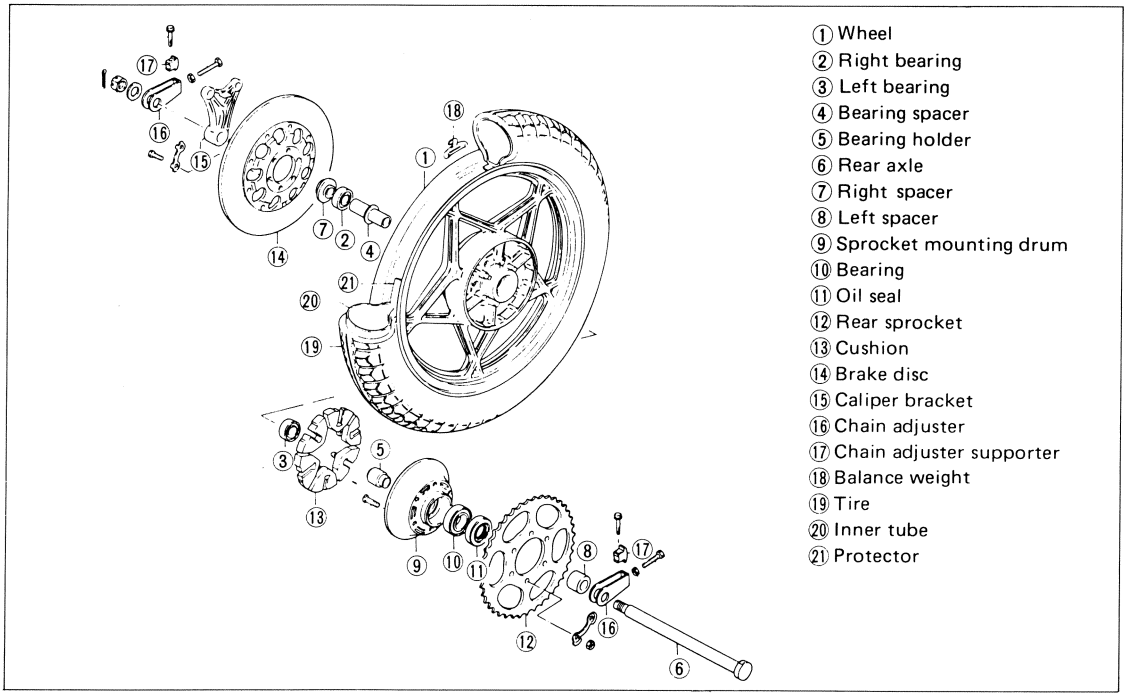
Air bleeding from brake fluid circuit

To bleed air out of the calipers, proceed as described in page 115 of the GS750 manual. Bleed out from the left caliper first, and then from the right caliper.

WHEEL



Exploded view of GS750E front wheel



Exploded view of GS750E rear wheel

Disassembly

Either right or left caliper must be removed to allow removal of front wheel.

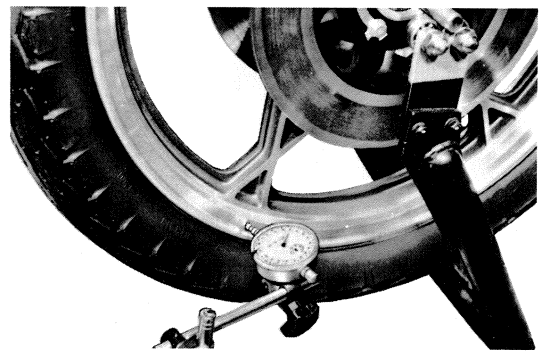
Tightening torque for caliper mounting bolt	2.5 - 4.0 kg-m 250 - 400 kg-cm 18.1 - 29.0 lb-ft

NOTE: Be careful in handling the casting wheel as it is made of aluminum alloy and apt to be damaged compared with a general steel wheel.

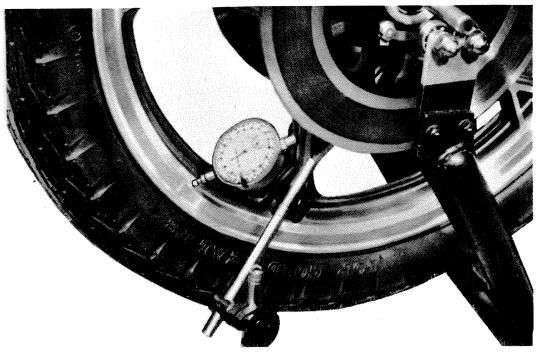
Inspection

1. Check the wheel for cracks, bends and deflections and replace if such defects are found. Deflected wheel can not be reused after being corrected.
2. CHECKING WHEEL RUN-OUT
   Measure the run-out of the wheel in the face and radial directions. Replace when allowable limit is exceeded.

	Face run-out	Radial run-out
Run-out limit	2 mm (0.08 in.)	2 mm (0.08 in.)



Measuring face run-out

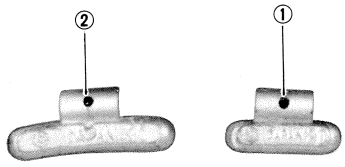


Measuring radial run-out

3. CHECKING THE WHEEL BALANCE

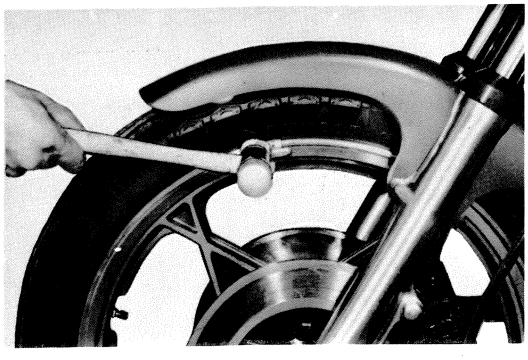
Check the wheel balance in the same way as in GS750. Use a balance weight of 20g or 30g when necessary.

Wheel balancer	
Weight	Part No.
20 g (0.04 lbs)	55411-47000
30 g (0.07 lbs)	55412-47000

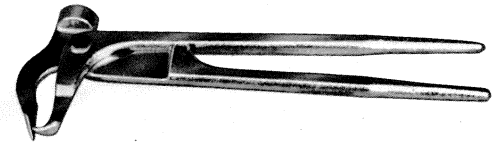


①20g, ②30g

NOTE: When thrusting a balance weight to the wheel (rim section), use a plastic hammer to prevent damage to the wheel. Never use a metallic hammer.



NOTE: When removing a balance weight or when cutting it for minute adjustment, use wheel weight pliers.



Wheel weight pliers

4. CHECKING DISC WEAR

In the '78 machines of the GS series, to which the GS750E belongs, front brake discs are 6 mm thick, that is, 0.7 mm less thick than those of the preceding-year models, in which the thickness is 6.7 mm. Because of this change, the service (wear) limit is lowered as indicated here:

Front disc thickness	
STANDARD	SERVICE LIMIT
6.0 mm (0.236 in.)	5.5 mm (0.217 in.)

FRONT SUSPENSION

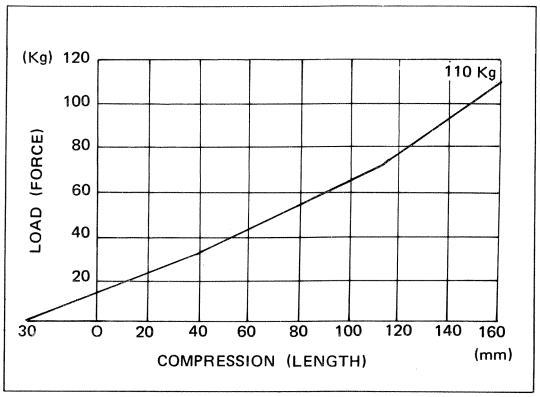
Two front fork specifications are provided for the GS750E: one is for machines shipped to the United States (E03), Canada (E28) and Australia (E24); and the other is for those shipped to Europe.

(a) U.S.A., Canadian and Australian specifications

(b) European specification

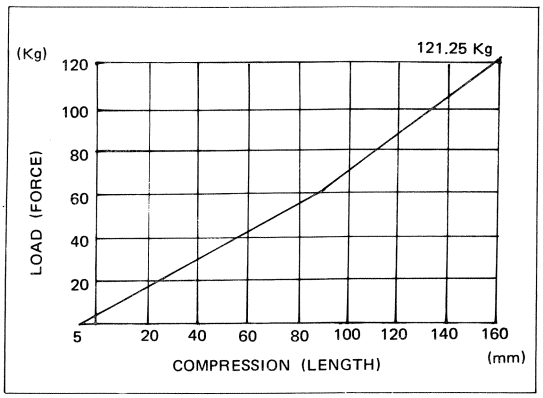
The difference in spring characteristic will be noted in these two graphs:

(a) U.S.A., Canadian and Australian specifications



Front fork spring characteristic

(b) European specification

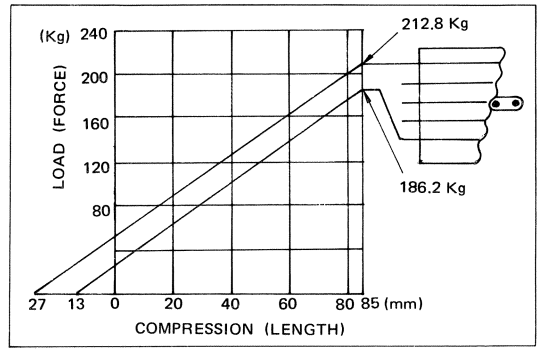


Front fork spring characteristic

REAR SUSPENSION

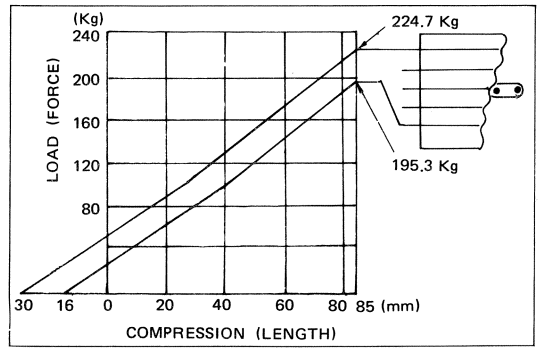
Just as for front suspension, the rear shock absorber specifications are two, (a) and (b). Specifications (a) are the same as for single-disc machines, spec. (b) being for the machines shipped to Europe. Note the difference in spring characteristic between the two:

(a) U.S.A., Canadian and Australian specifications



Rear shock absorber spring characteristic

(b) European specification



Rear shock absorber spring characteristic

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