



4. SERVICE DATA

ENGINE

Unit: mm (in.)

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



Unit: mm (in.)

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

FRAME

Unit: mm (in.)

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

5. TROUBLE SHOOTING

ENGINE

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



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



CHASSIS

Trouble	Probable Cause	Remedies
Heavy steering	<ol style="list-style-type: none"> 1. Steering stem excessively tightened. 2. Damaged steering stem steel balls. 3. Bent steering. 4. Low front tire pressure. 	Loosen the steering stem nut. Replace. Replace. Add air to the specified pressure of 1.8 kg/cm ² (26 psi).
Front and rear wheel wobble	<ol style="list-style-type: none"> 1. Loose steering stem mounting bolt. 2. Worn front and rear wheel bearings. 3. Front or rear wheel runout or distorted. 4. Loose spoke. 5. Defective tire. 	Retorque. Replace bearing. Repair or replace. Retorque. Replace.
Soft suspension	<ol style="list-style-type: none"> 1. Loss of spring tension. 2. Excessive load. 	Replace.
Hard suspension	<ol style="list-style-type: none"> 1. Ineffective front fork damper. 2. Ineffective rear damper. 	Repair. Replace.
Suspension noise	<ol style="list-style-type: none"> 1. Front case or rear damper rubbing. 2. Interference between cushion case and spring. 3. Faulty fork stopper rubber. 4. Insufficient front fork oil. 	Inspect cushion spring and case. Repair or replace. Replace. Add ATF.
Defective brake	<ol style="list-style-type: none"> 1. Front brake. <ul style="list-style-type: none"> - Insufficient brake fluid. - Air in the brake system. - Worn brake pad. - Worn piston. - Worn or distorted brake disc. - Brake lever out of adjustment. 2. Rear brake. <ul style="list-style-type: none"> - Worn brake lining. - Worn brake shoe or poor contacts. - Worn brake cam. - Wet brake from water or oil. - Worn brake shaft. - Brake pedal out of adjustment. 	Add brake fluid. Bleed brake system. Replace pad. Replace piston. Replace disc. Readjust. Replace. Replace. Replace. Clean. Replace. Readjust.



ELECTRICAL

Troubles	Probable Causes	Remedies
Engine does not Start	<ol style="list-style-type: none"> Battery <ul style="list-style-type: none"> Discharged. Poor contact of battery terminals. Main switch <ul style="list-style-type: none"> Open or shorted circuit, disconnected connections. Poor contact between main switch wire and wire harness. Ignition coil <ul style="list-style-type: none"> Improperly insulated high tension coil. Open or shorted circuit in ignition coil. Contact breaker <ul style="list-style-type: none"> Open circuit in the primary coil. Dirty ground point with oil or dust. Point gap out of adjustment. Improperly charged condenser. 	Recharge or replace. Repair. Repair. Repair. Replace. Replace. Repair. Clean. Readjust. Replace.
Starting motor does not operate	<ol style="list-style-type: none"> Defective battery. Poor contact of magnetic switch. Poor contact of starting motor carbon brush. 	Charge or replace. Repair or replace. Repair or replace.
Horn inoperative, poor sound or too weak sound	<ol style="list-style-type: none"> Horn <ul style="list-style-type: none"> Cracked diaphragm. Horn button. <ul style="list-style-type: none"> Poor grounding. Wiring <ul style="list-style-type: none"> Poor contact. Adjusting screw <ul style="list-style-type: none"> Out of adjustment. 	Replace. Repair. Repair. Readjust.
Taillight and headlight inoperative	<ol style="list-style-type: none"> Fuse <ul style="list-style-type: none"> Blown fuse or burnt bulb filament. Bulb <ul style="list-style-type: none"> Burnt bulb filament. Switch <ul style="list-style-type: none"> Poor contact of lighting switch. Wiring 	Replace. Replace. Repair.
Stop light inoperative	<ol style="list-style-type: none"> Bulb <ul style="list-style-type: none"> Burnt or broken bulb filament. Front and tail stop light switch <ul style="list-style-type: none"> Malfunction of switch. Wiring <ul style="list-style-type: none"> Poor contact of leads. 	Replace. Readjust. Repair.
Winker lamp blinks too fast or too slow	<ol style="list-style-type: none"> Bulb <ul style="list-style-type: none"> Blinks unusually fast: improperly connected relay. Wiring <ul style="list-style-type: none"> Blinks too fast: bulb with unsuitable wattage. Blinks too slow: burnt or broken bulb filament. Defective relay 	Replace. Replace. Replace. Replace.

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

7. SPECIFICATION

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



	Item	Metric	English	
Carburetor	Type	Piston valve		
	Setting mark	656 c		
	Main jet	# 75		
	Slow jet	# 35		
	Air screw opening	$7/8 \pm 1/8$		
	Float height	21 mm	0.827 in.	
Drive train	Clutch	Wet, multi-plate type		
	Transmission	5-speed, constant mesh		
	Primary reduction	3.423		
	Gear ratio I	2.733		
	Gear ratio II	1.850		
	Gear ratio III	1.416		
	Gear ratio VI	1.148		
	Gear ratio V	0.965		
	Final reduction	2.235		
	Gear shift pattern	Left foot operated return system		
Electrical	Ignition	Battery and ignition coil		
	Starting system	Starting motor and kick starter		
	Alternator	A-C generator 0.156 kW/5,000 rpm		
	Battery capacity	12 V-12 AH		
	Spark plug	NGK D8ESL ND X24ES		
	Headlight	Low/High beam	12 V-35 W/50 W	
	Tail/stoplight	Tail/Stop	12 V-3/32 cp (SAE TRADE NO. 1157)	
	Turn signal light		12 V-32 cp (SAE TRADE NO. 1073)	
	Speedometer light		12 V-2 cp (SAE TRADE NO. 57)	
	Tachometer light		12 V-2 cp (SAE TRADE NO. 57)	
	Neutral indicator light		12 V-2 cp (SAE TRADE NO. 57)	
	Turn signal indicator light		12 V-2 cp (SAE TRADE NO. 57)	
	High beam indicator light		12 V-2 cp (SAE TRADE NO. 57)	