

When the battery voltage exceeds approximately 14.5V the armature coil pulls the armature away from the upper contacts and closes the lower contacts to insert a resistance (10 Ω resistor) in the generator field coil circuit ; as the result of the resistance, the current to the field coil is reduced to 0.7 A and consequently a lower voltage is produced by the generator, limiting the amount of charge to the battery.

This function of inserting or removing the resistance into the generator field coil is performed by the voltage regulator in accordance with the charge condition of the battery regulate the charging of the battery. (Fig. 8-2)

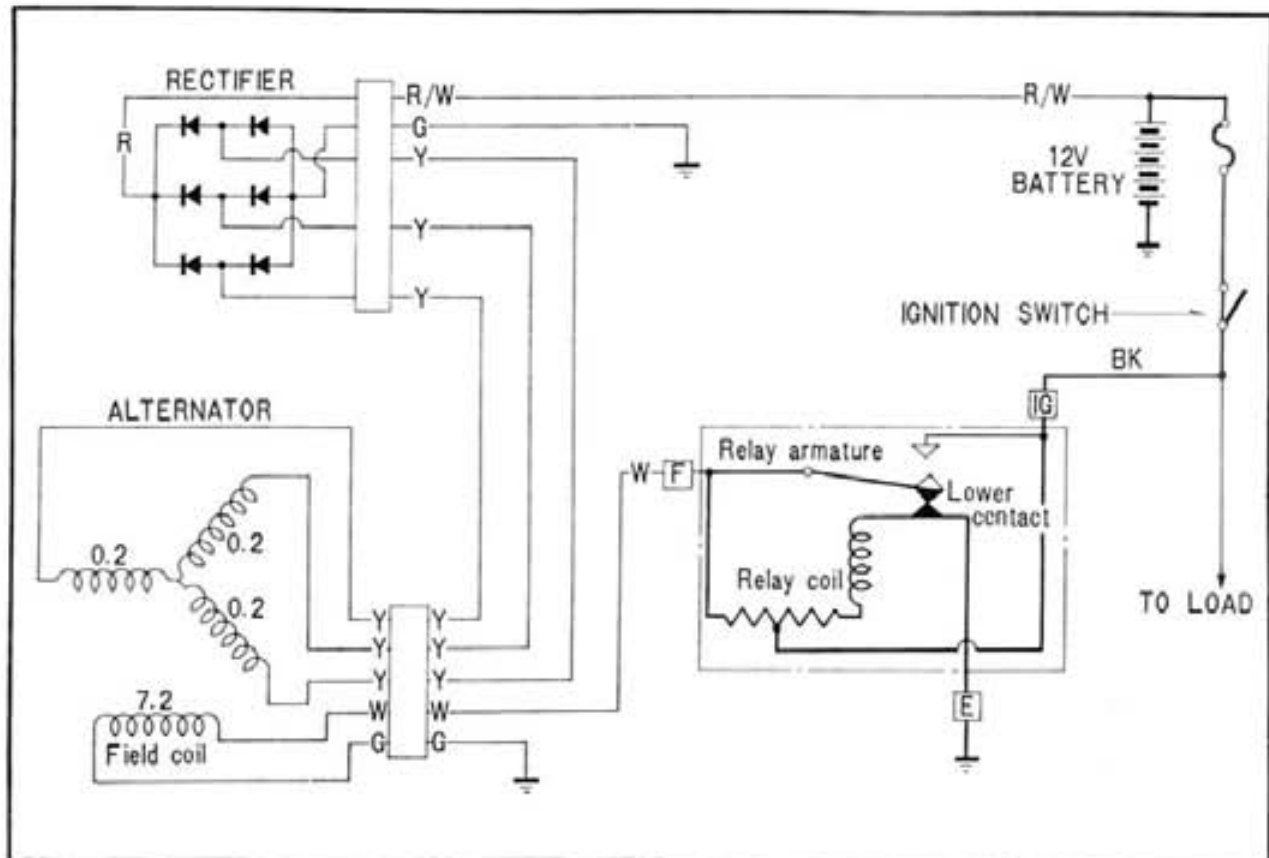


Fig. 8-2



SPECIFICATIONS

1. Alternator	
Type and make	LD 113-01, Hitachi.
Battery voltage	12 V
Output	12 V 13 A
Polarity	(-) ground
Weight	11.0 lbs (5 kg)
Stator coil resistance	0.2 Ω
Field coil resistance	7.2 Ω
2. Regulator	
Type and make	TLIZ-38, Hitachi.
Battery voltage	12 V
Polarity	(-) ground
Weight	0.49 lb (0.22 kg)
Core gap	0.024~0.04 in (0.6~1.0 mm)
Point gap	0.012~0.016 in (0.3~0.4 mm)
3. Silicon rectifier	
Type and make	SB6B-7, Hitachi.
Battery voltage	12 V
Output	12 V 15 A
Polarity	(-) ground
Weight	0.99 lb (0.45 kg)

DIAGNOSIS

Trouble	Probable Causes	Remedy
No charging	<ol style="list-style-type: none"> 1. Broken wire or short, loose connection. 2. Defective coil due to short, grounding, open circuit. 3. Defective silicon diode. 4. Broken or shorted lead wire at regulator. 5. Regulator voltage at no load is too low. 	Repair or replace Replace Replace Repair or replace Readjust
Insufficient charging	<ol style="list-style-type: none"> 1. Wiring <ul style="list-style-type: none"> • Broken wire, intermittent shorting or loose connection. 2. Generator <ul style="list-style-type: none"> • Shorting across layer in the field coil (resistance indicated in continuity test). • Shorting across layer in stator coil. • Open circuit in one of the stator coil. • Defective silicon diode. 3. Regulator <ul style="list-style-type: none"> • Voltage below specified value at no load. • Dirty or pitted points. • Coil or resistor internally shorted. 4. Battery <ul style="list-style-type: none"> • Low electrolyte level. • Defective battery plates. 	Repair, retighten Replace Replace Replace Replace Readjust Polish Replace Add distilled water Replace
Excessive charging	<ol style="list-style-type: none"> 1. Wiring <ul style="list-style-type: none"> • P terminal circuit and F terminal circuit shorted resulting in split wound generator. 2. Battery <ul style="list-style-type: none"> • Internal short. 3. Regulator <ul style="list-style-type: none"> • Excessive voltage at no load voltage. • Defective grounding. • Broken coil lead wire. 	Repair Replace Repair Provide proper ground Repair, replace
Unstable charging voltage	<ol style="list-style-type: none"> 1. Wiring <ul style="list-style-type: none"> • Bare wire shorting intermittently under vibration or broken wire making partial contact. 2. Generator <ul style="list-style-type: none"> • Layer short (intermittent shorting) 3. Generator <ul style="list-style-type: none"> • Intermittent open circuit in the coil. • Improperly adjusted voltage. • Defective key switch. • Dirty points. 	Repair or replace Repair or replace Repair or replace Readjust Replace Clean

CHARGING TEST

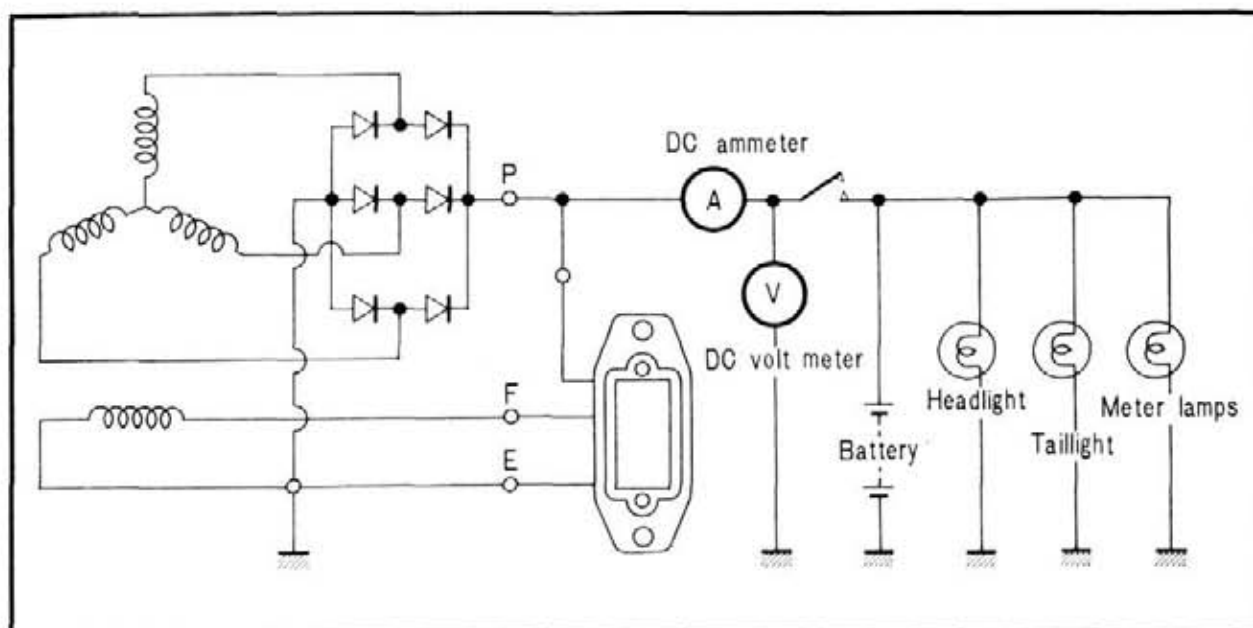


Fig. 8-3

1. Check the battery voltage in accordance with procedure described in the Battery Group, page 105. Make sure that the battery voltage is at 12 V, if not, charge the battery conducting the following test.
 2. From the battery (+) terminal remove the red/white selenium rectifier lead and the red power lead, and connect both to the (+) terminal of the ammeter. Next, connect the battery (+) terminal to the ammeter (−) terminal by using a wire lead.
 3. Start the engine and conduct the test for the following two modes :
 - a. Set the main key switch to the night riding position turning on only the headlight high beam.
 - b. Set main key switch to day riding position, however, do not turn on the turn signal or the stop lights.
 4. Operate the engine at the different speed listed in the table below and check to see if the measured value corresponds to those shown.
If the measured values are below the rated current, adjust the regulator in accordance with next section on page 100~101.
- Note :** The charge current may fluctuate slightly depending upon the charge condition of the battery.
5. Also, check the battery terminal voltages for the respective engine RPM. The rated voltages are shown in the table below.

Engine (rpm)	1,000	2,000	3,000	4,000	5,000	6,000	7,000	8,000
Charging current (A)								
Night riding	6.5	0	2.4	1.3	1.0	1.0	0.8	0.6
Day riding	2-3	1	1	1	1	1	1	1
Battery terminal voltage (V)	12	12.4	13.2	14.5	14.5	14.5	14.5	14.5

8-2 ALTERNATOR

a. Description

The alternator consists of the field coil, stator coil and the rotor. Field coil and the stator coil are mounted on the dynamo cover while the rotor is mounted on the crankshaft (Fig. 8-4).

b. Disassembly

1. Remove the dynamo cover and pull out the generator rotor using the rotor puller (Tool No. 07933-3000000) (Fig. 8-5)
2. Remove the stator coil from the dynamo cover by unscrewing the four 6mm bolts (Fig. 8-6).
3. Remove the field coil from the dynamo cover by unscrewing the three screws (Fig. 8-7).

c. Inspection

1. Field coil continuity test

The insulation and open circuit condition of the field coil winding is checked with a tester. If there is continuity between the lead wires and the core, the coil is grounded and if there is no continuity between the two lead wires, the coil has an open circuit, in either case, the coil is defective and must be replaced. The rated resistance value is 7.2Ω . (Fig. 8-8)

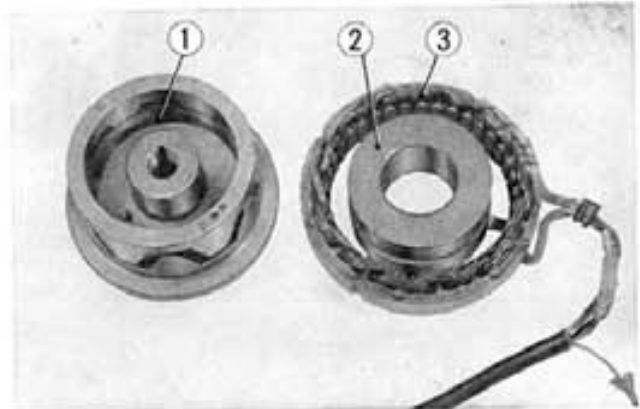


Fig. 8-4 ① Generator rotor
② Field coil ③ Stator coil

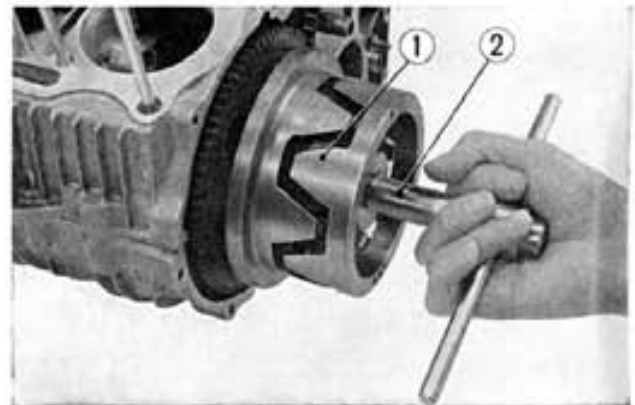


Fig. 8-5 ① A.C generator rotor
② Rotor puller

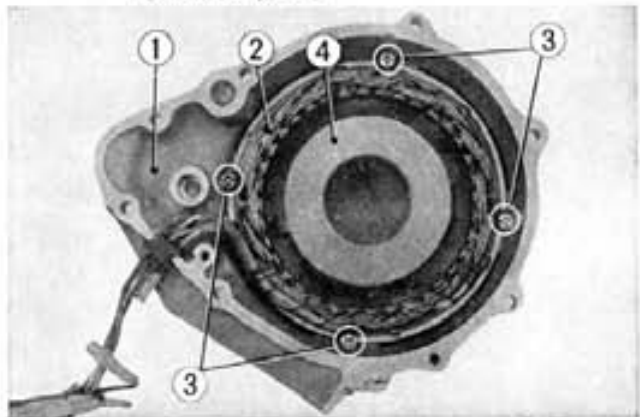


Fig. 8-6 ① Dynamo cover ③ 6mm cross screws
② Stator coil ④ Field coil

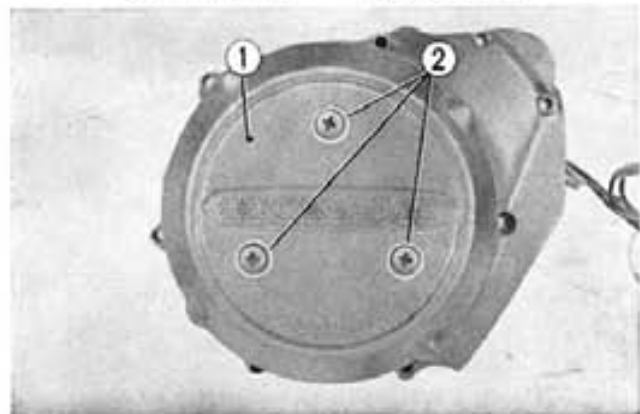


Fig. 8-7 ① Dynamo cover
② 6mm cross screws



Fig. 8-8 ① Field coil
② Tester

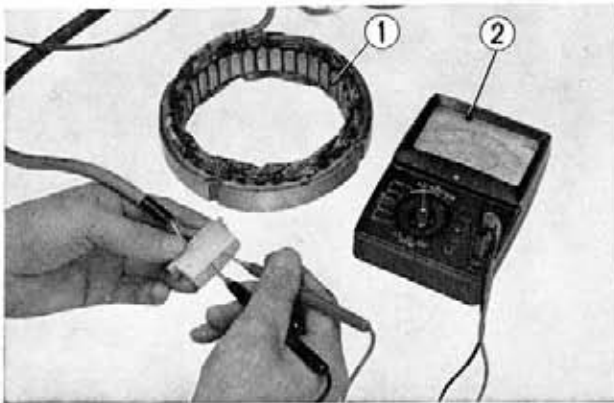


Fig. 8-9 ① Stator coil
② Tester

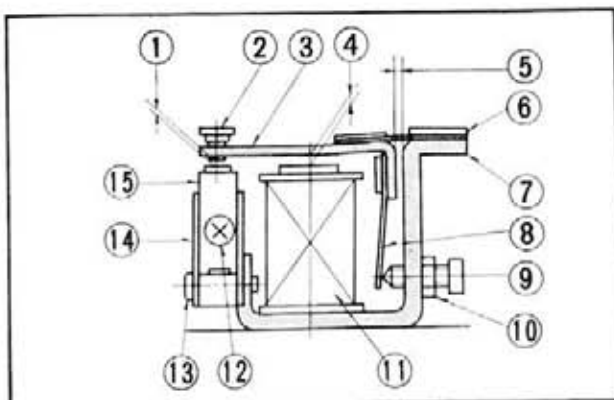


Fig. 8-10 ① Point gap
② Lower contact
③ Armature
④ Core gap
⑤ Yoke gap
⑥ Spring
⑦ Yoke
⑧ Adjusting spring
⑨ Voltage adjusting screw
⑩ Lock nut
⑪ Coil
⑫ Point gap adjusting screw
⑬ Core gap adjusting screw
⑭ Contact set
⑮ Upper contact

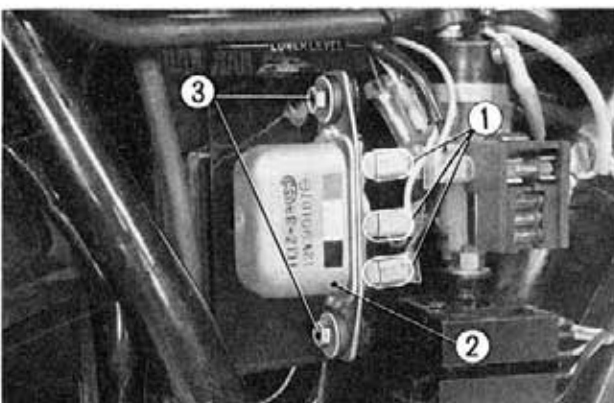


Fig. 8-11 ① Connectors
② Regulator
③ Regulator setting bolts

2. Stator coil continuity test

The insulation and open circuit condition of the stator coil is checked with a tester. If there are no continuity between the three terminals, the coil has an open circuit, in either case, the coil is defective and must be replaced. The rated resistance value is 0.2Ω , (Fig. 8-9)

d. Reassembly

Reassembly is performed in the reverse order of disassembly.

8-3 REGULATOR

a. Description

The regulator is a dual contact type regulator and it functions by opening or closing the resistance circuit to the alternator field coil; in this way, the output voltage is maintained at a constant level.

It is mounted in the center of the frame within the battery cover. (Fig. 8-10)

b. Disassembly

1. Detach the battery cover and remove the regulator by unscrewing the two setting bolts. (Fig. 8-11)
2. Remove the regulator cover by unscrewing the two setting screws.

c. Inspection

1. If an adjustment is necessary to the regulator after checking the voltage or charging current by the procedure outlined in the test section, perform the adjustment by the following manner.

If the charging current or battery voltage is too low, loosen the voltage adjusting screw lock nut and turn the adjusting screw clockwise. If the charging current or battery voltage is excessively high, turn the screw in the opposite direction. (Fig. 8-12)

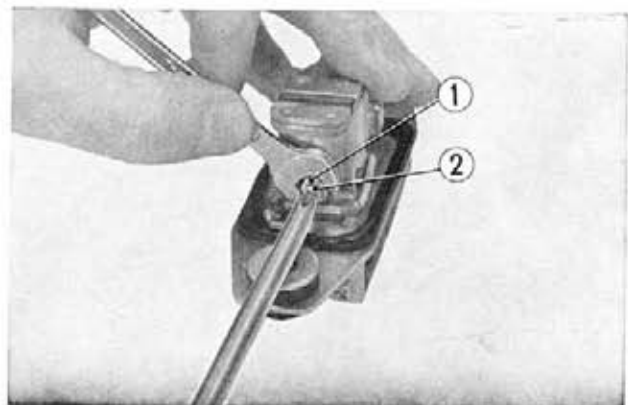


Fig. 8-12 ① Adjusting screw lock nut
② Adjusting screw

Note: The voltmeter indicates an output of 14~15 V at 5,000 rpm at no load, the circuit is satisfactory.

2. After completing the adjustment, reinstall the regulator cover and perform a recheck of the voltage.

Note: There will be a 0.5V rise in voltage when the low speed contacts changes to the high speed contacts in the regulator. (Fig. 8-13)

If the change in voltage is higher than 0.5V or if there is a drop in voltage, core gap should be adjusted by referring to next paragraph.

3. Core gap adjustment

If the surface of the points are dirty or pitted, use a fine grade emery paper and clean up the points. Check the core gap with a thickness gauge to see if it is within the specified limits, 0.024~0.04 in. (0.6~1.0 mm). Core gap can be adjusted by loosening the adjusting screw. (Fig. 8-14)

4. Point gap adjustment

If the surface of the points and if they are dirty or pitted, use a fine grade emery paper and clean up the points. Check the gap with a thickness gauge. Standard gap is 0.12~0.016 in. (0.3~0.4 mm). If necessary to adjust, loosen the point gap lock screw, then tighten the screw after adjustment. (Fig. 8-15)

d. Reassembly

Reassembly is performed in the reverse order of disassembly.

8-4 SILICON RECTIFIER

a. Description

As the rotor rotates three phase alternation currents are induced in the stator coil. However, the currents are rectified to D.C currents by the six silicon diodes which are in one unit and attached to the center of the frame. The silicon rectifier requires cooling and complete condition in negative terminal by which the rectifier is attached to the frame. Therefore it is necessary to take special care for attachment. (Fig. 8-16)

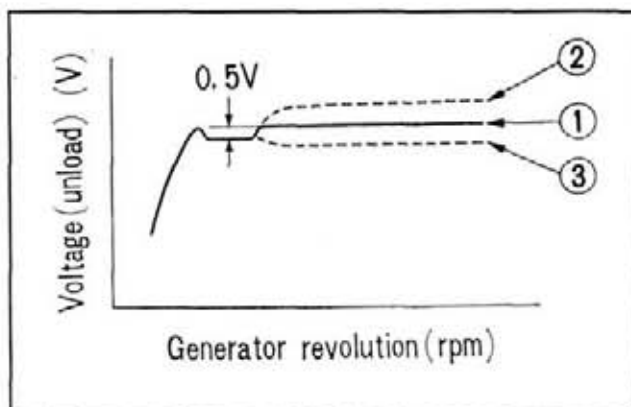


Fig. 8-13 ① Standard ② Wide core gap ③ Narrow core gap

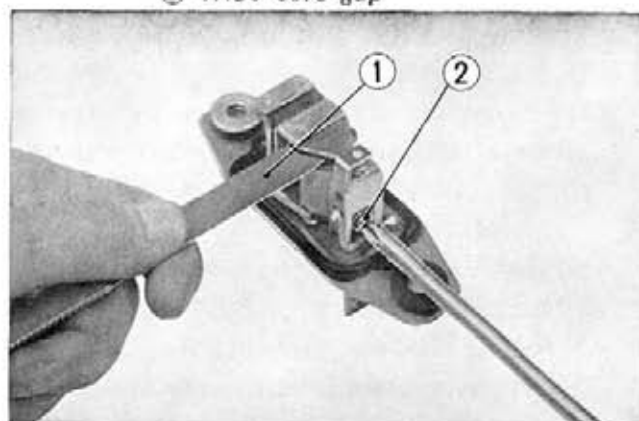


Fig. 8-14 ① Thickness gauge ② Core gap adjusting screw

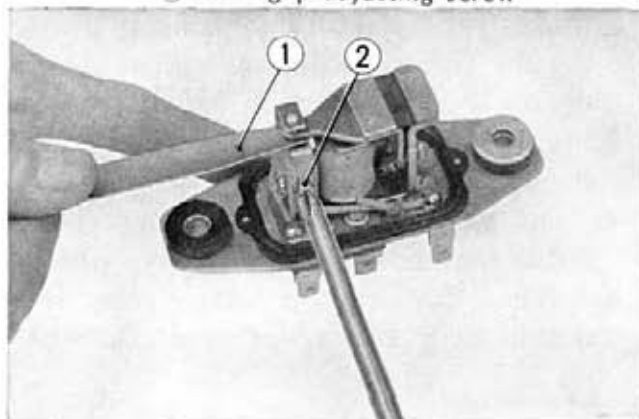


Fig. 8-15 ① Thickness gauge ② Point gap lock screw

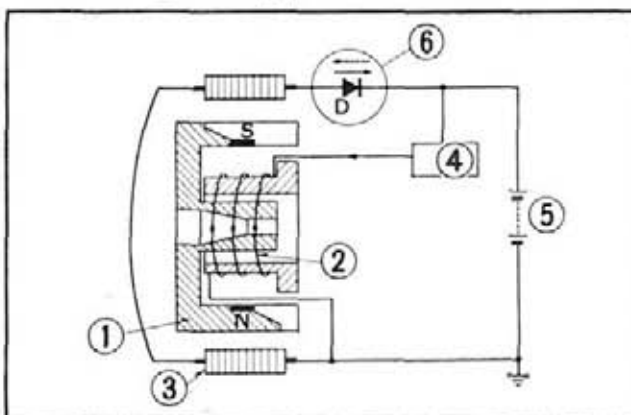


Fig. 8-16 ① Generator rotor ② Field coil ③ Stator coil ④ Regulator ⑤ Battery ⑥ Silicon rectifier

b. Disassembly

Detach the battery cover and remove the silicon rectifier by unscrewing a setting nut. (Fig. 8-17)

c. Inspection

1. The condition of the silicon rectifier is tested by disconnecting it from the generator and testing the rectifier function in both the normal and reverse directions. A continuity in only one direction indicates a good condition. Continuity in both directions or no continuity in either direction indicates a defective rectifier and should be replaced. (Fig. 8-18)

Note: Do not use a megger for testing since it will expose the silicon diodes to excessively high voltage and cause damages.

2. Observe the following precautions.
 - a. Battery polarity should be strictly observed, do not connect the battery in reverse. Reversing the battery connection will cause the battery to become shorted, resulting in a large current to flow through the electrical system and damaging the silicon rectifier as well as burning up the wiring harness.
 - b. Care should be exercised to assure that the electrical terminals are not connected in reverse.
 - c. Do not operate the generator at high speed with the "P" terminal of the rectifier disconnected. The high voltage produced may cause damage to the silicon rectifier.
 - d. When charging the battery from an external source such as quick charging, the lead should be disconnected from the 'P' terminal of the rectifier.

d. Reassembly

Reassembly is performed in the reverse order of disassembly.

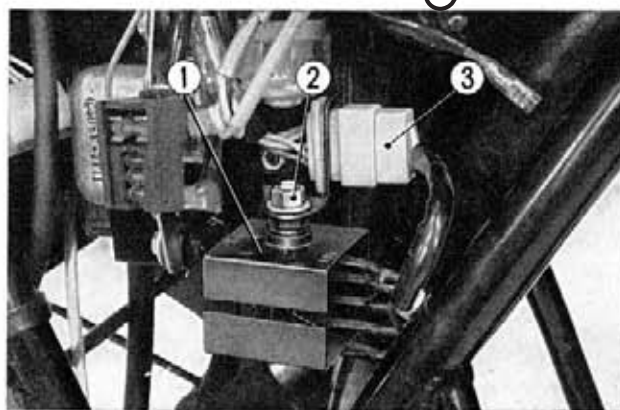


Fig. 8-17 ① Silicon rectifier ② Rectifier setting nut ③ Connector

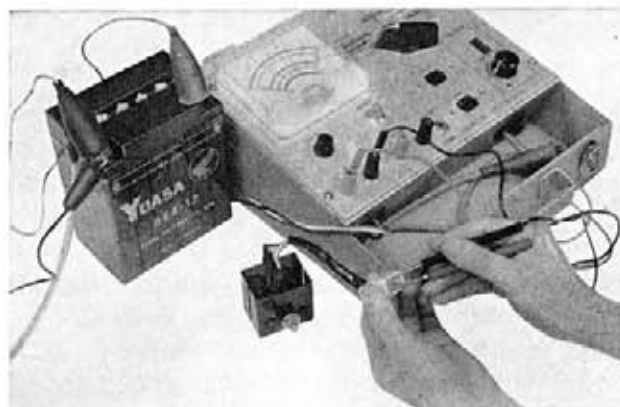


Fig. 8-18

STARTING SYSTEM

GROUP

9

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9-1 GENERAL DESCRIPTION

DESCRIPTION

A push button type starter switch is located on the right side of the handle bar. When pressed, it engages the starter magnetic switch in the starter circuit to close the starting circuit.

Approximately 120A current flows from the battery to operate the starting motor. (Fig. 9-1)

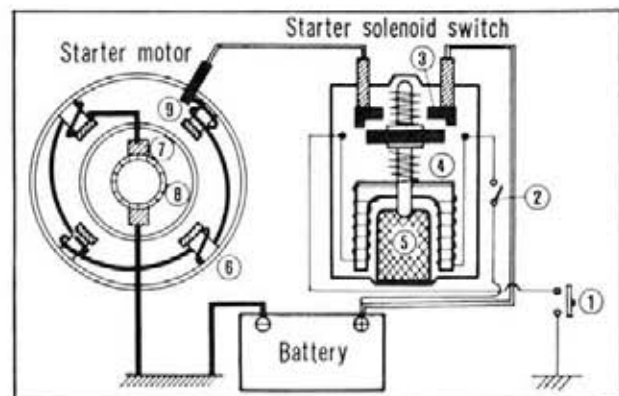


Fig. 9-1

- | | |
|-------------------------|--------------|
| ① Starter button switch | ⑥ Pole |
| ② Ignition switch | ⑦ Brush |
| ③ Contact unit | ⑧ Armature |
| ④ Excitation coil | ⑨ Field coil |
| ⑤ Plunger | |



SPECIFICATIONS

Starting motor			
Rated voltage	12V		
Rated output	0.6kW		
Rated operation	30seconds		
Direction of rotation	Counterclockwise (viewing into shaft)		
Weight	5.3lbs (2.4kg)		
	Without load	With load	Stalling load
Voltage	11V	8.5V	5V
Amperage	Max. 35 A	120A	Max. 280A
Torque	—	Min. 0.12kg-m	Min. 0.32kg-m
Revolution	11,000~22,000rpm	Min. 3,200rpm	—
Primary reduction ratio	4.7 : 1		
Secondary reduction ratio	4.69 : 1		
Total reduction ratio	22.04 : 1		
Starter magnetic switch			
Rated voltage	12V		
Operating voltage	7.5V		

Item	Standard value	Serviceable limit
Carbon brush length	0.472~0.512in. 12~13 mm	0.217in. 5.5 mm
Mica undercut		0.012in. 0.3 mm
Carbon brush spring	500~600gr	—

DIAGNOSIS

Trouble	Probable Causes	Remedy
Starting motor does not operate	1. Defective battery 2. Poor contact of magnetic switch 3. Poor contact of starting motor carbon brush	Charge or replace Repair or replace Repair or replace

9-2 STARTING MOTOR

a. Description

The starting motor is mounted in the upper crankcase behind the cylinder and drive the crankshaft through the starting clutch gear.

The primary reduction is accomplished by the starting motor reduction gear and the secondary reduction is by the starting clutch gear. (Fig. 9-2)

b. Disassembly

1. Remove the left side cover and disconnect the starting motor cable from the magnetic switch. (Fig. 9-3)
2. Remove the starting motor cover from the upper crankcase and detach the starting motor. (Fig. 9-4)
3. Remove the starting motor side cover.
4. Unscrew the brush mounting screws and remove the brushes from the brush holders. (Fig. 9-5)

c. Inspection

1. Checking the carbon brush length
Measure the length of the starting motor brush using a vernier caliper to determine amount of wear. If it is less than 0.217 in. (5.5 mm), the brush should be replaced (Fig. 9-6)

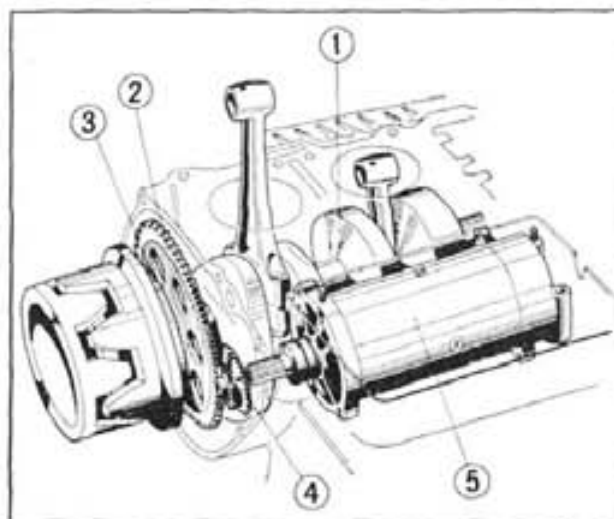


Fig. 9-2 ① Crankshaft
② Starting clutch gear
③ Starting clutch
④ Starting motor reduction gear
⑤ Starting motor

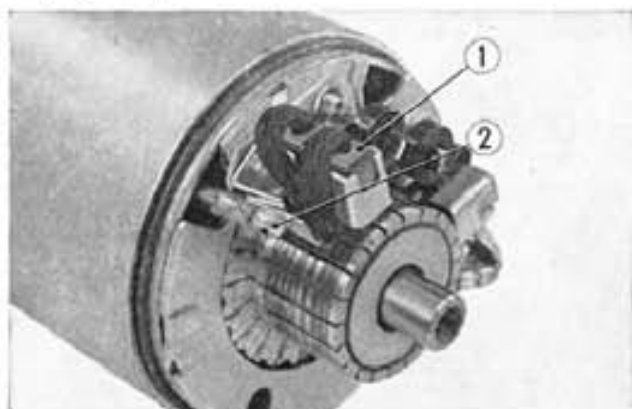


Fig. 9-5 ① Brush ② Brush mounting screw

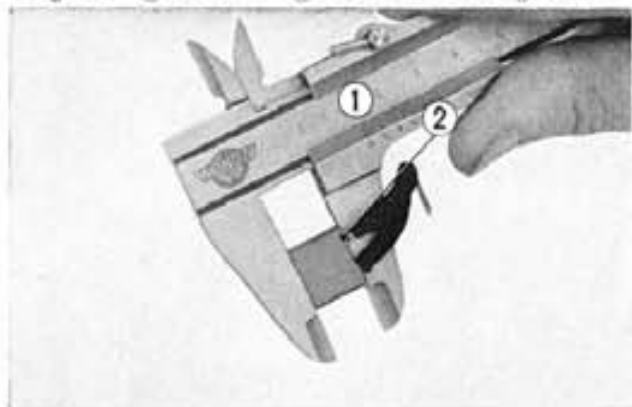


Fig. 9-6 ① Vernier caliper ② Carbon brush



Fig. 9-3 ① Magnetic switch
② Starting motor cable

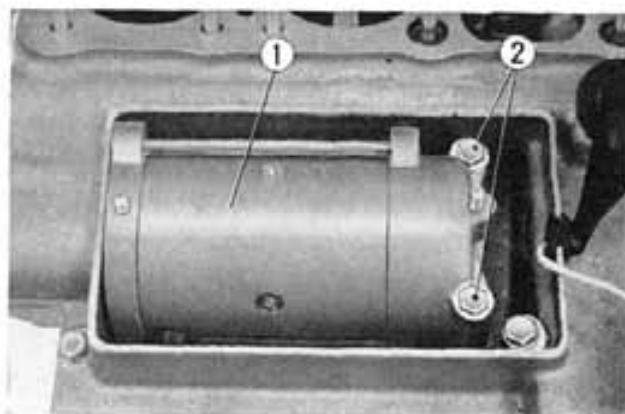


Fig. 9-4 ① Starting motor
② Motor setting bolts

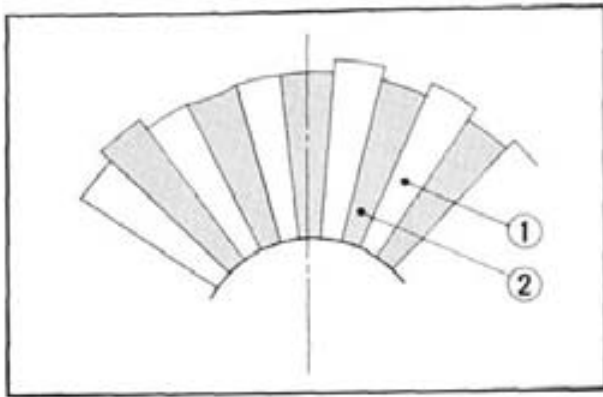


Fig. 9-7 ① Commutator
② Mica

The current draw of the starting motor can be measured with the Honda service tester by using external shunt (refer to the service tester operational manual for the testing procedure)

The starting motor should conform to the standard value shown in the specification on page 104.

d. Reassembly

Perform the reassembly in the reverse order of disassembly.

2. Checking the amount of mica undercut.
Measure the amount of mica undercut and if the difference in height is less than **0.012 in. (0.3 mm)**, it should be repaired. It is recommended that this repair be performed by a specialist. (Fig. 9-7)
3. Armature insulation test
Perform a continuity test between the commutator and the shaft mounting area. If a short is indicated, a defect is in the armature and, therefore, it should be replaced.
4. Measuring the starting current.

9-3 STARTING CLUTCH

a. Description

The one way clutch is used for starter clutch which incorporates the A.C. generator rotor connected to the crankshaft. As the rotation of the starting motor is transmitted to the starting clutch gear, the rollers within the starting clutch will move the narrow section of the slot to lock the starting clutch (lock to A.C. generator rotor) and ensuring the starting clutch to rotate. (Fig. 9-8)

Since the generator rotor is mounted on the crankshaft with a key, the crankshaft will rotate and causes the engine to start. After the engine starts and the crankshaft speed exceeds the speed of the starting clutch gear, the roller between the starting clutch gear and the clutch outer will move toward the wide section of the groove due to centrifugal force and the transmission of the rotating force will no longer be transmitted. As a result, the crankshaft rotation will no longer be transmitted to the starting motor.

b. Disassembly

Perform the disassembly in accordance with 3-6 b on page 46.

c. Inspection

1. Check to make sure that the clutch roller operates smoothly.
2. Inspect the starting clutch for defect.

d. Reassembly

Perform the reassembly in accordance with 3-6 d on page 53.

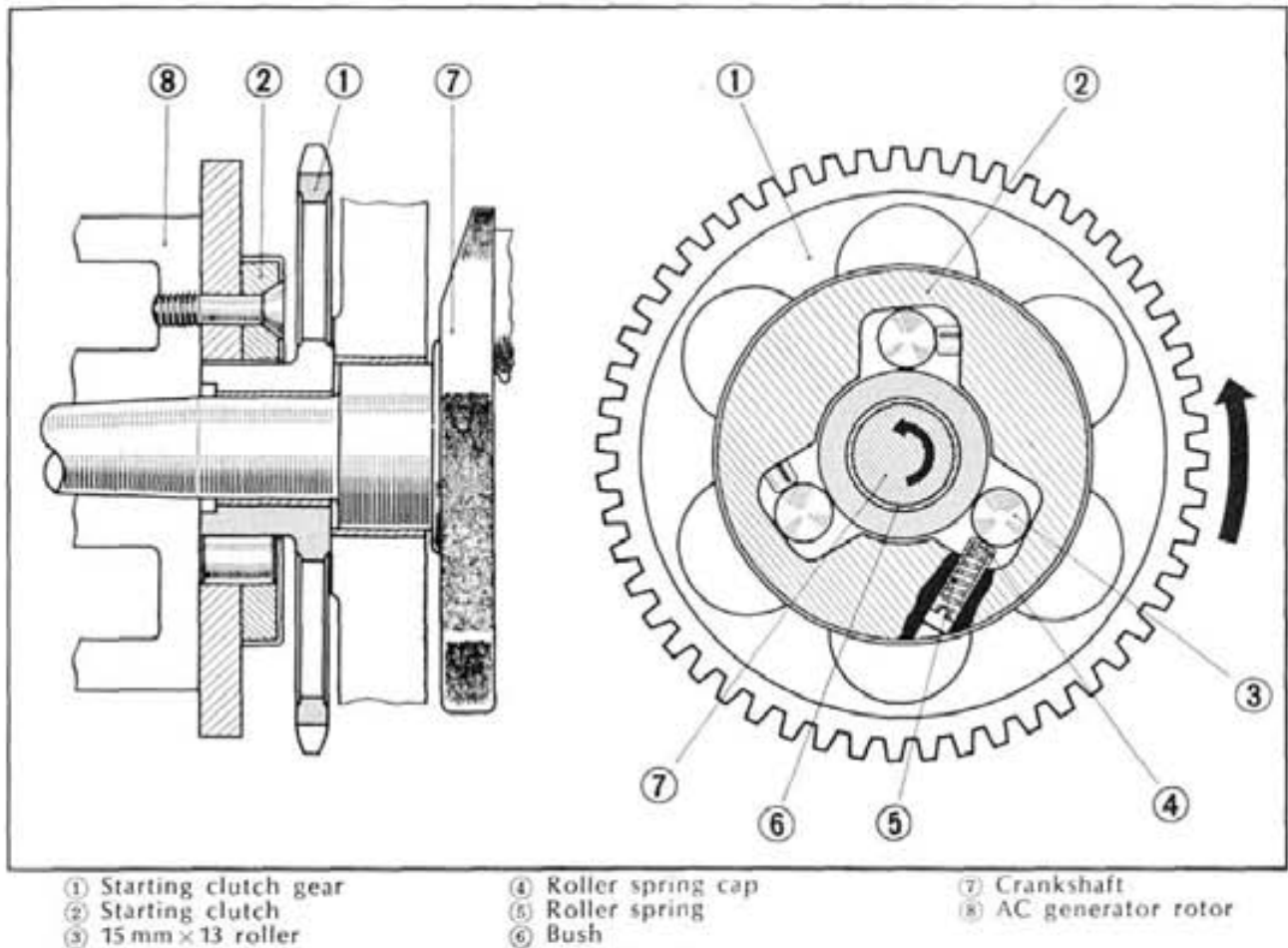


Fig. 9-8

9-4. STARTER MAGNETIC SWITCH

a. Description

A large current is required to operate the starter and if the starter circuit was connected directly to the push button switch on the handle, the switch will burn out. A starter solenoid of a large capacity is installed between the battery and the starting motor. When the push button switch is pressed, the solenoid coil is energized, creating an electromagnet which draws the iron core. A heavy duty electrical contacts are mounted to this iron core which closes the circuit between the battery and the starting motor. (Fig. 9-9)

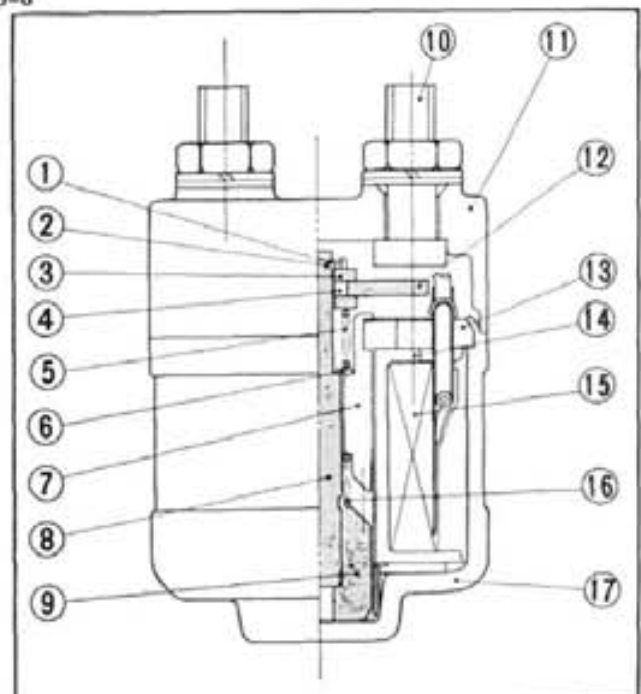


Fig. 9-9

- | | |
|-----------------------|-----------------|
| ① Stopper | ⑩ Contact bolt |
| ② Stopper holder | ⑪ Case |
| ③ Insulation washer | ⑫ Contact plate |
| ④ Insulation collar A | ⑬ Yoke |
| ⑤ Contact spring | ⑭ Coil bobbin |
| ⑥ Flat washer | ⑮ Coil complete |
| ⑦ Plunger holder | ⑯ Return spring |
| ⑧ Plunger shaft | ⑰ Body |
| ⑨ Plunger | |

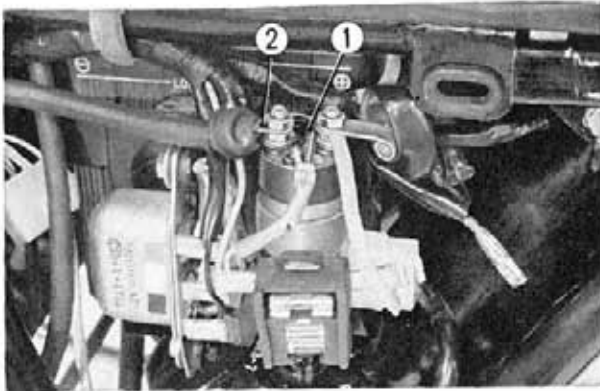


Fig. 9-10 ① Magnetic switch
② Starting motor cable

b. Disassembly

1. Remove the left side cover, disconnect the electric lead to the magnetic switch and then remove the magnetic switch. (Fig. 9-10)
2. Remove the cover.

c. Inspection

1. Press the starter switch listen for the click in the magnetic switch, it is an indication that the plunger within the magnetic switch is functioning.
2. If the magnetic switch has been used for a long period, the contacts will become

pitted or burned, creating a high resistance which will prevent flow of current to properly operate the starting motor. When such condition develops, dress the contact points with a file or sand paper.

d. Reassembly

Reassembly is performed in the reverse order of the disassembly procedure.

BATTERY

GROUP

10

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10-1. GENERAL DESCRIPTION

DESCRIPTION

The 12V-14AH battery is mounted under the seat. The service life of the battery depends upon the maintenance it receives.

The following instructions must be carefully observed.

SPECIFICATIONS

Type	Yuasa B64-12 (Vacuum sealed dry charged battery)
Battery voltage	12V
Capacity rating	14AH
Electrolyte specific gravity	1.26~1.28 at 20°C (68°F)

DIAGNOSIS

Trouble	Probable Cause	Remedy
Sulfation The electrode plates are covered with white layer or in spots.	<ol style="list-style-type: none">1. Charging rate is too small or else excessively large.2. The specific gravity or the mixture of the electrolyte is improper.3. Battery left in a discharge condition for a long period. (Left with the switch turned on).4. Exposed to excessive vibration due to improper insulation.5. Motorcycle stored during cold season with battery connected.	<ol style="list-style-type: none">1. When motorcycle is in storage, the battery should be recharged once a month even though the motorcycle is not used.2. Check the electrolyte periodically and always maintain the proper level.3. In a lightly discharge condition, performing recharging and discharging several times by starting the engine may be sufficient.

Trouble	Probable cause	Remedy
Self discharge Battery discharges in addition to that caused by the connected load.	1. Dirty contact areas and case. 2. Contaminated electrolyte or electrolyte excessively concentrated	1. Always maintain the exterior clean 2. Handle the replenishing electrolyte with care and use clean container.
C. Large discharge rate Specific gravity gradually lowers and around 1.100 (S.G) the winker and the no longer function.	1. The fuse and the wiring is satisfactory, loads such as winker and horn does not function. In this condition the motorcycle will operate but with prolong use, both \oplus and \ominus plates will react with the sulfuric acid and form lead sulfide deposits, (sulfation) making it impossible to recharge.	1. When the specific gravity falls below 1.200 (20°C : 68°F), the battery should be recharged immediately. 2. When the battery frequently becomes discharged while operating at normal speed, check the generator for proper output. 3. If the battery discharges under normal charge output, it is an indication of overloading, remove some of the excess load
High charging rate The electrolyte level drops rapidly but the charge is always maintained at 100 % and the condition appears satisfactory. A condition which is overlooked. (Specific gravity over 1.260)	1. The deposit will heavily accumulate at the bottom and will cause internal shorting and damage the battery.	1. Check to assure proper charging rate. 2. When overcharge condition exist with the proper charging rate, place on appropriate resistor in the charging circuit.
Specific gravity drops Electrolyte evaporates	1. Shorted 2. Insufficient charging 3. Distilled water overfilled 4. Contaminated electrolyte	1. Perform specific gravity measurement. 2. If the addition of distilled water causes a drop in specific gravity, add sulfuric acid and adjust to proper value.

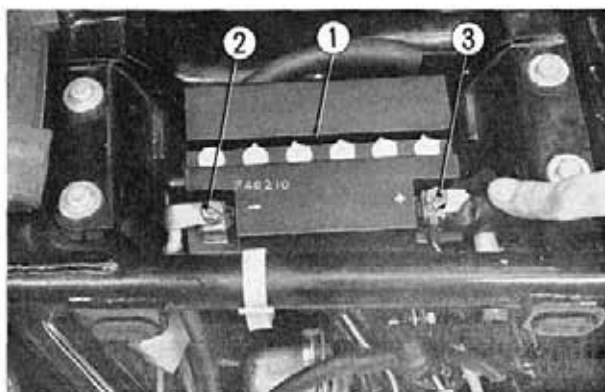


Fig. 10-1 ① Battery ③ \oplus terminal
② \ominus terminal

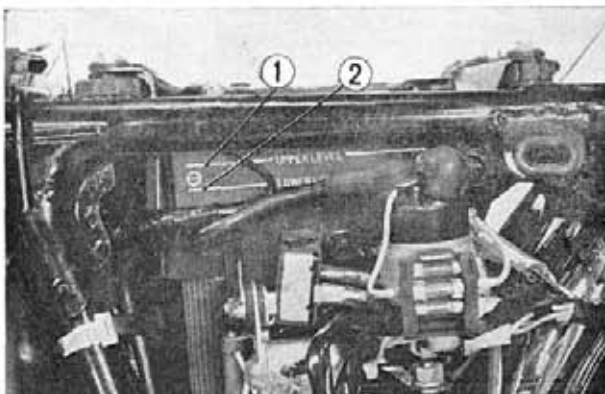


Fig. 10-2 ① Upper level mark
② Lower level mark

10-2. REPAIRING PROCEDURE

a. Disassembly

1. Raise the seat and remove the battery band from the battery.
2. Disconnect the ground \ominus negative cable connection first and the positive \oplus last. (Fig. 10-1)
3. Remove the battery from the battery compartment.

b. Inspection

1. Checking the battery electrolyte level
Remove the left side cover at the frame center and observe the battery electrolyte level marking on the side of the battery to make sure that the electrolyte level is between the upper and lower marks. (Fig. 10-2)

To correct the electrolyte level, remove the battery cell caps from the cells needing level correction. For ease of cell level correction a small syringe or plastic funnel should be used. Carefully add the proper amount of distilled water to bring the electrolyte level of the cells between the lower and upper marks. For maximum battery performance and life, only distilled water should be added, however, in an emergency situation where electrolyte level is found to be low and distilled water is not available, drinking water of a low mineral content can be used. Reinstall the cell caps. (Fig. 10-3)

2. Check the specific gravity of the battery electrolyte

The specific gravity is measured with a hydrometer, the type shown in Fig. 10-4. When making a reading of the measured value, the electrolyte level in the hydrometer should be held at the eye level and the scale read at the fluid level. Temperature of the electrolyte can be measured by a rod thermometer. (Fig. 10-4)

The relation between the battery capacity and the specific gravity (residual capacity) is shown in Fig. 10-5. When the specific gravity is 1.189 at 20°C (68°F) (less than 50%) the residual capacity is small and if continued to be used in such a condition, it will eventually lead to trouble as well as shortening the battery life, therefore, the battery should, under such a condition, be recharged as soon as possible. (Fig. 10-5)

The electrolyte used in the battery must be comprised of pure sulfuric acid diluted to the designated specific gravity. The specific gravity will vary with the temperature, therefore, the specific gravity index is based on the electrolyte temperature of 20°C (68°F). The temperature correction formula should be used to derive at the proper specific gravity for the measure temperature of the electrolyte.

$$S_{20} = S_t + 0.0007 (t - 20)$$

Where:

S_{20} = Specific gravity of the electrolyte corrected to 68°F (20°C)

S_t = Specific gravity of the electrolyte measured temperature, t°C

t = Temperature of the measured electrolyte

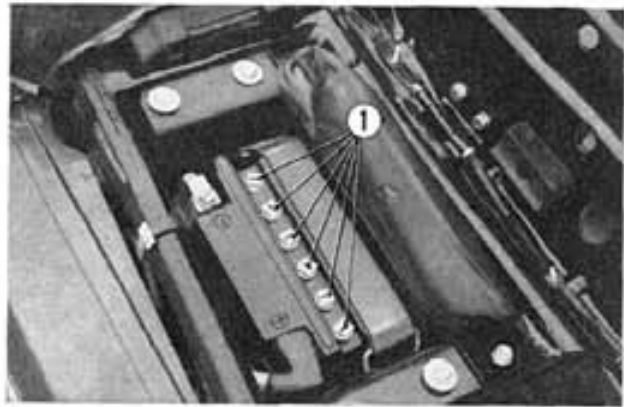


Fig. 10-3 ① Battery cell caps

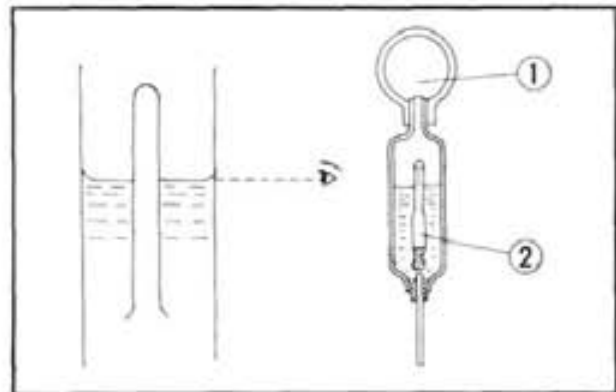


Fig. 10-4 ① Hydrometer
② Float

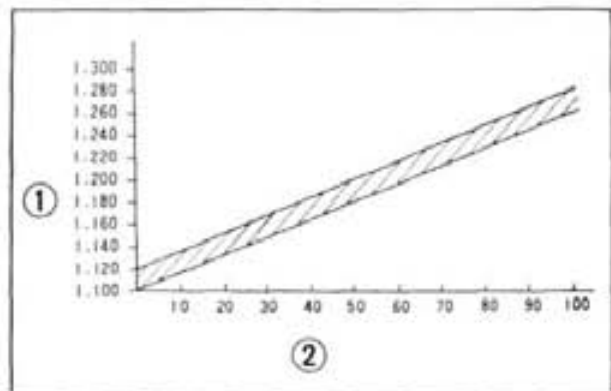


Fig. 10-5 ① Specific gravity (20°C)
② Residual capacity (%)

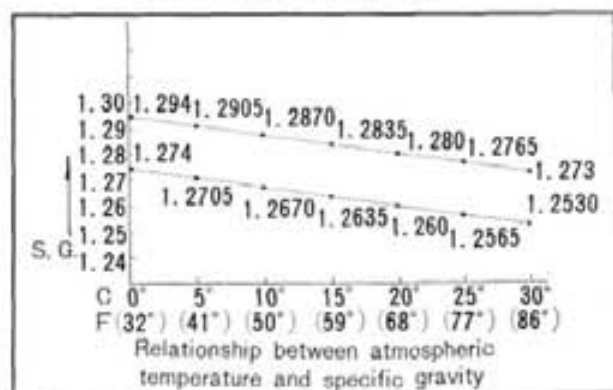


Fig. 10-5-1

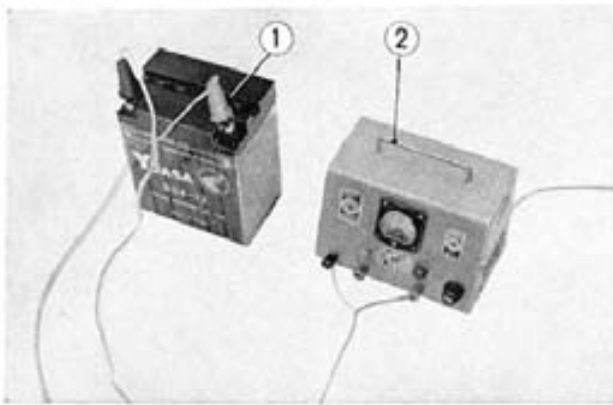


Fig. 10-6 ① Battery ② Battery charger

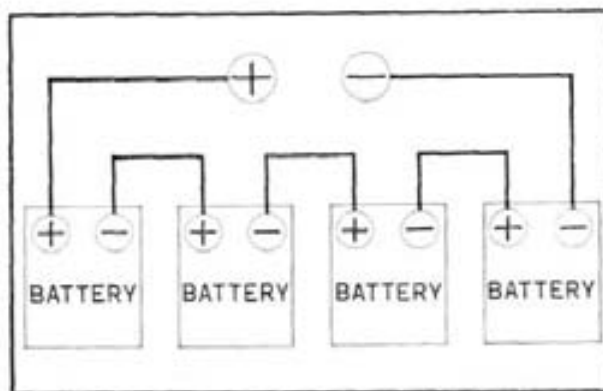


Fig. 10-7

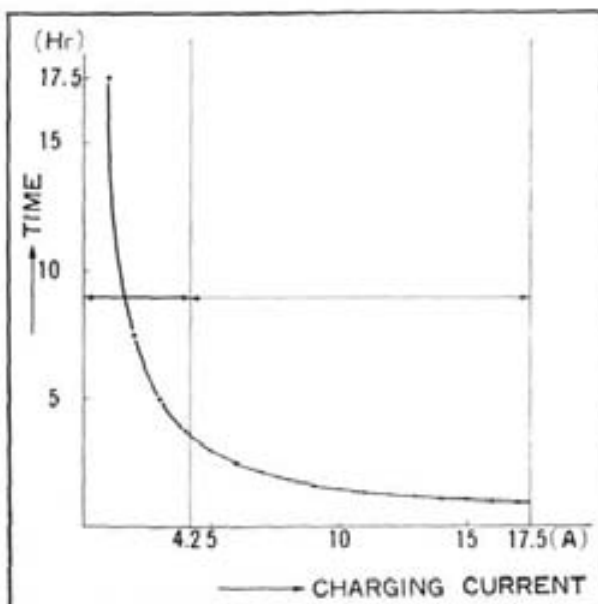


Fig. 10-8

3. Battery charging procedure

There are two methods of charging of a battery, namely, the constant current method and the constant voltage method. In the constant current method, the battery is charged at a constant current throughout the charging period. This method is safe and is recommended for initial charging of the battery. In the constant voltage charging method, a constant voltage is applied during the charging period. In this method, the charging period can be shortened by applying a larger current, however, one drawback is that if too large a current is applied, the battery will overheat.

• Charger hook-up

Connect the positive terminal \oplus and the negative battery terminal \ominus to the respective terminal of the charger. (Fig. 10-6)

When more than one battery is to be charged at once, they should be connected in series, as shown in Fig. 10-7.

The charger voltages must be the sum of the battery voltages. For example, to charge three 12V batteries, the charger must have an output voltage in excess of 36 (12) + 12 (12) + 12 (12) or 36 (or 42) volts.

A fully discharged battery will require charging rate that is 1.25 higher than the normal charge rate of the battery. As an example, a 14AH battery will require 17.5AH charging rate ($14\text{AH} \times 1.25 = 17.5\text{AH}$). There is a definite relationship between the charging current and the charging time. This is shown in Fig. 10-8. The charging current should not be greater than three times the 10 hours current rate. (For a 14AH battery, $1.4\text{A} \times 3 = 4.2\text{A}$).

As the battery approaches the full charge condition, gas will be released from the electrolyte. At this time, check the battery electrolyte to see if the specific gravity is up to the standard value of 1.26~1.28, and the terminal voltage is up to the standard value of 15~16V. Perform the check again after 30 minutes and again in an hour, and if for the three checks the values are constants, the battery is fully charged and the charging can be terminated. (Fig. 10-8)

Note: If during the charging process the temperature of the electrolyte should raise above 45°C (113°F) or if the gas is being released from the electrolyte in abundance, the charging should be stopped temporarily or the charging current reduced to a lower rate.

• Quick charger

Quick charger should not be on battery which has been fully discharged. Further, quick charging method should not be frequently used. However, when it is inevitable and quick charging must be performed, the following items should be observed.

For quick charging a 14AH battery, use the charging current rate of 14A. A battery which is 50% discharged, approximately 30 minutes should be adequate to charge the battery. However, if during the charging process the electrolyte temperature should raise above 50°C (122°F), the charging should be temporarily stopped or the charging current rate reduced.

Note: Disconnect the silicon diode P terminal when quick charging the battery.

• Other precaution

If the electrolyte level falls during charging, refill with distilled water to the upper level mark.

Inflammable hydrogen gas is discharged from the cells, therefore, do not charge batteries near any open fire.

After charging, add distilled or battery water to the cells to bring the electrolyte to the upper mark.

Tighten cell caps firmly and wash off with clean water any acid spilled.

The battery is now ready for installation. When installing a battery in the motorcycle, be sure not to pinch the battery vent tube. Explosion may result if the exhaust tube is blocked.

4. Check the terminal voltage

The battery terminal voltage can be checked with a service tester. The standard battery voltage is 12V, however, immediately after charging, the voltage will be at 15~16V.

Set the selector knob to the D.C. VOLTAGE position on the tester and clamp the (+) tester lead to the (+) terminal of the battery and then connect the other tester lead to the (-) terminal of the battery and read the voltage off the blue scale. When performing battery charging, refer to the battery charging section. (Fig. 10-9)

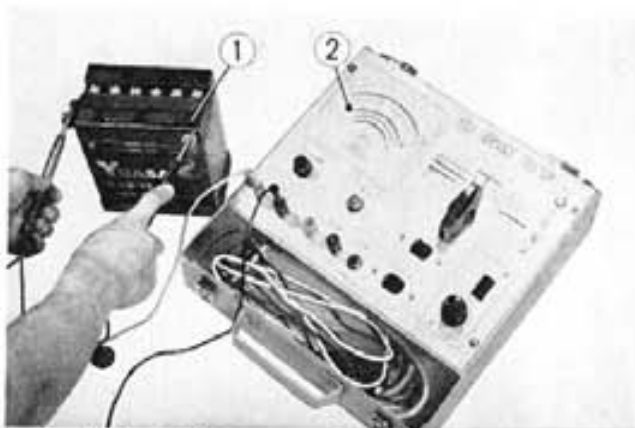


Fig. 10-9 ① Battery ② Tester

c. Reassembly

Battery installation is performed in the reverse order of removal. Pay particular attention the battery rubber mount pads and the vent tube routing. Connect and protect the positive (+) terminal with the rubber insulator first. Connect the negative (-) terminal second.

Note: Do not over tighten these terminal connection as damage to the battery terminals may result. Install battery retainer, lower the seat and install the left side cover.

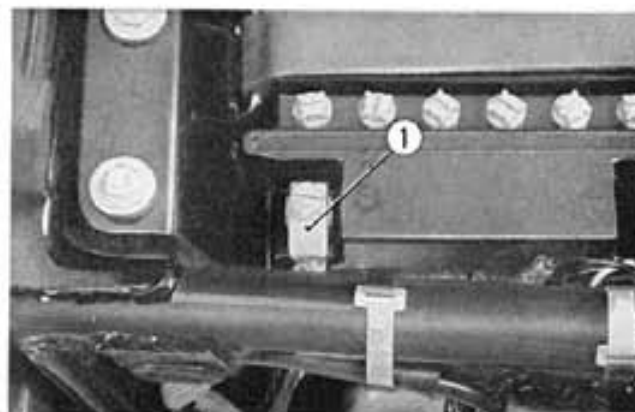


Fig. 10-10 ① Negative (-) terminal

STEERING AND FRONT SUSPENSION

GROUP 11

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11-1 GENERAL DESCRIPTION

DESCRIPTION

The steering and the front suspension have been designed particularly to provide comfort and prevent riding fatigue caused from long distance traveling.

SPECIFICATIONS

Steering handle type	Up-handle type
Steering handle width	31.89 in (810 mm)
Steering angle	40° right and left from center
Front suspension type	Telescopic fork
Front fork oil	
Oil used	SAE 10 W-30 or its equivalent
Oil capacity	7.0~7.3 ozs. (220~230 cc)

Item	Standard value	Serviceable limit
Front cushion spring		
Spring outer diameter	0.992~1.008 in 25.2~25.6 mm	—
Free length	19.075 in 484.5 mm	18.11 in 460 mm
Coil dia	0.185 in 4.7 mm	—
Installation load	17.579 in/71.2 lbs 446.5 mm/32.3 kg	—
Tilt	within 1.5°	Over 2.5°
Front fork piston		
Outer diameter	1.552~1.553 in 39.425~39.45 mm	1.5512 in 39.4 mm
Taper, out of round	within 0.0003 in 0.008 mm	over 0.0006 in 0.015 mm
Front fork bottom case		
Inner diameter	1.555~1.556 in 39.50~39.534 mm	1.5591 in 39.68 mm
Taper, out of round	within 0.0012 in 0.03 mm	over 0.0012 in (0.03 mm)

DIAGNOSIS

Trouble	Probable Causes	Remedy
Heavy steering	1. Steering stem excessively tightened. 2. Damaged steering stem steel balls. 3. Bent steering	Loosen the steering stem nut. Replace Replace
Wheel wobble	Loose steering stem mounting bolts	Retorque
Soft suspension	1. Loss of spring tension 2. Excessive load	Replace
Hard suspension	1. Ineffective front cushion damper 2. Ineffective rear cushion damper	Repair Replace
Suspension noise	1. Cushion case rubbing 2. Interference between cushion case and spring 3. Damaged cushion stopper rubber 4. Insufficient spring damper oil	Inspect cushion spring and case Repair or replace Replace Add damper oil

11-2 STEERING

a. Description

The handle bar is mounted on the fork top bridge and is fixed with the two handle bar holders.

The fork top bridge is mounted on the front forks with the two front fork top bolts, the fork top bridge in turn is mounted to the steering stem with the steering stem nut.

The steering stem is mounted on the frame head pipe and pivots on the upper and lower sets of the ball bearings. (Fig. 11-1)

b. Disassembly

1. Remove the master cylinder body by unscrewing the two master cylinder body mounting bolts and disconnect the clutch cable from the clutch lever. (Fig. 11-2)
2. Remove the starter lighting ignition switch and disconnect the throttle cable from the throttle grip pipe.
3. Detach the headlight assembly from the headlight case and disconnect the wiring at the connectors.
4. Remove the two upper handle holders and then remove the handle bar. (Fig. 11-3)

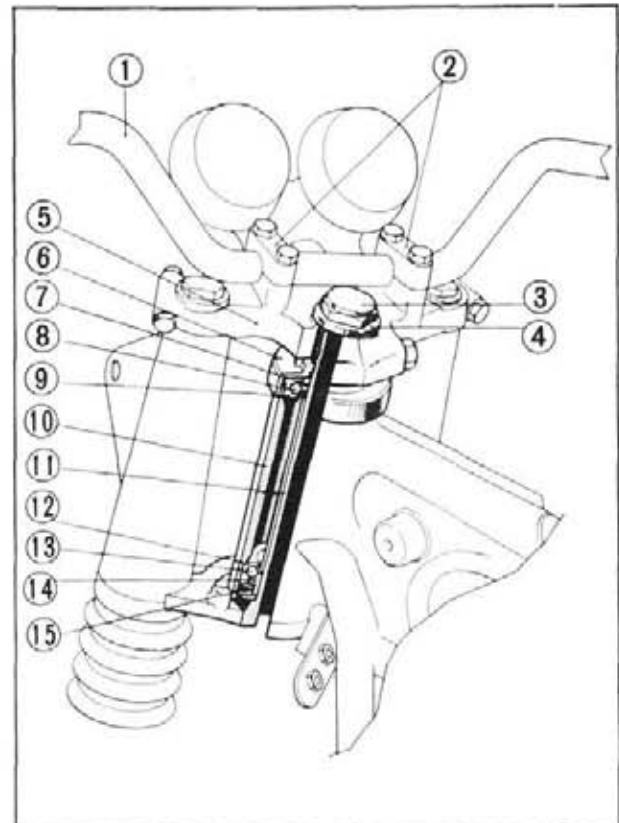


Fig. 11-1 ① Steering handle pipe
② Handle pipe holder
③ Steering stem nut
④ Steering stem washer
⑤ Fork top bridge
⑥ Steering head top thread
⑦ Steering top cone race
⑧ Steel ball
⑨ Steering top ball race
⑩ Steering head
⑪ Steering stem
⑫ Steering bottom ball race
⑬ Steel ball
⑭ Steering bottom cone race
⑮ Steering head dust seal



Fig. 11-3 ① Upper handle holders
② Handle bar

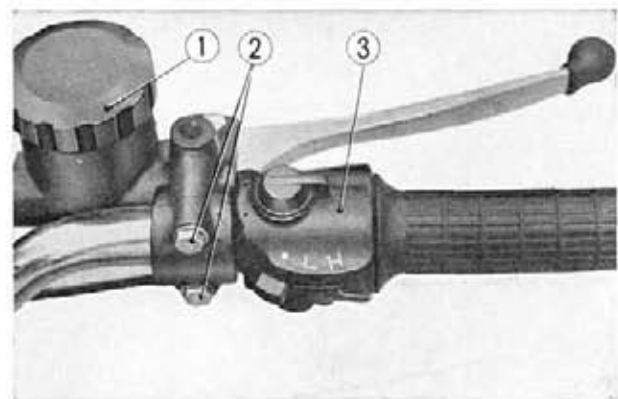


Fig. 11-2 ① Master cylinder body
② Cylinder body mounting bolts
③ Starter lighting ignition switch

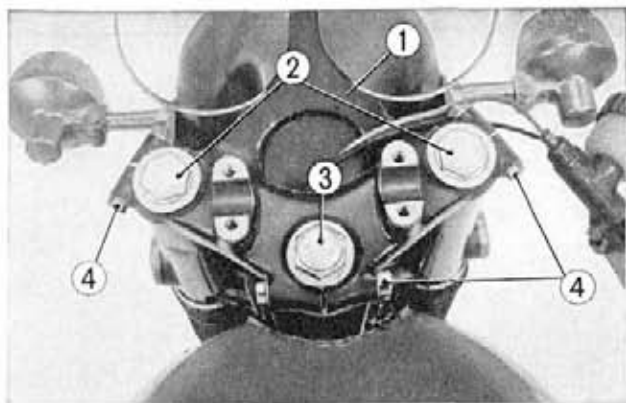


Fig. 11-4 ① Fork top bridge ③ Stem nut
② Front fork top bolts ④ 8mm setting bolts

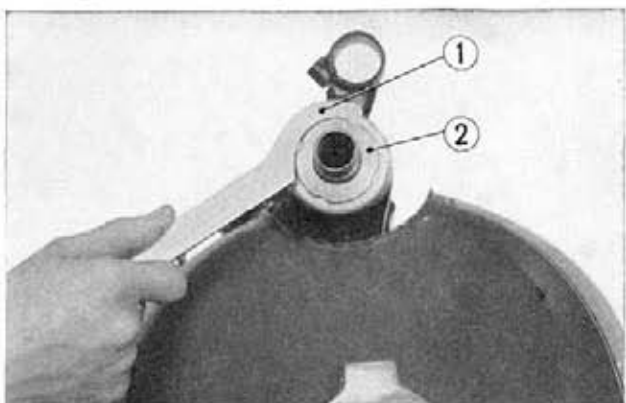


Fig. 11-5 ① Steering stem thread wrench
② Steering stem thread

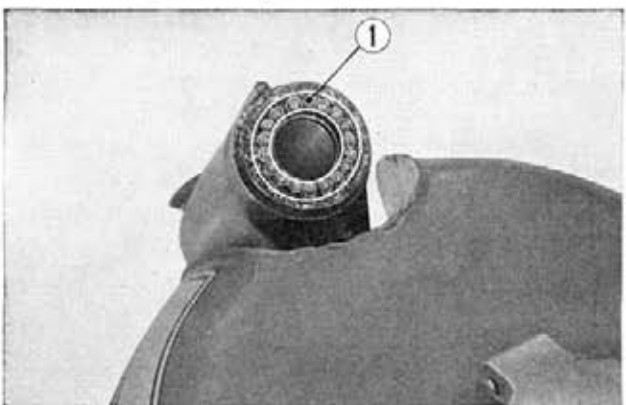


Fig. 11-6 ① Steel balls

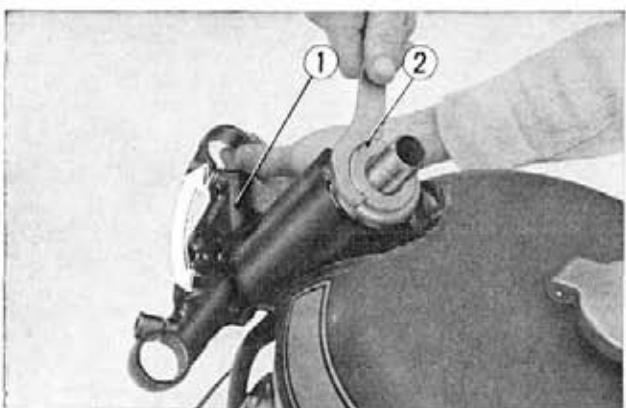


Fig. 11-7 ① Steering stem
② Steering stem thread

5. Loosen the speedometer/tachometer holding clamp and remove the speedometer/tachometer from the fork top bridge.
6. Loosen the stem nut, two front fork top bolts, three 8mm setting bolts and then remove the fork top bridge. (Fig. 11-4)
7. Place a support block under the engine to raise the front wheel off the ground and remove the front suspension in accordance with section 11-3 b. on page 120.
8. Remove the steering stem thread. Work can be facilitated by using the special wrench (Tool No. 07902-2000000). (Fig. 11-5)
9. Pull the steering stem out the bottom, exercising care not to lose the steel balls.

c. Inspection

1. Check the steering handle bar for damage and distortion.
2. Check the steering stem for distortion or cracks.
3. Check to make sure that there is adequate grease in the cone race and also check the steel balls and if found to be excessively worn, they should be replaced.

d. Reassembly

1. Apply a liberal amount of grease on the steering ball races and assemble the steel balls 18 on the upper side and 19 on the lower side. (Fig. 11-6)
2. Exercise care installing the steering stem into the head pipe so that the steel balls are not dropped. Install the top cone race and then screw on the steering stem thread so that there is no clearance between the steering stem and the head pipe in the vertical direction and that the handle turns lightly through the full range of travel. (Fig. 11-7)
3. Assemble the front fork in accordance with 11-3 d on page 121~122.

4. Install the front fork bridge, the stem nut, the two front fork bolts and then fix in place with three 8 mm bolts.
5. Install the speedo/tachometer unit and attach the drive cables.
6. Set the handle bar on the handle holder and mount in place with the upper handle holders.

Position the handle bar by aligning the punch marks on the handle bar to the upper surface of the handle holder. (Fig. 11-8)

7. Connect the electrical wires within the headlight case by matching the same colored wires.
8. Connect the throttle cable to the throttle grip pipe and then mount the throttle grip bracket on the handle. Install the lower bracket by positioning the dowel pin into the hole in the handle bar.
9. Connect the clutch cable to the clutch lever and mount the master cylinder bracket on the handle bar. The cables, wire harness and brake hose should be routed as shown in Fig. 11-9.

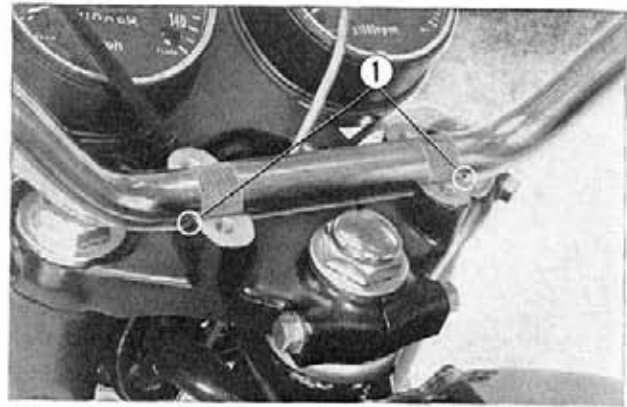


Fig. 11-8 ① Punch marks

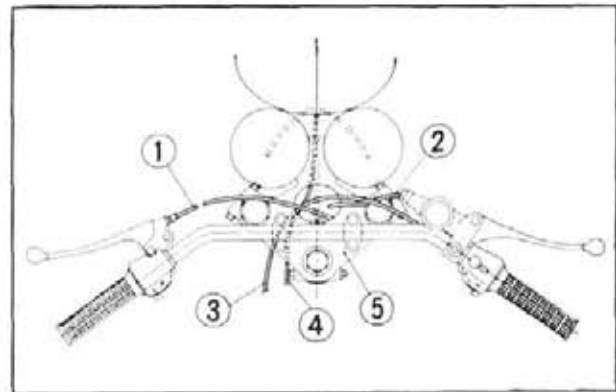


Fig. 11-9

- | | |
|--------------------|-------------------|
| ① Clutch cable | ④ Wire harness |
| ② Front brake hose | ⑤ Fork top bridge |
| ③ Throttle cable | |

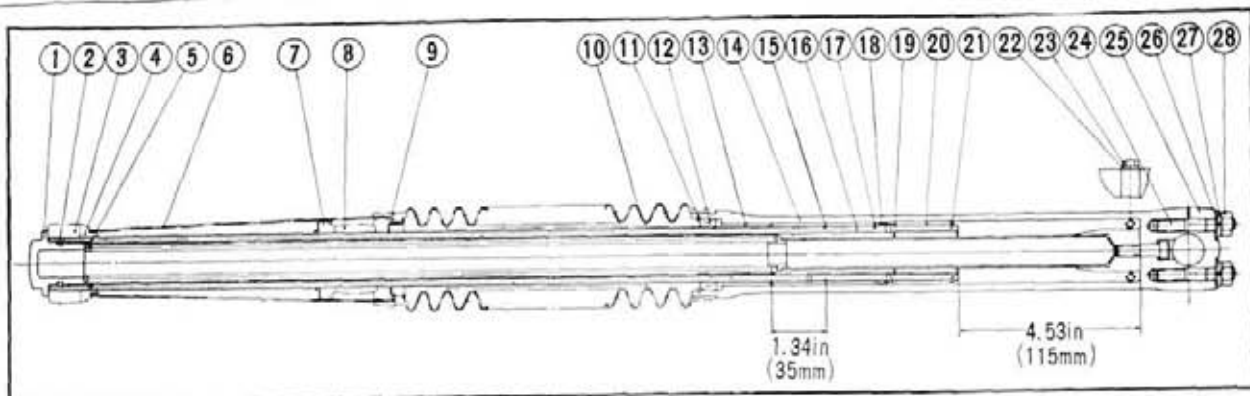
11-3 FRONT SUSPENSION

Piston type

a. Description

The front suspension is a telescoping oil damper type with an aluminum front fork bottom case used for lightness. (Fig. 11-10)

It consists mainly of a fork pipe ① complete with piston ④, a fork bottom case ③ and a cushion spring. On "compression", that is, when any downward load is imposed on the front fork, for example, under heavy front braking, the piston moves down, compressing the oil in chamber "A", and forcing it into chamber "B" through orifices "a" in the periphery of the fork pipe to lift damper valve ⑤ off its seat. On the other hand, the cushion spring, now compressed, exerts an upward reaction to move up the piston. The piston when so moved compresses the oil in chamber "B" and forces it back into chamber "A" through orifice "b" to provide damping action. On "full bump", or bump overcoming the capacity of the cushion spring, the pipe is moved down toward the bottom end of the bottom case, trapping the oil in the space between the pipe and tapered lock piece ⑥ to provide maximum damping. On "full rebound", the orifice "b" is covered by guide ③ and the oil is trapped within chamber "B" to provide damping on the extension side.



- ① Front fork bolt
- ② 23×2.8 "O" ring
- ③ Fork top bridge
- ④ Fork cover upper cushion
- ⑤ Front cushion spring
- ⑥ Front fork cover
- ⑦ Fork cover lower cushion
- ⑧ Steering stem
- ⑨ Front fork rib
- ⑩ Front fork boot

- ⑪ 47 mm circlip
- ⑫ 354611 oil seal
- ⑬ Front fork pipe guide
- ⑭ Front fork bottom case
- ⑮ Fork pipe stopper ring
- ⑯ Front fork pipe
- ⑰ Fork valve stopper ring
- ⑱ Front damper valve
- ⑲ Piston stopper ring
- ⑳ Front fork piston

- ㉑ Fork piston snap ring
- ㉒ Drain cock packing
- ㉓ 6mm hex bolt
- ㉔ 8mm stud bolt
- ㉕ Front axle holder
- ㉖ 8mm flat washer
- ㉗ 8mm spring washer
- ㉘ 8mm hex nut

Fig. 11-10

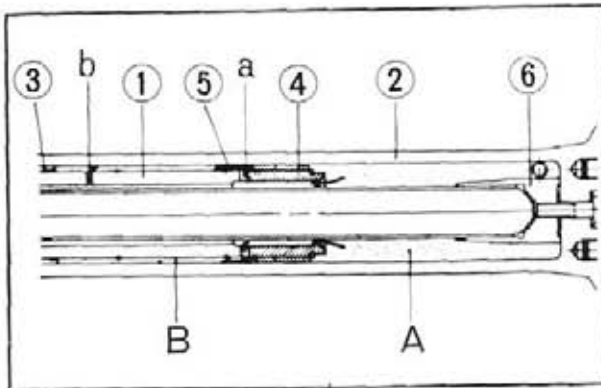


Fig. 11-10-1

- ① Front fork pipe complete
- ② Front fork bottom Case complete

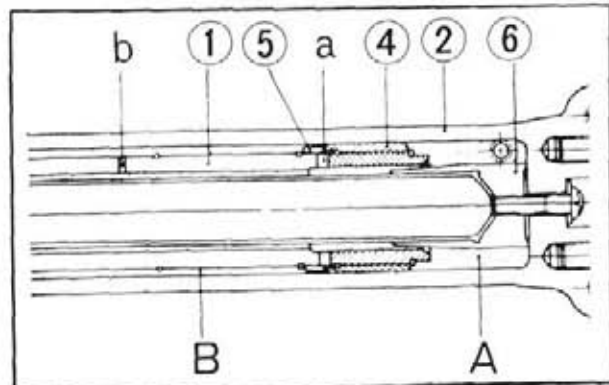


Fig. 11-10-2

- ③ Front fork pipe guide
- ④ Front fork piston
- ⑤ Front damper valve
- ⑥ Oil lock piece

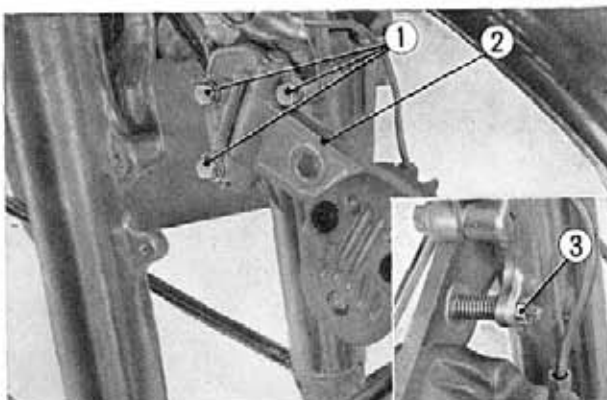


Fig. 11-11 ① Caliper setting bolts
② Caliper assembly ③ Adjuster nut

b. Disassembly

1. Remove the front wheel in accordance with section 13-1b. on page 132~133.
2. Remove the three caliper setting bolts and adjuster nut, and separate the caliper from the left front fork. (Fig. 11-11)
3. Loosen the 8×56 mm front fork pipe mounting bolts (located on the fork top bridge) and the 10×40 mm front fork pipe mounting bolts (located on the steering stem). Pull the front fork gently out the bottom. (Fig. 11-12)

4. Disassemble the front fork by removing the internal circlip with a circlip pliers and separating the front fork pipe from the bottom case (Fig. 11-13).
5. By removing the fork piston snap ring, the front fork piston and the front fork damper valve may be disassembled from the front fork pipe. (Fig. 11-14)

c. Inspection

1. Checking front fork oil

To maintain good riding characteristics and increase fork service life, the oil in the front fork should be changed periodically.

Unscrew the front fork drain plug at the bottom of the fork cylinder, drain the oil by pumping the forks while plug is out. Replace the plug securely after draining. (Fig. 11-15)

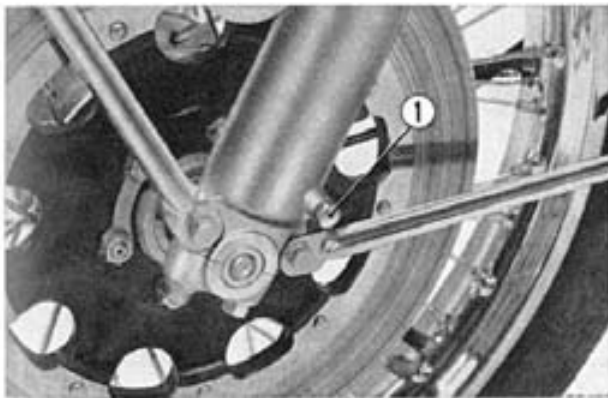


Fig. 11-15 ① Front fork drain plug

Remove the top filler plug and fill the front fork cylinder with 7.0~7.3 ozs. (220~230 cc) of **premium quality oil of SAE 10 W-30 grade**. (Fig. 11-16)

Securely tighten the top filler plug after filling.

2. Check the front fork assembly by locking the front brake and pumping the fork up and down vigorously.
 - Smooth cushion action.
 - Oil seepage around the cushion oil seals.

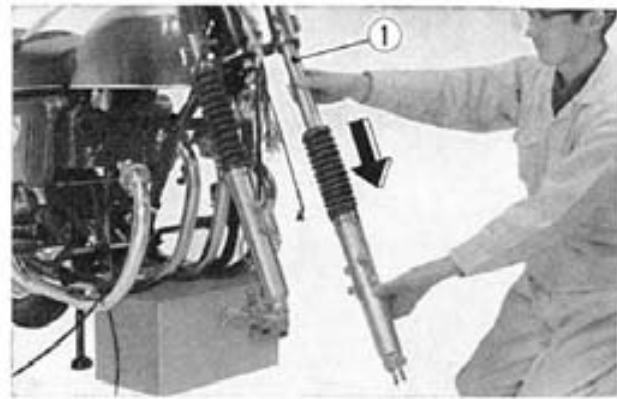


Fig. 11-12 ① Front fork

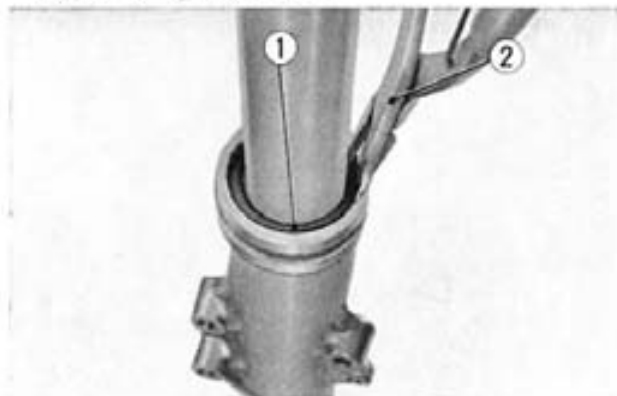


Fig. 11-13 ① Internal circlip ② Pliers

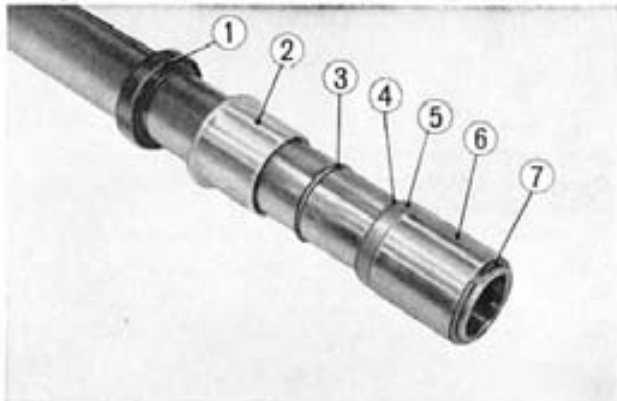


Fig. 11-14

- | | |
|---------------------------|-------------------------|
| ① 354611 oil seal | ⑤ Front damper valve |
| ② Front fork pipe guide | ⑥ Front fork piston |
| ③ Fork pipe stopper ring | ⑦ Fork piston snap ring |
| ④ Fork valve stopper ring | |

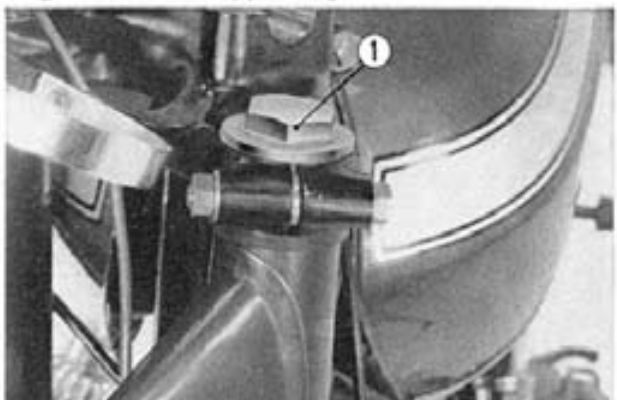


Fig. 11-16 ① Top filler plug

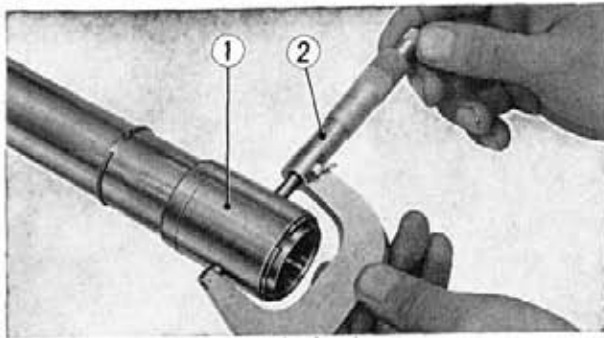


Fig. 11-17 ① Front fork piston
② Micrometer

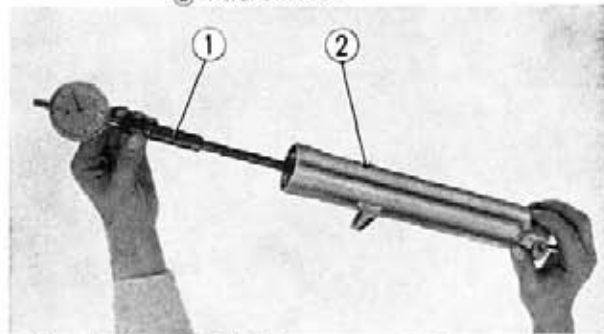


Fig. 11-18 ① Cylinder gauge ② Bottom case

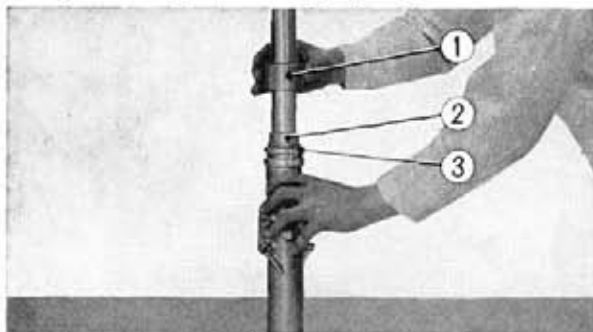


Fig. 11-19 ① Oil seal driving weight
② Oil seal driving guide
③ Oil seal



Fig. 11-20 ① Front fork assembling bar
② Front fork pipe setting bolt (8 mm)
③ Front fork pipe setting bolt (10 mm)

3. Measure the diameter of the front fork piston. Use a micrometer to perform this check and if it is found to be less than 1.551 in. (39.4 mm), the piston should be replaced. (Fig. 11-17)

4. Measure the inner diameter of the front fork bottom case. Use a cylinder gauge to perform this check and if it is found to be over than 1.562 in (39.68 mm), the front fork bottom case should be replaced. (Fig. 11-18)

d. Reassembly

1. Wash all the parts and then assemble the pipe guide, stopper rings, damper valve, piston and snap ring in that order on the front fork pipe. (Fig. 11-14)

2. Assemble the front fork pipe into the front fork bottom case and install the oil seal using the oil seal guide (Tool No. 07947-3290000). (Fig. 11-19)

Exercise care that the oil seal is not damaged during installations and install the circlip into the groove in the bottom case.

Note: To disassemble the front forks of motorcycles from Frame No. 1044650 to 2089878, proceed as follows:

- Replace the oil seals with new ones (double lip type) (Part No. 91255-341-305).

Replacement

- The employment of new oil seals abolished higherto used back-up rings due to the change in seal width.
- Apply a coat of oil to the seals and insert them from the piston side while rotating.

3. Install the front fork upper cover on the steering stem (above and below the cushion rubbers) and insert the front fork pipe assembly through the steering stem, and temporarily tighten with the 10mm front fork setting bolt. (Fig. 11-20)

4. Fill the front fork cylinder with 7.0~7.3 ozs (220~230 cc) of premium quality oil of SAE 10W-30 grade, and securely tighten the top filler plug after filling.

5. Properly tighten the front fork pipe setting bolts (8, 10 mm).

6. Adjust the front brake caliper by referring to page 147~148.

REAR SUSPENSION

GROUP

12

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12-1 GENERAL DESCRIPTION

DESCRIPTIONS

The suspensions must not only absorb the vertical shock caused from the road conditions but must also be able to sustain applied force resulting from steering function. The rear suspension mechanism consists of the rear cushion and rear fork.

SPECIFICATIONS

Item	Standard value	Serviceable limit
Rear cushion spring		
Spring inner diameter	1.401~1.429 in. 35.7~36.3 mm	—
Free length	8.74 in. 222 mm	8.504 in. 216 mm
Coil diameter	0.276 in. 7 mm	—
Installation load	8.17 in./66.6 lbs 207.5 mm/30.2 kg	—
Tilt	within 1.5°	Over 2.5°

Item	Standard value	Serviceable limit
Rear fork		
Pivot bush inner diameter	0.8426~0.8447 in. 21.403~21.455 mm	0.8504 in. 21.6 mm
Center collar outer diameter	0.8412~0.8425 in. 21.367~21.400 mm	0.8386 in. 21.3 mm

DIAGNOSIS

Trouble	Probable Causes	Remedy
Soft suspension	1. Loss of spring tension 2. Excessive load	Replace
Hard suspension	1. Ineffective front cushion damper 2. Ineffective rear cushion damper	Replace Replace
Suspension noise	1. Cushion case rubbing 2. Interference between cushion case and spring 3. Damaged cushion stopper rubber 4. Insufficient spring damper oil (front and rear)	Inspect cushion spring and case Repair Replace Replace

12-2 REAR SHOCK ABSORBERS

a. Description

The rear suspension is a swing arm type with a large stroke of 3.43 in. (87 mm).

A De Carbon type rear damper is employed on the CB750 is of a single cylinder double acting type. (Fig. 12-1)

This damper is, as shown in the figure below, a double-acting type single cylinder in which nitrogen gas and oil are used to give an optimum damping performance under all bumping and rebounding conditions. Over the damper is installed a dual-pitch spring which absorbs a wide range of vibrations or shocks and maintains the unit in accurate alignment. Another design feature is that the cushion is adjustable for different riding, loading and road conditions.

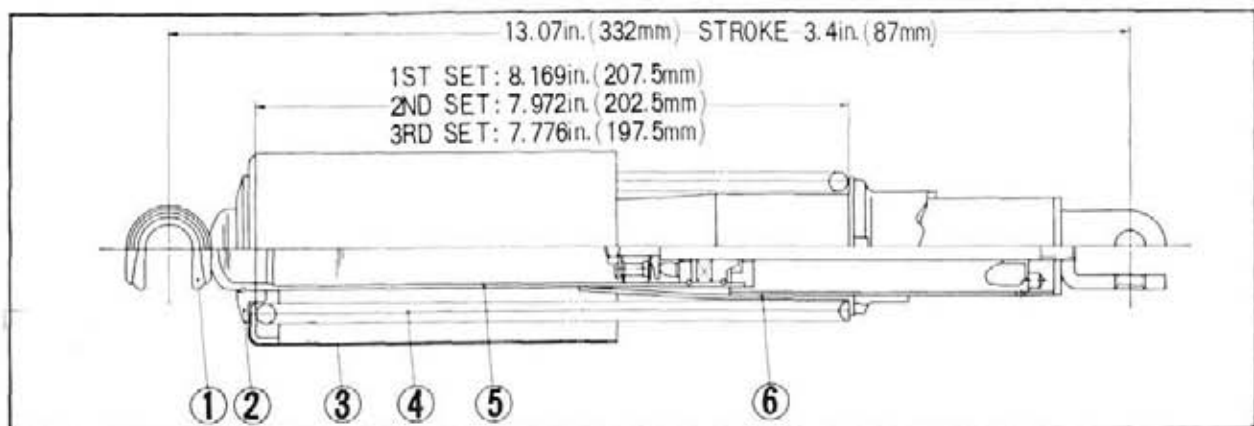


Fig. 12-1

- | | |
|----------------------------|-----------------------------|
| ① Joint rubber | ④ Rear cushion spring |
| ② Spring seat stopper | ⑤ Rear damper assembly |
| ③ Rear cushion upper cover | ⑥ Rear cushion spring guide |

Simple type of a construction the heat radiation is good, therefore, performance being especially good at low speed. Further, vibration stabilizes very quickly.

Air and oil mixture will not occur and function will not be deteriorates even when operated for extended period over adverse road condition.

The difference in pressure between the front and rear of the valve is small; since form does not form, noise is minimized; deterioration of the damping force is prevented. (Fig. 5-61)

The rear cushion employs a dual pitch spring, the section with the larger pitch absorbs the large vibration while the section with the smaller pitch absorbs the smaller vibration. This provides for exceptionally smooth riding. Further, there are three ranges of adjustment incorporated in the rear cushion, making it possible to adjust the cushion to the different riding, loading and road conditions.

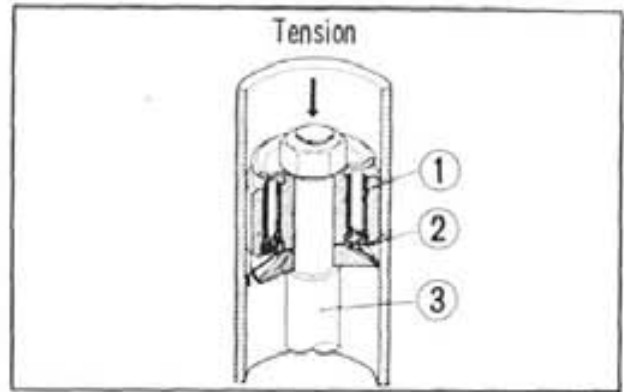


Fig. 12-1-1 ① Piston ② Valve ③ Rod

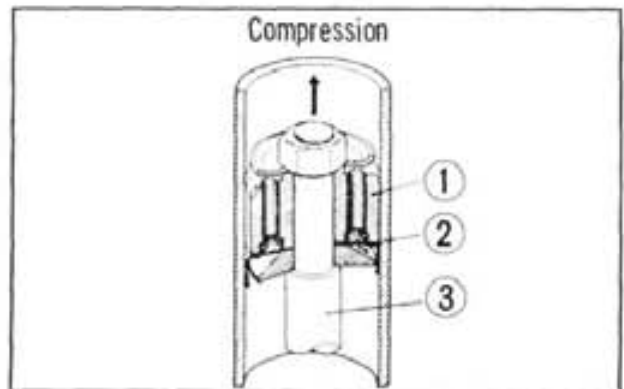


Fig. 12-1-2 ① Piston ② Valve ③ Rod

b. Disassembly

1. Unscrew the rear cushion cap nut and bolt, and remove the rear cushion from the frame. (Fig. 12-2)
2. Remove the rear cushion spring using the rear cushion disassembling tool (Tool No. 07959-3290000). (Fig. 12-3)

Note: The rear cushion contains nitrogen gas under high pressure, therefore, disassembly should not be attempted because possible injury may result.

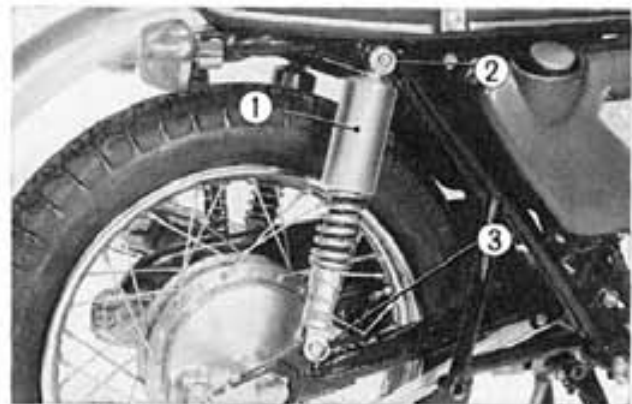


Fig. 12-2 ① Rear cushion ② Cap nut ③ Setting bolt

c. Inspection

1. Rear cushion spring free length

Measure the free length of the rear cushion spring using a vernier caliper, if it is under 18.11 in. (460 mm), the spring should be replaced with a new part. (Fig. 12-4)

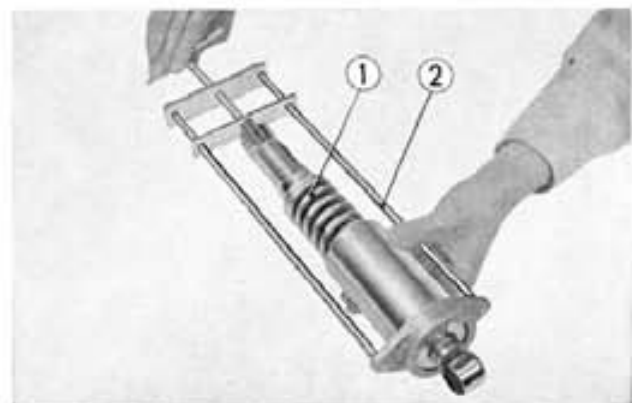


Fig. 12-3 ① Rear cushion spring ② Rear cushion disassembling tool

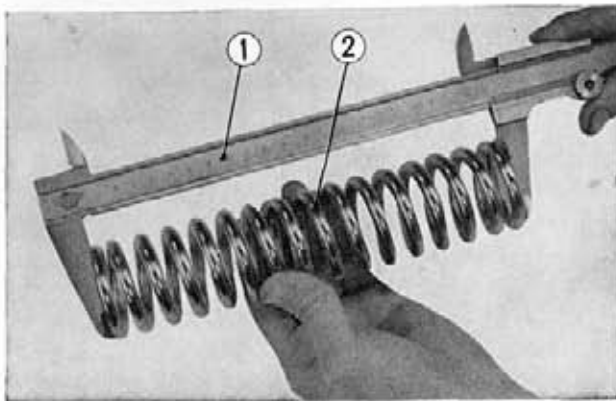


Fig. 12-4 ① Vernier caliper
② Rear cushion spring

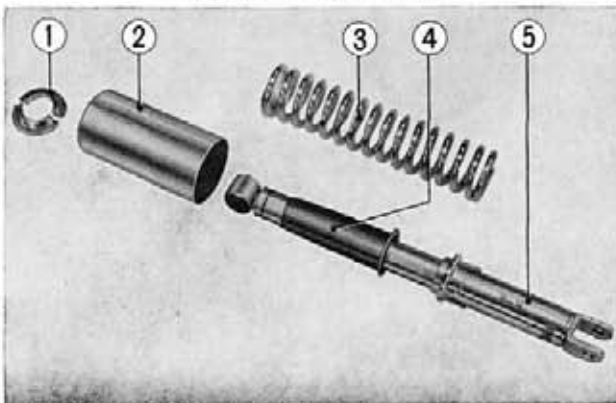


Fig. 12-5 ① Spring seat stopper
② Rear cushion upper case ③ Rear cushion spring
④ Rear cushion spring guide ⑤ Rear damper unit

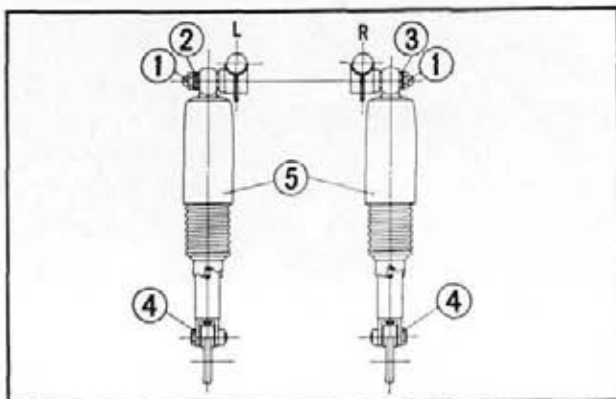


Fig. 12-6 ① 10 mm cap nuts ④ 10 mm bolts
② Side grip ⑤ Rear cushions
③ Washer

2. Rear cushion spring trueness

Set the spring up on its end on the surface gauge and measure the amount of tilt with a square and vernier caliper.

If the tilt is over 2.5° , the rear cushion should be replaced.

3. Inspect the cushion damper to insure that there is no fluid leakage.
4. Inspect the damper case and rod to insure that they are not damped or deformed.
5. Inspect the rear cushion stopper to insure that it is not damaged or deformed.

d. Reassembly

1. Assemble the under seat, spring and upper case to the damper. Compress the assembly using a rear cushion assembly tool (Tool No. 07959-3290000) and lock the assembly with spring seat stopper. (Fig. 12-5)

Note : Upon completing the assembly, actuate the cushion assembly by hand to make sure that they are not binding.

2. Mount the rear cushion on the frame with the rear cushion cap nut and bolt.

Note : After installing the cushion, check the alignment of the right and left cushion and also the alignment of the cushion mounting bolt for both right and left sides (Fig. 12-6).

12-3 REAR FORK

a. Description

The rear fork has a rectangular cross section made from pressed steel plate to provide greater rigidity at the wheel mounting which is a clamp design.

One end of the rear fork is fitted to a section on the frame and the other end is fitted to the frame through the rear cushion. When the rear wheel moves in the vertical direction, the section which is fitted to the frame becomes the pivot point and the rear wheel moves in an arc.

The close proximity of the pivot point to the drive sprocket poses negligible effect on the chain tension.

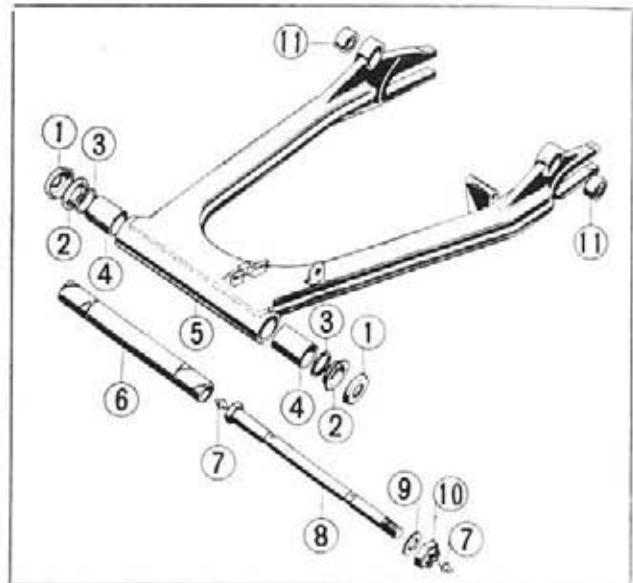


Fig. 12-7

- | | |
|---------------------------|----------------------------------|
| ① Dust seal cap | ⑦ Grease nipple |
| ② Pivot thrust bush | ⑧ Rear fork pivot bolt |
| ③ Rear fork felt ring | ⑨ Rear fork pivot bolt washer |
| ④ Rear fork pivot bush | ⑩ 14mm self lock nut |
| ⑤ Rear fork | ⑪ Rear cushion under rubber bush |
| ⑥ Rear fork center collar | |

b. Disassembly

1. The exhaust mufflers must first be removed before the rear fork can be removed.
2. Remove the cotter pin from the rear wheel axle, loosen the axle nut and remove the drive chain.
3. Unscrew the rear brake adjuster nut, the rear brake torque bolt and remove the axle to separate the rear wheel. (refer to page 137)
4. Unscrew the rear fork pivot nut and bolt, and then separate the rear fork from the frame. The rear fork side washer and the pivot collar can be removed. (Fig. 12-8)

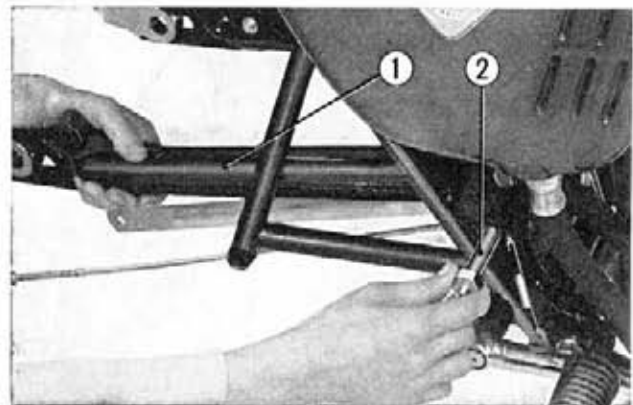


Fig. 12-8 ① Rear fork
② Rear fork pivot bolt

c. Inspection

1. Visually check the rear fork for bend and distortion, and if found to be excessive, it should be replaced with a new part.
2. Scratched and deformed part should be either repaired or replaced.
3. Measure the bores of the rear fork pivot bushing with a inner dial gauge and the outside diameter of the center collar with micrometer, and if they are not within the serviceable limit shown below, they should be replaced. (Fig. 12-9)

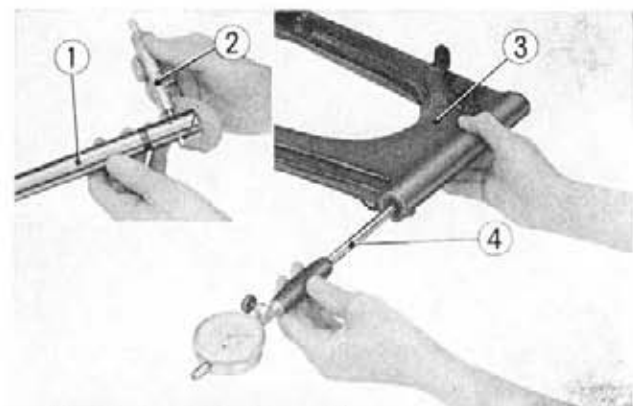


Fig. 12-9 ① Center collar
② Micrometer
③ Rear fork
④ Inner dial gauge



Item	Serviceable limit
Rear fork pivot bush inner diameter	0.858 in. (21.8 mm)
Rear fork center collar outer diameter	0.8452 in. (21.4 mm)

4. There are two lubrication points as shown in the Fig. 19-18. It is recommended that lubrication be performed in accordance with section 19 on page 185.

d. Reassembly

1. Apply a liberal amount of grease on the pivot collar and assemble it into the rear fork. Insert the pivot bolt from the right side while holding the dust seal caps on both sides of the rear fork, and then install and tighten the 14 mm self lock nut.
2. Install the rear wheel.
3. Install the drive chain.
4. When the assembly is completed, adjust the rear brake pedal and drive chain tension. (refer to page 149 and 186)

WHEELS, TIRES AND FINAL DRIVE

GROUP
13

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13-1 GENERAL DESCRIPTION

DESCRIPTION

Carefully check to make sure that the front and rear wheels are properly aligned and both tires have specified air pressure.

If these are not properly maintained, it will be dangerous, especially when riding at a high speed.



SPECIFICATIONS

Item	Standard value		Serviceable limit	
Rim runout	Within	0.02 in. 0.5 mm	Over	0.08 in. 2.0 mm
Ball bearing diametrical runout (F)	Within	0.00012 in. 0.003 mm	Over	0.002 in. 0.05 mm
" (R)	Within	0.0002 in. 0.005 mm	Over	0.0024 in. 0.06 mm
Ball bearing axial runout	Within	0.0028 in. 0.07 mm	Over	0.004 in. 0.1 mm
Rear brake lining	7.0787~7.0866 in. 179.8~180 mm		7.205 in. 183 mm	
Rear brake shoe thickness	0.197 in. 5.0 mm		0.08 in. 2.0 mm	

DIAGNOSIS

Trouble	Probable Causes	Remedy
Heavy steering	Low tire pressure	Add air to the specified tire pressure 28.5 lbs/in ² /(2 kg/cm ²)
Front and rear wheel wobble	1. Worn front and rear wheel bearings. 2. Front or rear wheel runout of distorted. 3. Loose spoke. 4. Defective tire.	Replace bearing Repair or replace. Retorque. Replace.

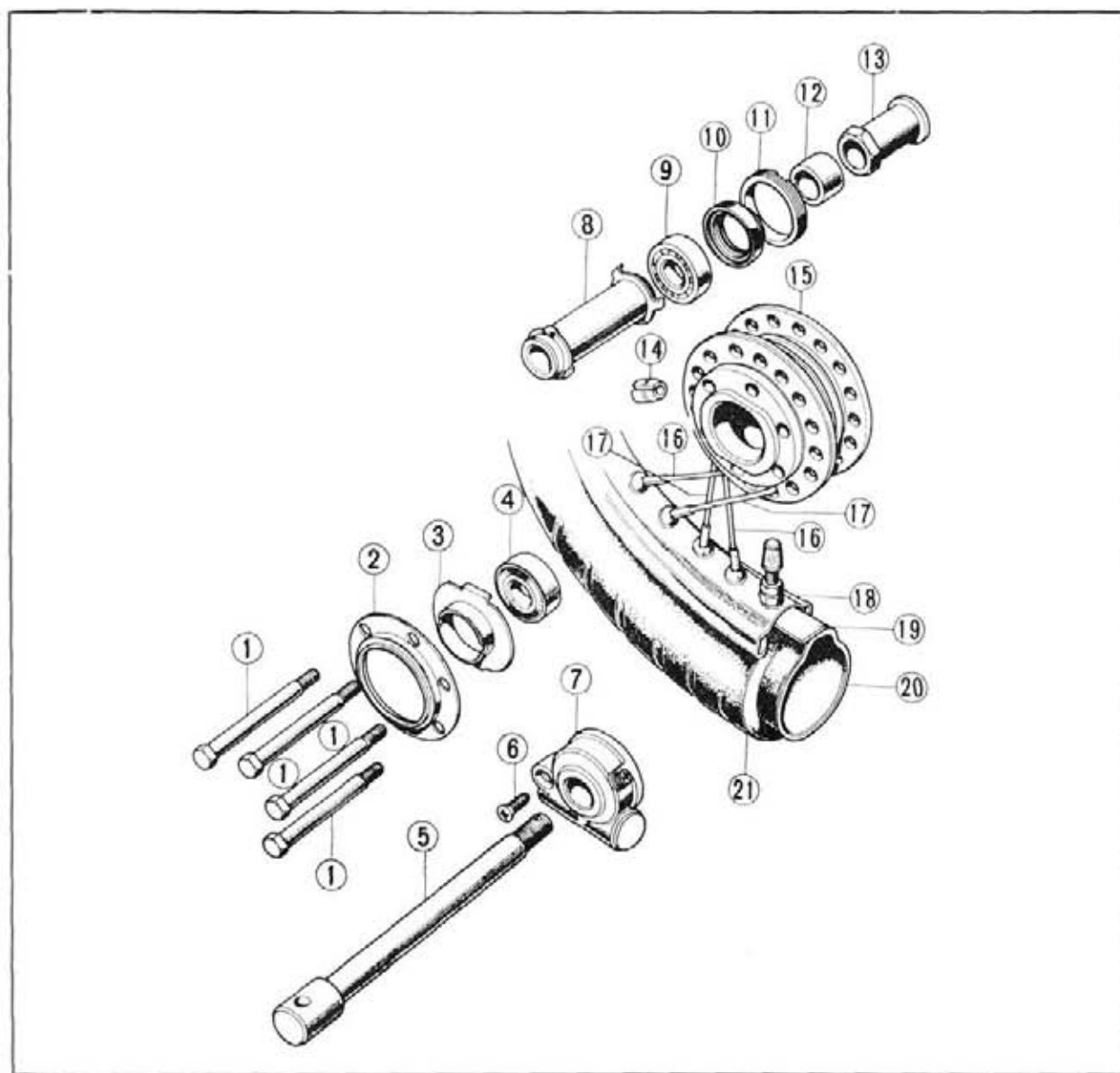
13-2 FRONT WHEEL AND TIRE

a. Description

For the front wheel, large size tire, 3.25-19, is used to provide a greater safety factor and a comfortable riding.

The cast aluminum hub houses the front brake disc, two 6302 Z ball bearings, front axle distance collar, dust seal and bearing retainer.

The Fig. 13-1 shows the front wheel component parts.



- ① 8×10 mm bolt
- ② Gear box retainer cover
- ③ Gear box retainer
- ④ 6302 Z ball bearing
- ⑤ Front wheel axle
- ⑥ 5×15 mm oval screw
- ⑦ Speedometer gear box

- ⑧ Front axle distance collar
- ⑨ 6302 Z ball bearing
- ⑩ 22368 dust seal
- ⑪ Front wheel bearing retainer
- ⑫ Front wheel collar
- ⑬ Front wheel axle nut
- ⑭ Wheel balancer

- ⑮ Front wheel hub
- ⑯ Front spoke A
- ⑰ Front spoke B
- ⑱ Front wheel rim
- ⑲ Front tire flap
- ⑳ Front wheel tube
- ㉑ Front wheel tire

Fig. 13-1

ceed in this manner until the entire side of the tire casing is above and clear of the rim edge.

- e. The deflated inner tube can now be pulled from the tire casing and the inner tire casing inspected for damage or protruding sharp object etc. Locate and eliminate cause of flat or puncture.

c. Inspection

1. Check the flatness of front brake disc.
Place the disc on the surface plate and measure the flatness using the dial gauge. If the difference is greater than **0.012 in. (0.3 mm)**, the disc should be replaced with a new part. Further, the disc should also be changed if the thickness of the disc is less than **0.217 in. (5.5 mm)**. (Fig. 13-6)
2. Checking the rim runout
Pass a shaft through the front wheel and spin the wheel by hand, and read the runout at the rim using a dial gauge. If the runout is greater than **0.080 in. (2.0 mm)**, the rim should be either repaired or replaced. (Fig. 13-7)

3. Wheel ball bearing

Measure the axial and diametrical runout of the ball bearing with a dial gauge. If the value is over serviceable limit listed below the ball bearing should be replaced. (Fig. 13-8)

Item	Serviceable limit
Axial runout	0.004 in (0.1 mm)
Diametrical runout	0.002 in (0.05 mm)

d. Reassembly

1. Install the tire in accordance with following manner.
 - a. Install a new inner tube of the correct size by inflating very slightly, leave the valve core in the valve stem.
 - b. Inspect the wheel rim strip inner tube protector to see that it is in good condition and centered over the spoke nipples in the rim recess.
 - c. Align the tire balance mark with the valve stem hole in the rim and insert the partially inflated inner tube into the tire casing. With the valve stem aligned with the valve stem hole in the rim.
 - d. Work the inner tube into proper position in the tire casing and insert the valve stem through the valve stem hole in the rim. Install a valve stem retaining nut partially on to the valve stem. (1/4-1/2 in. do not tighten.) Remove valve core.
 - e. Apply a light coating of tire mounting solution (liquid detergent can be used in an emergency) to each of the tire bead surfaces and between the free tire bead and rim edge.
 - f. The tire can now be stepped into place using your heels. Placing both heels on the tire bead opposite the valve core and depressing the tire bead into place a slight amount with each step in opposite directions around the wheel.
 - g. When 80~90% of the tire bead is in place, use a tire mounting mallet (heavy rub-

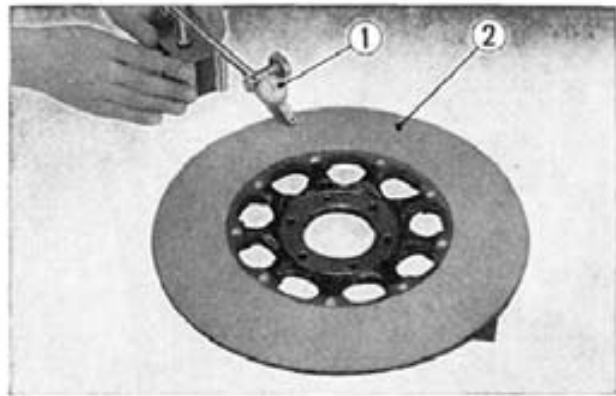


Fig. 13-6 ① Dial gauge
② Front brake disc

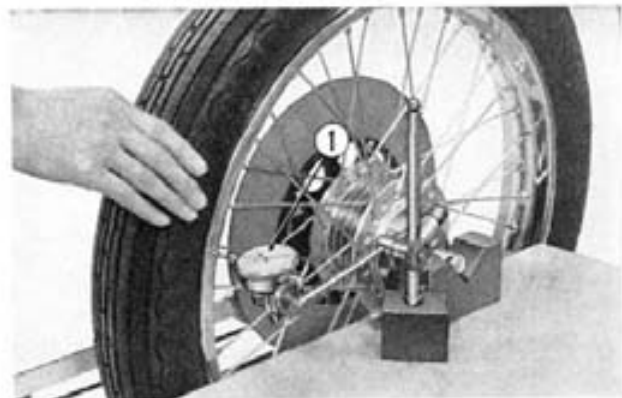


Fig. 13-7 ① Dial gauge

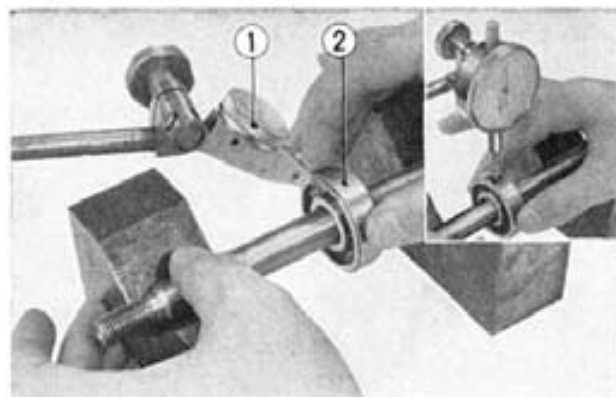


Fig. 13-8 ① Dial gauge
② Ball bearing

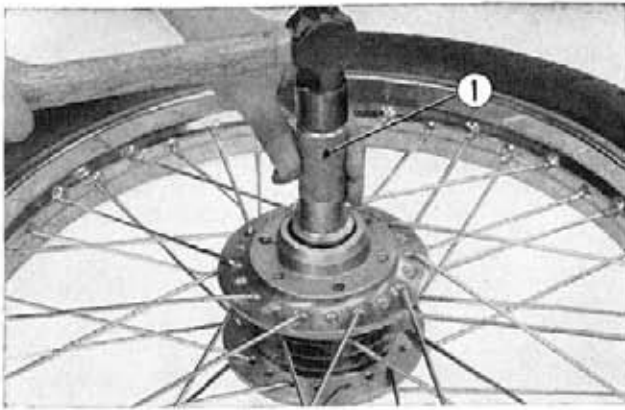


Fig. 13-9 ① Bearing driver

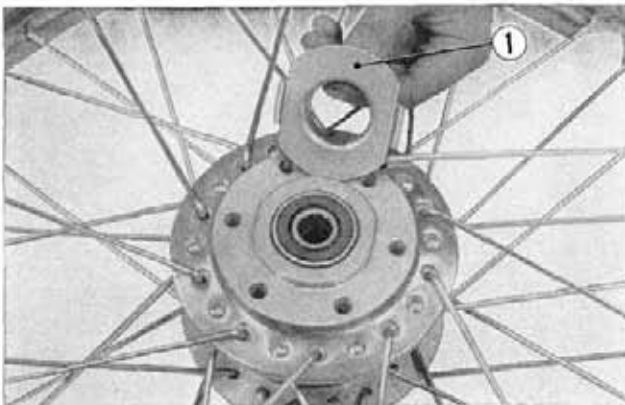


Fig. 13-10 ① Gear box retainer

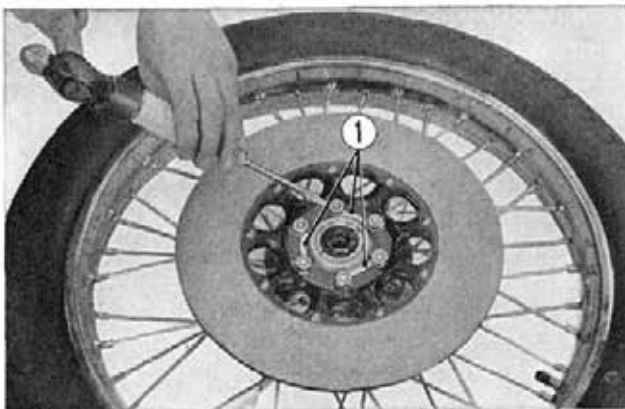
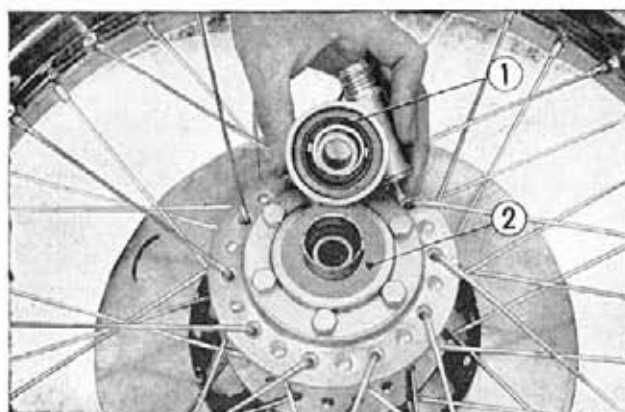


Fig. 13-11 ① Tongued washer

Fig. 13-12 ① Speedometer gear box
② Gear box retainer

ber, leather or plastic hammer) to force the remaining to section into position. Avoid using tire irons or screw drivers for this operation as inner tube punctures will result due to pinching with the tool.

h. Insert the valve core and over inflate the standard pressure by approximately 10 psi. This will help to properly seat the tire beads into the rim. Inspect for proper tire bead seating and deflate the tire. Reinflate to the correct specified pressure 28.5 lb/in² (2.0 kg/cm²), and tighten the valve stem retaining nut lightly.

- i. Recheck the tire pressure and install the valve stem cap.
2. Drive the wheel bearing into the wheel using a bearing driver (Tool No. 07949~3000100). (Fig. 13-9)
3. Install the dust seal into the front wheel bearing retainer, mount the front wheel bearing retainer into the wheel hub.
4. Align the gear box retainer to the cutout in the wheel hub and install the gear box retainer cover from above, and install the six disc mounting bolts. Mount the disc of the opposite side and fix in place with the nuts. (Fig. 13-10)

Note : New tongued washers should be used and the tab on the washers bent up to lock. (Fig. 13-11)

5. Insert the front axle through the speedometer gear box from the right side and tighten the front axle nut. (Fig. 13-12)
6. Mount the front wheel on the front forks and mount the axle holders and tighten the setting nuts.

7. Connect the speedometer cable to the gear box. (Fig. 13-13)



Fig. 13-13 ① Speedometer cable
② Setting screw

8. Balance the wheel (Fig. 13-22)

Perform the balancing in the following manner.

- a. Raise the wheel off the ground and lightly rotate.

Note: If the front wheel does not rotate freely, turn the front brake stopper bolt clockwise until the front wheel rotates freely.

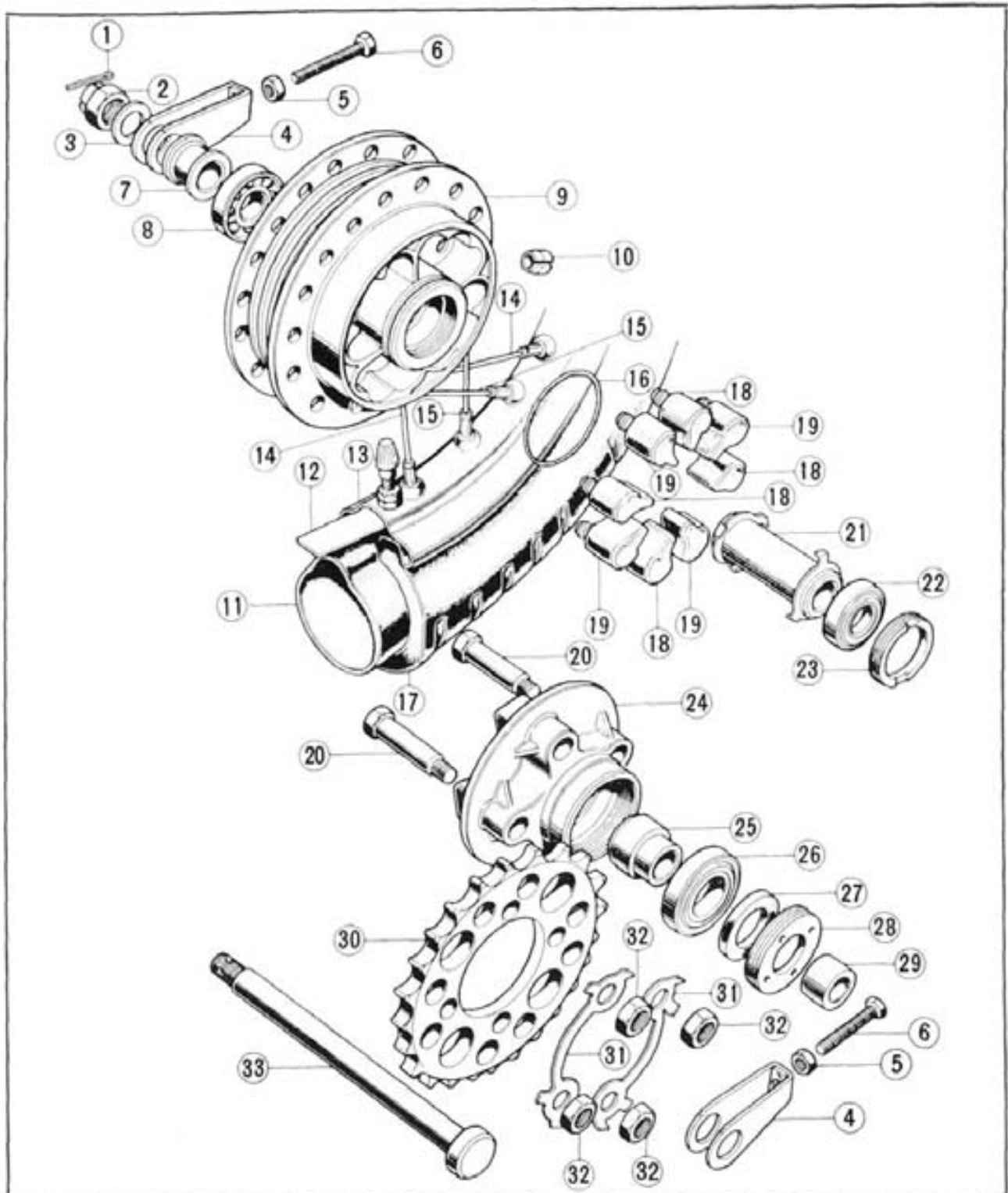
- b. Lightly attach an appropriate weight on the spoke adjacent to the nipple which stops at the highest position. Weights are available in four types, 5 gr, 10 gr, 15 gr and 20 gr.
- c. The wheel is in proper balance if the wheel after spinning will come to rest at no definite position.
- d. If the wheel does not statically balance, change the weight and reperform items b and c.
- e. Lock the weight with pliers after completing the balance.

13-3 REAR WHEEL AND TIRE

a. Description

For the rear wheel, a tire size, 4.00-18, is used to provide a greater safety factor. The wheel consists of an aluminum casting rear wheel hub which contains two 6304 ball bearings, final drive flange and brake panel.

Also, eight rear wheel dampers are mounted in the wheel hub to reduce the vibration or shock from the final driven sprocket. Fig. 13-14 shows the rear wheel component parts.



- ① 4×30 Cotter pin
- ② Rear axle nut
- ③ 18.5×34 washer
- ④ Chain adjuster
- ⑤ 8 mm hex nut
- ⑥ Chain adjusting bolt
- ⑦ Rear brake panel side collar
- ⑧ 6304 ball bearing
- ⑨ Rear wheel hub
- ⑩ Wheel balancer
- ⑪ Rear wheel tube

- ⑫ Rear tire flap
- ⑬ Rear wheel rim
- ⑭ Rear spoke B
- ⑮ Rear spoke A
- ⑯ 68×2.6 "O" ring
- ⑰ Rear wheel tire
- ⑱ Left rear wheel damper
- ⑲ Right rear wheel damper
- ⑳ Driven sprocket fixing bolt
- ㉑ Rear axle distance collar
- ㉒ 6304 ball bearing

- ㉓ Rear wheel bearing retainer
- ㉔ Final drive flange
- ㉕ Rear axle sleeve
- ㉖ 6305 ball bearing
- ㉗ 34×56×9 Oil seal
- ㉘ Rear wheel bearing retainer
- ㉙ Rear wheel side collar
- ㉚ Final driven sprocket
- ㉛ 12mm tongued washer
- ㉜ 12mm hex nut
- ㉝ Rear wheel axle

Fig. 13-14

b. Disassembly

1. Place the motorcycle on the main stand.
2. Remove the rear brake adjusting nut and brake rod from the brake arm. (Fig. 13-15)
3. Remove rear brake stopper arm lock pin, nut, flat washer, spring washer and bolt. (Fig. 13-16)
4. Remove the cotter pin from the right side of the rear axle and loosen the axle nut. (Fig. 13-17)
5. Loosen the drive chain adjusting bolt lock nuts, back out the abjuster bolts and turn the chain adjusters downward. Remove the rear fork cap fixing bolts and fork caps. (Fig. 13-17)
6. Push the wheel forward, lift the chain off the sprocket, then pull the wheel rearward, clear of the rear fork.
7. Remove the rear wheel from the frame.
8. Unlock the tongued washers, remove the nuts and the driven sprocket can then be removed. (Fig. 13-18)
9. Remove the rear wheel bearing retainer, and remove the bearing from the wheel hub. (Fig. 13-19)

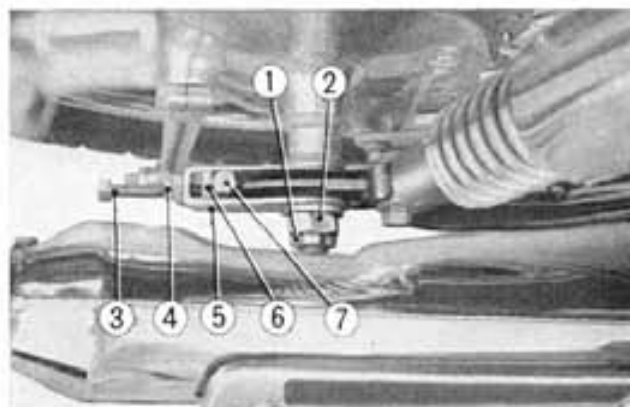


Fig. 13-17 ① Cotter pin ⑤ Chain adjuster
② Rear axle nut ⑥ Fork cap
③ Drive chain adjusting bolt ⑦ Fork cap fixing bolt
④ Lock nut



Fig. 13-15 ① Rear brake arm
② Rear brake adjusting nut

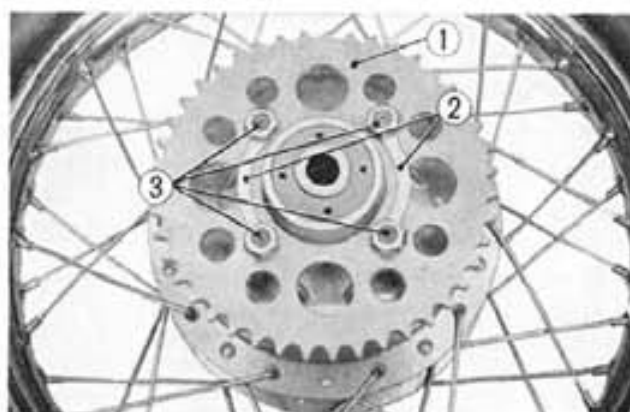


Fig. 13-18 ① Final driven sprocket
② Tongued washers
③ Sprocket setting bolts

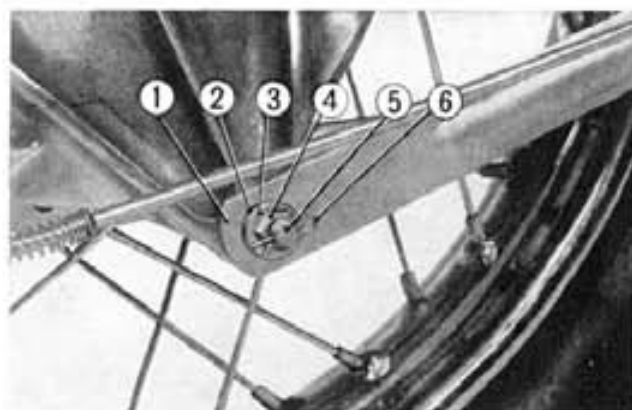


Fig. 13-16 ① Rear brake stopper arm
② 10 mm spring washer
③ 8 mm flat washer
④ 8 mm nut
⑤ Rear brake panel stopper bolt
⑥ Lock pin

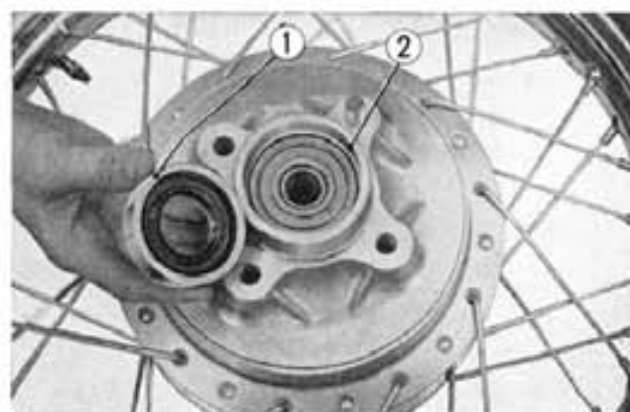


Fig. 13-19 ① Rear wheel bearing retainer
② 6304 ball bearing

10. Remove the two cotter pin, washer and then the rear brake shoes can be removed from the rear brake panel. (Fig. 13-20)

c. Inspection

1. Rear brake lining
Refer to section 14-3 c on page 148.
2. Rear brake shoes
Refer to section 14-3 c on page 148.
3. Wheel ball bearing (Fig. 13-8)
Measure the axial and diametrical runout of the ball bearing with a dial gauge. If the value is over serviceable limit listed below the ball bearing should be replaced.

Item	Serviceable limit
Axial runout	0.004 in. (0.1 mm)
Diametrical runout	0.002 in. (0.05 mm)

d. Reassembly

1. Install the rear brake shoes on the rear brake panel and install the washer, two cotter pins and bend the pins.
2. Clean the inside of the drum so that it is free of oil, dust and other foreign objects, and then install the brake panel.
3. Mount the bearing retainer on the wheel hub, install the driven sprocket with the mounting nuts and bend up the tab on the locking washer to prevent loosening.
4. Install the rear wheel on the frame.
5. Assemble the torque link bolt, washers, nut and lock pin on the rear brake panel. Install the brake lever rod on the brake arm and install the brake adjusting nut.
6. Adjust the drive chain tension with the adjuster bolt so that there is a slack of 0.40 to 0.80 in. (10~20 mm), at the center of the chain. After completing the adjustment tighten the axle nut and lock with a cotter pin. (Fig. 13-21)
7. Adjust rear brake pedal free play. (refer to page 48).

Note: At any time the front or rear wheel is removed, take the opportunity to thoroughly inspect the suspension components, brake friction linings and wheel assemblies. Pay particular attention to the condition of the wheel bearings, wheel rim, tire bead seating and spoke tension.

8. Balance the wheel
Perform the balancing in the following procedures. (Fig. 13-22)
 - a. Raise the wheel off the ground and lightly rotate.
 - b. Lightly attach an appropriate weight on the spoke adjacent to the nipple which stop at the highest position. Weights are available in four types, 5 gr, 10 gr, 15 gr and 20 gr.
- c. The wheel is in proper balance if the

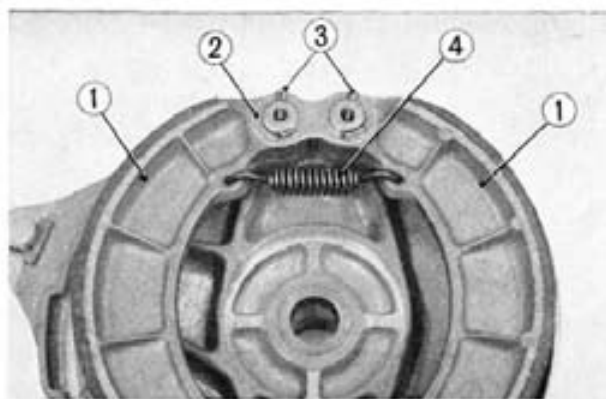


Fig. 13-20

- ① Rear brake shoes ③ 25×20 cotter pin
② Anchor pin washer ④ Brake shoe spring



Fig. 13-21

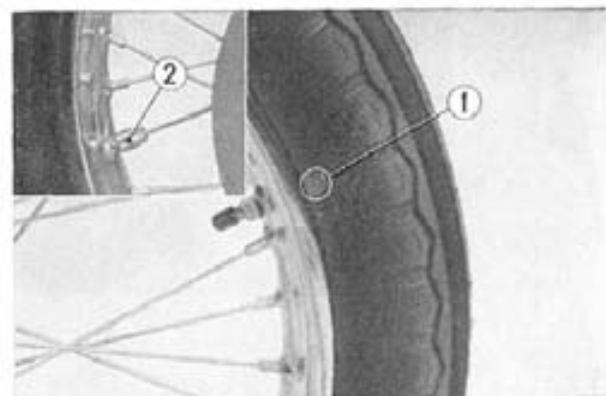


Fig. 13-22

- ① Balance mark
② Balance weight

- wheel after spinning will come to rest at no definite position.
- d. If the wheel does not statically balance, change the weight and reperform items b and c.
- e. Lock the weight with pliers after completing the balance.

13-4 FINAL DRIVE

a. Description

The power from the engine is transmitted from the final drive sprocket by the drive chain to the final driven sprocket mounted on the rear wheel and turns the rear wheel.

b. Disassembly

1. Remove the rear crankcase cover.
2. Remove the joint clip with a pliers to disconnect the chain. (Fig. 13-23)
3. Disconnect the chain by separating the retainer plate and retainer, and remove the chain from the sprocket.
4. For the procedure on the removal of the final drive sprocket, refer to page 137, rear wheel removal section.

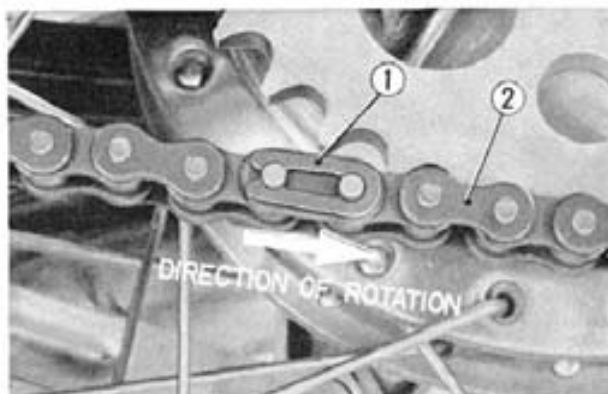


Fig. 13-23 ① Joint clip
② Drive chain

c. Inspection

1. Check the chain stretch

Hang the chain by one end and measure the entire length of the chain between the two pin holes. If the stretch of the chain is computed to be greater than 0.4 in (10 mm) for one meter of length, the chain should be replaced. (Fig. 13-24)

2. Check for any cracks in the chain.
3. Visually inspect the sprocket teeth and replace the sprocket if there are any broken teeth or excessively worn teeth.
4. If the chain is excessively dirty, clean the drive chain by referring to page 187.

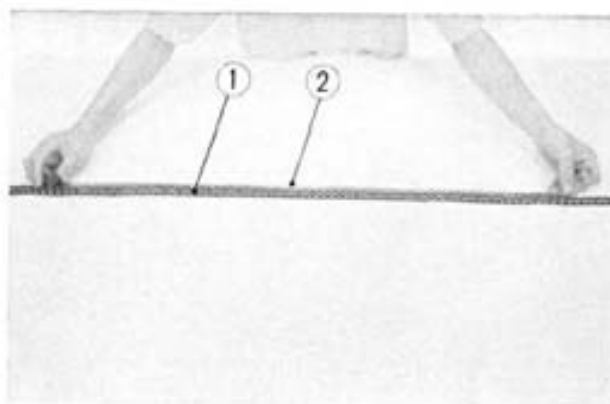


Fig. 13-24 ① Drive chain
② Scale

d. Reassembly

1. Reassembly is performed in the reverse order of disassembly, however, exercise care on the following points:
 - a. After reassembly, perform the drive chain adjustment by referring to page 178.
 - b. The drive chain clip must be installed so that the cutout is toward the trailing end.

BRAKES

GROUP

14

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14-1 GENERAL DESCRIPTION

SPECIFICATIONS

Item	Standard value	Serviceable limit
Front brake disc thickness	0.272~0.279 in 6.9~7.1 mm Max. 0.004 in	under 0.217 in 5.5 mm over 0.012 in
Front brake disc deflection	0.1 mm	0.3 mm
Master cylinder inner diameter	0.5512~0.5529 in 14.0~14.043 mm	over 0.553 in 14.055 mm
Master cylinder piston diameter	0.550~0.5506 in 13.957~13.984 mm	under 0.549 in 13.940 mm
Caliper cylinder inner diameter	1.503~1.504 in 38.18~38.20 mm	over 1.504 in 38.215 in
Caliper cylinder piston diameter	1.505~1.515 in 38.115~38.48 mm	under 1.500 in 38.105 mm

DIAGNOSIS

Trouble	Probable Causes	Remedy
Defective brake	<ol style="list-style-type: none"> Front brake <ul style="list-style-type: none"> • Insufficient brake fluid. • Air in the brake system. • Worn brake pad. • Worn piston. • Worn or distorted front brake disc. • Brake lever out of adjustment. Rear brake <ul style="list-style-type: none"> • 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. 	<p>Add brake fluid. Bleed brake system Replace pad Replace piston Replace disc</p> <p>Readjust</p> <p>Replace Replace Replace Clean Replace Readjust</p>

14-2 FRONT BRAKE

a. Description

The CB 750 employs a hydraulically operated disc brake on the front wheel which provides smooth and stable braking from slow to high speed.

The disc brake system is composed of the brake lever and master cylinder on the right handle bar, a caliper mounted on the left side front fork and the stainless steel disc mounted on the wheel hub.

Operation takes place in the following sequence. (Fig. 14-1)

1. When the front brake lever ① is gripped, the cam ② at the base of the brake lever will actuate the master cylinder ③ and pressurizes the fluid within chamber A.
2. Pressurized fluid in the system actuates the stop light switch ⑧ installed in the 3-way joint ⑦, and pad A ⑪.

The pressure built-up within chamber B forces pad A ⑪ against disc to produce braking. As the caliper assembly is pivoted to the front fork housing, the reaction from pad A ⑪ is transmitted to pad B ⑫.

3. The clearance of 0.002~0.004 in (0.05~0.1 mm) between the disc and the pad to be consistent with the wear of the pad. When hydraulic pressure is applied against the back of the piston, the piston seal first deforms and as the piston moves further, the piston slides over the piston seal until the pad contacts the disc (Fig. 14-2). When the hydraulic pressure is released, the deformed piston seal will return to its normal shape, and consequently, pulls the piston away from the disc by the amount of the piston seal deformation.
4. When the brake lever is released, the spring within the master cylinder returns the primary cup and the piston to their original positions, pressure within the brake system is relieved.

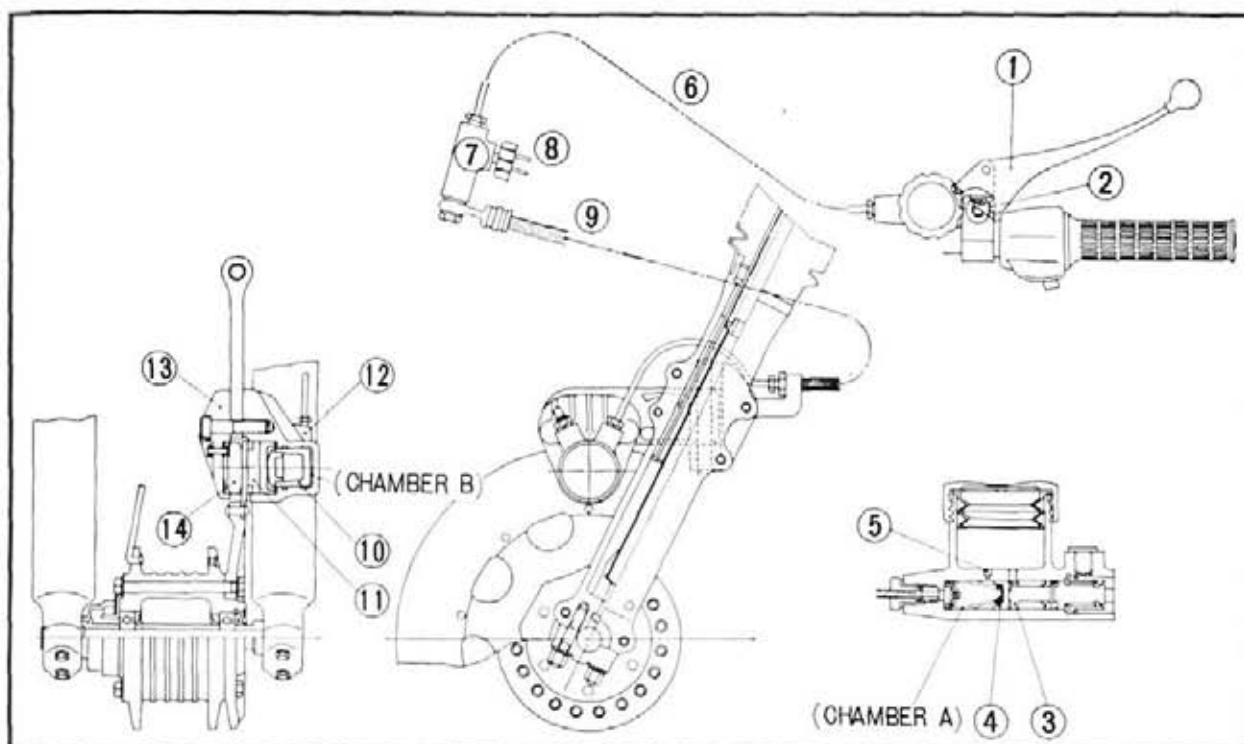


Fig. 14-1 ① Front brake lever
② Front brake lever cam
③ Master cylinder
④ Primary cup
⑤ Fluid passage

⑥ Front brake hose B
⑦ Three way joint
⑧ Stoplight switch
⑨ Front brake hose
⑩ Piston

⑪ Pad A
⑫ Caliper A
⑬ Caliper B
⑭ Pad B

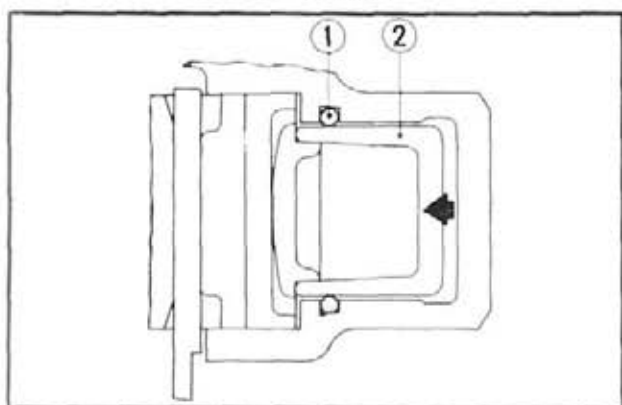


Fig. 14-2 ① Piston seal
② Piston

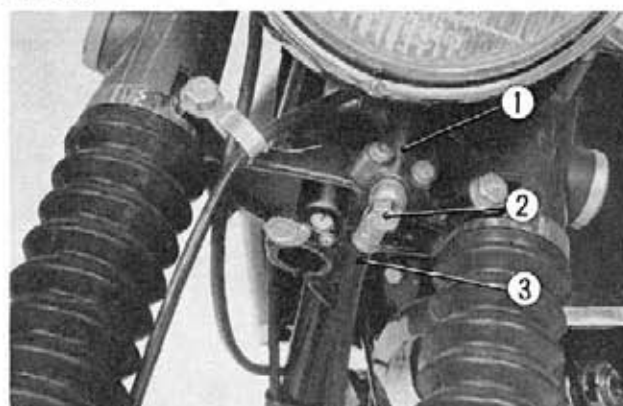


Fig. 14-3 ① Joint
② Oil bolt
③ Oil hose

b. Disassembly

1. Remove the front wheel by referring to page 132.
2. Disconnect the front brake hose at the joint by removing the oil bolt. (Fig. 14-3)
3. Unscrew the three caliper mounting bolts from the fork bottom case, and remove the caliper assembly.

To remove caliper B, unscrew the two hollow head set bolts and this will also permit caliper A to remove. (Fig. 14-4)

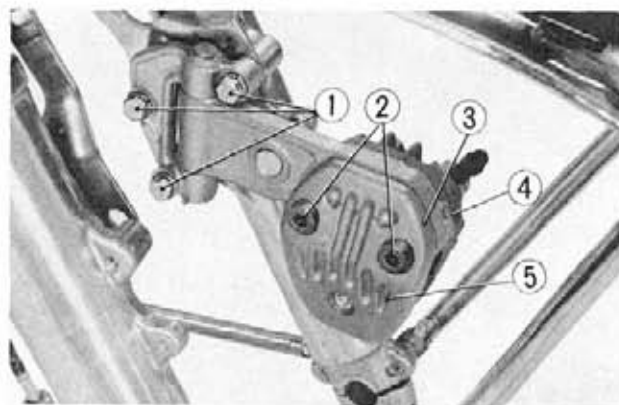


Fig. 14-4 ① Caliper mounting bolts
② Hollow head set bolts
③ Caliper
④ Caliper A
⑤ Caliper B