



**YAMAHA**

**'87**

A large, semi-transparent Yamaha logo watermark is centered on the page, serving as a background for the main text.

**TZR250**

**SERVICE MANUAL**

**MANUEL D'ATELIER**

**WARTUNGSANLEITUNG**

# INDEX

GENERAL INFORMATION	
	GEN INFO <b>1</b>
SPECIFICATIONS	
	SPEC <b>2</b>
PERIODIC INSPECTION AND ADJUSTMENT	
	INSP ADJ <b>3</b>
ENGINE OVERHAUL	
	ENG <b>4</b>
COOLING SYSTEM	
	COOL <b>5</b>
CARBURETION	
	CARB <b>6</b>
CHASSIS	
	CHAS <b>7</b>
ELECTRICAL	
	ELEC <b>8</b>
TROUBLESHOOTING	
	TRBL SHTG <b>9</b>

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## 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  
MOTORCYCLE OPERATIONS  
YAMAHA MOTOR CO., LTD.

## HOW TO USE THIS MANUAL

### PARTICULARLY IMPORTANT INFORMATION

This material is distinguished by the following notation.

**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.

① GEN INFO 	② SPEC 	
③ INSP ADJ 	④ ENG 	
⑤ COOL 	⑥ CARB 	
⑦ CHAS 	⑧ ELEC 	
⑨ TRBL SHTG ?	⑩ 	
⑪ 	⑫ 	
⑬ 	⑭ 	
⑮ 	⑯ 	
⑰ 	⑱ 	⑲ 
⑳ 	㉑ 	㉒ 
㉓ 		

## 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
- ㉑ 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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# CONTENTS

## CHAPTER 1.

### GENERAL INFORMATION

<b>MOTORCYCLE IDENTIFICATION</b> .....	1-1
FRAME SERIAL NUMBER .....	1-1
ENGINE SERIAL NUMBER .....	1-1
<b>IMPORTANT INFORMATION</b> .....	1-3
PREPARATION FOR REMOVAL AND DISASSEMBLY .....	1-3
ALL REPLACEMENT PARTS .....	1-5
GASKETS, OIL SEALS, AND O-RINGS .....	1-5
LOCK WASHERS/PLATES AND COTTER PINS .....	1-5
BEARINGS AND OIL SEALS .....	1-5
CIRCLIPS .....	1-7
<b>SPECIAL TOOLS</b> .....	1-7
FOR TUNE UP .....	1-7
FOR ENGINE SERVICE .....	1-9
FOR CHASSIS SERVICE .....	1-11
FOR ELECTRICAL COMPONENTS .....	1-11

## CHAPTER 2.

### SPECIFICATIONS

<b>GENERAL SPECIFICATIONS</b> .....	2-1
<b>MAINTENANCE SPECIFICATIONS</b> .....	2-4
ENGINE .....	2-4
CHASSIS .....	2-10
ELECTRICAL .....	2-13
<b>GENERAL TORQUE SPECIFICATIONS</b> .....	2-16
<b>DEFINITION OF UNITS</b> .....	2-16
<b>LUBRICATION POINTS AND LUBRICANT TYPE</b> .....	2-17
ENGINE .....	2-17
CHASSIS .....	2-18
<b>LUBRICATION DIAGRAM</b> .....	2-55
<b>COOLANT FLOW CHART</b> .....	2-57
<b>CABLE ROUTING</b> .....	2-59

## CHAPTER 3. PERIODIC INSPECTION AND ADJUSTMENT

INTRODUCTION .....	3-1
PERIODIC MAINTENANCE/LUBRICATION INTERVALS .....	3-1
<b>COWLINGS</b> .....	3-7
REMOVAL .....	3-7
INSTALLATION .....	3-9
<b>SIDE COVERS</b> .....	3-11
REMOVAL .....	3-11
INSTALLATION .....	3-13
<b>ENGINE</b> .....	3-13
Y.P.V.S. CABLE ADJUSTMENT .....	3-13
CARBURETOR SYNCHRONIZATION .....	3-17
IDLE SPEED ADJUSTMENT .....	3-23
THROTTLE CABLE FREE PLAY ADJUSTMENT .....	3-25
AUTOLUBE PUMP CABLE ADJUSTMENT .....	3-27
AUTOLUBE PUMP STROKE ADJUSTMENT .....	3-29
AUTOLUBE PUMP AIR BLEEDING .....	3-31
SPARK PLUG INSPECTION .....	3-35
IGNITION TIMING CHECK .....	3-37
ENGINE OIL LEVEL CHECK .....	3-41
TRANSMISSION OIL LEVEL INSPECTION .....	3-45
TRANSMISSION OIL REPLACEMENT .....	3-45
CLUTCH ADJUSTMENT .....	3-49
AIR FILTER CLEANING .....	3-51
CARBURETOR JOINT INSPECTION .....	3-55
FUEL LINE INSPECTION .....	3-59
EXHAUST SYSTEM INSPECTION .....	3-61
COOLANT LEVEL INSPECTION .....	3-63
COOLANT REPLACEMENT .....	3-67
COOLING SYSTEM INSPECTION .....	3-75
<b>CHASSIS</b> .....	3-79
FRONT BRAKE ADJUSTMENT .....	3-79
REAR BRAKE ADJUSTMENT .....	3-79
BRAKE FLUID INSPECTION .....	3-81
BRAKE PAD INSPECTION .....	3-83
BRAKE LIGHT SWITCH ADJUSTMENT .....	3-83
DRIVE CHAIN SLACK ADJUSTMENT .....	3-85
DRIVE CHAIN LUBRICATION .....	3-89
STEERING HEAD ADJUSTMENT .....	3-89
FRONT FORK OIL REPLACEMENT .....	3-95
FRONT FORK ADJUSTMENT .....	3-99
REAR SHOCK ABSORBER ADJUSTMENT .....	3-101



**GEN  
INFO 1**



**SPEC 2**



**INSP  
ADJ 3**



**ENG 4**



**COOL 5**



**CARB 6**



**CHAS 7**



**ELEC 8**

**?**

**TRBL  
SHTG 9**

RECOMMENDED COMBINATIONS OF FRONT FORK AND REAR	
SHOCK ABSORBER SETTINGS .....	3-103
TIRE INSPECTION .....	3-105
WHEEL INSPECTION .....	3-107
CABLE INSPECTION AND LUBRICATION .....	3-109
LEVER AND PEDAL LUBRICATION .....	3-109
SIDESTAND LUBRICATION .....	3-109
SWINGARM AND RELAY ARM LUBRICATION .....	3-109

<b>ELECTRICAL</b> .....	3-111
BATTERY INSPECTION .....	3-111
FUSE INSPECTION .....	3-115
HEADLIGHT BEAM ADJUSTMENT .....	3-119
HEADLIGHT BULB REPLACEMENT .....	3-119

## CHAPTER 4. ENGINE OVERHAUL

<b>ENGINE REMOVAL</b> .....	4-1
COWLINGS .....	4-1
TRANSMISSION OIL .....	4-1
COOLANT .....	4-1
MUFFLER ASSEMBLY .....	4-3
SEAT .....	4-3
FUEL TANK .....	4-3
CARBURETOR .....	4-5
AUTOLUBE PUMP CABLE AND HOSE .....	4-5
CLUTCH CABLE .....	4-7
Y.P.V.S. CABLES .....	4-9
RADIATOR .....	4-9
LEADS .....	4-11
DRIVE CHAIN .....	4-11
ENGINE REMOVAL .....	4-13
<b>ENGINE DISASSEMBLY</b> .....	4-15
CYLINDER HEAD, CYLINDERS AND PISTONS .....	4-15
CLUTCH AND PRIMARY DRIVE GEAR .....	4-19
KICK AXLE AND KICK IDLE GEAR .....	4-23
SHIFT SHAFT .....	4-25
C.D.I. MAGNETO .....	4-27
CRANKCASE (UPPER) .....	4-29
TRANSMISSION, SHIFTER AND CRANKSHAFT .....	4-31
POWER VALVES .....	4-33
OIL PUMP AND STRAINER .....	4-35
<b>INSPECTION AND REPAIR</b> .....	4-37
CYLINDER HEAD .....	4-37
CYLINDER AND PISTON .....	4-39
PISTON RINGS .....	4-43
PISTON PIN AND BEARING .....	4-45

CLUTCH .....	4-47
PRIMARY DRIVE .....	4-51
TRANSMISSION AND SHIFTER .....	4-51
KICK STARTER .....	4-55
SHIFT SHAFT .....	4-55
OIL PUMP .....	4-55
AUTOLUBE PUMP .....	4-57
CRANKSHAFT .....	4-57
CRANKCASE .....	4-59
OIL PIPE AND STRAINER .....	4-61
POWER VALVE .....	4-61
<b>ENGINE ASSEMBLY AND ADJUSTMENT .....</b>	<b>4-63</b>
OIL PUMP AND STRAINER .....	4-63
POWER VALVES .....	4-67
TRANSMISSION, SHIFTER AND CRANKSHAFT .....	4-71
CRANKCASE (UPPER) .....	4-83
C.D.I. MAGNETO .....	4-85
SHIFT SHAFT .....	4-91
KICK AXLE AND KICK IDLE GEAR .....	4-95
CLUTCH AND PRIMARY DRIVE GEAR .....	4-99
CYLINDER HEAD, CYLINDERS AND PISTONS .....	4-107
REMOUNTING ENGINE .....	4-115

## CHAPTER 5. COOLING SYSTEM

<b>WATER PUMP .....</b>	<b>5-1</b>
REMOVAL .....	5-3
INSPECTION .....	5-7
INSTALLATION .....	5-9
<b>THERMOSTATIC VALVE AND RADIATOR .....</b>	<b>5-13</b>
REMOVAL .....	5-15
INSPECTION .....	5-19
INSTALLATION .....	5-23

## CHAPTER 6. CARBURETION

<b>CARBURETOR .....</b>	<b>6-1</b>
SECTION VIEW .....	6-3
REMOVAL .....	6-5
DISASSEMBLY .....	6-9
INSPECTION .....	6-11
ASSEMBLY .....	6-15
INSTALLATION .....	6-19
FUEL LEVEL ADJUSTMENT .....	6-21



**GEN INFO 1**



**SPEC 2**



**INSP ADJ 3**



**ENG 4**



**COOL 5**



**CARB 6**



**CHAS 7**



**ELEC 8**

**?**

**TRBL SHTG 9**

<b>REED VALVE</b> .....	6-23
REMOVAL .....	6-25
DISASSEMBLY .....	6-25
INSPECTION .....	6-25
ASSEMBLY .....	6-27
INSTALLATION .....	6-29

## CHAPTER 7. CHASSIS

<b>FRONT WHEEL</b> .....	7-1
REMOVAL .....	7-3
INSPECTION .....	7-5
INSTALLATION .....	7-7
<b>REAR WHEEL</b> .....	7-11
REMOVAL .....	7-13
INSPECTION .....	7-15
INSTALLATION .....	7-15
<b>FRONT AND REAR BRAKE</b> .....	7-19
BRAKE PAD REPLACEMENT .....	7-23
CALIPER DISASSEMBLY .....	7-31
MASTER CYLINDER DISASSEMBLY .....	7-35
INSPECTION AND REPAIR .....	7-41
ASSEMBLY .....	7-43
AIR BLEEDING .....	7-55
<b>FRONT FORK</b> .....	7-59
REMOVAL .....	7-61
DISASSEMBLY .....	7-63
INSPECTION .....	7-67
ASSEMBLY .....	7-69
INSTALLATION .....	7-73
<b>STEERING HEAD AND HANDLEBARS</b> .....	7-77
REMOVAL .....	7-79
INSPECTION .....	7-85
INSTALLATION .....	7-87
<b>REAR SHOCK ABSORBER AND SWINGARM</b> .....	7-97
HANDLING NOTES .....	7-99
NOTES ON DISPOSAL .....	7-99
REMOVAL .....	7-101
INSPECTION .....	7-107
INSTALLATION .....	7-109

<b>DRIVE CHAIN AND SPROCKETS</b> .....	7-115
REMOVAL .....	7-115
INSPECTION .....	7-117
INSTALLATION .....	7-121
<b>METER ASSEMBLY</b> .....	7-125
REMOVAL .....	7-127
INSTALLATION .....	7-129

## CHAPTER 8. ELECTRICAL

<b>TZR250 CIRCUIT DIAGRAM</b> .....	8-1
COLOR CODE .....	8-2
<b>ELECTRICAL COMPONENTS</b> .....	8-7
<b>IGNITION AND STARTING SYSTEM</b> .....	8-11
CIRCUIT DIAGRAM .....	8-11
IGNITION CONTROL CIRCUIT OPERATION .....	8-15
TROUBLESHOOTING (1) .....	8-17
TROUBLESHOOTING (2) .....	8-31
<b>CHARGING SYSTEM</b> .....	8-37
CIRCUIT DIAGRAM .....	8-37
TROUBLESHOOTING .....	8-41
<b>LIGHTING SYSTEM</b> .....	8-47
CIRCUIT DIAGRAM .....	8-47
TROUBLESHOOTING .....	8-51
LIGHTING SYSTEM TESTS AND CHECKS .....	8-59
<b>SIGNAL SYSTEM</b> .....	8-69
CIRCUIT DIAGRAM .....	8-69
TROUBLESHOOTING .....	8-73
SIGNAL SYSTEM TESTS AND CHECKS .....	8-81
REED SWITCH TEST .....	8-91
<b>DISPLAY SYSTEM</b> .....	8-93
CIRCUIT DIAGRAM .....	8-93
TROUBLESHOOTING .....	8-97
DISPLAY SYSTEM TESTS AND CHECKS .....	8-103
OIL LEVEL GAUGE OPERATION CHECK .....	8-113
<b>COOLING SYSTEM</b> .....	8-115
CIRCUIT DIAGRAM .....	8-115
TROUBLESHOOTING .....	8-119
<b>YAMAHA POWER VALVE SYSTEM</b> .....	8-127
CIRCUIT DIAGRAM .....	8-127
TROUBLESHOOTING .....	8-131



**GEN INFO 1**



**SPEC 2**



**INSP ADJ 3**



**ENG 4**



**COOL 5**



**CARB 6**



**CHAS 7**



**ELEC 8**



**TRBL SHTG 9**

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## CHAPTER 9. TROUBLESHOOTING

<b>STARTING FAILURE/HARD STARTING</b> .....	9-1
FUEL SYSTEM .....	9-1
ELECTRICAL SYSTEM .....	9-2
COMPRESSION SYSTEM .....	9-3
<b>POOR IDLE SPEED PERFORMANCE</b> .....	9-3
POOR IDLE SPEED PERFORMANCE .....	9-3
<b>POOR MEDIUM AND HIGH SPEED PERFORMANCE</b> .....	9-4
FUEL SYSTEM .....	9-4
ELECTRICAL SYSTEM .....	9-4
COMPRESSION SYSTEM .....	9-5
Y.P.V.S. ....	9-5
<b>FAULTY GEAR SHIFTING</b> .....	9-6
HARD SHIFTING .....	9-6
CHANGE PEDAL DOES NOT MOVE .....	9-6
JUMP-OUT GEAR .....	9-6
<b>CLUTCH SLIPPING/Dragging</b> .....	9-7
CLUTCH SLIPPING .....	9-7
CLUTCH DRAGGING .....	9-7
<b>IMPROPER KICKING</b> .....	9-8
SLIPPING .....	9-8
HARD KICKING .....	9-8
KICK CRANK NOT RETURNING .....	9-8
<b>FAULTY BRAKE</b> .....	9-9
POOR BRAKING EFFECT .....	9-9
<b>FRONT FORK OIL LEAKAGE AND FRONT FORK MALFUNCTION</b> ..	9-9
OIL LEAKAGE .....	9-9
MALFUNCTION .....	9-9
<b>INSTABLE HANDLING</b> .....	9-10
INSTABLE HANDLING .....	9-10
<b>FAULTY SIGNAL AND LIGHTING SYSTEM</b> .....	9-11
HEADLIGHT DARK .....	9-11
BULB BURNT OUT .....	9-11
FLASHER DOES NOT LIGHT .....	9-11
FLASHER KEEPS ON .....	9-11
FLASHER WINKS SLOWER .....	9-12
FLASHER WINKS QUICKER .....	9-12
HORN IS INOPERATIVE .....	9-12

FAULTY Y.P.V.S.....	9-12
FAULTY Y.P.V.S.....	9-12

OVERHEATING OR OVER-COOLING .....	9-13
OVERHEATING .....	9-13
OVER-COOLING .....	9-13

**TZR250 WIRING DIAGRAM**



**GEN INFO 1**



**SPEC 2**



**INSP ADJ 3**



**ENG 4**



**COOL 5**



**CARB 6**



**CHAS 7**



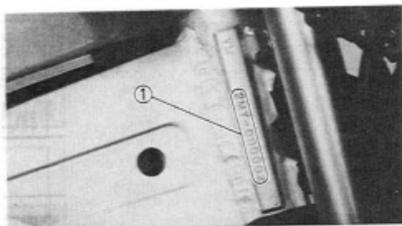
**ELEC 8**



**TRBL SHTG 9**



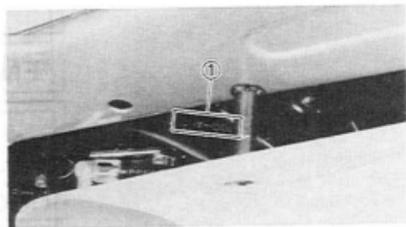
## GENERAL INFORMATION

**MOTORCYCLE IDENTIFICATION  
FRAME SERIAL NUMBER**

The frame serial number ① is stamped into the right side of the steering head pipe.

**Starting Serial Number:**

TZR250 .....2MA-000101

**ENGINE SERIAL NUMBER**

The engine serial number ① is stamped into the elevated part of the right rear section of the engine.

**Starting Serial Number:**

TZR250 .....2MA-000101

**NOTE:**

- The first three digits of these numbers are for model identifications; the remaining digits are the unit production number.
- Designs and specifications are subject to change without notice.



IMPORTANT INFORMATION

PREPARATION FOR REMOVAL AND  
DISASSEMBLY

1. Remove all dirt, mud, dust, and foreign material before removing and disassembling.



2. Use proper tools and cleaning equipment. Refer to "SPECIAL TOOL."



3. When disassembling the motorcycle, keep mated parts together. This includes gears, cylinders, pistons, and other mated parts that have been "mated" through normal wear. Mated parts must be reused as an assembly or replaced.



4. During the motorcycle disassembly, clean all parts and place them in trays in the order of disassembly. This will speed up assembly time and help assure that all parts are correctly reinstalled.

5. Keep away from fire.





**ALL REPLACEMENT PARTS**

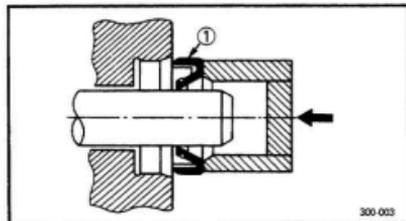
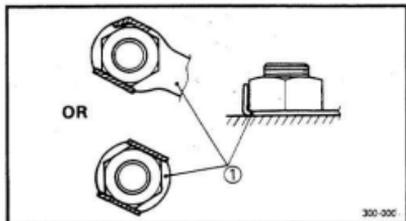
1. Use only genuine Yamaha parts for all replacements. Use oil and/or grease recommended by Yamaha for assembly and adjustment. Other brands may be similar in function and appearance, but inferior in quality.

**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.



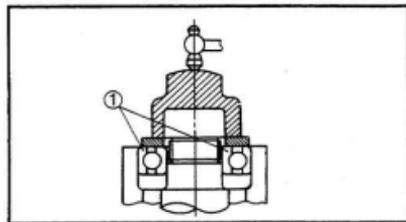
**BEARINGS AND OIL SEALS**

1. Install the bearing(s) and oil seal(s) 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.

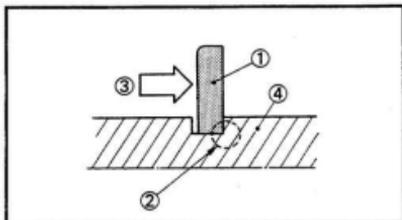
① Oil seal

**CAUTION:**

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



① Bearing

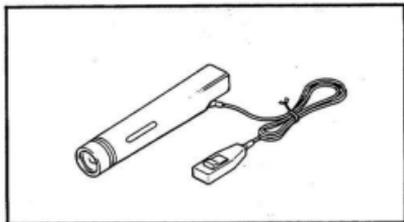
**CIRCLIPS**

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

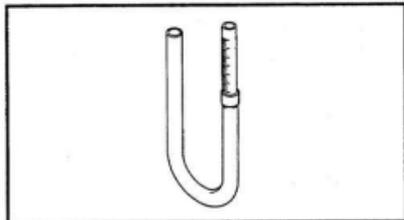
**SPECIAL TOOLS**

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**

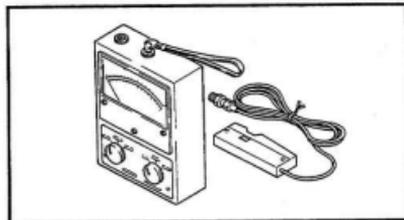
1. Inductive Timing Light  
P/N. 90890-03109

This tool is necessary for adjusting ignition timing.



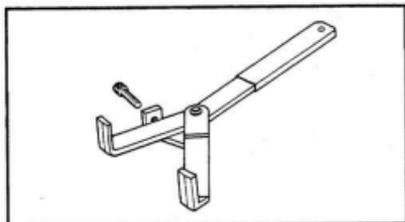
2. Fuel Level Gauge  
P/N. 90890-01312

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



3. Inductive Tachometer  
P/N. 90890-03113

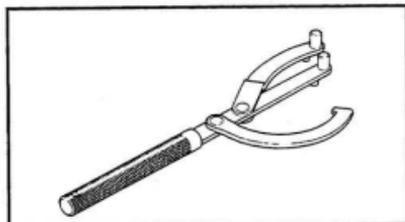
This tool is needed for detecting engine rpm.



## FOR ENGINE SERVICE

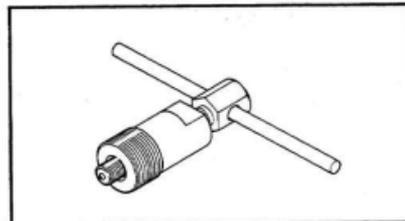
1. Universal Clutch Holder  
P/N. 90890-04086

This tool is used to hold the clutch when loosening or tightening the clutch boss locknut.



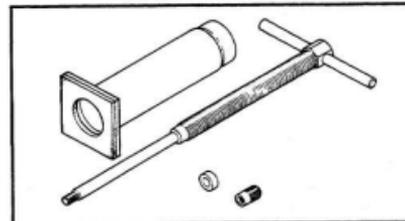
2. Universal Rotor Holder  
P/N. 90890-01235

This tool is used when loosening or tightening the flywheel magneto securing bolt.



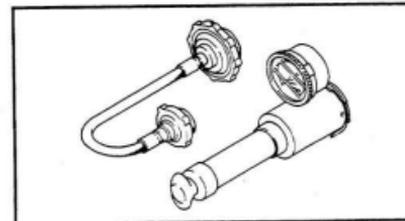
3. Flywheel Puller  
P/N. 90890-01189

This tool is used for removing the flywheel.



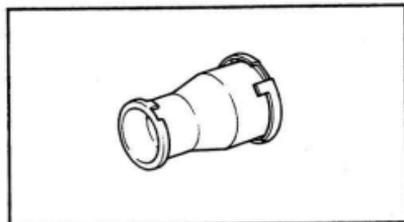
4. Piston Pin Puller  
P/N. 90890-01304

This tool is used to remove the piston pin.



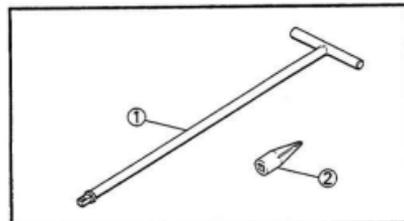
5. Cooling System Tester  
P/N. 90890-01325

This tester is needed for checking the cooling system.



6. Adapter  
P/N. 90890-01352

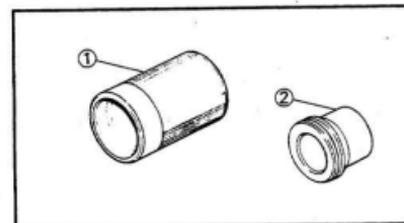
This tool is used for checking the radiator cap.



#### FOR CHASSIS SERVICE

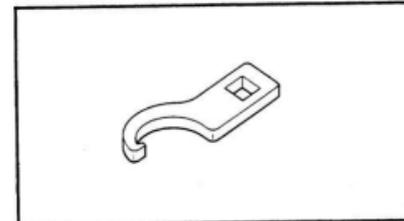
1. T-Handle ..... ①  
P/N. 90890-01326  
Front Fork Cylinder Holder..... ②  
P/N. 90890-01294

This tool is used to loosen and tighten the front fork cylinder holding bolt.



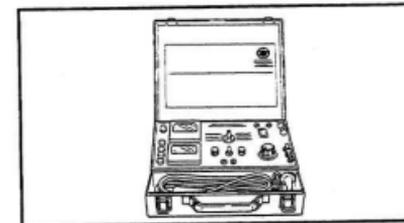
2. Front Fork Seal Driver (Weight) ..... ①  
P/N. 90890-01367  
Adapter ..... ②  
P/N. 90890-01398

These tools are used when installing the fork seal.



3. Ring Nut Wrench  
P/N. 90890-01403

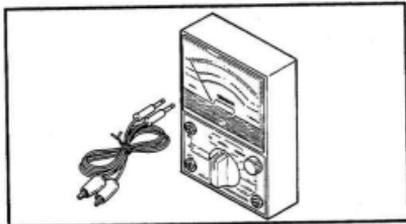
This tool is used to loosen and tighten the steering ring nut.



#### FOR ELECTRICAL COMPONENTS

1. Electro Tester  
P/N. 90890-03021

This tester is necessary for checking the ignition system components.



2. Pocket Tester  
P/N. 90890-03112

This tester is invaluable for checking the electrical system.



## SPECIFICATIONS

## GENERAL SPECIFICATIONS

Model	TZR250
Model Code Number:	2MA
Frame Starting Number:	2MA-000101
Engine Starting Number:	2MA-000101
Dimensions:	
Overall Length	2,055 mm (80.9 in) (Except for France) 2,005 mm (78.9 in) (For France)
Overall Width	660 mm (26.0 in)
Overall Height	1,135 mm (44.7 in)
Seat Height	760 mm (29.9 in)
Wheelbase	1,375 mm (54.1 in)
Minimum Ground Clearance	135 mm ( 5.3 in)
Basic Weight:	
With Oil and Full Fuel Tank	144 kg (317 lb)
Minimum Turning Radius:	2,800 mm (110.2 in)
Engine:	
Engine Type	Liquid cooled 2-stroke
Induction System	Reed valve
Cylinder Arrangement	Forward inclined parallel 2-cylinder
Displacement	249 cm <sup>3</sup>
Bore x Stroke	56.4 x 50.0 mm (2.22 x 1.97 in)
Compression Ratio	5.9 : 1
Starting System	Kick starter
Lubrication System:	
Type	Separate lubrication (Yamaha Autolube)
Engine Oil Type	Yamaha Oil 2T or air cooled 2 stroke engine oil
Transmission Oil Type	SAE 10W30 type SE motor oil
Oil Capacity:	
Engine Oil (Oil Tank)	1.4 L (1.23 Imp qt, 1.48 US qt)
Transmission Oil	
Periodic Oil Change	1.0 L (0.9 Imp qt, 1.1 US qt)
Total Amount	1.0 L (0.9 Imp qt, 1.1 US qt)
Coolant Capacity:	
Including All Routes	1.35 L (1.19 Imp qt, 1.43 US qt)
Air Filter:	
Type	Wet element

# GENERAL SPECIFICATIONS

**SPEC**

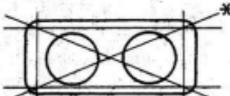
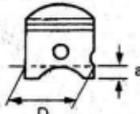
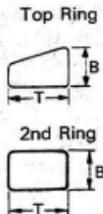

Model	TZR250	
<b>Fuel:</b>		
Type	Premium gasoline	
Fuel Tank Capacity		
Full Amount	16.0 L (3.52 Imp gal, 4.23 US gal)	
Reserve Amount	4.0 L (0.88 Imp gal, 1.06 US gal)	
<b>Carburetor:</b>		
Type/Quantity	TM28SS/2 pcs.	
Manufacturer	MIKUNI	
<b>Spark Plug:</b>		
Type/Quantity	BR9ES/2 pcs.	
Manufacturer	NGK	
Plug Gap	0.7 – 0.8 mm (0.028 – 0.032 in)	
<b>Clutch:</b>		
Type	Wet, multiple disc	
<b>Transmission:</b>		
Type	Constant mesh 6-speed	
Primary Reduction System	Helical gear	
Primary Reduction Ratio	56/22 (2.545)	
Secondary Reduction System	Chain drive	
Secondary Reduction Ratio	41/14 (2.929)	
Operation	Left foot operation	
Gear Ratio		
1st	32/13 (2.462)	
2nd	28/16 (1.750)	
3rd	25/19 (1.316)	
4th	26/24 (1.083)	
5th	25/26 (0.962)	
6th	23/27 (0.852)	
<b>Chassis:</b>		
Frame Type	Semi double cradle	
Caster Angle	26°	
Trail	96 mm (3.78 in)	
<b>Tire:</b>		
Type	Tubeless	
Size		
Front	100/80 – 17 52H	
Rear	120/80 – 17 61H	
<b>Tire Pressure (Cold tire):</b>	Front	Rear
Up to 90 kg (198 lb) load*	180 kPa (1.8 kg/cm <sup>2</sup> , 26 psi)	200 kPa (2.0 kg/cm <sup>2</sup> , 28 psi)
90 kg (198 lb) ~ Maximum [196 kg (432 lb)] load*	200 kPa (2.0 kg/cm <sup>2</sup> , 28 psi)	230 kPa (2.3 kg/cm <sup>2</sup> , 32 psi)
High speed riding	200 kPa (2.0 kg/cm <sup>2</sup> , 28 psi)	230 kPa (2.3 kg/cm <sup>2</sup> , 32 psi)

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



MAINTENANCE SPECIFICATIONS

ENGINE

Model	TZR250
Cylinder Head: Warpage Limit 	0.03 mm (0.0012 in) *Lines indicate straightedge measurement.
Cylinder: Bore Size Taper Limit Out of Round Limit	56.40~56.42 mm (2.220~2.221 in) 0.05 mm (0.002 in) 0.05 mm (0.002 in)
Piston: Piston Size "D" Measuring Point "a" 	56.39~56.40 mm (2.220 in) 15 mm (0.59 in)  Piston Off-Set Piston-to-Cylinder Clearance < Limit > Over Size 1st Over Size 2nd
Piston Ring: Sectional Sketch 	Top Ring Keystone type B = 1.2 mm (0.047 in) T = 2.2 mm (0.087 in)  2nd Ring Plain type B = 1.2 mm (0.047 in) T = 1.85 mm (0.073 in)  End Gap (Installed) Top Ring 2nd Ring Side Clearance Top Ring 2nd Ring



Model	TZR250
<b>Crankshaft:</b> Crank Width "A" Assembly Width "B" Runout Limit "C" Big End Side Clearance "D" <Limit> Small End Free Play "E" <Limit>	55.95 – 56.00 mm (2.203 – 2.205 in) 167.90 – 168.05 mm (6.610 – 6.616 in) 0.03 mm (0.0012 in) 0.25 – 0.75 mm (0.010 – 0.030 in) < 1.0 mm (0.039 in) > 0.4 – 0.6 mm (0.016 – 0.024 in) < 1.0 mm (0.039 in) >
<p>The diagram shows a side view of the crankshaft assembly. Dimension A is the width of the crank pin. Dimension B is the total width of the crankshaft assembly. Dimension C is the runout limit at the crank pin ends. Dimension D is the side clearance at the big end. Dimension E is the small end free play, indicated by a double-headed arrow.</p>	
<b>Clutch:</b> Friction Plate Thickness Quantity Wear Limit Clutch Plate Thickness Quantity Warpage Limit Clutch Spring Free Length Quantity Minimum Free Length Clutch Release Method	2.9 – 3.1 mm (0.114 – 0.122 in) 7 pcs. 2.8 mm (0.110 in) 1.5 – 1.7 mm (0.059 – 0.067 in) 6 pcs. 0.1 mm (0.004 in) 34.9 mm (1.374 in) 4 pcs. 32.9 mm (1.295 in) Outer pull (Rack and pinion pull)
<b>Transmission:</b> Main Axle Runout Limit Drive Axle Runout Limit	0.08 mm (0.003 in) 0.08 mm (0.003 in)
<b>Shifter:</b> Type Guide Bar Bending Limit	Cam drum and guide bar 0.03 mm (0.0012 in)
<b>Kick Starter:</b> Type	Ratchet type
<b>Air Filter:</b> Oil Grade	Air-Cooled 2 Stroke engine oil or Yamaha oil 2T

# MAINTENANCE SPECIFICATIONS

**SPEC**


Model	TZR250
<b>Carburetor:</b> I.D. Mark Main Jet (M.J.) Air Jet (A.J.) Jet Needle-Position (J.N.) Needle Jet (N.J.) Cutaway (C.A.) Pilot Air Jet (P.A.J.) Pilot Outlet (P.O.) Pilot Jet (P.J.) Bypass 1 (B.P.1) Valve Seat Size (V.S.) Starter Jet (G.S.) Power Jet (PW.J.) Fuel Level (F.L.) Float Height (F.H.) Idling Speed	2MA 00 #230 $\phi 1.5$ 5L19-2/5 Q-2 (#505) 2.5 $\phi 1.4$ $\phi 0.6$ #20 $\phi 1.6$ $\phi 2.8$ #35 #60 1.1-2.1 mm (0.04-0.08 in) 15-17 mm (0.59-0.67 in) 1,150-1,250 r/min
<b>Reed Valve:</b> Valve Thickness Valve Stopper Height Valve Bending Limit	0.4 mm (0.016 in) 9.4 mm (0.370 in) 1.5 mm (0.07 in)
<b>Lubrication System:</b> Autolube Pump Color Code Minimum Stroke Maximum Stroke Minimum Output Maximum Output Pulley Adjusting Mark Oil Pump Type Tip Clearance <Limit> Side Clearance <Limit>	Sky blue 0.15-0.20 mm (0.006-0.008 in) 2.05-2.27 mm (0.080-0.089 in) 0.75-1.00 cm <sup>3</sup> per 200 strokes 10.3-11.4 cm <sup>3</sup> per 200 strokes At full throttle Trochoid type 0.10-0.15 mm (0.004-0.006 in) <0.17 mm (0.007 in)> 0.04-0.09 mm (0.002-0.004 in) <0.12 mm (0.005 in)>
<b>Cooling System:</b> Radiator Core Width Radiator Core Height Radiator Core Thickness Radiator Cap Opening Pressure Reservoir Tank Capacity Water Pump Type	290.6 mm (11.44 in) 180.0 mm (7.09 in) 16.0 mm (0.63 in) 75-105 kPa (0.75-1.05 kg/cm <sup>2</sup> , 10-14 psi) 0.25 L (0.22 Imp qt, 0.26 US qt) Single-suction centrifugal pump
<b>Thermostatic valve:</b> Opening Temperature Full Open Temperature/Lift	63-67°C (146-153°F) 80°C (176°F)/7 mm (0.28 in) or more

# MAINTENANCE SPECIFICATIONS

**SPEC**


Tightening Torque:						
Part to be tightened	Q'ty	Thread size	Tightening torque			Remarks
			Nm	m•kg	ft•lb	
Cylinder head						
Cap nut	4	M8 × 1.25	22	2.2	16	
Flange nut	6	M8 × 1.25	22	2.2	16	
Spark plug	2	M14 × 1.25	20	2.0	14	
Cylinder						
Stud bolt	4	M8 × 1.25	13	1.3	9.4	
Stud bolt	6	M8 × 1.25	13	1.3	9.4	
Flange nut	8	M8 × 1.25	28	2.8	20	
Crankcase						
Stud bolt	4	M8 × 1.25	13	1.3	9.4	
Stud bolt	4	M8 × 1.25	13	1.3	9.4	
Flange bolt	7	M8 × 1.25	24	2.4	17	L: 90 mm (3.5 in)
Flange bolt	1	M8 × 1.25	24	2.4	17	L: 105 mm (4.1 in)
Flange bolt	7	M6 × 1.0	10	1.0	7.2	L: 55 mm (2.2 in)
Flange bolt	1	M6 × 1.0	10	1.0	7.2	L: 40 mm (1.6 in)
Pulley cover (Power valve)						
Hexagon socket head bolt	2	M5 × 0.8	7	0.7	5.1	
Pulley housing (Power valve)						
Hexagon socket head bolt	2	M5 × 0.8	7	0.7	5.1	
Power valve						
Hexagon socket head bolt	2	M5 × 0.8	7	0.7	5.1	
Power valve pulley						
Hexagon bolt with spring washer and plain washer	1	M6 × 1.0	10	1.0	7.2	
Thrust plate (Power valve)						
Hexagon socket head bolt	2	M5 × 0.8	7	0.7	5.1	
Power valve holder						
Hexagon socket head bolt	1	M5 × 0.8	7	0.7	5.1	
Power valve joint						
Hexagon socket head bolt	2	M5 × 0.8	7	0.7	5.1	
Power valve cable adjuster						
Hexagon nut	2	M6 × 1.0	8	0.8	5.8	
Water pump housing cover						
Hexagon socket head bolt	2	M6 × 1.0	10	1.0	7.2	L: 25 mm (1.0 in)
Hexagon socket head bolt	2	M6 × 1.0	10	1.0	7.2	L: 65 mm (2.5 in)
Drain bolt	1	M8 × 1.25	16	1.6	11	
Thermostatic valve cover						
Hexagon socket head bolt	3	M6 × 1.0	10	1.0	7.2	
Radiator						
Flange bolt	2	M6 × 1.0	6	0.6	4.3	
Radiator cover						
Panhead screw with spring washer and plain washer	4	M6 × 1.0	6	0.6	4.3	
Autolube pump						
Panhead screw	2	M5 × 0.8	5	0.5	3.6	

# MAINTENANCE SPECIFICATIONS

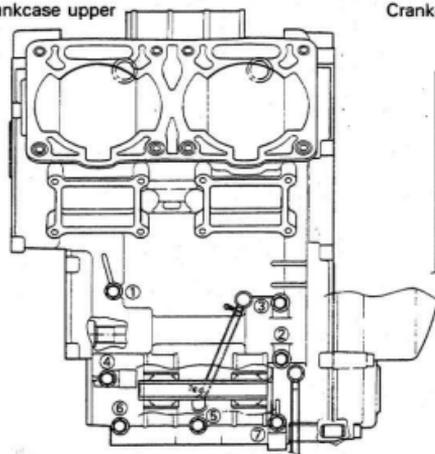
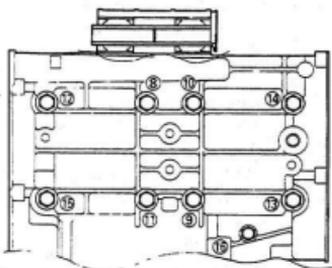
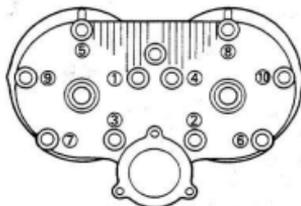
**SPEC**


Part to be tightened	Q'ty	Thread size	Tightening torque			Remarks
			Nm	m.kg	ft.lb	
Oil pump						
Panhead screw	3	M5 × 0.8	5	0.5	3.6	
Delivery pipe (Oil pump)						
Panhead screw	1	M5 × 0.8	5	0.5	3.6	
Strainer cover						
Panhead screw	2	M5 × 0.8	5	0.5	3.6	
Intake manifold						
Hexagon socket head bolt	8	M6 × 1.0	10	1.0	7.2	
Starter lever						
Panhead screw with spring washer	2	M4 × 0.7	2	0.2	1.4	
Muffler						
Flange nut	4	M8 × 1.25	18	1.8	13	
A. C. Generator cover						
Hexagon socket head bolt	4	M6 × 1.0	5	0.5	3.6	
Crankcase cover (Left)						
Hexagon socket head bolt	3	M6 × 1.0	5	0.5	3.6	
Crankcase cover (Right)						
Hexagon socket head bolt	7	M6 × 1.0	10	1.0	7.2	
Flange bolt	1	M10 × 1.0	22	2.2	16	
Drain bolt	1	M8 × 1.25	16	1.6	11	
Autolube pump cover						
Hexagon socket head bolt	2	M6 × 1.0	6	0.6	4.3	
Clutch cable holder						
Hexagon socket head bolt	1	M6 × 1.0	10	1.0	7.2	
Kick crank						
Hexagon bolt	1	M8 × 1.25	25	2.5	18	
Primary drive gear						
Hexagon nut	1	M16 × 1.0	65	6.5	47	
Clutch boss						
Hexagon nut	1	M20 × 1.0	90	9.0	65	
Pressure plate						
Hexagon screw with plain washer	4	M5 × 0.8	7	0.7	5.1	
Pull lever holder						
Panhead screw	1	M6 × 1.0	10	1.0	7.2	
Bearing holder (Main axle)						
Hexagon socket head bolt	2	M6 × 1.0	10	1.0	7.2	
Drive sprocket						
Hexagon nut	1	M20 × 1.0	90	9.0	65	
Stopper plate (Shift cam)						
Flat head screw	2	M6 × 1.0	8	0.8	5.8	
Stopper lever						
Bolt	1	M6 × 1.0	10	1.0	7.2	
Shift lever adjuster						
Hexagon nut	1	M8 × 1.25	30	3.0	22	

# MAINTENANCE SPECIFICATIONS

**SPEC**


Part to be tightened	Q'ty	Thread size	Tightening torque			Remarks
			Nm	m•kg	ft•lb	
Change pedal						
Hexagon socket head bolt	1	M6 × 1.0	10	1.0	7.2	
Shift rod						
Hexagon nut	2	M8 × 1.25	10	1.0	7.2	
Stator coil						
Panhead screw with spring washer	3	M6 × 1.0	7	0.7	5.1	
Pickup coil						
Panhead screw with spring washer and plain washer	2	M5 × 0.8	5	0.5	3.6	
C.D.I. magneto						
Hexagon nut	1	M12 × 1.25	80	8.0	58	
Neutral switch	1	M10 × 1.25	3	0.3	2.2	
Thermo unit	1	PT 1/8	15	1.5	11	

**Tightening sequence:**
**Crankcase upper**

**Crankcase lower**

**Cylinder head**


# MAINTENANCE SPECIFICATIONS

**SPEC**

**CHASSIS**

Model	TZR250
<b>Steering System:</b> Bearing Type Bearing Size (Quantity) Upper Lower	Ball Bearing  1/4 in (19 pcs.) 1/4 in (19 pcs.)
<b>Front Suspension:</b> Front Fork Travel Fork Spring Free Length < Limit > Collar Length Spring Rate (K <sub>1</sub> ) Stroke (K <sub>1</sub> ) Optional Spring Oil Capacity Oil Level  Oil Grade	140 mm (5.51 in) 427.2 mm (16.82 in) < 420.0 mm (16.53 in) > 90.0 mm (3.54 in) 8 N/mm (0.8 kg/mm, 68.8 lb/in) 0.0 – 140.0 mm (0.0 – 5.51 in) No. 444 cm <sup>3</sup> (15.63 Imp oz, 15.01 US oz) 90 mm (3.54 in) From top of inner tube fully compressed without spring. Fork oil 10W or equivalent
<b>Rear Suspension:</b> Shock Absorber Travel Spring Free Length Fitting Length Spring Rate (K <sub>1</sub> ) Stroke (K <sub>1</sub> ) Optional Spring Enclosed Gas Pressure < Minimum – Maximum >	40 mm (1.57 in) 182 mm (7.17 in) 168 mm (6.61 in) 105 N/mm (10.5 kg/mm, 578.3 lb/in) 0.0 – 40.0 mm (0.0 – 1.57 in) No. 1,200 kPa (12.0 kg/cm <sup>2</sup> , 170.6 psi) < 1,100 – 1,300 kPa (11.0 – 13.0 kg/cm <sup>2</sup> , 156.4 – 184.8 psi) >
<b>Swingarm:</b> Free Play Limit (Swingarm end)	1.0 mm (0.039 in) Move swingarm end side to side
<b>Front Wheel:</b> Type Rim Size Rim Material Rim Runout Limit Vertical Lateral	Cast wheel MT2.15 × 17 Aluminum  2.0 mm (0.079 in) 2.0 mm (0.079 in)

# MAINTENANCE SPECIFICATIONS

**SPEC**


Model	TZR250
<b>Rear Wheel:</b> Type Rim Size Rim Material Rim Runout Limit Vertical Lateral	Cast wheel MT2.50 × 17 Aluminum 2.0 mm (0.079 in) 2.0 mm (0.079 in)
<b>Drive Chain:</b> Type/Manufacturer Number of Links Chain Free Play	520 V4/DAIDO 110 Links 30 ~ 40 mm (1.18 ~ 1.57 in)
<b>Front Disc Brake:</b> Type Disc Outside Diameter Disc Thickness Pad Thickness <Wear Limit> Master Cylinder Inside Diameter Caliper Cylinder Inside Diameter Brake Fluid Type	Single 320 mm (12.6 in) 5.0 mm (0.20 in) 7.5 mm (0.29 in) <0.5 mm (0.02 in)> 14.0 mm (0.55 in) 33.96 mm (1.34 in) DOT No.3
<b>Rear Disc Brake:</b> Type Disc Outside Diameter Disc Thickness Pad Thickness <Wear Limit> Master Cylinder Inside Diameter Caliper Cylinder Inside Diameter Brake Fluid Type	Single 210 mm (8.27 in) 5.0 mm (0.20 in) 5.5 mm (0.22 in) <0.5 mm (0.02 in)> 12.7 mm (0.50 in) 38.1 mm (1.50 in) DOT No.3
<b>Brake Lever and Brake Pedal:</b> Brake Lever Free Play  Brake Pedal Position	2 ~ 5 mm (0.08 ~ 0.20 in) At end of brake lever 55 mm (2.16 in) Below top of footrest
<b>Clutch Lever and Throttle Grip:</b> Clutch Lever Free Play  Throttle Cable Free Play	10 ~ 15 mm (0.39 ~ 0.59 in) At end of clutch lever 2 ~ 5 mm (0.08 ~ 0.20 in) At grip flange


**Tightening Torque:**

Part to be tightened	Thread size	Tightening torque			Remarks
		Nm	m•kg	ft•lb	
Engine mount					
Front	M10 × 1.25	55	5.5	40	
Rear	M10 × 1.25	55	5.5	40	
Engine bracket and crankcase (Lower)	M10 × 1.25	55	5.5	40	
Engine bracket and torque rod	M10 × 1.25	45	4.5	32	
Torque rod and torque rod stay	M10 × 1.25	45	4.5	32	
Down tube and frame					
Upper	M8 × 1.25	25	2.5	18	
Lower	M10 × 1.25	45	4.5	32	
Pivot shaft and nut	M14 × 1.5	90	9.0	65	
Swing arm and connecting arm	M10 × 1.25	37	3.7	27	
Connecting arm and relay arm	M12 × 1.25	40	4.0	29	
Relay arm and frame	M10 × 1.25	37	3.7	27	
Rear shock absorber and frame	M10 × 1.25	40	4.0	29	
Steering shaft and nut	M22 × 1.0	110	11.0	80	
Handle crown and inner tube	M8 × 1.25	32	3.2	23	
Under bracket and inner tube	M10 × 1.25	35	3.5	25	
Cap bolt (Front fork)	M35 × 1.0	23	2.3	17	
Inner tube and damper rod	M10 × 1.25	20	2.0	14	
Brake disc and wheel hub	M8 × 1.25	20	2.0	14	
Brake caliper and front fork	M10 × 1.25	35	3.5	25	
Brake hose and brake caliper	M10 × 1.25	26	2.6	19	
Front wheel axle	M12 × 1.25	74	7.4	53	
Rear wheel axle and nut	M14 × 1.5	105	10.5	75	
Driven sprocket and wheel hub	M8 × 1.25	32	3.2	23	
Caliper bracket and swingarm	M10 × 1.25	45	4.5	32	
Brake caliper and caliper bracket	M10 × 1.25	35	3.5	25	
Handlebar and inner tube	M6 × 1.0	13	1.3	9.4	
Frame and footrest bracket	M8 × 1.25	32	3.2	23	
Footrest (For rider) and footrest bracket	M10 × 1.25	55	5.5	40	
Sidestand bracket and frame	M10 × 1.25	55	5.5	40	
Ring nut (Steering shaft)	M25 × 1.0	20	2.0	14	Refer to "NOTE".

**NOTE:**

1. First, tighten the ring nut approximately 40 Nm (4.0 m•kg, 29 ft•lb) by using the torque wrench, then loosen the ring nut one turn.
2. Retighten the ring nut to specification.


**ELECTRICAL**

Model	TZR250
<b>Voltage:</b>	12V
<b>Ignition System:</b> Ignition Timing (B.T.D.C.) Advancer Type	14° at 1,200 r/min Electrical type
<b>C.D.I.:</b> Magneto Model/Manufacturer C.D.I. Unit Model/Manufacturer Pickup Coil Resistance (Color) Source Coil (1) Resistance (Color) Source Coil (2) Resistance (Color)	TVCE38/NIPPON DENSO QAB73/NIPPON DENSO 94 ~ 140Ω at 20°C (68°F) (White/Green—White/Red) 128 ~ 193Ω at 20°C (68°F) (Green—Brown) 3.6 ~ 5.4Ω at 20°C (68°F) (Brown—Red)
<b>Ignition Coil:</b> Model/Manufacturer Minimum Spark Gap Primary Coil Resistance Secondary Coil Resistance	JO136/NIPPON DENSO 6 mm (0.24 in) 0.26 ~ 0.40kΩ at 20°C (68°F) 4.7 ~ 7.0kΩ at 20°C (68°F)
<b>Spark Plug Cap:</b> Type Plug Cap Resistance	Resin Type 10kΩ at 20°C (68°F)

# MAINTENANCE SPECIFICATIONS

**SPEC**


<b>Model</b>	<b>TZR250</b>
<b>Charging System:</b>	A.C. Magneto Generator
<b>A.C. Magneto Generator:</b>	
Model/Manufacturer	VCE38/NIPPON DENSO
Stator Coil Resistance (Color)	0.44 ~ 0.66Ω at 20°C (68°F) (White—White)
Standard Output	14.3 ~ 15.3V at 3,000 r/min
<b>Voltage Regulator:</b>	
Model/Manufacturer	SH569/SHINDENGEN
<b>Rectifier:</b>	
Model/Manufacturer	SH569/SHINDENGEN
Capacity	25A
Withstand Voltage	200V
<b>Battery:</b>	
Specific Gravity	1.280
<b>Horn:</b>	
Type	Plane Type
Quantity	1 pc.
Model/Manufacturer	YF3-12/NIKKO
Maximum Amperage	2.5A

# MAINTENANCE SPECIFICATIONS

**SPEC**

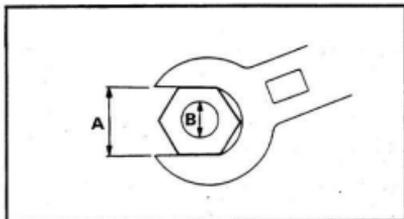

Model	TZR250
Flasher Relay: Type Model/Manufacturer Self Cancelling Device Flasher Frequency Wattage	Condenser Type FU257CD/NIPPON DENSO Yes 75 - 95 cycles/min 27W x 2 + 3.4W
Flasher Cancelling Unit (Except for Germany): Model/Manufacturer	1A0/MATSUSHITA
Ignition Control Unit: Model/Manufacturer	4Y3/YAMAHA
Oil Level Switch: Model/Manufacturer	1KT/TAIHEIYO ASTI
Thermo Unit: Model/Manufacturer	11H/NIPPON SEIKI
Y.P.V.S. Control Unit: Model/Manufacturer	1KT/YAMAHA
Y.P.V.S. Servo Motor: Model/Manufacturer	1KT/YAMAHA
Circuit Breaker: Type	Fuse
Circuit (Fuse): "MAIN" "HEADLIGHT" "SIGNAL" "YPVS"	20A (1 pc.) 15A (1 pc.) 15A (1 pc.) 5A (1 pc.)



## 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 multi-fastener 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
10 mm	6 mm	6	0.6	4.3
12 mm	8 mm	15	1.5	11
14 mm	10 mm	30	3.0	22
17 mm	12 mm	55	5.5	40
19 mm	14 mm	85	8.5	61
22 mm	16 mm	130	13.0	94



A: Distance across flats  
B: Outside thread diameter

## DEFINITION OF UNITS

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



## LUBRICATION POINTS AND LUBRICANT TYPE

## ENGINE

Lubrication Points (Part name)	Lubricant Type
Oil seal lips (All)	
O-rings (All)	
Bearing retainer Crankshaft bearings (Left and center) Needle bearings (Connecting rod) Main axle bearings Drive axle bearings Shift cam bearings Pull rod bearing	     
Crank pins	
Piston rings, piston pins and pistons	
Power valve holders	
Impeller shaft (Water pump)	
Warm shaft (Autolube pump)	
Pump shaft (Oil pump)	
Kick idle gear	
Kick axle	
Primary driven gear (Clutch housing)	
Pull rod	
Pull lever axle	
Sliding gear (Transmission)	
Free movement gear (Transmission)	
Collar (Drive axle)	
Guide bar (Shift forks)	
Link ball (Change pedal)	
Pivoting points (Change pedal)	
Crankcase mating surfaces	Yamaha Bond No. 4

# LUBRICATION POINTS AND LUBRICANT TYPE

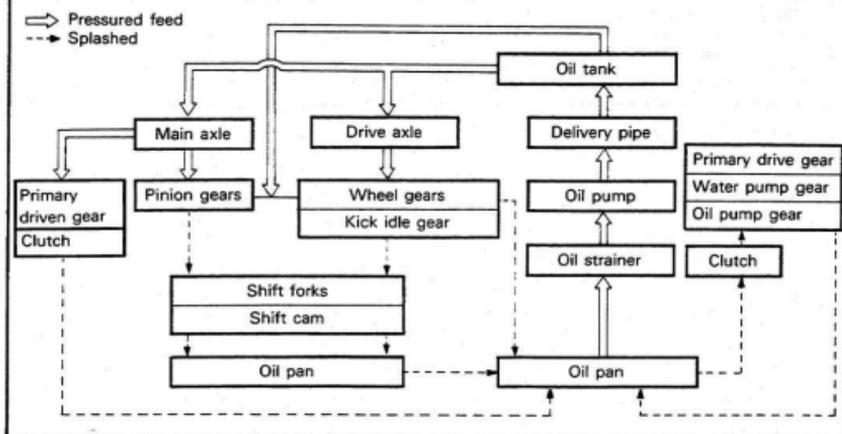
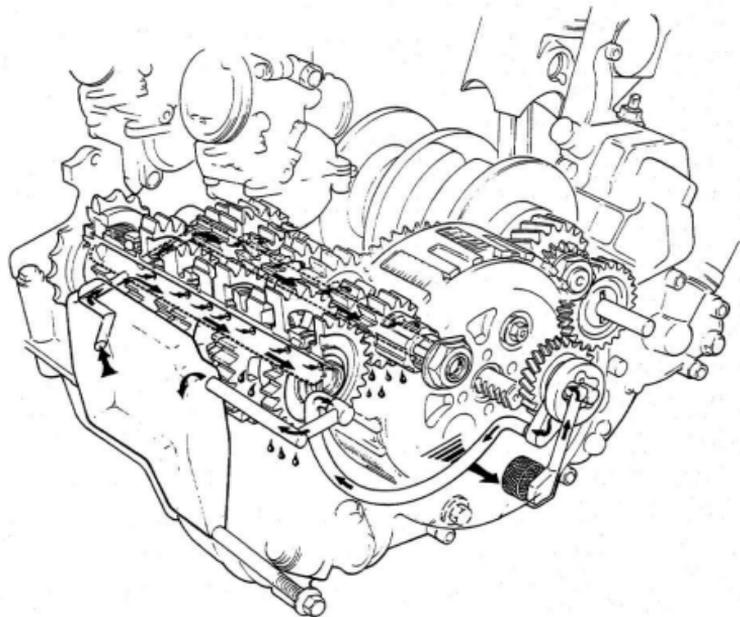
**SPEC**

**CHASSIS**

Lubrication Points (Part name)	Lubricant Type
Ball bearings (Steering shaft)	<del>SES</del>
Oil seal lips (Front wheel and rear wheel)	<del>SES</del>
Pivoting point (Brake pedal)	<del>SES</del>
Pivoting point (Sidestand)	<del>SES</del>
Right handlebar end	<del>SES</del>
Throttle cable end (Throttle grip)	<del>SES</del>
Pivoting point (Clutch lever)	<del>SES</del>
Clutch cable end (Clutch lever)	<del>SES</del>
Pivoting point (Brake lever)	<del>SES</del>
Bushes (Rear shock absorber)	<del>SES</del>
Oil seal lips (Rear shock absorber)	<del>SES</del>
Pivot shaft (Swingarm)	<del>SES</del>
Oil seal lips (Swingarm)	<del>SES</del>
Bearing (Swingarm)	<del>SES</del>
Bushes (Relay arm)	<del>SES</del>
Collars (Relay arm)	<del>SES</del>
Oil seal lips (Connecting arm)	<del>SES</del>
Bearing (Connecting arm)	<del>SES</del>
Collars (Connecting arm)	<del>SES</del>
Front wheel axle	<del>SES</del>
Rear wheel axle	<del>SES</del>
Collar (Front wheel)	<del>SES</del>
Speedometer gear unit	<del>SES</del>

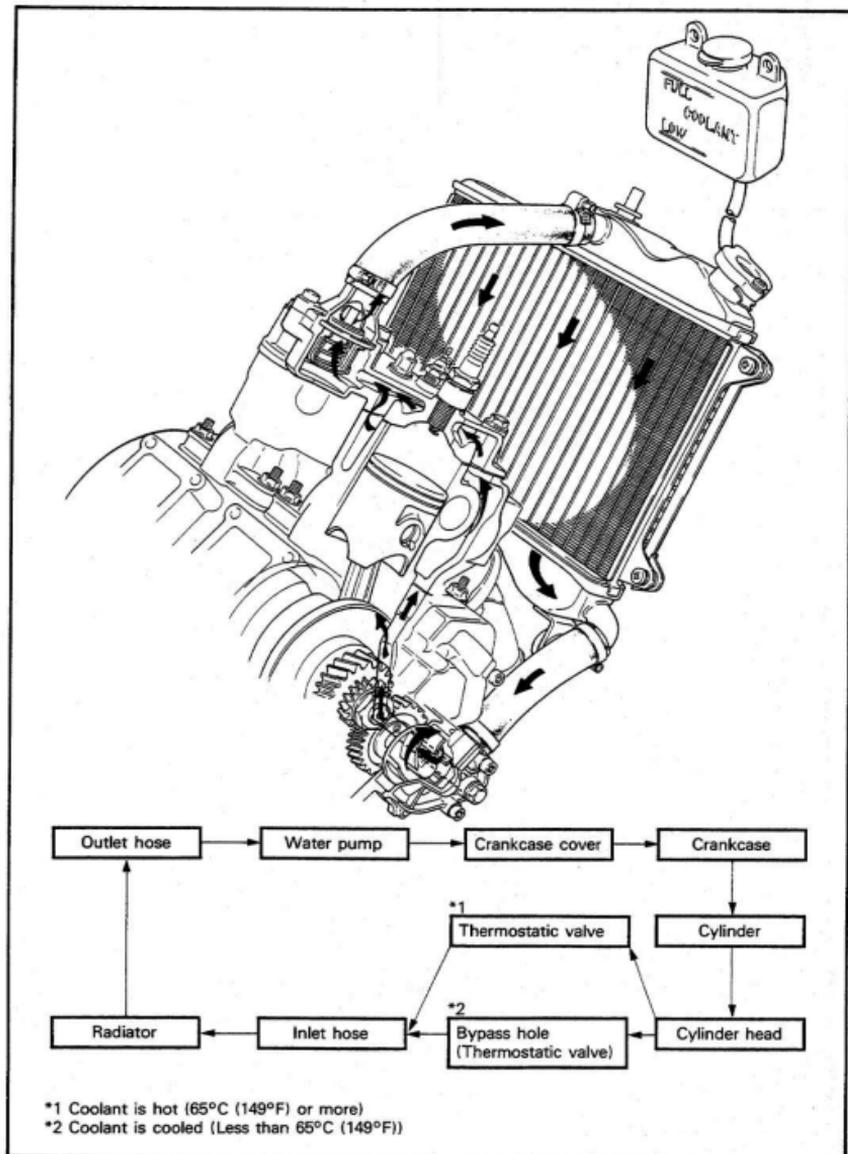


## LUBRICATION DIAGRAM



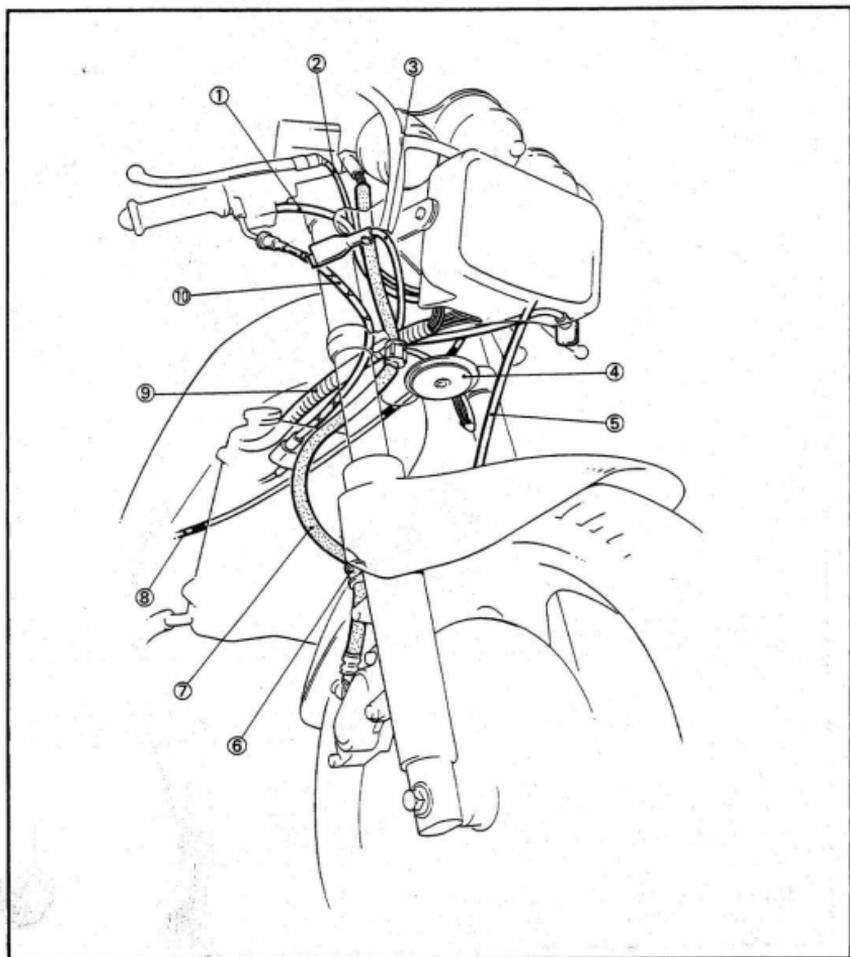


## COOLANT FLOW CHART



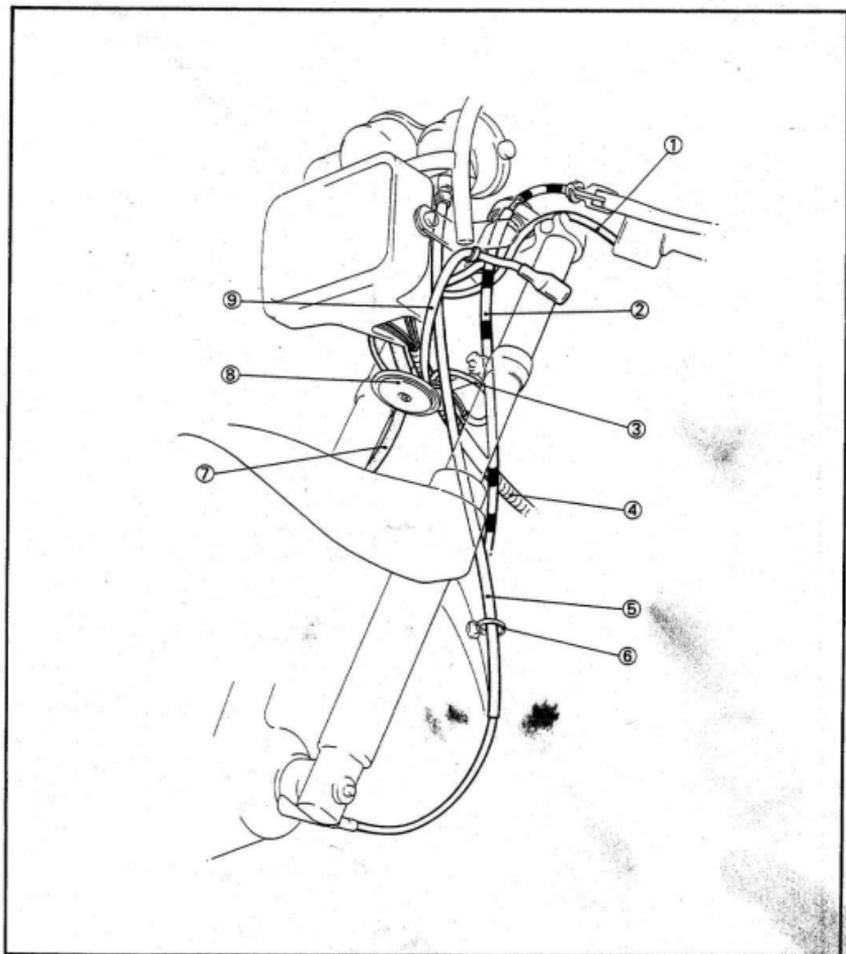
**CABLE ROUTING**

- ① Handlebar switch lead (Right)
- ② Front brake switch lead
- ③ Front flasher light lead (Right)
- ④ Horn
- ⑤ Speedometer cable
- ⑥ Clamp
- ⑦ Brake hose
- ⑧ Clutch cable
- ⑨ Wire harness
- ⑩ Throttle cable



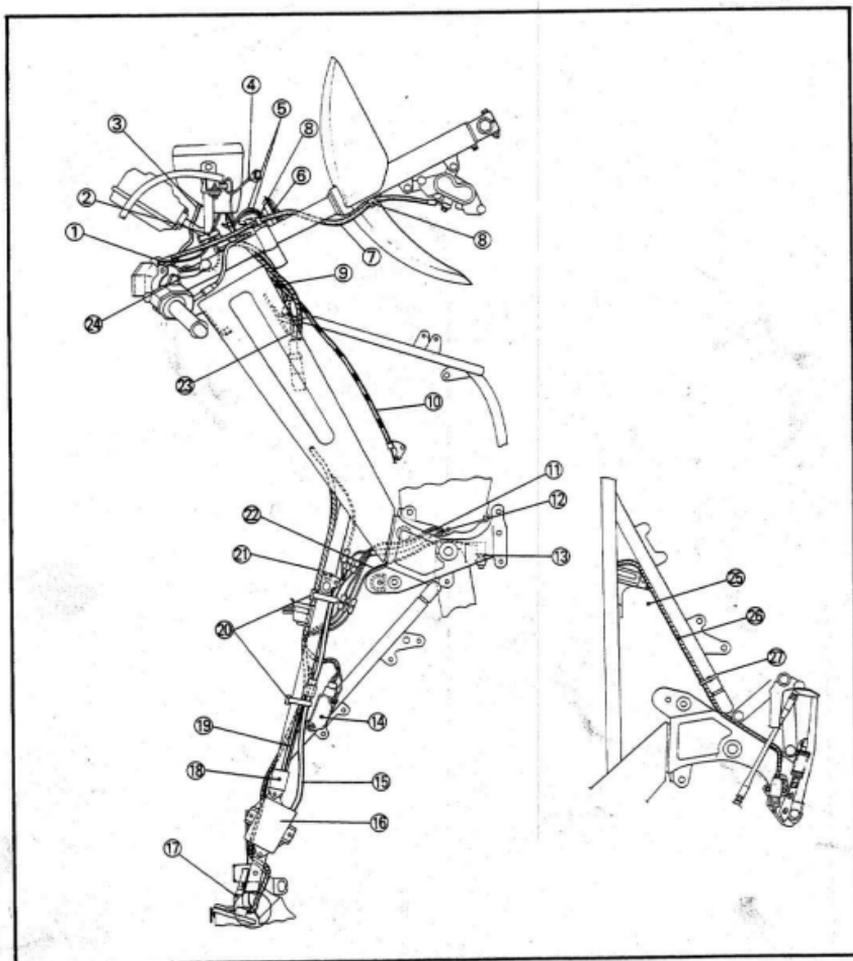


- ① Handlebar switch lead (Left)
- ② Clutch cable
- ③ Horn lead
- ④ Wire harness
- ⑤ Speedometer cable
- ⑥ Clamp
- ⑦ Brake hose
- ⑧ Horn
- ⑨ Front flasher light lead (Left)





- |                                    |                         |                                 |
|------------------------------------|-------------------------|---------------------------------|
| ① Front brake switch lead          | ⑩ Clutch cable          | ⑲ Sidestand switch lead         |
| ② Band                             | ⑪ Pickup coil lead      | ⑳ Band                          |
| ③ Main switch lead                 | ⑫ Stator coil lead      | ㉑ Wire harness                  |
| ④ Front flasher light lead (Right) | ⑬ Rear brake switch     | ㉒ Rear brake switch lead        |
| ⑤ Horn lead                        | ⑭ Rectifier/Regulator   | ㉓ Throttle cable                |
| ⑥ Horn                             | ⑮ C.D.I. unit lead      | ㉔ Handlebar switch lead (Right) |
| ⑦ Brake hose                       | ⑯ C.D.I. unit           | ㉕ Oil tank                      |
| ⑧ Clamp                            | ⑰ Fender stay 1         | ㉖ Sidestand switch lead         |
| ⑨ Wire harness                     | ⑱ Ignition control unit | ㉗ Band                          |



# CABLE ROUTING

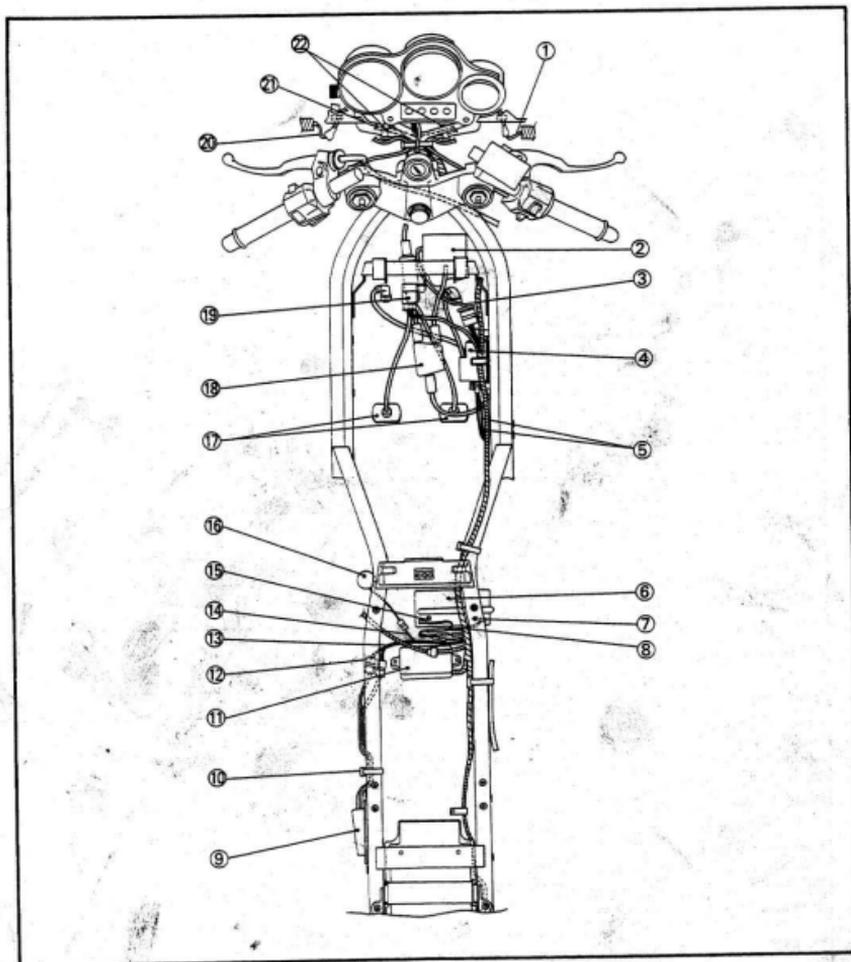
SPEC



- ① Front flasher light lead (Right)
- ② Servomotor
- ③ Servomotor lead
- ④ Ignition coil
- ⑤ Ignition coil lead
- ⑥ Battery
- ⑦ Battery ⊕ terminal

- ⑧ Battery ⊕ lead
- ⑨ Control unit
- ⑩ Band
- ⑪ Fuse box
- ⑫ Sidestand switch lead
- ⑬ Control unit lead
- ⑭ Oil level gauge lead

- ⑮ Battery ⊖ terminal
- ⑯ Oil level gauge
- ⑰ Carburetor
- ⑱ Wire cylinder assembly
- ⑲ Flasher relay
- ⑳ Front flasher light lead (Left)
- ㉑ Main switch lead
- ㉒ Band



PERIODIC INSPECTION AND ADJUSTMENT

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 INTERVALS

Unit: km (mi)

ITEM	REMARKS	BREAK-IN 1,000 (600)	EVERY	
			6,000 (4,000) or 6 months	12,000 (8,000) or 12 months
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 hose for cracks or damage. Replace if necessary.		○	○
Transmission oil	Check oil level/oil leakage. Correct if necessary. Replace every 24,000 (16,000) or 24 months. Warm engine before draining.	REPLACE	○	○
Autolube pump	Check operation. Correct if necessary. Air bleeding.	○	○	○
Y.P.V.S. system	Check operation. Correct if necessary.	○	○	○
Brake	Check operation/fluid leakage/ See NOTE. Correct if necessary.		○	○
Clutch	Check operation. Adjust if necessary.		○	○
Swingarm pivot	Check swingarm assembly for looseness. Correct if necessary. Moderately repack every 24,000 (16,000) or 24 months. Lubricate.**		○	○
Rear suspension link pivots	Check operation. Apply grease lightly every 24,000 (16,000) or 24 months. Lubricate.**			○
Wheels	Check balance/damage/runout. Repair if necessary.		○	○
Wheel bearings	Check bearing assembly for looseness/damage. Replace if damaged.		○	○
Steering bearing	Check bearing 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.		○	○
Cooling system	Check coolant leakage. Repair if necessary. Replace coolant every 24,000 (16,000) or 24 months.		○	○
Drive chain	Check chain slack/alignment. Adjust if necessary. Clean and lube.		EVERY 500 (300)	
Fittings/Fasteners	Check all chassis fittings and fasteners. Correct if necessary.	○	○	○
Sidestand	Check operation. Repair if necessary.	○	○	○
Sidestand switch	Check operation. Repair if necessary.	○	○	○
Battery	Check specific gravity. Check breather pipe for proper operation. Correct if necessary.		○	○

\*\* : Lithium soap base 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 if cracked or damaged.

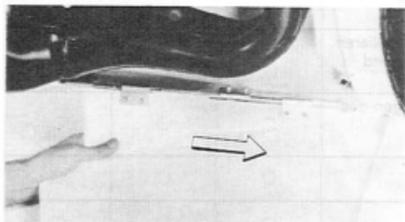
**COWLINGS****REMOVAL**

1. Remove:
  - Lower cowl (Right) ①

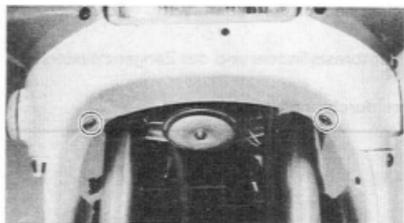
**NOTE:** \_\_\_\_\_

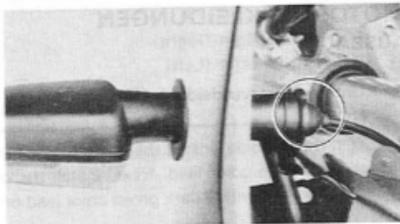
Slide the lower cowl (Right) forward and remove it.

\_\_\_\_\_



2. Remove:
  - Lower cowl (Left)





3. Disconnect:
  - Flasher light leads (Green and black leads)
  - Flasher light leads (Chocolate and black leads)

4. Remove:
  - Flasher light (Right)
  - Flasher light (Left)



5. Remove:
  - Rear view mirrors



6. Remove:
  - Upper cowl

### INSTALLATION

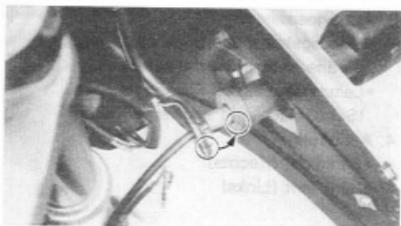
Reverse the "REMOVAL" procedure.  
Note the following points.

1. Install:
  - Upper cowl

	<b>Bolts (Upper Cowl):</b> <b>8 Nm (0.8 m·kg, 5.8 ft·lb)</b>
---	---

2. Install:
  - Rear view mirrors

	<b>Bolt (Rear View Mirror):</b> <b>8 Nm (0.8 m·kg, 5.8 ft·lb)</b> <b>Nut (Rear View Mirror):</b> <b>8 Nm (0.8 m·kg, 5.8 ft·lb)</b>
---	---

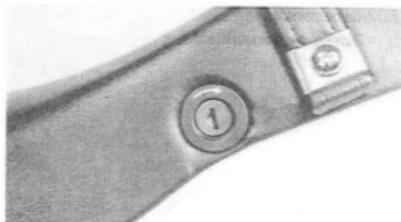


## 3. Install:

- Flasher light (Right)
- Flasher light (Left)

**NOTE:** \_\_\_\_\_

- On the left side, install the flasher light having a chocolate color lead. Next, install the other flasher light with a dark green color lead on the right side.
- Install the flasher light with the notch in its end fitting the convex part of the flasher light stay.
- Connect the flasher light lead and the negative lead to the wire harness. The leads of identical colors should be connected.



## SIDE COVERS

## REMOVAL

1. Remove:
  - Seat

**NOTE:** \_\_\_\_\_

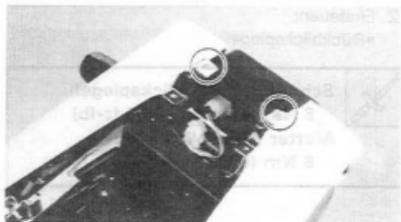
To open the seat lock, insert the key in the lock and turn it clockwise.



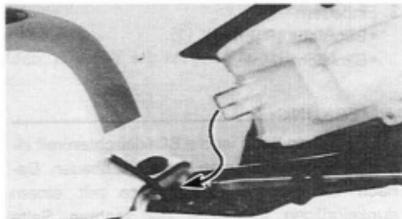
2. Remove:
  - Tail cover

**NOTE:** \_\_\_\_\_

Slide the tail cover backward and remove it.



3. Remove:
  - Side cover (Left)
  - Side cover (Right)



### INSTALLATION

Reverse the "REMOVAL" procedure.  
Note the following points.

1. Install:
  - Seat

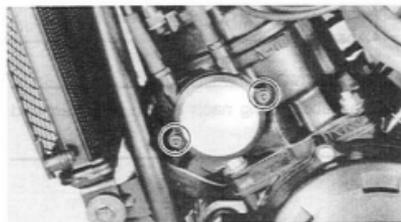
### NOTE:

Insert the lobe on the seat front into the receptacle on the frame, then push down the seat.

## ENGINE

### Y.P.V.S. CABLE ADJUSTMENT

1. Remove:
  - Lower cowl (Right)
  - Lower cowl (Left)Refer to the "COWLINGS" section in the CHAPTER 3.



2. Remove:
  - Pulley cover (Power valve)

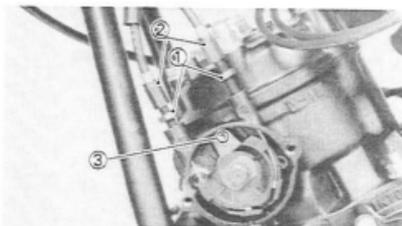
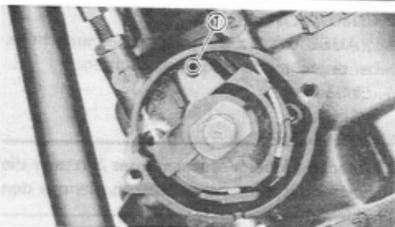
3. Turn on the main switch.

### NOTE:

If does not operate the Y.P.V.S. motor, refer to the "Y.P.V.S. SYSTEM" in the CHAPTER 8.

## Y.P.V.S. CABLE ADJUSTMENT

INSP  
ADJ



#### 4. Check:

- Alignment mark ①
- Not aligned → Adjust the Y.P.V.S. cables.

#### 5. Adjust:

- Y.P.V.S. cables

#### Adjustment steps:

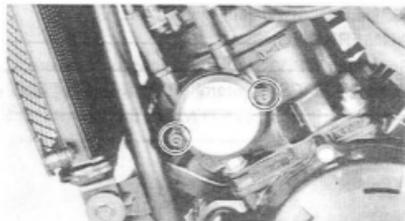
- Loosen both locknuts ① and turn in both adjusters ②.
- Insert a pin ③ [ $\phi 4$  mm ( $\phi 0.16$  in)] through the aligning indent in the pulley and into the hole.
- Turn both adjusters, counterclockwise so that the cable free play becomes Zero mm (Zero in) with fingers.
- Turn both adjusters 1/4 turn clockwise.
- Tighten the locknuts.



#### Locknuts:

**8 Nm (0.8 m·kg, 5.8 ft·lb)**

- Remove the pin.
  - Turn on the main switch and, check that the alignment mark is aligned.
- If not, repeat the above steps.



#### 6. Install:

- Pulley cover (Power valve)



#### Bolts (Pulley Cover):

**7 Nm (0.7 m·kg, 5.1 ft·lb)**

7. Install:

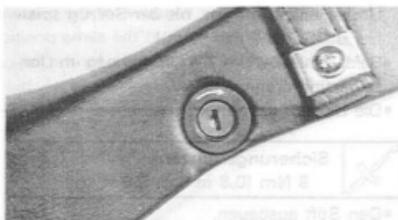
- Lower cowl (Left)
- Lower cowl (Right)

Refer to the "COWLINGS" section in the CHAPTER 3.

## CARBURETOR SYNCHRONIZATION

### NOTE:

Right carburetor and left carburetor must be adjusted to open and close simultaneously.

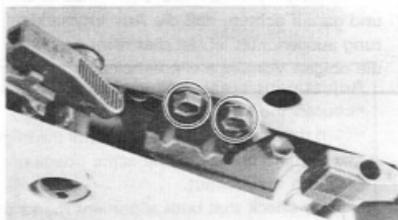


1. Remove:

- Seat

### NOTE:

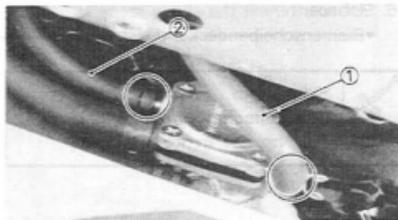
To open the seat lock, insert the key in the lock and turn it clockwise.



2. Turn the fuel cock to "ON" position.

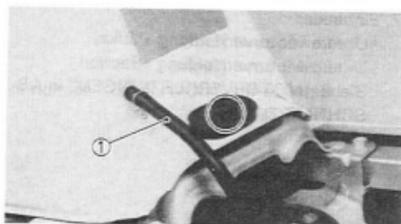
3. Remove:

- Bolts (Fuel cock bracket)

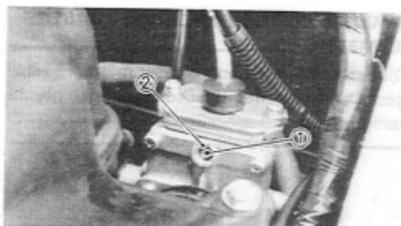


4. Disconnect:

- Fuel delivery hose ①
- Vacuum hose ②



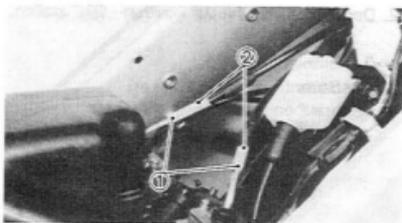
5. Disconnect:
- Fuel breather hose ①



6. Remove:
- Fuel tank
7. Check:
- Alignment mark ① (on the throttle valve)
- Not aligned → Adjust the throttle cable.

### Checking steps:

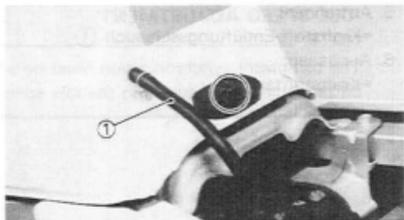
- Turn the throttle grip until the alignment mark appears in the center of the window ② of the right carburetor.
- While keeping the grip at this position, check the left carburetor window for the presence of the alignment mark at the same position.
- If not, adjust the throttle cable for the left carburetor.



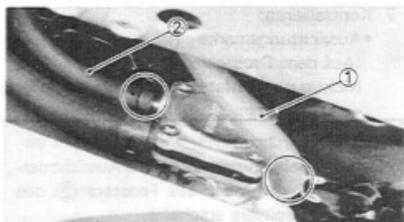
8. Adjust:
- Throttle cables

### Adjustment steps:

- Loosen the locknut ①.
- Turn the adjuster ② in or out until the alignment mark comes to the same position.
- Tighten the locknut.
- Finally check that both alignment marks appear at the same position at the same time.
- If not, repeat the above steps.



9. Install:
- Fuel tank
10. Connect:
- Fuel breather hose ①



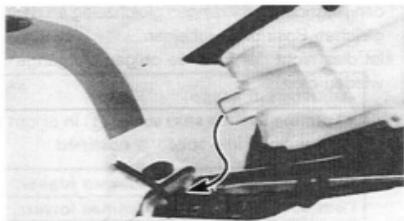
11. Connect:
- Fuel delivery hose ①
  - Vacuum hose ②
12. Install:
- Fuel cock

13. Check:
- Engine idle speed  
Refer to the "IDLE SPEED ADJUSTMENT" section in the CHAPTER 3.

	<b>Engine Idle Speed:</b> 1,150 ~ 1,250 r/min
---	--

14. Check:
- Throttle cable free play  
Refer to the "THROTTLE CABLE FREE PLAY ADJUSTMENT" section in the CHAPTER 3.

	<b>Free Play:</b> 2 ~ 5 mm (0.08 ~ 0.20 in)
--	--



15. Install:
- Seat

**NOTE:** \_\_\_\_\_  
Insert the lobe on the seat front into the receptacle on the frame, then push down the seat.  
\_\_\_\_\_



## IDLE SPEED ADJUSTMENT

### NOTE:

The carburetor synchronization must be adjusted properly before adjusting the idle speed.

- Remove:
  - Lower cowl (Right)
  - Lower cowl (Left)

Refer to the "COWLINGS" section in the CHAPTER 3.
- Start the engine and let it warm up.
- Attach:
  - Inductive tachometer

To the spark plug lead.



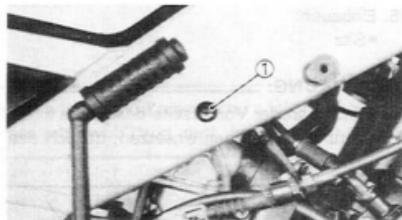
**Inductive Tachometer:**  
90890-03113

- Check:
  - Engine idle speed

Out of specification → Adjust.



**Engine Idle Speed:**  
1,150 – 1,250 r/min



- Adjust:
  - Engine idle speed

### Adjustment steps:

- Turn the throttle stop screw ① in or out until specified idle speed is obtained.

Turn in	Idle speed becomes higher.
Turn out	Idle speed becomes lower.

## THROTTLE CABLE FREE PLAY ADJUSTMENT

INSP  
ADJ



### NOTE:

- Left-hand and right-hand throttle stop screws must be set so that both cylinders are working together.
- After adjusting engine idle speed, throttle cable free play should be adjusted.

### 6. Install:

- Lower cowl (Left)
- Lower cowl (Right)

Refer to the "COWLINGS" section in the CHAPTER 3.



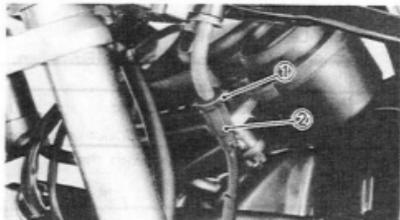
### THROTTLE CABLE FREE PLAY ADJUSTMENT

#### 1. Check:

- Throttle cable free play **a**
- Out of specification → Adjust.



**Throttle Cable Free Play:**  
2~5 mm (0.08~0.20 in)



#### 2. Adjust:

- Throttle cable free play

#### Adjustment steps:

- Loosen the locknut **1**.
- Turn the adjuster **2** in or out until the correct free play is obtained.

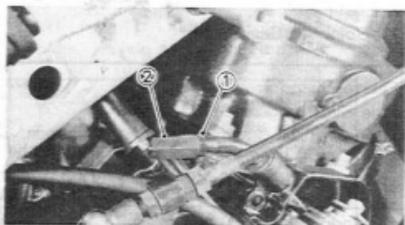
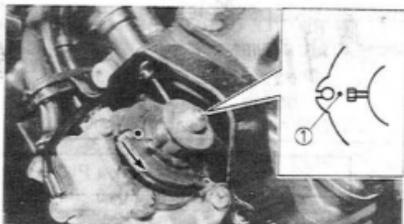
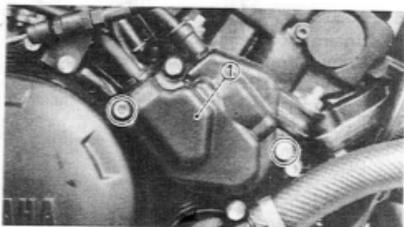
Turn in	Free play is increased.
Turn out	Free play is decreased.

- Tighten the locknut.

## AUTOLUBE PUMP CABLE ADJUSTMENT

### NOTE:

Before adjusting Autolube pump cable, carburetor synchronization and throttle cable free play should be adjusted.



#### 1. Remove:

- Lower cowl (Right)  
Refer to the "COWLINGS" section in the CHAPTER 3.

#### 2. Remove:

- Autolube pump cover ①

#### 3. Fully open the throttle grip and hold it at this position.

#### 4. Check:

- Alignment mark ①  
Not aligned → Adjust Autolube pump cable.

#### 5. Adjust:

- Autolube pump cable

#### Adjustment steps:

- Loosen the locknut ①.
- Turn the adjuster ② in or out until the alignment mark is aligned with the pin.
- Tighten the locknut.

#### 6. Install:

- Autolube pump cover
- Lower cowl (Right)



**Bolts (Autolube Pump Cover):**  
**6 Nm (0.6 m·kg, 4.3 ft·lb)**

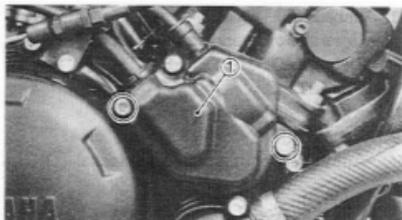


### AUTOLUBE PUMP STROKE ADJUSTMENT

#### 1. Remove:

- Lower cowl (Right)

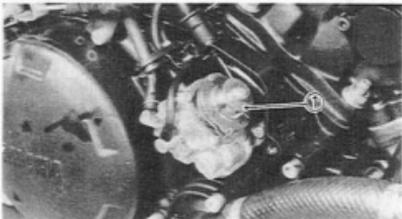
Refer to the "COWLINGS" section in the CHAPTER 3.



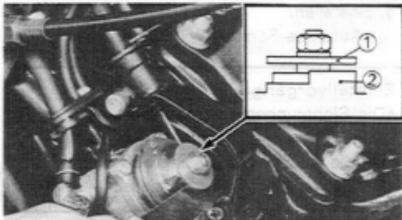
#### 2. Remove:

- Autolube pump cover ①

#### 3. Start the engine and let it warm up.



#### 4. While running the engine at idle, observe the pump adjusting plate carefully. Stop the engine moment that the adjusting plate ① moves out to its limit.



#### 5. Measure:

- Gap

Out of specification → Adjust.

Measure the gap with the thickness gauge between the raised boss ② on the pump adjusting pulley and the adjusting plate ①.



**Minimum Pump Stroke:**

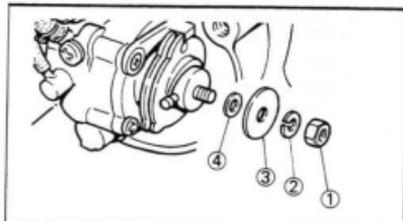
0.15 ~ 0.20 mm (0.006 ~ 0.008 in)

#### NOTE:

When inserting the thickness gauge between the adjusting plate and the adjusting pulley, be careful so that neither the plate nor the pulley is moved. In other words, do not force the thickness gauge into the gap.

## AUTOLUBE PUMP STROKE ADJUSTMENT/ AUTOLUBE PUMP AIR BLEEDING

INSP  
ADJ



### 6. Adjust:

- Autolube pump minimum stroke

#### Adjustment steps:

- Remove the locknut ①, spring washer ② and adjusting plate ③.
- Adjust the pump stroke by adding or removing a shim ④.

Add shim

Pump stroke is increased.

Remove shim

Pump stroke is decreased.

- Install the adjusting plate, spring washer and locknut.



Locknut:

7 Nm (0.7 m•kg, 5.1 ft•lb)

- Recheck the minimum pump stroke. If out of specification, perform the above steps again.

### 7. Install:

- Autolube pump cover
- Lower cowl (Right)



Bolts (Autolube Pump Cover):

6 Nm (0.6•kg, 4.3 ft•lb)

## AUTOLUBE PUMP AIR BLEEDING

### NOTE:

The Autolube pump and delivery lines must be bled on the following occasions:

- Setting up a new motorcycle out of the crate.
- Whenever the oil tank has run dry.
- Whenever any portion of the engine oil system is disconnected.

## SPARK PLUG INSPECTION

INSP  
ADJ



### 5. Install:

- Clip
- Autolube pump cover
- Lower cowl (Right)



**Bolts (Autolube Pump Cover):**  
6 Nm (0.6 m•kg, 4.3 ft•lb)

## SPARK PLUG INSPECTION

### 1. Remove:

- Lower cowl (Right)
- Lower cowl (Left)

Refer to the "COWLINGS" section in the CHAPTER 3.

### 2. Remove:

- Spark plug

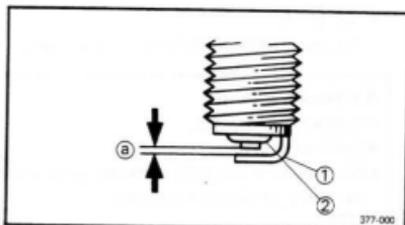
### 3. Inspect:

- Spark plug type  
Incorrect → Replace.

**Standard Spark Plug:**  
**BR9ES (N.G.K.)**

### 4. Inspect:

- Electrode ①  
Wear/Damage → Replace.
- Insulator ②  
Abnormal color → Replace  
Normal color is a medium-to-light tan color.



- ### 5. Clean the spark plug with a spark plug cleaner or wire brush.

**6. Measure:**

- Plug gap ②

Use a Wire Gauge or Feeler Gauge.

Out of specification → Regap.

**Spark Plug Gap:****0.7 – 0.8 mm (0.028 – 0.032 in)****7. Tighten:**

- Spark plug(s)

Before installing a spark plug, clean the gasket and plug surfaces.

**Spark Plug:****20 Nm (2.0 m·kg, 14 ft·lb)****NOTE:**

Finger-tighten the spark plug(s) before torquing to specification.

**8. Install:**

- Lower cowl (Left)
- Lower cowl (Right)

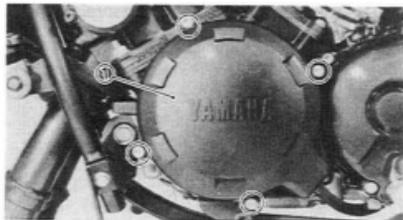
**IGNITION TIMING CHECK****1. Remove:**

- Lower cowl (Right)
- Lower cowl (Left)

Refer to the "COWLINGS" section in the CHAPTER 3.

**2. Remove:**

- A.C. Generator cover ①



## IGNITION TIMING CHECK

**INSP**  
**ADJ**



### 3. Attach:

- Timing Light
  - Inductive Tachometer
- To #1 spark plug lead (Left).



**Timing Light:**

**90890-03109**

**Inductive Tachometer:**

**90890-03113**

### 4. Check:

- Ignition timing

#### Checking steps:

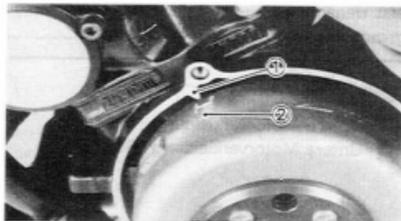
- Warm up the engine and let it at the specified speed.



**Engine Speed:**

**1,200 r/min**

- Visually check the stationary pointer ① to verify it is within the required firing range ② indicated on the flywheel.  
Incorrect firing range → Check timing plate and/or pickup assembly (tightness damage).



### 5. Install:

- A.C. Generator cover
- Lower cowl (Left)
- Lower cowl (Right)



**Bolts (A.C. Generator Cover):**

**5 Nm (0.5 m·kg, 3.6 ft·lb)**



## ENGINE OIL LEVEL CHECK

## 1. Check:

- Oil level

Oil level low → Add sufficient oil.



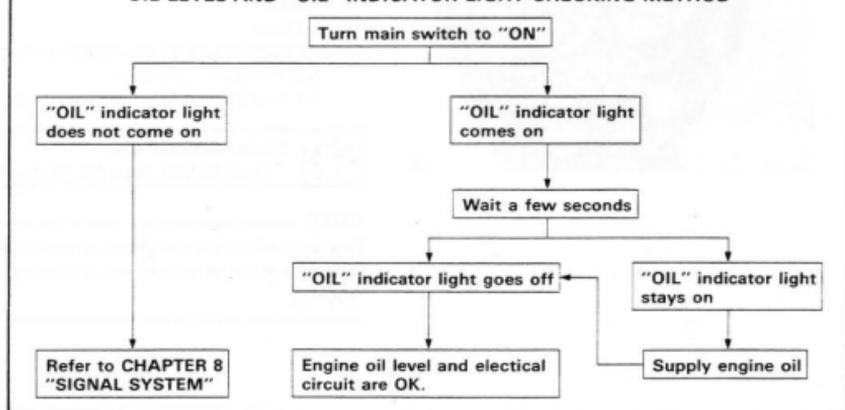
## Recommended Oil:

Yamaha Oil 2T or Air Cooled 2  
Stroke Engine Oil

## Oil Tank Capacity:

1.4 L (1.2 Imp qt, 1.5 US qt)

## OIL LEVEL AND "OIL" INDICATOR LIGHT CHECKING METHOD



## NOTE:

If the main switch is turned off after the "OIL" light goes off and then immediately again the main switch is turned on, the "OIL" light may not come on. This is not because of failure.

- ① "OIL" indicator light

## CAUTION:

Always use the same type of engine oil; mixing oils may result in a harmful chemical reaction and lead to poor performance.

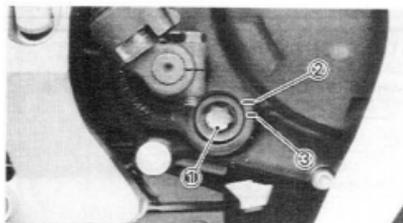


**TRANSMISSION OIL LEVEL INSPECTION**

1. Place the motorcycle on a level surface and warm up the engine for several minutes.
2. Stop the engine and inspect the oil level through the level window ①.

**NOTE:** \_\_\_\_\_

Wait a few minutes until level settles before inspecting.



3. Inspect:

- Oil level

Oil level should be between maximum ② and minimum ③ marks.

Oil level low → Add oil to proper level.



**Recommended Oil:**

**SAE 10W30 Type SE Motor Oil**

**NOTE:** \_\_\_\_\_

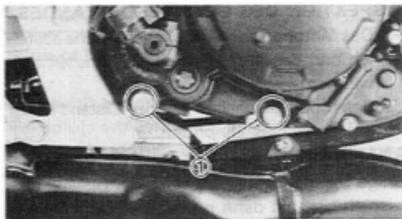
Position motorcycle straight up when inspecting oil level, a slight tilt to the side can produce false readings.

**TRANSMISSION OIL REPLACEMENT**

1. Warm up the engine for several minutes.
2. Remove:
  - Lower cowl (Right)  
Refer to the "COWLINGS" section in the CHAPTER 3.

## TRANSMISSION OIL REPLACEMENT

INSP  
ADJ



3. Place an open container under the engine.

4. Remove:

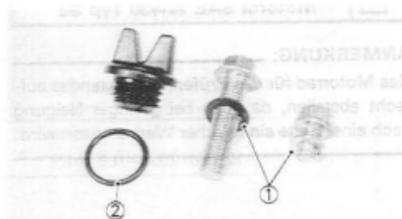
- Oil filler cap
- Drain bolts ①

5. Drain:

- Transmission oil

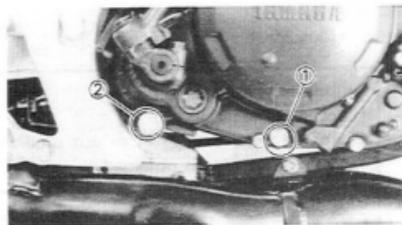
**NOTE:** \_\_\_\_\_

Drain the transmission oil with the motorcycle slightly inclined to the right.



6. Inspect:

- Gasket ① (Drain bolt)
  - O-ring ② (Oil filler cap)
- Damage → Replace.



7. Install:

- Drain bolts

	<b>Drain Bolt ①:</b>
	<b>16 Nm (1.6 m·kg, 11 ft·lb)</b>
	<b>Drain Bolt ②:</b>
	<b>22 Nm (2.2 m·kg, 16 ft·lb)</b>

8. Fill:

- Crankcase

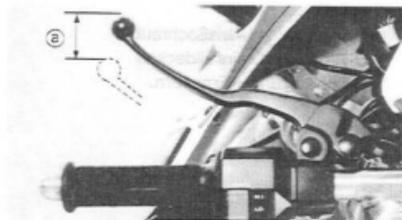
	<b>Recommended Oil:</b>
	<b>SAE 10W30 Type SE Motor Oil</b>
	<b>Oil Capacity:</b>
	<b>1.0 L (0.9 Imp qt, 1.1 US qt)</b>

**CAUTION:**

- Do not allow foreign material to enter the crankcase.
- Do not add any chemical additives. Transmission oil also lubricates the clutch and additives could cause clutch slippage.

## 9. Install:

- Oil filler cap
- Lower cowl (Right)

**CLUTCH ADJUSTMENT**

## 1. Check:

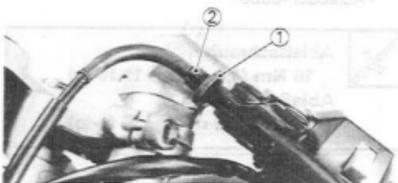
- Clutch cable free play **a**  
Out of specification → Adjust.

**Free Play:**

10 ~ 15 mm (0.4 ~ 0.6 in)

## 2. Adjust:

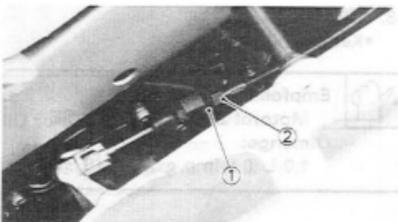
- Clutch cable free play

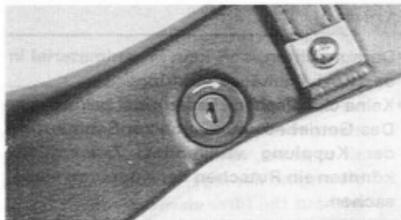
**Adjustment steps:**

- Loosen the locknuts **1**.
- Turn the adjusters **2** in or out until the specified free play is obtained.

Turn in	Free play is increased.
Turn out	Free play is decreased.

- Tighten the locknuts.



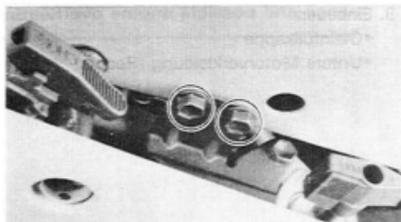
**AIR FILTER CLEANING**

1. Remove:

- Seat

**NOTE:** \_\_\_\_\_

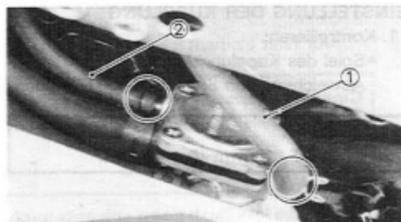
To open the seat lock, insert the key in the lock and turn it clockwise.



2. Turn the fuel cock to "ON" position.

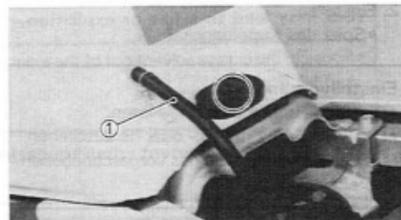
3. Remove:

- Bolts (Fuel cock bracket)



4. Disconnect:

- Fuel delivery hose ①
- Vacuum hose ②

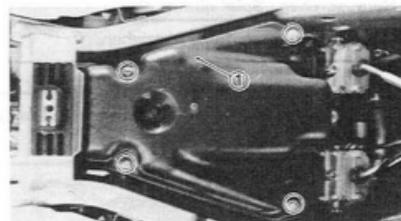


5. Disconnect:

- Fuel breather hose ①

6. Remove:

- Fuel tank

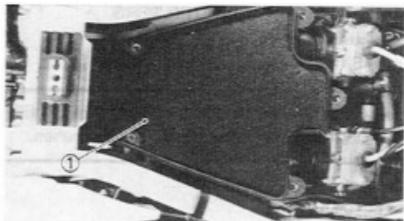


7. Remove:

- Air filter case cover ①

## AIR FILTER CLEANING

INSP  
ADJ



8. Remove:
- Air filter element ①

**CAUTION:** \_\_\_\_\_

Never operate the engine with the air filter element removed. This will allow unfiltered air to enter, causing rapid wear and possible engine damage. Additionally, operation without the filter element will affect carburetor tuning with subsequent poor performance and possible engine overheating.

9. Clean:
- Air filter element

**Cleaning steps:**

- Wash the element gently, but thoroughly in solvent.

**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 solvent out of the element and let dry.

**CAUTION:** \_\_\_\_\_

Do not twist the element when squeezing the element.

10. Install:
- Air filter element

**CAUTION:** \_\_\_\_\_

Make sure the element edge fits into the corresponding filter case groove.



11. Inspect:
  - ElementDamage→Replace.
12. Apply:
  - Air-Cooled 2 stroke engine oil or Yamaha oil 2TOnto the element.
13. Squeeze out the excess oil.

**NOTE:** \_\_\_\_\_

The element should be wet but not dripping.

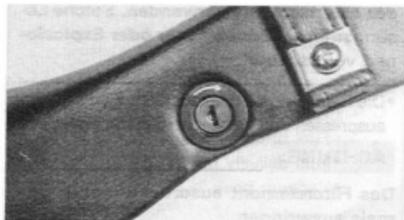
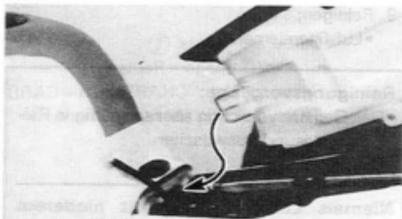
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14. Install:
  - Air filter case cover
  - Fuel tank
  - Fuel cock
15. Connect:
  - Fuel breather hose
  - Fuel delivery hose
  - Vacuum hose
16. Install:
  - Seat

**NOTE:** \_\_\_\_\_

Insert the lobe on the seat front into the receptacle on the frame, then push down the seat.

---



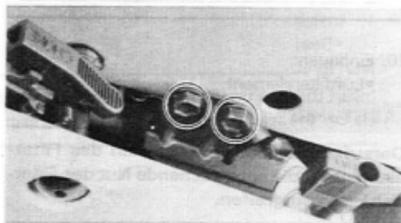
## CARBURETOR JOINT INSPECTION

1. Remove:
  - Seat

**NOTE:** \_\_\_\_\_

To open the seat lock, insert the key in the lock and turn it clockwise.

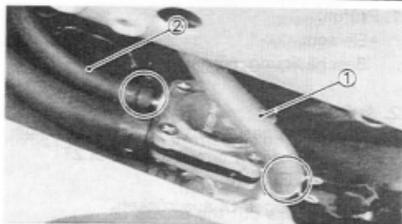
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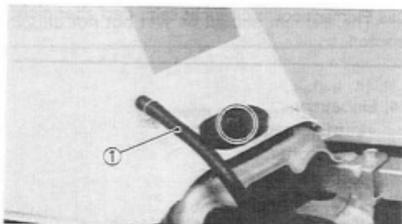
2. Turn the fuel cock to "ON" position.
3. Remove:
  - Bolts (Fuel cock bracket)

## CARBURETOR JOINT INSPECTION

INSP  
ADJ

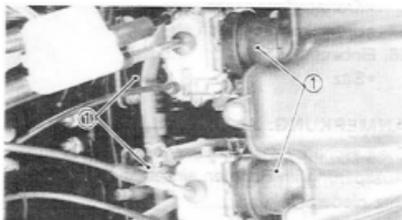


4. Disconnect:
- Fuel delivery hose ①
  - Vacuum hose ②



5. Disconnect:
- Fuel breather hose ①

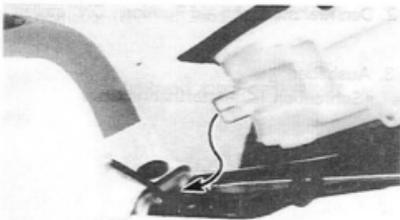
6. Remove:
- Fuel tank



7. Inspect:
- Carburetor joints ①
- Cracks/Damage → Replace.  
Refer to the "CHAPTER 6—CARBURETION" section for replacement.

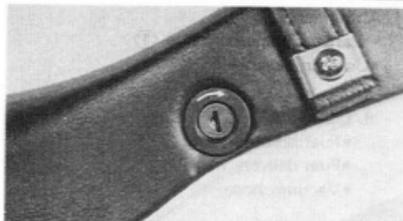
8. Install:
- Fuel tank
  - Fuel cock

9. Connect:
- Fuel breather hose
  - Fuel delivery hose
  - Vacuum hose



10. Install:
- Seat

**NOTE:** \_\_\_\_\_  
Insert the lobe on the seat front into the receptacle on the frame, then push down the seat.  
\_\_\_\_\_



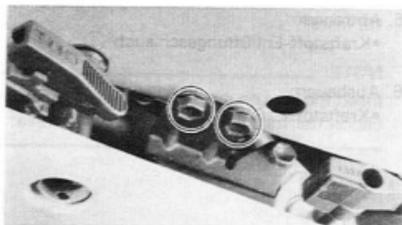
## FUEL LINE INSPECTION

### 1. Remove:

- Seat

### NOTE:

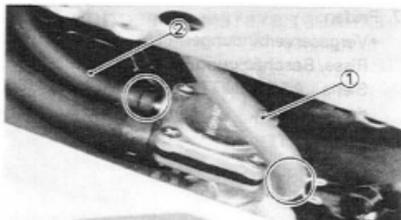
To open the seat lock, insert the key in the lock and turn it clockwise.



### 2. Turn the fuel cock to "ON" position.

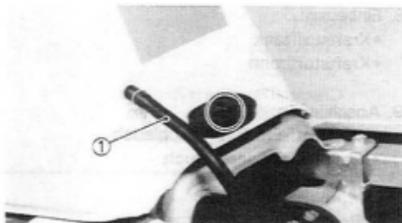
### 3. Remove:

- Bolts (Fuel cock bracket)



### 4. Disconnect:

- Fuel delivery hose ①
- Vacuum hose ②

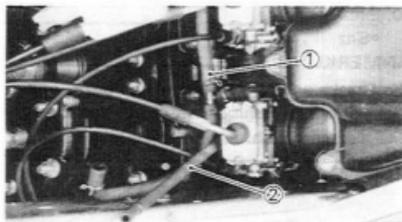


### 5. Disconnect:

- Fuel breather hose ①

### 6. Remove:

- Fuel tank

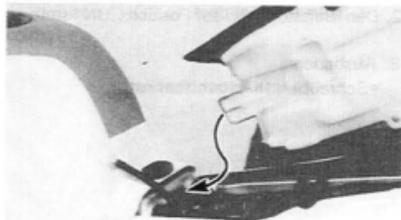


### 7. Inspect:

- Fuel delivery hoses ①
  - Vacuum hose ②
- Cracks/Damage → Replace.



8. Install:
  - Fuel tank
  - Fuel cock
  
9. Connect:
  - Fuel breather hose
  - Fuel delivery hose
  - Vacuum hose



10. Install:
  - Seat

**NOTE:** \_\_\_\_\_

Insert the lobe on the seat front into the receptacle on the frame, then push down the seat.

\_\_\_\_\_

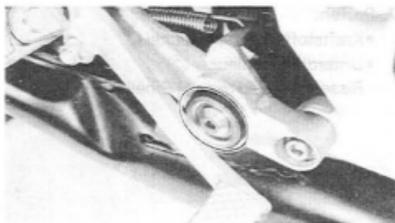
## EXHAUST SYSTEM INSPECTION

1. Remove:
  - Lower cowl (Right)
  - Lower cowl (Left)

Refer to the "COWLINGS" section in the CHAPTER 3.



2. Inspect:
  - Exhaust pipes
  - Mufflers
    - Cracks/Damage → Replace.
  - Gaskets
    - Exhaust gas leaks → Replace.



### Replacement steps:

- Remove the muffler assembly.
- Install a new muffler assembly.



**Nuts (Exhaust Pipe):**  
18 Nm (1.8 m•kg, 13 ft•lb)

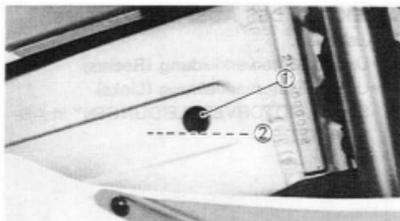
**Bolt (Muffler):**  
32 Nm (3.2 m•kg, 23 ft•lb)



3. Install:
  - Lower cowl (Left)
  - Lower cowl (Right)

**COOLANT LEVEL INSPECTION**

1. Place the motorcycle on a level surface and warm up the engine.



2. Stop the engine and inspect the coolant level through the checking hole ① of the right-hand frame.

**NOTE:** \_\_\_\_\_

Wait a few minutes until the coolant level settles before inspecting.

---

3. Inspect:
  - Coolant level
  - Coolant level is under low level line ②→
  - Add soft water (tap water).

**NOTE:** \_\_\_\_\_

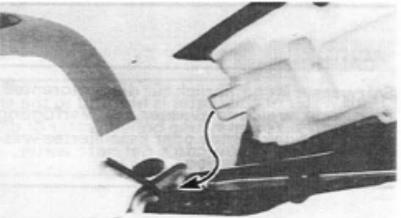
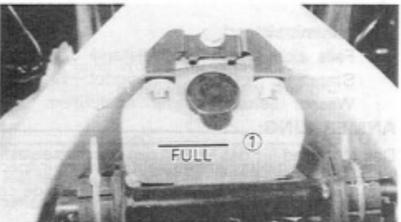
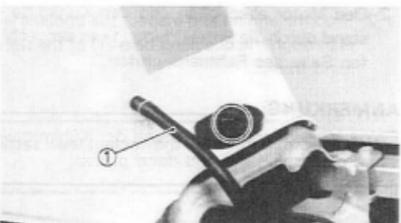
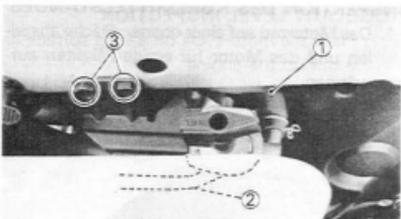
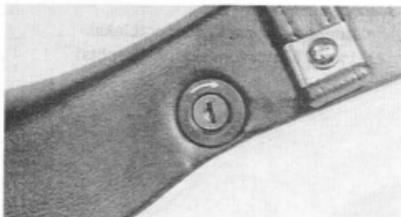
Position the motorcycle straight up when inspecting the coolant level, a slight tilt to the side can produce false readings.

---

**CAUTION:** \_\_\_\_\_

Hard water or salt water is harmful to the engine parts. You may use boiled water or distilled water, if you can't get soft water.

---



## 4. Add:

- Soft water (tap water)  
To reservoir tank.

**Adding steps:**

- Remove the seat.

**NOTE:** \_\_\_\_\_

To open the seat lock, insert the key in the lock and turn it clockwise.

- Turn the fuel cock to "ON" position, and disconnect the fuel delivery hose (1) and vacuum hose (2).

- Remove the bolts (3) (Fuel cock bracket).

- Disconnect the fuel breather hose (1) and remove the fuel tank.

- Add the soft water (tap water) until the coolant level reaches "FULL" level mark (1).

- Install the fuel tank and fuel cock, then connect the fuel delivery hose, vacuum hose and breather hose.

- Install the seat.

**NOTE:** \_\_\_\_\_

Insert the lobe on the seat front into the receptacle on the frame, then push down the seat.

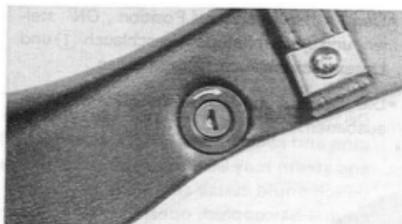


## COOLANT REPLACEMENT

## 1. Remove:

- Lower cowl (Right)

Refer to the "COWLINGS" section in the CHAPTER 3.

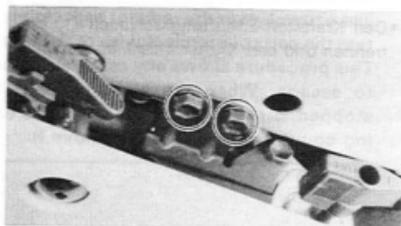


## 2. Remove:

- Seat

**NOTE:**

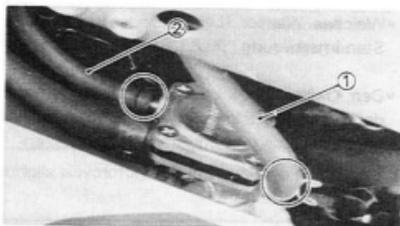
To open the seat lock, insert the key in the lock and turn it clockwise.



## 3. Turn the fuel cock to "ON" position.

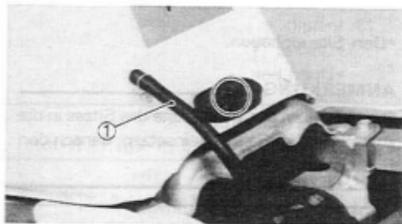
## 4. Remove:

- Bolts (Fuel cock bracket)



## 5. Disconnect:

- Fuel delivery hose ①
- Vacuum hose ②



## 6. Disconnect:

- Fuel breather hose ①

## 7. Remove:

- Fuel tank

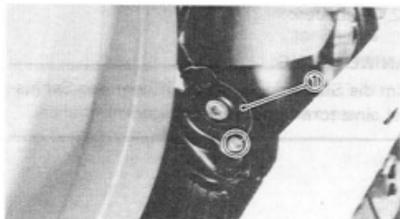
## COOLANT REPLACEMENT

INSP  
ADJ



8. Disconnect:
- Breather hose ①

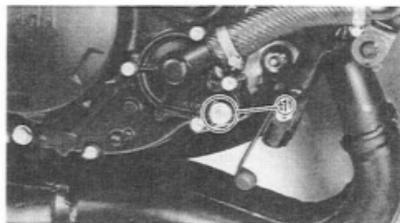
9. Drain the reservoir tank of its coolant.



10. Remove:
- Radiator cap ①

**WARNING:**

Do not remove the radiator cap when the engine and radiator are hot. Scalding hot fluid and steam may be blown out under pressure, which could cause serious injury. When the engine has cooled, open the radiator cap by the following procedure: Place a thick rag, like a towel, over the radiator cap, slowly rotate the cap counterclockwise to the detent. This procedure allows any residual pressure to escape. When the hissing sound has stopped, press down on the cap while turning counterclockwise and remove it.

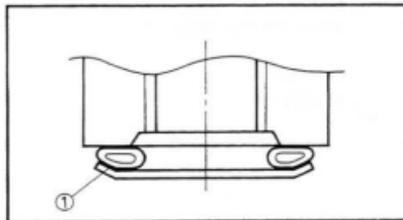


11. Remove:
- Drain bolt ①

12. Drain:
- Coolant

**NOTE:**

Drain the coolant with the motorcycle slightly inclined to the right.



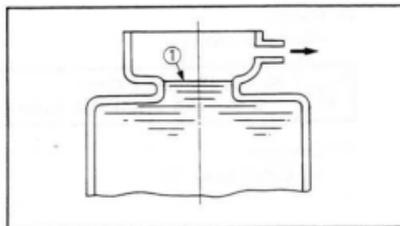
13. Install:
- Gasket ①
  - Drain bolt



**Drain Bolt:**  
16 Nm (1.6 m·kg, 11 ft·lb)

**NOTE:**

Install the gasket as shown.



## 14. Fill:

- Radiator
  - Engine
- To specified level ①.

**Recommended Coolant:**

High Quality Ethylene Glycol  
Anti-freeze Containing  
Anti-corrosion for  
Aluminum Engine Inhibitors  
Coolant and Water (Soft Water)

**Mixed Ratio:**

50%/50%

**Total Amount:**

1.35 L (1.2 Imp qt, 1.4 US qt)

**Reservoir Tank Capacity:**

0.25 L (0.22 Imp qt, 0.26 US qt)

**Handling notes of coolant:**

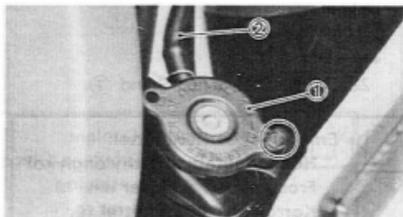
The coolant is harmful so it should be handled with special care.

**WARNING:**

- When coolant splashes to your eye.  
Thoroughly wash your eye with water and see your doctor.
- When coolant splashes to your clothes.  
Quickly wash it away with water and then with soap.
- When coolant is swallowed.  
Quickly make him vomit and take him to a doctor.

**CAUTION:**

- Hard water or salt water is harmful to the engine parts; use boiled or distilled water if you can't get soft water.
- Do not use water containing impurities or oil.
- Take care so that coolant does not splash to painted surfaces. If splashes, wash it away with water.

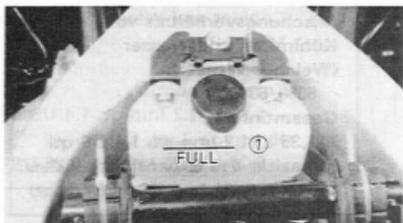


15. Install:
- Radiator cap ①



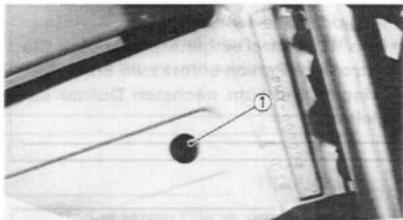
**Screw (Radiator Cap):**  
5 Nm (0.5 m•kg, 3.6 ft•lb)

16. Connect:
- Breather hose ②



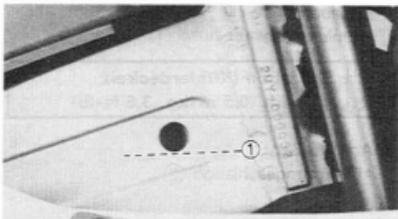
17. Fill the reservoir tank with the coolant until the coolant level reaches "FULL" level mark ①.

18. Install:
- Fuel tank
  - Fuel cock
19. Connect:
- Fuel delivery hose
  - Vacuum hose
  - Fuel breather hose



20. Start the engine and let it warm up.
21. Stop the engine and inspect the coolant level through the checking hole ① of the right-hand frame.

**NOTE:** \_\_\_\_\_  
Wait a few minutes until the coolant level settles before inspecting.



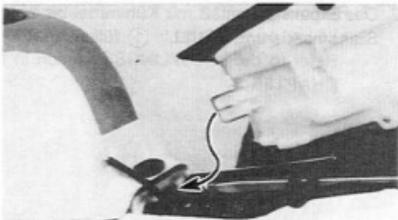
22. Inspect:

- Coolant level
- Coolant level is under low level line ① → Add Coolant.

**NOTE:** \_\_\_\_\_

Position the motorcycle straight up when inspecting the coolant level, a slight tilt to the side can produce false readings.

---



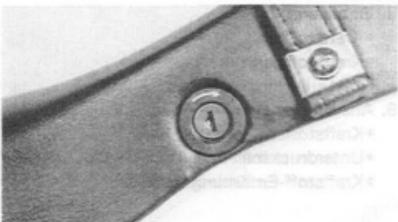
23. Install:

- Lower cowl (Right)
- Seat

**NOTE:** \_\_\_\_\_

Insert the lobe on the seat front into the receptacle on the frame, then push down the seat.

---



## COOLING SYSTEM INSPECTION

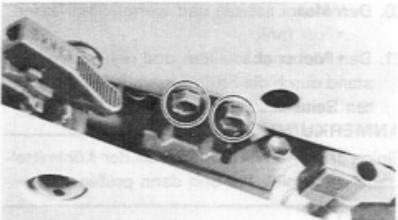
1. Remove:

- Seat

**NOTE:** \_\_\_\_\_

To open the seat lock, insert the key in the lock and turn it clockwise.

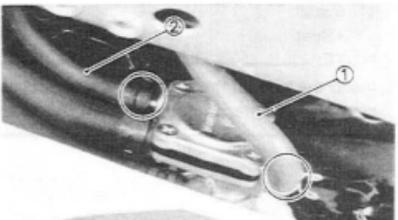
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2. Turn the fuel cock to "ON" position.

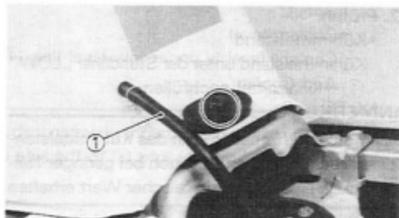
3. Remove:

- Bolts (Fuel cock bracket)



4. Disconnect:

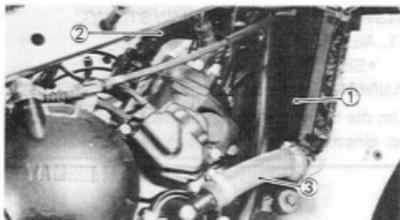
- Fuel delivery hose ①
- Vacuum hose ②



5. Disconnect:
- Fuel breather hose ①

6. Remove:
- Fuel tank

7. Remove:
- Lower cowl (Right)
- Refer to the "COWLINGS" section in the CHAPTER 3.



8. Inspect:
- Radiator ①
  - Inlet hose ②
  - Outlet hose ③
- Cracks/Damage → Replace.

Refer to the "CHAPTER 5—COOLING SYSTEM" for replacement.

9. Install:
- Fuel tank
  - Fuel cock

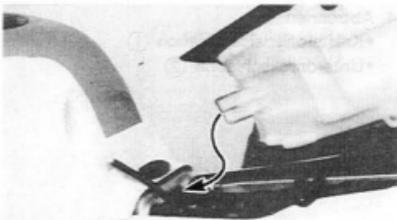
10. Connect:
- Fuel breather hose
  - Fuel delivery hose
  - Vacuum hose

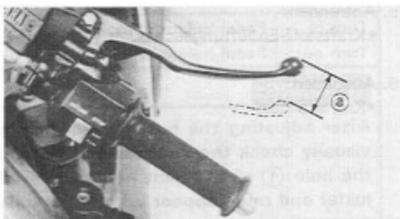
11. Install:
- Seat

**NOTE:** \_\_\_\_\_

Insert the lobe on the seat front into the receptacle on the frame, then push down the seat.

\_\_\_\_\_





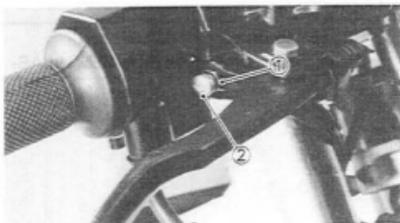
## CHASSIS

### FRONT BRAKE ADJUSTMENT

1. Check:
  - Brake lever free play ②
 Out of specification → Adjust.



**Free Play:**  
2~5 mm (0.08~0.20 in)



2. Adjust:
  - Brake lever free play

#### Adjustment steps:

- Loosen the locknut ①.
- Turn the adjuster ② in or out until the specified free play is obtained.

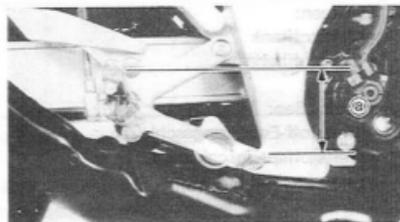
Turn in      Free play is decreased.

Turn out    Free play is increased.

- Tighten the locknut.

#### CAUTION:

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

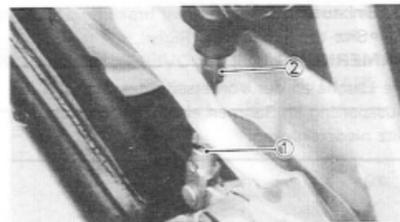


### REAR BRAKE ADJUSTMENT

1. Check:
  - Brake pedal height ②
 Out of specification → Adjust.



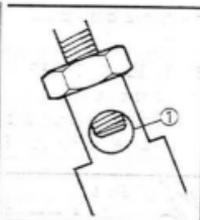
**Brake Pedal Height:**  
55 mm (2.16 in)  
Below Top of Footrest.



2. Adjust:
  - Brake pedal height

#### Adjustment steps:

- Loosen the locknut ①.
- Turn the adjuster ② in or out until the specified pedal height is obtained.



Turn in	Pedal height is increased.
Turn out	Pedal height is decreased.

Turn out	Pedal height is decreased.
----------	----------------------------

**WARNING:**

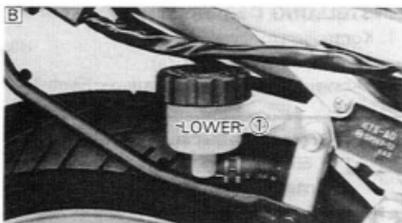
After adjusting the brake pedal height, visually check the adjuster end through the hole ① of the joint holder. The adjuster end must appear within this hole.

- Tighten the locknut.



**Locknut:**

26 Nm (2.6 m•kg, 19 ft•lb)



## BRAKE FLUID INSPECTION

1. Place the motorcycle on a level surface.
2. Inspect:
  - Brake fluid level
  - Fluid level is under "LOWER" level line
  - ① → Replenish.



**Recommended Brake Fluid:**

DOT #3

**A** For front brake.

**B** For rear brake.

**NOTE:**

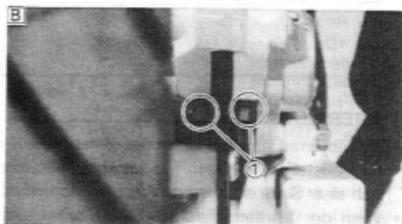
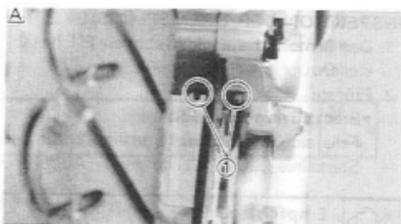
- Position the motorcycle straight up when inspecting the brake fluid level.
- When inspecting the front brake fluid level, make sure the master cylinder top is horizontal by turning the handlebars.
- Before inspecting the rear brake fluid level, remove the side cover (Right). Refer to the "SIDE COVERS" section in the CHAPTER 3.

**CAUTION:**

Brake fluid may erode painted surfaces or plastic parts. Always clean up spilled fluid immediately.

**WARNING:**

- Use only the designated quality brake fluid; otherwise, the rubber seals may deteriorate, causing leakage and poor brake performance.
- Refill with the same type of brake fluid; mixing fluids may result in a harmful chemical reaction and lead to poor performance.
- Be careful that water does not enter the master cylinder when refilling. Water will significantly lower the boiling point of the fluid and may result in vapor lock.

**BRAKE PAD INSPECTION**

1. Activate the brake lever or brake pedal.
2. Inspect:
  - Brake pad  
Wear indicator (1) almost contacts brake disc → Replace brake pad as a set.

- A** Front brake  
**B** Rear brake

Refer to the "BRAKE PAD REPLACEMENT" section in the CHAPTER 7 for replacement.

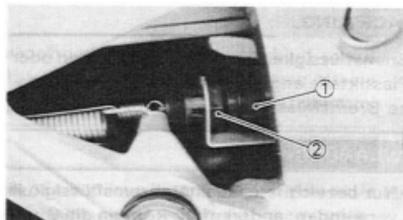
**BRAKE LIGHT SWITCH ADJUSTMENT****NOTE:**

The brake light switch is operated by movement of the brake pedal.

Proper adjustment is achieved when the brake light comes on just before the brake begins to take effect.

## DRIVE CHAIN SLACK ADJUSTMENT

INSP  
ADJ



1. Hold the switch body (1) with your hand so that it does not rotate and turn the adjusting nut (2).

### DRIVE CHAIN SLACK ADJUSTMENT

#### NOTE:

Before checking and/or adjusting, rotate the rear wheel through several revolutions and check slack at several points to find the tightest point. Check and/or adjust the chain slack with the rear wheel in this "tightest" position.



1. Check:

- Drive chain slack (a)  
Out of specification → Adjust.



#### Drive Chain Slack:

30 ~ 40 mm (1.18 ~ 1.57 in)

2. Adjust:

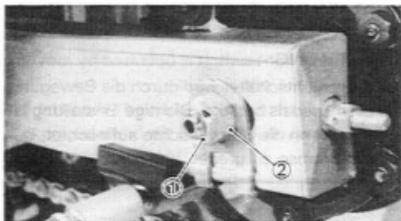
- Drive chain slack

#### Adjustment steps:

##### CAUTION:

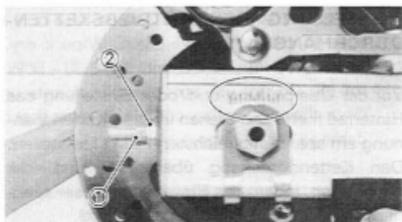
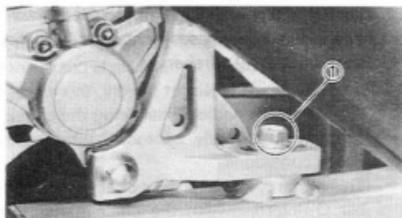
Too small chain slack will overload the engine and other vital parts; keep the slack within the specified limits.

- Loosen the locknut (1) and axle nut (2).



## DRIVE CHAIN SLACK ADJUSTMENT

**INSP**  
**ADJ**



- Loosen the bolt ① (Brake caliper bracket).

- Loosen the locknut ① and turn the adjuster ② in or out until the specified slack is obtained.

Turn in	Slack is increased.
---------	---------------------

Turn out	Slack is decreased.
----------	---------------------

**NOTE:**

Turn each adjuster exactly the same amount to maintain correct axle alignment. (There are marks on each side of swingarm and on each chain puller; use them to check for proper alignment.)

- Tighten the locknut.

- Tighten the bolt (Brake caliper bracket), axle nut and locknut (axle nut).



**Bolt (Brake Caliper Bracket):**  
45 Nm (4.5 m·kg, 32 ft·lb)

**Axle Nut:**

105 Nm (10.5 m·kg, 75 ft·lb)

**Locknut (Axle Nut):**

45 Nm (4.5 m·kg, 32 ft·lb)



## DRIVE CHAIN LUBRICATION

The chain consists of many parts which work against each other. If the chain is not maintained properly, it will wear out rapidly, therefore, form the habit of periodically servicing the chain. This service is especially necessary when riding in dusty conditions.

This motorcycle has a drive chain with small rubber O-rings between the chain plates. Steam cleaning, high-pressure washes, and certain solvents can damage these O-rings. Use only kerosene to clean the drive chain. Wipe it dry, and thoroughly lubricate it with SAE 30~50W motor oil. Do not use any other lubricants on the drive chain. They may contain solvents that could damage the O-rings.

## STEERING HEAD ADJUSTMENT

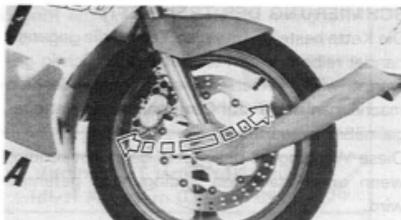
### **WARNING:**

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

1. Remove:
  - Lower cowl (Right)
  - Lower cowl (Left)Refer to the "COWLINGS" section in the CHAPTER 3.
2. Elevate the front wheel by placing a suitable stand under the engine.

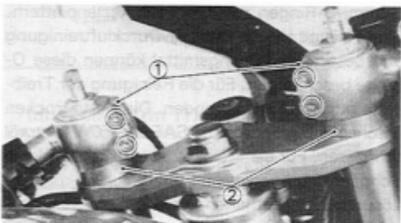
## STEERING HEAD ADJUSTMENT

INSP  
ADJ



### 3. Check:

- Steering assembly bearings  
Grasp the bottom of the forks and gently rock the fork assembly back and forth.  
Looseness → Adjust steering head.



### 4. Adjust:

- Steering head



### Adjustment steps:

- Remove the front wheel.

### NOTE:

Do not depress the brake lever when the disc is off the caliper as the brake pads will be forced shut.

- Remove the handlebars ①, spacers ② and handle crown ③.



- Tighten the ring nut using the Ring Nut Wrench.



Ring Nut Wrench:  
90890-01403

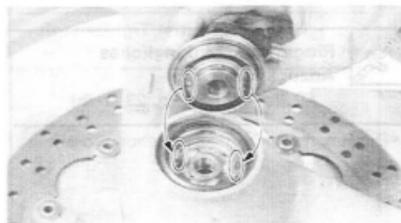
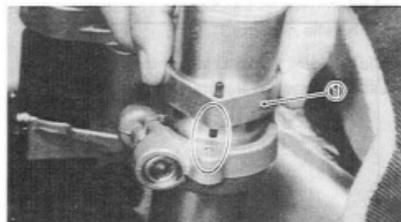
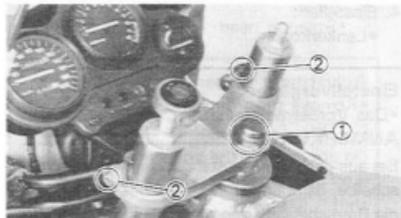
### NOTE:

Set the torque wrench to the ring nut wrench so that they form a right angle.



Ring Nut (Initial Tightening):  
40 Nm (4.0 m·kg, 29 ft·lb)

- Loosen the ring nut one turn.



- Retighten the ring nut using the Ring Nut Wrench.

**WARNING:** \_\_\_\_\_

Avoid over-tightening.



**Ring Nut (Final Tightening):**  
20 Nm (2.0 m•kg, 14 ft•lb)

- Install the handle crown.



**Nut ①:**  
110 Nm (11 m•kg, 80 ft•lb)  
**Bolts ②:**  
32 Nm (3.2 m•kg, 23 ft•lb)

- Install the spacer ①.

**NOTE:** \_\_\_\_\_

Insert the pin on the spacer into the corresponding hole on the handle crown.

- Install the handlebars.

**NOTE:** \_\_\_\_\_

Insert the pin on the spacer into the corresponding hole on the handlebar.



**Bolts (Handlebar):**  
13 Nm (1.3 m•kg, 9.4 ft•lb)

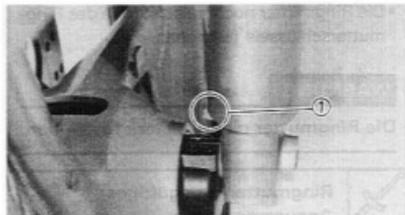
- Install the front wheel.

**NOTE:** \_\_\_\_\_

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

## FRONT FORK OIL REPLACEMENT

INSP  
ADJ



### NOTE:

Be sure that the projecting portion ① (torque stopper) of the speedometer gear unit is positioned correctly.



#### Wheel Axle:

74 Nm (7.4 m•kg, 53 ft•lb)

#### Pinch Bolt:

20 Nm (2.0 m•kg, 14 ft•lb)

### 5. Install:

- Lower cowl (Left)
- Lower cowl (Right)

## FRONT FORK OIL REPLACEMENT

### WARNING:

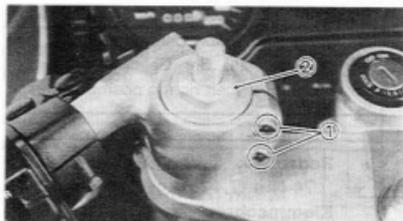
- Fork oil leakage can cause loss of stability and safe handling. Have any problem corrected before operating the motorcycle.
- Securely support the motorcycle so there is no danger of it falling over.

### 1. Remove:

- Lower cowl (Right)
- Lower cowl (Left)

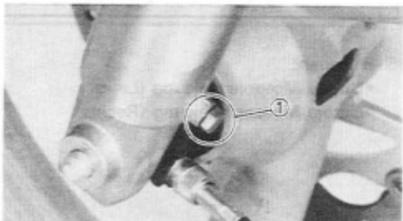
Refer to the "COWLINGS" section in the CHAPTER 3.

- ### 2. Elevate the front wheel by placing a suitable stand under the engine.



3. Loosen:
- Bolts ① (Handlebar)

4. Remove:
- Cap bolt ②



5. Place an open container under the drain hole.

6. Remove:
- Drain screw ①

**WARNING:** \_\_\_\_\_

Do not let oil contact the disc brake components. If any oil should contact the brake components, it must be removed before the motorcycle is operated. Oil will cause diminished braking capacity and will damage the rubber components of the brake assembly.

---

7. After most of the oil has been drained, slowly pump the forks up and down to remove any remaining oil.

8. Inspect:
- O-ring (Cap bolt)
  - Gasket (Drain screw)
- Damage → Replace.

9. Install:
- Drain screw
  - Gasket (Drain screw)

## FRONT FORK OIL REPLACEMENT/FRONT FORK ADJUSTMENT

INSP  
ADJ



### 10. Fill:

- Fork oil



**Front Fork Oil Capacity (Each Fork):**

**444 cm<sup>3</sup> (15.7 Imp oz, 15.0 US oz)**

**Recommended Oil:**

**Fork Oil 10W or Equivalent**

11. After filling, slowly pump the forks up and down to distribute the oil.

### 12. Install:

- Cap bolt



**Cap Bolt:**

**23 Nm (2.3 m•kg, 17 ft•lb)**

### 13. Tighten:

- Bolts (Handlebar)



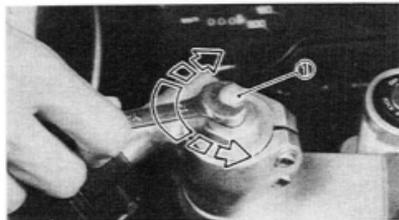
**Bolts (Handlebar):**

**13 Nm (1.3 m•kg, 9.4 ft•lb)**

## FRONT FORK ADJUSTMENT

### WARNING:

Always adjust each fork preload to the same setting. Uneven adjustment can cause poor handling and loss of stability.



### 1. Adjust:

- Spring preload

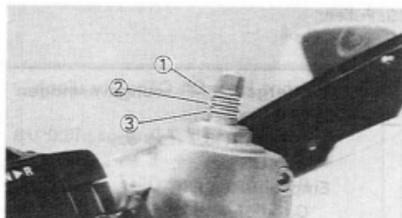
**Adjustment steps:**

- Turn the adjuster ① in or out.

Turn in	Preload is increased.
Turn out	Preload is decreased.

## REAR SHOCK ABSORBER ADJUSTMENT

**INSP  
ADJ**



### CAUTION:

The grooves are there just to show the adjusting level.

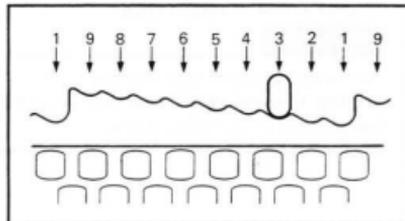
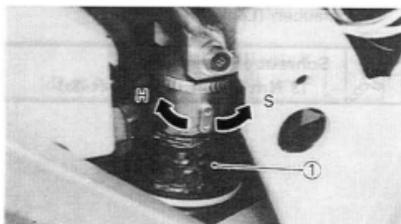
- ① Hard
- ② Standard
- ③ Soft

### REAR SHOCK ABSORBER ADJUSTMENT

The spring preload of the rear shock absorber can be adjusted to suit rider's preference, weight, and the course conditions.

1. Remove:
  - Side cover (Right)

Refer to the "SIDE COVERS" section in the CHAPTER 3.
2. Adjust:
  - Spring preload



### Adjustment steps:

- To increase preload, adjuster ① is turned toward the "H". To decrease preload, adjuster is turned toward the "S".

	Hard					STD	Soft		
Adjusting position	9	8	7	6	5	4	3	2	1

### NOTE:

When adjusting, use the special wrench and extension bar which are included in the owner's tool kit.

3. Install:
  - Side cover (Right)

**RECOMMENDED COMBINATIONS OF FRONT FORK AND REAR SHOCK ABSORBER SETTINGS**



**RECOMMENDED COMBINATIONS OF FRONT FORK AND REAR SHOCK ABSORBER SETTINGS**

Use this table as a guide for specific riding and motorcycle load conditions.

	Front fork Adjusting position	Rear shock absorber Spring seat	Loading condition			
			Solo rider	With passenger	With accessories and equipment	With accessories, equipment and passenger
1.	STANDARD	3	○			
2.	HARD	4			○	
3.	HARD	5		○		
4.	HARD	6, 7				○



## TIRE INSPECTION

**WARNING:**

Do not attempt to use tubeless tires on a wheel designed for tube type tires only. Tire failure and personal injury may result from sudden deflation.

Wheel	Tire
Tube type	Tube type only
Tubeless	Tube type or tubeless

Be sure to install the correct tube when using tube type tires.

## 1. Measure:

- Tire pressure

Out of specification → Adjust.

**WARNING:**

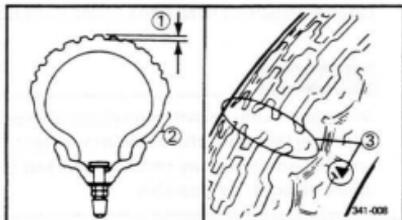
Tire inflation pressure should be checked and adjusted when the temperature of the tire equals the ambient air temperature. Tire inflation pressure must be adjusted according to total weight of cargo, rider, passenger, and accessories (fairing, saddlebags, etc. if approved for this model), and vehicle speed.

Basic weight: With oil and full fuel tank	144 kg (318 lb)	
Maximum load*	196 kg (432 lb)	
Cold tire pressure	Front	Rear
Up to 90 kg (198 lb) load*	180 kPa (1.8 kg/cm <sup>2</sup> , 26 psi)	200 kPa (2.0 kg/cm <sup>2</sup> , 28 psi)
90 kg (198 lb) – Maximum load*	200 kPa (2.0 kg/cm <sup>2</sup> , 28 psi)	230 kPa (2.3 kg/cm <sup>2</sup> , 32 psi)
High speed riding	200 kPa (2.0 kg/cm <sup>2</sup> , 28 psi)	230 kPa (2.3 kg/cm <sup>2</sup> , 32 psi)

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

## WHEEL INSPECTION

INSP  
ADJ



### 2. Inspect:

- Tire surfaces
- Wear/Damage → Replace.



**Minimum Tire Tread Depth:**  
**(Front and Rear)**  
**1.0 mm (0.04 in)**

- ① Tread depth
- ② Side wall
- ③ Wear indicator

## 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.

\_\_\_\_\_

### 2. Tighten:

- Valve stem locknut



**1.5 Nm (0.15 m•kg, 1.1 ft•lb)**

**WARNING:** \_\_\_\_\_

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

\_\_\_\_\_



**CABLE INSPECTION AND LUBRICATION**

**WARNING:**

Damaged cable sheath may cause corrosion and interfere with the cable movement. An unsafe condition may result so replace such cable as soon as possible.

1. Inspect:

- Cable sheath  
Damage → Replace.

2. Check:

- Cable operation  
Unsmooth operation → Lubricate.



**Recommended Lubricant:**  
**SAE 10W30 Motor Oil**

**NOTE:**

Hold cable end high and apply several drops of lubricant to cable.

**LEVER AND PEDAL LUBRICATION**

Lubricate pivoting parts of each lever and pedal.



**Recommended Lubricant:**  
**SAE 10W30 Motor Oil**

**SIDESTAND LUBRICATION**

Lubricate the sidestand at pivot points.



**Recommended Lubricant:**  
**SAE 10W30 Motor Oil**

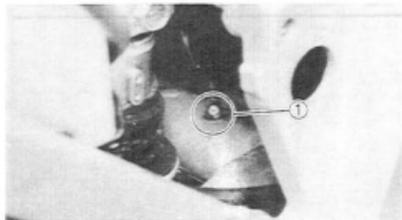
**SWINGARM AND RELAY ARM  
LUBRICATION**

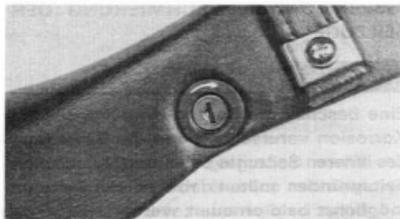
Lubricate the swingarm and relay arms at their pivoting points.



**Light-weight Lithium Soap Base  
Grease**

① Grease nipple



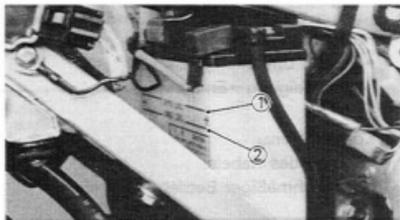
**ELECTRICAL****BATTERY INSPECTION**

## 1. Remove:

- Seat
- Side cover (Right)

**NOTE:** \_\_\_\_\_

To open the seat lock, insert the key in the lock and turn it clockwise.



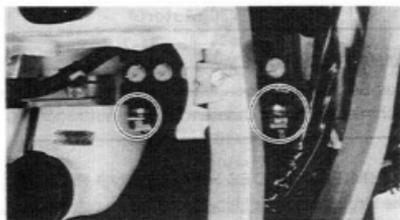
## 2. Inspect:

Fluid level should be between upper ① and lower ② level marks.

Incorrect → Refill.

**CAUTION:** \_\_\_\_\_

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

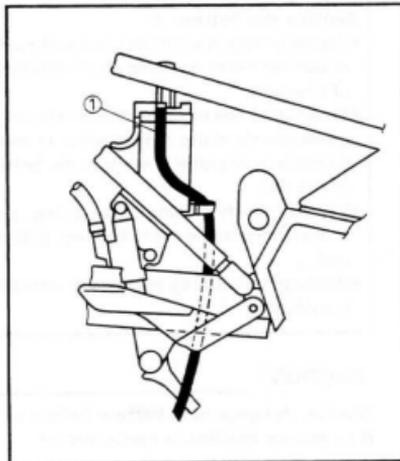


## 3. Inspect:

- Battery terminal
- Dirty terminal → Clean with wire brush.  
Poor connection → Correct.

**NOTE:** \_\_\_\_\_

After cleaning the terminals, apply grease lightly to the terminals.



## 4. Connect:

- Breather pipe ①
- Be sure the hose is properly attached and routed.

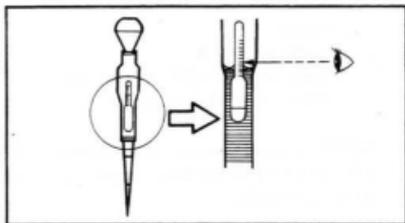


## 5. Inspect:

- Breather pipe  
Obstruction→Remove.  
Damage→Replace.

**CAUTION:**

When inspecting the battery, be sure the breather pipe is routed correctly. If the breather pipe 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.



## 6. Check:

- Specific gravity  
Less than 1.280→Recharge battery.

**Charging Current:**

0.4 amps/10 hrs

**Specific Gravity:**

1.280 at 20°C (68°F)

**Replace the battery if:**

- Battery voltage will not rise to a specific value or bubbles fail to rise even after many hours of charging.
- Sulfation of one or more cells occurs, as indicated by the plates turning white, or an accumulation of material exists in the bottom of the cell.
- Specific gravity readings after a long, slow charge indicate one cell to be lower than the rest.
- Warpage or buckling of plates or insulators is evident.

**CAUTION:**

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

**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.

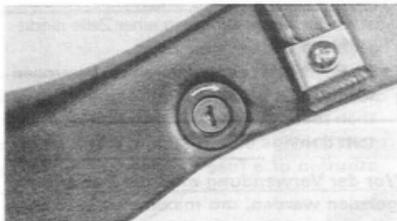
Antidote (INTERNAL):

- Drink large quantities of water or milk followed 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.**

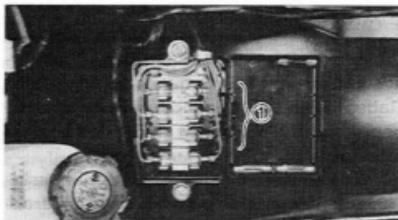
**FUSE INSPECTION**

1. Remove:

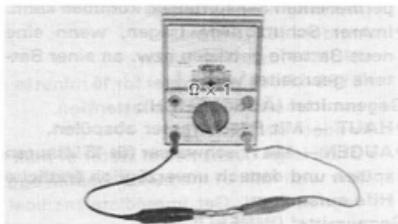
- Seat

**NOTE:**

To open the seat lock, insert the key in the lock and turn it clockwise.



2. Remove:
- Fuse ①



3. Inspect:
- Fuse

**Inspection steps:**

- Connect the Pocket Tester to the fuse and check it for continuity.

**NOTE:** \_\_\_\_\_

Set the tester selector to " $\Omega \times 1$ " position.

\_\_\_\_\_



**Pocket Tester:**  
90890-03112

- If the tester is indicated at  $\infty$ . The fuse is blown, replace it.

4. Replace:
- Blown fuse

**Blown fuse replacement steps:**

- Turn off ignition and the circuit.
- Install a new fuse of proper amperage.
- Turn on switches to verify operation of electrical device.
- If fuse blows immediately again, check circuit in question.

**WARNING:** \_\_\_\_\_

Do not use fuses of higher amperage rating than recommended. Extensive electrical system damage and fire could result from substitution of a fuse of improper amperage.

# HEADLIGHT BEAM ADJUSTMENT/HEADLIGHT BULB REPLACEMENT

INSP  
ADJ



## HEADLIGHT BEAM ADJUSTMENT

### 1. Adjust:

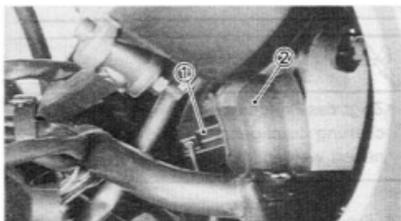
- Headlight beam (Vertical)

To raise the beam	Turn the adjuster ① clockwise.
To lower the beam	Turn the adjuster ① counterclockwise.

### 2. Adjust

- Headlight beam (Horizontal)

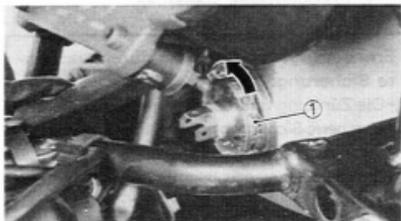
To right the beam	Turn the adjuster ② counterclockwise.
To left the beam	Turn the adjuster ② clockwise.



## HEADLIGHT BULB REPLACEMENT

### 1. Remove:

- Headlight lead coupler ①
- Cover ②



### 2. Remove:

- Bulb holder ①
- Bulb

### NOTE:

Turn the bulb holder counterclockwise and remove the defective 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.



3. 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.

---

4. Install:

- Cover
- Headlight lead coupler



## ENGINE OVERHAUL

### ENGINE REMOVAL

**NOTE:** \_\_\_\_\_

It is not necessary to remove the engine in order to remove the following components:

- Cylinder head
  - Cylinder
  - Piston and piston ring
  - Power valve
  - Clutch
  - Primary drive gear
  - Kick axle
  - Shift shaft
  - AC magneto
  - Autolube pump
  - Oil pump
- 

### COWLINGS

## 1. Remove:

- Lower cowl (Right)
- Lower cowl (Left)

Refer to "COWLINGS" section in CHAPTER 3.

### TRANSMISSION OIL

## 1. Drain:

- Transmission oil

Refer to "TRANSMISSION OIL REPLACEMENT" section in CHAPTER 3.

### COOLANT

## 1. Drain:

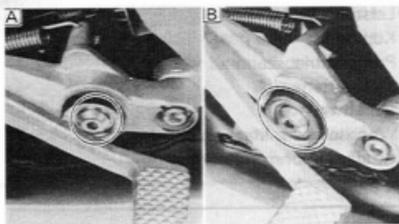
- Coolant

Refer to "COOLANT REPLACEMENT" section in CHAPTER 3.

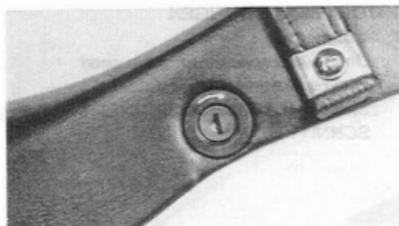
**MUFFLER ASSEMBLY**

1. Remove:

- Muffler assembly



- A** Right-hand
- B** Left-hand

**SEAT**

1. Remove:

- Seat

**NOTE:**

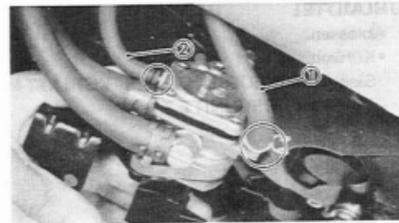
To open the seat lock, insert the key in the lock and turn it clockwise.

**FUEL TANK**

1. Turn the fuel cock to "ON" position.

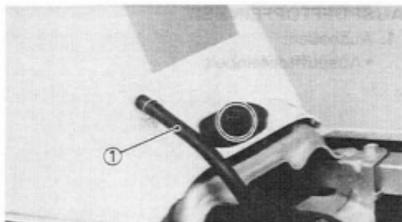
2. Remove:

- Bolts (Fuel cock bracket)



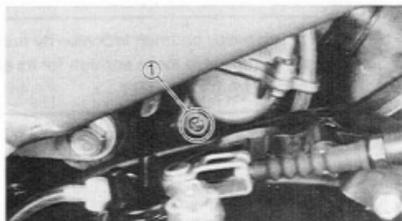
3. Disconnect:

- Fuel delivery hose ①
- Vacuum hose ②

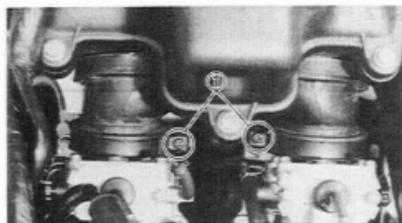


4. Disconnect:  
•Breather hose ①

5. Remove:  
•Fuel tank

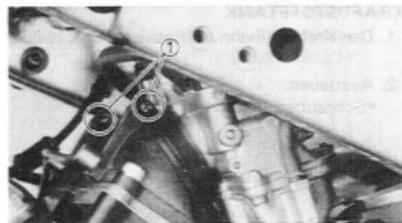
**CARBURETOR**

1. Loosen the drain screw ① and drain the float chamber of fuel.



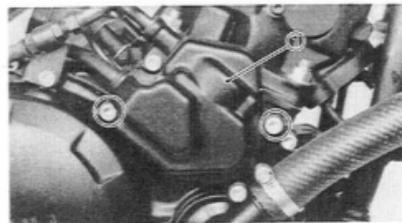
2. Loosen:  
•Screws ① (Carburetor joint)

3. Remove:  
•Air cleaner case

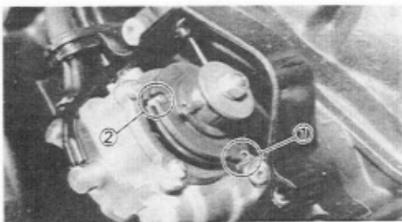


4. Loosen:  
•Screws ① (Carburetor joint)

5. Remove:  
•Carburetors

**AUTOLUBE PUMP CABLE AND HOSE**

1. Remove:  
•Autolube pump cover ①



2. Remove:
- Clip ①
  - Cable end ②



**NOTE:** \_\_\_\_\_  
 Turn the pump pulley counterclockwise by finger to make the pump cable loose enough for its end to be removed from the pulley.  
 \_\_\_\_\_



3. Remove:
- Clip ①
  - Autolube pump cable ②
  - Oil hose ③

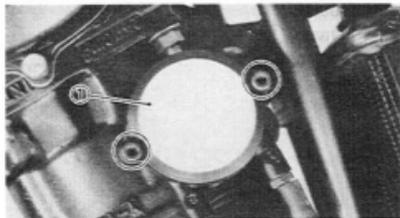


#### CLUTCH CABLE

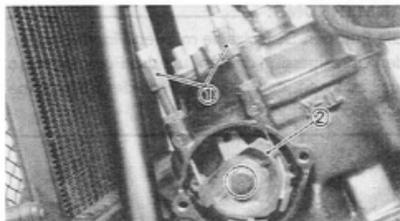
1. Loosen:
- Cable adjusters ①



2. Remove:
- Clutch cable

**Y.P.V.S. CABLES****1. Remove:**

- Pulley cover ① (Power valve)

**2. Loosen:**

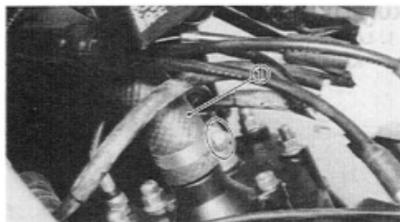
- Cable adjusters ①

**3. Remove:**

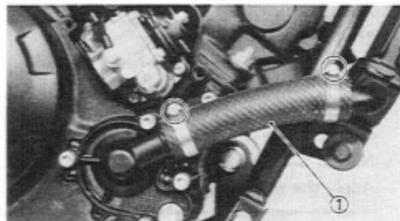
- Pulley ②

**4. Remove:**

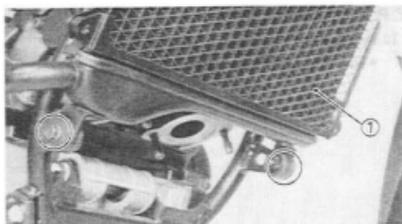
- Pulley housing ①

**RADIATOR****1. Disconnect:**

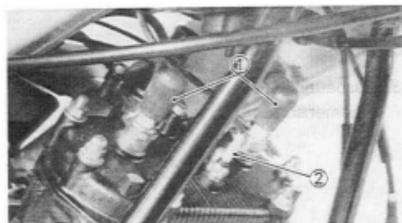
- Inlet hose ①

**2. Disconnect:**

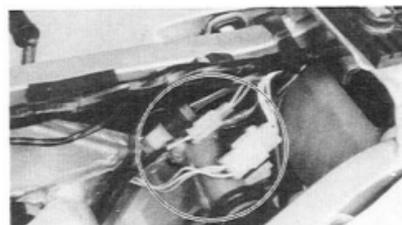
- Outlet hose ①



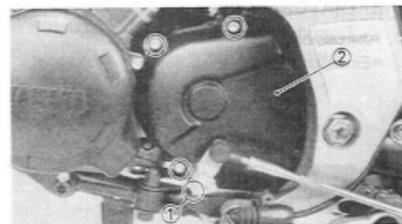
3. Remove:
- Radiator ①

**LEADS**

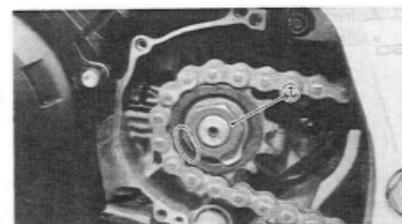
1. Disconnect:
- Spark plug leads ①
  - Thermo unit lead ②



2. Disconnect:
- Stator coil leads
  - Pickup coil leads
  - Source coil leads

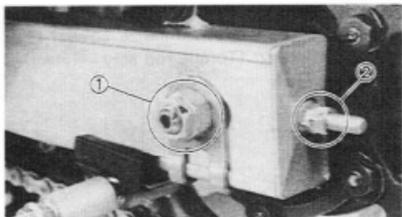
**DRIVE CHAIN**

1. Remove:
- Bolt ① (Shift arm)
  - Crankcase cover ② (Left)

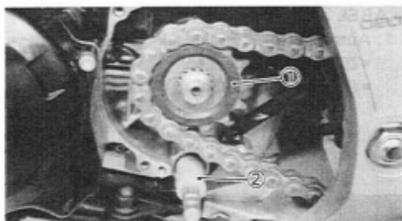


2. Straighten:
- Lock washer tab
3. Loosen:
- Nut ① (Drive sprocket)

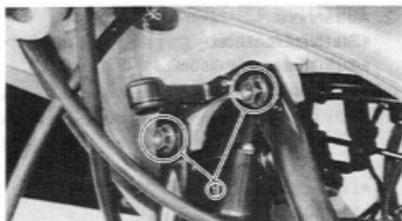
**NOTE:** \_\_\_\_\_  
Apply the rear brake for loosening the nut.  
\_\_\_\_\_



4. Loosen:
- Rear axle nut ①
  - Adjusters ② (Chain puller)



5. Remove:
- Drive sprocket ①
  - Collar ②



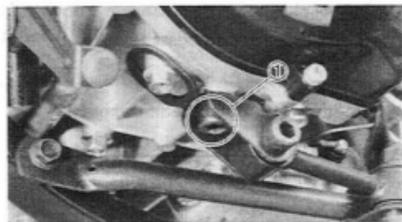
## ENGINE REMOVAL

1. Place a suitable stand under the engine.

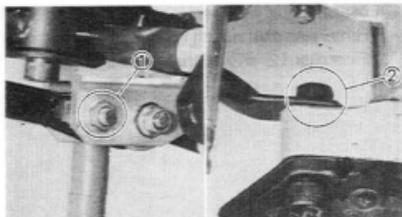
2. Remove:
- Bolts ① (Down tube — Upper)



3. Remove:
- Bolt ① (Engine mount — Front)

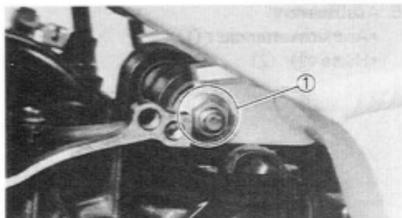


4. Remove:
- Bolt ① (Engine bracket)



## 5. Loosen:

- Bolt ① (Down tube — Lower)
- Bolt ② (Torque rod stay — Rear)



## 6. Remove:

- Bolt ① (Engine mount-Rear)
- Engine assembly

## ENGINE DISASSEMBLY

### CYLINDER HEAD, CYLINDERS AND PISTONS

## NOTE: \_\_\_\_\_

With the engine mounted, the cylinder head, cylinders and pistons can be maintained by removing the following parts.

- Lower cowls
- Mufflers
- Y.P.V.S. cables
- Radiator

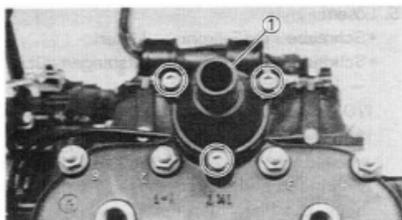


## 1. Remove:

- Spark plugs ①
- Thermo unit ②

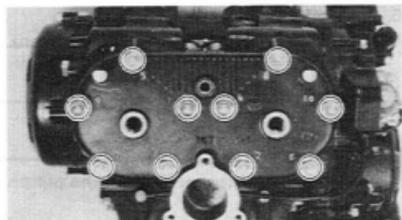
**WARNING:** \_\_\_\_\_

Handle the thermo-unit with special care. Never subject it to strong or allow it to be dropped. Should it be dropped, it must be replaced.



## 2. Remove:

- Cover ① (Thermostatic valve)
- Thermostatic valve

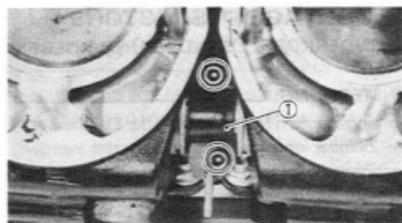


## 3. Remove:

- Cylinder head
- Gasket (Cylinder head)

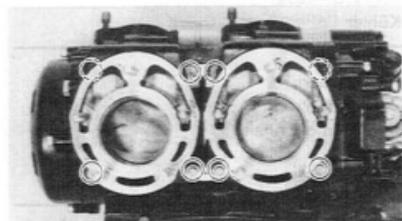
**NOTE:**

- Loosen the nuts starting with the highest numbered one.
- Loosen the each nut 1/4 turn, and remove them after all nuts are loosened.



## 4. Remove:

- Joint ① (Power valve)



## 5. Remove:

- Cylinders
- Gaskets (Cylinder)
- Dowel pins

**NOTE:**

- Loosen each nut 1/4 turn, and remove them after all nuts are loosened.



## 6. Remove:

- Piston pin clip ①

**NOTE:**

- Before removing piston pin circlip, cover crankcase with a clean rag to prevent circlip from falling into crankcase cavity.



## 7. Remove:

- Piston pin
- Piston
- Small end bearing

**NOTE:**

Before removing the piston pin, deburr the clip grooved 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:**  
90890-01304

**CAUTION:**

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

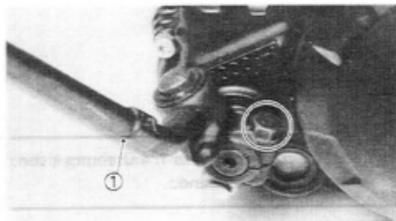
**CLUTCH AND PRIMARY DRIVE GEAR****NOTE:**

With the engine mounted, the clutch and primary drive gear can be maintained by removing the following parts.

- Lower cowl (Right)
- Outlet hose
- Autolube pump cable and hose

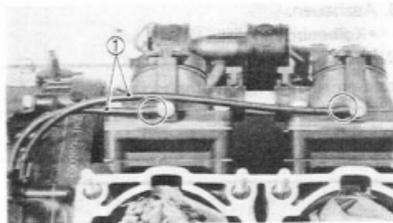
## 1. Remove:

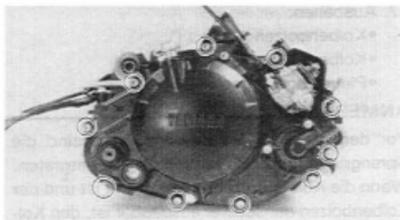
- Kick crank ①



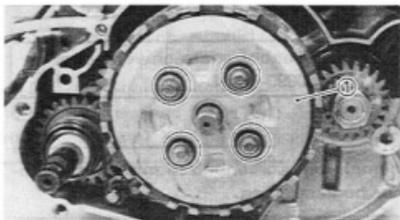
## 2. Disconnect:

- Oil delivery hoses ①

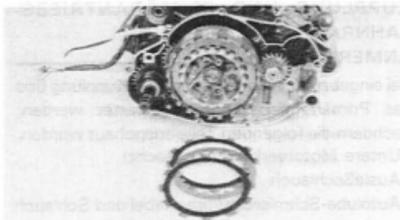




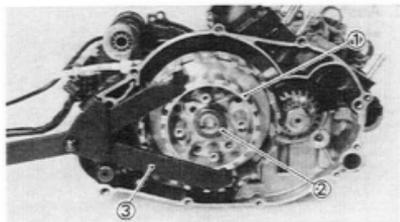
3. Remove:
- Crankcase cover (Right)
  - Dowel pins
  - Gasket (Crankcase cover)



4. Remove:
- Pressure plate ①



5. Remove:
- Clutch plates
  - Friction plates

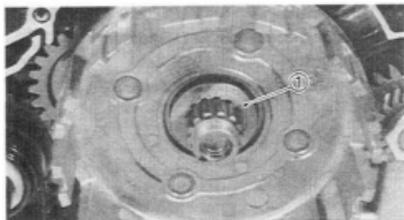


6. Straighten:
- Lock washer tab
7. Remove:
- Clutch boss ①

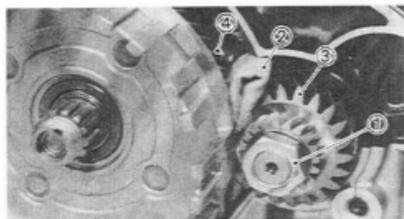
**NOTE:** \_\_\_\_\_  
 Hold the clutch boss to loosen the nut ② by the  
 Universal Clutch Holder ③.



Universal Clutch Holder:  
 90890-04086



8. Remove:
- Thrust washer ①

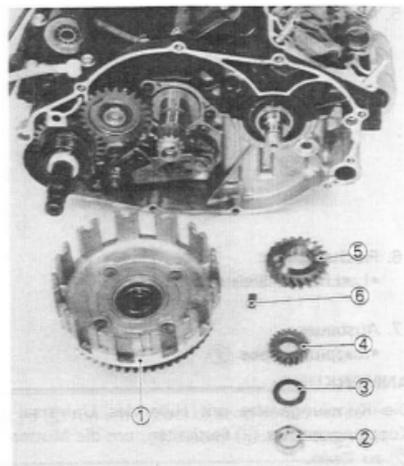


9. Loosen:
- Nut ① (Primary drive gear)

**NOTE:** \_\_\_\_\_

Place a folded rag ② between the teeth of the drive gear ③ and driven gear ④ to lock them.

---

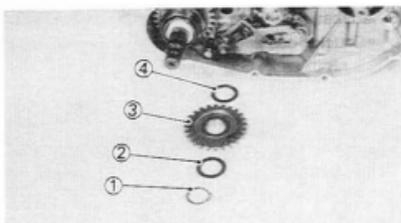


10. Remove:
- Clutch housing ①
  - Nut ② (Primary drive gear)
  - Conical spring washer ③
  - Water pump drive gear ④
  - Primary drive gear ⑤
  - Key ⑥

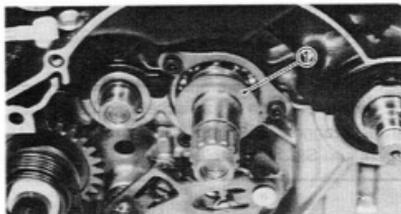
**KICK AXLE AND KICK IDLE GEAR****NOTE:** \_\_\_\_\_

With the engine mounted, the kick axle and kick idle gear can be maintained by removing the following parts.

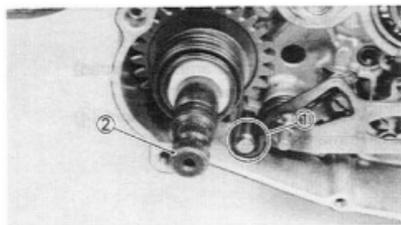
- Lower cowl (Right)
  - Outlet hose
  - Autolube pump cable and hose
  - Crankcase cover (Right)
  - Clutch
-



1. Remove:
  - Circlip ①
  - Washer ②
  - Kick idle gear ③
  - Washer ④



2. Remove:
  - Thrust washer ① (Clutch housing)



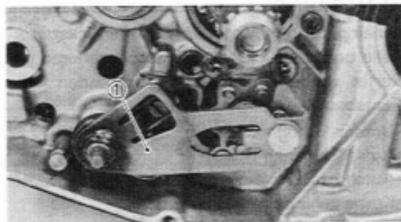
3. Unhook:
  - Return spring ①
4. Remove:
  - Kick axle ②

### SHIFT SHAFT

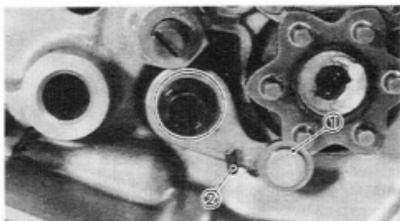
NOTE: \_\_\_\_\_

With the engine mounted, the shift shaft can be maintained by removing the following parts.

- Lower cowl (Right)
  - Outlet hose
  - Autolube pump cable and hose
  - Crankcase cover (Right)
  - Clutch
- 



1. Remove:
  - Shift shaft ①



2. Remove:

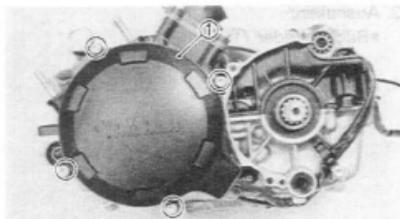
- Stopper lever ①
- Return spring ②

### C.D.I. MAGNETO

#### NOTE:

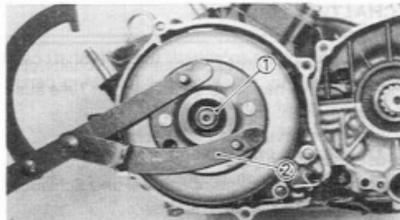
With the engine mounted, the CDI magneto can be maintained by removing the following parts.

- Lower cowls
- Seat



1. Remove:

- A.C. generator cover ①

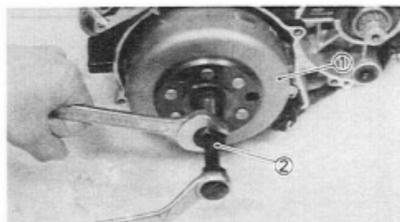


2. Remove:

- Nut ① (Rotor)

#### NOTE:

Hold the rotor to loosen the nut by the Universal Rotor Holder ②.



3. Remove:

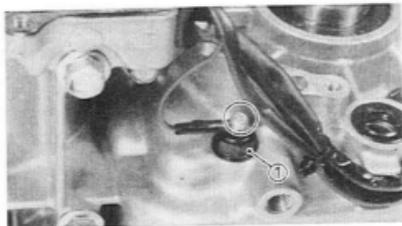
- Rotor ①
  - Woodruff key
- Use the Flywheel Puller ②.



**Universal Rotor Holder:**  
90890-01235

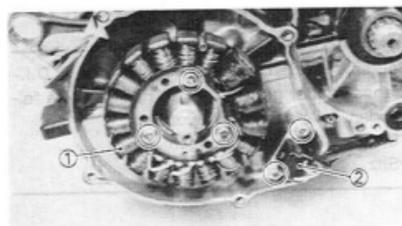


**Flywheel Puller:**  
90890-01189



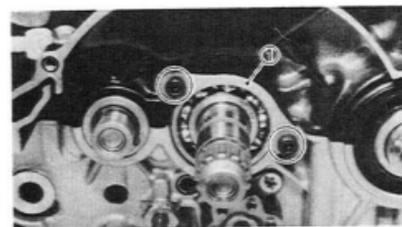
## 4. Loosen:

- Screw (Neutral switch ①)



## 5. Remove:

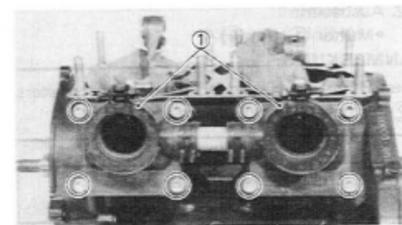
- Stator coil ①
- Pickup coil ②



## CRANKCASE (UPPER)

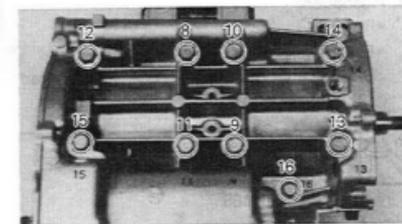
## 1. Remove:

- Bearing holder ①



## 2. Remove:

- Carburetor joints ①
- Reed valves
- Spacers
- Gaskets

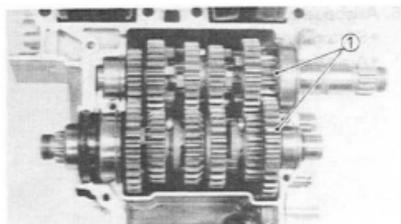
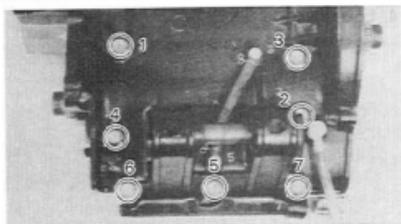


## 3. Remove:

- Crankcase (Upper)

## NOTE:

- Loosen the bolts starting with the highest numbered one.
- Loosen each bolt 1/4 turn, and remove them after all bolts are loosened.



### TRANSMISSION, SHIFTER AND CRANKSHAFT

#### 1. Remove:

- Transmission assembly ①
- Stopper rings



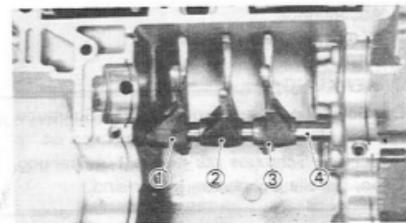
#### 2. Remove:

- Stopper plate ① (Shift cam)



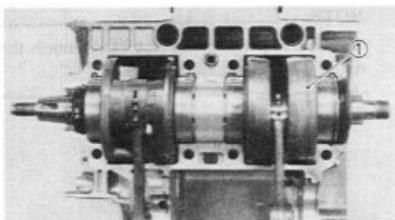
#### 3. Remove:

- Shift cam ①

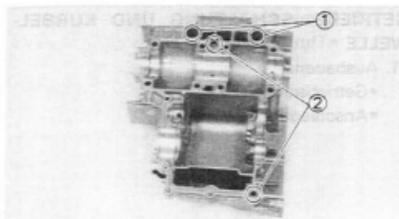


#### 4. Remove:

- Shift fork # 1 ①
- Shift fork # 2 ②
- Shift fork # 3 ③
- Guide bar ④



5. Remove:
- Crankshaft assembly ①
  - Stopper ring



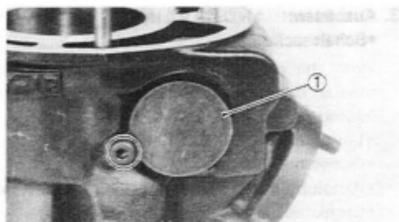
6. Remove:
- O-rings ①
  - Dowel pins ②

### POWER VALVES

#### NOTE:

With the engine mounted, the power valves can be maintained by removing the following parts.

- Lower cowls
- Mufflers
- Y.P.V.S. cables
- Radiator
- Cylinder head
- Cylinder



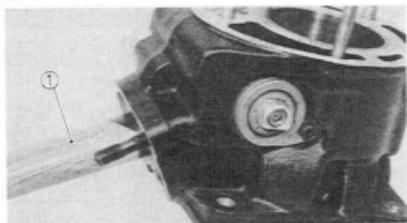
1. Remove:
- Power valve holder ①

#### NOTE:

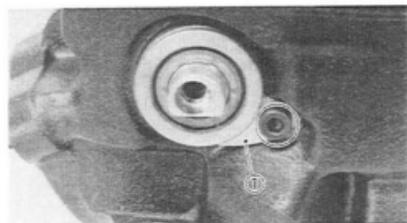
Remove the holder to maintain the power valve in the right-hand cylinder.



2. Remove:
- Bolt (Power valve)

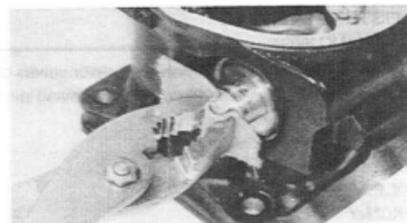
**NOTE:**

If stiff, use a wooden piece (1) through the exhaust port to steady the valve.



## 3. Remove:

- Thrust plate (1)



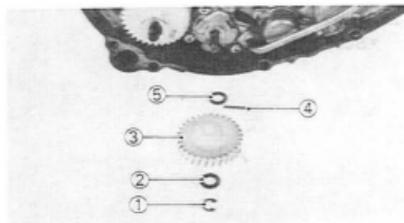
## 4. Remove:

- Power valve (1)

**OIL PUMP AND STRAINER****NOTE:**

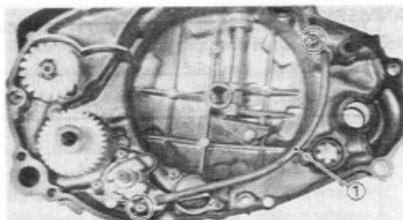
With the engine mounted, the oil pump and strainer can be maintained by removing the following parts.

- Lower cowl (Right)
- Outlet hose
- Autolube pump cable and hose
- Crankcase cover (Right)

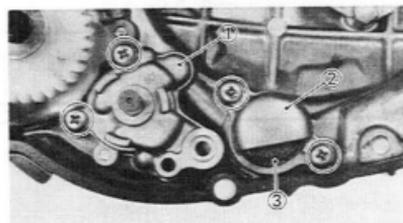


## 1. Remove:

- Circlip (1)
- Washer (2)
- Oil pump gear (3)
- Pin (4)
- Washer (5)



2. Remove:
- Oil delivery pipe ①
  - O-rings



3. Remove:
- Oil pump ①
  - Strainer cover ②
  - Strainer ③



## INSPECTION AND REPAIR CYLINDER HEAD

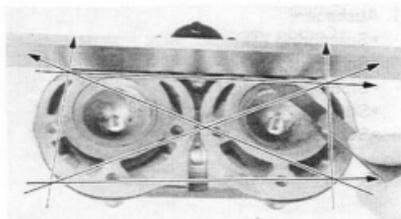
1. Eliminate:
- Carbon deposits
- Use a rounded scraper ①.

**NOTE:** \_\_\_\_\_

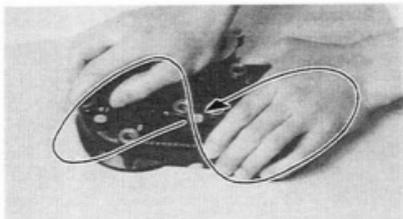
Take care to avoid damaging the spark plug threads. Do not use a sharp instrument. Avoid scratching the aluminum.

2. Inspect:
- Cylinder head water jacket.
- Crust of minerals/Rust → Remove.

3. Measure:
- Cylinder head warpage
- Out of specification → Resurface.



**Warpage Limit:**  
0.03 mm (0.0012 in)

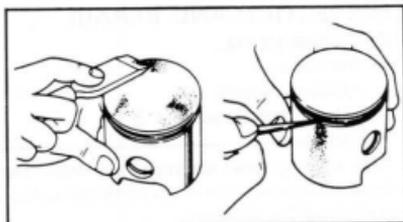


#### Warpage measurement and resurfacing steps:

- Attach a straight edge and a thickness gauge on the cylinder head.
- Measure the warpage.
- If the warpage is out of specification, resurface the cylinder head.
- Place a 400 – 600 grit wet sandpaper on the surface plate, and resurface the head using a figure-eight sanding pattern.

#### NOTE:

Rotate the head several times to avoid removing too much material from one side.

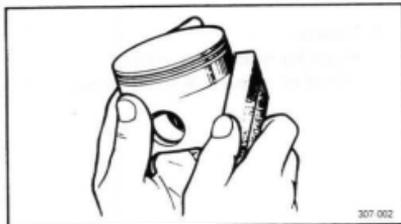


#### CYLINDER AND PISTON

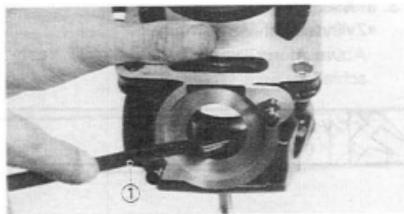
1. Eliminate:
  - Carbon deposits  
From the piston crown and ring grooves.
2. Eliminate:
  - Score marks and lacquer deposits  
From the sides of piston.  
Use a 600 – 800 grit wet sandpaper.

#### NOTE:

Sand in a crisscross pattern. Do not sand excessively.



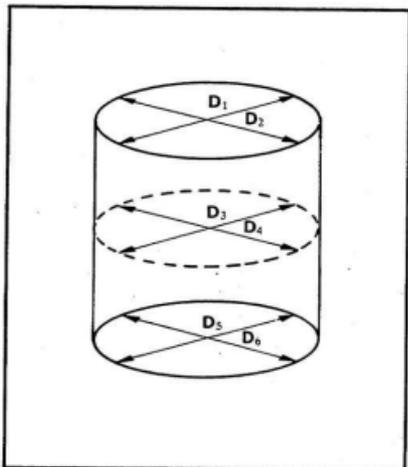
3. Inspect:
  - Piston wall  
Wear/Scratches/Damage → Replace.
4. Eliminate:
  - Carbon deposits  
Use a rounded scraper ①.





## 5. Inspect:

- Cylinder water jacket  
Crust of minerals/Rust → Remove.
- Cylinder wall  
Wear/Scratches → Rebore or replace.



## 6. Measure:

- Piston-to-cylinder clearance

**Piston-to-cylinder clearance measurement steps:**

## First step:

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

**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"	56.40 – 56.42 mm (2.220 – 2.221 in)	56.5 mm (2.224 in)
Taper "T"	–	0.05 mm (0.0019 in)
Out of Round "R"	–	0.05 mm (0.0019 in)

**C = Maximum D**

**T = (Maximum D<sub>1</sub> or D<sub>2</sub>) –  
(Maximum D<sub>5</sub> or D<sub>6</sub>)**

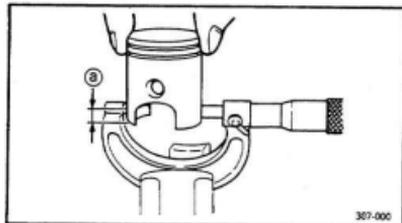
**R = (Maximum D<sub>1</sub>, D<sub>3</sub> or D<sub>5</sub>) –  
(Minimum D<sub>2</sub>, D<sub>4</sub> or D<sub>6</sub>)**

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

## 2nd step:

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

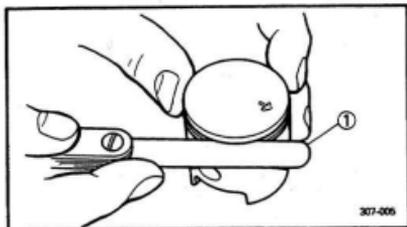
- ③ 15.0 mm (0.59 in) from the piston bottom edge.



307-000



	Piston Size P
Standard	56.39 ~ 56.40 mm (2.220 in)
Oversize 1	56.65 mm (2.23 in)
Oversize 2	56.90 mm (2.24 in)
<ul style="list-style-type: none"> <li>• If out of specification, replace piston and piston rings as a set.</li> </ul> 3rd step: <ul style="list-style-type: none"> <li>• Calculate the piston-to-cylinder clearance with following formula:</li> </ul>	
<b>Piston-to-cylinder Clearance = Cylinder Bore "C" – Piston Skirt Diameter "P"</b>	
<ul style="list-style-type: none"> <li>• If out of specification, rebore or replace cylinder, and replace piston and piston rings as a set.</li> </ul>	
	<b>Piston-to-cylinder Clearance:</b> 0.050 ~ 0.055 mm (0.0019 ~ 0.0021 in) <b>Limit: 0.1 mm (0.004 in)</b>



307-005

**PISTON RINGS**

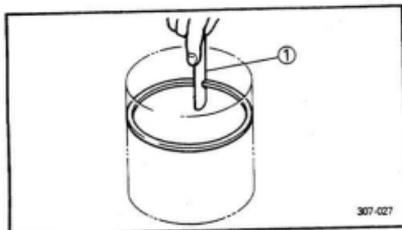
## 1. Measure:

- Side clearance

Out of specification → Replace piston and/or rings.

Use a Feeler Gauge ①.

	Side Clearance	Top	0.020 ~ 0.060 mm (0.0008 ~ 0.0024 in)
		2nd	0.030 ~ 0.065 mm (0.0012 ~ 0.0026 in)



## 2. Install:

- Piston ring  
(Into the cylinder)  
Push the ring with the piston crown.

## 3. Measure:

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

	End Gap	Top	0.30 – 0.45 mm (0.012 – 0.018 in)
		2nd	0.30 – 0.45 mm (0.012 – 0.018 in)

Oversize Piston Ring	
Oversize 1	25
Oversize 2	50

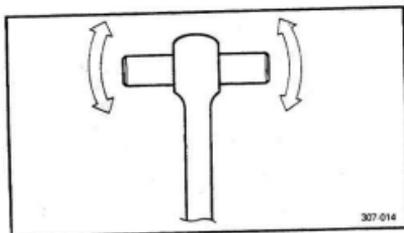
## PISTON PIN AND BEARING

## 1. Lubricate:

- Piston pin (Lightly)

## 2. Install:

- Small end bearing
- Piston pin  
(Into the small end of connecting rod)

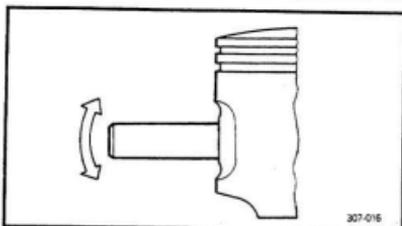


## 3. Check:

- Free play  
There should be no noticeable for the play.  
Free play exists → Inspect the connecting rod for wear/ Replace the pin and/or connecting rod as required.

## 4. Install:

- Piston pin  
(Into the piston pin hole).



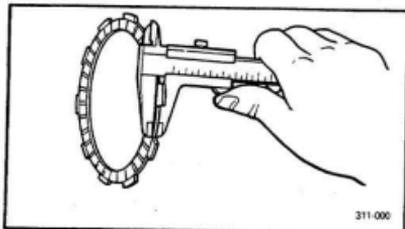
307-016

## 5. Check:

- Free play (when the piston pin is in place in the piston)  
There should be no noticeable for the play.  
Free play exists → Replace piston pin and/or piston.

## 6. Inspect:

- Piston pin and bearing  
Signs of heat discoloration → Replace.



311-000

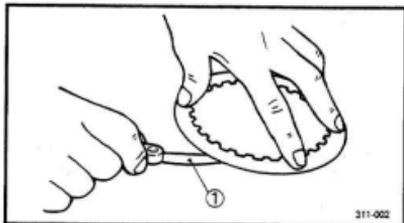
**CLUTCH**

## 1. Inspect:

- Friction plate  
Damage/Wear → Replace friction plate as a set.

## 2. Measure:

- Friction plate thickness  
Out of specification → Replace friction plate as a set.  
Measure at all four point.

**Wear Limit: 2.8 mm (0.11 in)**

311-002

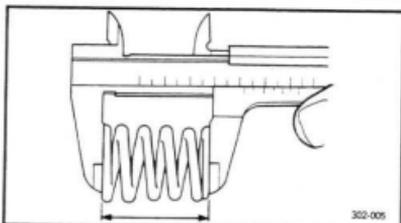
## 3. Inspect:

- Clutch plate  
Damage → Replace clutch plate as a set.

## 4. Measure:

- Clutch plate warpage  
Out of specification → Replace clutch plate as a set.  
Use a surface plate and Feeler Gauge ①.

**Warp Limit: 0.1 mm (0.004 in)**

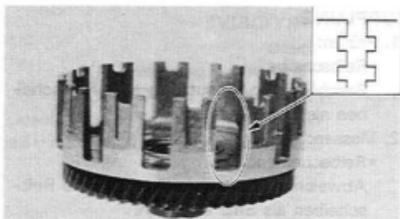


## 5. Measure:

- Clutch spring free length
- Out of specification → Replace spring as a set.



**Clutch Spring Minimum Length:**  
32.9 mm (1.295 in)



## 6. Inspect:

- Dogs on the clutch housing
- Cracks/Wear/Damage → Deburr or replace.
- Clutch housing bearing
- Scoring/Wear/Damage → Replace clutch housing.

**NOTE:** \_\_\_\_\_

Scoring on the clutch housing dogs will cause erratic operation.



## 7. Inspect:

- Clutch boss splines
- Scoring/Wear/Damage → Replace clutch boss.

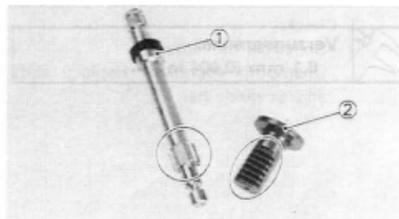
**NOTE:** \_\_\_\_\_

Scoring on the clutch boss splines will cause erratic operation.



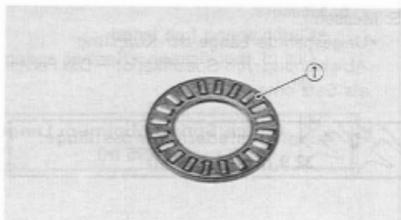
## 8. Check:

- Circumferential play
- Free play exists → Replace.



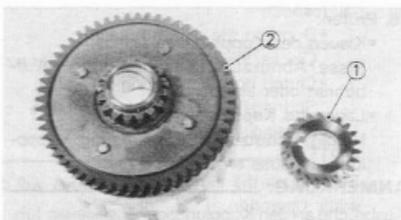
## 9. Inspect:

- Pull lever ①
- Pull rod ②
- Wear/Damage → Replace.



10. Inspect:

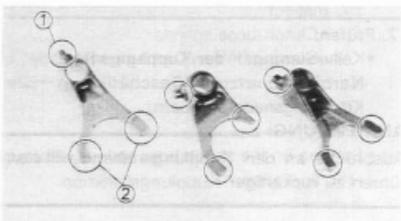
- Bearing ① (Pull rod)
- Wear/Damage → Replace.



#### PRIMARY DRIVE

1. Inspect:

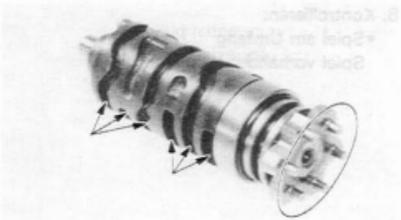
- Primary drive gear teeth ①
- Primary driven gear teeth ②
- Wear/Damage → Replace both gears.
- Excessive noises during operation → Replace both gears.



#### TRANSMISSION AND SHIFTER

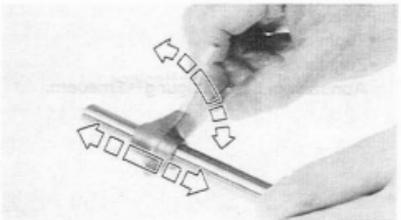
1. Inspect:

- Shift fork cam follower ①
- Shift fork pawl ②
- Scoring/Bends/Wear → Replace.



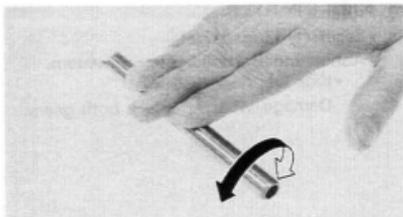
2. Inspect:

- Shift cam groove
- Shift cam segment
- Wear/Damage → Replace.



3. Check:

- Shift fork movement
- Unsmooth operation → Replace shift fork and/or guide bar.



## 4. Inspect:

- Guide bar
- Roll the guide bar on a flat surface.
- Bends → Replace.

**WARNING:**

**Do not attempt to straighten a bent guide bar.**

## 5. Measure:

- Axle runout
- Use centering device and dial gauge.
- Out of specification → Replace bent axle.



**Runout Limit:**  
**0.08 mm (0.003 in)**

## 6. Inspect:

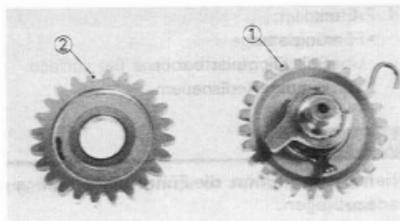
- Gear teeth
- Blue discoloration/Pitting/Wear → Replace.
- Mated dogs
- Rounded edges/Cracks/Missing portions → Replace.

## 7. Check:

- Proper gear engagement (Each gear)  
(to its counter part)
- Incorrect → Reassemble.
- Gear movement
- Roughness → Replace.

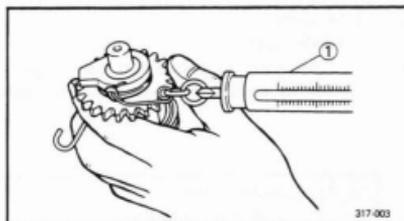
## 8. Inspect:

- Circlips
- Damage/Looseness/Bends → Replace.

**KICK STARTER**

## 1. Inspect:

- Kick gear teeth ①
  - Kick idle gear teeth ②
- Damage/wear → Replace both gears.



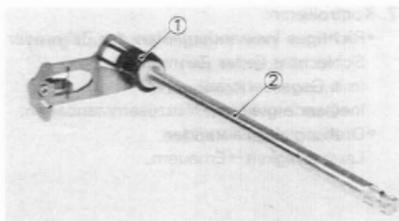
## 2. Measure:

- Kick clip tension
- Out of specification → Replace.  
Use a spring balance ①.

**Kick Clip Tension:**  
0.8 ~ 1.3 kg (1.76 ~ 2.87 lb)

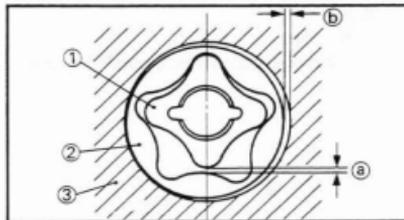
**CAUTION:**

Do not try to bend the clip.

**SHIFT SHAFT**

## 1. Inspect:

- Spring ①
  - Shift shaft ②
- Damage → Replace.  
Damage/Bends/Wear → Replace.

**OIL PUMP**

## 1. Measure:

- Tip clearance a
  - (between inner rotor ① and outer rotor ②)
  - Side clearance b
  - (between outer rotor ② and pump housing ③)
- Out of specifications → Replace oil pump.

**Oil Pump Clearance:**

Tip Clearance <Limit>	0.10 - 0.15 mm (0.004 - 0.006 in) <0.17 mm (0.007 in)>
Side Clearance <Limit>	0.04 - 0.09 mm (0.002 - 0.004 in) <0.12 mm (0.005 in)>

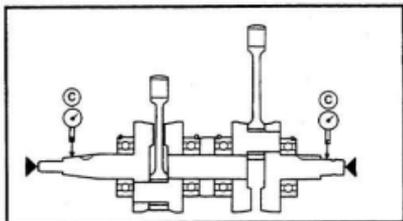
**AUTOLUBE PUMP**

Wear or an internal malfunction may cause pump output to vary from the factory setting. This situation is, however, extremely rare. If improper output is suspected, inspect the following:

- Inspect:
  - Delivery line  
Obstructions → Blow out.
  - Pump body seal/Crankcase cover seal  
Wear/Damage → Replace.
  - Check ball/Spring  
Miss/Improper → Repair.
- Inspect:
  - Allowing air  
Air exists → Air bleed.
- Check:
  - Pump output  
Out of specification → Adjust.

**Minimum Output/200 Stroke:**  
0.75 - 1.00 cm<sup>3</sup> (0.026 - 0.035 Imp oz,  
0.025 - 0.034 US oz)

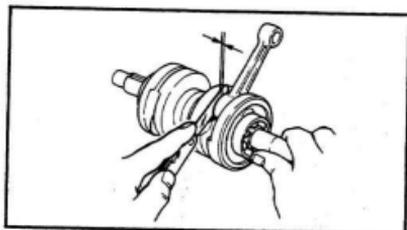
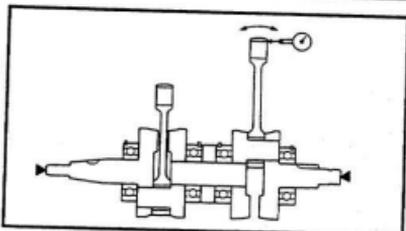
**Maximum Output/200 Stroke:**  
10.3 - 11.4 cm<sup>3</sup> (0.36 - 0.40 Imp oz,  
0.35 - 0.39 US oz)

**CRANKSHAFT**

- Measure:
  - Runout  
Use a centering device and Dial Gauge.  
Out of specification → Replace or repair.



**Runout Limit:**  
0.03 mm (0.0012 in)



## 2. Measure:

- Small end free play

Use a Dial Gauge

Out of specification → Replace the defective parts.

**Small End Free Play:**

0.4 – 0.6 mm (0.016 – 0.024 in)

< Limit > :

< 1.0 mm (0.039 in) >

## 3. Measure:

- Big end side clearance

Use a Feeler Gauge.

Out of specification → Replace the defective parts.

**Big End Side Clearance:**

0.25 – 0.75 mm (0.010 – 0.030 in)

< Limit > :

< 1.0 mm (0.039 in) >

## 4. Inspect:

- Crankshaft bearing

Pitting/Damage → Replace.

**NOTE:** \_\_\_\_\_

Lubricate the bearing immediately after examining them to prevent rust.

## 5. Inspect:

- Stopper rings

Bend/Damage → Replace.

- Oil seals

Wear/Damage → Replace.

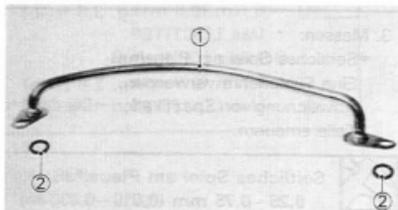
**CRANKCASE**

1. Thoroughly wash the case halves in mild solvent.
2. Clean all the gasket mating surfaces and crankcase mating surfaces thoroughly.



## 3. Inspect:

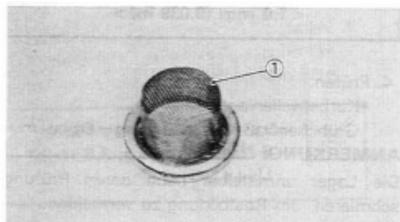
- Crankcase  
Cracks/ Damage→Replace.
- Oil delivery passages  
Clog→Blow out with compressed air.



## OIL PIPE AND STRAINER

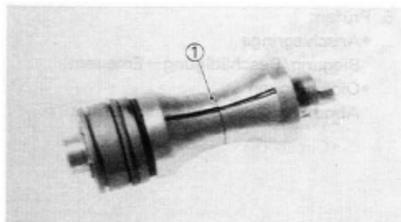
## 1. Inspect:

- Oil delivery pipe ①  
Cracks/ Damage→Replace.  
Clog→Blow out with compressed air.
- O-rings ②  
Damage→Replace.



## 2. Inspect:

- Oil strainer ①  
Damage→Replace



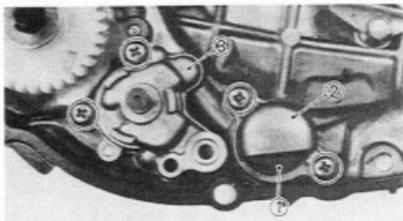
## POWER VALVE

## 1. Remove:

- Score marks and lacquer deposits  
From curved surface (especially cleaning  
groove ①).

## 2. Inspect:

- O-rings
- Bushes
- Oil seals  
Wear/Damage→Replace.



## ENGINE ASSEMBLY AND ADJUSTMENT

### OIL PUMP AND STRAINER

1. Install:

- Strainer ①
- Strainer cover ②
- Oil pump ③



**Screws (Strainer Cover):**

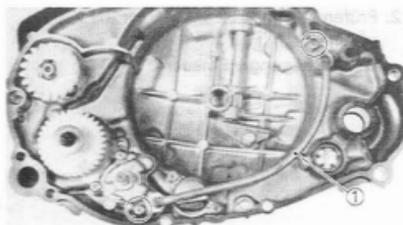
5 Nm (0.5 m·kg, 3.6 ft·lb)

Use LOCTITE®.

**Screws (Oil Pump):**

5 Nm (0.5 m·kg, 3.6 ft·lb)

Use LOCTITE®.



2. Install:

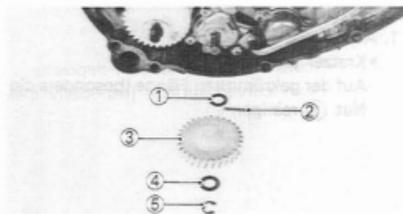
- O-rings
- Oil delivery pipe ①



**Screws (Oil Delivery Pipe):**

5 Nm (0.5 m·kg, 3.6 ft·lb)

Use LOCTITE®.



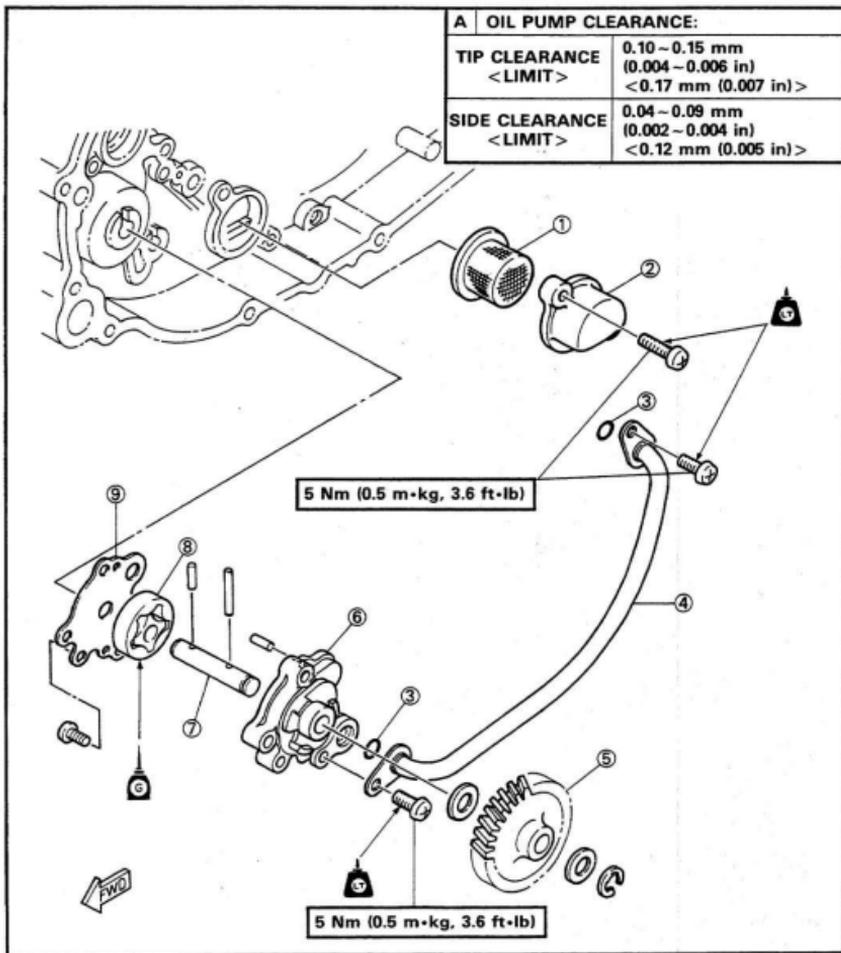
3. Install:

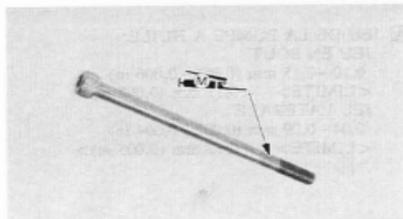
- Washer ①
- Pin ②
- Oil pump gear ③
- Washer ④
- Circlip ⑤



**OIL PUMP AND STRAINER**

- ① Strainer
- ② Strainer housing
- ③ O-ring
- ④ Oil delivery pipe
- ⑤ Oil pump gear
- ⑥ Oil pump housing
- ⑦ Shaft
- ⑧ Rotor
- ⑨ Oil pump cover

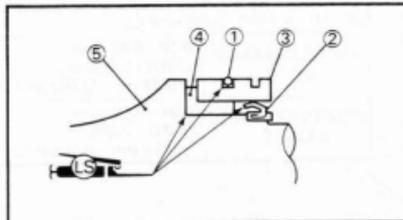




## POWER VALVES

## 1. Apply:

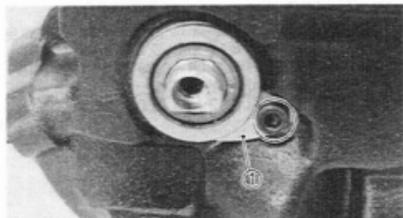
- Molybdenum disulfide grease  
To hexagon socket head bolts.



## 2. Apply:

- Lithium soap base grease

- ① O-ring
- ② Oil seal
- ③ Holder
- ④ Solid bush
- ⑤ Power valve



## 3. Install:

- Half power valve (Left)
- Knock pins
- Half power valve (Right)
- Thrust plate ①

**Bolt (Thrust Plate):**

**7 Nm (0.7 m·kg, 5.1 ft·lb)**

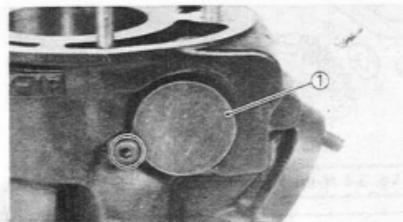


## 4. Tighten:

- Bolt (Power valve)

**Bolt (Power Valve):**

**7 Nm (0.7 m·kg, 5.1 ft·lb)**



## 5. Install:

- Power valve holder ①

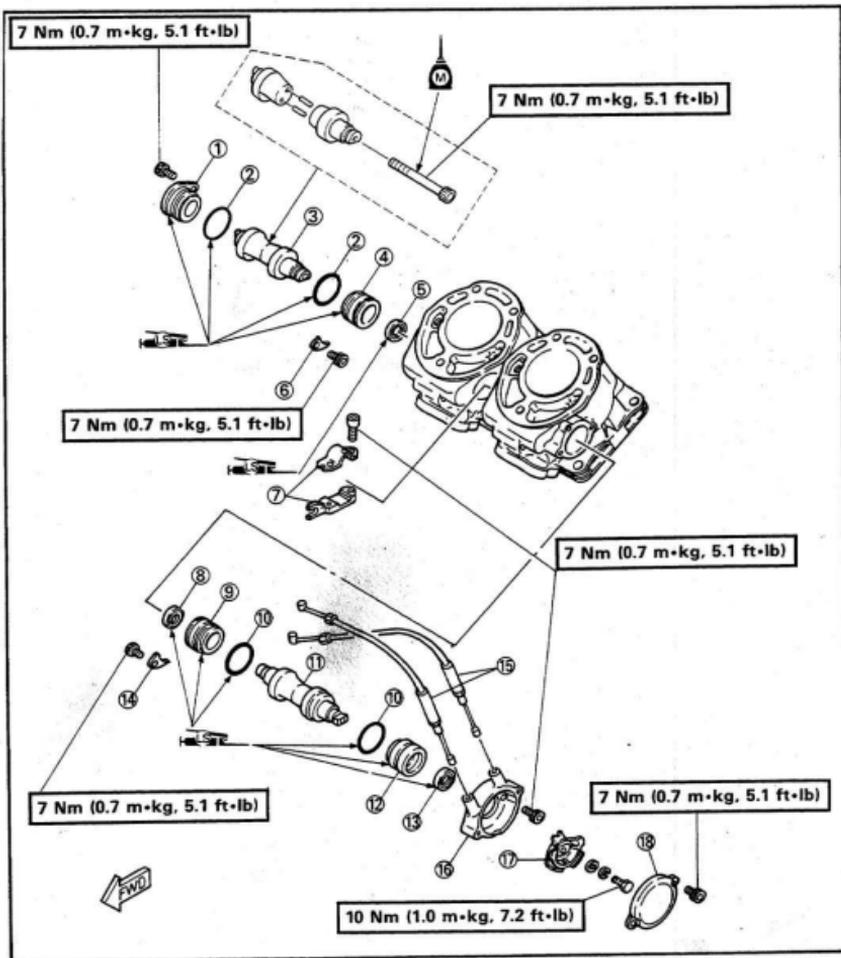
**Bolt (Power Valve Holder):**

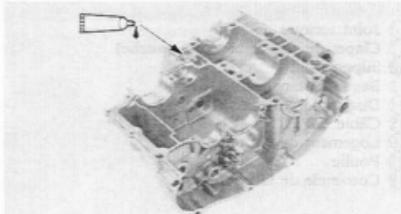
**7 Nm (0.7 m·kg, 5.1 ft·lb)**



### POWER VALVE

- |                            |                           |
|----------------------------|---------------------------|
| ① Power valve holder       | ⑩ O-ring                  |
| ② O-ring                   | ⑪ Power valve (Left-hand) |
| ③ Power valve (Right-hand) | ⑫ Holder                  |
| ④ Power valve holder       | ⑬ Oil seal                |
| ⑤ Oil seal                 | ⑭ Thrust plate            |
| ⑥ Thrust plate             | ⑮ Y.P.V.S. cable          |
| ⑦ Joint                    | ⑯ Pulley housing          |
| ⑧ Oil seal                 | ⑰ Pulley                  |
| ⑨ Power valve holder       | ⑱ Pulley cover            |





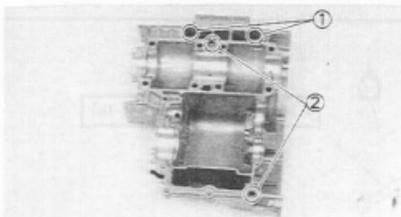
### TRANSMISSION, SHIFTER AND CRANKSHAFT

#### 1. Apply:

- Yamaha Bond No. 4  
To the mating surfaces of both crankcase halves.

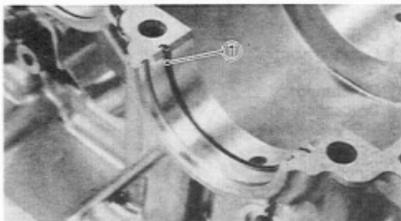


**Yamaha Bond No. 4:**  
**90890-05143**



#### 2. Install:

- O-rings ①
- Dowel pins ②  
Onto the crankcase (Lower)

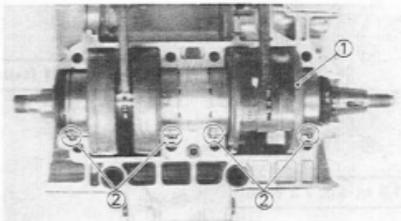


#### 3. Install:

- Stopper ring ①  
On the clutch side.

#### 4. Apply:

- Lithium soap base grease  
To the oil seal lips.
- Engine oil  
To the bearings.

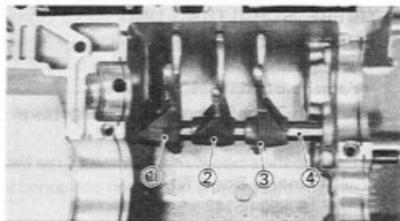


#### 5. Install:

- Crankshaft assembly ①

#### NOTE:

- Align the bearing knock pin ② with the pin slot in the crankcase lower half.
- Be sure the stopper ring is fitted to the bearing and the stopper ring have been positioned in the ring groove.

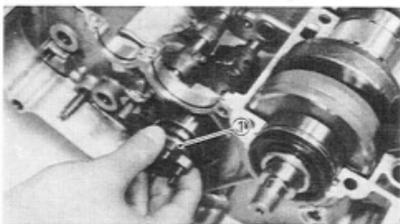


## 6. Install:

- Shift fork #1 ①
- Shift fork #2 ②
- Shift fork #3 ③
- Guide bar ④

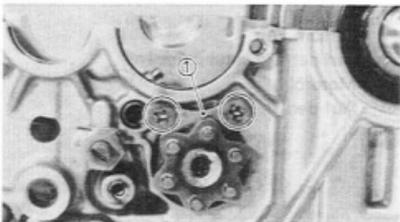
**NOTE:**

Each shift fork is identified by a number cast on its side. All the numbers should face right side.



## 7. Install:

- Shift cam ①



## 8. Install:

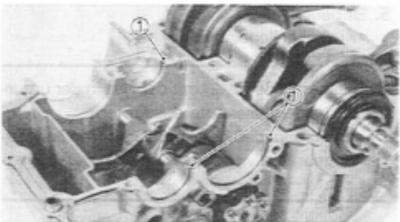
- Stopper plate ① (Shift cam)



**Screws (Stopper Plate):**  
 8 Nm (0.8 m•kg, 5.8 ft•lb)  
 Use LOCTITE®.

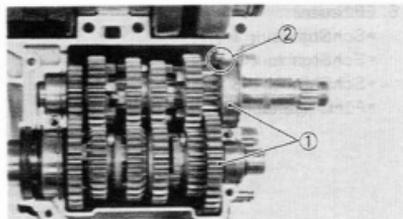
**NOTE:**

Be sure the stopper plate is fitted in the groove of the shift cam.



## 9. Install:

- Stopper rings ①



## 10. Install:

- Transmission assembly ①

**NOTE:**

- Align the bearing knock pin ② with the pin slot in the crankcase lower half.
- Be sure the stopper ring is fitted to the bearing and the stopper ring have been positioned in the ring groove.



## 11. Check:

- Shifter and transmission operation  
Unsmooth operation → Repair.



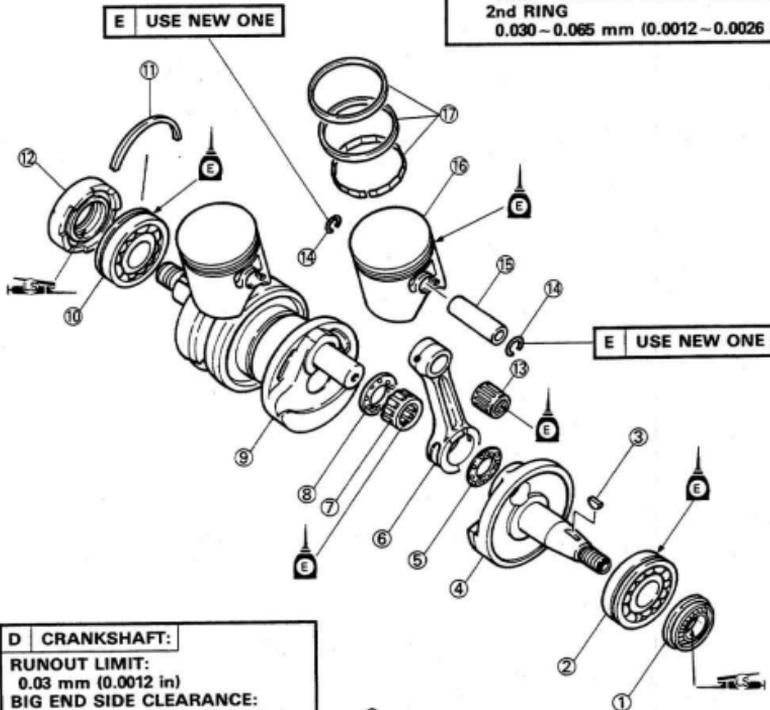
## CRANKSHAFT, PISTON AND PISTON RING

- |                   |                     |
|-------------------|---------------------|
| ① Oil seal        | ⑩ Bearing           |
| ② Bearing         | ⑪ Circlip           |
| ③ Woodruff key    | ⑫ Oil seal          |
| ④ Crank (Left)    | ⑬ Small end bearing |
| ⑤ Washer          | ⑭ Piston pin clip   |
| ⑥ Connecting rod  | ⑮ Piston pin        |
| ⑦ Big end bearing | ⑯ Piston            |
| ⑧ Washer          | ⑰ Piston ring set   |
| ⑨ Crank (Right)   |                     |

**A PISTON TO CYLINDER CLEARANCE:**  
 0.050–0.055 mm (0.0019–0.0021 in)  
 <LIMIT>  
 <0.1 mm (0.004 in)>

**B END GAP (INSTALLED):**  
**TOP RING**  
 0.30–0.45 mm (0.012–0.018 in)  
**2nd RING**  
 0.30–0.45 mm (0.012–0.018 in)

**C SIDE CLEARANCE:**  
**TOP RING**  
 0.020–0.060 mm (0.0008–0.0024 in)  
**2nd RING**  
 0.030–0.065 mm (0.0012–0.0026 in)



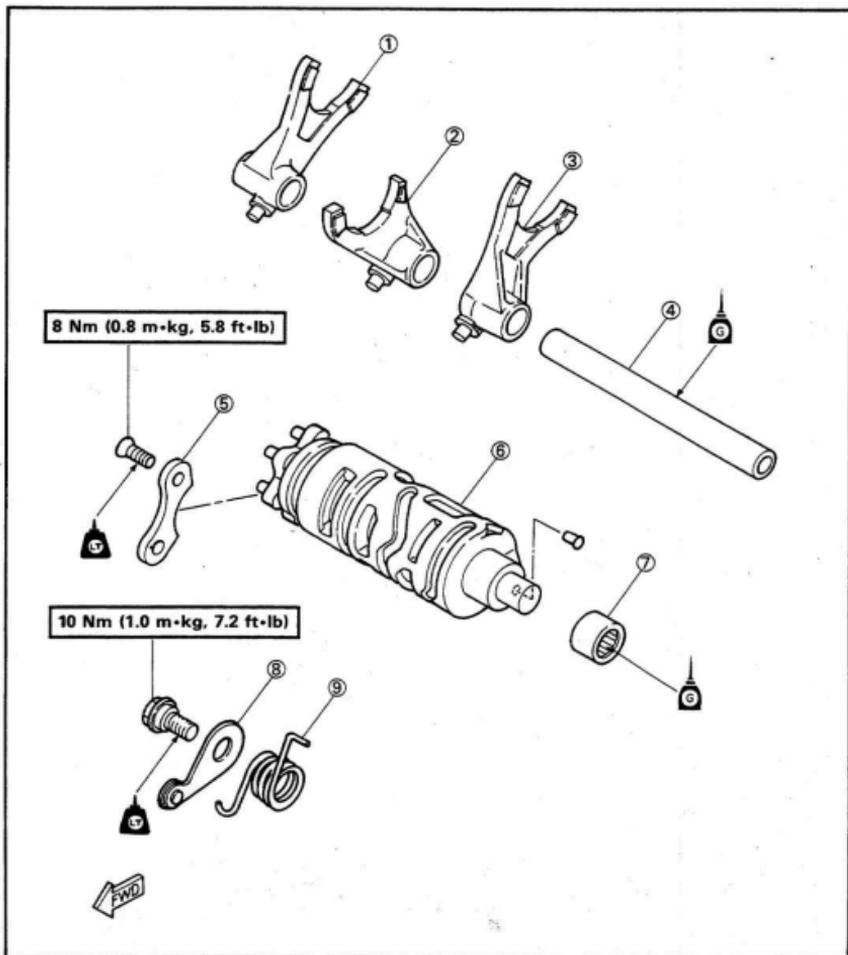
**D CRANKSHAFT:**

**RUNOUT LIMIT:**  
 0.03 mm (0.0012 in)  
**BIG END SIDE CLEARANCE:**  
 0.25–0.75 mm (0.01–0.03 in)  
**SMALL END FREE PLAY:**  
 0.4–0.6 mm (0.016–0.024 in)



## SHIFTER

- ① Shift fork #3
- ② Shift fork #2
- ③ Shift fork #1
- ④ Guide bar
- ⑤ Stopper plate
- ⑥ Shift cam
- ⑦ Bearing
- ⑧ Stopper lever
- ⑨ Return spring



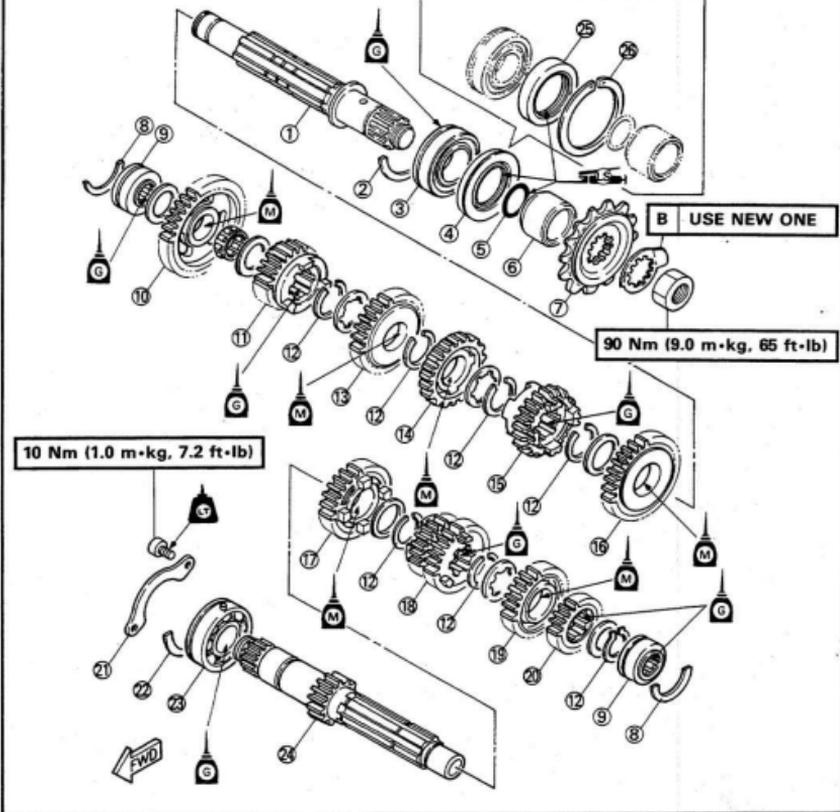


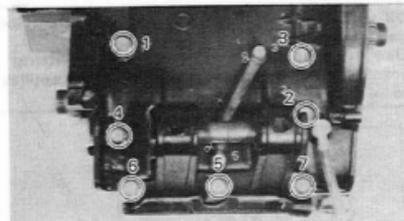
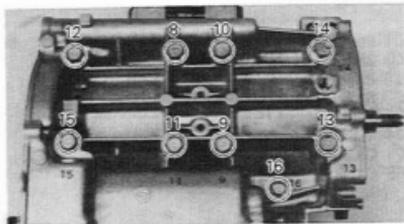
## TRANSMISSION

- |                  |                       |                   |
|------------------|-----------------------|-------------------|
| ① Drive axle     | ⑩ 1st wheel gear      | ⑲ 5th pinion gear |
| ② Stopper ring   | ⑪ 6th wheel gear      | ⑳ 2nd pinion gear |
| ③ Bearing        | ⑫ Circlip             | ㉑ Bearing holder  |
| ④ Oil seal       | ⑬ 3rd wheel gear      | ㉒ Stopper ring    |
| ⑤ O-ring         | ⑭ 4th wheel gear      | ㉓ Bearing         |
| ⑥ Collar         | ⑮ 5th wheel gear      | ㉔ Main axle       |
| ⑦ Drive sprocket | ⑯ 2nd wheel gear      | ㉕ Oil seal        |
| ⑧ Stopper ring   | ⑰ 6th pinion gear     | ㉖ Circlip         |
| ⑨ Bearing        | ⑱ 3rd/4th pinion gear |                   |

**A** AXLE RUNOUT LIMIT:  
0.08 mm (0.003 in)

Oil seal ㉕ and circlip ㉖ are available as service parts for oil seal ④.  
Use of ㉕ and ㉖ saves trouble of splitting crankcase for oil seal replacement. This applies to ④ only.



**CRANKCASE (UPPER)**

## 1. Install:

- Crankcase (Upper)

**Bolts tightening steps:**

- Temporarily tighten ① to ⑦ and next ⑧ to ⑮, in that order.
- Tighten ① to ⑦.

 **5 Nm (0.5 m·kg, 3.6 ft·lb)**

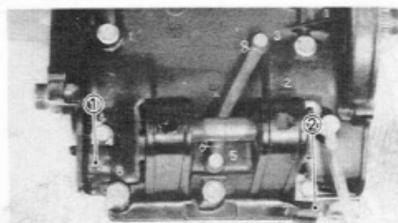
- Tighten ⑧ to ⑮.

 **10 Nm (1.0 m·kg, 7.2 ft·lb)**

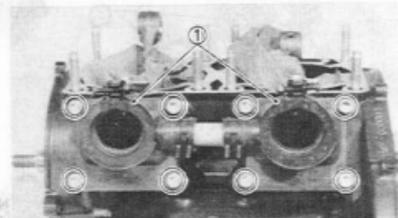
- Tighten ⑧ to ⑮.

 **24 Nm (2.4 m·kg, 17 ft·lb)**

- Tighten ① to ⑦ and ⑮.

 **10 Nm (1.0 m·kg, 7.2 ft·lb)**
**NOTE:**

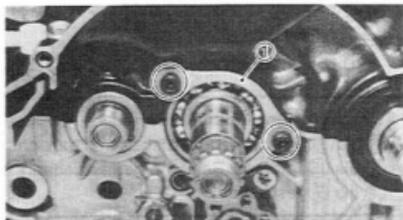
Install the clamp ① on the bolt No.4 and the clamp ② on the bolt No.7 as shown.



## 2. Install:

- Gaskets
- Spacers
- Reed valves
- Carburetor joints ①

 **Bolts (Carburetor Joint):  
10 Nm (1.0 m·kg, 7.2 ft·lb)**

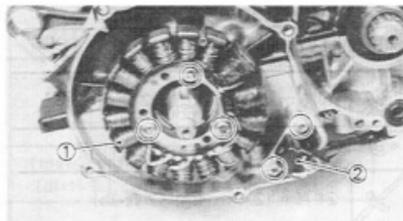


## 3. Install:

- Bearing holder ①



**Bolts (Bearing Holder):**  
 10 Nm (1.0 m•kg, 7.2 ft•lb)  
 Use LOCTITE®.



## C.D.I. MAGNETO

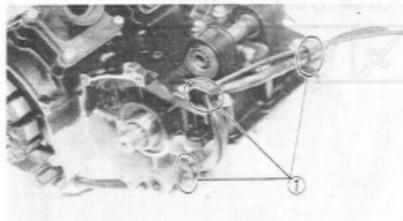
## 1. Install:

- Stator coil ①
- Pickup coil ②



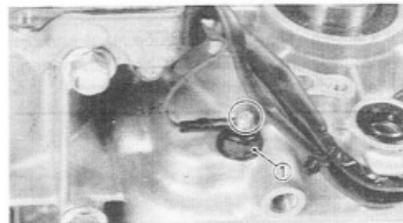
**Screws (Stator Coil):**  
 7 Nm (0.7 m•kg, 5.1 ft•lb)  
 Use LOCTITE®.

**Screws (Pickup Coil)**  
 5 Nm (0.5 m•kg, 3.6 ft•lb)  
 Use LOCTITE®.

**NOTE:**

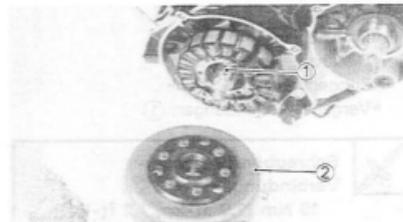
Clamp the C.D.I. magneto leads with the clamps

①



## 2. Install:

- Neutral switch lead ①

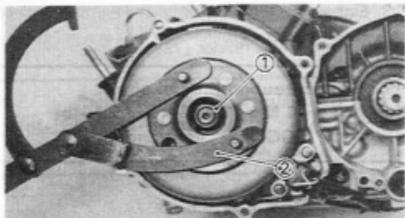


## 3. Install:

- Woodruff key ①
- Rotor ②

**NOTE:**

When installing the rotor, make sure the woodruff key is properly seated in the key way of the crankshaft. Apply a light coating of lithium soap base grease to the tapered portion of the crankshaft end.

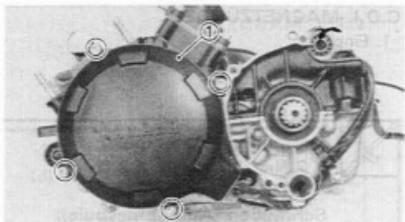


## 4. Tighten:

- Nut ① (Rotor)

**NOTE:**

Hold the rotor to tighten the nut by the Universal Rotor Holder ②.



**Universal Rotor Holder:**  
90890-01235



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

## 5. Install:

- A.C. generator cover ①



**Bolts (A.C. generator Cover):**  
5 Nm (0.5 m•kg, 3.6 ft•lb)

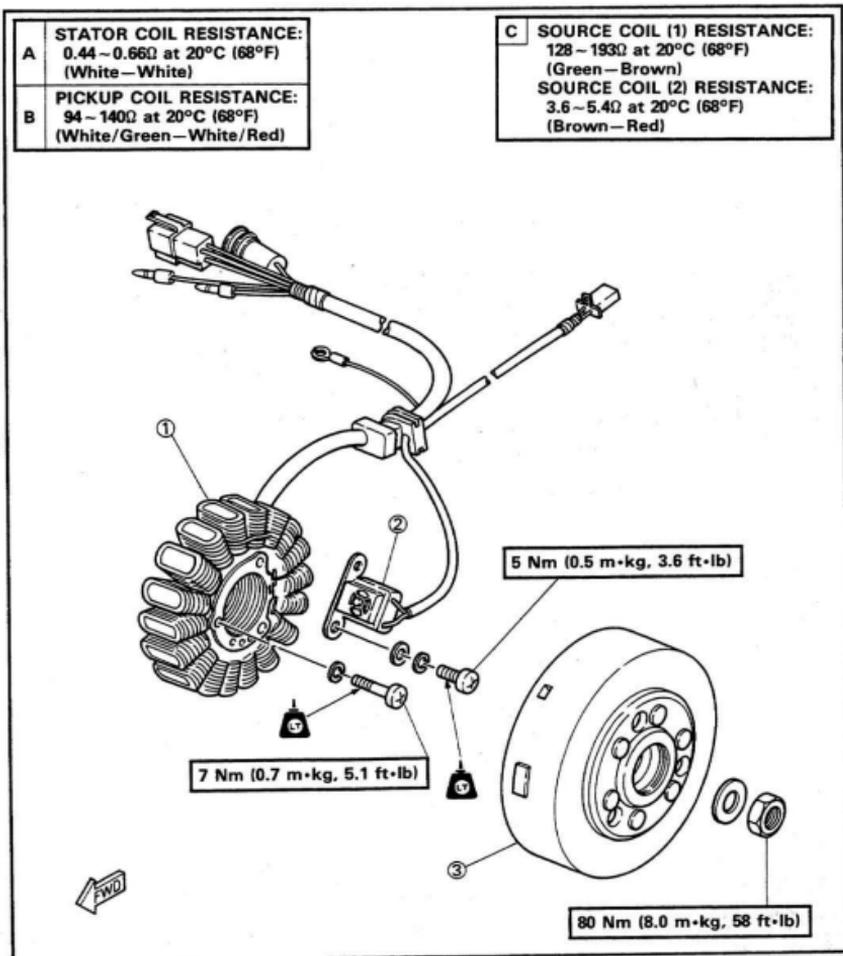


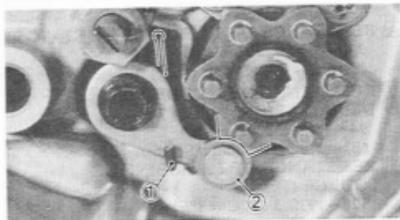
## C.D.I. MAGNETO

- ① Stator coil
- ② Pickup coil
- ③ Rotor

<b>A</b>	<b>STATOR COIL RESISTANCE:</b> 0.44 ~ 0.66Ω at 20°C (68°F) (White—White)
<b>B</b>	<b>PICKUP COIL RESISTANCE:</b> 94 ~ 140Ω at 20°C (68°F) (White/Green—White/Red)

<b>C</b>	<b>SOURCE COIL (1) RESISTANCE:</b> 128 ~ 193Ω at 20°C (68°F) (Green—Brown) <b>SOURCE COIL (2) RESISTANCE:</b> 3.6 ~ 5.4Ω at 20°C (68°F) (Brown—Red)
----------	--





### SHIFT SHAFT

1. Install:

- Return spring ①
- Stopper lever ②

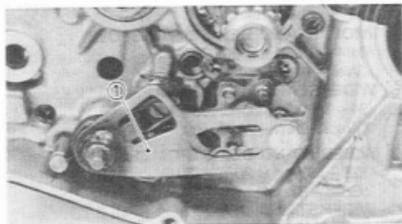


**Bolt (Stopper Lever):**

10 Nm (1.0 m·kg, 7.2 ft·lb)  
Use **LOCTITE®**.

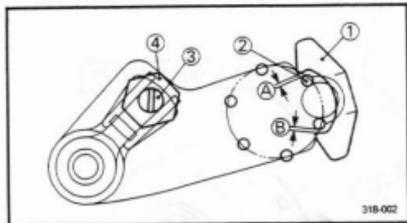
**NOTE:**

Mesh the stopper lever with the shift cam.



2. Install:

- Shift shaft ①



3. Check

- Change lever position
- Gap (A) and (B) are not equal → Adjust.

**Change lever position adjustment steps:**

- Straighten lock washer tab.
- Loosen lock nut ①.
- Turn adjuster ② in or out until gap (A) and (B) are equal.
- Tighten lock nut.



**Nut:**

30 Nm (3.0 m·kg, 22 ft·lb)  
Use **LOCTITE®**.

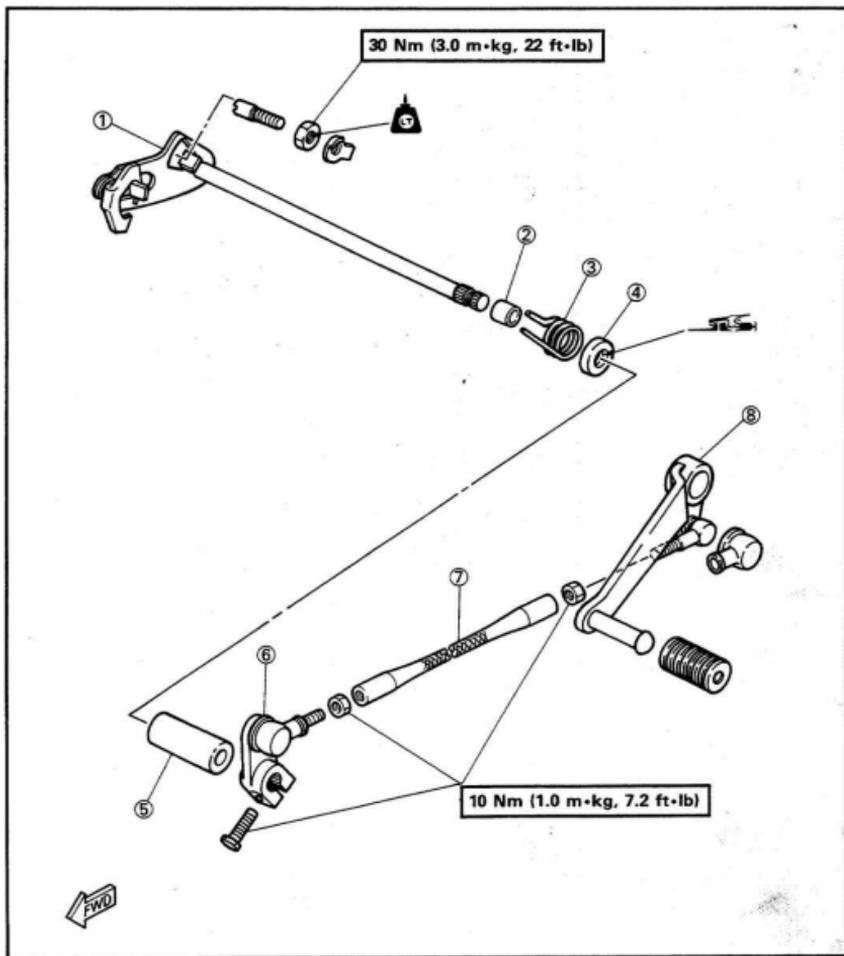
- Bend lock washer tab.

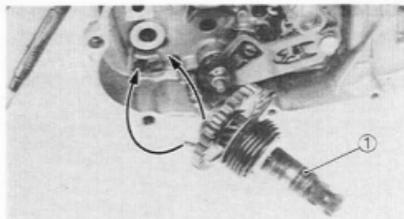
- ③ Segment
- ④ Change lever



## SHIFT SHAFT AND CHANGE PEDAL

- ① Shift shaft
- ② Spacer
- ③ Torsion spring
- ④ Oil seal
- ⑤ Collar
- ⑥ Shift arm
- ⑦ Shift rod
- ⑧ Change pedal



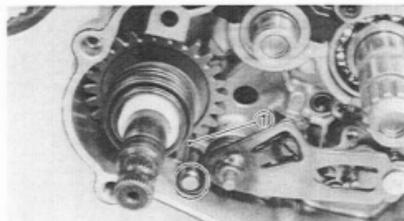
**KICK AXLE AND KICK IDLE GEAR**

1. Install:

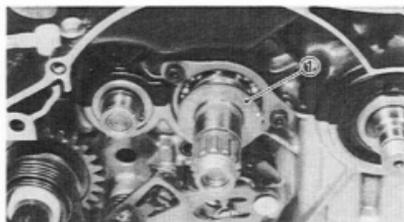
- Kick axle assembly ①

**NOTE:**

- Make sure that the kick stopper is stopped at the projection of the crankcase.
- Make sure that the kick clip is engaged with the crankcase hole.

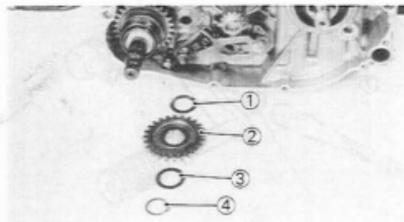


2. Set the kick spring ① to the spring hook.



3. Install:

- Thrust washer ① (Clutch housing)



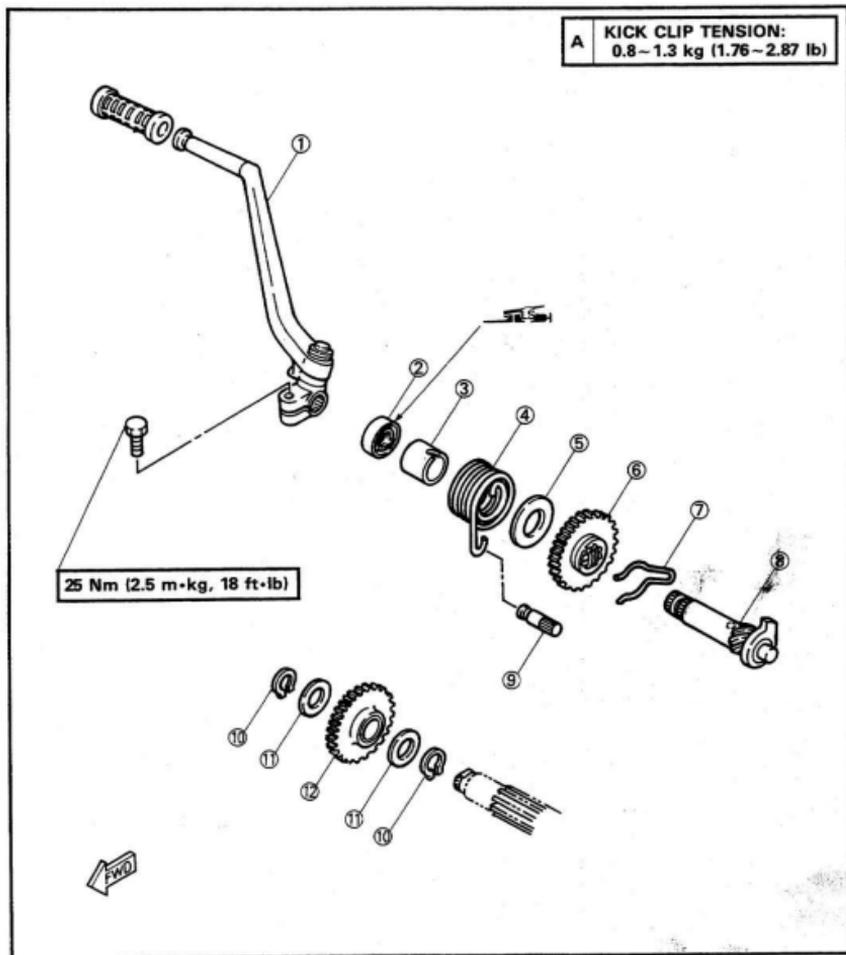
4. Install:

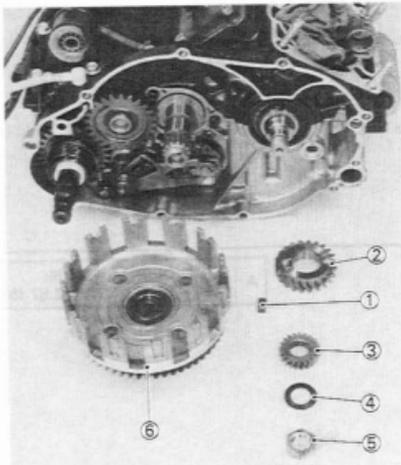
- Washer ①
- Kick idle gear ②
- Washer ③
- Circlip ④



## KICK AXLE AND KICK IDLE GEAR

- |              |                  |
|--------------|------------------|
| ① Kick crank | ⑦ Kick clip      |
| ② Oil seal   | ⑧ Kick axle      |
| ③ Spacer     | ⑨ Stopper        |
| ④ Spring     | ⑩ Circlip        |
| ⑤ Washer     | ⑪ Washer         |
| ⑥ Kick gear  | ⑫ Kick idle gear |

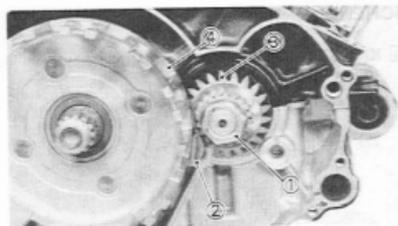




## CLUTCH AND PRIMARY DRIVE GEAR

## 1. Install:

- Key ①
- Primary drive gear ②
- Water pump drive gear ③
- Conical spring washer ④
- Nut ⑤ (Primary drive gear)
- Clutch housing ⑥



## 2. Tighten:

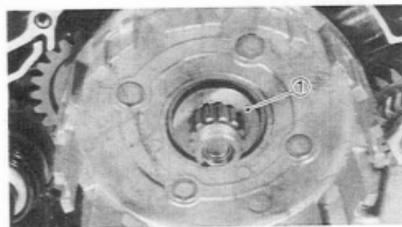
- Nut ① (Primary drive gear)



**Nut (Primary Drive Gear):**  
65 Nm (6.5 m·kg, 47 ft·lb)

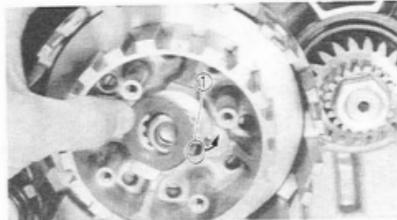
**NOTE:**

Place a folded rag ② between the teeth of the drive gear ③ and driven gear ④ to lock them.



## 3. Install:

- Thrust washer ①



## 4. Install:

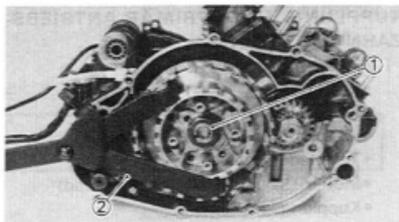
- Clutch boss
- Lock washer
- Nut

**NOTE:**

Install the lock washer tab ① into the hole of the clutch boss.

**WARNING:**

Always use a new lock washer.



## 5. Tighten:

- Nut ① (Clutch boss)

**NOTE:**

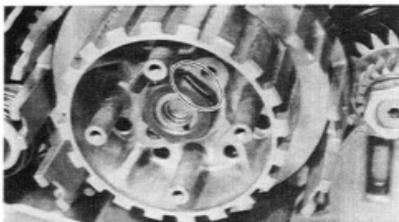
Hold the clutch boss to tighten the nut by the Universal Clutch Holder ②.



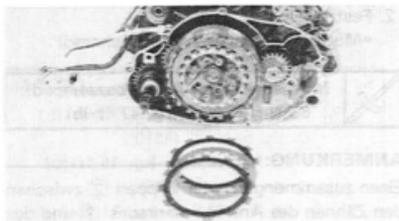
**Universal Clutch Holder:**  
90890-04086



**Nut (Clutch boss):**  
90 Nm (9.0 m•kg, 65 ft•lb)

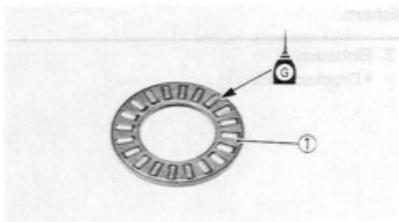


## 6. Bend the lock washer tab along the nut flats.



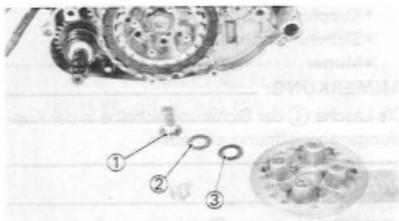
## 7. Install:

- Friction plates
- Clutch plates



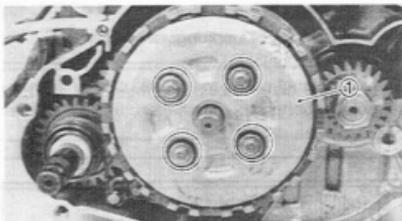
## 8. Apply:

- Gear oil
- To the bearing ①.



## 9. Install:

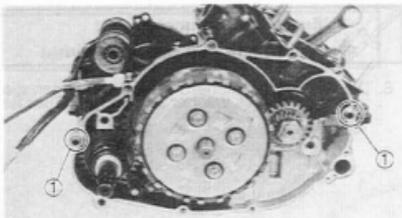
- Pull rod ①
- Bearing ②
- Washer ③
- To the pressure plate.



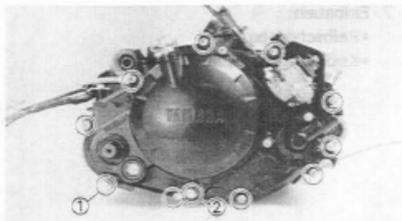
10. Install:
- Pressure plate ①
  - Springs
  - Bolts



**Bolts (Pressure Plate):**  
7 Nm (0.7 m•kg, 5.1 ft•lb)



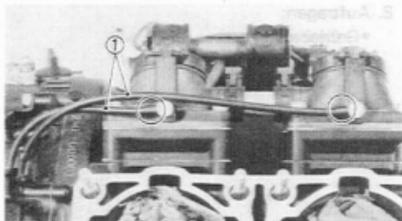
11. Install:
- Dowel pins ①
  - Gasket (Crankcase cover)



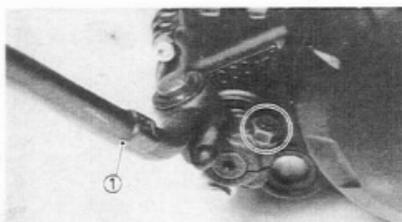
12. Install:
- Crankcase cover (Right)



**Screws (Crankcase Cover):**  
10 Nm (1.0 m•kg, 7.2 ft•lb)  
**Drain bolt ① (M10):**  
22 Nm (2.2 m•kg, 16 ft•lb)  
**Drain bolt ② (M8):**  
16 Nm (1.6 m•kg, 11 ft•lb)



13. Connect:
- Oil delivery hoses ①



14. Install:
- Kick crank ①

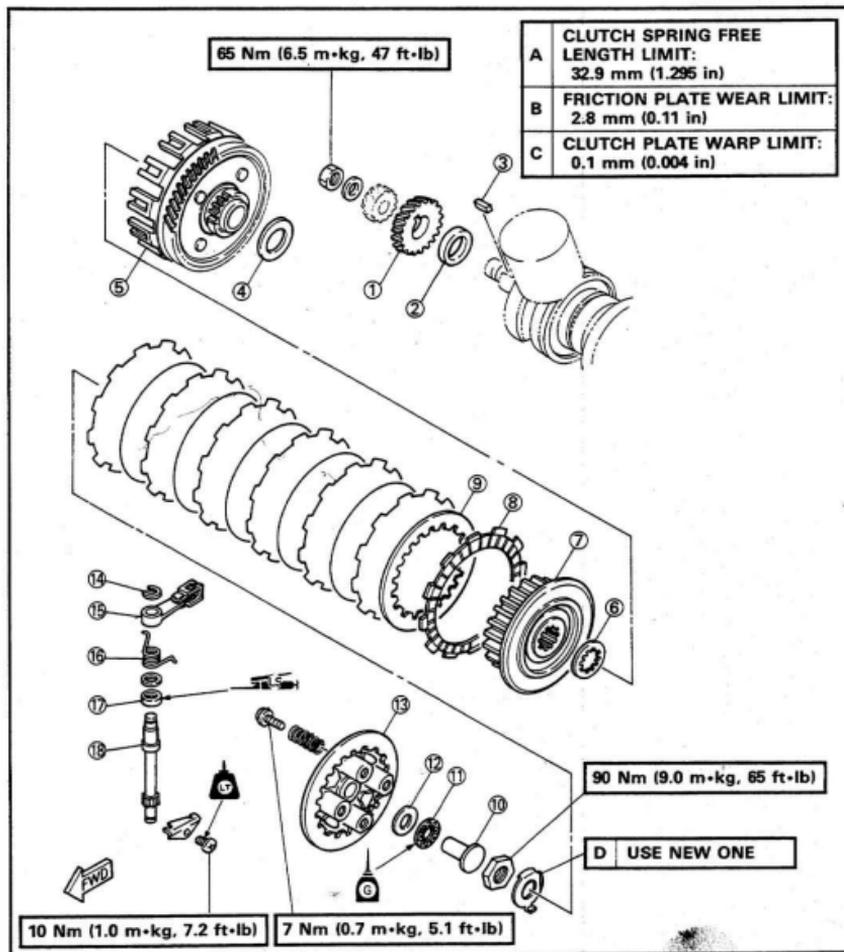


**Bolt (Kick Crank):**  
25 Nm (2.5 m•kg, 18 ft•lb)



## CLUTCH AND PRIMARY DRIVE GEAR

- |                      |                  |
|----------------------|------------------|
| ① Primary drive gear | ⑩ Pull rod       |
| ② Spacer             | ⑪ Bearing        |
| ③ Key                | ⑫ Washer         |
| ④ Thrust washer      | ⑬ Pressure plate |
| ⑤ Clutch housing     | ⑭ Circlip        |
| ⑥ Thrust washer      | ⑮ Pull lever     |
| ⑦ Clutch boss        | ⑯ Spring         |
| ⑧ Friction plate     | ⑰ Oil seal       |
| ⑨ Clutch plate       | ⑱ Lever rod      |

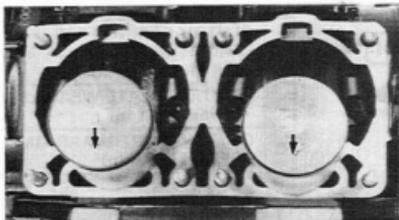




### CYLINDER HEAD, CYLINDERS AND PISTONS

#### 1. Apply:

- Engine oil  
To the small end bearing and big end bearing.



#### 2. Install:

- Small end bearing
- Piston
- Piston pin

#### NOTE:

The arrow on the piston must point to the front of the engine.

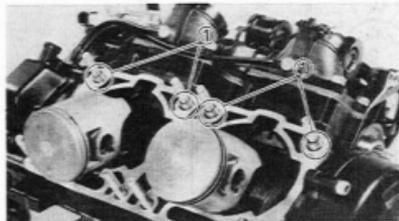


#### 3. Install:

- Piston pin clip ①

#### NOTE:

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.

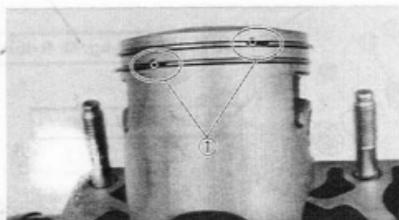


#### WARNING:

Always use a new piston pin clip.

#### 4. Install:

- Dowel pins ①
- Gaskets (Cylinder)

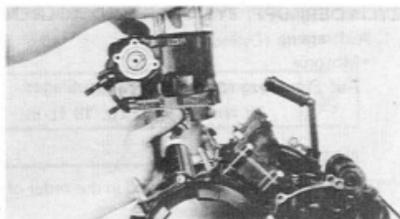


#### 5. Check:

- Piston rings

#### NOTE:

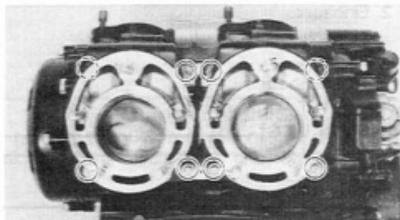
Make sure the ring ends ① are properly fitted around the ring locating pins in the piston grooves.



6. Install:
- Cylinders

**NOTE:** \_\_\_\_\_

Install the cylinder with one hand while compressing the piston rings with the other hand.



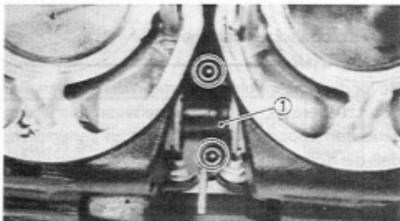
7. Tighten:
- Nuts (Cylinder)



**Nuts (Cylinder):**  
28 Nm (2.8 m•kg, 20 ft•lb)

**NOTE:** \_\_\_\_\_

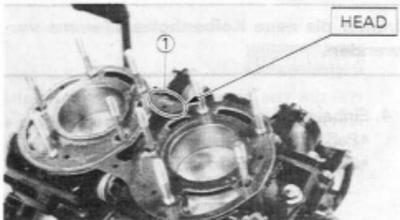
Tighten the nuts in stage, using a crisscross pattern.



8. Install:
- Joint ① (Power valve)



**Screws (Joint):**  
7 Nm (0.7 m•kg, 5.1 ft•lb)



9. Install:
- Gasket (Cylinder head)

**NOTE:** \_\_\_\_\_

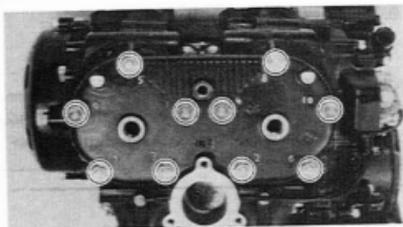
Install the gasket with the "HEAD" mark ① faced upward.



10. Install:
- Cylinder head
  - Copper washers
  - Nuts

**NOTE:** \_\_\_\_\_

The copper washers and cap nuts should be installed on the No.1, No.4, No.9 and No.10.



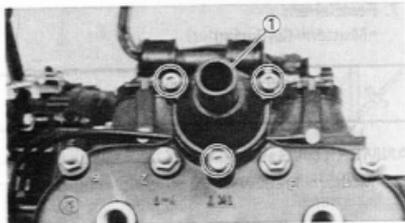
11. Tighten:
- Nuts (Cylinder head)



**Nuts (Cylinder Head):**  
22 Nm (2.2 m·kg, 16 ft·lb)

**NOTE:**

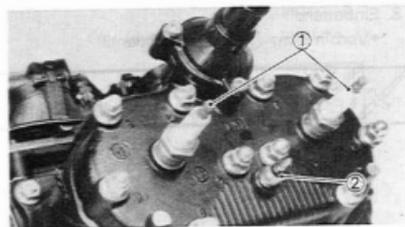
The nuts should be tightened in the order of numbers and in two steps.



12. Install:
- Thermostatic valve
  - Cover ① (Thermostatic valve)



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



13. Install:
- Spark plugs ①
  - Thermo unit ②



**Spark Plugs:**  
20 Nm (2.0 m·kg, 14 ft·lb)  
**Thermo Unit:**  
15 Nm (1.5 m·kg, 11 ft·lb)  
Use Water Resistant Sealant

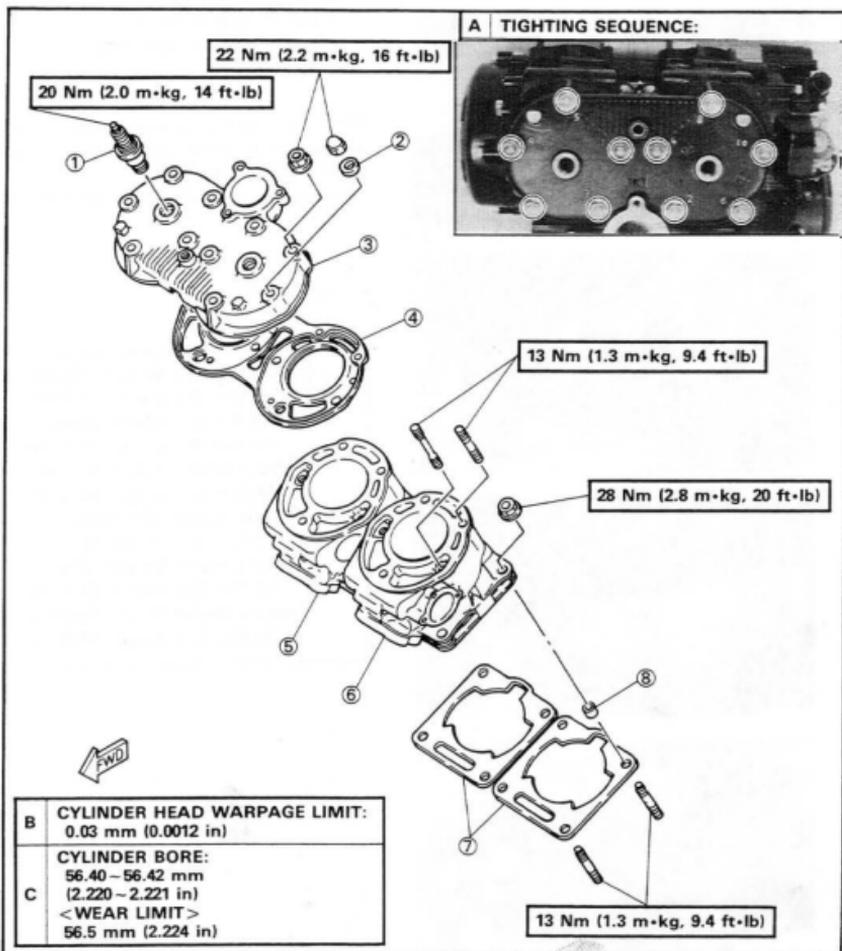
**WARNING:**

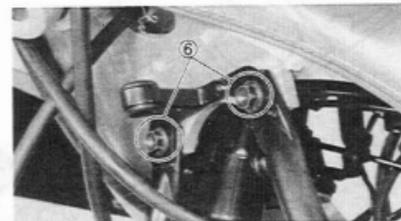
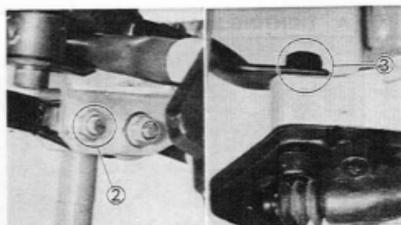
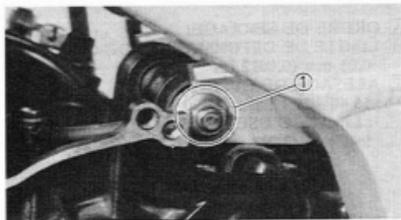
Handle the thermo unit with special care. Never subject it to strong or allow it to be dropped. Should it be dropped, it must be replaced.



### CYLINDER AND CYLINDER HEAD

- ① Spark plug
- ② Copper washer
- ③ Cylinder head
- ④ Gasket
- ⑤ Cylinder (Right-hand)
- ⑥ Cylinder (Left-hand)
- ⑦ Gasket
- ⑧ Dowel pin





### REMounting ENGINE

Reverse the "ENGINE REMOVAL" procedure. Note the following points.

#### 1. Install:

- Engine assembly
- Bolt ① (Engine mount—Rear)
- Bolt ② (Down tube—Lower)
- Bolt ③ (Torque rod stay—Rear)
- Bolt ④ (Engine bracket)
- Bolt ⑤ (Engine mount—Front)
- Nuts ⑥ (Down tube—Upper)

#### NOTE:

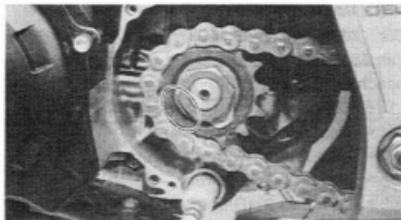
Temporarily tighten the bolts and nuts before tightening them to specification.

#### 2. Tighten:

- Bolts
- Nuts



- Nut (Engine Mount—Rear):  
55 Nm (5.5 m·kg, 40 ft·lb)
- Nut (Down Tube—Lower):  
45 Nm (4.5 m·kg, 32 ft·lb)
- Nut (Torque Rod Stay—Rear)  
55 Nm (5.5 m·kg, 40 ft·lb)
- Bolt (Engine Bracket):  
55 Nm (5.5 m·kg, 40 ft·lb)
- Nut (Engine Mount—Front):  
55 Nm (5.5 m·kg, 40 ft·lb)
- Nuts (Down Tube—Upper):  
25 Nm (2.5 m·kg, 18 ft·lb)



3. Tighten:
- Nut (Drive Sprocket)



**Nut (Drive Sprocket):**  
90 Nm (9.0 m•kg, 65 ft•lb)

**NOTE:** \_\_\_\_\_

Bend the lock washer tab along the nut flats.

---

**WARNING:** \_\_\_\_\_

Always use a new lock washer.

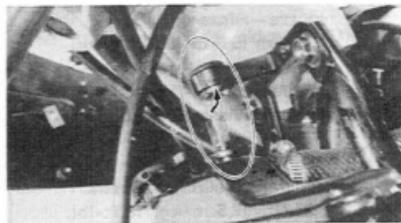
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4. Adjust:
- Drive chain slack



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

Refer to "DRIVE CHAIN SLACK ADJUSTMENT" section in CHAPTER 3.



5. Install:
- Radiator



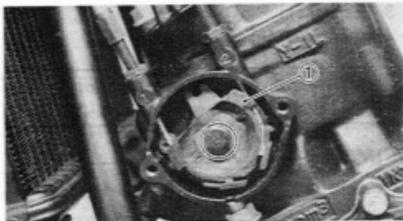
**Bolts (Radiator):**  
6 Nm (0.6 m•kg, 4.3 ft•lb)



6. Install:
- Pulley housing ①



**Bolts (Pulley Housing):**  
7 Nm (0.7 m•kg, 5.1 ft•lb)



## 7. Install:

- Pulley ① (Power valve)

**Bolt (Pulley):**

**10 Nm (1.0 m·kg, 7.2 ft·lb)**

## 8. Adjust:

- Y.P.V.S. cables

**NOTE:**

Before adjusting the Y.P.V.S. cables, turn the main switch to "ON" and operate the Y.P.V.S. motor.

Refer to "Y.P.V.S. CABLE ADJUSTMENT" section in CHAPTER 3.



## 9. Install:

- Pulley cover ① (Power valve)

**Bolts (Pulley Cover):**

**7 Nm (0.7 m·kg, 5.1 ft·lb)**

## 10. Adjust:

- Clutch cable

**Free Play:**

**10 ~ 15 mm (0.4 ~ 0.6 in)**

**At Lever End.**

Refer to "CLUTCH ADJUSTMENT" section in CHAPTER 3.

## 11. Adjust:

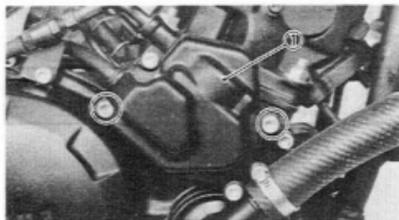
- Autolube pump cable

Refer to "AUTOLUBE PUMP CABLE ADJUSTMENT" section in CHAPTER 3.

## 12. Air bleeding:

- Autolube pump

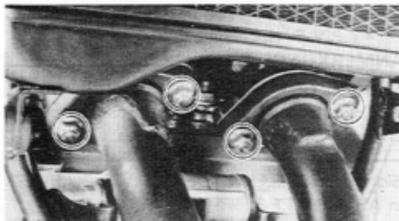
Refer to "AUTOLUBE PUMP AIR BLEEDING" section in CHAPTER 3.



13. Install:  
 • Autolube pump cover ①



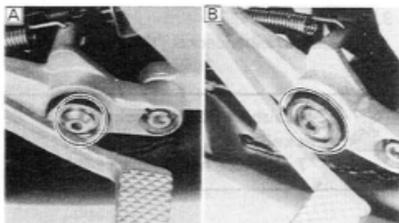
**Bolts (Autolube Pump Cover):**  
 6 Nm (0.6 m·kg, 4.3 ft·lb)



14. Install:  
 • Muffler assembly



**Nuts:**  
 18 Nm (1.8 m·kg, 13 ft·lb)  
**Bolts:**  
 32 Nm (3.2 m·kg, 23 ft·lb)



- A** Right-hand  
**B** Left-hand

15. Fill:  
 • Coolant



**Total Amount:**  
 1.35 L (1.2 Imp qt, 1.4 US qt)

Refer to "COOLANT REPLACEMENT" section in CHAPTER 3.

16. Fill:  
 • Transmission Oil



**Total Amount:**  
 1.0 L (0.9 Imp qt, 1.1 US qt)

Refer to "TRANSMISSION OIL REPLACEMENT" section in CHAPTER 3.



17. Install:

- Lower cowl (Left)
- Lower cowl (Right)

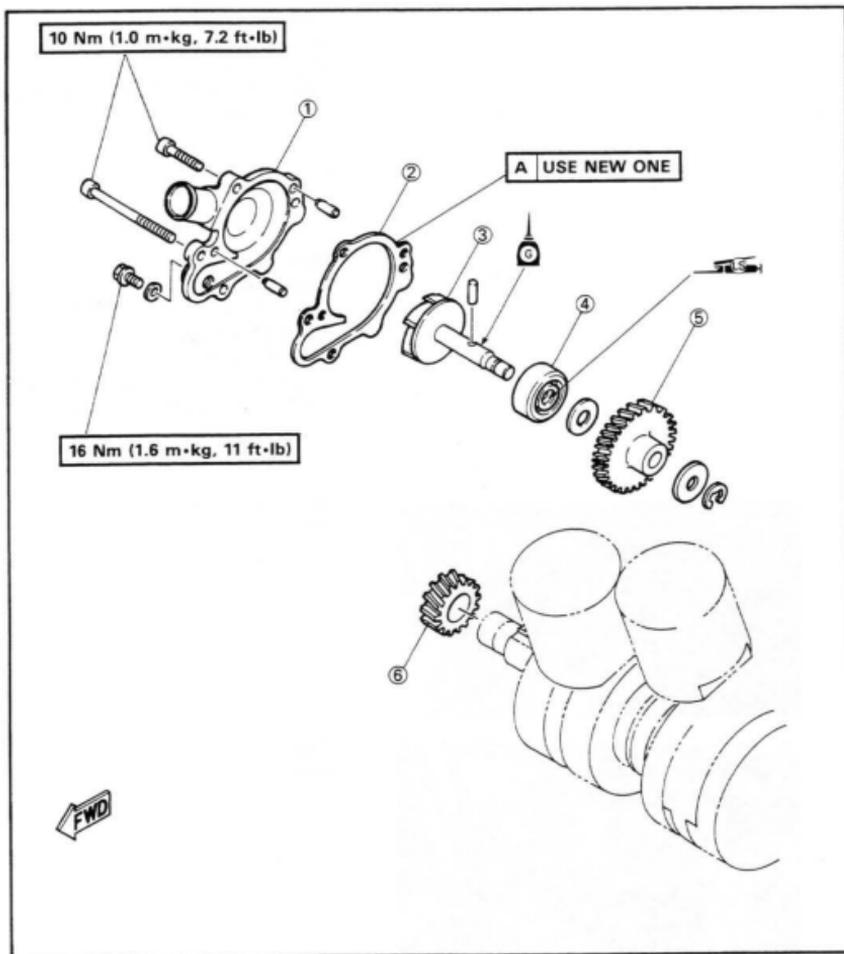
Refer to "COWLINGS" section in CHAPTER 3.



## COOLING SYSTEM

## WATER PUMP

- ① Water pump housing cover
- ② Gasket
- ③ Impeller shaft
- ④ Oil seal
- ⑤ Impeller shaft gear
- ⑥ Impeller shaft drive gear



**REMOVAL****NOTE:**

It is necessary to disassemble the water pump, unless there is no abnormality such as excessive change in coolant temperature and/or level, discoloration of coolant, or milky transmission oil.

**1. Remove:**

- Lower cowl (Right)
- Lower cowl (Left)

Refer to the "COWLINGS" section in the CHAPTER 3.

**2. Drain:**

- Crankcase

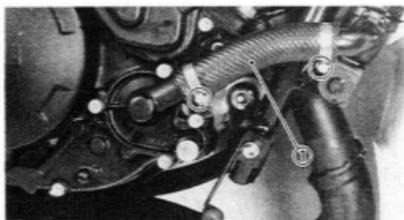
Refer to the "TRANSMISSION OIL REPLACEMENT" section in the CHAPTER 3.

- Cooling system

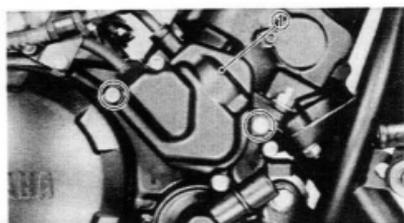
Refer to the "COOLANT REPLACEMENT" section in the CHAPTER 3.

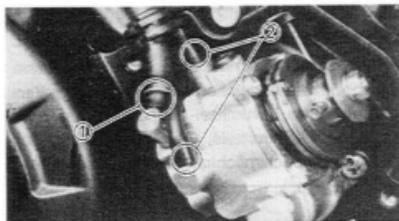
**3. Remove:**

- Outlet hose ①

**4. Remove:**

- Autolube pump cover ①



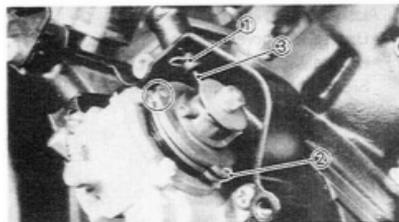


## 5. Disconnect:

- Oil hose ①
- Oil delivery hoses ②

**NOTE:**

Plug the oil pipe so oil will not run out of oil tank.

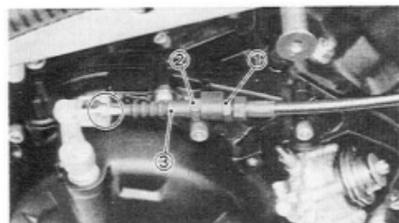


## 6. Remove:

- Clip ①
- Clip ②
- Autolube pump cable ③

**NOTE:**

Turn the pump pulley counterclockwise by finger to make the pump cable loose enough for its end to be removed from the pulley.

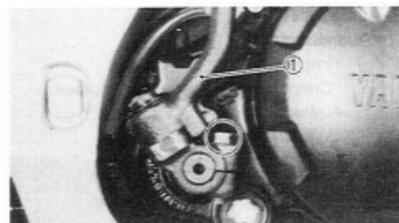


## 7. Loosen:

- Locknut ① (Clutch cable)
- Adjuster ② (Clutch cable)

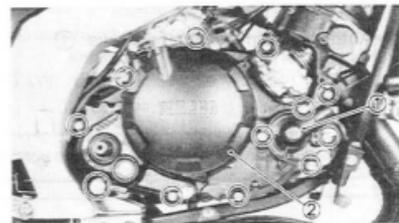
## 8. Remove:

- Clutch cable ③



## 9. Remove:

- Kick crank ①

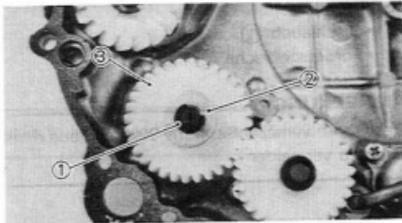


## 10. Remove:

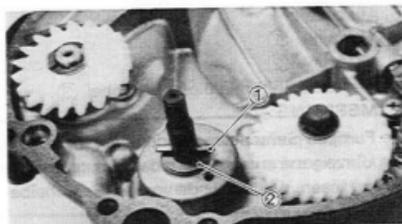
- Water pump housing cover ①
- Crankcase cover ② (Right)

**CAUTION:**

Drain the coolant out of the water pump while taking care so that it does not splash to the Autolube pump.



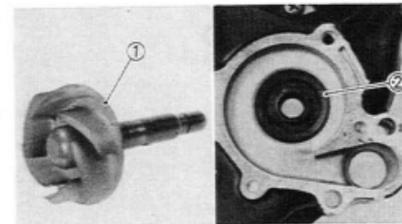
11. Remove:
- Circlip ①
  - Plain washer ②
  - Impeller shaft gear ③



12. Remove:
- Pin ①
  - Plain washer ②

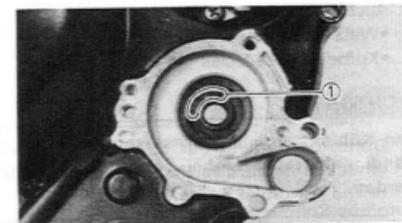


13. Remove:
- Impeller shaft
14. Eliminate deposits from the impeller and water pump housing.



#### INSPECTION

1. Inspect:
- Impeller ①  
Cracks/Wear/Damage → Replace.
  - Oil seal ②  
Wear/Damage → Replace.



#### Oil seal replacement steps:

- Remove the oil seal from the crankcase cover by tapping its toward the outside.
- Install the new oil seal with the "WATER SIDE" mark ① on the outside.

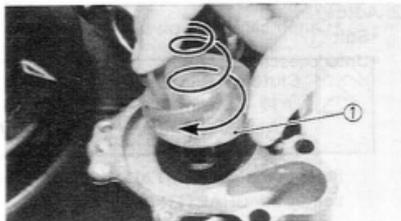
#### NOTE:

Press-fit the oil seal until its contact the bottom.

**INSTALLATION**

Reverse the "REMOVAL" procedure.  
Note the following points.

- Apply:
  - Lightweight lithium base grease  
To oil seal lips and impeller shaft.



- Install:
  - Impeller shaft ①  
Install the shaft while turning it.

**NOTE:**

Take care so that the oil seal lip is not damaged  
or the spring does not slip off its position.

- Install:
  - Crankcase cover (Right)
  - Water pump housing cover

**Bolts (Crankcase Cover):**

10 Nm (1.0 m•kg, 7.2 ft•lb)

**Bolts (Water Pump Housing Cover):**

10 Nm (1.0 m•kg, 7.2 ft•lb)

**CAUTION:**

Always use new gaskets.

- Install:
  - Kick crank

**Bolt (Kick Crank):**

25 Nm (2.5 m•kg, 18 ft•lb)



## 5. Fill:

- Transmission oil  
Refer to the "TRANSMISSION OIL REPLACEMENT" section in the CHAPTER 3.
- Coolant  
Refer to the "COOLANT REPLACEMENT" section in the CHAPTER 3.

## 6. Adjust:

- Clutch cable free play



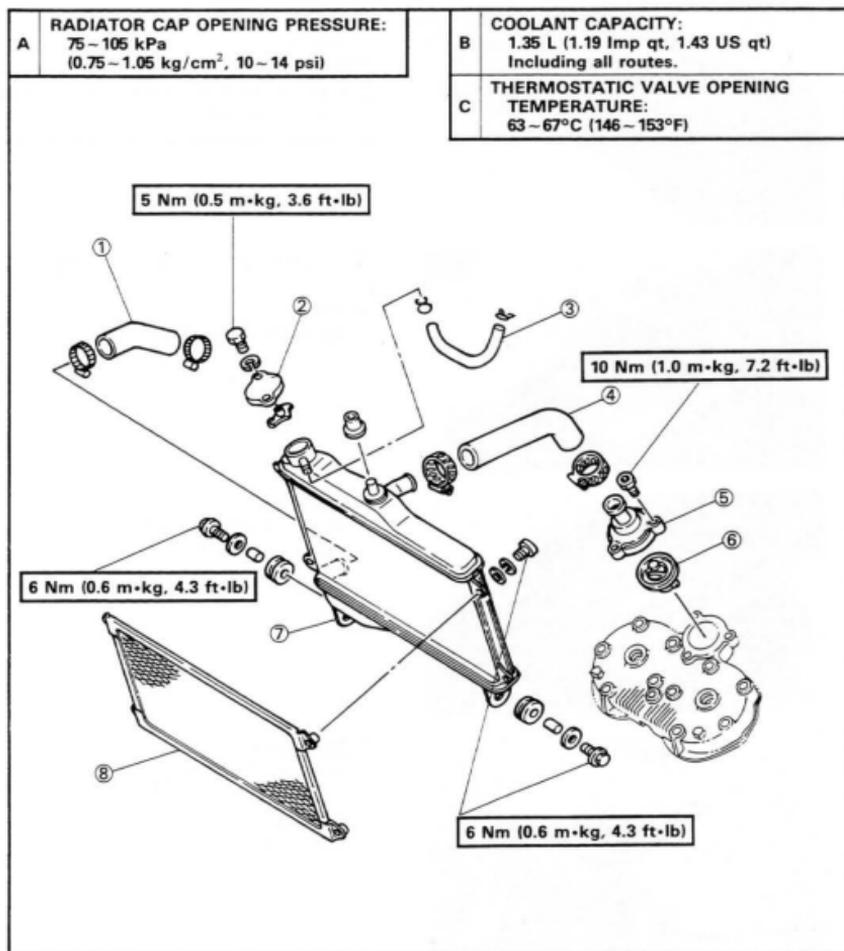
**Clutch Cable Free Play:**  
**10 – 15 mm (0.4 – 0.6 in)**  
**At Lever End.**

Refer to the "CLUTCH ADJUSTMENT" section in the CHAPTER 3.



## THERMOSTATIC VALVE AND RADIATOR

- ① Outlet hose
- ② Radiator cap
- ③ Coolant breather hose
- ④ Inlet hose
- ⑤ Thermostatic valve cover
- ⑥ Thermostatic valve
- ⑦ Radiator
- ⑧ Radiator cover



**REMOVAL**

## 1. Remove:

- Lower cowl (Right)
- Lower cowl (Left)

Refer to the "COWLINGS" section in the CHAPTER 3.



## 2. Remove:

- Seat

**NOTE:**

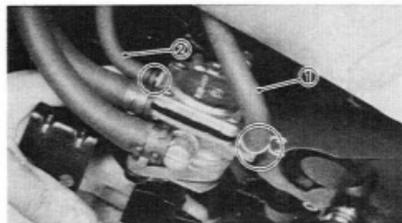
To open the seat lock, insert the key in the lock and turn it clockwise.



## 3. Turn the fuel cock to "ON" position.

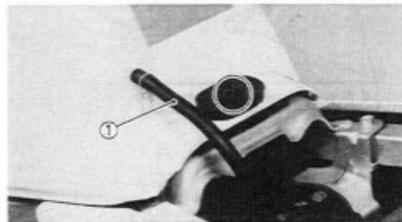
## 4. Remove:

- Bolts (Fuel cock bracket)



## 5. Disconnect:

- Fuel delivery hose ①
- Vacuum hose ②



## 6. Disconnect:

- Fuel breather hose ①

## 7. Remove:

- Fuel tank



## 8. Drain:

- Cooling system

Refer to the "COOLANT REPLACEMENT" section in the CHAPTER 3.

**NOTE:** \_\_\_\_\_

Thoroughly flush the cooling system with clean tap water.

**CAUTION:** \_\_\_\_\_

Take care so that coolant does not splash to painted surfaces. If splashes, wash it away with water.

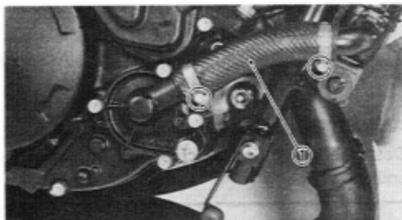
**WARNING:** \_\_\_\_\_

Do not remove the radiator cap, drain bolts and hoses especially when the engine and radiator are hot. Scalding hot fluid and steam may be blown out under pressure, which could cause serious injury. When the engine has cooled, place a thick rag like a towel over the radiator cap, slowly rotate the cap counterclockwise to the detent. This procedure allows any residual pressure to escape. When the hissing sound has stopped, press down on the cap while turning counterclockwise and remove it.

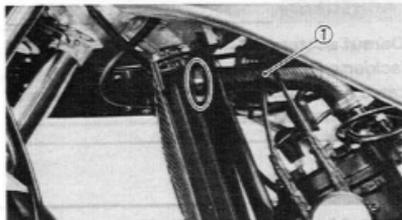


## 9. Disconnect:

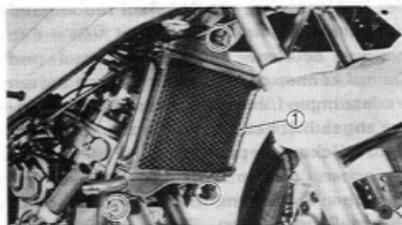
- Coolant breather hose ①



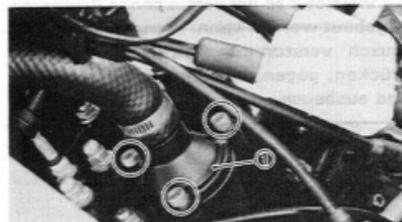
10. Remove:  
•Outlet hose ①



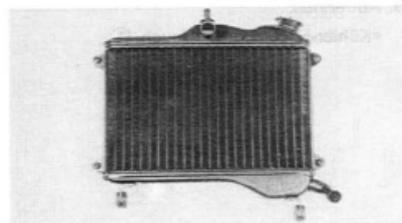
11. Remove:  
•Inlet hose ①



12. Remove:  
•Radiator ①



13. Remove:  
•Thermostatic valve cover ①  
•Thermostatic valve



#### INSPECTION

1. Inspect:  
•Radiator core  
Obstruction → Blow out with compressed air through rear of the radiator.  
Flattened fin → Repair/replace.



## 2. Inspect:

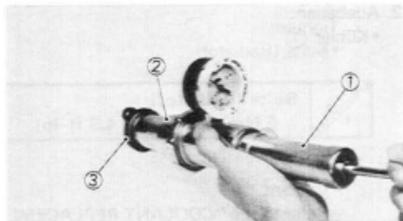
- Inlet hose  
Crack/ Damage → Replace.
- Outlet hose  
Crack/ Damage → Replace.

## 3. Measure:

- Radiator cap opening pressure  
Radiator cap opens at pressure below the specified pressure → Replace.

**Valve Opening Pressure:**

75 ~ 105 kPa

(0.75 ~ 1.05 kg/cm<sup>2</sup>, 10 ~ 14 psi)**Measurement steps:**

- Attach the Cooling System Tester ① and Adapter ② to the radiator cap ③.

**Cooling System Tester:**

90890-01325

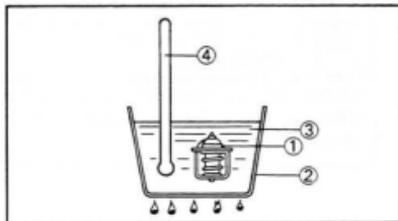
**Adapter:**

90890-01352

- Apply the specified pressure for 10 seconds, and make sure there is no pressure drop.

## 4. Inspect:

- Thermostatic valve  
Valve does not open at 63 ~ 67°C (146 ~ 153°F) → Replace.

**Inspection steps:**

- Suspend thermostatic valve ① in a vessel ②.
- Place reliable thermometer in a water ③.
- Heat water slowly.
- Observe thermometer ④, while stirring water continually.

**NOTE:**

Thermostatic valve is sealed and its setting is specialized work. If its accuracy is in doubt, always it. A faulty unit could cause serious overheating or overcooling.

**INSTALLATION**

Reverse the "REMOVAL" procedure.  
Note the following points.

## 1. Tighten:

- Bolts (Thermostatic valve cover)

	<b>Bolts (Thermostatic Valve Cover):</b> 10 Nm (1.0 m•kg, 7.2 ft•lb)
---	---

## 2. Tighten:

- Bolts (Radiator)

	<b>Bolts (Radiator):</b> 6 Nm (0.6 m•kg, 4.3 ft•lb)
---	--

## 3. Fill:

- Coolant

Refer to the "COOLANT REPLACEMENT" section in the CHAPTER 3.

## 4. Inspect:

- Cooling system

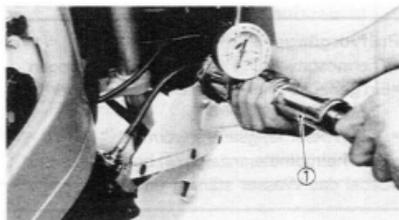
Decrease of pressure (leaks) → Repair as required.

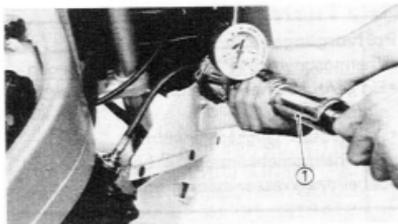
**Inspection steps:**

- Attach the Cooling System Tester ① to the radiator.

	<b>Cooling System Tester:</b> 90890-01325
---	--

- Apply 100 kPa (1.0 kg/cm<sup>2</sup>, 14 psi) pressure.
- Measure the indicated pressure with the gauge.





5. Install:

- Seat

**NOTE:**

Insert the lobe on the seat front into the receptacle on the frame, then push down the seat.



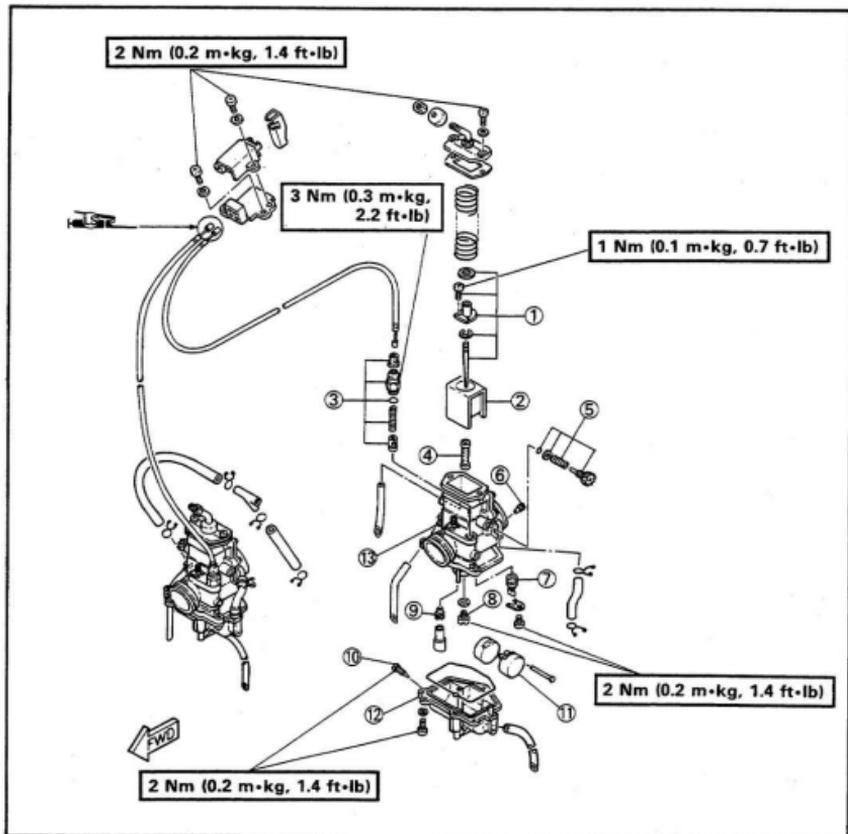
## CARBURETION

## CARBURETOR

- ① Jet needle assembly
- ② Throttle valve
- ③ Starter plunger assembly
- ④ Main nozzle
- ⑤ Throttle stop screw assembly
- ⑥ Pilot air jet
- ⑦ Needle valve assembly
- ⑧ Main jet
- ⑨ Pilot jet
- ⑩ Drain screw
- ⑪ Float
- ⑫ Float chamber
- ⑬ Carburetor body

## SPECIFICATIONS

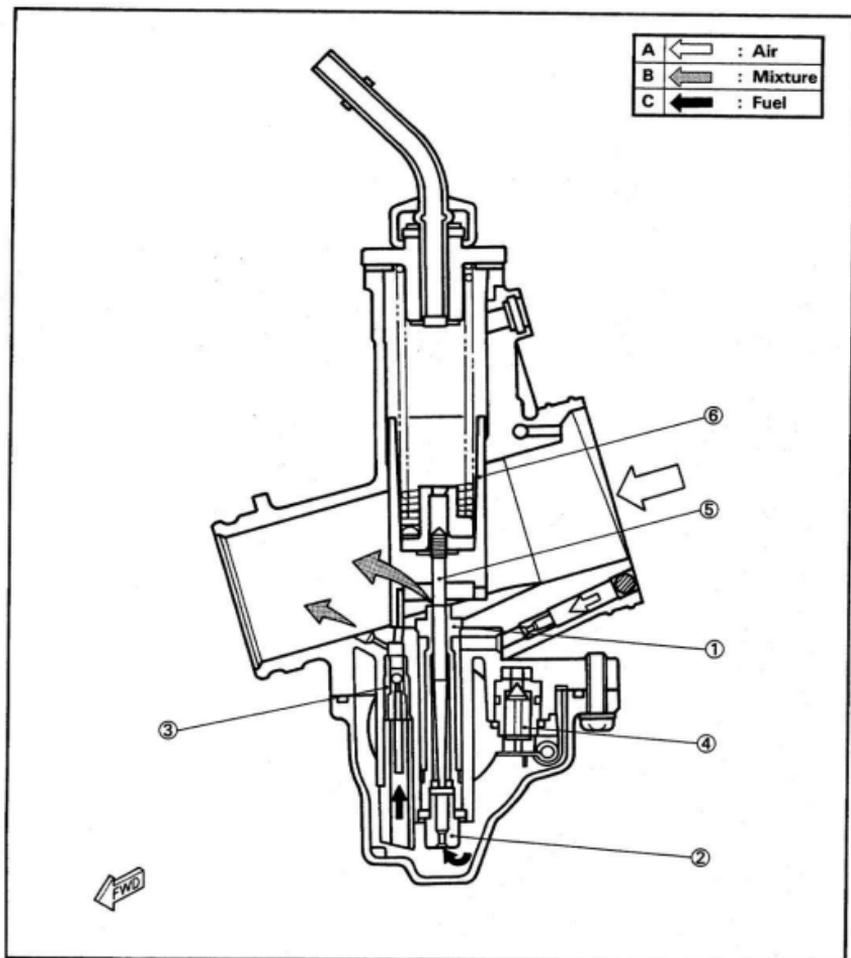
MAIN JET (M.J.)	# 230
PILOT JET (P.J.)	# 20
MAIN AIR JET (M.A.J.)	φ1.5
PILOT AIR JET (P.A.J.)	φ1.4
JET NEEDLE (J.N.)	5L19-2/5
CUTAWAY (C.A.)	2.5
STARTER JET (G.S.)	# 35
MAIN NOZZLE (N.J.)	Q-2
POWER JET (P.W.J.)	# 60
FUEL LEVEL (F.L.)	1.1 ~ 2.1 mm (0.04 ~ 0.08 in)
FLOAT HEIGHT (F.H.)	15 ~ 17 mm (0.59 ~ 0.67 in)





## SECTION VIEW

- ① Main nozzle
- ② Main jet
- ③ Pilot jet
- ④ Needle valve
- ⑤ Jet needle
- ⑥ Throttle valve



**REMOVAL****NOTE:**

To following parts can be cleaned and inspected without disassembly.

- Throttle valve
- Starter plunger
- Throttle stop screw

**1. Remove:**

- Lower cowl (Right)
- Lower cowl (Left)

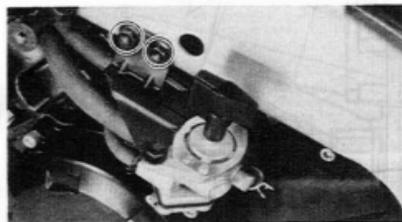
Refer to the "COWLINGS" section in the CHAPTER 3.

**2. Remove:**

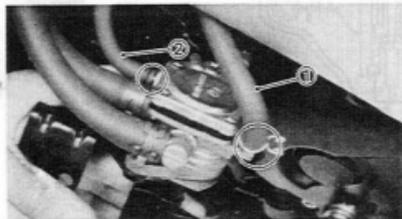
- Seat

**NOTE:**

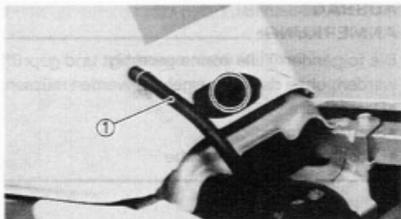
To open the seat lock, insert the key in the lock and turn it clockwise.

**3. Turn the fuel cock to "ON" position.****4. Remove:**

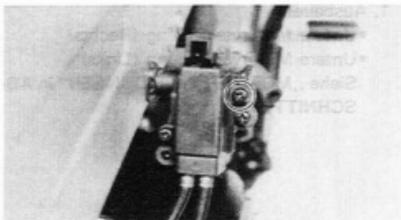
- Bolts (Fuel cock bracket)

**5. Disconnect:**

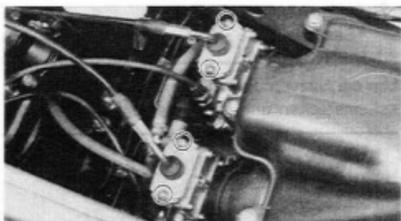
- Fuel delivery hose ①
- Vacuum hose ②



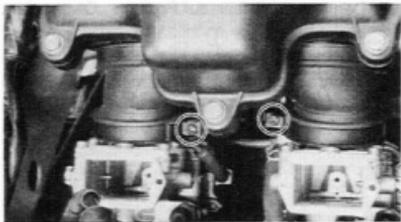
6. Disconnect:  
 • Fuel breather hose ①



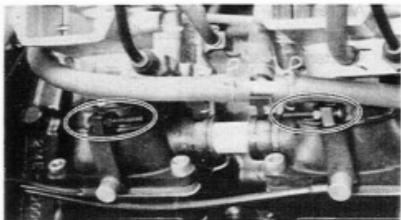
7. Remove:  
 • Fuel tank
8. Remove:  
 • Screw (Starter lever bracket)



9. Remove:  
 • Screws (Carburetor top cover)

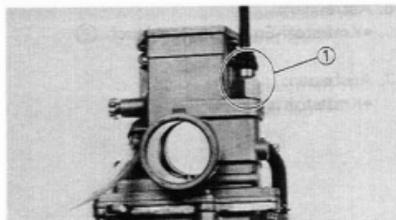


10. Remove:  
 • Throttle valve assembly
11. Remove:  
 • Air cleaner case



12. Loosen:  
 • Screws (Carburetor joint)

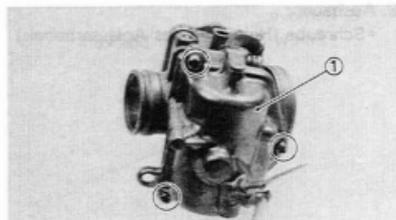
13. Remove:  
 • Carburetors



## DISASSEMBLY

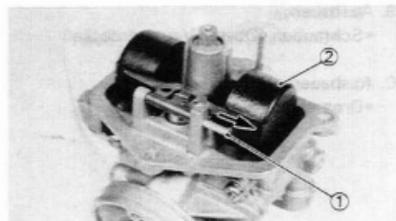
## 1. Remove:

- Starter plunger assembly ①



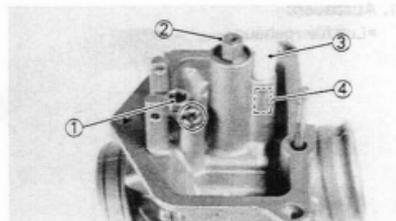
## 2. Remove:

- Float chamber ①



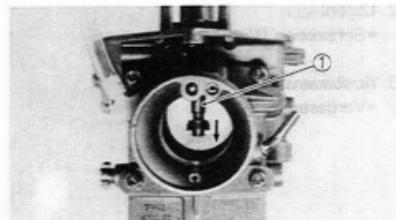
## 3. Remove:

- Float pin ①
- Float ②
- Needle valve



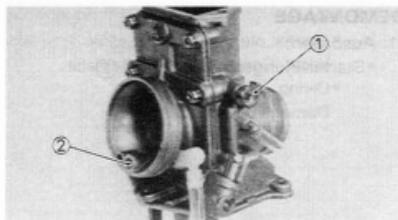
## 4. Remove:

- Valve seat ①
- Main jet ②
- Pipe ③
- Pilot jet ④



## 5. Remove:

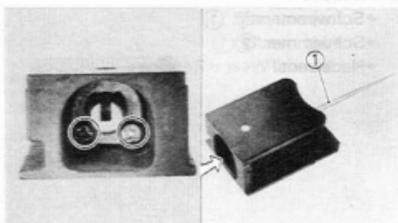
- Main nozzle ①



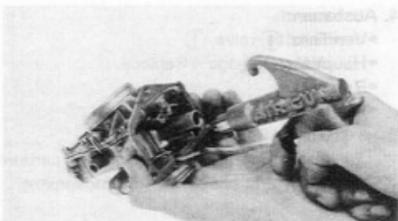
6. Remove:
- Throttle stop screw ①
  - Pilot air jet ②



7. Remove:
- Throttle valve ①



8. Remove:
- Jet needle ①



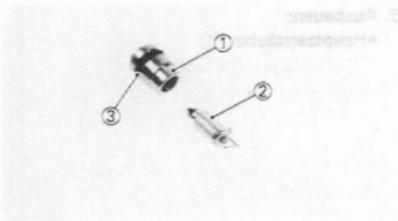
### INSPECTION

1. Inspect:
- Carburetor body  
Contamination → Clean.

**NOTE:** \_\_\_\_\_

Use a petroleum based solvent for cleaning. Blow out all passages and jets with compressed air.

---

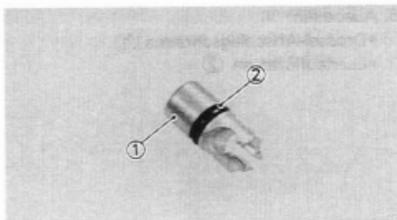


2. Inspect:
- Valve seat ①
  - Needle valve ②  
Wear / Contamination → Replace.
  - O-ring ③  
Damage → Replace.

**NOTE:** \_\_\_\_\_

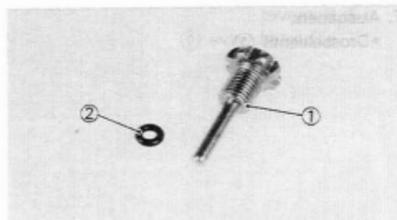
Always replace the needle valve and valve seat as a set.

---



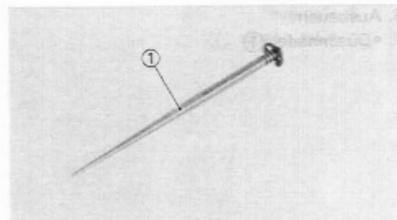
## 3. Inspect:

- Starter plunger ①  
Wear/Contamination → Replace.
- O-ring ②  
Damage → Replace.



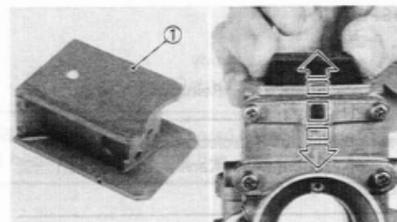
## 4. Inspect:

- Throttle stop screw ①  
Wear/Contamination → Replace.
- O-ring ②  
Damage → Replace.



## 5. Inspect:

- Jet needle ①  
Bends/Wear → Replace.

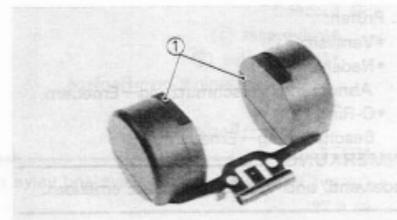


## 6. Inspect:

- Throttle valve ①  
Wear/Damage → Replace.

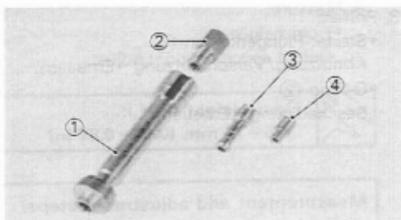
## 7. Check:

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



## 8. Inspect:

- Float ①  
Damage → Replace.



## 9. Inspect:

- Main jet ①
- Main nozzle ②
- Pilot jet ③
- Pilot air jet ④

Contamination → Clean.

**NOTE:**

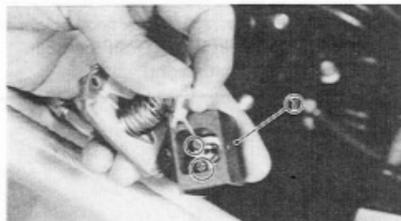
Blow out the jets with compressed air.

**ASSEMBLY**

Reverse the "DISASSEMBLY" procedures. Note the following points.

**CAUTION:**

Before reassembling, wash the all parts with a clean gasoline.



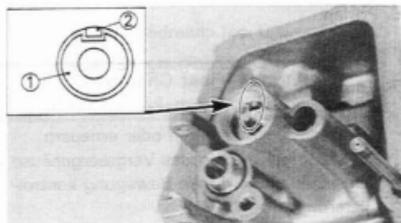
## 1. Tighten:

- Screws (Throttle valve ①)



**Screws (Throttle Valve):**

**1 Nm (0.1 m·kg, 0.7 ft·lb)**

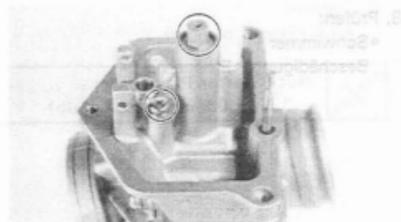


## 2. Install:

- Main nozzle ①

**NOTE:**

Align the knock pin ② with the pin slot in the main nozzle.



## 3. Tighten:

- Screw (Valve seat holder)
- Main jet

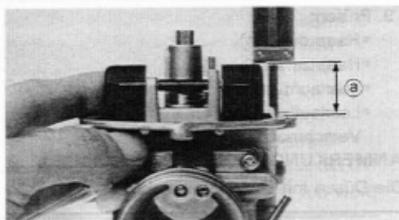


**Screw (Valve Seat Holder):**

**2 Nm (0.2 m·kg, 1.4 ft·lb)**

**Main Jet:**

**2 Nm (0.2 m·kg, 1.4 ft·lb)**



## 4. Measure:

- Float height **a**
- Out of specification → Adjust.



**Float Height (F.H.):**  
15 ~ 17 mm (0.59 ~ 0.67 in)

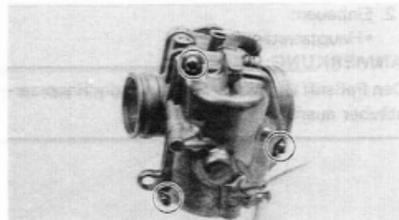
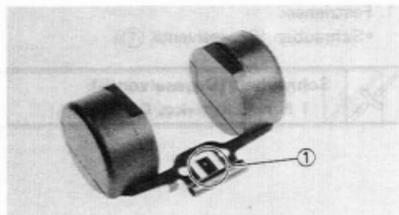
**Measurement and adjustment steps:**

- Hold the carburetor in an upside down position.
- Measure the distance from the mating surface of the float chamber (gasket removed) to the top of the float.

**NOTE:**

The float arm should be resting on the needle valve, but not compressing the needle valve.

- If the float height is not within specification, inspect the valve seat and needle valve.
- If either is worn, replace them both.
- If both are fine, adjust the float height by bending the float tang **1** on the float.
- Recheck the float height.

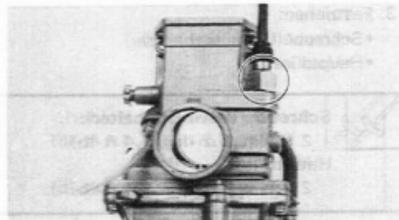


## 5. Tighten:

- Screws (Float chamber)



**Screws (Float Chamber):**  
2 Nm (0.2 m·kg, 1.4 ft·lb)

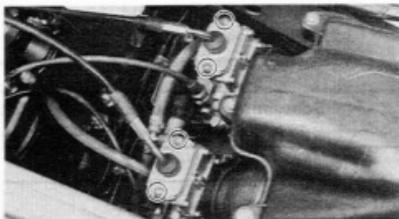


## 6. Tighten:

- Nut (Starter plunger)



**Nut (Starter Plunger):**  
3 Nm (0.3 m·kg, 2.2 ft·lb)

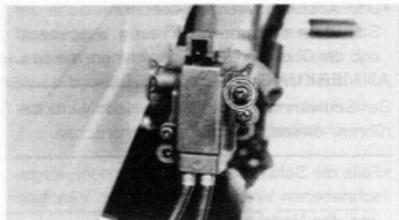
**INSTALLATION**

Reverse the "REMOVAL" procedures.  
Note the following points.

1. Tighten:
  - Screws (Carburetor Top Cover)



**Screws (Carburetor top cover):**  
2 Nm (0.2 m•kg, 1.4 ft•lb)



2. Tighten:
  - Screw (Starter lever bracket)



**Screw (Starter Lever Bracket):**  
2 Nm (0.2 m•kg, 1.4 ft•lb)

3. Adjust:
  - Carburetor Synchronization  
Refer to the "CARBURETOR SYNCHRONIZATION" section in the CHAPTER 3.

4. Adjust:
  - Idle speed  
Refer to the "IDLE SPEED ADJUSTMENT" section in the CHAPTER 3.

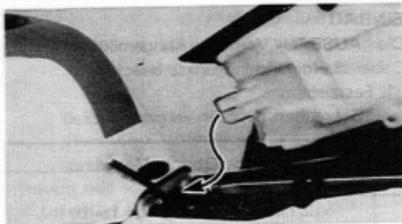


**Engine Idle Speed:**  
1,150 ~ 1,250 r/min

5. Adjust:
  - Throttle cable free play  
Refer to the "THROTTLE CABLE FREE PLAY ADJUSTMENT" section in the CHAPTER 3.



**Throttle Cable Free Play:**  
2 ~ 5 mm (0.08 ~ 0.20 in)

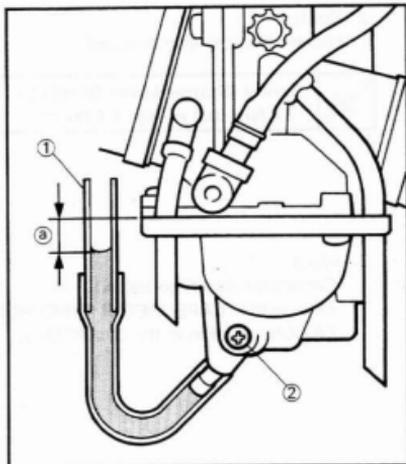


## 6. Install:

- Seat

**NOTE:**

Insert the lobe on the seat front into the receptacle on the frame, then push down the seat.

**FUEL LEVEL ADJUSTMENT**

1. Place the motorcycle on a level place.
2. Use a garage jack under the engine to ensure that the carburetor is positioned vertically.
3. Attach the Fuel Level Gauge (1) to the float chamber nozzle.

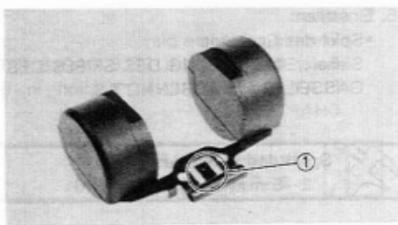


**Fuel Level Gauge**  
90890-01312

4. Loosen the drain screw (2), and warm up the engine for several minutes.
5. Measure:
  - Fuel level (a)
 Out of specification → Adjust.



**Fuel Level:**  
1.1 ~ 2.1 mm (0.04 ~ 0.08 in)  
Below the Carburetor Body Edge.



## 6. Adjust:

- Fuel level

**Adjustment steps:**

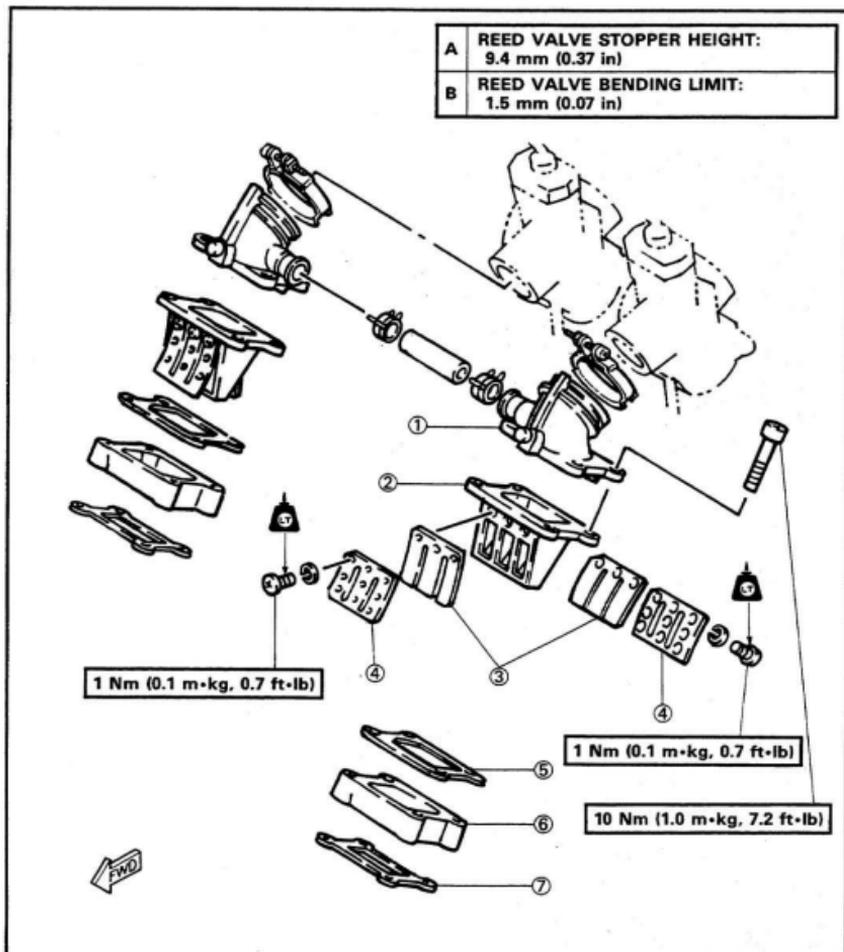
- Remove the carburetor.
- Inspect the valve seat and needle valve.
- If either is worn, replace them both.
- If both are fine, adjust the float height by bending the float tang (1) on the float.
- Recheck the fuel level.



**REED VALVE**

- ① Intake manifold
- ② Reed valve seat
- ③ Reed valve
- ④ Reed valve stopper
- ⑤ Gasket
- ⑥ Spacer
- ⑦ Gasket

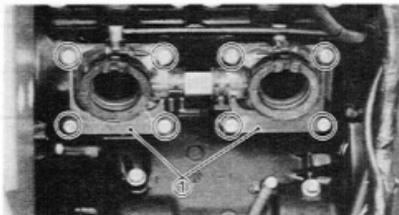
<b>A</b>	<b>REED VALVE STOPPER HEIGHT:</b> 9.4 mm (0.37 in)
<b>B</b>	<b>REED VALVE BENDING LIMIT:</b> 1.5 mm (0.07 in)



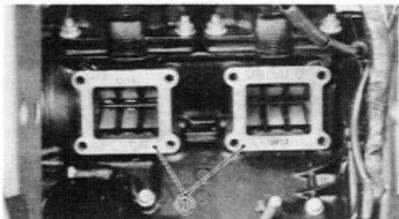


**REMOVAL**

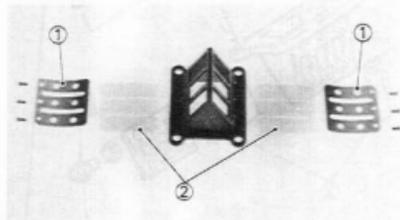
1. Remove:
  - Carburetor
 Refer to the "CARBURETOR—REMOVAL" section in the CHAPTER 6.



2. Remove:
  - Intake manifold ①

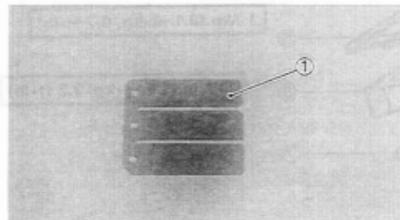


3. Remove:
  - Reed valve assembly ①



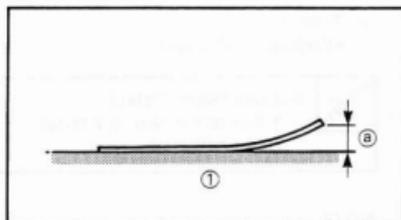
**DISASSEMBLY**

1. Remove:
  - Reed valve stopper ①
  - Reed valve ②



**INSPECTION**

1. Inspect:
  - Reed valve ①
  - Reed valve stopper
 Cracks/Damage → Replace.

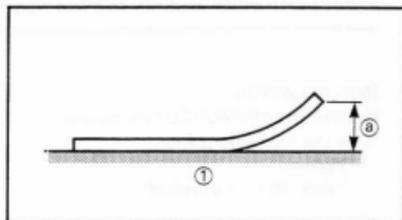


2. Measure:
- Reed valve bending limit **a**
- Out of specification → Replace.



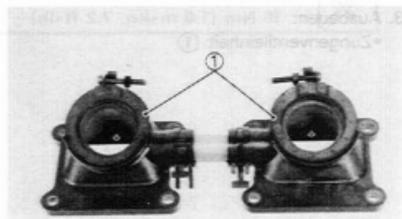
**Reed Valve Bending Limit:**  
1.5 mm (0.07 in)

- ① Surface plate

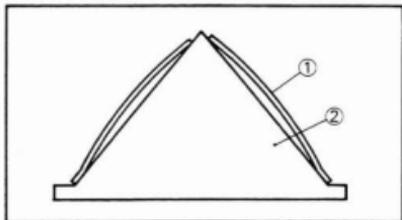


**Reed Valve Stopper Height:**  
9.4 mm (0.37 in)

- ① Surface plate



4. Inspect:
- Intake manifold **①**
  - Gaskets
- Cracks/ Damage → Replace.



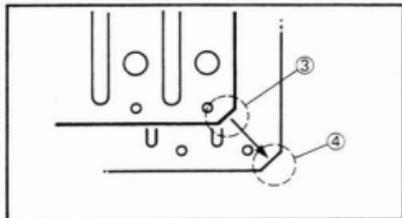
**ASSEMBLY**

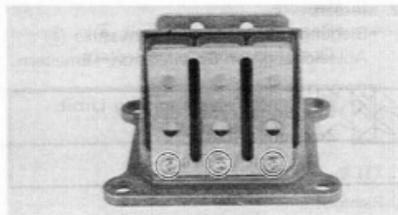
Reverse the "DISASSEMBLY" procedure.  
Note the following points.

1. Install:
- Reed valves
  - Reed valve stoppers

**NOTE:** \_\_\_\_\_

- Place the reed valve **①** with its concave facing the reed valve seat **②**.
  - Fit the reed valve stopper cut **③** with the corresponding cut **④** on the reed valve.
- \_\_\_\_\_





## 2. Tighten:

- Screws (Reed valve)

**Screws (Reed Valve):**

**1 Nm (0.1 m•kg, 0.7 ft•lb)**

**Use LOCTITE®.**

**NOTE:**

Tighten each screw gradually to avoid warping.

**INSTALLATION**

Reverse the "REMOVAL" procedure.

Note the following points.

## 1. Tighten:

- Bolts (Intake manifold)

**Bolts (Intake Manifold):**

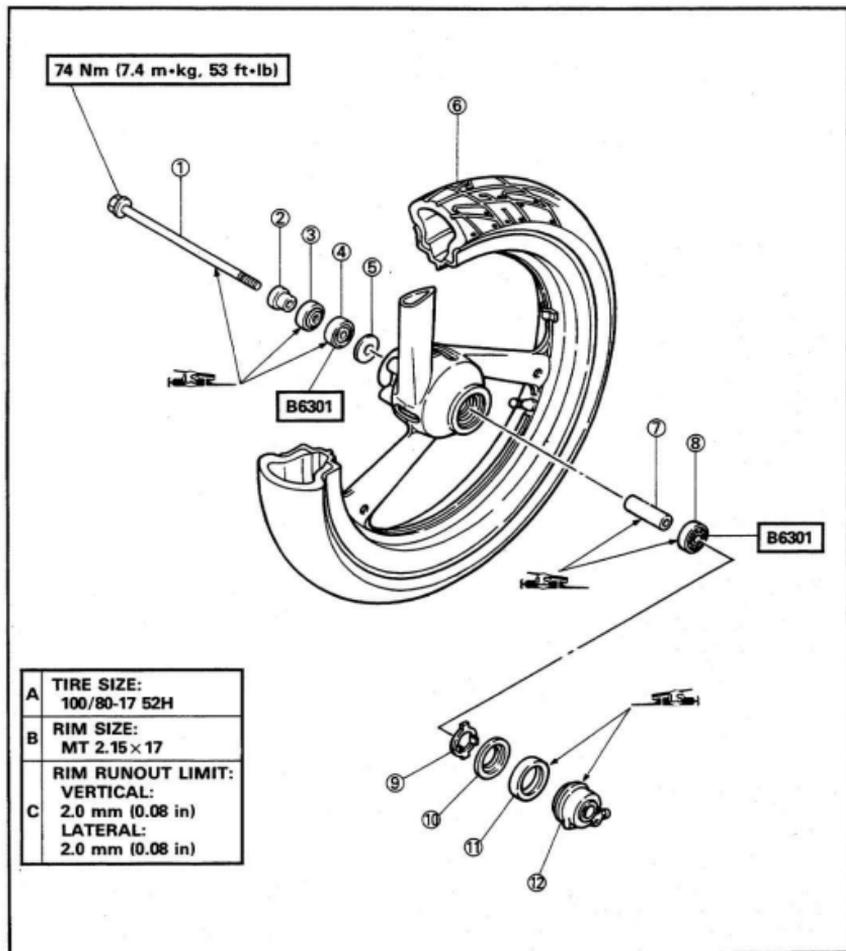
**10 Nm (1.0 m•kg, 7.2 ft•lb)**



## CHASSIS

## FRONT WHEEL

- |                 |                      |
|-----------------|----------------------|
| ① Wheel axle    | ⑦ Spacer             |
| ② Collar        | ⑧ Bearing            |
| ③ Oil seal      | ⑨ Meter clutch       |
| ④ Bearing       | ⑩ Clutch retainer    |
| ⑤ Flange spacer | ⑪ Oil seal           |
| ⑥ Front wheel   | ⑫ Gear unit assembly |





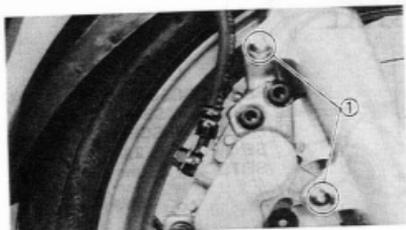
## REMOVAL

- Remove:
  - Lower cowl (Right)
  - Lower cowl (Left)
 Refer to "COWLINGS" section in CHAPTER 3.

- Elevate the front wheel by placing a suitable stand under the engine.

**WARNING:**

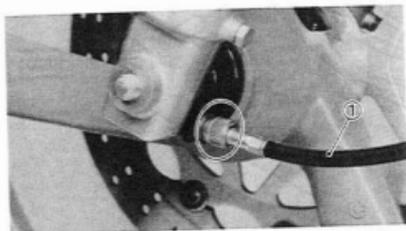
Support the motorcycle securely so there is no danger of it falling over.



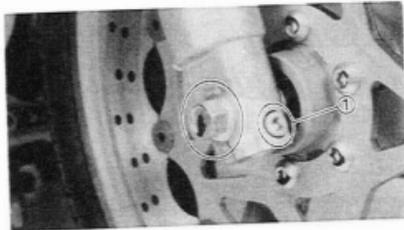
- Remove:
  - Bolts ① (Brake caliper)

**NOTE:**

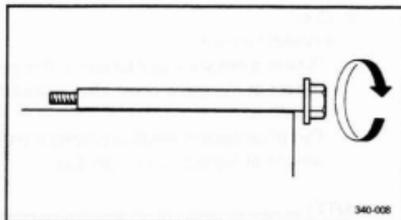
Do not depress the brake lever when the wheel is off the motorcycle otherwise the brake pads will be forced shut.



- Remove:
  - Speedometer cable ①



- Loosen:
  - Pinch bolt ①
- Remove:
  - Front wheel



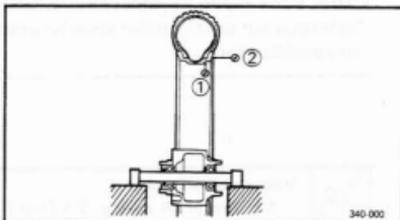
## INSPECTION

1. Eliminate any corrosion from parts.
2. Inspect:
  - Front axle
 Roll the axle on a flat surface.  
 Bends → Replace.

**WARNING:**

Do not attempt to straighten a bent axle.

3. Inspect:
  - Wheel
 Cracks/Bends/Warpage → Replace.

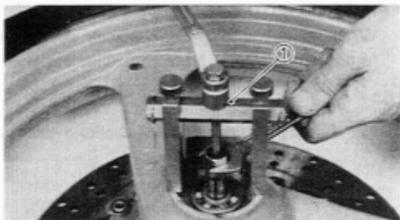


4. Measure:
  - Wheel runout
 Out of specification → Check the wheel and bearing play.

**Rim Runout Limits:**

Radial ①: 2.0 mm (0.08 in)

Lateral ②: 2.0 mm (0.08 in)



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

**Wheel bearing replacement steps:**

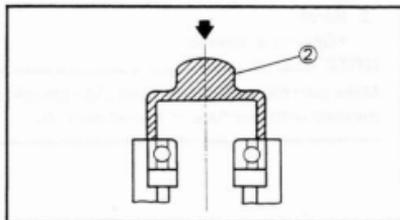
- Clean the outside of the wheel hub.
- Remove the bearing using a general bearing puller ①.
- Install the new bearing.

**NOTE:**

Use a socket ② that matches the outside diameter of the race of the bearing.

**CAUTION:**

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





## 6. Check:

## • Wheel balance

Wheel is not statically balanced if it comes to rest at the same point after several light rotations.

Out of balance → Install appropriate balance weight at lightest point (on top).

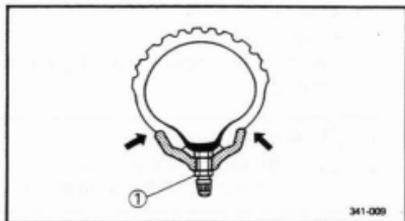
**NOTE:** \_\_\_\_\_

Balance wheel with brake disc installed.

**WARNING:** \_\_\_\_\_

• After mounting a tire, ride conservatively to allow proper tire to rim seating. Failure to do so may cause an accident resulting in motorcycle damage and possible operator injury.

• After a tire repair or replacement, be sure to torque tighten the valve stem locknut ① to specification.

**Valve-stem Locknut:**

1.5 Nm (0.15 m•kg, 1.1 ft•lb)

**INSTALLATION**

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

## 1. Apply:

## • Lithium base grease

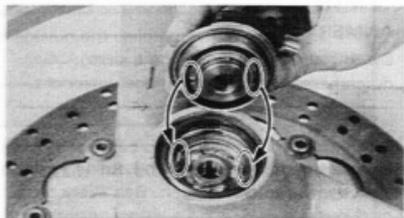
Lightly grease to the oil seal and gear unit.

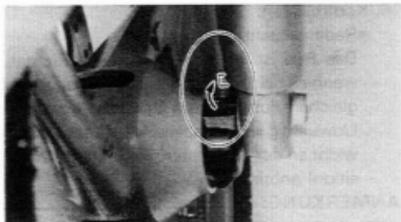
## 2. Install:

## • Gear unit assembly

**NOTE:** \_\_\_\_\_

Make sure the projections inside the gear unit are meshed with the flats in the wheel hub.





## 3. Install:

- Front wheel assembly

**NOTE:**

Be sure the boss on the outer fork tube correctly engages with the locating slot on the gear unit assembly.

## 4. Tighten:

- Wheel axle
- Pinch bolt
- Bolts (Brake caliper)

**Wheel Axle:**

74 Nm (7.4 m•kg, 53 ft•lb)

**Pinch Bolt:**

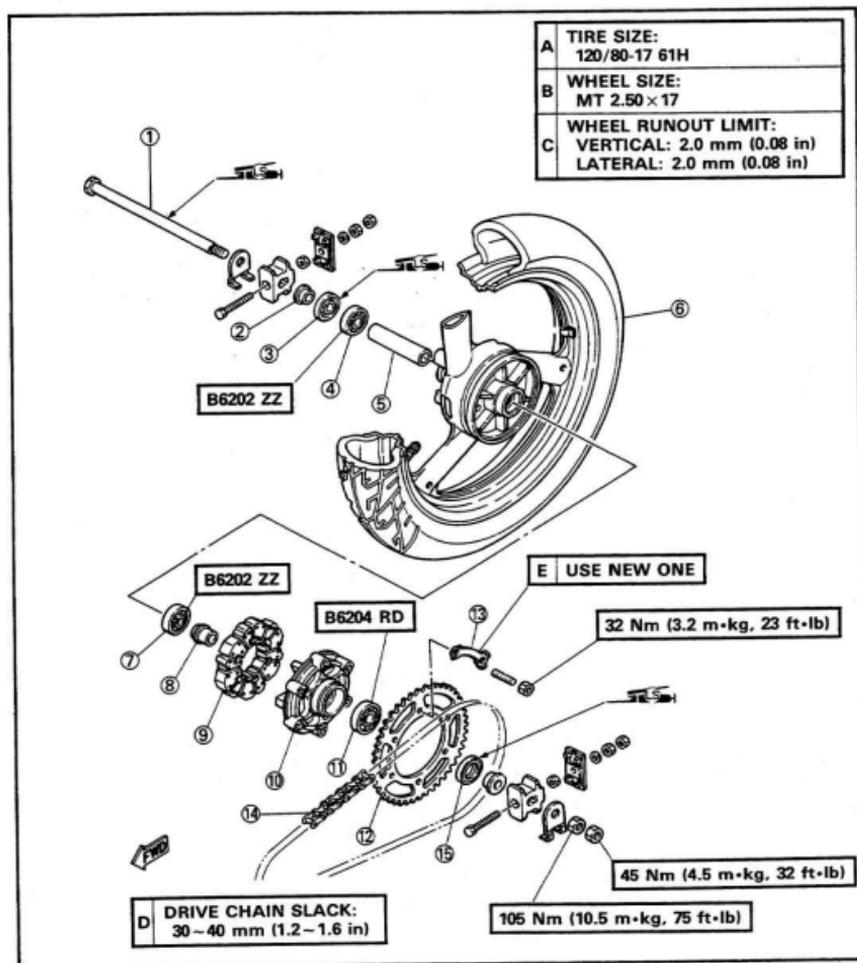
23 Nm (2.3 m•kg, 17 ft•lb)

**Bolts (Brake Caliper):**

35 Nm (3.5 m•kg, 25 ft•lb)

**REAR WHEEL**

- |                 |                   |
|-----------------|-------------------|
| ① Wheel axle    | ⑨ Damper          |
| ② Flange collar | ⑩ Hub             |
| ③ Oil seal      | ⑪ Bearing         |
| ④ Bearing       | ⑫ Driven sprocket |
| ⑤ Collar        | ⑬ Lock washer     |
| ⑥ Rear wheel    | ⑭ Drive chain     |
| ⑦ Bearing       | ⑮ Oil seal        |
| ⑧ Flange collar |                   |





## REMOVAL

## 1. Remove:

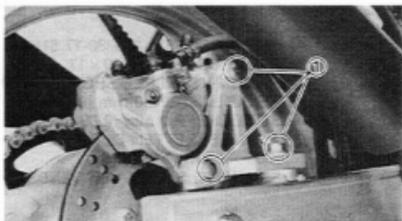
- Lower cowl (Right)
- Lower cowl (Left)

Refer to "COWLINGS" section in CHAPTER 3.

## 2. Elevate the rear wheel by placing a suitable stand under the engine.

**WARNING:**

Support the motorcycle securely so there is no danger of it falling over.

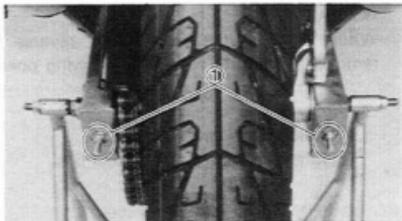


## 3. Remove:

- Bolts ① (Brake caliper)

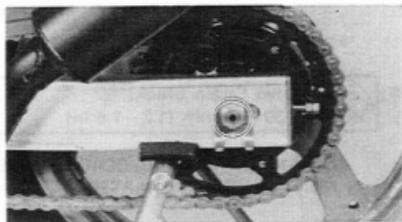
**NOTE:**

Do not depress the brake pedal when the wheel is off the motorcycle as the brake pads will be forced shut.



## 4. Loosen:

- Nuts ① (Chain puller)



## 5. Remove:

- Rear wheel

**NOTE:**

Before removing the rear wheel, push the wheel forward and remove the drive chain.

**INSPECTION**

1. Inspect:
  - Rear wheel axle  
Refer to "FRONT WHEEL—INSPECTION" section.
2. Inspect:
  - Wheel  
Refer to "FRONT WHEEL—INSPECTION" section.
3. Measure:
  - Wheel runout  
Refer to "FRONT WHEEL—INSPECTION" section.
4. Check:
  - Wheel bearings  
Refer to "FRONT WHEEL—INSPECTION" section.
5. Check:
  - Wheel balance  
Refer to "FRONT WHEEL—INSPECTION" section.

**INSTALLATION**

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

1. Apply:
  - Lithium base grease  
Lightly grease to the oil seal lips.
2. Adjust:
  - Drive chain slack



**Drive Chain Slack:**  
**30 – 40 mm (1.2 ~ 1.6 in)**

Refer to "DRIVE CHAIN SLACK ADJUSTMENT" section in CHAPTER 3.



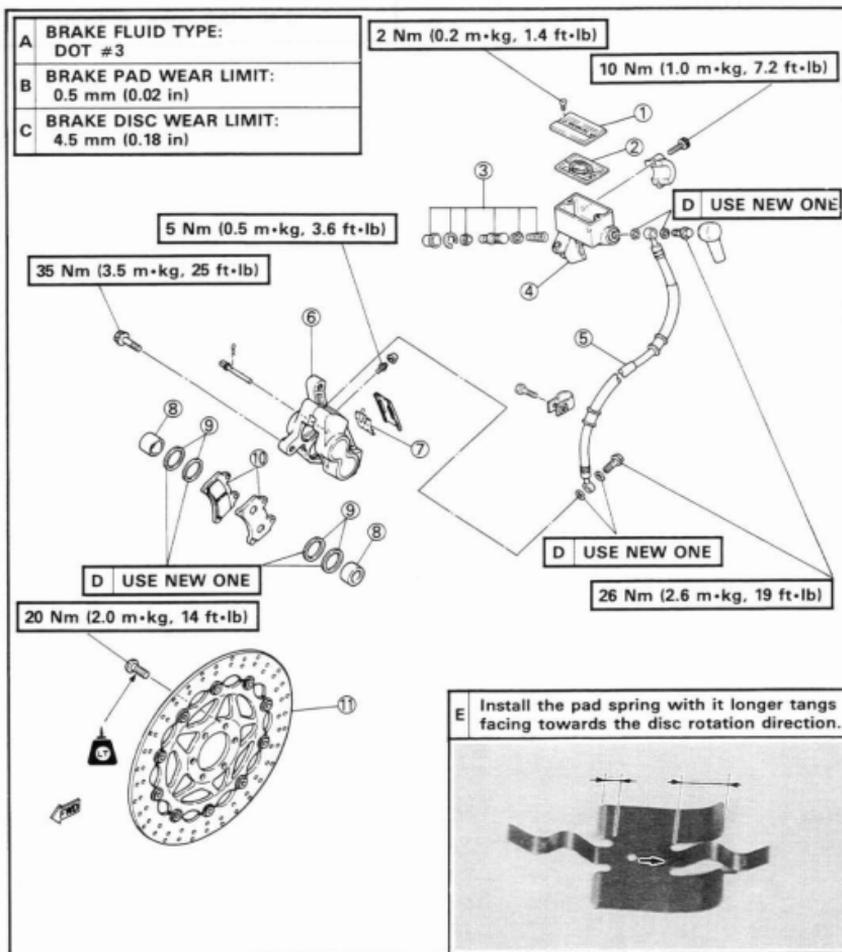
## 3. Tighten:

- Axle nut
- Locknut (Wheel axle)
- Bolts (Brake caliper)

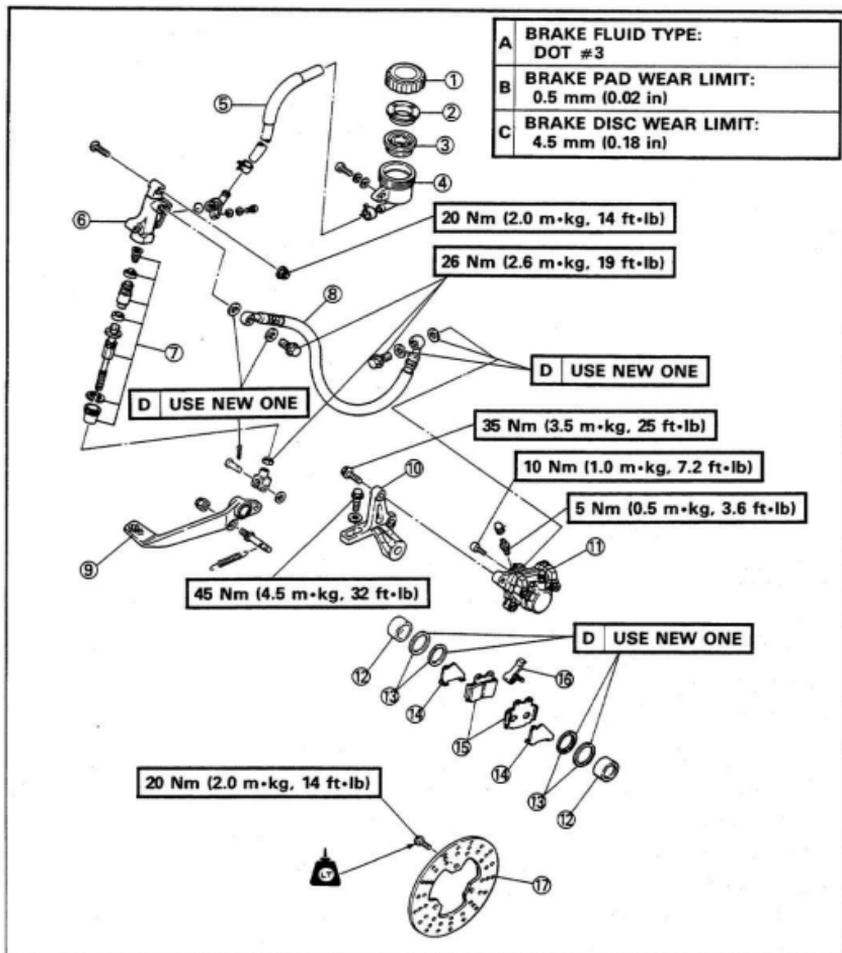
**Axle Nut:****105 Nm (10.5 m•kg, 75 ft•lb)****Locknut (Wheel Axle):****45 Nm (4.5 m•kg, 32 ft•lb)****Bolts (Brake Caliper):****35 Nm (3.5 m•kg, 25 ft•lb)**

## FRONT AND REAR BRAKE

- |                       |               |
|-----------------------|---------------|
| ① Master cylinder cap | ⑦ Pad spring  |
| ② Rubber seal         | ⑧ Piston      |
| ③ Master cylinder kit | ⑨ Piston seal |
| ④ Master cylinder     | ⑩ Brake pad   |
| ⑤ Brake hose          | ⑪ Brake disc  |
| ⑥ Brake caliper       |               |



- |                       |                   |
|-----------------------|-------------------|
| ① Reservoir tank cap  | ⑩ Caliper bracket |
| ② Bush                | ⑪ Brake caliper   |
| ③ Diaphragm           | ⑫ Piston          |
| ④ Reservoir tank      | ⑬ Piston seal     |
| ⑤ Reservoir hose      | ⑭ Shim            |
| ⑥ Master cylinder     | ⑮ Brake pad       |
| ⑦ Master cylinder kit | ⑯ Pad spring      |
| ⑧ Brake hose          | ⑰ Brake disc      |
| ⑨ Brake pedal         |                   |



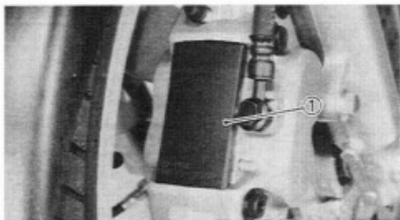
**CAUTION:**

Disc brake components rarely require disassembly. Do not disassemble components unless absolutely necessary. If any hydraulic connection in the system is opened, the entire system should be disassembled, drained, cleaned and then properly filled and bled upon reassembly. Do not use solvents on brake internal components.

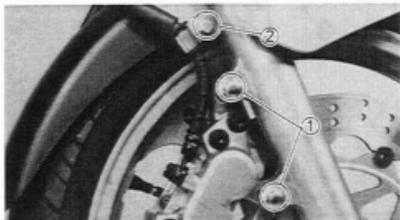
Solvents will cause seals to swell and distort. Use only clean brake fluid for cleaning. Use care with brake fluid. Brake fluid is injurious to eyes and will damage painted surfaces and plastic parts.

**BRAKE PAD REPLACEMENT****NOTE:**

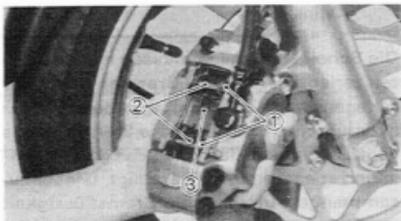
It is not necessary to disassemble the brake caliper and brake hose to replace the brake pads.

**Front Brake****1. Remove:**

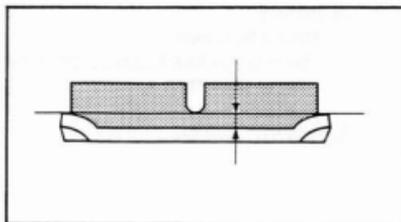
- Caliper cover ①

**2. Remove:**

- Bolts ① (Brake caliper)
- Bolt ② (Clamp)



3. Remove:
- Clips ①
  - Retaining pins ②
  - Pad spring ③



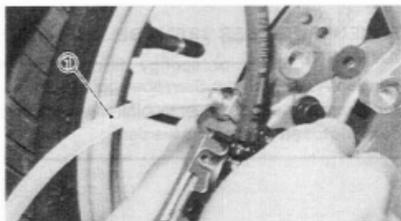
4. Remove:
- Brake pads



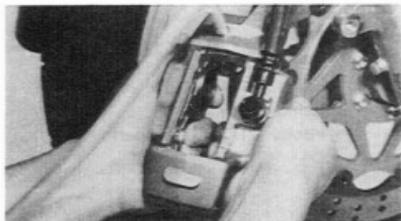
**Pad Wear Limit:**  
0.5 mm (0.02 in)

**NOTE:**

Replace the pads as a set if either is found to be worn to the wear limit.



5. Connect a suitable hose ① tightly to the caliper bleed screw. Then, place other end of this hose into an open container.

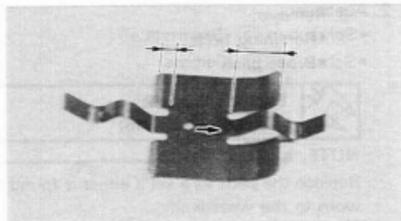


6. Loosen the caliper bleed screw and push the pistons into the caliper by your finger.

7. Tighten:
- Caliper bleed screw



**Caliper Bleed Screw:**  
5 Nm (0.5 m·kg, 3.6 ft·lb)



8. Install:
- Brake pads (New)
  - Pad spring
  - Retaining pins
  - Clips

**NOTE:**

Install the pad spring with it longer tangs facing towards the disc rotation direction.



## 9. Install:

- Bolts (Brake caliper)
- Caliper cover

**Bolts (Brake Caliper):****35 Nm (3.5 m·kg, 25 ft·lb)**

## 10. Inspect:

- Brake fluid level

Refer to "BRAKE FLUID INSPECTION" section in CHAPTER 3.

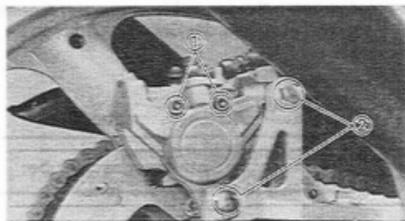
- ① "LOWER" level line

## 11. Check:

- Brake lever operation

A softy or spongy filling → Bleed brake system.

Refer to "AIR BLEEDING" section in CHAPTER 7.

**Rear Brake**

## 1. Loosen:

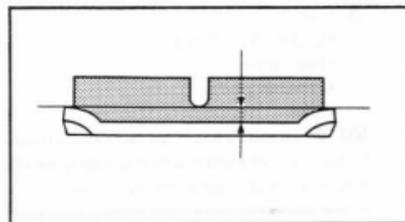
- Retaining bolts ①

## 2. Remove:

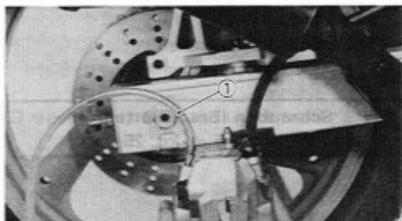
- Bolts ② (Brake caliper)

## 3. Remove:

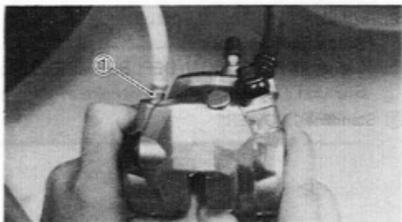
- Retaining bolts
- Brake pads

**Pad Wear Limit:****0.5 mm (0.02 in)****NOTE:**

Replace the pads as a set if either is found to be worn to the wear limit.



4. Connect a suitable hose ① tightly to the caliper bleed screw. Then, place other end of this hose into an open container.

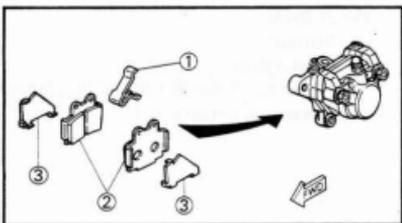


5. Loosen the caliper bleed screw ① and push the pistons into the caliper by your finger.

6. Tighten:
- Caliper bleed screw



**Caliper Bleed Screw:**  
5 Nm (0.5 m·kg, 3.6 ft·lb)

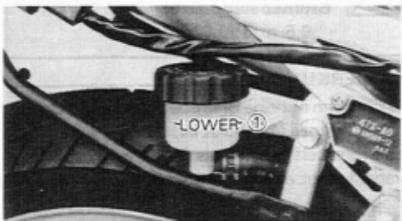


7. Install:
- Pad spring ①
  - Brake pads ②
  - Shims ③

8. Install:
- Retaining bolts
  - Bolts (Brake caliper)



**Retaining Bolts:**  
10 Nm (1.0 m·kg, 7.2 ft·lb)  
**Bolts (Brake Caliper):**  
35 Nm (3.5 m·kg, 25 ft·lb)



9. Inspect:
- Brake fluid level  
Refer to "BRAKE FLUID INSPECTION" section in CHAPTER 3.

① "LOWER" level line



## 10. Check:

- Brake pedal operation

A softy or spongly filling → Bleed brake system.

Refer to "AIR BLEEDING" section in CHAPTER 7.

**CALIPER DISASSEMBLY****NOTE:** \_\_\_\_\_

Before disassembling the front brake caliper or rear brake caliper, drain the brake system of its brake fluid.

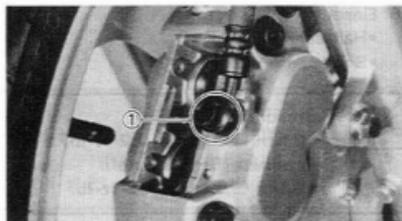
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**Front Brake**

## 1. Remove:

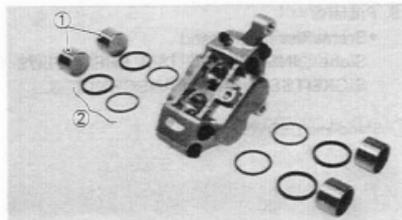
- Brake pads

Refer to "BRAKE PAD REPLACEMENT" section in CHAPTER 7.



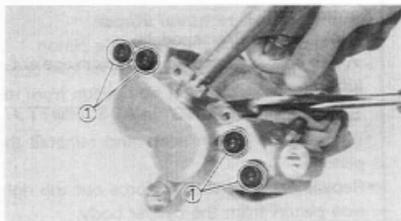
## 2. Remove:

- Union bolt ①
- Copper washers
- Caliper body



## 3. Remove:

- Pistons ①
- Piston seals ②

**Caliper piston removal steps:**

- Using a rag, lock the right side piston.
- Blow compressed air into the hose joint opening to force out the left side piston from the caliper body.
- Remove the piston seals and reinstall the piston.
- Repeat previous step to force out the right side piston from the caliper body.

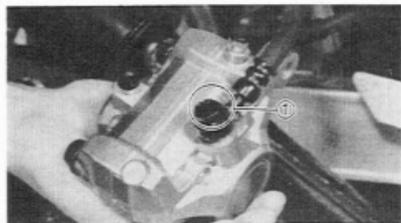
**WARNING:**

Do not loosen the bolts ①.

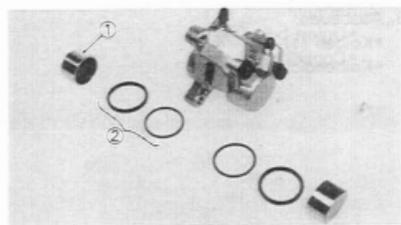
**Rear Brake****1. Remove:**

- Brake pads

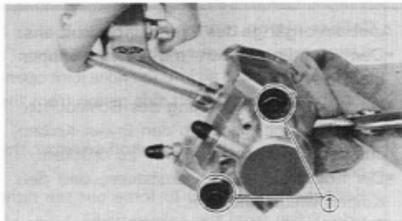
Refer to "BRAKE PAD REPLACEMENT" section in CHAPTER 7.

**2. Remove:**

- Union bolt ①
- Copper washers

**3. Remove:**

- Pistons ①
- Piston seals ②

**Caliper piston removal steps:**

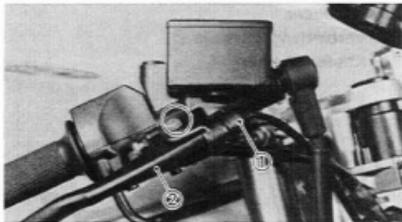
- Using a rag, lock the right side piston.
- Blow compressed air into the hose joint opening to force out the left side piston from the caliper body.
- Remove the piston seals and reinstall the piston.
- Repeat previous step to force out the right side piston from the caliper body.

**WARNING:**

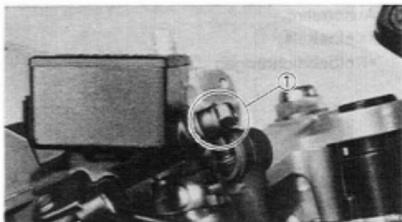
Do not loosen the bolts ①.

**MASTER CYLINDER DISASSEMBLY****NOTE:**

Before disassembling the front or rear brake master cylinders, drain the brake system of its brake fluid.

**Front Brake****1. Remove:**

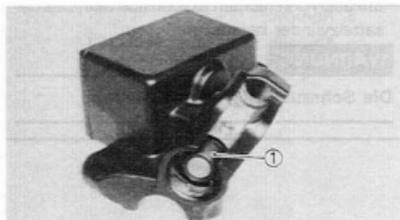
- Brake switch ①
- Brake lever ②

**2. Remove:**

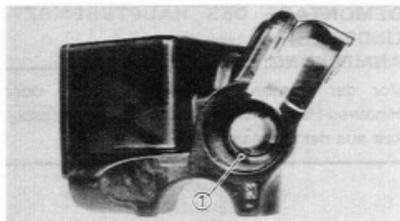
- Union bolt ①
- Copper washers



3. Remove:  
 • Master cylinder assembly ①



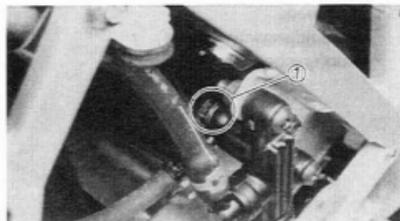
4. Remove:  
 • Dust boot ①



5. Remove:  
 • Circlip ①  
 • Master cylinder kit

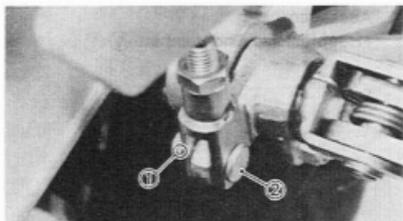


6. Remove:  
 • Master cylinder cap ①  
 • Rubber seal

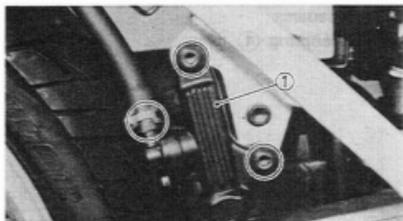


#### Rear Brake

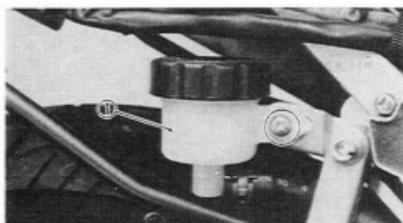
1. Remove:  
 • Union bolt ①  
 • Copper washer



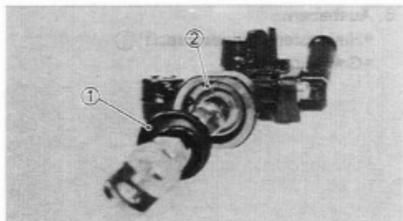
2. Remove:
- Cotter pin ①
  - Plain washer
  - Pin ②



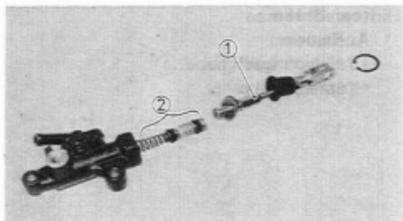
3. Remove:
- Master cylinder assembly ①



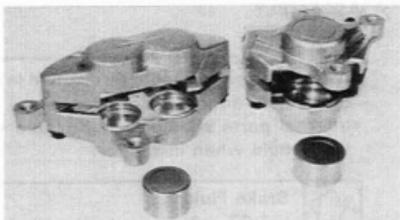
4. Remove:
- Reservoir tank ①



5. Remove:
- Dust boot ①
  - Circlip ②



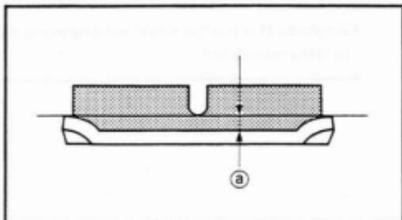
6. Remove:
- Adjusting rod ①
  - Master cylinder kit ②



## INSPECTION AND REPAIR

## 1. Inspect:

- Caliper piston  
Rust/Wear → Replace.
- Caliper cylinder body  
Wear/Scratches → Replace.



## 2. Measure:

- Brake pad thickness **a**  
Out of specification → Replace.



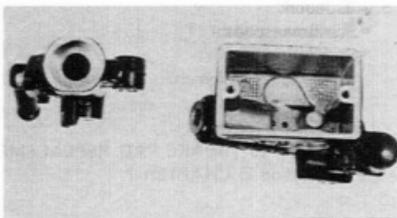
**Pad Wear Limit:**  
0.5 mm (0.02 in)

**NOTE:** \_\_\_\_\_

Replace the pads as a set if either is found to be worn to the wear limit.

## 3. Inspect:

- Brake hose  
Cracks/Damage → Replace.

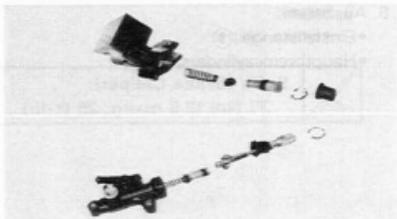


## 4. Inspect:

- Master cylinder body  
Scratches/Wear → Replace.

**NOTE:** \_\_\_\_\_

Clean all passages with new brake fluid.



## 5. Inspect:

- Master cylinder kit  
Scratches/Wear → Replace.

## ASSEMBLY

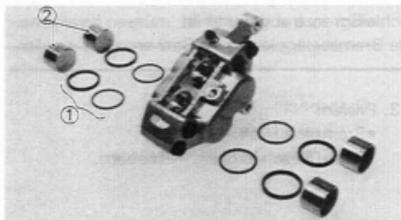
**WARNING:**

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



Brake Fluid:  
DOT #3

- Replace the piston seals whenever a caliper is disassembled.



## Front Brake

## 1. Install:

- Piston seals ①
- Pistons ②

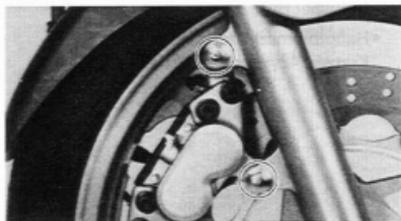
## 2. Install:

- Brake pads
- Pad spring
- Retaining pins
- Circlips
- Caliper cover

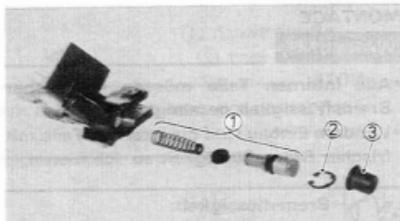
Refer to "BRAKE PAD REPLACEMENT" section in CHAPTER 7.

## 3. Install:

- Brake caliper

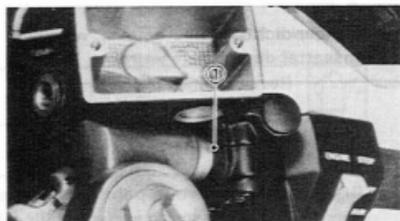


Bolts (Brake Caliper):  
35 Nm (3.5 m•kg, 25 ft•lb)



## 4. Install:

- Master cylinder kit ①
- Circlip ②
- Dust boot ③



## 5. Install:

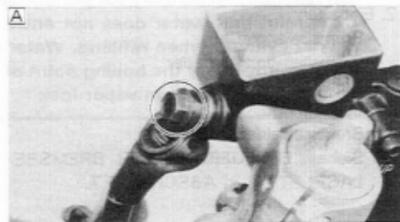
- Master cylinder (Front brake)

## NOTE:

- Align the end of the master cylinder bracket with the punch mark ① on the handlebar.
- Install the master cylinder bracket with the "UP" mark facing upward.
- Tighten first the upper bolt, then the lower bolt.



**Bolts (Master Cylinder Bracket):**  
10 Nm (1.0 m•kg, 7.2 ft•lb)



## 6. Install:

- Brake hose
- Copper washers
- Union bolts

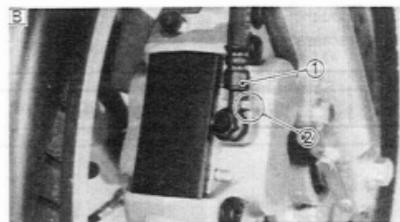


**Union Bolts:**  
26 Nm (2.6 m•kg, 19 ft•lb)

- A Master cylinder
- B Brake caliper

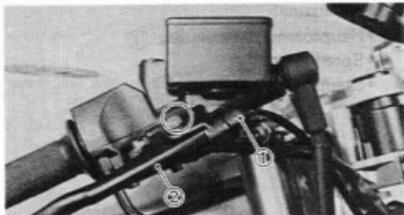
## CAUTION:

When installing the brake hose to the caliper, lightly touch the brake pipe ① with the projection ② on the caliper.



## WARNING:

Always use new copper washers.



## 7. Install:

- Brake switch ①
- Brake lever ②

## NOTE:

Apply lithium soap base grease to pivot shaft of brake lever.

## 8. Fill:

- Brake fluid



**Recommended Brake Fluid:**  
DOT #3

**CAUTION:**

Brake fluid may erode painted surfaces or plastic parts. Always clean up spilled fluid immediately.

**WARNING:**

- Use only the designated quality brake fluid: otherwise, the rubber seals may deteriorate, causing leakage and poor brake performance.
- Refill with the same type of brake fluid; mixing fluids may result in a harmful chemical reaction and lead to poor performance.
- Be careful that water does not enter the master cylinder when refilling. Water will significantly lower the boiling point of the fluid and may result in vapor lock.



## 9. Install:

- Rubber seal
- Master cylinder cap ①



**Screws (Master Cylinder Cap):**  
2 Nm (0.2 m·kg, 1.4 ft·lb)



## 10. Air bleed:

- Brake system

Refer to "AIR BLEEDING" section in CHAPTER 7.

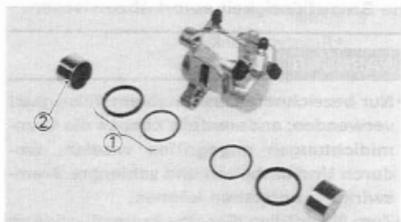


## 11. Inspect:

- Brake fluid level

Fluid level is under "LOWER" level line ① → Replenish.

Refer to "BRAKE FLUID INSPECTION" section in CHAPTER 3.



## Rear Brake

## 1. Install:

- Piston seals ①
- Pistons ②

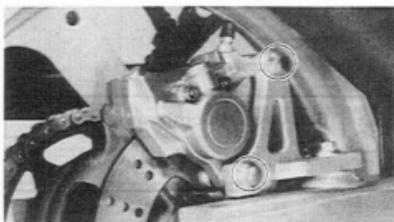
## 2. Install:

- Brake pads
- Pad spring
- Shims
- Retaining bolts

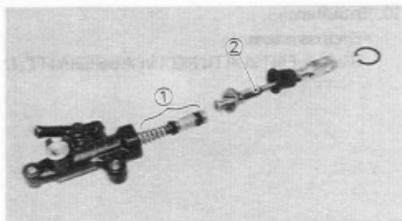
Refer to "BRAKE PAD REPLACEMENT" section in CHAPTER 3.

## 3. Install:

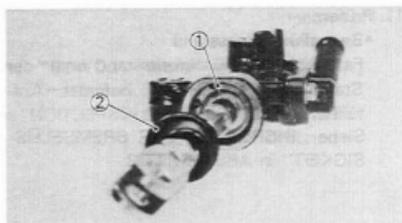
- Brake caliper



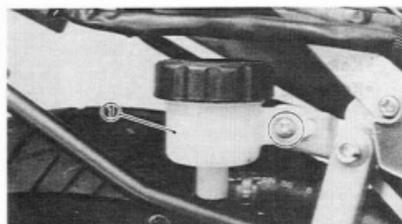
**Bolts (Brake Caliper):**  
35 Nm (3.5 m•kg, 25 ft•lb)



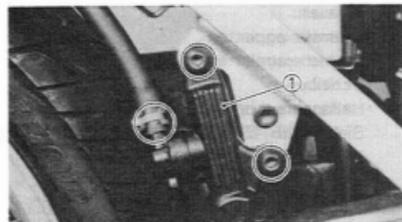
4. Install:
- Master cylinder kit ①
  - Adjusting rod ②



5. Install:
- Circlip ①
  - Dust boot ②



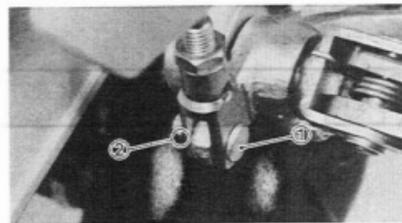
6. Install:
- Reservoir tank ①



7. Install:
- Master cylinder assembly ①



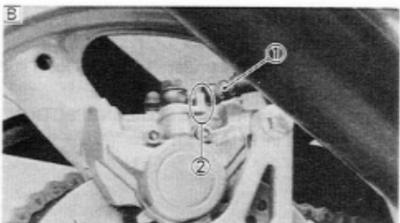
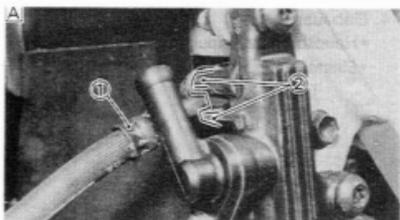
**Bolts (Master Cylinder Assembly):**  
35 Nm (3.5 m·kg, 25 ft·lb)



8. Install:
- Pin ①
  - Plain washer
  - Cotter pin ②

**WARNING:**

Always use new cotter pin.



## 9. Install:

- Brake hose
- Copper washers
- Union bolts



## Union Bolts:

26 Nm (2.6 m·kg, 19 ft·lb)

A

Master cylinder

B

Brake caliper

**CAUTION:**

When installing the brake hose, lightly touch the brake pipe ① with the projections ② on the caliper and master cylinder.

**WARNING:**

Always use new copper washers.

## 10. Fill:

- Brake fluid



## Recommended Brake Fluid:

DOT #3

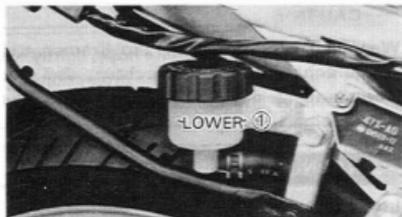
**CAUTION:**

Brake fluid may erode painted surfaces or plastic parts. Always clean up spilled fluid immediately.

**WARNING:**

- Use only the designated quality brake fluid; otherwise, the rubber seals may deteriorate, causing leakage and poor brake performance.
- Refill with the same type of brake fluid; mixing fluids may result in a harmful chemical reaction and lead to poor performance.
- Be careful that water does not enter the master cylinder when refilling. Water will significantly lower the boiling point of the fluid and may result in vapor lock.

11. Air bleed:
- Brake system
- Refer to "AIR BLEEDING" section in CHAPTER 7.



12. Inspect:
- Brake fluid level
- Fluid level is under "LOWER" level line ① → Replenish.
- Refer to "BRAKE FLUID INSPECTION" section in CHAPTER 3.

#### 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:**

- Add proper brake fluid to the reservoir.
- Install the diaphragm. Be careful not to spill any fluid or allow the reservoir to overflow.
- Connect the clear plastic tube ① tightly to the caliper bleed screw.

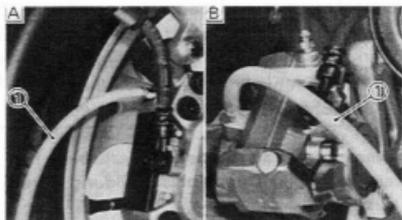
**A** Front

**B** Rear

- Place the other end of the tube into a container.

- Slowly apply the brake lever or pedal several times.

- Pull the lever in or push down on the pedal. Hold the lever or pedal in position.





- g. Loosen the bleed screw and allow the lever or pedal to travel towards its limit.
- h. Tighten the bleed screw when the lever or pedal limit has been reached; then release the lever or pedal.

**Bleed Screw:****5 Nm (0.5 m•kg, 3.6 ft•lb)**

- i. Repeat steps (e) to (h) until 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 disappeared.

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

## FRONT FORK

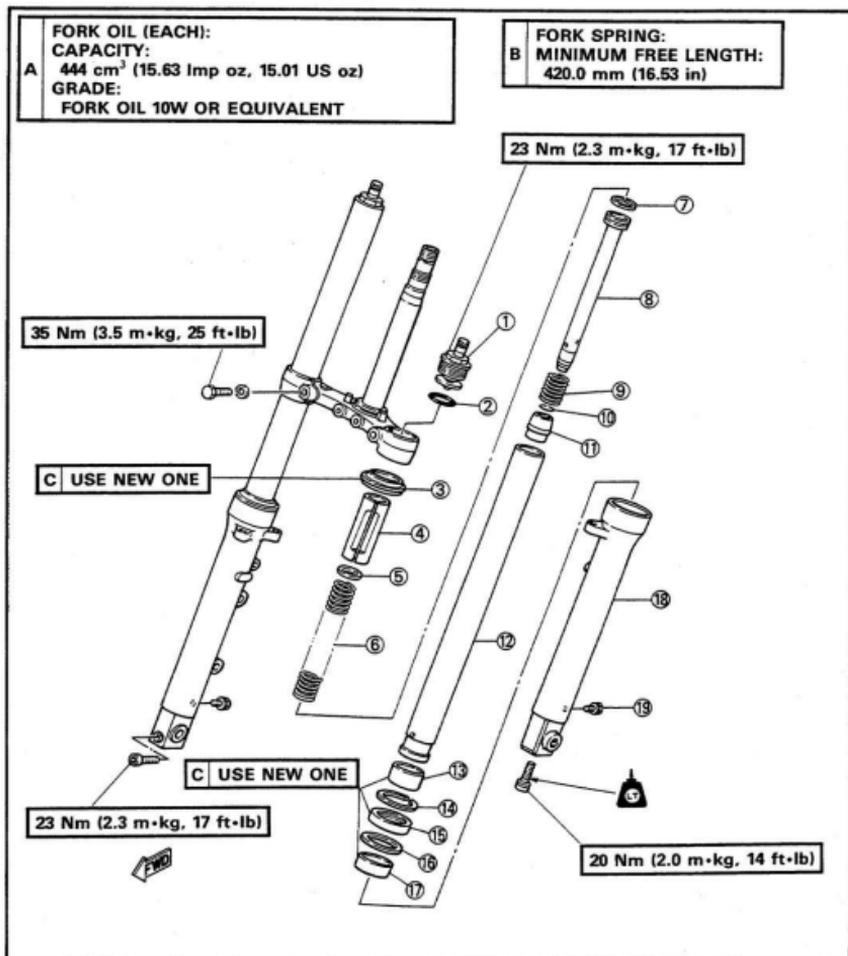
- |                  |                   |
|------------------|-------------------|
| ① Cap bolt       | ⑪ Oil lock pieces |
| ② O-ring         | ⑫ Inner fork tube |
| ③ Dust seal      | ⑬ Slide metal     |
| ④ Spacer         | ⑭ Retaining clip  |
| ⑤ Spring seat    | ⑮ Oil seal        |
| ⑥ Fork spring    | ⑯ Washer          |
| ⑦ Piston ring    | ⑰ Guide bush      |
| ⑧ Damper rod     | ⑱ Outer fork tube |
| ⑨ Rebound spring | ⑲ Drain screw     |
| ⑩ Circlip        |                   |

## FORK OIL (EACH):

- A** CAPACITY:  
444 cm<sup>3</sup> (15.63 Imp oz, 15.01 US oz)  
GRADE:  
FORK OIL 10W OR EQUIVALENT

## FORK SPRING:

- B** MINIMUM FREE LENGTH:  
420.0 mm (16.53 in)



**REMOVAL**

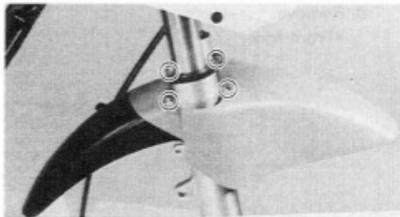
1. Remove:
  - Lower cowl (Right)
  - Lower cowl (Left)Refer to "COWLINGS" section in CHAPTER 3.

2. Elevate the front wheel by placing a suitable stand under the engine.

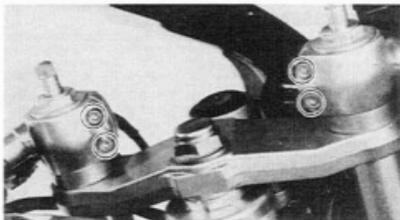
**WARNING:**

Support the motorcycle securely so there is no danger of it falling over.

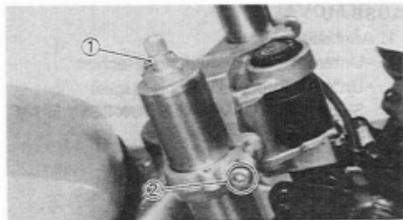
3. Remove:
  - Front wheelRefer to "FRONT WHEEL — REMOVAL" section in CHAPTER 7.



4. Remove:
  - Front fender



5. Remove:
  - Handlebar (Right)
  - Handlebar (Left)
  - Spacers



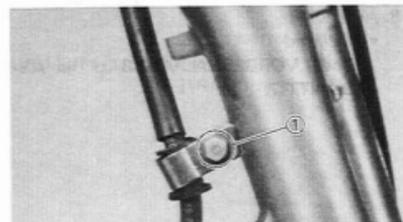
6. Loosen:
- Cap bolt ①
  - Pinch bolt ② (Handle crown)



7. Loosen:
- Pinch bolt ① (Under bracket)

**WARNING:**

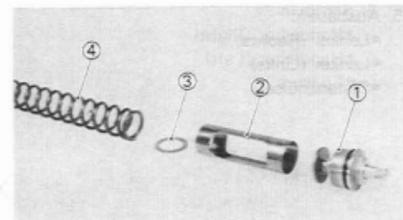
Support the fork before loosening the pinch bolt.

**NOTE:**

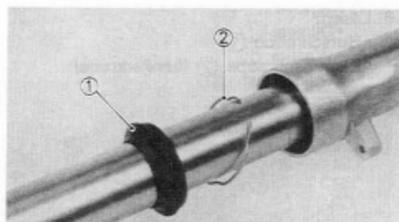
When removing the right-hand front fork, remove the bolt ① (Hose clamp).



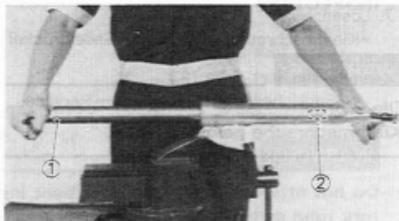
8. Remove:
- Front fork

**DISASSEMBLY**

1. Remove:
- Cap bolt ①
  - Spacer ②
  - Spring seat ③
  - Fork spring ④



2. Drain:
  - Fork oil
3. Remove:
  - Dust seal ①
  - Retaining clip ②

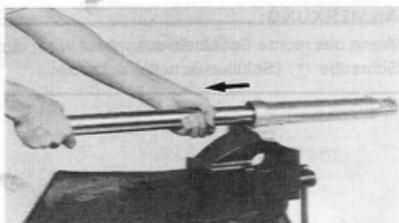


4. Remove:
  - Bolt (Damper rod)
 Use the Holder ① and T-Handle ② to lock the damper rod.



T-Handle:  
90890-01326

Holder:  
90890-01294



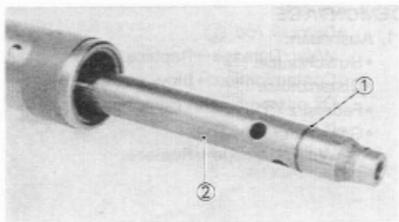
5. Remove:
  - Inner fork tube

#### Removal steps:

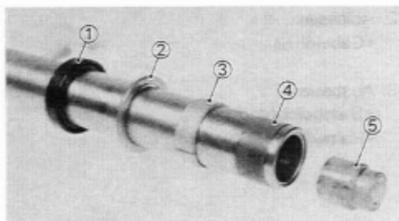
- Hold the fork leg horizontally.
- Pull out the inner fork tube from the outer tube by forcefully, but carefully, withdrawing the inner fork tube.

#### CAUTION:

Avoid bottoming the inner tube in the outer tube during the above procedure, as the oil lock piece will be damaged.

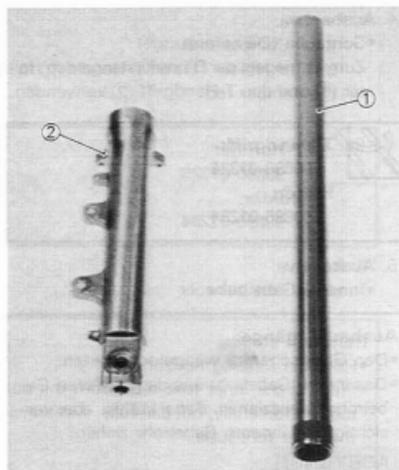


6. Remove:
  - Circlip ①
  - Damper rod ②



## 7. Remove:

- Oil seal ①
- Washer ②
- Guide bush ③
- Slide bush ④
- Oil lock piece ⑤



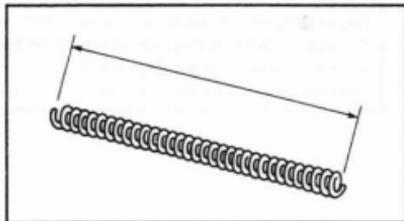
## INSPECTION

## 1. Inspect:

- Inner fork tube ①
  - Outer fork tube ②
- Scratches/Bends/Damage → Replace.

**WARNING:**

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



## 2. Measure:

- Fork spring free length
- Out of specification → Replace.

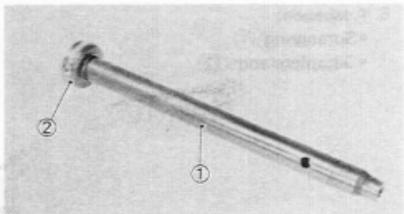


**Fork Spring Free Length:**

427.2 mm (16.82 in)

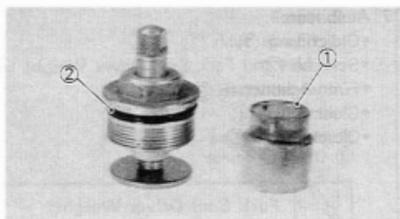
**Minimum Free Length:**

420.0 mm (16.53 in)



## 3. Inspect:

- Damper rod ①
- Wear/Damage → Replace.  
Contamination → Blow out all Oil passages with compressed air.
- Piston ring ②
- Wear/Damage → Replace.



## 4. Inspect:

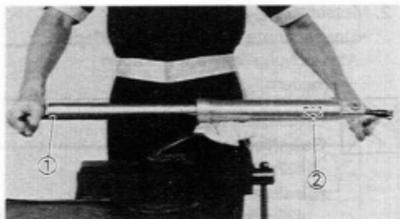
- Oil lock piece ①
  - O-ring ②
- Damage → Replace.

**ASSEMBLY**

Reverse the "DISASSEMBLY" procedure.  
Note the following points.

**NOTE:**

- In front fork reassembly, be sure to use following new parts.
  - \* Guide bush
  - \* Slide bush
  - \* Oil seal
  - \* Dust seal
- Make sure all components are clean before reassembly.



## 1. Tighten:

- Bolt (Damper rod)  
Use the Holder ① and T-Handle ② to lock the damper rod.

**T-Handle:**

90890-01326

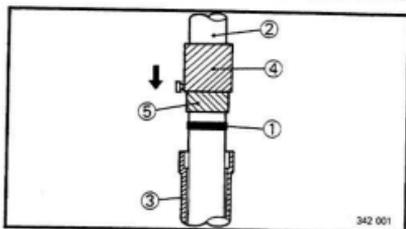
**Holder:**

90890-01294

**Bolt (Damper Rod):**

20 Nm (2.0 m·kg, 14 ft·lb)

Apply **LOCTITE®**.



## 2. Install:

- Guide bush (1)
- Use the Fork Seal Driver Weight (4) and Adapter (5).

- (2) Inner fork tube
- (3) Outer fork tube

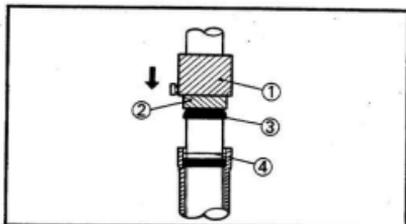


**Fork Seal Driver Weight:**

**90890-01367**

**Adapter:**

**90890-01398**



## 3. Install:

- Oil seal (3)
- Use the Fork Seal Driver Weight (1) and Adapter (2).

- (4) Washer



**Fork Seal Driver Weight:**

**90890-01367**

**Adapter:**

**90890-01398**

## 4. Fill:

- Front fork



**Fork Oil Capacity:**

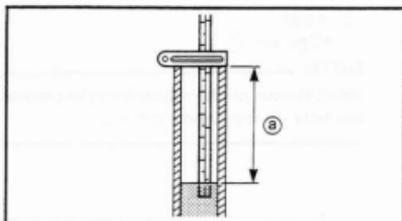
**444 cm<sup>3</sup> (15.63 Imp oz,  
15.01 US oz)**

**Grade:**

**Fork Oil 10W or Equivalent**

**NOTE:**

After filling the front fork with fork oil, slowly pump the front fork up and down to distribute oil.



## 5. Measure:

- Oil level (a)
- Out of specification → Add or reduce oil.



## Oil Level:

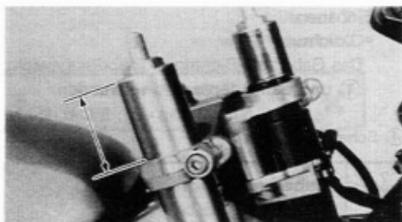
90 mm (3.54 in)

From the top of the inner fork tube.

## NOTE:

- When measuring the oil level, fully compress the inner fork tube without fork spring.
- Place the front fork on upright position.

6. Before installing the front fork, temporary tighten the cap bolt.



## INSTALLATION

Reverse the "REMOVAL" procedure.  
Note the following points.

## 1. Install:

- Front fork
- Temporary tighten the pinch bolts.

## NOTE:

Hold the inner tube with its top 52 mm (2.04 in) above the top of the handle crown.

## 2. Tighten:

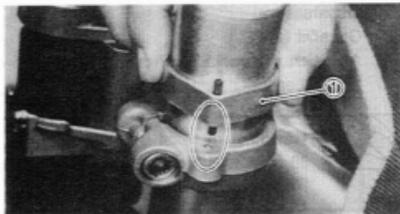
- Pinch bolt (Under bracket)
- Cap bolt
- Pinch bolt (Handle crown)



**Pinch Bolt (Under Bracket):**  
35 Nm (3.5 m·kg, 25 ft·lb)

**Cap Bolt:**  
23 Nm (2.3 m·kg, 17 ft·lb)

**Pinch Bolt (Handle Crown):**  
32 Nm (3.2 m·kg, 23 ft·lb)



3. Install:  
 • Spacers ①

**NOTE:** \_\_\_\_\_  
 Insert the pin on the spacer into the corresponding hole on the handle crown.



4. Install:  
 • Handlebars

**NOTE:** \_\_\_\_\_  
 Insert the pin on the spacer into the corresponding hole on the handlebar.



**Bolts (Handlebar):**  
 13 Nm (1.3 m·kg, 9.4 ft·lb)

5. Install:  
 • Front fender



**Bolts (Front Fender):**  
 8 Nm (0.8 m·kg, 5.8 ft·lb)

6. Install:  
 • Front wheel



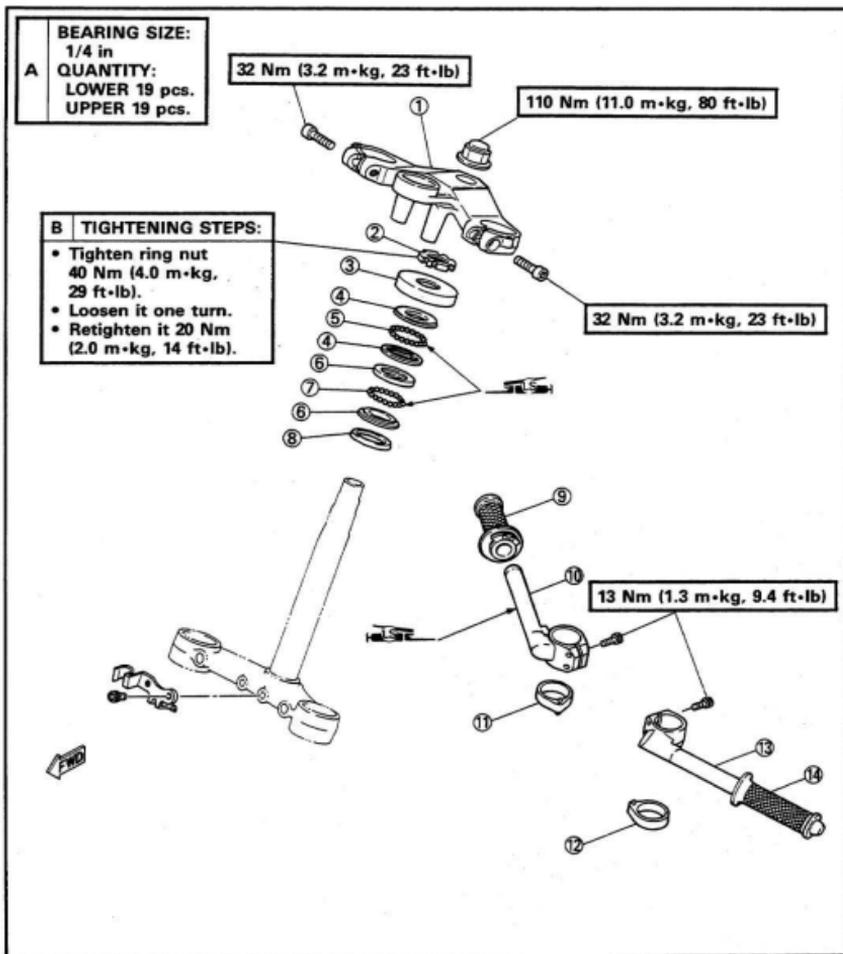
**Wheel Axle:**  
 74 Nm (7.4 m·kg, 53 ft·lb)  
**Bolts (Brake Caliper):**  
 35 Nm (3.5 m·kg, 25 ft·lb)

Refer to "FRONT WHEEL — INSTALLATION" section in CHAPTER 7.

7. Install:  
 • Lower cowl (Left)  
 • Lower cowl (Right)  
 Refer to "COWLINGS" section in CHAPTER 3.

## STEERING HEAD AND HANDLEBARS

- |                      |                               |
|----------------------|-------------------------------|
| ① Handle crown       | ⑧ Dust seal                   |
| ② Ring nut           | ⑨ Handlebar grip (Right-hand) |
| ③ Ball race cover    | ⑩ Handlebar (Right-hand)      |
| ④ Upper bearing race | ⑪ Spacer                      |
| ⑤ Ball bearing       | ⑫ Spacer                      |
| ⑥ Lower bearing race | ⑬ Handlebar (Left-hand)       |
| ⑦ Ball bearing       | ⑭ Handlebar grip (Left-hand)  |



**REMOVAL**

## 1. Remove:

- Lower cowl (Right)
- Lower cowl (Left)

Refer to "COWLINGS" section in CHAPTER 3.

2. Elevate the front wheel by placing a suitable stand under the engine.

**WARNING:**

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

## 3. Remove:

- Front wheel

Refer to "FRONT WHEEL—REMOVAL" section in CHAPTER 7.

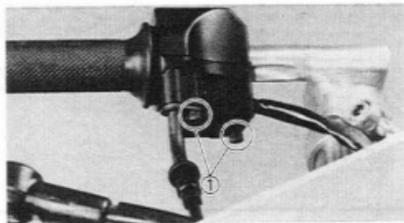
## 4. Remove:

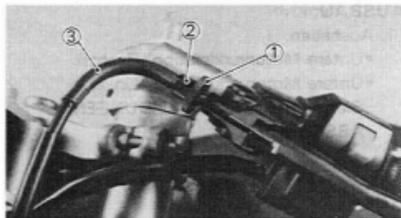
- Bolts ① (Master cylinder bracket)



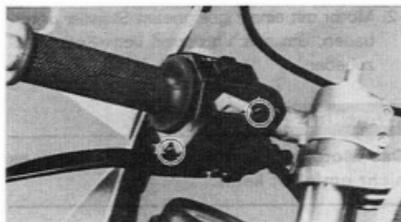
## 5. Loosen:

- Screws ① (Right-hand handlebar switch)

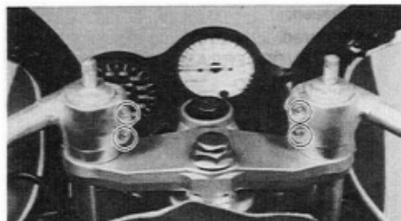




6. Loosen:
- Locknut ①
  - Adjuster ②
7. Remove:
- Clutch cable ③



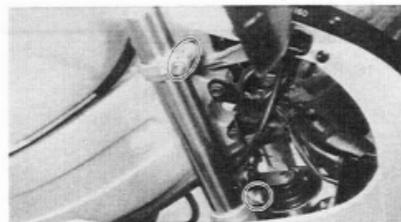
8. Remove:
- Left handlebar switch



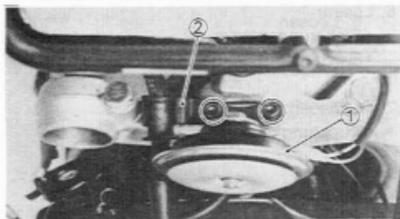
9. Remove:
- Handlebar (Left-hand)
  - Handlebar (Right-hand)
  - Right-hand handlebar switch (With throttle grip)



10. Remove:
- Spacers ①



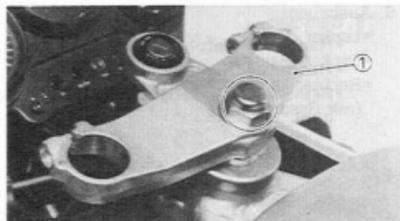
11. Remove:
- Front forks



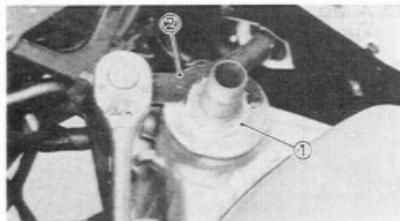
12. Remove:
- Horn ①
  - Brake hose clamp ②



13. Disconnect:
- Main switch leads



14. Remove:
- Handle crown ①



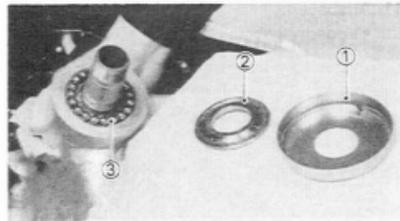
15. Remove:
- Ring nut ①
- Use Ring Nut Wrench ②.



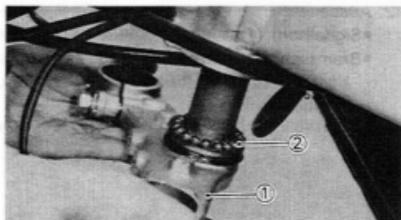
Ring Nut Wrench:  
90890-01403

**WARNING:**

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



16. Remove:
- Bearing race cover ①
  - Bearing race ②
  - Upper bearings ③



## 17. Remove:

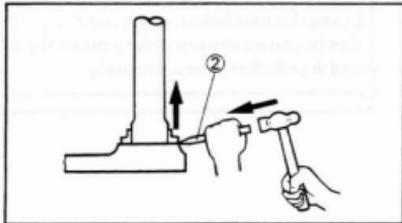
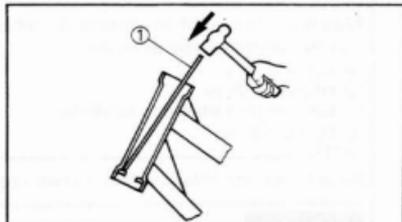
- Under bracket ①
- Lower bearings ②

## INSPECTION

1. Wash the ball bearings and bearing races with a solvent.
2. Inspect:
  - Ball bearings
  - Bearing races
 Pitting/Damage → Replace.

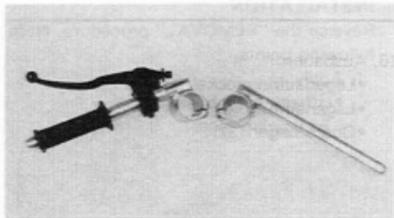
## NOTE:

Always replace bearings and races as a set.



## Bearing race replacement steps:

- Remove the bearing races on the head pipe using long rod ① and the hammer as shown.
- Remove the bearing race on the under bracket using the floor chisel ② and the hammer as shown.
- Install the new dust seal and races.

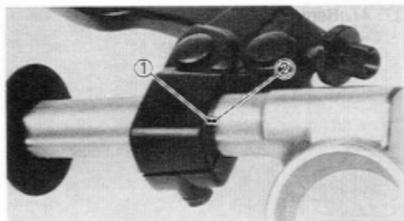


## 3. Inspect:

- Handlebars
- Bends/Cracks/Damage → Replace.

## WARNING:

Do not attempt to straighten a bent handlebar as this may dangerously weaken the handlebar.

**Left-hand handlebar replacement steps:**

- For reinstalling the lever holder, put an identifying mark ① on the lever holder as shown.
- ② Punch mark
- Remove the handlebar grip and lever holder.

- Install the lever holder to a new handlebar.

**NOTE:**

Align the identifying mark on the lever holder with the punch mark on the handlebar.

**Bolt (Lever Holder):**

**13 Nm (1.3 m·kg, 9.4 ft·lb)**

- Apply a light coat of an adhesive for rubber on the handlebar end as shown.

Ⓐ 14 mm (1.57 in)

Ⓑ 115 mm (4.53 in)

- Install the handlebar grip as shown.

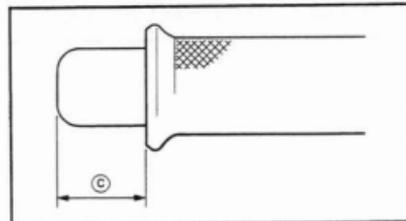
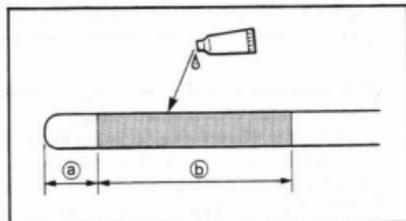
Ⓒ 14 mm (1.57 in)

**NOTE:**

Wipe off excess adhesive with a clean rag.

**WARNING:**

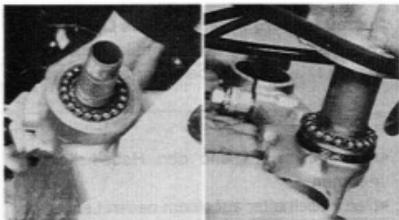
Leave the handlebar intact until the adhesive becomes dry enough to make the grip and handlebar stuck securely.

**INSTALLATION**

Reverse the "REMOVAL" procedure. Note the following points.

## 1. Apply:

- Lithium soap base grease  
To bearing races.



## 2. Install:

## •Bearings

Arrange the bearings around race, and apply more grease.

**Ball Quantity/Size**

**Upper 19 pcs./1/4 in**

**Lower 19 pcs./1/4 in**

## 3. Install:

## •Under bracket

**WARNING:** \_\_\_\_\_

**Hold the under bracket until it is secured.**



## 4. Tighten:

## •Ring nut

**Ring nut tightening steps:**

- Tighten the ring nut using the Ring Nut Wrench.

**Ring Nut Wrench:**

**90890-01403**

**NOTE:** \_\_\_\_\_

Set the torque wrench to the ring nut wrench so that they form a right angle.

**Ring Nut (Initial Tightening):**

**40 Nm (4.0 m•kg, 29 ft•lb)**

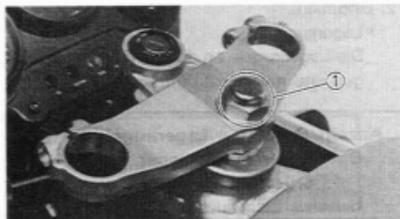
- Loosen the ring nut one turn.
- Retighten the ring nut using the Ring Nut Wrench.

**WARNING:** \_\_\_\_\_

**Avoid over-tightening.**

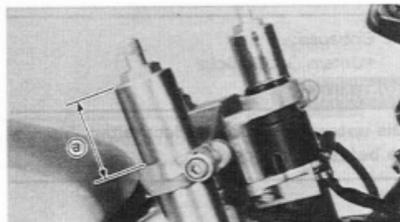
**Ring Nut (Final Tightening):**

**20 Nm (2.0 m•kg, 14 ft•lb)**



5. Install:
- Handle crown

**NOTE:** \_\_\_\_\_  
Temporary tighten the steering fitting nut ①.



6. Install:
- Front forks
- Refer to the "FRONT FORK—INSTALLATION" section.

② 52 mm (2.04 in)

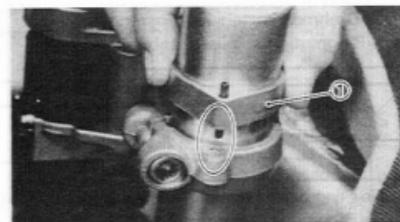


**Pinch Bolt (Under Bracket):**  
35 Nm (3.5 m•kg, 25 ft•lb)  
**Pinch Bolt (Handle Crown):**  
32 Nm (3.2 m•kg, 23 ft•lb)

7. Tighten:
- Steering fitting nut



**Steering Fitting Nut:**  
110 Nm (11.0 m•kg, 80 ft•lb)



8. Install:
- Spacers ①

**NOTE:** \_\_\_\_\_  
Insert the pin on the spacer into the corresponding hole on the handle crown.

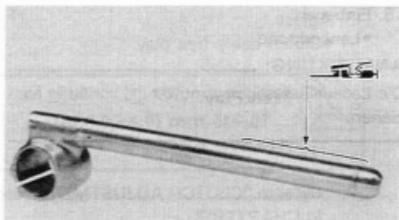


9. Install:
- Handlebars

**NOTE:** \_\_\_\_\_  
Insert the pin on the spacer into the corresponding hole on the handlebar.



**Bolts (Handlebar):**  
13 Nm (1.3 m•kg, 9.4 ft•lb)

**NOTE:**

Before installing the right-hand handlebar onto the handle crown, apply a light coat of lithium soap base grease onto the handlebar end and install the throttle grip to the handlebar.



## 10. Install:

- Front brake master cylinder

**NOTE:**

- Align the end of the master cylinder bracket with the punch mark ① on the handlebar.
- Install the master cylinder bracket with the "UP" mark facing upward.
- Tighten first the upper bolt, then the lower bolt.



**Bolts (Master Cylinder Bracket):**  
10 Nm (1.0 m•kg, 7.2 ft•lb)

## 11. Install:

- Clutch cable

**NOTE:**

Apply a light coat of lithium soap base grease onto the clutch cable end.

## 12. Install:

- Front wheel

Refer to "FRONT WHEEL—INSTALLATION" section in CHAPTER 7.



**Wheel Axle:**  
74 Nm (7.4 m•kg, 53 ft•lb)  
**Pinch Bolt:**  
23 Nm (2.3 m•kg, 17 ft•lb)



13. Adjust:

- Clutch cable free play

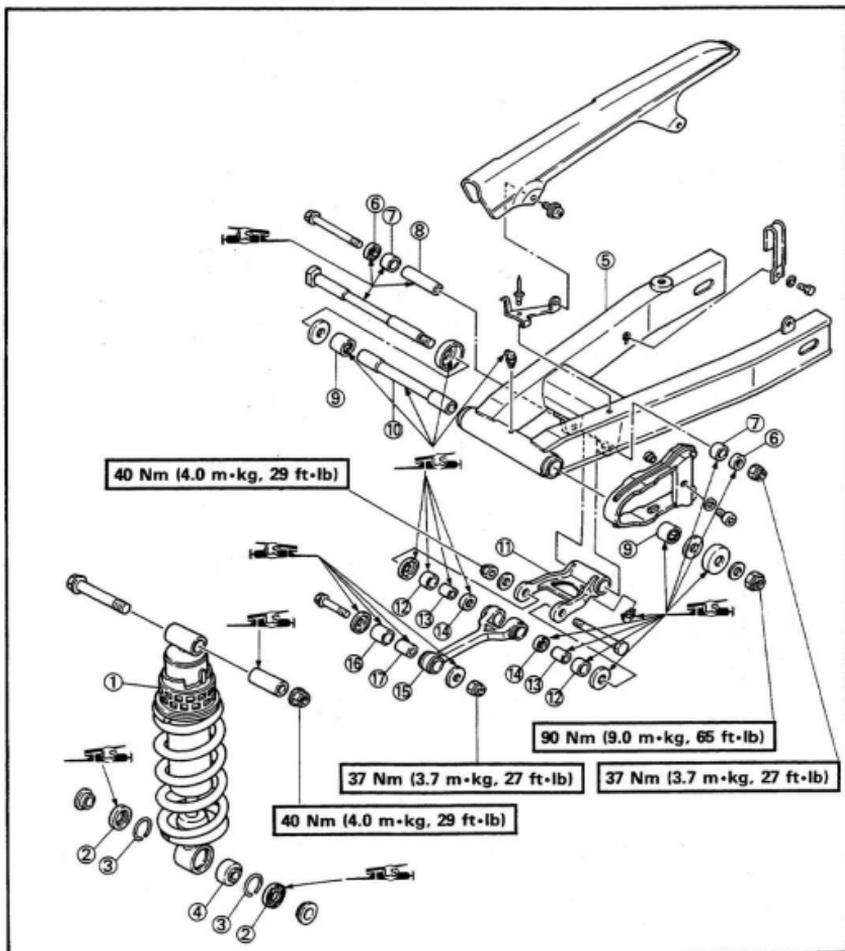


**Free Play:**  
**10 – 15 mm (0.4 – 0.6 in)**  
**At Lever End.**

Refer to "CLUTCH ADJUSTMENT" section  
in CHAPTER 3.

## REAR SHOCK ABSORBER AND SWINGARM

- |                       |                  |
|-----------------------|------------------|
| ① Rear shock absorber | ⑩ Bush           |
| ② Oil seal            | ⑪ Connecting arm |
| ③ Circlip             | ⑫ Bush           |
| ④ Bearing             | ⑬ Collar         |
| ⑤ Swingarm            | ⑭ Oil seal       |
| ⑥ Oil seal            | ⑮ Relay arm      |
| ⑦ Bearing             | ⑯ Bush           |
| ⑧ Collar              | ⑰ Collar         |
| ⑨ Bearing             |                  |



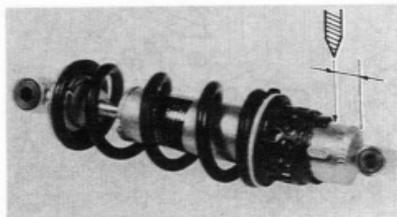


## HANDLING NOTES

**WARNING:**

This shock absorber contains highly pressurized nitrogen gas. Read and understand the following information before handling the shock absorber. The manufacturer cannot be held responsible for property damage or personal injury that may result from improper handling.

- Do not tamper with or attempt to open the cylinder assembly.
- Do not subject shock absorber to an open flame or other high heat source. This may cause the unit to explode due to excessive gas pressure.
- Do not deform or damage the cylinder in any way. Cylinder damage will result in poor damping performance.
- Take care not to scratch the contact surface of the piston rod with the cylinder; or oil could leak out.
- When scrapping the shock absorber, Refer to the "NOTES ON DISPOSAL" section.



## NOTES ON DISPOSAL

**Shock absorber disposal steps:**

Gas pressure must be released before disposing of shock absorber. To do so, drill a 2~3 mm (0.08~0.12 in) hole through the cylinder wall at a point 15~20 mm (0.6~0.8 in) from the end of the gas chamber.

**WARNING:**

Wear eye protection to prevent eye damage from escaping gas and/or metal chips.



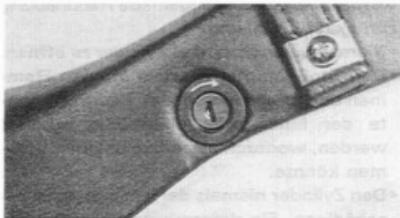
## REMOVAL

## Rear Shock Absorber

## 1. Remove:

- Lower cowl (Right)
- Lower cowl (Left)

Refer to "COWLINGS" section in CHAPTER 3.



## 2. Remove:

- Seat

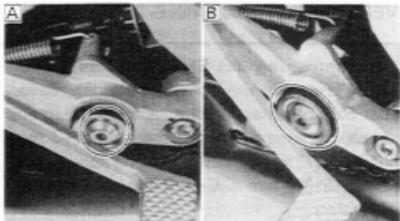
**NOTE:** \_\_\_\_\_

To open the seat lock, insert the key in the lock and turn it clockwise.



## 3. Remove:

- Mufflers

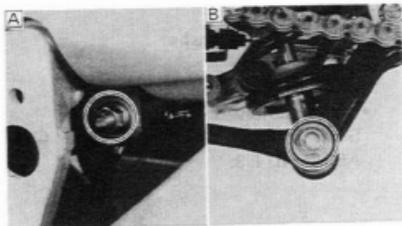


- A** Right-hand
- B** Left-hand

## 4. Elevate the rear wheel by placing a suitable stand under the engine.

**WARNING:** \_\_\_\_\_

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

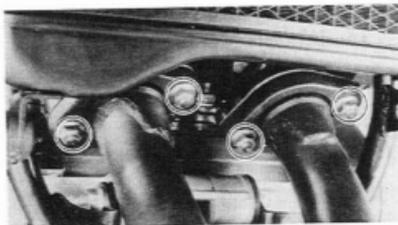


5. Remove:
- Rear shock absorber

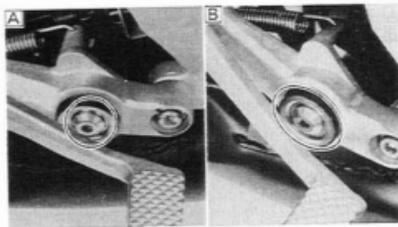
**A** Upper  
**B** Lower

### Swingarm

1. Remove:
- Lower cowl (Right)
  - Lower cowl (Left)
- Refer to "COWLINGS" section in CHAPTER 3.



2. Remove:
- Mufflers



**A** Right-hand  
**B** Left-hand

3. Elevate the rear wheel by placing a suitable stand under the engine.

### **WARNING:**

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



4. Remove:

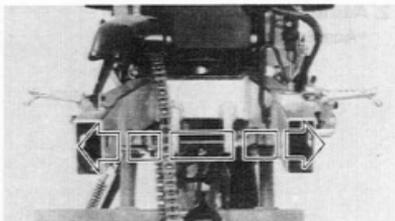
- Rear wheel

Refer to "REAR WHEEL—REMOVAL" section in CHAPTER 7.



5. Remove:

- Bolt (Relay arm—connecting arm)



6. Check:

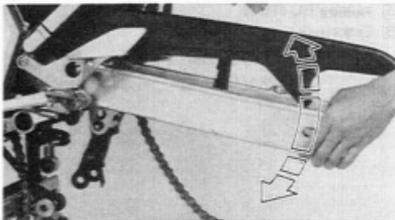
- Swingarm (side play)

Move swingarm from side to side.

Over specified limit→Replace bearings



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

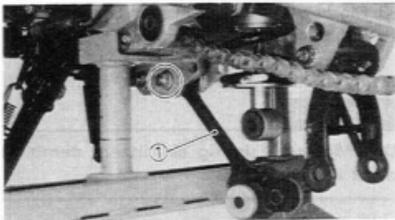


7. Check:

- Swingarm (Vertical movement)

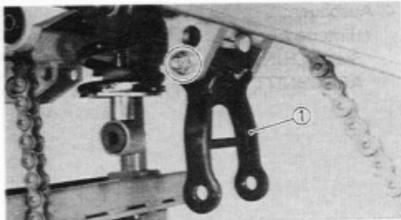
Move swingarm up and down.

Tightness/Binding/Rough Spots→Replace Bearings.

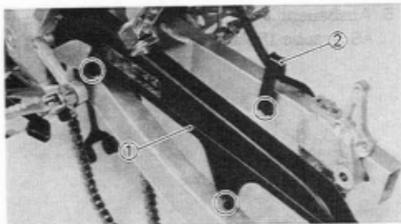


8. Remove:

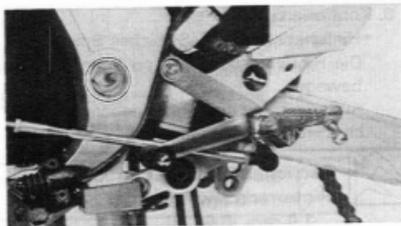
- Relay arm ①



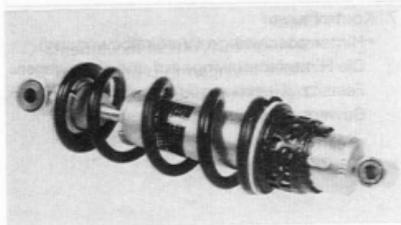
9. Remove:
- Connecting arm ①



10. Remove:
- Chain guard ①
  - Brake hose guide ②

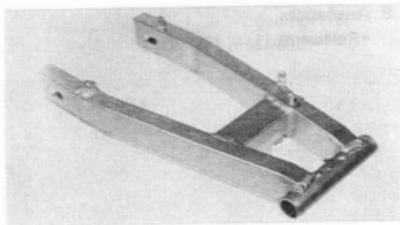


11. Remove:
- Swingarm

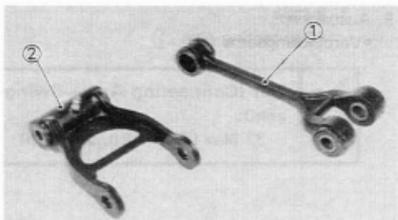


## INSPECTION

1. Inspect:
- Shock absorber
  - Oil leaks/Damage→Replace.



2. Inspect:
- Swingarm
  - Bends/Cracks/Damage→Replace.



### 3. Inspect:

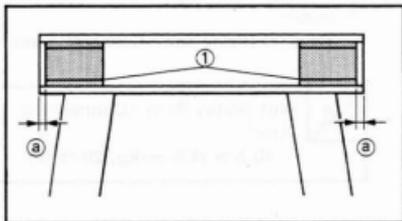
- Relay arm ①
  - Connecting arm ②
- Bends/Cracks/Damage → Replace.

### 4. Inspect:

- Oil seals  
Damage → Replace.
- Thrust covers  
Damage → Replace.
- Bushes  
Scratches/Damage → Replace.
- Bearings  
Pitting/Damage → Replace.

### NOTE:

When replacing the bearings of swingarm pivot, install new bearings ① as shown.



① 0.5 ~ 1.0 mm (0.02 ~ 0.04 in)

## INSTALLATION

### Swingarm

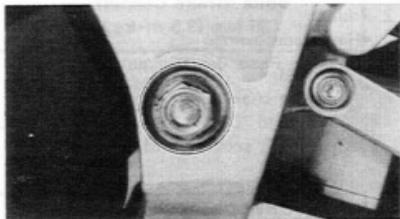
Reverse the "REMOVAL" procedure.  
Note the following points.

#### 1. Apply:

- Lithium soap base grease  
To oil seals, bearings, bushes and inside of thrust covers.

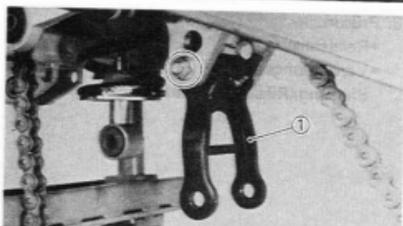
#### 2. Install:

- Swing arm



#### Pivot Shaft:

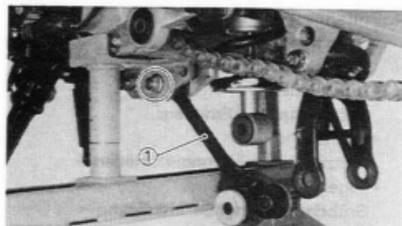
90 Nm (9.0 m•kg, 65 ft•lb)



3. Install:  
 • Connecting arm ①



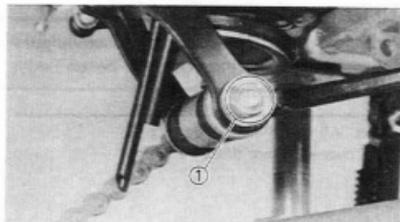
**Nut (Connecting Arm—Swing-arm):**  
 37 Nm (3.7 m·kg, 27 ft·lb)



4. Install:  
 • Relay arm ①



**Nut (Relay Arm—Frame):**  
 37 Nm (3.7 m·kg, 27 ft·lb)



5. Install:  
 • Nut ① (Relay arm—Connecting arm)



**Nut (Relay Arm—Connecting Arm):**  
 40 Nm (4.0 m·kg, 29 ft·lb)

6. Install:  
 • Rear wheel  
 Refer to "REAR WHEEL—INSTALLATION" section in CHAPTER 7.



**Axle Nut:**  
 105 Nm (10.5 m·kg, 75 ft·lb)  
**Locknut (Wheel Axle):**  
 45 Nm (4.5 m·kg, 32 ft·lb)  
**Bolts (Brake Caliper):**  
 35 Nm (3.5 m·kg, 25 ft·lb)

7. Adjust:  
 • Drive chain slack  
 Refer to "DRIVE CHAIN SLACK ADJUSTMENT" section in CHAPTER 3.



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



8. Install:
- Mufflers

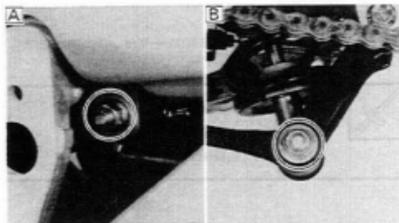


**Nuts (Exhaust Pipe):**  
18 Nm (1.8 m•kg, 13 ft•lb)  
**Bolts (Muffler):**  
32 Nm (3.2 m•kg, 23 ft•lb)

### Rear Shock Absorber

Reverse the "REMOVAL" procedure.  
Note the following points.

1. Apply:
  - Lithium soap base grease  
To oil seals and collar.



2. Install:
  - Rear shock absorber.



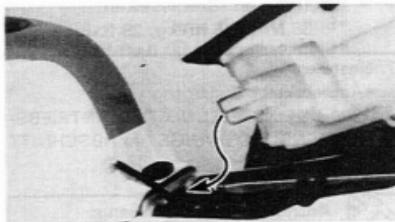
**Nut (Upper):**  
40 Nm (4.0 m•kg, 29 ft•lb)  
**Nut (Lower):**  
40 Nm (4.0 m•kg, 29 ft•lb)

- A** Upper
- B** Lower

3. Install:
  - Mufflers



**Nuts (Exhaust Pipe):**  
18 Nm (1.8 m•kg, 13 ft•lb)  
**Bolts (Muffler):**  
32 Nm (3.2 m•kg, 23 ft•lb)



4. Install:
  - Seat

**NOTE:** \_\_\_\_\_  
Insert the lobe on the seat front into the receptacle on the frame, then push down the seat.  
\_\_\_\_\_



## DRIVE CHAIN AND SPROCKETS

## NOTE:

Before removing the drive chain and sprockets, drive chain slack and 10-link length of drive chain should be measured.

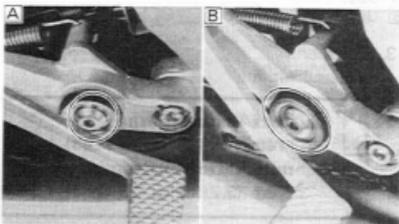
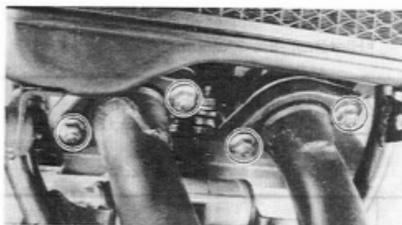
## REMOVAL

## 1. Remove:

- Lower cowl (Right)
  - Lower cowl (Left)
- Refer to "COWLINGS" section in CHAPTER 3.

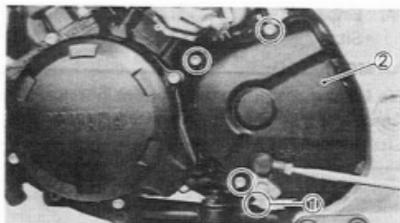
## 2. Remove:

- Mufflers



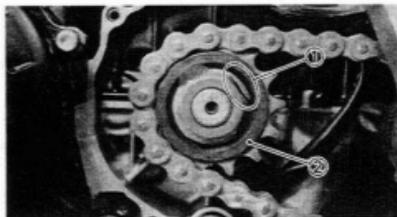
**A** Right-hand

**B** Left-hand



## 3. Remove:

- Bolt ① (Shift arm)
- Crankcase cover ② (Left-hand)



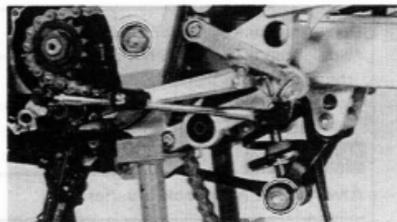
4. Straighten:
  - Lock washer tab ①
5. Remove:
  - Drive sprocket ②

6. Elevate the rear wheel by placing a suitable stand under the engine.

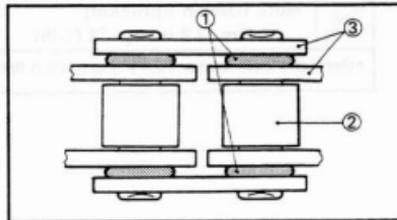
**WARNING:**

**Support the motorcycle securely so there is no danger of it falling over.**

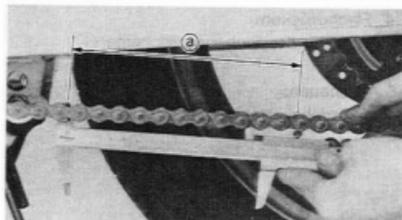
7. Remove:
  - Rear Wheel
 Refer to "REAR WHEEL—REMOVAL" section in CHAPTER 7.



8. Remove:
  - Swingarm
  - Drive chain

**INSPECTION**

1. Inspect:
  - O-rings ① (Drive Chain)  
Damage→Replace drive chain.
  - Rollers ② and side plates ③  
Damage/Wear→Replace drive chain.



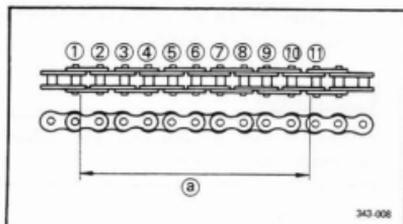
## 2. Measure:

- 10-link length **a** (Drive chain)
- Out of specification → Replace drive chain.



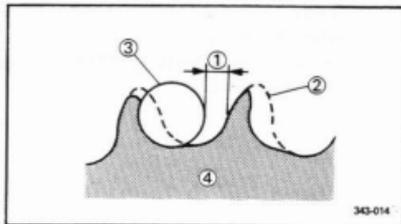
### 10-Link Length Limit:

150.1 mm (5.91 in)



## NOTE:

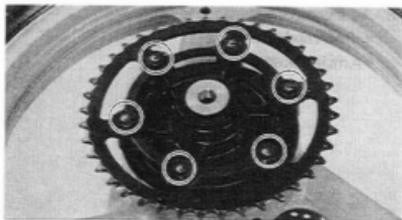
- For measurement make the chain tense by finger.
- 10-link length is a measurement between the insides of the ① and ⑪ rollers as shown.
- Two or three different 10-link lengths should be measured.



## 3. Inspect:

- Drive and driven sprockets
- Wear/Damage → Replace.

- ① 1/4 tooth
- ② Correct
- ③ Roller
- ④ Sprocket



### Driven sprocket replacement steps:

- Straighten the lock washer tabs and remove the driven sprocket.
- Install a new driven sprocket and lock washers.

### WARNING:

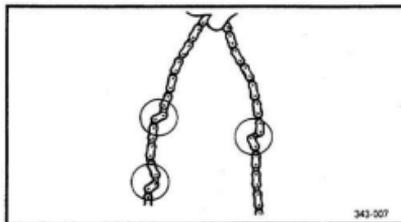
Always use new lock washers.



### Nuts (Driven Sprocket):

32 Nm (3.2 m·kg, 23 ft·lb)

- Bend the lock washer tabs along the nut flats.



## 4. Inspect:

- Drive chain
- Stiff → Lubricate or replace.

**INSTALLATION**

Reverse the "REMOVAL" procedure.  
Note the following points.

## 1. Install:

- Swingarm

**Nut (Pivot Shaft):**

90 Nm (9.0 m•kg, 65 ft•lb)

**Nut (Swingarm—Connecting****Arm):**

37 Nm (3.7 m•kg, 27 ft•lb)

## 2. Install:

- Drive sprocket

**Nut (Drive Sprocket):**

90 Nm (9.0 m•kg, 65 ft•lb)

**WARNING:**

Always use a new lock washer.

**NOTE:**

After tightening the nut, bend the lock washer tab along the nut flats.

## 3. Install:

- Rear wheel

Refer to "REAR WHEEL—INSTALLATION"  
section in CHAPTER 7.

**Axle Nut:**

105 Nm (10.5 m•kg, 75 ft•lb)

**Locknut (Wheel Axle):**

45 Nm (4.5 m•kg, 32 ft•lb)

**Bolts (Brake Caliper):**

35 Nm (3.5 m•kg, 25 ft•lb)



## 4. Adjust:

- Drive chain slack

Refer to "DRIVE CHAIN SLACK ADJUSTMENT" section in CHAPTER 3.

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

## 5. Install:

- Crankcase cover (Left-hand)

**Bolts (Crankcase Cover):****5 Nm (0.5 m·kg, 3.6 ft·lb)**

## 6. Install:

- Mufflers

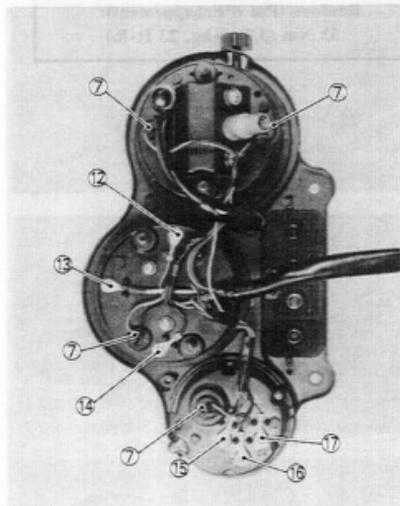
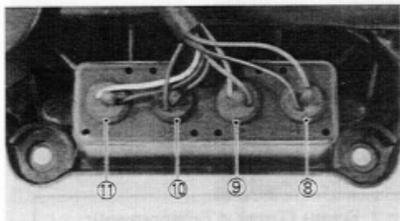
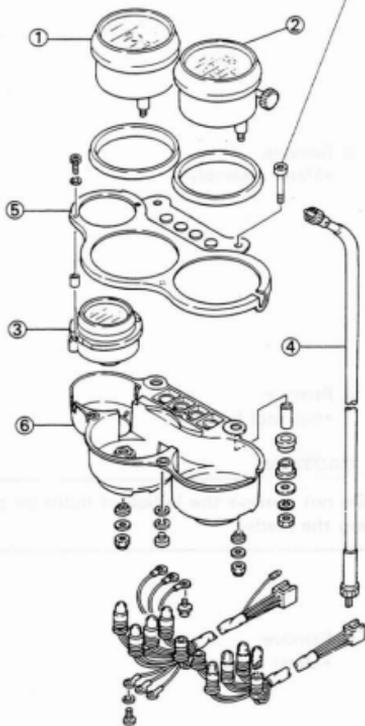
**Nuts (Exhaust Pipe):****18 Nm (1.8 m·kg, 13 ft·lb)****Bolts (Muffler):****32 Nm (3.2 m·kg, 23 ft·lb)**

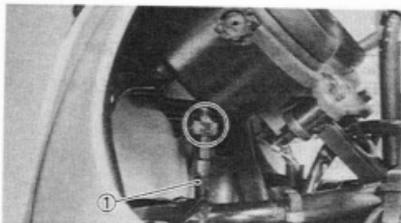


## METER ASSEMBLY

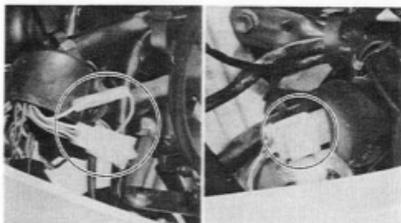
- |                     |   |                  |
|---------------------|---|------------------|
| ① Tachometer        | ⑧ "OIL" indicator light<br>(With Brown and Black/Red leads)       | ⑫ Brown lead     |
| ② Speedometer       | ⑨ "NEUTRAL" indicator light<br>(With Brown and Sky blue leads)    | ⑬ Gray lead      |
| ③ Temperature gauge | ⑩ "TURN" indicator light<br>(With Dark green and Chocolate leads) | ⑭ Black lead     |
| ④ Speedometer cable | ⑪ "HIGH BEAM" indicator light<br>(With Yellow and Black leads)    | ⑮ Green/Red lead |
| ⑤ Meter panel       |   | ⑯ Black lead     |
| ⑥ Meter housing     |   | ⑰ Brown lead     |
| ⑦ Meter light       |   |                  |

8 Nm (0.8 m•kg, 5.8 ft•lb)



**REMOVAL**

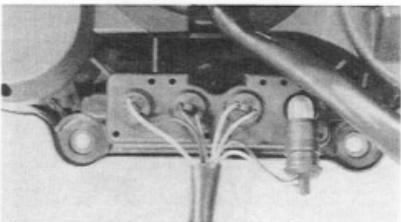
1. Remove:
  - Speedometer cable ①



2. Disconnect:
  - Meter leads



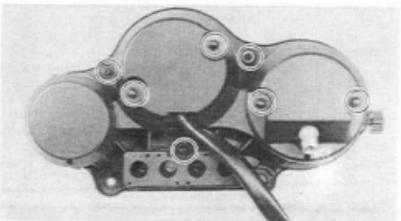
3. Remove:
  - Meter assembly



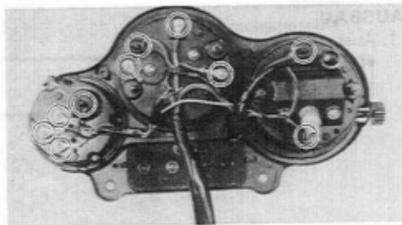
4. Remove:
  - Indicator bulbs

**CAUTION:**

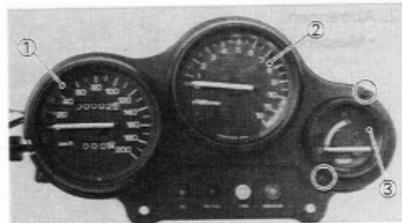
Do not remove the indicator bulbs by pulling the leads.



5. Remove:
  - Meter housing



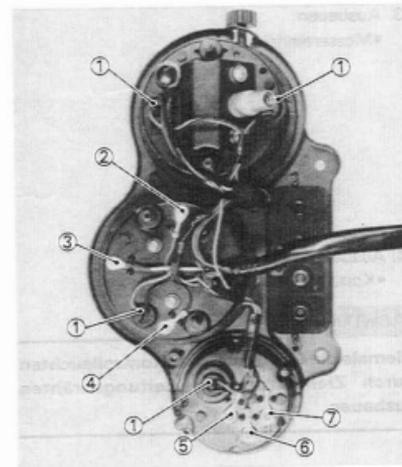
6. Remove:
- Meter lights
  - Leads



7. Remove:
- Speedometer ①
  - Tachometer ②
  - Temperature gauge ③

#### INSTALLATION

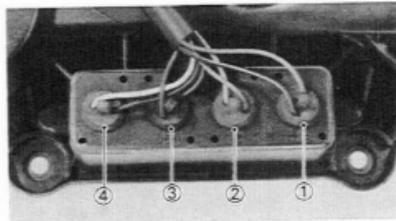
Reverse the "REMOVAL" procedure.  
Note the following points.



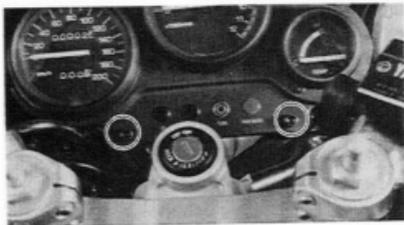
1. Install the meter lights and leads as shown.

- ① Meter lights
- ② Brown lead
- ③ Gray lead
- ④ Black lead
- ⑤ Green/Red lead
- ⑥ Black lead
- ⑦ Brown lead

2. Install the indicator lights as shown.



- ① "OIL" indicator light  
(With Brown and Black/Red leads)
- ② "NEUTRAL" indicator light  
(With Brown and Sky blue leads)
- ③ "TURN" indicator light  
(With Dark green and Chocolate leads)
- ④ "HIGH BEAM" indicator light  
(With Yellow and Black leads)



## 3. Install:

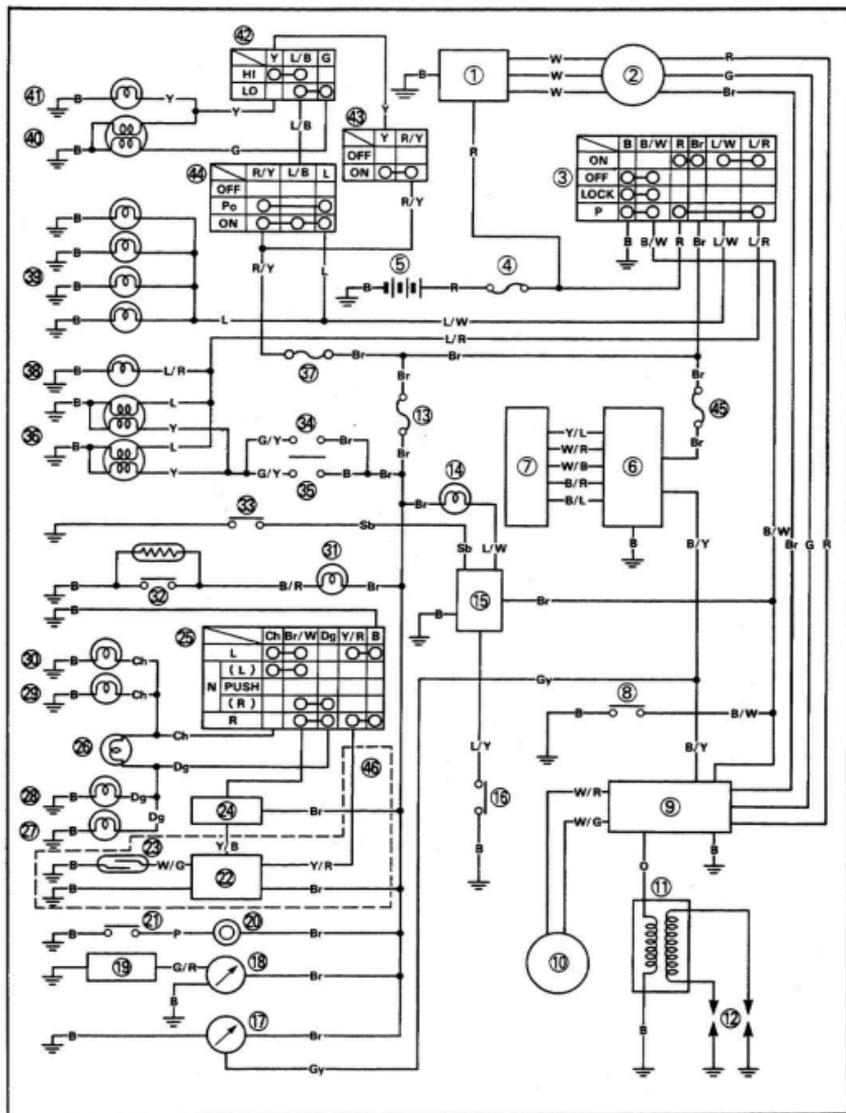
- Meter assembly

**Bolts (Meter Assembly):****8 Nm (0.8 m•kg, 5.8 ft•lb)**



ELECTRICAL

TZR250 CIRCUIT DIAGRAM





- |                             |                                |
|-----------------------------|--------------------------------|
| ① Rectifier/Regulator       | ②④ Flasher relay               |
| ② C.D.I. magneto            | ②⑤ "TURN" switch               |
| ③ Main switch               | ②⑥ "TURN" indicator light      |
| ④ "MAIN" fuse               | ②⑦ Rear flasher light (Right)  |
| ⑤ Battery                   | ②⑧ Front flasher light (Right) |
| ⑥ Y.P.V.S. control unit     | ②⑨ Rear flasher light (Left)   |
| ⑦ Servomotor                | ③⑩ Front flasher light (Left)  |
| ⑧ "ENGINE STOP" switch      | ③⑪ "OIL" indicator light       |
| ⑨ C.D.I. unit               | ③⑫ Oil level gauge             |
| ⑩ Pick-up coil              | ③⑬ Neutral switch              |
| ⑪ Ignition coil             | ③⑭ Front brake switch          |
| ⑫ Spark plug                | ③⑮ Rear brake switch           |
| ⑬ "SIGNAL" fuse             | ③⑯ Tail/Brake light            |
| ⑭ "NEUTRAL" indicator light | ③⑰ "HEAD" fuse                 |
| ⑮ Ignition control unit     | ③⑱ Auxiliary light             |
| ⑯ Sidestand switch          | ③⑲ Meter light                 |
| ⑰ Tachometer                | ④⑰ Headlight                   |
| ⑱ Temperature gauge         | ④⑱ "HIGH BEAM" indicator light |
| ⑲ Thermo unit               | ④⑲ "LIGHTS" (Dimmer) switch    |
| ⑳ Horn                      | ④⑲ "PASS" switch               |
| ㉑ "HORN" switch             | ④⑲ "LIGHTS" switch             |
| ㉒ Cancelling unit           | ④⑲ "YPVS" fuse                 |
| ㉓ Reed switch               | ④⑲ Except for Germany          |

## COLOR CODE

B	Black	Sb	Sky blue	W/B	White/Black
R	Red	Br	Brown	W/G	White/Green
O	Orange	L/B	Blue/Black	Y/L	Yellow/Blue
L	Blue	L/W	Blue/White	Y/R	Yellow/Red
P	Pink	L/Y	Blue/Yellow	Y/B	Yellow/Black
Y	Yellow	L/R	Blue/Red	G/R	Green/Red
G	Green	B/Y	Black/Yellow	G/Y	Green/Yellow
W	White	B/W	Black/White	Br/W	Brown/White
Ch	Chocolate	B/R	Black/Red	R/Y	Red/Yellow
Dg	Dark green	B/L	Black/Blue		
Gy	Gray	W/R	White/Red		



## ELECTRICAL COMPONENTS

- ① Ignition coil
- ② Servomotor
- ③ Main switch
- ④ Horn
- ⑤ Neutral switch
- ⑥ Sidestand switch
- ⑦ Y.P.V.S. control unit
- ⑧ Thermo unit

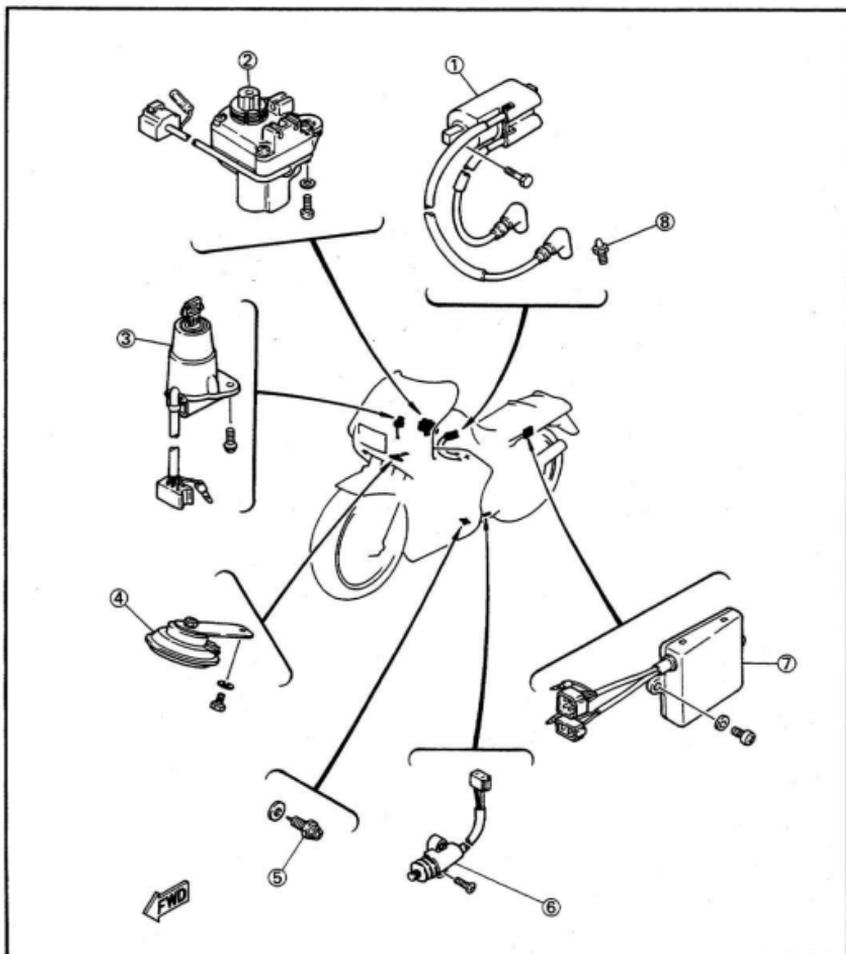
## IGNITION COIL:

PRIMARY COIL RESISTANCE

0.26 – 0.40Ω at 20°C (68°F)

SECONDARY COIL RESISTANCE

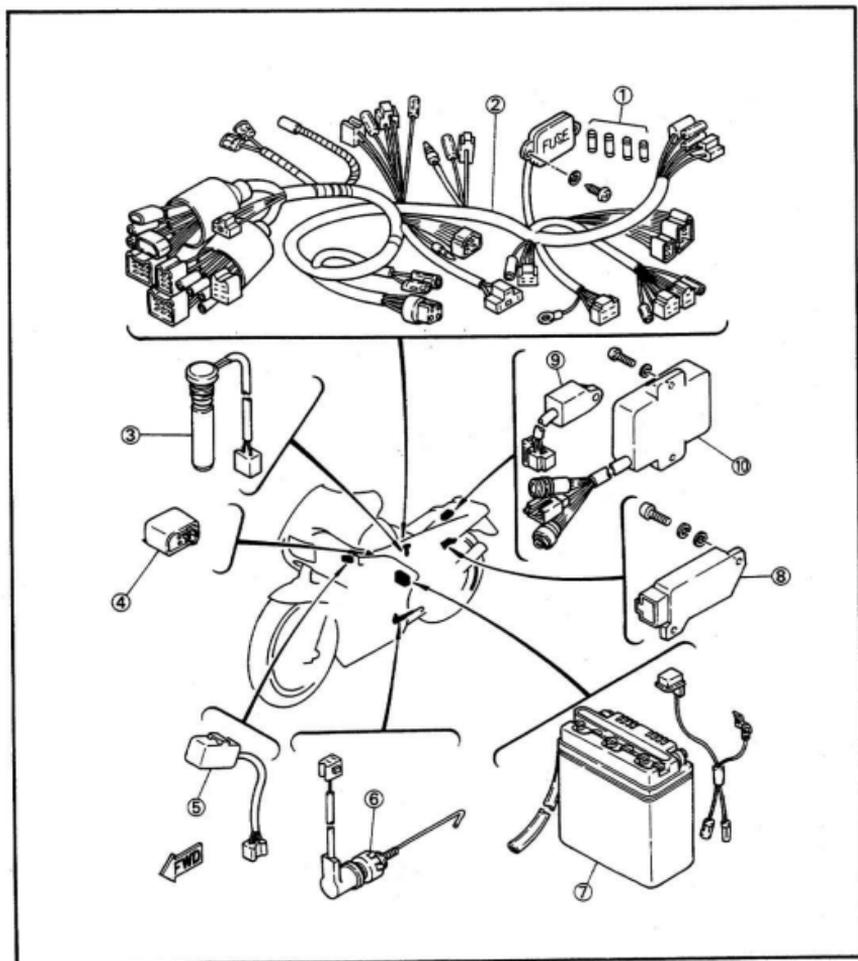
4.7 – 7.0 kΩ at 20°C (68°F)





- ① Fuse
- ② Wire harness
- ③ Oil level gauge
- ④ Flasher relay
- ⑤ Cancelling unit (Except for Germany)
- ⑥ Brake switch
- ⑦ Battery
- ⑧ Rectifier/Regulator
- ⑨ Ignition control unit
- ⑩ C.D.I. unit

**BATTERY:**  
**CAPACITY**  
 12V 4AH  
**SPECIFIC GRAVITY**  
 1.280



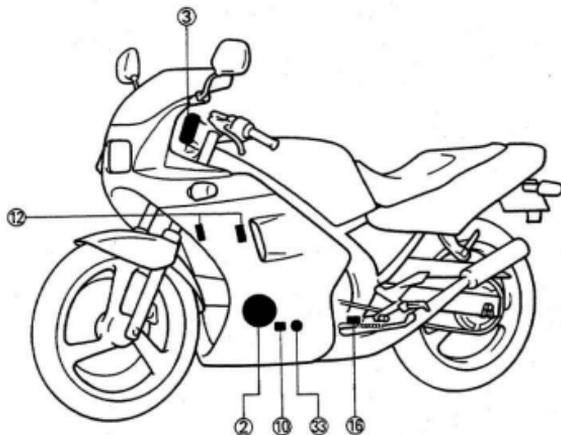
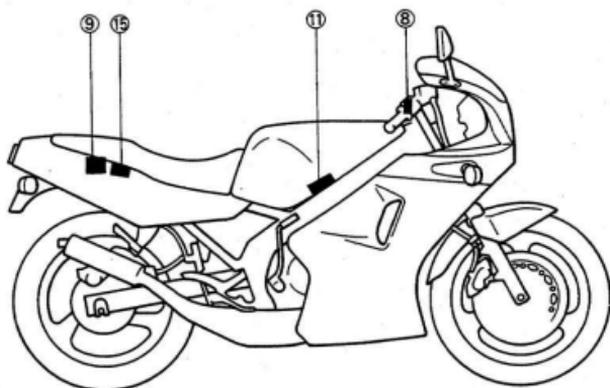




**NOTE:** \_\_\_\_\_

For the color codes, see page 8-2.

- ② C.D.I. magneto
- ③ Main switch
- ⑧ "ENGINE STOP" switch
- ⑨ C.D.I. unit
- ⑩ Pick-up coil
- ⑪ Ignition coil
- ⑫ Spark plug
- ⑮ Ignition control unit
- ⑯ Sidestand switch
- ⑳ Neutral switch



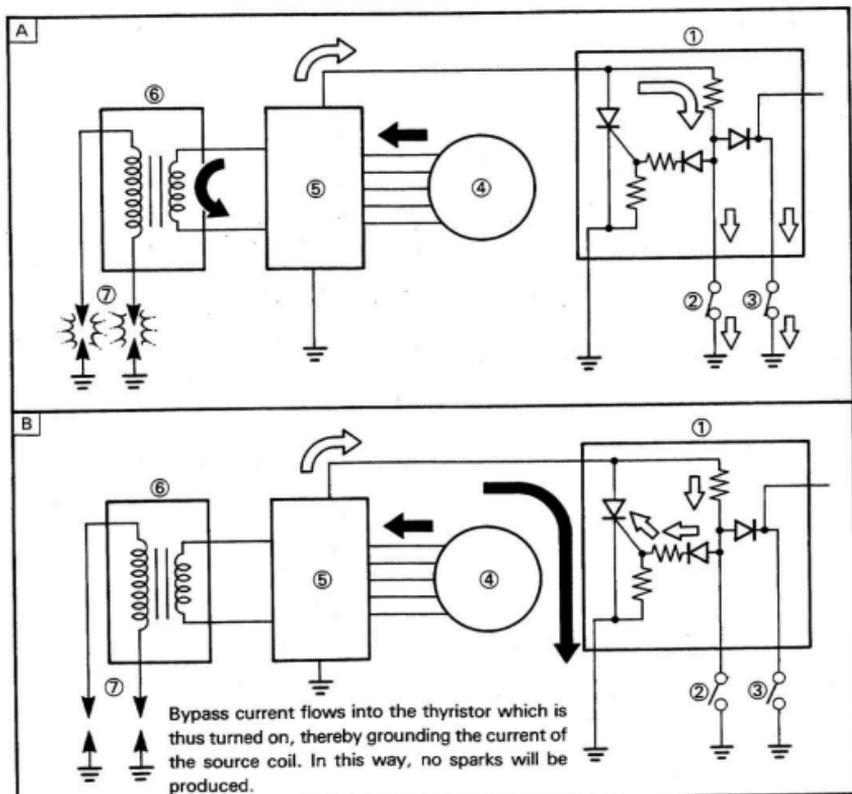


### IGNITION CONTROL CIRCUIT OPERATION

The ignition control circuit on this model consists of the ignition control unit, neutral switch, neutral indicator light, and the sidestand switch. If the engine stop switch and the main switch are both on, the ignition spark can produce only if:

1. The transmission is in neutral (the neutral switch is on).
2. The sidestand is up (the sidestand switch is on).

	Transmission (Neutral switch)	Sidestand (Sidestand switch)	Spark plug
A	Neutral (close)	Up (close)	Spark
A	Neutral (close)	Down (open)	Spark
A	IN gear (open)	Up (close)	Spark
B	IN gear (open)	Down (open)	No spark



- ① Ignition control unit
- ② Sidestand switch
- ③ Neutral switch
- ④ C.D.I. magneto
- ⑤ C.D.I. unit
- ⑥ Ignition coil
- ⑦ Spark plug
- ⑧ Thyristor

- ← Bypass current  
← Current of source coil

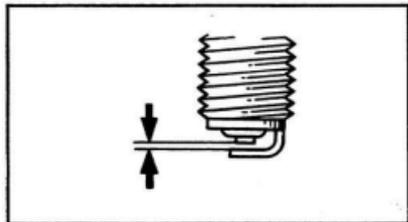


## TROUBLESHOOTING (1)

IF IGNITION SYSTEM SHOULD BECOME INOPERATIVE (NO SPARK OR INTERMITTENT SPARK).

## 1. Remove:

- Lower cowl (Right)
- Lower cowl (Left)



## 2. Spark plug inspection

- Remove spark plug.
- Clean spark plug with spark plug cleaner, if necessary.
- Inspect electrode, insulator and plug gap. Refer to "SPARK PLUG INSPECTION" section in CHAPTER 3.

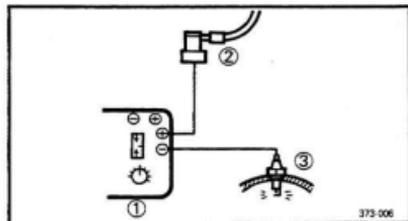
OK

No good

Replace or regap spark plug.

## 3. Ignition spark gap test

- Connect Electro Tester ① as shown.



Electro Tester:  
90890-03021

- ② Spark plug cap
- ③ Spark plug

373-006



- Start engine, and increase spark gap until misfire occurs.

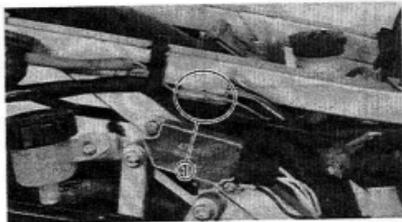
 **Minimum Spark Gap:**  
6.0 mm (0.24 in)

Out of  
specification  
or no spark

Meets  
specification

Ignition system is good.

4. Remove:
- Seat
  - Side covers



5. Disconnect ignition control unit lead ① (Brown) and start engine.

Engine does not  
start

Engine starts  
(Spark)

Go to TROUBLESHOOTING (2).



## 6. Main switch operation check

- Disconnect main switch leads (Black/White, Black, Blue/Red, Blue/White, Brown, Red).
- Connect Pocket Tester to main switch leads.

Tester (+) Lead → Black/White Lead  
Tester (-) Lead → Black Lead

## NOTE:

Set tester selector to " $\Omega \times 1$ " position.



Pocket Tester:  
90890-03112

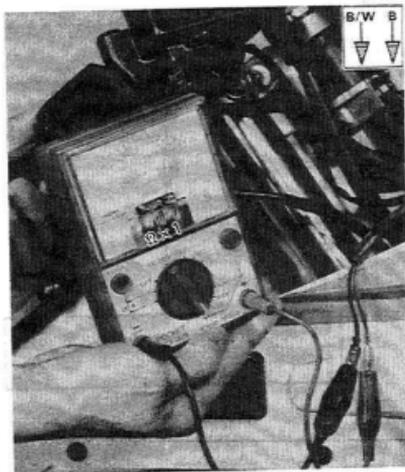
- Check main switch for operation.

Turn main switch to "OFF".	Switch is continued ( $0\Omega$ ).
Turn main switch to "ON".	Switch is discontinued. ( $\infty\Omega$ )

Switch operation is correct

Switch operation is incorrect.

Main switch is faulty, replace it.



## 7. "ENGINE STOP" switch operation check

- Disconnect "ENGINE STOP" switch leads (Black/White, Black).
- Connect pocket Tester to "ENGINE STOP" switch leads.



Pocket Tester:  
90890-03112

Tester (+) Lead → Black/White Lead  
Tester (-) Lead → Black Lead

## NOTE:

Set tester selector to " $\Omega \times 1$ " position.



- Check the "ENGINE STOP" switch for operation.

Turn switch to "RUN" position	Switch is discontinued ( $\infty$ )
Turn switch to "OFF" position	Switch is continued (0 $\Omega$ ).

Switch operation is correct

Switch operation is incorrect.

"ENGINE STOP" switch is faulty, replace handlebar switch assembly (Right).

### 8. Remove:

- Fuel tank

### 9. Ignition coil resistance check

- Disconnect ignition coil leads (orange, Black) and spark plug leads.
- Connect Pocket Tester to terminals of ignition coil.



**Pocket Tester:**  
90890-03112



Tester (+) Lead → Terminal  
 Tester (-) Lead → Terminal

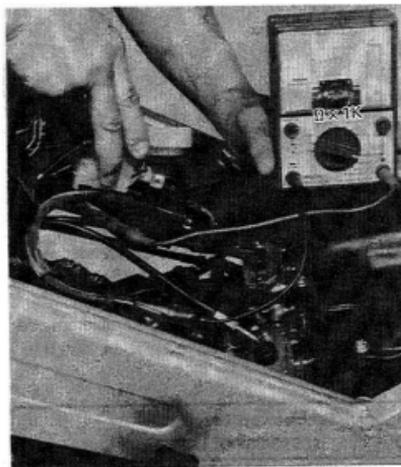
**NOTE:** \_\_\_\_\_  
 Set tester selector to " $\Omega \times 1$ " position.

• Measure primary coil resistance.



**Primary Coil Resistance:**  
 0.26 ~ 0.40  $\Omega$  at 20°C (68°F)

• Connect Pocket Tester to spark plug leads.



Tester (+) Lead → Spark Plug Lead  
 Tester (-) Lead → Spark plug Lead

**NOTE:** \_\_\_\_\_  
 Set tester selector to " $\Omega \times 1K$ " position.

• Measure secondary coil resistance.



**Secondary Coil Resistance:**  
 4.7 ~ 7.0 k $\Omega$  at 20°C (68°F)

Both resistances  
 meet specifications

Out of  
 specification

Ignition coil is faulty, replace it.

## IGNITION AND STARTING SYSTEM

**ELEC**

10. Pick-up Coil resistance check
- Disconnect pick-up coil leads (White/Green, White/Red).
  - Connect Pocket Tester to pick-up coil leads.



**Pocket Tester:**  
90890-03112

**Tester (+) Lead** → White/Green Lead  
**Tester (-) Lead** → White/Red Lead.

**NOTE:** \_\_\_\_\_

Set tester selector to " $\Omega \times 100$ " position.

- Measure Pick-up Coil resistance.



**Pick-up Coil Resistance:**  
94 – 140 $\Omega$  at 20°C (68°F)

Resistance meets  
specification

Out of  
specification

Pick-up coil is faulty, replace  
it.

11. Source coils resistance check
- Disconnect source coil leads (Brown, Green, Red).
  - Connect Pocket Tester to source coil leads.



**Pocket Tester:**  
90890-03112



Tester (+) Lead → Brown Lead  
 Tester (-) Lead → Green Lead

**NOTE:**

Set tester selector to " $\Omega \times 100$ " position.

- Measure source coil (1) resistance.



**Source Coil (1) Resistance:**  
 128 – 193 $\Omega$  at 20°C (68°F)



Tester (+) Lead → Brown Lead  
 Tester (-) Lead → Red Lead

**NOTE:**

Set tester selector to " $\Omega \times 1$ " position.

- Measure source coil (2) resistance.



**Source Coil (2) Resistance:**  
 3.6 – 5.4 $\Omega$  at 20°C (68°F)

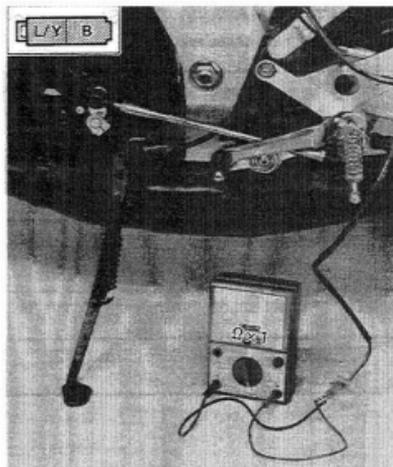
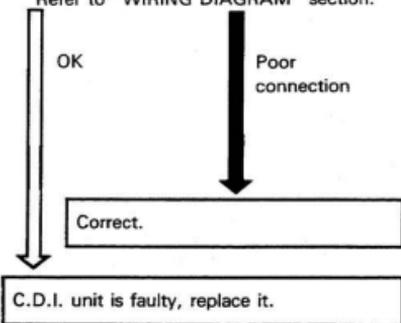
Both resistances  
 meet specification

Out of  
 specification

Source coil is faulty, replace it.



12. Check entire ignition system for connections.  
Refer to "WIRING DIAGRAM" section.



#### TROUBLESHOOTING (2)

- Sidestand switch operation check
  - Disconnect sidestand switch leads (Blue/Yellow, Black).
  - Connect the Pocket Tester to sidestand switch leads.

 **Pocket Tester:**  
90890-03112

**Tester (+) Lead** → Blue/Yellow Lead  
**Tester (-) Lead** → Black Lead

**NOTE:** \_\_\_\_\_  
Set tester selector to " $\Omega \times 1$ " position.

- Check sidestand switch for operation.

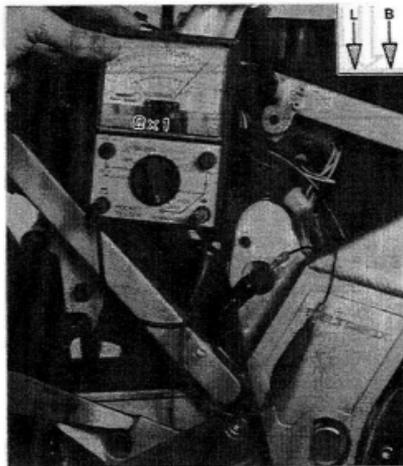
Sidestand is up.	Switch is continued (0 $\Omega$ ).
Sidestand is down.	Switch is discontinued ( $\infty$ ).



Switch operation  
is correct.

Switch operation  
is incorrect.

Sidestand switch is faulty, replace it.



## 2. Neutral switch operation check

- Disconnect neutral switch leads (Blue, Black).

- Connect Pocket Tester to neutral switch leads.



**Pocket Tester:**  
90890-03112

**Tester (+) Lead → Blue Lead**  
**Tester (-) Lead → Black Lead**

### NOTE:

Set tester selector to " $\Omega \times 1$ " position.

- Check neutral switch for operation.

Transmission is in neutral	Switch is continued (0 $\Omega$ ).
Transmission is in gear	Switch is discontinued ( $\infty$ ).

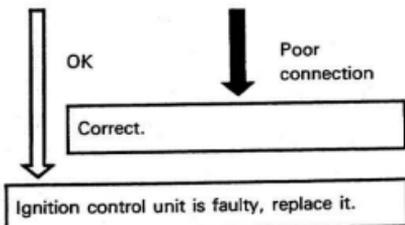
Switch operation  
is correct.

Switch operation  
is incorrect.

Neutral switch is faulty, replace it.



3. Check connections. Refer to "WIRING DIAGRAM" section.

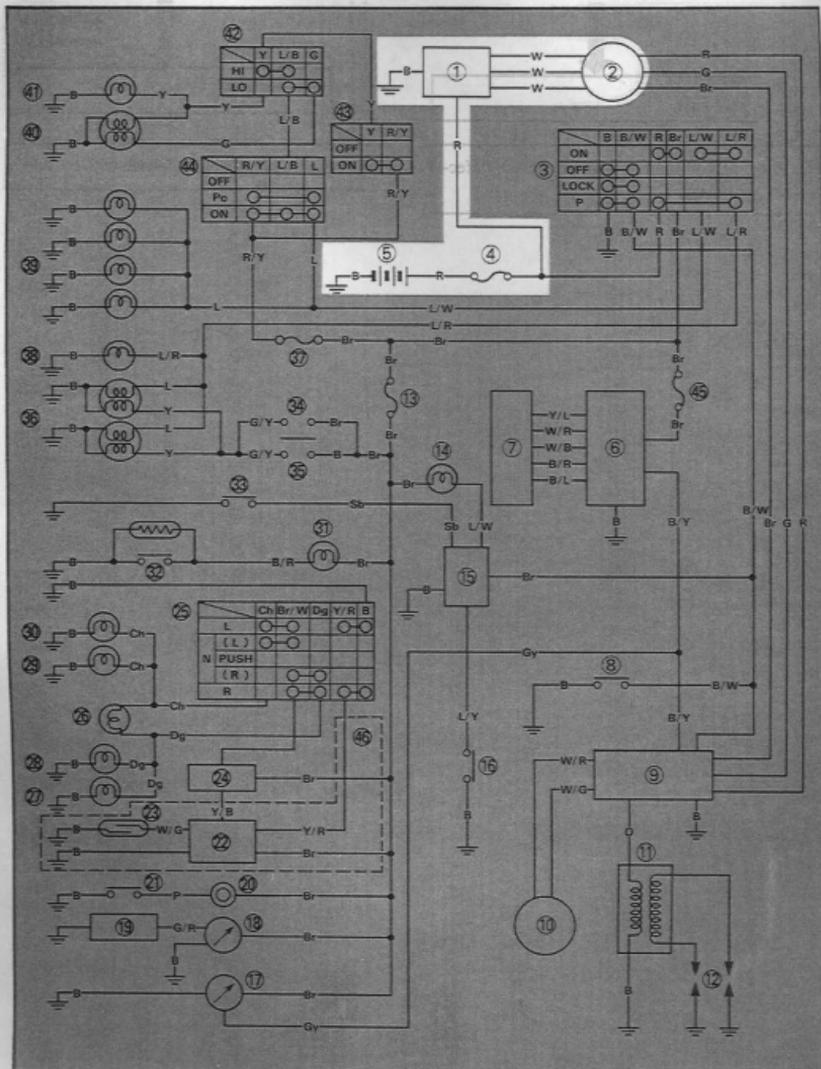




## CHARGING SYSTEM

## CIRCUIT DIAGRAM

Below circuit diagram shows charging circuit.

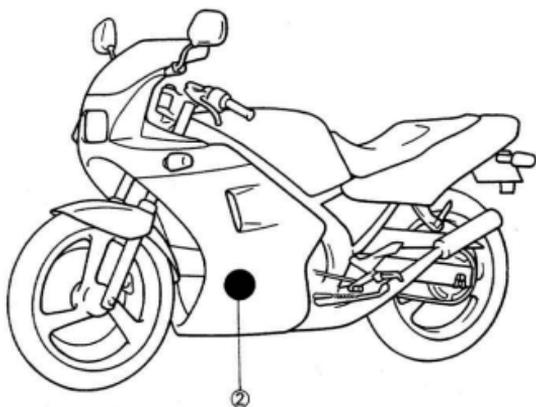
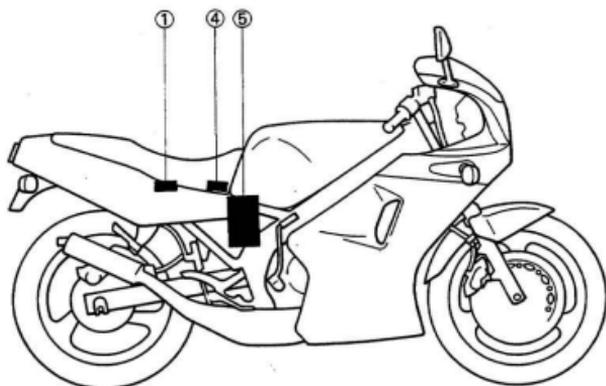




NOTE: \_\_\_\_\_

For the color codes, see page 8-2.

- ① Rectifier/Regulator
- ② C.D.I. magneto
- ④ "MAIN" fuse
- ⑤ Battery





## TROUBLESHOOTING

## THE BATTERY IS NOT CHARGED.

## 1. Remove:

- Seat



## 2. Fuse inspection

- Remove "MAIN" fuse and check it for continuity.

Refer to "FUSE INSPECTION" section in CHAPTER 3.



Continuity

Discontinuity



Fuse is faulty, replace it.

## 3. Battery inspection

- Fluid level
- Battery terminals
- Fluid specific gravity

Refer to "BATTERY INSPECTION" section in CHAPTER 3.



OK

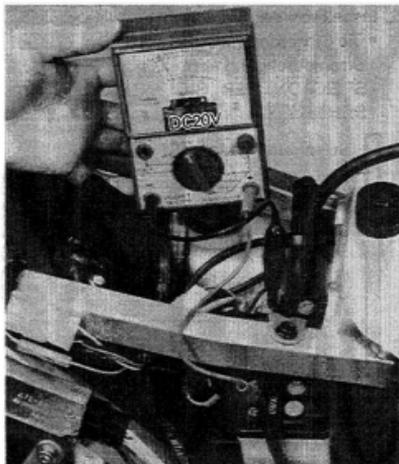
No good



Connect or replace battery.



4. Remove:
- Side cover (Right)



5. Charging voltage check
- Connect Inductive Tachometer to spark plug lead.



**Inductive Tachometer:**  
90890-03113

- Connect Pocket Tester to battery.



**Pocket Tester:**  
90890-03112

**Tester (+) Lead → Battery (+) Terminal**  
**Tester (-) Lead → Battery (-) Terminal**

**NOTE:** \_\_\_\_\_  
Set tester selector to "DC20V" position.

- Start engine and accelerate to about 3,000 r/min.
- Measure charging voltage.

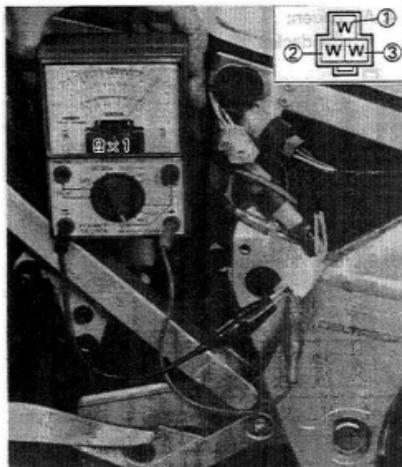


**Charging Voltage:**  
14.3 ~ 15.3V at 3,000 r/min

Out of  
specification

Charging voltage  
meets specificatio

Charging system is good.



6. Stator coil resistance check
- Disconnect stator coil leads (White, White, White).
  - Connect Pocket Tester to stator coil leads.



**Pocket Tester:**  
90890-03112

**Stator Coil (1)**

Tester (+) Lead → White Lead ①  
Tester (-) Lead → White Lead ②

**Stator Coil (2)**

Tester (+) Lead → White Lead ①  
Tester (-) Lead → White Lead ③

**NOTE:**

Set tester selector to "Ω × 1" position.

- Measure stator coil resistance.



**Stator Coil Resistance:**

White ① – White ②  
0.44 ~ 0.66Ω at 20°C (68°F)  
White ① – White ③  
0.44 ~ 0.66Ω at 20°C (68°F)

Both resistances  
meet specifications

Out of  
specification

Stator coil is faulty, replace it.

7. Check entire charging system for connections. Refer to "WIRING DIAGRAM" section.

OK

Poor  
connection

Correct.

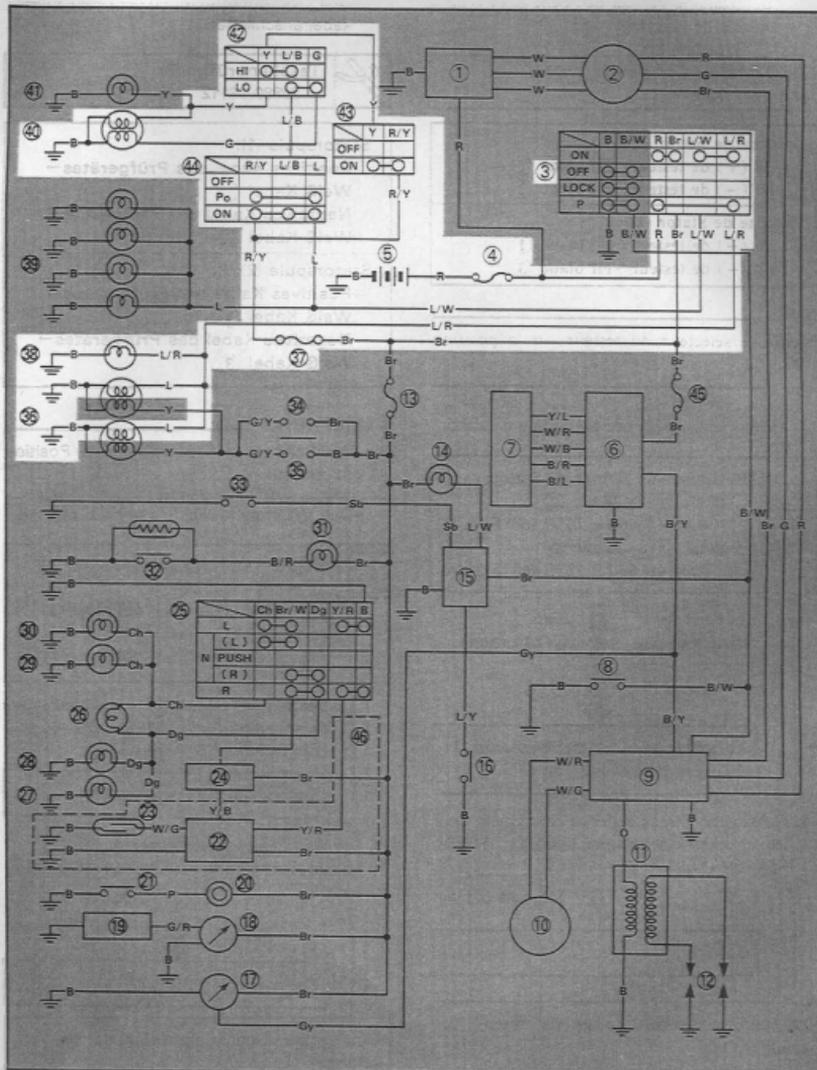
Rectifier/Regulator is faulty, replace it.



## LIGHTING SYSTEM

## CIRCUIT DIAGRAM

Below circuit diagram shows lighting circuit.

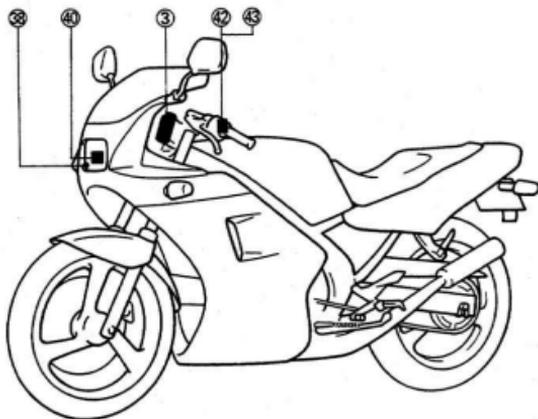
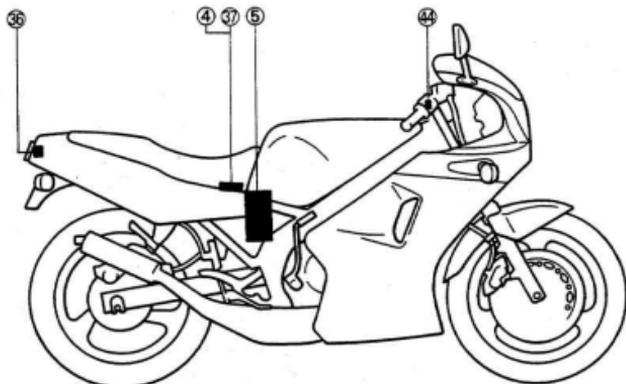




**NOTE:** \_\_\_\_\_

For the color codes, see page 8-2.

- ③ Main switch
- ④ "MAIN" fuse
- ⑤ Battery
- ⑩ Tail/Brake light
- ⑪ "HEAD" fuse
- ⑫ Auxiliary light
- ⑬ Headlight
- ⑭ "LIGHTS" (Dimmer) switch
- ⑮ "PASS" switch
- ⑯ "LIGHTS" switch





## TROUBLESHOOTING

## NOTE:

The battery provides power for operation of the lighting system. If none of the above fail to operate proceed further. Low battery voltage indicates either a faulty battery, low battery fluid level or a defective charging system. Also check fuse condition.

**HEADLIGHT, TAILLIGHT OR AUXILIARY LIGHT DO NOT COME ON.**

## 1. Remove:

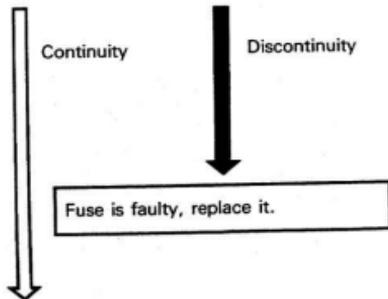
- Seat



## 2. Fuse inspection

- Remove "MAIN" fuse and "HEAD" fuse.
- Check "MAIN" fuse and "HEAD" fuse for continuity.

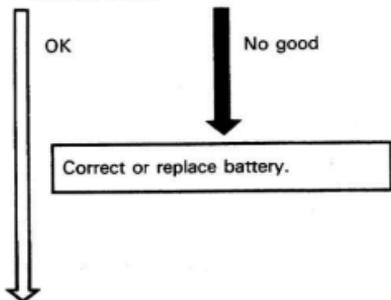
Refer to "FUSE INSPECTION" section in CHAPTER 3.





3. Battery inspection
- Fluid level
  - Battery terminals
  - Fluid specific gravity

Refer to "BATTERY INSPECTION" section in CHAPTER 3.

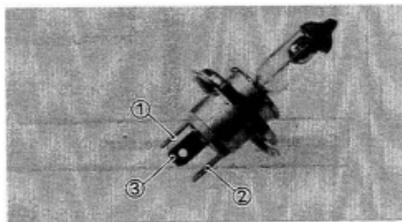


4. Headlight bulb conduct check
- Remove headlight bulb.

**WARNING:** \_\_\_\_\_

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

- Connect Pocket Tester to bulb terminals and check bulb for continuity.



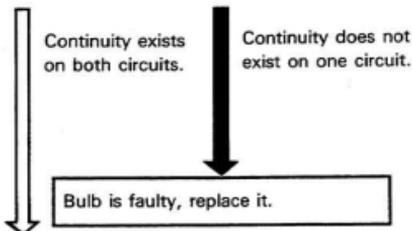
Pocket Tester:  
90890-03112

Tester (+) Lead → Terminal ①  
Tester (-) Lead → Terminal ③

Tester (+) Lead → Terminal ②  
Tester (-) Lead → Terminal ③

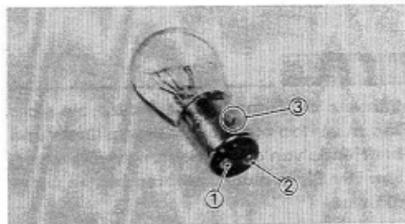
**NOTE:** \_\_\_\_\_

Set tester selector to " $\Omega \times 1K$ " position.



5. Tail/Brake light bulb conduct check.

- Remove tail/brake light bulb.
- Connect Pocket Tester to bulb terminals and check bulb for continuity.

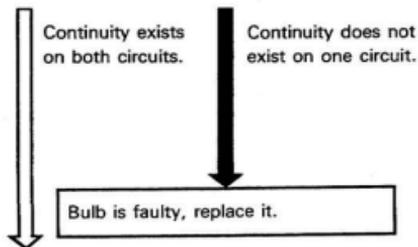


 **Pocket Tester:**  
90890-03112

Tester (+) Lead → Terminal ①
Tester (-) Lead → Terminal ③
Tester (+) Lead → Terminal ②
Tester (-) Lead → Terminal ③

**NOTE:** \_\_\_\_\_

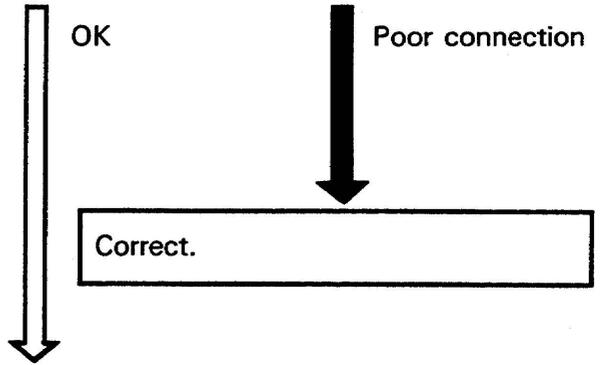
Set tester selector to " $\Omega \times 1K$ " position.



6. Check entire lighting system for connections.  
Refer to "WIRING DIAGRAM" section.

# LIGHTING SYSTEM

<b>ELEC</b>	
-------------	--



7. Check condition of each circuit for lighting system.  
Refer to "LIGHTING SYSTEM TESTS AND CHECKS" section.



## LIGHTING SYSTEM TESTS AND CHECKS

### 1. Headlight does not come on.

Turn main switch to "ON" and "LIGHTS" switch to "ON".

Check for voltage (12V) on "Red" lead at main switch connector.

No voltage

Wiring circuit from "MAIN" fuse to main switch is faulty, repair it.

12V

Check for voltage (12V) on "Brown" lead at main switch connector.

No voltage

Main switch is faulty, replace it.

12V

Check for voltage (12V) on "Red/Yellow" lead at "LIGHTS" switch connector.

No voltage

Wiring circuit from "MAIN" switch to "LIGHTS" switch is faulty, repair it.

12V

Check for voltage (12V) on "Blue/Black" lead at "LIGHTS" switch connector.

No voltage

"LIGHTS" switch is faulty, replace right handlebar switch.

12V

Check for voltage (12V) on "Blue/Black" lead at "LIGHTS" (Dimmer) switch connector.

No voltage

Wiring circuit from "LIGHTS" switch to "LIGHTS" (Dimmer) switch is faulty, repair it.

12V

Turn "LIGHTS" (Dimmer) switch to "HI" position.

Check for voltage (12V) on "Yellow" lead at "LIGHTS" (Dimmer) switch connector.

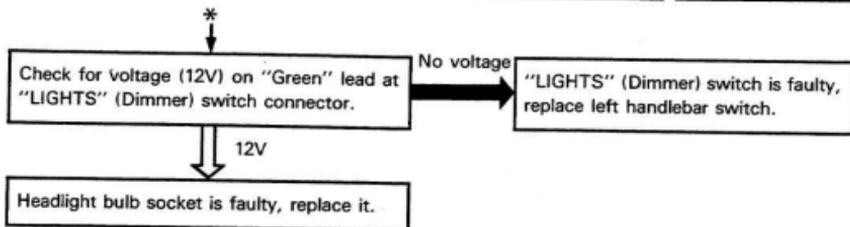
No voltage

"LIGHTS" (Dimmer) switch is faulty, replace left handlebar switch.

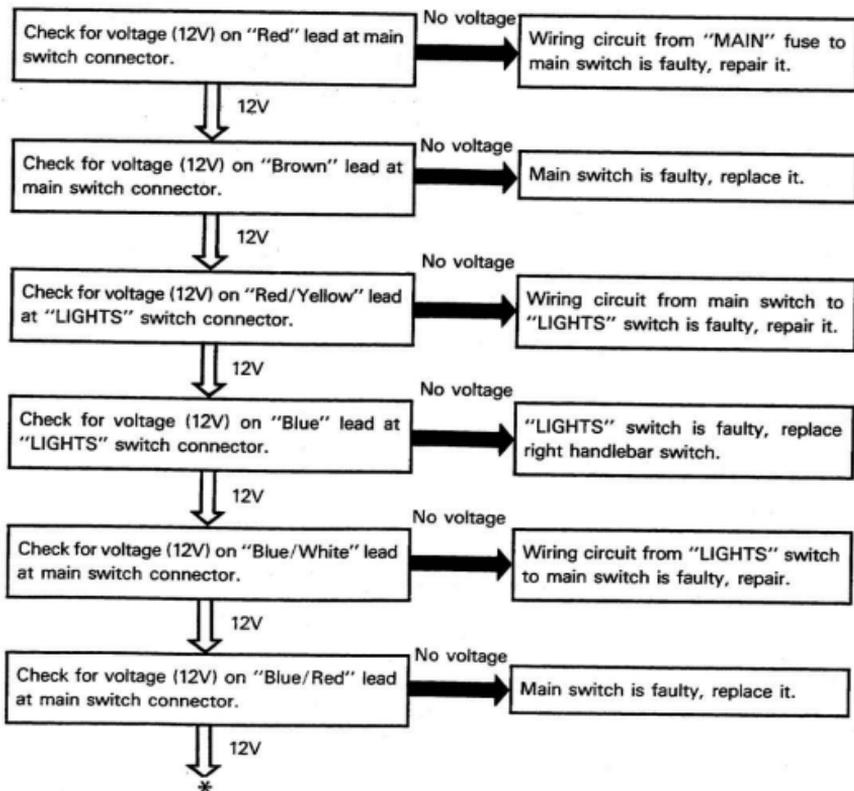
12V

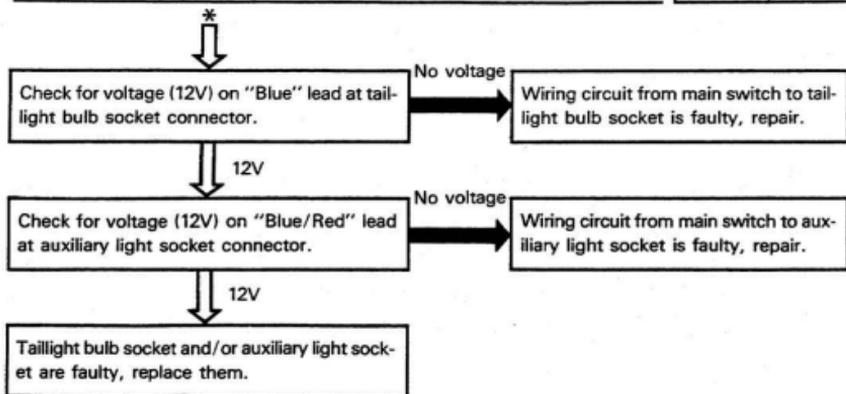
Turn "LIGHTS" (Dimmer) switch to "LO" position.

\*

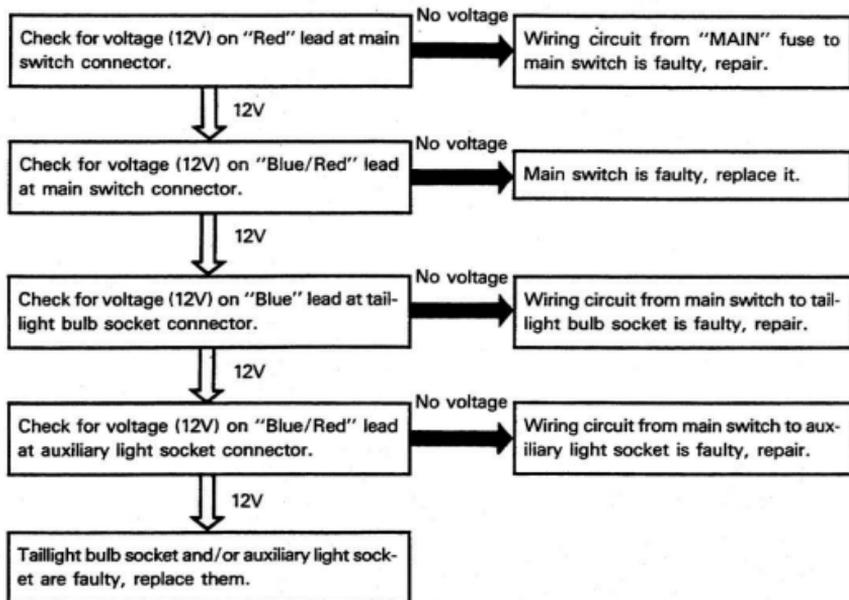


2. When turning main switch to "ON" and "LIGHTS" switch to "ON", taillight and/or auxiliary light do not come on.





3. When turning main switch to "P" position, taillight and/or auxiliary light do not come on.



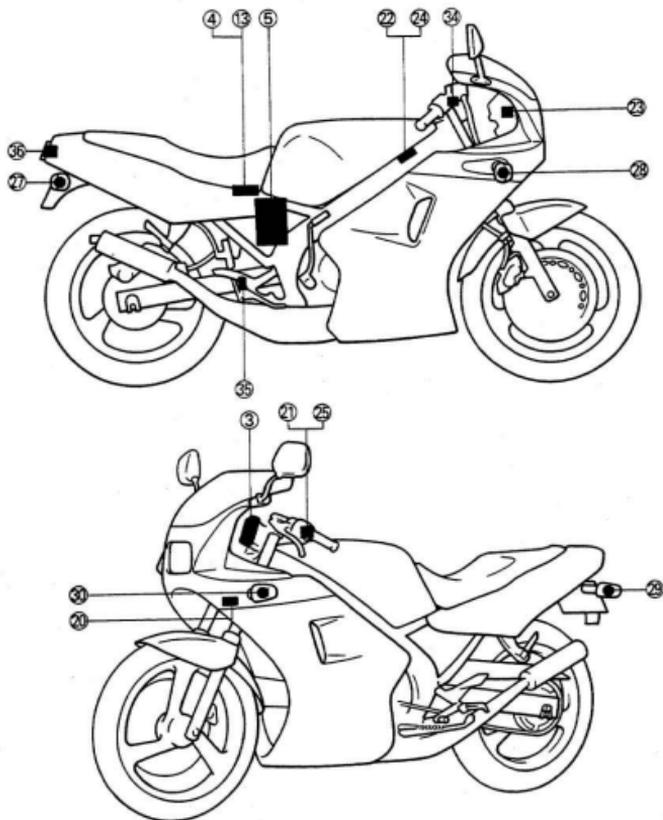


**NOTE:**

For the color codes, see page 8-2.

- ③ Main switch
- ④ "MAIN" fuse
- ⑤ Battery
- ⑬ "SIGNAL" fuse
- ⑯ Horn
- ⑰ "HORN" switch
- ⑳ Cancelling unit
- ㉑ Reed switch
- ㉒ Flasher relay

- ㉓ "TURN" switch
- ㉔ Rear flasher light (Right)
- ㉕ Front flasher light (Right)
- ㉖ Rear flasher light (Left)
- ㉗ Front flasher light (Left)
- ㉘ Front brake switch
- ㉙ Rear brake switch
- ㉚ Tail/ Brake light
- ㉛ Except for Germany





## TROUBLESHOOTING

## NOTE:

The battery provides power for operation of the signal system. If none of the above fail to operate proceed further. Low battery voltage indicates either a faulty battery, low battery fluid level, or a defective charging system. Also check fuse condition.

**FLASHER LIGHT, BRAKE LIGHT OR HORN DO NOT OPERATE.**

## 1. Remove:

- Seat



## 2. Fuse inspection

- Remove "MAIN" fuse and "SIGNAL" fuse.
- Check fuses for continuity.

Refer to "FUSE INSPECTION" section in CHAPTER 3.

Continuity

Discontinuity

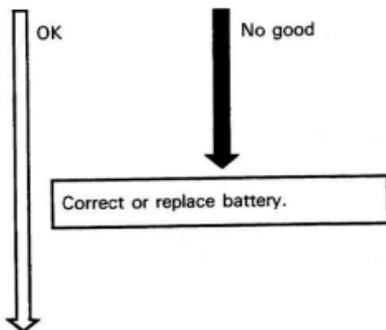
**Fuse is faulty, replace it.**



## 3. Battery inspection

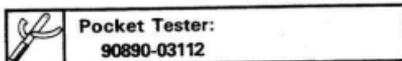
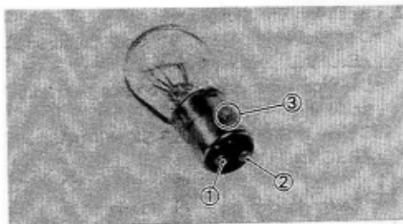
- Fluid level
- Battery terminals
- Fluid specific gravity

Refer to "BATTERY INSPECTION" section in CHAPTER 3.



## 4. Tail/Brake light bulb conduct check

- Remove tail/brake light bulb.
- Connect Pocket Tester to bulb terminals and check bulb for continuity.



Pocket Tester:

90890-03112

Tester (+) Lead → Terminal ①

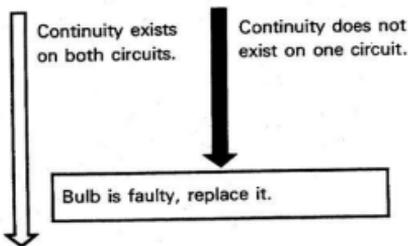
Tester (-) Lead → Terminal ③

Tester (+) Lead → Terminal ②

Tester (-) Lead → Terminal ③

**NOTE:**

Set tester selector to " $\Omega \times 1K$ " position.





## 5. Flasher light bulb conduct check

- Remove flasher light bulb
- Connect Pocket Tester to bulb terminals and check bulb for continuity.

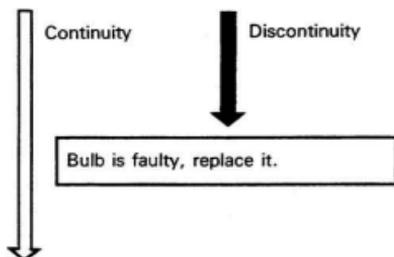


**Pocket Tester:**  
90890-03112

**Tester (+) Lead → Terminal ①**  
**Tester (-) Lead → Terminal ②**

**NOTE:**

Set tester selector to " $\Omega \times 1K$ " position.



## 6. Main switch operation check

- Disconnect main switch leads (Brown, Red, Blue/Red, Blue/White, Black).
- Connect Pocket Tester to main switch leads.



**Pocket Tester:**  
90890-03112

**Tester (+) Lead → Red Lead**  
**Tester (-) Lead → Brown Lead**

**NOTE:**

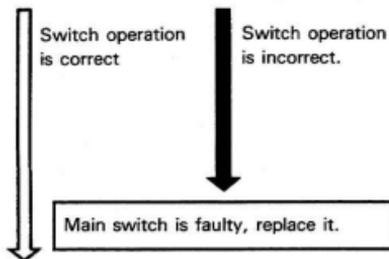
Set tester selector " $\Omega \times 1$ " position.



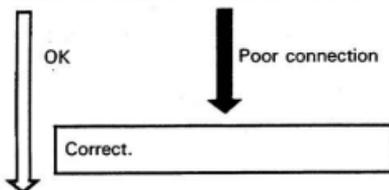


- Check main switch for operation.

Turn main switch to "ON".	Switch is continued (0Ω).
Turn main switch to "OFF".	Switch is discontinued (∞).



7. Check entire signal system for connections.  
Refer to "WIRING DIAGRAM" section.

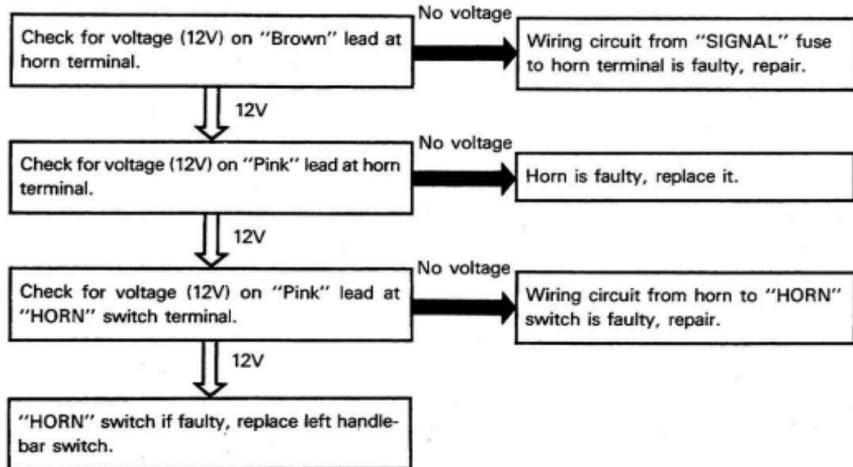


8. Check condition of each circuit for signal system.  
Refer to "SIGNAL SYSTEM TESTS AND CHECKS."

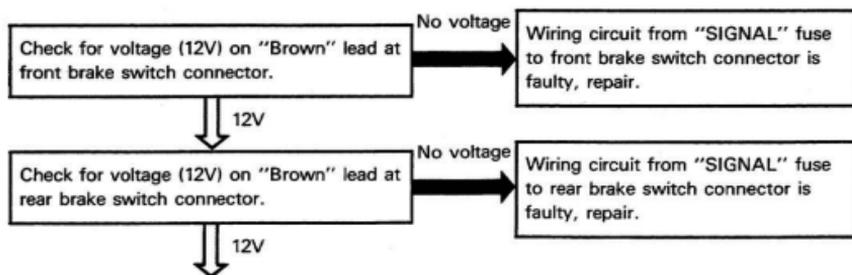


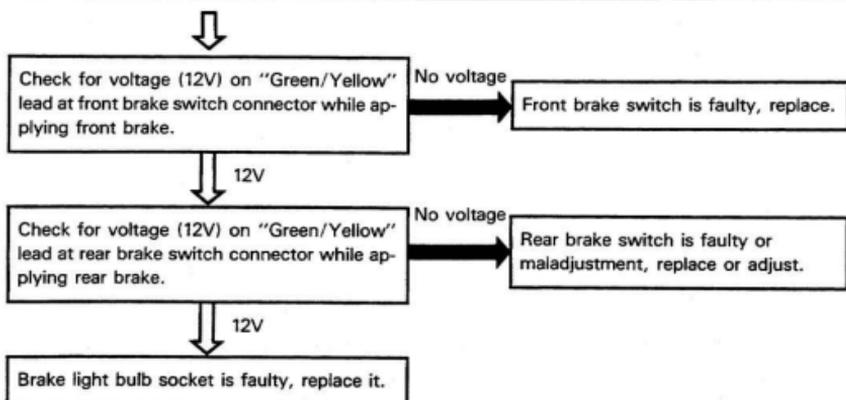
### SIGNAL SYSTEM TESTS AND CHECKS

1. Horn does not sound, when pushing "HORN" switch.

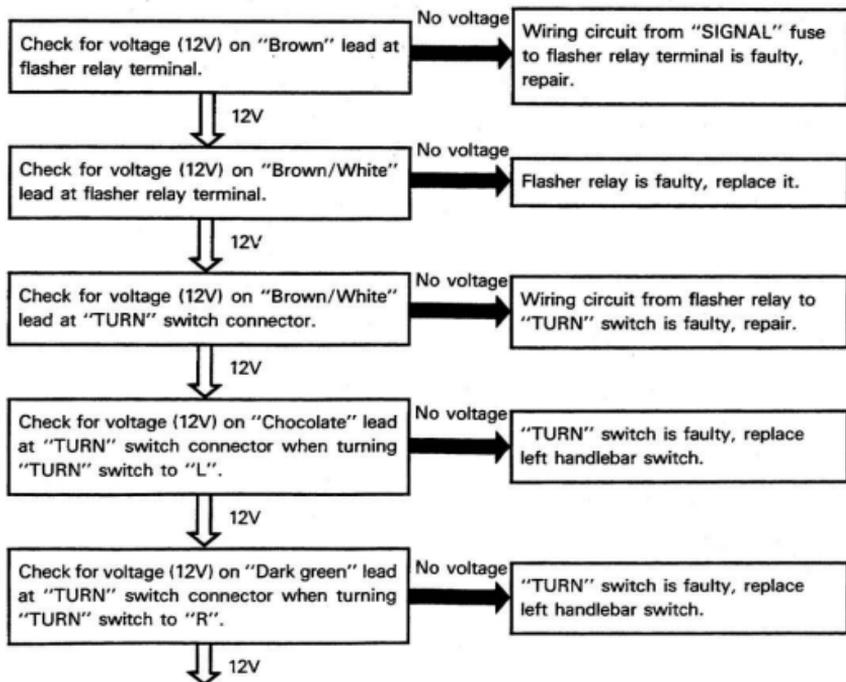


2. Brake light does not come on, when applying rear or front brake.





### 3. Flasher lights do not blink.

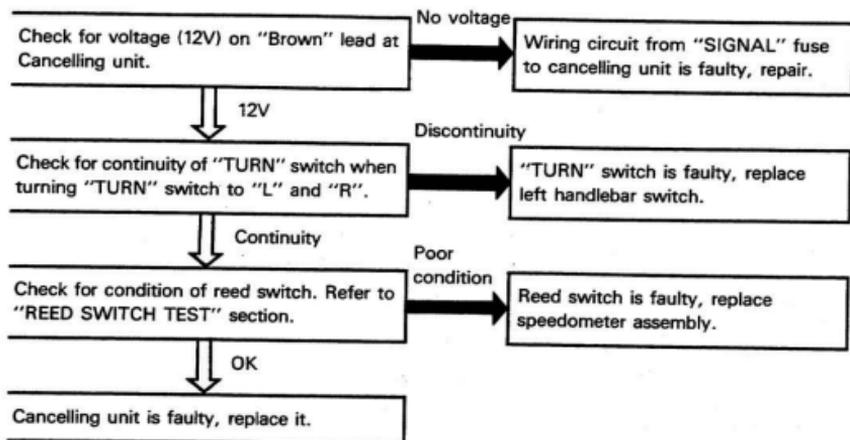


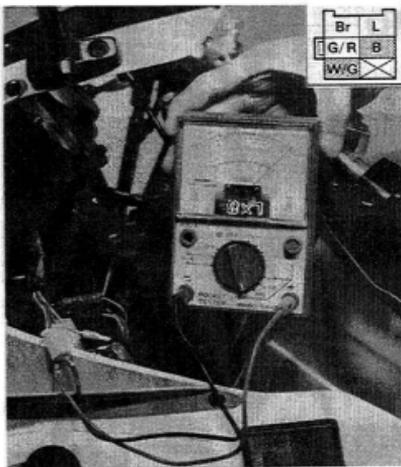


↓ 12V

Flasher light bulb socket is faulty, replace it.

4. Blinking (Flasher light) is not cancelled automatically.



**REED SWITCH TEST**

## 1. Disconnect:

- Meter coupler (Brown, Blue, Green/Red, White/Green, Black)

## 2. Connect:

- Pocket Tester



**Pocket Tester:**  
90890-03112

**Tester (+) Lead → White/Green Lead**  
**Tester (-) Lead → Black Lead**

**NOTE:** \_\_\_\_\_

Set tester selector to " $\Omega \times 1$ " position.

## 3. Measure:

- Reed switch resistance
- Out of specification → Replace.



**Reed Switch Resistance**  
**(White/Green — Black):**

**About  $7\Omega$**

**Then return back  $0\Omega$  or  $\infty\Omega$**   
**when wheel is stopped**

**NOTE:** \_\_\_\_\_

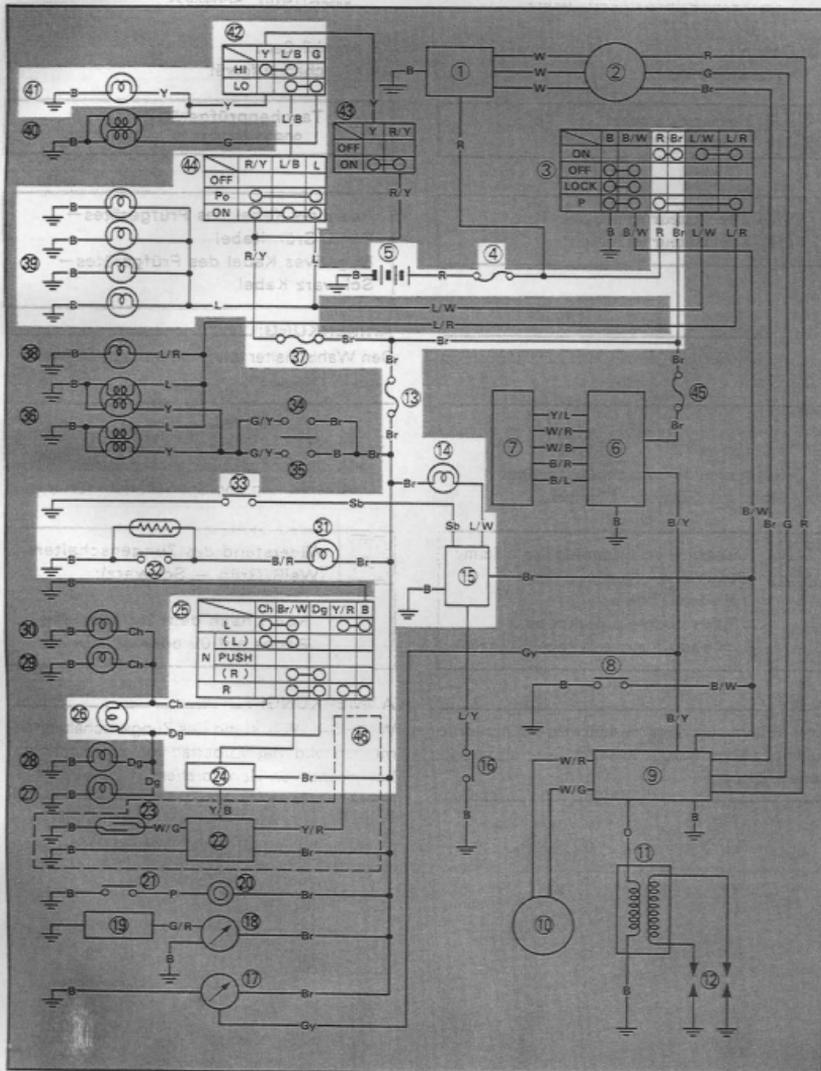
When measuring reed switch resistance, lift front wheel and rotate the wheel by hand.



**DISPLAY SYSTEM**

**CIRCUIT DIAGRAM**

Below circuit diagram shows display system.





**NOTE:** \_\_\_\_\_

For the color codes, see page 8-2.

③ Main switch

④ "MAIN" fuse

⑤ Battery

⑬ "SIGNAL" fuse

⑭ "NEUTRAL" indicator light

⑮ Ignition control unit

⑲ Flasher relay

⑳ "TURN" switch

⑳ "TURN" indicator light

㉑ "OIL" indicator light

㉒ Oil level gauge

㉓ Neutral switch

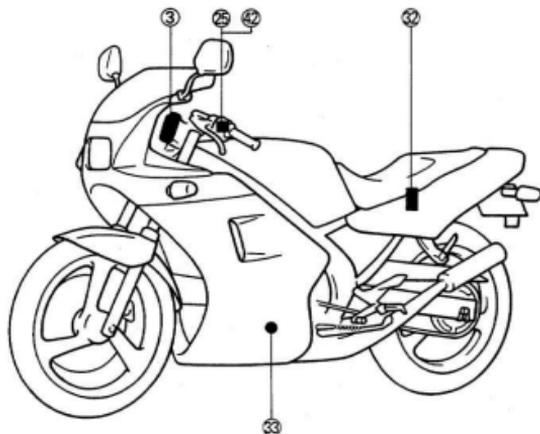
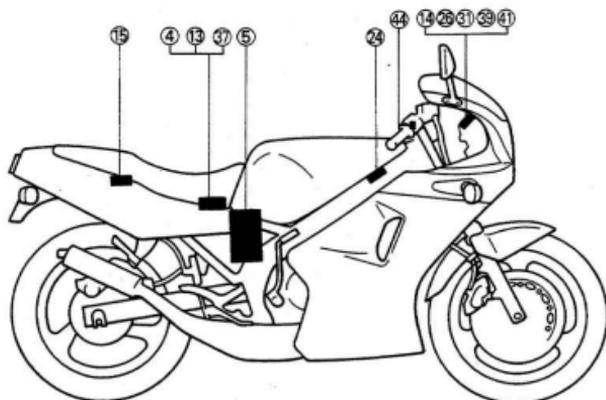
㉔ "HEAD" fuse

㉕ Meter light

㉖ "HIGH BEAM" indicator light

㉗ "LIGHTS" (Dimmer) switch

㉘ "LIGHTS" switch





## TROUBLESHOOTING

## NOTE:

The battery provides power for operation of the display system. If none of the above fail to operate proceed further. Low battery voltage indicates either a faulty battery, low battery fluid level or a defective charging system.

Also check fuse condition.

**INDICATOR LIGHTS AND METER LIGHTS DO NOT COME ON.**

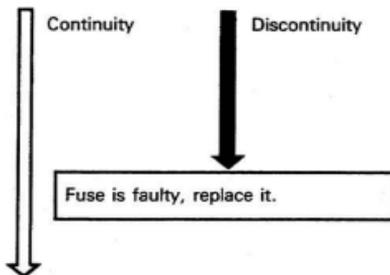
## 1. Remove:

- Seat



## 2. Fuse inspection

- Remove "MAIN", "SIGNAL" and "HEAD" fuses.
- Check fuses for continuity.  
Refer to "FUSE INSPECTION" section in CHAPTER 3.

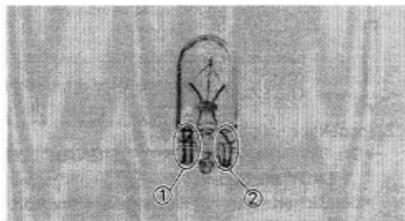
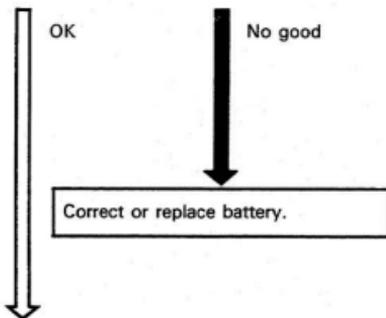




3. Battery inspection

- Fluid level
- Battery terminals
- Fluid specific gravity

Refer to "BATTERY INSPECTION" section in CHAPTER 3.



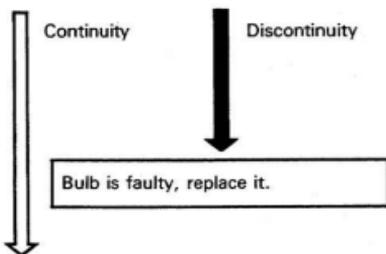
4. Indicator light and meter light bulb conduct check

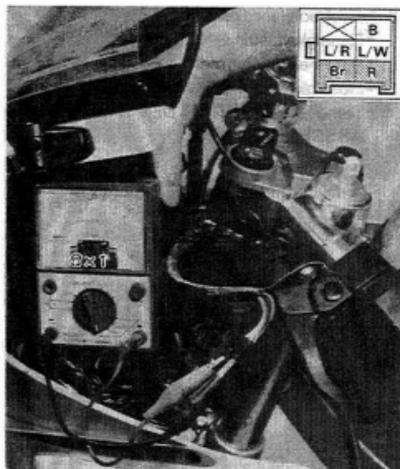
- Connect Pocket Tester to bulb terminals and check bulb for continuity.

	<b>Pocket Tester:</b> 90890-03112
--	--------------------------------------

Tester (+) Lead → Terminal ① Tester (-) Lead → Terminal ②
--

**NOTE:** \_\_\_\_\_  
 Set tester selector to " $\Omega \times 1K$ " position.





5. Main switch operation check
- Disconnect main switch leads (Brown, Red, Blue/Red, Blue/White, Black)
  - Connect Pocket Tester to main switch leads.

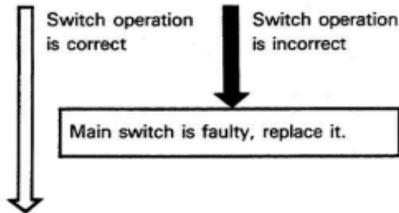
 **Pocket Tester:**  
90890-03112

**Tester (+) Lead → Red Lead**  
**Tester (-) Lead → Brown Lead**

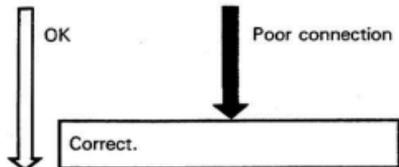
**NOTE:** \_\_\_\_\_  
Set tester selector "Ω × 1" position.

- Check main switch for operation.

Turn main switch to "ON".	Switch is continued (0Ω).
Turn main switch to "OFF".	Switch is discontinued (∞)



6. Check entire display system for connections.  
Refer to "WIRING DIAGRAM" section.

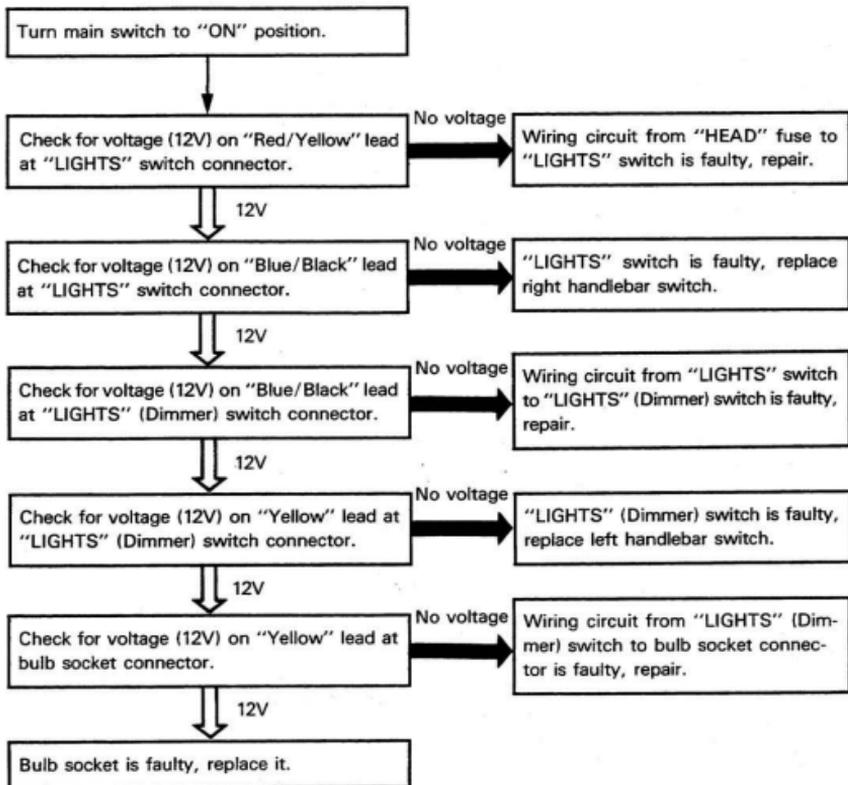


7. Check condition of each circuit for display system.  
Refer to "DISPLAY SYSTEM TESTS AND CHECKS."



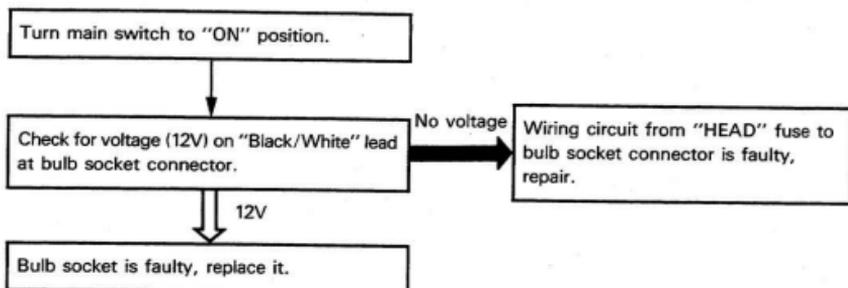
**DISPLAY SYSTEM TESTS AND CHECKS**

1. "HIGH BEAM" indicator light does not come on when turning "LIGHTS" (Dimmer) switch to "HI" and "LIGHTS" switch to "ON".

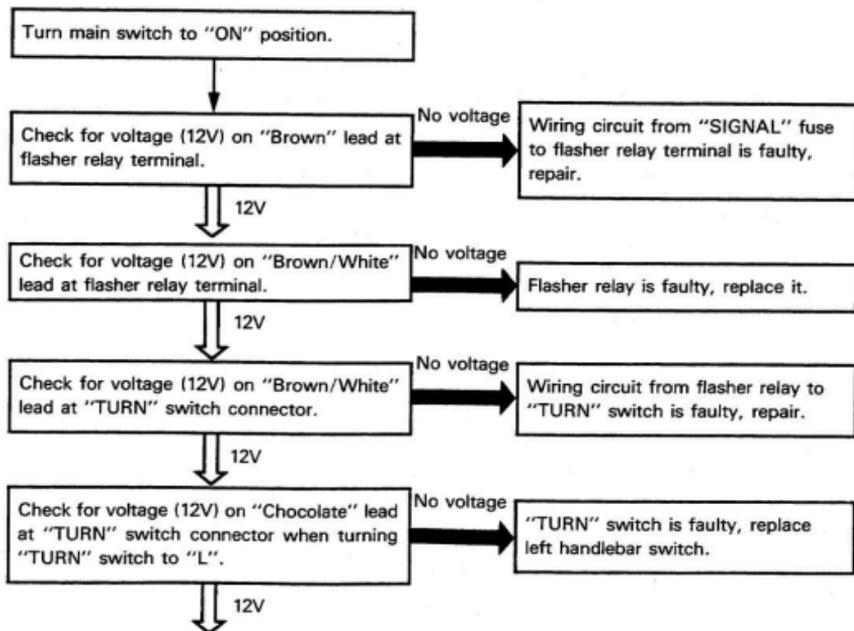


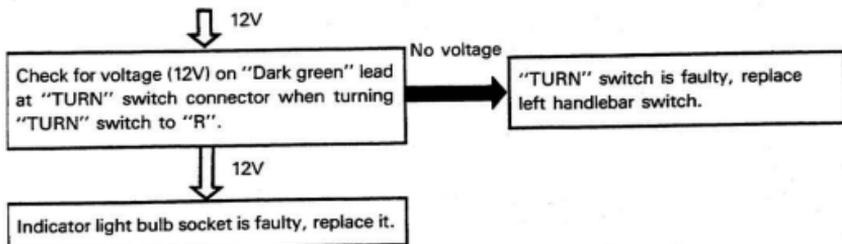


2. Meter light does not come on.

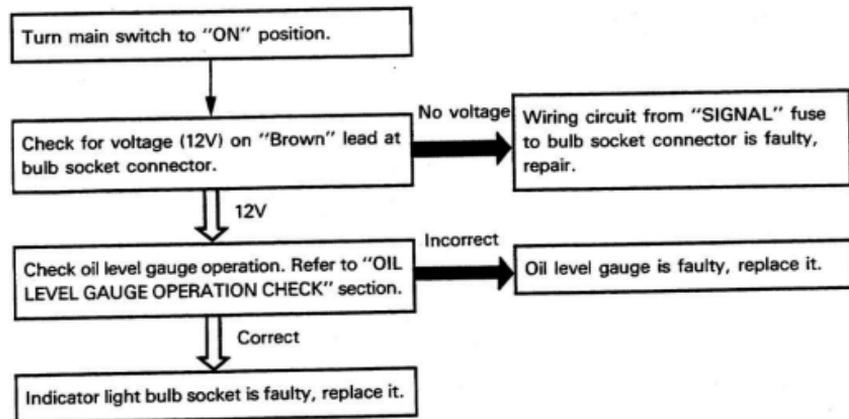


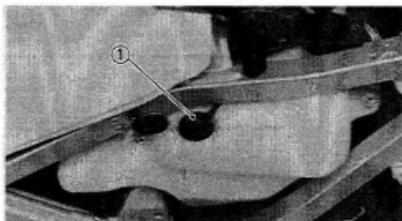
3. "TURN" indicator light does not come on.





4. "OIL" indicator light does not come on when oil tank is dry.

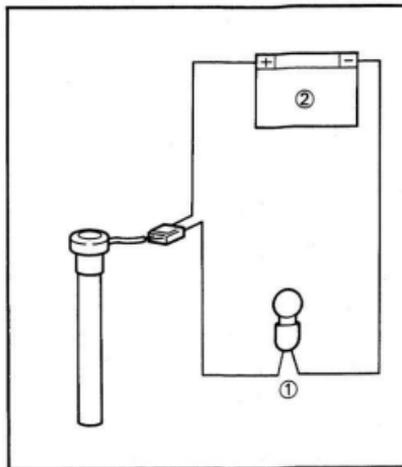




**OIL LEVEL GAUGE OPERATION CHECK**

1. Remove:

- Oil level gauge ①



2. Connect oil level gauge and checking light (12V/3.4W) ① to 12V battery ② as shown.

**NOTE:** \_\_\_\_\_

Use a full charged battery.

3. Check the oil level gauge for operation.

Upright position	<ul style="list-style-type: none"> <li>• Light comes on</li> <li>• Wait a few second</li> <li>• Light goes out</li> </ul>
Up-side down position	<ul style="list-style-type: none"> <li>• Light comes on</li> <li>• Wait a few second</li> <li>• Light stays on</li> </ul>

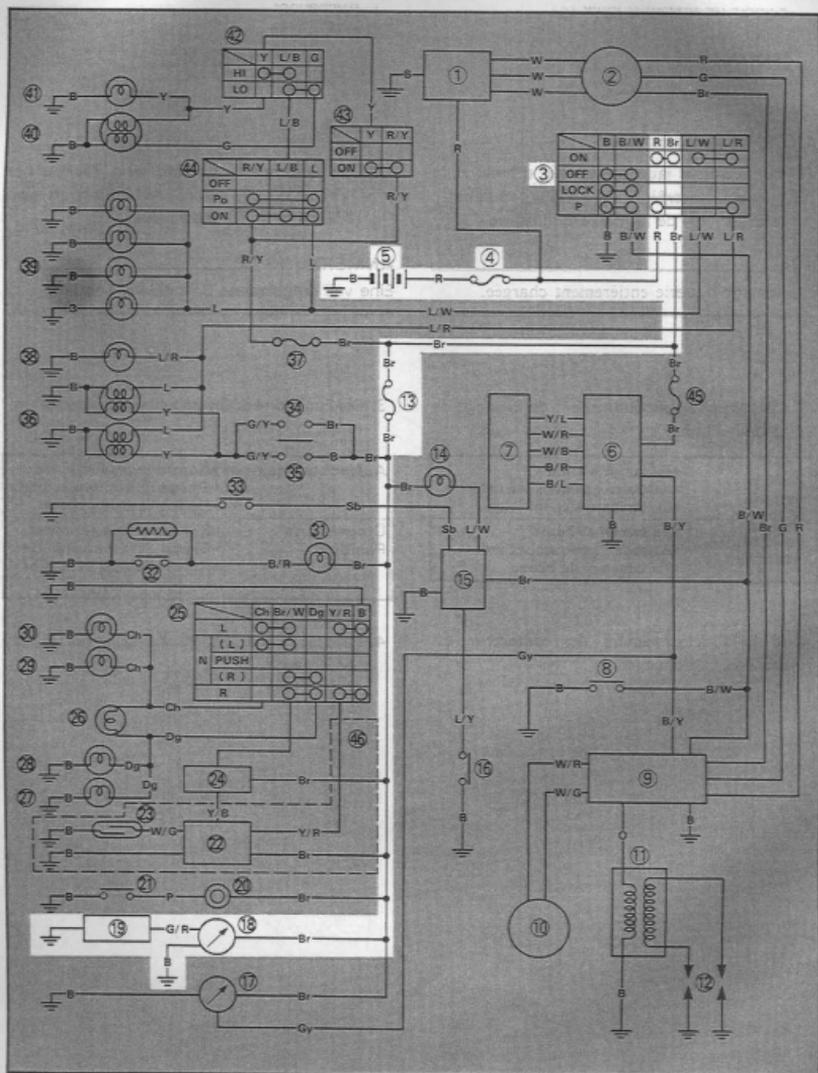
4. If the switch operation is incorrect, replace it.



## COOLING SYSTEM

## CIRCUIT DIAGRAM

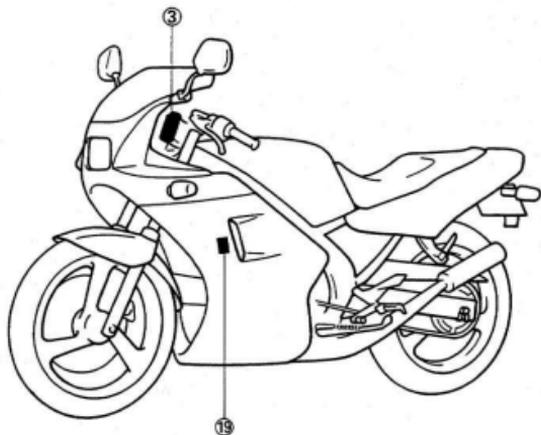
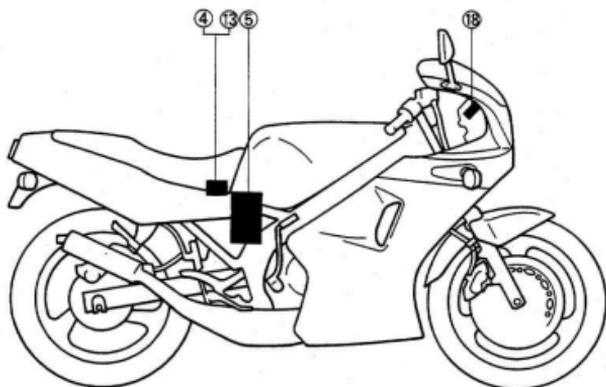
Below circuit diagram shows cooling circuit.



**NOTE:** \_\_\_\_\_

For the color codes, see page 8-2.

- ③ Main switch
- ④ "MAIN" fuse
- ⑤ Battery
- ⑬ "SIGNAL" fuse
- ⑱ Temperature gauge
- ⑲ Thermo unit





## TROUBLESHOOTING

**WHEN ENGINE IS HOT, TEMPERATURE GAUGE DOES NOT MOVE.**

## 1. Remove:

- Seat



## 2. Fuse inspection

- Remove "MAIN" fuse and "SIGNAL" fuse.
- Check fuses for continuity.

Refer to "FUSE INSPECTION" section in CHAPTER 3.



Continuity

Discontinuity



Fuse is faulty, replace it.

## 3. Battery inspection.

- Fluid level
- Battery terminals
- Fluid specific gravity

Refer to "BATTERY INSPECTION" section in "CHAPTER 3.

# COOLING SYSTEM

**ELEC**



OK

No good

Correct or replace battery.

## 4. Remove:

- Lower cowl (Right)
- Lower cowl (Left)

## 5. Main switch operation check

- Disconnect main switch leads (Brown, Red, Blue/Red, Blue/White, Black).
- Connect Pocket Tester to main switch leads.



**Pocket Tester:**  
90890-03112

Tester (+) Lead → Red Lead  
Tester (-) Lead → Brown Lead

**NOTE:** \_\_\_\_\_

Set tester selector to "Ω × 1" position.

- Check main switch for operation.

Turn main switch to "ON".	Switch is continued (0Ω).
Turn main switch to "OFF".	Switch is discontinued (∞).



Switch operation  
is correct.

Switch operation  
is incorrect.

Main switch is faulty, replace it.

6. Check for voltage (12V) on "Brown" lead at temperature gauge.

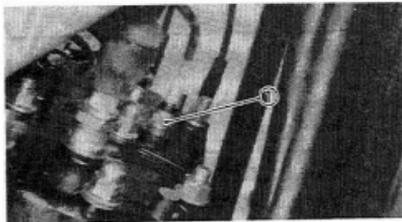
12V

No voltage

Wiring circuit from "SIGNAL" fuse  
to temperature gauge is faulty,  
repair.

7. Thermo unit resistance check

- Remove thermo unit ①.



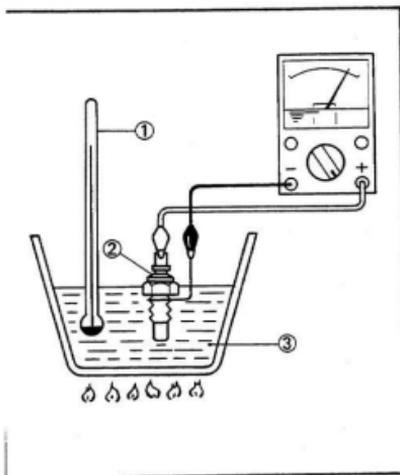
**WARNING:**

Handle the thermo unit with special care. Never subject it to strong or allow it to be dropped. Should it be dropped, it must be replaced.

- Connect Pocket Tester to thermo unit.



Pocket Tester:  
90890-03112



- Measure thermo unit resistance.
- If resistance is out of specification, replace it.

#### Thermo unit resistance measurement steps:

- Immerse the thermo unit (2) in coolant (3).
- Measure the resistance at each temperature as tabulated.

① Temperature gauge

Coolant Temperature	Resistance
40°C (104°F)	240Ω
60°C (140°F)	94 – 114Ω
80°C (176°F)	52.1Ω
100°C (212°F)	26.2 – 29.3Ω

- After measuring the thermo unit, install the unit.



15 Nm (1.5 m·kg, 11 ft·lb)

Use Water Resistant Sealant.

#### CAUTION:

Avoid overtightening.

Resistances meet specifications

Out of specification

Thermo unit is faulty, replace it.

8. Check entire cooling system for connection. Refer to "WIRING DIAGRAM" section.

OK

Poor Connection

Correct.

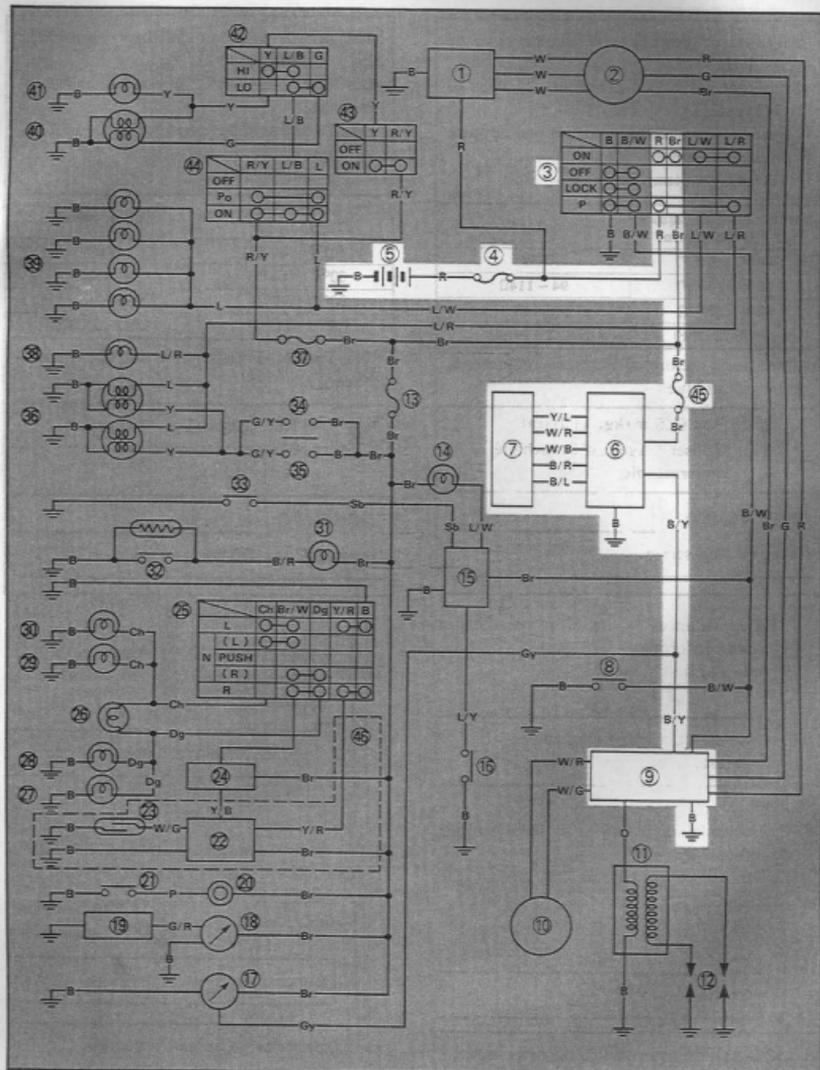
Temperature gauge is faulty, replace it.



## YAMAHA POWER VALVE SYSTEM

## CIRCUIT DIAGRAM

Below circuit diagram shows Y.P.V.S. circuit.

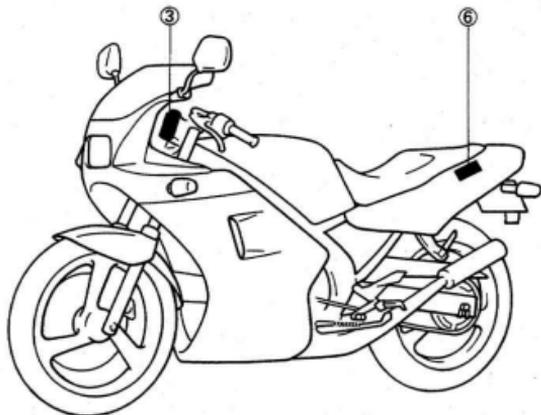
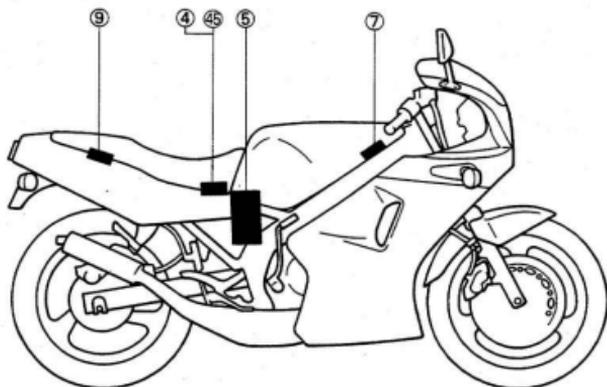




NOTE: \_\_\_\_\_

For the color codes, see page 8-2.

- ③ Main switch
- ④ "MAIN" fuse
- ⑤ Battery
- ⑥ Y.P.V.S. control unit
- ⑦ Servomotor
- ⑧ C.D.I. unit
- ⑨ "Y.P.V.S." fuse





## TROUBLESHOOTING

WHEN MAIN SWITCH IS TURNED TO "ON", SERVMOTOR DOES NOT OPERATE ONE CYCLE.

## 1. Remove:

- Seat



## 2. Fuse inspection

- Remove "MAIN" fuse and "Y.P.V.S." fuse.
- Check fuses for continuity.

Refer to "FUSE INSPECTION" section in CHAPTER 3.



Continuity

Discontinuity

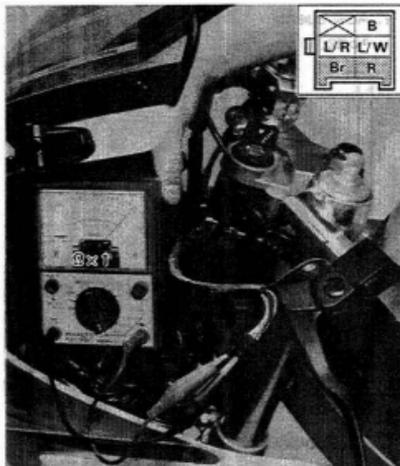
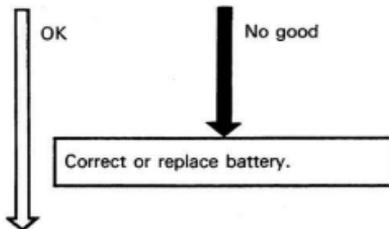


Fuse is faulty, replace it.

## 3. Battery inspection

- Fluid level
- Battery terminals
- Fluid specific gravity

Refer to "BATTERY INSPECTION" section in CHAPTER 3.



## 4. Main switch operation check

- Disconnect main switch leads (Brown, Red, Blue/Red, Blue/White, Black).
- Connect Pocket Tester to main switch leads.

 **Pocket Tester:**  
90890-03112

**Tester (+) Lead → Red Lead**  
**Tester (-) Lead → Brown Lead**

**NOTE:** \_\_\_\_\_  
Set tester selector to " $\Omega \times 1$ " position.  
\_\_\_\_\_

- Check main switch for operation.

Turn main switch to "ON"	Switch is continued ( $0\Omega$ ).
Turn main switch to "OFF".	Switch is discontinued ( $\infty$ ).



Switch operation  
is correct.

Switch operation  
is incorrect.

Main switch is faulty, replace it.

5. Remove:

- Side covers



6. Servomotor operation check

- Disconnect servomotor leads coupler (Yellow/Blue, White/Black, Black/Red, Black/Blue)
- Connect battery leads to servomotor leads and check servomotor for operation.

Battery (+) Lead → Black/Blue Lead  
Battery (-) Lead → Black/Red Lead

**CAUTION:**

This test should be performed within a few seconds to prevent further damage.

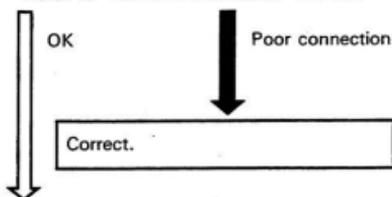
Servomotor  
operates.

Servomotor does  
not operate.

Servomotor is faulty, replace it.



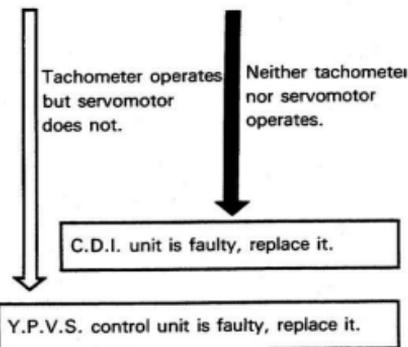
7. Check entire Y.P.V.S. circuit of connection.  
Refer to "WIRING DIAGRAM" section.



8. Start engine and increase revolution to about 7,000 r/min. Check servomotor and tachometer for operation.

**CAUTION:**

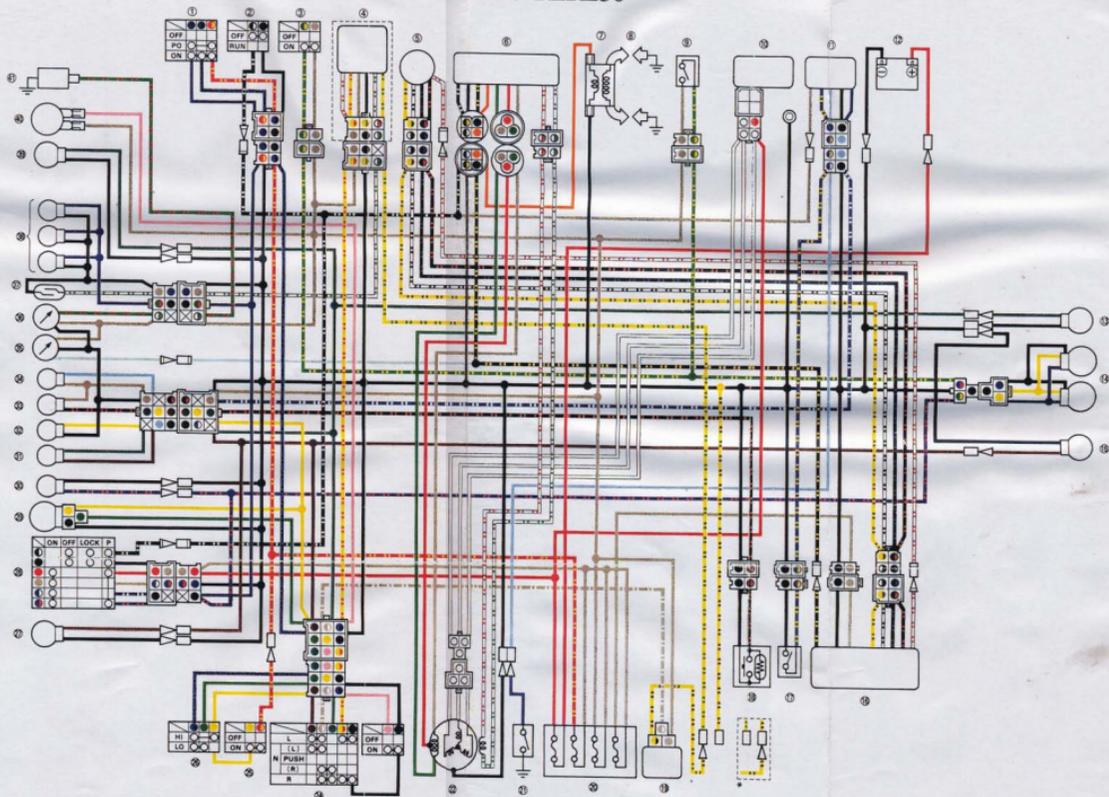
This test should be performed within a few seconds to prevent further damage.



# TZR250 WIRING DIAGRAM

# SCHEMA DE CABLAGE DE LA TZR250

# TZR250 SCHALTPLAN



### COLOR CODE

Black Noir Schwarz	Green Vert Grün	Brown Brun Braun	Chocolate Schokoladenfarbe	Dark green Vert foncé Buntelgrün
Grey Gris Grau	Blue Bleu Blau	Orange Orange Orange		

### CODE DE COULEUR

Pink Rose Rosa	Red Rouge Rot	Sky blue Bleu ciel Himmelsblau	White Blanc Weiß

### FARBKODIERUNG

Yellow Jaune Gelb	Black/Red Noir/Rouge Schwarz/Rot	Black/White Noir/Blanc Schwarz/Weiß	Black/Blue Noir/Bleu Schwarz/Blau

Blue/Black Bleu/Noir Blau/Schwarz	Blue/Red Bleu/Rouge Blau/Rot	Blue/White Bleu/Blanc Blau/Weiß	Blue/White Bleu/Blanc Blau/Weiß

Red/Yellow Rouge/Jaune Rot/Gelb	White/Black Blanc/Noir Weiß/Schwarz	White/Green Blanc/Vert Weiß/Grün	White/Red Blanc/Rouge Weiß/Rot

Yellow/Black Jaune/Noir Gelb/Schwarz	Yellow/Green Jaune/Vert Gelb/Grün	Yellow/Blue Jaune/Bleu Gelb/Blau
--	---	--

## 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	<ul style="list-style-type: none"> <li>• Empty</li> <li>• Clogged fuel filter</li> <li>• Clogged fuel breather hose</li> <li>• Deteriorated fuel or fuel containing water or foreign material</li> </ul>
Fuel cock	<ul style="list-style-type: none"> <li>• Clogged fuel hose</li> <li>• Clogged or damaged vacuum hose</li> </ul>
Carburetor	<ul style="list-style-type: none"> <li>• Deteriorated fuel, fuel containing water or foreign material</li> <li>• Clogged pilot jet</li> <li>• Clogged pilot air passage</li> <li>• Sucked-in air</li> <li>• Deformed float</li> <li>• Groove-worn needle valve</li> <li>• Improperly sealed valve seat</li> <li>• Improperly adjusted fuel level</li> <li>• Improperly set pilot jet</li> <li>• Clogged starter jet</li> <li>• Starter plunger malfunction</li> <li>• Improperly adjusted starter cable</li> </ul>
Air cleaner	<ul style="list-style-type: none"> <li>• Clogged air filter</li> </ul>

## STARTING FAILURE/HARD STARTING

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### ELECTRICAL SYSTEM

### PROBABLE CAUSE

Spark plug	<ul style="list-style-type: none"><li>• Improper plug gap</li><li>• Worn electrodes</li><li>• Wire between terminals broken</li><li>• Improper heat range</li><li>• Faulty spark plug cap</li></ul>
Ignition coil	<ul style="list-style-type: none"><li>• Broken or shorted primary/secondary</li><li>• Faulty spark plug lead</li><li>• Broken body</li></ul>
C.D.I. unit system	<ul style="list-style-type: none"><li>• Faulty C.D.I. unit</li><li>• Faulty source coil</li><li>• Faulty pick-up coil</li><li>• Broken woodruff key</li></ul>
Switches and wiring	<ul style="list-style-type: none"><li>• Faulty main switch</li><li>• Faulty engine stop switch</li><li>• Broken or shorted wiring</li><li>• Faulty neutral switch</li><li>• Faulty sidestand switch</li><li>• Faulty Ignition control unit</li></ul>

# STARTING FAILURE/HARD STARTING/POOR IDLE SPEED PERFORMANCE

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## COMPRESSION SYSTEM

## PROBABLE CAUSE

- Cylinder and cylinder head
  - Loose spark plug
  - Loose cylinder head or cylinder
  - Broken cylinder head gasket
  - Broken cylinder 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 crankcase (Damaged oil seal)
  - Seized crankshaft
- Reed valve
  - Deformed reed valve stopper
  - Improperly seated reed valve
  - Loose intake manifold
  - Broken gasket
  - Broken reed valve

## POOR IDLE SPEED PERFORMANCE

### POOR IDLE SPEED PERFORMANCE

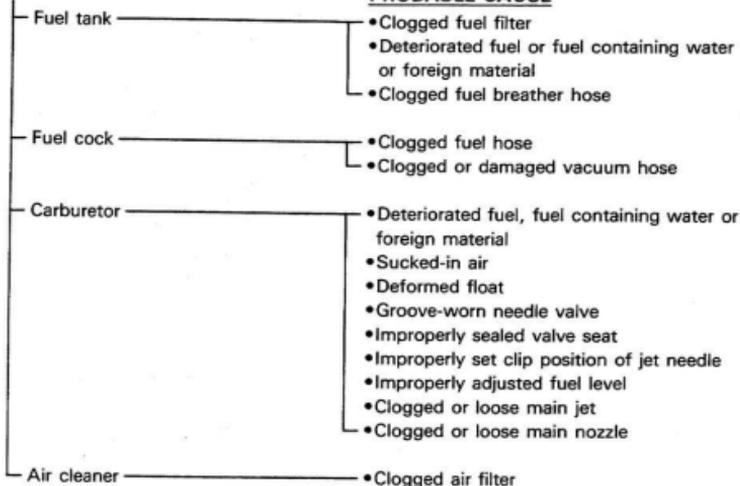
### PROBABLE CAUSE

- Carburetor
  - Improperly returned starter plunger
  - Clogged or loose pilot jet
  - Clogged pilot air jet
  - Improperly synchronized carburetors
  - Improperly adjusted idle speed (Throttle stop screw)
  - Improper throttle cable play
  - Flooded carburetor

**POOR MEDIUM AND HIGH SPEED PERFORMANCE**

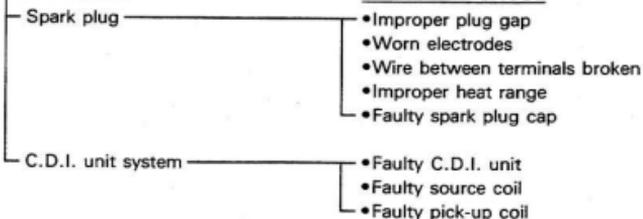
**FUEL SYSTEM**

**PROBABLE CAUSE**

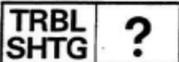


**ELECTRICAL SYSTEM**

**PROBABLE CAUSE**

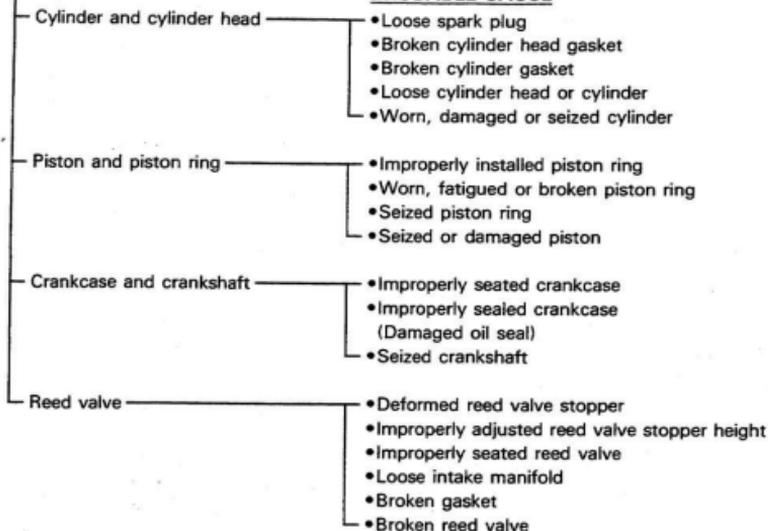


# POOR MEDIUM AND HIGH SPEED PERFORMANCE



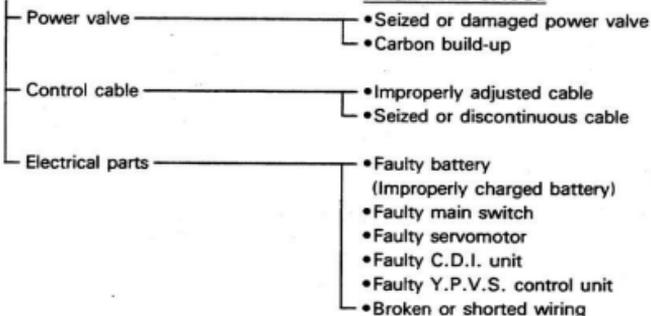
## COMPRESSION SYSTEM

### PROBABLE CAUSE



## Y.P.V.S.

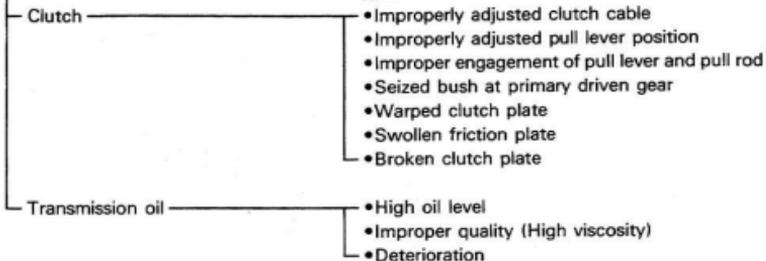
### PROBABLE CAUSE



**FAULTY GEAR SHIFTING**

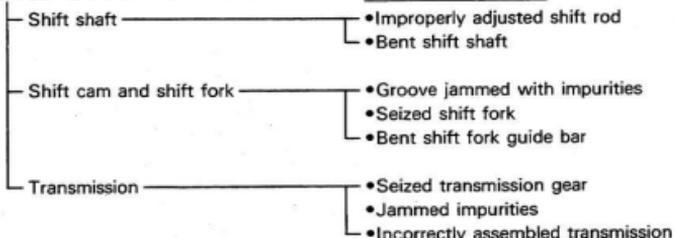
**HARD SHIFTING**

**PROBABLE CAUSE**



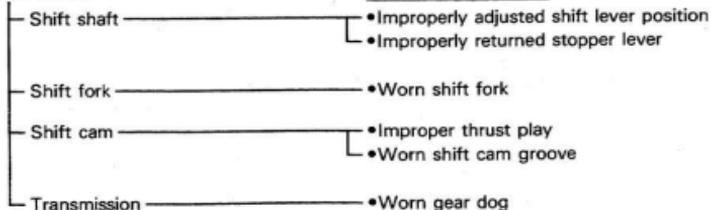
**CHANGE PEDAL DOES NOT MOVE**

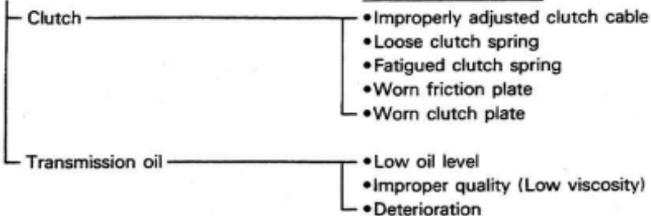
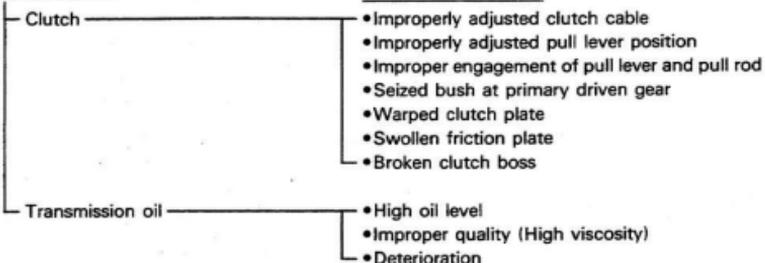
**PROBABLE CAUSE**



**JUMP-OUT GEAR**

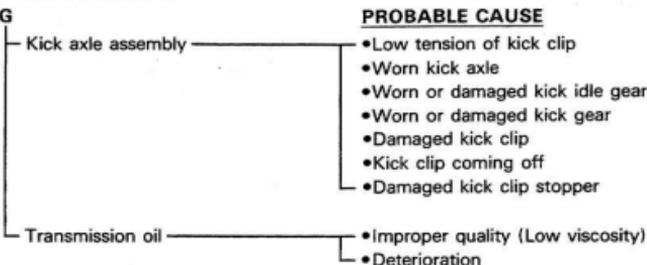
**PROBABLE CAUSE**



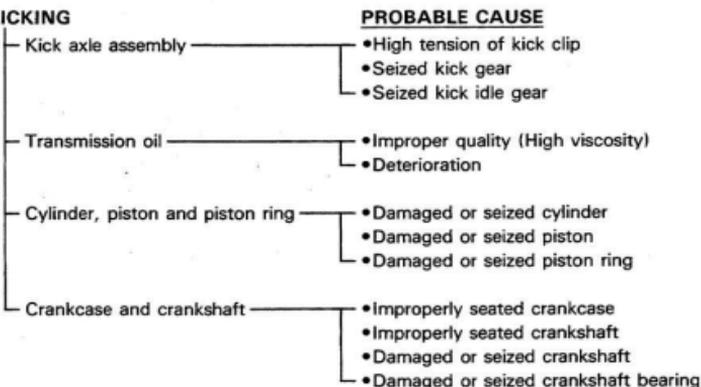
**CLUTCH SLIPPING/Dragging****CLUTCH SLIPPING****PROBABLE CAUSE****CLUTCH DRAGGING****PROBABLE CAUSE**

**IMPROPER KICKING**

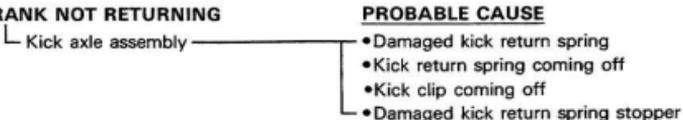
**SLIPPING**



**HARD KICKING**



**KICK CRANK NOT RETURNING**



# FAULTY BRAKE/FRONT FORK OIL LEAKAGE AND FRONT FORK MALFUNCTION

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SHTG

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## FAULTY BRAKE

### POOR BRAKING EFFECT

#### PROBABLE CAUSE

- Worn brake pad
- Worn brake 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 brake disc
- Oily or greasy brake pad
- Improper brake fluid level

## 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
- Loose drain bolt
- Damaged drain bolt gasket

### MALFUNCTION

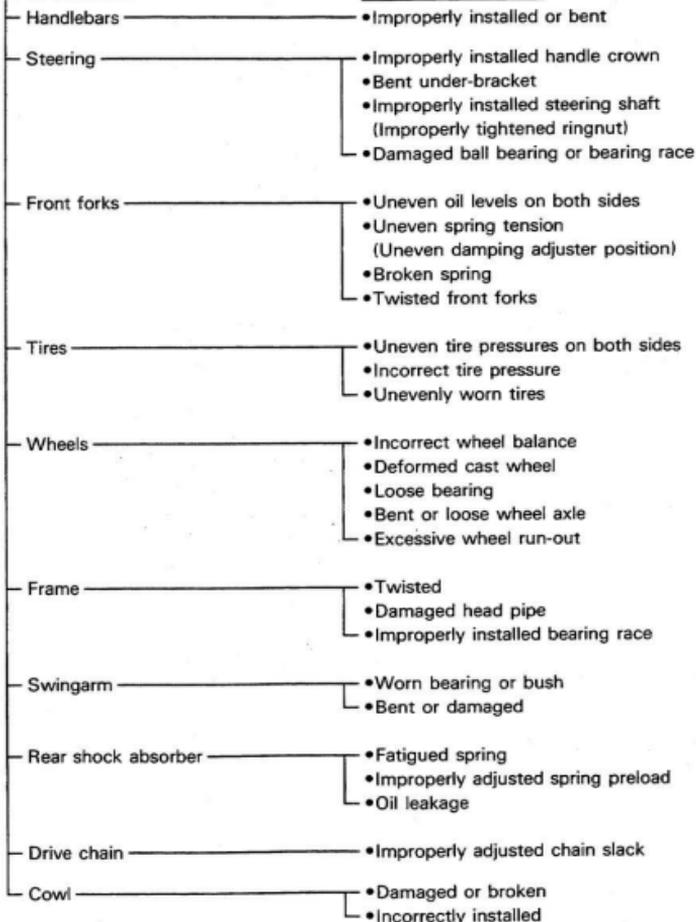
#### PROBABLE CAUSE

- Bent, deformed or damaged inner tube
- Bent or deformed outer tube
- Damaged fork spring
- Worn or damaged slide metal
- Bent or damaged damper rod
- Improper oil viscosity
- Improper oil level

**INSTABLE HANDLING**

**INSTABLE HANDLING**

**PROBABLE CAUSE**



**FAULTY SIGNAL AND LIGHTING SYSTEM**

**HEADLIGHT DARK**

**PROBABLE CAUSE**

- Improper bulb
- Too many electric accessories
- Hard charging (Broken charging coil and/or faulty rectifier/regulator)
- Incorrect connection
- Improperly grounded
- Poor contacts (main or light switch)
- Bulb life expired

**BULB BURNT OUT**

**PROBABLE CAUSE**

- Improper bulb
- Faulty battery
- Faulty rectifier/regulator
- Improperly grounded
- Faulty main and/or light switch
- Bulb life expired

**FLASHER DOES NOT LIGHT**

**PROBABLE CAUSE**

- Improperly grounded
- Discharged battery
- Faulty flasher switch
- Faulty flasher relay
- Broken wireharness
- Loosely connected coupler
- Bulb burnt out

**FLASHER KEEPS ON**

**PROBABLE CAUSE**

- Faulty flasher relay
- Insufficient battery capacity (nearly discharged)
- Bulb burnt out

**FAULTY SIGNAL AND LIGHTING SYSTEM/  
FAULTY Y.P.V.S.**

<b>TRBL SHTG</b>	<b>?</b>
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**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**

**PROBABLE CAUSE**

- Faulty battery
- Faulty main and/or horn switch
- Improperly adjusted horn
- Faulty horn
- Broken wireharnes

**FAULTY Y.P.V.S.**

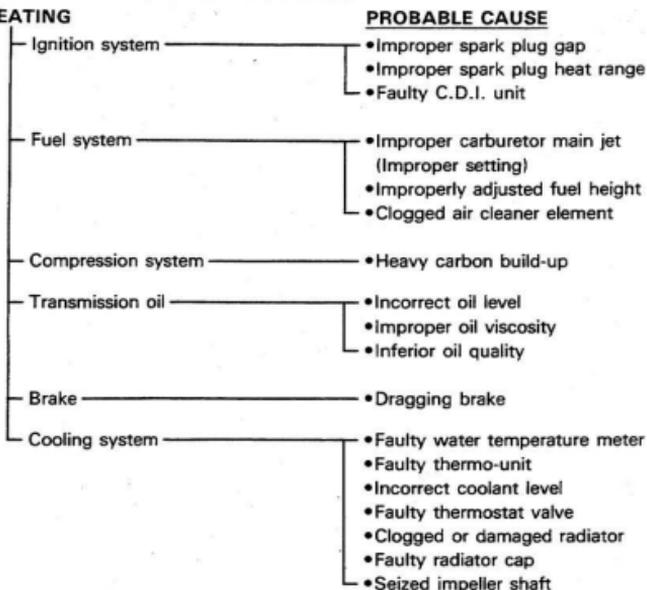
**FAULTY Y.P.V.S.**

**PROBABLE CAUSE**

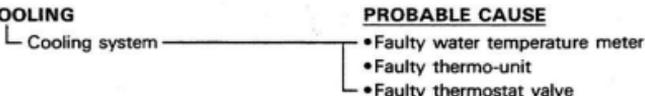
- Power valve
  - Seized or damaged power valve
  - Carbon build-up
- Control cable
  - Improperly adjusted cable
  - Seized or discontinuous cable
- Electrical parts
  - Insufficient battery capacity (Improperly charged battery)
  - Faulty main switch
  - Faulty servomotor
  - Faulty C.D.I. unit
  - Faulty Y.P.V.S. control unit
  - Broken or shorted wiring

**OVERHEATING OR OVER-COOLING**

**OVERHEATING**



**OVER-COOLING**



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## HANDLING OF ASBESTOS PARTS

### WARNING:

CERTAIN COMPONENTS USED IN THE CONSTRUCTION OF THIS MACHINE CONTAIN ASBESTOS.

ASBESTOS MAY BE FOUND IN THE FOLLOWING:

BRAKE SHOES, BRAKE PADS, GASKETS, CLUTCH PLATES AND HEAT INSULATORS. BREATHING ASBESTOS DUST IS HAZARDOUS TO HEALTH.

PLEASE TAKE CARE WHEN WORKING WITH OR SERVICING THE PARTS CONTAINING ASBESTOS.

- (1) ALWAYS WORK OUT OF DOORS IN A WELL VENTILATED PLACE.
  - (2) DO NOT DRILL, FILE OR CUT THE COMPONENT UNLESS ESSENTIAL AND THEN USE ONLY LOW SPEED TOOLS EQUIPPED, IF POSSIBLE, WITH DUST EXTRACTORS. IF HIGH SPEED TOOLS ARE USED THEY MUST BE EQUIPPED WITH DUST EXTRACTION FACILITY.
  - (3) WHEN POSSIBLE DAMPEN BEFORE CUTTING TO REDUCE POSSIBILITY OF DUST.
  - (4) DAMPEN DUST AND PLACE IT IN A PROPERLY SEALED RECEPTACLE AND DISPOSE OF IT SAFELY.
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