

SUZUKI

SERVICE MANUAL

SUZUKI

RV90

FOREWORD

The "Suzuki RV90" is a completely new type of fan motorcycle designed and built for not only off the road use but on the road use. The Suzuki RV90 has outstanding mechanisms such as reed valve type intake system and CCI lubrication system.

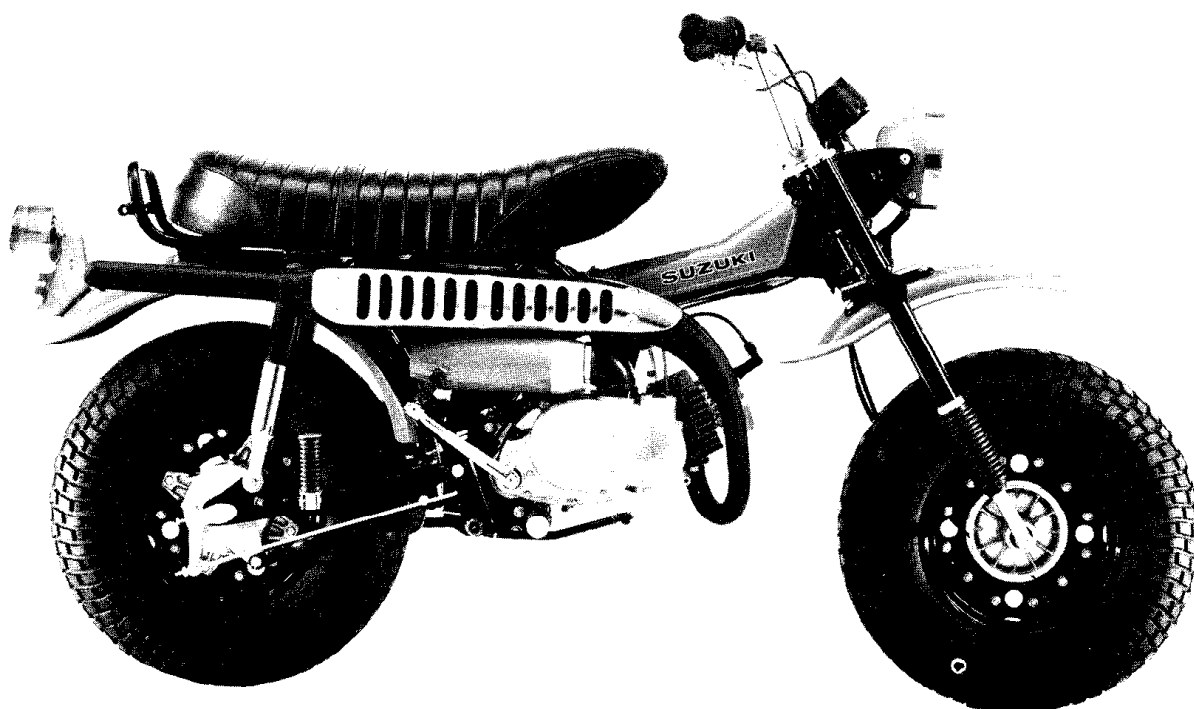
In order to obtain a high performance, many other features are built into the machine and regular inspection and maintenance for these points are of vital importance.

This manual is written to assist the mechanics in the efficient servicing of the RV90 and includes important information pertaining to the construction, inspection and service procedures of the components. All the measurements contained in this manual are based on the metric system but the values are also given in inches in parentheses for a handy reference.

It is hoped that this manual will assist the mechanics in performing perfect maintenance.

❖ SUZUKI MOTOR CO., LTD.

LEFT & RIGHT SIDE VIEWS



CONTENTS

	Page
1. SPECIFICATIONS	4
2. PERFORMANCE CURVES	6
3. TIPS ON OPERATION	7
4. SPECIAL TOOLS	8
5. TROUBLE SHOOTING	10
6. ENGINE	14
6-1. Removing engine from frame	14
6-2. Disassembling engine	16
6-3. Assembling engine	22
6-4. Reed valve	25
6-5. Oil pump	26
6-6. Transmission	28
6-7. Carburetor specification	30
7. BODY	31
7-1. Front fork	31
7-2. Wheels	32
7-3. Air filter	33
8. SPECIFICATIONS FOR INSPECTION AND REPAIR	34
9. ADJUSTMENT	36
10. TIGHTENING TORQUE	39
11. IMPORTANT FUNCTIONAL PARTS	40
* PERIODICAL INSPECTION LIST	
* WIRING DIAGRAMS	
For standard specification	
For USA & CANADA specification	
* EXPLODED VIEW OF ENGINE	
* REMOVABLE CHARTS	
Wiring diagram (For USA & CANADA specification)	
Exploded view of engine	

1. SPECIFICATIONS

DIMENSIONS

Overall Length	1,085 mm (71.1 in)
Overall Width	820 mm (32.3 in)
Overall Height	990 mm (39.0 in)
Wheel base	1,180 mm (46.5 in)
Ground Clearance	195 mm (7.7 in)
Tire, Front	6.70 - 10 4PR
Rear	6.70 - 10 4 PR
Dry Weight	84 kg (185 lbs)

PERFORMANCE

Maximum Speed	72 - 80 kph (45 - 50 mph)
Climbing Ability	30° (tan θ = 0.58)
Braking Distance	7 m (23 ft) at 35 kph (22 mph)

ENGINE

Type	2-stroke, air cooled gasoline
Cylinder	Single, inclined forward
Bore x Stroke	50 x 45 mm (1.97 x 1.77 in)
Piston Displacement	88 cc (5.37 cu-in)
Compression Ratio (corrected)	6.2 : 1
Maximum Horse Power	8.0 hp/6,000 rpm
Maximum Torque	1.0 kg-m (7.23 lb-ft)/4,000 rpm
Starter	Kick starter

FUEL SYSTEM

Carburetor	VM 17 SC
Air Cleaner	Wet polyurethane filter
Fuel Tank Capacity	3.3 ltr (0.87/0.73 gal, US/IMP)

LUBRICATION SYSTEM

Engine	Suzuki CCI
Gear-Box	0.7 ltr (1.5/1.2 pt, US/IMP)
Engine Oil Tank Capacity	0.8 ltr (1.7/1.4 pt, US/IMP)

IGNITION SYSTEM

Type	Flywheel magneto
Ignition Timing	22 degree (2.04 mm) before T.D.C.
Spark Plug	NGK BP-6HS or Nippon Denso W-20FP

POWER TRANSMISSION

Clutch Type	Wet, multi-disc type
Number of Speeds	4 Speeds
Gear Shifting	Left foot operated, return type
Gear Ratios (Overall Reduction Ratio)	

1st	2.909 : 1 = 32/11	(31.59)
2nd	1.866 : 1 = 28/15	(20.26)
3rd	1.470 : 1 = 25/17	(15.96)
4th	1.100 : 1 = 22/20	(11.94)

Primary Reduction Ratio	3.466 : 1 = 52/15
Final Reduction Ratio	3.133 : 1 = 47/15

SUSPENSION

Front Suspension	Telescopic forks
Rear Suspension	Swinging arm, with hydraulic damper

STEERING

Steering Angle	43° (right and left)
Caster Angle	60°
Trail	112 mm (4.4 in)
Turning Radius	1,900 mm (74.8 in)

BRAKES

Front Brake	Right hand, internal expanding
Rear Brake	Right foot, internal expanding

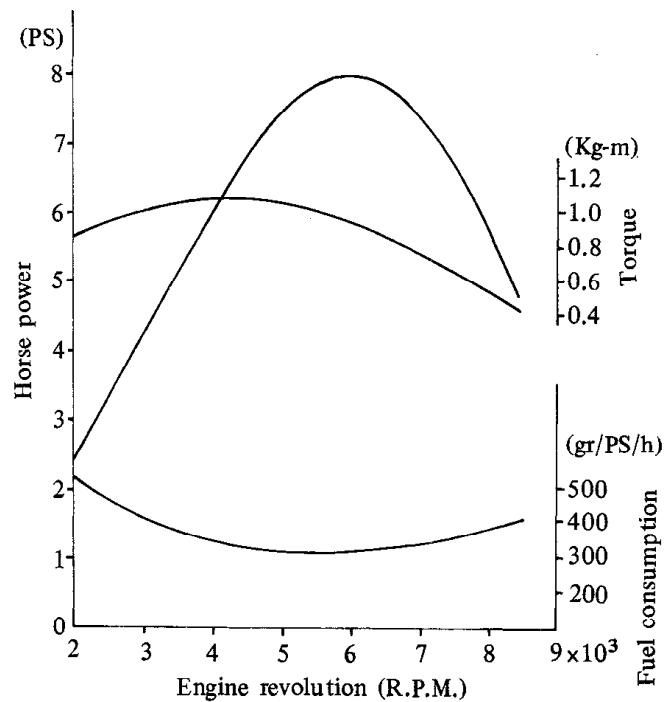
ELECTRICAL EQUIPMENT

Generator	Flywheel magneto
Battery	6V 2AH
Fuse	15A
Head Lamp	6V 25/25W
Tail/Brake Lamp	6V 3/10W (3/21CP)
Neutral Indicator Lamp	6V 3W
Speedometer Lamp	6V 3W
Turn Signal Lamp	6V 8W × 4 (Option for USA & CANADA)
High Beam Indicator Lamp	6V 1.7W
Turn Signal Indicator Lamp	6V 1.7W

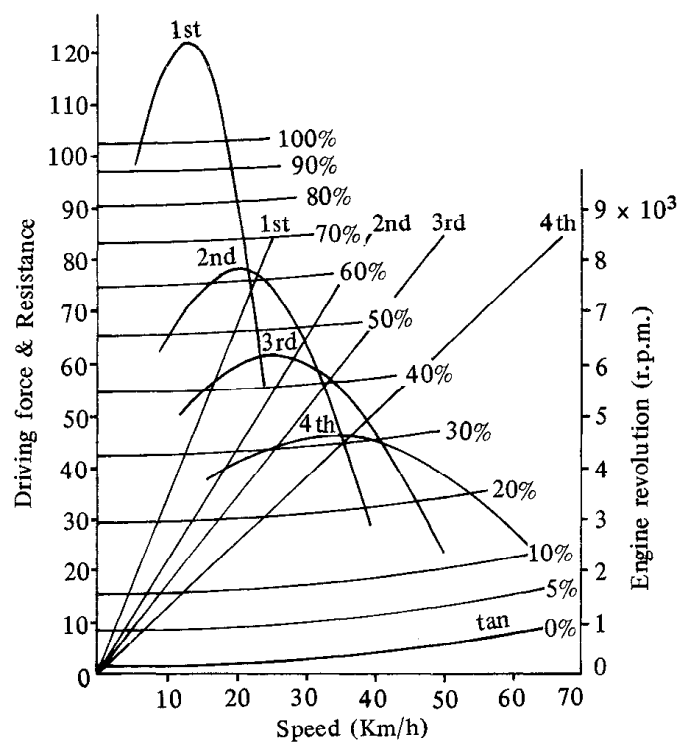
* The specifications subject to change without notice.

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) 30 mile/h (45 km/h)
up to 1,000 miles (1,600 km) 35 mile/h (55 km/h)

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.

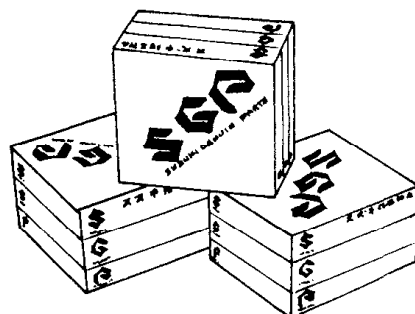
FUEL REGULAR GRADE GASOLINE
OIL SUZUKI CCI OIL

* 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.

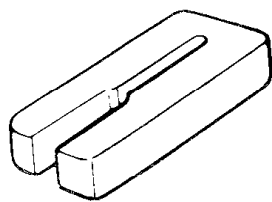


4. SPECIAL TOOLS

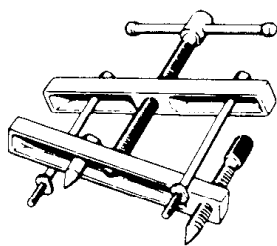
Special tools listed below are used to disassemble, assemble and to perform maintenance and service. These special tools make works easy which cannot be done simply with ordinary tools and prevent the parts from damage. It is recommended to provide these special tools as shop equipment.

Ref. No.	Tool No.	Tool Name	Use for
1	09910-20111	Piston holder	Locking crankshaft
2	09910-80112	Crankcase separating tool	Separating crankcase
3	09913-50110	Oil seal remover	Removal of oil seals
4	09913-70122	Bearing & oil seal installing tool	Installation of bearings & oil seals
5	09913-80110	Bearing & oil seal installing tool	Installation of bearings & oil seals
6	09920-20310	Clutch spring hook	Removal or Installation of clutch spring pin
7	09920-52310	Clutch sleeve hub holder	Locking clutch sleeve hub
8	09920-60310	Clutch sleeve hub holder handle	Locking clutch sleeve hub
9	09920-70111	Snap ring opener	Removal or Installation of snap rings
10	09930-10111	Spark plug wrench	Removal or Installation of spark plug
11	09930-20111	Point wrench with 0.35 mm gauge	Adjustment of contact point
12	09930-30113	Rotor remover	Removal of flywheel
13	09930-40113	Engine sprocket & flywheel holder	Locking engine sprocket or flywheel
14	09931-00111	Timing gauge	Checking ignition timing
15	09940-10122	Steering stem lock nut wrench	Tightening or loosening steering stem nut or front fork lower tube
16	09940-60112	Spoke nipple wrench	Adjustment of spoke tension
17	09900-09002	Shock driver	Loosening cross-head screw
18	09900-25001	Pocket tester	Checking electrical equipments
19	09900-27002	Timing tester	Adjustment of ignition timing

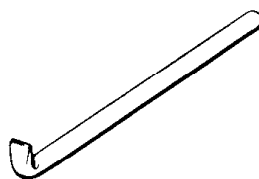
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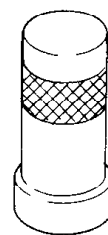
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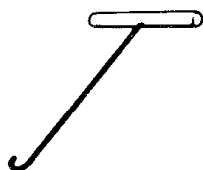
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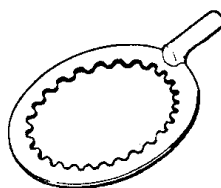
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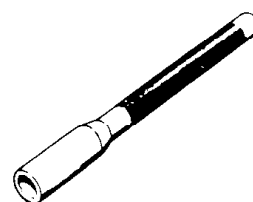
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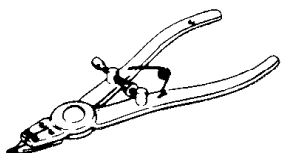
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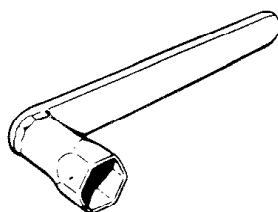
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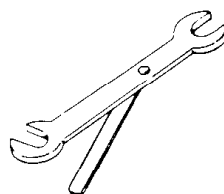
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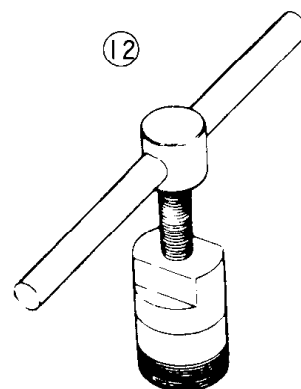
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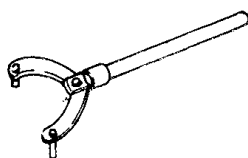
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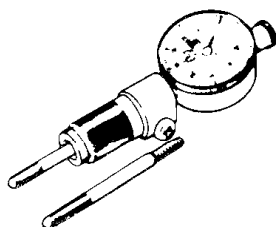
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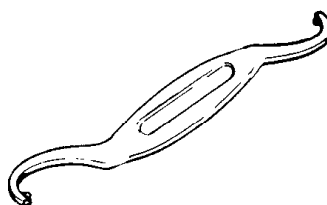
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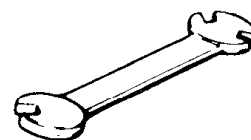
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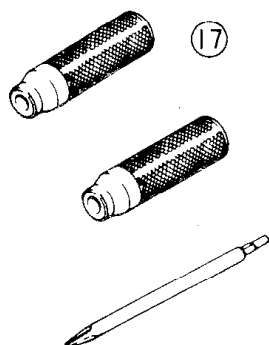
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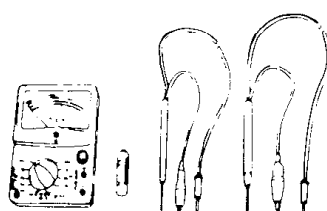
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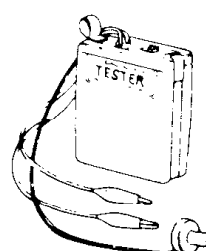
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5. TROUBLE SHOOTING

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 2. Fuel pipe clogged or damaged 3. Tank cap air vent clogged 4. Fuel cock clogged	Remove and clean Clean or replace Clean with wire 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 2. Carburetion 3. Engine compression	Adjust Adjust Recover it
	* If spark is weak 1. Damage in spark plug 2. Incorrect spark plug gap 3. Damage in spark plug cap 4. Dirty contact points 5. Bad insulation in condenser 6. Damage in ignition coil or primary coil	Replace Adjust Replace Clean and adjust Replace Replace
	* If there is no spark 1. Damage in spark plug 2. Dirty or wet spark plug 3. Incorrect spark plug gap 4. Dirty or incorrect contact point gap 5. Bad insulation in condenser 6. Damage in ignition coil or primary coil 7. Damage in ignition switch 8. Damage in wiring harness 9. Incorrect spark plug heat range	Replace Clean Adjust Clean and adjust Replace Replace Replace Repair or replace 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. Defective 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 breather pipe choked	Rectify
	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

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 position.	

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

5–6. Bad stability and steering

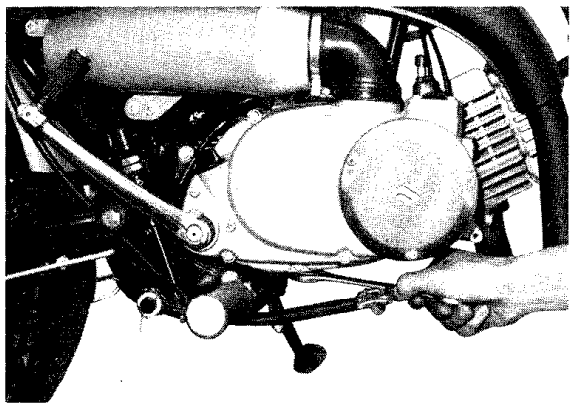
Description	Check Points	Remedy
1. Handlebar is stiff	1. Steering stem lock nut tight 2. Steering stem bent 3. Steel balls damaged	Adjust Repair or replace Replace
2. Handlebar is not stable	1. Incorrect wheel alignment 2. Play in front wheel fitting 3. Steel balls damaged 4. Fork stem bent 5. Bearing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

6. ENGINE

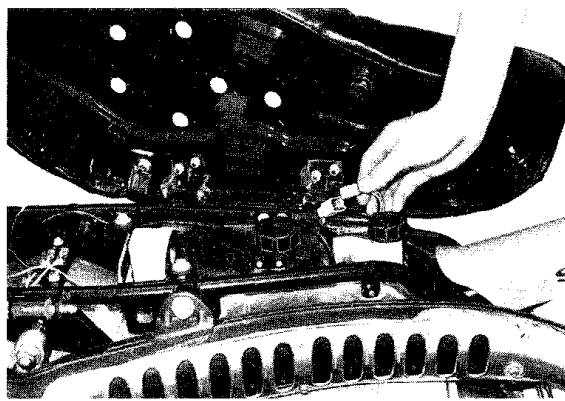
6-1. Removing engine from frame

Prior to the removal operation, thoroughly clean the engine with a steam cleaner or cleaning solvent to remove road dirt.

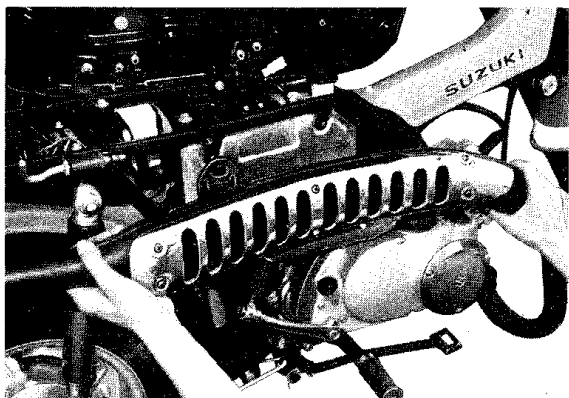
The removal procedure is as follow.



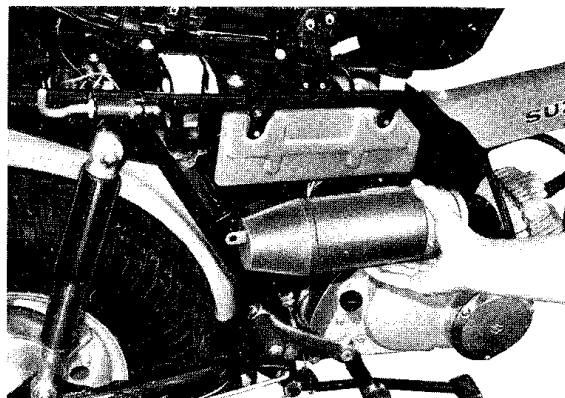
6-1-1 Draining oil away



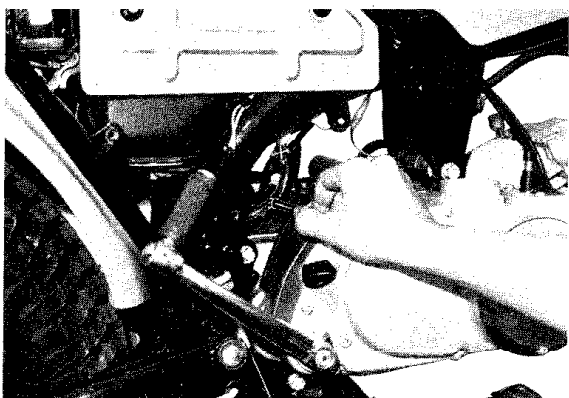
6-1-2 Disconnecting magneto wires



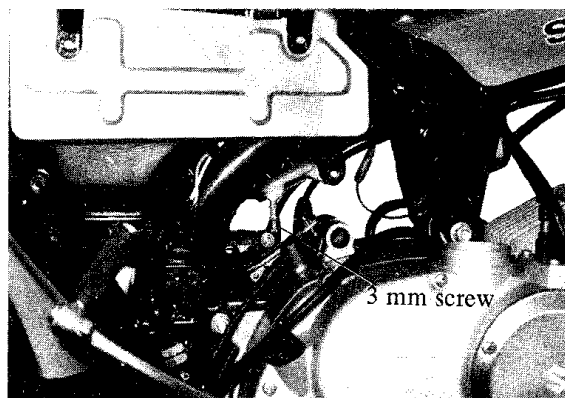
6-1-3 Removing muffler



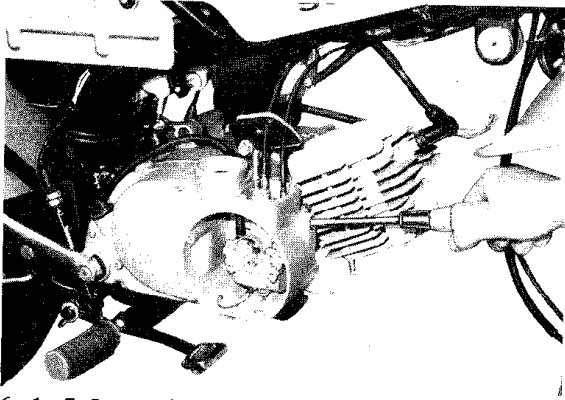
6-1-4 Removing air filter



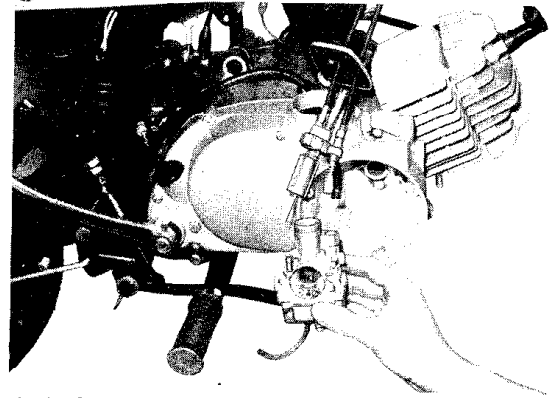
6-1-5 Disconnecting fuel hose



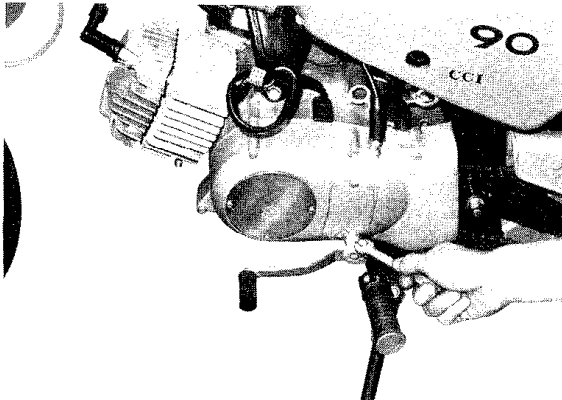
6-1-6 Disconnecting oil pipe and plugging
3 mm screw into oil tank outlet



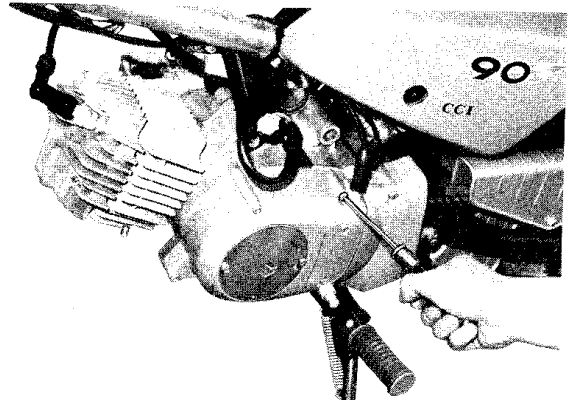
6-1-7 Loosening carburetor clip bolt



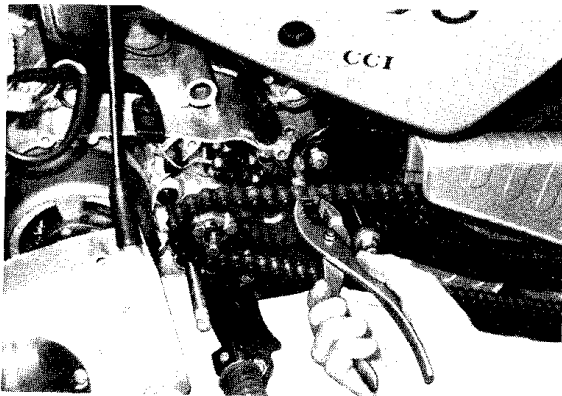
6-1-8 Removing carburetor



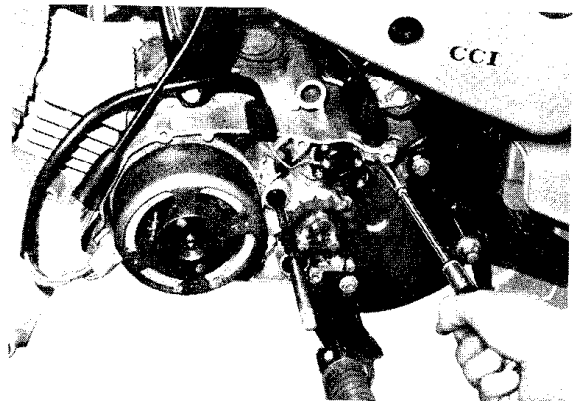
6-1-9 Removing gear shift lever



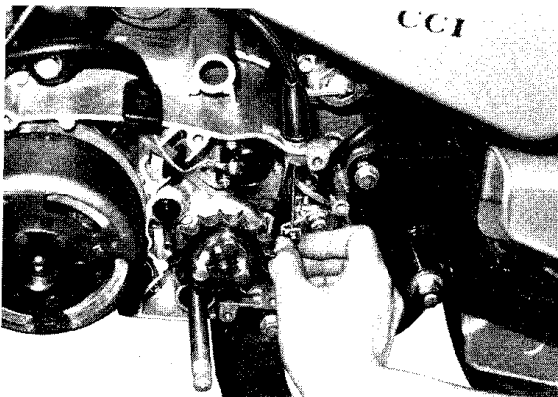
6-1-10 Removing engine left cover



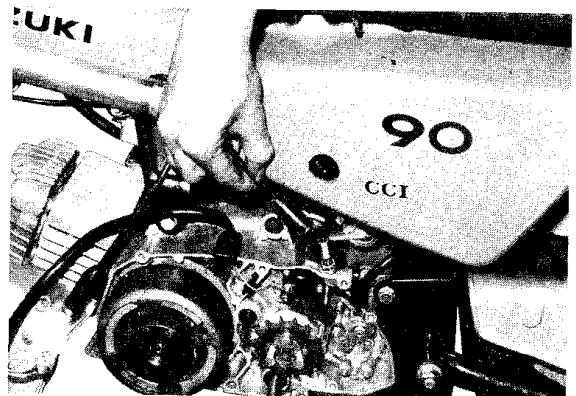
6-1-11 Disconnecting drive chain



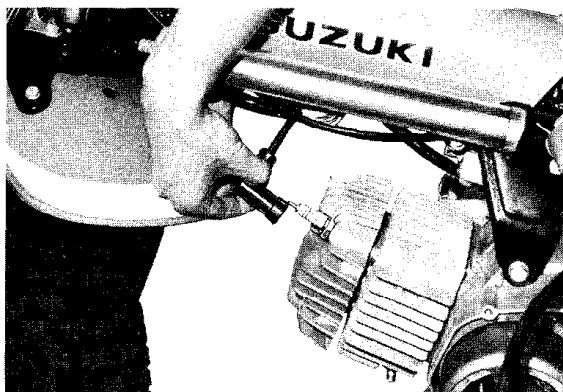
6-1-12 Removing oil pump cover



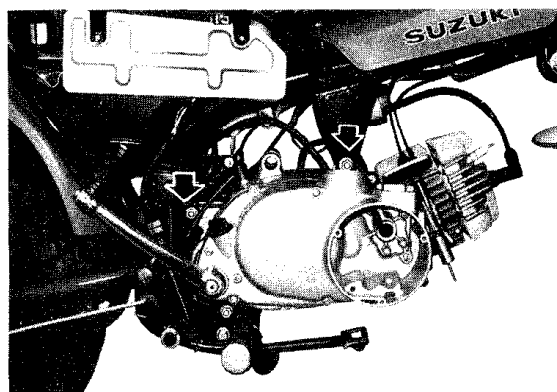
6-1-13 Disconnecting oil pump control cable



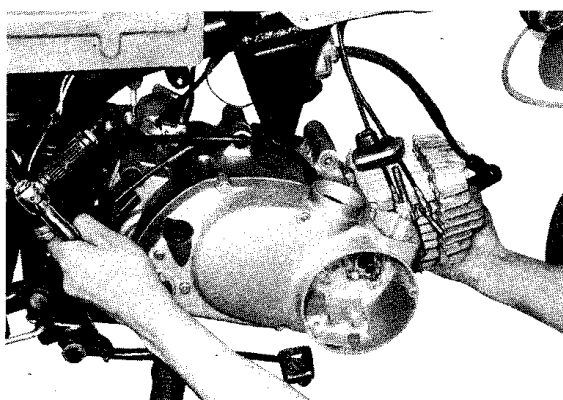
6-1-14 Disconnecting oil pump control cable



6-1-15 Disconnecting high tension cord



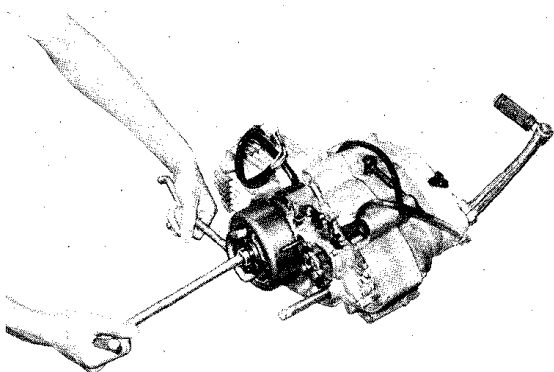
6-1-16 Removing engine mounting bolts



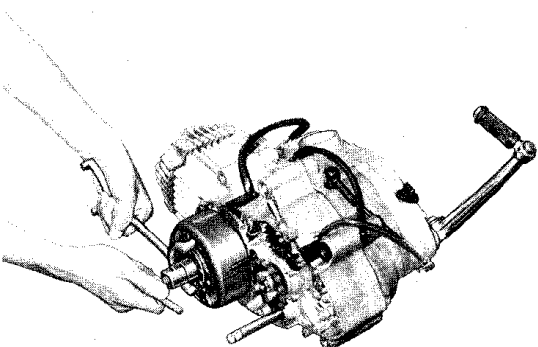
6-1-17 Removing engine

6-2. Disassembling engine

When disassembling engine, take the following steps.



6-2-1 Removing rotor fitting nut

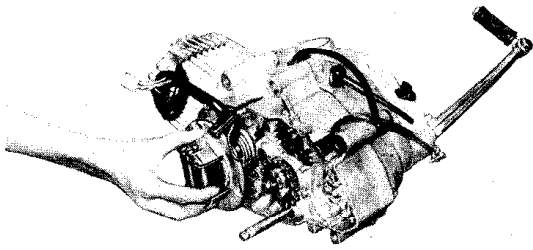


6-2-2 Removing rotor

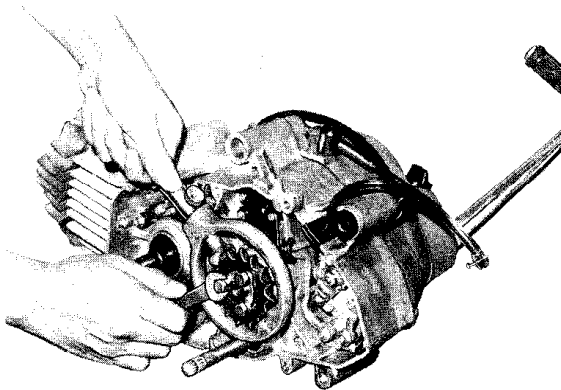
1. Hold the flywheel rotor with special tool 09930-40113 or 09930-40111 and remove the rotor fitting nut. fig. 6-2-1

To remove the flywheel rotor from the crankshaft, screw the rotor remover, special tool 09930-30113, counterclockwise into the center hole of the flywheel rotor and turn the handle clockwise. fig. 6-2-2.

2. Take off the magneto stator after removing 3 screws fitted on the stator and disconnect the neutral switch wire from the switch body. fig. 6-2-3.



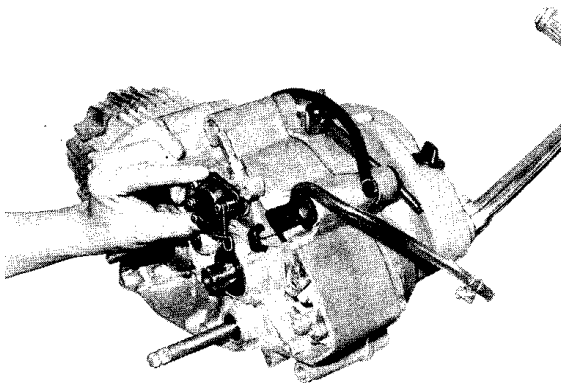
6-2-3 Removing magneto stator



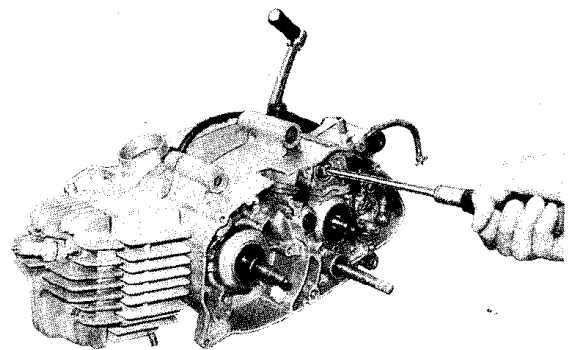
6-2-4 Removing drive sprocket

3. Hold the drive sprocket with special tool 09930-40113 or 09921-10111 and remove 3 bolts on the sprocket. Now the sprocket can be easily taken off by turning the sprocket plate half pitch of the spline. fig. 6-2-4.

4. Remove the neutral switch body by loosening three fitting screws. fig. 6-2-5.
Remove the neutral switch contact point as shown in fig. 6-2-6.

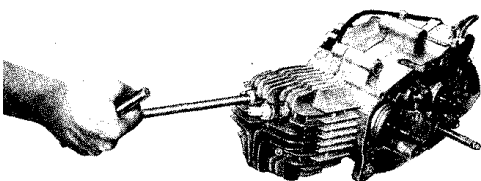


6-2-5 Removing neutral switch body



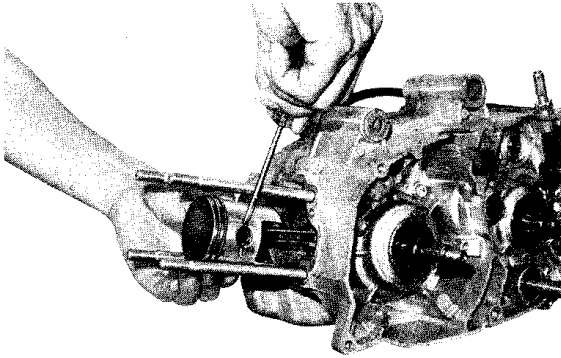
6-2-6 Removing contact point

5. Unscrew 4 cylinder head nuts and take off the cylinder head and the cylinder.

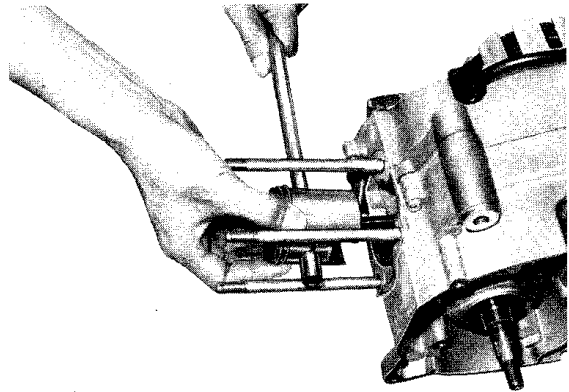


6-2-7 Removing cylinder head

6. After removing the cylinder, cover the crankchamber with a clean rag to prevent a piston circlip or a foreign substance from dropping into it. Remove one piston pin circlip from the piston with a small screw driver or nose pliers. Now, piston pin can be easily removed by pushing the other end of the pin with a rod. fig. 6-2-8 & 6-2-9.

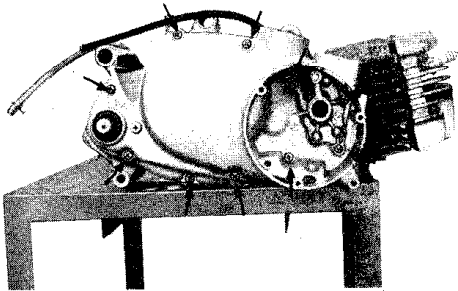


6-2-8 Removing piston pin circlip



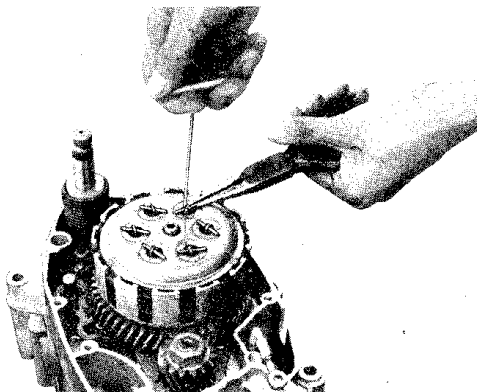
6-2-9 Removing piston pin

7. Remove the crankcase right cover by loosening 10 cross head screws and taking off the kick starter lever. fig. 6-2-10

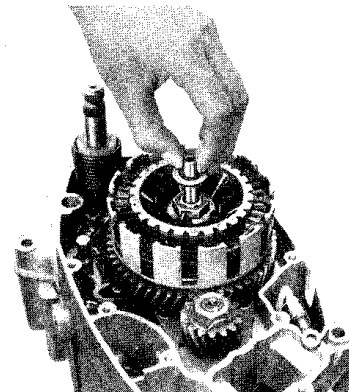


6-2-10 Fitting screws

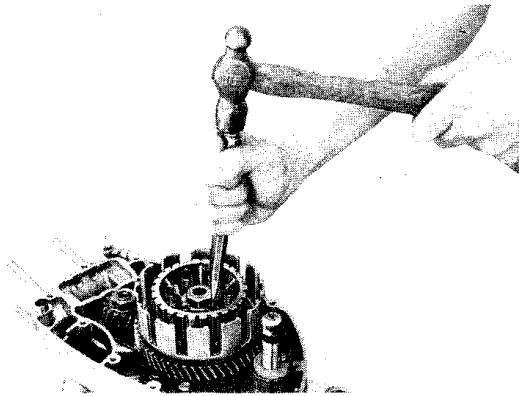
8. Pulling the clutch springs with the clutch spring hook, special tool 09920-20310, take out the clutch spring pins with nose pliers. Remove the clutch pressure plate, release rod and drive driven plates from the clutch. fig. 6-2-11 & 6-2-12



6-2-11 Removing clutch spring pin

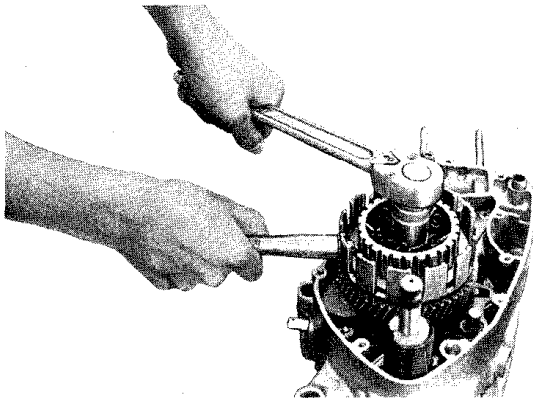


6-2-12 Removing clutch release rod



6-2-13 Clutch sleeve hub washer

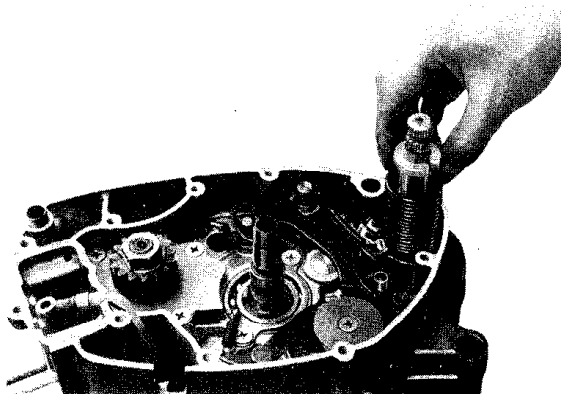
9. Flatten the clutch sleeve hub washer with a chisel and a hammer. fig. 6-2-13. Loosen the clutch sleeve hub nut by holding the hub with special tools 09920-60310 and 09920-52310. fig. 6-2-14.



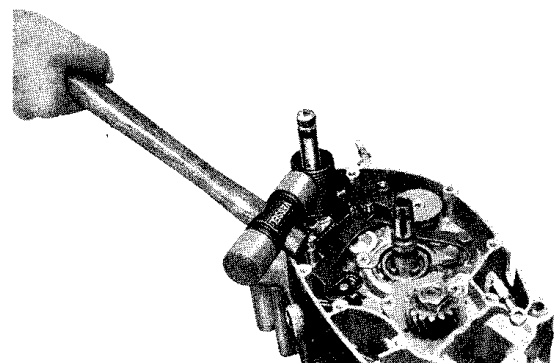
6-2-14 Loosening clutch sleeve hub nut

10. Remove the clutch housing from the counter shaft together with the clutch sleeve hub and the clutch sleeve hub spacer. Also remove the coil spring placed behind the housing.

11. Pull out the spring guide (fig. 6-2-15) and tap the spring out of the kick starter shaft hole with a soft hammer. (fig. 6-2-16)

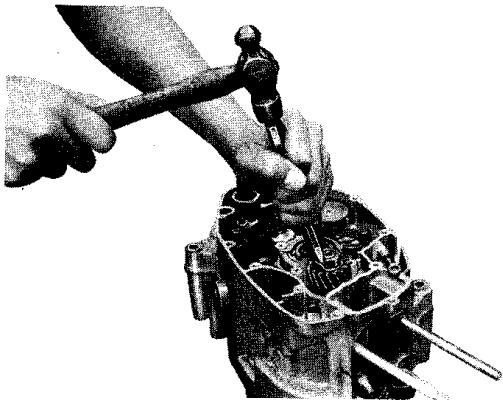


6-2-15 Kick starter spring guide

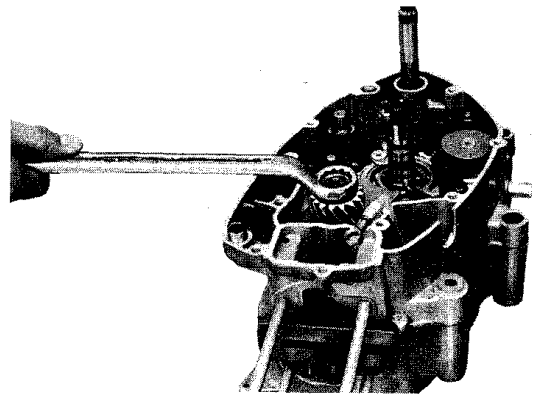


6-2-16 Removing kick starter spring

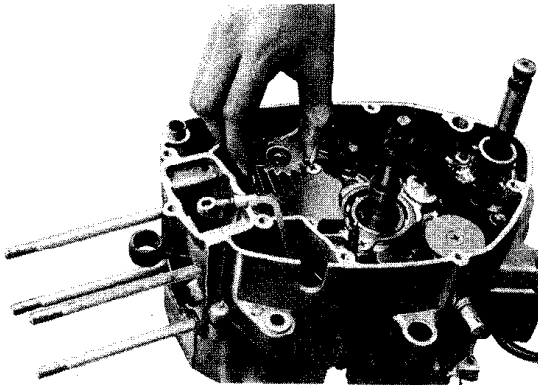
12. After flattening the primary pinion lock washer with a chisel and a hammer (fig. 6-2-17), place piston holder, special tool 09910-20111, between the connecting rod and the crankcase, and loosen primary pinion lock nut. (fig. 6-2-18) The primary pinion can be removed by hand. (fig. 6-2-19) Remove the key from the crankshaft. (fig. 6-2-20)



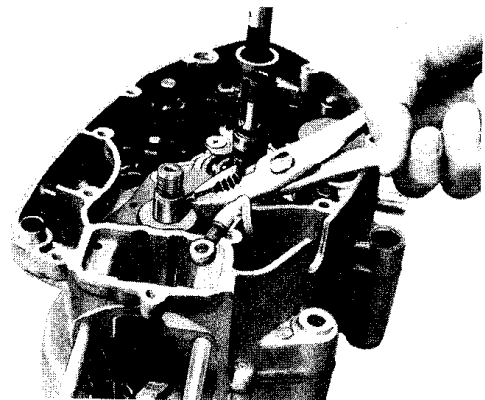
6-2-17 Flattening lock washer



6-2-18 Loosening lock nut



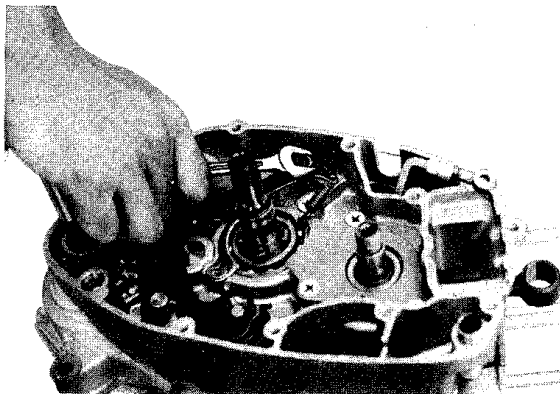
6-2-19 Removing primary pinion



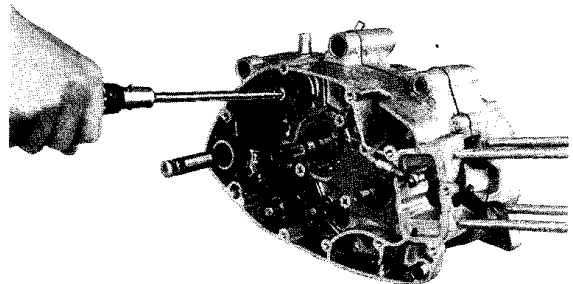
6-2-20 Removing key

13. Remove the gear shifting cam stopper by loosening its pivot bolt. fig. 6-2-21.

14. Remove the gear shifting cam stopper plate and 4 pieces of cam pin. fig. 6-2-22.



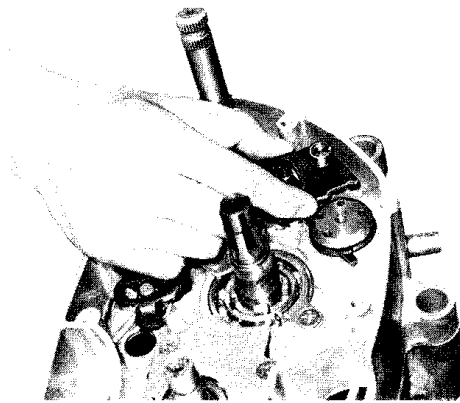
6-2-21 Removing cam stopper



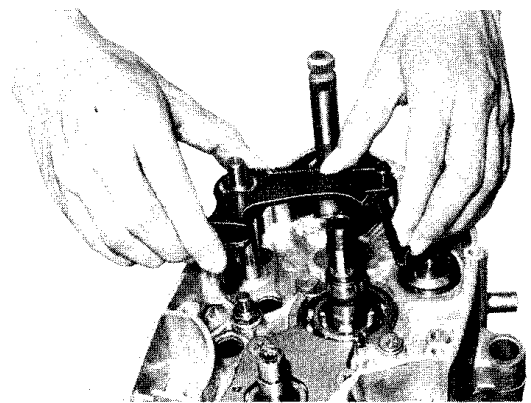
6-2-22 Removing cam stopper plate

15. Remove the gear shifting cam stopper paul after taking off the circlip fitted at pivot of the paul. fig. 6-2-23.

16. Pull up the gear shifting shaft by hand pressing back the gear shifting paul with fingers. fig. 6-2-24.

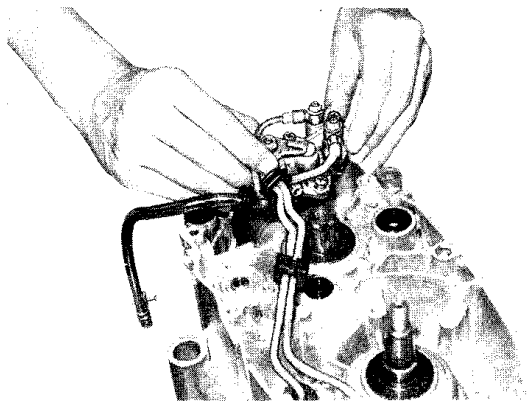


6-2-23 Removing cam stopper paul

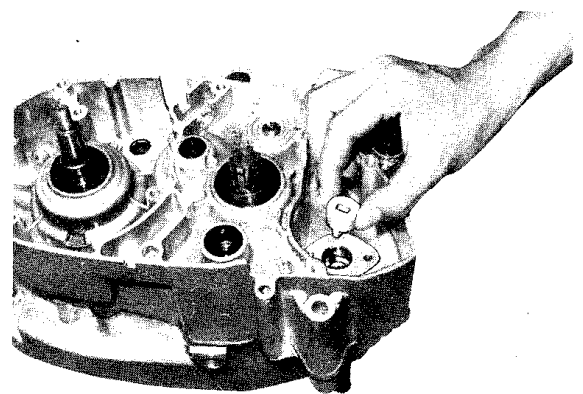


6-2-24 Pulling out gear shifting shaft

17. Remove the oil pump and its driving piece after taking off the pump fitting bolts and disconnecting the oil pipes at crankcase side end. fig. 6-2-25 & 6-2-26.

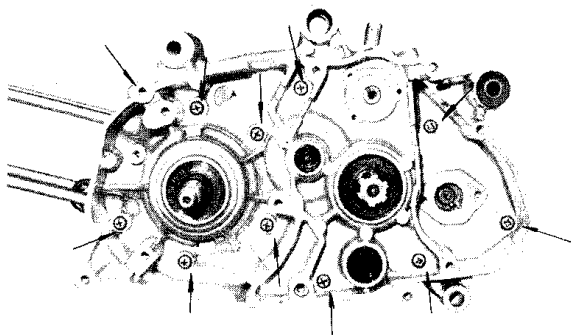


6-2-25 Removing oil pump



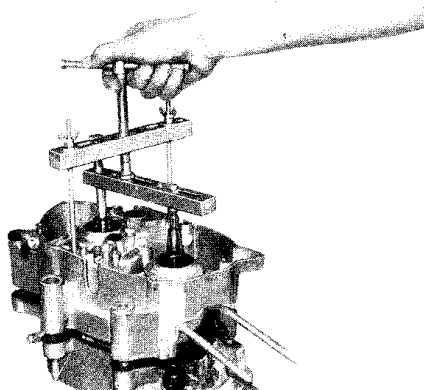
6-2-26 Oil pump driving piece

18. Loosen 11 crankcase joining screws with an impact driver or a cross head screw driver. fig. 6-2-27.

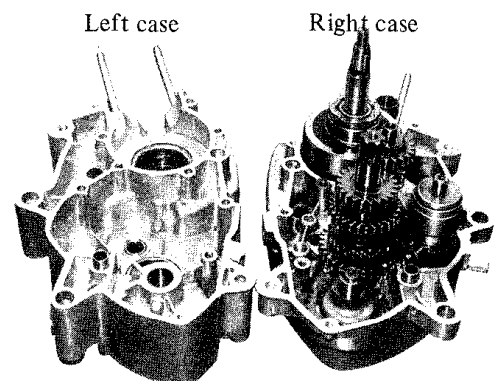


6-2-27 Crankcase joining screws

19. Separate the crankcase into right and left half with special tool 09910-80111 leaving inside parts on right half of the case. fig. 6-2-28 & 6-2-29.

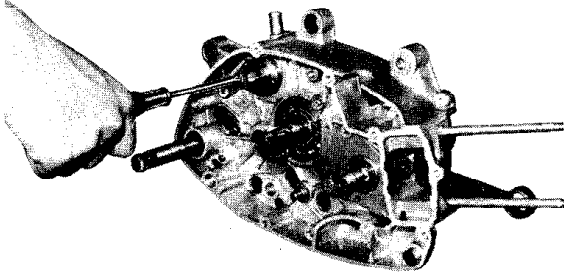


6-2-28 Separating crankcase

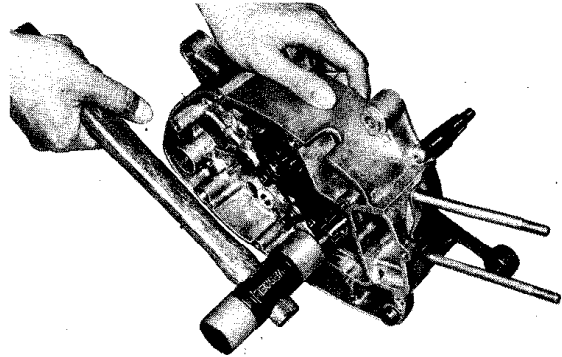


6-2-29 Separated crankcase

20. Transmission inside parts can be taken out of the case by removing the gear shifting cam guide as shown in fig. 6-2-30.
30. Remove the crankshaft from the crankcase right half by striking the right end of the crankshaft with a soft hammer. fig. 6-2-31.



6-2-30 Removing cam guide



6-2-31 Removing crankshaft

6-3. Assembling engine

For reassembling the engine after necessary inspections or repairs, follow the reverse order of disassembling. The instructions for assembling are described in this section.

1. Install the crankshaft and the gear box components in the crankcase right half as shown in fig. 6-3-1.

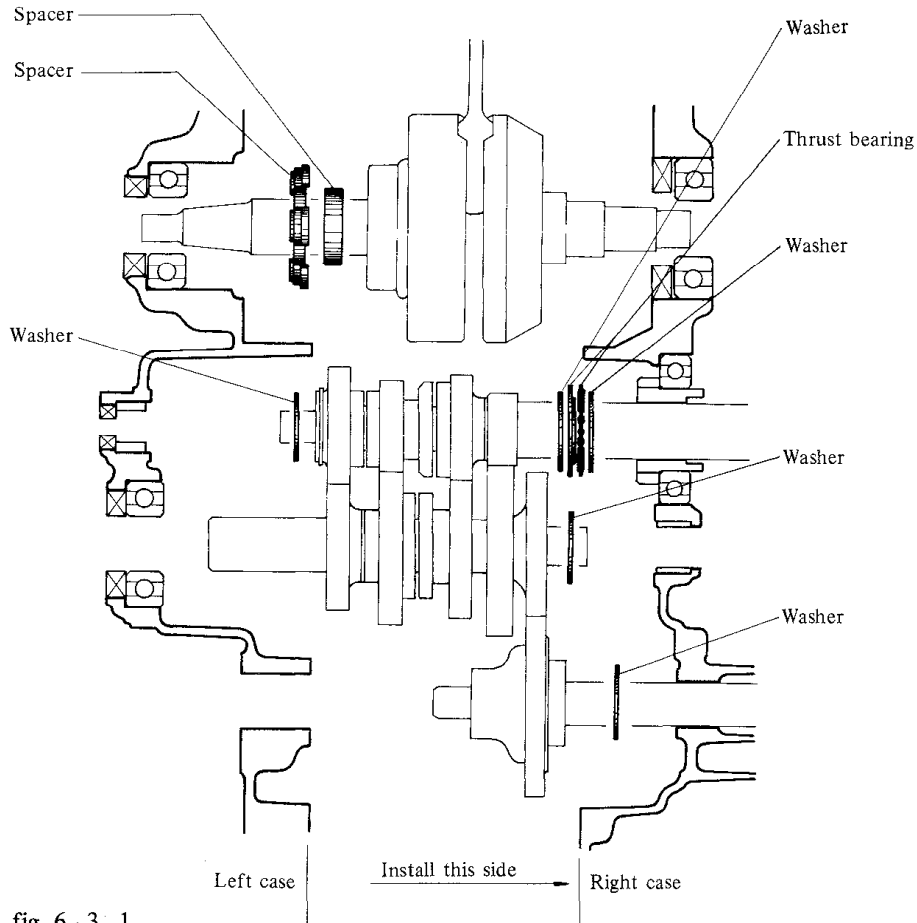


fig. 6-3-1

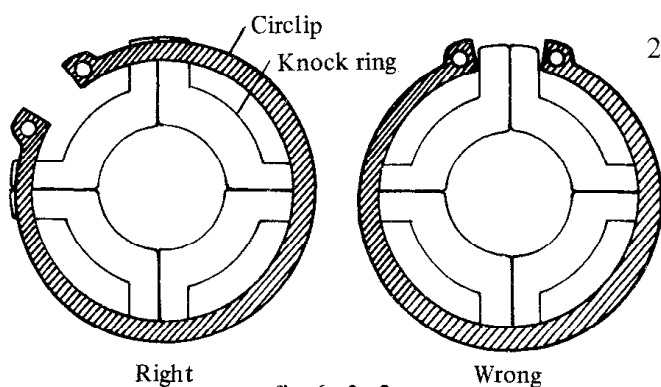
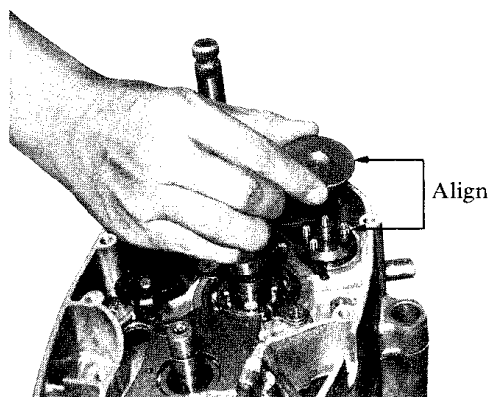


fig. 6-3-2

2. When installing the 4th pinion on the countershaft, use the circlip and the knock rings to position the gear in right place on the shaft. The circlip should be installed on the gear as shown in fig. 6-3-2.

3. Before joining the separated crankcase, apply oil to the connecting rod big end, bearings and transmission parts.
4. Apply a little grease to the lips of oil seals.
5. After joining the crankcase, tighten the crankcase 11 cross head screws evenly in a criss-cross fashion from crank chamber side to transmission side in order to prevent the case from warping and crank chamber compression from leakage. After tightening the screws, check if all the shafts turn easily and smoothly by hand.
6. When installing the gear shifting cam stopper plate, align the positioning mark on the plate with the short pin. fig. 6-3-3.



6-3-3 Aligning mark

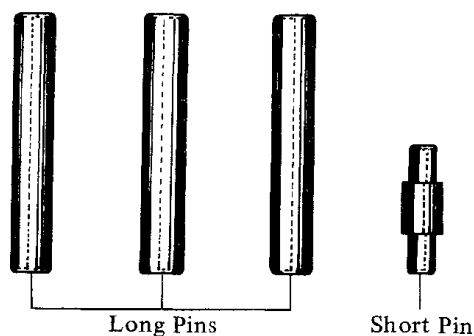
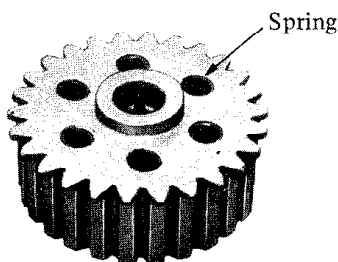
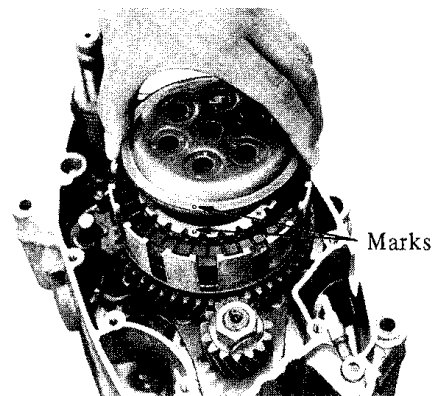


fig. 6-3-4

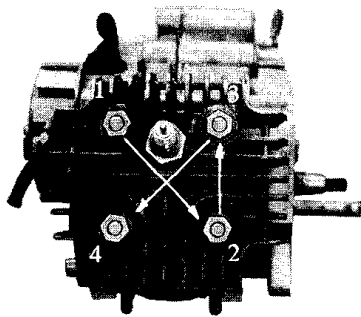
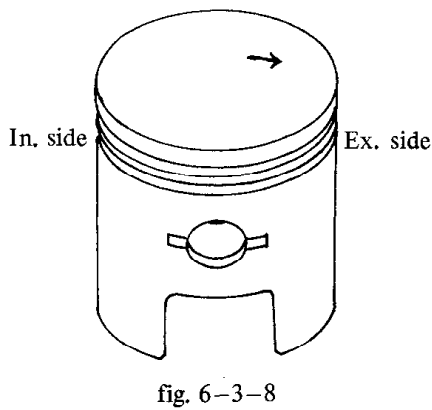
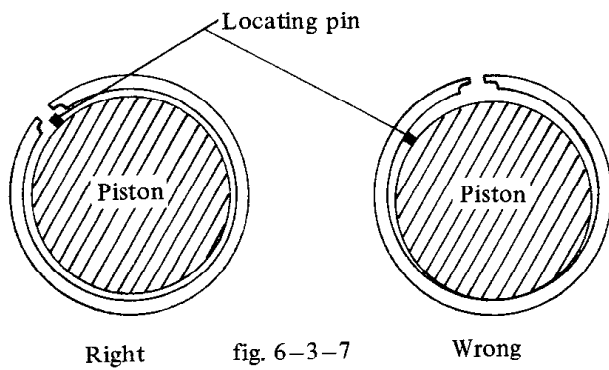
7. Clutch spring bottom ends should be kept in the same level with the bottom surface of the clutch sleeve hub and should not be protruded. fig. 6 3 -5.
8. Align the positioning mark on the clutch pressure plate with the mark on the edge of the clutch sleeve hub. fig. 6-3-6.



6-3-5 Clutch springs



6-3-6 Aligning marks



9. When fitting the piston rings in the piston, pay attention to the following matters.

- A. Clean the piston and piston rings thoroughly with a cleaning solvent.
 - B. Install the rings with the stamped mark facing upward.
 - C. Align the piston ring open ends with the piston ring locating pin set in the piston ring groove. fig. 6-3-7.
 - D. Insert expander ring inside the 2nd piston ring.
- * Top ring is tapered and 2nd ring is flat shaped.

10. The piston pin hole is off-center and the piston skirt is cut according to the shape of scavenging passage on the crankcase, therefore, the piston should be installed in proper direction. The arrow mark on the piston head indicates the exhaust side.

11. When installing the cylinder head, tighten the 4 cylinder head nuts diagonally and evenly. fig. 6-3-9.

6-4 Reed valve

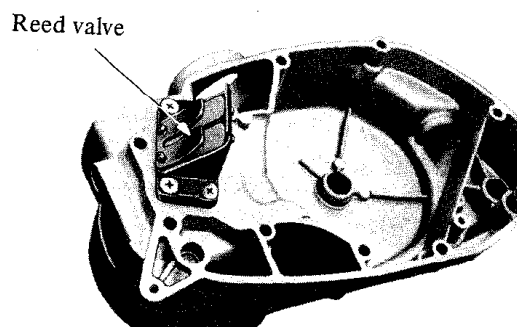


fig. 6-4-1

The reed valve unit is installed on the engine right cover as shown in fig. 6-4-1, which checks the fuel blow-back to the carburetor and enables smooth fuel inlet flow at the beginning of the engine suction stroke.

The valve is operated by the vacuum and pressure in the crank chamber as shown in the illustration.

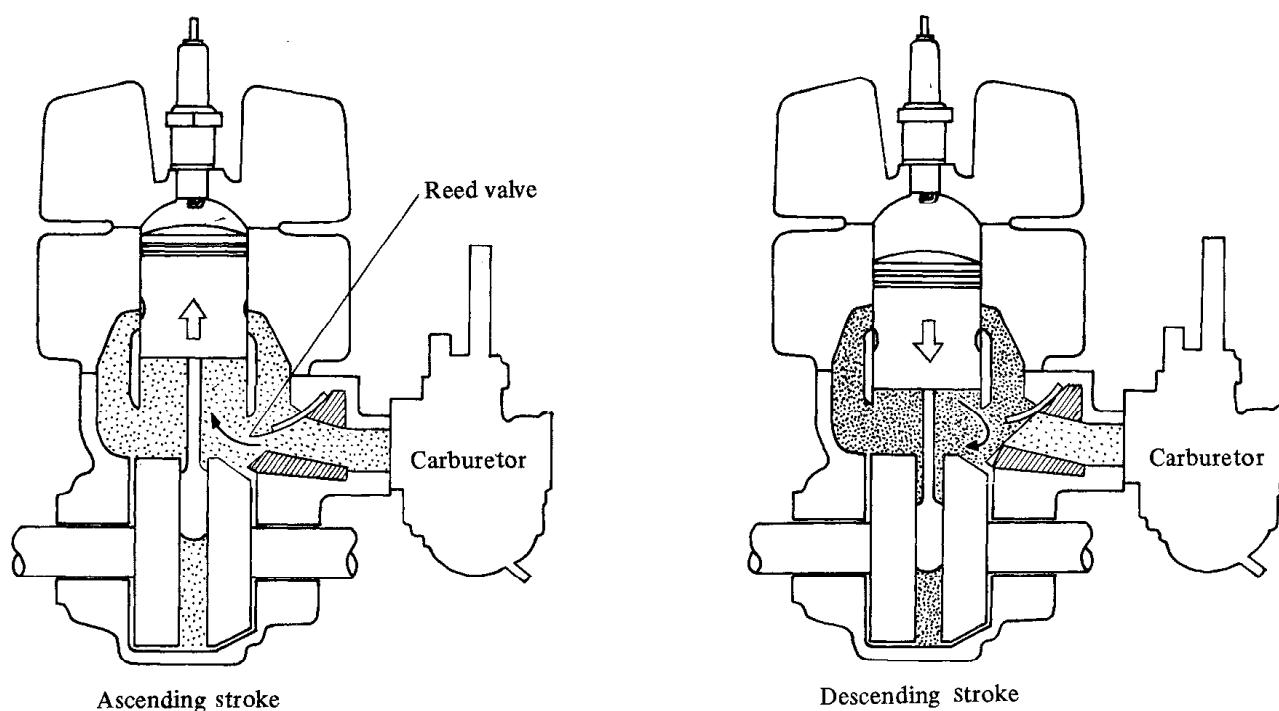


fig. 6-4-2

6-5. Oil pump

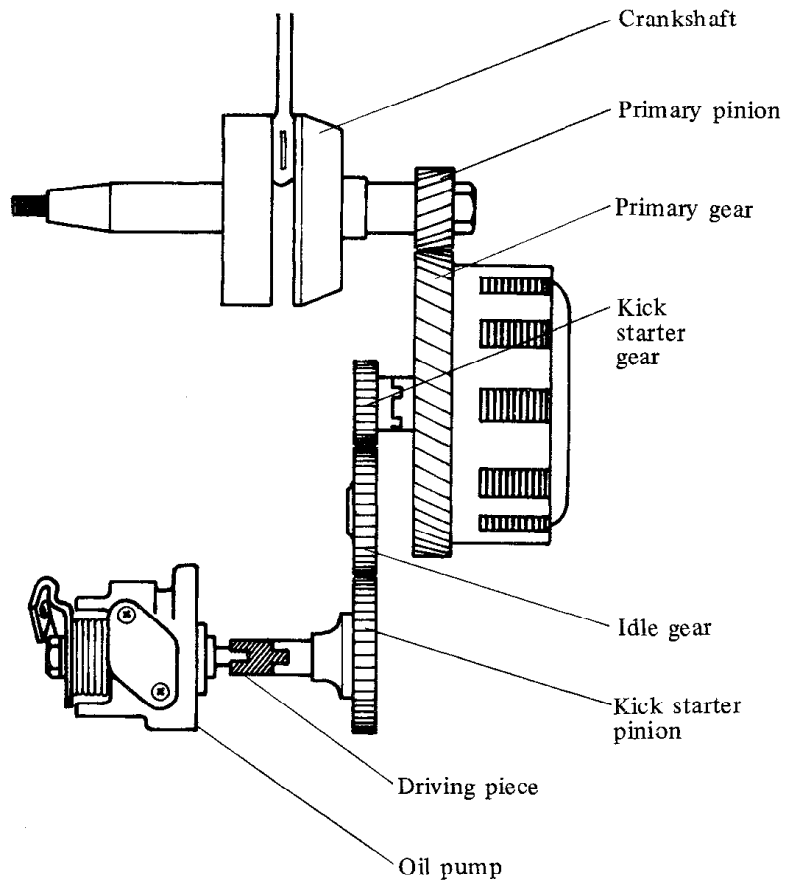


fig. 6-5-1

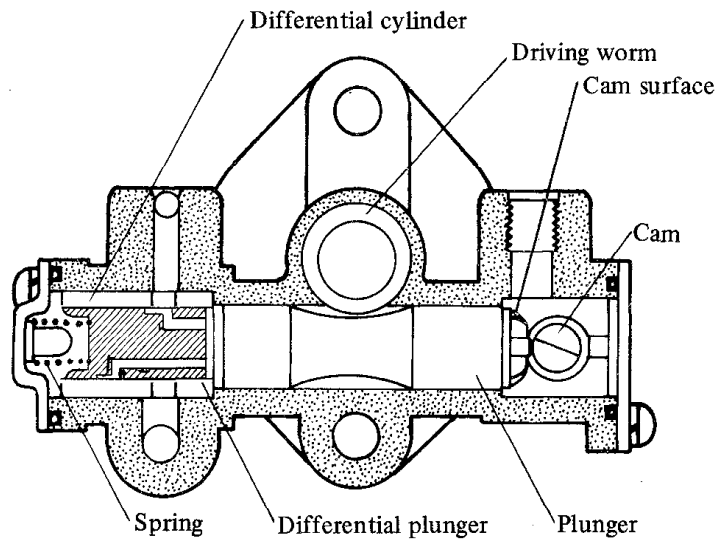


fig. 6-5-2

The oil pump driving force is transmitted from the crankshaft to the pump through the primary pinion, primary gear, kick starter gear, idle gear and kick starter pinion as shown in fig. 6-5-1.

The construction of the oil pump is shown in fig. 6-5-2.

The plunger and the differential plunger are always pressed to the right side by the spring and their movements to the right are restricted by the cam or the stationary base fitted on the right side of the pump body. The plunger is worm geared in its center part which engages the driving worm. When the driving worm turns, the plunger also turns together with the differential plunger and moves left and right according to the cam shape, which is machined on the right end of the plunger.

The discharge and suction of oil in the pump take place by the change of inside volume caused by the strokes of plunger and differential plunger.

The cam fitted on right side of the pump body is to change the travels of plungers and is connected with the oil pump control lever which moves according to the throttle valve opening of carburetor.

The discharging amount of oil is regulated by the prescribed plunger travels. Therefore, much oil is fed to the engine when the throttle grip is fully opened and less oil is delivered when the grip is closed.

The oil pump performance is shown in fig. 6-5-3.

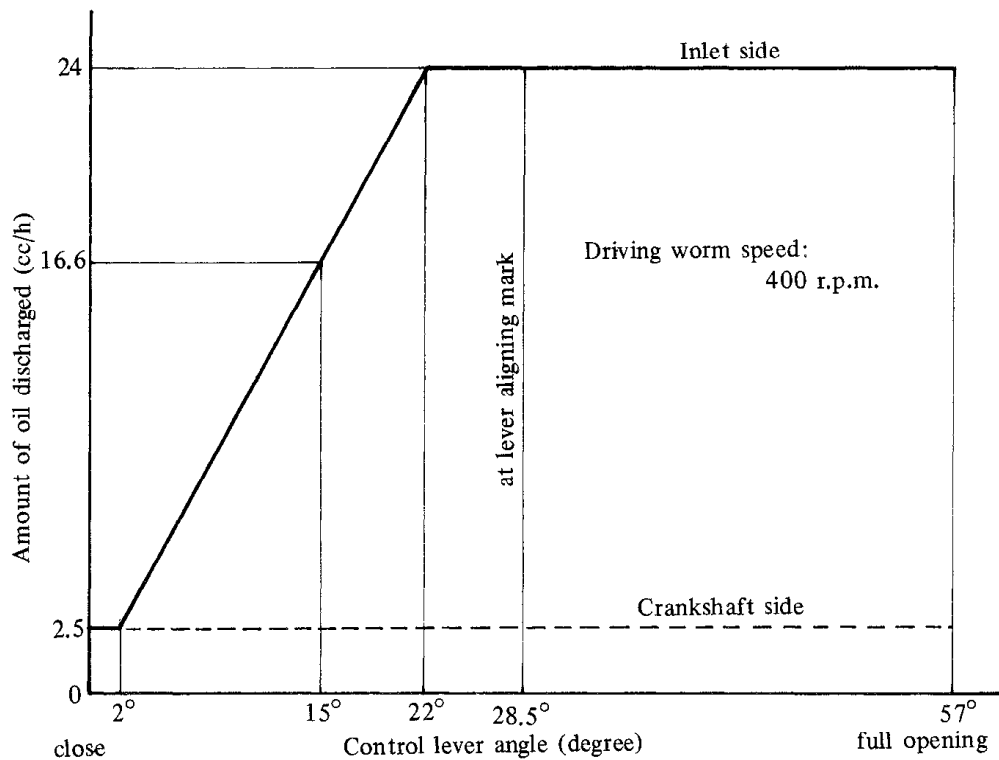


fig. 6-5-3

* The amount is measured when the driving worm speed is kept at 400 rpm.

6-6. Transmission

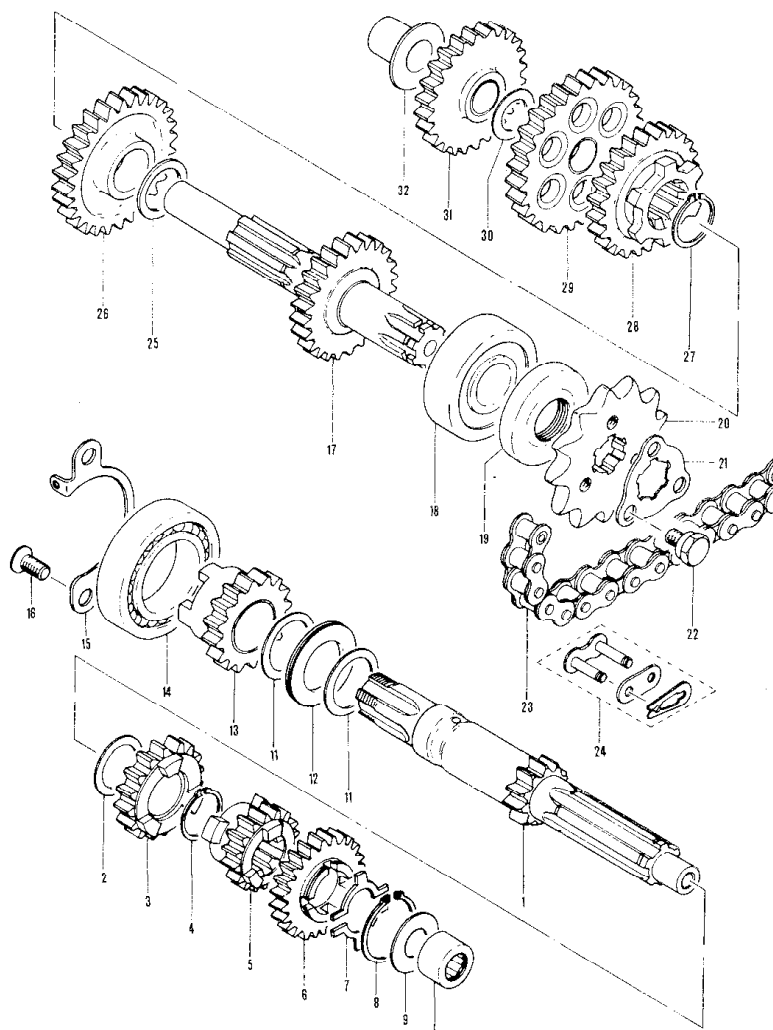
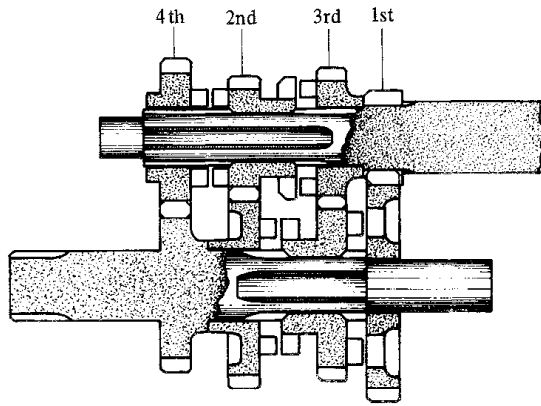


fig. 6-6-1

1. Countershaft	N.T. 11	17. Driveshaft	N.T. 22
2. Thrust Washer	17 x 23 x 1	18. Bearing	
3. 3rd Drive Gear	N.T. 17	19. Oil Seal	20 x 40 x 7
4. Circlip		20. Engine Sprocket	N.T. 14
5. 2nd Drive Gear	N.T. 15	21. Engine Sprocket Plate	
6. 4th Drive Gear	N.T. 20	22. Engine Sprocket Bolt	
7. Knock Ring		23. Drive Chain	#428, 104L
8. Circlip		24. Drive Chain Joint	
9. Thrust Washer		25. Thrust Washer	20 x 27 x 1.0
10. Bearing	12 x 19 x 12	26. 2nd Driven Gear	N.T. 28
11. Thrust Washer	21 x 30 x 0.8	27. Circlip	
12. Bearing	21 x 35 x 2.8	28. 3rd Driven Gear	N.T. 25
13. Kick Starter Driven Gear	N.T. 18	29. 1st Driven Gear	N.T. 32
14. Bearing		30. Thrust Washer	
15. Countershaft Bearing Retainer		31. Kick Starter Idle Gear	N.T. 26
16. Screw		32. Bushing	

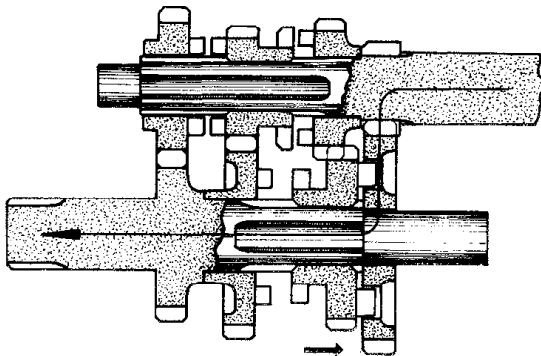
The type of transmission is constant mesh 4 speed. The construction and working principle are explained in this paragraph.

Engine power is transmitted to the drive shaft through the clutch, countershaft, gears on countershaft and gears on drive shaft. From the drive shaft to the rear wheel, the power is further transmitted through the drive sprocket, drive chain and driven sprocket. Each one set of drive and driven gears is used for each speed and these two gears are always paired so that one gear is free and the other gear is fixed on the related shaft in its turning direction.

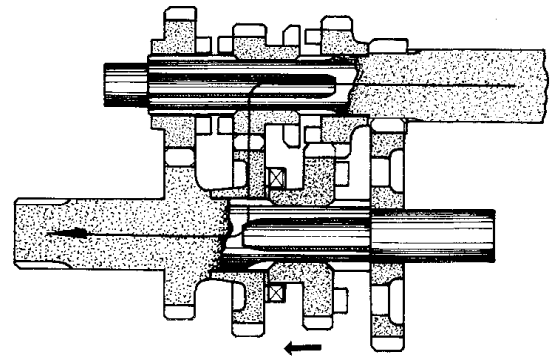


The sliding gears shown in the illustration can move axially and clutch their facing free gears with dogs, which enable the free gears to be fixed with the shaft. This movement is done by the gear shifting forks.

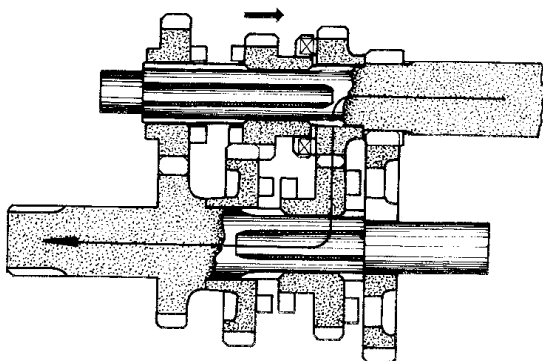
6-6-2 Neutral position



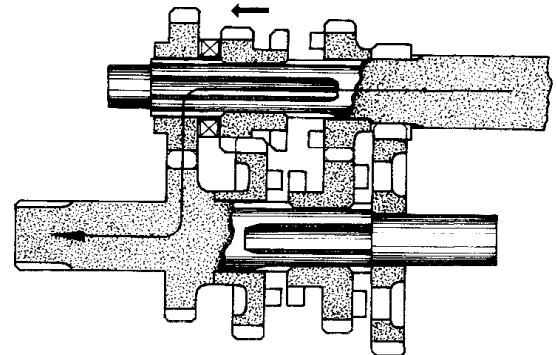
6-6-3 1st position



6-6-4 2nd position



6-6-5 3rd position



6-6-6 4th position

6-7. Carburetor specification

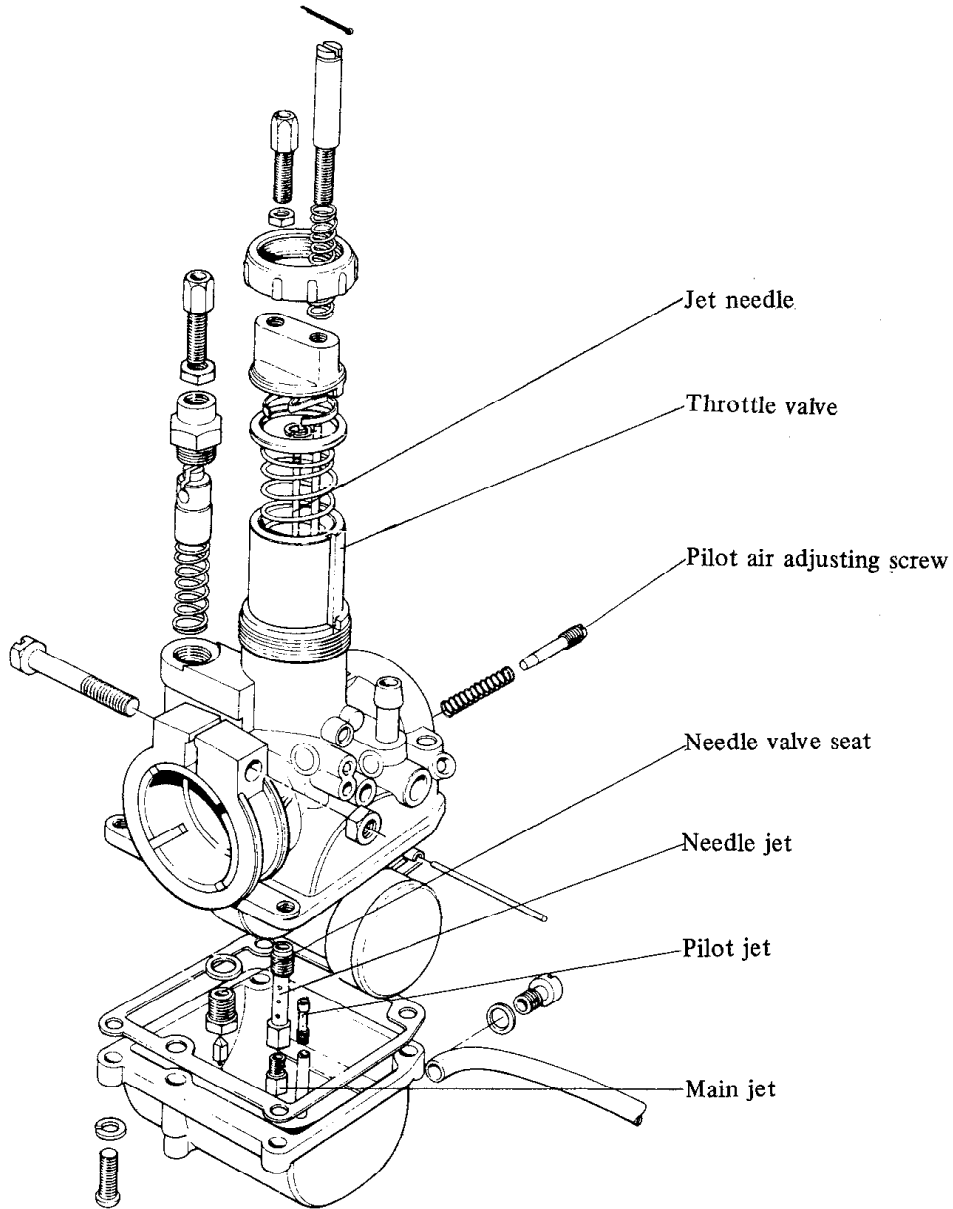
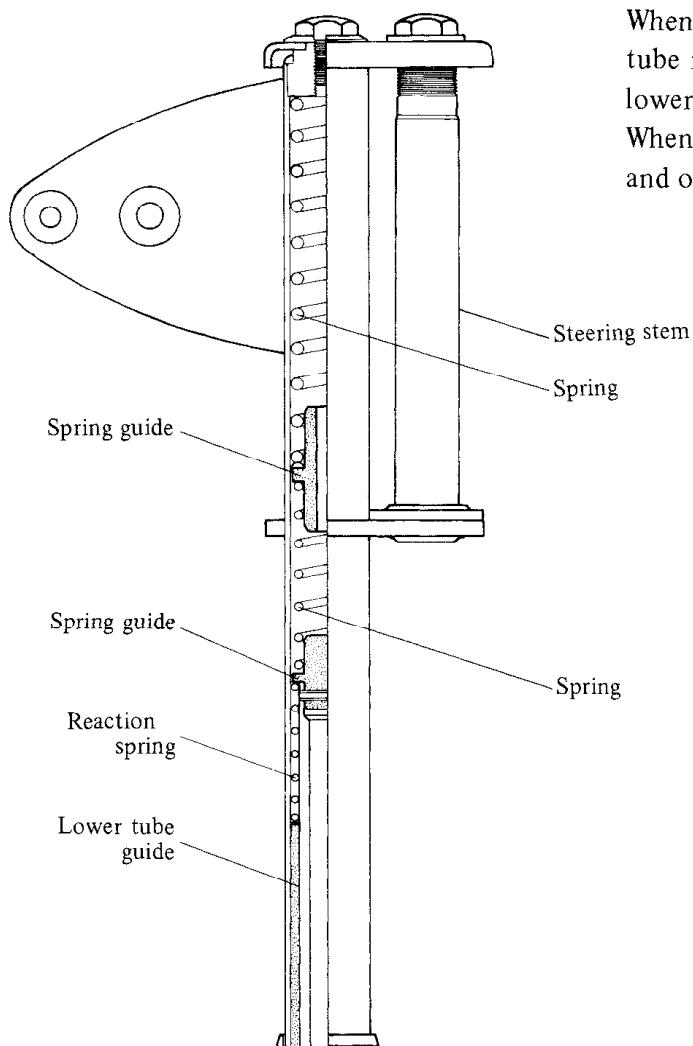


fig. 6-7-1.

Type	VM17SC
Main jet	# 250
Jet needle	4I 1-2
Needle jet	E-6
Throttle valve cut away	# 3.0
Pilot jet	17.5
Pilot outlet	1.0
Pilot air adjusting screw	1¼ turns back
Needle valve seat	1.2
Starter jet	40
Float level	22.5 mm

7. BODY

7-1. Front forks



When disassembling the front fork, unscrew the lower tube nut with special tool 09940-10122 and pull out lower tube downwards.

When assembling the fork, smear grease on the springs and other moving parts.



7-1-1 Disassembling front fork

Vordergabelöl

Normalerweise benötigt die Vordergabel keine Wartung außer einem gelegentlichen Ölwechsel.

Wird der Ölstand zu niedrig, zeigt sich das allerdings erst nach erheblicher Fahrstrecke durch übermäßige Bewegung der Gabel.

- Jedes Federbein der Gabel hat eine Ablassschraube (1). Nach Entfernen Federbein auf- und abbewegen, bis das Öl abgeflossen ist.
- Schraube wieder hineindreihen.
- Gabelöleinfüllschraube (2) oben an jedem Federbein öffnen.

– Gießen Sie 98 ccm SAE 10 W/30 Motoröl oder Automatikgetriebeflüssigkeit in jedes Federbein.

– Nach dem Auffüllen die Öleinfüllschraube wieder fest anziehen.

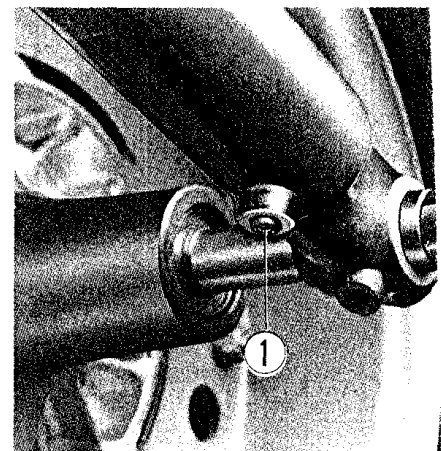


fig. 7-7-2

7-2. Wheels

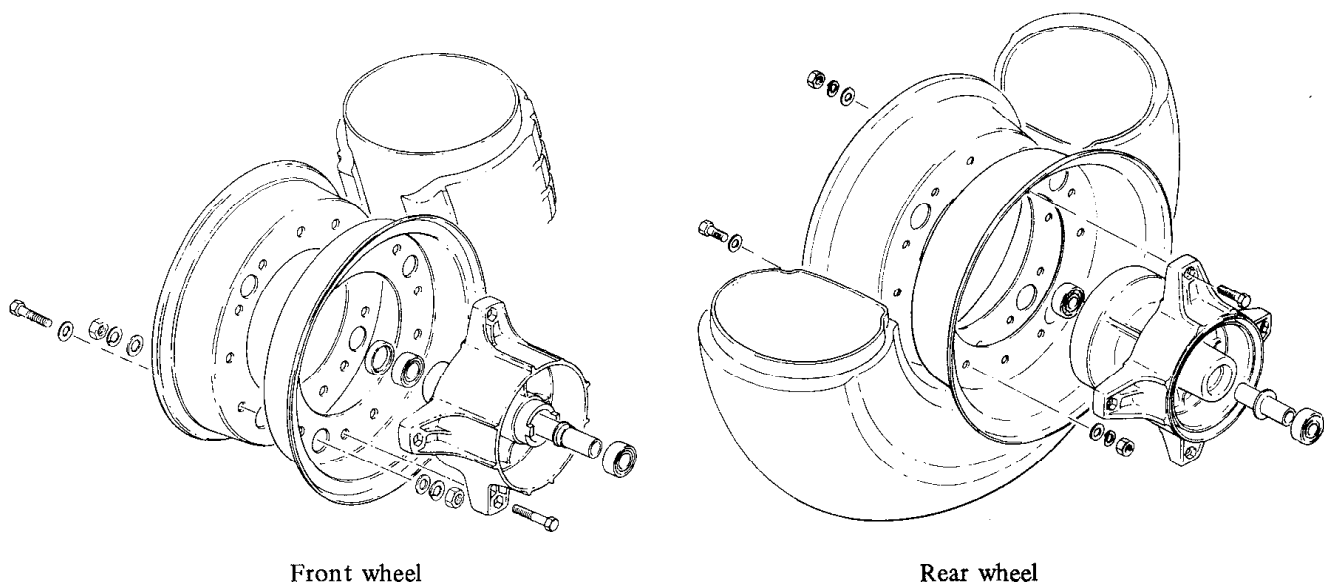


fig. 7-2-1

* Tire Size :	6.70-10 4PR		
* Tire Pressure :	On road	Front	0.8 kg/cm ² (11.4 lb/in ²)
		Rear (solo riding)	0.8 kg/cm ² (11.4 lb/in ²)
		(dual riding)	1.0 kg/cm ² (14.2 lb/in ²)
	On sand	Front	0.6 kg/cm ² (8.5 lb/in ²)
		Rear (solo riding)	0.6 kg/cm ² (8.5 lb/in ²)
		(dual riding)	0.8 kg/cm ² (11.4 lb/in ²)

The rim can be separated in half as shown in fig. 7-2-1 and special designed tire is used on this model. These particular differences from the conventional motorcycle wheel necessitate special attention to the maintenance. The important points for this wheel related to the maintenance are explained in this paragraph.

In order to have the tire driven without a slip of rim, large friction force is required on the mating surface of rim and tire. This force is caused by the inside air pressure which presses the tire edge to the rim. As the tire used on this model is inflated low, the force of the tire to press the rim is also small. In order to get enough friction force without high air pressure, the wheel is specially designed and carefully made. However, the rim might slip if the maintenance is not done properly, therefore, be sure to perform following necessary points when assembling or disassembling the wheel.

1. Do not use any tool such as tire lever to insert between rim and tire when taking out the tire from rim.
2. The tire should only be removed from the rim by separating it in half.
3. The edge of tire and rim (where they meet) should be always kept clean in order to have them stuck rigidly by their surfaces.
4. When joining the rim, be sure not to pinch the inner tube.
5. After assembling the wheel and fitting it to the brake drum, inflate the tire with the pressure of about 2.0 kg/cm^2 (29 lb/in^2) so that the tire settles properly in the rim. Then deflate it until the pressure becomes standard value.

7-3. Air filter

The element is made of washable spongy polyurethane and contains oil in it so as to further prevent the dust penetration. The construction is shown in fig. 7-3-1.

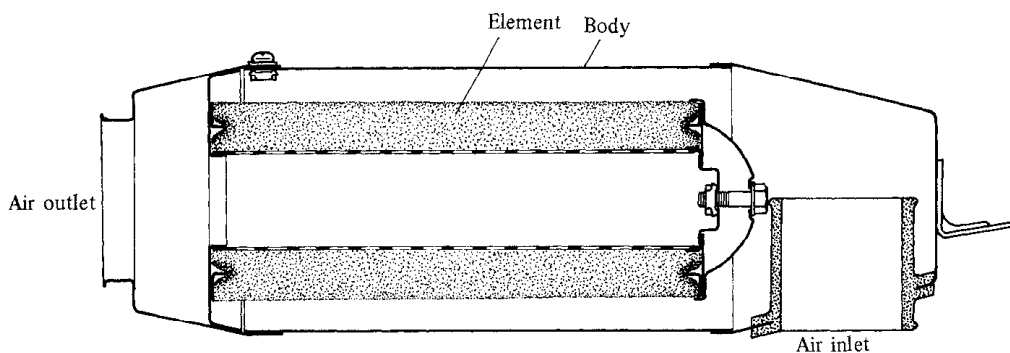


fig. 7-3-1

When cleaning the element, pull it off and wash with clean petrol. After draining the element, soak it into Suzuki CCI oil or the engine oil with around SAE #30 and squeeze the oil from the element.

8. SPECIFICATIONS FOR INSPECTION AND REPAIR

8-1. Engine

Part	Item	Standard	Limit	Operation	Remarks
Cylinder head	Warp on the joining surface	below 0.03 mm (1/1,000 in)		Rectify	Put emery paper on a flat surface plate and grind the head on the paper by sliding it evenly.
Cylinder	Wear		0.05 mm (2/1,000 in)	Rebore	Measurement is the difference between largest and smallest diameter of the bore.
	Cylinder-piston clearance	0.070 mm (2.7/1,000 in)	0.125 (4.9/1,000 in)		
	Cylindrical and circular tolerance in diameter	below 0.01 mm (0.4/1,000 in)			
Piston ring	Open end	0.15–0.35 mm (6–14/1,000 in)	1.2 mm (47/1,000 in)	Replace	Measure the gap with thickness gauge when the ring is inserted into the lower part of cylinder.
Crank-shaft	Con-rod small end shake	Below 3 mm (0.12 in)		Replace	Check the shake at TDC with dial gauge.
	Radial runout	below 0.05 mm (2/1,000 in)		Rectify or replace	Check runout at left and right ends with dial gauge when inside journal positions are hold.
Primary pinion and gear	Backlash	0.02–0.07 mm (0.8–3/1,000 in)	0.15 mm (6/1,000 in)	Replace	Use dial gauge for measuring.
Clutch drive plate	Thickness	3 mm (0.12 in)	2.8 mm (0.11 in)	Replace	
	Warp	below 0.4 mm (16/1,000 in)		Replace	

Part	Item	Standard	Limit	Operation	Remarks
Clutch driven plate	Warp	Below 0.1 mm (4/1,000 in)		Replace	

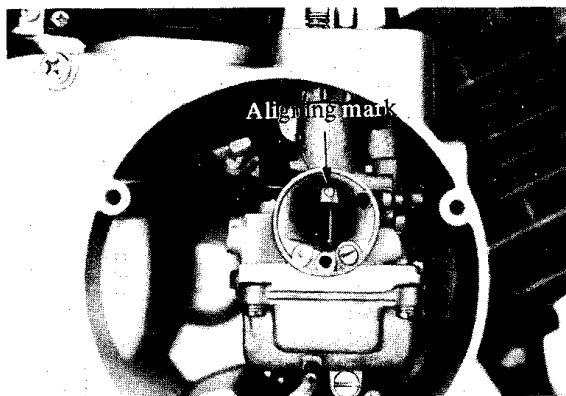
8-2. Electrical equipment

Part	Item	Standard	Limit	Operation	Remarks
Flywheel magneto	Resistance, primary coil	1.9Ω		Replace	Measure between black colored wire and the ground with inserting a insulation material to the points.
	Resistance, lighting coil	Yellow/White 0.54Ω Green 0.11Ω		Replace	Measure between each colored wire and ground.
	Condenser capacity	0.18μF		Replace	
	Charging capacity in day time	3,000 rpm. 0.3A/7.2V 4,000 rpm 0.5A/8.2V		Replace	With fully charged battery.
	Charging capacity in night time	3,000 rpm. 0.3A/7.7V 4,000 rpm. 0.4A/8.0V		Replace	With fully charged battery.
	Ignition performance	over 6 mm (0.24 in)			The testing gap is to be connected in series with spark plug.
	Contact point gap	0.3–0.4 mm (12–16/1,000 in)		Adjust	
Ignition coil	Resistance, primary coil	2.5Ω		Replace	
	Resistance, secondary coil	8.3 KΩ			
Rectifier	Conductivity	Not in reverse direction		Replace	

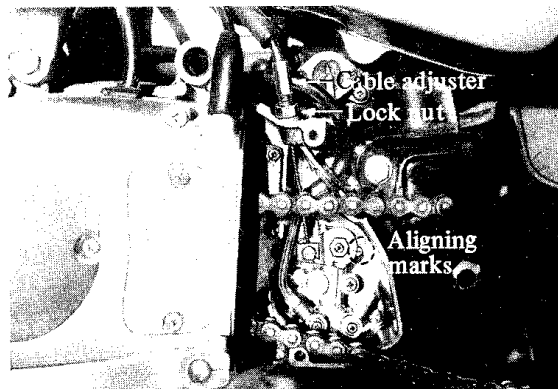
9. ADJUSTMENT

9-1. Oil pump

Align the upper part of the round mark on the throttle valve with the upper surface of the carburetor main bore by turning throttle grip as shown in fig. 9-1-1. Keeping the carburetor in this state, adjust the oil pump control cable by turning the adjuster so that the aligning marks on the lever and body may be in line as shown in fig. 9-1-2.



9-1-1 Throttle valve aligning mark

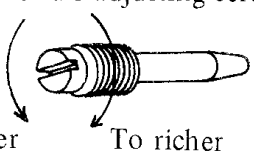
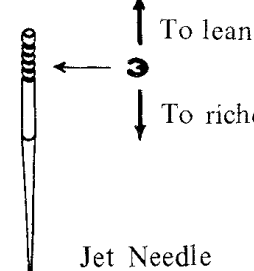
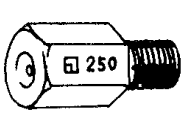


9-1-2 Oil pump control cable

9-2. Carburetor

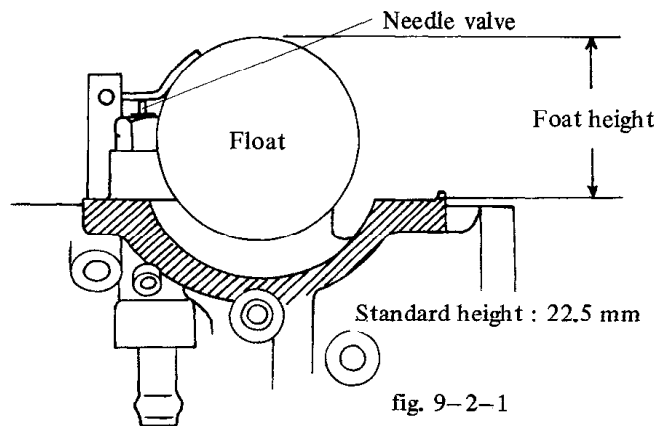
The adequate carburetion is determined according to the result of various tests mainly in consideration of the engine power, fuel consumption and fuel cooling effect to the engine and the jets settings are done so as to satisfy and balance all of these conditions. Therefore, it is not recommended to replace the jet with the other size then original or to change the setting position of adjustable parts except when compensating the mixture ratio due to the different altitude or climate conditions. When the adjustment is necessarily required, carry out the job referring to the following instructions.

1. Fuel-air mixture ratio can be changed by following manners.

Throttle opening	Method to change the ratio	Standard setting
Slight	<p>Pilot air adjusting screw</p>  <p>To leaner To richer</p>	1 ¼
Medium	 <p>To leaner To richer</p> <p>Jet Needle</p>	2nd position from top groove
High	 <p>Main Jet</p> <p>Larger number : Richer mixture Smaller number : Leaner mixture</p>	Number 250

2. The fuel level inside the float chamber should also be set in proper position. To adjust the fuel level, measure the height of the float from the mixing chamber body in the way explained as follow.

- A. Remove the float chamber.
- B. Hold the carburetor upside down with the float fitted to the mixing chamber body.
- C. Lower the float gradually and stop it just when the float tongue touches the upper end of the needle valve.
- D. Measure the distance between the float chamber fitted surface and bottom of the float as shown in fig. 9-2-1.



9-3. Ignition timing

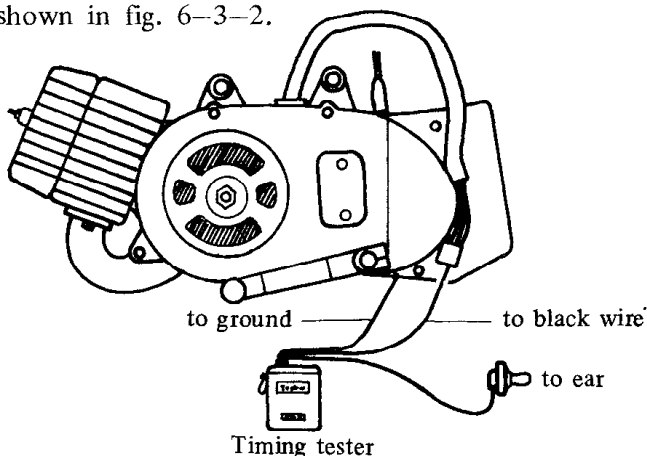
Before checking or adjusting the ignition timing, be sure that the contact point gap is set to 0.3 or 0.4 mm (12-16/1,000 in).

Use timing dial gauge (09931-00111) and timing tester (09900-27002), and carry out the job following the procedure mentioned below.

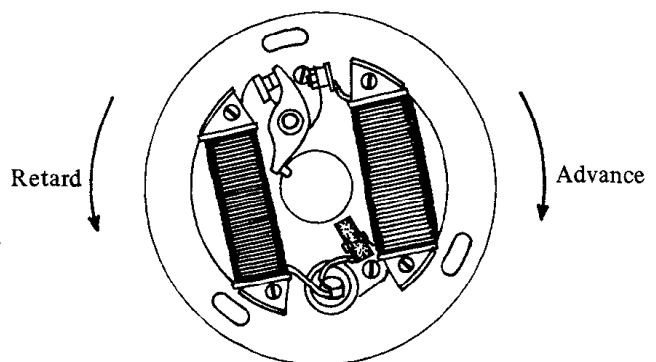
1. Remove the spark plug from the cylinder head and screw in the timing dial gauge.
2. Connect one end of lead wire of the timing tester to the black wire in magneto wiring harness and other lead wire to the ground.
3. Search TDC in the dial gauge by turning the crankshaft slowly and there, set the needle to "0" position.
4. Turn the crankshaft slowly clockwise, ie. reverse direction of engine rotation, and stop the crankshaft being turned where the sound of the timing tester changes.
5. Read the indication of dial gauge. This indication shows the ignition timing in piston travel from TDC.

Standard ignition timing : 2.04 mm BTDC (22 Degree)

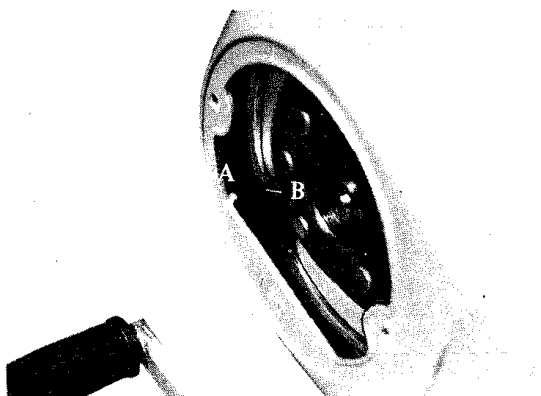
The magneto is originally set so that the correct ignition timing point can usually be obtained by only adjusting the contact point gap within the range of 0.3-0.4 mm. However, in case that the magneto base is removed or the point is renewed, the relative positions between the base, point and crankcase may change and they require re-adjustment of the magneto base. In this case, adjust the base as shown in fig. 6-3-2.



9-3-1 Checking ignition timing



9-3-2 Magneto base setting position



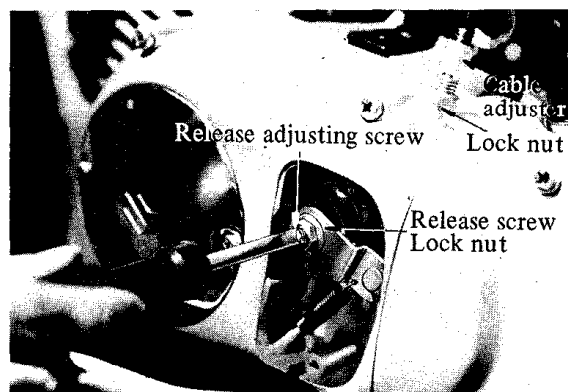
9-3-1 Ignition timing marks

For easier check of the ignition timing, the use of the timing dial gauge is dispensable. The ignition timing point in crankshaft rotation can roughly be found by checking if the aligning marks on the flywheel and on the engine left cover shown in fig. 9-3-1 are in line just when the sound of the timing tester changes.

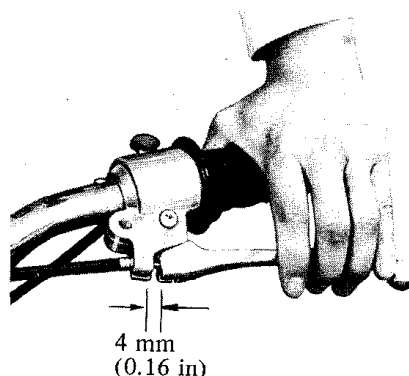
9-4. Clutch

The clutch can be adjusted by both the clutch cable adjuster and the release adjusting screw. However, the adjustment should be normally made in the state that the clutch release screw is fully returned, therefore, the maximum play should be made on clutch cable before the adjustment.

1. Loosen the clutch release screw lock nut.
2. Screw in the release adjusting screw until it stops and turn it back around half a turn, then tighten the lock nut.
3. Adjust the cable adjuster so that the cable end play at the clutch lever may be around 4 mm (0.16 in).



9-4-1 Clutch release screw



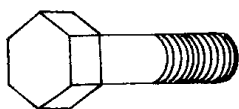
9-4-2 Clutch cable end play

10. TIGHTENING TORQUE

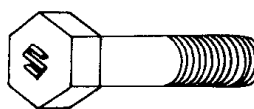
	Part	Tightening torque	
		kg-cm	lb-ft
1	Front axle nut	360 – 520	26 – 38
2	Rear axle nut	270 – 430	20 – 31
3	Front fork upper bracket bolt	350 – 530	26 – 39
4	Steering handle clamp bolts	90 – 200	6.5 – 14
5	Brake cam lever bolt (F & R)	40 – 70	2.9 – 5.1
6	Swinging arm pivot bolt	180 – 280	13 – 21
7	Rear shock absorber (upper & lower)	180 – 280	13 – 21
8	Rear torque link nuts	90 – 140	6.5 – 10
9	Rim bolts	150 – 200	12 – 14
10	Wheel fitting bolts (Front)	360 – 520	26 – 38
	(Rear)	270 – 430	20 – 31
11	Engine mounting bolts (Front)	130 – 230	9.5 – 17
	(Upper)	180 – 280	13 – 20
	(Lower)	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
5	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.

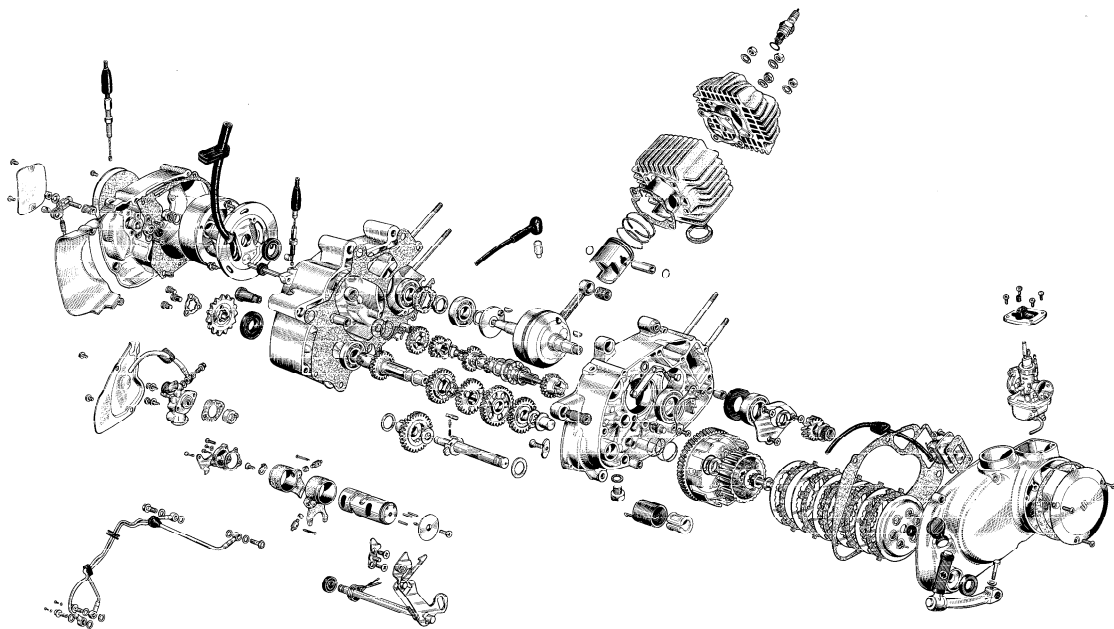
	Item	Check for
Fuel system	Fuel hose Fuel tank	Fuel leakage
Suspension system	Front fork ass'y	Crack, Faulty welding of bracket
	Front fork comp. Front fork upper bracket	Crack, Faulty welding
	Front axle Rear axle	Crack
	Rear swinging arm	Crack, Faulty welding
Steering	Handlebar Handlebar upper clamp 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

PERIODICAL INSPECTION LIST

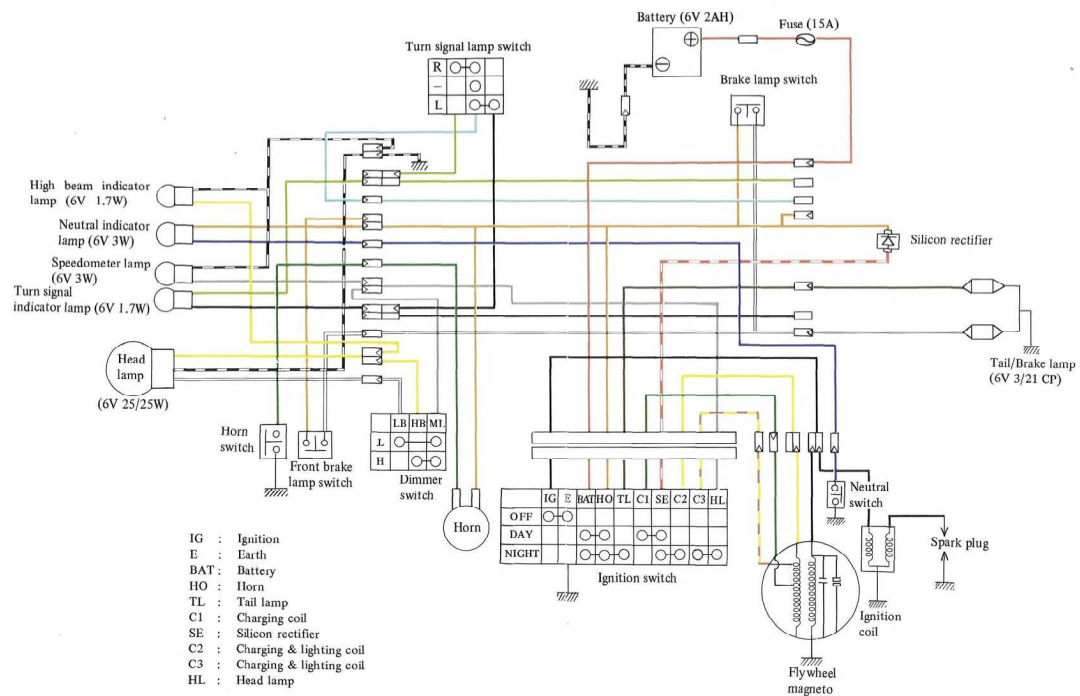
The chart below indicates time when inspections, adjustments and maintenance are required based on the distance the motorcycle runs, that is first 1,000 km (750 mi), and every 3,000 km (2,000 mi), 6,000 km (4,000 mi) and 12,000 km (8,000 mi) thereafter. According to the chart, advise users to make the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

Distance (km)	1,000 km	Every 3,000 km	Every 6,000 km	Every 12,000 km
Distance (mi)	750 mi	Every 2,000 mi	Every 4,000 mi	Every 8,000 mi
Service				
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 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
Magneto	Retighten magneto nut			
Cylinder head and Cylinder	Retighten cylinder and cylinder head nuts	Retighten cylinder and cylinder head nuts	Remove carbon	
Battery	Check and service electrolyte	Check and service electrolyte		
Fuel cock	Clean fuel strainer		Clean fuel strainer	
Drive chain	Adjust	Adjust and lubricate	Wash	
Brakes	Adjust play	Adjust play		
Air cleaner		Clean		
Throttle grip			Put grease in throttle cap	
Exhaust pipe and Muffler	Retighten exhaust pipe flange fitting screw	Retighten exhaust pipe flange fitting screw	Remove carbon	
Steering stem	Check play Retighten stem nut		Check play Retighten stem nut	
Bolts, Nuts and Spokes	Retighten		Retighten	

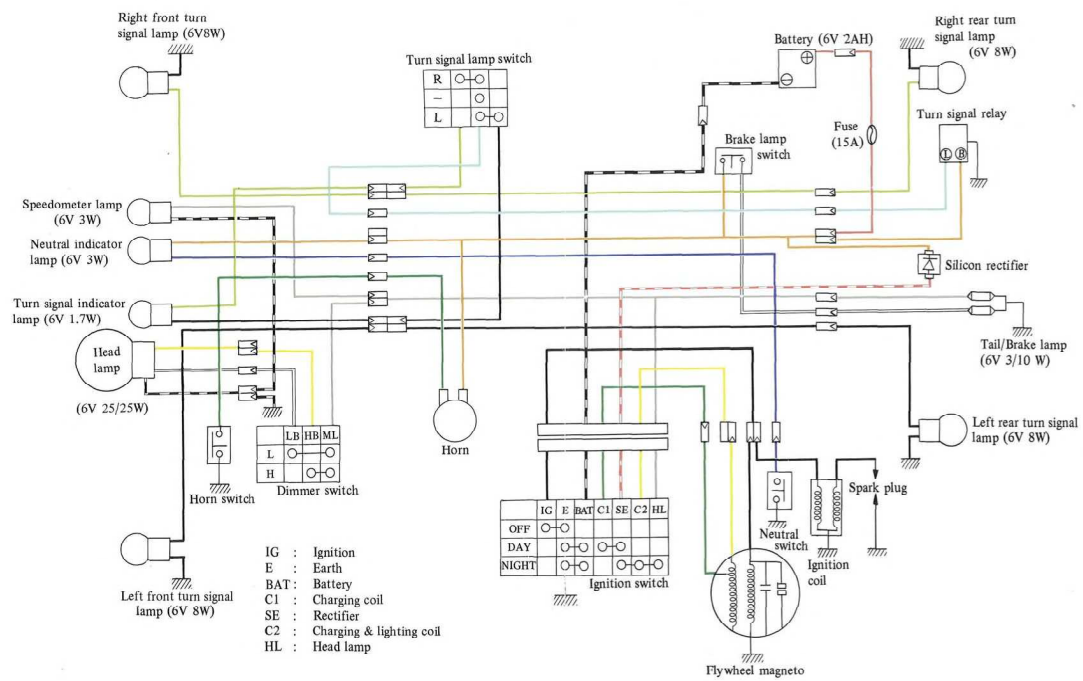
EXPLODED VIEW OF ENGINE



SUZUKI RV90 WIRING DIAGRAM (FOR USA & CANADA SPECIFICATION)



SUZUKI RV90 WIRING DIAGRAM (FOR STANDARD SPECIFICATION)



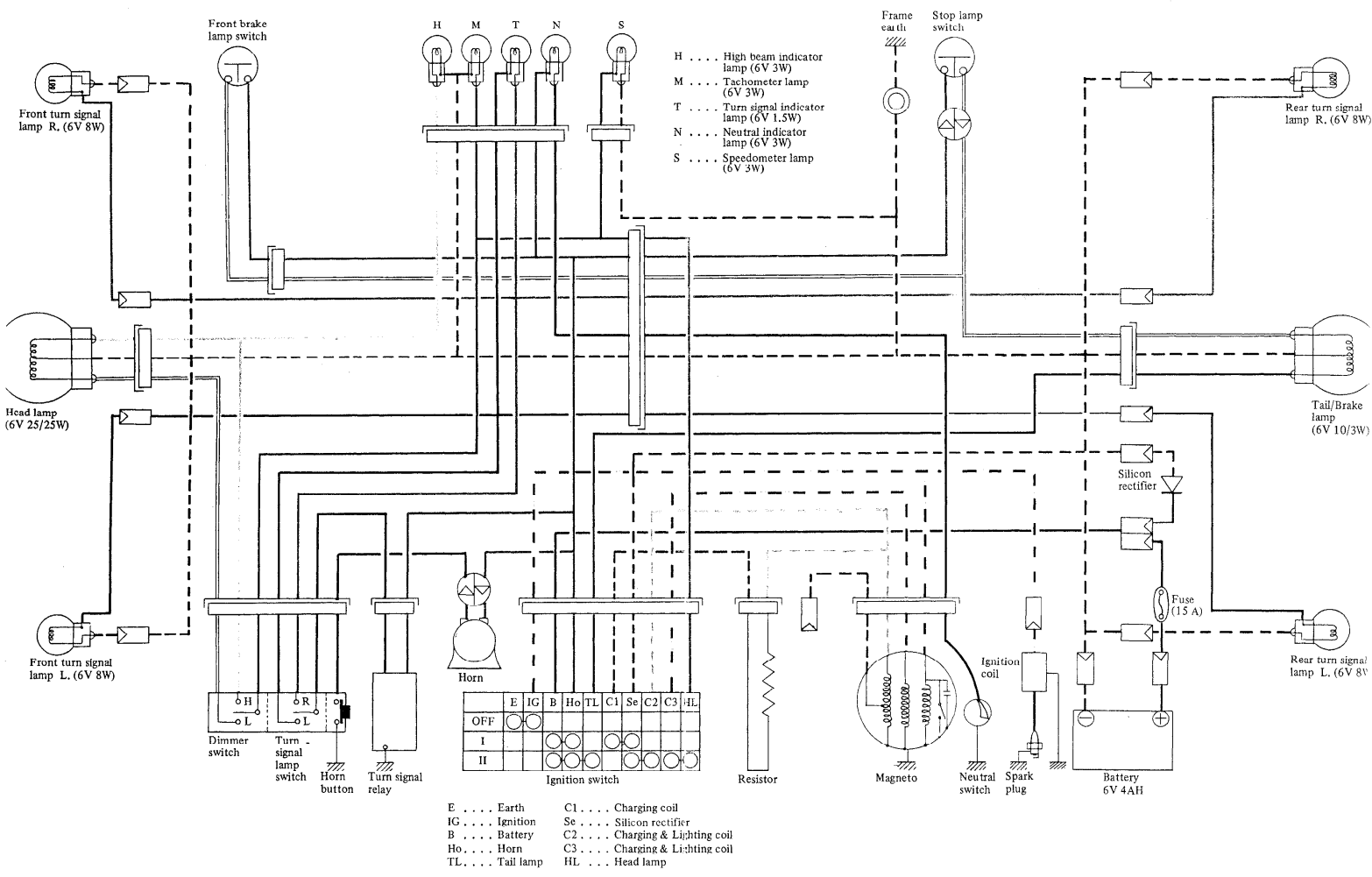
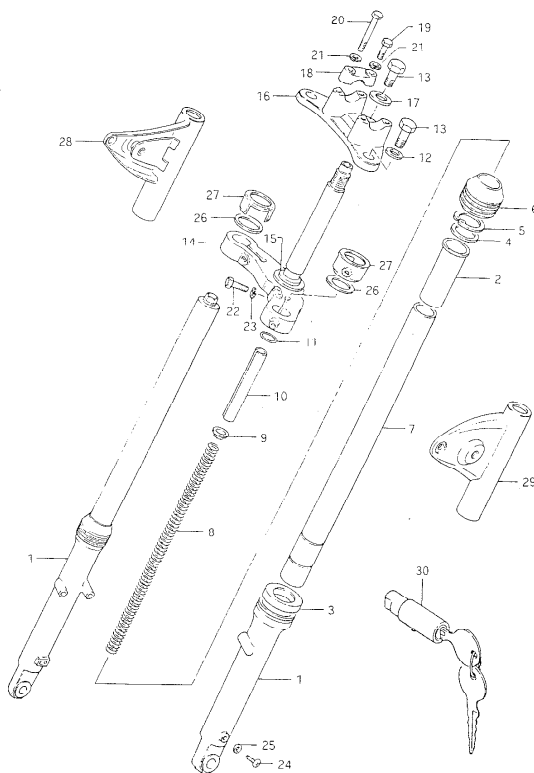


FIG. 26



RV90D E22

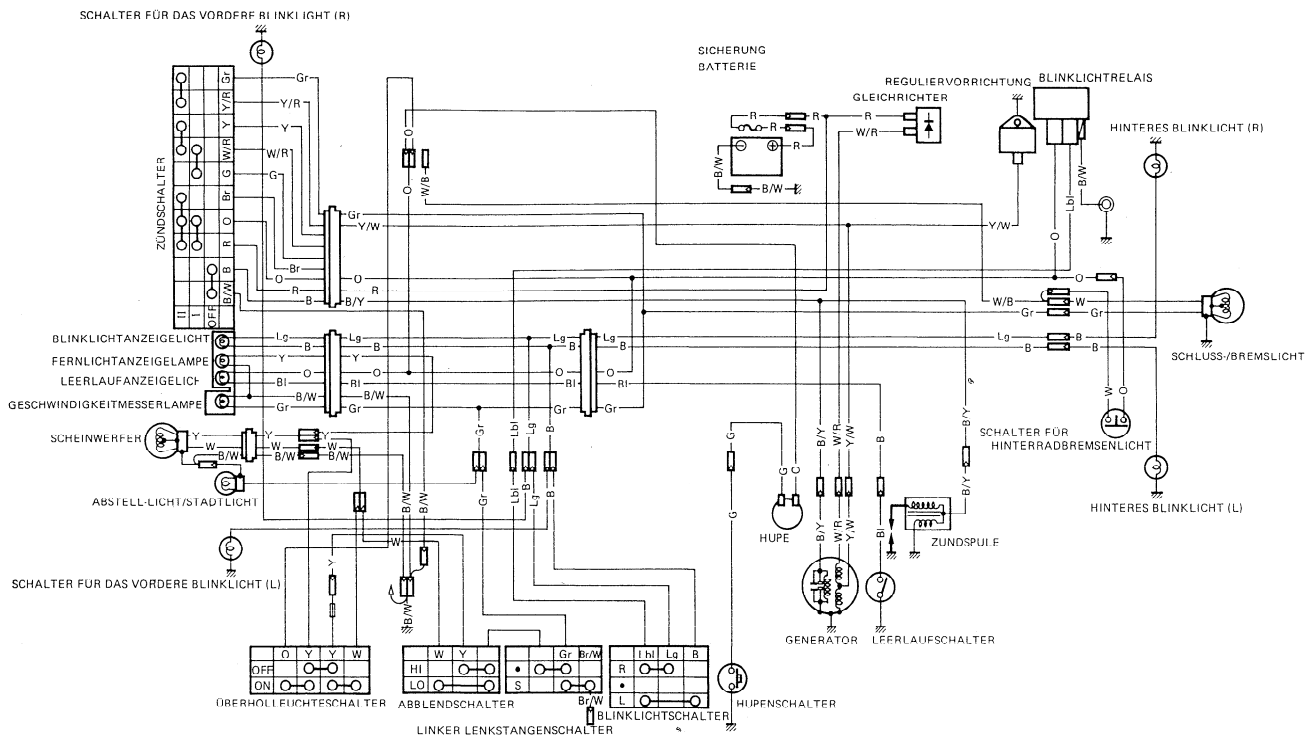
FIG. 26 (E-2) FRONT FORK

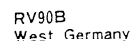
REF. NO.	PART NO.	DESCRIPTION	Q'TY	REMARKS
	51106-27722	FORK SUB ASSY, front	1	
	51106-27682	FORK SUB ASSY, front	1	E34
1	51130-27681	.OUTER TUBE	2	
2	51152-27410	.SLIDE METAL	2	
3	51153-27410	.OIL SEAL	2	
4	51158-27410	.WASHER	2	
5	08331-21409	.RING, oil seal stopper	2	
6	51173-26210	.DUST SEAL	2	
7	51110-27680	.INNER TUBE	2	
8	51171-27680	.SPRING	2	
9	51172-26210	.WASHER	2	
10	51176-27680	.SPACER	2	
11	51181-22011	.O RING	2	
12	51356-07010	.WASHER	2	
13	51351-20010	.BOLT	3	
14-1	51410-27722	.STEM, steering	1	
14-2	51410-27691	.STEM, steering	1	E34
15	51621-53001	.OUTER RACE	1	
16	51311-27760	.STEM HEAD, steering	1	
17	51356-22012	.WASHER	1	
18	56211-27210-019	.HOLDER, handle (Black)	2	
19	01204-08357	.BOLT	2	
20	01204-08957	.BOLT	4	
21	08321-21088	.LOCK WASHER	4	
22	01107-10408	.BOLT	2	
23	08321-21108	.LOCK WASHER	2	
24	02112-04088	.SCREW	2	
25	51183-09010	.GASKET	2	
26	51553-20610	.GASKET	2	
27	51551-26010	.GUIDE, cover	2	
28	51530-27680-291	BRACKET, headlamp RH	1	Black
29	51540-27680-291	BRACKET, headlamp LH	1	Black
30	51900-22662	LOCK ASSY, steering (Excuted locally)	1	

RV90D E22

VERDRAHTUNGSSSCHEMA

(Für BRD)







SUZUKI MOTOR CO., LTD.