CONTENTS

CHAPTER 1.
GENERAL INFORMATION

MOTORCYCLE IDENTIFICATION 1-1
VEHICLE IDENTIFICATION NUMBER 1-1
ENGINE SERIAL NUMBER 1-1

IMPORTANT INFORMATION 1-2
PREPARATION FOR REMOVAL 1-2
ALL REPLACEMENT PARTS 1-2
GASKETS, OIL SEALS, AND O-RINGS 1-2
LOCK WASHERS/PLATES AND COTTER PINS 1-3
BEARINGS AND OIL SEALS 1-3
CIRCLIPS 1-3

SPECIAL TOOLS 1-4
FOR TUNE UP 1-4
FOR ENGINE SERVICE 1-5
FOR CHASSIS SERVICE 1-8
FOR ELECTRICAL COMPONENTS 1-9

CHAPTER 2.
SPECIFICATIONS

SPECIFICATIONS 2-1
GENERAL SPECIFICATIONS 2-1
MAINTENANCE SPECIFICATIONS 2-4
ENGINE 2-4
CHASSIS 2-11
ELECTRICAL 2-14
GENERAL TORQUE SPECIFICATIONS 2-16
DEFINITION OF UNITS 2-16
LUBRICATION POINT AND GRADE OF LUBRICANT 2-17

LUBRICATION DIAGRAM 2-19

COOLANT DIAGRAM 2-20

CABLE ROUTING 2-21

CHAPTER 3.
PERIODIC INSPECTION AND ADJUSTMENT

INTRODUCTION 3-1

MAINTENANCE INTERVALS CHART 3-1
- PERIODIC MAINTENANCE EMISSION CONTROL SYSTEM 3-1
- GENERAL MAINTENANCE/LUBRICATION 3-2

COWLING REMOVAL AND INSTALLATION 3-4

ENGINE 3-7
- EXUP CABLE ADJUSTMENT (For California only) 3-7
- VALVE CLEARANCE ADJUSTMENT 3-8
- CARBURETOR SYNCHRONIZATION 3-15
- IDLE SPEED ADJUSTMENT 3-17
- THROTTLE CABLE FREE PLAY ADJUSTMENT 3-18
- SPARK PLUG INSPECTION 3-19
- IGNITION TIMING CHECK 3-20
- COMPRESSION PRESSURE MEASUREMENT 3-21
- ENGINE OIL LEVEL INSPECTION 3-23
- ENGINE OIL REPLACEMENT 3-23
- ENGINE OIL FILTER REPLACEMENT 3-24
- CLUTCH ADJUSTMENT 3-26
- AIR FILTER CLEANING 3-27
- CARBURETOR JOINT INSPECTION 3-27
- FUEL LINE INSPECTION 3-27
- CRANKCASE VENTILATION HOSE INSPECTION 3-28
- EXHAUST SYSTEM INSPECTION 3-28
- COOLANT LEVEL INSPECTION 3-29
- COOLANT REPLACEMENT 3-29

CHASSIS 3-32
- FRONT BRAKE ADJUSTMENT 3-32
- REAR BRAKE ADJUSTMENT 3-32
- BRAKE FLUID INSPECTION 3-33
- BRAKE PAD INSPECTION 3-33
- REAR BRAKE LIGHT SWITCH ADJUSTMENT 3-33
- BRAKE HOSE INSPECTION 3-34
- AIR BLEEDING 3-34
- DRIVE CHAIN SLACK ADJUSTMENT 3-35
- DRIVE CHAIN LUBRICATION 3-37
- STEERING HEAD INSPECTION 3-37
- FRONT FORK INSPECTION 3-40
- REAR SHOCK ABSORBER ADJUSTMENT 3-40
- TIRE INSPECTION 3-41
- WHEEL INSPECTION 3-42
- CABLE INSPECTION 3-43
- LUBRICATION 3-43

ELECTRICAL 3-44
BATTERY INSPECTION 3-44
FUSE INSPECTION 3-46
HEADLIGHT BEAM ADJUSTMENT 3-46
HEADLIGHT BULB REPLACEMENT 3-47
TAIL/BRAKE BULB REPLACEMENT 3-48

CHAPTER 4.
ENGINE OVERHAUL

ENGINE REMOVAL 4-1
LOWER COWLING, CENTER COWLING,
UPPER COWLING AND TOP COVER 4-1
FUEL TANK 4-1
ENGINE OIL 4-1
COOLANT 4-1
AIR FILTER CASE AND CARBURETOR 4-2
RADIATOR 4-2
MUFFLER ASSEMBLY 4-4
CLUTCH CABLE AND DRIVE CHAIN 4-4
LEADS 4-5
ENGINE REMOVAL 4-7

ENGINE DISASSEMBLY 4-7
CYLINDER HEAD COVER, CAMSHAFT AND
CYLINDER HEAD 4-10
CYLINDER AND PISTON 4-12
STARTER CLUTCH 4-13
CLUTCH 4-14
A.C. MAGNETO 4-15
WATER PUMP 4-16
OIL PUMP AND SHIFT SHAFT 4-17
OIL PAN AND OIL STRAINER 4-18
STARTER MOTOR 4-18
CRANKCASE DISASSEMBLY 4-19
TRANSMISSION, SHIFTER AND SHIFT CAM 4-20
CRANKSHAFT 4-21
VALVE PAD AND VALVE 4-23
CONNECTING ROD 4-23
INNER ROTOR (OIL PUMP) 4-24

INSPECTION AND REPAIR 4-24
CYLINDER HEAD 4-25
VALVE 4-26
VALVE GUIDE 4-27
VALVE SEAT 4-30
VALVE SPRING 4-31
VALVE LIFTER 4-31
CAMSHAFT, CAM CHAIN AND CAM SPROCKET 4-33
CYLINDER AND PISTON 4-33

PISTON RING AND PISTON PIN 4-35
CRANKSHAFT AND CONNECTING ROD 4-37
OIL PUMP 4-41
PRIMARY DRIVE 4-42
STARTER CLUTCH 4-43
CLUTCH 4-44
TRANSMISSION 4-46
RELIEF VALVE AND PIPE 4-47
CRANKCASE 4-47
BEARING AND OIL SEAL 4-47
YAMAHA EXHAUST VARIABLE VALVE (For California only) 4-48

ENGINE ASSEMBLY AND ADJUSTMENT 4-49
INNER ROTOR (OIL PUMP) 4-49
CONNECTING ROD 4-49
CRANKSHAFT 4-50
VALVE PAD AND VALVE 4-51
CRANKCASE 4-54
TRANSMISSION 4-55
TRANSMISSION, SHIFTER AND SHIFT CAM 4-56
CRANKCASE ASSEMBLY 4-57
STARTER MOTOR 4-59
OIL PAN AND OIL STRAINER 4-59
OIL PUMP AND SHIFT SHAFT 4-60
A.C. MAGNETO 4-61
CLUTCH 4-63
STARTER CLUTCH 4-65
PISTON AND CYLINDER 4-67
CYLINDER HEAD AND CAMSHAFT 4-70
CAM CHAIN TENSIONER 4-75
REMOUNTING ENGINE 4-76
YAMAHA EXHAUST VARIABLE VALVE (For California only) 4-78

CHAPTER 5.
COOLING SYSTEM

RADIATOR 5-1
REMOVAL 5-2
INSPECTION 5-3
INSTALLATION 5-4

WATER PUMP AND THERMOSTATIC VALVE 5-6
REMOVAL 5-7
INSPECTION 5-9
INSTALLATION 5-10

CHAPTER 6.
CARBURETOR

CARBURETOR 6-1
SECTION VIEW 6-2
REMOVAL 6-3
DISASSEMBLY 6-5
INSPECTION 6-6
ASSEMBLY 6-8
INSTALLATION 6-9
ADJUSTMENT 6-10

CHAPTER 7.
CHASSIS

FRONT WHEEL 7-1
REMOVAL 7-2
INSPECTION 7-2
INSTALLATION 7-4

REAR WHEEL 7-7
REMOVAL 7-8
INSPECTION 7-8
INSTALLATION 7-9

FRONT AND REAR BRAKE 7-10
BRAKE PAD REPLACEMENT 7-12
CALIPER DISASSEMBLY 7-16
MASTER CYLINDER DISASSEMBLY 7-18
INSPECTION AND REPAIR 7-19
ASSEMBLY 7-21

FRONT FORK 7-28
REMOVAL 7-29
DISASSEMBLY 7-30
INSPECTION 7-31
ASSEMBLY 7-32
INSTALLATION 7-34

STEERING HEAD AND HANDLEBAR 7-36
REMOVAL 7-38
INSPECTION 7-41
INSTALLATION 7-42

REAR SHOCK ABSORBER AND SWINGARM 7-47
HANDLING NOTES 7-49
DISPOSAL NOTES 7-49
REMOVAL 7-49
INSPECTION 7-52
INSTALLATION 7-54

DRIVE CHAIN AND SPROCKET 7-56
REMOVAL 7-56
INSPECTION AND CLEANING 7-56
INSTALLATION 7-57

CHAPTER 8.
ELECTRICAL

FZR400U/SUC CIRCUIT DIAGRAM 8-1

ELECTRICAL COMPONENTS 8-3

CHECKING OF SWITCHES 8-5
SWITCH CONNECTION AS SHOWN IN MANUAL 8-5
CHECKING SWITCH FOR TERMINAL CONNECTION 8-5

CHECKING OF BULBS 8-8
KINDS OF BULBS 8-8
CHECKING BULB CONDITION 8-8

IGNITION SYSTEM 8-11
CIRCUIT DIAGRAM 8-11
DIGITAL IGNITION CONTROL SYSTEM DESCRIPTION 8-13
OPERATION 8-13
TROUBLESHOOTING 8-14

ELECTRIC STARTING SYSTEM 8-21
CIRCUIT DIAGRAM 8-21
STARTING CIRCUIT OPERATION 8-23
TROUBLESHOOTING 8-24
STARTER MOTOR 8-30

CHARGING SYSTEM 8-33
CIRCUIT DIAGRAM 8-33
TROUBLESHOOTING 8-35

LIGHTING SYSTEM 8-39
CIRCUIT DIAGRAM 8-39
TROUBLESHOOTING 8-41
LIGHTING SYSTEM CHECK 8-44

SIGNAL SYSTEM 8-49
CIRCUIT DIAGRAM 8-49
TROUBLESHOOTING 8-51
SIGNAL SYSTEM CHECK 8-53

COOLING SYSTEM 8-69
CIRCUIT DIAGRAM 8-69
TROUBLESHOOTING 8-71

FUEL SYSTEM 8-75
CIRCUIT DIAGRAM 8-75
FUEL PUMP CIRCUIT OPERATION 8-77
TROUBLESHOOTING 8-78
FUEL PUMP TEST 8-82

YAMAHA EXHAUST VARIABLE VALVE SYSTEM
(For California only) 8-83
CIRCUIT DIAGRAM 8-83
TROUBLESHOOTING 8-85

METER ASSEMBLY 8-89
REMOVAL 8-90
INSTALLATION 8-91

CHAPTER 9.
TROUBLESHOOTING

STARTING FAILURE/HARD STARTING 9-1

POOR IDLE SPEED PERFORMANCE 9-3

POOR MEDIUM AND HIGH SPEED PERFORMANCE 9-4

FAULTY GEAR SHIFTING 9-4

CLUTCH SLIPPING/DRAGGING 9-5

OVERHEATING OR OVER-COOLING 9-6

FAULTY BRAKE 9-7

FRONT FORK OIL LEAKAGE/MALFUNCTION 9-7

INSTABLE HANDLING 9-8

FAULTY SIGNALS AND LIGHTS 9-9

FAULTY EXUP (For California only) 9-10

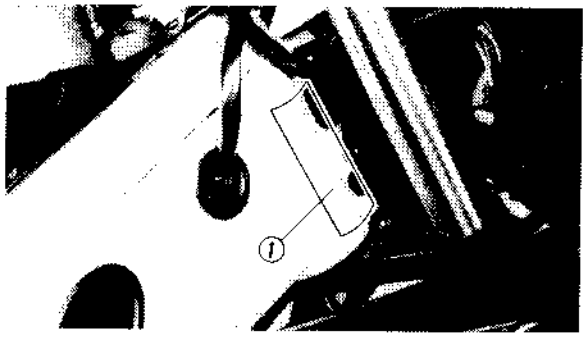
CONTENTS

GENERAL INFORMATION 1
MOTORCYCLE IDENTIFICATION 1
VEHICLE IDENTIFICATION NUMBER 1
ENGINE SERIAL NUMBER 1

SPECIFICATIONS 2
GENERAL SPECIFICATIONS 2
MAINTENANCE SPECIFICATIONS 3
CHASSIS 3
TIGHTENING TORQUE 4
GENERAL TORQUE SPECIFICATIONS 5

PERIODIC INSPECTIONS AND ADJUSTMENTS 6
CHASSIS 6
DRIVE CHAIN SLACK ADJUSTMENT 6

CHASSIS 8
REAR WHEEL 8
REMOVAL 9
INSPECTION 10
INSTALLATION 10
STATIC WHEEL BALANCE ADJUSTMENT 11
FRONT AND REAR BRAKE 12
BRAKE PAD REPLACEMENT 14
CALIPER DISASSEMBLY 19
MASTER CYLINDER DISASSEMBLY 21
INSPECTION AND REPAIR 23
ASSEMBLY 26



GENERAL INFORMATION

MOTORCYCLE IDENTIFICATION

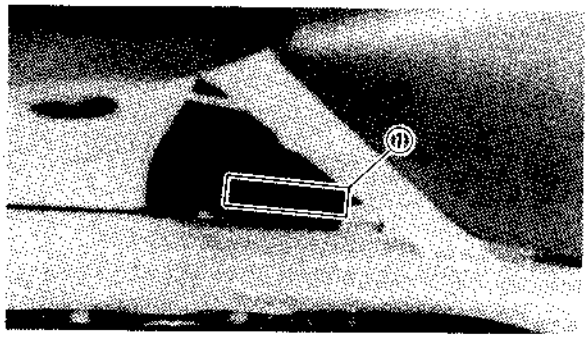
VEHICLE IDENTIFICATION NUMBER

The vehicle identification number ① is stemped into the right side of the steering head.

Starting serial number:
FZR400A (Except for California):
JYA3BFE0 * LA012101
FZR400SAC (For California):
JYA3FHC0 * LA003101

NOTE:

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



ENGINE SERIAL NUMBER

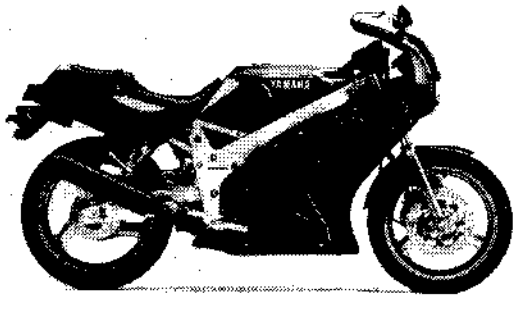
The engine serial number ① is stamped into the right side of the engine.

Starting serial number:
FZR400A (Except for California):
3BF-012101
FZR400SAC (For California):
3FH-003101

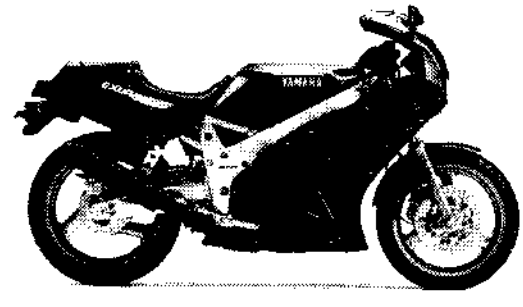
NOTE:

- 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.

FZR400A



FZR400SAC



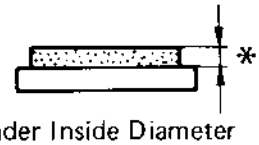
SPECIFICATIONS

GENERAL SPECIFICATIONS

Model	FZR400A/FZR400SAC	
Model Code Number:	3BF5 (FZR400A) 3FH3 (FZR400SAC)	
Vehicle Identification Number:	JYA3BFE0 * LA012101 (FZR400A) JYA3FHC0 * LA003101 (FZR400SAC)	
Engine Starting Number:	3BF-012101 (FZR400A) 3FH-003101 (FZR400SAC)	
Basic Weight: With Oil and Full Fuel Tank	188 kg (414 lb) (FZR400A) 191 kg (421 lb) (FZR400SAC)	
Tire:	Front	Rear
Type Size Manufacture (Type)	Tubeless 110/70R17-54H BRIDGESTONE (CY15) DUNLOP (K510F)	Tubeless 140/60R18-64H BRIDGESTONE (CY16) DUNLOP (K510)

MAINTENANCE SPECIFICATIONS

CHASSIS

Model		FZR400A/FZR400SAC
Front Suspension:		
Front Fork Travel		130 mm (5.12 in)
Front Spring Free Length		412 mm (16.2 in)
< Limit >		408 mm (16.1 in)
Collar Length		160 mm (6.3 in)
Spring Rate:	K1	4.4 N/mm (0.5 kg/mm, 25.2 lb/in)
	K2	6.6 N/mm (0.7 kg/mm, 37.5 lb/in)
Stroke	K1	0.0 ~ 90 mm (0.0 ~ 3.54 in)
	K2	90 ~ 130 mm (3.54 ~ 5.12 in)
Optional Spring		No
Oil Capacity		440 cm³ (15.5 Imp oz, 14.9 US oz)
Oil Level (Fully Compression)		92 mm (3.62 in) Bellow the top of inner fork tube without fork spring
Oil Grade		Yamaha Fork Oil 10WT or equivalent
Front Disc Brake:		
Type		Dual
Disc Outside Diameter x Thickness		282 x 4 mm (11.10 x 0.16 in)
Pad Thickness	Inner	5.5 mm (0.22 in)
	< Limit >*	0.5 mm (0.02 in)
Pad Thickness	Outer	5.5 mm (0.22 in)
	< Limit >*	0.5 mm (0.02 in)
		
Master Cylinder Inside Diameter		15.87 mm (0.62 in)
Caliper Cylinder Inside Diameter		32.10 mm (1.26 in)
Brake Fluid Type		DOT # 4 or DOT # 3

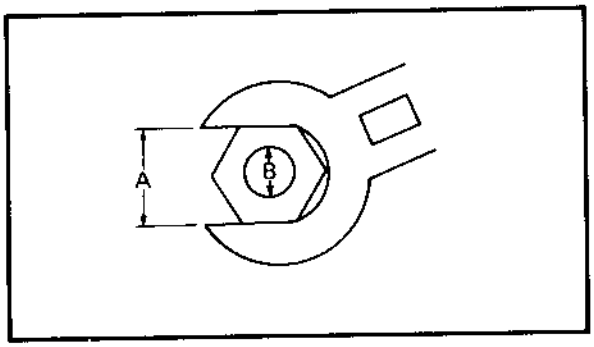
TIGHTENING TORQUE

Part to be tightened	Thread size	Tightening torque		
		Nm	m·kg	ft·lb
Front Axle and Outer Tube	M14 x 1.5	58	5.8	42
Rear Axle and Nut	M16 x 1.5	107	10.7	77
Handlebar Crown and Inner Tube	M8 x 1.25	26	2.6	19
Handlebar Crown and Steering Stem	M22 x 1.0	110	11.0	80
Brake Caliper (Front/Rear)	M10 x 1.25	35	3.5	25
Bleed Screw and Brake Caliper	M8 x 1.25	6	0.6	4.3
Brake Hose and Union Bolt	M10 x 1.25	26	2.6	19
Front Master Cylinder and Master Cylinder Holder	M6 x 1.0	9	0.9	6.5
Front Master Cylinder and Cylinder Cap	M5 x 0.8	2	0.2	1.4
Front Fender and Outer Tube	M6 x 1.0	6	0.6	4.3
Handlebar and Inner Tube	M8 x 1.25	23	2.3	17
Engine Mounting: Front	M10 x 1.25	55	5.5	40
Rear — Upper	M10 x 1.25	55	5.5	40
Rear — Lower	M8 x 1.25	45	4.5	32
Down Tube and Frame: Front	M10 x 1.25	60	6.0	43
Rear	M8 x 1.25	33	3.3	24
Footrest Bracket and Frame	M10 x 1.25	33	3.3	24
Pivot Axle and Nut	M14 x 1.5	90	9.0	65
Relay Arm and Frame	M10 x 1.25	40	4.0	29
Arm and Swingarm	M10 x 1.25	40	4.0	29
Arm and Relay Arm	M10 x 1.25	40	4.0	29
Rear Shock Absorber and Relay Arm	M10 x 1.25	40	4.0	29
Rear Shock Absorber and Frame	M10 x 1.25	40	4.0	29
Footrest and Footrest Bracket	M10 x 1.25	57	5.7	41
Rear Footrest Bracket and Frame	M8 x 1.25	20	2.0	14
Rear Master Cylinder and Rear Arm Bracket	M8 x 1.25	20	2.0	14
Cowling and Stay	M6 x 1.0	4	0.4	2.9
Compression Bar and Brake Caliper Bracket	M8 x 1.25	23	2.3	17
Front Fork Pinch Bolt	M8 x 1.25	20	2.0	14
Sprocket and Clutch Hub	M8 x 1.25	32	3.2	23
Brake Disc and Clutch Hub	M8 x 1.25	20	2.0	14
Inner Tube and Steering Stem	M8 x 1.25	22	2.2	16
Frame and Rear Frame: Upper	M10 x 1.25	64	6.4	46
Lower	M12 x 1.25	88	8.8	64

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

PERIODIC INSPECTIONS AND ADJUSTMENTS

CHASSIS

DRIVE CHAIN SLACK ADJUSTMENT

NOTE:

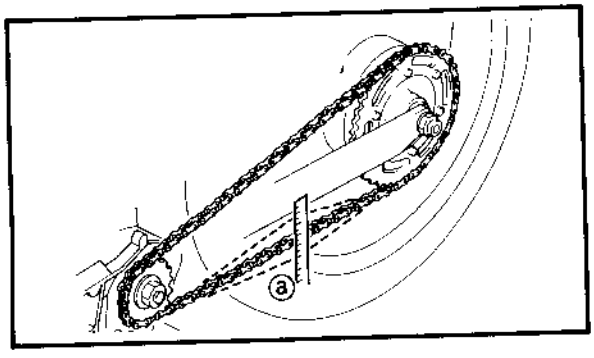
Before checking and/or adjusting the chain slack, rotate the rear wheel several revolutions. Check the chain slack several times to find the point where the chain is the tightest. Check and/or adjust the chain slack where the rear wheel is in this "tight chain" position.

CAUTION:

Too little of chain slack will overload the engine and over vital parts; keep the slack within the specified limits.

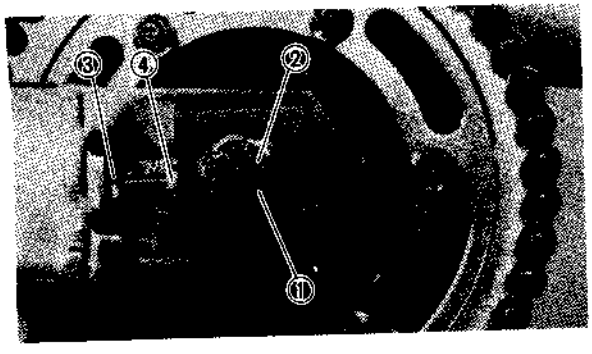
⚠ WARNING

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



1. Place the motorcycle on a level place, and hold it in an upright position.
2. Check:
   - Drive chain slack ⓐ
     Out of specification → Adjust.

Drive chain slack:
10 ~ 20 mm (0.4 ~ 0.8 in)
at both wheels should be on the ground without the rider on it.



3. Adjust:
   - Drive chain slack

Adjustment steps:
- Remove the cotter pin ① .
- Loosen the axle nut ② .
- Loosen both locknuts ③ (adjuster) and turn the adjuster ④ clockwise or counter-clockwise until the specified slack is obtained.

Clockwise	→	Slack is increased.
Counterclockwise	→	Slack is decreased.

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

- Tighten the locknut.
- Tighten the axle nut to specification, while pushing up or down on the chain to zero slack.

Axle nut:
107 Nm (10.7 m · kg, 77 ft · lb)

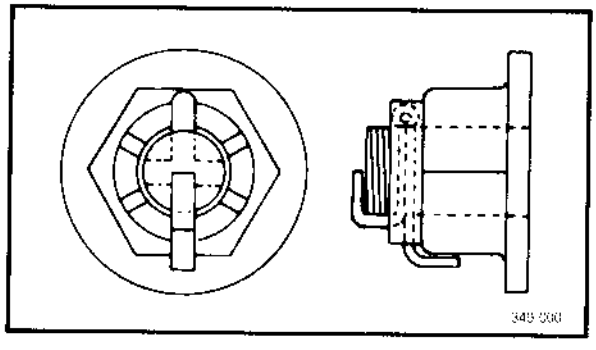
- Install the cotter pin.

⚠ WARNING

Always use a new cotter pin on the axle nut.

CAUTION:

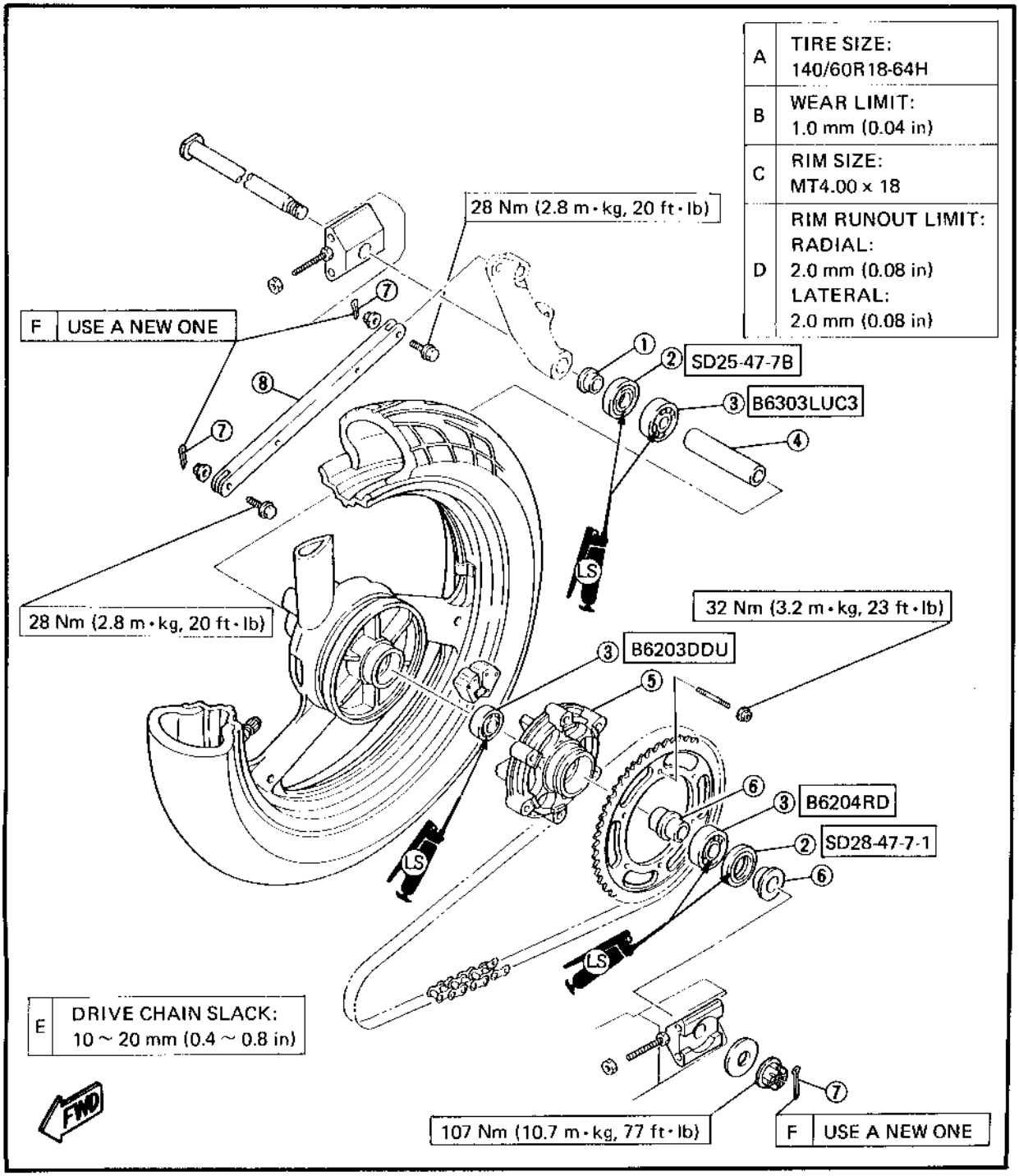
Do not loosen the axle nut after torque tightening. If the axle nut groove is not aligned with the cotter pin hole, align groove with the hole by tightening up on the axle nut.



CHASSIS

REAR WHEEL

① Collar
② Oil seal
③ Bearing
④ Spacer
⑤ Clutch hub
⑥ Collar
⑦ Cotter pin
⑧ Tension bar



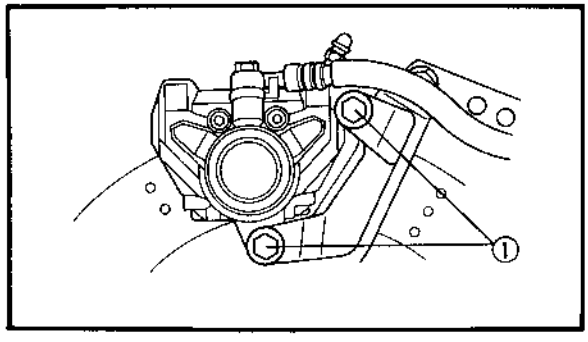
REMOVAL

1. Place the motorcycle on a level place.

⚠ WARNING

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

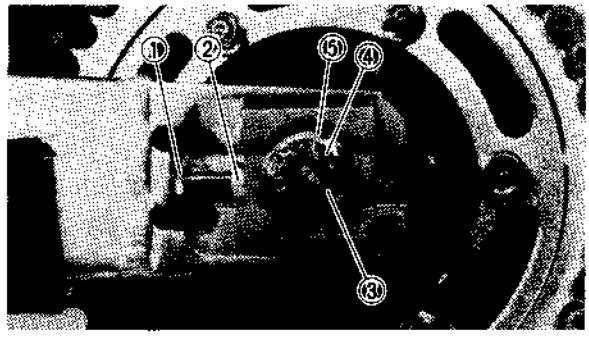
2. Elevate the rear wheel by placing a suitable stand under the swingarm.



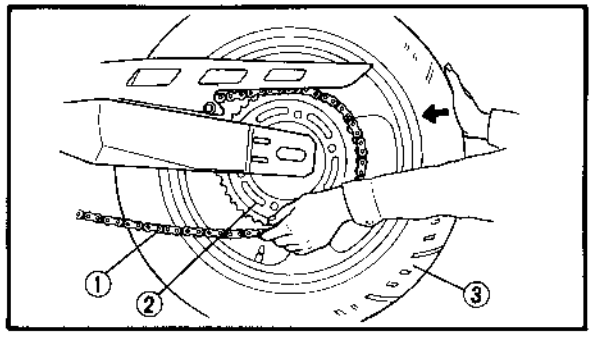
3. Remove:
   - Bolts (brake caliper) ①

NOTE:

Do not depress the brake pedal while the caliper is removed.



4. Loosen:
   - Locknut ①
   - Adjuster ②
5. Remove:
   - Cotter pin ③
   - Axle nut ④
   - Washer ⑤



6. Push the rear wheel forward and disconnect the drive chain ① from the driven sprocket ②
7. Remove:
   - Rear wheel axle
   - Adjuster collars (left and right)
   - Rear wheel ③

8. Remove:
   - Collar (left and right)

INSPECTION

1. Inspect:
   - Tire
   - Rear wheel axle
   - Wheel
   - Wheel bearings
   - Oil seals

   Refer to the "FRONT WHEEL – INSPECTION".
2. Measure:
   - Wheel runout

   Refer to the "FRONT WHEEL – INSPECTION".
3. Check:
   - Wheel balance

   Refer to the "FRONT WHEEL – INSPECTION".

INSTALLATION

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

1. Lubricate:
   - Rear wheel axle
   - Bearings
   - Oil seals
   - Spacer
   - Collar



Lithium soap base grease

2. Adjust:
   - Drive chain slack



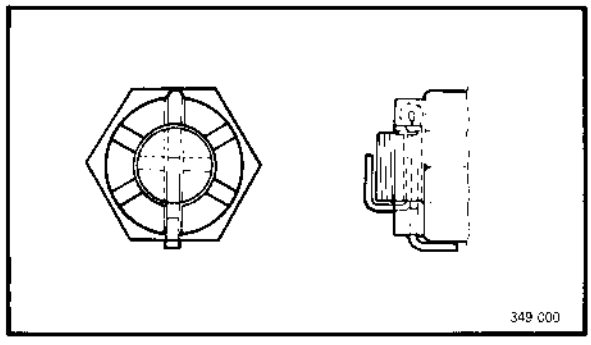
Drive chain slack:
10 ~ 20 mm (0.4 ~ 0.8 in)

Refer to the "DRIVE CHAIN SLACK ADJUSTMENT".

3. Tighten:
   - Nut (rear wheel axle)
   - Bolts (brake caliper)

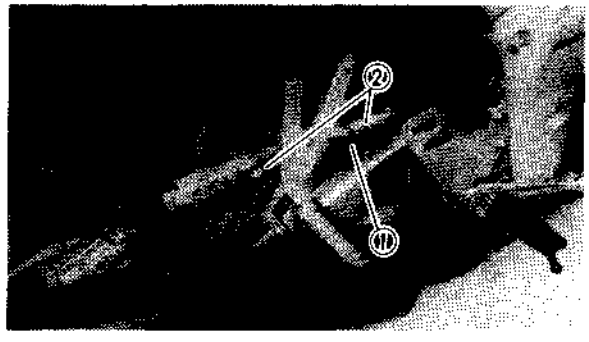


Nut (rear wheel axle):
107 Nm (10.7 m · kg, 77 ft · lb)
Bolt (brake caliper):
35 Nm (3.5 m · kg, 25 ft · lb)



CAUTION:

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



4. Install:
   - Cotter pin

⚠ WARNING

- **Always use a new cotter pin on the axle nut.**
- **Make sure that the brake hose is routed properly.**

① Brake hose
② Brake hose guide

STATIC WHEEL BALANCE ADJUSTMENT

NOTE:

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

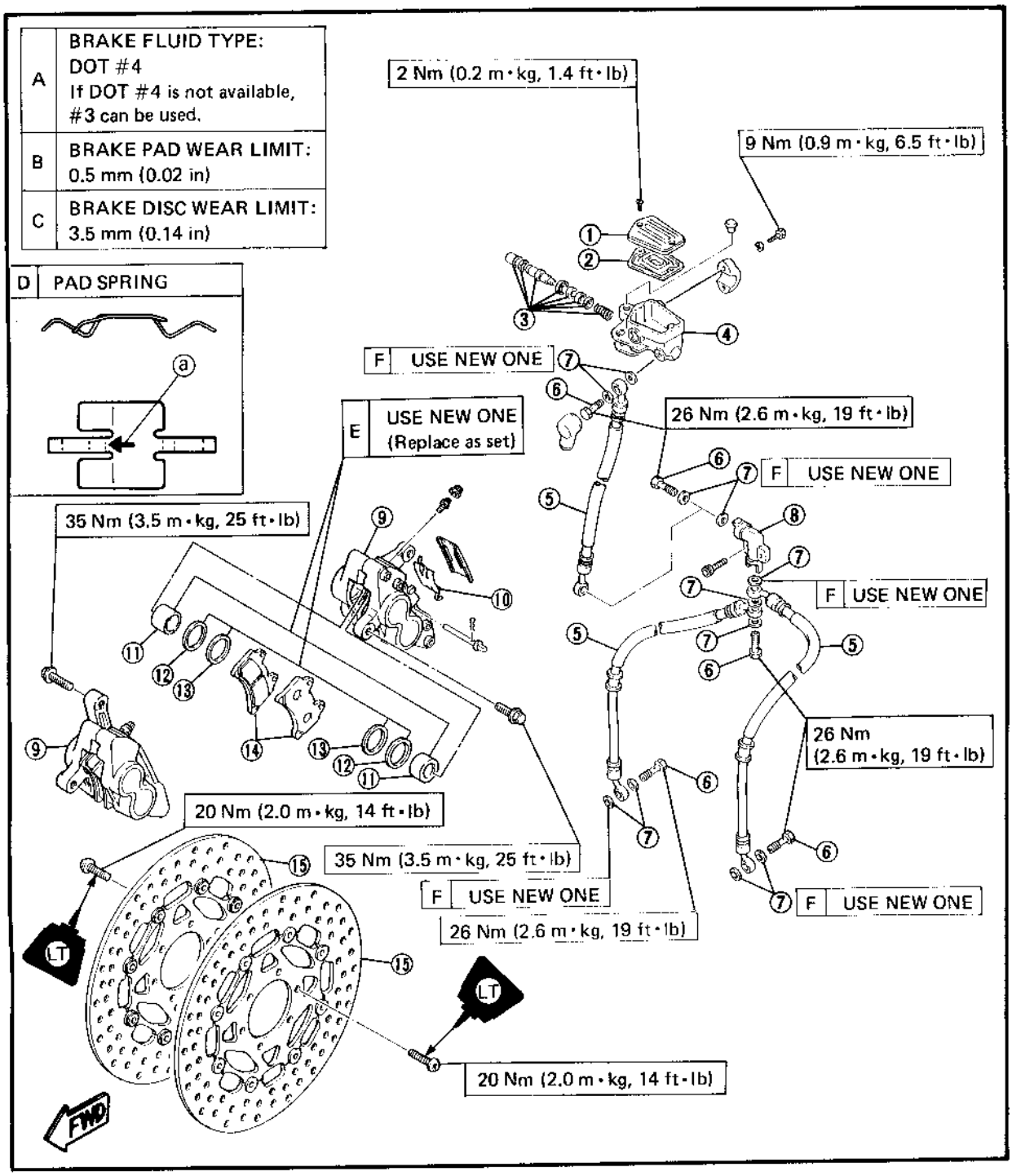
1. Adjust:
   - Wheel balance

   Refer to the "FRONT WHEEL – STATIC WHEEL BALANCE ADJUSTMENT" section.

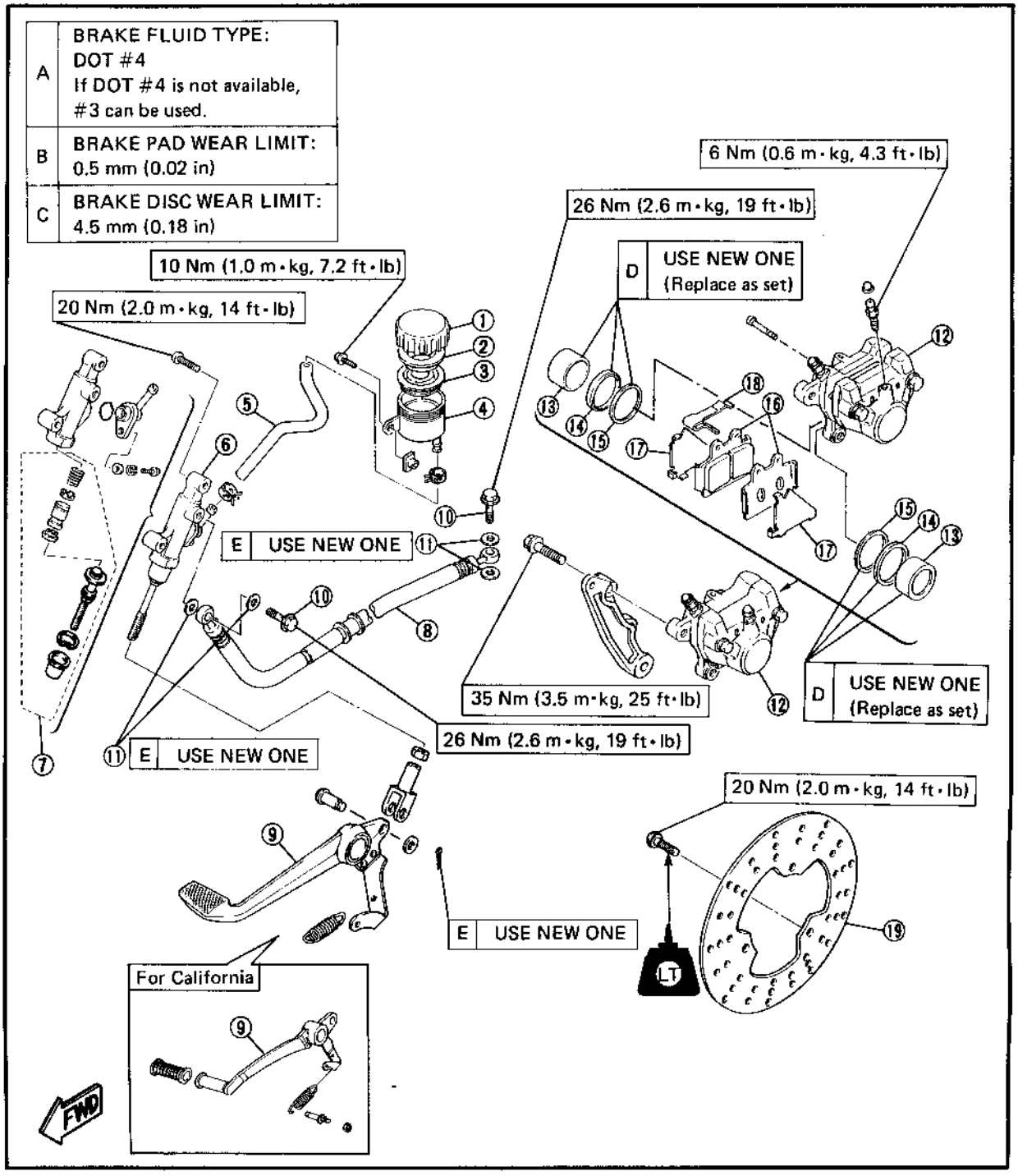
FRONT AND REAR BRAKE

① Master cylinder cap
② Diaphragm
③ Master cylinder kit
④ Master cylinder
⑤ Brake hose
⑥ Union bolt
⑦ Copper washer
⑧ Joint
⑨ Brake caliper
⑩ Pad spring
⑪ Piston
⑫ Piston seal
⑬ Dust seal
⑭ Brake pad
⑮ Brake disc

[D] The arrow mark ⓐ on the pad spring must pointing the disc rotating direction.



① Reservoir tank cap
② Bush
③ Diaphragm
④ Reservoir tank
⑤ Reservoir hose
⑥ Master cylinder
⑦ Master cylinder kit
⑧ Brake hose
⑨ Brake pedal
⑩ Union bolt
⑪ Copper washer
⑫ Brake caliper
⑬ Piston
⑭ Piston seal
⑮ Dust seal
⑯ Brake pad
⑰ Pad shim
⑱ Pad spring
⑲ Brake disc



CAUTION:

Disc brake components rarely require disassembly. DO NOT:

- Disassembly components unless absolutely necessary.
- Use solvents on internal brake component.
- Use contaminated brake fluid for cleaning. Use only clean brake fluid.
- Allow brake fluid to come in contact with the eyes otherwise eye injury may occur.
- Allow brake fluid to contact painted surfaces or plastic parts otherwise damage may occur.
- Disconnect any hydraulic connection otherwise the entire system must be disassembled, drained, cleaned, and then properly filled and bled after reassembly.

BRAKE PAD REPLACEMENT

NOTE:

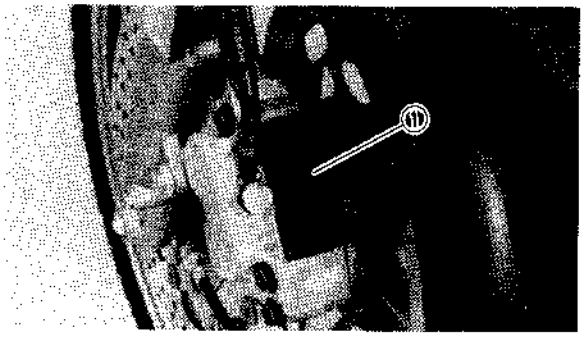
It is not necessary to disassemble the brake caliper and brake hose to replace the brake pads.

⚠WARNING

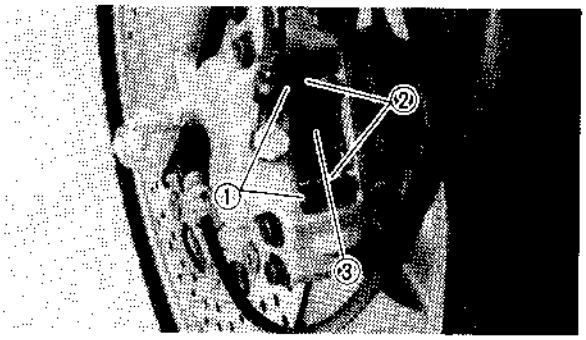
Securely support the motorcycle so there is no danger of it falling over.

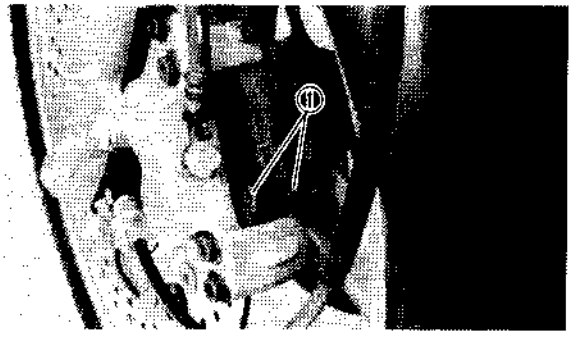
Front brake

1. Remove:
   - Cover ①



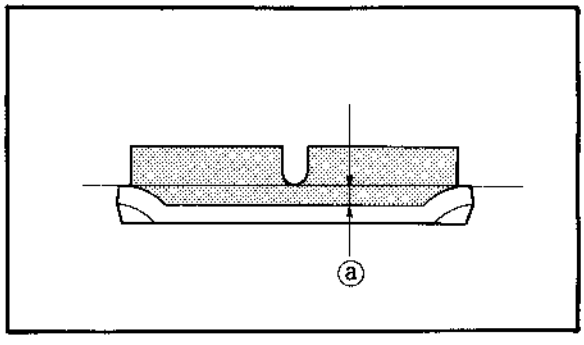
2. Remove:
   - Retaining clips ①
   - Retaining pins ②
   - Pad spring ③



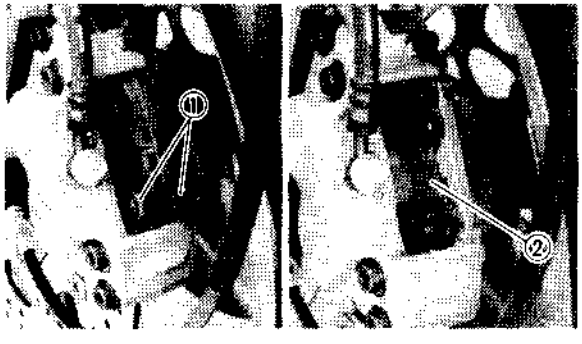


3. Remove:
   • Brake pads ①

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



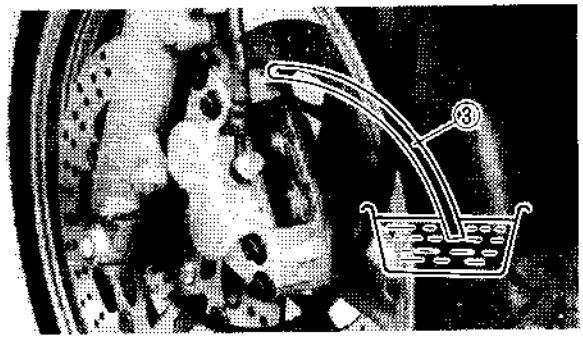
Wear limit ⓐ :
0.5 mm (0.02 in)



4. Install:
   • Brake pads ①
   • Pad spring ②

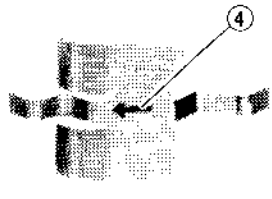
Installation steps:
- Connect a suitable hose ③ tightly to the caliper bleed screw. Then, place the other end of this hose into an open container.
- Loosen the caliper bleed screw and push the piston into the caliper by your finger.
- Tighten the caliper bleed screw.

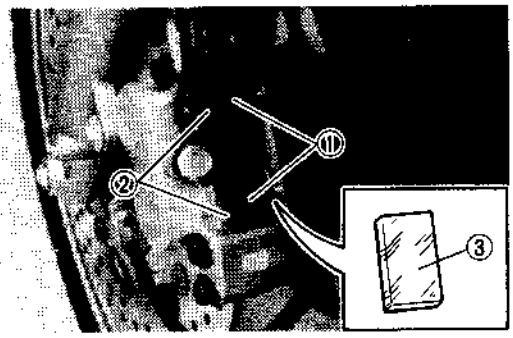
Caliper bleed screw:
6 Nm (0.6 m · kg, 4.3 ft · lb)



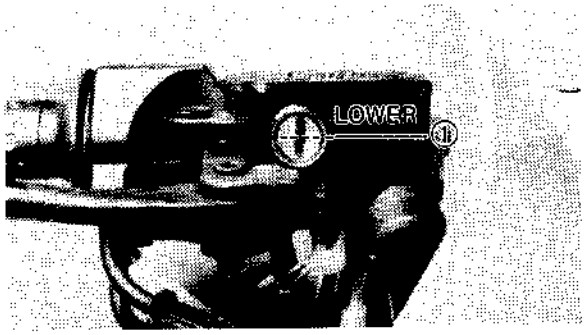
- Install the brake pad (new) and pad spring (new).

NOTE:
The arrow mark ④ on the pad spring must point in the disc rotating direction.





5. Install:
   - Retaining pins ①
   - Retaining clips ②
   - Cover ③



6. Inspect:
   - Brake fluid level

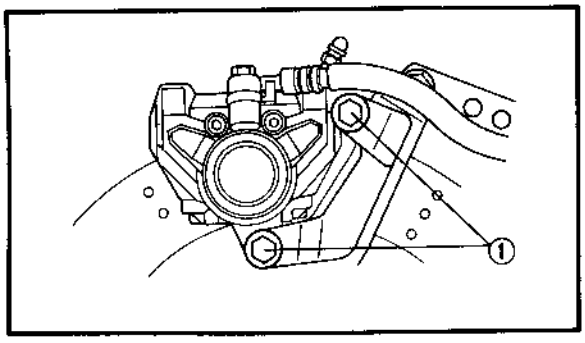
   Refer to the "BRAKE FLUID INSPECTION" section in the CHAPTER 3.

① "LOWER" level line

7. Check:
   - Brake lever operation

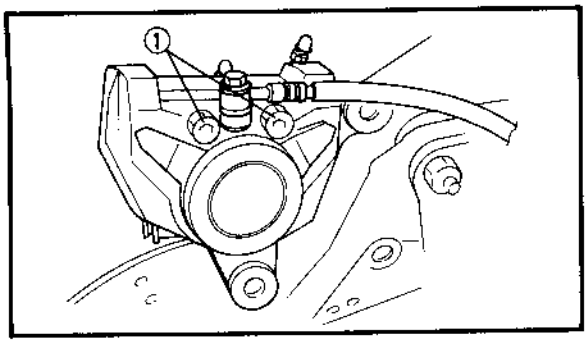
   A softy or spongy filling → Bleed brake system.

   Refer to the "AIR BLEEDING" section in the CHAPTER 3.

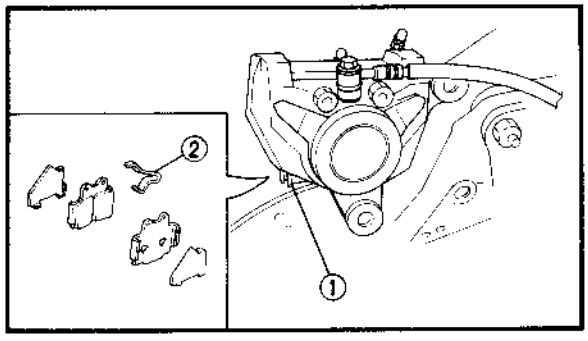


Rear brake

1. Remove:
   - Seat
2. Remove:
   - Bolts (brake caliper) ①

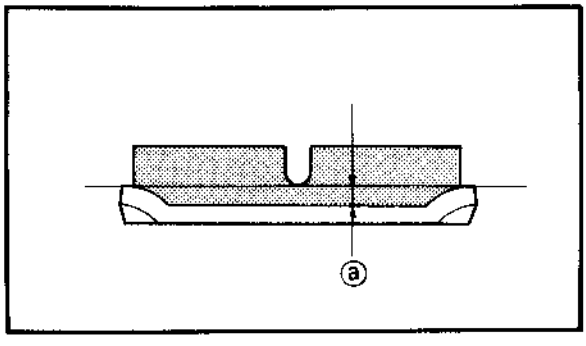


3. Remove:
   - Retaining bolts ①

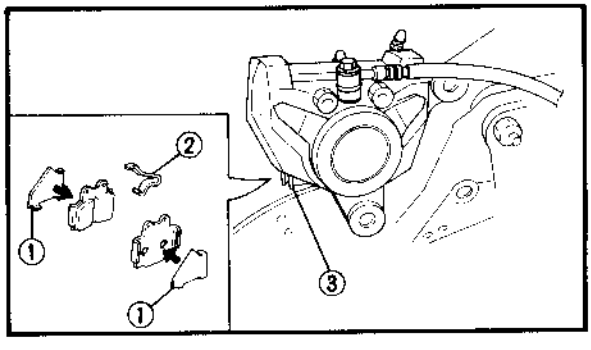


4. Remove:
   - Brake pads (with shims) ①
   - Pad spring ②

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



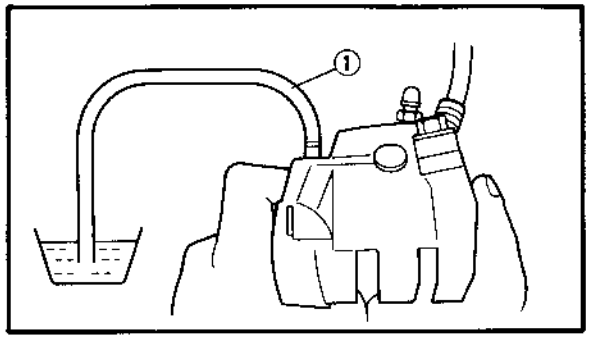
Wear limit ⓐ :
0.5 mm (0.02 in)



5. Install:
   - Pad shims ①
   - Pad spring ②
   - Brake pads (with shims) ③

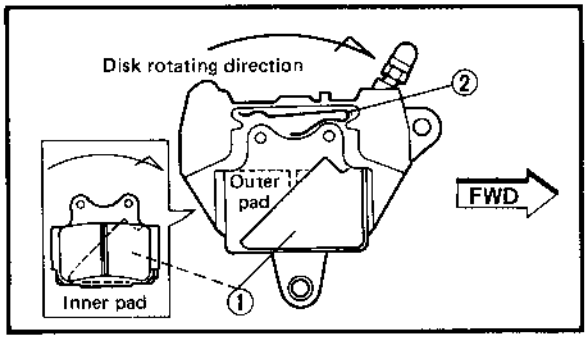
Installation steps:
- Connect a suitable hose ① tightly to the caliper bleed screw. Then, place the other end of this hose into an open container.
- Loosen the caliper bleed screw and push the piston into the caliper by your finger.
- Tighten the caliper bleed screw.

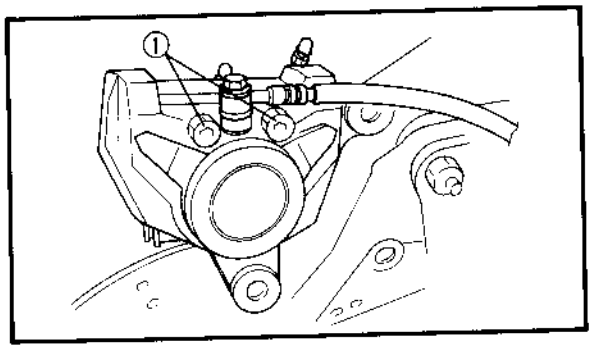
Caliper bleed screw:
6 Nm (0.6 m · kg, 4.3 ft · lb)



- Install the brake pads (new), pad spring (new) and pad shims (new).

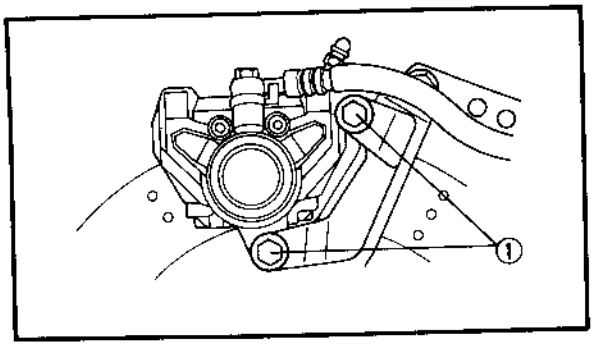
NOTE:
Install pad shims ① and pad spring ② on caliper as shown in the disc rotating direction.





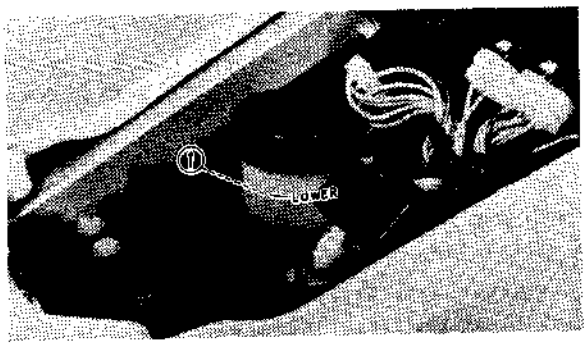
6. Install:
   • Retaining bolts ①

Retaining bolts:
10 Nm (1.0 m · kg, 7.2 ft · lb)



7. Install:
   • Bolts (brake caliper) ①

Bolts (brake caliper):
35 Nm (3.5 m · kg, 25 ft · lb)



8. Inspect:
   • Brake fluid level
   Refer to the "BRAKE FLUID INSPECTION" section in the CHAPTER 3.

① "LOWER" level line

9. Check:
   • Brake pedal operation
   A softy or spongy filling → Bleed brake system.
   Refer to the "AIR BLEEDING" section in the CHAPTER 3.

10. Install:
    • Seat

CALIPER DISASSEMBLY

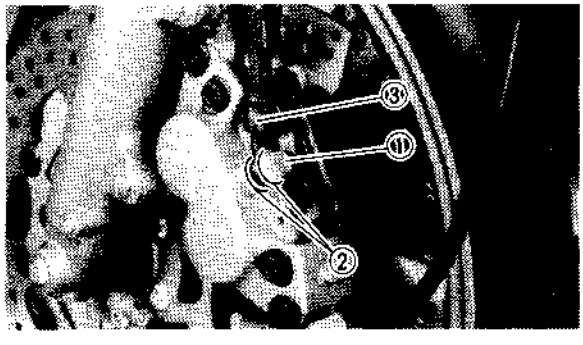
NOTE:
Before disassembling the front or rear brake master cylinders, drain the brake hose, master cylinder, brake caliper and reservoir tank of their brake fluid.

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

Front brake

1. Remove:
   - Cover
   - Reflector
   - Retaining clips
   - Retaining pins
   - Pad spring
   - Brake pads

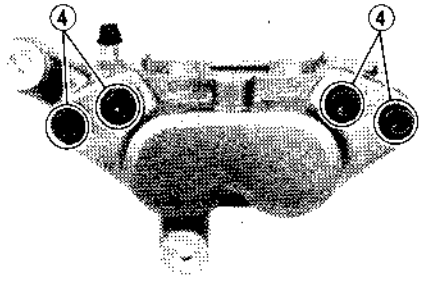
   Refer to the "BRAKE PAD REPLACEMENT" section.

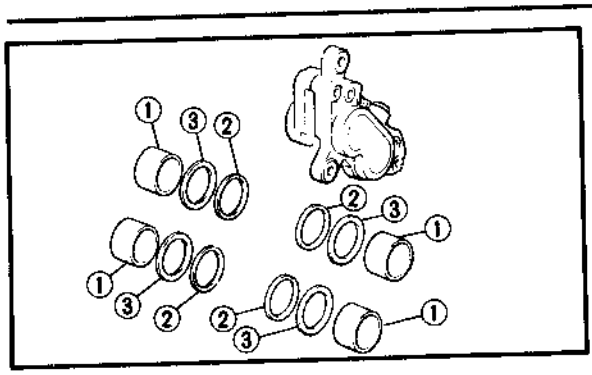


2. Remove:
   - Union bolt ①
   - Copper washers ②
   - Brake hose ③

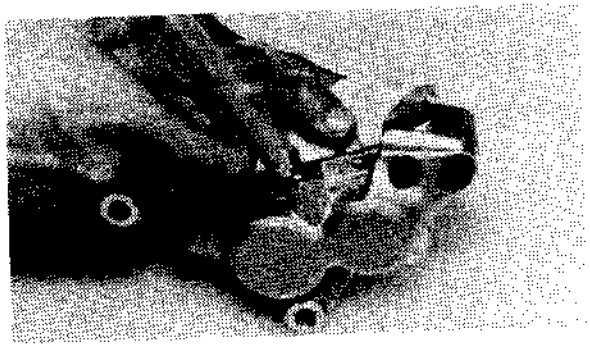
   Place the open hose end into a container and pump the old fluid out carefully.
3. Remove:
   - Caliper body

CAUTION:
Do not loosen the bridge bolts ④ .





4. Remove:
   - Pistons ①
   - Dust seals ②
   - Piston seals ③



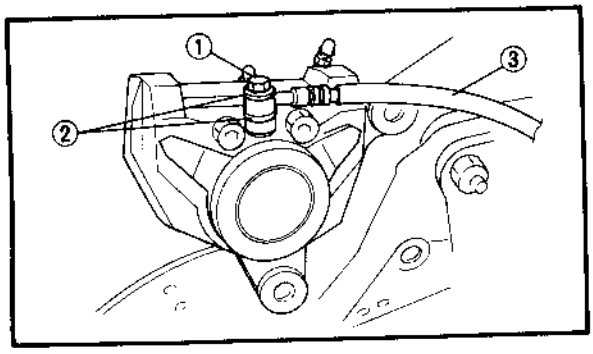
Remove steps:
- Blow compressed air into the tube joint opening to force out the piston from the caliper body.

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

Rear brake

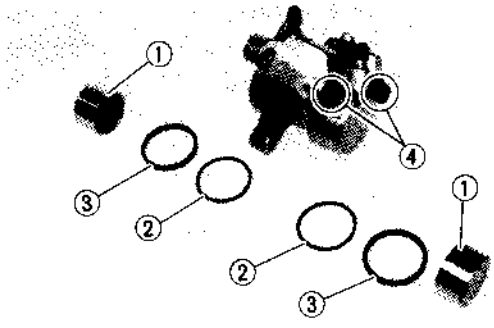
1. Remove:
   - Bolts (brake caliper)
   - Retaining bolts
   - Brake pads (with sims)
   - Brake spring

   Refer to "BRAKE PAD REPLACEMENT" section.



2. Remove:
   - Union bolt ①
   - Copper washers ②
   - Brake hose ③

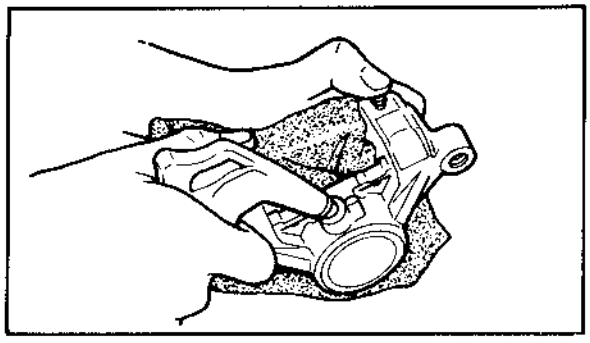
   Place the open hose end into a container and pump the old fluid out carefully.



3. Remove:
   - Pistons ①
   - Dust seals ②
   - Piston seals ③

CAUTION:

Do not loosen the bridge bolts ④ .



Remove steps:

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

⚠ WARNING

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

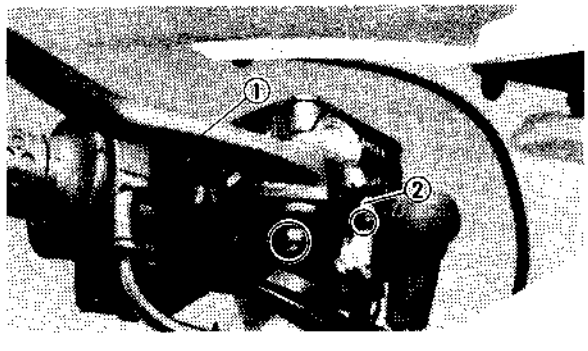
MASTER CYLINDER DISASSEMBLY

NOTE:

Before disassembling the front or rear brake master cylinders, drain the brake hose, master cylinder, brake caliper and reservoir tank of their brake fluid.

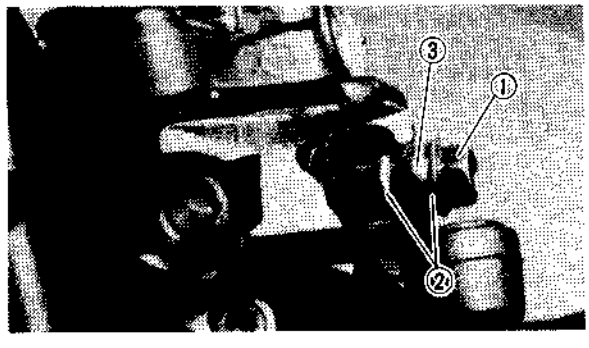
⚠ WARNING

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



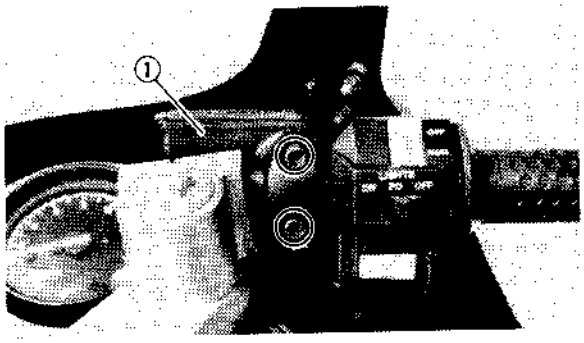
Front brake

1. Remove:
   - Brake lever ①
   - Brake switch ②

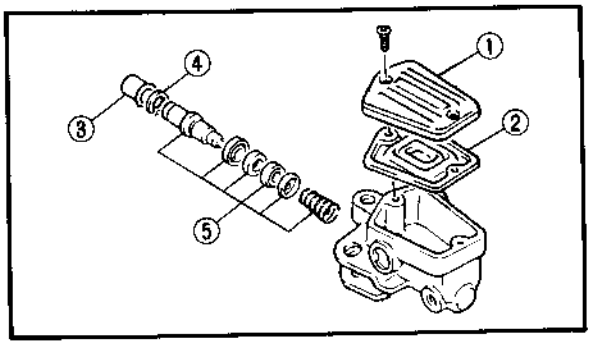


2. Remove:
   - Union bolt ①
   - Copper washer ②
   - Brake hose ③

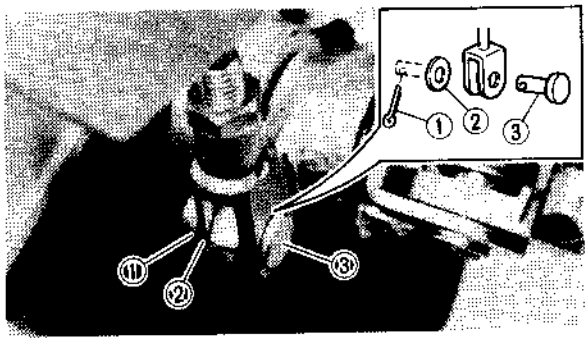
   Place the open hose end into a container and pump the old fluid out carefully.



3. Remove:
   - Master cylinder ①



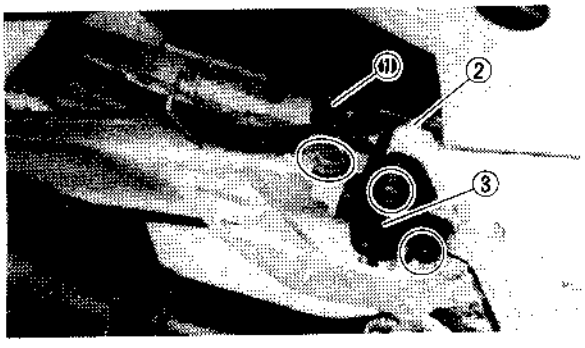
4. Remove:
   - Cap (master cylinder) ①
   - Diaphragm ②
   - Dust boot ③
   - Circlip ④
   - Master cylinder kit ⑤



Rear brake

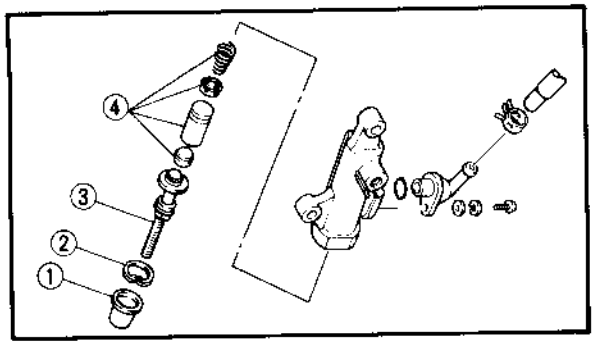
1. Remove:
   - Seat
   - Side cover (right)
2. Remove:
   - Cotter pin ①
   - Washer ②
   - Pin ③
3. Disconnect:
   - Reservoir hose ①

   Place the open hose end into a container and pump the old fluid out carefully.

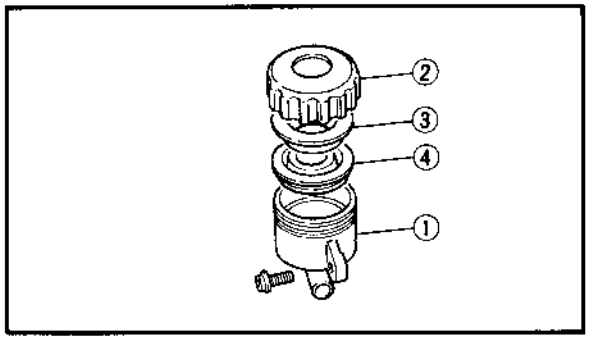


4. Remove:
   - Union bolt ②
   - Copper washers

   Place the open hose end into a container and pump the old fluid out carefully.
5. Remove:
   - Master cylinder ③



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

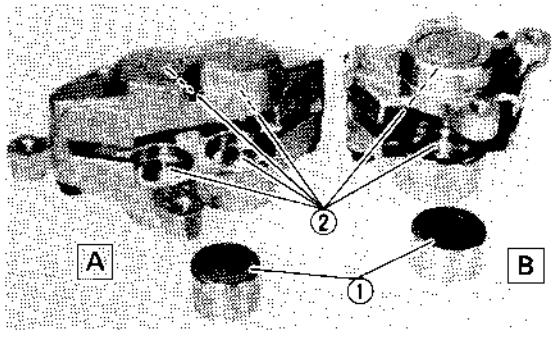


7. Remove:
   - Reservoir tank ①
     (from flame)
   - Cap (reservoir tank) ②
   - Holder (diaphragm) ③
   - Diaphragm ④

INSPECTION AND REPAIR

⚠ WARNING

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

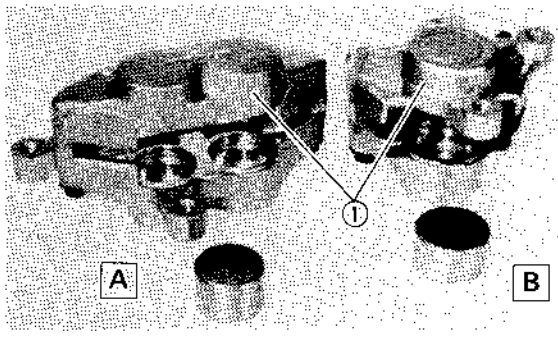


1. Inspect:
   - Caliper pistons ①
     Scratches/Rust/Wear → Replace.
   - Caliper cylinders ②
     Wear/Scratches → Replace.

[A] Front
[B] Rear

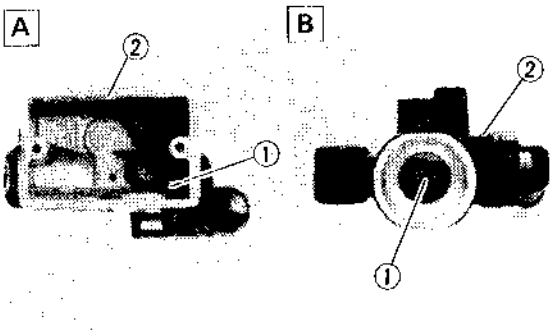
⚠ WARNING

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



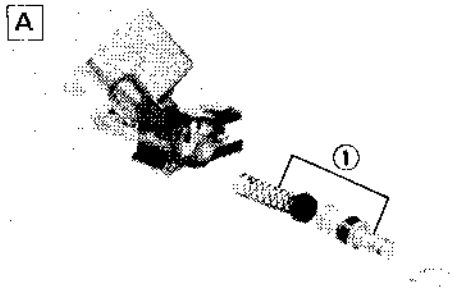
2. Inspect:
   - Caliper body ①
     Cracks/Damage → Replace.
   - Oil delivery passage (caliper body)
     Blow out with compressed air.

[A] Front
[B] Rear

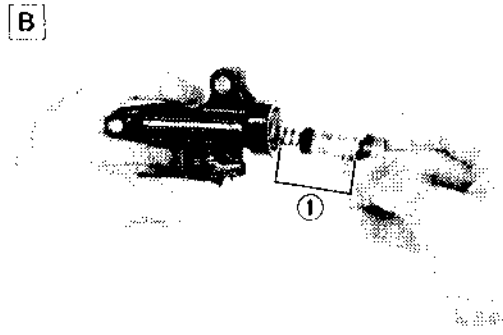


3. Inspect:
   - Master cylinder ①
     Wear/Scratches → Replace.
   - Master cylinder body ②
     Cracks/Damage → Replace.
   - Oil delivery passage (master cylinder body)
     Blow out with compressed air.

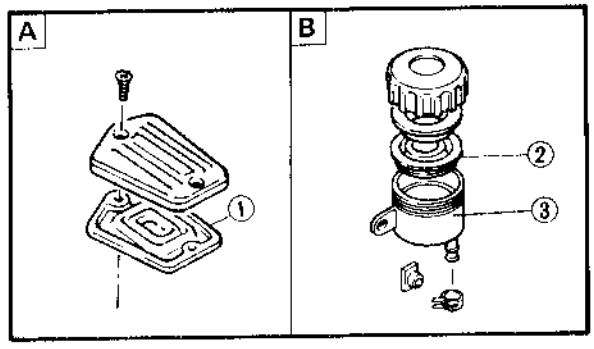
[A] Front
[B] Rear



4. Inspect:
   - Master cylinder kit ①
     Scratches/Wear/Damage → Replace.

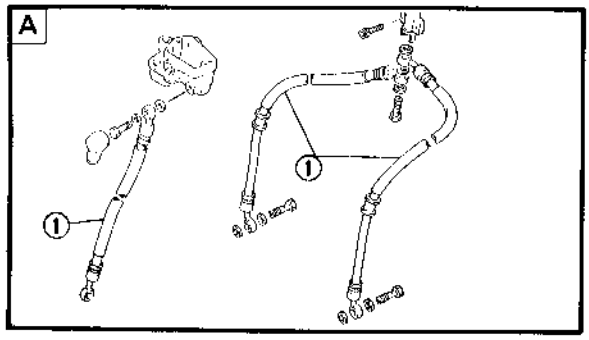


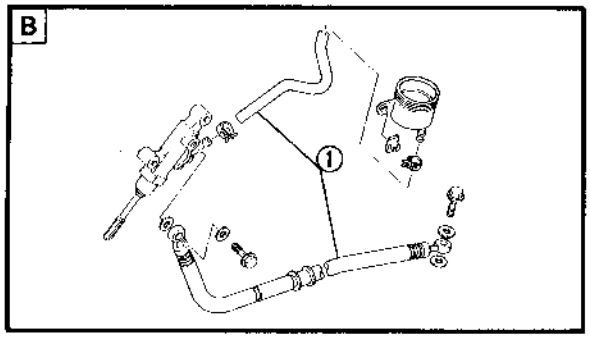
[A] Front
[B] Rear

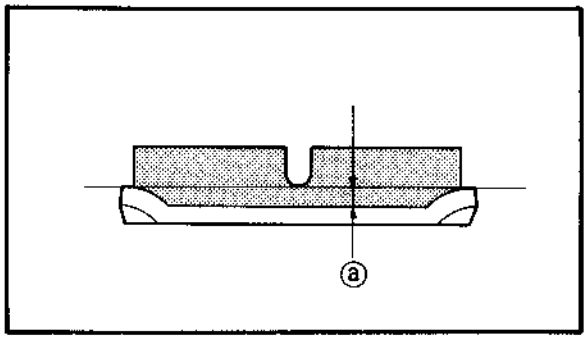


5. Inspect:
   - Diaphragm (front) ①
   - Diaphragm (rear) ②
     Wear/Damage → Replace.
   - Reservoir tank ③
     Cracks/Damage → Replace.

[A] Front
[B] Rear







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

A Front
B Rear

7. Measure:
   - Brake pads (thickness) ⓐ
     Out of specification → Replace.

Wear limit:
0.5 mm (0.02 in)

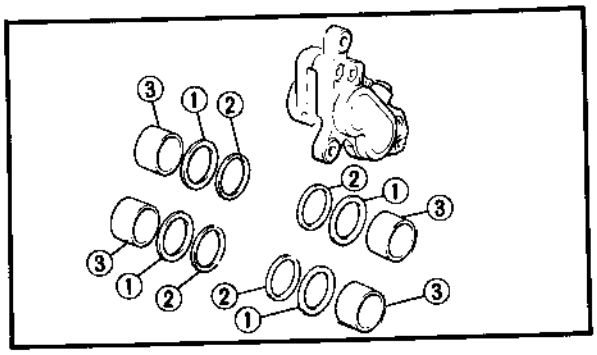
NOTE:
- Replace the pad spring as a set if pad replacement is required.
- Replace the pads as a set if either if found to be worn to the wear limit.

ASSEMBLY

⚠ WARNING

- **All internal parts should be cleaned in new brake fluid only.**
- **Internal parts should be lubricated with brake fluid when installed.**
- **Replace the piston seal and dust seal whenever a caliper is disassembled.**
- **Securely support the motorcycle so there is no danger of it falling over.**

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



Front brake

1. Install:
   - Piston seals ①
   - Dust seals ②
   - Pistons ③

⚠ WARNING

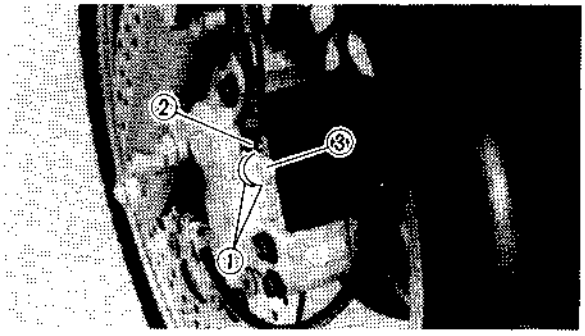
Always use new piston seal and dust seal.

2. Install:
   - Brake pads
   - Pad spring
   - Retaining pins
   - Retaining crips
   - Cover

   Refer to the "BRAKE PAD REPLACEMENT" section.

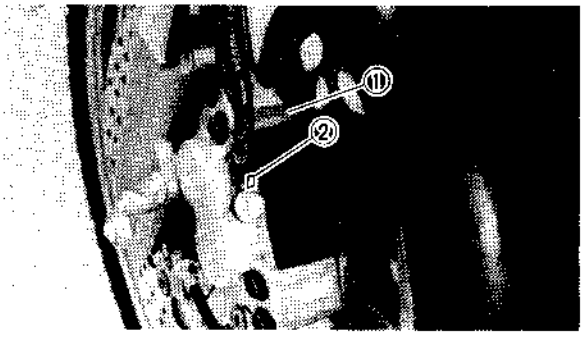
3. Install:
   - Brake caliper
   - Reflector

Bolts (brake caliper):
35 Nm (3.5 m · kg, 25 ft · lb)



4. Install:
   - Copper washers ①
   - Brake hose ②
   - Union bolt ③
     (onto brake caliper)

Union bolt:
26 Nm (2.6 m · kg, 19 ft · lb)

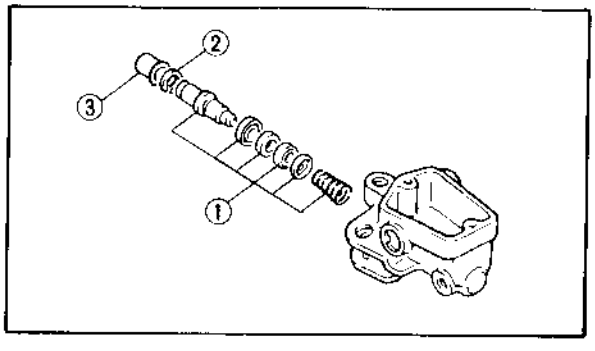


CAUTION:

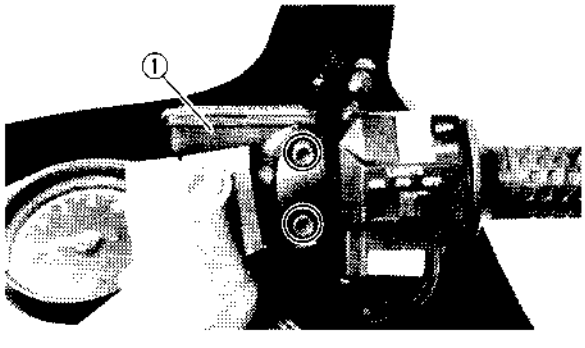
When installing the brake hose to the caliper ①, lightly touch the brake pipe with the projection ② on brake caliper.

⚠ WARNING

- **Proper hose routing is essential to insure safe motorcycle operation. Refer to "CABLE ROUTING".**
- **Always use new copper washers.**



5. Install:
   - Master cylinder kit ①
   - Circlip ②
   - Dust boot ③

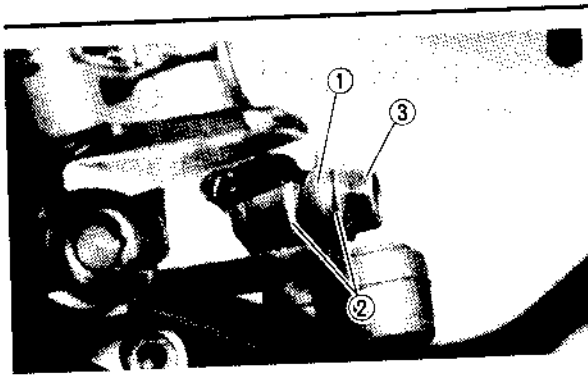


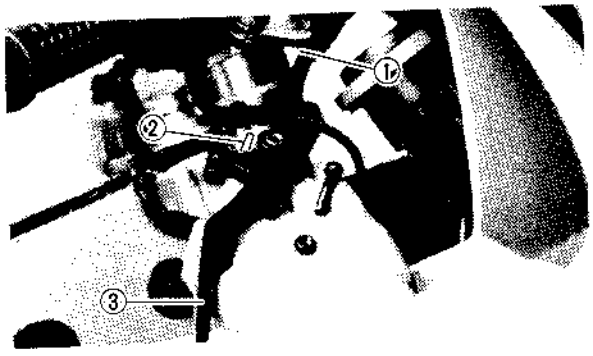
6. Install:
   - Master cylinder ①

NOTE:

Tighten first the upper bolt, then the lower bolt.

Bolts (master cylinder bracket):
9 Nm (0.9 m · kg, 6.5 ft · lb)





7. Install:
   - Brake hose ①
   - Copper washers ②
   - Union bolts ③

Union bolts:
26 Nm (2.6 m · kg, 19 ft · lb)

⚠ WARNING

- **Proper hose routing is essential to insure safe motorcycle operation. Refer to the "CABLE ROUTING".**
- **Always use new copper washers.**

8. Install:
   - Brake switch ①
   - Spring ②
   - Brake lever ③

NOTE:
Apply lithium soap base grease to pivot shaft of brake lever.

9. Fill:
   - Brake fluid

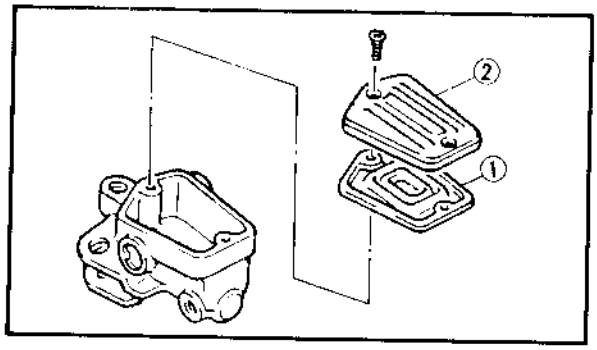
Recommended brake fluid:
DOT #4
If DOT #4 is not available, #3 can be used.

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.**

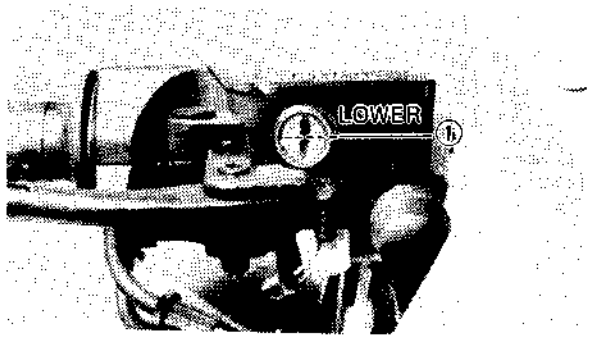


10. Install:
- Diaphragm ①
- Master cylinder cap ②

Screws (master cylinder cap):
2 Nm (0.2 m · kg, 1.4 ft · lb)

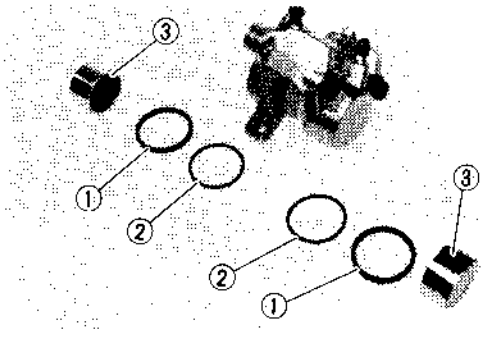
11. Air bleed:
- Brake system

Refer to the "AIR BLEEDING" section in the CHAPTER 3.



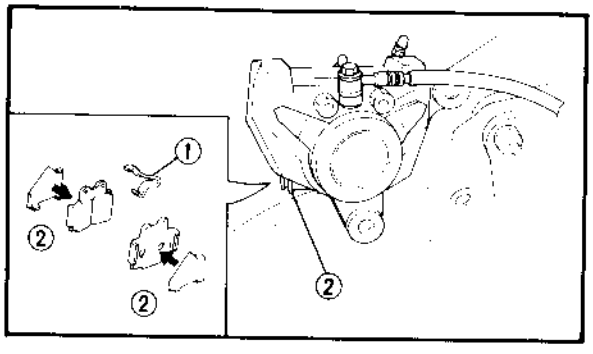
12. Inspect:
- Brake fluid level

Fluid lever is under "LOWER" level line ①
→ Replenish.
Refer to the "BRAKE FLUID INSPECTION" section in the CHAPTER 3.



Rear brake

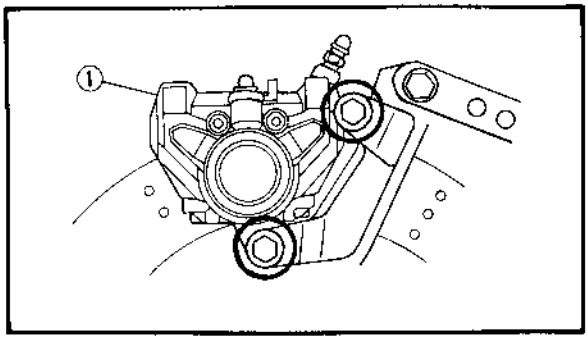
1. Install:
- Piston seals ①
- Dust seals ②
- Pistons ③



2. Install:
- Pad spring ①
- Brake pads (with shims) ②
- Retaining bolts

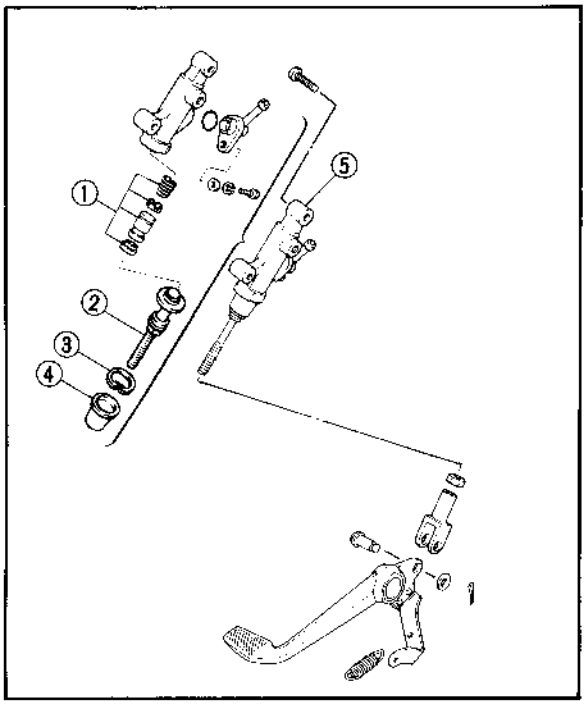
Retaining bolts:
10 Nm (1.0 m · kg, 13 ft · lb)

Refer to the "BRAKE PAD REPLACEMENT" section.



3. Install:
   - Brake caliper ①

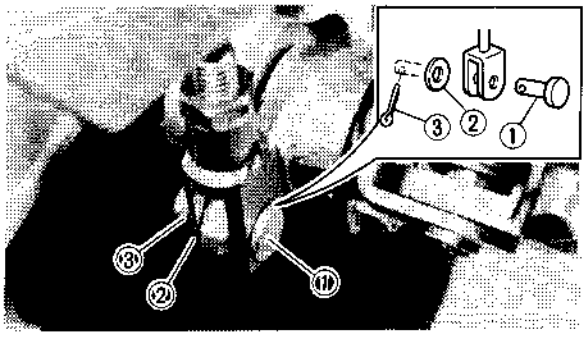
	Bolts (brake caliper): **35 Nm (3.5 m · kg, 25 ft · lb)**



4. Install:
   - Master cylinder kit ①
   - Push rod ②
   - Circlip ③
   - Dust boot ④

5. Install:
   - Master cylinder assembly ⑤

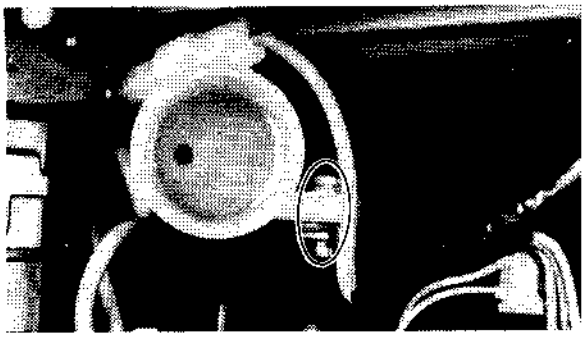
	Bolts (master cylinder assembly): **35 Nm (3.5 m · kg, 25 ft · lb)**



6. Install:
   - Pin ①
   - Plain washer ②
   - Cotter pin ③

⚠ WARNING

Always use new cotter pin.

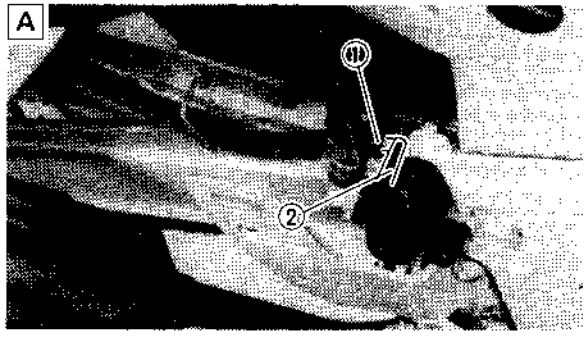


7. Install:
   - Reservoir tank

8. Install:
   - Brake hose
   - Copper washers
   - Union bolts
   - Reservoir hose

Union bolts:
26 Nm (2.6 m · kg, 19 ft · lb)

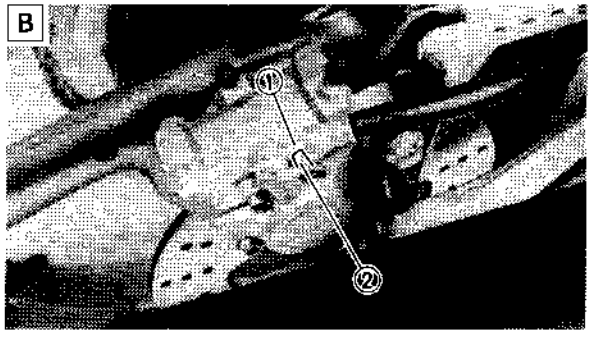
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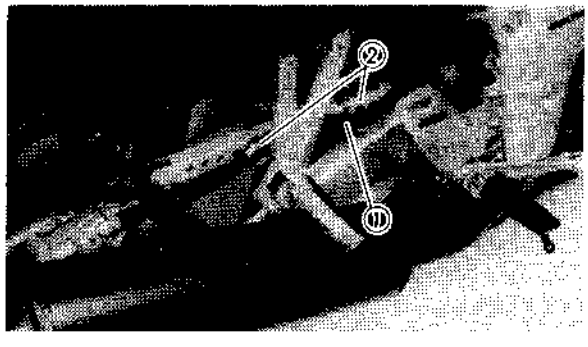
CAUTION:

When installing the brake hose, lightly touch the brake pipe ① with the projections ② on the caliper and master cylinder.

B



Ⓐ Master cylinder
Ⓑ Brake caliper



⚠ WARNING

- **Proper hose routing is essential to insure safe motorcycle operation, Refer to the "CABLE ROUTING".**
- **Always use new copper washers.**

① Brake hose
② Brake hose guide

9. Fill:
   - Brake fluid

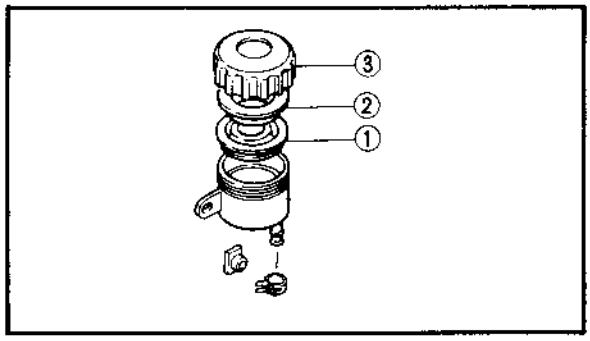
Recommended brake fluid:
DOT #4
If DOT #4 is not available,
DOT #3 can be used.

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.**

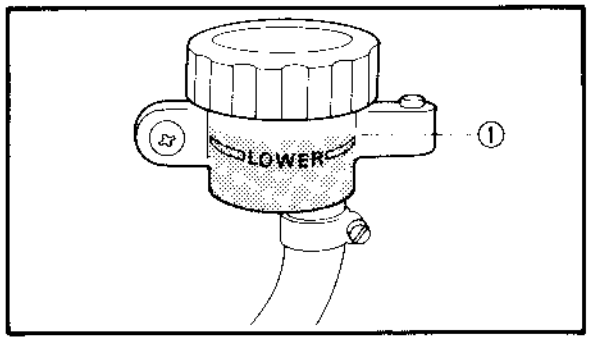


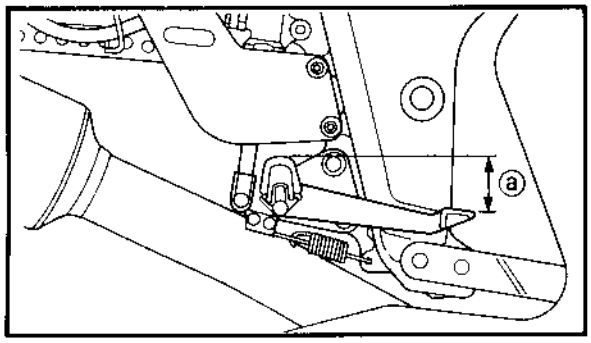
10. Install:
    - Diaphragm ①
    - Bush ②
    - Reservoir tank cap ③
11. Air bleed:
    - Brake system

    Refer to the "AIR BLEEDING" section in the CHAPTER 3.
12. Inspect:
    - Brake fluid level

    Fluid level is under "LOWER" level line ① → Replenish.

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





13. Adjust:
    - Rear brake pedal height ⓐ

Pedal height:
42 mm (1.7 in)
Below top of footrest.

Refer to "REAR BRAKE ADJUSTMENT" section in the CHAPTER 3.

14. Install:
    - Side cover (right)
    - Seat

CONTENTS

CHAPTER 1.
GENERAL INFORMATION

MOTORCYCLE IDENTIFICATION 1-1
VEHICLE IDENTIFICATION NUMBER 1-1
ENGINE SERIAL NUMBER 1-1

IMPORTANT INFORMATION 1-2
PREPARATION FOR REMOVAL 1-2
ALL REPLACEMENT PARTS 1-2
GASKETS, OIL SEALS, AND O-RINGS 1-2
LOCK WASHERS/PLATES AND COTTER PINS 1-3
BEARINGS AND OIL SEALS 1-3
CIRCLIPS 1-3

SPECIAL TOOLS 1-4
FOR TUNE UP 1-4
FOR ENGINE SERVICE 1-5
FOR CHASSIS SERVICE 1-8
FOR ELECTRICAL COMPONENTS 1-9

CHAPTER 2.
SPECIFICATIONS

SPECIFICATIONS 2-1
GENERAL SPECIFICATIONS 2-1
MAINTENANCE SPECIFICATIONS 2-4
ENGINE 2-4
CHASSIS 2-11
ELECTRICAL 2-14
GENERAL TORQUE SPECIFICATIONS 2-16
DEFINITION OF UNITS 2-16
LUBRICATION POINT AND GRADE OF LUBRICANT 2-17

LUBRICATION DIAGRAM 2-19

COOLANT DIAGRAM 2-20

CABLE ROUTING 2-21

CHAPTER 3.
PERIODIC INSPECTION AND ADJUSTMENT

INTRODUCTION 3-1

MAINTENANCE INTERVALS CHART 3-1
- PERIODIC MAINTENANCE EMISSION CONTROL SYSTEM 3-1
- GENERAL MAINTENANCE/LUBRICATION 3-2

COWLING REMOVAL AND INSTALLATION 3-4

ENGINE 3-7
- EXUP CABLE ADJUSTMENT (For California only) 3-7
- VALVE CLEARANCE ADJUSTMENT 3-8
- CARBURETOR SYNCHRONIZATION 3-15
- IDLE SPEED ADJUSTMENT 3-17
- THROTTLE CABLE FREE PLAY ADJUSTMENT 3-18
- SPARK PLUG INSPECTION 3-19
- IGNITION TIMING CHECK 3-20
- COMPRESSION PRESSURE MEASUREMENT 3-21
- ENGINE OIL LEVEL INSPECTION 3-23
- ENGINE OIL REPLACEMENT 3-23
- ENGINE OIL FILTER REPLACEMENT 3-24
- CLUTCH ADJUSTMENT 3-26
- AIR FILTER CLEANING 3-27
- CARBURETOR JOINT INSPECTION 3-27
- FUEL LINE INSPECTION 3-27
- CRANKCASE VENTILATION HOSE INSPECTION 3-28
- EXHAUST SYSTEM INSPECTION 3-28
- COOLANT LEVEL INSPECTION 3-29
- COOLANT REPLACEMENT 3-29

CHASSIS 3-32
- FRONT BRAKE ADJUSTMENT 3-32
- REAR BRAKE ADJUSTMENT 3-32
- BRAKE FLUID INSPECTION 3-33
- BRAKE PAD INSPECTION 3-33
- REAR BRAKE LIGHT SWITCH ADJUSTMENT 3-33
- BRAKE HOSE INSPECTION 3-34
- AIR BLEEDING 3-34
- DRIVE CHAIN SLACK ADJUSTMENT 3-35
- DRIVE CHAIN LUBRICATION 3-37
- STEERING HEAD INSPECTION 3-37
- FRONT FORK INSPECTION 3-40
- REAR SHOCK ABSORBER ADJUSTMENT 3-40
- TIRE INSPECTION 3-41
- WHEEL INSPECTION 3-42
- CABLE INSPECTION 3-43
- LUBRICATION 3-43

ELECTRICAL 3-44
BATTERY INSPECTION 3-44
FUSE INSPECTION 3-46
HEADLIGHT BEAM ADJUSTMENT 3-46
HEADLIGHT BULB REPLACEMENT 3-47
TAIL/BRAKE BULB REPLACEMENT 3-48

CHAPTER 4.
ENGINE OVERHAUL

ENGINE REMOVAL 4-1
LOWER COWLING, CENTER COWLING,
UPPER COWLING AND TOP COVER 4-1
FUEL TANK 4-1
ENGINE OIL 4-1
COOLANT 4-1
AIR FILTER CASE AND CARBURETOR 4-2
RADIATOR 4-2
MUFFLER ASSEMBLY 4-4
CLUTCH CABLE AND DRIVE CHAIN 4-4
LEADS 4-5
ENGINE REMOVAL 4-7

ENGINE DISASSEMBLY 4-7
CYLINDER HEAD COVER, CAMSHAFT AND
CYLINDER HEAD 4-10
CYLINDER AND PISTON 4-12
STARTER CLUTCH 4-13
CLUTCH 4-14
A.C. MAGNETO 4-15
WATER PUMP 4-16
OIL PUMP AND SHIFT SHAFT 4-17
OIL PAN AND OIL STRAINER 4-18
STARTER MOTOR 4-18
CRANKCASE DISASSEMBLY 4-19
TRANSMISSION, SHIFTER AND SHIFT CAM 4-20
CRANKSHAFT 4-21
VALVE PAD AND VALVE 4-23
CONNECTING ROD 4-23
INNER ROTOR (OIL PUMP) 4-24

INSPECTION AND REPAIR 4-24
CYLINDER HEAD 4-25
VALVE 4-26
VALVE GUIDE 4-27
VALVE SEAT 4-30
VALVE SPRING 4-31
VALVE LIFTER 4-31
CAMSHAFT, CAM CHAIN AND CAM SPROCKET 4-33
CYLINDER AND PISTON 4-33

PISTON RING AND PISTON PIN 4-35
CRANKSHAFT AND CONNECTING ROD 4-37
OIL PUMP 4-41
PRIMARY DRIVE 4-42
STARTER CLUTCH 4-43
CLUTCH 4-44
TRANSMISSION 4-46
RELIEF VALVE AND PIPE 4-47
CRANKCASE 4-47
BEARING AND OIL SEAL 4-47
YAMAHA EXHAUST VARIABLE VALVE (For California only) 4-48

ENGINE ASSEMBLY AND ADJUSTMENT 4-49
INNER ROTOR (OIL PUMP) 4-49
CONNECTING ROD 4-49
CRANKSHAFT 4-50
VALVE PAD AND VALVE 4-51
CRANKCASE 4-54
TRANSMISSION 4-55
TRANSMISSION, SHIFTER AND SHIFT CAM 4-56
CRANKCASE ASSEMBLY 4-57
STARTER MOTOR 4-59
OIL PAN AND OIL STRAINER 4-59
OIL PUMP AND SHIFT SHAFT 4-60
A.C. MAGNETO 4-61
CLUTCH 4-63
STARTER CLUTCH 4-65
PISTON AND CYLINDER 4-67
CYLINDER HEAD AND CAMSHAFT 4-70
CAM CHAIN TENSIONER 4-75
REMOUNTING ENGINE 4-76
YAMAHA EXHAUST VARIABLE VALVE (For California only) 4-78

CHAPTER 5.
COOLING SYSTEM

RADIATOR 5-1
REMOVAL 5-2
INSPECTION 5-3
INSTALLATION 5-4

WATER PUMP AND THERMOSTATIC VALVE 5-6
REMOVAL 5-7
INSPECTION 5-9
INSTALLATION 5-10

CHAPTER 6.
CARBURETOR

CARBURETOR 6-1
SECTION VIEW 6-2
REMOVAL 6-3
DISASSEMBLY 6-5
INSPECTION 6-6
ASSEMBLY 6-8
INSTALLATION 6-9
ADJUSTMENT 6-10

CHAPTER 7.
CHASSIS

FRONT WHEEL 7-1
REMOVAL 7-2
INSPECTION 7-2
INSTALLATION 7-4

REAR WHEEL 7-7
REMOVAL 7-8
INSPECTION 7-8
INSTALLATION 7-9

FRONT AND REAR BRAKE 7-10
BRAKE PAD REPLACEMENT 7-12
CALIPER DISASSEMBLY 7-16
MASTER CYLINDER DISASSEMBLY 7-18
INSPECTION AND REPAIR 7-19
ASSEMBLY 7-21

FRONT FORK 7-28
REMOVAL 7-29
DISASSEMBLY 7-30
INSPECTION 7-31
ASSEMBLY 7-32
INSTALLATION 7-34

STEERING HEAD AND HANDLEBAR 7-36
REMOVAL 7-38
INSPECTION 7-41
INSTALLATION 7-42

REAR SHOCK ABSORBER AND SWINGARM 7-47
HANDLING NOTES 7-49
DISPOSAL NOTES 7-49
REMOVAL 7-49
INSPECTION 7-52
INSTALLATION 7-54

DRIVE CHAIN AND SPROCKET 7-56
REMOVAL 7-56
INSPECTION AND CLEANING 7-56
INSTALLATION 7-57

CHAPTER 8.
ELECTRICAL

FZR400U/SUC CIRCUIT DIAGRAM 8-1

ELECTRICAL COMPONENTS 8-3

CHECKING OF SWITCHES 8-5
SWITCH CONNECTION AS SHOWN IN MANUAL 8-5
CHECKING SWITCH FOR TERMINAL CONNECTION 8-5

CHECKING OF BULBS 8-8
KINDS OF BULBS 8-8
CHECKING BULB CONDITION 8-8

IGNITION SYSTEM 8-11
CIRCUIT DIAGRAM 8-11
DIGITAL IGNITION CONTROL SYSTEM DESCRIPTION 8-13
OPERATION 8-13
TROUBLESHOOTING 8-14

ELECTRIC STARTING SYSTEM 8-21
CIRCUIT DIAGRAM 8-21
STARTING CIRCUIT OPERATION 8-23
TROUBLESHOOTING 8-24
STARTER MOTOR 8-30

CHARGING SYSTEM 8-33
CIRCUIT DIAGRAM 8-33
TROUBLESHOOTING 8-35

LIGHTING SYSTEM 8-39
CIRCUIT DIAGRAM 8-39
TROUBLESHOOTING 8-41
LIGHTING SYSTEM CHECK 8-44

SIGNAL SYSTEM 8-49
CIRCUIT DIAGRAM 8-49
TROUBLESHOOTING 8-51
SIGNAL SYSTEM CHECK 8-53

COOLING SYSTEM 8-69
CIRCUIT DIAGRAM 8-69
TROUBLESHOOTING 8-71

FUEL SYSTEM 8-75
CIRCUIT DIAGRAM 8-75
FUEL PUMP CIRCUIT OPERATION 8-77
TROUBLESHOOTING 8-78
FUEL PUMP TEST 8-82

YAMAHA EXHAUST VARIABLE VALVE SYSTEM
(For California only) 8-83
CIRCUIT DIAGRAM 8-83
TROUBLESHOOTING 8-85

METER ASSEMBLY 8-89
REMOVAL 8-90
INSTALLATION 8-91

CHAPTER 9.
TROUBLESHOOTING

STARTING FAILURE/HARD STARTING 9-1

POOR IDLE SPEED PERFORMANCE 9-3

POOR MEDIUM AND HIGH SPEED PERFORMANCE 9-4

FAULTY GEAR SHIFTING 9-4

CLUTCH SLIPPING/DRAGGING 9-5

OVERHEATING OR OVER-COOLING 9-6

FAULTY BRAKE 9-7

FRONT FORK OIL LEAKAGE/MALFUNCTION 9-7

INSTABLE HANDLING 9-8

FAULTY SIGNALS AND LIGHTS 9-9

FAULTY EXUP (For California only) 9-10



GENERAL INFORMATION

MOTORCYCLE IDENTIFICATION

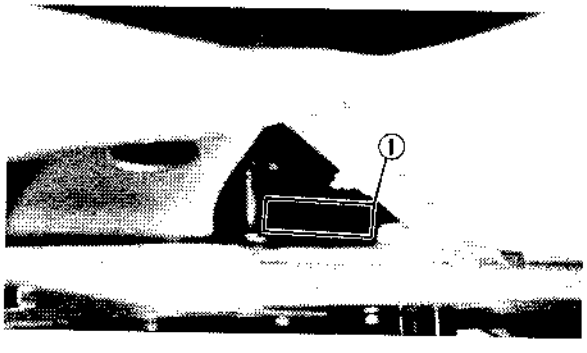
VEHICLE IDENTIFICATION NUMBER

The vehicle identification number ① is stemped into the right side of the steering head.

Starting Serial Number:
FZR400U (Except for California):
JYA3BFE0 * JA000101
FZR400SUC (For California):
JYA3FHC0 * JA000101

NOTE:

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



ENGINE SERIAL NUMBER

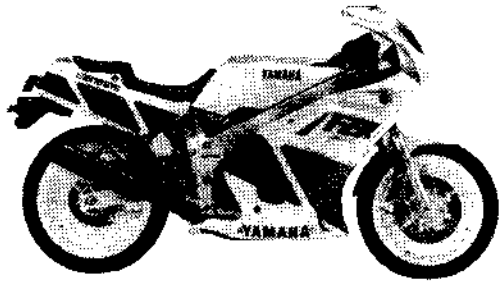
The engine serial number ① is stamped into the right side of the engine.

Starting Serial Number:
FZR400U (Except for California):
3BF-000101
FZR400SUC (For California):
3FH-000101

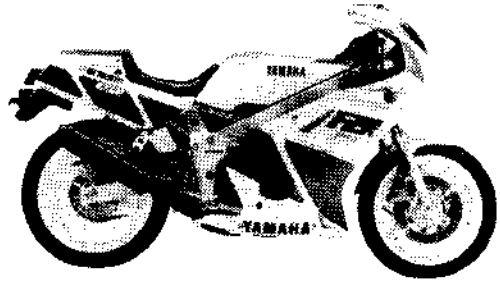
NOTE:

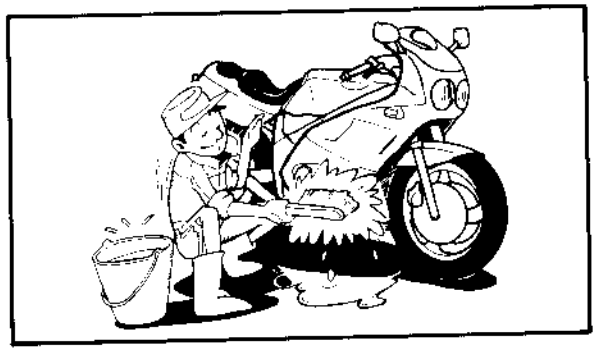
- The first three digits of these numbers are for model identifications; the remaining digits are the unit production number.
- Designs and specifications are subject to change without notice.

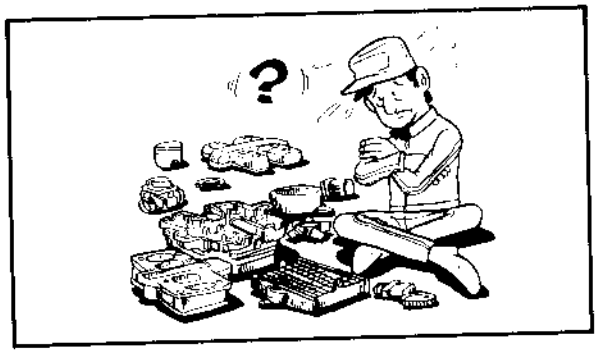
FZR400U

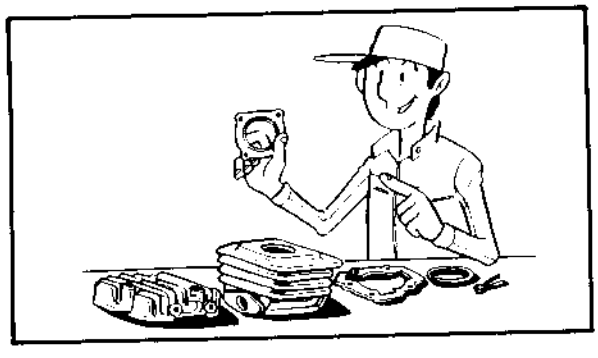


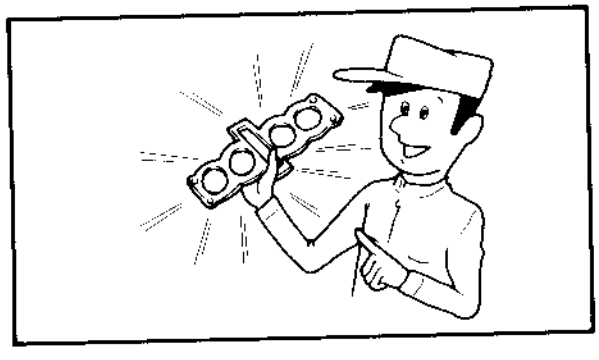
FZR400SUC











IMPORTANT INFORMATION

PREPARATION FOR REMOVAL

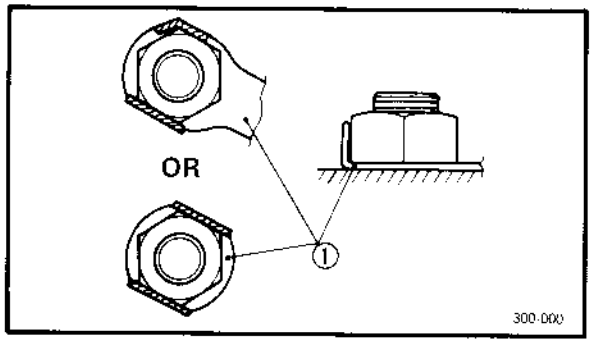
1. Remove all dirt, mud, dust, and foreign material before removal and disassembly.
2. Use proper tools and cleaning equipment. Refer to "SPECIAL TOOL".
3. When disassembling the machine, keep mated parts together. This includes gears, cylinders, pistons, and other mated parts that have been "mated" through normal wear. Mated parts must be reused as an assembly or replaced.
4. During the machines 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.

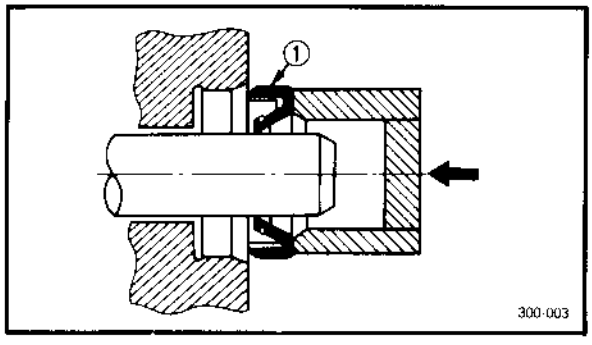
GASKETS, OIL SEALS, AND O-RINGS

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

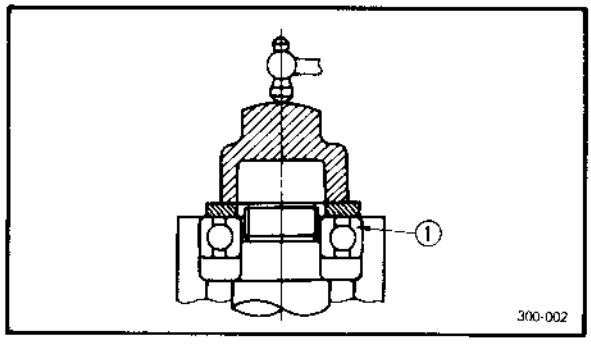
1. All lock washers/plates ① and cotter pins must be replaced when they are removed. Lock tab(s) should be bent along the bolt or nut flat(s) after the bolt or nut has been properly tightened.



BEARINGS AND OIL SEALS

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

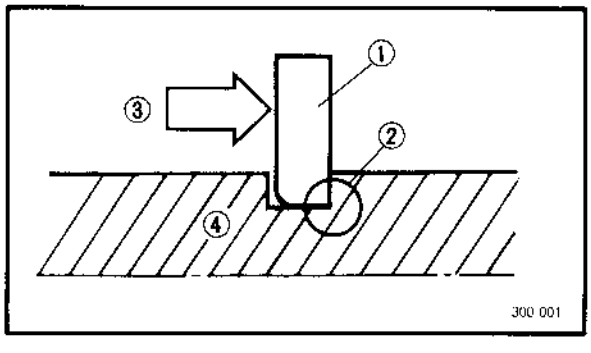
① Oil seal



⚠ CAUTION:

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

① Bearing



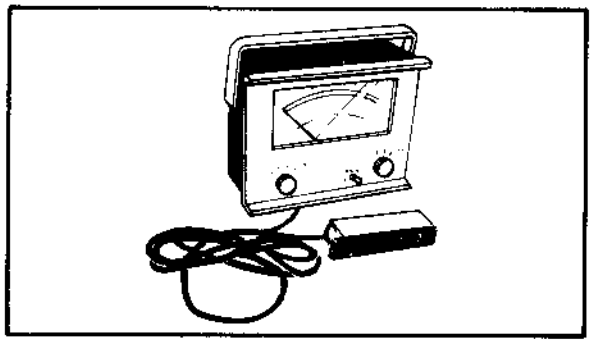
CIRCLIPS

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

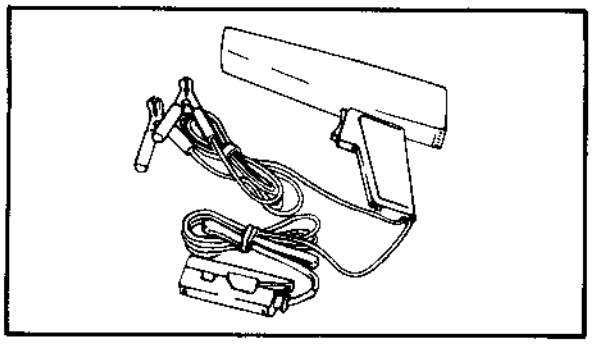
The proper special tools are necessary for complete and accurate tune-up and assembly. Using the correct special tool will help prevent damage caused by the use of improper tools or improvised techniques.



FOR TUNE UP

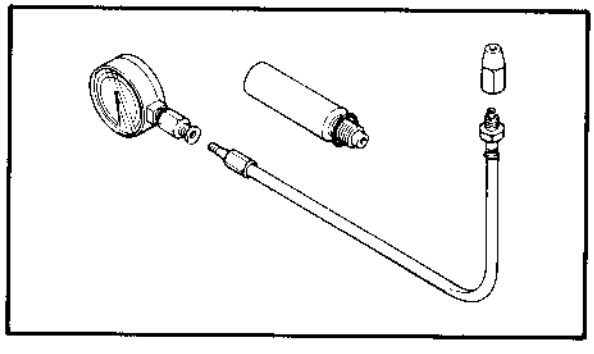
1. Inductive Tachometer
   P/N YU-08036

This tool is needed for detecting engine rpm.



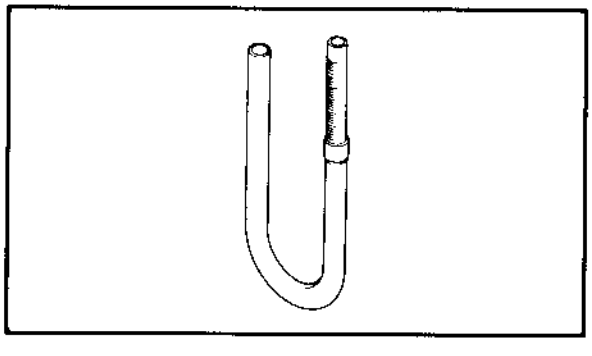
2. Inductive Timing Light
   P/N YU-08037

This tool is necessary for checking ignition timing.



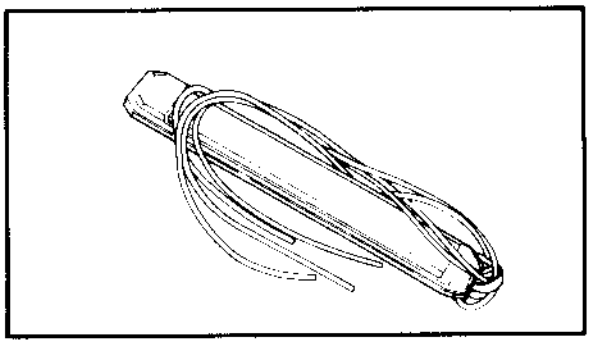
3. Compression Gauge
   P/N YU-33223

This gauge is used to measure the engine compression.



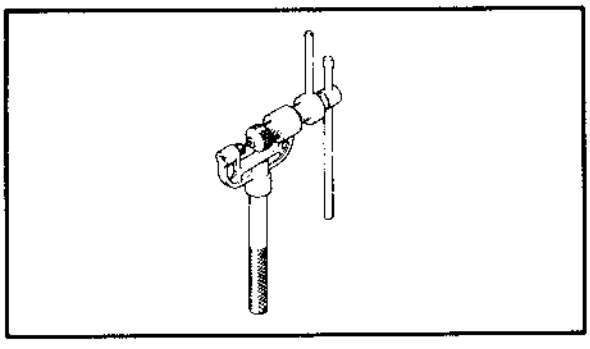
4. Fuel Level Gauge
   P/N YU-01312

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



5. Vacuum Gauge
   P/N YU-08030

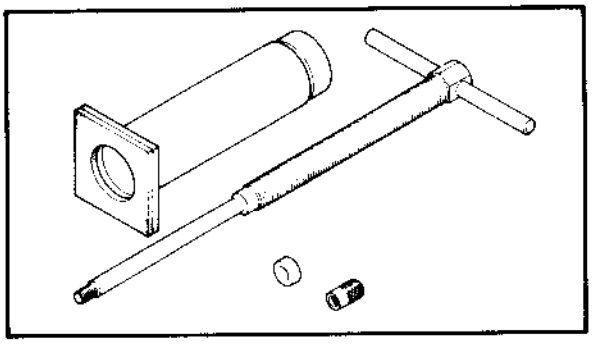
This gauge is needed for carburetor synchronization.



FOR ENGINE SERVICE

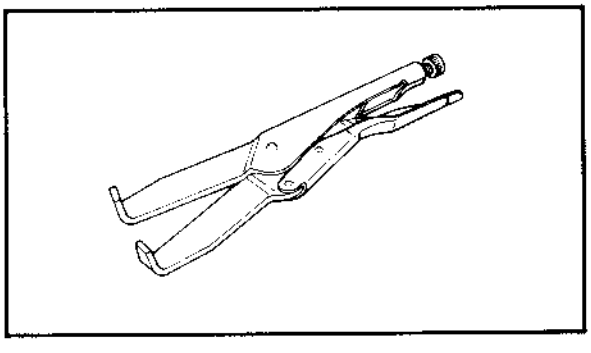
1. Cam Chain Cutter
   P/N YM-01112

This tool is used when cutting the cam chain.



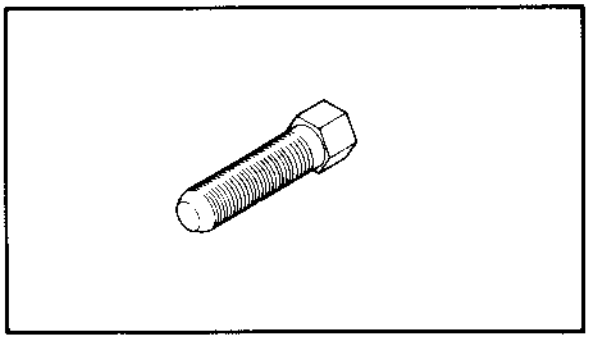
2. Piston Pin Puller
   P/N YU-01304

This tool is used to remove the piston pin.

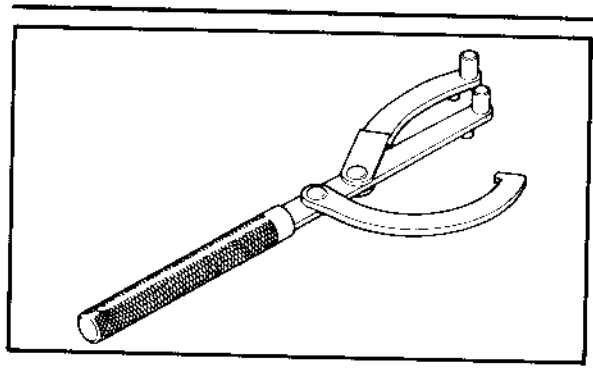


3. Universal Clutch Holder
   P/N YM-91042

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

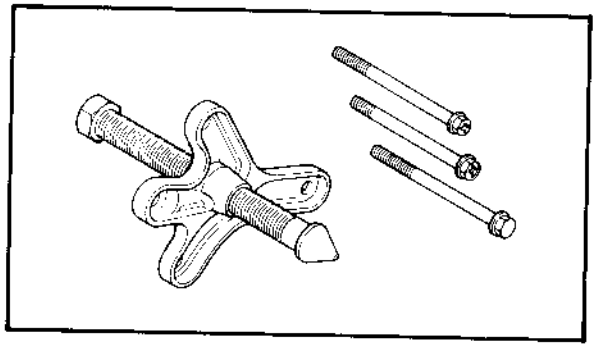


4. Rotor Puller
   P/N YM-01080
   This tool is used to remove the rotor.



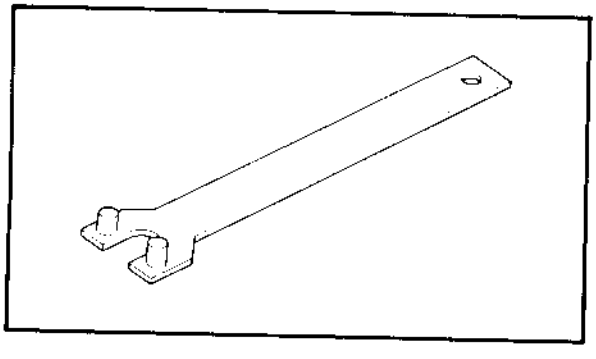
5. Universal Rotor Holder
   P/N YU-01235

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



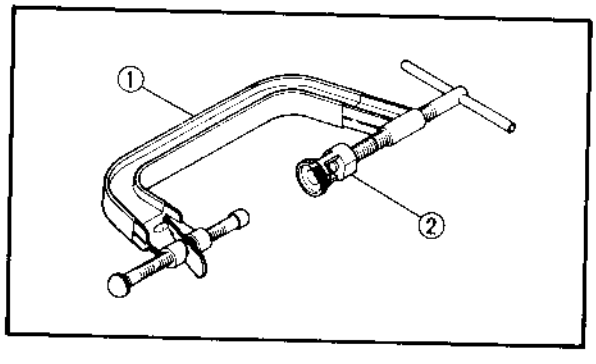
6. Heavy Duty Puller
   P/N YU-33270

This tool is used to remove the starter clutch.



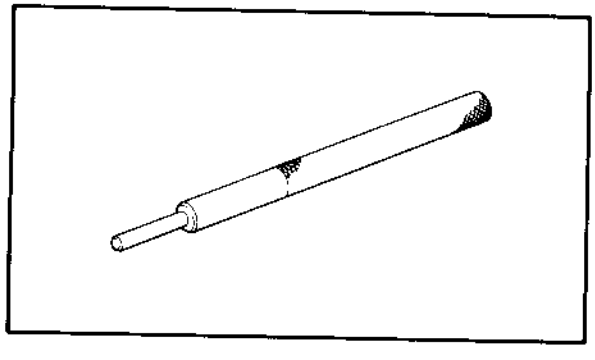
7. Camshaft Wrench
   P/N YM-04115

This tool is used to turn the camshaft.



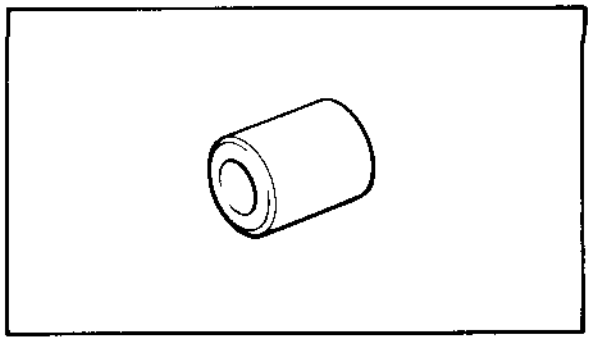
8. Valve Spring Compressor ①
   P/N YM-04019
   Attachment ②
   P/N YM-04114

This tool is needed to remove and install the valve assemblies.



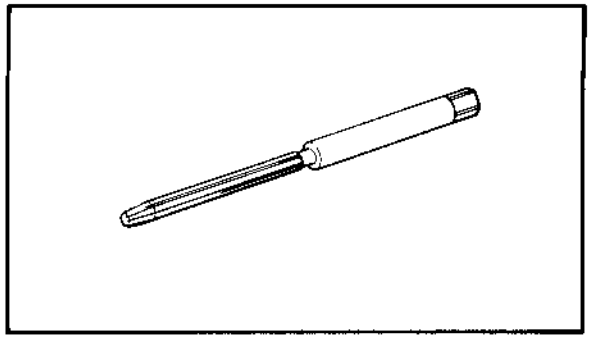
9. Valve Guide Remover (4.5 mm)
   P/N YM-04116

This tool is used to remove the valve guides.



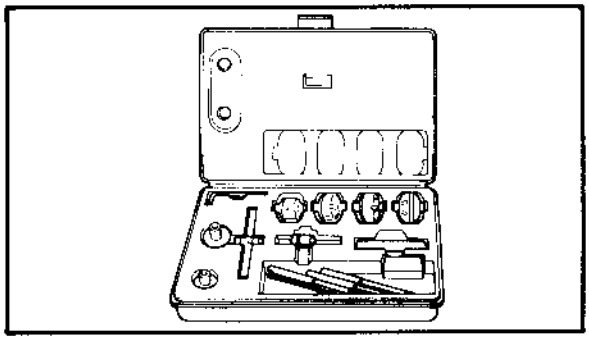
10. Valve Guide Installer
P/N YM-04117

This tool is needed to install the valve guides properly.



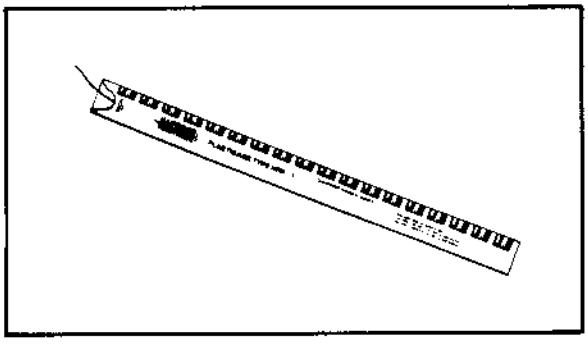
11. Valve Guide Reamer (4.5 mm)
P/N YM-04118

This tool is used to rebore the new valve guide.



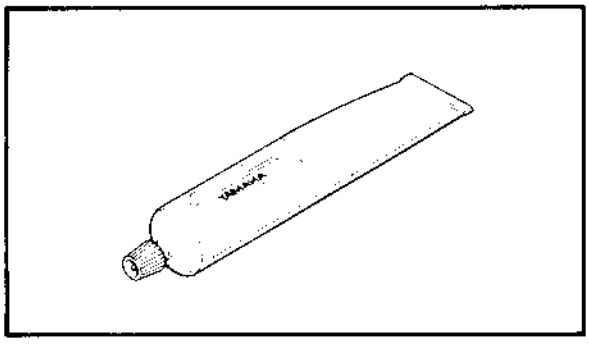
12. Valve Seat Cutter
P/N YM-91043

This tool is needed to resurface the valve seat.



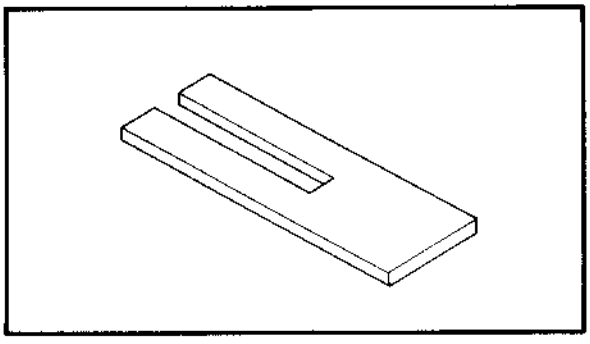
13. Plastigage® Set "Green"
P/N YU-33210

This gauge is needed to measure the clearance for the connecting rod bearing and the crank shaft bearing.



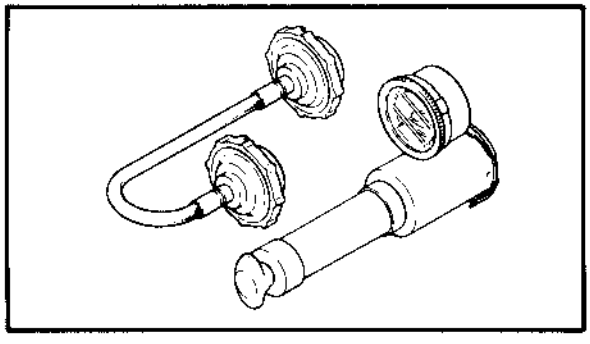
14. Quick Gasket®
P/N ACC-11001-05-01

This sealant (Bond) is used for crankcase mating surfaces, etc.



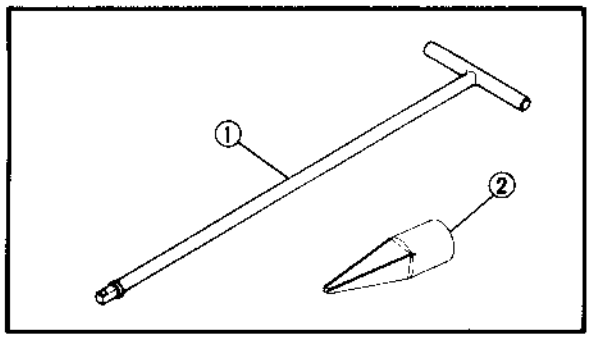
15. Piston Base
P/N YM-01067

Use 4 of these to hold the piston during cylinder installation.



16. Radiator Cap Tester
P/N YU-24460-01
Adaptor
P/N YU-33984

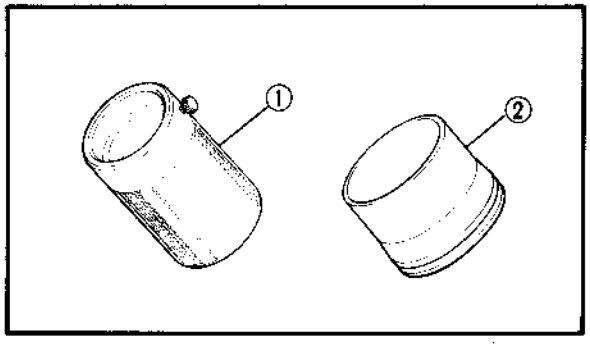
This tester is needed for checking the cooling system.



FOR CHASSIS SERVICE

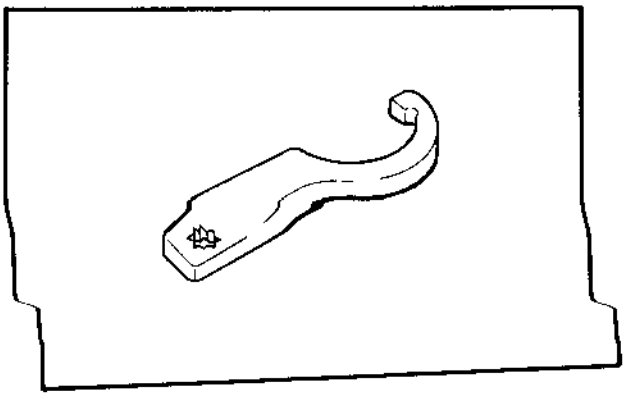
1. T-Handle
P/N YM-01326 – ①
Front Fork Cylinder Holder
P/N YM-01300-1 – ②

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



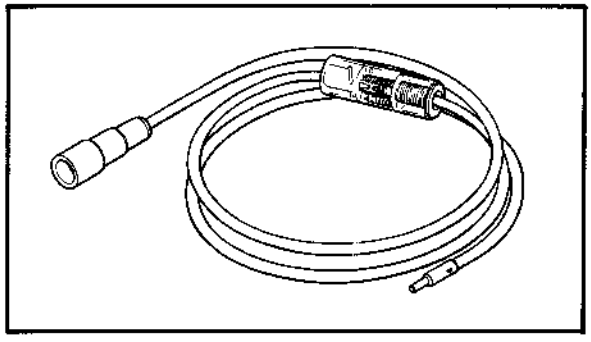
2. Front Fork Seal Driver (weight)
P/N YM-33963 – ①
Adapter (38 mm)
P/N YM-01372 – ②

These tools are used when installing the fork seat.



3. Ring Nut Wrench
P/N YU-33975

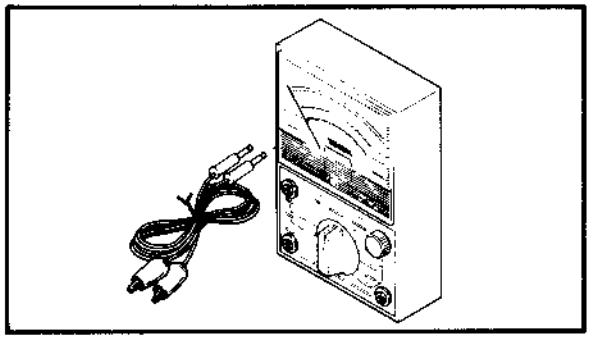
This tool is used to loosen and tighten the steering ring nut.



FOR ELECTRICAL COMPONENTS

1. Dynamic Coil Tester
   P/N YM-34487

This tester is necessary for checking the ignition system components.

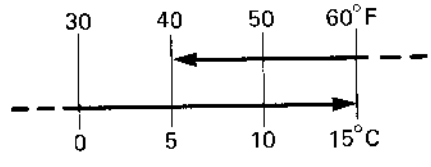


2. Pocket Tester
   P/N YU-03112

This instrument is invaluable for checking the electrical system.

SPECIFICATIONS

GENERAL SPECIFICATIONS

Model	FZR400U/FZR400SUC
Model Code Number:	3BF (FZR400U) 3FH (FZR400SUC)
Vehicle Identification Number:	JYA3FHC0 * JA000101 JYA3BFE0 * JA000101
Engine Starting Number:	3BF-000101 (FZR400U) 3FH-000101 (FZR400SUC)
Dimensions: Overall Length Overall Width Overall Height Seat Height Wheelbase Minimum Ground Clearance	 2,070 mm (81.5 in) 690 mm (27.2 in) 1,125 mm (44.3 in) 785 mm (30.9 in) 1,400 mm (55.1 in) 135 mm (5.31 in)
Basic Weight: With Oil and Full Fuel Tank	 186 kg (410 lb) (FZR400U) 189 kg (417 lb) (FZR400SUC)
Minimum Turning Radius:	3,100 mm (122 in)
Engine: Engine Type Cylinder Arrangement Displacement Bore x Stroke Compression Ratio Compression Pressure Starting System	 Liquide cooled 4-stroke, gasoline, DOHC 4-cylinder parallel 399 cm³ (24.3 cu.in) 56.0 x 40.5 mm (2.2047 x 1.5945 in) 11.5 : 1 932 kPa (9.5 kg/cm², 135 psi) Electric starter
Lubrication System:	Wet sump
Engine Oil Type or Grade:	 Yamalube 4-cycle oil or SAE 20W40 type SE motor oil SAE 10W30 type SE motor oil
Engine Oil Capacity: Engine Oil: Periodic Oil Change: With Oil Filter Replacement Total Amount	 2.2 L (1.9 Imp qt, 2.33 US qt) 2.5 L (2.2 Imp qt, 2.64 US qt) 3.0 L (2.6 Imp qt, 3.17 US qt)
Coolant Total Amount: (Including All Routes)	1.9 L (1.7 Imp qt, 2.0 US qt)
Air Filter:	Dry type element

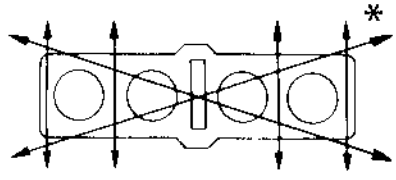
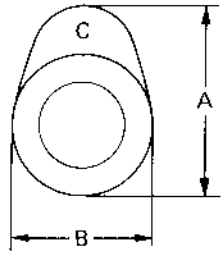
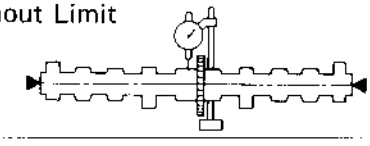
Model	FZR400U/FZR400SUC	
Fuel: Type Tank capacity Reserve Amoun	 Unleaded fuel recommended 18.0 L (3.94 Imp gal, 4.8 US gal) 3.0 L (0.66 Imp gal, 0.79 US gal)	
Carburetor: Type x Quantity Manufacturer	 BDS32 x 4 MIKUNI	
Spark Plug: Type (Manufacture) Gap	 CR8E (NGK), U24ESR-N (N.D.) 0.7 ~ 0.8 mm (0.028 ~ 0.032 in)	
Clutch Type:	Wet, multiple-disc	
Transmission: Primary Reduction System Primary Reduction Ratio Secondary Reduction System Secondary Reduction Ratio Transmission Type Operation Gear Ratio 1st 2nd 3rd 4th 5th 6th	 Spur gear 89/41 (2.170) Chain drive 55/19 (2.894) Constant-mesh, 6-speed Left foot operation 43/13 (3.307) 40/18 (2.222) 36/21 (1.714) 33/23 (1.434) 28/22 (1.272) 27/23 (1.173)	
Chassis: Frame Type Caster Angle Trail	 Double cradle 24° 89 mm (3.5 in)	
Tire Type Size Manufacture (Type)	Front Tubeless 110/70R17-53H BRIDGESTONE (CYROX-03) DUNLOP (K455F)	Rear Tubeless 140/60R18-64H BRIDGESTONE (CYROX-04) DUNLOP (K455)
Maximum Load*	156 kg (344 lb) (Except for California) 153 kg (337 lb) (For California)	
Tire Pressure (Cold tire):	Front	Rear
Up to 90 kg (198 lb) load*	200 kPa (2.0 kg/cm², 28 psi)	230 kPa (2,3 kg/cm², 32 psi)
90 kg (198 lb) ~ Maximum load*	200 kPa (2.0 kg/cm², 28 psi)	250 kPa (2.5 kg/cm², 36 psi)
High speed riding	200 kPa (2.0 kg/cm², 28 psi)	250 kPa (2.5 kg/cm², 36 psi)

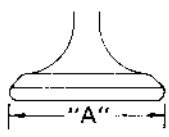
*Load is total weight of cargo, rider, passenger, and accessories.

Model	FZR400U/FZR400SUC
Brake:	
Front Brake Type	Dual disc brake
Operation	Right hand operation
Rear Brake Type	Single disc brake
Operation	Right foot operation
Suspension:	
Front Suspension	Telescopic fork
Rear Suspension	Swingarm (New monocross)
Shock Absorber:	
Front Shock Absorber	Coil spring/Oil damper
Rear Shock Absorber	Coil gas spring/Oil damper
Wheel Travel:	
Front Wheel Travel	130 mm (5.12 in)
Rear Wehel Travel	130 mm (5.12 in)
Electrical:	
Ignition System	T.C.I. (Digital ignition)
Generator System	A.C. magneto generator
Battery Type or Model	GM12AZ-3A-2
Battery Capacity	12V 12AH
Headlight type:	Quartz bulb (Halogen)
Bulb Wattage x Quantity:	
Headlight	35W/35W x 2
Tail/Brake Light	8W/27W x 1
Rear Flasher Light	27W x 2
Front Position Light/Front Flasher Light	27W/8W x 2
License Light	3.8W x 2
Meter Light	1.7W x 5
Auxiliary Light	3.4W x 2
Indicator Light:	
Wattage x Quantity "NEUTRAL"	3.4W x 1
"HIGH BEAM"	3.4W x 1
"TURN"	3.4W x 1
"OIL LEVEL"	3.4W x 1

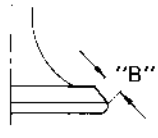
MAINTENANCE SPECIFICATIONS

Engine

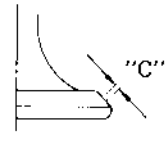
Model	FZR400U/FZR400SUC
Cylinder Head: Warp Limit* 	0.03 mm (0.0012 in) * Lines indicate straightedge measurement
Cylinder: Bore Size Taper Limit Out of Round Limit	 56.000 ~ 56.005 mm (2.2047 ~ 2.2049 in) 0.05 mm (0.002 in) 0.03 mm (0.0012 in)
Camshaft: Drive Method Cam Cap Inside Dia. Camshaft Outside Dia. Shaft-to-Cap Clearance < Limit > Cam Dimensions: Intake "A" < Limit > "B" < Limit >  Exhaust "A" < Limit > "B" < Limit > Camshaft Runout Limit 	 Chain drive (Center) 23.000 ~ 23.021 mm (0.9055 ~ 0.9063 in) 22.967 ~ 22.980 mm (0.9042 ~ 0.9047 in) 0.020 ~ 0.054 mm (0.0008 ~ 0.0021 in) 0.08 mm (0.0031 in) 32.55 ~ 32.65 mm (1.2815 ~ 1.2854 in) 32.51 mm (1.2799 in) 25.045 ~ 25.145 mm (0.986 ~ 0.990 in) 25.005 mm (0.9844 in) 32.25 ~ 32.35 mm (1.2697 ~ 1.2736 in) 32.21 mm (1.2681 in) 25.0 ~ 25.1 mm (0.9843 ~ 0.9882 in) 24.96 mm (0.9827 in) 0.03 mm (0.0012 in)
Cam Chain: Cam Chain Type/No. of Links Cam Chain Adjustment Method Valve, Valve Seat, Valve Guide: Valve Clearance (Cold): IN. EX. Valve Dimensions:	 BF04MA/112 Links Automatic 0.11 ~ 0.20 mm (0.004 ~ 0.008 in) 0.21 ~ 0.30 mm (0.008 ~ 0.012 in)



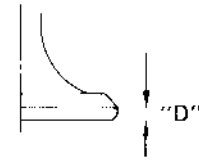
Head Dia.



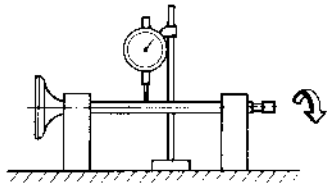
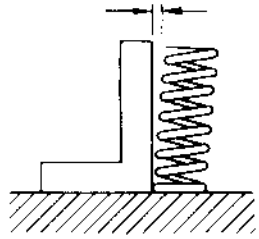
Face Width

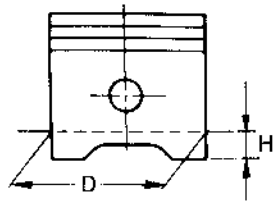
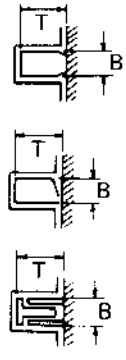
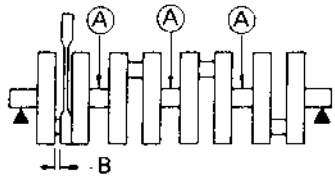


Seat Width



Margin Thickness

Model		FZR400U/FZR400SUC
"A" Head Dia.	IN.	21.9 ~ 22.1 mm (0.8622 ~ 0.8701 in)
	EX.	18.9 ~ 19.1 mm (0.7441 ~ 0.7520 in)
"B" Face Width	IN.	1.6 ~ 2.4 mm (0.0630 ~ 0.0945 in)
	EX.	1.6 ~ 2.4 mm (0.0630 ~ 0.0945 in)
"C" Seat Width	IN.	0.9 ~ 1.1 mm (0.0354 ~ 0.0433 in)
	EX.	0.9 ~ 1.1 mm (0.0354 ~ 0.0433 in)
< Limit >	IN.	1.6 mm (0.063 in)
	EX.	1.6 mm (0.063 in)
"D" Margin Thickness	IN.	0.6 ~ 0.8 mm (0.0236 ~ 0.0315 in)
	EX.	0.6 ~ 0.8 mm (0.0236 ~ 0.0315 in)
< Limit >	IN.	0.4 mm (0.0157 in)
	EX.	0.4 mm (0.0157 in)
Stem Outside Diameter	IN.	4.475 ~ 4.490 mm (0.1762 ~ 0.1768 in)
	EX.	4.460 ~ 4.475 mm (0.1756 ~ 0.1762 in)
< Limit >	IN.	4.45 mm (0.175 in)
	EX.	4.435 mm (0.175 in)
Guide Inside Diameter	IN.	4.500 ~ 4.512 mm (0.1772 ~ 0.1776 in)
	EX.	4.500 ~ 4.512 mm (0.1772 ~ 0.1776 in)
< Limit >	IN.	4.542 mm (0.179 in)
	EX.	4.542 mm (0.179 in)
Stem-to-Guide Clearance	IN.	0.010 ~ 0.037 mm (0.0004 ~ 0.0015 in)
	EX.	0.025 ~ 0.052 mm (0.001 ~ 0.002 in)
< Limit >	IN.	0.08 mm (0.0031 in)
	EX.	0.1 mm (0.0039 in)
Stem Runout Limit		0.02 mm (0.0008 in)
		
Valve Seat Width	IN.	0.9 ~ 1.1 mm (0.0354 ~ 0.0433 in)
	EX.	0.9 ~ 1.1 mm (0.0354 ~ 0.0433 in)
< Limit >	IN.	1.6 mm (0.063 in)
	EX.	1.6 mm (0.063 in)
Valve Spring:		
Free Length	IN.	41.94 mm (1.65 in)
	EX.	41.94 mm (1.65 in)
Installed Length (Valve Closed)	IN.	37.5 mm (1.48 in)
	EX.	37.5 mm (1.48 in)
Compressed Pressure	IN.	14.2 ~ 16.4 kg (31.3 ~ 36.2 lb)
(Valve closed)	EX.	14.2 ~ 16.4 kg (31.3 ~ 36.2 lb)
Tilt Limit	IN.	2.5°/1.8 mm (0.0709 in)
	EX.	2.5°/1.8 mm (0.0709 in)
		
Direction of Winding (Top view)	IN.	
	EX.	

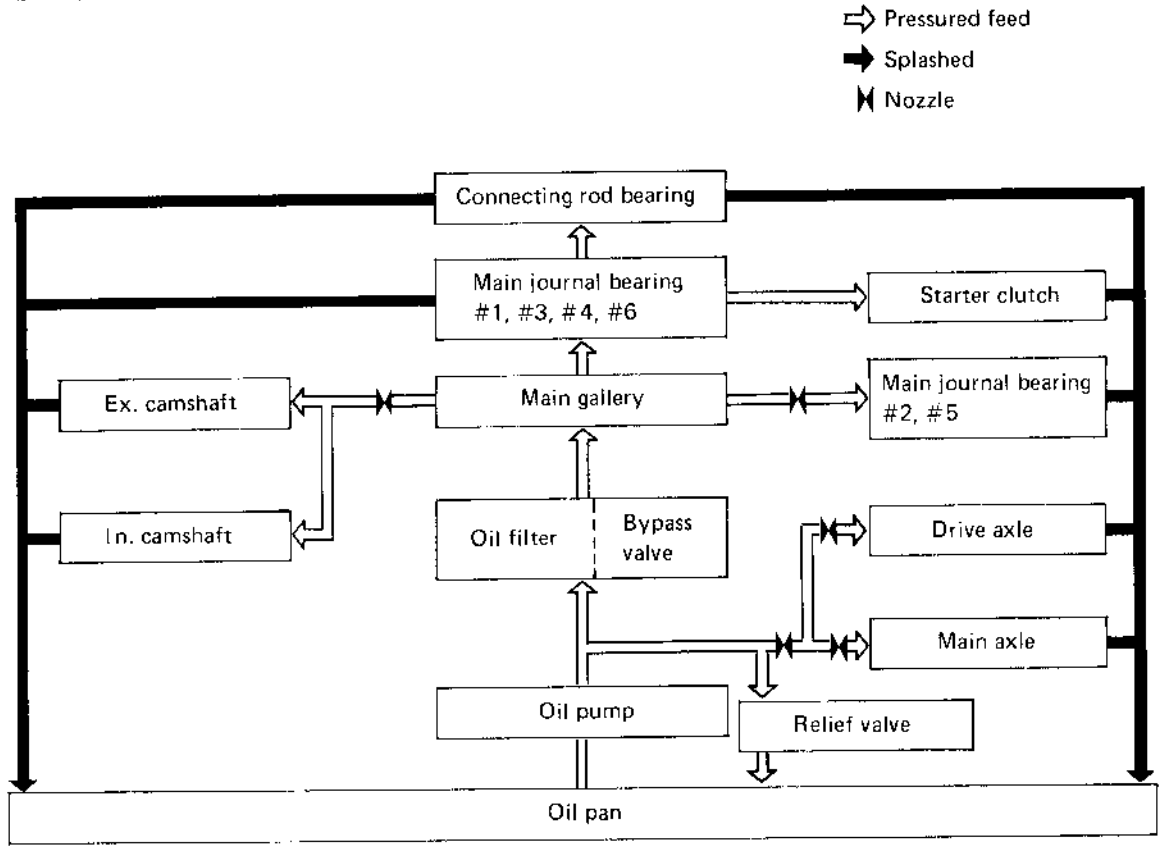
Model	FZR400U/FZR400SUC
Piston: Piston Size "D" Measuring Point "H"  	55.945 ~ 55.960 mm (2.2026 ~ 2.2031 in) 5 mm (0.197 in) (From bottom line of piston skirt)
Piston-to-Cylinder Clearance < Limit > Oversize: 2nd 4th	0.04 ~ 0.06 mm (0.0016 ~ 0.0024 in) < 0.15 mm (0.006 in) > 56.5 mm (2.22 in) 57.0 mm (2.24 in)
Piston Ring: Sectional Sketch  	Top Ring 2nd Ring Oil Ring
	Barrel B = 0.8 mm (0.0315 in) T = 2.1 mm (0.0827 in)
	Taper B = 0.8 mm (0.0315 in) T = 2.1 mm (0.0827 in)
	Expander B = 2.0 mm (0.0787 in) T = 2.2 mm (0.0866 in)
End Gap (Installed): Top Ring 2nd Ring Oil Ring	0.15 ~ 0.30 mm (0.0059 ~ 0.0118 in) 0.15 ~ 0.30 mm (0.0059 ~ 0.0118 in) 0.2 ~ 0.8 mm (0.0079 ~ 0.0315 in)
Side Clearance: Top Ring < Limit > 2nd Ring < Limit > Oil Ring	0.03 ~ 0.07 mm (0.0012 ~ 0.0028 in) 0.10 mm (0.004 in) 0.02 ~ 0.06 mm (0.0008 ~ 0.0024 in) 0.10 mm (0.004 in) —
Connecting Rod: Connecting Rod Oil Clearance Bearing Size No. Color Code	0.043 ~ 0.066 mm (0.0017 ~ 0.0026 in) 1. Blue 2. Black 3. Blown 4. Green
Crankshaft:  	
Runout Limit "A" Big End Side Clearance "B"	0.03 mm (0.0012 in) 0.160 ~ 0.262 mm (0.0063 ~ 0.0103 in)

Model		FZR400U/FZR400SUC
Main Journal Oil Clearance		0.025 ~ 0.043 mm (0.0010 ~ 0.0017 in)
Bearing Size No. Color Code		1. Blue 2. Black 3. Brown 4. Green 5. Yellow
Clutch:		
Friction Plate Thickness x Quantity		2.9 ~ 3.1 mm (0.114 ~ 0.122 in) x 8
Wear Limit		2.8 mm (0.11 in)
Clutch Plate Thickness x Quantity		1.8 ~ 2.2 mm (0.072 ~ 0.085 in) x 7
Warp Limit		0.1 mm (0.04 in)
Clutch Spring Free Length x Quantity		0.1 mm (0.004 in)
Clutch Spring Minimum Length		29.0 mm (1.14 in)
Clutch Housing Thrust Clearance		0.02 ~ 0.10 mm (0.0008 ~ 0.0039 in)
Clutch Release Method		Inner push, screw — push
Push Rod Bending Limit		0.5 mm (0.020 in)
Transmission:		
Main Axle Deflection Limit		0.08 mm (0.0031 in)
Drive Axle Deflection Limit		0.08 mm (0.0031 in)
Shifter:		
Shifter Type		Guide bar
Carburetor:		
Type/Manufacture x Quantity		BD32/MIKUNI x 4
I.D. Mark		3BF-00 (Except for California) 3FH-00 (For California)
Main Jet	(M.J.)	#87.5
Main Air Jet	(M.A.J.)	#60
Jet Needle-Clip Position	(J.N.)	5CFZ2
Needle Jet	(N.J.)	Y-0
Pilot Jet	(P.J.)	#15
Pilot Outlet Size	(P.O.)	0.85
Pilot Air Jet	(P.A.J.)	#130
Pilot Screw	(P.S.)	3½
Valve Seat Size	(V.S.)	1.2
Starter Jet	($G.S_1$)	#27.5
	($G.S_2$)	0.5
Bypass 1	(B.P. 1)	0.8
Bypass 2	(B.P. 2)	0.8
Throttle Valve Size	(Th. V)	#130
Fuel Level	(F.L.)	4.5 ~ 6.5 mm (0.18 ~ 0.26 in) Below from the float chamber line

Model	FZR400U/FZR400SUC
Lubrication System:	
Oil Filter Type	Paper
Oil Pump Type	Trochoid pump
Tip Clearance	0.09 ~ 0.15 mm (0.0035 ~ 0.0060 in)
< Limit >	< 0.2 mm (0.008 in) >
Side Clearance	0.03 ~ 0.08 mm (0.0012 ~ 0.0031 in)
< Limit >	< 0.15 mm (0.006 in) >
Bypass Valve Setting Pressure	80 ~ 120 kPa (0.8 ~ 1.2 kg/cm², 11.38 ~ 17.06 psi)
Relief Valve Operating Pressure	450 ~ 550 kPa (4.5 ~ 5.5 kg/cm², 63.99 ~ 78.21 psi)
Cooling System:	
Radiator Core Size Width	325 mm (12.8 in)
Height	160 mm (6.3 in)
Thickness	32 mm (1.26 in)
Radiator Cap Opening Pressure	74 ~ 103 kPa (0.75 ~ 1.05 kg/cm², 10.7 ~ 14.9 psi)
Reservoir Tank Capacity	
< To Full level >	0.28 L (0.25 Imp qt, 0.30 US qt)
Water Pump	
Type	Single-suction centrifugal pump
Reduction Ratio	89/41 x 48/49 (2.126)

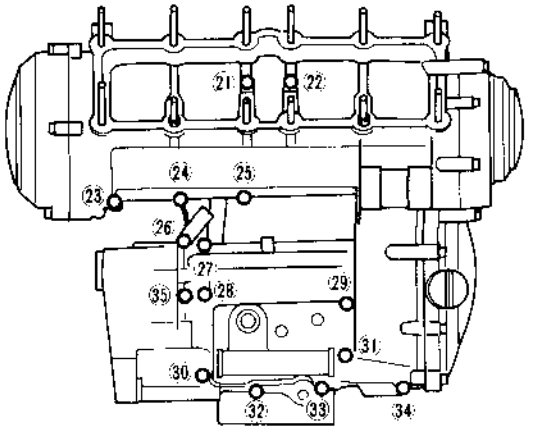
Model	FZR400U/FZR400SUC

Lubrication chart:

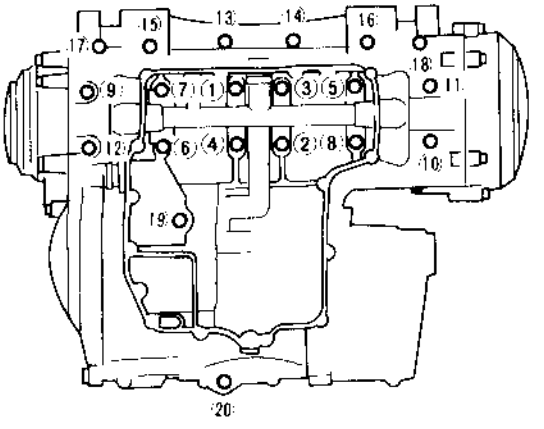


Crankcase Tightening Sequence:

Crankcase (Upper)



Crankcase (Lower)



① ~ ⑫ , ㉚ 8 mm Bolt: 24 Nm (2.4 m·kg, 17 ft·lb)
⑬ ~ ㉙ , ㉛ ~ ㉟ 6 mm Bolt: 12 Nm (1.2 m·kg, 8.7 ft·lb)

TIGHTENING TORQUE

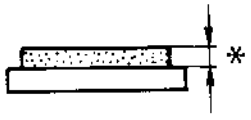
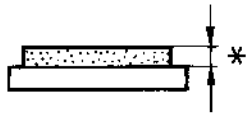
Part to be tightened	Part name	Thread size	Q'ty	Tightening torque			Remarks
				Nm	m·kg	ft·lb	
Camshaft Cap	Flange bolt	M6	24	10	1.0	7.2	
Cylinder Head	Nut	M8	12	25	2.5	18	
Spark Plug	–	M10	4	13	1.3	9.4	
Cylinder Head Cover	Bolt	M6	8	10	1.0	7.2	
Blind Plug (Sand)	Screw	M12	6	37	3.7	27	
Blind Plug (Water)	Screw	M6	3	7	0.7	5.1	
Connecting Rod	Nut	M7	8	23	2.3	17	
Cam Chain Sprocket	Bolt	M7	4	24	2.4	17	
Cam Chain Tensioner	Bolt	M6	2	10	1.0	7.2	
Cam Chain Guide (Intake)	Bolt	M6	2	10	1.0	7.2	
Cam Chain Tensioner End	Cap bolt	M11	1	20	2.0	14	
Pipe Stopper	Bolt	M6	6	10	1.0	7.2	
Thermostat Housing Assembly	Flange bolt	M6	1	10	1.0	7.2	
Thermostat Housing Cover	Bolt	M6	2	10	1.0	7.2	
Radiator	Flange bolt	M6	2	7	0.7	5.1	
Water Pipe Joint	Bolt	M6	4	10	1.0	7.2	
Water Pump	Bolt	M6	2	10	1.0	7.2	
Water Pump Cover	Bolt	M6	2	10	1.0	7.2	
Radiator Cover	Screw	M5	4	5	0.5	3.6	
Oil Pump Housing	Screw	M6	1	7	0.7	5.1	
Oil Pump Mount	Bolt	M6	3	10	1.0	7.2	
Drain Plug	Bolt	M14	1	43	4.3	31	
Oil Delivery Pipe	Bolt	M10	2	20	2.0	14	
Carburetor Joint	Bolt	M6	8	10	1.0	7.2	
Exhaust Pipe	Nut	M6	8	10	1.0	7.2	
Muffler Bracket	Bolt	M8	1	20	2.0	14	
Exhaust Pipe Blind Plug (CO test)	Bolt	M6	4	10	1.0	7.2	
Crankcase	Flange bolt	M8	13	24	2.4	17	
Crankcase	Flange bolt	M6	21	12	1.2	8.7	
Oil baffle plate	Screw	M6	4	7	0.7	5.1	
Crankcase Cover (Left)	Bolt	M6	5	10	1.0	7.2	
Crankcase Cover (Right)	Bolt	M6	10	10	1.0	7.2	
Bearing Plate	Bolt	M6	2	10	1.0	7.2	
Generator Cover	Bolt	M6	5	10	1.0	7.2	
Starter Clutch Cover	Bolt	M6	7	10	1.0	7.2	
Starter Clutch	Flange bolt	M10	1	80	8.0	58	
Starter Clutch Outer and Starter Wheel	Screw	M6	3	10	1.0	7.2	
Pressure Plate	Bolt	M5	5	6	0.6	4.3	
Clutch Boss	Nut	M18	1	70	7.0	51	Use lock washer
Push Lever	Screw	M5	2	5	0.5	3.6	
Push Rod	Nut	M6	1	16	1.6	11	
Drive Sprocket	Nut	M18	1	70	7.0	51	Use lock washer
Stopper Plate	Flange bolt	M6	1	10	1.0	7.2	
A.C. Magneto	Bolt	M10	1	80	8.0	58	
Stator Coil	Bolt	M6	3	10	1.0	7.2	
Pickup Coil	Screw	M5	2	5	0.5	3.6	
Starter Motor	Bolt	M6	2	10	1.0	7.2	
Neutral Switch	Screw	M6	2	4	0.4	2.9	
Oil Level Switch	Flange bolt	M6	2	7	0.7	5.1	

Chassis

Model		FZR400U/FZR400SUC
Steering System:		
Steering Bearing Type		Taper Roller Bearing
Front Suspension:		
Front Fork Travel		130 mm (5.12 in)
Front Spring Free Length		412 mm (16.2 in)
< Limit >		408 mm (16.1 in)
Collar Length		160 mm (6.3 in)
Spring Rate:	K1	4.4 N/mm (0.5 kg/mm, 25.2 lb/in)
	K2	6.6 N/mm (0.7 kg/mm, 37.5 lb/in)
Stroke	K1	0.0 ~ 90 mm (0.0 ~ 3.54 in)
	K2	90 ~ 130 mm (3.54 ~ 5.12 in)
Optional Spring		No
Oil Capacity		444 cm³ (15.6 Imp oz, 15 US oz)
Oil Level (Fully Compression)		92 mm (3.62 in)
		Bellow the top of inner fork tube without fork spring
Oil Grade		Yamaha Fork Oil 10WT or equivalent
Rear Suspension:		
Shock Absorber Travel		50 mm (1.97 in)
Spring Free Length		196.5 mm (7.74 in)
< Limit >		186.5 mm (7.34 in)
Fitting Length		174 mm (6.85 in)
Spring Rate	K1	98.1 N/mm (10 kg/mm, 560 lb/in)
Stroke	K1	0 ~ 50 mm (0.0 ~ 1.97 in)
Optional Spring		No

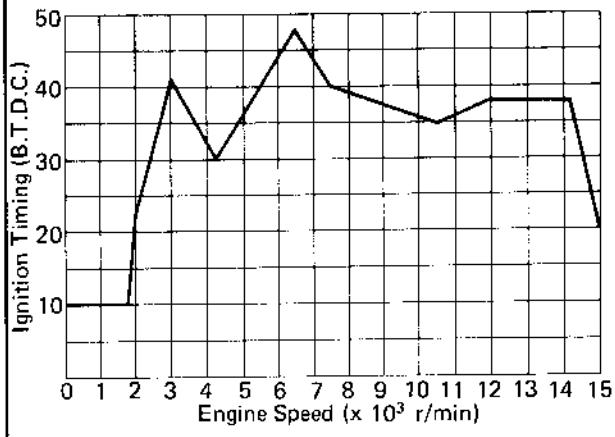
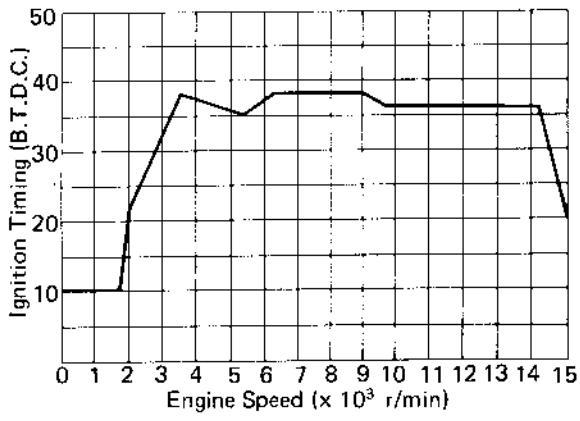
	Hard				STD	Soft	
Adjusting position	7	6	5	4	3	2	1

Swingarm:		
Free Play Limit	End	1.0 mm (0.04 in)
	Side	1.0 mm (0.04 in)
Front Wheel:		
Type		Cast Wheel
Rim Size		MT3.00 x 17
Rim Material		Aluminum
Rim Runout Limit	Radial	1 mm (0.04 in)
	Lateral	0.5 mm (0.02 in)
Rear Wheel:		
Type		Cast wheel
Rim Size		MT4.00 x 18
Rim Material		Aluminum
Rim Runout Limit	Radial	1 mm (0.04 in)
	Lateral	0.5 mm (0.02 in)
Drive Chain:		
Type/Manufacturer		428HVS/DAIDO
No. of Links		130
Chain Free Play		10 ~ 20 mm (0.4 ~ 0.8 in)

Model	FZR400U/FZR400SUC
Front Disc Brake:	
Type	Dual
Disc Outside Diameter x Thickness	282 x 4 mm (11.10 x 0.16 in)
Pad Thickness Inner	5.5 mm (0.22 in)
< Limit >*	0.5 mm (0.02 in)
Pad Thickness Outer	5.5 mm (0.22 in)
< Limit >*	0.5 mm (0.02 in)
	
Master Cylinder Inside Diameter	15.87 mm (0.62 in)
Caliper Cylinder Inside Diameter:	42.85 mm (1.69 in)
Brake Fluid Type	DOT #4 or DOT #3
Rear Disc Brake:	
Type	Single
Disc Outside Diameter x Thickness	210 x 5 mm (8.27 x 0.20 in)
Pad Thickness Inner	5.5 mm (0.22 in)
< Limit >*	0.5 mm (0.02 in)
Pad Thickness Outer	5.5 mm (0.22 in)
< Limit >*	0.5 mm (0.02 in)
	
Master Cylinder Inside Diameter	14.0 mm (0.55 in)
Caliper Cylinder Inside Diameter	38.18 mm (1.5 in)
Brake Fluid Type	DOT #4 or DOT #3
Clutch Lever:	
Clutch Lever Free Play	10 ~ 15 mm (0.4 ~ 0.6 in)
Brake Lever and Brake Pedal:	
Brake Lever Free Play	2 ~ 5 mm (0.08 ~ 0.20 in)
Brake Pedal Position	42 mm (1.7 in) Bellow the top of the footrest.

Part to be tightened	Thread size	Tightening torque		
		Nm	m·kg	ft·lb
Front Axle and Outer Tube	M14 x 1.5	58	5.8	42
Rear Axle and Nut	*M16 x 1.5*	*107*	*10.7*	*77*
Handlebar Crown and Inner Tube	*M8 x 1.25*	*26*	*2.6*	*19*
Handlebar Crown and Steering Stem	M22 x 1.0	110	11.0	80
Brake Caliper (Front/Rear)	M10 x 1.25	35	3.5	25
Bleed Screw and Brake Caliper	M8 x 1.25	6	0.6	4.3
Brake Hose and Union Bolt	M10 x 1.25	26	2.6	19
Front Master Cylinder and Master Cylinder Holder	M6 x 1.0	9	0.9	6.5
Front Master Cylinder and Cylinder Cap	M5 x 0.8	2	0.2	1.4
Front Fender and Outer Tube	M6 x 1.0	6	0.6	4.3
Handlebar and Inner Tube	M8 x 1.25	23	2.3	17
Engine Mounting: Front	M10 x 1.25	55	5.5	40
Rear — Upper	M10 x 1.25	55	5.5	40
Rear — Lower	M10 x 1.25	45	4.5	32
Down Tube and Frame: Front	M10 x 1.25	60	6.0	43
Rear	M8 x 1.25	33	3.3	24
Footrest Bracket and Frame	M8 x 1.25	28	2.8	20
Pivot Axle and Nut	M14 x 1.5	90	9.0	65
Relay Arm and Frame	M10 x 1.25	40	4.0	29
Arm and Swingarm	M10 x 1.25	40	4.0	29
Arm and Relay Arm	M10 x 1.25	40	4.0	29
Swingarm and Frame	M10 x 1.25	40	4.0	29
Rear Shock Absorber	M10 x 1.25	40	4.0	29
Footrest and Footrest Bracket	M10 x 1.25	57	5.7	41
Rear Footrest Bracket and Frame	M8 x 1.25	20	2.0	14
Rear Master Cylinder and Rear Arm Bracket	M8 x 1.25	20	2.0	14
Cowling and Stay	M6 x 1.0	4	0.4	2.9
Tension Bar and Brake Caliper Bracket	M8 x 1.25	28	2.8	20
Front Fork Pinch Bolt	M8 x 1.25	20	2.0	14
Sprocket and Clutch Hub	M8 x 1.25	32	3.2	23
Brake Disc and Clutch Hub	*M8 x 1.25*	*20*	*2.0*	*14*
Inner Tube and Steering Stem	M8 x 1.25	22	2.2	16
Frame and Rear Frame: Upper	M10 x 1.25	64	6.4	46
Lower	M12 x 1.25	88	8.8	64

Electrical

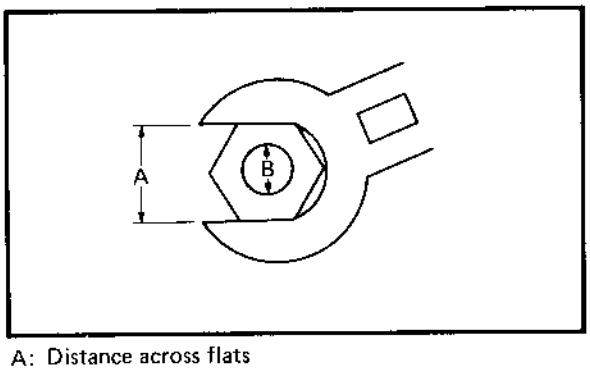
Model	FZR400U/FZR400SUC
Voltage:	12V
Ignition System:	
Ignition Timing (B.T.D.C.)	10° at 1,300 r/min
Advanced Timing (B.T.D.C.)	48° at 6,500 r/min (3BF), 38° at 3,500 r/min (3FH)
Advancer Type	Electrical
3BF: 	3FH: 
T.C.I.:	
Pickup Coil Resistance	85 ~ 115Ω at 20°C (68°F)
(Color)	(White/Red – White/Black)
T.C.I. Unit/Manufacturer	TID14-53A/HITACHI (3BF) TID14-63A/HITACHI (3FH)
Ignition Coil:	
Model/Manufacturer	CM12-30/HITACHI
Minimum Spark Gap	6 mm (0.24 in)
Primary Winding Resistance	1.8 ~ 2.2Ω at 20°C (68°F)
Secondary Winding Resistance	9.6 ~ 14.4kΩ at 20°C (68°F)
Spark Plug Cap Resistance	10 kΩ
Charging System:	
Type	A.C. Magneto Generator
A.C. Generator:	
Model/Manufacturer	FL118-13/HITACHI
Nominal Output	12V, 18A at 5,000 r/min
Stator Coil Resistance	0.44 ~ 0.66Ω at 20°C (68°F)
Voltage Regulator:	
Type	Semi conductor – short circuit
Model/Manufacturer	SH569/SHINDENGEN
No Load Regulated Voltage	14.3 ~ 15.3V
Battery:	
Capacity	12V, 12AH
Specific Gravity	1.280

Model	FZR400U/FZR400SUC
Electrical Starter System:	
Type	Constant mesh type
Starter Motor:	
Model/Manufacturer	SM-7/MITSUBA
Output	0.4kw
Armature Coil Resistance	0Ω at 20°C (68°F)
Brush – Overall Length	11 mm (0.43 in)
< Limit >	5 mm (0.20 in)
– Spring Force	540 ~ 660 g (19.05 ~ 23.28 oz)
Commutator Dia.	23 mm (0.91 in)
Wear Limit	22 mm (0.87 in)
Mica Undercut	1.8 mm (0.07 in)
Starter Switch:	
Model/Manufacturer	A104-128/HITACHI
Amperage Rating	100A
Horn:	
Type/	Plane Type/1 pcs.
Model/Manufacturer	MF-12/NIKKO
Maximum Amperage	1.5A
Flasher Relay (Relay Assembly):	
Type	Semi transistor type
Model/Manufacturer	FX257N/NIPPON DENSO
Self Cancelling Device	Yes
Flasher Frequency	60 ~ 120 cycle/min
Wattage	27W x 2 pcs + 3.4W
Sidestand Relay:	
Model/Manufacturer	G4MW-112IT-010-Y17/OMRON
Coil Winding Resistance	67.5 ~ 82.5Ω at 20°C (68°F)
Diode	No
Oil Level Switch:	
Model/Manufacturer	1WG/NIPPON DENSO
Starting Circuit Cut-Off Relay:	
Model/Manufacturer	G4MW/OMRON
Coil Winding Resistance	67.5 ~ 82.5Ω at 20°C (68°F)
Diode	No
Fuel Pump Relay:	
Model/Manufacturer	G4MW/OMRON
Coil Winding Resistance	67.5 ~ 82.5Ω at 20°C (68°F)
Color Code	Black
Electric Fan:	
Model/Manufacturer	NAAB08/NIPPON DENSO
Thermostat Switch:	
Model/Manufacturer	47X/NIPPON THERMOSTAT
Thermo Unit:	
Model/Manufacturer	11H/NIPPON SEIKI
Circuit Breaker:	
Type	Fuse
Amperage for Individual Circuit x Quantity:	
MAIN	30A x 1
HEADLIGHT	10A x 1
SIGNAL	10A x 1
IGNITION	10A x 1
RESERVE	10A x 1, 30A x 1

GENERAL TORQUE SPECIFICATIONS

This chart specifies torque for standard fasteners with standard I.S.O. pitch threads. Torque specifications for special components or assemblies are included in the applicable sections of this book. To avoid warpage, tighten 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 cm	millimeter centimeter	10^{-3} meter 10^{-2} meter	Length Length
kg	kilogram	10^{3} gram	Weight
N	Newton	1 kg x m/sec^2	Force
Nm m·kg	Newton meter Meter kilogram	N x m m x kg	Torque Torque
Pa N/mm	Pascal Newton per millimeter	N/m^2 N/mm	Pressure Spring rate
L cm^3	Liter Cubic centimeter		Volume or Capacity
r/min	Rotation per minute		Engine Speed

LUBRICATION POINT AND GRADE OF LUBRICANT

ENGINE

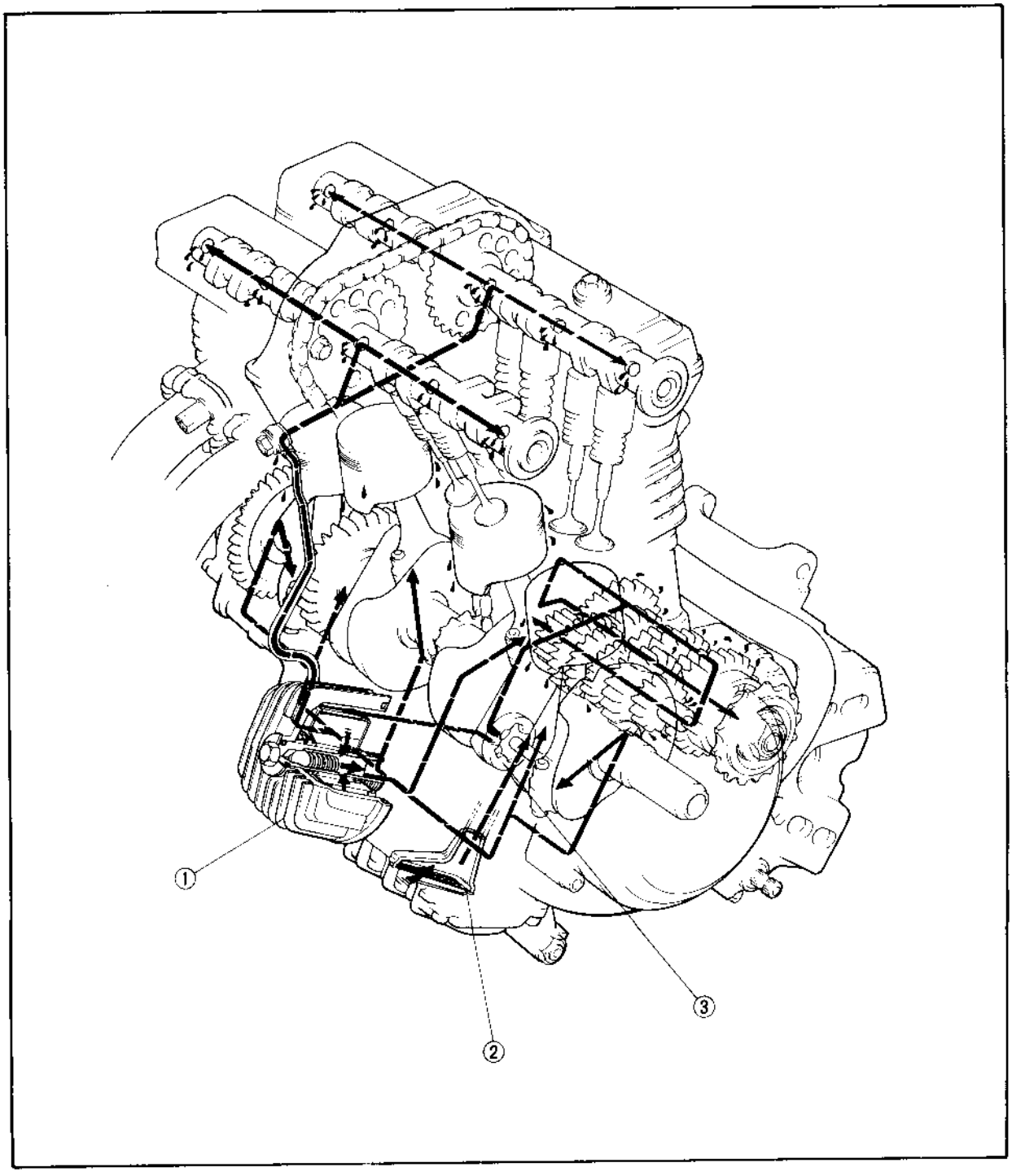
Lubrication Point	Symbol
Oil seal lip	LS
O-Ring	LS
Bearing	E
Piston surface	E
Piston pin	E
Cylinder head bolt	E
Crankshaft pin	E
Crankshaft journal	E
Connecting rod bolt/Nut	M
Camshaft cam lobe/Journal	M
Valve stem (IN, EX)	M
Valve stem end (IN, EX)	E
Valve lifter	E
Water pump impeller shaft	LS
Oil pump rotor (Inner/Outer), housing	E
Oil strainer assembly	E
Idle gear surface/Bearing	E
Starter idle gear	E
Starter idle gear shaft	M
Primary driven gear	E
Transmission gear (Wheel/Pinion)	M
Axe (Main/Drive)	M
Push lever assembly	LS
Push rod	E
Shift cam	E
Shift fork/Guide bar	E
Shift shaft assembly	E
Neutral switch O-Ring	E

CHASSIS

Lubrication Point	Symbol
Steering bearing (Upper/Lower)	LS
Wheel bearing/Axle	LS
Front wheel oil seal (Right/Left)	LS
Rear wheel oil seal	LS
Clutch hub oil seal	LS
Clutch hub fitting area	LS
Rear brake pedal shaft	LS
Change pedal	LS
Side stand sliding surface	LS
Tube guide (Throttle grip) inner surface	LS
Brake lever bolt, sliding surface	LS
Clutch lever bolt, sliding surface	LS
Rear shock absorber (Upper/Lower)	LS
Swingarm pivot bearing	LS
Pivot shaft	LS
Arm bearing	LS
Thrust cover (Inner)	LS
Swingarm bearing (Inner)	LS
Rear footrest ball	LS
Rear footrest pin	LS

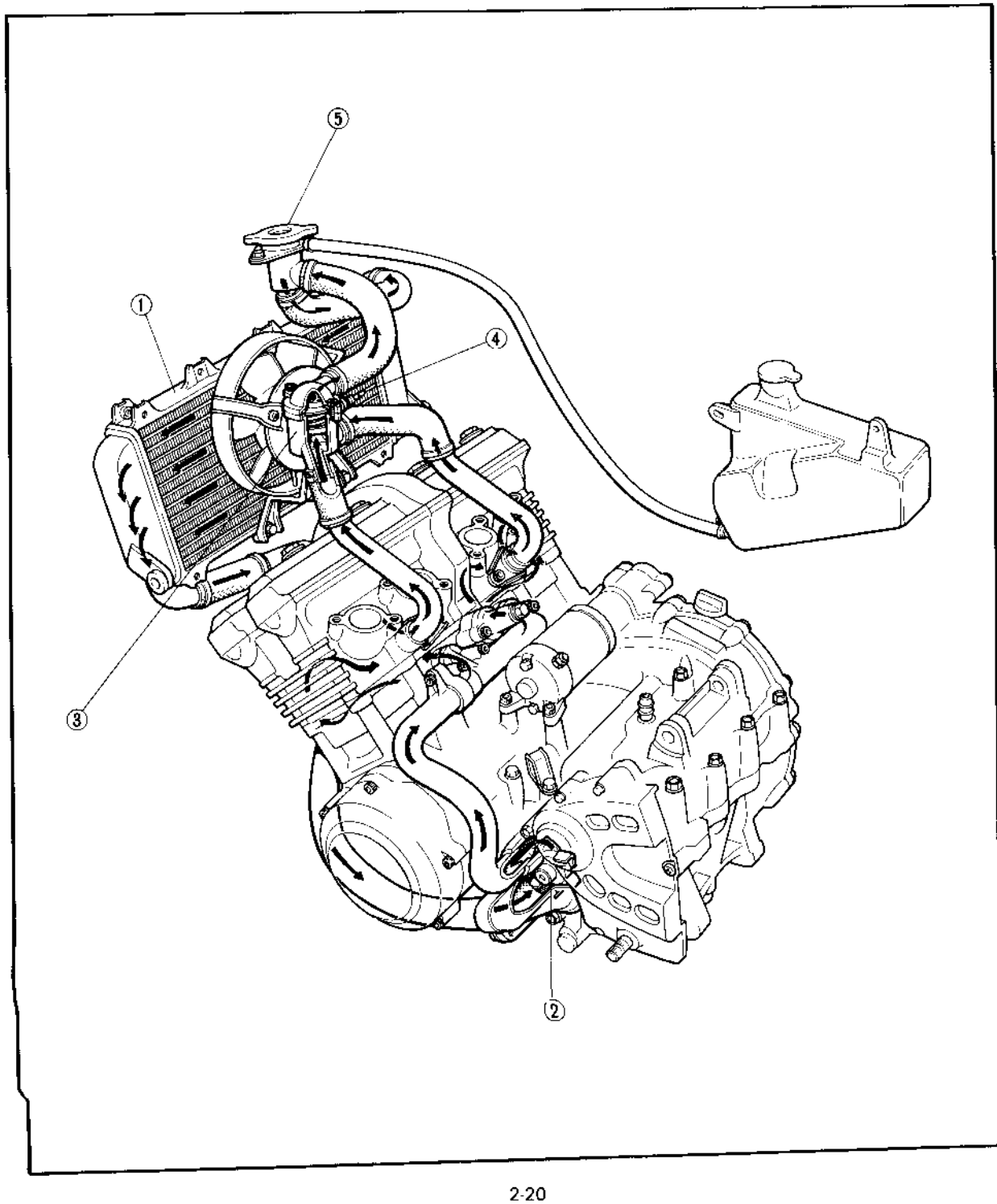
LUBRICATION DIAGRAM

① Oil filter
② Oil strainer
③ Oil pump



COOLANT DIAGRAM

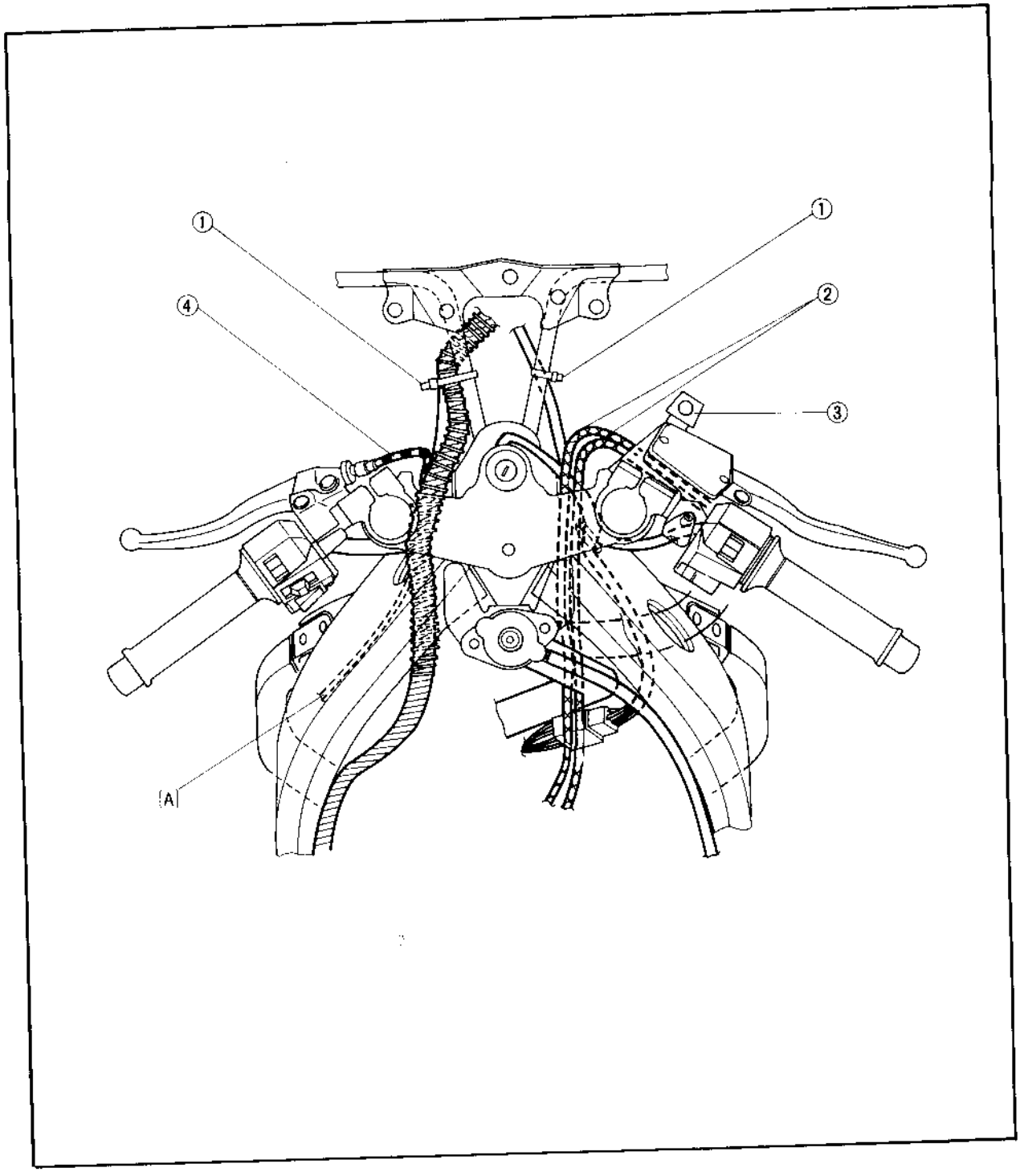
① Radiator
② Water pump
③ Thermostat housing
④ Thermostatic valve
⑤ Radiator cap



CABLE ROUTING (1)

① Band
② Throttle cables
③ Brake hose
④ Clutch cable

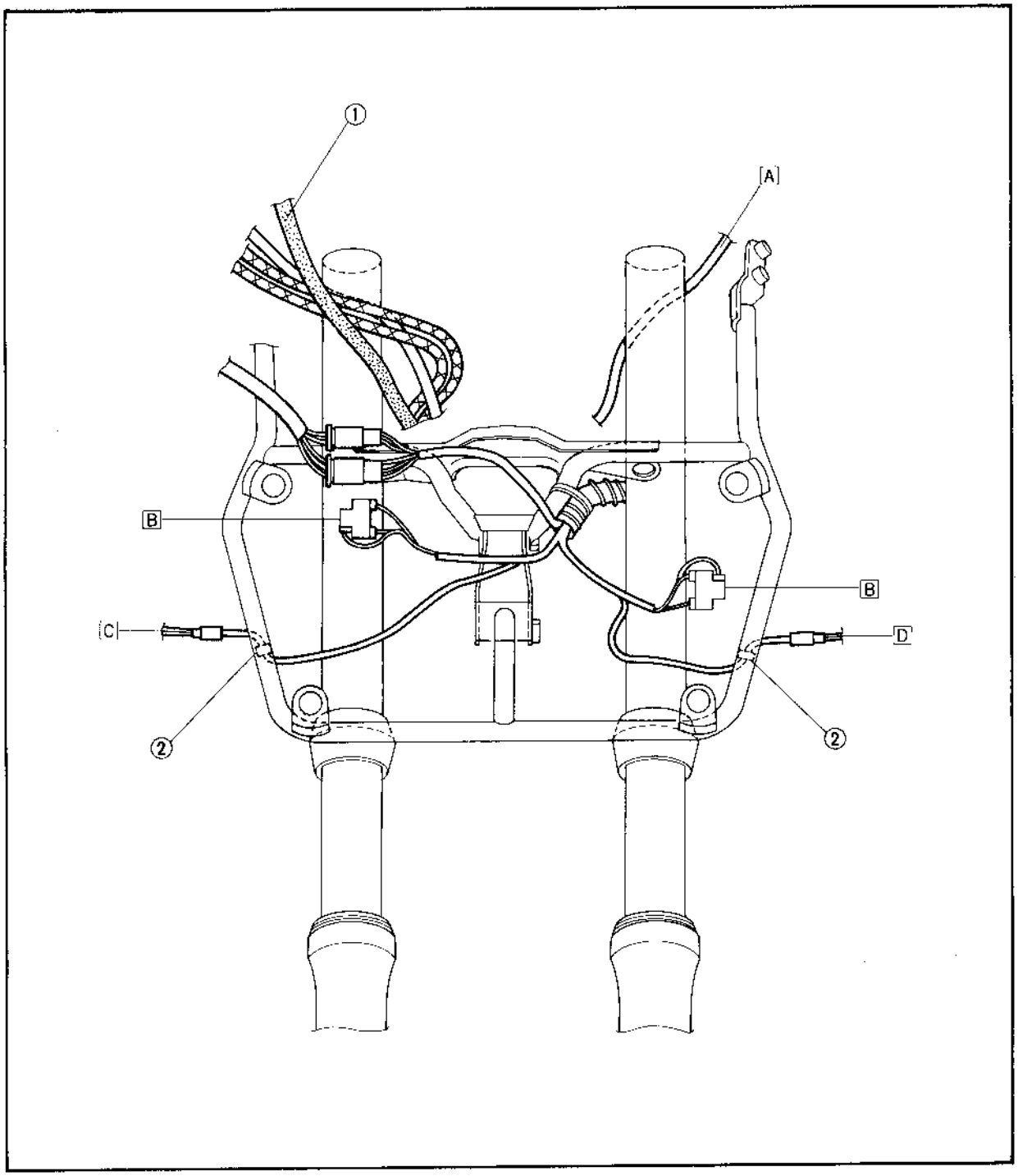
[A] Insert the clutch cable into the frame inner hole.



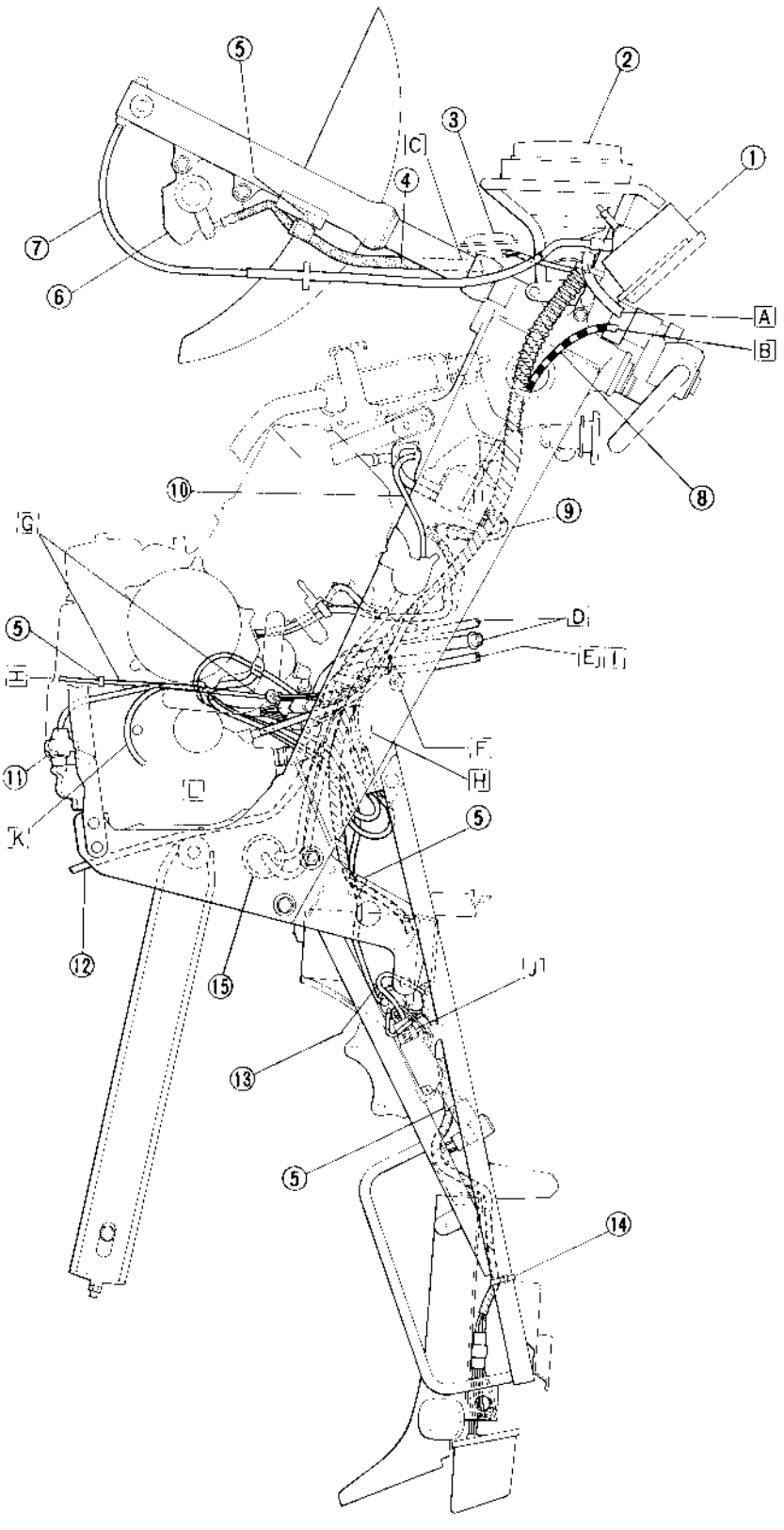
CABLE ROUTING (2)

① Brake hose
② Clamp

[A] Pass the handlebar switch lead (Left) behind the inner tube
[B] To headlight unit
[C] To flasher light (Left)
[D] To flasher light (Right)



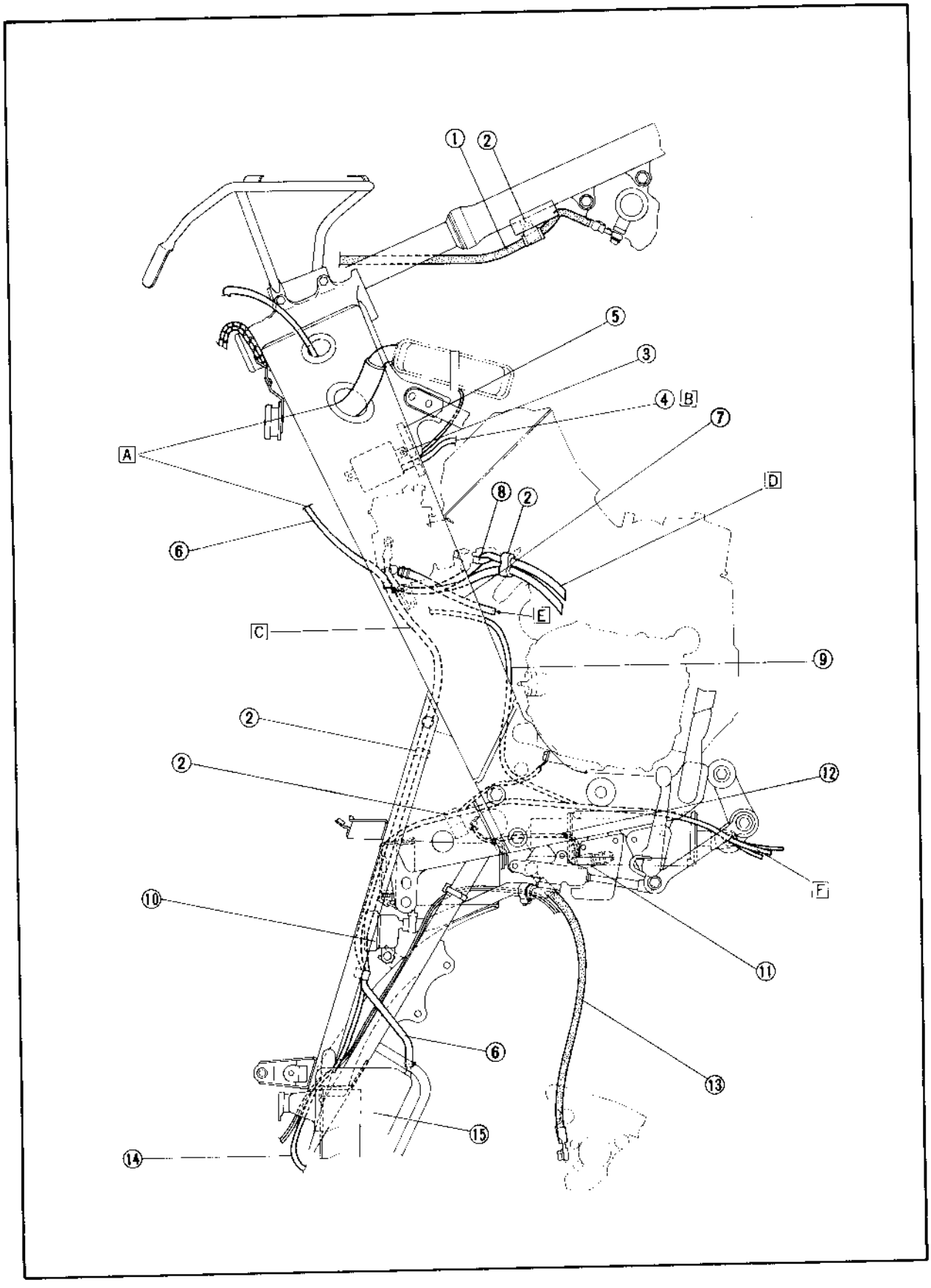
CABLE ROUTING (3)



① Speedometer assembly
② Headlight unit
③ Horn
④ Brake hose
⑤ Clamp
⑥ Front brake caliper (Left)
⑦ Speedometer cable
⑧ Clutch cable
⑨ Ignition coil lead (Left)
⑩ Starter cable
⑪ Sidestand switch
⑫ Air vent hose
⑬ Rectifier/Regulator lead
⑭ Band
⑮ Canister (For California only)

[A] To handlebar switch (Left)
[B] To clutch lever
[C] Pass the speedometer cable outside the inner tube.
[D] To air filter case
[E] To fuel tank
[F] To fuel pump
[G] Pass the sidestand switch lead inside the water pipe.
[H] To oil lever gauge
[I] Get these cords together, put them in the recess on the left inside of the frame, and place the cover on them.
[J] Fasten the lead and the rectifier/regulator together.
[K] Fasten the lead under the water pump installing bolt.
[L] To neutral lead

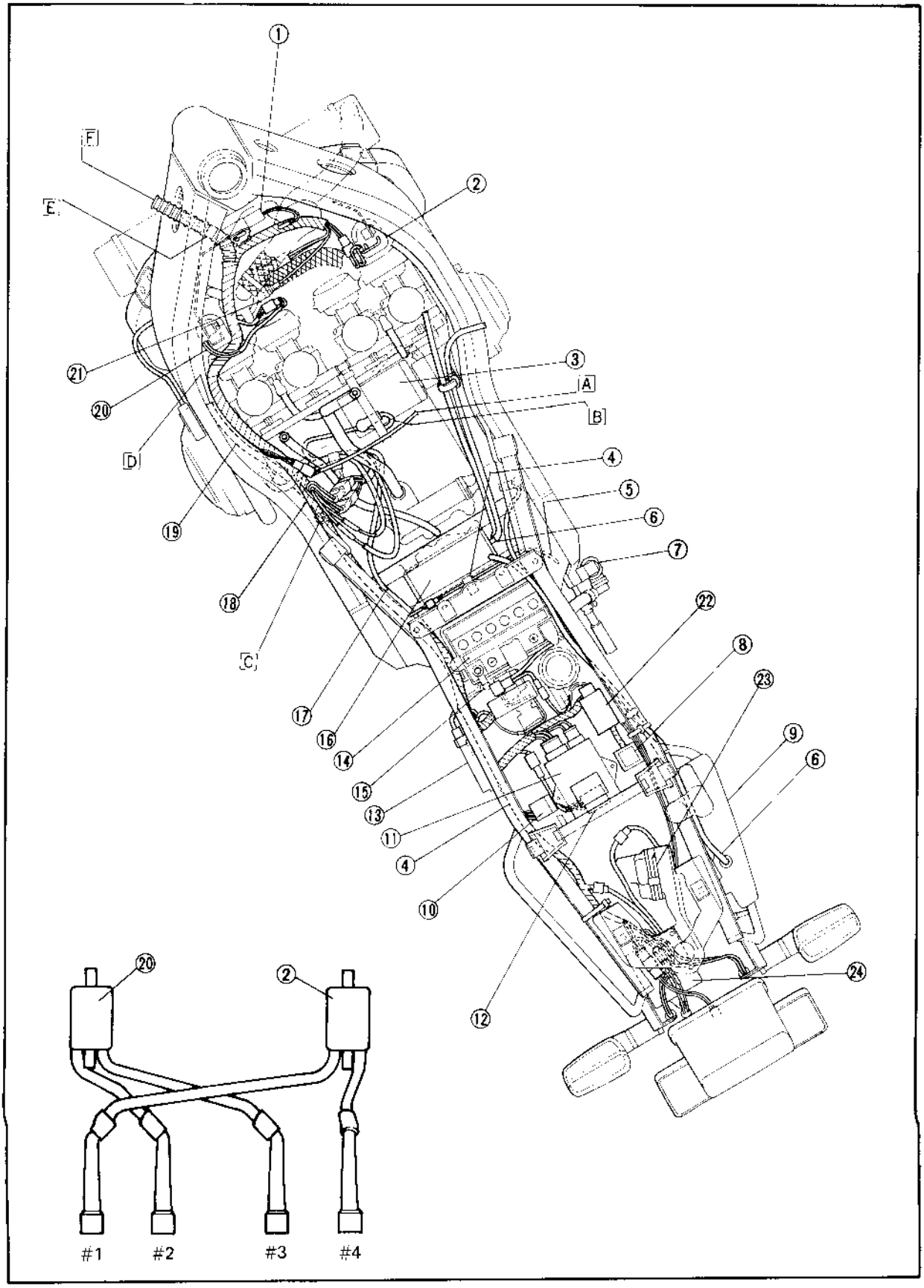
CABLE ROUTING (4)



① Brake hose (Right)
② Clamp
③ Ignition coil (Right)
④ Spark lead (Right)
⑤ Air guide
⑥ Recovery tank hose
⑦ Fuel hose
⑧ Water pipe
⑨ Breather hose (Fuel tank)
⑩ Rear brake reservoir tank
⑪ Rear brake switch
⑫ Rear brake switch lead
⑬ Rear brake hose
⑭ Breather hose (Recovery tank)
⑮ Recovery tank

[A] To radiator cap assembly
[B] Pass the spark lead and fan motor lead along the air guide groove.
[C] Pass the recovery tank hose on the fuel tank bracket.
[D] Pass on the inside of the water pipe the carburetor air vent hose on the side of the #1 and #2 cylinders, and clamp this hose together with the carburetor air vent hose on the side of the #3 and #4 cylinders. Then let these hoses go down in front of the starter motor.
[E] To fuel pump.
[F] Pass breather hose (Fuel tank), Breather hose (Recovery tank) and carburetor air vent hose inside the relay arm.

CABLE ROUTING (5)



① Fuel pump relay
② Ignition coil (Right)
③ Starter motor
④ Clamp
⑤ Rear brake switch lead
⑥ Breather hose (Recovery tank)
⑦ Rear brake master cylinder
⑧ Main fuse
⑨ Recovery tank
⑩ Sidestand relay
⑪ Digital ignitor unit
⑫ Diode assembly
⑬ Rectifier/Regulator
⑭ Battery
⑮ Battery (–) terminal
⑯ Canister (For California only)
⑰ Starter lead
⑱ Generator lead
⑲ Clutch cable
⑳ Ignition coil (Left)
㉑ Thermo unit
㉒ Relay assembly
㉓ Exup servo motor (For California only)
㉔ Exup control unit (For California only)

[A] To fuel pump
[B] Pass the starter motor lead under the starter motor.
[C] Pass on the inside of the water pipe the carburetor air vent hose on the side of the #1 and #2 cylinders, and clamp this hose together with the carburetor air vent hose on the side of the #3 and #4 cylinders. Then let these hoses go down in front of the starter motor.
[D] To clutch lever
[E] Locate the wire harness with its white taped portion in line with the hole on the inside of the tank rail.
[F] To headlight unit



PERIODIC INSPECTIONS AND ADJUSTMENTS

INTRODUCTION

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

MAINTENANCE INTERVALS CHART

Proper periodic maintenance is important. Especially important are the maintenance services related to emissions controls. These controls not only function to ensure cleaner air but are also vital to proper engine operation and maximum performance. In the following maintenance tables, the services related to emissions control are grouped separately.

PERIODIC MAINTENANCE EMISSION CONTROL SYSTEM

No.	Item	Remarks	Initial	Odometer readings				
			1,000 km or 1 month (600 mi)	**1 7,000 km or 7 months (4,400mi)	**2 13,000 km or 13 months (8,200mi)	19,000 km or 19 months (12,000mi)	**3 25,000 km or 25 months (15,800mi)	31,000 km or 31 months (19,600mi)
1*	Valve clearance	Check and adjust valve clearance when engine is cold.					○	
2	Spark plug	Check condition. Adjust gap and clean. Replace at 13,000 km (or 13 months) and thereafter every 12,000 km (or 12 months).		○	Replace	○	Replace	○
3*	Crankcase ventilation system	Check ventilation hose for cracks or damage. Replace if necessary.		○	○	○	○	○
4*	Fuel line	Check fuel hose and vacuum pipe for cracks or damage. Replace if necessary.		○	○	○	○	○
5*	Fuel filter	Replace initial 31,000 km (19,600 mi) and thereafter every 30,000 km (19,000 mi).						Replace
6*	Exhaust system	Check for leakage. Retighten if necessary. Replace gasket(s) if necessary.		○	○	○	○	○
7*	Carburetor synchronization	Adjust synchronization of carburetors.	*○	○	○	○	○	○
8*	Idle speed	Check and adjust engine idle speed. Adjust cable free play.		○	○	○	○	○

*It is recommended that these items be serviced by a Yamaha dealer or other qualified mechanic.

NOTE:

For father odometer reading, repeat the above maintenance at the period established; **1: Every 6,000 km (3,800 mi), **2: Every 12,000 km (7,600 mi), and **3: Every 24,000 km (15,200 mi) intervals.

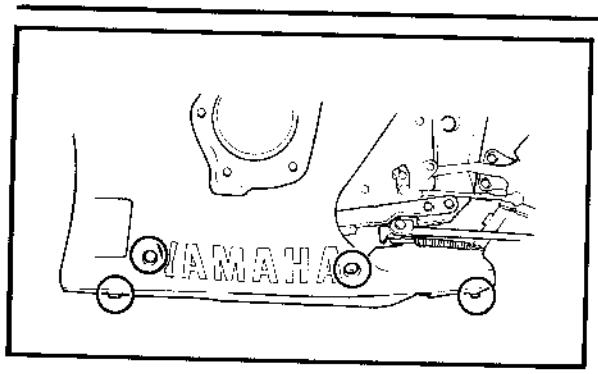
GENERAL MAINTENANCE/LUBRICATION

No.	Item	Remarks	Type	Initial	Odometer readings				
				1,000 km or 1 month (600 mi)	**1 7,000 km or 7 months (4,400 mi)	**2 13,000 km or 13 months (8,200 mi)	19,000 km or 19 months (12,000 mi)	**3 25,000 km or 25 months (15,800 mi)	31,000 km or 31 months (19,600 mi)
1	Engine oil	Warm-up engine before draining	*1)Yamalube 4-cycle oil or SAE 20W40 type "SE" motor oil *2)SAE 10W30 type "SE" motor oil	○	○	○	○	○	○
2*	Oil filter	Replace.	–	○		○		○	
3*	Air filter	Clean with compressed air. Replace if necessary.	–		○	○	○	○	○
4	Cooling system	Check hose for cracks or damage, replace if necessary.	–		○	○	○	○	○
		Replace coolant 24 months.	Ethylene glycol anti-freeze coolant					Replace	
5*	Brake system	Adjust free play. Replace pads if necessary.	–	○	○	○	○	○	○
6	Drive chain	Check chain condition. Adjust and lubricate chain thoroughly.	SAE 30W-50W motor oil.		Every 500 km (300 mi)				
7	Control and meter cable	Apply chain lube thoroughly.	Yamaha chain and cable lube or SAE 10W30 motor oil.	○	○	○	○	○	○
8*	Rear arm pivot shaft and rear suspension link pivots.	Apply grease lightly.	Lithium soap base grease.					○	
9	Brake/ clutch lever pivot shaft	Apply chain lube lightly.	Yamaha chain and cable lube or SAE 10W30 motor oil.		○	○	○	○	○
10	Brake pedal and change pedal shaft	Lubricate. Apply chain lube lightly.	Yamaha chain and cable lube or SAE 10W30 motor oil.		○	○	○	○	○

No.	Item	Remarks	Type	Initial	Odometer readings				
				1,000 km or 1 month (600 mi)	**1 7,000 km or 7 months (4,400 mi)	**2 13,000 km or 13 months (8,200 mi)	19,000 km or 19 months (12,000 mi)	**3 25,000 km or 25 months (15,800 mi)	31,000 km or 31 months (19,600 mi)
11*	Side stand pivot	Check operation and lubricate. Apply chain lube lightly.	Yamaha chain and cable lube or SAE 10W30 motor oil.		○	○	○	○	○
12*	Front fork oil	Check operation and leakage.	Yamaha Fork Oil 10WT or equivalent		○	○	○	○	○
13*	Steering bearing	Check bearings assembly for looseness. Moderately repack every 24,000 km (15,000 mi).	Medium weight wheel bearing grease.		○	○	○	Repack	○
14*	Wheel bearings	Check bearings for smooth rotation.	–		○	○	○	○	○
15	Battery	Check specific gravity and breather pipe for proper operation.	–		○	○	○	○	○
16*	Sidestand switch	Check and clean or replace if necessary.	–	○	○	○	○	○	○

*1) If ambient temperature does not go below 5°C (41°F).
*2) If ambient temperature does not go below 15°C (59°F).
* It is recommended that these items be serviced by a Yamaha dealer or other qualified mechanic.

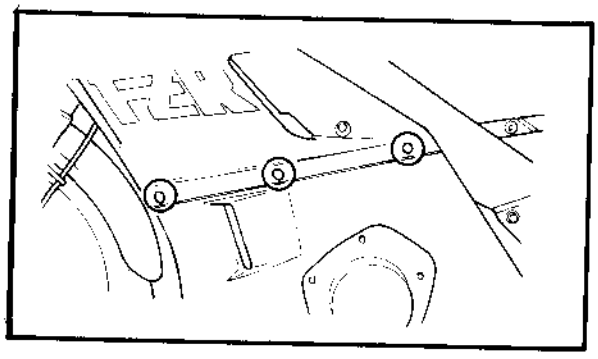
NOTE:
For farther odometer reading, repeat the above maintenance at the period established, **1: Every 6,000 km (3,800 mi), **2: Every 12,000 km (7,600 mi) and **3: Every 24,000 km (15,200 mi) intervals.

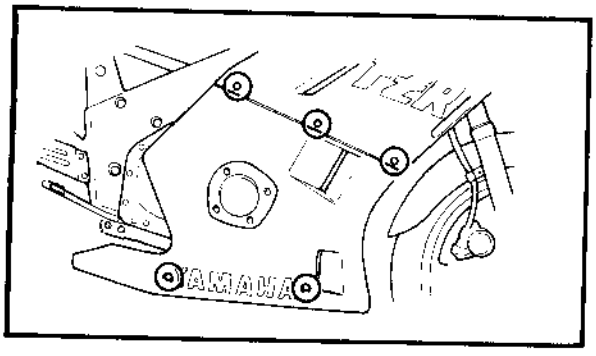


COWLING REMOVAL AND INSTALLATION

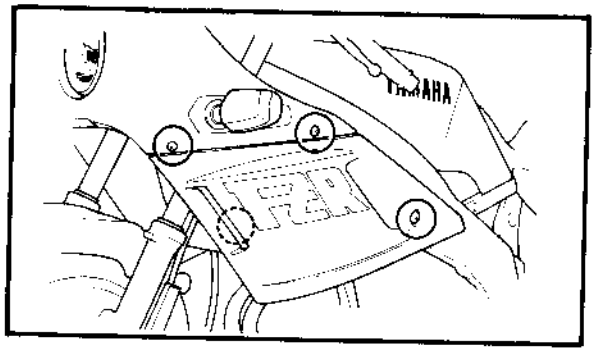
REMOVAL

1. Remove:
   - Lower cowling (Left)

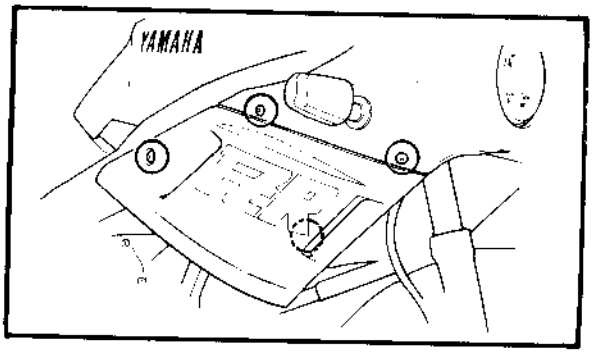




2. Remove:
   - Lower cowling (Right)



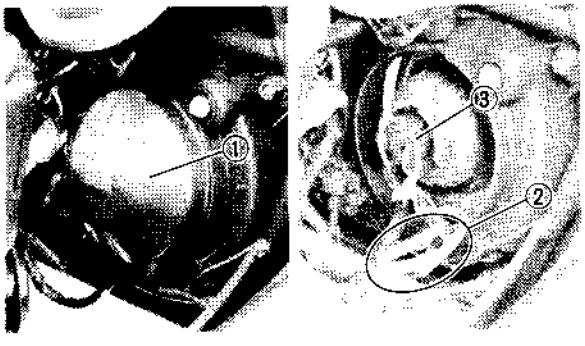
3. Remove:
   - Center cowling (Left)



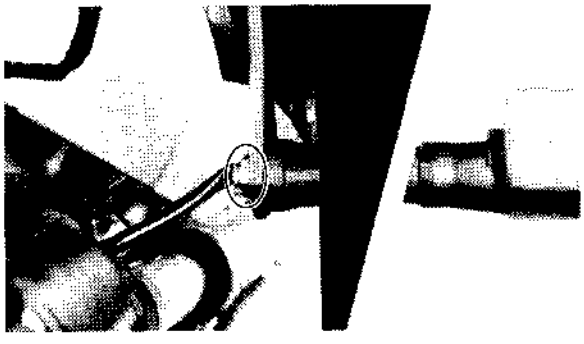
4. Remove:
   - Center cowling (Right)



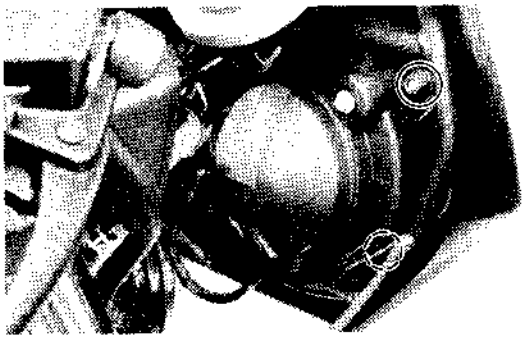
5. Remove:
   - Rear view mirrows (Left and right)



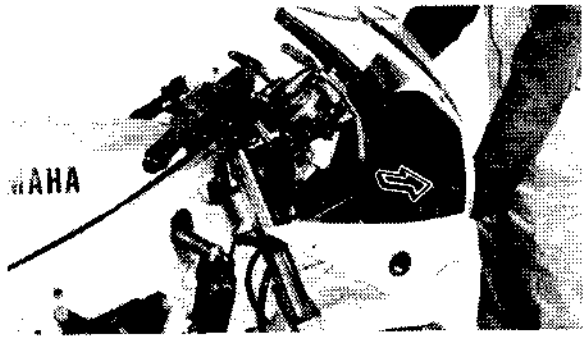
6. Remove:
   - Headlight covers (Left and right) ①
7. Disconnect:
   - Flasher light leads (Left and right) ②
   - Headlight coupler ③

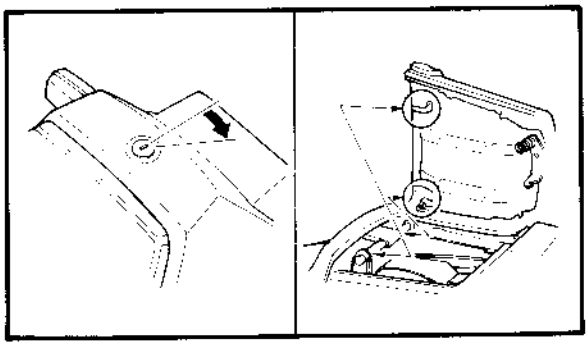


8. Remove:
   - Flasher lights (Left and right)



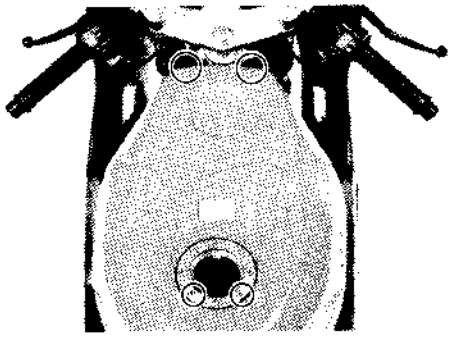
9. Remove:
   - Upper cowling

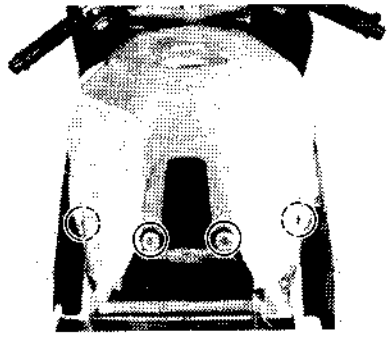




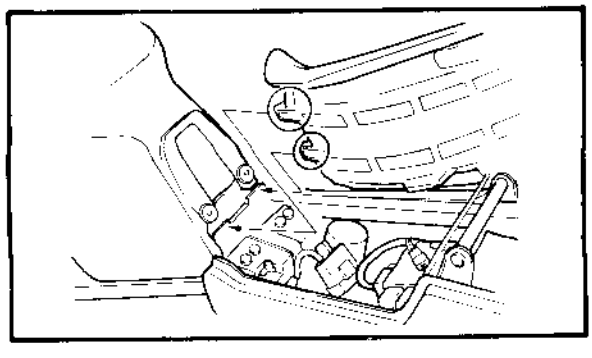
10. Remove:
    • Seat

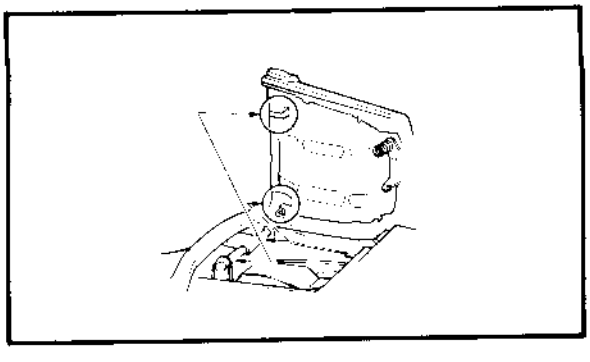
NOTE:
To open the seat lock, insert the key in the lock and turn it clockwise.





11. Remove:
    • Top cover



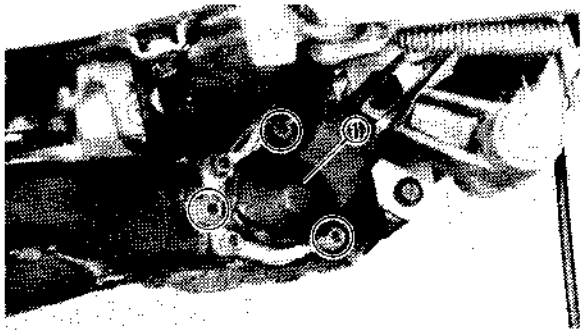


INSTALLATION

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

1. Install:
    • Seat

NOTE:
- Make sure that the seat is securely fitted.
- When reinstalling the seat, insert the lobes on the seat front into the receptacles on the frame, then push down the seat.



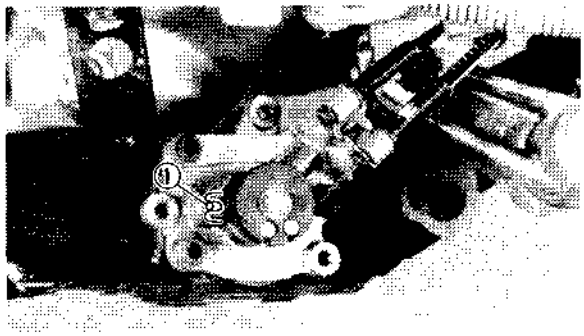
ENGINE

EXUP CABLE ADJUSTMENT (For California only)

1. Remove:
   - Lower cowling (Left)
   - Seat

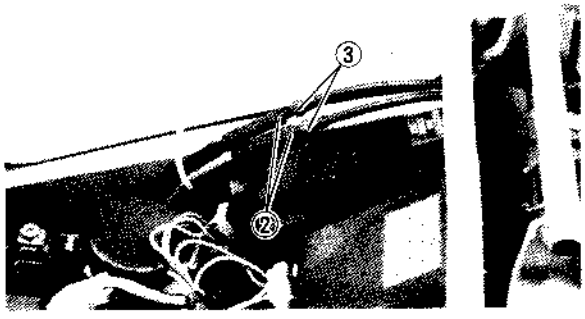
   Refer to the "COWLINGS REMOVAL AND INSTALLATION – REMOVAL" section.
2. Remove:
   - Valve cover ①
3. Turn on the main switch.

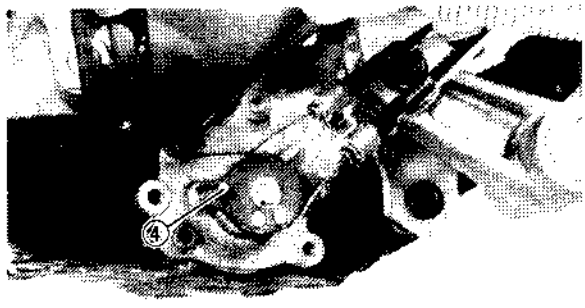
NOTE:
If does not operate EXUP servo motor, refer to the "YAMAHA EXHAUST VARIABLE VALVE SYSTEM" section in the CHAPTER 8.



4. Check:
   - Alignment mark ①

   Not aligned → Adjust EXUP cables.
5. Adjust:
   - EXUP cables

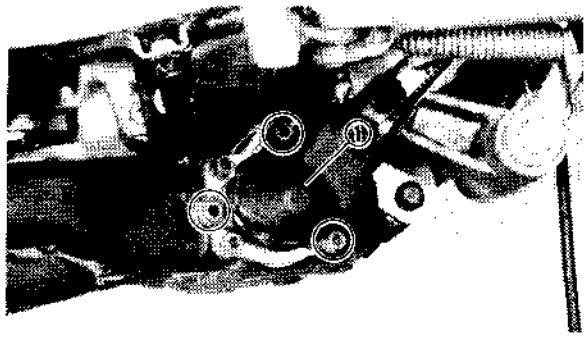




Adjustment steps:
- Loosen both locknuts ② and turn in both adjuster ③ .
- Insert a [φ4 mm (φ0.16 in)] pin ④ through the aligning indent in the pulley and into the hole.
- Turn both adjusters, counterclockwise so that the cables free play becomes Zero mm (Zero in) with fingers.
- Turn both adjuster 1/2 turn clockwise.
- Tighten the locknuts.

Locknuts:
8 Nm (0.8 m·g, 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 step.



7. Install:
   - Valve cover ①

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

VALVE CLEARANCE ADJUSTMENT

⚠ WARNING:

The engine must be cool before servicing the valve clearance.

NOTE:

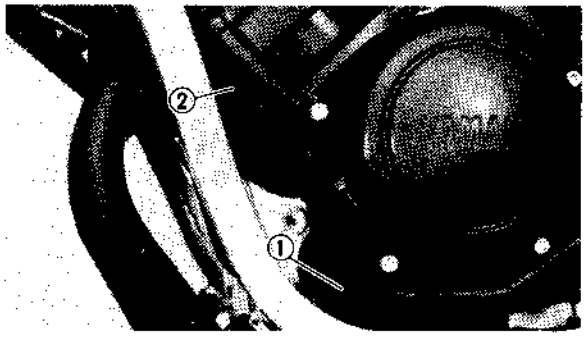
Measure and adjust valve clearance when piston is at TDC on compression stroke.

REMOVAL

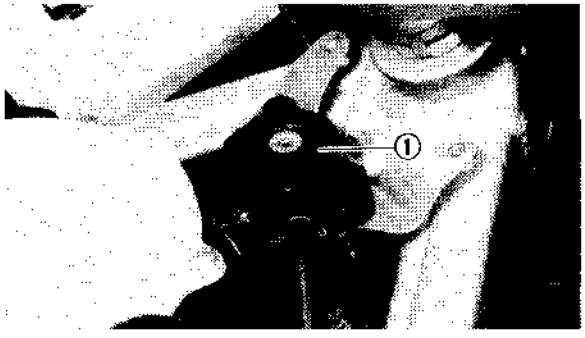
1. Remove:
   - Lower cowlings (Left and Right)
   - Center cowlings (Left and Right)
   - Seat

   Refer to the "COWLING REMOVAL AND INSTALLATION – REMOVAL" section.
2. Remove:
   - Fuel tank

   Refer to the "CARBURETOR – REMOVAL" section in the CHAPTER 6.
3. Place a drain pan under the drain bolts.

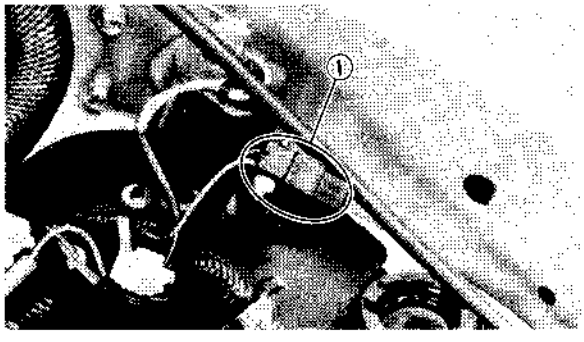


4. Remove:
   - Drain bolt (Outlet pipe) ①
   - Drain bolt (Cylinder) ②

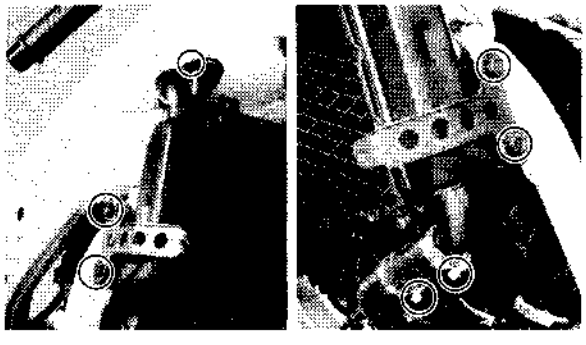


5. Remove:
   - Radiator cap ①

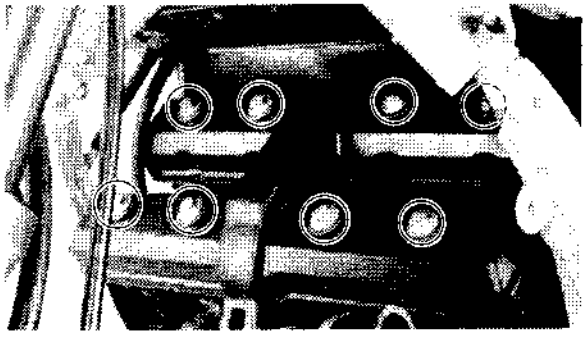
6. Drain:
   - Cooling system
     Refer to the "COOLANT REPLACEMENT" section.



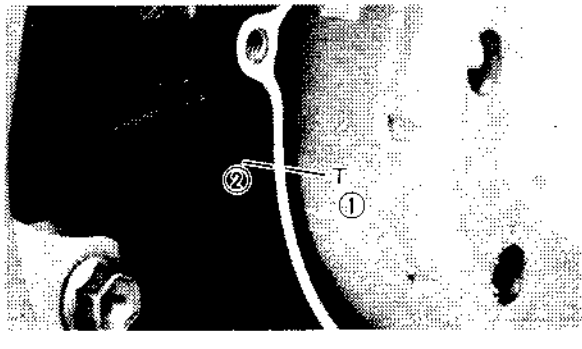
7. Disconnect:
   - Fan motor coupler ①



8. Disconnect:
   - Hose (Radiator – Inlet)
   - Hose (Radiator – Outlet)
9. Remove:
   - Radiator



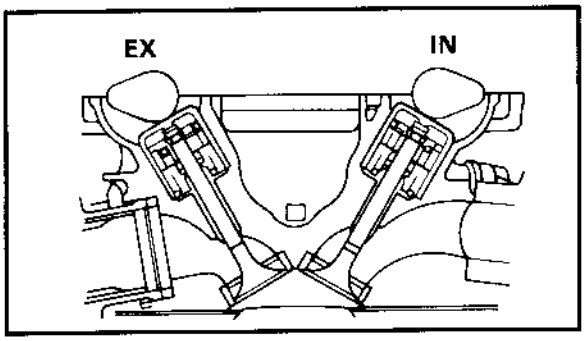
10. Remove:
    - Spark plug leads
    - Cylinder head cover
    - Generator cover

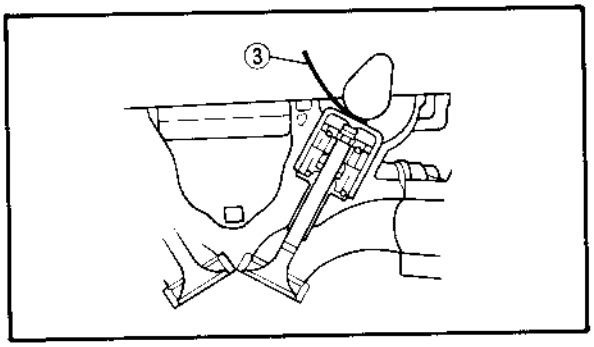


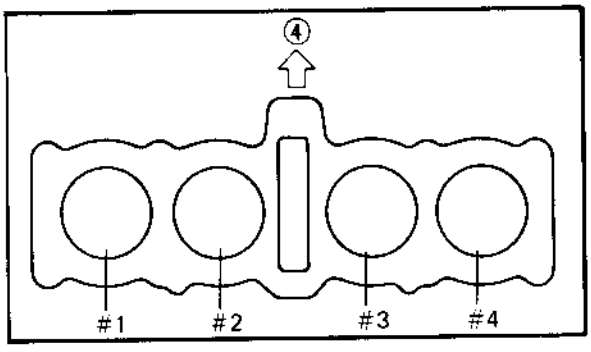
Valve Clearance Measurement

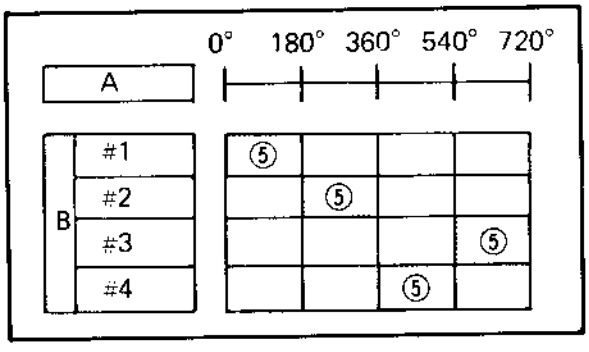
1. Measure:
   - Valve clearance

Valve clearance measurement steps:
- Turn the crankshaft counterclockwise.
- Align the "T" mark ① on the magneto with the crankcase end ② when #1 piston is at TDC on compression stroke.









NOTE:
Compression T.D.C. can be found when the cam lobes are apart from each other, as shown.

- Measure the valve clearance using Thickness Gauge ③.
  Out of specification → Adjust valve clearance.

Intake Valve (Cold):
0.11 ~ 0.20 mm (0.004 ~ 0.008 in)
Exhaust Valve (Cold):
0.21 ~ 0.30 mm (0.008 ~ 0.012 in)

- Record the measured amount if the clearance is incorrect.
- Measure the valve clearance in sequence, for #2, 4 and #3 cylinders.
  Out of specification → Adjust valve clearance.

Firing Sequence:
#1 → #2 → #4 → #3

④ Front

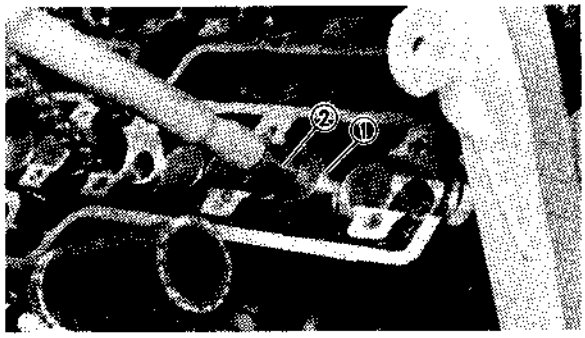
NOTE:
Turn crankshaft each degrees counterclockwise from #1 Cylinder TDC.

#2 Cylinder	180 degrees
#4 Cylinder	360 degrees
#3 Cylinder	540 degrees

[A] Crankshaft counterclockwise turning angle
[B] Cylinder
⑤ Combustion

Adjusting Pad Replacement

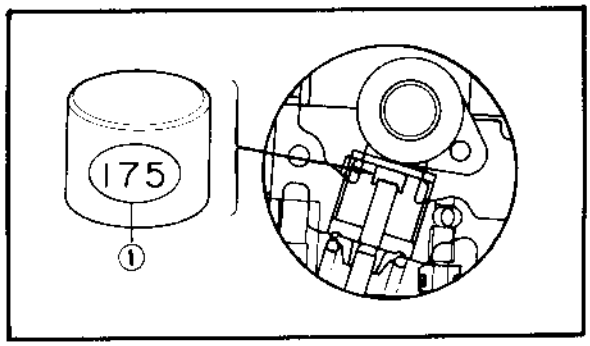
1. Remove:
   - Cam chain tensioner
   - Chain guide (Upper)
   - Chain guide (Exhaust side)
   - Cam caps
   - Cam chain
   - Cam shafts



NOTE:
Refer to the "ENGINE DISASSEMBLY CAMSHAFT AND CYLINDER HEAD – Procedure 2", in the CHAPTER 4.
Fasten the wire to the cam chain to prevent it from falling into the crankcase.

2. Remove:
   - Valve lifter ①
   - Pad
     Use valve lapper ②
     Record the installed pad number.

NOTE:
- Place a piece of rug in the cam chain room to prevent the pad from falling into the crankcase.
- Remove the rug after adjustment.



3. Select:
   - Proper pad

Proper pad selection steps:
- Select the proper pad from the table:

Pad range		Pad Availability: 25 increments
No. 120 ~ No. 240	1.20 mm (0.047 in) 2.40 mm (0.094 in)	Pads stepped in 0.05 mm (0.002 in) increments

NOTE:
Thickness ① of each pad is marked on the pad side wall.

- Round off the hundredths digit of the installed pad number to the nearest 0.05 mm increment.

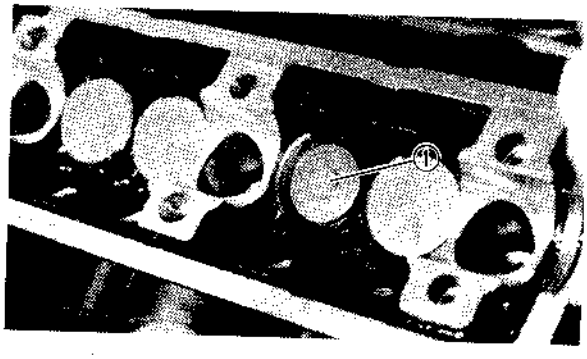
Hundredths digit	Rounded valve
0 or 2	0
5	(NOT ROUNDED OFF)
8	10

EXAMPLE:
Installed pad number = 148 (1.48 mm)
Rounded off digit = 150

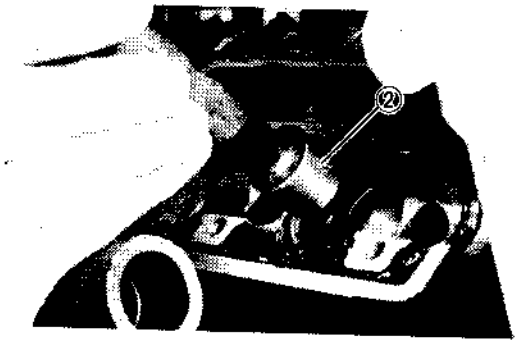
NOTE:
Pads can only be selected in 0.05 mm (0.002 in) increments.

- Locate the "Rounded off Pad Number" on the chart, and then find the measured valve clearance. The point where these coordinates intersect is the new pad number.

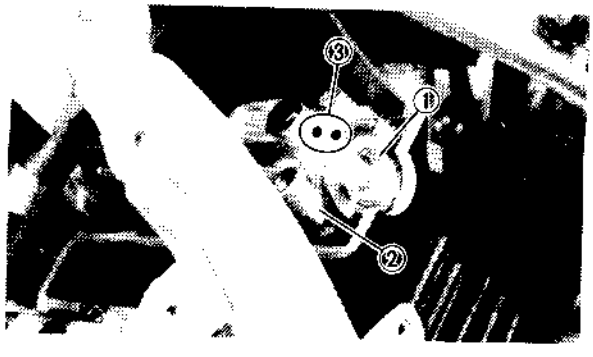
NOTE:
Use the new pad number as a guide only as the number must be verified.



4. Install:
   - Pad (New) ①
5. Install:
   - Valve lifter ②



NOTE:
- Apply molybdenum disulfide grease to the pad.
- Valve lifter must be rotated smoothly by a finger.



5. Install:
   - Camshafts ①
   - Cam chain
   - Camshaft caps ②



Bolts (Camshaft Cap):
10 Nm (1.0 m·kg, 7.2 ft·lb)

NOTE:
- Install the exhaust camshaft first.
- Align the matching marks ③.
- Apply molybdenum disulfide grease to the camshafts and cam caps.

INTAKE

B MEASURED CLEARANCE	A INSTALLED PAD NUMBER																								
	120	125	130	135	140	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240
0.00 ~ 0.02				120	125	130	135	140	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225
0.03 ~ 0.07			120	125	130	135	140	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230
0.08 ~ 0.10		120	125	130	135	140	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235
0.11 ~ 0.20	RECOMMENDED CLEARANCE																								
0.21 ~ 0.22	125	130	135	140	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240	
0.23 ~ 0.27	130	135	140	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240		
0.28 ~ 0.32	135	140	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240			
0.33 ~ 0.37	140	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240				
0.38 ~ 0.42	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240					
0.43 ~ 0.47	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240						
0.48 ~ 0.52	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240							
0.53 ~ 0.57	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240								
0.58 ~ 0.62	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240									
0.63 ~ 0.67	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240										
0.68 ~ 0.72	175	180	185	190	195	200	205	210	215	220	225	230	235	240											
0.73 ~ 0.77	180	185	190	195	200	205	210	215	220	225	230	235	240												
0.78 ~ 0.82	185	190	195	200	205	210	215	220	225	230	235	240													
0.83 ~ 0.87	190	195	200	205	210	215	220	225	230	235	240														
0.88 ~ 0.92	195	200	205	210	215	220	225	230	235	240															
0.93 ~ 0.97	200	205	210	215	220	225	230	235	240																
0.98 ~ 1.02	205	210	215	220	225	230	235	240																	
1.03 ~ 1.07	210	215	220	225	230	235	240																		
1.08 ~ 1.12	215	220	225	230	235	240																			
1.13 ~ 1.17	220	225	230	235	240																				
1.18 ~ 1.22	225	230	235	240																					
1.23 ~ 1.27	230	235	240																						
1.28 ~ 1.32	235	240																							
1.33 ~ 1.37	240																								

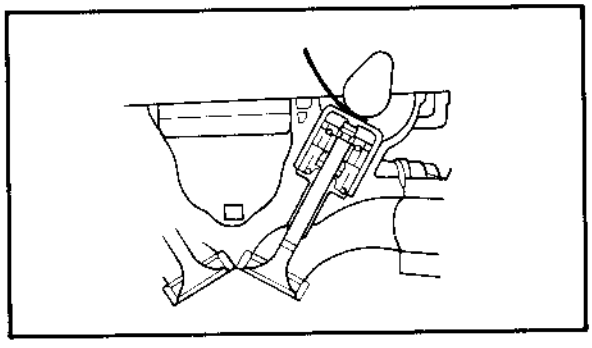
VALVE CLEARANCE (cold):
0.11 ~ 0.20 mm (0.004 ~ 0.008 in)
Example: Installed is 170
Measured clearance is 0.24 mm (0.009 in)
Replace 170 pad with 180 pad

EXHAUST

B MEASURED CLEARANCE	A INSTALLED PAD NUMBER																								
	120	125	130	135	140	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240
0.00 ~ 0.02						120	125	130	135	140	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215
0.03 ~ 0.07					120	125	130	135	140	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220
0.08 ~ 0.12				120	125	130	135	140	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225
0.13 ~ 0.17			120	125	130	135	140	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230
0.18 ~ 0.20		120	125	130	135	140	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235
0.21 ~ 0.30	RECOMMENDED CLEARANCE																								
0.31 ~ 0.32	125	130	135	140	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240	
0.33 ~ 0.37	130	135	140	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240		
0.38 ~ 0.42	135	140	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240			
0.43 ~ 0.47	140	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240				
0.48 ~ 0.52	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240					
0.53 ~ 0.57	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240						
0.58 ~ 0.62	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240							
0.63 ~ 0.67	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240								
0.68 ~ 0.72	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240									
0.73 ~ 0.77	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240										
0.78 ~ 0.82	175	180	185	190	195	200	205	210	215	220	225	230	235	240											
0.83 ~ 0.87	180	185	190	195	200	205	210	215	220	225	230	235	240												
0.88 ~ 0.92	185	190	195	200	205	210	215	220	225	230	235	240													
0.93 ~ 0.97	190	195	200	205	210	215	220	225	230	235	240														
0.98 ~ 1.02	195	200	205	210	215	220	225	230	235	240															
1.03 ~ 1.07	200	205	210	215	220	225	230	235	240																
1.08 ~ 1.12	205	210	215	220	225	230	235	240																	
1.13 ~ 1.17	210	215	220	225	230	235	240																		
1.18 ~ 1.22	215	220	225	230	235	240																			
1.23 ~ 1.27	220	225	230	235	240																				
1.28 ~ 1.32	225	230	235	240																					
1.33 ~ 1.37	230	235	240																						
1.38 ~ 1.42	235	240																							
1.43 ~ 1.47	240																								

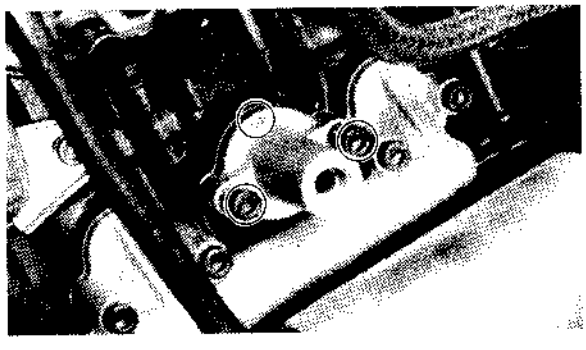
VALVE CLEARANCE (cold):
0.21 ~ 0.30 mm (0.008 ~ 0.012 in)
Example: Installed is 175
Measured clearance is 0.35 mm (0.014 in)
Replace 175 pad with 185 pad

NOTE:
- Refer to the "ENGINE ASSEMBLY AND ADJUSTMENT – CYLINDER HEAD AND CAMSHAFT" section in the CHAPTER 4.
- Turn the carnkshaft counterclockwise several turns for the installed parts to settle into the correct position.



6. Measure:
   - Valve clearance

Valve clearance verification steps:
- Follow the valve clearance measurement steps.
- If the clearance is incorrect, repeat all Adjusting Pad Replacement steps until the proper clearance is obtained.



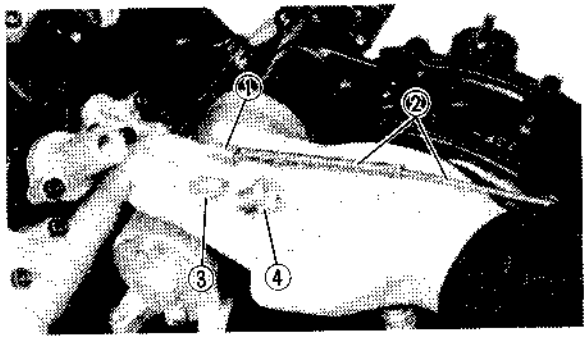
INSTALLATION

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

1. Install:
   - Cam chain tensioner

NOTE:
Install the cam chain tensioner with the "UP" mark facing upward.

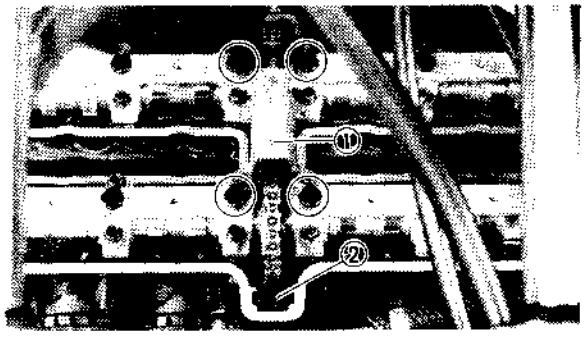
Bolts (Cam Chain Tensioner):
10 Nm (1.0 m·kg, 7.2 ft·lb)



2. Install:
   - Guide collar ①
   - Spring ②
   - Washer ③
   - Cam chain tensioner cap ④



3. Recheck:
   - Align the matching marks ①.



4. Install:
   - Chain guide (Upper) ①
   - Chain guide (Exhaust side) ②

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

5. Install:
   - Cylinder head cover

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

6. Fill:
   - Cooling system

	Coolant Total Amount **(Including All Routes):** **1.9 L (1.7 Imp qt, 2.0 US qt)**

CARBURETOR SYNCHRONIZATION

Carburetors must be adjusted to open and close simultaneously.

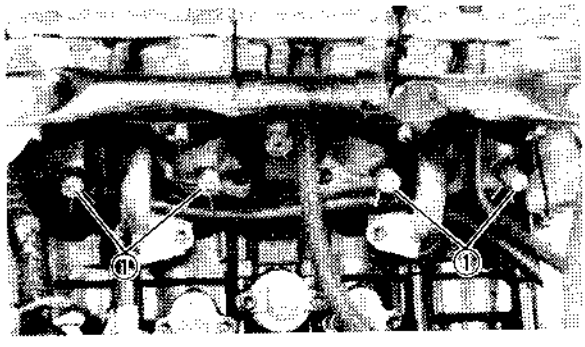
NOTE:

Valve clearance must be set properly before synchronizing the carburetors.

1. Remove:
   - Center cowlings
   - Seat

   Refer to the "COWLING REMOVAL AND INSTALLATION – REMOVAL" section.
2. Remove:
   - Fuel tank

   Refer to the "CARBURETOR – REMOVAL" section in the CHAPTER 6.



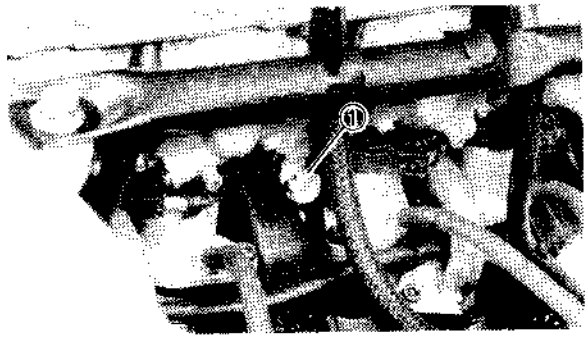
3. Remove:
   - Vacuum plugs ①



4. Install:
   - Vacuum gauge
   - Sub tank

	Vacuum Gauge: P/N YU-08030

5. Start the engine and let it warm up.

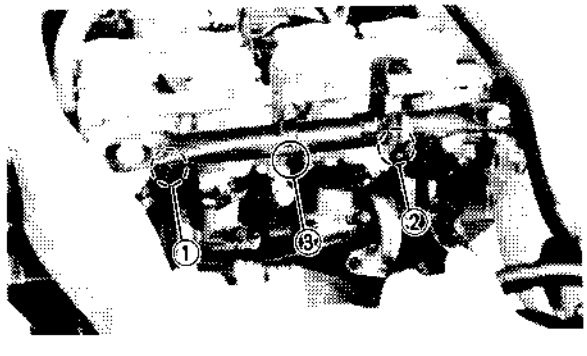


6. Adjust:
   - Idle speed

   Turn the throttle stop screw ① .

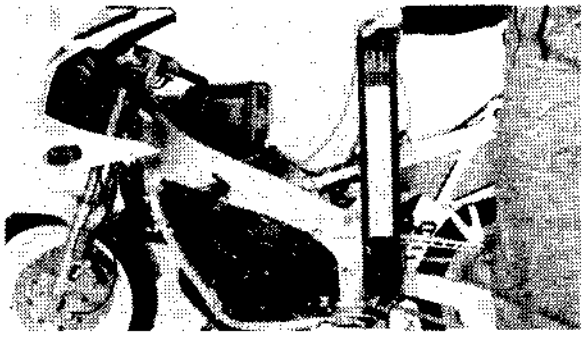
Turn in	**Engine speed is increased.**
Turn out	**Engine speed is decreased.**

	Idle Speed: 1,250 ~ 1,350 r/min



7. Adjust:
   - Carburetors synchronization

Carburetor synchronization adjustment steps:
- Lift up the front of fuel tank
- Synchronize carburetor No. 1 to carburetor No. 2 by turning synchronizing screw ① until both gauges read the same.



- Racing the engine for less than a second, two or three times, and check the synchronization again.

Vacuum Pressure at Idle Speed:
21.33 ± 0.6 kPa
(160 ± 5 mmHg, 6.30 ± 0.2 inHg)
Vacuum Synchronous Difference:
1.33 kPa (10 mmHg, 0.4 inHg)

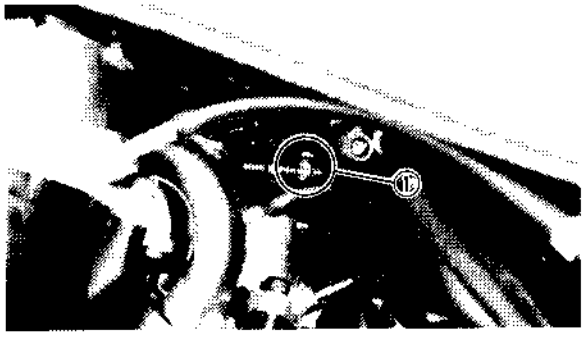
- Repeat the above steps to synchronize carburetor No. 4 to carburetor No. 3 by turning synchronizing screw ② until both gauges read the same.
- Repeat the same steps to synchronize No. 2 carburetor to No. 3 carburetor by turning synchronizing screw ③ until both gauges read the same.

8. Adjust:
   - Idle speed
9. Install:
   - Vacuum plug
   - Fuel tank
   - Seat
   - Center cowlings

IDLE SPEED ADJUSTMENT

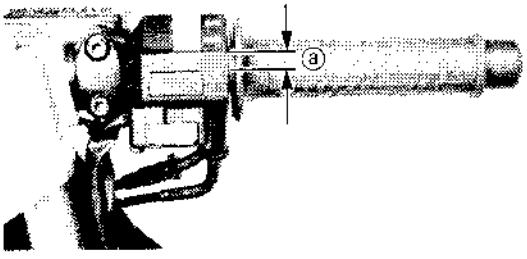
1. Start the engine and let it warm up.
2. Inspect:
   - Idle speed
     Out of specification → Adjust.

Idle Speed: 1,250 ~ 1,350 r/min



3. Adjust:
   - Idle speed
     Turn the throttle stop screw ①

Turn in	**Engine speed is increased.**
Turn out	**Engine speed is decreased.**

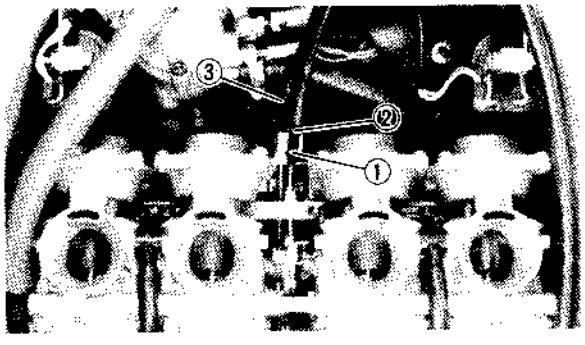


THROTTLE CABLE FREE PLAY ADJUSTMENT

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

1. Check:
   - Throttle cable free play ⓐ
     Out of specification → Adjust.

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



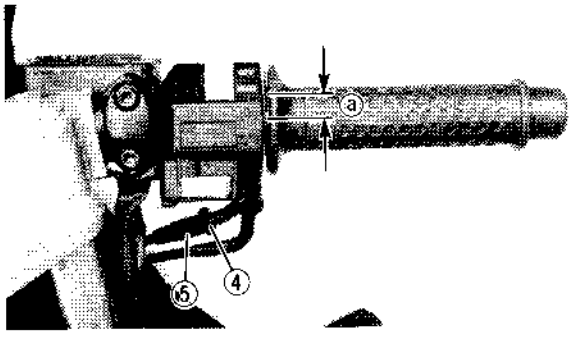
2. Adjust:
   - Throttle cable free play

Throttle cable adjustment steps:
- Remove the seat, top cover and air filter case.
  Refer to the "CARBURETOR – REMOVAL" section in the CHAPTER 6.
- Loosen the locknut (Throttle cable 1) ① .
- Turn the adjuster (Throttle cable 1) ② clockwise or counterclockwise until proper free play (Throttle grip) is attained.

③ Throttle cable 2

Throttle Cable Free Play (Throttle Grip)ⓐ:
2 ~ 3 mm (0.08 ~ 0.12 in)

- Tighten the locknut ① .
- If the free play is incorrect, adjust the throttle cable free play with the adjuster (Throttle grip side).
- Loosen the locknut (Throttle cable 1 – Throttle grip side) ④ .
- Turn the adjuster (Throttle cable 1 – Throttle grip side) ⑤ clockwise or counterclockwise until proper free play (Throttle grip) ⓐ is attained.

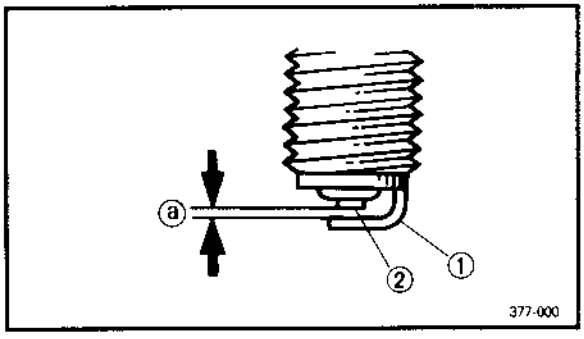


Throttle Cable Free Play (Throttle Grip) ⓐ :
2 ~ 5 mm (0.08 ~ 0.20 in)

- Tighten the locknut ④ .

NOTE:

Normally, once the throttle cable length adjuster (carburetor) is properly set; the only adjustment required is maintenance of free play at the throttle cable length adjuster (Throttle grip).



SPARK PLUG INSPECTION

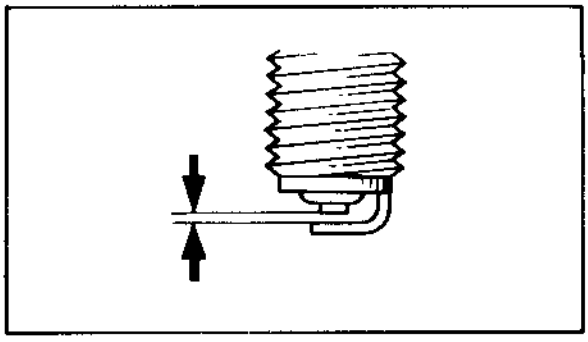
1. Inspect:
   - Electrode ①
     Wear/Damage → Replace.
   - Insulator color ②
     Normal condition is a medium to light tan color.
     Distinctly different color → Check the engine condition.

ⓐ Spark plug gap

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

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

Standard Spark Plug:
CR8E (NGK),
U24ESR-N (NIPPON DENSO)



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

Spark Plug Gap:
0.7 ~ 0.8 mm (0.028 ~ 0.032 in)

5. Tighten:
   • Spark plug

NOTE:

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

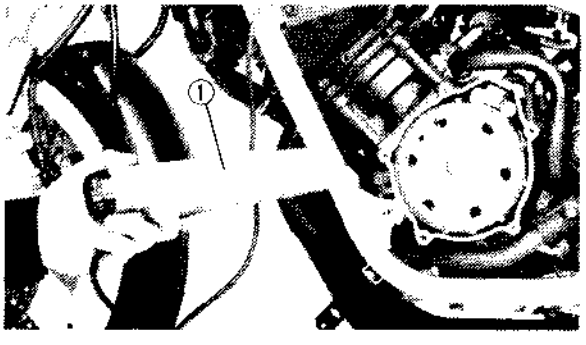
Spark Plug:
13 Nm (1.3 m·kg, 9.4 ft·lb)

NOTE:

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

IGNITION TIMING CHECK

1. Remove:
   • Lower cowling (Left)
   • Center cowling
   Refer to the "COWLING REMOVAL AND INSTALLATION – REMOVAL" section.
2. Remove:
   • Generator cover

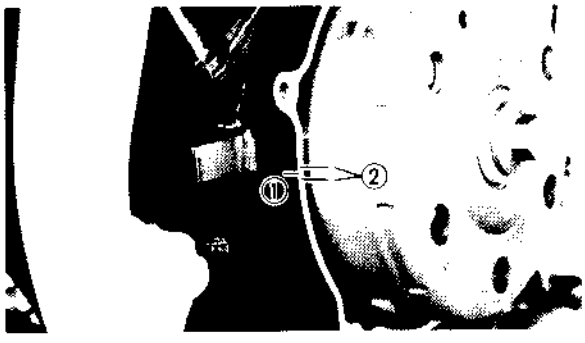


3. Connect:
   • Timing light ①
   To the #1 spark plug lead.
   • Inductive tachometer

Timing Light:
P/N YU-33223
Inductive Tachometer:
P/N YU-08037

4. Warm up the engine and allow it to idle at the specified speed.

	Engine Idle Speed: **1,250 ~ 1,350 r/min**



5. Check:
   - Ignition timing
     Visually check the crankcase end ① is within the firing range ② on the magneto.
     Out of firing range → Check pickup assembly.

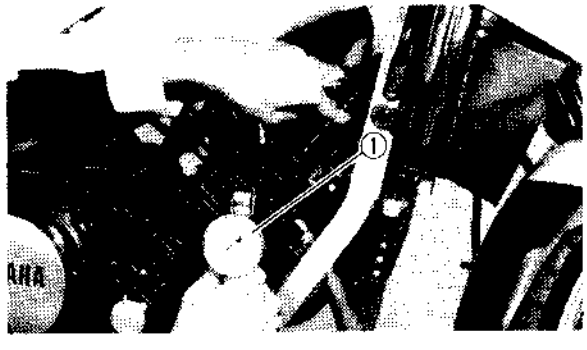
NOTE:
Ignition timing is not adjustable.

6. Install:
   - Generator cover

COMPRESSION PRESSURE MEASUREMENT

NOTE:
Insufficient compression pressure will result in performance loss.

1. Measure:
   - Valve clearance
     Out of specification → Adjust.
     Refer to the "VALVE CLEARANCE ADJUSTMENT" section.
2. Warm up the engine.
3. Remove:
   - Spark plugs
4. Remove:
   - Lower cowling (Left)
   - Center cowling (Left)
     Refer to the "COWLING REMOVAL AND INSTALLATION – REMOVAL" section.
5. Measure:
   - Compression pressure



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

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



Compression Gauge:
P/N YU-33223

Compression Pressure (At sea level):
Standard:
950 kPa (9.5 kg/cm², 138 psi)
Minimum:
750 kPa (7.5 kg/cm², 109 psi)
Maximum:
1,150 kPa (11.5 kg/cm², 164 psi)

⚠ WARNING:

When cranking the engine, ground spark plug lead to prevent sparking.

- Repeat the previous steps for the other cylinders.
- If pressure falls bellow the minimum level:

1) Squirt a few drops of oil into the affected cylinder.
2) Measure the compression again.

Compression Pressure (with oil introduced into cylinder)

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

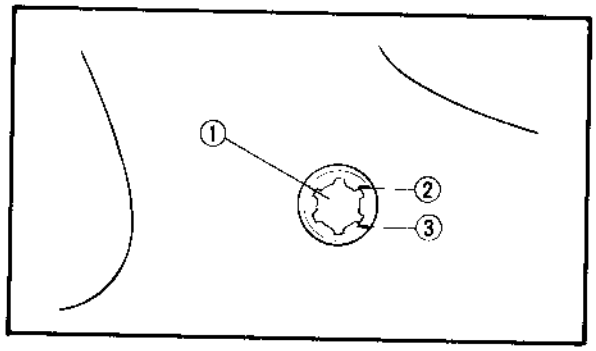
NOTE:
The difference between the highest and lowest cylinder compression readings must not vary more than the specified value.

Difference Between Each Cylinder:
Less than 100 kPa (1 kg/cm², 15 psi)

ENGINE OIL LEVEL INSPECTION

1. Place the motorcycle on its centerstand and warm up the engine for several minutes.

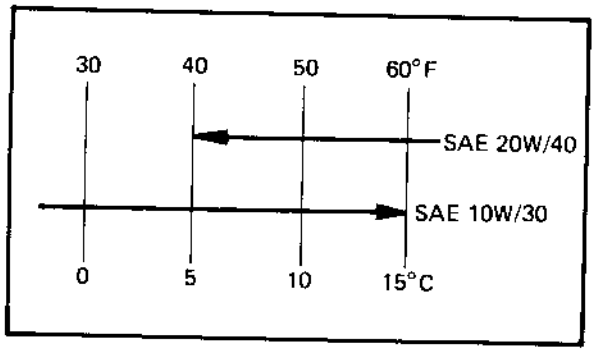
NOTE:
Position motorcycle straight up when checking oil level, a slight tilt to the side can produce false readings.



2. Stop the engine and visually check the oil level throught the level window ① .
3. Inspect:
   - Oil level

   Oil level should be between maximum ② and minimum ③ marks.
   Low oil level → Add oil to proper level.

NOTE:
Wait a few minutes until level settles before inspecting.

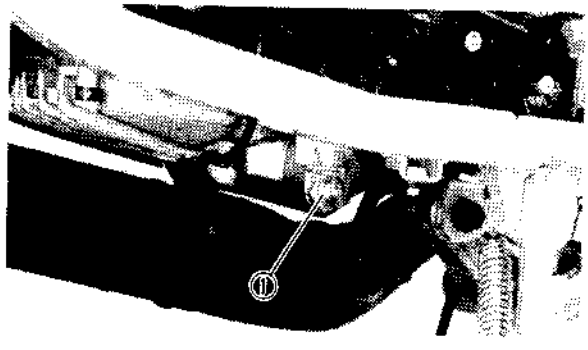


Recommended Engine Oil:
At 5°C (40°F) or Higher:
Yamalube 4-cycle oil or
SAE 20W40 Type SE Motor Oil
At 15°C (60°F) or Lower:
SAE 10W30 Type SE Motor Oil

ENGINE OIL REPLACEMENT

1. Warm up the engine for serveral minutes.
2. Place a drain pan under the engine.
3. Remove:
   - Lower cowling (Left)

   Refer to the "COWLING REMOVAL AND INSTALLATION – REMOVAL" section.
4. Remove:
   - Oil filler cap



5. Remove:
   - Drain plug ①

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

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

7. Fill:
   - Crankcase

⚠ CAUTION:

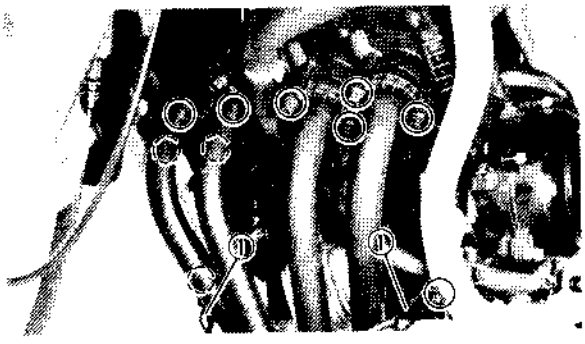
Do not allow foreign material to enter the crankcase.

Periodic Oil Change:
2.7 L (2.4 Imp qt, 2.9 US qt)
Recommended Engine Oil:
At 5°C (40°F) or Higher:
Yamalube 4-cycle oil or
SAE 20W40 Type SE Motor Oil
At 15°C (60°F) or Lower:
SAE 10W30 Type SE Motor Oil

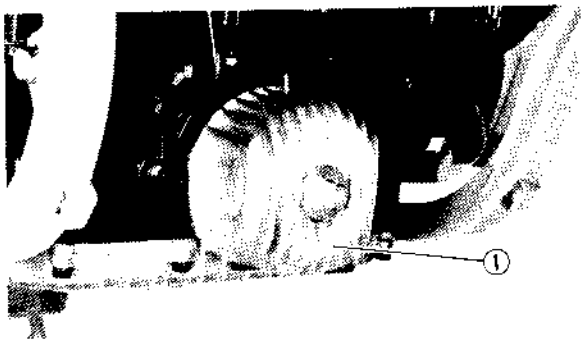
8. Install:
   - Oil filler cap

ENGINE OIL FILTER REPLACEMENT

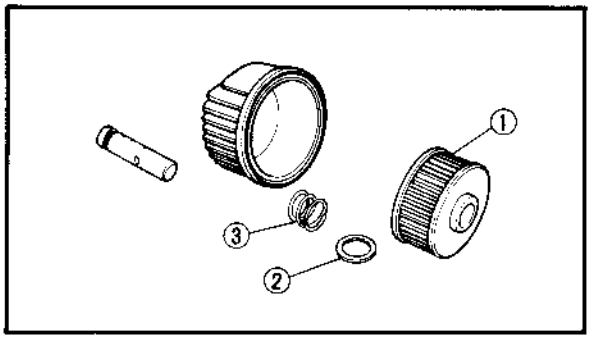
1. Remove:
   - Lower cowlings (Left and right)
     Refer to the COWLING REMOVAL AND INSTALLATION – REMOVAL" section.
2. Warm up the engine for several minutes.



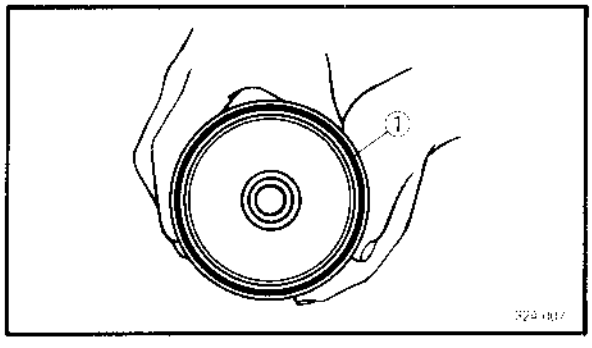
3. Remove:
   - Cowling stays (Left and right) ①
   - Exhaust pipe
     Refer to the "ENGINE REMOVAL – MUFFLER ASSEMBLY" section in the CHAPTER 4.
4. Drain the oil.



5. Remove:
   - Oil filler cap
   - Filter cover ①

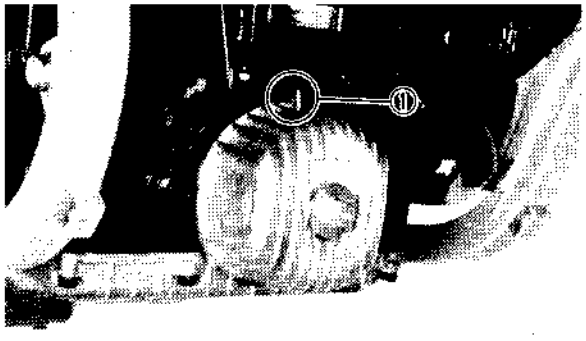


6. Remove:
   - Oil filter ①
   - Shim ②
   - Spring ③
7. Check:
   - O-ring
     Cracks/Damage → Replace.



8. Install:
   - Oil filter (New)
   - Shim
   - Spring
     To oil filter cover.

NOTE:
Be sure the O-ring ① is positioned properly.



9. Install:
   - Oil filter cover

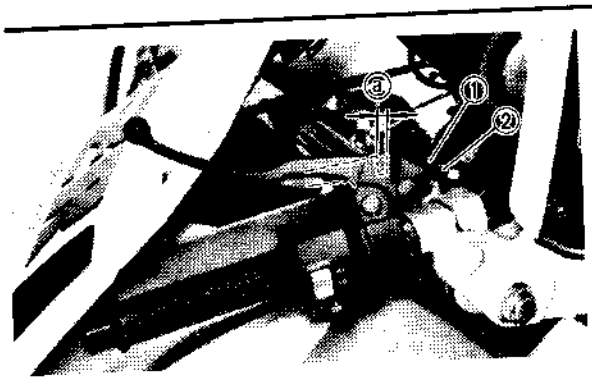
	Bolt (Oil Filter Cover): **15 Nm (1.5 m·kg, 11 ft·lb)**

NOTE:
Mesh the oil filter cover projection ① with the crankcase slot.

10. Fill:
    - Crankcase

	With Oil Filter Replacement: **2.5 L (2.2 Imp qt, 2.64 US qt)**

11. Warm up the engine for a few minutes, then stop the engine.
12. Observe:
    - Oil level
13. Install:
    - Center cowlings (Left and right)
    - Lower cowlings (Left and right)



CLUTCH ADJUSTMENT

1. Check:
   - Clutch lever free play (a)
     Out of specification → Adjust.

Free Play:
2 ~ 3 mm (0.08 ~ 0.12 in)

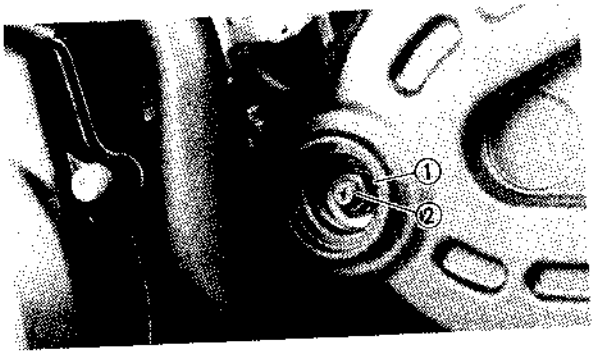
2. Adjust:
   - Clutch lever free play

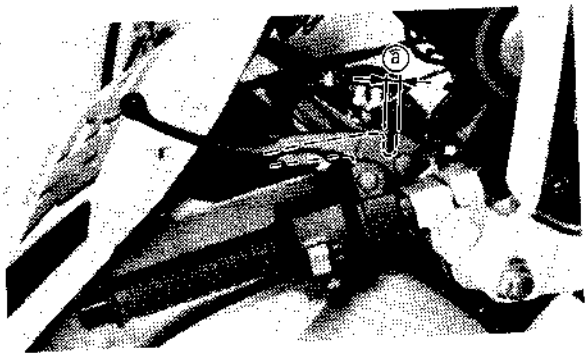
Adjustment steps:
- Loosen the locknut (1).
- Turn the adjuster (2) in or out until the specified free play is obtained.

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

- Tighten the locknut.

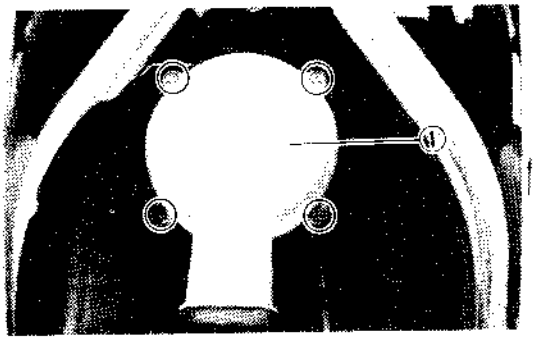
NOTE:
Normally, once the clutch cable length adjuster (crankcase) is properly set; the only adjustment required is maintenance of free play at the clutch cable length adjuster (handlebar lever).

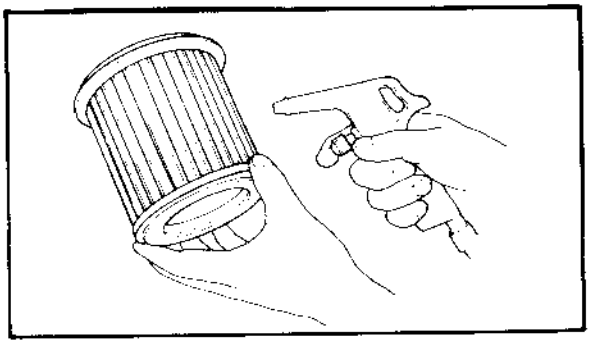




3. Remove:
   - Lower cowling (Left)
   - Cover
4. Loosen:
   - Lock nut (1)
5. Screw in adjuster (2) until lightly tight and back it out 1/4 turn.
6. Tighten:
   - Locknut (1)

7. Check:
   - Clutch lever free play (a)





AIR FILTER CLEANING

1. Remove:
   - Seat
   - Top cover

   Refer to the "COWLING REMOVAL AND INSTALLATION – REMOVAL" section.
2. Remove:
   - Air filter case cover ①
   - Air filter element

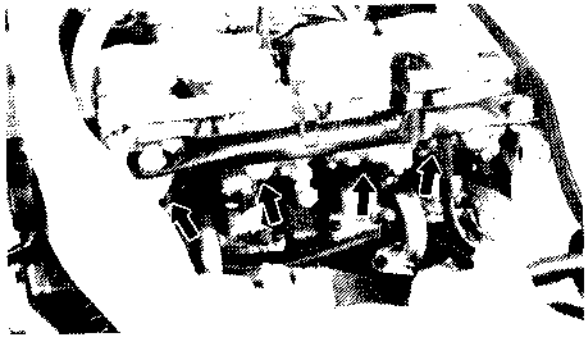
⚠ CAUTION:

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

3. Clean:
   - Air filter element

   Blow out dust in the element from the outer surface using compressed air.
4. Inspect:
   - Air filter element

   Damage → Replace.
5. Install:
   - Air filter element
   - Air filter case cover
   - Top cover
   - Seat



CARBURETOR JOINT INSPECTION

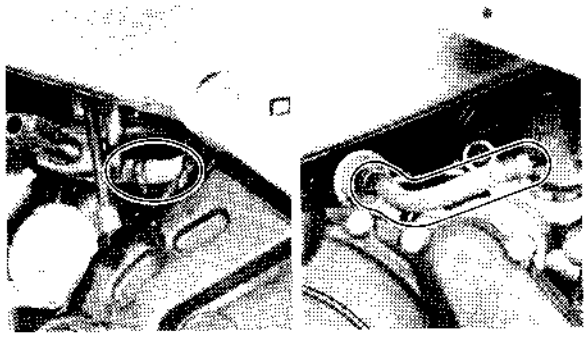
1. Remove:
   - Fuel tank
   - Air filter case

   Refer to the "CARBURETOR – REMOVAL" section in the CHAPTER 6.
2. Inspect:
   - Carburetor joint

   Cracks/Damage → Replace.

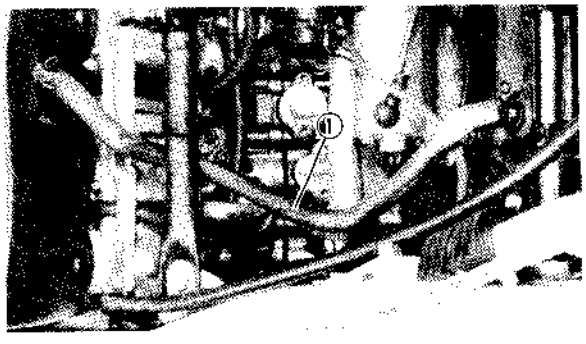
FUEL LINE INSPECTION

1. Remove:
   - Lower cowlings (Left and right)



2. Inspect:
   - Fuel pipes
     Cracks/Damage → Replace.
   - Fuel filter
     Contamination/Damage → Replace.

NOTE:
Drain and flush the fuel tank if abrasive damage to any components is evident.

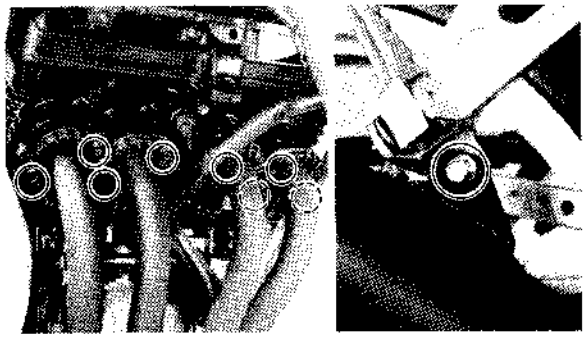


CRANKCASE VENTILATION HOSE INSPECTION

1. Remove:
   - Seat
   - Top cover
     Refer to the "COWLING REMOVAL AND INSTALLATION – REMOVAL" section.
2. Inspect:
   - Crankcase ventilation hose ①
     Cracks/Damage → Replace.

EXHAUST SYSTEM INSPECTION

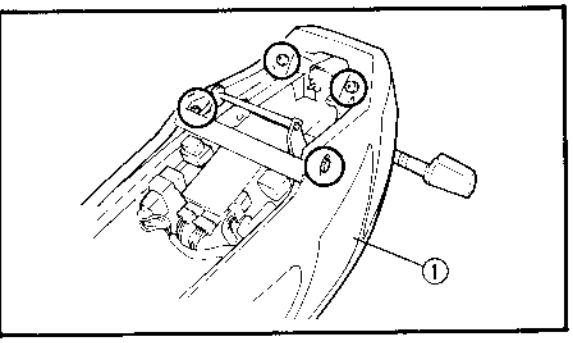
1. Remove:
   - Lower cowlings (Left and right)
   - Center cowlings (Left and right)
     Refer to the "COWLING REMOVAL AND INSTALLATION – REMOVAL" section.



2. Inspect:
   - Exhaust pipe
   - Gaskets (Exhaust pipe)
   - Muffler
     Cracks/Damage → Replace.
   - Bolt
   - Nut
     Loose → Tighten.

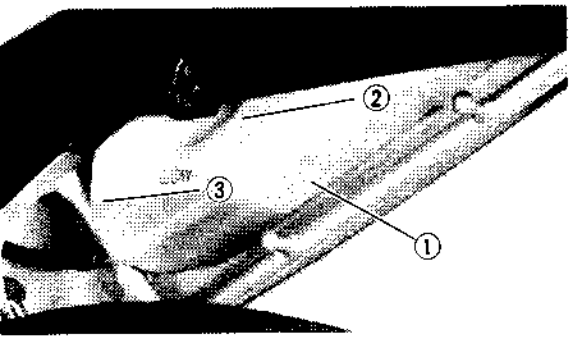
3. Tighten:

Nuts (Exhaust Pipe):
10 Nm (1.0 m·kg, 7.2 ft·lb)
Bolt (Muffler/Rear Footrest):
20 Nm (2.0 m·kg, 14 ft·lb)
Bolt (Muffler Star):
(For California only)
20 Nm (2.0 m·kg, 14 ft·lb)



COOLANT LEVEL INSPECTION

1. Remove:
   - Seat
   - Seat cowling ①



2. Inspect:
   - Coolant level
     (Reservoir tank ①)
     Low level → Add tap water (Soft water).

① Coolant reservoir tank
② "FULL" level
③ "LOW" level

⚠ WARNING:

Do not remove the radiator cap when the engine is hot.

⚠ CAUTION:

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

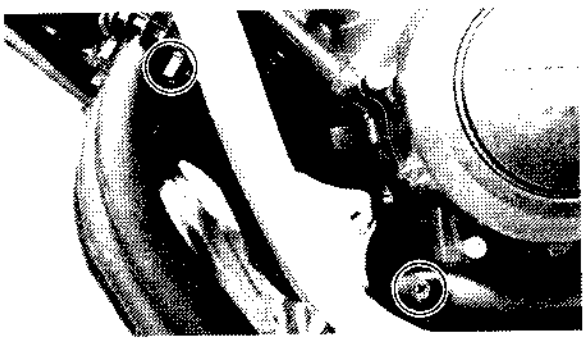
COOLANT REPLACEMENT

⚠ 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.

1. Remove:
   • Lower cowling (Left)
   AND INSTALLATION – REMOVAL" section.
2. Place a drain pan under the drain bolts.



3. Remove:
   • Drain bolt (Outlet pipe) ①
   • Drain bolt (Cylinder) ②
   • Radiator cap
   Drain the coolant.

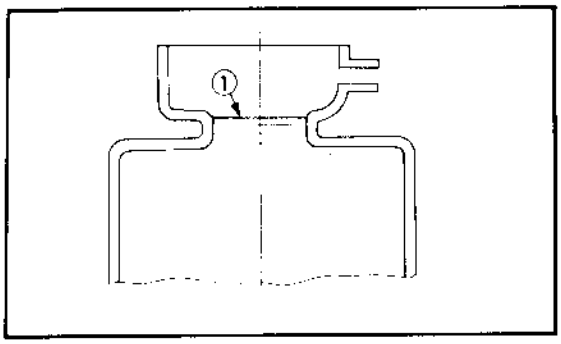
NOTE:
Remove the drain bolts first, then remove the radiator cap to prevent the coolant spilling.

4. Tighten:
   • Drain bolt (Cylinder)
   • Drain bolt (Outlet pipe)

Drain Bolt (Cylinder):
7 Nm (0.7 m·kg, 5.1 ft·lb)
Drain Bolt (Outlet Pipe):
7 Nm (0.7 m·kg, 5.1 ft·lb)

NOTE:
Replace with new copper gasket.

5. Fill:
   • Cooling system



Coolant filling steps:
- Fill the coolant into the radiator until the radiator is full.
- Start the engine (Coolant level decreases.)

⚠ CAUTION:

Always check coolant level, and check for coolant leakage before starting engine.

- Add the coolant while engine is running.
- Stop the engine when coolant level stabilizes.
- Add the coolant again to specified level ① .
- Install the radiator cap.

Recommended Coolant:
High Quality Ethylene Glycol Anti-Freeze Containing Anti-Corrosion for Aluminum Engine Inhibitors

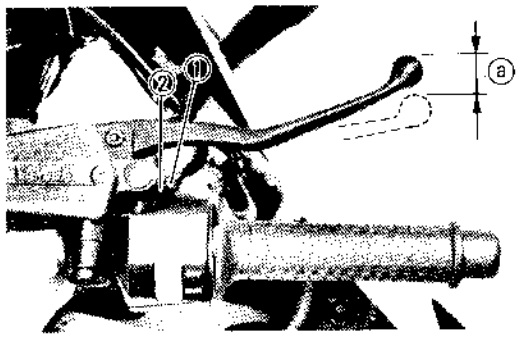
Coolant and Water Mixed Ratio:
50%/50%

Total Amount:
1.9 L (1.7 Imp qt, 2.0 US qt)

Reservoir Tank Capacity:
(From Low to Full Level):
0.28 L (0.25 Imp qt, 0.30 US qt)

⚠ CAUTION:

- **Hard water or salt water is harmful to the engine. You may use distilled water if you can't get soft water.**
- **Do not mix more than one type of ethlen glycol antifreeze containing corrosion for aluminum engine inhabitors.**



CHASSIS

FRONT BRAKE ADJUSTMENT

1. Loosen:
   - Adjuster locknut ①
2. Adjust:
   - Free play

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

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

Front Brake Lever Free Play:
2 ~ 5 mm (0.08 ~ 0.20 in)

⚠ CAUTION:

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

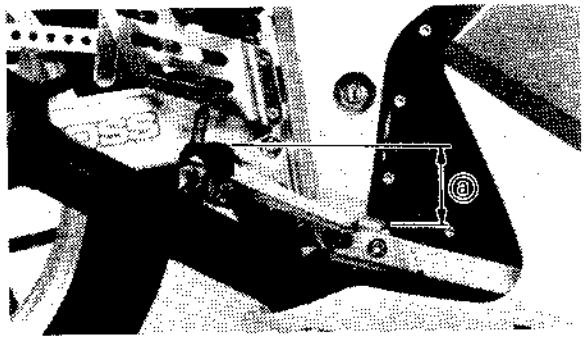
3. Tighten:
   - Adjuster locknut

REAR BRAKE ADJUSTMENT

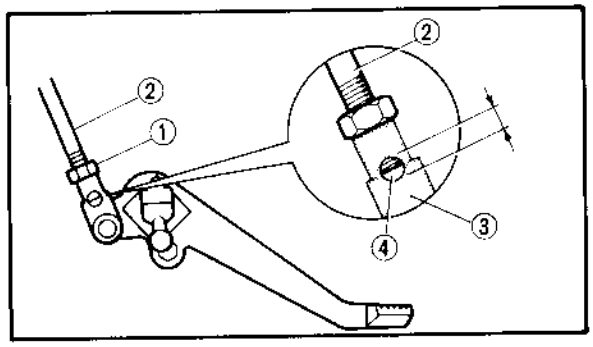
1. Loosen:
   - Adjuster locknut ①
2. Adjust:
   - Brake pedal height ⓐ

   Turn the adjuster ② until the brake pedal position is at the specified height.
   - Rear brake light switch

   Refer to the "REAR BRAKE LIGHT SWITCH ADJUSTMENT" section.



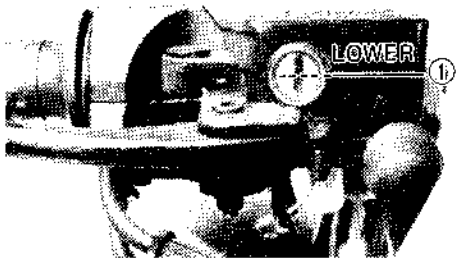
Brake Pedal Height:
42 mm (1.7 in)
Below the Top of the Footrest

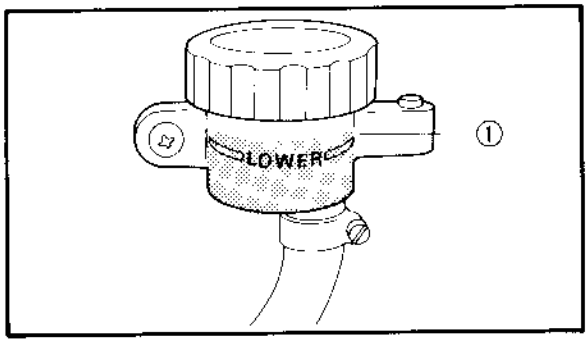


⚠ WARNING:

After adjusting the brake pedal height, visually check the adjuster end ② through the hole of the joint holder ③ . The adjuster end must appear within this hole ④ .

3. Lock:
   - Lock nut ①





BRAKE FLUID INSPECTION

1. Inspect:
   - Brake fluid level
     Fluid at lower level→Replenish.

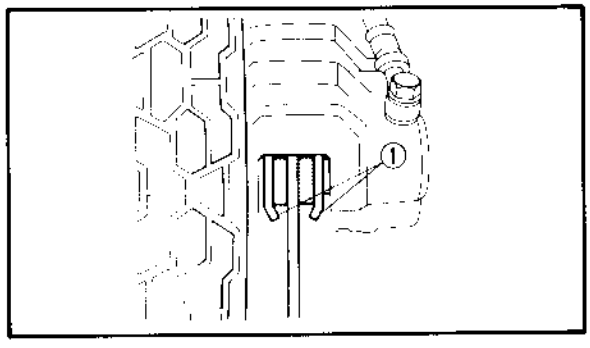
① Front brake fluid lower level

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

⚠ WARNING:

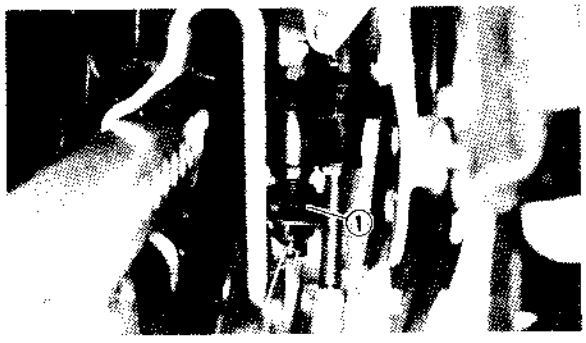
- **Use only designated quality brake fluid to avoid poor brake performance.**
- **Refill with same type and brand of brake fluid; mixing fluids could result in poor brake performance.**
- **Be sure that water or other contaminants do not enter master cylinder when refilling.**
- **Clean up spilled fluid immediately to avoid erosion of painted surfaces or plastic parts.**

① Rear brake fluid lower level



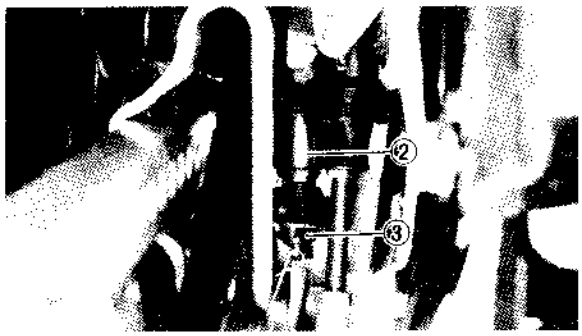
BRAKE PAD INSPECTION

1. Activate the brake lever or brake pedal.
2. Inspect:
   - Wear indicator ①
     Indicator almost contacts disc→Replace pads.



REAR BRAKE LIGHT SWITCH ADJUSTMENT

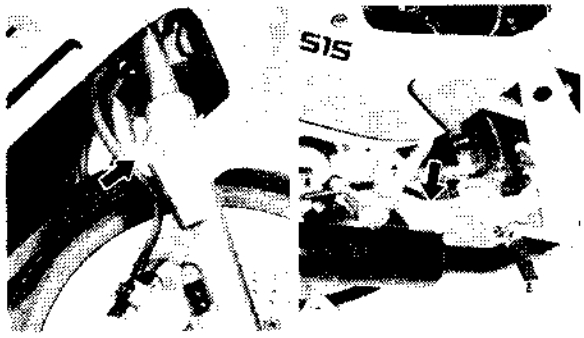
1. Loosen:
   - Locknut ①



2. Adjust:
   • Rear brake light switch
   Hold the switch body ② with your hand so it does not rotate and turn the adjuster ③.

NOTE:

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



BRAKE HOSE INSPECTION

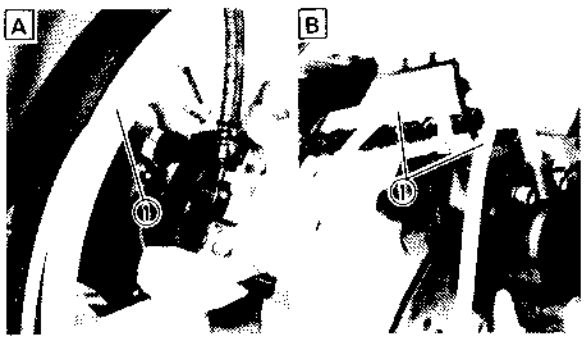
1. Inspect:
   • Brake hoses
   Cracks/Damage → Replace.

AIR BLEEDING

⚠ WARNING:

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

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



1. Bleed:
   • Brake system

Air bleeding steps:

a. Add proper brake fluid to the reservoir.
b. Install the diaphragm. Be careful not to spill any fluid or allow the reservoir to overflow.
c. Connect the clear plastic tube ① tightly to the caliper bleed screw.

[A] Front
[B] Rear

d. Place the other end of the tube into a container.
e. Slowly apply the brake lever or pedal several times.
f. 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:
6 Nm (0.6 m·kg, 4.3 ft·lb)

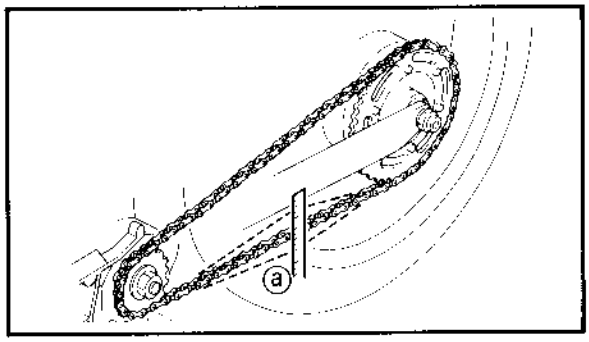
i. Repeat steps (e) to (h) until of the air bubbles have been removed from the system.

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

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

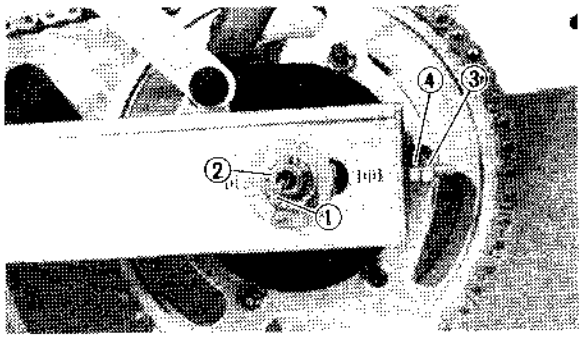
DRIVE CHAIN SLACK ADJUSTMENT

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



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

Drive Chain Slack:
10 ~ 20 mm (0.4 ~ 0.8 in)



3. Remove:
   • Cotter pin ①
4. Loosen:
   • Nut (Rear axle) ②
   • Locknut ③
5. Adjust:
   • Chain slack
     Turn the adjuster ④ in or out.

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

NOTE:

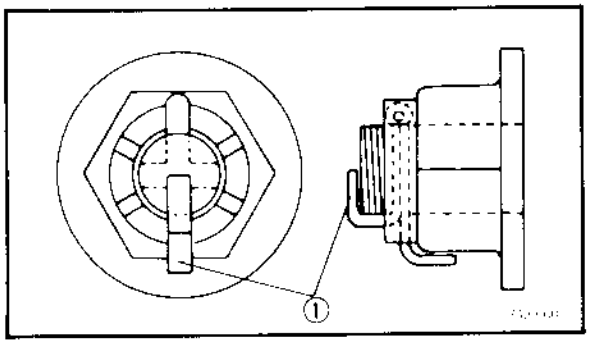
There are marks on each side of rear arm and on each chain puller; use them to check for proper alignment.

⚠ CAUTION:

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

6. Tighten:
   • Nut (Rear axle)

	**Nut (Rear Axle):** **107 Nm (10.7 m · kg, 77 ft · lb)**



7. Tighten:
   • Adjuster
   • Locknut
8. Install:
   • Cotter pin ① (New)

⚠WARNING:

Always use a new cotter pin on the axle nut.

NOTE:

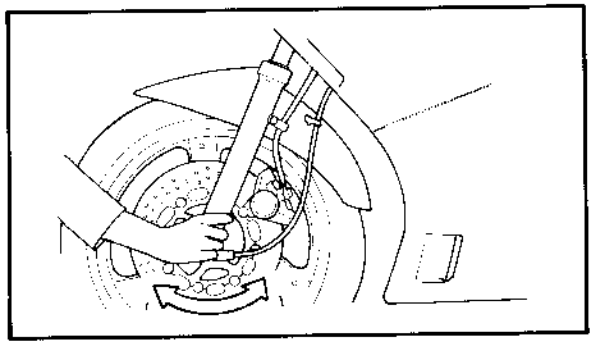
Do not loosen the axle nut after torque tightening. If the axle nut groove is not aligned with the wheel shaft cotter pin hole, align groove to hole by tightening up on the axle nut.

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.

Recommended Lubricant:
SAE 30 ~ 50 Motor Oil or Chain Lubricants Suitable for "O-ring" Chains

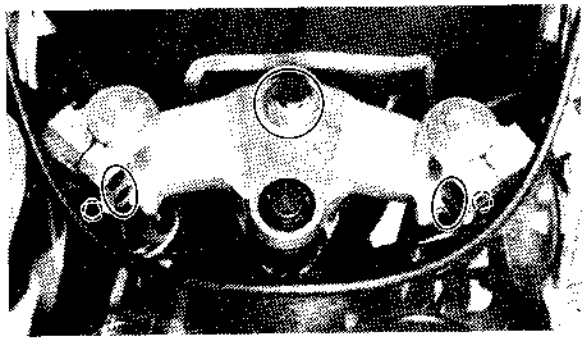


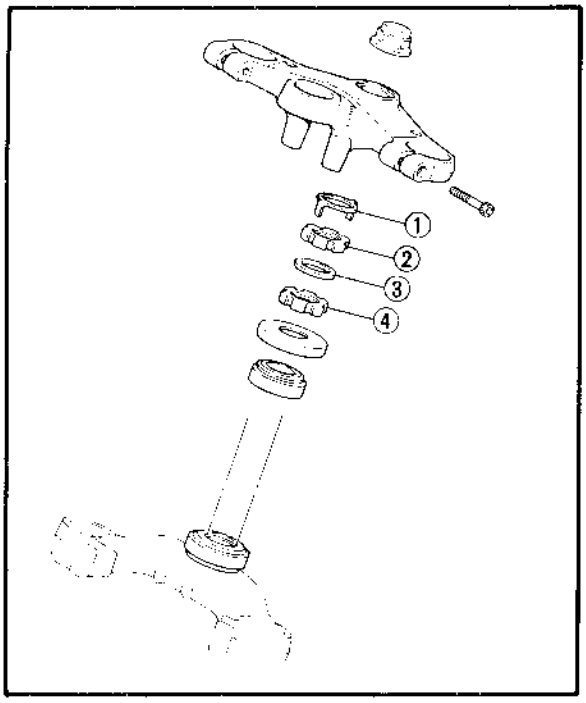
STEERING HEAD INSPECTION

⚠ WARNING:

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

1. Place the motorcycle on a level place.
2. Elevate the front wheel by placing a suitable stand under the engine.
3. Check:
   - Steering assembly bearings
     Grasp the bottom of the front forks and gently rock the fork assembly back and forth.
     Looseness → Adjust the steering head.
4. Remove:
   - Seat
   - Top cover
     Refer to the "COWLING REMOVAL AND INSTALLATION – REMOVAL" section.
5. Remove:
   - Handlebars bosses (Left and right)
   - Handlebar crown
     Refer to the "STEERING HEAD HANDLEBAR – REMOVAL" section in the CHAPTER 7.





6. Remove:
   - Lock washer ①
   - Ring nut (Upper) ②
   - Washer ③
7. Remove:
   - Front fork

   Refer to the "FRONT FORK – REMOVAL" section in the CHAPTER 7.

8. Tighten:
   - Ring nuts (Lower and upper)

Ring nuts tightening steps:

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

- Install the ring nut (Lower) ④ .

NOTE:
The tapered side of ring nut must faced downward.

- Tighten the ring nut ④ using the Ring Nut Wrench.

Ring Nut Wrench:
P/N YU-33975

Ring Nut ④ (Initial Tightening):
52 Nm (5.2 m·kg, 37 ft·lb)

- Loosen the ring nut ④ completely and retighten it to specification.

⚠ WARNING:
Do not over-tightening.

Ring Nut ④ (Final Tightening):
3 Nm (0.3 m·kg, 2.2 ft·lb)

NOTE:
Recheck the steering head by turning the steering from lock to lock, after adjusting steering head.

If steering is binded, loosen the ring nut so that there is no free play on bearing.
If steering is loosened, repeat the adjustment steps.

- Install the washer ③ .
- Install the ring nut (Upper) ② .

NOTE:
The tapered side of ring nut must face downward.

- Finger tighten the ring nut ② , then align the slots of both ring nuts. If not aligned, hold the lower ring nut ④ and tighten the other until they are aligned.
- Install the lock washer ① .

NOTE:
Make sure the lock washer tab is placed in the slots.

- Install the handle crown and tighten the steering stem nut to specification.



Nut (Steering Stem):
110 Nm (11.0 m·kg, 80 ft·lb)

- Tighten the pinch bolts to specification.



Pinch Bolt (Handle Crown):
20 Nm (2.0 m·kg, 14 ft·lb)

10. Install:
    - Front fork
    - Handlebars (Left and right)



Nut (Front Axle):
58 Nm (5.8 m·kg, 42 ft·lb)
Bolt (Front Fork Pinch):
20 Nm (2.0 m·kg, 14 ft·lb)
Bolts (Brake Caliper):
35 Nm (3.5 m·kg, 25 ft·lb)
Bolts (Handlebar):
20 Nm (2.0 m·kg, 14 ft·lb)

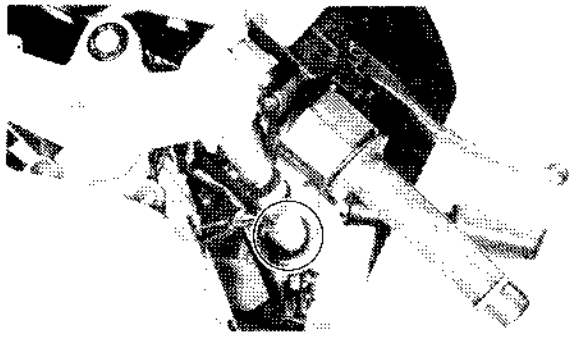
11. Install:
    - Top cover
    - Seat

FRONT FORK INSPECTION

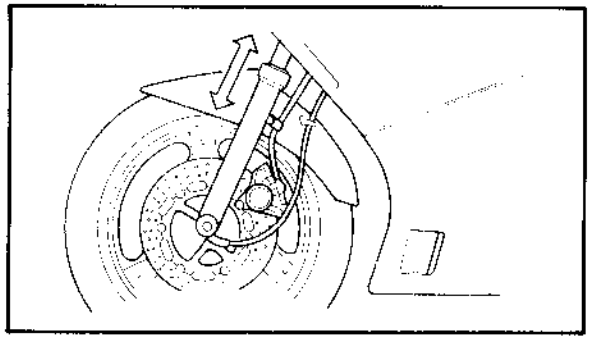
⚠WARNING:

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

1. Place the motorcycle on a level place.



2. Check:
   - Inner tube
     Scratch/Damage → Replace.
   - Oil seal
     Excessive oil leakage → Replace.
3. Hold the motorcycle on upright position and apply the front brake.

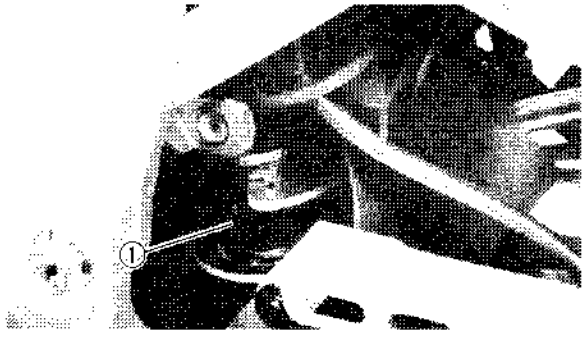


4. Check:
   - Operation
     Pump the front fork up and down for several times.
     Unsmooth operation → Repair.

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.

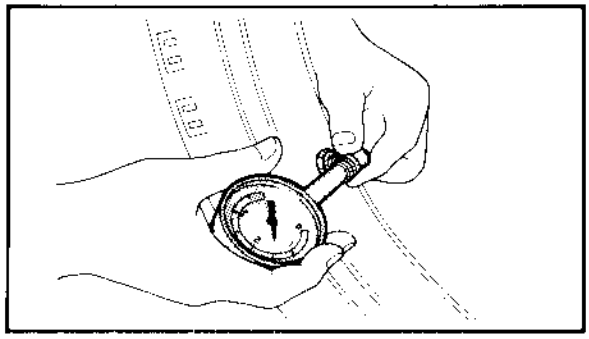
1. Adjust:
   - Spring preload



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	7	6	5	4	3	2	1



TIRE INSPECTION

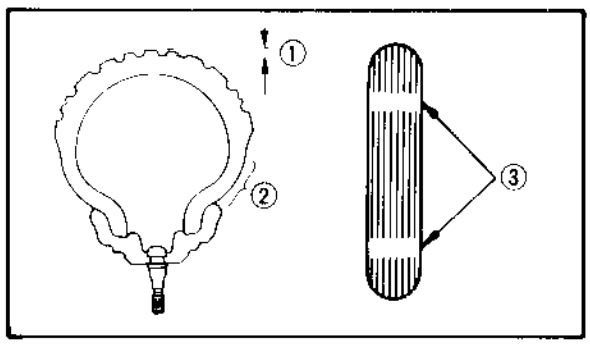
1. Measure:
   - Tire pressure
     Out of specification → Adjust.

⚠ WARNING:

Tire inflation pressure should be checked and adjusted when the temperature of the tire euqals 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	186 kg (410 lb) (Except for California) 189 kg (417 lb) (For California)	
Maximum load*	156 kg (344 lb) (Except for California) 153 kg (337 lb) (For California)	
Cold tire pressure	Front	Rear
Up to 90 kg (198 lb) load*	200 kPa (2.0 kg/cm², 28 psi)	230 kPa (2.3 kg/cm², 32 psi)
90 kg (198 lb) ~ Maximum load*	200 kPa (2.0 kg/cm², 28 psi)	250 kPa (2.5 kg/cm², 36 psi)
High speed riding	200 kPa (2.0 kg/cm², 28 psi)	250 kPa (2.5 kg/cm², 36 psi)

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



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

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

① Tread depth
② Side wall
③ Wear indicator

⚠ WARNING:

- After extensive tests, the tires mentioned below have been approved by Yamaha motor Co., Ltd. for this model. No guarantee for handling characteristics can be given if tire combinations other than what is approved are used on this motorcycle. The front and rear tires should be of the same manufacture and design.

FRONT:

Manufacture	Size	Type
Bridgestone	110/70 R17–53H	CY03
Dunlop	110/70 R17–53H	K455F

REAR:

Manufacture	Size	Type
Bridgestone	140/60 R18–64H	CY04
Dunlop	140/60 R18–64H	K455

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

Be sure to instal

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

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

WHEEL INSPECTION

1. Inspect:
   - Aluminum wheels
     Damage/Bends → Replace.
     Never attempt even small repairs to the wheel.

NOTE:

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

CABLE INSPECTION

1. Inspect:
   - Throttle cables
   - Cable sheaths
   - Clutch cable
   - Starter cable

   Check for damage to the cable insulation.
   Corrosion/Damage → Replace.
   Obstruction → Reroute.
   Unsmoothness → Lubricate.

LUBRICATION

Throttle cables/Clutch cable/Starter cable

Cable lubrication steps:
- Remove the two grip ends that secure throttle to handlebar.
- Hold cable end high and apply several drops of lubricant to cable.
- Coat metal surface of disassembled throttle twist grip with suitable all-purpose grease to minimize friction.



SAE 10W30 Motor Oil

Lever/Pedal

Lubricate pivoting part of each lever and pedal.



SAE 10W30 Motor Oil

Sidestand

Lubricate the pivoting part.

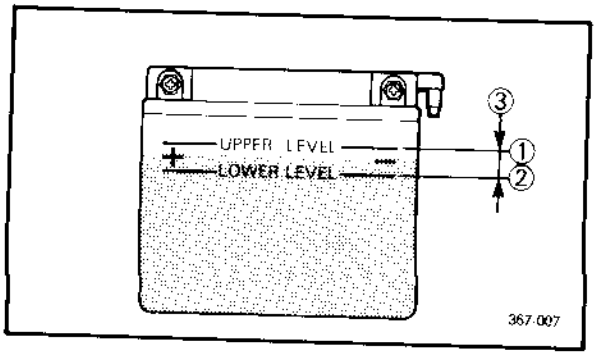


SAE 10W30 Motor Oil

ELECTRICAL

BATTERY INSPECTION

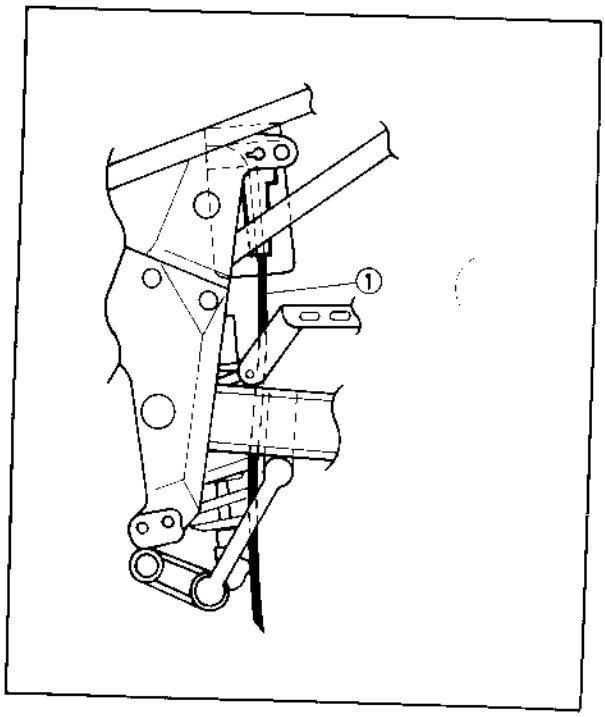
1. Remove:
   - Seat
     Refer to the "COWLING REMOVAL AN
     INSTALLATION – REMOVAL" section.



2. Inspect:
   Fluid level ③ should be between upper ①
   and lower ② marks.
   Incorrect → Refill.

⚠ CAUTION:

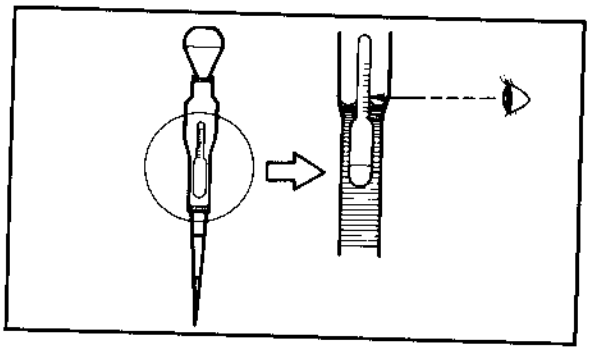
Refill with distilles water only; tap water con tains minerals harmful to a battery.



3. Connect:
   - Breather pipe (Battery) ①
     Be sure the hose is properly attached and routed.
4. Inspect:
   - Breather pipe (Battery) ①
     Obstruction → Reroute.
     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.



5. Check:
   - Specific gravity:
     Less than 1.280 → Recharge battery.

Charging Current:
1.2 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.

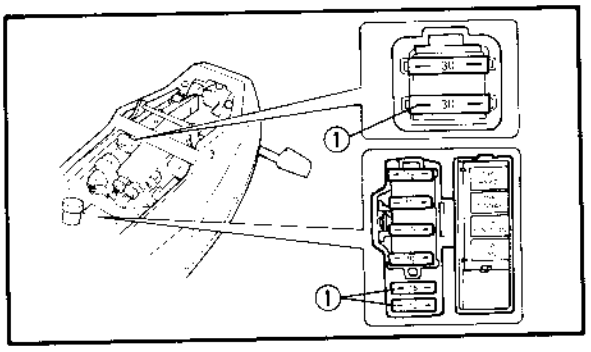
Always follow these preventive measures:
- **Avoid bodily contact with electrolyte as it can cause servere burns or permanent eye injury.**
- **Wear protective eye gear when handling or working near batteries.**

Antidote (EXTERNAL):
- **SKIN—Flush with water.**
- **EYES—Flush with water for 15 minutes and get immediate medical attention.**

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

Batteries also generate explosive hydrogen gas, therefore you should always follow these preventive measures:
- **Charge batteries in a well-ventilated area.**
- **Keep batteries away from fire, sparks, or open flames (e.g., welding equipment, lighted cigarettes, etc.)**
- **DO NOT SMOKE when charging or handling batteries.**

KEEP BATTERIES AND ELECTROLYTE OUT OF REACH OF CHILDREN.



FUSE INSPECTION

The fuse panel is located under the seat.

1. Inspect:
   - Fuses
     Defective → Replace.
     Blown fuse (New) → Inspect circuit.

NOTE:

Install new fuses of proper amperage.

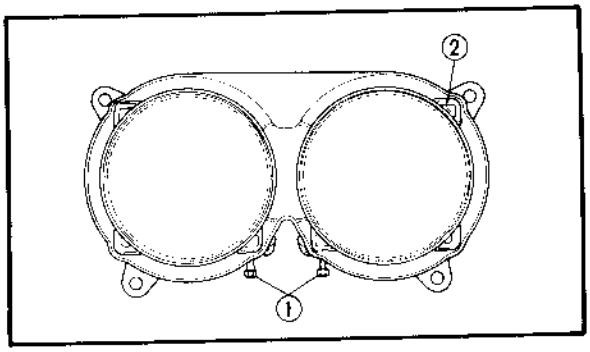
① Spare fuses

Description	Amperage	Quantity
Main	30A	1
Headlight	10A	1
Signal	10A	1
Ignition	10A	1
Reserve	10A	1
	30A	1

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.

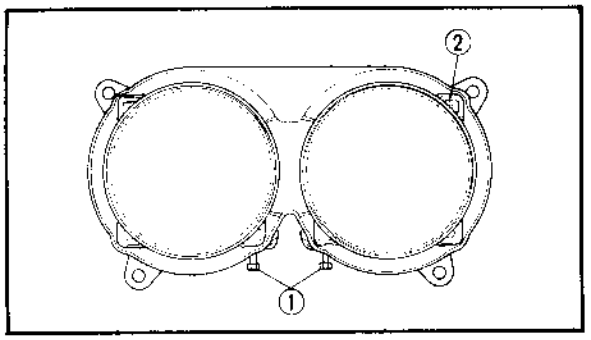
⚠ WARNING:

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.



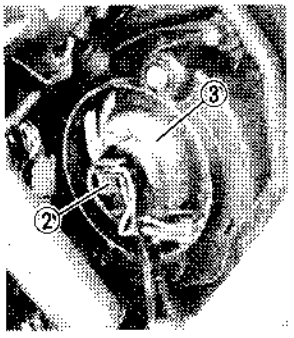
HEADLIGHT BEAM ADJUSTMENT

1. Adjust:
   - Horizontal adjustment:
     To adjust the beam to the right, turn the adjusting screw ① clockwise.
     To adjust the beam to the left, turn the screw ① counterclockwise.



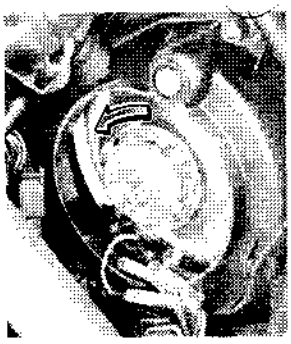
2. Adjust:
   - Vertical adjustment:
     To raise the beam, turn the adjusting screw ② clockwise.
     To lower the beam, turn the screw ② counterclockwise.





HEADLIGHT BULB REPLACEMENT

1. Remove:
   - Headlight cover ①
2. Disconnect:
   - Headlight bulb coupler ②
3. Remove:
   - Headlight bulb cover ③





4. Remove:
   - Bulb
     Turn the bulb holder counterclockwise to release 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.

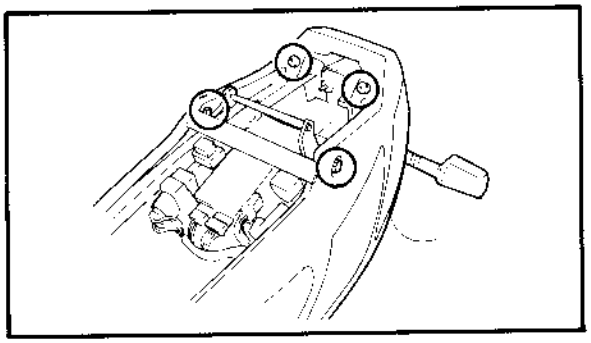
5. Install:
   - Bulb (New)
     Secure the new bulb with the bulb holder.

⚠ 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.

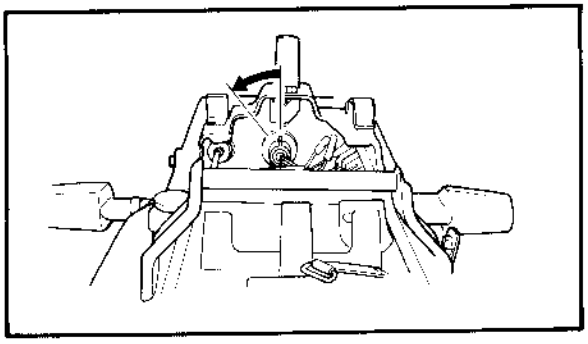
6. Install:
   - Headlight bulb cover

7. Connect:
   - Headlight bulb coupler
8. Install:
   - Headlight cover.



TAIL/BRAKE BULB REPLACEMENT

1. Remove:
   - Seat
   - Seat cowling



2. Remove:
   - Bulb socket

   Turn the bulb socket approximately 30° counterclockwise.
3. Remove:
   - Defective bulb
4. Install:
   - Bulb socket
   - Seat cowling
   - Seat

ENGINE OVERHAUL

ENGINE REMOVAL

NOTE:
It is not necessary to remove the engine in order to remove the following components:
- Cylinder head
- Cylinder
- Piston
- Clutch
- Water pump
- A.C. magneto

LOWER COWLING, CENTER COWLING, UPPER COWLING AND TOP COVER

1. Remove:
   - Lower cowlings (Left and right)
   - Center cowlings (Left and right)
   - Upper cowling
   - Seat
   - Top cover

   Refer to the "COWLING REMOVAL AND INSTALLATION – REMOVAL" section in the CHAPTER 3.

FUEL TANK

1. Remove:
   - Fuel tank

   Refer to the "CARBURETOR – REMOVAL" section in the CHAPTER 6.

ENGINE OIL

1. Drain:
   - Engine oil

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

COOLANT

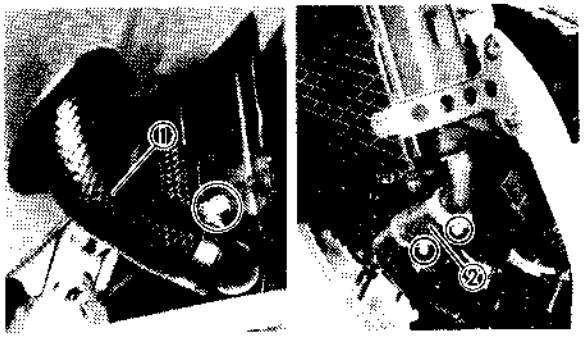
1. Drain:
   - Coolant

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

AIR FILTER CASE AND CARBURETOR

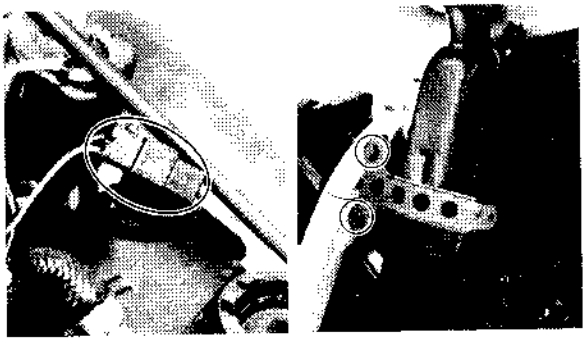
1. Remove:
   - Air filter case
   - Carburetor

   Refer to the "CARBURETOR – REMOVAL" section in the CHAPTER 6.



RADIATOR

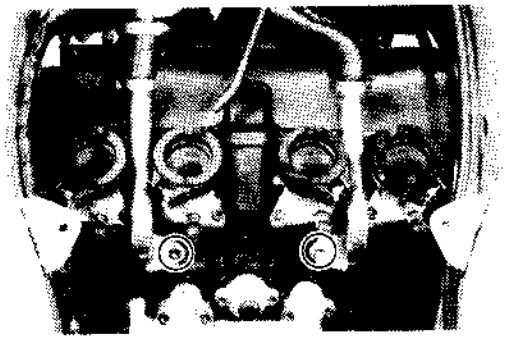
1. Disconnect:
   - Hose (Radiator – Inlet) ①
   - Hose (Radiator – Outlet) ②



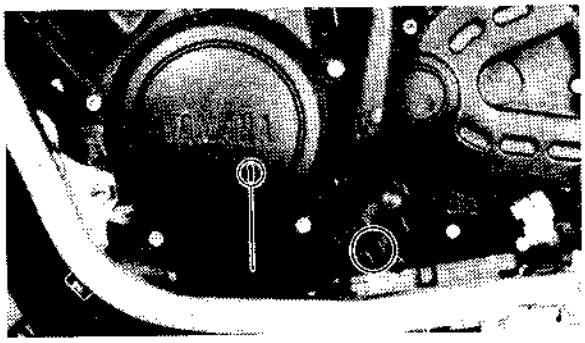
2. Disconnect:
   - Fan motor coupler
3. Remove:
   - Radiator assembly

⚠ CAUTION:

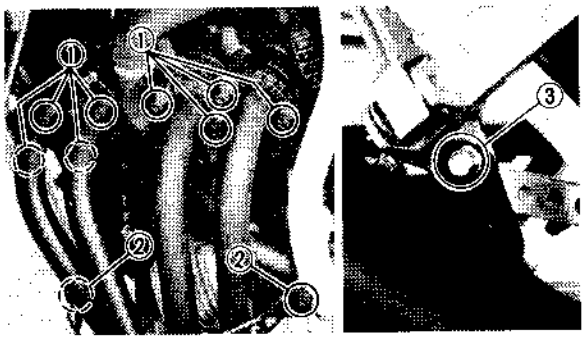
Cover the cylinder head cover and the fender with rugs to prevent a scratching.



4. Disconnect:
   - Pipes (Left and right)

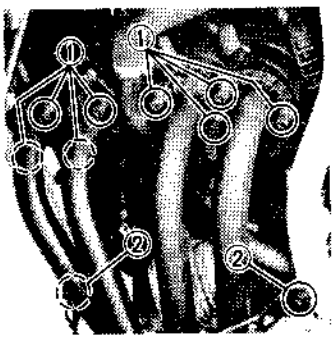
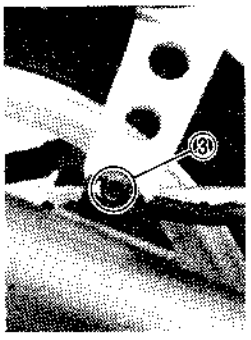


5. Remove:
   - Pipes (Radiator – Outlet) ①



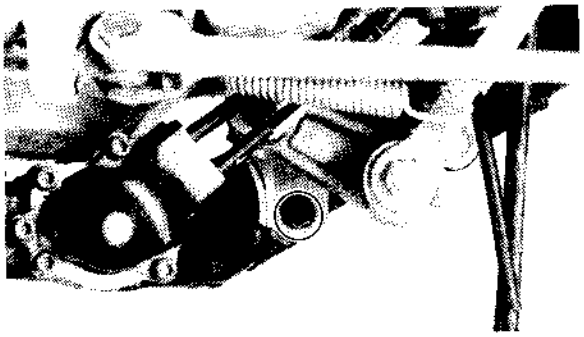
MUFFLER ASSEMBLY

1. Remove:
   - Nuts (Exhaust pipe) ①
   - Cowling stays ②
   - Bolt (Muffler bracket) ③

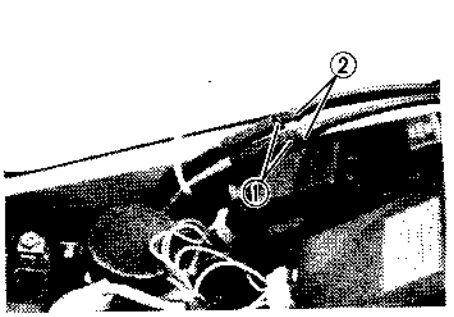



MUFFLER ASSEMBLY (For California only)

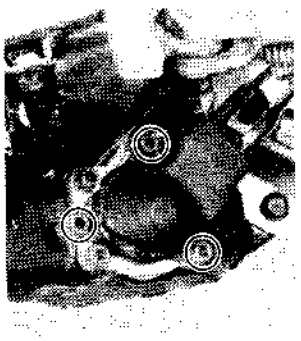
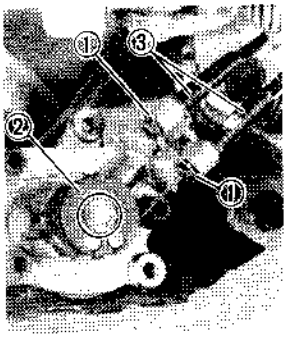
1. Remove:
   - Nuts (Exhaust pipe) ①
   - Cowling stays ②
   - Bolt (Muffler bracket) ③



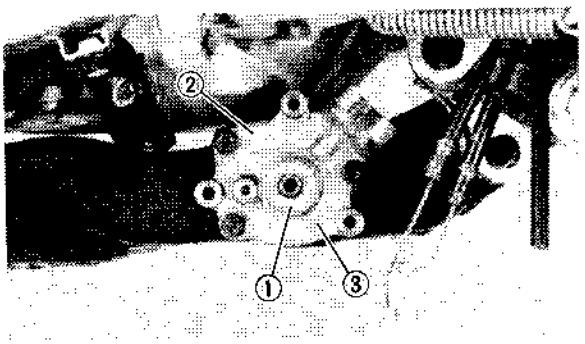
2. Remove:
   - Bolt (Muffler stay)



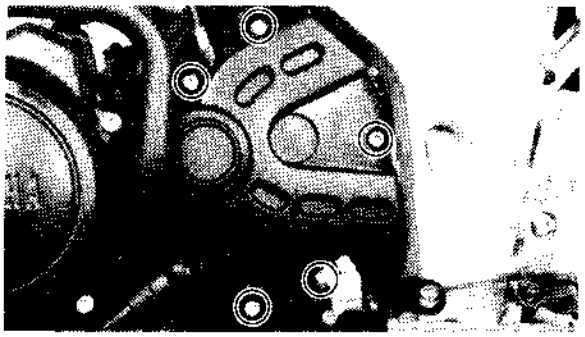

3. Loosen:
   - Lock nut ①
   - Adjuster ②

4. Remove:
   - Cover
   - Clips ①
   - Pulley ②
   - Cables ③

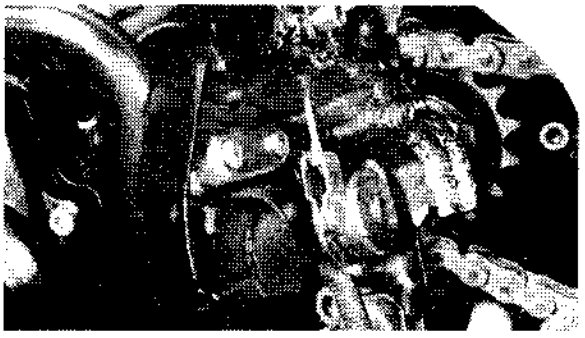


5. Remove:
   - Washer ①
   - Bracket ②
   - Housing ③
   - Gasket (Left side)
   - Shaft arm

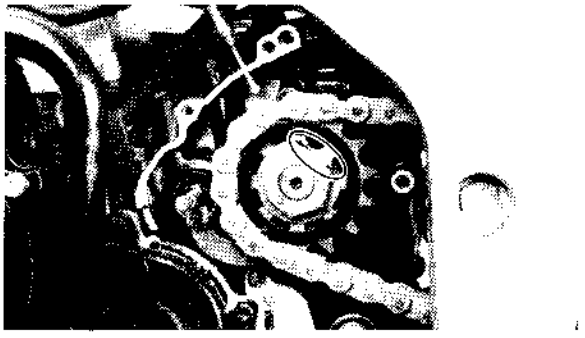


CLUTCH CABLE AND DRIVE CHAIN

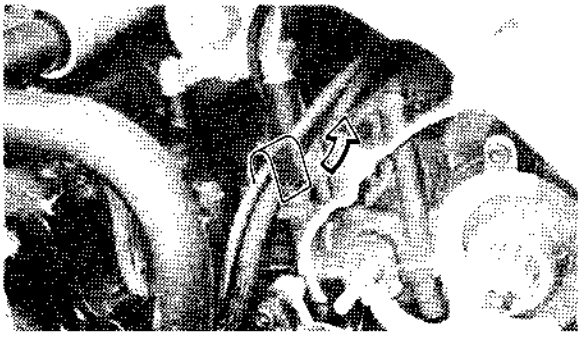
1. Remove:
   - Shift arm
   - Crankcase cover (Left)



2. Remove:
   - Clutch cable

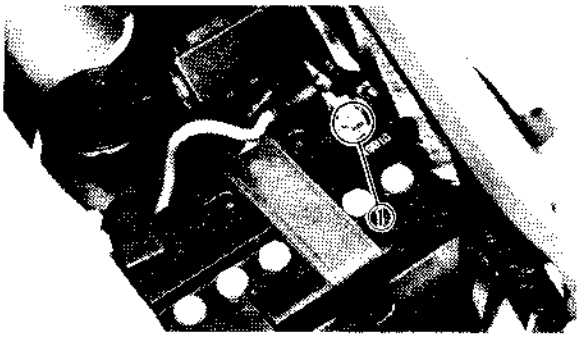


3. Straighten:
   - Lock washer tab
4. Remove:
   - Drive sprocket



LEADS

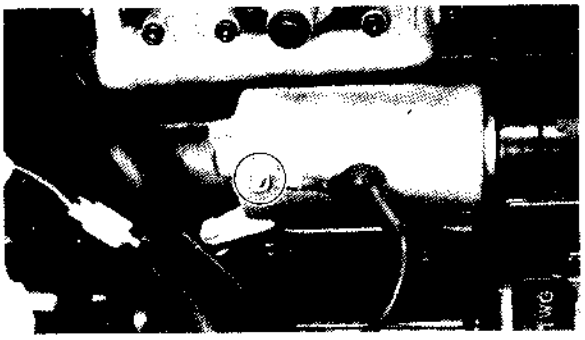
1. Straighten:
   - Clamp



2. Disconnect:
   - Battery leads

NOTE:

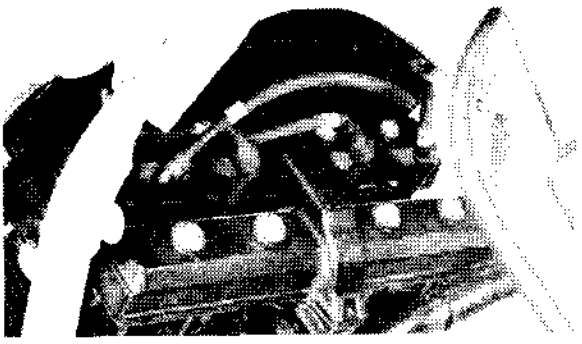
Disconnect the negative lead ① first.



3. Disconnect:
   - Lead (Starter motor)

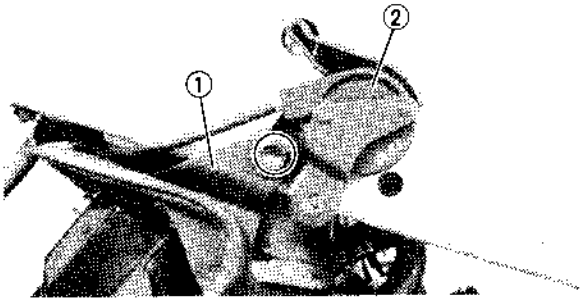


4. Remove:
   - Cover
5. Disconnect:
   - Coupler (Oil level Neutral switch)
   - Coupler (A.C. generator)
   - Coupler (Sidestand switch)

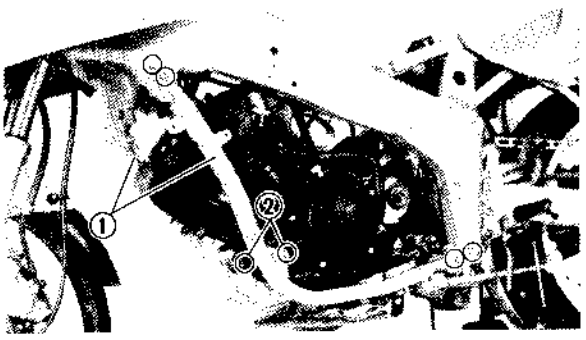


6. Remove:
   - Spark plug leads

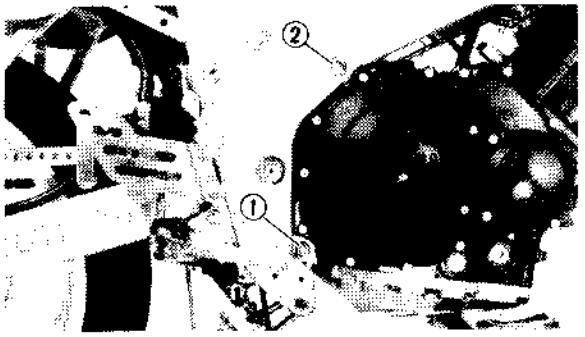
ENGINE REMOVAL

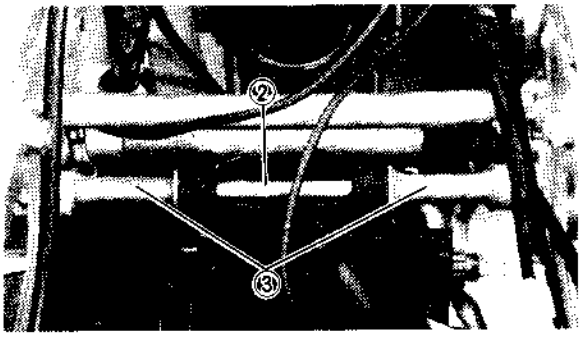


1. Remove:
   - Cover ①
   - Starter lever ②



2. Place a suitable stand under the engine.
3. Remove:
   - Down tube frames (Left and right) ①
   - Bolt (Engine-mount) ②

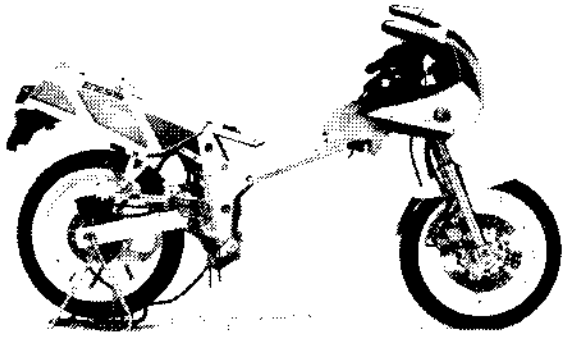




4. Remove:
   - Bolt (Engine-mounting Lower) ①
   - Bolt (Engine-mounting Upper) ②
   - Collars ③



5. Remove:
   - Engine assembly.
     From right side.



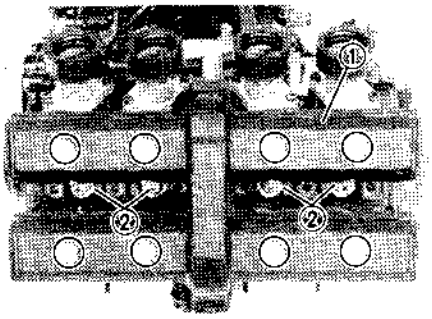
ENGINE DISASSEMBLY

CYLINDER HEAD COVER, CAMSHAFT AND CYLINDER HEAD

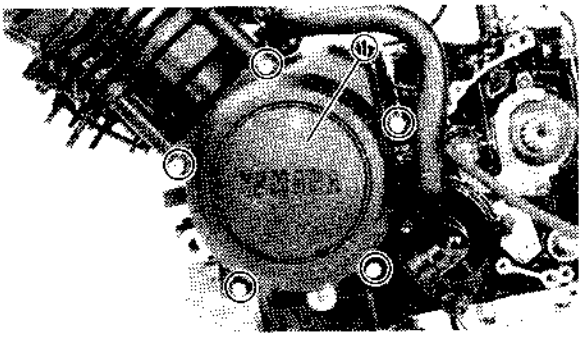
NOTE:

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

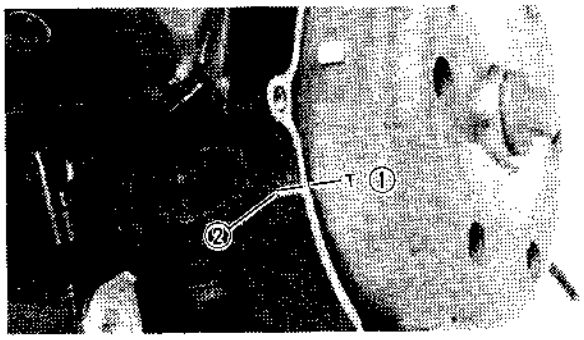
- Lower cowlings (Left and right)
- Center cowlings (Left and right)
- Seat
- Top cover
- Radiator
- Air filter case
- Carburetor
- Muffler assembly
- Down tube frame (Right)



1. Remove:
   - Cylinder head cover ①
   - Gasket (Cylinder head cover)
   - Spark plugs ②



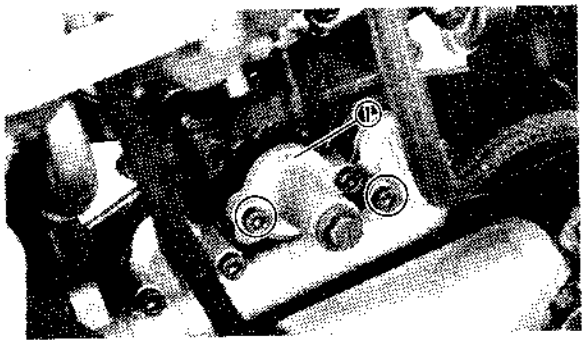
2. Remove:
   - Generator cover ①
   - Dowel pins



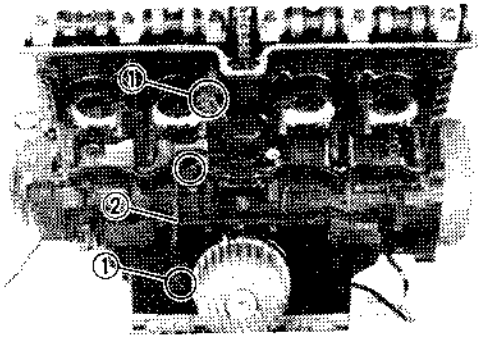
3. Turn:
   - Crankshaft
     Counterclockwise
4. Align:
   - "T" mark ①
   - Crankcase end ②

NOTE:

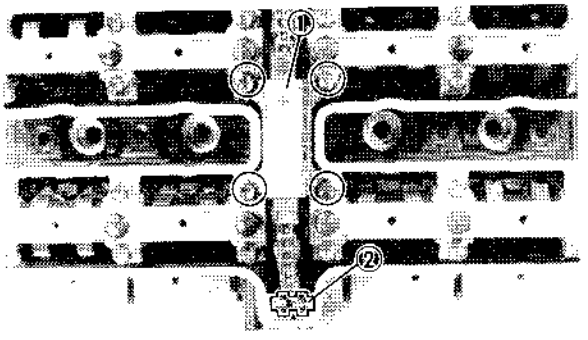
When #1 piston is at TDC on compression stroke.



5. Remove:
   - Cam chain tensioner ①
   - Gasket (Cam chain tensioner)



6. Remove:
   - Union bolts ①
   - Oil delivery pipe ②



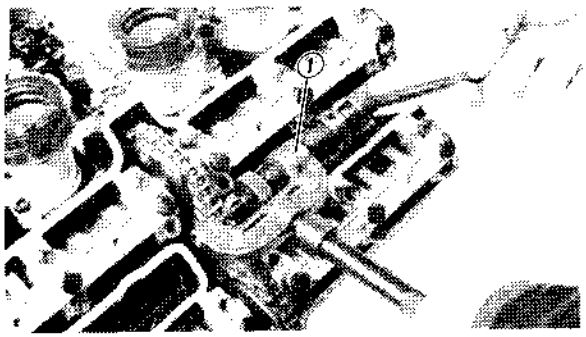
7. Remove:
   - Cam chain guide (Upper) ①
   - Cam chain guide (Exhaust side) ②

NOTE:

- Select either of the two procedures explained in this manual, as follows:

- **Procedure 1.**
  For engine service except cylinder head disassembly.
  → Disconnect the cam chain.
  The pistons and cylinder can be removed without removing the camshafts.

- **Procedure 2.**
  For engine service including cylinder head disassembly.
  → Remove the cam caps and camshafts.
  The camshafts can be removed without disconnecting the cam chain.

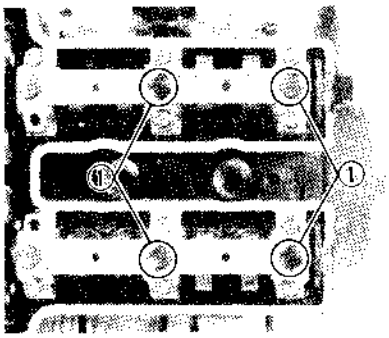


Procedure 1.

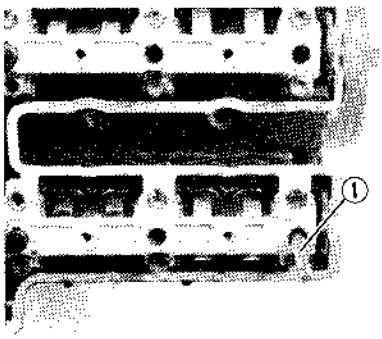
1. Disconnect:
   - Cam chain

   Use the Cam Chain Cutter ① .

Cam Chain Cutter:
P/N YM-01112

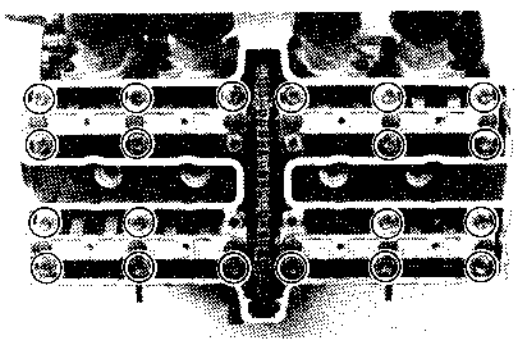


2. Remove:
   - Rubbers (Camshaft cap) ①



3. Remove:
   - Nuts (Cylinder head)

   Use the Hexagon Wrench 6 mm (0.24 in) ①.
4. Remove:
   - Cylinder head
   - Gasket (Cylinder head)
   - Dowel pins
5. Go to "CYLINDER AND PISTON".



Procedure 2.

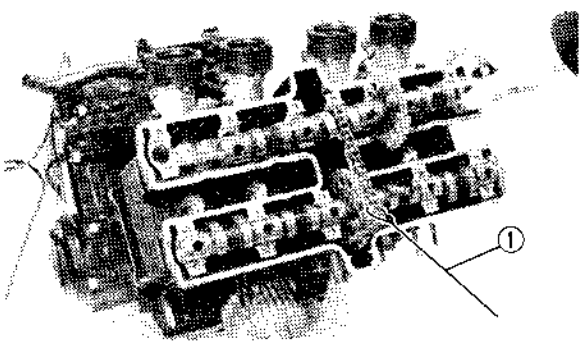
1. Remove:
   - Camshaft caps
   - Dowel pins

NOTE:

Remove the camshaft caps in a crisscross pattern from outermost to inner caps.

⚠ CAUTION:

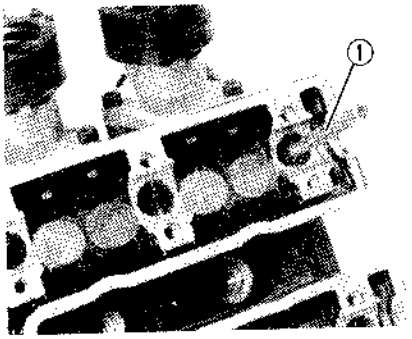
Do not rotate the camshaft or valve damage may occur.

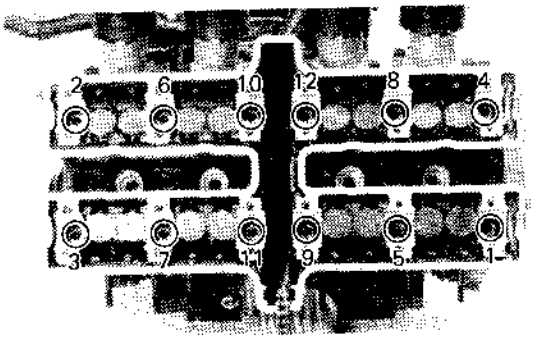


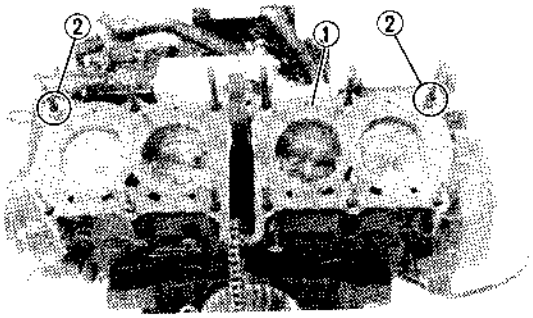
2. Remove:
   - Camshafts

NOTE:

Fasten safety wire ① to the cam chain to prevent it from falling into the crankcase.







3. Remove:
   - Nuts (Cylinder head)
     Use the Hexagon Wrench 6 mm (0.24 in) ①.

NOTE:
- Loosen the nuts in their proper loosening sequence.
- Follow numerical order shown in photo. Start by loosening each nut 1/2 turn until all are loose.

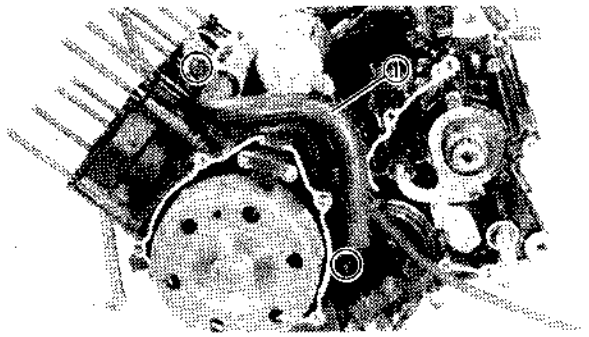
4. Remove:
   - Cylinder head

NOTE:
Remove the cylinder head as a whole to prevent the valve lifters and adjusting pads from falling into the crankcase.

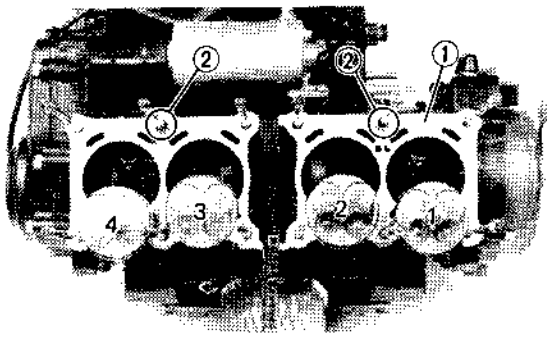
5. Remove:
   - Gasket (Cylinder head) ①
   - Dowel pins ②

CYLINDER AND PISTON

NOTE:
With the engine mounted, the cylinder and piston can be maintained by removing the following parts.
- Lower cowlings (Left and right)
- Center cowlings (Left and right)
- Seat
- Top cover
- Radiator
- Air filter case
- Carburetor
- Muffler assembly
- Down tube frame (Right)
- Cylinder head

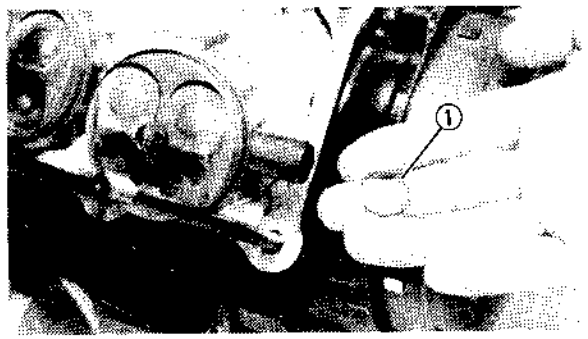


1. Remove:
   - Water pipe ①
   - O-rings
   - Cylinder



2. Remove:
   - Gasket (Cylinder) ①
   - Dowel pins ②
3. Mark:
   - Pistons

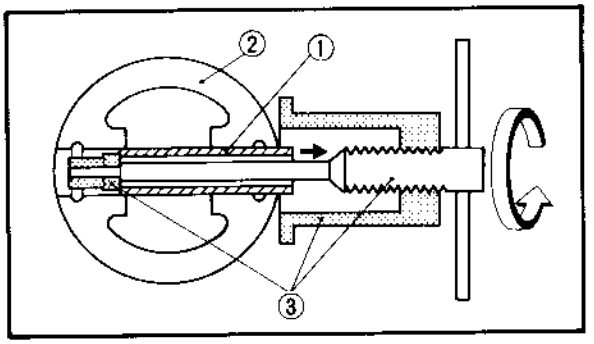
   With the piston number designations as shown.



4. Remove:
   - Circlips (Piston pin) ①

NOTE:

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



5. Remove:
   - Piston pins ①
   - Pistons ②

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 the Piston Pin Puller ③.



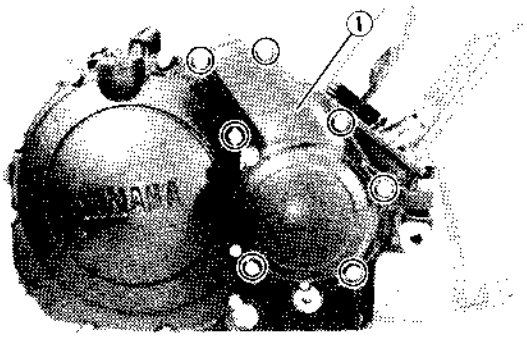
Piston Pin Puller:
P/N YU-01304

⚠ CAUTION:

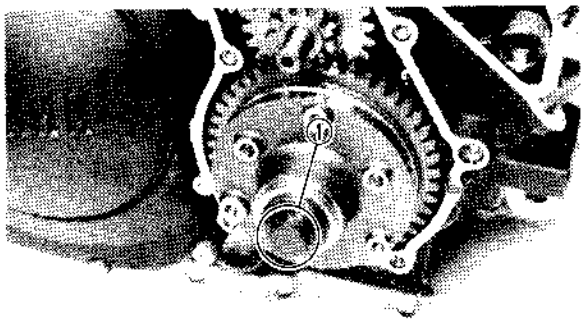
Do not use a hammer to drive the piston pin out.

STARTER CLUTCH

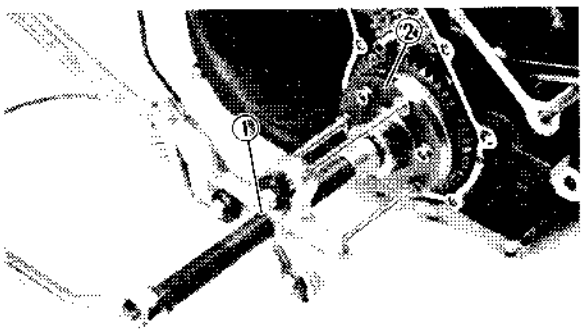
NOTE:
With the engine mounted, the starter clutch can be maintained by removing the following parts.
- Lower cowling (Right)
- Starter clutch cover



1. Remove:
   - Starter clutch cover ①
   - Gasket (Starter clutch cover)
   - Dowel pens.



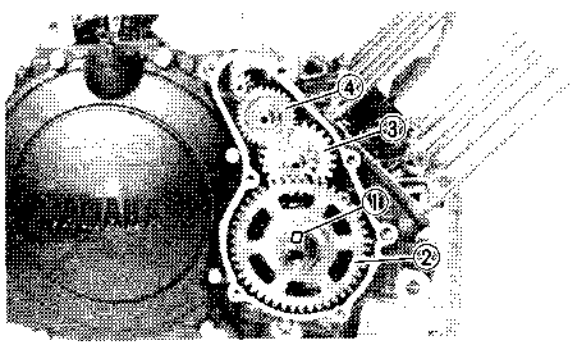
2. Remove:
   - Bolt (Starter clutch) ①
   - Washer



3. Attach:
   - Heavy Duty Puller ①

	Heavy Duty Puller: **YU-33270**

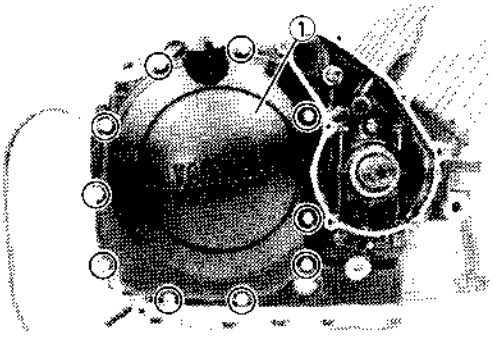
4. Remove:
   - Starter clutch ②



5. Remove:
   - Woodruff key ①
   - Starter clutch gear ②
   - Idle gear ③
   - Idle gear ④

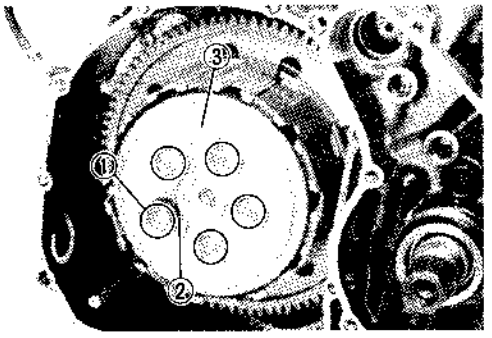
CLUTCH

NOTE:
With the engine mounted, the starter clutch can be maintained by removing the following parts.
- Lower cowling (Right)
- Crankcase cover (Right)



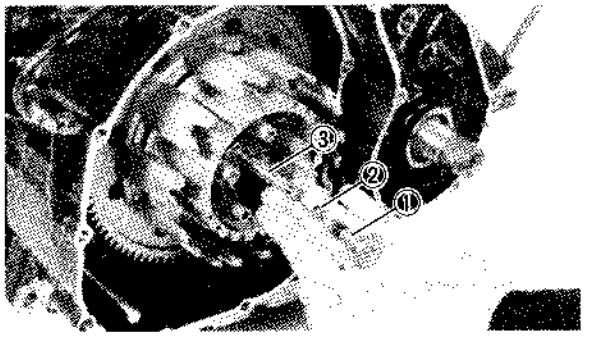
1. Remove:
   - Crankcase cover (Right) ①
   - Gasket (Crankcase cover)
   - Dowel pins

NOTE:
Working in a crisscross pattern, loosen bolts 1/4 turn each. Remove them after all are loosened.

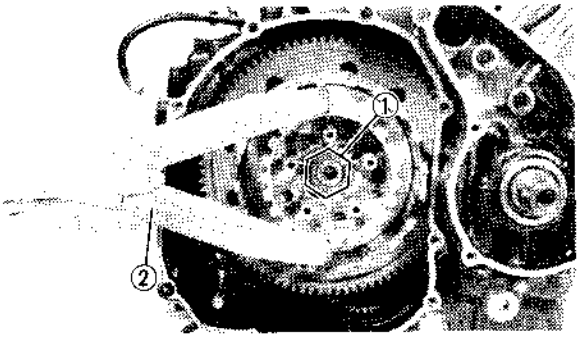


2. Remove:
   - Bolts (Clutch spring) ①
   - Clutch springs ②
   - Pressure plate ③
   - Friction plates
   - Clutch plates

NOTE:
Loosen the bolts in a crisscross pattern.



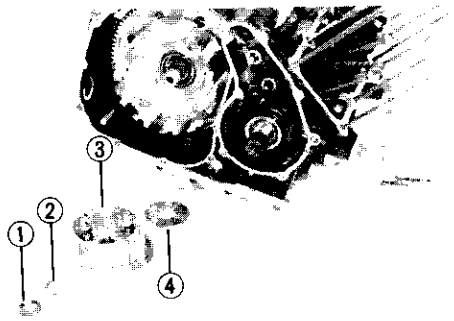
3. Remove:
   - Push rod #1 ①
   - Ball ②
   - Push rod #2 ③



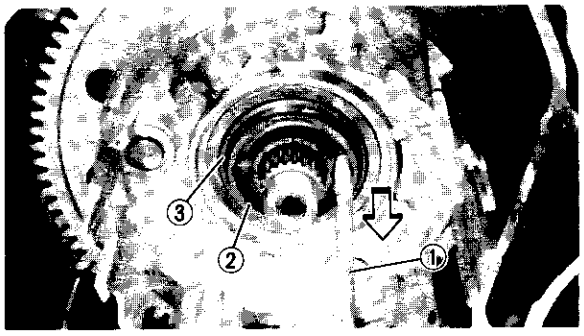
4. Straighten the lock washer tabs.
5. Loosen:
   - Nut (Clutch boss) ①
     Use the Universal Clutch Holder ②.

	Universal Clutch Holder: P/N YM-91042

NOTE:
Hold the clutch boss loosen the nut by Universal Clutch Holder ②.

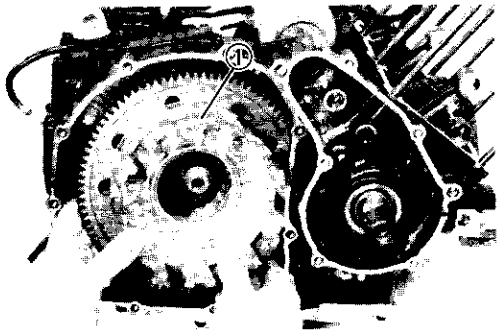


6. Remove:
   - Nut (Clutch boss) ①
   - Lock washer ②
   - Clutch boss ③
   - Thrust washer ④

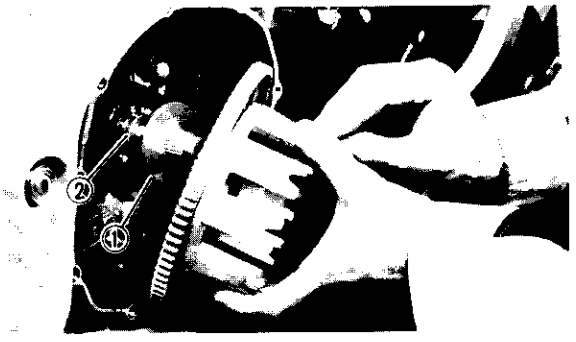


7. Remove:
   - Spacer ②
   - Bearing ③

NOTE:
Install the 5 mm (0.2 in) screw ① on the spacer ② then remove the spacer with pulling out screw.



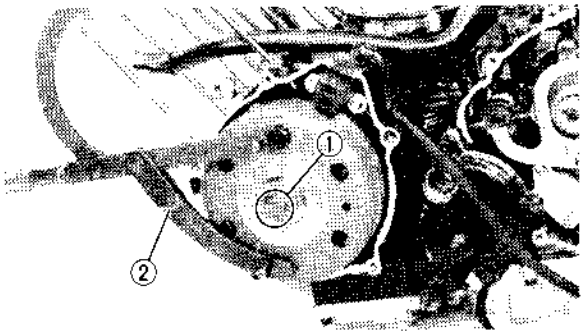
8. Remove:
   - Clutch housing ①



9. Remove:
   - Thrust washer ①
   - Collar ②

A.C. MAGNETO

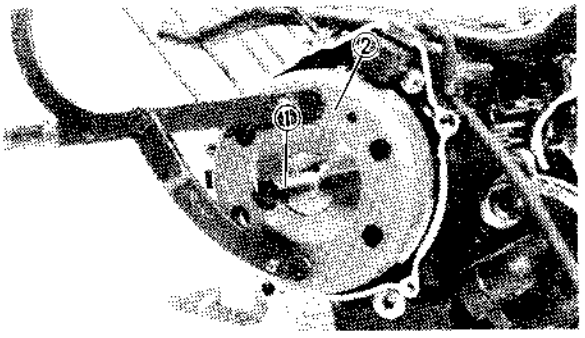
NOTE:
With the engine mounted, the A.C. Magneto can be maintained by removing the following parts.
- Lower cowling (Left)
- Generator cover



1. Remove:
   - Bolt (Magneto) ①
   - Washer

NOTE:
Hold the magneto to loosen the nut by the Universal Rotor Holder ②.

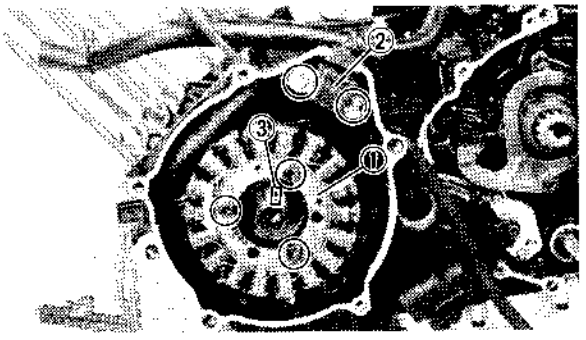
Universal Rotor Holder:
P/N YU-01235



2. Attach:
   - Rotor puller ①

Rotor Puller:
P/N YM-01080

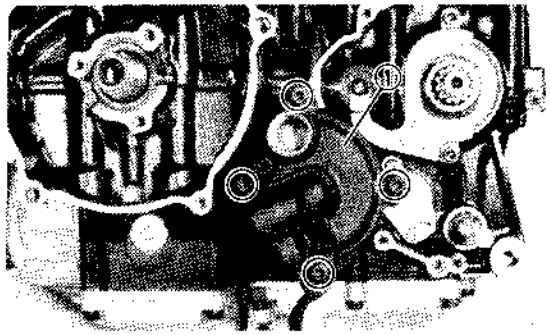
3. Remove:
   - Magneto ②



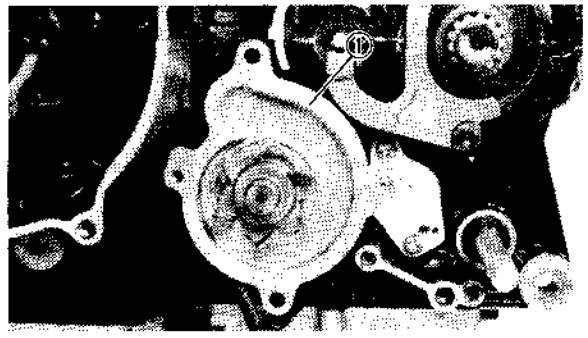
4. Remove:
   - Startor coil assembly ①
   - Pickup coil ②
   - Woodruff key ③

WATER PUMP

NOTE:
With the engine mounted, the water pump can be maintained by removing the following parts.
- Seat
- Top cover
- Lower cowling (Right)
- Shift arm
- Crankcase cover (Right)
- Water pipe
- Water pump cover



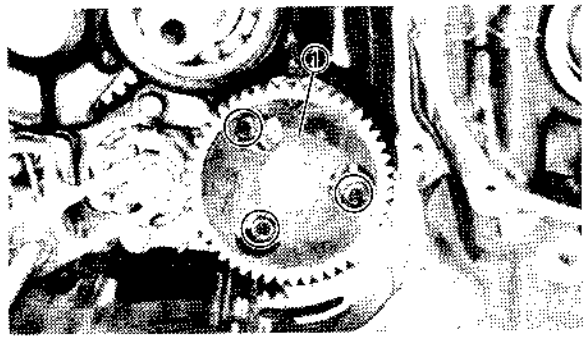
1. Remove:
   - Water pump cover ①
   - O-ring



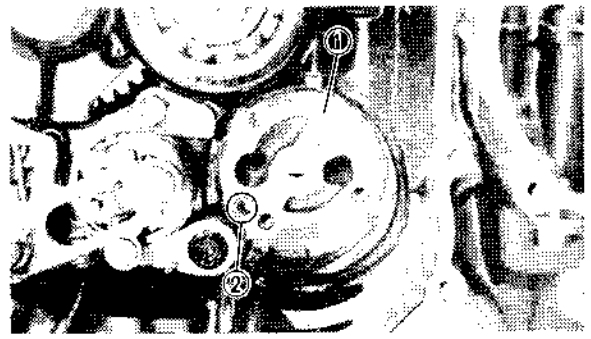
2. Remove:
   - Water pump housing ①

OIL PUMP AND SHIFT SHAFT

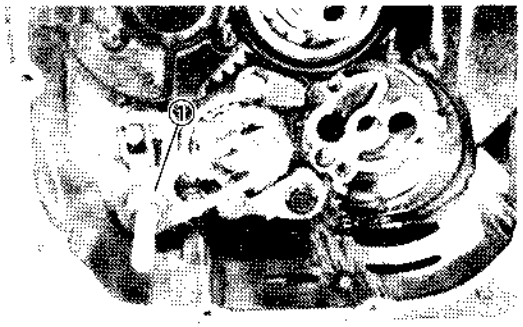
NOTE:
With the engine mounted, the oil pump and shift shaft can be maintained by removing the following parts.
- Lower cowling (Right)
- Crankcase cover (Right)
- Clutch housing



1. Remove:
   - Oil pump assembly ①



2. Remove:
   - Gasket (Oil pump assembly) ①
   - Dowel pin ②



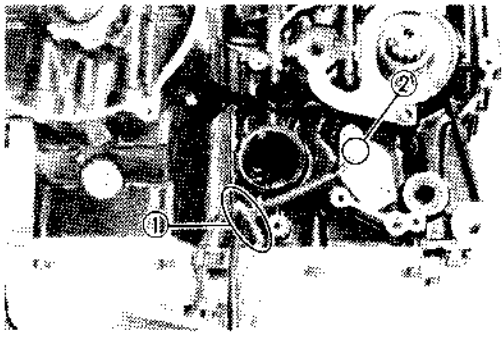
3. Remove:
   - Shift shaft assembly ①

OIL PAN AND OIL STRAINER

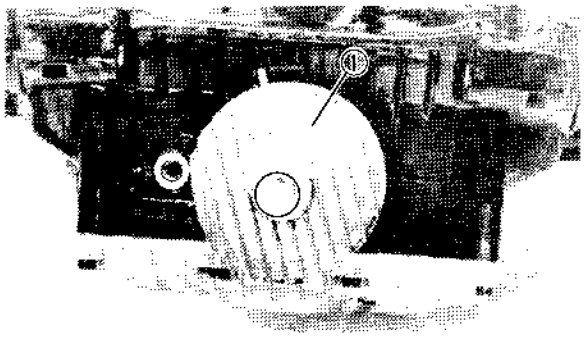
NOTE:

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

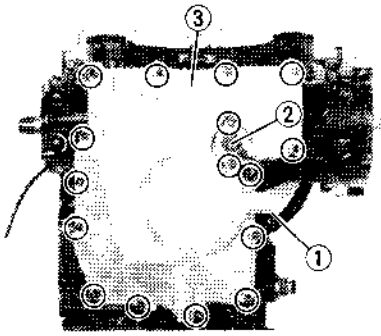
- Lower cowlings (Left and right)
- Muffler assembly
- Cowling stay



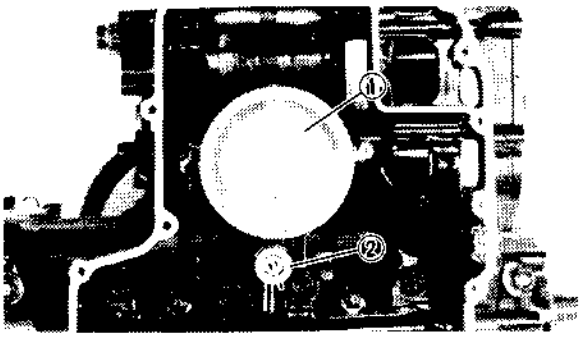
1. Disconnect:
   - Oil level switch lead ①
   - Neutral switch lead ②



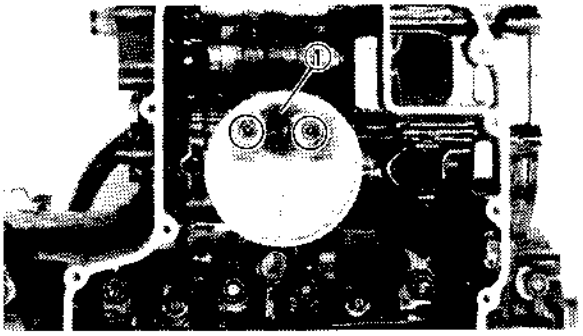
2. Remove:
   - Oil filter cover ①
   - Oil filter



3. Remove:
   - Drain plug ①
   - Oil level switch ②
   - Oil pan ③
   - Gasket (Oil pan)
   - Dowel pins



4. Remove:
   - Oil strainer cover ①
   - Relief valve ②



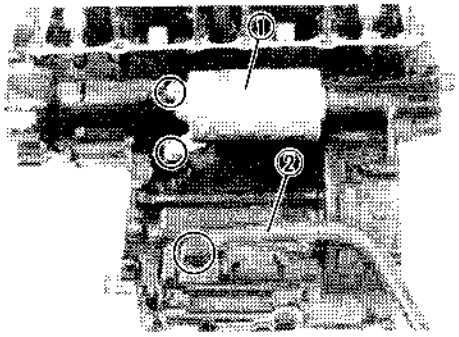
5. Remove:
   - Oil strainer assembly ①

STARTER MOTOR

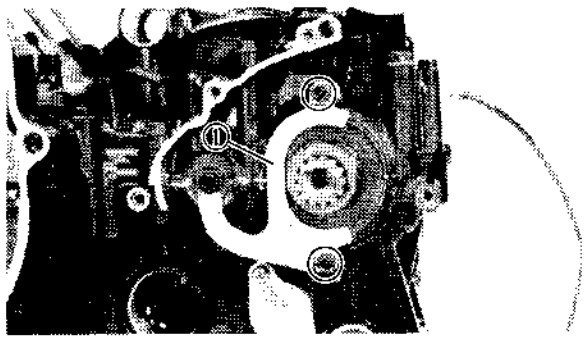
NOTE:

With the engine mounted, the starter motor, can be maintained by removing the following parts.

- Seat
- Top cover
- Fuel tank

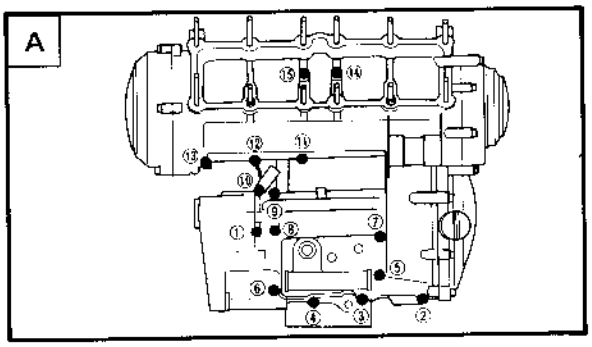


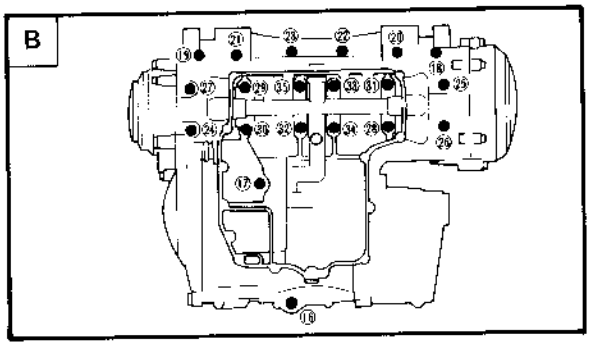
1. Remove:
   - Starter motor ①
   - Crankcase ventilation hose ②



CRANKCASE DISASSEMBLY

1. Remove:
   - Oil seal stopper ①



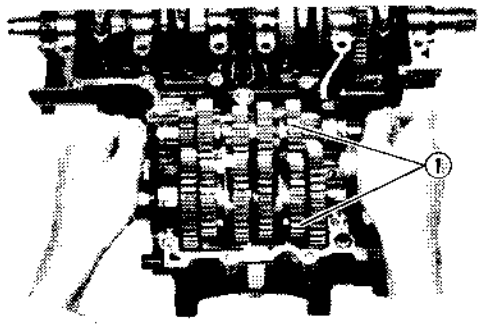


3. Remove:
   - Bolts (Crankcase)

NOTE:
- Remove the bolts starting with the highest numbered one.
- The embossed numbers in the crankcase designate the crankcase tightening sequence.

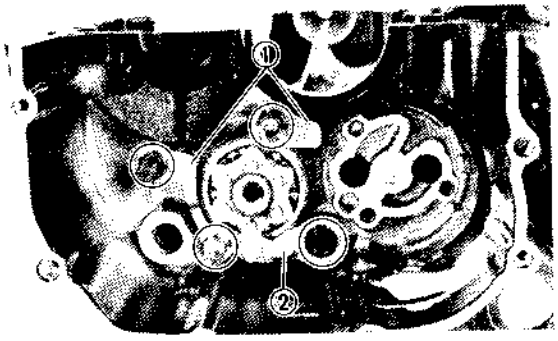
4. Place the engine upside down.
5. Remove:
   - Crankcase (Lower)
     Use a soft hammer.

[A] Upper case
[B] Lower case

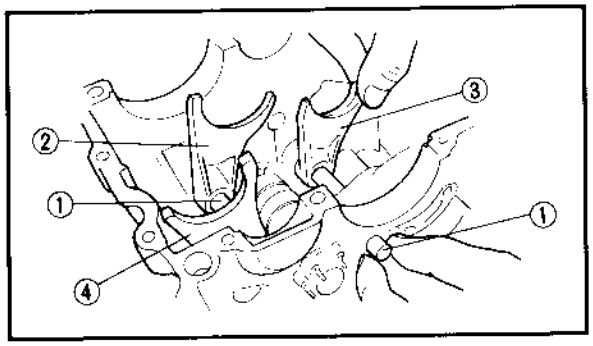


TRANSMISSION, SHIFTER AND SHIFT CAM

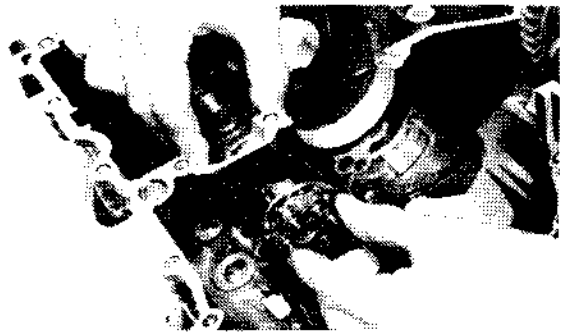
1. Remove:
   - Transmission assembly ①
   - Dowel pins



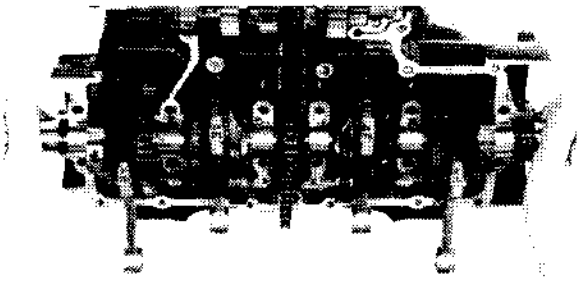
2. Remove:
   - Stopper lever ①
   - Stopper plate (Shift cam) ②



3. Remove:
   - Guide bars ①
   - Shift fork #1 ②
   - Shift fork #2 ③
   - Shift fork #3 ④

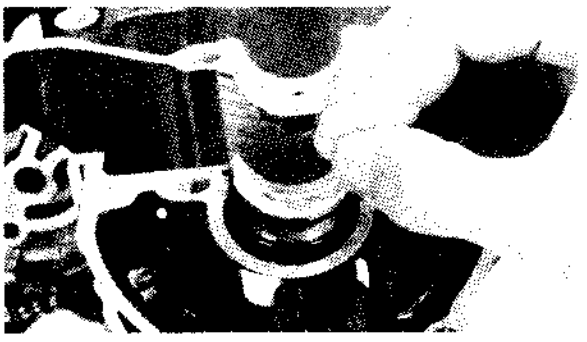


4. Remove:
   • Shift cam



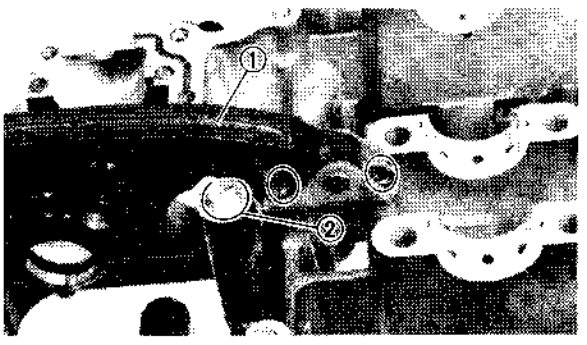
CRANKSHAFT

1. Remove:
   • Crankshaft assembly

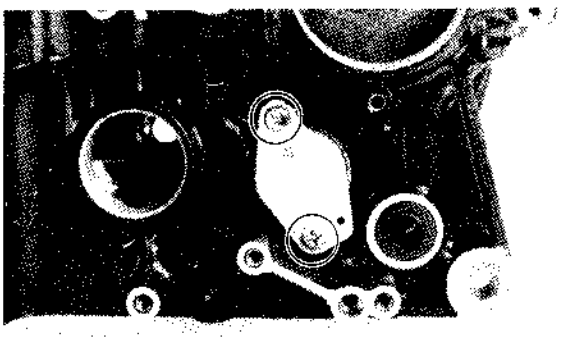


2. Remove:
   • Main journal bearing

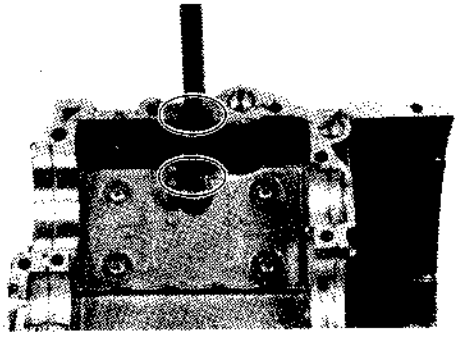
NOTE:
Identify each main journal bearing position very carefully so that it can be reinstalled in its original place.



3. Remove:
   • Cam chain guide (Intake side) ①
   • O-ring ②



4. Remove:
   • Neutral switch



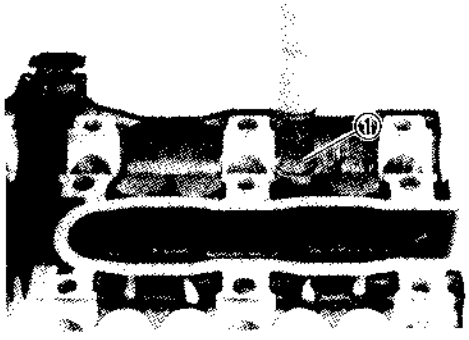
5. Remove:
   - Breather hose
   - Oil baffle plate

VALVE PAD AND VALVE

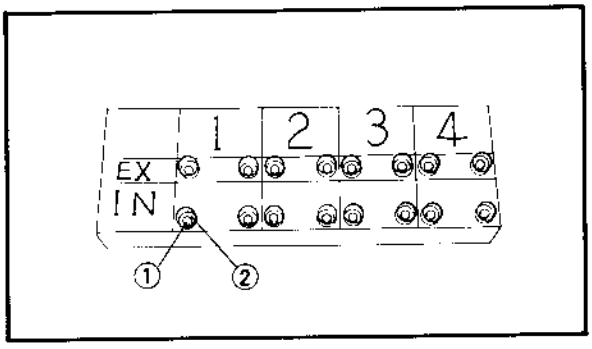
NOTE:

With the engine mounted, the valve pad and valve can be maintained by removing the following parts.

- Lower cowlings (Left and right)
- Center cowlings (Left and right)
- Fuel tank
- Carburetor
- Radiator
- Generator cover
- Cylinder head cover
- Cam chain tensioner
- Cylinder head



1. Remove:
   - Lifters ①
   - Valve pads



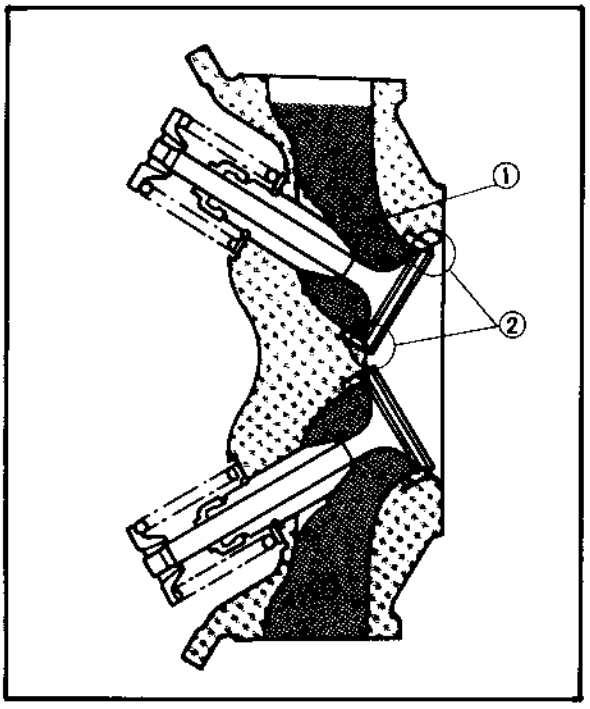
NOTE:

Identify each lifter and pad position very carefuly so that it can be reinstalled in its original place.

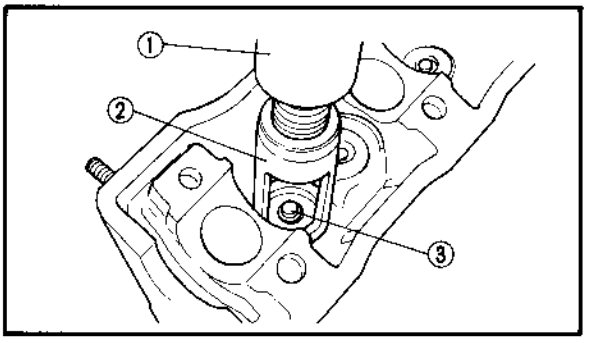
① Lifters
② Valve pads

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

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



Valve seal checking steps:
- Supply a clean solvent ① into the intake and exhaust ports.
- Check the valve sealing. There should be no leakage at the valve seats ②.

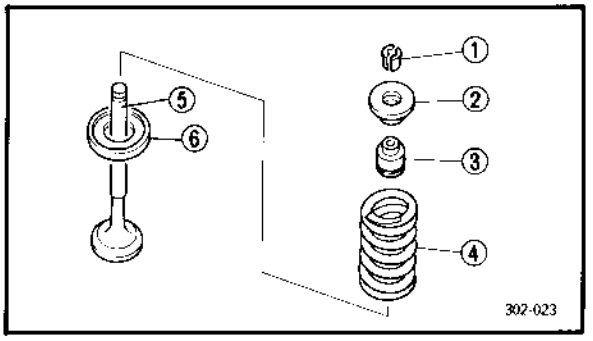


3. Attach:
   - Valve spring compressor ①
   - Attachment ②



Valve Spring Compressor:
P/N YM-04019
Attachment:
P/N YM-04108

③ Valve retainers



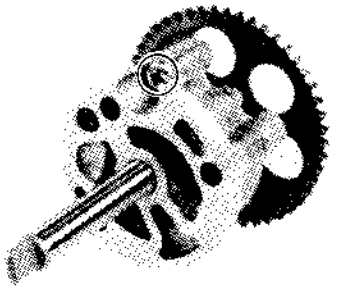
4. Remove:
   - Valve retainers ①
   - Valve spring seat ②
   - Oil seal ③
   - Valve spring ④
   - Valve ⑤
   - Valve spring seat ⑥

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



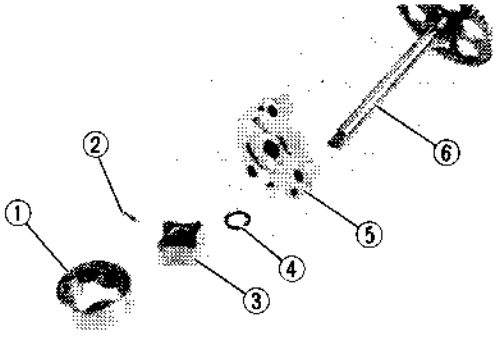
CONNECTING ROD

1. Remove:
   - Connecting rod ①
   - Connecting rod bearing

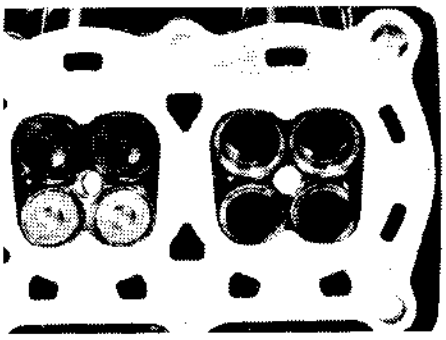


INNER ROTOR (OIL PUMP)

1. Remove:
   - Pump housing



2. Remove:
   - Outer rotor ①
   - Pin ②
   - Inner rotor ③
   - Washer ④
   - Pump cover ⑤
   - Pump shaft ⑥



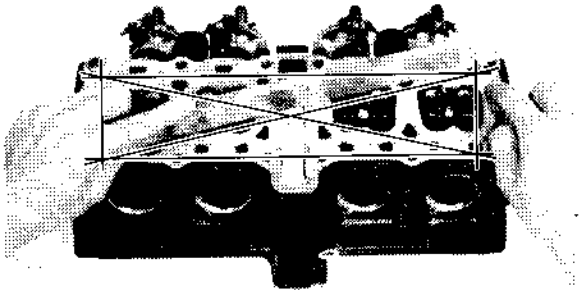
INSPECTION AND REPAIR

CYLINDER HEAD

1. Eliminate:
   - Carbon deposit
     (from combustion chamber)
     Use rounded scraper.

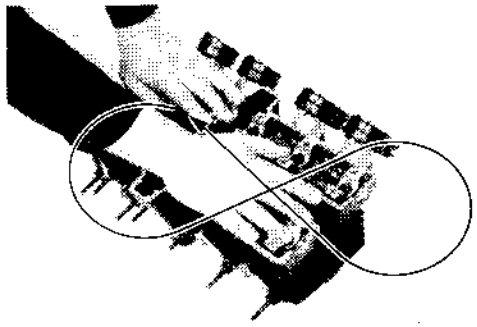
NOTE:
Do not use a sharp instrument and avoid damaging or scratching:
- Spark plug threads
- Valve seat

2. Inspect:
   - Cylinder head
     Scratches/Damage → Replace.



3. Measure:
   - Warpage
     Out of specification → Resurface.

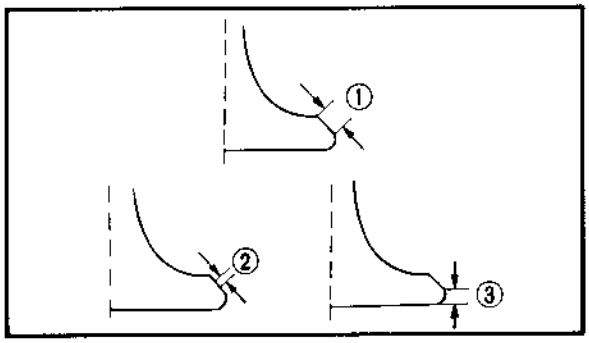
Cylinder Head Warpage:
Less than 0.03 mm (0.0012 in)



4. Resurface:
   - Cylinder head

Resurfacement steps:
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.

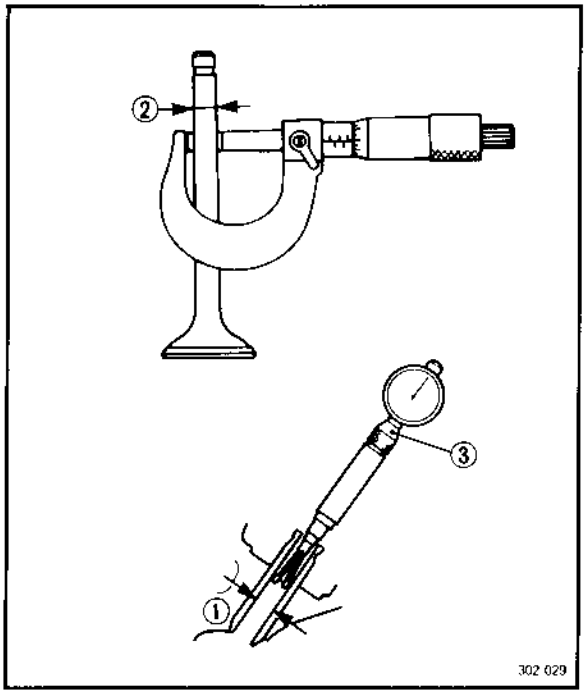


VALVE

1. Inspect:
   - Valve face
   - Stem end

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

Face Width ① :
1.6 ~ 2.4 mm (0.0630 ~ 0.0945 in)
Seat Width ② :
0.9 ~ 1.1 mm (0.0354 ~ 0.0433 in)
< Limit >
1.6 mm (0.063 in)
Margin Thickness ③ :
0.6 ~ 0.8 mm (0.0236 ~ 0.0315 in)
< Limit >
0.4 mm (0.0157 in)

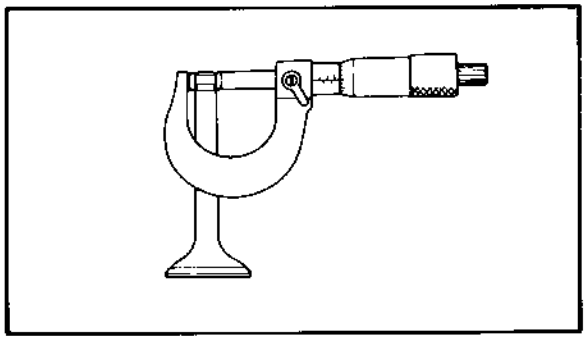


2. Measure:
   - Valve stem clearance

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

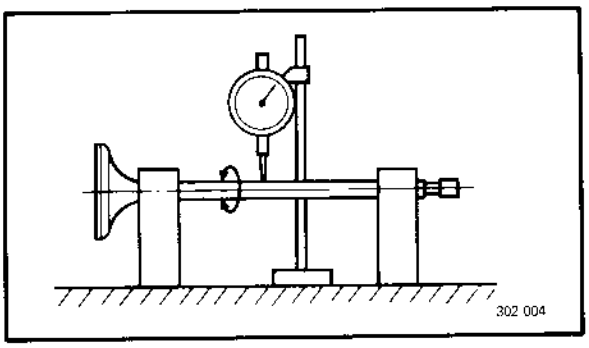
Out of specification → Replace either valve and/or guide.
Use a Micrometer and Bore Gauge ③ .

	Valve Stem Clearance	Maximum
Intake	0.010 ~ 0.037 mm (0.0004 ~ 0.0015 in)	0.08 mm (0.0031 in)
Exhaust	0.025 ~ 0.052 mm (0.001 ~ 0.002 in)	0.1 mm (0.0039 in)



3. Inspect:
   - Valve stem end

   Mushroom shape/Larger diameter than rest of stem → Replace valve, valve guide, and oil seal.



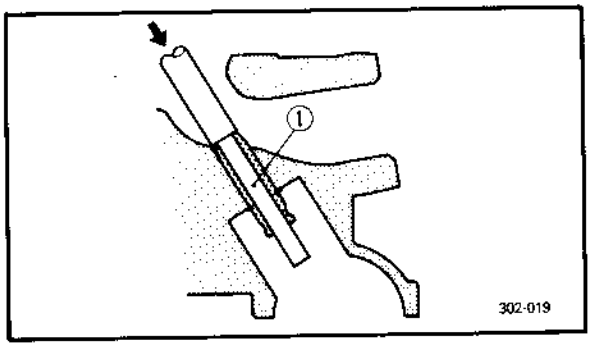
4. Measure:
   • Valve stem runout
   Out of specification → Replace.

Maximum Runout:
0.02 mm (0.0008 in)

VALVE GUIDE

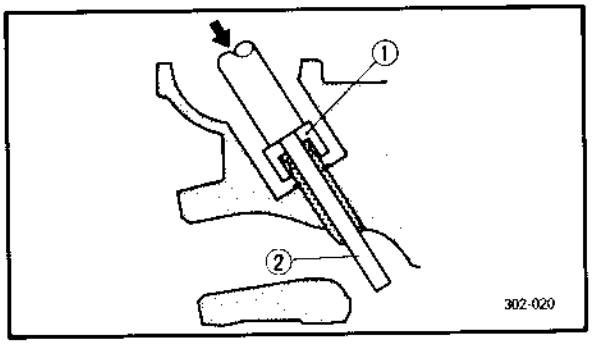
NOTE:
- Always replace the valve guide if the valve is replaced.
- Always replace the oil seal if the valve is removed.

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



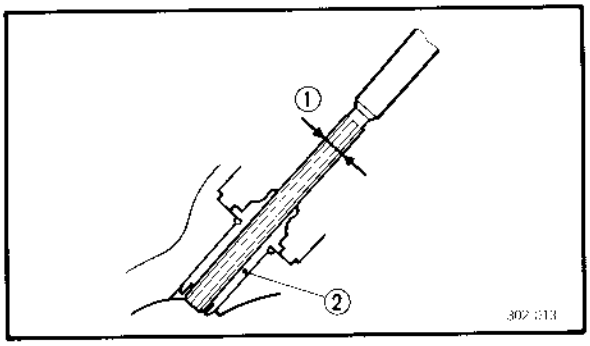
2. Remove:
   • Valve guide
   Use the Valve Guide Remover ①.

Valve Guide Remover (4.5 mm):
P/N YM-04116



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

Valve Guide Installer:
P/N YM-04117
Valve Guide Remover (4.5 mm):
P/N YM-04116



4. Bore valve guide ② to obtain proper valve stem clearance.
   Use the Valve Guide Reamer (4.5 mm) ①.

Valve Guide Reamer (4.5 mm):
P/N YM-04118

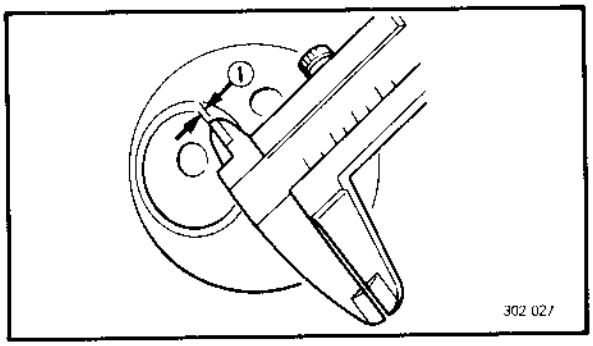
NOTE:
Reface the valve seat after installing the valve guide.

VALVE SEAT

1. Clean:
   - Valve face
   - Valve seat

   Remove carbon deposit.
2. Inspect:
   - Valve seat

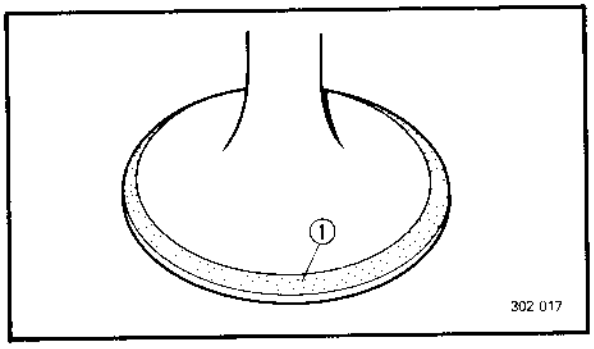
   Pitting/Wear → Reface valve seat.



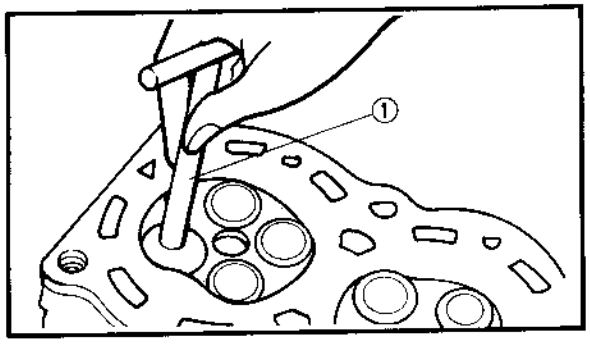
3. Measure:
   - Valve seat width ①

   Out of specification → Reface valve seat.

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



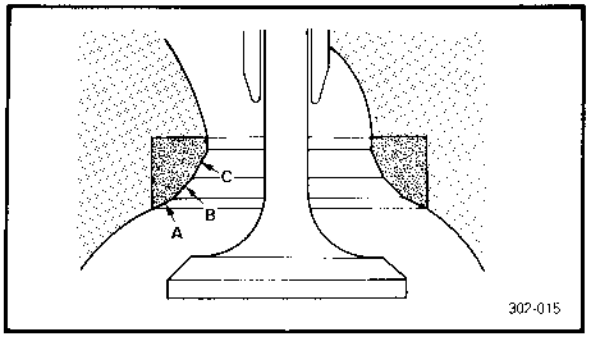
Valve seat width measurement steps:
- Apply the Mechanic's bluing dye (Dykem) ① to the valve face.
- Install the valve into the cylinder head.
- Press the valve through the valve guide and onto the valve seat to make a clean pattern.
- Measure the valve seat width. Whether the valve seat and valve face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

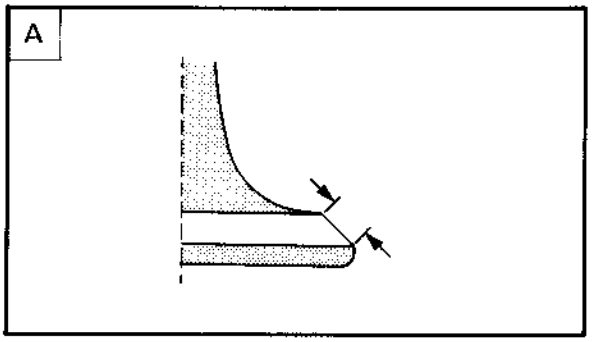


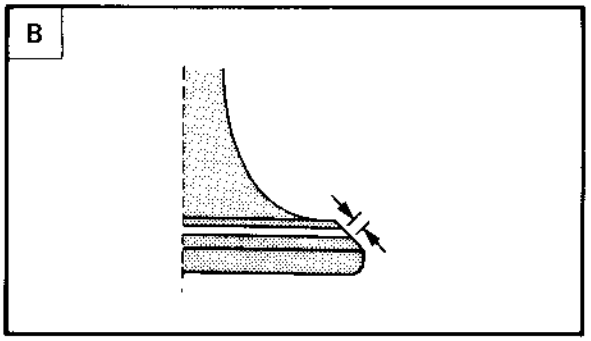
4. Reface:
   - Valve seat

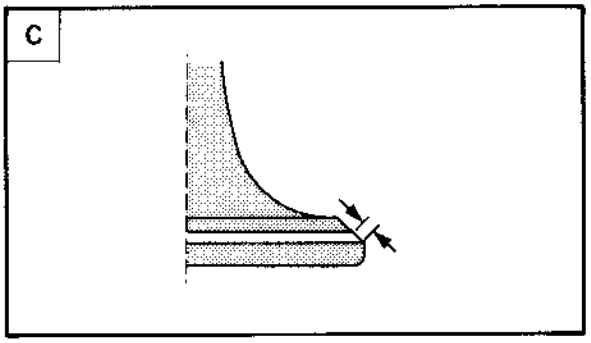
   Use 20°, 45° and 60° Valve Seat Cutter.

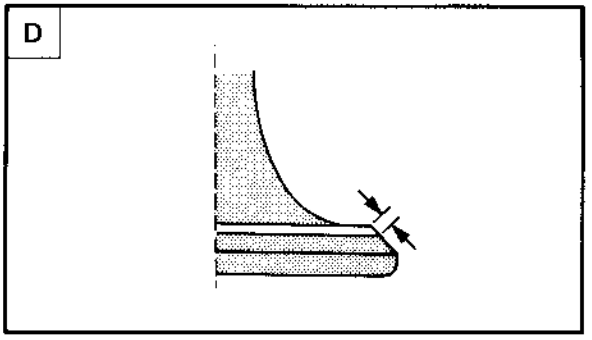
	Valve Seat Cutter Set ①: P/N YM-91043











⚠ CAUTION:

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

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

Valve seat refacing steps:

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

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

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

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

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

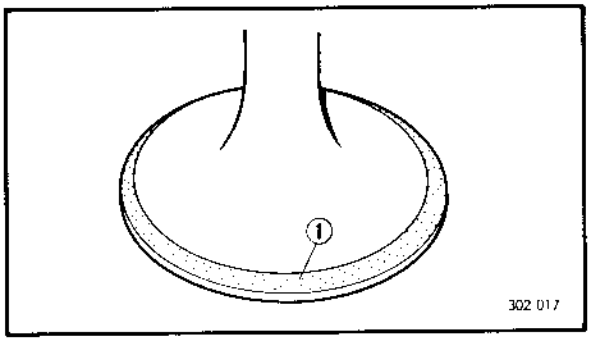
Valve Seat Cutter Set		Desired Result
Use	20° cutter 45° cutter	To center the seat and to achieve its width of 1.0 mm (0.04 in)

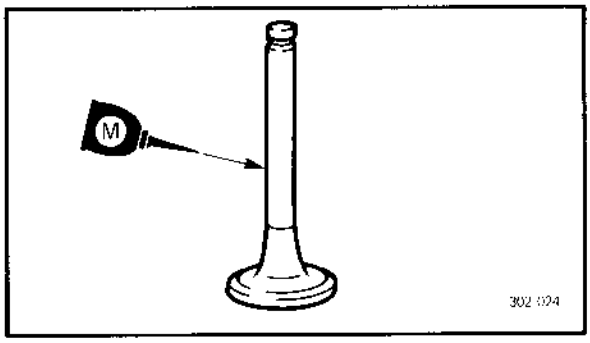
D Valve seat is too narrow and is located down near the bottom edge of the valve face.

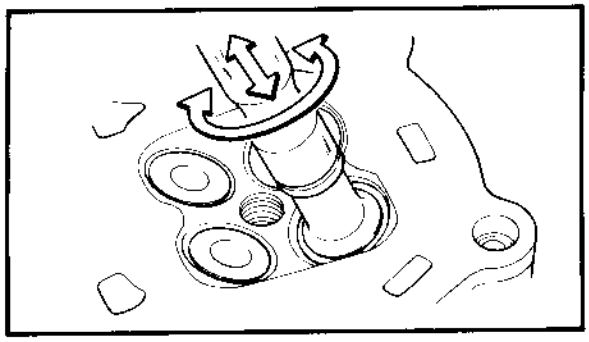
Valve Seat Cutter Set		Desired Result
Use	60° cutter, first 45° cutter	To center the seat and increase its width.

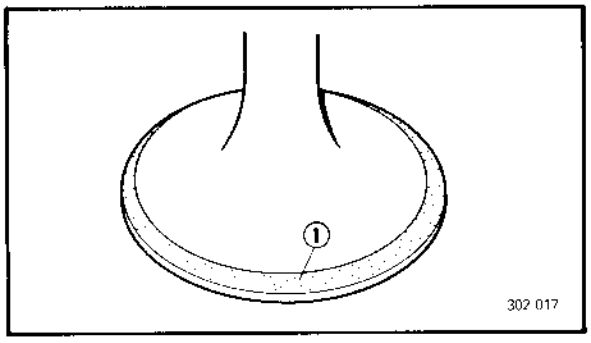
5. Lap:
   - Valve face
   - Valve seat

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









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

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

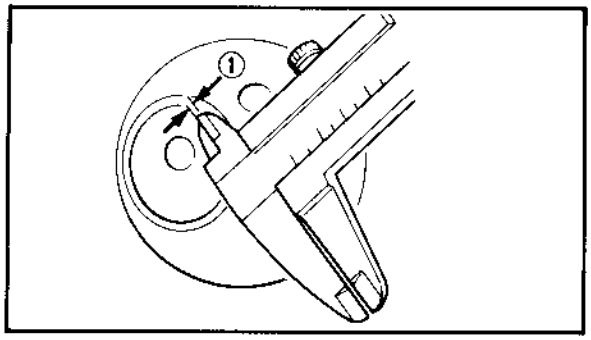
- Apply a molybdnum disulfide oil to the valve stem.
- Install the valve into the cylinder head.
- Turn the valve until the valve face and valve seat are evenly polished, then clean off all compound.

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

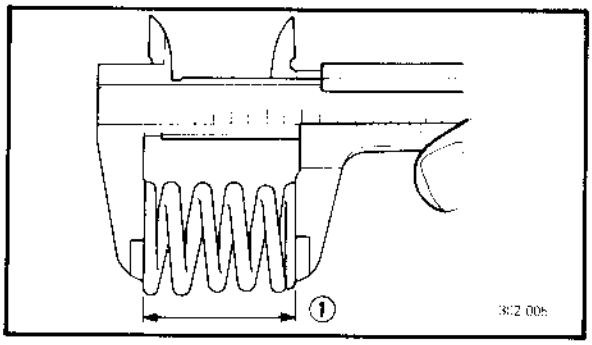
- Apply a fine lapping compound to the valve face and repeat the above steps.

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

- Apply the Mechanic's bluing dye (Dykem) ① to the valve face.
- Install the valve into the cylinder head.



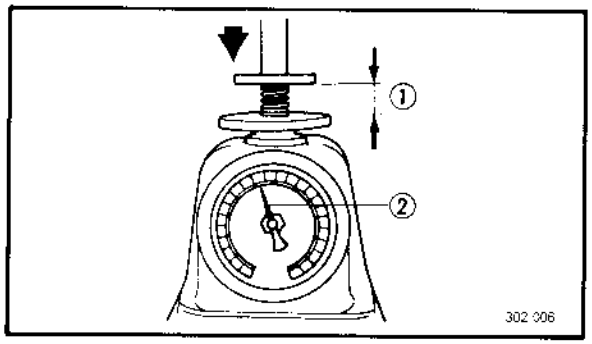
- Press the valve through the valve guide and onto the valve seat to make a clear pattern.
- Measure the valve seat width ① again. If the valve seat width is out of specification, reface and lap the valve seat.



VALVE SPRING

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

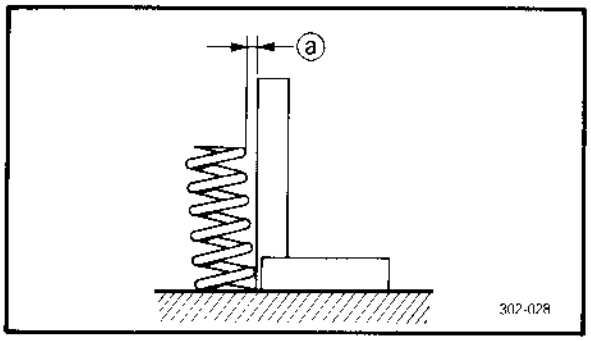
Valve Spring Free Length:
41.94 mm (1.65 in)



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

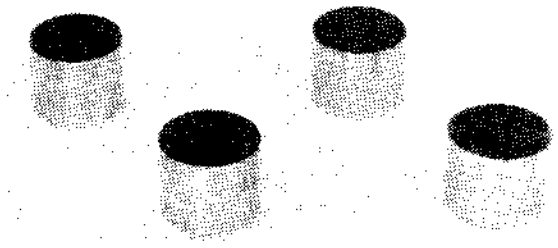
① Installed length

Valve Spring Installed Force:	
①	②
37.5 mm (1.48 in)	14.2 ~ 16.4 kg (31.3 ~ 36.2 lb)



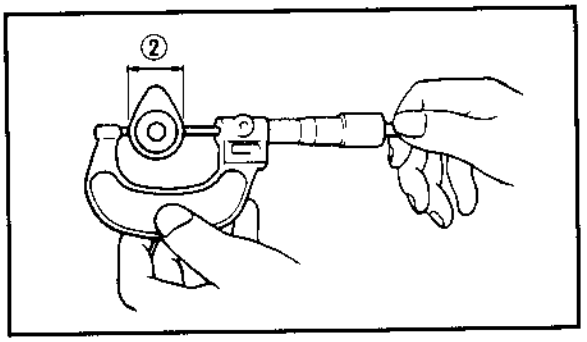
3. Measure:
   - Spring Tilt ⓐ
     Out of specification → Replace.

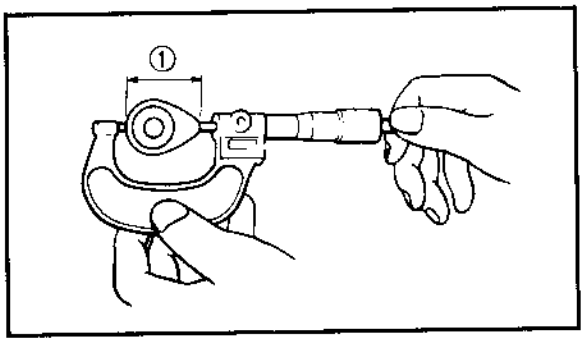
Spring Tilt:
Less than 1.8 mm (0.0709 in)

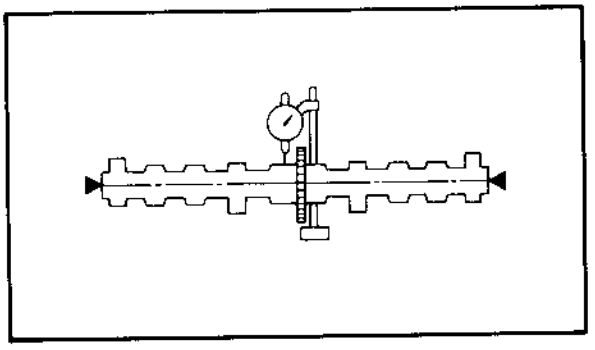


VALVE LIFTER

1. Inspect:
   - Valve lifters
     Scratches/Damage → Replace both lifters and camshaft case.







CAMSHAFT, CAM CHAIN, AND CAM SPROCKET

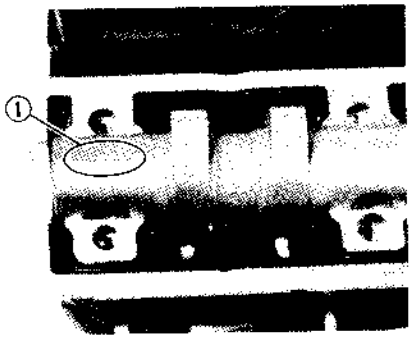
Camshaft

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

	Cam Lobe ① (Limit)	Cam Lobe ② (Limit)
Intake	32.51 mm (1.2799 in)	25.005 mm (0.9844 in)
Exhaust	32.21 mm (1.2681 in)	24.96 mm (0.9827 in)

3. Measure:
   - Camshaft runout
     Use the Micrometer.
     Out of specification → Replace.

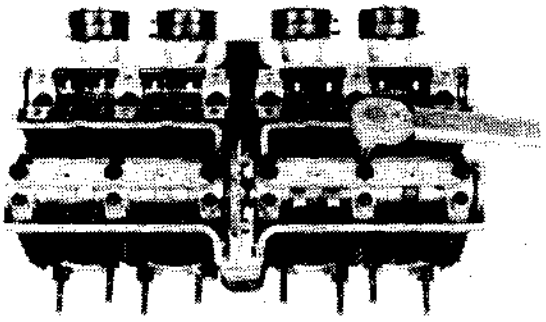
Camshaft Runout Limit:
0.03 mm (0.0012 in)



Camshaft/Cap Clearance Measurement

1. Install:
   - Camshaft
2. Position:
   - Strip of Plastigage® ①
     Onto the camshaft.

Plastigage®:
P/N YU-33210

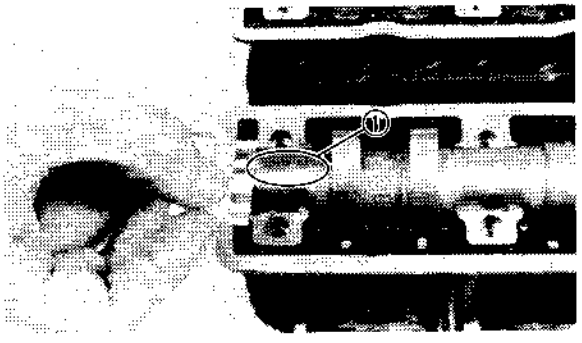


3. Install:
   - Dowel pins
   - Camshaft caps
4. Tighten:
   - Camshaft cap bolts

Bolts (Camshaft Cap):
10 Nm (1.0 m·kg, 7.2 ft·lb)

NOTE:
- Tighten the camshaft caps in a crisscross pattern from innermost to outer caps.
- Do not turn the camshaft when measuring clearance with the Plastigage®.

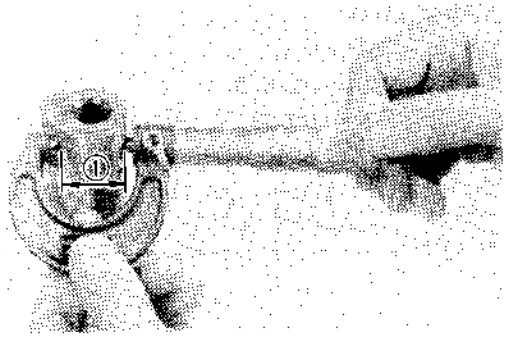
5. Remove:
   - Camshaft caps



6. Measure:
   - Width of Plastigage® ①

   Out of specification → Follow step 7.

Camshaft-to-cap Clearance:
0.020 ~ 0.054 mm
(0.0008 ~ 0.0021 in)



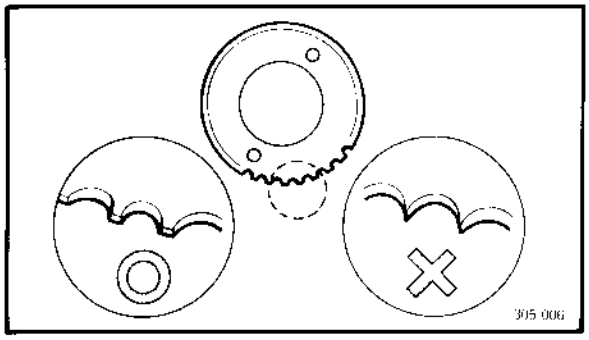
7. Measure:
   - Camshaft outside diameter ①

   Use a micrometer.
   Out of specification → Replace the camshaft.
   Within specification → Replace the camshaft case.

Camshaft Outside Diameter:
Standard: 22.967 ~ 22.980 mm
(0.9042 ~ 0.9047 in)
Cam Cap Inside Diameter:
Standard: 23.000 ~ 23.021 mm
(0.9056 ~ 0.9063 in)

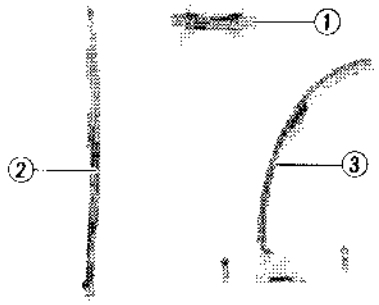
Cam Chain

1. Inspect:
   - Cam chain
     Chain stretch/Cracks → Replace.



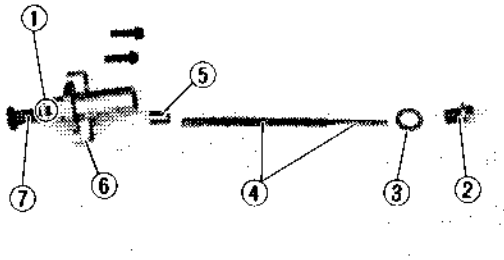
Cam Sprockets

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



Cam Chain Guide

1. Inspect:
   - Cam chain guide (Upper) ①
   - Cam chain guide (Exhaust side) ②
   - Cam chain guide (Intake side) ③
     Wear → Replace.



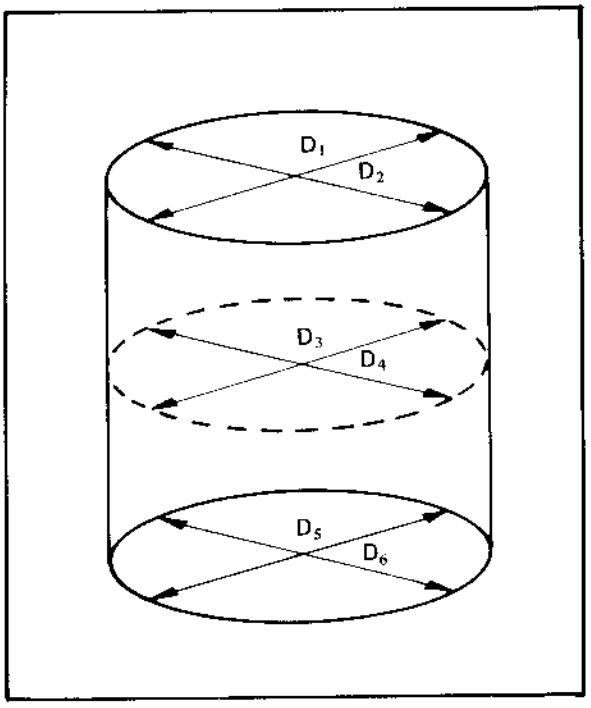
Cam Chain Tensioner

1. Check:
   - One-way cam ① operation
     Unsmooth operation → Replace.
2. Inspect:
   - All parts
     Damage/Wear → Replace.

② End plug	⑤ Collar
③ Washer	⑥ Tensioner body
④ Springs	⑦ Tensioner rod

CYLINDER AND PISTON

1. Inspect:
   - Cylinder and Piston walls
     Vertical scratches → Rebore or Replace cylinder and piston.
2. Measure:
   - Piston-to-cylinder clearance



Piston-to-cylinder clearance measurement steps:

First step:

- Measure the cylinder bore "C" with 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"	56.000 ~ 56.005 mm (2.2047 ~ 2.2049 in)	56.05 mm (2.2067 in)
Taper "T"	–	0.05 mm (0.0019 in)
Out of round "R"	–	0.03 mm (0.001 in)

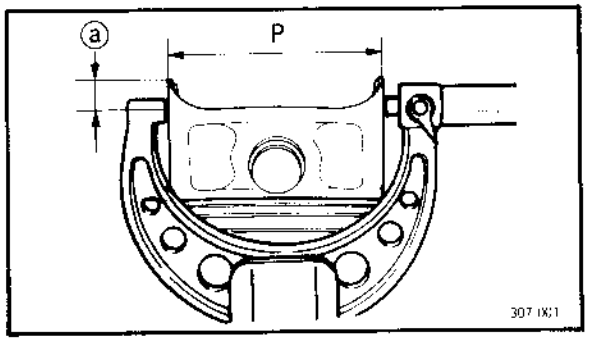
C = Maximum D
T = (Maximum D_1 or D_2) – (Maximum D_5 or D_6)
R = (Maximum D_1, D_3 or D_5) – (Minimum D_2, D_4 or D_6)

- 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.

ⓐ 5.0 mm (0.2 in) from the piston bottom edge.



	Piston Size P
Standard	55.945 ~ 55.960 mm (2.2026 ~ 2.2031 in)
Oversize 2	56.5 mm (2.22 in)
Oversize 4	57.0 mm (2.24 in)

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

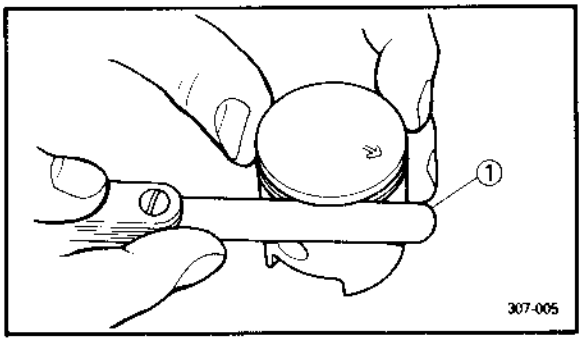
3rd step:

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

Piston-to-cylinder Clearance = Cylinder bore "C" – Piston skirt diameter "P"

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

Piston-to-cylinder Clearance:
0.04 ~ 0.06 mm
(0.0016 ~ 0.0024 in)
Limit: 0.15 mm (0.006 in)



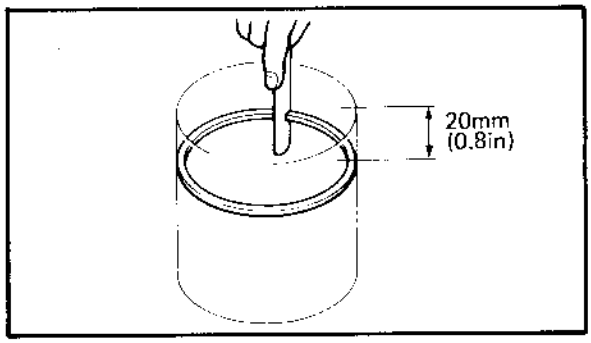
PISTON RING AND PISTON PIN

Piston Ring

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

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

	Side Clearance:	
	Standard	Limit
Top ring	0.03 ~ 0.07 mm (0.0012 ~ 0.0028 in)	0.10 mm (0.004 in)
2nd ring	0.02 ~ 0.06 mm (0.0008 ~ 0.0024 in)	0.10 mm (0.004 in)

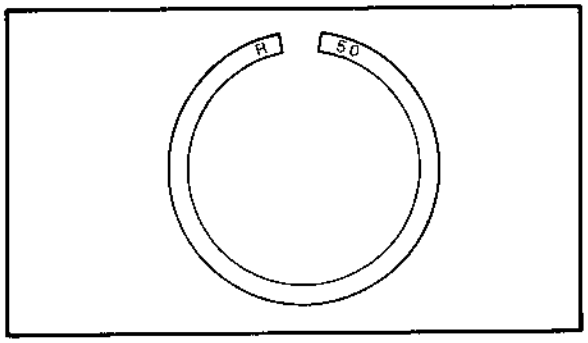


2. Position:
   - Piston ring
   Into cylinder.

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

3. Measure:
   - End gap
   Out of specification → Replace.

	End Gap (Installed):
	Standard
Top ring	0.15 ~ 0.30 mm (0.0059 ~ 0.0118 in)
2nd ring	0.15 ~ 0.30 mm (0.0059 ~ 0.0118 in)
Oil control (Rails)	0.2 ~ 0.8 mm (0.0079 ~ 0.0315 in)

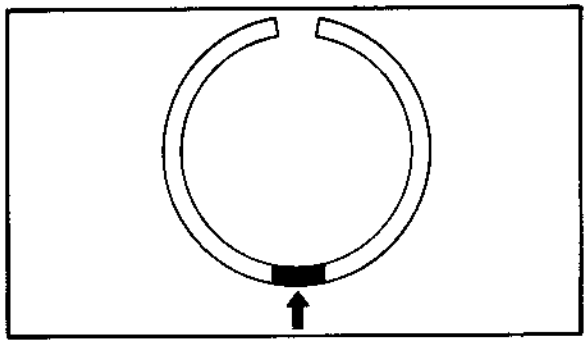


Piston Ring Oversize

- Top and 2nd piston ring

Oversize top and middle ring size is stamped on the top of ring.

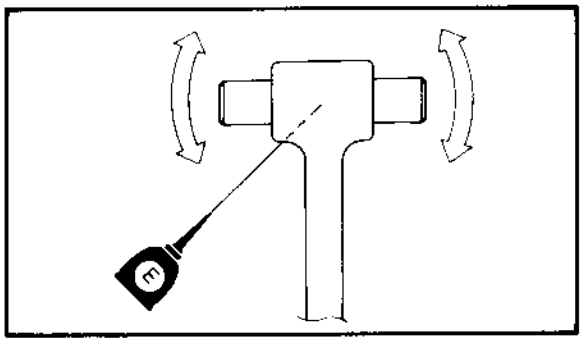
Oversize 2	0.50 mm (0.0197 in)



- Oil control ring

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

Size	Color
Oversize 2	Red



Piston Pin

1. Lubricate:
   - Piston pin (Lightly)

SAE 10W30 Motor Oil

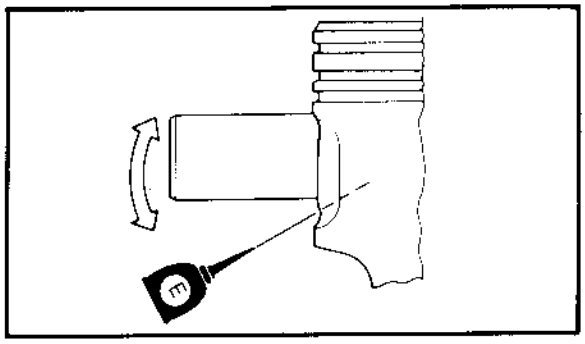
2. Install:
   - Piston pin

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

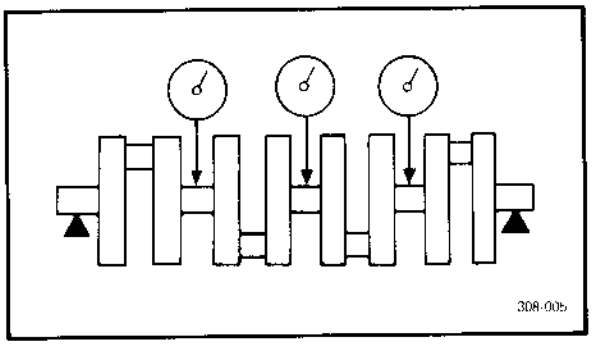
   Free play → Inspect the connecting rod for wear.

   Wear → Inspect the connecting rod and piston pin.
4. Position:
   - Piston pin

   Into the piston.



5. Check:
   • Free play
   When the pin is in place in the piston.
   Free play → Replace the piston pin and/or piston.



CRANKSHAFT AND CONNECTING ROD

Crankshaft

1. Measure:
   • Runout
   Use the V-Blocks and Dial Gauge.
   Out of specification → Replace.

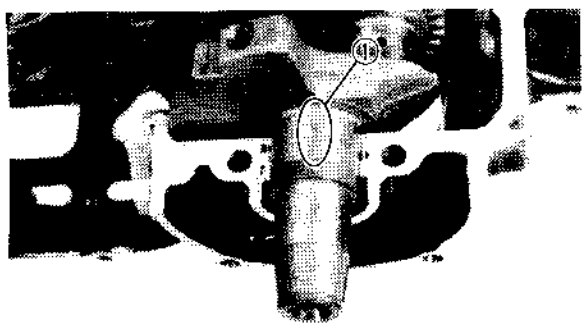
   Out of specification → Replace.

Runout Limit:
0.03 mm (0.0012 in)

2. Inspect:
   • Crankshaft journal surfaces
   Wear/Scratches → Replace.

Main Journal Oil Clearance

1. Clean all parts.
2. Position:
   • Crankshaft journal surfaces
   Place on a bench in an upside down position.
3. Install:
   • Main journal bearings
   Into the upper crankcase.
   • Crankshaft
4. Attach:
   • Plastigage® ①
   Onto the crankshaft journal surface.

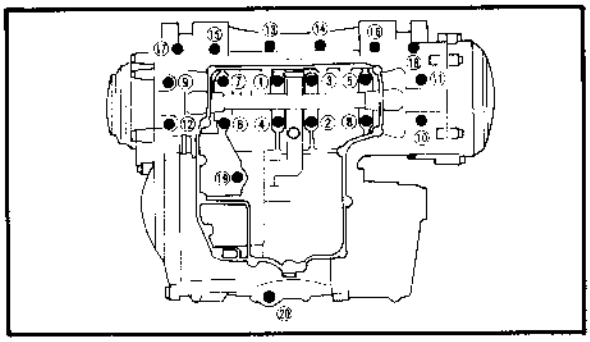


Plastigage® :
P/N YU-33210

5. Install:
   - Bearings
     Into the lower crankcase.
   - Crankcase (Lower)
6. Tighten:
   - Bolts

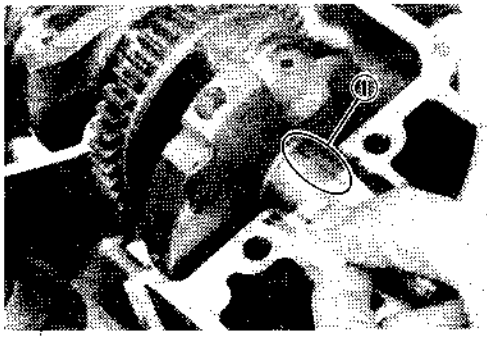
⚠ CAUTION:

Tighten to full torque in torque sequence cast on the crankcase.



Bolt ① ~ ⑫ :
24 Nm (2.4 m·kg, 17 ft·lb)
Bolt ⑬ ~ ⑳ :
12 Nm (1.2 m·kg, 8.7 ft·lb)

7. Remove:
   - Bolts
     Reverse assembly procedure.
   - Crankcase (Lower)
     Use care in removing.

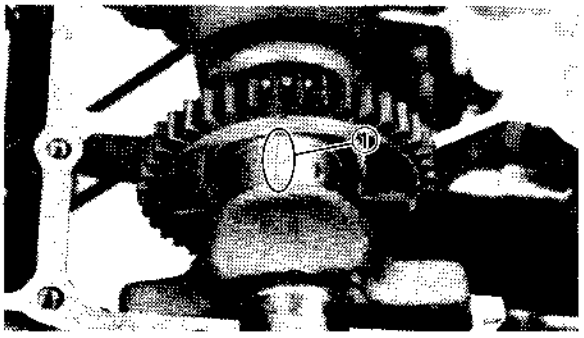


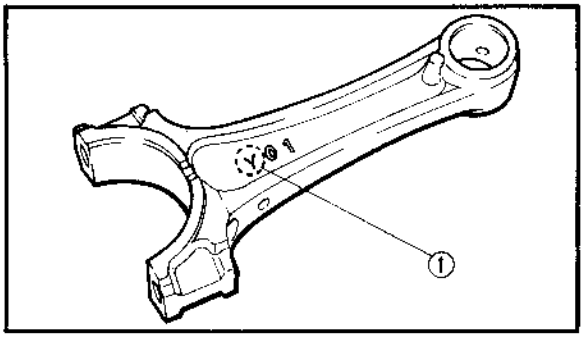
8. Measure:
   - Plastigage width ①
     Out of specification → Replace the bearings; replace the crankshaft if necessary.

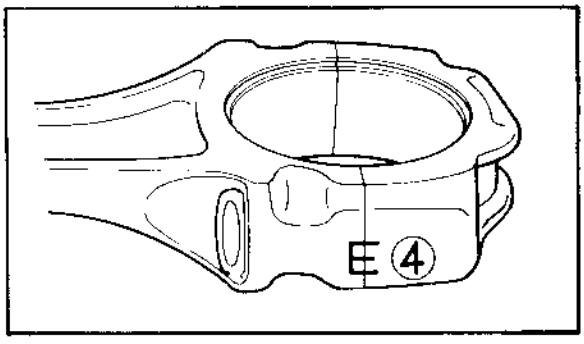
Main Journal Oil Clearance:
0.025 ~ 0.043 mm
(0.0010 ~ 0.0017 in)

Connecting Rod Bearings

1. Inspect:
   - Connecting rod bearings
     Burns/Flaking/Roughness/Scratches → Replace.







Connecting Rod Oil Clearance

1. Clean all parts thoroughly.
2. Install:
   - Connecting rod bearings
     Into the connecting rod and cap.
3. Attach:
   - Plastigage® ①
     Onto the crank pin.

Plastigage®:
P/N YU-33210

4. Install:
   - Connecting rod
   - Connecting rod cap

NOTE:
- Be sure the "Y" marks ① on the connecting rods face toward left crankshaft end .
- Be sure the letters on both components align to form a perfect character.

5. Lubricate:
   - Bolt threads (Connecting rod)
   - Nut seats (Connecting rod)

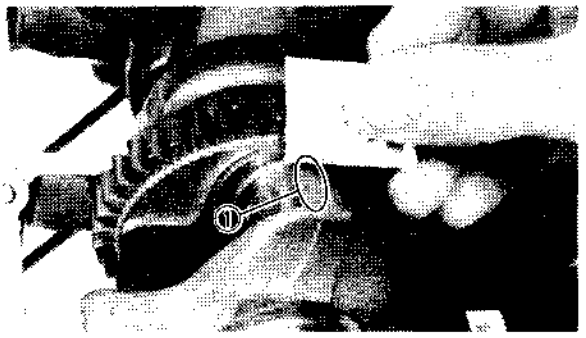
Molybdenum Disulfide Grease

6. Tighten:
   - Nuts (Connecting rod cap)

NOTE:
Do not turn the connecting rod until the clearance measurement has been completed.

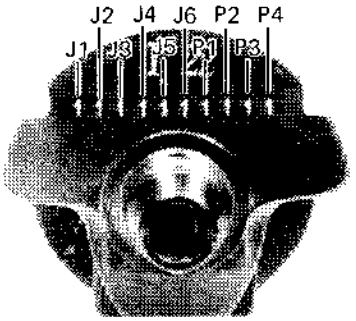
⚠ CAUTION:
Tighten to full torque specification without pausing. Apply continuous torque between 1.2 and 2.3 m·kg. Once you reach 1.2 m·kg DO NOT STOP TIGHTENING until final torque is reached. If tightening is interrupted between 1.2 and 2.3 m·kg, loosen nut to less than 1.2 m·kg, and start again.

Nuts (Connecting Rod):
23 Nm (2.3 m·kg, 17 ft·lb)



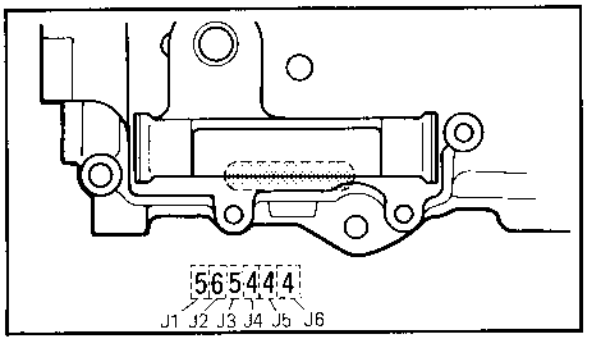
7. Remove:
   - Connecting rod cap
     Use care in removing.
8. Measure:
   - Width of Plastigage® ①
     Out of specification → Replace the bearings and/or replace the crankshaft if necessary.

Connecting Rod Oil Clearance:
0.043 ~ 0.0066 mm
(0.0017 ~ 0.0026 in)

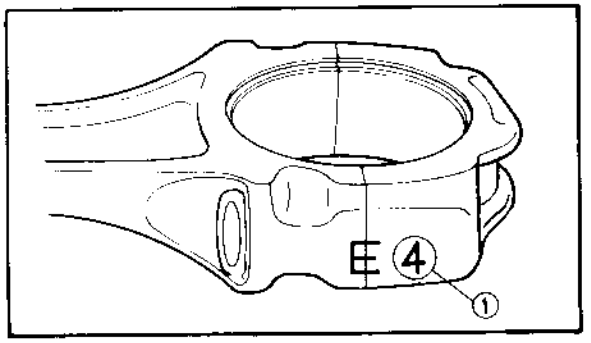


Crankshaft Main Journal and Connecting Rod Bearing Selection

- Numbers used to indicate crankshaft journal sizes are stamped on the LH crankweb. The first six (6) are main journal bearing numbers, starting with the left journal. The four (4) connecting rod bearing numbers follow in the same sequence.



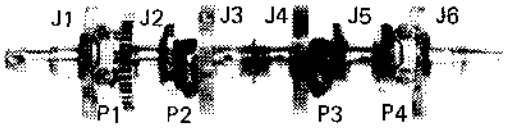
- The upper crankcase half is numbered J1, J2, J3, J4, J5 and J6 on the rear right bosse as shown.



- The numbers are stamped in ink on the rod cap ① .

BEARING COLOR CODE	
No. 1	Blue
No. 2	Black
No. 3	Brown
No. 4	Green
* No. 5	Yellow

* No. 5 applies only to the main journal bearing selection.



Example 1: Selection of the main journal bearings:

- If the crankcase J1 and crankshaft J1 sizes are No. 4 and No. 1, respectively, the bearing size No. is:

Bearing Size No. =
Crankcase No. – Crankshaft No. =
4 – 1 = 3 (Brown)

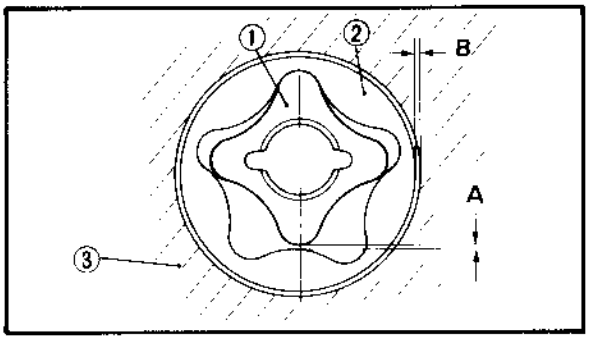
BEARING COLOR CODE	
No. 1	Blue
No. 2	Black
No. 3	Brown
No. 4	Green
No. 5	Yellow

Example 2: Selection of the connecting rod bearing:

- If the connecting rod P1 and crankshaft P1 sizes are No. 5 and No. 1, respectively, the bearing size No. is:

Bearing Size No. =
Connecting rod No. – Crankshaft No. =
5 – 1 = 4 (Green)

BEARING COLOR CODE	
No. 1	Blue
No. 2	Black
No. 3	Brown
No. 4	Green



OIL PUMP

1. Measure:
   - Tip clearance "A"
     Between the inner rotor ① and the outer rotor ② .
   - Side clearance "B"
     Between the outer rotor ② and the pump housing ③ .
     Use the Filler Gauge and Straight Edge.
     Out of specification → Replace the oil pump assembly.

Tip Clearance "A" Limit:
0.2 mm (0.008 in)
Side Clearance "B" Limit:
0.15 mm (0.006 in)

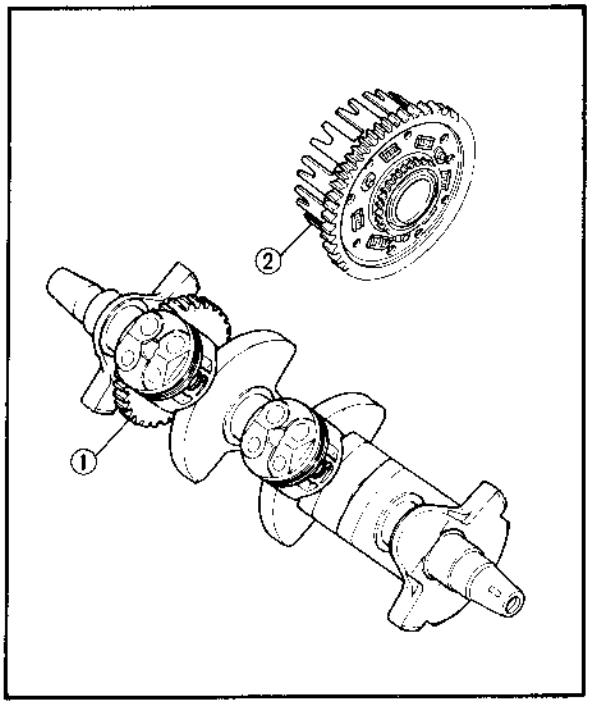
2. Lubricate:
   - Inner rotors
   - Outer rotors
   - Oil seal
   - Pump shaft

SAE 10W30 Motor Oil

3. Install:
   Reverse removal procedure.

NOTE:
Alighn the pins in the pump shaft and the groove on the inner rotors dualing assembly.

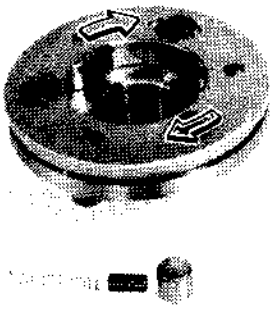
4. Check:
   - Oil pump operation
     With a finger.
     Unsmooth operation → Repeat step 2. or replace.



PRIMARY DRIVE

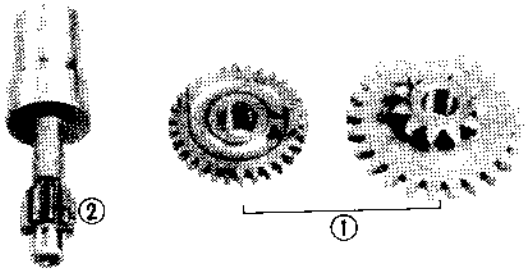
1. Inspect:
   - Primary drive gear (Crank shaft) ①
   - Primary driven gear ②
     Wear/Damage → Replace both gears.
     Excessive noises during operation → Replace both gears.

Primary reduction ratio:		
No. of teeth		Ratio
Drive	Driven	
41	89	2.170

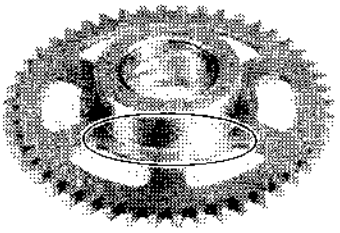


STARTER CLUTCH

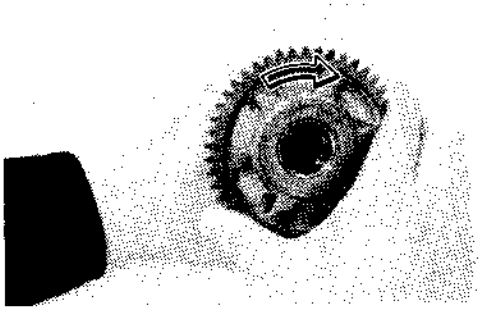
1. Check:
   - Roller operation
     Push the roller to arrow direction.
     Unsmooth operation → Replace starter clutch.

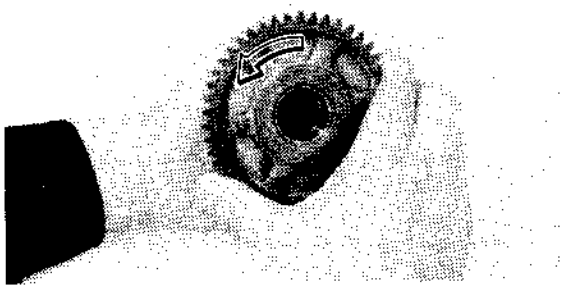


2. Inspect:
   - Starter idle gear teeth ①
   - Starter drive gear teeth ②
     Burrs/Chips/Roughness/Wear → Replace.



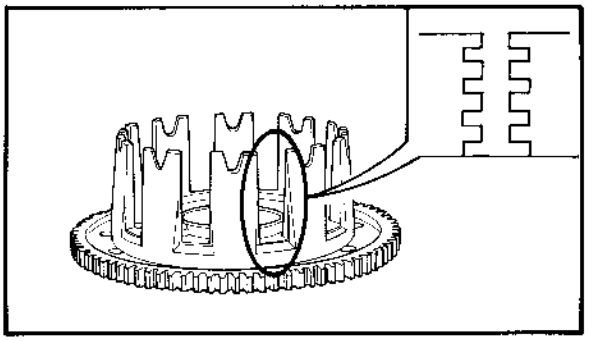
3. Inspect:
   - Contacting surfaces
     Pitting/Wear/Damage → Replace.





4. Check:
   - Starter clutch operation

Clutch operation checking steps:
- Install the starter clutch gear to the starter clutch, and hold the starter clutch.
- When turning the starter clutch gear clockwise the starter clutch and the wheel gear should be engaged.
  If not, the starter clutch is faulty. Replace it.
- When turning the starter clutch gear counterclockwise, the starter clutch gear should turn freely.
  If not, the starter clutch is faulty. Replace it.

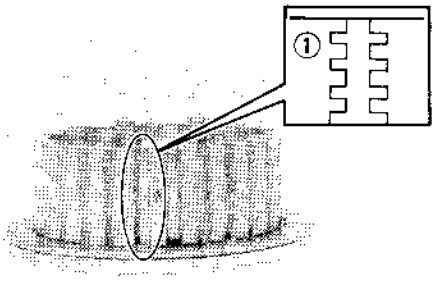


CLUTCH

Clutch Housing

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

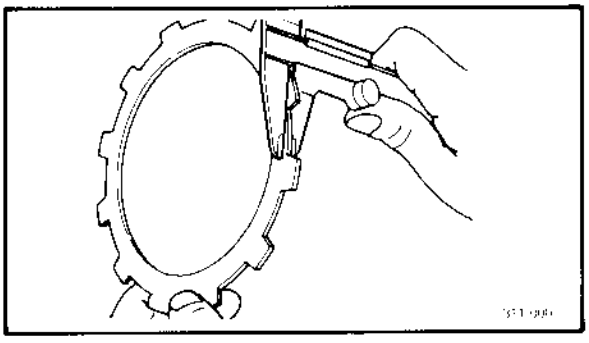
NOTE:
Wear on the friction plate dogs of the clutch housing will cause an erratic operation.



Clutch Boss

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

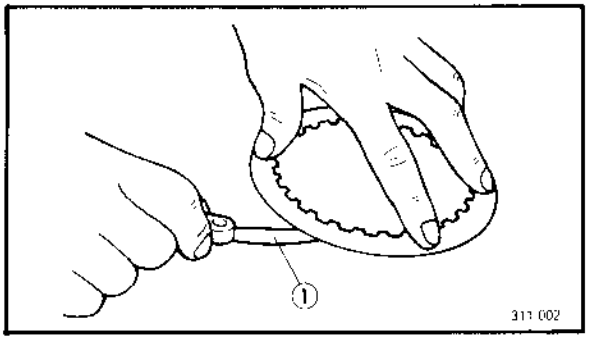
NOTE:
Scoring on the clutch plate splines will cause erratic operation.



Friction Plates

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

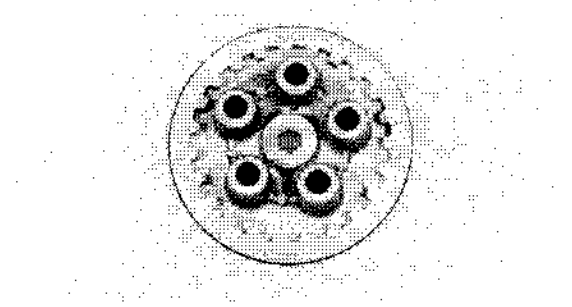
Wear Limit:
2.8 mm (0.11 in)



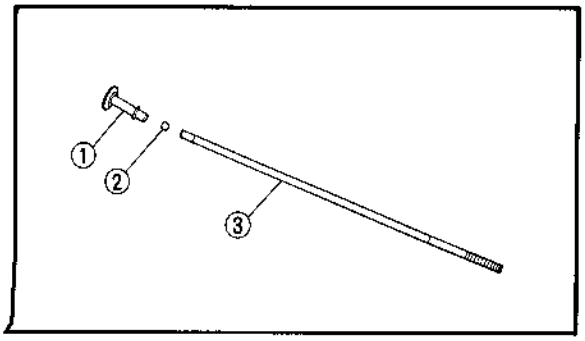
Clutch Plates

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

Warp Limit:
0.1 mm (0.004 in)

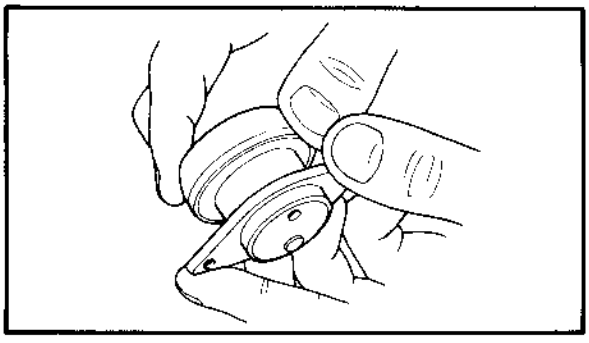


2. Inspect:
   - Pressure plate
     Damage → Replace.



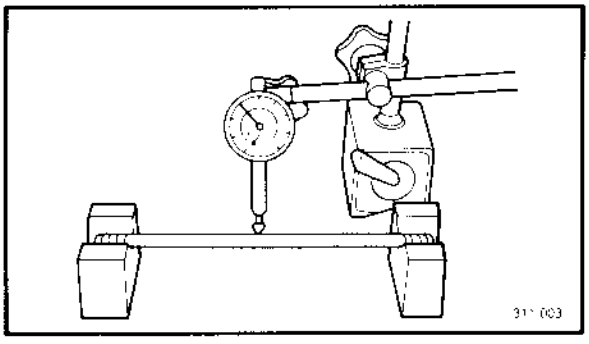
Push Rod

1. Inspect:
   - Push rod 1 ①
   - Boll ②
   - Push rod 2 ③
     Wear/Cracks/Damage → Replace.



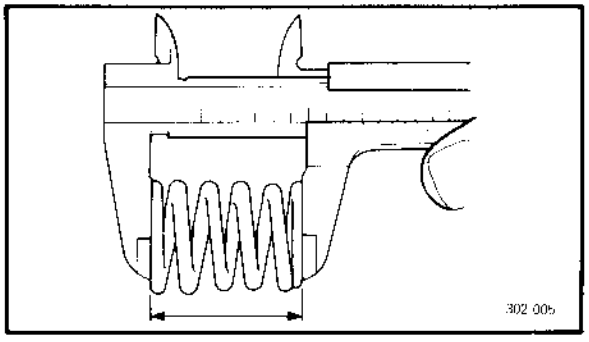
Push Lever Assembly and Boll Screw Housing

1. Inspect:
   - Push lever assembly
     Unsmooth → Replace.



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

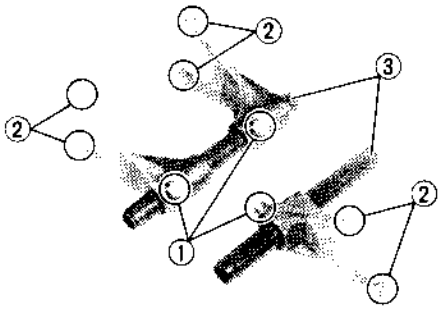
Bending Limit:
0.3 mm (0.012 in)



Clutch Spring

1. Measure:
   - Clutch spring free length
     Out of specification → Replace the springs as a set.

Clutch Spring Minimum Free Length:
29.0 mm (1.14 in)



TRANSMISSION

Shift Fork

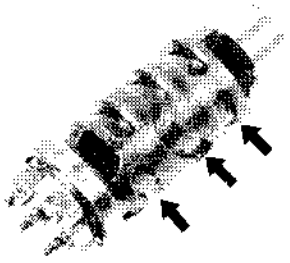
1. Inspect:
   - Shift fork cam follower ①
   - Shift fork pawl ②

   Wear/Chafing/Bends/Damage → Replace.
2. Check:
   - Shift fork movement

   On its guide bar ③.

   Unsmooth operation → Replace the fork and/guide bar.

Shift Cam

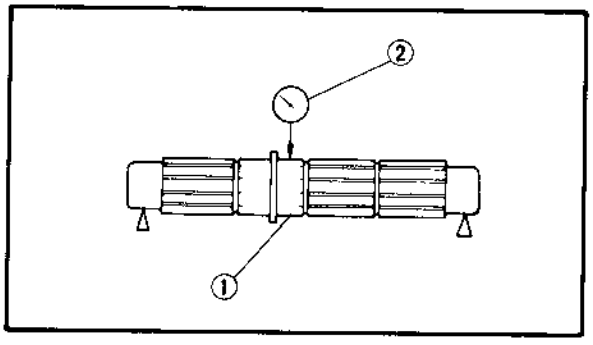


1. Inspect:
   - Shift cam grooves

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

     Damage/Wear → Replace.
   - Shift cam bearing

     Pitting/Damage → Replace.



Main and Drive Axles

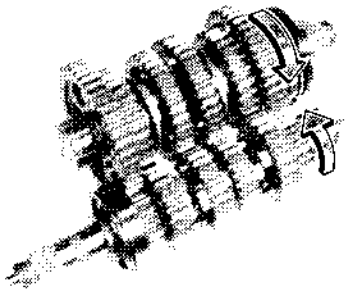
1. Measure:
   - Axle runout ①

     Use the centering device and Dial Gauge ②.

     Out of specification → Replace.

     Out of specification → Replace.

Runout Limit: 0.08 mm (0.0031 in)



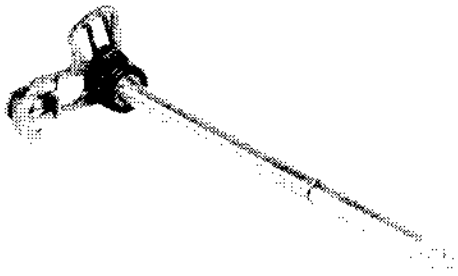
Gears

1. Inspect:
   - Gears

     Damage/Wear → Replace.
2. Check:
   - Gear movement

     Unsmooth operation → Replace.
3. Inspect:
   - Mating dogs

     Cracks/Wear/Damage → Replace.



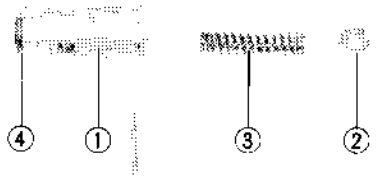
Shift Shaft Assembly

1. Inspect:
   - Shift shaft

     Bends/Wear/Damage → Replace.
   - Spring

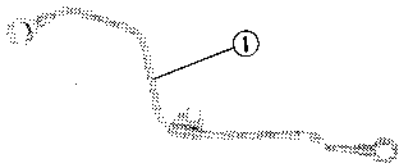
     Damage → Replace.

RELIEF VALVE AND PIPE



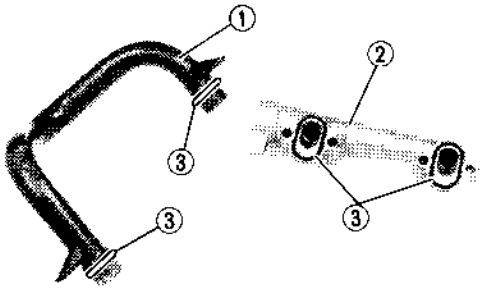
1. Check:
   - Relief valve body ①
   - Cover ②
   - Spring ③
   - O-ring ④

   Damage/Wear → Replace.



2. Check:
   - Oil pipe ①

   Damage → Replace.
   Comtamination → Wash and blow out the passage.



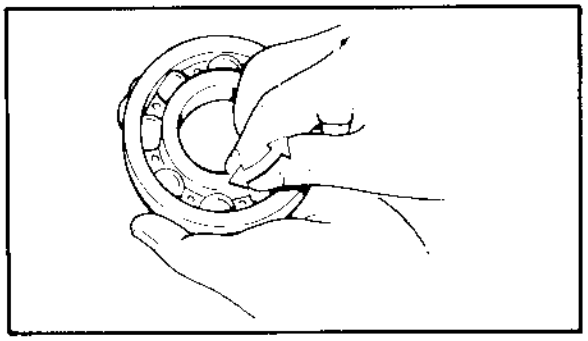
3. Check:
   - Water pipe ①
   - Water jacket joint ②
   - O-rings ③

   Damage → Replace.

CRANKCASE

1. Inspect:
   - Case halves
   - Bearing seat
   - Fitting

   Damage → Replace



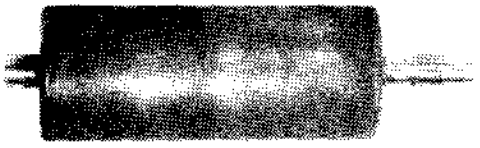
BEARING AND OIL SEAL

1. Inspect:
   - Bearings

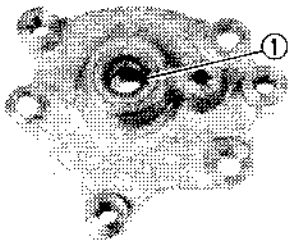
   Clean and lubricate, then rotate inner race with finger.
   Roughness → Replace the bearing (see Removal).
2. Inspect:
   - Oil seals

   Damage/Wear → Replace the (see Removal).

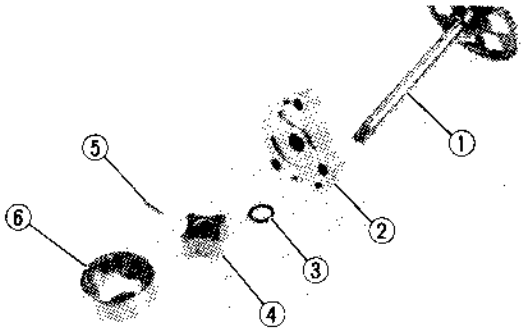
YAMAHA EXHAUST VARIABLE VALVE (For California Only)



1. Inspect:
   - Shaft arm
     Wear/Cracks/Damage → Replace.



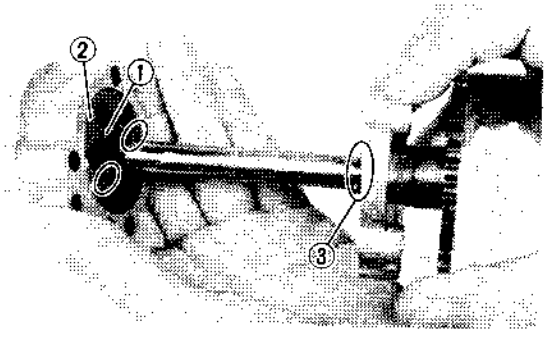
2. Inspect:
   - Bush ①
     Wear → Replace.



ENGINE ASSEMBLY AND ADJUSTMENT

INNER ROTOR (OIL PUMP)

1. Install:
   - Pump shaft ①
   - Pump cover ②
   - Washer ③
   - Inner rotor ④
   - Pin ⑤
   - Outer rotor ⑥

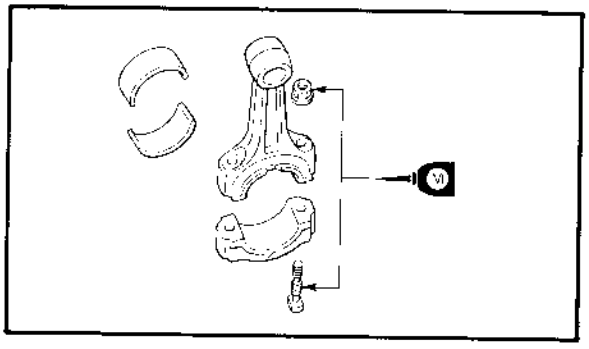


NOTE:

Insert the inner rotor ① into the outer rotor ②. Then with the pump shaft dowel pin ③ in the inner rotor slit.

2. Install:
   - Pump housing

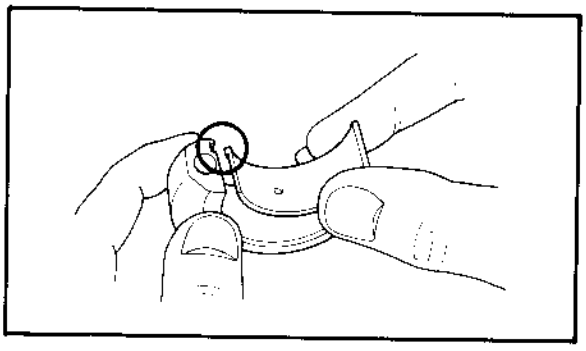




CONNECTING ROD

1. Clean:
   - Crankshaft
   - Connecting rods
2. Install:
   - Connecting rod bearings
     Into the connecting rod and cap.
3. Lubricate:
   - Connecting rod bolt threads
   - Connecting rod nuts

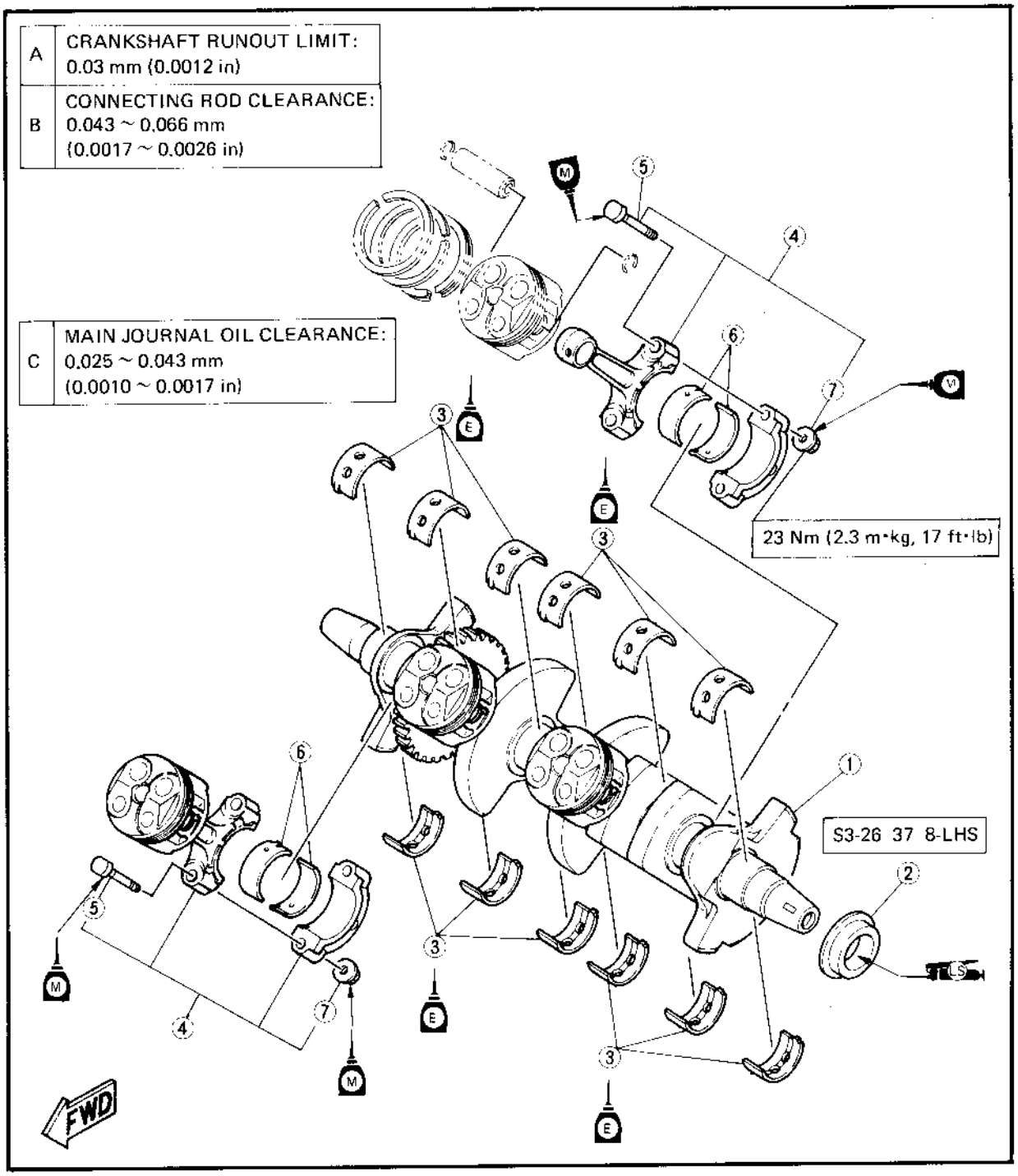
	Molybdenum Disulfide Oil

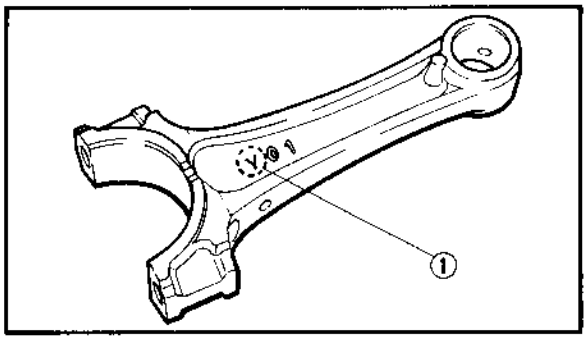


4. Apply engine oil to the crankshaft pins.

CRANKSHAFT

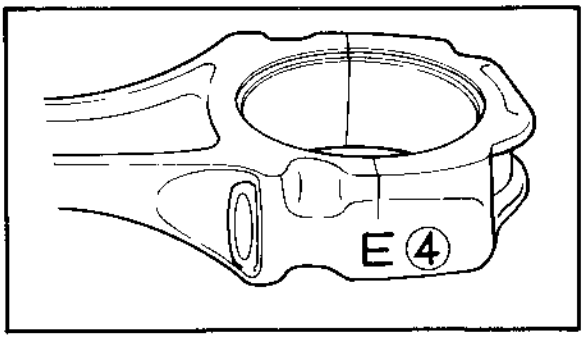
① Crankshaft
② Oil seal
③ Main journal bearing
④ Connecting rod assembly
⑤ Connecting rod bolt
⑥ Connecting rod bearing
⑦ Nut





5. Install:
   - Connecting rods
   - Connecting rod caps

NOTE:
- The stamped "Y" mark on the connecting rods ① should face towards the left side of the crankcase.
- Be sure the letter on both components align to form a perfect character.

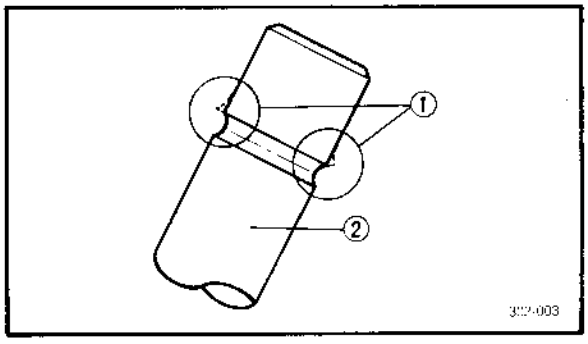


6. Install:
   - Connecting rod bolts
     Align the bolt head and connecting rod cap.
7. Tighten:
   - Connecting rod nuts

⚠ CAUTION:

Tighten to full torque specification without pausing. Apply continuous torque between 1.2 and 2.3 m·kg. Once you reach 1.2 m·kg. DO NOT STOP TIGHTENING until final torque is reached. If the tightening is interrupted between 1.2 and 2.3 m·kg, loosen the nut to less than 1.2 m·kg and start again.

	23 Nm (2.3 m·kg, 17 ft·lb)



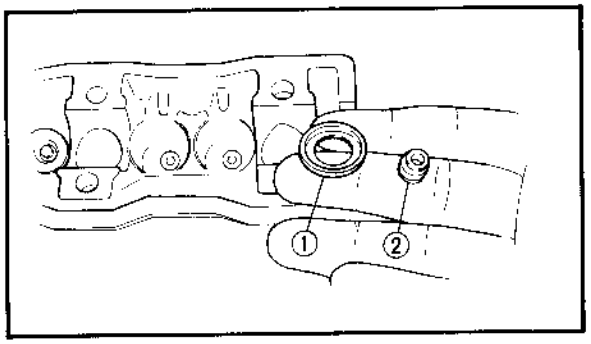
VALVE PAD AND VALVE

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

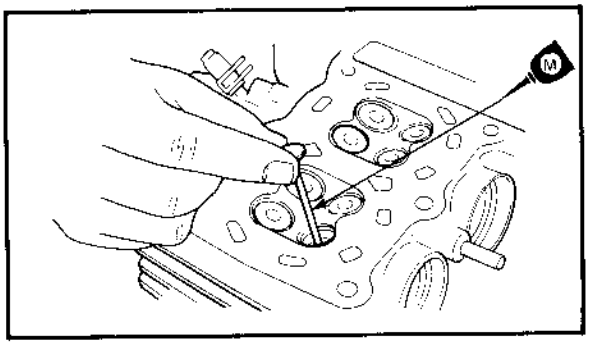
①Deburr
②Valve stem

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

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

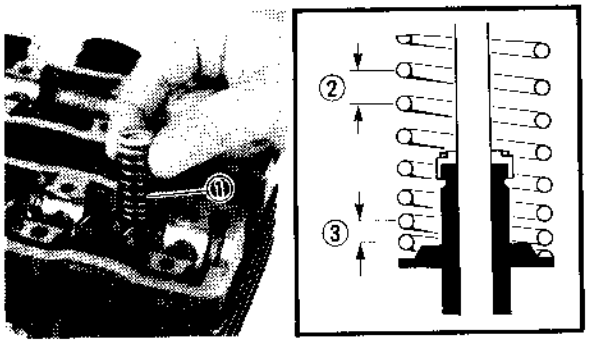


2. Install:
   - Valve spring seat ①
   - Oil seal ②



3. Install:
   - Valve

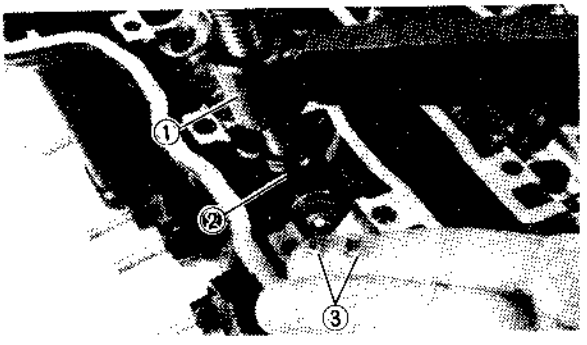
NOTE:
Apply molybdenum disulfide oil.



4. Install:
   - Valve spring ①

NOTE:
Install springs with wider-gapped coils facing upwards, as shown.

② Larger pitch
③ Smaller pitch



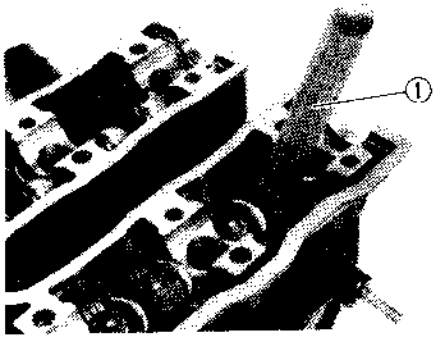
5. Attach:
   - Valve spring compressor ①
   - Attachment ②

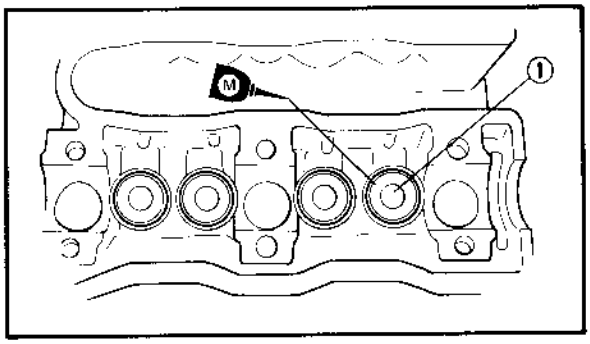


Valve Spring Compressor:
P/N YM-04019
Attachment:
P/N YM-04108

6. Install:
   - Valve retainers ③
7. Settle the valve retainer by lightly patting the valve seat with a piece of wood ① in between.

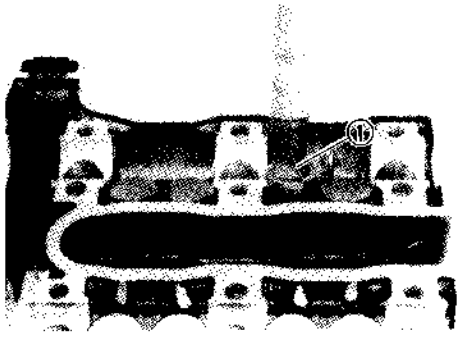
NOTE:
Do not hit so much as to damage the valve.





8. Install:
   • Valve pads ①

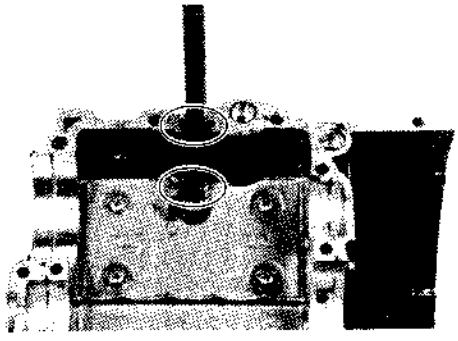
NOTE:
Apply molybdnum disulfide oil.

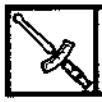


9. Install:
   • Lifters ①

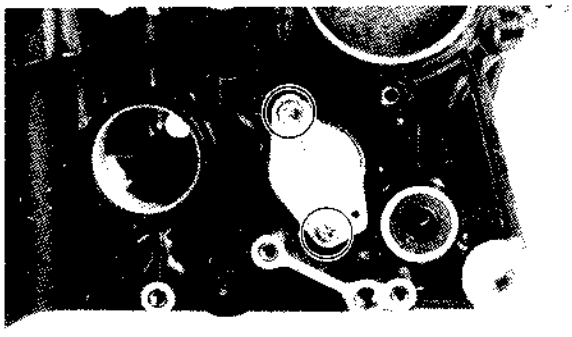
CRANKSHAFT

1. Install:
   • Oil baffle plate
   • Breather hose

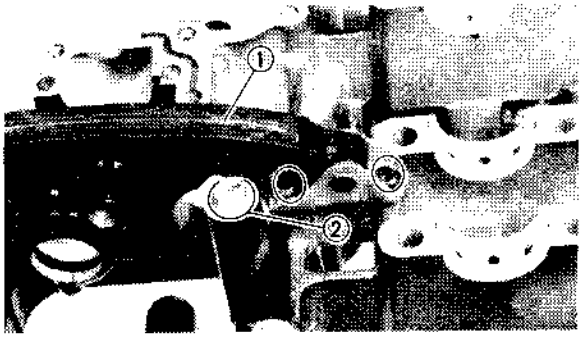




Oil Baffle Plate Bolts:
10 Nm (1.0 m·kg, 7.2 ft·lb)



2. Install:
   • Neutral switch assembly ①



3. Install:
   • Cam chain guide (Intake side) ①
   • O-ring ②

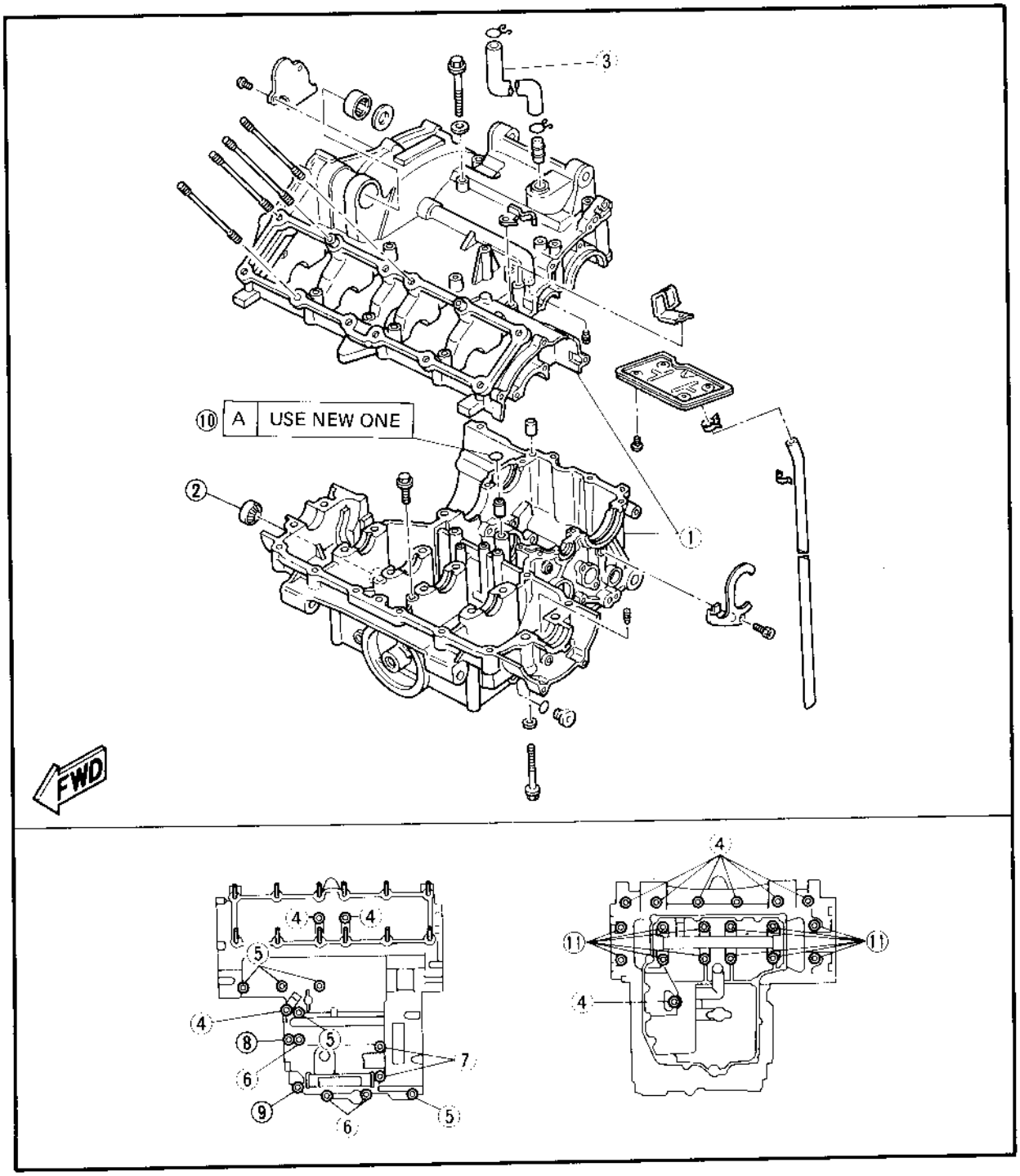


Bolts (Chain Guide):
10 Nm (1.0 m·kg, 7.2 ft·lb)

CRANKCASE

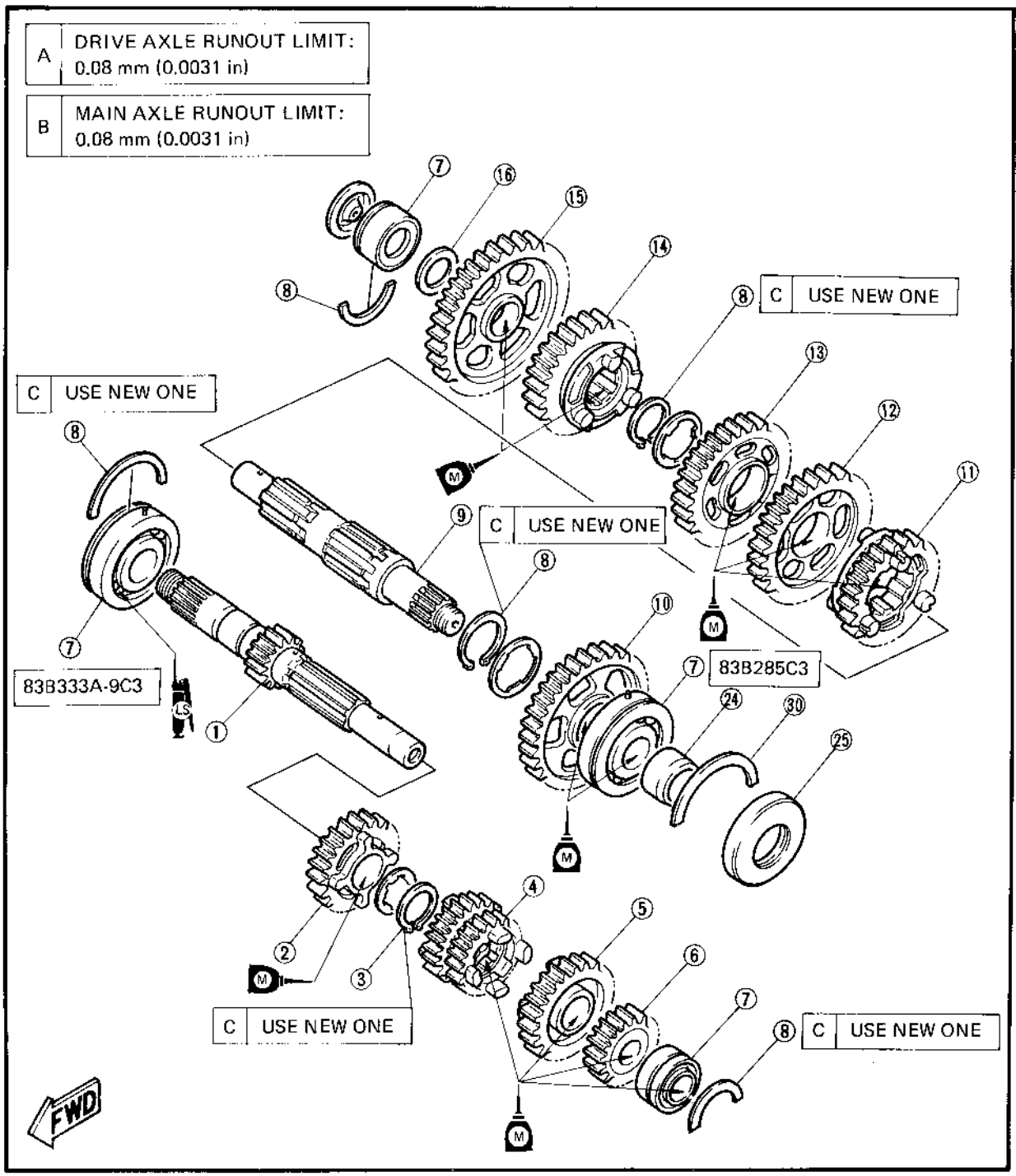
① Crankcase assembly
② Oil level window
③ Crankcase ventilation hose
④ 6 mm bolt
⑤ 6 mm bolt
⑥ 6 mm bolt
⑦ 6 mm bolt
⑧ 8 mm bolt
⑨ 8 mm bolt
⑩ O-ring
⑪ 8 mm bolt

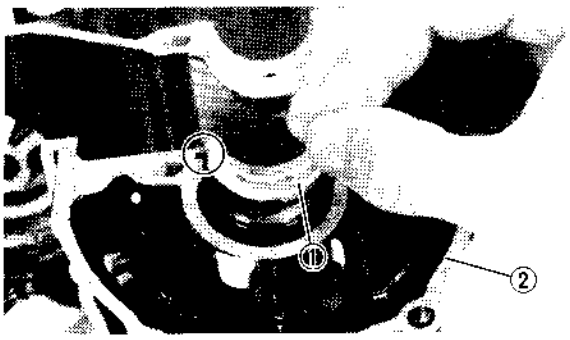
④⑤⑥⑦⑧:
12 Nm (1.2 m·kg, 8.7 ft·lb)
⑨ ⑪ :
24 Nm (2.4 m·kg, 17 ft·lb)



TRANSMISSION

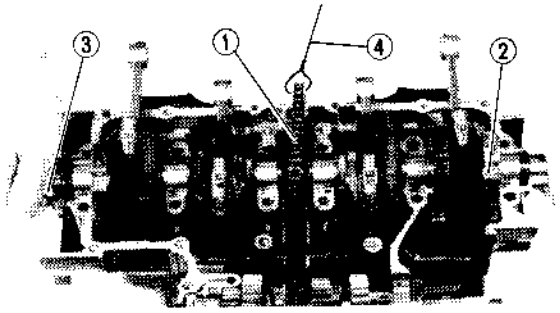
① Main axle
② 5th pinion gear
③ Circlip
④ 3rd pinion gear
⑤ 6th pinion gear
⑥ 2nd pinion gear
⑦ Bearing
⑧ Circlip
⑨ Drive axle
⑩ 2nd wheel gear
⑪ 6th wheel gear
⑫ 3rd wheel gear
⑬ 4th wheel gear
⑭ 5th wheel gear
⑮ 1st wheel gear
⑯ Washer





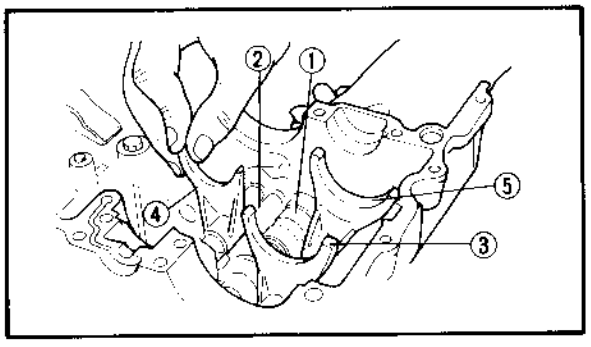
4. Install:
   - Main journal bearing ①
     To crankcase (Lower) ②

NOTE:
Apply molybedenum disulfide oil.



5. Install:
   - Cam cahin ①
     Onto the crankshaft
   - Crankshaft assembly ②

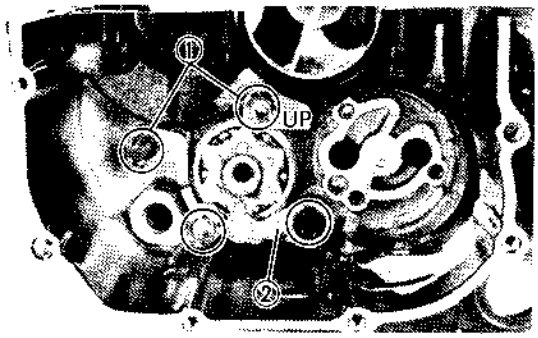
NOTE:
- The stepped crankshaft end ③ should face to the left.
- Pass the cam chain through the cam chain cavity. Be sure to attach a retaining wire ④ to the cam chain.



TRANSMISSION, SHIFTER AND SHIFT CAM

1. Install:
   - Shift cam assembly ①
   - Guide bar ②
   - Shift fork #1 ③
   - Shift fork #2 ④
   - Shift fork #3 ⑤

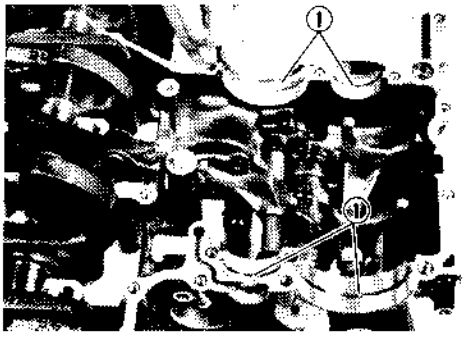
NOTE:
All shift fork letters should face to the left side and be in sequence (1, 2, 3) beginning from the left.



2. Install:
   - Stopper plate (Shift cam) ①
   - Stopper lever ②

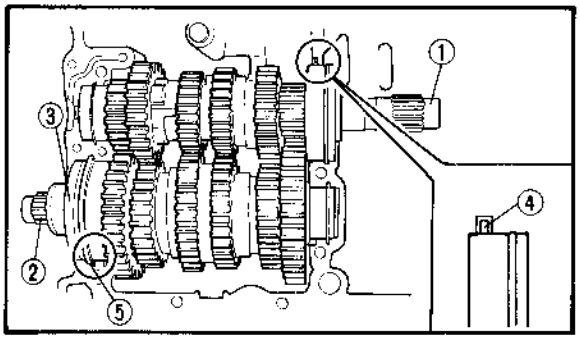
Bolts (Stopper Plate):
10 Nm (1.0 m·kg, 7.2 ft·lb)
Use LOCTITE®

Bolt (Stopper Lever):
10 Nm (1.0 m·kg, 7.2 ft·lb)
Use LOCTITE®



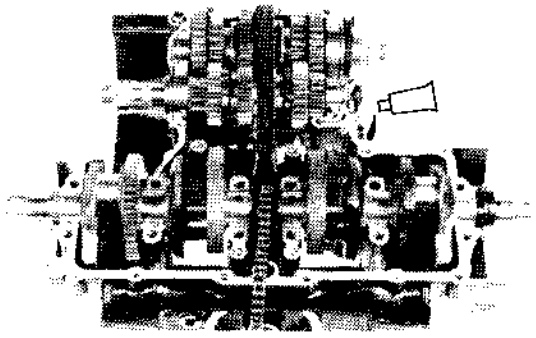
3. Install:
   - Circlip ①
     To crankcase (Lower)

NOTE:
Be sure the circlips ① are inserted into the lower crankcase positioning grooves.



4. Install:
   - Main axle assembly ①
   - Drive axle assembly ②
   - Oil seal ③

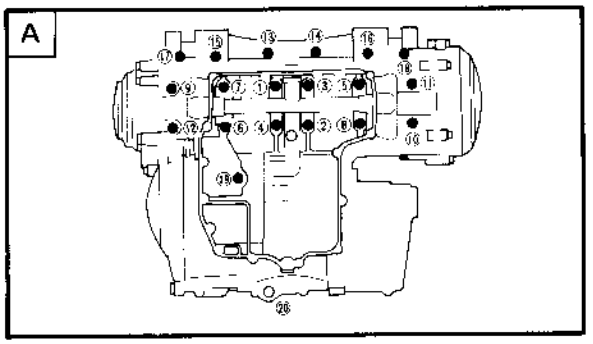
NOTE:
- Be sure the main axle bearing pin ④ should face to front and the drive axle bearing pins ⑤ should face to rear.
- Mesh the shift fork #1 with the 4th wheel gear ① and #2 with the 5th wheel gear ② on the drive axle.
- Mesh the shift fork #2 with the 3rd pinion gear ③ on the main axle.
- Carefully guide the shift forks so that they mesh smoothly with transmission gears.

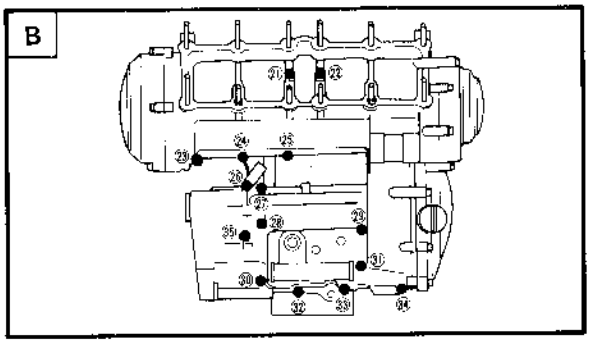


CRANKCASE ASSEMBLY

1. Apply:
   - Quick Gasket®
     To crankcase matching surfaces.

Quick Gasket®
P/N ACC-11001-05-01





⚠ CAUTION:

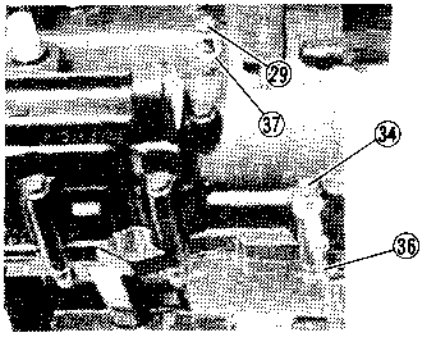
Before tightening the crankcase bolts, check the following points:

- **Be sure the gear shifts correctly while hand-turning the shift cam.**

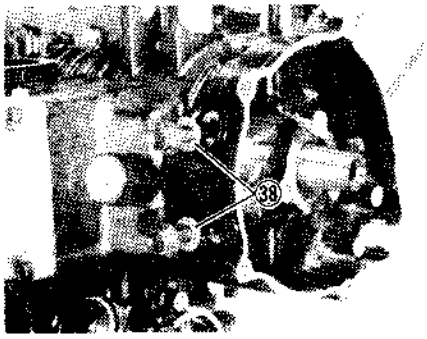
2. Tighten:
   - Lower crankcase bolt [A]
   - Upper crankcase bolt [B]

   (Follow the proper tightening sequence.)

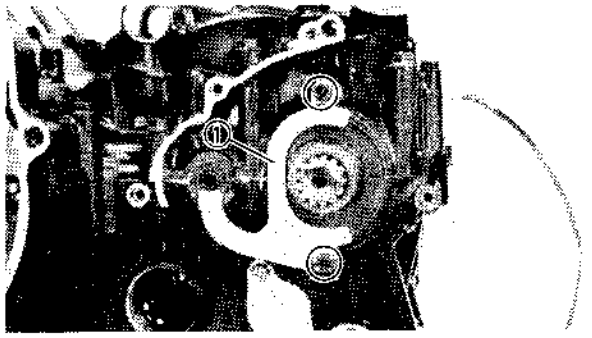
8 mm Bolt ① ~ ⑫ ㉚ :
24 Nm (2.4 m·kg, 17 ft·lb)
6 mm Bolt ⑬ ~ ㉙ ㉛ ~ ㉟ :
12 Nm (1.2 m·kg, 8.7 ft·lb)



NOTE:
- Install the ground lead ㊱ on bolt No. ㉞ .
- Install the copper washer ㊲ on bolt No. ㉙ .

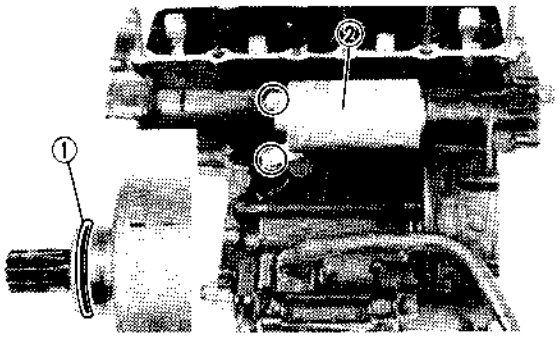


NOTE:
- Install the washer ㊳ on bolt No. ⑨ , ⑩ , ⑪ , ⑫ .



3. Install:
   - Oil seal stopper ①

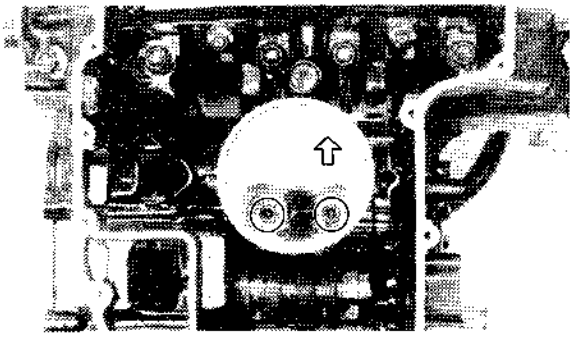
Bolts (Oil Seal Stopper):
10 Nm (1.0 m·kg, 7.2 ft·lb)



STARTER MOTOR

1. Check:
   - O-ring (Starter motor) ①
     Damage → Replace.
2. Install:
   - Starter motor ②

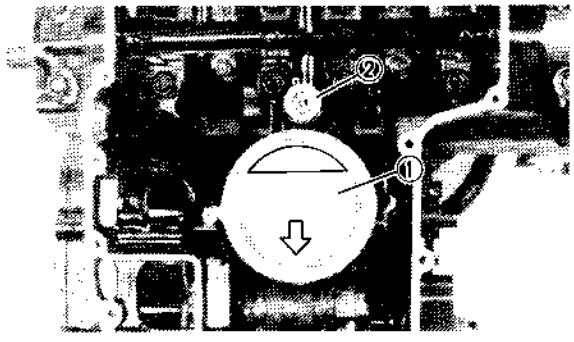
	Bolt (Starter Motor): **10 Nm (1.0 m·kg, 7.2 ft·lb)**



OIL PAN AND OIL STRAINER

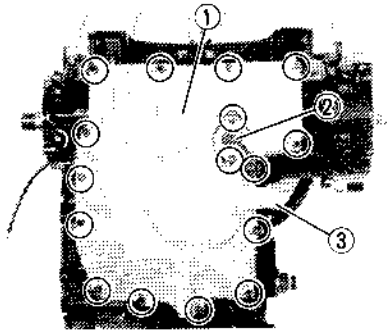
1. Install:
   - Oil strainer assembly

	Bolts (Oil Strainer Assembly): **10 Nm (1.0 m·kg, 7.2 ft·lb)**



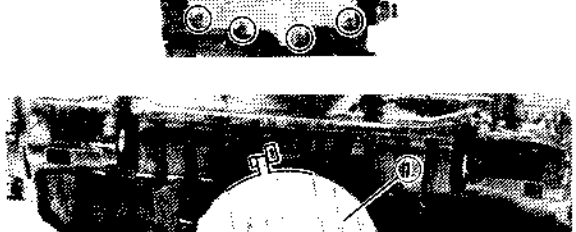
2. Install:
   - Oil strainer cover ①
   - Relief valve ②

NOTE:
The element (window) must be installed vertically against housing arrow mark.



3. Install:
   - Dowel pins
   - Gasket (New)
   - Oil pan ①
   - Oil level switch ②
   - Drain plug ③

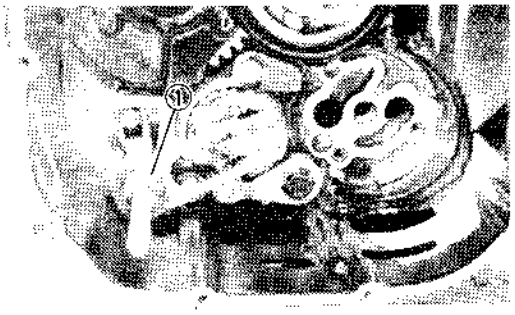
	Bolts (Oil Pan): **10 Nm (1.0 m·kg, 7.2 ft·lb)**



4. Install:
   - Oil filter
   - Oil filter cover ①

	Bolt (Oil Filter Cover): **15 Nm (1.5 m·kg, 11 ft·lb)**

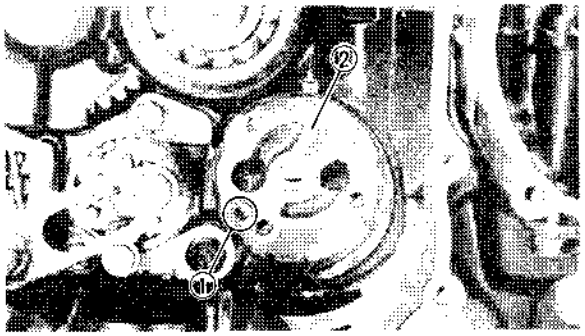
Refer to the "ENGINE OIL FILTER REPLACEMENT" section in the CHAPTER 3.



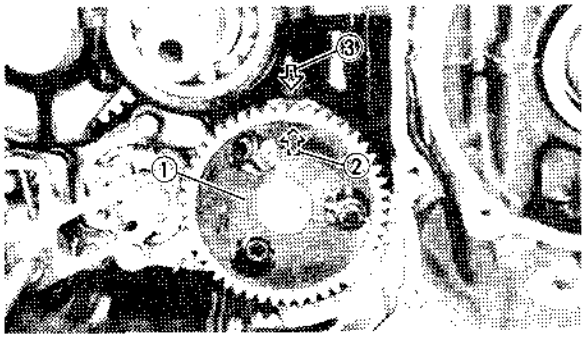
OIL PUMP AND SHIFT SHAFT

1. Install:
   - Shift shaft

NOTE:
Insert the stopper between spring ends.



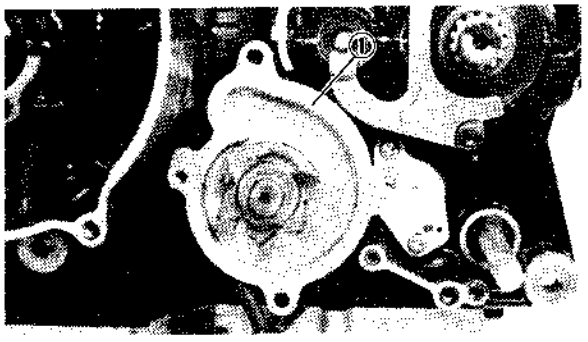
2. Install:
   - Dowel pin ①
   - Gasket (New) ②



3. Install:
   - Oil pump assembly ①

Oil Pump Mounting Bolts:
10 Nm (1.0 m·kg, 7.2 ft·lb)
Use LOCTITE®

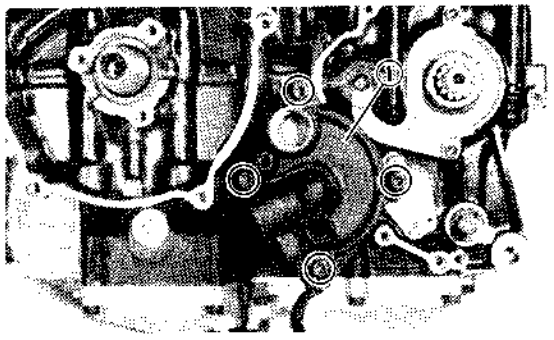
NOTE:
Align the oil pump arrow mark ② with crankcase arrow mark ③.



WATER PUMP

1. Install:
   - Water pump housing ①

Bolts (Water Pump Housing):
10 Nm (1.0 m·kg, 7.2 ft·lb)

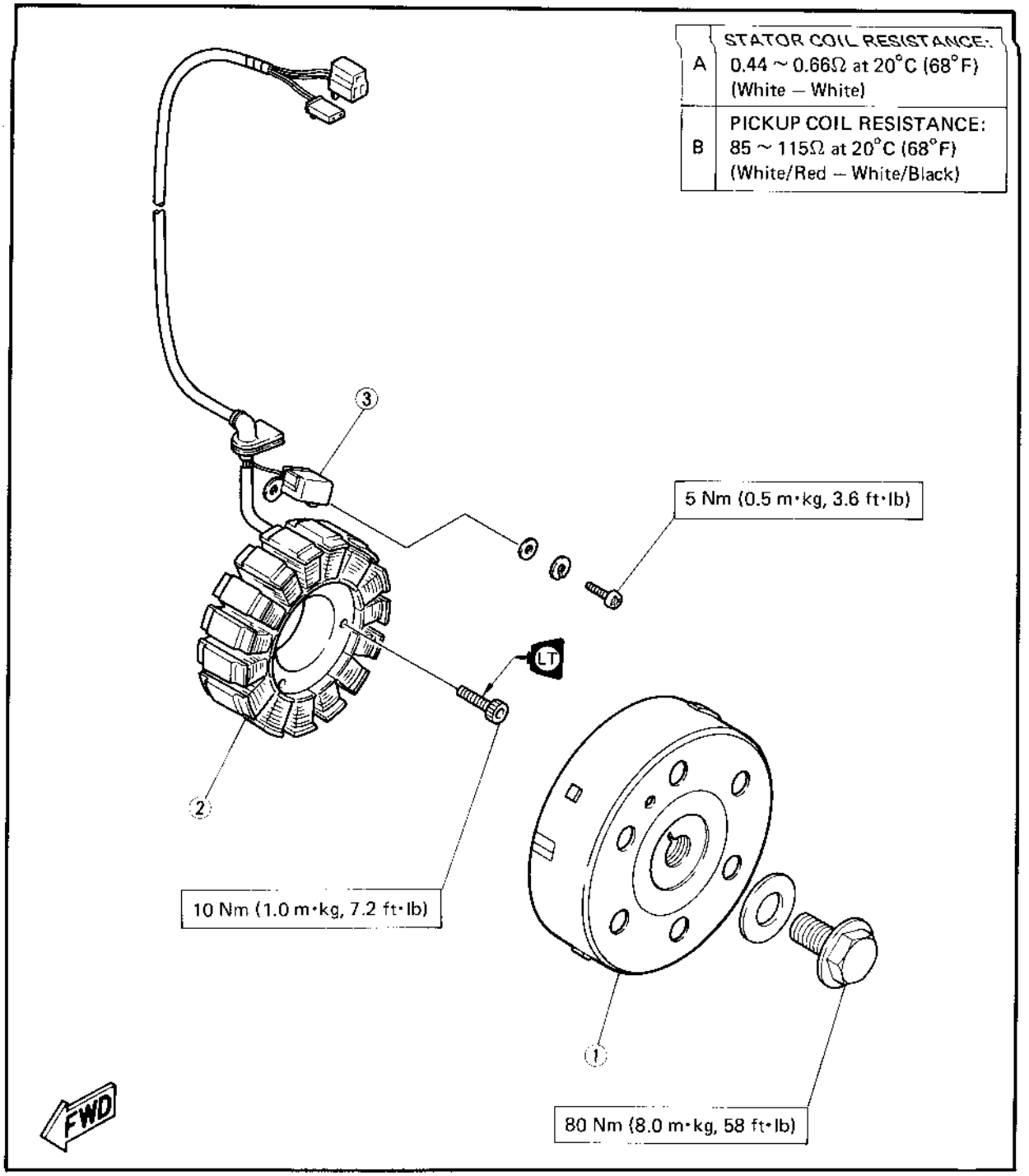


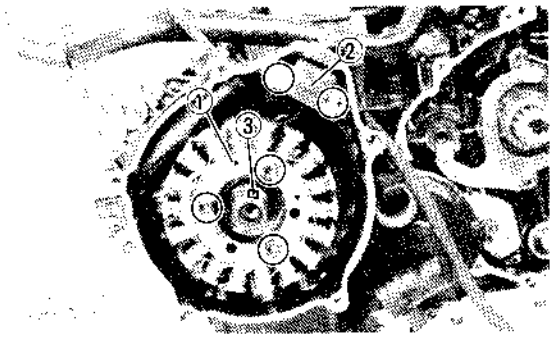
2. Install:
   - O-ring
   - Water pump cover ①

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

A.C. MAGNETO

① Magneto
② Stator coil assembly
③ Pickup coil



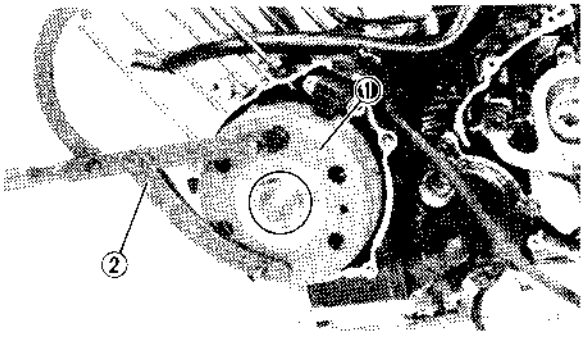


A.C. MAGNETO

1. Install:
   - Stator coil assembly ①
   - Pickup coil ②
   - Woodruff key ③

Bolts (Stator Coil Assembly):
10 Nm (1.0 m·kg, 7.2 ft·lb)
Use LOCTITE®
Screws (Pickup Coil):
5 Nm (0.5 m·kg, 3.6 ft·lb)

NOTE:
- Clean the tapered portions of the crankshaft and magneto.
- When installing the magneto, make sure the woodruff key is properly seated in the key way of the crankshaft.



2. Install:
   - Magneto ①
   - Bolt (Magneto)
3. Attach:
   - Universal Rotor Holder ②

NOTE:
Hold the magneto to tighten the nut by the Universal Rotor Holder ② .

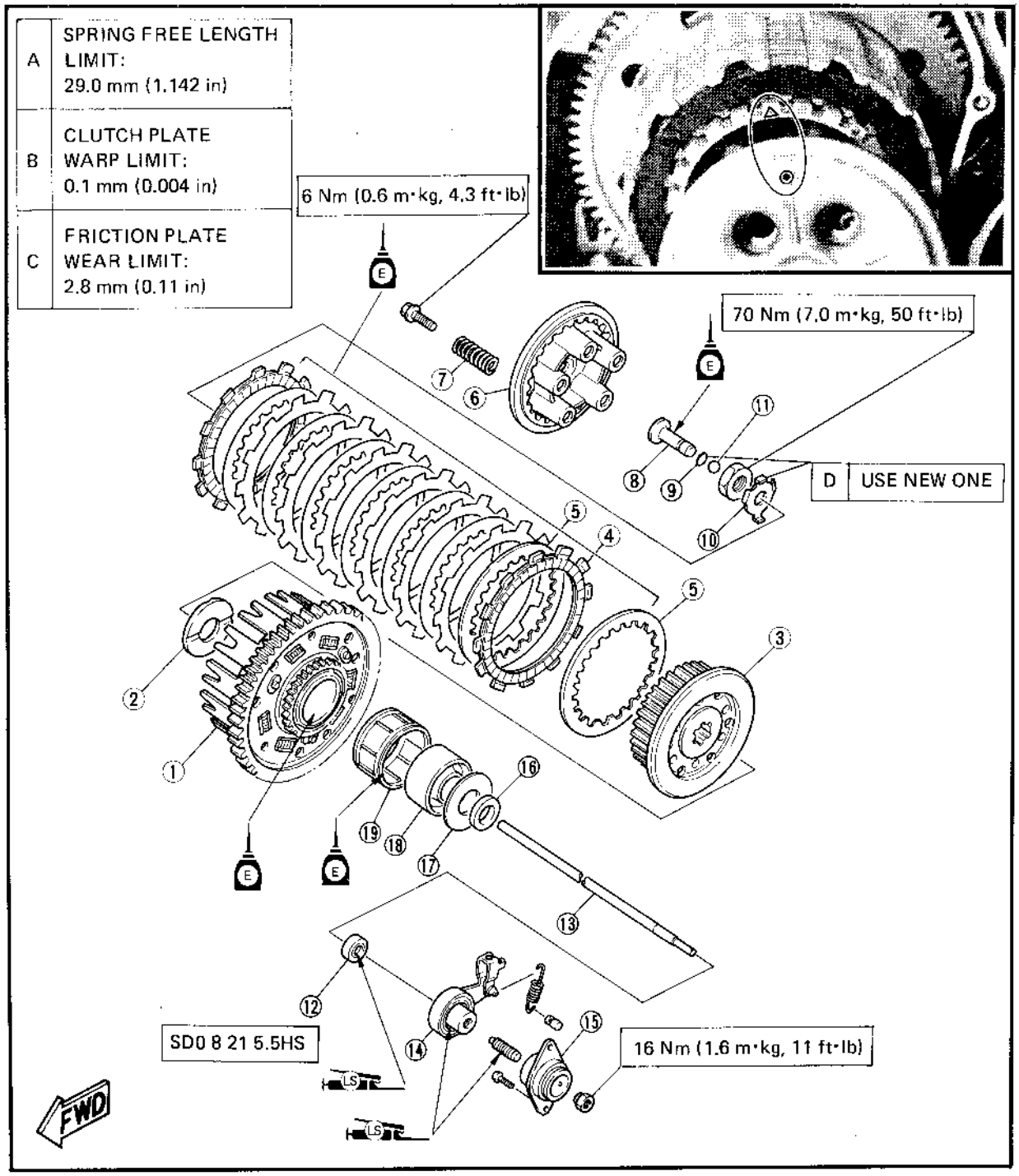
Universal Rotor Holder:
P/N YU-01235

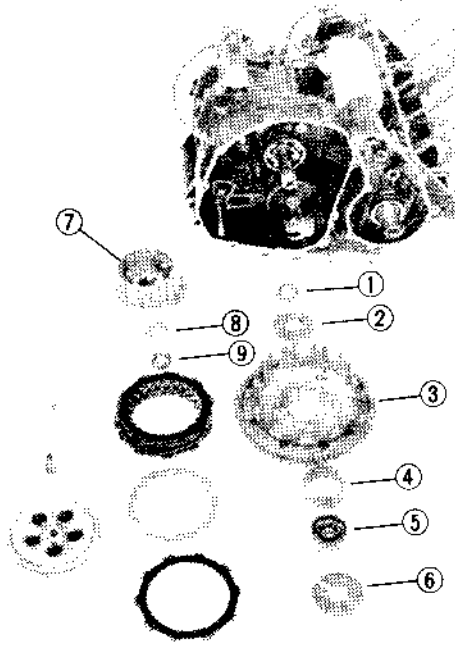
4. Tighten:
   - Bolt (Magneto)

Bolt (Magneto):
80 Nm (8.0 m·kg, 58 ft·lb)

CLUTCH

① Primary driven gear
② Thrust washer
③ Clutch boss
④ Friction plate
⑤ Clutch plate
⑥ Pressure plate
⑦ Clutch spring
⑧ Push rod #1
⑨ O-ring
⑩ Lock washer
⑪ Bolt
⑫ Oil seal
⑬ Push rod #2
⑭ Push lever assembly
⑮ Bolt screw housing
⑯ Collar
⑰ Thrust washer
⑱ Spacer
⑲ Bearing

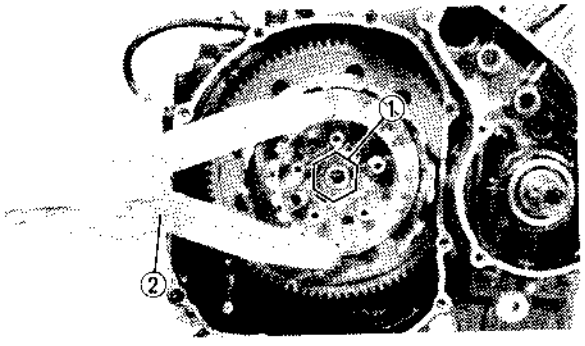




CLUTCH

1. Install:
   - Collar ①
   - Thrust washer ②
   - Clutch housing ③
   - Bearing ④
   - Spacer ⑤
   - Thrust washer ⑥
   - Clutch boss ⑦
   - Lock washer (New) ⑧
   - Nut (Clutch boss) ⑨

NOTE:
Install the bearing ④ and spacer ⑤ after installation of the clutch housing ③.

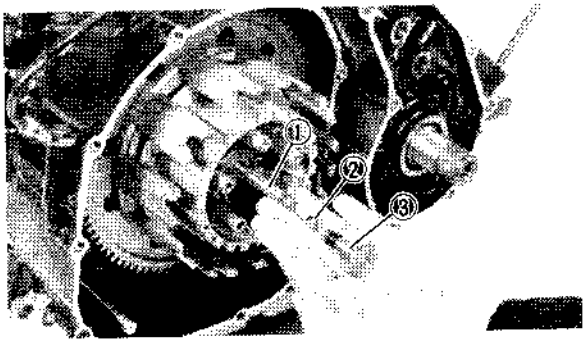


2. Tighten:
   - Nut (Clutch boss) ①
     Use the Universal Clutch Holder ②.

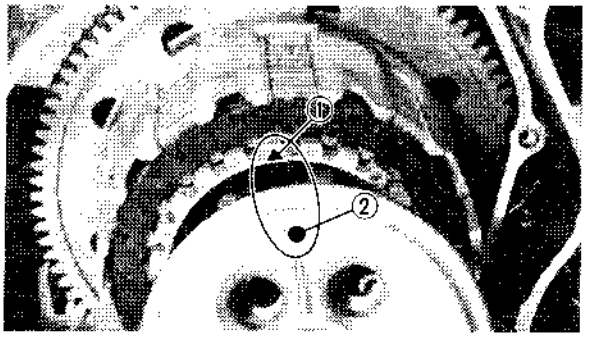
NOTE:
Hold the clutch boss to tighten the nut by Universal Clutch Holder ②.

	Universal Clutch Holder: P/N YM-91042
	Nut (Clutch Boss): 70 Nm (7.0 m·kg, 50 ft·lb)

NOTE:
Bend the lock washer tab along the nut flat.

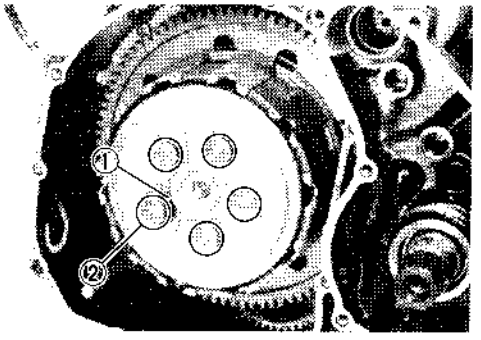


3. Install:
   - Push rod #2 ①
   - Boll ②
   - Push rod #1 ③
   - Friction plates
   - Clutch plates



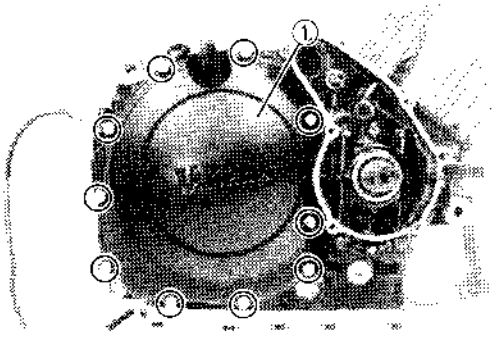
4. Install:
   • Pressure plate

NOTE:
Be sure the match mark ① on the clutch boss is aligned with the match mark ② on the pressure plate.



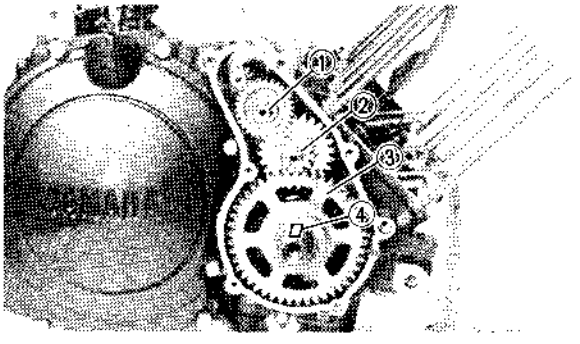
5. Install:
   • Clutch springs ①
   • Bolts (Clutch spring) ②

Bolts (Clutch Spring):
6 Nm (0.6 m·kg, 4.3 ft·lb)



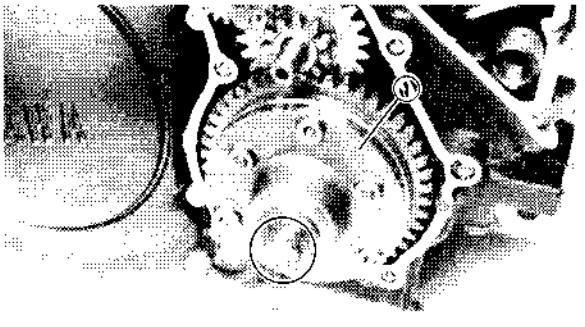
6. Install:
   • Dowel pins
   • Gasket (Crankcase cover)
   • Crankcase cover (Right) ①

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



STARTER CLUTCH

1. Install:
   • Idle gear ①
   • Idle gear ②
   • Starter clutch gear ③
   • Woodruff key ④

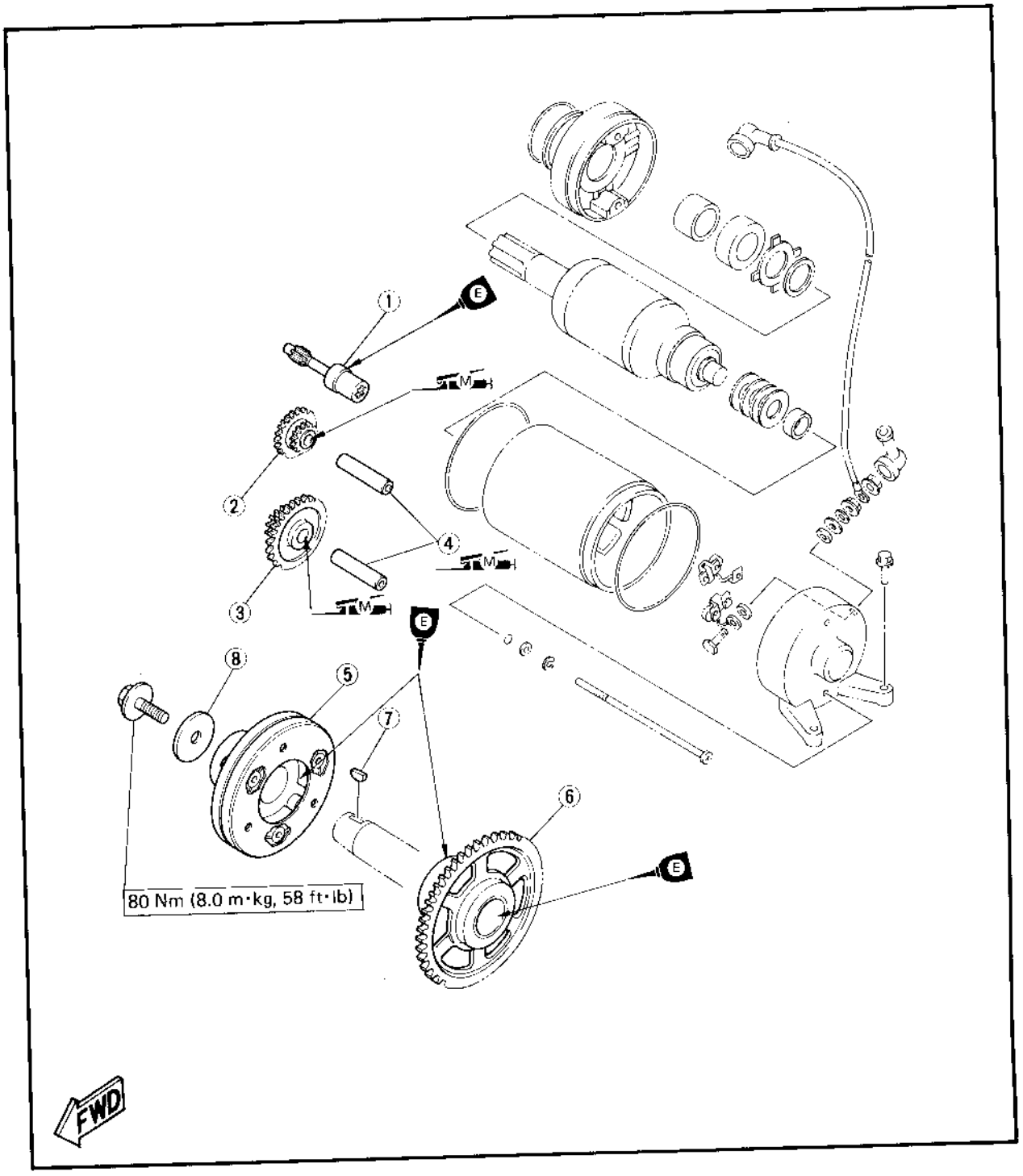


2. Install:
   • Starter clutch ①
   • Washer
   • Bolt (Starter clutch)

Bolt (Starter Clutch):
80 Nm (8.0 m·kg, 58 ft·lb)

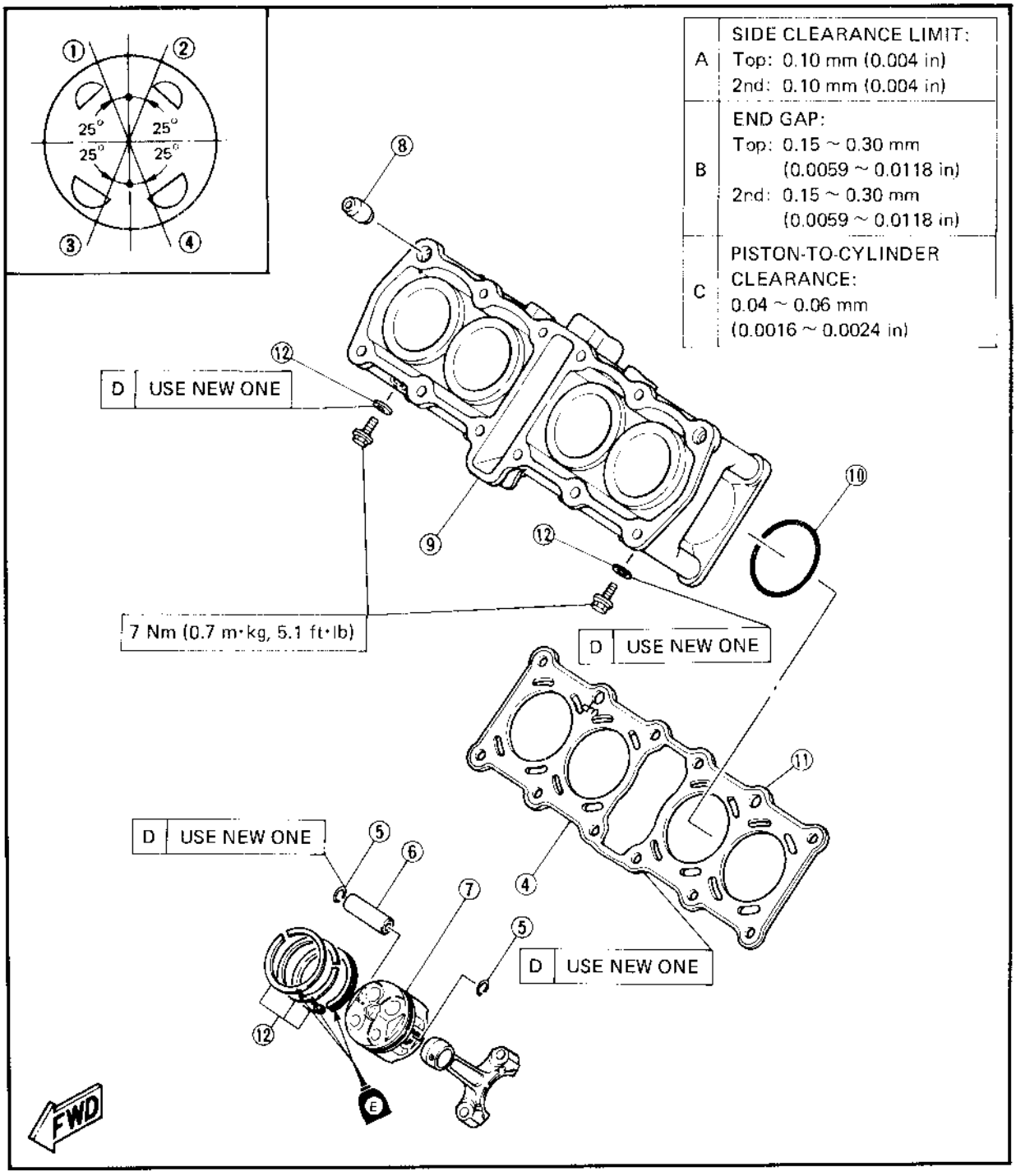
STARTER CLUTCH

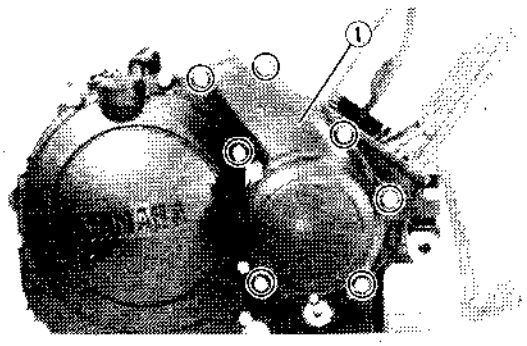
① Starter drive gear
② Idle gear
③ Idle gear
④ Shaft
⑤ Starter clutch assembly
⑥ Starter clutch gear
⑦ Woodruff key
⑧ Washer



PISTON AND CYLINDER

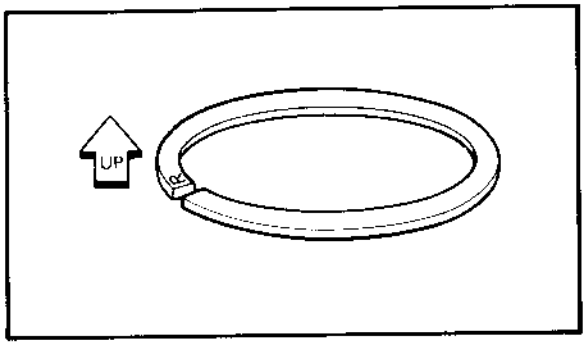
① Top ring
② Oil ring (Lower)
③ Oil ring (Upper)
④ Second ring
⑤ Circlip
⑥ Piston pin
⑦ Piston
⑧ Dowel pin
⑨ Cylinder
⑩ O-ring
⑪ Gasket (Cylinder)
⑫ Piston ring





3. Install:
   - Dowel pins
   - Gasket (Stater clutch cover) (New)
   - Stater clutch cover ①

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

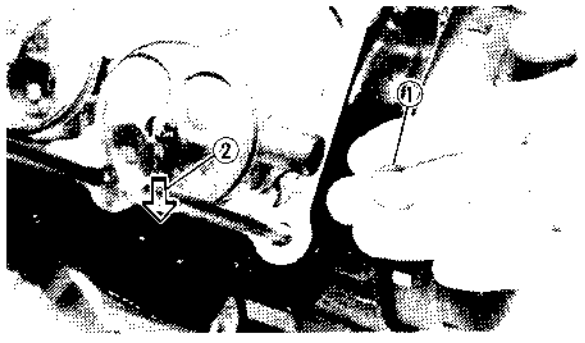


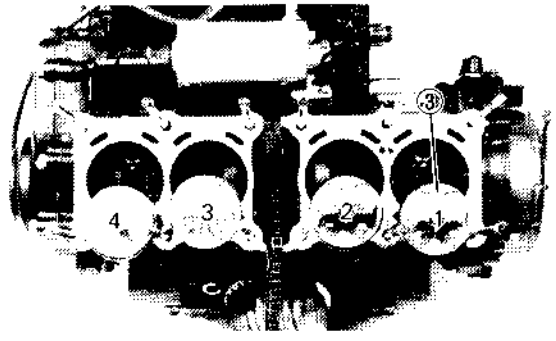
PISTON AND CYLINDER

1. Install:
   - Piston rings

NOTE:

Be sure to install rings so that Manufacturer's marks or numbers are located on the top side of the rings. Oil the pistons and rings liberally.





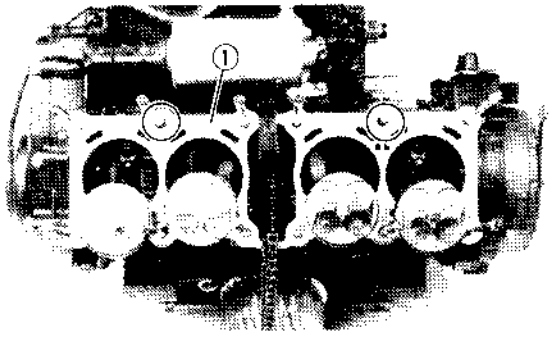
2. Install:
   - Piston pins
   - Pistons
   - Circlips (Piston pin) ①

NOTE:

- Be sure the piston arrow mark ② face to exhaust side of the engine.
- Before installing the piston pin circlip, cover the crankcase with a clean rag to prevent the circlip from falling into the crankcase cavity.
- Be sure the marked piston numbers ③ should be in sequence (1, 2, 3, 4) begining from the left.

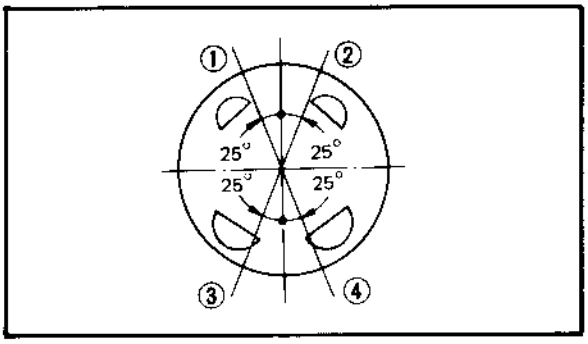
WARNING:

Always use new circlips (Piston pin).

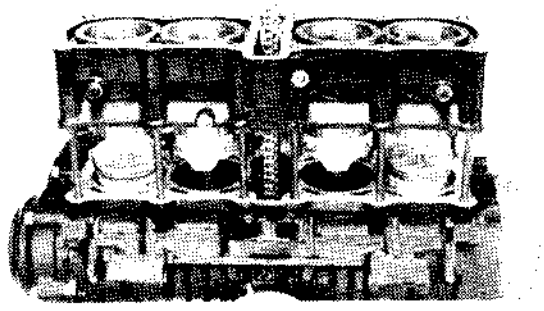


3. Install:
   - Gasket (Cylinder) ①
   - Dowel pins
4. Lubricate:
   - Pistons
   - Piston rings
   - Cylinder

NOTE:
Apply a liberal coating of 4-stroke engine oil.

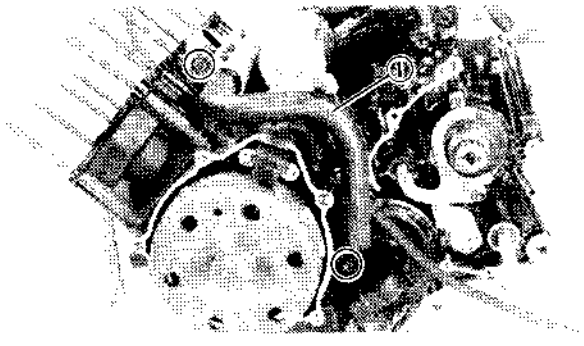


5. Position:
   Offset the piston ring end gaps.
   - Top ring end ①
   - Oil ring end (Lower) ②
   - Oil ring end (Upper) ③
   - 2nd ring end ④



6. Install:
   - Cylinder

NOTE:
- Install pistons #2 and #3 first.
- Pass the cam chain and cam chain guide (Exhaust side) through the cam chain cavity.



7. Install:
   - O-ring
   - Water pipe ①

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

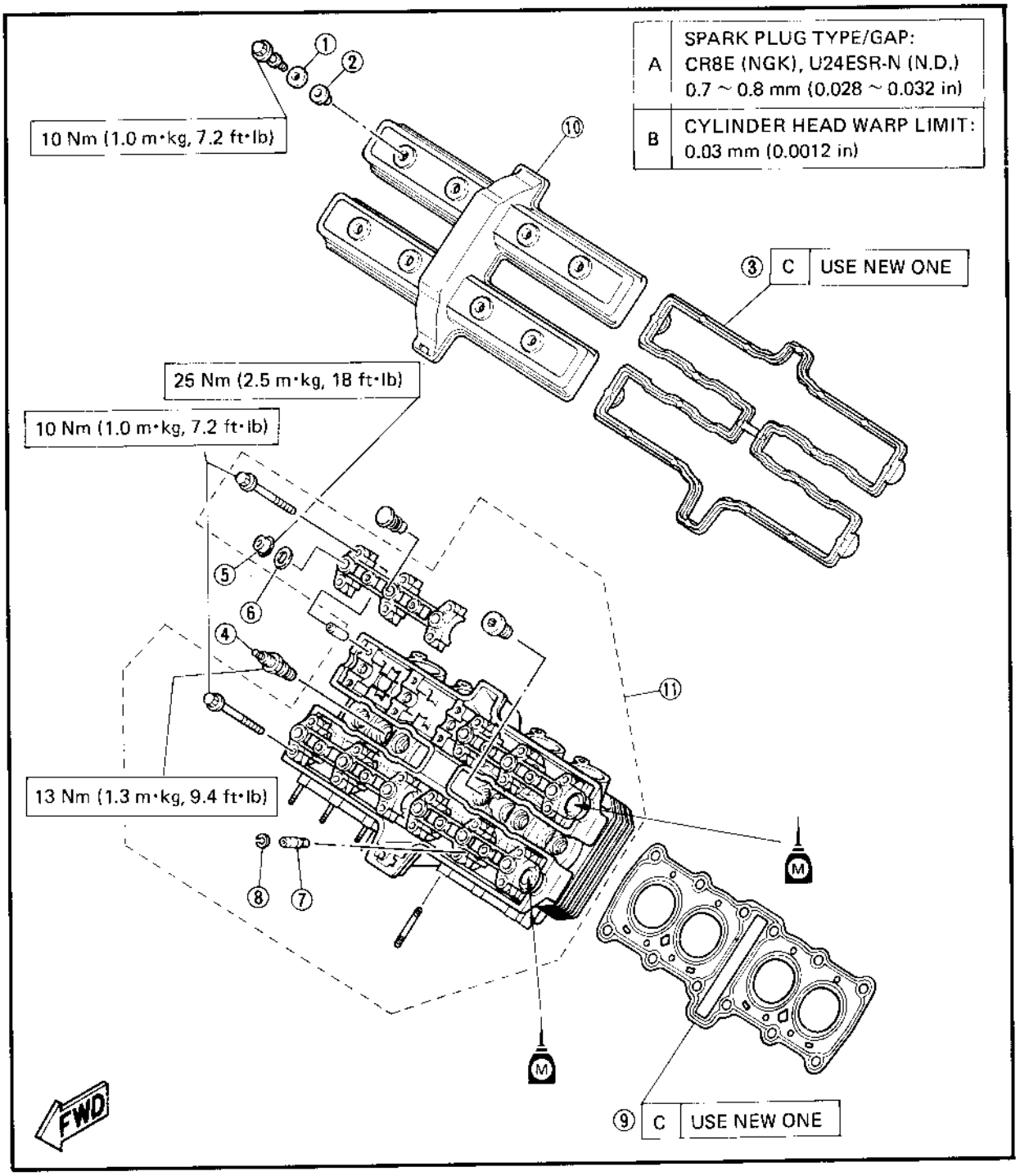
8. Turn:
   - Crankshaft
     Counterclockwise.
9. Align:
   - "T" mark
   - Stationary pointer
     Refer to "ENGINE DISASSEMBLY - CYLINDER HEAD AND CAMSHAFT".

NOTE:
When # 1 piston is at TDC.

CYLINDER HEAD AND CAMSHAFT

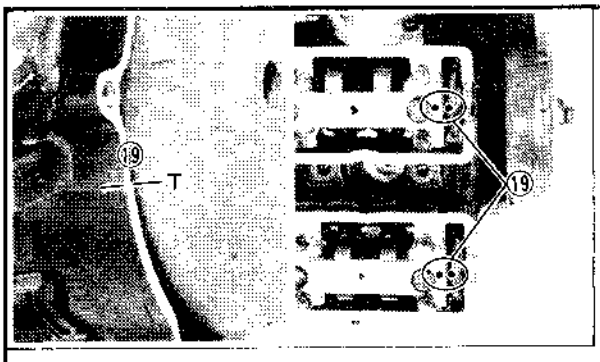
Cylinder Head

① Washer
② Rubber washer
③ Gasket (Cylinder head cover)
④ Spark plug
⑤ Nut
⑥ Washer
⑦ Valve guide
⑧ Circlip
⑨ Gasket (Cylinder head)
⑩ Cylinder head cover
⑪ Cylinder head assembly

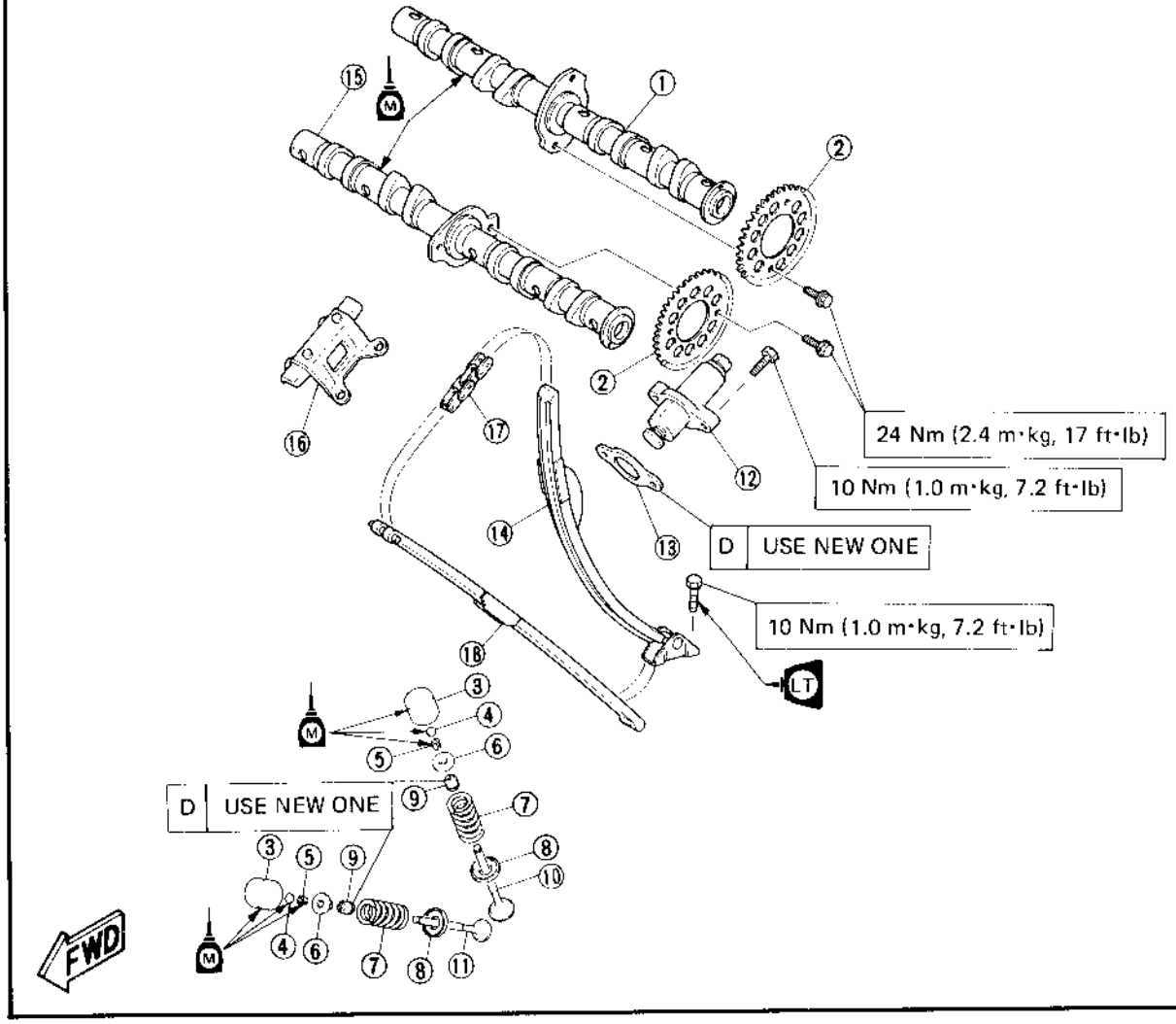


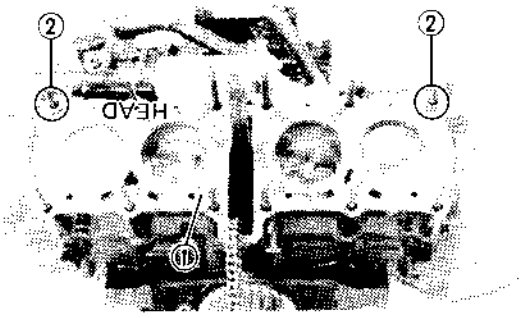
Camshaft

① Camshaft (Intake)
② Cam chain sprocket
③ Valve lifter
④ Valve pad
⑤ Valve retainer
⑥ Spring seat
⑦ Valve spring
⑧ Spring seat
⑨ Oil seal
⑩ Intake valve
⑪ Exhaust valve
⑫ Cam chain tensioner
⑬ Gasket (Cam chain tensioner)
⑭ Cam chain guide (Intake side)
⑮ Camshaft (Exhaust)
⑯ Chain guide (Upper)
⑰ Cam chain
⑱ Cam chain guide (Exhaust side)
⑲ Match mark



A	VALVE CLEARANCE (COLD):
B	INTAKE: 0.11 ~ 0.20 mm (0.004 ~ 0.008 in)
C	EXHAUST: 0.21 ~ 0.30 mm (0.008 ~ 0.012 in)



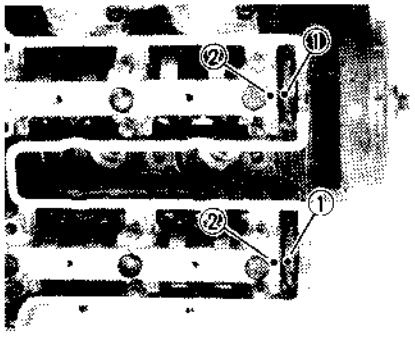


CYLINDER HEAD AND CAMSHAFT

1. Install:
   - Gasket (Cylinder head) (New) ①
   - Dowel pins ②

NOTE:
The gasket "HEAD" mark should face upward.

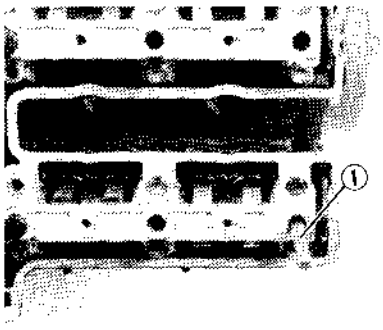
NOTE:
- Select either of the two procedures explained in this manual, as follows:
- Procedure 1.
  The cam chain is disconnected → Connect.
- Procedure 2.
  The camshafts are removed → Install.



Procedure 1

1. Install:
   - Camshafts, and cylinder head assembly

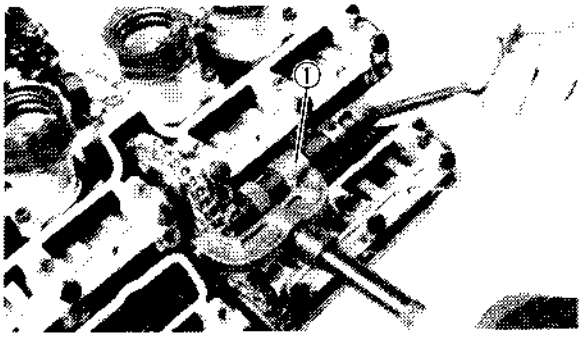
NOTE:
- Be sure the camshaft timing marks ① align with the camshaft cap marks ② .
- Be sure the "T" mark on the magneto align the stationary pointer when #1 piston is at TDC.



2. Tighten:
   - Nuts (Cylinder head)
     Use the Hexagon Wrench 6 mm (0.24 in) ① .

NOTE:
Tighten the nuts in their proper tightening sequence and torque nuts in two stages.

	Nuts (Cylinder Head): **25 Nm (2.5 m·kg, 18 ft·lb)**



4. Connect:
   • Cam chain
   With the chain joint (New).
   Use the Cam Chain Cutter ① .

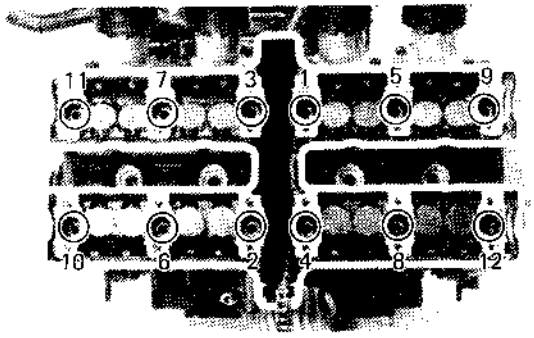
Cam Chain Cutter:
P/N YM-01112

NOTE:
Keep the cam chain as tense as possible on the exhaust side.

5. Go to "CAM CHAIN TENSIONER".

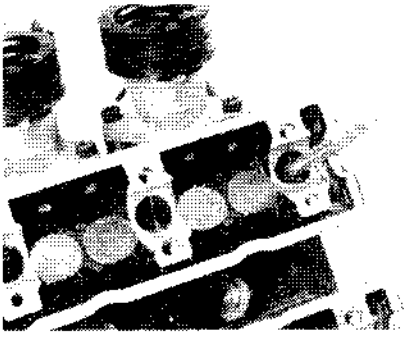
Procedure 2.

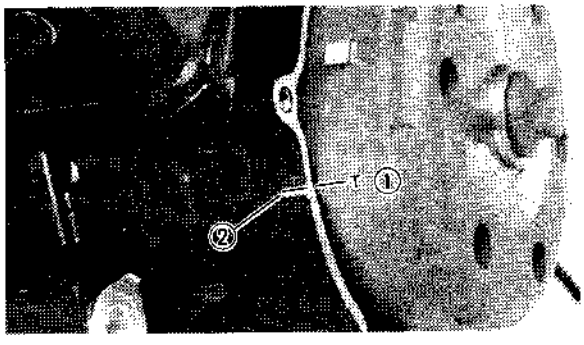
1. Install:
   • Camshaft case and cylinder head assembly
2. Tighten:
   • Nuts (Cylinder head)
   Use the Hexagon Wrench 6 mm (0.24 in).



NOTE:
Tighten the nuts in their proper tightening sequence and torque nuts in two stages.

Nuts (Cylinder Head):
25 Nm (2.5 m·kg, 18 ft·lb)



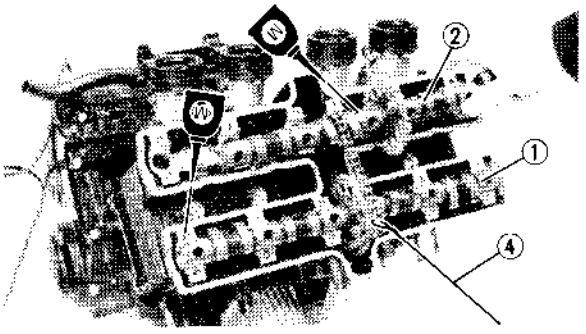


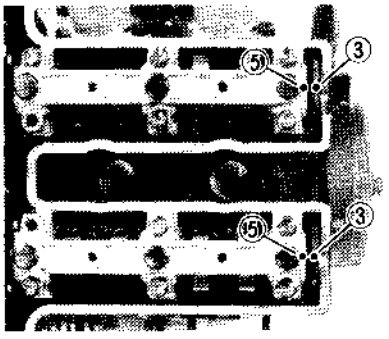
3. Install:
   • Camshafts

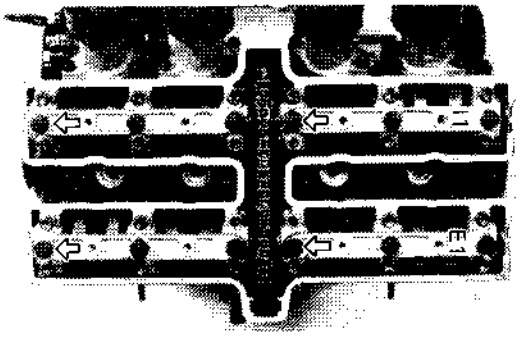
Camshaft installation steps:
- Turn the crankshaft counterclockwise.
- Align the "T" mark ① on the magneto with the crankcase end ② when #1 piston is at TDC.

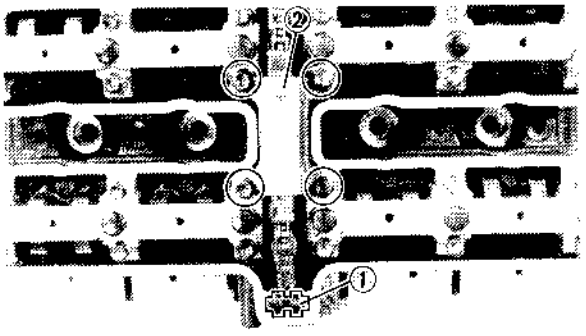
⚠ CAUTION:

Do not turn the crankshaft during the camshafts installation. Damage or improper valve timing will result.









- Lubricate the camshaft bearing surfaces, cam lobes and cam journals.

Molybdeum Disulfide Oil

- Install the exhaust camshaft ① first, then install the intake camshaft ② .
- Be sure the timing marks ③ on the camshaft face upward.
- Keep the cam chain as tense as possible on the exhaust side.
- Remove the retaining wire ④ .

⚠ CAUTION:

Do not turn the camshaft separately or damage to the piston and valve will result.

- Install the dowel pins.
- Install the camshaft caps.
- Align the camshaft timing marks ③ with the camshaft cap marks ⑤ .

NOTE:

- The numbers are punched on the camshaft caps in increments from right to left.
- Do not install the bolts at * marked place in this stage.
- Tighten the bolts (Camshaft caps).

NOTE:

Tighten the camshaft caps in a crisscross pattern from innermost to outer caps.

⚠ CAUTION:

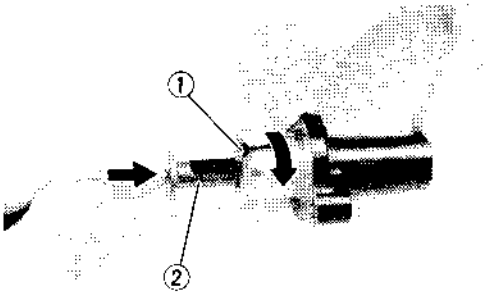
The cam caps must be tightened evenly or damage to the cylinder head, camshaft caps and cam will result.

Bolts (Camshaft Cap):
10 Nm (1.0 m·kg, 7.2 ft·lb)

4. Install:
   - Cam chain guide (Exhaust side) ①
   - Cam chain guide (Upper) ②

CAM CHAIN TENSIONER

1. Position:
   - Cam chain
     Exhaust side → Tense.
     Intake side → Slack.
2. Install:
   - Cam chain tensioner

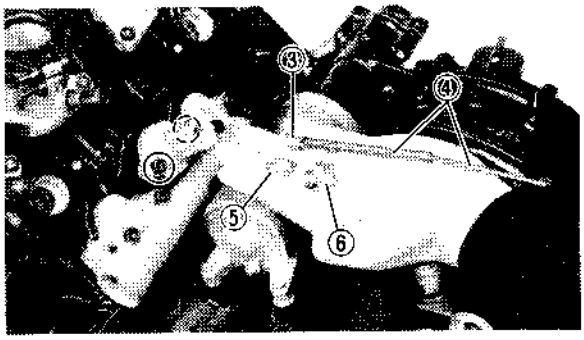


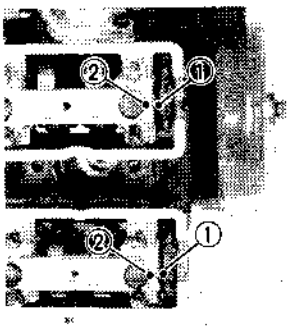
Cam chain tensioner installation steps:
- Remove the tensioner end cap bolt and spring.
- Release the cam chain tensioner one-way cam ① and push the tension rod ② .
- Install the tensioner with a new gasket into the cylinder.

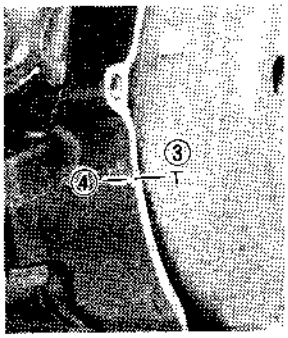
Bolts (Cam Chain Tensioner):
10 Nm (1.0 m·kg, 7.2 ft·lb)

- Install the collar ③ , springs ④ , washer ⑤ and end cap bolt ⑥ .

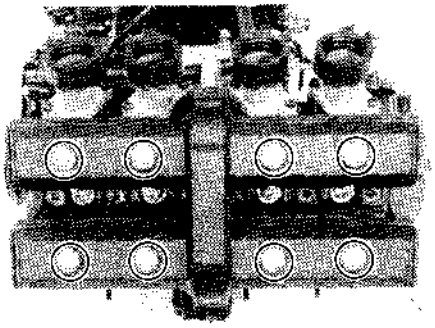
End Cap Bolt (Cam Chain Tensioner):
20 Nm (2.0 m·kg, 14 ft·lb)



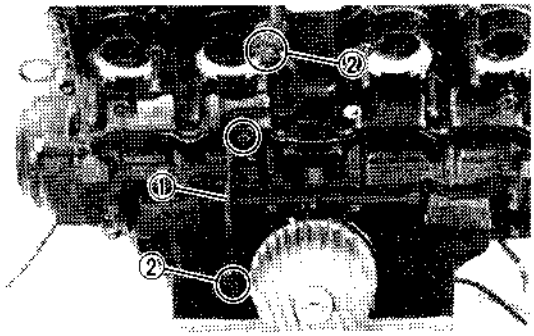




3. Turn:
   - Crankshaft
     Counterclockwise for a several turns.
4. Inspect:
   - Camshaft timing marks ①
     Align with the camshaft cap marks ② .
   - Crankshaft "T" mark ③
     Align with the crankcase end ④ .
     Out of alignment → Adjust.
     Refer to "CAMSHAFT INSTALLATION STEPS".
5. Install:
   - Gasket (Cylinder head cover)
   - Cylinder head cover

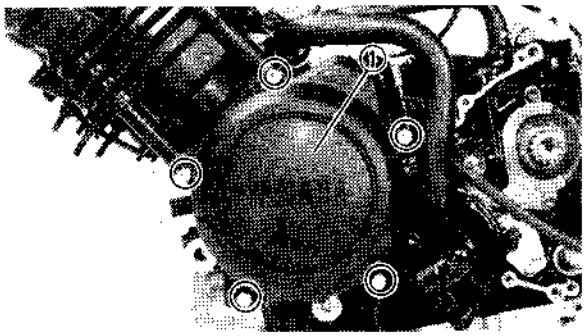


Bolts (Cylinder Head Cover):
10 Nm (1.0 m·kg, 7.2 ft·lb)



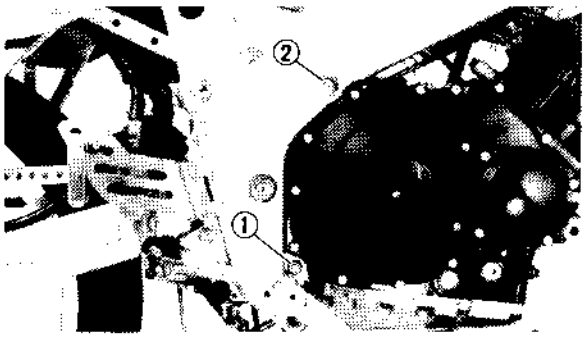
6. Install:
   - Washers (New)
   - Oil delivery pipe ①
   - Union bolts ②

Union Bolts (Oil Delivery Pipe):
20 Nm (2.0 m·kg, 14 ft·lb)



7. Install:
   - Dowel pins
   - Generator cover ①

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

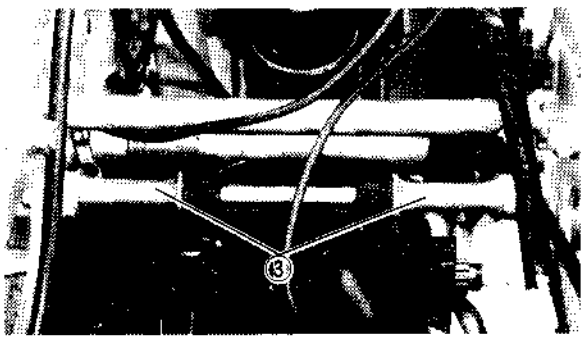


REMOUNTING ENGINE

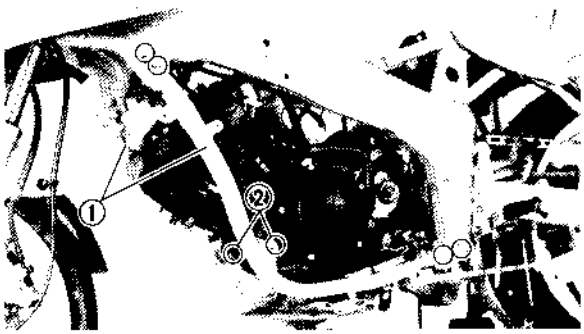
When remounting the engine, reverse the removal procedure. Note the following points.

1. Install:
   - Engine assembly
   - Bolt (Engine mount – Rear Lower) ①
   - Bolt (Engine mount – Rear Upper) ②

Bolt (Engine Mount – Rear Lower):
45 Nm (4.5 m·kg, 32 ft·lb)
Bolt (Engine Mount – Rear Upper):
55 Nm (5.5 m·kg, 40 ft·lb)

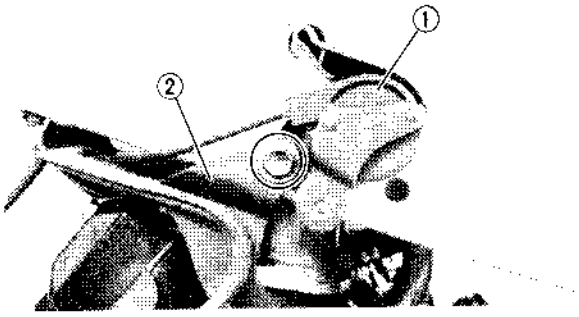


③Collars



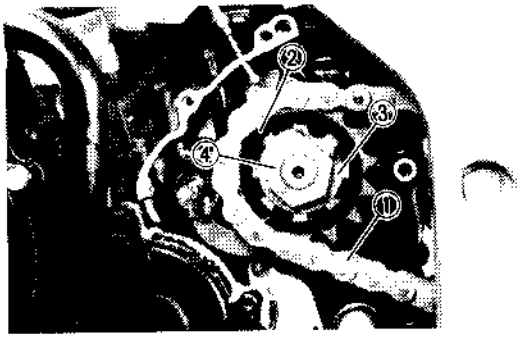
2. Install:
   - Down tube frames (Left and right) ①
   - Bolt (Engine – Mount) ②

Bolts (Down Tube Frame – Lower):
33 Nm (3.3 m·kg, 24 ft·lb)
Bolts (Down Tube Frame – Upper):
60 Nm (6.0 m·kg, 43 ft·lb)
Use LOCTITE®
Bolt (Engine Mount):
55 Nm (5.5 m·kg, 40 ft·lb)



3. Install:
   - Starter lever ①
   - Cover ②

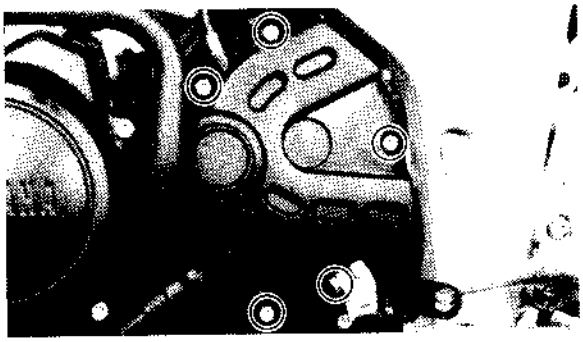
Bolt (Starter Lever):
8 Nm (0.8 m·kg, 5.8 ft·lb)



4. Install:
   - Drive chain ①
   - Drive sprocket ②
   - Lock washer (New) ③
   - Nut (Drive sprocket) ④

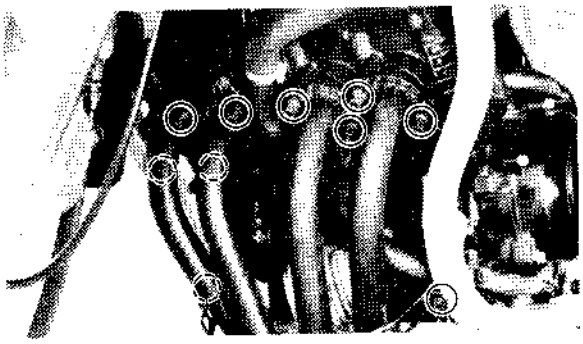
Nut (Drive Sprocket):
70 Nm (7.0 m·kg, 50 ft·lb)

NOTE:
Adjust the drive chain slack if necessary.



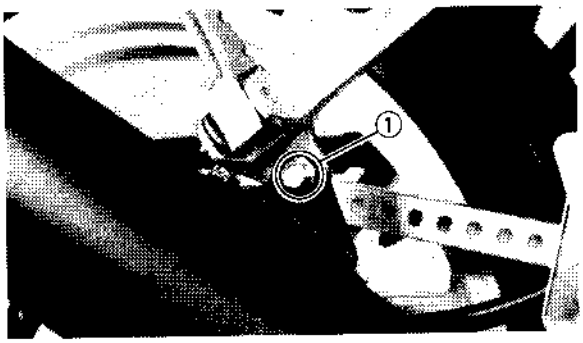
5. Install:
   - Cover (Crankcase Left)
   - Shift arm

Bolts (Crankcase Cover):
10 Nm (1.0 m·kg, 7.2 ft·lb)
Use LOCTITE®
Bolt (Shift Arm):
10 Nm (1.0 m·kg, 7.2 ft·lb)



6. Install:
   - Muffler assembly
7. Tighten:
   - Flange nuts (Exhaust pipe)

Flange Nuts (Exhaust Pipe):
10 Nm (1.0 m·kg, 7.2 ft·lb)
Bolts (Cowling Stay):
10 Nm (1.0 m·kg, 7.2 ft·lb)

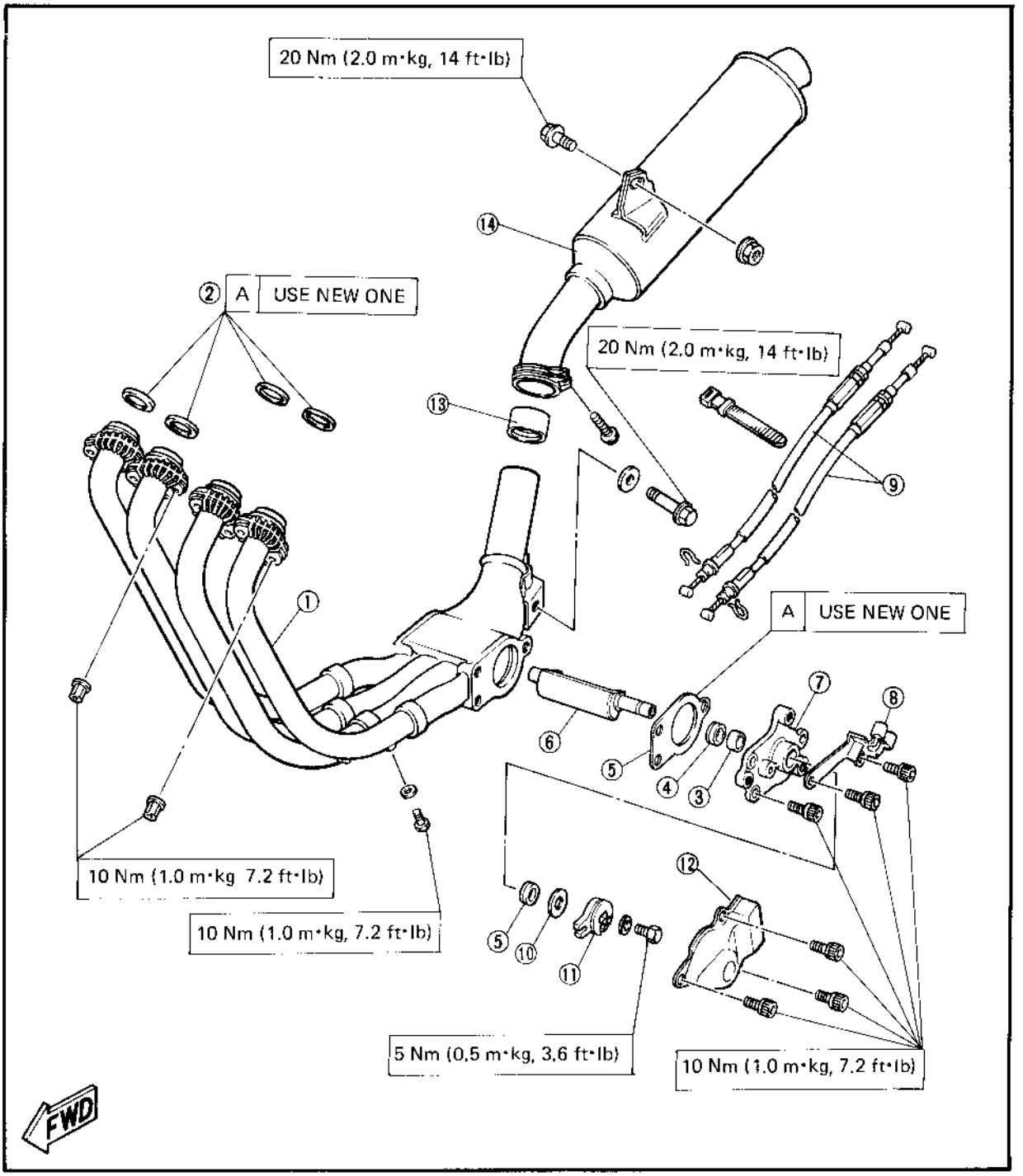


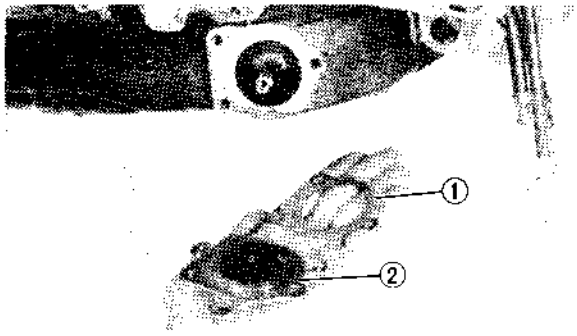
8. Tighten:
   - Bolt (Muffler bracket) ①
   - Bolt (Muffler stay) (For California only) ②

Bolt (Muffler Bracket):
20 Nm (2.0 m·kg, 14 ft·lb)
Bolt (Muffler Stay — For California only):
20 Nm (2.0 m·kg, 14 ft·lb)

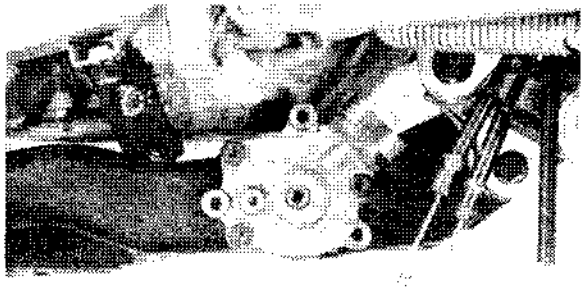
YAMAHA EXHAUST VARIABLE VALVE (For California Only)

① Exhaust pipe assembly
② Gasket (Exhaust pipe)
③ Bush
④ Oil seal
⑤ Gasket
⑥ Shaft arm
⑦ Housing
⑧ Bracket
⑨ Cables
⑩ Washer
⑪ Pulley
⑫ Valve cover
⑬ Gasket (Muffler)
⑭ Muffler assembly



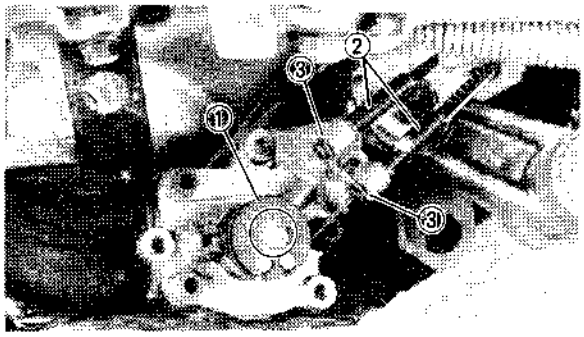


9. Install (For California only):
   - Shaft arm
   - Gasket ①
   - Housing ②



10. Install (For California only):
    - Washer
    - Bracket

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



11. Install (For California only):
    - Pulley ①
    - Cables ②
    - Clips ③

12. Adjust (For California only):
    - Cable

    Refer to the "EXUP CABLE ADJUSTMENT" section in the CHAPTER 3.

13. Adjust:
    - Throttle cable

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

Refer to the "THROTTLE CABLE FREE PLAY ADJUSTMENT" section in the CHAPTER 3.

14. Adjust:
- Clutch cable



Clutch Cable Free Play:
2 ~ 3 mm (0.08 ~ 0.12 in)

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

15. Fill:
- Coolant



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

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

16. Fill:
- Engine oil



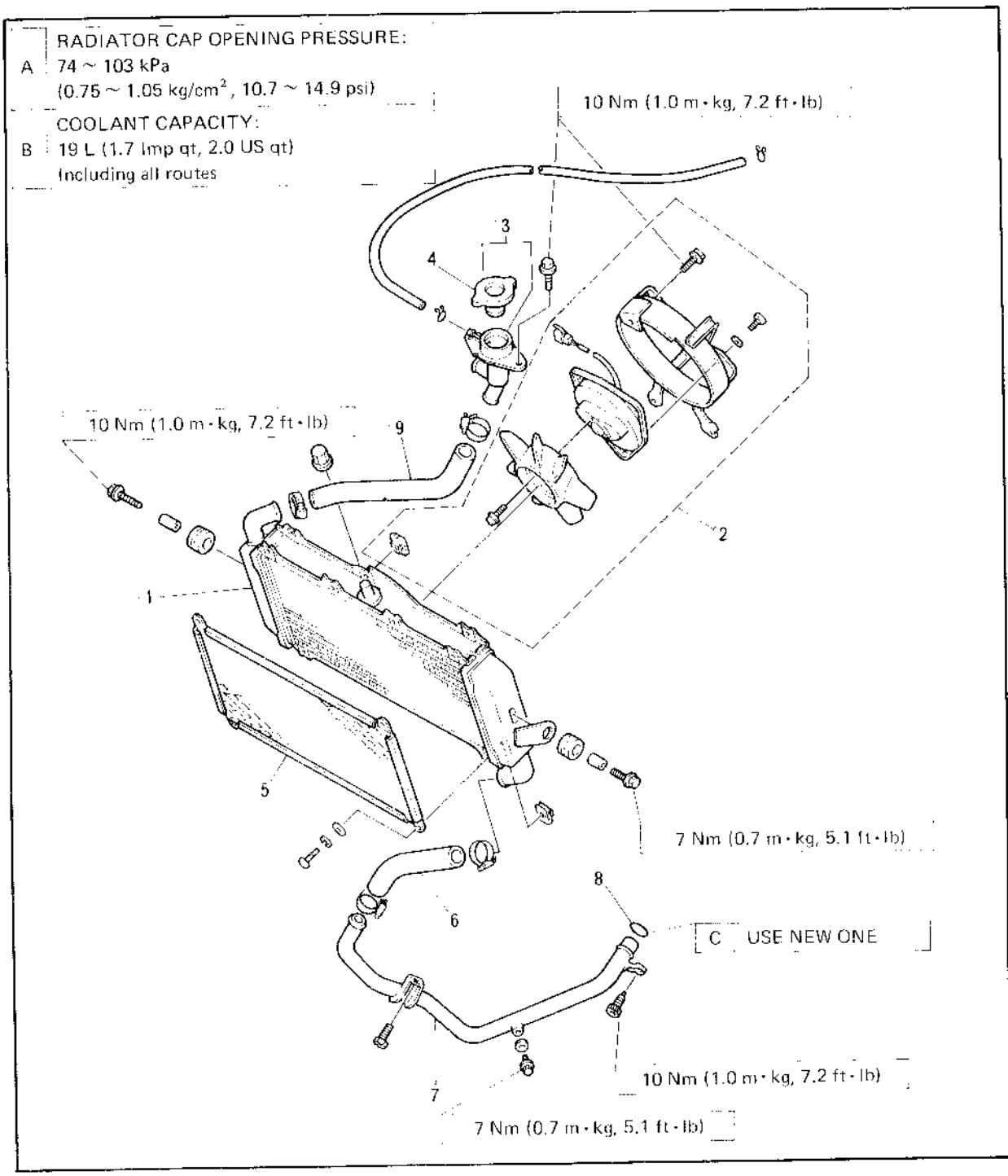
Total Amount:
0.8 L (0.7 Imp qt, 0.84 US qt)

Refer to the "ENGINE OIL REPL
MENT" section in the CHAPTER 3.

COOLING SYSTEM

RADIATOR

① Radiator assembly
② Fan motor assembly
③ Radiator cap assembly
④ Radiator cap
⑤ Radiator cover
⑥ Hose (Radiator – Outlet)
⑦ Outlet pipe
⑧ O-ring
⑨ Hose (Radiator – Inlet)



REMOVAL

1. Remove:
   - Lower cowlings (Left and Right)
   - Side cowlings (Left and Right)

   Refer to the "COWLING REMOVAL AND INSTALLATION – REMOVAL" section in the CHAPTER 3.
2. Drain:
   - Cooling system

   Refer to the "COOLANT REPLACEMENT" section in the CHAPTER 3.
3. Remove:
   - Muffler assembly

NOTE:

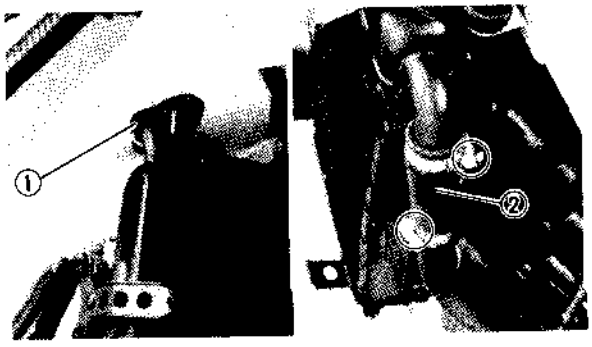
Thoroughly flush the cooling system with clean tap water.

⚠ CAUTION:

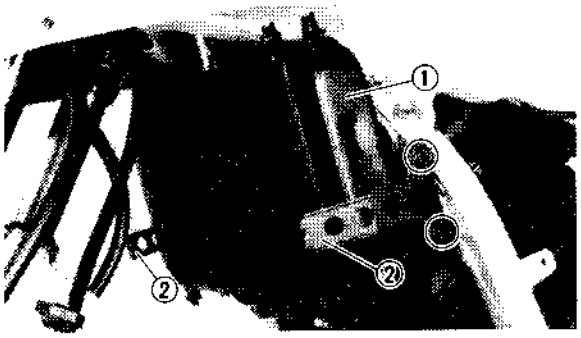
Take care so that coolant does not splash to painted surfaces. If splashes, wash it away with water.

⚠ WARNING:

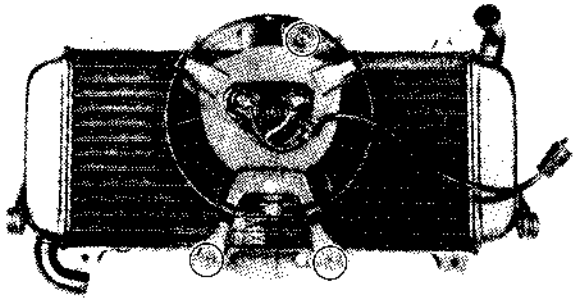
Do not remove the radiator cap, drain bolt and hoses especially when the engine and radiator are hot. Scalding hot fluid and steam may be blown out under pressure, which could cause serious injury. When the engine has cooled place a thick rag like a towel over the radiator cap, slowly rotate the cap 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.



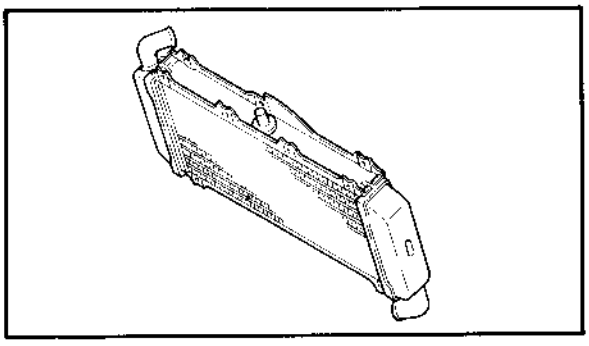
4. Disconnect:
   - Hose (Radiator – Inlet) ①
   - Hose (Radiator – Outlet) ②



5. Remove:
   - Radiator assembly ①
   - Cowling stay ②



6. Remove:
   - Fan motor assembly



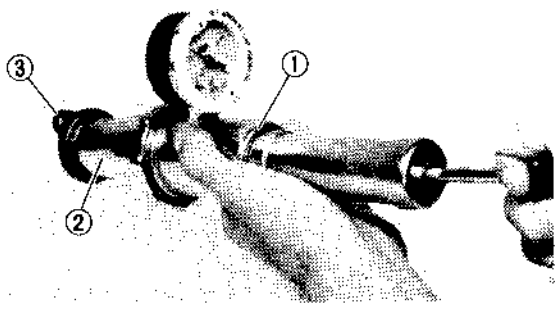
INSPECTION

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

2. Inspect:
   - Hose (Radiator – Inlet)
     Cracks/Damage → Replace.
   - Hose (Radiator – Outlet)
     Cracks/Damage → Replace.
   - Outlet pipe
     Cracks/Damage → Replace.

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

Radiator Cap Opening Pressure:
74 ~ 103 kPa
(0.75 ~ 1.05 kg/cm², 10.7 ~ 14.9 psi)



Measurement steps:

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

Cooling System Tester:
YU-24460-01
Adapter:
YU-33984

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

INSTALLATION

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

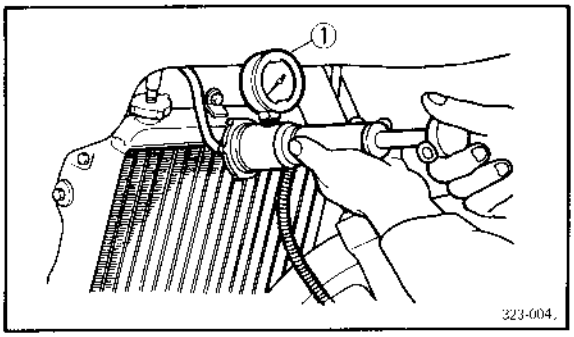
1. Install:
   - Fan motor assembly

Screws (Fan Motor Assembly):
10 Nm (1.0 m · kg, 7.2 ft · lb)

2. Install:
   - Radiator

Bolts (Radiator):
7 Nm (0.7 m · kg, 5.1 ft · lb)

3. Fill:
   - Cooling system
     Refer to the "COOLANT REPLACEMENT" section in the CHAPTER 3.
4. Inspect:
   - Cooling system
     Decrease of pressure (leaks) → Repair required.



Inspection steps:

- Attach the Cooling System Tester ① to the radiator.

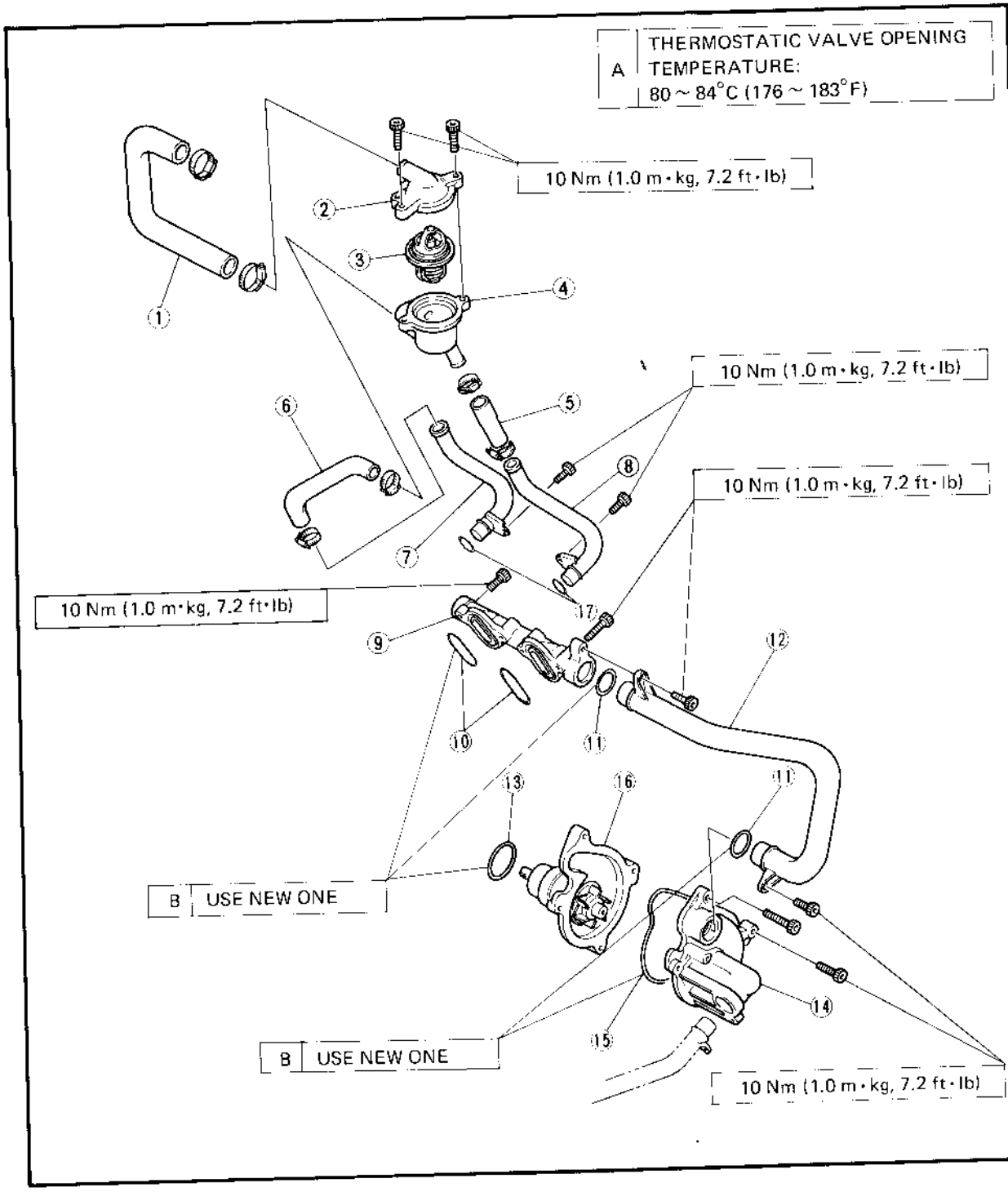


Cooling System Tester:
YU-24460-01

- Apply 100 kPa (1.0 kg/cm², 14 psi) pressure.
- Measure the indicated pressure with the gauge.

WATER PUMP AND THERMOSTATIC VALVE

① Hose 3
② Thermostatic cover
③ Thermostatic
④ Thermostatic housing
⑤ Hose 1
⑥ Hose 2
⑦ Pipe 2
⑧ Pipe 1
⑨ Water jacket joint
⑩ O-ring
⑪ O-ring
⑫ Water pipe
⑬ O-ring
⑭ Water pump cover
⑮ O-ring
⑯ Water pump housing
⑰ O-ring



REMOVAL

1. Remove:
   - Lower cowlings (Left and right)
   - Center cowlings (Left and right)
   - Seat
   - Top cover

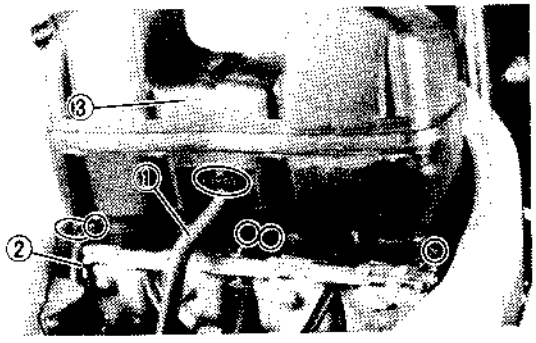
   Refer to the "COWLING REMOVAL AND INSTALLATION – REMOVAL" section in the CHAPTER 3.

2. Drain:
   - Cooling system

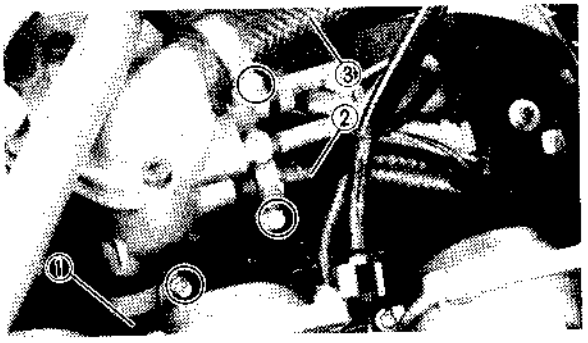
   Refer to the "COOLANT REPLACEMENT" section in the CHAPTER 3.

3. Remove:
   - Fuel tank

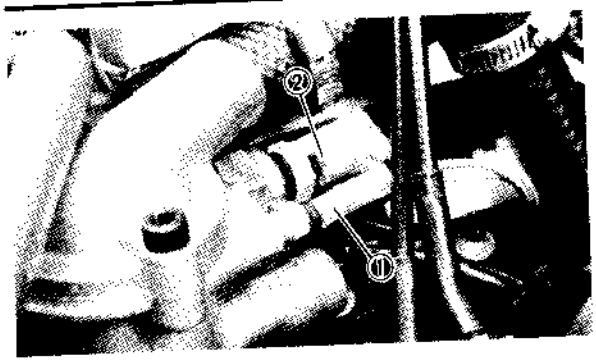
   Refer to the "CARBURETOR – REMOVAL" section in the CHAPTER 6.



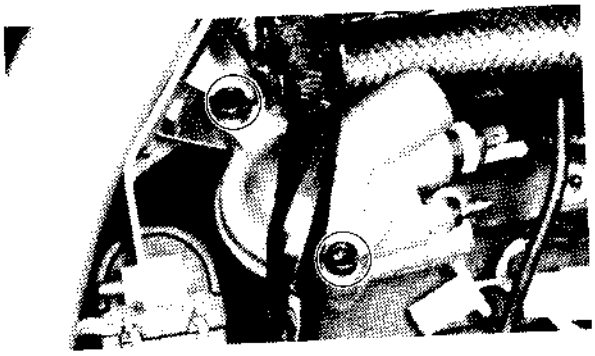
4. Disconnect:
   - Crankcase ventilation hose ①
   - Air vent hose ②
5. Remove:
   - Air filter case ③



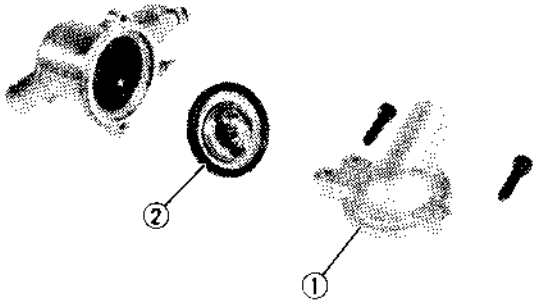
6. Disconnect:
   - Hose 1 ①
   - Hose 2 ②
   - Hose 3 ③



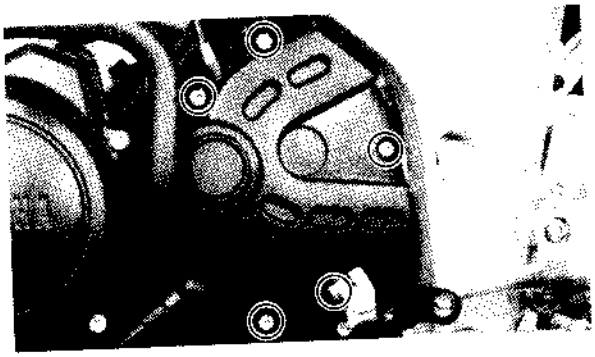
7. Disconnect:
   - Thermo unit lead ①
   - Thermo switch lead ②



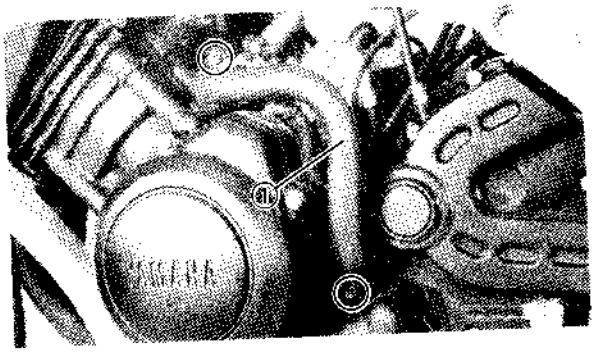
8. Remove:
   - Thermostatic housing



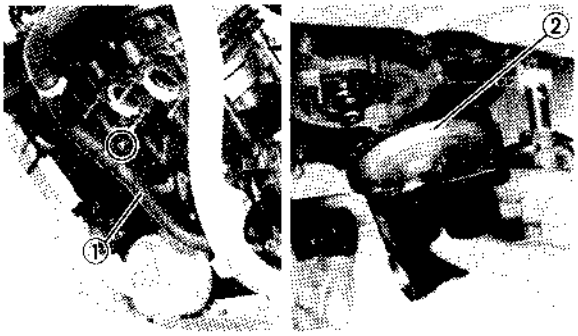
9. Remove:
   - Thermostatic cover ①
   - Thermostatic ②



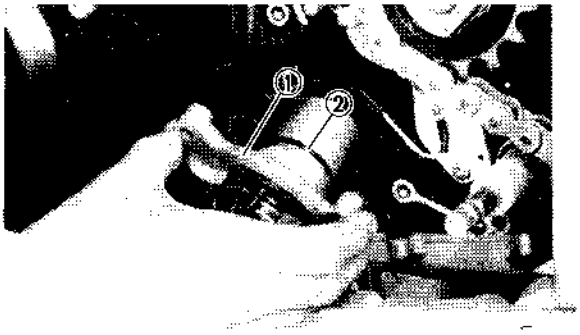
10. Remove:
    - Shift arm
    - Crankcase cover (Left)



11. Remove:
    - Water pipe ①



12. Remove:
    - Water pipe ①
    - Water pump cover ②

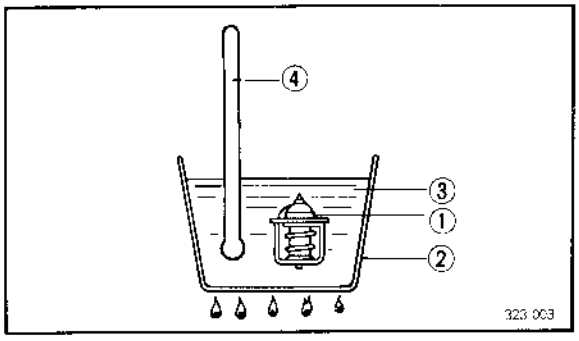


13. Remove:
    - Water pump housing ①

② O-ring

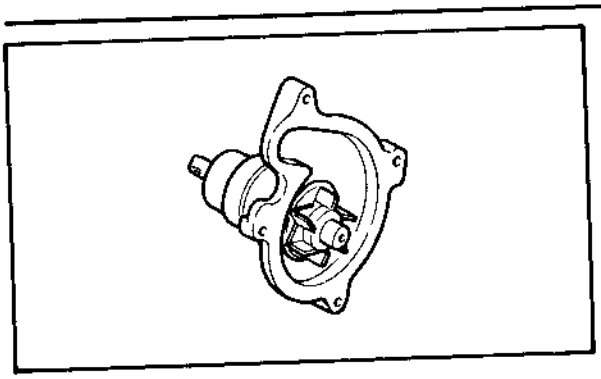
INSPECTION

1. Inspect:
    - Thermostatic valve
      Valve does not open at 80 ~ 84°C (176 ~ 183°F) → Replace.



Inspection steps:
- Suspend thermostatic valve ① in a vessel ② .
- Place reliable thermometer in a water ③ .
- Head 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 replace it. A faulty unit could cause serious overheating or overcooling.



2. Inspect:
   • Impeller
   Cracks/Wear/Damage → Replace.

INSTALLATION

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

1. Install:
   • Water pump cover
   • Pipe
   • Crankcase cover (Left)
   • Shift arm
   • Thermostatic cover

Bolts (Water Pump Cover):
10 Nm (1.0 m · kg, 7.2 ft · lb)
Bolts (Pipe):
10 Nm (1.0 m · kg, 7.2 ft · lb)
Bolts (Crankcase Cover – Left):
10 Nm (1.0 m · kg, 7.2 ft · lb)
Bolt (Shift Arm):
10 Nm (1.0 m · kg, 7.2 ft · lb)
Bolts (Thermostatic Cover):
10 Nm (1.0 m · kg, 7.2 ft · lb)

⚠ CAUTION:
Always use new O-ring.

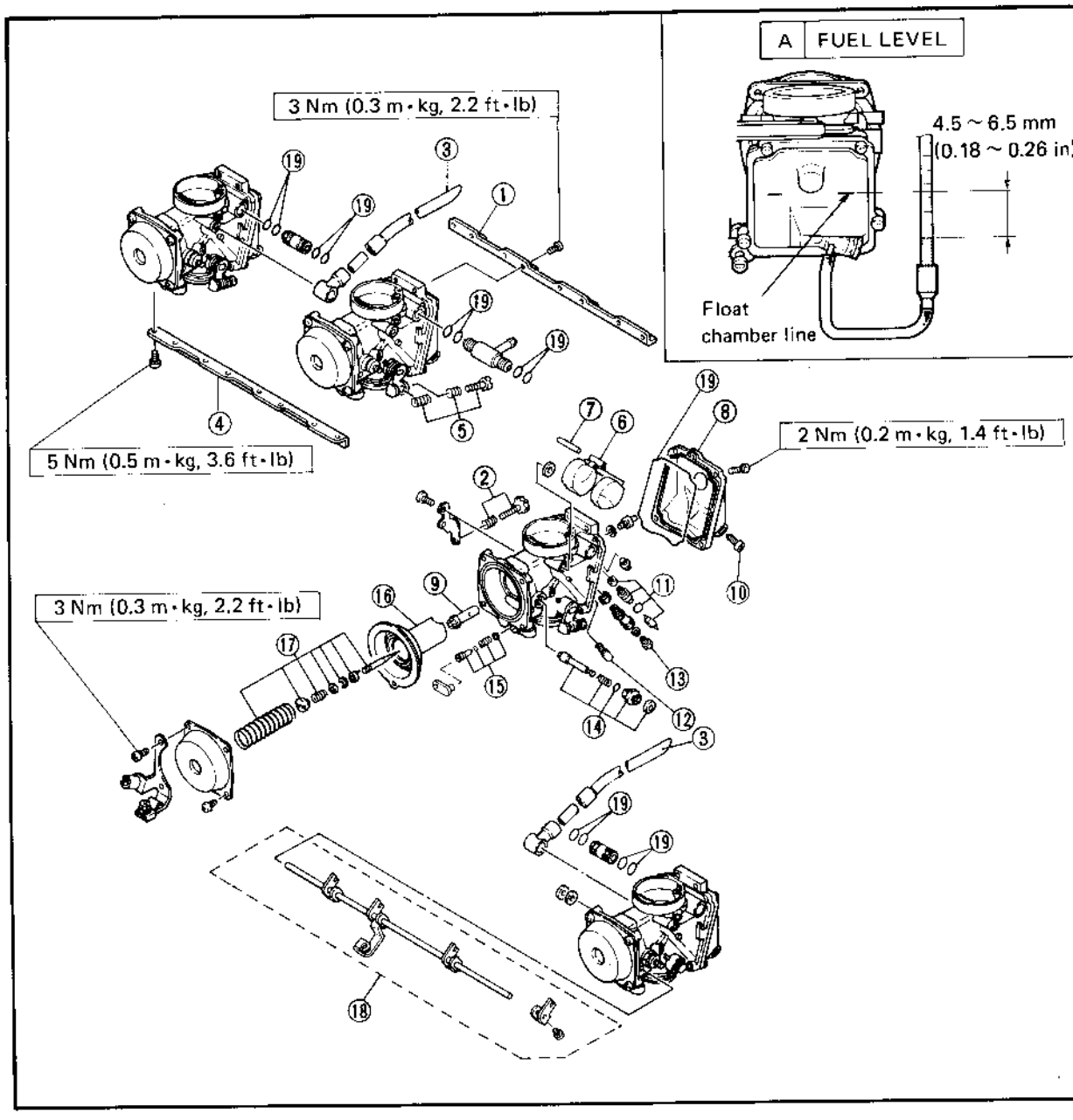
2. Fill:
   • Cooling system
   Refer to the "COOLANT REPLACEMENT" section in the CHAPTER 3.
3. Inspect:
   • Cooling system
   Decrease of pressure (Leaks) → Repair as required.

CARBURETOR

CARBURETOR

① Upper bracket
② Throttle stop screw
③ Fuel overflow hose
④ Lower bracket
⑤ Syncronizing screw
⑥ Float
⑦ Float pin
⑧ Float chamber
⑨ Needle jet
⑩ Fuel drain screw
⑪ Valve seat assembly
⑫ Pilot jet
⑬ Main jet
⑭ Starter plunger assembly
⑮ Pilot screw
⑯ Piston valve assembly
⑰ Jet needle set
⑱ Starter lever shaft
⑲ O-ring

SPECIFICATIONS	
ID Mark	3BF-00 (Except for California), 3FH-00 (For California)
MAIN JET	#87.5
MAIN AIR JET	#60
PILOT JET	#15
PILOT AIR JET	#130
JET NEEDLE	5CFZ2
PILOT SCREW	3½
THROTTLE VALVE	#130
ENGINE IDLE SPEED	1,250 ~ 1,350 r/min
FUEL LEVEL	4.5 ~ 6.5 mm (0.18 ~ 0.26 in

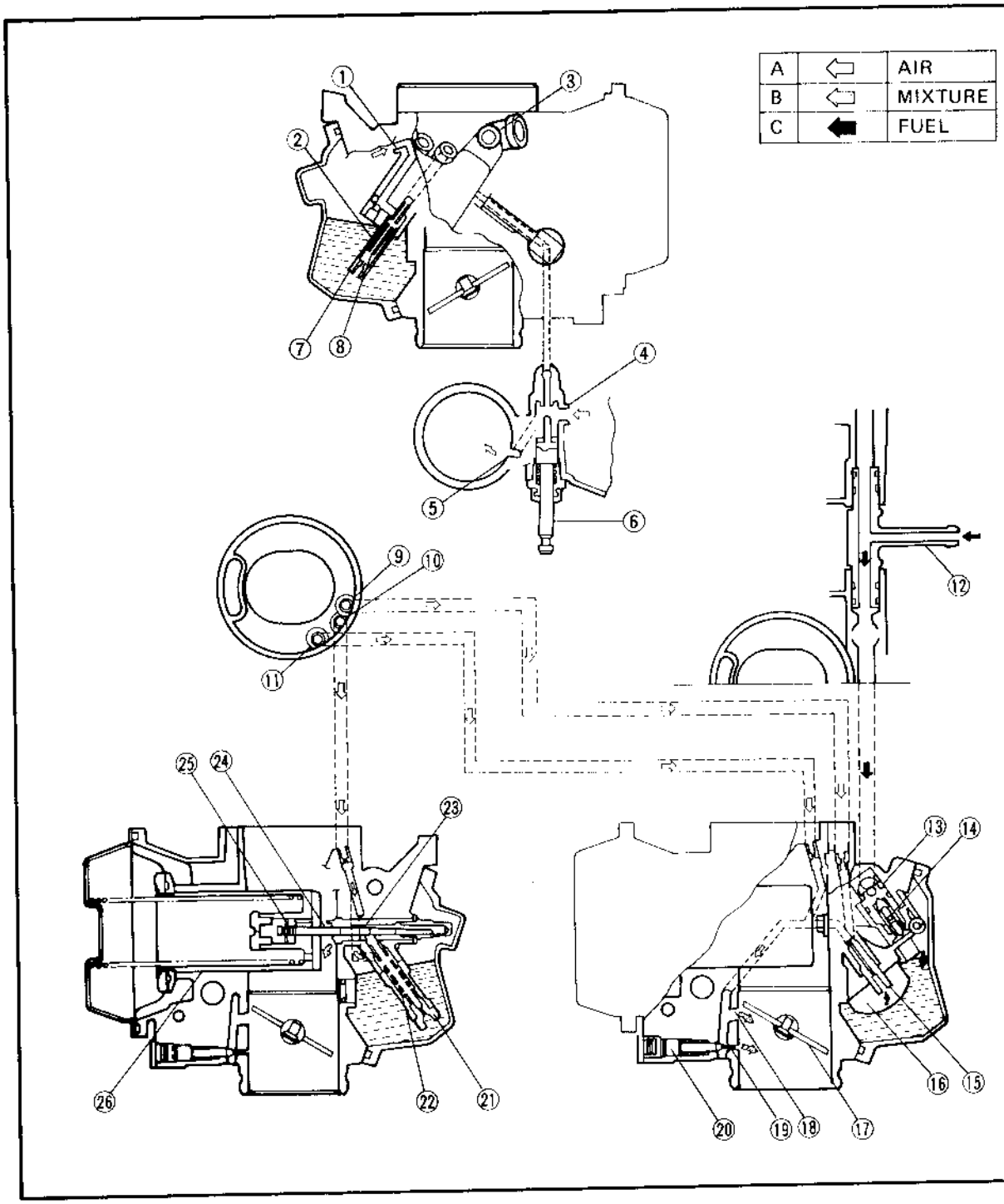


SECTION VIEW

① Starter air bleed
② Starter air bleed pipe
③ Air vent
④ Air inlet
⑤ Mixture outlet
⑥ Starter plunger
⑦ Starter jet No 1
⑧ Starter jet No. 2
⑨ Pilot air jet 2
⑩ Main air jet
⑪ Pilot air jet 1
⑫ Fuel inlet
⑬ Float needle valve
⑭ Valve seat
⑮ Pilot jet
⑯ Float
⑰ Throttle valve
⑱ Bypass hole
⑲ Pilot outlet
⑳ Pilot screw
㉑ Main jet
㉒ Main bleed pipe
㉓ Needle jet
㉔ Jet needle
㉕ Spring clip
㉖ Piston valve

⚠ CAUTION:

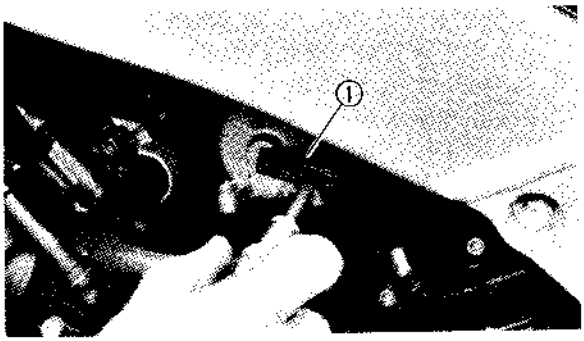
The pilot screw settings are adjusted fo maximum performance at the factory. Any attempt to change these settings w ll decrease engine performance.



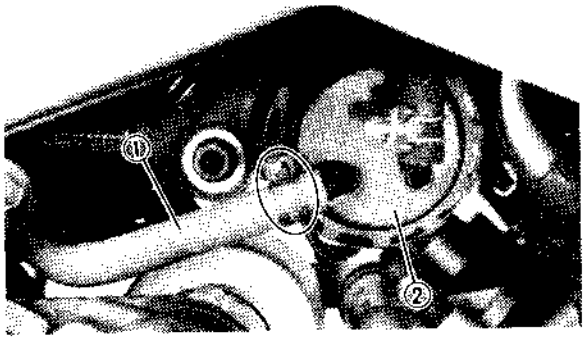
REMOVAL

1. Remove:
   - Seat
   - Top cover

   Refer to the "COWLING REMOVAL AND INSTALLATION – REMOVAL" section in the CHAPTER 3.



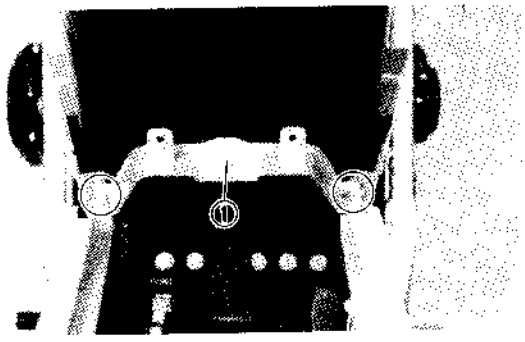
2. Turn the fuel cock to "OFF" position.
3. Remove:
   - Fuel cock lever ①



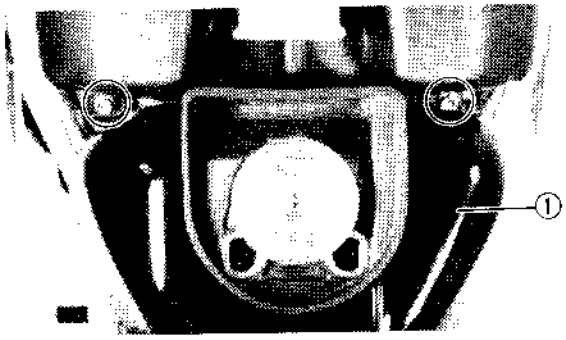
4. Disconnect:
   - Fuel hose ①
5. Remove:
   - Fuel pump ②

⚠ WARNING:

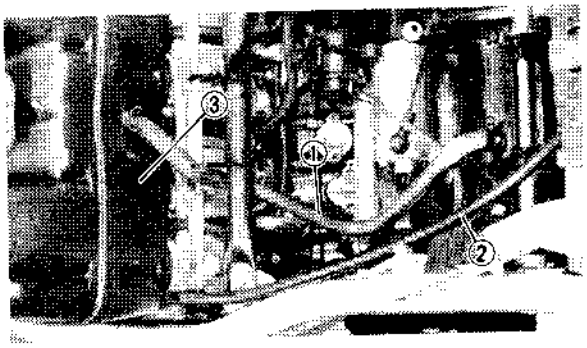
Gasoline is highly flammable.
Avoid spilling fuel on the hot engine.



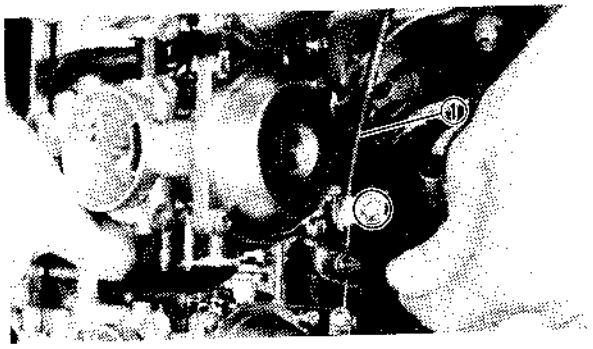
6. Remove:
   - Fuel tank bracket ①



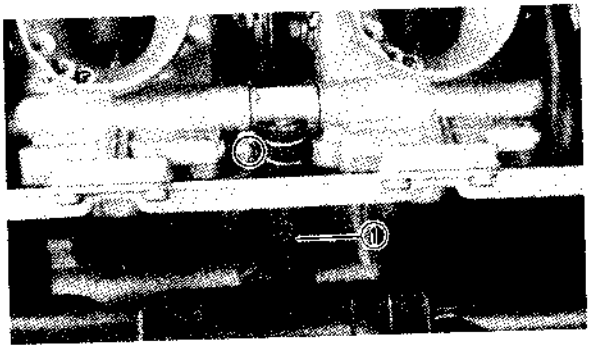
7. Remove:
   - Fuel tank ①



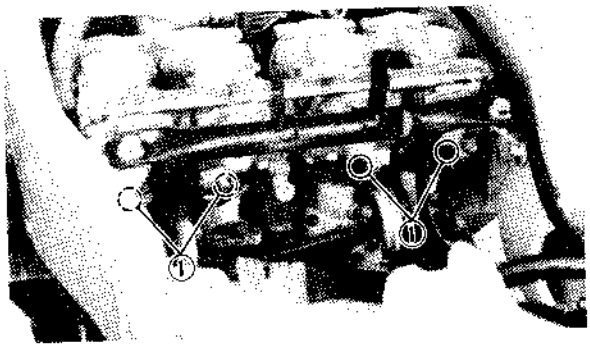
8. Disconnect:
   - Crankcase ventilation hose ①
   - Air vent hose ②
9. Remove:
   - Air filter case ③



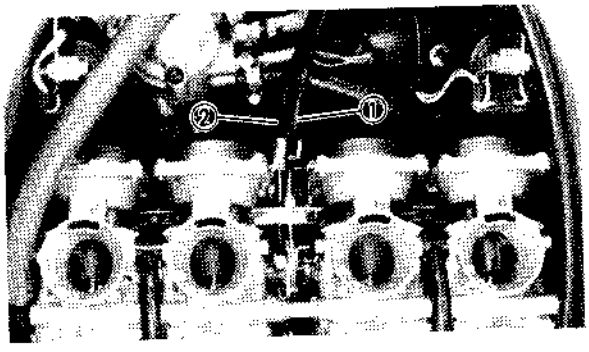
10. Loosen:
    - Screw (Starter cable clamp)
11. Disconnect:
    - Starter cable ①



12. Disconnect:
    - Fuel hose ①



13. Loosen:
    - Screws (Carburetor joint clamp – U
      ①



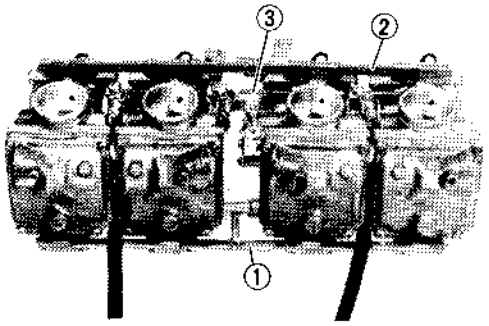
14. Remove:
    - Carburetor assembly
15. Disconnect:
    - Throttle cable 1 ①
    - Throttle cable 2 ②

DISASSEMBLY

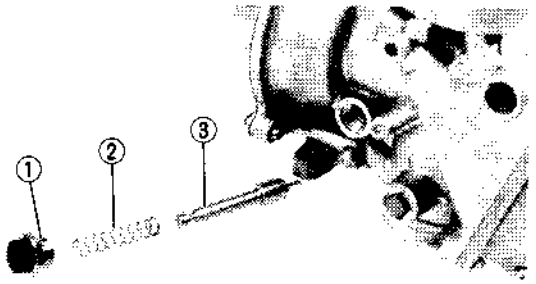
NOTE:

The following parts can be cleaned and inspected without carburetor separation.

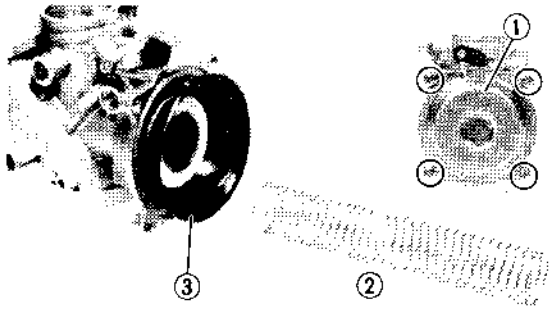
- Throttle valve
- Piston valve
- Starter plunger
- Float chamber components



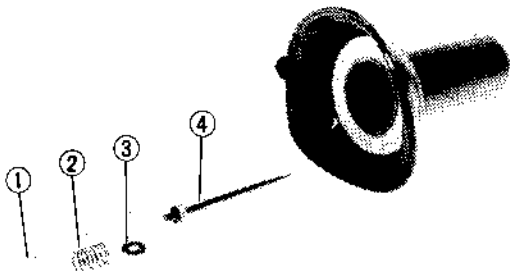
1. Remove:
   - Bracket (Upper) ①
   - Bracket (Lower) ②
   - Starter lever shaft ③



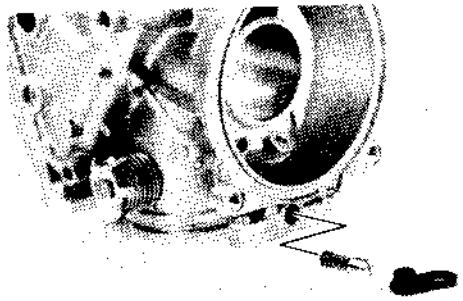
2. Remove:
   - Nut ①
   - Spring ②
   - Starter plunger ③



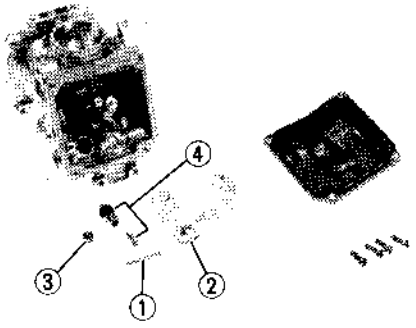
3. Remove:
   - Vacuum chamber cover ①
   - Spring ②
   - Piston valve assembly ③



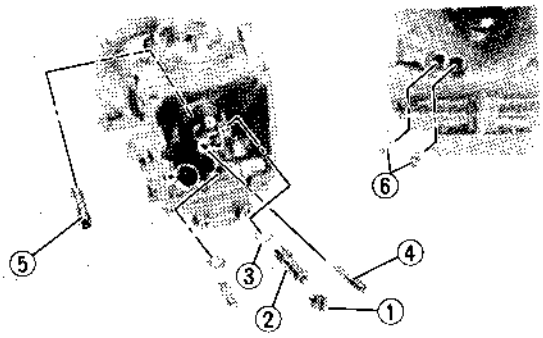
4. Remove:
   - Plug (Jet needle) ①
   - Spring ②
   - Washer ③
   - Jet needle ④



5. Remove:
   - Pilot screw



6. Remove:
   - Float chamber cover
   - Gasket
   - Float pin ①
   - Float ②
   - Valve seat screw ③
   - Valve seat assembly ④



7. Remove:
   - Main jet ①
   - Holder (Main jet) ②
   - Washer ③
   - Pilot jet ④
   - Needle jet ⑤
   - Pilot air jet ⑥

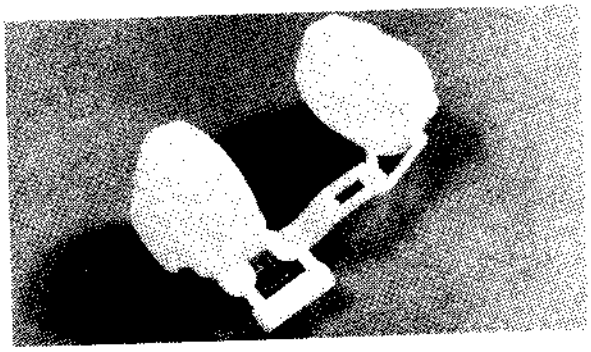
INSPECTION

1. Inspect:
   - Carburetor body
   - Float chamber
   - Fuel passage

   Contamination → Clean as indicated.

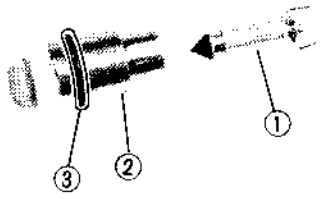


Carburetor cleaning steps:
- Wash carburetor in petroleum based solv
  (Do not use any caustic carburetor clea
  solution.)
- Blow out all passages and jets with a
  pressed air.



2. Inspect:
   - Floats

   Damage → Replace.



3. Inspect:
   - Float needle valve ①
   - Valve seat ②
   - O-ring ③

   Damage/Wear/Contamination → Replace as a set.



4. Inspect:
   - Throttle valve

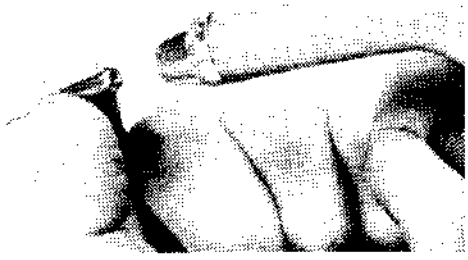
   Scratches → Replace.
   - Rubber diaphragm

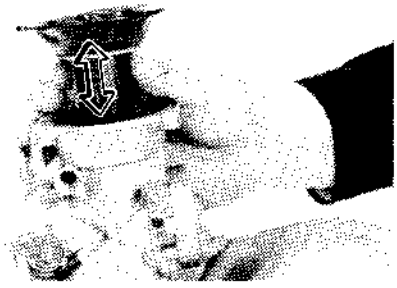
   Tears → Replace.



5. Inspect:
   - Needle jet ①
   - Main jet ②
   - Holder ③
   - Pilot jet ④
   - Pilot adjust screw ⑤
   - Pilot air jet ⑥

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





6. Check:
   - Free movement

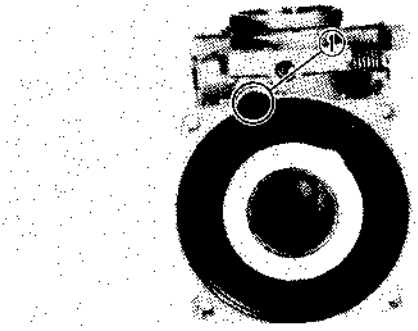
   Insert the throttle valve into the carburetor body, and check for free movement.
   Stick → Replace.

ASSEMBLY

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

⚠ CAUTION:

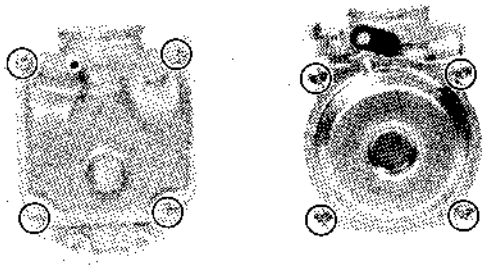
• Before reassembling, wash all parts in clean gasoline.
• Always use a new gasket.



1. Install:
   • Piton valve assembly

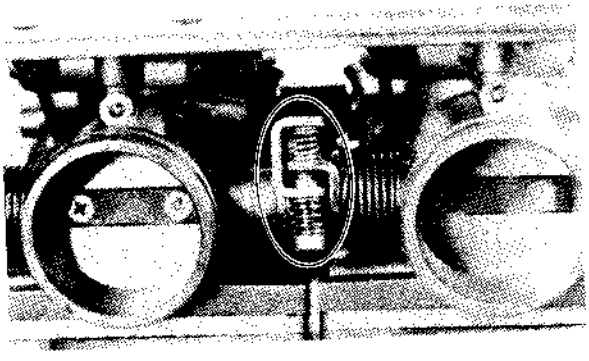
NOTE:

Note position of tab ① on diaphragm. This tab must be placed in the cavity of the carburetor body during reassembly.



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

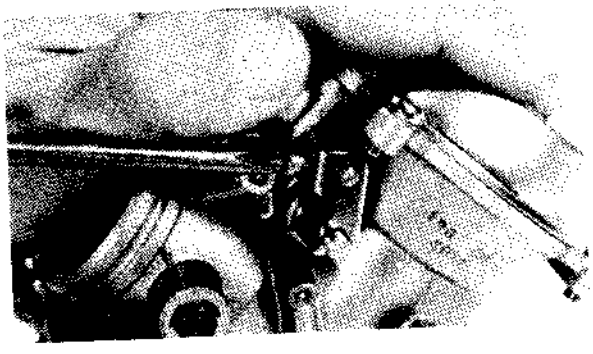
Screw (Float Chamber Cover): 2 Nm (0.2 m•kg, 1.4 ft•lb)
Screw (Vacuum Chamber Cover): 3 Nm (0.3 m•kg, 2.2 ft•lb)



3. Connect:
   • Throttle shaft

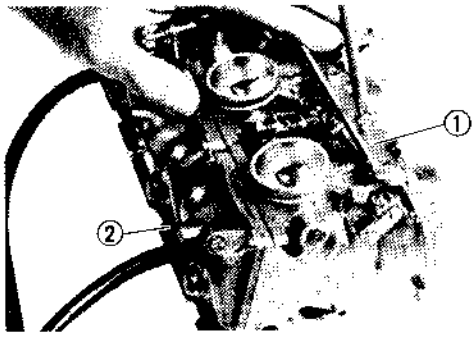
⚠ CAUTION:

Throttle valves must be fully closed.



4. Install:
   • Starter lever shaft

Screw (Starter Lever Shaft): 3 Nm (0.3 m•kg, 2.2 ft•lb)
Apply LOCTITE®.

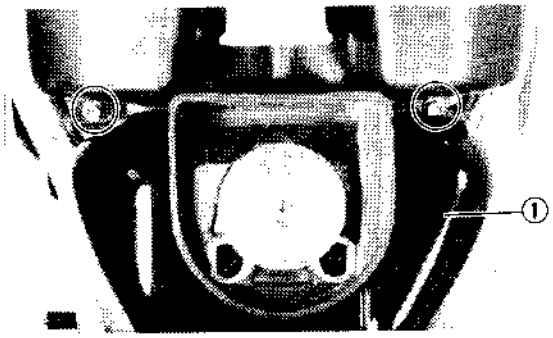


5. Installer:
   - Upper bracket ①
   - Lower bracket ②

Screw (Upper Bracket):
3 Nm (0.3 m·kg, 2.2 ft·lb)
Screw (Lower Bracket):
5 Nm (0.5 m·kg, 3.6 ft·lb)

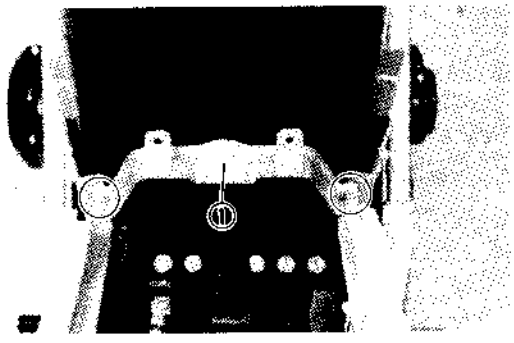
INSTALLATION

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



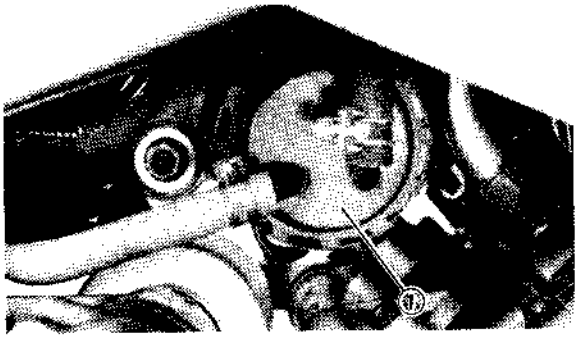
1. Install:
   - Fuel tank ①

Bolts (Fuel Tank):
14 Nm (1.4 m·kg, 10.2 ft·lb)



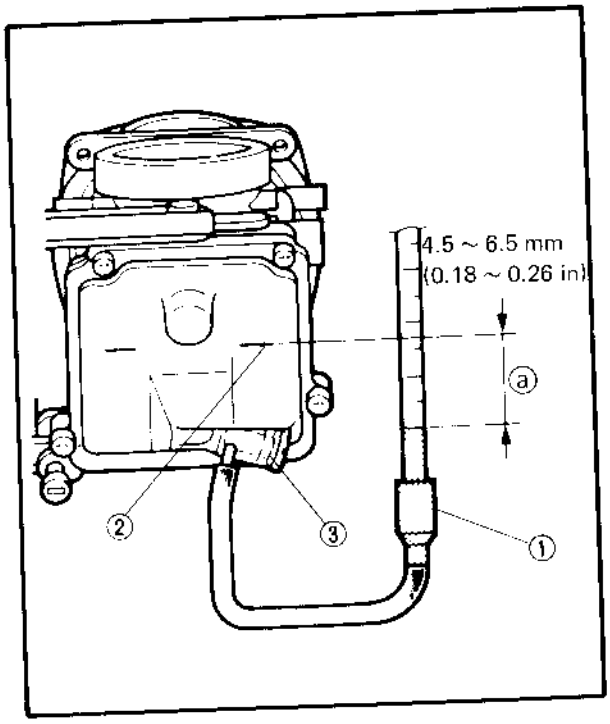
2. Install:
   - Fuel tank bracket ①

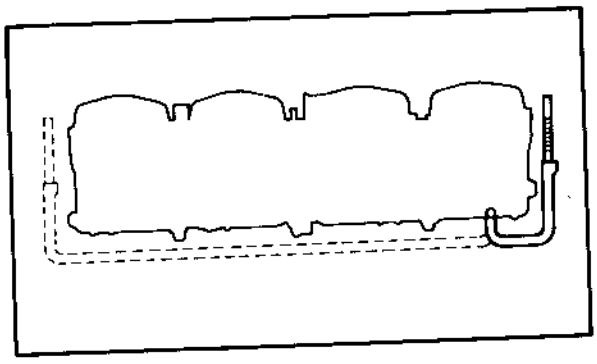
Bolts (Fuel Tank Bracket):
10 Nm (1.0 m·kg, 7.2 ft·lb)



3. Install:
   - Fuel pump ①

Bolt (Fuel Pump):
8 Nm (0.8 m·kg, 5.6 ft·lb)





ADJUSTMENT

NOTE:

Before adjusting the fuel level, the float heigl should be adjusted.

⚠ CAUTION:

The pilot screw settings are adjusted f maximum performance at the factory. A attempt to change these settings w decrease engine performance.

Fuel Level Adjustment

1. Measure:
   - Fuel level ⓐ

   Out of specification → Adjust it by the follo ing adjustment steps.

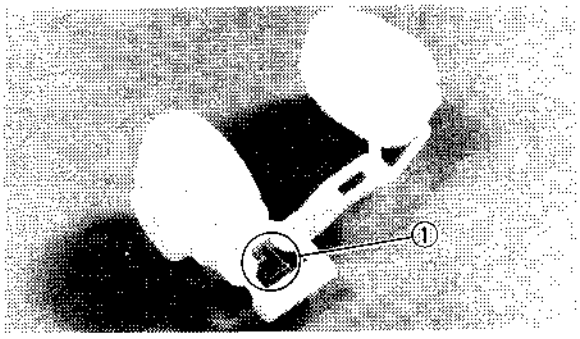
Fuel Level ⓐ :
4.5 ~ 6.5 mm (0.18 ~ 0.26 in)
Below the float chamber line.

Fuel level measurement steps:

- Place the motorcycle on the level place.
- Connect the Fuel Level Gauge (YM-013 to the carburetor ①.
- Place the Gauge vertically next to the fl chamber line ②.
- Loosen the drain screw ③.
- Warm up the engine, then shut it off aft few minutes.
- Measure the fuel level. It should be wit the specified range.

NOTE:

Fuel level readings of both side of carbur line should be equal.



2. Adjust:
   • Fuel level

Fuel level adjustment steps:
- Remove the carburetor assembly. Refer to "REMOVAL" section.
- Remove the float, valve seat and the needle valve.
- Inspect the valve seat and the needle valve. If either is worn, replace as a set.
- If both are fine, adjust the float height by bending the float tang ①.
- Recheck the fuel level.

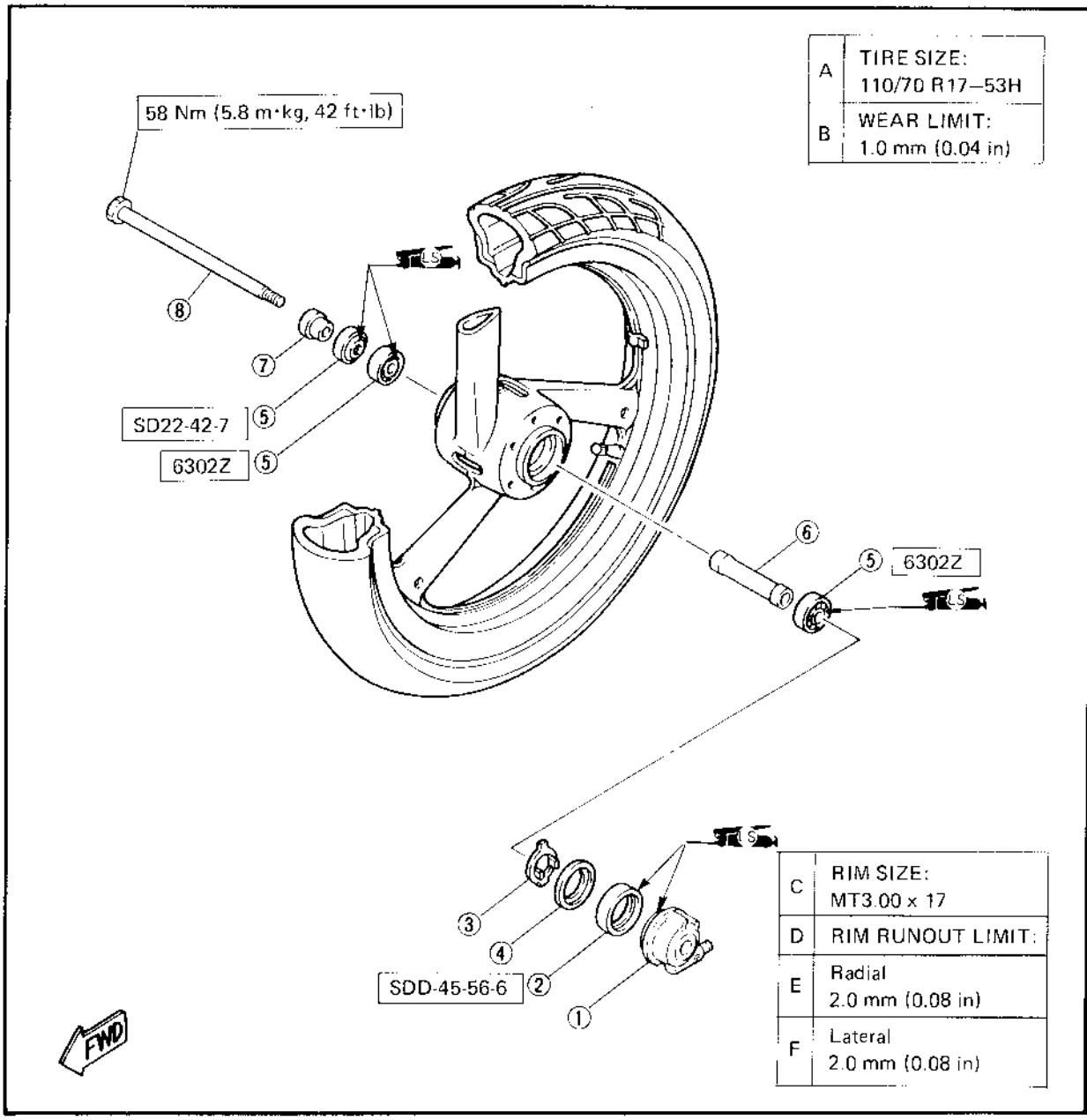
CHASSIS

FRONT WHEEL

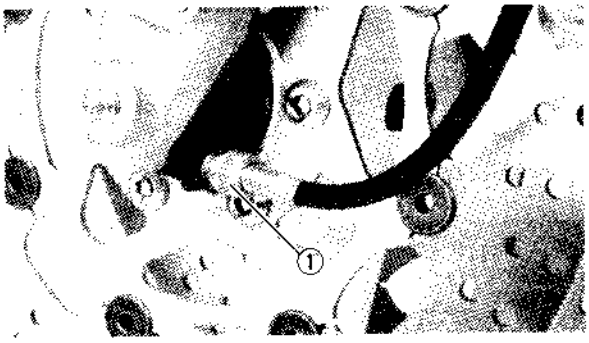
① Gear unit assembly
② Oil seal
③ Meter clutch
④ Clutch retainer
⑤ Bearing
⑥ Spacer
⑦ Collar
⑧ Wheel axle

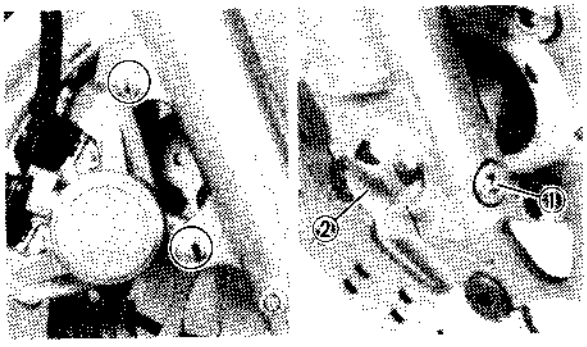
TIRE AIR PRESSURE (COLD):		
Cold tire pressure	Front	Rear
Up to 90 kg (198 lb) load*	200 kPa (2.0 kg/cm², 28 psi)	230 kPa (2.3 kg/cm², 32 psi)
90 kg (198 lb) ~ Maximum load*	200 kPa (2.0 kg/cm², 28 psi)	250 kPa (2.5 kg/cm², 36 psi)
High speed riding	200 kPa (2.0 kg/cm², 28 psi)	250 kPa (2.5 kg/cm², 36 psi)

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

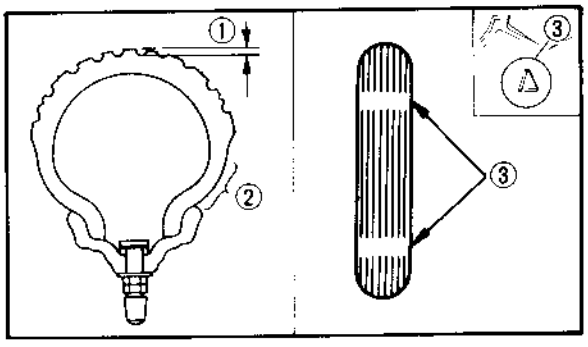


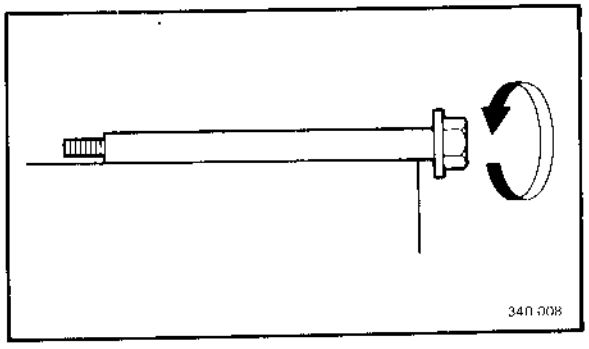
A	TIRE SIZE: 110/70 R17—53H
B	WEAR LIMIT: 1.0 mm (0.04 in)
C	RIM SIZE: MT3.00 x 17
D	RIM RUNOUT LIMIT:
E	Radial 2.0 mm (0.08 in)
F	Lateral 2.0 mm (0.08 in)











REMOVAL

1. Place the motorcycle on a level place.

⚠ WARNING:

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

2. Remove:
   - Speedometer cable ①
3. Remove:
   - Brake calipers (Right/Left)
4. Loosen:
   - Pinch bolt (Front axle) ①
   - Axle (Front) ②
5. Elevate the front wheel by placing a suitable stand under the engine.
6. Remove:
   - Axle ①
   - Wheel (Front)
   - Speedometer gear unit

NOTE:

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

INSPECTION

1. Inspect:
   - Tire

   Tire tread shows crosswise lines (minimum tread depth)/Cracks → Repalce.

Minimum Tire Tread Depth:
1.0 mm (0.04 in)

① Tread depth ② Side wall ③ Wear indicator

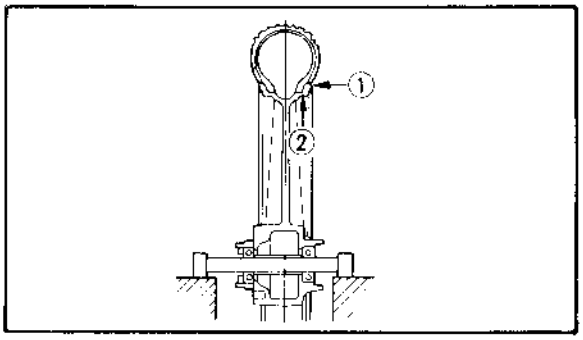
2. Inspect:
   - Front axle

   Bends → Replace.

   Roll the axle on a flat surface.

⚠ WARNING:

Do not attempt to straighten a dent axle.



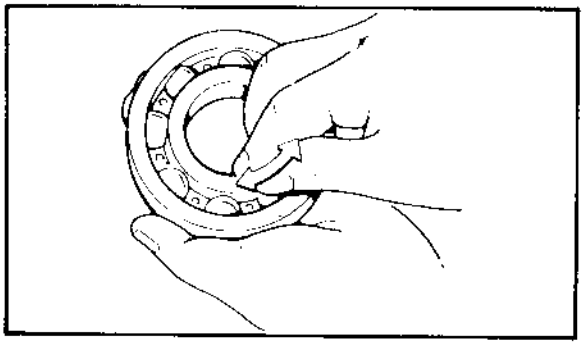
3. Inspect:
   - Wheel
     Cracks/Bends/Warpage → Replace.
4. Measure:
   - Wheel runout
     Over specified limit → Repalce.

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

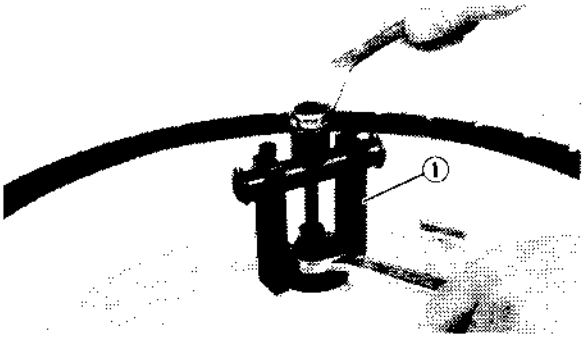
⚠ WARNING:

- **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.**

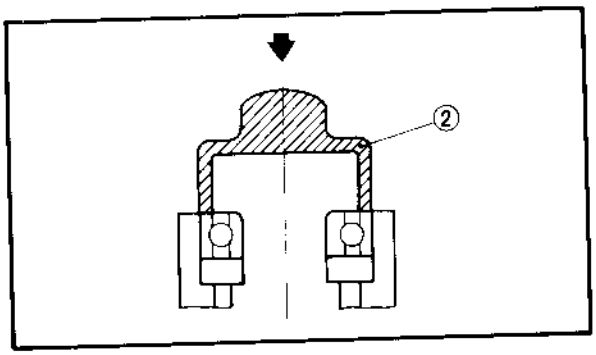
Valve-stem Locknut:
1.5 Nm (0.15 m · kg, 1.1 ft · lb)



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

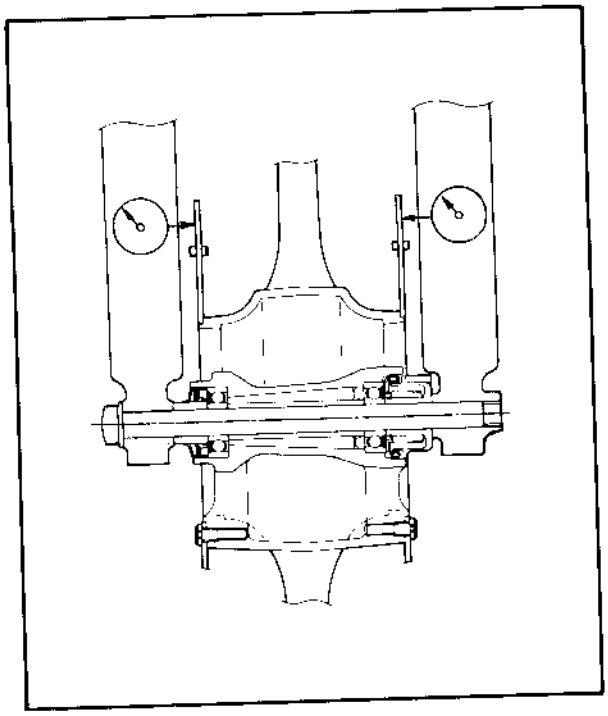


Wheel bearing replacement steps:
- Clean the outside of the wheel hub.
- Remove the bearing using a general bearing puller ① .
- Install the new bearing by reversing the previous steps.



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

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



6. Inspect:
   - Brake disc
     Wear/Over specified limit → Replace.

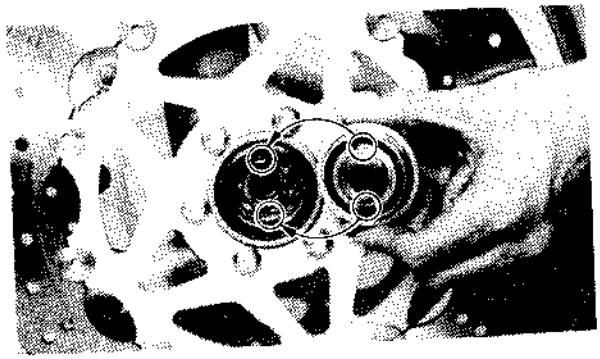
Maximum Deflection:
(Front and Rear):
0.5 mm (0.02 in)
Minimum Disc Thickness
Front:
3.5 mm (0.14 in)

INSTALLATION

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

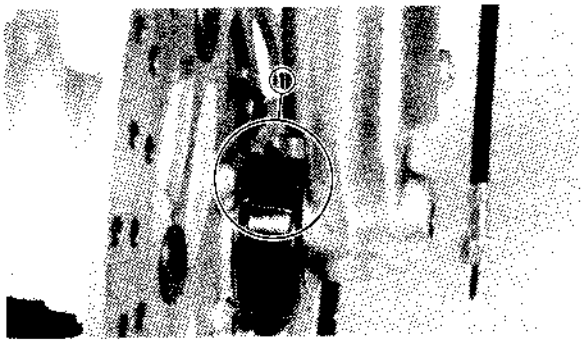
1. Lublicate:
   - Bearings
   - Oil seals

Lithium – Soap Base Grease



2. Install:
   - Speedometer gear unit

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

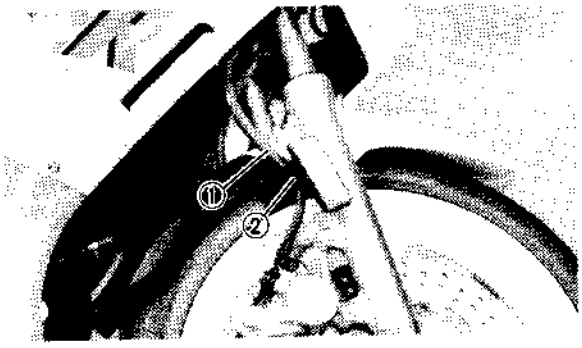


3. Install:
   • Front wheel

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

4. Tighten:
   • Front axle
   • Pinch bolt (Front axle)
   • Brake calipers (Right/Left)
   • Speedometer cable

Front Axle:
58 Nm (5.8 m·kg, 42 ft·lb)
Pinch Bolt (Front Axle):
20 Nm (2.0 m·kg, 14 ft·lb)
Bolts (Brake Caliper):
35 Nm (3.5 m·kg, 25 ft·lb)



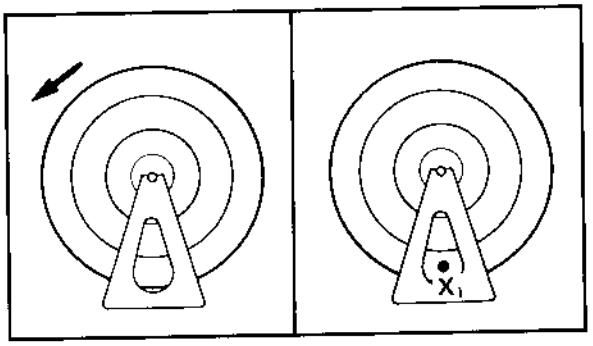
WARNING:
Make sure that the brake hoses are routed properly.

① Brake hose
② Brake hose holder

STATIC WHEEL BALANCE ADJUSTMENT

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

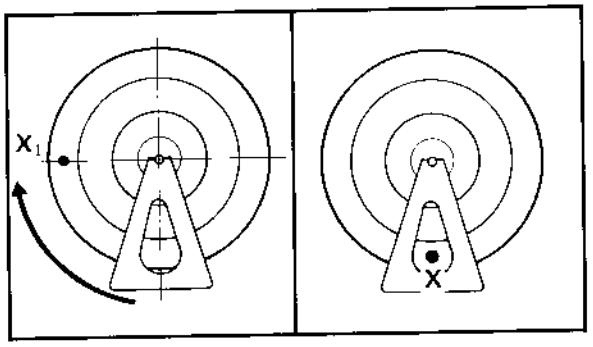
1. Remove:
   • Balancing weight

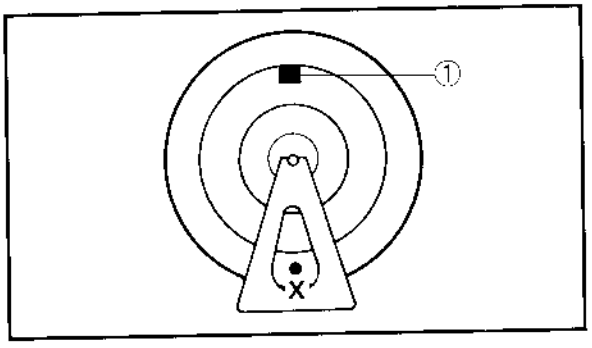


2. Set the wheel on a suitable stand.

3. Find:
   • Heavy spot

Procedure:
a. Spin the wheel and wait for it to rest.
b. Put an "X_1" mark on the wheel bottom spot.
c. Turn the wheel so that the "X_1" mark is 90° up.
d. Let the wheel fall and wait for it to rest. Put an "X_2" mark on the wheel bottom spot.
e. Repeat the above b., c., and d. several times until these marks come to the same spot.
f. This spot is the heavy spot "X".



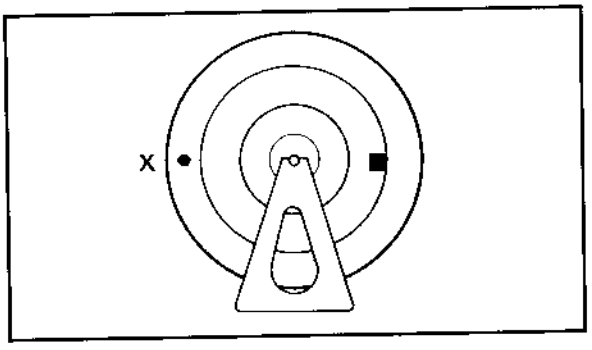


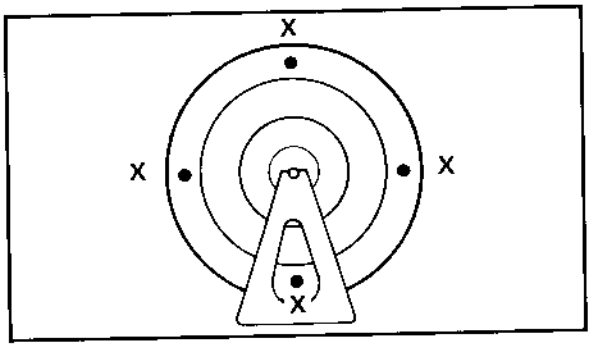
4. Adjust:
   • Wheel balance

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

NOTE:
Start with the smallest weight.

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



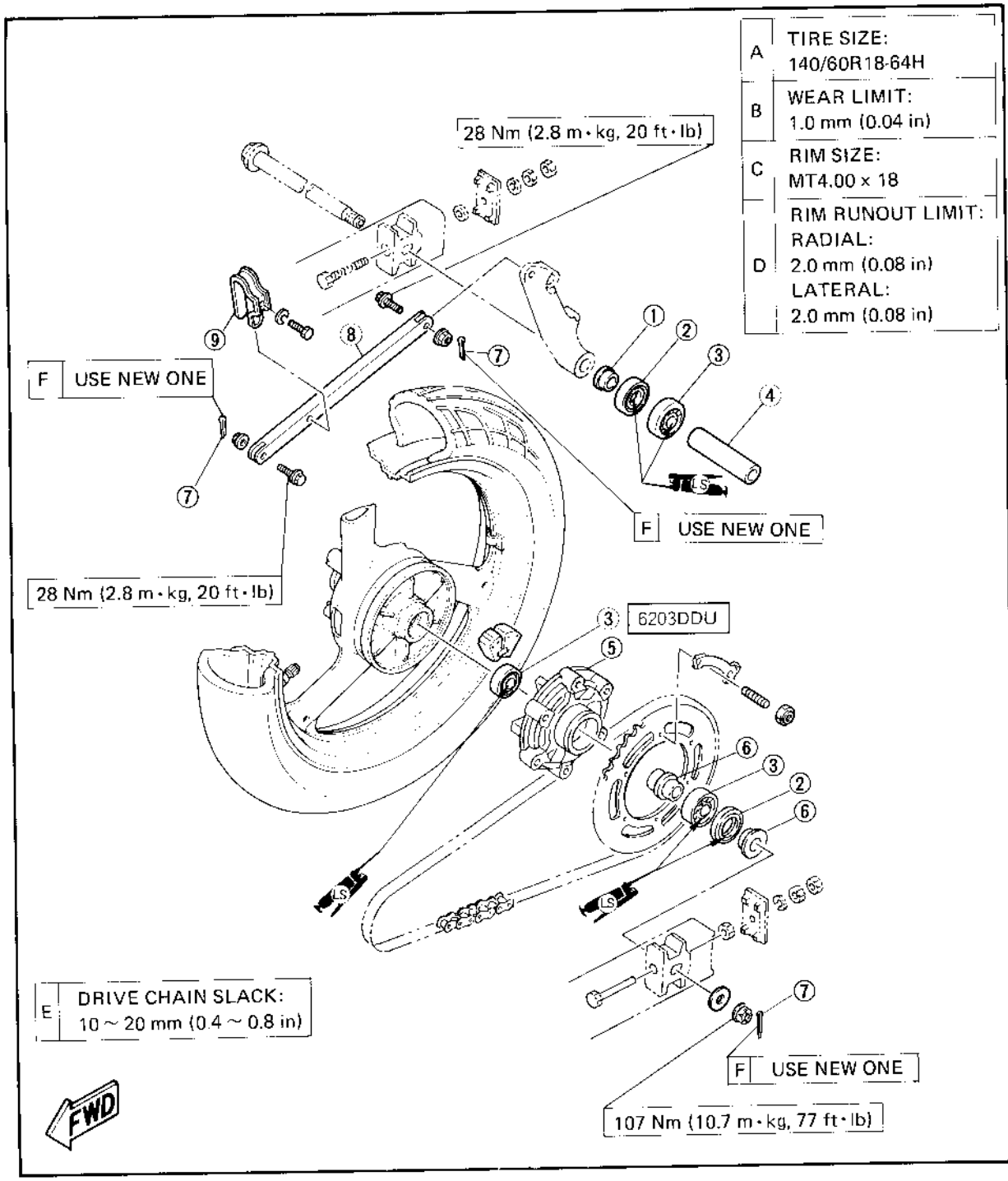


5. Check:
   • Wheel balance

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

REAR WHEEL

① Collar
② Oil seal
③ Bearing
④ Spacer
⑤ Clutch hub
⑥ Collar
⑦ Cotter pin
⑧ Tension bar
⑨ Brake hose holder



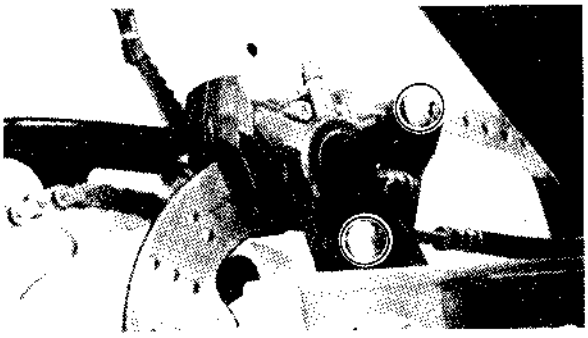
REMOVAL

1. Place the motorcycle on a level place.

WARNING:

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

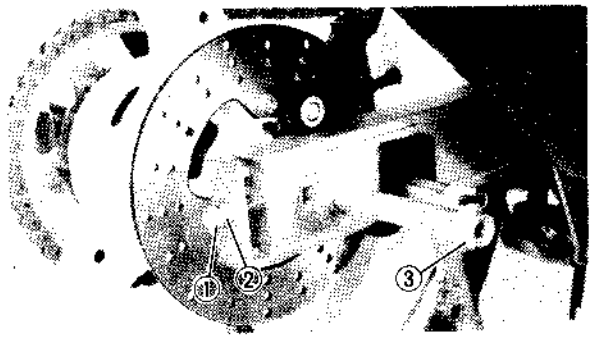
2. Elevate the rear wheel by placing a suitable stand under the swing arm.



3. Remove:
   - Brake caliper

NOTE:

Do not depress the brake pedal while the caliper is off the disc.



4. Loosen:
   - Lock nut ①
   - Adjuster ②
5. Remove:
   - Cotter pin
   - Axle nut
   - Axle ③
   - Rear wheel

INSPECTION

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

   Refer to the "FRONT WHEEL – INSPEC TION".
2. Measure:
   - Wheel runout

   Refer to the "FRONT WHEEL – INSPEC TION".

INSTALLATION

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

1. Lubricate:
   - Bearings
   - Oil seals
   - Spacer
   - Collar



Lithium – Soap Base Grease

2. Adjust:
   - Drive chain slack



Drive Chain Slack:
10 ~ 20 mm (0.4 ~ 0.8 in)

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

3. Tighten:
   - Nut (Rear axle)
   - Brake caliper



Nut (Rear Axle):
107 Nm (10.7 m·kg, 77 ft·lb)
Bolts (Brake Caliper):
35 Nm (3.5 m·kg, 25 ft·lb)

NOTE:
Do not loosen the axle nut after torque tightening.

STATIC WHEEL BALANCE ADJUSTMENT

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

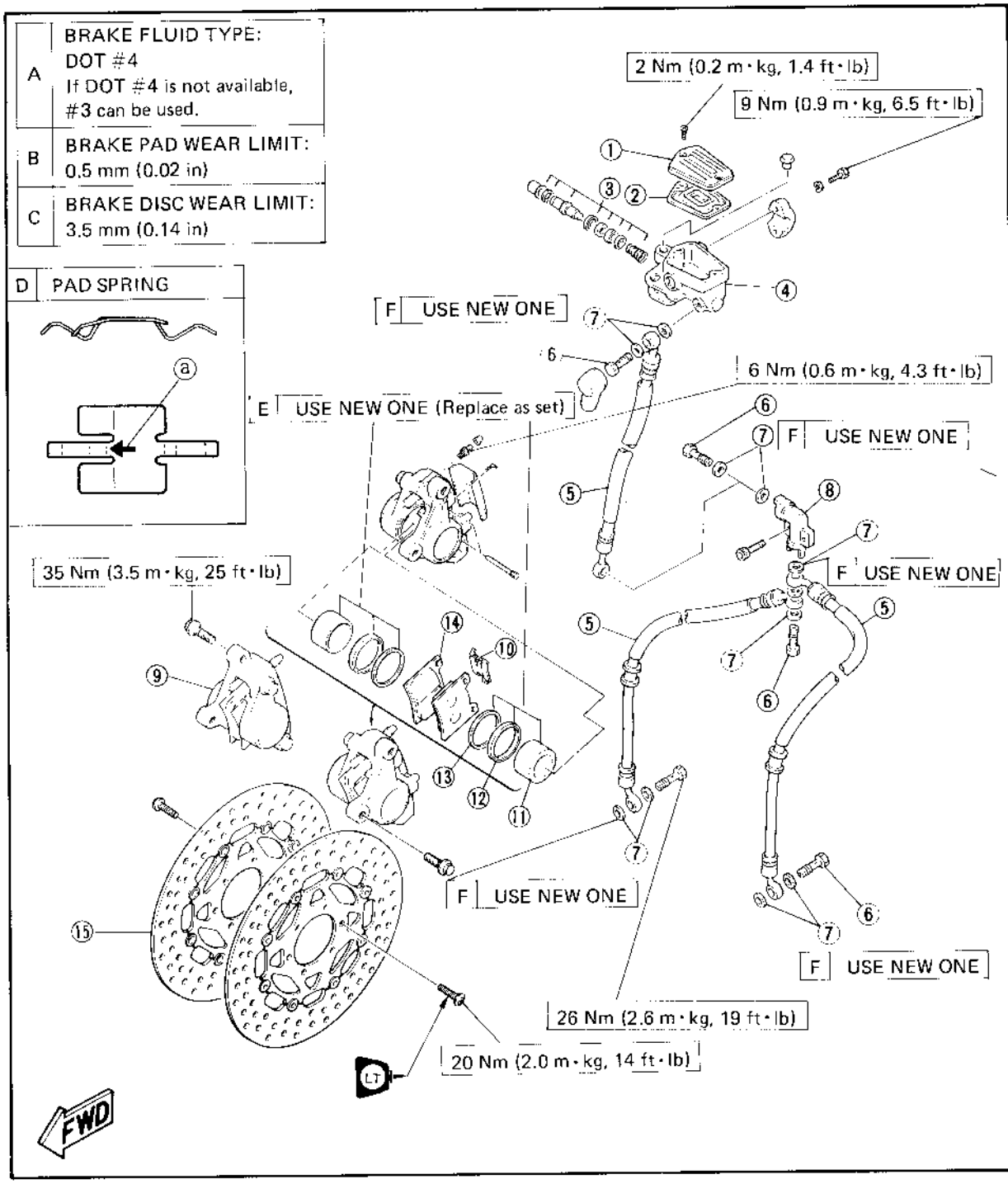
1. Adjust:
   - Wheel balance

   Refer to the "FRONT WHEEL – STATIC WHEEL BALANCE ADJUSTMENT" section in the CHAPTER 7.

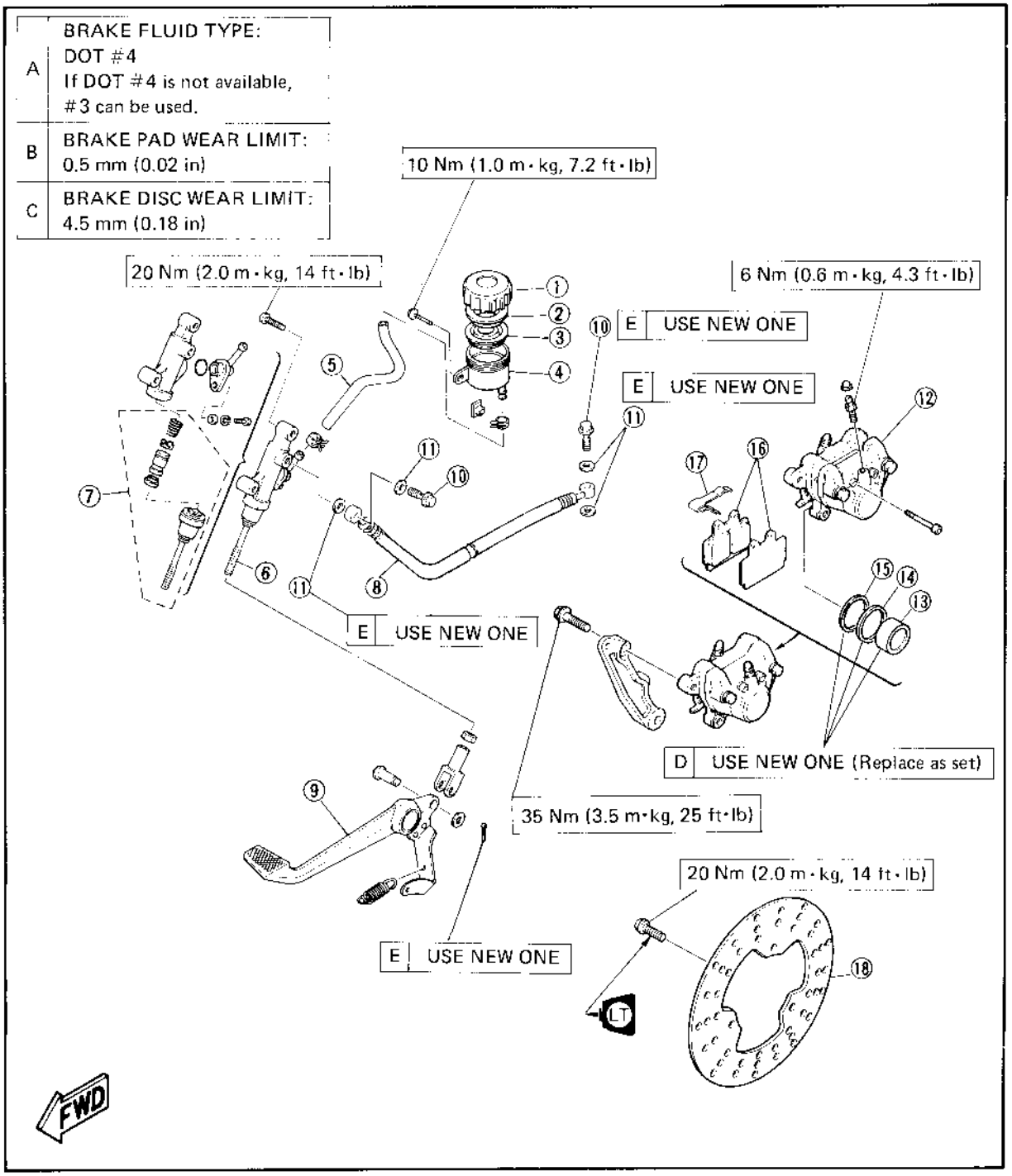
FRONT AND REAR BRAKE

① Master cylinder cap
② Rubber seal
③ Master cylinder kit
④ Master cylinder
⑤ Brake hose
⑥ Union bolt
⑦ Copper washer
⑧ Joint
⑨ Brake caliper
⑩ Pad spring
⑪ Piston
⑫ Piston seal
⑬ Dust seal
⑭ Brake pad
⑮ Brake disc

D The arrow mark ⓐ on the pad spring must pointing the disc rotating direction.



① Reservoir tank cap
② Bush
③ Diaphragm
④ Reservoir tank
⑤ Reservoir hose
⑥ Master cylinder
⑦ Master cylinder kit
⑧ Brake hose
⑨ Brake pedal
⑩ Union bolt
⑪ Copper washer
⑫ Brake caliper
⑬ Piston
⑭ Piston seal
⑮ Dust seal
⑯ Brake pad
⑰ Pad spring
⑱ Brake disc



⚠ 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:
   - Cover ①

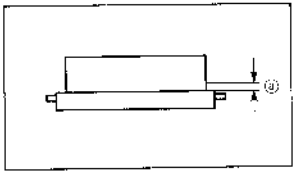


2. Remove:
   - Retaining clips ①
   - Retaining pins ②
   - Pad spring ③



3. Remove:
   - Brake pads ①

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



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

Wear Limit:
0.5 mm (0.02 in)



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 and push the piston into the caliper by your finger.
6. Tighten:
   - Caliper bleed screw

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



7. Install:
   - Brake pad (New) ①
   - Pad spring (New) ②
   - Retaining pins ③
   - Retaining clips

8. Inspect:
   • Brake fluid level
   Refer to the "BRAKE FLUID INSPECTION" section in the CHAPTER 3.

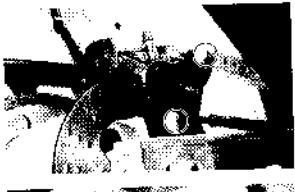


① "LOWER" level line

9. Check:
   • Brake lever operation
   A softy or spongy filling → Bleed brake system.
   Refer to the "AIR BLEEDING" section in the CHAPTER 3.

Rear Brake

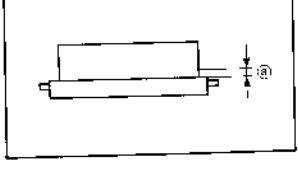
1. Remove.
   • Bolts (Brake caliper)



2. Remove:
   • Retaining bolts ①
   • Brake pads ②
   • Pad spring



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



Wear Limit:
0.5 mm (0.02 in)



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 and push the pistons into the caliper by your finger.
6. Tighten:
   - Caliper bleed screw

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



7. Install:
   - Brake pad (New) ①
   - Pad spring (New) ②
8. Install:
   - Retaining bolt ③

Retaining Bolts: 18 Nm (1.8 m · kg, 13 ft · lb)



9. Inspect:
   - Brake fluid level

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

① "LOWER" level line

10. Check:
    - Brake pedal operation

    A softy or spongy feeling → Bleed brake system.

    Refer to the "AIR BLEEDING" section in the CHAPTER 3.

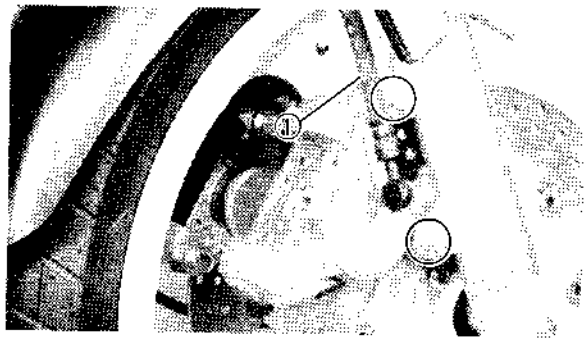
CALIPER DISASSEMBLY

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

Front Brake

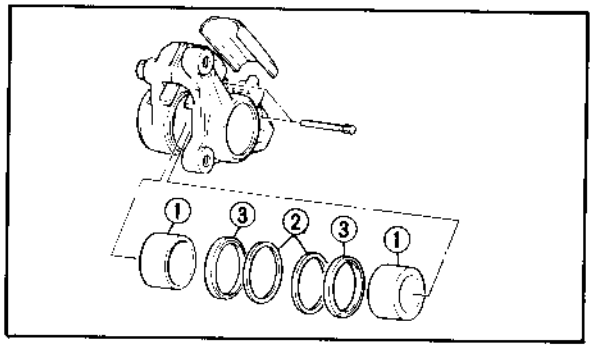
1. Remove:
   - Cover
   - Retaining clips
   - Retaining pins
   - Pad spring

   Refer to the "BRAKE PAD REPLACEMENT" section.

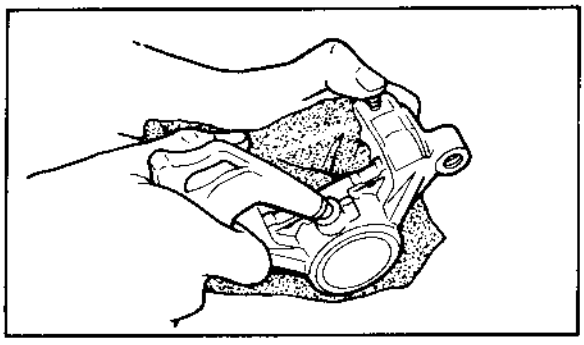


2. Remove:
   - Brake hose ①

   Place the open hose end into a container and pump the old fluid out carefully.
3. Remove:
   - Caliper body

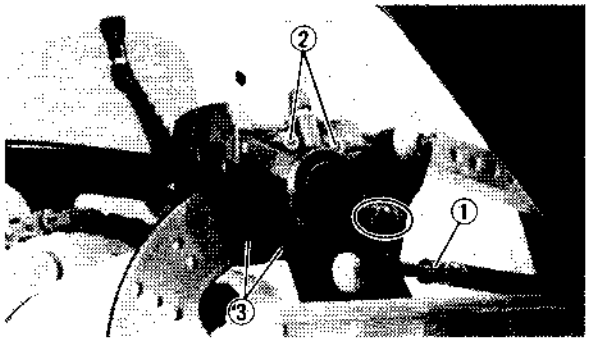


4. Remove:
   - Pistons ①
   - Dust seals ②
   - Piston seals ③



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

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

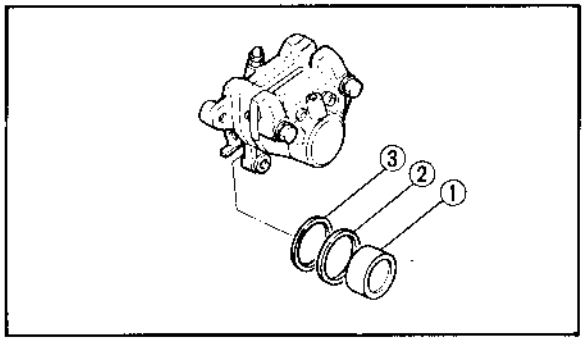


Rear Brake

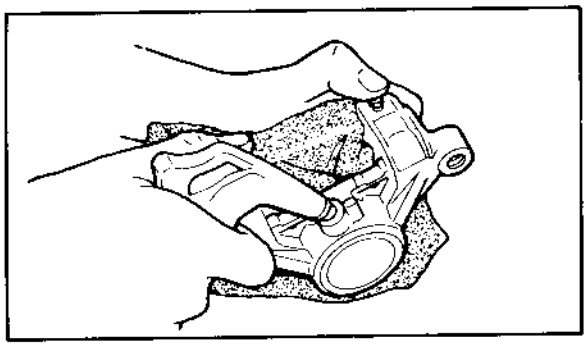
1. Remove:
   - Brake hose ①

     Place the open hose end into a container and pump the old fluid out carefully.
2. Remove:
   - Retaining bolts ②
   - Brake pads ③
   - Pad spring

     Refer to the "BRAKE PAD REPLACEMENT" section.



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

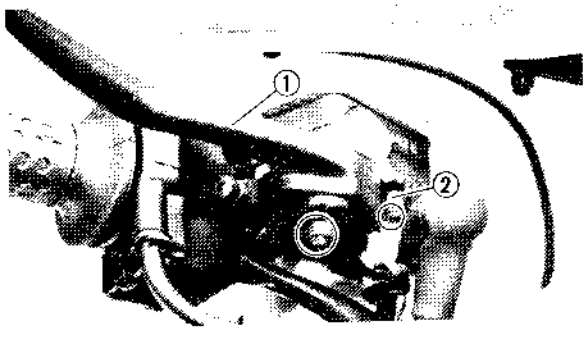


Removal steps:
- Blow compressed air into the tube joint opening to force out the piston from the caliper body.

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

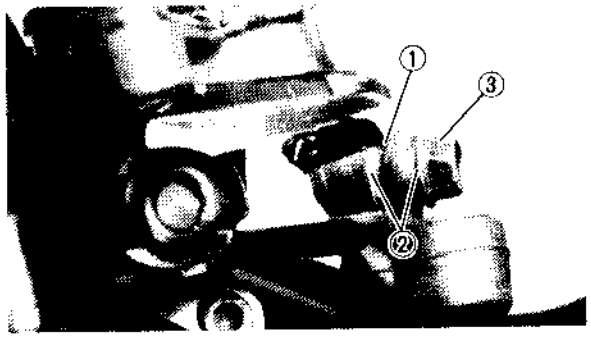
MASTER CYLINDER DISASSEMBLY

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

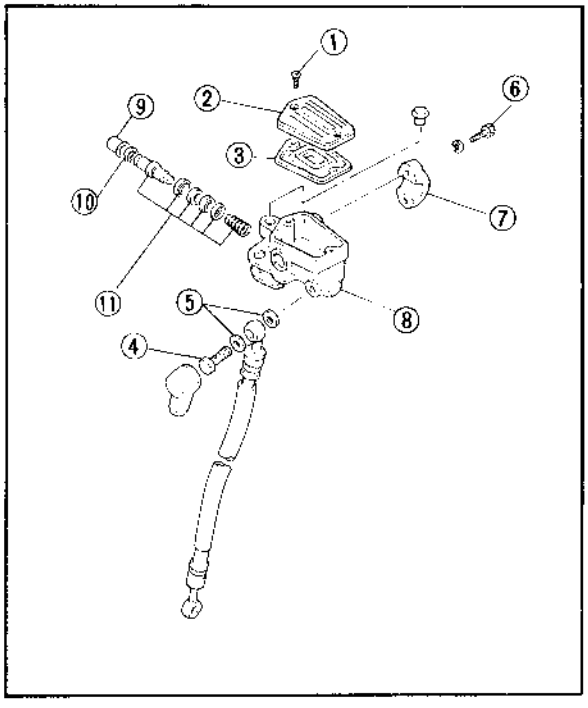


Front Brake

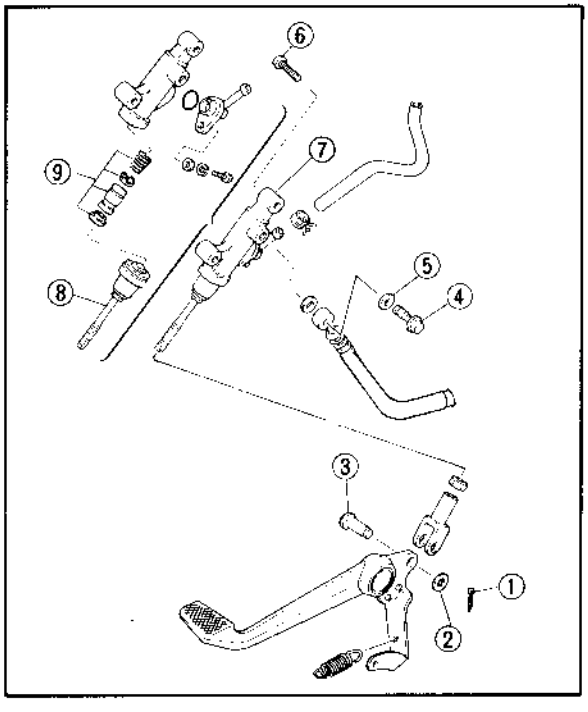
1. Remove:
   - Brake lever ①
   - Brake switch ②



2. Remove:
   - Union bolt ①
   - Copper washer ②
   - Brake hose ③

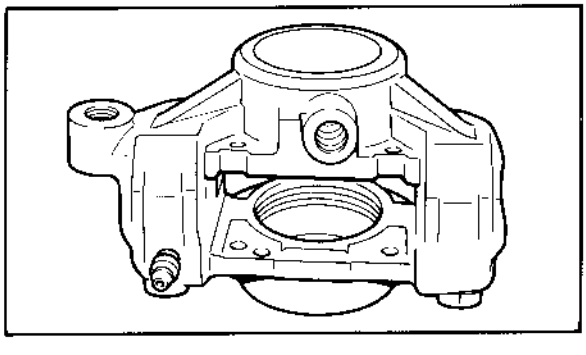


3. Remove:
- Screw (Master cylinder cap) ①
- Master cylinder cap ②
- Rubber seal ③
- Union bolt ④
- Copper washer ⑤
- Bolt (Master cylinder bracket) ⑥
- Master cylinder bracket ⑦
- Master cylinder ⑧
- Dust boot ⑨
- Circlip ⑩
- Master cylinder kit ⑪



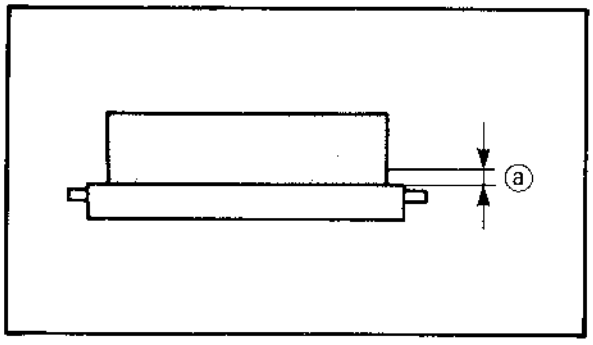
Rear Brake

1. Remove:
- Cotter pin ①
- Plain washer ②
- Shaft ③
- Union bolt ④
- Copper washer ⑤
- Bolt (Master cylinder) ⑥
- Master cylinder ⑦
- Adjusting rod ⑧
- Master cylinder kit ⑨



INSPECTION AND REPAIR

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



2. Measure:
   • Brake pad thickness ⓐ
   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.

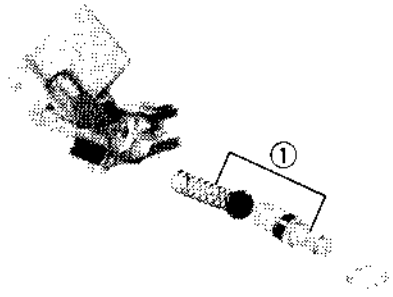
3. Inspect:
   • Brake hose
   Cracks/Damage → Replace.



4. Inspect:
   • Master cylinder body
   Scratches/Wear → Replace.

NOTE:
Clean all passages with new brake fluid.

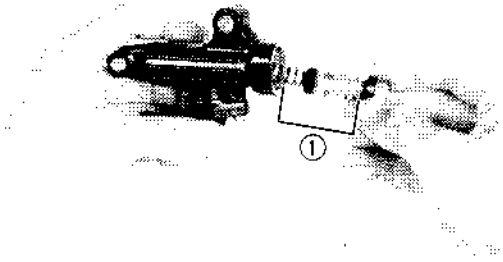
A



5. Inspect:
   • Master cylinder kit ①
   Scratches/Wear → Replace.

A Front brake
B Rear brake

B



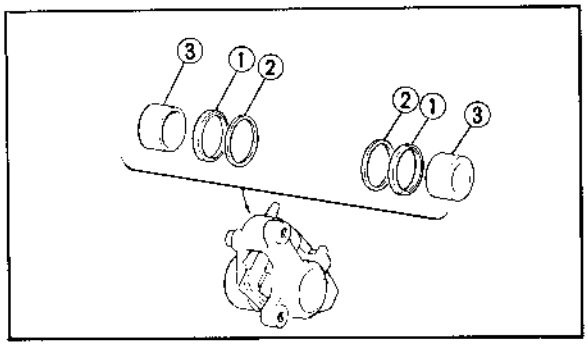
ASSEMBLY

⚠ 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 #4
If DOT #4 is not available, #3 can be used.

- Replace the piston seals whenever a caliper is disassembled.

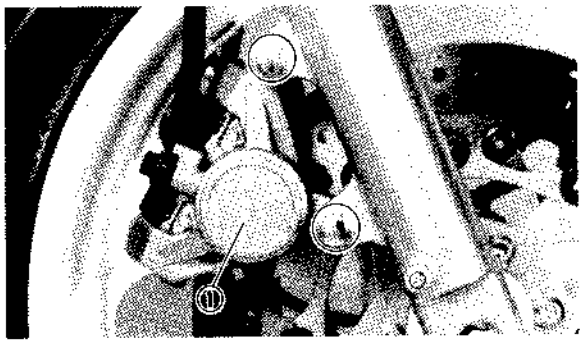


Front Brake

1. Install:
   - Piston seals ①
   - Dust seals ②
   - Pistons ③

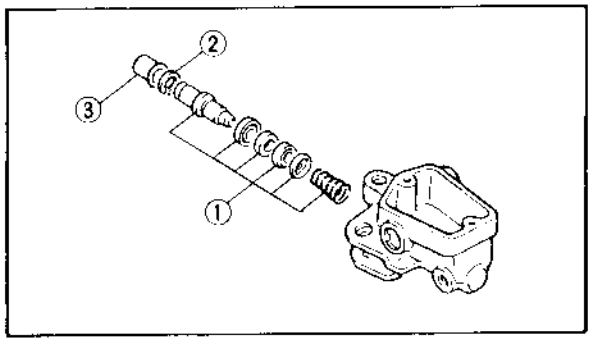
2. Install:
   - Brake pad
   - Pad spring
   - Retaining bolt
   - Retaining crip

   Refer to the "BRAKE PAD REPLACEMENT" section.

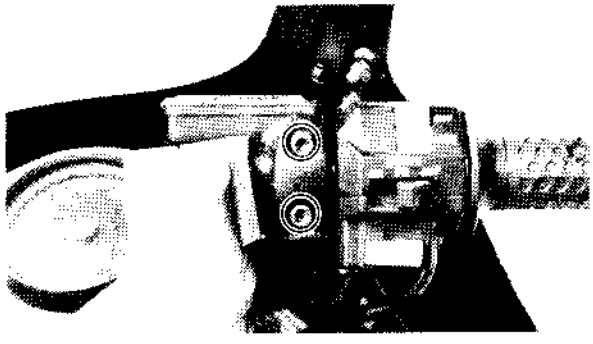


3. Install:
   - Brake caliper ①

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



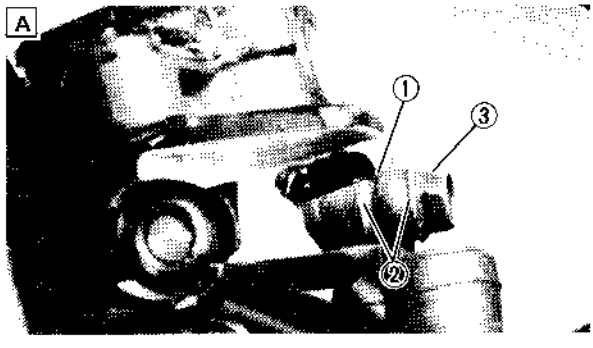
4. Install:
   - Master cylinder kit ①
   - Circlip ②
   - Dust boot ③



5. Install:
   - Master cylinder

NOTE:
Tighten first the upper bolt, then the lower bolt.

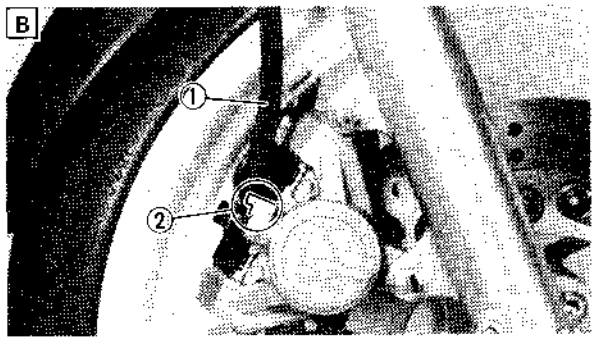
Bolts (Master Cylinder Bracket):
9 Nm (0.9 m · kg, 6.5 ft · lb)



6. Install:
   - Brake hose ①
   - Copper washers ②
   - Union bolts ③

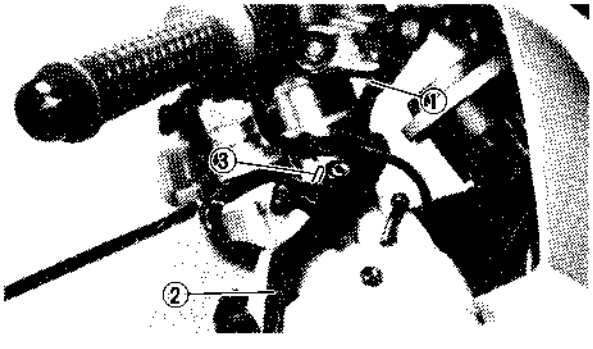
Union Bolts:
26 Nm (2.6 m · kg, 19 ft · lb)

[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
   - Spring ③

NOTE:
Apply lithium soap base grease to pivot shaft of brake lever.

8. Fill:
   • Brake fluid

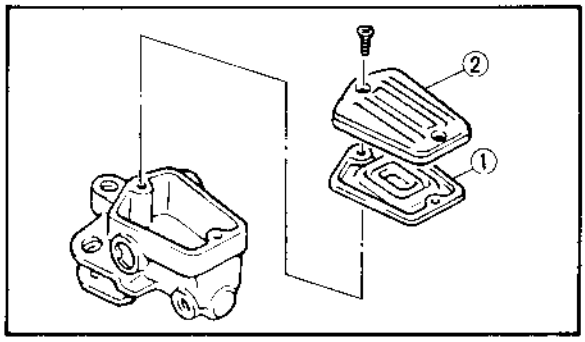
	Recommended Brake Fluid: DOT # 4 If DOT # 4 is not available, # 3 can be used.

⚠ CAUTION:

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

⚠ WARNING:

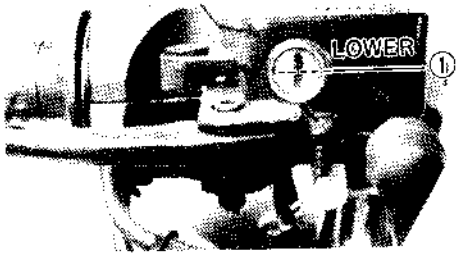
- **Use only the designated quality brake fluid. otherwise, the rubber seals may deteriorate, causing leakage and poor brake performance.**
- **Refill with the same type of brake fluid; mixing fluids may result in a harmful chemical reaction and lead to poor performance.**
- **Be careful that water does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



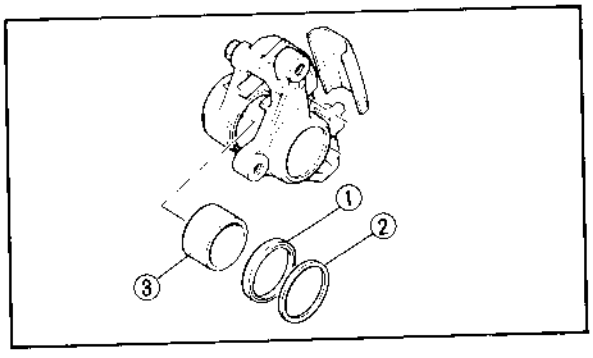
9. Install:
   • Rubber seal ①
   • Master cylinder cap ②

	Screws (Master Cylinder Cap): 2 Nm (0.2 m · kg, 1.4 ft · lb)

10. Air bleed:
   • Brake system
   Refer to the "AIR BLEEDING" section in the CHAPTER 3.

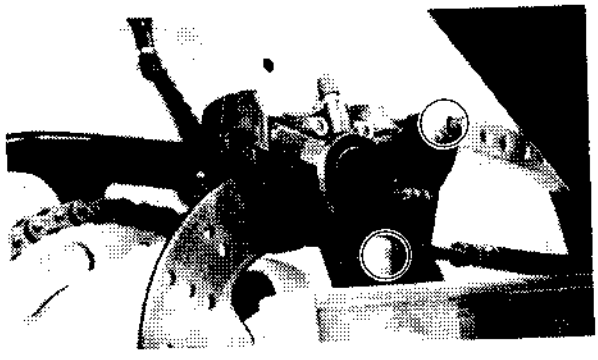


11. Inspect:
- Brake fluid level
  Fluid level is under "LOWER" level line ① → Replenish.
  Refer to the "BRAKE FLUID INSPECTION" section in the CHAPTER 3.



Rear Brake

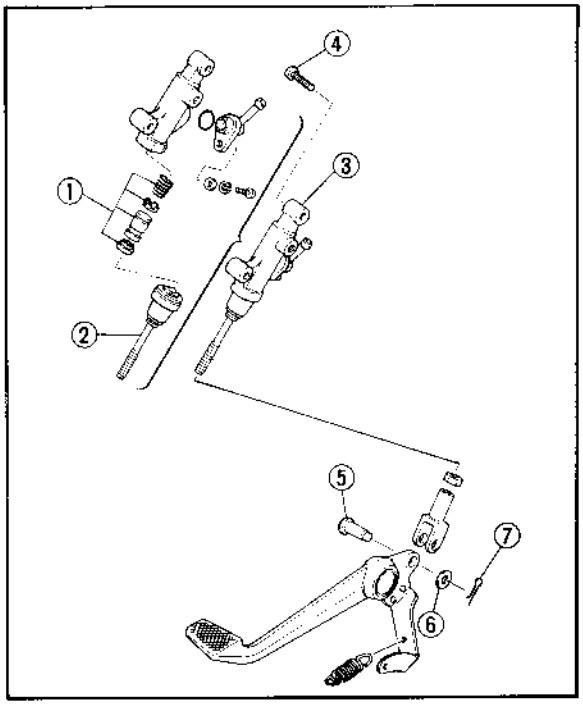
1. Install:
- Piston seal ①
- Dust seal ②
- Piston ③



2. Install:
- Brake caliper

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

3. Install:
- Brake pad
- Pad spring
- Retaining bolt
  Refer to the "BRAKE PAD REPLACEMENT" section.

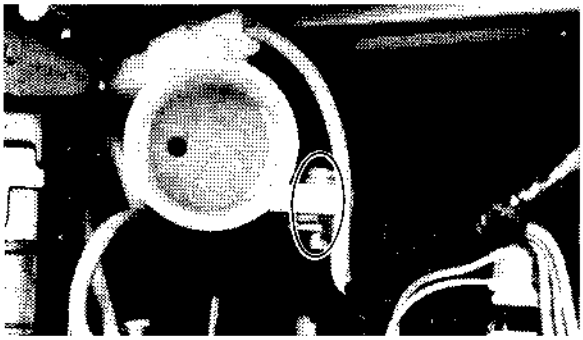


4. Install:
   - Master cylinder kit ①
   - Adjusting rod ②
   - Master cylinder ③
   - Bolt (Master Cylinder) ④
   - Shaft ⑤
   - Plain washer ⑥
   - Cotter pin ⑦

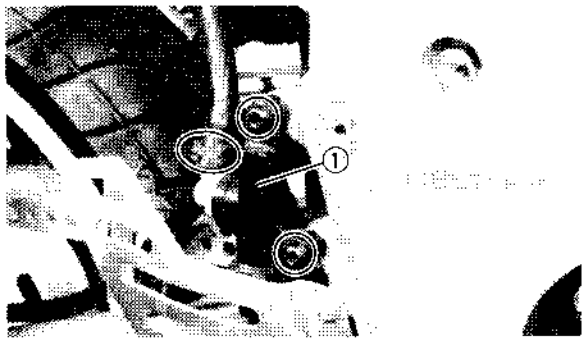
	Bolt (Master Cylinder): 20 Nm (2.0 m · kg, 14 ft · lb)

⚠ WARNING:

Always use new cotter pin.

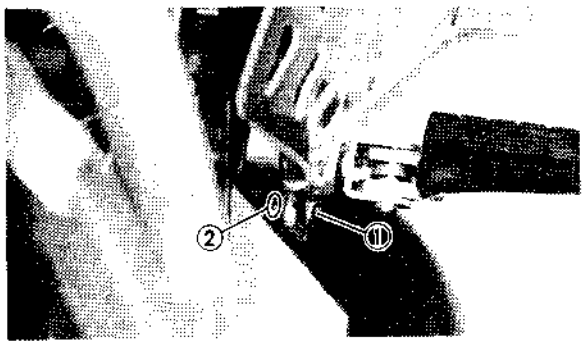


5. Install:
   - Reservoir tank



6. Install:
   - Master cylinder assembly ①

	Bolts (Master Cylinder Assembly): 35 Nm (3.5 m · kg, 25 ft · lb)



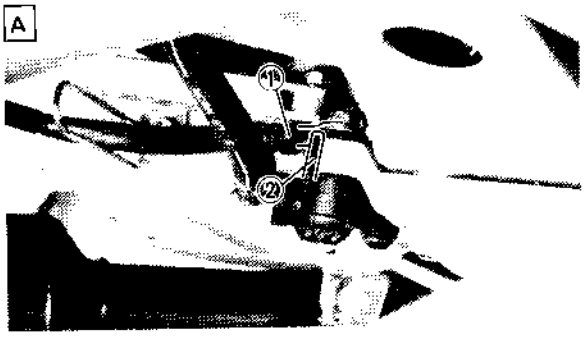
7. Install:
   - Pin ①
   - Plain washer
   - Cotter pin ②

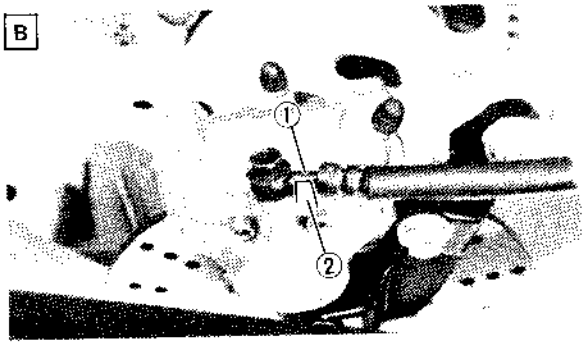
⚠ WARNING:

Always use new cotter pin.

8. Install:
   - Brake hose
   - Copper washers
   - Union bolts

	Union Bolts: 26 Nm (2.6 m·kg, 19 ft·lb)

A


B


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.

9. Fill:
   - Brake fluid

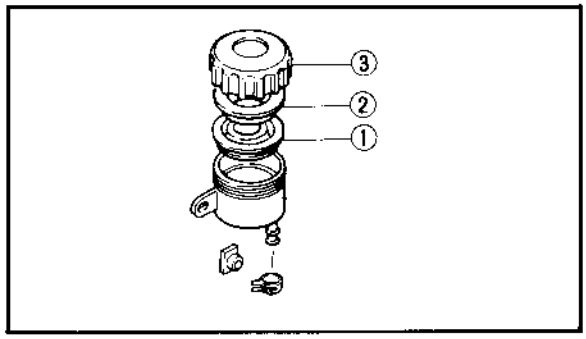
	Recommended Brake Fluid: DOT #4 If DOT #4 is not available, DOT #3 can be used.

⚠ CAUTION:

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

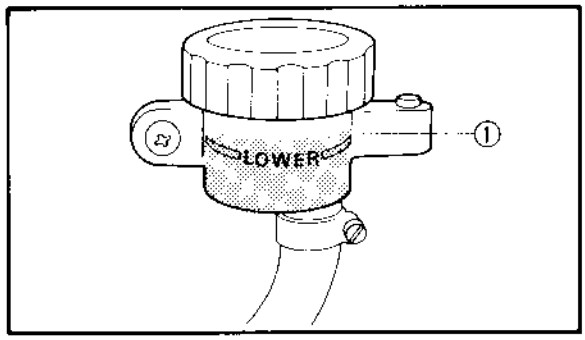
⚠ WARNING:

- **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.**



10. Install:
    - Diaphragm ①
    - Bush ②
    - Reservoir tank cap ③
11. Air bleed:
    - Brake system

    Refer to the "AIR BLEEDING" section in the CHAPTER 3.



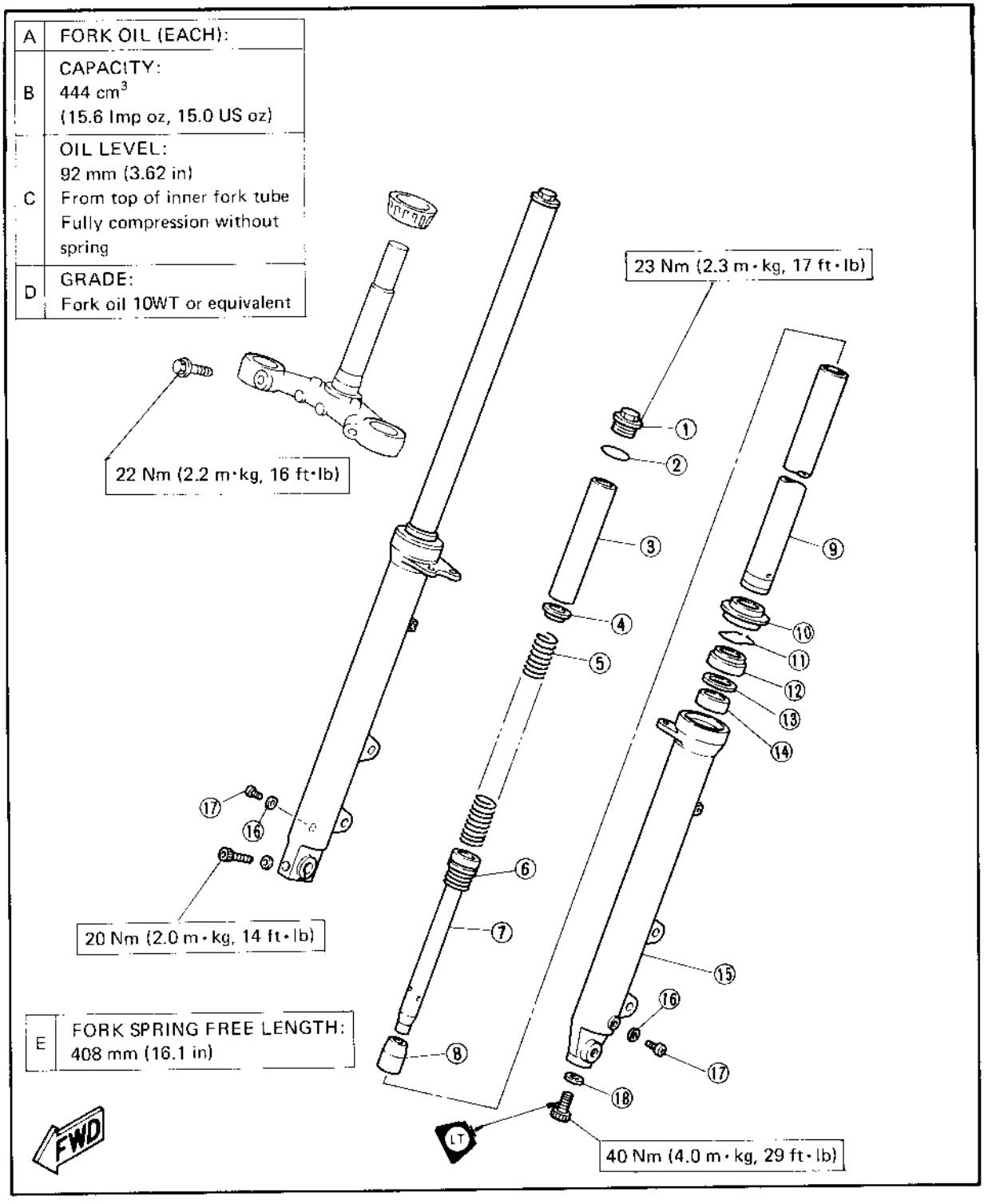
12. Inspect:
    - Brake fluid level

    Fluid level is under "LOWER" level line ① → Replenish.

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

FRONT FORK

① Cap bolt
② O-ring
③ Collar
④ Spring seat
⑤ Fork spring
⑥ Rebound spring
⑦ Damper rod
⑧ Oil lock piece
⑨ Inner tube
⑩ Dust seal
⑪ Retaining clip
⑫ Oil seal
⑬ Seal spacer
⑭ Guide bushing
⑮ Outer tube
⑯ Gasket
⑰ Drain screw
⑱ Gasket



REMOVAL

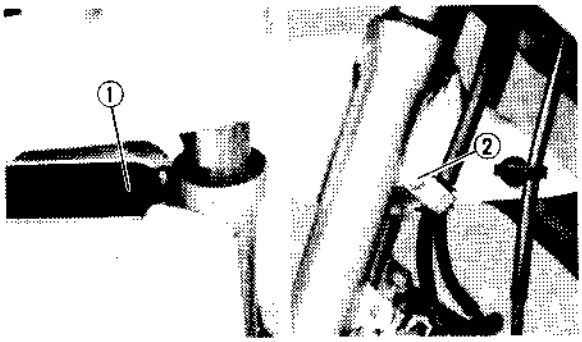
⚠ WARNING:

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

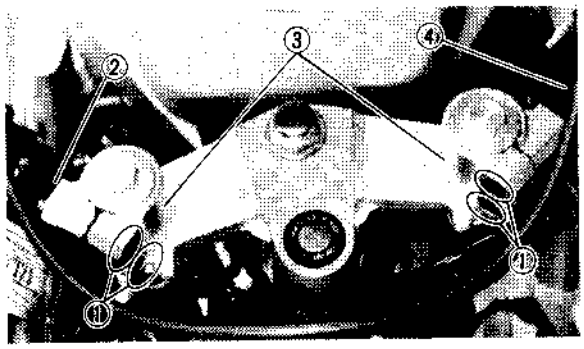
1. Elevate the front wheel by placing a suitable stand under the engine.

2. Remove:
   - Front wheel

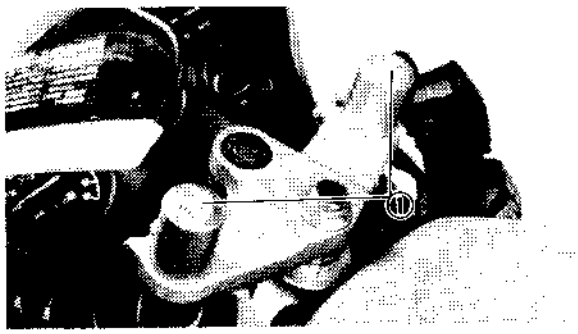
   Refer to the "FRONT WHEEL – REMOVAL" section.



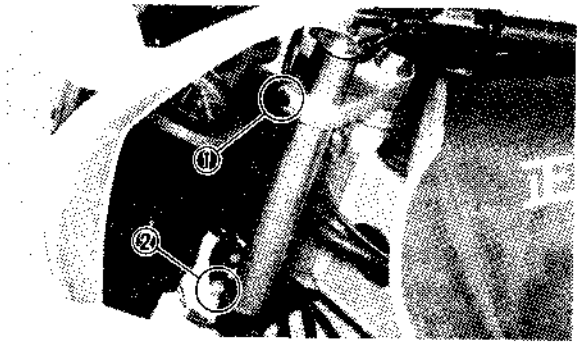
3. Remove:
   - Front brake caliper
   - Front fender ①
   - Bolts (Brake hose clamp) ②



4. Loosen:
   - Bolts (Handlebar bosses) ①
5. Remove:
   - Handlebar (Right) ②
   - Handlebar bosses (Left and right) ③ with handlebar (Left) ④



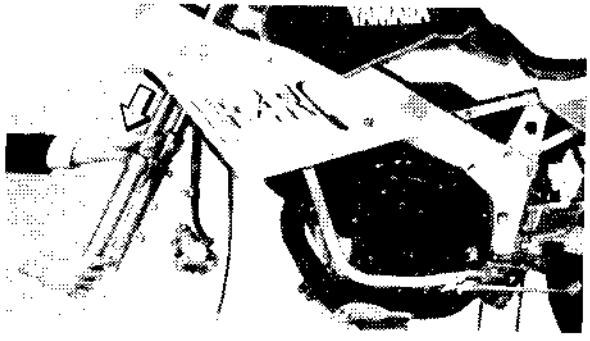
6. Loosen:
   - Cap bolts ①



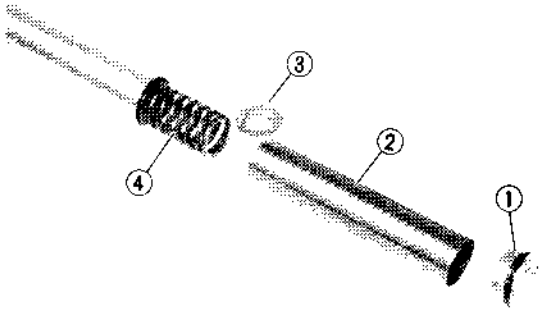
7. Loosen:
   - Pinch bolt (Handlebar crown) ①
   - Pinch bolt (Steering stem) ②

⚠ WARNING:

Support the fork before loosening the pinch bolts.



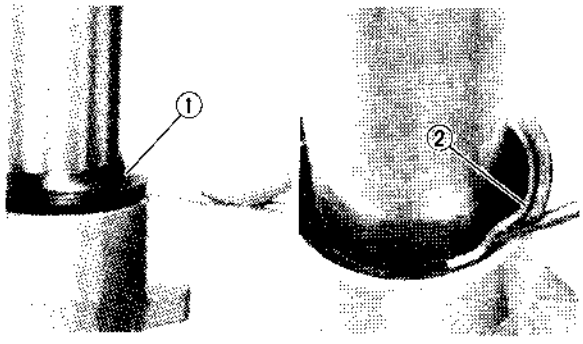
8. Remove:
   - Front fork



DISASSEMBLY

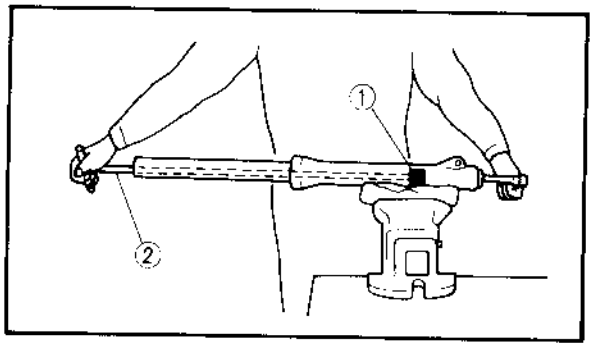
1. Remove:
   - Cap bolt ①
   - Collar ②
   - Spring seat ③
   - Fork spring ④

   Drain the fork oil



2. Remove:
   - Dust seal ①
   - Retaining clip ②

   Use a thin flat screwdriver, and be careful not to scratch the inner fork tube.

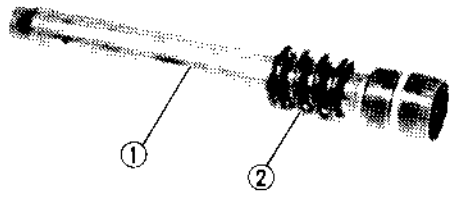


3. Remove:
   - Bolt (Damper rod)

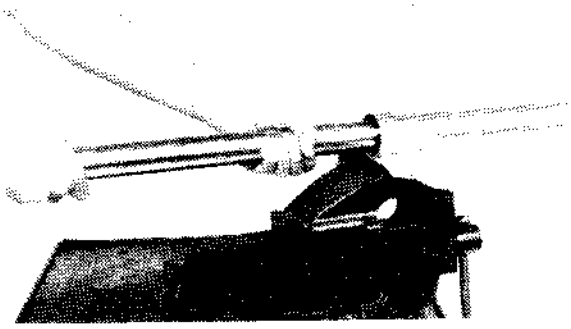
   Use the Damper Rod Holder ① and T-Handle ② to lock the damper rod.



Damper Rod Holder:
P/N YM-01300-1
T-Handle:
P/N YM-01326



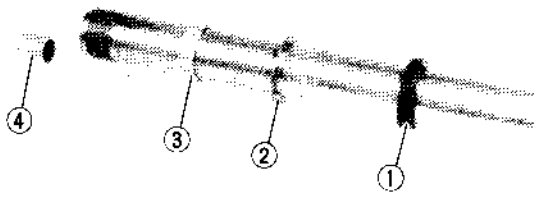
4. Remove:
   - Damper rod ①
   - Rebound spring ②



5. Remove:
   - Inner tube

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

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



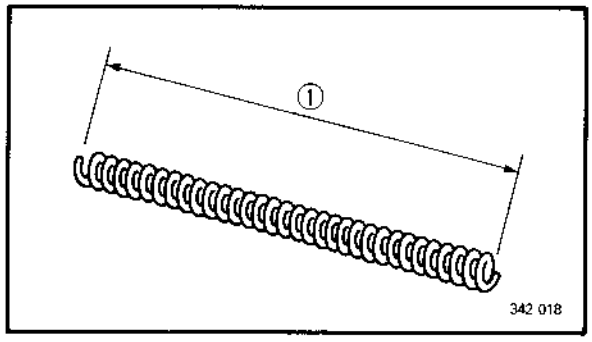
6. Remove:
   - Oil seal ①
   - Seal spacer ②
   - Guide bushing ③
   - Oil lock piece ④

INSPECTION

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

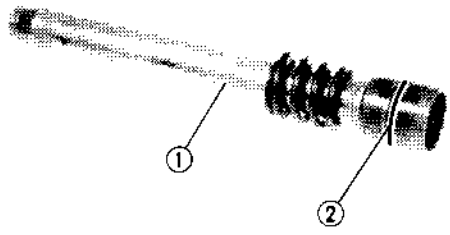
⚠ WARNING:

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



2. Inspect:
   - Outer tube
     Scratches/Bends/Damage → Replace.
3. Measure:
   - Fork spring
     Over specified limit → Replace.

Fork Spring Free Length (Limit) ①:
408 mm (16.1 in)



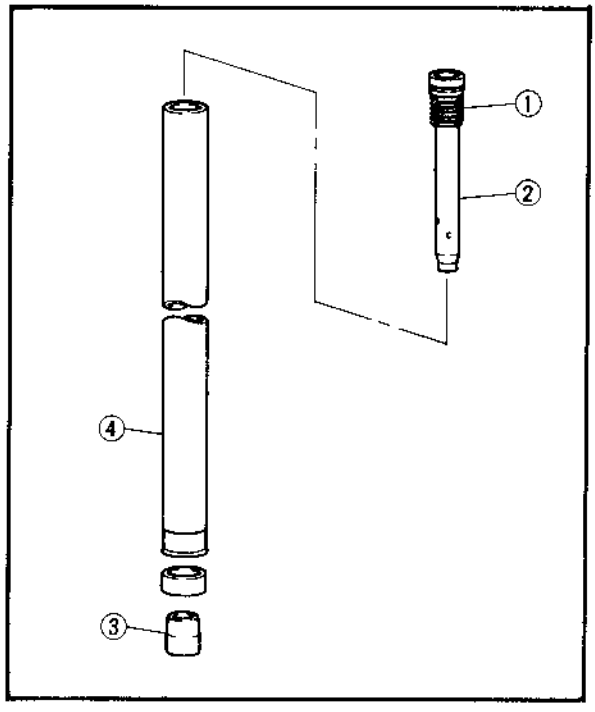
4. Inspect:
   - Damper rod ①
   - Ring ②
     Wear/Damage → Replace.
     Contamination → Blow out all oil passages with compressed air.
   - Oil lock piece
   - O-ring (Cap bolt)
     Damage → Replace.

ASSEMBLY

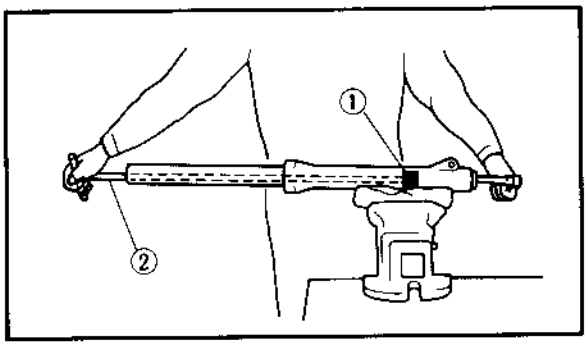
Before assembling, clean and inspect all parts and replace when necessary.

NOTE:

In front fork assembly, be sure to use following new parts. Do not reuse them.
- Slide bushing
- Guide bushing
- Oil seal
- Dust seal



1. Install:
   - Rebound spring ①
   - Damper rod ②
     Allow the rod to slide slowly down the tube until the it protrudes from the bottom.
   - Oil lock piece ③
     Fit oil lock piece over damper rod sticking out of the inner tube.
   - Inner tube ④
     Into the outer tube.

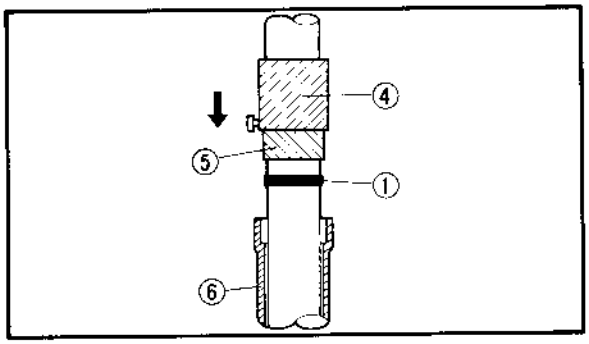


2. Tighten:
   - Bolt (Damper rod)

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

Damper Rod Holder:
P/N YM-01300-1
T-Handle:
P/N YM-01326

Bolt (Damper Rod):
40 Nm (4.0 m · kg, 29 ft · lb)
Apply LOCTITE ®

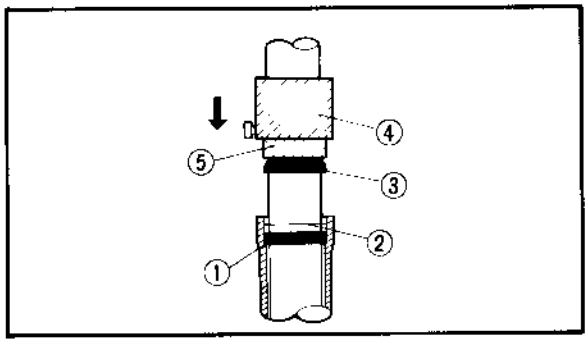


3. Install:
   - Guide bushing ① (New)

   Into the outer tube ⑥.
   - Seal spacer ②

   On the top of guide bushing ①.
   - Oil seal ③

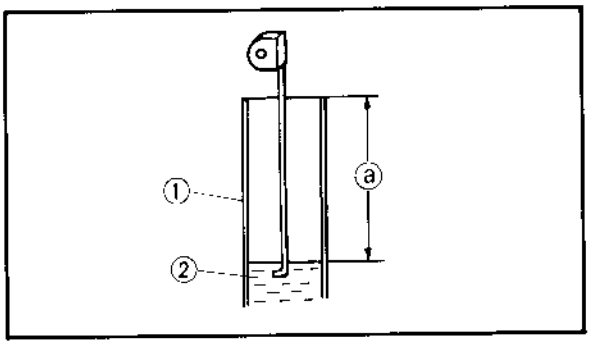
   Use the Fork Seal Driver Weight ④ and Adopter ⑤.



Fork Seal Driver Weight:
P/N YM-33963
Fork Seal Driver Adapter:
P/N YM-01372

- Retaining clip
- Dust seal

4. Fill:
   - Front fork



Each Fork:
444 cm³
(15.6 Imp oz, 15.0 US oz)
Fork Oil 10WT or equivalent
After filling, slowly pump the fork up and down to distribute oil.

Oil Level ⓐ :
92 mm (3.62 in)
From the top of inner fork tube fully compressed without spring.

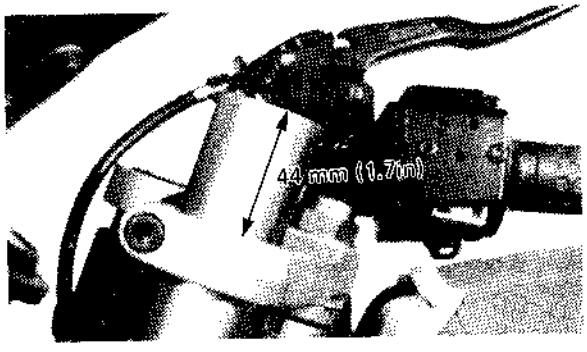
① Inner tube
② Fork oil

5. Install:
   - Fork spring
     With the smaller pitch side up.
   - Spring seat
   - Collar
   - Cap bolt
     Temporarily tighten the cap bolt.

Cap Bolt:
23 Nm (2.3 m·kg, 17 ft·lb)

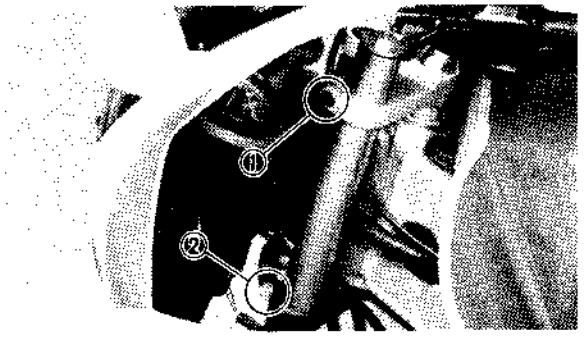
INSTALLATION

Reverse the removal procedure.
Note the following point.



1. Install:
   - Front fork
     Temporary tighten the pinch bolts.

NOTE:
Hold the inner tube with its top 44 mm (1.7 in) above the top of the handlebar crown.



2. Tighten:
   - Pinch bolt (Handlebar crown) ①
   - Pinch bolt (Steering stem) ②

Pinch Bolt (Handlebar Crown):
26 Nm (2.6 m·kg, 19 ft·lb)
Pinch Bolt (Steering Stem):
22 Nm (2.2 m·kg, 16 ft·lb)

3. Install:
   - Handlebar boss

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

Bolts (Handlebar Boss):
23 Nm (2.3 m·kg, 17 ft·lb)

4. Install:
   - Front fender

Bolt (Front Fender):
7 Nm (0.7 m·kg, 5.1 ft·lb)

5. Install:
   - Front wheel
     Refer to the "FRONT WHEEL – INSTALLATION" section.

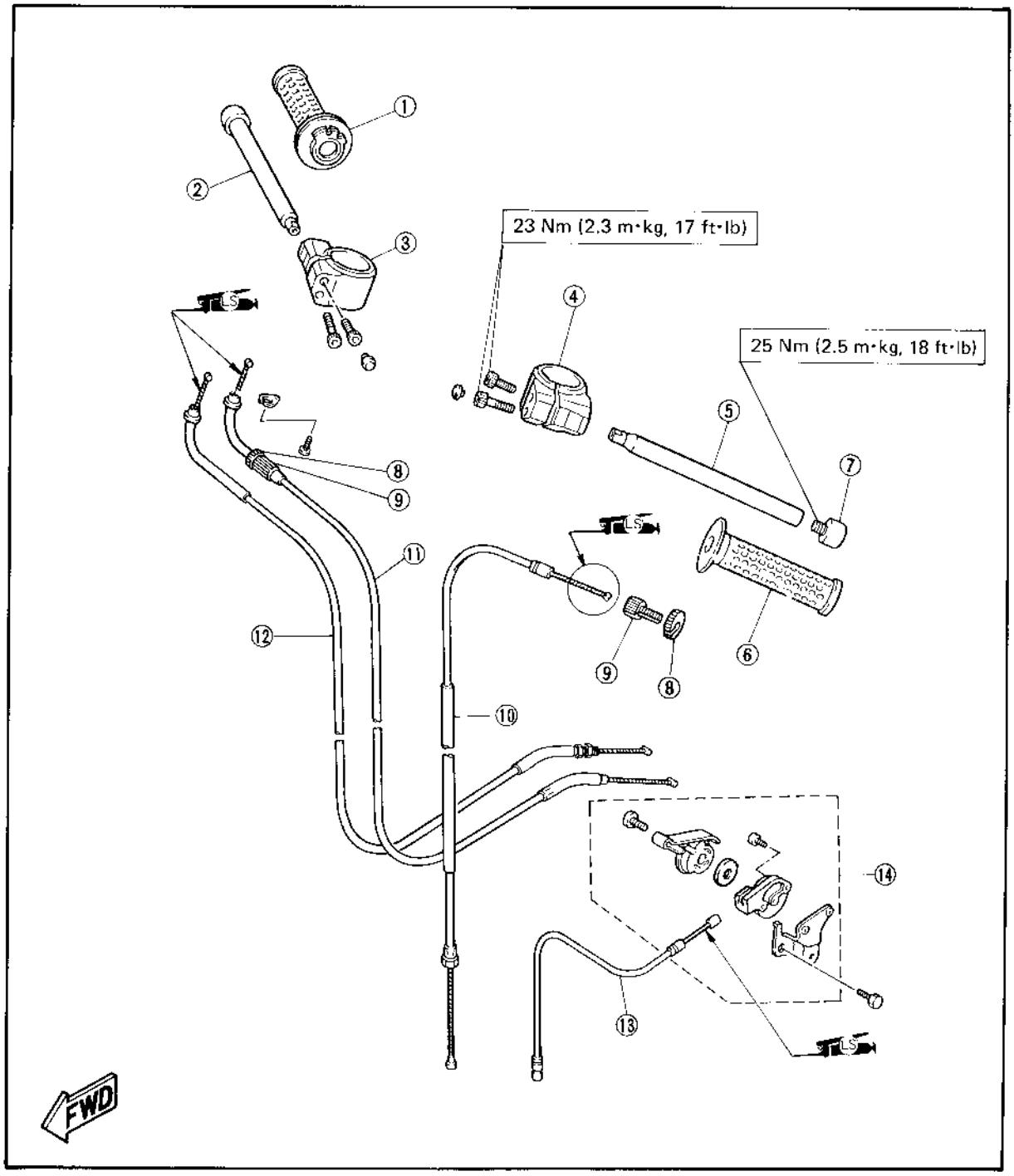
Front Axle:
58 Nm (5.8 m·kg, 42 ft·lb)
Bolts (Brake Caliper):
35 Nm (3.5 m·kg, 25 ft·lb)
Pinch Bolt (Front Fork):
20 Nm (2.0 m·kg, 14 ft·lb)

⚠ WARNING:
Make sure that the brake hoses are routed properly.

STEERING HEAD AND HANDLEBAR

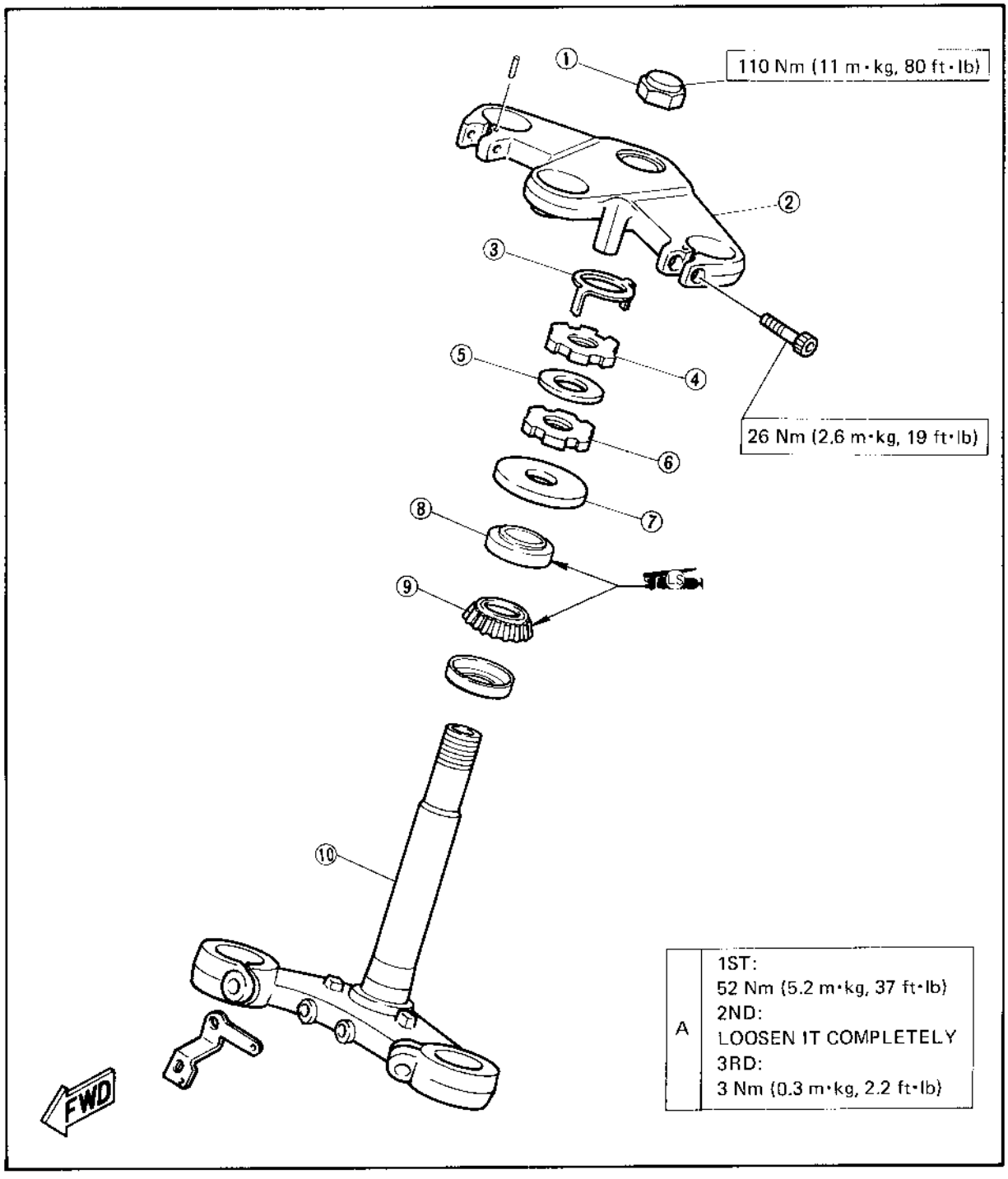
Handlebar

① Throttle guide tube
② Handlebar (Right)
③ Handlebar boss (Right)
④ Handlebar boss (Left)
⑤ Handlebar (Left)
⑥ Grip rubber
⑦ Handlebar grip end
⑧ Locknut
⑨ Adjuster
⑩ Clutch cable
⑪ Throttle cable 1
⑫ Throttle cable 2
⑬ Starter cable
⑭ Starter lever assembly



Steering Head

① Steering stem nut
② Handle crown
③ Lock washer
④ Ring nut (Upper)
⑤ Washer
⑥ Ring nut (Lower)
⑦ Bearing cover
⑧ Bearing (Upper)
⑨ Bearing (Lower)
⑩ Steering stem



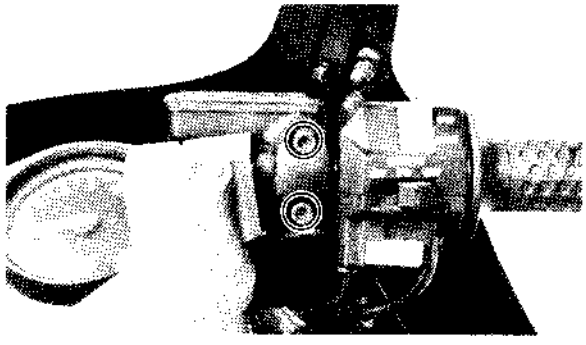
REMOVAL

⚠ WARNING:

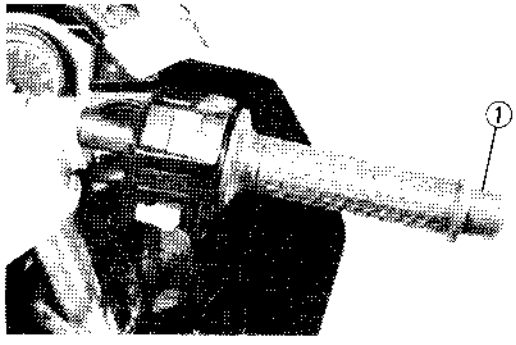
Securely support the motorcycle so there is no danger of it falling over.

1. Elevate the front wheel by placing a suitable stand under the engine.
2. Remove:
   - Front wheel

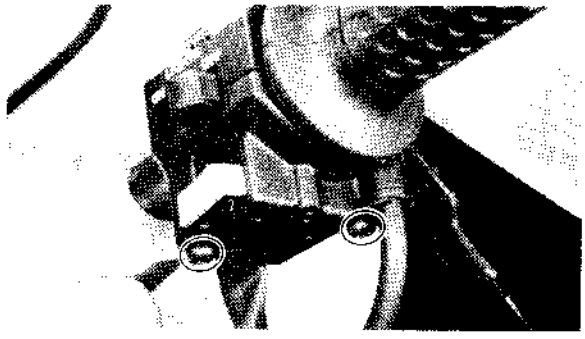
   Refer to the "FRONT WHEEL – REMOVAL" section.



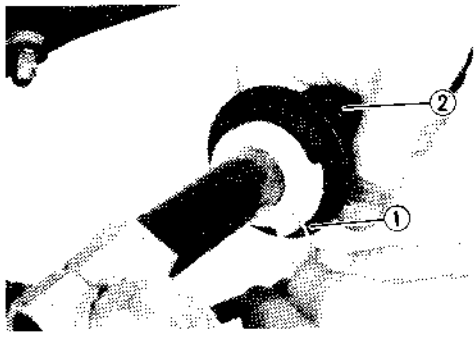
3. Remove:
   - Bracket (Master cylinder)



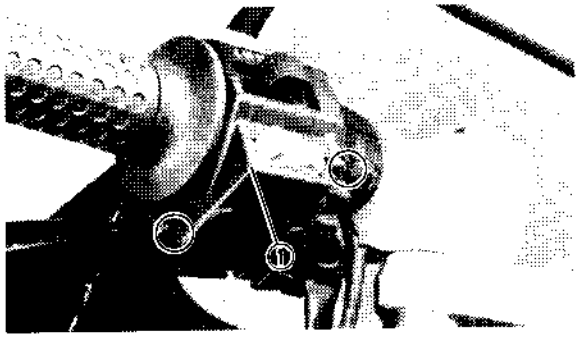
4. Remove:
   - Handlebar grip end (Right) ①



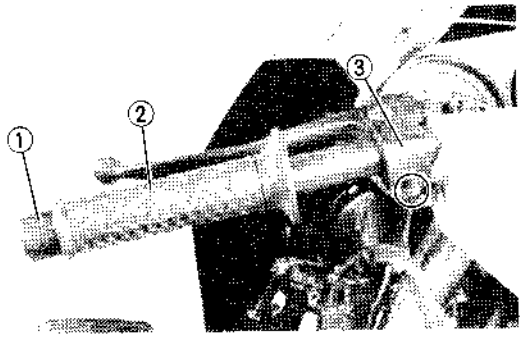
5. Remove:
   - Handlebar switch (Right)



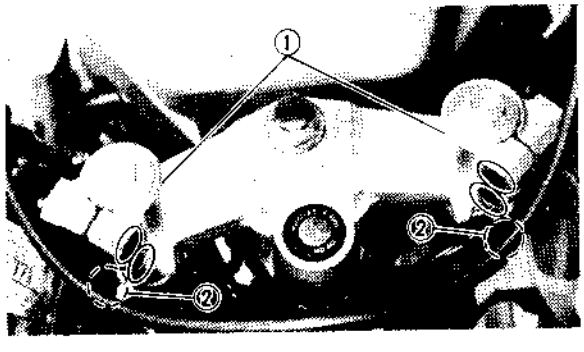
6. Remove:
   - Throttle cable ①
   - Handlebar grip (Right) ②



7. Remove:
   - Handlebar switch (Left) ①



8. Remove:
   - Handlebar grip end (Left) ①
   - Handlebar grip (Left) ②
   - Clutch lever holder ③

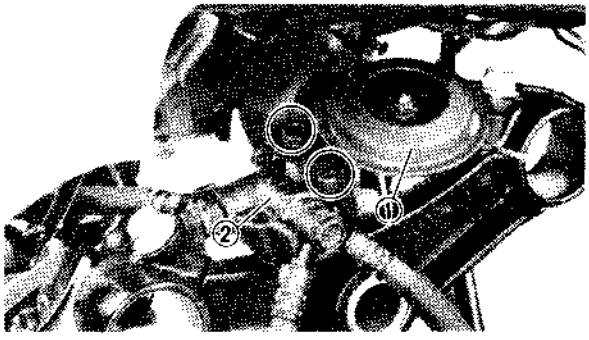


9. Remove:
   - Handlebar (Right)
   - Handlebar bosses (Left and right) ① with handlebar (Left).
10. Loosen:
    - Pinch bolt (Handlebar crown) ②

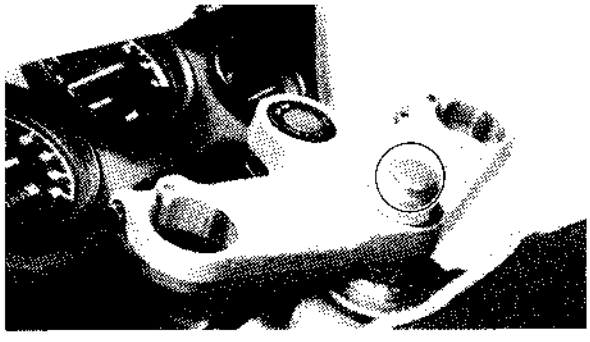
11. Remove:
    - Lower cowlings (Left and right)
    - Center cowlings (Left and right)

    Refer to the "COWLING REMOVAL AND INSTALLATION – REMOVAL" section in the CHAPTER 3.
12. Remove:
    - Front forks (Left and right)

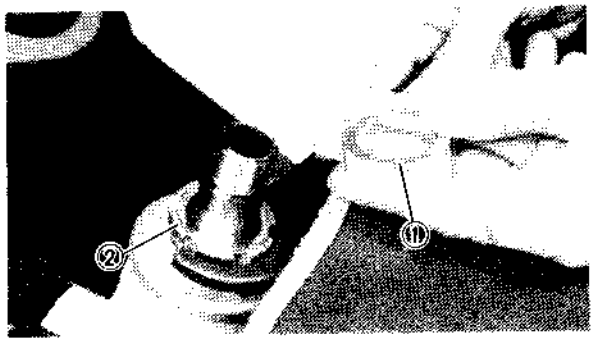
    Refer to the "FRONT FORK – REMOVAL" section.



13. Remove:
- Horn ①
- Joint (Brake hose) ②



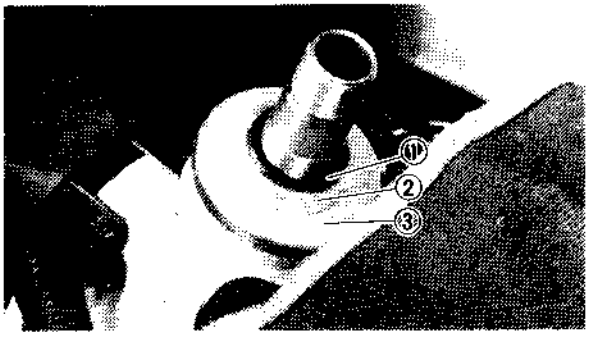
14. Remove:
- Handlebar crown



15. Remove:
- Lock washer ①
- Ring nut (Upper) ②

Use Ring Nut Wrench

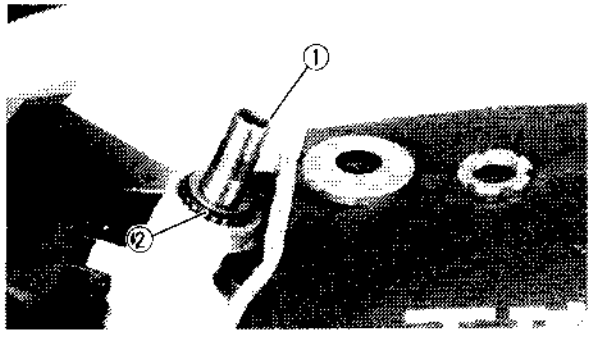
	Ring Nut Wrench: P/N YU-33975



16. Remove:
- Washer ①
- Ring nut (Lower) ②
- Bearing cover ③

⚠ WARNING:

Support the steering shaft so that it may not fall down.

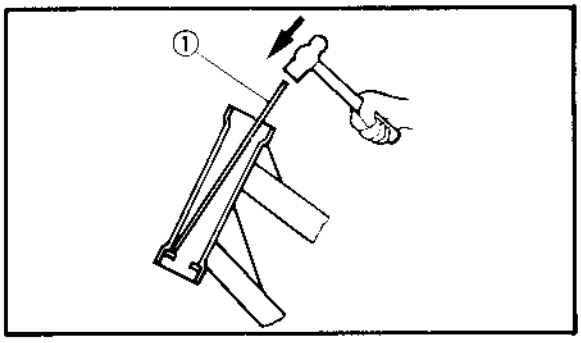


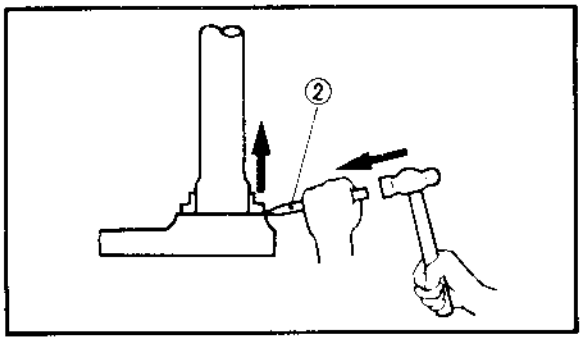
17. Remove:
- Steering stem ①
- Bearing (Upper) ②
- Bearing (Lower)

INSPECTION

1. Wash the bearing in a solvent.
2. Inspect:
   - Bearings
   - Bearing race

   Pitting/Damage → Replace.





Bearing race remplacement steps:

- Remove the bearing races using long rod ① and the hammer as shown.
- Remove the bearing race on the steering stem using the floor chisel ② and the hammer as shown.
- Install the new dust seal and races.

NOTE:

Always replace bearings and races as a set.

3. Inspect:
   - Handlebars

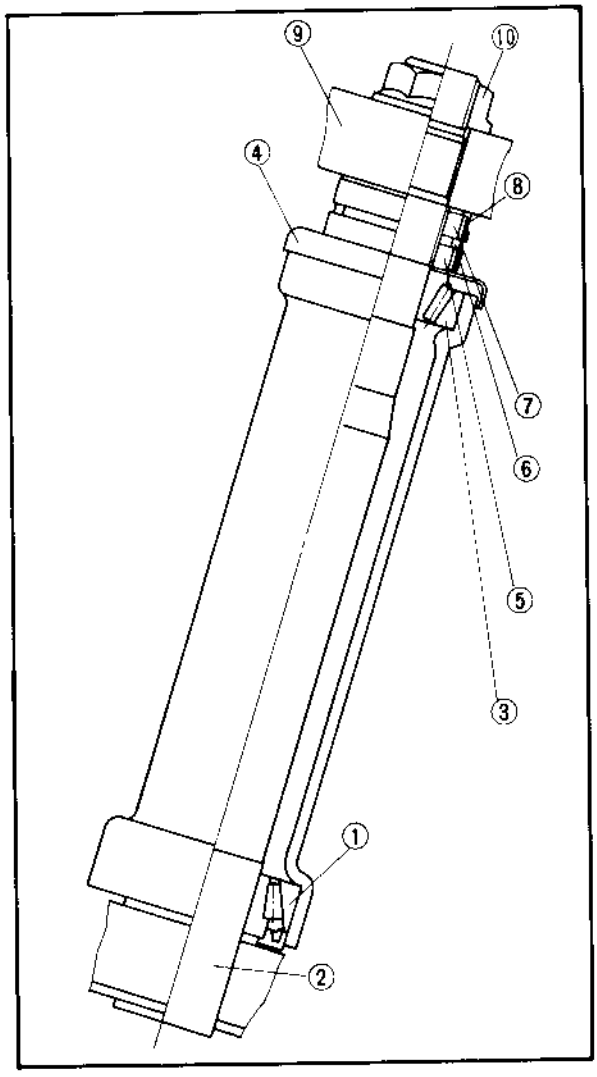
   Bents/Damage → Replace.

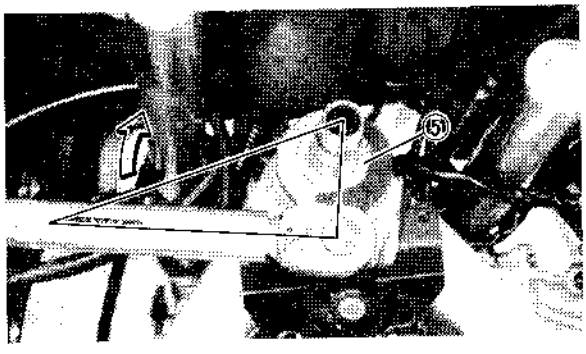


4. Inspect:
   - Handlebar bosses

   Cracks/Damage → Replace.







INSTALLATION

Reverse the removal procedure.
Note the following points.

1. Lubricate:
   - Bearings (Upper/Lower)
   - Bearing races

Lithium-Soap Base

2. Install:
   - Bearing (Lower) ①
     Onto the steering stem.
   - Steering stem ②

⚠ CAUTION:

Hold the steering stem until it is secured.

   - Bearing (Upper) ③
   - Bearing cover ④
   - Ring nut (Lower) ⑤

3. Tighten:
   - Ring nuts (Lower/Upper)

Ring nuts tightening steps:

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

- Install the ring nut (Lower) ⑤.

NOTE:
The tapered side of ring nut must face downward.

- Tighten the ring nut ⑤ using the Ring Nut Wrench.

Ring Nut Wrench:
P/N YU-33975

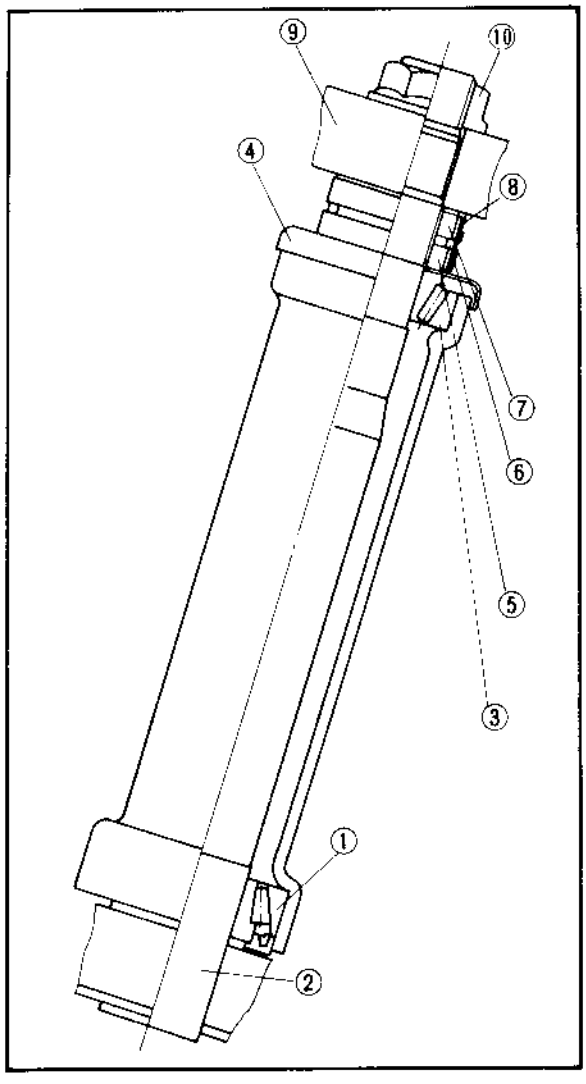
Ring Nut ⑤ (Initial Tightening):
52 Nm (5.2 m·kg, 37 ft·lb)

- LOOSEN THE RING NUT ⑤ COMPLETELY and retighten it to specification.

⚠ WARNING:

Do not over-tightening.

Ring Nut ⑤ (Final Tightening):
3 Nm (0.3 m·kg, 2.2 ft·lb)



- Check the steering stem by turning it lock to lock. If there is any binding, remove the steering stem assembly and inspect the steering bearings ①, ③.
- Install the washer ⑥.
- Install the ring nut (Upper) ⑦.

NOTE:
The tapered side of ring nut must face downward.

- FINGER TIGHTEN THE RING NUT ⑦, then align the slots of both ring nuts. If not aligned, hold the lower ring nut ⑤ and tighten the other until they are aligned.
- Install the lock washer ⑧.

NOTE:
Make sure the lock washer tab is placed in the slots.

- Install the handle crown ⑨, and tighten the steering stem nut ⑩ to specification.

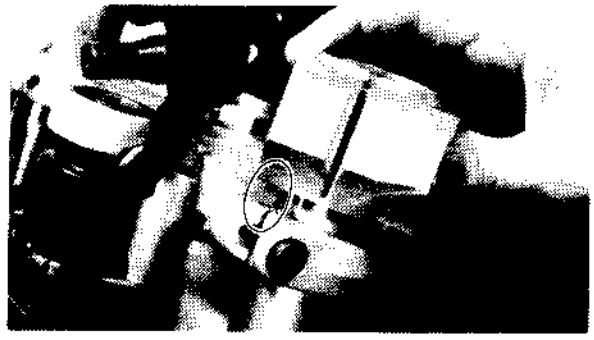
	Nut (Steering Stem): **110 Nm (11.0 m·kg, 80 ft·lb)**

4. Install:
   - Brake hose joint

	Brake (Brake Hose Joint): **10 Nm (1.0 m·kg, 7.2 ft·lb)**

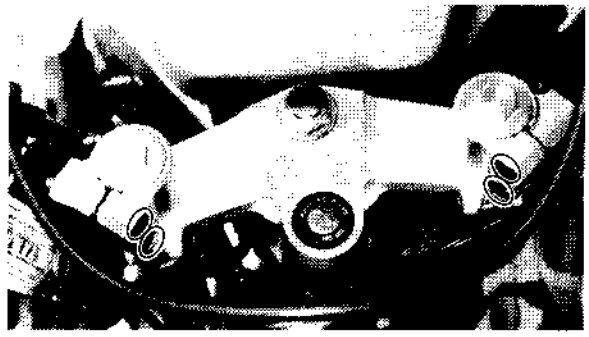
5. Install:
   - Front fork (Left and right)
     Refer to the "FRONT FORK – INSTALLTION" section.

	Pinch Bolt (Handlebar Crown): **26 Nm (2.6 m·kg, 19 ft·lb)** **Pinch Bolt (Steering Stem):** **22 Nm (2.2 m·kg, 16 ft·lb)**



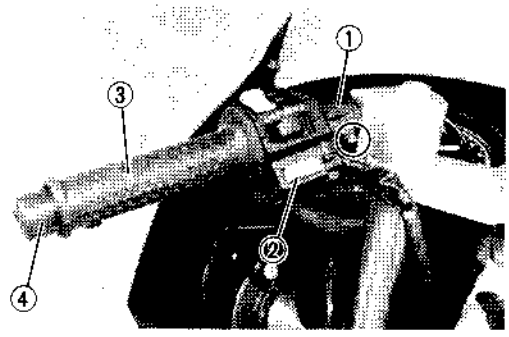
8. Install:
   - Handlebar bosses

NOTE:
Insert the pin on the handlebar bosses into the corresponding hole on the handlebar crown.

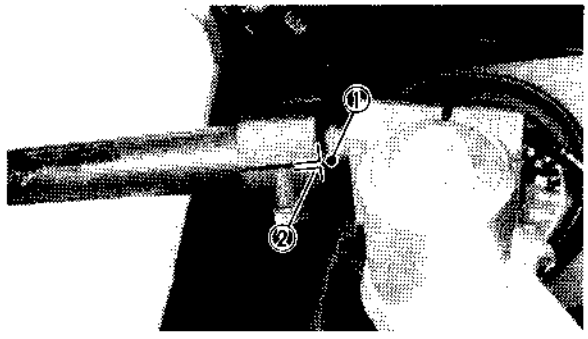


9. Install:
   - Handlebars

	Pinch Bolts (Handlebar): **23 Nm (2.3 m·kg, 17 ft·lb)**



10. Install:
    - Clutch lever holder ①
    - Handlebar switch (Left) ②
    - Handlebar grip (Left) ③
    - Handlebar grip end (Left) ④



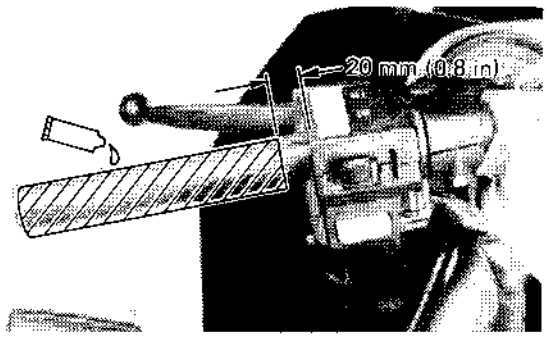
Handlebar (Left) installation steps:
- Install the lever holder with the punched mark ① on the handlebar aligning with the slit in the lever holder ②.

	Bolt (Lever Holder): **10 Nm (1.0 m·kg, 7.2 ft·lb)**

- Install the handlebar switch (Left)
- Apply align coat of an adhesive for rubber to the handlebar end, as shown.

ⓐ 20 mm (0.8 in)

- Fit the handlebar grip fully over the handlebar end.



⚠ WARNING:

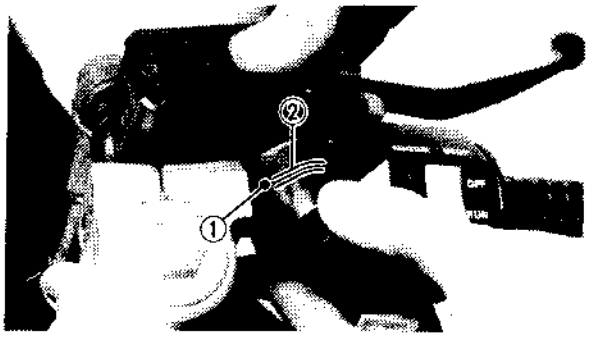
Leave the handlebar intact until the adhesive becomes dry enough to make the grip and handlebar stuck securely.

• Install the handlebar grip end (Left).

	Handlebar Grip End: **25 Nm (2.5 m·kg, 18 ft·lb)**

11. Install:
    • Handlebar grip (Right)
    • Throttle cable
    • Handlebar switch (Right)

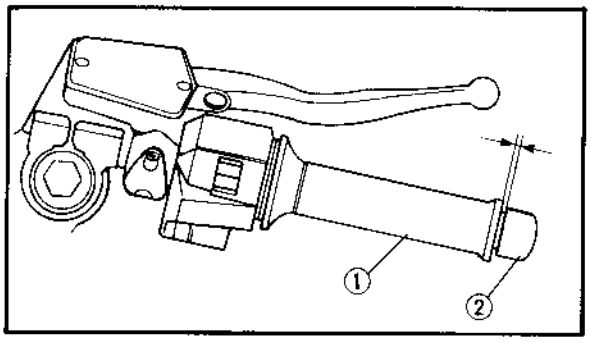
NOTE:
Before installing the handlebar grip (Right), apply a light coat of lithium soap base grease onto the handlebar end.



12. Install:
    • Front brake master cylinder

NOTE:
Install the master cylinder with the punched mark ① on the handlebar aligning with the master cylinder end ②.

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



13. Install:
    • Handlebar grip end (Right) ①

⚠ WARNING:
Provide a clearance of 1 mm (0.04 in) between the handlebar grip ② and the handlebar grip end ①. Otherwise, the grip may not move.

	Handlebar Grip End: **25 Nm (2.5 m·kg, 18 ft·lb)**

14. Install:
    - Front fender



Bolt (Front Fender):
7 Nm (0.7 m·kg, 5.1 ft·lb)

15. Install:
    - Front wheel

    Refer to the "FRONT WHEEL – INSTALLATION" section.



Wheel Axle:
58 Nm (5.8 m·kg, 42 ft·lb)
Bolt (Brake Caliper):
35 Nm (3.5 m·kg, 25 ft·lb)
Pinch Bolt (Front Fork):
20 Nm (2.0 m·kg, 14 ft·lb)

16. Install:
    - Clutch cable

NOTE:
Apply a light coat of lithium soap base grease onto the clutch cable end.

17. Adjust
    - Clutch cable free play

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

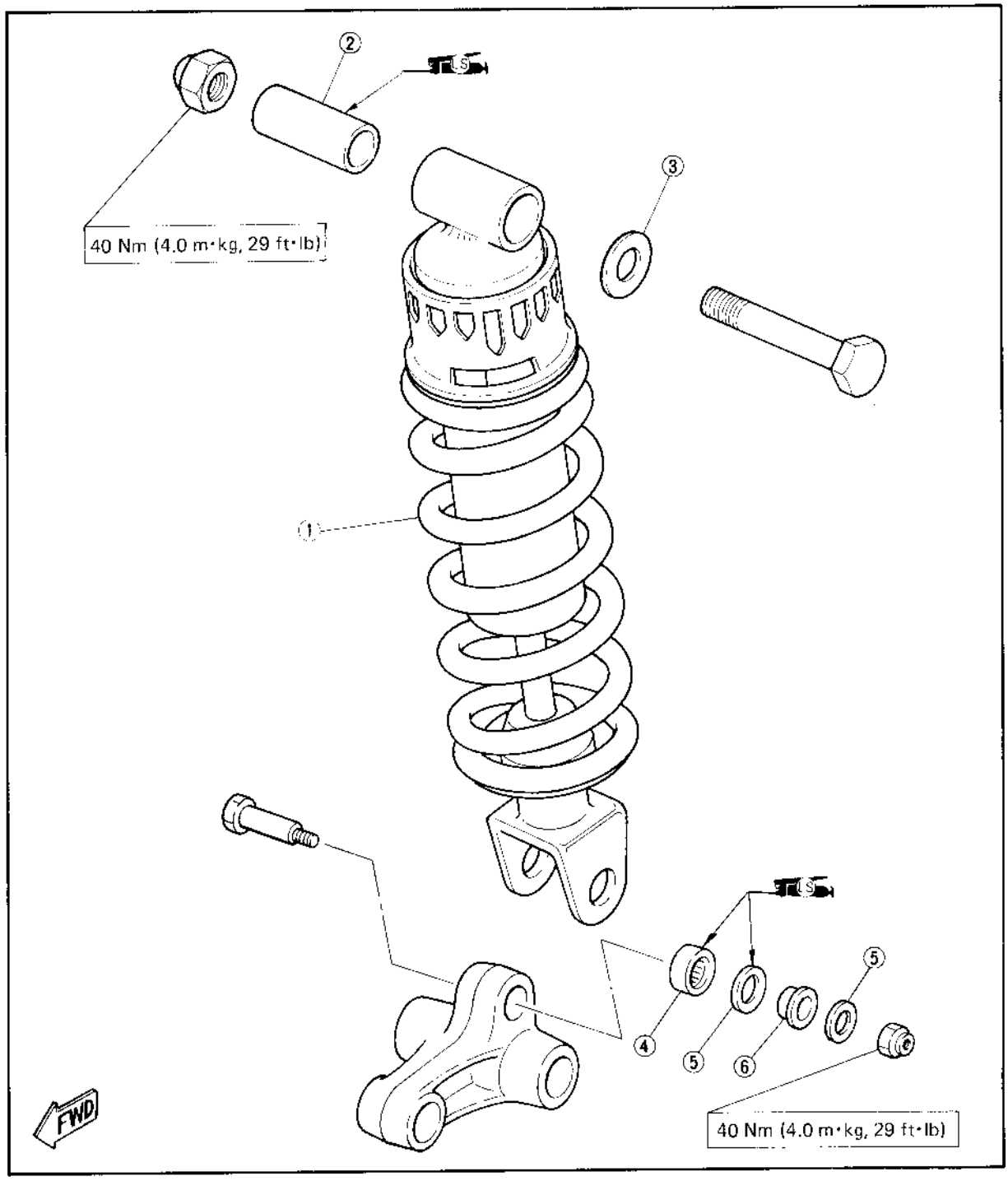


Free Play:
2 ~ 3 mm (0.08 ~ 0.12 in)
At The Lever Pivot.

REAR SHOCK ABSORBER AND SWINGARM

Rear Shock Absorber

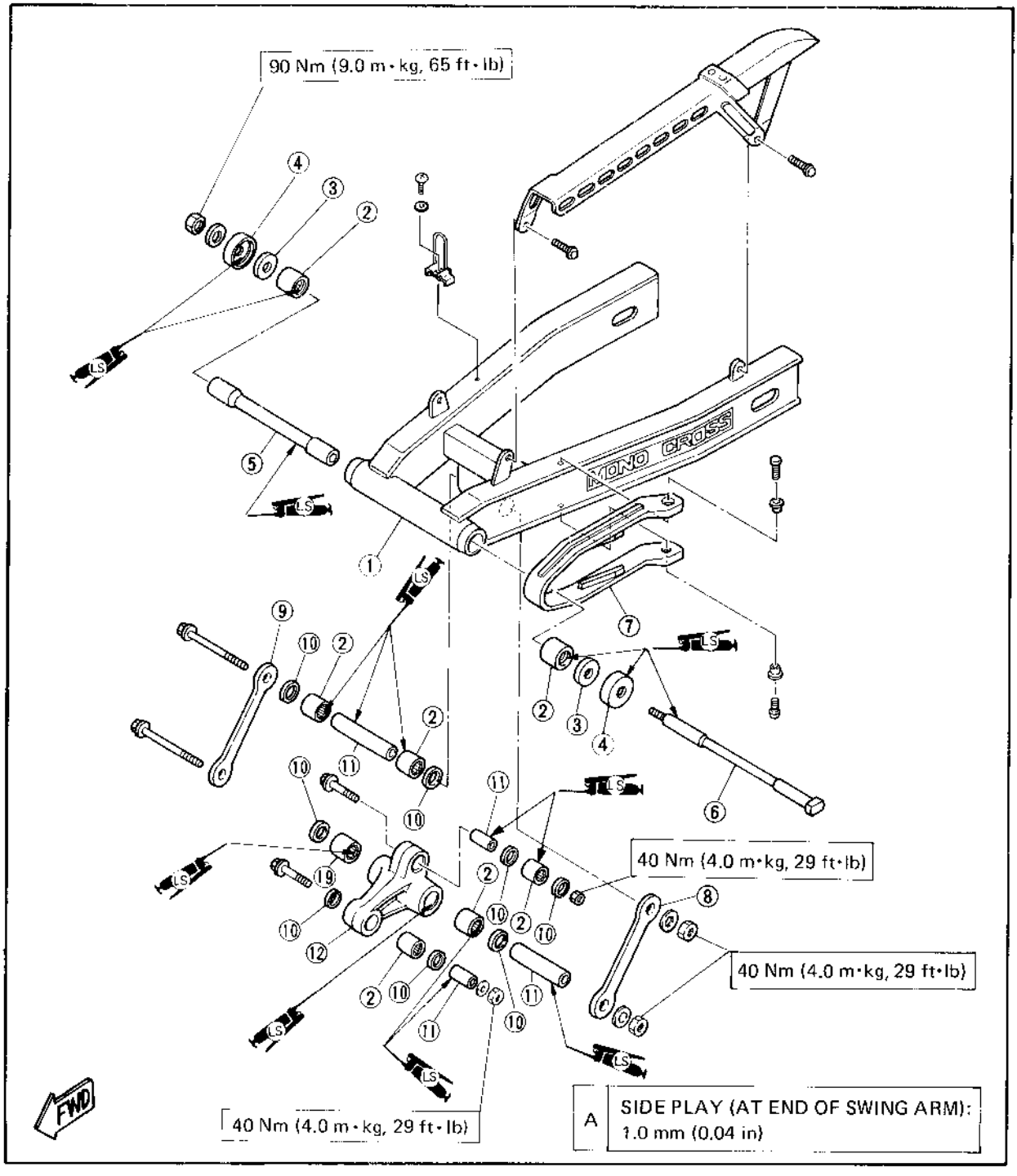
① Shock absorber
② Collar
③ Washer
④ Collar
⑤ Oil seal
⑥ Bearing



Swingarm

① Swingarm
② Bearing
③ Thrust washer
④ Thrust cover
⑤ Bush
⑥ Pivot shaft
⑦ Guard seal
⑧ Arm (Left)
⑨ Arm (Right)
⑩ Oil seal
⑪ Collar
⑫ Relay arm

NOTE:
Coat the bearings, bushings, thrust covers, oil seals, and collars with a liberal amount of light weight lithium-soap base grease before installing. After installing, thoroughly wipe off excess grease.

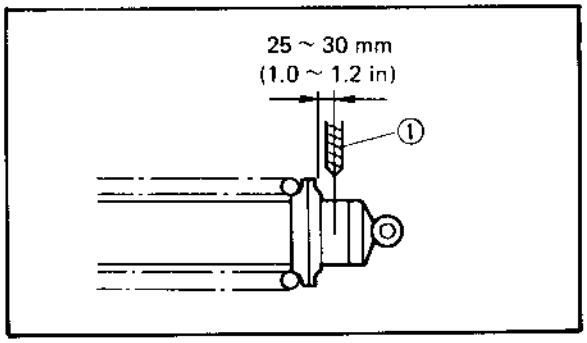


HANDLING NOTES

⚠ WARNING:

This shock absorber contains highly compressed 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.

1. **Do not tamper or attempt to open the cylinder assembly.**
2. **Do not subject shock absorber to an open flame or other high heat. This may cause the unit to explode due to excessive gas pressure.**
3. **Do not deform or damage the cylinder in any way. Cylinder damage will result in poor damping performance.**



DISPOSAL NOTES

Shock absorber disposal steps:

Gas pressure must be released before disposing the shock absorber. To do so, drill ① a 2 ~ 3 mm (0.08 ~ 0.12 in) hole through the cylinder wall at a point 25 ~ 30 mm (1.0 ~ 1.2 in) under the spring seat.

⚠ CAUTION:

Wear eye protection to prevent eye damage from escaping gas and/or metal chips.

REMOVAL

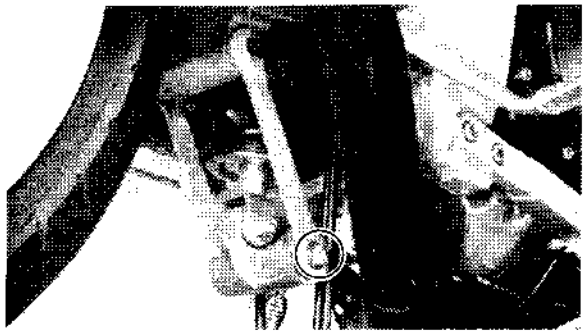
Rear Shock Absorber

1. Place the motorcycle on a level place.

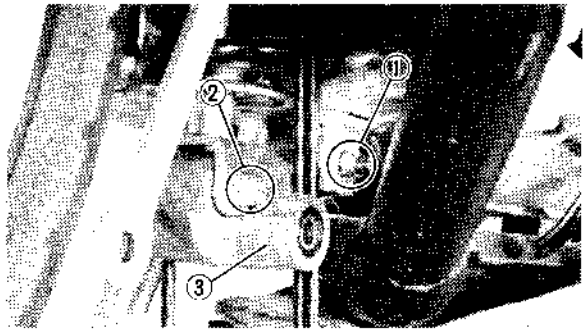
⚠ WARNING:

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

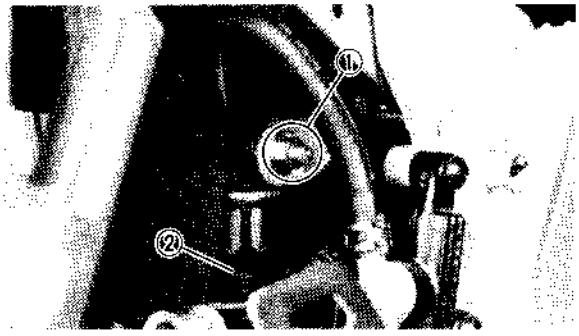
2. Remove:
   - Lower cowlings (Left and right)
     Refer to the "COWLING REMOVAL AND INSTALLATION – REMOVAL" section in the CHAPTER 3.



3. Remove:
   - Bolt (Arms – Bottom)



4. Remove:
   - Bolt (Swingarm) ①
   - Bolt (Rear shock absorber – Bottom) ②
   - Relay arm ③



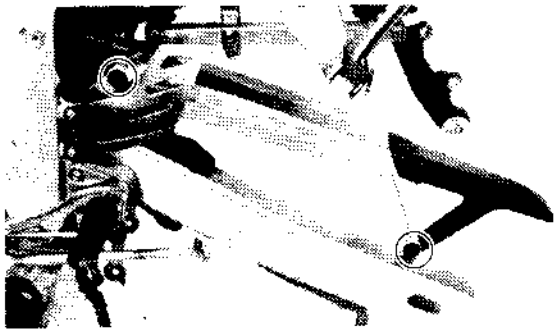
5. Remove:
   - Bolt (Rear shock absorber – Top) ①
   - Rear shock absorber ②

Swingarm

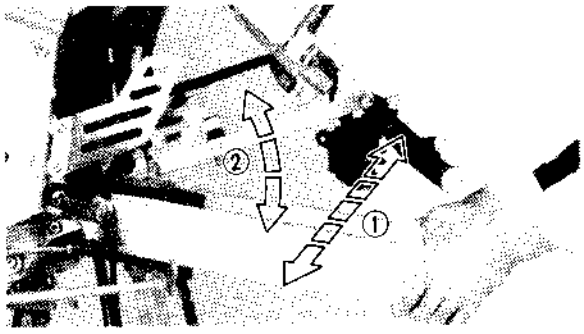
⚠ WARNING:

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

1. Remove:
   - Rear wheel
     Refer to the "REAR WHEEL – REMOVAL" section.
   - Rear shock absorber



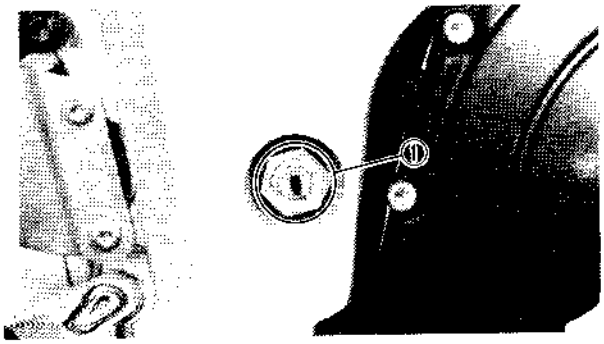
2. Remove:
   - Chain case



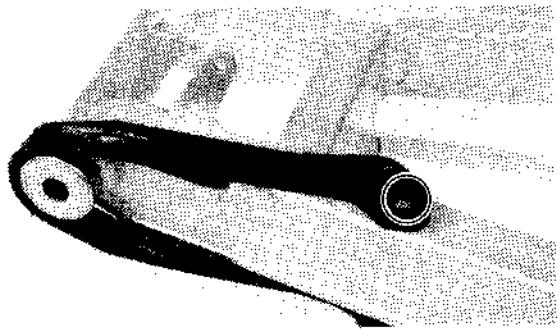
3. Check:
   - Swingarm (Side play) ①
     Side play → Replace the bearings and collar.
     Move the swingarm from side to side.
     There should be no noticeable side play.

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

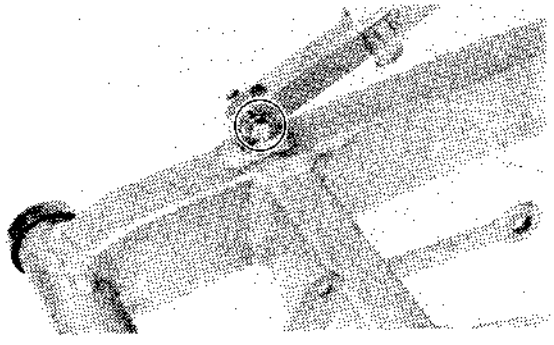
4. Check:
   - Swingarm (Vertical movement) ②
     Tightness/Binding/Rough spots → Replace the bearings.
     Move the swingarm up and down.



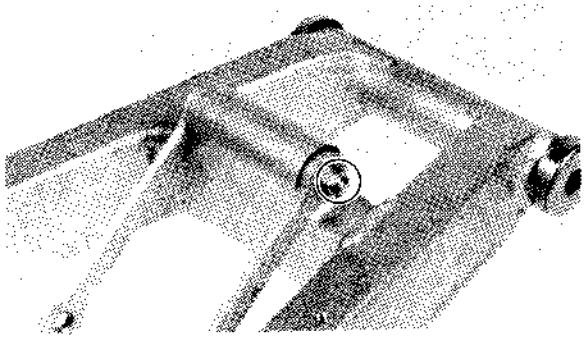
5. Remove:
   - Nut (Pivot shaft) ①
   - Swingarm



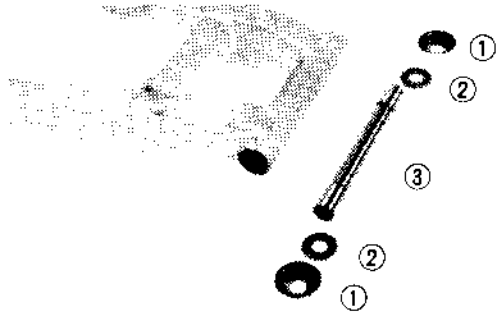
6. Remove:
   - Guard seal



7. Remove:
   - Tension bar



8. Remove:
   - Arms (Left and right)



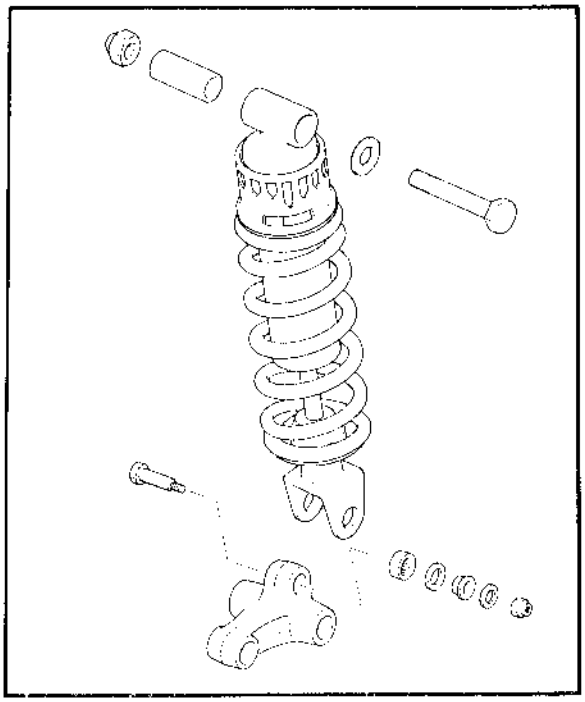
9. Remove:
   - Thrust covers ①
   - Thrust washer ②
   - Bush ③



INSPECTION

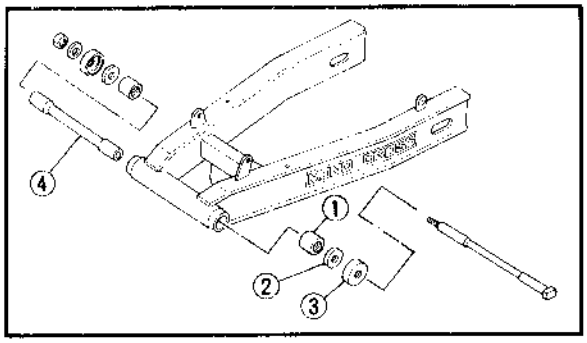
Rear shock absorber

1. Inspect:
   - Rear shock absorber
     Oil leaks/Damage → Replace.



2. Inspect:
   - Bushings
   - Bearing
   - Dust seals

   Wear/Damage → Replace.



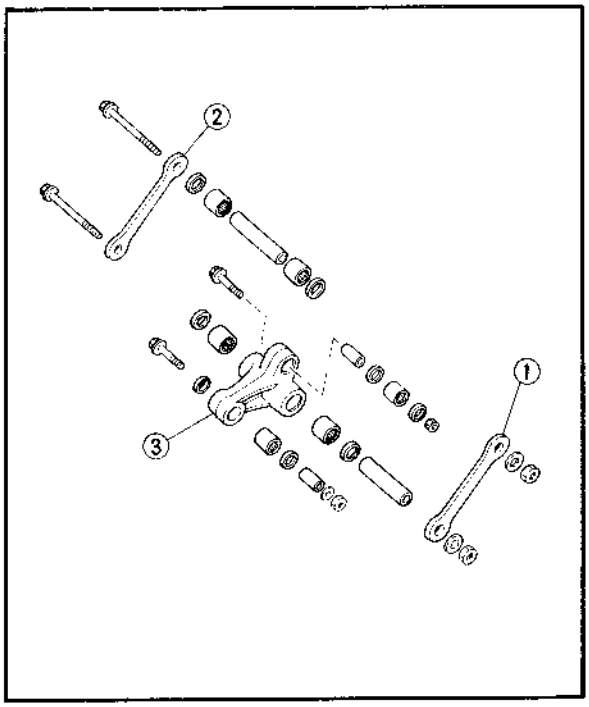
Swingarm

1. Wash the bearings in a solvent.
2. Inspect:
   - Bearings (Race/Rollers) ①

     Pitting/Damage → Replace.
   - Trust washers ②
   - Trust covers ③

     Damage → Replace.
   - Collar ④
   - Pivot shaft

     Damage → Replace.



3. Inspect:
   - Arm (Left) ①
   - Arm (Right) ②
   - Relay arm ③

     Damage → Replace.
   - Bearings

     Pitting/Damge → Replace.
   - Oil seals
   - Collars

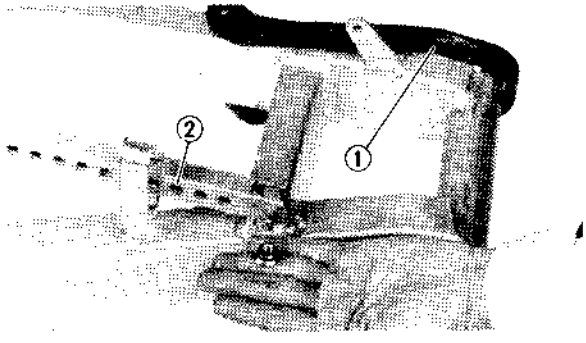
     Damage → Replace.

INSTALLATION

Reverse the removal procedure.
Note the following points.

1. Lubricate:
   - Bearings
   - Oil seals
   - Collars

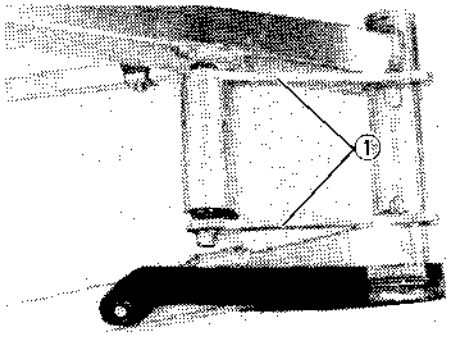
Lithium-Soap Base Grease



Swingarm

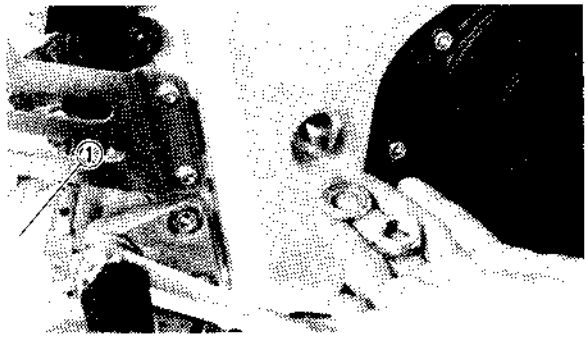
1. Install:
   - Guard seal ①
   - Tension bar ②

Screw (Guard Seal):
8 Nm (0.8 m · kg, 5.8 ft · lb)
Bolt (Tension Bar):
15 Nm (1.5 m · kg, 11 ft · lb)



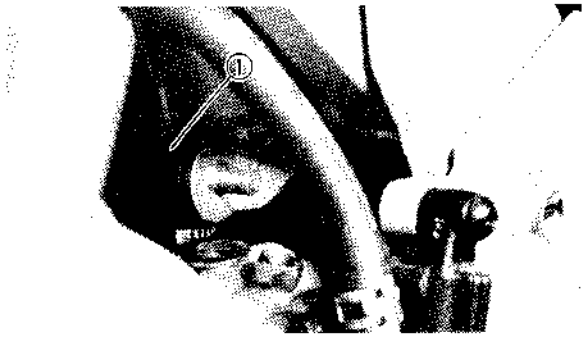
2. Install:
   - Arms (Left and right) ①

Bolt (Arm):
40 Nm (4.0 m · kg, 29 ft · lb)



3. Install:
   - Swing arm ①

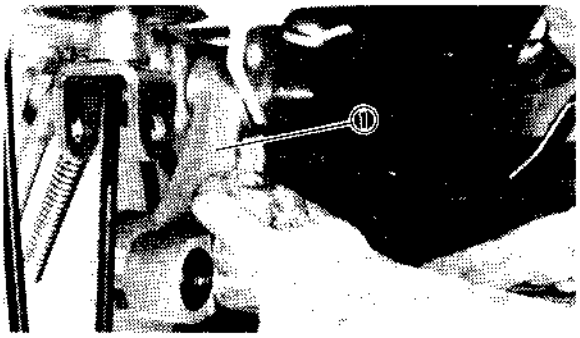
Pivot Shaft (Swingarm):
90 Nm (9.0 m · kg, 65 ft · lb)



Rear Shock Absorber

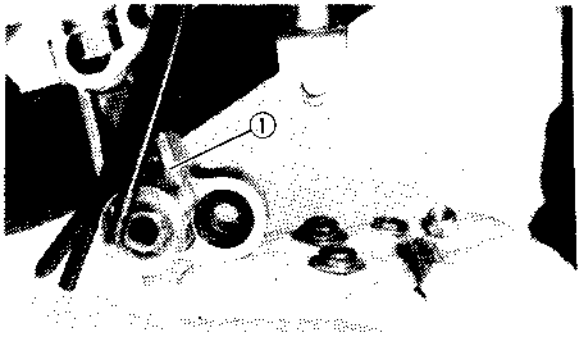
1. Install:
   - Rear shock absorber ①

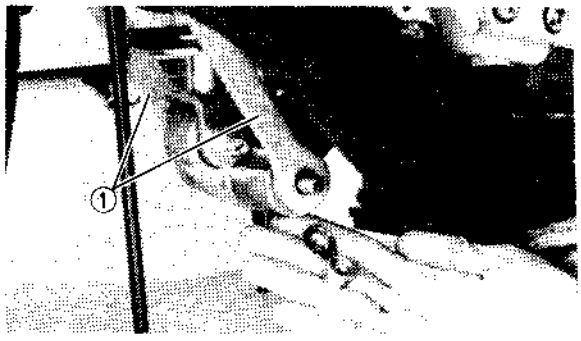
Rear Shock Absorber:
Upper:
40 Nm (4.0 m · kg, 29 ft · lb)



2. Install:
   • Relay arm ①

	Rear Arm – Frame: **40 Nm (4.0 m · kg, 29 ft · lb)** **Relay Arm – Rear Shock Absorber:** **40 Nm (4.0 m · kg, 29 ft · lb)**





3. Install:
   • Arms (Left and right) ①

	Relay Arm – Arms: **40 Nm (4.0 m · kg, 29 ft · lb)**

4. Install:
   • Rear wheel
   Refer to the "REAR WHEEL – INSTALLATION" section.

	Nut (Rear Axle): **107 Nm (10.7 m · kg, 77 ft · lb)** **Bolts (Brake Caliper):** **35 Nm (3.5 m · kg, 25 ft · lb)**

5. Adjust:
   • Drive chain slack
   Refer to the "DRIVE CHAIN SLACK ADJUSTMENT" section in the CHAPTER 3.

	Drive Chain Slack: **10 ~ 20 mm (0.4 ~ 0.8 in)**

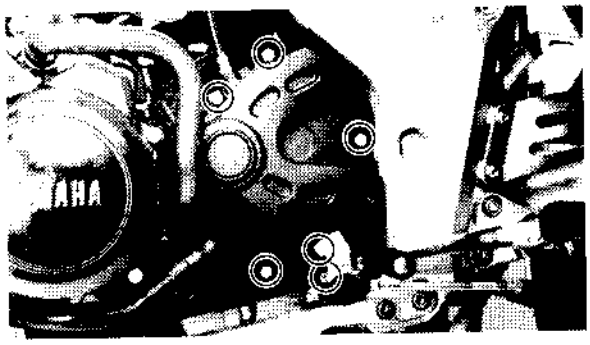
DRIVE CHAIN AND SPROCKET

REMOVAL

1. Place the motorcycle verticaly on a level place.

⚠ WARNING:

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

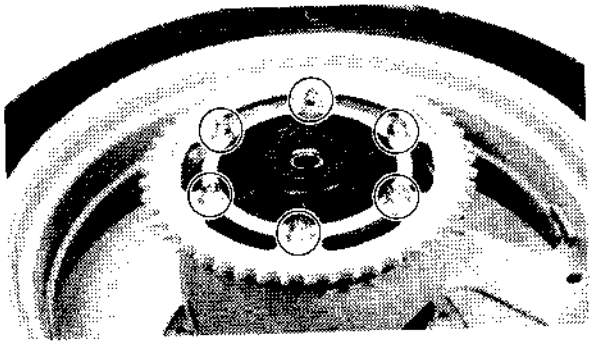


2. Remove:
   - Shift arm
   - Crankcase cover (Left)
   - Nut (Drive sprocket)
   - Lock washer
   - Drive sprocket

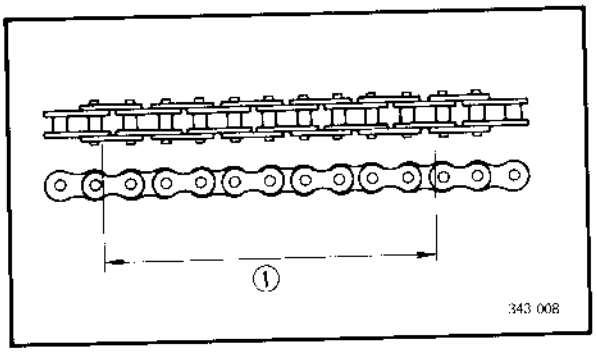
   Refer to the "ENGINE – REMOVAL" section in the CHAPTER 4.

3. Remove:
   - Rear wheel
   - Swingarm
   - Drive chain

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



4. Remove:
   - Driven sprocket



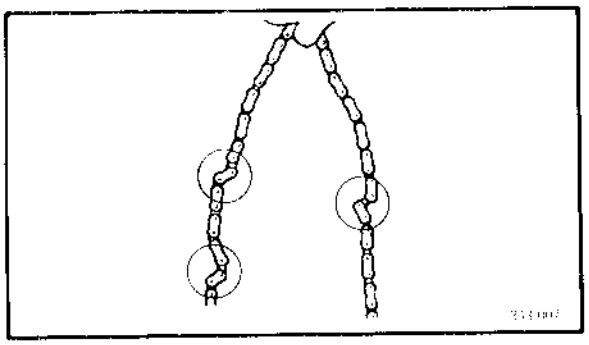
INSPECTION AND CLEANING

1. Measure:
   - Drive chain wear ①

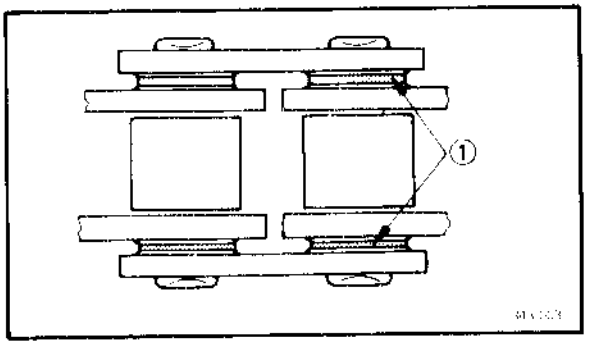
   Length of 10 links.

   Over specified limit → Replace the drive chain, drive sprocket and driven sprocket as a set.

Drive Chain Wear Limit (10 Links):
150.1 mm (5.91 in)



2. Check:
- Drive chain stiffness
  Clean and oil the chain and hold as illustrated.
  Stiff → Replace drive chain.

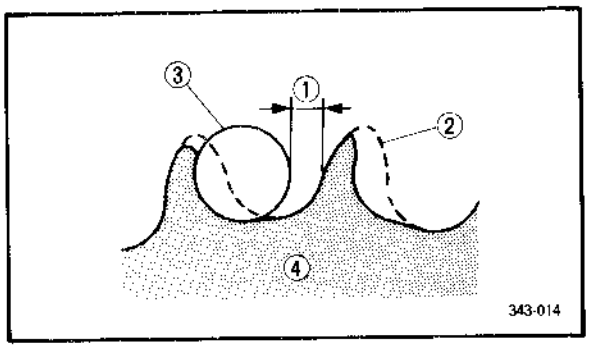


3. Clean:
- Drive chain

Drive Chain Cleaner: Kerosene

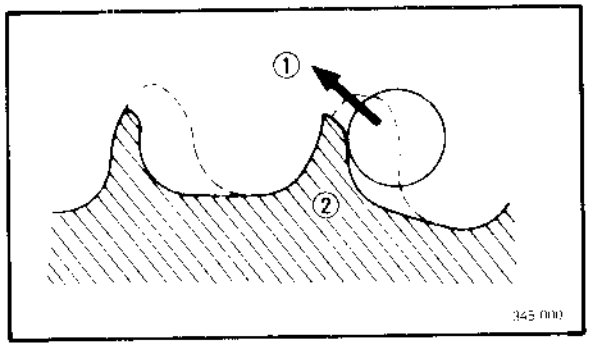
⚠CAUTION:

Do not use steam cleaning, high-pressure washes, and certain solvent of O-ring ① damage may occur.



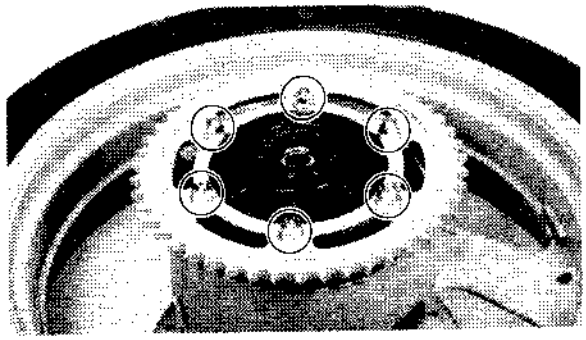
4. Inspect:
- Drive sprocket
  More than 1/4 teeth ① wear → Replace sprocket.

② Correct
③ Roller
④ Sprocket



5. Inspect:
- Drive sprocket
  Bent teeth ② → Replace sprocket.

① Slip off



INSTALLATION

Reverse the removal procedure.
Note the following points.

1. Install:
- Driven sprocket

Nuts (Driven Sprocket): 32 Nm (3.2 m · kg, 23 ft · lb)

2. Lubricate:
   - Bearings
   - Oil seals
   - Collars



Lithium-Soap Base Grease

3. Install:
   - Drive chain
   - Swingarm
   - Rear wheel

   Refer to the "REAR SHOCK ABSORBER AND SWINGARM – INSTALLATION" and "REAR – WHEEL – INSTALLATION".
4. Install:
   - Drive sprocket
   - Lock washer (New)
   - Nut (Drive sprocket)



Nut (Drive Sprocket):
70 Nm (7.0 m·kg, 50 ft·lb)

5. Install:
   - Crankcase cover (Left)
   - Shift arm



Bolts (Crankcase Cover – Left):
10 Nm (1.0 m·kg, 7.2 ft·lb)
Bolt (Shift Arm):
10 Nm (1.0 m·kg, 7.2 ft·lb)

6. Adjust:
   - Drive chain slack

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



Drive Chain Slack:
10 ~ 20 mm (0.4 ~ 0.8 in)

⚠ CAUTION:

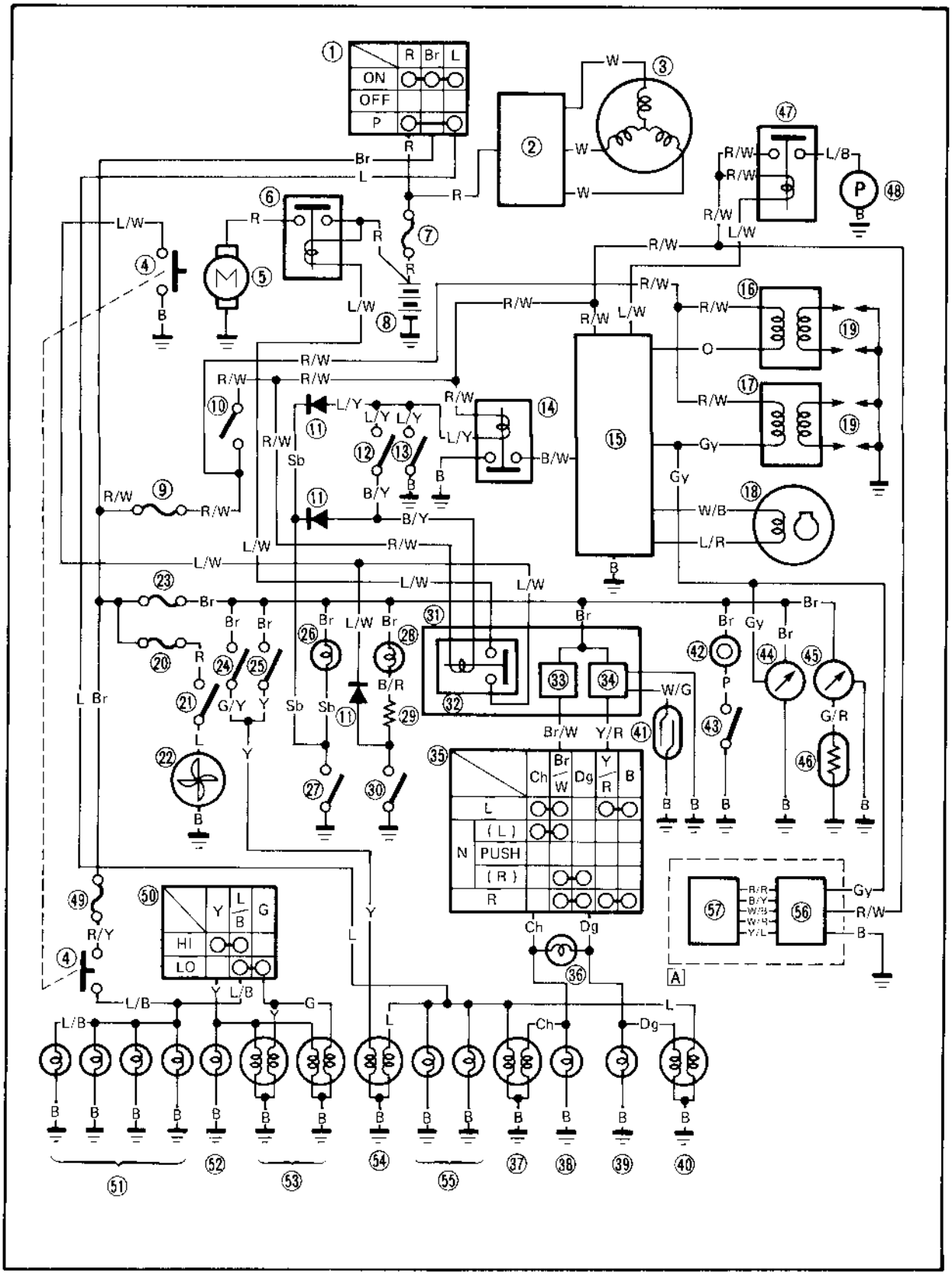
Too small chain slack will overload the engine and other vital parts; keep the slack within the specified limits.

⚠ WARNING:

Always use a new cotter pin on the axle nut.

ELECTRICAL

FZR400U/SUC CIRCUIT DIAGRAM



① Main switch
② Rectifier/Regulator
③ A.C. generator
④ "START" switch
⑤ Starter motor
⑥ Starter relay
⑦ Fuse "MAIN"
⑧ Battery
⑨ Fuse "IGNITION"
⑩ "ENGINE STOP" switch
⑪ Diode block
⑫ Clutch switch
⑬ Sidestand switch
⑭ Ignition circuit cut-off relay
⑮ Digital ignitor unit
⑯ Ignition coil (#1 and #4 cylinder)
⑰ Ignition coil (#2 and #3 cylinder)
⑱ Pickup coil
⑲ Spark plug
⑳ Fuse "FAN"
㉑ Thermo switch
㉒ Fan motor
㉓ Fuse "SIGNAL"
㉔ Front brake switch
㉕ Rear brake switch
㉖ "NEUTRAL" indicator light
㉗ Neutral switch
㉘ "OIL" indicator light
㉙ Resistor
㉚ Oil level switch
㉛ Relay assembly
㉜ Starting circuit cut-off relay
㉝ Flasher relay
㉞ Cancelling unit
㉟ "TURN" switch
㊱ "TURN" indicator light
㊲ Front position light/Flasher light (Left)
㊳ Rear flasher light (Left)
㊴ Rear flasher light (Right)
㊵ Front position light/Flasher light (Right)
㊶ Reed switch
㊷ Horn
㊸ "HORN" switch
㊹ Tachometer
㊺ Temp meter
㊻ Thermo unit
㊼ Fuel pump relay
㊽ Fuel pump
㊾ Fuse "HEAD"
㊿ "LIGHTS" (Dimmer) switch
(51) Meter light
(52) "HIGH BEAM" indicator light
(53) Headlight
(54) Tail/Brake light
(55) License light
(56) EXUP control unit
(57) EXUP servomotor

[A] For California only

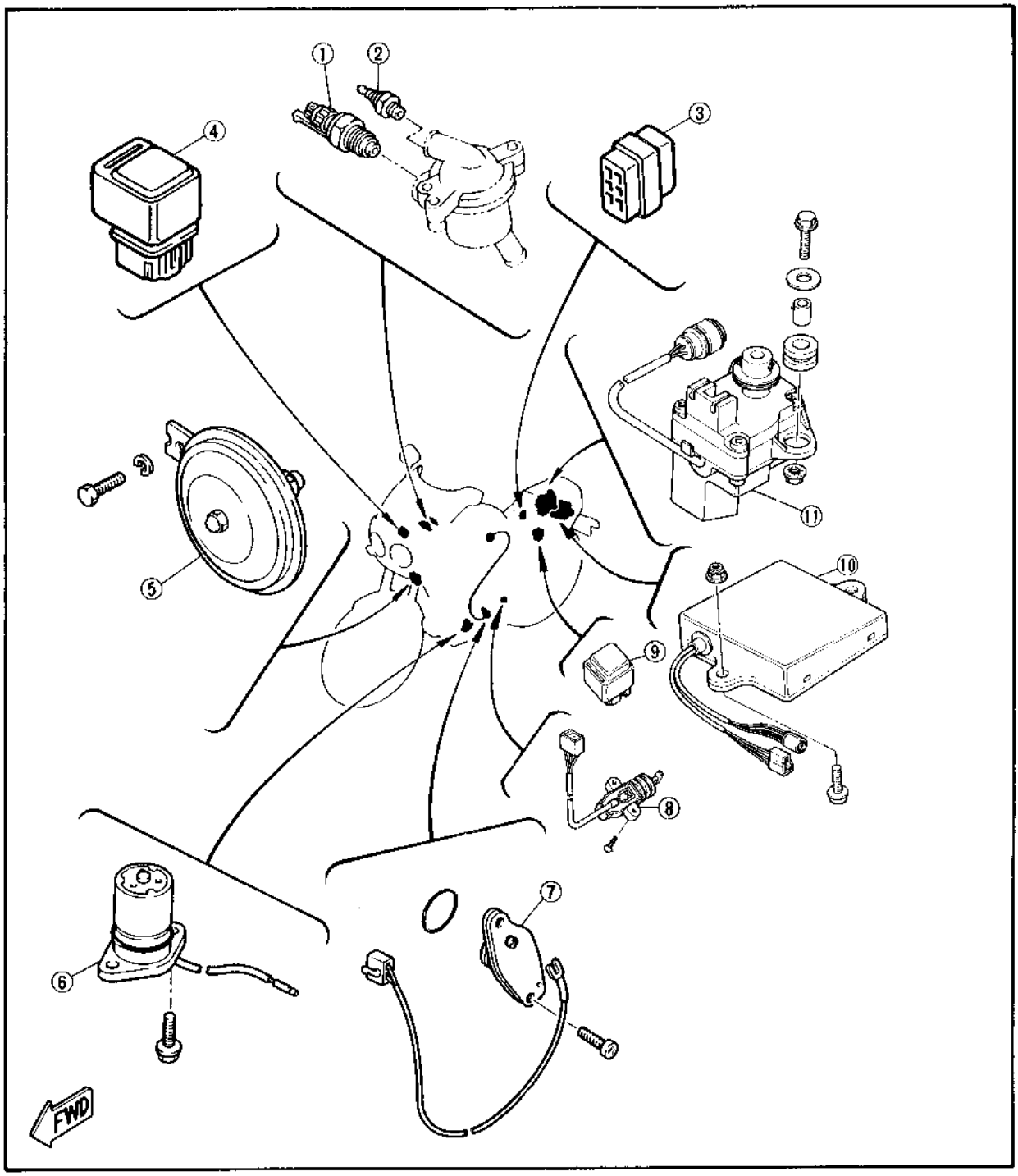
COLOR CODE

O	Orange	Y/R	Yellow/Red
R	Red	Br/W	Brown/White
L	Blue	R/W	Red/White
Br	Brown	R/Y	Red/Yellow
B	Black	B/R	Black/Red
Y	Yellow	B/W	Black/White
W	White	B/Y	Black/Yellow
G	Green	L/W	Blue/White
P	Pink	L/B	Blue/Black
Dg	Dark green	L/Y	Blue/Yellow
Ch	Chocolate	G/Y	Green/Yellow
Gy	Gray	W/R	White/Red
Sb	Sky blue	W/G	White/Green

ELECTRICAL COMPONENTS (1)

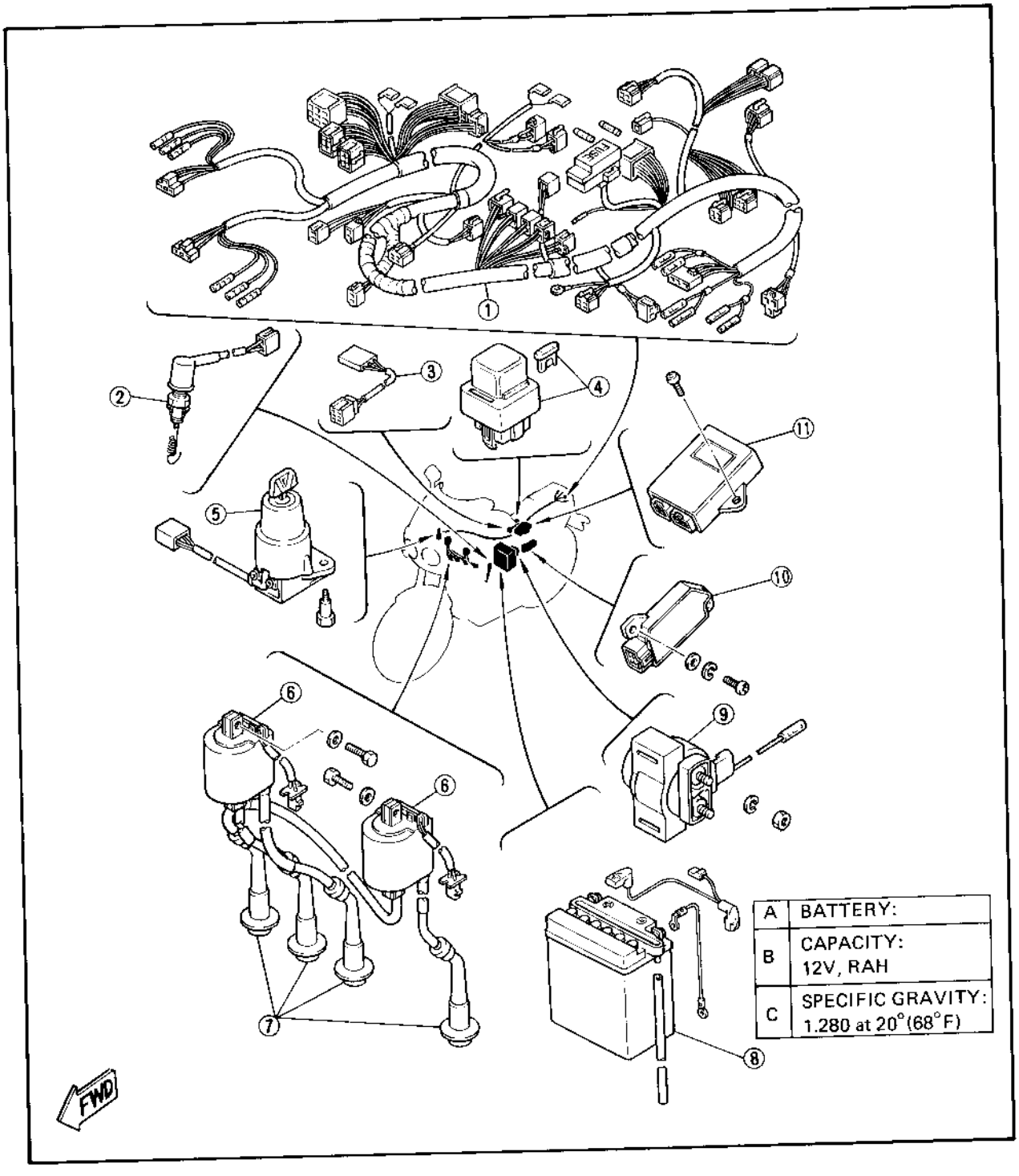
① Thermo switch
② Thermo unit
③ Relay assembly
④ Fuel pump relay
⑤ Horn
⑥ Oil level switch
⑦ Neutral switch
⑧ Sidestand switch
⑨ Sidestand relay
⑩ EXUP control unit (For California only)
⑪ EXUP servomotor (For California only)

SPECIFICATIONS	RESISTANCE
IGNITION COIL:	
PRIMARY	1.8 ~ 2.2Ω at 20°C (65°F)
SECONDARY	9.6 ~ 14.4 kΩ at 20°C (68°F)
PICKUP COIL:	85 ~ 115Ω at 20°C (68°F)



ELECTRICAL COMPONENTS (2)

① Wireharness
② Rear brake switch
③ Diode block
④ Fuse "MAIN"
⑤ Main switch
⑥ Ignition coil
⑦ Plug cap
⑧ Battery
⑨ Starter relay
⑩ Rectifier/Regulator
⑪ Digital ignitor unit



A	BATTERY:
B	CAPACITY: 12V, RAH
C	SPECIFIC GRAVITY: 1.280 at 20°(68°F)

CHECKING OF SWITCHES

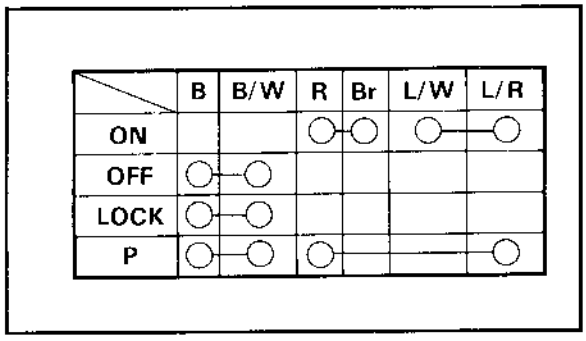
Check the switches for the continuity between the terminals to determine correct connection.

Read the following for switch inspection.

SWITCH CONNECTION AS SHOWN IN MANUAL

The manual contains a connection chart as shown left showing the terminal connections of the switches (e.g., main switch, handlebar switch, brake switch, lighting switch, etc.)

The extreme left column indicates the switch positions and the top line indicates the colors of leads connected with the terminals in the switch component.



"○—○" indicates the terminals between which there is a continuity of electricity; i.e., a closed circuit at the respective switch positions.

In this chart:
"R and Br" and "L/W and L/R" are continuous with the "ON" switch position.

"B and B/W" is continuous with the "OFF" switch position.

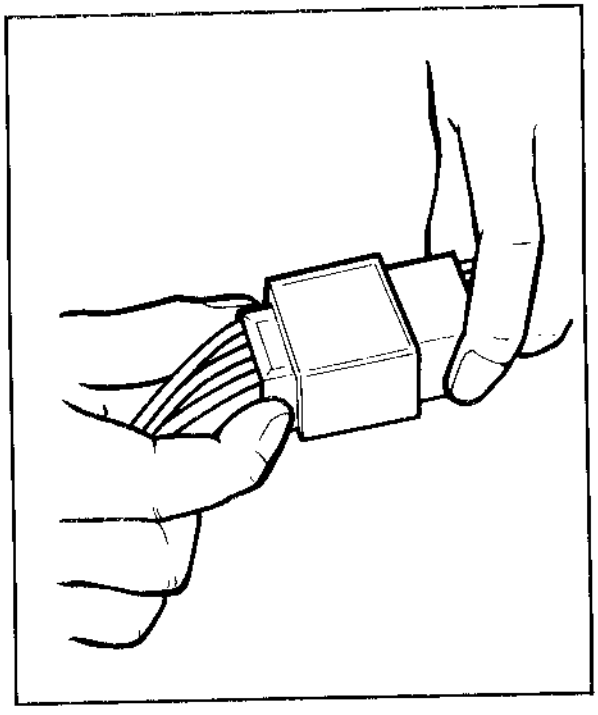
"B and B/W" is continuous with the "LOCK" switch position.

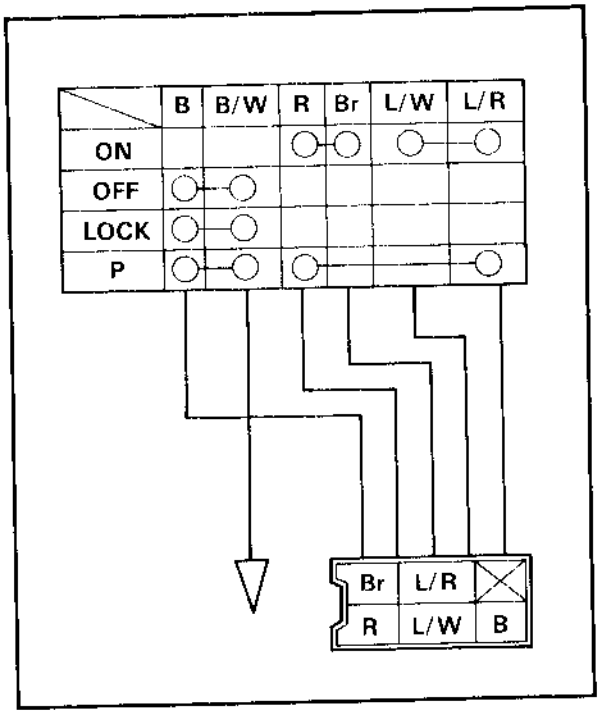
"B and B/W" and "R and L/R" are continuous with the "P" switch position.

CHECKING SWITCH FOR TERMINAL CONNECTION

Before checking the switch, refer to the connection chart as shown above and check for the correct terminal connection (closed circuit) by the color combination.

To explain how to check the switch, the main switch is taken for example in the following.





1. Disconnect the main switch coupler from the wireharness.

⚠ CAUTION:

Never disconnect the main switch coupler by pulling the leads. Otherwise, leads may be pulled off the terminals inside the coupler.

2. Inspect whether any lead is off the terminal inside the coupler. If it is, repair it.

NOTE:

If the coupler is clogged with mud or dust, blow it off by compressed air.

3. Use the connection chart to check the color combination for continuity (a closed circuit). In this example, the continuity is as follows.

   "R and Br" and "L/W and L/R" are continuous with the "ON" switch position.

   "B and B/W" is continuous with the "OFF" switch position.

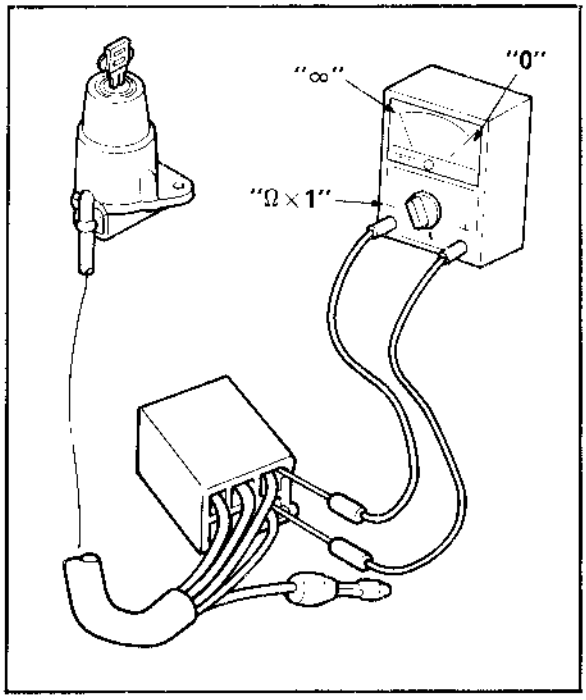
   "B and B/W" is continuous with the "LOCK" switch position.

   "B and B/W" and "R and L/R" are continuous with the "P" switch position.

   Please note that there is no continuity (an open circuit) at all for the color combinations other than the above.

4. Check the switch component for the continuity between "R and Br".

Checking steps:
- Turn the switch key to the "ON", "OFF", "LOCK", and "P" several times.
- Set the pocket tester selector to the "Ω × 1".
- Connect the tester (+) lead to the "R" lead terminal in the coupler and the (−) lead to the "Br" lead terminal.



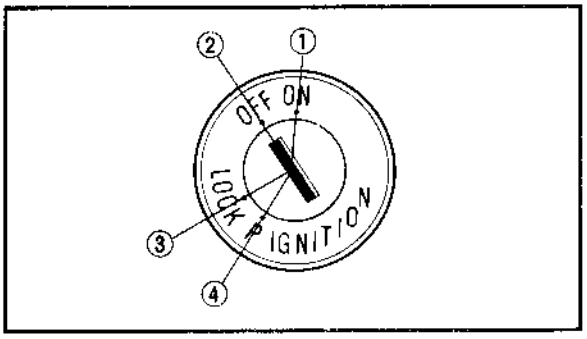
NOTE:

Use thin probes for checking the continuity. Otherwise, the probes may contact other terminals inside the coupler.

- Check the continuity between "R" and "Br" at the respective switch positions of "ON" ①, "OFF" ②, "LOCK" ③, and "P" ④. There must be continuity (the tester indicating "0") at the "ON" switch position, and there must be no continuity (the tester indicating "∞") at "OFF", "LOCK", or "P". There is something wrong between "R" and "Br" if there is no continuity at the "ON" position or if there is some continuity either at the "OFF" or "LOCK" or "P".

NOTE:

Check the switch for continuity several times.

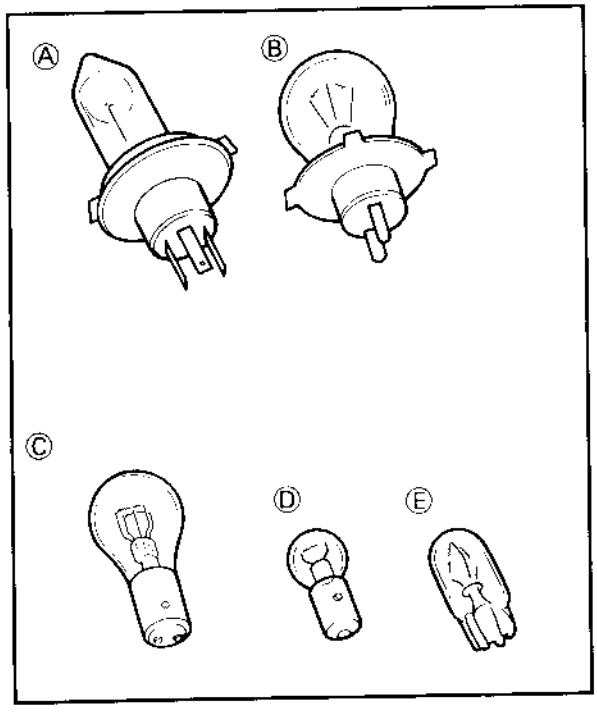


5. Next go on to checking of the continuity between "B and B/W", "L/W and L/R", and "R and L/R" at the respective switch positions, as in the same manner mentioned above.

6. If there is something wrong with any one of the combinations, replace the switch component.

CHECKING OF BULBS (FOR HEADLIGHT, TAIL/BRAKE LIGHT, FLASHER LIGHT, METER LIGHT, ETC.)

Check the bulb terminal continuity for the condition of the bulb.



KINDS OF BULBS

The bulbs used in the motorcycle are classified as shown left by the shape of the bulb socket.

Ⓐ and Ⓑ are mainly used for the headlight.

Ⓒ is mainly used for the flasher light and tail/brake light.

Ⓓ and Ⓔ are mainly used for the meter light and other indicator lights.

CHECKING BULB CONDITION

1. Remove the bulb.

NOTE:

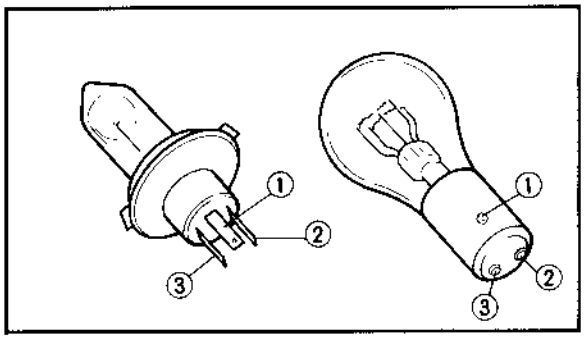
- Bulbs of the Ⓐ and Ⓑ type uses a bulb holder. Remove the bulb holder before removing the bulb itself. Most of the bulb holders for this type can be removed by turning them counterclockwise.
- Most of the bulbs of Ⓒ and Ⓓ type can be removed from the bulb sockets by pushing and turning them counterclockwise.
- Bulbs of the Ⓔ type can be removed from the bulb sockets by simply pulling them out.

⚠ CAUTION:

Be sure to hold the socket firmly when removing the bulb. Never pull the lead. Otherwise, the lead may be pulled off the terminal in the coupler.

⚠ WARNING:

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



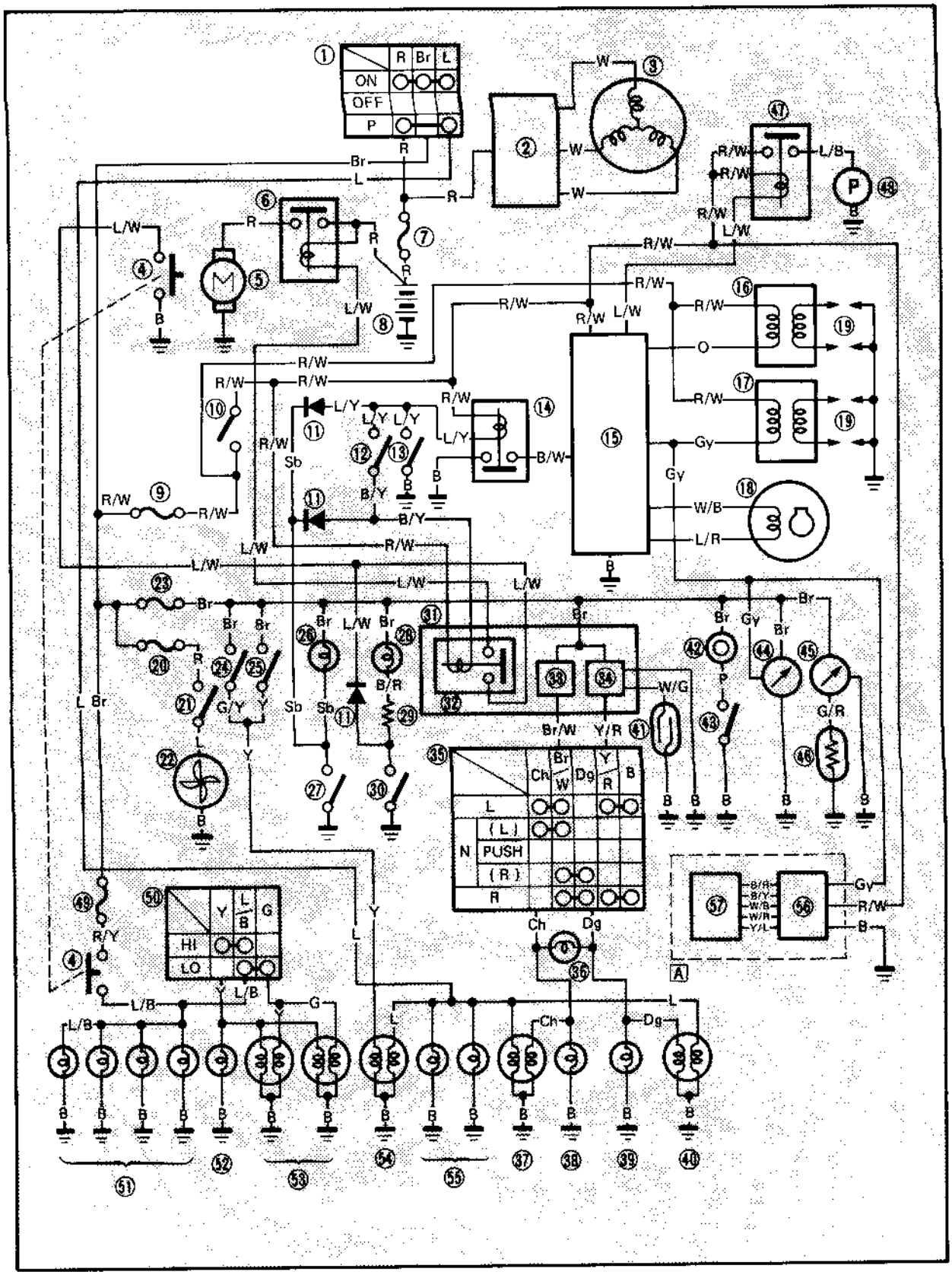
2. Check the bulb terminals for continuity.

Checking steps:
- Set the pocket tester selector to the "Ω × 1".
- Connect the tester leads to the respective bulb terminals. Take for example a 3-terminal bulb as shown left. First check the continuity between the ① and ② terminals by connecting the tester (+) lead to the ① terminal and the tester (−) lead to the ② terminal. Then check the continuity between the ① and ③ terminals by connecting the tester (+) lead still to the ① terminal and the tester (−) lead to the ③ terminal. If the tester shows "∞" in either case, replace the bulb.

3. Check the bulb socket by installing a proven bulb to it. As in the checking of bulbs, connect the pocket tester leads to the respective leads of the socket and check for continuity in the same manner as mentioned above.

IGNITION SYSTEM

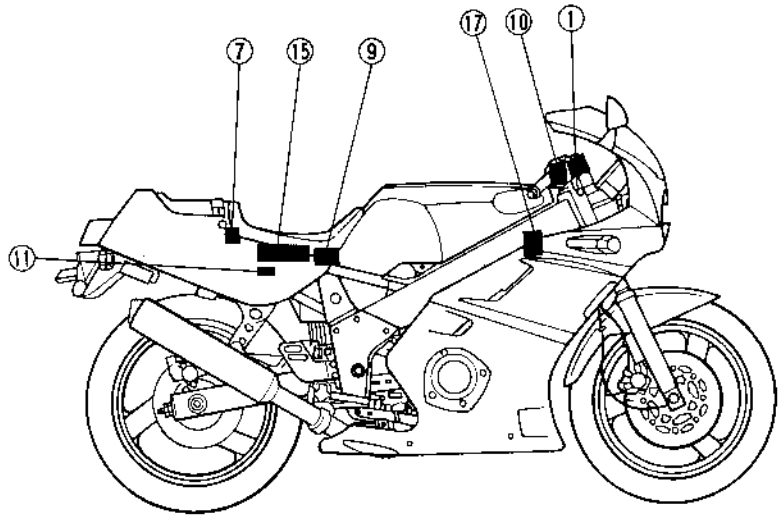
CIRCUIT DIAGRAM

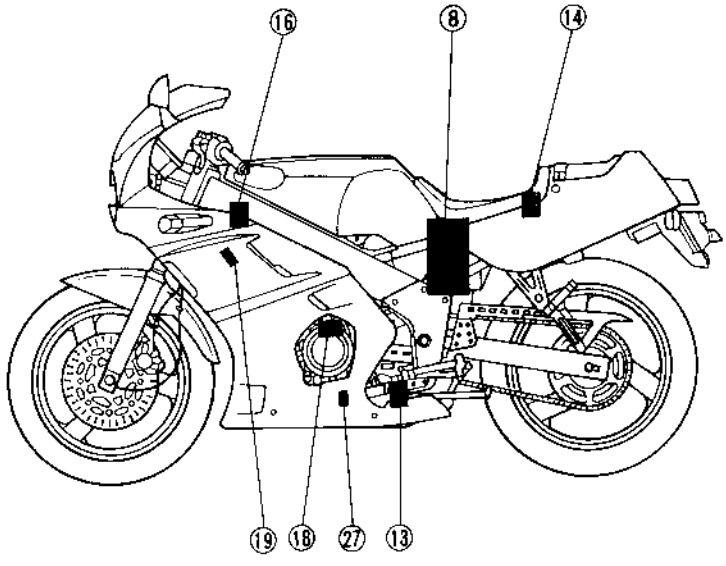


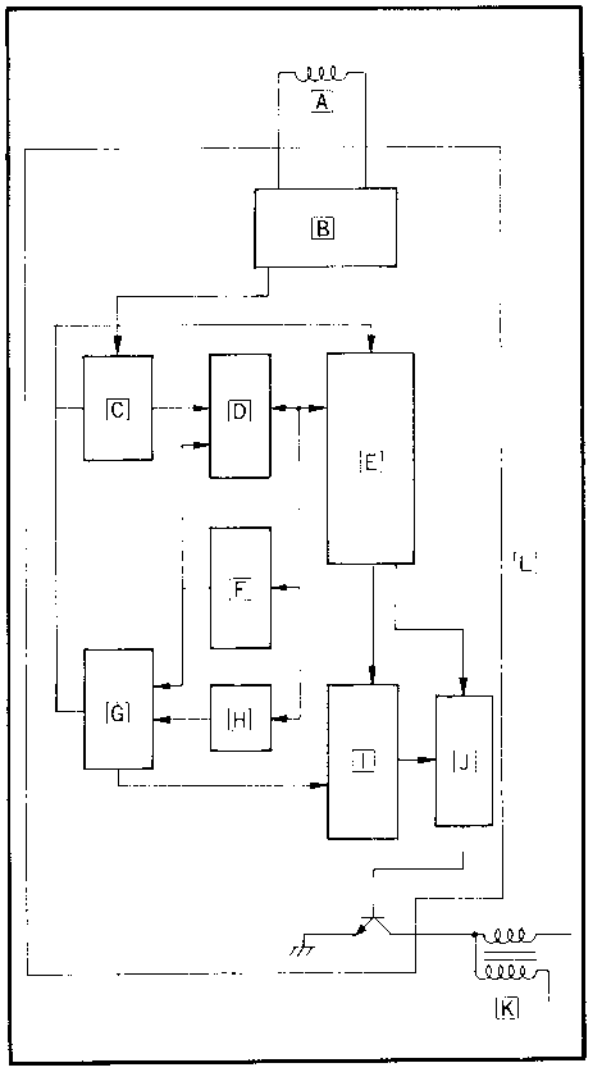
Aforementioned circuit diagram shows the ignition circuit in the wiring diagram.

NOTE:
For the color codes, see page 8-2.

① Main switch
⑦ Fuse "MAIN"
⑧ Battery
⑨ Fuse "IGNITION"
⑩ "ENGINE STOP" switch
⑪ Diode block
⑬ Sidestand switch
⑭ Sidestand relay
⑮ Digital ignitor unit
⑯ Ignition coil (#1 and #4 cylinder)
⑰ Ignition coil (#2 and #3 cylinder)
⑱ Pickup coil
⑲ Spark plug
㉗ Neutral switch







DIGITAL IGNITION CONTROL SYSTEM

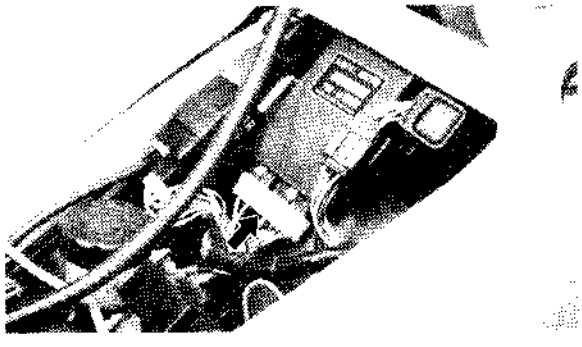
DESCRIPTION

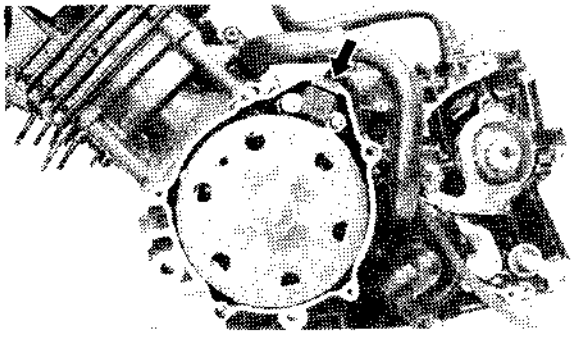
The electronic ignition that sparks the engine is computer controlled and operated by the digital microprocessor. It has a pre-programed ignition advance curve.

This programed advance curve closely matches the spark timing to the engine's ignition requirements. Only one pickup coil is needed to meet the requirements of the digital ignitor unit.

The digital ignitor also includes the control unit for the electric fuel pump.

[A] Pickup coil
[B] Wave-shape shaping circuit
[C] Edge detection circuit
[D] Latch circuit
[E] Microprocessor
[F] Free-running counter
[G] Comparison circuit
[H] Register
[I] Flip-flop circuit
[J] Driving circuit
[K] Ignition coil
[L] Digital ignitor unit





OPERATION

The following operations are digitally-performed by signal from the pickup coil signal:

1. Determing proper ignition timing.
2. Sensing the engine revolution speed.
3. Determing timing for switching on ignition coil (duty control).
4. Increasing ignition coil primary current for starting the engine.
5. Sensing engine stall.
6. Preventing over-revolution of the engine.

TROUBLESHOOTING

IF IGNITION SYSTEM SHOULD BECOME INOPERATIVE (NO SPARK OR INTERMITTENT SPARK)

Procedure

Check;

1. Fuse "MAIN"
2. Battery
3. Spark plug
4. Ignition spark gap
5. Spark plug cap resistance
6. Ignition coil resistance
7. Main switch
8. "ENGINE STOP" switch
9. Neutral switch
10. Sidestand switch
11. Sidestand relay
12. Pickup coil resistance
13. Wiring connection (Entire ignition system)

NOTE:

- Remove the following before troubleshooting.
  1) Seat
  2) Lower cowling
  3) Center cowling
  4) Top cover
  5) Air filter case
  6) Crankcase cover (Left)
- Use the following special tools in this troubleshooting.



Dynamic Spark Tester: P/N. YM-34487



Pocket Tester: P/N. YU-03112

1. Fuse "MAIN"

- Remove the fuse "MAIN".
- Connect the Pocket Tester (Ω x 1) to the fuse "MAIN".
- Check the fuse "MAIN" for continuity.

NON CONTINUITY → Replace fuse "MAIN".

CONTINUITY ↓

2. Battery

- Check the battery condition. Refer to the "BATTERY INSPECTION" section in the CHAPTER 3.

Specific Gravity: 1.280 at 20°C (68°F)

INCORRECT →
- Refill battery fluid.
- Clean battery terminals.
- Recharge or replace battery.

CORRECT ↓

*

*

3. Spark plug

- Check the spark plug condition.
- Check the spark type.
- Check the spark plug gap.
  Refer to the "SPARK PLUG INSPECTION" section in the CHAPTER 3.

Standard Spark Plug:
CR8E (NGK), U24ESR-N (N.D.)

Spark Plug Gap:
0.7 ~ 0.8 mm (0.028 ~ 0.032 in)

INCORRECT → Repair or replace spark plug.

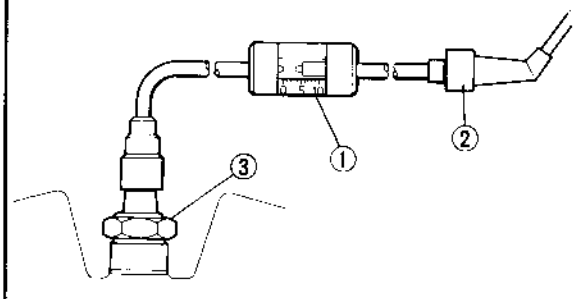
CORRECT

4. Ignition spark gap

- Disconnect the spark plug cap from spark plug.
- Connect the Dynamic Spark Tester ① as shown.

② Spark plug cap
③ Spark plug

- Turn the main switch to "ON".



- Check the ignition spark gap.
- Start engine, and increase spark gap until misfire occurs.

Minimum Spark Gap:
6.0 mm (0.24 in)

MEETS SPECIFICATION → Ignition system is good.

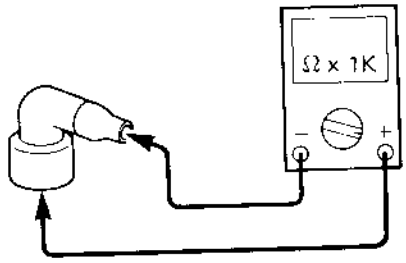
OUT OF SPECIFICATION OR NO SPARK

*

*

5. Spark plug cap resistance

- Remove the spark plug cap.
- Connect the Pocket Tester (Ω x 1k) to the spark plug cap.



- Check the spark plug cap for specificated resistance.

Spark Plug Cap Resistance:
9 ~ 11 kΩ at 20°C (68°F)

OUT OF SPECIFICATION

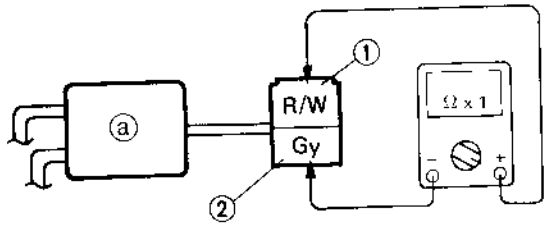
Replace spark plug cap.

MEETS SPECIFICATION

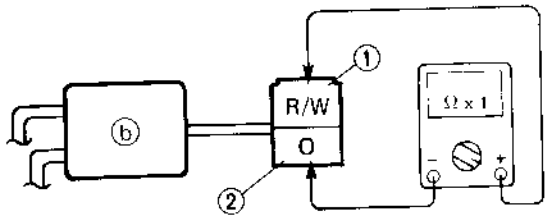
6. Ignition coil resistance

- Disconnect the ignition coil coupler from the wireharness.
- Connect the Pocket Tester (Ω x 1) to the ignition coil.

Ignition coil (Right) ⓐ :
Tester (+) lead → Red/White ① Terminal
Tester (–) lead → Gray ② Terminal



Ignition coil (Left) ⓑ :
Tester (+) lead → Red/White ① Terminal
Tester (–) lead → Orange ② Terminal

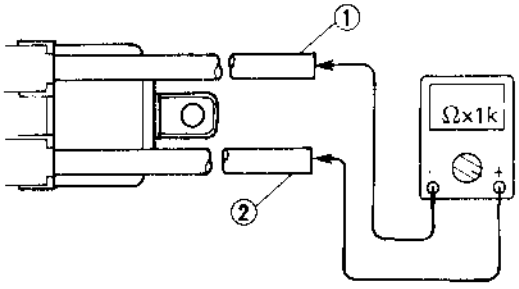


- Check the primary coil for specificated resistance.

Primary Coil Resistance:
1.8 ~ 2.2Ω at 20°C (68°F)

• Connect the Pocket Tester (Ω x 1k) to the ignition coil.

Tester (+) Lead → Spark Plug Lead ①
Tester (−) Lead → Spark Plug Lead ②



• Check the Secondary coil for specificated resistance.

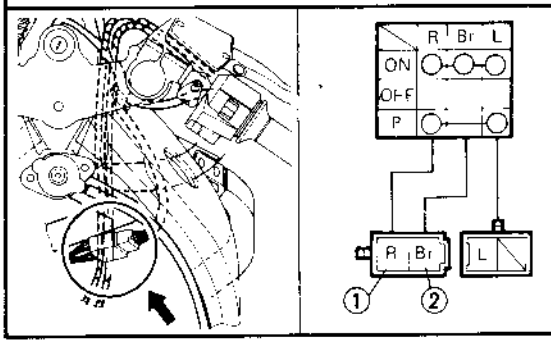
Secondary Coil Resistance:
9.6 ~ 14.4 kΩ at 20°C (68°F)
(Spark Plug Lead – Spark plug)

OUT OF SPECIFICATION → Replace ignition coil.

BOTH MEET SPECIFICATIONS

7. Main switch

• Disconnect the main switch coupler from the wire harness.
• Check the switch component for the continuity between "Red ① and Brown ② ". Refer to the "CHEKING OF SWITCHES" section.



INCORRECT → Replace main switch.

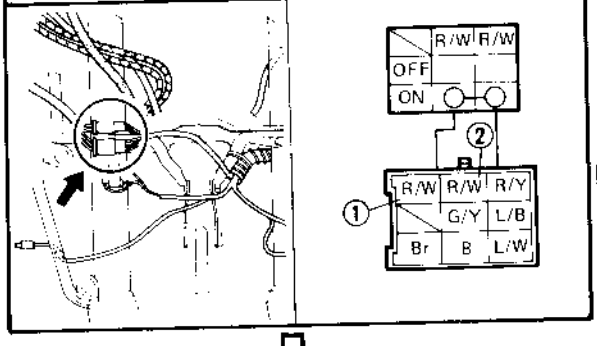
CORRECT

*

*

8. "ENGINE STOP" switch

- Disconnect the "ENGINE STOP" switch coupler from the wire harness.
- Check the switch component for the continuity between "Red/White ① and Red/-White ② ". Refer to the "CHECKING OF SWITCHES" section.

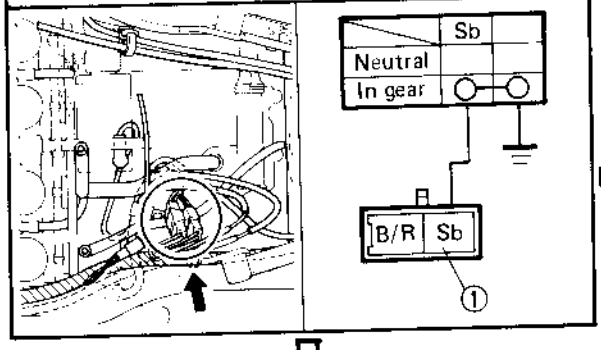


INCORRECT → Replace handlebar switch (Right).

CORRECT

9. Neutral switch

- Disconnect the neutral switch coupler from the wire harness.
- Check the switch component for the continuity between "Sky blue ① and Ground". Refer to the "CHECKING OF SWITCHES" section.



INCORRECT → Replace neutral switch.

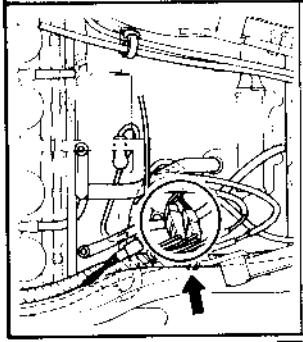
CORRECT

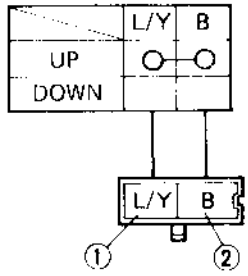
*

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10. Sidestand switch

- Disconnect the sidestand switch coupler from the wire harness.
- Check the switch component for the continuity between "Blue/Yellow ① and Black ② ". Refer to the "CHECKING OF SWITCHES" section.





INCORRECT

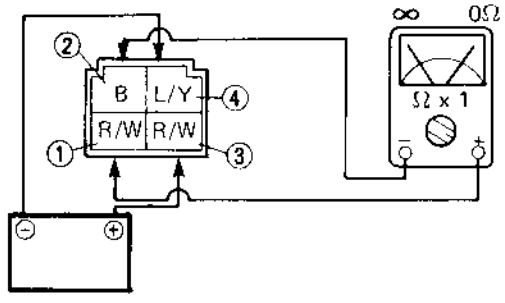
Replace sidestand switch.

CORRECT

11. Sidestand relay

- Disconnect the sidestand relay coupler from the wire harness.
- Connect the Pocket Tester (Ω x 1) and battery (12V) voltage to the sidestand relay coupler terminals.

Tester (+) Lead → Red/White ① Terminal
Tester (–) Lead → Black ② Terminal
Battery (+) Lead → Red/White ③ Terminal
Battery (–) Lead → Blue/Yellow ④ Terminal



- Check the relay for continuity.

NOCONTINUITY

Replace sidestand relay.

CONTINUITY

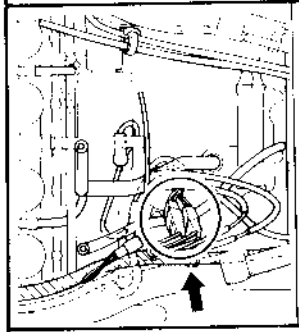
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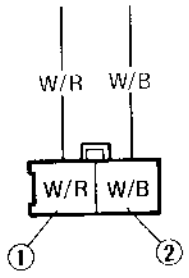
*

12. Pickup coil resistance

- Disconnect the A.C. magneto coupler from the wire harness.
- Connect the Pocket Tester (Ω x 100) to the pickup coil terminal.

Tester (+) Lead → White/Red ① Terminal
Tester (–) Lead → White/Black ② Terminal





- Check the pickup coil for specificated resistance.

Pickup Coil Resistance:
85 ~ 115Ω at 20°C (68°F)
(White/Red – White/Black)

OUT OF SPECIFICATION

Replace pickup coil.

MEET SPECIFICATION

3. Wiring connection

Check the entire ignition system for connections.
Refer to the "WIRING DIAGRAM" section.

POOR CONNECTION

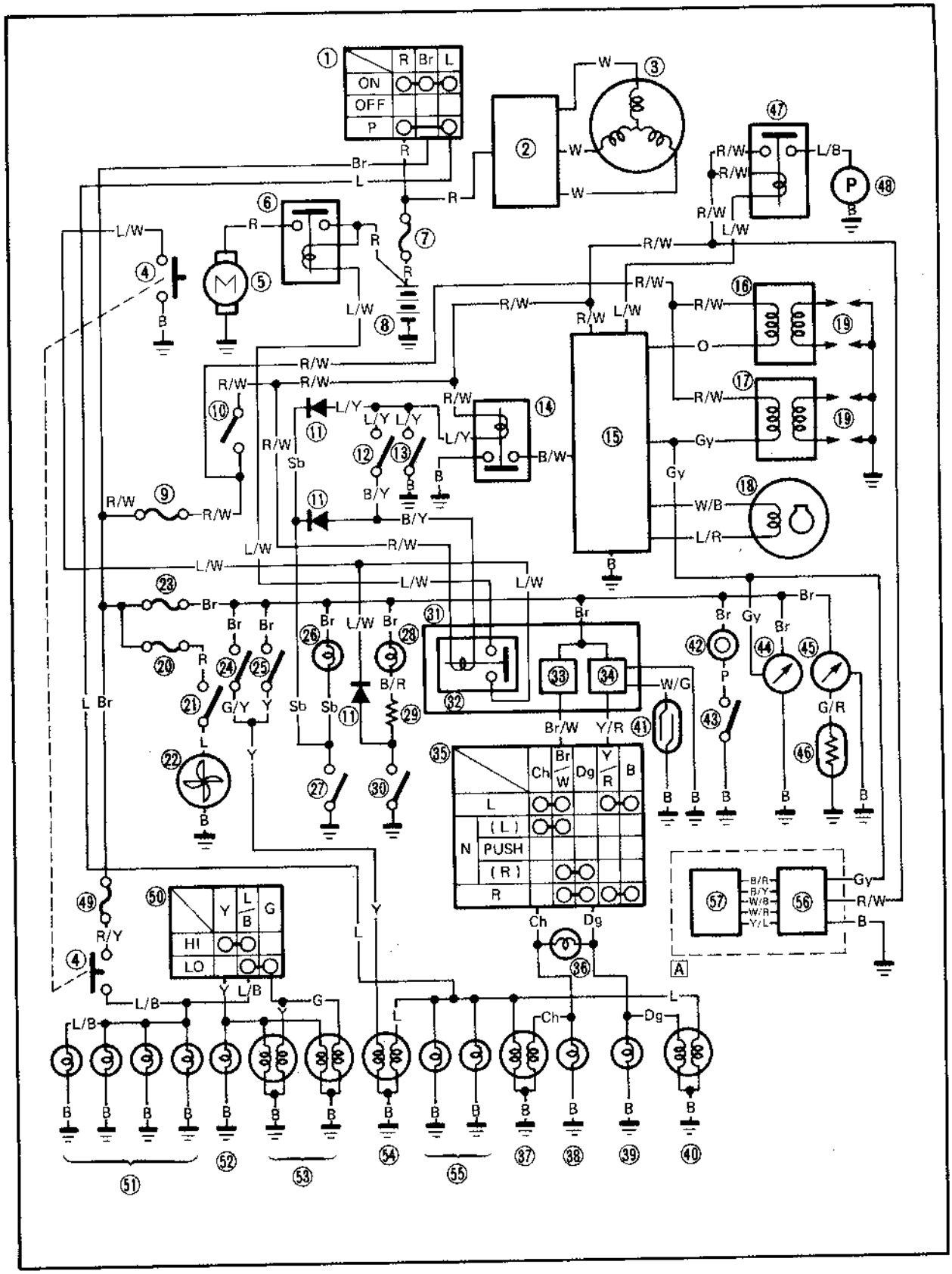
Correct.

CORRECT

Digital ignitor unit is faulty.
Replace the digital ignitor unit.

ELECTRIC STARTING SYSTEM

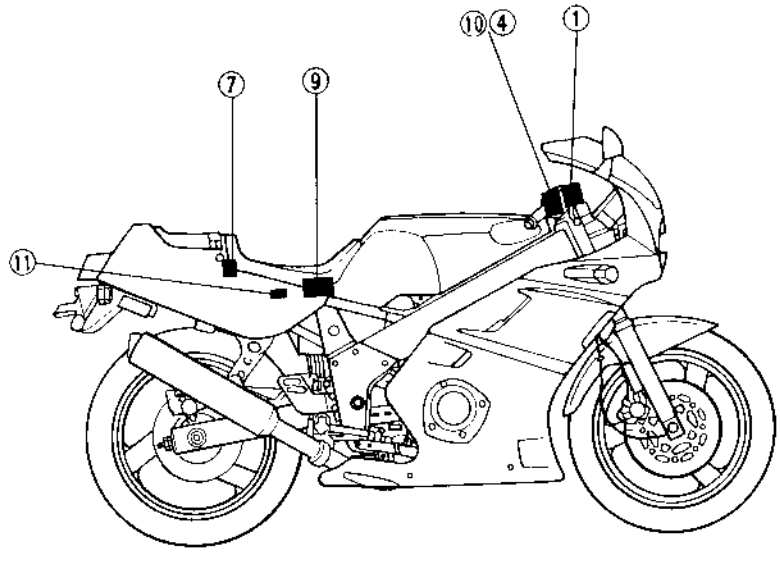
CIRCUIT DIAGRAM

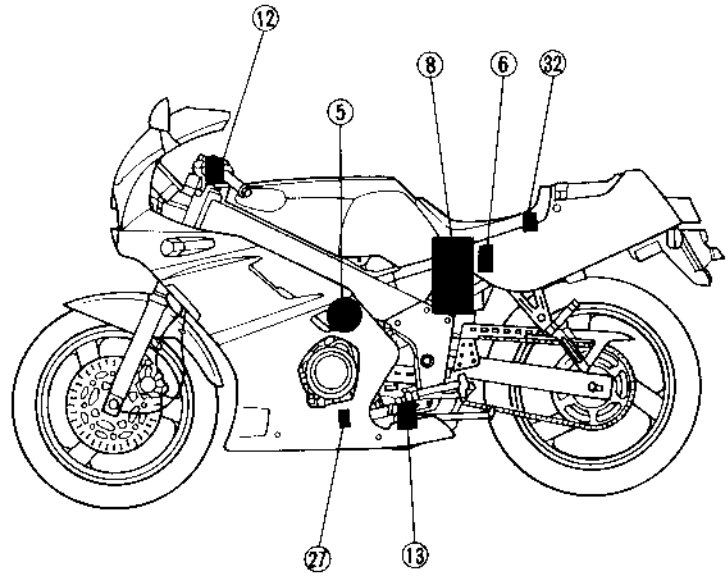


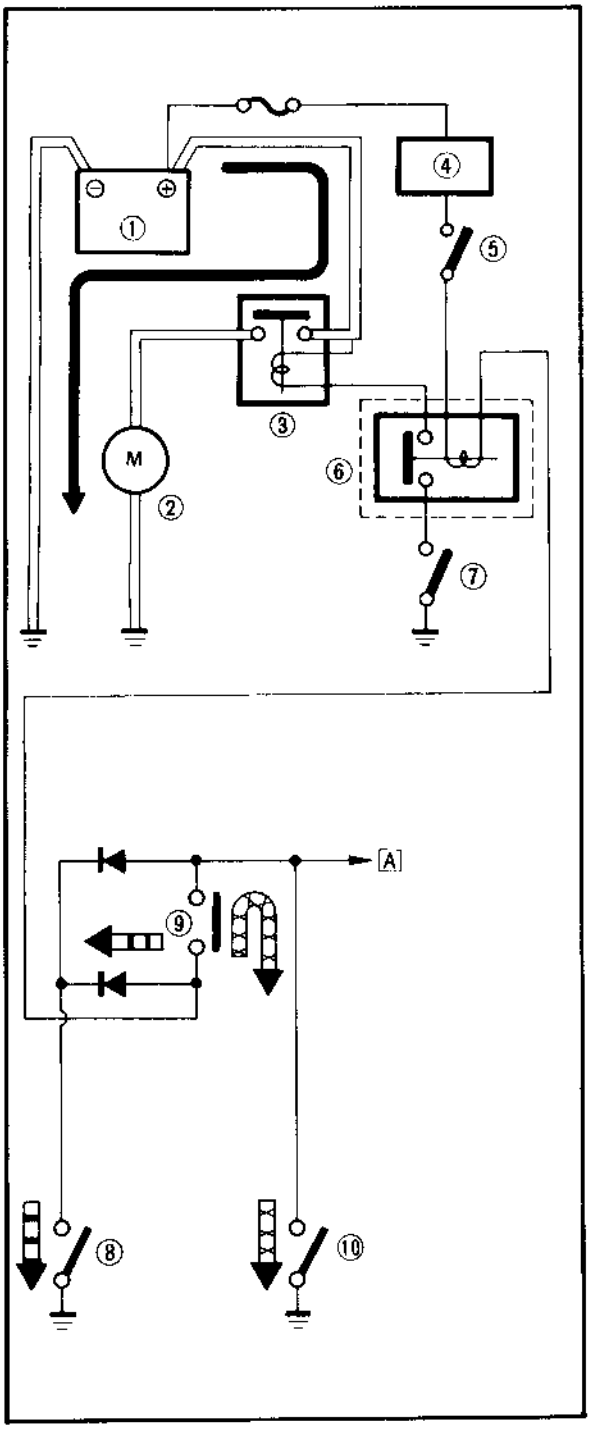
A forementioned circuit diagram shows the electric starting circuit in the wiring diagram.

NOTE:
For the color codes, see page 8-2.

① Main switch
④ "START" switch
⑤ Starter motor
⑥ Starter relay
⑦ Fuse "MAIN"
⑧ Battery
⑨ Fuse "IGNITION"
⑩ "ENGINE STOP" switch
⑪ Diode block
⑫ Clutch switch
⑬ Sidestand switch
㉗ Neutral switch
㉜ Starting circuit cut-off relay (Relay assembly ㉛)







STARTING CIRCUIT OPERATION

The starting circuit on this model consist of the starter motor, starter relay, and the relay unit (starting circuit cut-off relay). If the engine stop switch and the main switch are both closed, the starter motor can operate only if:

> The transmission is in neutral (the neutral switch is closed).
>
> **or if**
>
> The clutch lever is pulled to the handlebar (the clutch switch is closed) and the sidestand is up (the sidestand switch is closed.)

The starting circuit cut-off relay prevents the starter from operating when neither of these conditions has been met. In this instance, the starting circuit cut-off relay is open so current cannot reach the starter motor.

When one of both of the above conditions have been met, however, the starting circuit cut-off relay is closed, and the engine can be started by pressing the starter switch.

◀□□□ WHEN THE TRANSMISSION IS IN NEUTRAL
◀XXX WHEN THE SIDESTAND IS UP AND THE CLUTCH LEVER IS PULLED IN

① Battery
② Starter motor
③ Starter relay
④ Main switch
⑤ "ENGINE STOP" switch
⑥ Starting circuit cut-off relay
⑦ "START" switch
⑧ Neutral switch
⑨ Clutch switch
⑩ Sidestand switch

[A] To ignition circuit cut-off relay

TROUBLESHOOTING

STARTER MOTOR DOES NOT OPERATE.

Procedure

Check;

1. Fuse "MAIN"
2. Battery
3. Starter motor
4. Starter relay
5. Starting circuit cut-off relay
6. Main switch
7. "ENGINE STOP" switch
8. Neutral switch
9. Sidestand switch
10. Clutch switch
11. "START" switch
12. Wiring connection
    (Entire electric starting system)

NOTE:

Remove the following before troubleshooting.

1) Seat
2) Seat cowling
3) Lower cowling
4) Fuel tank

- Use the following special tool in this troubleshooting.



Pocket Tester:
P/N. YU-03112

1. Fuse "MAIN"

- Remove the fuse "MAIN".
- Connect the Pocket Tester (Ω x 1) to the fuse "MAIN".
- Check the fuse "MAIN" for continuity.

NON CONTINUITY → Replace fuse "MAIN".

CONTINUITY ↓

2. Battery

Check the battery condition.
Refer to the "BATTERY INSPECTION" section in the CHAPTER 3.

Specific Gravity:
1.280 at 20°C (68°F)

INCORRECT → • Refill battery fluid. • Clean battery terminals. • Recharge or replace battery.

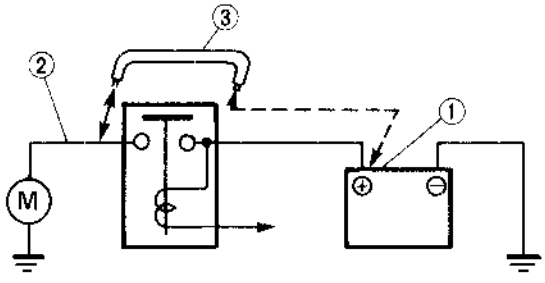
CORRECT ↓

*

*

3. Starter motor

- Connect the battery positive terminal ① and starter motor cable ② using the jumper lead ③ * as shown.



- Check the starter motor operation.

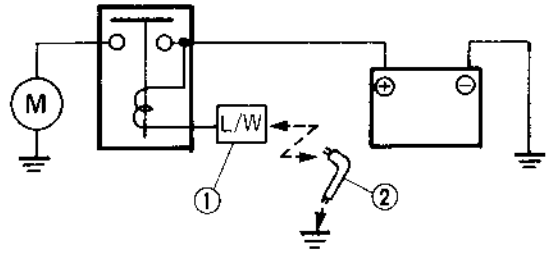
NO OPERATIVE

Repair or replace starter motor.

OPERATIVE

4. Starter relay

- Disconnect the starter relay lead.
- Ground the starter relay lead ① to the frame using the jumper lead ② as shown.



- Check the starter motor operation.

NO OPERATIVE

Replace starter relay.

OPERATIVE

5. Starting circuit cut-off relay

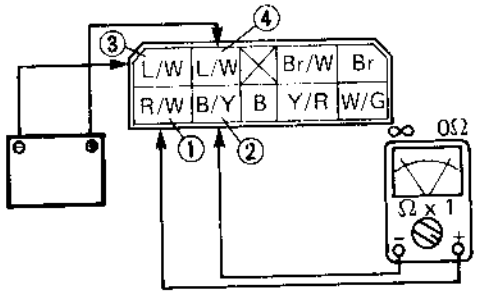
- Disconnect the relay assembly coupler from the wire harness.
- Connect the pocket tester (Ω x 1) and battery (12V) voltage to the relay assembly coupler terminals.

*

⚠ WARNING:

- **A wire for the jumper lead must have the equivalent capacity as that of the battery lead or more, otherwise it may cause the jumper lead to be burned.**
- **This check is likely to produce sparks, so be sure that no flammable gas or fluid is in the vicinity.**

Tester (+) Lead → Red/White ① Terminal
Tester (–) Lead → Black/Yellow ② Terminal
Tester (+) Lead → Blue/White ③ Terminal
Tester (–) Lead → Blue/White ④ Terminal



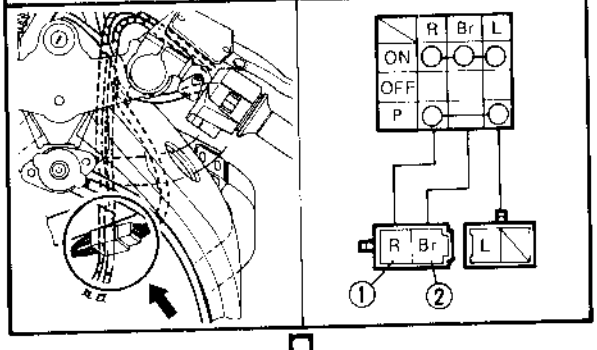
- Check the starting circuit cut-off relay for continuity.

NO CONTINUITY → Replace relay assembly.

CONTINUITY ↓

6. Main switch

- Disconnect the main switch coupler and lead from the wire harness.
- Check the switch component for the continuity between "Red ① and Brown ② ". Refer to the "CHECKING OF SWITCHES" section.

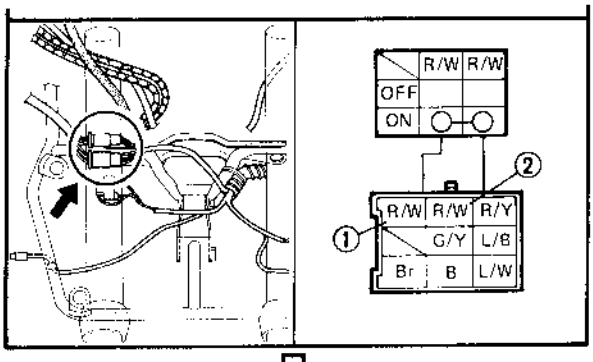


INCORRECT → Replace main switch.

CORRECT ↓

7. "ENGINE STOP" switch

- Disconnect the "ENGINE STOP" switch coupler from the wire harness.
- Check the switch component for the continuity between "Red/White ① and Red/White ② ". Refer to the "CHECKING OF SWITCHES" section.



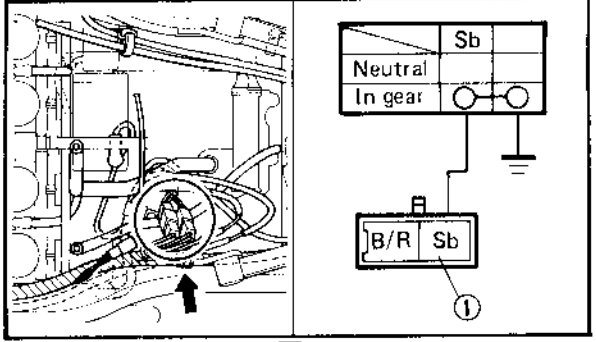
INCORRECT

Replace handlebar switch (Right).

CORRECT

8. Neutral switch

- Disconnect the neutral switch coupler from the wire harness.
- Check the switch component for the continuity between "Sky blue ① and Ground". Refer to the "CHECKING OF SWITCHES" section.



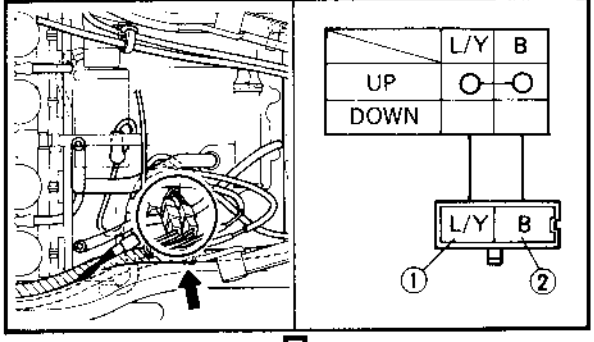
INCORRECT

Replace neutral switch.

CORRECT

9. Sidestand switch

- Disconnect the sidestand switch coupler from the wire harness.
- Check the switch component for the continuity between "Blue/Yellow ① and Black ② ". Refer to the "CHECKING OF SWITCHES" section.



INCORRECT

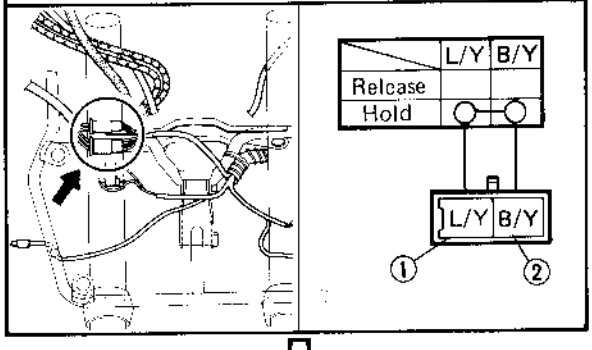
Replace sidestand switch.

CORRECT

*

10. Clutch switch

- Disconnect the clutch switch coupler from wire harness.
- Check the switch component for the continuity between "Blue/Yellow ① and Black/-Yellow ② ". Refer to the "CHECKING OF SWITCHES" section.

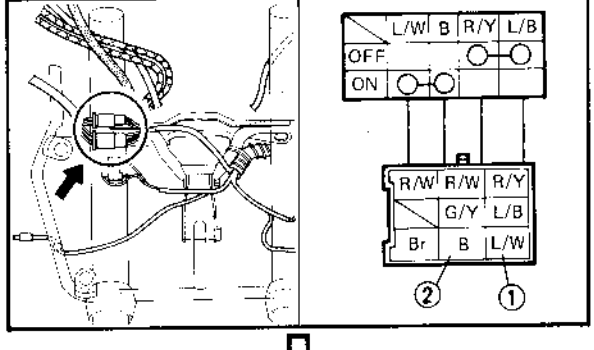


INCORRECT → Replace clutch switch.

CORRECT

11. "START" switch

- Disconnect the "START" switch coupler from wire harness.
- Check the "START" switch component for the continuity between "Blue/White ① and Black ②. ". Refer to the "CHECKING OF SWITCHES" section.



INCORRECT → Replace handlebar switch (Right).

CORRECT

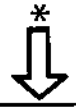
12. Wiring connection

Check the entire ignition system for connections.
Refer to the "WIRING DIAGRAM" section.

POOR CONNECTION → Correct.

OK

*

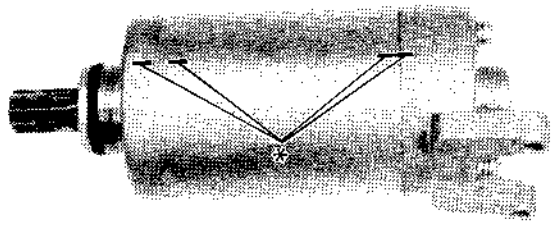


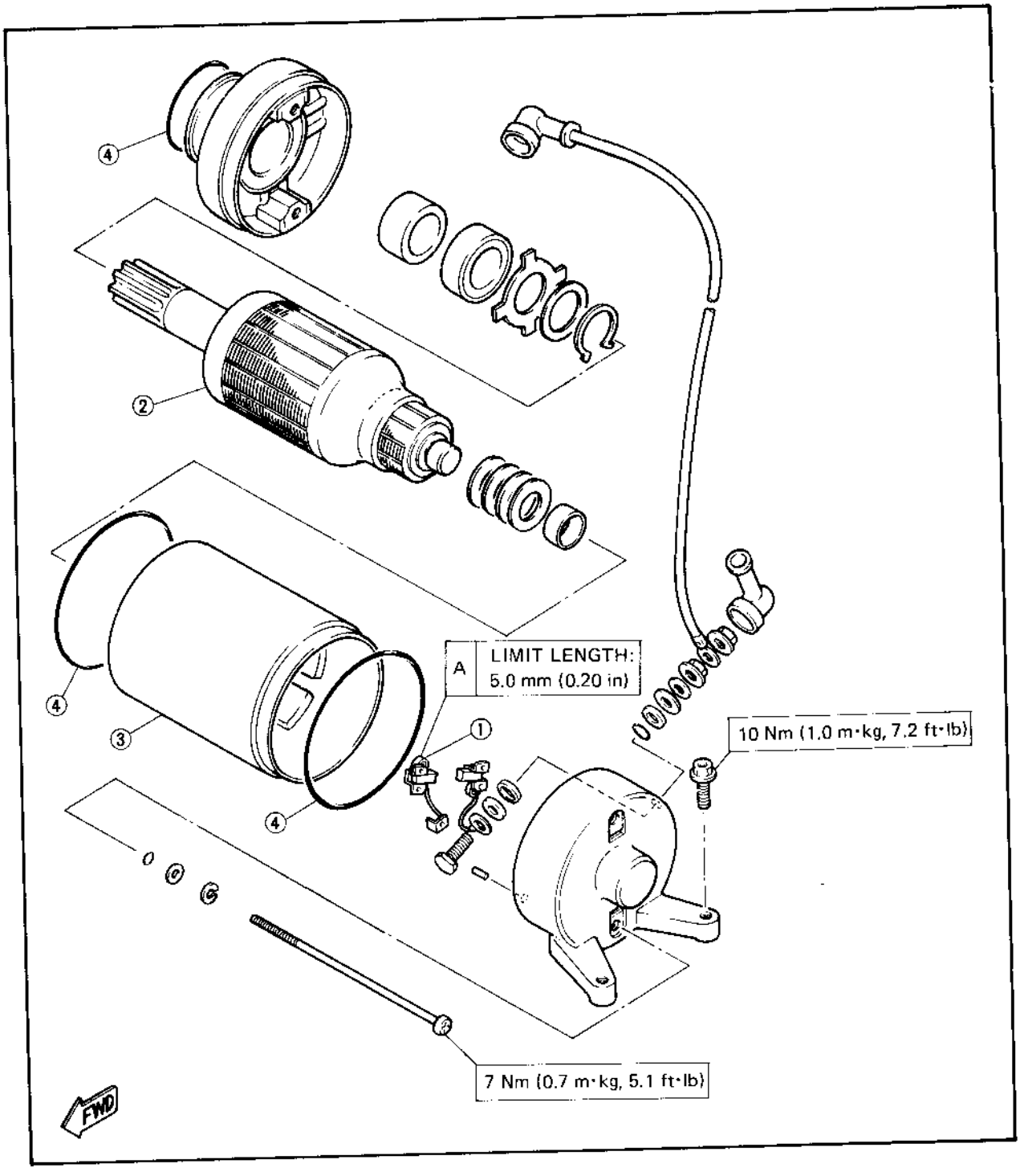
Diode block is faulty.
Replace the diode block.

STARTER MOTOR

① Brush
② Armature
③ Stator
④ O-ring

* MATCH MARKS

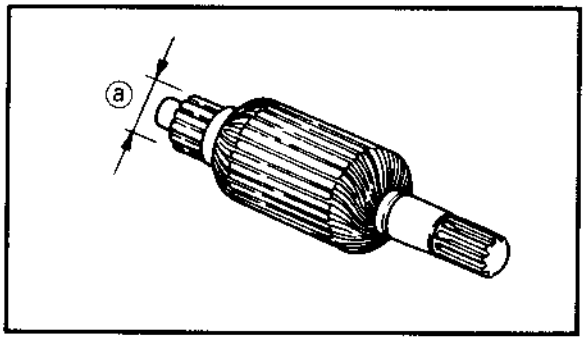


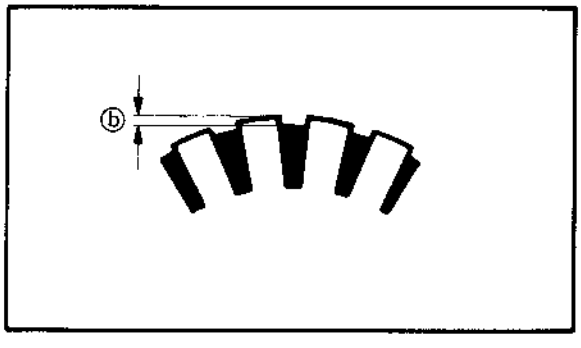


Removal

1. Remove:
   - Starter motor

   Refer to the "ENGINE OVERHAUL – ENGINE REMOVAL" section in the CHAPTER 4.





Inspection and Repair

1. Inspect:
   - Commutator

   Dirty → Clean it with #600 grit sandpaper.
2. Measure:
   - Commutator diameter ⓐ

   Out of specification → Replace starter motor.

Commutator Wear Limit ⓐ :
22 mm (0.87 in)

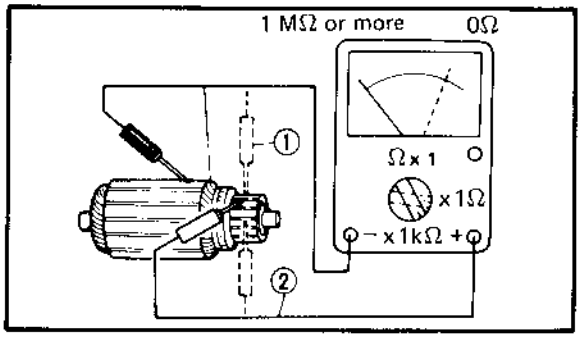
3. Measure:
   - Mica undercut ⓑ

   Out of specification → Scrape the mica to proper value use a hacksaw blade can be ground to fit.

Mica Undercut ⓑ :
1.8 mm (0.07 in)

NOTE:

The mica insulation of the commutator must be undercut to ensure proper operation of commutator.



4. Inspect:
   - Armature coil (insulation/continuity)

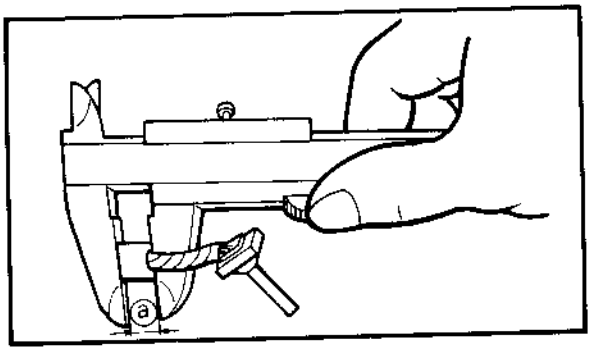
   Defects(s) → Replace starter motor.

Armature coil inspecting steps:
- Connect the Pocket Tester for continuity check ① and insulation check ② .
- Measure the armautre resistances.

Armature Coil Resistance:
Continuity Check ① :
0Ω at 20°C (68°F)
Insulation Check ② :
More than 1MΩ at 20°C (68°F)

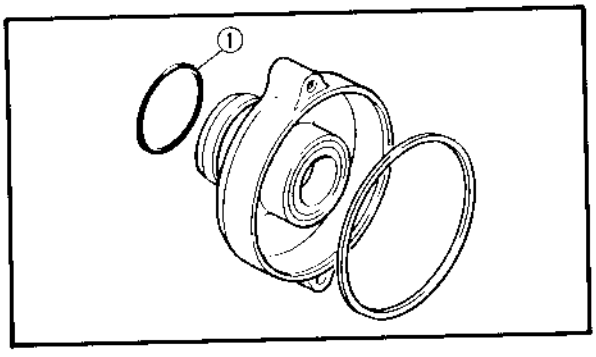
- If the resistance is incorrect, replace the starter motor.

5. Measure:
   - Brush length ⓐ
     Out of specification → Replace.



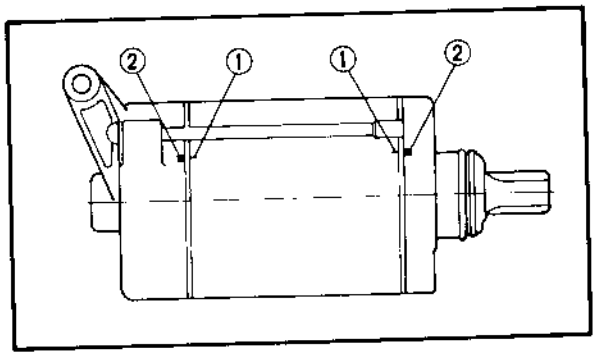
Brush Length Limit:
5.0 mm (0.20 in)

6. Measure:
   - Brush spring pressure
     Fatigue/Out of specification → Replace as a set.



Brush Spring Pressure:
540 ~ 660 g (19.05 ~ 23.28 oz)

7. Inspect:
   - Bearing
   - Oil seal
   - O-rings ①
     Wear/Damage → Replace.



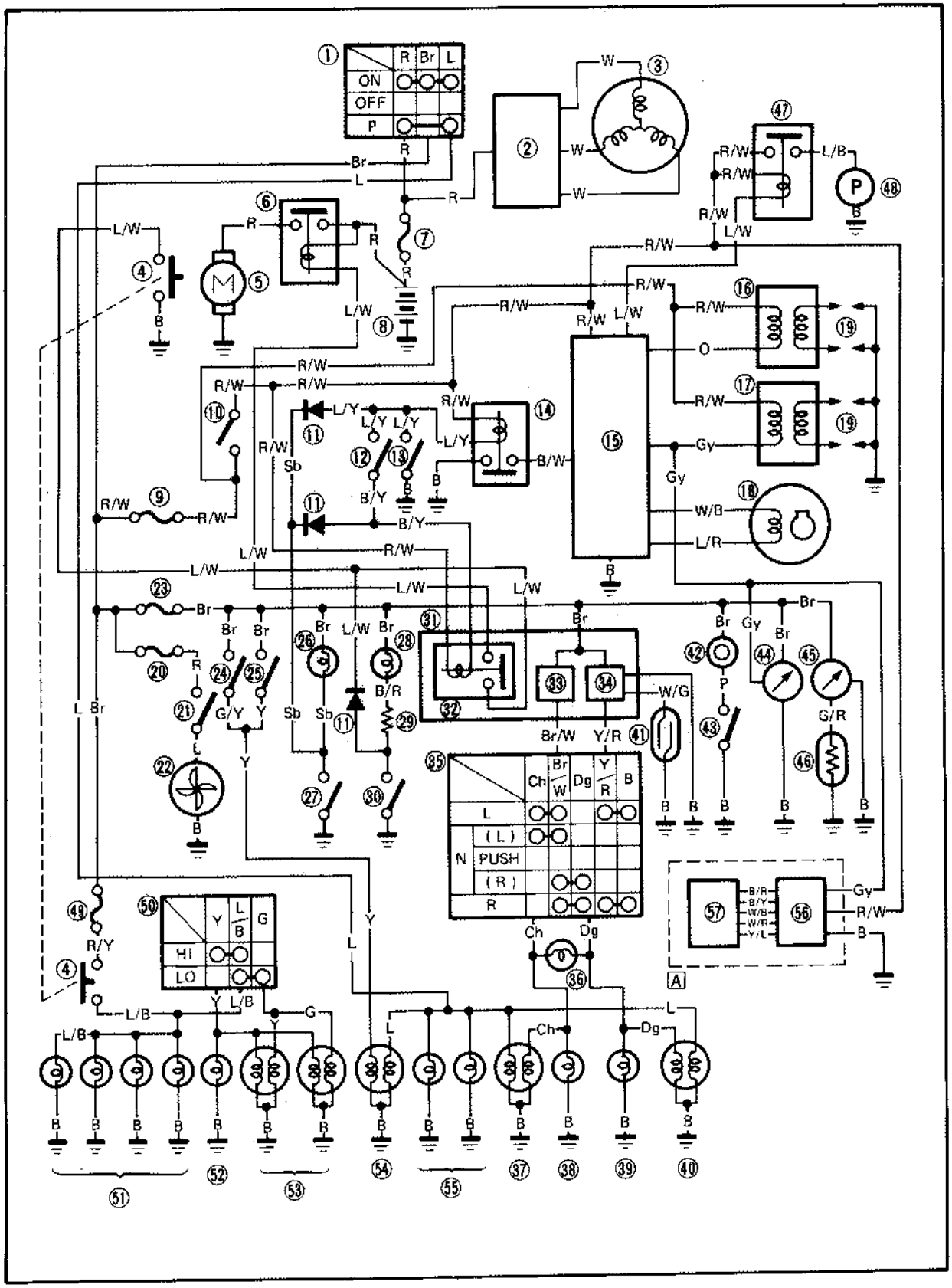
Installation

1. Install:
   - Starter motor

NOTE:
Align the match marks ① on the bracket with the match marks ② on the housing.

CHARGING SYSTEM

CIRCUIT DIAGRAM

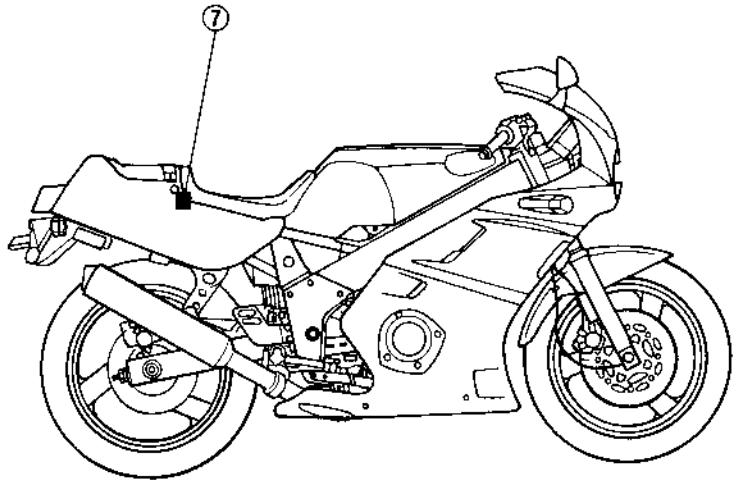


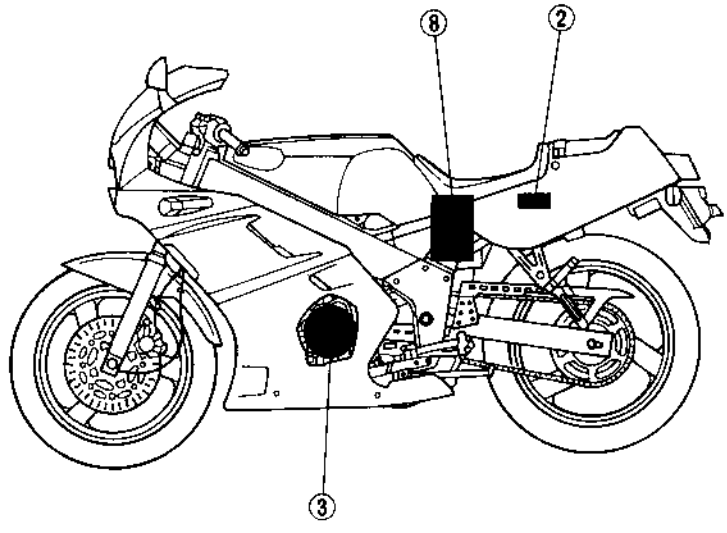
Aforementioned circuit diagram show the charging circuit in the wiring diagram.

NOTE:

For the color codes, see page 8-2.

② Rectifier/Regulator
③ A.C. generator
⑦ Fuse "MAIN"
⑧ Battery





TROUBLESHOOTING

THE BATTERY IS NOT CHARGED.

Procedure

Check;

1. Fuse "MAIN"
2. Battery
3. Charge voltage
4. Stator coil resistance
5. Wiring connection
   (Entire charging system)

NOTE:

- Remove the following parts before troubleshooting.
  1) Seat
  2) Seat colwing
  3) Top cover
  4) Fuel tank
  5) Lower cowling
- Use the following special tools in this troubleshooting.



Inductive Tachometer:
P/N. YU-08036



Pocket Tester:
P/N. YU-03112

1. Fuse "MAIN"
   - Remove the fuse "MAIN".
   - Connect the Pocket Tester (Ω x 1) to the fuse "MAIN".
   - Check the fuse "MAIN" for continuity.

NO CONTINUITY → Replace fuse "MAIN".

CONTINUITY ↓

2. Battery
   Check the battery condition.
   Refer to the "BATTERY INSPECTION" section in the CHAPTER 3.

   Specific Gravity:
   1.280 at 20°C (68°F)

INCORRECT →
- Refill battery fluid.
- Clean battery terminals.
- Recharge or replace battery.

CORRECT ↓

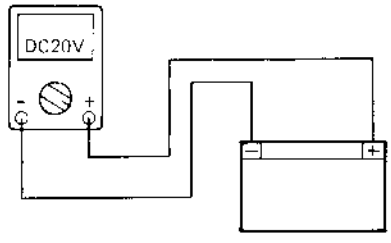
*

*

3. Charge voltage

- Connect the Inductive Tachometer to spark plug lead.
- Connect the Pocket Tester (DC20V) to the battery.

Tester (+) Lead → Battery (+) Terminal
Tester (—) Lead → Battery (—) Terminal



- Start the engine and accelerate to about, 3,000 r/min.
- Check charging voltage.

Charging Voltage:
14.3 ~ 15.3V at 3,000 r/min

MEETS SPECIFICATION → Replace battery.

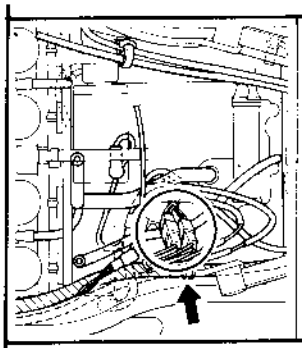
OUT OF SPECIFICATION

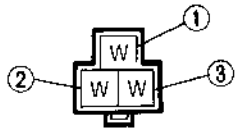
4. Stator coil resistance

- Disconnect the A.C. magneto coupler from the wire harness.
- Connect the Pocket Tester (Ω x 1) to the stator coil leads.

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





• Check the stator coil for specificated 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)

OUT OF SPECIFICATION

Replace stator coil.

BOTH RESISTANCES MEET SPECIFICATIONS

5.Wiring connection

Check the entire charging system for connections.
Refer to the "WIRING DIAGRAM" section.

POOR CONNECTION

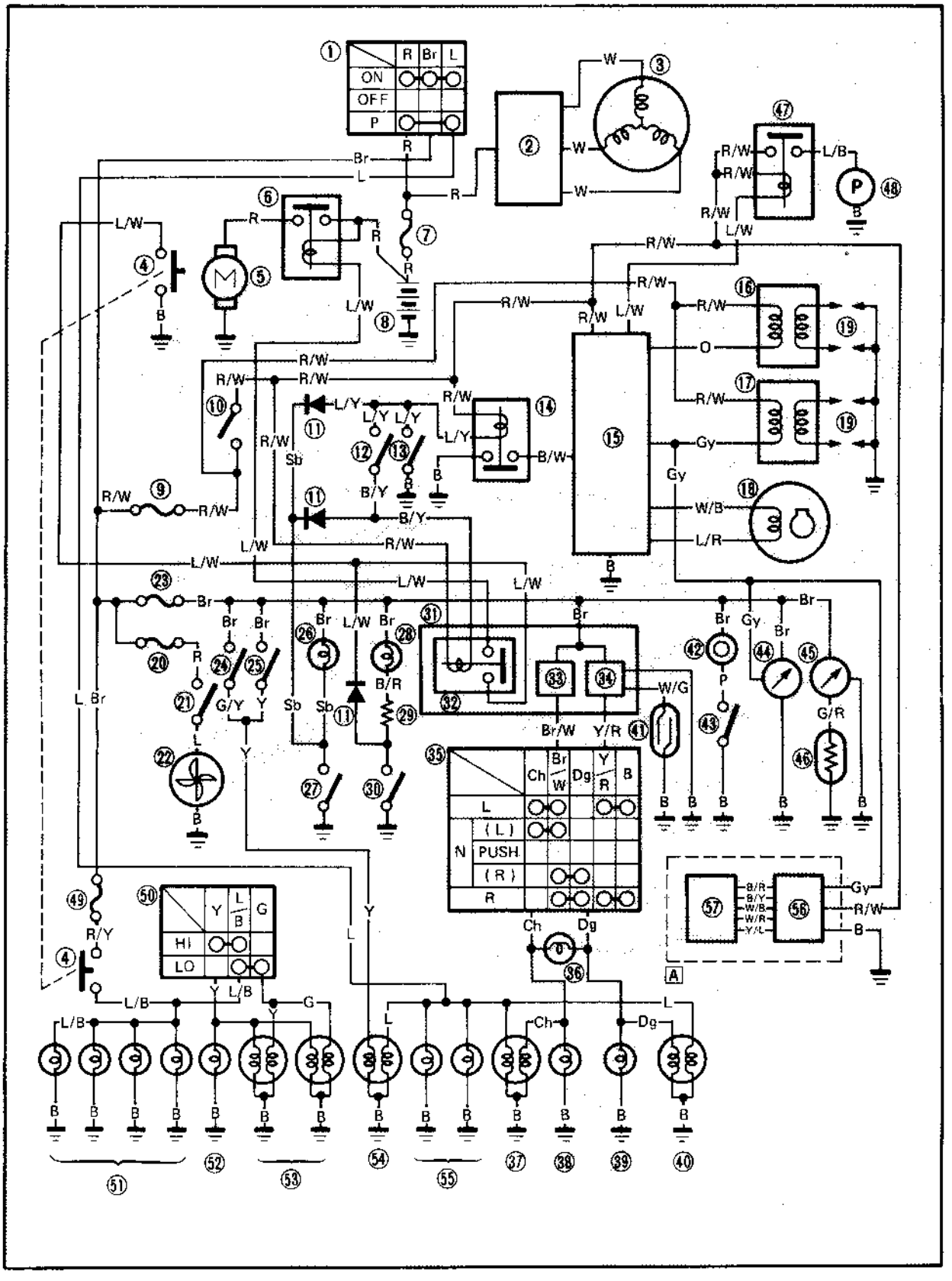
Correct.

CORRECT

Replace rectifier/regulator.

LIGHTING SYSTEM

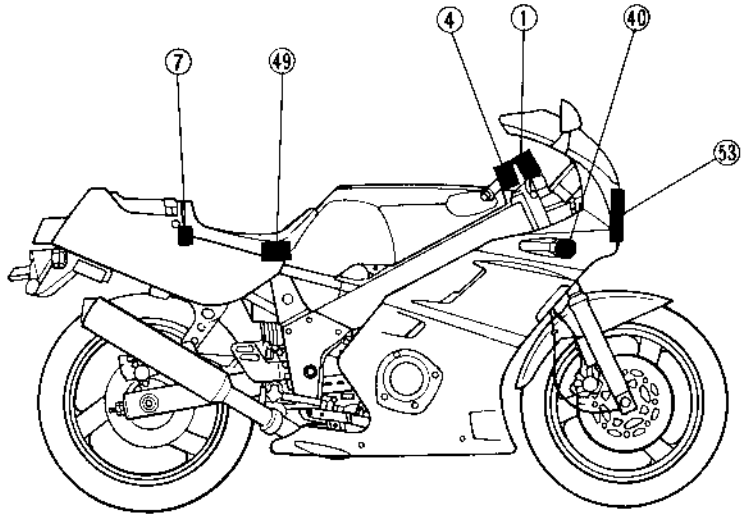
CIRCUIT DIAGRAM

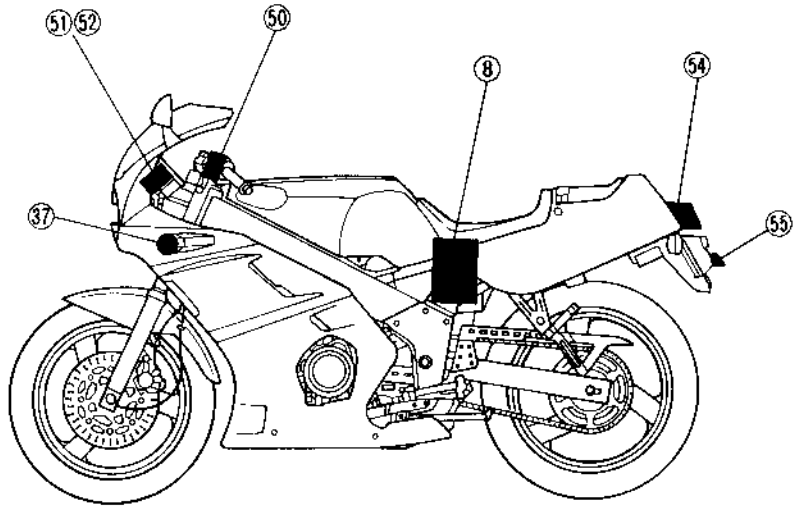


Aforementioned circuit diagram shows the lighting circuit in the wiring diagram.

NOTE:
For the color codes, see page 8-2.

① Main switch
④ "START" switch
⑦ Fuse "MAIN"
⑧ Battery
㊲ Front position light (Left)
㊵ Front position light (Right)
㊾ Fuse "HEAD"
㊿ "LIGHTS" (Dimmer) switch
(51) Meter light
(52) "HIGH BEAM" indicator light
(53) Headlight
(54) Tail light
(55) License light





TROUBLESHOOTING

HEADLIGHT, "HIGH BEAM" INDICATOR LIGHT, TAILLIGHT, LICENSE LIGHT METER LIGHT, AND POSITION LIGHT DO NOT COME ON.

Procedure

Check;

1. Fuse "MAIN"
2. Battery
3. Main switch
4. "LIGHTS" (Dimmer) switch
5. Wiring connection (Entire lighting system)

NOTE:

- Remove the following parts before troubleshooting.
  1) Seat
  2) Upper cowling
  3) Seat cowling
- Use the following special tool in this troubleshooting.



Pocket Tester:
P/N. YU-03112

1. Fuse "MAIN"

- Remove the fuse "MAIN".
- Connect the Pocket Tester (Ω x 1) to the fuse "MAIN".
- Check the fuse "MAIN" for continuity.

NO CONTINUITY → Replace fuse "MAIN".

CONTINUITY ↓

2. Battery

Check the battery condition.
Refer to the "BATTERY INSPECTION" section in the CHAPTER 3.

Specific Gravity:
1.280 at 20°C (68°F)

INCORRECT →

- Refill battery fluid.
- Clean battery terminals.
- Recharge or replace battery.

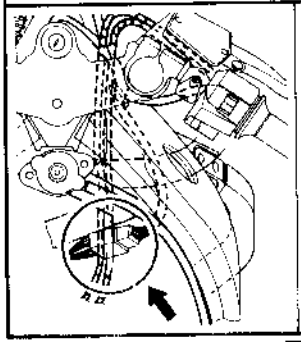
CORRECT ↓

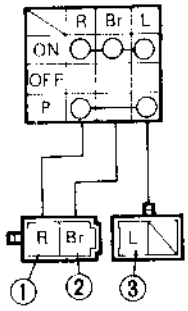
*

*

3. Main switch

- Disconnect the main switch couplers from the wire harness.
- Check the switch component for the continuity between "Red ① and Brown ②", and "Red ① and Blue ③". Refer to the "CHECKING OF SWITCHES" section.





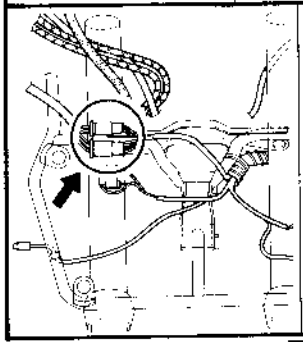
INCORRECT

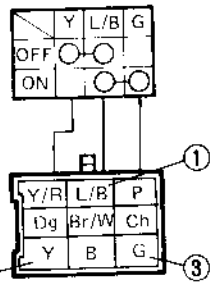
Replace main switch.

CORRECT

4. "LIGHTS" (Dimmer) switch

- Disconnect the handlebar switch (Left) coupler from the wire harness.
- Check the switch component for the continuity between "Blue/Black ① and Yellow ②" and Blue/Black ① and Green ③". Refer to the "CHECKING OF SWITCHES" section.





INCORRECT

Replace handlebar switch (Left).

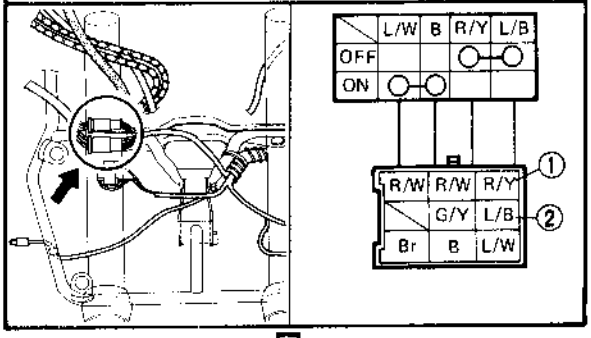
CORRECT

*

*

5. "START" switch

- Disconnect the "START" switch coupler from wire harness.
- Check the "START" switch component for the continuity between "Red/Yellow ① and Blue/Black ② ". Refer to the "CHECKING OF SWITCHES" section.



INCORRECT

Replace handlebar switch (Right).

CORRECT

6. Wiring connection

Check the entire lighting system for connections.
Refer to the "WIRING DIAGRAM" section.

POOR CONNECTION

Correct.

CORRECT

Check condition of each circuit for lighting system.
Refer to the "LIGHTING SYSTEM CHECK" section.

LIGHTING SYSTEM CHECK

1. Headlight and "HIGH BEAM" indicator light do not come on.

1. Fuse "HEAD"

- Remove the fuse "HEAD".
- Connect the Pocket Tester (Ω x 1) to the fuse "HEAD".
- Check the fuse "HEAD" for continuity.

NO CONTINUITY → Replace fuse "HEAD".

CONTINUITY ↓

2. Bulb and bulb socket

- Check the bulb and bulb socket for continuity.
  Refer to the "CHECKING OF BULBS" section.

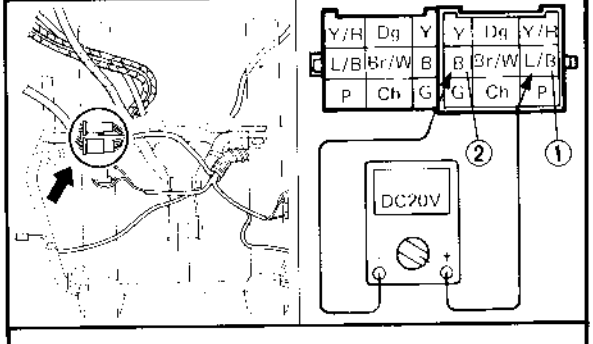
NO CONTINUITY → Replace bulb and/or bulb socket.

CONTINUITY ↓

3. Voltage

- Connect the Pocket Tester (DC20V) to the "LIGHTS" (Dimmer) switch connector.

Tester (+) Lead → Blue/Black ① Terminal
Tester (—) Lead → Black ② Terminal



- Turn the main switch to "ON".
- Check for voltage (12V) on the "Blue/-Yellow" at the "LIGHTS" (Dimmer) switch connector.

MEETS SPECIFICATION → This circuit is good.

OUT OF SPECIFICATION ↓

*

4. Wiring connection

Check the entire lighting system for connections.
Refer to the "WIRING DIAGRAM" section.

2. Meter light does not come on.

1. Fuse "HEAD"

- Remove the fuse "HEAD".
- Connect the Pocket Tester (Ω x 1) to the fuse "HEAD".
- Check the fuse "HEAD" for continuity.

NO CONTINUITY → Replace fuse "HEAD".

CONTINUITY

2. Bulb and bulb socket

- Check the bulb and bulb socket for continuity.
  Refer to the "CHECKING OF BULBS" section.

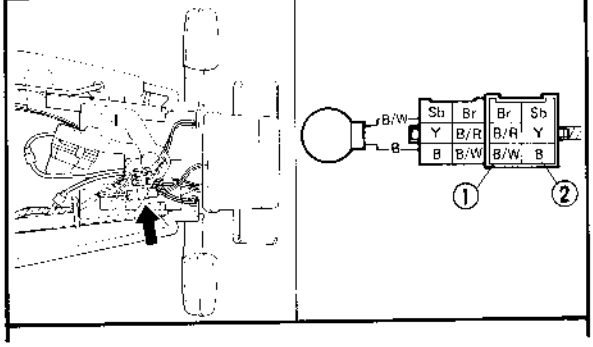
NO CONTINUITY → Replace bulb and/or bulb socket.

CONTINUITY

3. Voltage

- Connect the Pocket Tester (DC20V) to the bulb socket connector.

Tester (+) Lead → Black/White ① Terminal
Tester (–) Lead → Black ② Terminal



- Turn the main switch to "ON".
- Check for voltage (12V) on the "Black/White" lead at the bulb socket connector.

OUT OF SPECIFICATION

4. Wiring connection

Check the entire lighting system for connections.
Refer to the "WIRING DIAGRAM" section.

MEETS SPECIFICATION (12V)

This circuit is good.

3. License light does not come on.

1. Bulb and bulb socket

- Check the bulb and bulb socket for continuity. Refer to the "CHECKING OF BULBS" section.

NO CONTINUITY

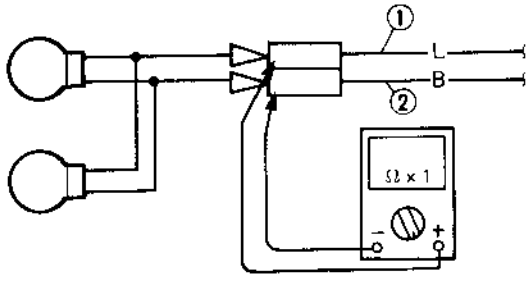
Replace bulb and/or bulb socket.

CONTINUITY

2. Voltage

- Connect the Pocket Tester (DC20V) to the bulb socket connector.

Tester (+) Lead → Blue ① Lead
Tester (–) Lead → Black ② Lead



- Turn the main switch to "ON".
- Check for voltage (12V) on the "Blue" lead at the bulb socket connector.

OUT OF SPECIFICATION

3. Wiring connection

Check the entire lighting system for connections.
Refer to the "WIRING DIAGRAM" section.

MEETS SPECIFICATION (12V)

This circuit is good.

4. Taillight does not come on.

1. Bulb and bulb socket

- Check the bulb and bulb socket for continuity. Refer to the "CHECKING OF BULBS" section.

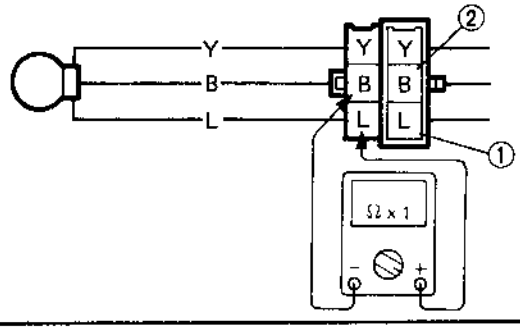
NO CONTINUITY → Replace bulb and/or bulb socket.

CONTINUITY ↓

2. Voltage

- Connect the Pocket Tester (DC20V) to the bulb socket connector.

Tester (+) Lead → Blue ① Terminal
Tester (–) Lead → Black ② Terminal



- Turn the main switch to "ON".
- Turn the "LIGHTS" switch to "ON".
- Check for voltage (12V) on the "Blue" lead at the bulb socket connector.

OUT OF SPECIFICATION → 3. Wiring connection

Check the entire lighting system for connections.
Refer to the "WIRING DIAGRAM" section.

MEETS SPECIFICATION (12V) ↓

This circuit is good.

4. Taillight does not come on.

1. Bulb and bulb socket

- Check the bulb and bulb socket for continuity. Refer to the "CHECKING OF BULBS" section.

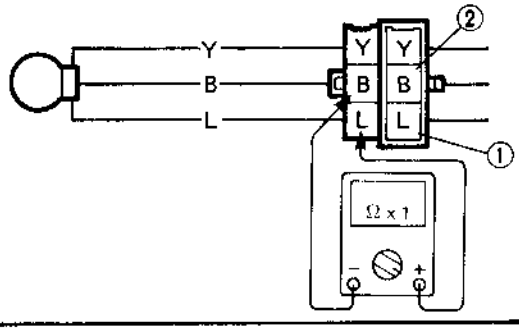
NO CONTINUITY → Replace bulb and/or bulb socket.

CONTINUITY ↓

2. Voltage

- Connect the Pocket Tester (DC20V) to the bulb socket connector.

Tester (+) Lead → Blue ① Terminal
Tester (–) Lead → Black ② Terminal



- Turn the main switch to "ON".
- Turn the "LIGHTS" switch to "ON".
- Check for voltage (12V) on the "Blue" lead at the bulb socket connector.

OUT OF SPECIFICATION → 3. Wiring connection

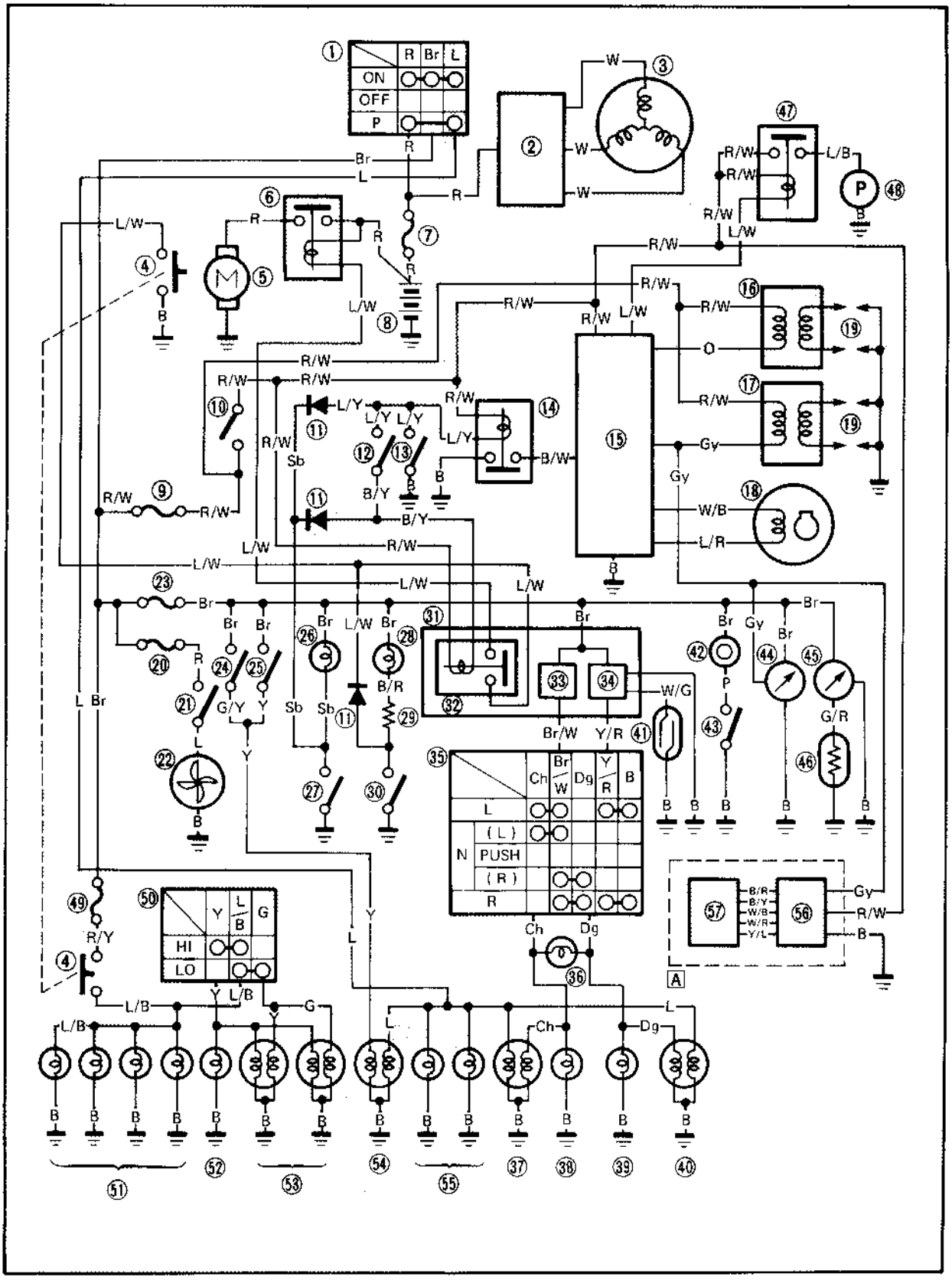
Check the entire lighting system for connections.
Refer to the "WIRING DIAGRAM" section.

MEETS SPECIFICATION (12V) ↓

This circuit is good.

SIGNAL SYSTEM

CIRCUIT DIAGRAM

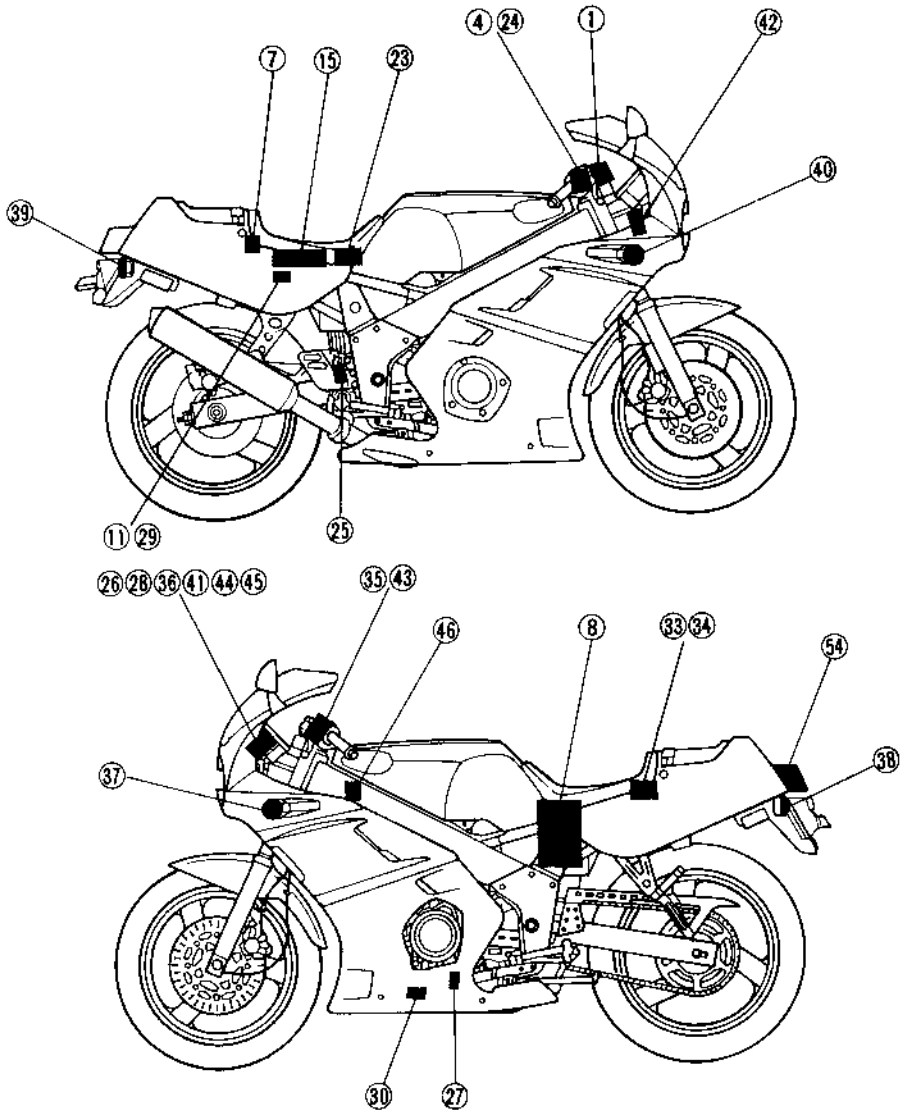


Aforementioned circuit diagram shows the signal circuit in the wiring diagram.

NOTE:

For the color codes, see page 8-2.

① Main switch
④ "START" switch
⑦ Fuse "MAIN"
⑧ Battery
⑪ Diode block
⑮ Digital ignitor unit
㉓ Fuse "SIGNAL"
㉔ Front brake switch
㉕ Rear brake switch
㉖ "NEUTRAL" indicator light
㉗ Neutral switch
㉘ "OIL" indicator light
㉙ Resistor
㉚ Oil level switch
㉝ Flasher relay (Relay assembly ㉛)
㉞ Cancelling unit (Relay assembly ㉛)
㉟ "TURN" switch
㊱ "TURN" indicator light
㊲ Front flasher light (Left)
㊳ Rear flasher light (Left)
㊴ Rear flasher light (Right)
㊵ Front flasher light (Right)
㊶ Reed switch
㊷ Horn
㊸ "HORN" switch
㊹ Tachometer
㊺ Temp meter
㊻ Thermo unit
㊿ Brake light



TROUBLESHOOTING

• FLASHER LIGHT, BRAKE LIGHT AND/OR INDICATOR LIGHT DO NOT COME ON.
• HORN DOES NOT SOUND.
• TACHOMETER DOES NOT OPERATE.

Procedure

Check;

1. Fuse "MAIN"
2. Battery
3. Main switch
4. Wiring connection (Entire signal system)

NOTE:

- Remove the following parts before troubleshooting.
  1) Seat
  2) Lower cowling
  3) Seat cowling
  4) Air filter case
- Use the following special tool in this troubleshooting.



Pocket Tester:
P/N. YU-03112

1. Fuse "MAIN"

- Remove the fuse "MAIN".
- Connect the Pocket Tester (Ω x 1) to the fuse "MAIN".
- Check the fuse "MAIN" for continuity.

NON CONTINUITY → Replace fuse "MAIN".

CONTINUITY ↓

2. Battery

Check the battery condition.
Refer to the "BATTERY INSPECTION" section in the CHAPTER 3.

Specific Gravity:
1.280 at 20°C (68°F)

INCORRECT →

- Refill battery fluid.
- Clean battery terminals.
- Recharge or replace battery.

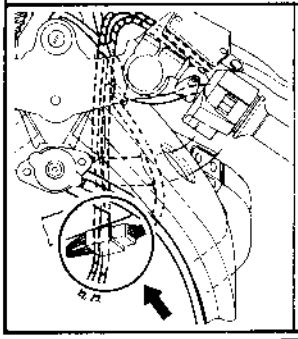
CORRECT ↓

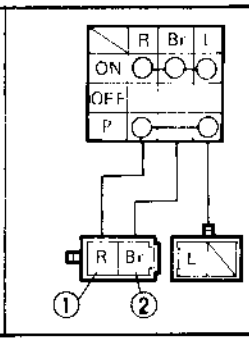
*

*

3. Main switch

- Disconnect the main switch coupler from the wire harness.
- Check the switch component for the continuity between "Red ① and Brown ②". Refer to the "CHECKING OF SWITCHES" section.





INCORRECT

Replace main switch.

CORRECT

4. Wiring connection

Check the entire signal system for connections.
Refer to the "WIRING DIAGRAM" section.

POOR CONNECTION

Correct.

CORRECT

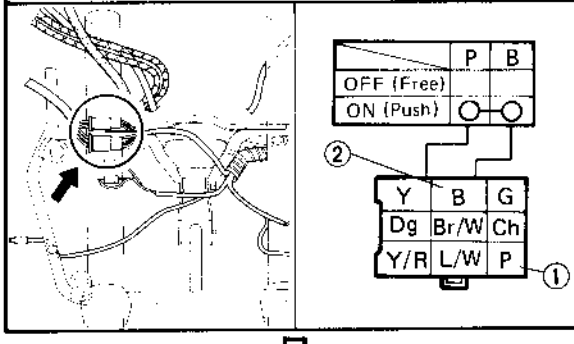
Check condition of each circuit for signal system.
Refer to the "SIGNAL SYSTEM CHECK" section.

SIGNAL SYSTEM CHECK

1. Horn does not sound.

1. "HORN" switch

- Disconnect the handlebar switch coupler from the wire harness.
- Check the switch component for the continuity between "Pink ① and Black ②". Refer to the "CHECKING OF SWITCHES" section.



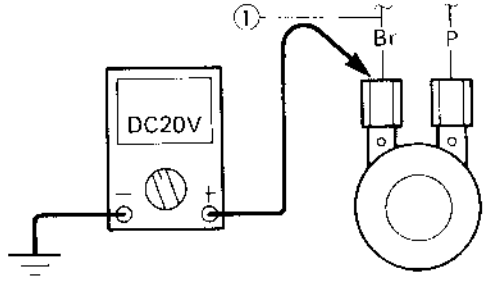
INCORRECT → Replace handlebar switch (Left).

CORRECT ↓

2. Voltage

- Connect the Pocket Tester (DC20V) to the horn connector.

Tester (+) Lead → Brown ① Lead
Tester (–) Lead → Frame Ground



- Turn the main switch to "ON".
- Check for voltage (12V) on the "Brown" lead at the horn terminal.

OUT OF SPECIFICATION → Check the entire lighting system for connections.

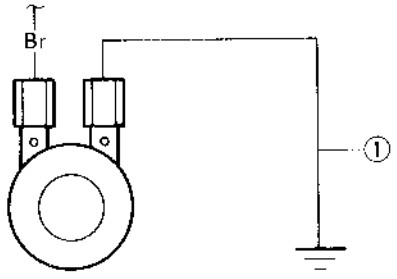
MEETS SPECIFICATION (12V) ↓

*

*

3. Horn

- Disconnect the "Pink" lead at the horn terminal.
- Connect a jumper lead ① to the horn terminal and ground the jumper lead.
- Turn the mainswitch to "ON".



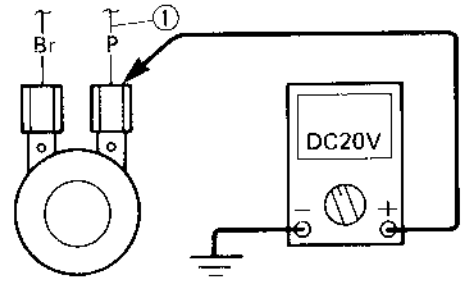
HORN IS SOUNDED → Horn is good.

HORN IS NOT SOUNDED

4. Voltage

- Connect the Pocket Tester (DC20V) to the horn at the Pink terminal.

Tester (+) Lead → Pink ① Lead
Tester (–) Lead → Frame Ground



- Turn the main switch to "ON".
- Check for voltage (12V) on the "Pink" lead at the horn terminal.

OUT OF SPECIFICATION → Replace horn.

MEETS SPECIFICATION (12V)

Adjust or replace horn.

2. Brake light does not come on.

1. Bulb and bulb socket

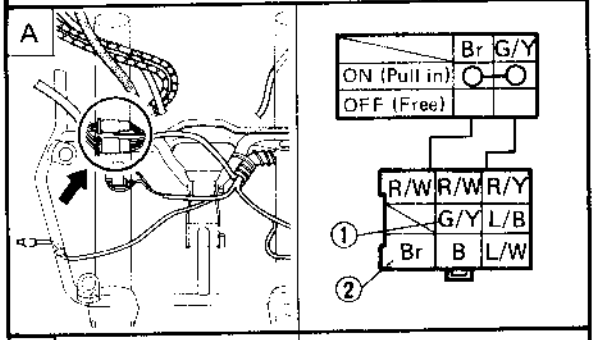
- Check the bulb and bulb socket for continuity. Refer to the "CHECKING OF BULBS" section.

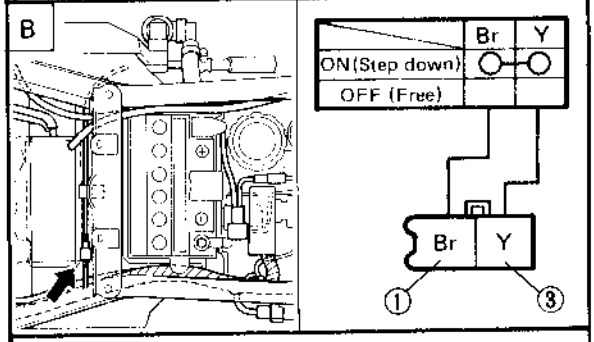
NON CONTINUITY → Replace bulb and/or bulb socket.

CONTINUITY ↓

2. Brake switch

- Disconnect the brake switch coupler from the wire harness.
- Check the switch component for the continuity between "Brown ① and Green/Yellow ②" or "Brown ① and Yellow ③". Refer to the "CHECKING OF SWITCHES" section.





A Front brake switch
B Rear brake switch

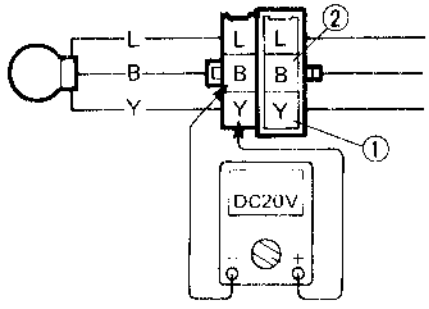
INCORRECT → Replace brake switch.

CORRECT ↓

3. Voltage

- Connect the Pocket Tester (DC20V) to the bulb socket connector.

Tester (+) Lead → Blue ① Lead
Tester (–) Lead → Black ② Lead



- Turn the main switch to "ON".
- The brake lever is pulled in or brake pedal is stepped down.
- Check for voltage (12V) on the "Yellow" lead at the bulb socket connector.

OUT OF SPECIFICATION

4. Wiring connection

Check the entire signal system for connections.
Refer to the "WIRING DIAGRAM" section.

MEETS SPECIFICATION (12V)

This circuit is good.

3. Flasher light and/or "TURN" indicator light do not blink.

1. Bulb and bulb socket

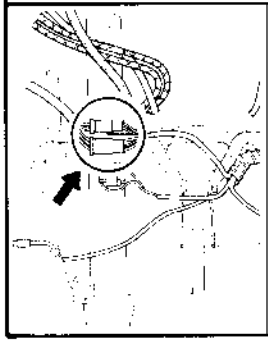
- Check the bulb and bulb socket for continuity. Refer to the "CHECKING OF BULBS" section.

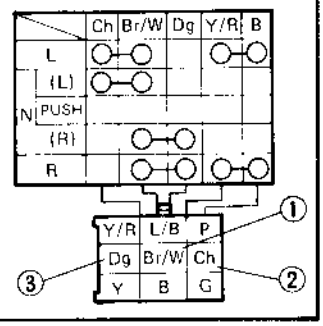
NO CONTINUITY

CONTINUITY

2. "TURN" switch

- Disconnect the handlebar switch coupler from the wire harness.
- Check the switch component for the continuity between "Brown/White ① and Chocolate ② " and "Brown/White ① and Dark green ③ . Refer to the "CHECKING OF SWITCHES" section.



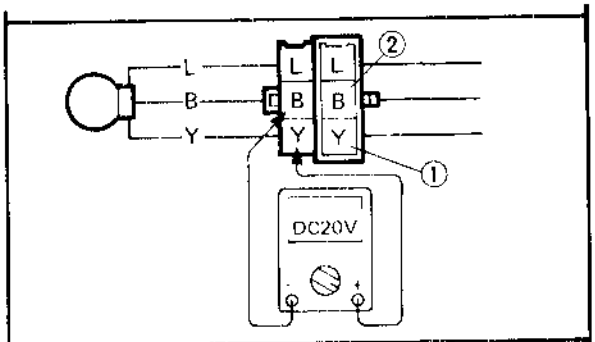


INCORRECT

Replace handlebar switch (Left).

CORRECT

*



- Turn the main switch to "ON".
- The brake lever is pulled in or brake pedal is stepped down.
- Check for voltage (12V) on the "Yellow" lead at the bulb socket connector.

OUT OF SPECIFICATION

4. Wiring connection

Check the entire signal system for connections.
Refer to the "WIRING DIAGRAM" section.

MEETS SPECIFICATION (12V)

This circuit is good.

3. Flasher light and/or "TURN" indicator light do not blink.

1. Bulb and bulb socket

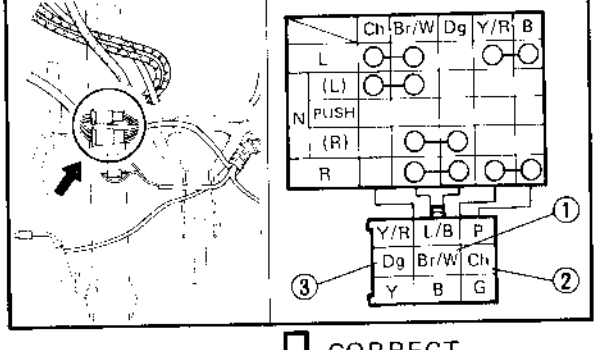
- Check the bulb and bulb socket for continuity. Refer to the "CHECKING OF BULBS" section.

NO CONTINUITY

CONTINUITY

2. "TURN" switch

- Disconnect the handlebar switch coupler from the wire harness.
- Check the switch component for the continuity between "Brown/White ① and Chocolate ② " and "Brown/White ① and Dark green ③ . Refer to the "CHECKING OF SWITCHES" section.



INCORRECT

Replace handlebar switch (Left).

CORRECT

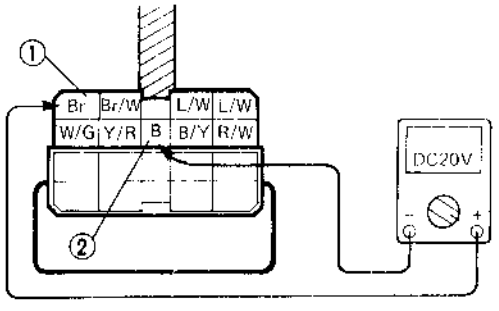
*

*

3. Voltage

- Connect the pocket tester (DC20V) to the relay assembly connector.

Tester (+) Lead → Brown ① Terminal
Tester (–) Lead → Black ② Terminal



- Turn the main switch to "ON".
- Check for voltage (12V) on the "Brown" lead at the flasher relay terminal.

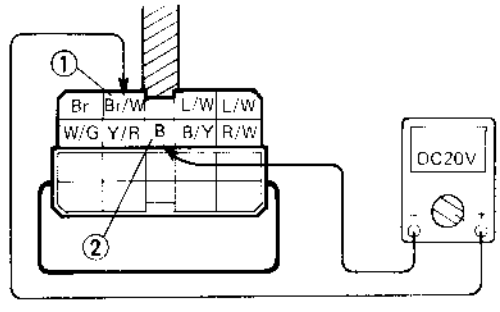
OUT OF SPECIFICATION → Check the entire signal system for connections.

MEETS SPECIFICATION (12V)

4. Voltage

- Connect the pocket tester (DC20V) to the relay assembly connector.

Tester (+) Lead → Brown/White ① Terminal
Tester (–) Lead → Black ② Terminal



- Turn the main switch to "ON".
- Check for voltage (12V) on the "Brown/White" lead at the flasher relay terminal.

OUT OF SPECIFICATION → Replace relay assembly.

MEETS SPECIFICATION (12V)

*

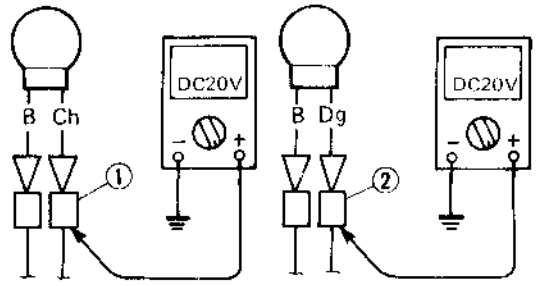
*

5. Voltage

- Connect the Pocket Tester (DC20V) to the bulb socket connector.

At Flasher Light (Left):
Tester (+) Lead → Chocolate ① Lead
Tester (–) Lead → Frame Ground

At Flasher Light (Right):
Tester (+) Lead → Dark green ② Lead
Tester (–) Lead → Frame Ground



- Turn the main switch to "ON".
- Turn the "TURN" switch to "L" or "R".
- Check for voltage (12V) on the "Chocolate" lead or "Dark green" lead at the bulb socket connector.

OUT OF SPECIFICATION

6. Wiring connection

Check the entire signal system for connections.
Refer to the "WIRING DIAGRAM" section.

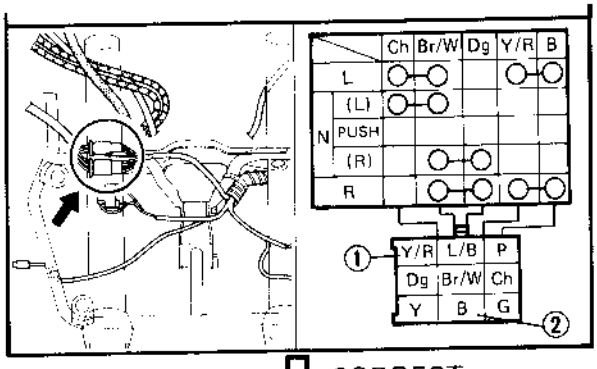
MEETS SPECIFICATION (12V)

This circuit is good.

4. Blinking (Flasher light) is not cancelled automatically.

1. "TURN" switch

- Disconnect the handlebar switch coupler from the wire harness.
- Check the switch component for the continuity between "Yellow/Red ① and Black ②".
Refer to the "CHECKING OF SWITCHES" section.



INCORRECT

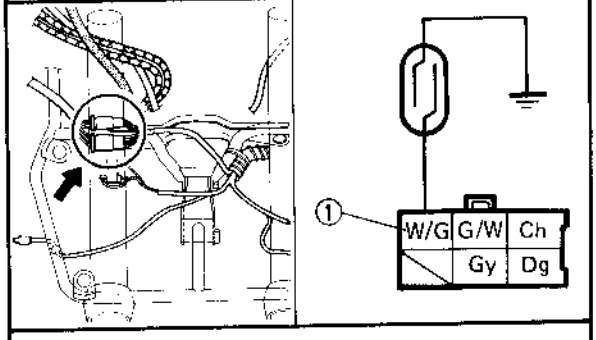
Replace handlebar switch (Left).

CORRECT

2. Reed switch

- Disconnect reed switch coupler from the wire harness.
- Connect the pocket tester (Ω x 1) to the reed switch terminal.

Tester (+) Lead → White/Green ① Terminal
Tester (–) Lead → Ground



- Check the reed switch for specificated resistance.

Reed Switch Resistance:
About 7Ω
(White/Green – Ground)
Then return back 0Ω or ∞Ω when wheel is stopped.

NOTE:
When measuring reed switch resistance, lift front wheel and rotate the wheel by hand.

OUT OF SPECIFICATION

Replace speedometer assembly.

MEETS SPECIFICATION

3. Wiring connection

Check the entire signal system for connections.
Refer to the "WIRING DIAGRAM" section.

POOR CONNECTION

Correct.

CORRECT

*

*

Replace relay assembly.

4. "NEUTRAL" indicator light does not come on.

1. Bulb and bulb socket

- Check the bulb and bulb socket for continuity. Refer to the "CHECKING OF BULBS" section.

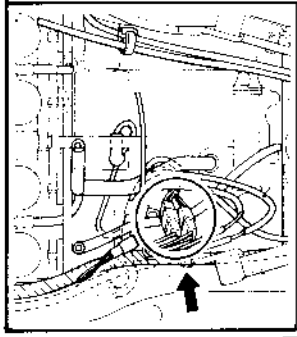
NO CONTINUITY

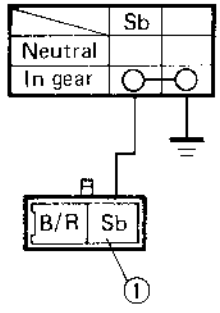
Replace bulb and/or bulb socket.

CONTINUITY

2. Neutral switch

- Disconnect the neutral switch coupler from the wire harness.
- Check the switch component for the continuity between "Sky blue ① and Ground". Refer to the "CHECKING OF SWITCHES" section.





INCORRECT

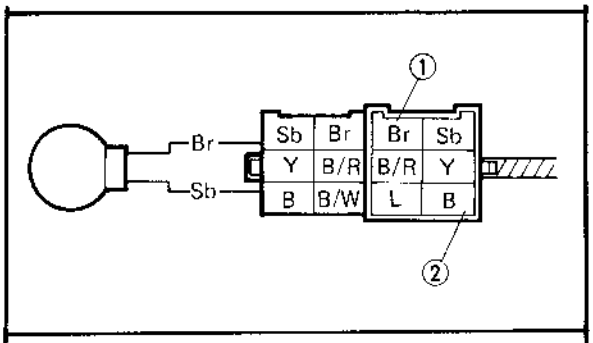
Replace neutral switch.

CORRECT

3. Voltage

- Connect the pocket tester (DC20V) to the bulb socket connector.

Tester (+) Lead → Brown ① Terminal
Tester (−) Lead → Black ② Terminal



- Turn the main switch to "ON".
- Check for voltage (12V) on the "Brown" lead at bulb socket connector.

OUT OF SPECIFICATION

6. Wiring connection

Check the entire signal system for connections.
Refer to the "WIRING DIAGRAM" section.

MEETS SPECIFICATION (12V)

This circuit is good.

5. "OIL" indicator light does not come on when push "START" switch.

1. Bulb and bulb socket

- Check the bulb and bulb socket for continuity. Refer to the "CHECKING OF BULBS" section.

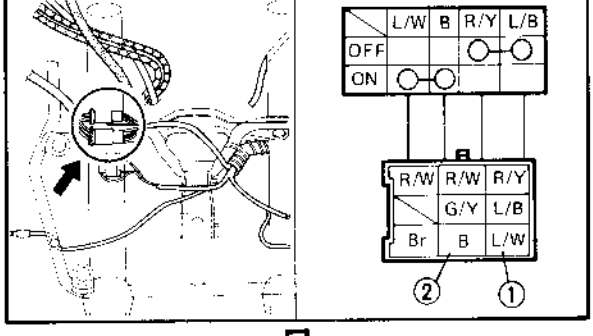
NO CONTINUITY

Replace bulb and/or bulb socket.

CONTINUITY

2. "START" switch

- Disconnect the "START" switch coupler from wire harness.
- Check the "STAR" switch component for the continuity between "Blue/White ① and Black ② ". Refer to the "CHECKING OF SWITCHES" section.



INCORRECT

Replace handlebar switch (Right).

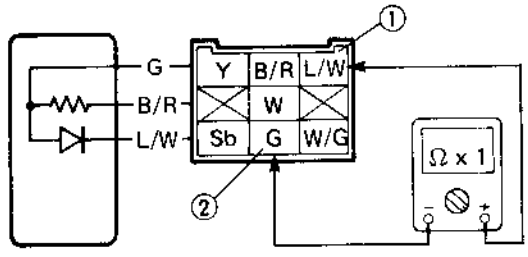
CORRECT

*

3. Diode

- Disconnect the diode unit coupler from the wire harness.
- Connect the pocket tester (Ω x 1) to the diode leads.

Tester (+) Lead → Blue/White ① Lead
Tester (–) Lead → Green ② Lead



- Check the diode for continuity.

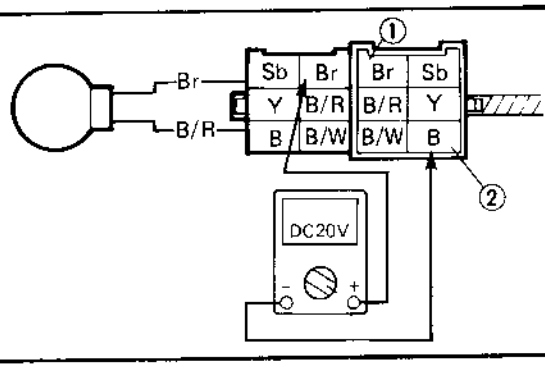
NO CONTINUITY → Replace diode unit.

CONTINUITY

4. Voltage

- Connect the pocket tester (DC20V) to the bulb socket connector.

Tester (+) Lead → Brown ① Terminal
Tester (–) Lead → Black ② Terminal



- Turn the main switch to "ON".
- Check for voltage (12V) on the "Brown" lead at bulb socket connector.

OUT OF SPECIFICATION

5. Wiring connection

Check the entire signal system for connections.
Refer to the "WIRING DIAGRAM" section.

MEETS SPECIFICATION (12V)

This circuit is good.

6. "OIL" indicator light does not come on, when oil tank is empty.

1. Bulb and bulb socket

- Check the bulb and bulb socket for continuity. Refer to the "CHECKING OF BULBS" section.

NO CONTINUITY

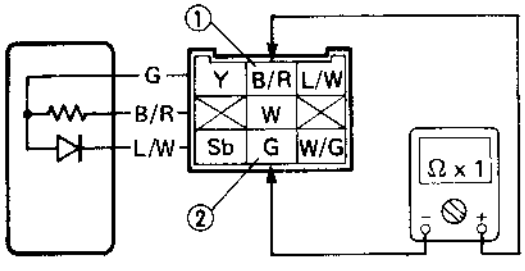
Replace bulb and/or bulb socket.

CONTINUITY

2. Resister

- Disconnect the diode unit coupler from the wire harness.
- Connect the pocket tester (Ω x 1) to the diode leads.

Tester (+) Lead → Black/Red ① Lead
Tester (–) Lead → Green ② Lead



- Check the resister for continuity.

NO CONTINUITY

Replace diode unit.

CONTINUITY

*

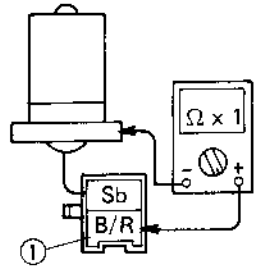
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3. Oil level switch

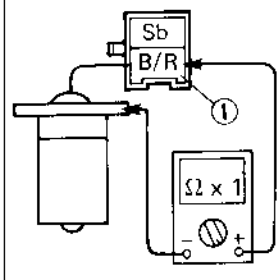
- Remove the oil level switch from the oil tank.
- Connect the pocket tester (Ω x 1) to the oil level gauge.

Tester (+) Lead → Black/Red ① Terminal
Tester (–) Lead → Oil Level Switch Body

A



B



- Check the oil level switch for continuity.

Switch position		Good condition	Bad condition		
A	Upright position	X	○	X	○
B	Upside down position	○	X	X	○

○: Continuity X: No continuity

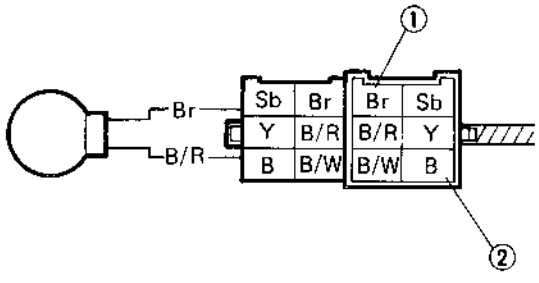
BAD CONDITION → Replace oil level switch.

GOOD CONDITION

4. Voltage

- Connect the Pocket Tester (DC20V) to the bulb socket connector.

Tester (+) Lead → Brown ① Terminal
Tester (–) Lead → Black ② Terminal



- Turn the main switch to "ON".
- Check for voltage (12V) on the "Brown" lead at bulb socket connector.

OUT OF SPECIFICATION

5. Wiring connection

Check the entire signal system for connections.
Refer to the "WIRING DIAGRAM" section.

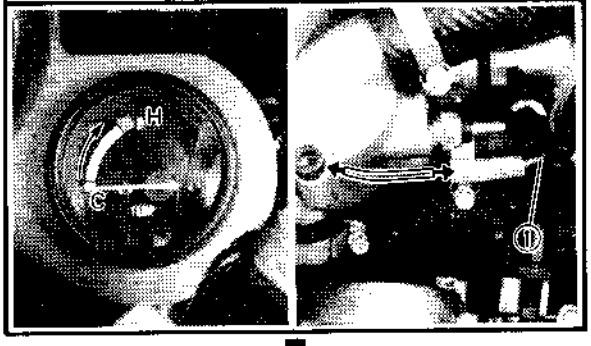
MEETS SPECIFICATION (12V)

This circuit is good.

7. When engine is hot, tempmeter does not move.

1. Tempmeter

- Disconnect the thermo unit lead (Green/-Red) ① .
- Check that the tempmeter stays put at "C".
- Ground the lead to the frame with the jumper lead.
- Turn the main switch to "ON".
- Check that the tempmeter hand moves up to "H".



⚠ CAUTION:

As soon as the meter hand get in the "Red zone, turn the main switch to "OFF" to avoid damage to the tempmeter.

CORRECT

Check wiring connection.

INCORRECT

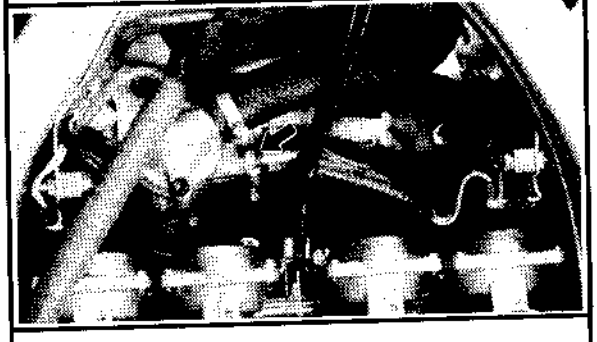
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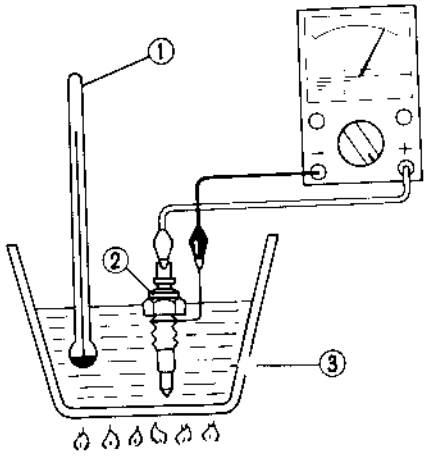
2. Thermo unit

- Remove the thermo unit.
- Immerse the thermo unit ② in coolant ③.
- Measure the resistance at each temperature as tabulated.

① Thermo meter

Coolant Temperature	Resistance
50°C (122°F)	154Ω
80°C (176°F)	47 ~ 57Ω
100°C (212°F)	26 ~ 29Ω
120°C (248°F)	16Ω





- After measuring the thermo unit, install the unit.

⚠ 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.

⚠ CAUTION:

Avoid overtightening.

Thermo Unit:
15 Nm (1.5 m · kg, 11 ft · lb)
Use Water Resistant Sealant.

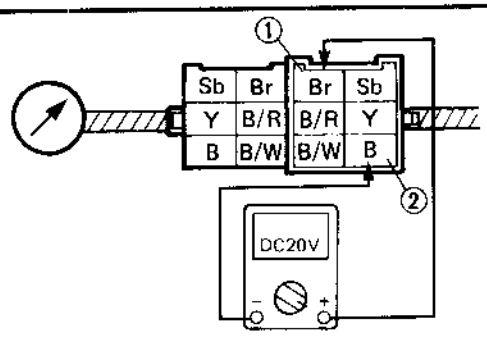
OUT OF SPECIFICATION → Replace thermo unit.

MEETS SPECIFICATIONS

5. Voltage

- Connect the pocket tester (DC20V) to the temperature gauge leads.

Tester (+) Lead → Brown ① Terminal
Tester (–) Lead → Black ② Terminal



- Turn the main switch to "ON".
- Check for voltage (12V) on the "Brown" lead at the temperature gauge connector.

OUT OF SPECIFICATION → Check the entire signal system for connections.

MEETS SPECIFICATION (12V)

6. Wiring connection

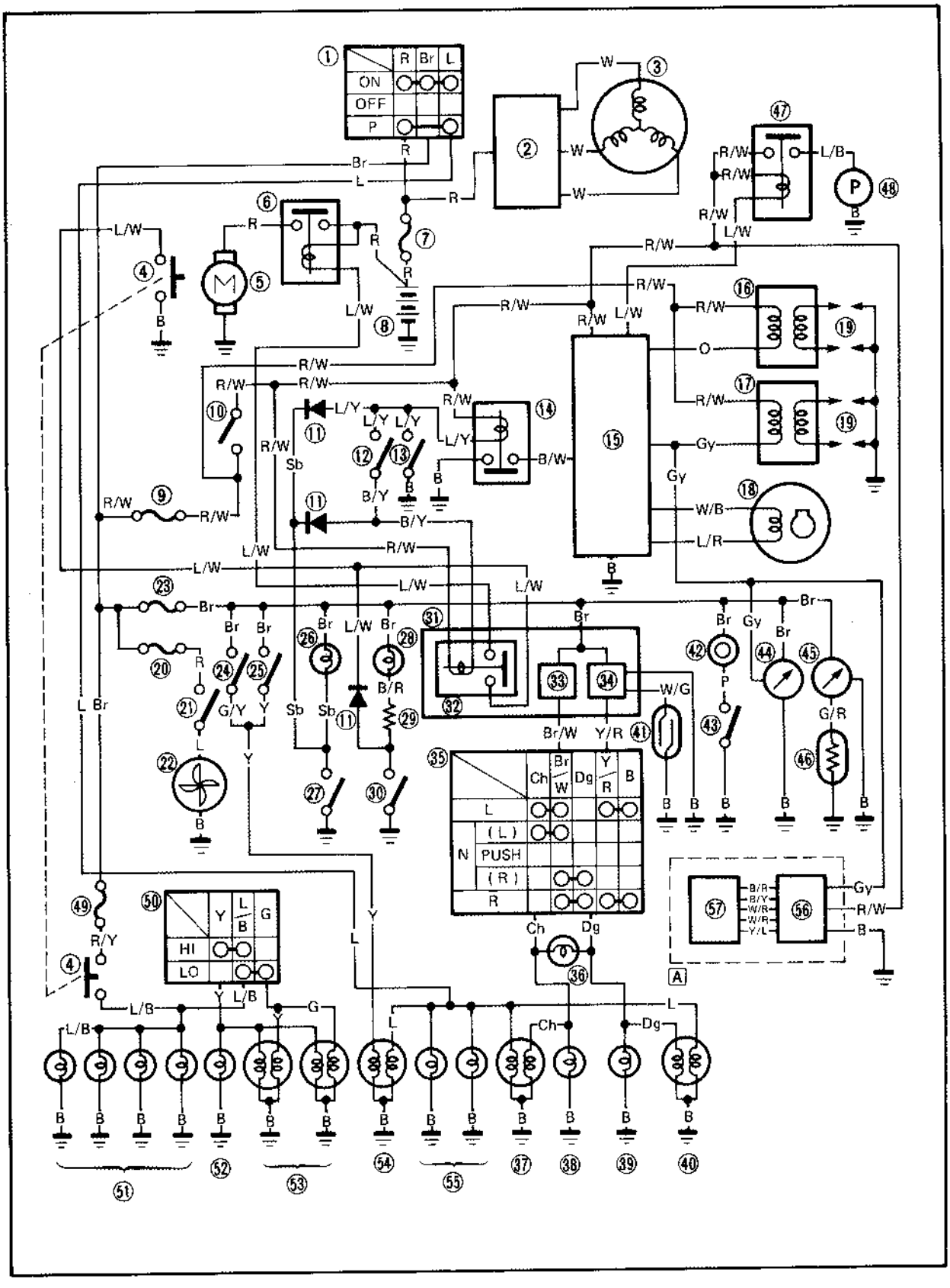
Check the entire signal system for connections. Refer to the "WIRING DIAGRAM" section.

POOR CONNECTION → Correct.

CORRECT

Replace tempmeter.

COOLING SYSTEM
CIRCUIT DIAGRAM

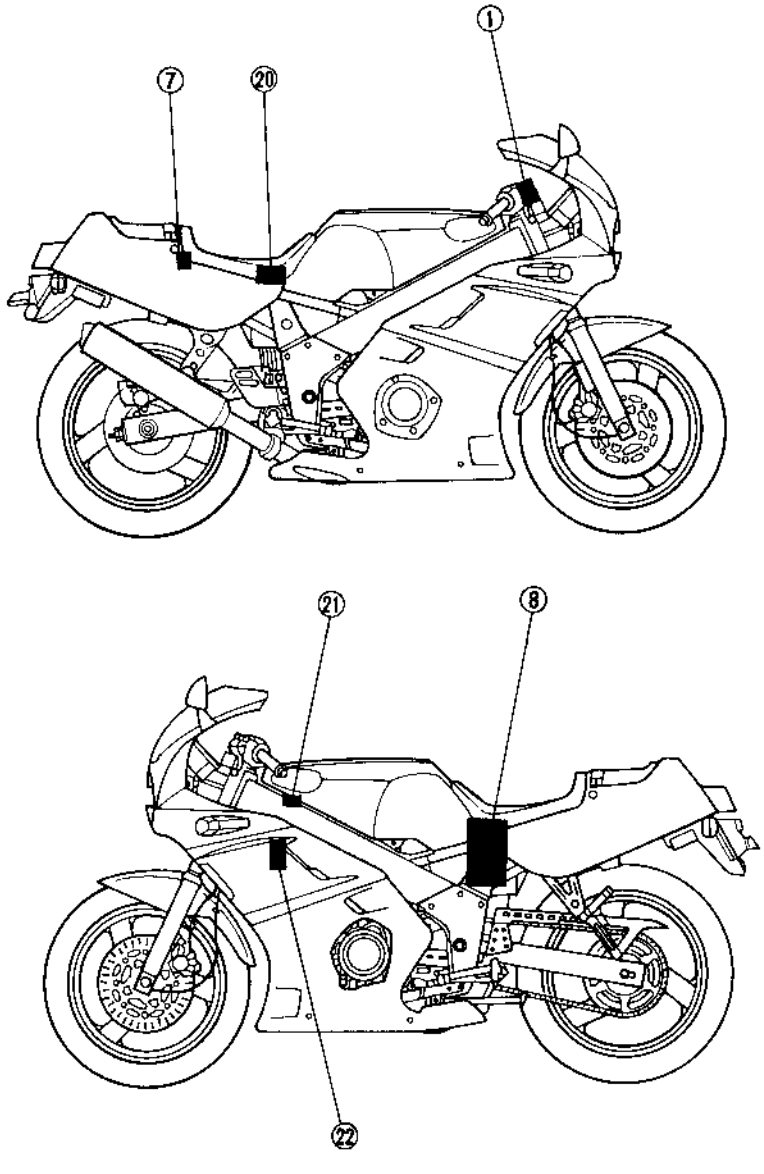


A forementioned circuit diagram shows the cooling circuit in the circuit diagram.

NOTE:

For the color codes, see page 8-2.

①Main switch
⑦Fuse "MAIN"
⑧Battery
⑳Fuse "FAN"
㉑Thermo switch
㉒Fan motor



TROUBLESHOOTING

FAN MOTOR DOES NOT TURN.

Procedure

Check;

1. Fuse "MAIN/FAN"
2. Battery
3. Fan motor (Test 1)
4. Fan motor (Test 2)
5. Thermo switch
6. Wiring connection (Entire cooling system)

NOTE:

- Remove the following before troubleshooting.
  1) Seat
  2) Top cover
  3) Air filter case
- Use the following special tool in this troubleshooting.



Pocket Tester:
P/N. YU-03112

1. Fuse "MAIN/FAN"

- Remove the fuse "MAIN" and "FAN".
- Connect the Pocket Tester (Ω x 1) to the fuse "MAIN" and "FAN".
- Check the fuse for continuity.

NO CONTINUITY → Replace fuse "MAIN" and/or "FAN".

CONTINUITY ↓

2. Battery

Check the battery condition.
Refer to the "BATTERY INSPECTION" section in the CHAPTER 3.

Specific Gravity:
1.280 at 20°C (68°F)

INCORRECT →

- Refill battery fluid.
- Clean battery terminals.
- Recharge or replace battery.

CORRECT ↓

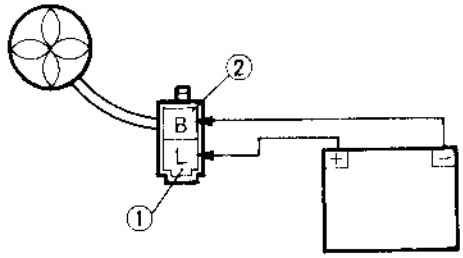
*

*

3. Fan motor (Test 1)

- Disconnect the fan motor coupler.
- Connect the battery voltage as shown.

Battery (+) Lead → Blue ① Terminal
Battery (–) Lead → Black ② Terminal



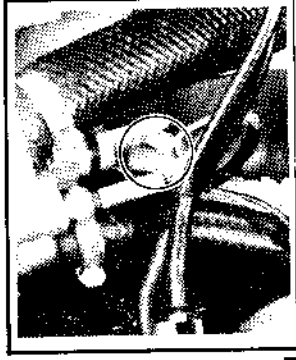
- Check the fan motor for operation.

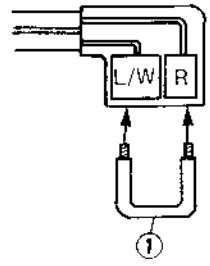
NO OPERATIVE → Replace fan motor.

OPERATIVE

4. Fan motor (Test 2)

- Disconnect the thermo switch coupler.
- Connect the terminal with the jumper ① lead as shown.





NO OPERATIVE → Check wiring connection(s).

OPERATIVE

*

*

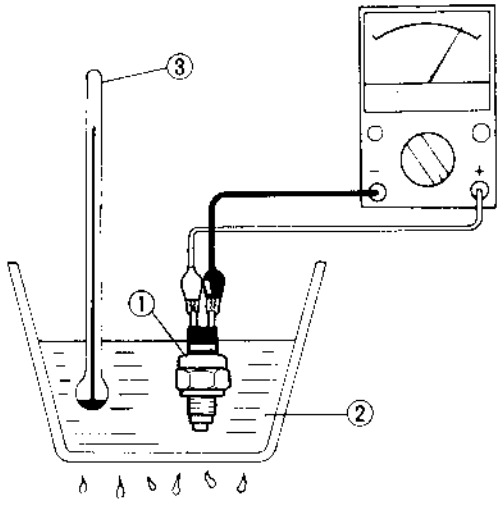
5. Thermo switch

- Remove the thermo switch from the thermostat housing.
- Connect the pocket tester (Ω x 1) to the thermo switch ① .
- Immerse the thermo switch in the water ② .
- Check the thermo switch for continuity. Note temperatures while heating the water with the temperature gauge ③ .

Test Step	Water Temperature	Good Condition
1	0 ~ 98°C (32 ~ 208.4°F)	X
2	More than 105 ± 3°C (221.0 ± 5.4°F)	○
3*	105 to 98°C (221.0 to 208.4°F)	○
4*	Less than 98°C (208.4°F)	X

Test 1 & 2; Heat-up tests
Test 3* & 4*; Cool-down tests

○ : Continuity X : No continuity



⚠ WARNING:

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



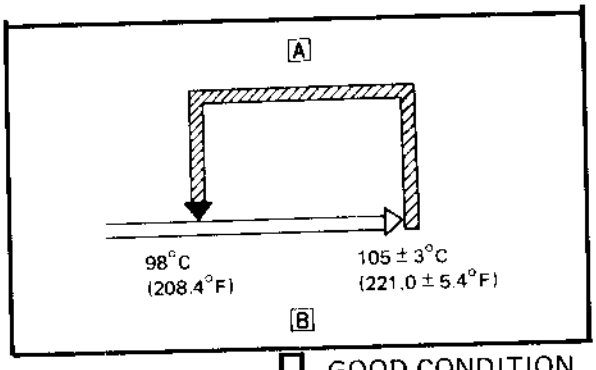
Thermo Switch:
8 Nm (0.8 m·kg, 5.8 ft·lb)
Three Bond Sealock® #10

⚠ CAUTION:

After replacing the thermo switch, check the cooland level in the radiator and also check for any leakage.

NOTE:

The electric fan is controlled by the thermo switch whenever the main switch is "ON" or "OFF". Thus, under certain operating conditions, this fan may continue to run until the engine temperature has cooled down to about 98°C (208°F).



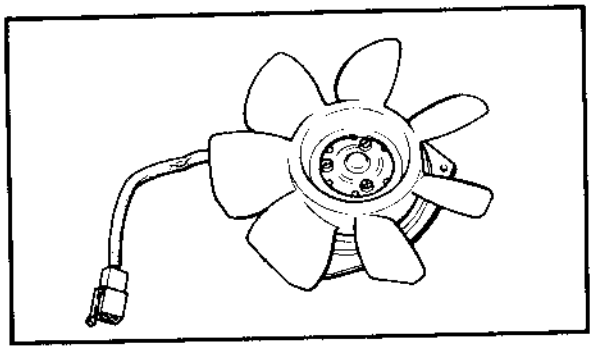
A THERMO SWITCH "ON", FAN "ON"
B COOLANT TEMPERATURE

BAD CONDITION → Replace thermo switch.

GOOD CONDITION

6. Wiring connection
- Check the entire cooling system for connections.
  Refer to the "WIRING DIAGRAM" section.

POOR CONNECTION → Correct.

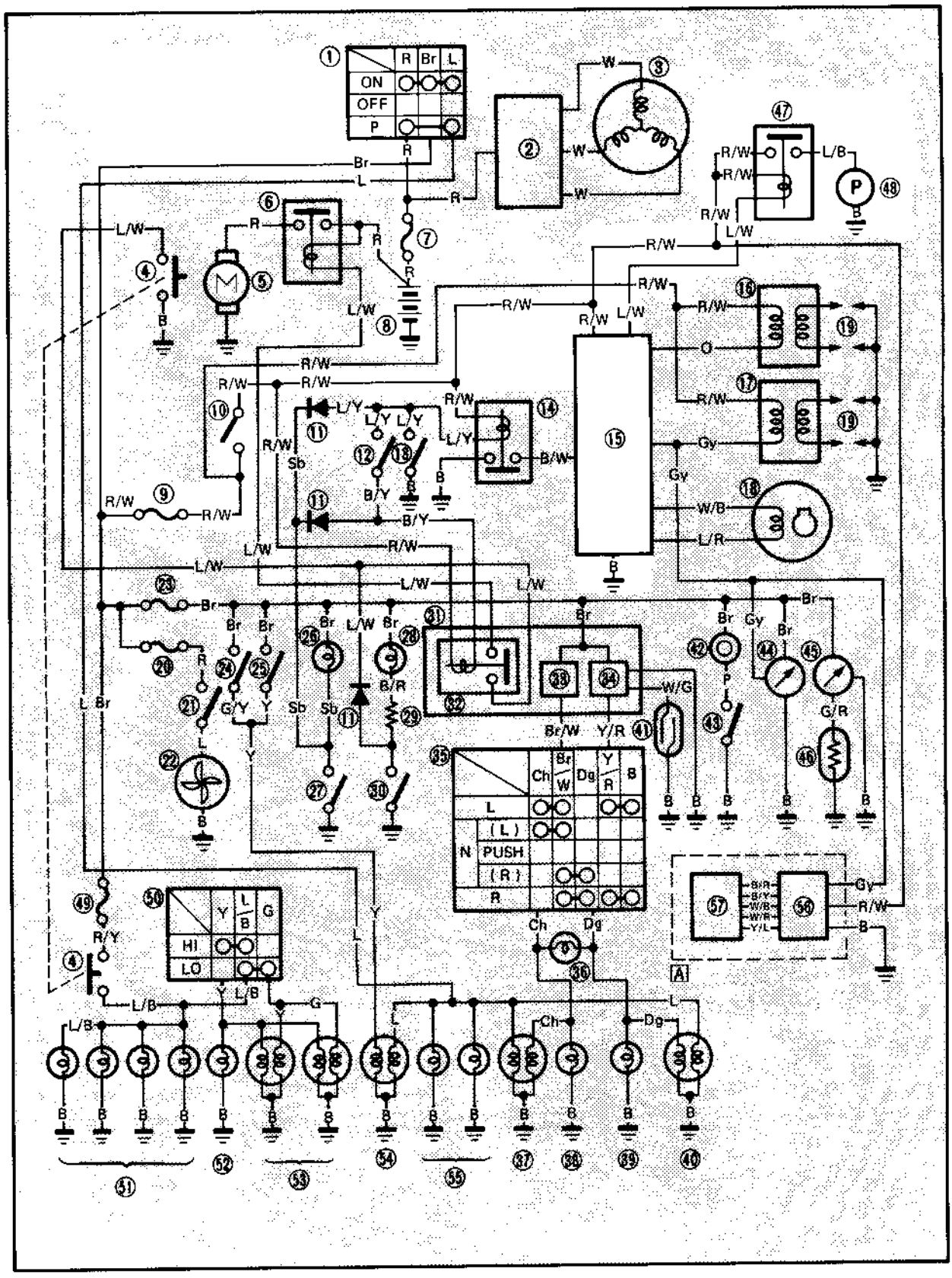


Fan Motor Inspection

The following problems may require repair or replacement of components

Component	Condition
Fan motor	Unsmooth operation
Fan motor	Excessive vibration
Fan motor bracket	Cracks
Fan blades	Cracks
Securing bolts	Looseness

FUEL SYSTEM
CIRCUIT DIAGRAM

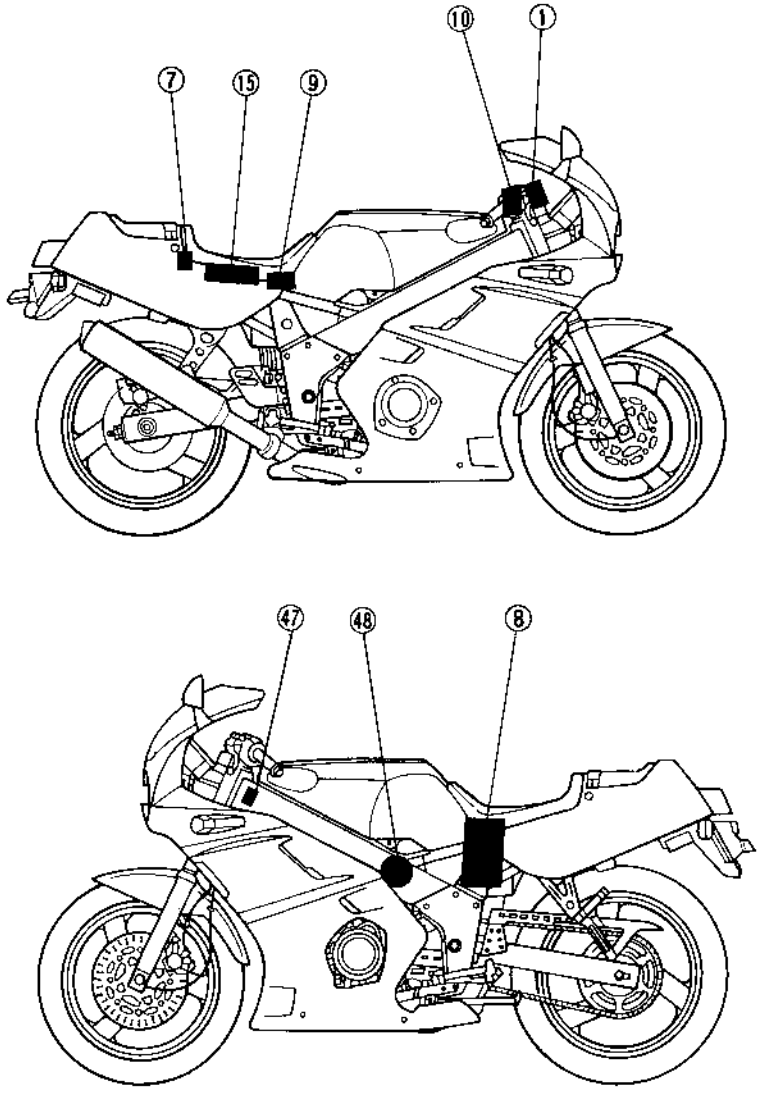


A forementioned circuit diagram shows the fuel circuit in the circuit diagram.

NOTE:

For the color codes, see page 8-2.

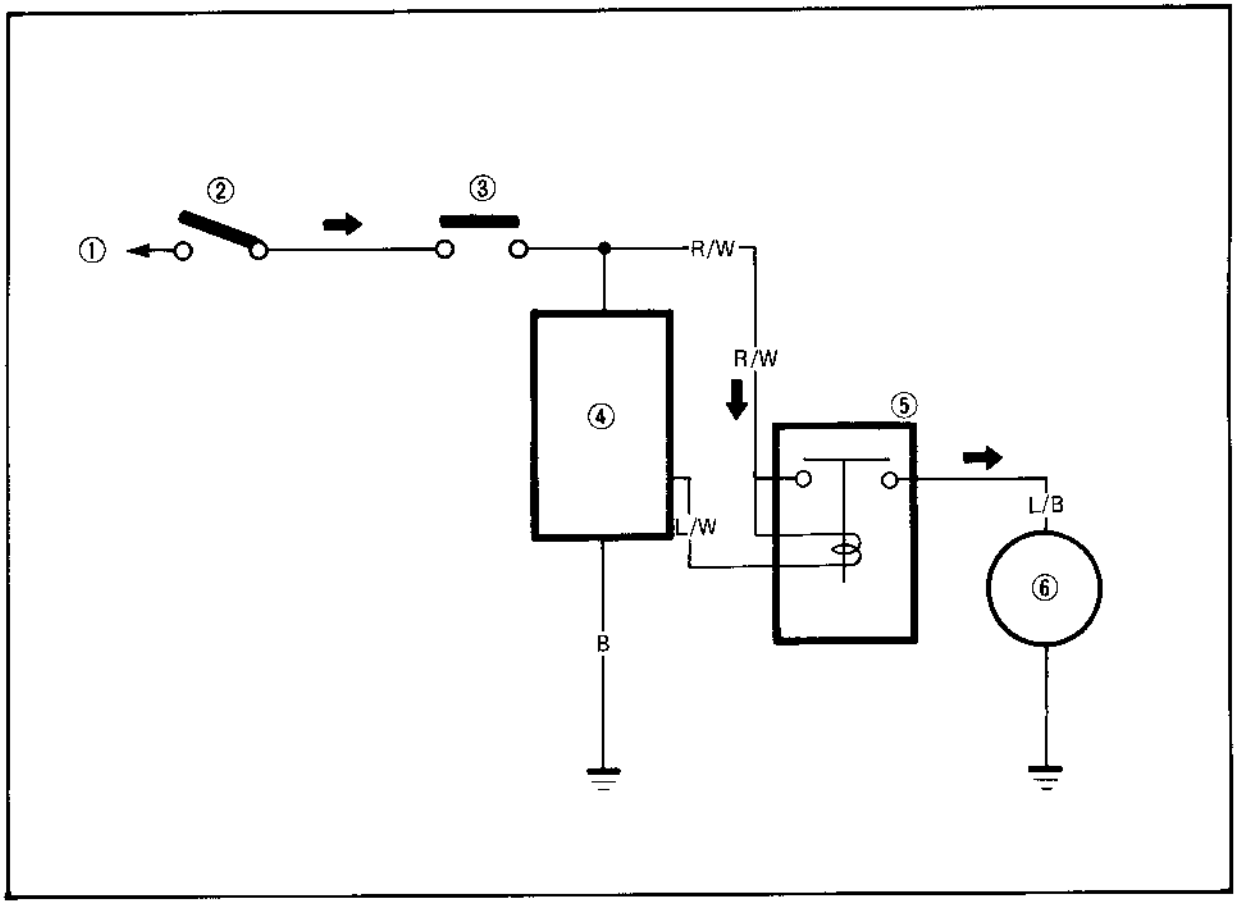
①Main switch
⑦Fuse "MAIN"
⑧Battery
⑨Fuse "IGNITION"
⑩"ENGINE STOP" switch
⑮Digital ignitor unit
㊼Fuel pump relay
㊽Fuel pump



FUEL PUMP CIRCUIT OPERATION

The fuel pump circuit consists of the fuel pump relay, fuel pump, "ENGINE STOP" switch and digital ignition unit.
The digital ignition unit includes the control unit for the fuel pump.
The fuel pump starts and stops as indicated in the chart below.

① To main fuse and battery
② Main switch
③ "ENGINE STOP" switch
④ Digital ignitor unit
⑤ Fuel pump relay
⑥ Fuel pump



FUEL PUMP		
START		STOP
• Main/Engine stop switch turned to "ON"	• Engine turned on	• Engine turned off
For about 5 seconds when carburetor fuel level is low	After about 0.1 second	After about 5 seconds

TROUBLESHOOTING

FUEL PUMP FAILS TO OPERATE.

Procedure

1. Fuse "MAIN/IGNITION"
2. Battery
3. Main switch
4. "ENGINE STOP" switch
5. Fuel pump relay
6. Fuel pump
7. Wiring connection (Entire fuel system)

NOTE:

- Remove the following before troubleshooting.
  1) Seat
  2) Fuel tank
- Use the following special tool in this troubleshooting.



Pocket Tester:
YU-03112

1. Fuse "MAIN/IGNITION"

- Remove the fuse "MAIN" and "IGNITION"
- Connect the Pocket Tester (Ω x 1) to the fuse "MAIN" and "IGNITION".
- Check the fuse for continuity.

NO CONTINUITY → Replace fuse "MAIN" and/or "IGNITION"

CONTINUITY ↓

2. Battery

- Check the battery condition. Refer to the "BATTERY INSPECTION" section in the CHAPTER 3.

Specific Gravity:
1.280 at 20°C (68°F)

INCORRECT → • Refill battery fluid. • Clean battery terminals. • Recharge or replace battery.

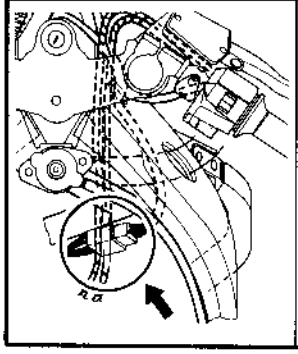
CORRECT ↓

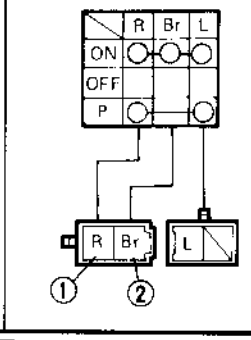
*

*

3. Main switch

- Disconnect the main switch coupler and lead from the wire harness.
- Check the switch component for the continuity between "Red ① and Brown ② ". Refer to the "CHECKING OF SWITCHES" section.





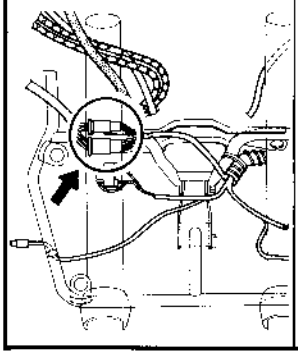
INCORRECT

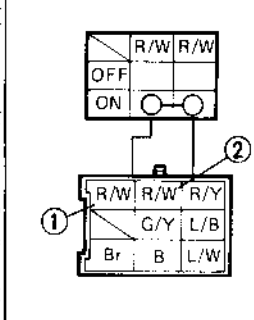
Replace main switch.

CORRECT

4. "ENGINE STOP" switch

- Disconnect the "ENGINE STOP" switch coupler from the wire harness.
- Check the switch component for the continuity between "Red/White ① and Red/White ② ". Refer to the "CHECKING OF SWITCHES" section.





INCORRECT

Replace handlebar switch (Right).

CORRECT

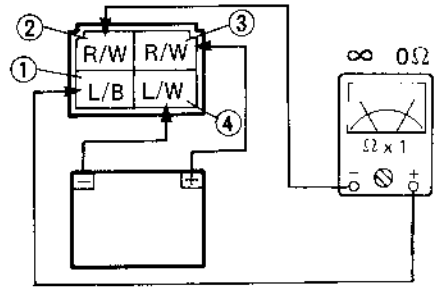
*

*

5. Fuel pump relay

- Disconnect the fuel pump relay coupler from the wire harness.
- Connect the pocket tester (Ω x 1) and battery (12V) voltage to the fuel pump relay coupler terminals.

Tester (+) Lead → Blue/Black ① Terminal
Tester (–) Lead → Red/White ② Terminal
Battery (+) Lead → Red/White ③ Terminal
Battery (–) Lead → Blue/White ④ Terminal



- Check the relay for continuity.

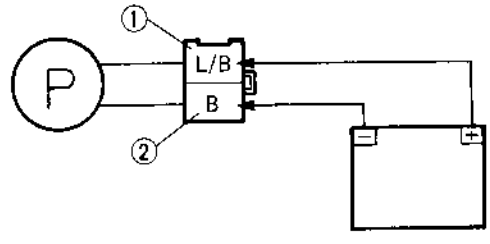
NO CONTINUITY → Replace fuel pump relay.

CONTINUITY ↓

6. Fuel pump

- Disconnect the fuel pump coupler from the wire harness.
- Connect the battery voltage as shown.

Battery (+) Lead → Blue/Black ① Terminal
Battery (–) Lead → Black ② Terminal

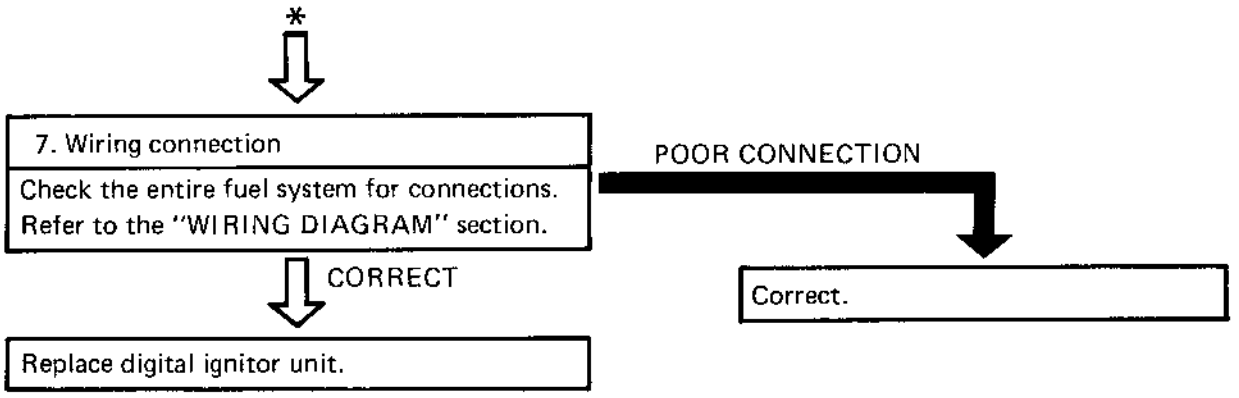


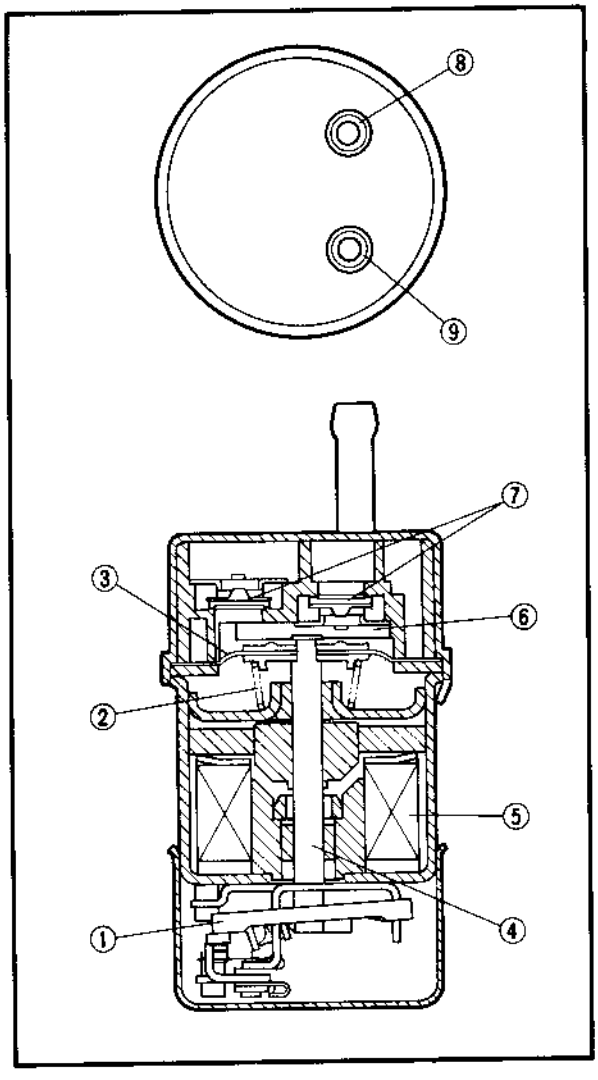
- Check the fuel pump operation.

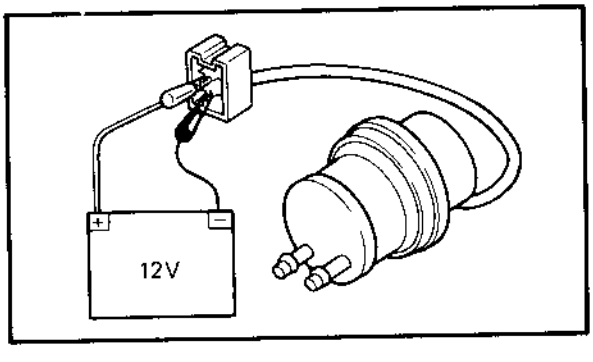
NO OPERATIVE → Replace fuel pump.

OPERATIVE ↓

*


*
7. Wiring connection
Check the entire fuel system for connections.
Refer to the "WIRING DIAGRAM" section.
POOR CONNECTION
Correct.
CORRECT
Replace digital ignitor unit.





FUEL PUMP TEST

Operation

The diaphragm is pulled in by the plunger allowing fuel to be sucked into the fuel chamber. Fuel is pushed out from the pump until carb float chamber is filled with fuel, and then the cut-off switch cuts off the circuit.
When the spring pushes the diaphragm further to the end, the cut-off switch turns on and the solenoid coil pulls the plunger with the diaphragm forcing fuel into the fuel chamber.

NOTE:
When the main and "ENGINE STOP" switches are ON, the fuel pump relay is activated for five (5) seconds at which time the fuel pump operates.

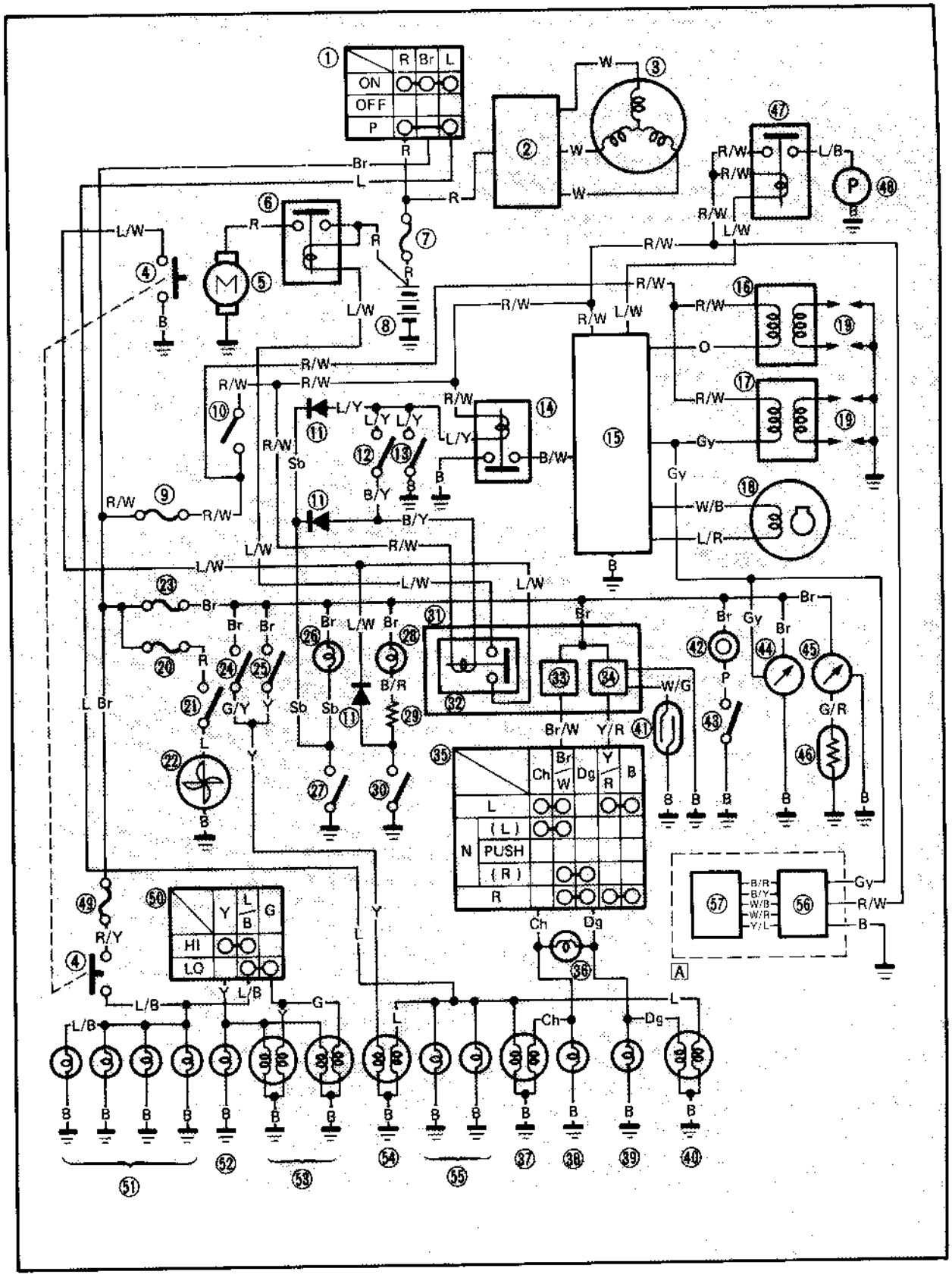
① Cut-off switch
② Spring
③ Diaphragm
④ Plunger
⑤ Solenoid coil
⑥ Fuel chamber
⑦ Valve
⑧ Outlet
⑨ Inlet

Inspection

1. Connect:
   • Battery (12V)
2. Inspect:
   • Fuel pump
   Cracks/Damage → Replace.
3. Check:
   • Fuel pump operation
   Faulty operation → Replace.

YAMAHA EXHAUST VARIABLE VALVE SYSTEM (For California only)

CIRCUIT DIAGRAM

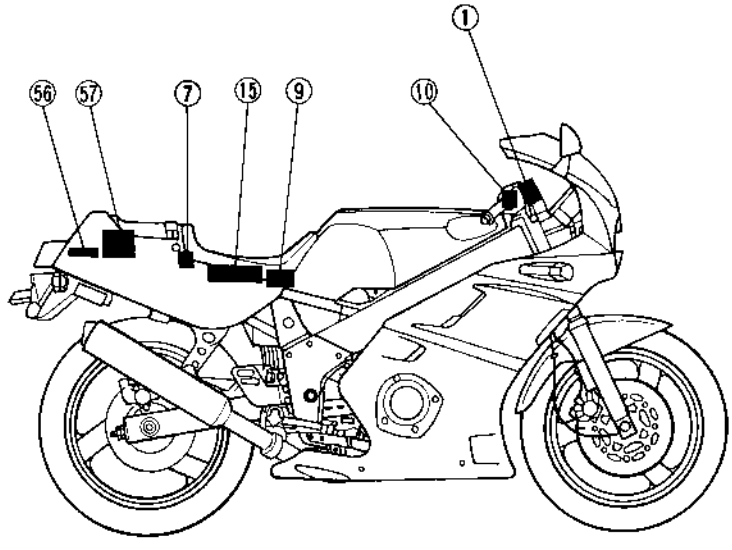


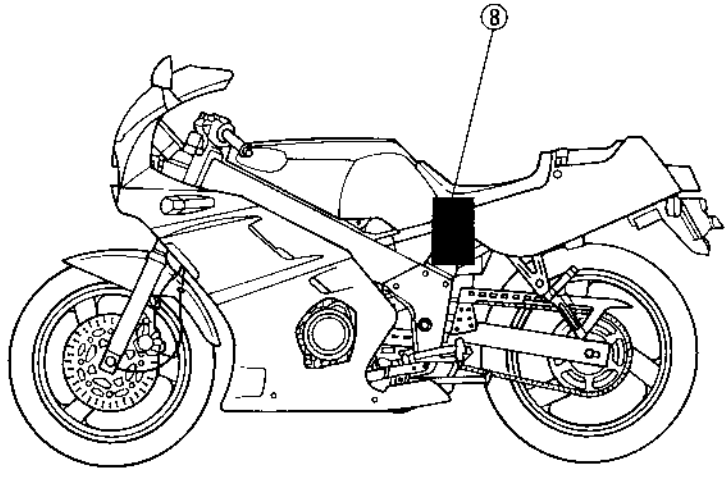
A forementioned circuit diagram shows the cooling circuit in the circuit diagram.

NOTE:

For the color codes, see page 8-2.

① Main switch
⑦ Fuse "MAIN"
⑧ Battery
⑨ Fuse "IGNITION"
⑩ "ENGINE STOP" switch
⑮ Digital ignition unit
⑯ EXUP control unit
⑰ EXUP servomotor





TROUBLESHOOTING

WHEN MAIN SWITCH IS TURNED TO "ON", EXUP SERVOMOTOR DOES NOT OPERATE ONE CYCLE.

Procedure (1)
Check;
1. Voltage
2. EXUP servomotor operation
3. EXUP servomotor operation
4. Wiring connection
   (Entire EXUP system)

Procedure (2)
Check;
1. Fuse "MAIN/IGNITION"
2. Battery
3. Main switch
4. "ENGINE STOP" switch
5. Wiring connection
   (Entire EXUP system)

NOTE:
- Remove the following parts before troubleshooting.
  1) Seat
  2) Seat cowling
  3) Lower cowling (Left)
- Use the following special tool in this troubleshooting.



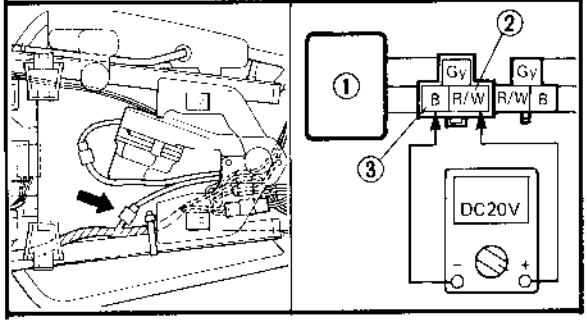
Pocket Tester:
P/N. YU-03112

Procedure (1)

1. Voltage

- Connect the pocket tester (DC20V) to the "EXUP control unit" ① connector.

Tester (+) Lead → Red/White ② Terminal
Tester (−) Lead → Black ③ Terminal



- Turn the main switch to "ON" and check for the voltage between "Black and Red/White".

Voltage (Red/White – Black):
10 ~ 14V

OUT OF SPECIFICATION → Go to the "Procedure (2)".

MEETS SPECIFICATION

2. EXUP servomotor operation

- Disconnect the EXUP cables from the pulley.
- Turn the main switch to "ON" and check the EXUP servomotor operation.

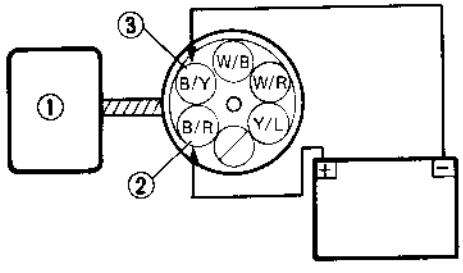
OPERATIVE → Seized or damaged power valve at muffler.

NO OPERATIVE

3. EXUP servomotor operation

- Disconnect the EXUP servomotor ① coupler.
- Connect the battery leads to the EXUP servomotor terminal.

Battery Positive Lead → Black/Red ② Lead
Battery Negative Lead → Black/Yellow ③ Lead



NO OPERATIVE → Replace EXUP servomotor.

⚠ CAUTION:
This test should be performed within a few seconds to prevent further damage.

OPERATIVE

*

*

4. Wiring connection

Check the entire EXUP system for connections. Refer to the "WIRING DIAGRAM" section.

POOR CONNECTION → Correct.

CORRECT

Replace EXUP control unit.

Procedure (2)

1. Fuse "MAIN/IGNITION"

- Remove the fuse "MAIN" and "IGNITION".
- Connect the Pocket Tester (Ω x 1) to the fuse "MAIN" and "IGNITION".
- Check the fuse for continuity.

NOCONTINUITY → Replace fuse "MAIN" and/or "IGNITION".

CONTINUITY

2. Battery

- Check the battery condition.
- Refer to the "BATTERY INSPECTION" section in the CHAPTER 3.

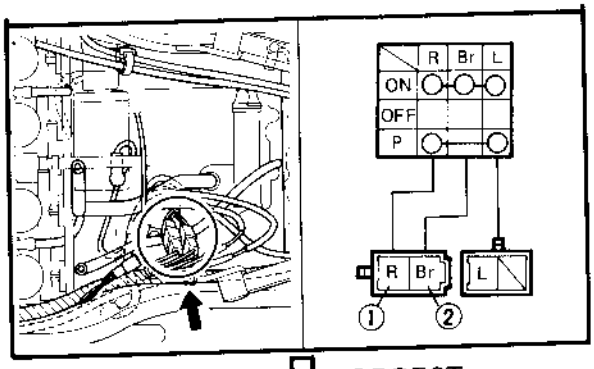
Specific Gravity:
1.280 at 20°C (68°F)

INCORRECT →
- Refill battery fluid.
- Clean battery terminals.
- Recharge or replace battery.

CORRECT

3. Main switch

- Disconnect the main switch coupler and lead from the wireharness.
- Check the switch component for the continuity between "Red ① and Brown ② ". Refer to the "CHECKING OF SWITCHES" section.



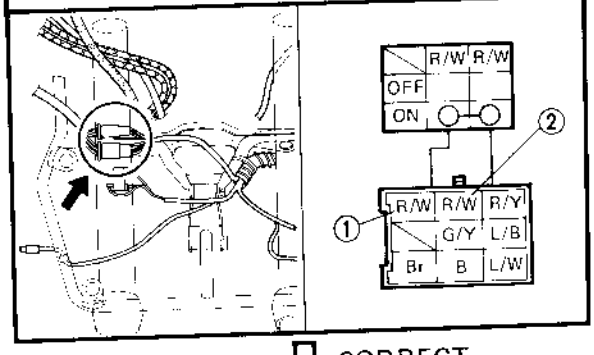
INCORRECT

Replace main switch.

CORRECT

4. "ENGINE STOP" switch

- Disconnect the "ENGINE STOP" switch coupler from the wire harness.
- Check the switch component for the continuity between "Red/White ① and Red/White ② ". Refer to the "CHECKING OF SWITCHES" section.



INCORRECT

Replace handlebar switch (Right).

CORRECT

5. Wiring connection

Check the entire EXUP system for connections. Refer to the "WIRING DIAGRAM" section.

POOR CONNECTION

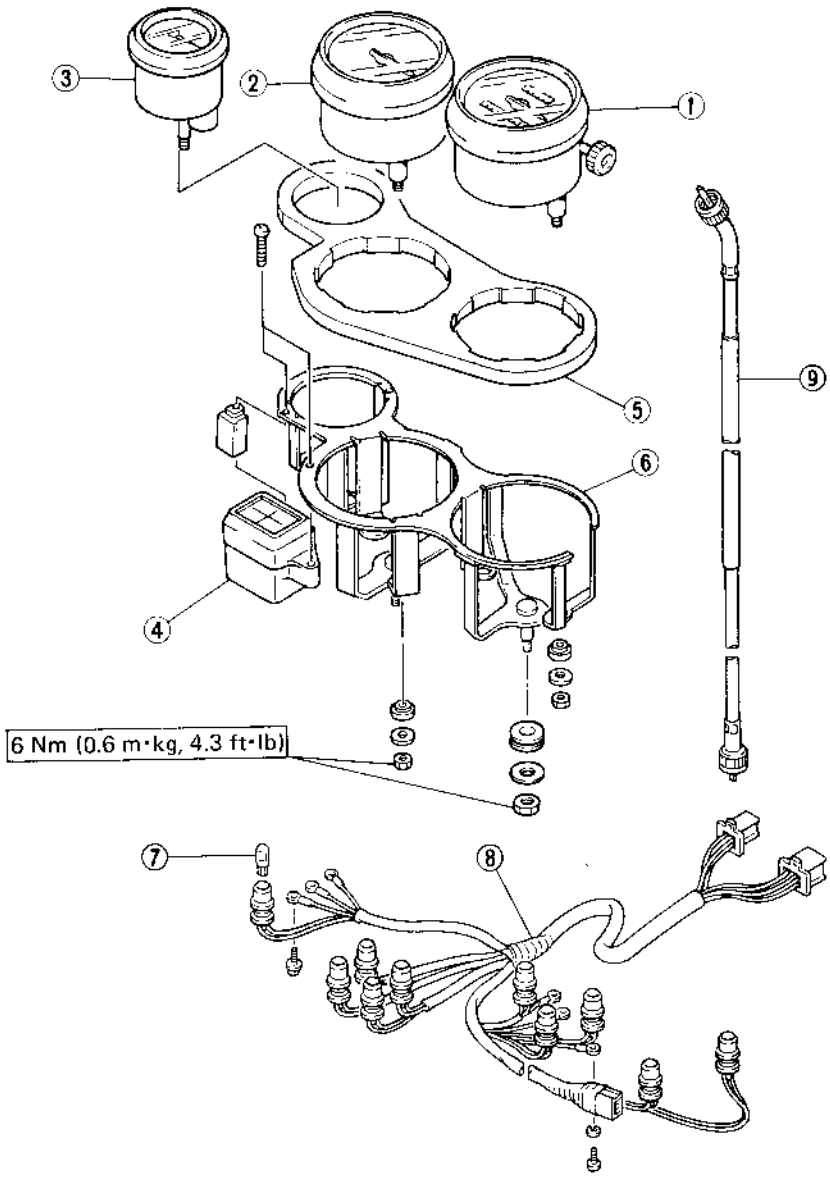
Correct.

CORRECT

Go to "Procedure (1)"

METER ASSEMBLY

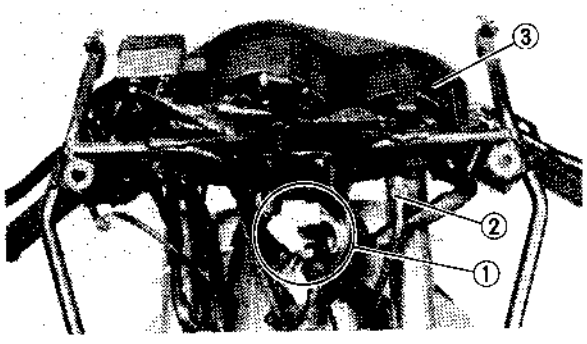
① Speedometer
② Tachometer
③ Tempmeter
④ Indicator lights unit
⑤ Damper
⑥ Meter bracket
⑦ Bulb
⑧ Bulb socket leads
⑨ Speedometer cable



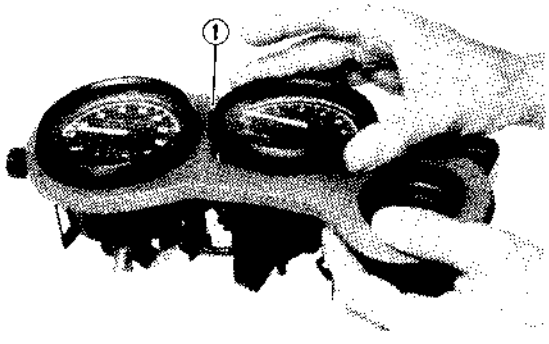
REMOVAL

1. Remove:
   - Upper cowling

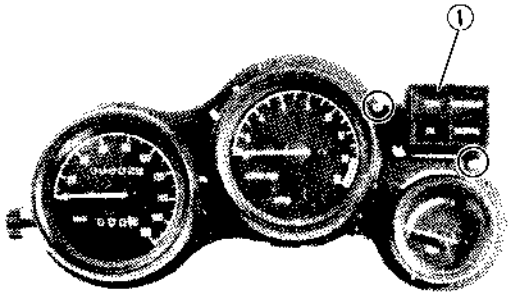
   Refer to the "COWLING REMOVAL AND INSTALLATION – REMOVAL" section in the CHAPTER 3.



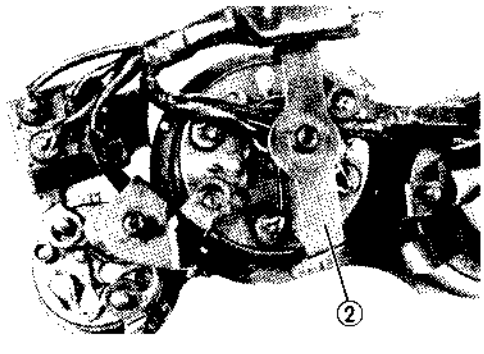
2. Disconnect:
   - Bulb socket coupler ①
   - Speedometer cable ②
3. Remove:
   - Speedometer assembly ③

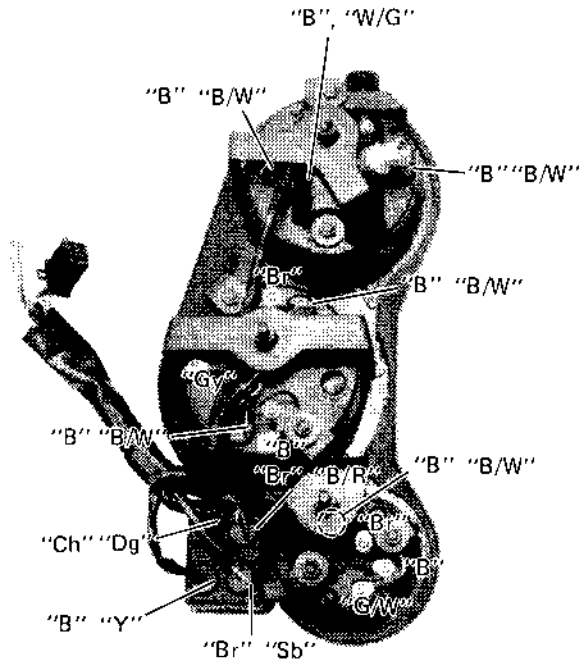


4. Remove:
   - Damper ①



5. Remove:
   - Indicator light unit ①
   - Meter bracket ②
6. Remove:
   - Bulb socket lead





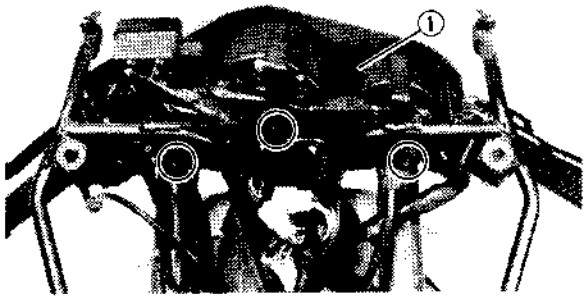
INSTALLATION

Reverse the "REMOVAL" procedure.

Note the following points.

1. Install the meter lights and leads as shown.

2. Install the indicator lights as shown.



3. Install:
   - Meter assembly ①

	Nut (Meter Assembly): **6 Nm (0.6 m · kg, 4.3 ft · lb)**

TROUBLESHOOTING

NOTE:

The following troubleshooting does not cover all the possible causes of trouble. It should be helpful, however, as a guide to troubleshooting. Refer to the relative procedure in this manual for inspection, adjustment and replacement of parts.

STARTING FAILURE/HARD STARTING

FUEL SYSTEM	PROBABLE CAUSE
Fuel tank	• Empty
	• Clogged fuel filter
	• Clogged fuel breather pipe
	• Deteriorated fuel or fuel containing water or foreign material
Fuel cock	• Clogged fuel hose
Carburetor	• Deteriorated fuel, fuel containing water or foreign material
	• Clogged pilot jet
	• Clogged pilot air passage
	• Sucked-in air
	• Deformed float
	• Groove-worn needle valve
	• Improperly sealed valve seat
	• Improperly adjusted fuel level
	• Improperly set pilot jet
	• Clogged starter jet
	• Starter plunger malfunction
	• Improperly adjusted starter cable
Air filter element	• Clogged
Fuel pump	• Faulty fuel pump
	• Faulty fuel pump relay

ELECTRICAL SYSTEM

- Spark plug
  - Improper plug cap
  - Worn electrodes
  - Wire between terminals broken
  - Improper heat range
  - Faulty spark plug cap
- Ignition coil
  - Broken or shorted primary/secondary
  - Faulty spark plug lead
  - Broken body
- Full-transistor system
  - Faulty igniter unit
  - Faulty pickup coil
- Switches and wiring
  - Faulty main switch
  - Faulty engine stop switch
  - Broken or shorted wiring
  - Faulty neutral switch
  - Faulty starter motor switch
  - Faulty sidestand switch
  - Faulty clutch switch
- Starter motor
  - Faulty starter motor
  - Faulty starter relay
  - Faulty circuit cut-off relay
  - Faulty starter clutch

COMPRESSION SYSTEM

- Cylinder and cylinder head
  - Loose spark plug
  - Loose cylinder head or cylinder
  - Broken cylinder head gasket
  - Worn, damaged or seized cylinder

- Piston and piston rings
  - Improperly installed piston ring
  - Worn, fatigued or broken piston ring
  - Seized piston ring
  - Seized or damaged piston
- Crankcase and crankshaft
  - Improperly seated crankcase
  - Damaged crankshaft oil seal lip
  - Improperly sealed valve
  - Improperly contacted valve and valve seat
  - Improper valve timing
  - Broken valve spring
  - Seized crankshaft
  - Seized camshaft

POOR IDLE SPEED PERFORMANCE

POOR IDLE SPEED PERFORMANCE	PROBABLE CAUSE
Carburetor	• Improperly returned starter plunger
	• Loose pilot jet
	• Clogged pilot air jet
	• Improperly synchronized carburetors
	• Improperly adjusted idle speed (Throttle stop screw)
	• Improper throttle cable play
	• Flooded carburetor
Electrical system	• Faulty battery
	• Faulty spark plug
	• Faulty igniter unit
	• Faulty pickup coil
	• Faulty ignition coil
Valve train	• Improperly adjusted valve clearance

POOR MEDIUM AND HIGH SPEED PERFORMANCE

POOR MEDIUM AND HIGH SPEED PERFORMANCE

Refer to "Starting failure/Hard starting." (Fuel system, electrical system, compression system and valve train)

	PROBABLE CAUSE
Carburetor	• Improper jet needle clip position
	• Diaphragm malfunction
	• Improperly adjusted fuel level
	• Clogged or loose main jet
Air cleaner	• Clogged air filter
Fuel pump	• Faulty fuel pump

FAULTY GEAR SHIFTING

HARD SHIFTING

Refer to "Clutch dragging."

SHIFT PEDAL DOES NOT MOVE

	PROBABLE CAUSE
Shift shaft	• Improperly adjusted shift rod
	• Bent shift shaft
Shift cam, shift fork	• Groove jammed with impurities
	• Seized shift fork
	• Bent shift fork guide bar
Transmission	• Seized transmission gear
	• Jammed impurities
	• Incorrectly assembled transmission

JUMP-OUT GEAR

Shift shaft	• Improperly adjusted
	• Improperly returned stopper lever
Shift fork	• Worn shift fork
Shift cam	• Improper thrust play
	• Worn shift cam groove
Transmission	• Worn gear dog

CLUTCH SLIPPING/DRAGGING

CLUTCH SLIPPING

	PROBABLE CAUSE
Clutch	• Loose clutch spring
	• Fatigued clutch spring
	• Worn friction plate/clutch plate
Engine oil	• Low oil level
	• Improper quality/viscosity

CLUTCH DRAGGING

Clutch	• Warped pressure plate
	• Unevenly tensioned clutch springs
	• Match marks not aligned
	• Bent push rod
	• Loose push rod/bent clutch boss nut
	• Burnt primary driven gear bushing
	• Bent clutch plate
	• Swollen friction plate
	• Faulty cylinder kit cup
	• Broken clutch cable
Engine oil	• Improper oil level
	• Improper quality/viscosity
	• Deterioration

OVERHEATING OR OVER-COOLING

OVERHEATING

- Ignition system
  - Improper spark plug gap
  - Improper spark plug heat range
  - Faulty ignitor unit
- Fuel system
  - Improper carburetor main jet (setting)
  - Improperly adjusted fuel level
  - Clogged air cleaner element
- Compression system
  - Heavy carbon build-up
- Engine oil
  - Incorrect oil level
  - Improper oil viscosity
  - Inferior oil quality
- Brake
  - Dragging brake
- Cooling system
  - Faulty water temperature meter
  - Faulty thermo-unit
  - Incorrect cooling water level
  - Faulty thermostat
  - Clogged or damaged radiator
  - Faulty radiator cap
  - Broken dowel pin/tipped gear
  - Faulty thermoswitch
  - Inoperative fan motor

OVER-COOLING

- Cooling system
  - Faulty water temperature meter
  - Faulty thermo-unit
  - Faulty thermostat
  - Faulty thermoswitch
  - Inoperative fan motor

FAULTY BRAKE

POOR BRAKING EFFECT

- Worn brake pads
- Worn disc
- Air in brake fluid
- Leaking brake fluid
- Faulty cylinder kit cup
- Faulty caliper kit seal
- Loose union bolt
- Broken brake hose
- Oily or greasy disc/brake pads
- Improper brake fluid level

FRONT FORK OIL LEAKAGE/MALFUNCTION

OIL LEAKAGE

- 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 hexagon bolt (front fork bottom)
- Broken cap bolt O-ring
- Loose drain bolt
- Damaged drain bolt gasket

MALFUNCTION

- Bent, deformed or damaged inner tube
- Bent or deformed outer tube
- Damaged fork spring
- Worn or damaged slide metal
- Bent or damaged piston
- Improper oil viscosity or level

INSTABLE HANDLING

- **HANDLEBARS**
  - Improperly installed or bent
- **STEERING**
  - Improperly installed handle crown
  - Bent steering stem
  - Damaged bearing
- **FRONT FORKS**
  - Uneven oil levels on both sides
  - Broken spring
  - Twisted front forks
- **WHEELS**
  - Incorrect wheel balance
  - Deformed cast wheel
  - Unevenly worn tires
  - Incorrect tire pressure
  - Uneven tire pressures on both sides
  - Loose bearing
  - Bent or loose wheel axle
  - Excessive wheel run-out
- **FRAME**
  - Twisted
  - Damaged head pipe bearing race
  - Improperly installed bearing race
- **REAR ARM**
  - Worn bearing bushes
  - Damaged
- **REAR CUSHION**
  - Fatigued spring
  - Improper adjustment
  - Oil leakage
- **DRIVE CHAIN**
  - Improperly adjusted chain
- **FAIRING**
  - Damaged or broken
  - Incorrectly installed

FAULTY SIGNALS AND LIGHTS

HEADLIGHT DARK
- Improper bulb
- Too many electrical accessories
- Hard charging (broken stator coil wire, faulty rectifier with regulator)
- Incorrectly connected coupler/connector/ wire harness
- Improperly grounded
- Poor contacts (main or light switch)
- Bulb life expired

BULB BURNT OUT
- Improper bulb
- Faulty battery
- Faulty rectifier/regulator
- Improperly grounded
- Faulty switch (main and light switch)
- Bulb life expired

FLASHER DOES NOT LIGHT
- Improperly grounded
- Discharged battery
- Faulty flasher switch
- Faulty flasher relay
- Broken wire harness/loosely connected coupler
- Bulb burnt out

FLASHER KEEPS ON
- Faulty flasher relay
- Insufficient battery capacity (nearly discharged)
- Bulb burnt out (front or rear)

FLASHER WINKS SLOWER
- Faulty flasher relay
- Insufficient battery capacity (nearly discharged)
- Improper bulb
- Faulty switch (main or flasher switch)

FLASHER WINKS QUICKER
- Improper bulb
- Faulty flasher relay

HORN IS INOPERATIVE
- Faulty battery
- Faulty switch (main or horn switch)
- Improperly adjusted horn
- Faulty horn (coil wire broken or having poor contacts)
- Broken wire harness

FAULTY EXUP (For California only)

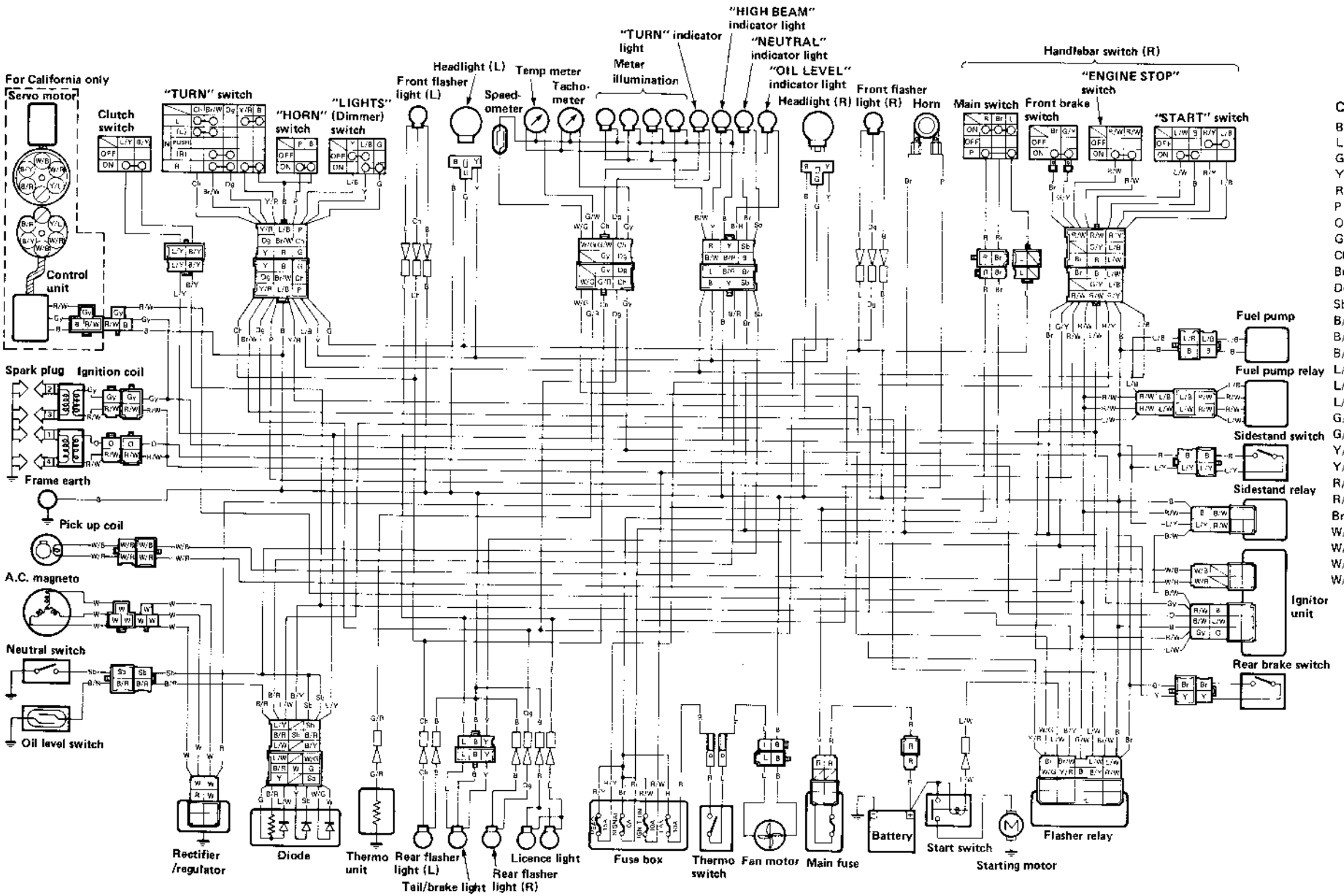
FAULTY EXUP

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 EXUP servo motor
- Faulty ignitor unit
- Faulty EXUP control unit
- Broken or shorted wiring

FZR400U/FZR400SUC WIRING DIAGRAM



COLOR CODE

B	Black
L	Blue
G	Green
Y	Yellow
R	Red
P	Pink
O	Orange
Gy	Gray
Ch	Chocolate
Br	Brown
Dg	Dark green
Sb	Sky blue
B/Y	Black/Yellow
B/R	Black/Red
B/W	Black/White
L/B	Blue/Black
L/Y	Blue/Yellow
L/W	Blue/White
G/Y	Green/Yellow
G/R	Green/Red
Y/L	Yellow/Blue
Y/R	Yellow/Red
R/Y	Red/Yellow
R/W	Red/White
Br/W	Brown/White
W/B	White/Black
W/L	White/Blue
W/G	White/Green
W/R	White/Red