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# 1. GENERAL INFORMATION

## 1-1.SPECIFICATIONS

BR8		PRODUCT SPECIFICATION								
MODE		BR8		AIR CLEANER TYPE		PAPER FILTER				
DIMENSION	TOTAL LENGTH (mm)		1860		FUEL TANK (ℓ)		6.8			
	TOTAL WIDTH (mm)		675		CARBURETOR	TYPE		CVK		
	TOTAL HEIGHT (mm)		1145			THROTTLE VALVE DIA. (mm)		24		
	WHEEL BASE (mm)		1270			VENTURI DIA. (mm)		22.1		
DRY WEIGHT (kg)		FRONT	43			THROTTLE VALVE TYPE		BUTTERFLY		
WEIGHT			REAR	68		IGNITION	TYPE		C.D.I.	
			TOTAL	111			SPARK ADVANCE		BTDC 13° / 2950rpm	
	TOTAL WEIGHT (kg) 1 PERSON (75kg)		FRONT	72			SPARK PLUG		NGK CR7HSA	
			REAR	114			SPARK PLUG GAP (mm)		0.6~0.7	
			TOTAL	186		BATTERY		12V 7AH		
	TYPE		4T		TRANSMISSION	PRIMA TRANSM.		C.V.T.		
FUEL TYPE		92/95 UNLEADED GASOLINE		SECONDARY TRANSM.		GEAR				
CYLINDER NO.		SINGLE		REDUCTION RATIO	CLUTCH TYPE		CENTRIFUGAL TYPE			
BORE * STORKE (mm)		52.4 * 57.8			PRIMA	1/0.90~2.40				
DISPLACEMENT (c.c.)		124		SECOND	1/9.45 (14/43×13/40)					
STARTER		ELECTRIC & KICK		LAMP	HEAD LAMP (H / L)		12V 35W/35W×1			
COOLING		FORCED AIR COOLING			REAR LAMP		12V 5W×1			
LUBRICATION		PUMP & SPLASH			BRAKE LAMP		12V 21W×1			
INTAKE VALVE GAP (mm)		0.08~0.10			TURN LAMP		12V 10W×4			
ENGINE	EXHAUST VALVE GAP (mm)		0.08~0.10		TIRE	FRONT & REAR		130/60-13 & 130/60-13 or120/70-12 & 130/70-12 or120/70-12 & 120/70-12		
	TOP SPEED (km/hr)		90			TIRE PRESSURE (kPa)		FRONT	175	
	IDLING SPEED (rpm)		1800 ±100				REAR	210		
	MAX. TORQUE (N-m/rpm)		7.90 / 7800		STEERING ANGLE ( ° )		LEFT	45		
	MAX. POWER (kW/rpm)		6.47 /7800				RIGHT	45		
	COMPRESSION RATIO		9.2 : 1		BRAKE		FRONT	DISK		
	CYLINDER PRESSURE (kg/cm <sup>2</sup> - rpm)		12.8-570				REAR	DRUM		
	ENGINE OIL TYPE		SAE 10W - 40		SUSPENSION SYSTEM		FRONT	TELESCOPE		
	ENGINE OIL QUANTITY (c.c.)		900				REAR	ROCKER ARM		
	GEAR OIL TYPE		SAE 90#		FRAME				STEEL TUBE	
GEAR OIL QUANTITY (c.c.)		120								

BF8		PRODUCT SPECIFICATION								
MODE		BF8		AIR CLEANER TYPE		PAPER FILTER				
DIMENSION	TOTAL LENGTH (mm)		1890		FUEL TANK (ℓ)		6.8 & 3.9			
	TOTAL WIDTH (mm)		715		CARBURETOR	TYPE		CVK		
	TOTAL HEIGHT (mm)		1115			THROTTLE VALVE DIA. (mm)		24		
	WHEEL BASE (mm)		1280			VENTURI DIA. (mm)		22.1		
				THROTTLE VALVE TYPE		BUTTERFLY				
WEIGHT	DRY WEIGHT (kg)	FRONT	47		ELECTRIC SYSTEM	IGNITION	TYPE		C.D.I.	
		REAR	68				SPARK ADVANCE		BTDC 13°/ 2950rpm	
		TOTAL	115				SPARK PLUG		NGK CR7HSA	
	TOTAL WEIGHT (kg) 1 PERSON (75kg)	FRONT	78			SPARK PLUG GAP (mm)		0.6~0.7		
		REAR	112			BATTERY		12V 7AH		
		TOTAL	190							
ENGINE	TYPE		4T		TRANSMISSION	PRIMA TRANSM.		C.V.T.		
	FUEL TYPE		92/95 UNLEADED GASOLINE			SECONDARY TRANSM.		GEAR		
	CYLINDER NO.		SINGLE			CLUTCH TYPE		CENTRIFUGAL TYPE		
	BORE * STORKE (mm)		52.4 * 57.8			REDUCTION RATIO	PRIMA	1/0.90~2.40		
	DISPLACEMENT (c.c.)		124		SECOND		1/9.45 (14/43×13/40)			
	STARTER		ELECTRIC & KICK		LAMP	HEAD LAMP (H / L)		12V 35W/35W×1		
	COOLING		FORCED AIR COOLING			REAR LAMP		12V 5W×1		
	LUBRICATION		PUMP & SPLASH			BRAKE LAMP		12V 21W×1		
						TURN LAMP		12V 10W×4		
	INTAKE VALVE GAP (mm)		0.08~0.10		TIRE	FRONT & REAR		130/60-13 & 130/60-13 or120/70-12 & 130/70-12 or120/70-12 & 120/70-12		
	EXHAUST VALVE GAP (mm)		0.08~0.10			TIRE PRESSURE (kPa)		FRONT	175	
	TOP SPEED (km/hr)		90					REAR	210	
	IDLING SPEED (rpm)		1800 ±100							
	MAX. TORQUE (N-m/rpm)		7.90 / 7800		STEERING ANGLE ( °)		LEFT	45		
	MAX. POWER (kW/rpm)		6.47 /7800				RIGHT	45		
	COMPRESSION RATIO		9.2 : 1		BRAKE	FRONT		DISK		
	CYLINDER PRESSURE (kg/cm <sup>2</sup> – rpm)		12.8-570			REAR		DRUM		
	ENGINE OIL TYPE		SAE 10W - 40		SUSPENSION SYSTEM		FRONT	TELESCOPE		
	ENGINE OIL QUANTITY (c.c.)		900		FRAME		REAR	ROCKER ARM		
	GEAR OIL TYPE		SAE 90#							
GEAR OIL QUANTITY (c.c.)		120								

BR9		PRODUCT SPECIFICATION							
MODE		BR9		AIR CLEANER TYPE		PAPER FILTER			
DIMENSION	TOTAL LENGTH (mm)		1860		FUEL TANK (ℓ)		6.8 & 3.9		
	TOTAL WIDTH (mm)		675		CARBURETOR	TYPE		CVK	
	TOTAL HEIGHT (mm)		1145			THROTTLE VALVE DIA. (mm)		26	
	WHEEL BASE (mm)		1270			VENTURI DIA. (mm)		23	
				THROTTLE VALVE TYPE		BUTTERFLY			
WEIGHT	DRY WEIGHT (kg)	FRONT	44		ELECTRIC SYSTEM	IGNITION	TYPE		C.D.I.
		REAR	74				SPARK ADVANCE		BTDC 13°/ 2950rpm
		TOTAL	118				SPARK PLUG		NGK CR7HSA
	TOTAL WEIGHT (kg) 1 PERSON (75kg)	FRONT	72			SPARK PLUG GAP (mm)		0.6~0.7	
		REAR	121			BATTERY		12V 7AH	
		TOTAL	193						
ENGINE	TYPE		4T		TRANSMISSION	PRIMA TRANSM.		C.V.T.	
	FUEL TYPE		92/95 UNLEADED GASOLINE			SECONDARY TRANSM.		GEAR	
	CYLINDER NO.		SINGLE			CLUTCH TYPE		CENTRIFUGAL TYPE	
	BORE * STORKE (mm)		57.4 * 58.4			REDUCTION RATIO	PRIMA	1/0.90~2.40	
	DISPLACEMENT (c.c.)		151		SECOND		1/7.8 (15/42×14/39)		
	STARTER		ELECTRIC & KICK		LAMP	HEAD LAMP (H / L)		12V 35W/35W×1	
	COOLING		FORCED COOLING AIR			REAR LAMP		12V 5W×1	
	LUBRICATION		PUMP & SPLASH			BRAKE LAMP		12V 21W×1	
						TURN LAMP		12V 10W×4	
	INTAKE VALVE GAP (mm)		0.08~0.10		TIRE	FRONT & REAR		130/60-13 & 130/60-13 or120/70-12 & 130/70-12 or120/70-12 & 120/70-12	
	EXAUST VALVE GAP (mm)		0.08~0.10			TIRE PRESSURE (kPa)		FRONT	175
	TOP SPEED (km/hr)		97					REAR	210
	IDLING SPEED (rpm)		1800 ±100						
	MAX. TORQUE (N-m/rpm)		11.14 / 6500		STEERING ANGLE ( °)		LEFT	45	
	MAX. POWER (kW/rpm)		7.89 /7250				RIGHT	45	
	COMPRESSION RATIO		10.8 : 1		BRAKE		FRONT	DISK	
	CYLINDER PRESSURE (kg/cm <sup>2</sup> – rpm)		11.7-700				REAR	DRUM	
	ENGINE OIL TYPE		SAE 10W - 40		SUSPENSION SYSTEM		FRONT	TELESCOPE	
	ENGINE OIL QUANTITY (c.c.)		1000				REAR	ROCKER ARM	
	GER OIL TYPE		SAE 90#		FRAME		STEEL TUBE		
GEAR OIL QUANTITY (c.c.)		120							

BF9		PRODUCT SPECIFICATION							
MODE		BF9		AIR CLEANER TYPE		PAPER FILTER			
DIMENSION	TOTAL LENGTH (mm)		1890		FUEL TANK (ℓ)		6.8 & 3.9		
	TOTAL WIDTH (mm)		715		CARBURETOR	TYPE		CVK	
	TOTAL HEIGHT (mm)		1115			THROTTLE VALVE DIA. (mm)		26	
	WHEEL BASE (mm)		1280			VENTURI DIA. (mm)		23	
				THROTTLE VALVE TYPE		BUTTERFLY			
WEIGHT	DRY WEIGHT (kg)	FRONT	48		ELECTRIC SYSTEM	IGNITION	TYPE		C.D.I.
		REAR	76				SPARK ADVANCE		BTDC 13°/ 2950rpm
		TOTAL	124				SPARK PLUG		NGK CR7HSA
	TOTAL WEIGHT (kg) 1 PERSON (75kg)	FRONT	77			SPARK PLUG GAP (mm)		0.6~0.7	
		REAR	122			BATTERY		12V 7AH	
		TOTAL	199						
ENGINE	TYPE		4T		TRANSMISSION	PRIMA TRANSM.		C.V.T.	
	FUEL TYPE		92/95 UNLEADED GASOLINE			SECONDARY TRANSM.		GEAR	
	CYLINDER NO.		SINGLE			CLUTCH TYPE		CENTRIFUGAL TYPE	
	BORE * STORKE (mm)		57.4 * 58.4			REDUCTION RATIO	PRIMA	1/0.90~2.40	
	DISPLACEMENT (c.c.)		151		SECOND		1/7.8 (15/42×14/39)		
	STARTER		ELECTRIC & KICK		LAMP	HEAD LAMP (H / L)		12V 35W/35W×1	
	COOLING		FORCED AIR COOLING			REAR LAMP		12V 5W×1	
	LUBRICATION		PUMP & SPLASH			BRAKE LAMP		12V 21W×1	
						TURN LAMP		12V 10W×4	
	INTAKE VALVE GAP (mm)		0.08~0.10		TIRE	FRONT & REAR		130/60-13 & 130/60-13 or120/70-12 & 130/70-12 or120/70-12 & 120/70-12	
	EXAUST VALVE GAP (mm)		0.08~0.10			TIRE PRESSURE (kPa)		FRONT	175
	TOP SPEED (km/hr)		97					REAR	210
	IDLING SPEED (rpm)		1800 ±100						
	MAX. TORQUE (N-m/rpm)		11.14 / 6500		STEERING ANGLE ( °)		LEFT	45	
	MAX. POWER (kW/rpm)		7.89 /7250				RIGHT	45	
	COMPRESSION RATIO		10.8 : 1		BRAKE		FRONT	DISK	
	CYLINDER PRESSURE (kg/cm <sup>2</sup> – rpm)		11.7-700				REAR	DRUM	
	ENGINE OIL TYPE		SAE 10W - 40		SUSPENSION SYSTEM		FRONT	TELESCOPE	
	ENGINE OIL QUANTITY (c.c.)		1000				REAR	ROCKER ARM	
	GEAR OIL TYPE		SAE 90#		FRAME		STEEL TUBE		
GEAR OIL QUANTITY (c.c.)		120							

BH8		PRODUCT SPECIFICATION								
MODE		BH8		AIR CLEANER TYPE		PAPER FILTER				
DIMENSION	TOTAL LENGTH (mm)		1790		FUEL TANK (ℓ)		6.8			
	TOTAL WIDTH (mm)		675		CARBURETOR	TYPE		CVK		
	TOTAL HEIGHT (mm)		1080			THROTTLE VALVE DIA. (mm)		24		
	WHEEL BASE (mm)		1240			VENTURI DIA. (mm)		22.1		
				THROTTLE VALVE TYPE		BUTTERFLY				
WEIGHT	DRY WEIGHT (kg)	FRONT	35		ELECTRIC SYSTEM	IGNITION	TYPE		C.D.I.	
		REAR	58				SPARK ADVANCE		BTDC 13°/ 2950rpm	
		TOTAL	93				SPARK PLUG		NGK CR7HSA	
	TOTAL WEIGHT (kg) 1 PERSON (75kg)	FRONT	63			SPARK PLUG GAP (mm)		0.6~0.7		
		REAR	105			BATTERY		12V 7AH		
		TOTAL	168							
ENGINE	TYPE		4T		TRANSMISSION	PRIMA TRANSM.		C.V.T.		
	FUEL TYPE		92/95 UNLEADED GASOLINE			SECONDARY TRANSM.		GEAR		
	CYLINDER NO.		SINGLE			CLUTCH TYPE		CENTRIFUGAL TYPE		
	BORE * STORKE (mm)		52.4 * 57.8			REDUCTION RATIO	PRIMA	1/0.77~1/2.19		
	DISPLACEMENT (c.c.)		124		SECOND		1/8.61 (15/42×13/40)			
	STARTER		ELECTRIC & KICK		LAMP	HEAD LAMP (H / L)		12V 35W/35W×1 or 18W /18W×2		
	COOLING		FORCED AIR COOLINE			REAR LAMP		12V 5W×1		
	LUBRICATION		PUMP & SPLASH			BRAKE LAMP		12V 21W×1		
						TURN LAMP		12V 10W×4		
	INTAKE VALVE GAP (mm)		0.08~0.10		TIRE	FRONT & REAR		120/90-10 & 110/90-10		
	EXHAUST VALVE GAP (mm)		0.08~0.10			TIRE PRESSURE (kPa)	FRONT	175		
	TOP SPEED (km/hr)		87				REAR	210		
	IDLING SPEED (rpm)		1800 ±100			STEERING ANGLE ( °)		LEFT	45	
	MAX. TORQUE (N-m/rpm)		7.90 / 7800				RIGHT	45		
	MAX. POWER (kW/rpm)		6.47 /7800		BRAKE		FRONT	DISK		
	COMPRESSION RATIO		9.2 : 1				REAR	DRUM		
	CYLINDER PRESSURE (kg/cm <sup>2</sup> – rpm)		12.8-570		SUSPENSION SYSTEM		FRONT	TELESCOPE		
	ENGINE OIL TYPE		SAE 10W - 40				REAR	ROCKER ARM		
	ENGINE OIL QUANTITY (c.c.)		900		FRAME				STEEL TUBE	
	GEAR OIL TYPE		SAE 90#							
GEAR OIL QUANTITY (c.c.)		110								

BK8		PRODUCT SPECIFICATION								
MODE		BK8		AIR CLEANER TYPE		PAPER FILTER				
DIMENSION	TOTAL LENGTH (mm)		1880		FUEL TANK (ℓ)		6.8			
	TOTAL WIDTH (mm)		715		CARBURETOR	TYPE		CVK		
	TOTAL HEIGHT (mm)		1160			THROTTLE VALVE DIA. (mm)		24		
	WHEEL BASE (mm)		1304			VENTURI DIA. (mm)		22.1		
				THROTTLE VALVE TYPE		BUTTERFLY				
WEIGHT	DRY WEIGHT (kg)	FRONT	38		ELECTRIC SYSTEM	IGNITION	TYPE		C.D.I.	
		REAR	70				SPARK ADVANCE		BTDC 13°/ 2950rpm	
		TOTAL	108				SPARK PLUG		NGK CR7HSA	
	TOTAL WEIGHT (kg) 1 PERSON (75kg)	FRONT	64			SPARK PLUG GAP (mm)		0.6~0.7		
		REAR	119			BATTERY		12V 7AH		
		TOTAL	183							
ENGINE	TYPE		4T		TRANSMISSION	PRIMA TRANSM.		C.V.T.		
	FUEL TYPE		92/95 UNLEADED GASOLINE			SECONDARY TRANSM.		GEAR		
	CYLINDER NO.		SINGLE			CLUTCH TYPE		CENTRIFUGAL TYPE		
	BORE * STORKE (mm)		52.4 * 57.8			REDUCTION RATIO	PRIMA	1/0.90~2.40		
	DISPLACEMENT (c.c.)		124		SECOND		1/9.45 (14/43×13/40)			
	STARTER		ELECTRIC & KICK		LAMP	HEAD LAMP (H / L)		12V 35W/35W×1		
	COOLING		FORCED AIR COOLING			REAR LAMP		12V 5W×1		
	LUBRICATION		PUMP & SPLASH			BRAKE LAMP		12V 21W×1		
						TURN LAMP		12V 10W×4		
	INTAKE VALVE GAP (mm)		0.08~0.10		TIRE	FRONT & REAR		80/80-14 & 110/80-14 or 110/80-14 & 110/80-14		
	EXHAUST VALVE GAP (mm)		0.08~0.10			TIRE PRESSURE (kPa)	FRONT	175		
	TOP SPEED (km/hr)		90				REAR	210		
	IDLING SPEED (rpm)		1800 ±100			STEERING ANGLE ( ° )		LEFT	45	
	MAX. TORQUE (N-m/rpm)		7.90 / 7800		BRAKE	RIGHT	45			
	MAX. POWER (kW/rpm)		6.47 / 7800			FRONT	DISK			
	COMPRESSION RATIO		9.2 : 1		SUSPENSION SYSTEM	REAR	DRUM			
	CYLINDER PRESSURE (kg/cm <sup>2</sup> - rpm)		12.8-570			FRONT	TELESCOPE			
	ENGINE OIL TYPE		SAE 10W - 40		REAR	ROCKER ARM				
	ENGINE OIL QUANTITY (c.c.)		900		FRAME		STEEL TUBE			
	GEAR OIL TYPE		SAE 90#							
GEAR OIL QUANTITY (c.c.)		120								

BK9			PRODUCT SPECIFICATION						
MODE		BK9		AIR CLEANER TYPE		PAPER FILTER			
DIMENSION	TOTAL LENGTH (mm)		1880		FUEL TANK (ℓ)		6.8 & 3.9		
	TOTAL WIDTH (mm)		715		CARBURETOR	TYPE		CVK	
	TOTAL HEIGHT (mm)		1160			THROTTLE VALVE DIA. (mm)		26	
	WHEEL BASE (mm)		1340			VENTURI DIA. (mm)		23	
				THROTTLE VALVE TYPE		BUTTERFLY			
WEIGHT	DRY WEIGHT (kg)	FRONT	39		ELECTRIC SYSTEM	IGNITION	TYPE		C.D.I.
		REAR	71				SPARK ADVANCE		BTDC 13°/ 2950rpm
		TOTAL	110				SPARK PLUG		NGK CR7HSA
	TOTAL WEIGHT (kg)   PERSON (75kg)	FRONT	65			SPARK PLUG GAP (mm)		0.6~0.7	
		REAR	120			BATTERY		12V 7AH	
		TOTAL	185						
ENGINE	TYPE		4T		TRANSMISSION	PRIMA TRANSM.		C.V.T.	
	FUEL TYPE		92/95 UNLEADED GASOLINE			SECONDARY TRANSM.		GEAR	
	CYLINDER NO.		SINGLE			CLUTCH TYPE		CENTRIFUGAL TYPE	
	BORE * STORKE (mm)		57.4 * 58.4			REDUCTION RATIO	PRIMA	1/0.90~2.40	
	DISPLACEMENT (c.c.)		151		SECOND		1/7.8 (15/42×14/39)		
	STARTER		ELECTRIC & KICK		LAMP	HEAD LAMP (H / L)		12V 35W/35W×1	
	COOLING		FORCED AIR COOLING			REAR LAMP		12V 5W×1	
	LUBRICATION		PUMP & SPLASH			BRAKE LAMP		12V 21W×1	
						TURN LAMP		12V 10W×4	
	INTAKE VALVE GAP (mm)		0.08~0.10		TIRE	FRONT & REAR		80/80-14 & 110/80-14 or 110/80-14 & 110/80-14	
	EXHAUST VALVE GAP (mm)		0.08~0.10			TIRE PRESSURE (kPa)		FRONT	175
	TOP SPEED (km/hr)		97					REAR	210
	IDLING SPEED (rpm)		1800 ±100						
	MAX. TORQUE (N-m/rpm)		11.14 / 6500		STEERING ANGLE ( °)		LEFT	45	
	MAX. POWER (kW/rpm)		7.89 /7250				RIGHT	45	
	COMPRESSION RATIO		10.8 : 1		BRAKE		FRONT	DISK	
	CYLINDER PRESSURE (kg/cm <sup>2</sup> – rpm)		11.7-700				REAR	DRUM	
	ENGINE OIL TYPE		SAE 10W - 40		SUSPENSION SYSTEM		FRONT	TELESCOPE	
	ENGINE OIL QUANTITY (c.c.)		1000				REAR	ROCKER ARM	
	GEAR OIL TYPE		SAE 90#		FRAME		STEEL TUBE		
	GEAR OIL QUANTITY (c.c.)		120						

## 1-2 INSPECTION PRECAUTIONS

1. The measurements use IS system for bolts and bolt heads. Please do not use British system for the bolts and nuts, otherwise it can damage the motorcycle.
2. Please clean parts outside deposits before maintenance. Otherwise, the deposits may drop into engine and damage engine in operation.
3. Please use kerosene or diesel to clean-up disassembled parts. Check and measure parts after clean-up. The parts' contact and sliding surface should apply engine oil for lubrication.
4. The packing, metal gasket, O-ring, seal, clamp, and clipper should be replaced with new ones after disassembly.
5. Please pay attention to the orientation and relative positions of the major components. Arrange the parts in order during disassembly. Make marks if necessary to avoid mistakes in re-assembly.
6. Loosing the parts should start from small to big, from outside to inside, and in alternative parts. Assembly is in reverse order of disassembly procedures.
7. The oil seals should be replaced with new ones after disassembly. The contact surface should be cleaned-up. Check if the contact axle has scratches or burry. Use special tools for assembly to avoid damaging seal lip area, which may lead to oil leak. The manufacturer logo should face outward in assembly. Apply grease at seal lip area.
8. Please do not presses, twist, and over scratch the wire cable to avoid bad wire contact.
9. Disconnect the battery negative (-) terminal before maintenance. Connect the positive (+) terminal first in assembly. Apply a thin layer of grease on terminals, and cover with terminal caps.

## 1-3 SAFETY PRECAUTIONS

### **Warning:** Engine Exhaust

Please keep good ventilation during engine operation. Do not operate engine in closed-room. The toxic carbon-oxygen (CO) in exhaust may lead human to loss conscious and even death.

### **Warning:** Gasoline

The gasoline is very easy to burn or explode. Forbid any fire during inspection of gasoline tank or gasoline leak.

### **Warning:** Battery H<sub>2</sub> and Battery Liquid

1. The battery liquid is toxic sodium liquid. Please do not contact the liquid with skin or eye. If any contact happens, please wash with massive clean water and contact with doctor.
2. The released H<sub>2</sub> from battery is explosive. Please keep good ventilation during charging battery and forbid any fire.

### **Watch:** Brake Fluid

The brake fluid can damage the painting on plastic. Please cover the plastic parts with towel or cloth during maintenance of brake disk. If the brake fluid is split on plastic component, please remove the fluid and wash the surface with water right away.

### **Watch:** High Temperature of Engine

The engine cover, cylinder, and exhaust pipe have high temperature after starting of engine. Please wear glove in maintenance of parts during engine operation, or maintenance should be waited until engine is cooled.

## 1-4 SPECIAL TOOLS

Universal Wrench 440601



Hold for removing flywheel.  
Hold for removing belt driver pulley.  
Hold for removing belt driven pulley.

Four Legs Sleeve 440604



Used for removing starter clutch gear lock nut.

Flywheel Remover 440602



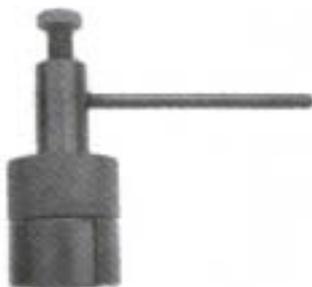
Used for removing flywheel.

Starter Spring Assembly Tool 440605



Used for starter spring assembly.

Gear Remover 440603



Used for removing starter driven gear.

Crank Shaft & Right Hand Crank Case 440606



To draw the crank shaft into the right hand crank case.

Inner Chain Wrench 440607



For disassembly the camshaft inner chain.

Bush Remover 440610



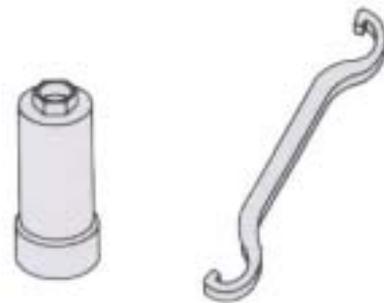
For removing the crankcase suspension bush.

Socket of Valve Adjusting Bolt 440608



Adjust the clearance of valve stem and rock arm.

Fixing Nut Socket 440611



Used for removing steering shaft nut.

Valve Cotter Tool 440609



For assembling valve cotter

## 1-5 TIGHTENING TORQUE

\* BR8 Representative Figure \*



### \*Standard Torque Values of Bolts and Nuts \*

Specification	Torque (kg-cm)	Specification	Torque (kg-cm)
5 mm Bolt and Nut	40	8 mm Bolt and Nut	220
5 mm Flange Bolt and Nut	50	8 mm Flange Bolt and Nut	270
6 mm Bolt and Nut	100	10 mm Bolt and Nut	350
6 mm Flange Bolt and Nut	120	10 mm Flange Bolt and Nut	400
6 mm SH Bolt and Nut	90	12 mm Bolt and Nut	550

### \* Torque Values of Chassis Components \*

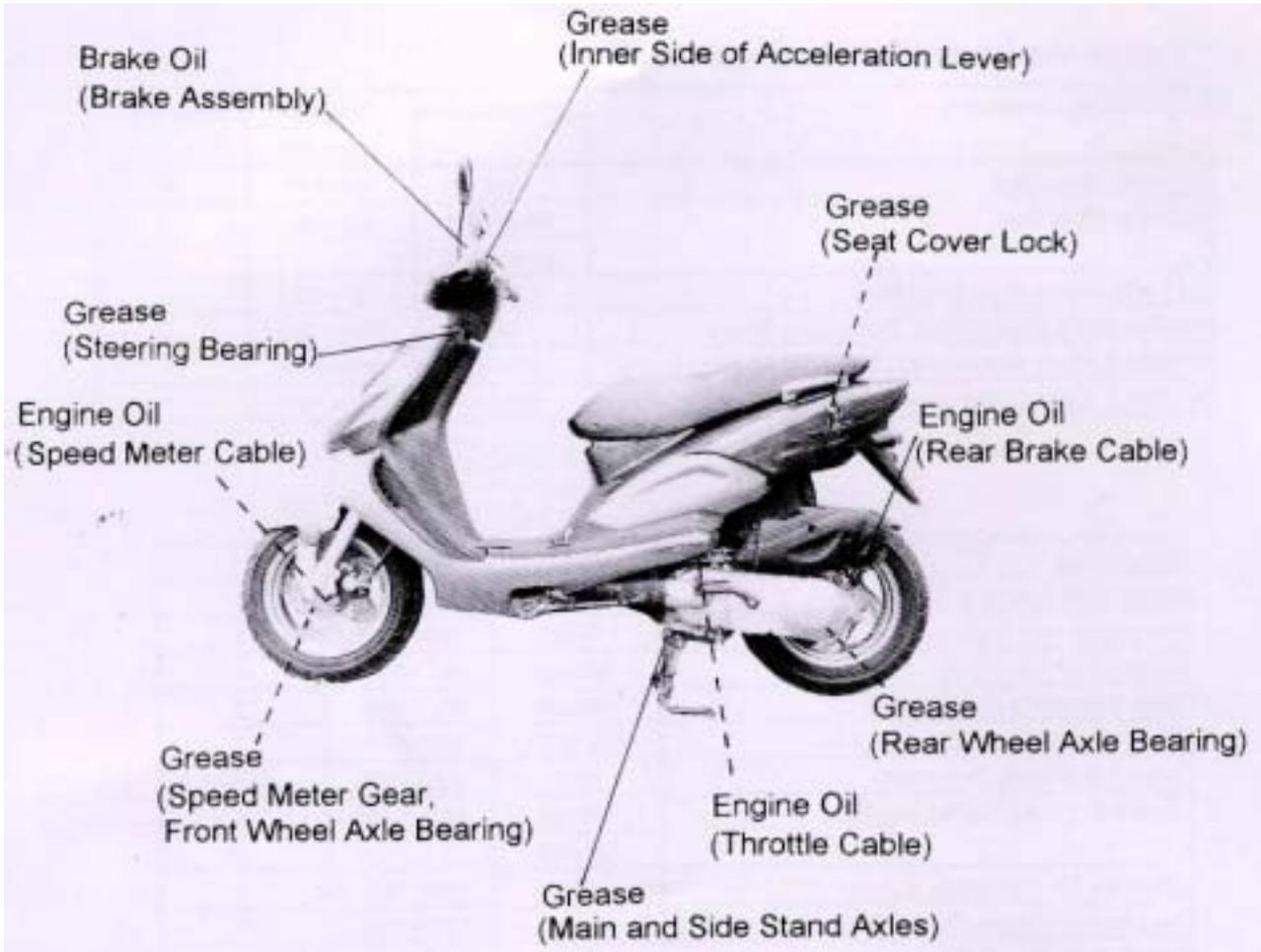
No.	Tightening Location	Specification	Torque (kg-cm)
1	Front Wheel Axle Self-lock Nut	M12	500~600
2	Brake Disk Hex Bolt	M5	180~280
3	Brake Clipper Tightening Bolt	M8x35	210~250
4	Speed Meter Cable Nut	X	60
5	Front Fork Bearing Tightening Nut	M25x1.0	600~650
6	Rear Wheel Axle Self-lock Nut	M16x10	600~900
7	Rear Brake Connecting Rod Bolt	M16x32	50~80
8	Rear Brake Pin Self-lock Nut	M8	250~270
9	Rear Upper Cushion Tightening Bolt	M10x46	200~300
10	Rear Lower Cushion Tightening Bolt	M8x35	200~300

**\* Torque Values of Engine components \***

<b>Tightening Location</b>	<b>Specification</b>	<b>Torque (kg-cm)</b>	<b>Quantities</b>
Cylinder Head Bolt	M6	80~100	4
Cylinder Stud Bolt	M8x182.5	500~800	2
	M8x195.5		2
Cylinder Intake Pipe Stud Bolt	M6x50	500~800	2
Muffler and Exhaust Pipe Tightening Screw	M6	100~120	2
Muffler & Right Crankcase Upper Tightening Screw	M8x42	300~400	1
Muffler & Right Crankcase Lower Tightening Screw	M8x38	300~400	1
Spark Plug	M10	100~120	1
Valve Gap Adjust Lock Bolt	M5	50~90	2
Fuel Filter Nut Cap	M30	150~200	1
Cooler Fan Lock CR	M6x18	500~800	4
Wire Assembly Lock Screw	M6x20	800~1000	2
Start Clutch Gear Tightening Nut	M22 (R.T.)	800~1000	1
Driven Belt Pully Assembly	M12	400~600	1
Gearbox Cover Tightening Bolt	M6x28	100~1200	3
	M6x35		3
Gearbox Oil Fill Cover Screw	M8	90~150	1
Gearbox Oil Drain Cover Screw	M8x12	90~150	1
Clutch Side Cover Screw	M6x40	50~80	6
	M6x65		2
Starter Arm Tightening Screw	M6x22	100~120	1

# 1-6 LUBRICATION POINTS

\*BR8 Representative Figure\*



## \* Chassis \*

Lubrication Area	Lubrication Type
Inner Side of Acceleration Lever	Grease
Steering Bearing	
Speed Meter Gear	
Front Wheel Axle Bearing	
Front Wheel Axle	
Main and Side Stand Axles	
Rear Wheel Bearing	
Seat Cover Lock	
Speed Meter Cable	
Throttle Wire	
Rear Brake Cable	Brake Fluid
Brake Assembly	

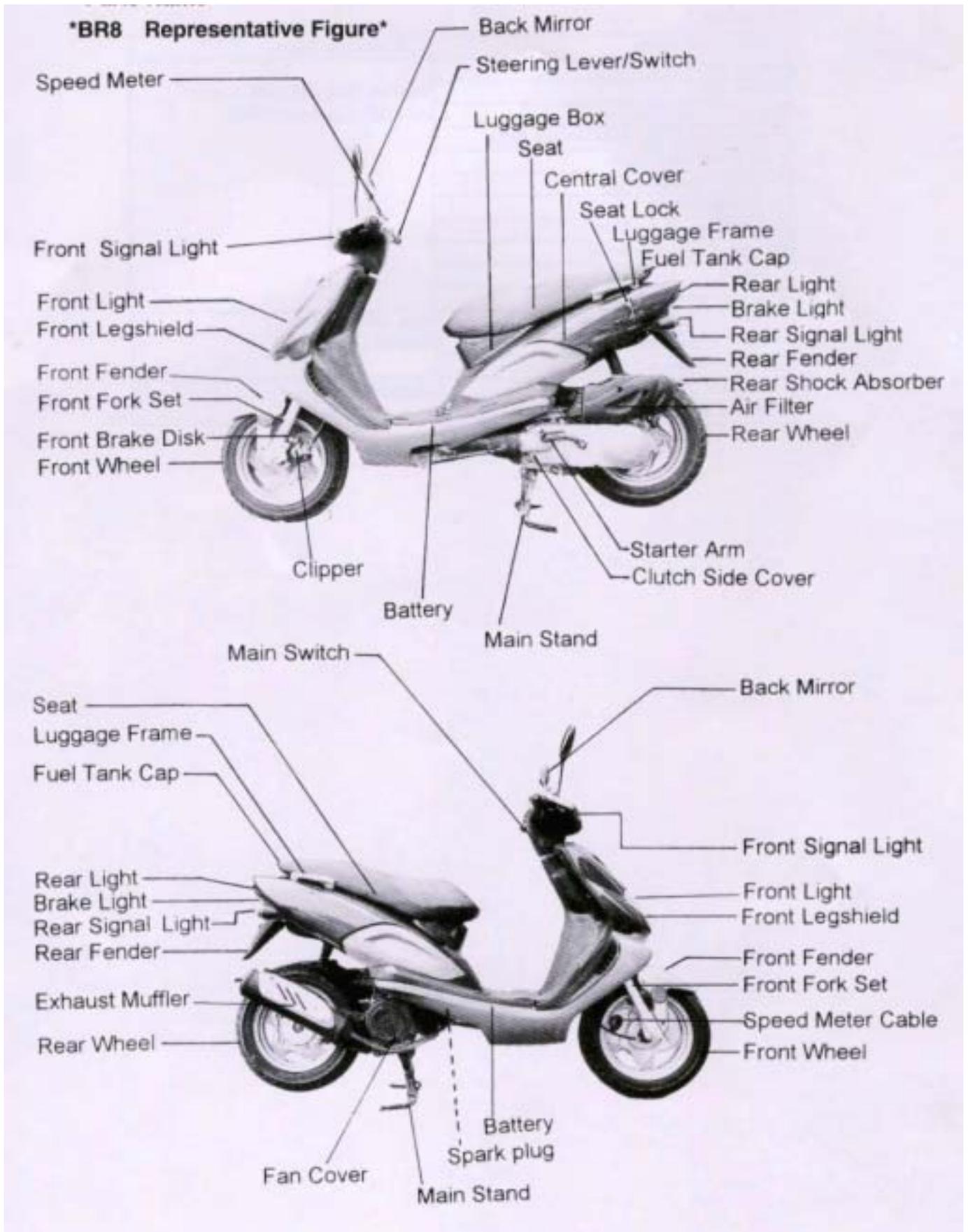
**\* Engine \***

Lubrication Area	Lubrication Type
Piston and Piston Rings Piston Pin Big End of Connecting Rod Rocker Arm Frictional Contact Area Cam Shaft and Chain Cylinder Frictional Area Oil Pump Chain Gears Contact Surface Bearing Operation Area O Rings Seal Lip Area	Satisfy SAE 10W-40 and API SE,SG Engine Oil
Starter Frictional Surface Starting Cam Gear Spring Operation Frictional Area	High Temperature Durable Grease
Generator Connector Gearbox Ventilation Tube	Adhesives

# 1-7 PARTS NAME AND WIRING DIAGRAM

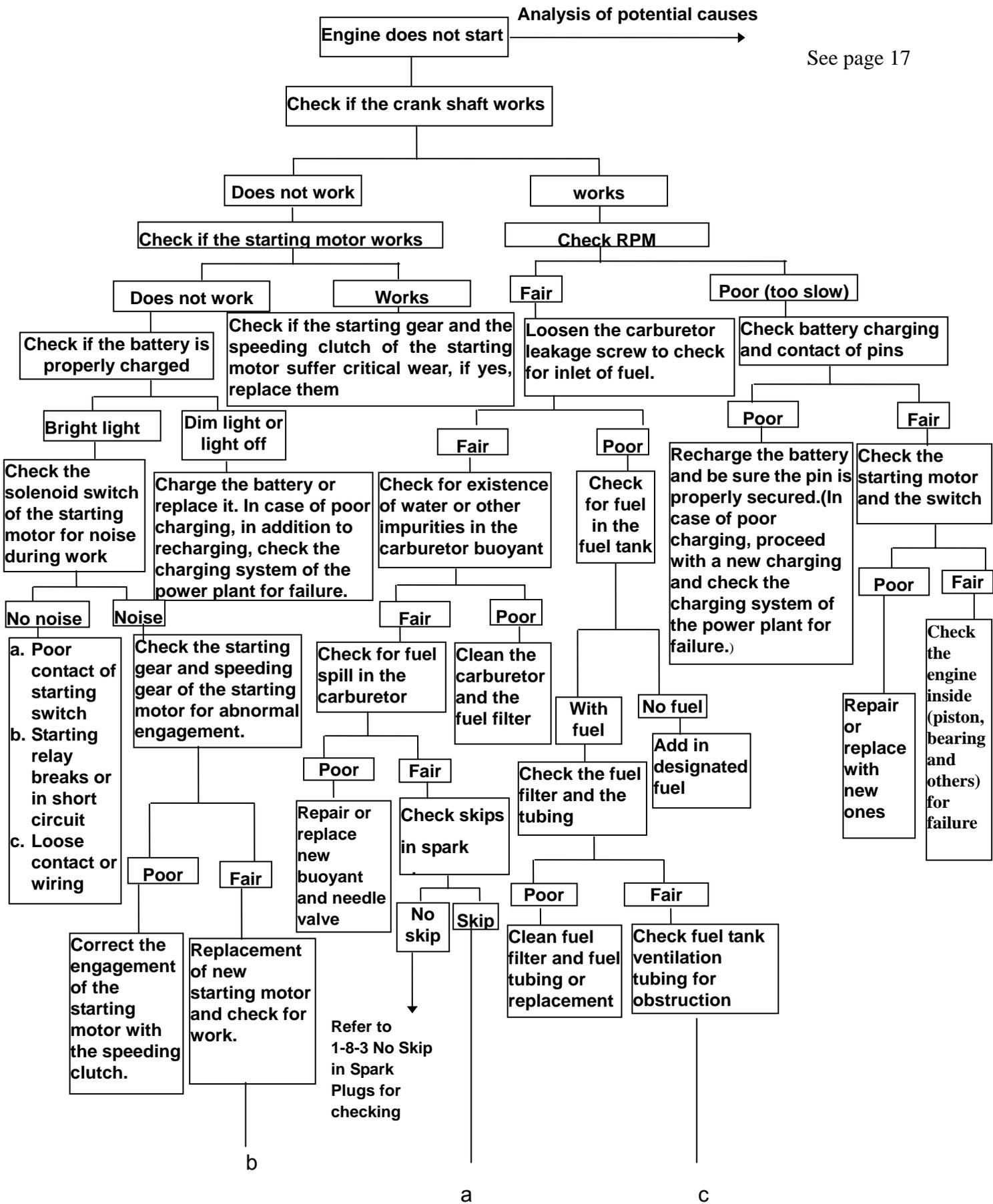
\* Parts Name \*

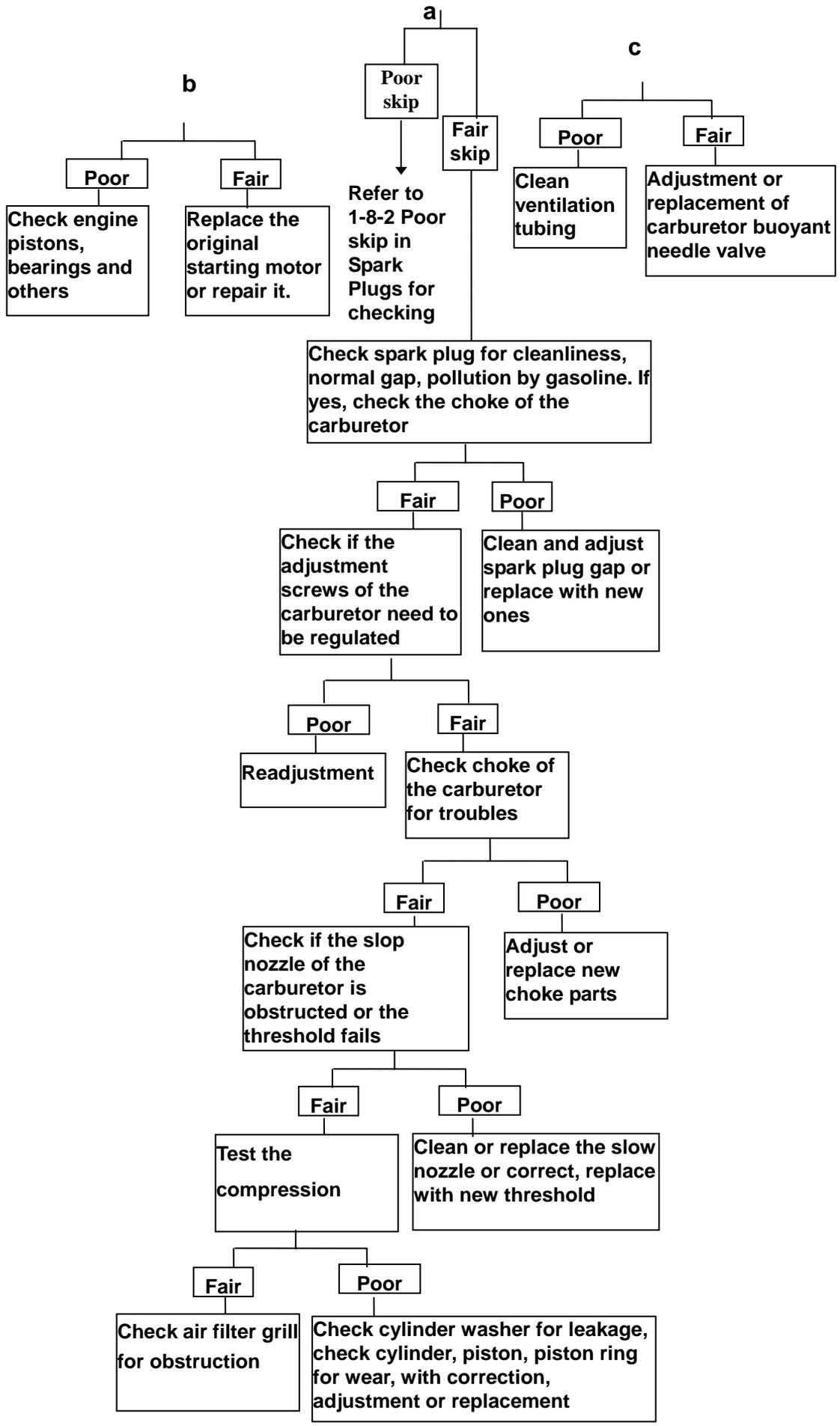
\*BR8 Representative Figure\*



# 1-8 TROUBLE SHOOTING

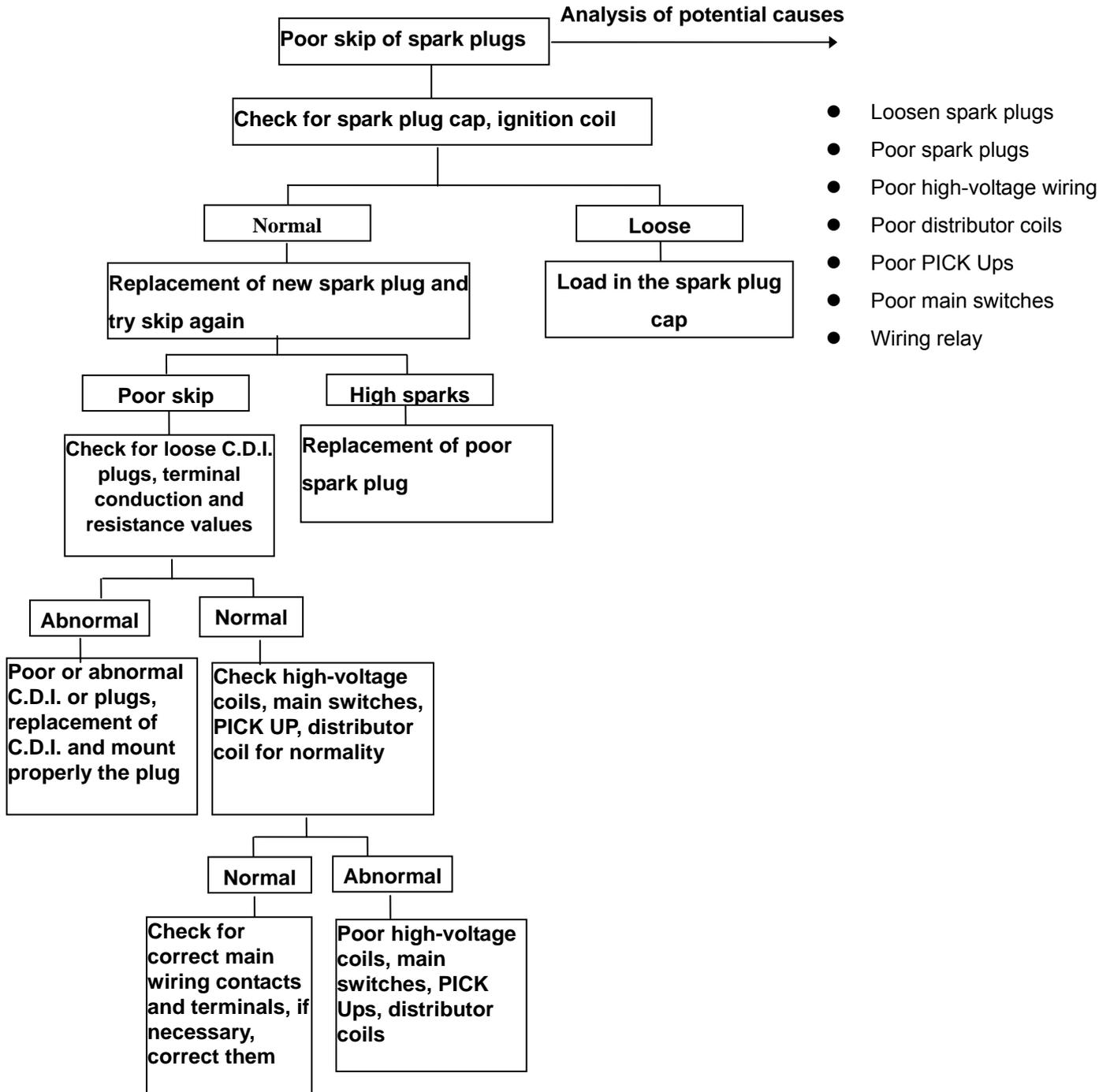
## 1-8-1 Troubleshooting for failure in starting the engine



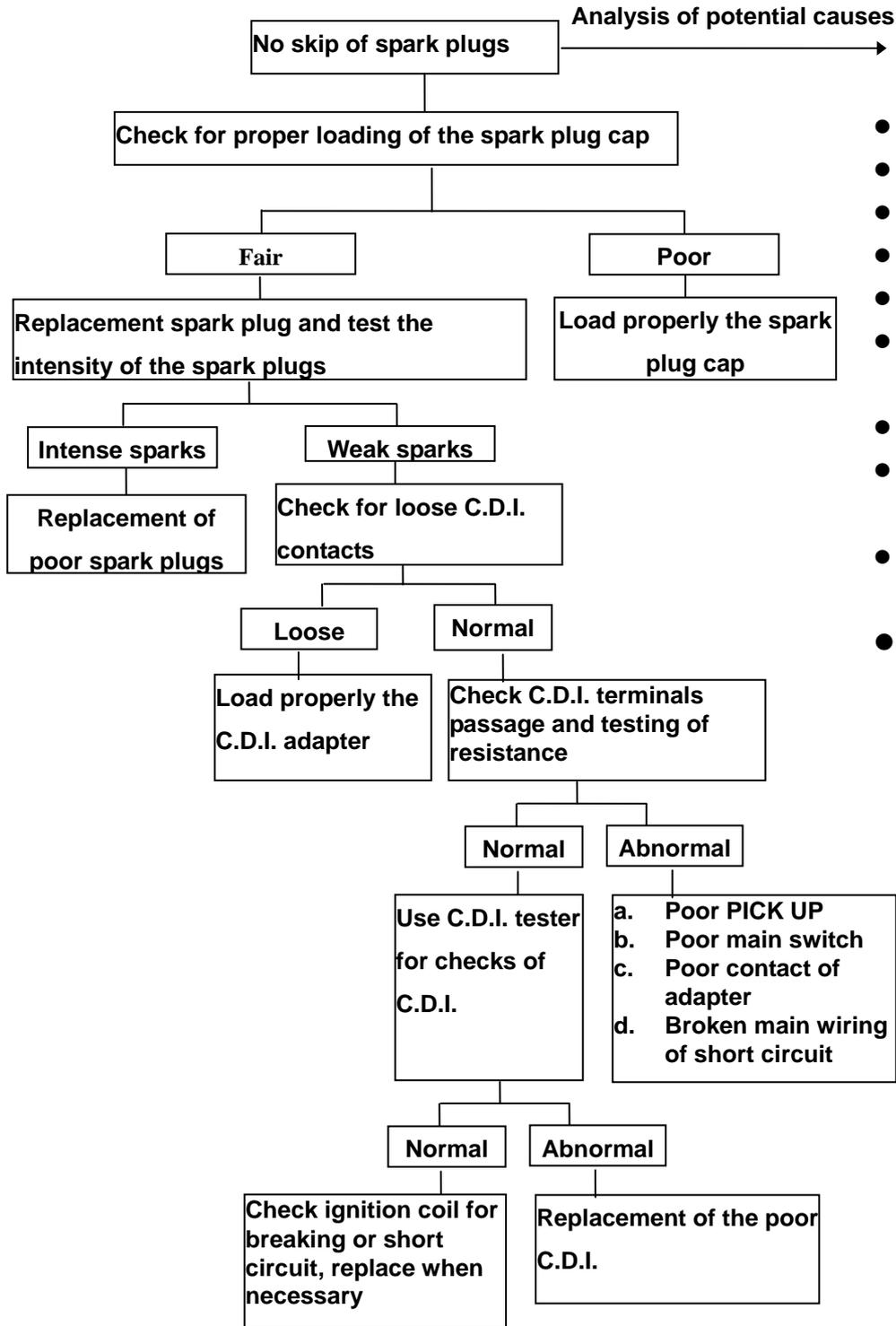


- No fuel
- Dirty fuel filter
- Obstructed fuel tubing
- Obstructed ventilation tubing of the fuel tank
- Poor carburetor buoyant needle valve
- Carburetor buoyant with impurities
- Poor carburetor buoyant
- No skip in spark plugs
- Poor skip in spark plugs
- Dirty spark plugs
- Incorrect spark plugs gap
- Dirty and wet spark plugs
- Loose adjustment screws in the carburetor
- Carburetor choke
- Obstructed carburetor slow nozzle
- Ailing carburetor threshold
- Obstructed air filter grill
- Leakage in cylinder washer
- Seriously damaged cylinder, piston, piston
- Dead battery
- Poor contact of battery pin and conductors
- Starting switch with poor or failure
- Starting relay with broken wire or short circuit
- Loose contact and wiring
- Starting gear and speeding clutch gear seriously worn
- Starting gear and speeding clutch gear in poor engagement
- Poor starting motor

## 1-8-2 Troubleshooting for poor skip of spark plugs

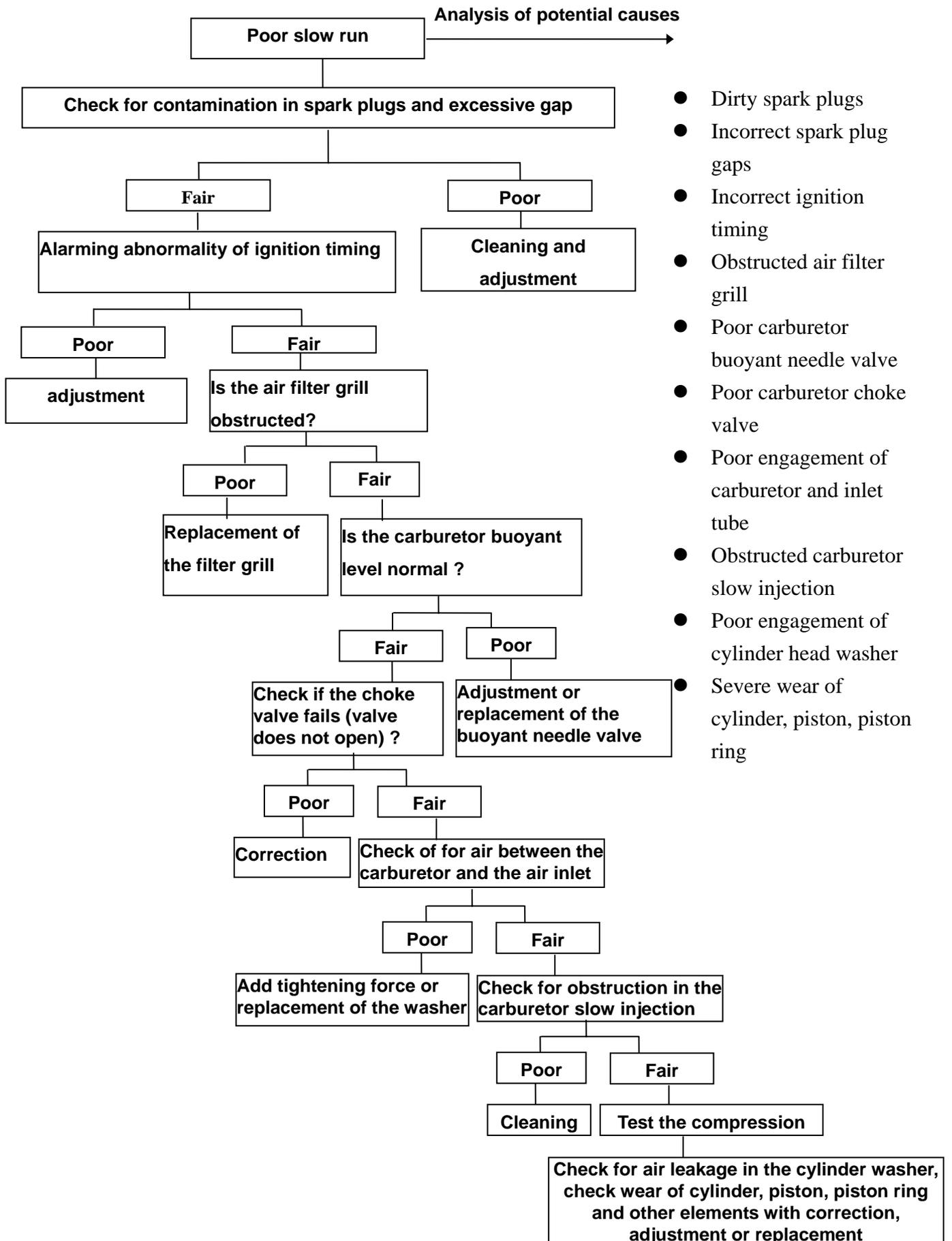


### 1-8-3 Troubleshooting for no-skip of spark plugs

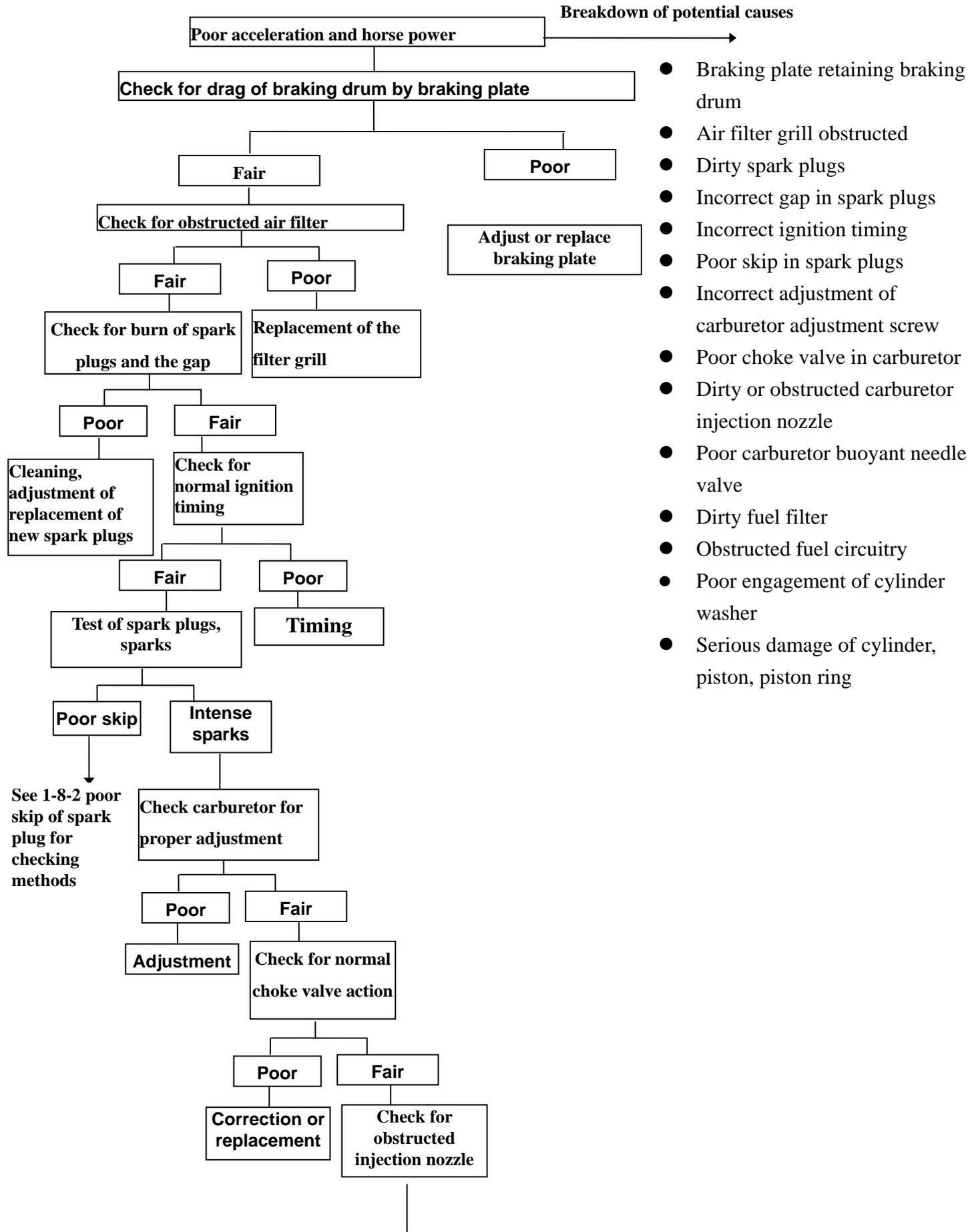


- Loose spark plug cap
- Poor spark plug
- Loose C.D. adapter
- Poor C.D.I.
- Poor PICK UP
- Poor distributor high-voltage wiring
- Poor main switch
- Main wiring broken or in short circuit
- Ignition coil broken or in short circuit
- Poor adapter contact

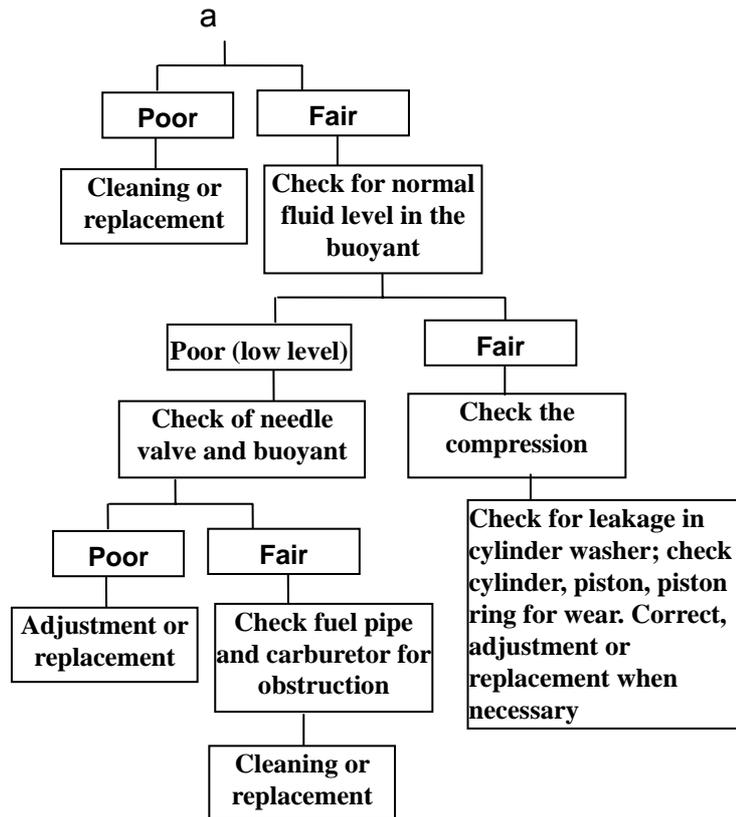
## 1-8-4 Troubleshooting for slow run (troubled engine)



# 1-8-5 Poor acceleration and horse power



- Braking plate retaining braking drum
- Air filter grill obstructed
- Dirty spark plugs
- Incorrect gap in spark plugs
- Incorrect ignition timing
- Poor skip in spark plugs
- Incorrect adjustment of carburetor adjustment screw
- Poor choke valve in carburetor
- Dirty or obstructed carburetor injection nozzle
- Poor carburetor buoyant needle valve
- Dirty fuel filter
- Obstructed fuel circuitry
- Poor engagement of cylinder washer
- Serious damage of cylinder, piston, piston ring



## 2. INSPECTION AND ADJUSTMENT

### 2-1 REGULAR MAINTENANCE SCHEDULE

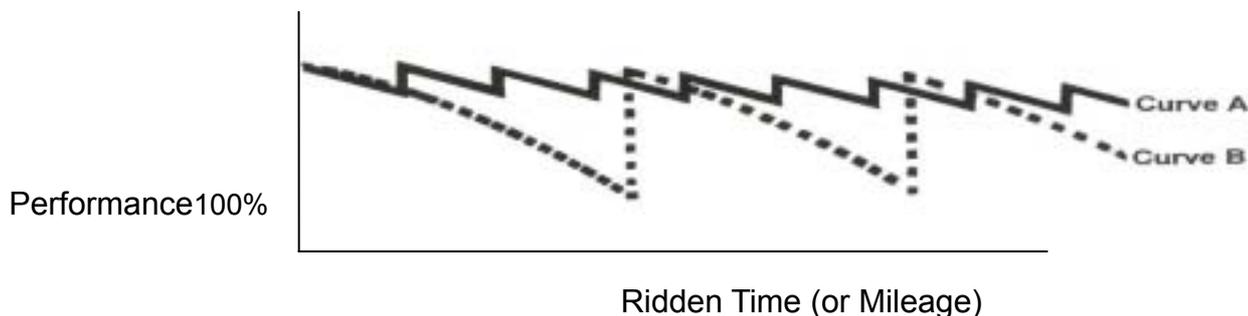
#### Explanation:

- (1) Please follow the regular maintenance schedule to ensure the motorcycle's function and life.
- (2) **I** : Inspection (including clean up, lubrication, refill, or replace parts),  
**C**: Clean, **R**: Replace, **A**: Adjust.

km or time	300 km	1000 km	2000 km	3000 km	4000 km	5000 km	6000 km	7000 km	8000 km	9000 km	10000	11000	12000
Maintenance Item	(1 mo.)	(3 mo.)	(6 mo.)	(9 mo.)	(12 mo.)	(15 mo.)	(18 mo.)	(21 mo.)	(24 mo.)	(27 mo.)	(30 mo.)	(33 mo.)	(36 mo.)
Engine Oil	R	R	R	R	R	R	R	R	R	R	R	R	R
Oil Strainer Screen					C				C				C
Gear Oil	R					R					R		
Brake	I	I	I	I	I	I	I	I	I	I	I	I	I
Tires					I				I				I
Air Cleaner	I					R					R		
Battery	I					I					I		
Spark Plug				C			C			C			C
Fuel Filter							R						R
Carburetor					I				I				C
Valve		A			A				A				A
V Belt									I				
Bolts and Nuts									T				

- Note:**
- (1) If ridden on dusty roads or raining days, please shorten the inspection and replacement schedule for air filter.
  - (2) If ridden under heavy load, frequent long distance travel, please shorten the replacement schedule for engine oil.
  - (3) Please clean the spark plug regularly, and replace the spark plug if necessary.

#### \* Regularly Maintenance and Performance Relationship\*



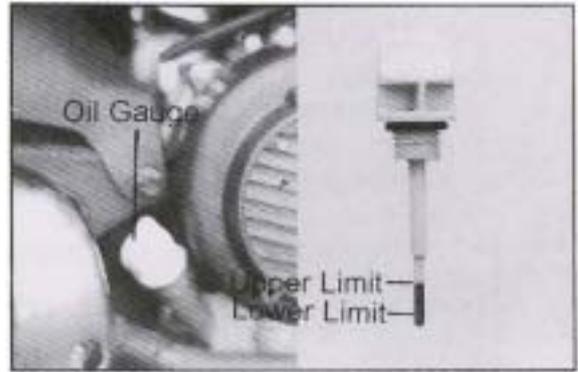
**Curve A:** With regular maintenance, the performance can be improved to optimal condition with maintenance at scheduled time.

**Curve B:** Without regular maintenance, the performance drops and engine can be damaged. Therefore, the engine needs repair to re-gain high performance, and the motorcycle's life can be shortened.

## 2-2 INSPECTION AND CHANGE OF ENGINE OIL

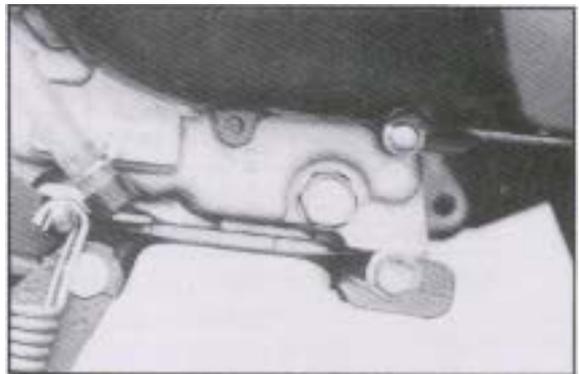
**Watch:** Please place main stand to park the motorcycle for inspection.

**Inspection:** Stop engine for 2~3 minutes when it is warmed. Remove the engine oil level and check if the oil level is below the lower limit. Fill engine oil to the level between upper and lower limits.



### \* Change Engine Oil \*

**Note:** Please change engine oil according to regular maintenance schedule. If ridden on heavy load or long distance, please shorten the maintenance schedule for oil change.



- Please put oil tray under the left crankcase and remove the oil drain plug. Re-install the drain plug when the engine oil is drained.

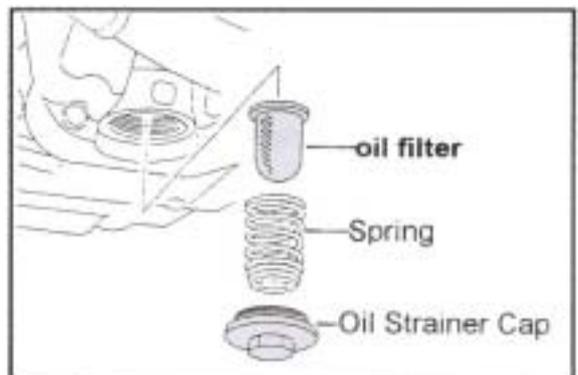
### \* Clean up the oil filter \*

#### **Inspection:**

- (1) If O-ring is damaged, please replace with new one.
- (2) If there is any deposit, please use clean up before re-assembly.

#### **Note:**

- (1) Torque of oil strainer screen:  
150 ~ 200 kg-cm.
- (2) Lubrication Type: SAE 10W-40  
Engine oil capacity  
\* BH8 / BR8 / BF8 \*  
125c.c. Engine disassembled : 900c.c.  
change oil : 750 c.c.  
\* BR9 / BF9 \*  
151c.c. Engine disassembled : 1000c.c.  
change oil : 900 c.c.
- (3) Check if there is any leakage after oil change. Warm the engine and check the engine oil level again.



## 2-3 FINAL GEAR OIL

**Watch:** Please place main stand to park the motorcycle for inspection. Clean grease around the drain plug.

**Disassembly:**

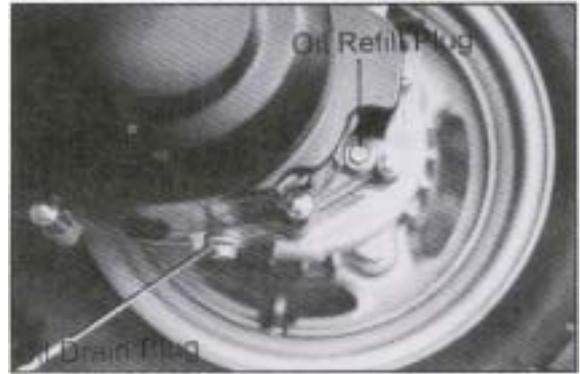
Oil refill plug.

Oil drain plug.

**Note:** Put an used oil tray under the gearbox before removing the drain bolt plug.

**Inspection:** Check if the oil drain plug washer is damaged. Please replace with new one if it is damaged.

Drain gear oil.



**Assembly:**

■ Assembly drain plug.

■ Refill gearbox oil.

■ Reinstall oil refill plug.

**Note:**

- (1) Torque on drain plug: 90 ~ 150 kg-cm.
- (2) Oil type: SAE 90 #
- (3) Oil capacity
  - \* BH8 \*
  - Gearbox disassembled : 110 c.c.
  - Regular Maintenance : 90 c.c.
  - \* BR8 / BF8 / BR9 / BF9 \*
  - Gearbox disassembled : 120 c.c.
  - Regular Maintenance : 100 c.c.
- (4) Please check if there is any leaking after oil refill.

## 2-4 BRAKE SYSTEM

### A. Front Brake Lever Free Play

**Note:** Front brake lever free play is 10~20 mm.

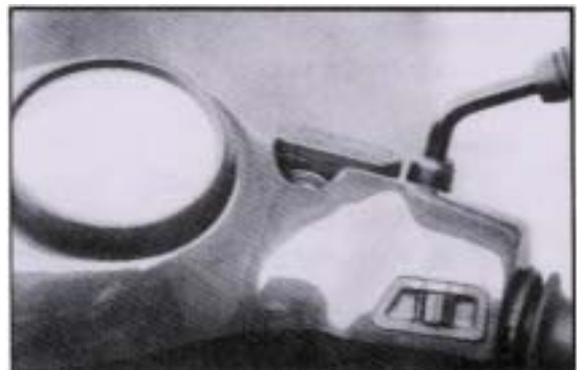
**Adjustment:** This motorcycle uses “non-adjust style”.



### B. Brake Fluid

**Inspection:** The front brake fluid level should be above “MIN”. If it is below, refill the brake fluid and check leakage of the brake system.

**Warning:** If there is low or no load when the brake lever is held, please check if there is air in the brake system or fluid leakage.



### C. Refill Brake Fluid

**Watch:** Please place main stand to park the motorcycle for inspection.

**Disassembly:**

2 tightening bolts on fuel cover.

Fuel trap.

Diaphragm.

Refill brake fluid to level between MIN and MAX.

**Assembly:** Assembly is in reverse order of disassembly procedures.

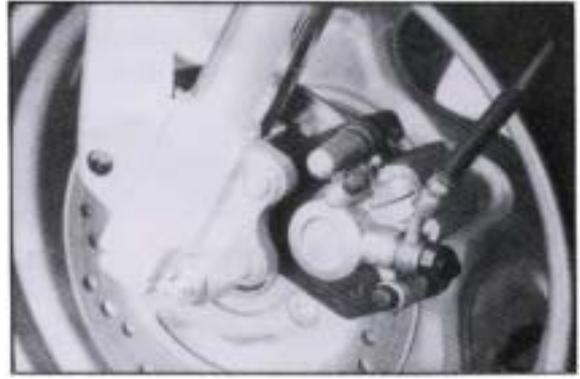
**Warning:**

- (1) Please refill the same type of brake fluid. Different fluid type may create toxic chemical ingredient and can damage the brake.
- (2) Please do not let water into the master cylinder. Otherwise, the boiling temperature may be reduced and bubbles can occur, then the brake may not work.
- (3) If the brake fluid is splashed on plastic parts or paints. Please wipe it out right away, otherwise it may affect engine firing.

#### D. Procedure to Release Air

- (1) Apply suitable plastic tube on drain plug, and put a tray under drain hole.
- (2) Slowly apply front brake several times.
- (3) Hold the front brake lever, and do not release the brake lever.
- (4) Unplug the air release plug, and still hold the brake lever.
- (5) Tighten the air release bolt, then release the brake lever.
- (6) Repeat procedure 1 to 5, and release air/bubble completely.

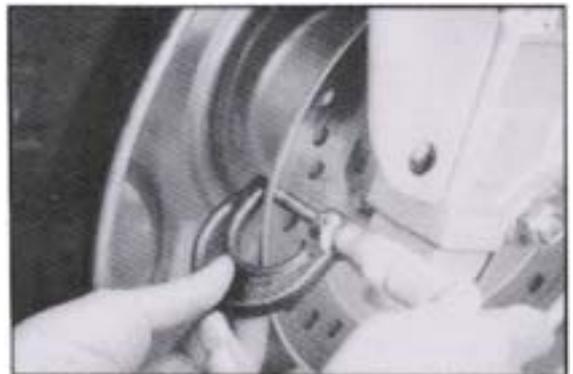
**Note:** Torque of air release bolt: 60 kg-cm.



#### E. Front Brake Disk

**Inspection:** If there is scratches, damage, or wear, please replace with new one.

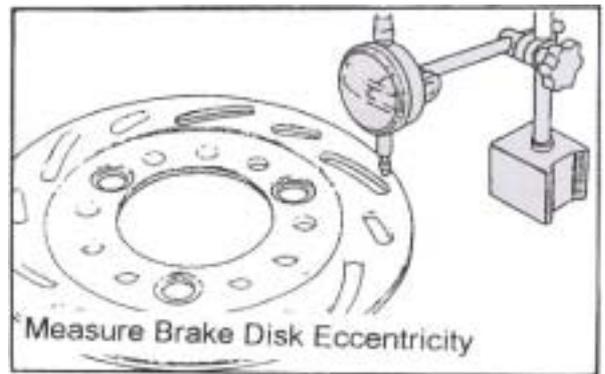
**Note:** The minimum disk thickness: 3.0 mm.



Brake disk eccentricity.

**Note:**

- A. The max. eccentricity: 0.5 mm.
- B. If eccentricity is not within the limit, please check tire roundness. If wheel rim roundness is not within the limit, then change the brake disk

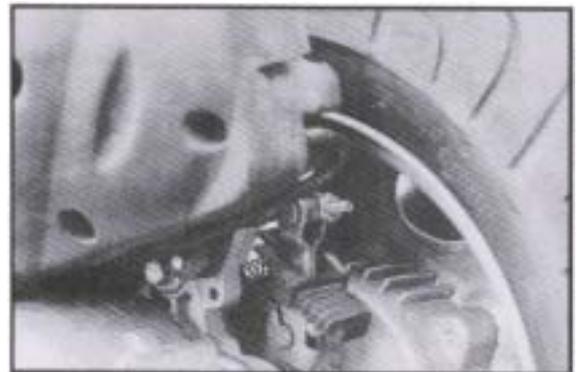


**F. Rear Brake Adjustment**

**Note:** The free play of rear brake lever:  
10 ~ 20 mm.



**Adjustment:** Adjust the adjustment nut.



## G. Inspection of Brake Lining and Wheel Rim

**Inspection:** Check the wear indicator plate. If the index is higher than the limit, please check the wear of wheel rim and brake lining.

### Disassembly:

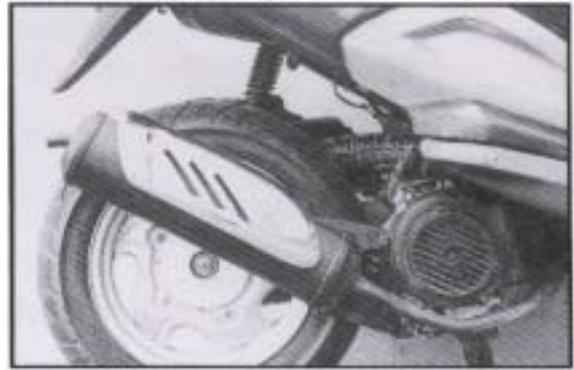
2 tightening bolts on exhaust pipe connector.

2 tightening bolts between exhaust pipe and right crankcase.

Tightening nut on rear wheel axle.

Washer.

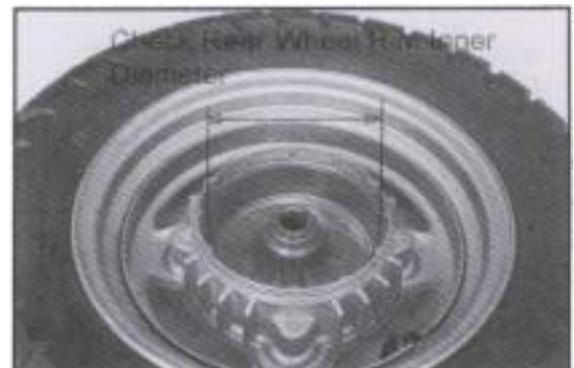
Rear wheel.



**Inspection:** check rear wheel rim inner diameter. If it is badly worn, please replace with new one.

### Note:

- (1) Please use vacuum to clean wheel rim and lining. Try to reduce the contamination of asbestos fiber, which may affect the human breath system or lead to cancer.
- (2) Use the Vernier calipers to measure the diameter of wheel rim. If the diameter is larger than 111 mm, then replace with new one.



Note: \*BH8\*

Wear limit  $\Phi$  111mm minimum.

\*BR8 / BF8 / BK8 / BR9 / BF9 / BK9\*

Wear limit  $\Phi$  131mm minimum.

Disassemble the brake shoe and brake shoe spring.



**Inspection:** Measure the brake lining thickness with three points of Vernier calipers (two ends and center). If badly worn, please replace with new one (brake shoe and brake shoe spring).

**Note:**

- (1) Useable thickness is 2.0 mm.
- (2) If less than useable thickness, please replace with new parts.

**Assembly:** Assembly is in reverse order of disassembly procedures.

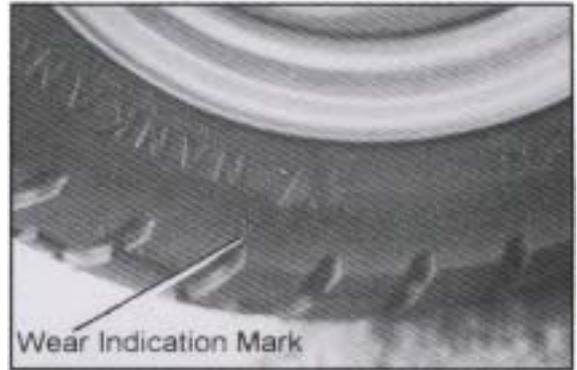
**Note:**

- (1) Torque of rear wheel bearing bolt: 600 ~ 900 kg-cm.
- (2) Torque of 2 bolts on exhaust pipe connector: 100 ~ 120 kg-cm.
- (3) Torque of 2 bolts on exhaust pipe and right crankcase: 300 ~ 400 kg-cm.

## 2-5 TIRE AND TIRE PRESSURE

**Inspection:** Check if tire has been cracked, damage, worn, inclusions (stone, nail, glass, etc.). If tire is in poor condition, please replace with new one.

**Note:** Tire specifications:  
See specification table.



### \* Tire pressure \*

**Watch:** Please measure cool tire pressure.

**Note:** Tire pressure.

Front tire: 175kPa(1.78 kg/cm<sup>2</sup> 25.38 PSI)

Rear tire: 210kPa(2.14 kg/cm<sup>2</sup> 30.45 PSI)

**Warning:** Don't over-load the motorcycle.  
The tire may explode with over-load and it is

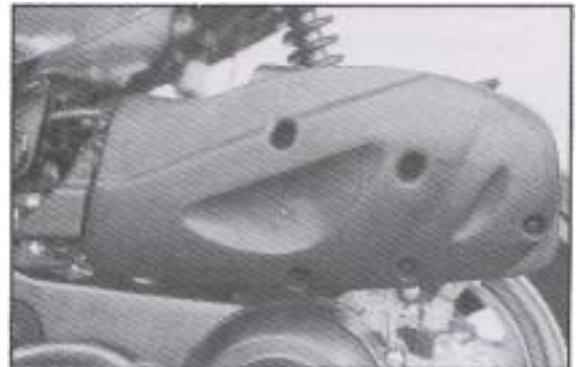


## 2-6 AIR FILTER

**Disassembly:**

Air filter side cover tightening bolt.

Air filter side cover.



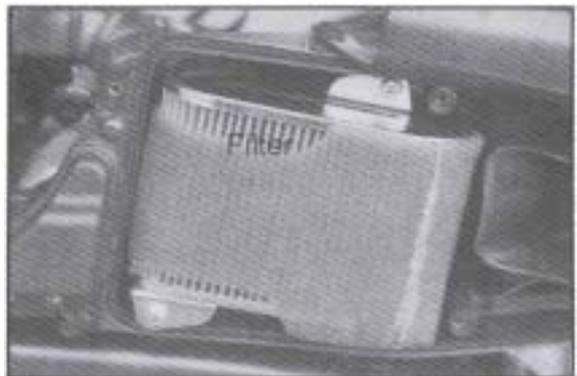
Filter tightening bolt.

Filter.

**Inspection:** Check if filter is filthy or broken. If filthy or broken, please replace with new one.

**Watch:**

(1) If ridden on dusty roads or raining days, please shorten the replacement schedule for air filter.



(2) Don't start engine when air filter is not installed, otherwise, the piston or cylinder can be damaged.

**Assembly:** Assembly is in reverse order of disassembly procedures.

**Watch:** Please install air filter and side cover closely.

## 2-7 BATTERY

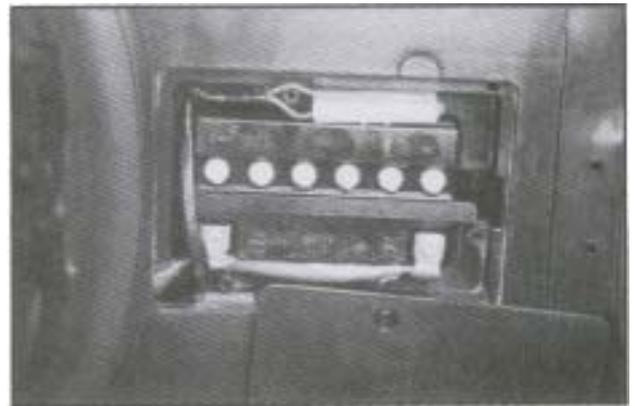
### Disassembly:

Foot mat.

Battery box cover.

Disconnect the battery negative “ - ” cable, and then the positive “ + ” cable.

**Warning:** Please do not touch tools with frame during disconnecting positive “+” cable. It can cause short circuit, then it may spark and damage battery.



**Inspection:** This motorcycle use wet type battery. Please fill with distillation water or lead battery fluid when the electrolysis fluid is lower than minimum.

**Assembly:** Assembly is in reverse order of disassembly procedures.

**Warning:** First connect the positive “ + ” cable, and then negative “ - ” cable.



## 2-8 SPARK PLUG

### Disassemble:

Spark plug cap.

**Note:** Please blow away deposits around spark plug with blower before removing spark plug. Otherwise, the dust may drop into cylinder and it can damage engine.

**Inspection:** Check if spark plug has carbon deposits, burned, or cracked. Use steel brush to remove carbon deposits and adjust spark plug gap. Replace burned or cracked spark plug with new one.

**Note:** Spark plug specification:

CR7HAS (NGK).

Spark plug gap: 0.6 ~ 0.7 mm.

**Warning:** First install the spark plug with hand, and then tighten it with spark plug wrench. Please do not over twist the spark plug.

**Note:** Torque of spark plug: 100 ~ 120 kg-cm.



## 2-9 FUEL FILTER

**Inspection:** Check if it is hardened, damaged, or leaking. If any above problem exists, please replace with new one.



## 2-10 CARBURETOR IDLE SPEED

### Note:

Please place main stand to park the motorcycle for inspection.

Start engine and adjust idle speed at warm engine condition.

### \* Adjust Procedure \*

Connect engine speed meter.

Adjust idle speed to adequate range with cross screw driver.



### Note:

- (1) Increase engine speed by rotating the screw clockwise.
- (2) Reduce engine speed by rotating the screw counter-clockwise.
- (3) Engine idle speed range:  
1800±100 rpm.

## 2-11 THROTTLE VALVE

**Inspection:** Check if the throttle valve operation is smooth.

### Note:

- (1) Throttle lever free play: 2 ~ 6 cm.
- (2) Micro-adjustment is performed at throttle lever. Macro-adjustment is performed at carburetor throttle valve cable.



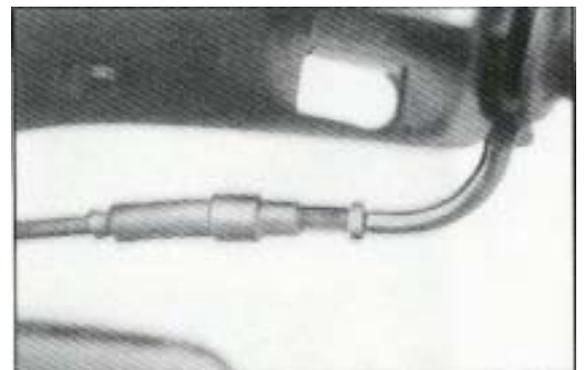
### A. Throttle Lever Gap Adjust

#### Procedures:

- Open dust boot.
- Loose lock bolt.
- Adjust by rotating adjust nut.

#### Note:

1. Increase engine speed by rotating nut clockwise.
  2. Reduce engine speed by rotating nut counter-clockwise.
- Tighten adjust nut after adjustment.  
Close dust boot.



## B. Carburetor Throttle Cable Gap

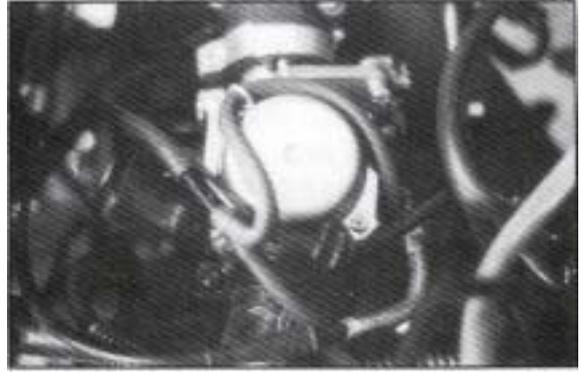
### Adjustment Procedure:

**Note:** First, adjust the throttle lever gap. If it does not satisfy the standard, then adjust the carburetor throttle gap.

Loose Tightening bolt.  
Rotate the adjust nut.

### Note:

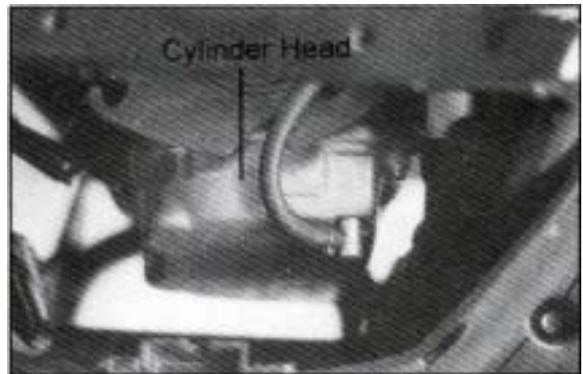
1. Increase gap by rotating the screw clockwise.
  2. Reduce gap by rotating the screw counter-clockwise.
- Tighten nut after adjustment.



## 2-12 VALVE

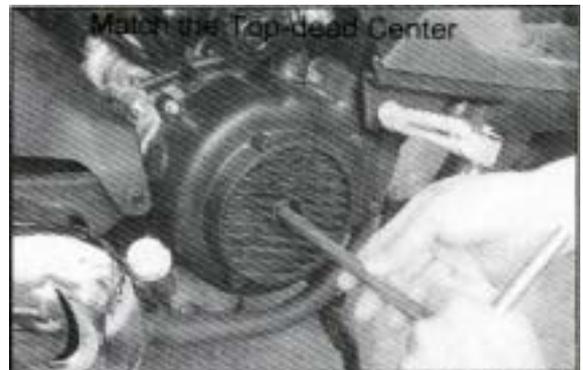
### Disassembly:

Cylinder head bolt.  
Cylinder head.



### Note:

- (1) Inspect and adjust are performed at engine temperature lower than 35°C.
- (2) Rotate the cooler fan, such that the mark on cam shaft gear match the top-dead center position and the "T" mark on flywheel match the mark on crankcase. Then, perform check and adjustment.



**Adjustment:** Use valve adjust wrench to loose tightening bolt, and rotate nut to adjust gap.

**Note:** Intake valve gap: 0.08 ~ 0.10 mm.

Exhaust valve gap: 0.08 ~ 0.10 mm.

**Watch:** Check if the gap is correct after bolt is tightened.

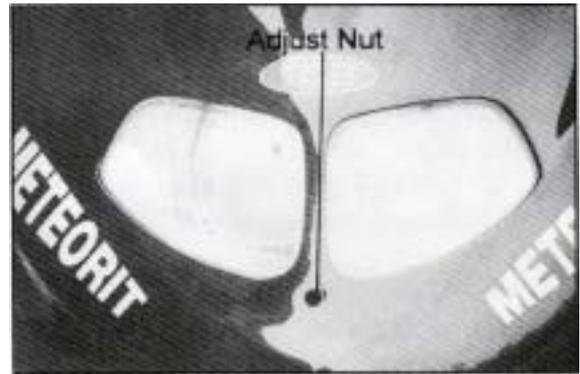


## 2-13 HEADLIGHT AXLE

Use cross screw driver to adjust the nut.

### Note:

1. Rotate the nut clockwise for higher light axle.
2. Rotate the nut counter-clockwise for lower light axle.

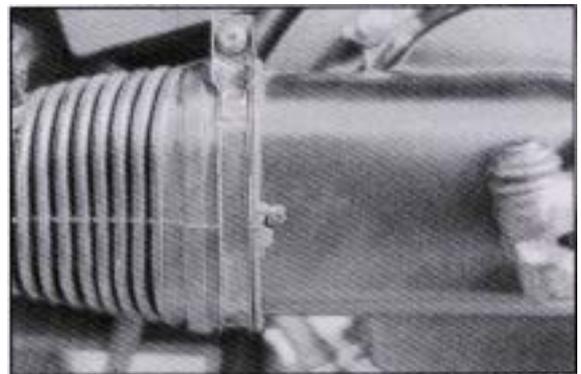


## 2-14 V BELT

**Watch:** Please place main stand to park the motorcycle for inspection.

### Disassembly:

Loose the cooler tube tightening ring.



Kicker starter arm tightening bolt.

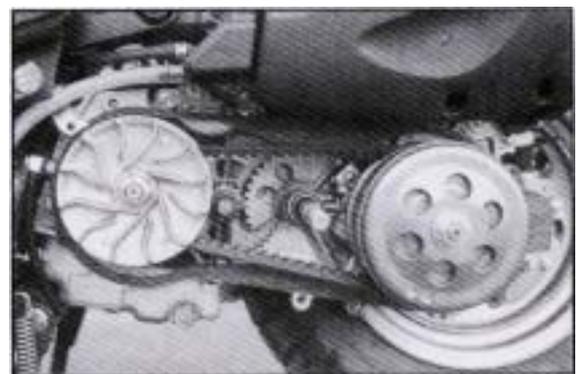
Kicker starter arm.

8 clutch side cover tightening bolts.

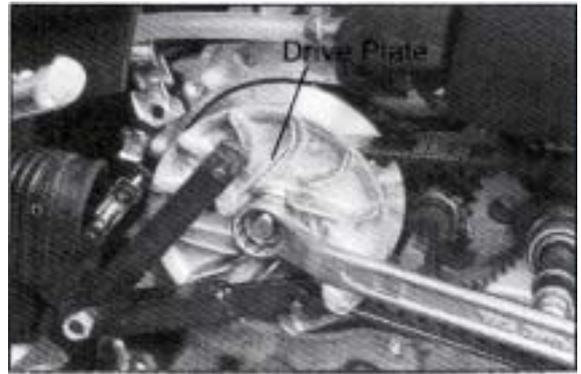


Clutch side plate.

Gasket.



Use universal wrench to tight the drive plate, and remove lock nut and gasket.  
Drive plate.



V belt.

**Inspection:** Check if the V belt has cracked, threaded, and pilling. If it is in poor condition, please replace with new V belt.

**Note:**

(1) Check the belt length.

Wear limit: 18.0 mm or 8000km

(2) Belt specification:

\*BH8\*

BANDO VS BELT 743 20 30

\*BR8 / BF8 / BR9 / BF9\*

BANDO VS BELT 846 20 30

**Assembly:** Assembly is in reverse order of disassembly procedures.

**Warning:** Please do not apply any grease on pulley and V belt, which can cause belt slip.

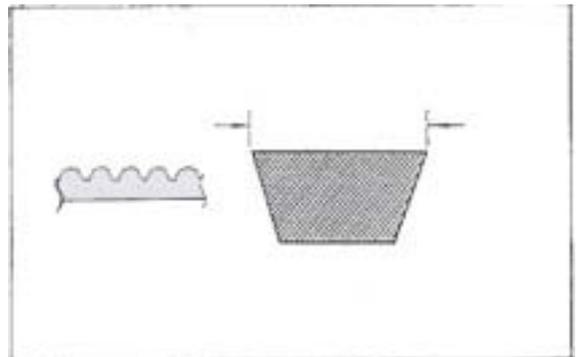
**Note:**

(1) Drive plate screw is left-threaded.

(2) Torque of driver plate nut: 800 ~ 1000 kg-cm.

(3) Torque of clutch side nut: 50 ~ 60 kg-cm.

(4) Torque of kick starter arm screw:  
100 ~ 120 kg-cm.



## 2-15 CYLINDER PRESSURE

### Note:

- (1) Check the cylinder pressure at warm engine condition.
- (2) Use compressed air to blow away deposits around spark plug before removing spark plug. Otherwise, deposits may drop into cylinder and damage engine.

### Disassembly:

- Spark plug cap.
- Spark plug.



### Inspection:

- (1) Install cylinder pressure gauge.
- (2) Full open fuel valve.
- (3) Ignite the starter motor by pressing the start button and measure cylinder pressure.

### Note:

- (1) Cylinder pressure
  - \*BH8 / BR8 / BF8\*
  - 125c.c. engine
  - 12.8 - 570 kg/cm<sup>2</sup>-rpm.
  - \*BR9 / BF9\*
  - 151c.c. engine
  - 11.7 - 700 kg/cm<sup>2</sup>-rpm.
- (2) Reasons of too high cylinder pressure:
  - A. Carbon deposits at combustion chamber.
  - B. Carbon deposits on piston top surface.
- (3) Reasons of too low cylinder pressure:
  - A. Valve gap too small.
  - B. Worn valve seat or seat is not completely closed.
  - C. Incorrect valve – timing.
  - D. Leakage due to worn cylinder gasket.
  - E. Worn piston ring.
  - F. Worn piston and cylinder wall.
- (4) Torque on spark plug 100 ~ 120 kg-cm.



### 3. RELEASE AND INSTALLATION OF ENGINE

#### 3-1 Starterd preparation data & Simplified troubleshooting

Disassembling of Crankcase :

Before disassembling the crankcase, the engine must at first dismantled and the following operations must be completed:

- Air cleaner, carburettor, and air intake mounted.
- Starter motor.
- Cylinder head cover, cylinder head.
- Cylinder, piston.
- Clutch cover, drive pully comp, driven pully comp.
- Rear wheel, rear shock absorber.
- Cooling fan, flywheel magneto.
- Oil pump.

Standard preparation data for crank, cylinder, piston, and piston rings:

Unit: mm

Item	Checking part	125 c.c. Engine		151 c.c. Engine		
		Standard value	Allowable limit	Standard value	Allowable limit	
Cylinder	Cylinder inner diameter	52.400-52.410	52.500	57.400-57.410	57.500	
	Roundness	-	0.05	-	0.05	
	Cylinder degree	-	0.05	-	0.05	
Piston and piston rings	Piston outer diameter	52.370-52.390	52.300	57.375-57.395	57.300	
	Inner diameter of piston pin	15.002-15.008	15.040	15.002-15.008	15.040	
	Gap between cylinder and piston	0.010-0.040	0.100	0.005-0.035	0.100	
	Gap between Piston and piston ring	Top ring	0.015-0.055	0.090	0.015-0.050	0.090
		Second ring	0.015-0.055	0.090	0.015-0.050	0.090
	Gap of piston ring	Top ring	0.10-0.25	0.50	0.015-0.300	0.50
		Second ring	0.10-0.25	0.50	0.015-0.300	0.50
		Lateral track of oil scraper ring	0.2-0.7	-	0.2-0.9	-
Gap between piston and piston pin		0.002-0.014	0.020	0.002-0.014	0.020	
Outer diameter of piston pin		14.994-15.000	14.960	14.994-15.000	14.960	
Inner diameter of the hole at connecting rod small end		15.016-15.034	15.060	15.016-15.034	15.060	

Blow with compressed air the parts after cleaning and before measuring.

### Simplified troubleshooting:

In case of bad ignition, not running smoothly in low speed, check if there is white smoke issuing from air intake of the crankcase. If it is the case, dismount the cylinder, piston, piston rings and measure them according to the above table. The causes may be the wear or break of piston pins.

If there is white smoke issue from muffler, its causes may be:

- Wear or break of piston pins.

- Serious wear of pistons and cylinders due to friction.

- Wear of connecting rod small end holes and piston rings.

Knocking pistons:

- Serious damage of cylinders, pistons, and piston rings by friction wear.

- Wear of piston pins and piston pin holes.

Low compression rate:

- Wear or break of piston rings.

- Wear or damage of cylinder walls and pistons.

- Too narrow gap or no gap at all of valve.

- Gap between valve and its seat.

- Valve burnt.

- Valve untimely.

- Spark plug not tightened.

- Gas leak at cylinder head washer.

Too high compression rate:

- Piston head or combustion chamber unclean.

Abnormal engine noise:

- Bearing of the end transmission mechanism loosened.

- Bearing of crank loosened.

## 3-2 RELEASE THE ENGINE

- Disconnect the terminals of the battery.
- Disconnect the electric terminals of the various components.
- Disconnect the fuel feed pipe and the vacuum cock control pipe.
- Disconnect the throttle valve control wire of carburettor.
- Release the rear brake cable.
- Release the shock absorber.
- Remove the engine mounting shaft screw.

## 3-3 INSTALLATION OF THE ENGINE

- Assemble the engine on the chassis by following the steps described for its disassembly in reverse order.
- Inspect the engine lubricate oil with the oil level indicated.
- Check the operation of the carburetor and accelerator.
- Adjust the rear brake.

## 3-4 CHECK THE ENGINE PARTS

### 3-4-1 Air Cleaner

- Remove the seven fixing screw of the air-cleaner cover.
- Inspect the filter is keep clean or not.
- Change a new filter, if it is badly dirty or broken.

### 3-4-2 Spark Plug

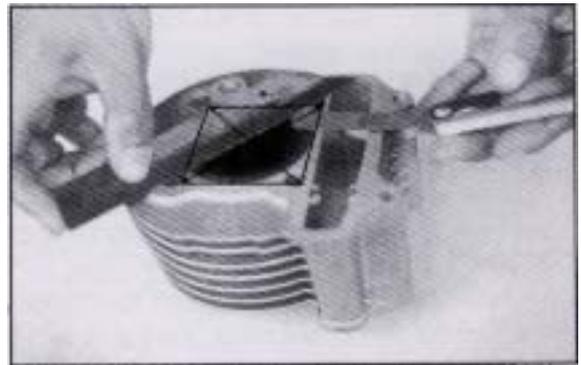
- Unscrew the spark plug with specified tool.
- Examine the spark plug does any dirty, deposit carbon or burn out ?
- Clean the spark plug if has dirty or deposit carbon with steel brush.
- Measure the clearance of the spark gap.
- The gap standard is 0.6-0.7 mm

### 3-4-3 Cylinder head and Timing

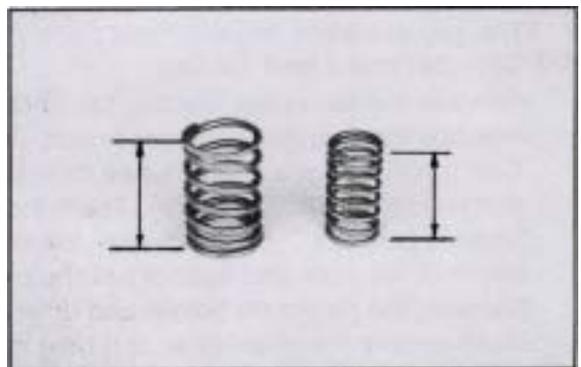
- Remove the fan cover, cooling fan and shroud set.
- Release the cylinder head cover bolt, remove the cylinder head cover.
- Turn the flywheel with clockwise direction, let the "T" mark on the flywheel point to the rib mark on crankcase. Then, the circle hole mark on the cam shaft gear will be upward position. Such position, the engine at top dead point position.
- Remove the nuts and washers of the camshaft holder.
- Remove the camshaft holder and dowel pins
- Disassembly the chain gear and take the camshaft off.
- Inspect the cam surface and the bearing.
- If cam surfaces are serious abraded and the bearings are damaged replaced with a new one.

- Pull out the rocker arms shaft and inspect that the rocker arms should not be worn and the oil hole is not obstructed.
- Pulling cylinder head gently off the cylinder.
- Remove the dowel pins, cylinder head gasket and the chain guide rod.
- Clean the coupling surfaces with carefully not to damage them.
- Clean the combustion chamber, ridding any carbon deposits.
- Check that the valve seats.
- Examine the combustion chamber and shown no sign of cracks or damage.
- Use a calibrated rule, inspect the cylinder head lower surface is perfect flatness.

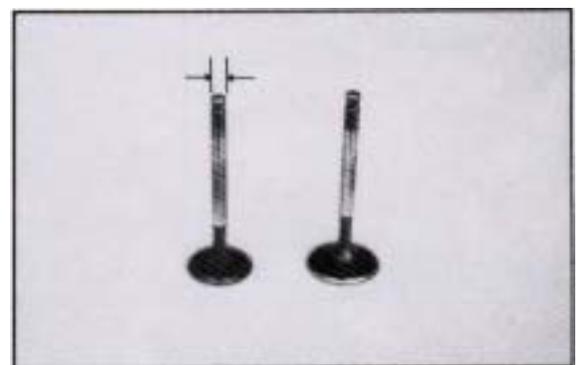
-Use a thickness gauge, inspect that the surface wear does not exceed 0.05mm.



-Measure the free length of the valve springs.  
 The limit of inner spring is 31.2mm.  
 The limit of outer spring is 34.1mm.



-Examine the valves should not be damaged, cracked, burnt or bended.  
 Clean the valve, removing all carbon formation and measure the diameter of vale axle.  
 The wear limit is 4.9mm.  
 Inspect the condition of the seat on the valve head, damaged or cracked are not allowed.



-Inspect the valve seats and show no signs of damages or crack.

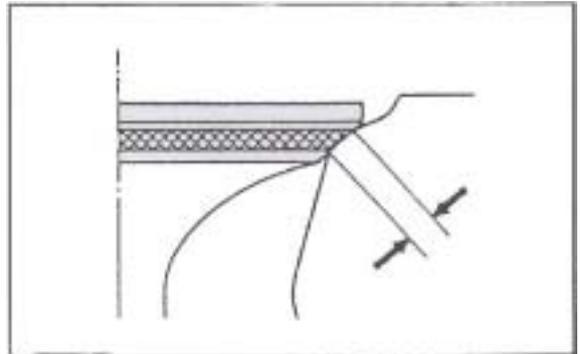
Measure the inside diameter of valve stem seal.

Wear limit of inlet valve stem seal is 0.08mm.

Wear limit of exhaust valve stem seal is 0.10mm.

-Measure the width of the impression on the valve seat.

Wear limit is 1.8mm maximum.



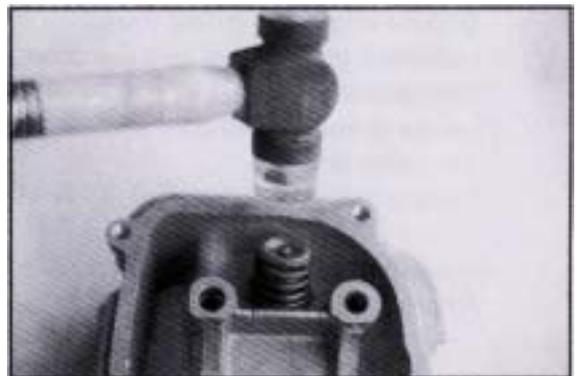
-Lubricate the valve stems and suit them to the guides. Fit the springs, the upper cups and the lock cones.

-Fit the valves with special tool carefully.

The springs may come off, it is dangerous.

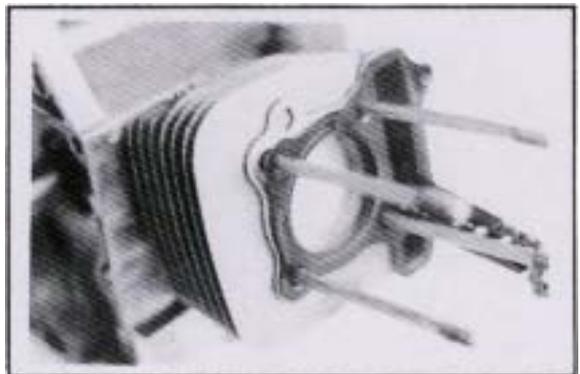
-Gently tap the valve stems with a plastic mallet to make the cones in their seats.

Be carefully, when doing this work.



-Insert the two rocker arms shaft.

-Fit a new cylinder head gasket and keep the surfaces of gasket and keep the surfaces of gasket clean.



-Assembly the cylinder head.

-Turn the flywheel, Let the "T" mark on the flywheel to aim at the rib mark on the crankcase.  
The circle hole on the camshaft gear is upward and the two mark line on the camshaft gear match with surface of the cylinder head.

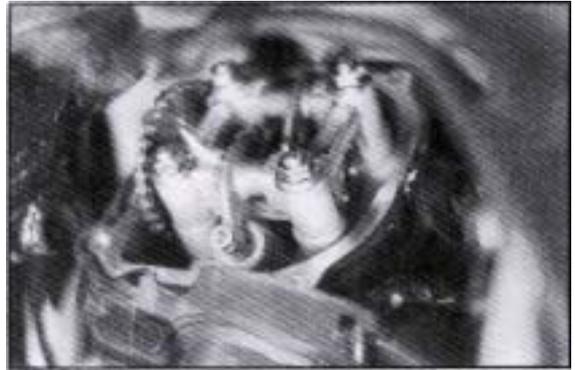
Fit the camshaft gear and fit the chain on this camshaft gear.

-Fit the dowel pin.

-Fit the camshaft holder.

Fit the nuts on the related studs and tighten them by diagonal step.

Tightening torque is 200 kg-cm



-Install the chain guide.

Loose the lock by turning the nut with counter-clock direction.

-Adjusting the valves

Should align with rotate the crankshaft by hand until the circle hole marks on camshaft gear wheel and the other two mark line cylinder head, then adjust the plays of the valves with special tool and with the aide of a thickness gauge measure the gap between the rocker arm adjusting bolt abutting end and the valve stem.

Clearance: Inlet valve gap: 0.08 ~ 0.10 mm

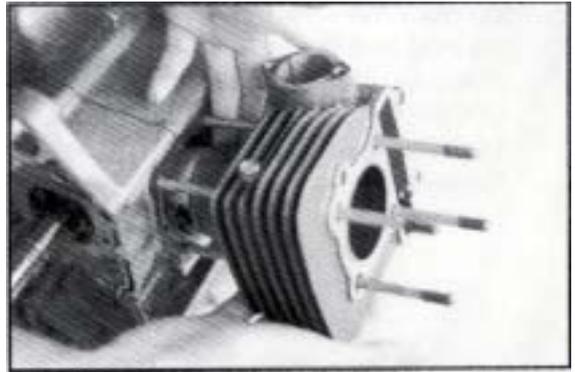
Exhaust valve gap: 0.08 ~ 0.10 mm

-Assemble the head cover.

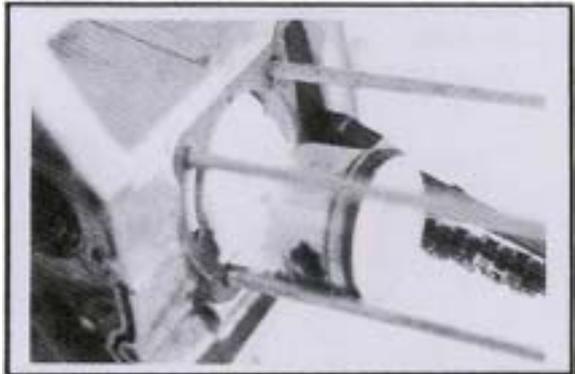
Replace the sealing ring with a new one, install the cover and screw the four bolts.

### 3-4-4 Cylinder and piston

- After removing the cylinder head and gasket, take out the cylinder.
- Take off the cylinder gasket and clean the crankcase surface.



- Place a clean cloth under the piston to prevent any dust from falling inside the crankcase chamber.
- Remove the piston pin circlip and the piston.



- Inspect the cylinder inside surfaces show no signs of seizure or anomalous wear, then measure the inside diameter of the cylinder with a bore meter.

**Note:** \*BH8 / BR8 / BF8\*

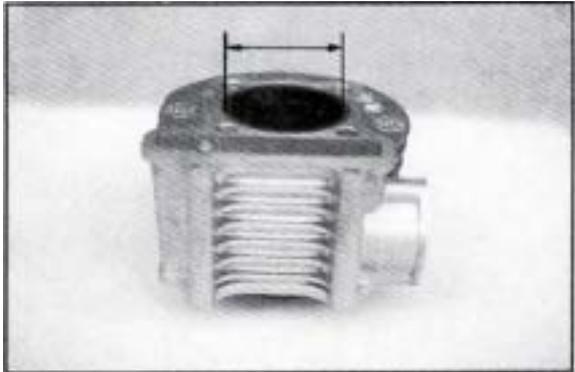
125c.c. engine

Wear limit  $\Phi 52.5\text{mm}$ .

\* BR9 / BF9\*

151c.c. engine

Wear limit  $\Phi 57.5\text{mm}$ .



- Take measurements on three planes along the cylinder axis; for each plane take a measurement on the circumference.

- Take off the piston rings carefully.
- Inspect the piston surface, anomalous wear is not allowed.

Note: \*BH8 /BR8/ BF8 / BK8\* 125c.c. engine

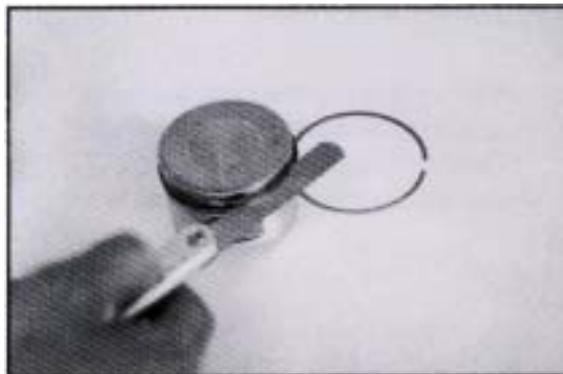
Wear limit  $\text{Ø}52.5\text{mm}$ .

\*BR9/ BF9 / BK9\* 151c.c. engine

Wear limit  $\text{Ø}57.5\text{mm}$ .



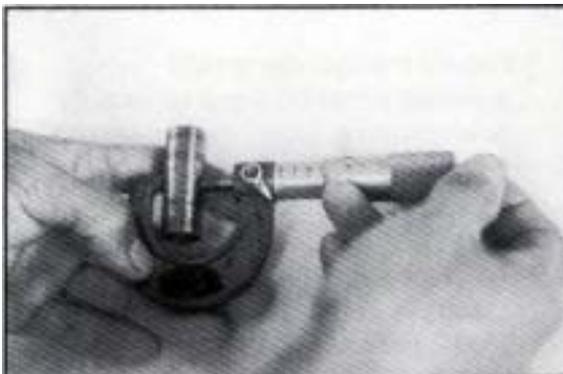
- Measure the clearance between the ring and the groove.  
The max. clearance of top ring is 0.09mm.  
The max. clearance of 2nd ring is 0.09mm too.



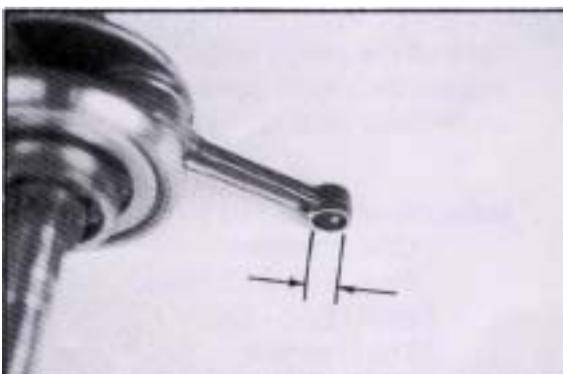
- Measure the diameter of the piston pin hole.  
Wear limit is  $\Phi 15.04$  mm.



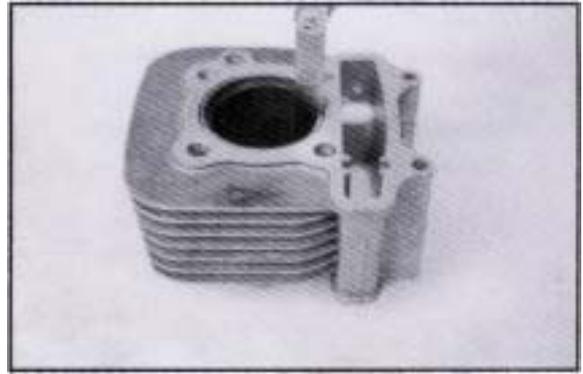
- Measure the piston pin outside diameter.  
Wear limit is  $\Phi 14.96$  mm.



- Measure the inside diameter of the piston-rod small end.  
Wear limit is  $\Phi 15.06$ mm.



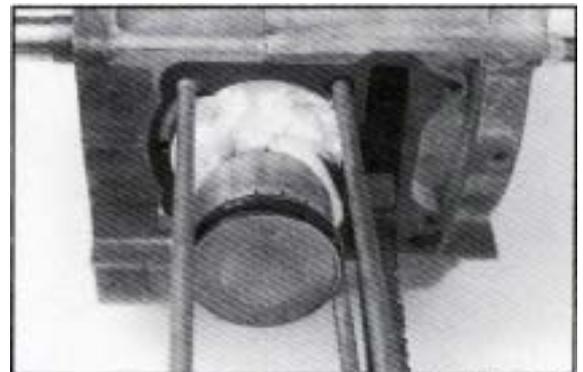
- Put the piston ring into the cylinder and measure the clearness of opening by thickness of opening by thickness gauge. Replaced if it exceeds 0.5mm.



- Fitting the rings on the piston.  
Take care not to damage the rings during the fitting and position them as shown in the figure.  
Once fitted, the rings must rotate freely in their grooves.
- The 2nd ring is engraved "2R" mark.  
The 1st ring is engraved "R" mark.  
The mark should face upwards while installing.

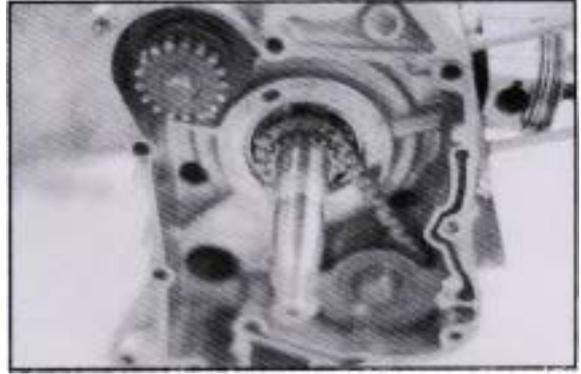


- Assemble the piston, the "IN" reference mark is at the inlet valve side.  
Insert the piston pin and assembly rings.  
Assemble the circlip carefully.
- Fit the cylinder gasket and cylinder.

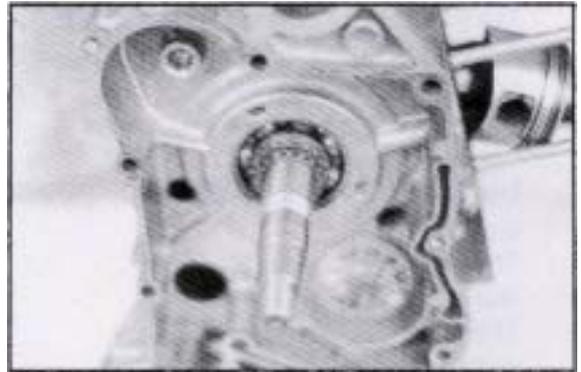


### 3-4-5 Crankcase-Crankshaft

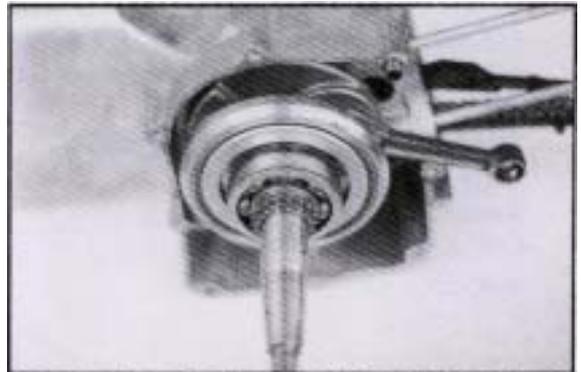
- Remove the chain and chain guider.
- Remove the oil divider and then remove the driving sprocket.



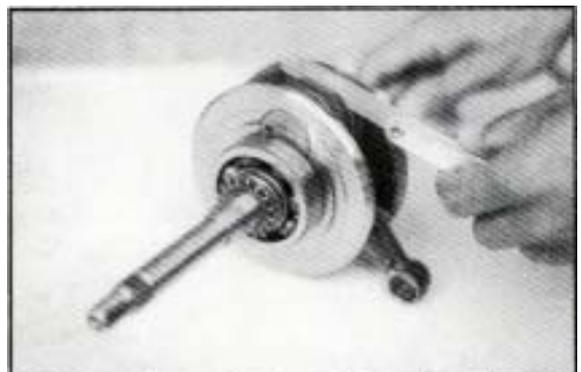
- Remove the coupling bolts, gasket and pin.



- Take out the crankshaft from crankcase.



- Check the side play of the piston-rod big end with a thinness gauge.  
Wear limit is 0.5mm.



-Measure the offset between the two shafts of crankshaft.

Maximum offset is 0.1mm.

-Bearing

Before removing the bearings, make sure that they rotate freely and have no play in their respective housings.

-Fit the crankshaft and smear the coupling surfaces with Loctite fixing glue.

-Fasten the flywheel-side crankcase half to the transmission-side crankcase half.

-Fit the crankcase halves coupling screws.

Tightening torques 90 kg-cm.

## 3-5 FUEL REED CIRCUIT

### 3-5-1 Carburetor

Disassemble all carburetor components, clean them with solvent, then dry them with compressed air.

Pay special attention to the ducts in carburetor body.

Carefully check the condition of all components.

The needle may be worn, replace it.

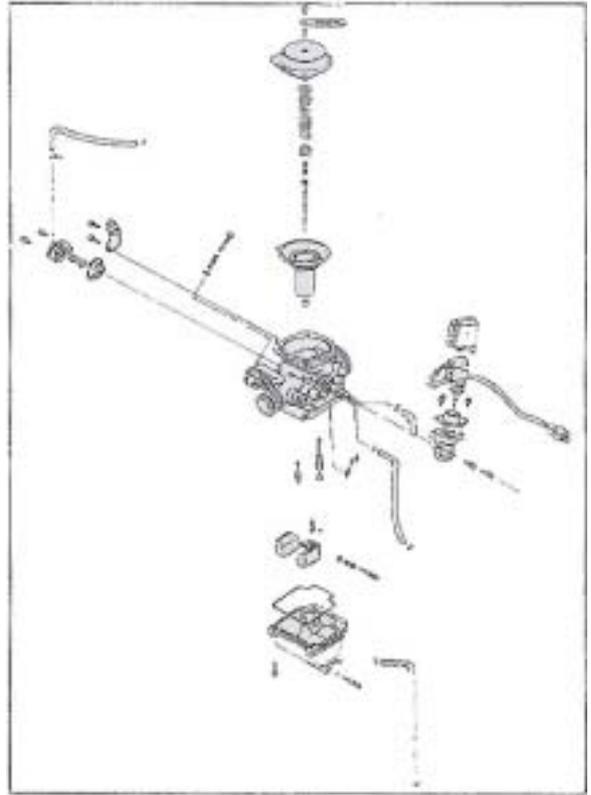
The throttle must slide free in the carburetor.

If there is excessive play due to wear the throttle must be replaced.

Using the new gaskets when reassembling the carburetor.

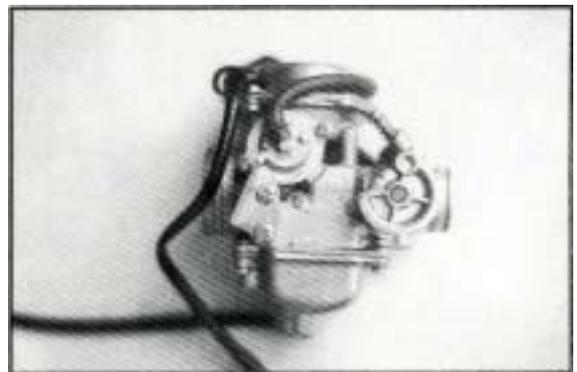
Inspect if the pressure piston is worn or presents notches, Inspect the vacuum membrane carefully.

Damaged or cut are not allowed.



### 3-5-2 How to take off the carburetor

- Remove the fuel feed pipes.
- Remove the automatic by choke connector.
- Loosen the throttle control cable adjusting nut and disconnect the throttle control cable from the carburetor.
- Loosen the air filter fastening strap and remove the carburetor.



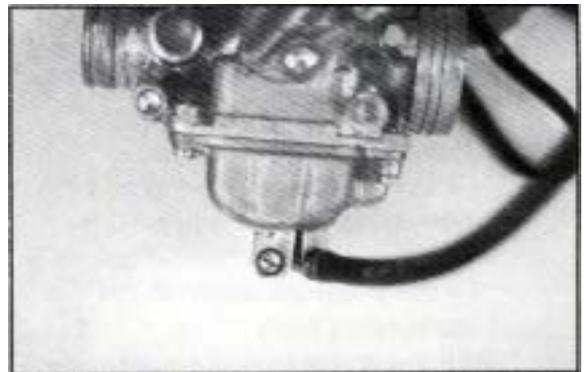
### 3-5-3 Automatic Choke

The needle of automatic choke must keep well. Notches, signs of wear, scratches or other damage are not allowed.

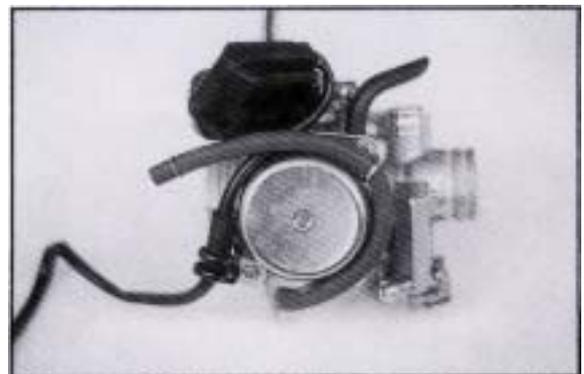


### 3-5-4 Membrane chamber

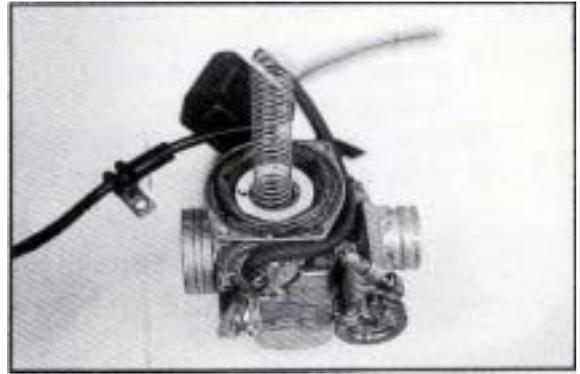
-Loosen the drain screw and let the fuel flow out from the float chamber.



-Remove the two screws of the pressure chamber.



-Remove the compression spring and the pressure piston



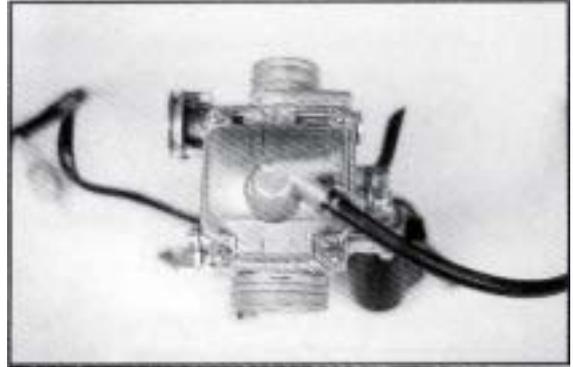
-Remove the needle holder and the needle from the piston.  
Inspect the pressure piston and membrane.  
Notches, scratches or other damage are not allowed.



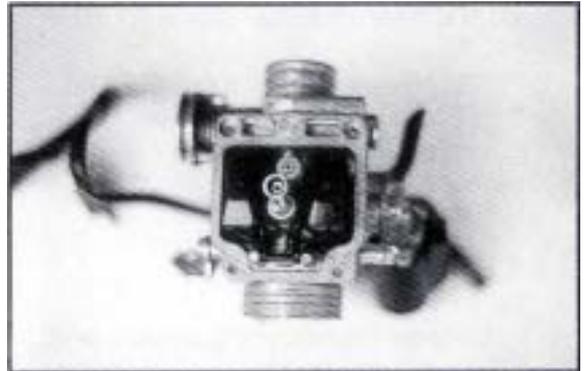
-Fit the needle, the spring and the needle holder in the pressure piston and fix the needle holder.  
-Fit the pressure piston in the carburetor body.  
-Fit the compression spring.  
-Fit the pressure chamber cover and fasten it with two screws.

### 3-5-5 Float/Needle valve/Jets

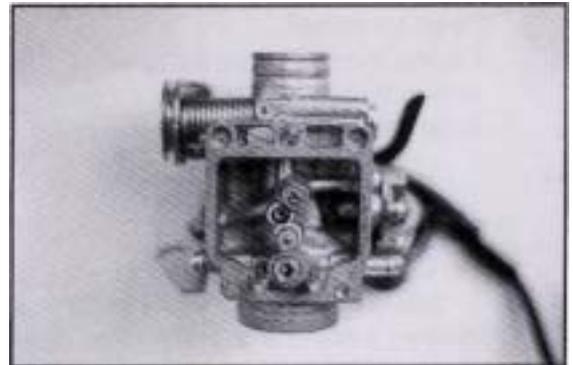
-Unscrew the four float chamber screws.



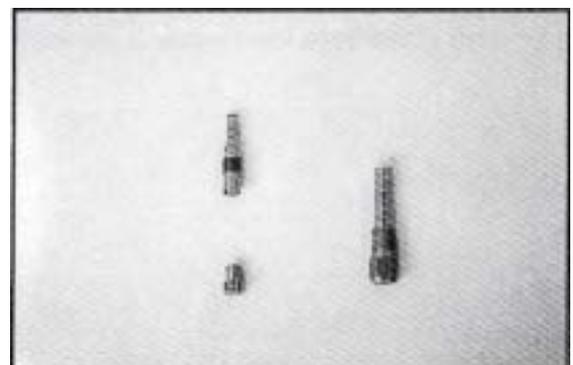
-Remove the float pivot, the float and the needle.



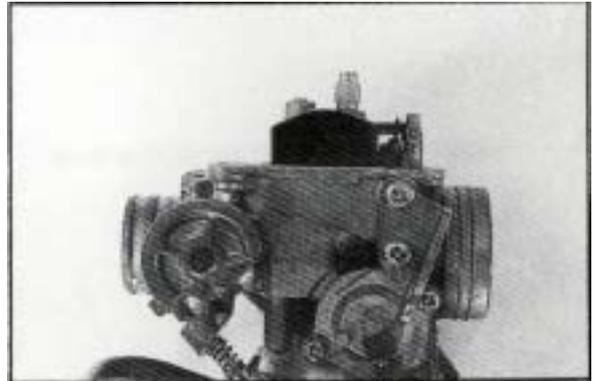
-Inspect the needle valve and its seat.  
Notches or deep scratches are not allowed.



-Remove the main jet, choke jet and idling jet.  
Inspect these jets.

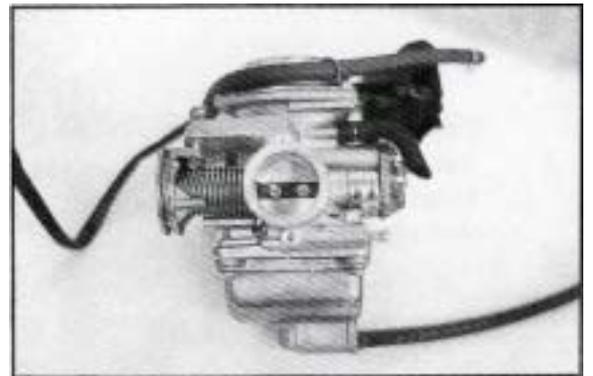


- Before fitting the parts again, blow all parts, and in particular the housings of the jets, with compressed air.
- Clean the main, choke and idling jets with a detergent solvent and blow them with compressed air.
- Fit the main, choke and idling jets.
- Fit the seat of the needle valve. Fit the needle valve. the float and the float pivot
- Measure the float height while its tongue touches the needle valve.  
Distance between the float and the float chamber plane is 18.5mm.  
Replace the float if the level is not as indicated.  
Fit the float chamber.



### 3-5-6 Throttle Valve

- Loosen the fastening screws and remove the throttle valve.
- Check that the valve rim shows no deep scratches.
- Fix the throttle valve again with Anti-loosen glue and new screws.



**Note:** Before tightening the two screws of throttle valve, carry out the following

- (a) Loosen the slow running adjuster completely, so as to enable the throttle to close the duct completely.
- (b) Proceeding with the utmost care, manually position the throttle in completely closed position.
- (c) Tighten the screws while holding the throttle in place.
- (d) Make sure the throttle is correctly repositioned.

## 3-6 LUBRICATION

### 3-6-1 Engine oil level

The engine must be in cold and the scotter positioned uprightly on its stand flat ways. Inspect the oil level with the oil meter that remove it from the crankcase.

If the level is close to the minimum point and the oil is not to be renewed, fill up with oil of the recommended type.



### 3-6-2 Oil renewal

Renew the oil easily while the engine is in hot condition.

Place a vessel under the engine, remove the outlet bolt and the oil lever gauge.

After draining the oil, clean the oil lever gauge (check the O-ring seal) and fit the oil lever gauge and outlet bolt again.

Tightening torque: 150 kg-cm

Supply the engine with recommended oil through the oil filter

Screw the filler plug.

Lubrication Type: SAE 10W-40

Engine oil capacity

\*BH8/BR8/BF8\*

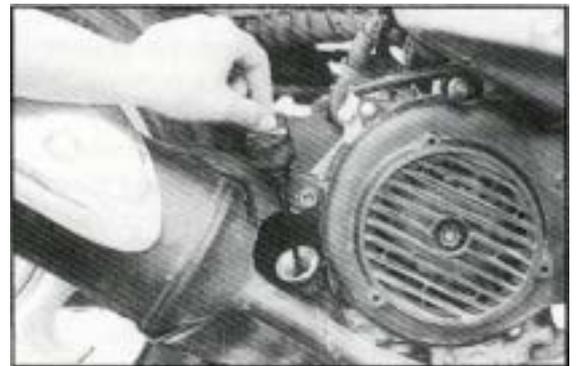
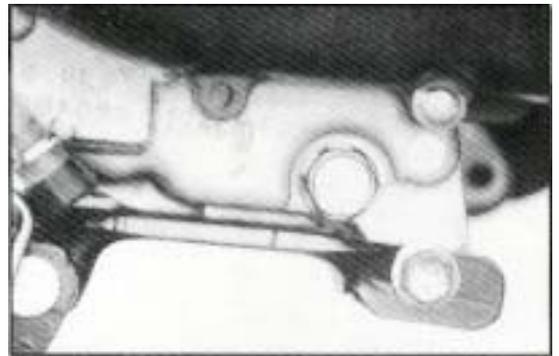
125c.c. Engine disassembled:900c.c.

Chang oil: 750c.c.

\*BR9/BF9\*

151c.c. Engine disassembled:1000c.c.

Chang oil: 800c.c.

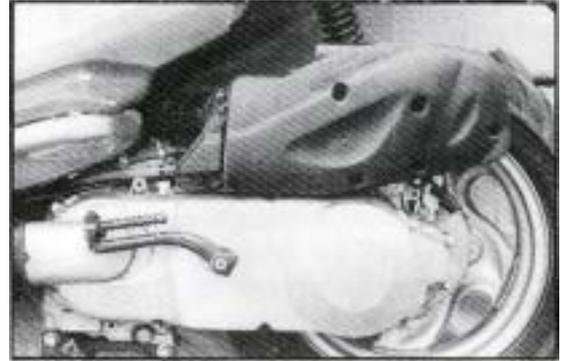


**Note:** Run the engine after a few minutes, then recheck the oil level again when the engine is until cold condition. The oil level should always be kept below the max. lin and above the min. line.

## 3-7 DRIVING PULLY-CLUTCH-DRIVEN PULLEY

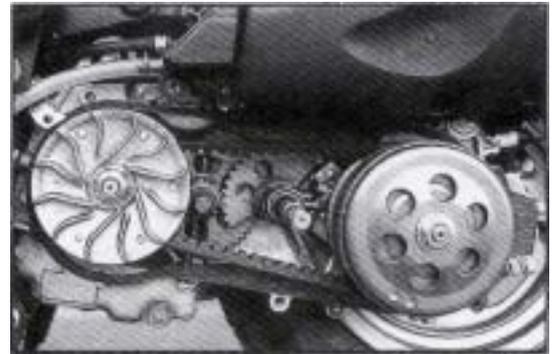
### 3-7-1 Transmission cover

- Loosen the fixing screw of cooling duct and remove the cooling duct.
- Remove the kick starter lever Assy..
- Remove the clutch cover screws by diagonal step and then remove the clutch cover.
- Take off the knock pins and remove the gasket.



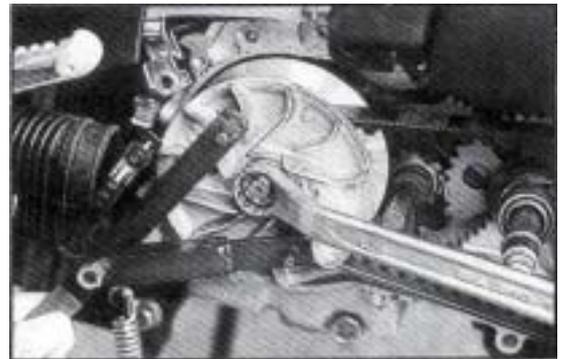
### 3-7-2 Driving pulley

- Use the special tool to lock the fixed drive face and loosen the central nut with wrench.



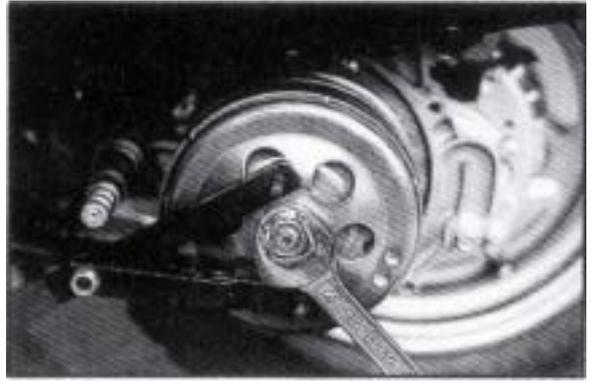
- Remove the belt from the spacer and remove the drive pulley

**Note:** Press the movable drive plate and drive pulley face while removing the drive pulley face Assy. in order to avoid the roller to stand up.



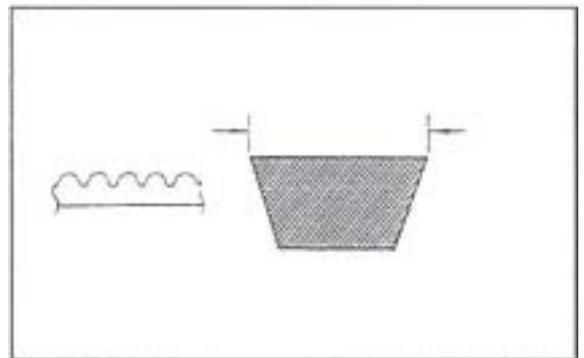
### 3-7-3 Driven pulley

- Remove the central nut of clutch housing with a compass spanner to lock the housing bell and loosen the nut with wrench.
- Remove the driven pulley comp and belt.

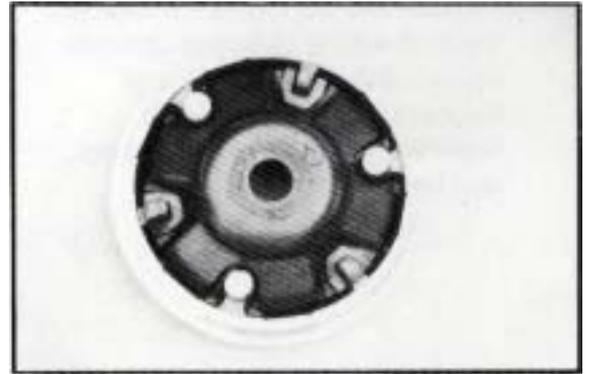


### 3-7-4 Checks

- \*Drive belt
- Be sure that the drive belt should not be cracked or damaged.
- Measure the belt length.  
Wear limit: 18.0mm or 8000km



-Remove the movable drive plate guide blocks and rollers.



Take care to make the mark on the rollers and groove of drive face in order to install rollers correctly.

**\*Rollers**

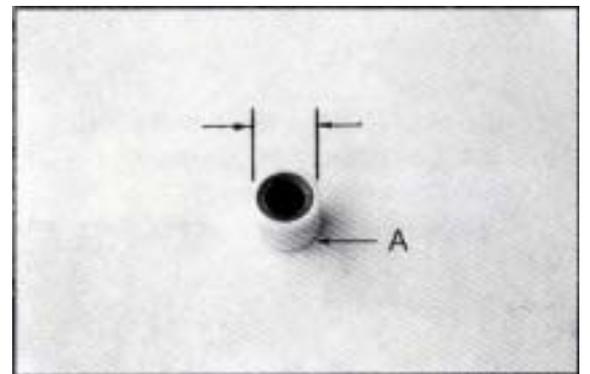
Inspection that the rollers should not to be damaged or worn.

**\*BH8\***

Wear limit  $\text{Ø}18.0\text{mm}$  minimum.

**\*BR8/BF8/BR9/BF9\***

Wear limit  $\text{Ø}17.4\text{mm}$  minimum.



**\*Roller Bush**

Inspection that the internal bushing of drive bush should show no signs of anomalous wear and with bore meter to measure its inside diameter.

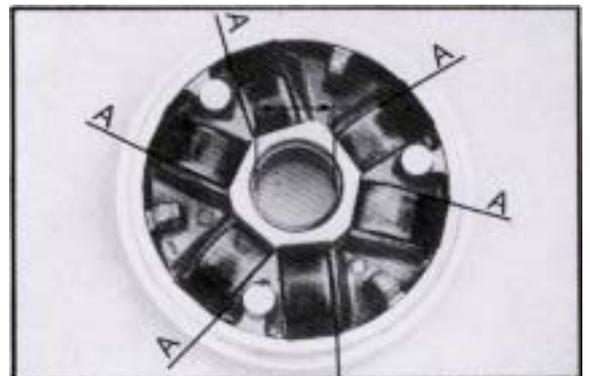
**\*BH8\***

Wear limit  $\text{Ø}25.0\text{mm}$  maximum.

**\*BR8/BF8/BR9/BF9\***

Wear limit  $\text{Ø}24.06\text{mm}$  maximum.

**Note:** Take care to replace the rollers in their original positions.



\*Spacer

-Make sure the spacer surface should not be damaged.

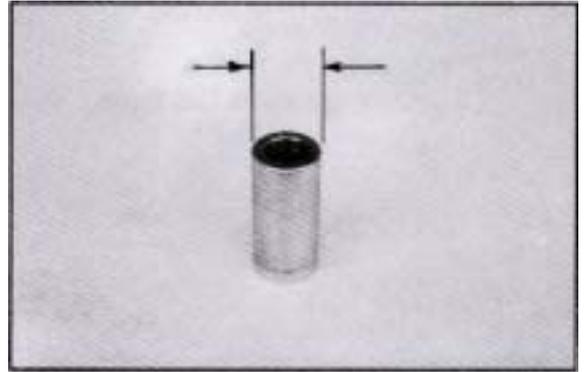
-Measure the outside diameter of the spacer.

\*BH8\*

Wear limit  $\text{Ø}26.0\text{mm}$  minimum.

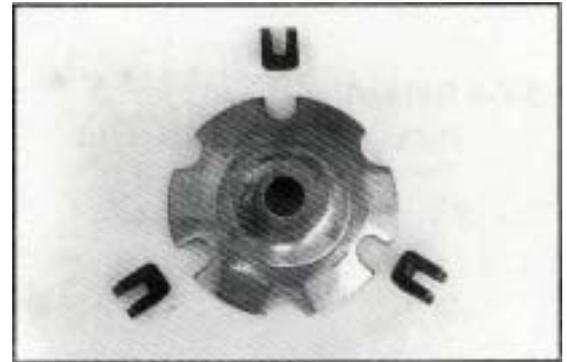
\*BR8/BF8/BR9/BF9\*

Wear limit  $\text{Ø}23.94\text{mm}$  minimum.



### 3-7-5 Guide shoes

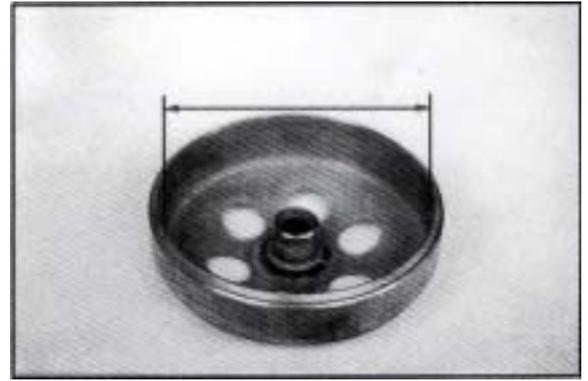
-Inspect the guide blocks should not be worn and then inlay them into the movable drive plate.



Assemble the movable drive plate cover.

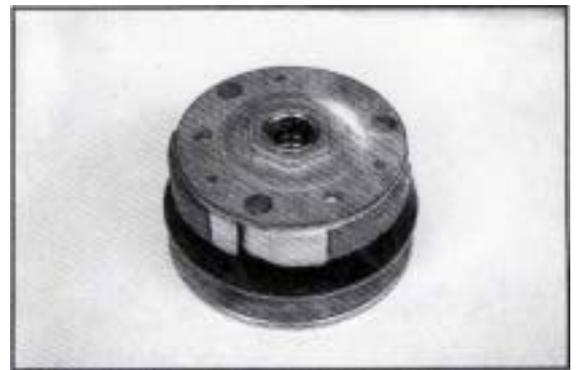
### 3-7-6 Clutch housing

- Inspect for any unusual damage and color change.
- Replaced if the inside diameter exceeds 125.5mm.



### 3-7-7 Driven pulley

- Remove the central nut with compass spanner to lock the driven pulley.
- Warning: Press tightly the driven pulley while unscrewing the nut, so that the spring will not jump out.

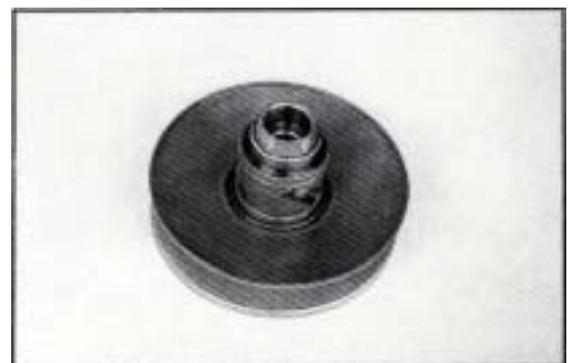


### 3-7-8 Retaining sheet

- Pull out the retaining sheet by hand

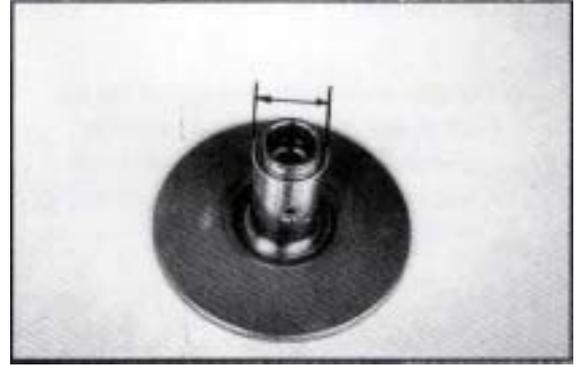


- Pull out the guide pins and extract the movable drive face from the fixed driven face



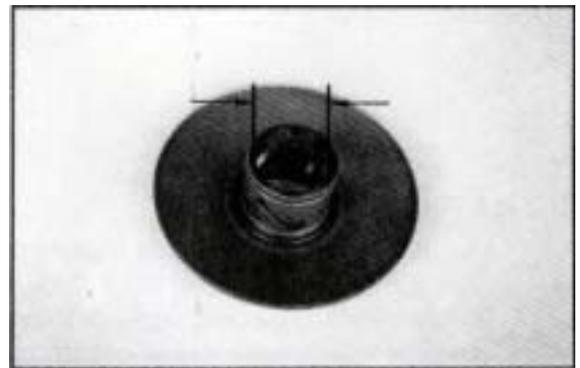
### 3-7-9 Fixed driven face comp

- Measure the outside diameter of the fixed driven face bush.
- Wear limit  $\text{Ø}33.94\text{mm}$



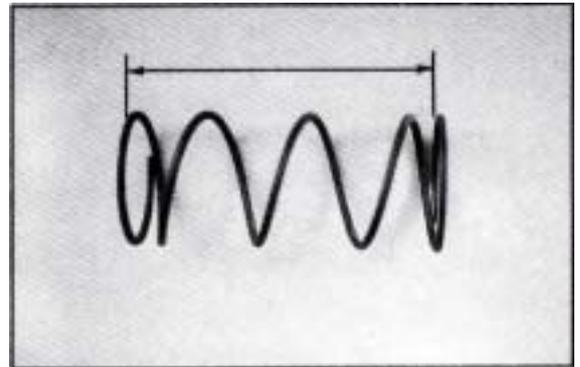
### 3-7-10 Movable driven face comp

- Measure the inside diameter of the movable drive face.
- Wear Limit  $\text{Ø}34.06\text{mm}$ .



### 3-7-11 Spring

- Measure the free length of the movable driven face spring.
- Replaced if the free length of spring is less than 135mm.

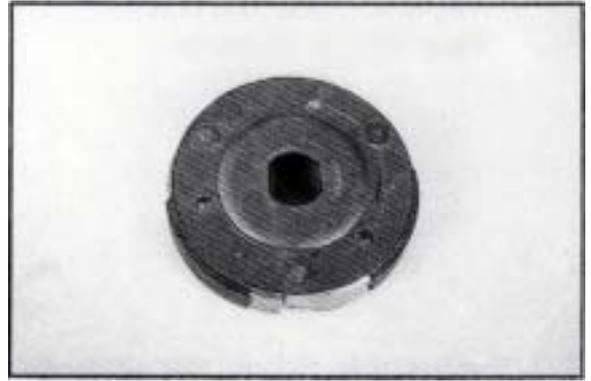


### 3-7-12 Fixed driven face comp bearings

- Push out the old bearings and install the new one with the tube that has corresponding length and suitable diameter.

### 3-7-13 Clutch

- Make sure that should not be oil strained, cracked and unusual damaged from the appearance.
- Replaced if the thickness of lining is less than 1.5mm



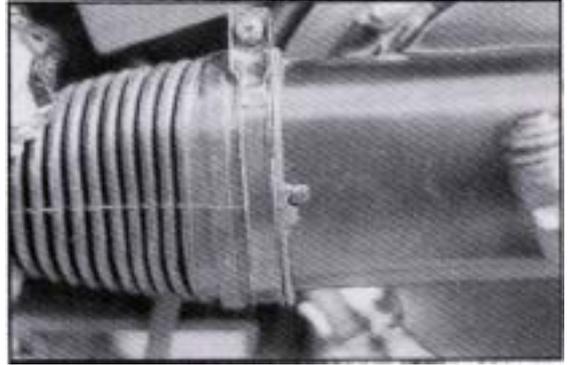
### 3-7-14 Fitting

- Install the fixed driven face comp into the movable driven face comp.  
Avoid to damage the lip of oil seal.
- Install two O-rings and apply grease to the groove of the cam then fit the guide pins.
- Apply a little grease inside of the spring sheet and manually push the spring sheet in lightly and the install the spring and screw the central nut.

## 3-8 STARTER ARM

### Disassembly:

Loose cooler tube tightening ring.

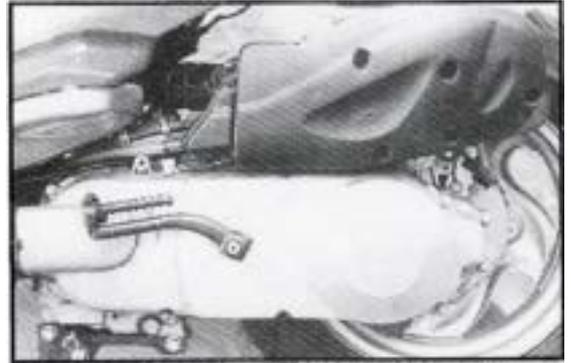


Starter arm tightening bolt.

Starter arm.

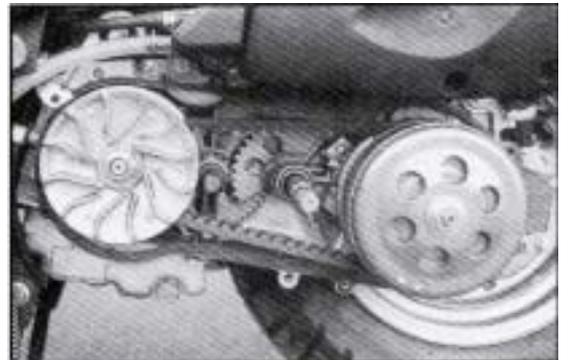
8 clutch side cover tightening bolts.

Clutch side cover.



Gasket.

Pin.

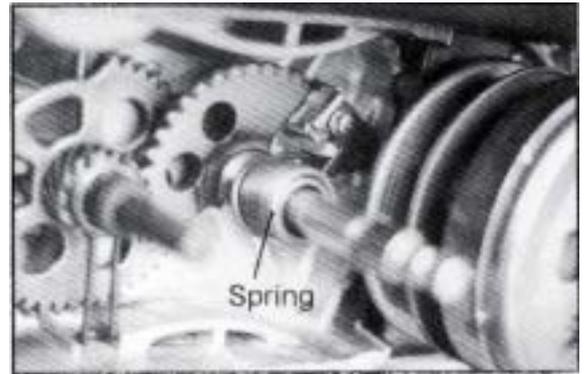


Use universal wrench to hold drive plate and remove drive belt pulley assembly.

Belt.



- Starter arm washer.
- Spring stop plate.
- Spring.
- Starter arm.
- Starter cam assembly.

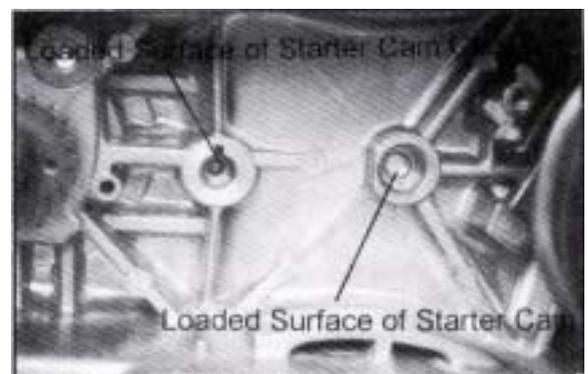


**Inspection:**

(1) Check if starter arm surface and collar are worn and damaged.

(2) Check if starter cam gear surface is worn and damage.

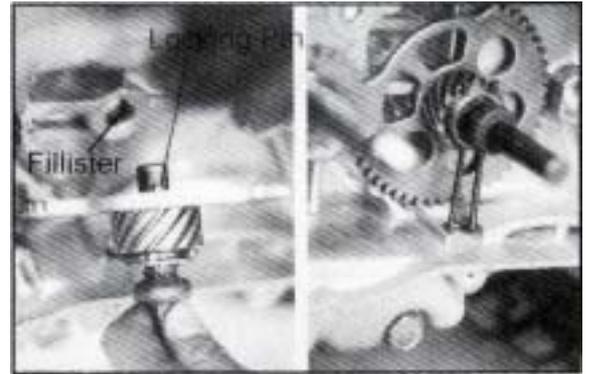
(3) Check if starter cam and starter arm loaded surface are worn and damaged.



**Assembly:** Assembly is in reverse order of disassembly procedures.

**Note:**

- (1) Apply grease on starter arm collar and cam loaded area for lubrication.
- (2) The starter cam locking pin should match with crankcase fillister for assembly.



- (3) The mark on starter axle gear should match mark on starter cam.



- (4) Use special tool for starter arm spring assembly. Rotate tool clockwise, such that spring locking pin is positioned under crank case half-moon location, then assemble stop plate.



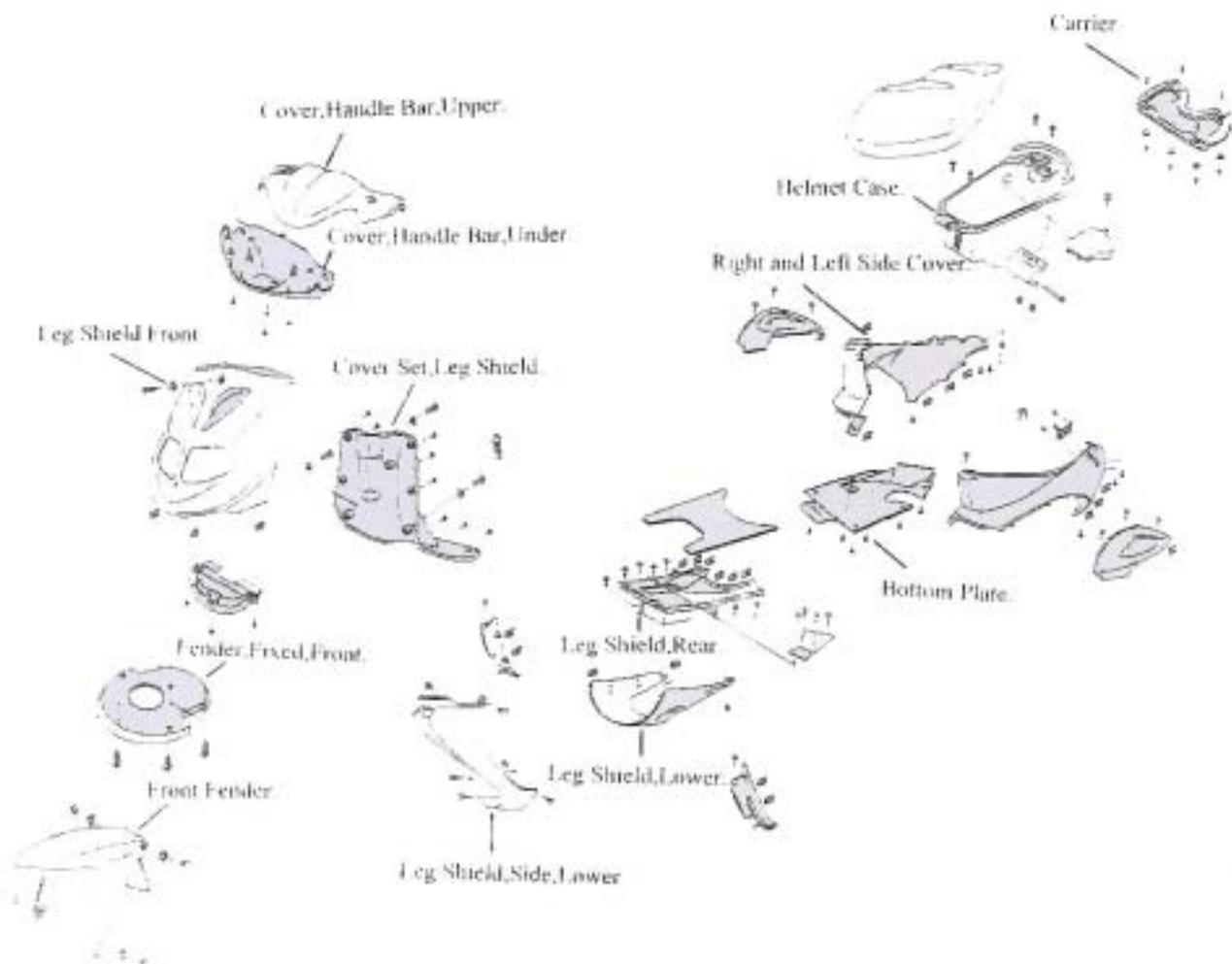
**Note:**

- (1) Torque of starter arm spring plate tightening bolt: 90 kg-cm.
- (2) Torque drive plate tightening nut: 800~1000 kg-cm.
- (3) Torque of clutch side cover bolt: 50~80 kg-cm.
- (4) Torque of starter arm tightening bolt: 100~120cm.

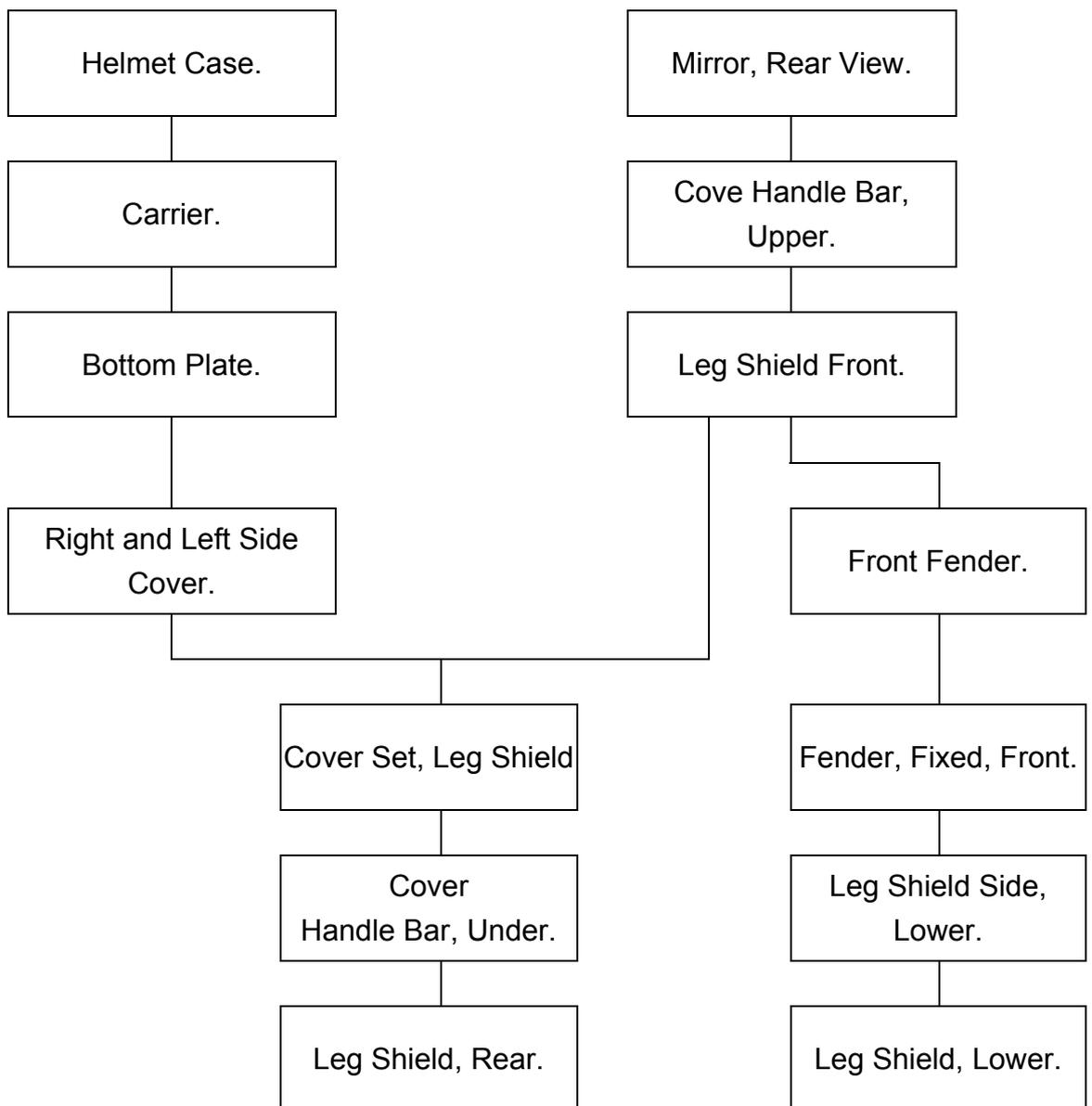
## 4 CHASSIS

### 4-1. REMOVAL OF COVER

\*BR8 Representative Figure\*



\* Dismount floor panels following the sequence shown in the list:



**Cautions:**

1. Do not damage cover of body panels while dismantling.
2. Handle with care regarding lugs of to avoid damage dismantling.
3. When remounting, do not scratch or crash wiring.
4. While assembling every lug shall be fixated effectively.
5. While assembling, make matching panels and their slots.

## 4-2. TROUBLESHOOTING OF CHASSIS

### ① STEERING/ SUSPENSION/ FRONT WHEELS/ FRONT BRAKES

#### Operation Cautions:

1. Leg shield lower must be dismantled before the front wheel is dismantled. Use a jack to raise the wheel above ground and support the car body firmly.
2. The brake inner cylinder and lining shall be kept free from grease during operation to avoid driving danger caused by braking effort reduced by grease.

#### Troubleshooting

##### Steering too tight (heavy)

1. The bolt of ball bearing fastening at the top of the steering column too tight.
2. Balls of the steering system broken.
3. The conical base for steering ball bearings damaged.
4. Bad curvature of the front fork comp.
5. Bad curvature of the front wheel shaft or deviation of the tire.
6. Insufficient tire pressure.

##### Straight driving impossible due to deviation of the steering wheel:

1. Deviation of the front fork comp.
2. Unequal working of the left and right shock absorber beside the front fork comp.
3. Running deviation due to the deviation of the front axle.
4. Deformation of the front tires.
5. Deformation of wheel rim.

##### Front shock absorber too flexible:

1. Shock absorber spring constant too low.
2. Shock absorber spring fatigue.
3. Lack of oil in the shock absorber resulting from leakage.
4. Loose front fork comp axle bolts.

Abnormal noise of working front shock absorber:

1. Noise coming from friction between the shock absorber and the outer tube joint.
2. Noise coming from friction between the shock absorber spring and the outer tube.
3. Noise coming from shock absorber deviation due to loosen screws.
4. Deformed moving parts of the absorber.

Too large sway of front wheels:

1. Deformed wheel rim.
2. Insufficiently tightened bolts of front wheel spindle, or although tightened but becoming loose.
3. Sway caused by too large gap around the front wheel bear or damaged bearing.
4. Bad of worn tires.

Inefficient braking

1. Unclean or oily friction lining surface.
2. Excessive wear of the friction lining.
3. Deviated or deformed brake discs.
4. Inefficient braking due to air resistance caused by air unduly existing in the braking system.
5. Insufficient brake fluid.
6. Deteriorated brake fluid.
7. Brake fluid pipe clogged.
8. Improper mounting of brake caliper body.
9. Uneven wear of the lining in the brake caliper.
10. Damaged grease seal of the piston of the brake caliper.
11. Bent brake rod.

Difficult to operate the brake rod:

1. Brake fluid pipe clogged.
2. The brake caliper not working well.
3. The piston the main cylinder not working smoothly or seriously damaged.
4. The brake rod bent.

Uneven braking effort.

1. Unclean brake lining or brake disc.
2. Bad mounting of wheels causing serious sway.
3. Deformed brake disc.
4. Clogged brake fluid pipe.
5. Serious wear of the brake caliper lining.
6. Serious damage of the grease seal of the brake caliper piston.
7. Deteriorated brake fluid.
8. Resistance due to air existing in the brake system.

## ②. REAR WHEELS/ REAR BRAKES/ REAR SUSPENSIONS

### Operating Cautions:

Do not leave greasy the surface of the brake lining inside the brake drum.

### Troubleshooting:

Serious sway while rear wheel rotates.

1. Distorted wheel rim.
2. Tire in bad state.
3. Defective mounting of wheel propeller shaft pieces.

Inefficient rear brake (Drum type):

1. Bad adjustment of the brake.
2. Serious wear of the brake drum.
3. Serious wear of the brake cam shaft.
4. Serious wear of the friction face between the rear brake lining and the cam shaft.
5. Wear of the rear brake lining.
6. Unmatched parts in the chisel groove of brake arm.

Rear shock absorber too flexible:

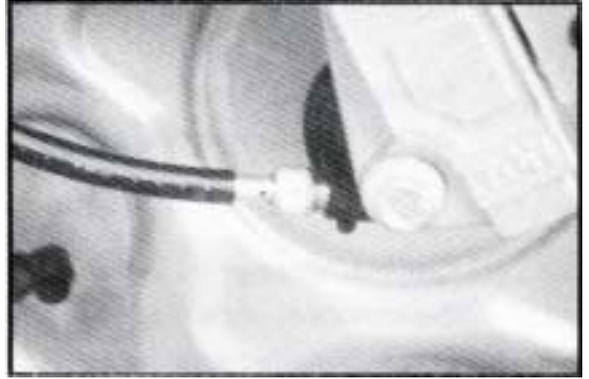
1. Absorber spring constant too low.
2. Fatigue of the absorber spring.

### 4-3 FRONT WHEEL

**Watch:** Please place main stand to park the motorcycle for maintenance.

**Disassembly:**

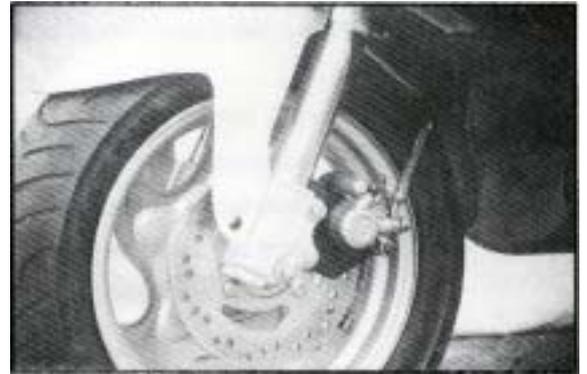
Speed meter cable nut.



2 tightening bolts on clipper.

Clipper.

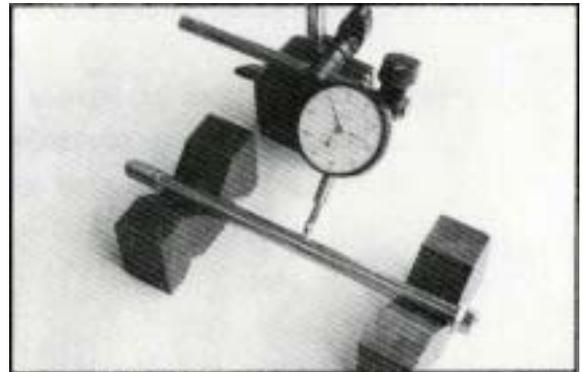
**Note:** Do not apply brake when removing clipper from brake disk. Otherwise, the lining can contact.



Front wheel.

**Inspection:** Check eccentricity and wear condition.

**Note:** If eccentricity is higher than 0.2mm, please replace with new one to ensure driving safety.



Speed meter gear assembly.

#### \*Inspection of Wheel Rim\*

Put wheel rim on rotation stand.

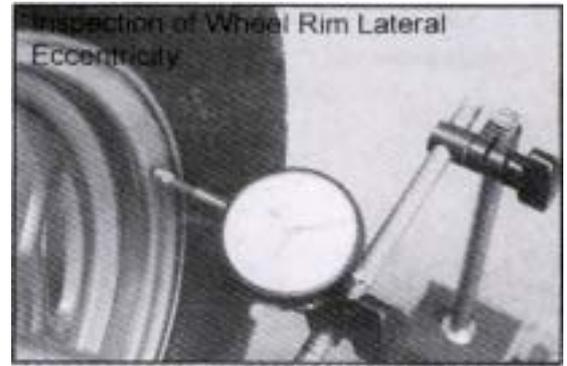
Rotate the wheel slowly and use dial-gauge to measure eccentricity

**Note:**

- (1) The transverse eccentricity should be within 3.0 mm. If the condition is poor, please replace with new one.



- (2) The lateral eccentricity should be within 3.0mm. If the condition is poor, please replace with new one.



**\*Be Careful Items in Assembly\***

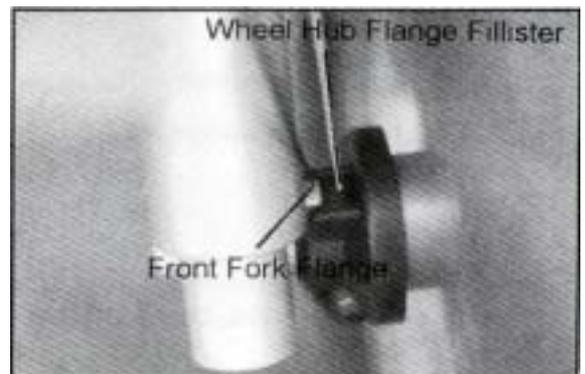
- (1) Speed meter gear assemble fillister and wheel hub flange should be fully matched.



- (2) The wheel hub flange fillister and front fork flange should be fully matched.

**Note:**

- (1) Torque of rear wheel axle self-lock nut: 600~ 900 kg-cm.  
(2) Torque of brake clipper tightening bolt: 210 ~250 kg-cm.  
(3) Torque of speed meter cable nut: 60kg-cm



## 4-4 REAR WHEEL

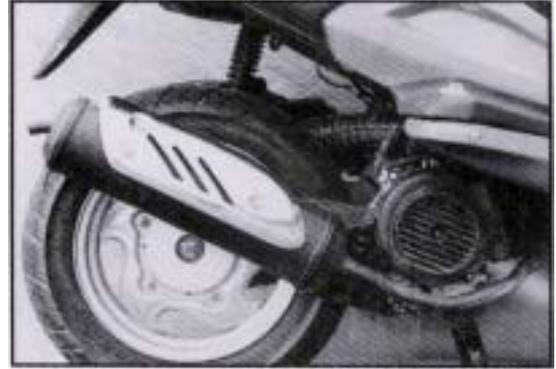
**Watch:** Please place main stand to park the motorcycle for maintenance.

**Disassembly:**

Exhaust pipe.

Lock screw nut and washer.

Rear wheel.



**Note:**

(1) Please use vacuum to clean wheel rim and lining. Try to reduce the contamination of asbestos fiber, which may affect the human breath system or lead to cancer.

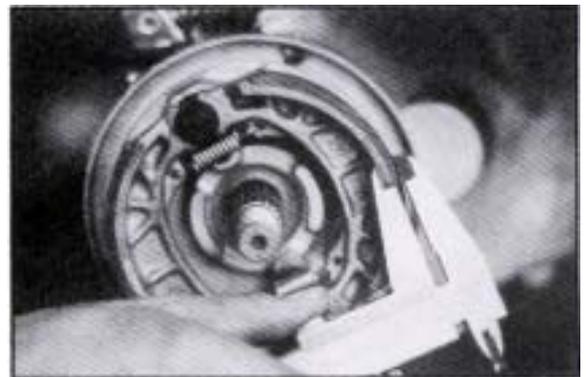
(2) The transverse eccentricity should be within 3.0mm. If the condition is poor, please replace with new one.

(3) The lateral eccentricity should be within 3.0 mm. If the condition is poor, please replace with new one.

Brake lining assembly (brake shoe, brake shoe spring).

**Inspection:** Use 3 points of Vernier calipers (two ends and center) to measure lining thickness. If lining is badly worn and thickness less than 2.0 mm. Please replace with new assembly (brake shoe, brake shoe spring).

**Warning:** Please do not apply any grease on brake lining, which can lead to unsafe drive.



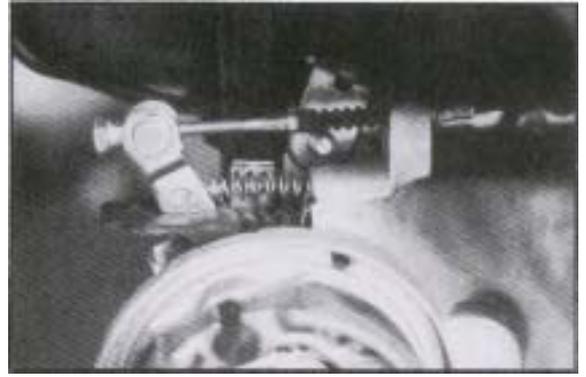
Loose rear brake adjusting nut and  
remove brake cable.

Brake arm cover.

Brake spring.

Rear brake connecting rod.

Rear brake cam axle.



**Assembly:** Assembly is in reverse order of  
disassembly procedures.

**Watch:** Please apply thin layer of grease on  
contact area of cam axle, pin and lining. Do  
not apply too much grease.

**Note:**

- (1) Torque of rear brake connecting rod bolt:  
50 ~80 kg-cm.
- (2) Torque of lock pin nut: 250 ~270 kg-cm.
- (3) Torque of rear wheel self-locking nut:  
600 ~ 900 kg-cm.

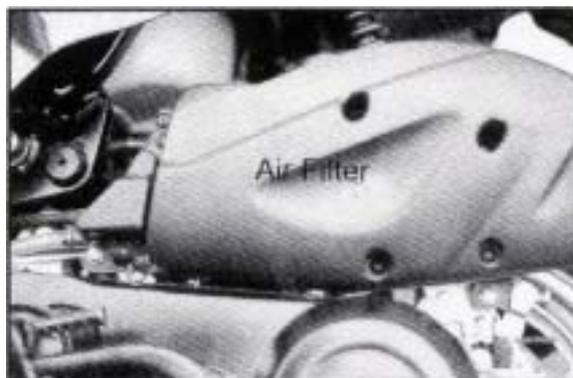
## 4-5 REAR SHOCK ABSORBER

**Watch:** Please place main stand to park the motorcycle for maintenance.

**Disassembly:**

2 attaching bolts on air filter.

Air filter.



Upper and lower attaching bolts on rear shock absorber.

Shock absorber.

**Inspection:** Check if the shock absorber is worn, scratched, leaking, or bent. If its condition is poor, please replace with new one.

**Note:** Torque of shock absorber upper and lower attaching bolts: 200 ~ 300 kg-cm.



## 5. ELECTRICAL SYSTEM

### 5-1. Operating Cautions & Troubleshooting

#### Operating Cautions:

##### 1. Warning:

- a. The liquid in the battery is diluted sulfuric acid that is dangerous. If, your skin or eye unfortunately get contact with it, please wash with water abundantly and consult immediately a doctor, lest you should lose vision.
- b. If your clothes is touched by the electrolyte, your skin would also be touched. Therefore you should get it off and wash with water abundantly.

2. Check if electrolyte in the battery is sufficient. If not, add distilled water till the liquid level reach the upper limit line.

3. The battery is rechargeable after discharging. If it is unused after discharge, it may deteriorate and shorten service life. It will become less efficient. After usage of 2~3 years, battery capacity will decrease. It can be regained by recharging several times.

4. When there is other loads while igniting, if the voltage will rise again after an abrupt falling, it is normal.

5. If a battery is unused during a long time, its energy storage will decrease by its auto-discharge. Therefore, a recharging is necessary around every 3 months.

6. To charge a battery, it shall be removed from the car and its filler plugs removed. To put the charging current 'ON' or 'OFF', you must operate at the charger's switch. You shall not connect or pull off directly on the battery because electric spark may provoke hydrogen explosion.

7. During battery charging, hydrogen (H<sub>2</sub>) is produced. It is an inflammable gas. Fire must be forbidden.

8. At recharging a battery, the temperature of electrolyte shall be lower than 45 .
9. To test if a battery is fully charged, please use a voltmeter. Never use 'Spark method'.
10. When there is current in an electrical installation, please do not pull off a contact then connect it again, because resulting over voltage may damage electronic parts in the commuter. Therefore, this operation must be done after the main switch is put 'OFF'.
11. If fresh electrolyte is poured in a new battery, a voltage will be generated after a certain lapse of time. If the voltage is not sufficient, then a recharging is necessary. A recharged new battery has necessarily a longer lifetime.
12. The C.D.I of the ignition system shall not fall swinging and be shocked. It is a cause of frequent breakdown. Therefore, a special precaution is necessary in its dismounting and remounting.
13. Bad contact between plug and jack causes often the breakdown of the ignition system. Therefore, before undertaking repair, the contact is to be checked at first.
14. Spark plugs of a suitable heat value and gap are to be used. Otherwise, engine will not work smoothly or break.

## Troubleshooting:

### Battery Recharging System:

#### No voltage:

1. Battery cable fallen or disconnected.
2. Fuse fused.
3. Defective of flywheel magneto.
4. Excessive battery discharging:
  - a. Electrolyte leaked.
  - b. Chemical reaction in battery.
  - c. Short circuit in battery.
  - d. Defective rectifier.

#### Low voltage:

1. Insufficient recharging.
2. Leaking of electrolyte.
3. Defective separator causing short circuit between positive and negative plates.
4. Defective battery terminals.
5. Defective recharging system.
6. Defective rectifier.

#### Excessive specific weight of electrolyte:

1. Insufficient recharging.
2. Leaking of electrolyte.
3. Reaction between sulfuric acid and pole plates.

#### Too low capacity:

1. Insufficient recharging.
2. Pole plates react with sulfuric acid.
3. Insufficient electrolyte.
4. Active matter fallen from pole plates because of excessive recharging.

Inefficient recharging system:

1. Bad contact at connectors, short circuitry, or broken circuit.
2. Defective rectifier.
3. Defective of flywheel magneto.
  - a. Armature winding short circuited or broken.
  - b. Magneto coil short circuited or broken.

Bad electric continuity:

1. Bad contact at battery connection.
2. Ignition system short circuit or bad contact at connectors.
3. Lighting system short circuit or bad contact at connections.

Ignition System:

Dysfunctioning of spark plugs:

1. Defective of flywheel magneto.
2. Defective high-tension coil.
3. Defective C.D.I .
4. Defective spark plugs.
5. Defective conductor contact, breaking, or short circuit, for example:
  - a. Conduction between flywheel magneto and C.D.I .
  - b. Conduction between C.D.I and the main switch.
  - c. Conduction between C.D.I and the high-tension coil.

Engine not running smoothly:

1. Defective ignition first circuit:
  - a. Bad contact in circuitry or cable.
  - b. Defective of flywheel magneto.
2. Bad ignition secondary circuit.
  - a. The ignition coil insulation defect causing electric leakage.
  - b. Defective magneto coil.
    - I. Short circuit between coil layers.
    - II. Defective coil.

- c. Defective spark plug.
  - I. Spark plug covered by carbon.
  - II. Electric leakage in ceramic part of spark plug.
- d. Electric leakage from spark plug rubber screen.
- 3. Defective ignition timing.
  - a. Defective flywheel magneto.
  - b. Defective C.D.I .
  - c. Too large gap of spark plug.
  - d. Too high electric resistance of spark plug.

## Starter System

Starter motor unable to run.

1. Damaged battery.
2. Battery circuit broken, bad contact or too large resistance at connections.
3. Fuse fused.
4. Defective main switch.
5. Defective front and rear brake switches.
6. Defective starter motor switch.
7. Defective starter motor relay.
8. Defective starter motor.
9. Circuitry conductor defective or broken.
10. Starter motor drive pinion locked with the over speed clutch gear.

Weak drive of starter motor:

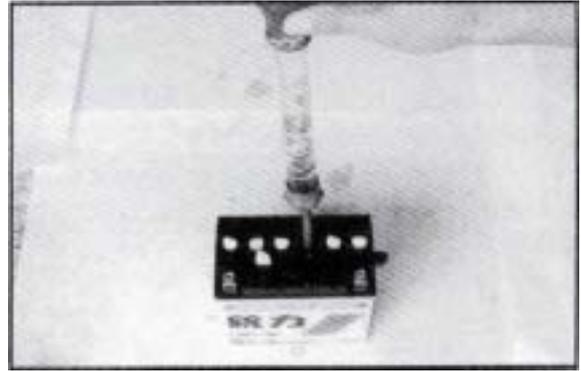
1. Insufficient recharging of battery.
2. Bad contact on circuit conductors.
3. Strange object introduced in the starter motor pinion.
4. Armature shaft bent.
5. Commutator unclean or worn.
6. Brush worn or spring too weak.
7. Starting motor of relay defective.

## 5-2. BATTERY

### A. Cautions in battery inspection and generator charging.

**Inspection:** Use gravity gauge to measure electrolyte. White is fully charged, yellow means charge is required, and red is broken or almost totally discharged.

**Note:** Electrolyte's specific gravity and charge level comparison table (20°C).

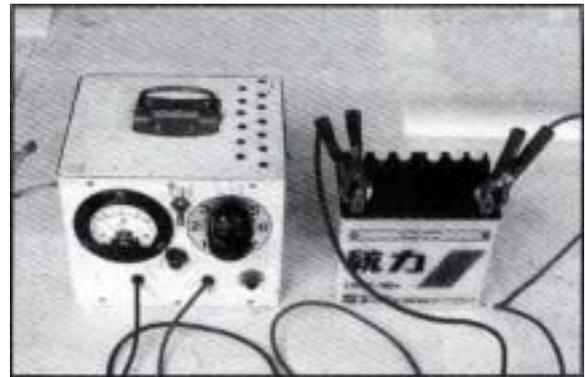


Electrolyte Specific Gravity	1.280	1.250	1.220	1.190	1.120
Charge Level	Full	3/4 Charged	1/2 Charged	1/4 Charged	Totally Discharg

### B. Charge by generator

Connecting battery and gener terminals by "+" with "+" and "-" with "-".

**Warning:** Battery releases explosive gas during charging or use battery. Therefore, it is dangerous to do so in concealed location. Please put battery in good ventilation location during charging, and forbid fire.



#### Note:

- (1) Standard charging current: 0.6 A for 5~10 hours.
- (2) Quick charging current: 6.0 A for 30 minutes.
- (3) Please do not use quick charge except for emergency.
- (4) Measure the battery voltage 30 minutes after battery is charged.  
The battery voltage should be higher than 12.8 V.

### C. Battery manufactured month and charge time comparison.

Manufactue Months	Within 3 mo.	After 3 mo.	6 mo.	10 mo.	Within 1 yr.	Over 1 yr.
Charge Time	Add electrolyte And wait 30 m.	10 hr.	20 hr .	30 hr .	40 hr .	60 hr .

### 5-3 SHORT CIRCUIT TEST

**Disassembly:**

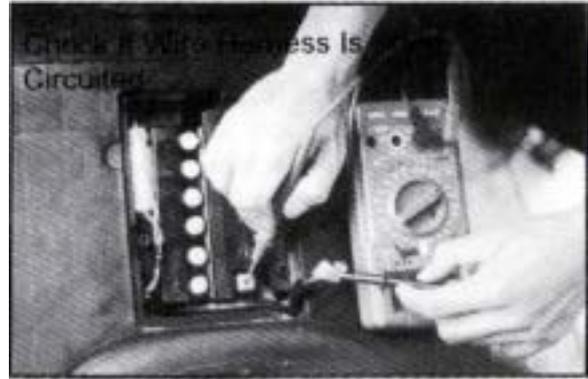
Disconnect battery negative terminal cable.

- Measure method:
  - A. Connect megga meter “+” terminal to battery “-” terminal.
  - B. Connect megga meter “-” terminal to circuit negative

**Note:** User megga meter “A” current position.

- Turn main switch to “OFF” position.

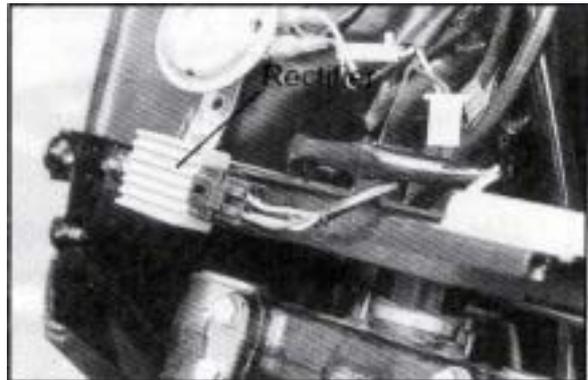
**Inspection:** Check if there is electrical current. If no current, check the main switch and wire harness for short circuit.



### 5-4 RECTIFIER

**Watch:**

- (1) Check if wire harness is normal before checking rectifier and end resistor. Check if rectifier socket is well connected.
- (2) Keep fingers away from tester probe. The circuit resistance can be changed with human body resistance involved.



**Rectifier Terminal Resistance Table.**

Meter+ Meter-	White/Red	Yellow/Red	Red	Black
White / Red		Infinity	3k-100k Ohm	Infinity
Yellow/ Red	Infinity		Infinity	3k-100k Ohm
Red	Infinity	Infinity		Infinity
Black	Infinity	5k-100k Ohm	Infinity	

## 5-5 STARTER RELAY

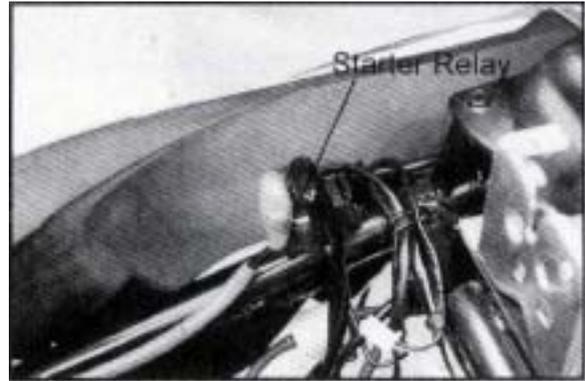
### A. Operation of starter relay.

**Watch:** Please place main stand to park the motorcycle for inspection.

**Inspection:** Turn the main switch to "ON" position and press the starter button.

**Note:**

- (1) If there is a snap sound, then the function is normal.
- (2) If there is no snap sound, then the function is abnormal.  
Please check:
  1. Starter relay ground circuit.
  2. Starter relay voltage.

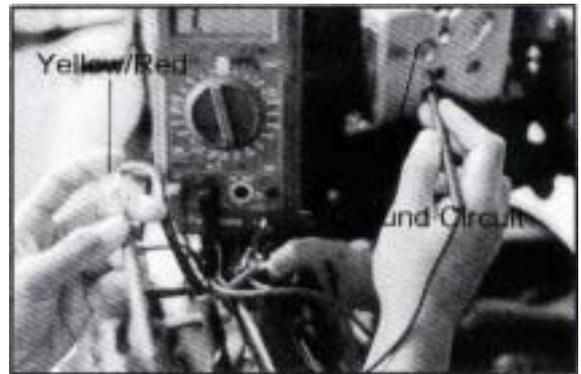


### B. Starter relay ground circuit

#### Disassembly:

Connect the start relay connector and electric tester by:

- A. Megga meter's positive terminal with the relay yellow/red terminal.
- B. Connect the negative terminal with ground circuit and press the starter button. Then, check the electricity continuity.



**Note:**

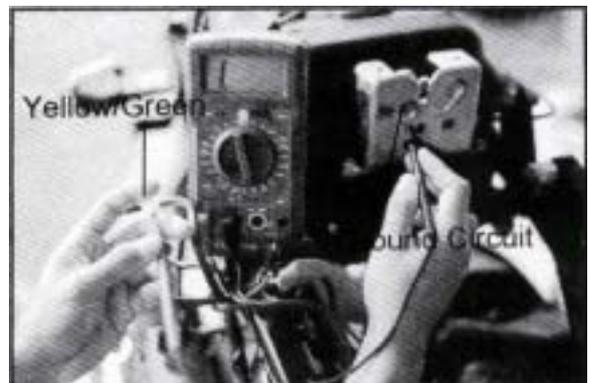
- (1) There should be continuity when pressing the start button.
- (2) If there is no continuity when pressing the starter button, then check the continuity between starter button and connecting cable.

### C. Check starter relay voltage.

**Watch:** Please place main stand to park the motorcycle for inspection.

Measure method:

- A. Connect megga meter's positive terminal with the relay green/yellow terminal.
- B. Connect the negative terminal with ground circuit and push the starter button. Then, check the electricity continuity.



Turn the main switch to "ON" position and hold the brake lever.

**Watch:** The battery voltage must satisfy requirement in checking starter voltage

**Note:**

- (1) If there is voltage, then the relay is normal.
- (2) If there is no voltage, then check the continuity of brake switch and cable.

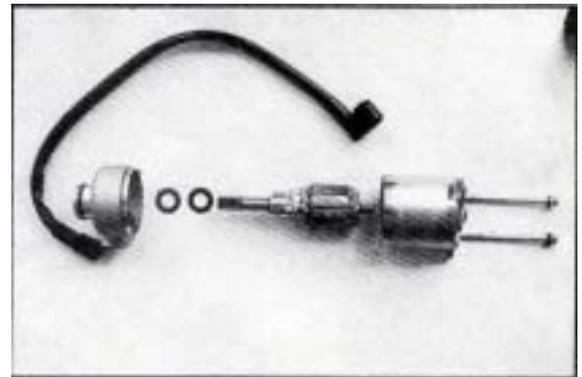
## 5-6 STARTER MOTOR

### Watch:

- (1) Please place main stand to park the motorcycle for inspection.
- (2) Turn the main switch to "OFF" position before maintenance. Disconnect the battery ground circuit. To ensure safety, turn the main switch to "ON" position and check if the motor has operated.

### Disassembly:

- 2 starter motor attaching bolts.
- Starter motor.
- Roll up the water-proof rubber jacket and remove connector.
- 2 motor case attaching bolts.
- Motor commutator.
- Front cover.



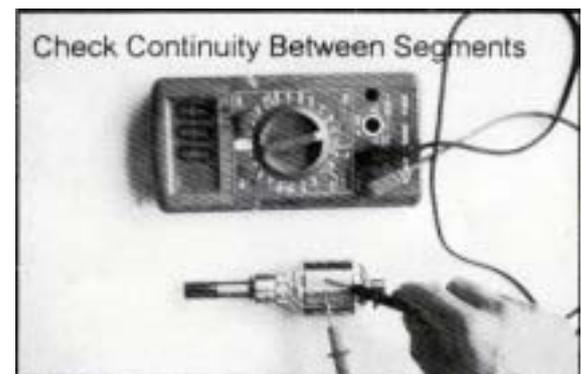
### Check Starter Commutator

#### Inspection:

- (1) Check continuity between segments.

#### Note:

- A. If continuity is good, then it is normal.
- B. If no continuity, then it is broken.



(2) Check continuity between segments and armature shaft.

**Note:**

- A. If no continuity, then it is normal.
- B. If continuity is good, then it is broken.

(3) Clean the commutators if there is metal powder between segments.

(4) Check the removed parts for damaging, burning (discoloration), and wearing. Replace with a new if necessary.

(5) Check brush length.

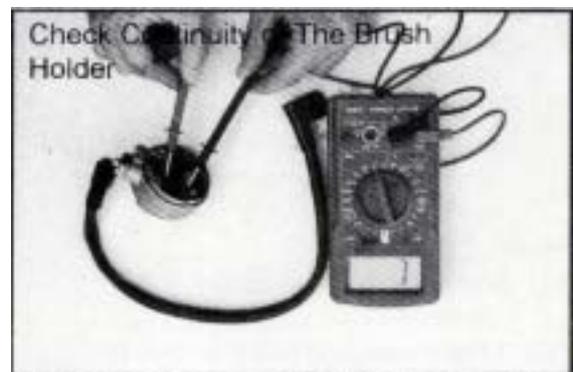
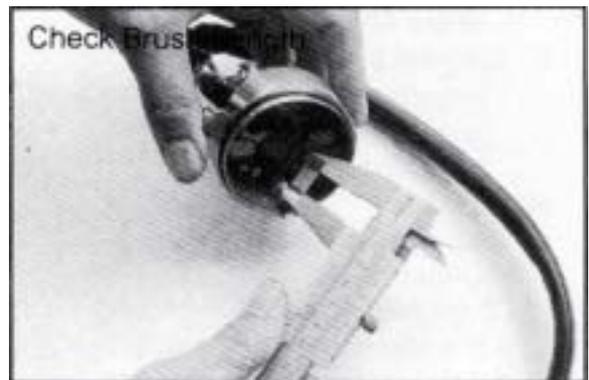
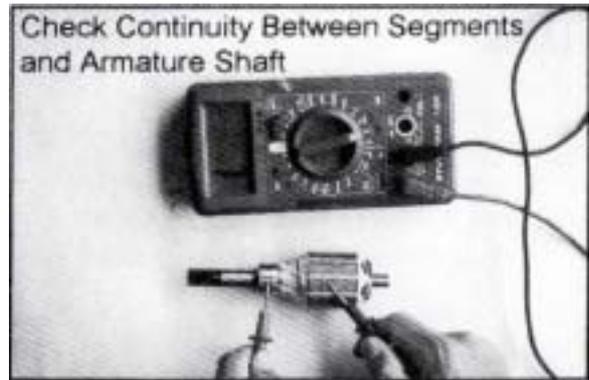
**Note:**

- A. Initial standard brush length is 112.5 mm.
- B. If brush length is smaller than 8.5 mm, please replace with new brush.

**Inspection:** Check continuity of the brush holder.

**Note:**

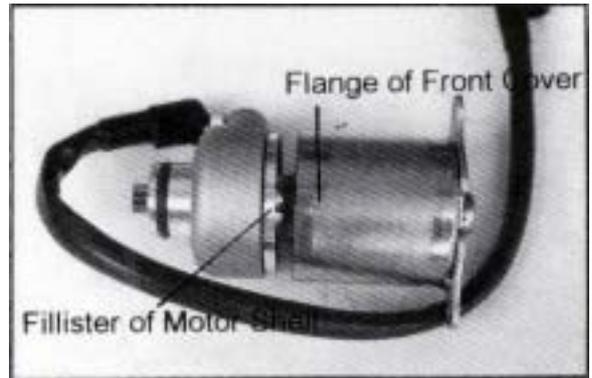
- A. If there is no continuity, it is normal.
- B. If there is continuity, it is broken.  
Please replace with new one.



**Assembly:** Assembly is in reverse order of disassembly procedures.

**Watch:**

- (1) Apply grease to the ends of armature shaft.
- (2) Apply grease to the dust seal before assembly front cover.
- (3) The flange of front cover should match the fillister of motor shell.



## 5-7 A.C. GENERATOR

### (A) A.C. generator coil

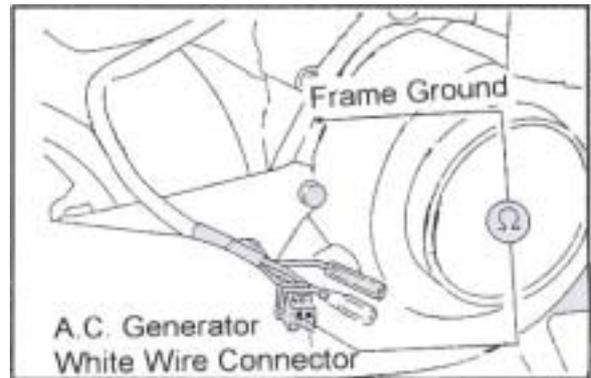
**Disassembly:** Disconnect the A.C. generator's 4P connector.

**Measure:**

- A. Use megga meter's positive terminal to connect the white wire of the 4P connector.
- B. Connect the megga meter's negative terminal with frame ground and measure the resistance.

**Note:**

- (1) Standard resistance: 0.2~1.0 Ohm (20°C).
- (2) If the measured value exceed the standard, replace with new A.C. generator charging coil.



### (B) A.C. generator lighting coil

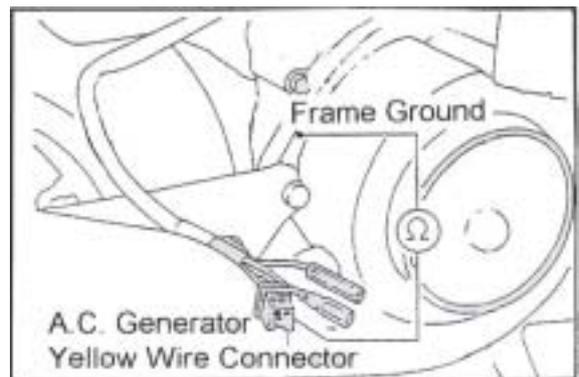
**Disassembly:** Disconnect the A.C. generator's 4P connector.

**Measure:**

- A. Use megga meter's positive terminal to connect the yellow wire of the 4P connector.
- B. Connect the megga meter's negative terminal with body ground and measure the resistance.

**Note:**

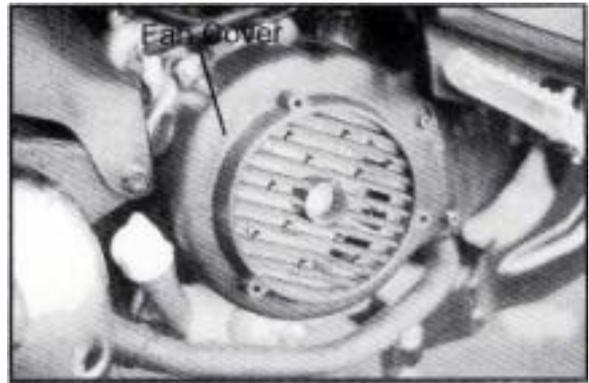
- (1) Standard resistance: 0.1~1.0 Ohm (20°C).
- (2) If the measured value exceeds the standard, replace with new A.C. generator lighting coil.



## A.C. generator Disassembly

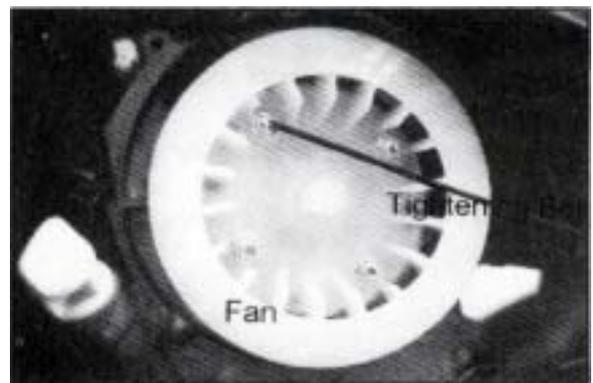
### Disassembly:

The fan cover.

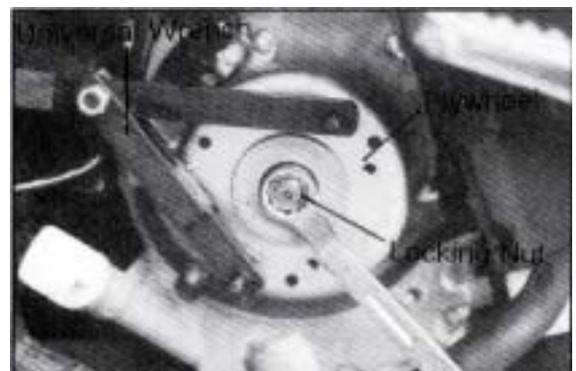


4 tightening bolts.

Fan.

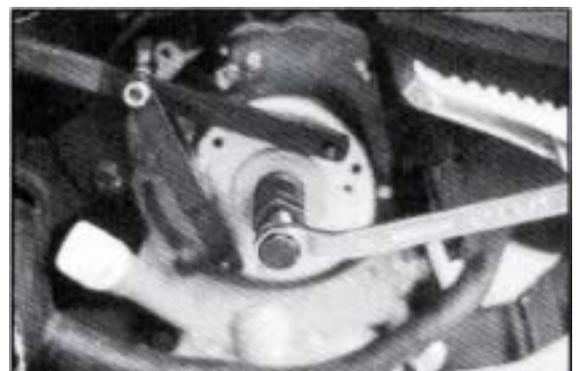


Use universal wrench to hold flywheel and remove lock nut.



Use the big end of flywheel remover and rotate counter-clockwisely into flywheel. Use universal wrench to hold flywheel, and rotate the flywheel remover clockwise to remove lock nut. Then the flywheel can be removed.

**Note:** The big end of flywheel remover is left-threaded.



Cable connector.  
Cable bracket.  
Tighten bolt of pick up.  
Pick up.

**Assembly:** Assembly is in reverse order of disassembly procedures.

**Watch:**

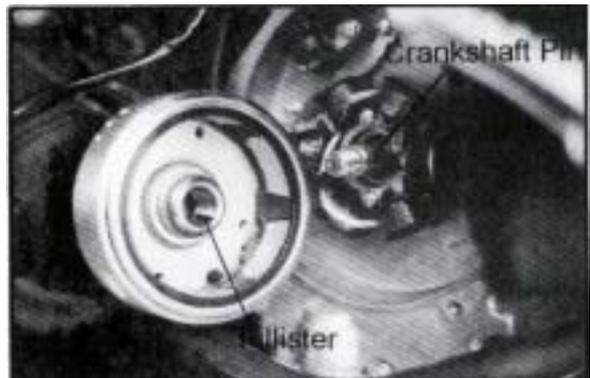
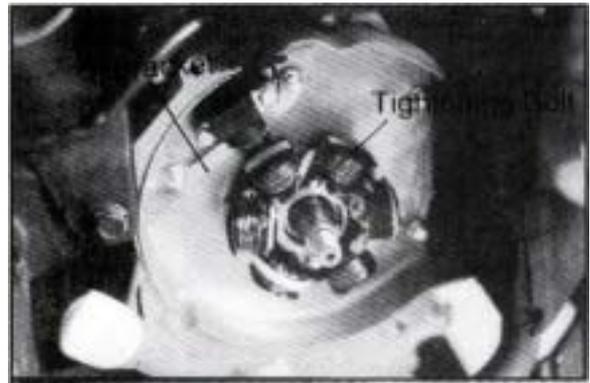
(1) The inside surface of the flywheel is magnetic. Be sure that there is nothing in there before assembly.

(2) The flywheel's fillister should match crankshaft pin.

**Note:**

(1) Torque of flywheel tightening bolt: 550 kg-cm.

(2) Torque of fan tightening bolt: 90 kg-cm.



## 5-8 RESISTOR

**Disassembly:** Remove front windshield cover.

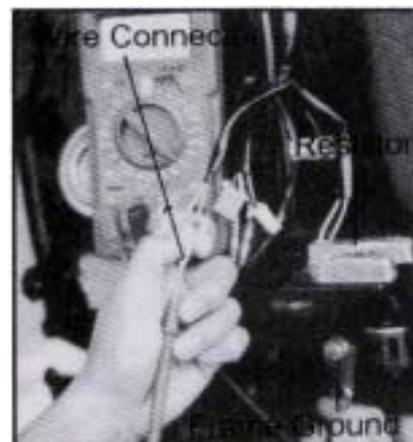
**Measure:**

- A. Use megga meter's positive terminal to connect resistor wire.
- B. Connect the megga meter's negative terminal with frame ground and measure the resistance.

**Note:** Resistor standard:

20 W 5.9 Ohm: 5.0~7.0 Ohm.

5W 5.0 Ohm: 4.0~6.0 Ohm.



## 5-9 CDI UNIT

Use megga meter to check the following items.



Check Item	Measuring Terminals	Standard Value (20°C)
Main Switch	Black/White - Body Ground	Continuity , When Main Switch "OFF"
Exciting Coil	Black/Red - Body Ground	300 ~ 1000 Ohm
Pulser Coil	Blue/Yellow - Body Ground	40 ~ 300 Ohm
Primary Coil	Black/White - Green	0.1 ~ 1.0 Ohm
Secondary Coil	Green - Spark Plug Cap	7 ~ 12 k Ohm

### A. Exciting Coil Inspection

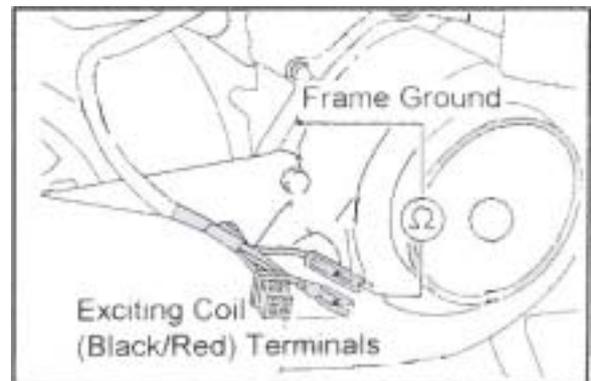
**Disassembly:** The exciting coil connector.

**Measure:**

- A. Use megga meter's positive terminal to connect exciting coil's black/red terminal.
- B. Connect the megga meter's negative terminal with frame ground and measure the

**Note:**

- (1) The standard resistance is: 300~1000 Ohm (20°C).
- (2) If the resistance is higher than standard, then it is broken.  
Please replace with new one.



## B. Pulse Coil Inspection

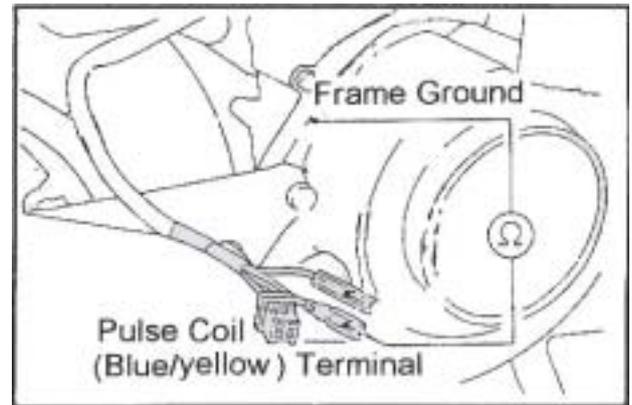
**Disassembly:** The pulse coil connector.

**Measure:**

- A. Use megga meter's positive terminal to connect pulse coil's blue/yellow terminal.
- B. Connect the megga meter's negative terminal with body ground and measure the resistance.

**Note:**

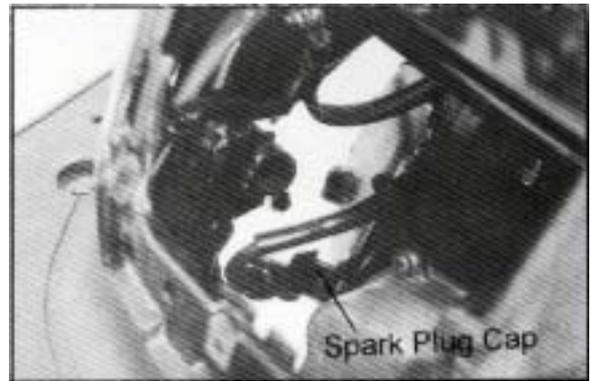
- (1) The standard resistance: 40~300 Ohm (20°C).
- (2) If the resistance is higher than standard, then it is broken. Please replace with new one.



### C. Ignition coil Inspection

#### Disassembly:

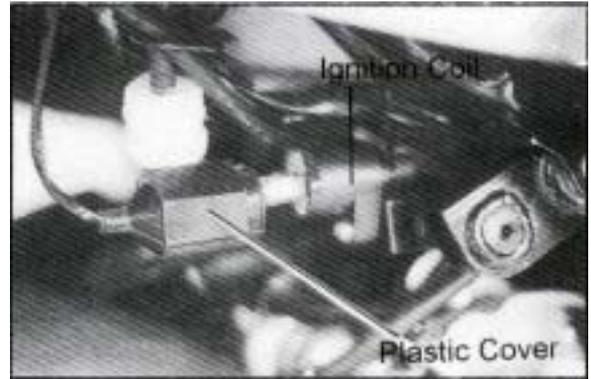
Remove spark plug.



Remove ignition coil's plastic cover.  
Ignition coil's primary coil.  
Ignition coil's tightening attaching bolt.  
Ignition Coil.

**Assembly:** Assembly is in reverse order of disassembly procedures.

**Note:** Connect the black/white wire to black terminal, and green wire to green terminal.



### D. Primary Coil Inspection

**Measure:** Connect the electric tester as Fig. and measure the resistance.

#### Note:

- (1) Standard resistance: 0.1~1.0 Ohm (20°C).
- (2) If the resistance is "Infinity", then the coil is broken. Replace it with new one.



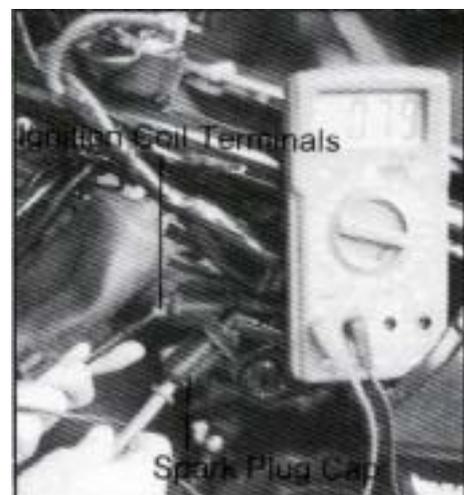
### E. Secondary Coil Inspection

#### Measure:

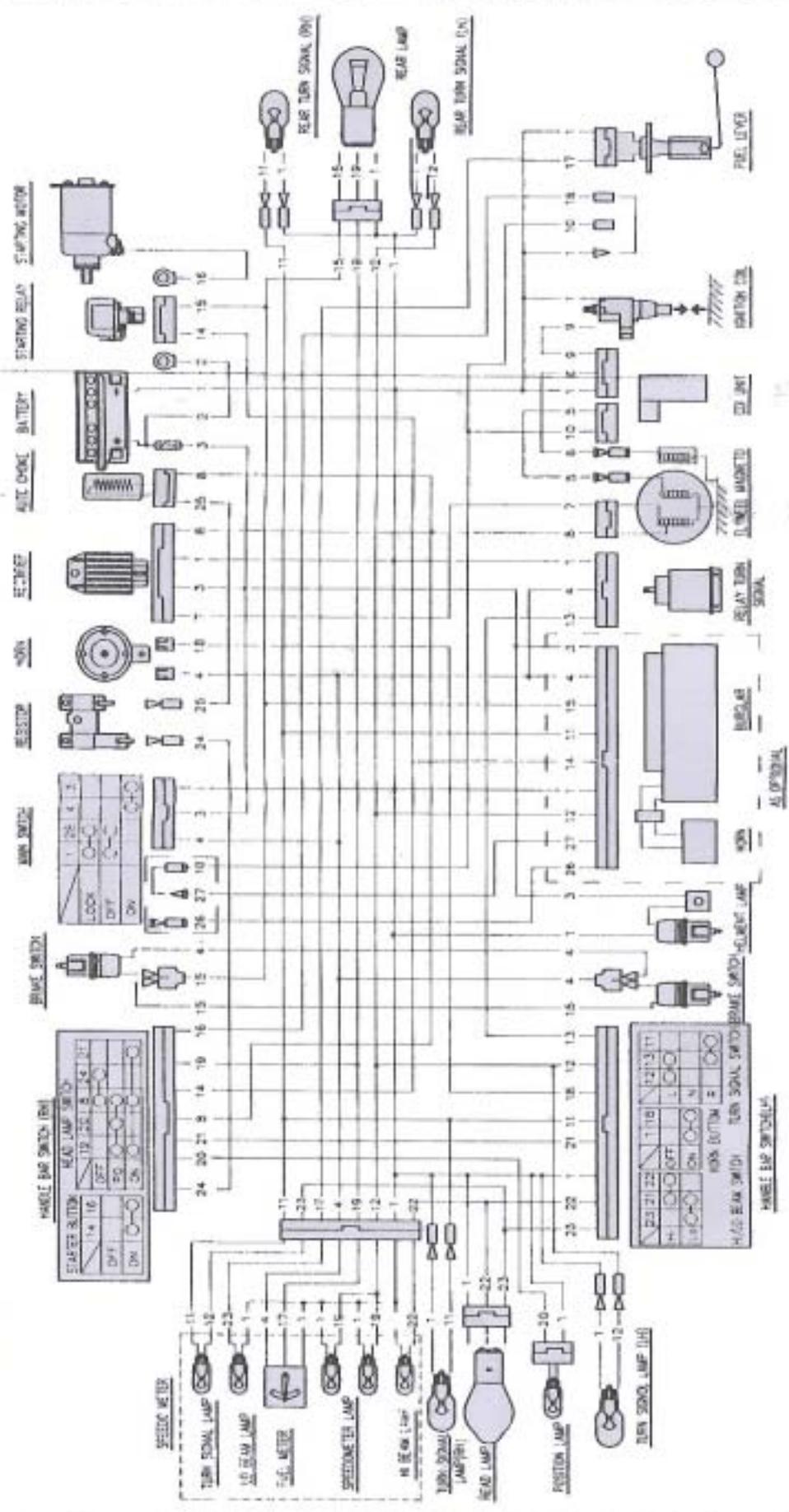
Connect the electric tester with spark plug cable and ignition wire terminal (as shown in Fig.), and measure the resistance.

#### Note:

- (1) Standard resistance: 0.1~1.0 Ohm (20°C).
- (2) If the resistance is "Infinity", then the coil is broken. Replace it with new one.



**APPENDIX CIRCUIT DIAGRAM**  
Circuit Drawing for BR8



CODE COLOR	CODE COLOR	CODE COLOR
1 BLACK	10 BLACK/YELLOW	19 BLUE
2 RED	11 DEEP GREEN	20 SKY BLUE
3 RED	12 CHOCOLATE	21 BLUE/BLACK
4 BROWN	13 BROWN/WHITE	22 YELLOW
5 BLACK/RED	14 BLUE/WHITE	23 GREEN
6 BLUE/YELLOW	15 GREEN/YELLOW	24 YELLOW/BLACK
7 WHITE/RED	16 WHITE/BLACK	25 GREEN/BLACK
8 YELLOW/RED	17 GREEN/WHITE	26 ORANGE/WHITE
9 BLACK/WHITE	18 PINK	27 PURPLE/WHITE