YAMAHA

XV250U '88

3DN-ME1

SERVICE MANUAL

XV250U
SERVICE MANUAL

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Printed in Japan

NOTICE

This manual was written by the Yamaha Motor Company primarily for use by Yamaha dealers and their qualified mechanics. It is not possible to put an entire mechanic's education into one manual, so it is assumed that persons using this book to perform maintenance and repairs on Yamaha motorcycles have a basic understanding of the mechanical concepts and procedures inherent in motorcycle repair technology. Without such knowledge, attempted repairs or service to this model may render it unfit to use and/or unsafe.

Yamaha Motor Company, Ltd. is continually striving to improve all models manufactured by Yamaha. Modifications and significant changes in specifications or procedures will be forwarded to all Authorized Yamaha dealers and will, where applicable, appear in future editions of this manual.

TECHNICAL PUBLICATIONS
SERVICE DIVISION
MOTORCYCLES GROUP
YAMAHA MOTOR CO., LTD.

HOW TO USE THIS MANUAL

PARTICULARLY IMPOTANT INFORMATION

This material is distinguished by the following notations.

NOTE: **A NOTE** provides key information to make procedures easier or clearer.

⚠CAUTION: **A CAUTION** indicates special procedures that must be followed to avoid damage to the motorcycle.

⚠WARNING: **A WARNING** indicates special procedures that must be followed to avoid injury to a motorcycle operator or person inspecting or repairing the motorcycle.

MANUAL FORMAT

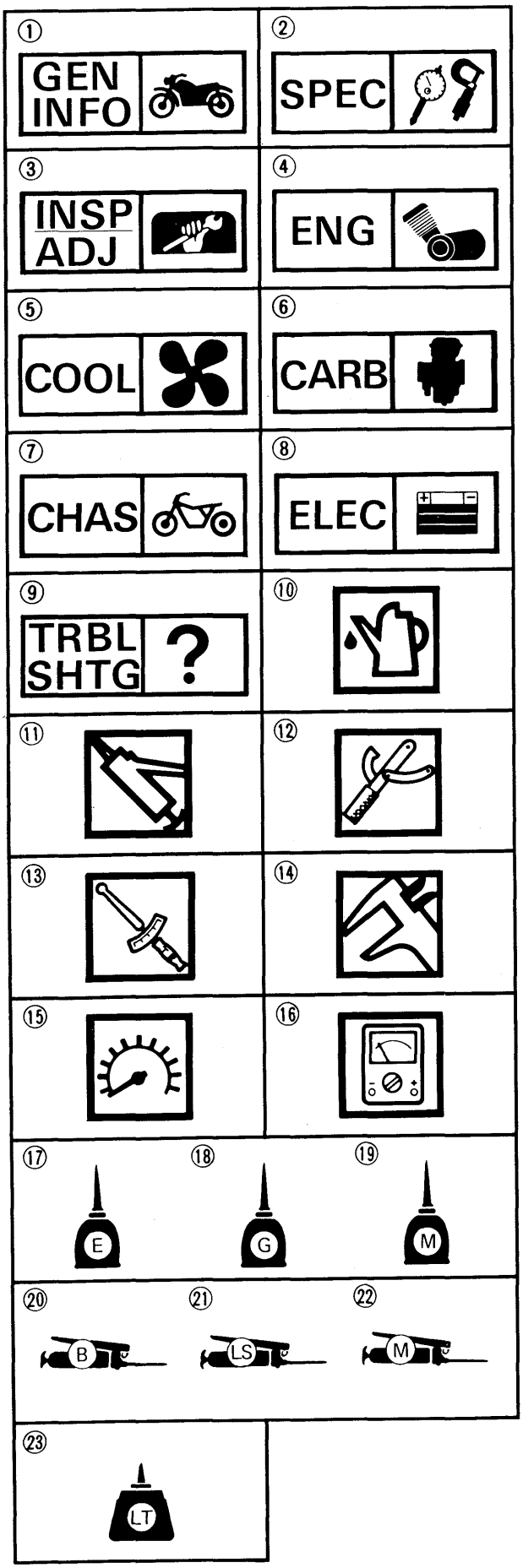
All of the procedures in this manual are organized in a sequential, step-by-step format. The information has been compiled to provide the mechanic with an easy to read, handy reference that contains comprehensive explanations of all disassembly, repair, assembly, and inspection operations.

In this revised format, the condition of a faulty component will precede an arrow symbol and the course of action required will follow the symbol, e.g.,

- Bearings:
  Pitting/Damage → Replace.

EXPLODED DIAGRAM

Each chapter provides exploded diagrams before each disassembly section for ease in identifying correct disassembly and assembly procedures.



ILLUSTRATED SYMBOLS (Refer to the illustration)

Illustrated symbols ① to ⑨ are designed as thumb tabs to indicate the chapter's number and content.

① General information
② Specifications
③ Periodic inspection and adjustment
④ Engine
⑤ Cooling system
⑥ Carburetion
⑦ Chassis
⑧ Electrical
⑨ Troubleshooting

Illustrated symbols ⑩ to ⑯ are used to identify the specifications appearing in the text.

⑩ Filling fluid
⑪ Lubricant
⑫ Special tool
⑬ Tightening
⑭ Wear limit, clearance
⑮ Engine speed
⑯ Ω, V, A

Illustrated symbols ⑰ to ㉓ in the exploded diagram indicate grade of lubricant and location of lubrication point.

⑰ Apply engine oil
⑱ Apply gear oil
⑲ Apply molybdenum disulfide oil
⑳ Apply wheel bearing grease
㉑ Apply lightweight lithium-soap base grease
㉒ Apply molybdenum disulfide grease
㉓ Apply locking agent (LOCTITE®)

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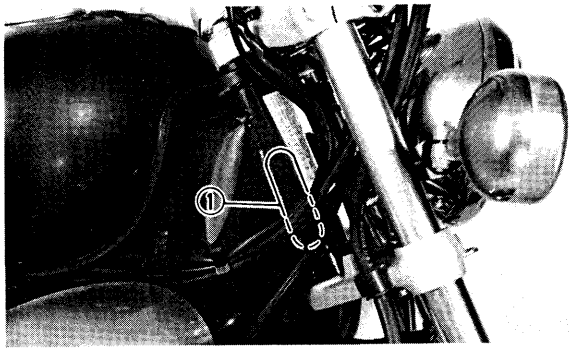
GENERAL INFORMATION



MOTORCYCLE IDENTIFICATION

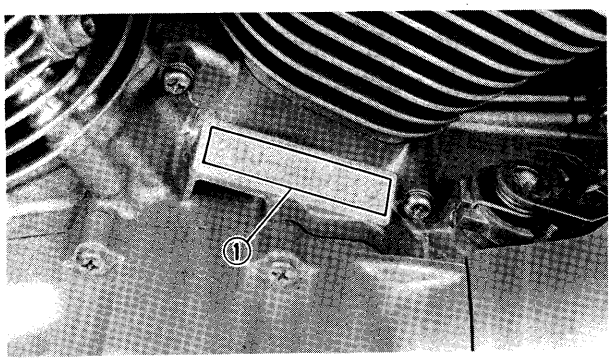
VEHICLE IDENTIFICATION NUMBER

The vehicle identification number ① is stamped into the steering head pipe.

NOTE:

The vehicle identification number is used to identify your motorcycle and may be used to register your motorcycle with the licensing authority in your state.

Starting Serial Number:
JYA3DNN0 * JA000101



ENGINE SERIAL NUMBER

The engine serial number ① is stamped into the right side of the engine.

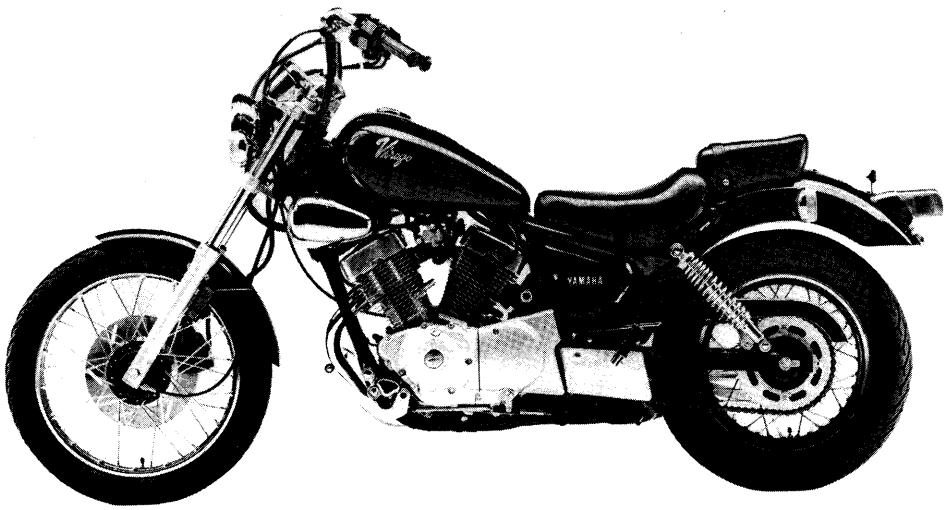
NOTE:

The first three digits of these numbers are for model identifications; the remaining digits are the unit production number.

Starting Serial Number:
3DN-000101

NOTE:

Designs and specifications are subject to change without notice.



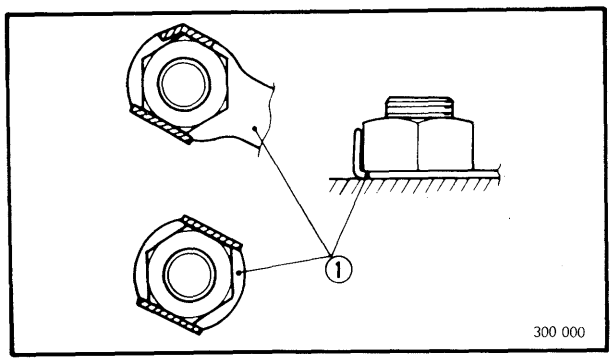
IMPORTANT INFORMATION

ALL REPLACEMENT PARTS

1. We recommend to use Yamaha genuine parts for all replacements. Use oil and/or grease recommended by Yamaha for assembly and adjustment.

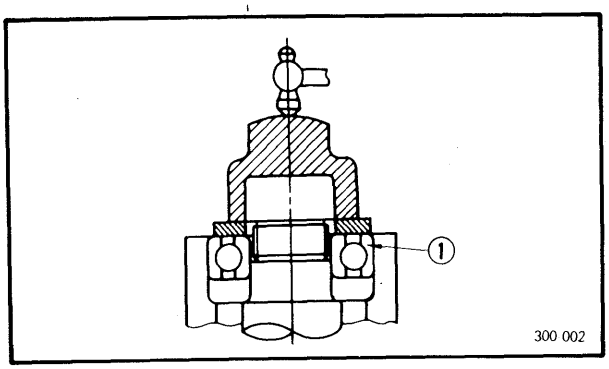
GASKETS, OIL SEALS, AND O-RINGS

1. All gaskets, seals, and O-rings should be replaced when an engine is overhauled. All gasket surfaces, oil seal lips, and O-rings must be cleaned.
2. Properly oil all mating parts and bearings during reassembly. Apply grease to the oil seal lips.



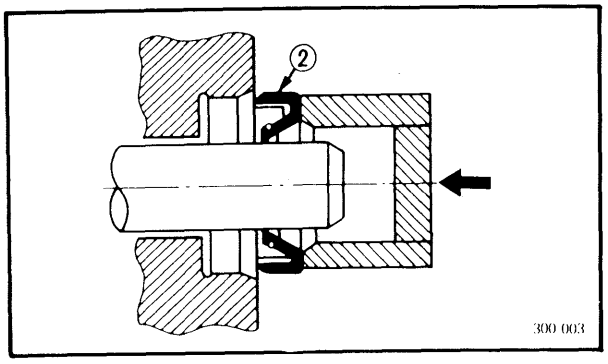
LOCK WASHERS/PLATES AND COTTER PINS

1. All lock washers/plates ① and cotter pins must be replaced when they are removed. Lock tab(s) should be bent along the bolt or nut flat(s) after the bolt or nut has been properly tightened.



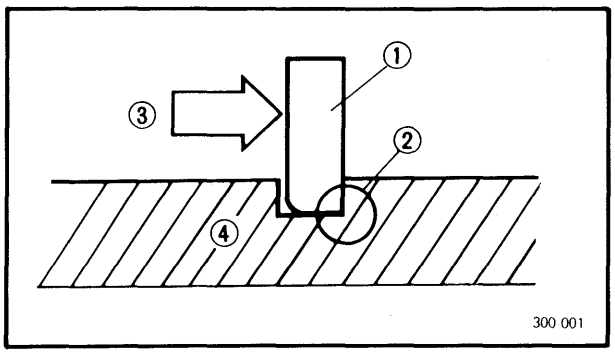
BEARINGS AND OIL SEALS

1. Install the bearing(s) ① and oil seal(s) ② with their manufacturer's marks or numbers facing outward. (In other words, the stamped letters must be on the side exposed to view.) When installing oil seal(s), apply a light coating of light-weight lithium base grease to the seal lip(s). Oil the bearings liberally when installing.



⚠ CAUTION:

Do not use compressed air to spin the bearings dry. This causes damage to the bearing surfaces.



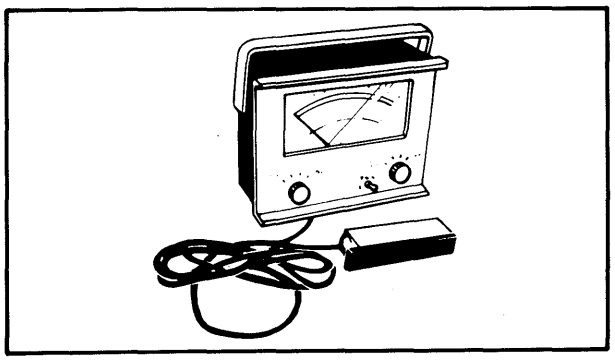
CIRCLIPS

1. All circlips should be inspected carefully before reassembly. Always replace piston pin clips after one use. Replace distorted circlips. When installing a circlip ① , make sure that the sharp-edged corner ② is positioned opposite to the thrust ③ it receives. See the sectional view.

④ Shaft

SPECIAL TOOLS

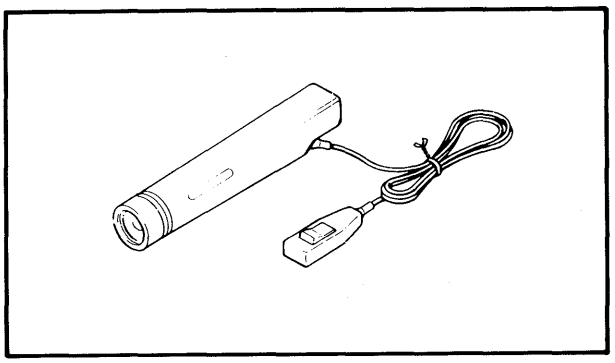
The proper special tools are necessary for complete and accurate tune-up and assembly. Using the correct special tool will help prevent damage caused by the use of improper tools or improvised techniques.



FOR TUNE UP

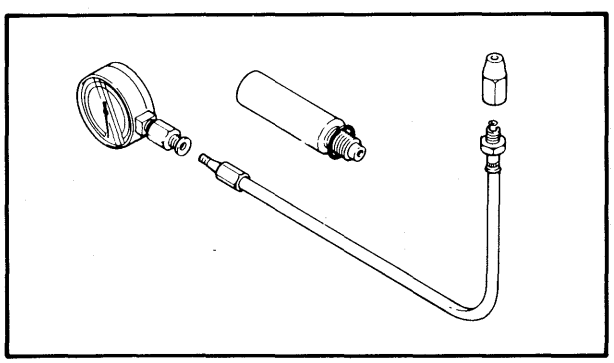
1. Inductive Tachometer
   P/N YU-08036

This tool is needed for detecting engine rpm.



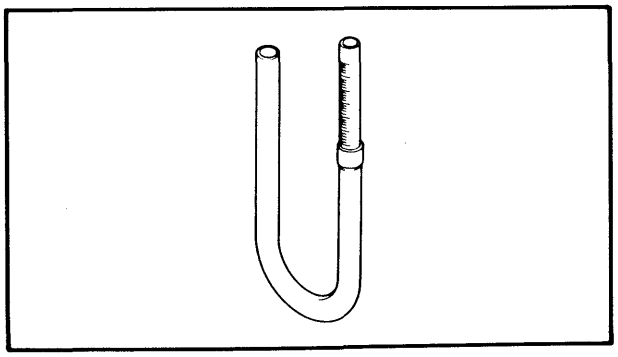
2. Inductive Timing Light
   P/N YM-33277

This tool is necessary for checking ignition timing.



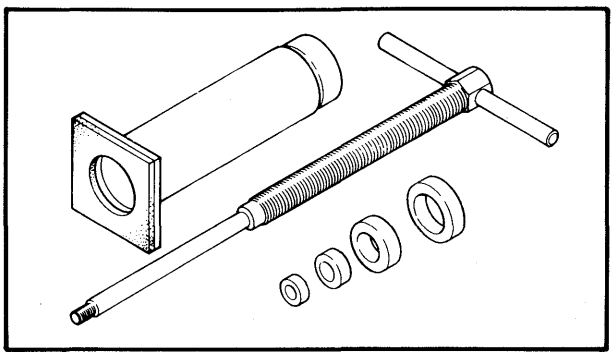
3. Compression Gauge
   P/N YU-33223

This gauge is used to measure the engine compression.



4. Fuel Level Gauge
   P/N YM-01312-A

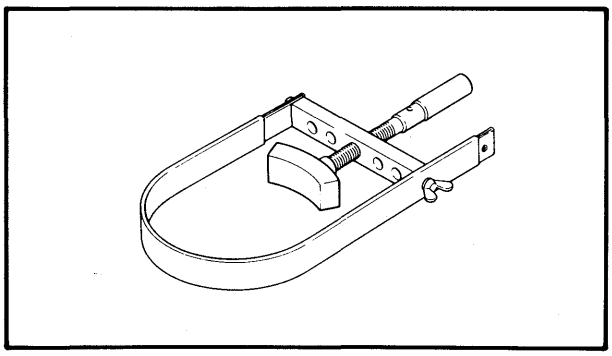
This gauge is used to measure the fuel level in the float chamber.



FOR ENGINE SERVICE

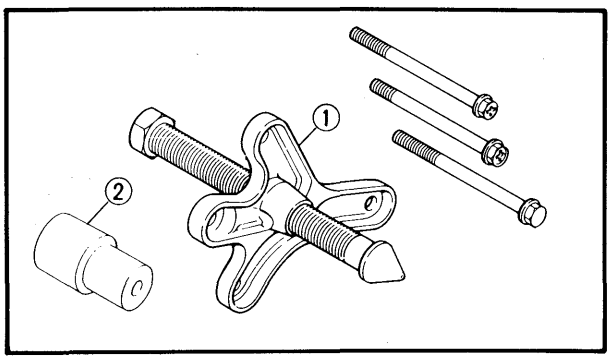
1. Piston Pin Puller
   P/N YU-01304

This tool is used to remove the piston pin.



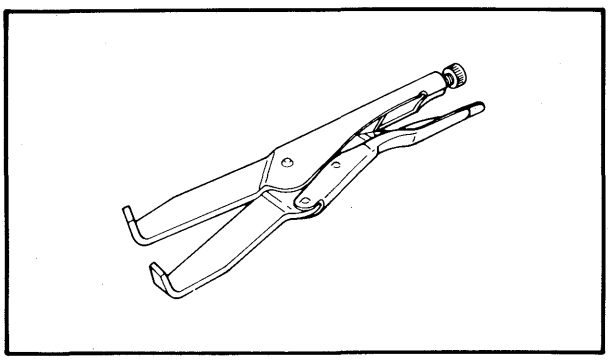
2. Sheave Holder
   P/N YS-01880

This tool is used to hold the flywheel when removing or installing the flywheel securing bolt.



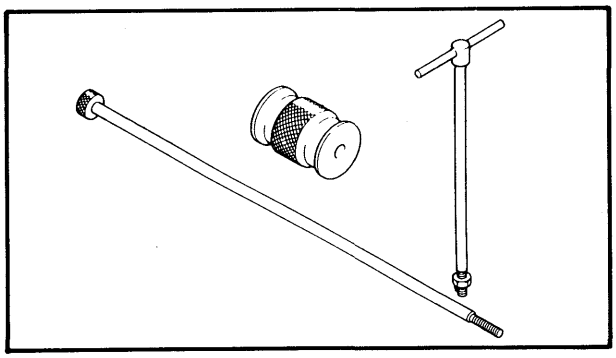
3. Flywheel Puller
   P/N YU-33270 – ①
   Adapter
   P/N YM-33282 – ②

These tools are used to remove the flywheel.

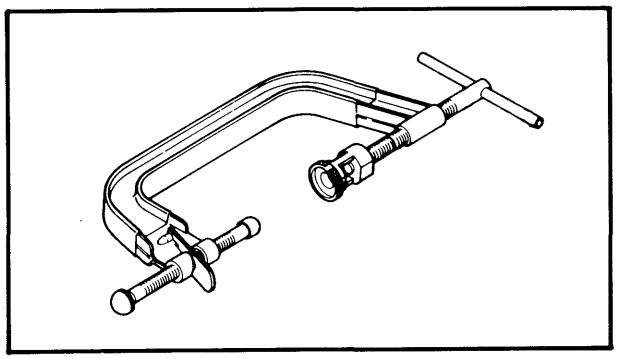


4. Clutch Holder
   P/N YM-91042

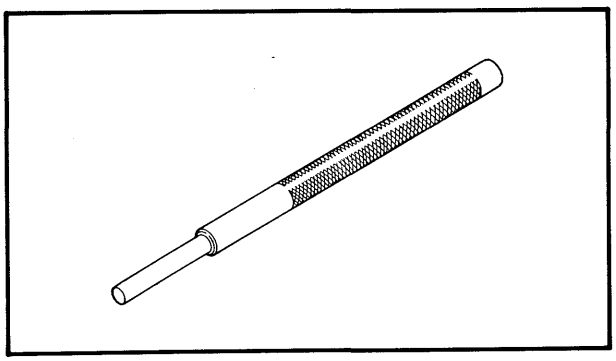
This tool is used to hold the clutch when removing or installing the clutch boss locknut.



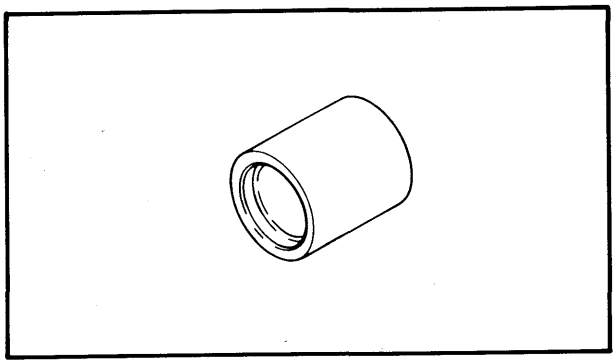
5. Slide Hammer Set
   P/N YU-01083
These tools are used when removing the rocker arm shaft.



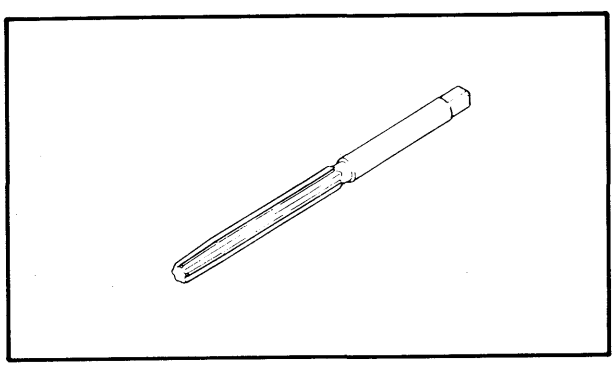
6. Valve Spring Compressor
   P/N YM-04019
This tool is needed to remove and install the valve assemblies.



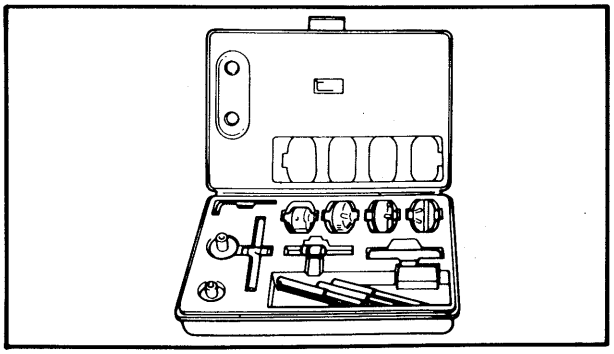
7. Valve Guide Remover (7.0 mm)
   P/N YM-01225
This tool is used to remove the valve guides.



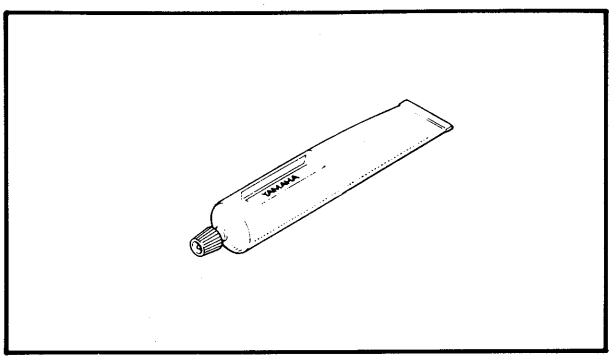
8. Valve Guide Installer
   P/N YM-04017
This tool is needed to install the valve guides properly.



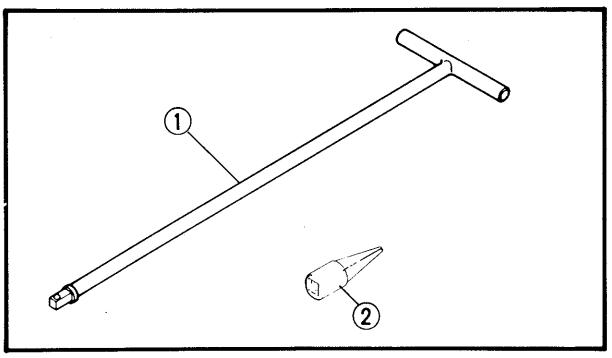
9. Valve Guide Reamer (7.0 mm)
   P/N YM-01227
This tool is used to rebore the new valve guide.



10. Valve Seat Cutter Set
    P/N YM-91043
This tool is needed to resurface the valve seat.

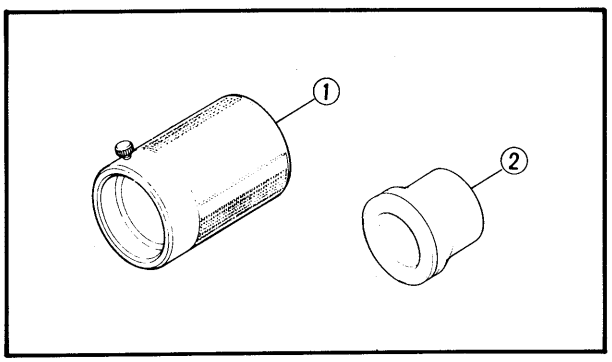


11. Sealant (Quick Gasket®)
    P/N ACC-11001-05-01
This sealant (bond) is used for crankcase mating surfaces, etc.

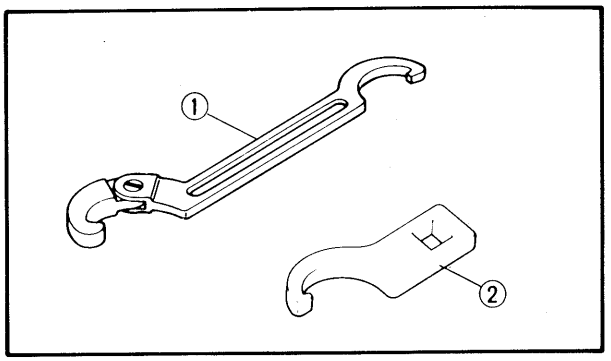


FOR CHASSIS SERVICE

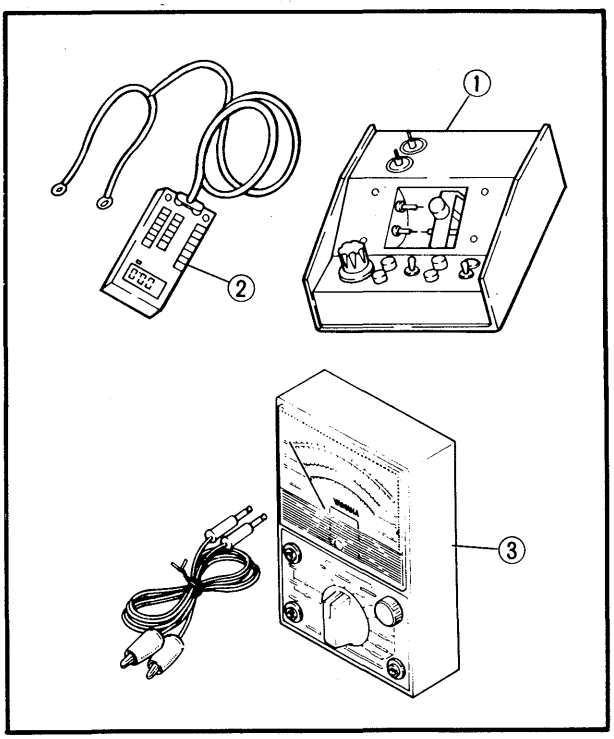
1. T-Handle
    P/N YM-01326 – ①
    Damper Rod Holder
    P/N YM-01300-1 – ②
These tools are used to loosen and tighten the front fork cylinder holding bolt.



2. Front Fork Seal Driver Weight
    P/N YM-01367 – ①
    Adapter (33 mm)
    P/N YM-1368 – ②
These tools are used when installing the fork seal.



3. Ring Nut Wrench
    P/N YU-01268 – ①
    P/N YU-33975 – ②
These tools are used to loosen and tighten the steering ring nut.



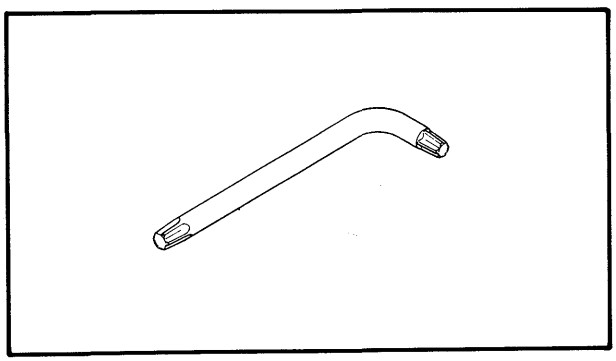
FOR ELECTRICAL COMPONENTS

1. Coil Tester
   P/N YU-33261 – ①

This instrument is necessary for checking the ignition system components.

2. Pocket Tester
   P/N YU-33263 – ② or
   P/N YU-03112 – ③

This instrument is invaluable for checking the electrical system.

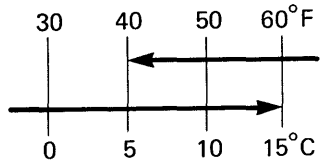


3. Special Torx Driver (T30)
   P/N YU-05258

This tool is used to remove and install the main switch bracket.

SPECIFICATIONS

GENERAL SPECIFICATIONS

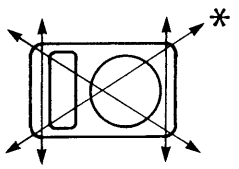
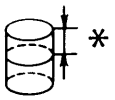
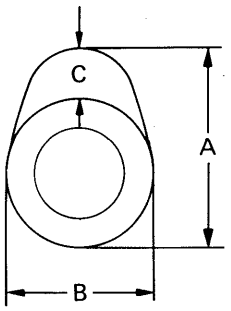
Model	XV250U
Model Code Number Vehicle Identification Number Engine Starting Number	3DN1 JYA3DNN0 * JA000101 3DN-000101
Dimensions: Overall Length Overall Width Overall Height Seat Height Wheelbase Minimum Ground Clearance	 2,190 mm (86.2 in) 800 mm (31.5 in) 1,130 mm (44.5 in) 685 mm (27.0 in) 1,488 mm (58.6 in) 145 mm (5.7 in)
Basic Weight: Weight Oil and Full Fuel Tank	 137 kg (302 lb)
Minimum Turning Radius:	2,800 mm (110.2 in)
Engine: Engine Type Cylinder Arrangement Displacement Bore x Stroke Compression Ratio Compression Pressure Starting System	 Air cooled 4-stroke gasoline, SOHC V-2 cylinder 249 cm^3 49 x 66 mm (1.929 x 2.598 in) 10 : 1 1,100 kPa (11 kg/cm^2, 156 psi) Electric starter
Lubrication System:	Wet sump
Oil Type or Grade: Engine Oil  Oil Capacity: Engine Oil: Periodic Oil Change With Oil Filter Replacement Total Amount	 Yamalube 4 or SAE 20W40 type SE motor oil (If temperature does not go below 5°C (40°F)) SAE 10W30 type SE motor oil (If temperature does not go above 15°C (60°F)) 1.4 L (1.2 Imp qt, 1.5 US qt) 1.6 L (1.4 Imp qt, 1.7 US qt) 1.8 L (1.6 Imp qt, 1.9 US qt)
Air Filter:	Wet type element
Fuel: Type Tank Capacity: Total Reserve	 Regular gasoline XV250U: 9.5 L (2.1 Imp gal, 2.5 US gal) XV250UC: 9.2 L (2.0 Imp gal, 2.4 US gal) 2.6 L (0.6 Imp gal, 0.7 US gal)

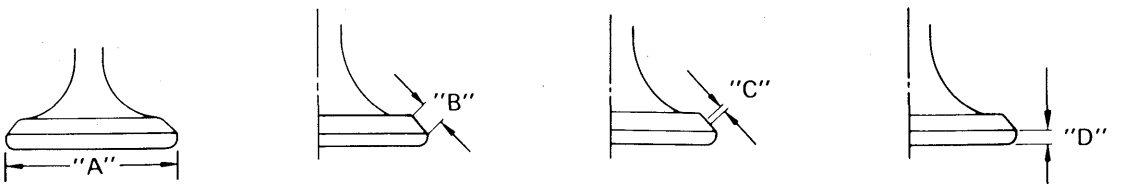
Model	XV250U	
Carburetor:		
Type/Manufacturer	BDS26 x 1/MIKUNI	
Spark Plug:		
Type/Manufacturer	CR6HS/NGK, U20FSR-U/NIPPONDENSO	
Gap	0.6 ~ 0.7 mm (0.024 ~ 0.028 in)	
Clutch Type:	Wet, multiple-disc	
Transmission:		
Primary Reduction System	Spur gear	
Primary Reduction Ratio	72/23 (3.130)	
Secondary Reduction System	Chain drive	
Secondary Reduction Ratio	45/16 (2.813)	
Transmission Type	Constant mesh, 5-speed	
Operation	Left foot operation	
Gear Ratio:		
1st	37/14 (2.643)	
2nd	32/19 (1.684)	
3rd	29/23 (1.261)	
4th	26/26 (1.000)	
5th	23/28 (0.821)	
Chassis:		
Frame Type	Double-cradle	
Caster Angle	32°	
Trail	120 mm (4.7 in)	
Tire:		
Type	With tube	
Size (F)	3.00S-18 4PR CHENG SHIN C916	
Size (R)	130/90-15 66P CHENG SHIN C915	
Wear Limit	0.8 mm (0.03 in)	
Tire Pressure (Cold Tire):		
Basic Weight:		
With Oil and Full Fuel Tank	147 kg (324 lb)	
Maximum Load*	198 kg (437 lb)	
Cold Tire Pressure:	FRONT	REAR
Up to 90 kg (198 lb) Load*	175 kPa (1.75 kg/cm², 25 psi)	200 kPa (2.0 kg/cm², 28 psi)
90 kg (198 lb)* ~ Maximum Load*	200 kPa (2.0 kg/cm², 28 psi)	225 kPa (2.25 kg/cm², 32 psi)
High Speed Riding	200 kPa (2.0 kg/cm², 28 psi)	225 kPa (2.25 kg/cm², 32 psi)
	* Load is the total weight of cargo, rider, passenger, and accessories.	
Brake:		
Front	Single disc brake	
Operation	Right hand operation	
Rear	Drum brake	
Operation	Right foot operation	

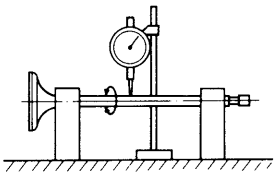
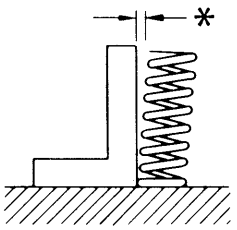
Model	XV250U
Suspension:	
Front Suspension	Telescopic fork
Rear Suspension	Swing arm
Shock Absorber:	
Front Shock Absorber	Coil spring, Oil damper
Rear Shock Absorber	Gas/Coil spring, Oil damper
Wheel Travel:	
Front Wheel Travel	140 mm (5.5 in)
Rear Wheel Travel	100 mm (3.9 in)
Electrical:	
Ignition System	T.C.I. (Digital)
Generator System	A.C. magneto generator
Battery Type or Model	GM10-3A-2
Battery Capacity	12V 10AH
Headlight Type:	Bulb type
Bulb Wattage x Quantity:	
Headlight	12V, 65W/60W x 1
Tail/Brake Light	12V, 8W/27W x 2
Rear Flasher Light	12V, 27W x 2
Front Position Light/Front Flasher Light	12V, 8W/27W x 2
Licence Light	12V, 7W x 1
Indicator Light:	
"NEUTRAL"	12V, 3W x 1
"HIGH BEAM"	12V, 1.7W x 1
"TURN"	12V, 3W x 1
Meter Light	12V, 3W x 1

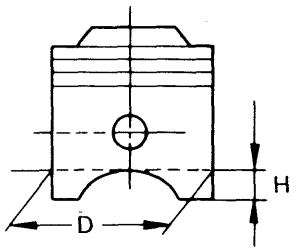
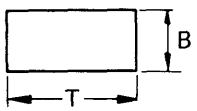
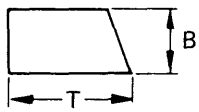
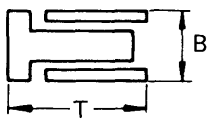
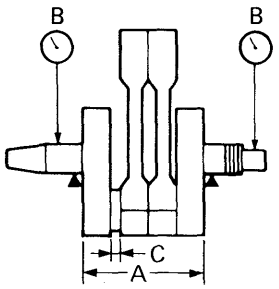
MAINTENANCE SPECIFICATIONS

Engine

Model	XV250U
Cylinder Head: Warp Limit* 	< 0.03 mm (0.0012 in) > * Lines indicate straight edge measurement.
Cylinder: Bore Size/Measuring Point*  Wear Limit	48.99 ~ 49.03 mm (1.929 ~ 1.930 in) 45 mm (1.77 in) < 0.15 mm (0.006 in) >
Camshaft: Drive Method Cam Cap Inside Dia. Camshaft Outside Dia. Shaft-to-Cap Clearance Cam Dimensions: Intake: "A" < Limit > "B" < Limit > "C" Exhaust: "A" < Limit > "B" < Limit > "C" Camshaft Runout Limit 	Chain drive (Left and right) 22.000 ~ 22.021 mm (0.866 ~ 0.867 in) 21.96 ~ 21.98 mm (0.864 ~ 0.865 in) 0.020 ~ 0.061 mm (0.0008 ~ 0.0024 in) 26.190 mm (1.031 in) < 26.090 mm (1.027 in) > 21.045 mm (0.829 in) < 20.045 mm (0.789 in) > 5.190 mm (0.204 in) 26.190 mm (1.031 in) < 26.090 mm (1.027 in) > 21.087 mm (0.830 in) < 20.087 mm (0.791 in) > 5.190 mm (0.204 in) < 0.015 mm (0.0006 in) >
Rocker Arm and Rocker Arm Shaft: Rocker Arm Inside Diameter Shaft Outside Diameter Arm-to-Shaft Clearance < Limit >	10.000 ~ 10.015 mm (0.3937 ~ 0.3943 in) 9.981 ~ 9.991 mm (0.3930 ~ 0.3933 in) 0.009 ~ 0.034 mm (0.0004 ~ 0.0013 in) < 0.08 mm (0.0032 in) >
Cam Chain: Cam Chain Type/No. of Links Cam Chain Adjustment Method	BUSH CHAIN/110 Automatic
Valve, Valve Seat, Valve Guide: Valve Clearance (Cold): IN. EX. Valve Dimensions:	0.08 ~ 0.12 mm (0.003 ~ 0.005 in) 0.10 ~ 0.14 mm (0.004 ~ 0.006 in)



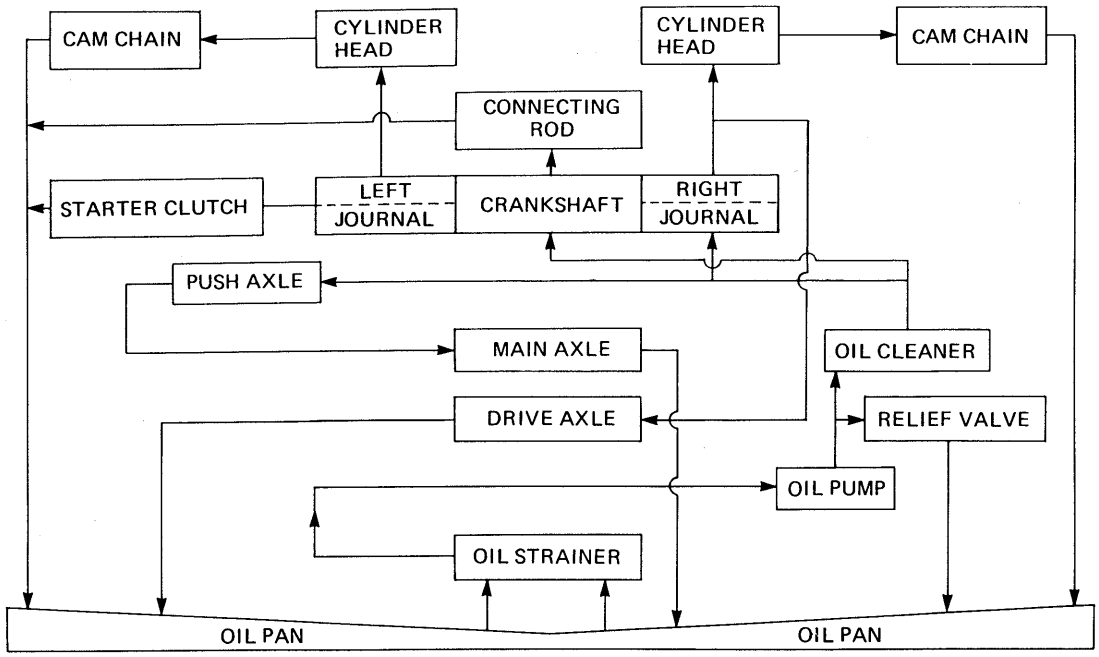
Model		XV250U
"A" Head Dia.	IN.	25.9 ~ 26.1 mm (1.020 ~ 1.028 in)
	EX.	21.9 ~ 22.1 mm (0.862 ~ 0.870 in)
"B" Face Width	IN.	1.4 ~ 3.2 mm (0.055 ~ 0.126 in)
	EX.	1.7 ~ 2.8 mm (0.067 ~ 0.110 in)
"C" Seat Width	IN.	0.9 ~ 1.1 mm (0.035 ~ 0.043 in)
	EX.	0.9 ~ 1.1 mm (0.035 ~ 0.043 in)
< Limit >	IN.	< 1.6 mm (0.063 in) >
	EX.	< 1.6 mm (0.063 in) >
"D" Margin Thickness	IN.	1.0 ~ 1.4 mm (0.04 ~ 0.06 in)
	EX.	1.0 ~ 1.4 mm (0.04 ~ 0.06 in)
< Limit >	IN.	< 0.7 mm (0.028 in) >
	EX.	< 0.7 mm (0.028 in) >
Stem Outside Dia.	IN.	6.975 ~ 6.990 mm (0.274 ~ 0.275 in)
	EX.	6.960 ~ 6.975 mm (0.273 ~ 0.274 in)
< Limit >	IN.	< 6.945 mm (0.273 in) >
	EX.	< 6.920 mm (0.272 in) >
Guide Inside Dia.	IN.	7.000 ~ 7.012 mm (0.275 ~ 0.276 in)
	EX.	7.000 ~ 7.012 mm (0.275 ~ 0.276 in)
< Limit >	IN.	< 7.05 mm (0.278 in) >
	EX.	< 7.05 mm (0.278 in) >
Stem-to-Guide Clearance	IN.	0.010 ~ 0.037 mm (0.0004 ~ 0.0015 in)
	EX.	0.025 ~ 0.052 mm (0.0010 ~ 0.0020 in)
< Limit >	IN.	< 0.08 mm (0.0031 in) >
	EX.	< 0.10 mm (0.0039 in) >
Stem Runout Limit		< 0.03 mm (0.0012 in) >
		
Valve Spring:		
Free Length	IN.	29.75 mm (1.171 in)
	EX.	29.75 mm (1.171 in)
< Limit >	IN.	< 28.75 mm (1.131 in) >
	EX.	< 28.75 mm (1.131 in) >
Set Length (Valve Closed)	IN.	25.7 mm (1.012 in)
	EX.	25.7 mm (1.012 in)
Compressed Pressure (Installed)	IN.	7.31 ~ 8.09 mm (16.1 ~ 17.8 in)
	EX.	7.31 ~ 8.09 mm (16.1 ~ 17.8 in)
Tilt Limit *	IN.	< 2.5°/1.2 mm (0.047 in) >
	EX.	< 2.5°/1.2 mm (0.047 in) >
		
Direction of Winding	IN.	Right
	EX.	Right

Model	: XV250U
Piston:	
Piston-to-Cylinder Clearance	0.02 ~ 0.04 mm (0.0008 ~ 0.0016 in)
< Limit >	< 0.1 mm (0.004 in) >
Piston Size "D"	48.96 ~ 49.00 mm (1.928 ~ 1.929 in)
Measuring Point "H"	6 mm (0.24 in)
	
Oversize: 1st	49.25 mm (1.939 in)
2nd	49.50 mm (1.949 in)
Piston Ring:	
Top Ring:	
Type	Barrel
Dimensions (B x T) 	1 x 2 mm (0.04 x 0.08 in)
End Gap (Installed)	0.15 ~ 0.30 mm (0.006 ~ 0.012 in)
< Limit >	< 0.4 mm (0.016 in) >
Side Clearance (Installed)	0.03 ~ 0.07 mm (0.001 ~ 0.003 in)
< Limit >	< 0.12 mm (0.005 in) >
2nd Ring:	
Type	Taper
Dimensions (B x T) 	1 x 2 mm (0.04 x 0.08 in)
End Gap (Installed)	0.15 ~ 0.30 mm (0.006 ~ 0.012 in)
< Limit >	< 0.4 mm (0.016 in) >
Side Clearance	0.02 ~ 0.06 mm (0.0008 ~ 0.0024 in)
< Limit > 	< 0.12 mm (0.005 in) >
Oil Ring:	
Dimensions (B x T)	2.0 x 2.2 mm (0.078 x 0.087 in)
End Gap (Installed)	0.3 ~ 0.9 mm (0.012 ~ 0.035 in)
Connecting Rod:	
Oil Clearance	0.020 ~ 0.048 mm (0.0008 ~ 0.0019 in)
Crankshaft:	
	
Crank Width "A"	67.95 ~ 68.00 mm (2.675 ~ 2.677 in)
Runout Limit "B"	< 0.03 mm (0.0012 in) >
Big End Side Clearance "C"	0.40 ~ 1.05 mm (0.016 ~ 0.041 in)
Journal Oil Clearance	0.020 ~ 0.048 mm (0.0008 ~ 0.0019 in)

Model		XV250U
Clutch:		
Friction Plate:	Thickness	2.9 ~ 3.1 mm (0.114 ~ 0.122 in)
	Quantity	5 pcs.
	Wear Limit	< 2.5 mm (0.098 in) >
Clutch Plate:	Thickness	1.9 ~ 2.1 mm (0.075 ~ 0.083 in)
	Quantity	4 pcs.
	Warp Limit	< 0.05 mm (0.002 in) >
Clutch Spring:	Free Length	34.6 mm (1.36 in)
	Quantity	4 pc.
	Minimum Length	< 33.6 mm (1.32 in) >
Push Rod Bending Limit		< 0.5 mm (0.02 in) >
Transmission:		
Main Axle Deflection Limit		< 0.08 mm (0.0031 in) >
Drive Axle Deflection Limit		< 0.08 mm (0.0031 in) >
Shifter:		
Shifter Type		Cam Drum and Guide Bar
Guide Bar Bending Limit		< 0.025 mm (0.001 in) >
Carburetor:		
I.D. Mark		3DM00 OR CALIFORNIA: 3BG00
Main Jet	(M.J.)	#110
Main Air Jet	(M.A.J.)	#60
Jet Needle	(J.N.)	4DM1-3
Needle Jet	(N.J.)	O-0
Pilot Jet	(P.J.)	#17.5
Pilot Air Jet	(P.A.J.)	#155
Pilot Screw	(P.S.)	2-5/8
Pilot Outlet	(P.O.)	ϕ0.85
Bypass	(B.P. 1)	ϕ0.8
	(B.P. 2)	ϕ0.8
Valve Seat Size	(V.S.)	ϕ1.0
Starter Jet	(G.S. 1)	#25
	(G.S. 2)	0.7
Fuel Level		13.5 ~ 14.5 mm (0.53 ~ 0.57 in)
Engine Idling Speed		1,250 ~ 1,350 r/min
Vacuum Pressure at Idling Speed		Above 47.9 kPa (360 mmHg, 14.17 inHg)
Vacuum Synchronous Difference		Below 1.3 kPa (10 mmHg, 0.39 inHg)
Fuel Pump:		
Type		Vacuum type
Lubrication System:		
Oil Filter Type		Paper type
Oil Pump Type:		Trochoid type
Tip Clearance		0 ~ 0.15 mm (0 ~ 0.006 in)
< Limit >		< 0.20 mm (0.008 in) >
Side Clearance		0.03 ~ 0.09 mm (0.001 ~ 0.004 in)
< Limit >		< 0.09 mm (0.004 in) >
Relief Valve Operating Pressure		441 ~ 539 kPa (4.5 ~ 5.5 kg/cm^2, 64 ~ 78 psi)

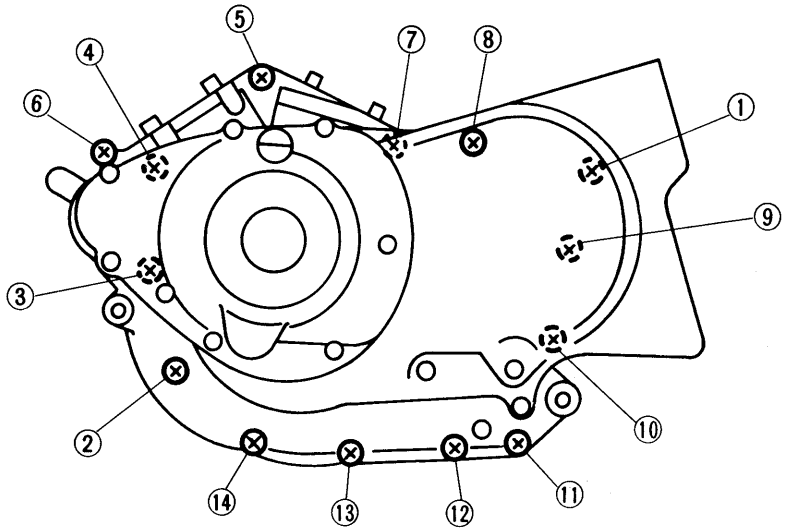
Model	XV250U

Lubrication Chart:



Crankcase Tightening Sequence:

LEFT-CASE

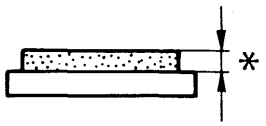


TIGHTENING TORQUE

Parts to be tightened	Part name	Thread size	Q'ty	Tightening torque			Remarks
				Nm	m·kg	ft·lb	
Cam Sprocket Cover	Bolt	M6 x 1.0	4	7	0.7	5.1	
Tappet Cover	—	M45	4	7	0.7	5.1	
Cylinder Head	Flange bolt	M8 x 1.25	8	22	2.2	16	
	Bolt	M6 x 1.25	4	12	1.2	8.7	
Cylinder Head (Exhaust pipe)	Stud bolt	M6 x 1.0	4	7	0.7	5.1	
Spark Plug	—	M10 x 1.25	2	13	1.3	8.4	
Cylinder Head (Cover)	Bolt	M6 x 1.0	8	10	1.0	7.2	
Rotor (A.C. Magneto)	Flange nut	M12	1	80	8.0	58	
Valve Adjusting Locknut	Nut	M5 x 1.0	4	7	0.7	5.1	
Rocker Arm Shaft Stopper	Bolt	M6 x 1.0	2	12	1.2	8.7	
Cam Sprocket	Bolt	M8 x 1.25	2	26	2.6	19	
Chain Guide	Bolt	M6 x 1.0	4	10	1.0	7.2	
Chain Tensioner	Bolt	M6 x 1.0	4	10	1.0	7.2	
Chain Tensioner End	Cap bolt	M8 x 1.25	2	8	0.8	5.8	
Oil Pump Cover	Screw	M6 x 1.0	1	7	0.7	5.1	
Oil Strainer Cover	Screw	M6 x 1.0	1	7	0.7	5.1	
Oil Pump	Screw	M6 x 1.0	3	7	0.7	5.1	
Oil Filter Cover	Screw	M6 x 1.0	3	7	0.7	5.1	
Drain Plug	—	M35 x 1.5	1	32	3.2	23	
Carburetor Joint	Bolt	M6 x 1.0	4	10	1.0	7.2	
Air Filter Element	Screw	M6 x 1.0	2	7	0.7	5.1	
Air Filter Cover	Bolt	M6 x 1.0	2	10	1.0	7.2	
Exhaust Pipe 3	Flange bolt	M8 x 1.25	2	20	2.0	14	
Exhaust Pipe Joint (Lower)	Flange bolt	M8 x 1.25	1	20	2.0	14	
Exhaust Pipe	Flange nut	M6 x 1.0	4	10	1.0	7.2	
Muffler	Flange bolt	M10 x 1.25	1	25	2.5	18	
Exhaust Pipe Joint (Upper)	Flange bolt	M6 x 1.0	1	10	1.0	7.2	
Air Filter Plate	Flange bolt	M6 x 1.0	2	10	1.0	7.2	
	Screw	M4 x 1.0	2	3	0.3	2.2	
Crankcase	Screw	M6 x 1.0	14	7	0.7	5.1	
Crankcase Cover (Left)	Screw	M6 x 1.0	9	7	0.7	5.1	
Crankcase Cover (Right)	Screw	M6 x 1.0	10	7	0.7	5.1	
Cover (Drive chain)	Screw	M6 x 1.0	3	7	0.7	5.1	
Drain Plug	—	M14 x 1.25	1	34	3.4	24	
Nozzle	—	M8 x 1.25	2	5	0.5	3.6	
Starter Clutch	Bolt	M8 x 1.25	3	30	3.0	22	Stake LT
Primary Drive Gear	Nut	M16 x 1.0	1	80	8.0	58	Use lock washer
Clutch Boss	Nut	M16 x 1.0	1	75	7.5	54	Use lock washer
Clutch Spring	Screw	M6 x 1.0	4	8	0.8	5.8	
Clutch Adjuster Locknut	Nut	M6 x 1.0	1	8	0.8	5.8	
Clutch Push Lever	Screw	M8 x 1.0	1	12	1.2	8.7	
Drive Sprocket	Bolt	M6 x 1.0	2	10	1.0	7.2	
Shiftcam Side Plate	Screw	M5 x 0.8	1	4	0.4	2.9	LT
Shiftcam Stopper	Screw	M8 x 1.0	1	22	2.2	16	LT
Shift Lever 3	Bolt	M6 x 1.0	1	8	0.8	5.8	
Shift Pedal	Nut	M6 x 1.0	1	8	0.8	5.8	Left-hand thread
	Nut	M6 x 1.0	1	8	0.8	5.8	
Neutral Switch	—	M10 x 1.25	1	20	2.0	14	
Stator	Screw	M6 x 1.0	3	7	0.7	5.1	
Pickup Coil	Screw	M5 x 1.0	2	5	0.5	3.6	
Starter Motor	Bolt	M6 x 1.0	2	10	1.0	7.2	

Chassis

Model		XV250U
Steering System:		
Steering Bearing Type		Ball bearing
Number/Size of Steel Ball:	Upper	19 pcs./0.25 in
	Lower	19 pcs./0.25 in
Front Suspension:		
Front Fork Travel		140 mm (5.5 in)
Fork Spring Free Length		415 mm (16.3 in)
< Limit >		< 410 mm (16.1 in) >
Spring Rate:	K1	3.92 N/mm (0.4 kg/mm, 22.4 lb/in)
	K2	5.69 N/mm (0.58 kg/mm, 32.5 lb/in)
Stroke	K1	0 ~ 106 mm (0 ~ 4.17 in)
	K2	106 ~ 162 mm (4.17 ~ 6.38 in)
Optional Spring		No.
Oil Capacity		245 cm^3 (8.62 Imp oz, 8.28 US oz)
Oil Level		120 mm (4.72 in) From top of fully compressed inner tube without fork spring
Oil Grade		Yamaha fork oil 10wt or equivalent
Rear Suspension:		
Shock Absorber Travel		70 mm (2.76 in)
Spring Free Length		233 mm (9.17 in)
< Limit >		< 226 mm (8.90 in) >
Fitting Length		207.5 mm (8.17 in)
Spring Rate:	K1	15.7 N/mm (1.6 kg/mm, 89.6 lb/in)
	K2	22.6 N/mm (2.3 kg/mm, 128.8 lb/in)
Stroke:	K1	0 ~ 75 mm (0 ~ 2.95 in)
	K2	75 ~ 162 mm (2.95 ~ 6.38 in)
Optional Spring		No.
Swingarm:		
Swingarm Free Play Limit:	End	< 1 mm (0.04 in) >
Front Wheel:		
Type		Spoke wheel
Rim Size		MT1.60 x 18
Rim Material		Steel
Rim Runout Limit:	Vertical	< 2 mm (0.08 in) >
	Lateral	< 2 mm (0.08 in) >
Rear Wheel:		
Type		Spoke wheel
Rim Size		MT2.75 x 15
Rim Material		Steel
Rim Runout Limit:	Vertical	< 2 mm (0.08 in) >
	Lateral	< 2 mm (0.08 in) >
Drive Chain:		
Type/Manufacturer		520DS/D.I.D.
No. of Links		140
Drive Chain Slack		30 ~ 40 mm (1.18 ~ 1.57 in)

Model	XV250U
Front Disc Brake:	
Type	Single
Disc Outside Diameter x Thickness	267 x 5 mm (10.5 x 0.2 in)
Pad Thickness	6.8 mm (0.27 in)
< Limit > *	< 0.8 mm (0.03 in) >
	
Master Cylinder Inside Diameter	12.7 mm (0.45 in)
Caliper Cylinder Inside Diameter	38.1 mm (1.50 in)
Brake Fluid Type	DOT #3 or #4
Rear Drum Brake:	
Type	Leading and trailing
Drum Inside Diameter	130 mm (5.12 in)
< Limit >	< 131 mm (5.16 in) >
Lining Thickness	4 mm (0.16 in)
< Limit >	< 2 mm (0.08 in) >
Shoe Spring Free Length	36.5 mm (1.44 in)
Brake Lever and Brake Pedal:	
Brake Lever Free Play	2 ~ 5 mm (0.08 ~ 0.20 in)
Brake Pedal Position	45 ~ 55 mm (1.77 ~ 2.17 in)
Brake Pedal Free Play	20 ~ 30 mm (0.8 ~ 1.2 in)
Clutch Lever:	
Clutch Lever Free Play	3 ~ 5 mm (0.12 ~ 0.20 in)

TIGHTENING TORQUE:

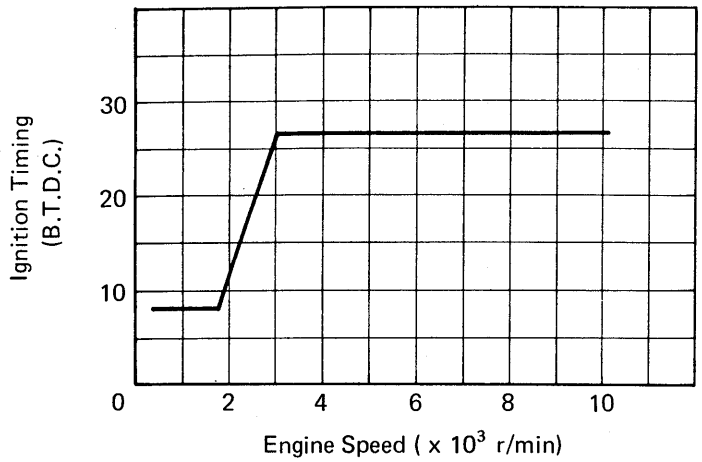
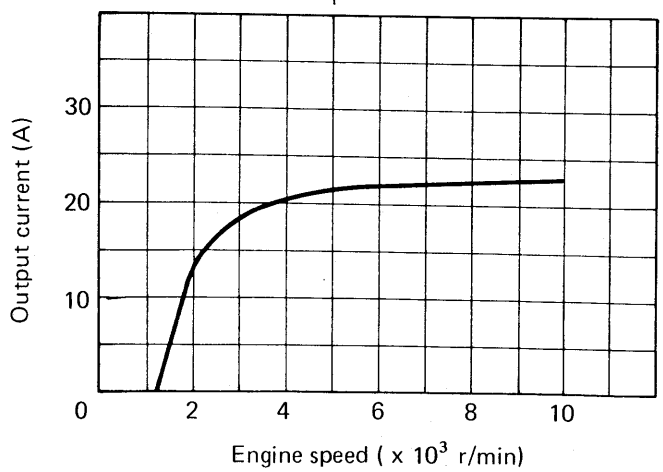
Part to be tightened	Thread size	Tightening torque			Remarks
		Nm	m·kg	ft·lb	
Front Wheel Axle	M14 x 1.5	58	5.8	42	
Front Axle Bolt	M8 x 1.25	20	2.0	14	
Steering Stem and Inner Tube	M12 x 1.25	38	3.8	27	
Front Fender and Front Fork	M8 x 1.25	20	2.0	14	
Front Brake Caliper and Front Fork	M10 x 1.25	35	3.5	25	
Steering Stem and Clamp	M6 x 1.0	7	0.7	5.1	
Headlight Stay and Steering Stem	M6 x 1.0	7	0.7	5.1	
Headlight Stay and Headlight (Lower)	M8 x 1.25	20	2.0	14	
Handlebar Crown and Inner Tube	M8 x 1.25	20	2.0	14	
Handlebar Crown and Steering Stem	M14 x 1.25	54	5.4	39	
Steering Stem and Ring Nut	M25 x 1.0	38	3.8	27	See NOTE
Handlebar Crown and Handlebar Holder (Lower)	M10 x 1.25	20	2.0	14	
Handlebar and Handlebar Holder (Upper)	M8 x 1.25	20	2.0	14	
Speedometer and Handle Crown	M6 x 1.0	7	0.7	5.1	
Headlight (Upper) and Meter Stay	M6 x 1.0	7	0.7	5.1	
Indicator Light Box and Meter Stay	M4 x 0.7	1	0.1	0.7	
Headlight Stay and Flasher Light Stay	M12 x 1.25	20	2.0	14	
Front Brake Disc and Hub	M8 x 1.25	20	2.0	14	Use lock washer
Front Brake Hose and Caliper	M10 x 1.25	26	2.6	19	
Front Brake Bleed Screw	M8 x 1.25	6	0.6	4.3	
Master Cylinder and Brake Hose	M10 x 1.25	26	2.6	19	
Master Cylinder and Cap	M5 x 0.8	2	0.2	1.4	
Master Cylinder and Bracket	M6 x 1.0	9	0.9	6.5	
Horn and Frame	M6 x 1.0	7	0.7	5.1	
Frame and Ignition Coil Stay	M6 x 1.0	7	0.7	5.1	
Ignition Coil and Coil Stay	M5 x 0.8	4	0.4	2.9	
Engine Stay (Front) and Frame	M10 x 1.25	55	5.5	40	
Igniter Unit and Fender (Rear)	M6 x 1.0	4	0.4	2.9	
Air Filter Case and Frame	M6 x 1.0	4	0.4	2.9	
Engine Stay (Rear) and Frame	M8 x 1.25	35	3.5	25	
Engine Mounting (Rear-Top) and Stay	M8 x 1.25	35	3.5	25	
Engine Mounting (Rear-Bottom) and Frame	M8 x 1.25	35	3.5	25	
Engine Mounting (Front) and Frame	M8 x 1.25	35	3.5	25	
Main Switch and Frame	M6 x 1.0	15	1.5	11	
Regulator and Frame	M6 x 1.0	7	0.7	5.1	
Helmet Hanger and Frame	M6 x 1.0	15	1.5	11	
Brake Pedal Adjuster Locknut	M6 x 1.0	7	0.7	5.1	
Sidestand	M10 x 1.25	26	2.6	19	
Rear Footrest and Frame	M8 x 1.25	30	3.0	22	
Pivot Shaft and Swingarm	M12 x 1.25	43	4.3	31	
Fuel Pump and Pump Bracket	M6 x 1.0	7	0.7	5.1	
Pump Bracket and Fuel Tank	M6 x 1.0	7	0.7	5.1	
Fuel Cock and Fuel Cock Stay	M6 x 1.0	7	0.7	5.1	
Fuel Tank and Fuel Cock Stay	M6 x 1.0	7	0.7	5.1	
Fuel Tank (Rear-Top) and Frame	M6 x 1.0	9	0.9	6.5	
Battery Box and Frame	M6 x 1.0	7	0.7	5.1	
Bracket 1 and Reinforcement (Rear Fender)	M6 x 1.0	7	0.7	5.1	
Seat (Front) and Frame	M6 x 1.0	7	0.7	5.1	
Seat (Rear) and Reinforcement	M8 x 1.25	20	2.0	14	

Part to be tightened	Thread size	Tightening torque			Remarks
		Nm	m·kg	ft·lb	
Rear Shock Absorber (Upper)	M8 x 1.25	20	2.0	14	
Rear Shock Absorber (Lower)	M8 x 1.25	20	2.0	14	
Rear Wheel Axle	M14 x 1.5	105	10.5	75	
Rear Fender (Front) and Frame	M10 x 1.25	60	6.0	43	
Rear Fender (Rear) and Frame	M10 x 1.25	60	6.0	43	
Rear Fender and Flasher Light Stay	M12 x 1.25	20	2.0	14	
Rear Fender and Taillight	M6 x 1.0	7	0.7	5.1	
Rear Fender and Licence Bracket	M6 x 1.0	7	0.7	5.1	
Brake Rod and Swingarm	M8 x 1.25	20	2.0	14	
Brake Rod and Brake Shoe Plate	M8 x 1.25	20	2.0	14	
Sidestand Switch and Sidestand Bracket	M5 x 1.0	3	0.3	2.2	
Sidestand Switch Pannel and Frame	M6 x 0.8	13	1.3	9.4	
Flasher Light and Flasher Stay	M6 x 1.0	7	0.7	5.1	
Wire Harness and Frame	M6 x 1.0	4	0.4	2.9	

NOTE:

1. First, tighten the ring nut approximately 38 Nm (3.8 m·kg, 27 ft·lb) by using the torque wrench, then loosen the ring nut one turn.
2. Retighten the ring nut 10 Nm (1.0 m·kg, 7.2 ft·lb).

Electrical

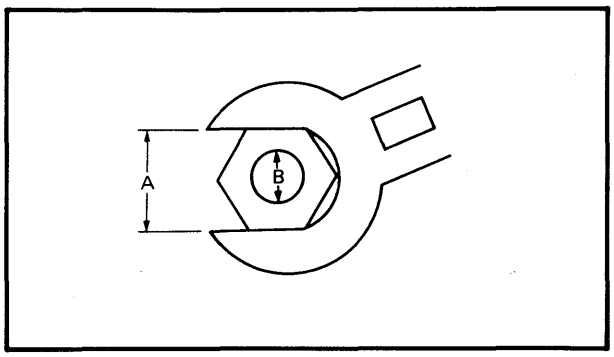
Model	XV250U
Voltage:	12V
Ignition System: Ignition Timing (B.T.D.C.) Advanced Timing (B.T.D.C.) Advancer Type	 8° at 1,300 r/min 27° at 3,000 r/min Electrical
	
T.C.I.: Pickup Coil Resistance (Color) T.C.I. Unit-Model/Manufacturer	 178 ~ 266Ω at 20°C (68°F) (Blue/Yellow – Green/White) QCA03/NIPPONDENSO
Ignition Coil: Model/Manufacturer Primary Winding Resistance Secondary Winding Resistance Spark Plug Cap Resistance	 J0226/NIPPONDENSO 3.2 ~ 4.8Ω at 20°C (68°F) 10.4 ~ 15.6 kΩ at 20°C (68°F) 10 kΩ
Charging System/Type:	A.C. magneto generator
A.C. Generator: Model/Manufacturer Nominal Output	 LMZ42/NIPPONDENSO 14V, 21A at 5,000 r/min
	
Stator Coil Resistance	0.19 ~ 0.29Ω at 20°C (68°F) (White – White)

Model	XV250U
Voltage Regulator:	
Type	Short circuit
Model/Manufacture	SH569/SHINDENGEN
No Load Regulated Voltage	14.3 ~ 15.3V
Rectifier:	
Model/Manufacturer	SH569/SHINDENGEN
Capacity	25A
Withstand Voltage	200V
Battery:	
Capacity:	12V, 10AH
Specific Gravity	1.280
Electric Starter System:	
Type	Constant mesh type
Starter Motor:	
Model/Manufacturer	2UJ/MORIYAMA
Output	0.4 kW
Brush	
Overall Length	10 mm (0.39 in)
< Limit >	< 3.5 mm (0.14 in) >
Spring Pressure	560 ~ 840 g (19.8 ~ 29.7 oz)
Commutator:	
Outside Diameter	22 mm (0.87 in)
< Wear Limit >	< 21 mm (0.83 in) >
Mica Undercut	1.5 mm (0.059 in)
Starter Relay:	
Model/Manufacturer	A104-128/HITACHI
Amperage Rating	100A
Coil Winding Resistance	3.0 ~ 3.7Ω at 20°C (68°F)
Heater (Carburetor):	
Resistance	9.5 ~ 10.5Ω at 20°C (68°F)
Horn:	
Type/Quantity	Plain type x 1
Model/Manufacturer	MF-12/NIKKO
Maximum Amperage	1.5A
Flasher Relay:	
Type	Semi transister type
Model/Manufacturer	FB257H/NIPPONDENSO
Self Cancelling Device	Yes.
Flasher Frequency	75 ~ 95 cycle/min
Wattage	27W x 2 + 3.4W
Self Cancelling Unit:	
Model/Manufacturer	FB257H
Starting Circuit Cut-off Relay:	
Model/Manufacturer	2UJ/OMRON
Diode	Yes
Circuit Breaker:	
Type	Fuse
Amperage for Individual Circuit x Quantity:	
Main	20A x 1
Signal	10A x 1

GENERAL TORQUE SPECIFICATIONS

This chart specifies torque for standard fasteners with standard I.S.O. pitch threads. Torque specifications for special components or assemblies are included in the applicable sections of this book. To avoid warpage, tighten multifastener assemblies in a crisscross fashion, in progressive stages, until full torque is reached. Unless otherwise specified, torque specifications call for clean, dry threads. Components should be at room temperature.

A (Nut)	B (Bolt)	General torque specifications		
		Nm	m·kg	ft·lb
10mm	6mm	6	0.6	4.3
12mm	8mm	15	1.5	11
14mm	10mm	30	3.0	22
17mm	12mm	55	5.5	40
19mm	14mm	85	8.5	61
22mm	16mm	130	13.0	94



A: Distance across flats
B: Outside thread diameter

DEFINITION OF UNITS

Unit	Read	Definition	Measure
mm cm	millimeter centimeter	10^{-3} meter 10^{-2} meter	Length Length
kg	kilogram	10^{3} gram	Weight
N	Newton	1kg x m/sec^2	Force
Nm m·kg	Newton meter Meter kilogram	N x m m x kg	Torque Torque
Pa N/mn	Pascal Newton per millimeter	N/m^2 N/mn	Pressure Spring rate
L cm^3	Liter Cubic centimeter	—	Volume or Capacity
r/min	Rotation per minute	—	Engine Speed

LUBRICATION POINTS AND LUBRICANT TYPE

ENGINE

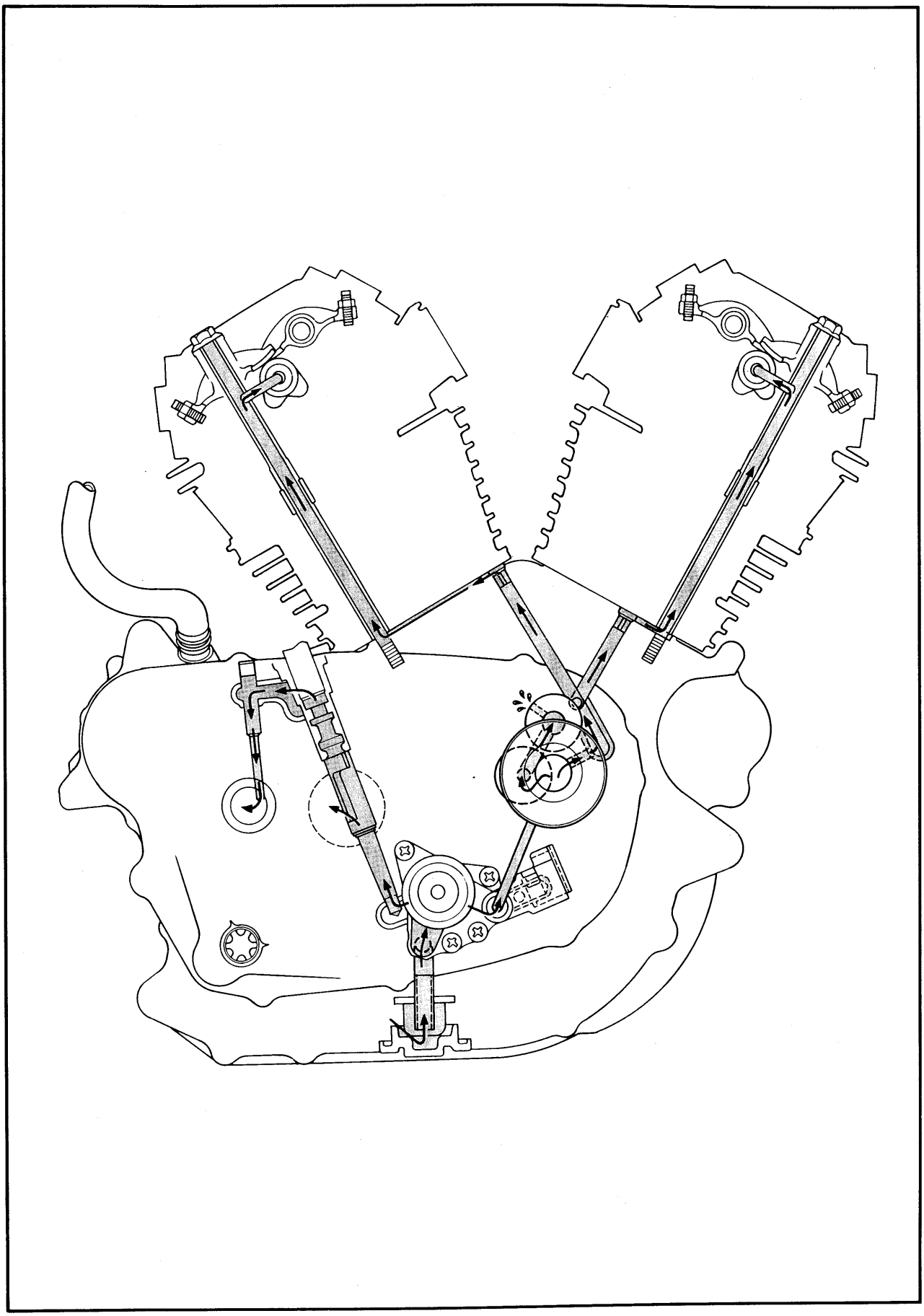
Lubrication Point	Symbol	Lubricant Type
Oil seal lip	LS	Lithium-soap base grease
O-Ring	LS	Lithium-soap base grease
Bearing	E	Engine oil
Cylinder head bolt/Washer	E	Engine oil
Rocker shaft bearing	M	Molybdeum disulfide oil
Crankshaft pin	E	Engine oil
Crankshaft journal	E	Engine oil
Connecting rod	E	Engine oil
Piston surface	E	Engine oil
Piston pin	E	Engine oil
Camshaft cam lobe/Journal	E	Engine oil
Valve stem (IN, EX)	M	Molybdeum disulfide oil
Valve stem end (IN, EX)	E	Engine oil
Cam chain/Cam sprocket	E	Engine oil
Oil pump shaft, rotor (IN, OUT), housing	E	Engine oil
Idle gear 1, 2 surface/Bushing	E	Engine oil
Starter clutch	E	Engine oil
Primary driven gear	E	Engine oil
Push lever axle	M	Molybdeum disulfide oil
Transmission gear (Wheel/Pinion)	M	Molybdeum disulfide oil
Axle (Main/Drive)	M	Molybdeum disulfide oil
Shift cam	M	Molybdeum disulfide oil
Shift fork/Guide bar	E	Engine oil
Crankcase mating surfaces	4	Yamaha bond No. 4®

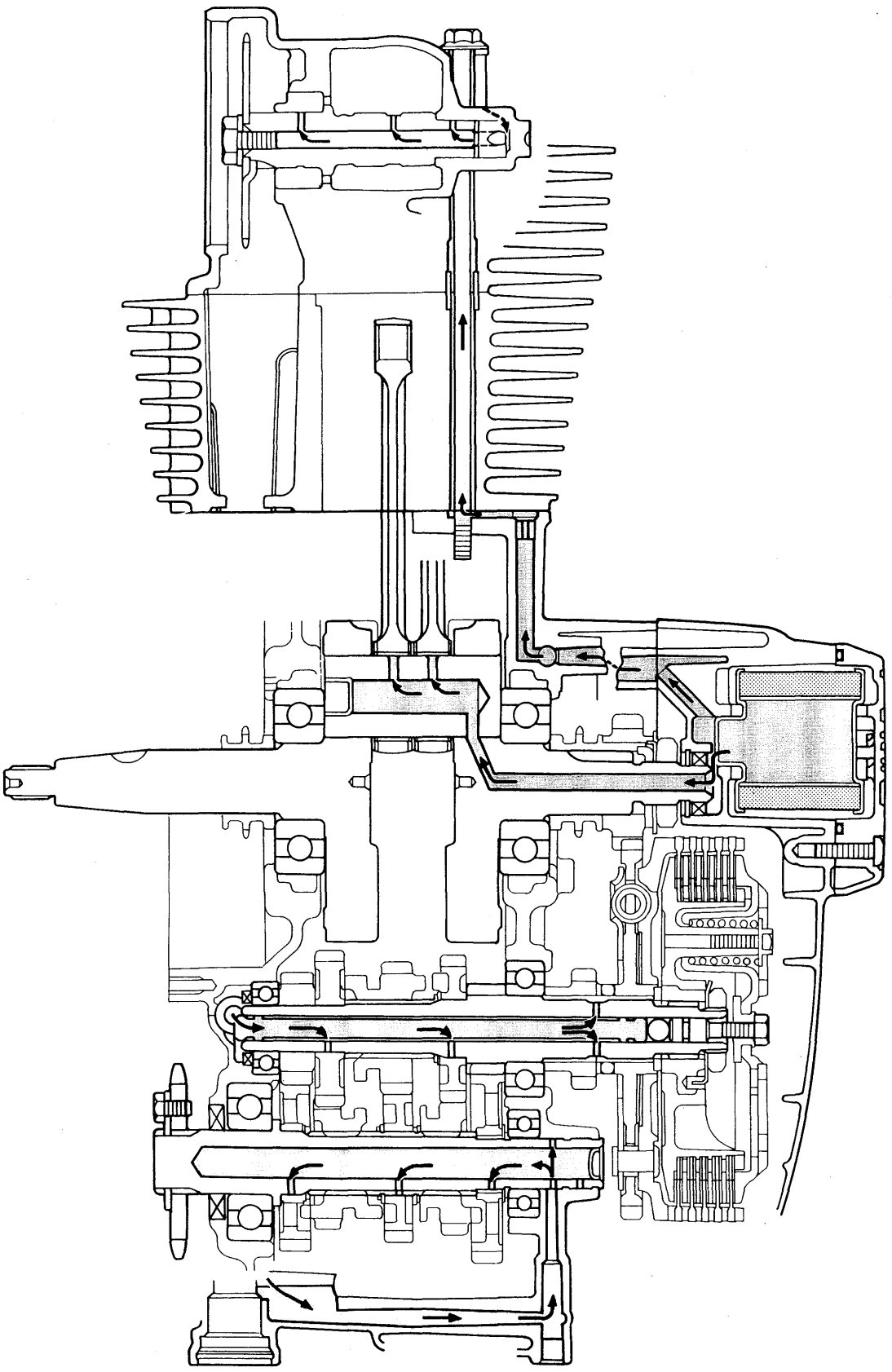
LUBRICATION POINTS AND LUBRICANT TYPE

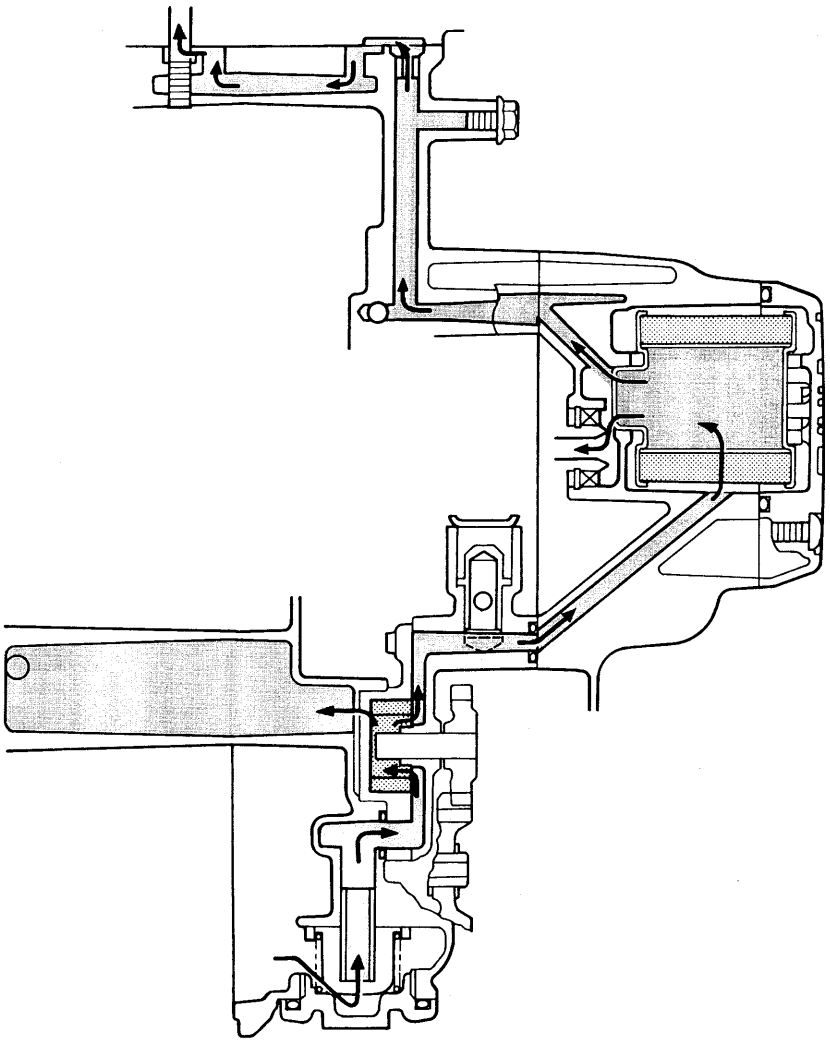
CHASSIS

Lubrication Point	Symbol	Lubricant Type
Steering bearing (Upper/Lower)	LS	Lithium-soap base grease
Wheel bearing/Axle	LS	Lithium-soap base grease
Front wheel oil seal (Right/Left)	LS	Lithium-soap base grease
Rear wheel oil seal	LS	Lithium-soap base grease
Clutch hub oil seal	LS	Lithium-soap base grease
Clutch hub fitting area	LS	Lithium-soap base grease
Rear brake pedal shaft	LS	Lithium-soap base grease
Change pedal	B	Wheel bearing grease
Side stand sliding surface	B	Wheel bearing grease
Tube guide (Throttle grip) inner surface	B	Wheel bearing grease
Brake lever bolt, sliding surface	B	Wheel bearing grease
Clutch lever collar, sliding surface	B	Wheel bearing grease
Swingarm pivot bearing	LS	Lithium-soap base grease
Speedometer gear unit	LS	Lithium-soap base grease
Rear brake camshaft	LS	Lithium-soap base grease
Brake shoe plate pivot	LS	Lithium-soap base grease

LUBRICATION DIAGRAMS



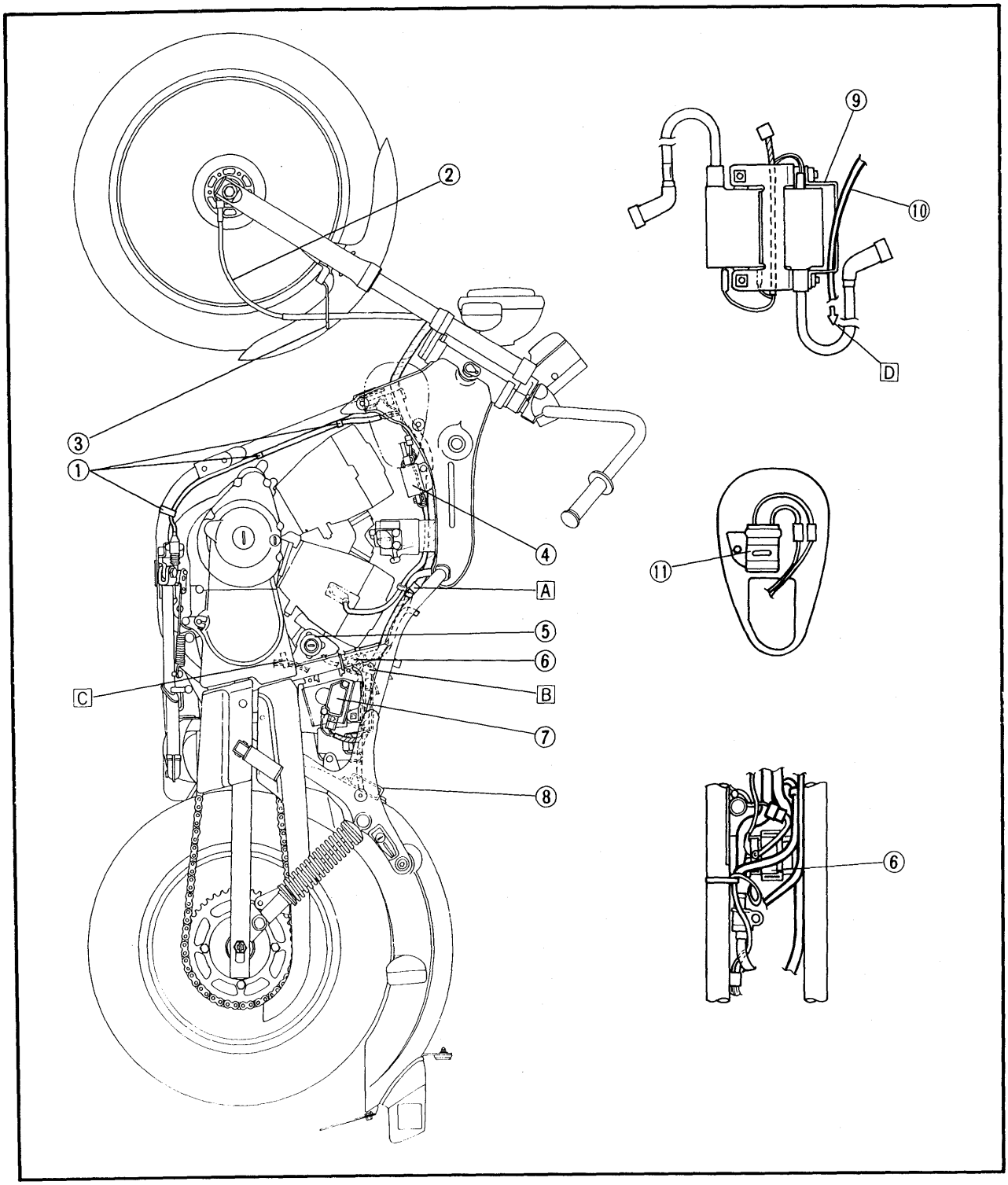




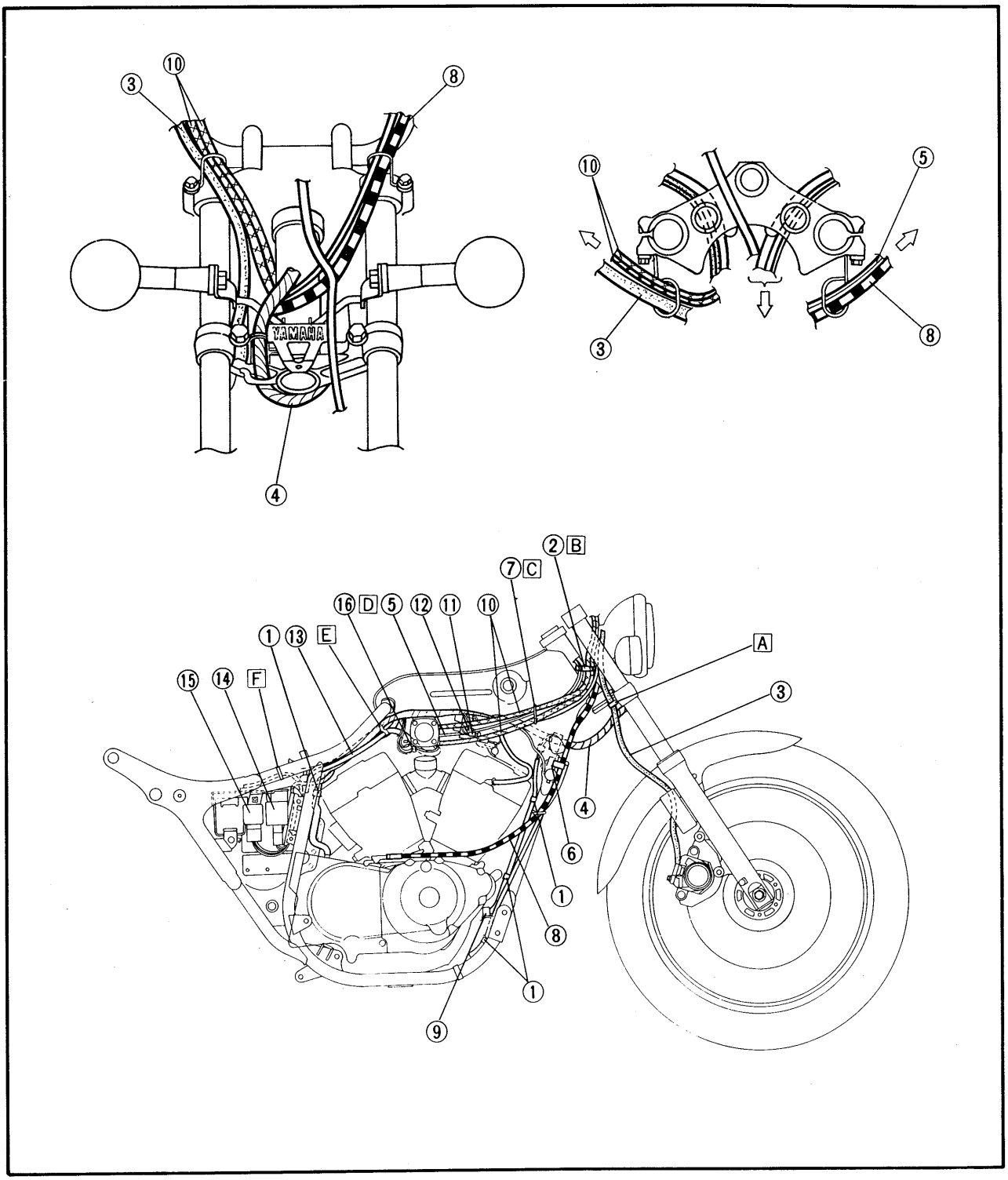
CABLE ROUTING

① Clamp
② Speedometer cable
③ Cable guide
④ Ignition coil
⑤ Main switch
⑥ Starter switch
⑦ Rectifier/Regulator
⑧ Ignitor unit (Digital)
⑨ Plate
⑩ Starter cable
⑪ Thermo switch

[A] Clamp the wireharness.
[B] Pass the wireharness and possitive lead.
[C] Clamp the starter motor lead and neutral switch lead.
[D] To carburetor



① Clamp
② Band
③ Brake hose
④ Wire harness
⑤ Starter cable
⑥ Horn
⑦ Cable guide
⑧ Clutch cable
⑨ Rear brake switch
⑩ Throttle cables
⑪ Front brake switch coupler
⑫ Handlebar switch (Right) coupler
⑬ Canister hose
⑭ Relay assembly
⑮ Flasher relay
⑯ Heater (Carburetor)
[A] Clamp the brake hose with hose holder.
[B] Clamp the leads.
[C] Pass the cables and leads.
[D] Pass the starter cable between ignition coil and plate.
[E] Clamp the wire harness and canister hose.
[F] Clamp the main switch and neutral switch leads.

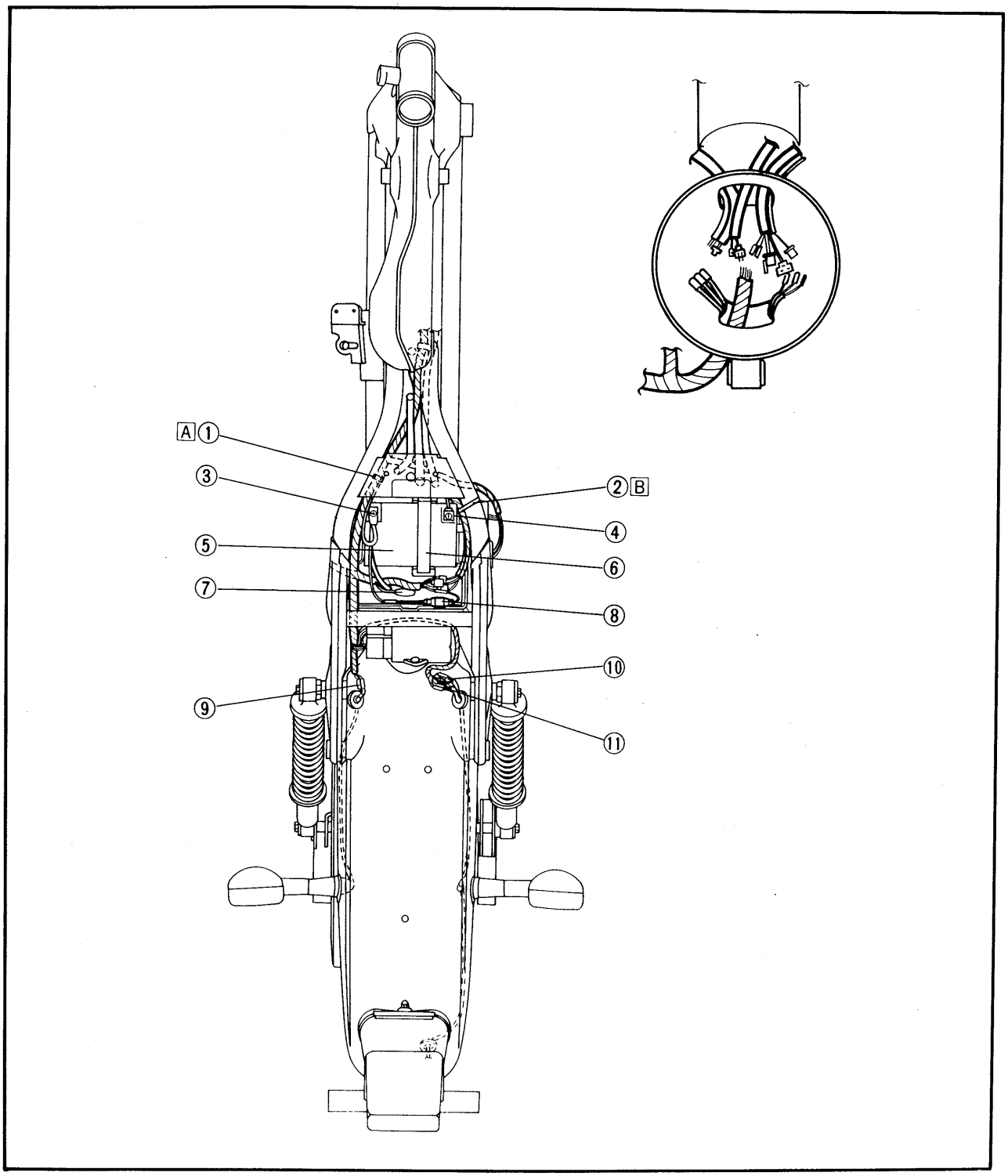


CABLE ROUTING

SPEC

① Clamp
② Band
③ Positive lead
④ Negative lead
⑤ Battery
⑥ Battery band
⑦ Fuse "SIGNAL"
⑧ Fuse "MAIN"
⑨ Flasher light (Left) leads
⑩ Flasher light (Right) leads
⑪ Tail/Brake light leads

[A] Clamp the wireharness and positive lead.
[B] Clamp the main switch and neutral switch lead.



PERIODIC INSPECTIONS AND ADJUSTMENTS

INTRODUCTION

This chapter includes all information necessary to perform recommended inspections and adjustments. These preventive maintenance procedures, if followed, will ensure more reliable vehicle operation and a longer service life. The need for costly overhaul work will be greatly reduced. This information applies to vehicles already in service as well as new vehicles that are being prepared for sale. All service technicians should be familiar with this entire chapter.

PERIODIC MAINTENANCE/LUBRICATION

Unit: km (miles)

Item	Remarks	Break-in 1,000 (600)	EVERY 6,000 (4,000) or 6 months	EVERY 12,000 (8,000) or 12 months
Valve(s)*	Check valve clearance. Adjust if necessary.	●		●
Spark plug(s)	Check condition. Clean or replace if necessary.	●	●	●
Air filter	Clean. Replace if necessary.		●	●
Carburetor*	Check idle speed/synchronization/starter operation. Adjust if necessary.	●	●	●
Fuel line*	Check fuel hose (and vacuum pipe) for cracks or damage. Replace if necessary.		●	●
Fuel filter*	Check condition. Replace if necessary.			●
Engine oil	Replace (Warm engine before draining). See NOTE.	●	●	●
Engine oil filter*	Replace.	●		●
Brake system*	Adjust free play. Replace pads if necessary (Front). Replace shoes if necessary (Rear).		●	●
Clutch	Check operation. Adjust if necessary.		●	●
Rear arm pivot*	Check rear arm assembly for looseness. Correct if necessary. Moderately repack every 24,000 (16,000) or 24 months.**			●
Wheel (Spoke wheels)*	Check balance/damage/runout/spoke tighteness. Repair if necessary.		●	●
Wheel bearings*	Check bearings assembly for looseness/damage. Replace if damaged.		●	●
Steering bearing*	Check bearings assembly for looseness. Correct if necessary. Moderately repack every 24,000 (16,000) or 24 months.**	●		●
Front forks*	Check operation/oil leakage. Repair if necessary.		●	●
Rear shock absorber*	Check operation/oil leakage. Repair if necessary.		●	●

PERIODIC MAINTENANCE/LUBRICATION INTERVALS

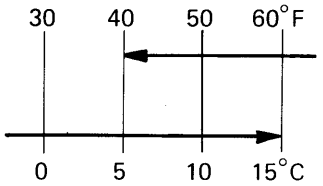
INSP ADJ

Item	Remarks	Break-in 1,000 (600)	EVERY 6,000 (4,000) or 6 months	EVERY 12,000 (8,000) or 12 months
Fittings/Fasteners*	Check all chassis fittings and fasterners. Correct if necessary.	●	●	●
Sidestand*	Check operation. Repair if necessary.	●	●	●
Sidestand switch*	Check operation. Clean or replace if necessary.	●	●	●
Battery*	Check specific gravity. Check breather pipe for proper operation. Correct if necessary.		●	●

*: It is recommended that these items be serviced by a Yamaha dealer.
**: Medium weight wheel bearing grease.

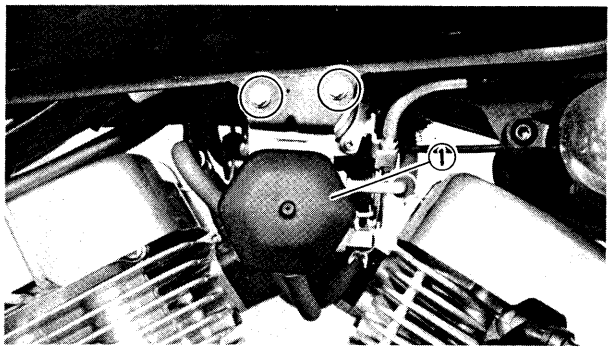
NOTE:

- Brake system:
  1) When disassembling the master cylinder or caliper cylinder, replace the brake fluid. Normally check the brake fluid level and add the fluid as required.
  2) We recommended that, on the inner parts of the master cylinder and caliper cylinder, replace the oil seals every two years.
  3) We recommended that, replace the brake hoses every four years, or it cracked or damaged.
- Engine oil:



Yamalube 4 or
SAE 20W40 Type SE Motor Oil

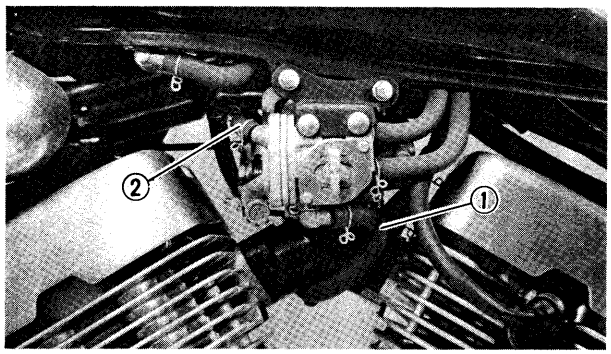
SAE 10W30 Type SE Motor Oil



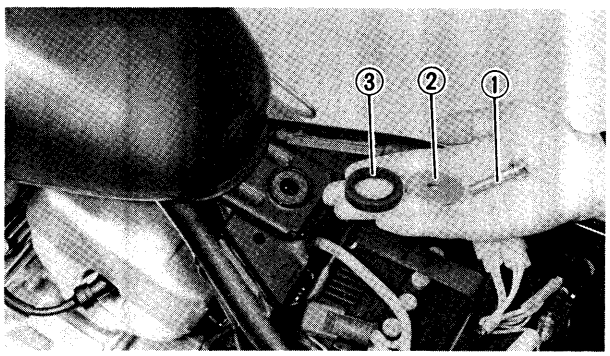
FUEL TANK REMOVAL AND INSTALLATION

Removal

1. Place the motorcycle on a level place.
2. Turn the fuel cock to "ON" position.
3. Remove:
   - Seat
   - Fuel pump ①



4. Disconnect:
   - Fuel hose ①
   - Vacuum hose ②



5. Remove:
   - Bolt ①
   - Plate ②
   - Damper ③
   - Fuel tank

Installation

1. Install:
   - Reverse removal procedure.
2. Turn the fuel cock to "ON" position.

ENGINE

VALVE CLEARANCE ADJUSTMENT

⚠ WARNING:

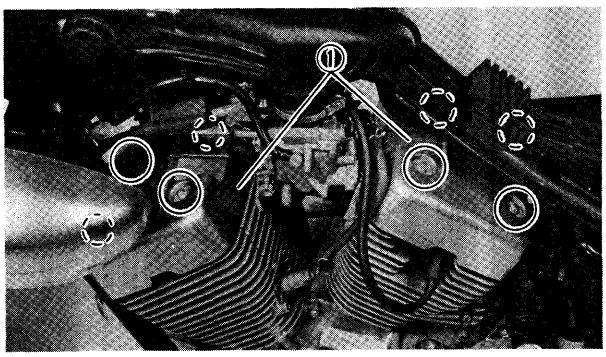
The engine must be cool before servicing the valve clearance.

NOTE:

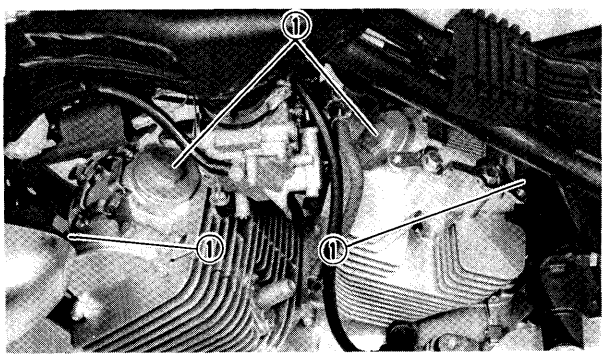
Measure and adjust valve clearance when piston is at TDC on compression stroke.

Removal

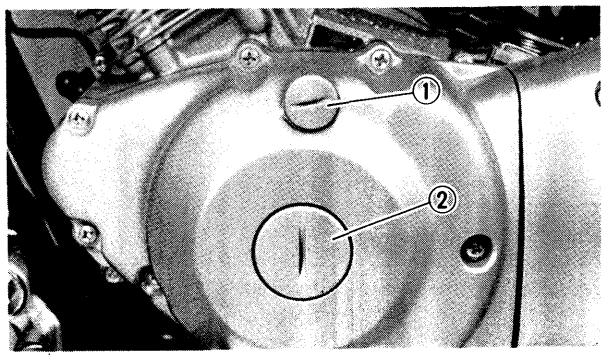
1. Remove:
   - Seat
   - Fuel tank
   - Air filter case



2. Remove:
   - Covers (Cylinder head) ①
   - Spark plug leads
   - Spark plugs



3. Remove:
   - Tappet covers ①



4. Remove:
   - Timing plug ①
   - Plate (Crankcase cover) ②

Measurement and Adjustment

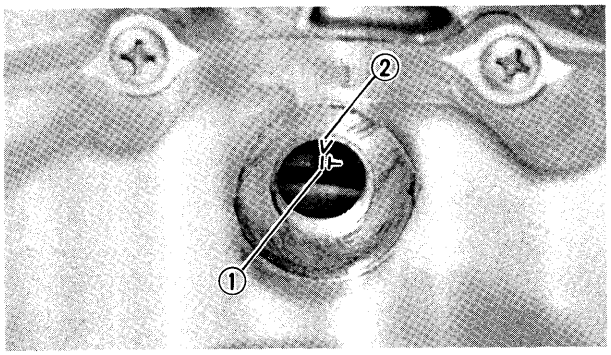
1. Measure:
   - Valve clearance

Valve clearance measurement steps:

- Turn the crankshaft clockwise with wrench.

NOTE:

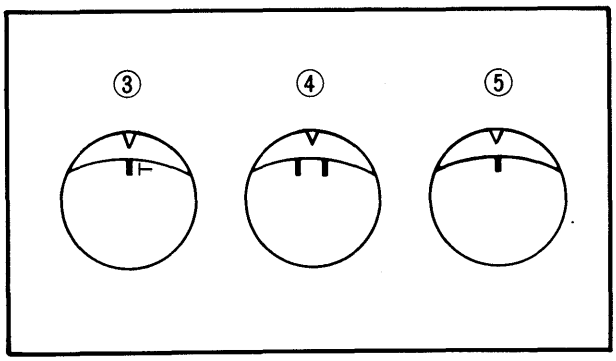
Valve clearance must be measured when the engine is cool to the touch.



- Align the "T" mark (For front cylinder) ① on the flywheel with the stationary pointer ② on the crankcase cover. When the "T" mark is aligned with the stationary pointer, the piston is at Top Dead Center (TDC).

NOTE:

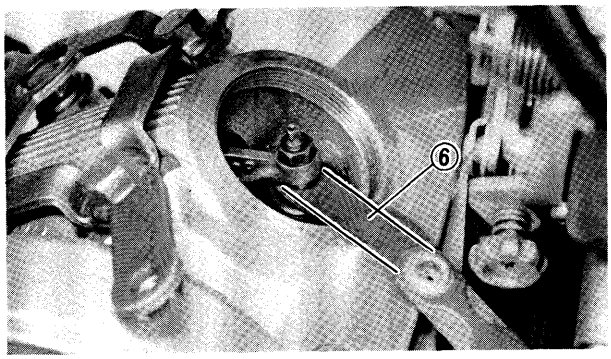
Be sure piston is at Top Dead Center (TDC) on compression stroke when measuring clearance.



- Note marks on flywheel to obtain correct valve clearance measurements.

③ TDC for front cylinder
④ Firing range for front cylinder
⑤ TDC for rear cylinder

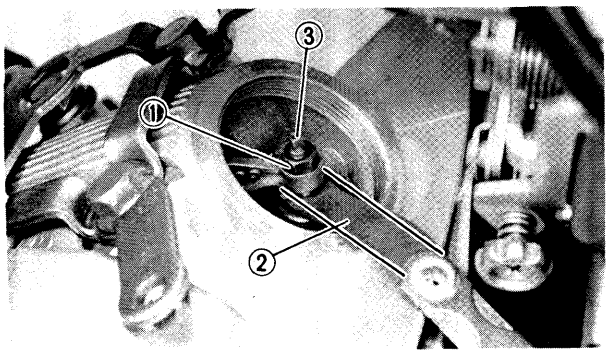
- Measure the valve clearance using a Feeler Gauge ⑥.
  Out of specification → Adjust clearance.



Intake Valve (Cold):
0.08 ~ 0.12 mm (0.003 ~ 0.005 in)
Exhaust Valve (Cold):
0.10 ~ 0.14 mm (0.004 ~ 0.006 in)

- Repeat the above steps for front cylinder.

2. Adjust:
   - Valve clearance



Valve clearance adjustment steps:

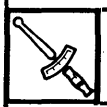
- Loosen the locknut ①.
- Insert a Feeler Gauge ② between the adjuster end and the valve end.
- Turn the adjuster ③ clockwise or counterclockwise with a wrench until proper clearance is attained.

CAM CHAIN ADJUSTMENT

INSP ADJ

Intake Valve (Cold):
0.08 ~ 0.12 mm (0.003 ~ 0.005 in)
Exhaust Valve (Cold):
0.10 ~ 0.14 mm (0.004 ~ 0.006 in)

- Hold the adjuster to prevent it from moving and thoroughly tighten the locknut.



Valve Clearance Adjusting Locknut:
7 Nm (0.7 m·kg, 5.8 ft·lb)

- Measure the valve clearance.
- If the clearance is incorrect, repeat above steps until the proper clearance is obtained.
- Repeat above steps for front cylinder.

Assembly

Reverse the removal procedure. Note the following points.

1. Inspect:
   - O-rings (Tappet covers)
   - O-ring (Timing plug)
   - O-ring (Crankcase cover plate)

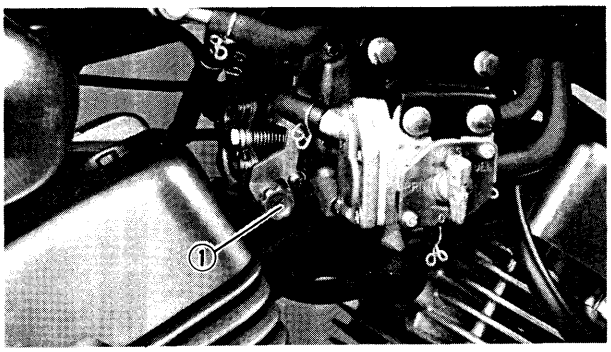
   Damage → Replace.

2. Install:
   - Tappet covers
   - Spark plugs
   - Covers (Cylinder head)
   - Fuel tank
   - Seat

Tappet Covers:
7 Nm (0.7 m·kg, 5.8 ft·lb))
Spark Plugs:
13 Nm (1.3 m·kg, 8.4 ft·lb)
Covers (Cylinder Head):
10 Nm (1.0 m·kg, 7.2 ft·lb)

CAM CHAIN ADJUSTMENT

This model has been equipped the automatic cam chain tensioner. No adjustment is necessary.

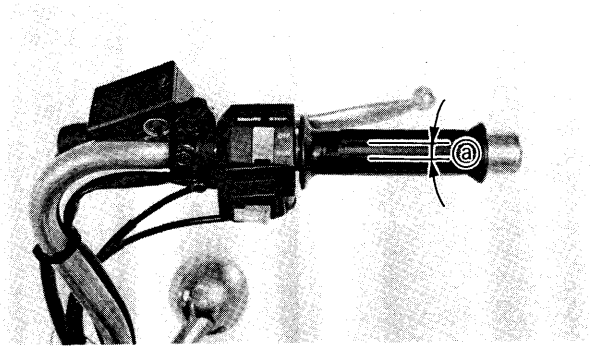


IDLE SPEED ADJUSTMENT

1. Adjust:
   - Idle speed

   Warm up the engine and turn the throttle stop screw ① to adjust.

Idle Speed:
1,150 ~ 1,250 r/min



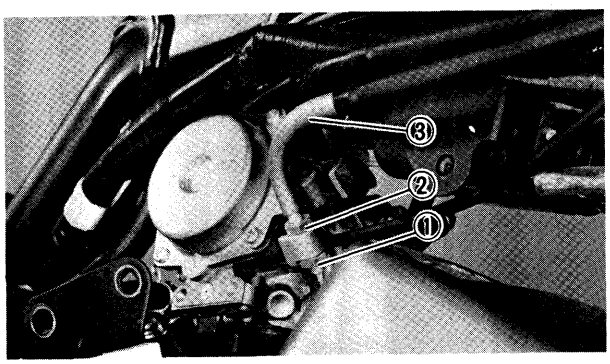
THROTTLE CABLE FREE PLAY ADJUSTMENT

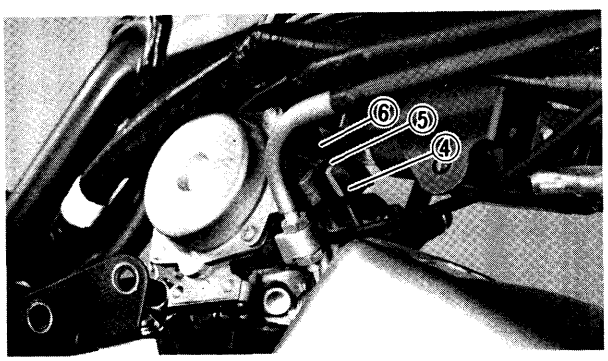
NOTE:
Before adjusting the throttle cable free play, the engine idling speed should be adjusted.

1. Check:
   - Throttle cable free play ⓐ

   Out of specification → Adjust.

Throttle Cable Free Play ⓐ :
3 ~ 5 mm (0.12 ~ 0.20 in)





2. Adjust:
   - Throttle cable free play

Throttle cable adjustment steps:

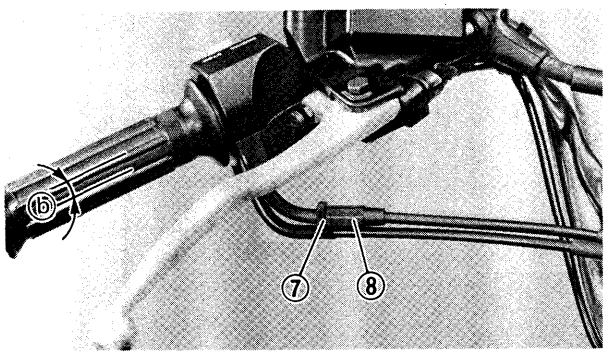
First step:
- Loosen the locknuts (Throttle cable 2) ① .
- Turn the adjuster (Throttle cable 2) ② clockwise or counterclockwise until the specified free play ⓐ .

Throttle Cable 2 Free Play ⓐ :
Zero mm (Zero in)

③ Throttle cable 2

- Tighten the locknuts ① .

Second step:
- Loosen the locknuts (Throttle cable 1) ④ .
- Turn the adjuster (Throttle cable 1) ⑤ clockwise or counterclockwise until proper free play (Throttle grip) is attained.



Throttle Cable Free Play (Throttle Grip):
3 ~ 5 mm (0.12 ~ 0.20 in)

⑥ Throttle cable 1

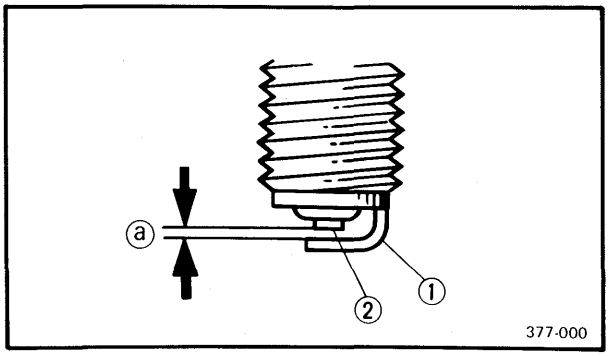
- Tighten the locknuts ④.

Final step:

- If the free play is incorrect, adjust the throttle cable free play with the adjuster (Throttle grip side).
- Loosen the locknut (Throttle cable 1 – Throttle grip side) ⑦.
- Turn the adjuster (Throttle cable 1 – Throttle grip side) ⑧ clockwise or counter-clockwise until proper free play (Throttle grip) ⓑ is attained.

Throttle Cable Free Play (Throttle Grip) ⓑ :
3 ~ 5 mm (0.12 ~ 0.20 in)

- Tighten the locknut ⑦.



SPARK PLUG INSPECTION

1. Inspect:
   - Electrode ①
     Wear/Damage → Replace.
   - Insulator color ②
     Normal condition is a medium to light tan color.
     Distinctly different color → Check the engine condition.

ⓐ Spark plug gap

2. Clean:
   - Spark plug
     Clean the spark plug with a spark plug cleaner or wire brush.

3. Inspect:
   • Spark plug type
   Incorrect → Replace.

Standard Spark Plug:
CR6HS (NGK) or U20FSR-U (N.D.)

4. Measure:
   • Spark plug gap
   Out of specification → Regap.
   Use a wire gauge.

Spark Plug Gap:
0.6 ~ 0.7 mm (0.024 ~ 0.028 in)

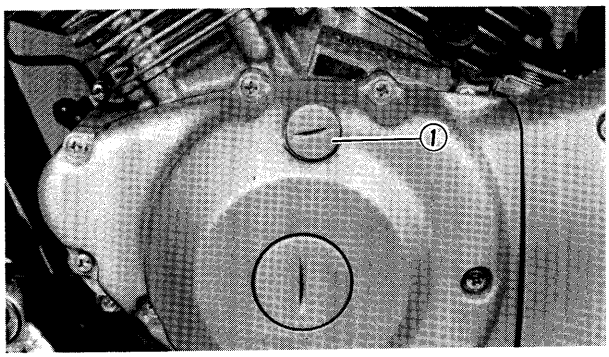
5. Tighten:
   • Spark plugs

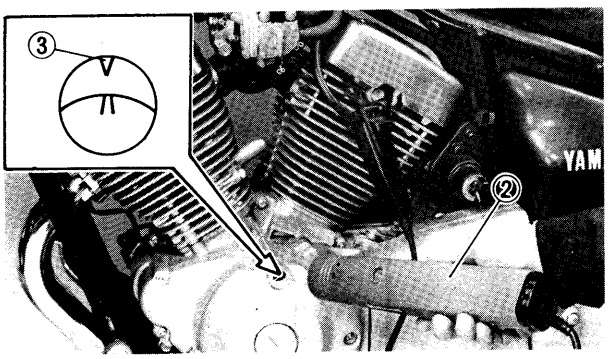
NOTE:
- Before installing a spark plug, clean the gasket surface and plug surface.
- If a torque wrench is not available when you are installing a spark plug, a good estimate of the correct torque is 1/4 to 1/2 turns part finger tight. Have the spark plug torqued to the correct value as soon as possible with a torque wrench.

Spark Plugs:
13 Nm (1.3 m·kg, 8.4 ft·lb)

IGNITION TIMING CHECK

1. Check:
   • Ignition timing





Ignition timing check steps:
- Remove the timing plug ①.
- Connect the Timing Light ② to rear (#1) cylinder spark plug lead.

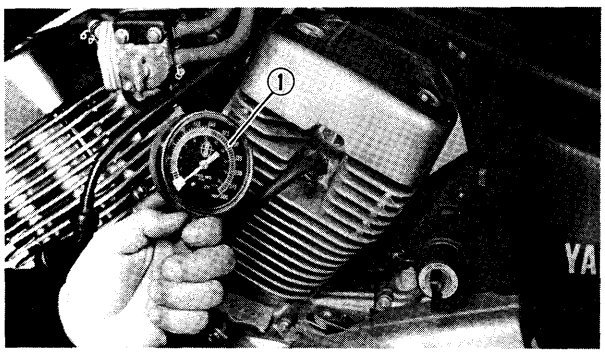
Timing Light:
YM-33277

- Warm up the engine and let it idle at the specified idle speed of 1,200 r/min.
- Visually check the stationary pointer ③ in the timing window to verify it is within the required firing range indicated on the flywheel.

Incorrect firing range → Check flywheel and/or pickup assembly (Tightness damage).
Refer to "CHAPTER 7. ELECTRICAL" for further information.

COMPRESSION PRESSURE MEASUREMENT

NOTE:
Insufficient compression pressure will result in performance loss.



1. Measure:
   - Valve clearance
     Out of specification → Adjust.
2. Warm up the engine.
3. Remove:
   - Spark plugs
4. Measure:
   - Compression pressure

Compression pressure measurement steps:
- Install the Compression Gauge ① using an adapter.

Compression Gauge:
YU-33223

- Crank over the engine with the electric starter (Be sure the battery is fully charged) with the throttle wide open until the compression reading on the gauge stabilizes.
- Check redings with specified levels (See chart)

Compression Pressure (At sea level):
Standard:
1,100 kPa (11 kg/cm², 156 psi)
Minimum:
1,000 kPa (10 kg/cm², 142 psi)
Maximum:
1,200 kPa (12 kg/cm², 171 psi)

⚠ WARNING:

When cranking the engine, ground all of the spark plug leads to prevent sparking.

- Repeat the previous steps for the other cylinders.
- If pressure falls bellow the minimum level:
  1) Squirt a few drops of oil into the affected cylinder.
  2) Measure the compression again.

Compression Pressure (with oil introduced into cylinder)

Reading	Diagnosis
Higher than without oil	Worn or damaged pistons
Same as without oil	Defective ring(s), valves, cylinder head gasket or piston is possible.
Above maximum level	Inspect cylinder head, valve surfaces, or piston crown for carbon deposits.

NOTE:
The difference between the highest and lowest cylinder compression readings must not vary more than the specified value.

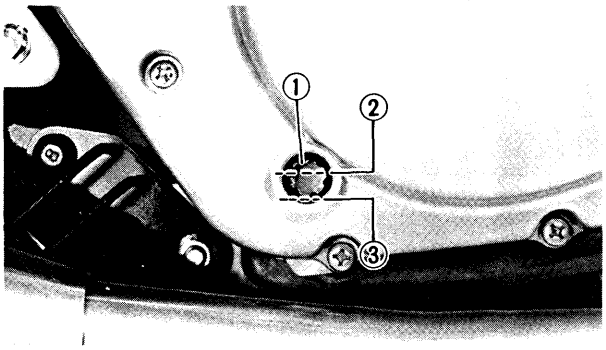
Difference Between Each Cylinder:
Less than 100 kPa
(1 kg/cm², 14 psi)

ENGINE OIL LEVEL INSPECTION

1. Inspect:
   - Oil level
     Oil level low → Add sufficient oil.

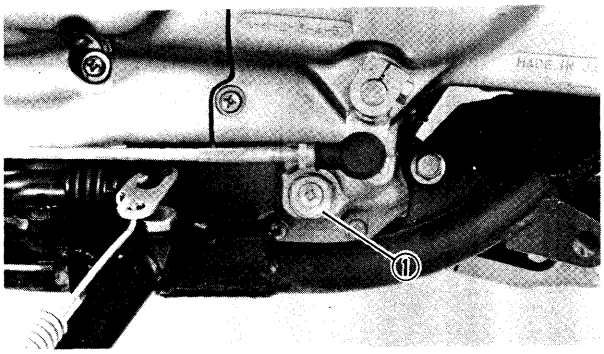
Engine oil level visual inspection steps:
- Place the motorcycle on a level place and support the motorcycle with a suitable stand.

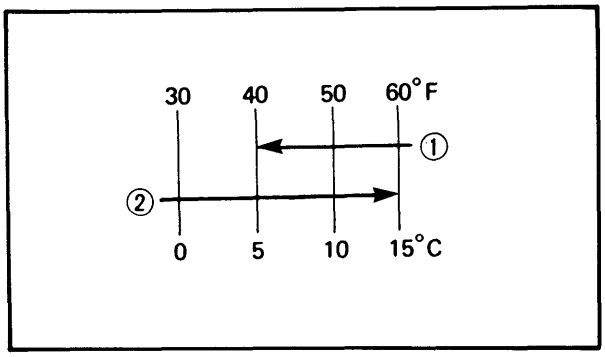
NOTE:
Position motorcycle straight up when checking oil level, a slight tilt to the side can produce false readings.



- Warm up the engine for several minutes.
- Stop the engine and visually check the oil level through the level window ① .

② Maximum
③ Minimum





ENGINE OIL REPLACEMENT

1. Warm up the engine for serveral minutes, then place an oil pan under the engine.
2. Remove:
   - Oil filler cap
   - Drain plug ①

   Drain the engine oil.
3. Tighten:
   - Drain plug ①

Drain Plug:
43 Nm (4.3 m·kg, 31 ft·lb)

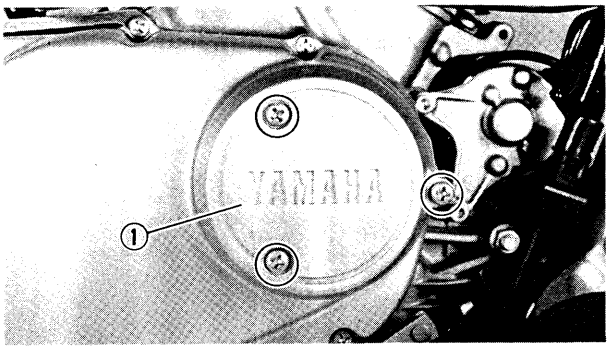
4. Fill:
   - Crankcase

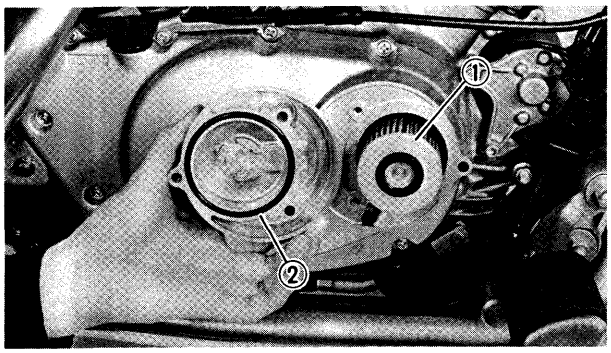
Recommended Oil:
At 5°C (40°F) or Highter ① :
Yamalube 4 or
SAE 20W40 Type SE Motor Oil
At 15°C (60°F) or Lower ② :
SAE 10W30 Type SE Motor Oil
Periodic Oil Change:
1.4 L (1.2 Imp qt, 1.5 US qt)

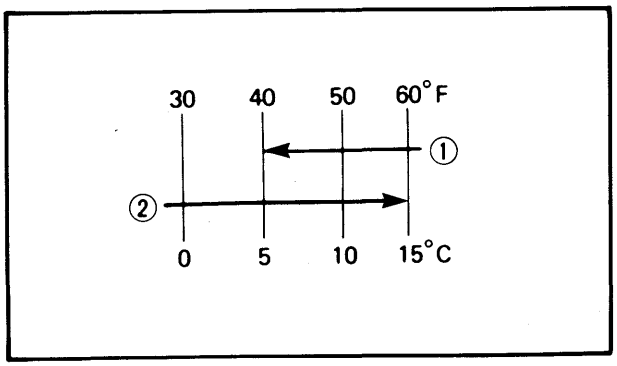
⚠ CAUTION:

Do not allow foreign material to enter the crankcase.

5. Install:
   - Filler cap
6. Inspect:
   - Oil leaks
   - Oil level







ENGINE OIL FILTER REPLACEMENT

1. Warm up the engine and place a drain pan under the engine.
2. Remove:
   - Oil filler cap
   - Drain plug

   Drain the engine oil.
3. Remove:
   - Cover (Oil filter) ①
4. Install:
   - Drain plug

Drain Plug:
32 Nm (3.2 m·kg, 23 ft·lb)

   - Oil filter (New) ①
   - O-ring (New) ②
   - Oil filter cover

NOTE:
Be sure the O-ring is positioned properly.

5. Tighten:
   - Screw (Oil filter)

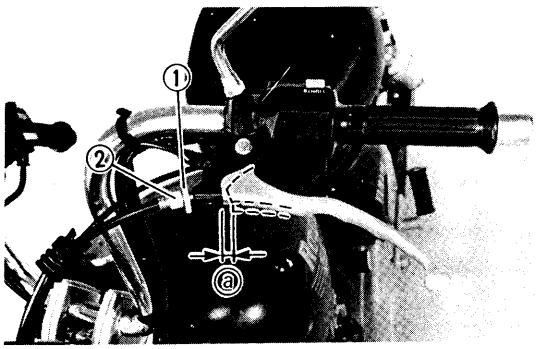
Screw (Oil Filter):
7 Nm (0.7 m·kg, 5.1 ft·lb)

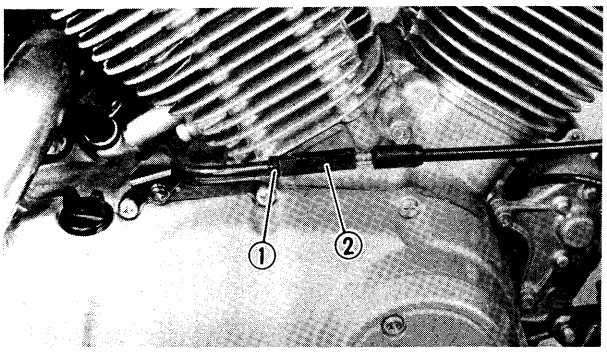
6. Fill:
   - Crankcase

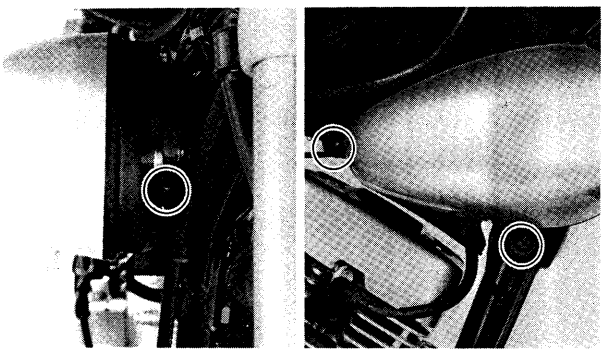
Recommended Oil:
At 5°C (40°F) or Higher ①:
Yamalube 4 or
SAE 20W40 Type SE Motor Oil
At 15°C (60°F) or Lower ②:
SAE 10W30 Type SE Motor Oil
With Oil Filter Replacement:
1.6 L (1.4 Imp qt, 1.7 US qt)

⚠ CAUTION:
Do not allow foreign material to enter the crankcase.

7. Install:
   - Oil filter cap
8. Inspect:
   - Oil leaks
   - Oil level







CLUTCH ADJUSTMENT

Free Play Adjustment

1. Loosen:
   - Locknuts ①
2. Adjust:
   - Free play ⓐ

   Turn the adjusters ② until the free play is within the specified limits.

Free Play ⓐ :
3 ~ 5 mm (0.12 ~ 0.20 in)

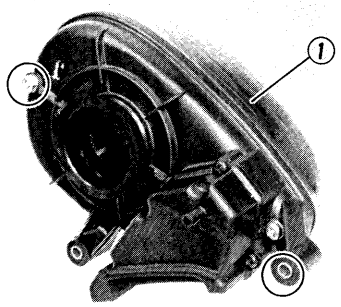
3. Tighten:
   - Locknuts

NOTE:

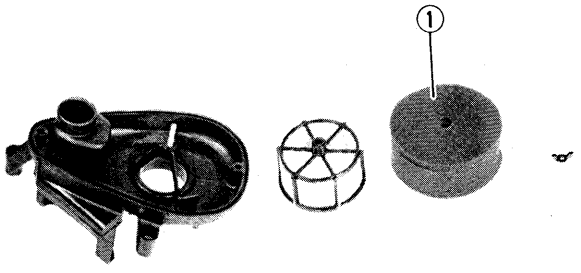
The above procedure provides for maximum cable free play to allow for proper clutch actuating mechanism adjustment. Refer to "CHAPTER 4. ENGINE OVERHAUL – ENGINE ASSEMBLY AND ADJUSTMENT" section.

AIR FILTER CLEANING

1. Remove:
   - Air filter case



2. Remove:
   - Cover (Air filter case) ①

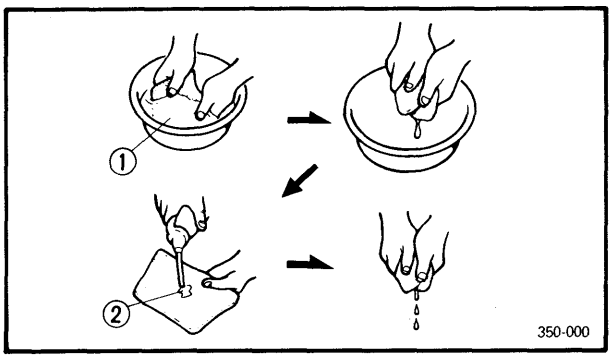


3. Remove:
   - Element (Air filter) ①

⚠ CAUTION:

The engine should never be run without the air filter element installed; excessive piston and/or cylinder wear may result.

4. Inspect:
   - Element (Air filter)
     Damage → Replacement.



5. Clean:
   - Air filter element

Cleaning steps:
- Wash the element gently, but thoroughly in solvent ①.

⚠ WARNING:

Never use low flash point solvents such as gasoline to clean the element. Such solvent may lead to a fire or explosion.

- Squeeze the excess solvant out of the element and let dry.

⚠ CAUTION:

Do not twist the element when squeezing the element.

- Apply the SAE 10W30 motor oil ②.
- Squeeze out the excess oil.

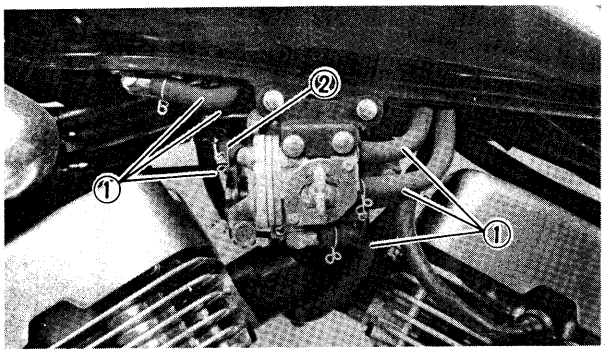
NOTE:
The element should be wet but not dripping.

6. Install:
   - Element (Air filter)
   - Air filter case

Bolts (Air Filter Case):
4 Nm (0.4 m·kg, 2.9 ft·lb)

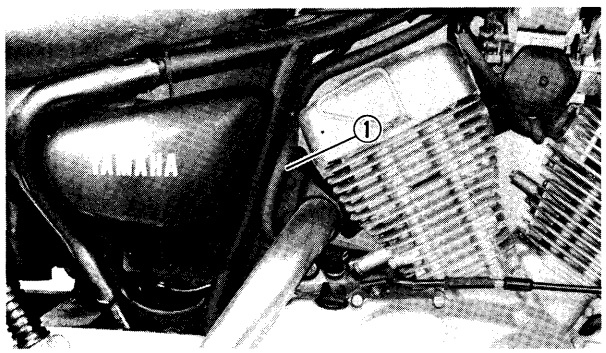
CARBURETOR JOINT INSPECTION

1. Inspect:
   - Carburetor joint
     Cracks/Damage → Replace.



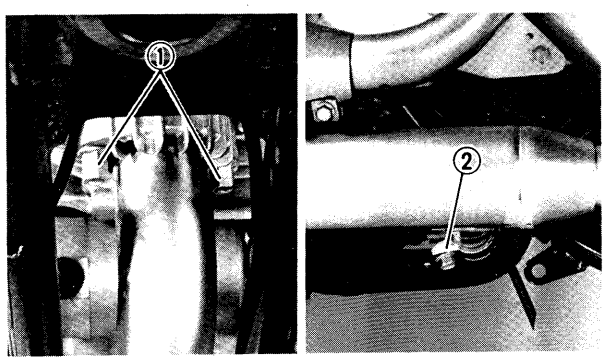
FUEL LINE INSPECTION

1. Inspect:
   - Fuel hoses ①
   - Vacuume hose ②
     Cracks/Damage → Replace.
     Clogs → Clean.



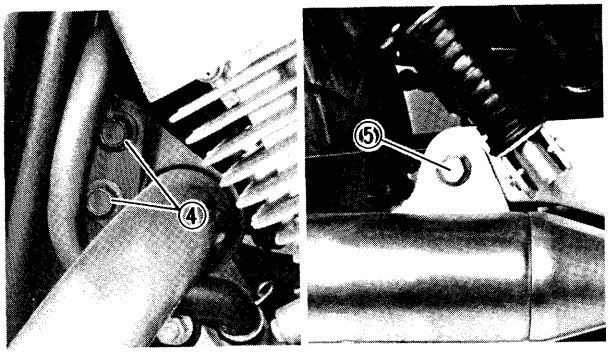
CRANKCASE VENTILATION HOSE INSPECTION

1. Inspect:
   - Crankcase ventilation hose ①
     Cracks/Damage → Replace.



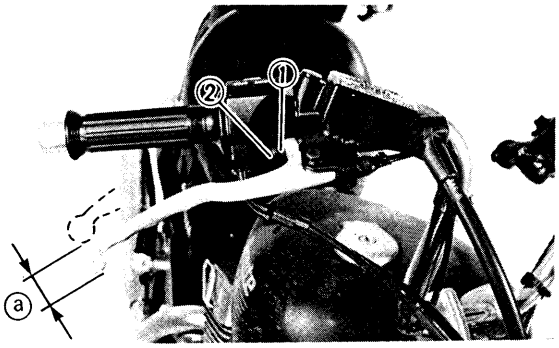
EXHAUST SYSTEM INSPECTION

1. Remove:
   - Side cover (Right)
2. Inspect:
   - Exhaust pipes
   - Muffler
   - Gaskets
     Cracks/Damage → Replace.
   - Nuts
   - Bolts
     Loose → Tighten.



3. Tighten:

Nuts (Exhaust Pipe) ① :
10 Nm (1.0 m·kg, 7.2 ft·lb)
Bolt (Exhaust Pipe Joint – Upper) ②:
10 Nm (1.0 m·kg, 7.2 ft·lb)
Bolt (Exhaust Pipe Joint – Lower) ③:
20 Nm (2.0 m·kg, 14 ft·lb)
Bolts (Exhaust Pipe 3) ④ :
20 Nm (2.0 m·kg, 14 ft·lb)
Bolt (Muffler) ⑤ :
25 Nm (2.5 m·kg, 18 ft·lb)



CHASSIS

FRONT BRAKE ADJUSTMENT

1. Loosen:
   - Lockunt ①
2. Adjust:
   - Free play ⓐ

   Turn the adjuster ② until the free play ⓐ is within the specified limits.

Free play ⓐ :
2 ~ 5 mm (0.08 ~ 0.20 in)

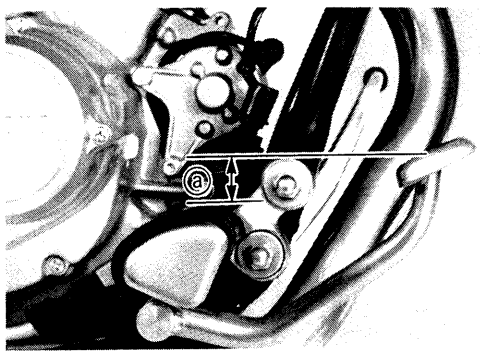
⚠ CAUTION:

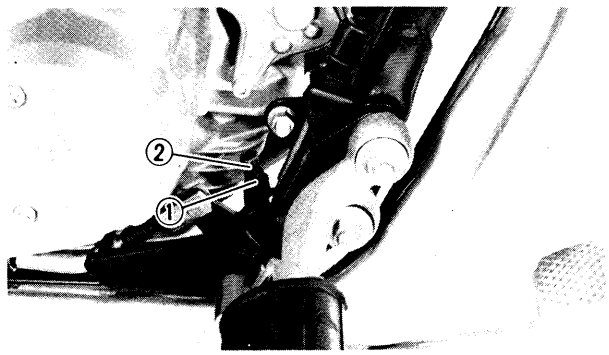
Proper lever free play is essential to avoid excessive brake drag.

⚠ WARNING:

A soft or spongy feeling in the brake lever can indicate the pressence of air in the brake system. This air must be removed by bleeding the brake system before the motorcycle is operated. Air in the system will cause greatly diminished braking capability and can result in loss of control and an accident. Inspect and bleed the system if necessary.

3. Tighten:
   - Locknut





REAR BRAKE ADJUSTMENT

Brake Pedal Height Adjustment

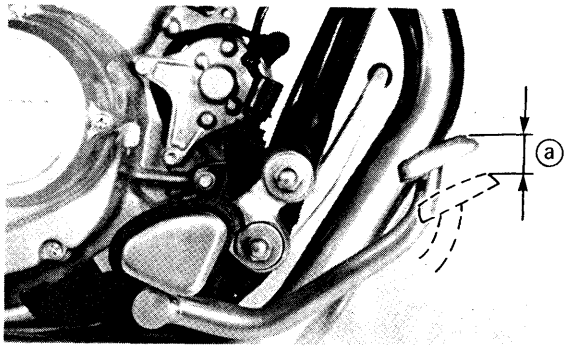
1. Loosen:
   - Locknut ①
2. Adjust:
   - Brake pedal height ⓐ

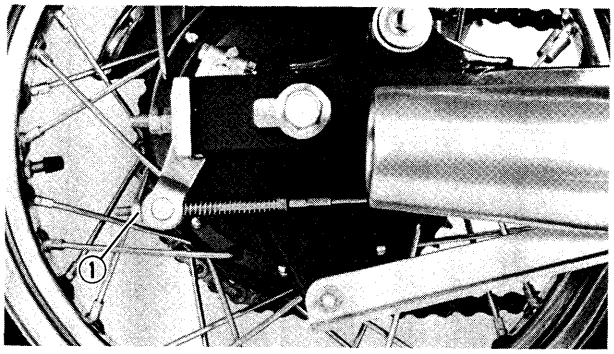
   Turn the adjuster ② until the brake pedal position is at the specified height.

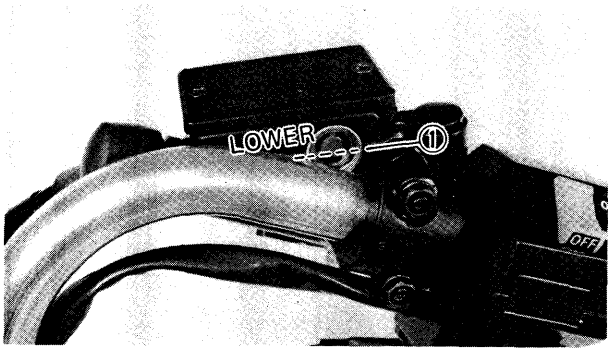
Brake Pedal Height ⓐ :
45 ~ 55 mm (1.77 ~ 2.17 in)
Above the Top of the Footrest

⚠ WARNING:

Check the operation of the brake light after adjusting the brake pedal height.







Brake Pedal Free Play Adjustment

1. Adjust:
   - Brake pedal free play ⓐ
     Turn the adjuster ① until the free play is within the specified limits.

Free Play ⓐ :
20 ~ 30 mm (0.8 ~ 1.2 in)

⚠ WARNING:

After adjusting the pedal height, adjust the brake pedal free play.

BRAKE FLUID LEVEL INSPECTION

1. Inspect:
   - Brake fluid level
     Level low → Replenish fluid.

Brake Fluid:
DOT #3 or #4
If DOT #4 is not available, #3 can be used.

① Lower level

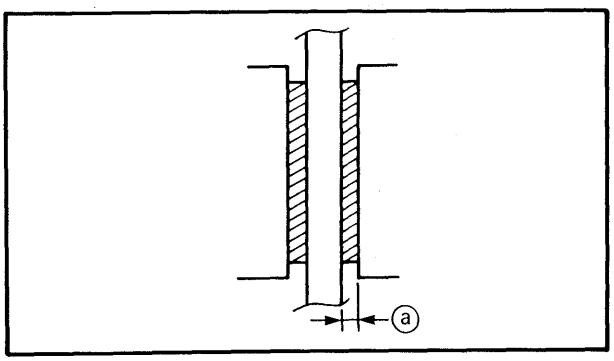
NOTE:

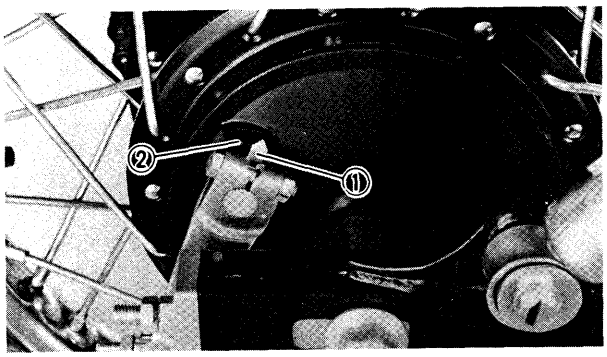
Be sure that:

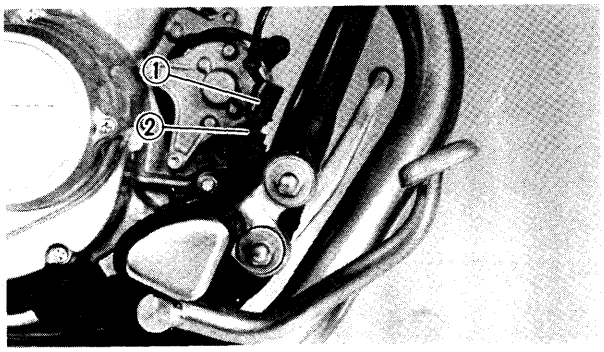
1) The master cylinder top is horizontal by turning the handlebars.
2) Spilled fluid is cleaned up immediately to prevent painted surfaces or plastic parts from eroding.

⚠ WARNING:

- **Use only the designated quality brake fluid, otherwise poor brake performance will result.**
- **Water does not enter the master cylinder when refilling, otherwise poor brake performance.**







FRONT BRAKE PAD INSPECTION

1. Remove:
   - Brake caliper
2. Inspect:
   - Wear limit ⓐ
     Out of specification → Replace pads.

Wear Limit:
0.8 mm (0.03 in)

Refer to "CHAPTER 5. CHASSIS" section.

REAR BRAKE SHOE INSPECTION

1. Activate the brake pedal.
2. Inspect:
   - Wear indicator ①
     Indicator reaches wear limit line ② → Replace shoes.
     Refer to "CHAPTER 5. CHASSIS" section.

BRAKE LIGHT SWITCH ADJUSTMENT

1. Adjust:
   - Brake light operating timing
     Hold the main body ① of the switch with your hand so it does not rotate, and turn the adjuster ② until the operating timing is correct.

BRAKE HOSE INSPECTION

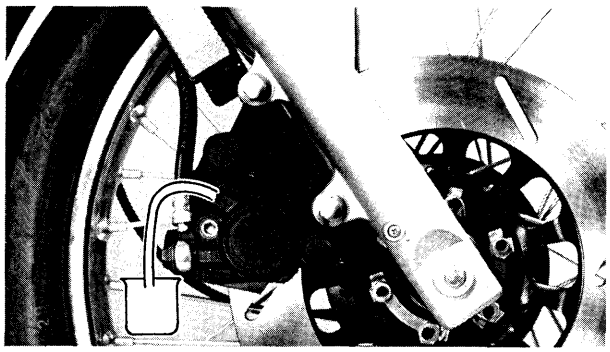
1. Inspect:
   - Brake hose
     Cracks/Wear/Damage → Replace.

AIR BLEEDING

⚠ WARNING:

Bleed the brake system if:
- **The system has been disassembled.**
- **A brake hose has been loosened or removed.**
- **The brake fluid is very low.**
- **The brake operation is faulty.**

A dangerous loss of braking performance may occur if the brake system is not properly bled.



1. Bleed:
   - Brake fluid

Air bleeding steps:

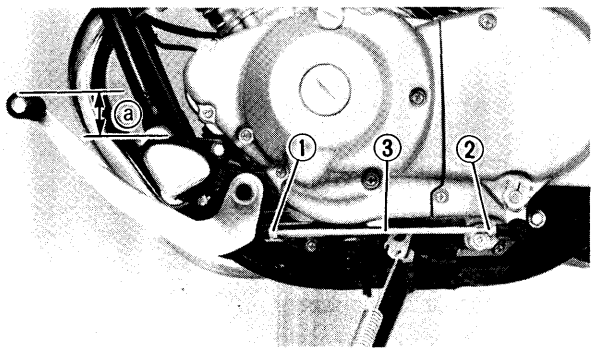
a. Add proper brake fluid to the reservoir.
b. Install the diaphragm. Be careful not to spill any fluid or allow the reservoir to overflow.
c. Connect the clear plastic tube ① tightly to the caliper bleed screw.
d. Place the other end of the tube into a container.
e. Slowly apply the brake lever several times.
f. Pull the lever in. Hold the lever in position.
g. Loosen the bleed screw and allow the lever to travel towards its limit.
h. Tighten the bleed screw when the lever limit has been reached; then release the lever.

Bleed Screw:
6 Nm (0.6 m·kg, 4.3 ft·lb)

i. Repeat steps (e) to (h) until of the air bubbles have been removed from the system.

NOTE:
If bleeding is difficult, it may be necessary to let the brake fluid system stabilize for a few hours. Repeat the bleeding procedure when the tiny bubbles in the system have disappered.

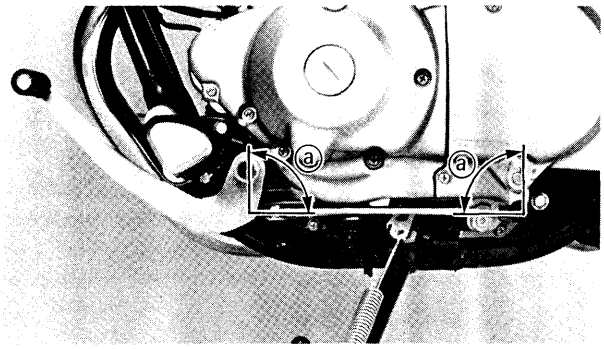
j. Add brake fluid to the level line on the reservoir.



SHIFT PEDAL ADJUSTMENT

1. Loosen:
   - Locknut (Front) ①
   - Locknut (Rear) ②

NOTE:
The locknut (Front) has left-hand threads.



2. Adjust:
   - Shift pedal height ⓐ
     Turn the adjuster rod ③ until the shift pedal position is at the specified height.

Shift Pedal Height:
30 ~ 36 mm (1.2 ~ 1.4 in)
Above the Top of the Footrest

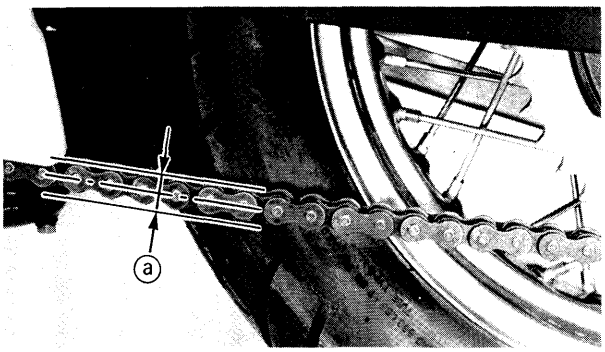
⚠ WARNING:

After adjusting the shift pedal height, visually check the angle of shift pedal arms. The angle of arms must be at right angles ⓐ with the adjuster rod.

DRIVE CHAIN SLACK CHECK

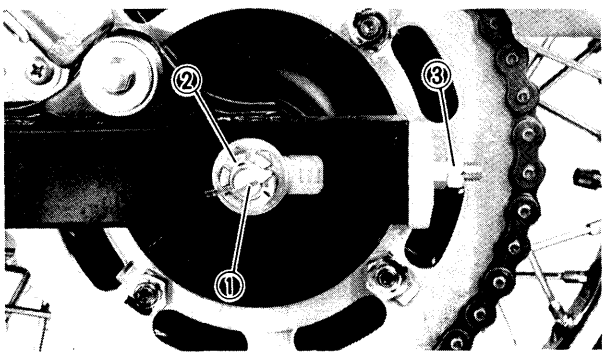
NOTE:

Before checking and/or adjusting the chain slack rotate the rear wheel through several revolutions. Check the chain slack several times to find the point where the chain is the tightest. Check and/or adjust the chain slack where the rear wheel is in this "tight chain" position.



1. Place the motorcycle vertically on a level place.
2. Measure:
   - Drive chain slack ⓐ
     Out of specification → Adjust.

Drive Chain Slack:
15 ~ 20 mm (0.6 ~ 0.8 in)



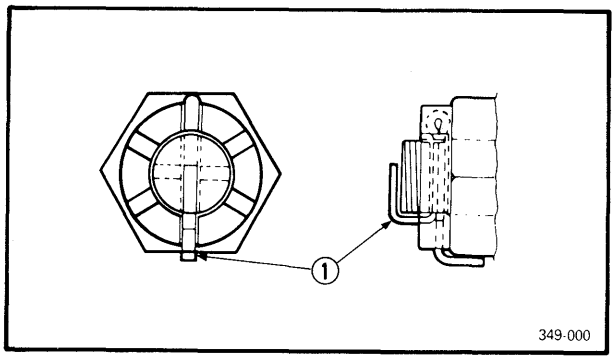
DRIVE CHAIN SLACK ADJUSTMENT

1. Remove:
   - Cotter pin ①
2. Loosen:
   - Nut (Rear axle) ②
   - Locknut ③
3. Adjust:

Turn in	Chain slack is decreased.
Turn out	Chain slack is increased.

NOTE:
There are marks on each side of rear arm and on each chain puller; use them to check for proper alignment.

⚠ CAUTION:
Too small chain slack will overload the engine and other vital parts; keep the slack within the specified limits.



4. Tighten:
   - Locknut
   - Nut (Rear axle)

Nut (Rear Axle): 105 Nm (10.5 m·kg, 75 ft·lb)

5. Install:
   - Cotter pin ① (New)

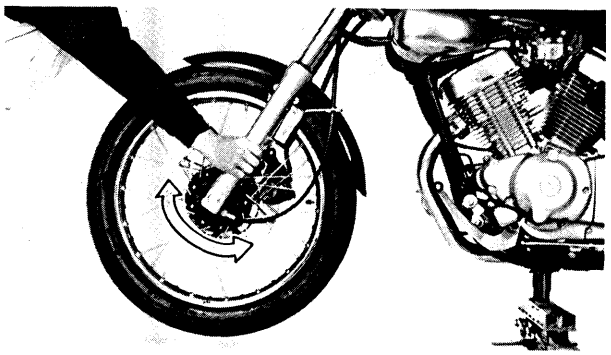
⚠ WARNING:
Always use a new cotter pin on the axle nut.

NOTE:
Do not loosen the axle nut after torque tightening. If the axle nut groove is not aligned with the wheel shaft cotter pin hole, align groove to hole by tightening up on the axle nut.

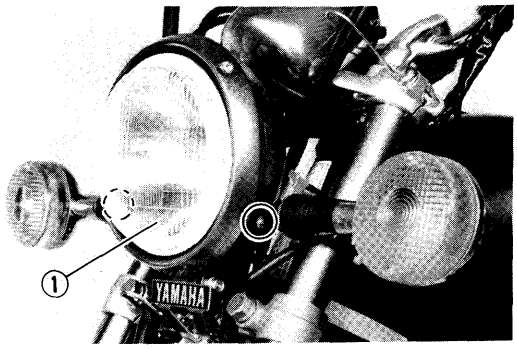
STEERING HEAD ADJUSTMENT

Inspection

⚠ WARNING:
Securely support the motorcycle so there is no danger of it falling over.

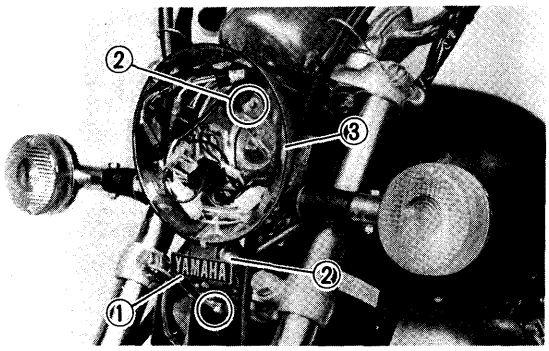


1. Place the motorcycle on a level place.
2. Elevate the front wheel by placing a suitable stand under the engine.
3. Check:
   - Steering assembly bearings
     Grasp the bottom of the forks and gently rock the fork assembly back and forth.
     Looseness → Adjust steering head.

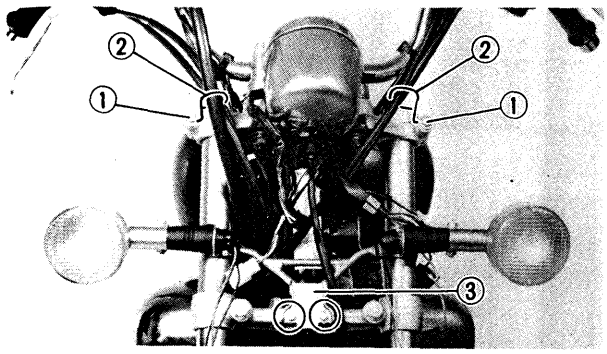


Adjustment

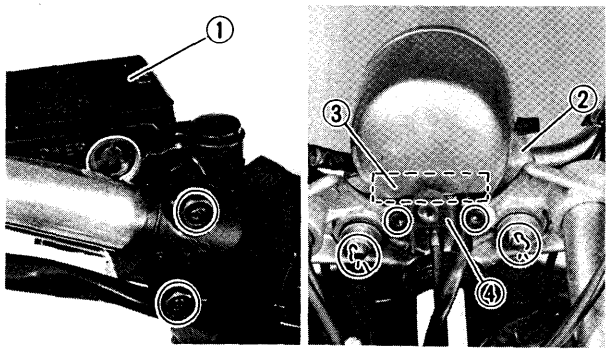
1. Remove:
   - Headlight lens unit ①
2. Disconnect:
   - All leads (In the headlight body)



3. Remove:
   - Emblem ①
   - Bolts (Headlight body) ②
   - Headlight body ③

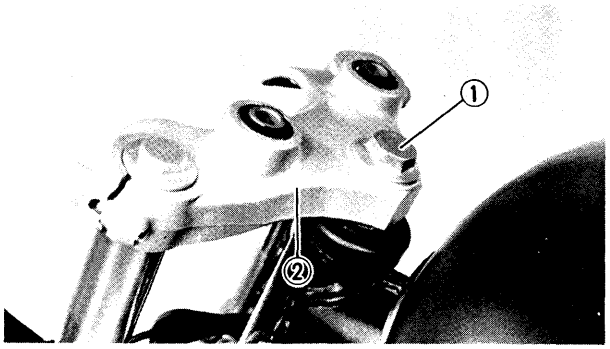


4. Remove:
   - Bolts (Handlebar crown) ①
   - Cable holders ②
   - Bracket (Flasher relay) ③

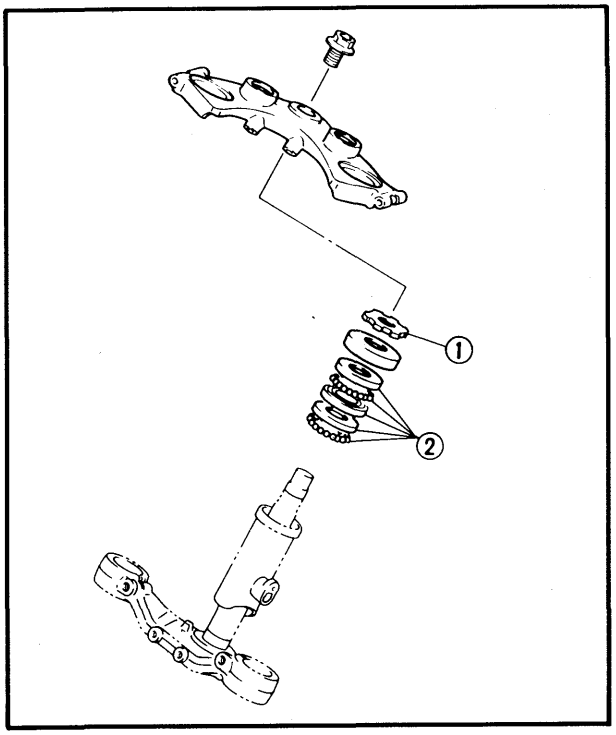


5. Remove:
   - Master cylinder assembly ①
   - Handlebar holder assembly ②
   - Indicator light box ③
   - Speedometer with bracket ④
   - Handlebar

NOTE:
Take care not to lose the clevis pins.



6. Remove:
   - Bolt (Steering stem) ①
   - Handlebar crown ②



7. Adjust:
   - Steering head tightening condition

Steering head adjustment steps:
- Loosen the ring nut ① completely.
- Tighten the ring nut using the Ring Nut Wrench.

Ring Nut Wrench:
YU-33975

NOTE:
Set the Torque Wrench to the Ring Nut Wrench so that they form a right angle.

Ring Nut (Initial Tightening):
38 Nm (3.8 m·kg, 27 ft·lb)

- Loosen the ring nut completely and retighten it to specification.

⚠ WARNING:
Do not over-tightening.

Ring Nut (Final Tightening):
10 Nm (1.0 m·kg, 7.2 ft·lb)

- Check the steering stem by turning it lock to lock. If there is any binding, remove the steering stem assembly and inspect the steering bearings ②.
  Refer to "CHAPTER 6. STEERING HEAD" for more details.

8. Install:
   Reverse the removal procedure.
   Note the following points.

NOTE:
- Do not forget to fit:
  1) The clevis pins to the handlebar holders.
  2) The cable holders to the front fork top.
- After installing the headlight lens unit, adjust the headlight beam.

TIRE INSPECTION

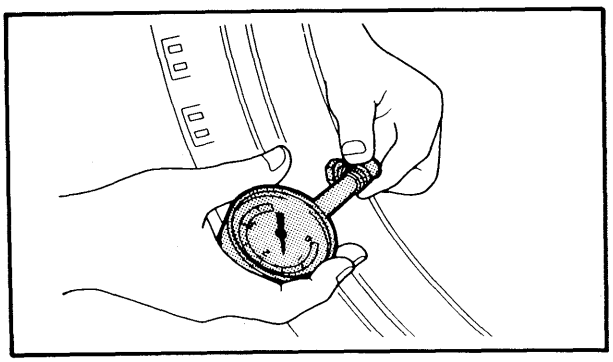
INSP ADJ

Bolt (Steering Stem):
54 Nm (5.4 m·kg, 39 ft·lb)
Bracket (Speedometer):
7 Nm (0.7 m·kg, 5.1 ft·lb)
Handlebar Holder (Lower):
20 Nm (2.0 m·kg, 14 ft·lb)
Master Cylinder Bracket:
9 Nm (0.9 m·kg, 6.5 ft·lb)
Headlight/Flasher Light Bracket:
7 Nm (0.7 m·kg, 5.1 ft·lb)
Bolts (Handlebar Crown):
20 Nm (2.0 m·kg, 14 ft·lb)
Headlight Body Bracket:
7 Nm (0.7 m·kg, 5.1 ft·lb)

TIRE INSPECTION

1. Measure:
   - Tire pressure

   Out of specification → Adjust.

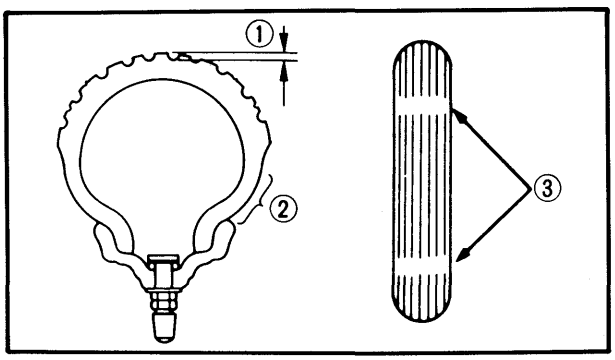


Basic weight: With oil and full fuel tank	147 kg (324 lb)	
Maximum load*	198 kg (437 lb)	
Cold tire pressure	Front	Rear
Up to 90 kg (198 lb) load*	175 kPa (1.75 kg/cm², 25 psi)	200 kPa (2.0 kg/cm², 28 psi)
90 kg (198 lb) ~ Maximum load*	200 kPa (2.0 kg/cm², 28 psi)	225 kPa (2.25 kg/cm², 32 psi)
High speed riding	200 kPa (2.0 kg/cm², 28 psi)	225 kPa (2.25 kg/cm², 32 psi)

* Load is the total weight of cargo, rider, passenger, and accessories.

⚠ WARNING:

- Tire inflation pressure should be checked and adjusted when the temperature of the tire equals the ambient air temperature.
  Tire inflation pressure must be adjusted according to total weight of cargo, rider, passenger, and accessories (fairing, saddlebags, etc. if approved for this model), and vehicle speed.
- Proper loading of your motorcycle is important for the handling, braking, and other performance and safety characteristics of your motorcyle. Do not carry loosely packed items that can shift. Securely pack your heaviest items close to the center of the motorcycle, and destribute the weight evenly from side to side. Properly adjust the suspension for your load, and check the condition and pressure of your tires. NEVER OVERLOAD YOUR MOTORCYCLE. Make sure the total weight of the cargo, rider, passenger, and accessories (fairing, saddlebags, etc. if approved for this model) does not exceed the maximum load of the motorcycle. Operation of an overloaded motorcycle could cause tire damage, an accident, or even injury.



2. Inspect:
   - Tire surfaces
     Wear/Damage → Replace.

Minimum Tire Tread Depth:
(Front and Rear)
0.8 mm (0.03 in)

① Tread depth
② Side wall
③ Wear indicator

⚠ WARNING:

- It is dangerous to ride with a wornout tire. When a tire tread begins to show lines, replace the tire immediately.
- Patching a punctured tube is not recommended. If it is absolutely necessary to do so, use great care and replace the tube as soon as possible with a good quality replacement.

WHEEL INSPECTION/ SPOKE INSPECTION AND TIGHTENING/ CABLE INSPECTION AND LUBRICATION

INSP ADJ

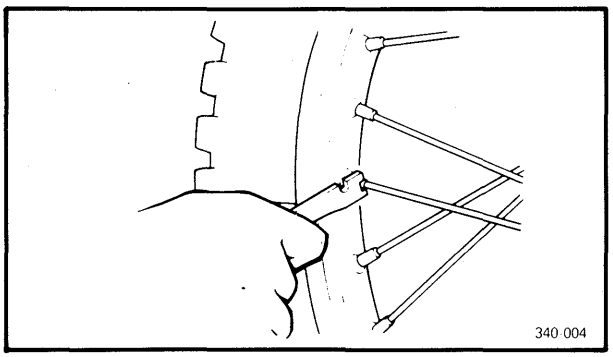
WHEEL INSPECTION

1. Inspect:
   - Wheels
     Damage/Bends → Replace.

NOTE:
Always balance the wheel when a tire or wheel has been changed or replaced.

⚠ WARNING:

- **Never attempt even small repairs to the wheel.**
- **Ride conservatively after installing a tire to allow it to seat itself properly on the rim.**



SPOKE INSPECTION AND TIGHTENING

1. Inspect:
   - Spokes
     Bend/Damage → Replace.
     Loose spoke → Retighten.
2. Tighten:
   - Spokes

Nipple:
6 Nm (0.6 m·kg, 4.3 ft·lb)

CABLE INSPECTION AND LUBRICATION

Cable inspection and lubrication steps:

- Remove the screws that secure throttle housing to handlebar.
- Hold cable end high and apply several drops of lubricant to cable.
- Coat metal surface of disassembled throttle twist grip with suitable all-purpose grease to minimize friction.
- Check for damage to cable insulation. Replace any corroded or obstructed cables.
- Lubricate any cables that do not operate smoothly.

Yamaha Chain and Cable Lube or SAE 10W30 Motor Oil

BRAKE AND SHIFT PEDALS/BRAKE AND CLUTCH LEVERS LUBRICATION

Lubricate pivoting parts of each lever and pedal.

Yamaha Chain and Cable Lube or SAE 10W30 Motor Oil

SIDESTAND LUBRICATION

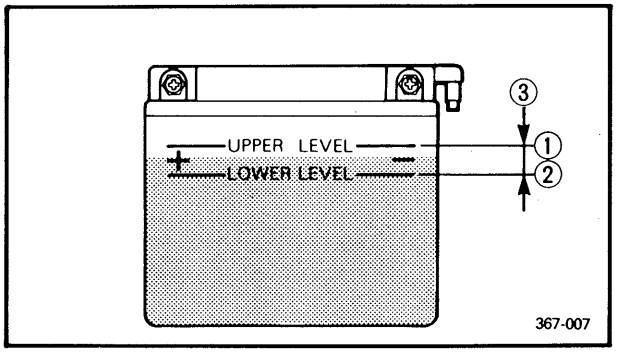
Lubricate the centerstand and sidestand at their pivot points.

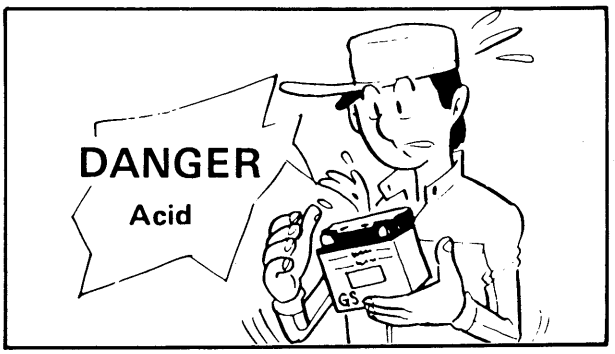
Ymaha Chain and Cable Lube or SAE 10W30 Motor Oil

SWINGARM LUBRICATION

Lubricate the swingarm bearing.

Medium Weight Wheel Bearing Grease





ELECTRICAL

BATTERY INSPECITON

1. Inspect:
   - Battery fluid level ③
     Battery fluid level low → Fill.
     Fluid level should be between upper and lower level marks.

① Upper level
② Lower level

⚠ CAUTION:

Refill with distilled water only; tap water contains minerals harmful to a battery.

⚠ WARNING:

Battery electrolyte is dangerous; it contains sulfuric acid and therefore is poisonous and highly caustic.

Always follow these preventive measures:

- **Avoid bodily contact with electrolyte as it can cause severe burns or permanent eye injury.**
- **Wear protective eye gear when handling or working near batteries.**

Antidote (EXTERNAL):

- **SKIN – Flush with water.**
- **EYES – Flush with water for 15 minutes and get immediate medical attention.**

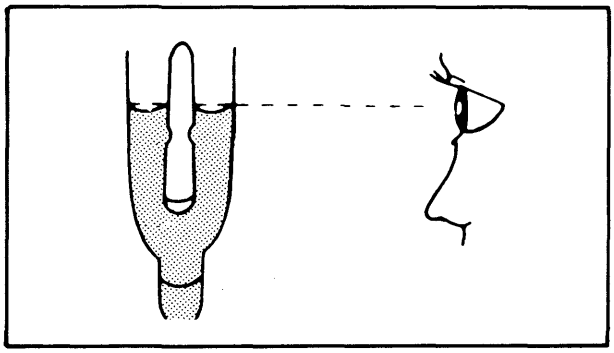
Antidote (INTERNAL):

- **Drink large quantities of water or milk follow with milk of magnesia beaten egg, or vegetable oil. Get immediate medical attention.**

Batteries also generate explosive hydrogen gas, therefore you should always follow these preventive measures:

- **Charge batteries in a well-ventilated area.**
- **Keep batteries away from fire, sparks, or open flames (e.g., welding equipment, lighted cigarettes, etc.)**
- **DO NOT SMOKE when charging or handling batteries.**

KEEP BATTERIES AND ELECTROLYTE OUT OF REACH OF CHILDREN.

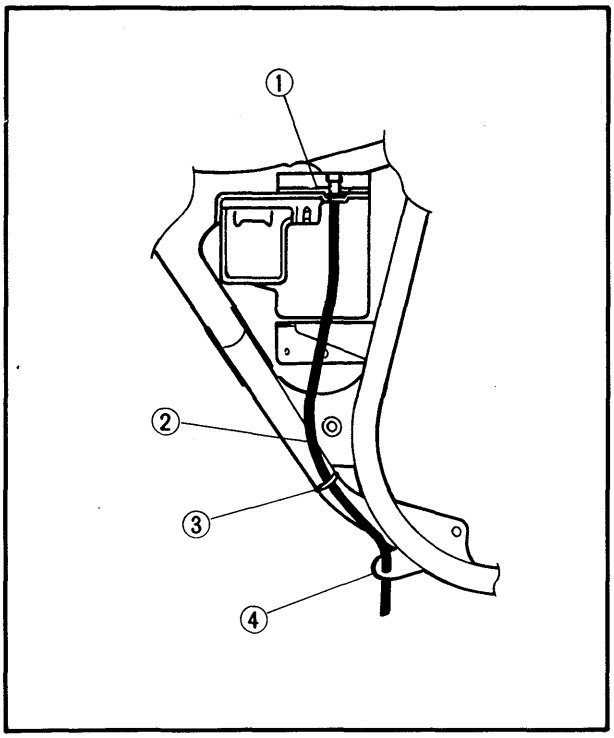


2. Remove:
   - Battery
3. Inspect:
   - Battery fluid specific gravity
     Out of specification → Charge.

⚠ CAUTION:

Always charge a new battery before using it to ensure maximum performance.

Charging Current:
1.2 amps/10 hrs
Specific Gravity:
1.280 at 20°C (68°F)



4. Install:
   - Battery ①
5. Connect:
   - Breather hose ②
     Be sure the hose is properly attached and routed.

⚠ CAUTION:

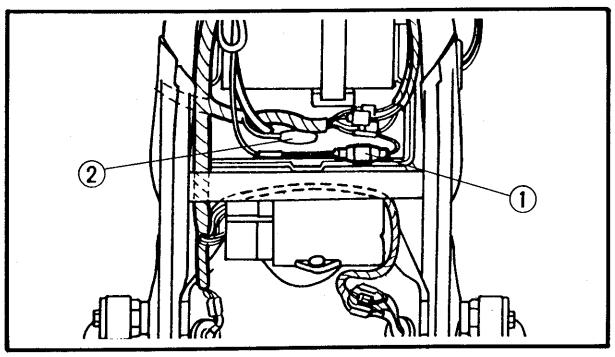
When inspecting the battery, be sure the breather hose is routed correctly. If the breather hose touches the frame or exits in such a way as to cause battery electrolyte or gas to exit onto the frame, structural and cosmetic damage to the motorcycle can occur.

③ Pass through the clamp
④ Pass through the bracket

6. Inspect:
   - Breather hose
     Obstruction → Remove.
     Damage → Replace.

FUSE INSPECTION/HEADLIGHT BEAM ADJUSTMENT/ HEADLIGHT BULB REPLACEMENT

INSP ADJ



FUSE INSPECTION

1. Remove:
   - Seat
2. Inspect:
   - Fuse "MAIN" ①
   - Fuse "SIGNAL" ②

   Defective → Replace.

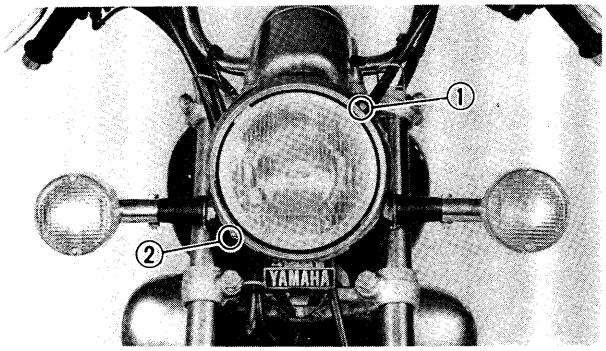
   Blown fuse (new) → Inspect circuit.

⚠ CAUTION:

Do not use fuses of higher amperage rating than those recommended.

Substitution of a fuse of improper rating can cause extensive electrical system damage and possibly a fire.

Description	Amperage	Quantity
Main	20A	1
Signal	10A	1



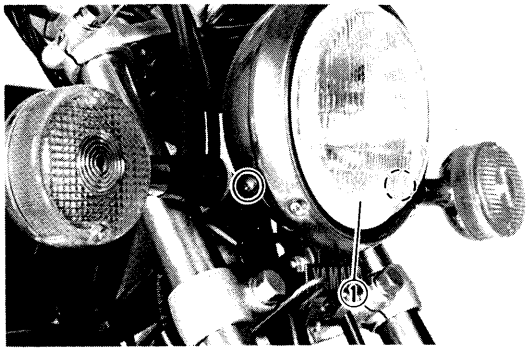
HEADLIGHT BEAM ADJUSTMENT

1. Adjust:
   - Headlight beam (Horizontally)

Horizontal Adjustment	
Right	Turn adjusting screw ① clockwise
Left	Turn adjusting screw ① counter-clockwise

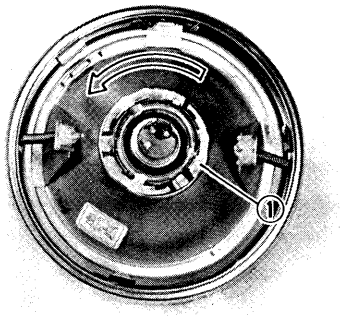
2. Adjust:
   - Headlight beam (Vertically)

Vertical Adjustment	
Higher	Turn the adjusting screw ② clock-wise.
Lower	Turn the adjusting screw ② counter-clockwise.



HEADLIGHT BULB REPLACEMENT

1. Remove:
   - Headlight lens unit ①
2. Disconnect:
   - Headlight lens unit leads



3. Remove:
   - Cover (Bulb) ①
   - Bulb

⚠ WARNING:

Keep flammable products or your hands away from the bulb while it is on, it will be hot. Do not touch the bulb until it cools down.

4. Install:
   - Bulb (New)

   Secure the new bulb with the bulb holder.

⚠ CAUTION:

Avoid touching glass part of bulb. Also keep it free from oil otherwise, transparency of glass, bulb life and illuminous flux will be adversely affected. If oil gets on bulb, clean it with a cloth moistened thoroughly with alcohol or lacquer thinner.

5. Install:
   - Cover (Bulb)
   - Headlight lens unit
6. Adjust:
   - Headlight beam

   Refer to "HEADLIGHT BEAM ADJUSTMENT" section.

ENGINE OVERHAUL

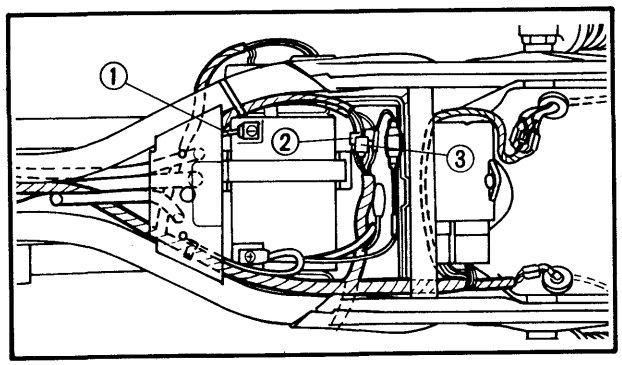
ENGINE REMOVAL

NOTE:
It is not necessary to remove the engine in order to remove the following components:
- Clutch
- Carburetor
- AC magneto

SEAT, FUEL TANK

1. Remove:
   - Seat
   - Fuel tank
   - Side covers (Right/Left)

   Refer to "CHAPTER – 3 FUEL TANK REMOVAL AND INSTALLATION".



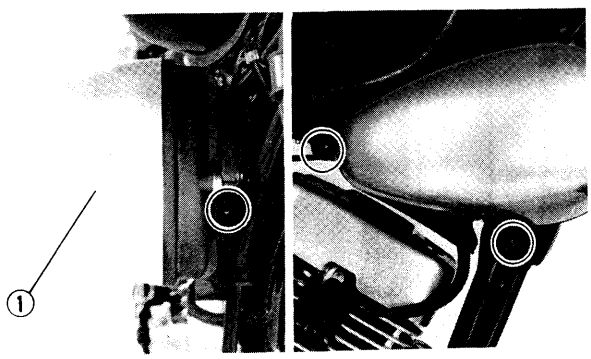
LEADS

1. Disconnect:
   - Leads (Battery)
   - Coupler (Pickup coil) ②
   - Coupler (A.C. Magneto) ③
   - Leads (Spark plug)

NOTE:
Disconnect the negative lead ① first.

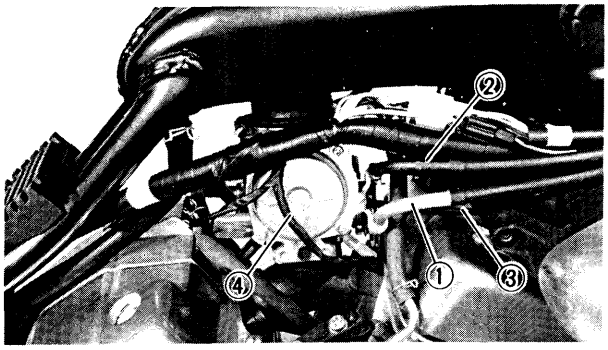
2. Drain:
   - Engine oil

   Refer to "CHAPTER – 3 ENGINE OIL REPLACEMENT".



AIR FILTER

1. Remove:
   - Case (Air filter) ①
   - Case (Thermo switch)

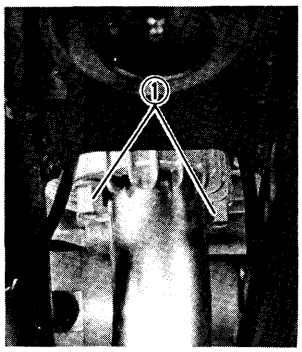


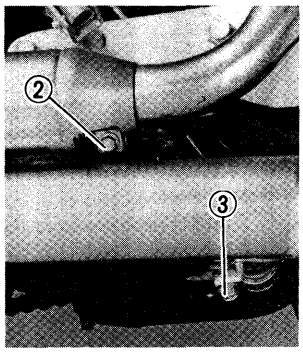
CARBURETOR

1. Remove:
   - Fuel pump
2. Disconnect:
   - Throttle cable 1 ①
   - Throttle cable 2 ②
   - Choke cable ③
   - Hoses
   - Leads (Carburetor heater) ④
3. Loosen:
   - Clamps
4. Remove:
   - Carburetor

   Move up the carburetor, and pull out the carburetor.

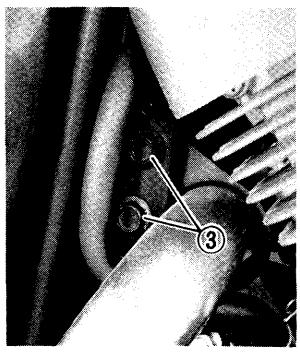
NOTE:
Cover the carburetor with a clean rag to prevent dirt or foreign matter into the carburetor.

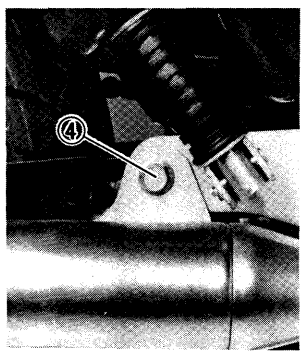


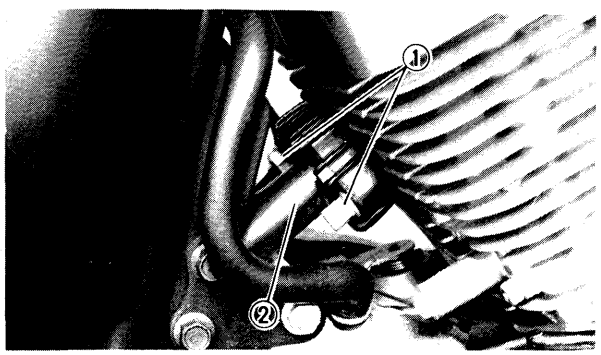


MUFFLER ASSEMBLY

1. Remove:
   - Nuts (Exhaust pipe 1 – Front) ①
   - Bolt (Exhaust pipe joint – Lower) ②
   - Bolts (Exhaust pipe 3) ③
   - Bolt (Muffler) ④
   - Muffler assembly





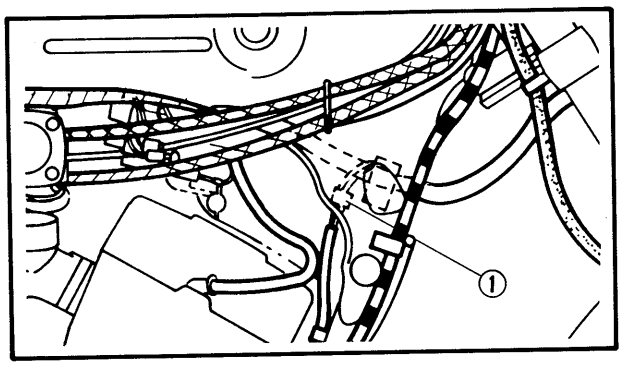


2. Remove:
   - Nuts (Exhaust pipe 2 – Rear) ①
   - Exhaust pipe (Rear) ②

3. Support the motorcycle with a suitable stand at the swingarm pivot.

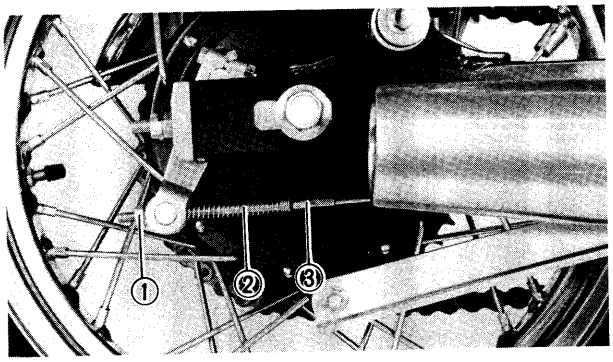
⚠ WARNING:

Securely support the motorcycle so there is no danger of it falling over.

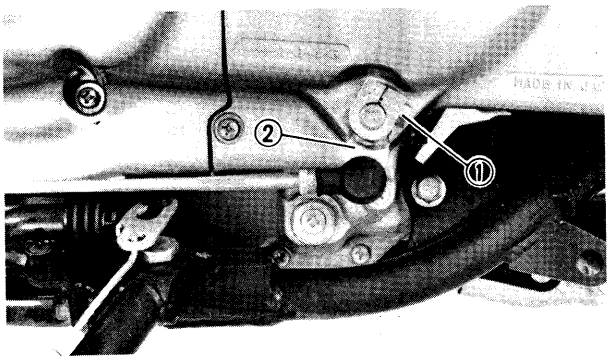


BRAKE PEDAL/FOOTREST (RIGHT) AND SHIFT PEDAL/FOOTREST (LEFT)

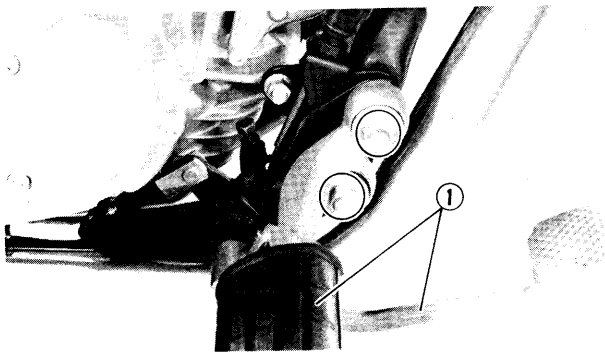
1. Disconnect:
   - Brake switch coupler (Brown and Yellow) ①



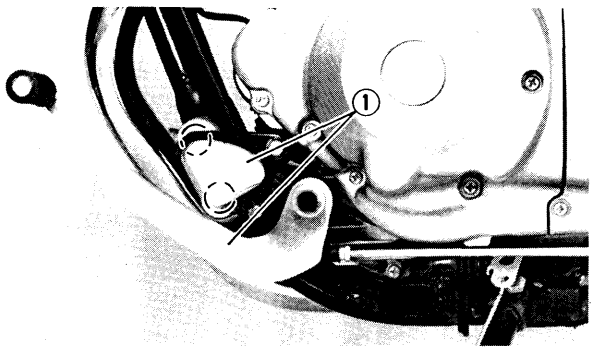
2. Remove:
   - Adjuster (Rear brake) ①
   - Spring ②
   - Brake rod ③



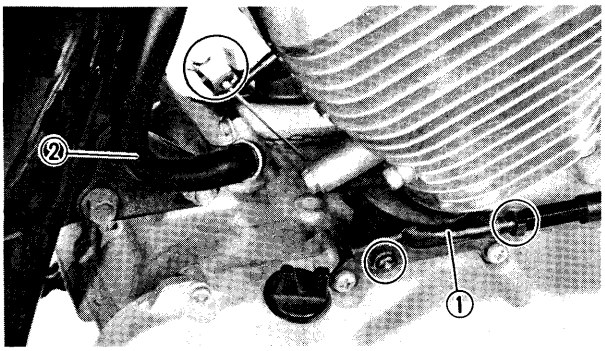
3. Remove:
   - Bolt (Shift pedal link) ①
   - Shift pedal link ②



4. Remove:
   - Brake pedal and footrest (Right) assembly ①

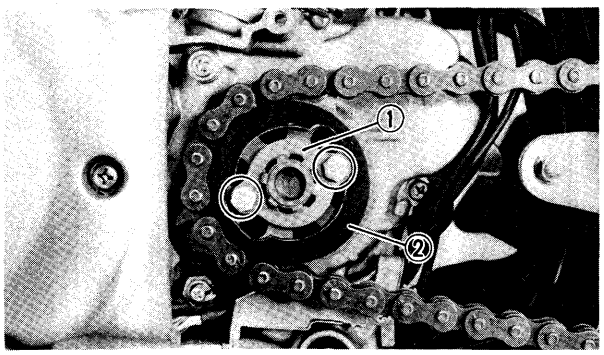


5. Remove:
   - Shift pedal and footrest (Left) assembly ①

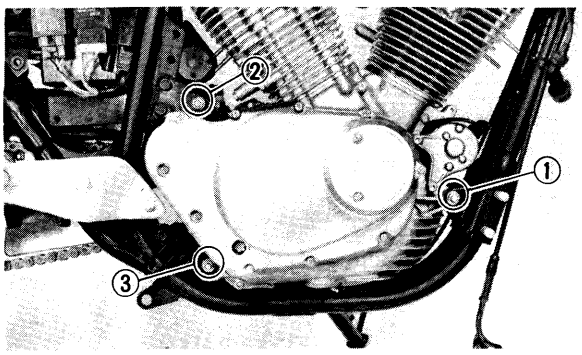


CLUTCH CABLE AND DRIVE SPROCKET

1. Disconnect:
   - Clutch cable ①
     Loosen the locknuts and disconnect the clutch cable.
   - Hose (Crankcase ventilation) ②

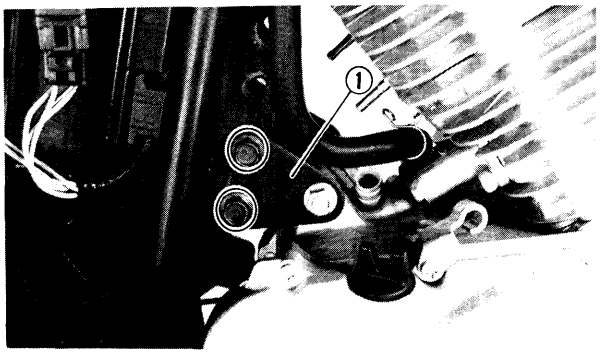


2. Remove:
   - Cover (Drive chain)
   - Sprocket holder ①
   - Drive sprocket ②

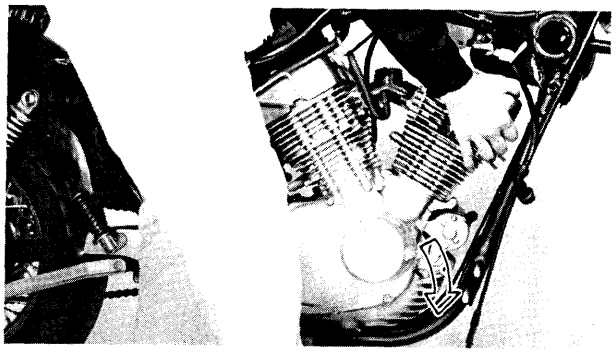


ENGINE REMOVAL

1. Place a suitable stand under the engine.
2. Remove:
   - Bolt (Engine mounting – Front) ①
   - Bolt (Engine mounting – Rear-Top) ②
   - Bolt (Engine mounting – Rear-Bottom) ③



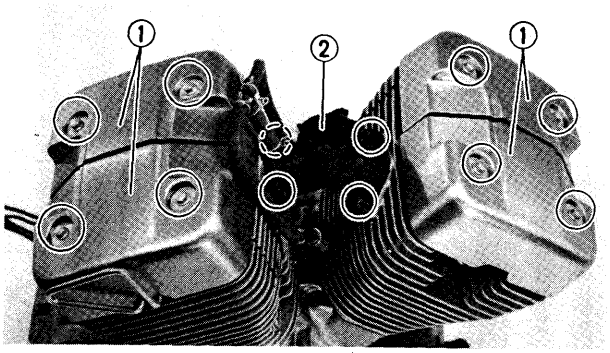
3. Remove:
   - Engine stay (Rear – Upper) ①
   - Engine stay (Rear – Lower)



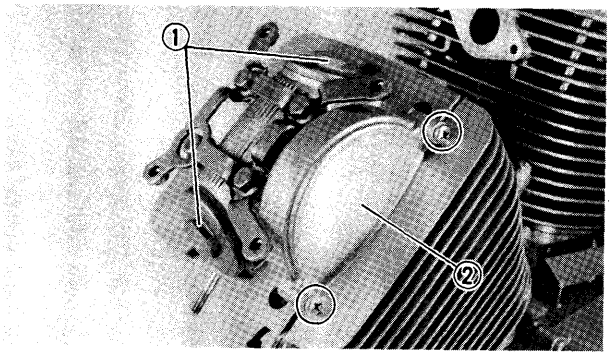
4. Remove:
   - Engine assembly
     From the right side.

ENGINE DISASSEMBLY

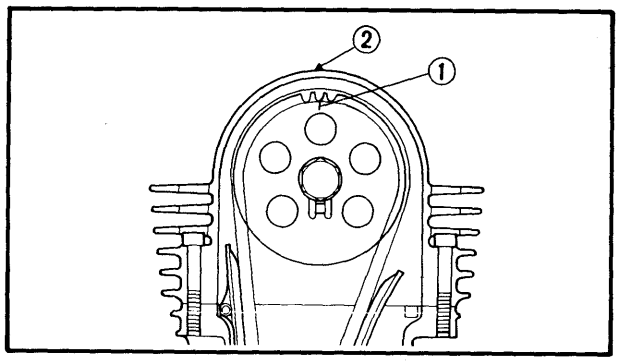
CYLINDER HEAD/CYLINDER AND PISTON

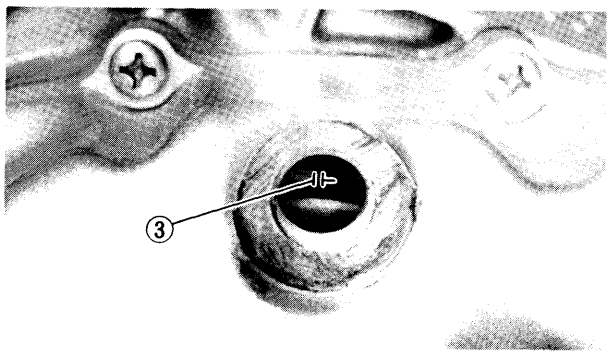


1. Remove:
   - Cylinder head covers ①
   - Carburetor joint ②
   - Spark plugs



2. Remove:
   - Tappet covers ①
   - Covers (Cam sprocket) ②





Front side

1. Align:
   - Cam sprocket punch mark
     With the stationary pointer on the front cylinder head.

TDC alignment steps (Front cylinder):

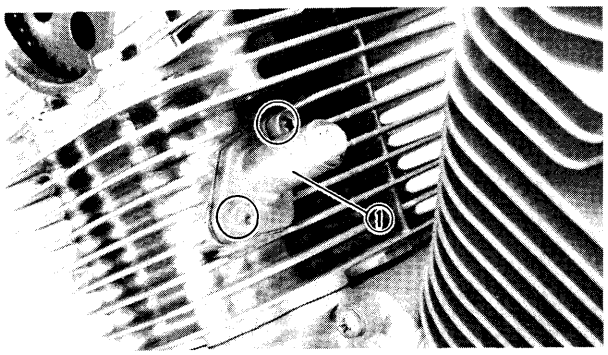
- Turn the crankshaft counter clockwise with a wrench.
- Align the cam sprocket punch mark ① with the stationary pointer ② on the front cylinder head. When the punch mark is aligned with the stationary pointer, the piston is at Top Dead Center (TDC).

NOTE:

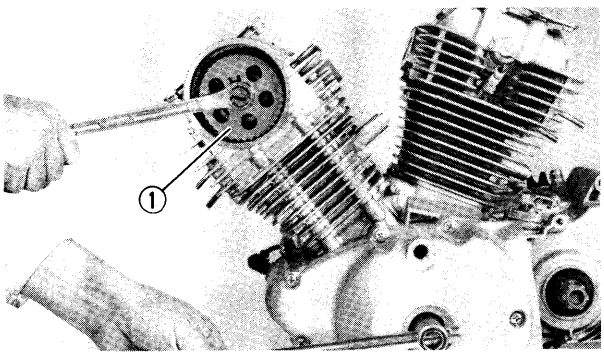
TDC on compression stroke check:

- Both rocker arms must have a valve clearance when the " ⊩ " mark ③ on the flywheel is aligned with the center line of the front cylinder.

• If not, give the crankshaft one counter clockwise turn too meet above condition.

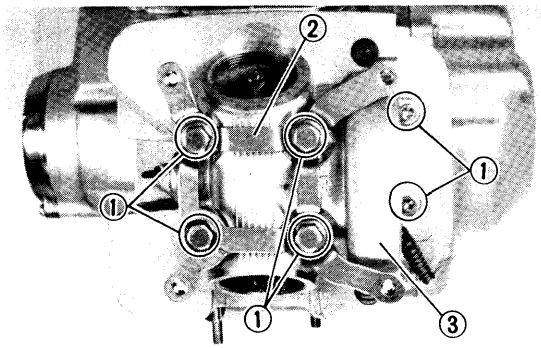


2. Remove:
   • Chain tensioner (Front cylinder) ①
   • Gasket



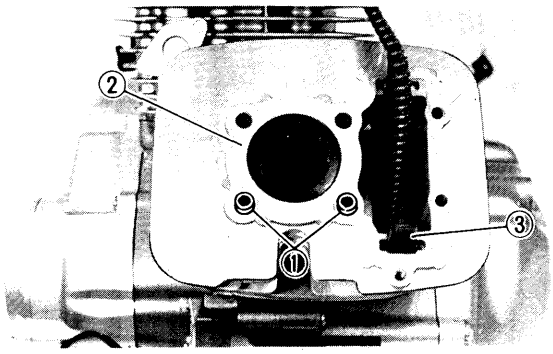
3. Remove:
   • Cam sprocket ①
   • Dowel pin

NOTE:
• Hold the crankshaft end with a wrench.
• Fasten a safety wire to the cam chain.
• When removing the cam sprocket, it is not necessary to separate the cam chain.

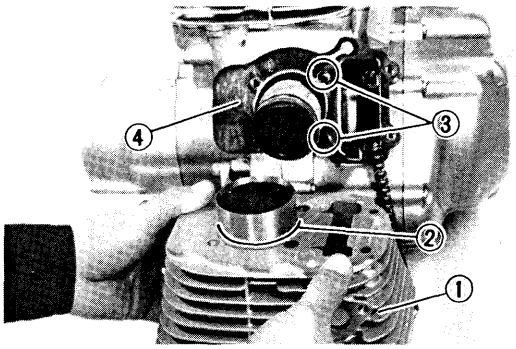


4. Remove:
   • Bolts (Cylinder head) ①
   • Bracket ②
   • Cylinder head ③

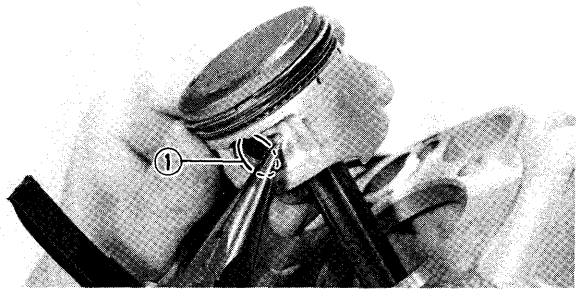
NOTE:
Loosen the bolts in this stage, using a crisscross pattern.



5. Remove:
   • Dowel pin ①
   • Gasket (Cylinder head) ②
   • Chain damper (Intake) ③

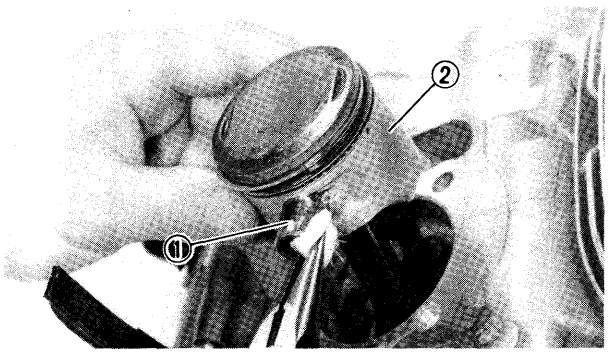


6. Remove:
   - Cylinder ①
   - O-ring ②
   - Dowel pins ③
   - Gasket (Cylinder) ④



7. Remove:
   - Piston pin clip ①

NOTE:
Before removing the piston pin clip, cover the crankcase with a clean rag so you will not accidentally drop the clip into the crankcase.



8. Remove:
   - Piston pin ①
   - Piston ②

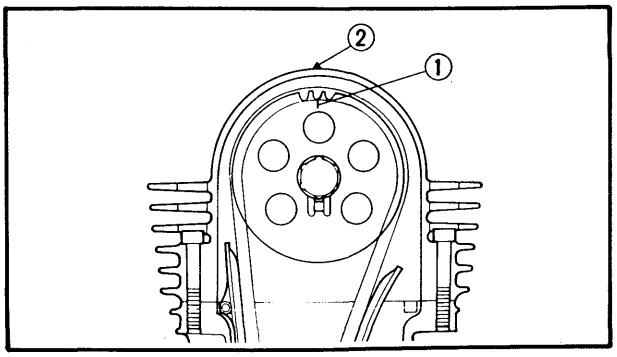
NOTE:
Before removing the piston pin, deburr the clip groove and pin hole area. If the piston pin groove is deburred and piston pin is still difficult to remove, use Piston Pin Puller.

Piston Pin Puller:
YU-01304

⚠ CAUTION:
Do not use a hammer to drive the piston pin out.

Rear Side
When removing the rear side components, repeat the front side removal procedure. However, note the following points.

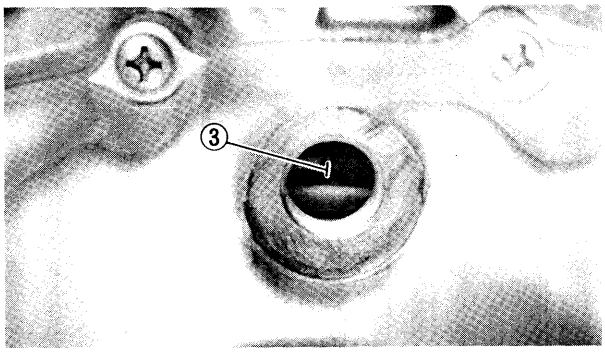
1. Align:
   - Cam sprocket punch mark
     With the stationary pointer on the rear cylinder head.

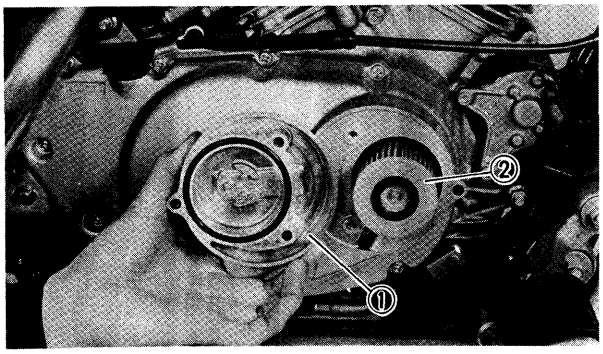


TDC alignment steps (Rear cylinder):
- Turn the crankshaft counter clockwise with wrench.
- Align the cam sprocket punch mark ① with the stationary pointer ② on the rear cylinder head. When the slit ③ is aligned with the stationary pointer, the piston is at Top Dead Center (TDC).

NOTE:

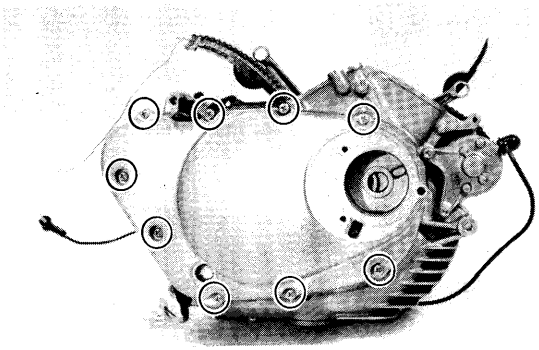
TDC on compression stroke check:
- Both rocker arms must have a valve celarance when the slit on the rotor is aligned with the center line of the rear cylinder.
- If not, give the crankshaft one clockwise turn too meet above condition.





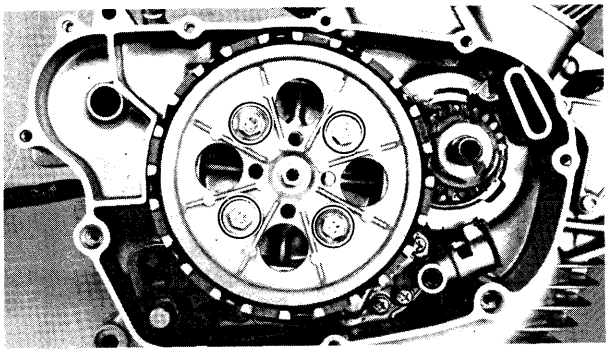
CRANKCASE COVER (RIGHT)

1. Remove:
   - Oil filter cover ①
   - Oil filter ②
   - O-ring (Filter cover)



2. Remove:
   - Crankcase cover (Right)
   - Gasket
   - Dowel pins

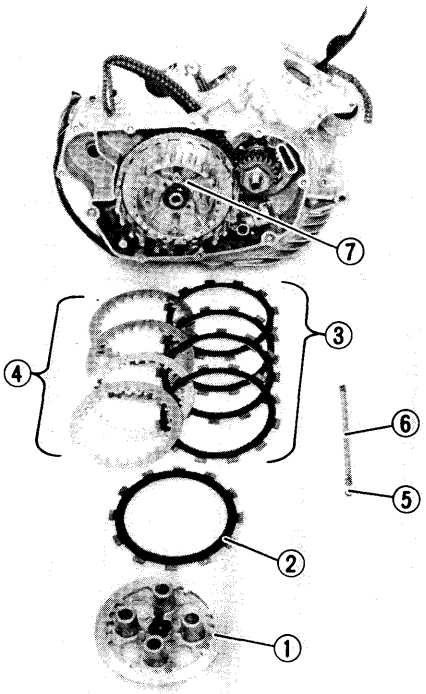
NOTE:
- Working in a crisscross pattern, loosen screw 1/4 turn each. Remove them after all are loosened.
- Be sure not to give damages to the mating surface.



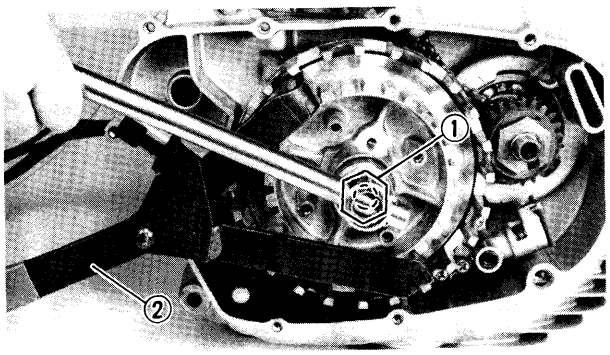
CLUTCH

1. Remove:
   - Screws (Clutch spring)
   - Clutch springs

NOTE:
Loosen the screws in this stage, using a crisscross pattern.



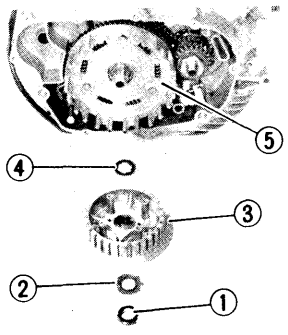
2. Remove:
   - Pressure plate ①
   - Friction plate 1 (1 pc) ②
   - Friction plate 2 (4 pcs.) ③
   - Clutch plates (4 pcs.) ④
   - Ball ⑤
   - Push rod #2 ⑥
3. Straighten:
   - Lock washer tab ⑦



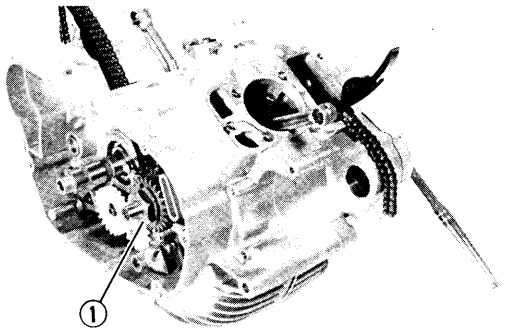
4. Loosen:
   - Nut (Clutch boss) ①

   Use the Universal Clutch Holder ② .

Universal Clutch Holder:
YM-91042

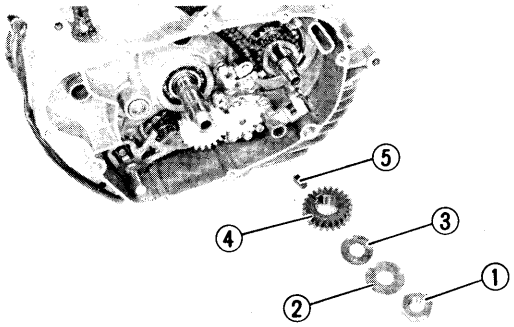


5. Remove:
   - Nut (Clutch boss) ①
   - Lock washer ②
   - Clutch boss ③
   - Holding plate ④
   - Clutch housing ⑤

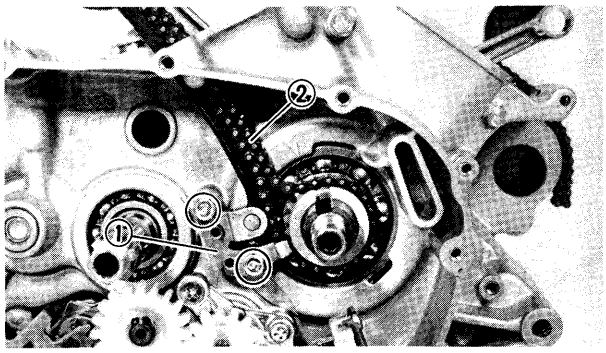


6. Straighten:
   - Lock washer tab
7. Loosen:
   - Nut (Primary driven gear) ①

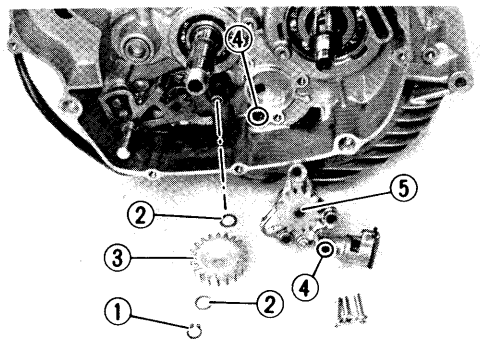
NOTE:
Use a wrench to hold the flywheel.



8. Remove:
   - Nut (Primary drive gear) ①
   - Lock washer ②
   - Washer ③
   - Primary drive gear ④
   - Key ⑤

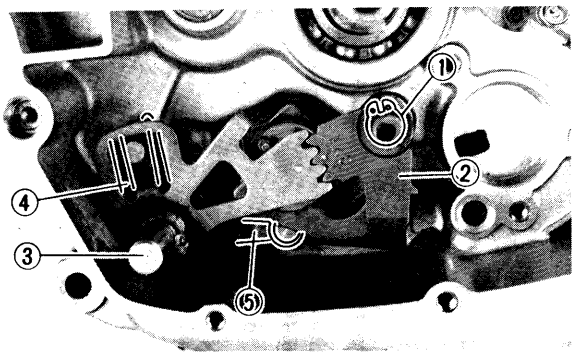


9. Remove:
   - Chain guide (Exhaust) ①
   - Timing chain ②



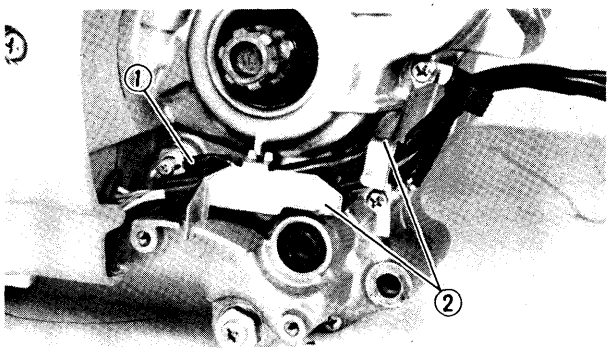
OIL PUMP

1. Remove:
   - Circlip ①
   - Washers ②
   - Drive gear (Oil pump) ③
   - O-rings ④
   - Oil pump ⑤



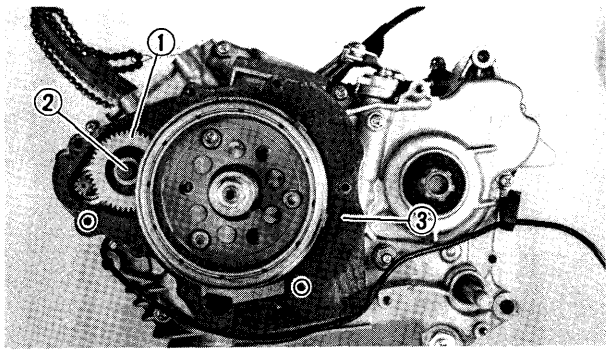
SHIFT SHAFT

1. Remove:
   - Circlip ①
   - Shift lever ②
   - Shift shaft ③
   - Spring ④
   - Shift cam stopper ⑤



CRANKCASE COVER (LEFT)

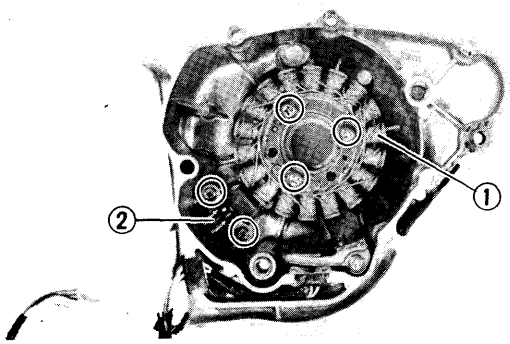
1. Disconnect:
   - Neutral switch lead ①
2. Remove:
   - Holders (Wiring) ②



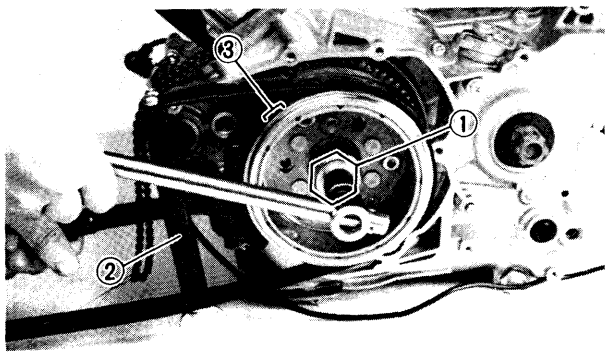
3. Remove:
   - Crankcase cover (Left)
   - Idle gear #1 ①
   - Guide bar ②
   - Dowel pins
   - Gasket ③

NOTE:

- Working in a crisscross pattern, loosen the bolts 1/4 turn each. Remove them after all are loosened.
- Be sure not to give damages to the mating surface.



4. Remove:
   - Stator ①
   - Pickup coil ②

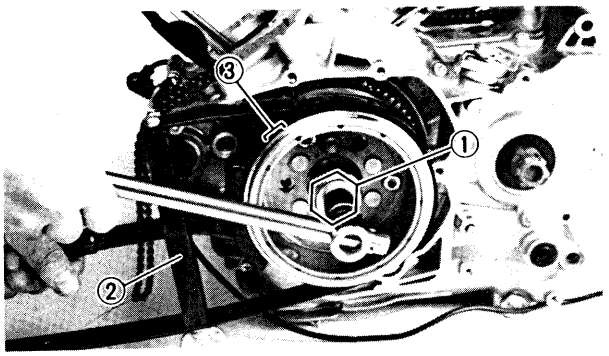


A.C. MAGNETO

1. Remove:
   - Bolt (Rotor) ①

   Use the Sheave Holder ② .

	Sheave Holder: YS-01880

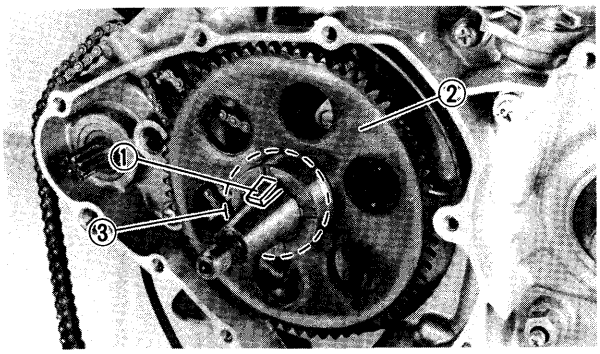


NOTE:
Do not allow the special tool to touch the projection ③ on the rotor.

2. Remove:
   - Rotor

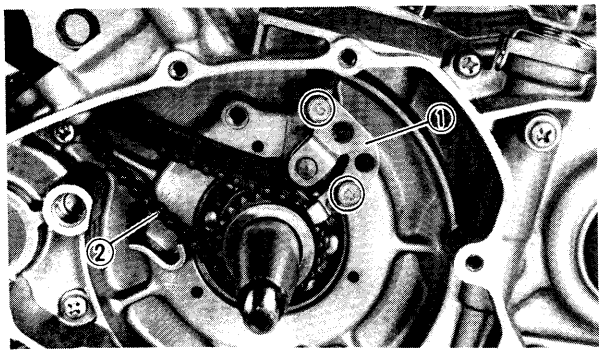
   Use the Flywheel Puller Set and Adapter.

Flywheel Puller Set:
YU-33270
Adapter:
YM-33282

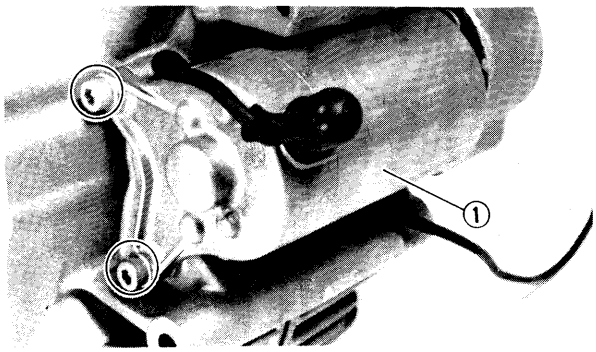


3. Remove:
   - Woodruff key ①
   - Idle gear #2 ②
   - Washer ③

NOTE:
When removing the idler gear # 2, the washer ④ fall out. Take care not to lose it.

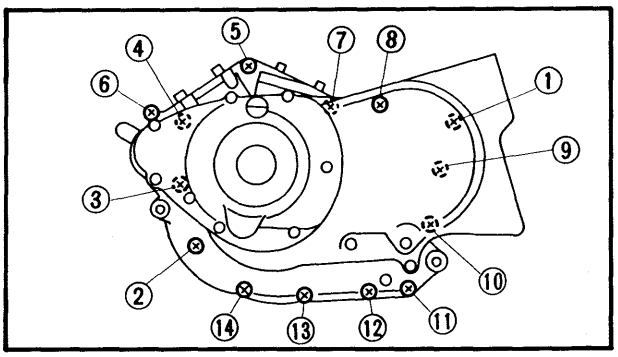


4. Remove:
   - Chain guide (Intake) ①
   - Timing chain ②



STARTER MOTOR

1. Remove:
   - Starter motor ①

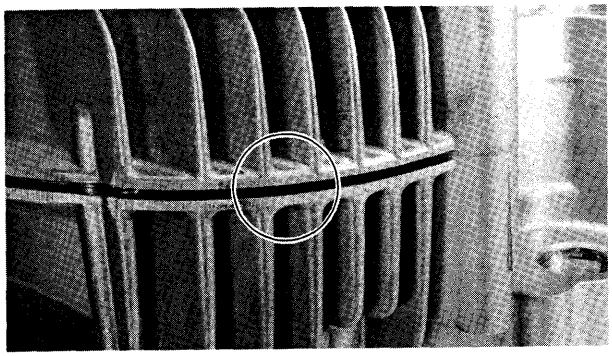


CRANKCASE

1. Remove:
   - Screws (Crankcase) ① ~ ⑭

NOTE:

Remove the screws starting with the highest numbered one.

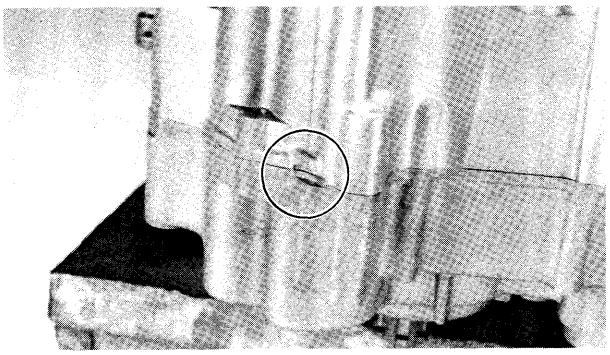


2. Remove:
   - Crankcase (Right)

   As pressure is applied, alternately tap on the front engine mounting boss, transmission shafts, and shift cam.

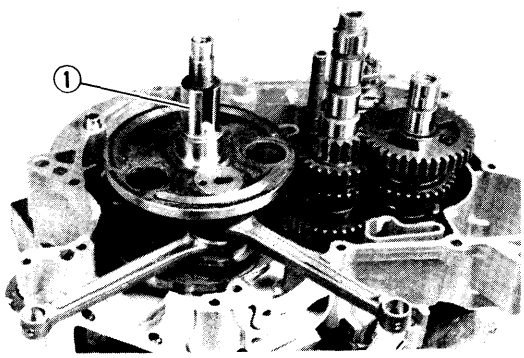
NOTE:

- Fot this removal , slits in the crankcase can be use as shown.
- Be sure not to give damages to the mating surface.



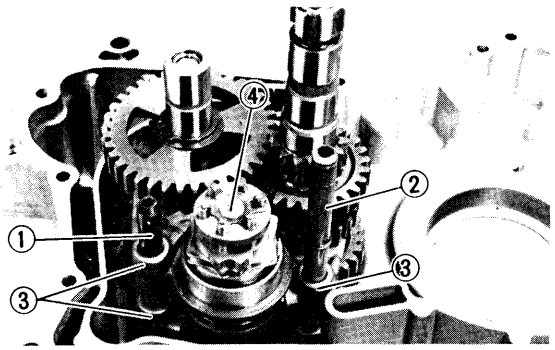
⚠ CAUTION:

Use soft hammer to tap on the case half. Tap only on reinforced portions of case. Do not tap on gasket mating surface. Work slowly and carefully. Make sure the case halves separate evenly. If one end "hangs", take pressure off the push screw, realign, and start over. If the cases do not separate, check for a remaining case screw or fitting. Do not force.



CRANKSHAFT AND TRANSMISSION

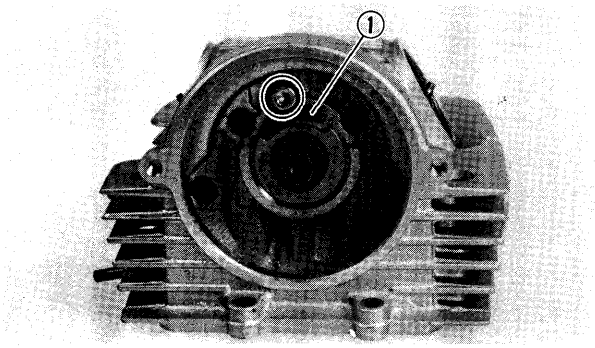
1. Remove:
   - Crankshaft ①
   - Dowel pins



2. Remove:
   - Guide bar (Rear – Longer) ①
   - Guide bar (Front – Shorter) ②
   - Shift forks ③
   - Shift cam ④

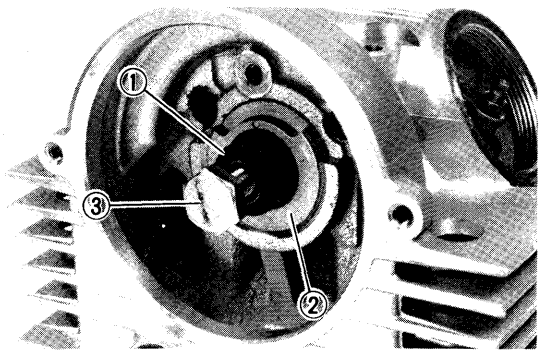
NOTE:
Note the position of each part. Pay particular attention to the location and direction of shift forks.

3. Remove:
   - Transmission



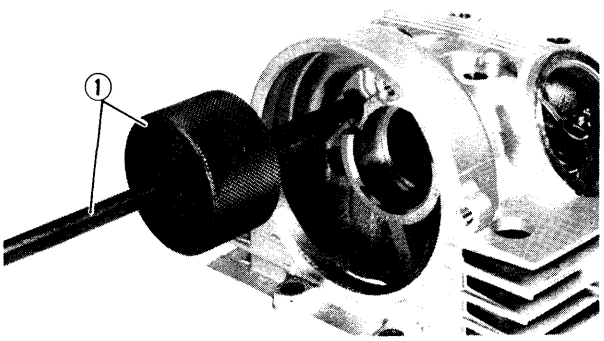
CYLINDER HEAD

1. Remove:
   - Tappet covers
2. Loosen:
   - Locknuts
   - Adjusters
3. Remove:
   - Stopper ①



4. Remove:
   - Camshaft ①
   - Camshaft bushing ②

NOTE:
Screw in a suitable length of 10 mm bolt ③ into the thread hole on the camshaft, and pull out the camshaft.



5. Attach:
   - Slide Hammer Set ①

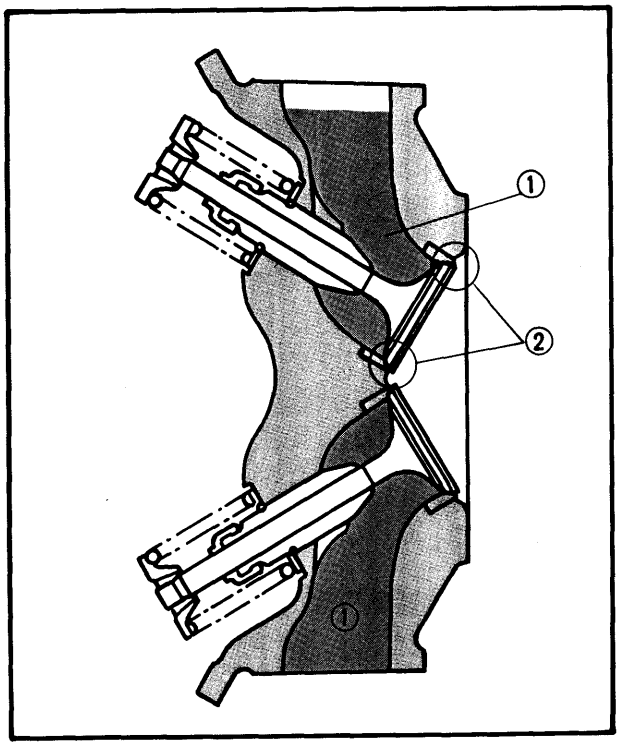
	Slide Hammer Set: **YU-01083**

6. Remove:
   - Rocker arm shafts
   - Rocker arms (Intake/Exhaust)

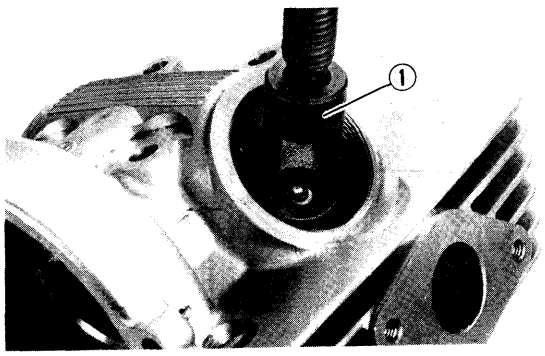
VALVE

NOTE:
Before removing the internal parts (Valve, valve spring, valve seat etc.) of the cylinder head,.the valve sealing should be checked.

1. Check:
   - Valve sealing
     Leakage at valve seat → Inspect the valve face, valve seat and valve seat width.
     Refer to "INSPECTION AND REPAIR – VALVE SEAT".

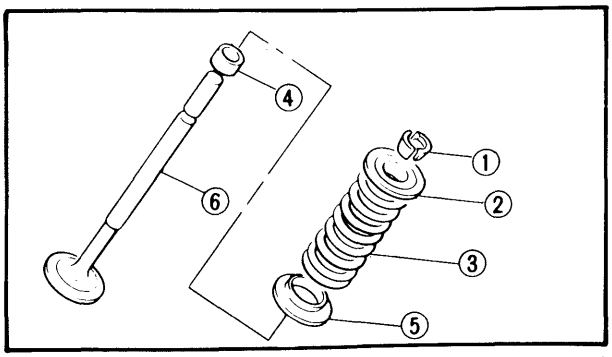


Valve Seat Checking Steps:
- Pour a clean solvent ① into the intake and exhaust ports.
- Check the valve seating.
  There should be no leakage at the valve seat ② .



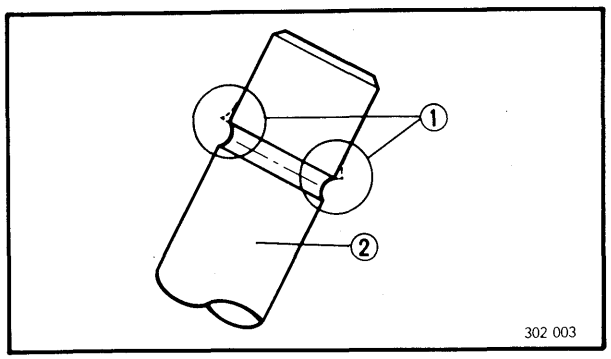
2. Attach:
   - Valve spring compressor ①

Valve Spring Compressor:
YM-04019



3. Remove:
   - Valve cotters ①
   - Valve spring seat ②
   - Valve spring ③
   - Valve stem seal ④
   - Valve spring seat ⑤
   - Valve ⑥

NOTE:
Identify each part position very carefuly so that it can be reinstalled in its original place.

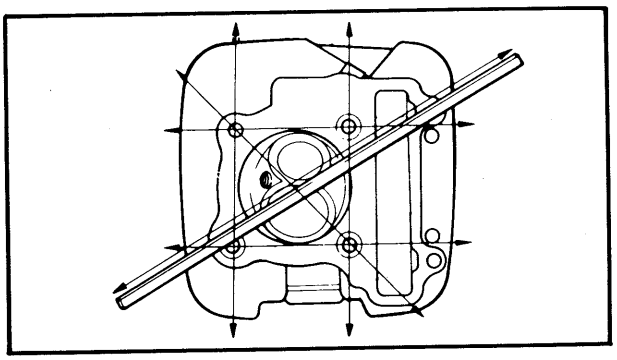


NOTE:
Deburr any deformed valve stem end. Use an oil stone to smooth the stem end.

① Deburr
② Valve stem

4. Eliminate:
   - Carbon deposit
     From the combustion chamber.
     Use a rounded scraper.

NOTE:
Do not use a sharp instrument and avoid damaging or scratching:
- Spark plug threads
- Valve seat
- Cylinder head



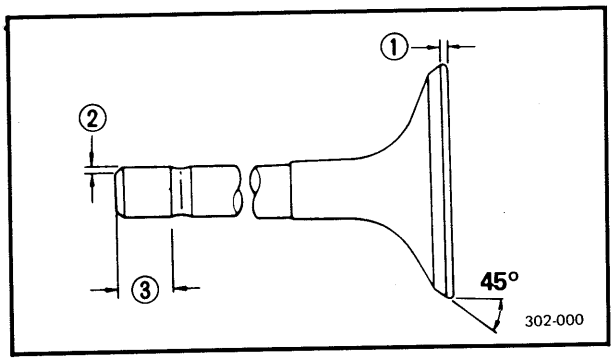
INSPECTION AND REPAIR

CYLINDER HEAD

1. Measure:
   - Warpage

   Under specification → Reface.
   Over specification → Replace.

Cylinder Head Warpage:
Less than 0.03 mm (0.0012 in)

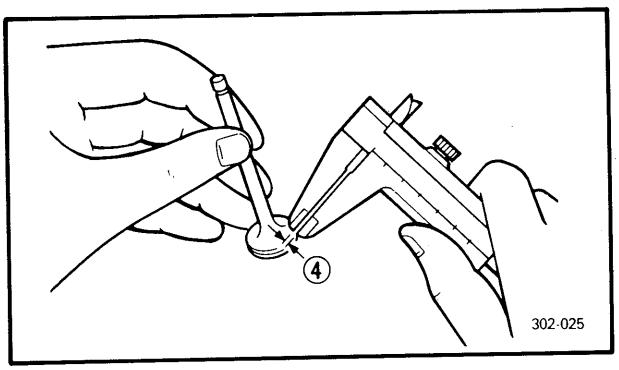


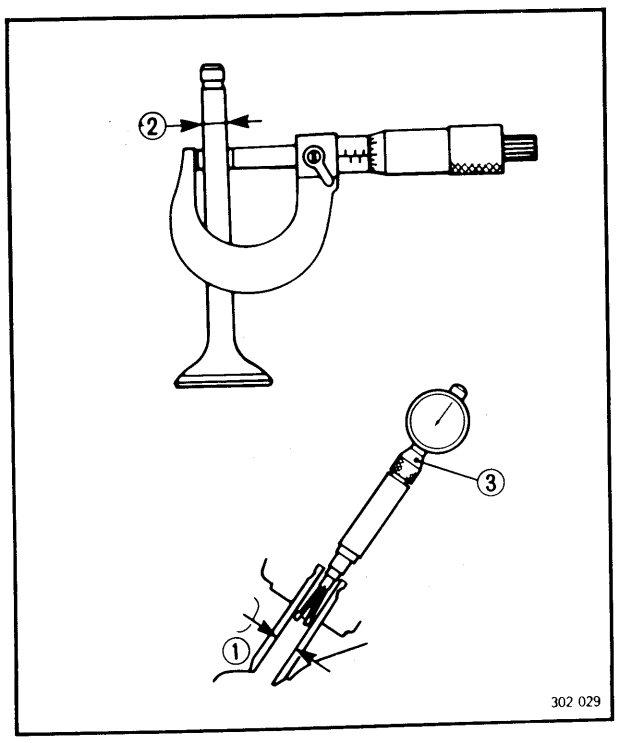
VALVE

1. Inspect:
   - Valve face
   - Stem end

   Wear/Pitting → Reface.
   Out of specification → Replace.

Minimum Thickness (Service limit) ① :
0.7 mm (0.0276 in)
Beveled ② :
0.5 mm (0.020 in)
Minimum Length (Service limit) ③ :
4.0 mm (0.157 in)
Seat Width (Valve face) ④ :
0.9 ~ 1.1 mm (0.035 ~ 0.43 in)



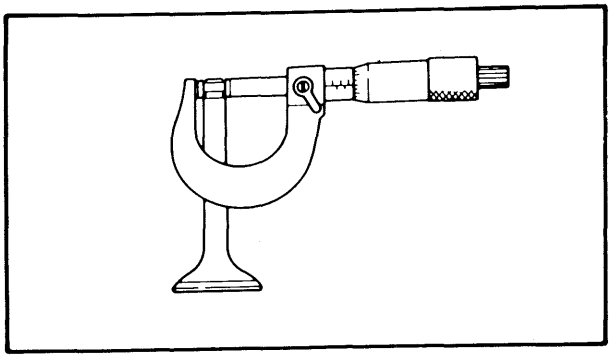


2. Measure:
   - Valve stem clearance

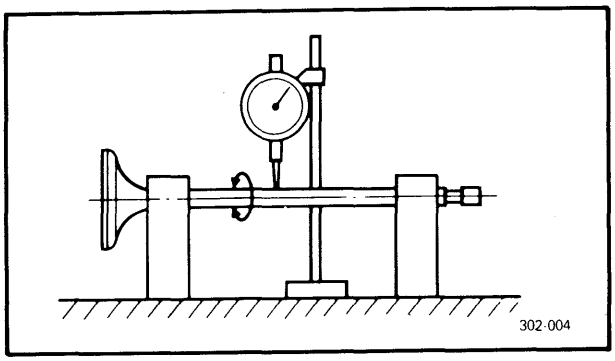
Valve stem clearance =
Valve guide inside diameter ① −
Valve stem diameter ②

Out of specification → Replace either valve and/or guide.
Use a Micrometer and Bore Gauge ③ .

	Valve Stem Clearance	Maximum
Intake	0.010 ~ 0.037 mm (0.0004 ~ 0.0015 in)	0.08 mm (0.0031 in)
Exhaust	0.025 ~ 0.052 mm (0.0010 ~ 0.0020 in)	0.10 mm (0.0039 in)



3. Inspect:
   - Valve stem end
     Mushroom shape/Larger diameter than rest of stem → Replace valve, valve guide, and oil seal.



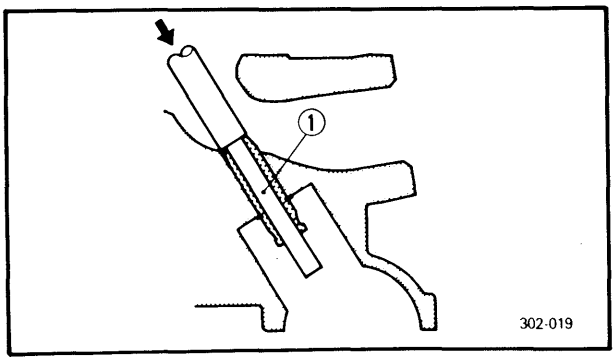
4. Measure:
   - Valve stem runout
     Out of specification → Replace.

Maximum Runout:
0.03 mm (0.0012 in)

VALVE GUIDE

NOTE:
- Always replace the valve guide if the valve is replaced.
- Always replace the oil seal if the valve is removed.

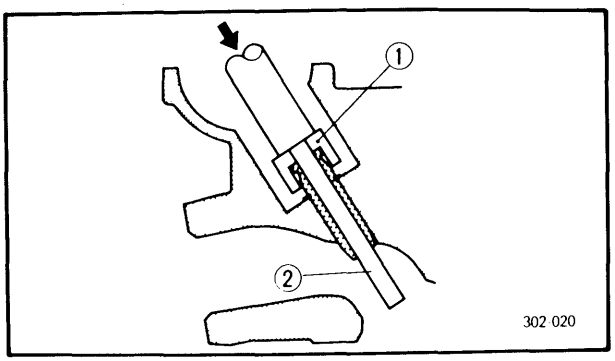
1. Inspect:
   - Valve guide
     Wear/Oil leakage into cylinder → Replace.



2. Remove:
   - Valve guide
     Use the Valve Guide Remover ①.

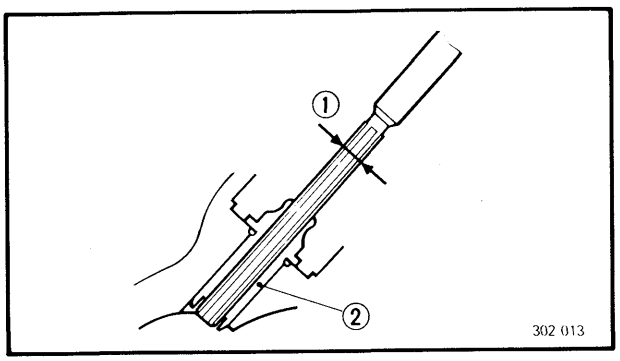
Valve Guide Remover (7.0 mm):
YM-01225

NOTE:
Heat the head in an oven to 100°C (212°F) to ease guide removal and installation and to maintain correct interference fit.



3. Install:
   - Valve guide (New)
     Use the Valve Guide Installer ① with the valve Guide Remover ②.

Valve Guide Installer:
YM-04017
Valve Guide Remover (7.0 mm):
YM-01225



4. Bore valve guide ② to obtain proper valve stem clearance.
   Use the Valve Guide Reamer (7.0 mm) ①.

	Valve Guide Reamer (7.0 mm): YM-01227

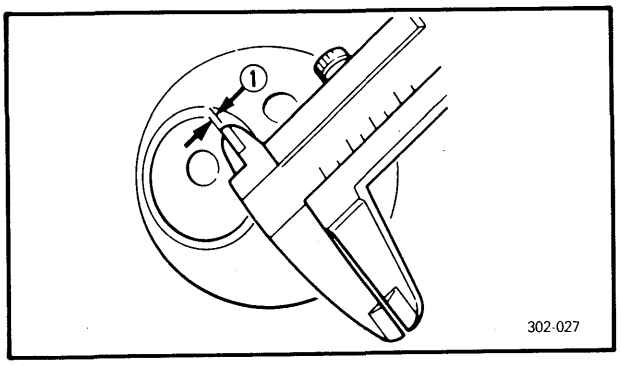
NOTE:
Reface the valve seat after installing the valve guide.

VALVE SEAT

1. Clean:
   - Valve face
   - Valve seat

   Remove carbon deposit.
2. Inspect:
   - Valve seat

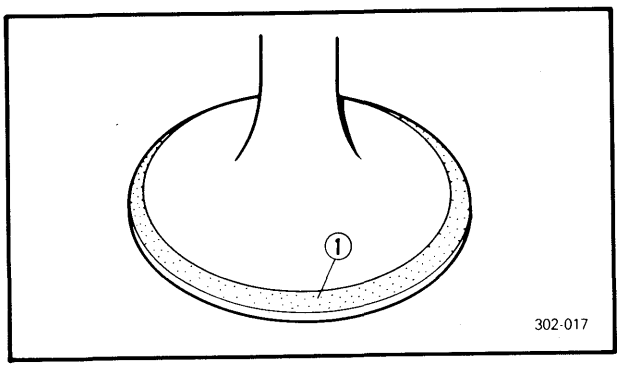
   Pitting/Wear → Reface valve seat.



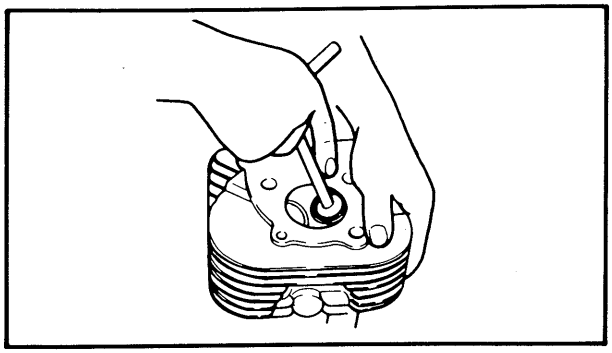
3. Measure:
   - Valve seat width ①

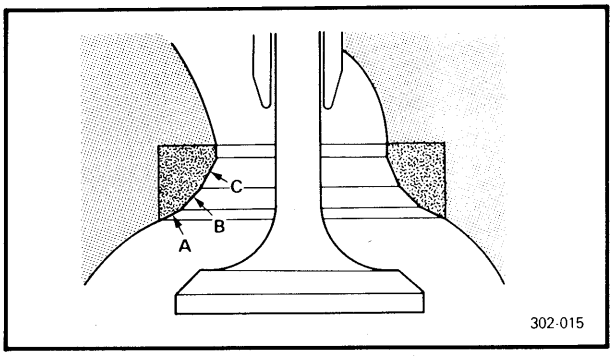
   Out of specification → Reface valve seat.

	Valve Seat Width
Intake	0.9 ~ 1.1 mm (0.035 ~ 0.043 in)
Exhaust	0.9 ~ 1.1 mm (0.035 ~ 0.043 in)

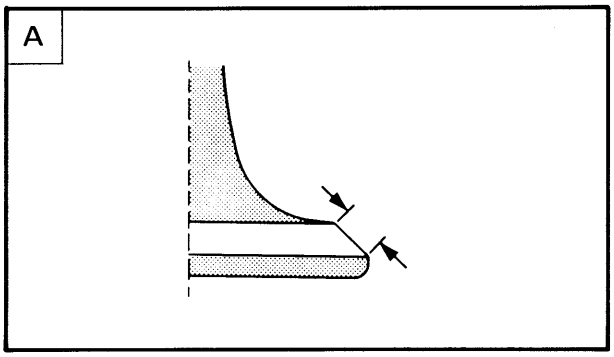


Valve seat width measurement steps:
- Apply the Mechanic's bluing dye (Dykem) ① to the valve face.
- Install the valve into the cylinder head.
- Press the valve through the valve guide and onto the valve seat to make a clean pattern.
- Measure the valve seat width. Whether the valve seat and valve face made contact, bluing will have been removed.
- If the valve seat width is too wide, too narrow, or seat has not centered. The valve seat must be refaced.

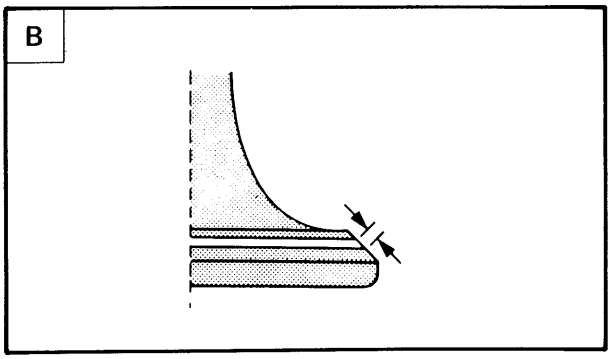




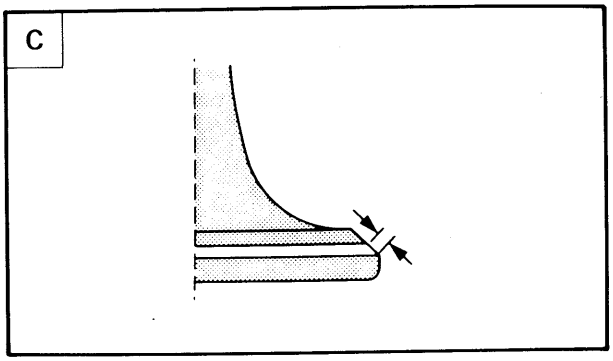
A



B



C



4. Reface:
   - Valve seat

   Use 20°, 45° and 60° Valve Seat Cutter.

⚠ CAUTION:

Remove just enough material to achieve satisfactory seat.
When twisting cutter, keep and even downward pressure to prevent chatter marks.

Cut sections as follows	
Section	Cutter
A	20°
B	45°
C	60°

Valve seat refacing steps:

A Valve face indicates that valve seat is centered on valve face but is too wide.

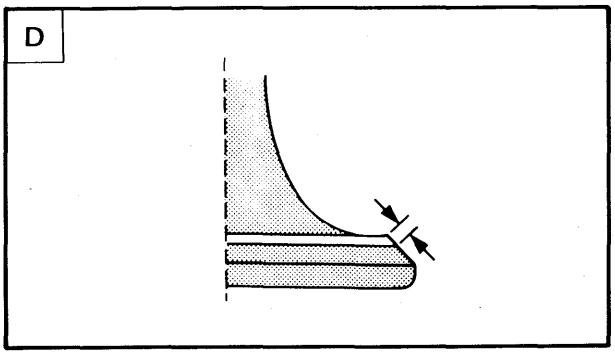
Valve Seat Cutter Set		Desired Result
Use lightly	20° cutter	To reduce valve seat width to 1.0 mm (0.04 in)
	60° cutter	

B Valve seat is in the middle of the valve face but too narrow.

Valve Seat Cutter Set		Desired Result
Use	45° cutter	To achieve a uniform valve seat width of 1.0 mm (0.04 in)

C Valve seat is too narrow and right up near valve margin.

Valve Seat Cutter Set		Desired Result
Use	20° cutter	To center the seat and to achieve its width of 1.0 mm (0.04 in)
	45° cutter	

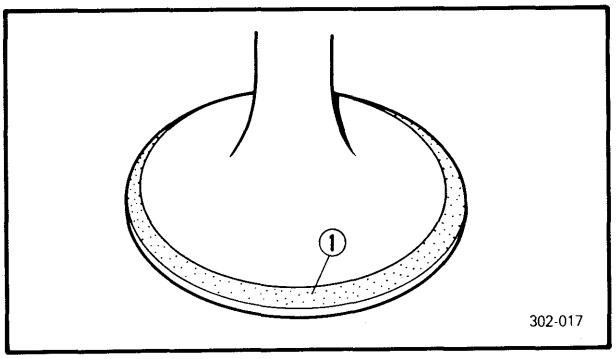


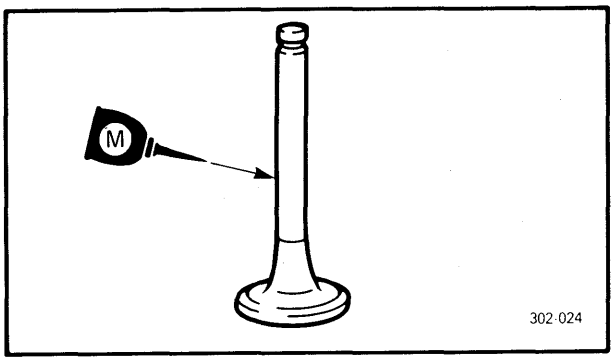
D Valve seat is too narrow and is located down near the bottom edge of the valve face.

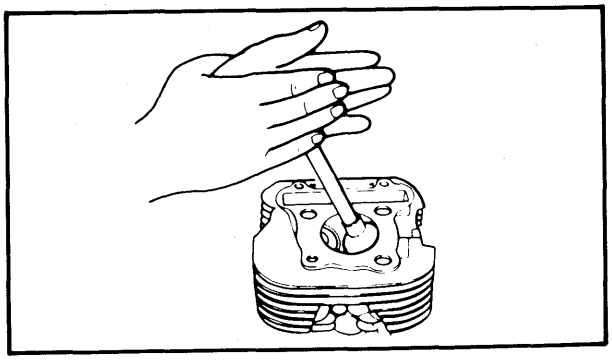
Valve Seat Cutter Set		Desired Result
Use	60° cutter, first	To center the seat and increase its width.
	45° cutter	

5. Lap:
   - Valve face
   - Valve seat

NOTE:
After refacing the valve seat or replacing the valve and valve guide, the valve seat and valve face should be lapped.





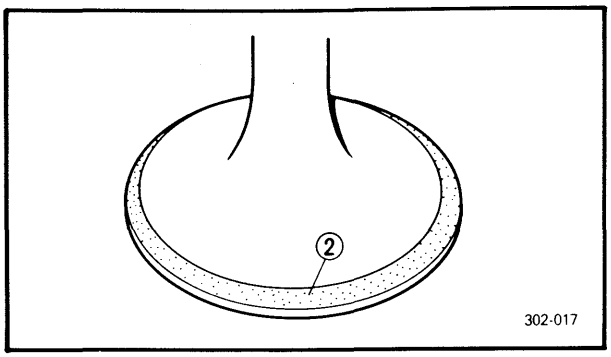


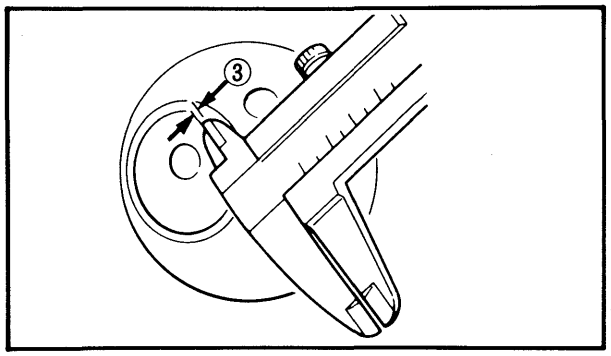
Valve lapping steps:
- Apply a coarse lapping compound ① to the valve face.

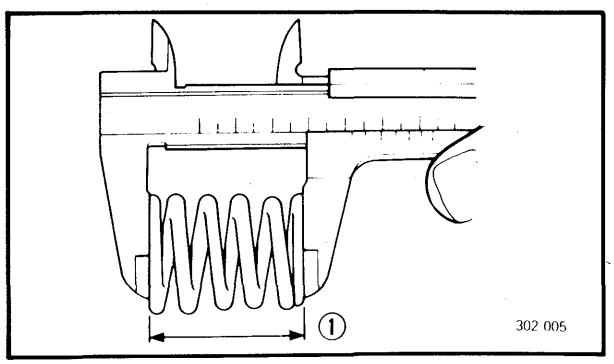
⚠ CAUTION:
Be sure no compound enteres the gap between the valve stem and guide.

- Apply a molybdnum disulfide oil to the valve stem.
- Install the valve into the cylinder head.
- Turn the valve until the valve face and valve seat are evenly polished, then clean off all compound.

NOTE:
To obtain the best lapping result, lightly tap the valve seat while rotating the valve back and forth between your hand.







- Apply a fine lapping compound to the valve face and repeat the above steps.

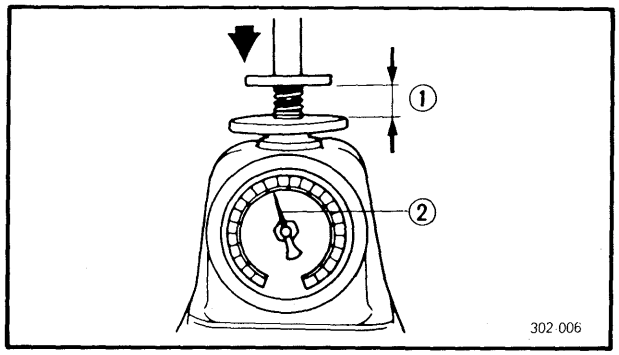
NOTE:
Be sure to clean off all compound from the valve face and valve seat after every lapping operation.

- Apply the Mechanic's bluing dye (Dykem) ② to the valve face.
- Install the valve into the cylinder head.
- Press the valve through the valve guide and onto the valve seat to make a clear pattern.
- Measure the valve seat width ③ again. If the valve seat width is out of specification, reface and lap the valve seat.

VALVE SPRING

1. Measure:
   - Valve spring free length ①
     Out of specification → Replace.

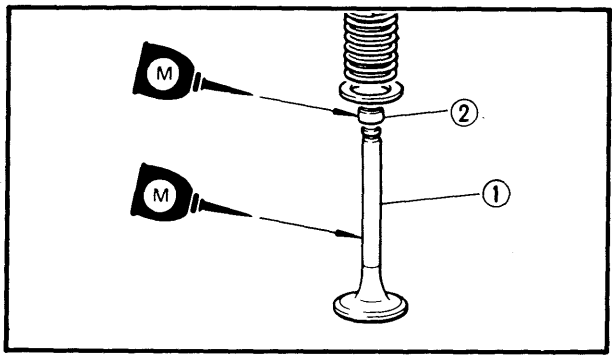
Valve Spring Free Length	
Intake spring	Exhaust spring
29.75 mm (1.171 in)	29.75 mm (1.171 in)



2. Measure:
   • Valve spring installed force ②
   Out of specification → Replace.

① Installed length

Valve Spring Installed Force			
Intake spring		Exhaust spring	
①	②	①	②
25.7 mm (1.012 in)	7.31 ~ 8.09 mm (16.1 ~ 17.8 in)	25.7 mm (1.012 in)	7.31 ~ 8.09 mm (16.1 ~ 17.8 in)



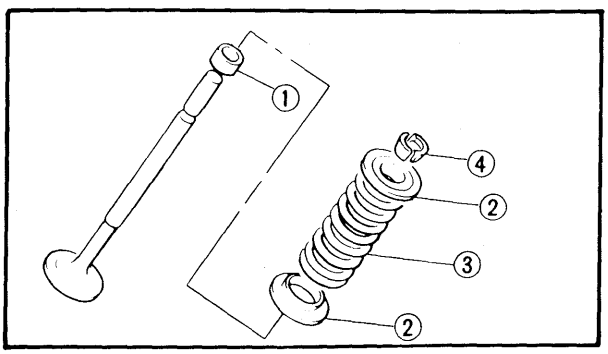
VALVE INSTALLATION

1. Lubricate:
   • Valve stem ①
   • Oil seal ②

High-Quality Molybdenum Disulfide Motor Oil or Molybdenum, Disulfide Grease

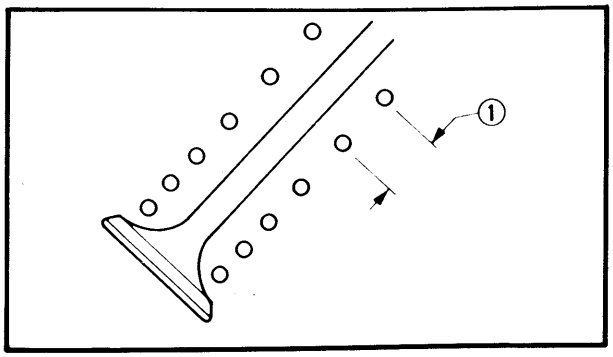
2. Install:
   • Intake valves
   • Exhaust valves

NOTE:
Be sure to reinstall in its original place.

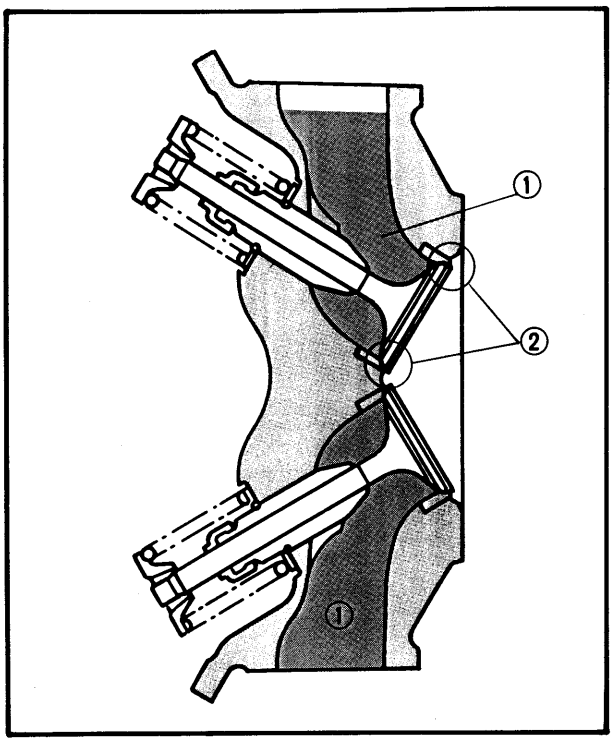


3. Install:
   • Oil seal ①
   • Valve spring seat ②
   • Valve spring ③
   • Valve retainers ④
   Use the Valve Spring Compressor.

Valve Spring Compressor: YM-04019



NOTE:
- All valve springs must be installed with the larger pitch ① upward as shown.
- Be sure the "Blue" spring is for intake and "Red" for exhaust.



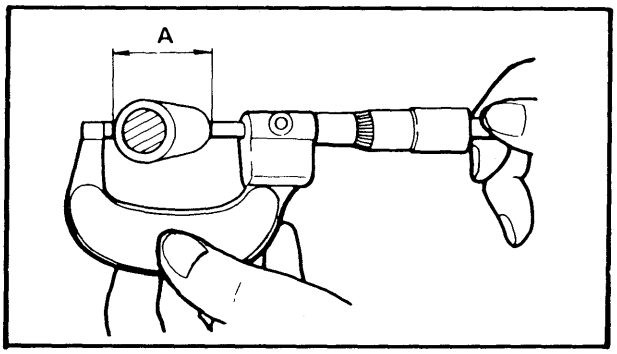
4. Check:
   - Valve sealing
     Leakage at valve seat → Reface, relap or replace valve, relap.
     Refer to "VALVE SEAT".

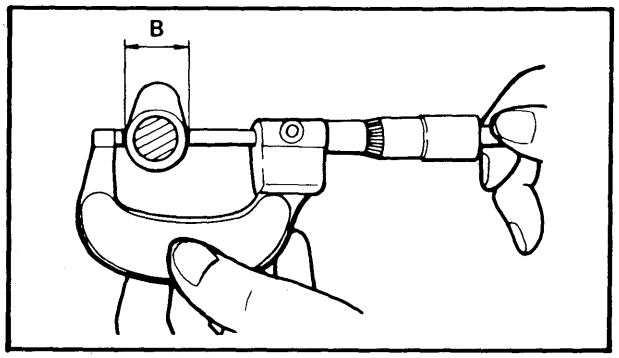
Valve seat checking steps:
- Pour a clean solvent ① into the intake and exhaust ports.
- Check the valve sealing, there should be no leakage at the valve seat ② .

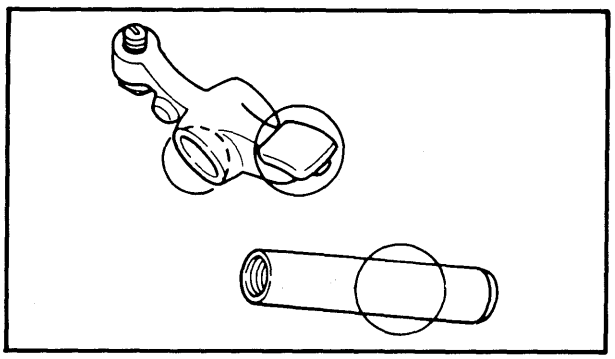
Relapping steps:
- Reassemble head parts.
- Repeat lapping steps using fine lapping compound.
- Clean all parts thoroughly.
- Reassemble and check for leakage again using solvent.
- Repeat steps as often as necessary to effect a satisfactory seal.

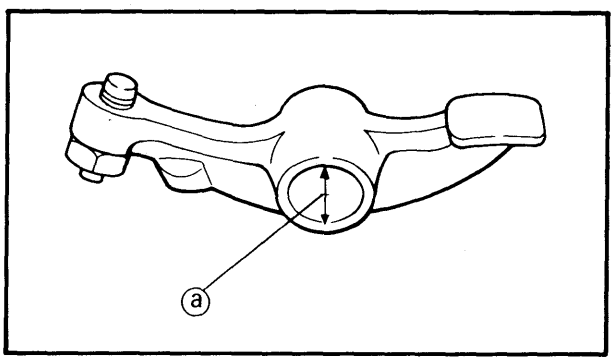
CAM SHAFT

1. Inspect:
   - Camshaft bushing (Cylinder head)
     Wear/Damage → Replace.









2. Inspect:
   - Cam lobes
     Pitting/Scratches/Blue discoloration → Replace.
3. Measure:
   - Cam lobes
     Use a Micrometer.
     Out of specification → Replace.

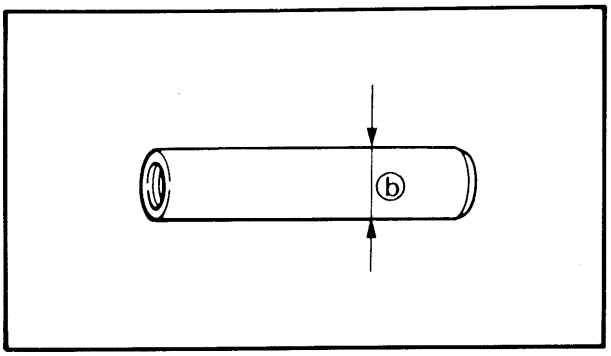
	Cam Lobe Limit "A"	Cam Lobe Limit "B"
Intake	26.090 mm (1.027 in)	20.045 mm (0.789 in)
Exhaust	26.090 mm (1.027 in)	20.087 mm (0.791 in)

ROCKER ARM AND ROCKER ARM SHAFT

1. Inspect:
   - Rocker arm shafts
   - Rocker arms
     Wear/Damage → Replace.

Rocker arm shaft and arm inspection steps:
- Inspect the two areas on the rocker arm for sings of unusual wear.
  1) Rocker arm shaft hole.
  2) Cam-lobe-contact surface.
     Excessive wear → Replace.
- Inspect the surface condition of the rocker arm shaft.
  Pitting/Scratches/Blue discoloration → Replace/Check lubrication.
- Measure the inside diameter ⓐ of the rocker arm hole.
  Out of specification → Replace.

Rocker Arm Inside Diameter:
10.000 ~ 10.015 mm
(0.3937 ~ 0.3943 in)



• Measure the outside diameter ⓑ of the rocker arm shaft.
Out of specification → Replace.

Rocker Arm Shaft Outside Diameter:
9.981 ~ 9.991 mm
(0.3930 ~ 0.3933 in)

• Calculate the clearance by subtracting the rocker-arm-shaft outside diameter from the rocker-arm inside diameter.
Clearance is greater than 0.08 mm (0.0032 in) → Replace either or both parts.

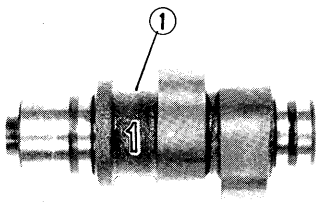
Arm-to-shaft Clearance (Standard):
0.009 ~ 0.034 mm
(0.0004 ~ 0.0013 in)

2. Lubricate:
   • Rocker arms
   • Rocker arm shafts
   • Cam shafts

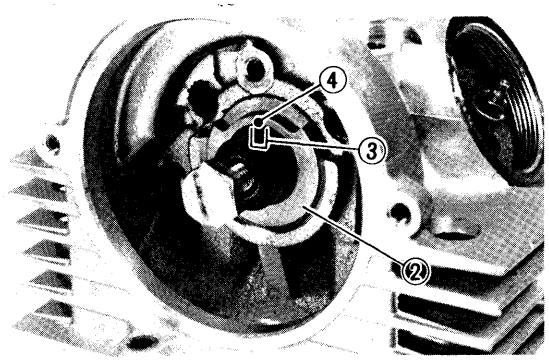
SAE 10W30 Motor Oil

3. Install:
   • Rocker arms
   • Rocker arm shafts

NOTE:
Thread hole of the rocker arm shaft should be placed outside.



4. Install:
   • Camshaft ①
   • Camshaft bushing ②
   To the cylinder head.



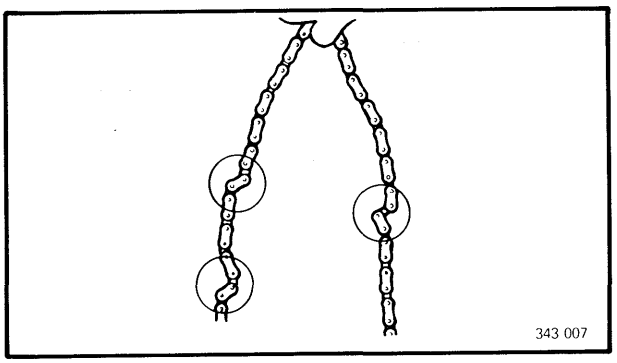
NOTE:
- Install the #1 camshaft into the front cylinder head.
- The Groove ③ on the end of the camshaft must align with the timing mark ④ on the cylinder head.
- The cut-out portion of the bushing must be flush with the cylinder head.

⚠ CAUTION:

Do not cock the bushing during installation. The bushing must be perpendicular to the camshaft during installation.

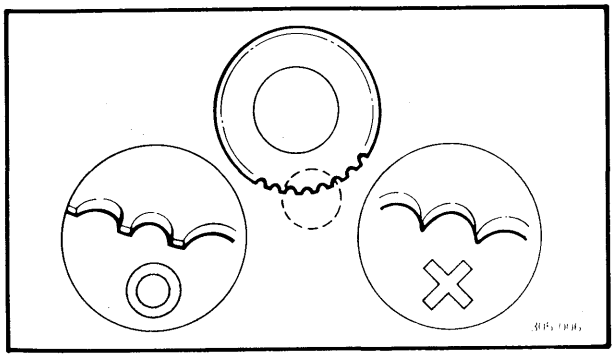
5. Install:
   - Stopper

	Bolt (Stopper): **12 Nm (1.2 m·kg, 8.7 ft·lb)**



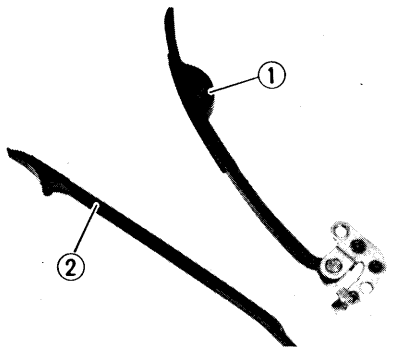
TIMING CHAIN, CAM SPROCKET AND CHAIN TENSIONER

1. Inspect:
   - Timing chain
     Stiff/Cracks → Replace timing chain and cam sprocket as a set.



Cam Sprocket

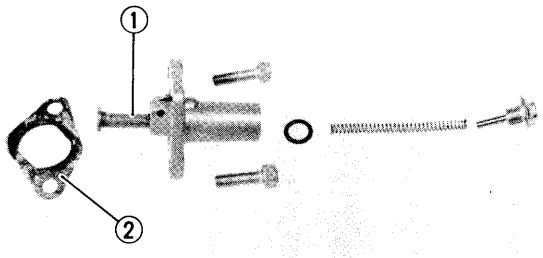
1. Inspect:
   - Cam sprocket
     Wear/Damage → Replace.



Chain Guide

1. Inspect:
   - Cam chain damper (Intake) ①
   - Cam chain damper (Exhaust) ②

   Wear → Replace.



Chain Tensioner

1. Inspect:
   - Chain tensioner rod ①
   - Gasket ②

   Damage/Wear → Replace.

TAPPET COVER AND CAM SPROCKET COVER

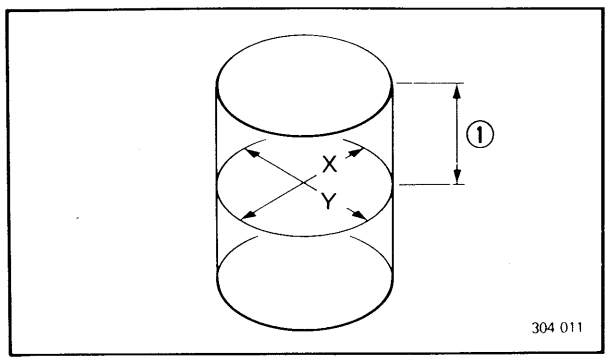
1. Inspect:
   - Tappet covers
   - Cam sprocket cover
   - O-rings

   Damage → Replace.

CYLINDER AND PISTON

1. Inspect:
   - Cylinder and piston walls

   Vertical scratches → Rebore or replace cylinder and piston.
2. Measure:
   - Piston-to-cylinder clearance



Piston-to-cylinder clearance measurement steps:

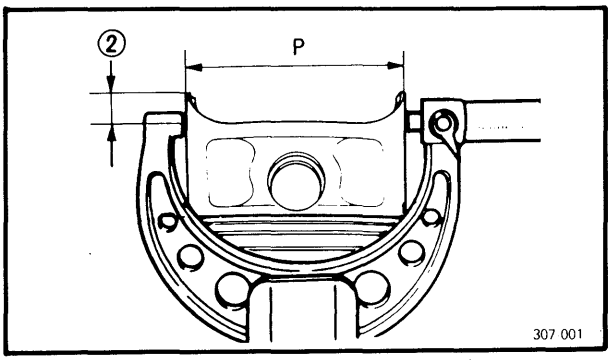
First step:

- Measure the cylinder bore "C" with the Cylinder Bore Gauge.

① 45 mm (1.77 in) from the cylinder top

NOTE:

Measure the cylinder bore "C" in parallel to and at right angles to the crankshaft. Then, find the average of the measurements.



	Standard	Wear Limit
Cylinder Bore "C":	48.99 ~ 49.03 mm (1.929 ~ 1.930 in)	49.10 mm (1.933 in)

$$C = \frac{X + Y}{2}$$

- If out of specification, rebore or replace the cylinder, and replace the piston and piston ring as a set.

Second step:

- Measure the piston skirt diameter "P" with a micrometer.

② 6 mm (0.24 in) from the piston bottom edge

Piston Outside Diameter "P"	
Standard	48.96 ~ 49.00 mm (1.928 ~ 1.929 in)
Oversize 1	49.25 mm (1.939 in)
Oversize 2	49.50 mm (1.949 in)

- If out of specification, replace the piston and piston rings as a set.

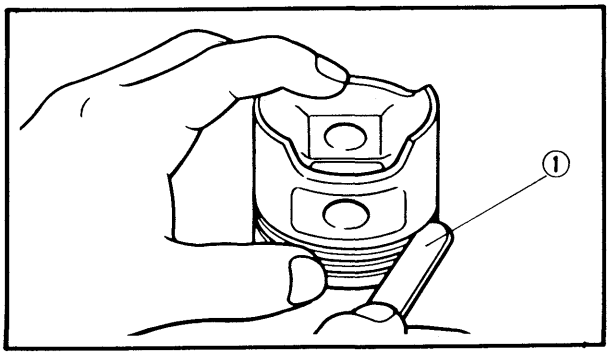
Third step:

- Find the piston-to-cylinder clearance with following formula:

Piston-to-cylinder Clearance = Cylinder Bore "C" – Piston Skirt Diameter "P"

- If out of specification, rebore or replace the cylinder, and replace the piston and piston rings as a set.

Piston-to-cylinder Clearance: 0.02 ~ 0.04 mm (0.0008 ~ 0.0016 in)



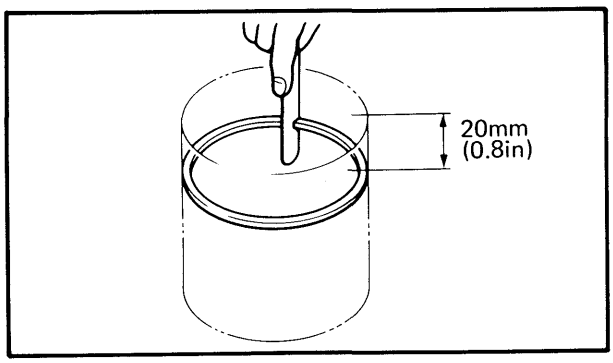
PISTON RING AND PISTON PIN

Piston Ring

1. Measure:
   - Side clearance
     Use the Feeler Gauge ① .
     Out of specification → Replace piston and/or rings.

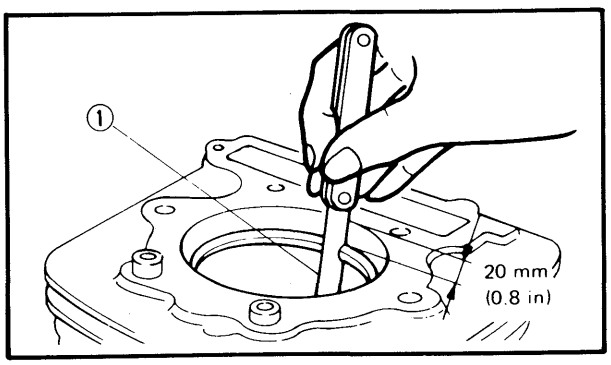
NOTE:
Decarbon the piston ring grooves and rings before measuring the side clearance.

	Side Clearance	
	Standard	Limit
Top Ring	0.03 ~ 0.07 mm (0.001 ~ 0.003 in)	0.12 mm (0.005 in)
2nd Ring	0.02 ~ 0.06 mm (0.0008 ~ 0.0024 in)	0.12 mm (0.005 in)



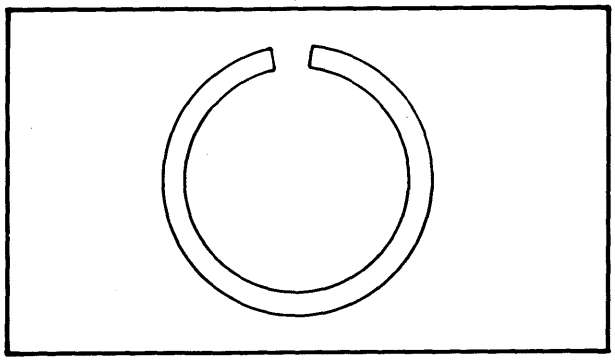
2. Position:
   - Piston ring
     Into cylinder.

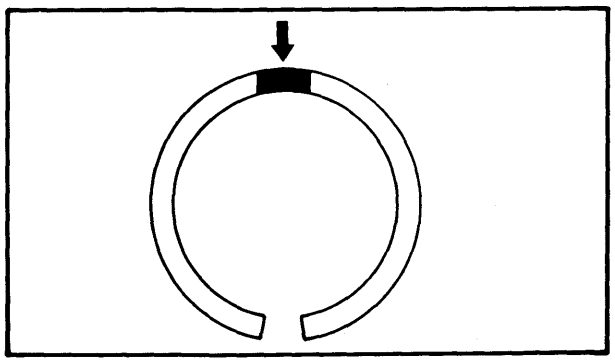
NOTE:
Insert the ring into the cylinder, and push it approximately 20 mm (0.8 in) into the cylinder. Push the ring with the piston crown so that the ring will be at a right angle to the cylinder bore.



3. Measure:
   - End gap
     Use a Feeler Gauge ①
     Out of specification → Replace rings as set.

	End Gap	
	Standard	Limit
Top Ring	0.15 ~ 0.30 mm (0.006 ~ 0.012 in)	0.4 mm (0.016 in)
2nd Ring	0.15 ~ 0.30 mm (0.006 ~ 0.012 in)	0.4 mm (0.016 in)
Oil Ring	0.2 ~ 0.9 mm (0.008 ~ 0.035 in)	–





Piston Ring Oversize

- Top and 2nd piston ring

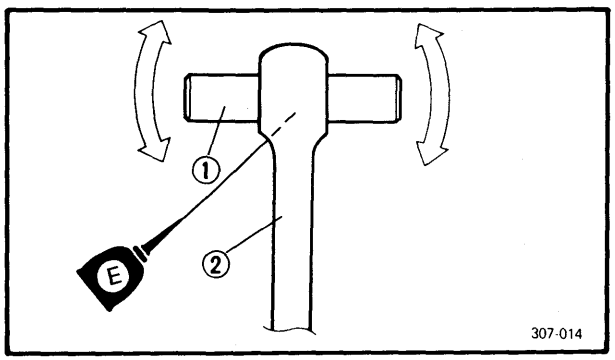
  Oversize top and middle ring sizes are stamped on top of ring.

Oversize 1	0.25 mm (0.0098 in)
Oversize 2	0.50 mm (0.0197 in)

- Oil control ring

  Expander spacer of bottom ring (oil control ring) is color-coded to identify sizes.

Size	Color
Oversize 2	Blue
Oversize 4	Yellow



Piston Pin

1. Lubricate:
   - Piston pin (Lightly)
2. Install:
   - Piston pin ①

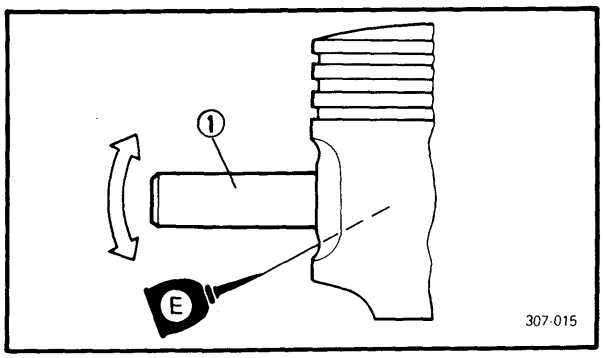
   Into small end of connecting rod ② .
3. Check:
   - Free play

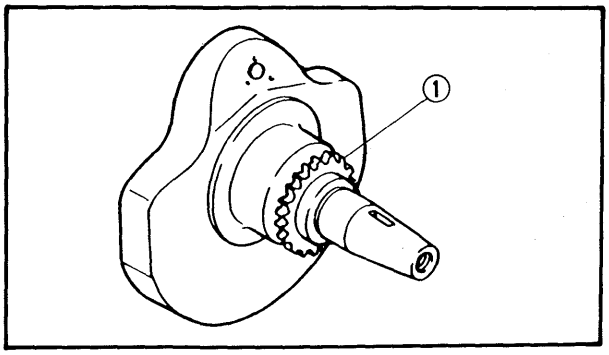
   Free play → Inspect connecting rod and piston pin for wear.
4. Position:
   - Piston pin ①

   Into piston.
5. Check:
   - Free play

   When pin is in place in piston.

   Free play → Replace piston pin and/or piston.

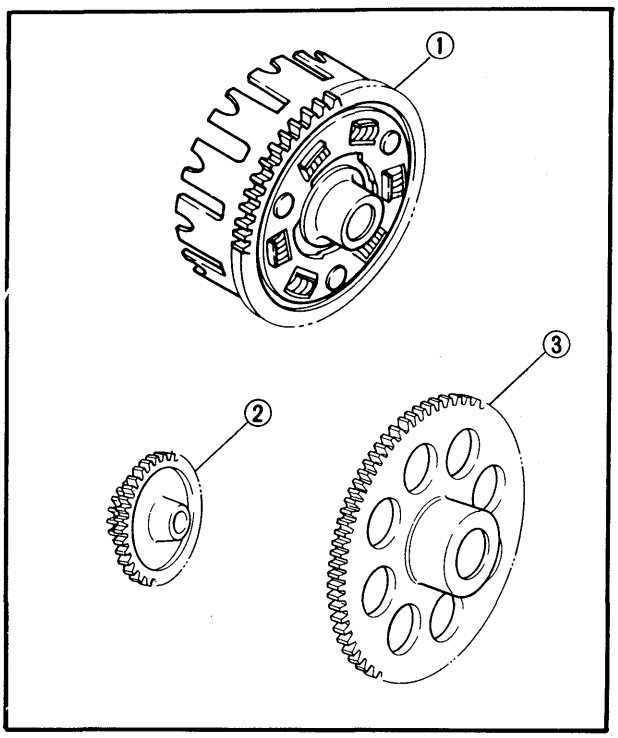




PRIMARY GEARS AND STARTER

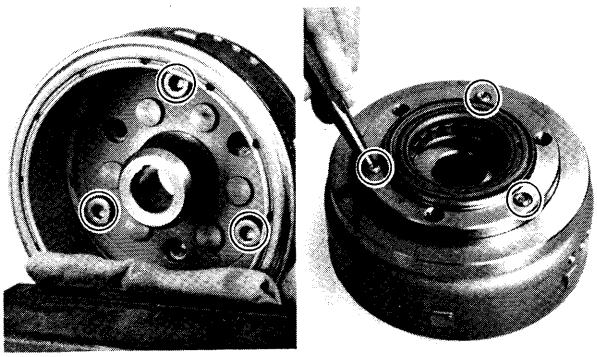
1. Inspect:
   - Drive gear ①

   Scratches/Wear/Damage → Replace crankshaft.



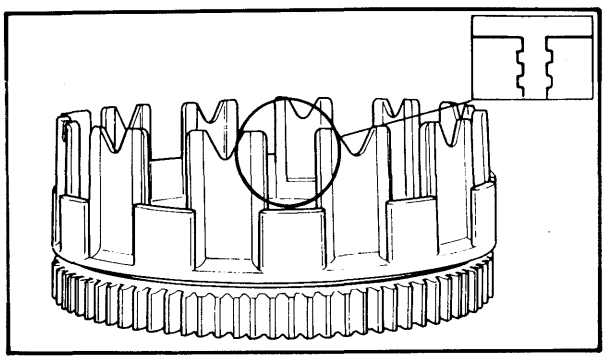
2. Inspect:
   - Driven gear ①
     Scratches/Wear/Damage → Replace clutch housing assembly.
   - Idler gears (# 1 and # 2) ② ③
     Scratches/Wear/Damage → Replace.

3. Check:
   - Starter clutch operation
     Unsmooth operation → Replace one way clutch.



4. Inspect:
   - Bolts (Starter clutch)
     Loose → Replace with a new one, and clinch the end of the bolt.

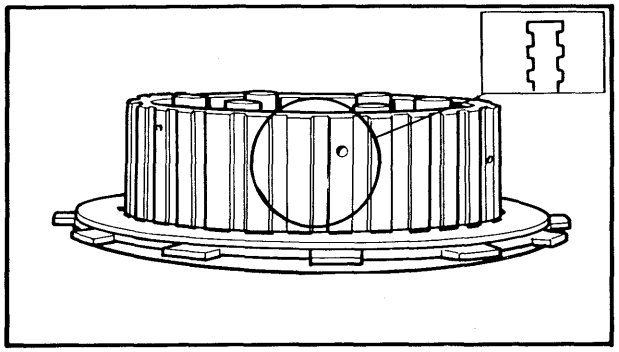
Bolts (Starter Clutch):
30 Nm (3.0 m·kg, 22 ft·lb)
LOCTITE®
Stake Over the End of the Bolt



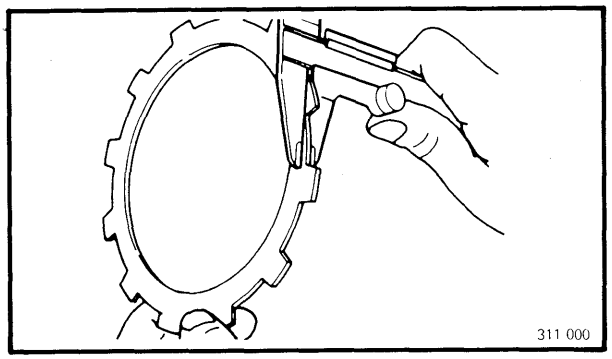
CLUTCH

Clutch Housing

1. Inspect:
   - Dogs on the housing
     Cracks/Wear/Damage → Deburr or replace.
   - Clutch housing bearing
     Chafing/Wear/Damage → Replace.



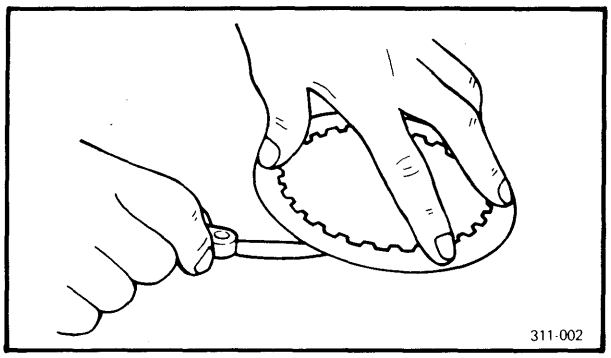
1. Inspect:
   - Clutch boss splines
     Scoring/Wear/Damage → Replace clutch boss assembly.



Friction Plates

1. Inspect:
   - Friction plate
     Damage/Wear → Replace friction plate as a set.
2. Measure:
   - Friction plate thickness
     Measure at all four points.
     Out of specification → Replace friction plate as a set.

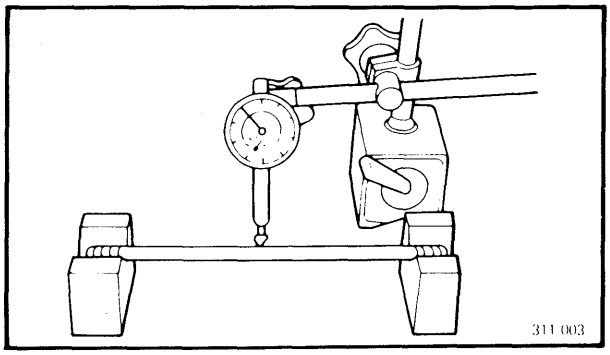
Friction Plate 1 Wear Limit:
2.8 mm (0.11 in) x 1 pc.
Friction Plate 2 Wear Limit:
2.5 mm (0.098 in) x 4 pcs.



Clutch Plates

1. Measure:
   - Clutch plate warpage
     Use the surface plate and the Feeler Gauge.
     Out of specification → Replace.

Warp Limit:
0.2 mm (0.008 in)



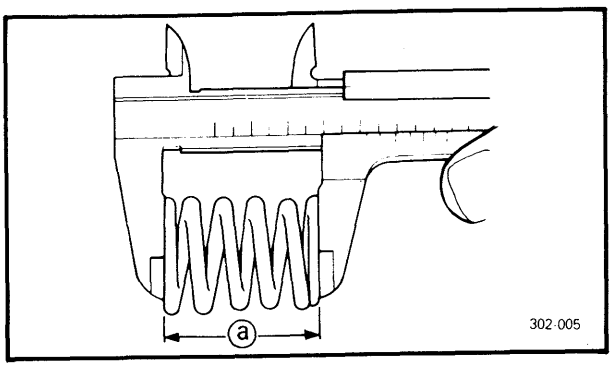
Push Rod

1. Measure:
   - Push rod runout
     Use V-Blocks and the Dial Gauge.
     Out of specification → Replace.

Bending Limit:
0.5 mm (0.02 in)

Clutch Bearing

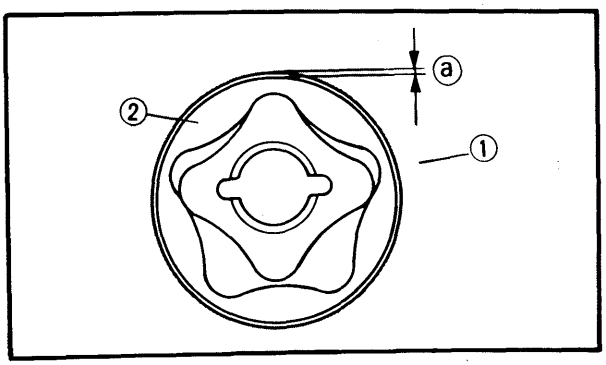
1. Inspect:
   - Bearing
     Pitting/Damage → Replace.

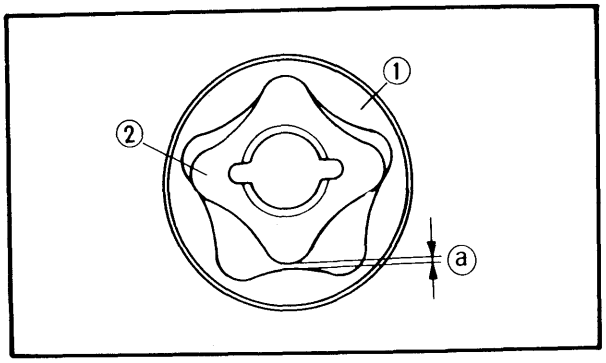


Clutch Spring

1. Inspect:
   - Clutch spring
     Wear/Damage → Replace.
2. Measure:
   - Clutch spring free length ⓐ
     Out of specification → Replace springs as a set.

Clutch Spring Minimum Length:
33.6 mm (1.32 in)





OIL PUMP

1. Measure:
   - Housing ① /Outer rotor ② clearance ⓐ
     Use a Feeler Gauge.
     Out of specification → Replace oil pump assembly.

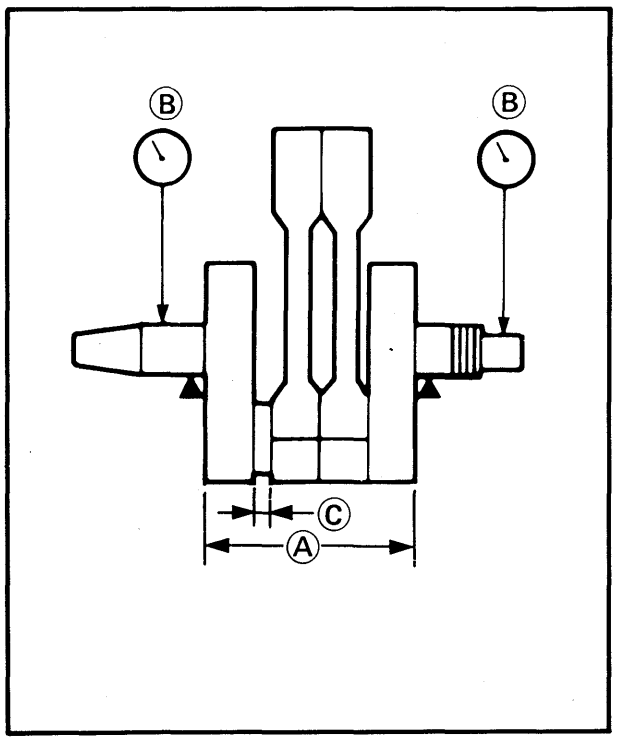
Side Clearance Limit:
0.09 mm (0.004 in)

2. Measure:
   - Outer rotor ① /Inner rotor ② clearance ⓐ
     Use a Feeler Gauge.
     Out of specification → Replace oil pump assembly.

Tip Clearance Limit:
0.20 mm (0.008 in)

3. Inspect:
   - Oil pump drive gear
   - Oil pump driven gear

   Wear/Damage → Replace.



CRANKSHAFT

1. Measure:
   - Crank width Ⓐ

   Out of specification → Replace crankshaft.

Crank Width:
69.75 ~ 68.00 mm
(2.675 ~ 2.677 in)

   - Runout Ⓑ

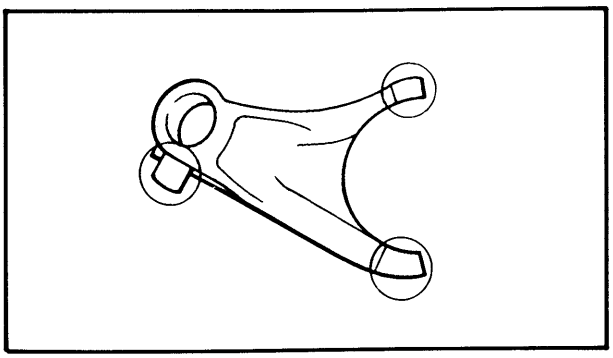
   Out of specification → Replace crankshaft and/or bearing.

Runout Limit:
0.03 mm (0.001 in)

   - Side clearance Ⓒ

   Out of specification → Replace connecting rod.

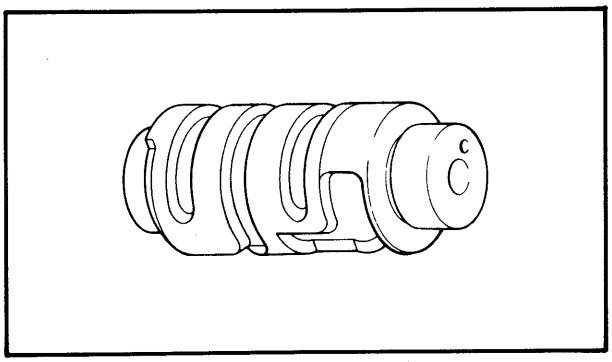
Big End Side Clearance:
0.40 ~ 1.05 mm (0.016 ~ 0.041 in)



TRANSMISSION

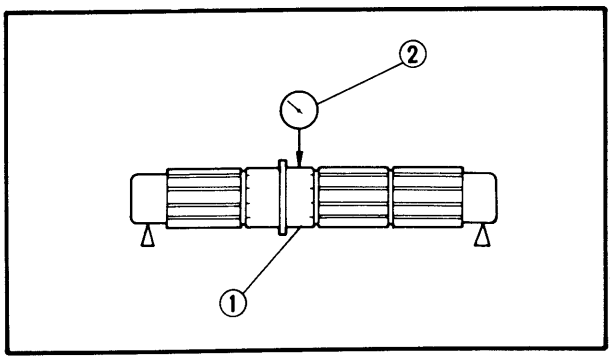
Shift Fork

1. Inspect:
   - Shift forks
     On the gear and shift cam contact surfaces.
     Wear/Chafing/Bends/Damage → Replace.
2. Check:
   - Shift fork movement
     On its guide bar.
     Unsmooth operation → Replace fork and/or guide bar.



Shift Cam

1. Inspect:
   - Shift cam grooves
     Wear/Damage/Scratches → Replace.
   - Shift cam segment
     Damage/Wear → Replace.
   - Shift cam bearing
     Pitting/Damage → Replace.

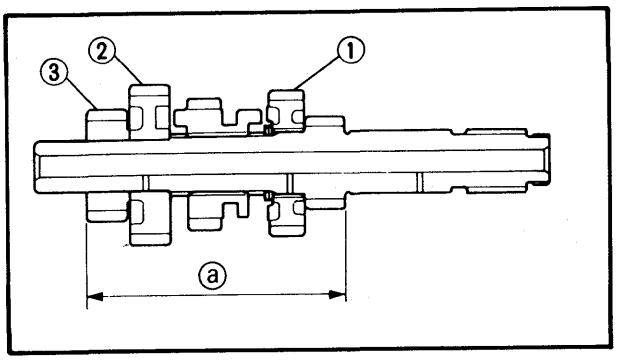


Main/Drive Axles and Gears

1. Measure:
   - Axle runout ①
     Use the centering device and Dial Gauge ② .
     Out of specification → Replace.

Runout Limit:
0.08 mm (0.0031 in)

2. Inspect:
   - Gears
     Damage/Wear → Replace.
3. Check:
   - Gear movement
     Unsmooth operation → Replace.
4. Inspect:
   - Mating dogs
     Cracks/Wear/Damage → Replace.



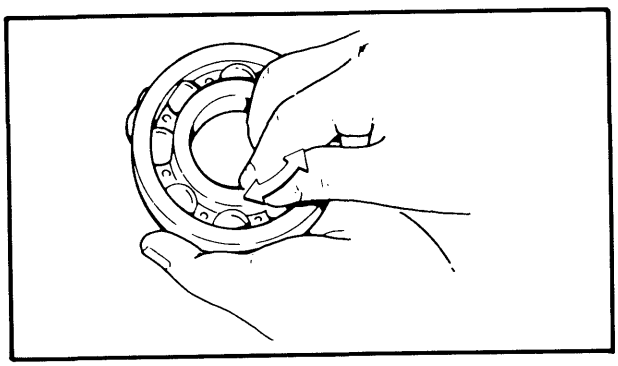
NOTE:

When replacing the main axle or pinions, take the following steps:

- Apply molybdenum oil to the 4th ① and 5th ② pinion gear bosses.
- Using a hydraulic press; force-fit the 2nd pinion gear ③ to the position specified ⓐ.

2nd Pinion Gear Position ⓐ :
87.2 ~ 87.4 mm
(3.43 ~ 3.44 in)

- After installing the pinions onto the main axle, make sure the 4th and 5th pinion gears turn freely.



BEARINGS

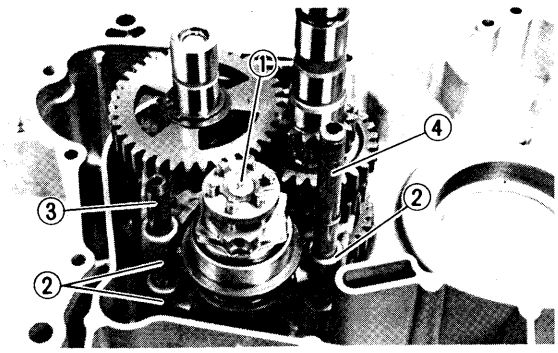
1. Inspect:
   - Axle bearings
   - Shift cam bearing

   Pitting/Damage → Replace.

CIRCLIPS AND WASHERS

1. Inspect:
   - Circlips
   - Washers

   Damage/Looseness/Bends → Replace.

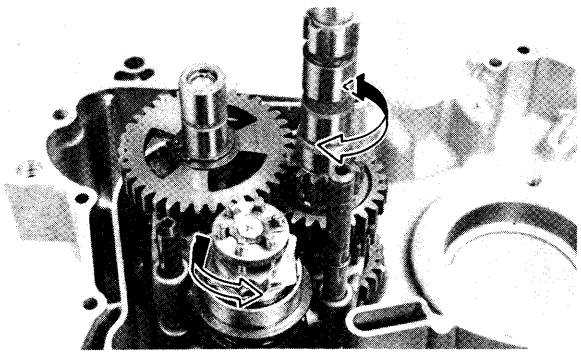


ENGINE ASSEMBLY AND ADJUSTMENT

TRANSMISSION AND CRANKSHAFT

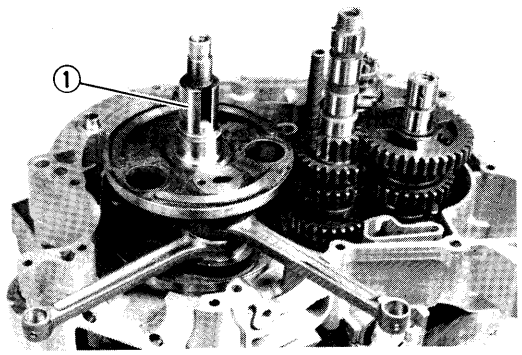
1. Install:
   - Transmission
   - Shift cam ①
   - Shift forks ②
   - Guide bar (Rear – Longer) ③
   - Guide bar (Front – Shorter) ④

NOTE:
Each shift forks is identified by a number cast on its side. All the numbers should face the left side.



2. Check:
   - Shifter operation
     Unsmooth operation → Repair.

NOTE:
- Oil each gear and bearing thoroughly.
- Before assembling the crankcase, be sure that the transmission is in neutral and that the gears turn freely.

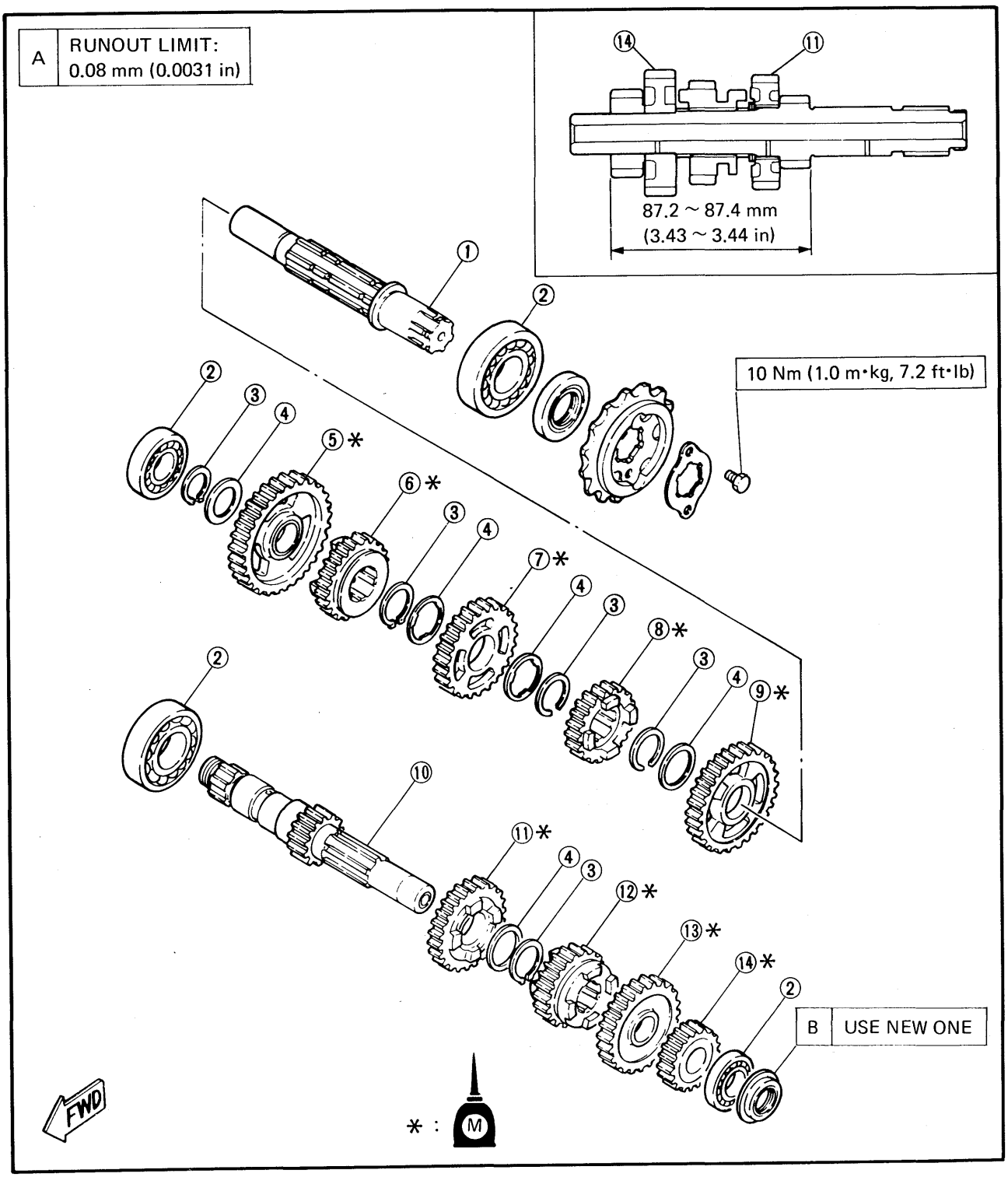


3. Install:
   - Crankshaft ①
     Into the crankcase (Left).

NOTE:
- Install the tapered end of the crankshaft (Left side) into the crankcase.
- Align the left connecting rod with the rear cylinder sleeve hole.
- The rod must be in this hole when the crankshaft is properly installed.

TRANSMISSION

① Drive axle
② Bearing
③ Circlip
④ Washer
⑤ Wheel gear (1st) (38T)
⑥ Wheel gear (4th) (28T)
⑦ Wheel gear (3rd) (35T)
⑧ Wheel gear (5th) (29T)
⑨ Wheel gear (2nd) (38T)
⑩ Main axle
⑪ Pinion gear (4th) (24T)
⑫ Pinion gear (3rd) (24T)
⑬ Pinion gear (5th) (30T)
⑭ Pinion gear (2nd) (20T)



CRANKSHAFT

① Piston ring set
② Piston
③ Piston pin
④ Connecting rod
⑤ Crank pin
⑥ Crank (Right)
⑦ Crank (Left)
⑧ Woodruff key

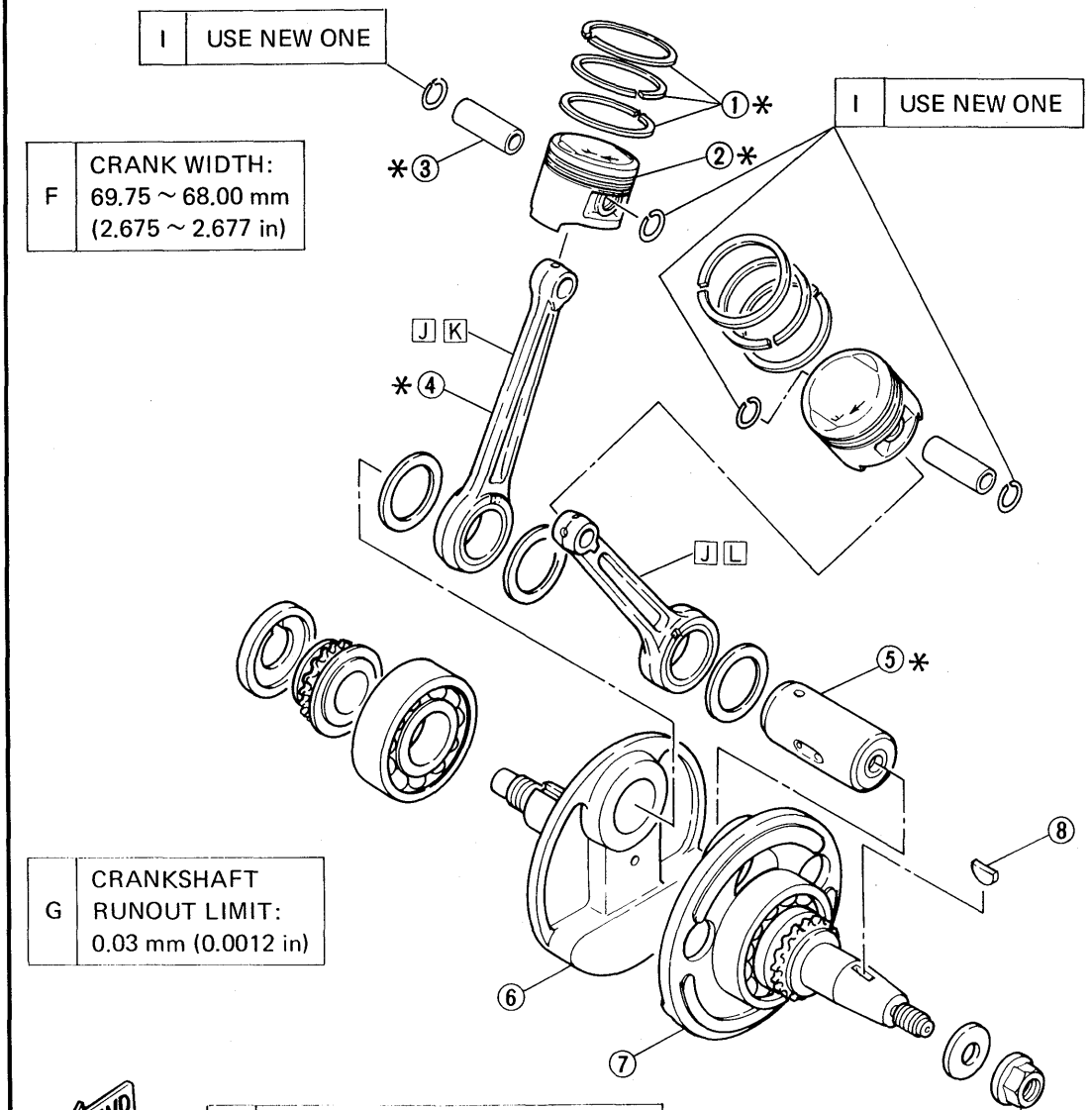
[J] "Y" mark towards the outside.
[K] For rear cylinder
[L] For front cylinder

		A	TOP RING	B	2ND RING
C	SIDE CLEARANCE LIMIT:	0.12 mm (0.005 in)		0.12 mm (0.005 in)	
D	END GAP LIMIT:	0.4 mm (0.016 in)		0.4 mm (0.016 in)	

E | PISTON-TO-CYLINDER CLEARANCE: 0.02 ~ 0.04 mm (0.0008 ~ 0.0016 in)

I | USE NEW ONE

F | CRANK WIDTH: 69.75 ~ 68.00 mm (2.675 ~ 2.677 in)

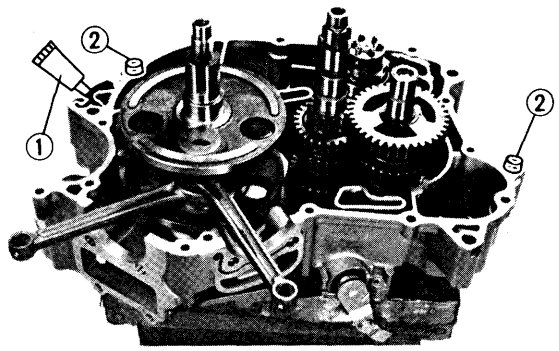


G | CRANKSHAFT RUNOUT LIMIT: 0.03 mm (0.0012 in)

H | BIG END SIDE CLEARANCE: 0.40 ~ 1.05 mm (0.016 ~ 0.041 in)

80 Nm (8.0 m·kg, 58 ft·lb)

* : E

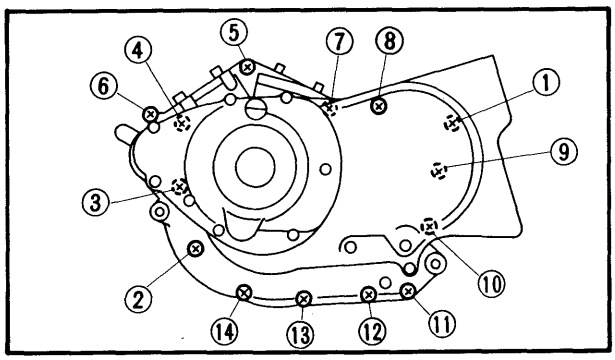


CRANKCASE

1. Apply:
   - Sealant (Quick Gasket®) ① (ACC-11001-05-01)
     To the mating surfaces of both case halves.
2. Install:
   - Dowel pins ②
3. Fit the right crankcase onto the left case. Tap lightly on the case with a soft hammer.

⚠ CAUTION:

Before installing and torquing the crankcase holding bolts, be sure to check whether the transmission is functioning properly by manually rotating the shift cam either way.



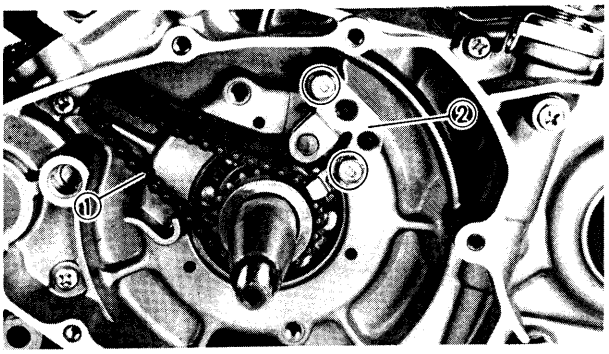
4. Tighten:
   - Screws (Crankcase) ① ~ ⑭

NOTE:

Tighten the screws starting with the lowest numbered one.

	Screws (Crankcase): **7 Nm (0.7 m·kg, 5.1 ft·lb)**

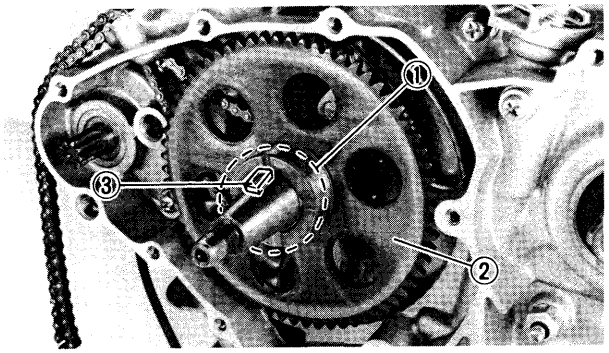
5. Apply:
   - 4-stoke engine oil
     To the crank pin, bearing and oil delivery hole.
6. Check:
   - Crankshaft and transmission operation
     Unsmooth operation → Repair.



A.C. MAGNETO

1. Install:
   - Timing chain ①
   - Chain guide (Intake) ②

	Bolts (Chain Guide): **10 Nm (1.0 m·kg, 7.2 ft·lb)**

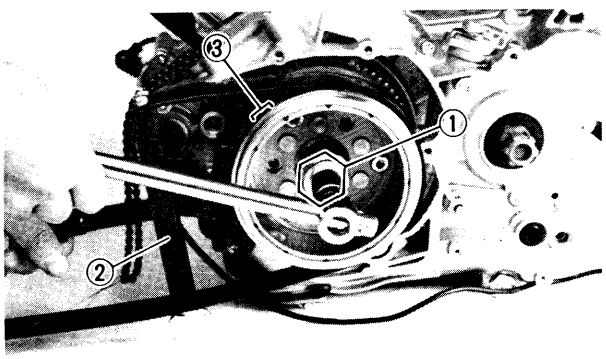


2. Install:
   - Washer ①
   - Idler gear # 2 ②
   - Woodruff key ③

NOTE:
Before installing the idler gear # 2, do not forget to fit the washer ①.

3. Install:
   - Rotor
   - Plain washer
   - Nut (Rotor)

NOTE:
- Before installing the rotor, clean the outside of the crankshaft and inside of the rotor.
- When installing the rotor, make sure the woodruff key is properly seated in the key way of the crankshaft.



4. Tighten:
   - Nut (Rotor) ①

   Use the Sheave Holder ②.

	Sheave Holder: **YS-01880**

NOTE:
Do not allow the special tool to touch the projection ③ on the rotor.

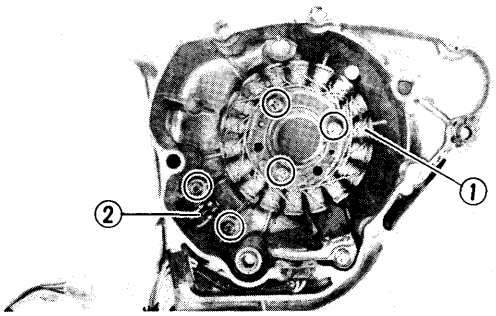
	Nut (Rotor): **80 Nm (8.0 m·kg, 58 ft·lb)**

STARTER MOTOR

1. Install:
   - Starter motor

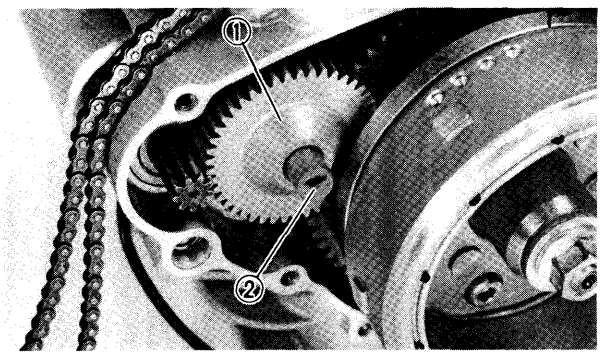
	Bolts (Starter Motor): 10 Nm (1.0 m·kg, 7.2 ft·lb)

CRANKCASE COVER (LEFT)

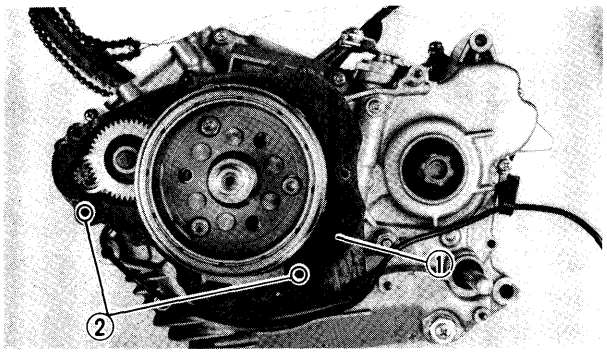


1. Install:
   - Stator ①
   - Pickup coil ②

	Screws (Stator Coil): 7 Nm (0.7 m·kg, 5.1 ft·lb) **Screws (Pickup Coil): 5 Nm (0.5 m·kg, 3.6 ft·lb)**



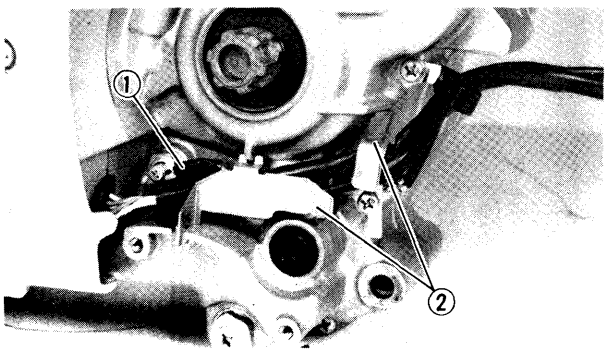
2. Install:
   - Idle gear #1 ①
   - Guide bar ②



3. Install:
   - Gasket ①
   - Dowel pins ②
   - Crankcase cover (Left)

NOTE:
Tighten in a crisscross pattern.

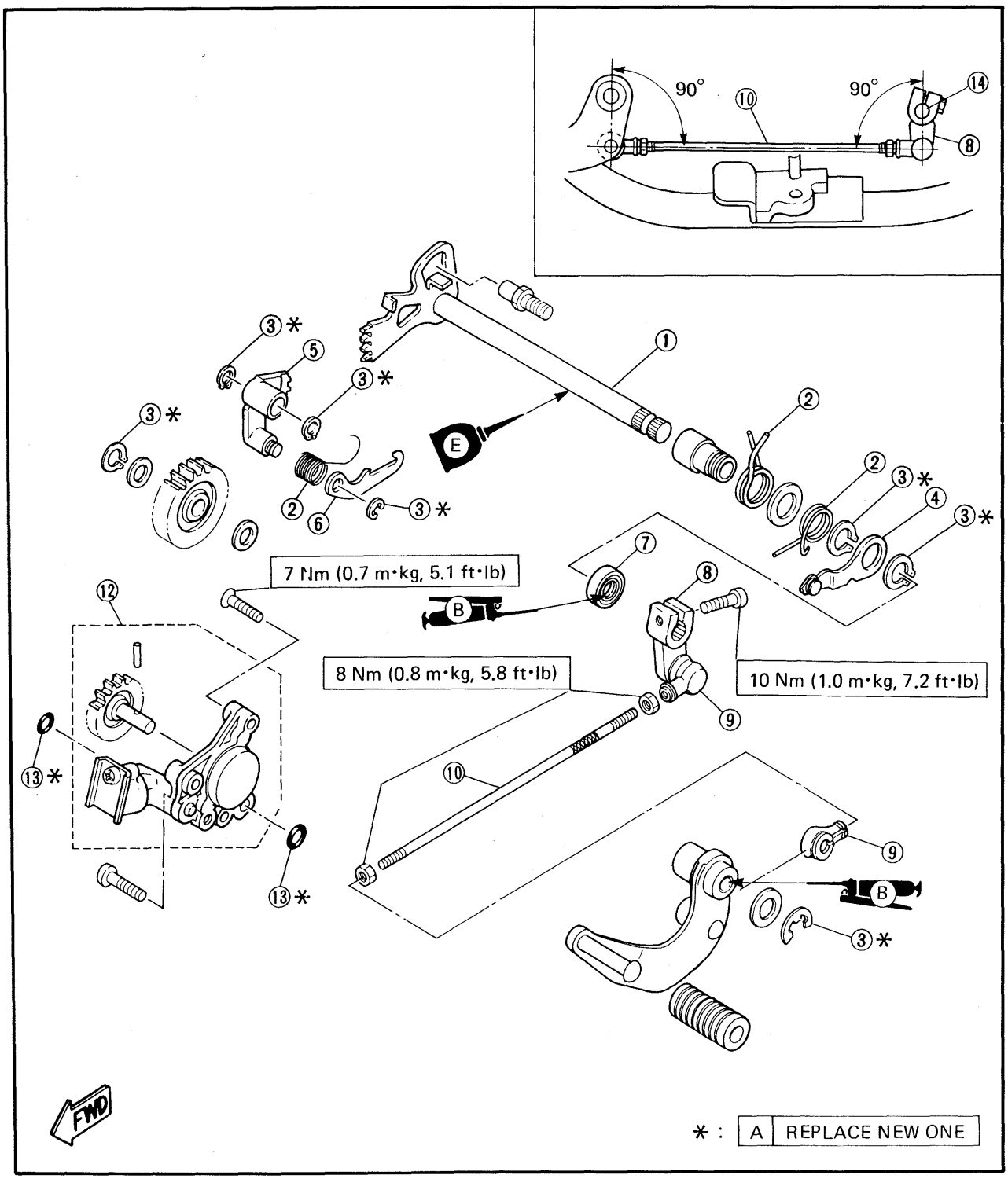
	Screws (Crankcase Cover – Left): 7 Nm (0.7 m·kg, 5.1 ft·lb)

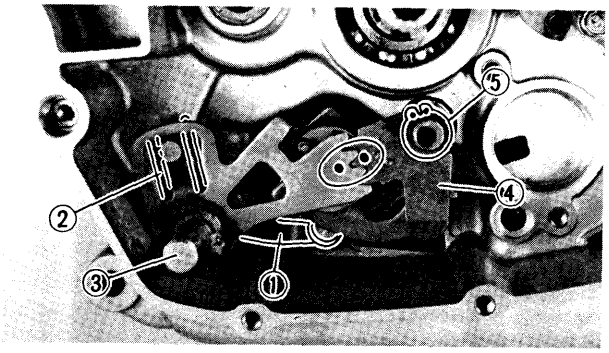


4. Connect:
   - Neutral switch lead ①
5. Install:
   - Holders (Wiring) ②

SHIFT SHAFT/OIL PUMP

① Shift shaft
② Spring
③ Circlip
④ Shift cam stopper
⑤ Shift lever
⑥ Shift lever arm
⑦ Oil seal
⑧ Shift pedal link
⑨ Dust cover
⑩ Adjuster rod
⑪ Shift pedal
⑫ Oil pump
⑬ O-ring
⑭ Align mark



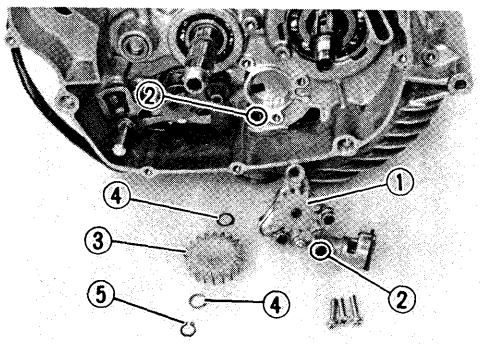


SHIFT SHAFT

1. Install:
   - Shift cam stopper ①
   - Spring ②
   - Shift shaft ③
   - Shift lever ④
   - Circlip ⑤

NOTE:

Be sure to aligen the match marks.

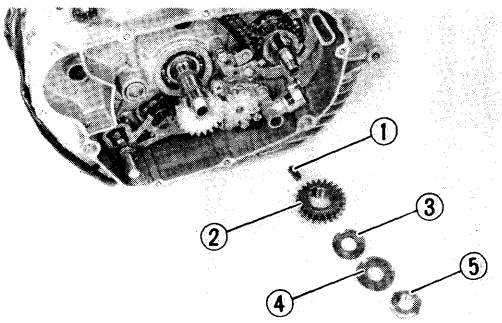


OIL PUMP

1. Install:
   - Oil pump ①
   - O-rings ②

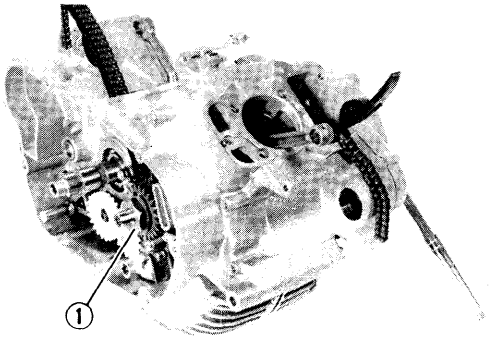
	Screws (Oil Pump): **7 Nm (0.7 m·kg, 5.1 ft·lb)**

   - Drive gear (Oil pump) ③
   - Washers ④
   - Circlip ⑤



CLUTCH

1. Install:
   - Key ①
   - Primary drive gear ②
   - Washer ③
   - Lock washer ④ (New)
   - Nut (primary drive gear) ⑤



2. Tighten:
   - Nut (Primary drive gear) ①

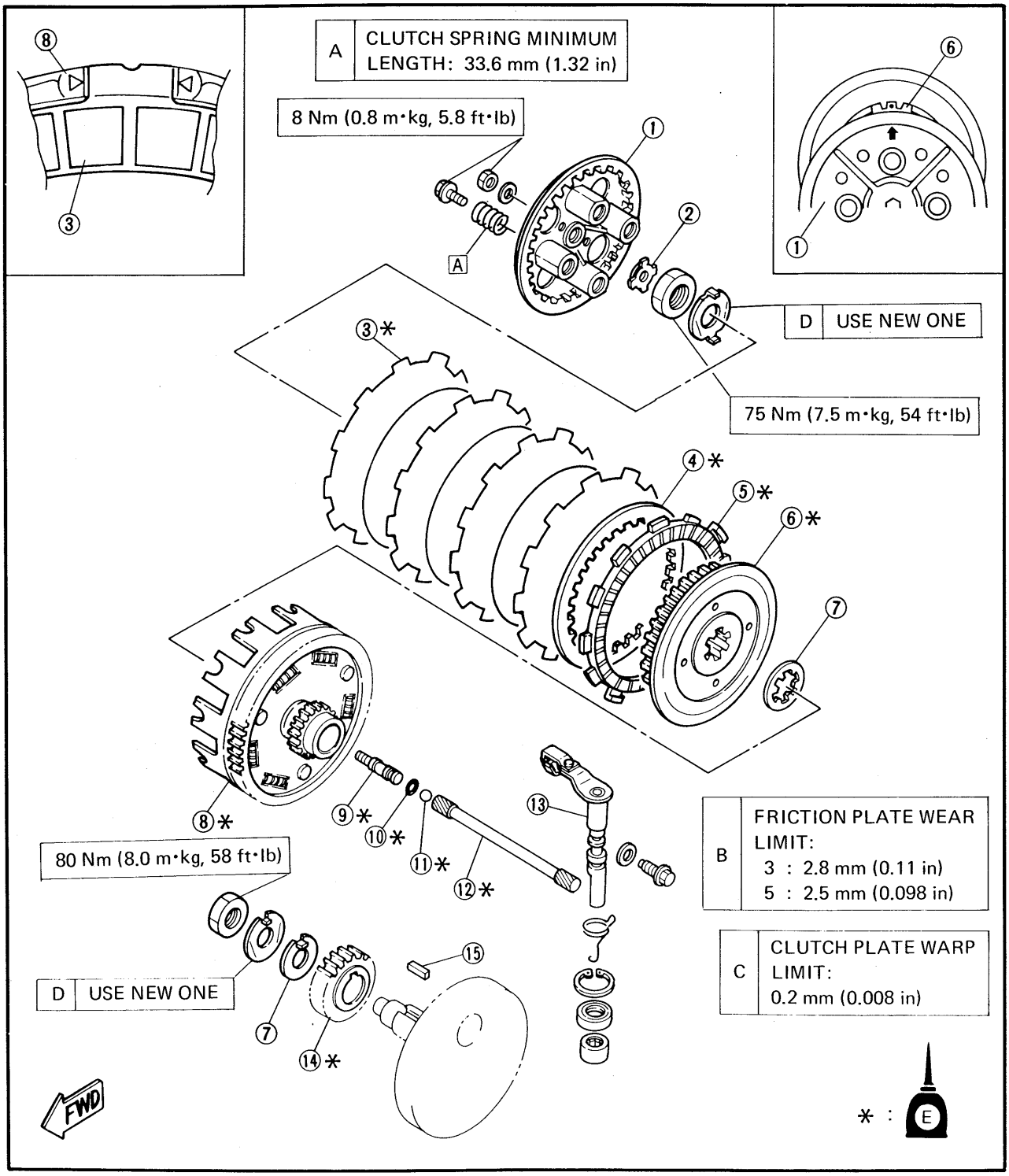
NOTE:

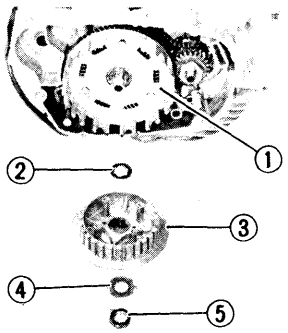
- Use a wrench to hold the rotor.
- Bend the lock washer tab along the nut flats.

	Nut (Primary Drive Gear): **80 Nm (8.0 m·kg, 58 ft·lb)**

CLUTCH

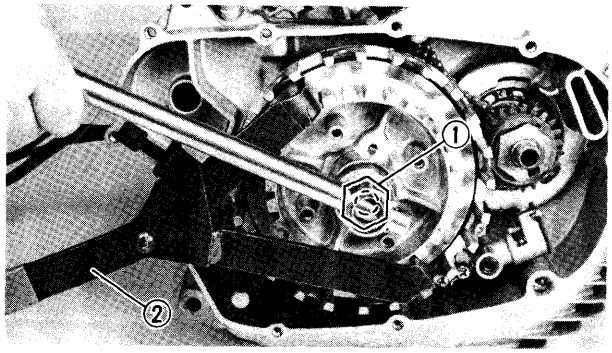
① Pressure plate
② Push plate
③ Friction plate 1 (1 pc.)
④ Clutch plate (4 pcs.)
⑤ Friction plate 2 (4 pcs.)
⑥ Clutch boss
⑦ Holding plate
⑧ Clutch housing
⑨ Push rod #1
⑩ O-ring
⑪ Ball
⑫ Push rod #2
⑬ Push lever assembly
⑭ Primary drive gear
⑮ Key





3. Install:
   - Clutch housing ①
   - Holding plate ②
   - Clutch boss ③
   - Lock washer ④ (New)
   - Nut (Clutch boss) ⑤

NOTE:
Make sure that the tab of the lock washer engages the slots in the clutch boss.

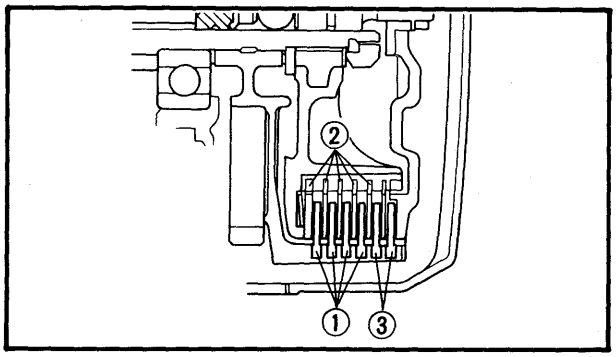


4. Tighten:
   - Nut (Clutch boss) ①

   Use the Universal Clutch Holder ② .

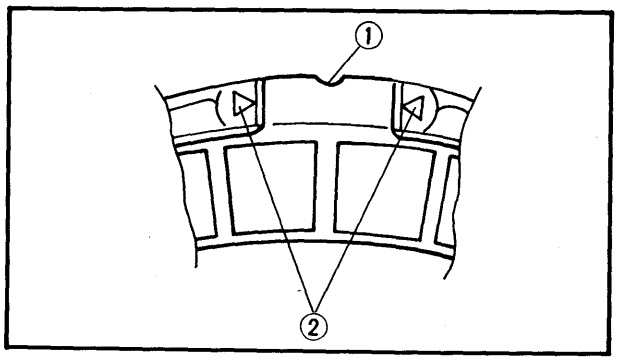
Universal Clutch Holder:
YM-91042

Nut (Clutch Boss):
75 Nm (7.5 m·kg, 54 ft·lb)



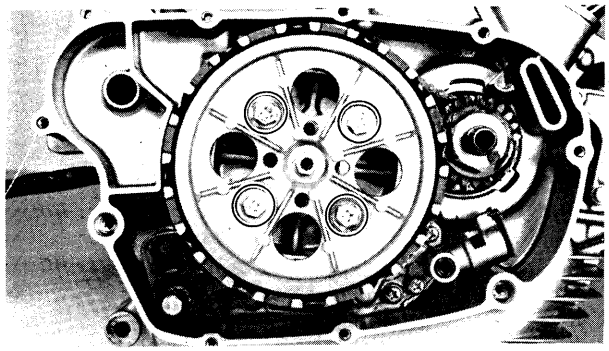
5. Install:
   - Push rod #2
   - Ball
   - Friction plate 2 (4 pcs.) ①
   - Clutch plates ②
   - Friction plate 1 (1 pc) ③

NOTE:
Install the clutch plates and friction plate alternately on the clutch boss, starting with a friction plate and ending with a friction plate.



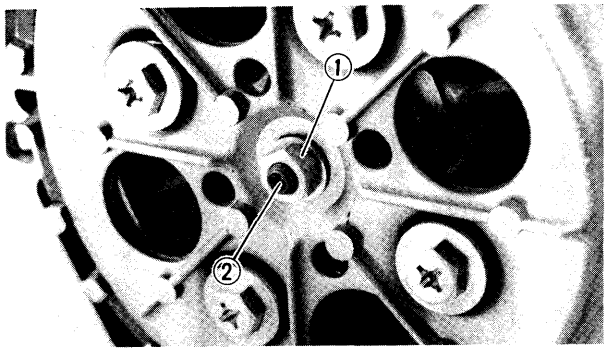
Friction plates and clutch plates installation steps:
- Install the four friction plates 2 (without the single semi-circular slots) and the four clutch plates.
- Install the one friction plate 1.

NOTE:
- Be sure the single semi-circular slot ① on the friction plate is aligned with the clutch housing embossed match marks ② .



6. Install:
   - Pressure plate
   - Clutch springs
   - Screws (Clutch spring)

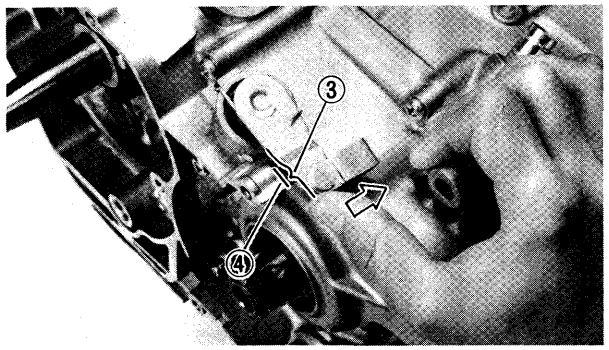
	Screws (Clutch Spring): **8 Nm (0.8 m·kg, 5.8 ft·lb)**



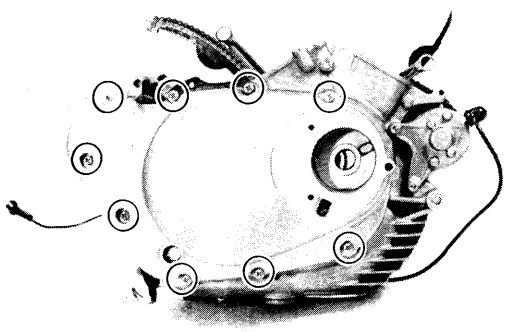
7. Adjust:
   - Clutch mechanism free play

Clutch mechanism free play adjustment steps:
- Loosen the locknut ①.
- Push the push lever toward the front of the engine with your finger until it stops.
- With the push lever in this position, turn the adjuster ② either in or out until the push lever mark ③ and crankcase match mark ④ are aligned.
- Tighten the locknut.

	Locknut: **8 Nm (0.8 m·kg, 5.8 ft·lb)**



8. Install:
   - Timing chain
   - Chain damper (Exhaust)

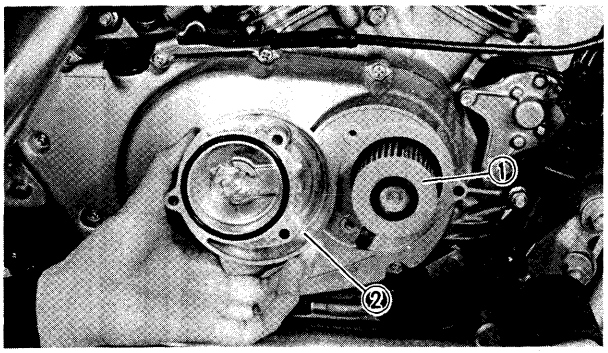


CRANKCASE COVER (RIGHT)

1. Install:
   - Dowel pins
   - Gasket (New)
   - Crankcase cover (Right)
2. Tighten:
   - Screws (Crankcase cover)

NOTE:
Tighten using a crisscross pattern.

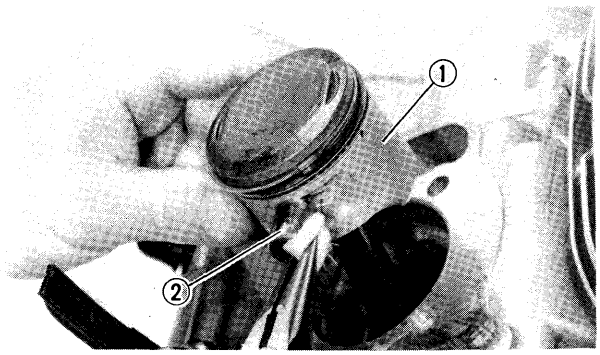
	Screws (Crankcase Cover): 7 Nm (0.7 m·kg, 5.1 ft·lb)



2. Install:
   - Oil filter ①
   - Oil filter cover ②
   - O-ring (Filter cover)

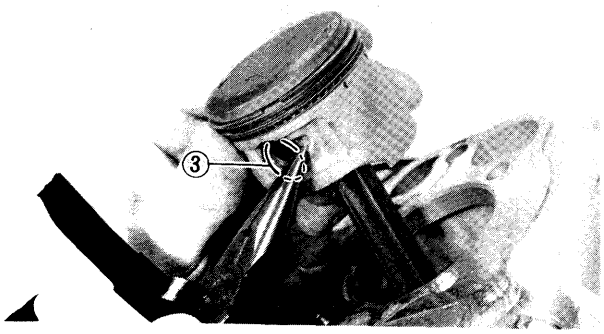
PISTON/CYLINDER AND CYLINDER HEAD

NOTE:
Identify following parts position carefully so that they can be installed in its original place.
- Piston
- Cylinder
- Cylinder head
- Cam sprocket



Front Side

1. Install:
   - Piston ①
   - Piston pin ②
   - Piston pin clip ③

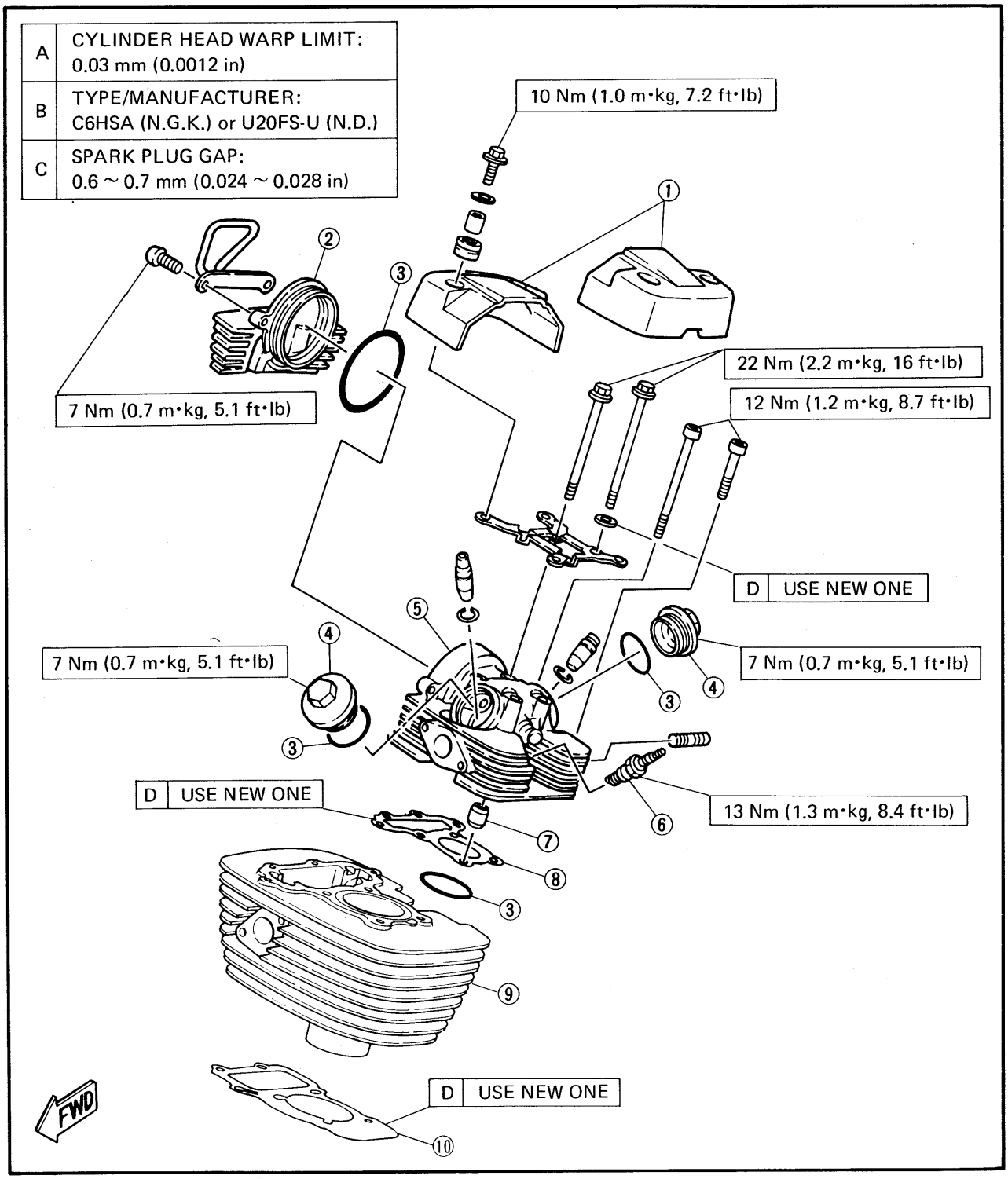


NOTE:
- The "F" mark on the piston must point to the forward side of the engine.
- Before installing the piston pin clip, cover the crankcase with a clean towel or rag so you will not accidentally drop the pin clip and material into the crankcase.

⚠ WARNING:
Always use a new piston pin clip.

CYLINDER AND CYLINDER HEAD

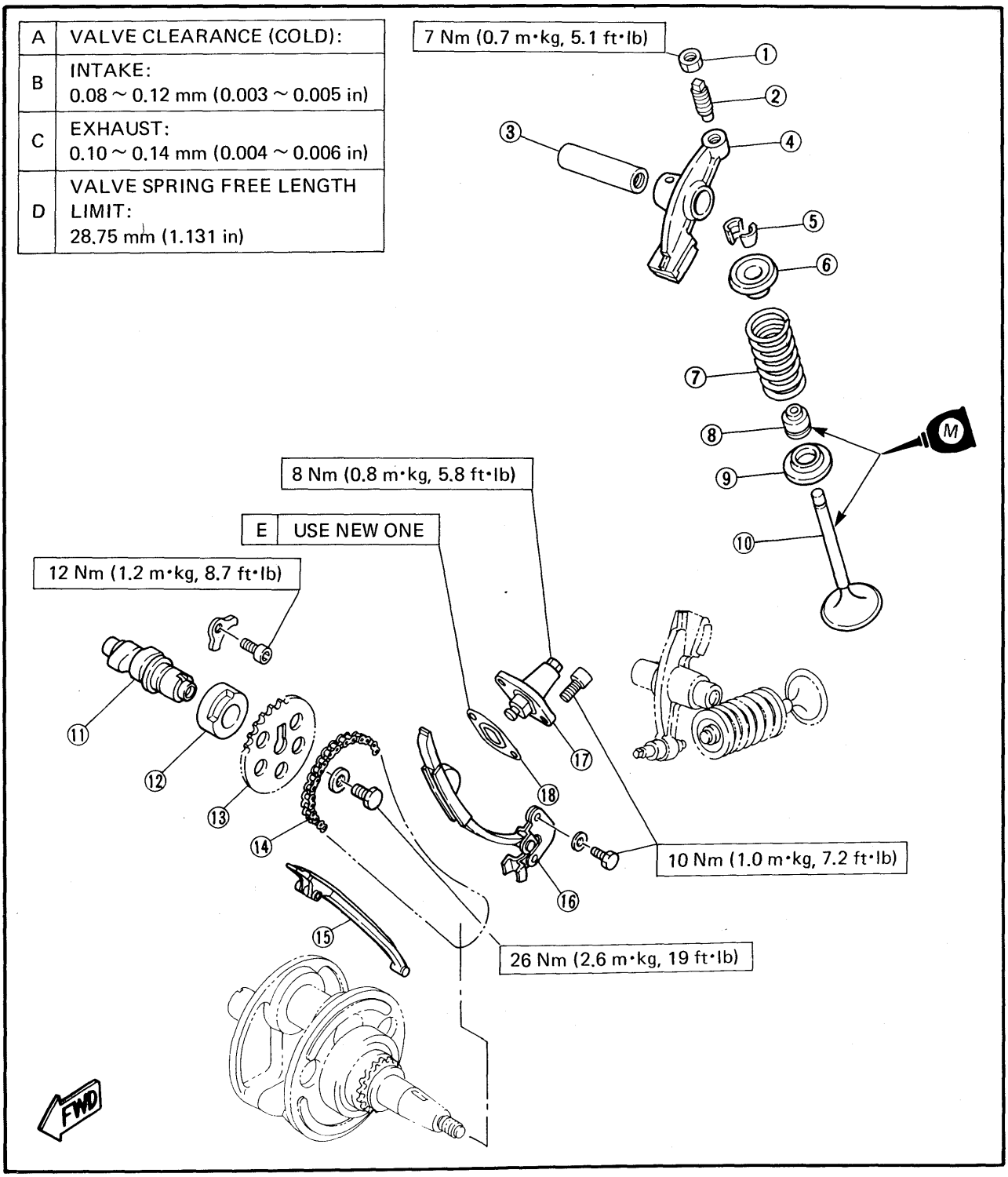
① Cylinder head covers
② Cam sprocket cover
③ O-ring
④ Tappet cover
⑤ Cylinder head
⑥ Spark plug
⑦ Dowel pin
⑧ Gasket (Cylinder head)
⑨ Cylinder
⑩ Gasket (Cylinder)

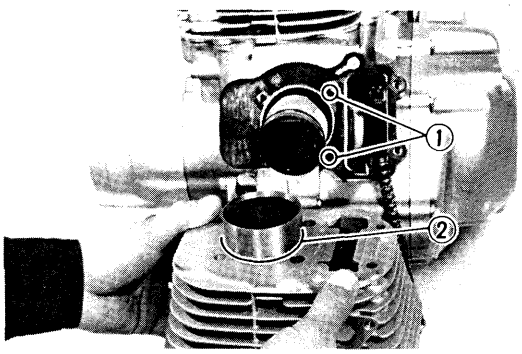


VALVE, CAMSHAFT AND TIMING CHAIN

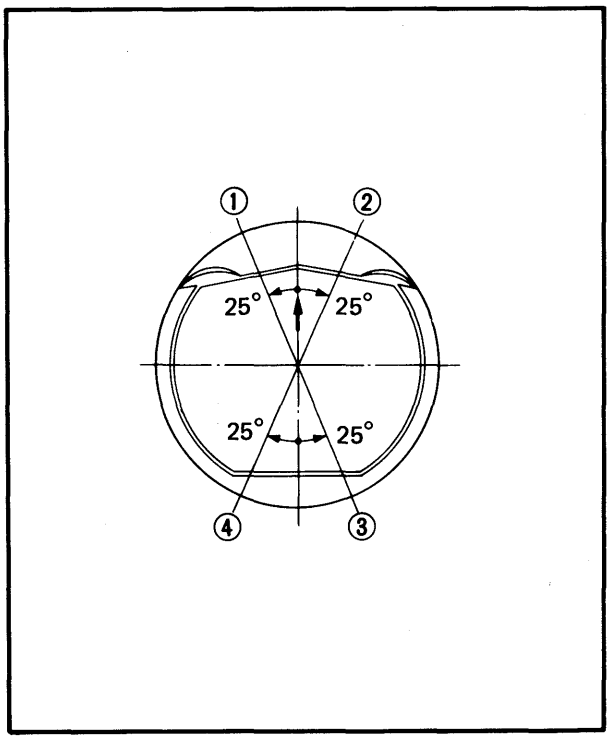
① Locknut
② Adjuster
③ Rocker arm shaft
④ Rocker arm
⑤ Valve Cotters
⑥ Valve spring retainer
⑦ Valve spring
⑧ Valve stem seal
⑨ Valve spring seat
⑩ Valve
⑪ Camshaft
⑫ Camshaft bushing
⑬ Cam sprocket
⑭ Timing chain
⑮ Chain guide (Exhaust)
⑯ Chain guide (Intake)
⑰ Chain tensioner
⑱ Gasket

A	VALVE CLEARANCE (COLD):
B	INTAKE: 0.08 ~ 0.12 mm (0.003 ~ 0.005 in)
C	EXHAUST: 0.10 ~ 0.14 mm (0.004 ~ 0.006 in)
D	VALVE SPRING FREE LENGTH LIMIT: 28.75 mm (1.131 in)





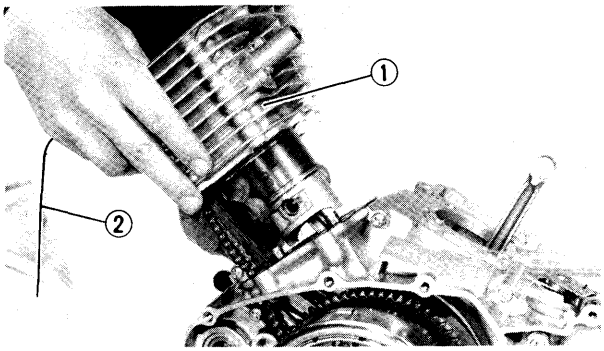
2. Apply:
   - 4-stroke engine oil
     To the piston pin, bearing, piston ring grooves and piston skirt areas.
3. Install:
   - Gasket (New)
   - Dowel pins ①
   - O-rings ②



4. Offset the piston ring end gaps as shown.

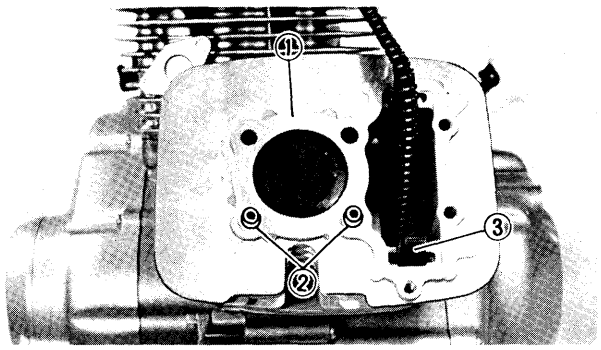
NOTE:
- Be sure to check the manufacturer's marks or numbers stamped on the rings are on the top side of the rings.
- Before installing the cylinder, apply a liberal coating of 4-stroke engine oil to the piston rings.

① Top ring
② Oil ring (Lower rail)
③ 2nd ring
④ Oil ring (Upper rail)



5. Install:
   - Cylinder ①

NOTE:
- Install the cylinder with one hand while compressing the piston rings with the other hand.
- Tie the cam chain with a piece of mechanics wire ② , and feed it through the chain opening.

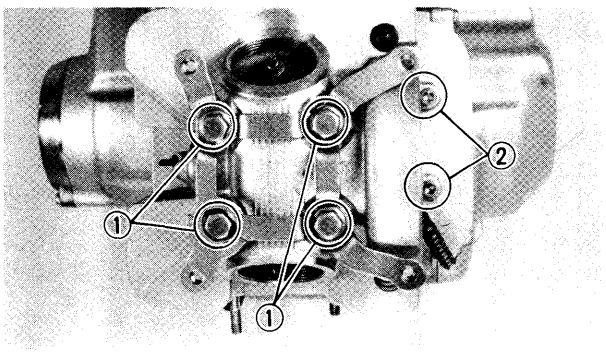


6. Install:
   - Gasket (New) ①
   - Dowel pins ②
   - Chain guide (Exhaust) ③

NOTE:
The chain guide should be installed with the "UP" mark upward.

7. Install:
   - Cylinder head
   - Washers
   - Bracket

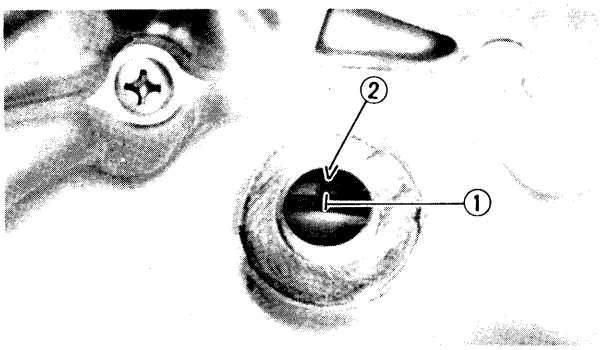
NOTE:
- Tie the timing chain so that it does not fall into the crankcase.
- The bracket with its has projected nut facing the inside.

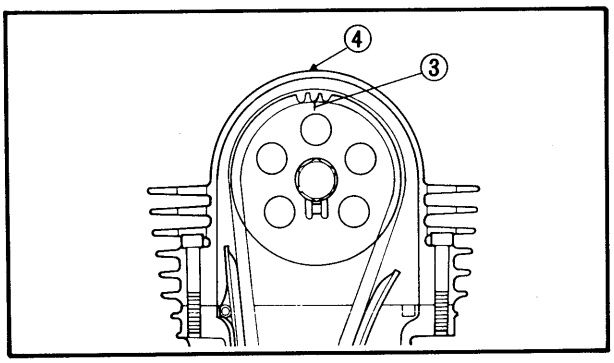


8. Tighten:
   - Bolts (Cylinder head) ①
   - Bolts (Cylinder head) ②

NOTE:
Tighten the bolts in this stage, using a crisscross pattern.

Bolts (Cylinder Head):
22 Nm (2.2 m·kg, 16 ft·lb)
Bolts (Cylinder Head):
12 Nm (1.2 m·kg, 8.7 ft·lb)



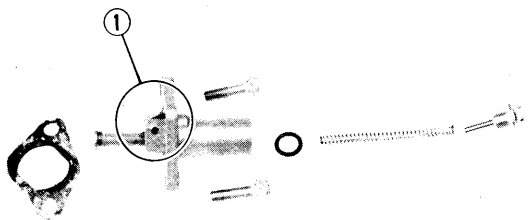


9. Install:
   - Cam sprocket

Cam sprocket installing steps (Front cylinder):
- Remove the timing plug and crankcase cover plate.
- Turn the crankshaft clockwise with wrench.
- Align the "T" mark ① on the rotor with the stationary pointer ② on the crankcase cover.
- Install the cam sprocket with the punched mark ③ facing outward.
- Force the camshaft counter clockwise to remove the cam chain slack.
- Insert your finger into the cam chain tensioner hole, and push the cam chain damper inward.
- While pushing the cam chain damper, be sure the cam sprocket punch mark ③ aligns with the stationary pointer ④ on the cylinder head at TDC.
- If marks are aligned, tighten the cam sprocket bolt.

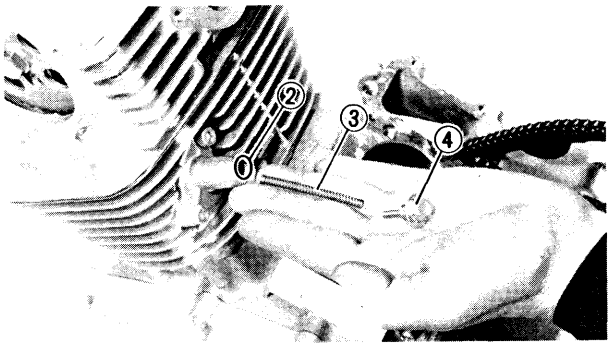
Bolt (Cam Sprocket):
26 Nm (2.6 m·kg, 19 ft·lb)

- If marks do not align, change the meshing position of sprocket and chain.



10. Install:
    - Gasket (New)
    - Cam chain tensioner

Cam chain tensioner installation steps:
- Remove the tensioner end cap bolt and spring.
- Release the cam chain tensioner one-way cam ①.



• Install the tensioner with a new gasket into the cylinder.

Cam Chain Tensioner Body:
10 Nm (1.0 m·kg, 7.2 ft·lb)

• Install the O-ring ② , tension spring ③ and end cap bolt ④ .

End Bolt (Chain Tensioner):
8 Nm (0.8 m·kg, 5.8 ft·lb)

11. Adjust:
    • Valve clearance
    Refer to "CHAPTER 3. VALVE CLEARANCE ADJUSTMENT" section.

Intake Valve (Cold):
0.08 ~ 0.12 mm
(0.003 ~ 0.005 in)
Exhaust Valve (Cold):
0.10 ~ 0.14 mm
(0.004 ~ 0.006 in)

12. Install:
    • O-rings
    • Tappet cover (Intake)
    • Tappet cover (Exhaust)
    • Cam sprocket cover

NOTE:
Inspect the O-rings. If damaged, replace them.

Tappet covers:
7 Nm (0.7 m·kg, 5.1 ft·lb)
Cam Sprocket Cover:
7 Nm (0.7 m·kg, 5.1 ft·lb)

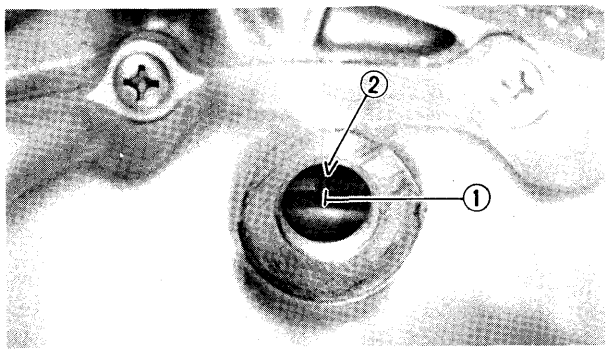
13. Install:
    • Carburetor joint
    • Cylinder head covers
    • Spark plugs

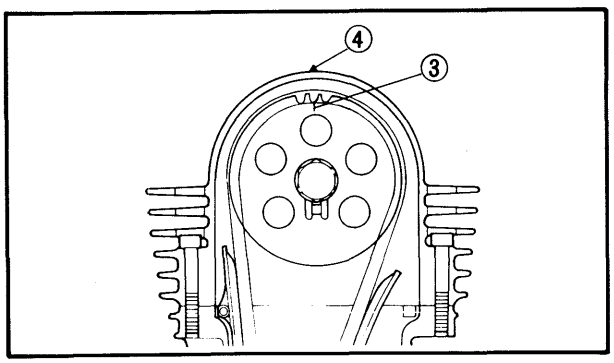
Bolts (Carburetor Joint):
10 Nm (1.0 m·kg, 7.2 ft·lb)
Bolts (Cylinder Head Cover):
10 Nm (1.0 m·kg, 7.2 ft·lb)
Spark Plug:
13 Nm (1.3 m·kg, 8.4 ft·lb)

Rear Side

When installing the rear side components, repeat the front side installation procedure. However, note the following points.

1. Install:
   - Cam sprocket





Cam sprocket installing steps (Rear cylinder):

- Turn the crankshaft counter clockwise with wrench.
- Align the slit ① on the rotor with the stationary pointer ② on the crankcase cover.
- Install the cam sprocket with the punched mark ③ facing outward.
- Force the camshaft counter clockwise to remove the cam chain slack.
- Insert your finger into the cam chain tensioner hole, and push the cam chain damper inward.
- While pushing the cam chain damper, be sure the cam sprocket punch mark ③ aligns with the stationary pointer ④ on the cylinder head at TDC.
- If marks are aligned, tighten the cam sprocket bolt.

Bolt (Cam Sprocket):
26 Nm (2.6 m·kg, 19 ft·lb)

- If marks do not align, change the meshing position of sprocket and chain.

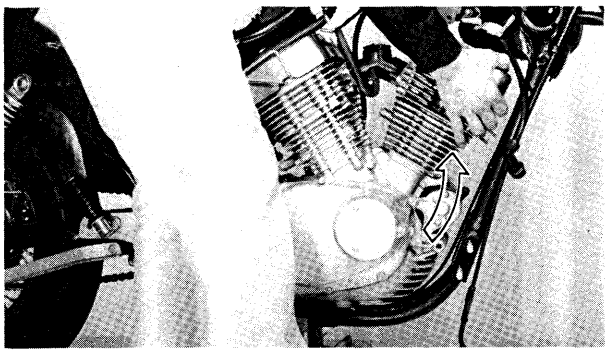
REMOUNTING ENGINE

When remounting the engine, reverse the removal procedure. Note the following points.

1. Place the suitable stands under the engine.

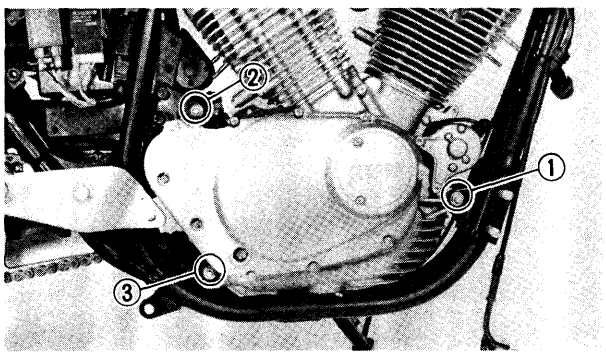
⚠ WARNING:

Securely support the motorcycle so there is no danger of it falling over.



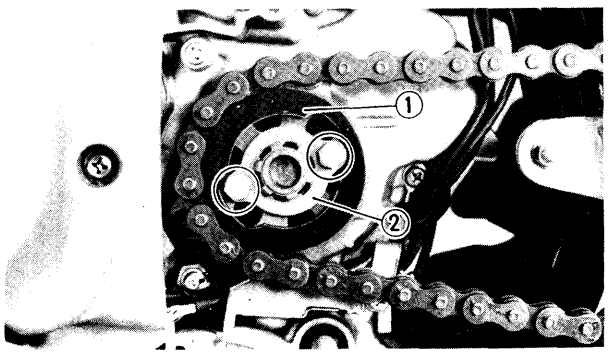
2. Install:
   - Engine assembly

   To the right side.



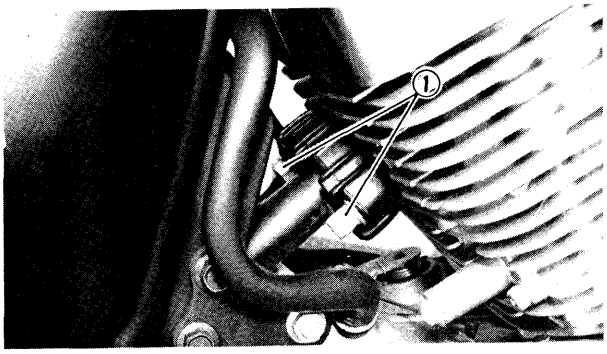
3. Install:
   - Engine stay (Rear)
   - Bolt (Engine mounting – Front) ①
   - Bolt (Engine mounting – Rear-Top) ②
   - Bolt (Engine mounting – Rear-Bottom) ③

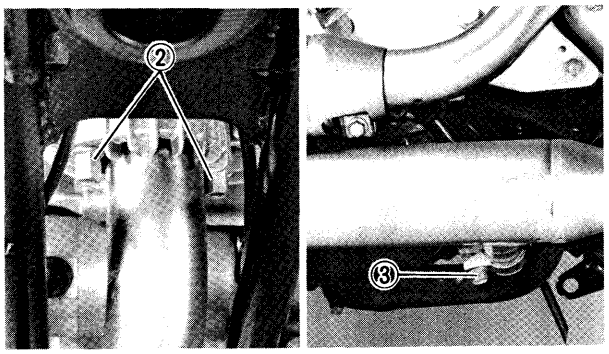
Engine Stay (Rear) and Frame:
35 Nm (3.5 m·kg, 25 ft·lb)
Engine Mounting (Front) and Frame:
35 Nm (3.5 m·kg, 25 ft·lb)
Engine Mounting (Rear-Top) and Stay:
35 Nm (3.5 m·kg, 25 ft·lb)
Engine Mounting (Rear-Bottom) and Frame:
35 Nm (3.5 m·kg, 25 ft·lb)

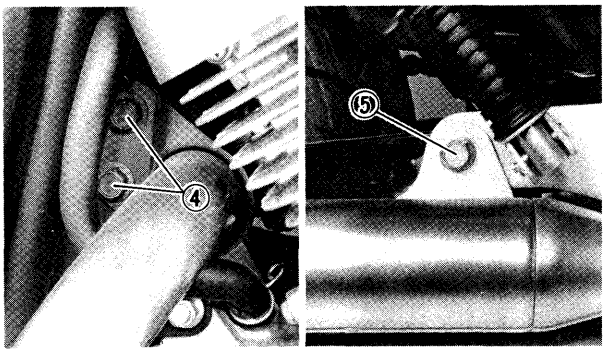


4. Install:
   - Drive sprocket ①
   - Sprocket holder ②
   - Cover (Drive chain)
   - Shift pedal link

Bolts (Drive Sprocket):
10 Nm (1.0 m·kg, 7.2 ft·lb)
Screws (Cover – Drive Chain):
7 Nm (0.7 m·kg, 5.1 ft·lb)
Bolt (Shift Pedal Link):
10 Nm (1.0 m·kg, 7.2 ft·lb)







5. Tighten:
   - Nuts (Exhaust pipe – Rear) ①
   - Nuts (Exhaust pipe 1 – Front) ②
   - Bolt (Exhaust pipe joint – Lower) ③
   - Bolts (Exhaust pipe 3) ④
   - Bolt (Muffler) ⑤

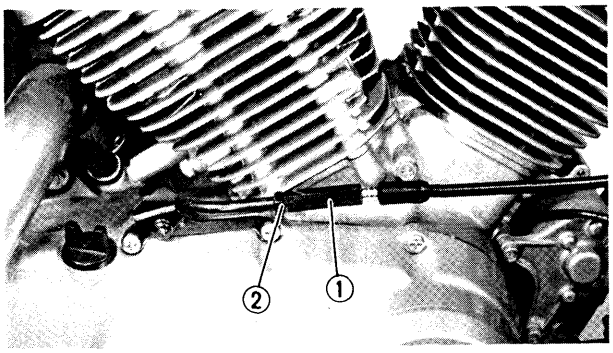
Nuts (Exhaust Pipe 2 – Rear):
10 Nm (1.0 m·kg, 7.2 ft·lb)
Nuts (Exhaust Pipe 1 – Front):
10 Nm (1.0 m·kg, 7.2 ft·lb)
Bolt (Exhaust Pipe Joint – Lower):
20 Nm (2.0 m·kg, 14 ft·lb)
Bolts (Exhaust Pipe 3):
20 Nm (2.0 m·kg, 14 ft·lb)
Bolt (Muffler):
25 Nm (2.5 m·kg, 18 ft·lb)

6. Adjust:
   - Drive chain slack
     Refer to "CHAPTER 3 – DRIVE CHAIN SLACK ADJUSTMENT".

Drive Chain Slack:
30 ~ 40 mm (1.18 ~ 1.57 in)

⚠ WARNING:

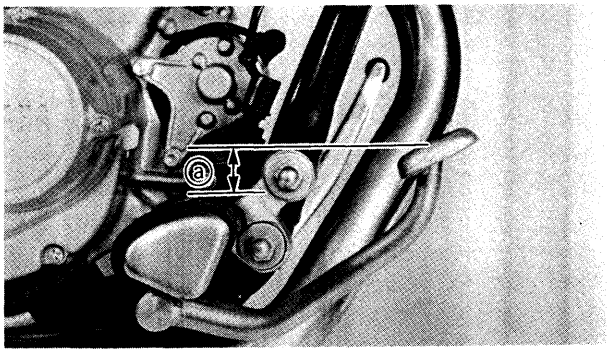
Always use a new lock washer.



7. Adjust:
   • Clutch cable free play
   Refer to "CHAPTER 3. – CLUTCH ADJUSTMENT".

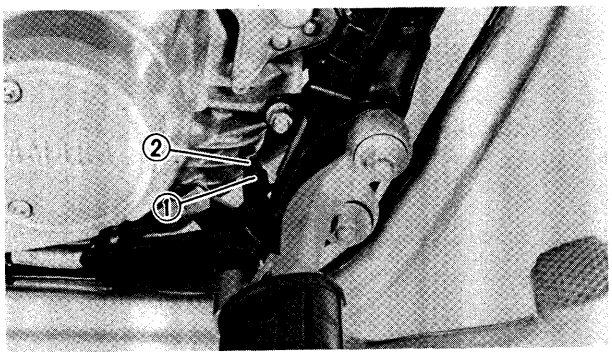
Clutch Cable Free Play:
3 ~ 5 mm (0.12 ~ 0.20 in)

① Locknut
② Adjuster



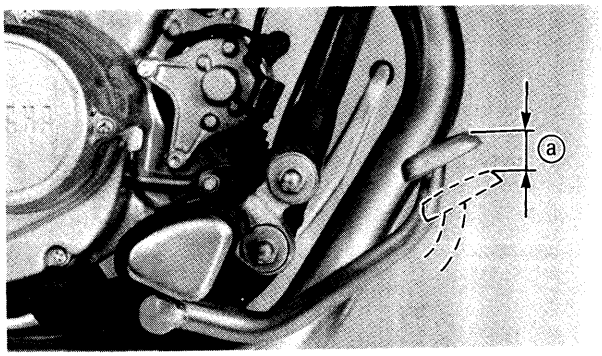
8. Adjust:
   • Brake pedal height ⓐ
   Refer to "CHAPTER 3. – REAR BRAKE ADJUSTMENT".

Brake Pedal Height ⓐ:
45 ~ 55 mm (1.77 ~ 2.17 in)
Above the Top of the Footrest



⚠ WARNING:
Check the operation of the brake light after adjusting the brake pedal height.

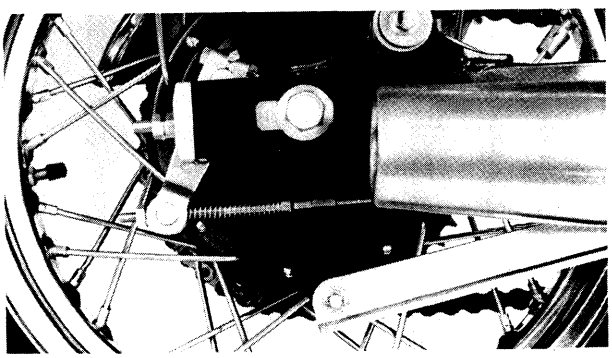
① Locknut
② Adjuster



9. Adjust:
   • Brake pedal free play ⓐ
   Refer to "CHAPTER 3. – REAR BRAKE ADJUSTMENT".

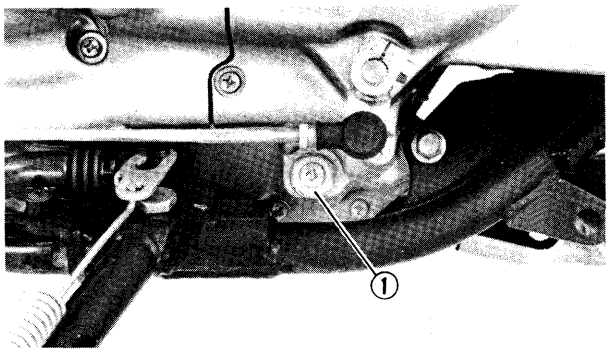
Brake Pedal Free Play ⓐ:
20 ~ 30 mm (0.8 ~ 1.2 in)

⚠ WARNING:
After adjusting the pedal height, adjust the brake pedal free play.



10. Adjust:
- Throttle cable free play
  Refer to "CHAPTER 3. – THROTTLE CABLE FREE PLAY ADJUSTMENT".

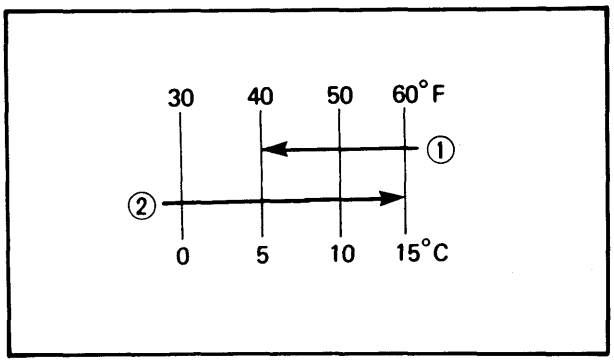
Throttle Cable Free Play:
3 ~ 5 mm (0.12 ~ 0.20 in)



11. Tighten:
- Drain plug ①

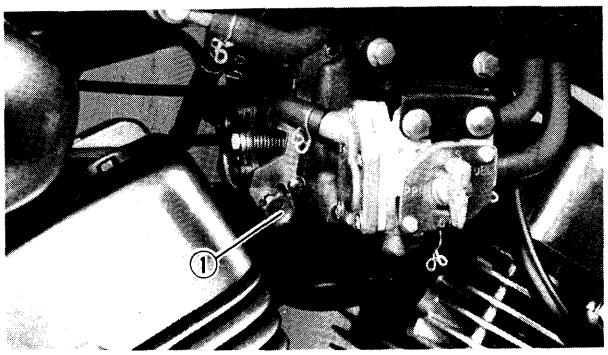
Drain Plug:
43 Nm (4.3 m·kg, 31 ft·lb)

12. Fill:
- Crankcase



Recommended Oil:
At 5°C (40°F) or Higher ① :
Yamalube 4 or SAE 20W40 Type SE Motor Oil
At 15°C (60°F) or Lower ② :
SAE 10W30 Type SE Motor Oil
With Oil Filter Replacement:
1.6 L (1.4 Imp qt, 1.7 US qt)

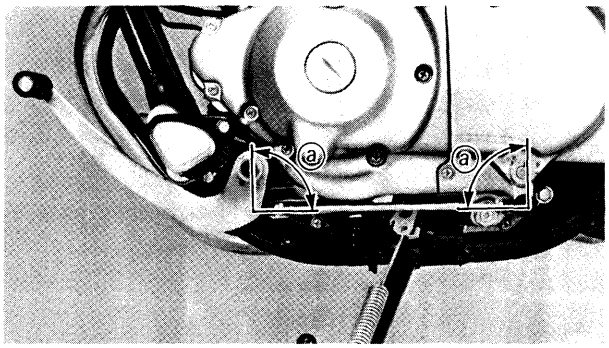
⚠ CAUTION:
Do not allow foreign material to enter the crankcase.



13. Adjust:
- Idle speed

Idle Speed:
1,150 ~ 1,250 r/min

① Throttle stop screw



10. Adjust:
- Shift pedal height
  Refer to "CHAPTER 3. – SHIFT PEDAL ADJUSTMENT".

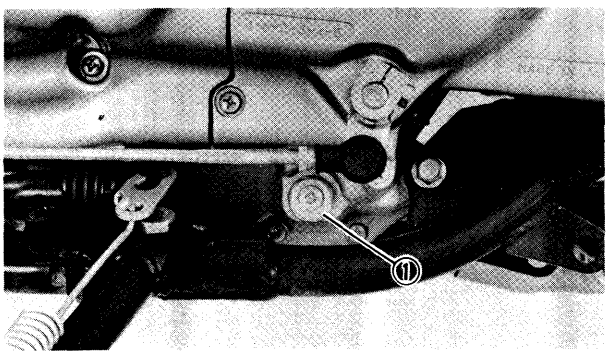
Shift Pedal Height:
30 ~ 36 mm (1.2 ~ 1.4 in)
Above the Top of the Footrest

⚠ WARNING:

After adjusting the shift pedal height, visually check the angle of shift pedal arms. The angle of arms must be at right angles ⓐ with the adjuster rod.

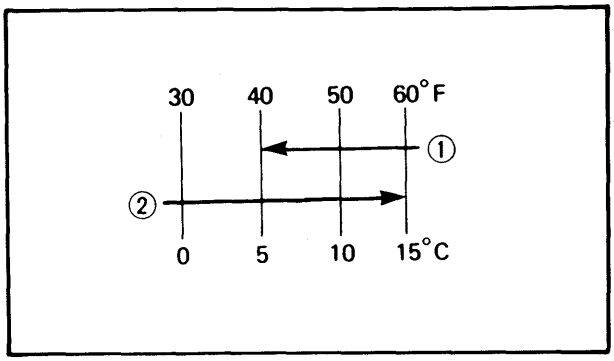
11. Adjust:
- Throttle cable free play
  Refer to "CHAPTER 3. – THROTTLE CABLE FREE PLAY ADJUSTMENT".

Throttle Cable Free Play:
3 ~ 5 mm (0.12 ~ 0.20 in)



12. Tighten:
- Drain plug ①

Drain Plug:
43 Nm (4.3 m·kg, 31 ft·lb)

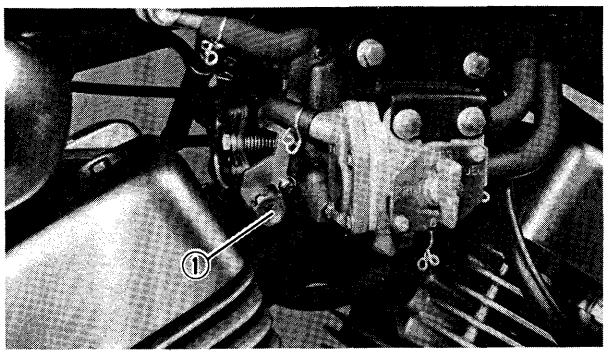


13. Fill:
- Crankcase

Recommended Oil:
At 5°C (40°F) or Higher ① :
Yamalube 4 or SAE 20W40
AT 15°C (60°F) or Lower ② :
SAE 10W30 Type SE Motor Oil
With Oil Filter Replacement:
1.6 L (1.4 Imp qt, 1.7 US qt)

⚠ CAUTION:

Do not allow foreign material to enter the crankcase.



1. Adjust:
   - Idle speed

   Warm up the engine and turn the throttle stop screw ① to adjust.

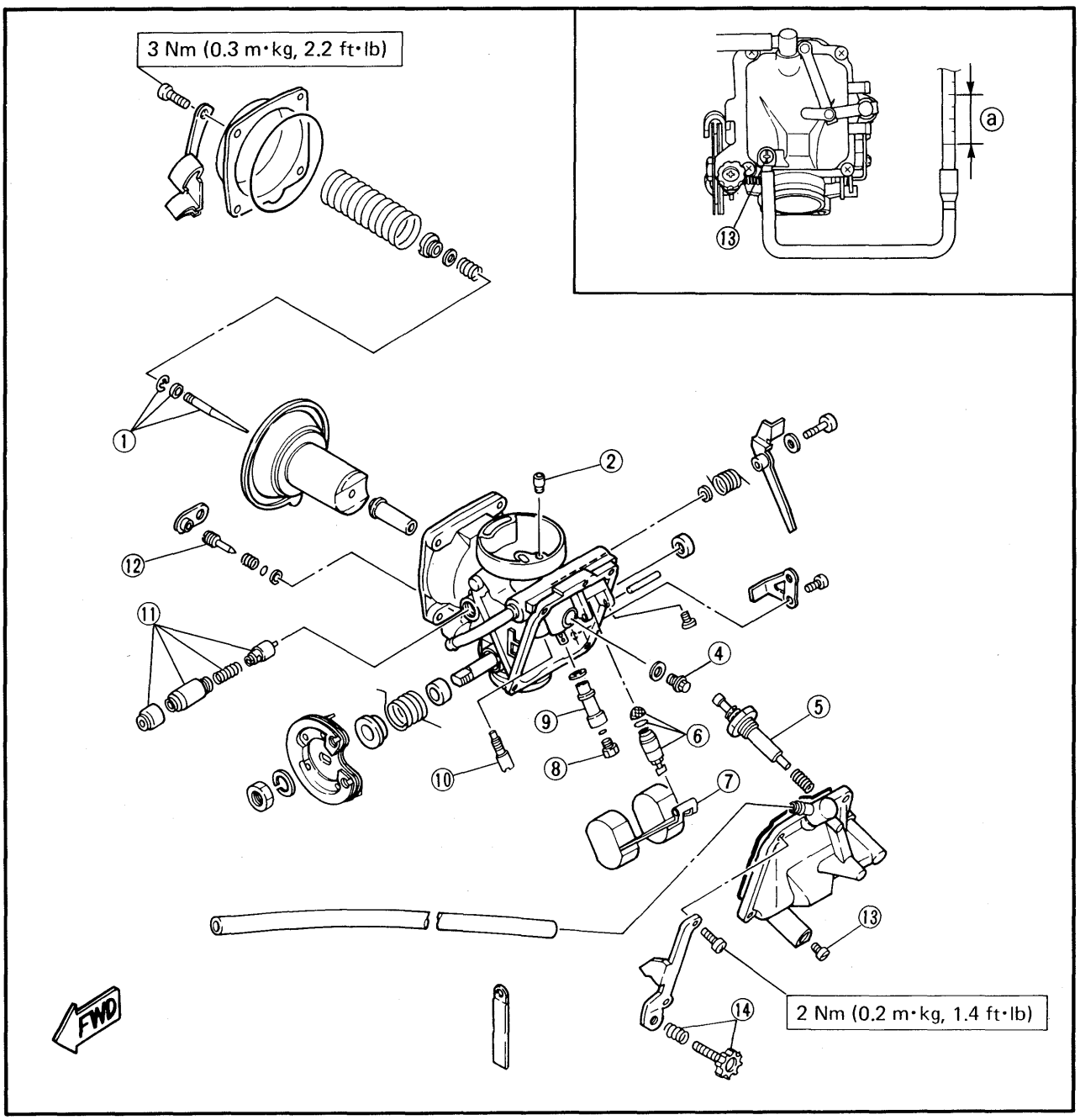
Idle Speed:
1,150 ~ 1,250 r/min

CARBURETION

CARBURETOR

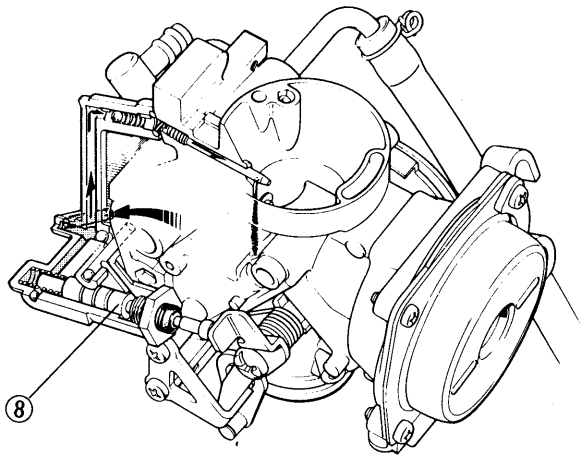
① Jet needle set
② Pilot air jet
③ Heater
④ Plug
⑤ Accelerator plunger
⑥ Float valve assembly
⑦ Float
⑧ Main jet
⑨ Main bleed
⑩ Pilot jet
⑪ Starter plunger assembly
⑫ Pilot screw
⑬ Drain plug
⑭ Throttle stop screw

SPECIFICATIONS	
ID MARK	3DM01
MAIN JET	#110
MAIN AIR JET	#60
JET NEEDLE-CLIP POSITION	4BM-3
NEEDLE JET	O-0
PILOT JET	#17.5
PILOT SCREW	2-5/8
STARTER JET 1	#25
FUEL LEVEL ⓐ	16.5 ~ 17.5 mm (0.65 ~ 0.69 in)
ENGINE IDLING SPEED	1,250 ~ 1,350 r/min

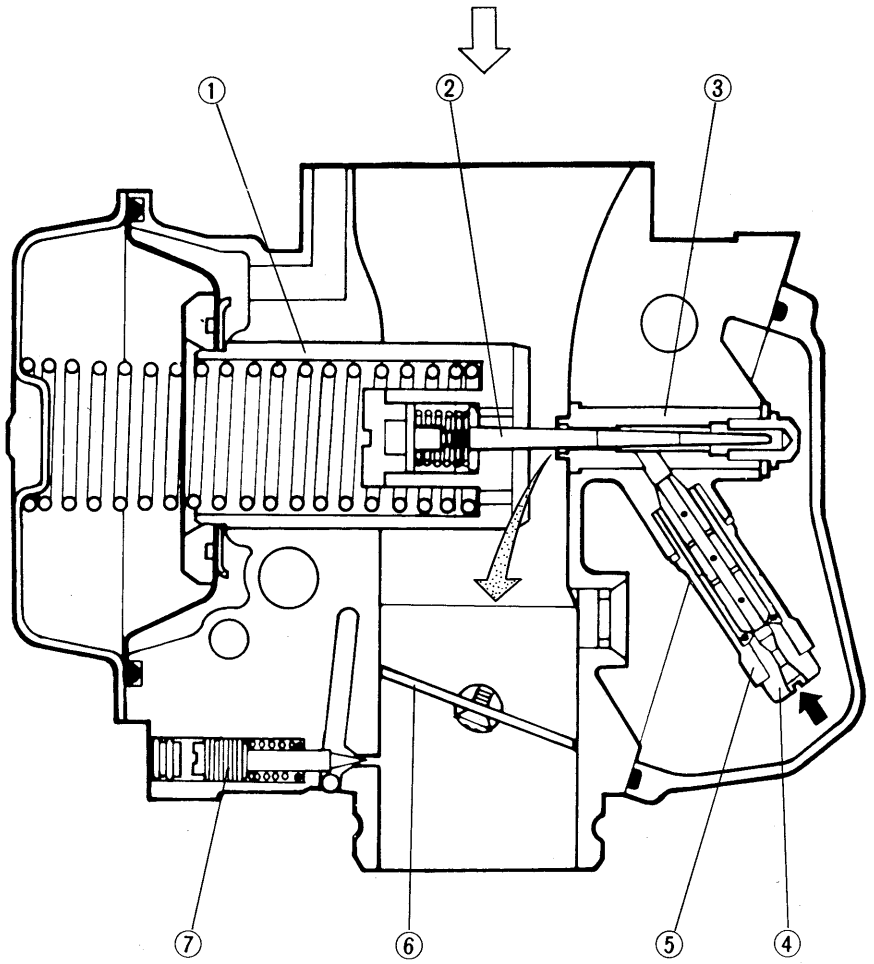


SECTION VIEW

① Piston valve
② Jet needle
③ Needle jet
④ Main jet
⑤ Main bleed
⑥ Throttle valve
⑦ Pilot screw
⑧ Accelerator pump plunger



A	⇦	: Air
B	⇦	: Mixture
C	⇦	: Fuel



REMOVAL

1. Remove:
   - Carburetor assembly
     Refer to engine removal section.

NOTE:

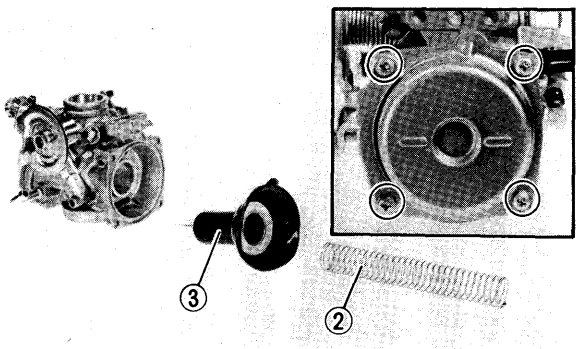
The following parts can be cleaned and inspected without disassembly.

- Vacuum piston
- Throttle stop screw

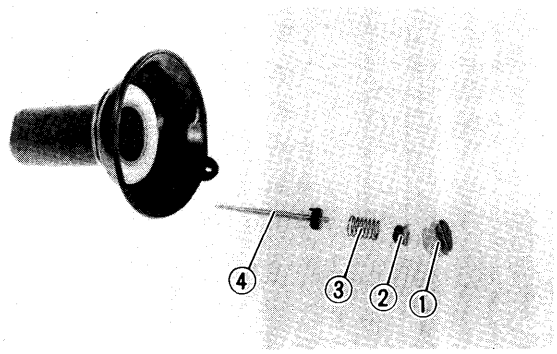
⚠ WARNING:

The pilot screw settings are adjusted for maximum performance at the factory with special equiment. DO NOT attempt to change these settings. If all other engine systems are functioning correctly, any changes will decrease performance and cause increased exhaust emissions.

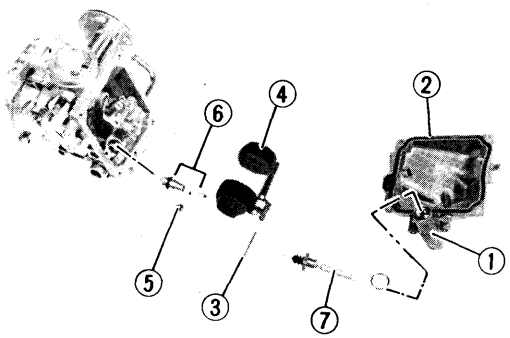
DISASSEMBLY



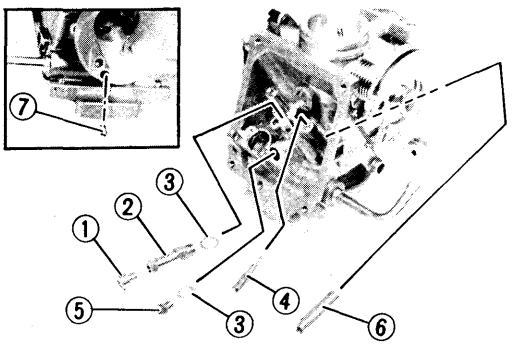
1. Remove:
   - Vacuum chamber cover ①
   - Spring ②
   - Piston valve assembly ③



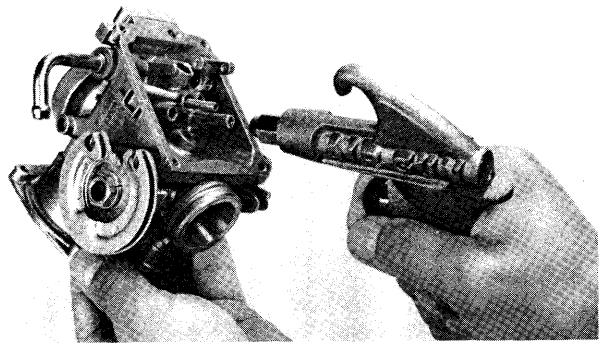
2. Remove:
   - Plug (Jet needle) ①
   - Washer ②
   - Spring ③
   - Jet needle ④



3. Remove:
   - Float chamber cover ①
   - Gasket ②
   - Float pin ③
   - Float ④
   - Screw (Valve seat) ⑤
   - Valve seat assembly ⑥
   - Accelerator pump plunger ⑦



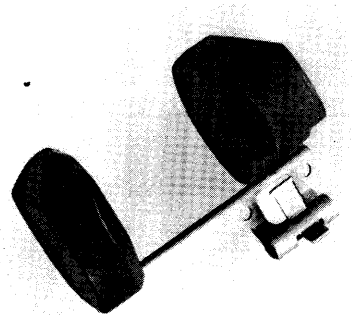
4. Remove:
   - Main jet ①
   - Main bleed ②
   - Washer ③
   - Pilot jet ④
   - Plug ⑤
   - Needle jet ⑥
   - Pilot air jet ⑦



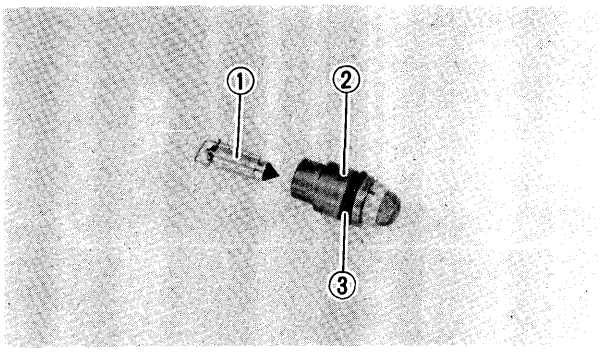
INSPECTION

1. Inspect:
   - Carburetor body
   - Fuel passage
   Contamination → Clean as indicated.

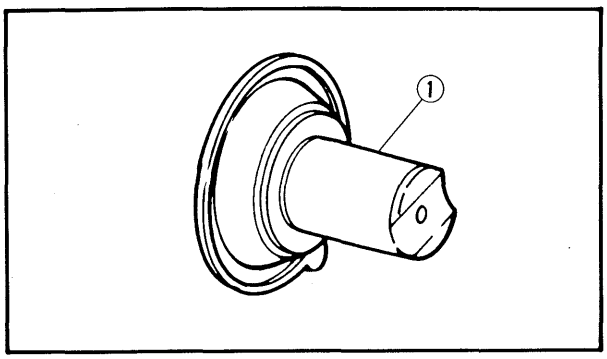
Carburetor cleaning steps:
- Wash carburetor in petroleum based solvent. (Do not use any caustic carburetor cleaning solution.)
- Blow out all passages and jets with a compressed air.



2. Inspect:
   - Floats
   Damage → Replace.

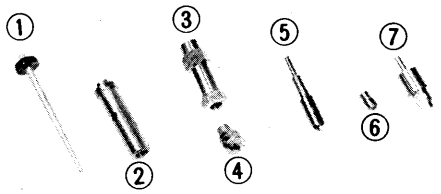


3. Inspect:
   - Float needle valve ①
   - Seat ②
   - O-ring ③
   Damage/Wear/Contamination → Replace as a set.



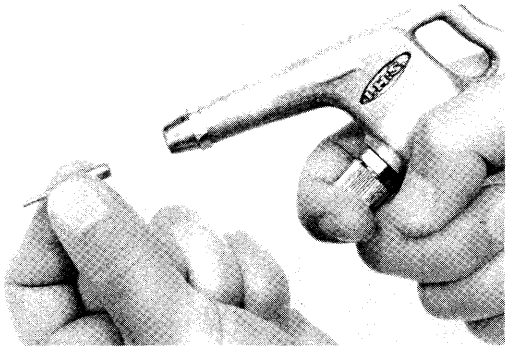
4. Inspect:
   - Vacuum piston ①
   Cracks → Replace.
   - Diaphragm
   Tears → Replace.

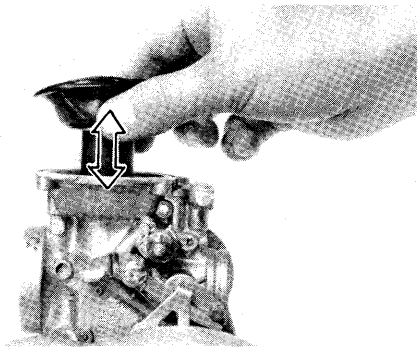
NOTE:
If you suspect the piston valve has been damaged, check the component for cracks by pouring gasoline into the valve. If it leaks, replace with a new piston valve.



5. Inspect:
   - Jet needle ①
   - Needle jet ②
   - Main bleed ③
   - Main jet ④
   - Pilot jet ⑤
   - Pilot air jet ⑥
   - Starter plunger ⑦

   Bends/Wear/Damage → Replace.
   Contamination → Blow out jets with a compressed air.





6. Check:
   - Free movement

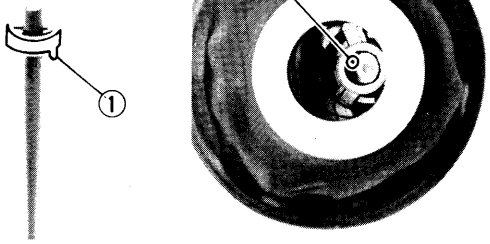
   Insert the throttle valve into the carburetor body, and check for free movement.
   Stick→Replace.

ASSEMBLY

To assemble the carburetor, reverse the disassembly procedures. Note the following points.

⚠ CAUTION:

- **Before reassembling, wash all parts in clean gasoline.**
- **Always use a new gasket.**

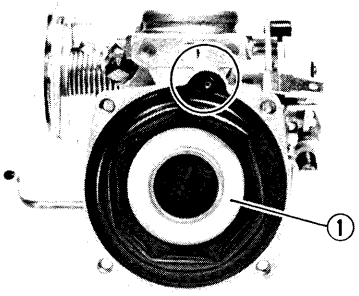


1. Install:
   - Jet needle assembly

   To the vacuum piston.

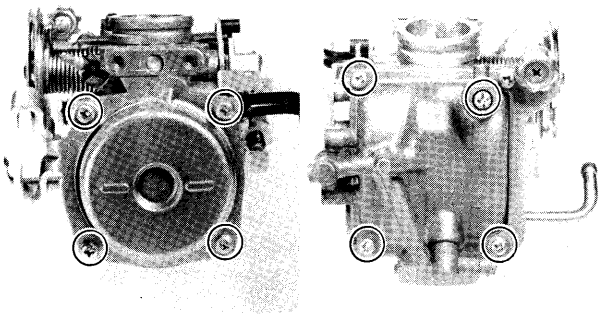
NOTE:

Be sure to install the jet needle plate so that the projection ① is located toward the hole ② in the vacuum piston.



2. Install:
   • Vacuum piston ①

NOTE:
Match the tab on the diaphragm to the matching recess in the vacuum piston.



3. Install:
   • Vacuum chamber cover
   • Float chamber cover

Screw (Vacuum Chamber Cover):
3 Nm (0.3 m·kg, 2.2 ft·lb)
Screw (Float Chamber Cover):
2 Nm (0.2 m·kg, 1.4 ft·lb)

INSTALLATION

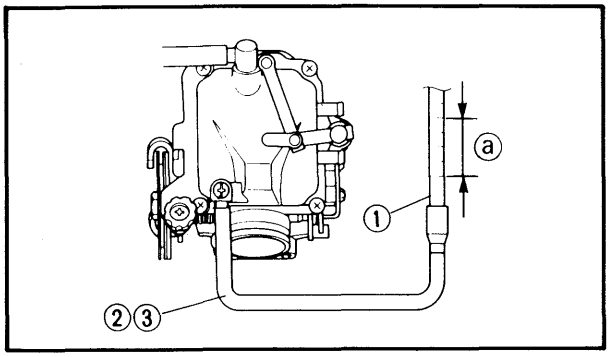
1. Install:
   • Carburetor assembly
   Reverse the removal procedure.

ADJUSTMENT

Fuel Level Adjustment

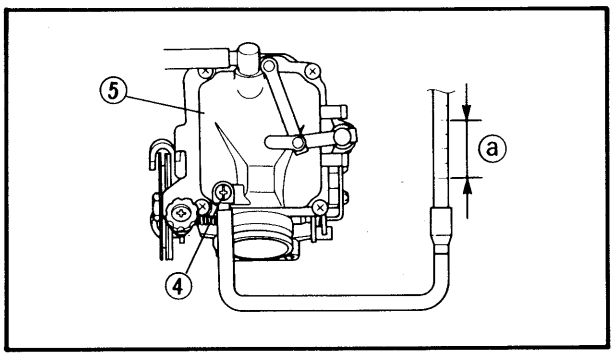
1. Measure:
   • Fuel level
   Out of specification → Adjust.

Fuel Level:
16.5 ~ 17.5 mm (0.65 ~ 0.69 in)
Below the Carburetor Piston Valve Center Mark.



Fuel level measurement and adjustment steps:
- Place the motorcycle on a level surface.
- Use a garage jack under the engine to ensure that the carburetor is positioned vertically.
- Connect the Fuel Level Gauge ① to the drain pipe ② using a level gauge adapter ③ .

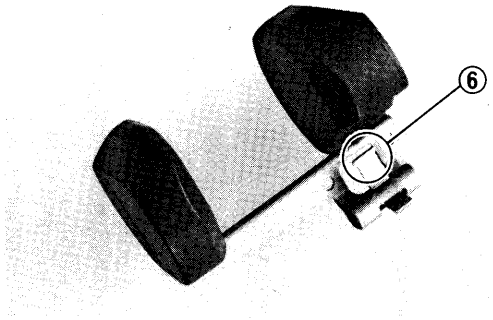
Fuel Level Gauge:
YM-01312-A



- Loosen the drain screw ④ and warm up the engine for several minutes.
- Measure the fuel level ⓐ with the gauge.

⑤ Piston valve center mark

- Repeat the above procedure for other carburetors.
- If the fuel level(s) is incorrect, adjust the fuel level(s).
- Remove the carburetors.
- Inspect the needle valve.
- If it is worn, replace it.
- If it is fine, adjust float level by bending the float tang ⑥ slightly.
- Repeat the procedure for the other carburetors.



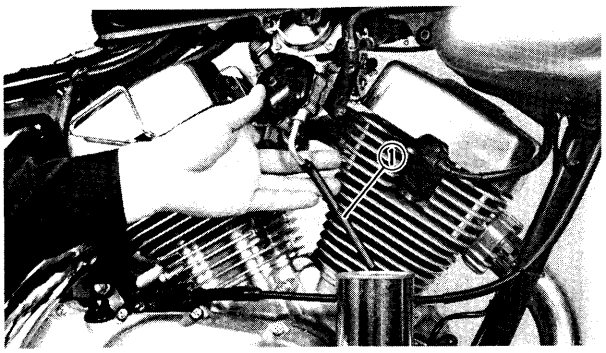
FUEL PUMP

PUMP OPERATION INSPECTION

1. Inspect:
   - Fuel pump operation

Pump operation inspection steps:
- Turn the fuel cock to "ON".
- Disconnect the fuel hose (Fuel pump – Carburetor) ① .
- Place a container under the fuel hose end.
- Turn the main switch to "ON".
- Push the "START" switch.
- Check the fuel flows out from the fuel hose ① end.

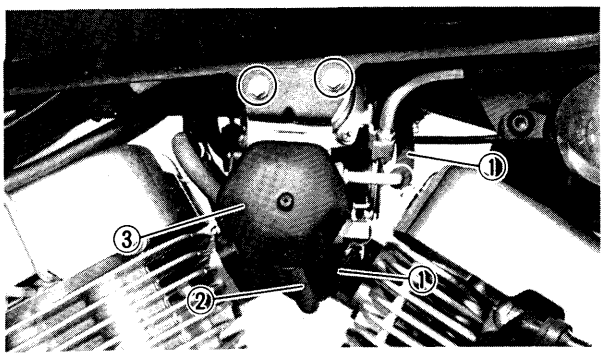
  If fuel does not flow out, refer to "FUEL PUMP INSPECTION" section.



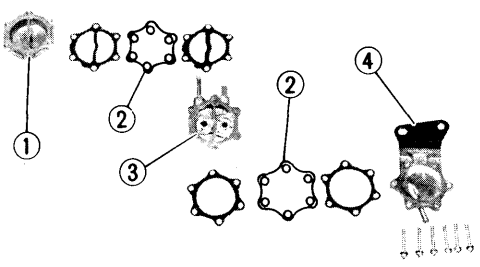
FUEL PUMP INSPECTION

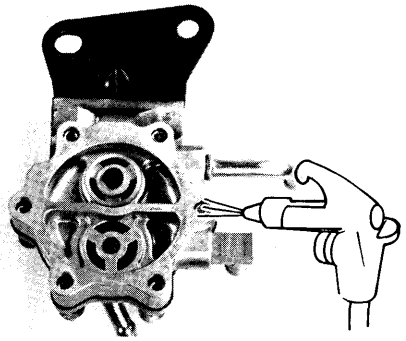
Removal

1. Turn the fuel cocks (Right and left) to "OFF".
2. Disconnect:
   - Fuel hoses ①
   - Pulser hose ②
3. Remove:
   - Fuel pump ③



4. Remove:
   - Fuel pump cover (Outer) ①
   - Diaphragms ②
   - Fuel pump body ③
   - Fuel pump cover (Inner) ④



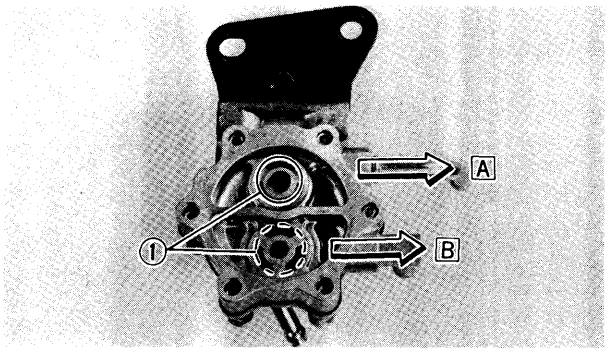


Inspection

1. Inspect:
   - Fuel pump body ①
     Contamination → Clean.
     Cracks/Damage → Replace fuel pump assembly.

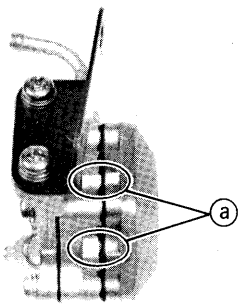
NOTE:
- Use a petroleum based solvent for cleaning.
- Blow out all passage with compressed air.

2. Inspect:
   - Diaphragms ①
     Torn/Fatigue/Cracks → Replace fuel pump assembly.
   - Gaskets (Outer and inner) ②
     Torn/Damage → Replace fuel pump assembly.



3. Inspect:
   - Valves ①
     Clacks/Damage → Replace fuel pump assembly.

A Upper side
B Lower side



Assembly and installation

Reverse the removal procedure.
Note the following points.

NOTE:
- Gaskets with two tabs should be installed outer side.
- Align the tabs ⓐ of the fuel pump cover and gaskets with those of the pump body.

	Screws (Pump Bracket – Fuel Tank): 7 Nm (0.7 m·kg, 5.1 ft·lb)

NOTE:
Be sure to connect the hoses correctly.

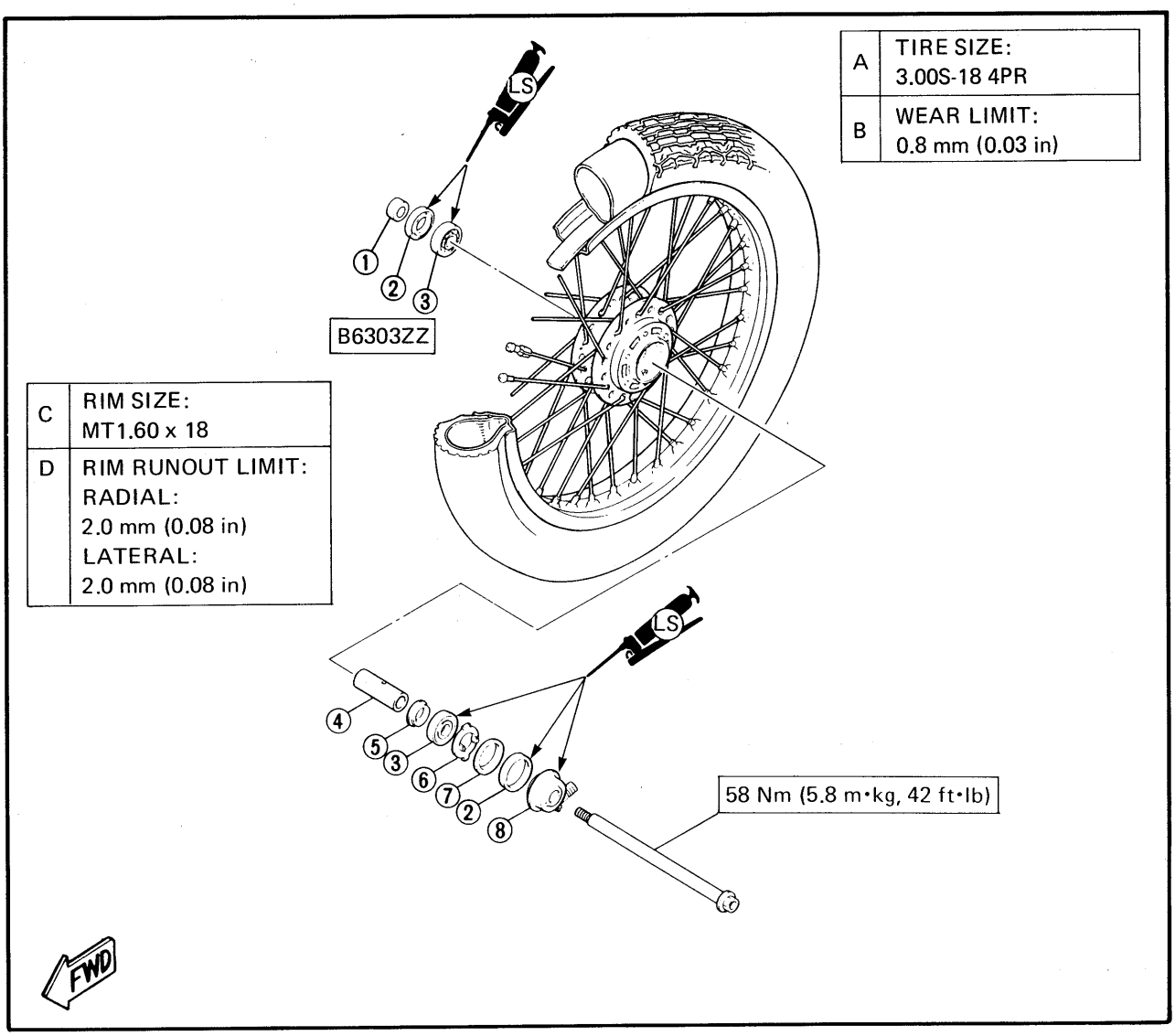
CHASSIS

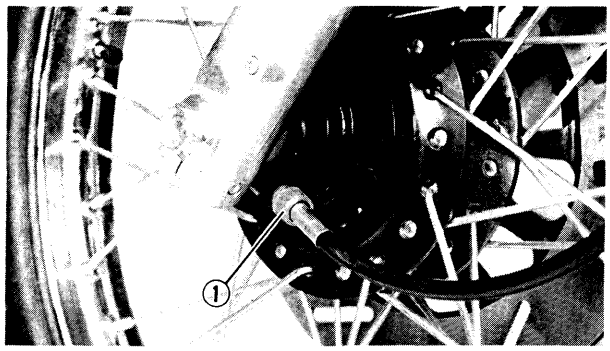
FRONT WHEEL

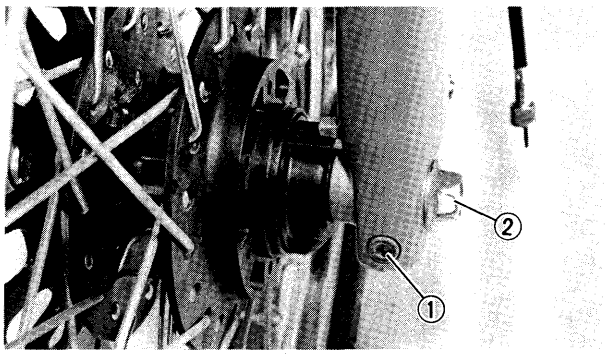
① Collar
② Oil seal
③ Bearing
④ Spacer
⑤ Spacer flange
⑥ Meter clutch
⑦ Clutch retainer
⑧ Speedometer gear unit

Basic weight: With oil and full fuel tank	147 kg (324 lb) CAL: 197 kg (434 lb)	
Maximum load*	198 kg (437 lb)	
Cold tire pressure	Front	Rear
Up to 90 kg (198 lb) load*	175 kPa (1.75 kg/cm², 25 psi)	200 kPa (2.0 kg/cm², 28 psi)
90 kg (198 lb) ~ Maximum load*	200 kPa (2.0 kg/cm², 28 psi)	225 kPa (2.25 kg/cm², 32 psi)
High speed riding	200 kPa (2.0 kg/cm², 28 psi)	225 kPa (2.25 kg/cm², 32 psi)

* Load is the total weight of cargo, rider, passenger, and accessories.







REMOVAL

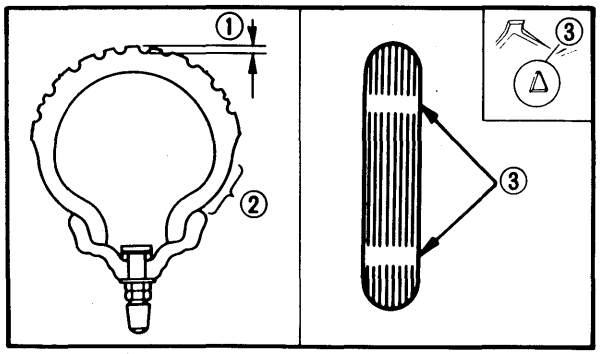
⚠ WARNING:

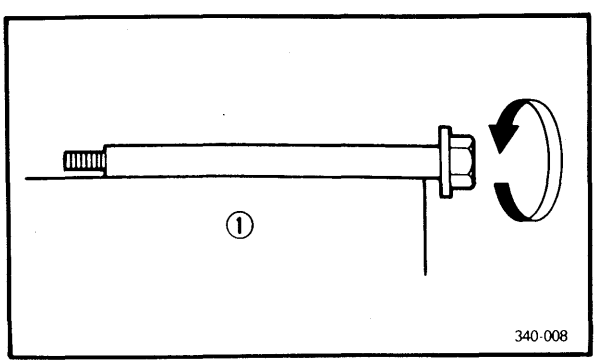
Securely support the motorcycle so there is no danger of it falling over.

1. Place the motorcycle on level place.
2. Remove:
   - Speedometer cable ①
3. Loosen:
   - Pinch bolt (Front axle) ①
   - Front axle ②
4. Elevate the front wheel by placing a suitable stand under the engine.
5. Remove:
   - Front axle
   - Front wheel

NOTE:

Do not squeeze the brake lever while the wheel is off the motorcycle.





INSPECTION

1. Inspect:
   - Tire

   Tire tread shows crosswise lines (Minimum tread depth)/Cracks → Replace.

Minimum Tire Tread Depth: 0.8 mm (0.03 in)

① Tread depth ② Sidewall ③ Wear indicator

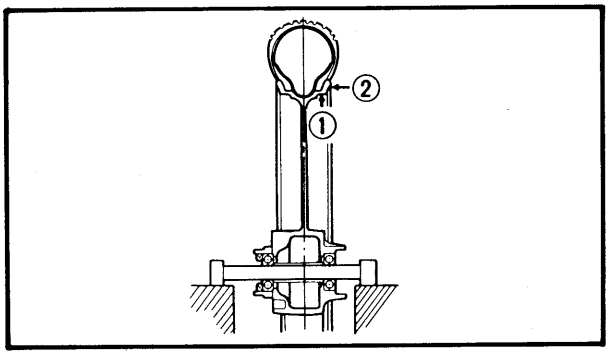
2. Inspect:
   - Front axle

   Bends → Replace.

   Roll the axle on a flat surface ① .

⚠ WARNING:

Do not attempt to straighten a bent axle.



3. Inspect:
   - Wheel
     Cracks/Bends/Warpage → Replace.
4. Measure:
   - Wheel runout
     Out of specification → Replace.

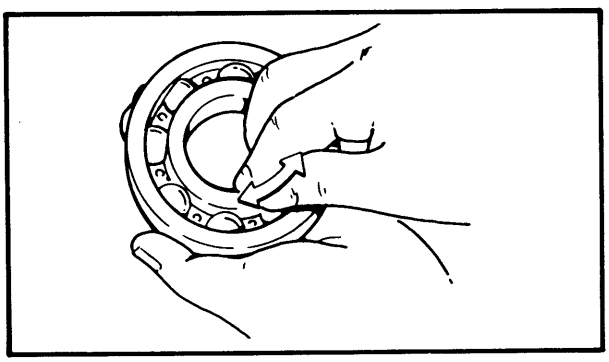
Rim Runout Limits:
Raidal ① : 2.0 mm (0.08 in)
Lateral ② : 2.0 mm (0.08 in)

⚠ CAUTION:

Be sure the valve stem locknut is tightened securely after repairing or replacing a tire and/or wheel.

⚠ WARNING:

Ride conservatively after installing a tire to allow the tire to seat itself correctly on the rim.



5. Inspect:
   - Wheel bearings
     Bearings allow play in the wheel hub or wheel turns roughly → Replace.

Wheel bearing replacement steps:
- Clean the outside of the wheel hub.
- Drive out the bearing.

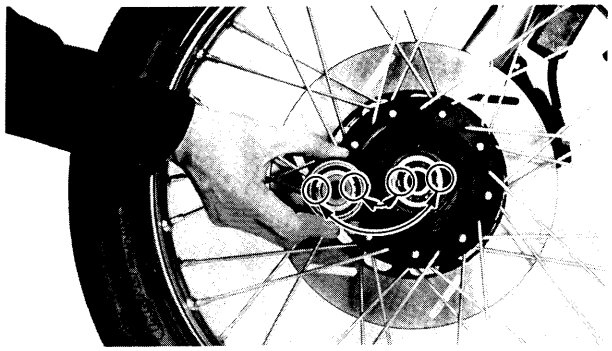
⚠ WARNING:

Eye protection is recommended when using striking tools.

- Install the new bearing by reversing the previous steps.

⚠ CAUTION:

Do not strike the center race or balls of the bearing. Contact should be made only with the outer race.



INSTALLATION

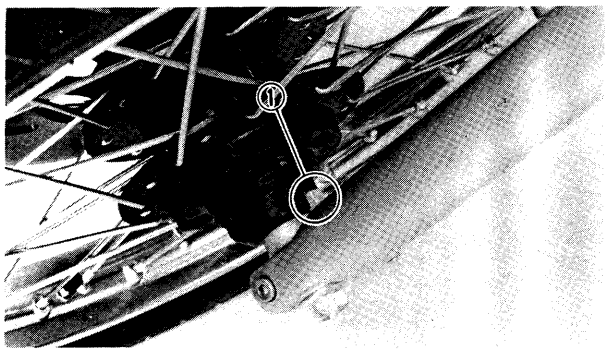
When installing the front wheel, reverse the removal procedure. Note the following points.

1. Lubricate:
   - Bearings
   - Oil seal

	Lithium-Soap Base Grease

2. Install:
   - Speedometer gear unit

NOTE:
Be sure that the two projections inside the wheel hub mesh with the two slots in the gear unit assembly.



3. Install:
   - Front wheel

NOTE:
Be sure that the projecting portion (Torque stopper) ① of the gear unit housing is positioned correctly.

4. Tighten:
   - Front axle
   - Pinch bolt (Front axle)

	Front Axle: **58 Nm (5.8 m·kg, 42 ft·lb)** **Pinch Bolt (Front Axle):** **20 Nm (2.0 m·kg, 14 ft·lb)**

STATIC WHEEL BALANCE ADJUSTMENT

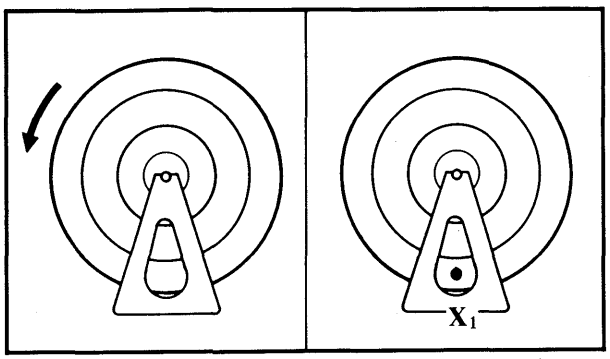
NOTE:

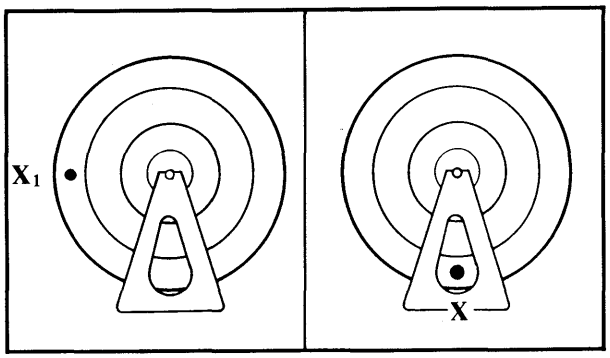
- After replacing the tire and/or rim, wheel balance should be adjusted.
- Adjust the wheel balance with brake disc installed.

1. Remove:
   - Balancing weight
2. Check:
   - Spoke(s)

   Loose spoke(s) → Retighten.

	Spoke: **6 Nm (0.6 m·kg, 4.3 ft·lb)**

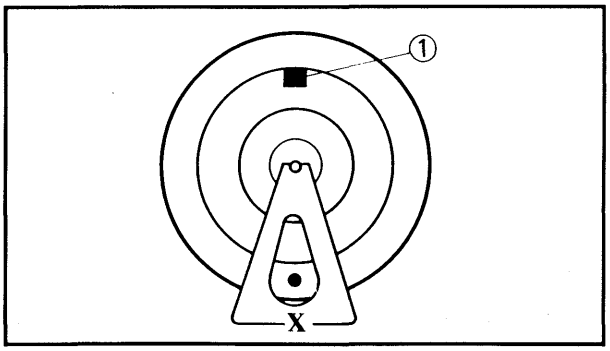


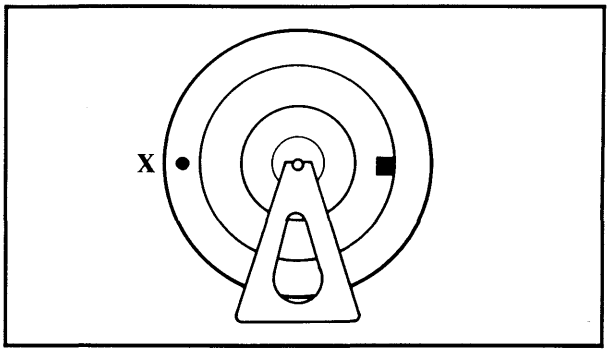


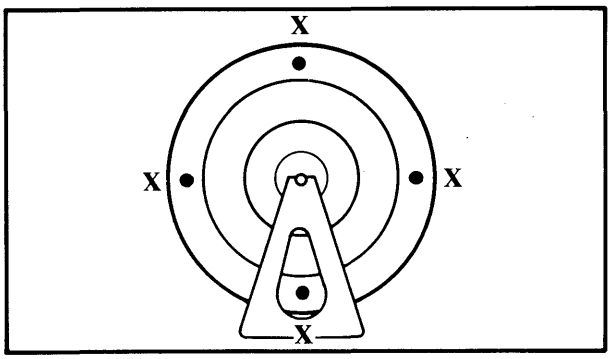
3. Set the wheel on a suitable stand.
4. Find:
   - Heavy spot

Procedure:

a. Spin the wheel and wait for it to rest.
b. Put an "X_1" mark on the wheel bottom spot.
c. Turn the wheel so that the "X_1" mark is 90° up.
d. Let the wheel fall and wait for it to rest. Put an "X" mark on the wheel bottom spot.
e. Repeat the above b., c., and d. several times until these marks come: to the same spot.
f. This spot is the heavy spot "X".







5. Adjust:
   Wheel balance

Adjusting steps:
- Install a balancing weight ① on the spoke exactly opposite to the heavy spot "X".

NOTE:
Start with the smallest weight.

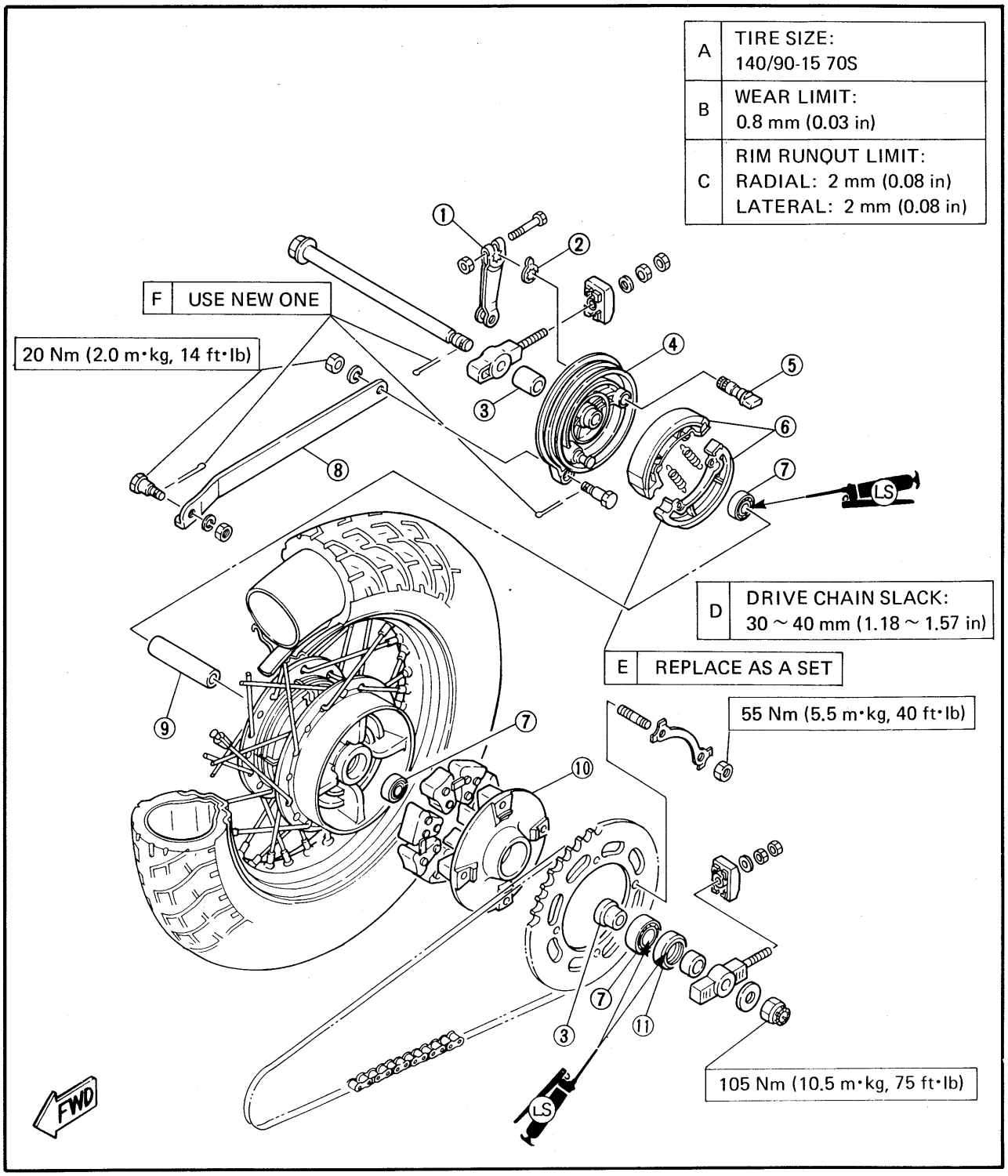
- Turn the wheel so that the heavy spot is 90° up.
- Check that the heavy spot is at rest there. If not, try another weight until the wheel is balanced.

6. Check:
   - Wheel balance

Checking steps:
- Turn the wheel so that it cames to each point as shown.
- Check the wheel is at rest at each point. If not, readjust the wheel balance.

REAR WHEEL

① Brake camshaft lever
② Indicator plate
③ Collar
④ Brake shoe plate
⑤ Brake camshaft
⑥ Brake shoe
⑦ Bearing
⑧ Brake rod
⑨ Spacer
⑩ Clutch hub
⑪ Oil seal

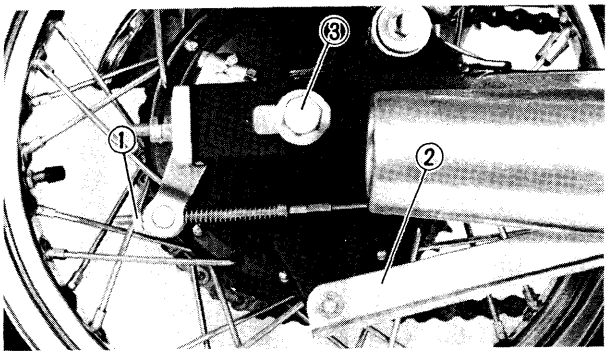


REMOVAL

⚠ WARNING:

Securely support the motorcycle so there is no danger of it falling over.

1. Place the motorcycle on level place.



2. Remove:
   - Adjuster (Rear brake) ①
   - Tension bar ②
3. Loosen:
   - Pinch bolt (Rear axle) ③
4. Remove:
   - Cotter pin
   - Nut (Rear axle)
   - Plain washer
5. Elevate the rear wheel by placing a suitable stand.
6. Remove:
   - Rear axle
   - Rear wheel
   - Washer
   - Collars

NOTE:

Move the rear wheel to the right side to separate it from the final gear case, and remove the wheel.

INSPECTION

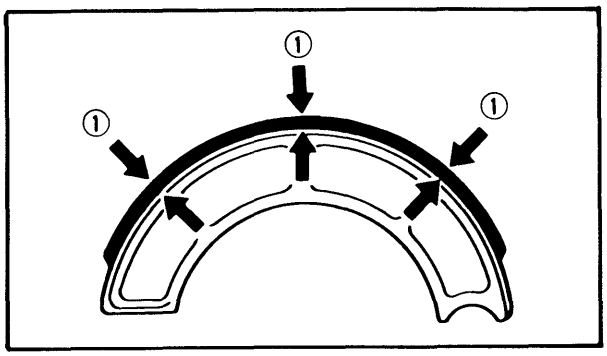
1. Inspect:
   - Tire
   - Rear axle
   - Wheel
   - Wheel bearings

   Refer to "FRONT WHEEL – INSPECTION" section.

2. Measure:
   • Wheel runout
   Refer to "FRONT WHEEL – INSPECTION" section.
3. Check:
   • Wheel balance
   Refer to "FRONT WHEEL – INSPECTION" section.

4. Inspect:
   • Brake lining surface
   Glazed areas → Remove.
   Use a coarse sand paper.

NOTE:
After using the sand paper, clean of the polished particles with cloth.



5. Measure:
   • Brake lining thickness
   Out of specification → Replace.

① Measuring points

NOTE:
Replace the brake shoes as a set if either is found to be worn to the wear limit.

Brake Lining Thickness:
4 mm (0.16 in)
Wear Limit:
2 mm (0.08 in)

6. Inspect:
   • Brake drum inner surface
   Oil/Scratches → Replace.

Oil	**Use a rag soaked in lacquer thinner or solvent.**
Scratches	**Use a emery cloth (lightly and evenly polishing)**

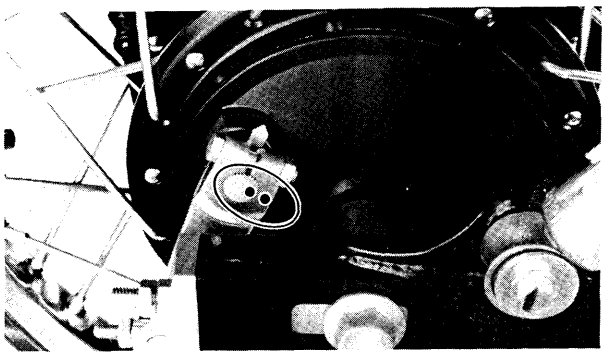
7. Inspect:
   • Camshaft face
   Wear → Replace.

INSTALLATION

When installing the rear wheel, reverse the removal procedure. Note the following points.

1. Lubricate:
   - Bearings
   - Oil seals

Lithium – Soap Base Grease



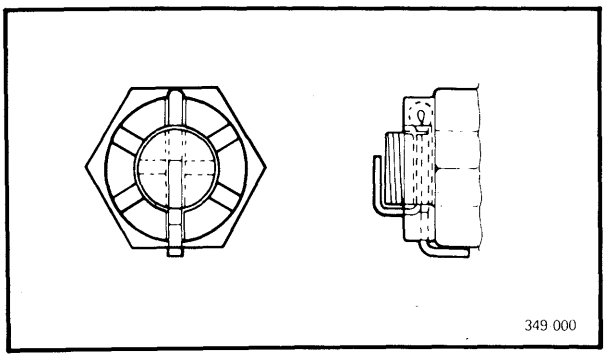
2. Install:
   - Brake camshaft
   - Brake camshaft lever
     To brake shoe plate.

NOTE:
Align the match marks.

3. Adjust:
   - Drive chain slack

Drive Chain Slack:
30 ~ 40 mm (1.18 ~ 1.57 in)

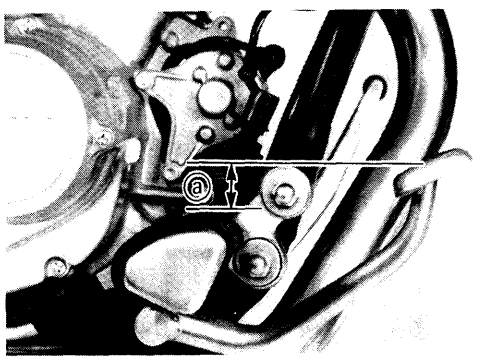
Refer to "CHAPTER 3. – DRIVE CHAIN SLACK ADJUSTMENT".



4. Tighten:
   - Nut (Rear axle)

Nut (Rear Axle):
105 Nm (10.5 m·kg, 75 ft·lb)

⚠ WARNING:
Always use a new cotter pin on the axle nut.

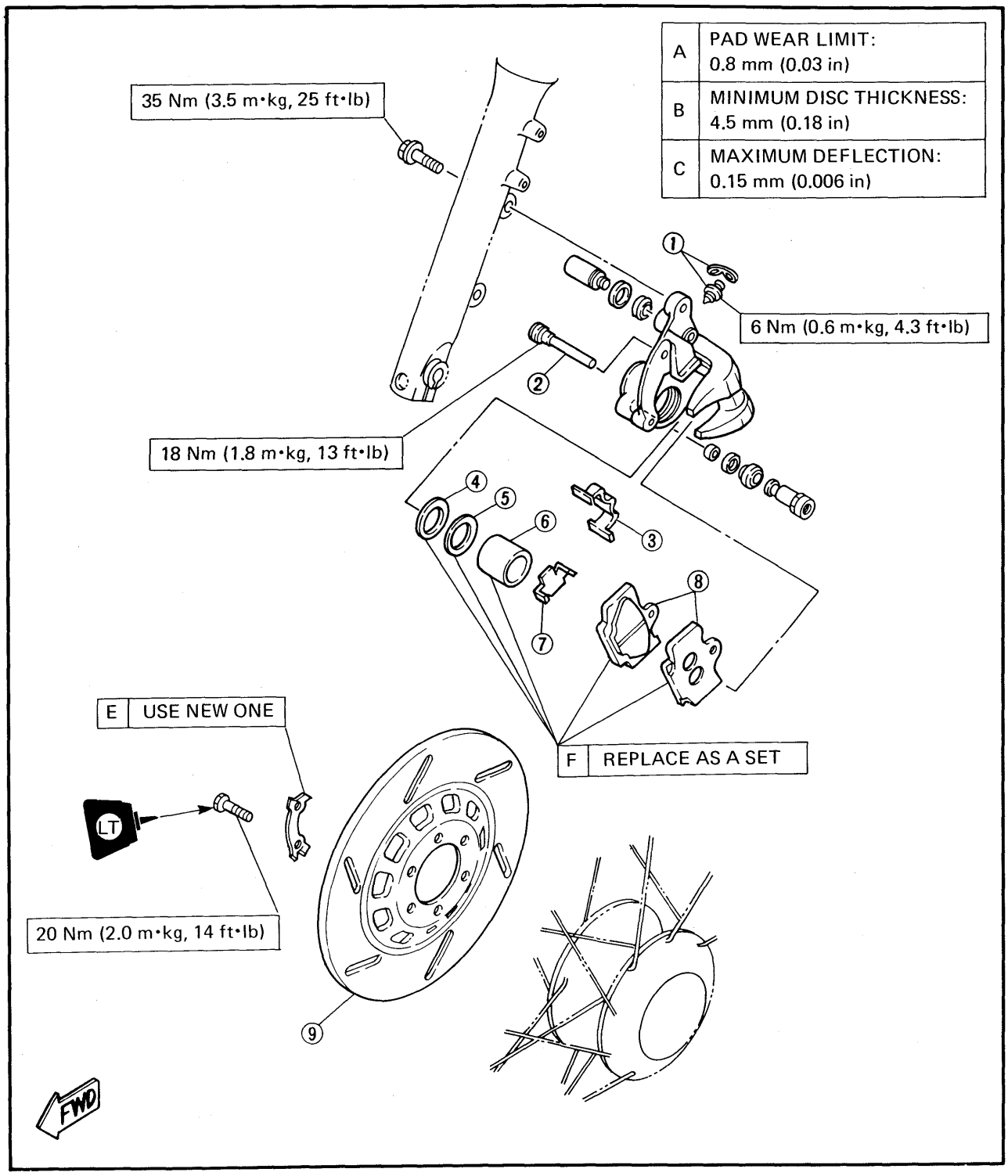


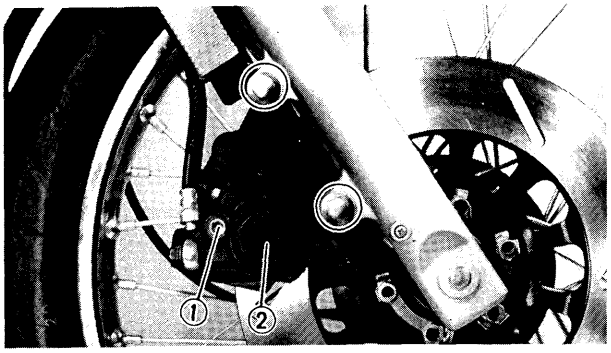
5. Adjust:
   - Brake pedal free play ⓐ
     Refer to "CHAPTER 3. – REAR BRAKE ADJUSTMENT" section.

Brake Pedal Free Play:
20 ~ 30 mm (0.8 ~ 1.2 in)

FRONT BRAKE

① Air bleed screw
② Retaining bolt
③ Pad springs
④ Piston seal
⑤ Dust seal
⑥ Piston
⑦ Pad shim
⑧ Pads
⑨ Brake disc

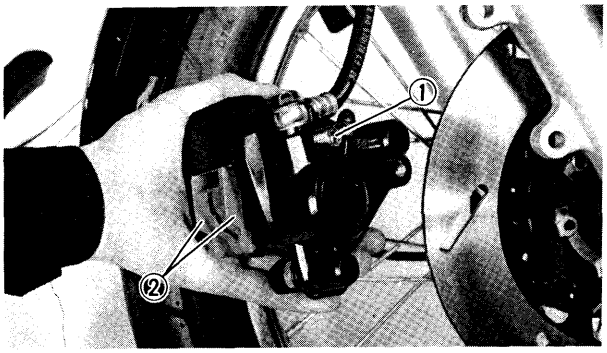




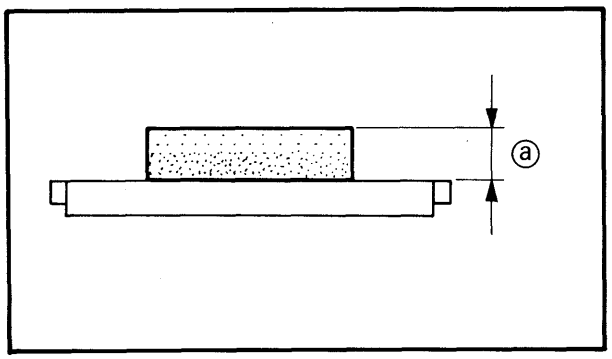
CALIPER PAD REPLACEMENT

It is not necessary to disassemble the brake caliper and brake hose to replace the brake pads.

1. Loosen:
   - Retaining bolt ①
2. Remove:
   - Brake caliper ②



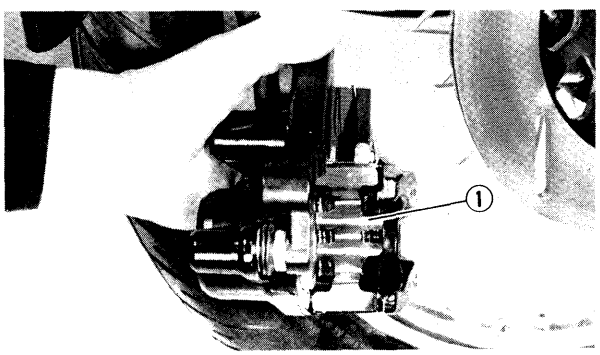
3. Remove:
   - Retaining bolt ①
   - Pads ②
   - Pad springs



4. Measure:
   - Pad thickness ⓐ
     Out of specification → Replace.

NOTE:
- Replace the pad spring if pad replacement is required.
- Replace the pads as a set if either if found to be worn to the wear limit.

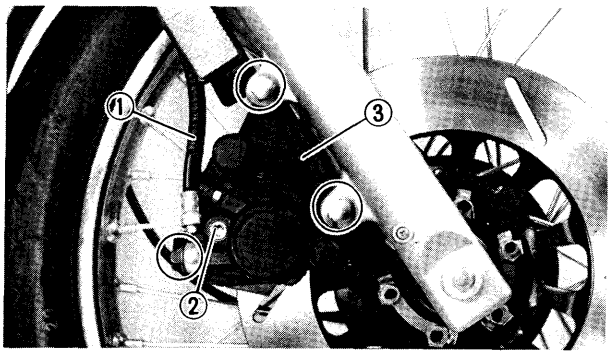
Wear Limit:
0.8 mm (0.03 in)



5. Install:
   - Pad spring (New) ①
   - Pads (New)
     To the caliper.

6. Install:
   - Retainign bolt
   - Brake caliper

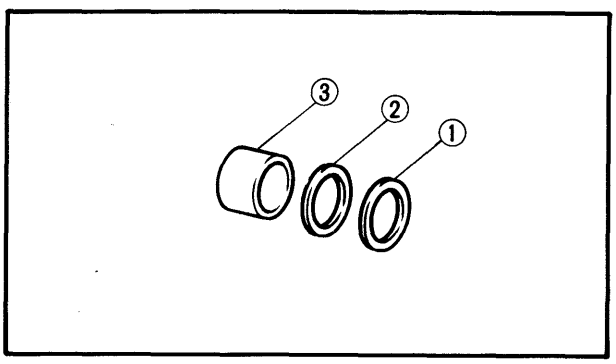
	Retaining Bolt: 18 Nm (1.8 m·kg, 13 ft·lb) **Bolts (Brake Caliper):** 35 Nm (3.5 m·kg, 25 ft·lb)



CALIPER DISASSEMBLY

1. Remove:
   - Brake hose ①
   - Retaining bolt ②
   - Brake caliper ③
   - Pads
   - Pad springs

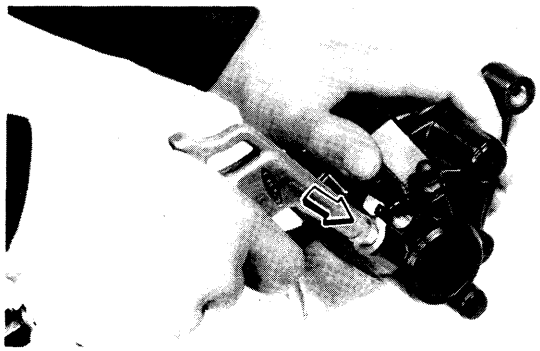
NOTE:
Drain the brake fluid before removing brake caliper.



3. Remove:
   - Dust seal ①
   - Piston seal ②
   - Piston ③

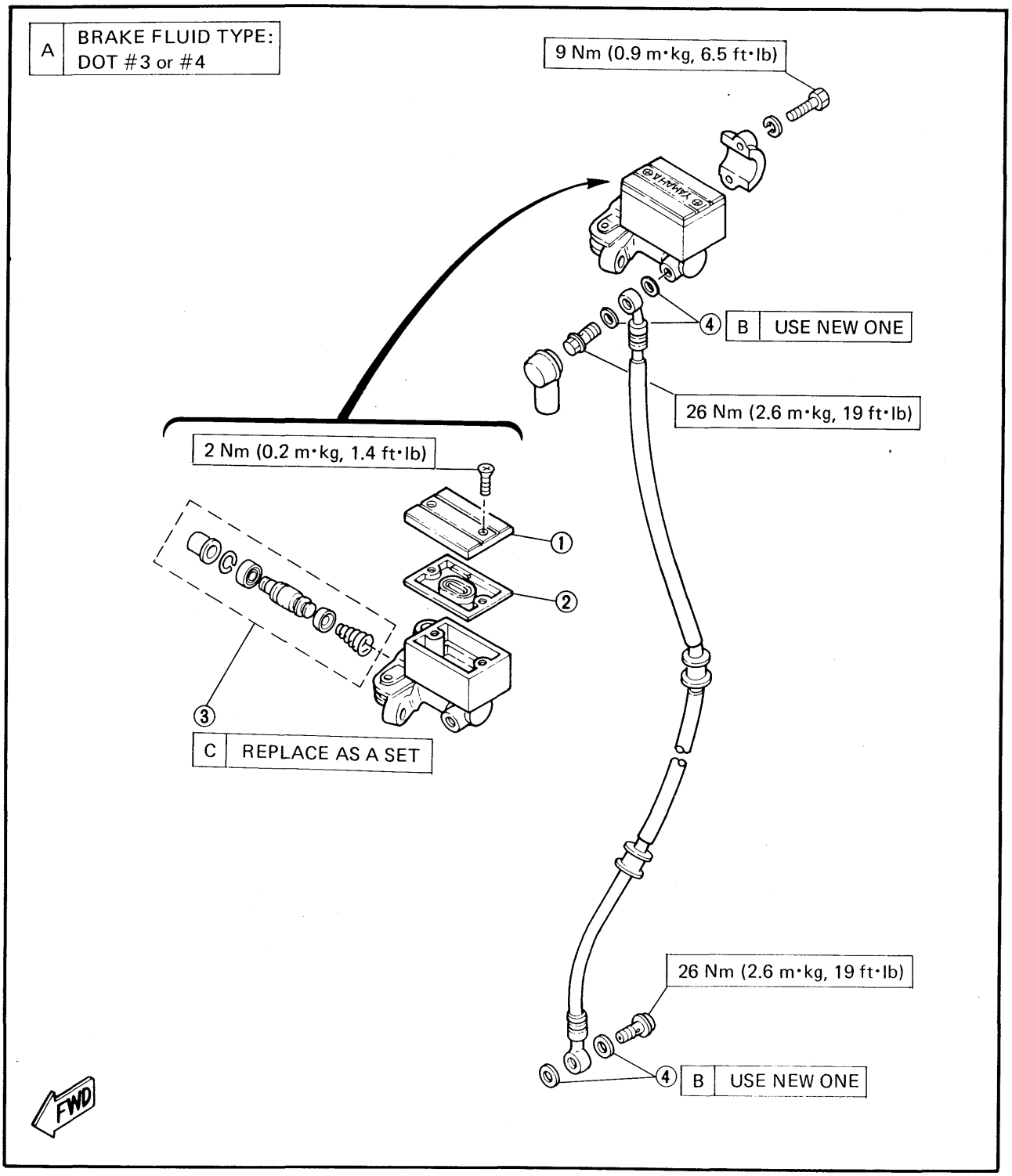
Caliper piston removal steps:
- Blow compressed air into the tube joint opening to force out the caliper piston from the caliper body.

⚠ WARNING:
- **Never try to pry out the caliper piston.**
- **Cover the piston with a rag. Use care so that piston does not cause injury as it is expelled from the cylinder.**



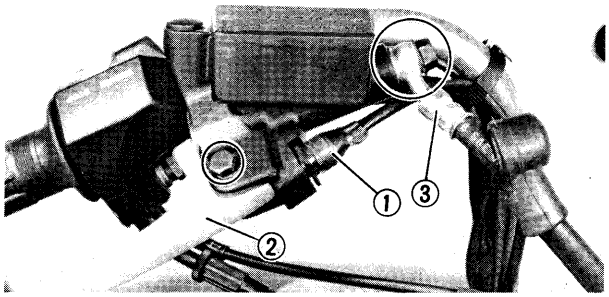
MASTER CYLINDER

① Master cylinder cap
② Rubber seal
③ Master cylinder kit
④ Copper washer



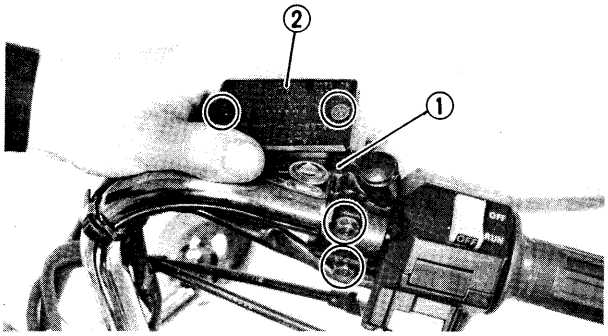
MASTER CYLINDER DISASSEMBLY

NOTE:
Drain the brake fluid before removing master cylinder.

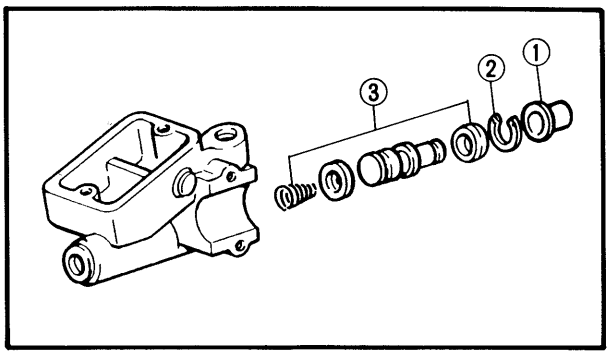


1. Remove:
   - Brake light switch lead ①
   - Brake lever ②
   - Lever spring
2. Disconnect:
   - Brake hose ③

   Drain the fluid.



3. Remove:
   - Master cylinder ①
   - Master cylinder cap ②



4. Remove:
   - Dust boot ①
   - Circlip ②
   - Master cylinder kit ③

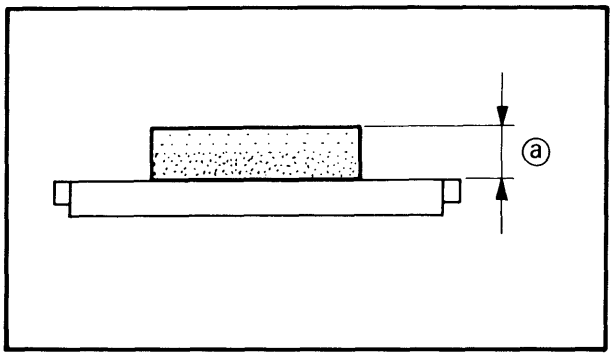
BRAKE INSPECTION AND REPAIR

Recommended Brake Component Replacement Schedule:	
Brake pads	As required
Piston seal, dust seal	Every two years
Brake hoses	Every four years
Brake fluid	Replace only when brakes are disassembled

⚠ WARNING:

All internal parts should be cleaned in new brake fluid only. Do not use solvents will cause seals to swell and distort.

1. Inspect:
   - Brake pads (Thickness) ⓐ
     Out of specification → Replace.



NOTE:
- Replace the pad spring if pad replacement is required.
- Replace the pads as a set if either if found to be worn to the wear limit.

Wear Limit:
0.8 mm (0.03 in)

2. Inspect:
   - Caliper piston
     Rust/Wear/Damage → Replace.
   - Dust seal/Piston seal
     Damage → Replace.

⚠ WARNING:

Replace the piston and dust seals whenever a caliper is disassembled.

- Master cylinder kit
- Master cylinder body
  Scratches/Wear → Replace.
- Brake hose
  Cracks/Wear/Damage → Replace.

3. Inspect:
   - Brake disc
     Out of specification → Replace.

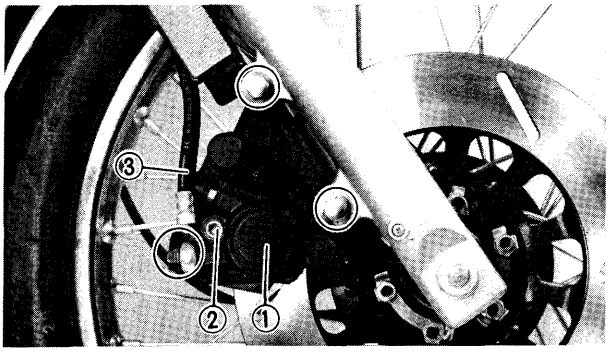
Maximum Deflection:
0.15 mm (0.006 in)
Minimum Disc Thickness:
4.5 mm (0.18 in)

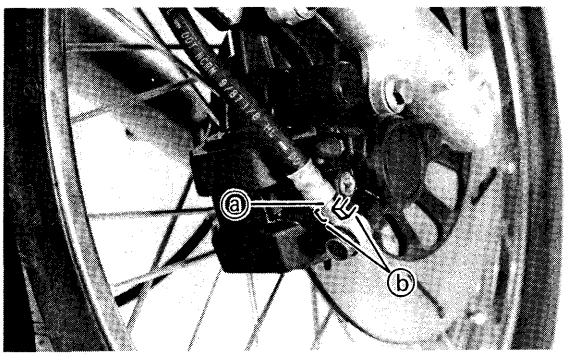
BRAKE REASSEMBLY

⚠ WARNING:

- **All internal parts should be cleaned in new brake fluid only.**
- **Internal parts should be lubricated with brake fluid when installed.**

Brake Fluid: DOT #4 or #3
If DOT #4 is not available, #3 can be used.





Caliper Reassembly

When assembling the caliper, reverse the disassembly procedure. Note the following points.

1. Install:
   - Brake caliper ①
   - Retaining bolt ②
   - Brake hose ③

⚠ CAUTION:

When installing the brake hose, lightly touch the brake pipe ⓐ with projections ⓑ on the caliper.

Brake Caliper:
35 Nm (3.5 m·kg, 25 ft·lb)
Retaining Bolt:
18 Nm (1.8 m·kg, 13 ft·lb)
Brake Hose:
26 Nm (2.6 m·kg, 19 ft·lb)

2. Bleed:
   - Air

   Refer to "CHAPTER 3. — AIR BLEEDING".

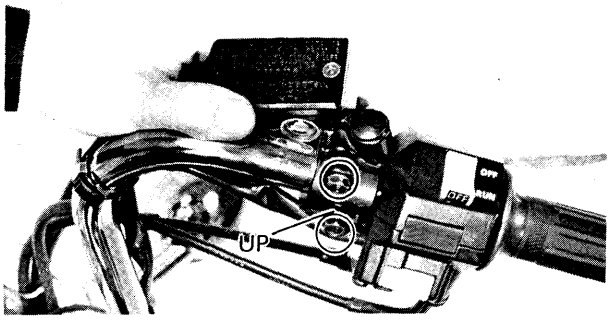
Master Cylinder Reassembly

When assembling the master cylinder, reverse the disassembly procedure. Note the following points.

1. Install:
   - Master cylinder kit

⚠ WARNING:

Internal parts should be lubricated with brake fluid when installed.



2. Install:
   - Master cylinder
   - Brake hose

NOTE:
Install the master cylinder bracket with its "UP" mark to top.

	Bracket (Master Cylinder): **9 Nm (0.9 m·kg, 6.5 ft·lb)** **Brake Hose:** **26 Nm (2.6 m·kg, 19 ft·lb)**

3. Fill:
   - Master cylinder

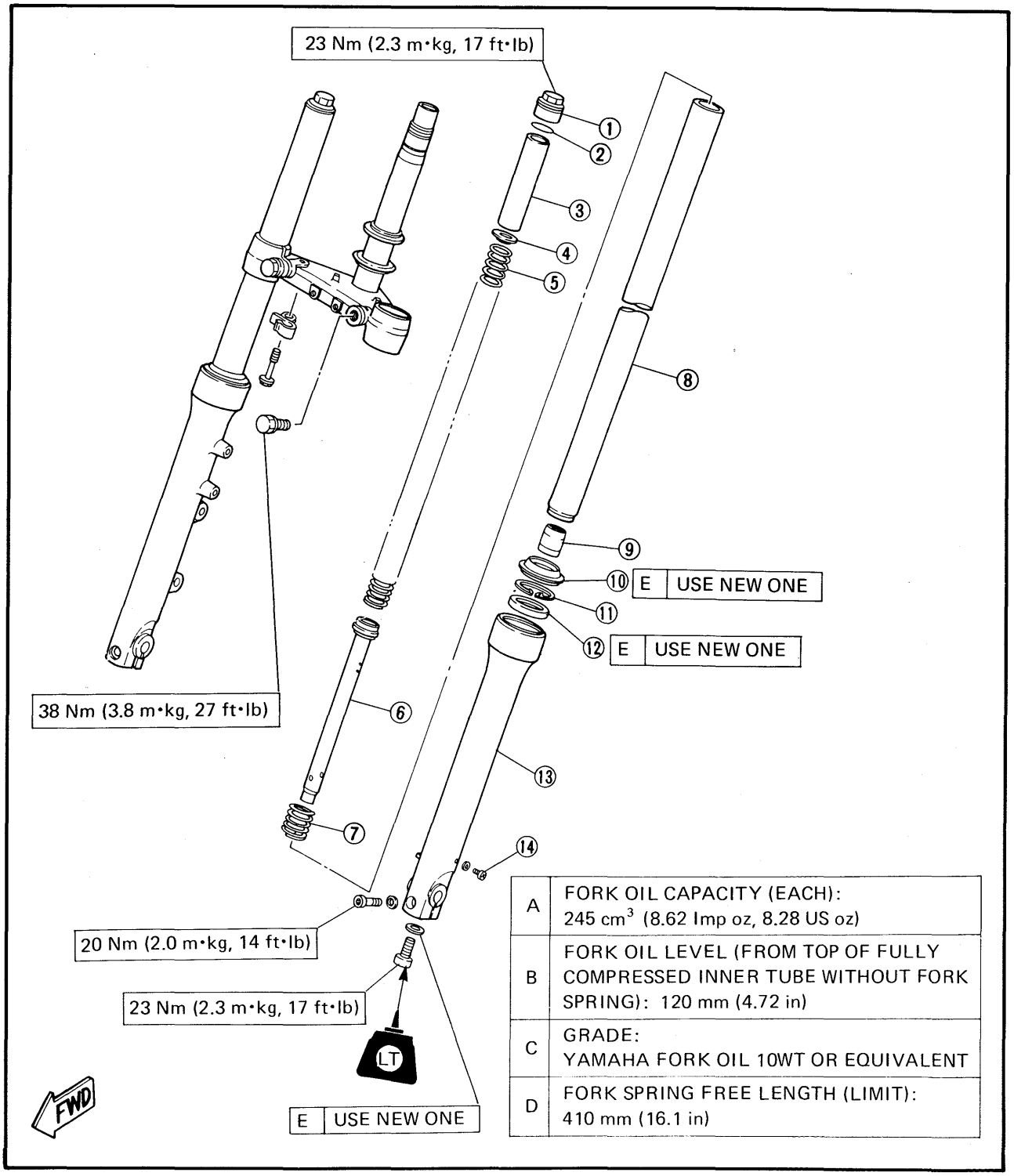
	Brake Fluid: **DOT #3 or #4** **If DOT #4 is not available, #3 can be used.**

4. Bleed:
   - Air

   Refer to "CHAPTER 3. – AIR BLEEDING".

FRONT FORK

① Cap bolt
② O-ring
③ Spacer
④ Spring retainer
⑤ Fork spring
⑥ Damper rod
⑦ Rebound spring
⑧ Inner fork tube
⑨ Oil lock piece
⑩ Dust seal
⑪ Circlip
⑫ Oil seal
⑬ Outer fork tube
⑭ Drain screw



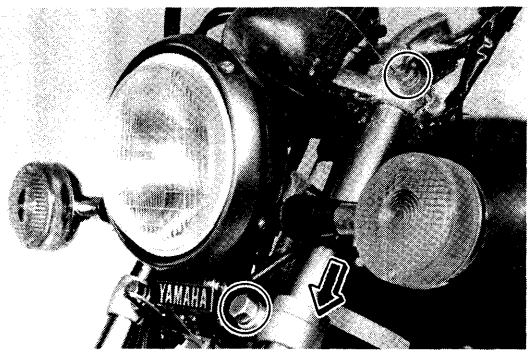
REMOVAL

⚠ WARNING:

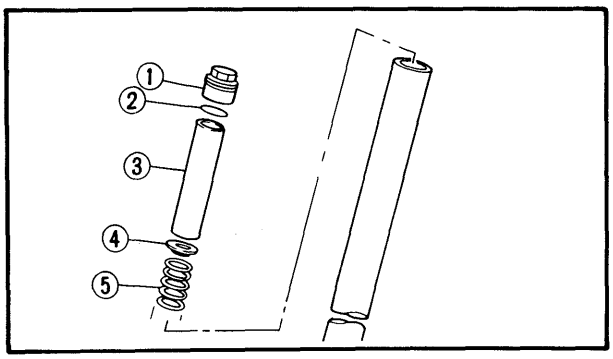
Securely support the motorcycle so there is no danger of it falling over.

1. Remove:
   - Front wheel
   - Brake caliper

   Refer to "FRONT WHEEL and FRONT BRAKE" sections.
2. Remove:
   - Front fender



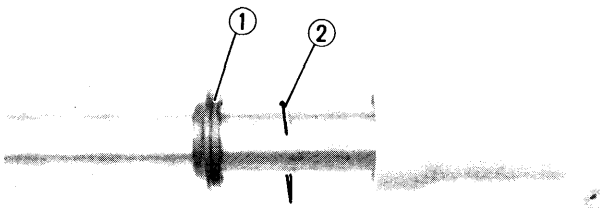
3. Loosen:
   - Bolts (Handlebar crown)
   - Bolts (Steering stem)
   - Cap bolts
4. Remove:
   - Front fork(s)



DISASSEMBLY

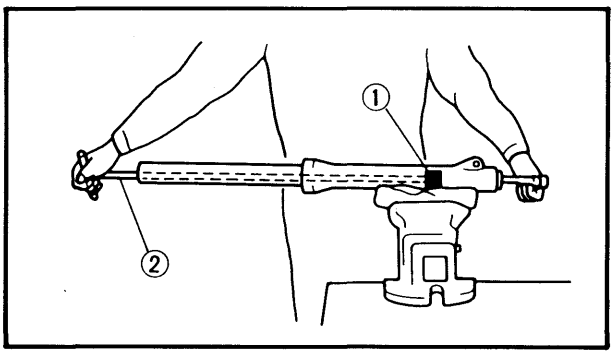
1. Remove:
   - Cap bolt ①
   - O-ring ②
   - Spacer ③
   - Spring retainer ④
   - Fork spring ⑤

   Drain the fork oil.



2. Remove:
   - Dust seal ①
   - Circlip ②

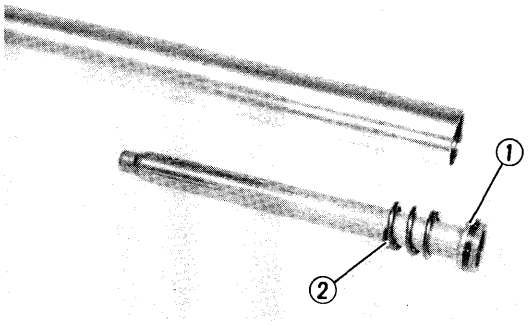
   Use a thin screwdriver, and be careful no to scratch the inner fork tube.



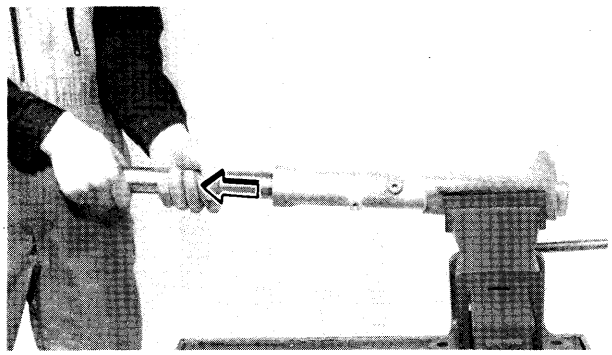
3. Remove:
   - Bolt (Damper rod)

   Use the Damper Rod Holder ① and T-Handle ② to lock the damper rod.

Damper Rod Holder:
YM-01300-1
T-Handle:
YM-01326



4. Remove:
   - Damper rod (Cylinder complete) ①
   - Rebound spring ②



5. Remove:
   - Inner fork tube

Inner fork tube removal steps:
- Hold fork leg horizontally.
- Clamp the caliper mounting boss of the outer tube securely in a vise with soft jaws.
- Pull out the inner fork tube from the outer tube by forcefully, but carefully, with drawing the inner tube.

NOTE:
- Excessive force will damage the oil seal and/or the bushes. Damaged oil seal and bushing must be replaced.
- Avoid bottoming the inner tube in the outer tube during the above procedure, as the oil lock piece will be damaged.

6. Remove:
   - Oil seal
   - Oil lock piece

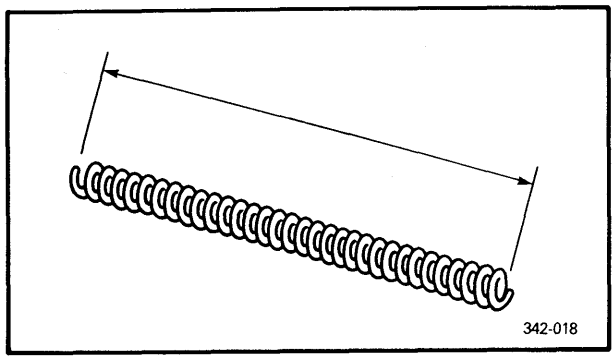
INSPECTION

1. Inspect:
   - Inner fork tube
     Scratches/Bends → Replace.

⚠ WARNING:

Do not attempt to straighten a bent inner fork tube as this may dangerously weaken the tube.

   - Outer fork tube
     Scratches/Bends/Damage → Replace.
   - Fork spring
     Over specified limit → Replace.



Fork Spring Free Length (Limit):
410 mm (16.1 in)

2. Inspect:
   - Damper rod
     Wear/Damage → Replace.
     Contamination → Blow out all oil passages with compressed air.
   - Oil lock piece
   - O-ring (Cap bolt)
     Damage → Replace.

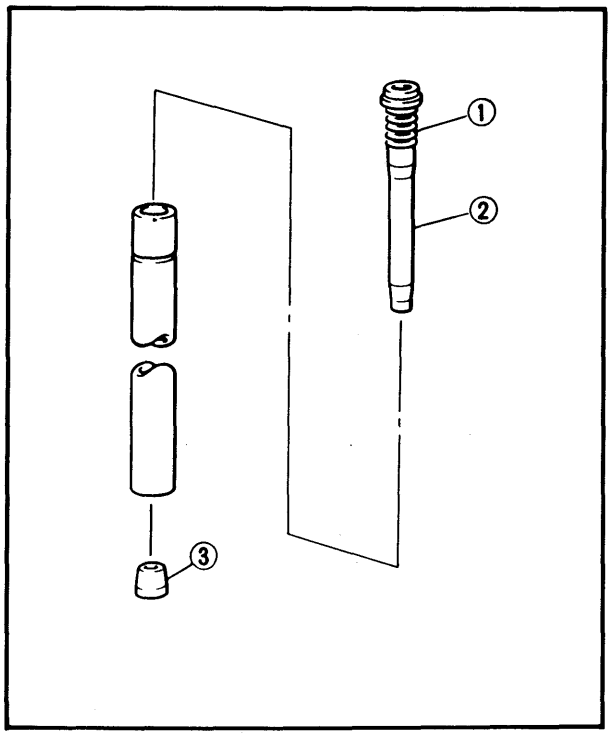
ASSEMBLY

Before assembling, clean and inspect all parts and replace when necessary.

NOTE:

In front fork assembly, be sure to use following new parts. Do not reuse them.

- Oil seal
- Dust seal

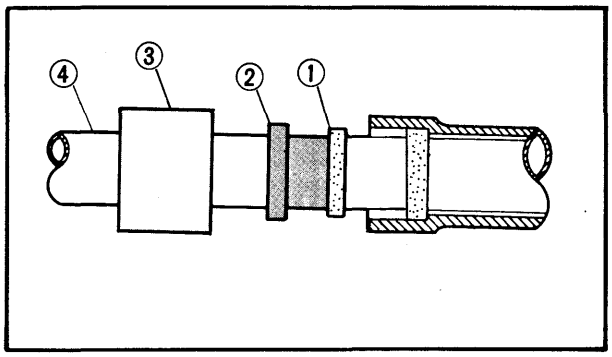


1. Install:
   - Rebound spring ①
   - Damper rod ②
     Allow the rod to slide slowly down the tube until the it protrudes from the bottom.
   - Oil lock piece ③
     Fit oil lock piece over damper rod sticking out of the inner fork tube.

2. Install:
   • Inner fork tube
     Into outer tube.
3. Tighten:
   • Bolt (Damper rod)
     Use the Damper Rod Holder and the T-Handle to lock the damper rod.

Damper Rod Holder:
YM-01300-1
T-Handle:
YM-01326

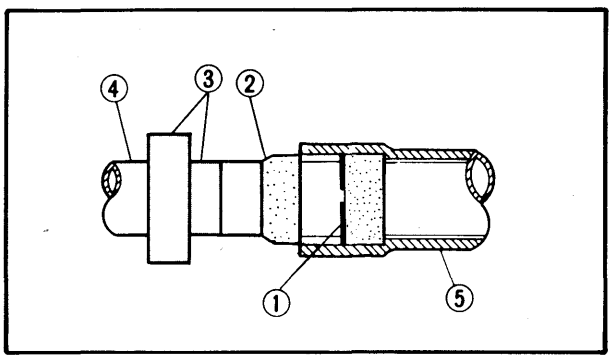
Bolt (Damper Rod):
23 Nm (2.3 m·kg, 17 ft·lb)
Apply LOCTITE®



4. Install:
   • Oil seal ①
     Use the Fork Seal Driver Weight ③ and the Adapter ②.

Fork Seal Driver Weight:
YM-01367
Adapter (33 mm):
YM-1368

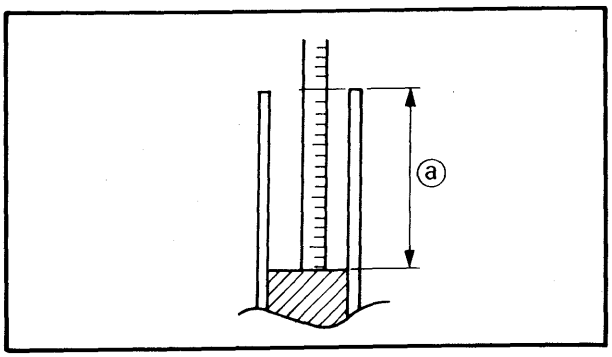
④ Inner fork tube
⑤ Outer fork tube



5. Install:
   • Circlip ①
   • Dust seal ②
     Use the Fork Seal Driver Weight ③ and the Adapter ②.

Fork Seal Driver Weight:
YM-01367
Adapter (33 mm):
YM-1368

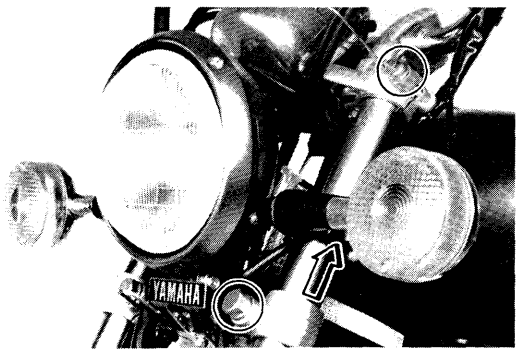
④ Inner fork tube
⑤ Outer fork tube



6. Fill:
   - Front fork

Fork Oil Capacity (Each):
245 cm³ (8.62 Imp oz, 8.28 US oz)
Fork Oil Level ⓐ (From Top of Fully Compressed Inner Tube Without Fork Spring):
120 mm (4.72 in)
Grade:
Yamaha fork oil 10wt or equivalent
After filling, slowly pump the fork up and down to distributed oil.

7. Install:
   - Fork spring
     With the smaller pitch side up.
   - Spring retainer
   - Cap bolt
     Temporarily tighten the cap bolt.



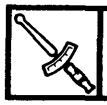
INSTALLATION

When installing the front fork, reverse the removal procedure.
Note the following points.

1. Install:
   - Front fork(s)
     Into the steering stem.
2. Tighten:
   - Pinch bolts (Steering stem)
   - Pinch bolt(s) (Handle crown)
     Temporarily tighten the pinch bolts.

NOTE:
Position the inner tube end so that it is flush with the top of the steering crown.

3. Tighten:
   - Bolts (Steering stem)

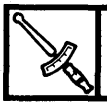
	**Bolts (Steering Stem):** **20 Nm (2.0 m·kg, 14 ft·lb)**

NOTE:
Do not tighten the pinch bolt (Handlebar crown) in this stage.

4. Tighten:
   - Cap bolt
   - Bolt (Handlebar crown)
   - Bolts (Handlebar)

	**Cap Bolt:** **23 Nm (2.3 m·kg, 17 ft·lb)** **Bolt (Handlebar Crown):** **20 Nm (2.0 m·kg, 14 ft·lb)**

5. Install:
   - Fork caps
   - Front fender

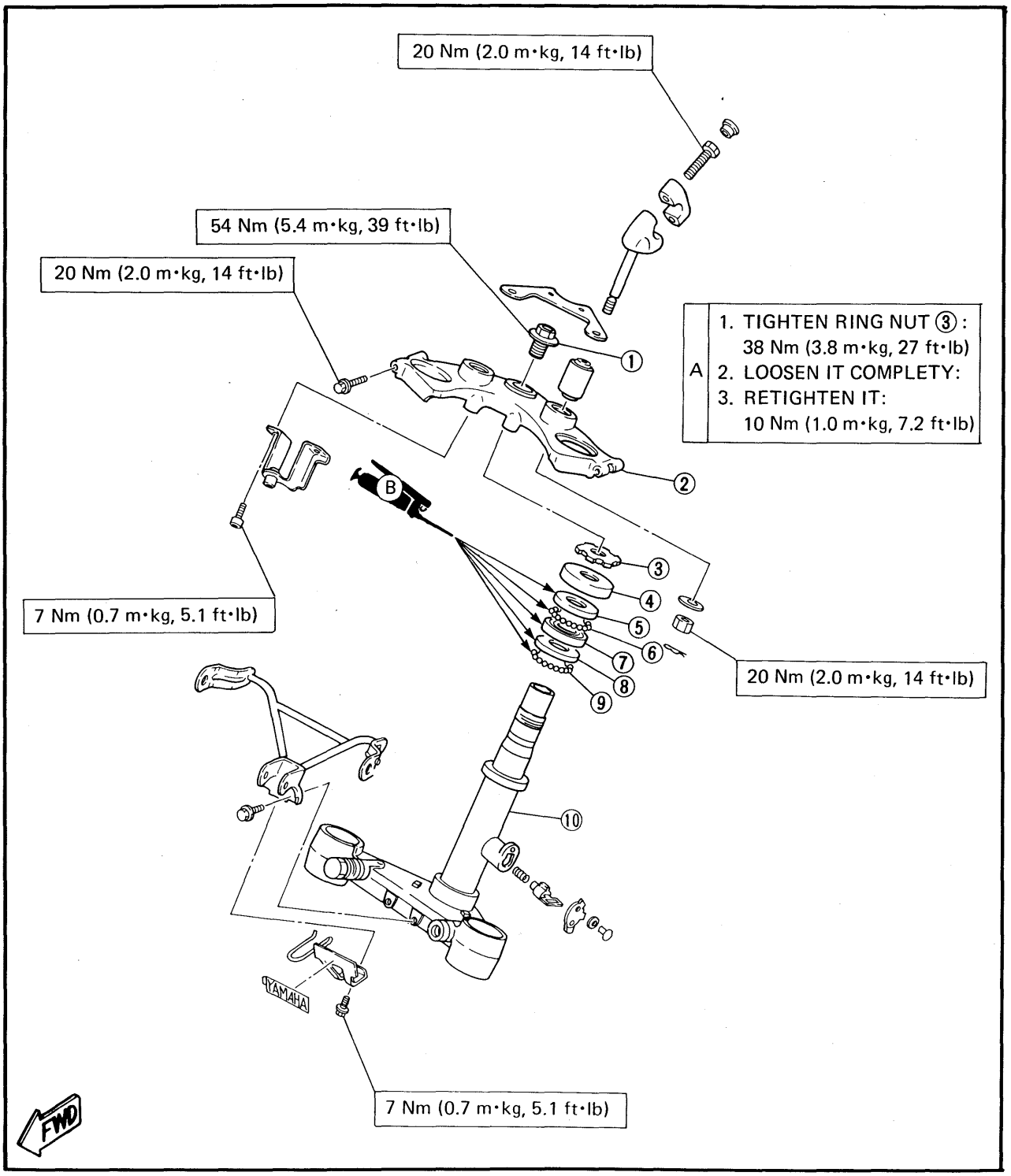
	**Front Fender:** **20 Nm (2.0 m·kg, 14 ft·lb)**

6. Install:
   - Front wheel
   - Brake caliper (Right)
     Refer to "FRONT WHEEL and FRONT BRAKE" section.

7. Inspect:
   - Fork operation
     Unsmooth operation → Repair.
   - Oil leaks
     Leakage → Repair.

STEERING HEAD

① Steering stem bolt
② Handlebar crown
③ Ring nut
④ Bearing cover
⑤ Ball race (Upper – Top)
⑥ Ball (19 pcs.)
⑦ Ball race (Upper – Bottom)
⑧ Ball race (Lower – Top)
⑨ Ball (19 pcs.)
⑩ Steering stem

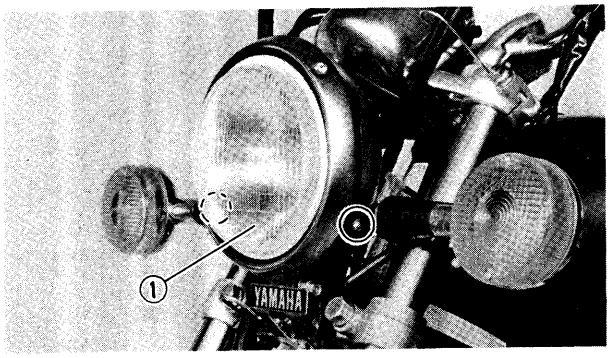


REMOVAL

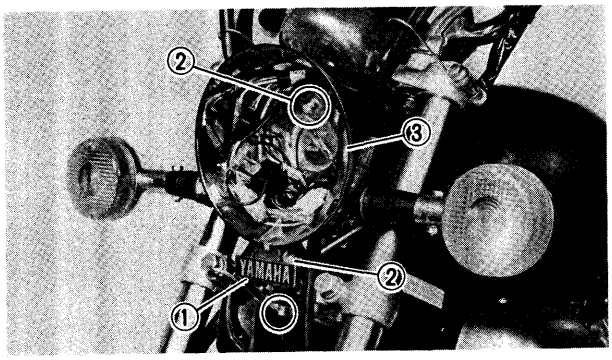
⚠ WARNING:

Securely support the motorcycle so there is no danger of it falling over.

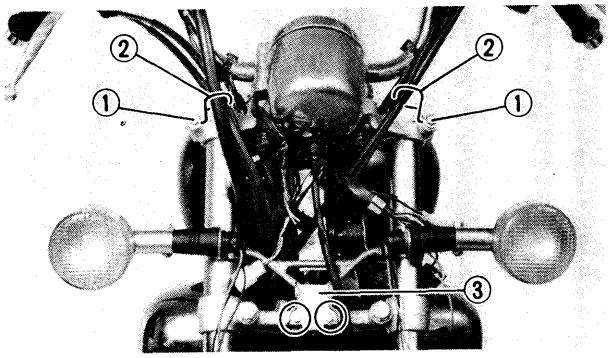
1. Remove:
   - Front wheel
     Refer to "FRONT WHEEL".



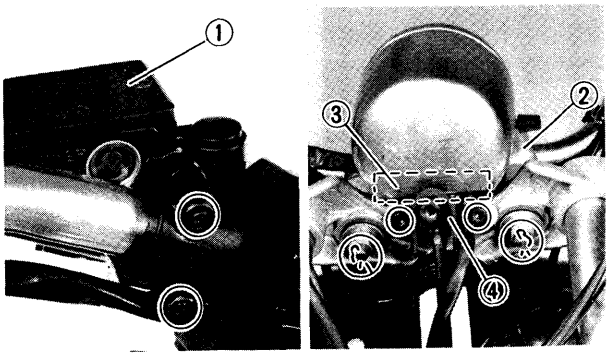
2. Remove:
   - Headlight lens unit ①
3. Disconnect:
   - All leads (In the headlight body)



4. Remove:
   - Emblem ①
   - Bolts (Headlight body) ②
   - Headlight body ③



5. Remove:
   - Bolts (Handlebar crown) ①
   - Cable holders ②
   - Bracket (Flasher relay) ③

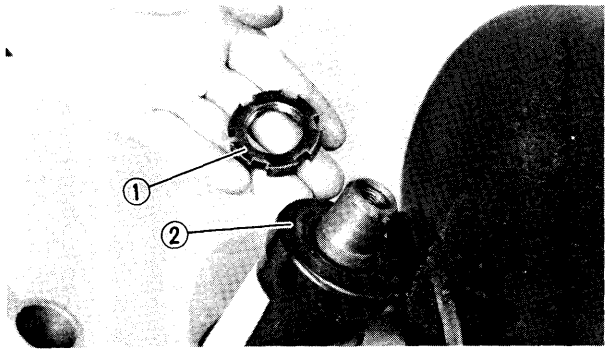


6. Remove:
   - Master cylinder assembly ①
   - Handlebar holder assembly ②
   - Indicator light box ③
   - Speedometer with bracket ④
   - Handlebar

NOTE:

Take care not to lose the clevis pins.

7. Remove:
   - Bolt (Steering stem) ①
   - Crown ②
   - Front fork assembly

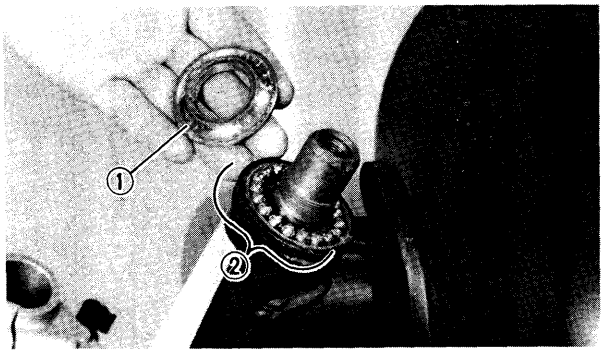


8. Remove:
   - Ring nut ①
     Use the Ring Nut Wrench.
   - Bearing cover ②

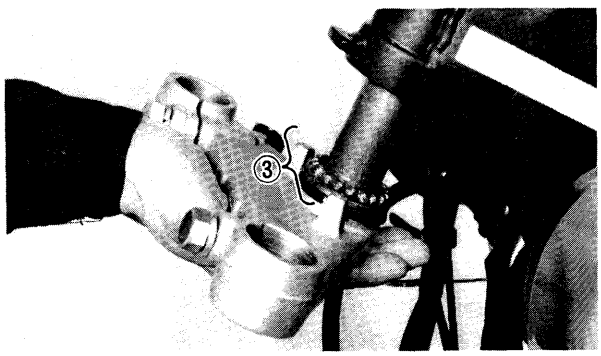
	Ring Nut Wrench: **YU-01268**

⚠ WARNING:

Support the under bracket so that it may not fall down.



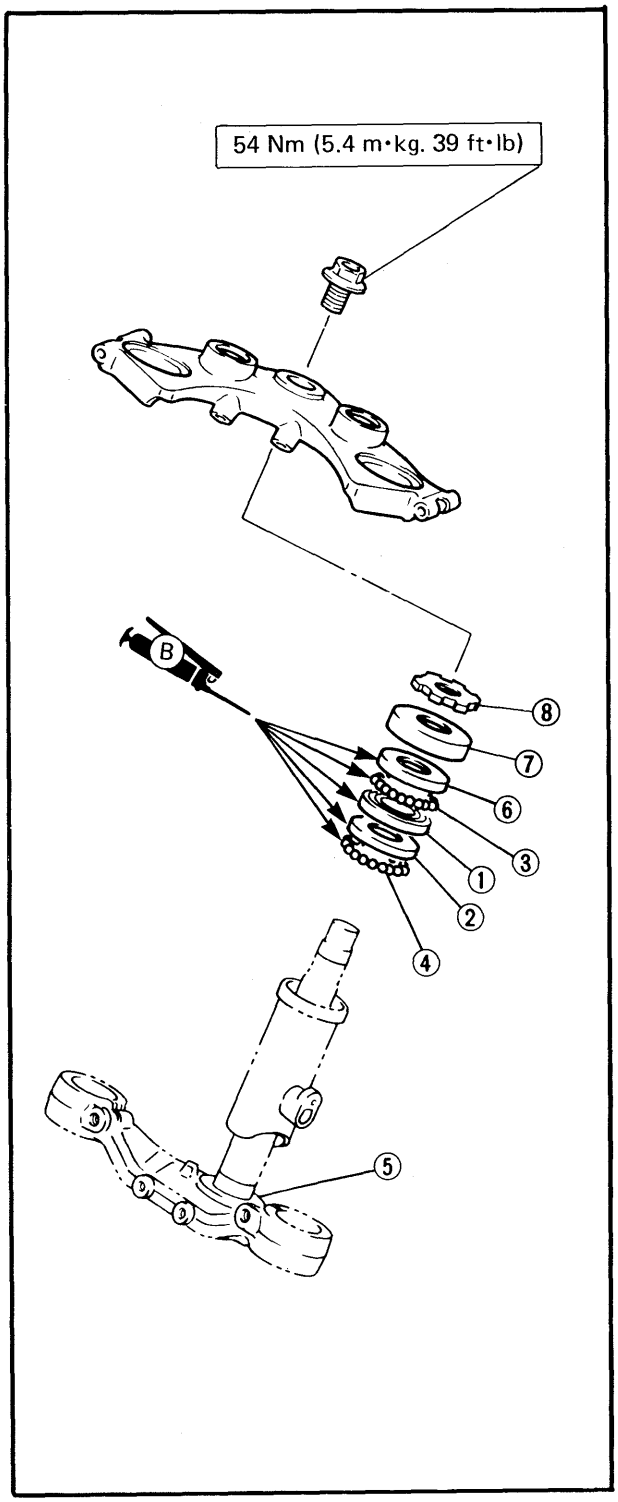
9. Remove:
   - Steering stem
   - Ball race (Upper – Top) ①
   - Ball (19 pcs.) ②
   - Ball (19 pcs.) ③



10. Remove:
    - Ball race (Upper – Bottom)
    - Ball race (Lower – Top)
      Use a drift punch and a hammer.

NOTE:

Work the race out gradually by tapping lightly around its complete backside diameter.



INSPECTION

1. Wash the bearing in a solvent.
2. Inspect:
   - Balls
   - Ball races

   Pitting/Damage → Replace.

NOTE:

Always replace ball and race as a set.

INSTALLATION

1. Install:
   - Ball race (Upper — Bottom) ①
   - Ball race (Lower — Top) ②

   Tap in the new races in the head pipe.
2. Lubricate:
   - Ball race (Upper — Bottom)
   - Ball race (Lower — Top)

Wheel Bearing Grease

3. Install:
   - Balls (Upper and lower) ③ , ④

   Arrange the balls around race, and apply more grease.

Ball Quantity/Size:
19 pcs./0.25 in

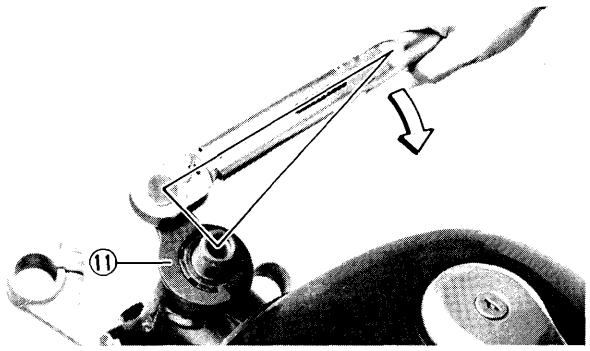
4. Install:
   - Steering stem ⑤
   - Ball race (Upper — Top) ⑥
   - Bearing cover ⑦
   - Ring nut ⑧

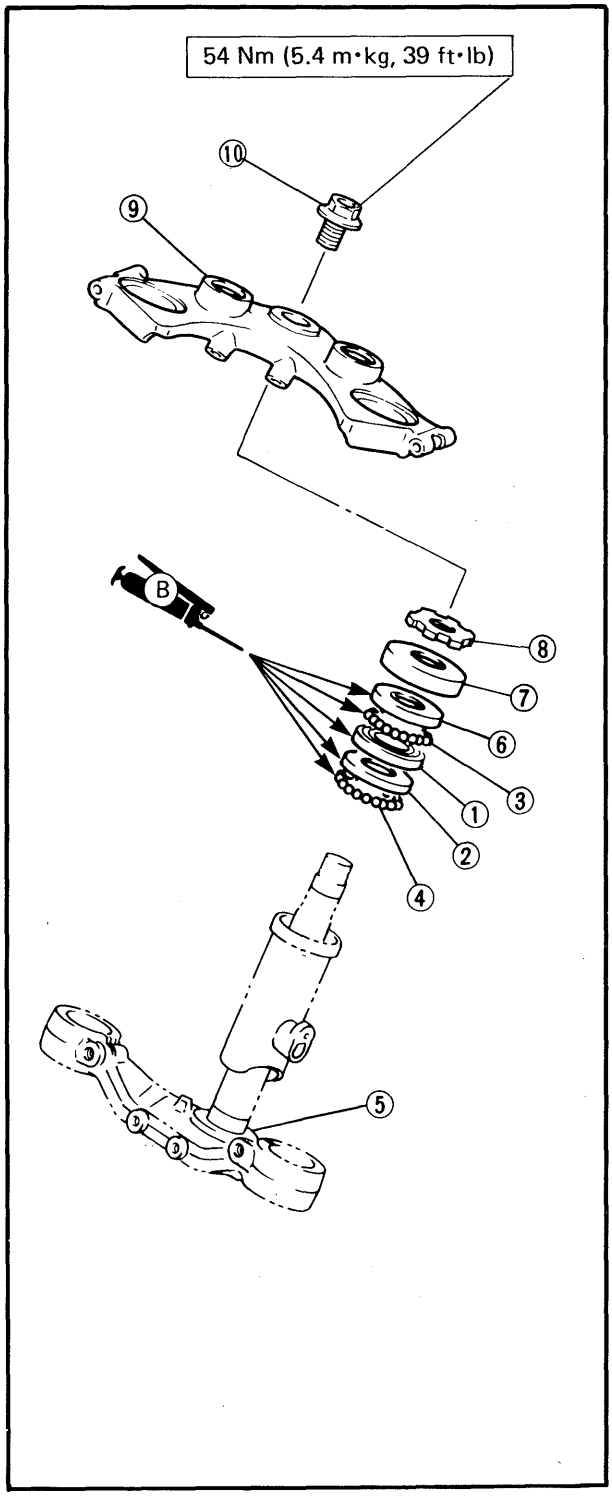
NOTE:

The tapered side of ring nut must face downward.

⚠ CAUTION:

Hold the steering stem until it is secured.





5. Tighten:
   - Ring nut ⑧

Ring nut tightening steps:

NOTE:
Set the Torque Wrench to the Ring Nut Wrench so that they form a right angle.

- Tighten the ring nut ⑧ using the Ring Nut Wrench ⑪ .

	Ring Nut Wrench: YU-33975
	Ring Nut (Initial Tightening): 38 Nm (3.8 m·kg, 27 ft·lb)

- Loosen the ring nut ⑧ completely and re-tighten it to specification.

⚠ WARNING:

Do not over-tightening.

	Ring Nut (Final Tightening): 10 Nm (1.0 m·kg, 7.2 ft·lb)

- Check the steering stem by turning it lock to lock. If there is any binding, remove the steering stem assembly and inspect the steering bearings ③ , ④ .
- Install the Handlebar crown ⑨ and tighten the steering stem nut ⑩ to specification.

	Nut (Steering Stem): 54 Nm (5.4 m·kg, 39 ft·lb)

6. Install:
   Reverse the removal procedure.

NOTE:
- Do not forget to fit:
  1) The clevis pins to the handlebar holders.
  2) The cable holders to the front fork top.
- After installing the headlight lens unit, adjust the headlight beam.

Bolt (Steering Stem):
54 Nm (5.4 m·kg, 39 ft·lb)

Bracket (Speedometer):
7 Nm (0.7 m·kg, 5.1 ft·lb)

Handlebar Holder (Lower):
20 Nm (2.0 m·kg, 14 ft·lb)

Master Cylinder Bracket:
9 Nm (0.9 m·kg, 6.5 ft·lb)

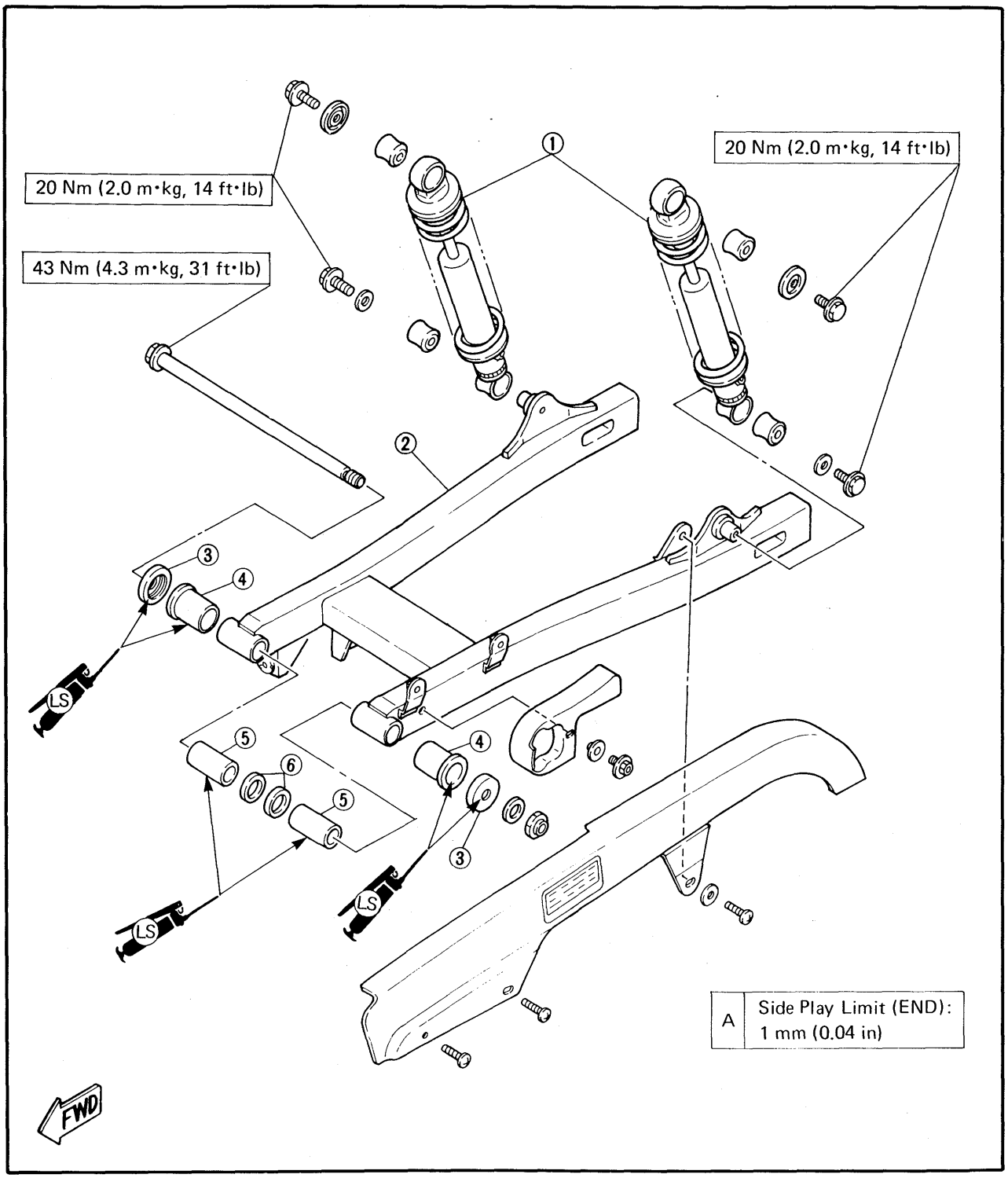
Headlight/Flasher Light Bracket:
7 Nm (0.7 m·kg, 5.1 ft·lb)

Bolts (Handlebar Crown):
20 Nm (2.0 m·kg, 14 ft·lb)

Headlight Body Bracket:
7 Nm (0.7 m·kg, 5.1 ft·lb)

REAR SHOCK ABSORBER AND SWINGARM

① Rear shock absorber
② Swingarm
③ Thrust cover
④ Bush (Outer)
⑤ Bush (Inner)
⑥ Oil seal



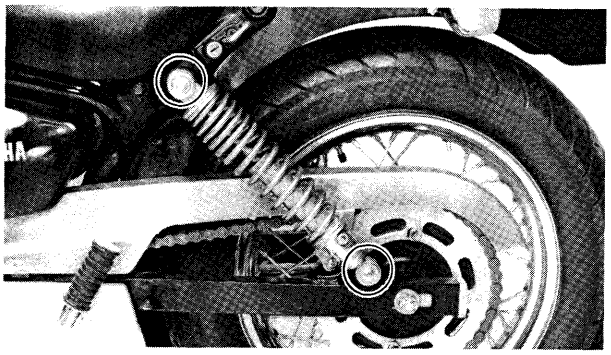
A	Side Play Limit (END): 1 mm (0.04 in)

REMOVAL

⚠WARNING:

Securely support the motorcycle so there is no danger of it falling over.

1. Place the motorcycle on level place.
2. Elevate the rear wheel by placing a suitable stand under the engine.

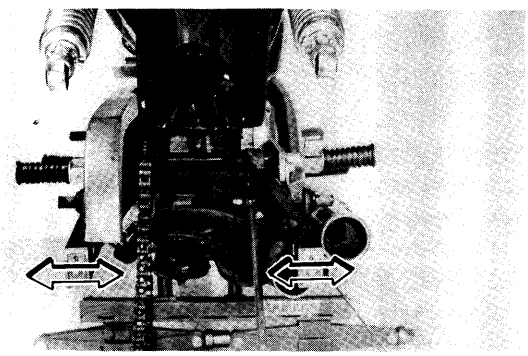


Rear Shock Absorber

1. Remove:
   - Rear shock absorbers

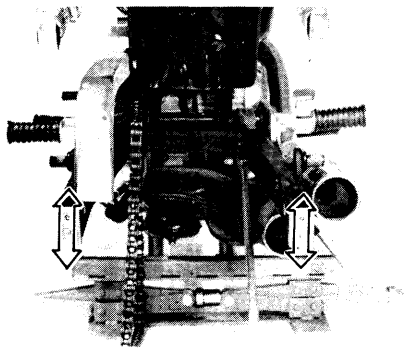
Swingarm

1. Remove:
   - Rear wheel
     Refer to "REAR WHEEL – REMOVAL".
   - Shock absorbers

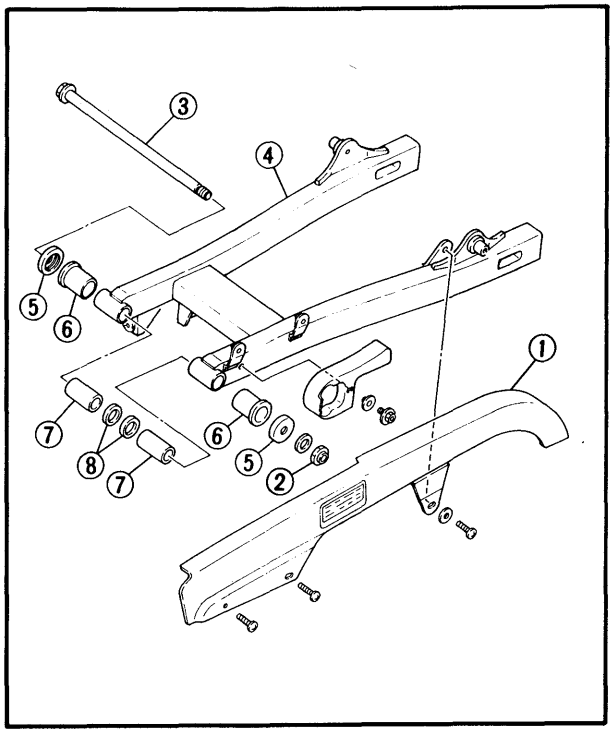


2. Check:
   - Swingarm (Side play)
     Side play → Replace bushes.
     Move the swingarm from side to side.

Side Play (At End of Swingarm):
1.0 mm (0.04 in)



3. Check:
   - Swingarm (Vertical movement)
     Tightness/Binding/Rough spots → Replace bushes.
     Move the swingarm up and down.



4. Remove:
   - Chain case ①
   - Nut (Pivot shaft) ②
   - Pivot shaft ③
   - Swingarm ④
   - Brake rod
   - Chain guide

5. Remove:
   - Thrust covers ⑤
   - Bushes (Outer) ⑥
   - Bushes (Inner) ⑦
   - Oil seals ⑧

INSPECTION

Rear Shock Absorber

1. Inspect:
   - Shock absorber rod
     Bends/Damage → Replace the shock absorber assembly.
   - Shock absorber
     Oil leakes → Replace the shock absorber assembly.
   - Spring
     Fatigue → Replace the shock absorber assembly.
     Move the spring up and down.

Swingarm

1. Inspect:
   - Bushes (Outer/Inner)
   - Thrust covers
   - Oil seals
     Damage → Replace.

INSTALLATION

Reverse the removal procedure. Note the following points.

Rear Shock Absorber

1. Install:
   - Rear shock absorbers

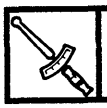
Rear Shock Absorber:
Upper:
20 Nm (2.0 m·kg, 14 ft·lb)
Lower:
20 Nm (2.0 m·kg, 14 ft·lb)

Swingarm

1. Lubricate:
   - Thrust covers
   - Bushings

Lithium Base Waterproof Wheel Bearing Grease

2. Install:
   - Brake rod
   - Cotter pin (New)
   - Chain guide

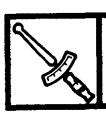


Bolt (Brake Rod):
20 Nm (2.0 m·kg, 14 ft·lb)

⚠ WARNING:

Always use new cotter pin.

3. Install:
   - Swingarm



Pivot Shaft (Swingarm):
43 Nm (4.3 m·kg, 31 ft·lb)

4. Install:
   - Rear wheel

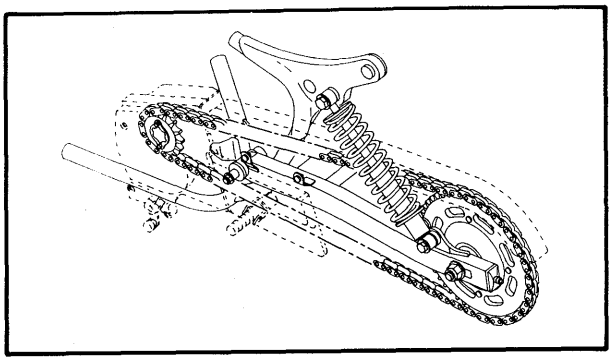
   Refer to "REAR WHEEL – INSTALLATION".

⚠ WARNING:

Always use a new cotter pin on the axle nut.

DRIVE CHAIN AND SPROCKETS

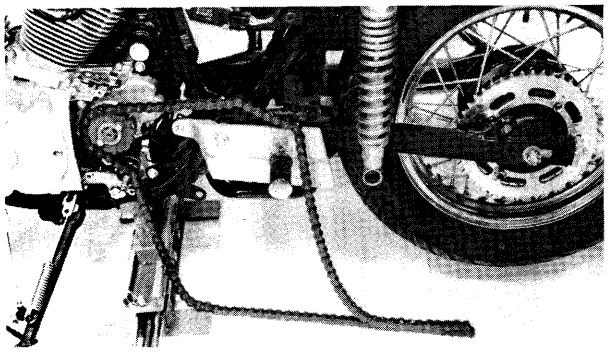
NOTE:
Before removing the drive chain and the sprocket, drive chain stretch should be checked.



REMOVAL

1. Place the motorcycle on a level place.

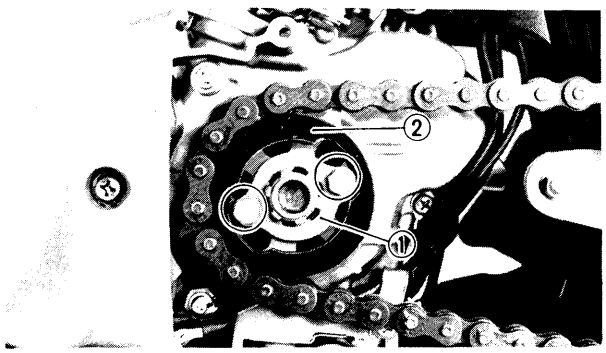
⚠ WARNING:
Securely support the motorcycle so there is no danger of it falling over.



Drive Chain

1. Remove:
   - Shift pedal link
   - Cover (Drive sprocket)
   - Chain case
   - Bolt (Rear shock absorber – Lower)
   - Rear shock absorber
   - Drive chain

NOTE:
The drive chain can be removed without removing the swingarm and both sprockets.



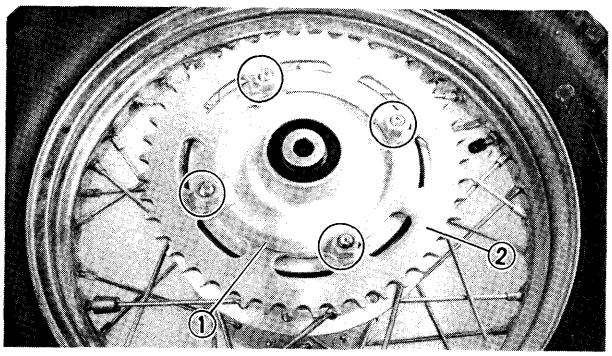
Sprockets

1. Remove:
   - Shift pedal link
   - Cover (Drive sprocket)
   - Sprocket holder ①
   - Drive sprocket ②

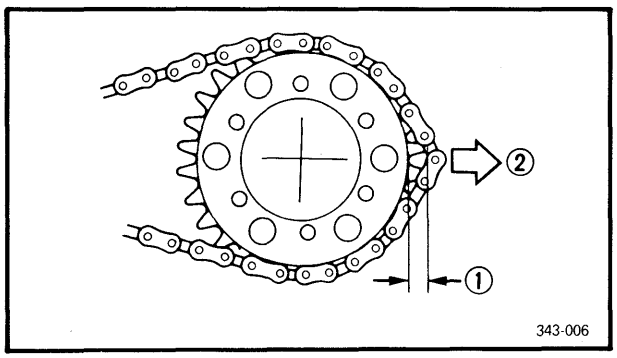
   Refer to "CHAPTER 4. ENGINE – REMOVAL".

2. Remove:
   - Rear wheel
   - Drive chain

   Refer to "REAR WHEEL – REMOVAL" and REAR SHOCK ABSORBER AND SWINGARM – REMOVAL".



3. Remove:
   - Lock washer ①
   - Driven sprocket ②

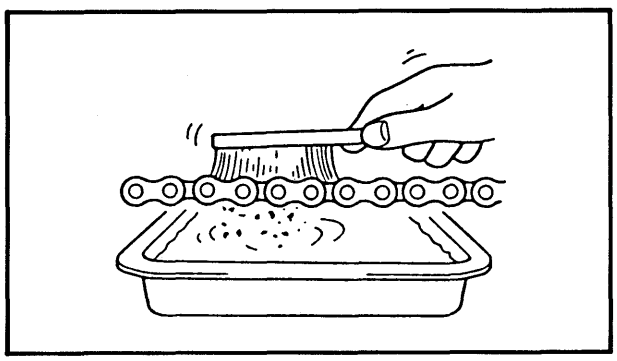


INSPECTION AND CLEANING

1. Check:
   - Drive chain stretch

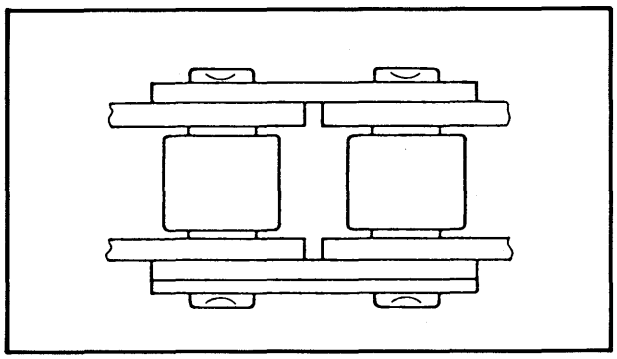
   Pull ② the chain away from the driven sprocket.

   Distance chain/sprocket higher than 1/2 tooth ① → Replace drive chain.



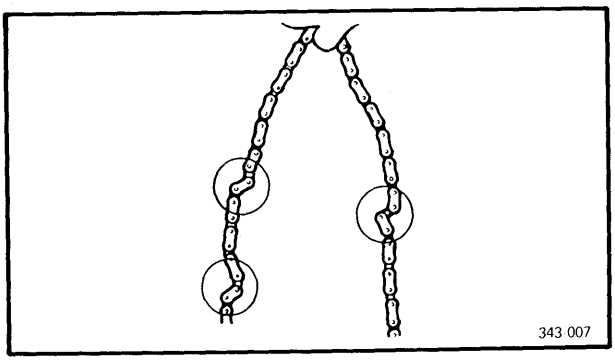
2. Clean:
   - Drive chain

   Place it in solvent, and brush off as much dirt as possible. Then remove the chain from the solvent and dry the chain.

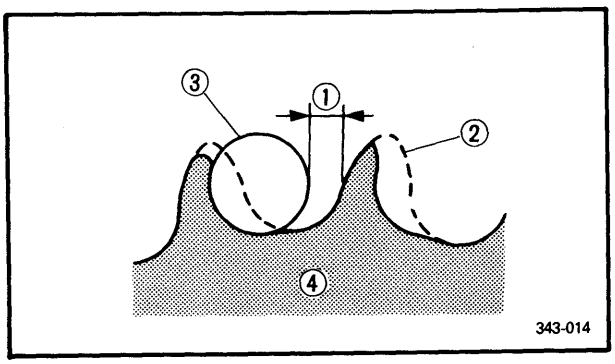


3. Inspect:
   - Rollers
   - Side plates

   Damage/Wear → Replace drive chain.

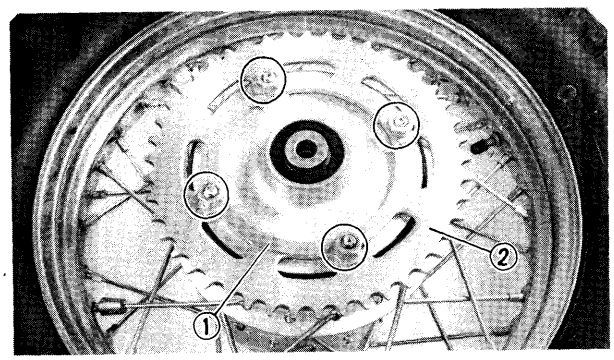


4. Check:
   - Drive chain stiffness
     Clean and oil the chain and hold as illustrated.
     Stiff → Replace drive chain.



5. Inspect:
   - Drive sprocket
     More than 1/2 teeth ① wear → Replace sprocket.

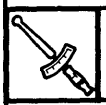
② Correct
③ Roller
④ Sprocket



Drive sprocket replacement steps:
- Straighten the lock washer ① tabs and remove the driven sprocket ② .
- Install a new driven sprocket and lock washers.

⚠ WARNING:

Always use new lock washers.



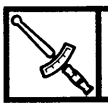
Bolt (Driven Sprocket):
55 Nm (5.5 m·kg, 40 ft·lb)

- Bend the lock washer tabs along the nut flats.

INSTALLATION

Reverse the "REMOVAL" procedure.
Note the following points.

1. Install:
   - Drive sprocket
   - Sprocket holder
   - Cover (Drive sprocket)



Bolts (Drive Sprocket):
10 Nm (1.0 m·kg, 7.2 ft·lb)

2. Install:
   - Drive chain
   - Rear wheel

   Rear to "REAR WHEEL – INSTALLATION and REAR SHOCK ABSORBER AND SWING ARM – INSTALLATION".

3. Install:
   - Rear shock absorber
   - Chain case
   - Cover (Drive sprocket)
   - Shift pedal link

Bolt (Rear Shock Absorber – Lower):
20 Nm (2.0 m·kg, 14 ft·lb)
Screws (Drive Sprocket Cover):
7 Nm (0.7 m·kg, 5.1 ft·lb)
Bolt (Shift Pedal Link):
10 Nm (1.0 m·kg, 7.2 ft·lb)

4. Lubricate:
   - Drive chain

SAE 10W/30 Type SE Motor Oil

5. Check:
   - Drive chain slack
     Refer to "CHAPTER 3. DRIVE CHAIN SLACK ADJUSTMENT".

Drive Chain Slack:
30 ~ 40 mm (1.18 ~ 1.57 in)

⚠ CAUTION:

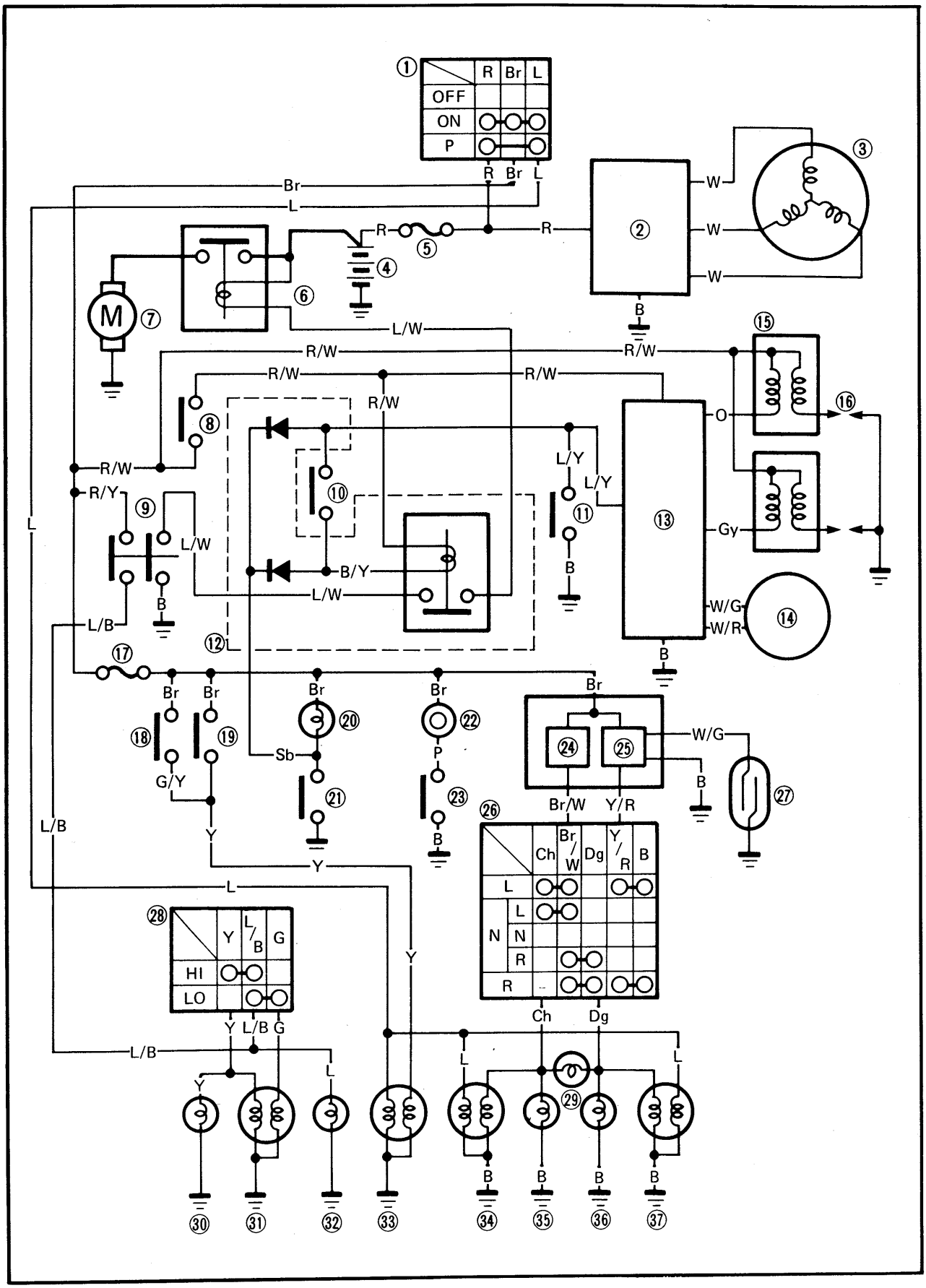
Too small chain slack will overload the engine and other vital parts; keep the slack within the specified limits.

⚠ WARNING:

Always use a new cotter pin on the axle nut.

ELECTRICAL

XV250U CIRCUIT DIAGRAM



① Main switch
② Rectifier/Regulator
③ A.C. Magneto
④ Battery
⑤ Fuse "MAIN"
⑥ Starter switch
⑦ Starter motor
⑧ "ENGINE STOP" switch
⑨ "START" switch
⑩ Clutch switch
⑪ Sidestand switch
⑫ Relay assembly
⑬ Ignitor unit (Digital)
⑭ Pickup coil
⑮ Ignition coil
⑯ Spark plug
⑰ Fuse "SIGNAL"
⑱ Front brake switch
⑲ Rear brake switch
⑳ "NEUTRAL" indicator light
㉑ Neutral switch
㉒ Horn
㉓ "HORN" switch
㉔ Flasher relay
㉕ Cancelling unit
㉖ "TURN" switch
㉗ Reed switch
㉘ "LIGHTS" (Dimmer) switch
㉙ "TURN" indicator light
㉚ "HIGH BEAM" indicator light
㉛ Headlight
㉜ Meter light
㉝ Tail/Brake light
㉞ Front position light/
Front flasher light (Left)
㉟ Rear flasher light (Left)
㊱ Rear flasher light (Right)
㊲ Front position light/
Front flasher light (Right)

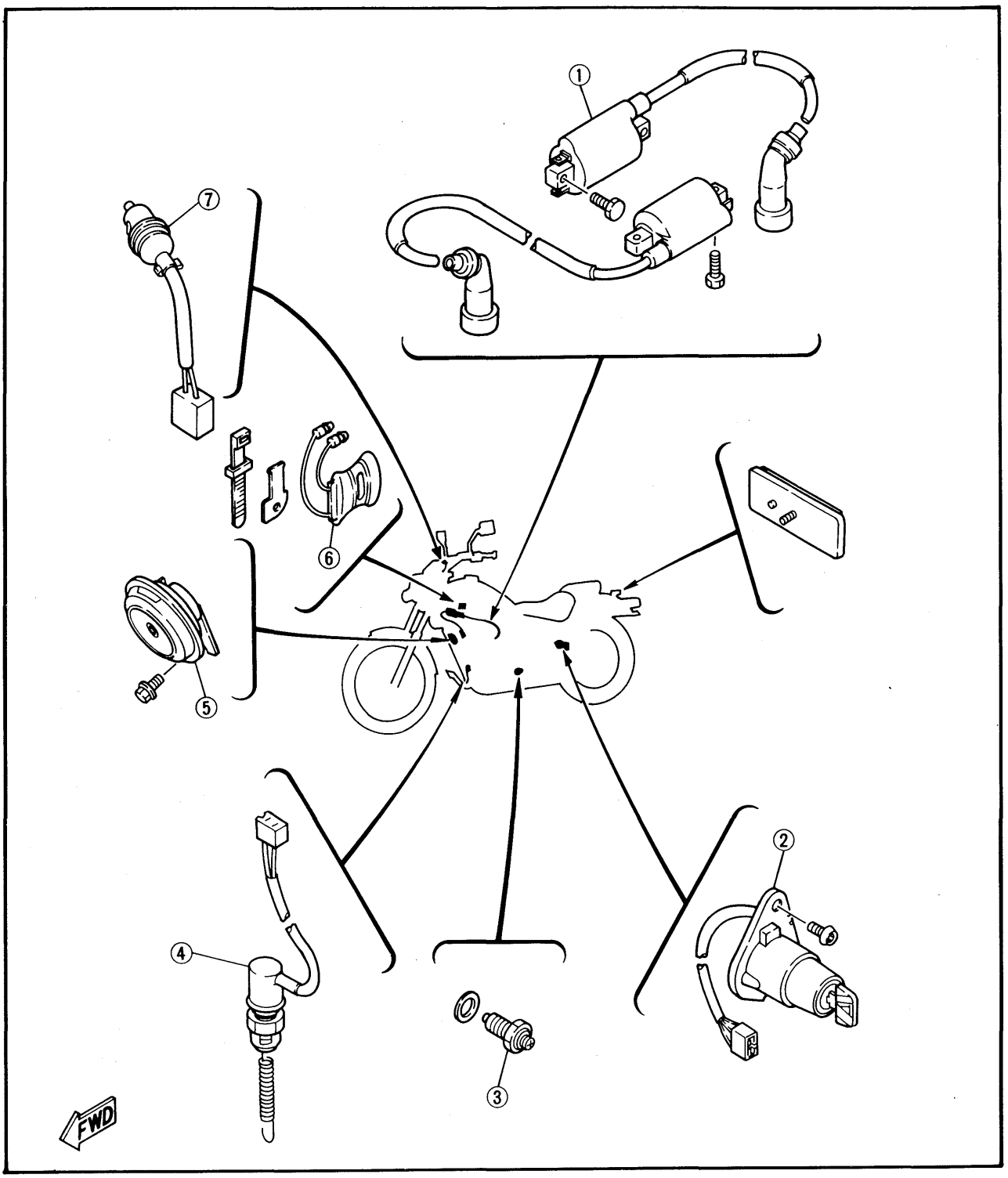
COLOR CODE

O	Orange	Gy	Gray
R	Red	Sb	Sky blue
L	Blue	Y/R	Yellow/Red
Br	Brown	Br/W	Brown/White
B	Black	R/W	Red/White
Y	Yellow	B/W	Black/White
W	White	B/Y	Black/Yellow
G	Green	L/W	Blue/White
P	Pink	L/B	Blue/Black
Dg	Dark green	L/Y	Blue/Yellow
Ch	Chocolate	G/Y	Green/Yellow

ELECTRICAL COMPONENTS (1)

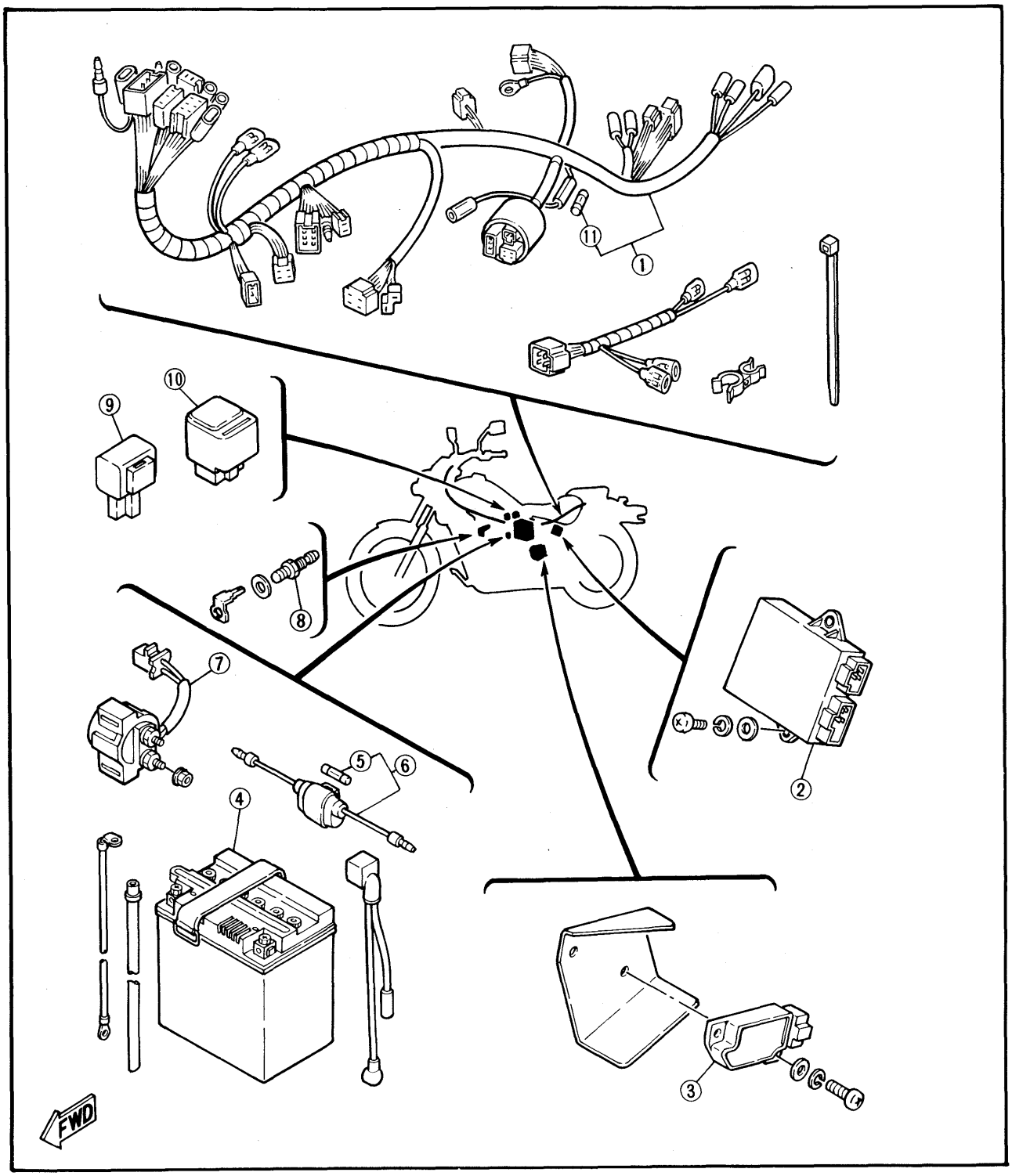
① Ignition coil
② "MAIN" switch
③ Neutral switch
④ Rear brake switch
⑤ Horn
⑥ Thermo switch
⑦ Front brake switch

SPECIFICATIONS	RESISTANCE
IGNITION COIL:	
PRIMARY	3.2 ~ 4.8Ω
SECONDARY	10.4 ~ 15.6 kΩ
PICKUP COIL	178 ~ 266Ω
STARTOR COIL	0.19 ~ 0.29Ω



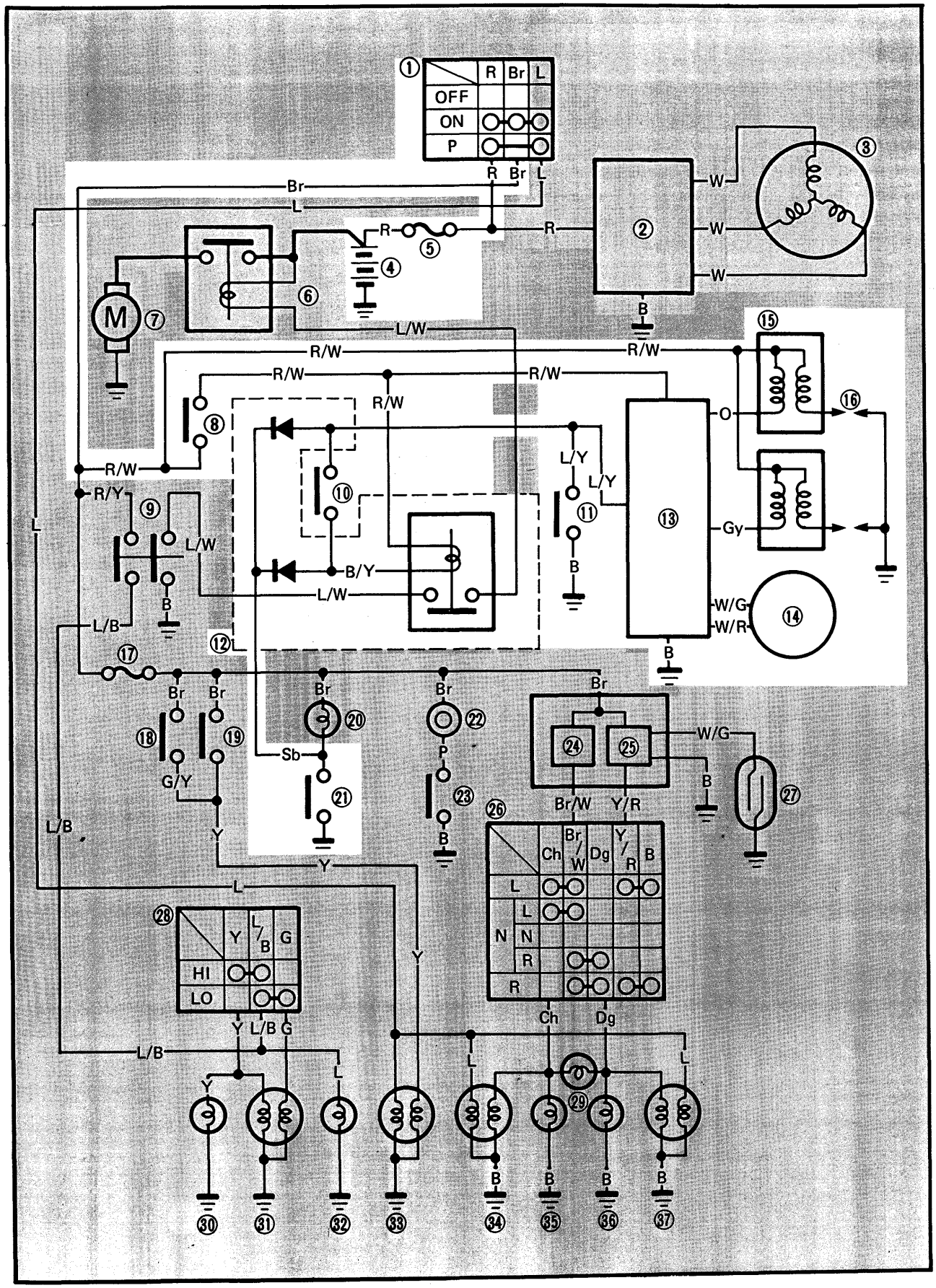
ELECTRICAL COMPONENTS (2)

① Wire harness
② Ignitor unit (Digital)
③ Rectifier/Regulator
④ Battery
⑤ Fuse "MAIN"
⑥ Fuse holder
⑦ Starter relay
⑧ Carburetor heater
⑨ Relay assembly
⑩ Flasher relay
⑪ Fuse "SIGNAL"



IGNITION SYSTEM

CIRCUIT DIAGRAM

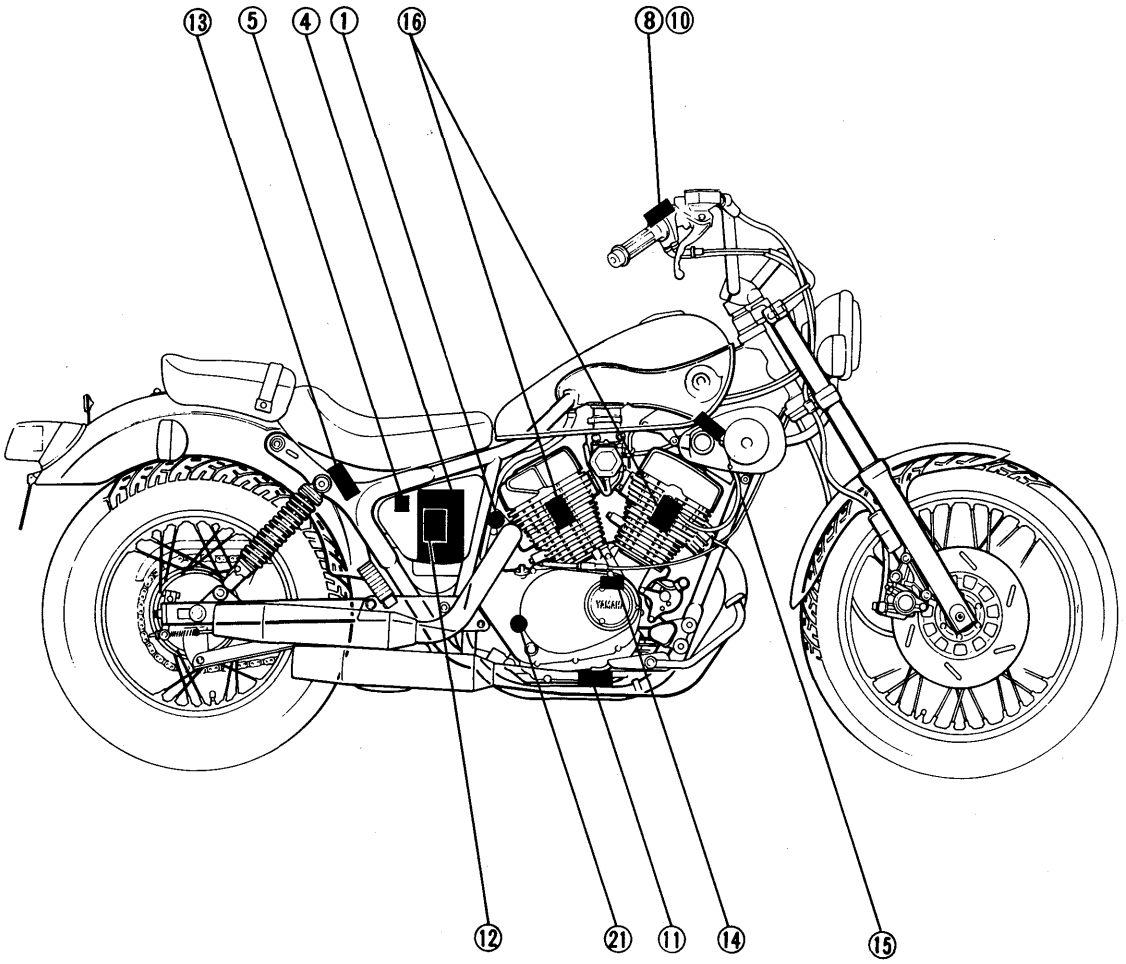


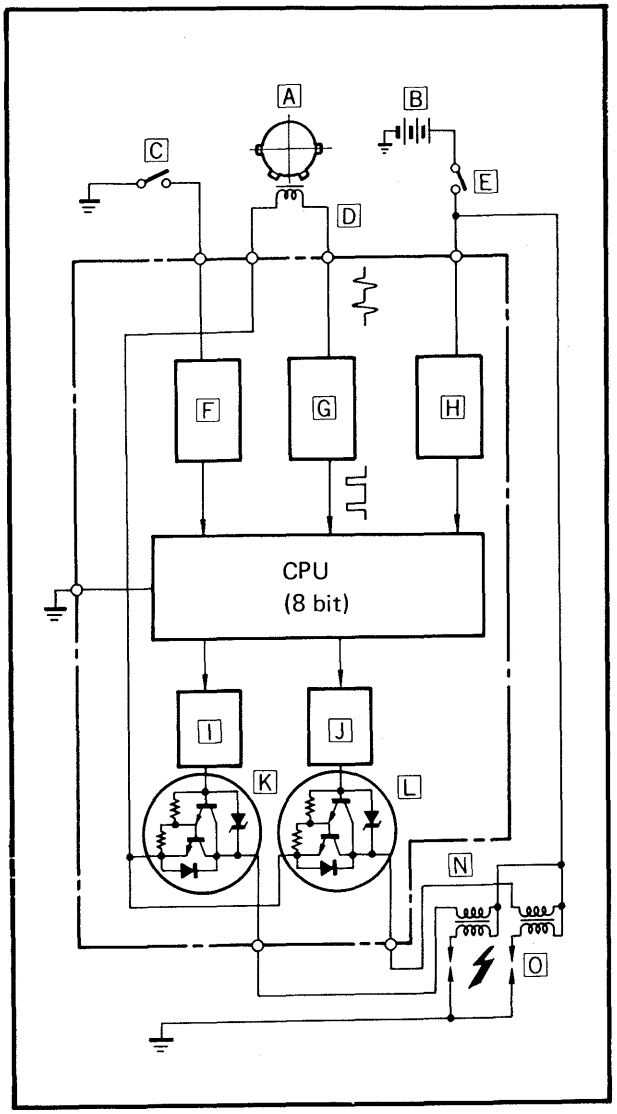
Aforementioned circuit diagram shows ignition circuit in circuit diagram.

NOTE:

For the color codes, see page 7-2.

①Main switch
④Battery
⑤Fuse "MAIN"
⑧"ENGINE STOP" switch
⑩Clutch switch
⑪Sidestand switch
⑫Relay assembly
⑬Ignitor unit (Digital)
⑭Pickup coil
⑮Ignition coil
⑯Spark plug
㉑Neutral switch





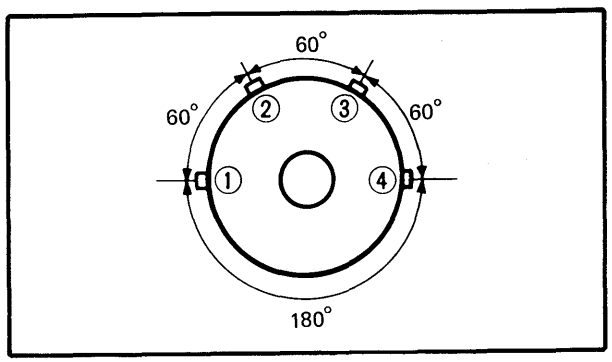
DIGITAL IGNITION SYSTEM DESCRIPTION

The electronic ignition that sparks the XV250 engine is computer controlled and operated by a digital CPU (Microprocessor).

It delivers a superhot spark, and has a pre-programed ignition advance curve. This programed advance curve closely matches that spark timing to the engines ignition requirements throughout the operating range.

Only one pickup coil is needed to meet the requirements of the ignitor unit (Digital).

- A Flywheel
- B Battery
- C "ENGINE STOP" switch
- D Pickup coil
- E Main switch
- F Ignition stop circuit
- G Wave-shape shaping circuit
- H Source circuit
- I Amplification circuit for #1 (Front) cylinder
- J Amplification circuit for #2 (Rear) cyliner
- K Power transister for #1 (Front) cylinder
- L Power transister for #2 (Rear) cylinder
- M Ignitor unit (Digital)
- N Ignition coil
- O Spark plug



FLYWHEEL

The flywheel has on one semicircle four (4) projections (① ~ ④) every 60° apart, ① and ④ of which are 180° apart on the other semicircle.

No projections on the other semicircle so as to provide the pickup trigger with a 180° non-signal range.

The CPU thus senses this range to determine the starting position of ignition timing.

TROUBLESHOOTING

IF IGNITION SYSTEM SHOULD BECOME INOPERATIVE (NO SPARK OR INTERMITTENT SPARK)

Procedure

Check;

1. Battery
2. Fuse "MAIN"
3. Spark plug
4. Ignition spark gap
5. Spark plug cap
6. Ignition coil resistance
7. Main switch
8. "ENGINE STOP" switch
9. Clutch switch (Relay assembly)
10. Sidestand switch
11. Pickup coil resistance
12. Wiring connection (Ignition system)

NOTE:

- Remove the following parts before troubleshooting.
  1) Seat
  2) Fuel tank
  3) Side cover (Right)
- Use the following special tools in this troubleshooting.

Dynamic Spark Tester:
YM-34487

Pocket Tester:
YU-03112

1. Battery

- Check the battery condition.
- Check the battery fluid level, battery terminals and specific gravity.

Specific Gravity:
1.280 at 20°C (68°F)

INCORRECT → Refill battery fluid. Clean battery terminals. Recharge or replace battery.

CORRECT ↓

2. Fuse "MAIN"

- Connect the Pocket Tester "Ω x 1" to the fuse.
- Check the fuse for continuity.

NOCONTINUITY → Replace fuse.

CONTINUITY ↓

*

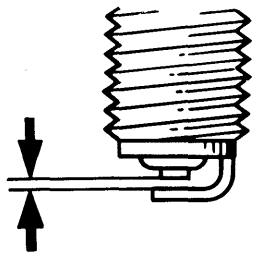
*

3. Spark plug

- Check the spark plug type.
- Check the spark plug gap.

Standard Spark Plug:
C6HSA (NGK)
U20FS-U (N.D.)

Spark Plug Gap:
0.6 ~ 0.7 mm (0.024 ~ 0.028 in)



OUT OF SPECIFICATION

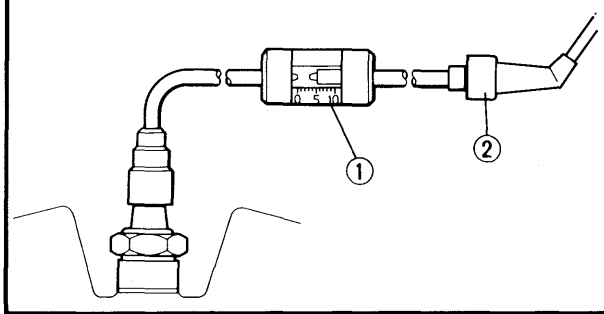
Regap or replace spark plug.

MEETS SPECIFICATION

4. Ignition spark test

- Disconnect the spark plug cap from the spark plug.
- Connect the Dynamic Spark Tester to the spark plug and spark plug cap, and set the specified spark gap.
- Turn the main switch to "ON" and "ENGINE STOP" switch to "RUN" then, shift the gear in neutral.
- Start the engine.
- Check the ignition spark condition.

Minimum Spark Gap:
6 mm (0.24 in)



① Dynamic spark tester
② Spark plug cap

SPARK

Ignition circuit is good.

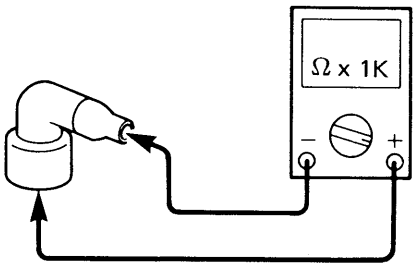
OUT OF SPECIFICATION

*

*

5. Spark plug cap resistance

- Remove the spark plug cap.
- Connect the Pocket Tester (Ω x 1k) to the spark plug cap.



- Check the spark plug cap for specificated resistance.

Spark Plug Cap Resistance:
8 ~ 12 kΩ at 20°C (68°F)

OUT OF SPECIFICATION

Replace spark plug cap.

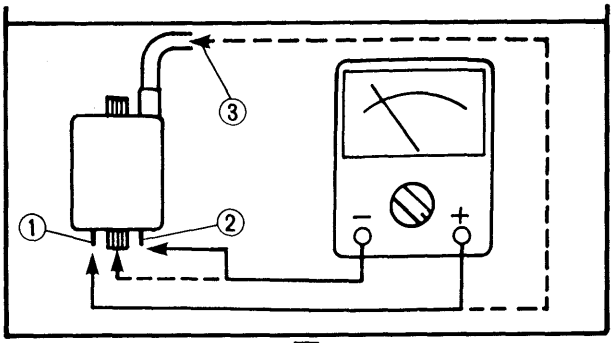
MEETS SPECIFICATION

6. Ignition coil resistance

- Disconnect the ignition coil leads (Orange, Red/White, Gray and Red/White) from the ignition coils.
- Connect the Pocket Tester to the ignition coils.
- Measure the primary and secondary winding resistances.

Primary Winding: (Ω x 1)
Tester (+) Lead →
Ignition Coil Terminal ①
Tester (–) Lead →
Ignition Coil Terminal ②
Secondary Winding: (Ω x 1K)
Tester (+) Lead →
Spark Plug Lead ③
Tester (–) Lead →
Ignition Coil Base

Primary Winding Resistance [A] :
3.4 ~ 4.6Ω at 20°C (68°F)
Secondary Winding Resistance [B] :
10.4 ~ 15.6 kΩ at 20°C (68°F)



OUT OF SPECIFICATION

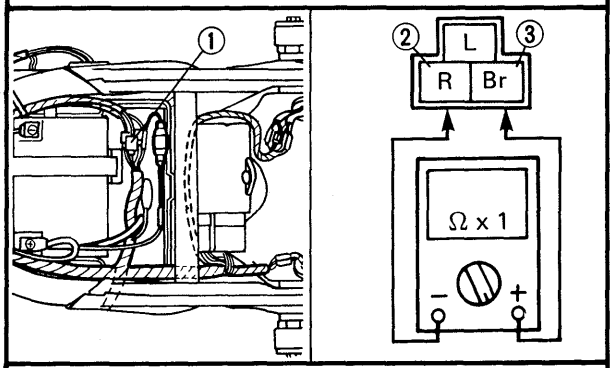
Replace ignition coil(s).

BOTH RESISTANCES MEET SPECIFICATION

7. Main switch

- Disconnect the main switch coupler ① from the wire harness.
- Connect the Pocket Tester (Ω x 1) to the main switch.

Tester (+) Lead → Red ② Terminal
Tester (–) Lead → Brown ③ Terminal



- Turn the main switch to "ON" and "OFF".
- Check the main switch for continuity.

Switch position	Good condition	Bad condition		
OFF	○	X	X	○
ON	X	○	X	○

○: Continuity X: Nocontinuity

BAD CONDITION

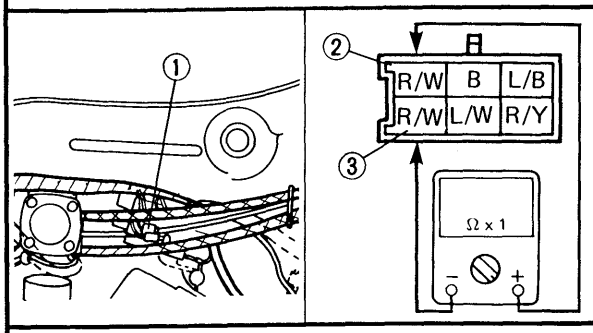
Replace main switch.

GOOD CONDITION

8. "ENGINE STOP" switch

- Disconnect the "ENGINE STOP" switch (Right handlebar switch) coupler ① from the wire harness.
- Connect the Pocket Tester (Ω x 1) to the "ENGINE STOP" switch.

Tester (+) Lead → Red/White ② Terminal
Tester (–) Lead → Red/White ③ Terminal



- Turn the "ENGINE STOP" switch to "OFF" and "RUN".
- Check the "ENGINE STOP" switch for continuity.

Switch position	Good condition	Bad condition		
RUN	○	X	X	○
OFF	X	○	X	○

○: Continuity X: Nocontinuity

BAD CONDITION

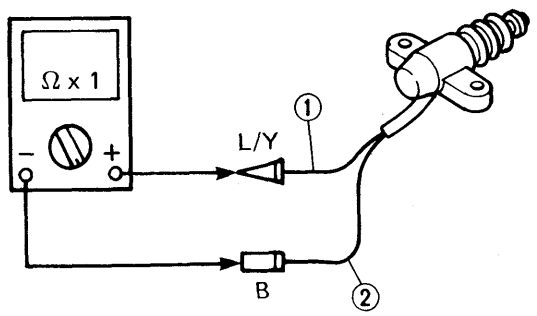
Replace handlebar switch (Right).

GOOD CONDITION

9. "SIDESTAND" switch

- Disconnect the "SIDESTAND" switch leads from the wire harness.
- Connect the Pocket Tester (Ω x 1) to the "SIDESTAND" switch.

Tester (+) Lead → Blue/Yellow ① Lead
Tester (–) Lead → Black ② Lead



- Move the sidestand to up position and down position.
- Check the "SIDESTAND" switch for continuity.

Sidestand position	Good condition	Bad condition		
Up	○	X	X	○
Down	X	○	X	○

○: Continuity X: Nocontinuity

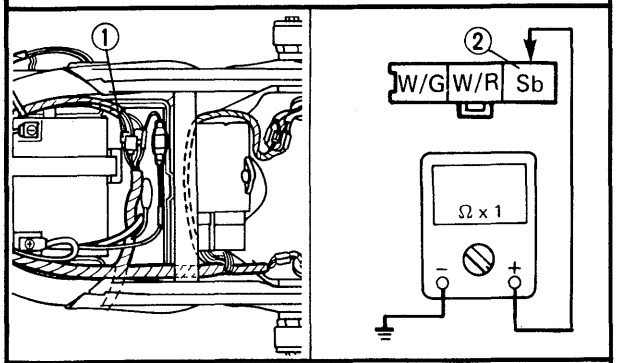
BAD CONDITION → Replace "SIDESTAND" switch.

GOOD CONDITION ↓

10. "NEUTRAL" switch

- Disconnect the neutral switch/pickup coil coupler ① from the wire harness.
- Connect the Pocket Tester (Ω x 1) to the "NEUTRAL" switch.

Tester (+) Lead → Sky blue ② Terminal
Tester (—) Lead → Ground



- Shift the transmission in neutral and gear.
- Check the "NEUTRAL" switch for continuity.

Transmission position	Good condition	Bad condition		
Neutral	○	X	X	○
Gear	X	○	X	○

○: Continuity X: Nocontinuity

BAD CONDITION → Replace "NEUTRAL" switch.

GOOD CONDITION ↓

*

*

11. Clutch switch

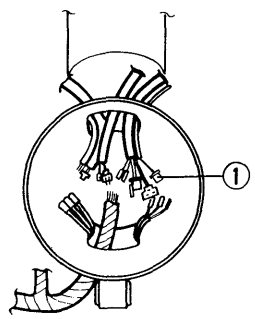
- Disconnect the clutch switch coupler ① from the wire harness.
- Connect the Pocket Tester (Ω x 1) to the clutch switch.

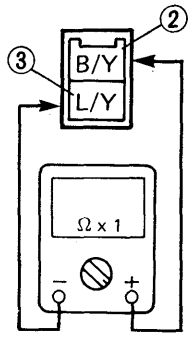
Tester (+) Lead → Black/Yellow ② Terminal
Tester (–) Lead → Blue/Yellow ③ Terminal

- Hold and release the clutch lever.
- Check the clutch switch for continuity.

Clutch lever position	Good condition	Bad condition		
Held	○	X	X	○
Released	X	○	X	○

○: Continuity X: Nocontinuity





BAD CONDITION

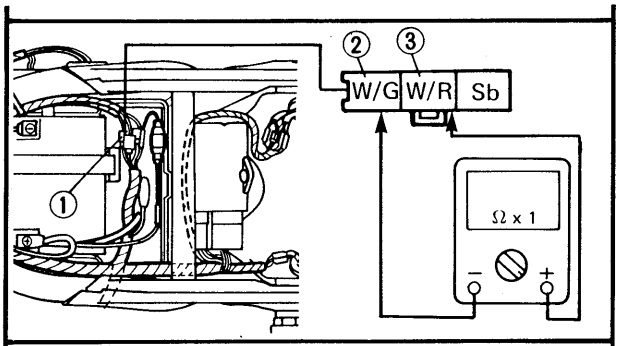
Replace clutch switch.

GOOD CONDITION

12. Pickup coil resistance

- Disconnect the pickup coil/neutral switch coupler ① from the wire harness.
- Connect the Pocket Tester (Ω x 100) to the pickup coil.

Tester (+) Lead → White/Green ② Terminal
Tester (–) Lead → White/Red ③ Terminal



• Check the pickup coil for specified resistance.

Pickup Coil Resistance:
178 ~ 266Ω at 20°C (68°F)
(White/Green – White/Red)

OUT OF SPECIFICATION

Replace pickup coil.

MEETS SPECIFICATION

13. Wiring connection

Check the entire ignition system for connections.
Refer to the "WIRING DIAGRAM" section.

POOR CONNECTION

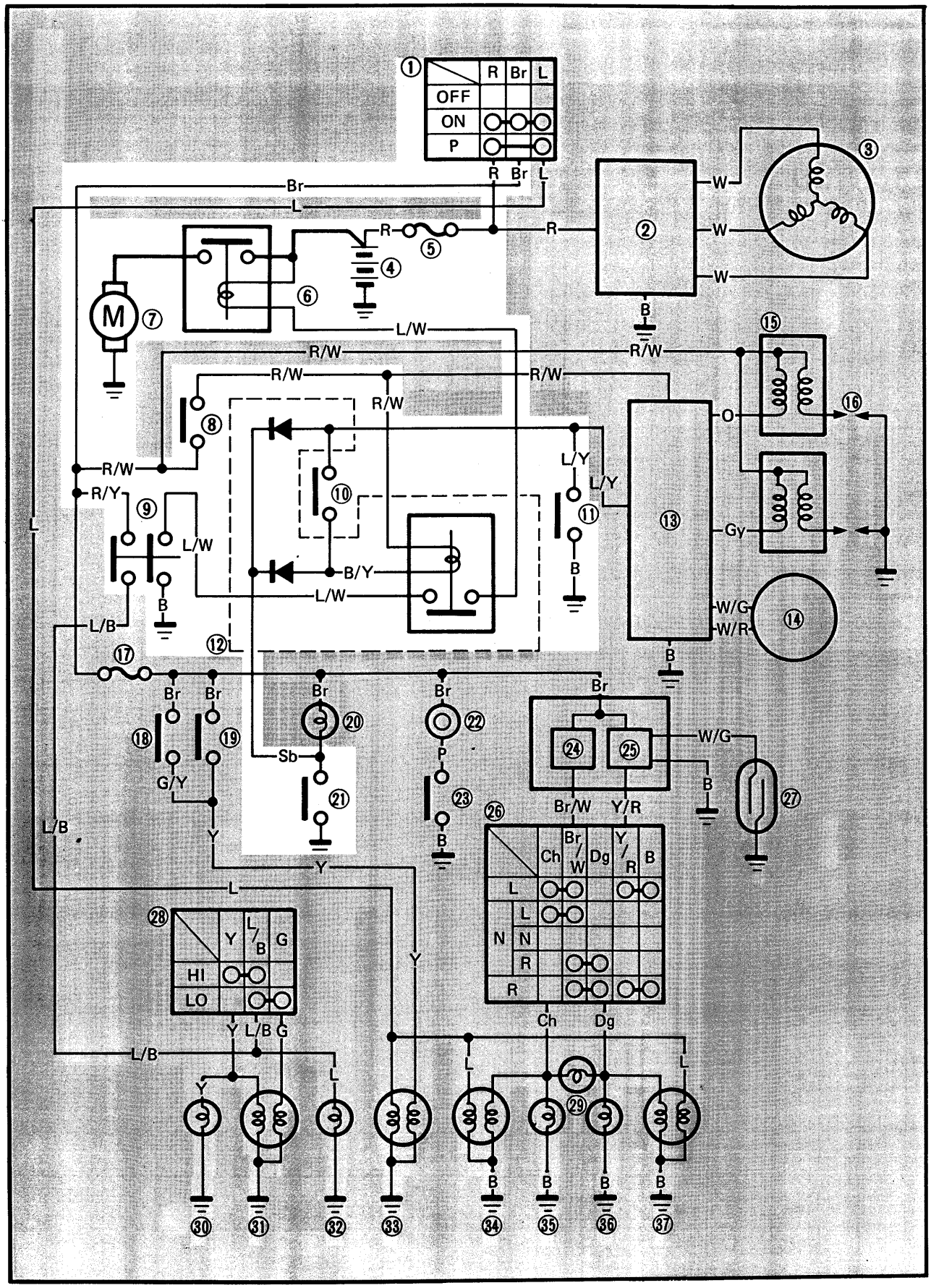
Correct.

CORRECT

Replace ignitor unit (Digital).

ELECTRIC STARTING SYSTEM

CIRCUIT DIAGRAM

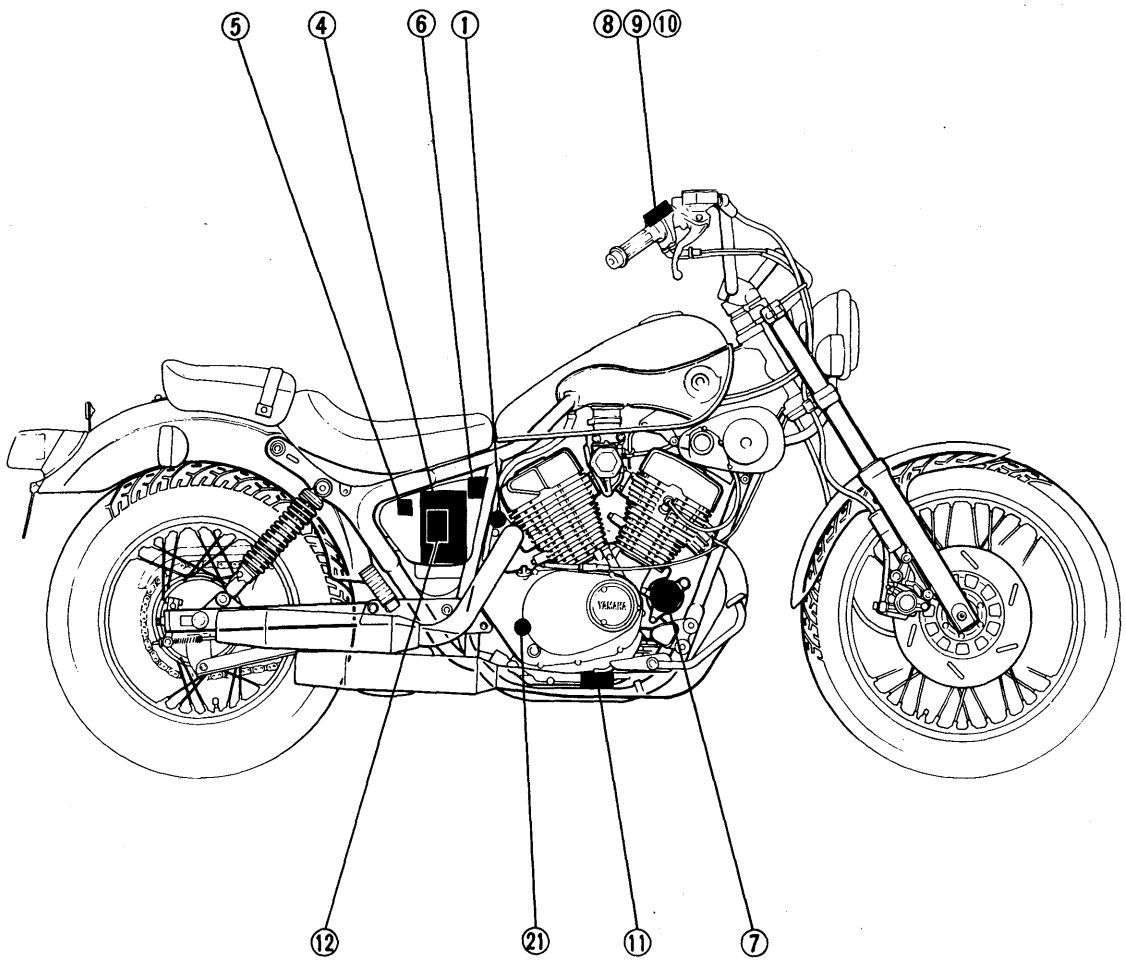


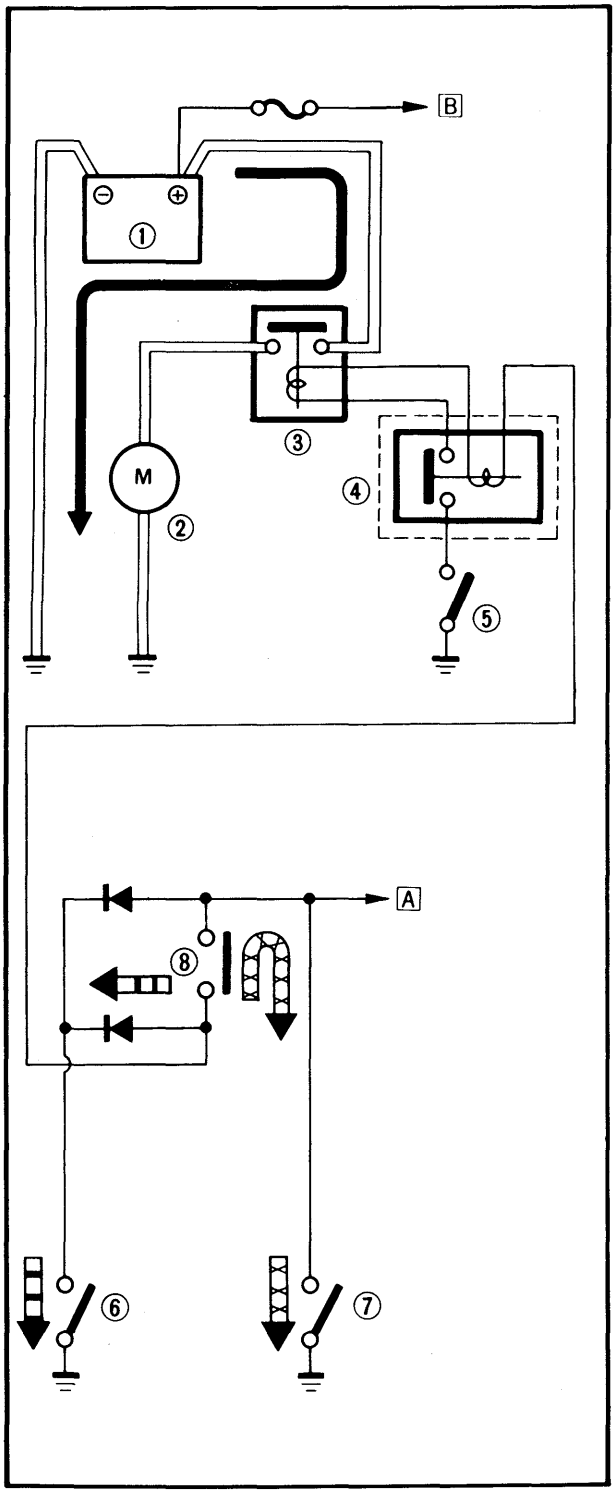
Aforementioned circuit diagram shows electrical starting circuit in wiring diagram.

NOTE:

For the color codes, see page 7-2.

① Main switch
④ Battery
⑤ Fuse "MAIN"
⑥ Starter relay
⑦ Starter motor
⑧ "ENGINE STOP" switch
⑨ "START" switch
⑩ Clutch switch
⑪ Sidestand switch
⑫ Relay assembly
㉑ Neutral switch





STARTING CIRCUIT OPERATION

The starting circuit on this model consist of the starter motor, starter relay, and the relay unit (starting circuit cut-off relay). If the engine stop switch and the main switch are both closed, the starter motor can operate only if:

> The transmission is in neutral (the neutral switch is closed).
>
> **or if**
>
> The clutch lever is pulled to the handlebar (the clutch switch is closed) and the sidestand is up (the sidestand switch is closed.)

The starting circuit cut-off relay prevents the starter from operating when neither of these conditions has been met. In this instance, the starting circuit cut-off relay is open so current cannot reach the starter motor.

When one of both of the above conditions have been met, however, the starting circuit cut-off relay is closed, and the engine can be started by pressing the starter switch.

◀□□□ WHEN THE TRANSMISSION IS IN NEUTRAL
◀XXXX WHEN THE SIDESTAND IS UP AND THE CLUTCH LEVER IS PULLED IN

① Battery
② Starter motor
③ Starter relay
④ Starting circuit cut-off relay (Relay assembly)
⑤ Engine stop switch
⑥ Neutral switch
⑦ Sidestand switch
⑧ Clutch switch

[A] To sidestand relay
[B] To main switch

TROUBLESHOOTING

STARTER MOTOR DOES NOT OPERATE.

Procedure

Check;

1. Battery inspection
2. Fuse "MAIN"
3. Starter motor
4. Starting circuit cut-off relay (Relay assembly)
5. Main switch
6. "ENGINE STOP" switch
7. Sidestand switch
8. Neutral switch
9. Clutch switch
10. Wiring connection (Electric starting system)

NOTE:

- Remove the following parts before troubleshooting.
  1) Seat
  2) Fuel tank
  3) Side cover (Right)
- Use the following special tool in this troubleshooting.

Pocket Tester: YU-03112

1. Battery

- Check the battery condition.
- Check the battery fluid level, battery terminals and specific gravity.

Specific Gravity: 1.280 at 20°C (68°F)

INCORRECT → Refill battery fluid. Clean battery terminals. Recharge or replace battery.

CORRECT ↓

2. Fuse "MAIN"

- Connect the Pocket Tester "Ω x 1" to the fuse.
- Check the fuse for continuity.

NOCONTINUITY → Replace fuse.

CONTINUITY ↓

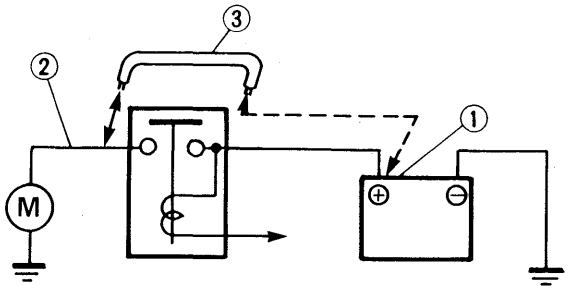
3. Starter motor

- Connect the battery positive terminal ① and starter motor cable ② using the jumper lead ③ *.
- Check the starter motor operation.

*

⚠ WARNING:

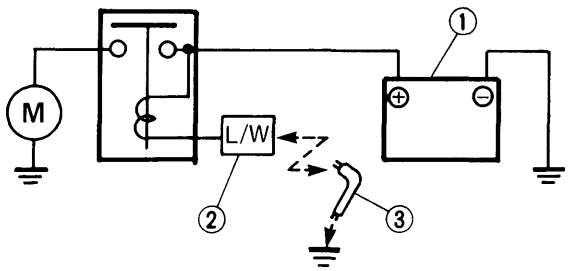
- **A wire for the jumper lead must have the equivalent capacity as that of the battery lead or more, otherwise it may cause the jumper lead to be burned.**
- **This check is likely to produce sparks, so be sure that no flammable gas or fluid is in the vicinity.**



- If the starter motor is operated, go to the next steps. If not, repair and/or replace the starter motor.
- Disconnect the starter relay lead (Blue/White).
- Ground the starter relay coupler (Blue/White) ② to the frame using the jumper lead ③.
- Check the starter motor operation.

INOPERATIVE

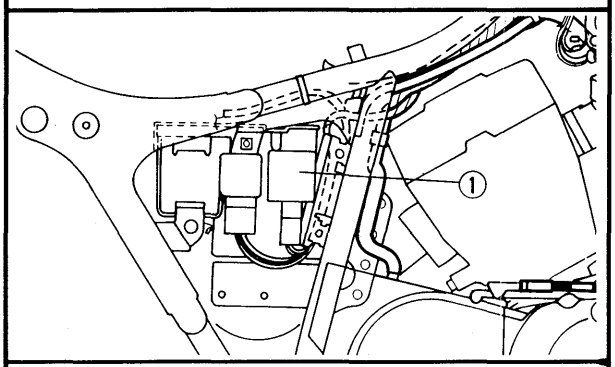
Repair or replace starter motor.



OK

4. Starting circuit cut-off relay (Relay assembly)

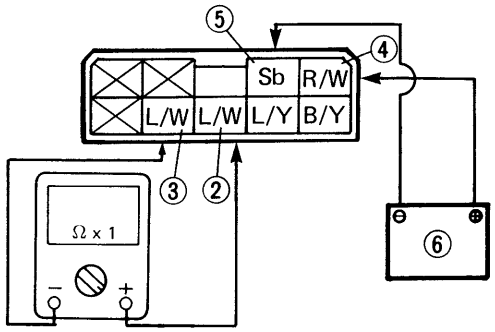
- Disconnect the relay assembly ① coupler from the wire harness.



• Connect the Pocket Tester (Ω x 1) and battery (12V) ⑥ to the relay terminals.

Tester (+) Lead → Blue/White ② Terminal
Tester (–) Lead → Blue/White ③ Terminal

Battery (+) Lead → Red/White ④ Terminal
Battery (–) Lead → Sky blue ⑤ Terminal



	Good Condition	Bad Condition		
Battery Connected	○	○	X	X
Battery Disconnected	X	○	X	○

○: Continuity X: Nocontinuity

BAD CONDITION → Replace relay assembly.

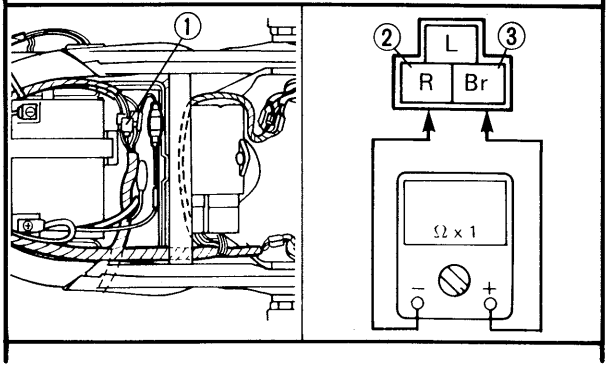
• Check the relay for continuity.

OK ↓

5. Main switch

• Disconnect the main switch coupler ① from the wire harness.
• Connect the Pocket Tester (Ω x 1) to the main switch.

Tester (+) Lead → Red ② Terminal
Tester (–) Lead → Brown ③ Terminal



- Turn the main switch to "ON" and "OFF".
- Check the main switch for continuity.

Switch position	Good condition	Bad condition		
OFF	○	X	X	○
ON	X	○	X	○

○: Continuity X: Nocontinuity

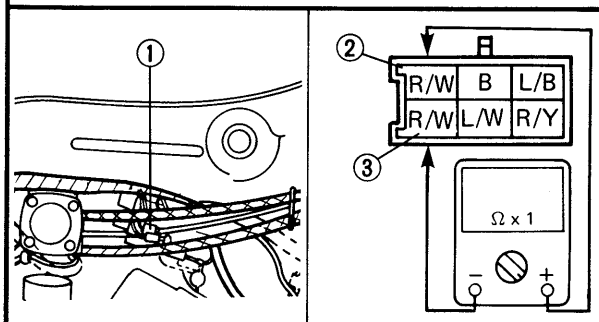
BAD CONDITION → Replace main switch.

GOOD CONDITION

6. "ENGINE STOP" switch

- Disconnect the "ENGINE STOP" switch (Right handlebar switch) coupler ① from the wire harness.
- Connect the Pocket Tester (Ω x 1) to the "ENGINE STOP" switch.

Tester (+) Lead → Red/White ② Terminal
Tester (—) Lead → Red/White ③ Terminal



- Turn the "ENGINE STOP" switch to "OFF" and "RUN".
- Check the "ENGINE STOP" switch for continuity.

Switch position	Good condition	Bad condition		
RUN	○	X	X	○
OFF	X	○	X	○

○: Continuity X: Nocontinuity

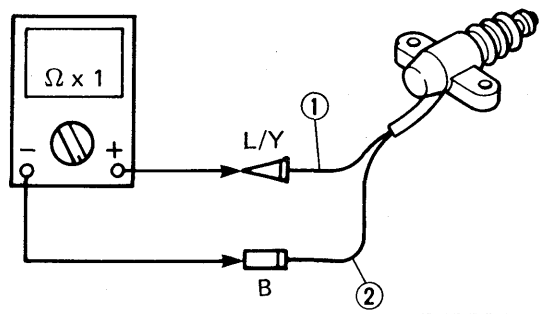
BAD CONDITION → Replace handlebar switch (Right).

GOOD CONDITION

7. "SIDESTAND" switch

- Disconnect the "SIDESTAND" switch coupler from the wireharness.
- Connect the Pocket Tester (Ω x 1) to the "SIDESTAND" switch.

Tester (+) Lead → Blue/Yellow ① Lead
Tester (–) Lead → Black ② Lead



- Move the sidestand to up position and down.
- Check the "SIDESTAND" switch for continuity.

Sidestand position	Good condition	Bad condition		
Up	○	X	X	○
Down	X	○	X	○

○: Continuity X: Nocontinuity

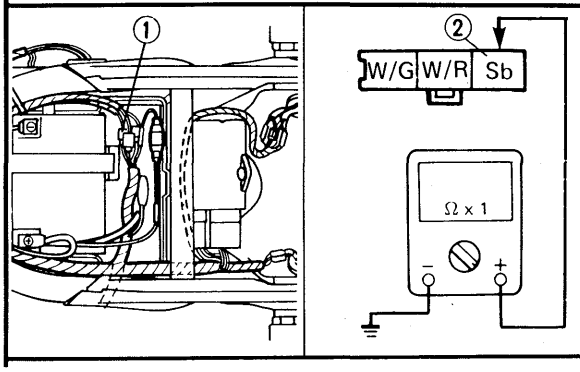
BAD CONDITION → Replace "SIDESTAND" switch.

GOOD CONDITION

8. "NEUTRAL" switch

- Disconnect the neutral switch/pickup coil coupler ① from the wire harness.
- Connect the Pocket Tester (Ω x 1) to the "NEUTRAL" switch.

Tester (+) Lead → Sky blue ① Terminal
Tester (–) Lead → Frame ground



- Shift the transmission in neutral and gear.
- Check the "NEUTRAL" switch for continuity.

Transmission position	Good condition	Bad condition		
Neutral	○	X	X	○
Gear	X	○	X	○

○: Continuity X: Nocontinuity

BAD CONDITION → Replace "NEUTRAL" switch.

GOOD CONDITION ↓

9. Clutch switch

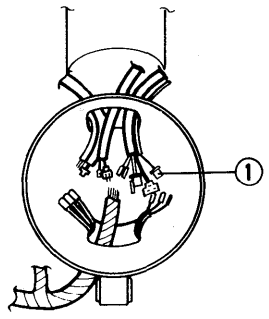
- Disconnect the clutch switch coupler ① from the wire harness.
- Connect the Pocket Tester (Ω x 1) to the clutch switch.

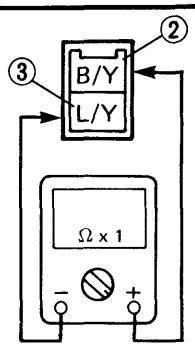
Tester (+) Lead → Black/Yellow ② Terminal
Tester (–) Lead → Blue/Yellow ③ Terminal

- Hold and release the clutch lever.
- Check the clutch switch for continuity.

Clutch lever position	Good condition	Bad condition		
Held	○	X	X	○
Released	X	○	X	○

○: Continuity X: Nocontinuity





BAD CONDITION → Replace clutch switch.

GOOD CONDITION ↓

10. Wiring connection

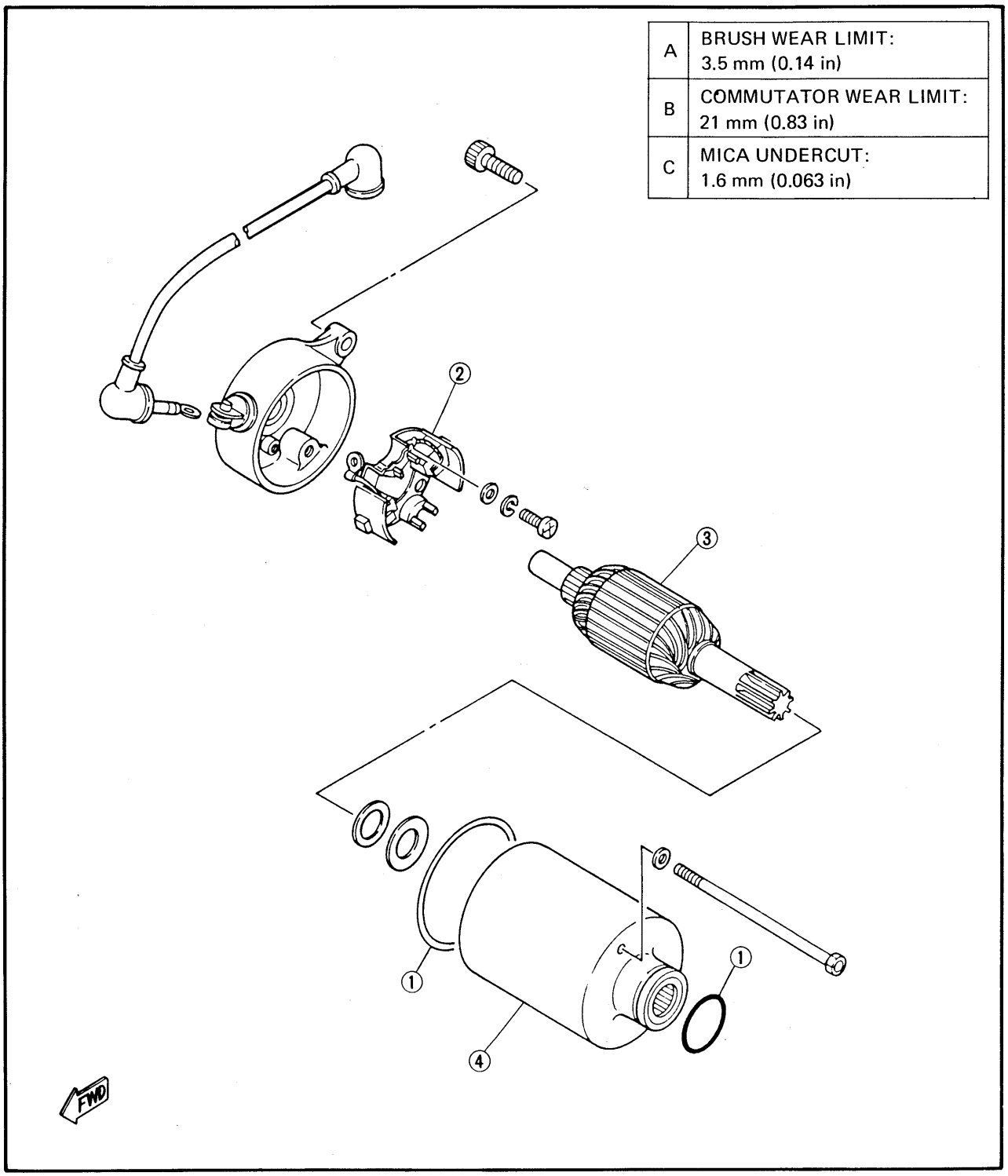
- Check the entire electrical starting system for connections.
  Refer to the "WIRING DIAGRAM" section.

POOR CONNECTION → Correct.

STARTER MOTOR TEST

① O-ring
② Brush set
③ Armature
④ Stator

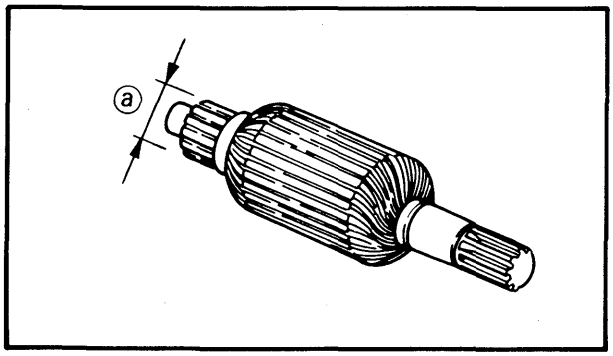
A	BRUSH WEAR LIMIT: 3.5 mm (0.14 in)
B	COMMUTATOR WEAR LIMIT: 21 mm (0.83 in)
C	MICA UNDERCUT: 1.6 mm (0.063 in)

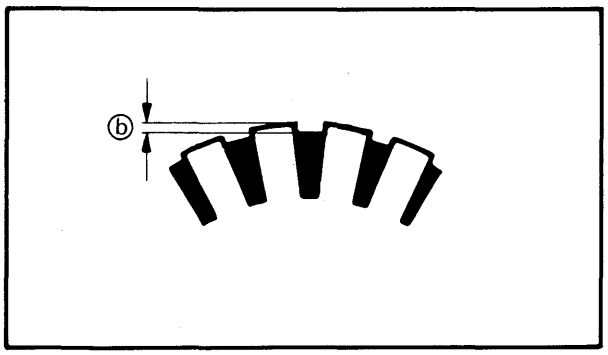


Removal

1. Remove:
   - Starter motor

   Refer to "CHAPTER 3. ENGINE OVERHAUL – ENGINE REMOVAL" section.





Inspection and Repair

1. Inspect:
   - Commutator

   Dirty → Clean it with #600 grit sandpaper.
2. Measure:
   - Commutator diameter ⓐ

   Out of specification → Replace starter motor.

	Commutator Wear Limit: 21 mm (0.83 in)

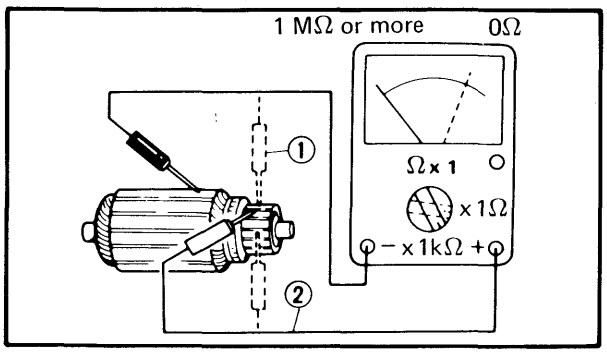
3. Measure:
   - Mica undercut ⓑ

   Out of specification → Scrape the mica to proper value use a hacksaw blade can be ground to fit.

	Mica Undercut ⓑ : 1.5 mm (0.059 in)

NOTE:

The mica insulation of the commutator must be undercut to ensure proper operation of commutator.



4. Inspect:
   - Armature coil (insulation/continuity)

   Defects(s) → Replace starter motor.

Armature coil inspecting steps:

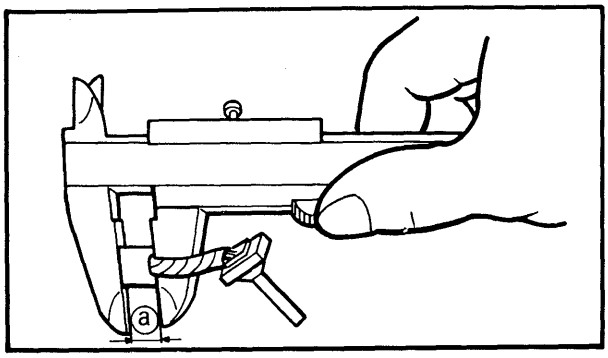
- Connect the Pocket Tester (YU-03112) for continuity check ① and insulation check ②.

	Pocket Tester: YU-03112

• Measure the armature coil resistances.

Armature Coil Resistance:
Continuity Check ① :
0Ω at 20°C (68°F)
Insulation Check ② :
More than 1MΩ at 20°C (68°F)

• If the resistance is incorrect, replace the starter motor.

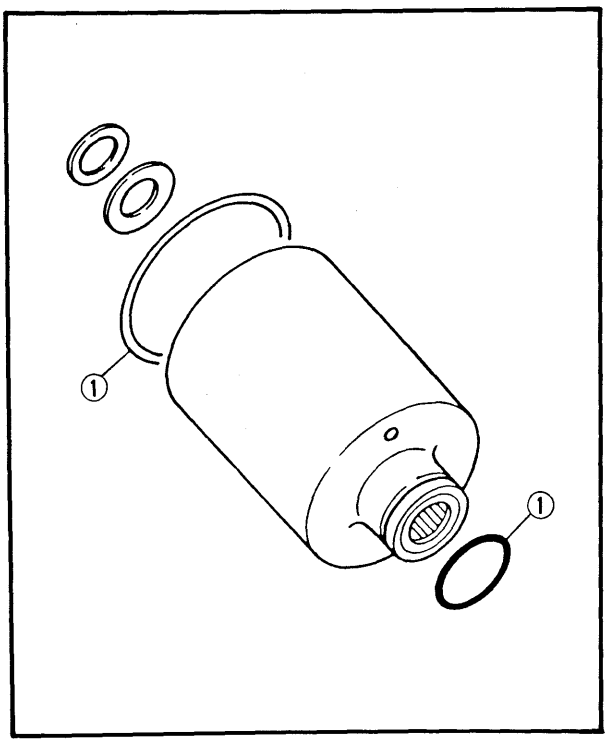


5. Measure:
• Brush length ⓐ
Out of specification → Replace.

Brush Length Limit:
3.5 mm (0.14 in)

6. Measure:
• Brush spring pressure
Fatigue/Out of specification → Replace as a set.

Brush Spring Pressure:
560 ~ 840 g (19.8 ~ 29.7 oz)



7. Inspect:
• Bearing
• Oil seal
• O-rings ①
Wear/Damage → Replace.

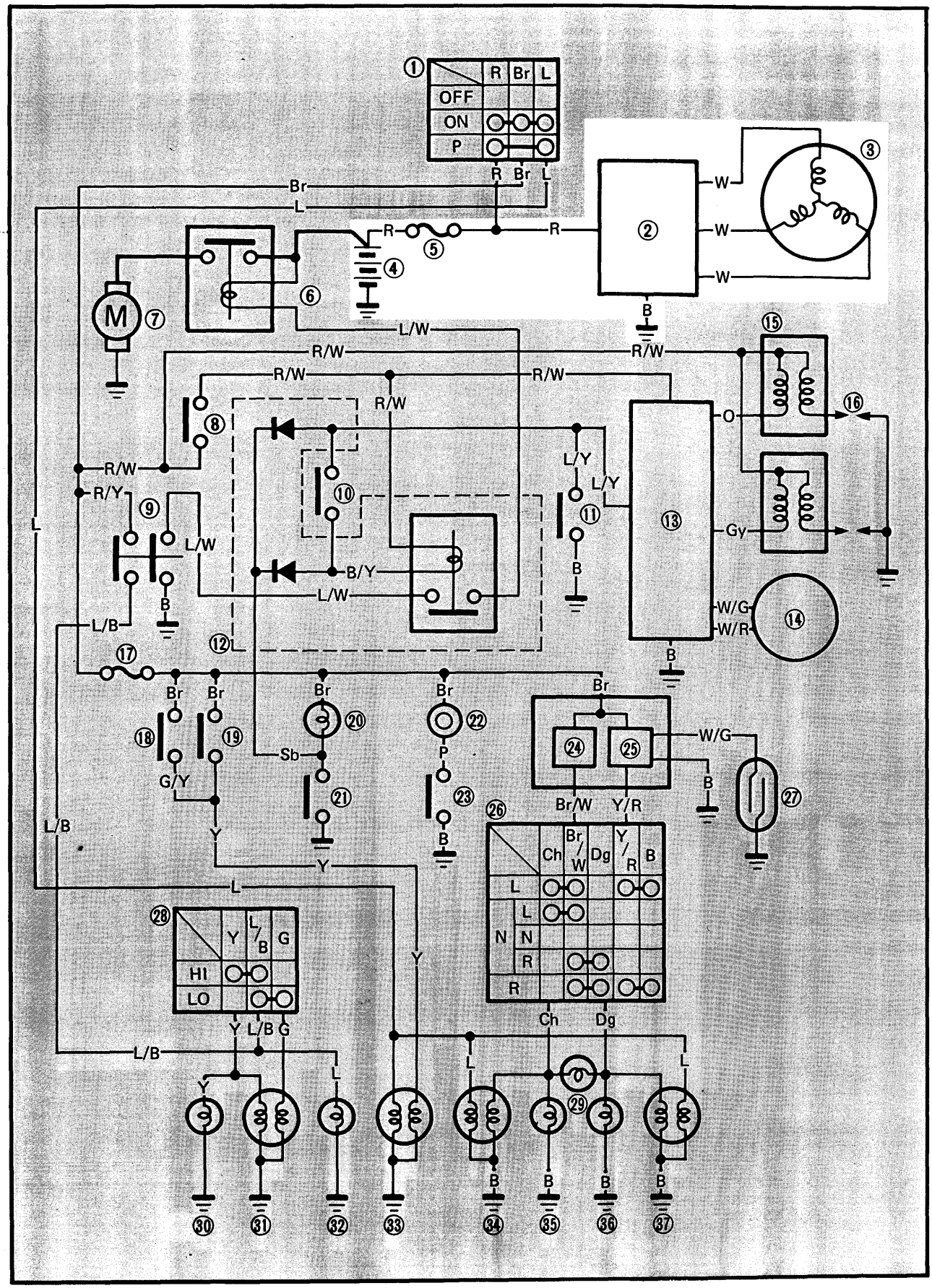
Installation

1. Install:
• Starter motor

Bolt (Starter Motor):
10 Nm (1.0 m·kg, 7.2 ft·lb)

CHARGING SYSTEM

CIRCUIT DIAGRAM

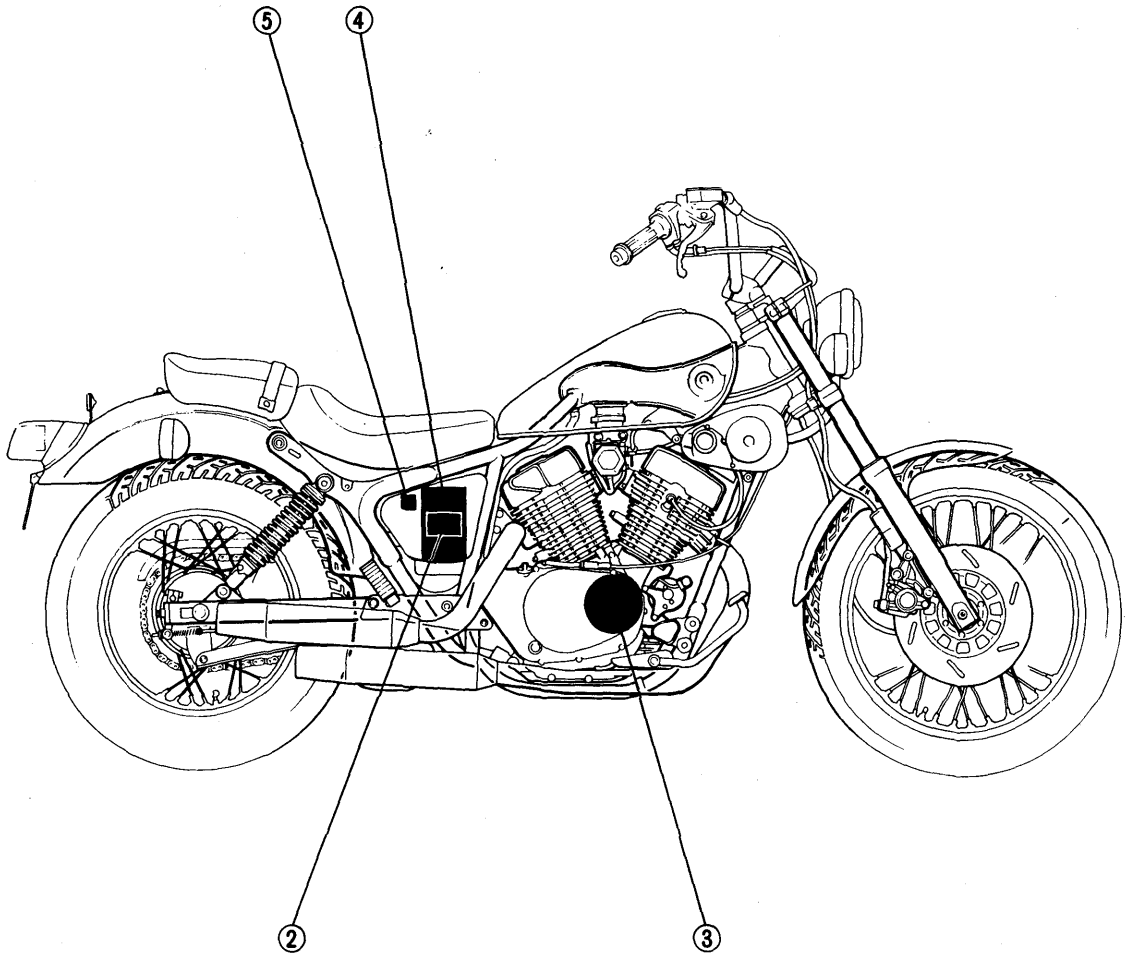


Aforementioned circuit diagram shows charging circuit in circuit diagram.

NOTE:

For the color codes, see page 7-2.

② Rectifier with regulator
③ A.C. magneto
④ Battery
⑤ Fuse "MAIN"



TROUBLESHOOTING

BATTERY IS NOT CHARGED

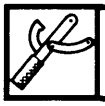
Procedure

Check;

1. Fuse "MAIN"
2. Battery
3. Charging voltage
4. Stator coil resistance
5. Wiring connection (Charging system)

NOTE:

- Remove the following before troubleshooting.
  1) Seat
  2) Side cover (Left)
- Use the following special tool in this troubleshooting.



Pocket Tester:
YU-03112

---

1. Fuse "MAIN"

- Connect the Pocket Tester "Ω x 1" to the fuse.
- Check the fuse for continuity.

NOCONTINUITY → Replace fuse.

CONTINUITY ↓

2. Battery

- Check the battery condition.
- Check the battery fluid level, battery terminals and specific gravity.

Specific Gravity:
1.280 at 20°C (68°F)

INCORRECT → Refill battery fluid.
Clean battery terminals.
Recharge or replace battery.

CORRECT ↓

3. Charging voltage test

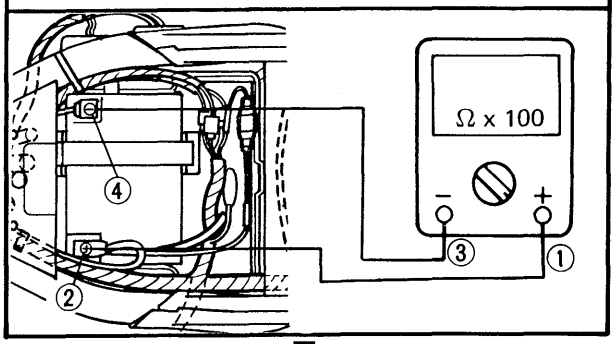
- Connect the Pocket Tester "DC20V" to the battery.
- Start the engine and accelerate to about 5,000 r/min.
- Measure the charging voltage.

Charging Voltage:
14 ~ 15V at 5,000 r/min

⚠ CAUTION:

Never disconnect the battery cables while the A.C. generator is operating or the rectifier/regulator will be damaged.

① Positive lead (Pocket Tester)
② Positive terminal (Battery)
③ Negative lead (Pocket Tester)
④ Negative terminal (Battery)



CHARGING VOLTAGE MEETS SPECIFICATION

Replace battery.

LESS THAN 13V

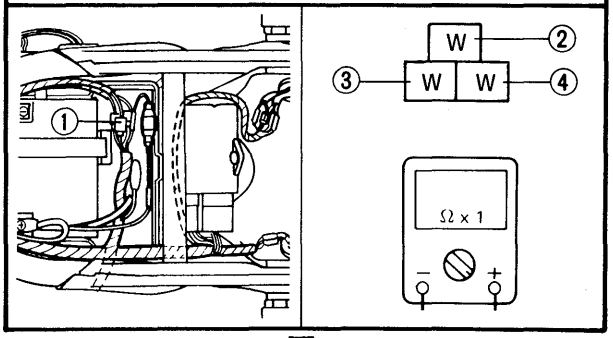
MORE THAN 15V

Replace Rectifier/Regulator.

4. Stator coil resistance test

- Disconnect the A.C. Magneto coupler ① from the wire harness.
- Connect the Pocket Tester (Ω x 1) to the stator coil.
- Measure the stator coil resistances.

Stator Coil Resistance:
(White ② – White ③, White ② – White ④, White ③ – White ④)
0.19 ~ 0.29Ω at 20°C (68°F)



OUT OF SPECIFICATION

Replace stator assembly.

RESISTANCE MEETS SPECIFICATION

5. Check entire charging system for connections.

- Refer to "WIRING DIAGRAM" section.

POOR CONNECTION

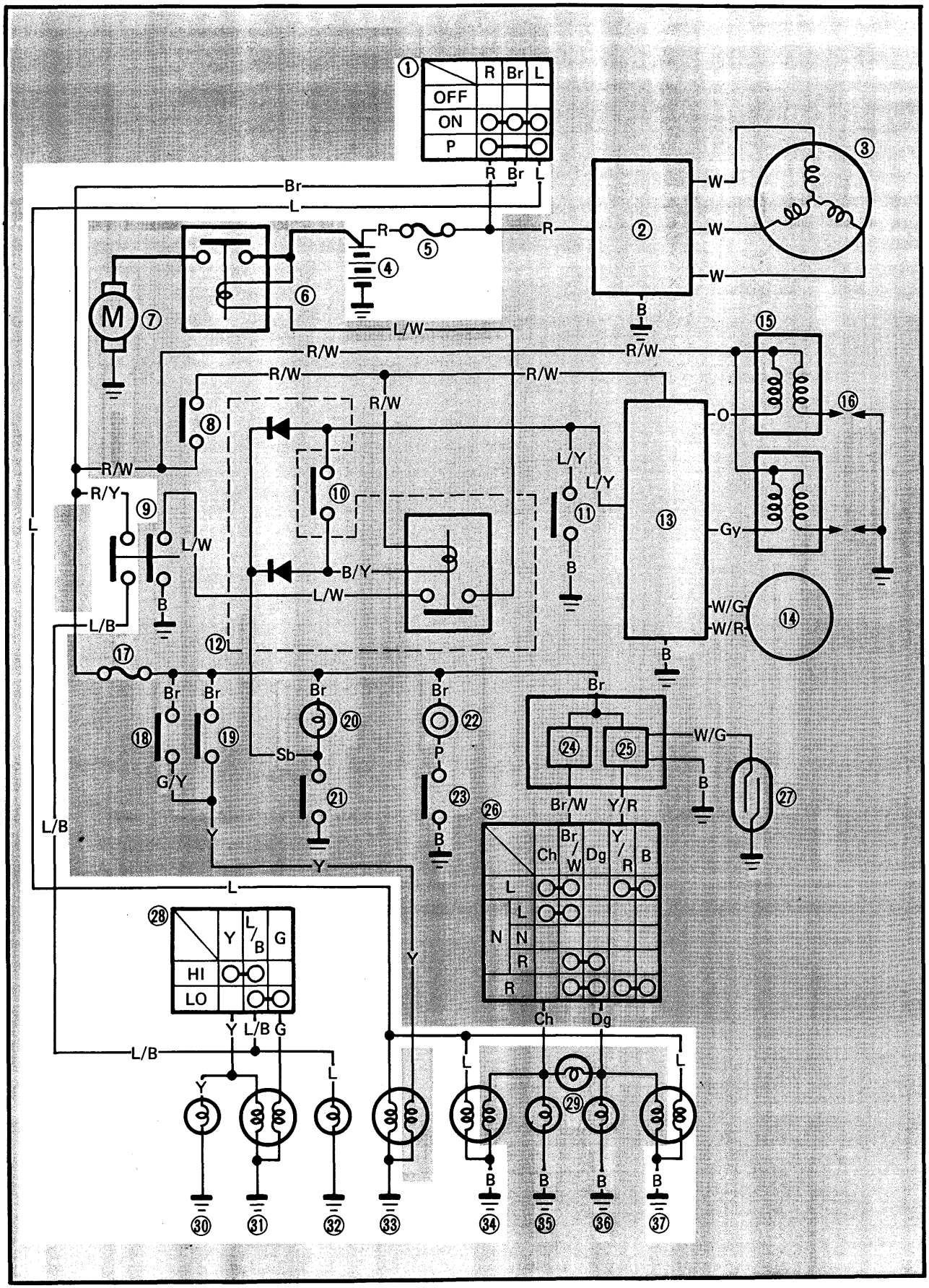
Correct.

OK

Rectifier/Regulator is faulty. Replace it.

LIGHTING SYSTEM

CIRCUIT DIAGRAM

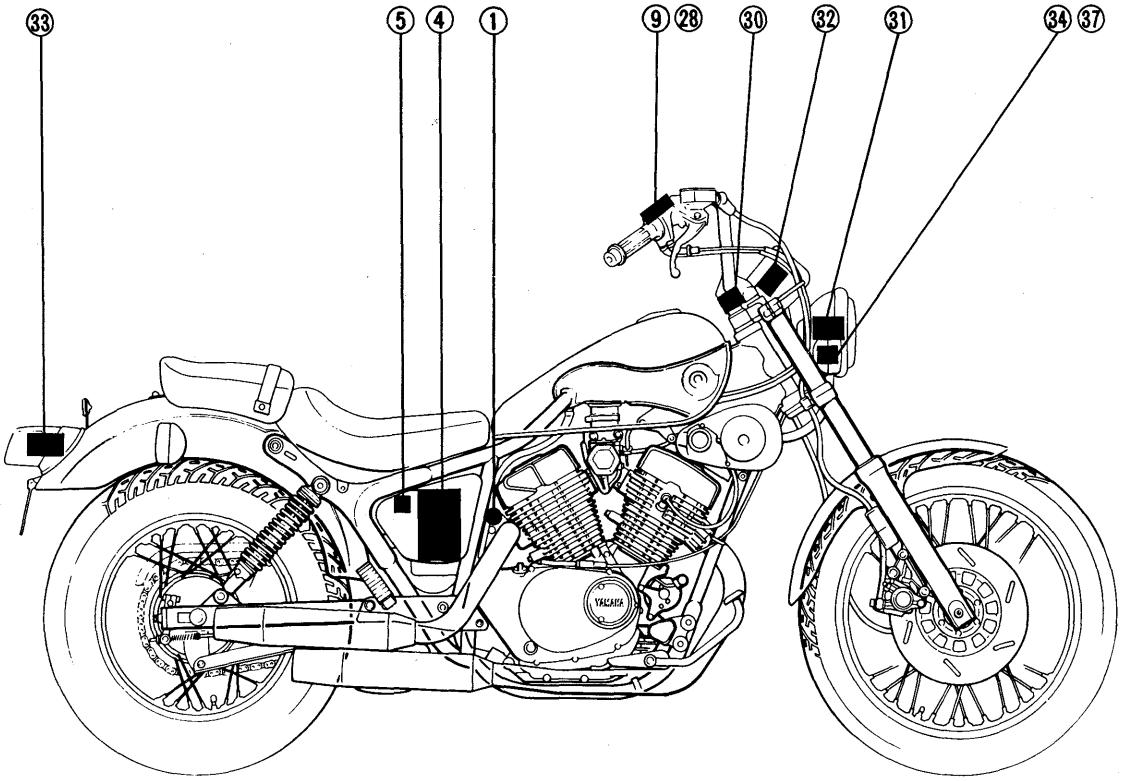


Aforementioned circuit diagram shows lighting circuit in circuit diagram.

NOTE:

For the color codes, see page 7-2.

① Main switch
④ Battery
⑤ Fuse "MAIN"
⑨ "START" switch
㉘ "LIGHTS" (Dimmer) switch
㉚ "HIGH BEAM" indicator light
㉛ Headlight
㉜ Meter light
㉝ Taillight
㉞ Front position light (Left)
㊲ Front position light (Right)



TROUBLESHOOTING

HEADLIGHT/"HI BEAM" INDICATOR LIGHT DO NOT COME ON

Procedure

Check;

1. Headlight bulb/"HI BEAM" indicator light bulb
2. Headlight bulb socket/"HIGH BEAM" indicator light bulb socket
3. Battery
4. Fuse "MAIN"
5. "LIGHTS" (Dimmer) switch
6. Main switch
7. Wiring connection (Lighting system)

NOTE:

- Remove the following parts before troubleshooting.
  1) Seat
  2) Headlight
  3) Handlebar
  4) Indicator lights box
- Use the following special tool in this troubleshooting.

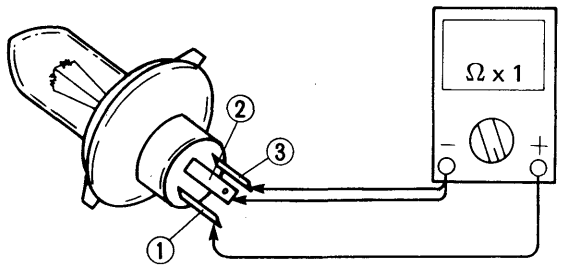
	**Pocket Tester: YU-03112**

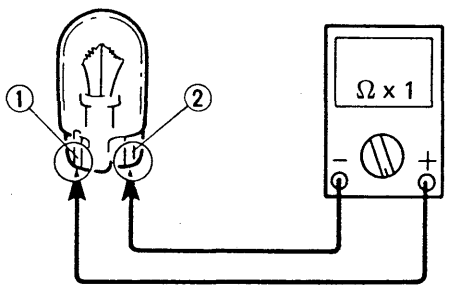
1. Bulb

- Remove the bulb.
  Refer to "CHAPTER 3. HEADLIGHT BULB REPLACEMENT".
- Connect the Pocket Tester (Ω x 1) to the bulb terminals.

Tester (+) Lead → Terminal ①
Tester (—) Lead → Terminal ②

Tester (+) Lead → Terminal ①
Tester (—) Lead → Terminal ③





- Check the bulb for continuity.

NOCONTINUITY → Replace bulb.

CONTINUITY → *

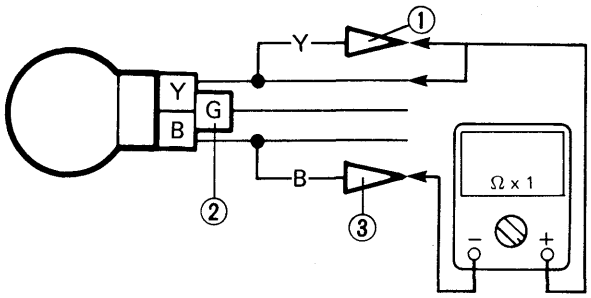
*

2. Bulb socket

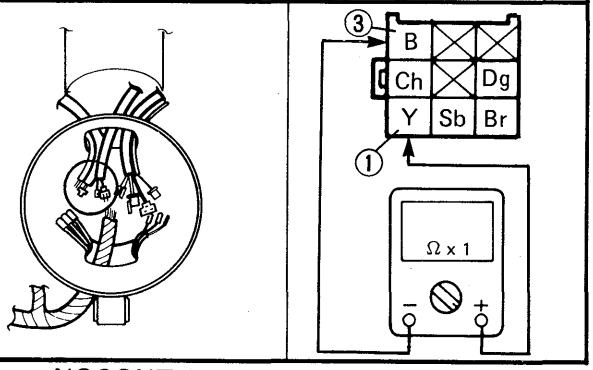
- Disconnect the bulb socket leads from the wire harness.
- Install the bulb to the bulb socket.
- Connect the Pocket Tester (Ω x 1) to the bulb socket leads.

Tester (+) Lead → Yellow ① Lead
Tester (–) Lead → Black ③ Lead

Tester (+) Lead → Green ② Terminal
Tester (–) Lead → Black ③ Lead



Tester (+) Lead → Yellow ① Terminal
Tester (–) Lead → Black ③ Terminal



- Check the bulb socket for continuity.

NOCONTINUITY → Replace bulb socket.

CONTINUITY ↓

3. Battery

- Check the battery condition.
- Check the battery fluid level, battery terminals and specific gravity.

Specific Gravity:
1.280 at 20°C (68°F)

INCORRECT → Refill battery fluid.
Clean battery terminals.
Recharge or replace battery.

CORRECT ↓

4. Fuse "MAIN"

- Connect the Pocket Tester "Ω x 1" to the fuse.
- Check the fuse for continuity.

NOCONTINUITY → Replace fuse.

CONTINUITY ↓

*

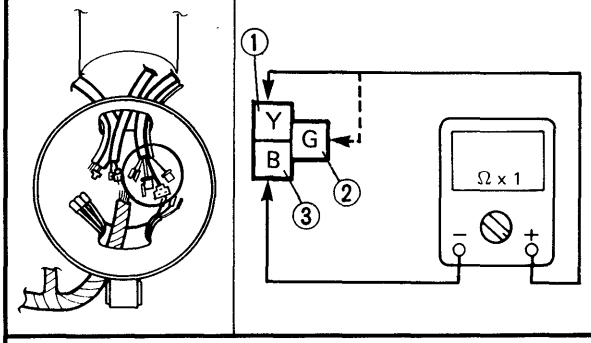
*

5. "LIGHTS" (Dimmer) switch

- Connect the Pocket Tester (Ω x 1) to the headlight bulb socket.

When turning "LIGHTS" (Dimmer) switch to "HI".
Tester (+) Lead → Yellow ① Terminal
Tester (–) Lead → Black ③ Terminal

When turning "LIGHTS" (Dimmer) switch to "LO".
Tester (+) Lead → Green ② Terminal
Tester (–) Lead → Black ③ Terminal



- Turn the "LIGHTS" (Dimmer) switch to the "HI" and "LO".
- Check the "LIGHTS" (Dimmer) switch for continuity.

Switch position	Good condition	Bad condition		
HI	○	X	○	X
LO	○	○	X	X

○: Continuity X: Nocontinuity

BAD CONDITION → Replace handlebar switch (Left).

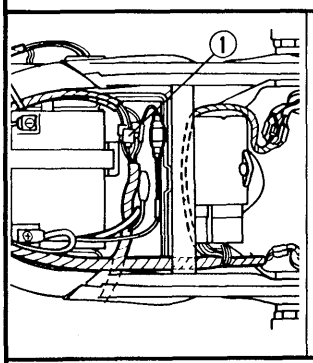
GOOD CONDITION

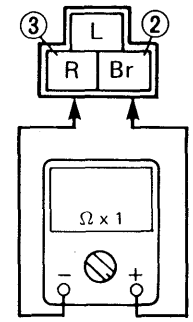
6. Main switch

- Disconnect the main switch coupler ① from the wire harness.
- Connect the Pocket Tester (Ω x 1) to the main switch.

Tester (+) Lead → Brown ② Terminal
Tester (–) Lead → Red ③ Terminal

NOTE:
The "LIGHTS" (Dimmer) switch is connected with the headlight bulb socket.





- Turn the main switch to "ON" and "OFF".
- Check the main switch for continuity.

Switch position	Good condition	Bad condition		
OFF	○	X	X	○
ON	X	○	X	○

○: Continuity X: Nocontinuity

BAD CONDITION → Replace main switch.

GOOD CONDITION ⇩

7. Check entire lighting system for connections.
- Refer to "WIRING DIAGRAM" section.

POOR CONNECTION → Correct.

OK ⇩

Check the charging system.

TAILLIGHT/FRONT POSITION LIGHT/METER LIGHT DO NOT COME ON.

Procedure

1. Taillight bulb/Front position light bulb/ Meter light bulb.
2. Taillight bulb socket/Front position light bulb socket/Meter light bulb socket.
3. Battery
4. Fuse "MAIN"
5. Main switch
6. Wiring connection (Lighting system)

NOTE:

- Remove the following parts before troubleshooting.
  1) Seat
  2) Lense (Taillight)
  3) Lense (Front flasher/Front position light)
  4) Headlight
- Use the following special tool in this troubleshooting.

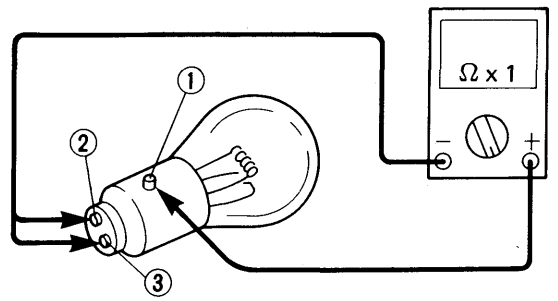
	**Pocket Tester: YU-03112**

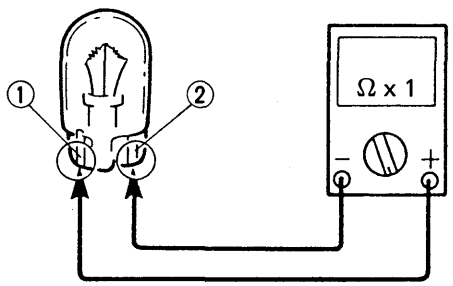
1. Bulb

- Remove the bulb.
- Connect the Pocket Tester (Ω x 1) to the bulb.

Tester (+) Lead → Terminal ①
Tester (–) Lead → Terminal ②

Tester (+) Lead → Terminal ①
Tester (–) Lead → Terminal ③





- Check the bulb for continuity.

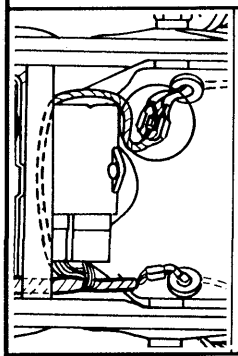
NOCONTINUITY → Replace bulb.

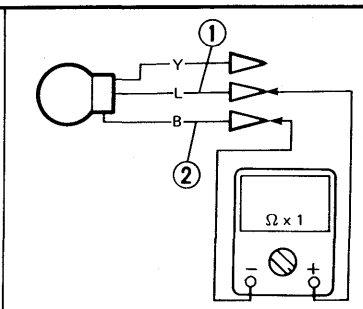
CONTINUITY ⇩

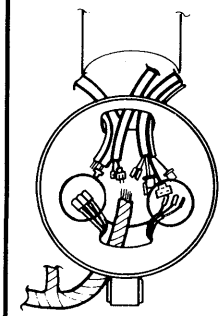
2. Bulb socket

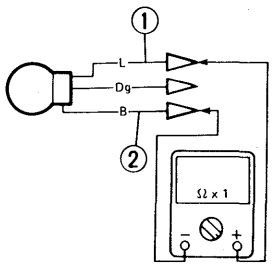
- Disconnet the bulb socket leads from the wireharness.
- Connect the Pocket Tester (Ω x 1) to the bulb socket leads.

Tester (+) Lead → Blue ① Lead
Tester (–) Lead → Black ② Lead









• Check the bulb socket for continuity.

NOCONTINUITY → Replace bulb.

CONTINUITY ↓

3. Battery

• Check the battery condition.
• Check the battery fluid level, battery terminals and specific gravity.

Specific Gravity:
1.280 at 20°C (68°F)

INCORRECT → Refill battery fluid.
Clean battery terminals.
Recharge or replace battery.

CORRECT ↓

4. Fuse "MAIN"

• Connect the Pocket Tester (Ω x 1) to the fuse.
• Check the fuse for continuity.

NOCONTINUITY → Replace fuse.

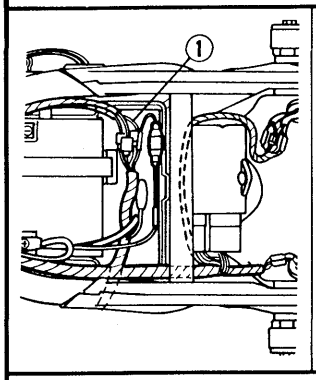
CONTINUITY ↓

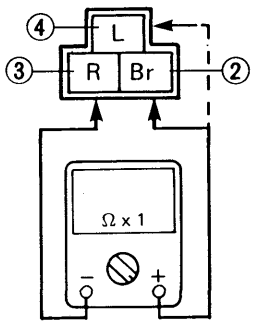
5. Main switch

• Disconnect the main switch coupler ① from the wire harness.
• Connect the Pocket Tester (Ω x 1) to the main switch.

Tester (+) Lead → Brown ② Terminal
Tester (–) Lead → Red ③ Terminal

Tester (+) Lead → Blue ④ Terminal
Tester (–) Lead → Red ③ Terminal





- Turn the main switch to "OFF", "ON" and "P".
- Check the main switch for continuity.

Switch position	Good condition	Bad condition		
OFF	○	X	X	○
ON	X	○	X	○
P	○	X	X	○

○: Continuity X: Nocontinuity

BAD CONDITION → Replace main switch.

GOOD CONDITION ↓

6. Check entire lighting system for connections.
   - Refer to "WIRING DIAGRAM" section.

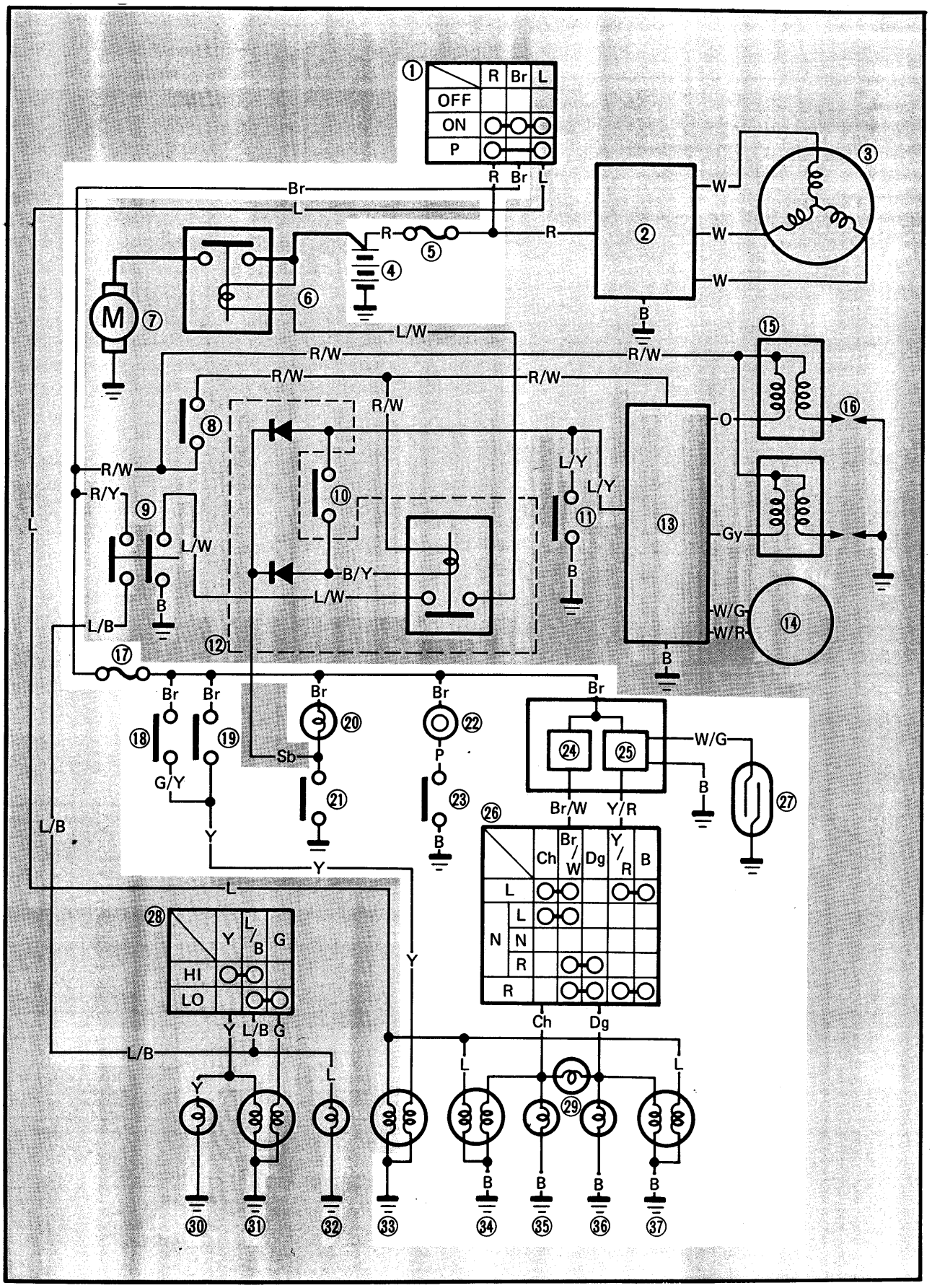
POOR CONNECTION → Correct.

OK ↓

Check the charging system.

SIGNAL SYSTEM

CIRCUIT DIAGRAM

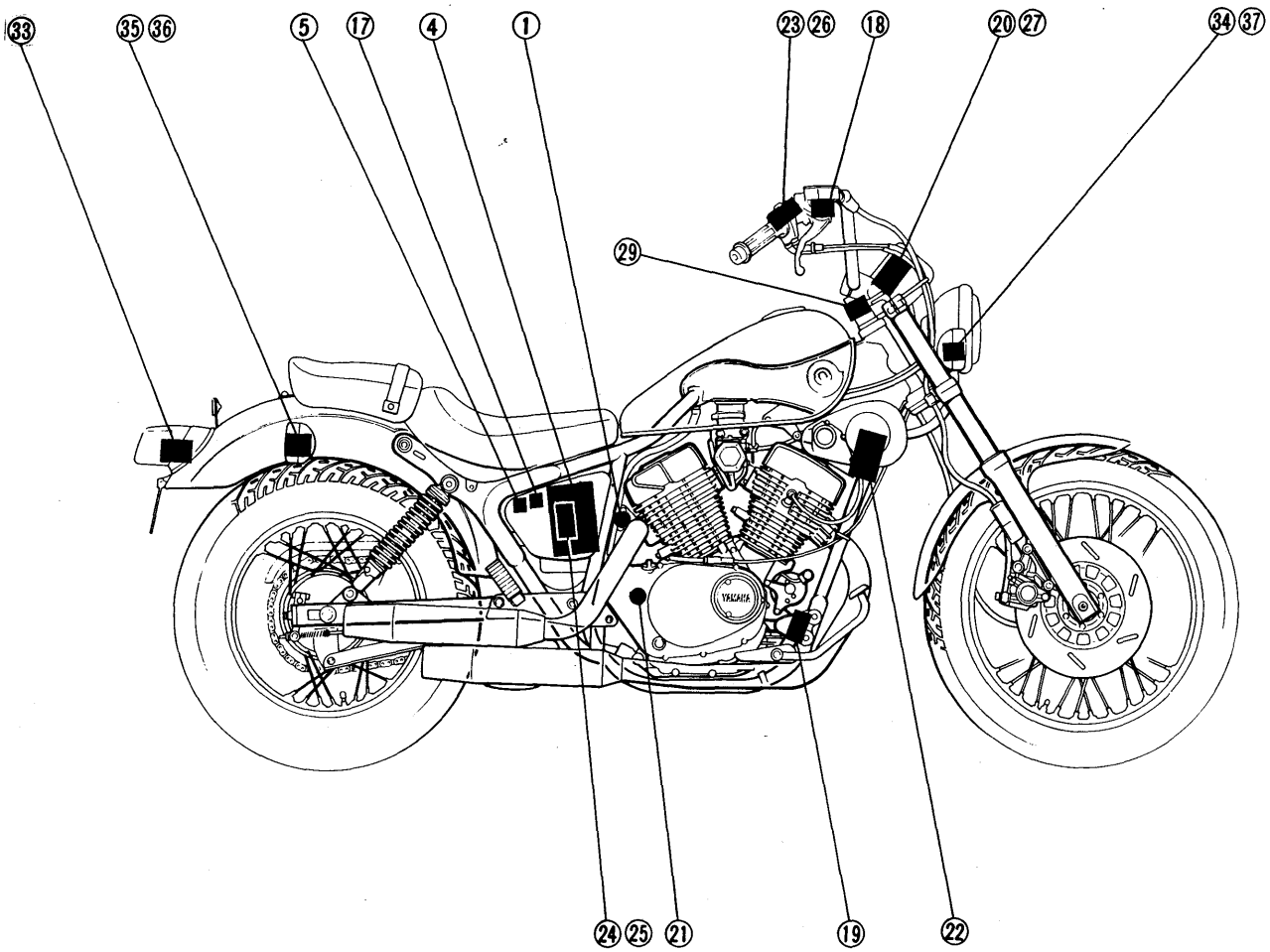


Aforementioned circuit diagram shows signal circuit in circuit diagram.

NOTE:

For the color codes, see page 7-2.

① Main switch
④ Battery
⑤ Fuse "MAIN"
⑰ Fuse "SIGNAL"
⑱ Front brake switch
⑲ Rear brake switch
⑳ "NEUTRAL" indicator light
㉑ Neutral switch
㉒ Horn
㉓ "HORN" switch
㉔ Flasher relay
㉕ Cancelling unit
㉖ "TURN" switch
㉗ Reed switch
㉙ "TURN" indicator light
㉝ Brake light
㉞ Front flasher light (Left)
㉟ Rear flasher light (Left)
㊱ Rear flasher light (Right)
㊲ Front flasher light (Right)



TROUBLESHOOTING

FLASHER LIGHT, BRAKE LIGHT, "NEUTRAL" INDICATOR LIGHT, "TURN" INDICATOR LIGHT DO NOT COME ON AND HORN DOES NOT OPERATE.

Procedure

Check;

1. Fuse "MAIN", "SIGNAL"
2. Battery
3. Main switch
4. Wiring connection (Signal system)

NOTE:

- Remove the following parts before troubleshooting.
  1) Seat
  2) Side cover (Right)
  3) Fuel tank
  4) Headlight unit
- Use the following special tool in this troubleshooting.

Pocket Tester:
YU-03112

1. Fuse

- Remove the fuse.
- Connect the Pocket Tester (Ω x 1) to the fuse.
- Check the fuse for continuity.

NOCONTINUITY → Replace fuse.

CONTINUITY ↓

2. Battery

- Check the battery condition. Refer to the CHAPTER 3. "BATTERY INSPECTION" section.

Specific Gravity:
1.280 at 20°C (68°F)

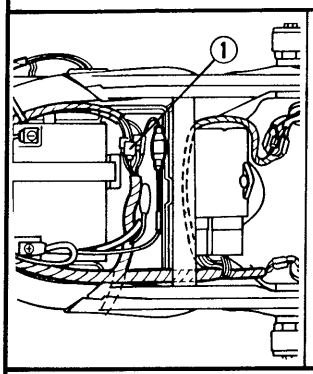
INCORRECT → Refill battery fluid. Clean battery terminals. Recharge or replace battery.

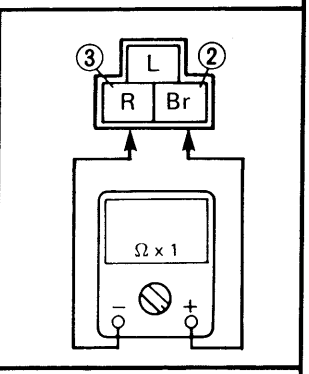
CORRECT ↓

3. Main switch

- Disconnect the main switch coupler ① from the wire harness.
- Connect the Pocket Tester (Ω x 1) to the main switch.

Tester (+) Lead → Brown ② Terminal
Tester (−) Lead → Red ③ Terminal





- Turn the main switch to "ON" and "OFF".
- Check the main switch for continuity.

Switch position	Good condition	Bad condition		
OFF	○	X	X	○
ON	X	○	X	○

○ : Continuity X : Nocontinuity

BAD CONDITION → Replace main switch.

GOOD CONDITION

4. Wiring connection

Check the entire signal system for connections. Refer to the "WIRING DIAGRAM" section.

POOR CONNECTION → Correct.

CORRECT

Go to the "SIGNAL SYSTEM TEST AND CHECK" section.

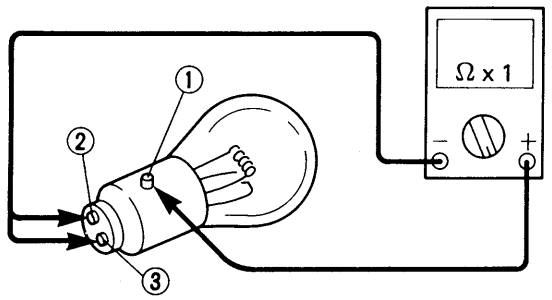
SIGNAL SYSTEM TEST AND CHECK

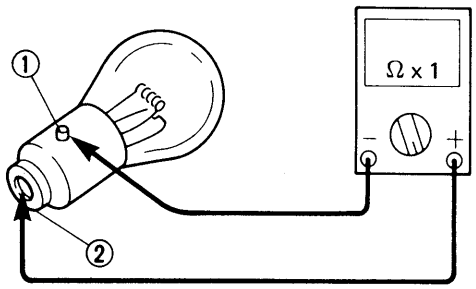
FLASHER LIGHT DOES NOT BRINK.

1. Bulb

- Remove the bulb.
- Connect the Pocket Tester (Ω x 1) to the bulb.

Tester (+) Lead → Terminal ①
Tester (–) Lead → Terminal ②
→ Terminal ③





- Check the bulb for continuity.

NOCONTINUITY → Replace bulb.

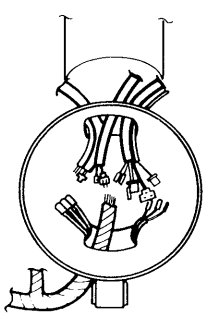
CONTINUITY ↓

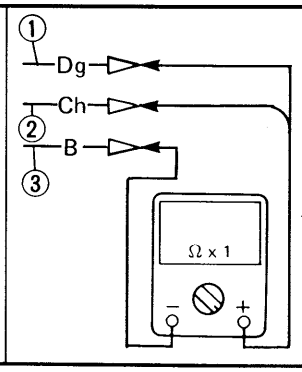
2. Bulb socket

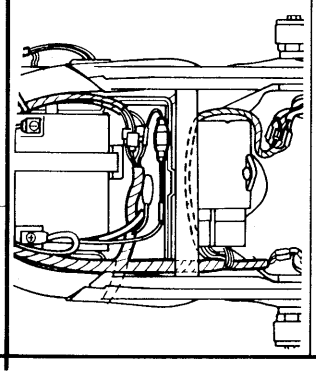
- Install the bulb to the socket.
- Disconnect the flasher light leads from the wire harness.
- Connect the Pocket Tester (Ω x 1) to the flasher light leads.

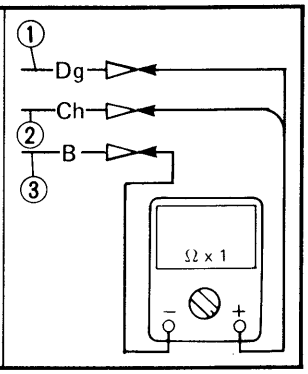
When checking right flasher light:
Tester (+) Lead → Dark green ① Lead
Tester (–) Lead → Black ③ Lead

When checking left flasher light:
Tester (+) Lead → Chocolate ② Lead
Tester (–) Lead → Black ③ Lead









• Check the flasher light bulb socket for continuity.

NOCONTINUITY → Replace flasher light bulb socket.

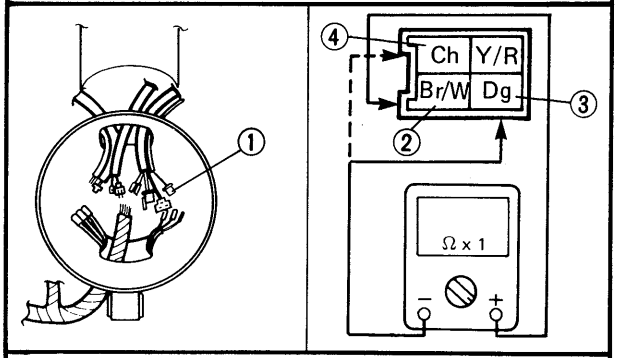
CONTINUITY ↓

3. "TURN" switch

• Disconnect the "TURN" switch (Left handlebar switch) coupler ① from the wire harness.
• Connect the Pocket Tester (Ω x 1) to the "TURN" switch

When turning "TURN" switch to "R":
Tester (+) Lead → Brown/White ② Lead
Tester (—) Lead → Dark green ③ Lead

When turning "TURN" switch to "L":
Tester (+) Lead → Brown/White ② Lead
Tester (—) Lead → Chocolate ④ Lead



• Turn the "TURN" switch to the "R" and "L".
• Check the "TURN" switch for continuity.

Switch position	Good condition	Bad condition		
R	○	X	○	X
L	○	○	X	X

○: Continuity X: No continuity

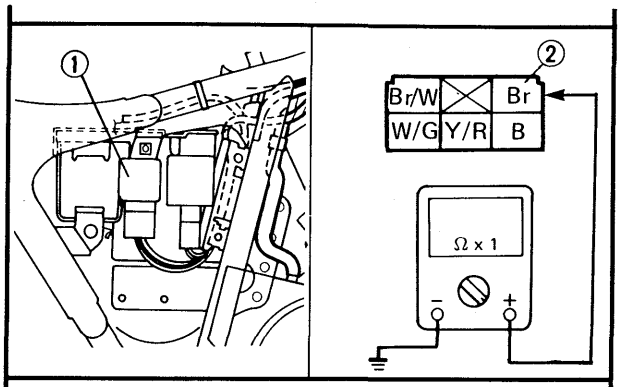
BAD CONDITION → Replace handlebar switch (Left).

GOOD CONDITION ↓

4. Voltage

• Disconnect the flasher relay ① coupler from the wire harness.
• Turn the main switch to "ON".
• Turn the "TURN" switch to the "R" or "L".
• Connect the Pocket Tester (DC20V) to the flasher relay coupler.

Tester (+) Lead → Brown ② Terminal
Tester (—) Lead → Ground



• Check the flasher voltage.

Flasher Voltage:
12.0V

MEET SPECIFICATION

Replace flasher relay.

OUT OF SPECIFICATION

5. Wiring connection

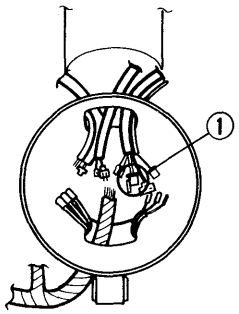
Check the entire signal system for connections. Refer to the "WIRING DIAGRAM" section.

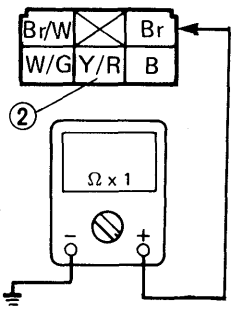
FLASHER LIGHT DOES NOT CANCEL.

1. "TURN" switch

- Disconnect the "TURN" switch (Left handlebar switch) coupler ① from the wire harness.
- Connect the Pocket Tester to the switch to coupler.

Tester (+) Lead → Yellow/Red ② Terminal
Tester (—) Lead → Ground





- Check the following for continuity.
- Push the "TURN" switch to left or right. Once the switch is released it will return to the center position.
  To cancel the signal, push the switch in after it has returned to the center position.

"TURN" Switch Position	Good Condition	Bad Condition		
"L" and "R"	○	○	X	X
"N" (Cancel)	X	○	X	○

○: Continuity X: No continuity

BAD CONDITION

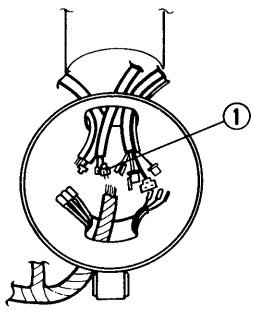
"TURN" switch is faulty.
Replace handlebar switch (Left).

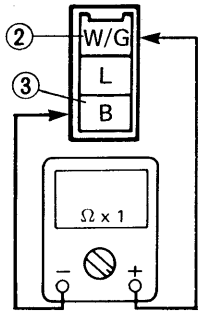
GOOD CONDITION

2. Reed switch

- Disconnect the speedometer coupler ① from the wire harness.
- Connect the Pocket Tester to the speedometer coupler.

Tester (+) Lead → White/Green ② Terminal
Tester (—) Lead → Black ③ Terminal.





• Lift the front wheel and rotate the wheel by hand, and measure the reed switch resistance.

Reed Switch Resistance:
About 7Ω
Then return back 0Ω or ∞
when wheel is stopped.

⚠ WARNING:

Securely support the motorcycle so there is no danger of it falling over.

BOTH RESISTANCES MEET SPECIFICATION

3. Wiring connection check
• Entire signal system
Refer to "WIRING DIAGRAM".

POOR CONNECTION

Correct connection(s).

OK

Replace the flasher relay.

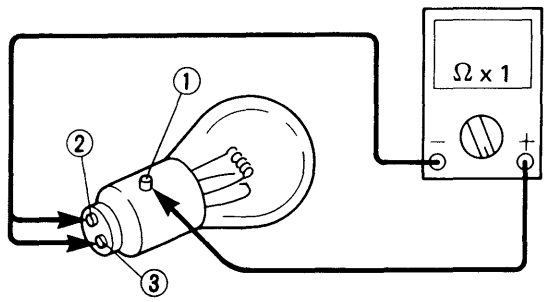
BRAKE LIGHT DOES NOT COME ON.

1. Bulb

- Remove the bulb.
- Connect the Pocket Tester (Ω x 1) to the bulb.

Tester (+) Lead → Terminal ①
Tester (–) Lead → Terminal ②

Tester (+) Lead → Terminal ①
Tester (–) Lead → Terminal ③



- Check the bulb for continuity.

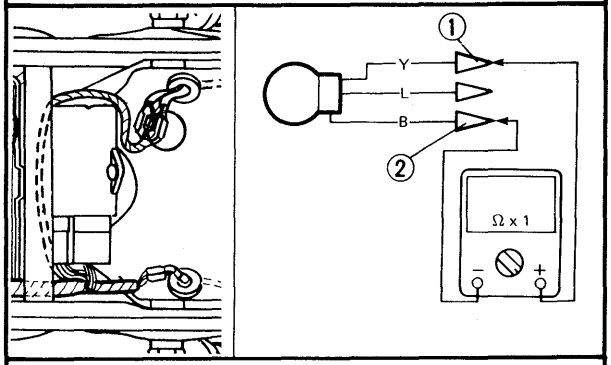
NOCONTINUITY → Replace bulb.

CONTINUITY ⇩

2. Bulb socket

- Disconnet the bulb socket leads from the wireharness.
- Connect the Pocket Tester (Ω x 1) to the bulb socket leads.

Tester (+) Lead → Yellow ① Lead
Tester (–) Lead → Black ② Lead



- Check the bulb socket for continuity.

NOCONTINUITY → Replace bulb socket.

CONTINUITY ⇩

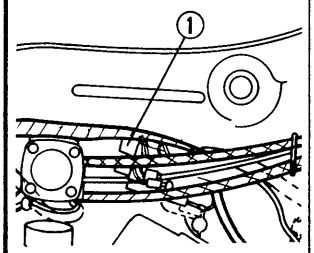
*

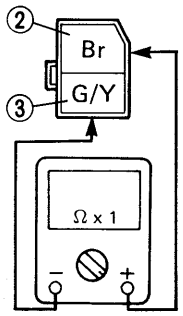
*

3. Front brake switch

- Disconnect the front brake switch coupler ① from the wireharness.
- Connect the Pocket Tester (Ω x 1) to the brake switch coupler.

Tester (+) Lead → Brown ② Terminal
Tester (–) Lead → Green/Yellow ③ Terminal





- Check the brake switch for continuity.

Switch position	Good condition	Bad condition		
Front brake is applied.	○	X	X	○
Front brake is not applied.	X	○	X	○

○: Continuity X: Nocontinuity

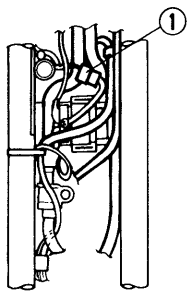
BAD CONDITION → Replace front brake switch.

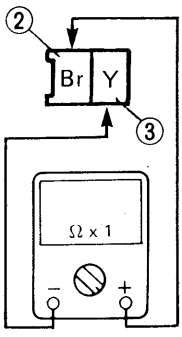
GOOD CONDITION

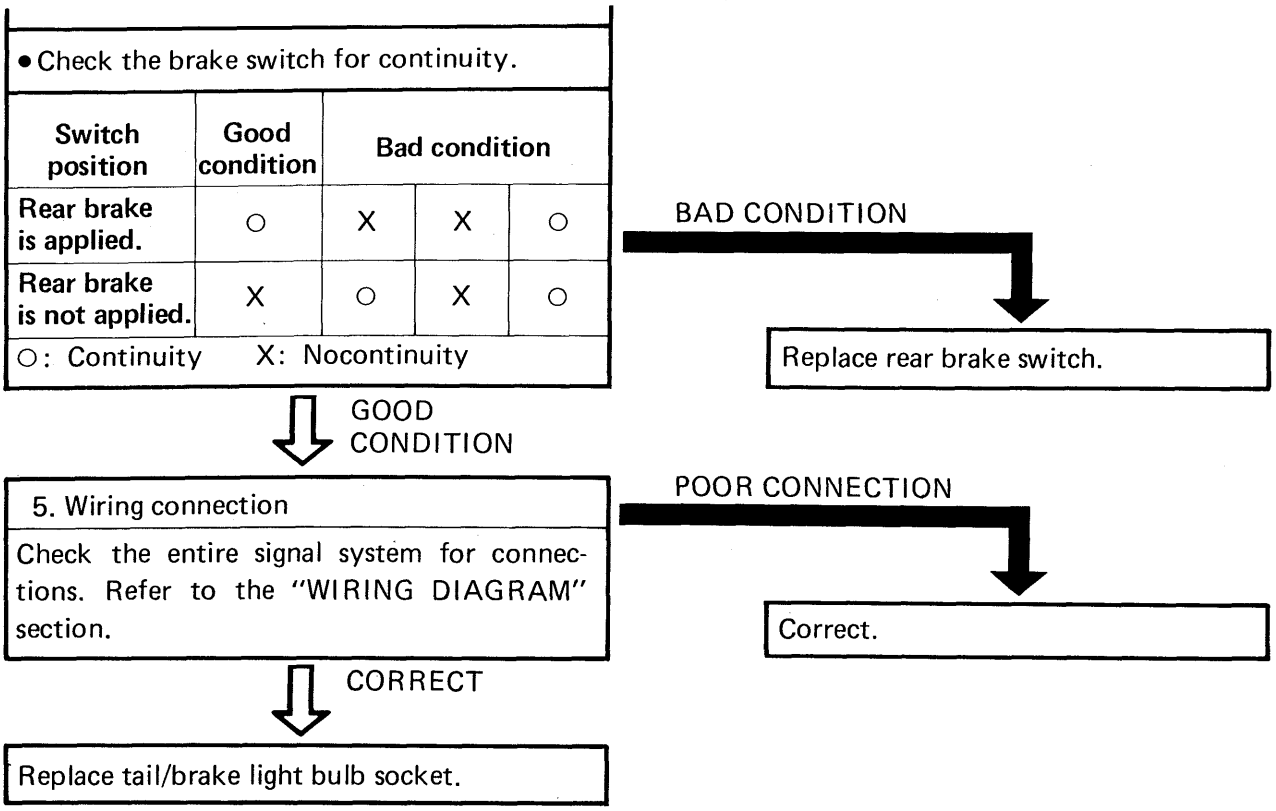
4. Rear brake switch

- Disconnect the rear brake switch coupler ① from the wire harness.
- Connect the Pocket Tester (Ω x 1) to the brake switch coupler.

Tester (+) Lead → Brown ② Terminal
Tester (–) Lead → Yellow ③ Terminal







• Check the brake switch for continuity.

Switch position	Good condition	Bad condition		
Rear brake is applied.	○	X	X	○
Rear brake is not applied.	X	○	X	○

○: Continuity X: Nocontinuity

BAD CONDITION

Replace rear brake switch.

GOOD CONDITION

5. Wiring connection

Check the entire signal system for connections. Refer to the "WIRING DIAGRAM" section.

POOR CONNECTION

Correct.

CORRECT

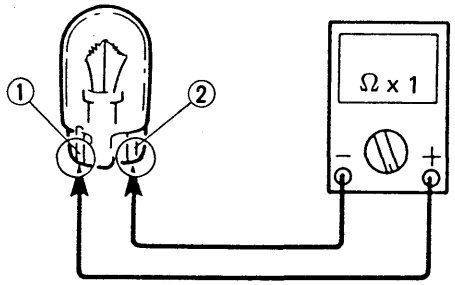
Replace tail/brake light bulb socket.

"NEUTRAL" INDICATOR LIGHT DOES NOT COME ON.

1. Bulb

- Remove the bulb.
- Connect the Pocket Tester (Ω x 1) to the bulb.

Tester (+) Lead → Terminal ①
Tester (–) Lead → Terminal ②



- Check the bulb for continuity.

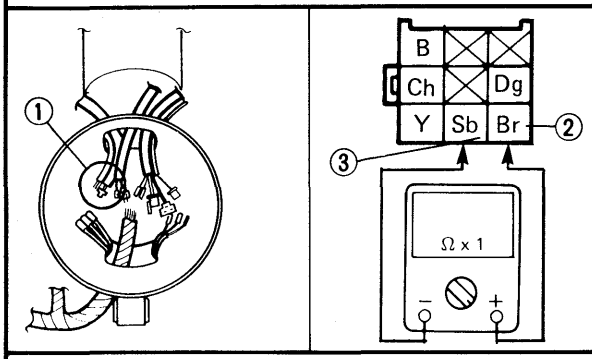
NOCONTINUITY → Replace bulb.

CONTINUITY ↓

2. Bulb socket

- Disconnect the indicator lights coupler ① from the wire harness.
- Connect the Pocket Tester (Ω x 1) to the coupler.

Tester (+) Lead → Brown ② Terminal
Tester (–) Lead → Sky blue ③ Terminal



- Check the bulb socket for continuity.

NOCONTINUITY → Replace bulb socket.

CONTINUITY ↓

*

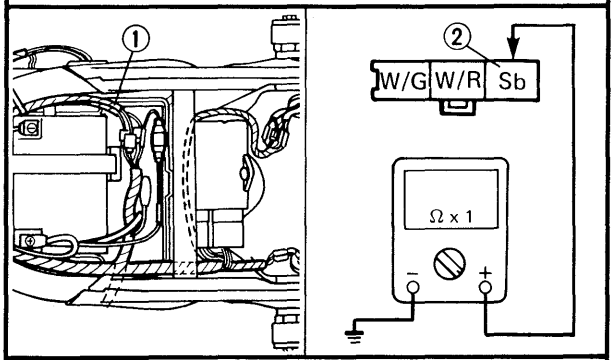
NOTE:
Remove the handlebar and indicator lights box.

*

3. "NEUTRAL" switch

- Disconnect the neutral switch/pickup coil coupler ① from the wire harness.
- Connect the Pocket Tester (Ω x 1) to the "NEUTRAL" switch.

Tester (+) Lead → Sky blue ② Terminal
Tester (–) Lead → Ground



- Shift the transmission in neutral and gear.
- Check the "NEUTRAL" switch for continuity.

Transmission position	Good condition	Bad condition		
Neutral	○	X	X	○
Gear	X	○	X	○

○: Continuity X: Nocontinuity

BAD CONDITION

Replace "NEUTRAL" switch.

GOOD CONDITION

4. Wiring connection

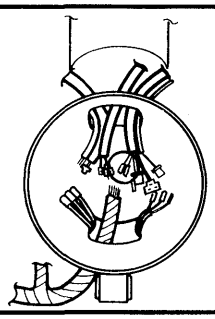
Check the entire signal system for connections. Refer to the "WIRING DIAGRAM" section.

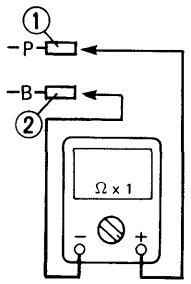
HONE DOES NOT SOUND, WHEN PUSHING "HORN" SWITCH.

1. "HORN" switch

- Disconnect the "HORN" switch leads from the wire harness.
- Connect the Pocket Tester (Ω x 1) to the switch leads.

Tester (+) Lead → Pink ① Lead
Tester (–) Lead → Black ② Lead





- Check the "HORN" switch for continuity.

Switch position	Good condition	Bad condition		
"HORN" switch is pushed	○	X	X	○
"HORN" switch is not pushed.	X	○	X	○

○ : Continuity X : Nocontinuity

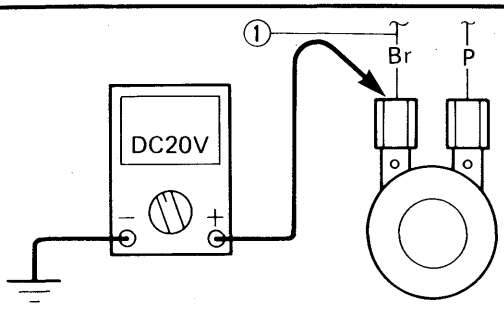
BAD CONDITION → "HORN" switch is faulty. Replace handlebar switch (Left).

GOOD CONDITION

2. Voltage

- Connect the Pocket Tester (DC20V) to the horn at the terminal.

Tester (+) Lead → Brown ① Terminal
Tester (–) Lead → Frame Ground



• Check the horn voltage.

Horn Voltage:
12.0V

OUT OF SPECIFICATION

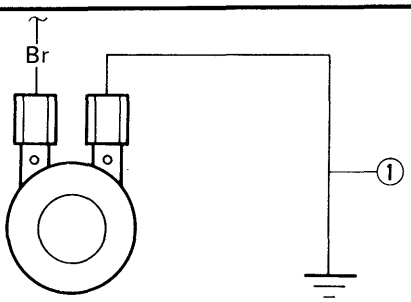
3. Wiring connection

Check the entire signal system for connections. Refer to the "WIRING DIAGRAM" section.

MEETS SPECIFICATION

4. Horn

• Disconnect the "Pink" lead at the horn terminal.
• Connect a jumper lead ① to the horn terminal and grund the jumper lead.



OUT OF SPECIFICATION

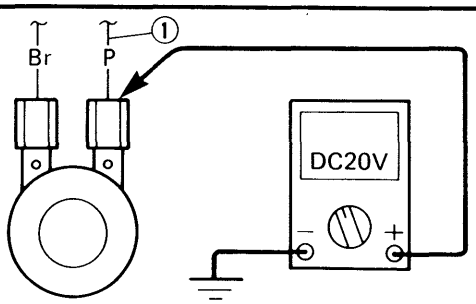
Horn is good.

HORN IS NOT SOUNDED

5. Voltage

• Connect the Pocket Tester (DC20V) to the horn at the Pink terminal.

Tester (+) Lead → Pink ① Terminal
Tester (–) Lead → Frame Ground



• Check the "Pink" terminal voltage.

"Pink" Terminal Voltage:
12.0V

HORN IS SOUNDED

Replace horn.

MEETS SPECIFICATION

Adjust or replace horn.

TROUBLESHOOTING

NOTE:

The following troubleshooting does not cover all the possible causes of trouble. It should be helpful, however, as a guide to troubleshooting. Refer to the relative procedure in this manual for inspection, adjustment and replacement of parts.

STARTING FAILURE/HARD STARTING

FUEL SYSTEM	PROBABLE CAUSE
Fuel tank	• Empty • Clogged fuel filter • Clogged fuel breather pipe • Deteriorated fuel or fuel containing water or foreign material
Fuel cock	• Clogged fuel hose
Carburetor	• Deteriorated fuel, fuel containing water or foreign material • Clogged pilot jet • Clogged pilot air passage • Sucked-in air • Deformed float • Groove-worn needle valve • Improperly sealed valve seat • Improperly adjusted fuel level • Improperly set pilot jet • Clogged starter jet • Starter plunger malfunction • Improperly adjusted starter cable
Air cleaner	• Clogged
Fuel pump	• Faulty fuel pump

STARTING FAILURE/HARD STARTING

TRBL SHTG ?

ELECTRICAL SYSTEM

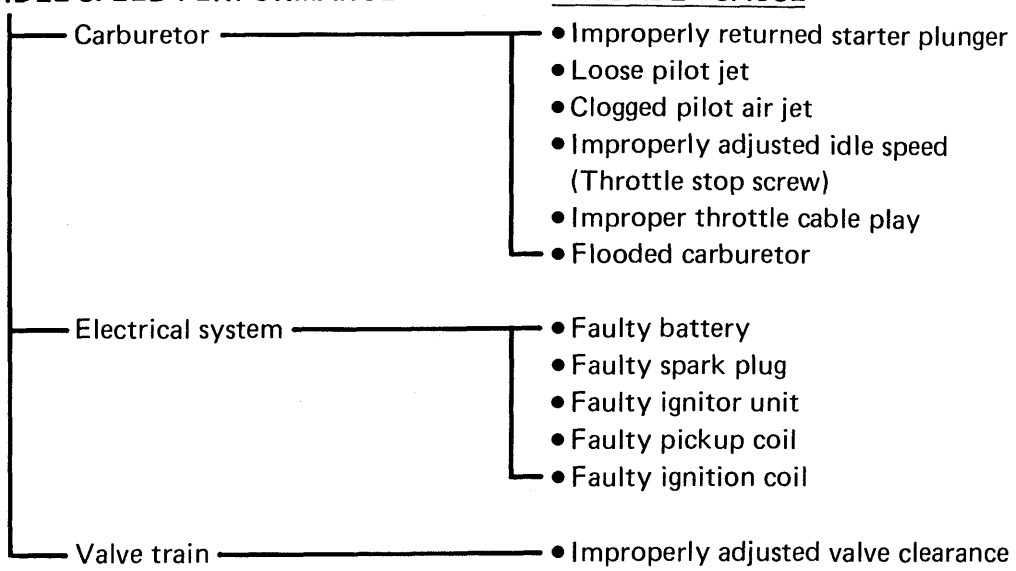
	PROBABLE CAUSE
Spark plug	• Improper plug cap • Worn electrodes • Wire between terminals broken • Improper heat range • Faulty spark plug cap
Ignition coil	• Broken or shorted primary/secondary • Faulty spark plug lead • Broken body
Full-transistor system	• Faulty ignitor unit • Faulty pickup coil
Switches and wiring	• Faulty main switch • Faulty engine stop switch • Broken or shorted wiring • Faulty neutral switch • Faulty starter motor switch • Faulty clutch switch
Starter motor	• Faulty starter motor • Faulty starter relay • Faulty circuit cut-off relay • Faulty starter clutch

COMPRESSION SYSTEM

	PROBABLE CAUSE
Cylinder and cylinder head	• Loose sprk plug • Loose cylinder head or cylinder • Broken cylinder head gasket • Worn, damaged or seized cylinder
Piston and piston rings	• Improperly installed piston ring • Worn, fatigued or broken piston ring • Seized piston ring • Seized or damaged piston
Crankcase and crankshaft	• Improperly seated crankcase • Improperly sealed valve • Improperly contacted valve and valve seat • Improper valve timing • Broken valve spring • Seized crankshaft

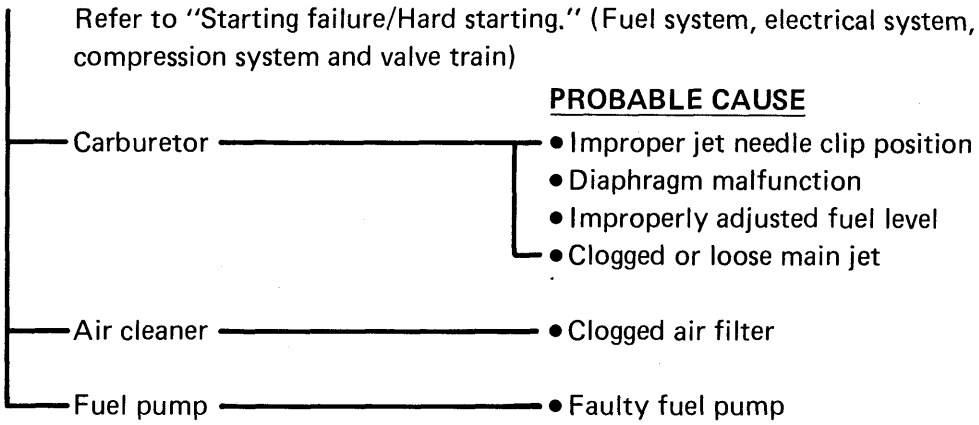
POOR IDLE SPEED PERFORMANCE

POOR IDLE SPEED PERFORMANCE



POOR MEDIUM AND HIGH SPEED PERFORMANCE

POOR MEDIUM AND HIGH SPEED PERFORMANCE



FAULTY GEAR SHIFTING

HARD SHIFTING

Refer to "Clutch dragging."

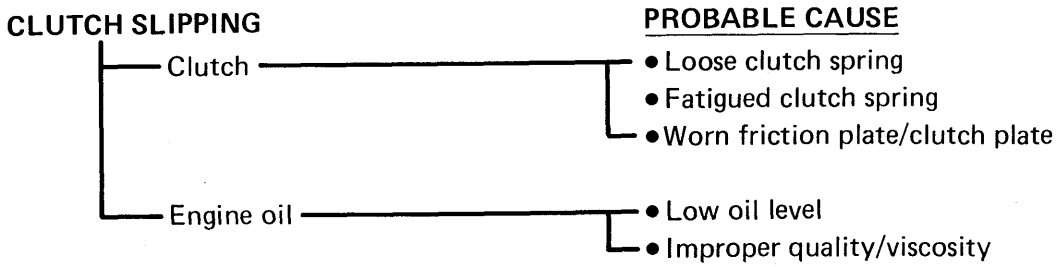
SHIFT PEDAL DOES NOT MOVE

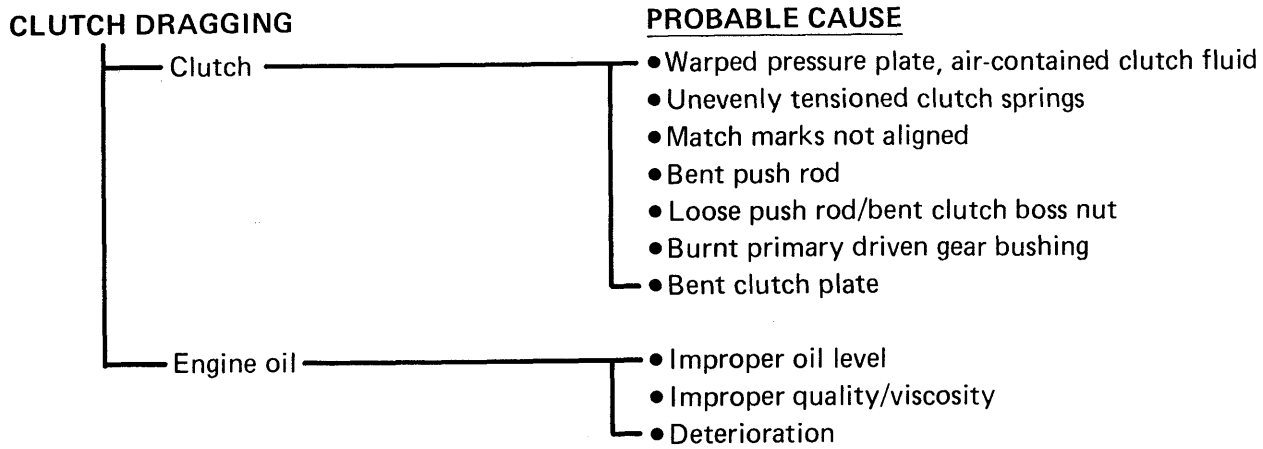
	PROBABLE CAUSE
Shift shaft	• Improperly adjusted shift rod • Bent shift shaft
Shift cam, shift fork	• Groove jammed with impurities • Seized shift fork • Bent shift fork guide bar
Transmission	• Seized transmission gear • Jammed impurities • Incorrectly assembled transmission

JUMP-OUT GEAR

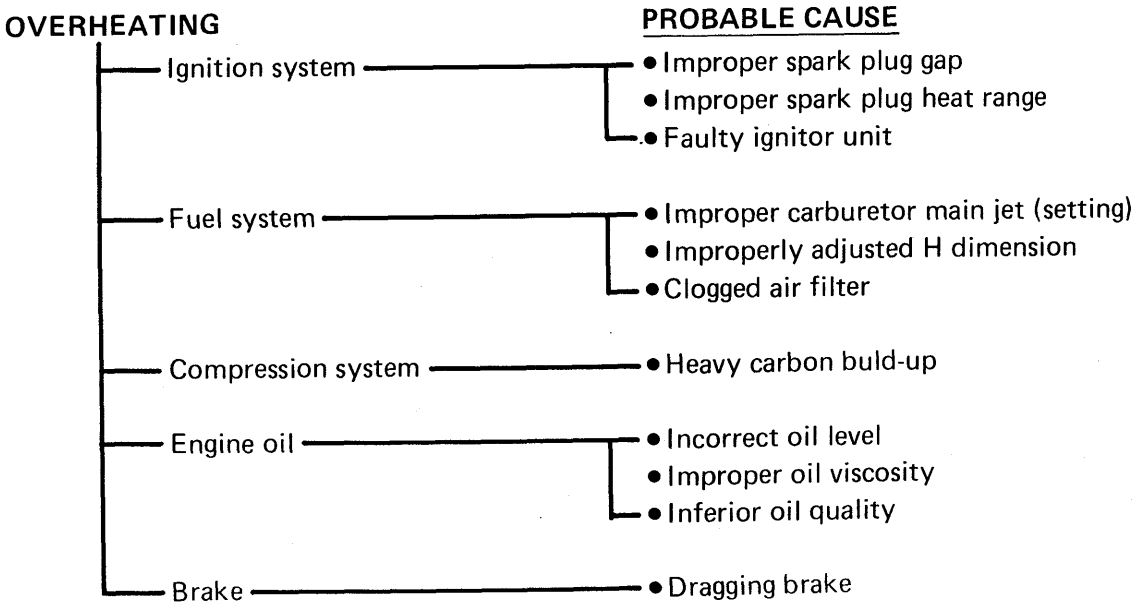
	PROBABLE CAUSE
Shift shaft	• Improperly adjusted • Improperly returned stopper lever
Shift fork	• Worn shift fork
Shift cam	• Improper thrust play • Worn shift cam groove
Transmission	• Worn gear dog

CLUTCH SLIPPING/DRAGGING





OVERHEATING



FAULTY BRAKE/FRONT FORK OIL LEAKAGE AND FRONT FORK MALFUNCTION

TRBL SHTG ?

FAULTY BRAKE

POOR BRAKING EFFECT

	PROBABLE CAUSE
Disc brake	• Worn brake pads • Worn disc • Air in brake fluid • Leaking brake fluid • Faulty cylinder kit cup • Faulty caliper kit seal • Loose union bolt • Broken brake hose • Oily or greasy disc/brake pads • Improper brake fluid level
Drum brake	• Worn brake shoe • Worn or rusty brake drum • Improperly adjusted brake free play • Improper brake cam lever position • Improper brake shoe position • Fatigue/Damaged return spring • Oily or greasy brake shoe • Oil or greasy brake drum • Broken brake cable

FRONT FORK OIL LEAKAGE AND FRONT FORK MALFUNCTION

OIL LEAKAGE

PROBABLE CAUSE
• Bent, damaged or rusty inner tube • Damaged or cracked outer tube • Damaged oil seal lip • Improperly installed oil seal • Improper oil level (too much) • Loose damper rod holding bolt • Broken cap bolt O-ring

MALFUNCTION

PROBABLE CAUSE
• Bent, deformed or damaged inner tube • Bent or deformed outer tube • Damaged fork spring • Worn or damaged slide metal • Improper oil viscosity • Improper oil level

INSTABLE HANDLING

INSTABLE HANDLING

INSTABLE HANDLING	PROBABLE CAUSE
Handlebar	• Improperly installed or bent
Steering	• Improperly installed handlebar crown • Bent steering stem • Improperly installed steering shaft (Improperly tightened ringnut) • Damaged ball bearing or bearing race
Front forks	• Uneven oil levels on both sides • Broken spring • Twisted front forks
Tires	• Uneven tire pressures on both sides • Incorrect tire pressure • Unevenly worn tires
Wheels	• Incorrect wheel balance • Deformed spoke wheel • Damaged bearing • Bent or loose wheel axle • Excessive wheel run-out • Loosed spoke
Frame	• Twisted • Damaged head pipe • Improperly installed bearing race
Swingarm	• Worn bearing or bush • Bent or damaged
Rear shock absorber	• Fatigued spring • Oil leakage
Drive chain	• Improperly adjusted chain slack

FAULTY SIGNAL AND LIGHTING SYSTEM

HEADLIGHT DARK

PROBABLE CAUSE

- Improper bulb
- Too many electric accessories
- Hard charging (broken stator coil wire, faulty rectifier with regulator)
- Incorrect connection
- Improperly grounded
- Poor contacts (main or light switch)
- Bulb life expires

BULB BURNT OUT

PROBABLE CAUSE

- Improper bulb
- Improperly grounded
- Faulty main and/or light switch
- Bulb life expires

FLASHER DOES NOT LIGHT

PROBABLE CAUSE

- Improperly grounded
- Discharged battery
- Faulty flasher switch
- Faulty flasher relay
- Broken wireharness
- Loosely connected coupler
- Bulb burnt out
- Faulty fuse

FLASHER KEEPS ON

PROBABLE CAUSE

- Faulty flasher relay
- Insufficient battery capacity (nearly discharged)
- Bulb burnt out

FLASHER WINKS SLOWER

PROBABLE CAUSE
• Faulty flasher relay
• Insufficient battery capacity (nearly discharged)
• Improper bulb
• Faulty main and/or "TURN" switch

FLASHER WINKS QUICKER

PROBABLE CAUSE
• Improper bulb
• Faulty flasher relay

HORN IS INOPERATIVE (Except for Holland)

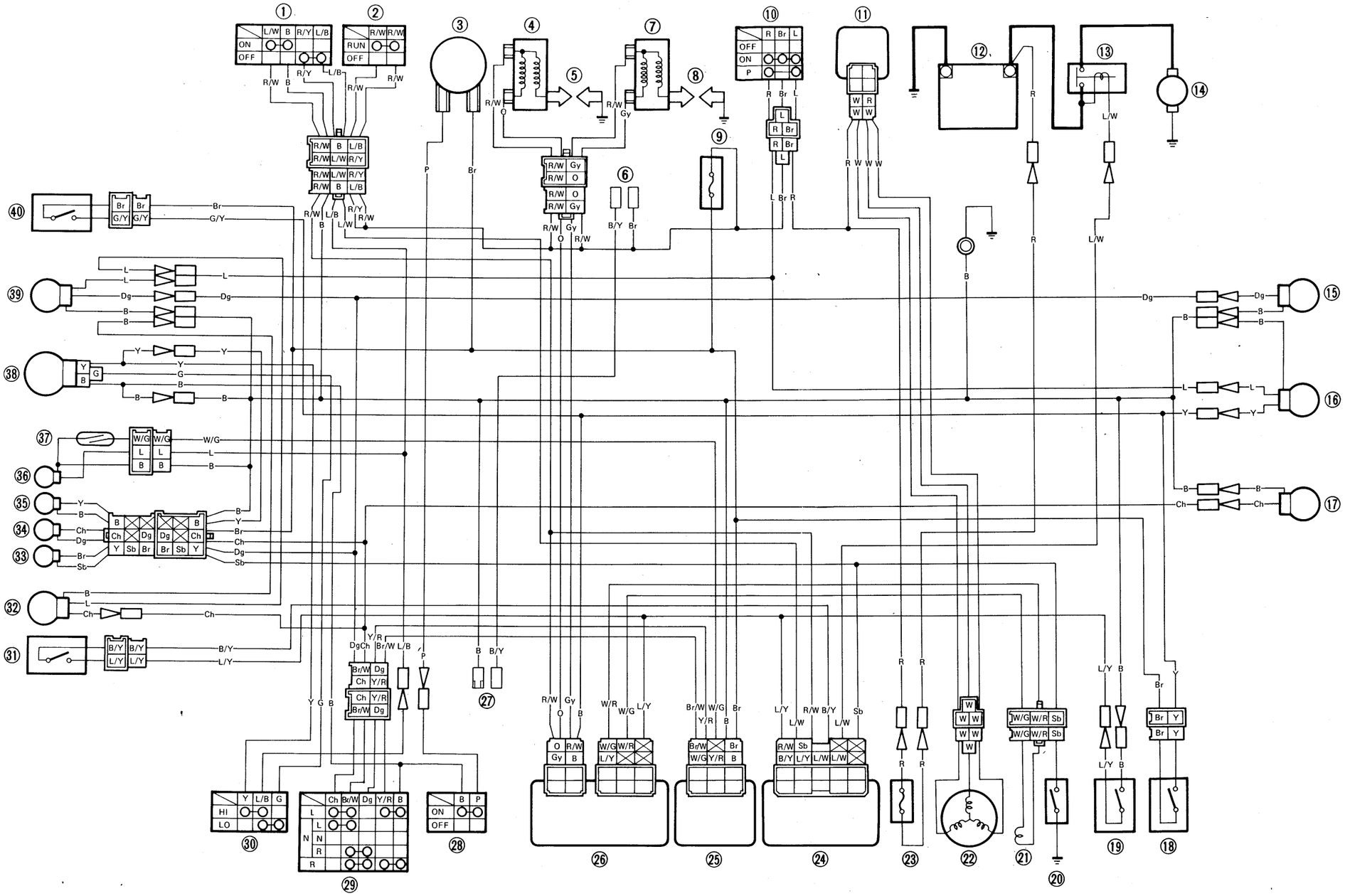
PROBABLE CAUSE
• Faulty battery
• Faulty fuse
• Faulty main and/or horn switch
• Improperly adjusted horn
• Faulty horn
• Broken wireharness

OVERHEATING

OVERHEATING

	PROBABLE CAUSE
Ignition system	• Improper spark plug gap
	• Improper spark plug heat range
	• Improper ignition timing
Fuel system	• Improper carburetor main jet (Improper setting)
	• Clogged air cleaner element
	• Lean mixture (Faulty Autolube pump settings)
Compression system	• Heavy carbon build-up
Transmission oil	• Incorrect, oil level
	• Improper oil viscosity
	• Inferior oil quality
Brake	• Dragging brake

XV250U WIRING DIAGRAM



① "START" switch
② "ENGINE STOP" switch
③ Horn
④ Ignition coil 1
⑤ Spark plug
⑥ Thermo switch
⑦ Ignition coil 2
⑧ Spark plug
⑨ Fuse "SIGNAL"
⑩ Main switch
⑪ Rectifier/Regulator
⑫ Battery
⑬ Starter relay
⑭ Starter motor
⑮ Rear flasher light (Right)
⑯ Tail/Brake light
⑰ Rear flasher light (Left)
⑱ Rear brake switch
⑲ Sidestand switch
⑳ Neutral switch
㉑ Pickup coil
㉒ AC magneto
㉓ Fuse "MAIN"
㉔ Relay assembly
㉕ Flasher relay
㉖ Ignitor unit
㉗ Heater
㉘ "HORN" switch
㉙ "TURN" switch
㉚ "LIGHTS" (Dimmer) switch
㉛ Clutch switch
㉜ Front flasher light (Left)
㉝ "NEUTRAL" indicator light
㉞ "TURN" indicator light
㉟ "HIGH BEAM" indicator light
㊱ Meter light
㊲ Reed switch
㊳ Headlight
㊴ Front flasher light (Right)
㊵ Front brake switch

COLOR CODE

B . . . . . .Black	L . . . . . .Blue	Y . . . . . .Yellow	L/W . . . .Blue/White
Br. . . . . .Brown	O . . . . . .Orange	B/W . . . .Black/White	L/Y . . . .Blue/Yellow
Ch . . . . . .Chocolate	P . . . . . .Pink	B/Y . . . .Black/Yellow	R/W . . . .Red/White
Dg . . . . . .Dark green	R . . . . . .Red	Br/W. . . .Brown/White	W/G . . . .White/Green
G . . . . . .Green	Sb . . . . . .Sky blue	L/B. . . . .Blue/Black	W/R . . . .White/Red
Gy . . . . . .Gray	W. . . . . .White	L/R . . . .Blue/Red	Y/R . . . .Yellow/Red