SHOP MANUAL

HONDA
CB750

6230010
(E) (SM) A 5007705
PRINTED IN JAPAN

FOREWORD

This shop manual describes the maintenance, inspection and adjustment procedures of the HONDA CB750 and CB750F.

The manual is divided into various functional groups to simplify the use of the manual. The pages for the respective groups are indexed on this pages for convenience.

Each of the groups are further divided into section 1. Description, 2. Specifications, 3. Diagnosis, 4. Disassembly, 5. Inspection and 6. Reassembly. Many photographs and illustrations are used to make the operations easy to understand.

Following are the initial serial numbers of each model at the time of change.

CB750	Frame No. 1000001~
CB750K1	Frame No. 1055004~
CB750K2	Frame No. 2000001~
CB750K3	Frame No. 2200001~
CB750K4	Frame No. 2341915~
CB750K5	Frame No. 2525947~
CB750F (F1)	Frame No. 1000001~
CB750K6	Frame No. 2540001~
CB750K7 ('77)	Frame No. 2700002~

HONDA MOTOR CO., LTD
Service Publications Office

GROUP INDEX

GENERAL INFORMATION

GROUP 1

CONTENTS

1-1 SERIAL NUMBER

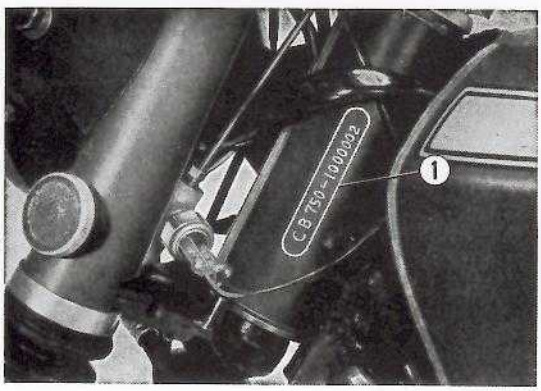


Fig. 1-1 ① Frame serial number

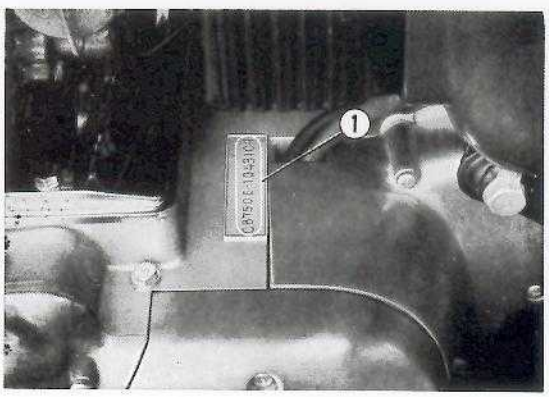


Fig. 1-2 ① Engine serial number

The frame serial number is stamped on the left side of the steering head pipe and engine serial number is located on the top of the crankcase left side. Whenever ordering replacement parts or making inquiries concerning the particular motorcycle, always included the frame or the engine number whichever is applicable. **(Fig. 1-1, 2)**

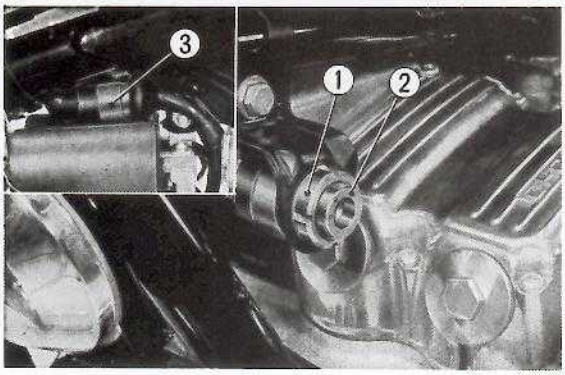


Fig. 1-3 ① Lock nut
② Main ignition switch
③ Coupler

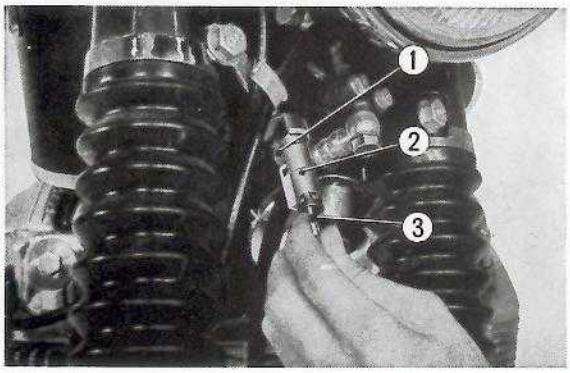


Fig. 1-4 ① Lock spring
② Handle lock
③ Key

1-2 KEY SYSTEM

The key is used to operate both the main ignition switch and the handle lock.

Four keys are provided for each motorcycle, two are to be given to the user and the remaining two are to be kept in custody of the dealer from whom the motorcycle is purchased so that they can be supplied as a spare to the user when they are lost. A rubber cap is provided to cover the head of the key which is in use. The same code number is stamped on the key and ignition switch. When the key is lost refer to the switch code. In case all spare keys are waste, the main ignition switch and the handle lock (key, main ignition switch and handle lock are sold in sets) must be replaced in set.

a. Replacement of main ignition switch

1. Loosen the main ignition switch lock nut and remove the switch from the switch bracket. **(Fig. 1-3)**
2. Disconnect the main switch coupler.
3. Install the new switch on the switch bracket and positively connect the coupler.

b. Replacement of handle lock

1. Remove the handle lock case mounting screw with a cross point screw driver and remove the lock case
2. Insert the key into the handle lock and turn counter clockwise approximately 60° and then the handle lock can be removed from the steering stem. **(Fig. 1-4)**
3. Install the new handle lock in the reverse order of removal procedure described above.

   Do not forget to assemble the handle lock spring.

Trouble	Probable Causes	Remedy
Poor engine idling	**Valve Mechanism**	
	1. Improper valve tappet clearance	Adjust to standard value, (Refer to page 36~37).
	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. Poor valve sealing	Regrind valve (Refer to page 34).
	3. Weak or broken valve spring	Replace (Refer to page 34~35)
	4. Improper valve timing	Check valve timing and adjust if necessary (Refer to page 36~37
	5. Defective cylinder head gasket	Replace (Refer to page 35).
	6. Worn cylinder and piston	Replace (Refer to page 38).
	7. Worn, weak or broken piston ring	Replace (Refer to page 38~39).
	8. Loose spark plug	Retighten.
Over heating	1. Heavy carbon deposit on combustion chamber and piston head	Remove carbon (Refer to page 35 and 38).
	2. Lean fuel mixture	Adjust the carburetor.
	3. Retarded ignition timing	Adjust ignition timing (Refer to page 83~84).
	4. Low oil level, poor quality	Add good grade oil.
	5. Extended operation in low gear	
Back fire	1. Poor sealing of the inlet valve	Check the valve seating
	2. Improper valve timing	Adjust (Refer to page 36~37).
	3. Improper ignition timing	Adjust (Refer to page 83~84).
	4. Excessively large spark plug gap	Adjust the gap to 0.024~0.028 in. (0.6~0.7 mm).
	5. Inadequate fuel supply	
White exhaust smoke	1. Excessive wear of cylinder and piston	Replace the piston (Refer to page 38).
	2. Overfilled engine oil	Adjust the oil level.
	3. Excessively high oil pressure	
	4. Poor quality oil	Replace with good quality oil.
Black exhaust smoke	Rich fuel mixture	Adjust the carburetor (Refer to page 70~71).
Pedal does not return	1. Defective return spring	Replace
	2. Unhook return spring	Hook return spring
Kick starter gear does not rotate	1. Worn kick stater pawl	Replace

1-3 TECHNICAL DATA

a. Dimensional drawing

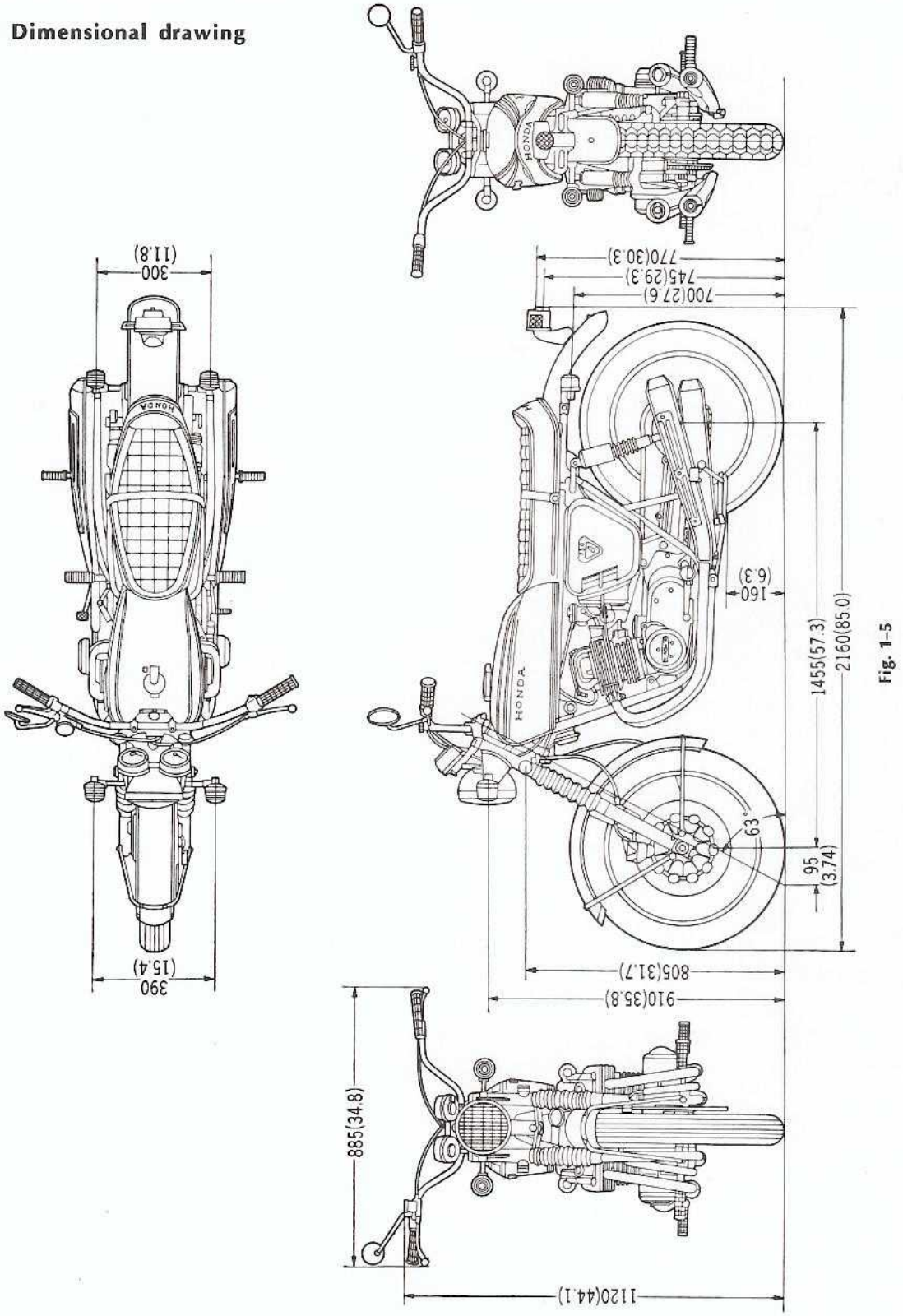


Fig. 1-5

b. Specifications CB 750

	Item	English	Metric
DIMENSION	Overall Length	85.0 in.	2,160 mm
	Overall Width	34.8 in.	885 mm
	Overall Height	45.5 in.	1,155 mm
	Wheel Base	57.3 in.	1,455 mm
	Seat Height	31.5 in.	800 mm
	Foot Peg Height	12.2 in.	310 mm
	Ground Clearance	5.5 in.	160 mm
	Curb Weight	517.3 lb.	235 kg
	Weight Distribution L/R	271.1/209.5 lb.	123/205 kg
FRAME	Type	Double cradle tubular steel	
	F. Suspension, Travel	Telescopic fork, travel 5.6 in.	143 mm
	R. Suspension, Travel	Swing arm, travel 3.3 in.	85 mm
	F. Tire Size, Type	3.25-19 (4 PR) Rib tire,	tire air pressure 2.0 kg/cm², 28 psi
	R. Tire Size, Type	4.00-18 (4 PR) Block tire,	tire air pressure 2.0 kg/cm², 28 psi
	F. Brake, Lining Area	Disc brake,	lining area 2.9 in²×2, 19 cm²×2
	R. Brake, Lining Area	Internal exanding shoe,	lining area 8.2 in²×2, 53 cm²×2
	Fuel Capacity	4.7 U.S. gal. 3.9 Imp. gal.	18 lit.
	Fuel Reserve Capacity	1.3 U.S. gal. 1.1 Imp. gal.	5 lit.
	Caster Angle	63°	
	Trail Length	3.74 in.	95 mm
	Front Fork Oil Capacity	7.0-7.3 ozs	220-230 cc
ENGINE	Type	Air-cooled, 4-stroke, O.H.C. engine	
	Cylinder Arrangement	4-cylinder in line	
	Bore and Stroke	2.401×2.408 in.	61×63 mm
	Displacement	44.93 cu in.	736 cc
	Compression Ratio	9.0	
	Carburetor, Venturi Dia	Four, piston valve, 28 mm dia.	
	Valve Train	Cnain drive overhead camshaft	
	Maximum Horsepower	67 BHP/8,000 rpm	
	Maximum Torque	44.12 lb-ft/7,000 rpm	6.1 kg-m/7,000 rpm
	Oil Capacity	7.39 U.S. pt., 6.16 Imp. pt.	3.5 lit.
	Oil Tank Capacity	4.22 U.S. pt., 3.55 Imp. pt.	2 lit.
	Lubrication System	Forced pressure and dry sump	
	Air Filtration	Paper element	

	Item	English	Metric
	Valve Tappet Clearance	IN: 0.002, EX: 0.003 in.	IN: 0.05, EX: 0.08 mm
	Engine weight (include oil)	176.3 lb.	80 kg
	Air Screw Opening	1±1/8	
	Idle Speed	900 rpm	
DRIVE TRAIN	Clutch	Wet, multi-plate	
	Transmission	5-speed, constant mesh	
	Primary Reduction, Secondary Reduction	Primary: 1.708, Secondary: 1.167	
	Gear Ratio I	2.500	
	〃 II	1.708	
	〃 III	1.333	
	〃 IV	1.097	
	〃 V	0.939	
	Final Reducion	2.667, drive sprocket 18 T, driven sprocket 48 T	
	Gear Shift Pattern	Left foot return type	
	Ignition	Battery and ignition coil	
	Starting System	Electrical motor and kick pedal	
	Alternator	Three phase A.C. 12 V-0.12 kW/5,000 rpm	
	Battery Capacity	12 V-14 AH	
	Spark plug	NGK D-8 ES	

CB 750 K 1

	Item		English	Metric
Dimension	Overall length		85.0 in.	2,160 mm
	Overall width		34.8 in.	885 mm
	Overall height		44.5 in.	1,155 mm
	Wheel base		57.3 in.	1,455 mm
	Seat height		31.5 in.	800 mm
	Foot peg height		12.2 in.	310 mm
	Ground clearance		5.5 in.	140 mm
	Dry weight		479 lb.	218 kg
Frame	Type		Double cradle	
	F. suspension, travel		Telescopic fork, travel 5.6 in. (143 mm)	
	R. suspension, travel		Swing arm, travel 3.3 in. (85 mm)	
	F. tire size, pressure		3.25-19 (4 PR) Rib pattern, tire air pressure 2.0 kg/cm² (28 psi)	
	R. tire size, pressure		4.00-18 (4 PR) Block pattern, tire air pressure 2.0 kg/cm² (28 psi)	
	F. brake, lining area		Disk brake, lining swept area 59.3 sq. in. (382.9 ɔm²)	
	R. brake, lining area		Internal expanding shoe, lining swept 33.2 sq. in. (220.5 cm²)	
	Fuel capacity		4.5 U.S. gal. 3.7 Imp. gal.	17 lit
	Fuel reserve capacity		1.3 U.S. gal. 1.1 Imp. gal.	5 lil
	Caster angle		63°	
	Trail leugth		3.7 in	95 mm
	Front fork oil capacity		7.5-7.8 ozs	220-230 cc (to fill if dry)
	Front fork oil capacity		6.9-7.1 ozs	200-210 cc (to fill after draining)
Engine	Type		Air cooled, 4 stroke O.H.C. engine	
	Cylinder arrangement		4 cylinder in line	
	Bore and stroke		2.402×2.480 in.	61.0×63.0 mm
	Displacement		44.9 cu-in.	736 cc
	Compression ratio		9.0 : 1	
	Valve train		Chain driven over head camshaft	
	Oil capacity		3.7 U.S. qt. 3.1 Imp. qt.	3.5 lit
	Lubrication system		Forced pressure and dry sump	
	Cylinder head compression pressure		12 kg/cm² (170.7 psi)	
	Intake valve	Open	At 5° (before top dead center)	
		Close	At 30° (after bottom dead center)	
	Exhaust valve	Open	At 35° (before bottom dead center)	
		Close	At 5° (after top dead center)	
	Valve tappet clearance		IN: 0.002, EX: 0.003 in.	IN: 0.05, EX: 0.08 mm
	Idle Speed		950 rmp	

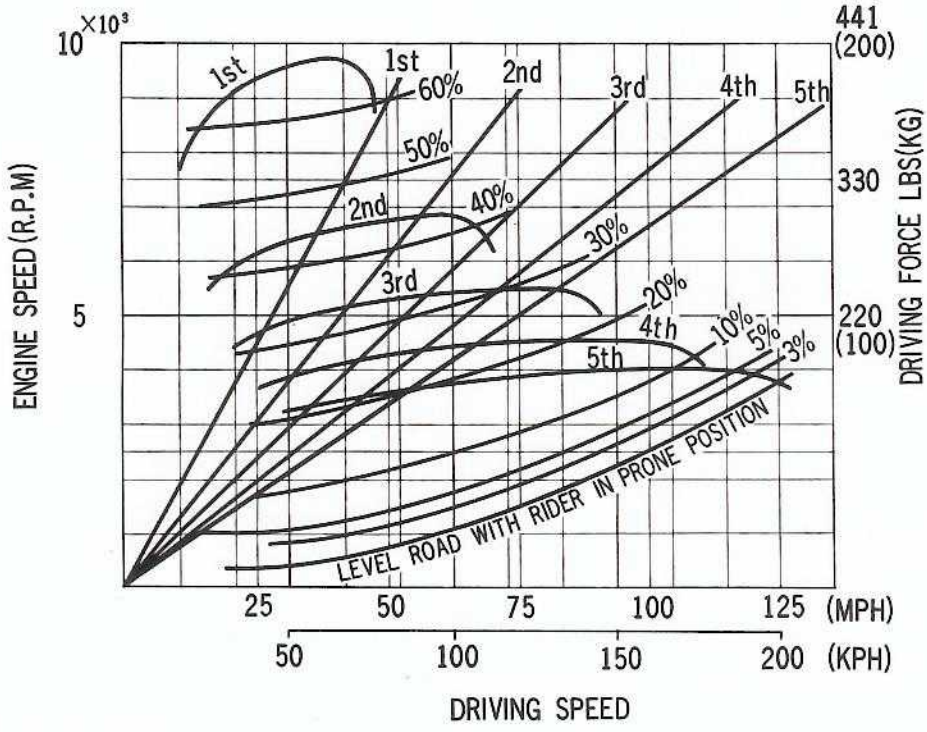
	Item	English	Metric
Carburetor	Type	Piston valve	
	Setting mark	7A	
	Main jet	#120	
	Slow jet	# 40	
	Air screw opening	1±3/8 turns	
	Float height	0.866 in.	26 mm
Drive train	Clutch	Wet multi plate type	
	Transmission	5-speed constant mesh	
	Primary reduction	1.708	
	Gear ratio I	2.500	
	Gear ratio II	1.708	
	Gear ratio III	1.333	
	Gear ratio VI	1.097	
	Gear ratio V	1.939	
	Final reduction	2.667, drive sprocket 18 T, driven sprocket 48 T	
	Gear shift pattern	Left foot operated return system	
Electrical	Ignition	Battery and ignition coil	
	Starting system	Starting motor or kick starter	
	Alternator	Three phase A.C. generator 12 V/0.21 kW/5,000 rpm	
	Battery capacity	12 V-14 AH	
	Spark plug	NGK D8ES-L, NDX 24ES	
	Headlight	Low/high 12 V-40 W/50 W	
	Tail/stoplight	Tail/stop 12 V-7/23 W (SEA TRADE No. 1157)	
	Turn signal-light	Front/rear 12 V-23/23 W	
	Speedometer light	12 V-3 W	
	Tachometer light	12 V-3 W	
	Neutral indicator light	12 V-3 W	
	Turn signal indicator light	12 V-3 W	
	High bean indicator light	12 V-3 W	

CB 750 K2, K3, K4

	Item		English	Metric
Dimension	Overall length		85.6 in.	2,175 mm
	Overall width		34.3 in.	870 mm
	Overall height		46.1 in.	1,170 mm
	Wheel base		57.3 in.	1,455 mm
	Seat height		31.9 in.	810 mm
	Foot peg height		12.2 in.	310 mm
	Ground clearance		5.5 in.	140 mm
	Dry weight		479 lb.	218 kg
Frame	Type		Double cradle	
	F. suspension, travel		Telescopic fork, travel 5.6 in. (143 mm)	
	R. suspension, travel		Swing arm, travel 3.3 in. (85 mm)	
	F. tire size, pressure		3.25-19 (4 PR) Rib pattern, tire air pressure 2.0 kg/cm² (28 psi)	
	R. tire size, pressure		4.00-18 (4 PR) Block pattern, tire air pressure 2.0 kg/cm² (28 psi)	
	F. brake, lining area		Disk brake, lining swept area 59.3 sq. in. (382.9 cm²)	
	R. brake, lining area		Internal expanding shoe, lining swept 34.2 sq. in. (220.5 cm²)	
	Fuel capacity		4.5 U.S. gal. 3.7 Imp. gal.	17 lit
	Fuel reserve capacity		1.3 U.S. gal. 1.1 Imp. gal.	5 lit
	Caster angle		63°	
	Trail length		3.7 in.	95 mm
	Front fork oil capacity		7.5-7.8 ozs	220-230 cc (to fill if dry)
	Front fork oil capacity		5.3-5.4 ozs	155-160 cc (to fill after draining)
Engine	Type		Air cooled, 4 stroke O.H.C. engine	
	Cylinder arrangement		4 cylinder in line	
	Bore and stroke		2.402×2.480 in.	61.0×63.0 mm
	Displacement		44.9 cu-in.	736 cc
	Compression ratio		9.0 : 1	
	Valve train		Chain driven over head camshaft	
	Oil capacity		3.7 U.S. qt. 3.1 Imp. qt.	3.5 lit
	Lubrication system		Forced pressure and dry sump	
	Cylinder head compression pressure		12 kg/cm² (170.7 psi)	
	Intake valve	Open	At 5° (before top dead center)	
		Close	At 30° (after bottom dead center)	
	Exhaust valve	Open	At 35° (before bottom dead center)	
		Close	At 5° (after top dead center)	
	Valve tappet elearance		IN: 0.002, EX: 0.003 in.	IN: 0.05, EX: 0.08 mm
	Idle speed		950 rpm	

	Item	English	Metric
Carburetor	Type	Piston valve	
	Setting mark	7A	
	Main jet	#120 (K3, #105)	
	Slow jet	# 40	
	Air screw opening	1±3/8 turns	
	Float height	0.866 in.	26 mm
Drive train	Clutch	Wet multi plate type	
	Transmission	5-speed constant mesh	
	Primary reduction	1.708	
	Gear ratio I	2.500	
	Gear ratio II	1.708	
	Gear ratio III	1.333	
	Gear ratio VI	1.097	
	Gear ratio V	1.939	
	Final reduction	2.667, drive sprocket 18 T, driven sprocket 48 T	
	Gear shift pattern	Left foot operated return system	
Electrical	Ignition	Battery and ignition coil	
	Starting system	Starting motor or kick starter	
	Alternator	Three phase A.C. generator 12 V/0.21 kW/5,000 rpm	
	Battery capacity	12 V-14 AH	
	Spark plug	NGK D8ES-L, NDX 24ES	
	Headlight	Low/high	12 V-40 W/50 W
	Tail/stoplight	Tail/stop	12 V-3/32 CP (SAE TRADE No. 1157)
	Turn signal-light	Front/rear	12 V-32/32 CP (SAE TRADE No. R1034, L1073)
	Speedometer light	12 V-2 CP (SAE TRADE No. 57)	
	Techometer 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)	
	Position Light	12 V-4 CP (SAE TRADE No. —)	

c. Driving Performance Curve (One Rider)



Driving Performance Curve (Two Rider)

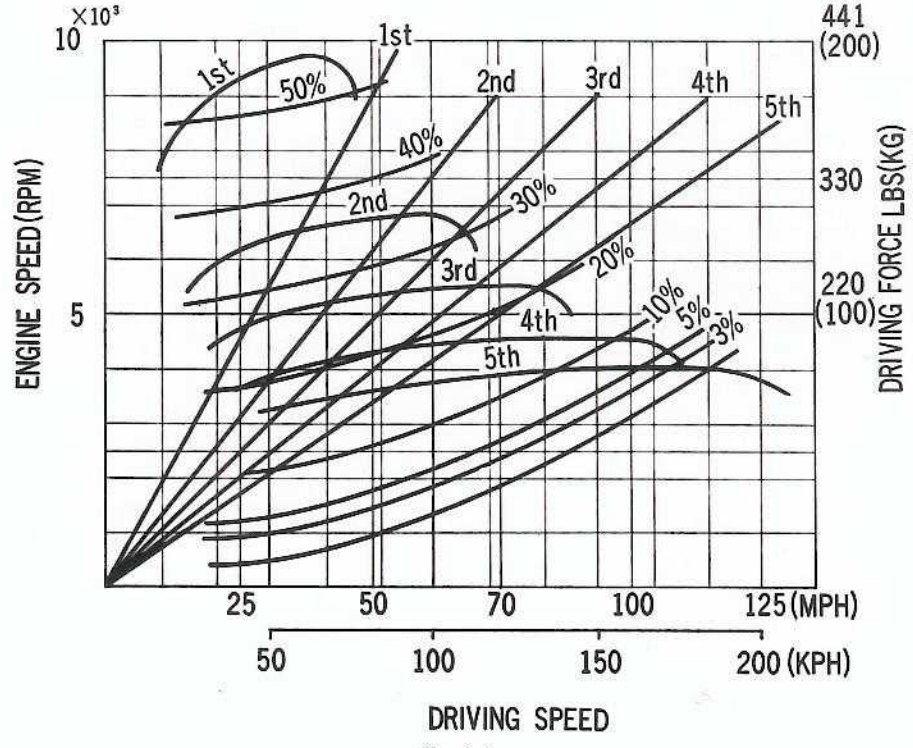


Fig. 1-6

1-4 THREAD SIZE

All threaded parts used on the HONDA CB 750 conform to ISO Standard (International Standardization Organization).

The differences between the dimensions of the JIS (Japan Industrial Standard) bolts, which were previously used, and the ISO bolts are in the thread pitch, width across flat and the thickness of the head. Do not use any JIS thread to fit ISO thread, otherwise the thread will be damaged. The width across flat is also different from JIS standard except 6 mm bolt or nut, thus the wrenches are not common to the ones based on JIS standard except 10 mm. The table below lists these dimensions for the ISO standard bolts.

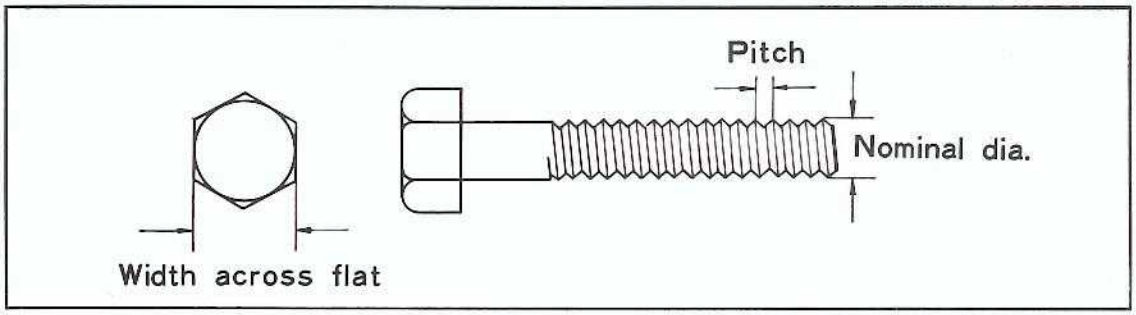


Fig. 1-7

Unit : mm

Nominal dia	Width across flat		Pitch	
	ISO	JIS	ISO	JIS
3	5.5	6	0.5	0.6
4	7	8	0.7	0.75
5	8	9	0.8	0.9
6	10 (Same as JIS std.)	10	1.0 (Same as JIS std.)	1.0
8	12	14	1.25 (Same as JIS std.)	1.25
10	14	17	1.25 (Same as JIS std.)	1.25
12	17	19	1.25	1.5
14	19	21	1.5 (Same as JIS std.)	1.5
16	22	23	1.5 (Same as JIS std.)	1.5
18	24	26	1.5 (Same as JIS std.)	1.5
20	27	29	1.5 (Same as JIS std.)	1.5

To make it possible to identify the ISO threads, they are marked as shown below.

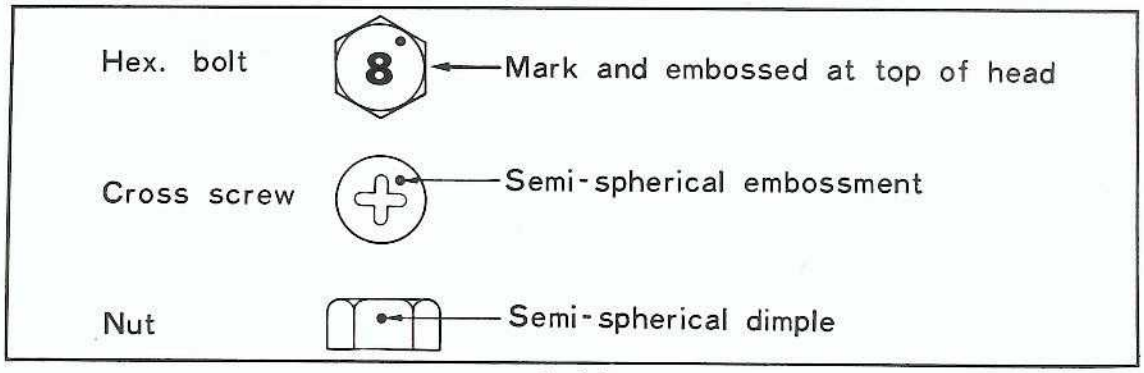
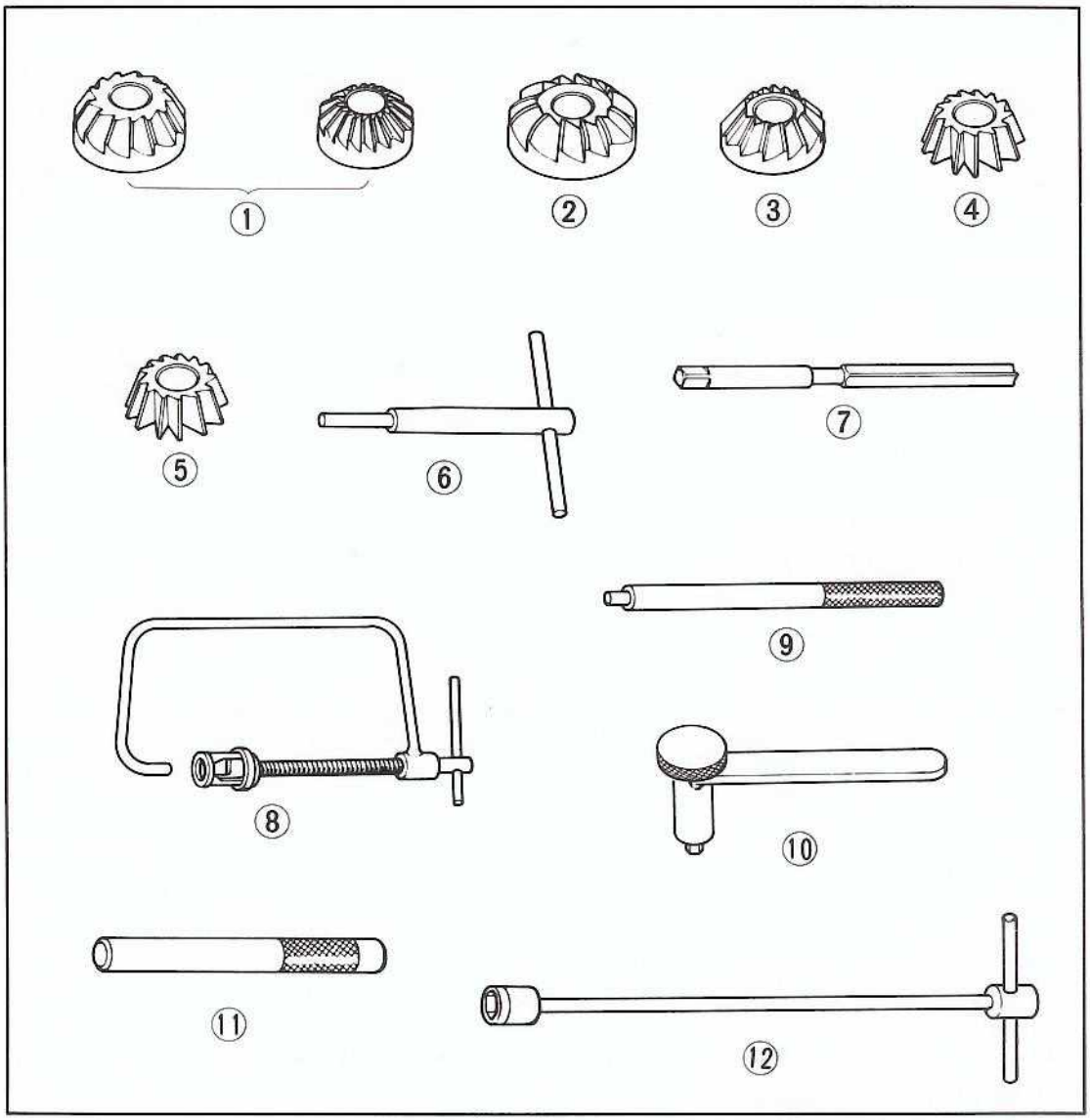
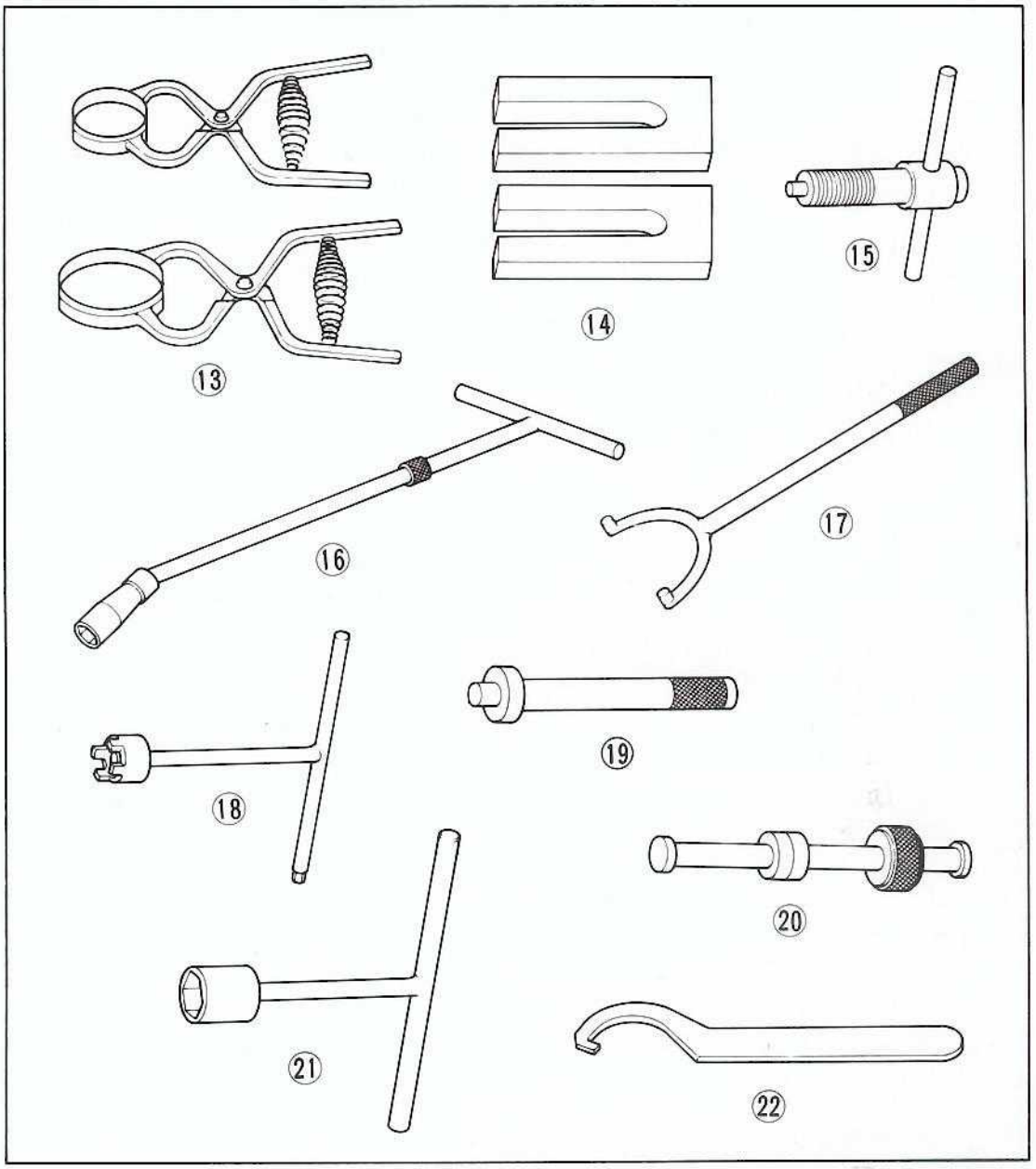


Fig. 1-8

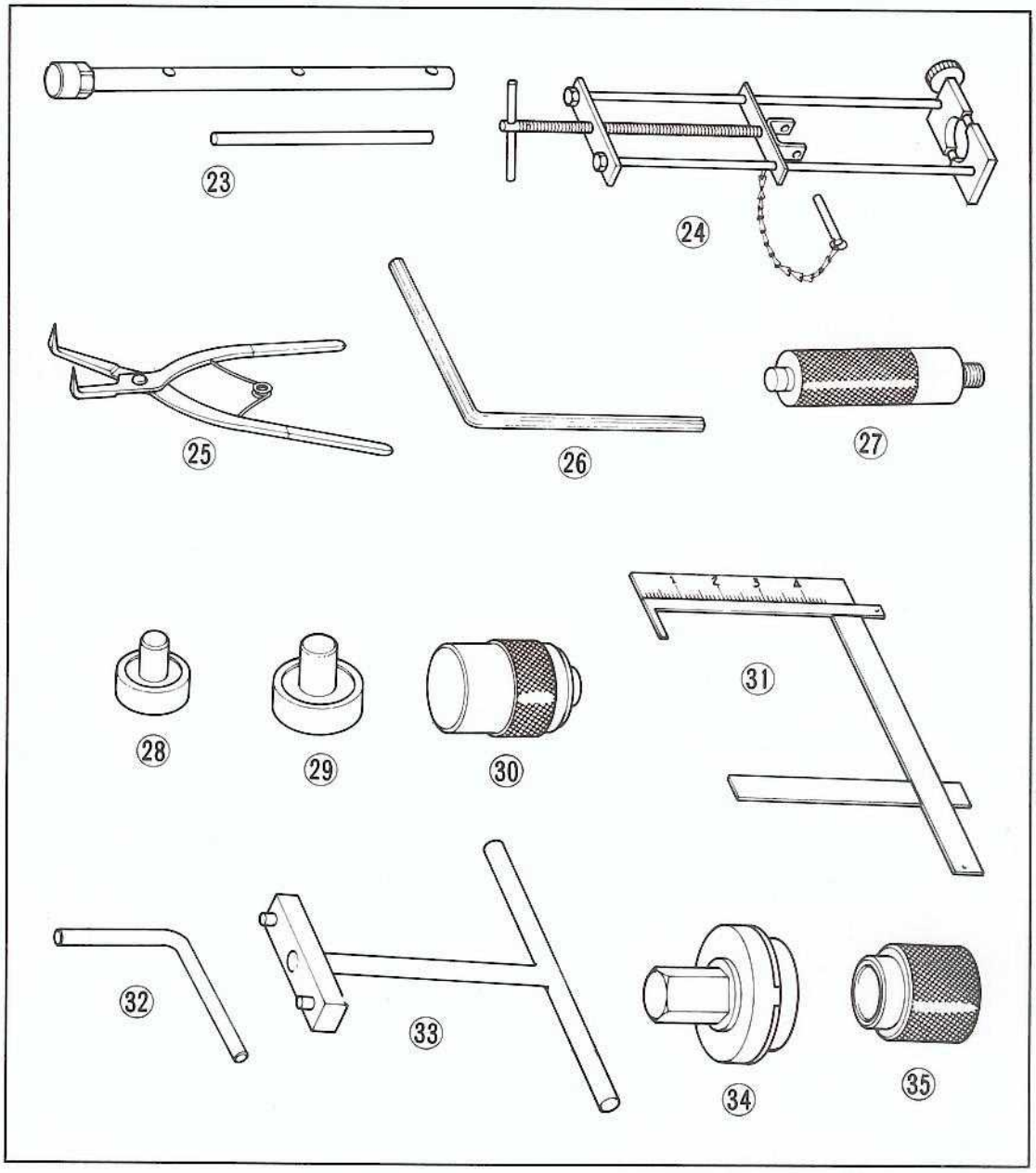
1-5 SERVICE TOOLS



Ref. No.	TOOL No.	DESCRIPTION
	07900-3000000	Special Tool Set for CB750
①	07980-3000100	Inlet/Exhaust valve seat cutter 90°
②	07980-5680400	Inlet valve seat top cutter
③	07980-5510400	Exhaust valve seat top cutter
④	07980-5510500	Inlet valve seat interior cutter
⑤	07980-5510500	Exhaust valve seat interior cutter
⑥	07981-5510000	Valve seat cutter holder
⑦	07984-6110000	Valve guide reamer
⑧	07957-3290000	Valve spring compressor
⑨	07942-3000000	Valve guide driving & removing tool
⑩	07908-3230000	Valve tappet lock nut wrench
⑪	07942-3000200	Valve guide driver
⑫	07906-3230000	Heat bolt 12 mm wrench

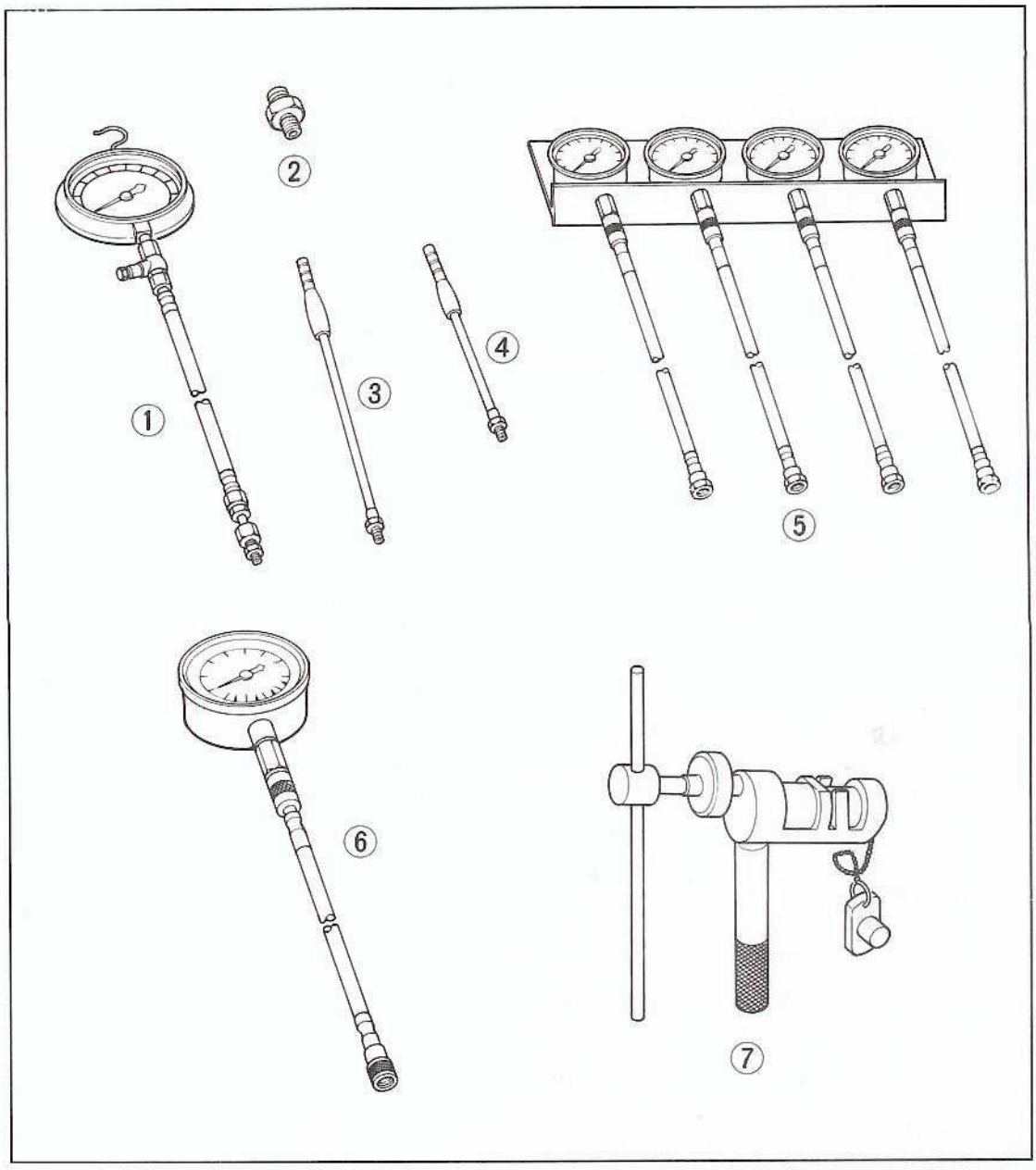


Ref. No.	TOOL No.	DESCRIPTION
⑬	07954-3000000	Piston ring compressor (2 pcs)
⑭	07958-3000000	Piston base (2 pcs)
⑮	07933-3000000	AC generator rotor puller
⑯	07909-3000000	Spark plug wrench
⑰	07922-3000000	Drive sprocket holder
⑱	07916-2830000	Clutch lock nut wrench
⑲	07945-3000400	Counter shaft bearing removing tool
⑳	07945-3000500	Counter shaft bearing removing tool
㉑	07915-2160000	Stem nut box wrench
㉒	07902-2000000	Steering stem top thread wrench



Ref. No.	TOOL No.	DESCRIPTION
㉓	07967-3000000	Front fork assembling bar
㉔	07959-3290000	Rear cushion disassembling & assembling tool
㉕	07914-3230000	Master cylinder circlip pliers
㉖	07917-3000000	Hollow set wrench
㉗	07949-3000000	Bearing driver handle
㉘	07946-3000100	Front wheel bearing driver
㉙	07946-3000200	Pear wheel bearing driver
㉚	07945-3000000	Final drive shaft bearing driver
㉛	07401-0010000	Carburetor float level gauge
㉜	07999-3000000	Crankshaft turning handle
㉝	07910-3230101	Retainer wrench
㉞	07910-2830000	Retainer wrench
㉟	07947-3290000	Oil seal guide

GAUGES AND ATTACHMENT



Ref. No.	TOOL No.	DESCRIPTION
①	07506-3000000	Oil pressure gauge (10 kg)
②	07510-3000000	Oil pressure gauge adaptor
③	07510-3000100	Vacuum gauge attachment (A) (2 pcs)
④	07510-3000200	Vacuum gauge attachment (B) (2 pcs)
⑤	07504-3000100	Vacuum gauge set (4 pcs)
⑥	07504-3000200	Vacuum gauge (1pcs)
⑦	07975-3000001	Joint tool set

ENGINE REMOVAL AND INSTALLATION

GROUP 2

CONTENTS

2-1 DESCRIPTION

The engine is made as single-unit including clutch and transmission and mounted to the frame with four mounting bolts.

The single-unit engine may be dismounted by disconnecting wiring system, fuel system, exhaust system, air intake system and final drive system, and removing engine mounting bolts. However, the following parts can be disassembled from the engine without dismounting the engine from the frame.

Clutch assembly, a. c. generator, cam chain tensioner, gear shift arm, gear shift drum stopper, gear shift positive stopper, contact breaker assembly and carburetor.

2-2 ENGINE REMOVAL

1. Shut off the fuel tank valve and disconnect the fuel tubes from the fuel tank valve. Raise the seat and remove the fuel tank. (refer to page 82).
2. Remove the oil filter and drain the engine oil by removing both the oil tank drain plug (refer to **Fig.** 15-7 on page 154) and the engine oil drain plug. **(Fig. 2-1)**
3. Remove the exhaust mufflers.
4. Disconnect the tachometer cable at the cylinder head cover and remove the high tension cord caps from the spark plugs. **(Fig. 2-2)**
5. After removing the throttle valves from the respective carburetor, detach the carburetors from the inlet pipes.
6. Remove the air cleaner case.
7. Remove the kick starter pedal and the clutch cover.

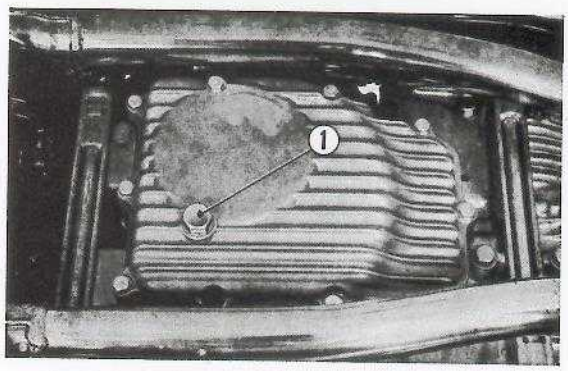


Fig. 2-1 ① Engine oil drain plug

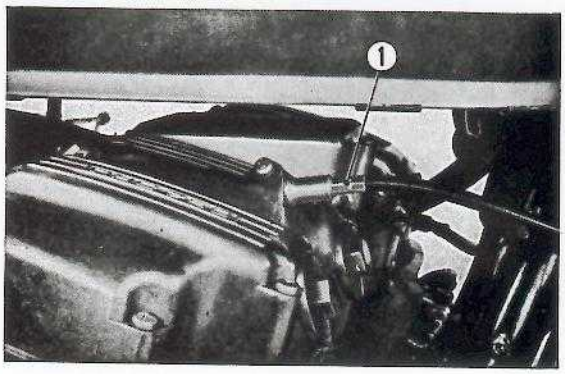


Fig. 2-2 ① Tachometer cable

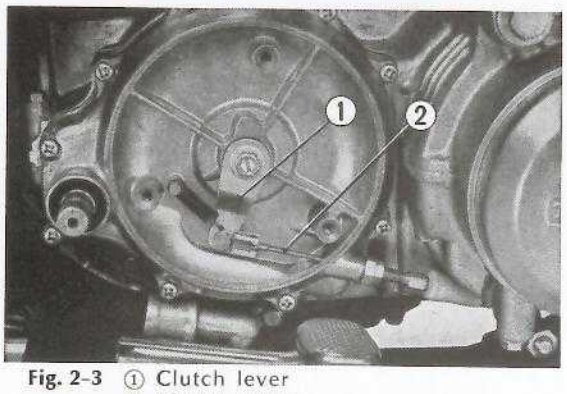


Fig. 2-3 ① Clutch lever
② Clutch cable

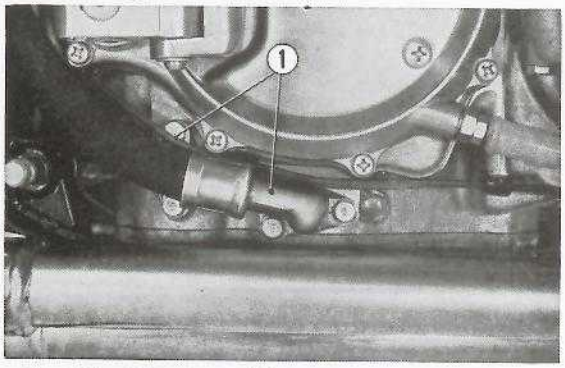


Fig. 2-4 ① Engine oil hoses

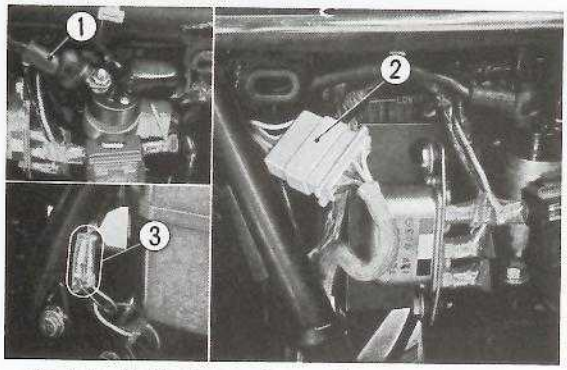


Fig. 2-5 ① Starter motor cable
② Dynamo leads connector
③ Stop switch lead

8. Disconnect the clutch cable from the clutch lever. **(Fig. 2-3)**

9. Disconnect the stop switch spring and remove the brake pedal and the step bar.

10. Disconnect the two engine oil hoses at the engine and remove the oil tank. Disconnect the oil tank breather pipe from the upper crankcase. **(Fig. 2-4)**

11. Remove the gear change pedal and the drive chain cover and disconnect the drive chain. After disconnecting the chain, the both ends together with a piece of wire to prevent chain from coiling.

12. Disconnect the starter motor cable, dynamo lead connector and the stop switch lead wire. **(Fig. 2-5)**

Note : Disconnect the starter motor cable at the magnetic switch and disconnect the negative terminal of the battery to prevent accidental shorting.

13. Unscrew the engine hanger bolts and nuts. **(Fig. 2-6)**

14. Raise the rear of the engine and remove it from the right side.

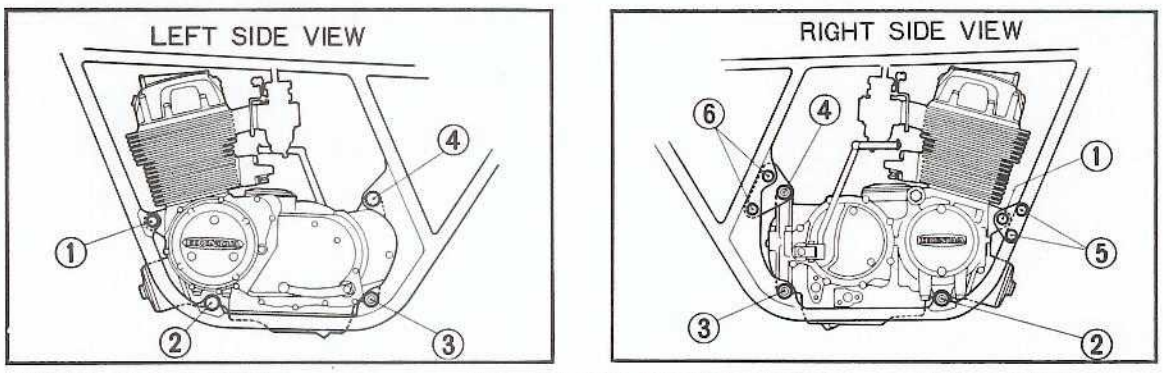


Fig. 2-6 ① 10 mm bolt
② Engine hanger bolt A
③ Rear engine hanger lower bolt
④ Engine hanger bolt C
⑤ 8 mm×56 bolt
⑥ 8 mm×45 bolt

2-3 ENGINE INSTALLATION

1. Mount the engine from the right side and position it in the proper location.
2. Install the hanger bolts and nuts and exercise care that the ground cable terminal is installed together with the engine rear upper bolt **(Fig. 2-7)**. The hanger plate and the stop switch stay are also mounted with the hanger bolts.
3. Connect all the wirings and cables.
4. Connect the drive chain, install the drive chain cover and the gear change pedal.
5. Mount the oil tank, install the oil hoses and connect the oil hoses to the engine.
   Note : When connecting the oil hoses, make sure that the oil deliverly hose and the scavenge hoses are not any crossed.
6. Install the rear brake pedal and connect the stop switch spring **(Fig. 2-8)**
7. Connect the clutch cable to the clutch lever.
8. Install the clutch pedal and the clutch cover.
9. Mount the carburetors and install the air cleaner case.
10. Connect the throttle valves, the high tension cord caps and the tachometer cable.
11. Observe the installation of the Nos. 1 and 2, and Nos. 3 and 4 muffler bands. Install the exhaust mufflers. **(Fig. 2-9)**
12. Mount the fuel tank and connect the fuel tubes.
13. Add engine oil into the oil tank. (refer to page 178)

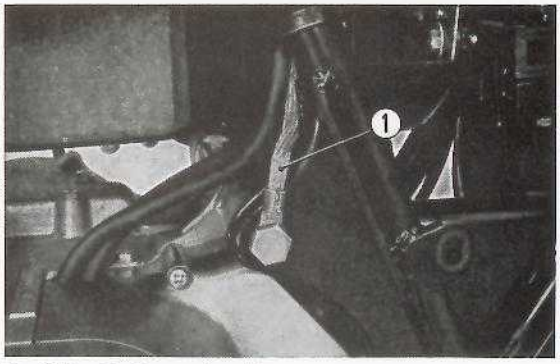


Fig. 2-7 ① Ground cable

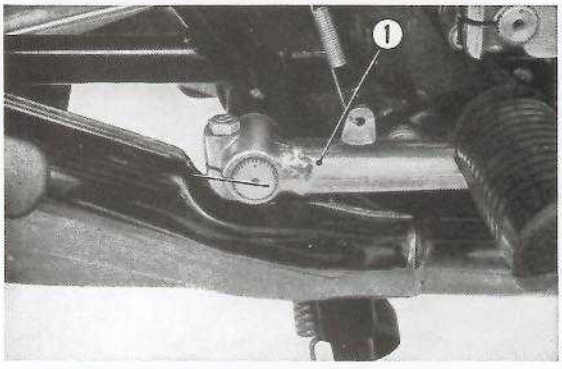


Fig. 2-8 ① Rear brake pedal

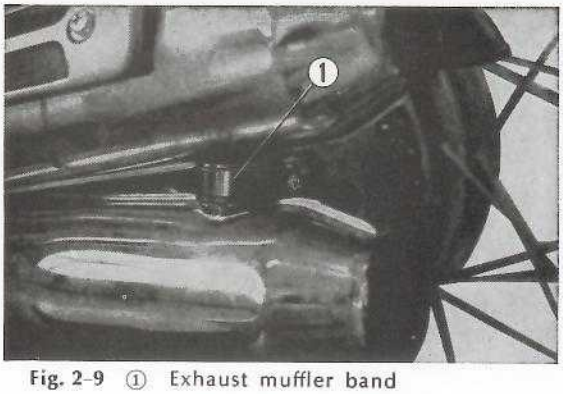


Fig. 2-9 ① Exhaust muffler band

ENGINE MECHANICAL

GROUP 3

CONTENTS

3-1 GENERAL DESCRIPTION

DESCRIPTION

HONDA CB 750 is a 736 cc, 4-cycle, inline engine incorporating an overhead cam, and mounting 4 carburetors.

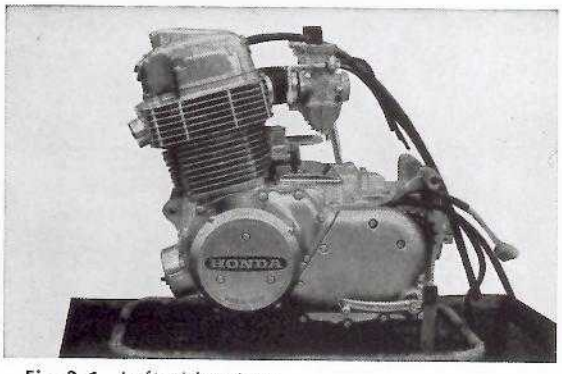


Fig. 3-1 Left side view

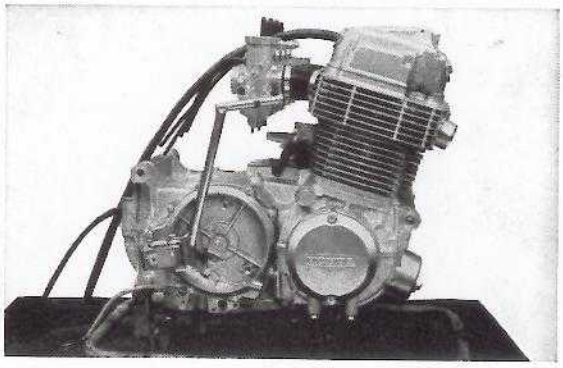


Fig. 3-2 Right side view

SPECIFICATIONS

Type	O.H.C. air-cooled, 4-cycle
Cylinder arrangement	4 cylinders in line
Bore and stroke	2.401×2.480 in. (61×63 mm)
Displacement	44.93 cu-in. (736 cc)
Compression ratio	9.0 : 1
Compression pressure	170 lbs/in² (12 kg/cm²)
Valve timing Inlet valve: open	B.T.D.C. 5°
Inlet valve: close	A.B.D.C. 30°
Exhaust valve: open	B.B.D.C. 35°
Exhaust valve: close	A.T.D.C. 5°
Ignition timing B.T.D.C.	6° at 1,000 rpm, 40° at 2,500 rpm

Item	Standard value	Serviceable limit
Oil pump		
Body inside diameter	1.600~1.602 in. 40.65~40.68 mm	1.6083 in. 40.85 mm
Rotor diameter	1.589~1.600 in. 40.53~40.56 mm	1.5945 in. 40.50 mm
Rotor thickness (delivery side)	0.7079~0.7087 in. 17.98~18.00 mm	0.7067 in. 17.95 mm
Rotor thickness (scavenge side)	0.4717~0.4724 in. 11.98~12.00 mm	0.4705 in. 11.95 mm
Body depth (delivery side)	0.7095~0.7102 in. 18.02~12.04 mm	0.7114 in. 18.07 mm
Body depth (scavenge side)	0.4732~0.4740 in. 12.02~12.04 mm	0.4744 in. 12.07 mm
Leak stopper valve diameter	0.7059~0.7067 in. 17.93~17.95 mm	0.7051 in. 17.91 mm
Leak stopper body inner diameter	0.7087~0.7097 in. 18.00~18.027 mm	0.7117 in. 18.077 mm
Relief valve diameter	0.4707~0.4718 in. 11.957~11.984 mm	0.4697 in. 11.93 mm
Relief valve body inner diameter	0.4714~0.4724 in. 11.973~12.00 mm	0.4736 in. 12.03 mm
Camshaft		
Shaft center diameter	0.8578~0.8587 in. 21.789~21.810 mm	0.8559 in. 21.74 mm
Shaft end diameter	0.8637~0.8646 in. 21.939~21.960 mm	0.8628 in. 21.89 mm
Base circle	1.1016~1.103 in. 27.98~28.02 mm	1.0996 in. 27.93 mm
Cam lift (inlet)	0.3142~0.3158 in. 7.98~8.02 mm	0.3122 in. 7.93 mm
Cam lift (exhaust)	0.2945~0.2961 in. 7.48~7.52 mm	0.2925 in. 7.43 mm
Camshaft holder		
Camshaft bearing diameter	0.8669~0.8678 in. 22.02~22.041 mm	0.8701 in. 22.00 mm
Rocker arm bearing diameter	0.4724~0.4731 in. 12.00~12.018 mm	0.4744 in. 12.05 mm
Rocker arm shaft diameter	0.4711~0.4718 in. 11.966~11.984 mm	0.4701 in. 11.94 mm
Cylinder head		
Valve guide inner diameter	0.2598~0.2602 in. 6.60~6.61 mm	0.2614 in. 6.64 mm
Clearance between valve guide and valve stem (IN)	0.0004~0.0012 in. 0.01~0.03 mm	0.0032 in. 0.08 mm
Clearance between valve guide and valve stem (EX)	0.0016~0.0024 in. 0.04~0.06 mm	0.0039 in. 0.1 mm
Valve spring		
Free length (outer)	1.622 in. 41.2 mm	1.5748 in. 40.0 mm
Free length (inner)	1.500 in. 38.1 mm	1.4567 in. 37.0 mm
Cylinder bore	2.402~2.4024 in. 61.01~61.02 mm	2.4055 in. 61.1 mm
Piston diameter	2.4002~2.4009 in. 60.965~60.985 mm	2.3957 in. 60.85 mm
Piston pin bore diameter	0.5906~0.5909 in. 15.002~15.008 mm	0.5937 in. 15.08 mm
Piston pin diameter	0.5903~0.5906 in. 14.994~15.00 mm	0.589 in. 14.96 mm

Item	Standard value	Serviceable limit
Piston ring		
Ring side clearance (top)	0.0016~0.0028 in. 0.04~0.07 mm	0.0071 in. 0.18 mm
Ring side clearance (second)	0.001~0.0022 in. 0.025~0.055 mm	0.0065 in. 0.165 mm
Ring side clearance (oil)	0.0004~0.0016 in. 0.010~0.04 mm	0.0055 in. 0.14 mm
End gap (top and second)	0.0079~0.016 in. 0.2~0.4 mm	0.0028 in. 0.7 mm
End gap (oil)	0.0004~0.0012 in. 0.1~0.3 mm	0.0028 in. 0.7 mm
Crankshaft		
Journal diameter	1.4169~1.4173 in. 35.99~36.00 mm	1.415 in. 35.94 mm
Crank pin diameter	1.4169~1.4173 in. 35.99~36.00 mm	1.415 in. 35.94 mm
Shaft to bearing clearance	0.0008~0.0018 in. 0.02~0.046 mm	0.0032 in. 0.08 mm
Connecting rod		
Small end diameter	0.5912~0.5919 in. 15.016~15.034 mm	0.5933 in. 15.07 mm
Bearing oil clearance	0.0008~0.0018 in. 0.02~0.046 mm	0.0032 in. 0.08 mm
Large end diameter	Select fit, refer to page 43~44.	Select fit, refer to page 43~44.
Number of teeth of kick starter gear	63 teeth	—
Kick starter gear		
Inner diameter	0.7866~0.789 in. 19.98~20.041 mm	0.790 in. 20.075 mm
Shaft outer diameter	0.7858~0.7866 in. 19.959~19.98 mm	0.7847 in. 19.93 mm

DIAGNOSIS

Trouble	Probable Causes	Remedy
Engine does not start	**Valve Mechanism**	
	1. Excessive by worn piston ring and cylinder	Replace.
	2. Seized valve	Replace.
	3. Seized piston	Replace.
	4. Valve timing out of adjustment	Adjust, (Refer to page 31~32).
	5. Low or lack of compression pressure	
	• Pressure leak	Grind the valve to obtain good valve seating or replace.
	5. Defective cylinder head gasket	Replace.
	6. Warped gasketting surface of the cylinder and cylinder head	Repair or replace.

3-2 LUBRICATION SYSTEM

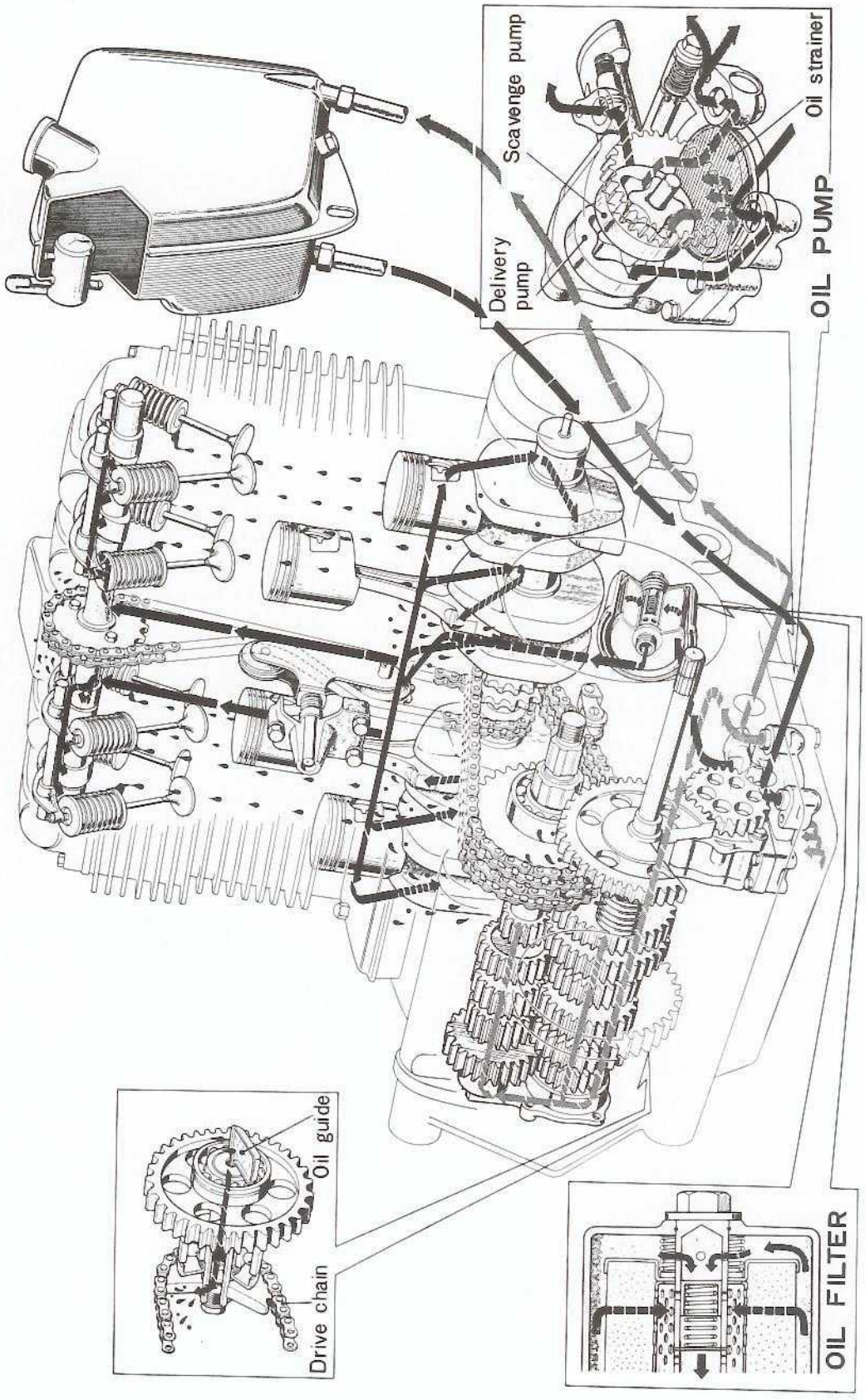


Fig. 3-3

a. Description

The engine is a dry sump type incorporating a separate oil tank which is mounted on the right side of the frame. The oil in the tank is delivered under pressure by the oil pump to lubricate the engine components. The oil accumulated in the crankcase sump is returned to the oil tank by the scavenge pump, however, part of the oil is deverted to lubricate transmission components.

1. Oil pump

The oil pump is a rotor type trochoid pump mounted on the bottom of the crankcase and driven from the primary shaft through the kick gear. It consists of both the delivery and scavenge pumps, a leak stopper valve and a relief valve. **(Fig. 3-4)**

(Oil leak stopper valve)

During engine operation, the oil pressure opens the oil leak stopper valve to maintain oil flow, and when the engine stops, the valve closes to prevent flow from the oil tank. **(Fig. 3-5)**

(Relief valve)

Relief valve is set at a specified pressure so that whenever the oil pressure exceeds this pressure, the valve opens and bypasses the oil to crankcase sump. In this way, the constant oil pressure is maintained.

This valve is incorporated in the delivery side of the oil pump. **(Fig. 3-6)**

Standard valve setting is 56.9lbs/in.^{2} (4.0$\pm$ 0.2 kg/cm^2) at 4,000 rpm engine speed at oil temperature of 176°F (80°C).

2. Oil filter

Oil filter is a full flow type using a replaceable element filter.

All the oil from the oil pump passes

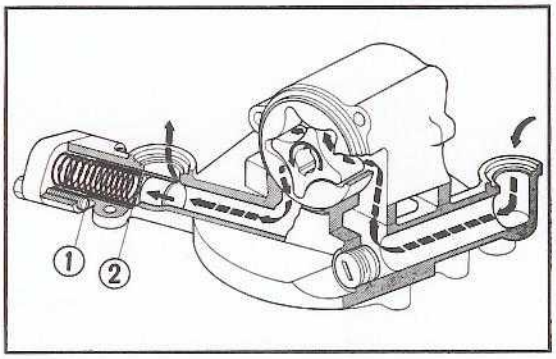


Fig. 3-5 ① Oil leak stopper spring
② Oil leak stopper valve

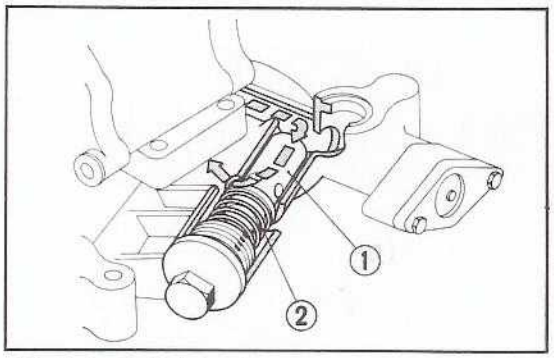


Fig. 3-6 ① Relief valve
② Relief valve spring

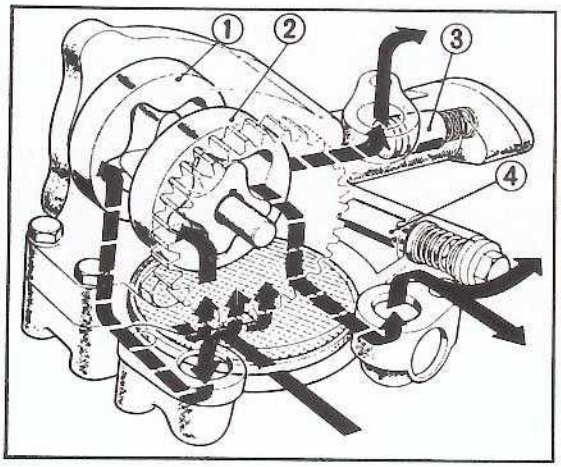


Fig. 3-4 ① Delivery pump
② Scavenge pump
③ Leak stopper valve
④ Relief valve

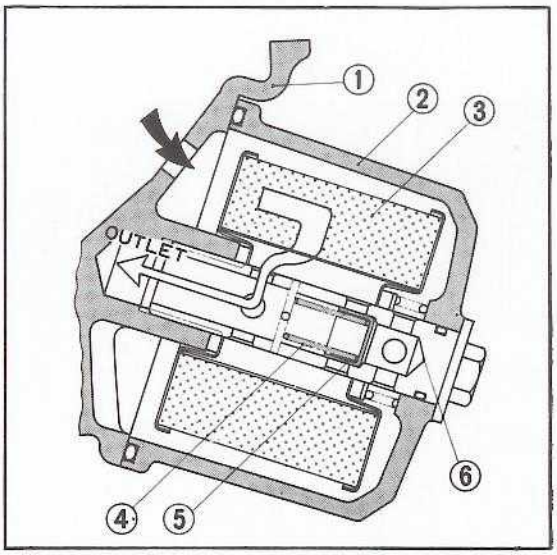


Fig. 3-7 ① Crankcase
② Oil filter case
③ Oil filter element
④ By-pass valve spring
⑤ By-pass valve
⑥ Center bolt

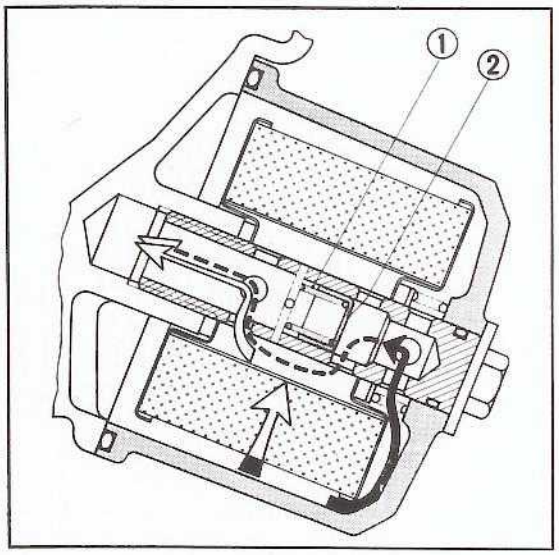


Fig. 3-8 ① By-pass valve spring
② By-pass valve

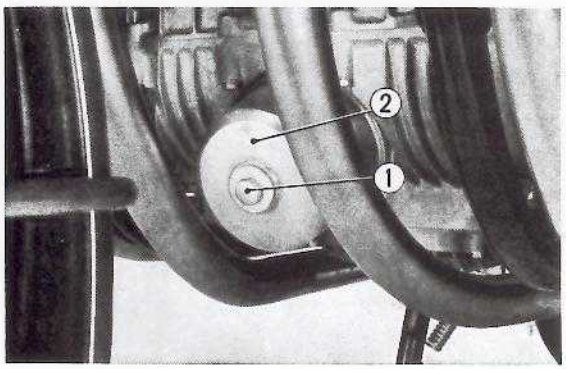


Fig. 3-9 ① Oil filter center bolt
② Oil filter case

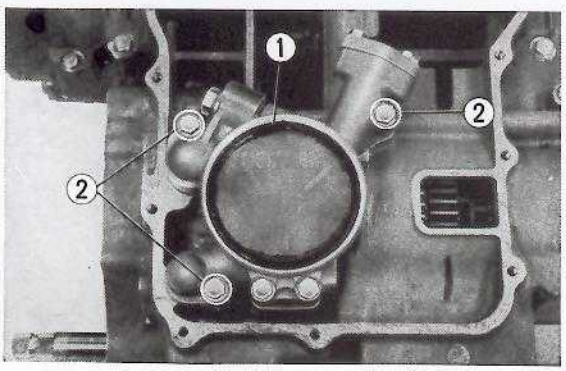


Fig. 3-10 ① Oil pump
② Oil pump mounting bolts

through the filter to be purified before being sent to the crankshaft. Filter assembly is mounted at the front of the engine with a bolt. Further, a by-pass valve is incorporated in the bolt to prevent oil stoppage when the element becomes clogged. **(Fig. 3-7)**

(By-pass valve)

When the element becomes clogged and the oil pump discharge pressure rises excessively, the by-pass valve open and the oil will by-pass the filter element and flow directly into the main gallery. At **21.3±2.8 lbs/in.²** **(1.5±0.2 kg/cm²)** pressure difference, the valve is functioned. **(Fig. 3-8)**

3. Oil pressure warning lamp

The red oil pressure warning lamp is located to the left side of the tachometer on the gauge. Normally the light will be on when the engine is stopped and the main key switch is turned on. However, it will go off as soon as the engine is started and oil pressure reaches **7.1 lbs/in²** **(0.5 kg/cm²)**.

If the warning light came on while riding the engine should be stopped and the cause of the problem determined.

When operating the engine under extremely high oil temperature (over 244°F, 100°C), the warning light may intermittently come on at idling speed (800~900 rpm), however, this does not indicate a problem.

4. Drive chain lubrication

The drive chain is automatically lubricated by the chain oiler equipped on the drive shaft.

The oil which is soaked into the felt oil reserve element located at the end of the drilled passage in the final drive shaft leaks out along the face of the drive sprocket by the centrifugal force to lubricate the chain.

b. Disassembly

The oil pump can be removed with the engine mounted on the frame.

1. Unscrew the oil filter center bolt from the front of the engine and take out the oil filter case. **(Fig. 3-9)**
2. Remove the oil pan from the lower crankcase to get access to the oil pump.
3. Unscrew the three oil pump mounting bolts and remove the oil pump. **(Fig. 3-10)**

4. To remove the oil pump rotors, disassemble the side cover and remove the rotor A, (delivery side); next, remove the dowel pin and pull out the shaft from the rotor body. This will permit the rotor B (scavenge side) to be removed. **(Fig. 3-11)**
5. Remove the metal oil screen and unscrew the four bolts at the pump base to remove the oil pump body. **(Fig. 3-12)**
6. For disassembling the oil leak stopper valve, remove the oil leak stopper cap bolts. The oil leak stopper cap, spring and oil leak stopper valve can be removed from the oil pump. **(Fig. 3-13)**
7. For disassembling the relief valve, unscrew the relief spring cap, the relief valve spring and relief valve can be removed. **(Fig. 3-13)**

c. Inspection

1. Check the oil pump side cover for cracks.
2. Outer rotor and body clearance
   Measure the clearance between the outer rotor and the body with a thickness gauge. If the clearance between rotor and body is greater than **0.0138 in. (0.35 mm)**, the rotor or the body should be replaced, depending on which part is worn. **(Fig. 3-14)**
3. Measuring the tip clearance
   Measure the clearance between the outer rotor and the inner rotor with a thickness gauge and if it is greater than **0.0138 in. (0.35 mm)**, the rotors should be replaced in set. **(Fig. 3-15)**

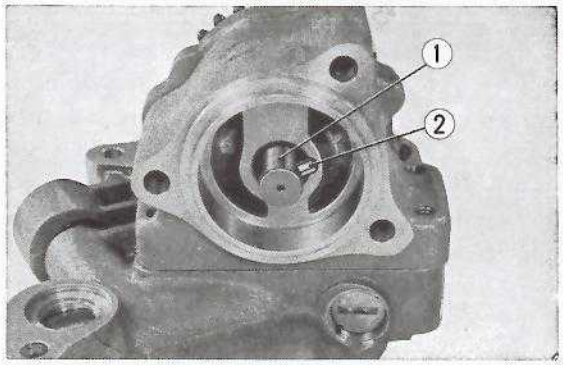


Fig. 3-11 ① Oil pump rotor shaft ② Dowel pin

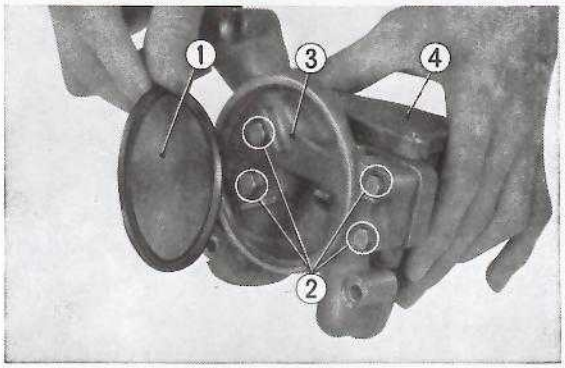


Fig. 3-12 ① Metal oil screen ② 6 mm hex bolts ③ Oil pump base ④ Oil pump body

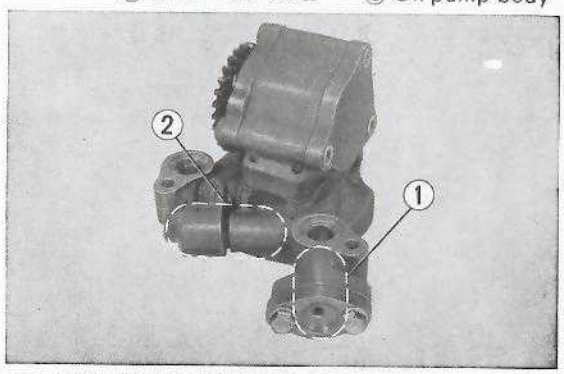


Fig. 3-13 ① Leak stopper valve ② Relief valve

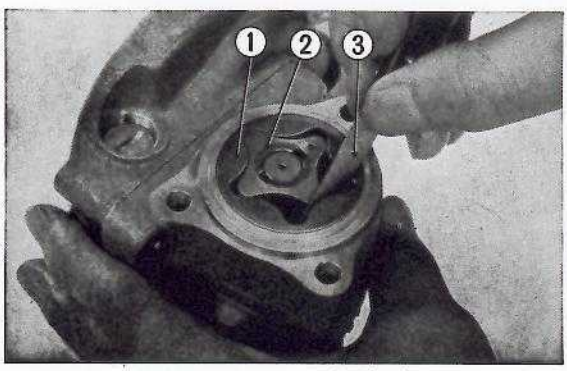


Fig. 3-15 ① Outer rotor ② Inner rotor ③ Thickness gauge

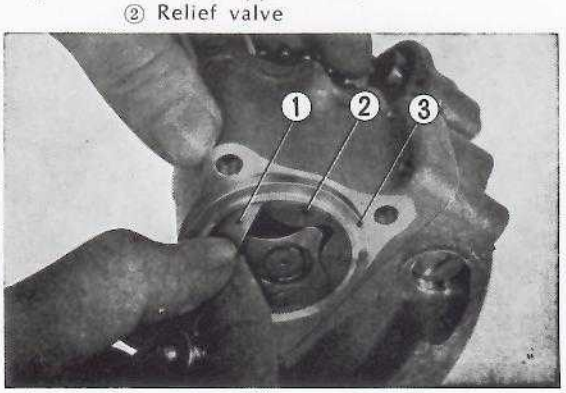


Fig. 3-14 ① Thickness gauge ② Outer rotor ③ Pump body

4. Measuring the leak stopper valve clearance
   Measure the body inside diameter and the leak stopper valve outside diameter using a dial gauge or a micrometer and if the clearance is calculated to be greater than **0.0067 in. (0.17 mm)**, the leak stopper valve or body whichever is worn beyond serviceable limit should be replaced.
5. Measuring the relief valve clearance
   Measure the body inside diameter and the relief valve diameter using a dial gauge or a micrometer and if the clearance is greater than **0.0039 in. (0.1 mm)**, the body or the valve whichever is beyond serviceable limit should be replaced.

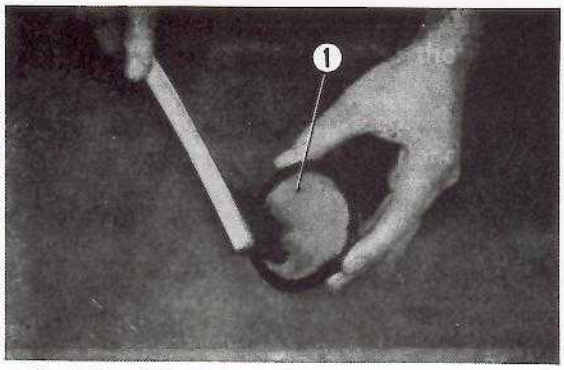
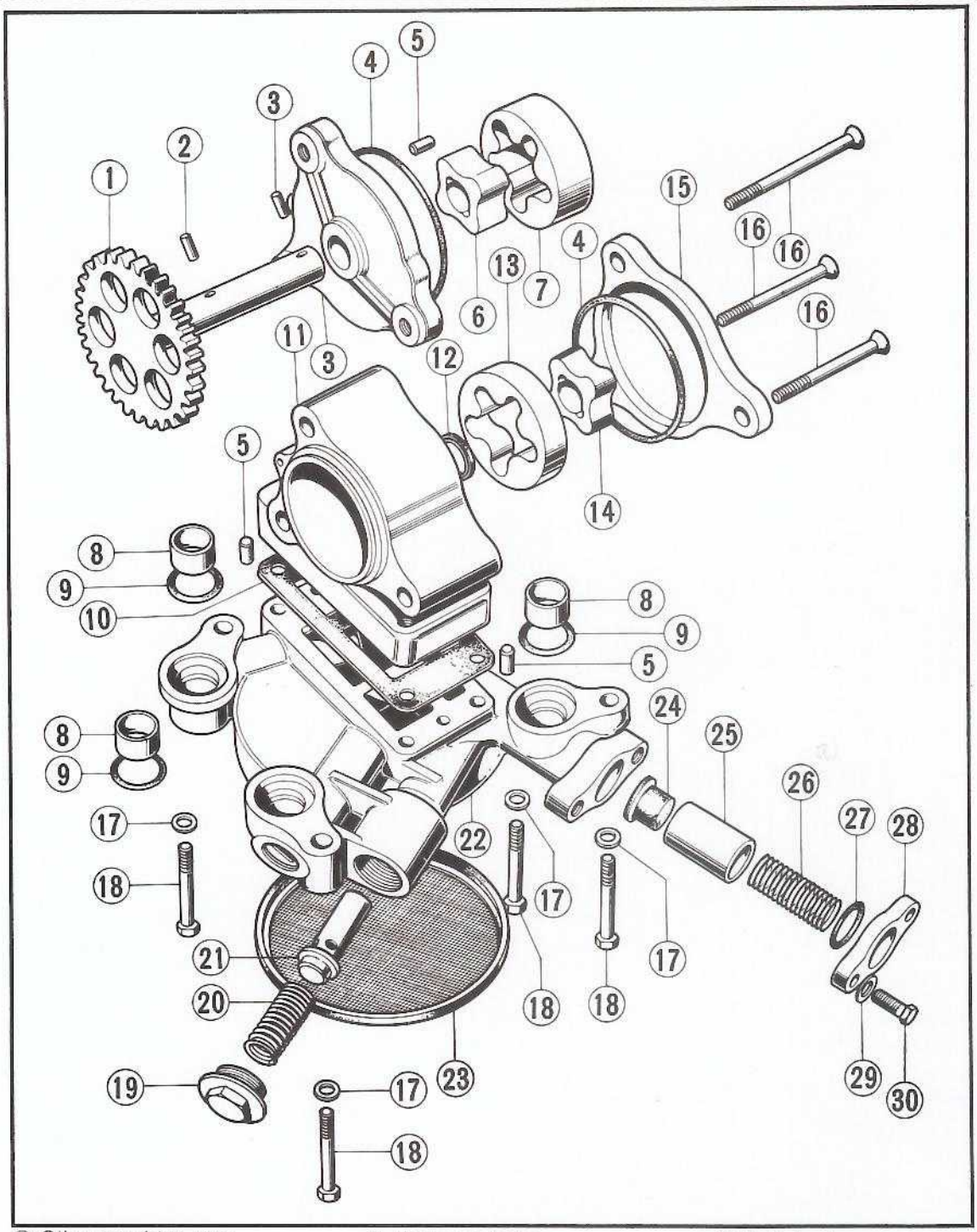


Fig. 3-16 Oil strainer

6. Measuring the rotor thickness and the body clearance
   Measure the rotor thickness with a micrometer and the depth using the depth micrometer and if the clearance is greater than **0.0047 in. (0.12 mm)**, the parts should be repaired or replaced.
7. Cleaning oil strainer
   Wash the oil strainer in clean solvent. Be sure to replace the oil strainer with a new one if damaged. **(Fig. 3-16)**

d. Reassembly

1. Assemble the oil pump component parts in accordance with **Fig. 3-17.** Assemble the relief valve, relief valve spring and screw the relief spring cap securely.
2. Assemble the oil leak stopper valve, spring, O ring and oil leak stopper cap, and then tighten the two bolts.
3. Mount the inner and outer rotors B into the oil pump body, and insert the oil pump drive gear. Do not forget to install the rotor dowel pin.
4. Mount the inner and outer rotors A into the pump body.



① Oil pump drive gear
② 4×14.8 mm pin
③ Oil pump right cover
④ 46×2 "O" ring
⑤ 4×8 dowel pin
⑥ Inner rotor B
⑦ Outer rotor B
⑧ "O" ring collar
⑨ 15×2.5 "O" ring
⑩ Oil pump gasket
⑪ Oil pump body
⑫ 11×15×3 Oil seal
⑬ Outer rotor A
⑭ Inner rotor A
⑮ Oil pump left cover
⑯ 6×59 flat screw
⑰ 6 mm flat washer
⑱ 6×32 hex bolt
⑲ Relief spring cap
⑳ Relief valve spring
㉑ Relief valve
㉒ Oil pump base
㉓ Oil strainer screen
㉔ Oil leak stopper seal
㉕ Oil leak stopper valve
㉖ Oil leak stopper spring
㉗ 15×2.5 "O" ring
㉘ Oil leak stopper cap
㉙ 6 mm flat washer
㉚ 6 mm hex bolt

Fig. 3-17

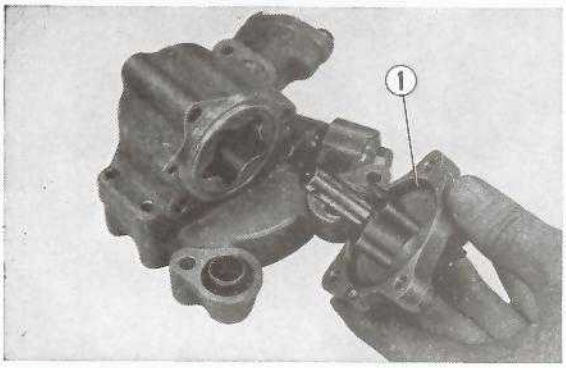


Fig. 3-18 ① "O" ring

Note : Do not forget to install the O-ring on the side cover. (Fig. 3-18)

5. After completing the assembly of the rotor, turn the shaft by hand to assure that it is turning smoothly.

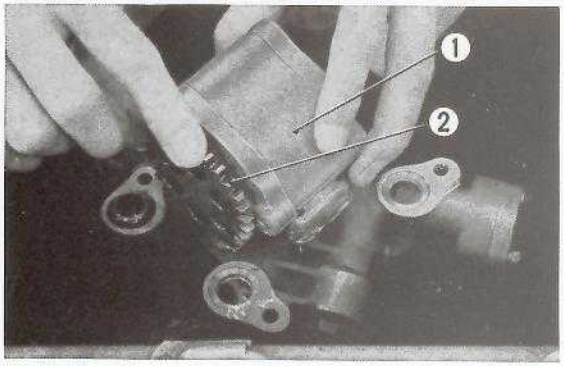


Fig. 3-19 ① Oil pump assembly
② Oil pump drive gear

6. Immerse the pump in oil and turn the pump until filled with oil before reinstalling the pump on the crankcase. **(Fig. 3-19)**
7. When reinstalling the oil pump on the crankcase, do not forget to install the oil guide pins (3 each) and the O-ring (3 each).
8. Changing oil and filter element procedures should be referred to group 19 on page 178.

3-3 CAMSHAFT DRIVE

a. Description

The camshaft is supported at the four points by two aluminum alloy camshaft holders and driven by an endless chain off the timing sprocket located at the center of the crankshaft.

The cam chain is guided by an adjustable cam chain tensioner, a guide roller and a cam chain guide. **(Fig. 3-20)**

b. Disassembly

1. Unscrew the three 6 mm cross screws and remove the breather cover. **(Fig. 3-21)**
2. Loosen the 6 mm cross screws and remove the cylinder head cover. **(Fig. 3-22)**

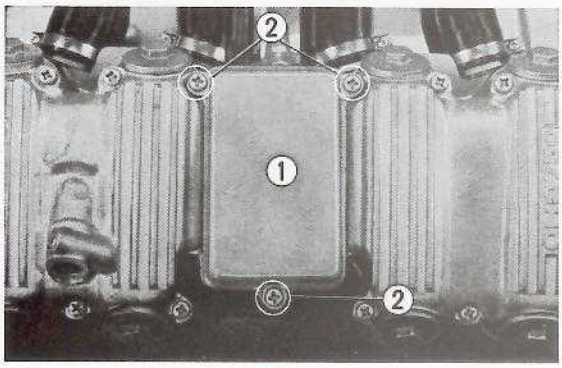


Fig. 3-21 ① Breather cover
② Cross screws

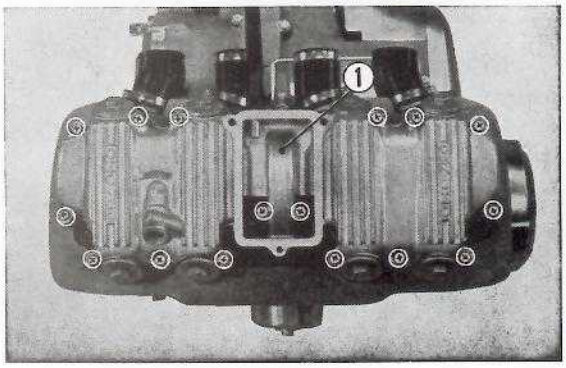
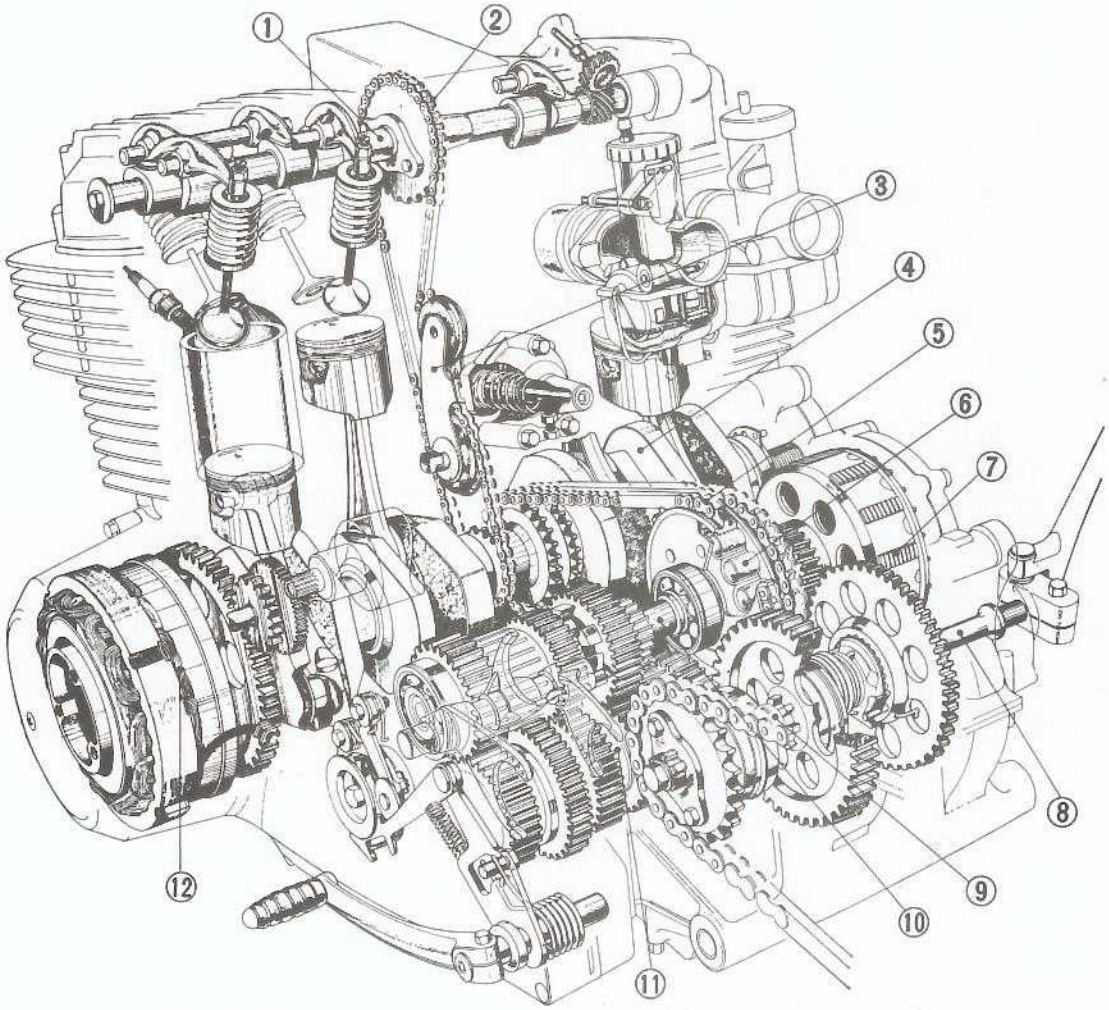


Fig. 3-22 ① Cylinder head cover



① Camshaft
② Camchain
③ Camchain tensioner
④ Crankshaft
⑤ Primary chain
⑥ Primary driven sprocket
⑦ Clutch
⑧ Kick starter spindle
⑨ Final driven shaft
⑩ Mainshaft
⑪ Countershaft
⑫ A.C. generator

Fig. 3-20

3. Turn the crankshaft to align the timing index line (on the tachometer gear end) so that it is parallel with the cylinder head mating surface (with the key groove toward the top) and then remove the camshaft holder cap. **(Fig. 3-23)**

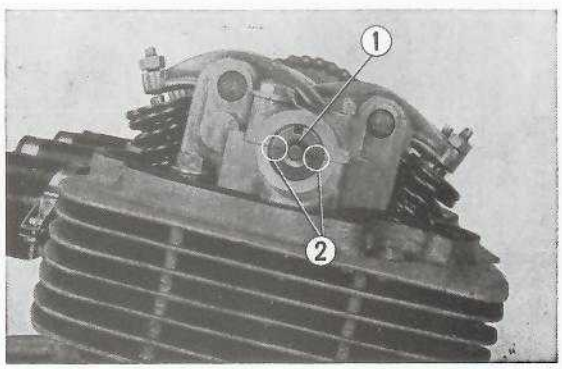


Fig. 3-23 ① Camshaft
② Timing index marked lines

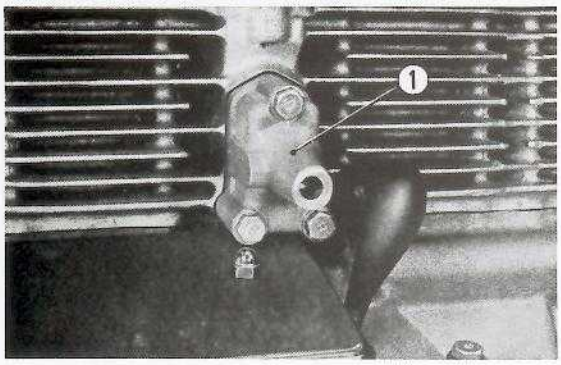


Fig. 3-24 ① Cam chain tensioner holder

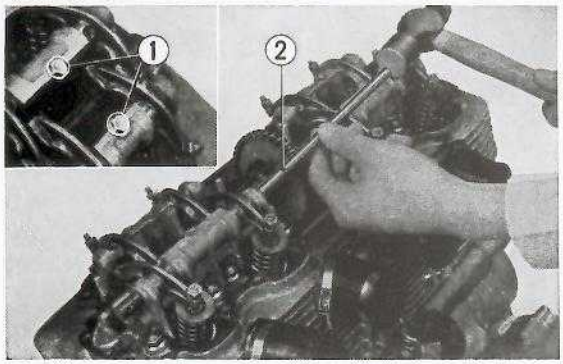


Fig. 3-25 ① Rocker arm shaft mounting bolts
② Rocker arm shaft remover

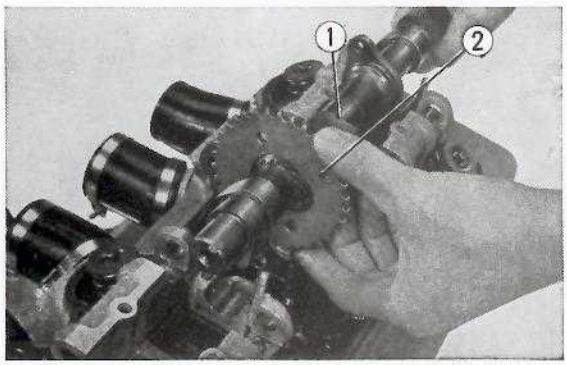


Fig. 3-26 ① Camshaft
② Cam sprocket

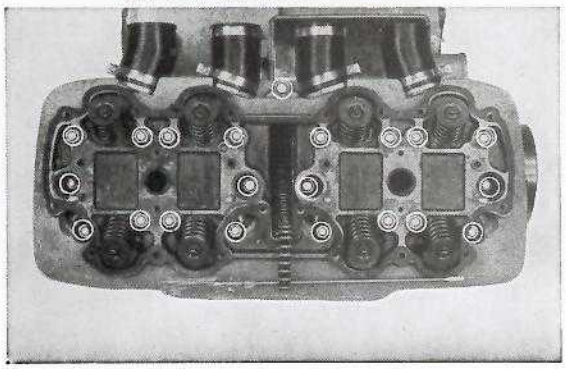


Fig. 3-27 Removing cylinder head mounting nuts and bolts

4. Detach the cam chain tensioner holder from the cylinder. **(Fig. 3-24)**
5. Unscrew the two cam sprocket mounting bolts and then loosen the valve tappet adjusting screws. Unscrew the four rocker arm shaft mounting bolts and pull out the rocker arm shaft using the rocker arm shaft remover (Tool No. 07050-30001) being careful not to damage the holder. **(Fig. 3-25)**

Note : Rocker arm No. 1 and No. 3, and rocker No. 2 and No. 4 are identical, therefore, tag the respective rocker arms for identification.

6. Remove the cam chain from the cam sprocket and then pull out the camshaft from the camshaft holder at the left side. **(Fig. 3-26).**
7. Detach the camshaft holder from the cylinder head.
8. Remove the sixteen cylinder head mounting nuts, the five 6 mm mounting bolts and then separate the cylinder head from the cylinder. Use a special tool (Tool No. 07906-3230000) to loosen the 6 mm mounting bolts on both sides. Loosening sequence of the mounting nuts is performed in the reverse sequence indicated **Fig. 3-38** on page 67. **(Fig. 3-27)**
9. Remove the cylinder from the crankcase.

10. Remove the two cam chain tensioner mounting rubbers from the crankcase and then remove the cam chain tensioner roller assembly. **(Fig. 5-28)**
11. Cam chain guide roller can be removed from the cam chain tensioner by pushing the cam chain roller pin.
12. Remove the cam chain guide pin from the bottom of the cylinder and remove the cam chain guide from the cylinder. **(Fig. 3-29)**

c. Inspection

1. Measuring the camshaft clearance
   (Perform the measurement with a micrometer and inside dial gauge)
   a. Assemble the camshaft holder on the cylinder head and assemble the cap on the camshaft holder making sure that the cap and holder are stamped with the identical markings.
   Torque to 6.0~8.0 ft. lbs (80~110 kg-cm)
   b. Measure the bearing inside diameter in both the vertical and horizontal direction using the inside dial gauge and calculate the average value. Next, measure the camshaft bearing with a micrometer and then compute the shaft clearance. If the clearance is greater than **0.0083 in. (0.21 mm)**, the camshaft holder and the cap should be replaced in set. Further, the clearance may be measured using a press gauge. **(Fig. 5-30, 31)**
2. Measuring the cam lift
   The camshaft lift is checked by measuring the height of the camshaft from the bottom of base circle. If the total height for the inlet cam is less than **1.411 in. (35.86 mm)**, and for the exhaust, **1.392 in. (35.36 mm)** the camshaft should be replaced. Further, if the base circle is less than **1.099 in. (27.93 mm)**, the camshaft should also be replaced. **(Fig. 3-32)**

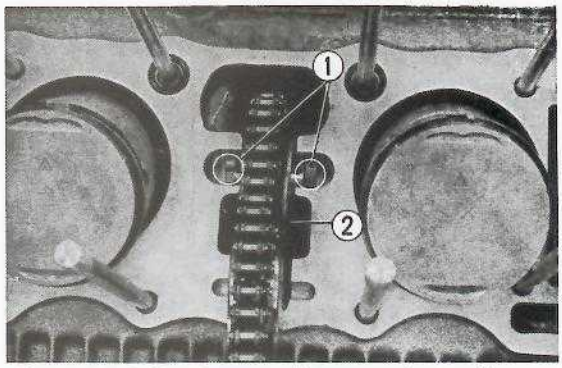


Fig. 3-28 ① Tensioner roller mounting rubbers
② Cam chain tensioner

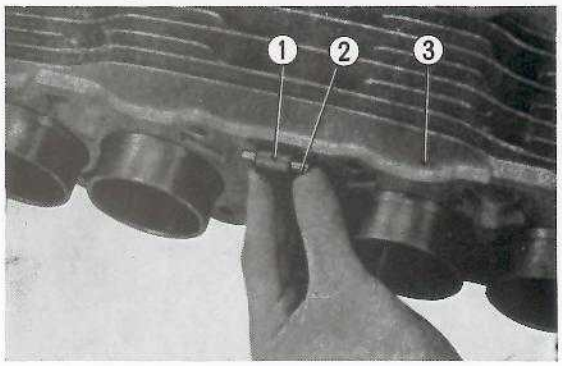


Fig. 3-29 ① Cam chain guide ③ Cylinder
② Cam chain guide pin

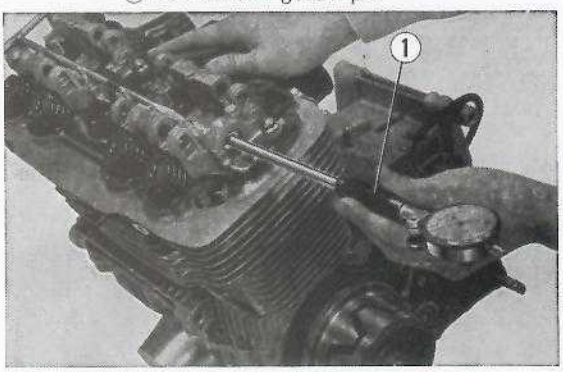


Fig. 3-30 ① Inside dial gauge

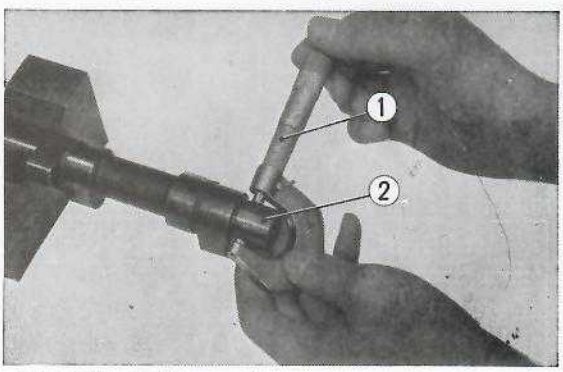


Fig. 3-31 ① Micrometer
② Camshaft bearing

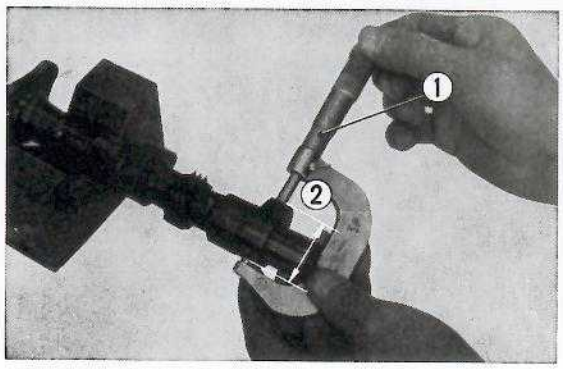


Fig. 3-32 ① Micrometer
② Cam height

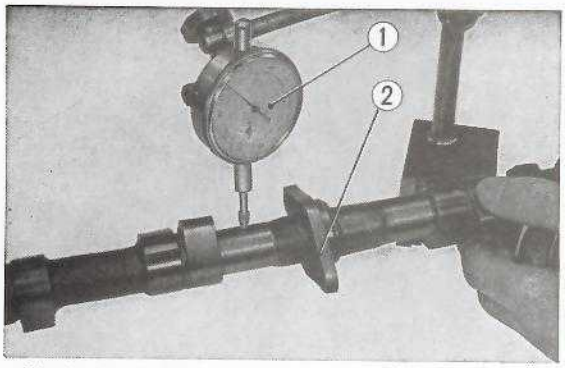


Fig. 3-33 ① Dial gauge
② Camshaft

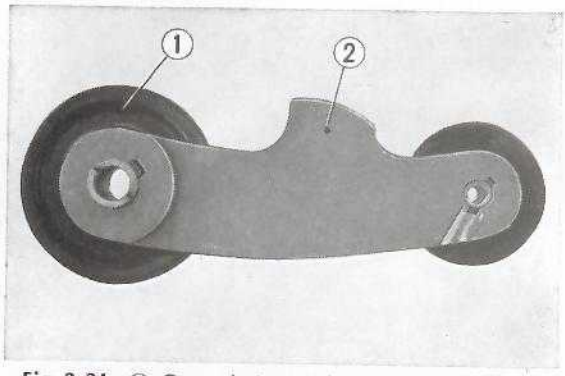


Fig. 3-34 ① Cam chain guide roller
② Cam chain tensioner

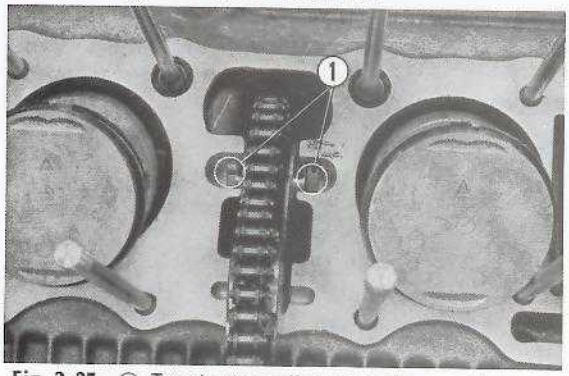


Fig. 3-35 ① Tensioner roller mounting rubbers

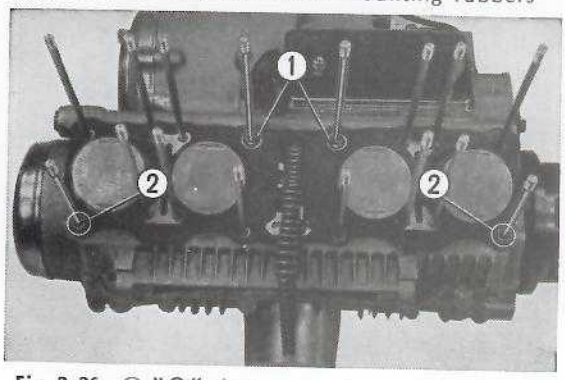


Fig. 3-36 ① "O" rings
② Dowel pins

3. Checking the bend in camshaft
Support both ends of the camshaft on the V blocks and check the dial gauge reading of the camshaft center support while rotating the camshaft. If the run-out is greater than **0.005 in. (0.1 mm)** TIR, the camshaft should be replaced. **(Fig. 3-33)**
4. Inspect the camshaft and camshaft holder for scratches and cracks.
If found defective, it should be replaced.
5. Checking cam chain guide roller
Check the chain contact surface for wear, and replace it, if found to be excessive. **(Fig. 3-34)**

d. Reassembly

1. Route the cam chain through the cam chain tensioner roller, mount it on the upper crankcase and install the mounting rubbers. **(Fig. 3-35)**
2. Assemble the gasket, the two dowel pins (on both side of the exhaust), two O rings (on inner side of the inlet) and then install the cylinder being careful not to damage the piston or the piston rings. The work can be facilitated by using the piston ring compressor (Tool No. 07954-3000000) and the piston base (Tool No. 07958-3000000). **(Fig. 3-36)**
3. On the cylinder gasket flange, assemble the two dowel pins, two O rings and the cylinder gasket, and then mount the cylinder head followed by installing and torquing the mounting nuts and bolts in accordance with **Fig. 3-38**. Torqued the nuts to **13.7~15.2 ft-lbs. (1.9~2.1 kg-m.) (Fig. 3-37, 38)**

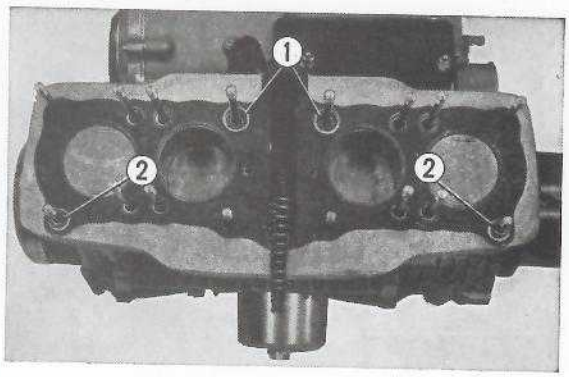


Fig. 3-37 ① "O" rings
② Dowel pins

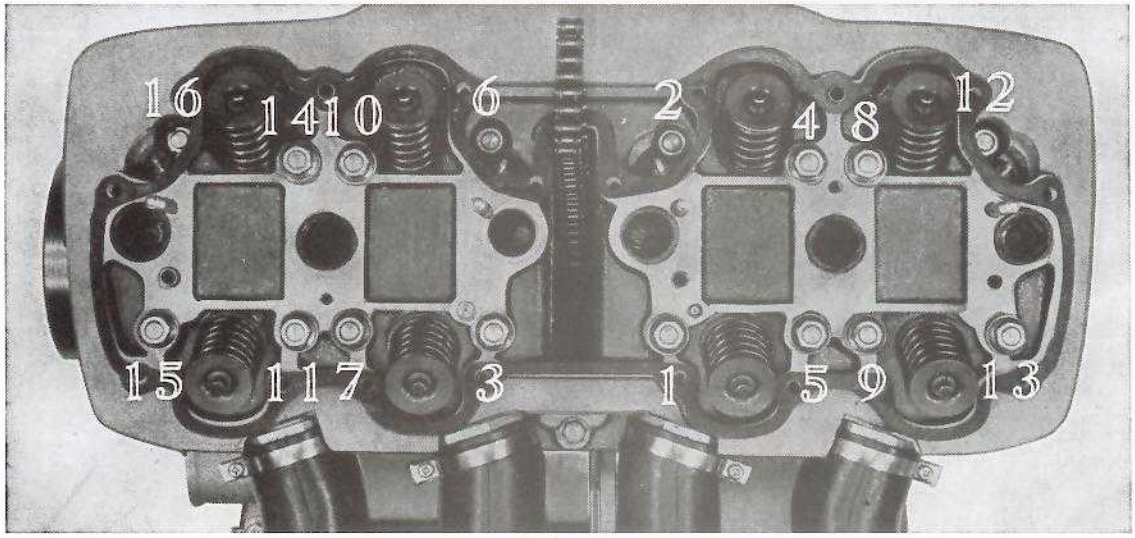


Fig. 3-38 Tightening sequence

CB 750 K4

• Cylinder head gasket rings

On the cars Engine No. 2352923 and after, a collar and oil seal (rubber) are inserted into between the cylinder and head at the points 4, 8, 5, 9, 14, 10, 11 and 7 in **Fig. 3-38.**

Note: Install the oil seal onto the collar and insert them into the attaching hole in the cylinder.

4. Timing the valves
   a. Position the No. 1 and No. 4 cylinders to the top-dead-center by turning the crankshaft and aligning the No. 1 and No. 4 "T" marks on the spark advancer to the index mark **(Fig. 3-39)**. During this operation, check the movement of the cam chain to make sure that it is properly fitted on the timing sprocket.
   b. Fit the cam sprocket on the camshaft and route the cam chain through the right side.
   c. Assemble the cam chain on the sprocket before mounting the cam sprocket. Place the camshaft on top of the camshaft holder and align the timing index line on the right side of the camshaft, so that it is parallel to the top surface of the camshaft holder. (The key groove must be toward the top). In this condition the base circle of the No. 4 cam is toward the top and the No. 1 cam is in the overlap position. **(Fig. 3-40, 41)**

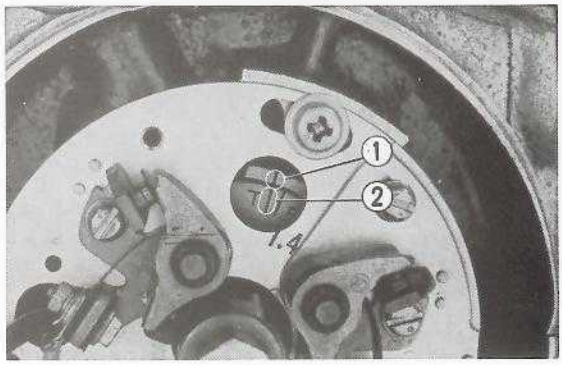


Fig. 3-39 ① Index mark
② "T" mark

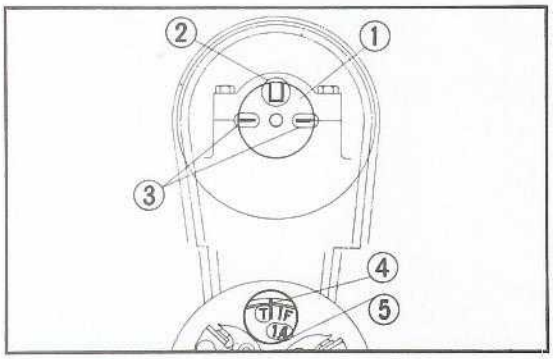


Fig. 3-40 ① Camshaft
② Groove
③ Index lines
④ "T" mark
⑤ 1.4 mark

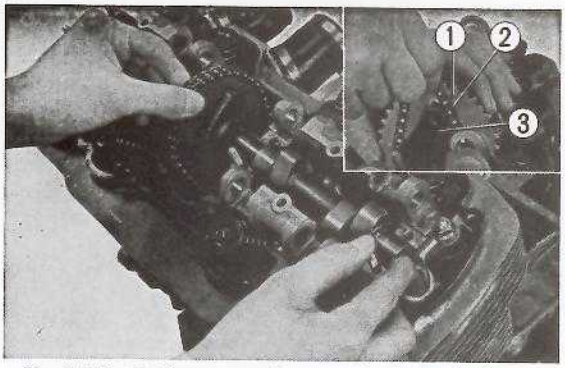


Fig. 3-41 ① Cam sprocket ③ Cam shaft
② Cam chain

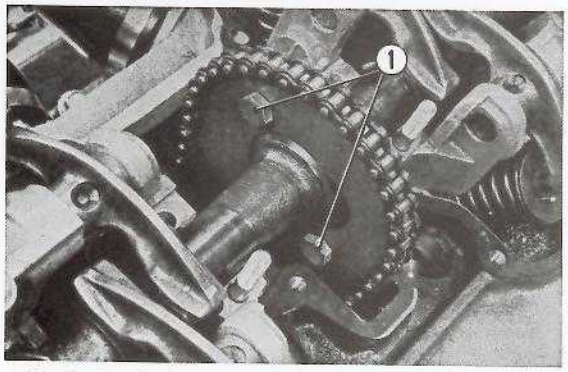


Fig. 3-42 ① Cam sprocket mounting bolts

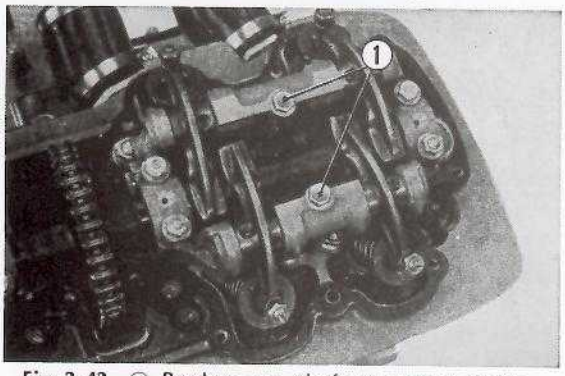


Fig. 3-43 ① Rocker arm shaft mounting bolts

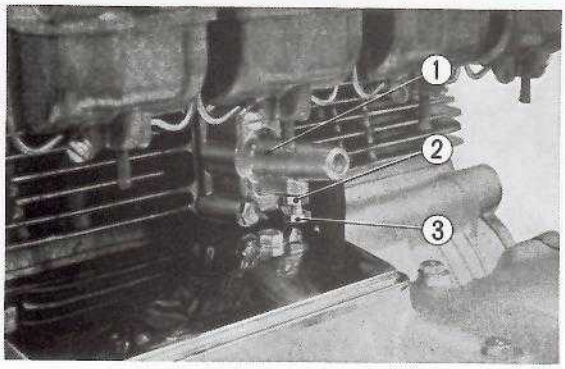


Fig. 3-44 ① Cam chain tensioner holder
② Lock nut
③ Tensioner adjusting bolt

d. At this point, the sprocket can be mounted on the camshaft with the two sprocket mounting bolts. **(Fig. 3-42)**

5. Mount the rocker arm on the rocker arm shaft and install the mounting bolts. **(Fig. 3-43)**
Note : Rocker arms No. 1 and No. 3, and No. 2 and No. 4 are interchangeable, therefore, do not error during installation.

6. Cam shaft holder and cap are matched set and can be identified by the identical numbers stamped on the holder and the cap. Torque the bolts to **6.5~9.4 ft-lbs (90 ~130 kg. cm)**

7. Push in the push bar for the cam chain tensioner. Install the tensioner on the cylinder, loosen the tensioner adjusting bolts and then retighten the bolts and lock with the lock nut. **(Fig. 3-44)**

8. Adjust the valve tappet clearance. **(Fig. 3-45)** Refer to page 42~43.

9. Install the cylinder head cover with the sixteen cross screws.

10. Mount the breather cover with the three cross screws.

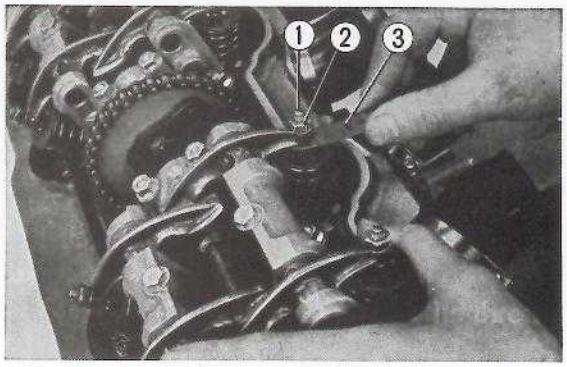


Fig. 3-45 ① Valve tappet adjusting screw
② Valve tappet lock nut
③ Thickness gauge

3-4 CYLINDER HEAD

a. Description

The engine being on overhead camshaft type, the valves are located in the combustion chamber in the head. The combustion chamber is semi-spherical design for greater power output and the valve guides are press-fitted into the head.

Remove the valves.

Compress the valve springs using the valve spring compressor (Tool No. 07957-3290000) and remove the valve cotters, springs and valve in this order.

CAUTION: Compress the valve springs with care attention paid not to damage the valve stem seal.

b. Disassembly

1. Remove the cylinder head in accordance with section 3-3 b on page 26~29.
2. Disassemble the cylinder head using the valve remover (Tool No. 07031-30001 and 07031-30010) and disassemble the following parts: cotter, retainer, valve spring (both inlet and exhaust), valve stem seal, spring seat in the order. **(Fig. 3-46)**
3. Remove the valve guide using a valve guide removing tool (Tool No. 07942-3000000. **(Fig. 3-47)**

c. Inspection

1. Measuring the clearance between valve and valve guide

   Insert the valve into the valve guide in the cylinder head and measure the clearance in both the X and Y axes, using a small dial gauge. **(Fig. 3-48)**

   If the measured clearance is greater than **0.003 in.(0.08 mm)** for the inlet valve or **0.004 in. (0.1 mm)** for the exhaust valve, both the valve and valve guide should be replaced. The replacement valve guide should be one that is oversize. Use a valve guide driving tool (Tool No. 07942-3000000) to drive the valve guide fully into the head.**(Fig. 3-49)** Complete the valve guide installation by reaming out the valve guide using a valve guide reamer (Tool No. 07984-6110000) to the standard dimension. Standard inlet and exhaust valve guide inside diameter is **0.2599~0.2603 in. (6.6~6.61 mm).**

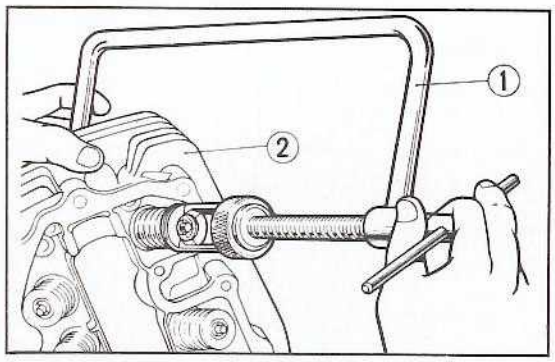


Fig. 3-46 ① Valve lifter
② Cylinder head

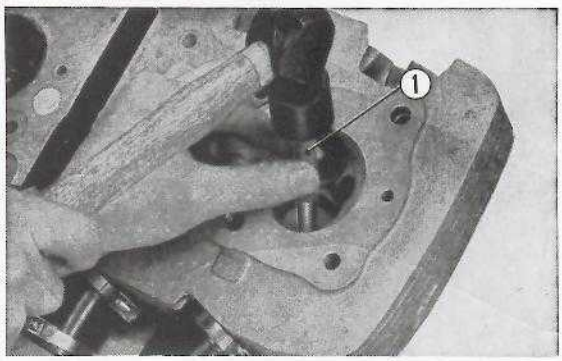


Fig. 3-47 ① Valve guide removing tool

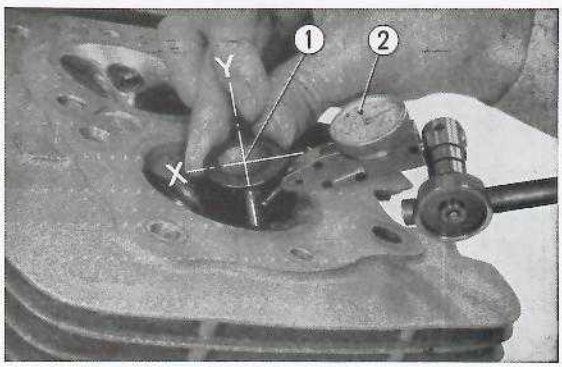


Fig. 3-48 ① Valve
② Dial gauge

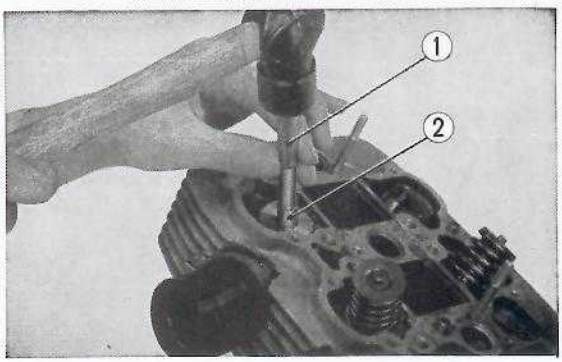


Fig. 3-49 ① Valve guide driving tool
② Valve guide

2. Measuring the width of the valve seat and vertical valve run-out

Place the valve on the V block and check the vertical run-out of the valve face by using a dial gauge. If the run out is greater than **0.002 in. (0.05 mm)**, the valve should be replaced. **(Fig. 3-50)** Further, measure the width of the valve face contact and if it is greater than **0.079 in. (2.0 mm)**, the valve should be replaced. However, if the valve is not seating uniformly, the valve seat should be repaired using a valve seat cutters. For information on the valve seat cutting operation, refer to **Fig. 3-51**.

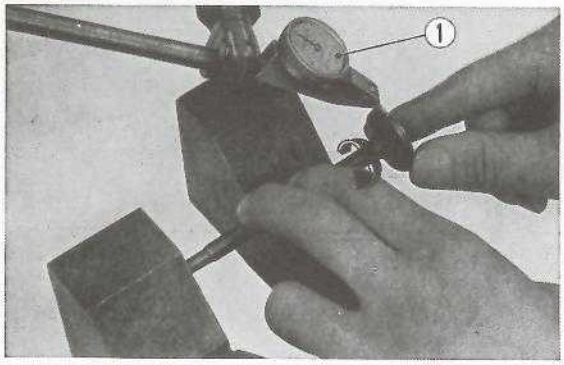


Fig. 3-50 ① Dial gauge

There are three types of valve seat cutter shown in **Fig. 3-51**. The valve seat interior cutter will cut the bottom or the port side of the valve seat and the valve seat top cutter will cut the top of the valve seat (combustion chamber side). Finally, a 90° seat cutter is used to cut the seat. The width of the valve seat should be finished to **0.039 to 0.051 in. (1~1.3 mm).** After the cutting of the valve seat, use a lapping

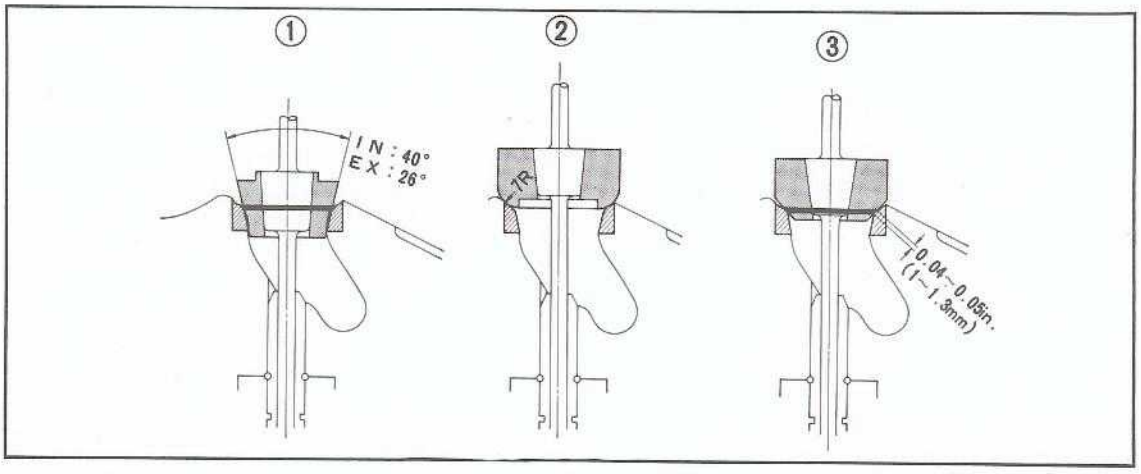


Fig. 3-51

① Valve seat interior cutter ② Valve seat top cutter ③ Valve seat 90° cutter

compounds to lap the valve to the new seat. Apply light coating of oil to the valve stem before assembling the valve into the cylinder head : Use the installation tool (Tool No. 07957-3290000)

CAUTION:

Use the valve seat grinder (tool No. 07782-0020000, A set) to correct the valve seat width and contact from the following serial number.

E No, CB 750 E-2242714~

Read carefully the instruction provided with the valve seat grinder.

3. Measuring the valve spring

Measure the free height of the valve spring using a vernier caliper and make sure that it conforms with this specification listed on the next page.

The spring forces are also listed the reference. **(Fig. 3-52)**

Item	Standard value in. (mm)	Serviceable limit in. (mm)	Standard spring force
Inner valve spring	**1.50 (38.1)**	**1.4566 (37.0)**	**22.8~25.8 kg/26 mm**
Outer valve spring	**1.6220 (41.2)**	**1.4748 (40.0)**	**45.6~51.6 kg/28 mm**

4. Measure the rocker arm shaft support area with a micrometer and measure the rocker arm shaft bearing diameter bore using inside micrometer. Calculate clearance and if it is greater than **0.0047 in. (0.11 mm)**, replace either one or both of the parts. **(Fig. 3-53)**

5. Removing carbon from the combustion chamber.

Assemble the valve into the combustion chamber and remove the carbon using a carbon brush or a scraper, being careful not to scratch or damage the parts.

6. Measuring flatness of the cylinder head

Place a straight across the mounting surface of the cylinder head and check the clearance with a thickness gauge at several points to make sure that the head is not warped. If the clearance between straight edge and the head mounting surface is greater than **0.009 in. (0.25mm)**, the head should be reworked or replaced by a new head. In any event, the warp of the head should be less than **0.002 in. (0.05 mm)**. **(Fig. 3-54)**

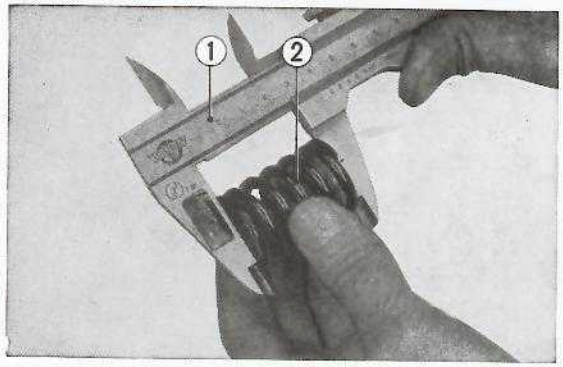


Fig. 3-52 ① Vernier caliper
② Spring

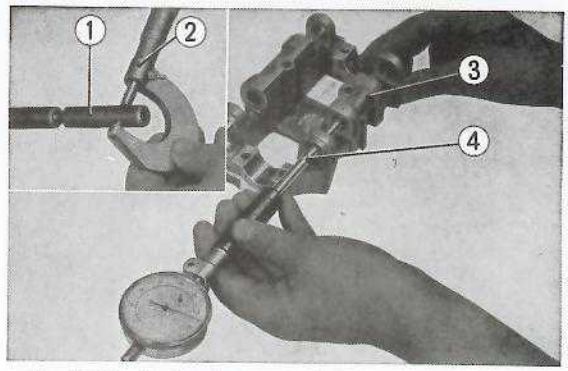


Fig. 3-53 ① Rocker arm shaft
② Micrometer
③ Camshaft holder
④ Inner dial gauge

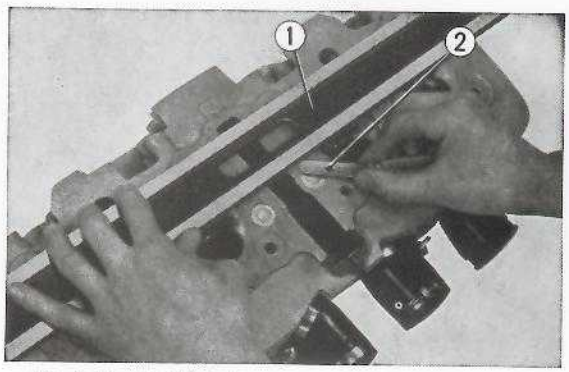
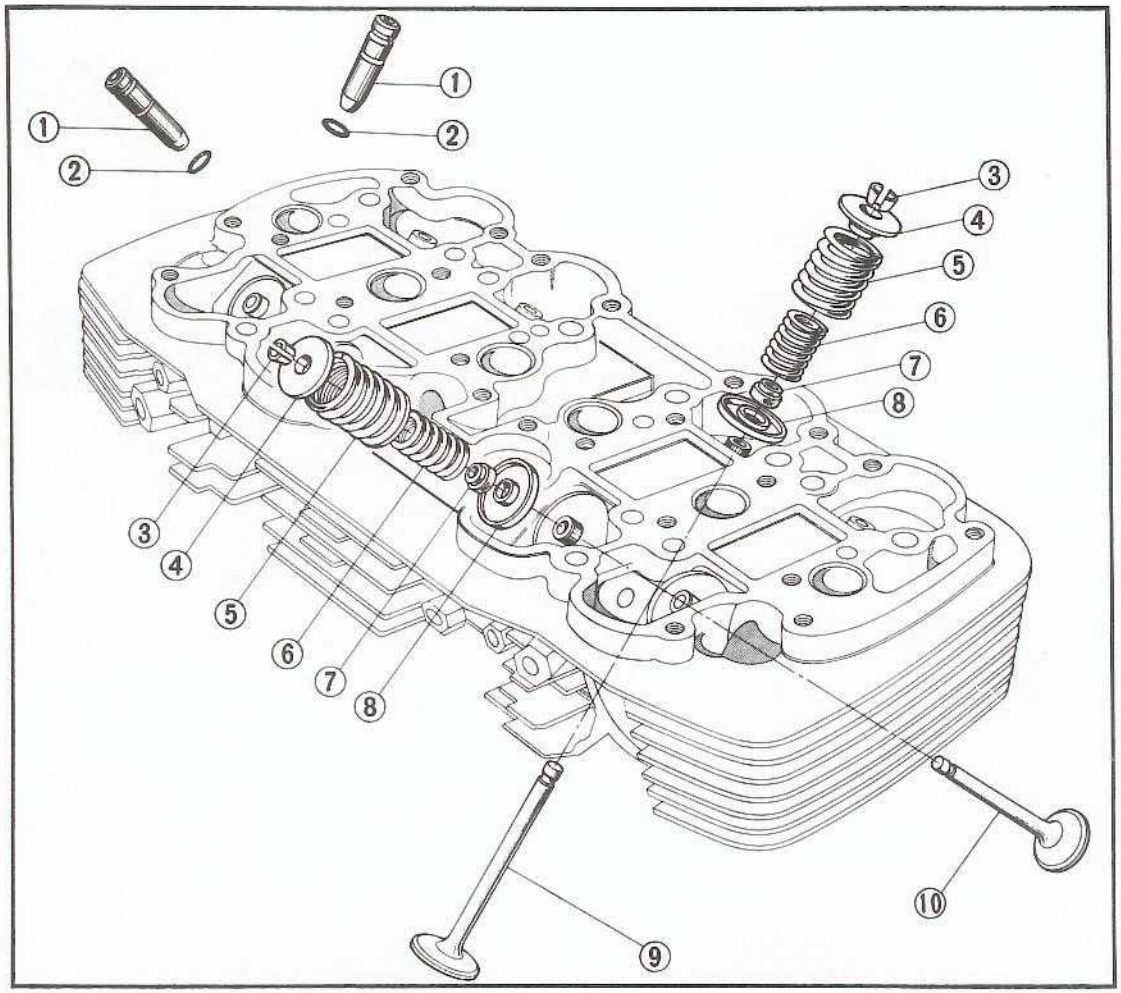


Fig. 3-54 ① Stretch
② Thickness gauge

d. Reassembly

1. Clean the component parts of the cylinder head and assemble them in accordance with **Fig. 3-55.**



① Valve guide
② Set ring
③ Valve cotter
④ Valve retainer
⑤ Outer valve spring
⑥ Inner valve spring
⑦ Valve stem seal
⑧ Valve spring seat
⑨ Exhaust valve
⑩ Inlet valve

Fig. 3-55

2. Install the cylinder head in accordance with section 3-3 d on page 36~38.
3. After assembling cylinder head, the valve tappet clearance should be performed to assure proper clearance in the following manner.
   a. While slowly rotating the crankshaft clockwise (see arrow) watch the # 1 cylinder inlet valve tappet. When this tappet retracts all the way and then starts to rise, watch for the alignment of the timing index mark and the "T" mark. Check the 1·4 cylinder mark. In this position the # 1 piston will be at T.D.C. (top dead center) of the compression stroke, and both the inlet and exhaust valves in that cylinder should be fully closed. The valve tappet clearances of the valves marked with the O in the table on the next page can be checked. **(Fig. 3-56)**

	No. 1	No. 2	No. 3	No. 4
IN	○	×	○	×
EX	○	○	×	×

Note : The cylinder are numbered 1~4 starting from the left side.

b. Check the clearance of both valves by inserting the thickness gauge, provided in the tool kit, between the tappet adjusting screw and the valve stem. If clearance is correct, there will be slight drag or resistance as the gauge is inserted. If clearance is too small or large, adjustment is necessary. **(Fig. 3-57)**

The standard valve tappet clearance is

IN 0.002 in (0.05 mm)
EX 0.003 in (0.08 mm)

c. Adjustment is made by loosening the tappet screw lock nut and turning the adjusting screw until there is a slight drag on the thickness gauge. Hold the tappet adjusting screw in this position and tighten the lock nut. Recheck the clearance with the gauge. Next, turn the crankshaft 360°, this will put No. 4 piston into the top-dead-center of the compression stroke and will permit the checking of the remaining valve tappet clearances marked × in the table above.

4. Install the cylinder head cover and breather cover.

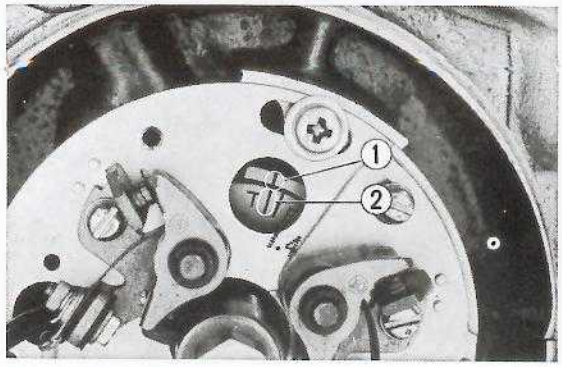


Fig. 3-56 ① Index mark
② "T" mark

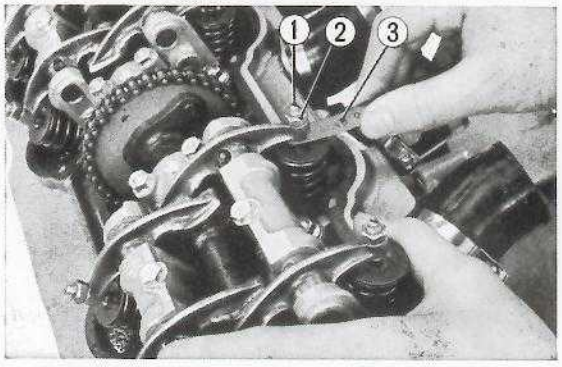


Fig. 3-57 ① Valve tappet adjusting screw
② Valve tappet lock nut
③ Thickness gauge

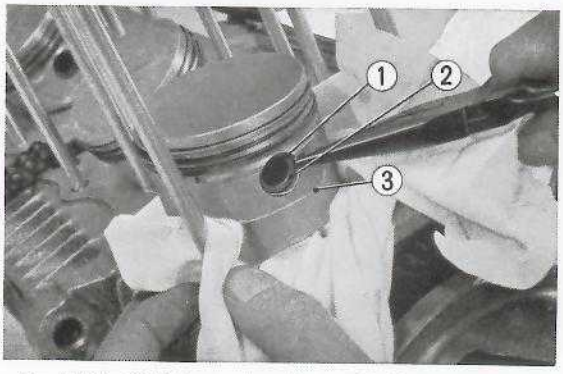


Fig. 3-58 ① Piston pin clip ③ Piston
② Piston pin

3-5 PISTON AND CYLINDER

a. Description

The piston is made from selected aluminum alloy casting. This material is light and making it suitable for high speed. In addition, it possess good heat conducting property to rapidly dissipate heat. Furthermore, the coefficient of heat expansion is small thus minimizing the warpage at elevated temperature and permitting a small piston to cylinder clearance design.

b. Disassembly

1. Remove the cylinder in accordance with section 3-3 b on page 32~35.
2. Remove the piston pin clip, push out the piston pin and remove the piston from the connecting rod. **(Fig. 3-58)**

Note : During the piston pin clip removal, exercise care not to drop the clip into the crankcase.

3. Remove the piston rings from the piston.

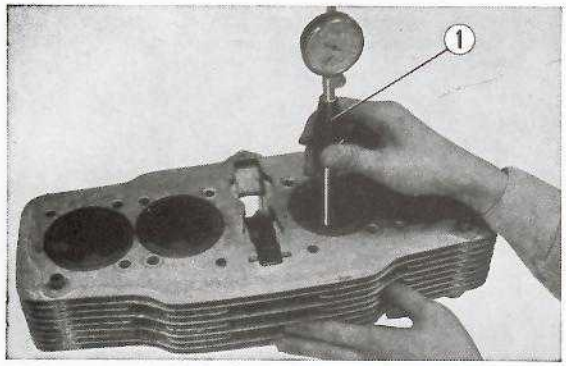


Fig. 3-59 ① Cylinder gauge

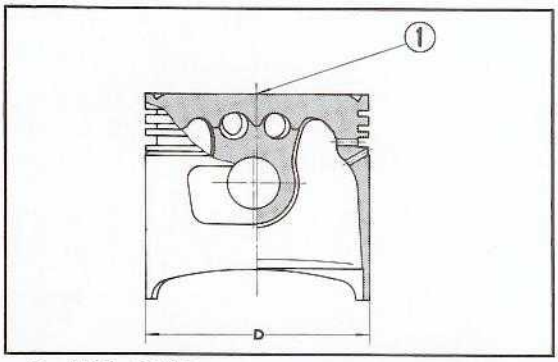


Fig. 3-60 ① Piston

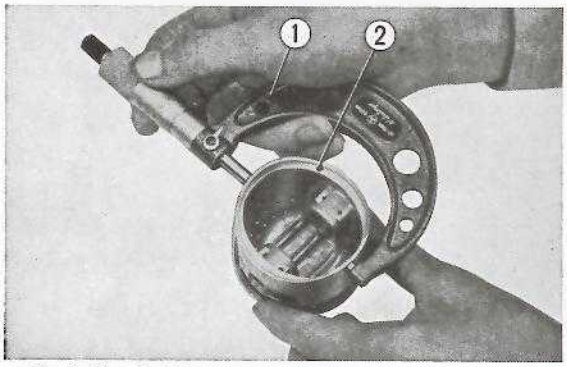


Fig. 3-61 ① Micrometer
② Piston

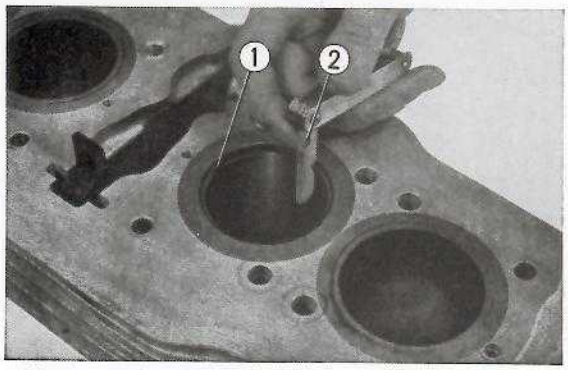


Fig. 3-62 ① Piston ring
② Thickness gauge

c. Inspection

1. Measuring the cylinder bore, taper and out of round. **(Fig. 3-59)**

Measure the cylinder bore at the top, center and bottom, measuring in both X and Y axes, using a cylinder gauge.

If the diameter is greater than **2.406 in. (61.1 mm)**, the cylinder should be rebored and honed. Further, if the taper and the out of round is greater than **0.0020 in. (0.05 mm)**, the cylinder should be repaired in same manner as above.

Measure the cylinder diameter at the point of maximum wear. Next, select the proper oversize piston to be used (0.25 mm to 1 mm oversize in increments of 0.25 mm) and determined the proper boring dimension. When boring is completed, finish up by honing. The minimum clearance between the piston and the cylinder is at the skirt section with a dimension of **0.0004~0.0016 in. (0.01~0.04 mm)**.

· Oversize piston diameter **(Fig. 3-60)**

Oversize		Piston diameter (D)
O/S	0.25	61.215~61.235 mm
O/S	0.50	61.465~61.485 mm
O/S	0.75	61.715~61.735 mm
O/S	1.00	61.965~61.985 mm

2. Measuring the diameter of the piston

Measure the piston diameter at the skirt, 90° from the pistonpin hole, using a micrometer. If the dimension is less than **2.3939 in. (60.85 mm)**, it should be replaced. **(Fig. 3-61)**

3. Removing the carbon

Remove the carbon from the piston top and the ring groove by using a carbon scraper.

If the ring groove is damaged or excessively worn, the piston should be replaced.

4. Measuring the piston ring end gap **(Fig. 3-62)**

Fit the ring into the cylinder bore and measure the gap at the end of the ring using a thickness gauge. When only the ring is to be replaced without boring the cylinder wear, the ring gap should be measured at the skirt of the bore.

FUEL SYSTEM

GROUP 6

CONTENTS

6-1 GENERAL DESCRIPTION

DESCRIPTION

The two fuel tubes connected to the fuel valve supply the fuel from the fuel tank to the four carburetors.

The fuel in the carburetor float chamber is sucked into the engine in the proper air-fuel mixture to conform with the engine speed. This has a great influence on the engine performance.

In an engine with four independent carburetors their precise adjustment is particularly important for smooth operation.

The fuel valve has three positions, ON, STOP and RES ; which can be selected by the lever.

SPECIFICATIONS

Fuel tank capacity	4.7 U.S gal. (18 lit)
Fuel tank reserve capacity	10.5 U.S pt. (5 lit.)

Carburetor setting table

Type		Piston valve, 4 pcs.
Main bore		1.102 in. (28 mm)
Main jet		# 120
Air jet		# 100
Air bleed	AB 1	0.035 in. (0.9 mm) × 4
	AB 2	0.035 in. (0.9 mm) × 4
	AB 3	0.024 in. (0.6 mm) × 2
	AB 4	0.024 in. (0.6 mm) × 2
Needle jet		0.102 × 0.15 in. (7.6 × 3.8^{R} mm)
Jet needle		0.098 in. (2.485 mm)
Cutaway		# 2.5 [recess 0.047 mm (1.2 mm), depth 0.008 in (0.2 mm)]
Air screw opening		1 ± 1/8
Slow jet		# 40
Valve seat		0.079 in. (2 mm)
Pilot outlet		0.047 in. (1.2 mm)
Setting mark		B 750 A

DIAGNOSIS

Trouble	Probable Causes	Remedy
Engine does not start	1. Choke open to wide	close choke.
	2. Carburetor air screw opened too far	Adjust air screw.
	3. Air leaking into the cylinder head	Retighten carburetor connecting tube.
	4. Clogged carburetor slow jet	Check, clean and retighten.
	5. Clogged fuel valve or piping	Disassemble and clean.
	6. Clogged vent hole in the fuel filler cap	Disassemble and clean.
	7. No fuel in the tank	Fill tank with gasoline.
Poor engine idling	1. Clogged or loose carburetor slow jet	Check, clean and retighten.
	2. Improper float level	Adjust (Refer to page 68).
	3. Improper air screw adjustment	Adjust (Refer to page 71~73).
	4. Improper carburetor linkage operation	Adjust.
	5. Air leaks	Tighten all air passage connection.
Improper running of engine	1. Jet size too small	Replace larger size jet.
	2. Improper float level	Adjust.
	3. Clogged carburetor main jet	Clean and retighten.
	4. Improper carburetor linkage operation	Adjust.
	5. Air leaks	Tighten all air passage connection.

6-2 CARBURETOR

a. Description

The quadruple piston type carburetors are mounted on the cylinder head with a stay plate. Choke lever is a link type which operates all four choke valves simultaneously.

Fig. 6-1 shows the construction details of the carburetor.

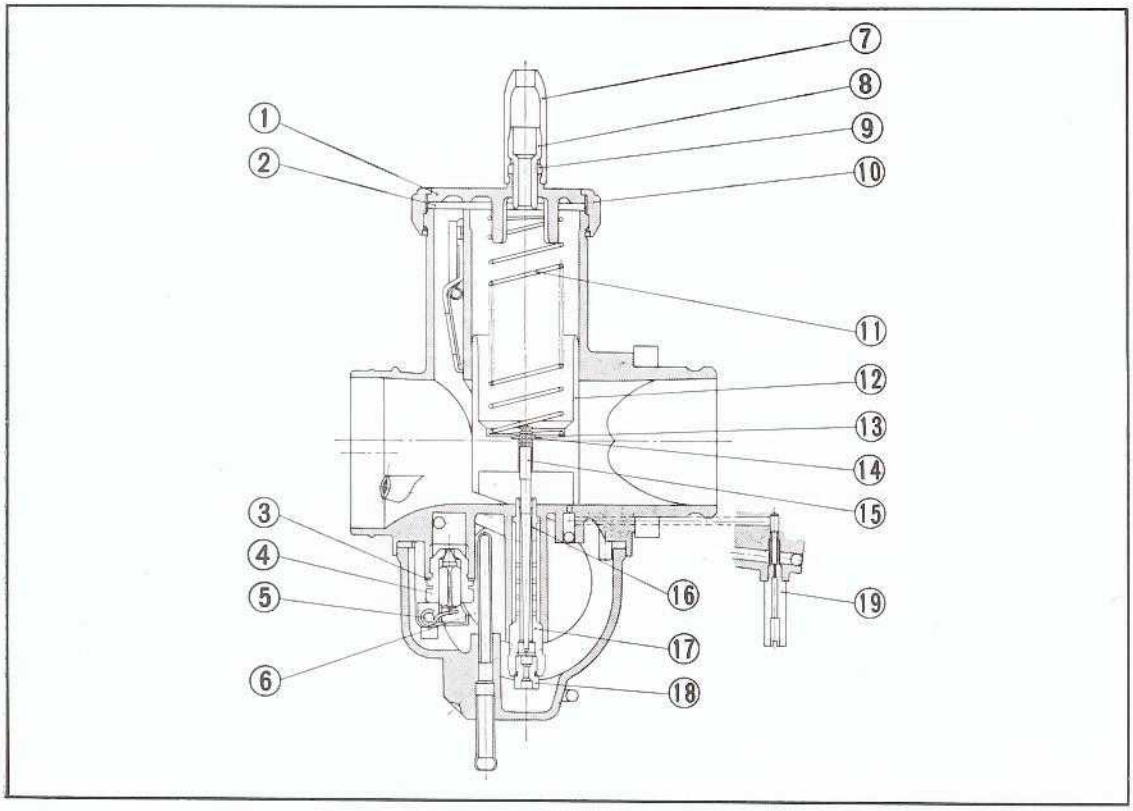


Fig. 6-1

① Carburetor top	⑧ Cable adjuster	⑮ Jet needle
② Top washer	⑨ Lock nut	⑯ Needle jet
③ Flat washer	⑩ Cap	⑰ Needle jet holder
④ Valve seat	⑪ Throttle spring	⑱ Main jet
⑤ Float arm pin	⑫ Throttle valve	⑲ Slow jet
⑥ Float	⑬ Needle set plate	
⑦ Rubber cap	⑭ Clip	

As the air enters the carburetor, it passses under the throttle valve where vacuum pressure is produced due to the restriction caused by the throttle valve extending into the main air passageway. The fuel discharge outlet is located in this so-called venturi area so that the vacuum pressure can draw out the fuel. This carburetor incorporates both the main and slow system.

· Main system

The fuel passes through the main jet ⑱ and enters the needle jet holder ⑰ where it mixes with the bleed hole located around the needle jet holder. The fuel air mixture passes by the opening between the needle jet ⑯ and jet needle ⑮ and is discharged from

below the throttle valve ⑫.

It is here that the mixture is combined with the main air and after being atomized, is taken in to the engine.

· Slow system

The air which enters from the inlet passes through the outside of the air screw where it is metered and enters the slow jet bleed hole. It mixes with the fuel which enters the slow jet ⑲ to produce a full spray that is discharged from the pilot outlet at a point under the throttle valve. This mixes with the air from the air inlet to form a combustible mixture before being taken into the engine.

· Float chamber

The carburetor must provide a proper mixture of fuel at different throttle openings and engine speeds; in order to accomplish this, the fuel level in the carburetor must be maintained constant. The float chamber functions to serve this purpose. The fuel from the tank enters the float chamber through the fuel inlet passage, between the float valve seat ④ and float valve and fills the chamber to the level where the float ⑤ rises to shut off the fuel by seating the float valve against the valve seat through the action of the float arm. As the fuel is consumed, the fuel level in the float chamber, drops the float will follow the level, and the fuel will start to enter the chamber between the opening of the float valve and valve seat to maintain a constant fuel level. **(Fig. 6-1)**

b. Disassembly

1. Turn the fuel tank valve to the "STOP" position, remove the fuel lines from the fuel valve body, raise the seat and pull the rear tank rubber mounting away from the rear tank mount. Remove the fuel tank.
2. Remove the throttle valve from each of the carburetors. **(Fig. 6-2)**
3. Loosen the air cleaner connecting tube and insulator bands and remove the carburetors as an assembly. **(Fig. 6-3)**
4. Unscrew the two 6 mm screws and dismount the respective carburetor from the stay plate. **(Fig. 6-4)**

   Disconnecting the individual choke rod will separate the carburetors.
5. In order to remove the needle jet from the throttle valve, first, disconnect the throttle cable from the throttle valve, and then remove the needle set plate from the throttle valve. **(Fig. 6-5)**

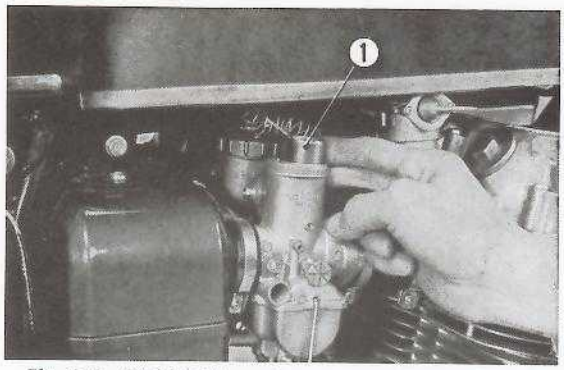


Fig. 6-2 ① Throttle valve

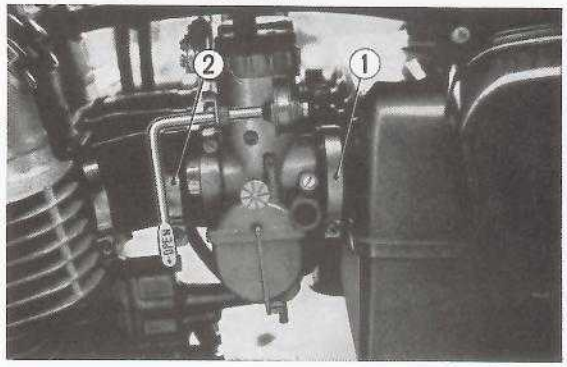


Fig. 6-3 ① Air cleaner connecting band
② Carburetor insulator band

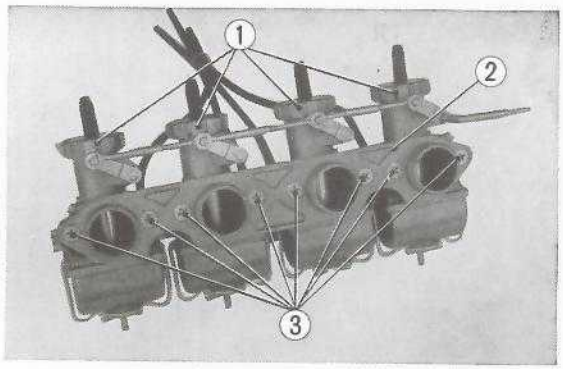


Fig. 6-4 ① Carburetor ③ Setting screws
② Carburetor stay plate

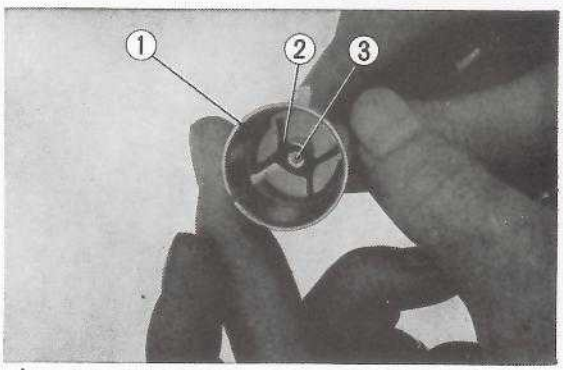


Fig. 6-5 ① Throttle valve ③ Jet needle
② Needle set plate

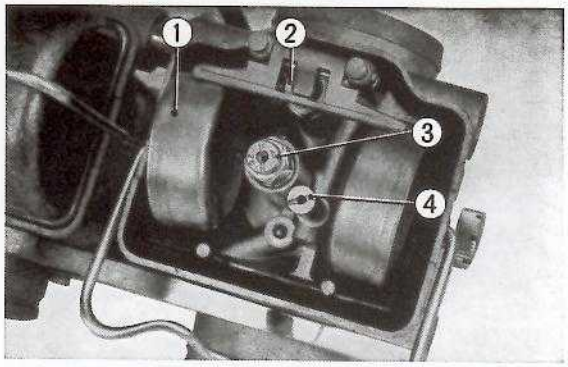


Fig. 6-6 ① Float ③ Main jet
② Float valve set ④ Slow jet

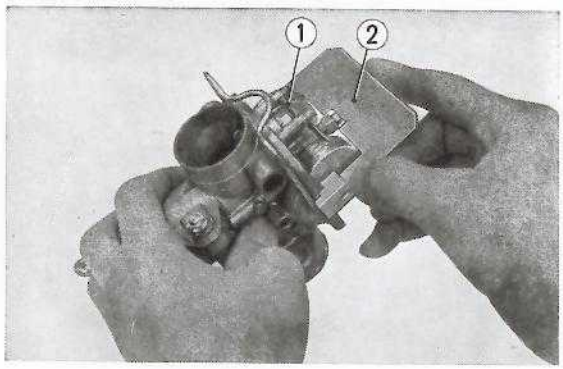


Fig. 6-7 ① Float
② Float level gauge

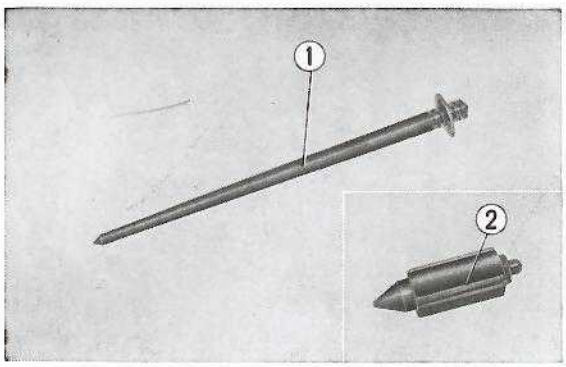


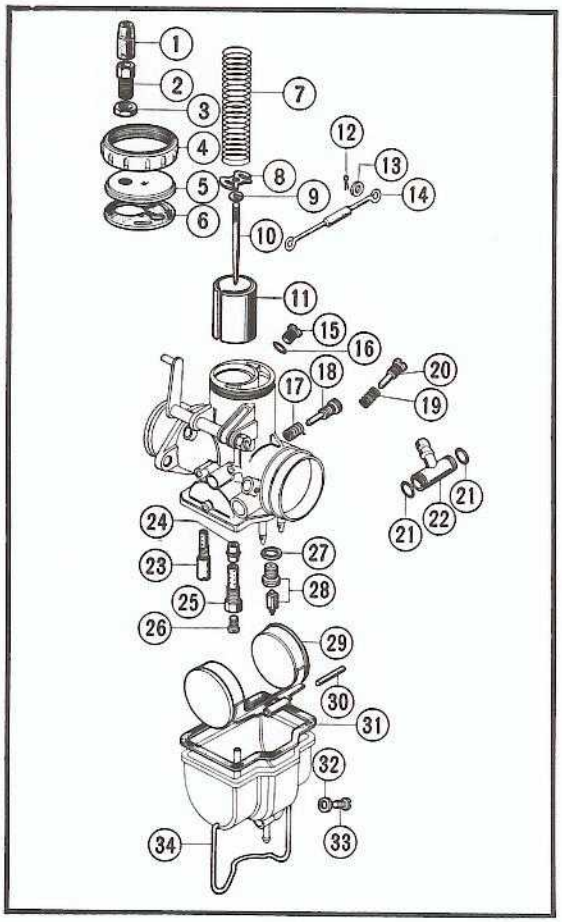
Fig. 6-8 ① Jet needle
② Float valve

6. Remove the float chamber retaining clip and the following carburetor components can be removed with a small screwdriver: slow jet, main jet, needle jet holder, float and float valve set. **(Fig. 6-6)**

c. Inspection

1. Carburetor adjustment should be made in accordance with the description on page 78~81.
2. Fuel level check
   Remove the float chamber and set the float arm as shown in the **Fig. 6-7** so that it just barely touches the valve and in this position, check the position of the float with the gauge set vertically. At a standard setting the float should just barely come in contact with the gauge. If there is clearance between the gauge and float or if the float is interfering with the gauge, adjustment should be made. The height of float can be adjusted by bending the float arm using a narrow screwdriver.
3. Jet needle, float valve
   The jet needle is constantly moving and if it is found to be excessively worn, it should be replaced. Further, check the wear of the valve and the valve seat and if it is defective, part should be replaced. **(Fig. 6-8)**
4. The clogging of the respective jet should be cleaned by blowing out the jets with compressed air followed by properly torquing the jets.

d. Reassembly



① Rubber cap
② Cable adjuster
③ Lock nut
④ Cap
⑤ Top
⑥ Top washer
⑦ Throttle spring
⑧ Needle set plate
⑨ Clip
⑩ Jet needle
⑪ Throttle valve
⑫ 1.0×10 split pin
⑬ 5 mm flat washer
⑭ Choke rod
⑮ Plug screw
⑯ Flat washer
⑰ Air screw spring
⑱ Air screw
⑲ Throttle stop screw spring
⑳ Throttle stop screw
㉑ 7.9×1.9 O-ring
㉒ T-type fuel tube joint
㉓ Slow jet
㉔ Needle jet
㉕ Needle jet holder
㉖ Main jet
㉗ Flat washer
㉘ Float valve set
㉙ Float
㉚ Float arm pin
㉛ Float chamber washer
㉜ 6 mm flat washer
㉝ Drain plug
㉞ Float chamber set clip

Fig. 6-9

1. Wash all the parts and dry completely with compressed air before reassembly.
   Assemble the main jet and slow jet on respective location. **(Fig. 6-10)**

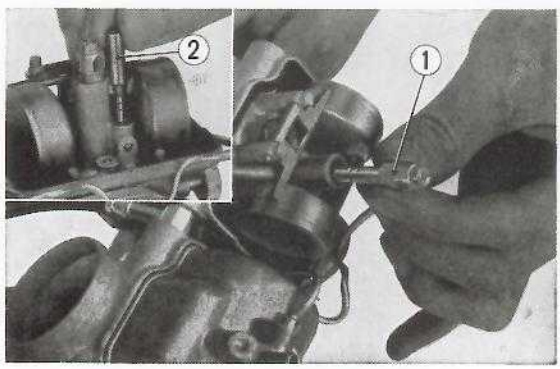


Fig. 6-10 ① Main jet ② Slow jet

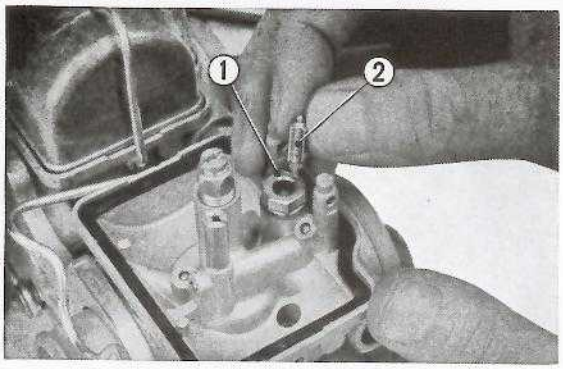


Fig. 6-11 ① Float valve seat ② Float valve

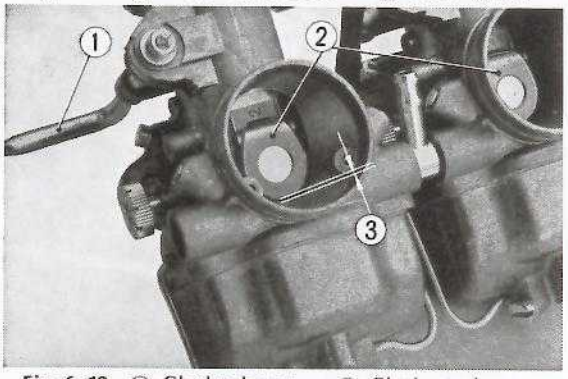


Fig. 6-12 ① Choke lever ② Choke valve
③ Clearance between choke valve and body

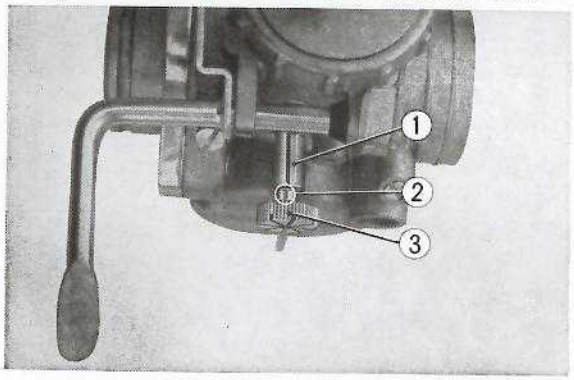


Fig. 6-13 ① Index mark ③ Throttle stop screw
② "T" mark

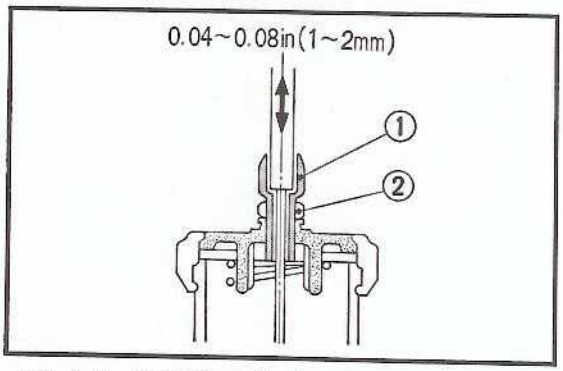


Fig. 6-14 ① Cable adjuster
② Cable adjuster lock nut

2. When either the float valve or valve seat requires replacement, they should be replaced in set. **(Fig. 6-11)**
3. Install the respective carburetor on the stay plate with two mounting screws and connect the choke rod to the carburetor; make sure that the action of the choke lever is smooth.
4. Install the carburetor assembly on the cylinder head.
5. Assemble the throttle valves and cables on the carburetors and actuate the throttle grip to assure smooth movement of the cable.
6. Carburetor adjustment

Before attempting carburetor adjustment, make sure that the following adjustments have been performed properly.

a. Contact braker point gap
b. Ignition timing
c. Valve tappet clearance
d. Spark plug gap
e. Crankcase oil level

(1) Preliminarly adjustment

a. To make easy of access to the throttle screws on all carburetors, the fuel tank should be removed.
b. To check the operation of the choke valves remove the air cleaner upper and lower cases. Observe the choke valves from the rear side of the carburetors whether all valves are fully closed or not, when the choke lever is operated.

If there is a clearance greater than **0.02 in. (0.5 mm)** between the choke valve and body, adjust the clearance by lengthening or shortening the choke lever adjusting rod connected to the annex carburetor. **(Fig. 6-12)**

c. Adjust the throttle stop screw to align the "T" mark to the index mark stamped on the carburetor body. Perform adjustments on all carburetors. **(Fig. 6-13)**
d. Loosen the throttle cable adjuster lock nut and turn the cable adjuster to either directions to obtain the free play of the throttle cable outer within the range of **0.04~0.08 in (1~2 mm).** After tightening the lock nut check the movement of the outer cable.

The four throttle cables should all be adjusted uniformly. (Fig. 6-14)

e. Gently turn the air screws in until they seat, then unscrew them one full turn each. **(Fig. 6-15)**

f. Install the air cleaner, air cleaner upper and lower case, fuel tank and fuel lines. Fill gasoline in the fuel tank.

(2) Final adjustment

For final adjustment use the vacuum gauge. Before attaching the vacuum gauge start the engine and warm up to operating temperature of 140~175°F (60~80°C).

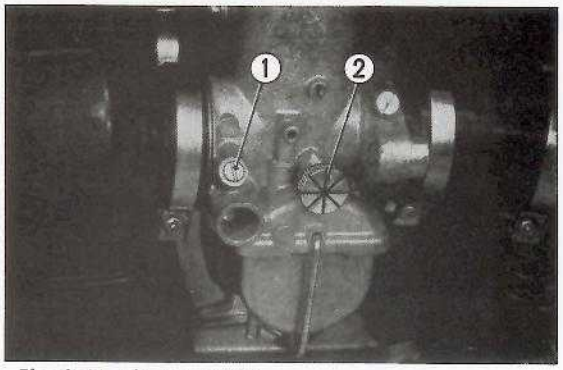


Fig. 6-15 ① Air screw
② Throttle stop screw

a. Stop the engine and remove the plug of adapter attachment hole on each carburetor bodies. Attach the adapters of vacuum gauge to all carburetors: the long adapters Ⓐ are for inside carburetors and the short ones for outside carburetors. Fit the vacuum gauge hose securely on the adapters. **(Fig. 6-16, 17)**

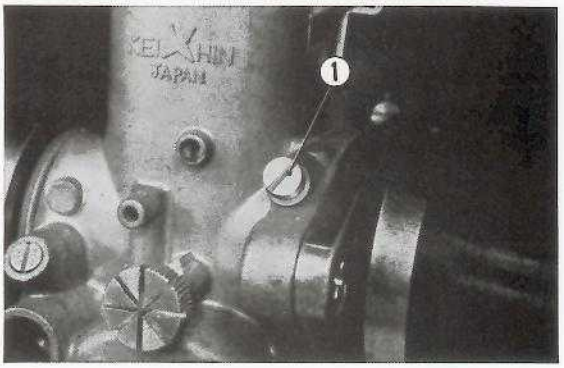


Fig. 6-16 ① plug

b. Start the engine and run it at the idling speed. Check RPM on the tachometer and if the RPM is not in the range of 850~950RPM adjust all throttle valve stop screws uniformly to obtain the proper speed.

Adjustment should be done within the range of 1/8 turn in both directions while checking the vacuum gauge.

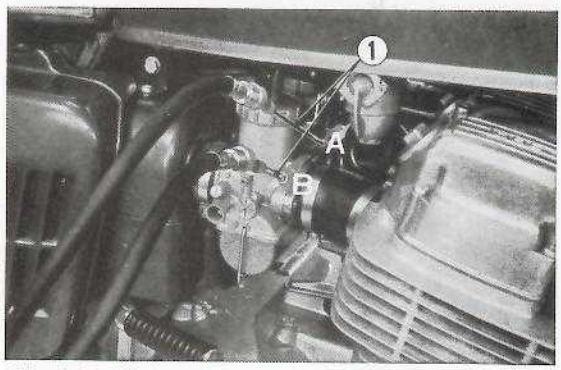


Fig. 6-17 ① Vacuum gauge adapter

c. The standard vacuum pressure reading should be **20~22cmHG.** in all four gauges. If any of these gauges indicates pressure higher or lower than the standard range adjust it with the throttle stop screw. Turning the stop screw clockwise will reduce the pressure and turning it counter-clockwise will bring the pressure higher. **(Fig. 6-18)**

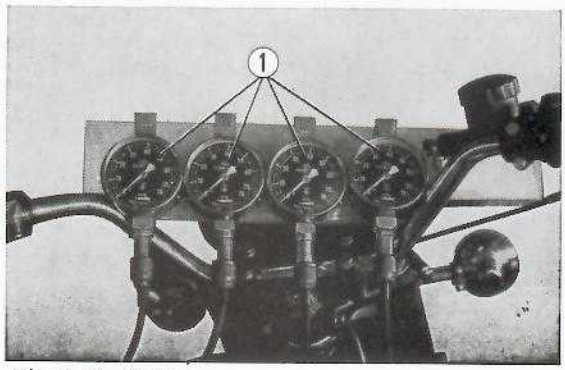


Fig. 6-18 ① Vacuum gauge

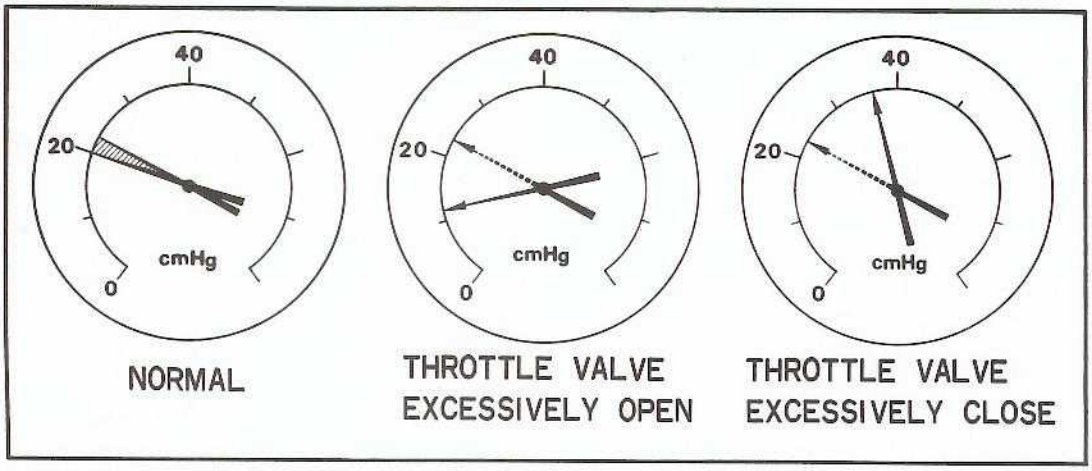


Fig. 6-19

d. If the swing of the gauge needle is large tighten the gauge restrictor valve to reduce the needle movement within 2 cmHG.

When the indicated pressure is lower than 15 cmHg, check the following possible defects.

- Inlet or exhaust valve sticking open
- Absence of slack in the throttle cable
- Loose spark plug
- Loose clamp on the carburetor connecting tube

e. Turn the air screw slightly at a time within 1/8 turn in both directions from the original setting, pausing for about 5 seconds to locate a point of highest engine speed by the tachometer. Perform this adjustment to all carburetors.

If it takes over a full turn more or 1/2 turn less than the original setting to change the engine speed check the following possible cause.

Air screw adjustment requires over 2 turns	Air screw adjustment requires less than 1/2 turn
Clogged air passage	Clogged slow jet
Worn air screw valve	Clogged slow jet passage
Float level too high	Float level too low
Loosened slow jet	Excessively worn air screw valve seat

f. Open the throttle valve slowly about 1/4 turn by the throttle grip for 30 seconds. Observe the vacuum gauge and note the location where the drop of pressure is not even to the other carburetors. Slow down the engine and adjust the throttle cable adjuster on the carburetor concerned. If drop of vacuum pressure is quicher than others turn the adjuster clockwise, namely increase the free play of the throttle cable.

If the drop of pressure is slower than the others, turn the adjuster counter clockwise.

The difference of the vacuum pressure the four carburetors should be less than 2 cmHG. Tighten the lock nuts and fit the rubber caps, when the adjustment has been completed.

(3) Final adjustment without vacuum gauge

a. Set the idling speed to 850~950 RPM with the throttle stop screws. Turn the throttle stop screws clockwise to increase the idling speed. Adjust each carburetor in the same amount.

b. Observe the tachometer and listen to the exhaust noise and/or place a hand at the exhaust outlet to check the exhaust pressure.

Turning out or in very slowly the air screw, obtain the highest engine idle speed or the highest exhaust pressure.

Repeat the same method on all carburetors. The adjustment should not be done exceeding 1/8 turn in both directions.

If there is no change in the engine condition even the adjustment exceeds 1/2 turn in both directions, check possible cause of the defects according to the items in section (2) e.

Adjust the idling speed again by the throttle stop screws to set back to the standard RPM.

c. Slowly twist the throttle grip 1/4 turn to open the throttle valve and allow seconds to run.

Listen to the exhaust noise and if the noise for four cylinders are not identical and random difference as the throttle opened, an adjustments is necessary. Place a hand at the exhaust outlet and check the exhaust pressure of all four cylinders. Locate one or two carburetors of which the exhaust pressures are different from the others.

Adjust them with the throttle cable adjusters. Turning the adjuster clockwise will increase the throttle cable end play and reduce the exhaust pressure. Turn the adjuster counterclockwise to increase the pressure. After completing the adjustment, tighten the adjuster lock nut and properly install the rubber seal cap.

(4) Other inspections.

a. Snap the throttle grip several times and then recheck the vacuum pressure readings or exhaust noise to assure that they are all the same.

b. Turn the steering all the way to the right and left side and snap the throttle grip few times to check that the carburetors are operated smoothly.

c. The air vent tube must be positioned over the air cleaner case.

d. The adjustments of the throttle grip free play and the grip damping force should be referred to the group 19 (page 182)

6-3 FUEL TANK AND VALVE

a. Description

The fuel tank is mounted on the frame body directly above the engine and is installed on the frame body through the fuel tank rubber cushions. **(Fig. 6-20)**

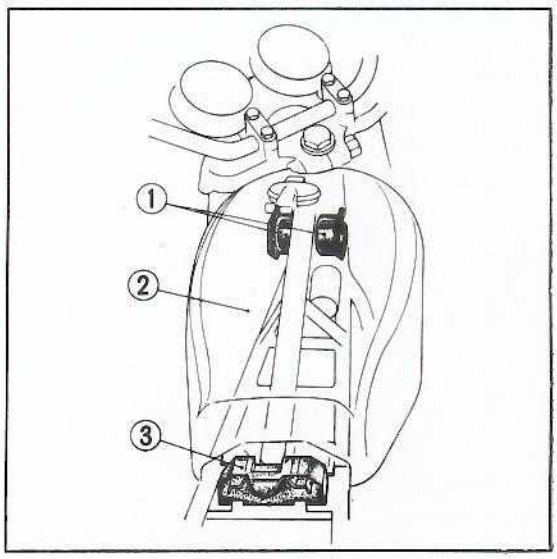


Fig. 6-20 ① Fuel tank front cushions
② Fuel tank
③ Fuel tank rear cushion

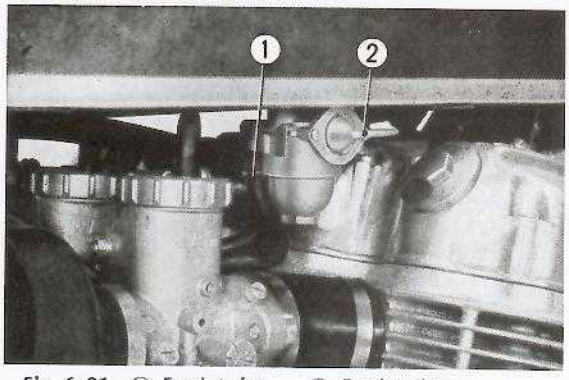


Fig. 6-21 ① Fuel tube ② Fuel valve

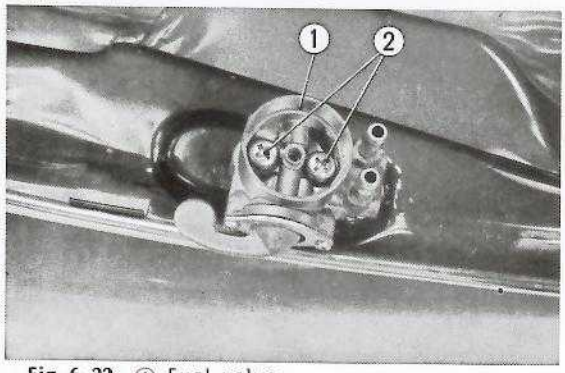


Fig. 6-22 ① Fuel valve
② Fuel valve mounting screws

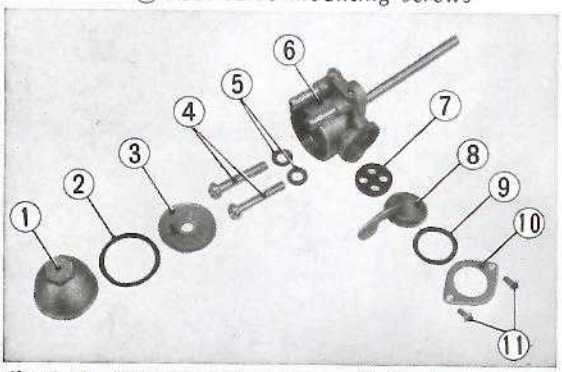


Fig. 6-23 ① Fuel strainer cup ② O ring ③ Fuel strainer screen ④ 6mm cross screws ⑤ Fuel cock fixing packing ⑥ Fuel valve body ⑦ Fuel cock valve packing ⑧ Fuel cock lever ⑨ Cock lever spring ⑩ Setting plate ⑪ Cross screws

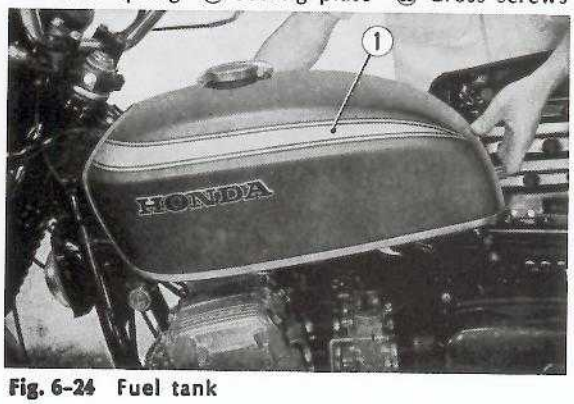


Fig. 6-24 Fuel tank

b. Disassembly

1. Switch the fuel valve to "STOP" and disconnect the fuel tube from the fuel valve. **(Fig. 6-21)**
2. Raise the seat, open the fuel tank rear cushion and remove the fuel tank to the rear and raise.
3. Remove the fuel strainer cap, O ring and fuel strainer screen.
4. Remove the two fuel valve mounting screws and remove the fuel valve from the tank. **(Fig. 6-22)**

c. Inspection

1. Inspect the fuel for leaks.
2. Inspect for clogging of the filler cap vent hole.
3. Inspect the front and rear cushion rubbers for deterioration, wear and other damages.
4. Inspect for damage to the valve cock packing and the filter screen, and then clean them with gasoline. **(Fig 6-23)**
5. Inspect the fuel tube for defects.

d. Reassembly

1. Install the fuel cock assembly on the tank with two screws.
2. Fit the front and rear rubber cushions to the frame body. The front rubber cushions should be inserted by pushing the fuel tank from the rear. **(Fig. 6-24)**

   Install the fuel tank rear bracket on the rear cushion.

   Note: When installing the tank, particular attention should be give to the condition of the wires and their routing.
3. Install the fuel lines using fuel tube clips and connect the fuel tubes to the tank valve.
4. Turn the fuel valve cock to the "ON" position and check the fuel for leaks.

IGNITION SYSTEM

GROUP 7

CONTENTS

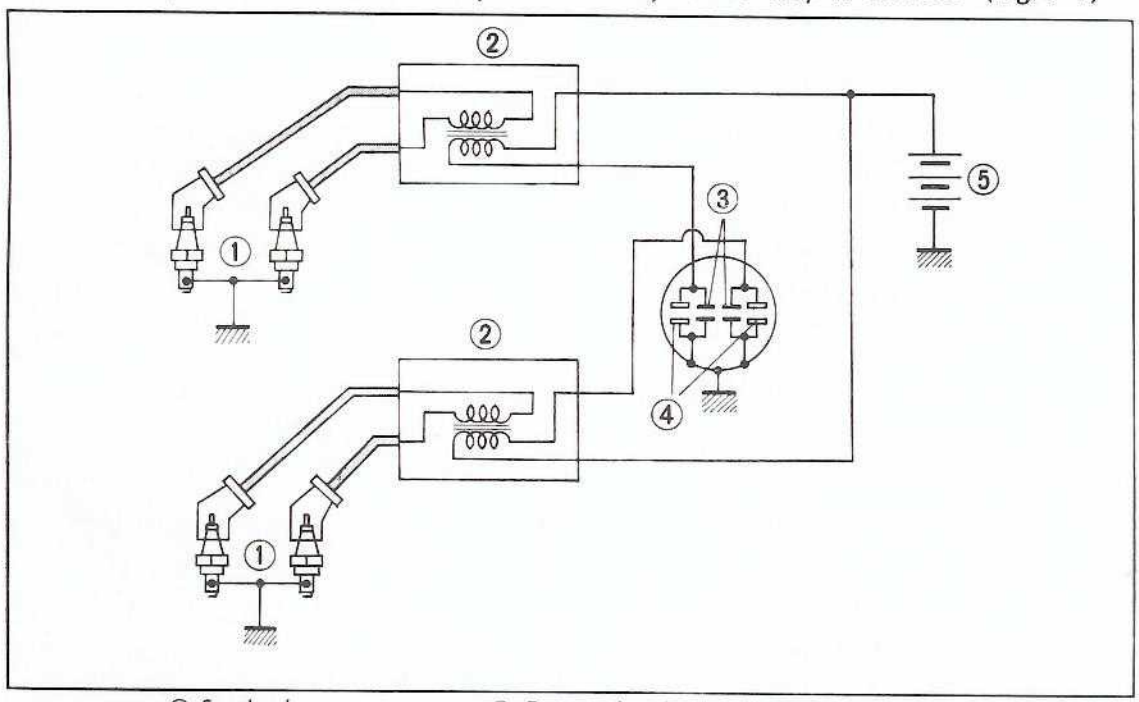
7-1 GENERAL DESCRIPTION

DESCRIPTION

The ignition system consists of two ignition coils, two contact breakers, four spark plugs, an ignition switch and a battery.

The current from the battery flows through the primary winding of the ignition coil and circuit is completed by grounding through the contact breaker. There are two contact breakers which are located 180° apart.

One of the breakers furnishes the high voltage currents to spark plugs 1 and 4; the other breaker furnishes the current to plugs 2 and 3. The contact breakers ignites the spark plugs in alternate sequence to provide a firing sequence of 1, 2, 4 and 3. Since no distributor is used, the construction is simple and the system is easy to service. **(Fig. 7-1)**



① Spark plugs ② Ignition coil ③ Contact breaker ④ Condenser ⑤ Battery

Fig. 7-1

SPECIFICATIONS

Ignition coil make	Toyo Denso
Spark plug type	
Standard	NGK D-8 ES
Optional	NGK D-7 ES, D-10 E
Size	12 mm (thread diameter), 12.7 mm (reach)
Gap	0.024~0.028 in (0.6~0.7 mm)
Contact breaker make	Hitachi
Spring force	1.43~1.87 lb (650~850 g)
Point gap	0.012~0.016 in (0.3~0.4 mm)
Condenser capacity	0.24 μF ± 10%
Condenser insulator resistance	Over 10 M Ω (1,000 meger)
Spark advancer	
Crankshaft speed at start of advance	1,000~1,150 rpm
Crankshaft speed at full advance	2,300~2,500 rpm
Advance angle	35°

DIAGNOSIS

Item	Probable Causes	Remedy
Engine over heat	1. Ignition timing out of adjustment	Adjust ignition timing
Spark plug does not fire	1. Defective ignition coil 2. Defective spark plug	Replace Replace
Spark at points excessive Weak spark No spark	1. Defective condenser 2. Broken or shorted ignition high tension cord 3. Dirty spark plug electrodes	Replace Replace Clean spark plug electrodes

IGNITION TIMING TEST

An accurate timing test can be made by using a strobo timing light.

Follow the procedure below for checking timing with the service tester. (Tool. No. 07308-0010000)

1. Connect the power cord to the battery and ground the black ground cable. **(Fig. 7-2)**
2. Set the selector knob to TIMING.
3. Plug in the timing light cable and attach the high voltage cord to the No. 1 (or No. 4) spark plug head attachment.
4. Remove the point cover on the right side of the crankcase.
5. Start the engine and with the engine idling (850~950 rpm), point the strobo timing mark.

   The ignition timing is correct, if the F mark (1.4 cylinder) on the spark advancer is aligned to the timing mark. **(Fig. 7-3)**
6. Next, raise the engine speed above 2,500 rpm : if the timing index mark is between the two timing marks located at 23.5~26.5° ahead of the "F" mark, the timing for both idling and full advance is satisfactory.

If there is malfunction with the ignition timing even though the RPM is constant, the fault is probably with the spark advancer spring or a defect in the breaker points, therefore, the unsatisfactory parts should be repaired or replaced.

If it is necessary to make adjustment, perform the adjustment in accordance with the procedure described in service adjustment on page 91~92.

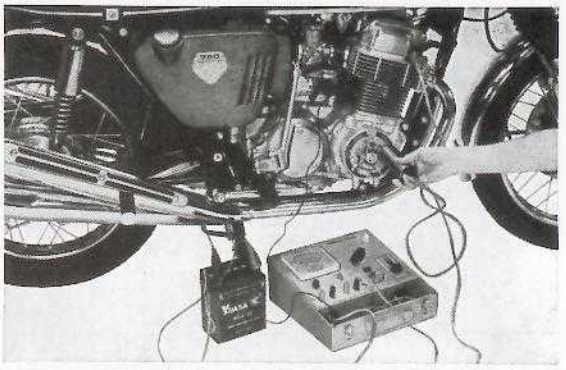


Fig. 7-2

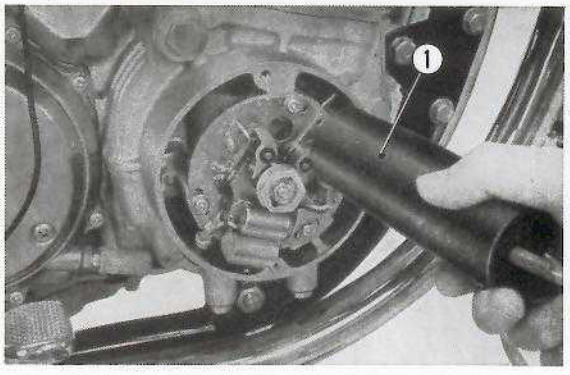


Fig. 7-3 Timing light

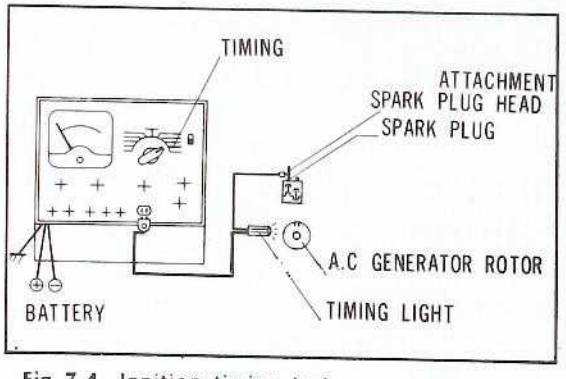


Fig. 7-4 Ignition timing test

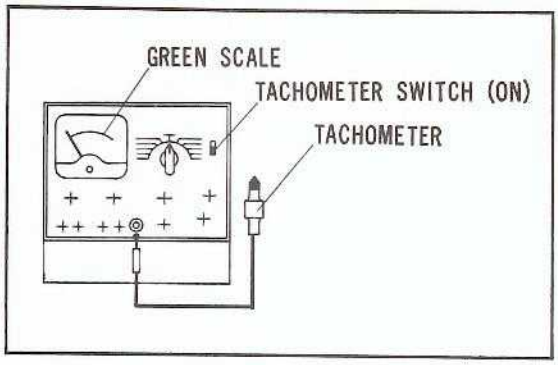


Fig. 7-5

7. The ignition timing for the No. 2 and 3 cylinders are also checked in the same manner described above.
8. The engine RPM is checked with a tachometer or a revolution counter located on the tester. Set the tachometer switch to the ON position, insert the tachometer cable, place the tachometer against the center of the spark advancer shaft and then read off the green scale.

7-2 IGNITION COIL

a. Description

The ignition coil of a primary coil with 380 turns of enameled and secondary coil with 15,000 turns wire wound around the primary coil, with an iron core of laminated silicon steel sheets in the center. Each secondary coil has two high tension cables that lead to two spark plugs. **(Fig. 7-6)**

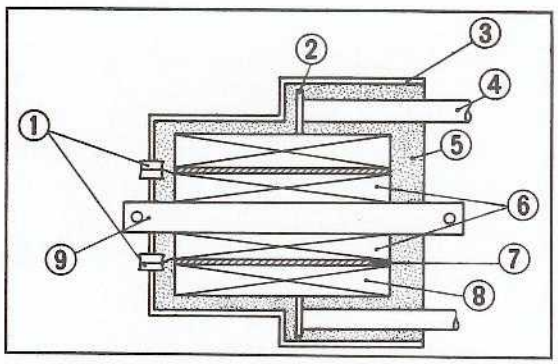


Fig. 7-6 ① Primary terminal ② High tension terminal ③ Case ④ High tesion cord ⑤ Synthetic resin ⑥ Primary coil ⑦ Bobbin ⑧ Secondary coil ⑨ Iron core

b. Disassembly

1. Open the seat and remove the fuel tank in accordance with section 6-3 b on page 74.
2. Disconnect the electrical leads (yellow, blue and black/white leads).
3. Unscrew the two ignition coil mounting bolts and then the ignition coil can be removed from the frame. **(Fig. 7-7)**

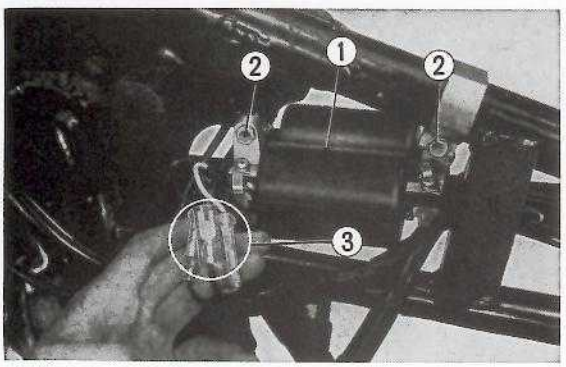


Fig. 7-7 ① Ignition coil ② Mounting bolts ③ Leads connectors

c. Inspection

1. Bench testing ignition coil

Check the ignition coil using the service tester by following the procedure below. **(Fig. 7-8, 9)**

Connect the power cord to the 12 V battery and ground the black ground cord. Connect the ignition primary cord plug to the tester and connect the opposite terminal end to the primary terminal of the coil. Connect red test lead to the black terminal of the ignition coil ; the white lead to the yellow cord of the left coil (right coil to the blue cord).

Connect the high tension cable (red) to the secondary coil terminal.

Position the selector knob to COIL TEST. Adjust the three point spark tester to the maximum distance spark is maintained and then note this distance. The coil is satisfactory if the distance is greater than **0.28 in (7 mm).**

Note :

Spark condition as shown in Fig. 7-9 A is normal. Fig. 7-9 B shown the spark condition when the test leads are connected in reverse at the ignition coil.

Fig. 7-8 Ignition coil test

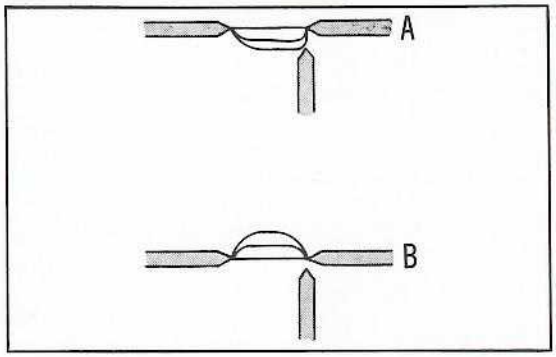


Fig. 7-9

2. Testing the coil without removing

External battery is not required. Connect the tester ground lead (black) to the motorcycle frame. Remove the spark plug cap and install the spark plug head attachment on the spark plug. Connect high voltage tester cable to the attachment and then reinstall the spark plug cap.

Turn the ignition switch to the ON position use the kick starter or starting motor to turn over the engine and determine the maximum sparking distance of the coil.

3. Check the high tension cord for damage and deterioration, if it is found to be improper condition, replace it with new one.

d. Reassembly

1. Mount the ignition coil assembly on the frame with the two bolts.
2. Connect electrical leads (yellow, blue and black/white leads) to wire harness leads.
3. Install the fuel tank carefully not to damage the electrical leads or cables.

7-3 SPARK PLUG

a. Description

The main parts of the spark plug are the electrodes, insulator and the plug body.

Standard spark plug used is NGK **D-8ES**.

However, the following types are also available for different operating condition **(Fig.7-10)**

Hotter type	D-7 ES
Standard	D-8 ES
Colder type	D-10 E

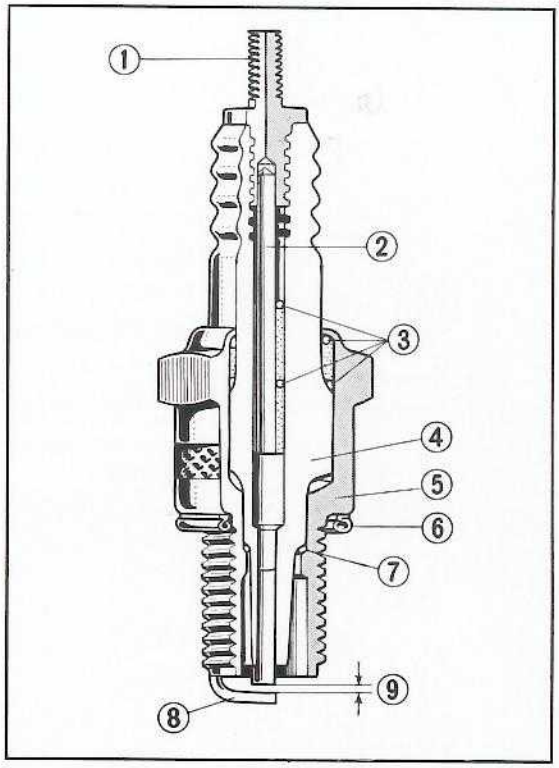


Fig. 7-10 ① Terminal ② Center electrode ③ Wire packing ④ Insulator ⑤ Shell ⑥ Gasket ⑦ Lower sealing ⑧ Ground electrode ⑨ Spark gap

b. Disassembly

1. Remove any foreign matter from around the spark plugs by blowing out with compressed air.
2. Detach the high tension cord cap and remove the spark plug with the special wrench provided in the tool kit.

c. Inspection

1. Inspect each spark plug for badly worn electrodes, broken or cracked procelain insulator. The spark plug conditions and corrective action procedure is shown below.

Spark plug condition	Cause	Corrective action
Electrode coated with carbon deposit 	1. Too rich a fuel 2. Excessive idling 3. Poor quality gasoline 4. Clogged air cleaner 5. Use of cold spark plug	Adjust carburetor Adjust idling Use good quality gasoline Service the air cleaner Use proper heat range plug (hot type)
Electrode fouled with oil 	1. Worn piston ring 2. Worn piston and cylinder 3. Excessive clearance between valve guide and valve stem	Replace piston ring Replace piston or cylinder Replace valve guide or valve
Electrode overheated or burnt 	1. Use of hot spark plug 2. Engine over heating 3. Improper ignition timing 4. Loose spark plug or damaged spark plug hole thread 5. Too lean a fuel mixture	Use proper heat range plug Readjust ignition timing Retighten plug or replace cylinder head Adjust carburetor
Damage	Spark plug over torqued	Replace with a new spark plug

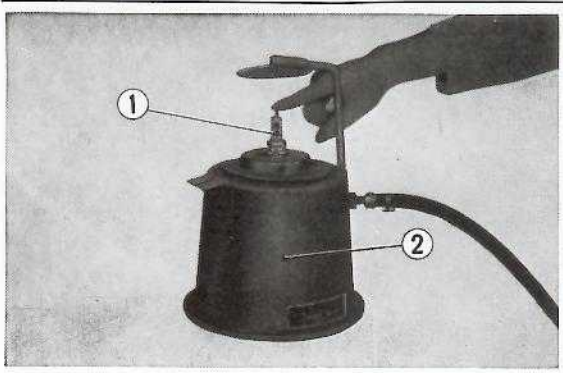


Fig. 7-11 ① Spark plug
② Spark plug cleaner

2. Plug cleaning is best performed by spark plug cleaning set, however, lacking this set, a satisfactory job can be performed by using a wire brush or stiff pin to remove the deposits and washing in gasoline. **(Fig. 7-11)**

3. After completing inspection of section 2 adjust spark plug gap to **0.024~0.028 in (0.6~0.7 mm)**. The gap can be measured by a thickness gauge. The adjustment is made by bending the negative (ground) electrode **(Fig. 7-12)**
4. Inspect the spark plug hole threads and clean before installing plugs. Corrosion deposits can be removed with a 12 mm × 1.25 mm pitch thread tap or by using a small wire brush.

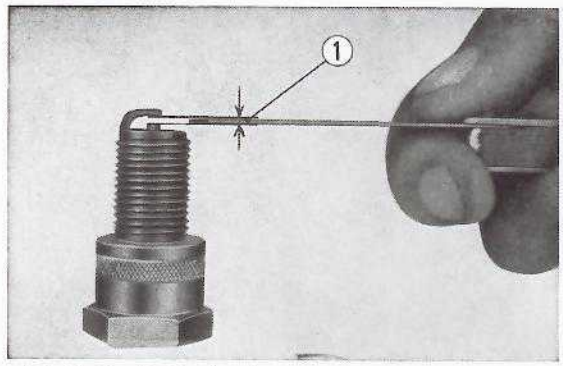


Fig. 7-12 ① Spark plug gap

Note :

1. Never use an improper heat range spark plug.

2. Do not attempt to dry or remove soot from the spark plug by burning.

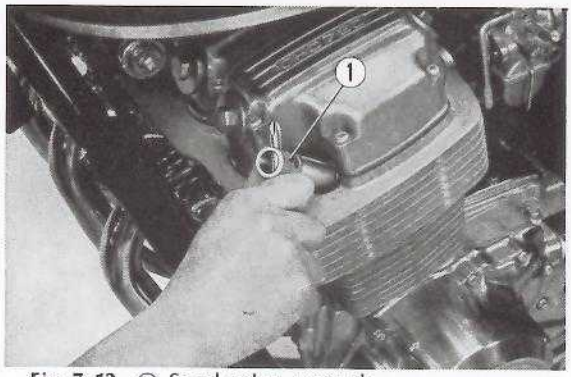


Fig. 7-13 ① Spark plug wrench

d. Reassembly

1. Install the spark plug in the reverse order of disassembly.

Note :

1. The spark plugs in the No. 2 and No. 3 cylinders are difficult to reach and if care is not taken during the removal and installation of these spark plugs, it is possible for the plugs to be dropped and become lodged in the cylinder head cavities. (Fig. 7-13)

2. All spark plugs must be properly torqued. Loose plug will not properly dissipate heat and become very hot, causing possibly damage to the engine.

7-4 CONTACT BREAKER AND CONDENSER

a. Description

The contact breaker is mounted in the compartment which is at the right end of the crankshaft and consits of a base plate, two breaker arms, fixed and movable points, primary terminal, spring and lubricating felt.

The two condensers are also located on the contact breaker base.

The purpose of the condenser is to prevent unwanted sparking across the points. **(Fig. 7-14)**

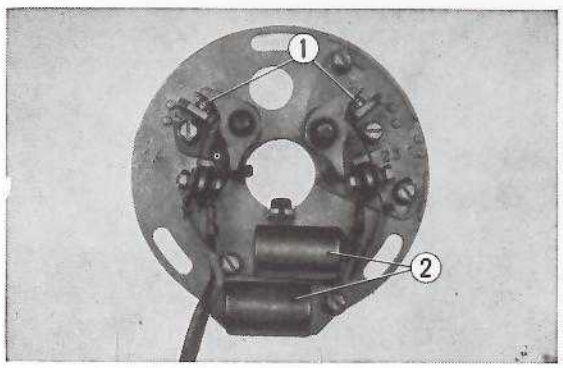


Fig. 7-14 ① Contact breaker
② Condenser

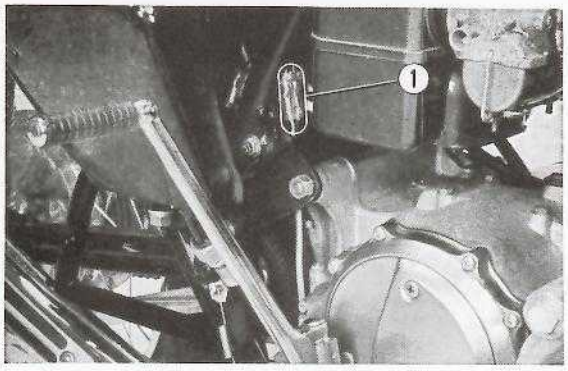


Fig. 7-15 ① Contact breaker lead

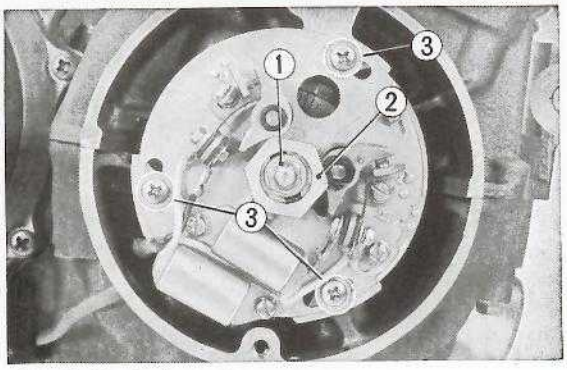


Fig. 7-16 ① 6 mm hex nut
② Special washer
③ Contact breaker setting screws

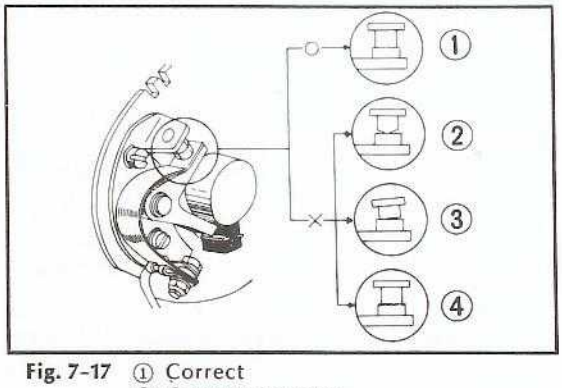


Fig. 7-17 ① Correct
② Contact is worn
③ One side contact
④ Contamination of the contact

b. Disassembly

1. Remove the point cover.
2. Disconnect the lead connectors (yellow and blue leads) at the center of the frame, right lower side. **(Fig. 7-15)**
3. Unscrew the 6 mm hex nut and remove the contact breaker assembly. **(Fig. 7-16)**
4. The condenser can be removed from the breaker base.

c. Inspection

1. Checking the contact breaker point.
   If oil is left for a long time without removal, a hard film will be formed and eventually result in misfiring.
   Therefore, remove oil with trichloroethylene from the contact breaker point.
   a. Dress the pitted or dirty point with either a point file or emery paper, however, if the condition is relatively severe, remove the contact breaker arm and dress the points on both the arm and the stationary point with an oil stone, making sure that the points will have parallel contact when assembled. The point gap should be adjusted to **0.012~0.016 in (0.3~0.4 mm)**. **(Fig. 7-17)**
   b. Replace the breaker arm if the pivot hole worn excessively.
   c. Always maintain the contact breaker terminal and insulators as well as the wiring free from water, oil, and foreign matters.
   d. After the points have been dressed, clean the surfaces with a clean rag soaked in small amount of trichloroethylene, further, oil or other foreign matters should not be permitted on the breaker assembly.
3. Condenser capacity
   Measure the condenser capacity with the service tester. If the capacity is **0.22~0.26** μF, it is satisfactory. Refer to the service tester operating instruction leaflet for the measuring procedure.

d. Reassembly

1. Assemble the each component parts on the contact breaker base plate.
2. Install the contact breaker assembly with the three setting screws.

3. Install the advancer shaft special washer, 6 mm washer and tighten 6 mm hex nut. **(Fig. 7-18)**
4. Connect the electrical leads.
5. When attempting the ignition timing adjustment, both the ignition timing and the breaker points gap should be adjusted.

(1) Contact breaker point gap **(Fig. 7-19)**

Before adjusting ignition timing the breaker points must be checked.

Open the spring loaded contact breaker point by a finger and check surface condition.

If the points are erroded, pitted or burnt, dress with a point file and follow by polishing with unwaxed paper to remove any file dust.

Next, turn the crankshaft in the clockwise direction hold at the position where the point gap is at maximum opening and check the gap by inserting a filler gauge. The standard gap is between 0.012 to 0.016 in (0.3~0.4 mm).

To adjust the point gap, loosen the contact breaker plate locking screw and move the contact breaker to the right or left until the proper gap opening is obtained and then tighten the locking screw. **(Fig. 7-19)**

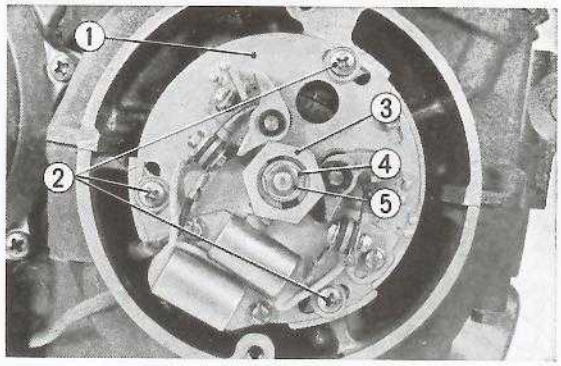


Fig. 7-18 ① Contact breaker assembly
② Contact breaker setting screws
③ Advancer shaft special washer
④ 6 mm washer ⑤ 6 mm hex nut

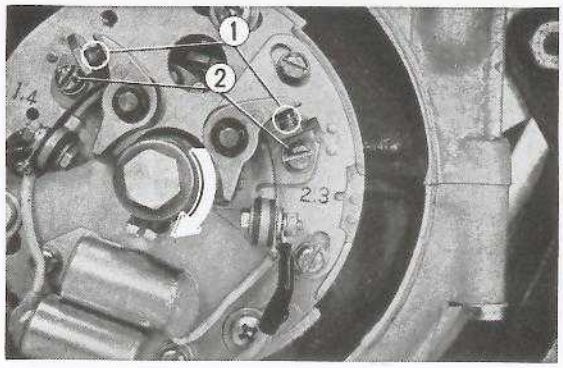


Fig. 7-19 ① Contact breaker points
② Contact breaker plate locking screw

(2) Ignition timing adjustment

After testing the ignition timing with the service tester, it is found to adjust the ignition timing, perform the following manner.

a. Start adjustment from the 1.4 breaker point indicated on the base plate.

b. Remove the contact breaker wire terminal unscrewing the retaining nut and connect one end of continuity light to the point terminal and hook the negative terminal to the crankcase.

Rotate the crankshaft in the clockwise direction slowly to align the "F" (1.4 cylinder) timing mark to the index mark. At this moment the breaker point should just to open while the continuity light flickers or goes off.

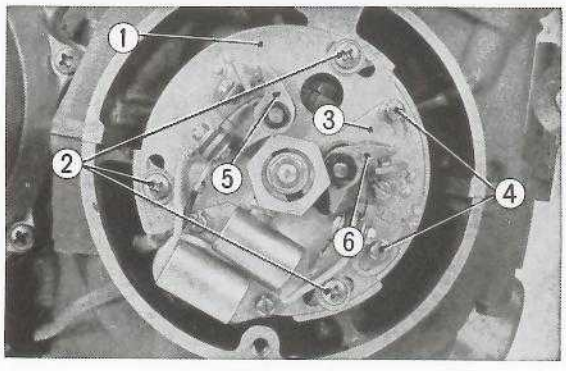


Fig. 7-20 ① Contact breaker base plate
② Base plate setting screws
③ Right base plate
④ Right base plate setting screws
⑤ 1.4 cylinder breaker points
⑥ 2.3 cylinder breaker points

If point opening moment is incorrect, adjustment should be made in the following manner.

c. Loosen the three base plate setting screws ② **(Fig. 7-20)** and carefully rotate the base plate until the continuity light flickers. Tighten base plate setting screws. Rotating the base

plate clockwise will retard ignition timing, counterclockwise rotation will advance ignition timing.

d. Next connect continuity light to 2.3 cylinder breaker points. Rotate the crankshaft 180° in the clockwise direction and align the "F" (2.3 cylinder) timing mark to the timing index mark.

Adjustment may be done in the same manner as mentioned in section a and b by loosening two base plate locking screws ④.

e. Recheck the contact breaker points gaps and recheck the ignition timing with service tester on page 85~86.

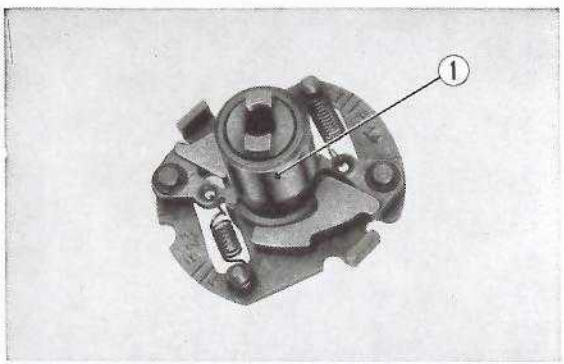


Fig. 7-21 ① Spark advancer

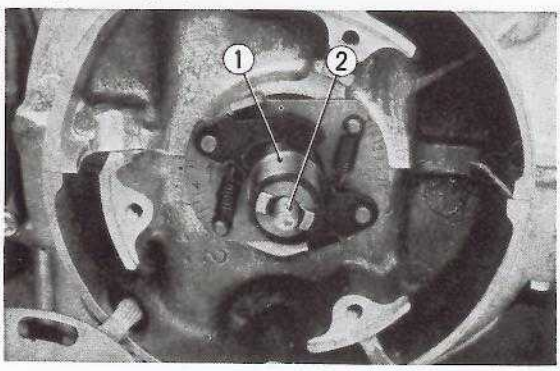


Fig. 7-22 ① Spark advancer
② Spark advancer shaft

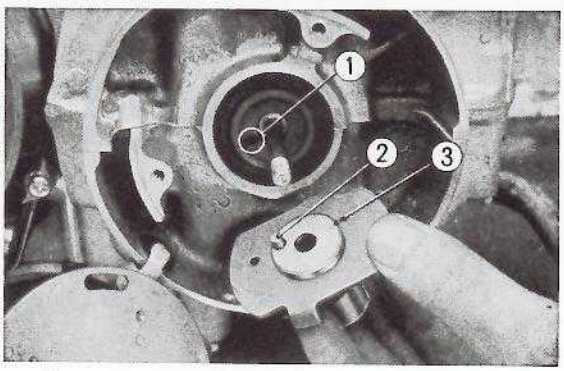


Fig. 7-23 ① Pin hole
② Spark advancer pin
③ Spark advancer

7-5 SPARK ADVANCER

a. Description

Centrifugal advance type mechanism is used to advance the spark.

As the speed of the engine increases, the centrifugal force of the advancer weight overrides the force of the spring and starts to move outward, moving the point cam in the direction of rotation, in other words, advances the point cam to produce an early ignition.

The advancer assembly is mounted on the crankshaft inboard of the contact breaker point assembly. **(Fig. 7-21)**

b. Disassembly

1. Remove the contact breaker in accordance with section 7-4. b on page 90.
2. Remove the spark advancer from the spark advancer shaft. **(Fig. 7-22)**

c. Inspection

Check the spark advancer spring for loss of tension and also the advancer pin for excessive wear ; replace any part found worn excessively or defective.

d. Reassembly

1. Install the spark advancer to make sure that the pin is inserted into the pin hole at the end of the crankshaft. **(Fig. 7-23)**
2. Install the contact breaker assembly in the reverse procedure of disassembly.

CHARGING SYSTEM

GROUP 8

CONTENTS

8-1 GENERAL DESCRIPTION

DESCRIPTION

The charging system for the CB 750 is made up of the excited field 3-phase alternator, rectifier, voltage regulator and the fuse. The alternator consists of the battery excited field coil, stator coil and the rotor; it does not, however, contain a slip-ring or brushes.

In order for the stator coil to produce a constant voltage, the current from the battery to produce the exciter field is regulated to very close limits by the dual contact regulator. The output from the alternator is rectified by the silicon rectifier before being sent to recharge the battery.

The regulator has two different types of function depending upon the charge condition of the battery.

The electrical current from the battery flows through the switch and into the regulator. When the battery voltage is lower than normal (less than 13.5V at the battery terminal), the current flowing through the armature away from the upper contact and the battery to the generator field coil. The strength of the magnetic field is depended upon the strength of the battery voltage. The current field coil is 1.6 A at a battery terminal voltage of 12 V. This produces an output voltage of corresponding strength which is used to charge the battery. **(Fig. 8-1)**

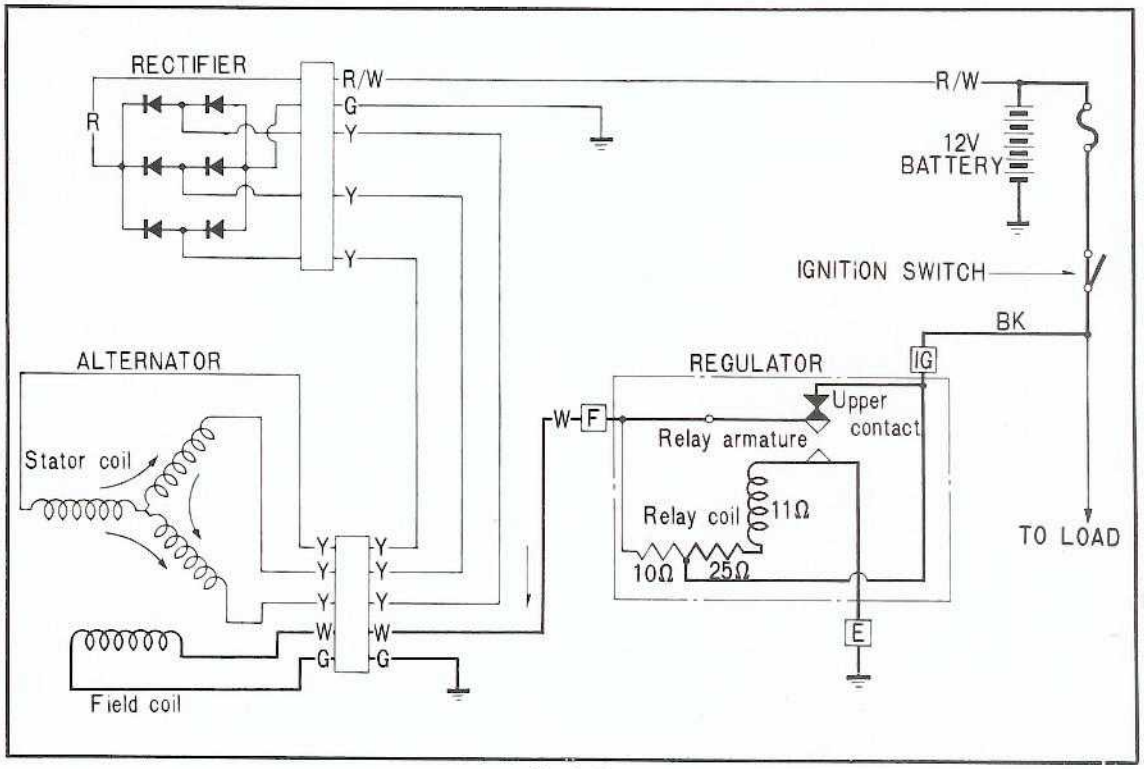


Fig. 8-1

When the battery voltage exceeds approximately 14.5 V 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)**

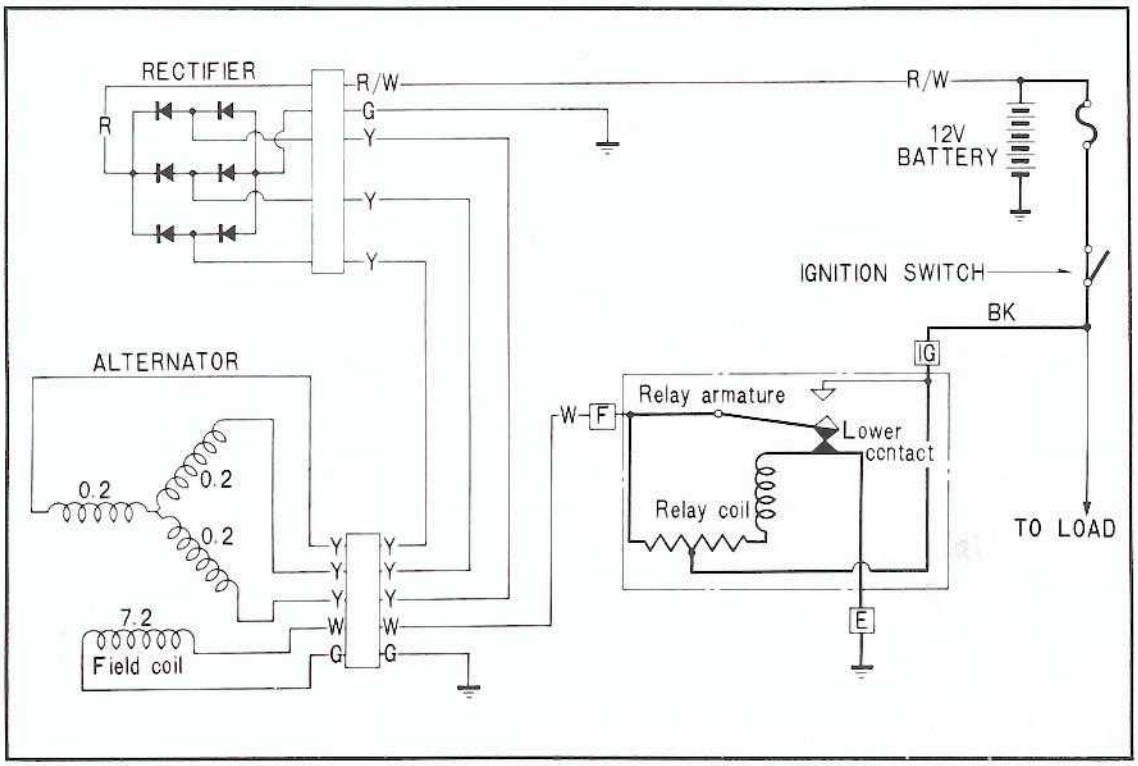


Fig. 8-2

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	1. Broken wire or short, loose connection.	Repair or replace
	2. Defective coil due to short, grounding, open circuit.	Replace
	3. Defective 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, retighten
	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
	• Defective silicon diode.	Replace
	3. Regulator	
	• Voltage below specified value at no load.	Readjust
	• Dirty or pitted points.	Polish
	• 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
	• Defective grounding.	Provide proper ground
	• Broken coil lead wire.	Repair, 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 key switch.	Replace
	• Dirty points.	Clean

CHARGING TEST

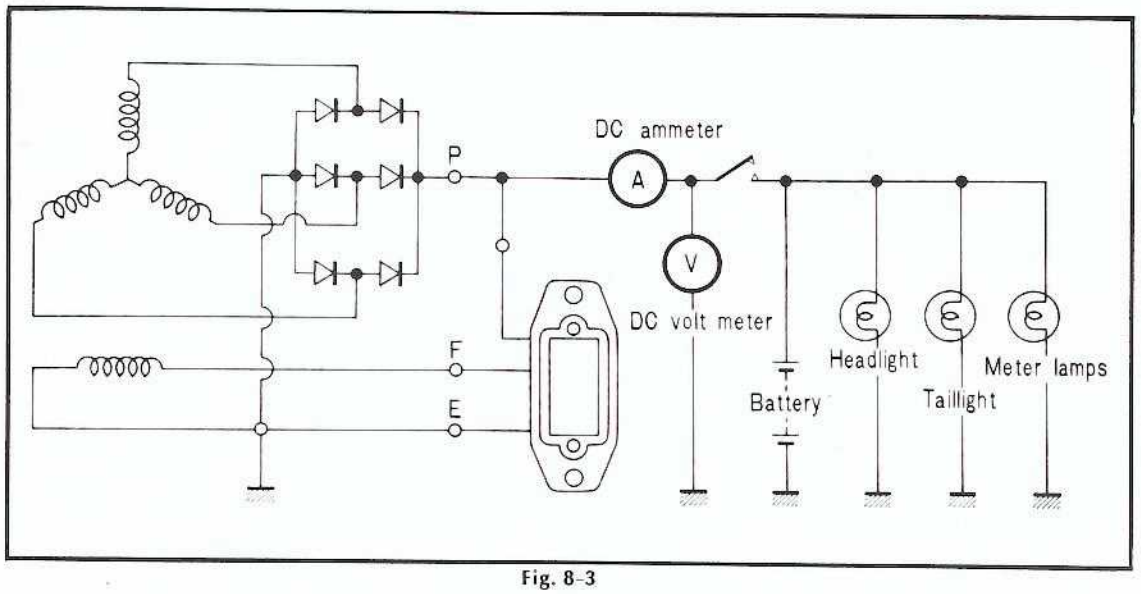


Fig. 8-3

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) / Charging current (A)	1,000	2,000	3,000	4,000	5,000	6,000	7,000	8,000
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).**

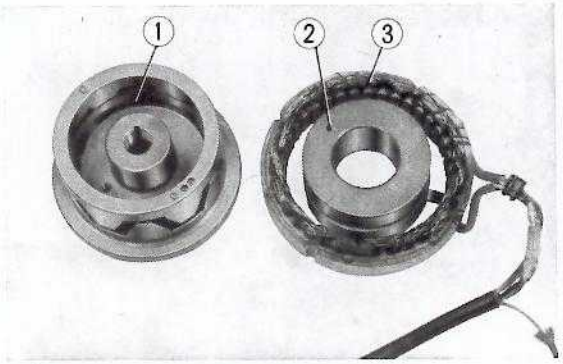


Fig. 8-4 ① Generator rotor ② Field coil ③ Stator coil

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).**

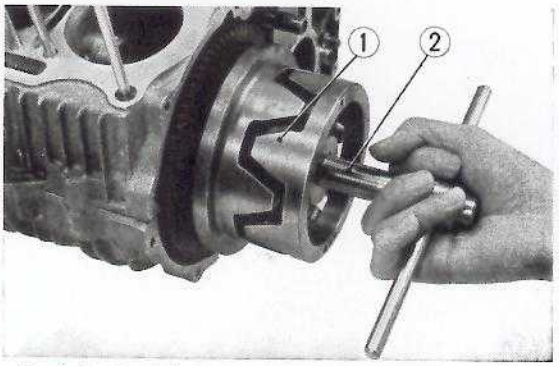


Fig. 8-5 ① A.C generator rotor ② Rotor puller

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)**

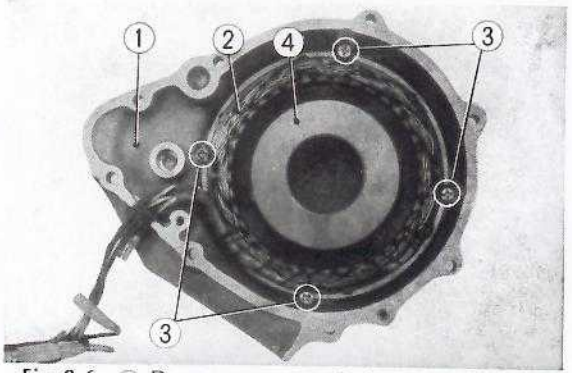


Fig. 8-6 ① Dynamo cover ② Stator coil ③ 6mm cross screws ④ Field coil

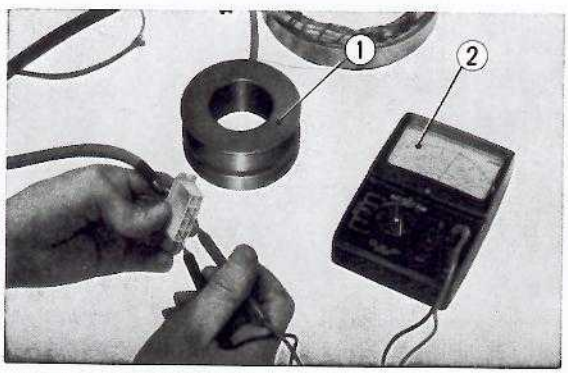


Fig. 8-8 ① Field coil ② Tester

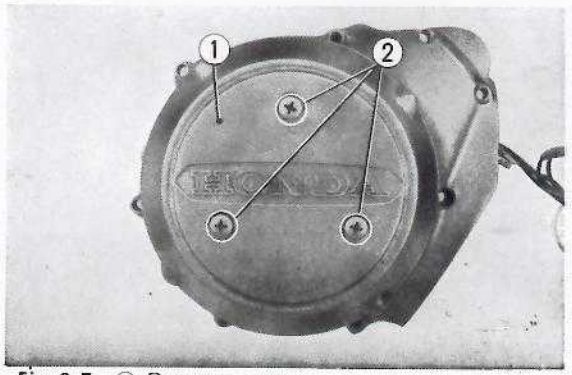


Fig. 8-7 ① Dynamo cover ② 6 mm cross screws

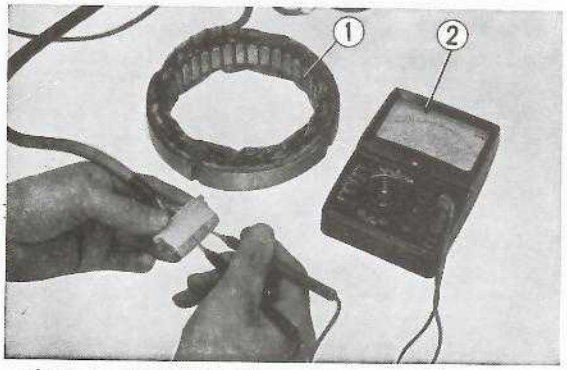


Fig. 8-9 ① Stator coil
② Tester

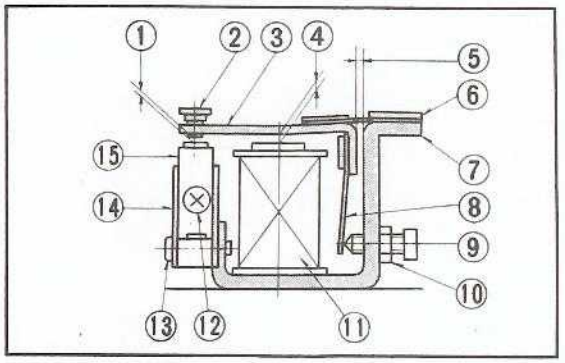


Fig. 8-10 ① Point gap
② Lower contact
③ Armature
④ Core gap
⑤ Yoke gap
⑥ Spring
⑦ Yoke
⑧ Adjusting spring
⑨ Voltage adjusting screw
⑩ Lock nut
⑪ Coil
⑫ Point gap adjusting screw
⑬ Core gap adjusting screw
⑭ Contact set
⑮ Upper contact

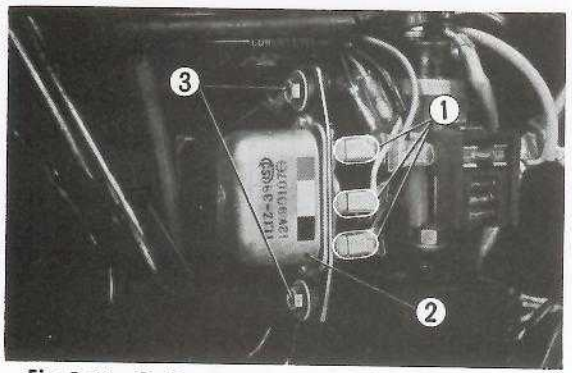


Fig. 8-11 ① Connectors
② Regulator
③ Regulator setting bolts

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 0.2 Ω. **(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 if 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 cheking 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)**

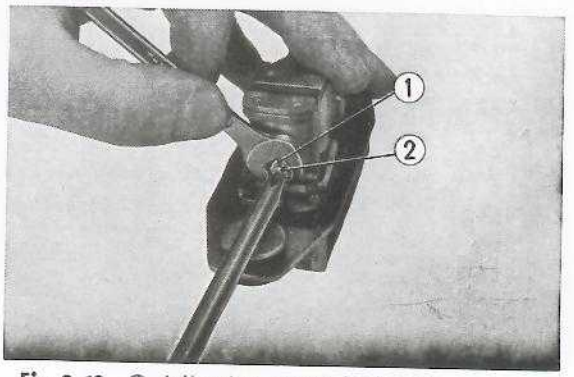


Fig. 8-12 ① Adjusting screw lock nut
② Adjusting screw

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 0.5 V 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 then 0.5 V 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.

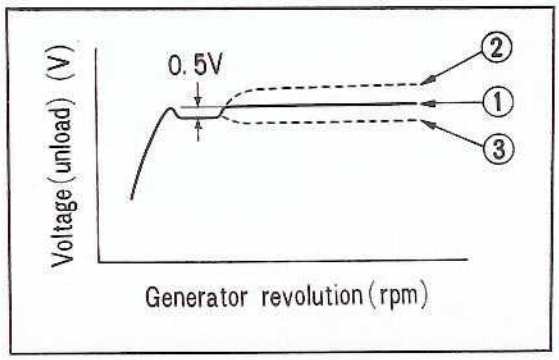


Fig. 8-13 ① Standard ③ Narrow core gap
② Wide core gap

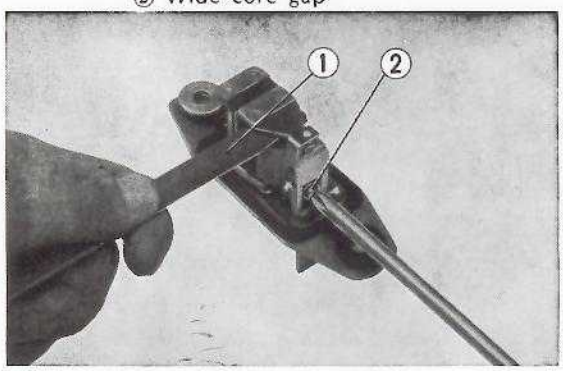


Fig. 8-14 ① Thickness gauge
② Core gap adjusting screw

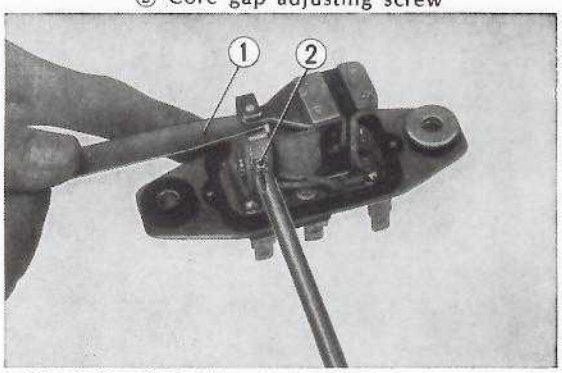


Fig. 8-15 ① Thickness gauge
② Point gap lock screw

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)**

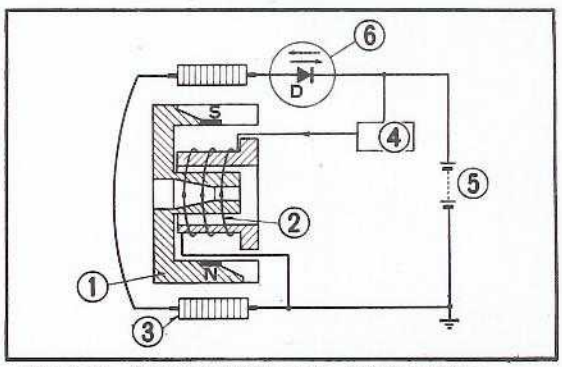


Fig. 8-16 ① Generator rotor ④ Regulator
② Field coil ⑤ Battery
③ Stator coil ⑥ Silicon rectifier

b. Disassembly

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

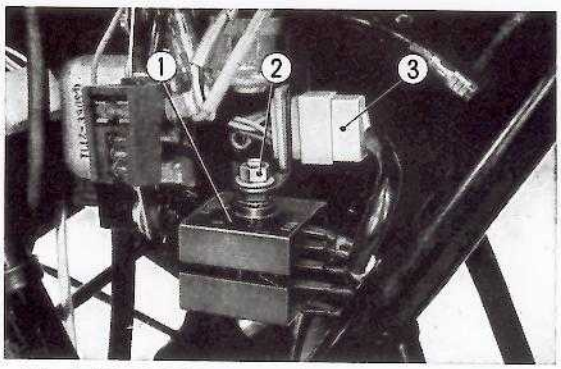


Fig. 8-17 ① Silicon rectifier ③ Connector
② Rectifier setting nut

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 countinuity 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.

Fig. 8-18

   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.

STARTING SYSTEM

GROUP 9

CONTENTS

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)**

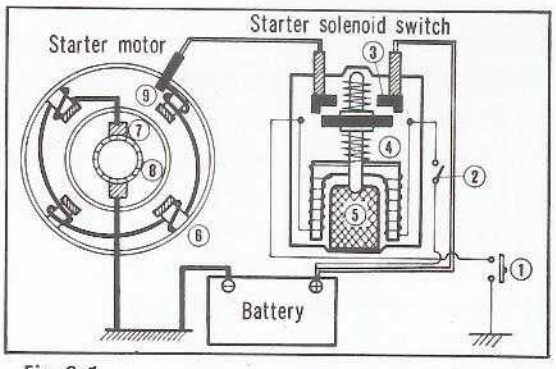


Fig. 9-1

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

SPECIFICATIONS

Starting motor Rated voltage Rated output Rated operation	 12V 0.6kW 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. 35A	120A	Max. 280A
Torque	—	Min. 0.12kg-m	Min. 0.32kg-m
Revolution	11,000~22,000rpm	Min. 3,200rpm	—
Primary reduction ratio Secondary reduction ratio Total reduction ratio	4.7 : 1 4.69 : 1 22.04 : 1		
Starter magnetic switch Rated voltage Operating voltage	 12V 7.5V		

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

DIAGNOSIS

Trouble	Probable Causes	Remedy
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

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)**

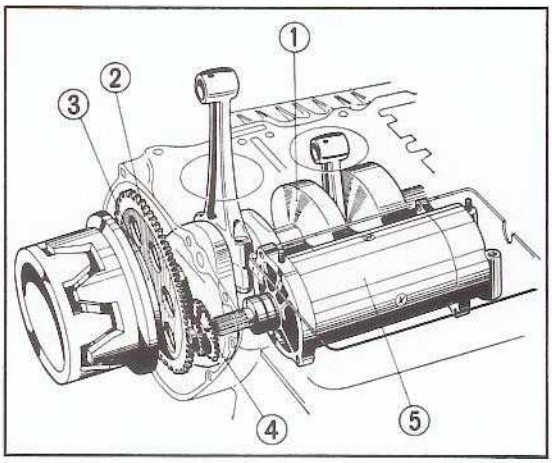


Fig. 9-2 ① Crankshaft
② Starting clutch gear
③ Starting clutch
④ Starting motor reduction gear
⑤ Starting motor

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)**

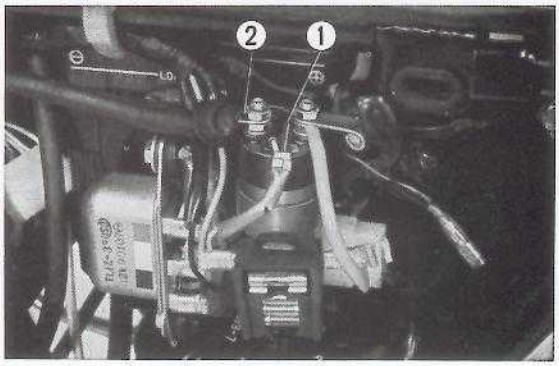


Fig. 9-3 ① Magnetic switch
② Starting motor cable

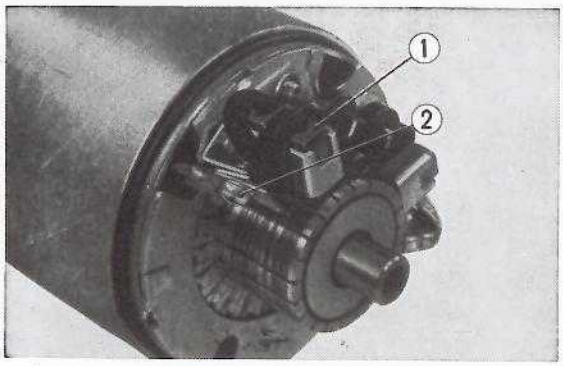


Fig. 9-5 ① Brush ② Brush mountting screw

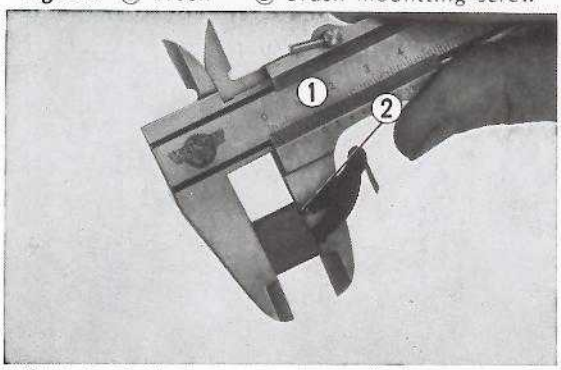


Fig. 9-6 ① Vernier caliper ② Carbon brush

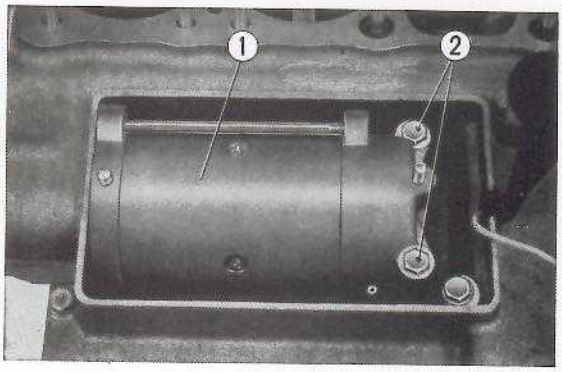


Fig. 9-4 ① Starting motor
② Motor setting bolts

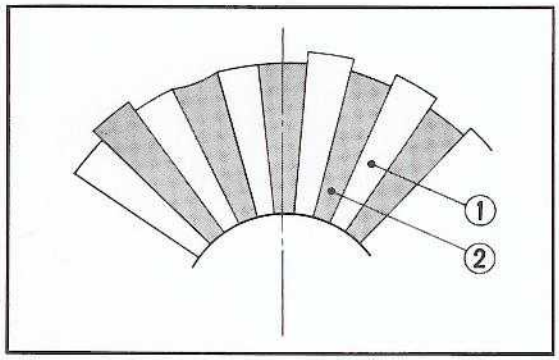


Fig. 9-7 ① Commutator
② Mica

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.

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.

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

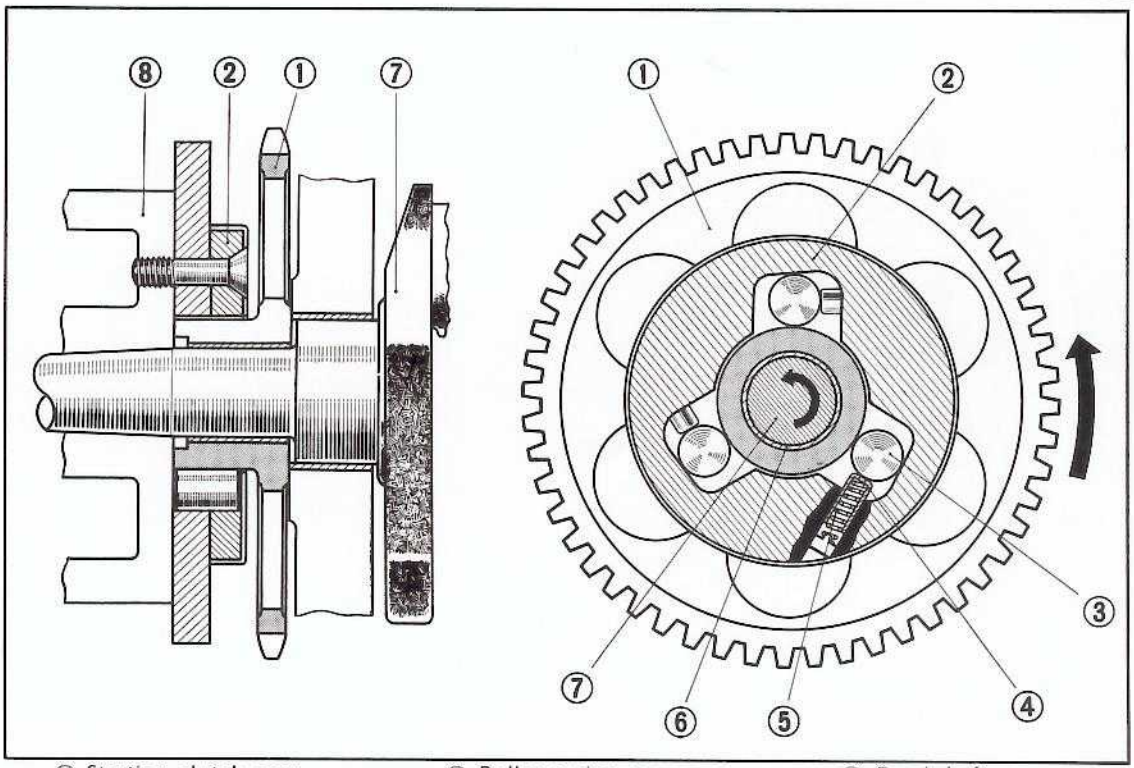
Perform the disassembly in accordance with 3-6 b on page 46.

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.



① Starting clutch gear
② Starting clutch
③ 15 mm × 13 roller
④ Roller spring cap
⑤ Roller spring
⑥ Bush
⑦ Crankshaft
⑧ AC generator rotor

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)**

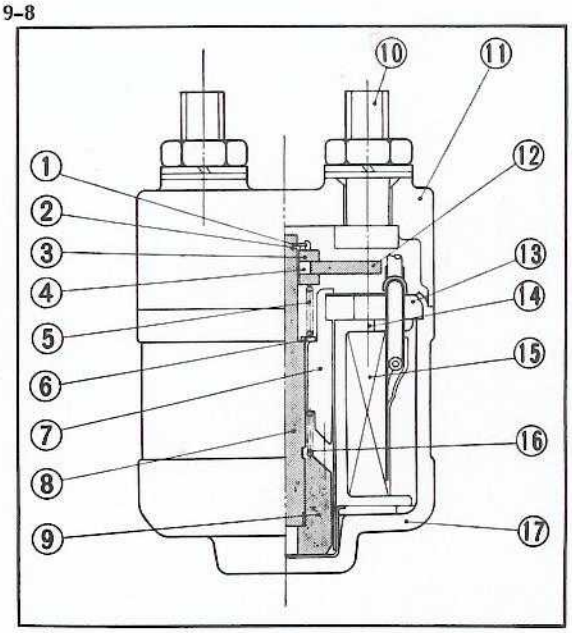


Fig. 9-9

① Stopper
② Stopper holder
③ Insulation washer
④ Insulation collar 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

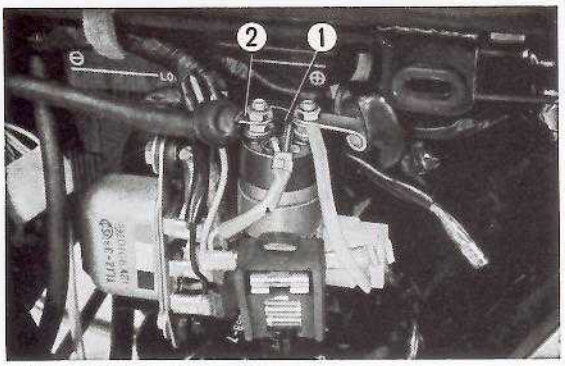


Fig. 9-10 ① Magnetic switch
② Starting motor cable

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

CONTENTS

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 obserbed.

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.	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.	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 ⊕ and ⊖ 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.

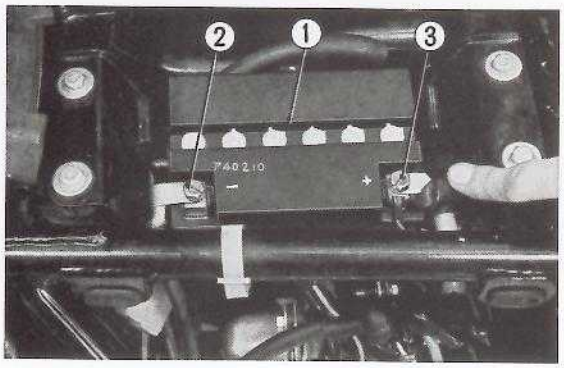


Fig. 10-1 ① Battery ③ ⊕ terminal
② ⊖terminal

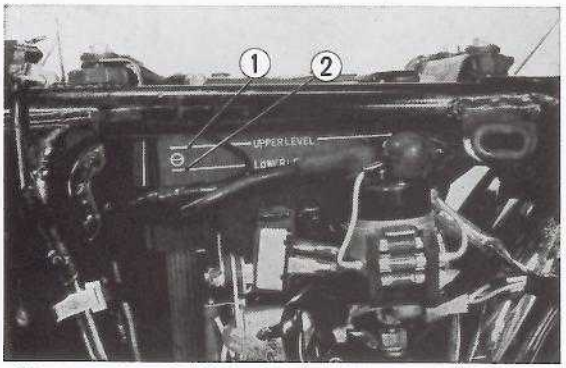


Fig. 10-2 ① Upper level mark
② Lower level mark

10-2. REPAIRING PROCEDURE

a. Disassembly

1. Raise the seat and remove the battery band from the battery.
2. Disconnect the ground ⊖ negative cable connection first and the positive ⊕ 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 eletrolyte 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)**

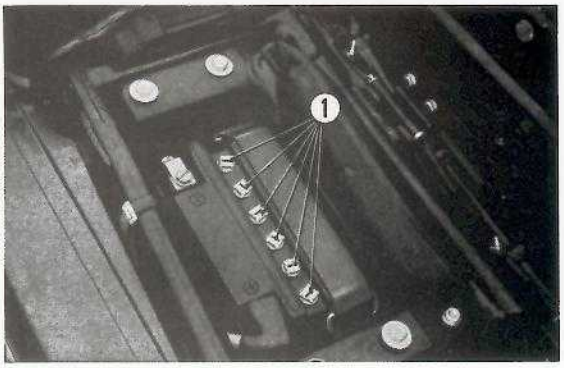


Fig. 10-3 ① Battery cell caps

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)**

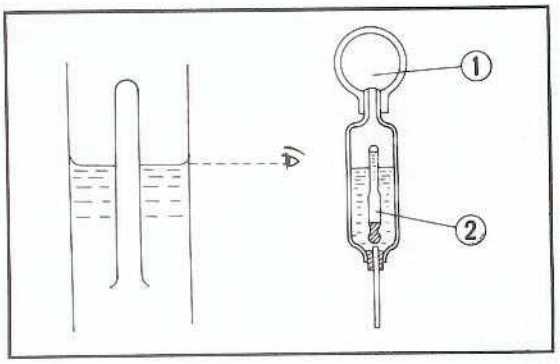


Fig. 10-4 ① Hydrometer
② Float

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)**

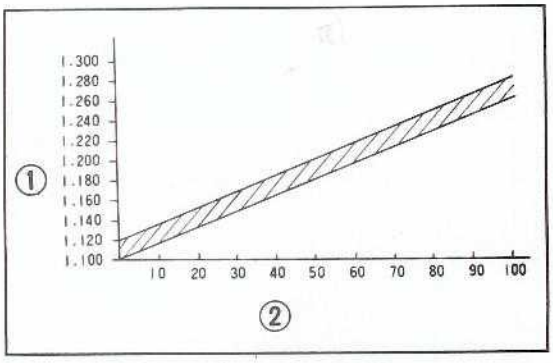


Fig. 10-5 ① Specific gravity (20°C)
② Residual capacity (%)

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.

$$S\,20 = St + 0.0007\ (t - 20)$$

Where:

S 20 = Specific gravity of the electrolyte corrected to 68°F (20°C)
St = Specific gravity of the electrolyte measured temperature, t°C
t = Temperature of the measured electrolyte

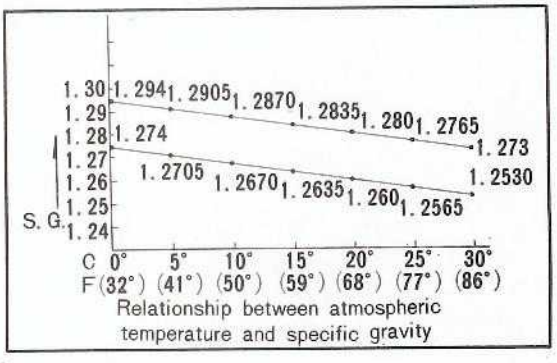


Fig. 10-5-1

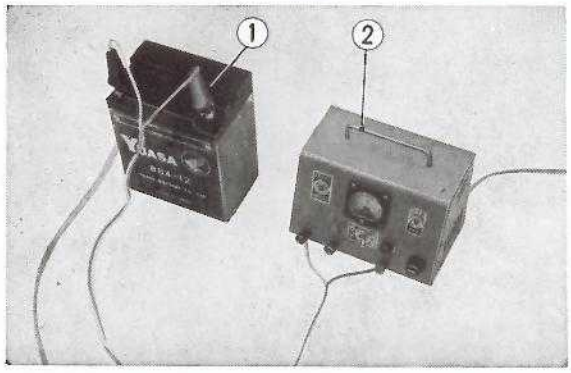


Fig. 10-6 ① Battery ② Battery charger

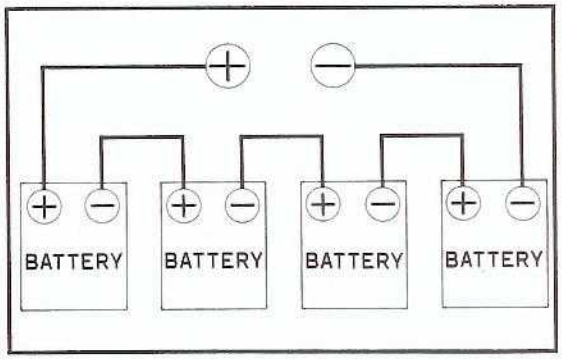


Fig. 10-7

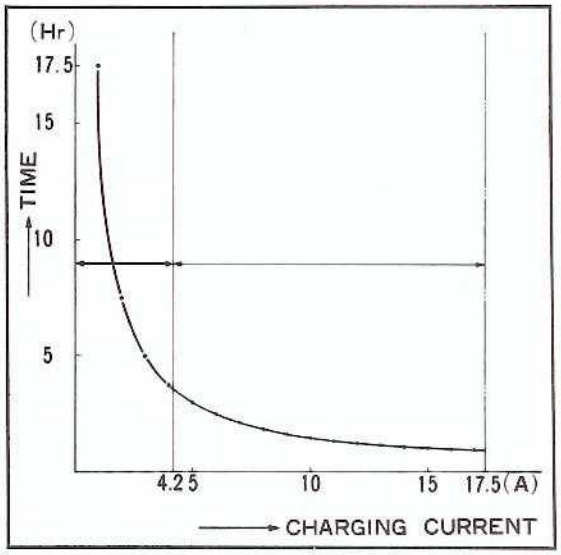


Fig. 10-8

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 ⊕ and the negative battery terminal ⊖ 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 16 (15)+16 (15)+16 (15) or 48 (or 45) 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 (14AH×1.25=17.5AH). 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, 1.4A×3=4.2A).

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)**

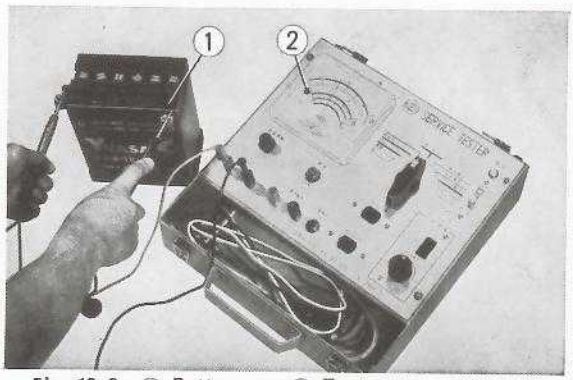


Fig. 10-9 ① Battery ② Tester

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.

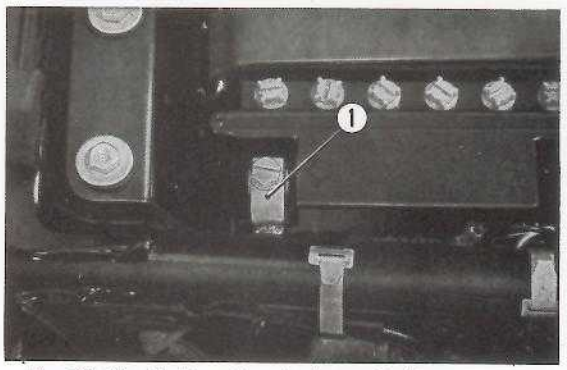


Fig. 10-10 ① Negative (−) terminal

STEERING AND FRONT SUSPENSION

GROUP 11

CONTENTS

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 10W-30 or its equivalent
Oil capacity	7.0~7.3 ozs. (220~230 cc)

Item	Standard value	Serviceable limit
Front cusion 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)**

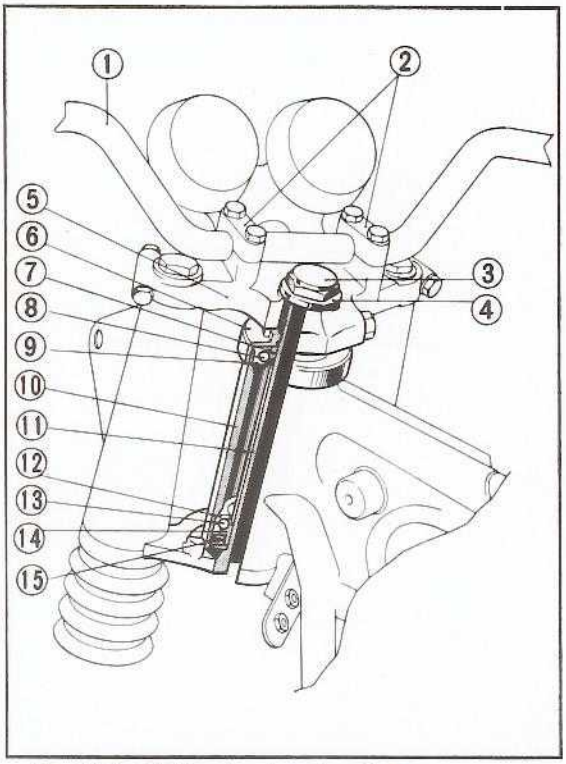


Fig. 11-1 ① Steering handle pipe
② Handle pipe holder
③ Steering stem nut
④ Steering stem washer
⑤ Fork top bridge
⑥ Steering head top thread
⑦ Steering top cone race
⑧ Steel ball
⑨ Steering top ball race
⑩ Steering head
⑪ Steering stem
⑫ Steering bottom ball race
⑬ Steel ball
⑭ Steering bottom cone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

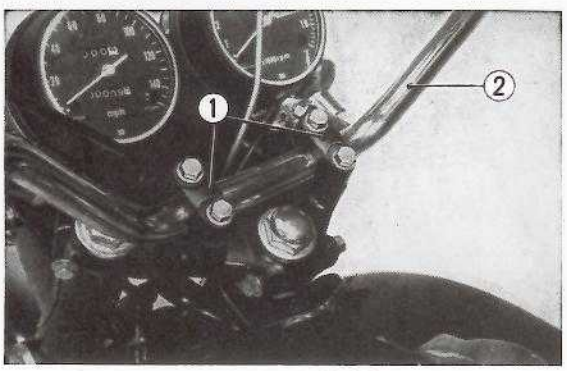


Fig. 11-3 ① Upper handle holders
② Handle bar

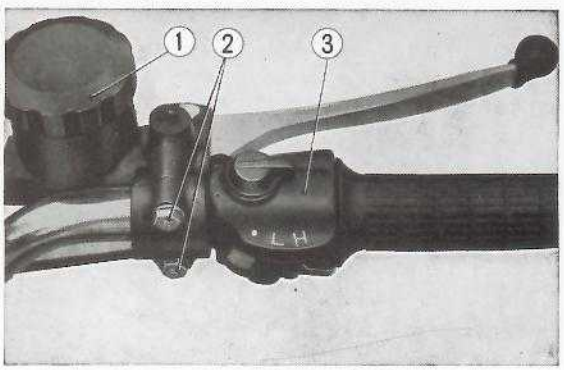


Fig. 11-2 ① Master cylinder body
② Cylinder body mounting bolts
③ Starter lighting ignition switch

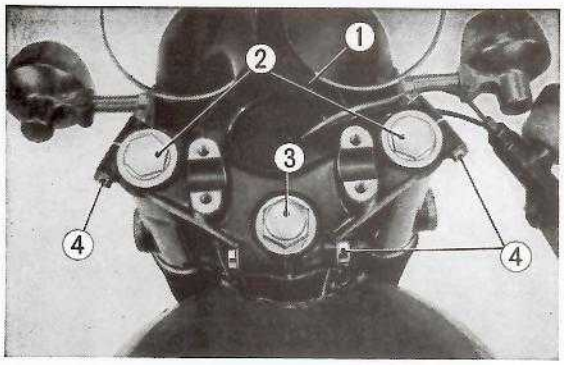


Fig. 11-4 ① Fork top bridge ③ Stem nut
② Front fork top bolts ④ 8mm setting bolts

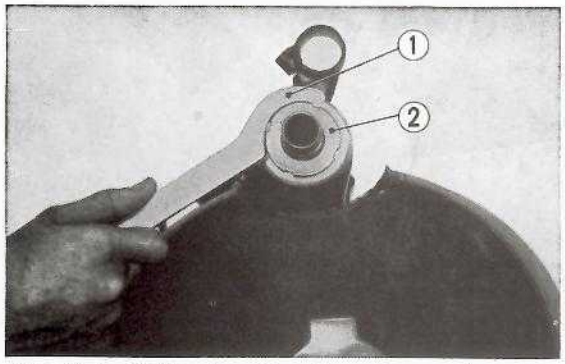


Fig. 11-5 ① Steering stem thread wrench
② Steering stem thread

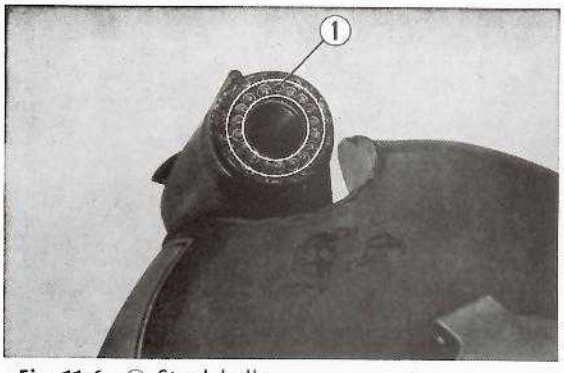


Fig. 11-6 ① Steel balls

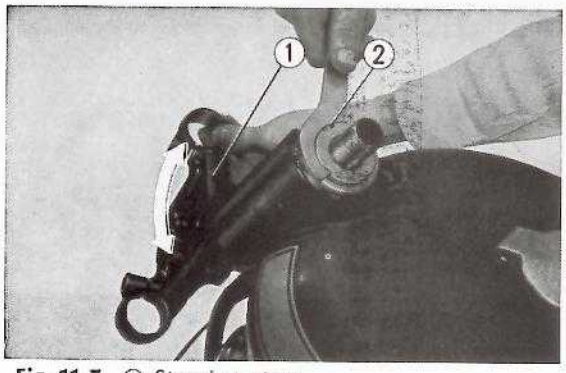


Fig. 11-7 ① Steering stem
② Steering stem thread

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 8 mm 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

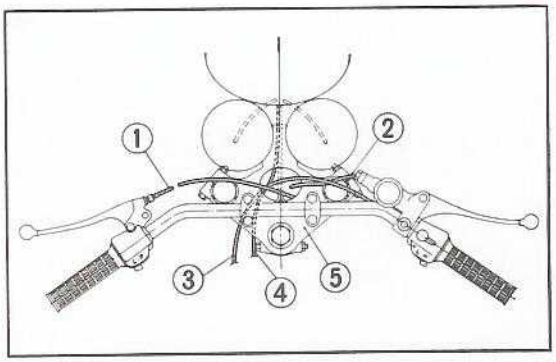


Fig. 11-9
① Clutch cable
② Front brake hose
③ Throttle cable
④ Wire harness
⑤ Fork top bridge

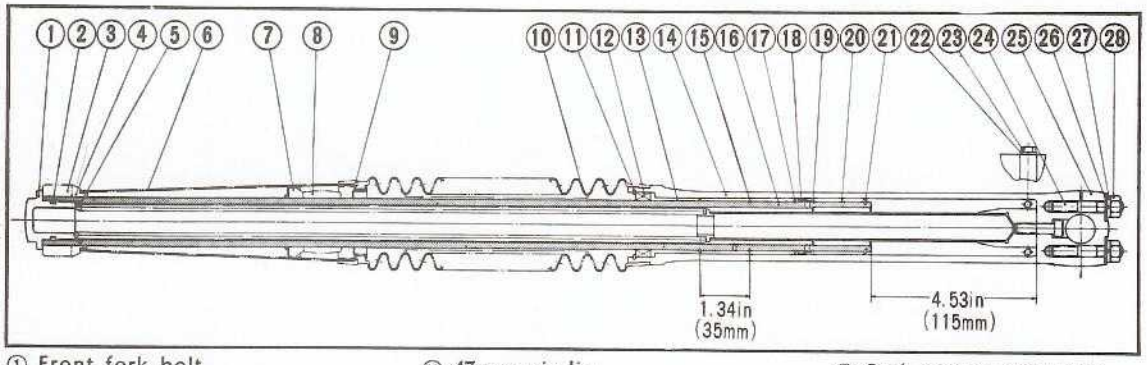
11-3 FRONT SUSPENSION

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 6 mm hex bolt
㉔ 8 mm stud bolt
㉕ Front axle holder
㉖ 8 mm flat washer
㉗ 8 mm spring washer
㉘ 8 mm hex nut

Fig. 11-10

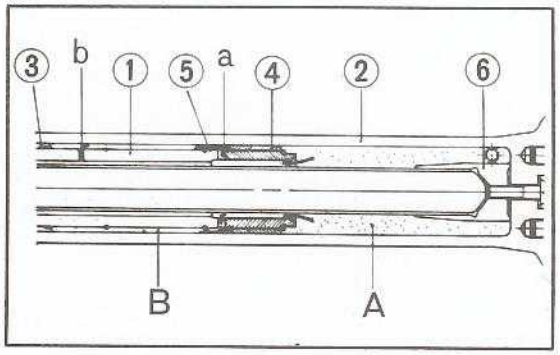


Fig. 11-10-1
① Front fork pipe complete
② Front fork bottom Case complete

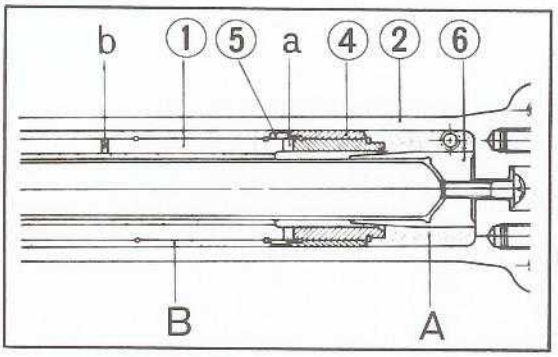


Fig. 11-10-2
③ Front fork pipe guide
④ Front fork piston
⑤ Front damper valve
⑥ Oil lock piece

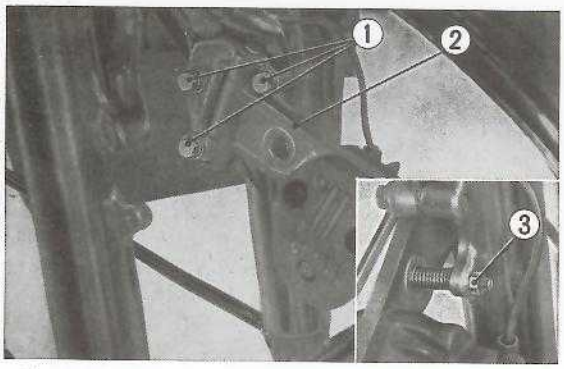


Fig. 11-11 ① Caliper setting bolts
② Caliper assembly ③ Adjuster nut

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 brige) and the 10×40 mm front fork pipe mounting bolts (located on the steering stem). Pull the front fork gentle 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)**

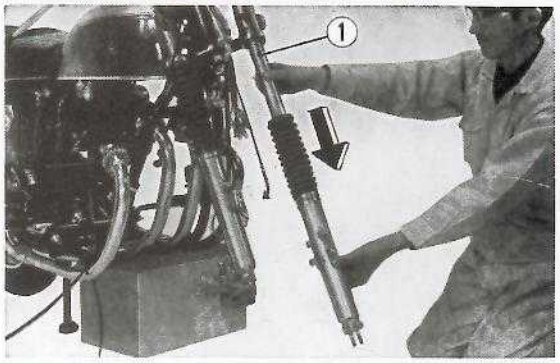


Fig. 11-12 ① Front fork

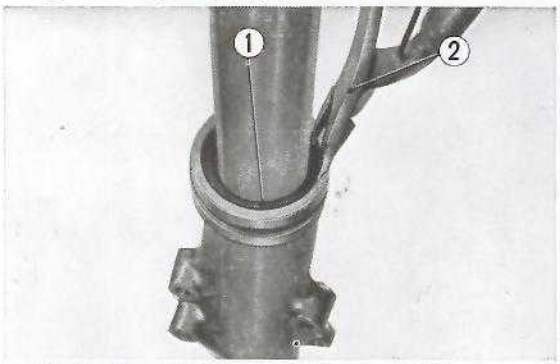


Fig. 11-13 ① Internal circlip ② Pliers

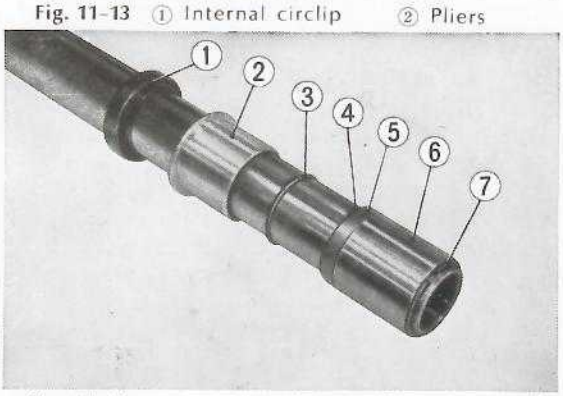


Fig. 11-14
① 354611 oil seal
② Front fork pipe guide
③ Fork pipe stopper ring
④ Fork valve stopper ring
⑤ Front damper valve
⑥ Front fork piston
⑦ Fork piston snap ring

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)**

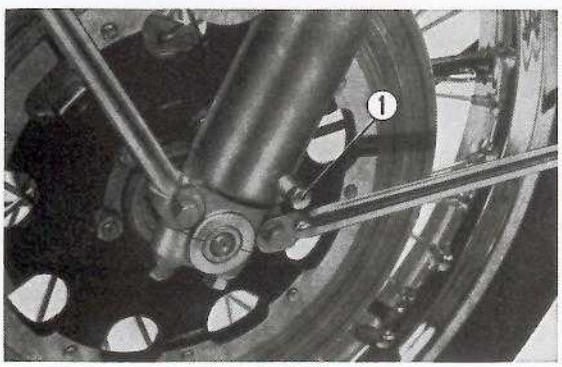


Fig. 11-15 ① Front fork drain plug

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.

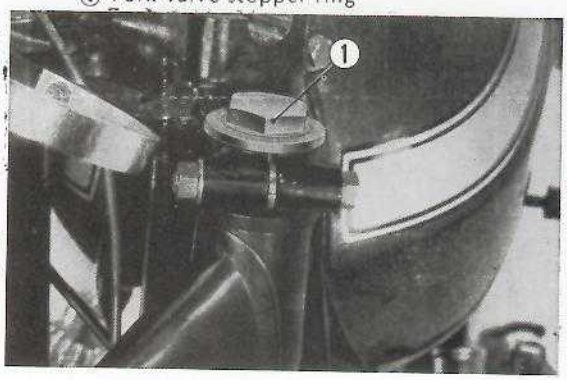


Fig. 11-16 ① Top filler plug

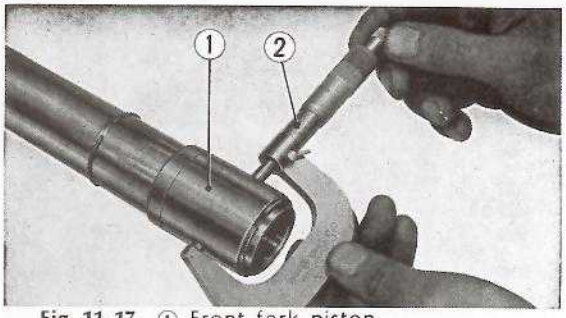


Fig. 11-17 ① Front fork piston
② Micrometer

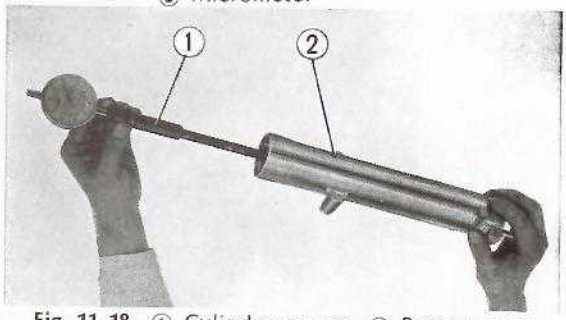


Fig. 11-18 ① Cylinder gauge ② Bottom case

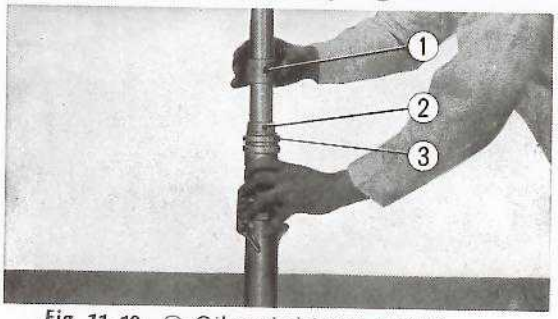


Fig. 11-19 ① Oil seal driving weight
② Oil seal driving guide
③ Oil seal

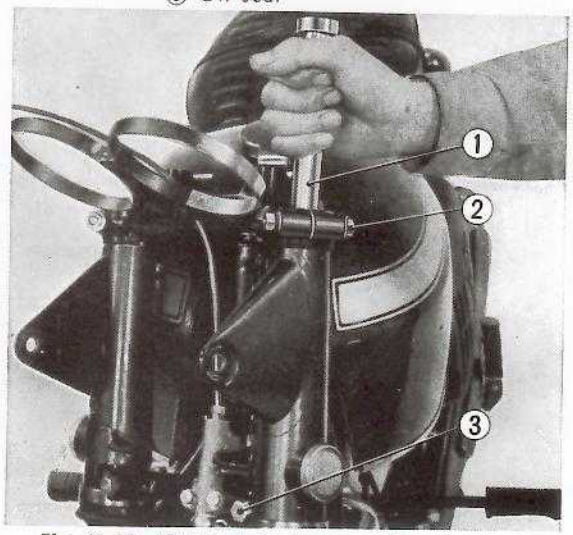


Fig. 11-20 ① Front fork assembling bar
② Front fork pipe setting bolt (8 mm)
③ Front fork pipe setting bolt (10 mm)

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 10 W-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 refer ring to page 147~148.

REAR SUSPENSION

GROUP 12

CONTENTS

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 (frot 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 CB 750 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.

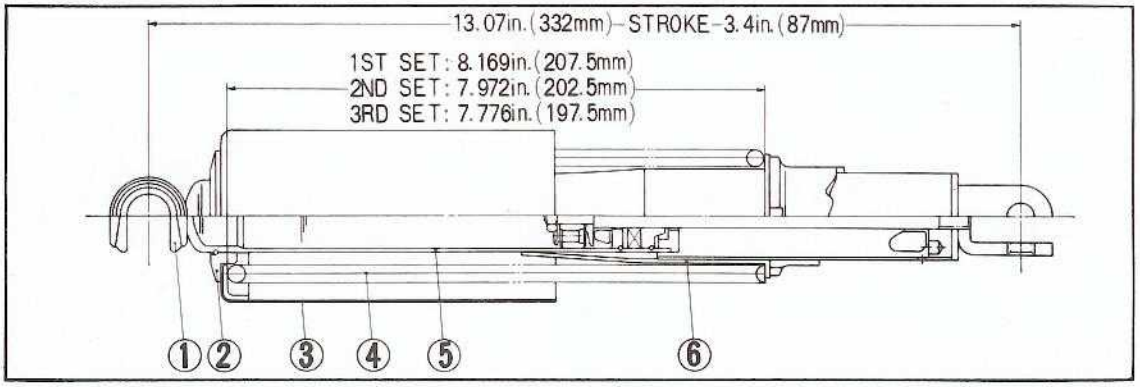


Fig. 12-1

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

Simple type of a construction the heat radiation is good, therefore, preformance 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 cusion 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.

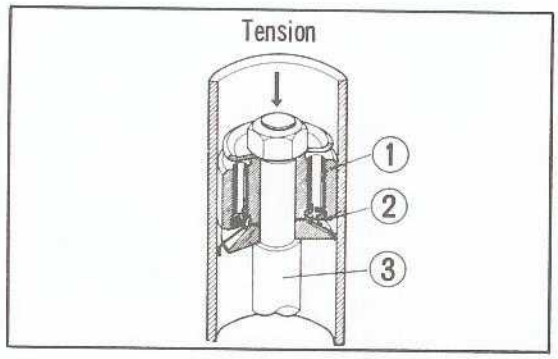


Fig. 12-1-1 ① Piston ② Valve ③ Rod

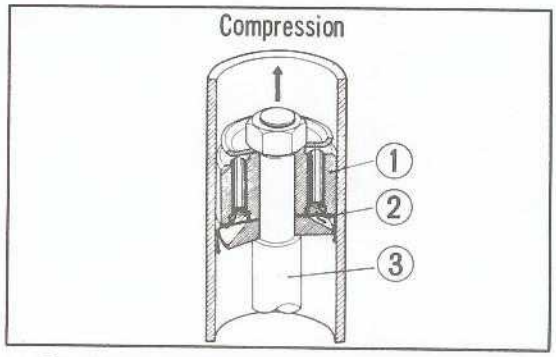


Fig. 12-1-2 ① Piston ② Valve ③ Rod

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.

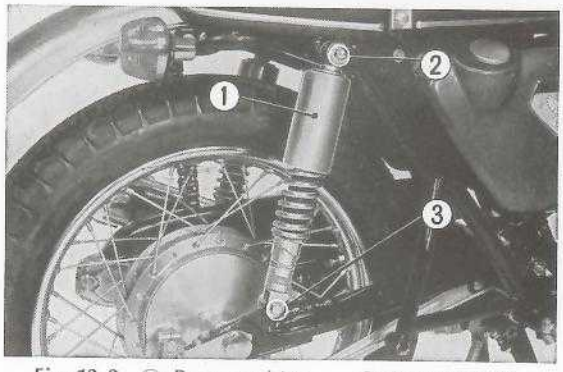


Fig. 12-2 ① Rear cushion ② Cap nut ③ Setting bolt

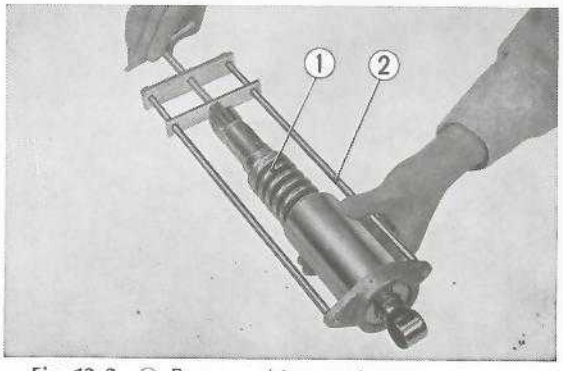


Fig. 12-3 ① Rear cushion spring ② Rear cushion disassembling tool

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)**

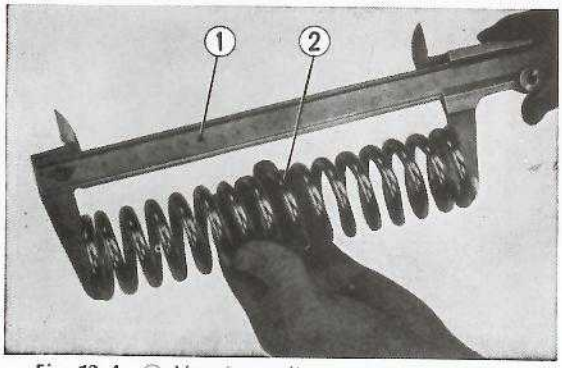


Fig. 12-4 ① Vernier caliper
② Rear cushion spring

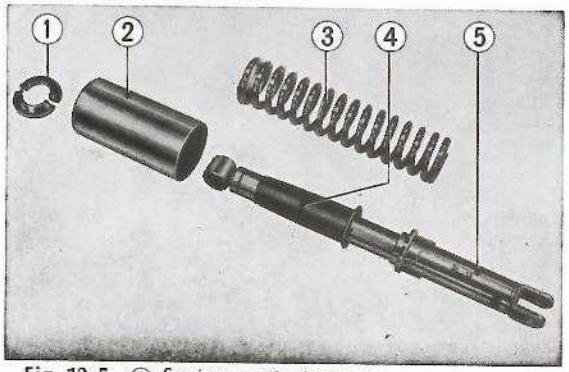


Fig. 12-5 ① Spring seat stopper
② Rear cushion upper case ③ Rear cushion spring
④ Rear cushion spring guide ⑤ Rear damper unit

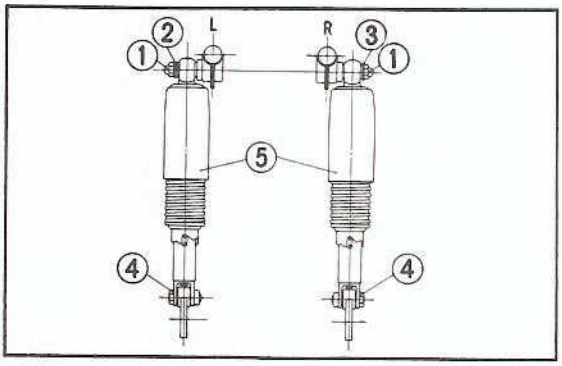


Fig. 12-6 ① 10 mm cap nuts ④ 10 mm bolts
② Side grip ⑤ Rear cushions
③ Washer

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 damper 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 posses negligible effect on the chain tension.

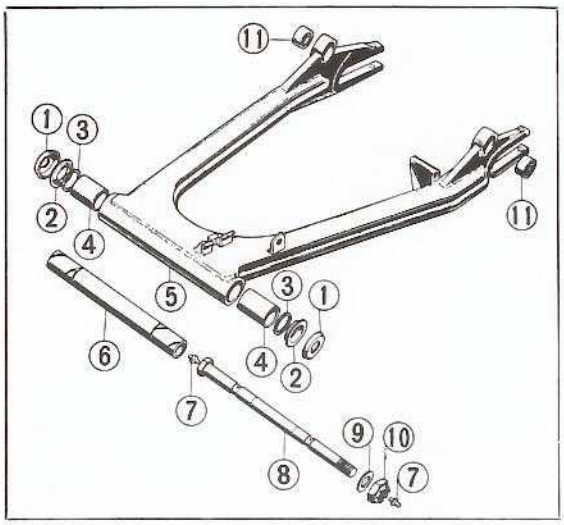


Fig. 12-7
① Dust seal cap
② Pivot thrust bush
③ Rear fork felt ring
④ Rear fork pivot bush
⑤ Rear fork
⑥ Rear fork center collar
⑦ Grease nipple
⑧ Rear fork pivot bolt
⑨ Rear fork pivot bolt washer
⑩ 14mm self lock nut
⑪ Rear cushion under rubber bush

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)**

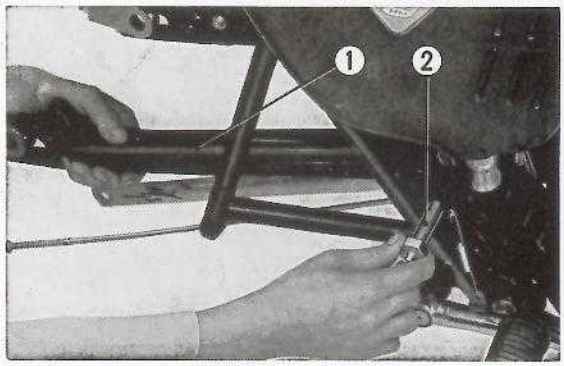


Fig. 12-8 ① Rear fork
② Rear fork pivot bolt

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)**

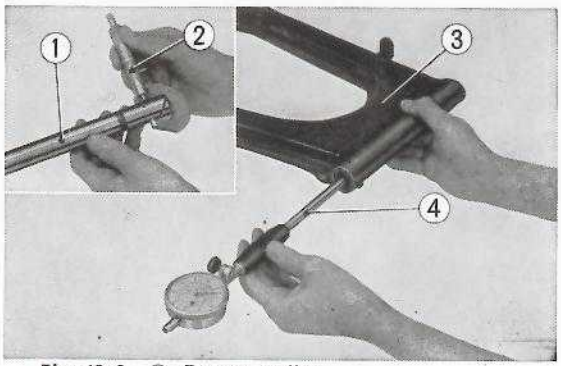


Fig. 12-9 ① Center collar
② Micrometer
③ Rear fork
④ Inner dial gauge

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 chan.
4. When the assembly is completed, adjust the rear brake pedal and drive chain tension. (refer to page 149 and 186)