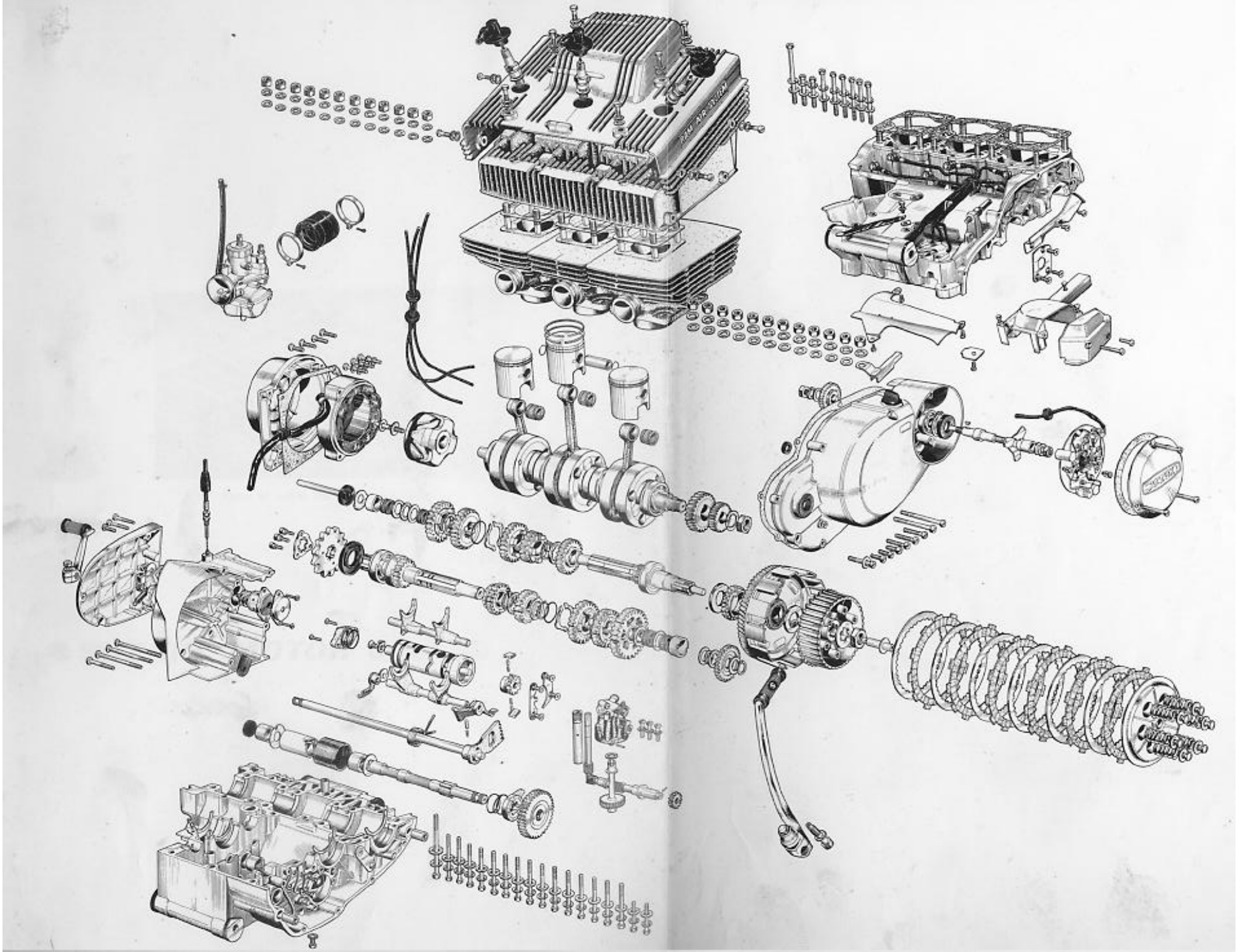
SUZUKI

SERVICE MANUAL

SUZUKI

GT380

EXPLODED VIEW OF ENGINE (SUZUKI GT380)



LEFT & RIGHT SIDE VIEWS

CONTENTS

1. SPECIFICATIONS

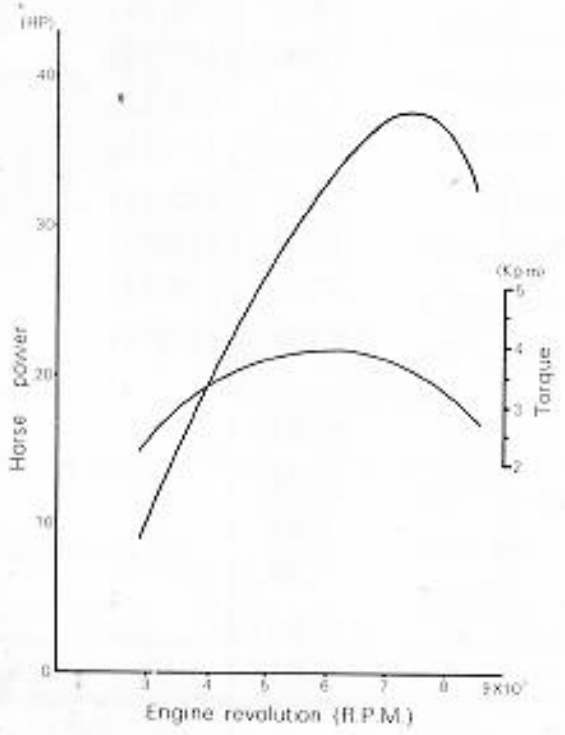
◆ Dimensions and Weight	
Overall length	2,105 mm (82.9 in)
Overall width	850 mm (33.5 in)
Overall height	1,100 mm (43.3 in)
Wheelbase	1,355 mm (53.4 in)
Ground clearance	155 mm (6.1 in)
Ties front	3.00 - 19 4PR
rear	3.50 - 18 4PR
Dry weight	171 kg (377 lbs)
◆ Performance	
Maximum speed	168-176 kph (105-110 mph)
Acceleration (0-400 m)	13.8 sec
Braking distance	14 m (46.0 ft) @50 kph (30 mph)
◆ Engine	
Type	2-cycle, ram air cooling, piston valve engine
Cylinder	Three, aluminum
Bore x stroke	54 x 54 mm (2.13 x 2.13 in)
Piston displacement	371 cc (22.6 cu-in)
Corrected compression ratio	6.7 : 1
Maximum horse power	38 hp/7,500 rpm
Maximum torque	3.93 kg-m (28.4 lb-ft)/6,000 rpm
Starter	Kick lever
◆ Fuel system	
Carburetor	Three, VM24SC
Air cleaner	Wet polyurethane filter
Fuel tank capacity	15.0 ltr (4.0/3.3 gal, US/Imp) including
	4.6 ltr (1.2/1.0 gal, US/Imp) of reserve
◆ Lubrication system	
Engine	SUZUKI CCI
Gearbox	Oil bath, 1,400 cc (3.0/2.5 pt, US/Imp)
Oil tank capacity	1.5 ltr (3.2/2.6 pt, US/Imp)
◆ Ignition system	
Ignition	Battery
Ignition timing	$24^\circ {}^{+3^\circ}_{-3^\circ}$ ($3.00 {}^{+0.76}_{-0.48}$ mm) B.T.D.C.
Spark plug	NGK B-7ES or Nippon Denso W-22ES

◆ Transmission		
Clutch		Wet multi-disc
Gearbox		6 speeds, constant mesh
Gear shifting		Left foot operated, return change
Primary reduction ratio		2.833 : 1 (68/24)
Final reduction ratio		3.000 : 1 (42/14)
Gear ratios	low	2.333 : 1 (28/12)
	second	1.500 : 1 (24/16)
	third	1.157 : 1 (22/19)
	fourth	0.904 : 1 (19/21)
	fifth	0.782 : 1 (18/23)
	top	0.708 : 1 (17/24)
Overall reduction ratios		
	low	19.82 : 1
	second	12.74 : 1
	third	9.83 : 1
	fourth	7.68 : 1
	fifth	6.64 : 1
	top	6.01 : 1
◆ Suspension system		
Front suspension		Telescopic fork with hydraulic damper
Rear suspension		Swinging arm with hydraulic damper
◆ Steering		
Steering angle		40° (right & left)
Caster		62°
Trail		109 mm (4.3 in)
Turning radius		2.3 m (7.5 ft)
◆ Brakes		
Front brake		Mechanical, 2 leading shoes
Rear brake		Mechanical, leading trading shoes
◆ Electrical equipment		
Generator		Alternator
Battery		12V 7AH
Head lamp		12V 35/25W
Tail/brake lamp		12V 8/23W
Neutral indicator lamp		12V 3.4W
Speedometer lamp		12V 3.4W
High beam indicator lamp		12V 3.4W
Tachometer lamp		12V 3.4W
Turn signal lamp		12V 23W
Turn signal indicator lamp		12V 1.7W
Fuse		15A

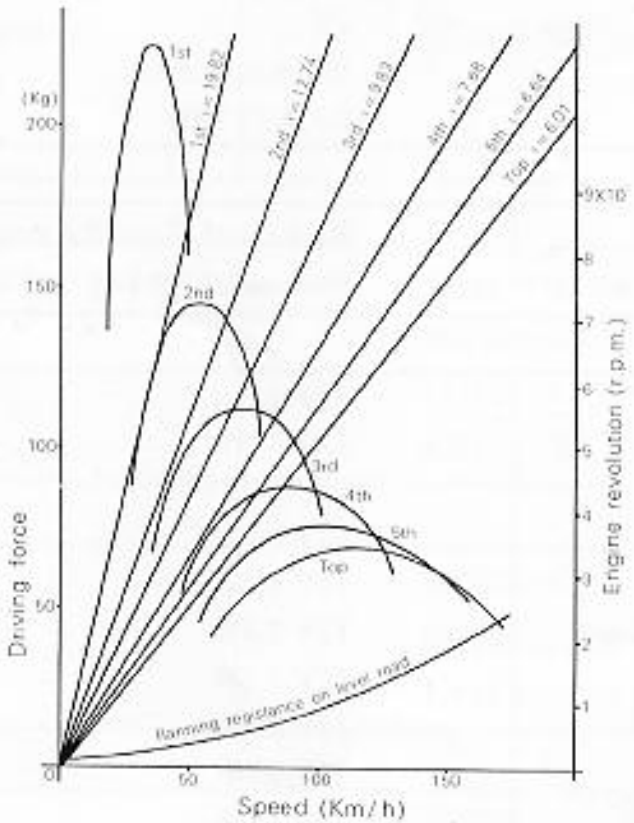
Specifications subject to change without notice.

2. PERFORMANCE CURVES

ENGINE PERFORMANCE



MOTORCYCLE PERFORMANCE



3. TIPS ON OPERATION

To keep the motorcycle in peak condition, please advise your customers to follow these tips and this will give top performance at all times.

3–1. Breaking-in

The life of the motorcycle depends on the breaking-in of the engine and the way in which the motorcycle is treated. Therefore, breaking-in with best care is much important to prevent excessive wear of the parts and noise and to prolong the engine life. During the breaking-in period, do not operate the motorcycle at high speed nor allow the engine to run wide open. Keep to specified breaking-in speed limits. Gradually raise the speed as the covered mileage increases.

First 500 miles (800 km) . . . . . Below 4,000 R.P.M.
up to 1,000 miles (1,600 km) . . . . . Below 5,000 R.P.M.

3–2. Fuel and oil

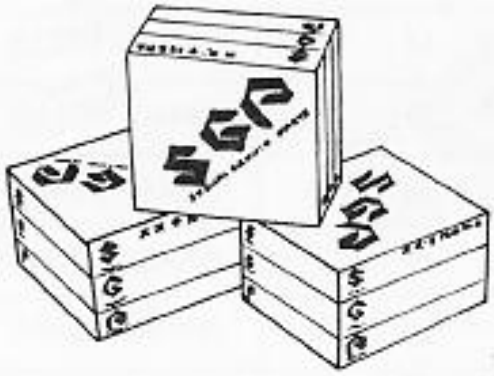
The engine's moving parts such as crankshaft, crankshaft bearings, con-rod, piston and cylinder wall are positively lubricated by fresh oil which is separately pressure-delivered from the variable displacement oil pump. This unique force oiling system is called "SUZUKI CCI". Put gasoline only in the fuel tank and lubrication oil in the oil tank. Recommended fuel and oil are as follows.

FUEL . . . . . REGULAR GRADE GASOLINE
OIL . . . . . SUZUKI CCI OIL

* If Suzuki CCI oil is not available, non-diluent (non-self mixing type) two stroke oil with around SAE #30 may be used.

3–3. Genuine parts

When replacing parts, always use genuine Suzuki parts, which is precision-made under severe quality controls. If imitation parts (not genuine parts) are used, good performance cannot be expected from the motorcycle and in the worst case, they can cause a breakdown.

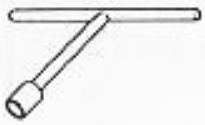


4. SPECIAL TOOLS

Special tool listed hear are used to disassemble, assemble and perform other maintenance and service. These special tools make work easy which cannot be done simply with ordinary tools.
It is recomended to provide these special tools as a shop equipment.

Ref.No.	Tool No.	Tool name
1	09910–10710	8mm stud installing tool
2	09910–11510	10mm stud installing tool
3	09910–20113	Piston holder
4	09920–51510	Clutch sleeve hub holder
5	09920–60310	Clutch sleeve hub holder handle
6	09920–70111	Snap ring opener (small)
7	09913–50110	Oil seal remover
8	09913–61110	Bearing puller
9	09913–70122	Bearing and oil seal installing tool
10	09913–80111	Bearing and oil seal installing tool
11	09930–10111	Spark plug wrench
12	09930–20111	Point wrench with 0.35 mm gauge
13	09930–33310	Rotor remover (for KOKUSAN)
14	09930–50951	Rotor remover (for DENSO)
15	09931–00112	Timing gauge
16	09940–10122	Steering stem lock nut wrench
17	09940–60112	Spoke nipple wrench
18	09900–07403	T-type cross head screw driver (for 6mm screw)
19	09900–09002	Shock driver
20	09900–06103	Snap ring remover
21	09900–21802	Chain joint tool
22	09900–27002	Timing tester
23	09900–25001	Pocket tester
24	09900–28102	Electro tester
25	09900–28401	Hydrometer

8mm stud installing tool



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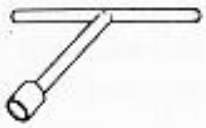
10mm stud installing tool



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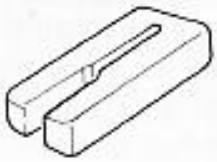
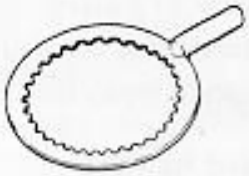
Piston holder



③

Clutch sleeve hub holder



④

Clutch sleeve hub holder handle

⑤

Snap ring opener (small)

⑥

Oil seal remover

⑦

Bearing puller

⑧

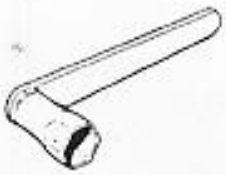
Bearing and oil seal installing tool

⑨

Bearing and oil seal installing tool

⑩

Spark plug wrench



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Point wrench with 0.35mm gauge

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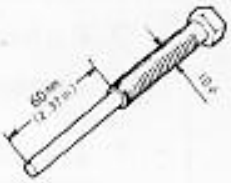
Rotor remover

⑬

Rotor remover



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Timing gauge

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Steering stem lock nut wrench

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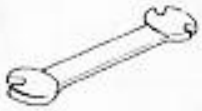
Spoke nipple wrench



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T type cross head screw (for 6mm screw)

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Shock driver set

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Snap ring remover

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Chain joint tool

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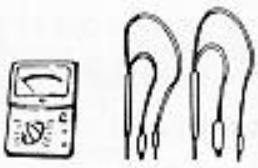
Timing tester



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Pocket tester

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Electro tester

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Hydromter

5. TROUBLE SHOOTING

When trouble occurs with a motorcycle, it is important to find the source of the trouble as rapidly as possible. It is also necessary to perform only the work required to repair the machine without bothering with parts which are functioning correctly. The list of possible troubles and their causes given below should help the service man to repair motorcycles quickly without loss of effort.

5–1. If engine is hard to start

Check fuel in the fuel tank first. When a proper amount of fuel is in the tank, check the following points.

Order and Description	Check Points	Remedy
1. Check to see that fuel flows into carburetor	* If fuel does not enter into carburetor	
	1. Fuel strainer clogged	Remove and clean
	2. Fuel pipe clogged or damaged	Clean or replace
	3. Tank cap air vent clogged	Clean with wire
	4. Fuel cock clogged	Clean
2. Check to see that spark jumps in spark plug. (Turn engine with kick starter).	* If blue or hot spark jumps in the spark plug, check the following points.	
	1. Ignition timing	Adjust
	2. Carburetion	Adjust
	3. Engine compression	Recover it
	* If spark is weak	
	1. Damage in spark plug	Replace
	2. Incorrect spark plug gap	Adjust
	3. Damage in spark plug cap	Replace
	4. Dirty contact points	Clean and adjust
	5. Bad insulation in condenser	Replace
	6. Damage in ignition coil	Replace
	* If there is no spark	
	1. Damage in spark plug	Replace
	2. Dirty or wet spark plug	Clean
	3. Incorrect spark plug gap	Adjust
	4. Dirty or incorrect contact point gap	Clean and adjust
	5. Bad insulation in condenser	Replace
	6. Damage in ignition coil or primary coil	Replace
	7. Damage in ignition switch	Replace
	8. Damage in wiring harness	Repair or replace
	9. Incorrect spark plug heat range	Replace

3. Check to see that engine compression is proper (Turn engine with kick starter).	* If engine compression is improper	
	1. Cylinder and piston rings worn	Repair or replace
	2. Piston ring stick on piston	Repair or replace
	3. Cylinder head gasket damaged	Replace
	4. Cylinder base gasket damaged	Replace
	5. Piston damaged	Replace
	6. Spark plug improperly tightened	Tighten securely
	7. Spark plug gasket faded	Replace
	8. Cylinder head improperly tightened	Tighten securely
	9. Gas leakage from crankcase	Repair or replace
	10. Cylinder or cylinder head damaged	Replace
	11. Oil seals damaged	Replace

5–2. If abnormal noise is heard in engine

	Check Points	Remedy
	1. Too big clearance between piston and cylinder	Repair or replace
	2. Too big clearance between piston rings and grooves	Replace piston
	3. Piston rings stiff with carbon	Clean
	4. Con-rod big end worn	Replace
	5. Con-rod small end bearing worn	Replace
	6. Piston rings damaged	Replace
	7. Ignition timing too advanced	Adjust
	8. Defective primary pinion and gear	Replace
	9. Crankshaft bearings worn	Replace
	10. Defective transmission gear	Replace
	11. Defectibe transmission bearings	Replace

5–3. If engine overheats

If engine overheats at high speed running after it is broken in, check to see if the oiling system is in good condition, the brake is dragging, or cylinder cooling fins are dirty. Inspect the following points.

Description	Check Points	Remedy
1. Check to see if oiling system functions properly.	1. Improperly adjusted oil pump control lever	Adjust
	2. Air in oil lines	Remove air
	3. Oil tank cap breather hole clogged.	Repair
	4. Incorrect oil used	Use prescribed oil

2. Check to see if engine compression is higher than standard	* Too high compression 1. Carbon deposits in combustion chamber 2. Too thin cylinder head gasket	 Remove carbon deposit Replace
3. Check carbon deposit	* Check carbon deposit in muffler, exhaust pipe, exhaust port and combustion chamber	Disassemble and remove carbon deposit
4. Check to see that piston rings move smoothly in grooves	* Piston rings stiff by carbon deposit	Remove carbon deposit
5. Check to see that the clutch works properly	Clutch slippage	Adjust
6. Check to see that the ignition timing is correct		Adjust
7. Drive chain too tight		Adjust
8. Incorrect spark plug heat range		Replace with colder plug
9. Too lean fuel mixture		Adjust carburetor

5–4. Defective clutch

Description	Check Points	Remedy
1. Clutch slippage	1. Improperly adjusted clutch 2. Clutch springs worn 3. Clutch plates worn	Adjust Replace Replace
2. If clutch drags	1. Improper weight oil 2. Uneven clutch spring tension	Replace Replace

5–5. Gear shifting troubles

1. Description	Check Points	Remedy
1. Gear engagement	* If gears do not engage 1. Gear shifting cam groove damaged 2. Gear shifting forks not moved smoothly on cam 3. Gear shifting fork damaged 4. Gears seized	 Replace shifting cam Rectify with emery paper Replace Replace
2. Gear shifting lever	* If gear shifting lever does not return to normal positon.	

	1. Gear shifting shaft return spring damaged	Replace
	2. Friction between gear shifting shaft and crankcase	Repair bent shaft or replace
3. Jumpting out of gear	* If the gears disengage while running.	
	1. Gear shifting fork worn or bent	Replace
	2. Gear dog teeth worn	Replace gear
	3. Gear shifting cam worn or damaged	Repair bent shaft or replace

5–6. Bad stability and steering

Description	Check Points	Remedy
1. Handlebar is stiff	1. Steering stem lock nut tight	Adjust
	2. Steering stem bent	Repair or replace
	3. Steel balls damaged	Replace
2. Handlebar is not stable	1. Incorrect wheel alignment	Repalce
	2. Play in front wheel fitting	Repair
	3. Steel balls damaged	Replace
	4. Fork stem bent	Repair or replace
	5. Bearing races worn or damaged	Repalce
	6. Front fork bent	Repair or replace
	7. Swinging arm bent	Repair
	8. Fork spring worn	Repalce
3. Wheel is not true	1. Incorrect wheel balance	Adjust
	2. Up-and-down play in hub bearings	Replace
	3. Wheel rim deformed	Repair or replace
	4. Loose spokes	Repair
	5. Chain too tight	Adjust
	6. Loose swinging arm fitting	Tighten
	7. Frame warped	Replace
	8. Incorrect tire pressure	Correct

6. ENGINE

6–1. Removing engine from frame

Prior to the removal operation, throughly clean the engine with a steam cleaner or cleaning solvent to remove road dirt.
The removal procedure is as follow.

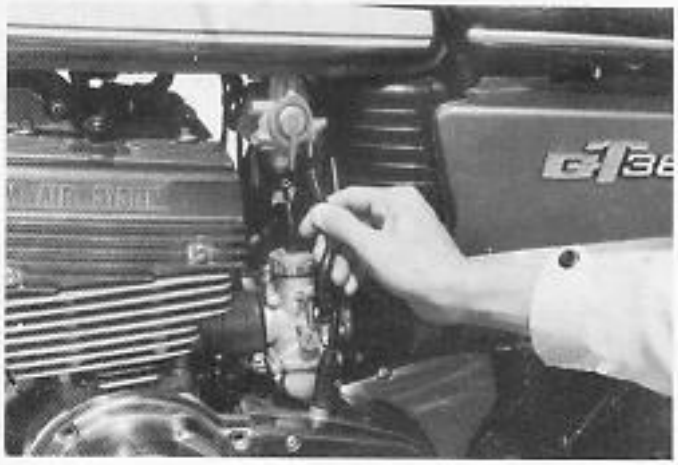


Fig. 6–1–1 Disconnecting fuel pipe

Fig. 6–1–2 Removing fuel tank

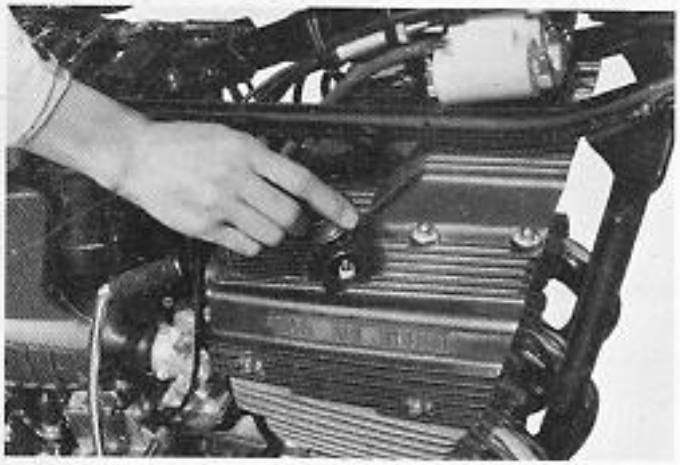


Fig. 6–1–3 Disconnecting high tension cord

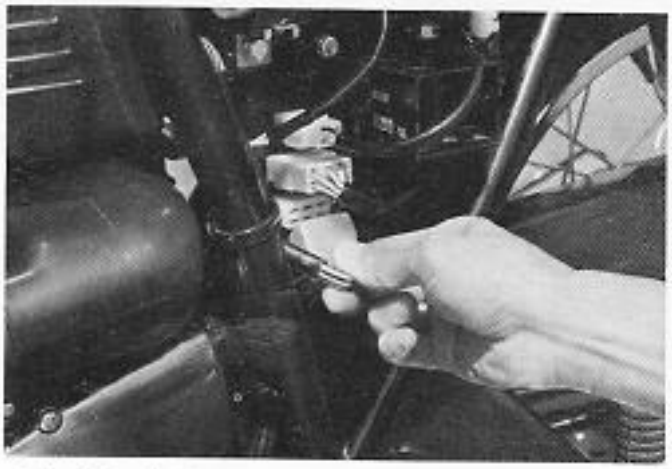


Fig. 6–1–4 Disconnecting alternator wires

Fig. 6–1–5 Disconnecting breaker wires

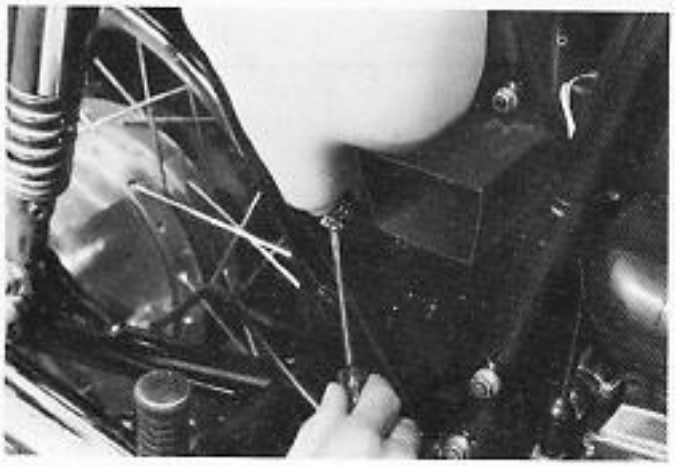


Fig. 6–1–6 Disconnecting oil pipe

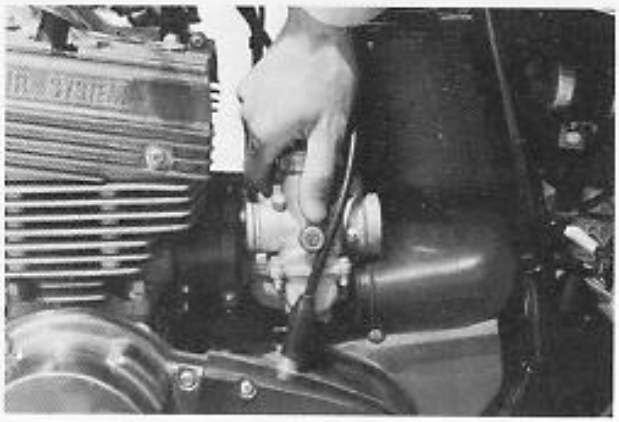


Fig. 6–1–7 Removing left carburetor

Fig. 6–1–8 Removing air cleaner

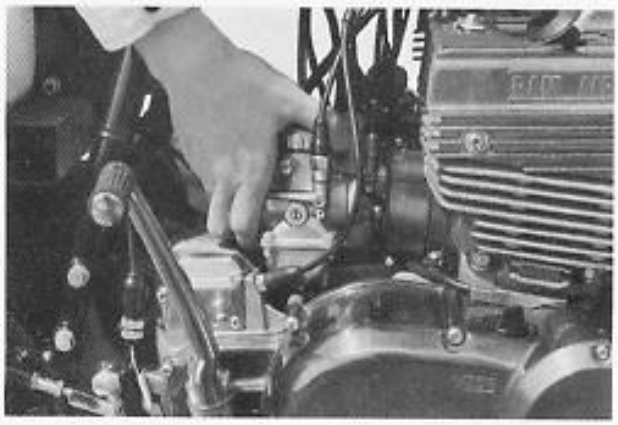


Fig. 6–1–9 Removing center & right carburetor

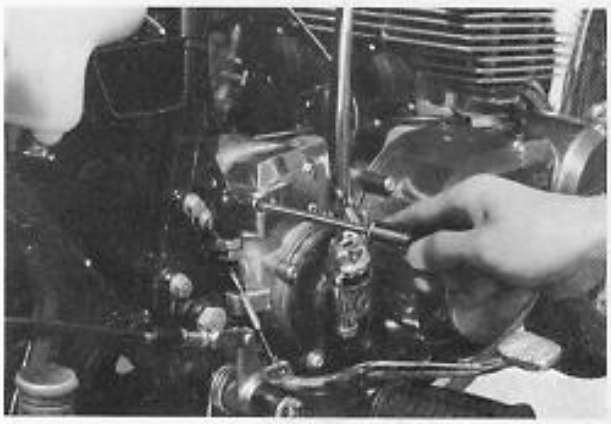


Fig. 6–1–10 Removing oil pump cover

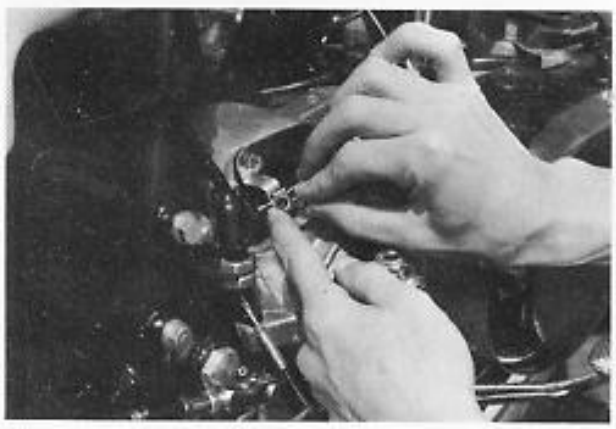


Fig. 6–1–11 Disconnecting oil pump control cable

Fig. 6–1–12 Disconnecting oil pump control cable

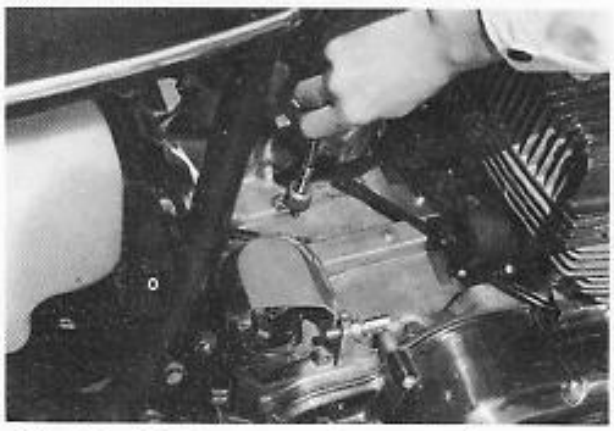


Fig. 6–1–13 Removing tachometer cable

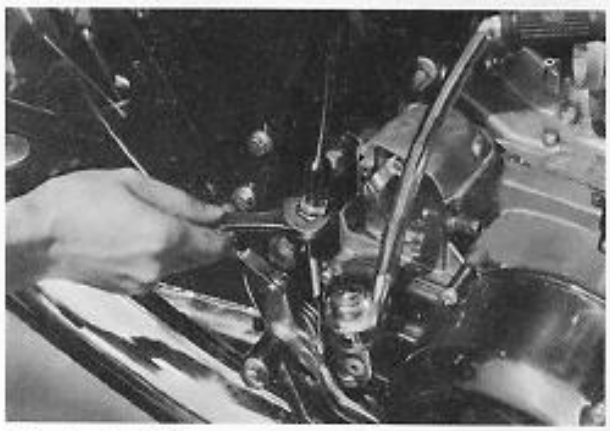


Fig. 6–1–14 Removing rear brake lamp switch

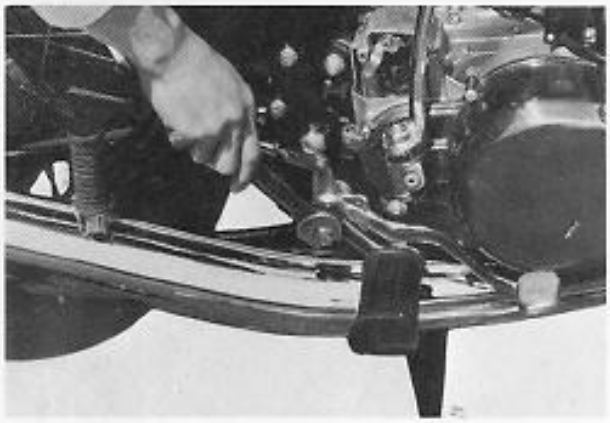


Fig. 6–1–15 Removing right front footrest

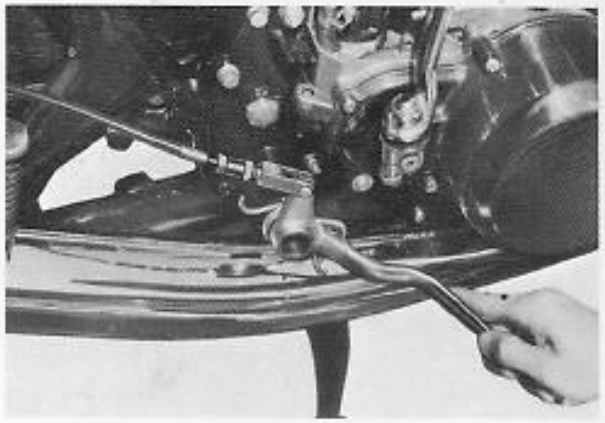


Fig. 6–1–16 Removing rear brake pedal

Fig. 6–1–17 Removing exhaust pipe clamp

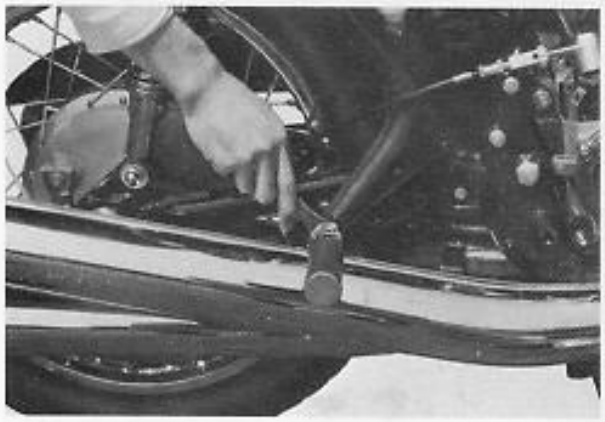


Fig. 6–1–18 Removing pillion footrest

Fig. 6–1–19 Removing right & left muffler

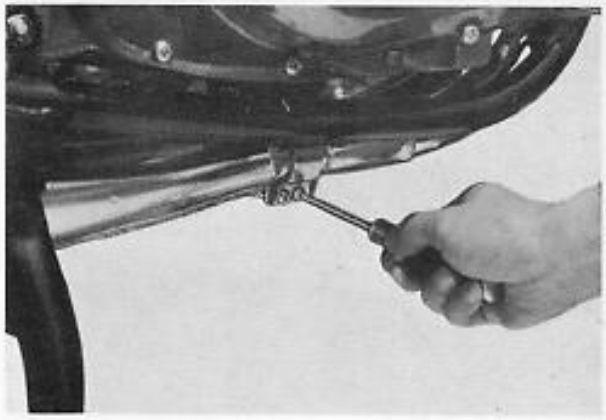


Fig. 6–1–20 Loosening muffler connector clamp

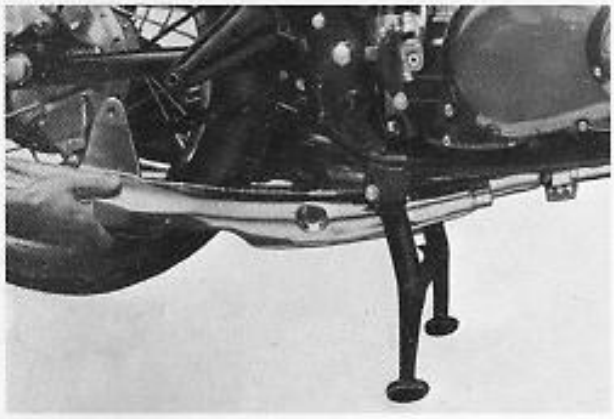


Fig. 6–1–21 Removing center muffler

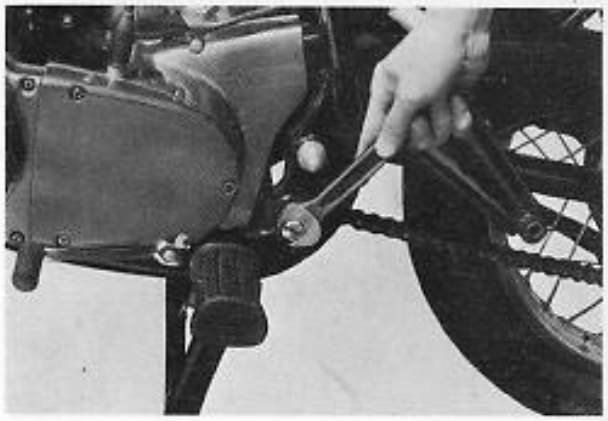


Fig. 6–1–22 Removing left front footrest

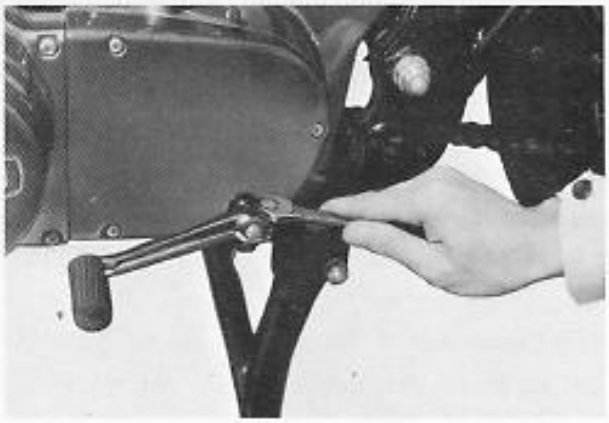


Fig. 6–1–23 Removing gear shift lever

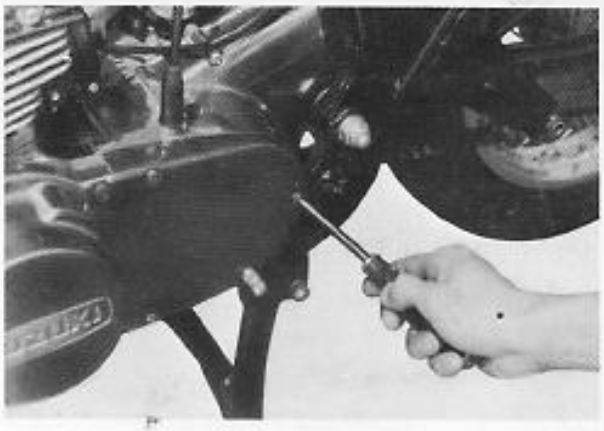


Fig. 6–1–24 Removing engine sprocket outer cover

Fig. 6–1–25 Removing engine sprocket inner cover

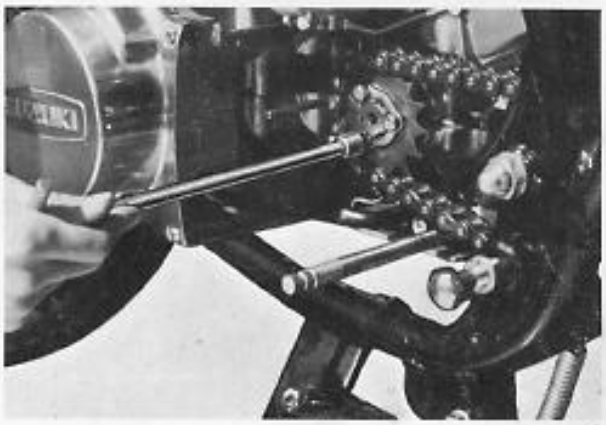


Fig. 6–1–26 Removing engine sprocket

Fig. 6–1–27 Removing RAM AIR cover

Fig. 6–1–28 Removing engine mounting plate

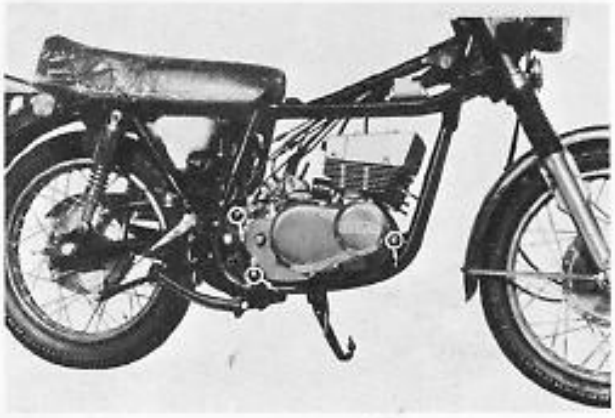


Fig. 6–1–29 Removing engine mounting bolts

6–2. Cylinder head

1. Removing and installing cylinder head

The cylinder head of this three cylinder engine has a solid structure being fixed with 12 cylinder head set nuts. In loosening and tightening these nuts, you should strictly observe the regular sequence as shown in Fig. 6-2-1. This is needed to avoid any distortion in the cylinder head at the time of an overhaul. Retightening of the cylinder head setting nuts must be carried out after the first 1,000km (750mi), then after that at every 3,000km (2,000mi).

*Tightening torque of cylinder head set nuts is 350kg-cm (26 lb-ft)

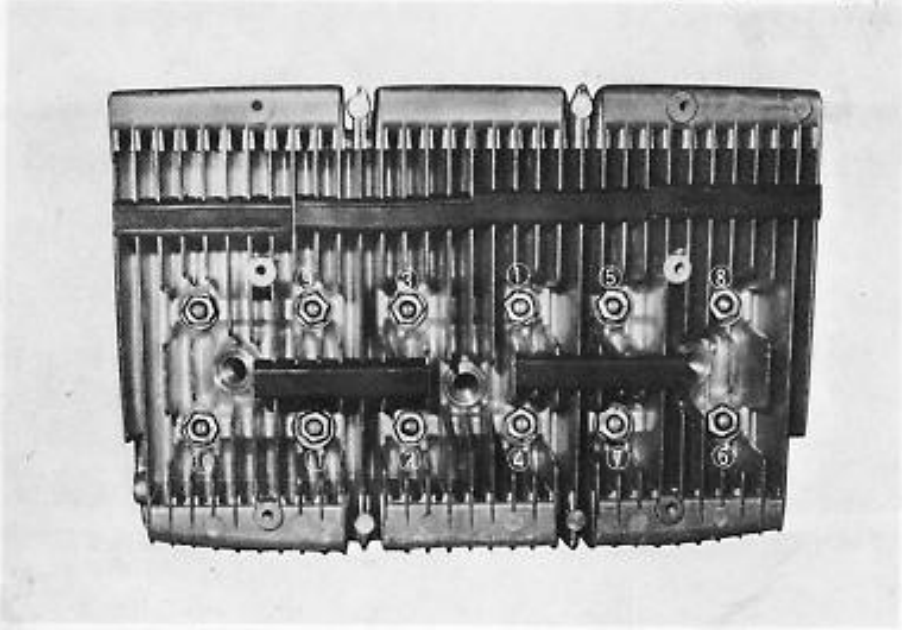


Fig. 6–2–1 Cylinder head set nuts tightening order

2. Inspection and servicing

1) Removing carbon

Deposited carbons on the combustion chamber of the cylinder head will cause abnormal combustion and the overheating. Therefore, the deposited carbon must be removed after every 6,000 km (4,000mi) of running.

Caution: In removing the carbon deposit, take care not to scratch the inner surface of the combustion chamber.

If scratched, polish the parts with sand paper.

2) Checking warp

Since this cylinder head is a solid structure, due care is needed to prevent the warp of the surface because of a possible leakage of fuel-air mixture through the cylinder head. In fitting the cylinder unit (cylinder and cylinder head), be sure to check the surface level first. Adjust the level to it when needed, and install it after the level check. In case the gasket has been stuck onto the cylinder, remove it completely and then replace it with a new gasket.

Level adjustment limit of each cylinder	0.03mm
Relative warp limit to other cylinders	0.1mm
Level limit of the whole unit	0.15mm

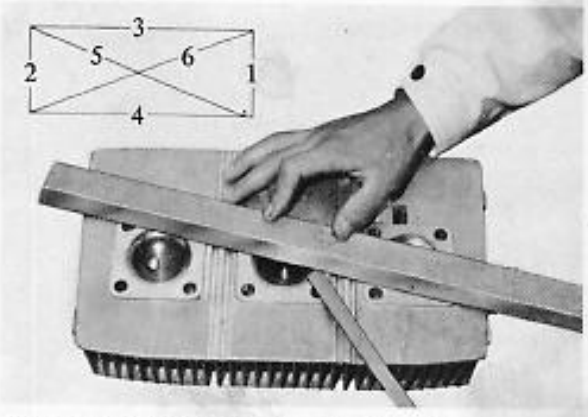


Fig. 6–2–2 Positions when checking the warp

6–3. Cylinder

1. Checking

Check the cylinder wear by using a cylinder gauge. As Fig. 6-3-1 shows, measurements must be taken at 6mm (0.24in) below the upper surface of the cylinder, 5mm (0.20in) above the exhaust port and 5mm (0.20in) below the inlet port, two times at each level in longitudinal and lateral directions. If the difference between the largest and the smallest values of the six times of the measurements is over 0.1mm (0.004in) the cylinder must be bored. After boring the cylinder, be sure to chamber the edge of each port. SUZUKI provides you with oversize pistons and piston rings (oversizes of 0.5mm and 1.0mm).

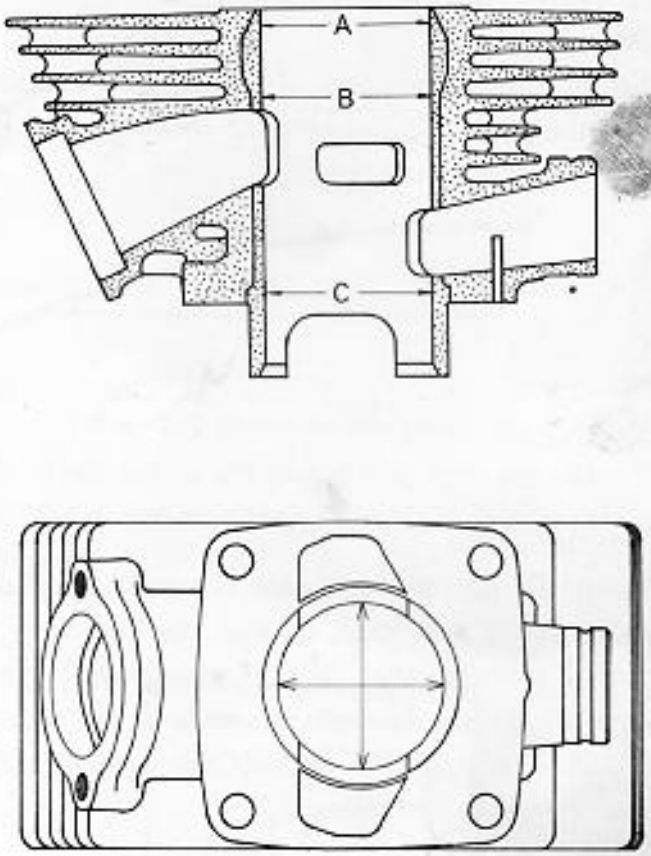


Fig. 6–3–1 Points to be measured

2. Removing carbon

The accumulation of carbon is the most in places where the exhaust gas undergoes a most abrupt change. Also any motorcycle running at low speeds or with a defective engine tends to accelerate the carbon deposit. Check after every 6,000km (4,000 mi) of running and remove the carbon deposit if it exists. In the cylinder the carbon accumulates most at the exhaust port (see Fig. 6-3-2). Remove the carbon using a plain head screw driver or the equivalent. After all, you must take the utmost care not to make scratches on the cylinder wall when you remove the carbon.

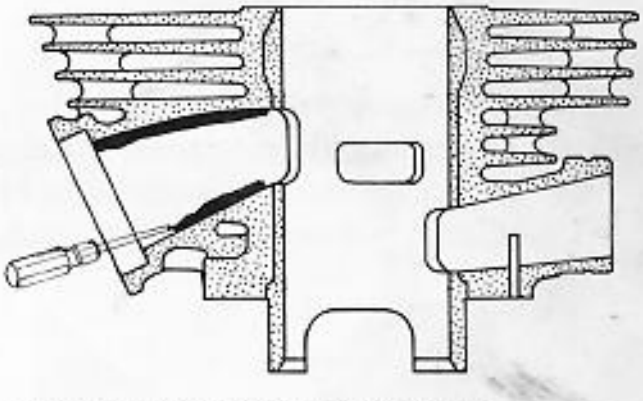


Fig. 6–3–2 Removing carbon deposit

6–4. Piston pin

Checking

The middle part of the piston pin functions as the inner race of the needle roller bearing, and the both ends makes a rubbing contact with the piston. Therefore, even a small size of defects on the piston pin will cause wears in the piston and the connecting rod. So check to see if there is any defect or wear in those parts whenever you disassemble them.

6–5. Piston ring

1. Removing piston ring

Separate the joining ends of a piston ring with both thumbs, and take the ring off from the opposite side of the ring ends first.

Fig. 6–5–1 Removing piston ring

2. Measuring wear

Insert the piston ring to the bottom of cylinder, using the piston skirt so that the ring may be placed perpendicular to the cylinder wall. Next, measure the gap between the ends of the inserted piston ring, and if it exceeds the limiting value, the ring has to be replaced.

	Standard	Limit
Piston ring end gap	0.15 - 0.35mm (0.0059-0.0138in)	1.0mm (0.04in)

Fig. 6–5–2 Inserting piston ring into cylinder

3. Hints for fitting piston rings

1) When fitting piston rings to piston

Fit piston rings onto the piston in the reverse order used in "removing" after the washing.

Fig. 6–5–3 Measuring end gap

* Warp

When piston rings are fitted around the piston, rotate the rings to check. If any foreign materials are found between them, it does not rotate too smoothly. In that case, wash them again before fitting the rings.

Because strain induces warp as shown in Fig. 6-5-4, the piston ring should not be forced in.

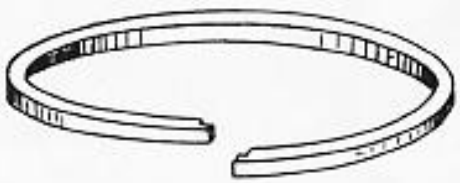


Fig. 6–5–4 Twisted piston ring

* Top side and bottom side of rings

Keystone type ring and the flat ring are used for the first and the second ring of GT380, respectively; therefore, the first and the second ring can not be interchanged.

The top side of these piston rings have letter markings, so make sure that they are on the top when you fit the rings.

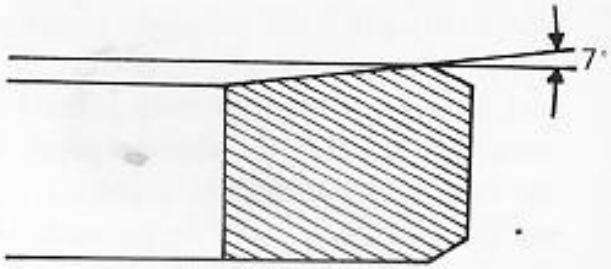


Fig. 6–5–5 Keystone type piston ring

2) When fitting piston into cylinder

In inserting a piston into cylinder, you may feel some resistance due to the tension of the piston rings. Also, unless the piston ring ends are not aligned to the knock pin position, you can not insert the piston into the cylinder. Do not try to insert it forcibly, otherwise the piston rings will be broken.

6–6. Piston

1. Inspecting and repairing

1) Clearance between piston and cylinder

A standard clearance between piston and cylinder is 0.045mm (0.0018in). The clearance denotes here the difference between the inner bore diameter of cylinder and the outer diameter of piston. In this case, the cylinder bore denotes the dimension measured at 20mm (0.79 in) below the upper surface of the cylinder in the transverse direction, and the piston diameter is the one measured at 26mm (1.02in) above the piston skirt in the direction perpendicular to the piston pin hole.

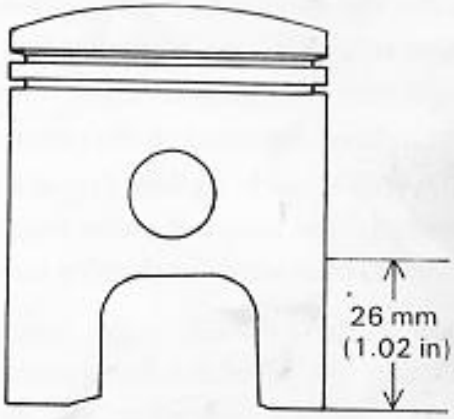


Fig. 6–6–1 Point to be measured

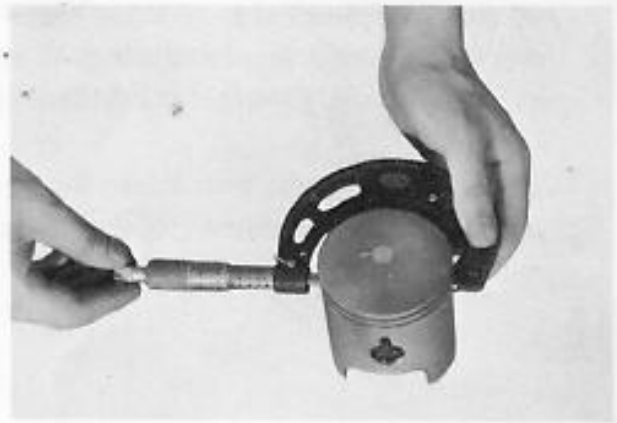


Fig. 6–6–2 Measuring piston diameter

2) Checking piston pin hole

Insert a piston pin into the piston and check the play between them. The piston pin hole worn from the rubbing will induce abnormal noises.

If the rubbing resistance between the piston pin and the needle bearing on the connecting rod smaller end is too great, piston pin hole may be worn off. If you find, wear in the pin hole, change the piston with a new one and check the small-end bearing, too.

Fig. 6–6–3 Inspecting piston pin holes

3) Checking and repairing defects

Once the piston is subjected to seizure with seized mark left, it will reduce the engine power and the seizure tends to be repeated at the same part. So if you see a seizure mark, polish it away, using # 400 waterproof abrasive paper. When the mark is too deep to be eliminated, replace the piston. (If there is a seizure mark on the piston a similar mark must be left on the cylinder wall. Repair the cylinder, too, with the #400 waterproof abrasive paper.)

Fig. 6–6–4 Polishing piston surface

4) Removing carbon

Carbon deposited on the piston head tends to raise the compression ratio, prevent the effective cooling of the piston leading to advanced ignitions. Also, rings are stuck to the piston due to carbons deposited on the piston ring grooves. Therefore, such carbon deposits must be removed. The scrapped piston rings may be most conveniently used for cleaning the ring grooves.

Fig. 6–6–5 Removing carbon

2. Caution in installing piston

1) In installing piston into cylinder, check if the arrow on cylinder is correctly aligned with the exhaust port side (front) of the cylinder.

2) Before installing the piston into the cylinder, make sure that the piston ring ends are aligned with the piston ring knock pin.

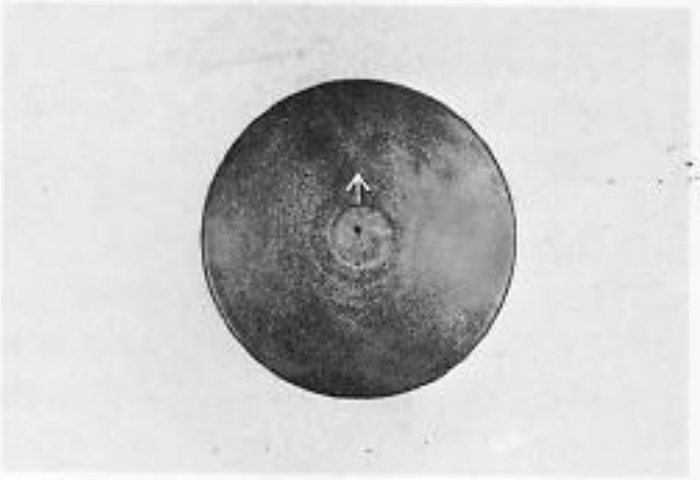


Fig. 6–6–6 Arrow mark

6–7. Oil pump

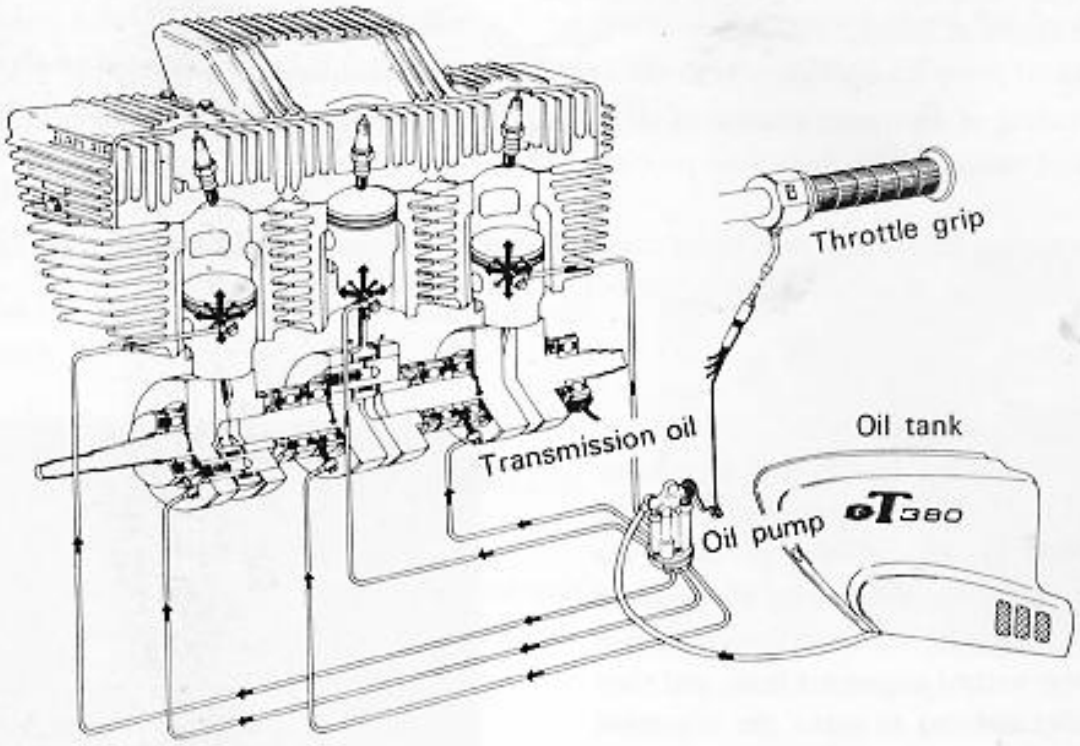


Fig. 6–7–1 Suzuki CCI system

The lubrication system for this engine uses "Suzuki C.C.I." system, which has been widely used in every model of SUZUKI and has its excellent lubrication performance and durability well established. The oil pump used for GT380 is the newly developed 6 outlet type, lubricating three crankshaft bearings and cylinders, respectively.

The oil pump is driven by the primary drive gear → primary driven gear → kick starter driven gear → kick starter idle gear → kick starter drive gear → oil pump drive shaft gear → oil pump drive shaft → oil pump driven gear. The reduction ratio between the crankshaft and the oil pump is 72.24 : 1.

1. Checking and adjuster

The inner construction of oil pump is very intricate so that an overhaul will often offset the prescribed discharging amount leading to engine troubles. So never overhaul the oil pump. If the oil pump is found to be defective, replace it with a new one.

In case any trouble has been found in the oil discharge rate, check all the parts relative to the pump and confirm the discharging rate again.

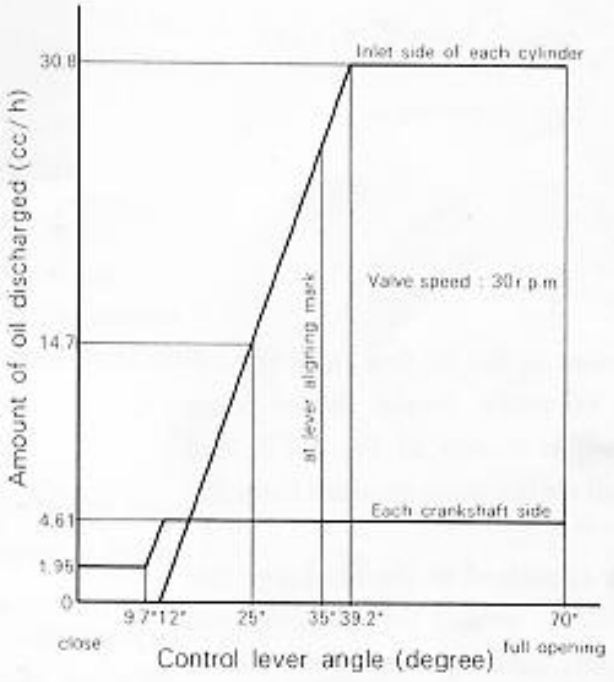


Fig. 6–7–2 Oil pump performance curves

1) Measuring discharging rate

Measure the discharging amount in the following order after warming up the engine sufficiently.

a. Set the measuring apparatus at the oil pump inlet.
b. Run the engine at 2,000 ±100 rpm.
c. Raise the oil pump lever all the way to full open and start measurement.
d. If the reading of decreasing amount of oil in the measuring apparatus is 2.82 - 3.74 cc after two minutes of measurement, there is no problem with the discharging rate of the oil pump.

Note: Because the discharging rate varies mashedly with the engine speed keep the engie speed constant, using on accurate tachometer before starting the measurement.

2) Adjusting oil pump control cable

The control cable can be adjusted as follows. Loosen off the bolt of the alignment holes of the carburetor mixing chamber, move up the throttle valve until the upper part of alignment mark on the side of the throttlevalve comes upto the top part of alignment hole, and then use the cable adjuster to make the alignment markings on the oilpump and the oil pump control lever match (see Fig. 6-7-4).

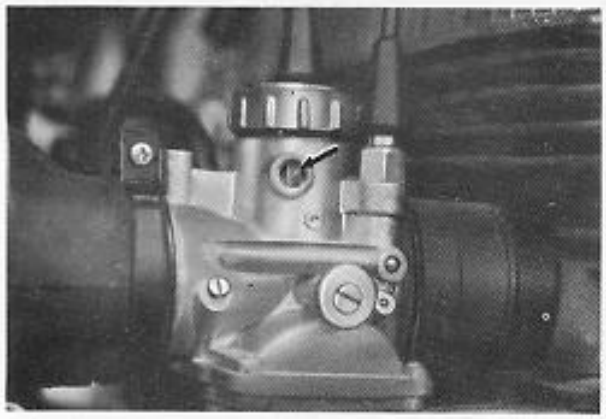


Fig. 6–7–3 Throttle valve dent mark

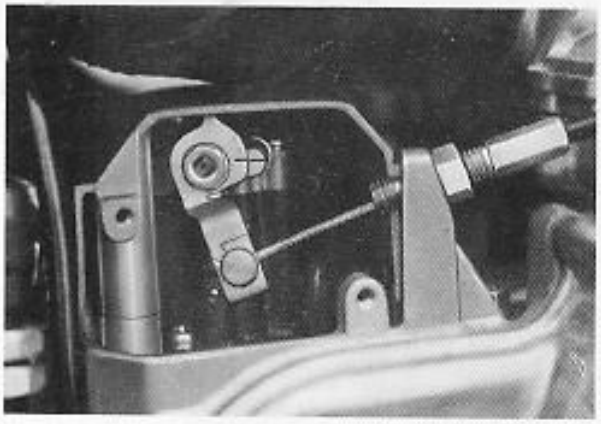


Fig. 6–7–4 Oil pump lever aligning mark

3) Bleeding

a. If air is present in the oil line from the oil tank to the oil pump, loosen the oil pump bleeder screw as shown in Fig. 6-7-5, and bleed until all air has been expelled from the oil.
b. To expel air contained at the discharge side of the oil pump, remove the oil pump, and using oil filler, send in oil until all air has been expelled, then install the oil pump. For this purpose, be sure to use CCI oil or engine oil recommended by Suzuki.

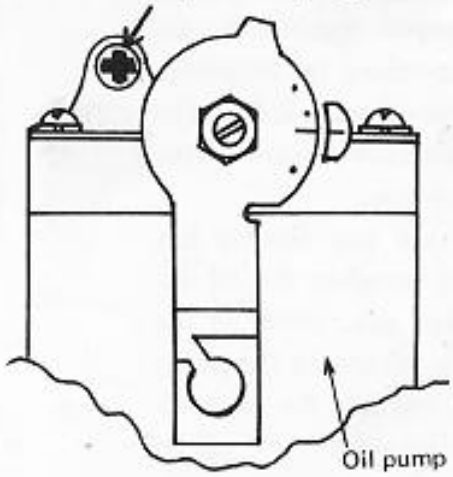


Fig. 6–7–5 Air bleeding screw

2. Tightening union bolt
   Tighten the union bolt to specified torques.
   The union bolt or the union bolt gasket will be damaged if tightened above the specified torque. Before fixing the bolts, check if the union bolt and gasket are defective or not.
   Union bolt tightening torque: 25 kg-cm (1.8 lb-ft)

6–8. Removing alternator

1. Remove the alternator cover
2. Separate the neutral switch lead wire from the neutral switch.
3. Loosen the three stator set screws.
4. Hold the small end of the left connecting rod with the piston holder and unfasten the rotor set bolt.
5. Fix the smaller end of the left connecting rod with piston holder and remove the rotor using rotor remover.

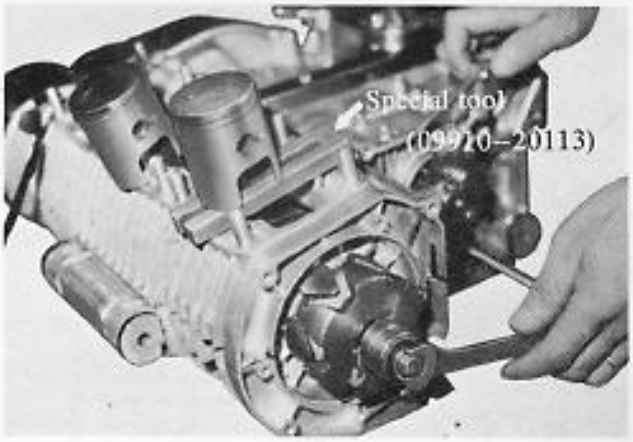


Fig. 6–8–1 Removing rotor

Note:
1. In mounting or dismounting stator, lift carbon brush off the slip ring by hand while you take off or fit the stator (This only applies to the Nippon Denso alternator.).
2. Before installing the alternator, make sure that there is no foreign materials sticking to the inner surfaces of rotor and stator.
3. The rotor remover comes in two kinds having different lengths. A screw with 60mm (2.36in) length of unthreaded part should be used for the Nippon Denso rotor, the one with 45mm (1.77in) for the Kokusan Denki rotor.

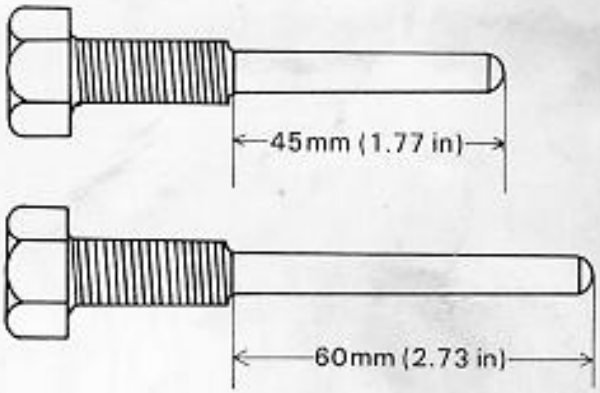


Fig. 6–8–2 Rotor remover

6–9. Contact breaker

1. Removal
   1) Remove the contact breaker inspection cap.
   2) Loosen the three breaker plate setting screws and remove the breaker from the crank case right cover.
2. Caution in installation
   1) Breaker lead wire must be led out of the case through A on the left side of the breaker fixing boss.
   2) After fixing with grommet, pull out the lead wire so that there is no play of wires inside the case.

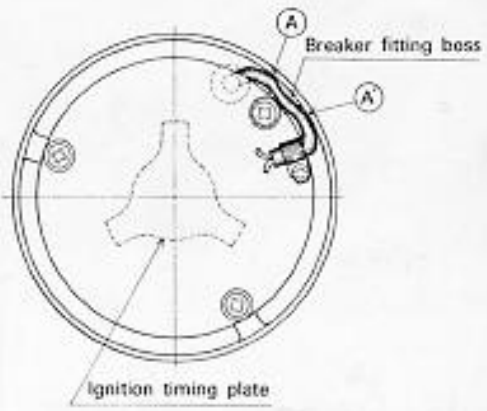


Fig. 6–9–1

3) In case the lead wire is led into the reverse side of the breaker plate through A' on the right side of the breaker fixing boss, the timing plate may come in contact with the lead wire and eventually may cut it off.
So the rules 1) and 2) of above must be strictly observed.

* The adjustment of ignition timing will be discussed in the chapter of "Engine Electrical Equipment"

6–10. Servicing of contact breaker cam shaft

In case it becomes necessary to loosen the breaker cam fitting nut because of unexpected trouble of the ignition timing plate and the breaker cam, be sure to dismount the crank case right cover first and then loosen the nut. Do not loosen the breaker cam fitting nut with the crank case right cover being in home position, or the cam shaft driven gear made of nylon will be broken.

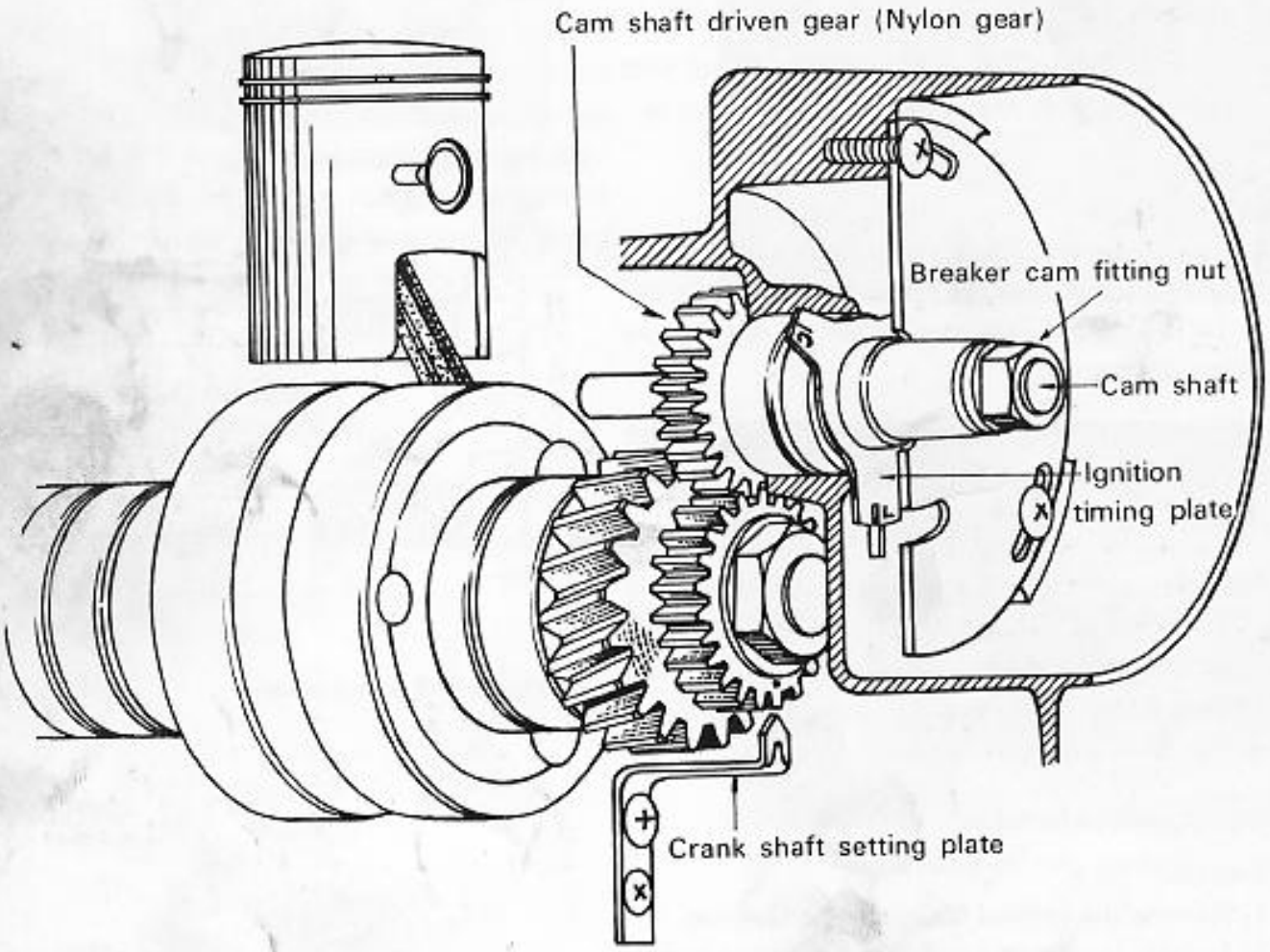


Fig. 6–10–1

6–11. Crank case right cover

Since the driving of the contact breaker cam of this engine is done through the breaker cam shaft drive gear and the cam shaft driven gear and the cam shaft driven gear is made of nylon, the special attention should be paid to the followings in dismounting and mounting the crank case right cover. Wrong job will possibly cause the breakage of the gear.

1. Removing

1) Loosen the kick starter lever set bolt and take off the kick starter lever.

2) Loosen nine crank case right cover screws and remove the crank case right cover. As the two screws locate inside the contact breaker plate, they should be unscrewed after removing the contact breaker plate. But when you take off the cover, confirm that the cover gasket does not stick to the cover. In case it is stuck to the cover, peel it off using a knife or the equivalent before removing the cover.

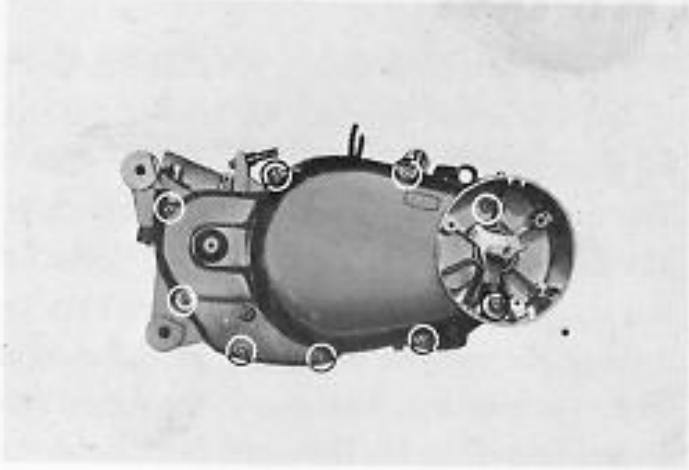


Fig. 6–11–1 Crank case right cover fitting screws

3) Remove the crank case right cover gasket. Then check visually if the gasket is still usable. (As a rule, however, the gasket must be replaced when you disassemble and assemble the engine.)

Caution: When you take off the crank case right cover, do not loosen the contact breaker cam fitting nut, for it is not necessary to remove the contact breaker cam, cam shaft and ignition timing plate.

2. Installing

Since the contact breaker cam and cam shaft are assembled with the crank case right cover, the following procedure must be observed when you reset the crank case right cover.

1) Align the punched mark on the breaker camshaft drive gear fitted on the crank shaft with the alignment mark on the crank shaft setting plat (see Fig. 6-11-2).

2) Align the dented mark (red line) of the L mark on the ignition timing plate attached to the cam shaft with the alignment mark on the crank case right cover (see Fig. 6-11-3).

3) After performing 1) and 2), match the knock pin of the crank case with the pin hole of the crank case right cover and set the cover.

Caution: Unless the above works properly carried out, the proper ignition timing will never be obtained.

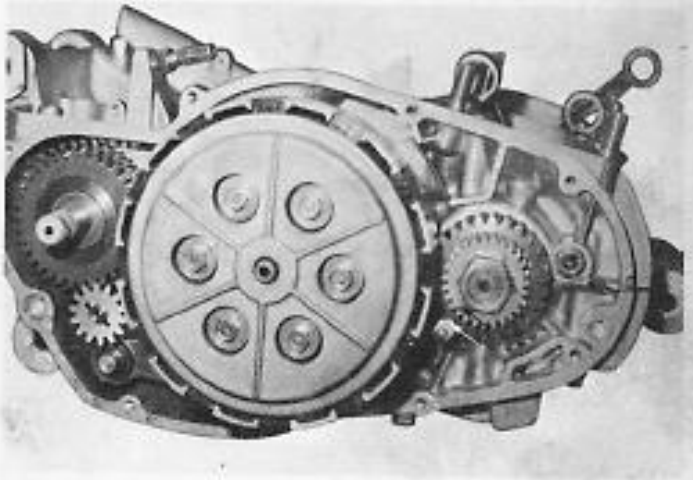


Fig. 6–11–2

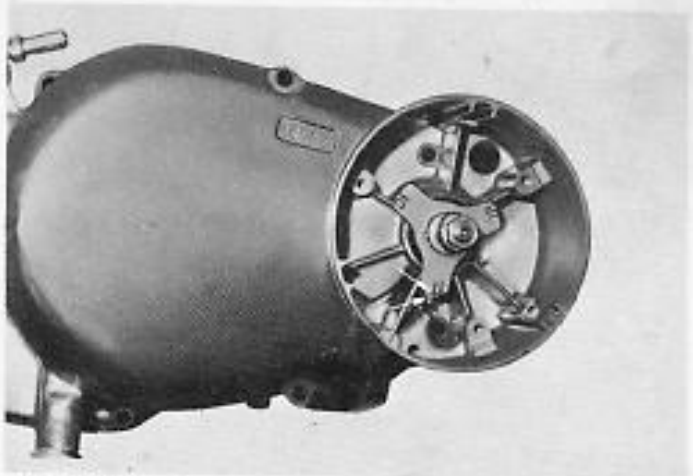


Fig. 6–11–3

6–12. Clutch

The function of the clutch is to transmit or disengage the power produced by the engine for the driving of the rear wheel through the transmission gears. Fig. 6–12–1B is a schematic drawing of the operating principles of the wet type, multiple palte clutch equipped on GT380.

The drive plates are turned by the clutch housing rotating in accordance with the engine revolutions. The driven plates are meshed in the sleeve hub on the countershaft, and are unable to transmit power in this state. But when pressed together between the drive plates by the force of the clutch spring acting through the pressure plate, the frictional force produced allows power to be transmitted.

When the clutch is disengaged, the spring force acting on the pressure plate does not act on the clutch plates. Therefore, the frictional force is decreased and the transmission of power between the plates is cut off.

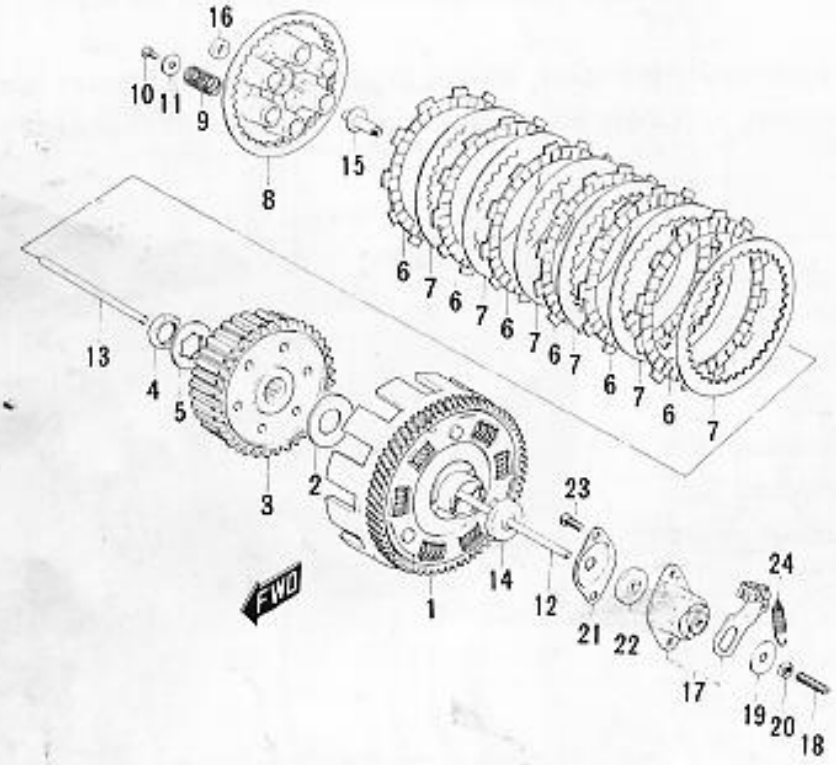


Fig. 6–12–1A

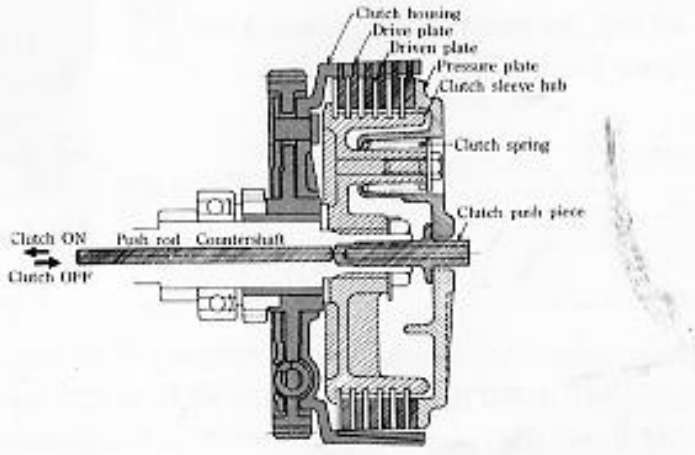


Fig. 6–12–1B

1. Clutch cushioning device

For the purpose of performing smoother transmission when engaging or disengaging the power from the engine, the primary driven gear has been assembled to the clutch housing with cushioning matter placed in between. In the GT380 clutch, two varieties of coil springs have been employed in order to ensure sufficient cushioning for quick transmission of high power.

2. Primary reduction ratio

No. of teeth in primary drive gear 24
No. of teeth in primary driven gear 68
Primary reduction ratio . . . . . 68/24 . . . . . 2.833

3. Disassembling

1) Remove the clutch spring fitting bolts on clutch pressure plate with 10-mm wrench.
2) Remove the pressure plate, release rod, drive plates, and driven plates from the clutch housing.
3) Pry up bent lock tongue of clutch sleeve hub washer with a chisel. Using clutch sleeve hub holder (special tool 09920-51510), secure the clutch sleeve hub and loosen the clutch sleeve hub nut with 27 mm socket wrench.
4) Remove the clutch sleeve hub and clutch housing from the countershaft.

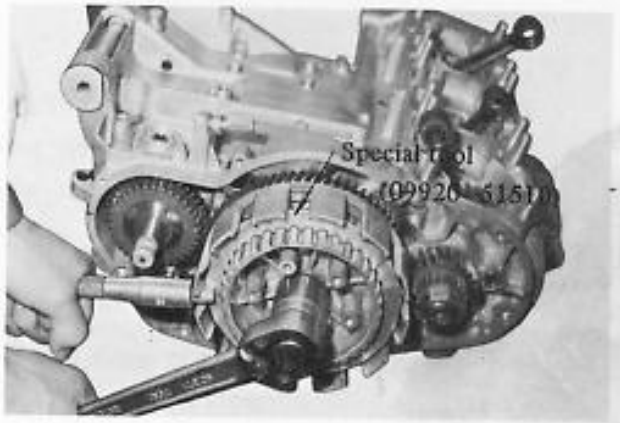


Fig. 6–12–2 Loosening clutch sleeve hub nut

4. Inspecting clutch parts

Improper use of the clutch, incorrect adjustments, or use of low grade transmission oil may result in excessive wear of the clutch parts. In such case, abnormal noise will be produced, or clutch slipping may develop, leading to insufficient transmission of power. Therefore, when the clutch is disassembled, the parts should be inspected carefully and any defective part found should be replaced.

1) Clutch drive plates

Inspect the clutch drive plates to see if the surfaces are burnt or roughened, and measure the thickness and warpage (run-out) to see if within the specified limits. Replace if found defective.


Fig. 6–12–3 Measuring drive plate thickness

	Standard	Limit
Thickness	3.5mm (0.138 in)	3.2mm (0.126 in)
Warpage	Under 0.4mm (0.016 in)	0.4mm (0.016 in)

2) Clutch springs

If the clutch spring free length should become 1.5 mm or more shorter than the standard, there will be possibility of slipping clutch.
Spring free length 38.4 mm (1.15 in).

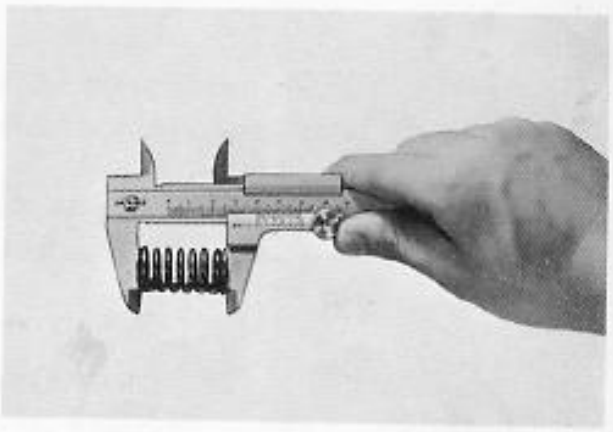


Fig. 6–12–4 Measuring clutch spring free length

3) Clutch housing

Inspect the primary driven gear tooth surfaces for abnormal conditons. check the axial play beteen primary driven gear and housing. Check the radial play between clutch housing and countershaft.

4) Clutch sleeve hub

If there are dented wear in the clutch sleeve hub splines, the clutch driven plates may stick when the clutch is disengaged and result in the clutch to lose smoothness of operation.

Repair or if the wear is excessive, replace with new part.

5) Clutch release screw

Check for excessive looseness by moving the release screw arm back and forth. If excessively loose, cracked, or injured, the clutch will not operate smoothly so in such case, replace the entire release screw assembly.

6) Clutch push rods

Pull out the two clutch push rods from the countershaft and check them for bending by rolling them on top of surface plate. A bent push rod will contact partially inside the countershaft during operation, resulting in eccentric wear, so that it should either be repaired or replaced.

5. Adjusting clutch

1) Adjusting clutch release screw.

(a) Remove the engine sprocket outer cover.

(b) Loosen the lock nut (A) with 12-mm box wrench.

(c) Tighten the adjusting screw (B) until it contacts push rods inside release screw lightly, and then return the adjusting screw one-fourth turn. After checking the clutch lever to see that it has proper play, tighten the lock nut.

2) Adjusting clutch cable

(a) Loosen the clutch cable adjusting lock nut. (a).

(b) With the clutch cable adjuster (b), adjust so that there will be about 4 mm (0.16 in) play at the clutch lever and then tighten the lock nut.

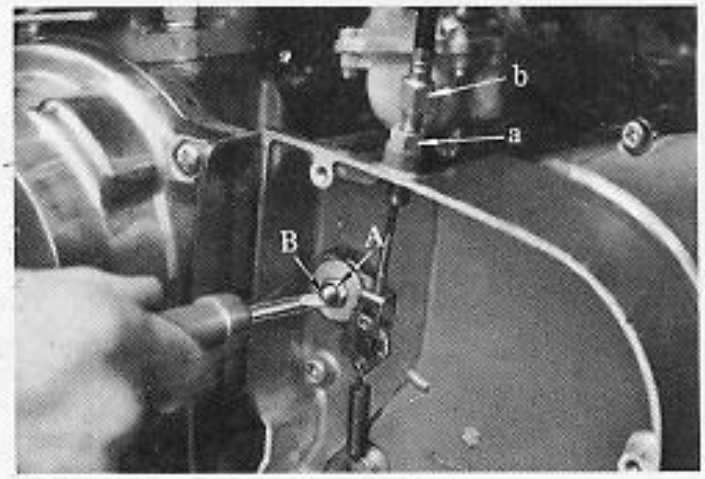


Fig. 6–12–5 Adjusting clutch release screw

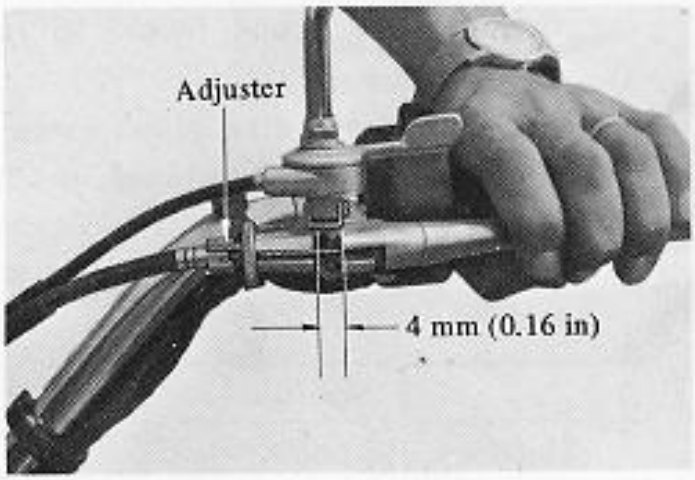


Fig. 6–12–6 Adjusting clutch lever

6–13. Primary pinion and breaker cam shaft drive gear

1. Removing
   1) Take off the crank shaft setting plate.
   2) Flatten the breaker cam shaft drive gear lock washer at the bend with a chisel.
   3) Hold the right hand connecting rod at the small end, using the piston holder (Special tool No. 09910-20113), and loosen the breaker cam shaft brive gear nut.
   4) Remove the breaker cam shaft drive gear, primary pinion and lock washer by hand.
2. Assembly

   Assembling must be done in the reverse order of the disassembling. When you fasten the breaker cam shaft drive gear nut, use the torque wrench to tighten it to specified torque.

   Tightening torque: 500 kg-cm (36 lb-ft)

6–14. Crank case

1. Disassembling crank case
   1) Remove the crank case fastening bolts (upper side 9 bolts. Lower side 18 bolts)
   2) Numbers are indicated on the crank case which show the tightening order of the bolts. So when you unfasten the bolts, start from the biggest number to the smaller, that is 27 . . . . . 1.
   3) Disassemble the crank case, tapping it lightly with a plastic hammer.

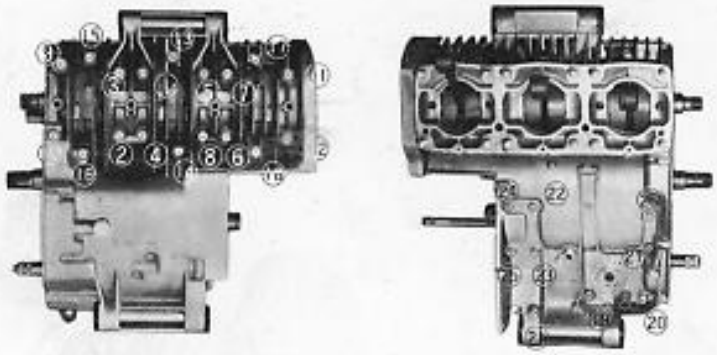


Fig. 6–14–1 Crank case set bolts tightening order

2. Assembling
   1) Clean the fitting surface of crank cases with benzine.
   2) Apply liquid gasket (parts No. 99000-31010) onto the upper crank case. But do not apply excessively, for the liquid gasket sometimes clog the lubricating oil passage of the right crank bearing.
   3) Fit the crank case properly and fasten the crank case fastening bolts. When you do this, first fasten the bolts provisionally, then tighten them to the specified torque in the order of the numbers marked on the crank case.

      Specified tightening torque

      6mm bolts . . . . . 130 kg-cm (9.4 lb-ft)

      8mm bolts . . . . . 200 kg-cm (14.5 lb-ft)

6–15. Transmission

Cautions of installing

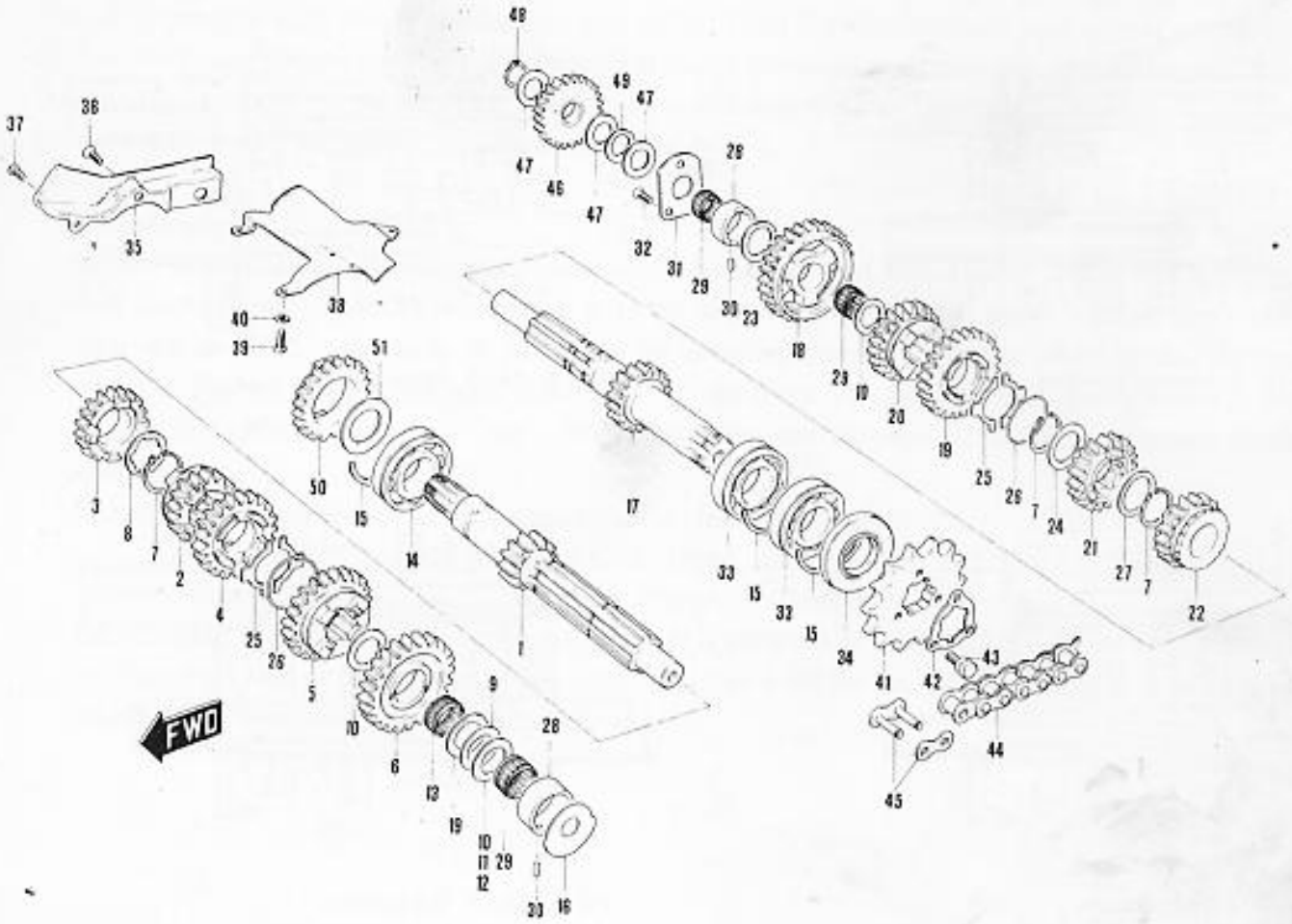
1.) Wash all the gears and shafts clean before you install them.

2.) Before mounting the upper crank case, check if the gear shift functions properly and that there is no such abnormality as misattachment.

3.) When you put each gear and shaft to the lower crank case, make sure that each bearing is matched with the knock pin.

4.) After the upper crank case is attached, check if the drive shaft and counter shaft can be turned smoothly by hand. (Compared with other models, this may give you the impression that these shafts are somewhat heavy, but it does not mean any abnormality since GT380 employs the neutral brake.)

The relative positions of the gears and washers are as shown in Fig. 6-15-1.



1	COUNTER SHAFT	1	NT:12
2	GEAR, 2nd drive	1	NT:16
3	GEAR, 3rd drive	1	NT:19
4	GEAR, 4th drive	1	NT:21
5	GEAR, 5th drive	1	NT:23
6	GEAR, 6th drive	1	NT:24
7	CIRCLIP, 3rd drive gear	3	
8	LOCK WASHER, 3rd drive gear	1	
9	THRUST WASHER, 6th drive gear	1	17x29x1
10	THRUST WASHER, 6th drive gear	2~4	17x29x3
11	THRUST WASHER, 6th drive gear	0~1	17x29x1
12	THRUST WASHER, 6th drive gear	0~2	17x29x1.2
13	BEARING, 6th drive gear	1	17x21x9.8
14	BEARING, counter shaft	1	25x52x15
15	C RING, counter shaft	3	
16	RETAINER, counter shaft	1	NT:17
17	DRIVESHAFT	1	NT:28
18	GEAR, first driven	1	NT:24
19	GEAR, 2nd driven	1	NT:27
20	GEAR, 3rd driven	1	NT:22
21	GEAR, 4th driven	1	NT:19
22	GEAR, 5th driven	1	NT:18
23	THRUST WASHER, 1st driven gear	1	17x26x3
24	WASHER, 4th driven gear RH	1	25x35x1.5
25	RING, 2nd driven gear	4	
26	CIRCLIP, 2nd driven gear	2	
27	THRUST WASHER, 4th driven gear	1	
28	BUSHING, transmission shaft	2	21x30x13
29	BEARING, transmission shaft	5	17x21x12.8
30	PIN, transmission shaft bushing	2	
31	RETAINER, driveshaft	1	
32	SCREW, retainer	5	
33	BEARING	2	
34	OIL SEAL, driveshaft	1	24.4x52x7
35	CUP, oil reserver	1	
36	SCREW	1	
37	SCREW	1	
38	PLATE, oil guide	1	
39	SCREW, oil guide plate	5	
40	LOCK WASHER	5	
41-1	SPROCKET, engine	1	NT:14, STD
41-2	SPROCKET, engine	1	NT:16, OPT
42	PLATE, engine sprocket	1	
43	BOLT, plate	3	
44	CHAIN ASSY, drive	1	L:104
45	JOINT, chain	1	OPT
46	GEAR, kick starter idle	1	NT:29
47	THRUST WASHER, kick idle gear	3	17x29x1
48	CIRCLIP, idle gear	1	
49	WAVE WASHER, idle gear	1	
50	GEAR, kick starter driven	1	NT:21
51	WASHER, kick starter driven	1	25x41x3

Fig. 6–15–1 Exploded view transmission

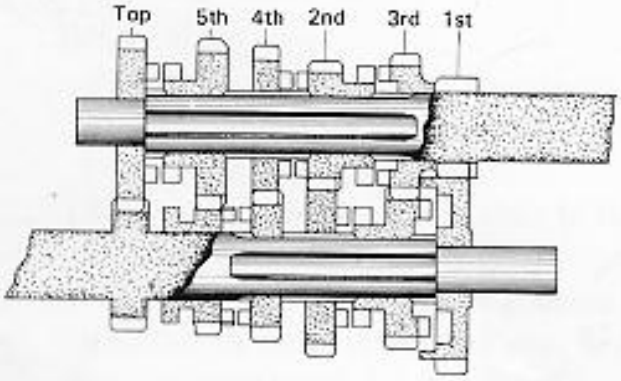


Fig. 6–15–2 Neutral position

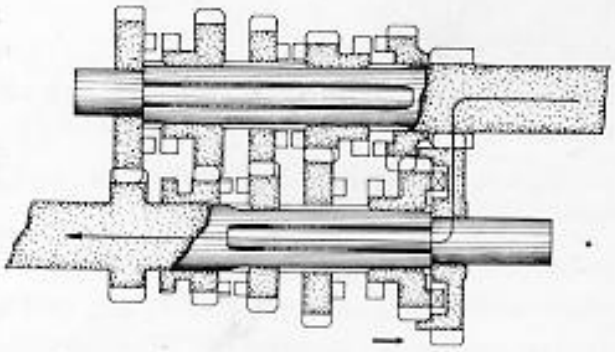


Fig. 6–15–3 1st position

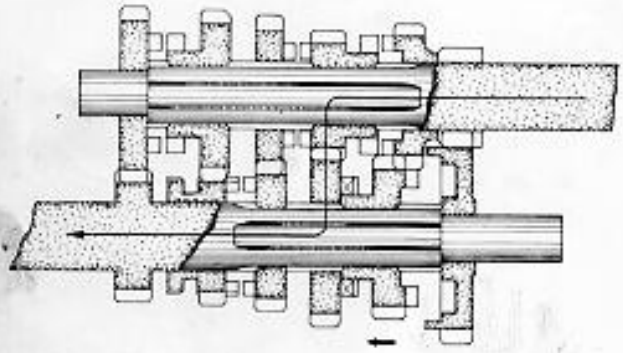


Fig. 6–15–4 2nd position

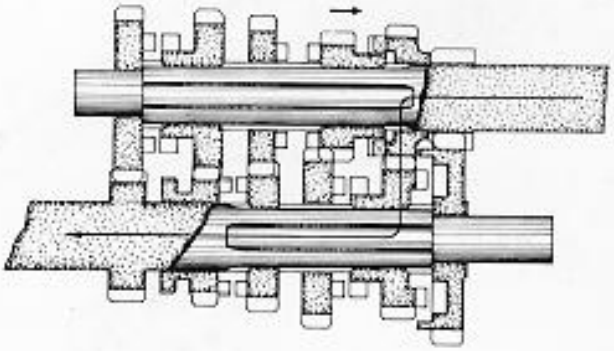


Fig. 6–15–5 3rd position

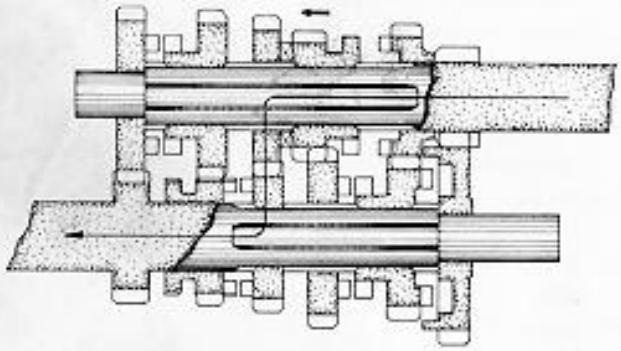


Fig. 6–15–6 4th position

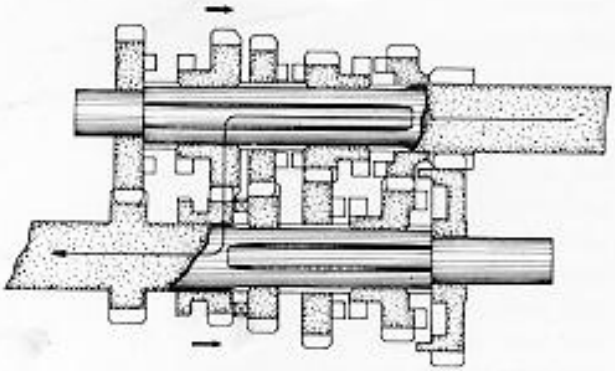


Fig. 6–15–7 5th positon

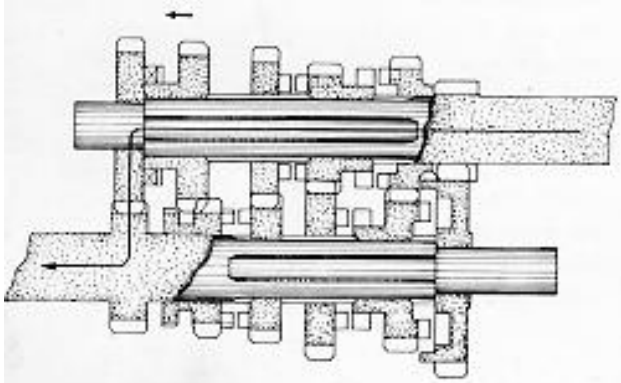


Fig. 6–15–8 Top position

6–16. Kick starter mechanism

This is a primary kick starter mechanism and differs from the conventional kick starter mechanism in that it does not operate through the clutch but turns the crankshaft directly through a gear train. As long as the clutch is disengaged, kick starting is possible regardless of the transmission gear position. The primary kick starter mechanism is illustrated in Fig. 6-16-1.

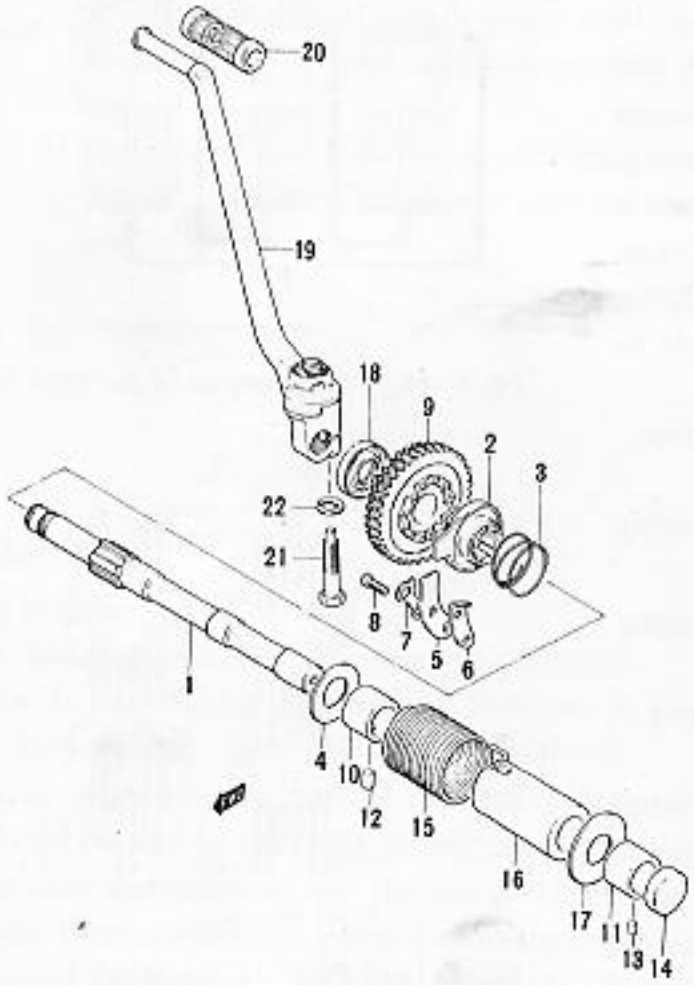
1. Operation

Before kick starting, the ratchet wheel is held by the ratchet wheel guide. Upon kick starting, the kick starter shaft rotates in accordance with the kick lever. The ratchet wheel being in mesh with the kick starter shaft also starts to turn, and on releasing from the ratchet wheel guide, the ratchet wheel is pushed toward the kick drive gear by the force of ratchet wheel spring where it meshes against the side of kick drive gear. The kick drive gear through its related gears then turns the crankshaft.

The transmission of power at kick starting takes place as follow :

Kick Lever → Ratchet Wheel → Kick Drive Gear → Kick Idle Gear → Kick Driven Gear → Primary Driven Gear → Primary Pinion → Crankshaft

On releasing the kick lever, the kick starter shaft is returned to its former position by the kick spring. At this time, the ratchet wheel which turns together with the kick starter shaft, due to the ratchet wheel guide, moves away from the kick drive gear.



1	SHAFT, kick starter	1	
2	STARTER, kick	1	
3	SPRING, kick starter	1	
4	THRUST WASHER	1	
5	GUIDE, kick starter	1	
6	STOPPER, kick starter	1	
7	WASHER, kick starter stopper	1	
8	BOLT, kick starter stopper	2	
9	GEAR, kick starter drive	1	NT-36
10	BUSHING, kick starter shaft (1)	1	17x24x18
11	BUSHING, kick starter shaft (2)	1	16x22x17.5
12	DOWEL PIN	1	
13	DOWEL PIN	1	
14	PLUG, kick starter shaft	1	
15	SPRING, kick starter shaft	1	
16	GUIDE, kick starter shaft spring	1	
17	WASHER, kick starter shaft guide	1	
18	OIL SEAL, kick starter shaft	1	15x30x8
19	LEVER ASSY, kick starter	1	
20	RUBBER, kick starter	1	
21	BOLT, kick starter lever	1	
22	LOCK WASHER	1	

Fig. 6–16–1 Exploded view of kick starter

2. Precautions on reassembling

1) Be sure to align the punch mark on the kick starter shaft with that on the ratchet wheel.
2) After assembling the kick starter shaft in the crankcase, check the shaft to see that it turns easily.

Fig. 6–16–2 Align the punch mark

6–17. Crankshaft

1. Cautions of mounting

1) Apply Suzuki C.C.I. oil sufficiently to each bearing and connecting rod big end.
2) Each bearing has a pin which prevents the outer race from turning. Align the pin position to the dent on the fitting surface of crank case. If it is not well positioned, the crank case will be damaged.
3) During the assembly, move each oil seal closer to the bearing so that it may not come in contact with the crank wheel.

6–18. Suzuki Recycle Injection System

Lubricating oil will accumulate in the crankcase during a continuous low-speed running on busy streets. During the rapid acceleration, the excess oil will be exhausted with exhaust gas through the muffler. In order to minimize this type of the phehomenon, this motorcycle adopts the system, whereby an excess lubricating oil in the crank case is led to the scavenging passage of the cylinder through an oil hose and is burnt completely in the combustion chamber. This reducing system of the exhaust gas (particularly during rapid accelerations) is called the Suzuki Recycle Injection System.

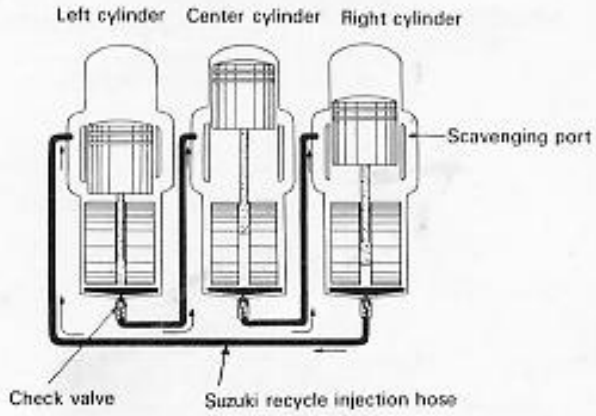


Fig. 6–18–1 Arrangement of the SRIS hoses

Fig. 6-18-1 shows the arrangement of the Suzuki recycle injection hoses.

Left crank case bottom → Center cylinder scavenging passage

Center crank case bottom→Right cylinder scavenging passage

Right crank case bottom→Left cylinder scavenging passage

In case of any error in the arrangement, the system will not function properly, deteriorateing the engine performance. So be very careful. At the time of periodic checks (every 6,000 km (4,000 mi)), check the injection hoses to see if they many not be bardened due to the cylinder heat.

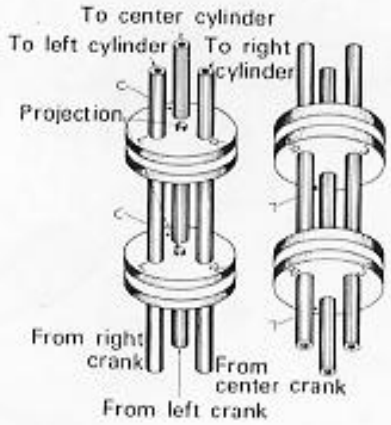


Fig. 6–18–2

1. Injection hose grommet

The three injection hoses are led together through the back part between the left and the center cylinders. Both upper and lower crank cases use one grommet of the same type to position the injection hoses. These grommets have the letters L, C and R indicating the positions of injection hoses. So attach them as shown in Fig. 6-18-2 (with the projection (⊓) at the center of the grommet side placed upper).

6–19. Oil seal

1. Removing oil seal

In removing the oil seal, use the oil seal remover (special tool No. 09913-50110). Do not use screwdriver or similar tools as there is danger of damaging the oil seal lip.

2. Installing oil seal

The oil seal can be installed easily by using oil seal installing tool.

Notes: 1) Before installing the oil seal, be sure to coat the oil seal lip with grease.

2) Use care not to install the oil seal at an angle as this will allow the pressure to leak out. Coating the outer surface of the oil seal lightly with grease will enable installing the oil seal with greater ease.

3) The general rule is to use new oil seals when reassembling the engine after overhaul.

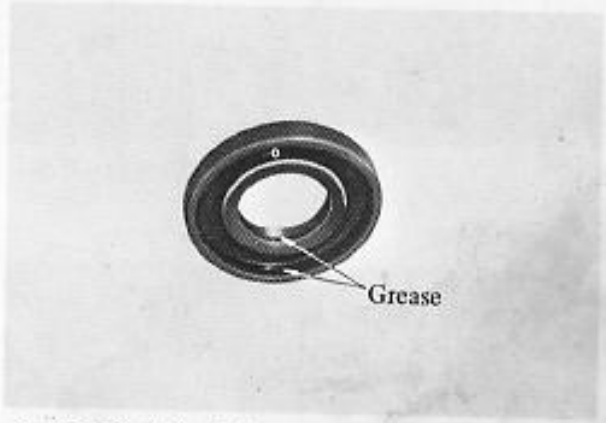
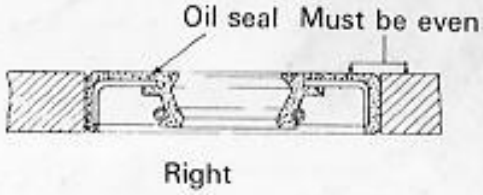


Fig. 6–19–1 Applying grease



Right

Wrong

Fig. 6–19–2 Fitting oil seal

6–20. Bearing

Inspecting bearing

Since the outer diameter of the bearing contracts slightly due to forcefitting allowance, a clearance is provided between the race and balls beforehand. Therefore, in inspecting the bearing for wear, judgement cannot be made by checking for excessive clearance. The only method is to spin the race and listen to the noise. If abnormal noise is heard while the race is being turned, the bearing is no good. Before starting inspection, wash the bearing in clean gasoline and then lubricate it. If the bearing is just washed and then spun, even a new bearing will give off abnormal noise due to lack of lubrication, and moreover, repeated spinning will damage the bearing. Therefore, care must be taken not to spin a dry bearing.

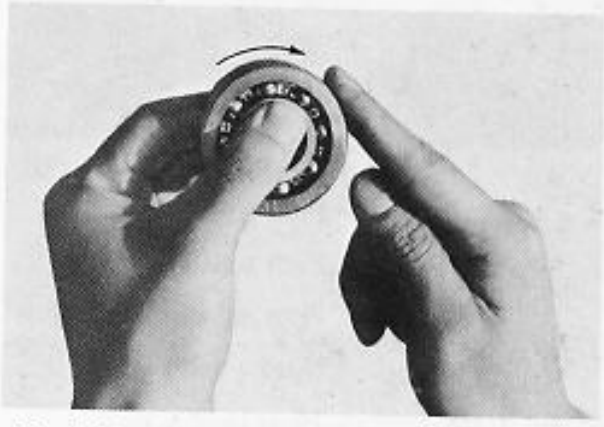
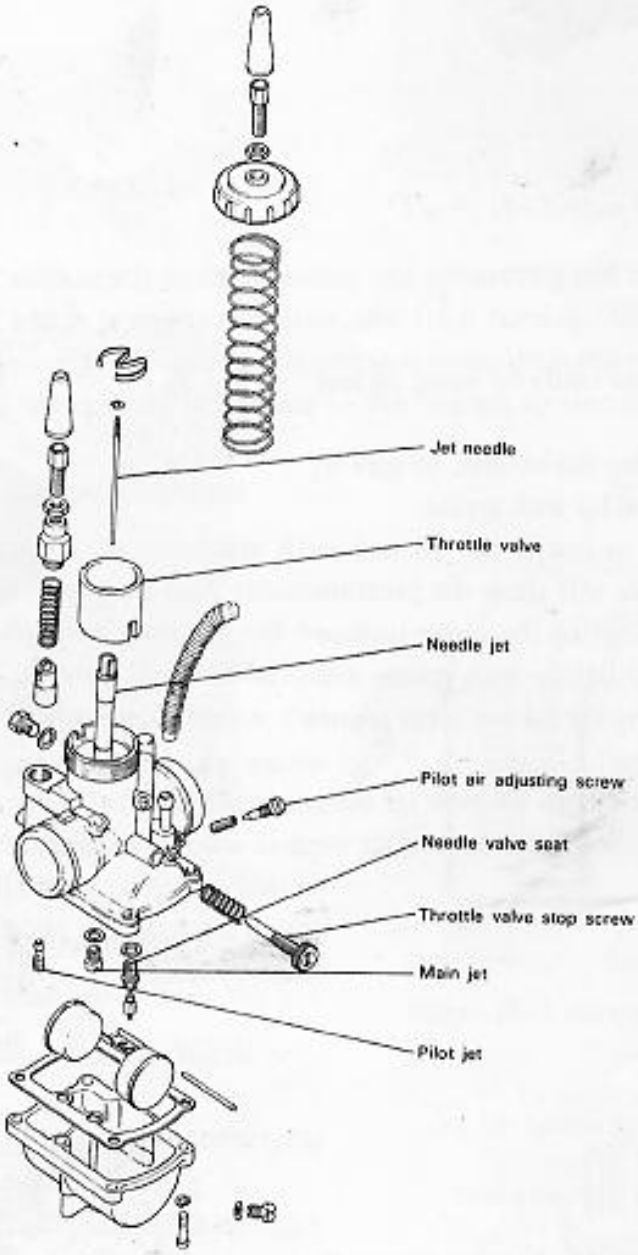


Fig. 6–20–1 Inspecting ball bearing

7. CARBURETOR

7–1. Specifications



Type	VM24SC
Main jet	#80
Jet needle	4DH7-2
Needle jet	0-4
Throttle valve cut away	#3.0
Pilot jet	22.5
Pilot outlet	0.8
Pilot air adjusting screw	1¼ turns back
Needle valve seat	2.0
Float level	24.25 mm (0.955 in)

7–2. Overhauling carburetor

In overhauling the carburetor, remove all parts and after washing with clean gasoline, blow out the interior with compressed air. In cleaning out the jets, wire or other sharp objects must never be used as it will disturb the carburetor performance.

7–3. Adjusting carburetor

1. Adjust the throttle cable adjuster on each carburetor to obtain 3 - 5mm (0.1 - 0.2in) cable play.
2. Screw in the pilot air screw of each carburetor until it bottoms, then screw each one out 1¼ turns.
3. Start the engine and let it warm for about 5 minutes.
4. Adjust the idle speed according to the following system:

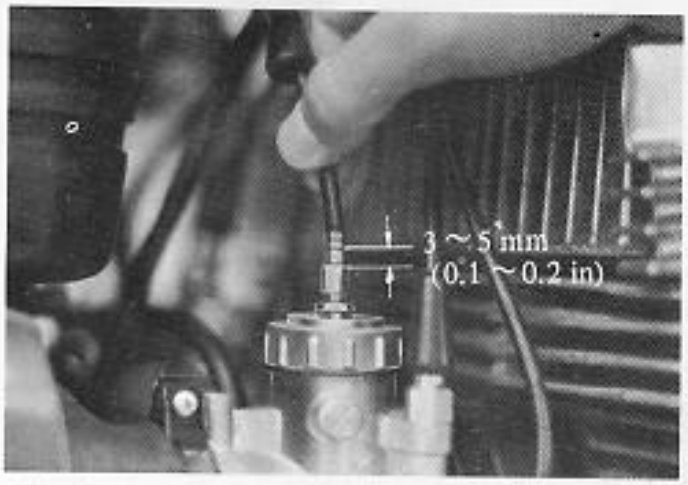


Fig. 7–3–1 Cable adjuster

L = Left Cylinder

M = Middle Cylinder

R = Right Cylinder

▨ = Spark plug connected, cylinder running

□ = Spark plug disconnected, cylinder not running

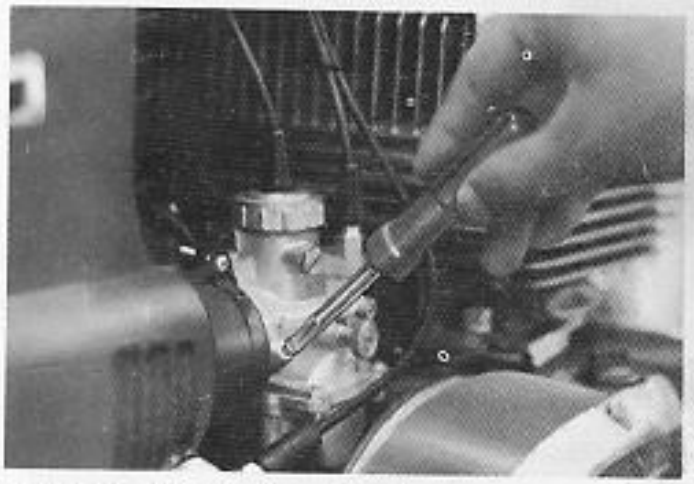


Fig. 7–3–2 Adjusting pilot air screw

1) Screw out each throttle stop screw 3½ turns from the bottomed position.
2) Start the engine and let it idle.

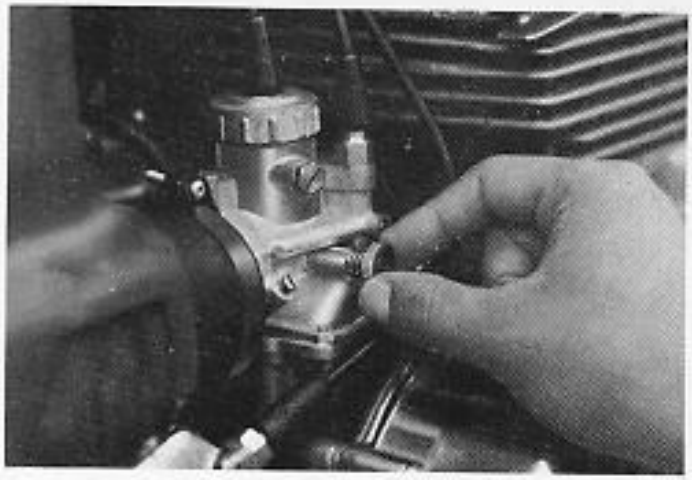
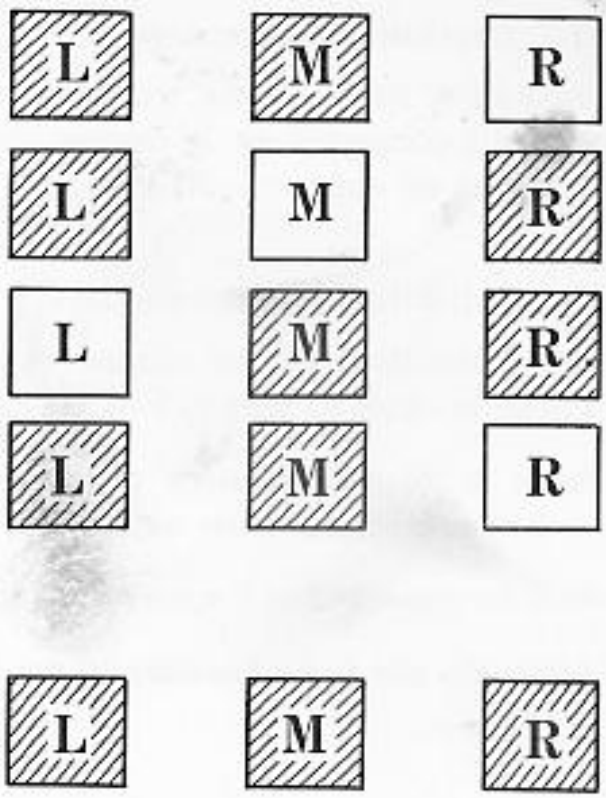


Fig. 7–3–3 Throttle stop screw

3) Remove the right spark plug cap and adjust the throttle stop screw on the M carburetor until 1,100 rpm reads on the tachometer.
4) Disconnect the middle spark plug cap and adjust the throttle stop screw on the R carburetor to 1,100 rpm.
5) Disconnect the left spark plug cap and read the idle rpm (X) with the M and R cylinders running.
6) Disconnect the right spark plug cap and adjust the throttle stop screw on the L carburetor to read X rpm obtained in step 5).
7) Repeat steps 4) and 5), and ascertain that X rpm is obtained in each case.
8) Connect all spark plug caps and screw out all throttle stop screws equally to bring engine idling speed to 1,100 rpm.



5. Synchronizing the carburetors:
In order to obtain maximum efficiency and throttle response, it is necessary that the throttle valve of each carburetor opens at the same time.
This can be adjusted as follows:
1) Remove the throttle valve inspection screws and twist the throttle grip until the throttle valve punch mark appears in this position.
2) Holding the throttle grip in that position, adjust each throttle cable adjusters so that each carburetor throttle valve is aligned at this postion as shown in Fig. 7-3-5.

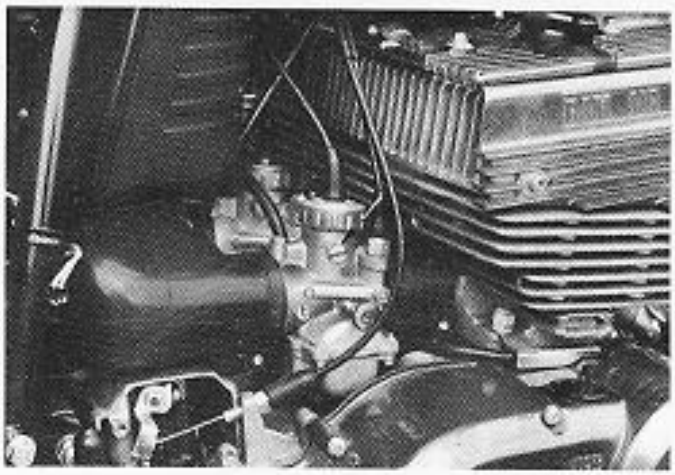
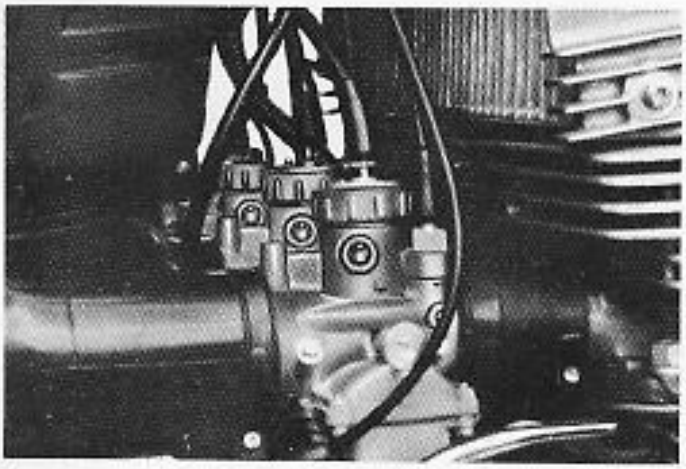
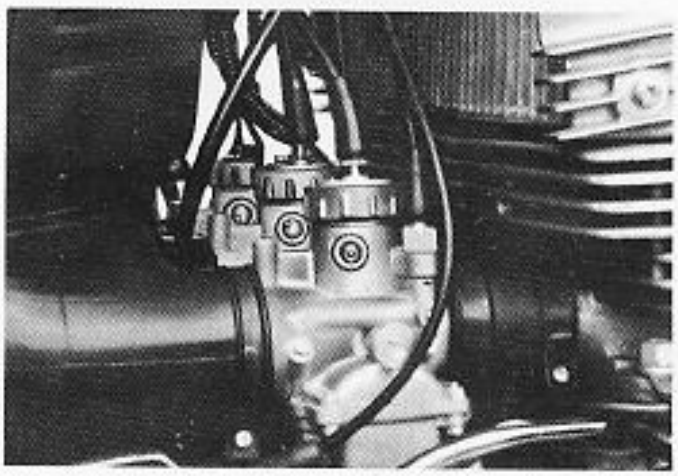


Fig. 7–3–4 Throttle valve inspection screw



Correct



Incorrect

Fig. 7–3–5 Alignment of punch mark

3) Adjust final throttle cable play to 1 - 2mm at the handlebar cable adjuster.
4) This adjustment could affect the oil pump lever adjustment.
Therefore, readjust the oil pump lever cable as necessary.

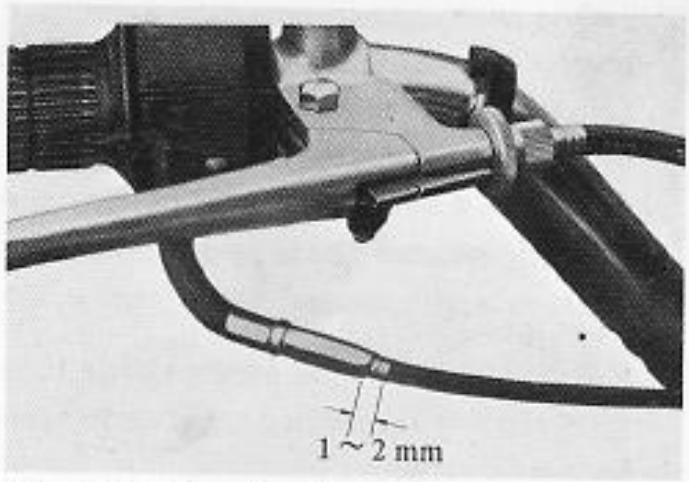


Fig.7–3–6 Throttle cable adjuster

7–4. Adjusting fuel level

1. Removing the float chamber body.
2. Turning up the mixing chamber.
3. As shown in Fig. 7-4-1, measure the height from the float chamber attaching surface to the float top.
4. Make adjustments to the height by bending the portion a (contacting area of needle vavle) in Fig. 7-4-2 so that the measured value of 3) will come within 24.25 ± 1mm.
However, the float has to be replaced if it is indented or gasoline has leaked into it.

Standard fuel level 24.25 ± 1mm (0.955 in)

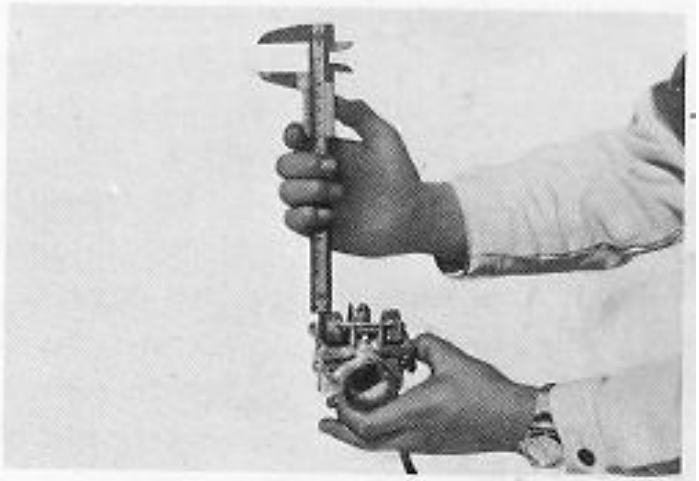


Fig.7–4–1 Checking fuel level

Note: Because the fuel level is quite stable, there is usually no need of correction. But when the float was replaced with a new one or a marked abnormality occured in the carburetion, checking and adjustment must be exercised.

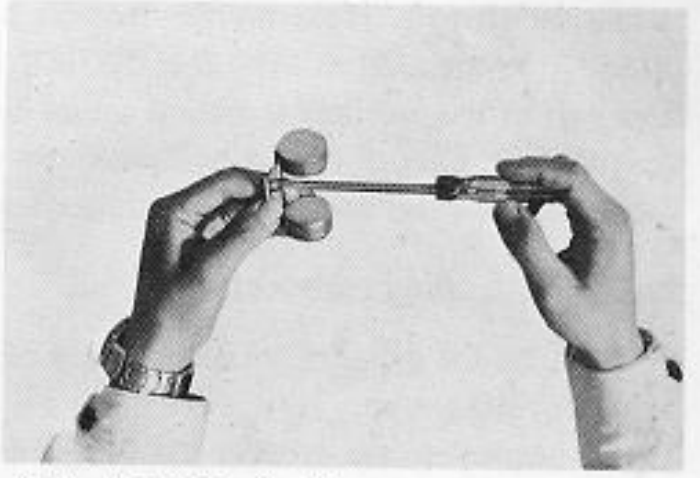


Fig.7–4–2 Adjusting float tongue

7–5. Inspecting float chamber parts

1. Float
If gasoline should enter into the float while operating, the fuel level will become higher and will cause improper engine operation. Check the float by holding it in hand and seeing if there is any fuel inside. Replace if defective and also replace if deformed.

2. Needle valve

Inspect the needle valve visually to see if worn or damaged. If the defect cannot be detected visually hold carburetor mixing chamber body at the same level with its original position and turn it upside down with the needle valve installed and fuel pipe connected to the fuel tank. Allow the valve to close tightly on the valve seat by the weight of valve alone. Under this state, turn the fuel cock lever to "PRI" position and if there is no leakage of fuel, the valve is still usable.

3. Valve spring

If the spring inside the needle should become weakened, gasoline may overflow from float chamber when running at specified speed under specified road conditions. In case such condition arises, replace the needle valve.

7–6. Overflowing

If overflow still continues to develop even after making the checks directed in (7-5) above, there is a strong chance of dirt being caught between the needle valve and valve seat as shown in Fig. 7-6-1.

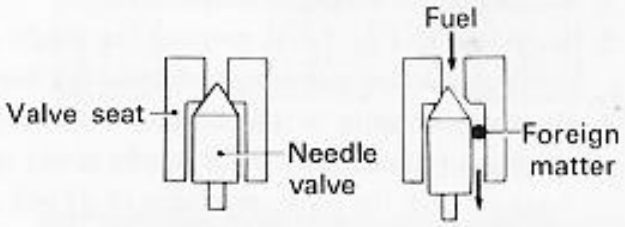


Fig. 7–6–1 Overflow caused by foregin matter

In such a case, close the fuel cock temporarily and run the engine so the fuel level inside the float chamber will drop. When the fuel level drops, the needle valve will drop correspondingly, causing the clearance between the valve seat and needle valve to grow larger. Under this state, reopening the fuel cock will allow the fuel to flow in through the valve seat with considerable force so that there is a good possibitlity of the dirt stuck at this part being washed away and the trouble remedied. However, this is merely an emergency measure. If the overflow trouble is to be remedied basically, the dirt must be removed completely from the fuel. At this time, the filter in the fuel cock should also be inspected carefully. Since a large part of the overflow trouble is caused by adherence of dirt, if this trouble occurs too frequently, the fuel tank interior should be flushed out clean with gasoline. The users should also be advised to always close the fuel cock whenever the motorcycle is to be parked for any length of time.

7–7. Attaching carburetor

In mounting the cylinder, intake pipe and carburetor together as Fig. 7-7-1 shows, you can attach the carburetor straight up.

The attachment to the cylinder must be properly made in accordance with the indication marks on the starter side (Fig. 7-7-1) of the carburetor.

Left carburetor	Indication mark L
Center carburetor	" M
Right carburetor	" R

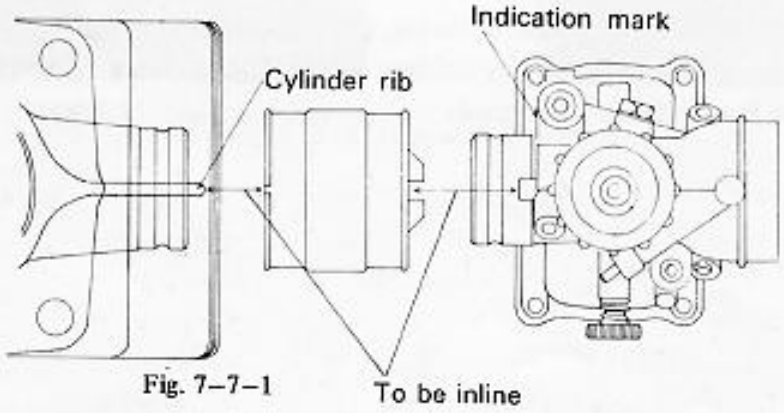


Fig. 7–7–1

8. ENGINE ELECTRICAL EQUIPMENT

8–1. Alternator

In order that the various electrical equipment can execute their functions with due consideration on "safety" the battery, their electrical source, must always be dept in the best possible condition. For this reason, we adopted, the alternator that demonstrates excellent charging performance even at the low-speed driving for this motorcycle.

1. Construction

   Electricity is supplied to the rotor with the field coil wound around through a brush. The armature-side coil is wound around the stator and so fixed. The generated electricity is rectified by six silicone diode, then used for charging the battery and then supplied to each load.

2. Features

   A normal DC dynamo has an armature on the rotor and field coil on the stator with the generated electricity being taken from the brush through commutator. Unlike the DC dynamo, the construction of alternator is opposite and therefore has the following features:-

   1) The rotor can be made smaller. (The field coil may be smaller than the generator coil.)
   2) The life of brush is semi-permanent. (Unlike the commutator contacting point of the brush is not rugged but rather perfectly flat, and the current flow within the field coil is less than that in the armature.)
   3) Since the armature is fixed. There is much less posibility of troubles such as disconnected wires, etc. (broken wire)

3. Charging circuit

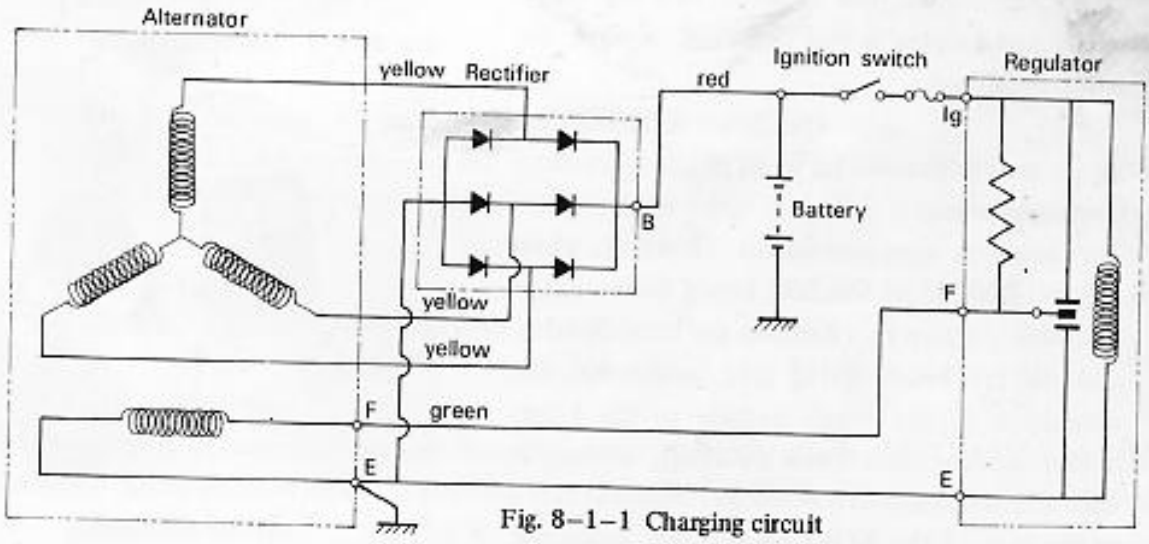


Fig. 8–1–1 Charging circuit

The charging circuit of the alternator is illustrated in Fig. 8-1-1. If the exciting current which flows in the rotor coil, remains constant, the voltage generated in the alternator stator coil is proportional to the number of rotations. As long as a battery is being charged, it is necessary to keep the voltage constant. And the role of regulator here is to reduce the exciting current whenever the generated voltage starts rising with the increasing rotational speed. Therefore, the principle of voltage regulation is based on the same principle as the conventional dynamo.

Turn on the ignition switch, and then the exciting current will flow from the battery. It first enters the regulator Ig terminal, goes through the point, leaving at the F terminal. Then it enters through the F terminal of the alternator and excites the rotor coil.

Now, as the engine starts, the rotor starts rotation inducing the three-phase alternating current in the stator coil. And the AC current will be rectified by the silicone rectifier and is charged into the battery through B terminal.

The terminal voltage of battery rises as the charging continues on, so will the voltage in the pressure-coil of regulator, and the contact point will be attracted. And the exciting current flowing in the rotor coil will decrease because it flows through a resistor, and thus the voltage generated in the alternator will be adjusted to regulated voltage.

Because the function of regulator used in alternator is only the adjustment of voltage, it requires neither cut-out relay nor current limiter. This is because the silicone rectifier prevents the reverse current from the battery (thus cut-out relay needs not be used) and the stator coil itself tends to keep the current under a certain level (thus avoiding the use of the current limiter).

4. Checking charging system

1) Insulation test of stator coil

Check if there is any conduction of electricity between each lead line from the stator coil and the body. The insulation is perfect if no electricity conduction is observed.

2) Disconnection test of stator coil

Check the conduction of electricity in each of the stator coil lead lines and all the measurements (at three points) must indicate being conductive. If not, some disconnection is most probable and the stator must be replaced.

	DENSO	KOKUSAN
Stator coil	0.26 - 0.1 Ω	0.43 - 0.1 Ω

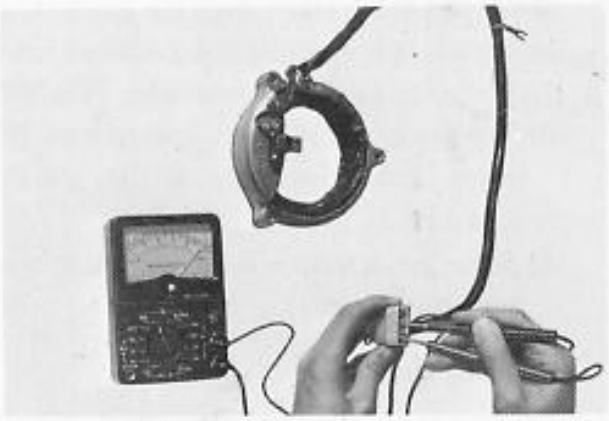


Fig. 8–1–2 Test of stator coil

3) Disconnection test of rotor coil

Check the conduction between two slip rings. If the conduction is not observed, replace the rotor complete.

	DENSO	KOKUSAN
Rotor coil resistance	10.5 - 11.5 Ω	4 - 5 Ω

Fig. 8–1–3 Test of rotor coil

4) Checking brush

The brush is semi-permanent. However, when the wear of 1/3 of the new brush dimension is observed, replace it. (Remove the brush holder, and set the brush spring free, and when the dimension of the brush outside of the brush holder is less than 7mm (0.28in), replace it with a new brush.)

In the case of the KOKUSAN brush, replace it when the wear has progressed close to the wear limit mark.

5) Checking silicone rectifier

Six silicone rectifiers are connected as illustrated in Fig. 8-1-4. Measure the resistance of each lead line and confirm that the measurements indicate very little resistance in the normal direction and infinitely large resistance in the reverse direction. Even if one of them is found to be defective, the whole rectifiers must be considered abnormal and need to be replaced.

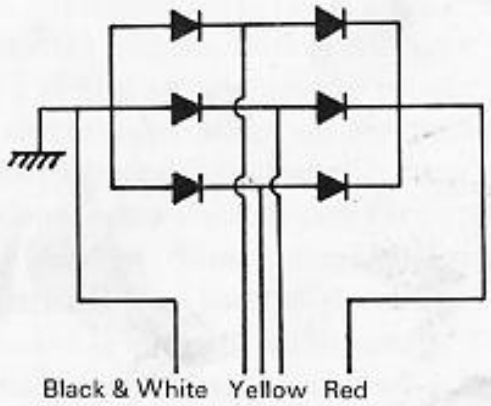
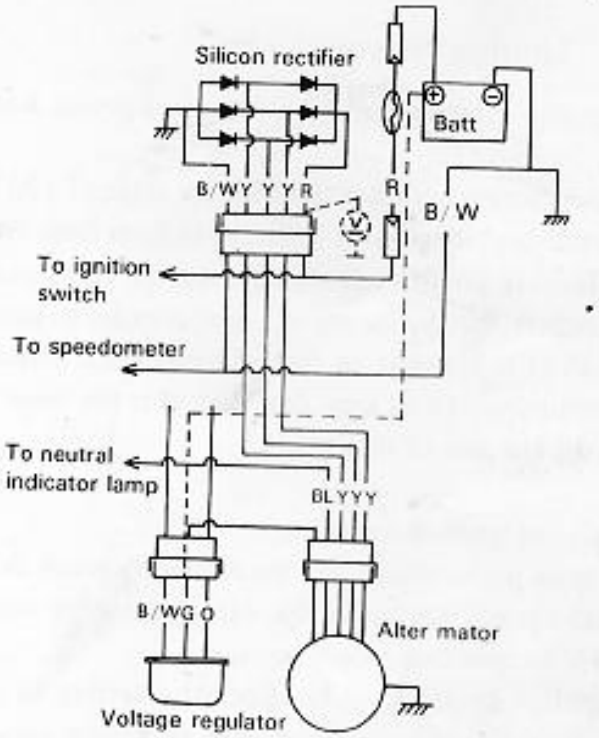


Fig. 8–1–4 Silicon rectifier

6) Confirming the combined performance of alternator and silicone rectifier

The generating performance of the alternator must be measured with all the loads being eliminated. In Fig. 8-1-5, solid lines indicate the standard connection. Disconnect, the coupler at the regulator and connect the positive terminal of battery directly to the green wire. Remove the red wire connection (power line) from the coupler of the rectifier, and measure the voltage between this line and the earth (see dotted lines in Fig. 8-1-5). With all these accomplished, you can measure accurate voltage generated in the alternator, for it is now excited by the battery electrical sourse and all the loads have been eliminated. If the result of measurement is short of the values given below, there is some trouble in the alternator. Also even if it meets required values in case over discharge of battery is observed the source of trouble in other parts such as battery itself or silicone rectifire etc. may be located.



Y ..... Yellow
R ..... Red
G ..... Green
O ..... Orange
BL ..... Blue
B/W..... Black with White tracer

Fig. 8–1–5

Caution: a. The time taken for the measurement must be as short as possible.

b. When you have to suspend the measurement, be sure to cut off the connection between the battery positive terminal and the rotor coil. This is needed to save the field coil from burning.

		DENSO	KOKUSAN
Minimum voltage to be generated	1,500 rpm	18V	22V
" " "	2,500 rpm	31V	40V

7) Checking regulated voltage

Measure the regulated voltage (voltage on charging circuit including the battery). Adjustment of regulated voltage can be made with the regulating arm (DENSO) or the regulating screw (KOKUSAN).

Regulated voltage 13.5 V - 14.5 V

8) Interchangeability of parts in charging system

Parts of both DENSO and KOKUSAN are used in the charging system of GT380. Therefore, when you replace parts, you should pay particular attention to the interchangeability between them. (The silicone rectifier is the product of STANLEY).

a. Alternator & Breaker

The whole sets of DENSO and KOKUSAN parts may be interchanged at the time of assembly, however, a component part (brush, rotor, stator, breaker , cam, etc.) itself can not be interchanged.

b. Voltage regulator

DENSO and KOKUSAN regulators can be interchanged.

8–2. Ignition system

The ignition system employs a 3-contact points 3-ignition coils method with the battery as its electric source.
Three contact points are attached at an angle of 120 ° to each other.
The center contact point is different in form from remaining right and left hand contact, points.
These breaker assembly is attached on the crank case right cover. The crankshaft does not directly drive the camshaft, but by means of a gear in order to prevent the shaking of the camshaft. Thus the rotation of camshaft is opposite to that of crankshaft. Therefore, you ought to be careful when you adjust the ignition timing. (You may deal with this the same way as the adjustment of the conventional breakers set on the left side of the engine.)

Adjusting of ignition timing
The engine performance and the durability much depends on how the ignition timing its properly set and to what extent the timing for each cylinder is well balanced. It is, therefore, very important to set it precisely to specified proper position.
The ignition timing may be checked referring to marks on the ignition timing plate, however, the indication by this procedure may not be precise enough for the required timing. As a matter of fact, the designed purpose for this plate is to enable to know roughly and easily the relative position of the pistons to the contact point movement.

In this point of view, it is suggested not to use the alignment marks on the ignition timing plate when checking or adjusting the ignition timing as proper procedure, except for an emmergency purpose, but to use the ignition timing tester together with the ignition timing gauge (dial gauge) in the same manner as that for other models.

Contact point gap:	0.35mm (14/1,000 in)
Ignition timing:	B.T.D.C. 3.0mm (allowance 2.52 - 3.76) in piston stroke.

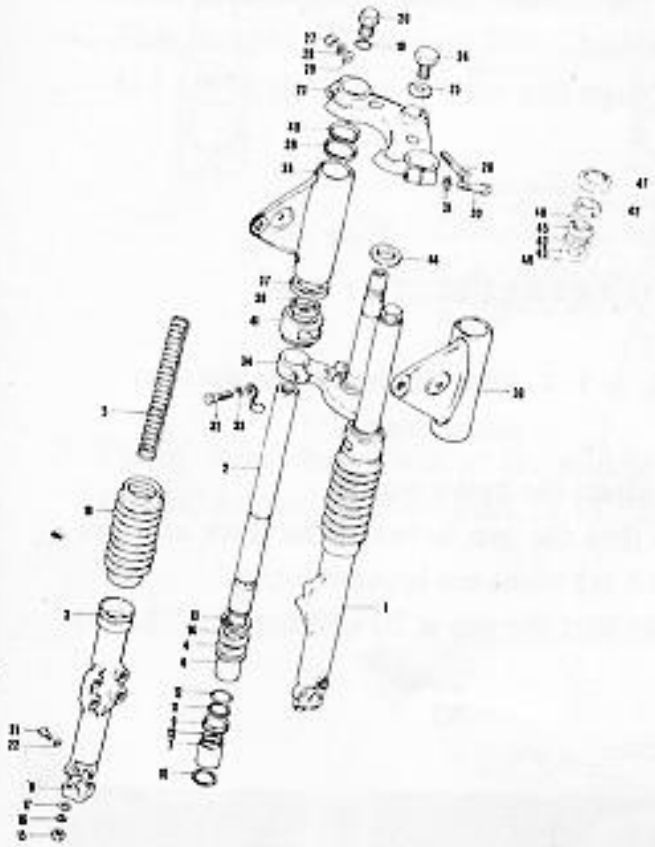
The ignition order is ① Left ② Center ③ Right.

8–3. Condenser capacity and ignition coil resistance

Condenser capacity	0.16 - 0.20 μF	
Ignition coil resistance	primary coil	4 - 6 Ω
	secondary coil	15 - 25 KΩ

9. BODY

9–1. Front fork



1	[illegible]	2	
2	[illegible]	2	
3	[illegible]	2	
4	[illegible]	2	
5	[illegible]	2	
6	[illegible]	2	
7	[illegible]	2	
8	[illegible]	2	
9	[illegible]	2	
10	[illegible]	2	
11	[illegible]	2	
12	[illegible]	4	
13	[illegible]	2	
14	[illegible]	2	
15	[illegible]	4	
16	[illegible]	4	
17	[illegible]	4	
18	[illegible]	2	
19	[illegible]	2	
20	[illegible]	2	
21	[illegible]	2	
22	[illegible]	2	
23	[illegible]	1	
24	[illegible]	1	Ø10mm, t=2t
25	[illegible]	1	[illegible]
26	[illegible]	1	
27	[illegible]	1	
28	[illegible]	1	
29	[illegible]	1	
30	[illegible]	2	
31	[illegible]	2	
32	[illegible]	2	
33	[illegible]	2	
34	[illegible]	1	
35-1	[illegible]	1	
35-2	[illegible]	1	
36-1	[illegible]	1	
36-2	[illegible]	1	
37	[illegible]	2	
38	[illegible]	2	
39	[illegible]	2	
40	[illegible]	2	
41	[illegible]	2	
42	[illegible]	1	
43	[illegible]	2	
44	[illegible]	1	
45	[illegible]	1	
46	[illegible]	36	
47	[illegible]	1	

The following procedure should be followed at overhauling and repair.

1. Remove the front axle by loosening the axle holder at the bottom part of a fork ourter tube first.
2. After pulling out an inner circlip as shown in the Figure using circlip remover (special tool No. 09900-06103), an outer tube is removable by pulling the outer tube downward while the inner tube staying at body side.
3. Feed 210 cc (0.45/0.36 pt. US/Imp) of motor oil 10W/30 to each front fork leg after assembly.

9–2. Brake

GT380 employs two leading brakes with the drum diameter of 180mm for the front wheel and the leading trailing brake with the drum diameter of 180mm for the rear wheel.

1. Checking and adjusting

Fit brake shoes onto the brake panels and measure their outer diameters, closing the cam fully.

Brake shoe wear limit

	Front wheel	Rear wheel
Outer diam. of brake shoe Wear limit	176mm	176mm

Brake drum wear limit

	Front wheel	Rear wheel
Inner diam. of brake drum Wear limit	180.7mm	180.7mm

: Adjusting front brake cam lever connecting rod

1) Loosen the lock nut of the connecting rod.
2) Turn the connecting rod toward the direction of ① as shown in the Fig. 9-2-1.
3) Pull the brake lever fully or push the brake cam first lever fully by hand.
4) Turn the connecting rod toward the direction of ② and the brake cam second lever will be drawn. When the brake shoes come in contact with the drum, the connecting rod will no longer rotate. So stop turning here.
5) Fasten the lock nut.

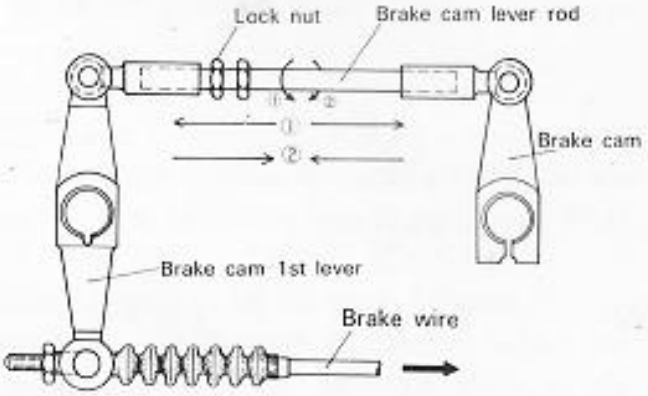


Fig. 9–2–1 Adjusting front brake cam lever connecting rod

Upon confirming all the above requirements are satisfied, adjust the brake wires:

Front brake . . . . . Adjust the brake lever play so that the gap between the lever and the throttle grip becomes 20mm (0.8 in) when the brake is locked.

Rear brake . . . . . Adjust the brake pedal travel so that the gap is 20 - 30mm (0.8 - 1.2in) when the brake is locked.

9–3. Drive chain

GT380 adopts a flaring type of joint for the drive chain from the strength point of view. Therefore, chain joint tool (special tool No. 09900-21802) must be used either to cut or joint the chain. The drive chain assembly and chain joint are available as replacement parts. Please note that new joint is definitely required once the chain is cut and never cut the same place twice.

Follow the instruction given with the tool when using chain joint tool.

Fig. 9–3–1

Proper lubrication and adjustment of the drive chain prolong its service life and ensure smooth power transmission to the rear wheel. Poor maintenance will cause rapid wear or damage to the drive chain. Therefore, the drive chain must be checked and serviced after the first 800 km (500 miles) of operation and every 800 km (500 miles) thereafter, and lubrication is indespensable before the motorcycle is operated at sustained high speeds, or under conditions of frequent rapid acceleration.

–Inspecting and adjusting drive chain–

* Place the motorcycle on its center stand with transmission in neutral. Check the drive chain and sprockets for any of the following conditions:

Drive chain

- ○ Damaged Rollers
- ○ Loose Pins
- ○ Dry or Rusted Links
- ○ Kinked or Binding Links
- ○ Excessive Wear
- ○ Improper adjustment

Sprockets

- ○ Excessively Worn Teeth
- ○ Broken or Damaged Teeth
- ○ Loosen sprockets nuts

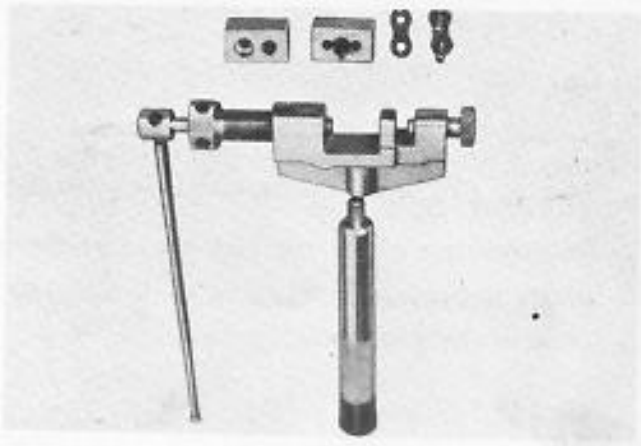
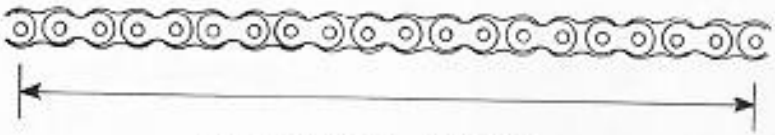


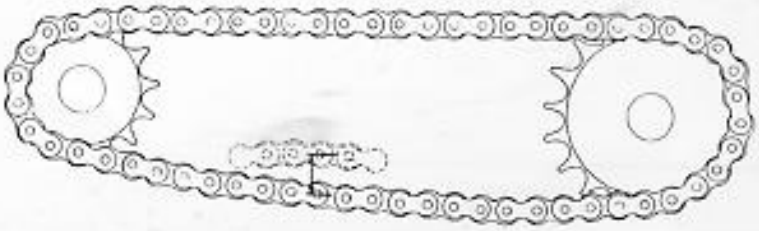
Fig. 9–3–2

* Measure the distance between a span of 20 pins, from pin center to pin center, with the chain held taut and any stiff joints straightened in order to determine if the chain is worn beyond its service limit. The distance of the new drive chain is 301.7 mm (11 7/8"), and if the distance exceeds 308.0 mm (12 1/8"), the chain is worn and must be replaced.



301.7mm (11 7/8 in)

* Check drive chain slack at the middle of the two sprockets by moving the chain up and down with fingers. Adjust the chain slack to 15–20 mm (0.6–0.8 in)



15–20mm (0.6–0.8 in)

9–4. Removing rear wheel

The rear axle bolt can not be removed to the side being blocked by four mufflers. Therefore, the rear wheel must be removed by the following procedure:

1. Pull out the cotter pin from the rear axle nut and loosen the nut.
2. Remove bolts, tightening the support to the tail of the swinging arm.
3. Loosen the chain adjuster, remove the support, push the wheel forward, and take off the chain from the sprocket.
4. Move the wheel backward and remove it.

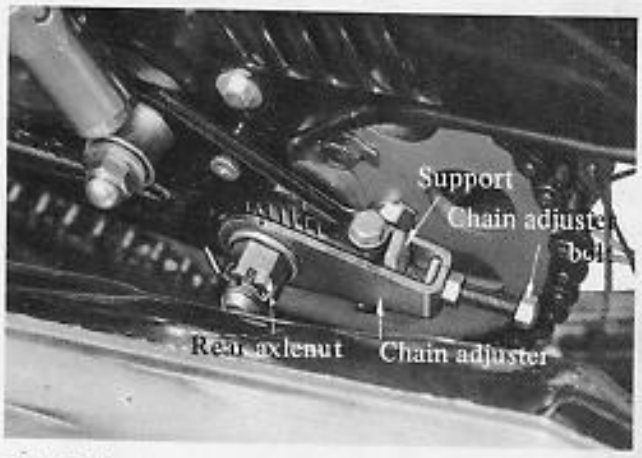


Fig. 9–4–1

9–5. Tire

The front tire is 3.00-19 and the rear tire is 3.50-18.

* Tire wear limits.

Because tires affect the high-speed safety directly, please encourage users (your customers) to strictly observe the wear limits given below.

Tire wear limit . . . . Depth of tread { Front 1.6mm / Rear 2.0mm

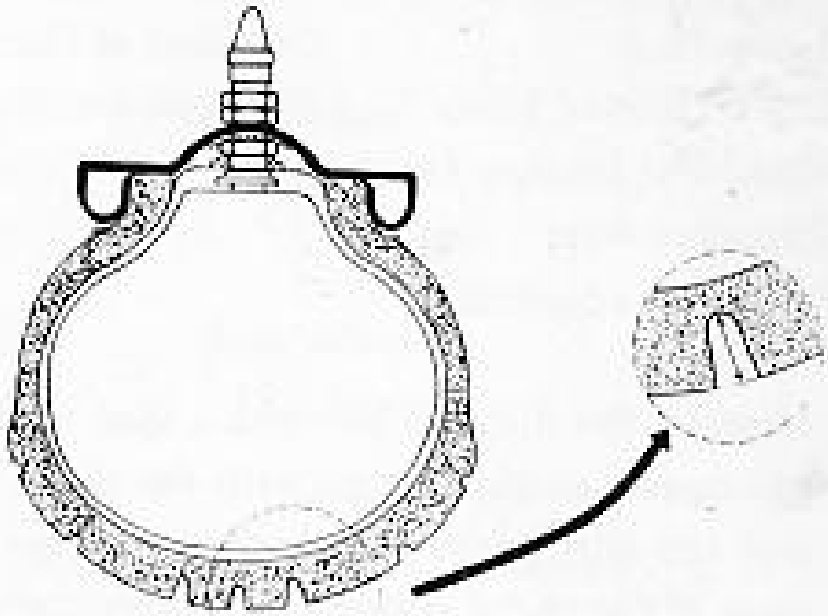


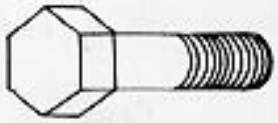
Fig. 9–5–1

10. TIGHTENING TORQUE

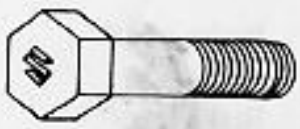
	Part	Tightening torque	
		kg-cm	lb-ft
1	Front axle nut	360-520	26-38
2	Front axle stopper nut	130-230	9.5-17
3	Rear axle nut	540-800	39-58
4	Steering stem head bolt (right & left)	180-300	13-23
5	Steering stem head bolt (rear side)	90-140	6.5-10
6	Steering stem bolt	200-300	14-23
7	Handle clamp bolt	90-200	6.5-14
8	Rear shock absorber (upper & lower)	180-280	13-20
9	Swinging arm pivot nut	500-750	36-54
10	Front & Rear brake cam lever nut	40- 70	2.9-5.1
11	Rear torque link nut	180-280	13-20
12	Front footrest bolt	300-450	23-33
13	Front torque link	180-280	13-21
14	Engine mounting bolt, nut	300-400	23-29
15	Engine mounting plate bolt	130-230	9.5-17

Tightening torque for general bolts

Bolt diameter (mm)	Tightening torque			
	Usual bolt		"S" marked bolt	
	kg-cm	lb-ft	kg-cm	lb-ft
	20 – 40	1.5 – 2.9	30 – 60	2.2 – 4.4
6	40 – 70	2.9 – 5.1	60 – 100	4.4 – 7.3
8	90 – 140	6.6 – 10	130 – 230	9.5 – 17
10	180 – 280	13 – 20	250 – 400	18 – 29



Usual bolt



"S" marked bolt

11. IMPORTANT FUNCTIONAL PARTS

For safety driving of motorcycle, it is highly requested to check up the important items in accordance with following check list taking opportunity of periodical inspection.

Check list of important functional parts for safety driving.

	Item	Check for
Fuel system	Fuel hose Fuel tank	Fuel leakage
Suspension system	Front fork ass'y	Crack, Faulty welding of bracket
	Front fork comp. Front fork upper bracket	Crack, Faulty welding
	Front axle Rear axle	Crack
	Rear swinging arm	Crack, Faulty welding
Steering	Handlebar Handlebar upper clamp Handlebar lower clamp	Crack
Braking system	Front hub drum Rear hub drum Front hub panel Rear hub panel	Crack
	Rear torque link	Crack
	Front brake shoe Rear brake shoe	Crack, Peeling off of lining
	Front brake cam shaft Rear brake cam shaft	Crack, Deformation of serration
	Rear brake rod	Crack
	Brake pedal	Crack, Faulty welding
	Brake lever	Crack
	Front brake cable ass'y	Detachment of cable end
Frame	Frame	Crack, Faulty welding

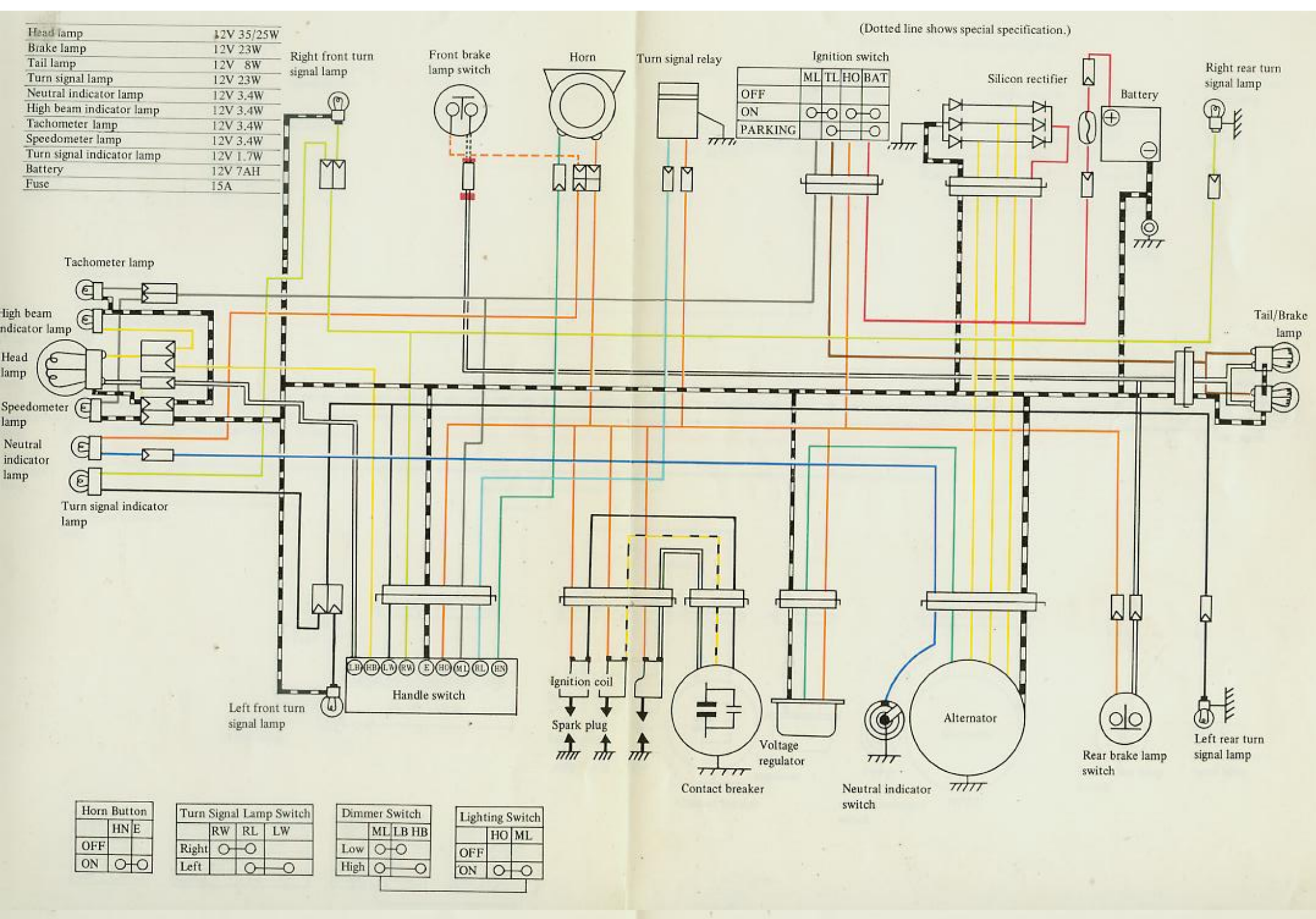
PERIODECAL INSPECTION LIST

The chart below indicates time when inspections, adjustments and maintenance are required based on the distance the motorcycle runs, that is first 1,000 km (750 mi), and every 3,000 km (2,000 mi), 6,000 km (4,000 mi) and 12,000 km (8,000 mi) thereafter. According to the chart, advise users to make the motorcycle checked and serviced at your shop. See the appropriate section for instructions on making the inspection.

Distance (km) / Distance (mi) / Service	1,000 km 750 mi	Every 3,000 km Every 2,000 mi	Every 6,000 km Every 4,000 mi	Every 12,000 km Every 8,000 mi
Oil pump	Check operation, adjust control lever adjusting marks	Check operation, adjust control lever adjusting marks		
Spark plug	Clean	Clean and adjust gap	Replace	
Gearbox oil	Change	Change		
Throttle clutch and brake cables	Adjust play	Adjust play	Lubricate	
Carburetor	Adjust with throttle valve screw and pilot air screw	Adjust with throttle valve screw and pilot air screw		Overhaul and clean
Contact point breaker ass'y	Check contact point gap and ignition timing	Check contact point gap and ignition timing. Lubricate contact breaker cam oil felt.		Replace contact point
Cylinder head and cylinder	Retighten cylinder and cylinder head nuts	Retighten cylinder and cylinder head nuts	Remove carbon	
Battery	Check and service electrolyte solution	Check and service electrolyte solution		
Fuel cock	Clean fuel strainer		Clean fuel strainer	
Drive chain	Wash, then adjust and lubricate	Wash, then adjust and lubricate	Wash, then adjust and lubricate	
Brakes	Adjust play	Adjust play		
Air cleaner		Clean		
Throttle grip			Put grease in throttle grip	
Clutch	Adjust	Adjust		
Muffler	Retighten exhaust pipe clamp fitting nuts	Retighten exhaust pipe clamp fitting nuts	Remove carbon	
Steering stem	Check play Retighten stem nut		Check play Retighten stem nut	
Bolts, nuts and spokes	Retithten		Retighten	
Tire		Check the tire tread condition		

Head lamp	12V 35/25W
Brake lamp	12V 23W
Tail lamp	12V 8W
Turn signal lamp	12V 23W
Neutral indicator lamp	12V 3.4W
High beam indicator lamp	12V 3.4W
Tachometer lamp	12V 3.4W
Speedometer lamp	12V 3.4W
Turn signal indicator lamp	12V 1.7W
Battery	12V 7AH
Fuse	15A

(Dotted line shows special specification.)



Horn Button		
	HN	E
OFF		
ON	○	○

Turn Signal Lamp Switch			
	RW	RL	LW
Right	○		
Left		○	○

Dimmer Switch			
	ML	LB	HB
Low	○		
High	○		○

Lighting Switch		
	HO	ML
OFF		
ON	○	○