V. ELECTRICAL

1. GENERAL DESCRIPTION

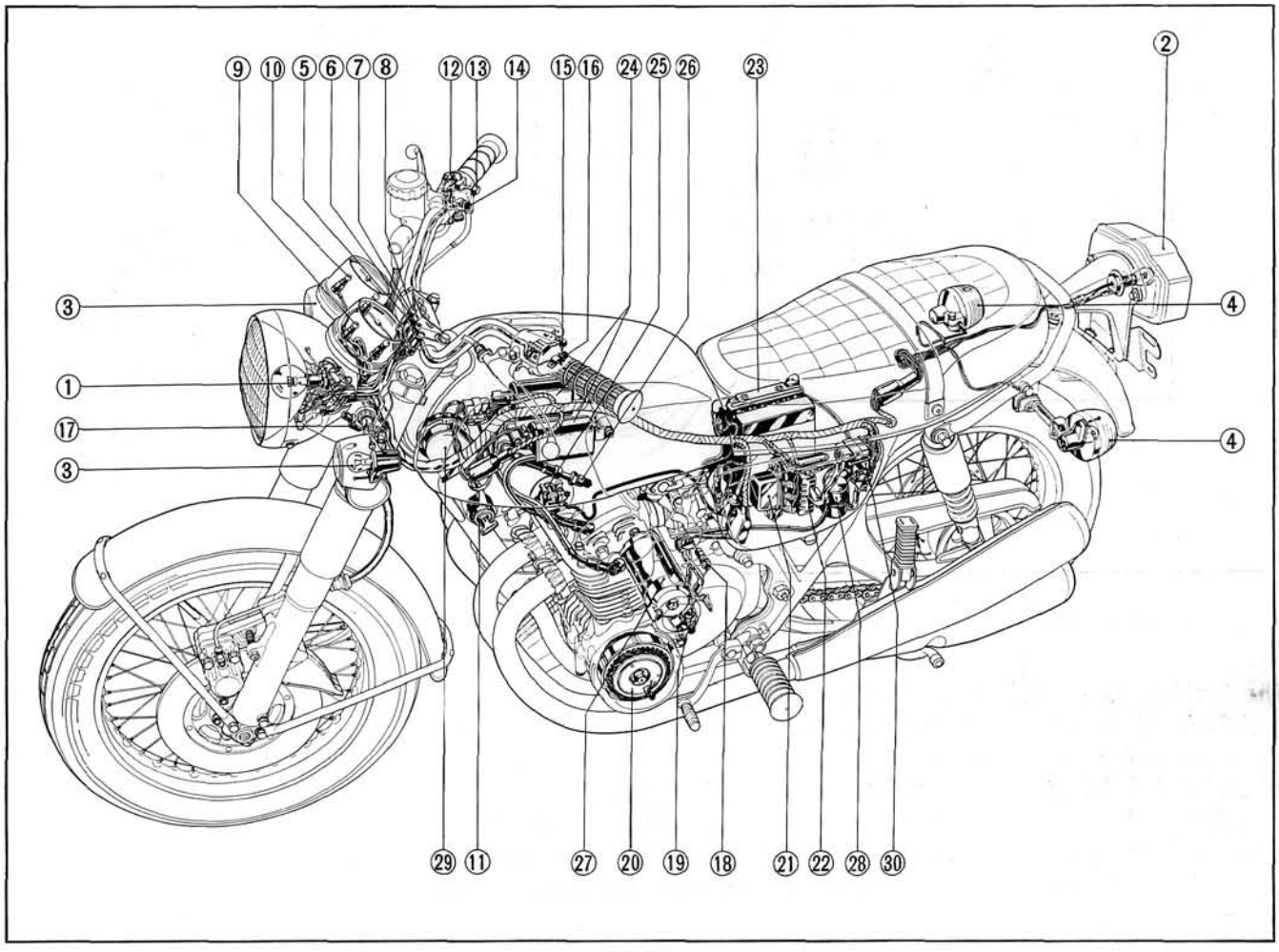


Fig. 5-1

LIGHTS
- ① Headlight
- ② Tail/stoplight
- ③ Front turn signal lights
- ④ Rear turn signal lights
- ⑤ Turn signal indicator lamp
- ⑥ Oil pressure warning lamp
- ⑦ Neutral indicator lamp
- ⑧ High beam indicator lamp
- ⑨ Speedometer lamp
- ⑩ Tachometer lamp

SWITCHES
- ⑪ Main switch
- ⑫ Emergency switch
- ⑬ Headlight control switch
- ⑭ Starter switch
- ⑮ Turn signal control switch
- ⑯ Horn button
- ⑰ Stop switch
- ⑱ Neutral switch
- ⑲ Oil pressure switch

CHARGING SYSTEM
- ⑳ A-C generator
- ㉑ Regulator
- ㉒ Silicon rectifier
- ㉓ Battery

IGNITION SYSTEM
- ㉔ Ignition coils
- ㉕ Contact breaker
- ㉖ Spark plugs

STARTING SYSTEM
- ㉗ Starting motor
- ㉘ Magnetic switch

ELECTRICAL EQUIPMENT
- ㉙ Horn
- ㉚ Winker relay

2. IGNITION SYSTEM

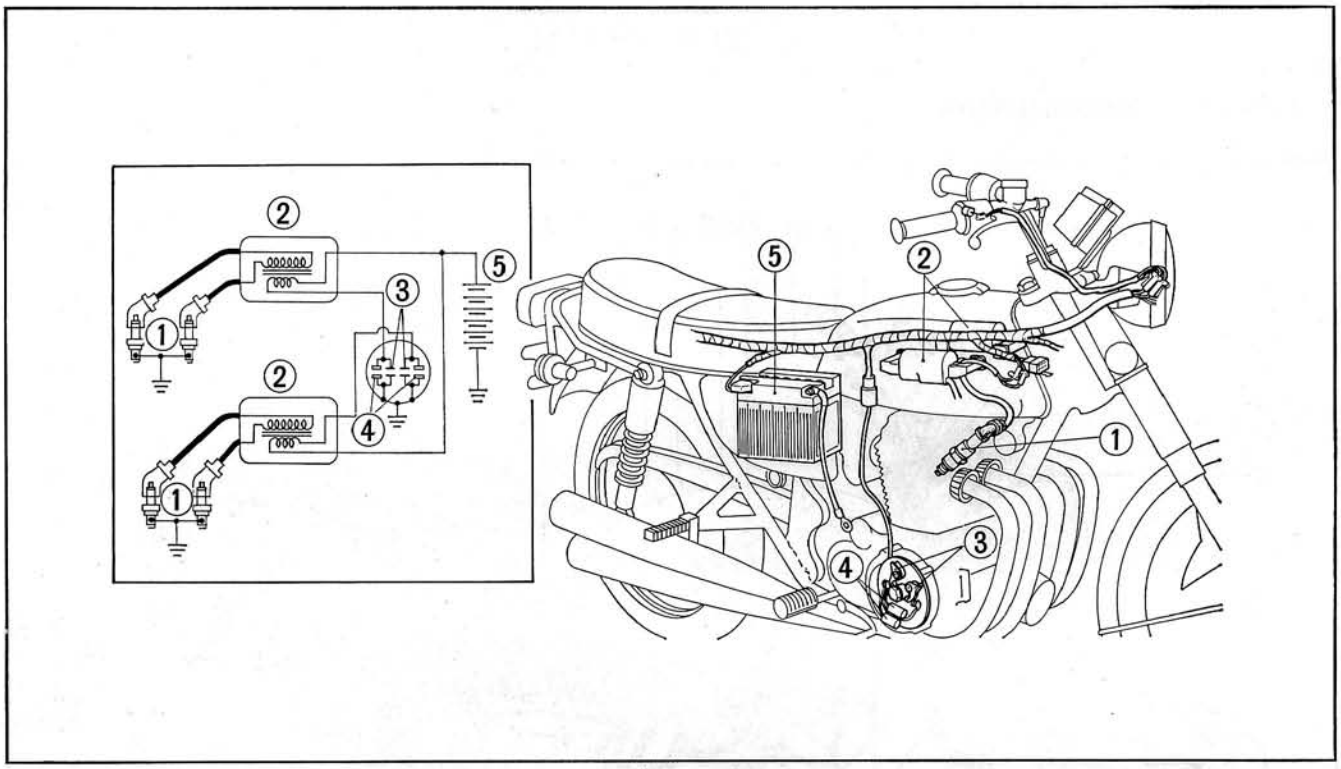


Fig. 5-2

① Spark plugs ② Ignition coils ③ Contact breakers ④ Capacitors ⑤ Battery

The ignition system fires the 4-cycle, 4-cylinder engine in a sequence of 1, 2, 4 and 3 of the cylinders at each 180° of the crankshaft rotation. The combustion strokes of all the cylinders are completed each time the crankshaft rotates two turns.

To the right end of the crankshaft are installed spark advancer and contact breaker housing which contains two contact breakers. The contact breakers are 180° out of phase and connect to two ingnition coils which provide each two high tension cords connecting four spark plugs as shown in the diagram above. Since no distributor is used, the system is of simple construction and facilitates servicing.

Ignition coil	
3 point spark gap opening	7 mm (0.27 in.), min.
Spark plug	
Type (standard)	D-8ESL (NGK), X-24ES (DENSO)
Plug gap	0.6-0.7 mm (0.024-0.028 in.)
Contact breaker	
Point gap	0.3-0.4 mm (0.012-0.016 in.)
Spring force	650-850 gr. (1.43-1.87 lbs)
Capacitor	
Capacity	0.22 μF ±10%
Insulation resistance	10 MΩ (1,000 V with a megger)
Spark advancer	
Start of advance (crankshaft rotation)	1,400-1,600 rpm
Full advance (crankshaft rotation)	2,300-2,500 rpm
Advance angle	23.5°-26.5°

Ignition coils

Inspection

1. Continuity test
   1) Primary coil
      Check for continuity between the two terminals of the primary coil with a radio tester.
      Right coil : yellow, black lead to white lead.
      Left coil : blue, black lead to white lead.
   2) Secondary coil
      Check for continuity the high tension cord terminal and primary side terminal on each cord. If there is no continuity, the coil has an open-circuit and must be replaced.

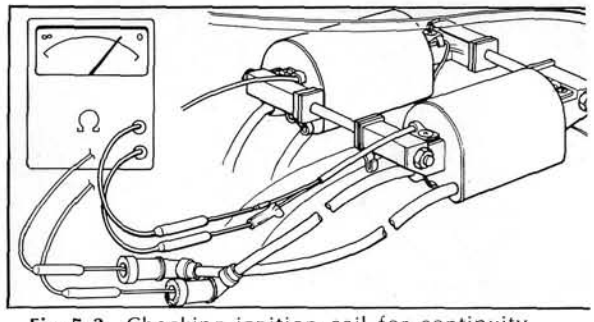


Fig. 5-3 Checking ignition coil for continuity

2. Performance test
   Even though continuity is ensured, an ignition coil may provide poor performance after a long period of use. Check to determine its performance as follows :
   1) Turn the service tester selector knob to IGNITION TEST and make connections of the tester following the instructions furnished by the tester manufacturer.
   2) Connect the tester power supply cord to a fully charged battery.
      Measure the maximum distance where spark jumps across the gap regularly, using a 3-point spark appears as B in Fig. 5-5, connect the high tension cords in reverse to make measurement under the condition of A in Fig. 5-5.

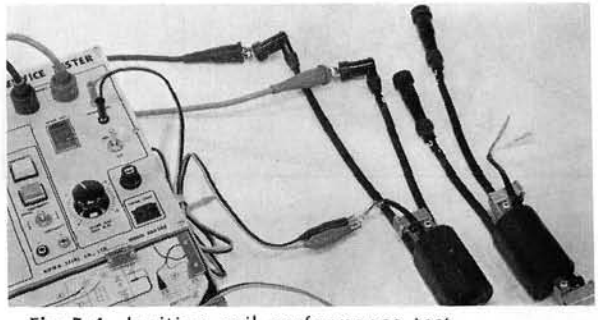


Fig. 5-4 Ignition coil performance test

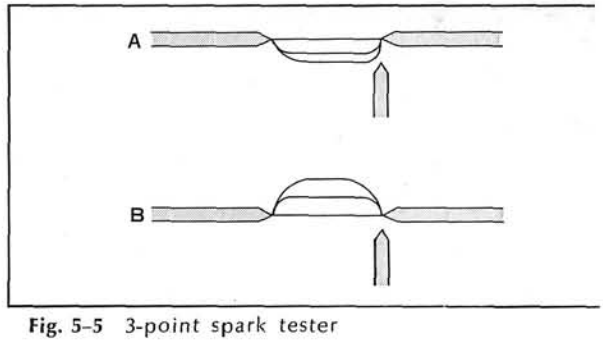


Fig. 5-5 3-point spark tester

Spark plugs

Inspection

1. Check the spark plug for worn or pitted electrodes, excessive gap, and damaged insulator.
   1) Clean dirty spark plug using a plug cleaner or wire brush.
   2) Measure the electrode gap with a thickness gauge, and adjust if necessary.
      Gap specification : **0.6~0.7 mm (0.024~0.028 in)**
   3) Replace the spark plug with a new one, if the insulator or gasket is damaged or distorted.

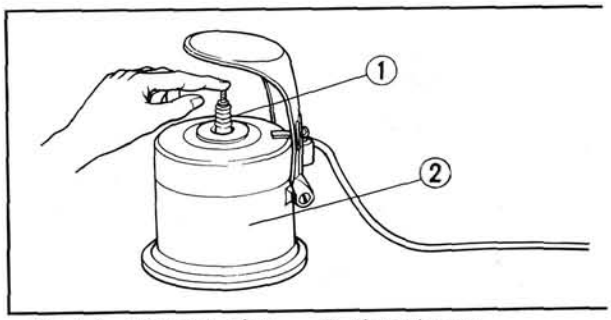


Fig. 5-6 ① Spark plug ② Plug cleaner

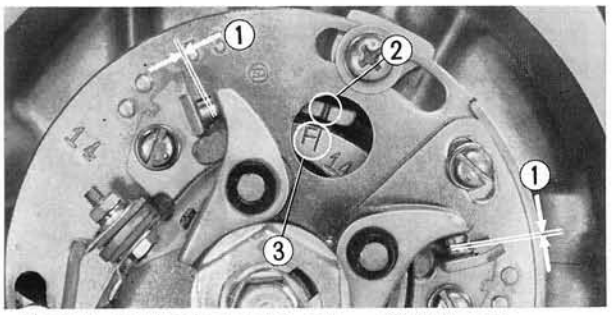


Fig. 5-7 ① Breaker point gap ③ "F" mark
② Matching mark

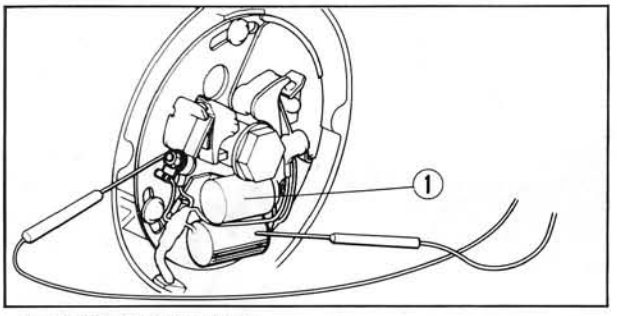


Fig. 5-8 ① Capacitors

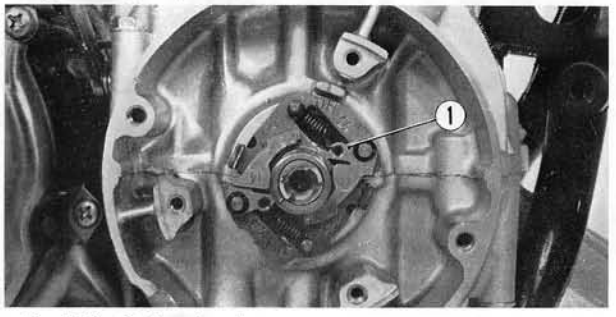


Fig. 5-9 ① Spark advancer

Contact breakers and capacitors

1. Contact breakers
   For the adjustment of the breaker point and ignition timing, refer to the section INSPECTION AND ADJUSTMENT.

2. Capacitors
   Measure the capacitance of the capacitors using the service tester.
   Capacitance specification : **0.22 μF $\pm$ 10%**

NOTE :
The point must be kept open when measuring.

Spark advancer

Inspection

1. Wipe off any foreign matter from the friction surfaces and check for smooth operation.
2. Check the advancer pin for excessive wear.
3. Take the readings of the crankshaft rpm at initial and full advance angles using the timing light of the service tester.

MEMO

3. CHARGING SYSTEM

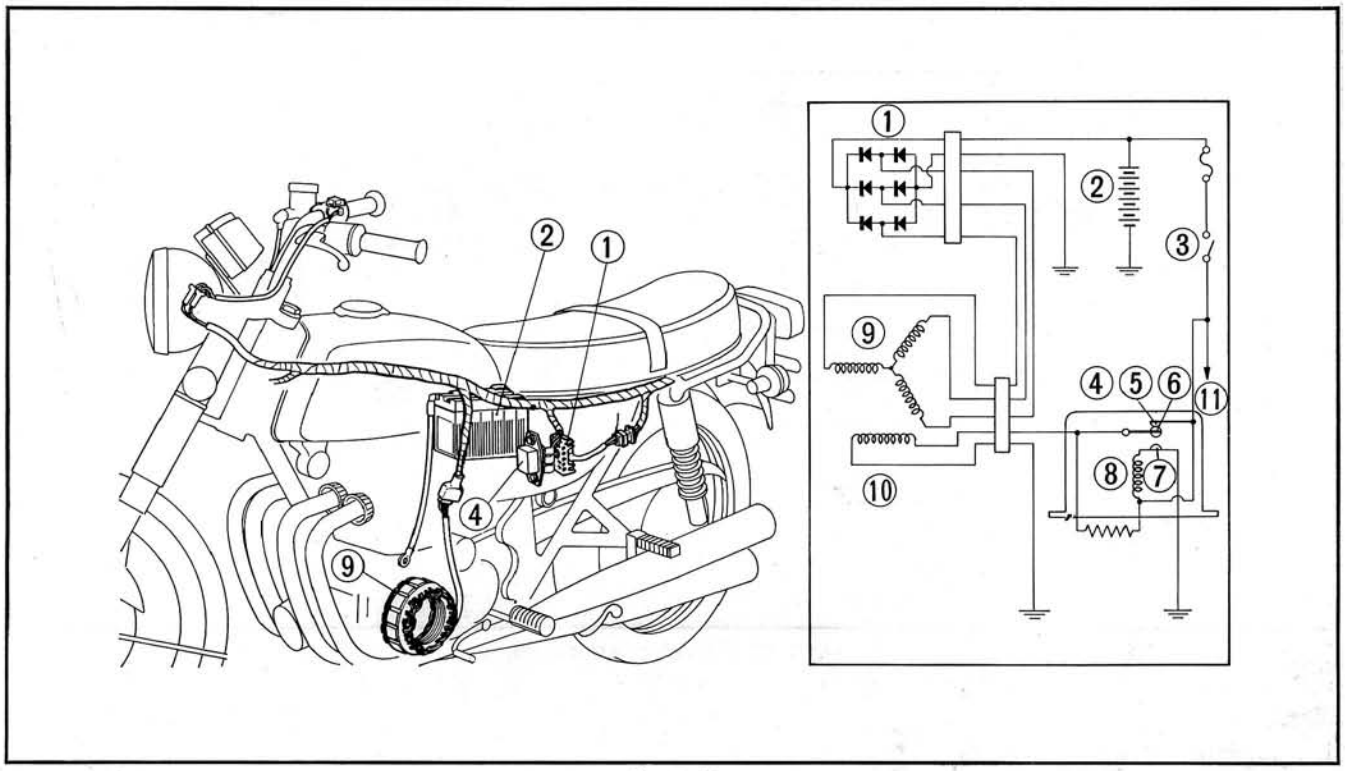


Fig. 5–10

① Silicon rectifier ② Battery ③ Main switch ④ Regulator ⑤ Upper contact ⑥ Moving contact ⑦ Lower contact ⑧ Relay coil ⑨ Stator coil ⑩ Field coil ⑪ Load

The charging system consists of a 3 phase A–C generator, silicon diode rectifier, voltage regulator and storage battery. The 3 phase A–C generator, a brushless exciting type, is capable to generate high voltage output enough to operate all electrical units of this machine. It features compact construction, light weight and reduced wear parts to facilitate its handling and servicing. A dual-contact type Tirrill regulator is used in the charging circuit.

1. Charging test

1) Use a fully charged battery for the test. (The specific gravity of the electrolyte in each cell must be **1.26~1.28 at 20 C°** or **68 F°**.)
2) Connect the negative probe of an ammeter to the positive terminal of the battery and the positive probe to the harness.
3) Connect the probes of a voltmeter to the battery terminals in similar polarity.
4) Run the engine under the conditions of NIGHT-TIME RIDING by switching the headlight on, and DAYTIME RIDING, with the headlight off and take the meter readings. If the readings are out of the charging characteristics as specified on next page, check the generator for condition. If it is normal, check and adjust the regulator.

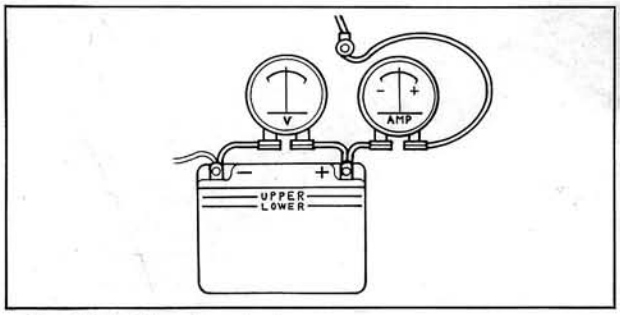


Fig. 5–11 Charging test

NOTE:
Remember the generator output may vary with a temperature.

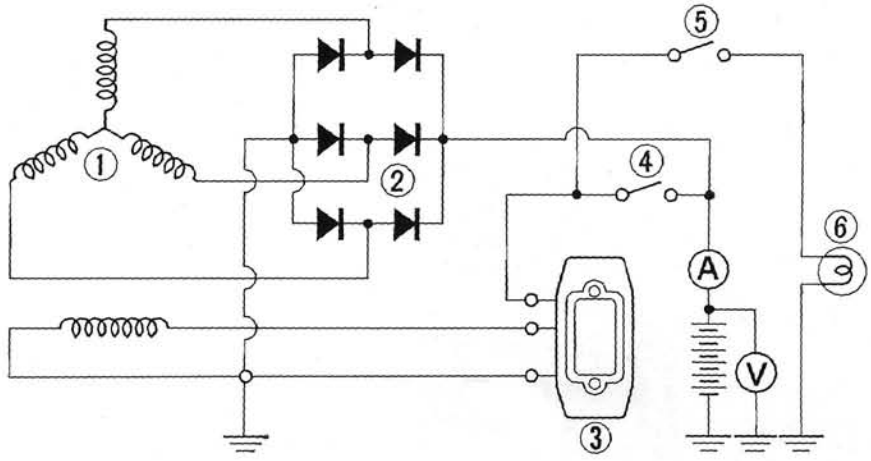


Fig. 5-12 Charging test circuit
① A-C generator ③ Regulator ⑤ Lighting switch
② Silicon rectifier ④ Main switch ⑥ Load

Charging characteristics

Engine (rpm) / Charging current (Ampere)	1,000	2,000	3,000	4,000	5,000	6,000	7,000	8,000
NIGHTTIME RIDING	1.6	1.9	2.0	1.8	1.6	1.5	1.4	1.4
DAYTIME RIDING	—	—	4	2.6	2.0	1.6	1.4	1.4
Battery terminal voltage (Volt)	12.5	14.2	15	15	15	15	15	15

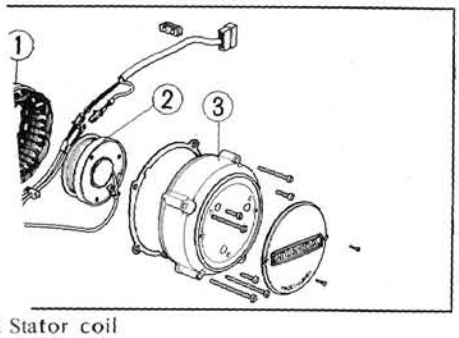


fig. 5-13 1 Stator coil
2 Field coil
3 Dynamo cover

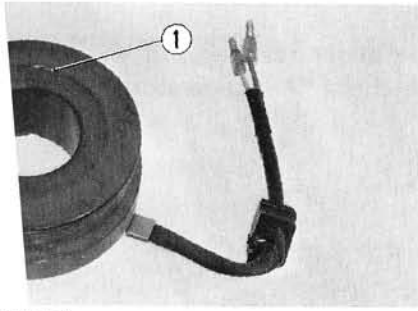


fig. 5-14 1 Field coil

A-C generator

Rated current output	14.5 V 13 A
Rated charging speed	5,000 rpm
Ground polarity	⊖

Inspection

1. Checking field coil for continuity
Check for continuity between the two leads (white and green) with a radio tester.
Resistance specification : **4.6~5.0** Ω

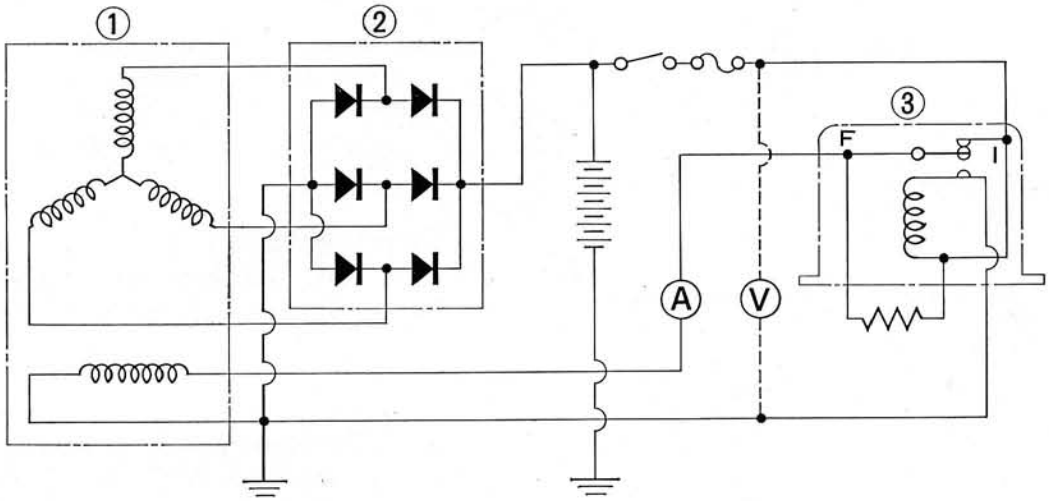


Fig. 5–15 ① A-C generator ② Silicon diode rectifier ③ Regulator

2. Checking resistance of the stator coil windings: Using an ohmmeter set to its lowest scale range, measure the resistance between one yellow wire lead and each of the remaining two. Test all three leads in this manner.
   Specification: 0.61–0.69 ohms resistance between leads

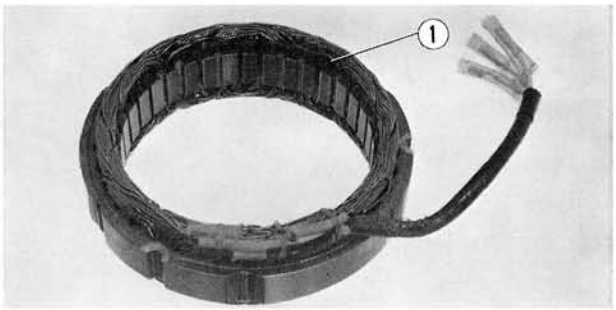


Fig. 5–16 ① Stator coil

Silicon diode rectifier

Test each diode for forward and reverse continuity with an ohmmeter or test light. Touch one of the yellow wire coupling pins ③ with either of the test instrument leads, then touch the second test lead to pins ④ and ⑤ in turn. Note the continuity indication. Repeat this procedure at each of the two remaining yellow wire coupling pins ③ **(Fig. 5–18)**.
Reverse the test instrument leads and repeat the above procedure.
The rectifier is good if the test shows continuity in one direction only at all diodes. The rectifier is defective if:
a. There is continuity in both directions at any diode.
b. There is no continuity in either direction at any diode.

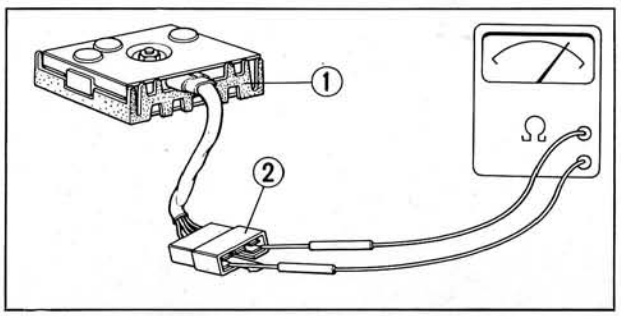


Fig. 5–17 ① Silicon diode rectifier
② Coupler

CAUTION:
Do not use an ohmmeter's megohm range (ohms X 1,000,000) for this test.

Do not operate the engine with the red/white rectifier lead disconnected.

When installing a battery, be careful to connect battery terminal wires in correct polarity.

Disconnect the rectifier coupling plug when charging the battery from an external power source.

Failure to observe these precautions may result in damage to the diodes.

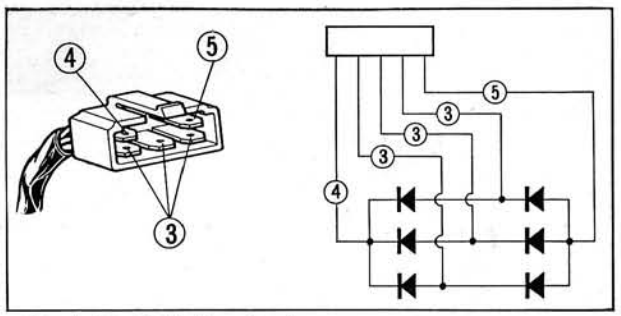
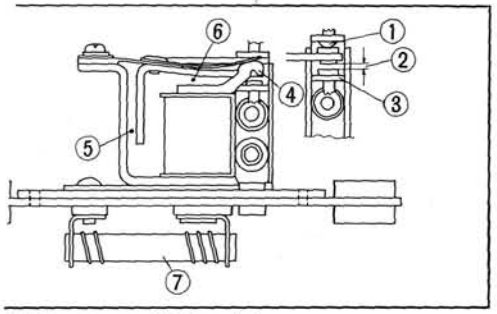
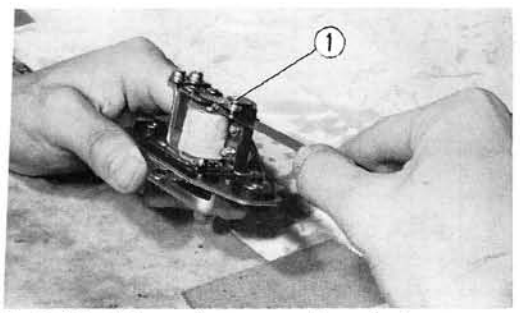


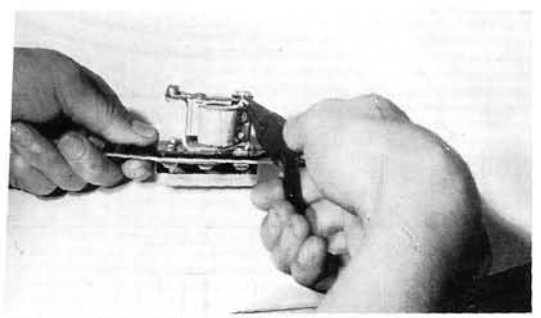
Fig. 5–18 ③ Yellow leads
④ Red/white lead
⑤ Green lead



① Upper contact point
② Point gap
③ Lower contact point
④ Charging rate adjustment arm
⑤ Angle gap
⑥ Armature gap
⑦ Resistor



0 ① Checking point gap with a feeler gauge



-21 Bending the adjusting arm to adjust the charging rate

Regulator

Intermittent opening of the regulator contact points during operation creates a resistance in the field circuit, reducing alternator output. The voltage level at which this occurs may be adjusted as necessary.

Testing

Test regulator with battery fully charged.

1. Connect a DC voltmeter from regulator ignition terminal (I) to ground. Remove the white lead from the field terminal (F), and connect an ammeter between the wire and the terminal.
2. With the engine idling, note the field current. If value exceeds Mode I limits in the table below, the regulator or alternator field coil is faulty.
3. Slowly increase engine speed until the ammeter needle deflects to half the Mode I value. Note the voltage reading at the moment the ammeter needle deflects and compare with Mode II in the table below.
4. Increase engine speed to 4000 rpm or more, and note the maximum voltage reading. Field current and voltage should agree with Mode III in the table below.

MODE	FIELD CURRENT	VOLTAGE
I (idle)	2.4–2.6 A	to 13.2 V
II	1.2–1.3 A	13.5–14.5 V
III	0–1.2 A	14.0–15.0 V

If field current does not decrease as voltage increases, the regulator is faulty.
If field current to voltage values are higher or lower than the limits in the table, adjustment is indicated.
If voltage exceeds 15.0 V at any speed, system is overcharging.

Adjustment

1. **Armature gap: 0.6–1.0 mm (0.020–0.040 in.)**
   If adjustment is required, loosen the point base screw, and raise or lower the point assembly to obtain the correct armature gap.
2. **Angle gap: 0.6 mm (0.024 in.)**
   Adjustment of the armature gap simultaneously adjusts the angle gap.
3. **Point gap: 0.3 mm (0.012 in.)**
   If adjustment is required, carefully bend the lower point bracket to obtain the correct point gap.
4. **Adjusting arm**
   After checking armature gap and point gap, bend the adjusting arm up or down to obtain the correct voltage readings. Bend the adjusting arm up to increase the charging rate or down to decrease the charging rate.

4. STARTING SYSTEM

The starting motor is located on the upper crankcase. It is of a drip- and dust-proof type.
The torque developed by the motor is transmitted through reduction gears, driven gear, and overrunning clutch to the primary shaft.

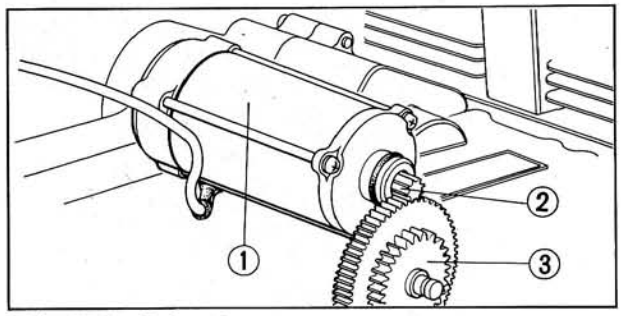


Fig. 5-22 ① Starting motor
② Starting motor shaft gear
③ Starting motor reduction gear

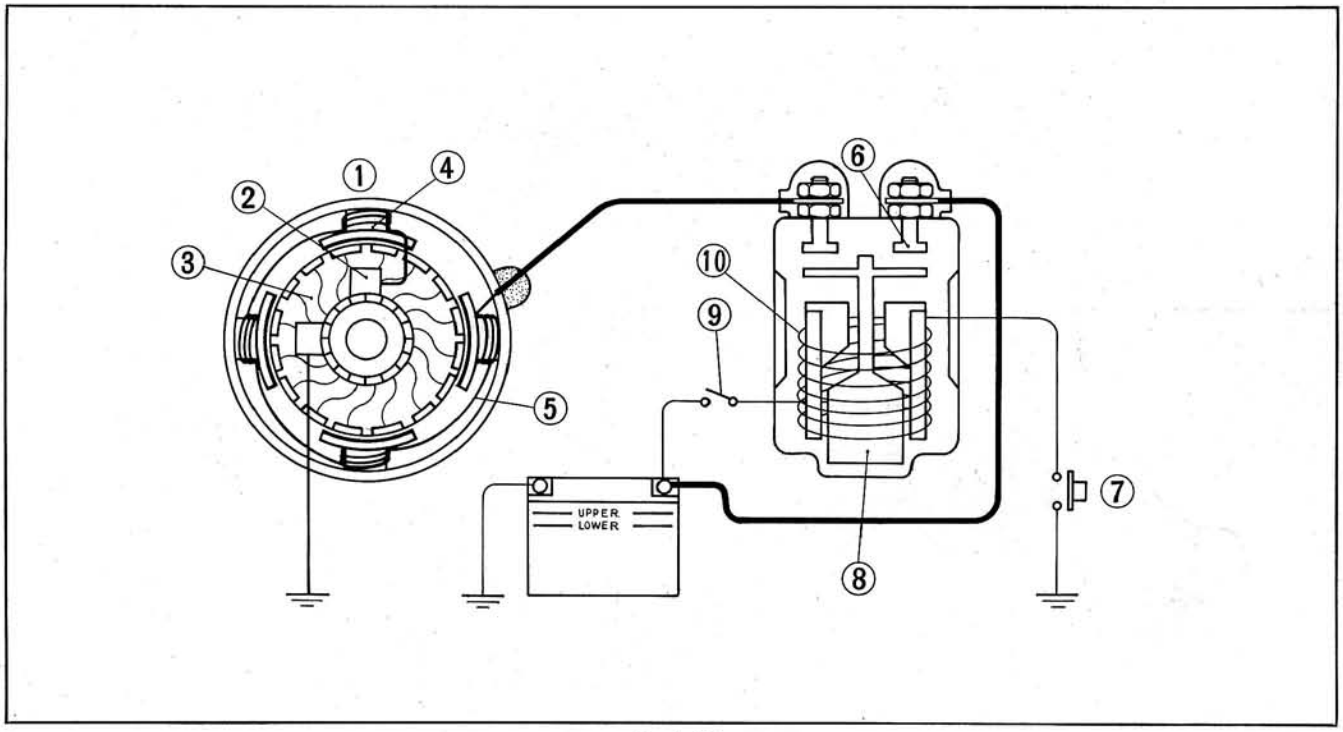


Fig. 5-23

① Starting motor
② Brushes
③ Armature
④ Poles
⑤ Field coil
⑥ Magnetic switch
⑦ Starter switch
⑧ Plunger
⑨ Main switch

Starting motor

Specifications and characteristics
Rated output voltage : 12V
Rated output : 0.6kW
Rated operating time : 30sec., (coutinuous)

	On-load	No-load	When locked
Voltage (V)	11	8	5
Amperage (A)	35	120	250
Torque (kg-cm) (lb-ft)	—	0.11 (0.795)	0.26 (1.880)
Speed (rpm)	1, 100-22, 000	3, 200	—

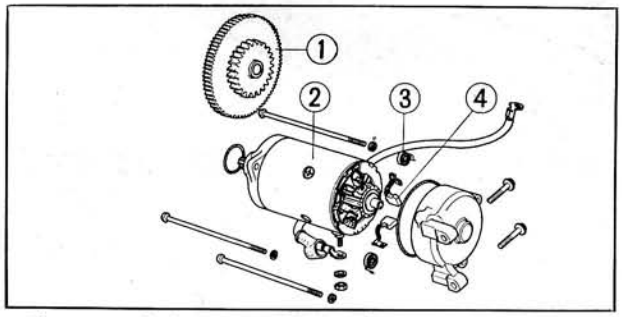


Fig. 5-24 ① Starting motor reduction gear
② Starting motor
③ Brush spring
④ Brush

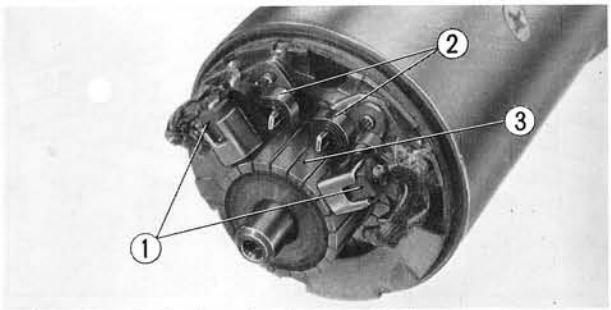


Fig. 5-25 ① Carbon brushes ③ Commutator
② Brush springs

Inspection

1. Checking carbon brushes
Check the brushes and springs for condition. Brushes which are excessively worn and not seating properly on commutator and weakened brush spring may cause the starting motor inoperative. Replace the brush or spring if out of the specifications below.

	Standard value	Repair limit
Carbon brush length, mm (in.)	12~13 (0. 47~0. 51)	5. 5 (0. 22) max.
Brush spring tension, kg (lbs)	0. 5~0. 6 (1. 1~1. 3)	0. 4 (0. 8) max.

2. Cleaning commutator
Check the commutator surface for condition. Polish the surface with a fine emery cloth if dirty, and thoroughly wipe it clean before reassembly.

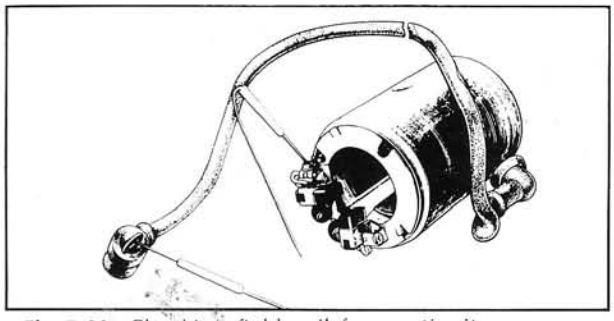


Fig. 5-26 Checking field coil for continuity

3. Checking field coil for continuity
Check for continuity between the brushes connected to the field coil and starting motor cable. If there is no continuity, it is an indication that the field coil has an open circuit.

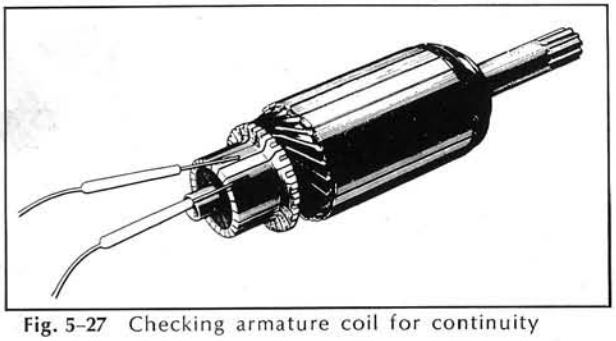


Fig. 5-27 Checking armature coil for continuity

4. Checking armature coil for continuity
The armature coil with a short-circuit will result in a failure of the starting motor to operate properly. Check for continuity between the commutator surface and core. If there is any continuity, the stator coil is grounded.

Starting magnetic switch

The starting motor draws a large amount of current of approx. 100A when cranking the engine.
This is why a large-capacity electromagnetic switch which is electrically remote-controlled by a separate switch (starter switch) is used.

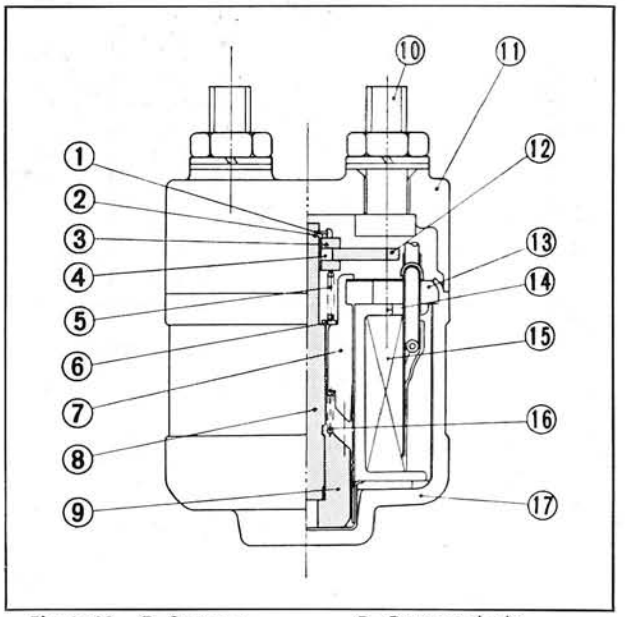


Fig. 5–28 ① Stopper ② Stopper holder ③ Washer ④ Roller A ⑤ Contact spring ⑥ Flat washer ⑦ Plunger holder ⑧ Plunger shaft ⑨ Plunger ⑩ Contact bolt ⑪ Case ⑫ Contact plate ⑬ Yoke ⑭ Coil bobbin ⑮ Coil complete ⑯ Return spring ⑰ Body

Inspection

1. Checking primary coil for continuity
   It there is no continuity, the primary coil has an open-circuit. The coil is in good condition when a clicking sound is heard by applying a 12V battery across the two leads of the coil.

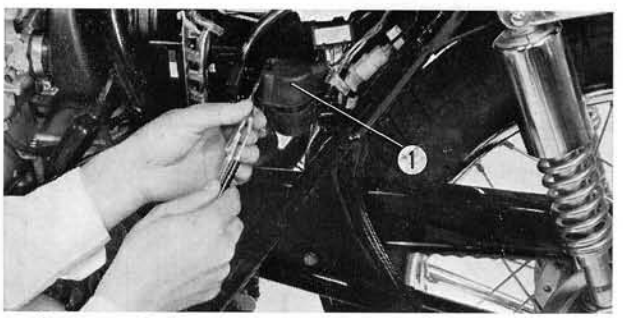


Fig. 5–29 ① Starting magnetic switch

2. After a long period of use, the contact points of the magnetic switch will become pitted or burnt due to a large amount of current, and, in the worst cases, the current will not flow due to increased resistance.
   Check for continuity across the two leads of the primary coil by connecting a 12V battery with the switch turned on. If there is no continuity, it is an indication that the starting magnetic switch is at fault.

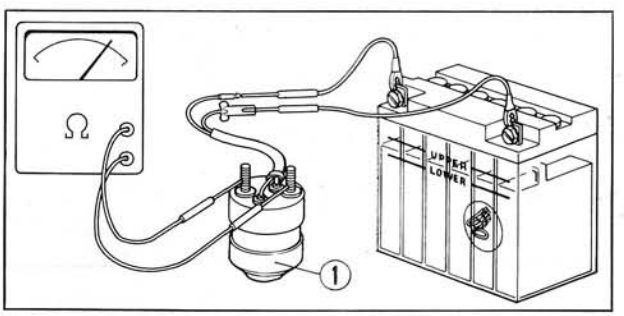


Fig. 5–30 ① Starting magnetic switch

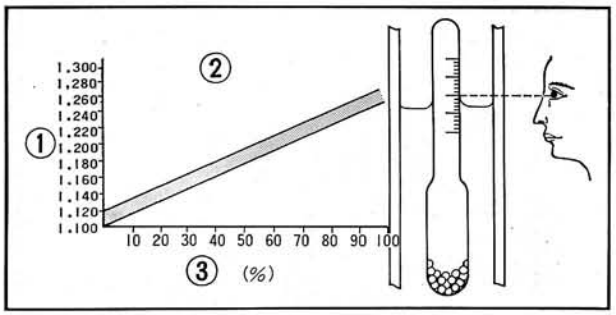


Fig. 5-31 ① Specific gravity
② Relation between specific gravity and residual charge
③ Residual charge

Battery

Specifications

Type	12 N 12 A-4 A
Voltage	12 V
Capacity	12 AH

Measuring specific gravity of electrolyte.
Using a hydrometer, measure the specific gravity of the electrolyte in each cell. When the reading taken is below 1.200 at 20°C or 68°F, recharge the battery. When reading the hydrometer, hold the gauge barrel vertically as shown.

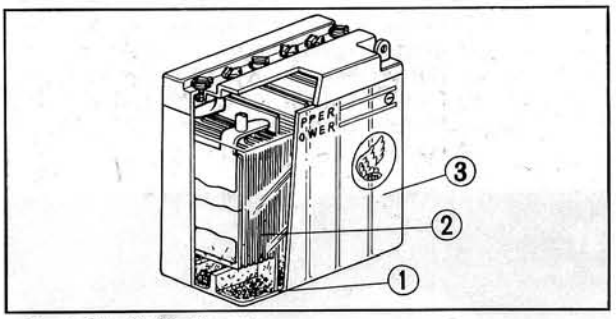


Fig. 5-32 ① Sediment
② Plates
③ Battery case

Inspection

1. Check each battery cell for correct electrolyte level semi-monthly or monthly. If the level is low, add distilled water up to the upper level.
2. When the electrolyte decreases rapidly, check the charging system.
3. Periodically check each cell for correct specific gravity. After adding distilled water, charge the battery by operating the engine, and then check the specific gravity.
4. Check the battery terminals for corrosion. Check for separated battery paste and for sulfation. These defects are the symptoms of a run-down battery. Periodical inspection is always necessary, especially the battery is kept in storage for an extended period of time.

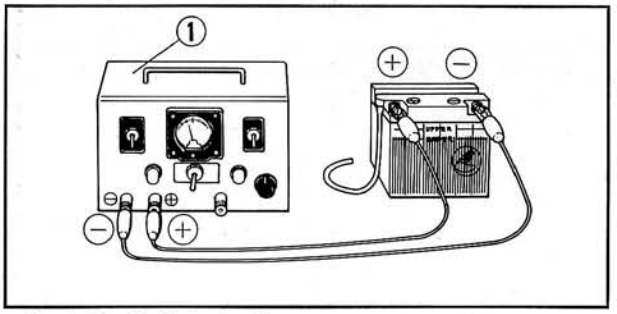


Fig. 5-33 ① Battery charger

Charging battery

1. It is advisable that the battery be charged as slowly as possible since quick charging is the sure way of shortening the battery service life. Where the battery has to be charged quickly the charging current should be held to 2.0A maximum.
2. Hydrogen gas is produced during charging operation. Keep away from fire.
3. After charging, flush the battery clean and grease the terminals.

5. ELECTRICAL EQUIPMENTS

Main switch

With the key in either ON or OFF, check the main switch for continuity. If there is continuity in the circuit (○—○), the switch is in good condition. If there is no continuity or if there is any continuity in other circuits shown below, the switch is at fault.

		BAT	IG	TL1	TL2
Cord color		Red	Black	Brown/ white	Brown
Key Position	OFF				
	I	○———	———○	○———	———○
	II	○———	———————	———————	———○

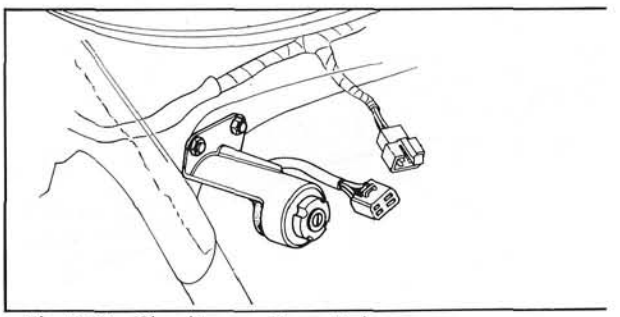


Fig. 5-34 Checking main switch

Front stop switch

Put the tester probes on the terminals of the front stop switch cords (black, green/yellow).
Operate the brake lever to check for continuity.
The stop light should come on with the brake lever is moved **5~10 mm (0.2~0.4 in.)** as measured at the tip of the lever.

NOTE:
Note that the lever play is 2~5 mm (0 08~0.2 in.) at the lever end.

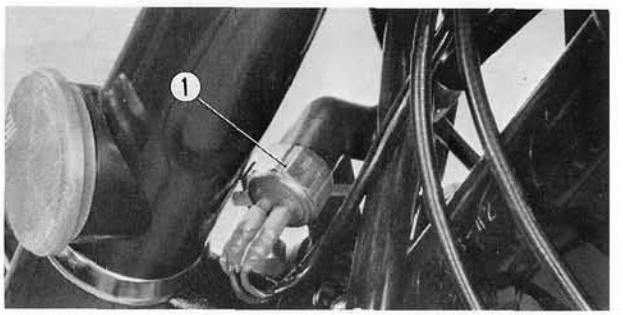


Fig. 5-35 ① Front stop switch

Rear stop switch

Put the tester probes on the terminals of the rear stop switch cords (green/yellow, black) to check for continuity. The rear stop light should come on when the rear brake pedal is depressed **20 mm (0.8 in.)** as measured at the tip of the pedal. Adjust by means of the adjusting nut if necessary.

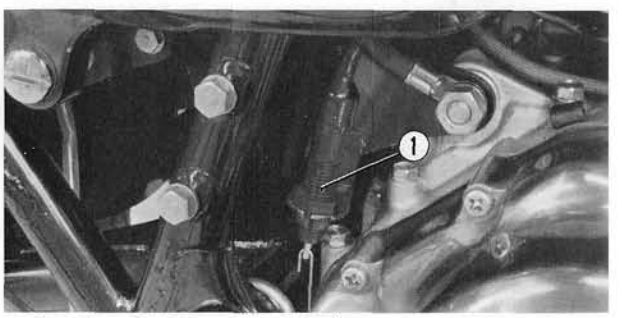


Fig. 5-36 ① Rear stop switch

Horn

Check for continuity between the horn cord terminals or check to make sure the horn sounds when it is connected to fully charged 12 V battery.

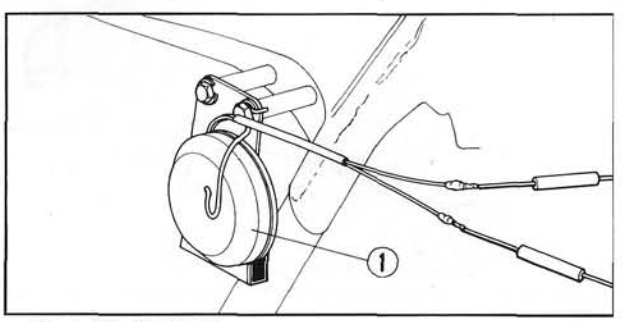


Fig. 5-37 ① Horn

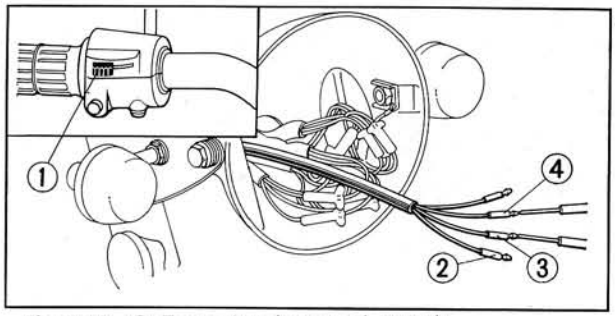


Fig. 5-38 ① Turn signal control switch
② Light blue cord
③ Gray cord
④ Orange cord

Turn signal control switch

Disconnect the cord of the turn signal control switch in the head light case. Check for continuity between the terminals of the gray cord and orange cord (left turn signal) and between those of the gray cord and light blue cord (right turn signal). The switch is in good condition if there is continuity in the circuits (○—○) shown below:

Cord color / Knob Position	Light blue	Gray	Orange
R	○	○	
OFF			
L		○	○

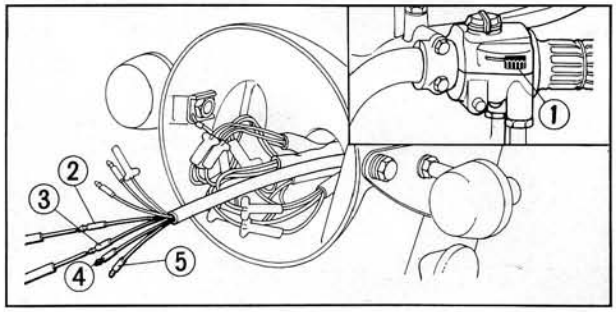


Fig. 5-39 ① Headlight control switch
② Black cord ④ Brown, white cord
③ Blue cord ⑤ White cord

Head light control switch

Check for continuity between the respective terminals of the switch cords in the head light case.
The switch is in good condition if there is continuity in the circuits (○—○) with the switch selector knob set in each position.
Any continuity in other circuits shown below is the symptom of malfunction of the switch.

		IG	HB	TL	LB
Cord color		Black	Blue	Brown/white	White
ON	H	○	○	○	
	N	○	○	○	○
	L	○		○	○

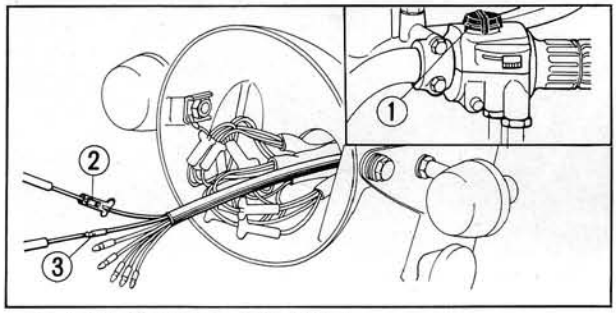


Fig. 5-40 ① Emergency switch
② Black cord ③ White cord

Emergency switch and starter switch

Check for continuity between the respective terminals of the switch cords in the head light case. The switch is normal if there is continuity as specified below (○—○) with the switch selector knob set in each position. Any continuity in other circuits shown below indicates malfunction of the switch.

Emergency switch

Cord color	Black	Black/white
RUN	○	○
OFF		

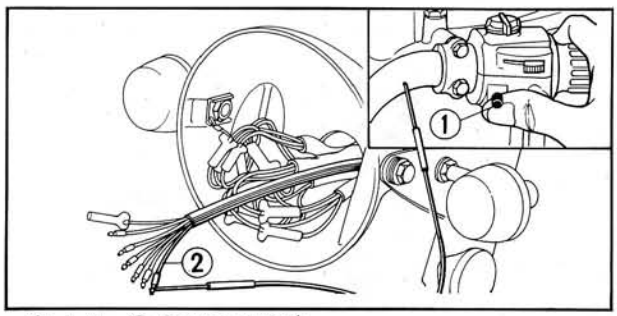


Fig. 5-41 ① Starter switch
② Yellow, red cord

Starter switch

Cord color	Yellow/red	Body grounding
ON	○	○
OFF		

Horn button

Check for continuity making contact the tester lead probes respectively on the terminal of the light green cord in the head light case and on the handlebar with the horn button pushed. If there is continuity, the horn button is normal.

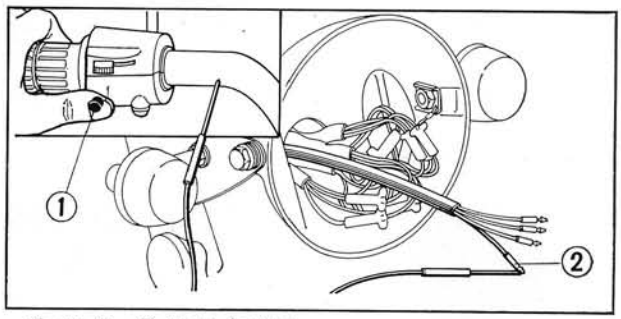


Fig. 5-42 ① Horn button
② Light green cord

Oil pressure control switch

The oil pump supplies lubricating oil to the engine under a pressure of **4.5 kg/cm²** (**64 lb/in²**). When the oil pressure drops below **0.3 kg/cm²** (**4.3 lb/in²**), the oil pressure control switch operates and the warning lamp comes on, indicating the oil supply is insufficient. Check the oil pressure control switch located on the oil pump for continuity. The switch is normal if there is continuity. The oil pressure pilot lamp will come on when the main switch is turned on and should go out after the engine is started.

If the pilot lamp remains on with the engine started, and the pressure control switch in good condition, the cause of trouble is suspected in the hydraulic system. Locate and correct the trouble with the engine stopped.

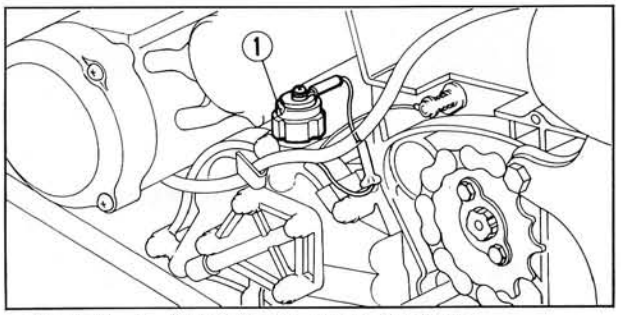


Fig. 5-43 ① Oil pressure control switch

Neutral switch

The neutral switch is located on the left side of the crankcase. With the transmission gears in neutral, the neutral switch is grounded and the neutral pilot lamp comes on.

Place the transmission gears in neutral and remove the left crankcase cover. Check the neutral switch for continuity. The switch is normal if there is continuity.

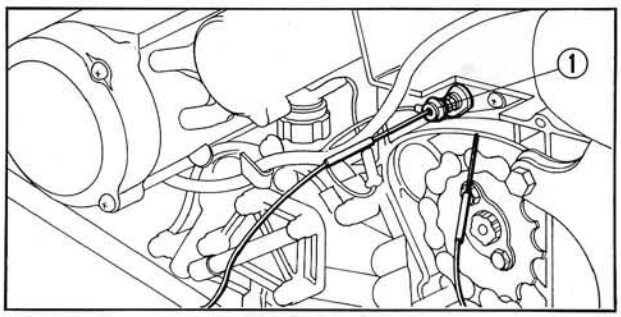
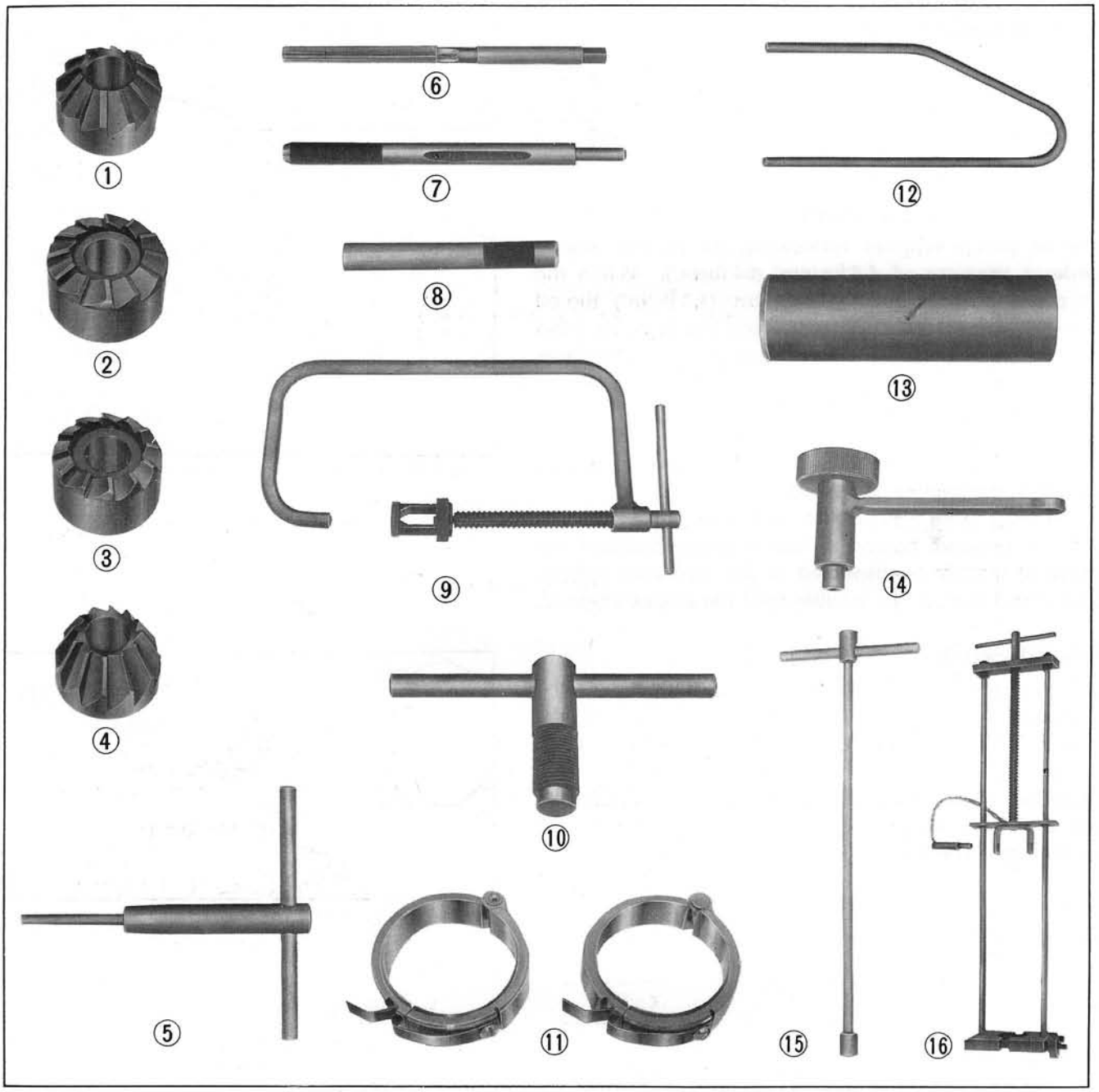


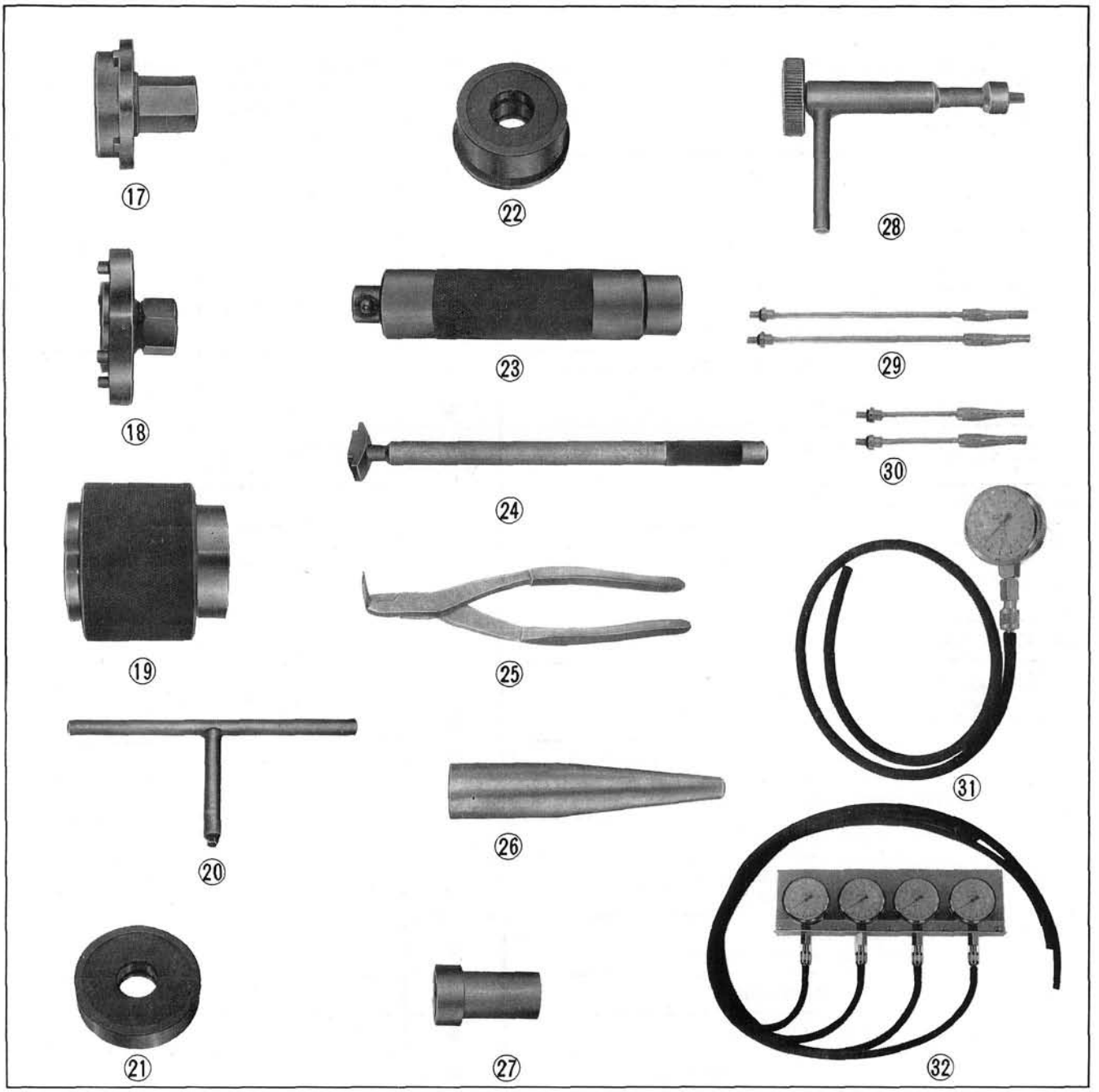
Fig. 5-44 ① Neutral switch

VI. SERVICE DATA

1. SPECIAL TOOLS



Ref. No.	Tool No.	Description	Ref. No.	Tool No.	Description
	07000-33300	CB 350 F Special tool set	⑧	07047-32901	Valve guide driver
	07000-33305	Valve seat cutter set (include No. 1-No. 8)	⑨	07031-32901	Valve lifter
			⑩	07011-33301	Generator rotor puller
①	07001-09802	Valve seat 90° cutter	⑪	07032-33301	Piston ring compressor (4 pcs)
②	07003-09802	Intake valve seat flat cutter	⑫	07033-33301	Piston base (4 pcs)
③	07004-09802	Exhaust valve seat flat cutter	⑬	07048-33305	Ball bearing attachment
④	07006-09802	Valve seat interior cutter	⑭	07081-00110	Tappet wrench set
⑤	07007-20001	Valve seat cutter holder	⑮	07078-32302	Box wrench 12 mm
⑥	07008-20002	Valve guide reamer	⑯	07035-32901	Rear suspension service tool
⑦	07046-32901	Valve guide remover			



Ref. No.	Tool No.	Description
⑰	07088-32301	Front wheel retainer wrench
⑱	07088-32901	Rear wheel retainer wrench
⑲	07054-33301	Front fork oil seal driver
⑳	07085-32301	Hollow set wrench 6 mm
㉑	07048-33301	Bearing driver attachment
㉒	07048-33310	Ball race driver attachment
㉓	07048-61101	Driver handle
㉔	07048-33315	Ball race remover
㉕	07073-32301	Snap ring pliers
㉖	07043-32301	Piston cup guide
㉗	07043-32305	Master piston slider
	OPTION	
㉘	07057-32302	Carburetor synchronization wrench
㉙	07068-30007	Vacuum gauge attachment A
㉚	07068-30012	Vacuum gauge attachment B
㉛	07064-30012	Vacuum gauge
㉜	07064-30001	Vacuum gauge set

2. MAINTENANCE SCHEDULE

MAINTENANCE SCHEDULE This maintenance schedule is based upon average riding conditions. Machines subjected to severe use, or ridden in unusually dusty areas, require more frequent servicing.	INITIAL SERVICE PERIOD	REGULAR SERVICE PERIOD Perform at every indicated month or mileage interval, whichever occurs first.			
	500 miles	1 month 500 miles	3 months 1,500 miles	6 months 3,000 miles	12 months 6,000 miles
Engine Oil—change.	●		○		
Oil Filter Element—raplace.	●			○	
Oil Filter Screen—clean.					○
Spark Plug—clean and adjust gap.				○	
*Contact Points—check, and adjust gap.	●			○	
*Ignition Timing—check, and adjust if necessary.	●			○	
*Valve Tappet Clearance—check, and adjust if necessary.	●			○	
*Cam Chain Tension—adjust.	●			○	
Air Cleaner—clean.	(Clean more frequently if operated in dusty areas)			○	
Air Cleaner—replace.					○
Carburetors—check, and adjust if necessary.	●			○	
Throttle Operation—inspect cables, check, and adjust free play.	●			○	
Fuel Cock Filter Screen—clean.				○	
Fuel Lines—check.				○	
*Clutch—check operation, and adjust if necessary.	●			○	
Drive Chain—check, lubricate, and adjust if necessary.	●	○			
Brake Fluid Level—check, and add fluid if necessary.	●			○	
*Brake Shoes/Pads—inspect, and replace if worn.				○	
Brake Control Linkage—check linkage, and adjust free play if necessary.	●			○	
*Wheel Rims and Spokes—check. Tighten spokes and true wheels, if necessary.	●			○	
Tires—inspect and check air pressure.	●		○		
Front Fork Oil—drain and refill.	●				○
Front and Rear Suspension—check operation.	●			○	
Rear Fork Bushing—grease.				○	
*Steering Head Bearings—adjust.					○
Battery—check electrolyte level, and add water if necessary.	●		○		
Lighting Equipment—check and adjust if necessary.	●	○			
All Nuts, Bolts, and Fasteners—check security and tighten if necessary.	●	○			

Items marked * should be serviced by an authorized Honda dealer, unless the owner has proper tools and is mechanically proficient. All other maintenance items are simple to perform and may be serviced by the owner.

3. TORQUE SPECIFICATIONS

ENGINE

Tightening point	Thread dia. (mm)	Torque	
		kg-cm	lbs-ft
Crankcase and crankcase covers	6, P1.0	70–110	5.1–8.0
Cylinder head	8, P1.25	200 (Apply oil to the nuts before tightening)	14.5
Carburetor insulator-to-cylinder head	6, P1.0	70–110	5.1–8.0
Cam sprocket	7, P1.0	160–200	11.6–14.5
A-C generator rotor	10, P1.25	300–400	21.7–29.0
Primary drive gear	12, P1.25	300–400	21.7–29.0
Tappet adjusting nut	5, P0.5	70–110	5.1–8.0
Upper and lower crankcases	8, P1.25	220–260	15.2–18.9
Cylinder head cover	6, P1.0	70–110	5.1–8.0

FRAME

Tightening point	Thread dia, (mm)	Torque	
		kg-cm	lbs-ft
Steering stem nut	24, P1.0	800–1,200	57.9–86.9
Fork top bridge to front forks	8, P1.25	180–230	13.1–16.7
Handlebar holder	8, P1.25	180–230	13.1–16.7
Front fork bottom bridge to front forks	8, P1.25	180–230	13.1–16.7
Spokes	——		
Front wheel	——	25–30	1.9–2.2
Rear wheel	——	20–25	1.5–1.9
Rear fork pivot bolt	14, P1.5	550–700	39.8–50.7
Front wheel axle nut	12, P1.5	450–550	32.6–39.8
Front fork axle holder	8, P1.25	180–230	13.1–16.7
Engine hanger bolt	10, P1.25	300–400	21.7–29.0
Rear wheel axle nut	16, P1.5	800–1,000	57.9–72.4
Final driven sprocket	10, P1.25	300–400	21.7–29.0
Brake arm	6, P1.0	80–100	5.9–7.3
Front and rear brake torque links	8, P1.25	180–230	13.1–16.7
Rear suspension	10, P1.25	300–400	21.7–29.0
Step bar	12, P1.25	450–550	32.6–39.8
Gear change pedal and kick arm	6, P1.0	80–100	5.9–7.3
Seat band	6, P1.0	80–100	5.9–7.3

4. SERVICE DATA

ENGINE

Unit : mm (in.)

Item	Assembly standard	Service limit
Rocker arm-to-rocker arm shaft clearance	0.016–0.052 (0.0006–0.0020)	0.1 (0.0039)
Cam height of camshaft		
Intake	28.185–28.225 (1.1096–1.1112)	28.0 (1.1024)
Exhaust	28.184–28.224 (1.1096–1.1111)	28.0 (1.1024)
Camshaft center journal runout	—	0.1 (0.0039)
Valve seat width	0.7 (0.03)	1.5 (0.06)
Valve stem O. D.		
Intake	5.48–5.49 (0.2158–0.2161)	5.35 (0.2106)
Exhaust	5.46–5.47 (0.2150–0.2154)	5.35 (0.2106)
Valve-to-valve guide clearance		
Intake	0.01–0.03 (0.0004–0.0012)	0.3 (0.0118)
Exhaust	0.03–0.05 (0.0012–0.0020)	0.3 (0.0118)
Valve spring preload		
Inner	19.2/13.0–14.6 kg (0.7559/28.665–32.1930 lbs)	—
Outer	23.7/32.0–32.4 kg (0.9330/70.560–71.4420 lbs)	—
Valve spring free length		
Inner	29.0 (1.1417)	27.0 (1.0630)
Outer	34.5 (1.3583)	32.5 (1.2795)
Cylinder head flatness	—	0.3 (0.0118)
Cylinder I. D.	47.00–47.01 (1.8504–1.8508)	47.1 (1.8543)
Piston skirt O. D.	46.97–46.99 (1.8492–1.8500)	46.85 (1.8445)
Piston pin hole I. D.	13.002–13.008 (0.5119–0.5121)	13.05 (0.5138)
Piston pin O. D.	12.994–13.00 (0.5116–0.5118)	12.9 (0.5079)
Piston ring-to-piston ring groove clearance		
Top ring	0.03–0.055 (0.0012–0.0022)	0.15 (0.0059)
Second ring	0.015–0.045 (0.0006–0.0018)	0.15 (0.0059)
Oil ring	0.015 (0.0006)	0.15 (0.0059)
Piston ring end gap		
Top ring	0.1–0.3 (0.0039–0.0118)	0.7 (0.0276)
Second ring	0.1–0.3 (0.0039–0.0118)	0.7 (0.0276)
Oil ring	0.1–0.3 (0.0039–0.0118)	0.7 (0.0276)
Outer rotor O. D.-to-pump body clearance		
Main pump	0.06–0.12 (0.0024–0.0047)	0.35 (0.0138)
Auxiliary pump	0.15–0.20 (0.0059–0.0079)	0.35 (0.0138)
Outer rotor-to-inner rotor clearance		
Main pump	0.15 (0.0059), max.	0.3 (0.0118)
Auxiliary pump	0.15 (0.0059), max.	0.3 (0.0118)
Friction disc thickness	2.62–2.78 (0.1032–0.1095)	2.3 (0.0906)
Clutch plate surface warpage	0.1 (0.0039), max.	0.2 (0.0079)
Clutch spring preload	25.0/19.3–20.7 kg (0.9842/42.557~45.643 lbs)	—
Clutch spring free length	35.5 (1.3976)	34.0 (1.3386)

Unit: mm (in.)

Item	Assembly standard	Service limit
Clutch center-to-clutch plate B clearance	0.1–0.5 (0.004–0.02)	Beyond assembly standard
Gear shift fork finger width	5.93–6.00 (0.2335–0.2362)	5.5 (0.2165)
Gear shift guide shaft O. D.	12.957–12.984 (0.5101–0.5112)	12.9 (0.5079)
Gear shift fork I. D.	13.000–13.018 (0.5118–0.5125)	12.95 (0.5098)
Kick starter pinion-to-shaft clearance	0.04–0.082 (0.0016–0.0032)	0.1 (0.004)
Gear shift fork dowel-to-drum groove clearance	0.05–0.22 (0.0020–0.0087)	0.3 (0.0118)
Transmission gear backlash		
1st and 2nd	0.044–0.134 (0.0017–0.0053)	0.2 (0.0079)
3rd, 4th and 5th	0.046–0.142 (0.0018–0.0056)	0.2 (0.0079)
Transmission gear-to-shaft clearance		
C–1	0.04–0.074 (0.0016–0.0029)	0.2 (0.0079)
Other gears	0.04–0.081 (0.0016–0.0032)	0.2 (0.0079)
Cam chain tensioner slipper thickness (center)	4.0 (0.1575)	3.0 (0.118) max.
Cam chain guide thickness	6.1–6.3 (0.2402–0.2480)	5.0 (0.197)
Crankshaft runout (center)	0.03 (0.0012), max.	0.05 (0.0020)
Crankshaft journal clearance	0.018–0.048 (0.0007–0.0019)	0.08 (0.0032)
Connecting rod small end I. D.	13.012–13.033 (0.5123–0.5131)	13.10 (0.5158)
Connecting rod big end side clearance	0.02–0.07 (0.0008–0.0028)	0.15 (0.0059)
Connecting rod big end-to-crankshaft journal clearance	0.018–0.048 (0.0007–0.0019)	0.08 (0.0032)
Primary chain guide thickness (center)	6.0–6.3 (0.236–0.248)	5.0 (0.197)

Unit: mm (in.)

Item	Assembly standard	Service limit
Brake disc face runout	0.3 (0.0118), max.	0.3 (0.0118). min.
Brake disc thickness	6.9–7.1 (0.2717–0.2795)	—
Wheel rim face runout	0.5 (0.0197), max.	2.0 (0.079)
Wheel bearing end play	0.07 (0.0028), max.	0.1 (0.0039)
Wheel bearing radial play	0.03 (0.0012), max.	0.05 (0.0020)
Front axle runout	0.01 (0.0004)	0.2 (0.0079)
Caliper cylinder I. D.	38.18–38.20 (1.5032–1.5039)	38.215 (1.5045)
Caliper piston O. D.	38.115–38.480 (1.5006–1.5150)	38.105 (1.5002)
Master cylinder I. D.	14.00–14.043 (0.5512–0.5529)	14.055 (0.5533)
Master cylinder piston O. D.	13.957–13.984 (0.5495–0.5505)	13.940 (0.5488)
Rear axle runout	0.01 (0.0004)	0.2 (0.0079)
Rear brake lining thickness	4.9–5.0 (0.1929–0.1969)	2.5 (0.0984)
Rear brake drum I. D.	160.0–160.3 (6.2992–6.3110)	161 (6.3386)
Front suspension spring preload	389.2/26.4 kg (15.3229/58.212 lbs)	—
Front suspension spring free length	426.5 (16.7917)	416 (16.378)
Rear suspension spring free length	195.8 (7.7087)	190 (7.480)
Rear fork pivot bushing-to-center collar clearance	0.1–0.3 (0.0039–0.0118)	0.5 (0.02)
Rear fork bushing I. D.	21.5–21.552 (0.8465–0.8485)	21.70 (0.8543)
Center collar O. D.	21.427–21.460 (0.8436–0.8449)	21.35 (0.8406)
Front fork bottom case I. D.	33.000–33.039 (1.2992–1.3007)	33.18 (1.3063)
Front fork bottom piston O. D.	32.925–32.950 (1.2963–1.2973)	32.875 (1.2944)

5. TROUBLE SHOOTING

ENGINE

Trouble	Probable Cause	Remedies
Engine does not start	1. Excessive wear of piston ring or cylinder.	Replace.
	2. Seized valve in valve guide.	Replace.
	3. Seized piston.	Replace.
	4. Faulty valve timing.	Adjust.
	5. Low or lack of compression pressure.	Lap the valve to obtain good valve seating or replace.
	· Pressure leak	
	5. Blown out cylinder head gasket.	Replace.
	6. Warped gasketting surface of the cylinder and cylinder head.	Repair or replace.
Poor engine idling	1. Incorrect tappet clearance.	Adjust to standard value.
	2. Low or lack of compression pressure.	Repair.
	3. Excessive valve guide clearance.	Replace valve and guide.
Loss of power	1. Valve sticking open.	Replace.
	2. Incorrect seating of valve.	Lap valve.
	3. Weak or broken valve spring.	Replace.
	4. Faulty valve timing.	Check valve timing and adjust if necessary.
	5. Blown out cylinder head gasket.	Replace.
	6. Excessive wear of cylinder and piston.	Replace.
	7. Worn, weak or broken piston ring.	Replace.
	8. Loose spark plug.	Retighten.
Overheating	1. Heavy carbon deposit on combustion chamber and piston head.	Remove carbon.
	2. Lean fuel mixture.	Adjust the carburetor.
	3. Retarded ignition timing.	Adjust ignition timing.
	4. Low oil level, poor quality.	Add good grade oil.
	5. Extended operation in low gear.	
Backfire	1. Incorrect seating of inlet valve.	Check the valve seating.
	2. Faulty valve timing.	Adjust.
	3. Incorrect ignition timing.	Adjust.
	4. Excessive spark plug gap.	Adjust the gap to 0.024~0.028 in. (0.6~0.7 mm).
	5. Improper fuel.	Use good quality fuel.
White exhaust smoke	1. Excessive wear of cylinder and piston.	Replace the piston.
	2. Overfilled engine oil.	Adjust the oil level.
	3. Excessively high oil pressure.	Check the breather.
	4. Poor quality oil.	Replace with good quality oil.
Black exhaust smoke	1. Rich fuel mixture.	Adjust the carburetor.
Difficult gear shifting	1. Improper clutch disengagement.	Adjust the clutch.
	2. Damaged gear or foreign object lodged in the gear.	Replace the defective parts.
	3. Gear shift fork inoperative.	Repair or replace.
	4. Incorrect operation of the gear shift drum stopper and change pedal.	Repair or replace.
	5. Mainshaft and countershaft out of alignment.	Repair or replace.
	6. High oil viscosity.	Change the oil.
Excessive high gear noise	1. Excessive gear backlash.	Repair or replace.
	2. Worn main and countershaft bearing.	Repair or replace.

Trouble	Probable Cause	Remedies
Gear slip out	1. Worn fingers on gear shift fork. 2. Worn gear dog hole. 3. Worn spline.	Replace. Replace. Replace.
Clutch slippage	1. No play in the clutch lever. 2. Weak or none uniform clutch spring. 3. Worn or grazed friction disc.	Adjust the clutch. Replace the weak spring. Replace.
Poor clutch engagement	1. Excessive play of clutch lever. 2. Warped friction disc. 3. Warped pressure plate. 4. Bent main shaft.	Adjust clutch lever play. Replace. Replace. Replace.
Pedal does not return	1. Faulty return spring. 2. Unhook return spring.	Replace. Hook return spring.
Kick starter gear does not rotate	1. Excessive wear of kick starter pawl.	Replace.
Engine does not start	Carburetor 1. Choke fully open. 2. Carburetor air screw improperly set. 3. Air leaking into the cylinder head. 4. Clogged carburetor slow jet. 5. Clogged fuel valve or piping. 6. Clogged vent hole in the fuel tank cap. 7. No fuel in the tank.	 Close choke. Adjust air screw. Retighten carburetor connecting tube. Check, clean and retighten. Disassemble and clean. Disassemble and clean. Fill tank with gasoline.
Poor engine idling	Carburetor 1. Clogged or loose carburetor slow jet. 2. Improper float level. 3. Incorrect air screw adjustment. 4. Carburetor linkage mulfunction. 5. Air leaks.	 Check, clean and retighten. Adjust. Adjust. Adjust. Tighten all air passage connection.
Improper running of engine	Carburetor 1. Jet size too small. 2. Improper float level. 3. Clogged carburetor main jet. 4. Carburetor linkage mulfunction. 5. Air leaks.	 Replace with larger size jet. Adjust. Clean and retighten. Adjust. Tighten all air passage connection.

CHASSIS

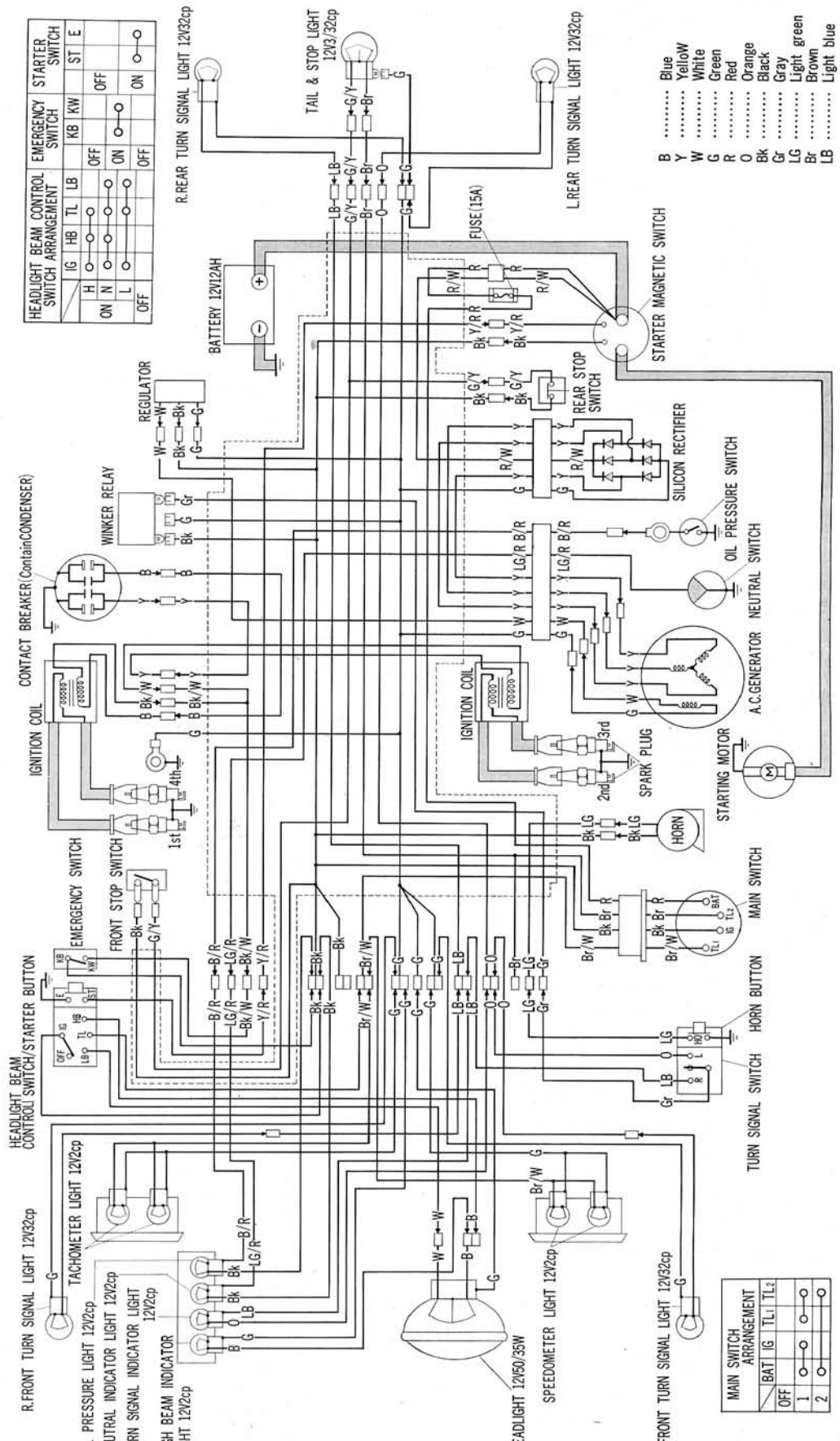
Trouble	Probable Cause	Remedies
Heavy steering	1. Steering stem excessively tightened. 2. Damaged steering stem steel balls. 3. Bent steering. 4. Low front tire pressure.	Loosen the steering stem nut. Replace. Replace. Add air to the specified pressure of 1.8 kg/cm² (26 psi).
Front and rear wheel wobble	1. Loose steering stem mounting bolt. 2. Worn front and rear wheel bearings. 3. Front or rear wheel runout or distorted. 4. Loose spoke. 5. Defective tire.	Retorque. Replace bearing. Repair or replace. Retorque. Replace.
Soft suspension	1. Loss of spring tension. 2. Excessive load.	Replace.
Hard suspension	1. Ineffective front fork damper. 2. Ineffective rear damper.	Repair. Replace.
Suspension noise	1. Front case or rear damper rubbing. 2. Interference between cushion case and spring. 3. Faulty fork stopper rubber. 4. Insufficient front fork oil.	Inspect cushion spring and case. Repair or replace. Replace. Add ATF.
Defective brake	1. Front brake. • Insufficent brake fluid. • Air in the brake system. • Worn brake pad. • Worn piston. • Worn or distorted brake disc. • Brake lever out of adjustment. 2. Rear brake. • Worn brake lining. • Worn brake shoe or poor contacts. • Worn brake cam. • Wet brake from water or oil. • Worn brake shaft. • Brake pedal out of adjustment.	 Add brake fluid. Bleed brake system. Replace pad. Replace piston. Replace disc. Readjust. Replace. Replace. Replace. Clean. Replace. Readjust.

ELECTRICAL

Troubles	Probable Causes	Remedies
Engine does not Start	1. Battery	
	· Discharged.	Recharge or replace.
	· Poor contact of battery terminals.	Repair.
	2. Main switch	
	· Open or shorted circuit, disconnected connections.	Repair.
	· Poor contact between main switch wire and wire harness.	Repair.
	3. Ignition coil	
	· Improperly insulated high tension coil.	Replace.
	· Open or shorted circuit in ignition coil.	Replace.
	4. Contact breaker	
	· Open circuit in the primary coil.	Repair.
	· Dirty ground point with oil or dust.	Clean.
	· Point gap out of adjustment.	Readjust.
	· Improperly charged condenser.	Replace.
Starting motor does not operate	1. Defective battery.	Charge or replace.
	2. Poor contact of magnetic switch.	Repair or replace.
	3. Poor contact of starting motor carbon brush.	Repair or replace.
Horn inoperative, poor sound or too weak sound	1. Horn	
	· Cracked diaphragm.	Replace.
	2. Horn button.	
	· Poor grounding.	Repair.
	3. Wiring	
	· Poor contact.	Repair.
	4. Adjusting screw	
	· Out of adjustment.	Readjust.
Taillight and headlight inoperative	1. Fuse	
	· Blown fuse or burnt bulb filament.	Replace.
	2. Bulb	
	· Burnt bulb filament.	Replace.
	3. Switch	
	· Poor contact of lighting switch.	Repair.
	4. Wiring	
Stop light inoperative	1. Bulb	
	· Burnt or broken bulb filament.	Replace.
	2. Front and tail stop light switch	
	· Malfunction of switch.	Readjust.
	3. Wiring	
	· Poor contact of leads.	Repair.
Winker lamp blinks too fast or too slow	1. Bulb	
	· Blinks unusually fast: improperly connected relay.	Replace.
	2. Wiring	
	· Blinks too fast: bulb with unsuitable wattage.	Replace.
	· Blinks too slow: burnt or broken bulb filament.	Replace.
	3. Defective relay	Replace.

Troubles	Probable Causes	Remedies
Winker lamp operative	1. Winker lamp switch	
	· Poor contact of winker relay.	Replace.
	· Open circuit in winker relay coil.	Replace.
	2. Bulb	
	· Bulb wattage is smaller than rated wattage.	Replace.
	3. Relay	
	· Poor contact ot winker relay.	Replace.
	· Improperly connected lead.	Replace.
No charging	1. Broken wire or shorted, loose connection.	Repair or replace.
	2. Faulty coil due to short or grounding.	Replace.
	3. Faulty or shorted silicon diode.	Replace.
	4. Broken or shorted lead wire at regulator.	Repair or replace.
	5. Regulator voltage at no load is too low.	Readjust.
Insufficient charging	1. Wiring	
	· Broken wire, intermittent shorting or loose connection.	Repair.
	2. Generator	
	· Shorting across layer in the field coil. (resistance indicated in continuity test)	Replace.
	· Shorting across layer in stator coil.	Replace.
	· Open circuit in one of the stator coil.	Replace.
	· Faulty or shorted silicon diode.	Replace.
	3. Regulator	
	· Voltage below specified value at no load.	Readjust.
	· Dirty of pitted points.	Polish or replace.
	· Coil or resistor internally shorted.	Replace.
	4. Battery	
	· Low electrolyte level.	Add distilled water.
	· Defective battery plates.	Replace.
Excessive charging	1. Wiring	
	P terminal circuit and F terminal circuit shorted resulting in split wound generator.	Repair.
	2. Battery	
	Internal short.	Replace.
	3. Regulator	
	· Excessive voltage at no load voltage.	Repair.
	· Improper grounding.	Provide proper ground.
	· Broken coil lead wire.	Repair or replace.
Unstable charging voltage	1. Wiring	
	· Bare wire shorting intermittently under vibration or broken wire making partial contact.	Repair or replace.
	2. Generator	
	· Layer short (intermittent shorting).	Repair or replace.
	3. Generator	
	· Intermittent open circuit in the coil.	Repair or replace.
	· Improperly adjusted voltage.	Readjust.
	· Defective main switch.	Replace.
	· Dirty points.	Clean.

6. WIRING DIAGRAM



7. SPECIFICATION

	Item		Metric	English
Dimension	Overall length		2,060 mm	81.1 in.
	Overall width		780 mm	30.7 in.
	Overall height		1,090 mm	42.9 in.
	Wheel base		1,355 mm	53.3 in.
	Seat height		780 mm	30.7 in.
	Foot peg height		300 mm	11.8 in.
	Ground clearance		155 mm	6.1 in.
	Dry weight		170 kg	373 lbs.
Frame	Type		Semi-double cradle	
	F. suspension, travel		Telescopic fork, Travel 114.6 mm (4.5 in.)	
	R. suspension, travel		Swing arm, Travel 91.0 mm (3.6 in.)	
	F. tire size, pressure		3.00–18 (4PR), Air pressure 1.8 kg/cm² (26 psi)	
	R. tire size, pressure		3.50–18 (4PR), Air pressure 2.0 kg/cm² (28 psi)	
	F. brake, lining area		Disc brake, Lining swept areas 288 cm² (44.8 sq. in.)	
	R. brake, lining area		Internal expanding shoes, Lining swept areas 150 cm² (23 sq. in.)	
	Fuel capacity		12 lit.	3.2 U.S.gal. 2.6 Imp.gal.
	Fuel reserve capacity		2 lit.	0.5 U.S.gal. 0.4 Imp.gal.
	Caster angle		63°40′	
	Trail length		85 mm	3.3 in.
	Front fork oil capacity		125 cc (to fill if dry)	4.2 ozs.
	Front fork oil capacity		105 cc (refill after draining)	3.0 ozs.
Engine	Type		Air cooled, 4-stroke O.H.C. engine	
	Cylinder arrangement		Vertical four parallel	
	Bore and stroke		47.0×50.0 mm	1.850×1.969 in.
	Displacement		347 cc	21.1 cu·in.
	Compression ratio		9.3 : 1	
	Valve train		Chain driven over head camshaft	
	Oil capacity		3.5 lit.	3.7 U.S.qt. 3.1 Imp.qt.
	Lubrication system		Forced and wet sump	
	Cylinder head compression pressure		12 kg/cm² (170.7 psi)	
	Intake valve	Opens	At 5° (before top dead center)	
		Closes	At 35° (after bottom dead center)	
	Exhaust valve	Opens	At 35° (before bottom dead center)	
		Closes	At 5° (after top dead center)	
	Valve tappet clearance		IN·EX 0.05 mm	0.002 in.
	Idle speed		1,200 rpm	

	Item	Metric	English
Carburetor	Type	Piston valve	
	Setting mark	656 c	
	Main jet	#75	
	Slow jet	#35	
	Air screw opening	$^{7}/_{8} \pm ^{3}/_{8}$	
	Float height	21 mm	0.827 in.
Drive train	Clutch	Wet, multi-plate type	
	Transmission	5-speed, constant mesh	
	Primary reduction	3.423	
	Gear ratio I	2.733	
	Gear ratio II	1.850	
	Gear ratio III	1.416	
	Gear ratio VI	1.148	
	Gear ratio V	0.965	
	Final reduction	2.235	
	Gear shift pattern	Left foot operated return system	
Electrical	Ignition	Battery and ignition coil	
	Starting system	Starting motor and kick starter	
	Alternator	A-C generator 0.156 kW/5,000 rpm	
	Battery capacity	12 V–12 AH	
	Spark plug	NGK D8ESL ND X24ES	
	Headlight	Low/High beam 12 V–35 W/50 W	
	Tail/stoplight	Tail/Stop 12 V–3/32 cp (SAE TRADE NO. 1157)	
	Turn signal light	12 V–32 cp (SAE TRADE NO. 1073)	
	Speedometer light	12 V–2 cp (SAE TRADE NO. 57)	
	Tachometer light	12 V–2 cp (SAE TRADE NO. 57)	
	Neutral indicator light	12 V–2 cp (SAE TRADE NO. 57)	
	Turn signal indicator light	12 V–2 cp (SAE TRADE NO. 57)	
	High beam indicator light	12 V–2 cp (SAE TRADE NO. 57)	