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**GENERAL
INFORMATION**

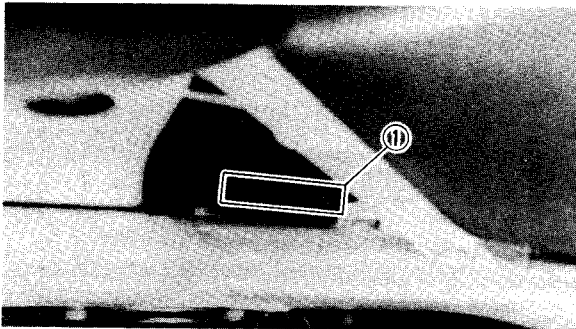
**MOTORCYCLE IDENTIFICATION
VEHICLE IDENTIFICATION NUMBER**

The vehicle identification number ① is stamped 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

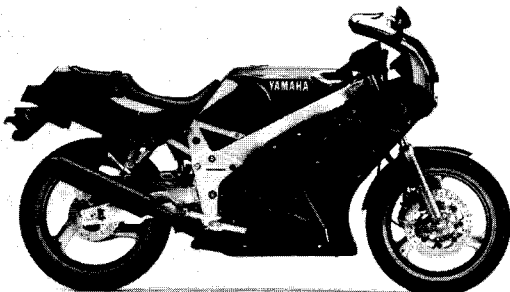
The engine serial number ① is stamped into the right side of the engine.

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

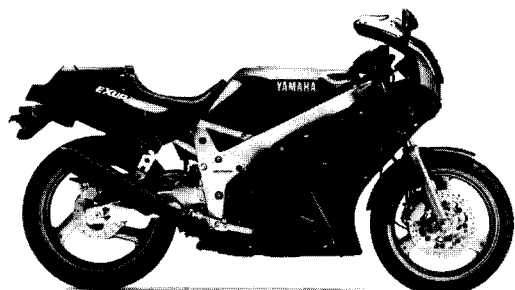
NOTE: _____

- 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





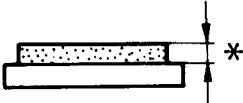
SPECIFICATIONS

GENERAL SPECIFICATIONS

Model	FZR400A/FZR400SAC	
Model Code Number:	3BF5 (FZR400A) 3FH3 (FZR400SAC)	
Vehicle Identification Number:	JYA3BFEO * LA012101 (FZR400A) JYA3FHCO * 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: Type Size Manufacture (Type)	Front	Rear
	Tubeless 110/70R17-54H BRIDGESTONE (CY15) DUNLOP (K510F)	Tubeless 140/60R18-64H BRIDGESTONE (CY16) DUNLOP (K510)

MAINTENANCE SPECIFICATIONS

CHASSIS

Model	FZR400A/FZR400SAC
<p>Front Suspension:</p> <p>Front Fork Travel</p> <p>Front Spring Free Length</p> <p>< Limit ></p> <p>Collar Length</p> <p>Spring Rate: K1</p> <p> K2</p> <p>Stroke K1</p> <p> K2</p> <p>Optional Spring</p> <p>Oil Capacity</p> <p>Oil Level (Fully Compression)</p> <p>Oil Grade</p>	<p>130 mm (5.12 in)</p> <p>412 mm (16.2 in)</p> <p>408 mm (16.1 in)</p> <p>160 mm (6.3 in)</p> <p>4.4 N/mm (0.5 kg/mm, 25.2 lb/in)</p> <p>6.6 N/mm (0.7 kg/mm, 37.5 lb/in)</p> <p>0.0 ~ 90 mm (0.0 ~ 3.54 in)</p> <p>90 ~ 130 mm (3.54 ~ 5.12 in)</p> <p>No</p> <p>440 cm³ (15.5 Imp oz, 14.9 US oz)</p> <p>92 mm (3.62 in)</p> <p>Bellow the top of inner fork tube without fork spring</p> <p>Yamaha Fork Oil 10WT or equivalent</p>
<p>Front Disc Brake:</p> <p>Type</p> <p>Disc Outside Diameter x Thickness</p> <p>Pad Thickness Inner</p> <p> < Limit > *</p> <p>Pad Thickness Outer</p> <p> < Limit > *</p> <div data-bbox="405 984 645 1087" style="text-align: center;">  </div> <p>Master Cylinder Inside Diameter</p> <p>Caliper Cylinder Inside Diameter</p> <p>Brake Fluid Type</p>	<p>Dual</p> <p>282 x 4 mm (11.10 x 0.16 in)</p> <p>5.5 mm (0.22 in)</p> <p>0.5 mm (0.02 in)</p> <p>5.5 mm (0.22 in)</p> <p>0.5 mm (0.02 in)</p> <p>15.87 mm (0.62 in)</p> <p>32.10 mm (1.26 in)</p> <p>DOT # 4 or DOT # 3</p>



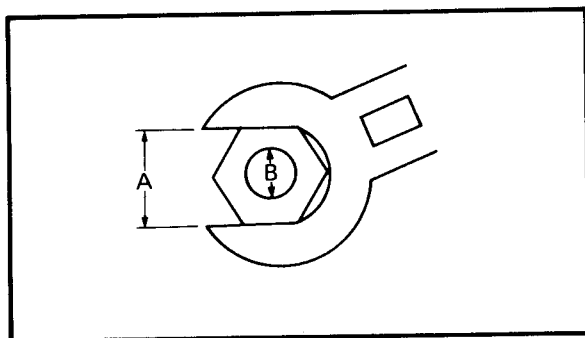
TIGHTENING TORQUE

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

PERIODIC INSPECTIONS AND ADJUSTMENTS

CHASSIS

DRIVE CHAIN SLACK ADJUSTMENT

NOTE:

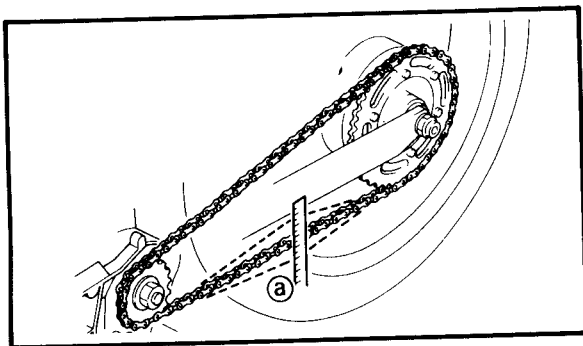
Before checking and/or adjusting the chain slack, rotate the rear wheel several revolutions. Check the chain slack several times to find the point where the chain is the tightest. Check and/or adjust the chain slack where the rear wheel is in this "tight chain" position.

CAUTION:

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

WARNING

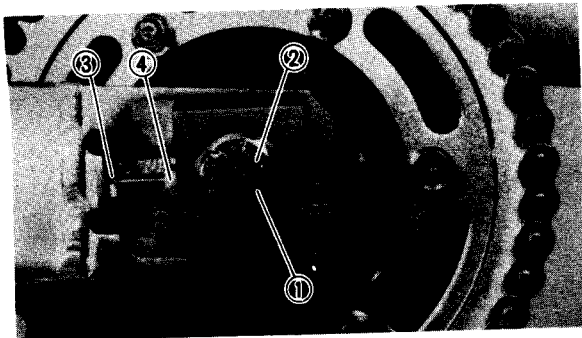
Securely support the motorcycle so there is no danger of it falling over.



1. Place the motorcycle on a level place, and hold it in an upright position.
2. Check:
 - Drive chain slack (a)
 - 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)

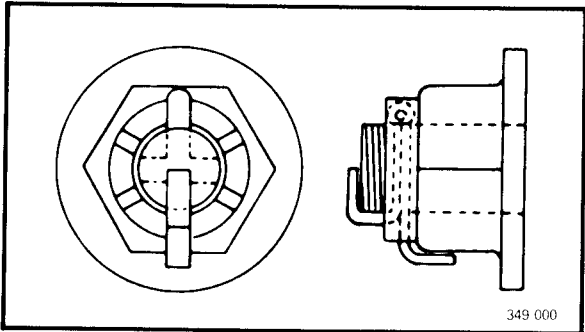
- Install the cotter pin.

⚠ WARNING _____

Always use a new cotter pin on the axle nut.

CAUTION: _____

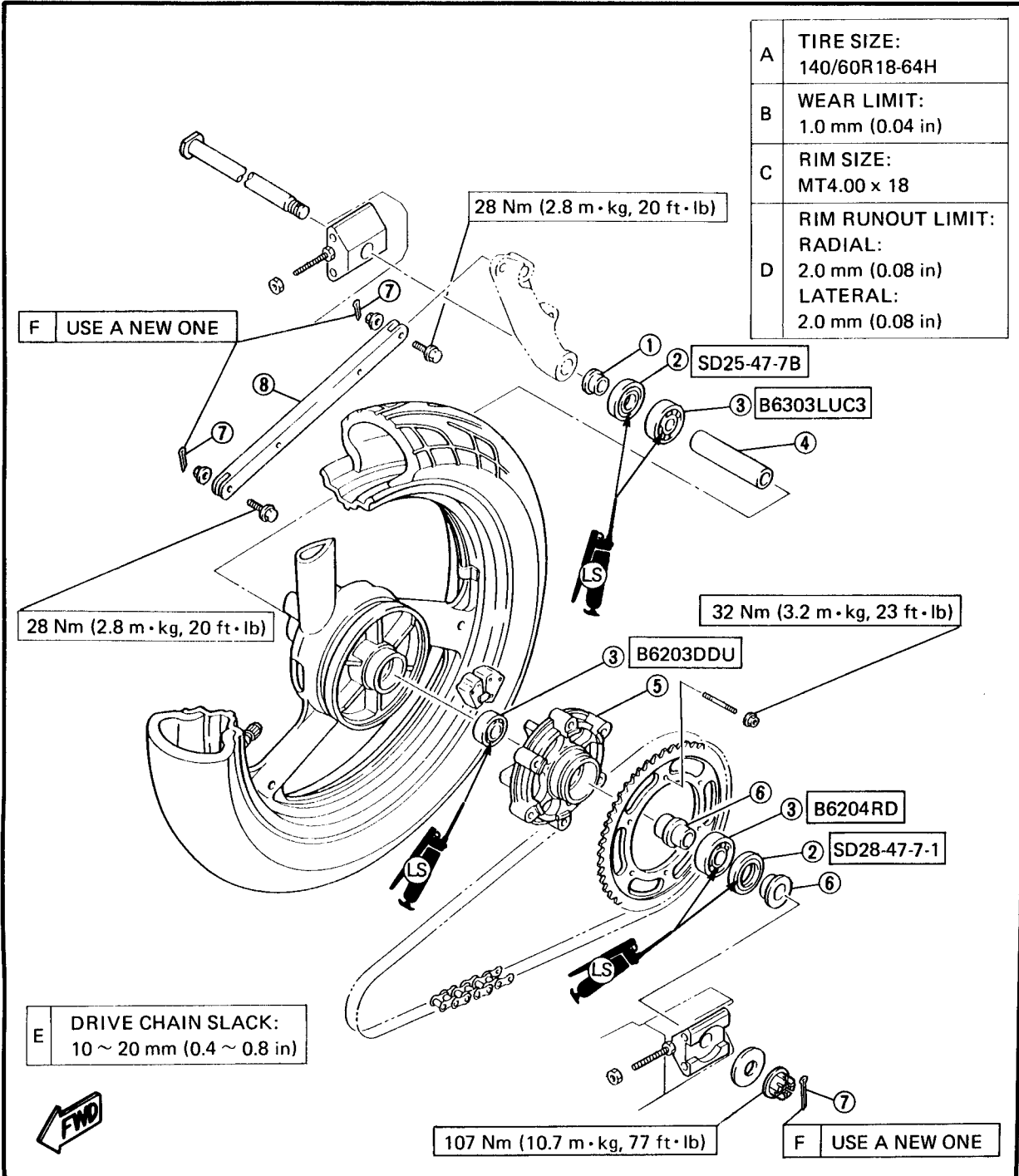
Do not loosen the axle nut after torque tightening. If the axle nut groove is not aligned with the cotter pin hole, align groove with the hole by tightening up on the axle nut.



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

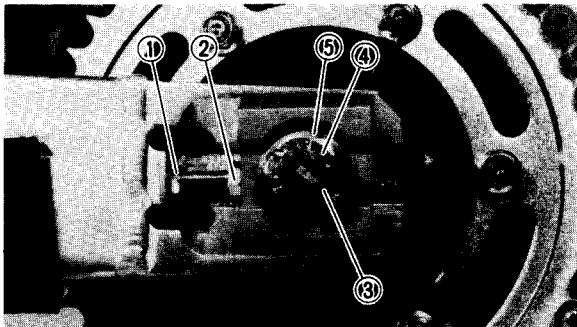
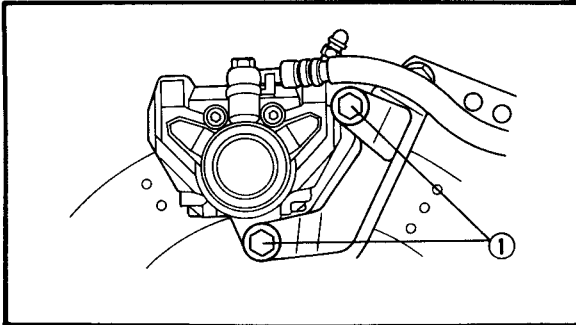
Securely support the motorcycle so there is no danger of it falling over.

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

3. Remove:
 - Bolts (brake caliper) ①

NOTE:

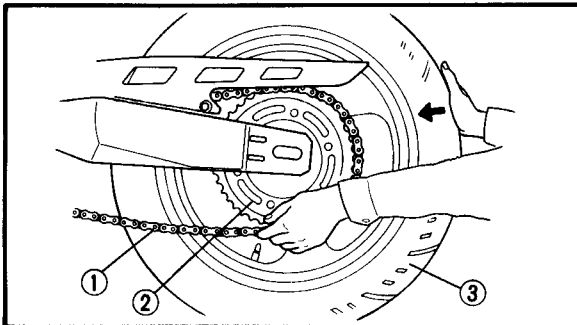
Do not depress the brake pedal while the caliper is removed.



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".

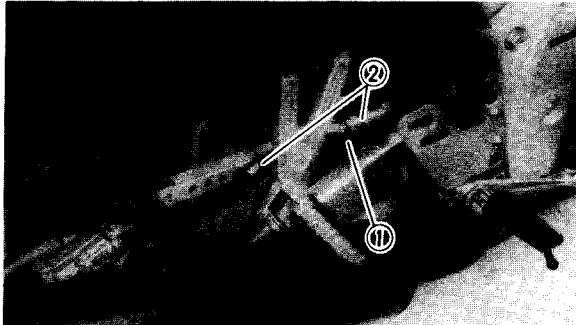
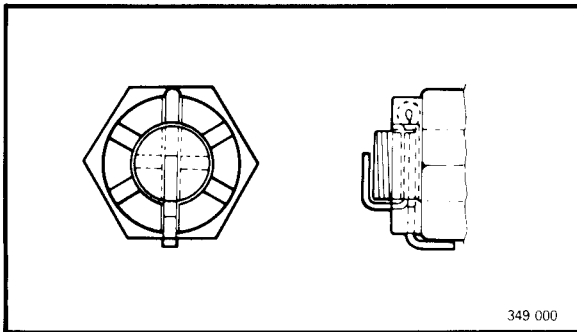
3. Tighten:

- 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:

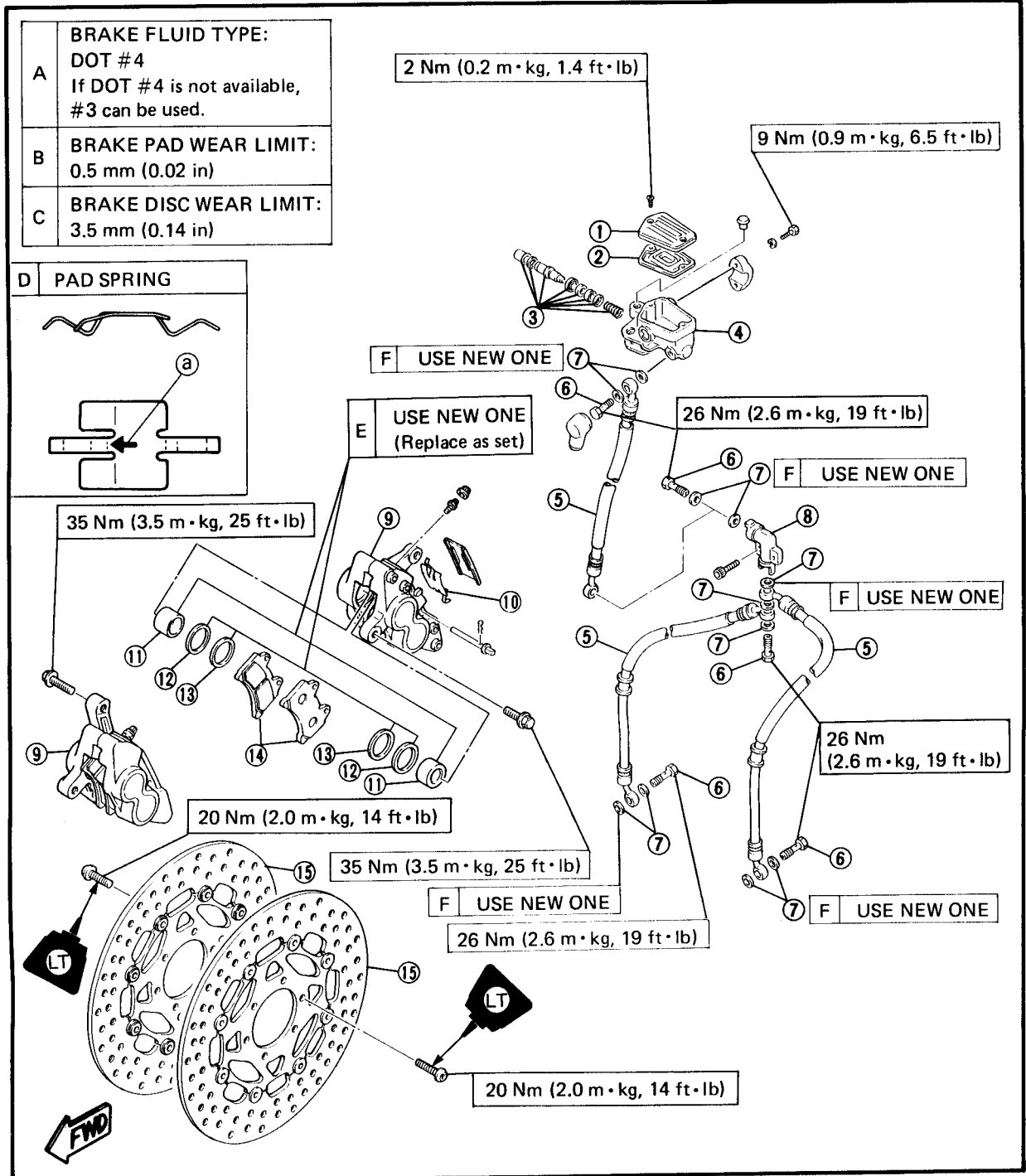
- Wheel balance

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

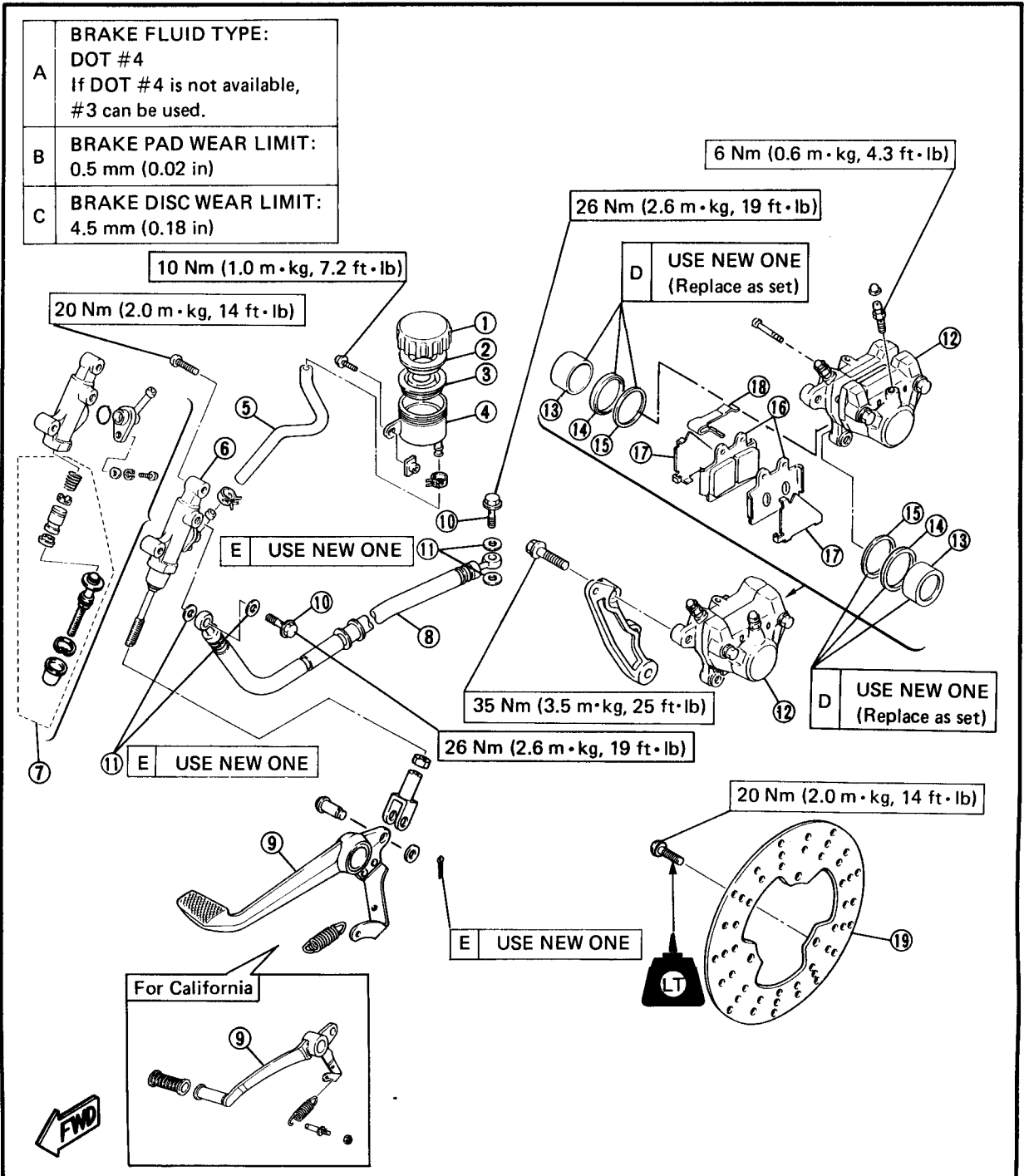
FRONT AND REAR BRAKE

- 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 **a** on the pad spring must pointing the disc rotating direction.



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



**CAUTION:**

Disc brake components rarely require disassembly. DO NOT:

- Disassemble 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:**

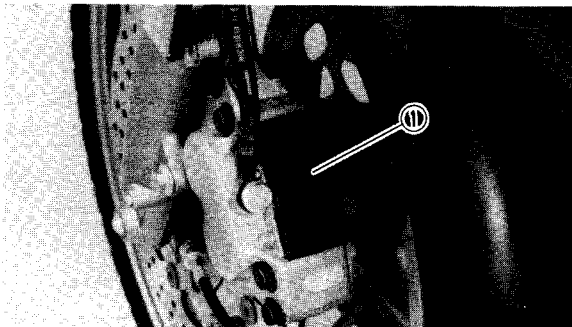
It is not necessary to disassemble the brake caliper and brake hose to replace the brake pads.

⚠ WARNING

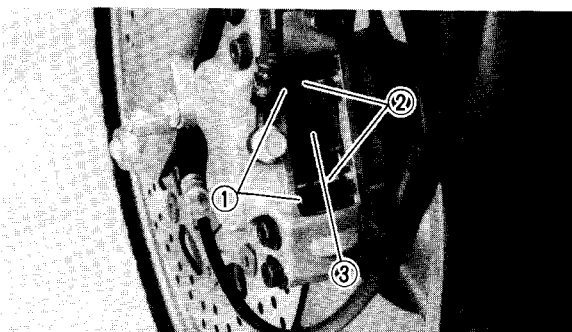
Securely support the motorcycle so there is no danger of it falling over.

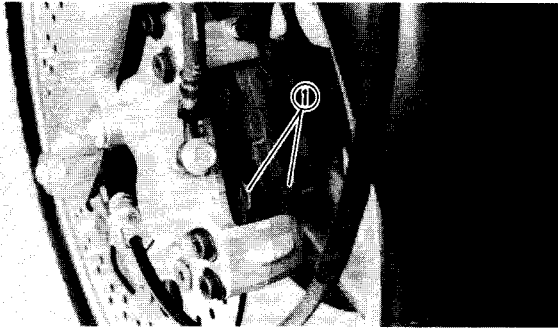
Front brake

1. Remove:
 - Cover ①



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

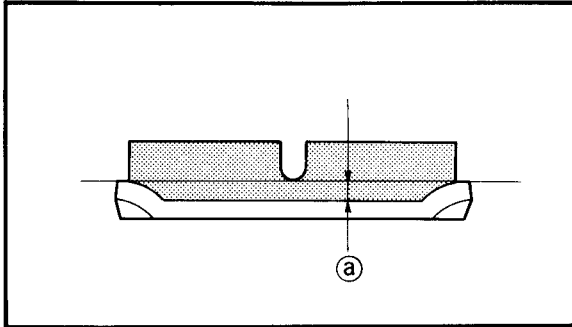





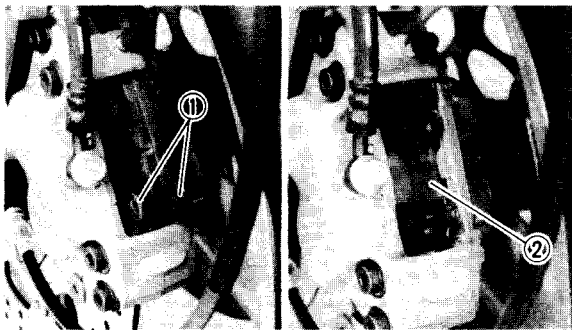
3. Remove:
- Brake pads ①

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.



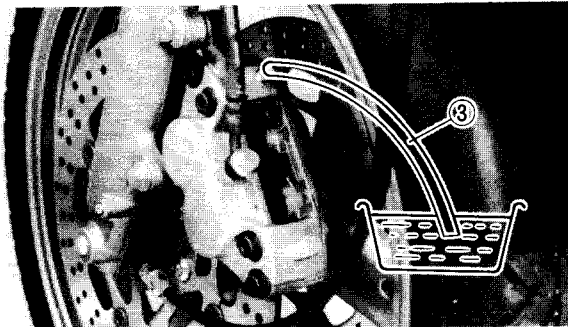
 **Wear limit ① :**
0.5 mm (0.02 in)




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.

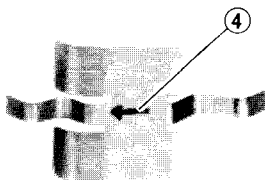


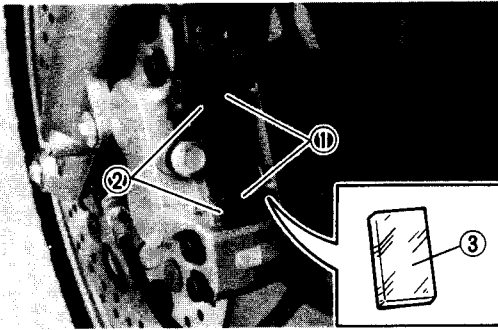
 **Caliper bleed screw:**
6 Nm (0.6 m·kg, 4.3 ft·lb)

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

NOTE: _____

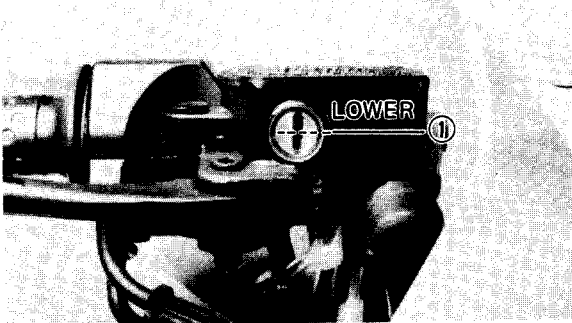
The arrow mark ④ on the pad spring must point in the disc rotating direction.





5. Install:

- Retaining pins ①
- Retaining clips ②
- Cover ③



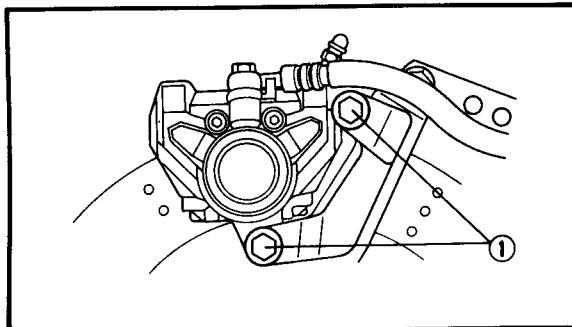
6. Inspect:

- 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.



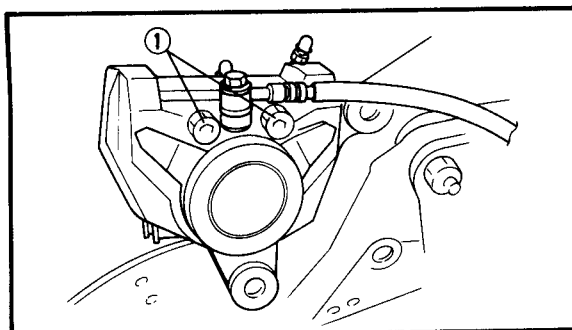
Rear brake

1. Remove:

- Seat

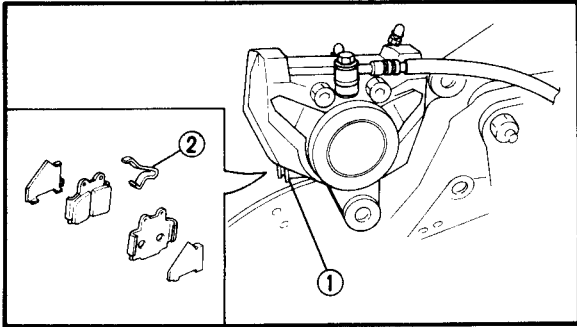
2. Remove:

- Bolts (brake caliper) ①



3. Remove:

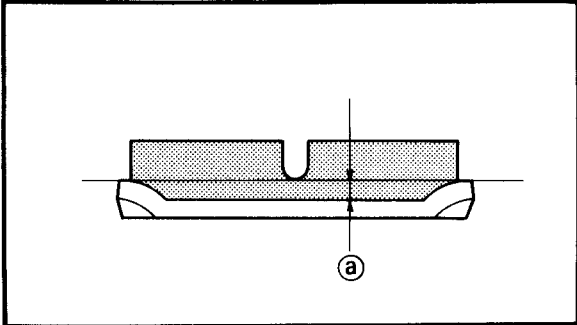
- Retaining bolts ①



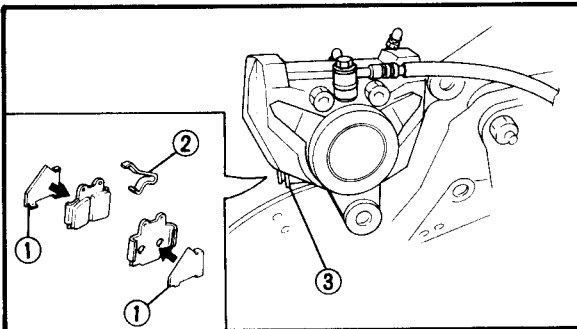
4. Remove:
- Brake pads (with shims) ①
 - Pad spring ②

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.



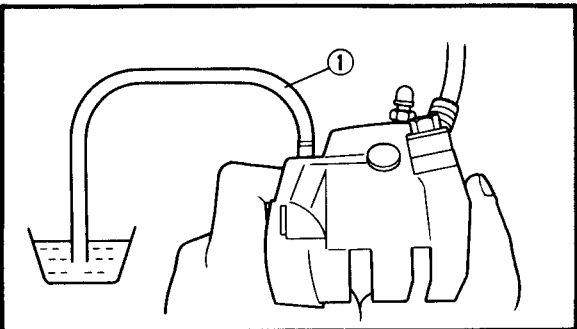
Wear limit (a) :
0.5 mm (0.02 in)



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.

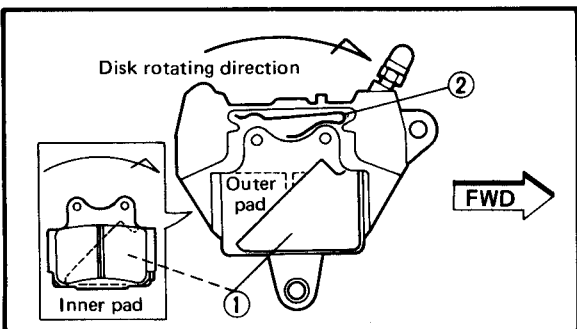


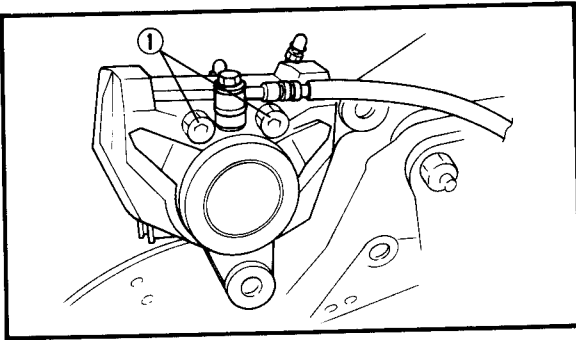
Caliper bleed screw:
6 Nm (0.6 m · kg, 4.3 ft · lb)

- 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.



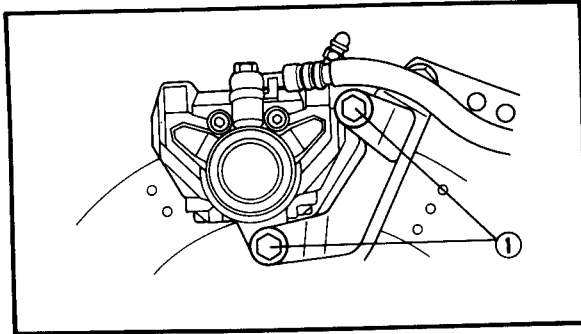


6. Install:

- Retaining bolts ①



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

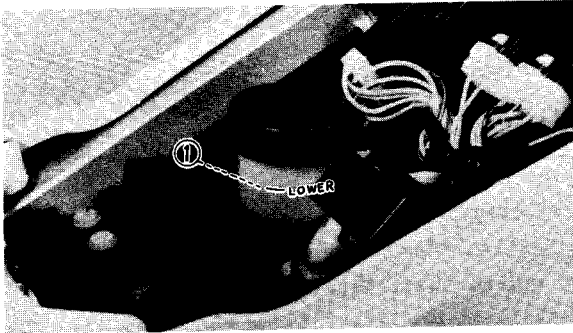


7. Install:

- 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.

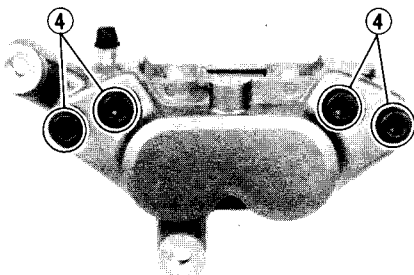
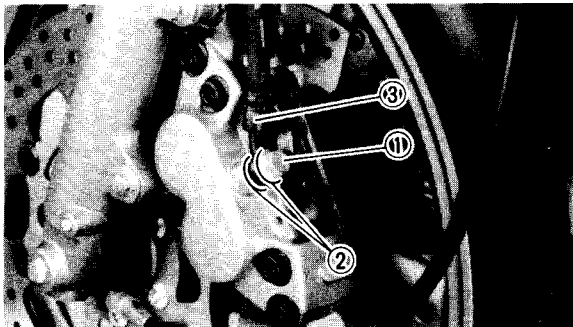
2. Remove:

- Union bolt ①
- Copper washers ②
- Brake hose ③

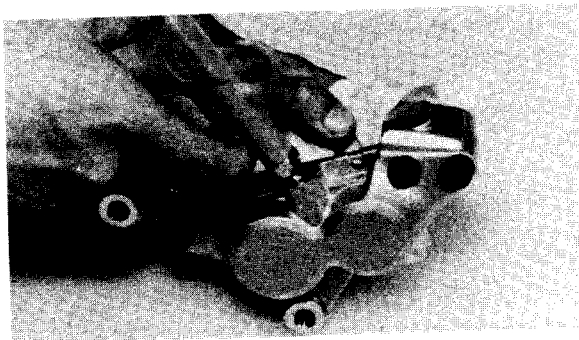
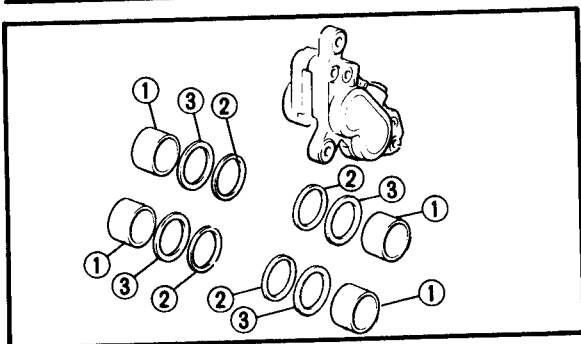
Place the open hose end into a container and pump the old fluid out carefully.

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:

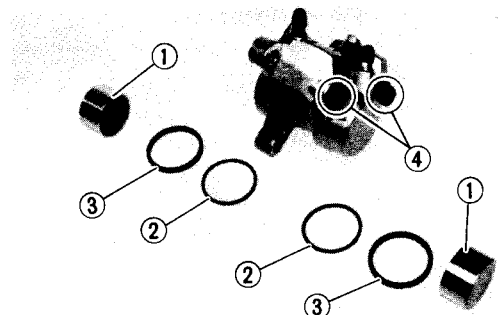
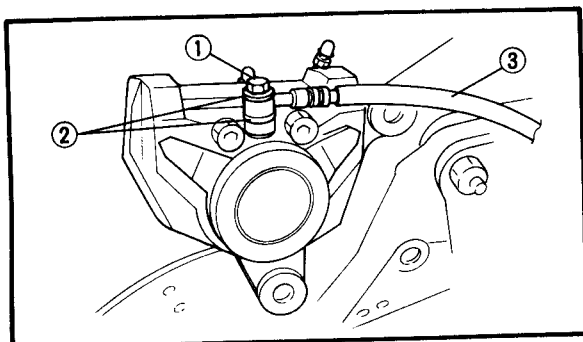
- Bolts (brake caliper)
- Retaining bolts
- Brake pads (with sims)
- Brake spring

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.

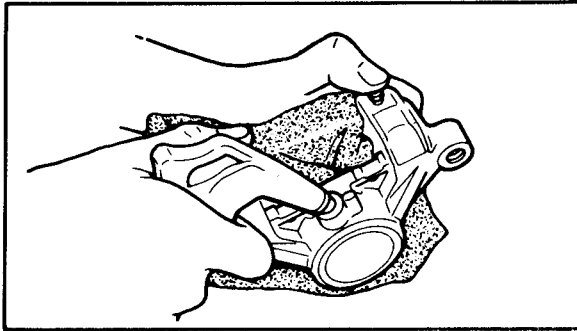


3. Remove:

- 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

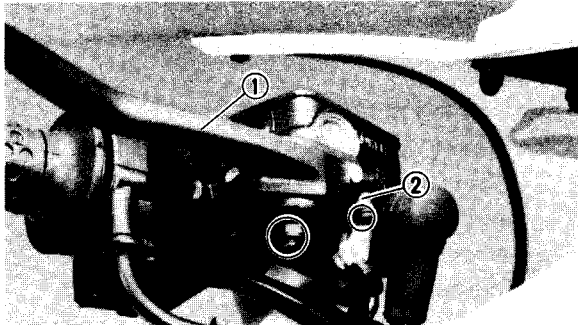
- Never try to pry out the piston.
- Cover the piston with a rag. Use care so that piston does not cause injury as it is expelled from the cylinder.

MASTER CYLINDER DISASSEMBLY**NOTE:**

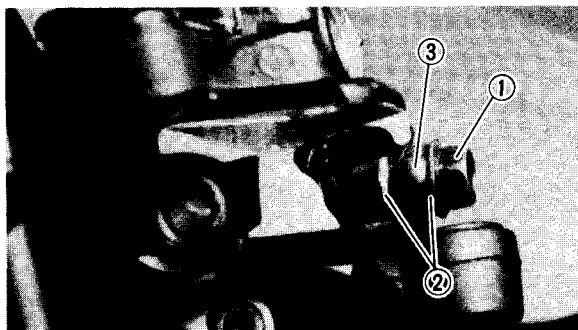
Before disassembling the front or rear brake master cylinders, drain the brake hose, master cylinder, brake caliper and reservoir tank of their brake fluid.

⚠ WARNING

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

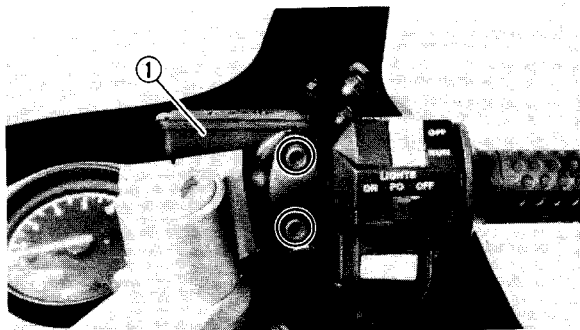
**Front brake****1. Remove:**

- Brake lever ①
- Brake switch ②

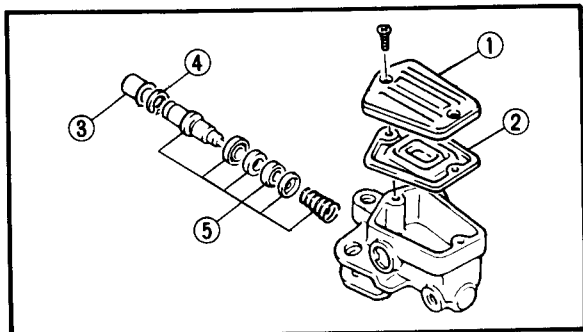
**2. Remove:**

- Union bolt ①
- Copper washer ②
- Brake hose ③

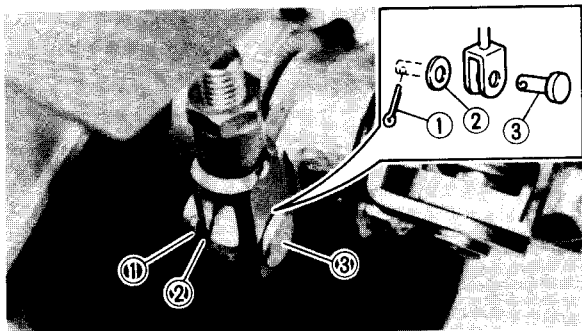
Place the open hose end into a container and pump the old fluid out carefully.



3. Remove:
- Master cylinder ①



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



Rear brake

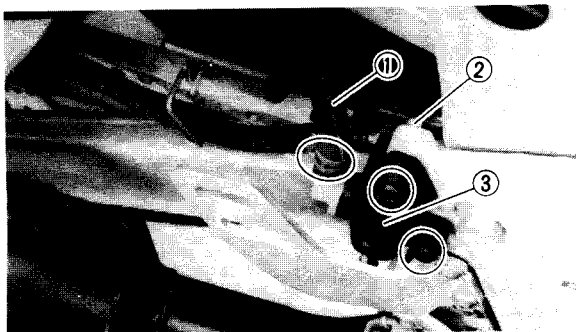
1. Remove:
- Seat
 - Side cover (right)

2. Remove:
- Cotter pin ①
 - Washer ②
 - Pin ③

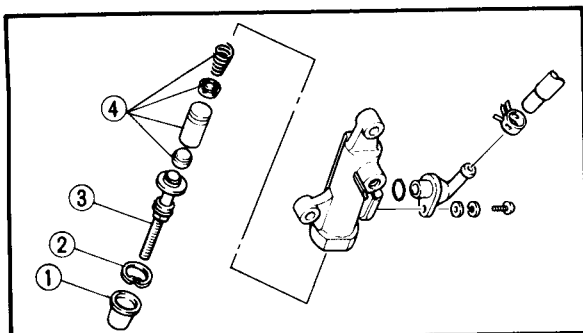
3. Disconnect:
- Reservoir hose ①
- Place the open hose end into a container and pump the old fluid out carefully.

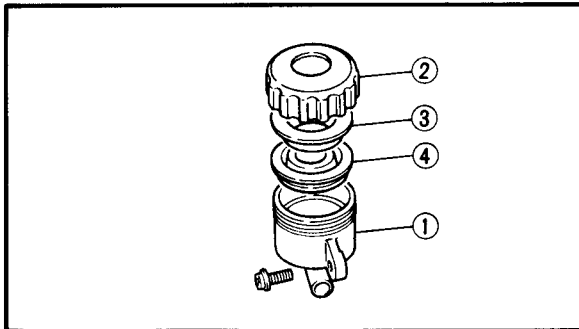
4. Remove:
- Union bolt ②
 - Copper washers
- Place the open hose end into a container and pump the old fluid out carefully.

5. Remove:
- Master cylinder ③



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





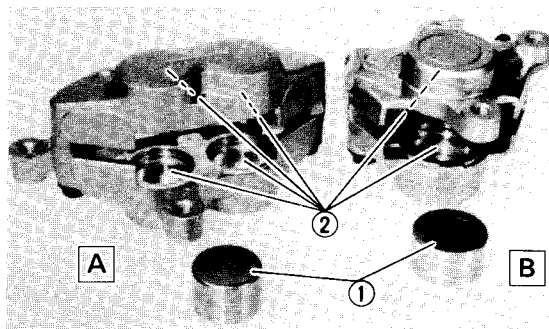
7. Remove:

- Reservoir tank ①
(from frame)
- 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.



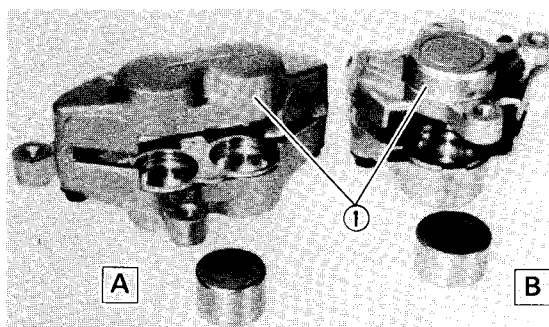
1. Inspect:

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

- A** Front
- B** Rear

⚠ WARNING

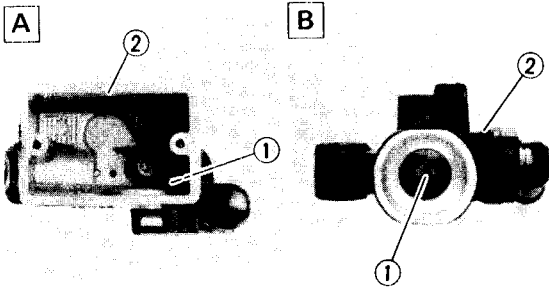
Replace the piston seal and dust seal whenever a caliper is disassembled.



2. Inspect:

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

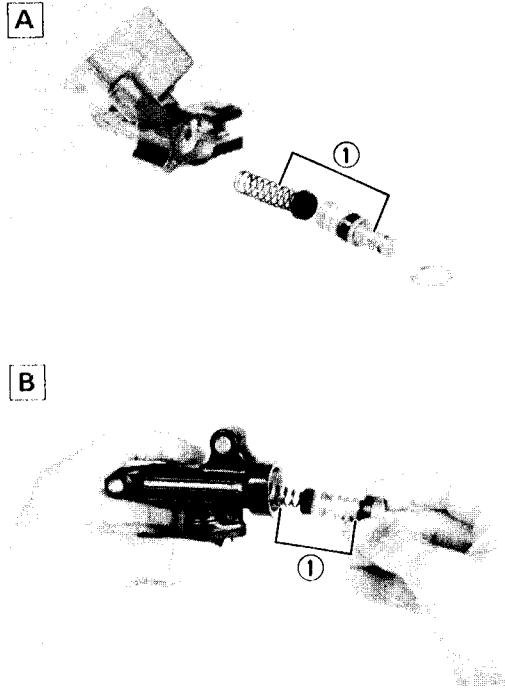
- A** Front
- B** Rear



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.

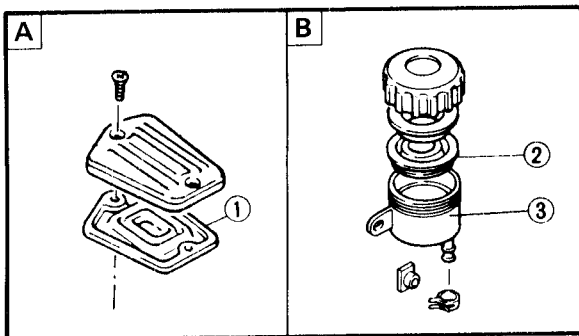
- Ⓐ Front
- Ⓑ Rear



4. Inspect:

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

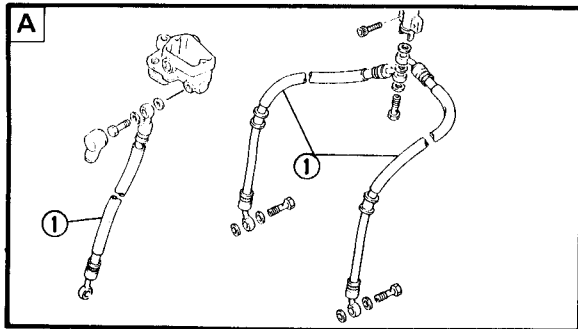
- Ⓐ Front
- Ⓑ Rear



5. Inspect:

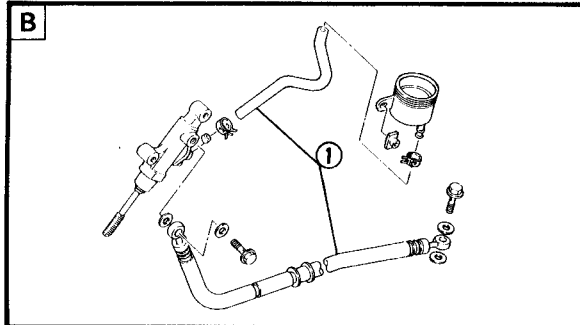
- Diaphragm (front) ①
- Diaphragm (rear) ②
Wear/Damage → Replace.
- Reservoir tank ③
Cracks/Damage → Replace.

- Ⓐ Front
- Ⓑ Rear



6. Inspect:

- Brake hoses ①
Cracks/Wear/Damage → Replace.

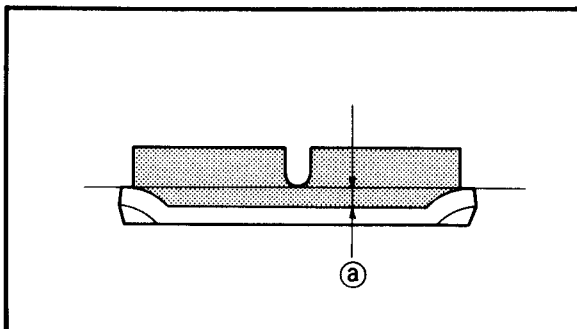



A Front

B Rear

7. Measure:

- Brake pads (thickness) ②
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 is found to be worn to the wear limit.



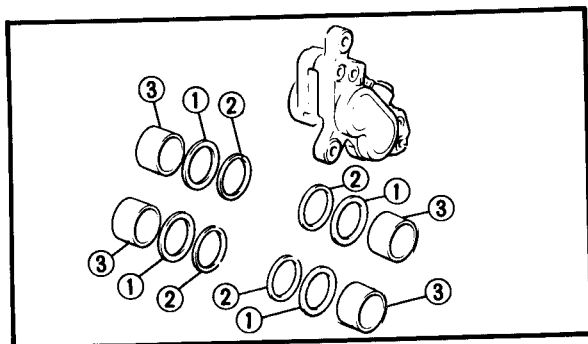
ASSEMBLY

⚠ 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

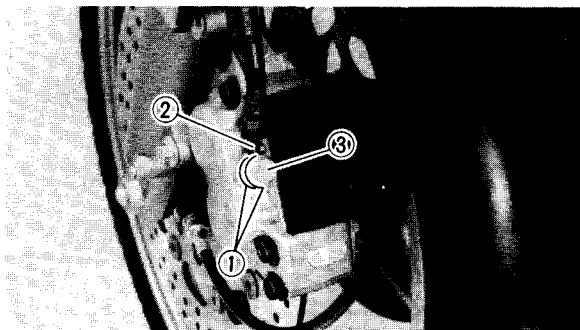
Refer to the "BRAKE PAD REPLACEMENT" section.

3. Install:

- Brake caliper
- Reflector




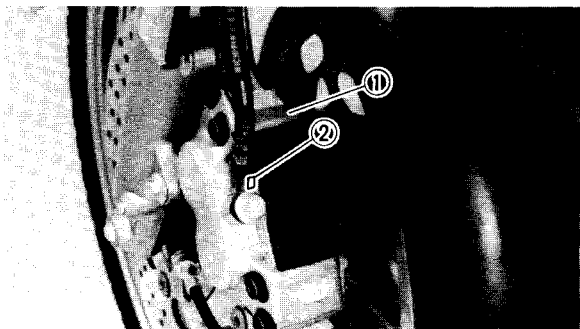
Bolts (brake caliper):
35 Nm (3.5 m · kg, 25 ft · lb)



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)
---	--

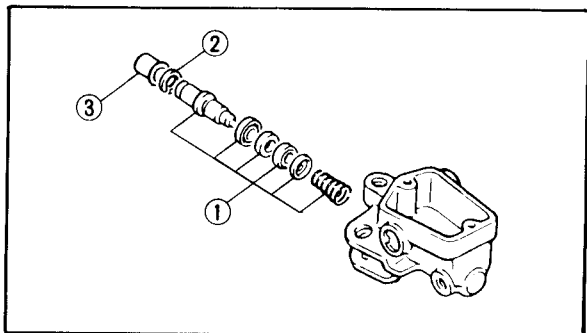


CAUTION:

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

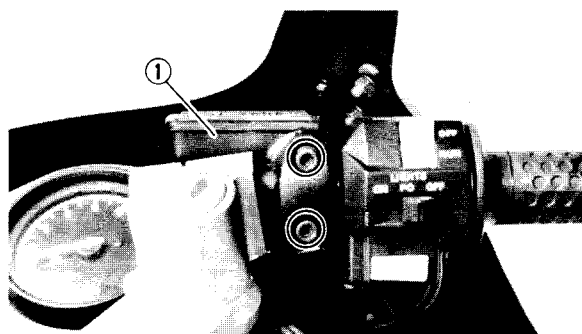
⚠ WARNING

- 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

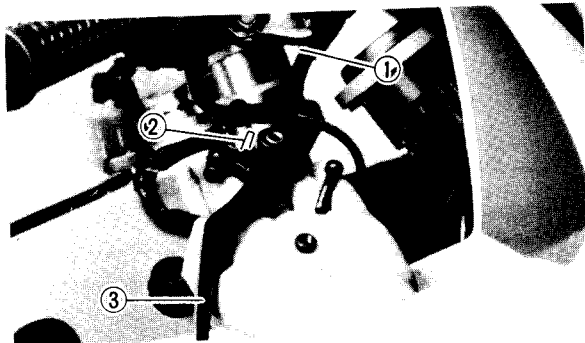
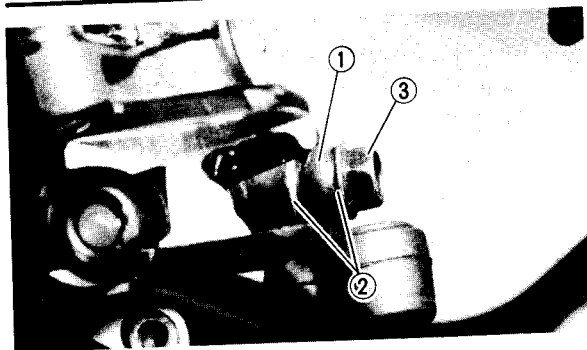


6. Install:

- 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



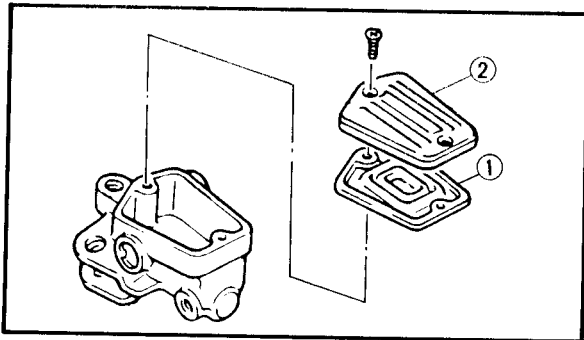
Recommended brake fluid:
DOT #4
If DOT #4 is not available,
#3 can be used.

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.



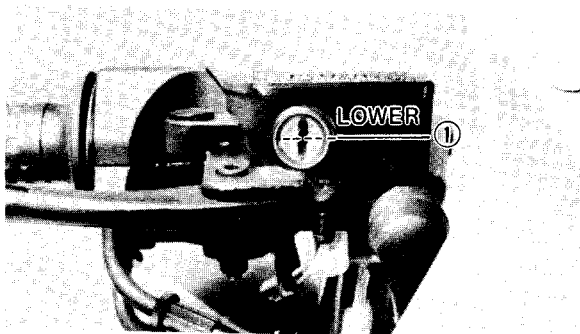
10. Install:

- Diaphragm ①
- Master cylinder cap ②

	<p>Screws (master cylinder cap): 2 Nm (0.2 m · kg, 1.4 ft · lb)</p>
---	--

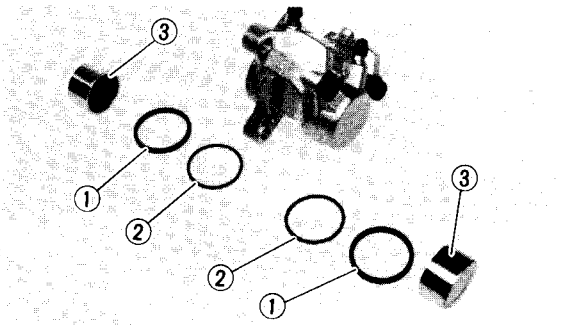
11. Air bleed:

- Brake system
- Refer to the "AIR BLEEDING" section in the CHAPTER 3.



12. Inspect:

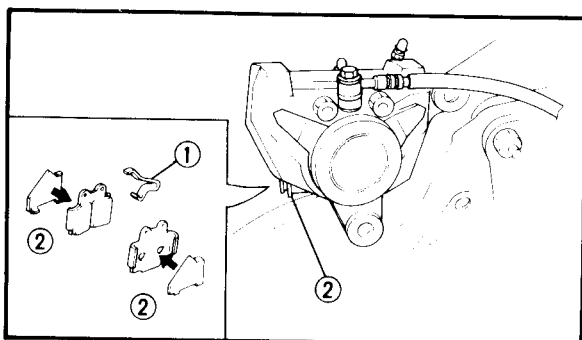
- Brake fluid level
- Fluid lever is under "LOWER" level line ①
→ Replenish.
- Refer to the "BRAKE FLUID INSPECTION" section in the CHAPTER 3.



Rear brake


1. Install:

- Piston seals ①
- Dust seals ②
- Pistons ③

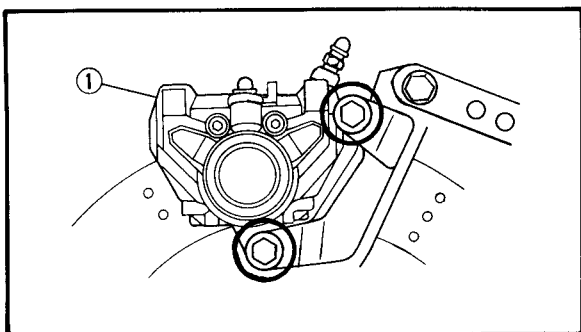


2. Install:


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

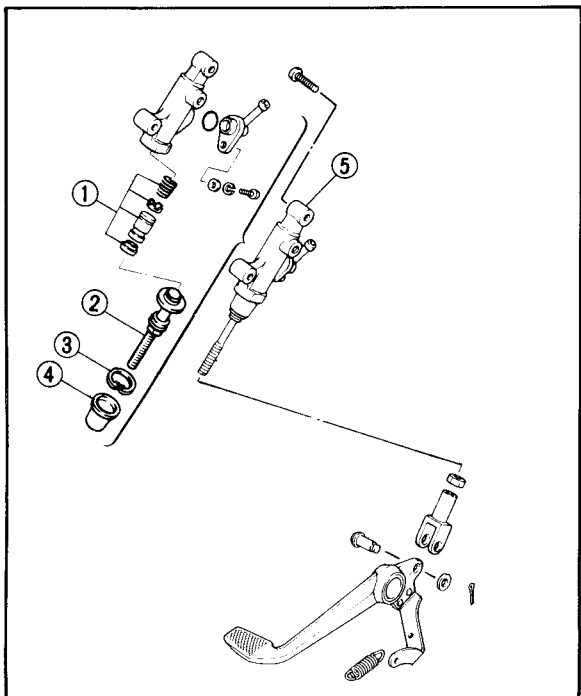
	<p>Retaining bolts: 10 Nm (1.0 m · kg, 13 ft · lb)</p>
---	---

Refer to the "BRAKE PAD REPLACEMENT" section.




3. Install:
- Brake caliper ①

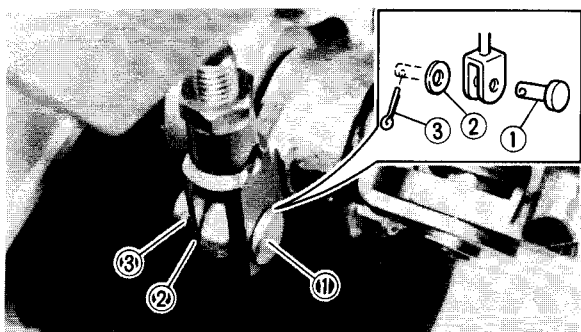
	Bolts (brake caliper): 35 Nm (3.5 m · kg, 25 ft · lb)
---	---



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

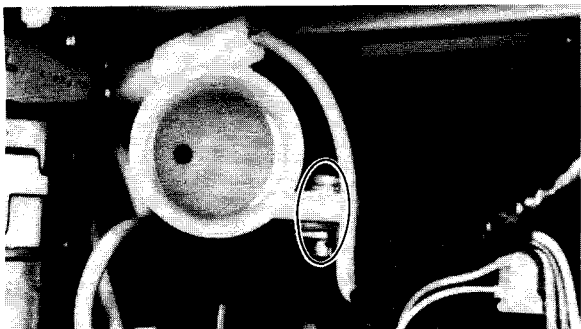
5. Install:
- Master cylinder assembly ⑤

	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.



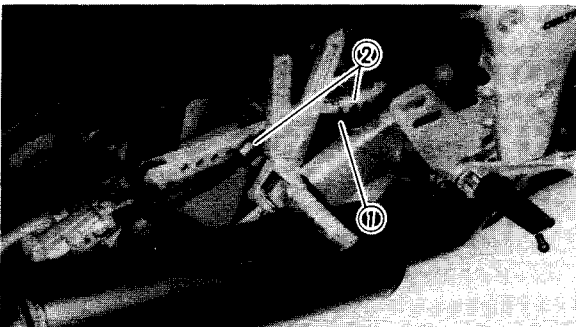
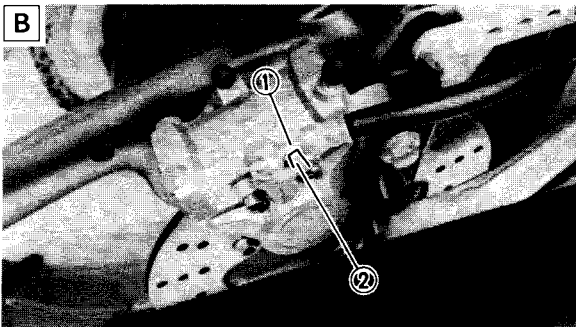
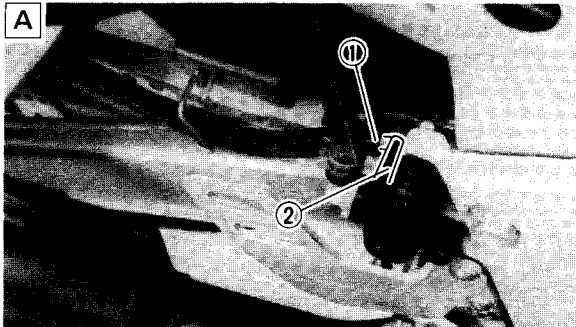
7. Install:
- Reservoir tank

8. Install:

- Brake hose
- Copper washers
- Union bolts
- Reservoir hose



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



CAUTION:

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

- A Master cylinder
- B 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



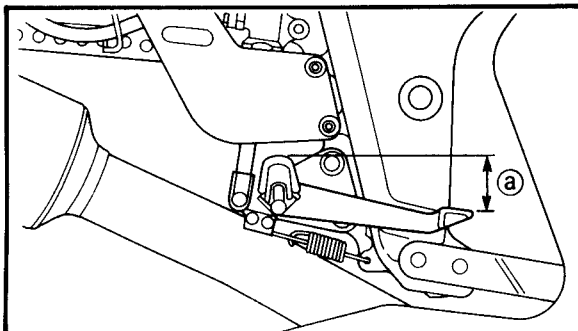
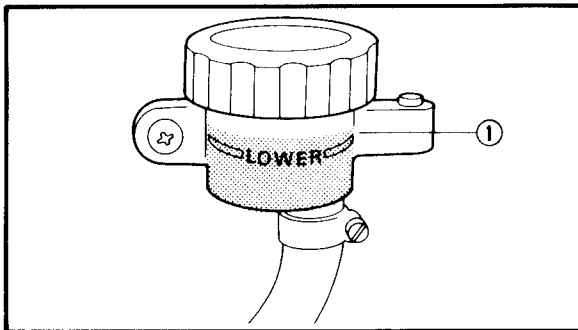
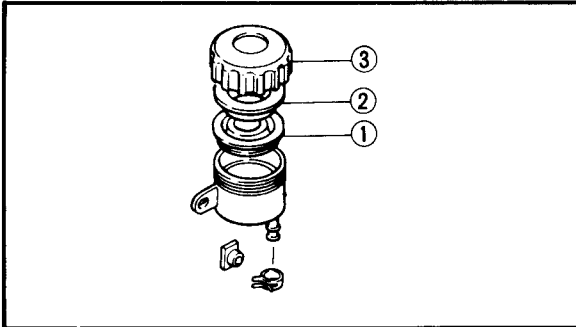
Recommended brake fluid:
DOT #4
If DOT #4 is not available,
DOT #3 can be used.

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 ②



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

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COOL	5
	
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CHAPTER 8. ELECTRICAL

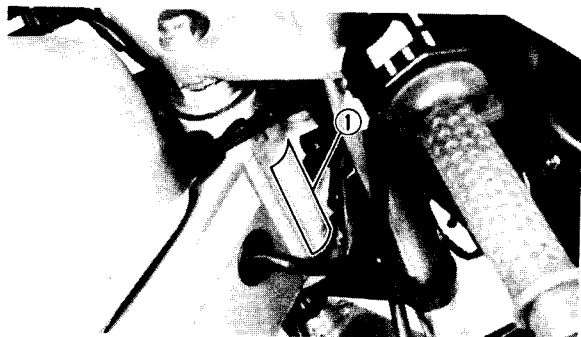
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?	
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**GENERAL
INFORMATION**

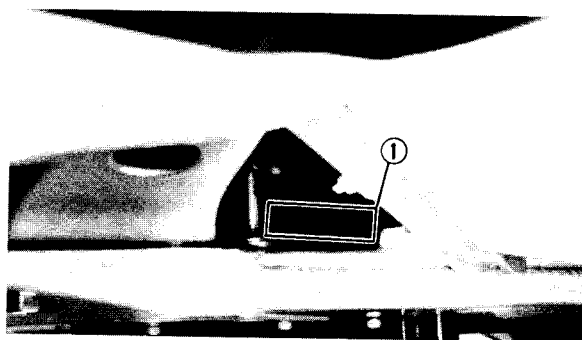
**MOTORCYCLE IDENTIFICATION
VEHICLE IDENTIFICATION NUMBER**

The vehicle identification number ① is stamped 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

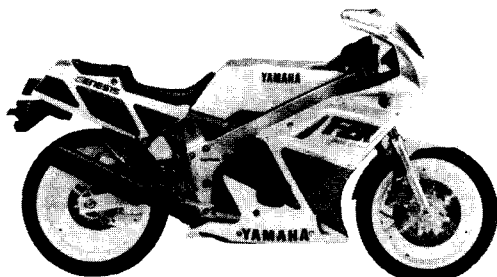
The engine serial number ① is stamped into the right side of the engine.

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

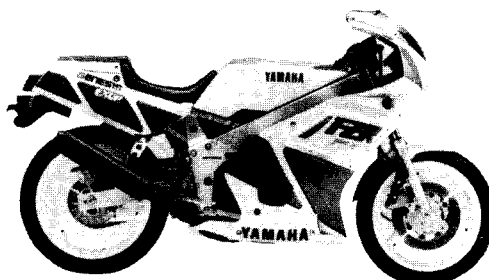
NOTE: _____

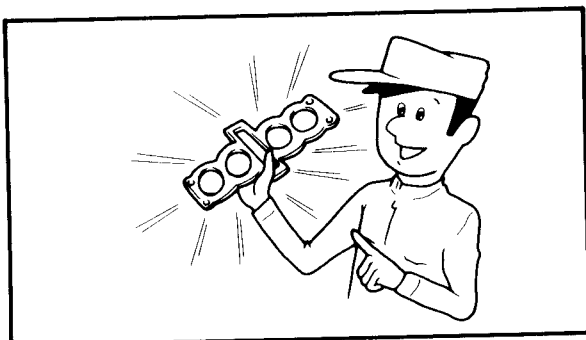
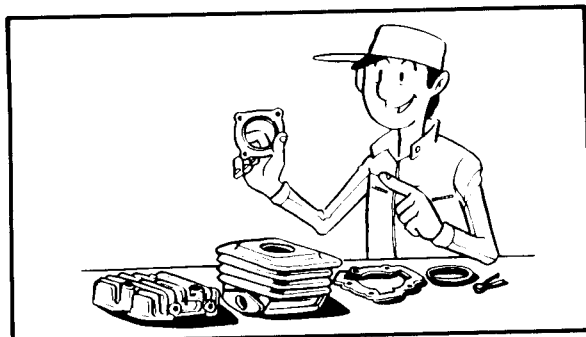
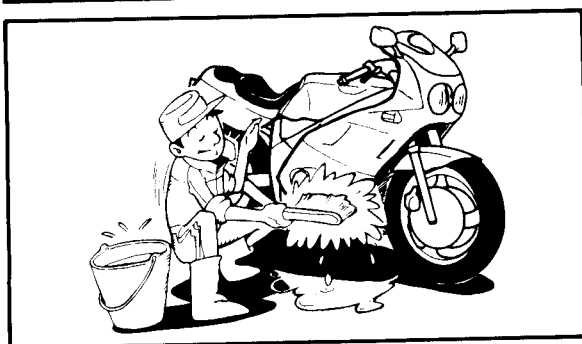
- The first three digits of these numbers are for model identifications; the remaining digits are the unit production number.
- Designs and specifications are subject to change without notice.

FZR400U



FZR400SUC





IMPORTANT INFORMATION

PREPARATION FOR REMOVAL

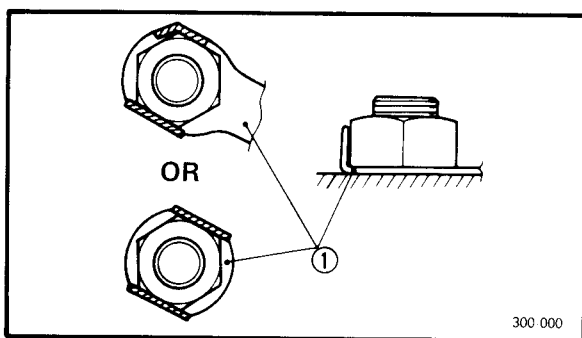
1. Remove all dirt, mud, dust, and foreign material before removal and disassembly.
2. Use proper tools and cleaning equipment. Refer to "SPECIAL TOOL".
3. When disassembling the machine, keep mated parts together. This includes gears, cylinders, pistons, and other mated parts that have been "mated"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

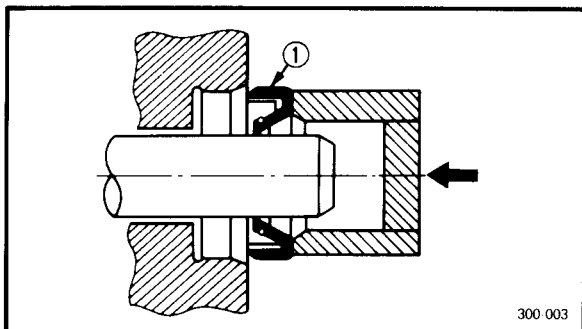
GASKETS, OIL SEALS, AND O-RINGS

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.



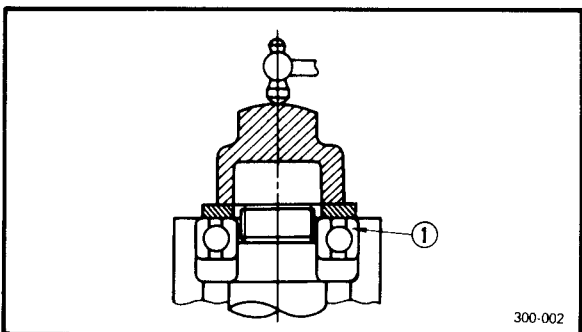
BEARINGS AND OIL SEALS

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.

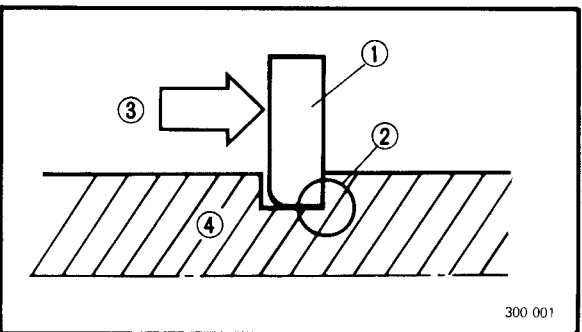
① Oil seal

⚠ CAUTION:

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



① Bearing



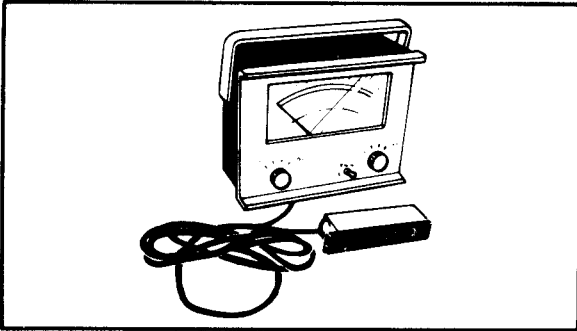
CIRCLIPS

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

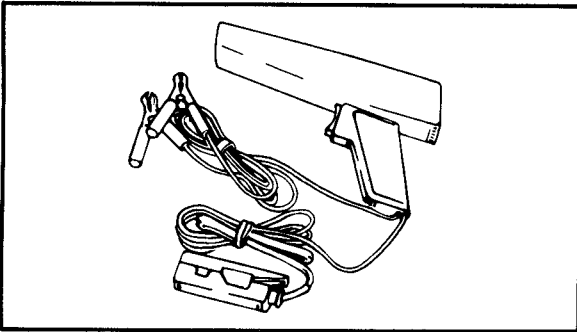
SPECIAL TOOLS

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**

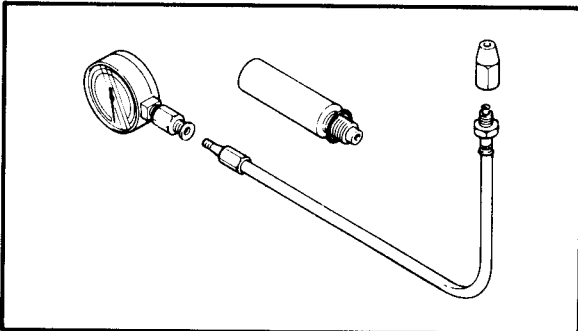
1. Inductive Tachometer
P/N YU-08036

This tool is needed for detecting engine rpm.



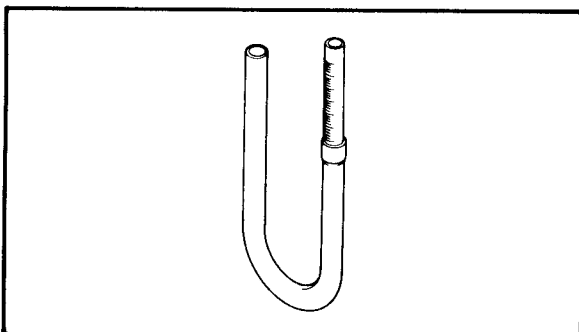
2. Inductive Timing Light
P/N YU-08037

This tool is necessary for checking ignition timing.



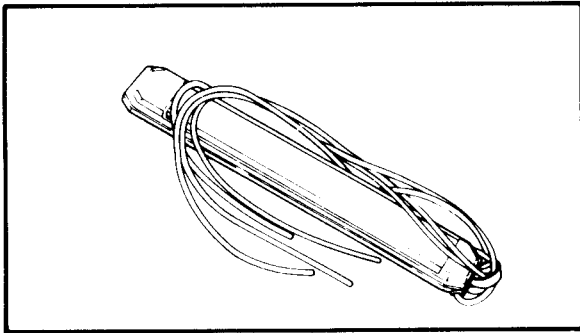
3. Compression Gauge
P/N YU-33223

This gauge is used to measure the engine compression.



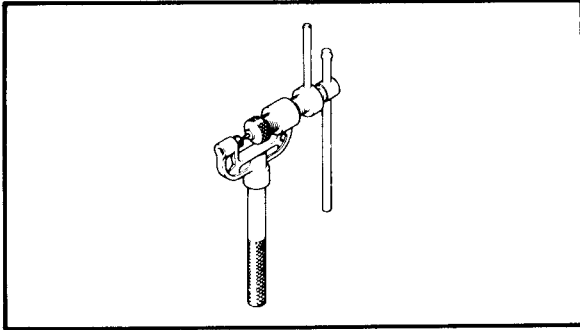
4. Fuel Level Gauge
P/N YU-01312

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



5. Vacuum Gauge
P/N YU-08030

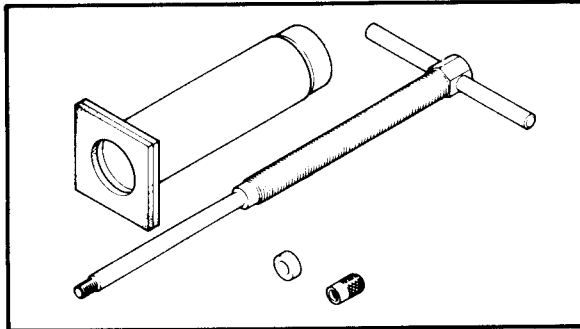
This gauge is needed for carburetor synchronization.



FOR ENGINE SERVICE

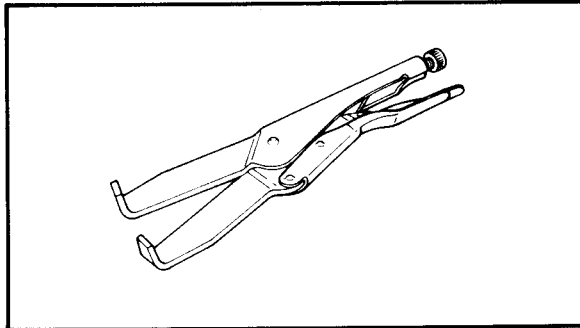
1. Cam Chain Cutter
P/N YM-01112

This tool is used when cutting the cam chain.



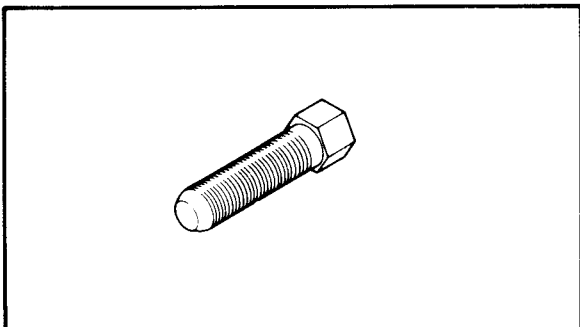
2. Piston Pin Puller
P/N YU-01304

This tool is used to remove the piston pin.



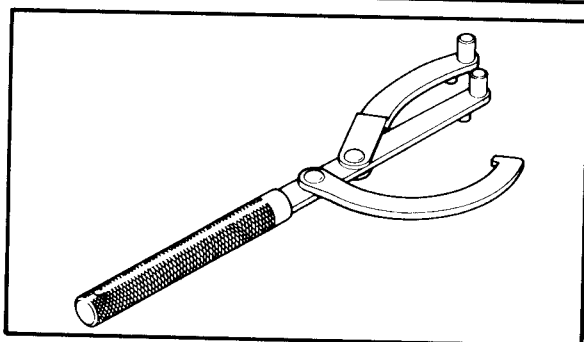
3. Universal Clutch Holder
P/N YM-91042

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



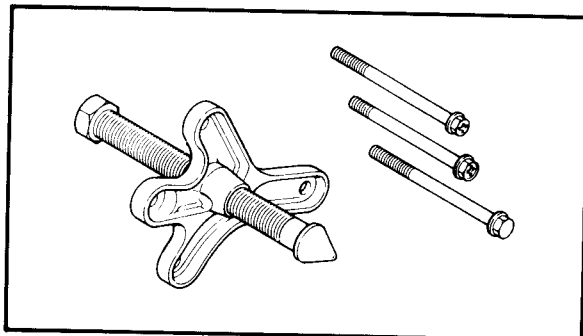
4. Rotor Puller
P/N YM-01080

This tool is used to remove the rotor.



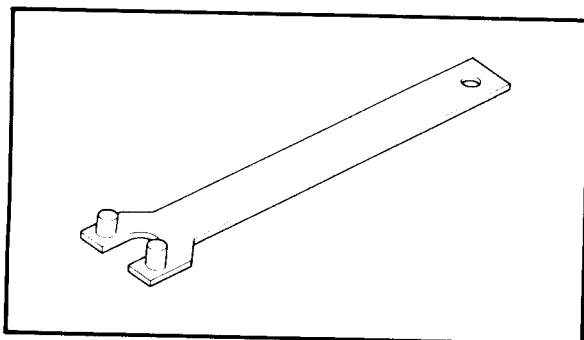
5. Universal Rotor Holder
P/N YU-01235

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



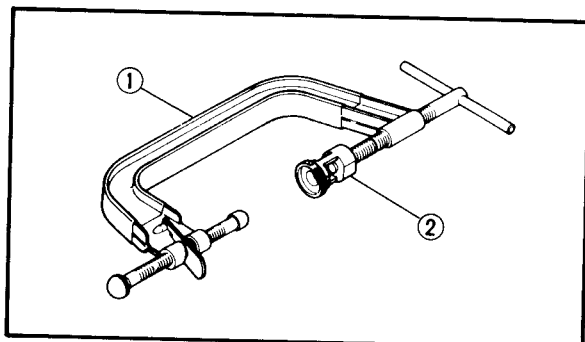
6. Heavy Duty Puller
P/N YU-33270

This tool is used to remove the starter clutch.



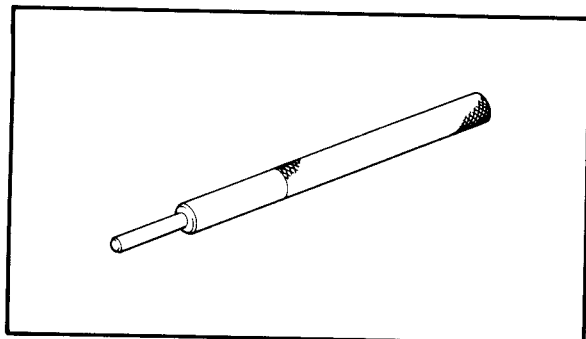
7. Camshaft Wrench
P/N YM-04115

This tool is used to turn the camshaft.



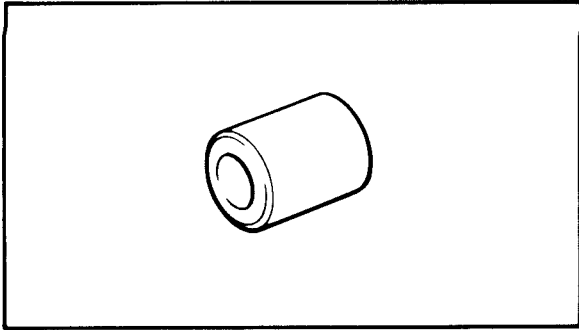
8. Valve Spring Compressor ①
P/N YM-04019
Attachment ②
P/N YM-04114

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



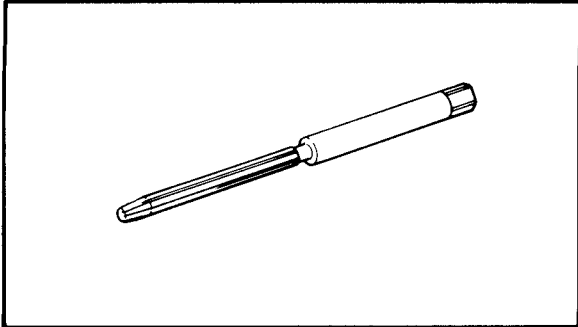
9. Valve Guide Remover (4.5 mm)
P/N YM-04116

This tool is used to remove the valve guides.



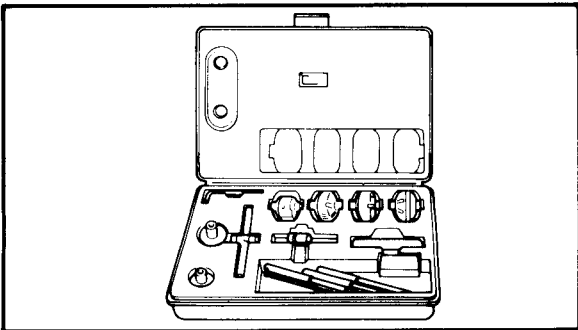
10. Valve Guide Installer
P/N YM-04117

This tool is needed to install the valve guides properly.



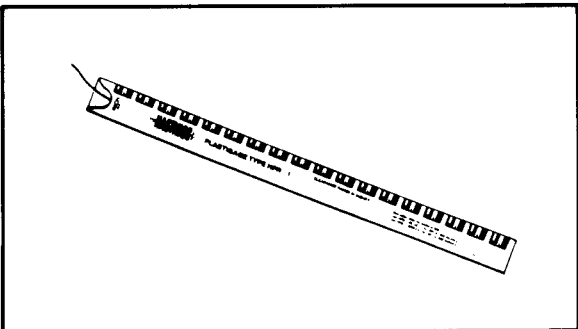
11. Valve Guide Reamer (4.5 mm)
P/N YM-04118

This tool is used to rebores the new valve guide.



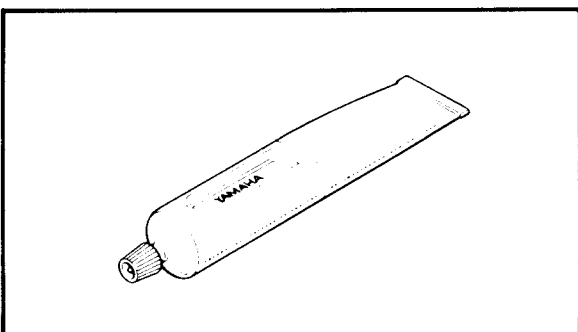
12. Valve Seat Cutter
P/N YM-91043

This tool is needed to resurface the valve seat.



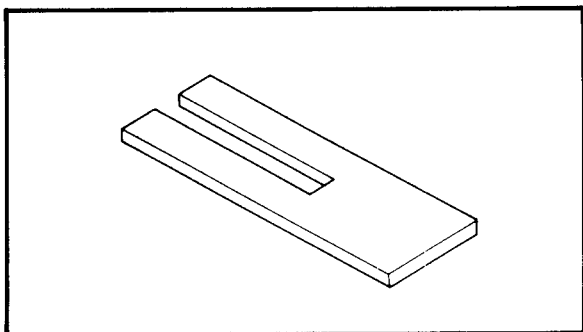
13. Plastigage® Set "Green"
P/N YU-33210

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



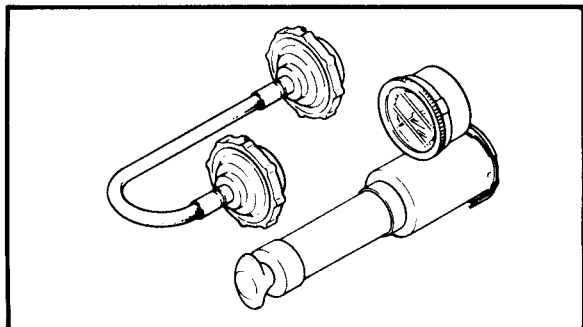
14. Quick Gasket®
P/N ACC-11001-05-01

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



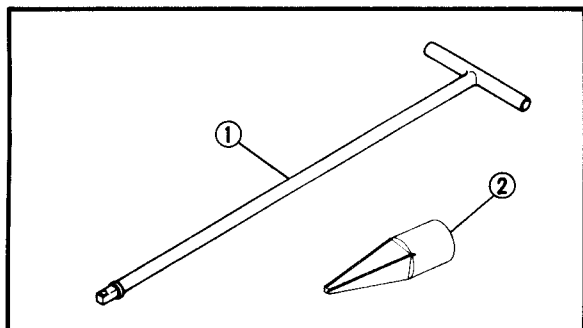
15. Piston Base
P/N YM-01067

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

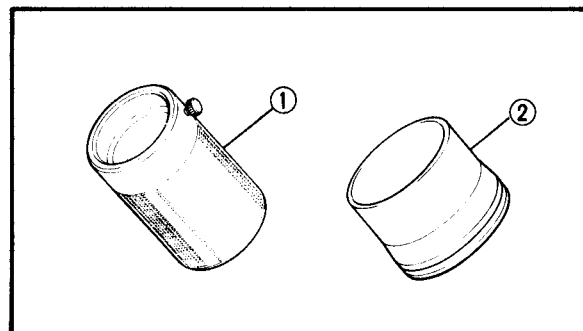
This tester is needed for checking the cooling system.



FOR CHASSIS SERVICE

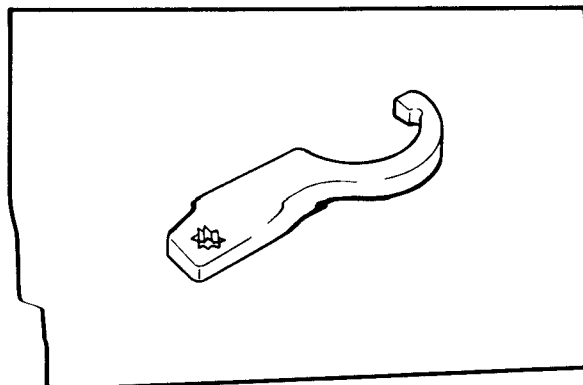
1. T-Handle
P/N YM-01326 – ①
Front Fork Cylinder Holder
P/N YM-01300-1 – ②

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



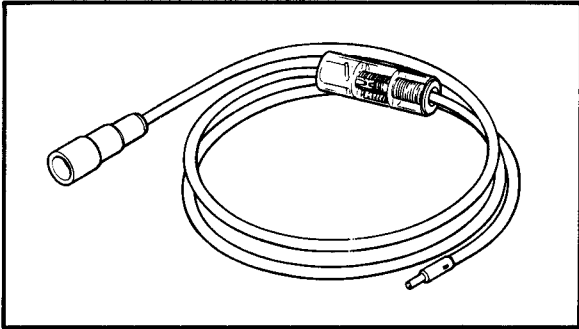
2. Front Fork Seal Driver (weight)
P/N YM-33963 – ①
Adapter (38 mm)
P/N YM-01372 – ②

These tools are used when installing the fork seat.



3. Ring Nut Wrench
P/N YU-33975

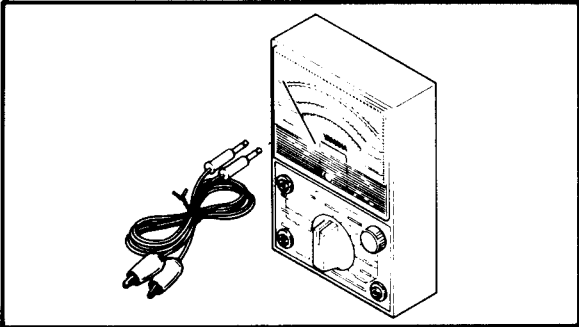
This tool is used to loosen and tighten the steering ring nut.



FOR ELECTRICAL COMPONENTS

1. Dynamic Coil Tester
P/N YM-34487

This tester is necessary for checking the ignition system components.



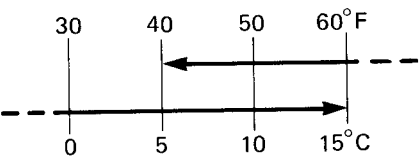
2. Pocket Tester
P/N YU-03112

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 JYA3BFEO * JA000101
Engine Starting Number:	3BF-000101 (FZR400U) 3FH-000101 (FZR400SUC)
Dimensions:	
Overall Length	2,070 mm (81.5 in)
Overall Width	690 mm (27.2 in)
Overall Height	1,125 mm (44.3 in)
Seat Height	785 mm (30.9 in)
Wheelbase	1,400 mm (55.1 in)
Minimum Ground Clearance	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	Liquide cooled 4-stroke, gasoline, DOHC
Cylinder Arrangement	4-cylinder parallel
Displacement	399 cm ³ (24.3 cu.in)
Bore x Stroke	56.0 x 40.5 mm (2.2047 x 1.5945 in)
Compression Ratio	11.5 : 1
Compression Pressure	932 kPa (9.5 kg/cm ² , 135 psi)
Starting System	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:	2.2 L (1.9 Imp qt, 2.33 US qt)
Periodic Oil Change:	2.5 L (2.2 Imp qt, 2.64 US qt)
With Oil Filter Replacement	3.0 L (2.6 Imp qt, 3.17 US qt)
Total Amount	
Coolant Total Amount:	
(Including All Routes)	1.9 L (1.7 Imp qt, 2.0 US qt)
Air Filter:	Dry type element

2

GENERAL SPECIFICATIONS



Model	FZR400U/FZR400SUC	
Fuel: Type Tank capacity Reserve Amount	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	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	Rear
	Tubeless 110/70R17-53H BRIDGESTONE (CYROX-03) DUNLOP (K455F)	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): Up to 90 kg (198 lb) load* 90 kg (198 lb) ~ Maximum load* High speed riding	Front	Rear
	200 kPa (2.0 kg/cm ² , 28 psi)	230 kPa (2,3 kg/cm ² , 32 psi)
	200 kPa (2.0 kg/cm ² , 28 psi)	250 kPa (2.5 kg/cm ² , 36 psi)
	200 kPa (2.0 kg/cm ² , 28 psi)	250 kPa (2.5 kg/cm ² , 36 psi)
*Load is total weight of cargo, rider, passenger, and accessories.		

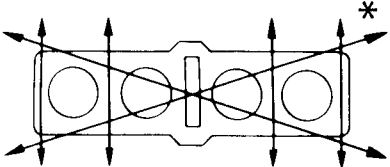
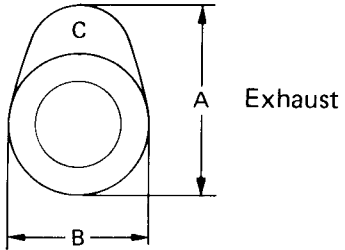
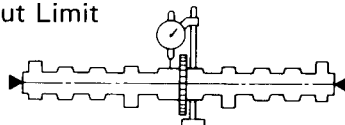
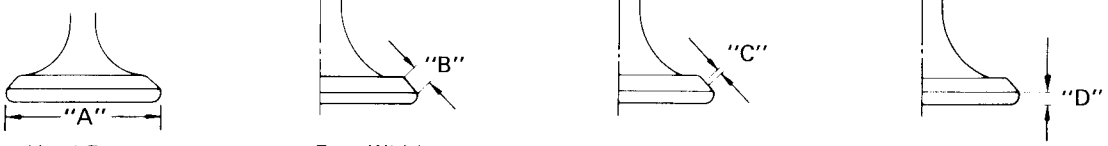
GENERAL SPECIFICATIONS

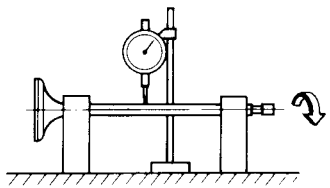
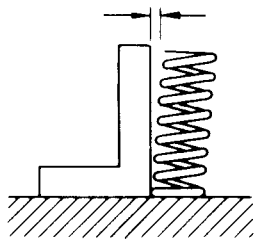



Model	FZR400U/FZR400SUC
Brake: Front Brake Type Operation Rear Brake Type Operation	Dual disc brake Right hand operation Single disc brake Right foot operation
Suspension: Front Suspension Rear Suspension	Telescopic fork Swingarm (New monocross)
Shock Absorber: Front Shock Absorber Rear Shock Absorber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

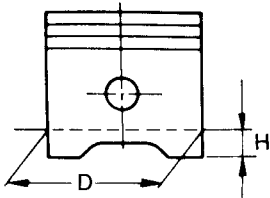
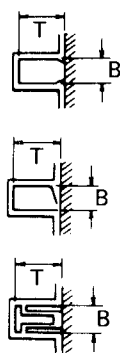
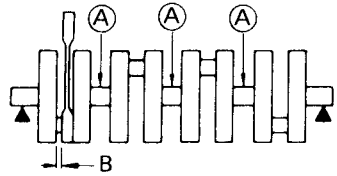
MAINTENANCE SPECIFICATIONS

Engine

Model	FZR400U/FZR400SUC
<p>Cylinder Head: Warp Limit *</p> 	<p>0.03 mm (0.0012 in) * Lines indicate straightedge measurement</p>
<p>Cylinder: Bore Size Taper Limit Out of Round Limit</p>	<p>56.000 ~ 56.005 mm (2.2047 ~ 2.2049 in) 0.05 mm (0.002 in) 0.03 mm (0.0012 in)</p>
<p>Camshaft: Drive Method Cam Cap Inside Dia.</p> <p>Camshaft Outside Dia. Shaft-to-Cap Clearance < Limit > Cam Dimensions: Intake</p>  <p>Camshaft Runout Limit</p> 	<p>Chain drive (Center) 23.000 ~ 23.021 mm (0.9055 ~ 0.9063 in)</p> <p>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)</p> <p>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)</p> <p>0.03 mm (0.0012 in)</p>
<p>Cam Chain: Cam Chain Type/No. of Links Cam Chain Adjustment Method</p> <p>Valve, Valve Seat, Valve Guide: Valve Clearance (Cold):</p> <p>Valve Dimensions:</p> 	<p>BF04MA/112 Links Automatic</p> <p>IN. 0.11 ~ 0.20 mm (0.004 ~ 0.008 in) EX. 0.21 ~ 0.30 mm (0.008 ~ 0.012 in)</p> <p>Head Dia. Face Width Seat Width Margin Thickness</p>

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 (Valve closed)	IN.	14.2 ~ 16.4 kg (31.3 ~ 36.2 lb)
	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	
<p>Piston: Piston Size "D" Measuring Point "H"</p>  <p>Piston-to-Cylinder Clearance < Limit > Oversize: 2nd 4th</p>	<p>55.945 ~ 55.960 mm (2.2026 ~ 2.2031 in) 5 mm (0.197 in) (From bottom line of piston skirt)</p> <p>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)</p>	
<p>Piston Ring: Sectional Sketch</p>  <p>End Gap (Installed): Side Clearance:</p>	<p>Top Ring 2nd Ring Oil Ring</p> <p>Top Ring 2nd Ring Oil Ring < Limit > 2nd Ring < Limit > Oil Ring</p>	<p>Barrel B = 0.8 mm (0.0315 in) T = 2.1 mm (0.0827 in)</p> <p>Taper B = 0.8 mm (0.0315 in) T = 2.1 mm (0.0827 in)</p> <p>Expander B = 2.0 mm (0.0787 in) T = 2.2 mm (0.0866 in)</p> <p>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) 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) —</p>
<p>Connecting Rod: Connecting Rod Oil Clearance Bearing Size No. Color Code</p>	<p>0.043 ~ 0.066 mm (0.0017 ~ 0.0026 in) 1. Blue 2. Black 3. Blown 4. Green</p>	
<p>Crankshaft:</p>  <p>Runout Limit "A" Big End Side Clearance "B"</p>	<p>0.03 mm (0.0012 in) 0.160 ~ 0.262 mm (0.0063 ~ 0.0103 in)</p>	

MAINTENANCE SPECIFICATIONS



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



Model	FZR400U/FZR400SUC
Lubrication System: Oil Filter Type Oil Pump Type Tip Clearance < Limit > Side Clearance < Limit > Bypass Valve Setting Pressure Relief Valve Operating Pressure	Paper Trochoid pump 0.09 ~ 0.15 mm (0.0035 ~ 0.0060 in) < 0.2 mm (0.008 in) > 0.03 ~ 0.08 mm (0.0012 ~ 0.0031 in) < 0.15 mm (0.006 in) > 80 ~ 120 kPa (0.8 ~ 1.2 kg/cm ² , 11.38 ~ 17.06 psi) 450 ~ 550 kPa (4.5 ~ 5.5 kg/cm ² , 63.99 ~ 78.21 psi)
Cooling System: Radiator Core Size Width Height Thickness Radiator Cap Opening Pressure Reservoir Tank Capacity < To Full level > Water Pump Type Reduction Ratio	325 mm (12.8 in) 160 mm (6.3 in) 32 mm (1.26 in) 74 ~ 103 kPa (0.75 ~ 1.05 kg/cm ² , 10.7 ~ 14.9 psi) 0.28 L (0.25 Imp qt, 0.30 US qt) Single-suction centrifugal pump 89/41 x 48/49 (2.126)

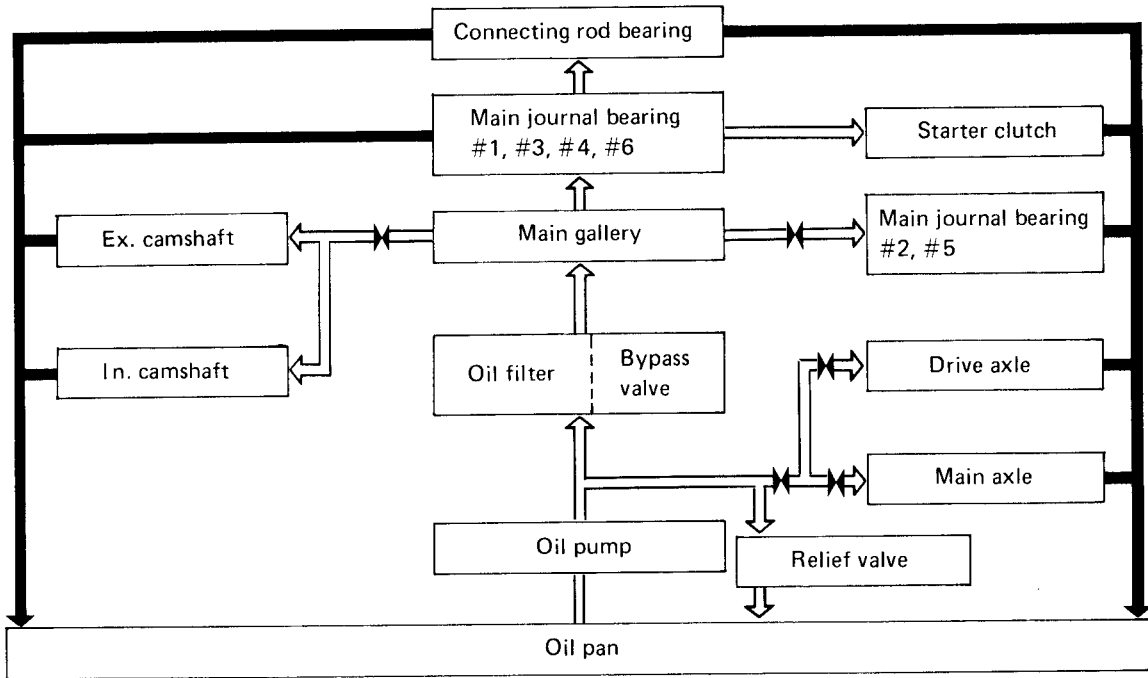


Model

FZR400U/FZR400SUC

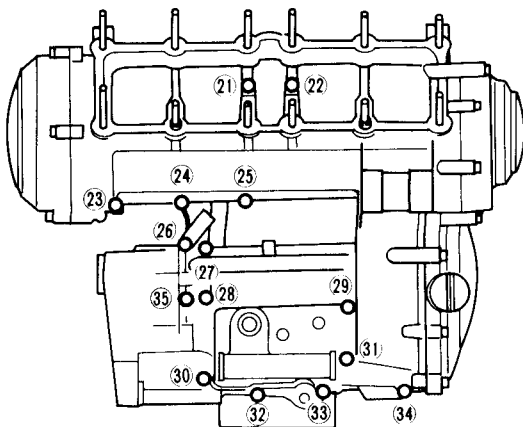
Lubrication chart:

- ⇨ Pressured feed
- ➔ Splashed
- ⌘ Nozzle

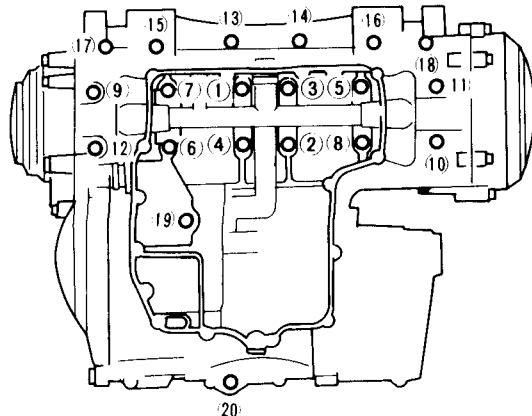


Crankcase Tightening Sequence:

Crankcase (Upper)



Crankcase (Lower)



- ① ~ ⑫ , ③① 8 mm Bolt: 24 Nm (2.4 m·kg, 17 ft·lb)
- ⑬ ~ ⑲ , ③② ~ ③⑤ 6 mm Bolt: 12 Nm (1.2 m·kg, 8.7 ft·lb)

MAINTENANCE SPECIFICATIONS





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 Front Spring Free Length < Limit > Collar Length Spring Rate: K1 K2 Stroke K1 K2 Optional Spring Oil Capacity Oil Level (Fully Compression) Oil Grade	130 mm (5.12 in) 412 mm (16.2 in) 408 mm (16.1 in) 160 mm (6.3 in) 4.4 N/mm (0.5 kg/mm, 25.2 lb/in) 6.6 N/mm (0.7 kg/mm, 37.5 lb/in) 0.0 ~ 90 mm (0.0 ~ 3.54 in) 90 ~ 130 mm (3.54 ~ 5.12 in) No 444 cm ³ (15.6 Imp oz, 15 US oz) 92 mm (3.62 in) Bellow the top of inner fork tube without fork spring Yamaha Fork Oil 10WT or equivalent								
Rear Suspension: Shock Absorber Travel Spring Free Length < Limit > Fitting Length Spring Rate K1 Stroke K1 Optional Spring	50 mm (1.97 in) 196.5 mm (7.74 in) 186.5 mm (7.34 in) 174 mm (6.85 in) 98.1 N/mm (10 kg/mm, 560 lb/in) 0 ~ 50 mm (0.0 ~ 1.97 in) No								
		Hard			STD	Soft			
Adjusting position		7	6	5	4	3	2	1	
Swingarm: Free Play Limit End Side	1.0 mm (0.04 in) 1.0 mm (0.04 in)								
Front Wheel: Type Rim Size Rim Material Rim Runout Limit Radial Lateral	Cast Wheel MT3.00 x 17 Aluminum 1 mm (0.04 in) 0.5 mm (0.02 in)								
Rear Wheel: Type Rim Size Rim Material Rim Runout Limit Radial Lateral	Cast wheel MT4.00 x 18 Aluminum 1 mm (0.04 in) 0.5 mm (0.02 in)								
Drive Chain: Type/Manufacturer No. of Links Chain Free Play	428HVS/DAIDO 130 10 ~ 20 mm (0.4 ~ 0.8 in)								

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

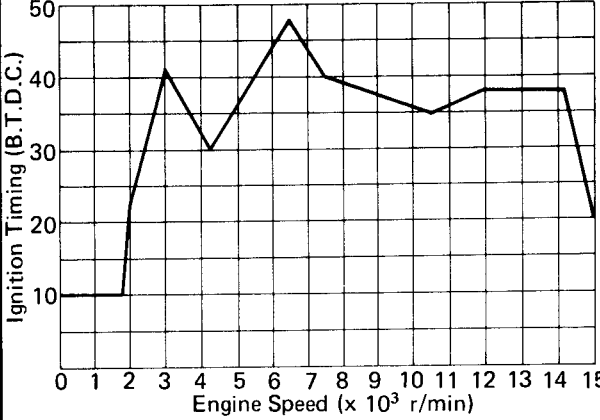
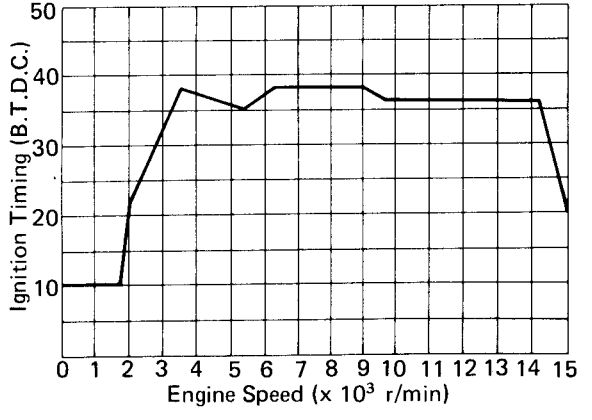
MAINTENANCE SPECIFICATIONS



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
<i>Rear Axle and Nut</i>	<i>M16 x 1.5</i>	<i>107</i>	<i>10.7</i>	<i>77</i>
<i>Handlebar Crown and Inner Tube</i>	<i>M8 x 1.25</i>	<i>26</i>	<i>2.6</i>	<i>19</i>
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
<i>Brake Disc and Clutch Hub</i>	<i>M8 x 1.25</i>	<i>20</i>	<i>2.0</i>	<i>14</i>
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
<p>Voltage:</p> <p>Ignition System:</p> <p>Ignition Timing (B.T.D.C.)</p> <p>Advanced Timing (B.T.D.C.)</p> <p>Advancer Type</p> <p>3BF:</p> 	<p>12V</p> <p>10° at 1,300 r/min</p> <p>48° at 6,500 r/min (3BF), 38° at 3,500 r/min (3FH)</p> <p>Electrical</p> <p>3FH:</p> 
<p>T.C.I.:</p> <p>Pickup Coil Resistance (Color)</p> <p>T.C.I. Unit/Manufacturer</p>	<p>85 ~ 115Ω at 20°C (68°F)</p> <p>(White/Red – White/Black)</p> <p>TID14-53A/HITACHI (3BF)</p> <p>TID14-63A/HITACHI (3FH)</p>
<p>Ignition Coil:</p> <p>Model/Manufacturer</p> <p>Minimum Spark Gap</p> <p>Primary Winding Resistance</p> <p>Secondary Winding Resistance</p> <p>Spark Plug Cap Resistance</p>	<p>CM12-30/HITACHI</p> <p>6 mm (0.24 in)</p> <p>1.8 ~ 2.2Ω at 20°C (68°F)</p> <p>9.6 ~ 14.4kΩ at 20°C (68°F)</p> <p>10 kΩ</p>
<p>Charging System:</p> <p>Type</p>	<p>A.C. Magneto Generator</p>
<p>A.C. Generator:</p> <p>Model/Manufacturer</p> <p>Nominal Output</p> <p>Stator Coil Resistance</p>	<p>FL118-13/HITACHI</p> <p>12V, 18A at 5,000 r/min</p> <p>0.44 ~ 0.66Ω at 20°C (68°F)</p>
<p>Voltage Regulator:</p> <p>Type</p> <p>Model/Manufacturer</p> <p>No Load Regulated Voltage</p>	<p>Semi conductor – short circuit</p> <p>SH569/SHINDENGEN</p> <p>14.3 ~ 15.3V</p>
<p>Battery:</p> <p>Capacity</p> <p>Specific Gravity</p>	<p>12V, 12AH</p> <p>1.280</p>

MAINTENANCE SPECIFICATIONS

SPEC

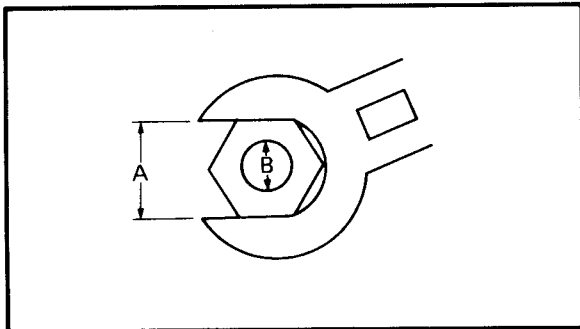


Model	FZR400U/FZR400SUC
Electrical Starter System: Type Starter Motor: Model/Manufacturer Output Armature Coil Resistance Brush – Overall Length < Limit > – Spring Force Commutator Dia. Wear Limit Mica Undercut Starter Switch: Model/Manufacturer Amperage Rating	Constant mesh type SM-7/MITSUBA 0.4kw 0Ω at 20°C (68°F) 11 mm (0.43 in) 5 mm (0.20 in) 540 ~ 660 g (19.05 ~ 23.28 oz) 23 mm (0.91 in) 22 mm (0.87 in) 1.8 mm (0.07 in) A104-128/HITACHI 100A
Horn: Type/ Model/Manufacturer Maximum Amperage	Plane Type/1 pcs. MF-12/NIKKO 1.5A
Flasher Relay (Relay Assembly): Type Model/Manufacturer Self Cancelling Device Flasher Frequency Wattage	Semi transistor type FX257N/NIPPON DENSO Yes 60 ~ 120 cycle/min 27W x 2 pcs + 3.4W
Sidestand Relay: Model/Manufacturer Coil Winding Resistance Diode	G4MW-1121T-010-Y17/OMRON 67.5 ~ 82.5Ω at 20°C (68°F) No
Oil Level Switch: Model/Manufacturer	1WG/NIPPON DENSO
Starting Circuit Cut-Off Relay: Model/Manufacturer Coil Winding Resistance Diode	G4MW/OMRON 67.5 ~ 82.5Ω at 20°C (68°F) No
Fuel Pump Relay: Model/Manufacturer Coil Winding Resistance Color Code	G4MW/OMRON 67.5 ~ 82.5Ω at 20°C (68°F) 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 Amperage for Individual Circuit x Quantity: MAIN HEADLIGHT SIGNAL IGNITION RESERVE	Fuse 30A x 1 10A x 1 10A x 1 10A x 1 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	millimeter	10^{-3} meter	Length
cm	centimeter	10^{-2} meter	Length
kg	kilogram	10^3 gram	Weight
N	Newton	$1 \text{ kg} \times \text{m}/\text{sec}^2$	Force
Nm	Newton meter	$\text{N} \times \text{m}$	Torque
m·kg	Meter kilogram	$\text{m} \times \text{kg}$	Torque
Pa	Pascal	N/m^2	Pressure
N/mm	Newton per millimeter	N/mm	Spring rate
L	Liter		Volume or Capacity
cm^3	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	
O-Ring	
Bearing	
Piston surface	
Piston pin	
Cylinder head bolt	
Crankshaft pin	
Crankshaft journal	
Connecting rod bolt/Nut	
Camshaft cam lobe/Journal	
Valve stem (IN, EX)	
Valve stem end (IN, EX)	
Valve lifter	
Water pump impeller shaft	
Oil pump rotor (Inner/Outer), housing	
Oil strainer assembly	
Idle gear surface/Bearing	
Starter idle gear	
Starter idle gear shaft	
Primary driven gear	
Transmission gear (Wheel/Pinion)	
Axe (Main/Drive)	
Push lever assembly	
Push rod	
Shift cam	
Shift fork/Guide bar	
Shift shaft assembly	
Neutral switch O-Ring	

LUBRICATION POINT AND GRADE OF LUBRICANT

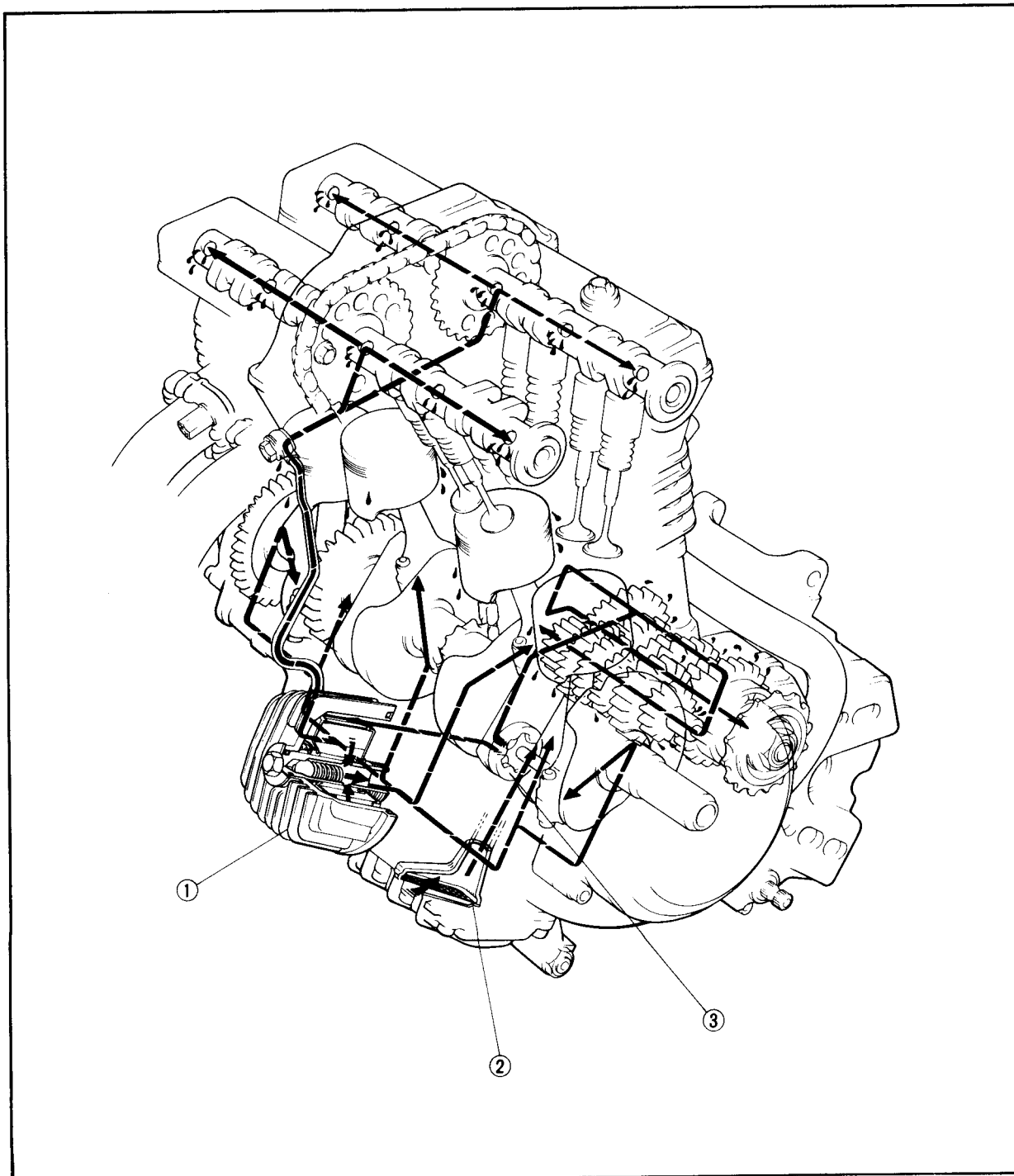


CHASSIS

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

LUBRICATION DIAGRAM

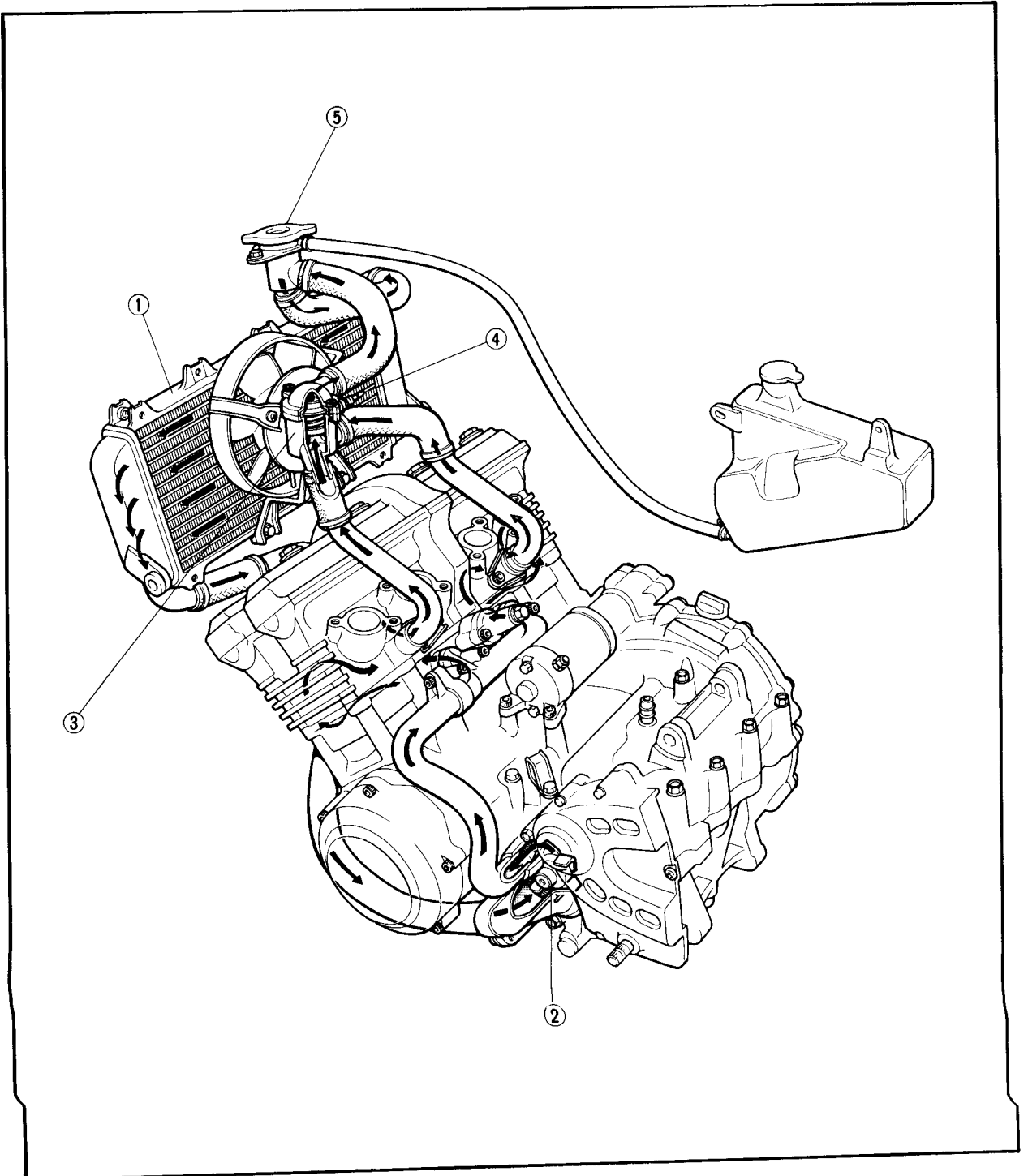
- ① Oil filter
- ② Oil strainer
- ③ Oil pump





COOLANT DIAGRAM

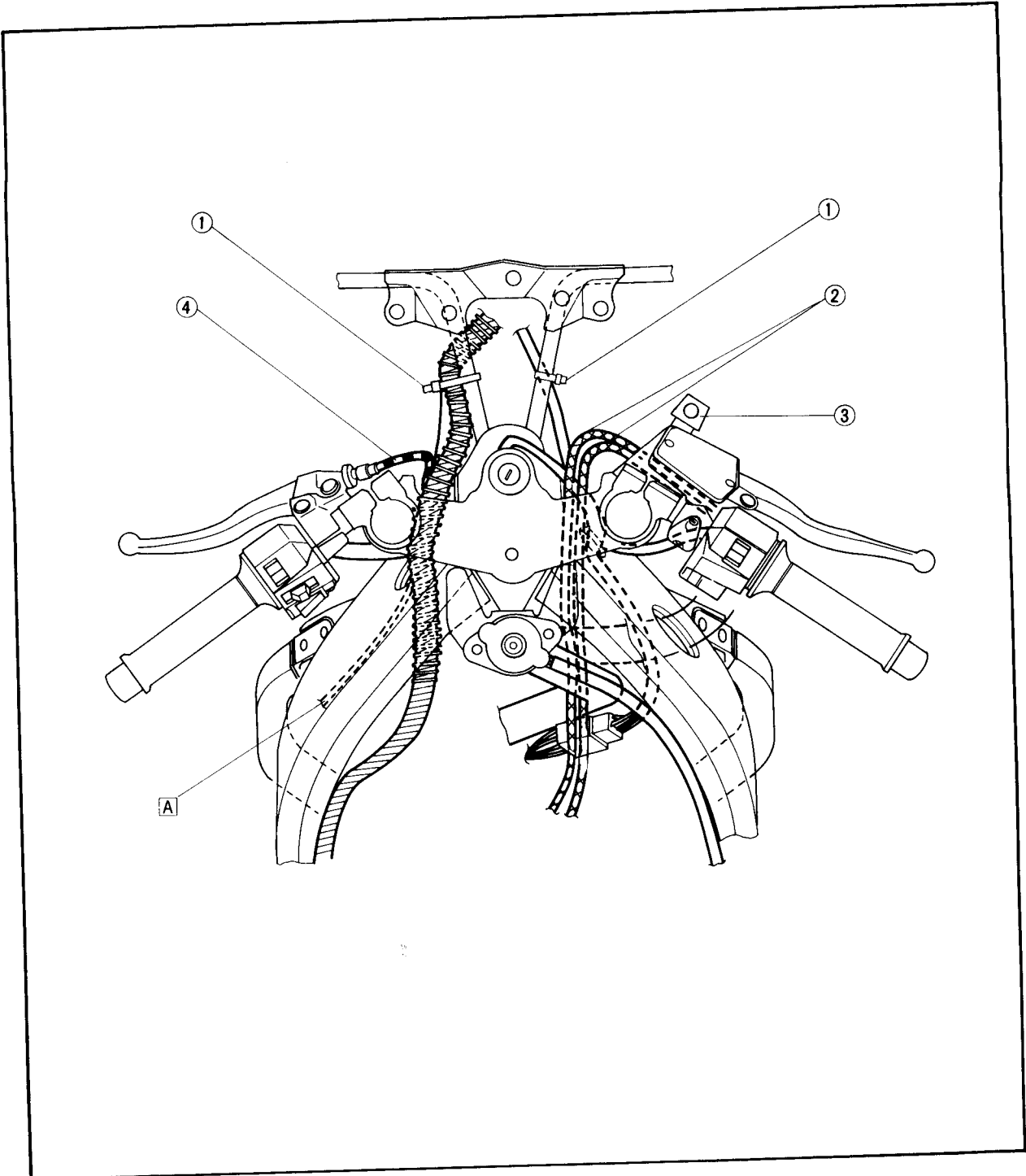
- ① Radiator
- ② Water pump
- ③ Thermostat housing
- ④ Thermostatic valve
- ⑤ Radiator cap



CABLE ROUTING (1)

- ① Band
- ② Throttle cables
- ③ Brake hose
- ④ Clutch cable

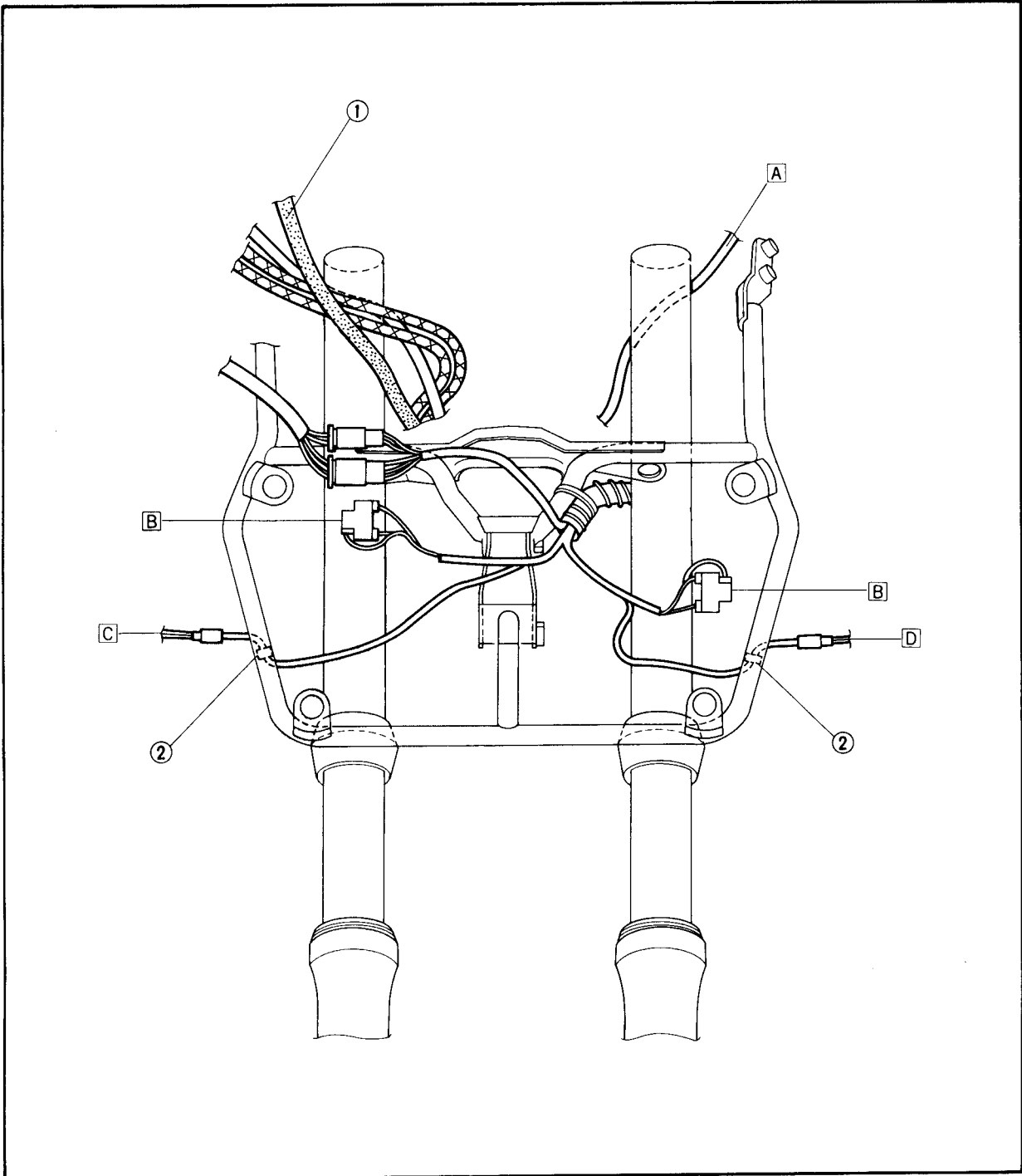
A Insert the clutch cable into the frame inner hole.



CABLE ROUTING (2)

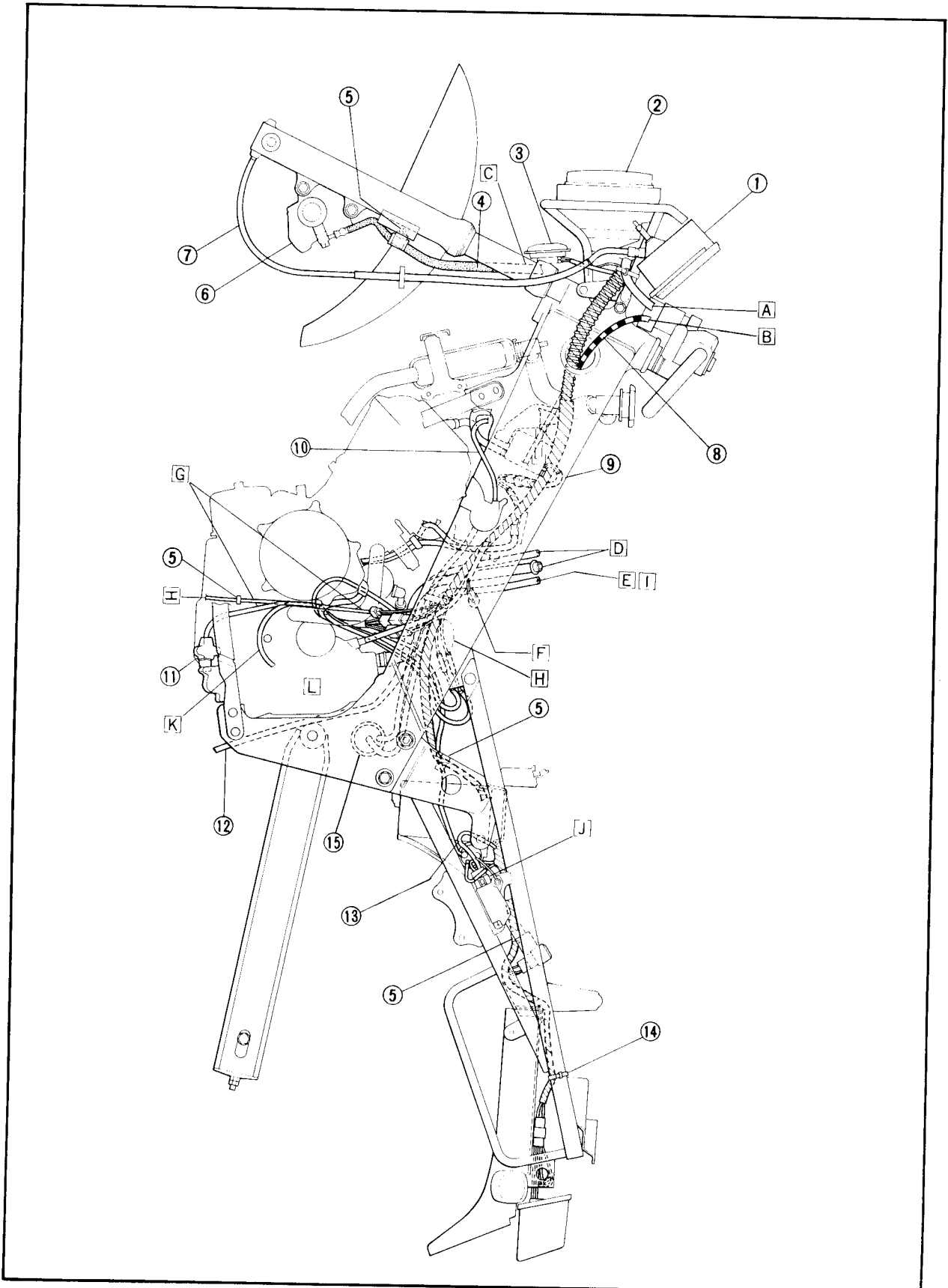
- ① Brake hose
- ② Clamp

- 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)





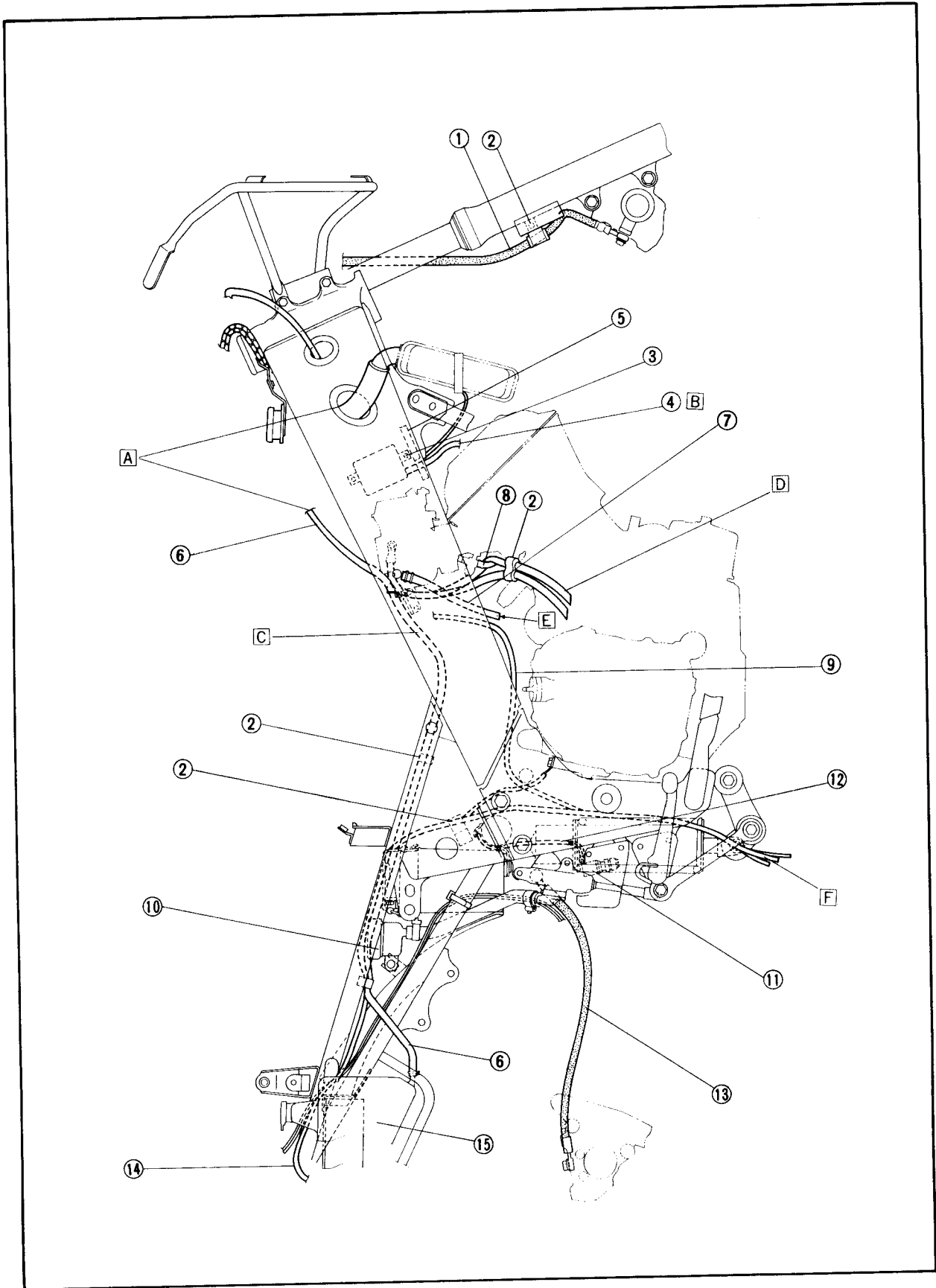
CABLE ROUTING (3)





- 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 level 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

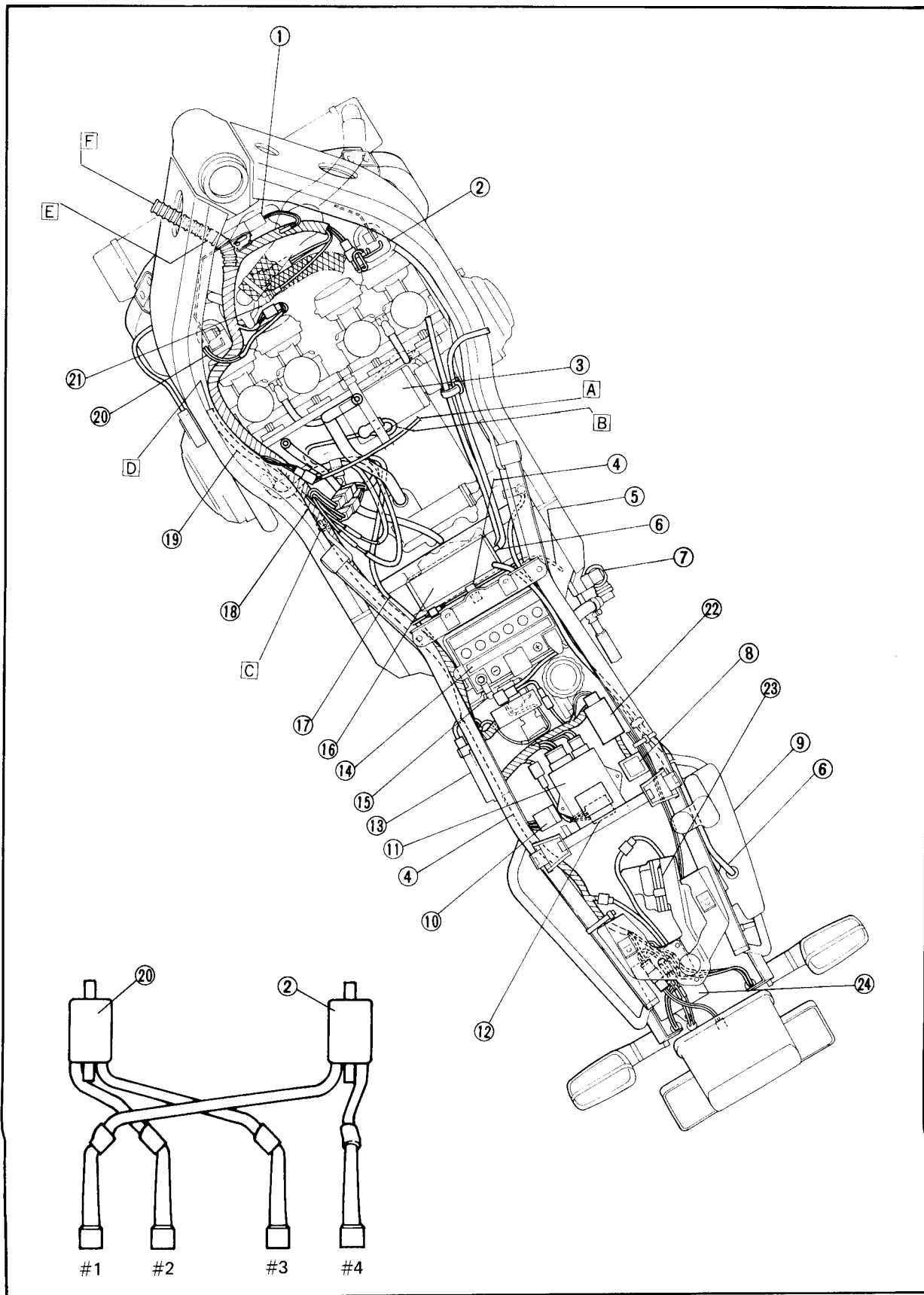
CABLE ROUTING (4)





- 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 30,000km (19,000mi).							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.

MAINTENANCE INTERVALS CHART



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.		○	○	○	○	○

MAINTENANCE INTERVALS CHART



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.	—	○	○	○	○	○	○

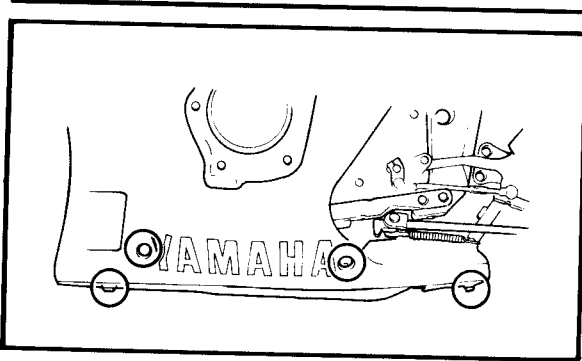
*1) If ambient temperature does not go below 5°C (41°F).

*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:

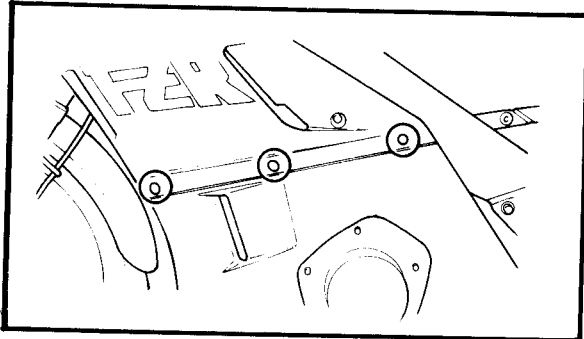
For farther odometer reading, repeat the above maintenance at the period established, **1: Every 6,000 km (3,800 mi), **2: Every 12,000 km (7,600 mi) and **3: Every 24,000 km (15,200 mi) intervals.



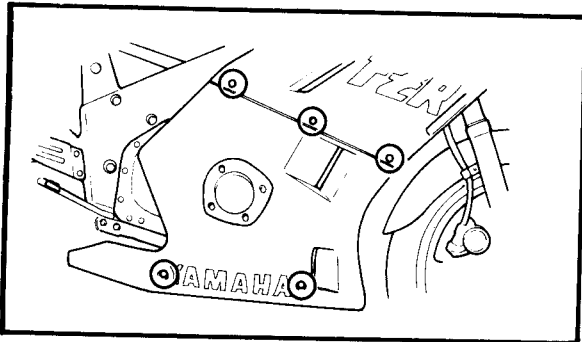
COWLING REMOVAL AND INSTALLATION

REMOVAL

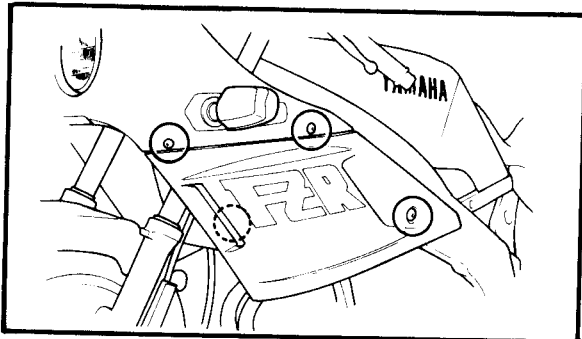
1. Remove:
 - Lower cowling (Left)



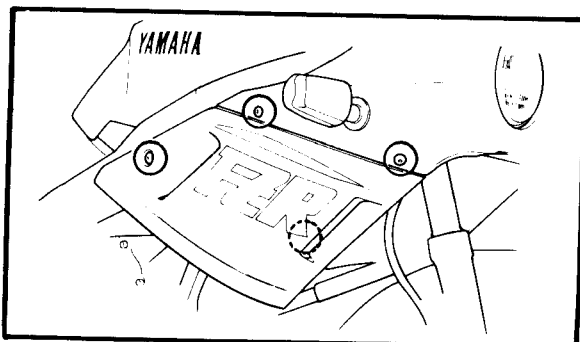
2. Remove:
 - Lower cowling (Right)



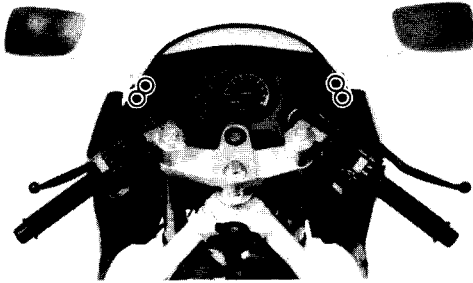
3. Remove:
 - Center cowling (Left)



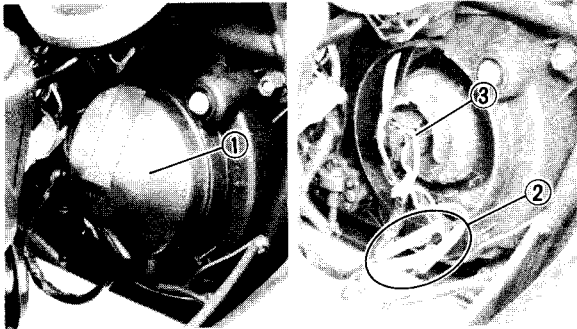
4. Remove:
 - Center cowling (Right)



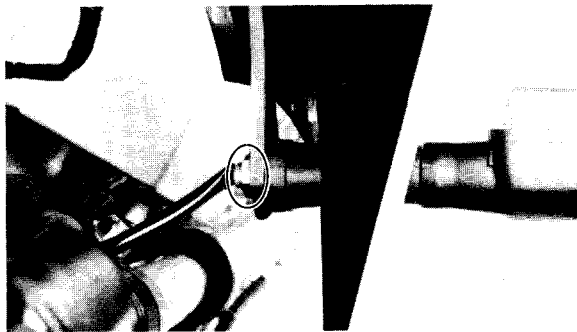
5. Remove:
- Rear view mirrors (Left and right)



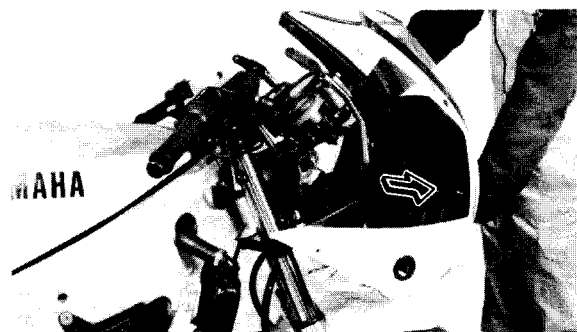
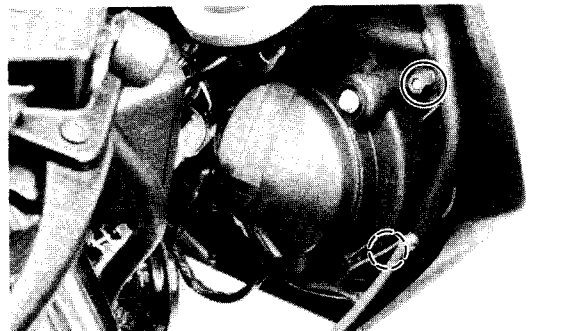
6. Remove:
- Headlight covers (Left and right) ①
7. Disconnect:
- Flasher light leads (Left and right) ②
 - Headlight coupler ③



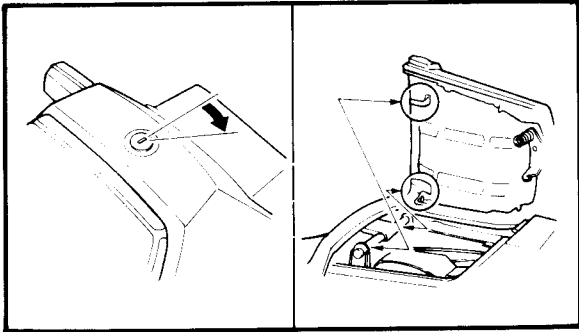
8. Remove:
- Flasher lights (Left and right)



9. Remove:
- Upper cowling



COWLINGS REMOVAL AND INSTALLATION

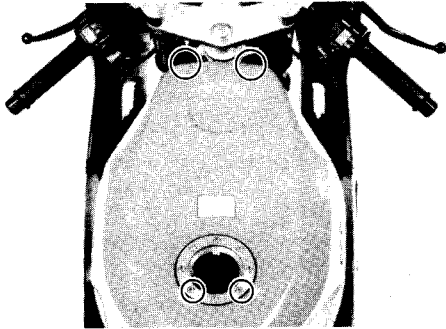


10. Remove:

- Seat

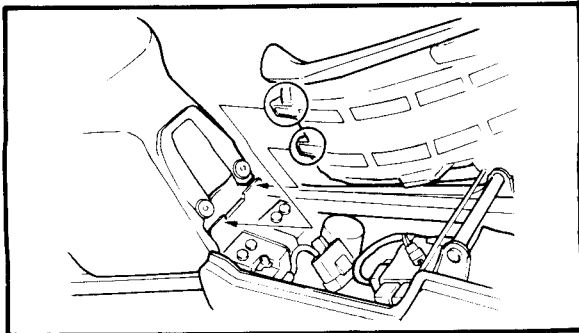
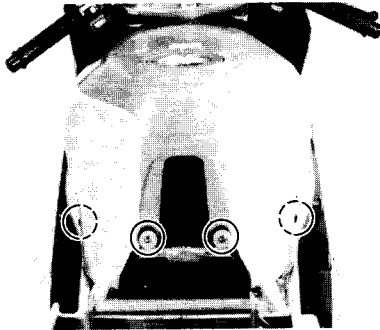
NOTE: _____

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.

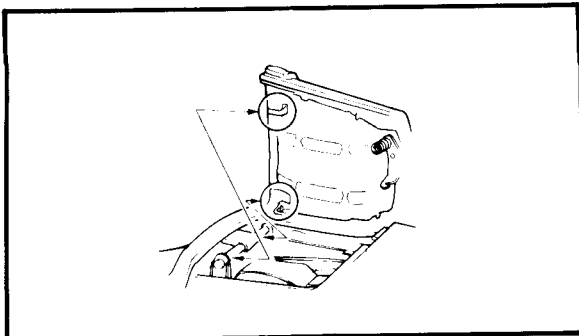
1. Install:

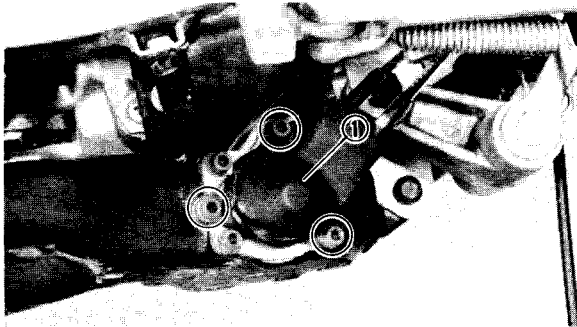
- Seat

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.



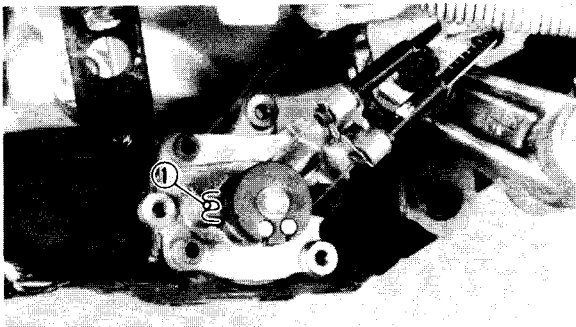


ENGINE

EXUP CABLE ADJUSTMENT (For California only)

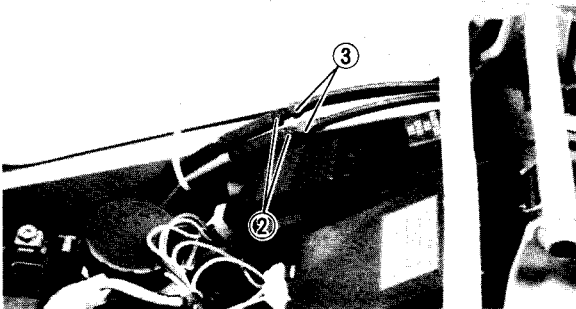
1. Remove:
 - Lower cowling (Left)
 - Seat
 Refer to the "COWLINGS REMOVAL AND INSTALLATION – REMOVAL" section.
2. Remove:
 - Valve cover ①
3. Turn on the main switch.


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

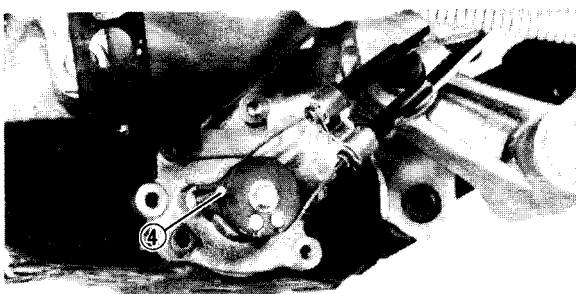


4. Check:
 - Alignment mark ①
 Not aligned → Adjust EXUP cables.
5. Adjust:
 - EXUP cables

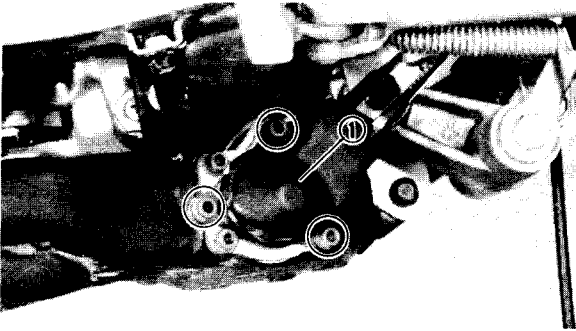
Adjustment steps:	
<ul style="list-style-type: none"> • Loosen both locknuts ② and turn in both adjuster ③ . • Insert a [$\phi 4$ mm ($\phi 0.16$ in)] pin ④ through the aligning indent in the pulley and into the hole. • Turn both adjusters, counterclockwise so that the cables free play becomes Zero mm (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

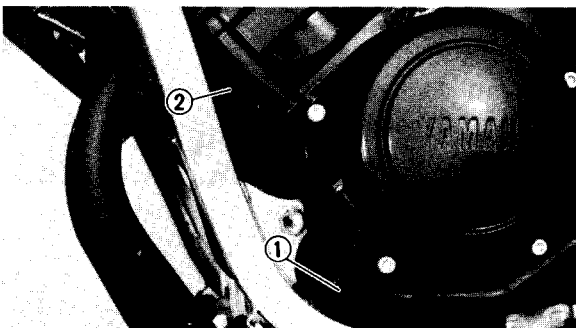
Refer to the "COWLING REMOVAL AND INSTALLATION – REMOVAL" section.

2. Remove:

- Fuel tank

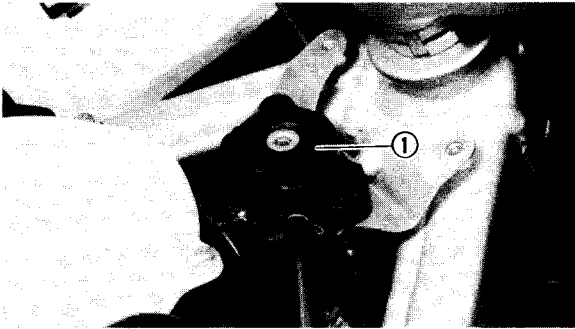
Refer to the "CARBURETOR – REMOVAL" section in the CHAPTER 6.

3. Place a drain pan under the drain bolts.

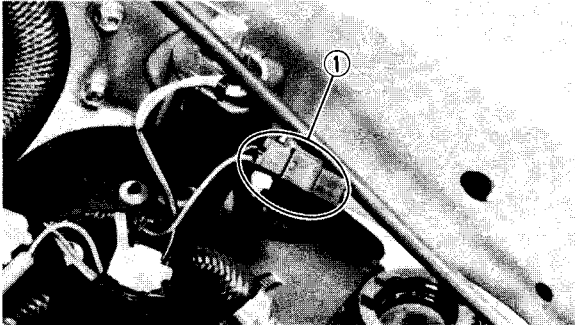


4. Remove:

- Drain bolt (Outlet pipe) ①
- Drain bolt (Cylinder) ②

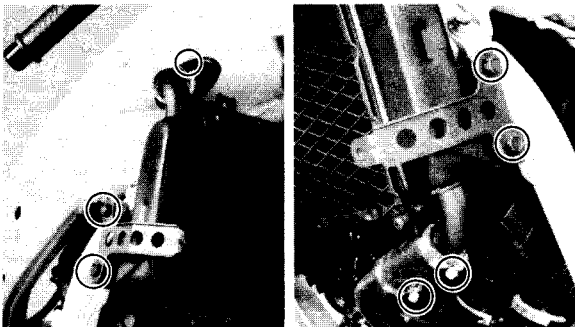


5. Remove:
- Radiator cap ①



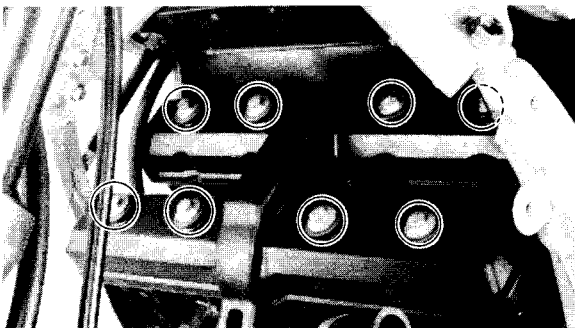
6. Drain:
- Cooling system
- Refer to the "COOLANT REPLACEMENT" section.

7. Disconnect:
- Fan motor coupler ①

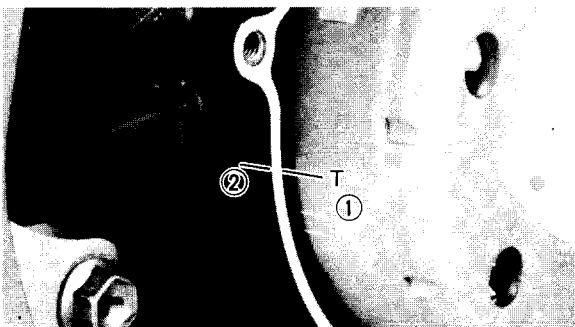


8. Disconnect:
- Hose (Radiator – Inlet)
 - Hose (Radiator – Outlet)

9. Remove:
- Radiator



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



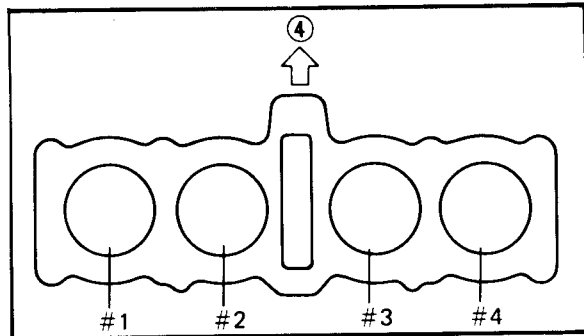
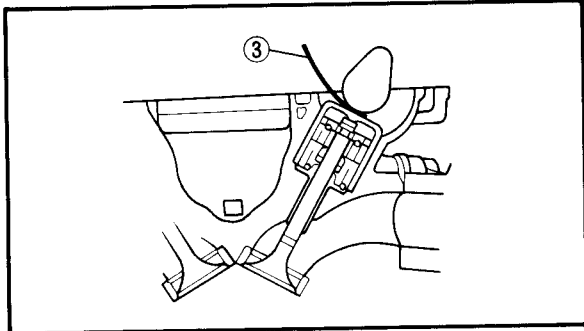
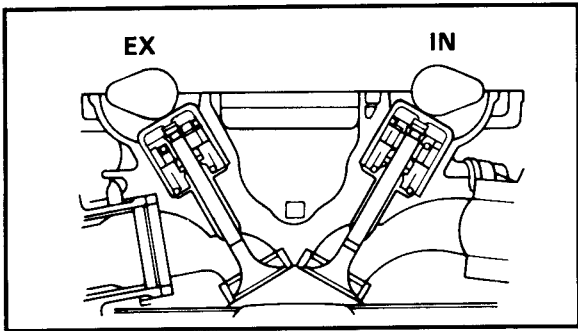
Valve Clearance Measurement

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.


VALVE CLEARANCE ADJUSTMENT



		0°	180°	360°	540°	720°
A		----- ----- ----- -----				
B	#1	(5)				
	#2		(5)			
	#3					(5)
	#4			(5)		

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

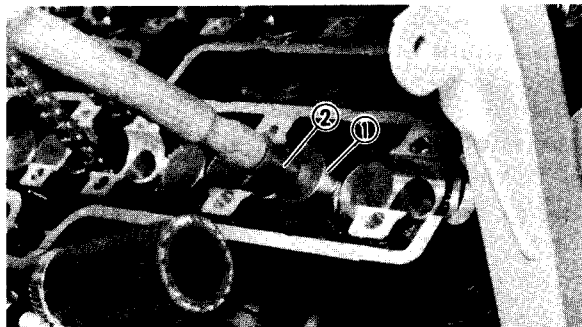
NOTE: _____
 Turn crankshaft each degrees counterclockwise from #1 Cylinder TDC.

#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 CAM-SHAFT 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

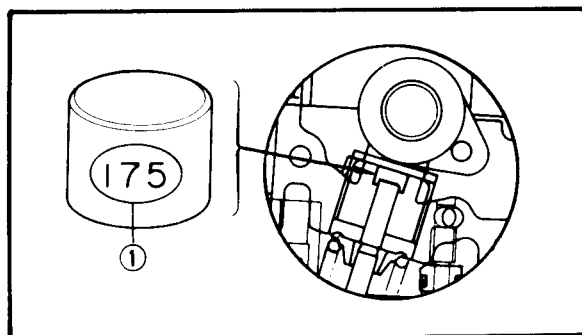
Use valve lapper ②

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

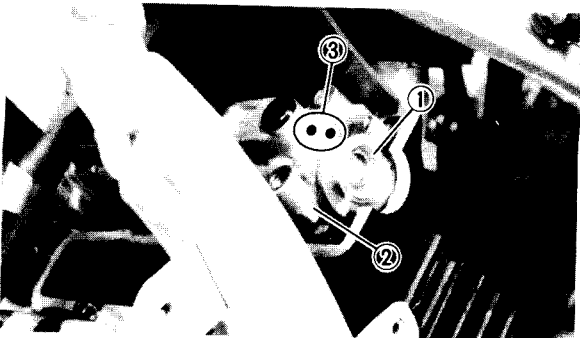
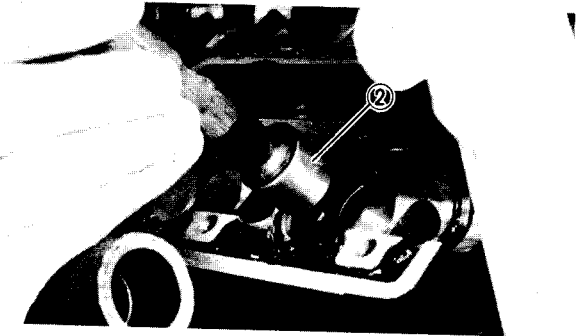
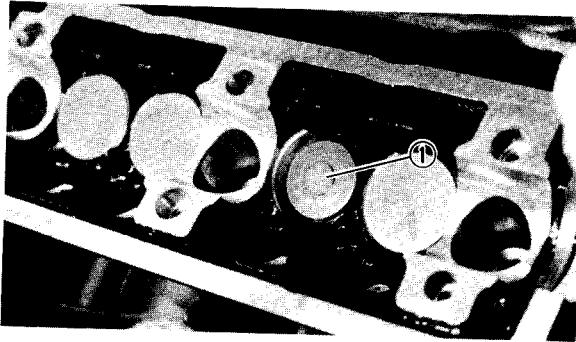
NOTE: _____

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.

VALVE CLEARANCE ADJUSTMENT



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

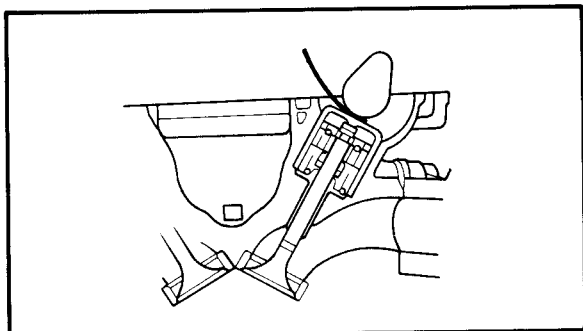
B MEASURED CLEARANCE	A INSTALLED PAD NUMBER																								
	120	125	130	135	140	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240
0.00 ~ 0.02						120	125	130	135	140	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215
0.03 ~ 0.07					120	125	130	135	140	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 camshaft counterclockwise several turns for the installed parts to settle into the correct position.

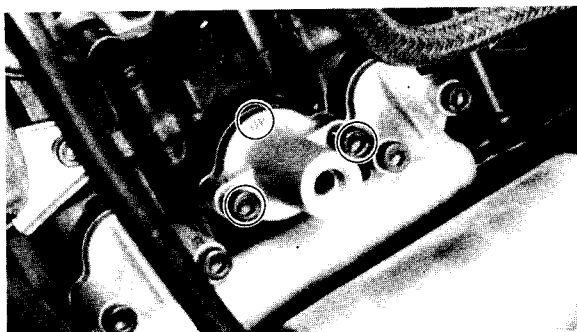


6. Measure:

- 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:

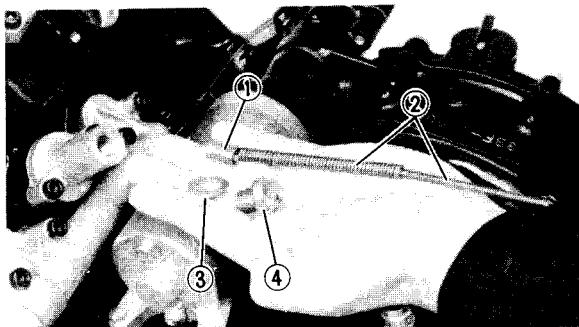
- Cam chain tensioner

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)

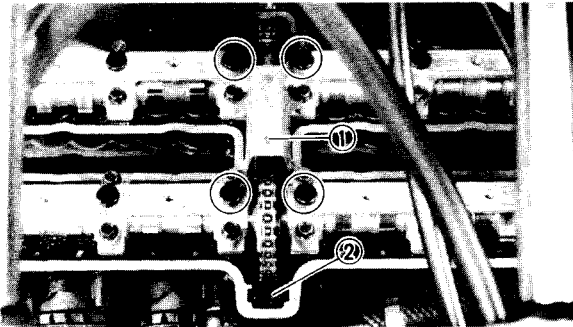


2. Install:


- 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

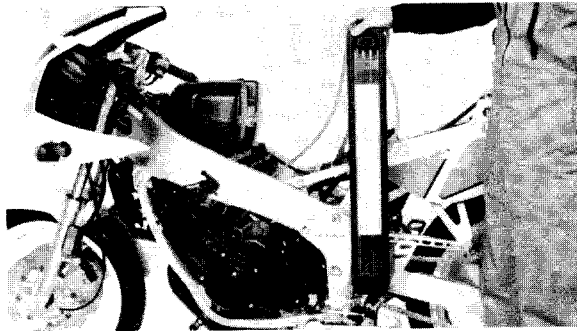
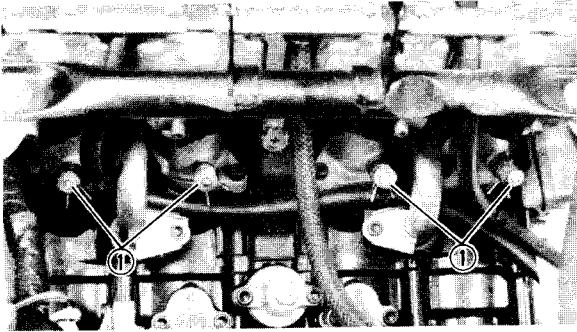
	Coolant Total Amount (Including All Routes): 1.9 L (1.7 Imp qt, 2.0 US qt)
---	--

CARBURETOR SYNCHRONIZATION

Carburetors must be adjusted to open and close simultaneously.

NOTE: _____
 Valve clearance must be set properly before synchronizing the carburetors.

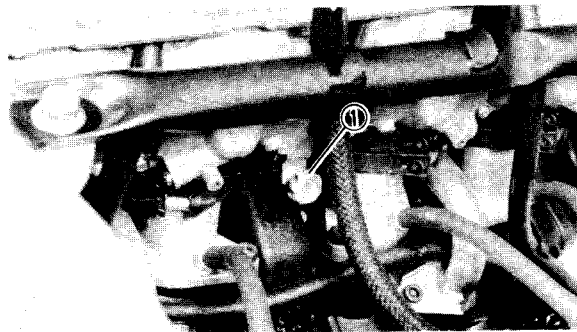
1. Remove:
 - Center cowlings
 - Seat
Refer to the "COWLING REMOVAL AND INSTALLATION – REMOVAL" section.
2. Remove:
 - Fuel tank
Refer to the "CARBURETOR – REMOVAL" section in the CHAPTER 6.
3. Remove:
 - Vacuum plugs ①



4. Install:
 - Vacuum gauge
 - Sub tank


	Vacuum Gauge: P/N YU-08030
---	--------------------------------------

5. Start the engine and let it warm up.

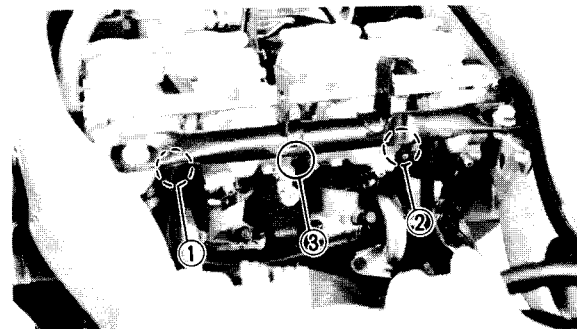


6. Adjust:
 - Idle speed
Turn the throttle stop screw ① .

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

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

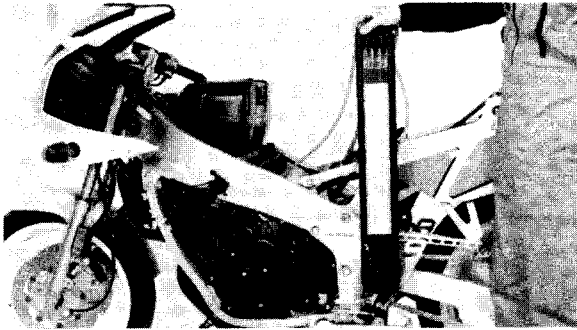
7. Adjust:
 - Carburetors synchronization



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.

IDLE SPEED ADJUSTMENT

**INSP
ADJ**



- 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.



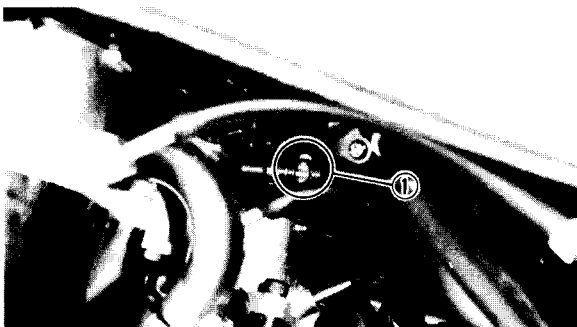
Idle Speed: 1,250 ~ 1,350 r/min

3. Adjust:

- Idle speed

Turn the throttle stop screw ①

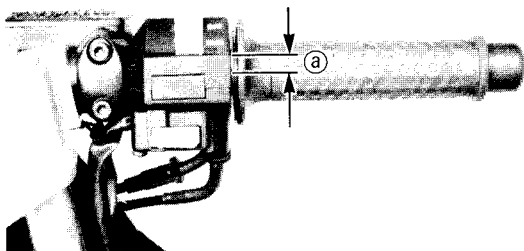
Turn in	Engine speed is increased.
Turn out	Engine speed is decreased.



THROTTLE CABLE FREE PLAY ADJUSTMENT

NOTE: _____

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

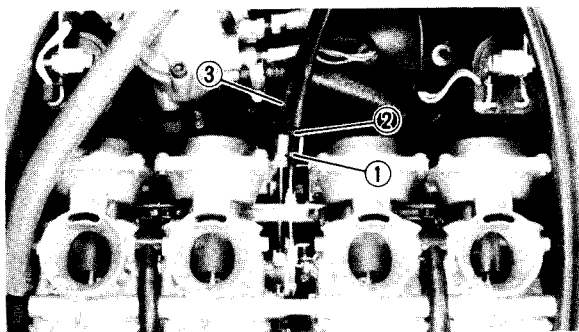


1. Check:

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



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



2. Adjust:

- Throttle cable free play

Throttle cable adjustment steps:

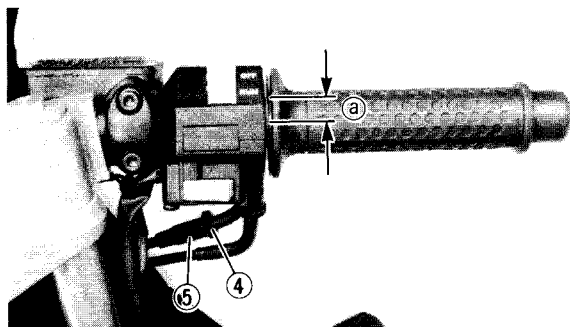
- Remove the seat, top cover and air filter case.
Refer to the "CARBURETOR – REMOVAL" section in the CHAPTER 6.
- Loosen the locknut (Throttle cable 1) ① .
- Turn the adjuster (Throttle cable 1) ② clockwise or counterclockwise until proper free play (Throttle grip) is attained.

③ Throttle cable 2



Throttle Cable Free Play (Throttle Grip) (a):
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) (a) is attained.



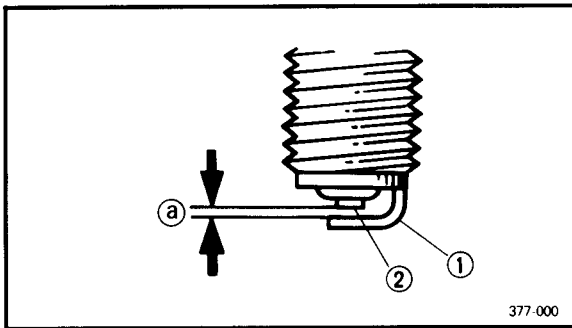


**Throttle Cable Free Play
(Throttle Grip) ③ :**
2 ~ 5 mm (0.08 ~ 0.20 in)

- 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.

③ Spark plug gap

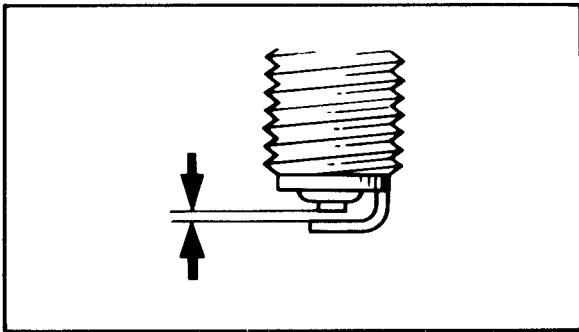
2. Clean:

- 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.

	<p>Spark Plug Gap: 0.7 ~ 0.8 mm (0.028 ~ 0.032 in)</p>
---	---

5. Tighten:
- Spark plug

NOTE: _____

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

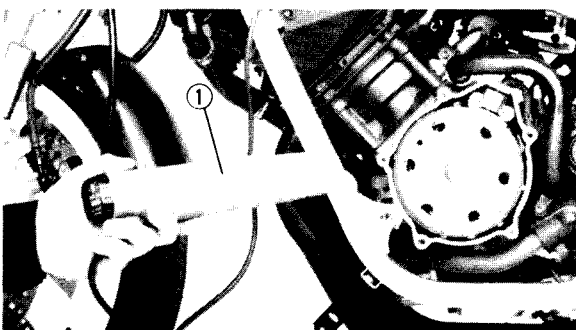
	<p>Spark Plug: 13 Nm (1.3 m·kg, 9.4 ft·lb)</p>
---	---


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

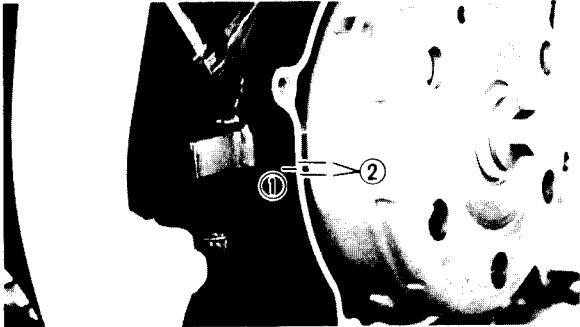


	<p>Timing Light: P/N YU-33223</p> <p>Inductive Tachometer: P/N YU-08037</p>
---	---

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

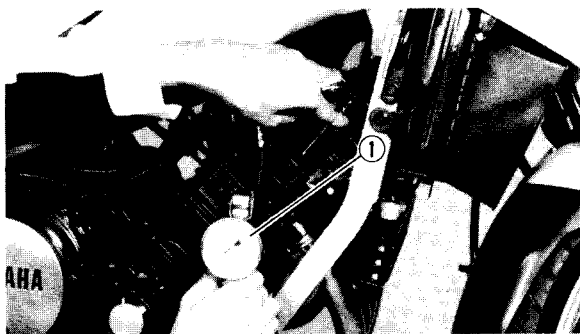
COMPRESSION PRESSURE MEASUREMENT

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.



COMPRESSION PRESSURE MEASUREMENT



- 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 below 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.

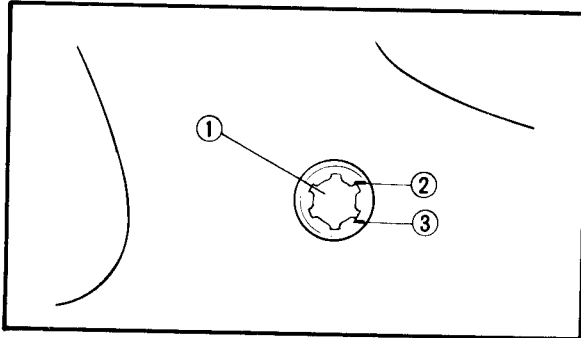
Difference Between Each Cylinder:
 Less than 100 kPa (1 kg/cm² , 15 psi)

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 through the level window ① .

3. Inspect:

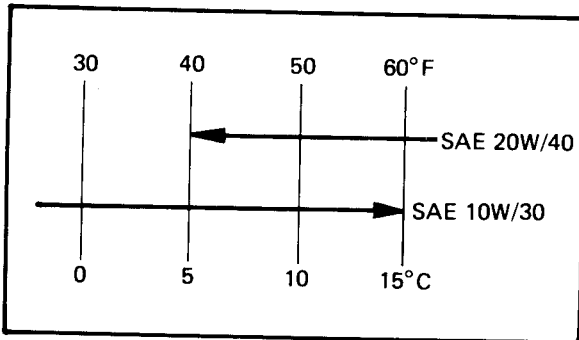
- Oil level


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.

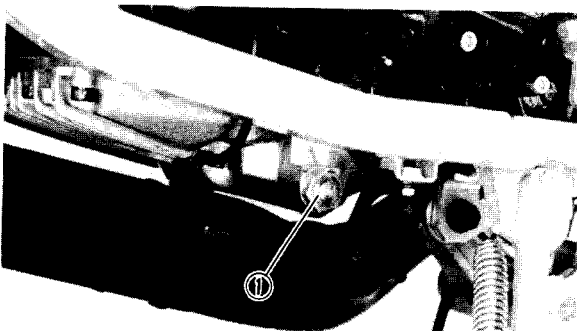





Recommended Engine Oil:
 At 5°C (40°F) or Higher:
 Yamalube 4-cycle oil or
 SAE 20W40 Type SE Motor Oil
 At 15°C (60°F) or Lower:
 SAE 10W30 Type SE Motor Oil

ENGINE OIL REPLACEMENT

1. Warm up the engine for several 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.

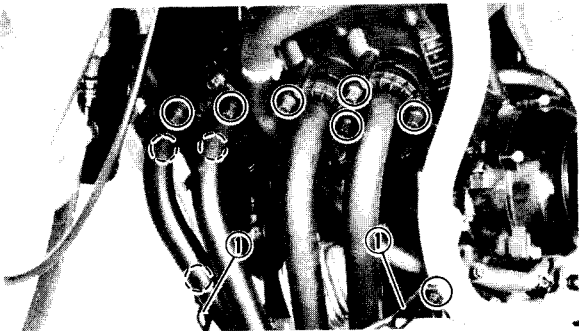


Periodic Oil Change:
 2.7 L (2.4 Imp qt, 2.9 US qt)
Recommended Engine Oil:
 At 5°C (40°F) or Higher:
 Yamalube 4-cycle oil or
 SAE 20W40 Type SE Motor Oil
 At 15°C (60°F) or Lower:
 SAE 10W30 Type SE Motor Oil

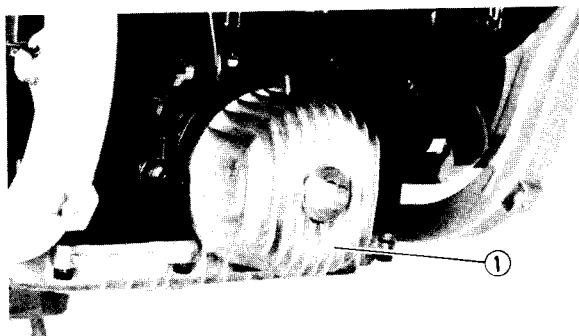
8. Install:
- Oil filler cap

ENGINE OIL FILTER REPLACEMENT

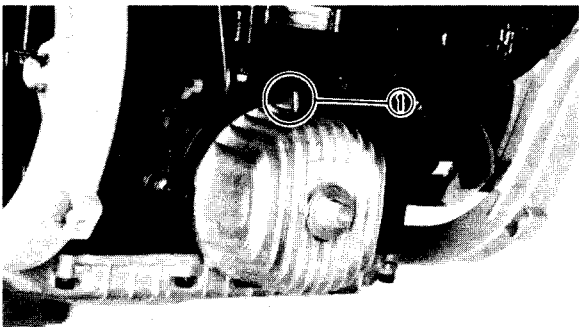
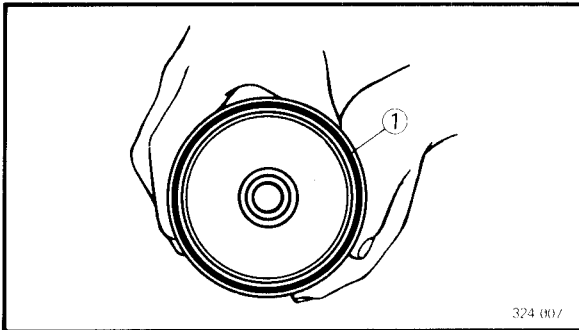
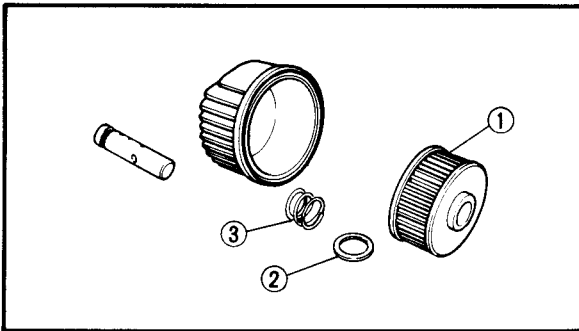
1. Remove:
- Lower cowlings (Left and right)
 Refer to the COWLING REMOVAL AND INSTALLATION – REMOVAL” section.
2. Warm up the engine for several minutes.



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:

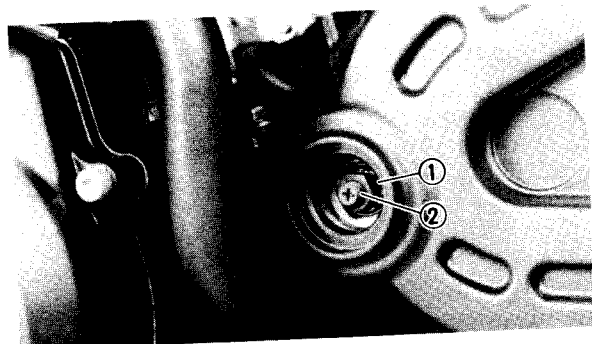
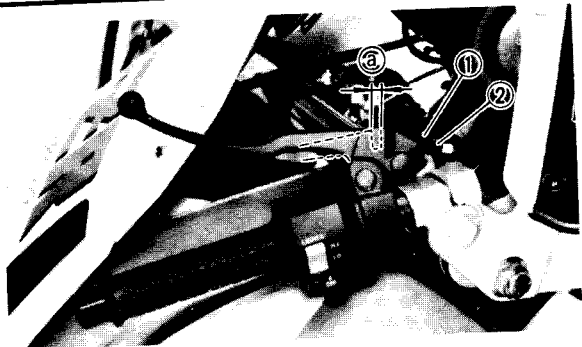
- Loosen the locknut (1).
- Turn the adjuster (2) in or out until the specified free play is obtained.

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

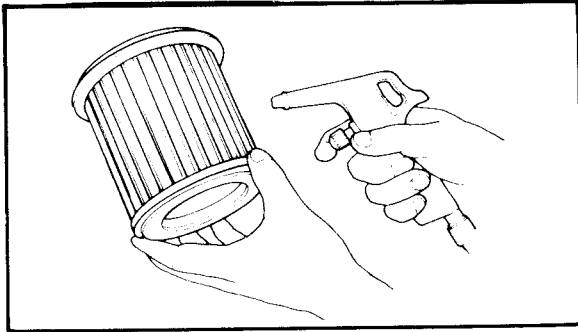
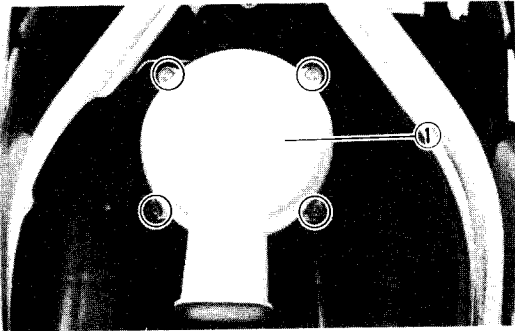
- Tighten the locknut.

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)



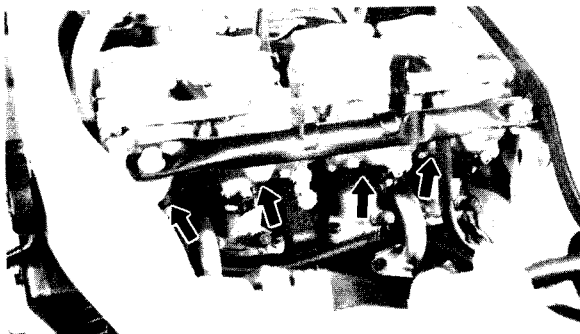
AIR FILTER CLEANING

1. Remove:
 - Seat
 - Top coverRefer 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 elementBlow out dust in the element from the outer surface using compressed air.
4. Inspect:
 - Air filter elementDamage → Replace.
5. Install:
 - Air filter element
 - Air filter case cover
 - Top cover
 - Seat

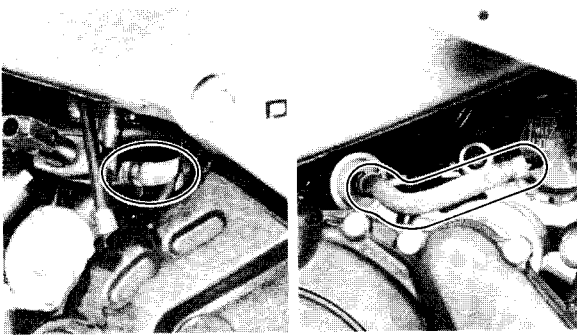


CARBURETOR JOINT INSPECTION

1. Remove:
 - Fuel tank
 - Air filter caseRefer to the "CARBURETOR – REMOVAL" section in the CHAPTER 6.
2. Inspect:
 - Carburetor jointCracks/Damage → Replace.

FUEL LINE INSPECTION

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

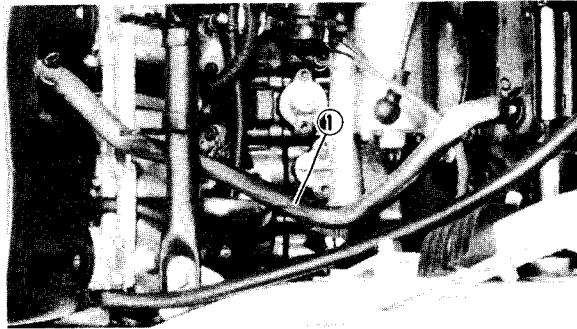


2. Inspect:

- 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.

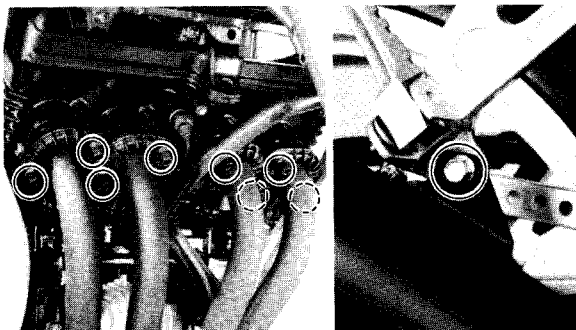
EXHAUST SYSTEM INSPECTION

1. Remove:


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

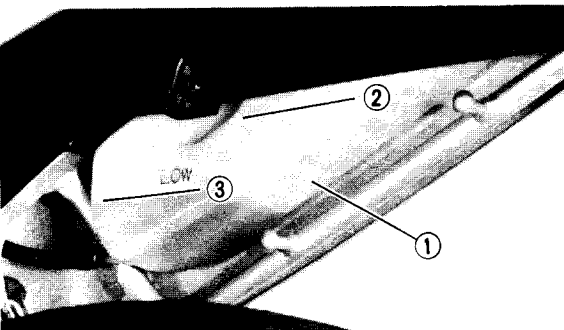
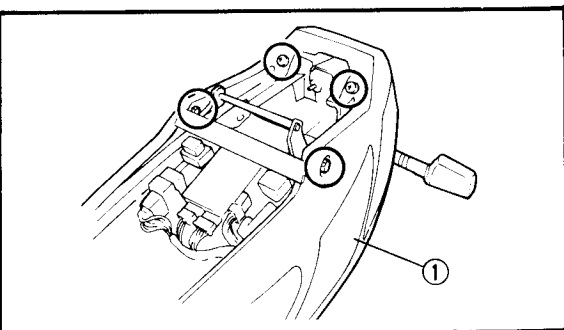
2. Inspect:

- 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)

Refer to the "COWLING REMOVAL 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)



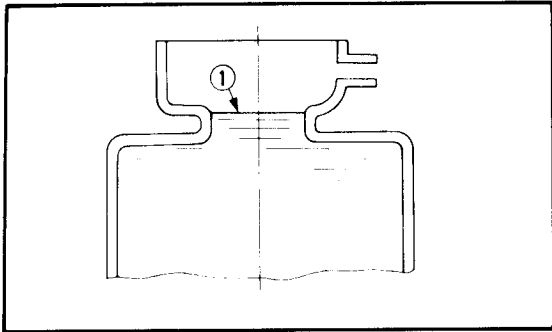
Drain Bolt (Cylinder):
7 Nm (0.7 m·kg, 5.1 ft·lb)
Drain Bolt (Outlet Pipe):
7 Nm (0.7 m·kg, 5.1 ft·lb)

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

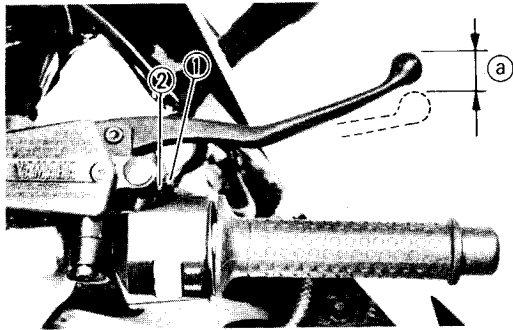
Coolant and Water Mixed Ratio:
50%/50%

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 inhibitors.




CHASSIS

FRONT BRAKE ADJUSTMENT

1. Loosen:
 - Adjuster locknut ①
2. Adjust:
 - Free play
 - Turn the adjuster ② until the free play ③ is within the specified limits.

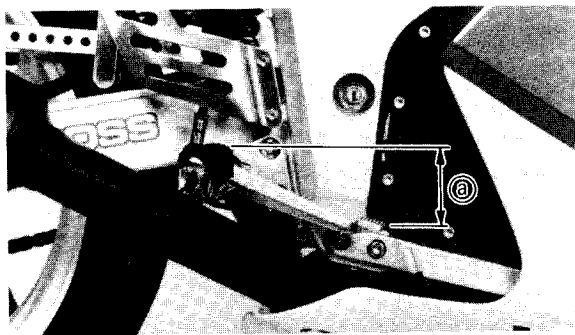
Turn in	Free play is decreased.
Turn out	Free play is increased.

 **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



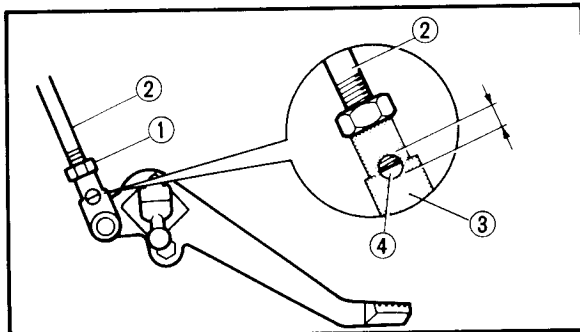
REAR BRAKE ADJUSTMENT

1. Loosen:
 - Adjuster locknut ①
2. Adjust:
 - Brake pedal height ②
 - Turn the adjuster ③ until the brake pedal position is at the specified height.
 - Rear brake light switch
 - Refer to the "REAR BRAKE LIGHT SWITCH ADJUSTMENT" section.

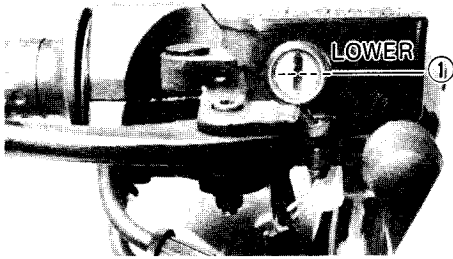
 **Brake Pedal Height:**
42 mm (1.7 in)
Below the Top of the Footrest

⚠ 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



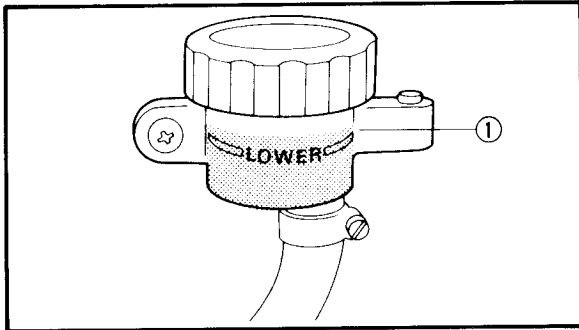
BRAKE FLUID INSPECTION

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

① Front brake fluid lower level



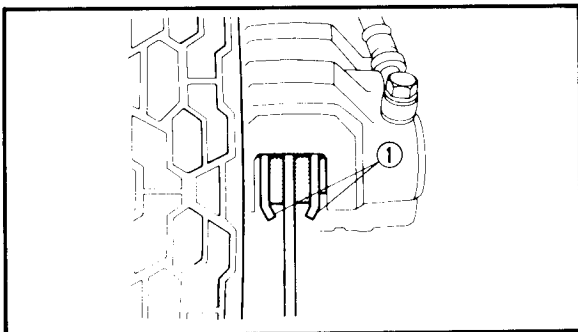
Brake Fluid: DOT #4
If DOT #4 is not available,
#3 can be used.



⚠ WARNING:

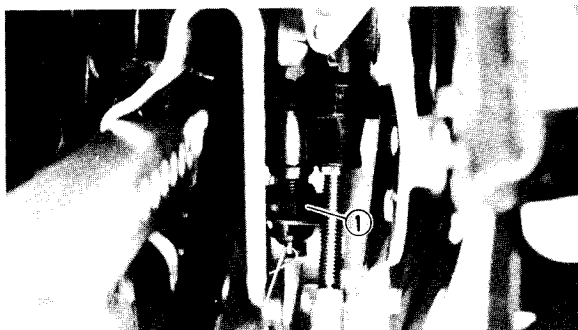
- Use only designated quality brake fluid to avoid poor brake performance.
- Refill with same type and brand of brake fluid; mixing fluids could result in poor brake performance.
- Be sure that water or other contaminants do not enter master cylinder when refilling.
- Clean up spilled fluid immediately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

① Rear brake fluid lower level



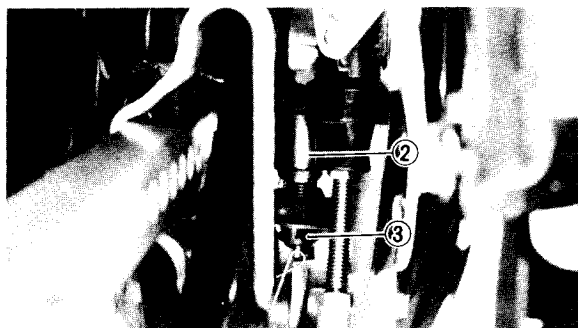
BRAKE PAD INSPECTION

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

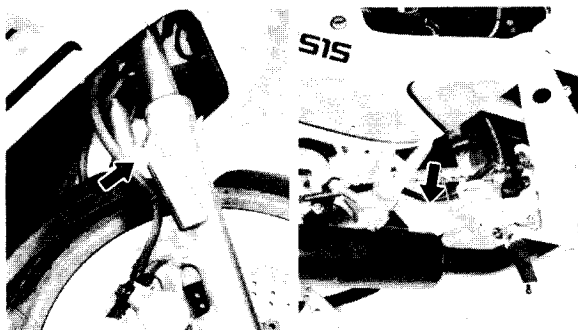


2. Adjust:

- 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.

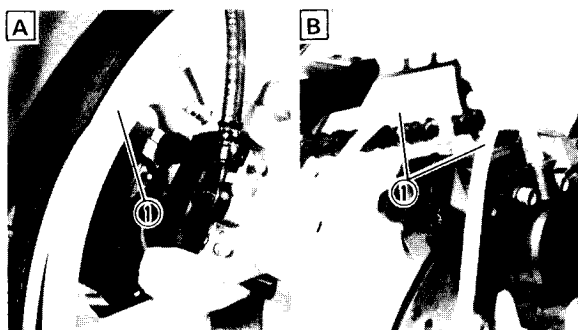
AIR BLEEDING

⚠ 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)

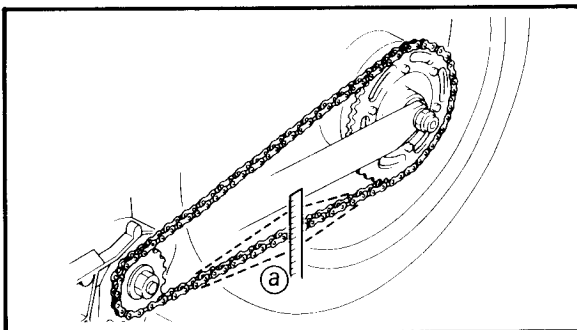
- i. Repeat steps (e) to (h) until the air bubbles have been removed from the system.

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

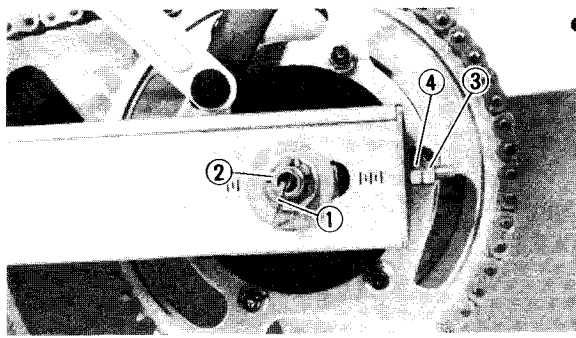
NOTE: _____
Before checking and/or adjusting the chain slack, rotate the rear wheel through several revolutions. Check the chain slack several times to find the point where the chain is the tightest. Check and/or adjust the chain slack where the rear wheel is in this "tight chain" position.



1. Place the motorcycle vertically on a level place.
2. Measure:
 - Drive chain slack (a)
 - 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: _____

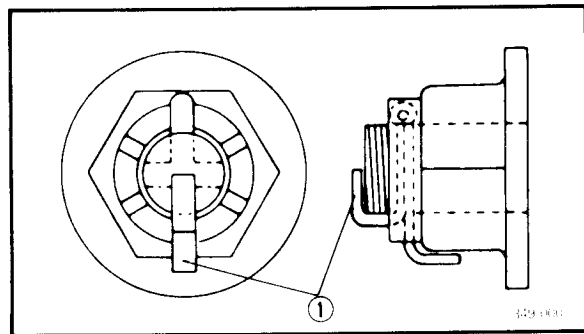
There are marks on each side of rear arm and on each chain puller; use them to check for proper alignment.

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.

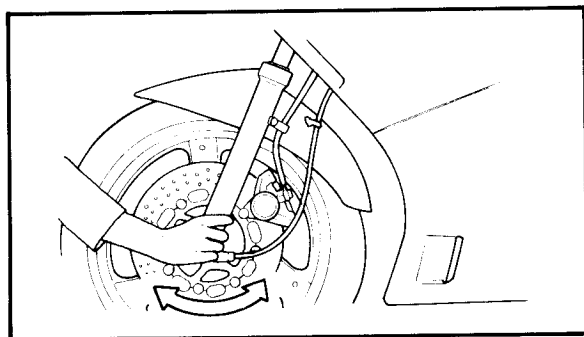
DRIVE CHAIN LUBRICATION

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

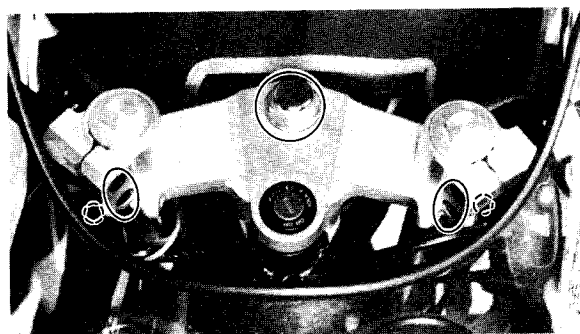


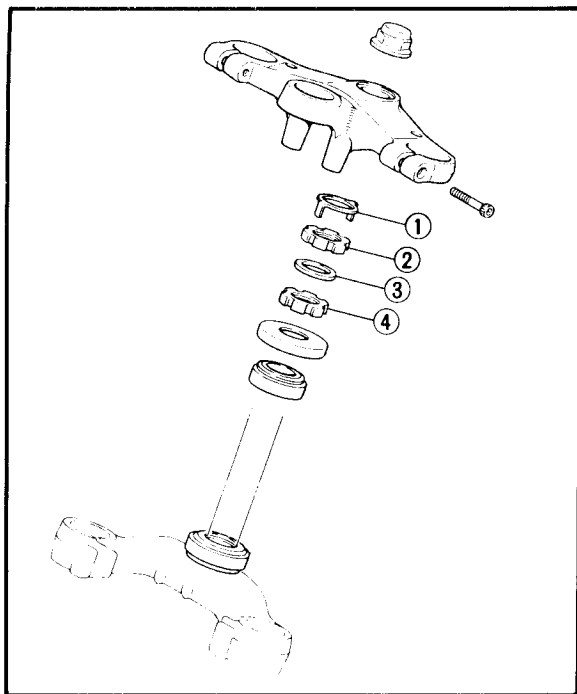
STEERING HEAD INSPECTION

⚠ 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

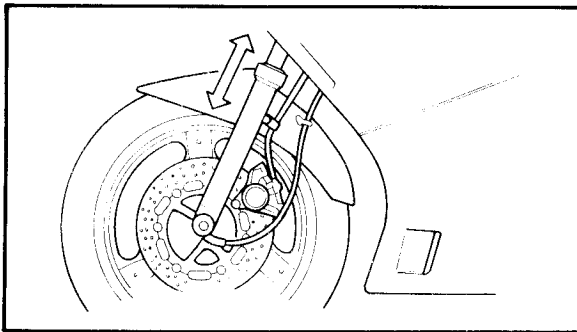
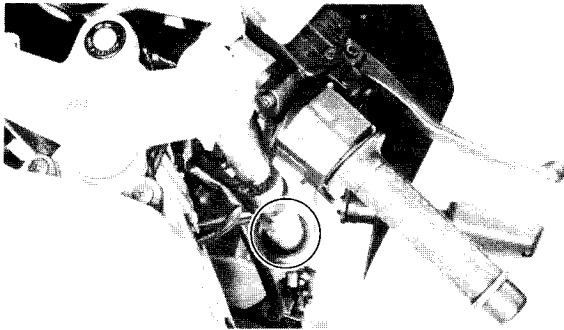
⚠ WARNING:

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

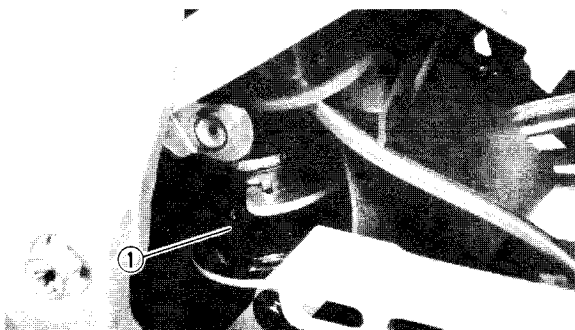
The spring preload of the rear shock absorber can be adjusted to suit rider's preference, weight, and the course conditions.

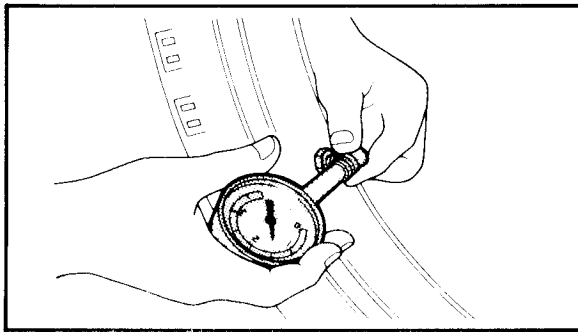
1. Adjust:
 - Spring preload

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:

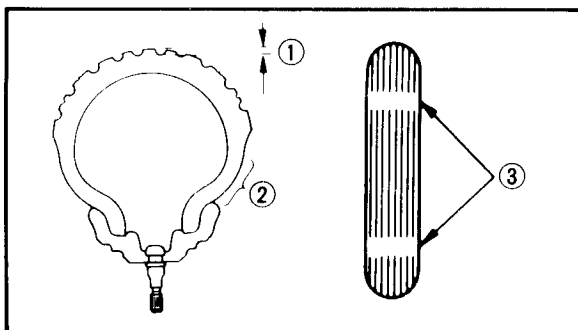
Tire inflation pressure should be checked and adjusted when the temperature of the tire equals the ambient air temperature. Tire inflation pressure must be adjusted according to total weight of cargo, rider, passenger, and accessories (fairing, saddlebags, etc. if approved for this model), and vehicle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


Basic weight: With oil and full fuel tank	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/cm ² , 28 psi)	230 kPa (2.3 kg/cm ² , 32 psi)
90 kg (198 lb) ~ Maximum load*	200 kPa (2.0 kg/cm ² , 28 psi)	250 kPa (2.5 kg/cm ² , 36 psi)
High speed riding	200 kPa (2.0 kg/cm ² , 28 psi)	250 kPa (2.5 kg/cm ² , 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



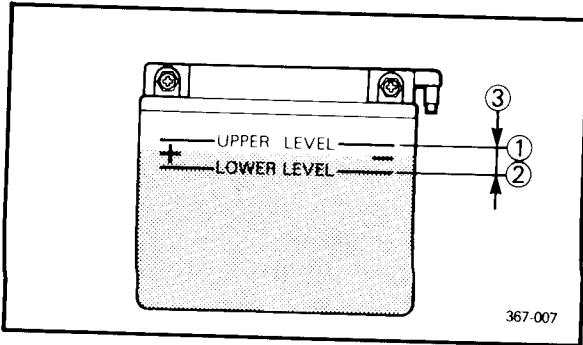
ELECTRICAL

BATTERY INSPECTION

1. Remove:

- Seat

Refer to the "COWLING REMOVAL AND INSTALLATION – REMOVAL" section.



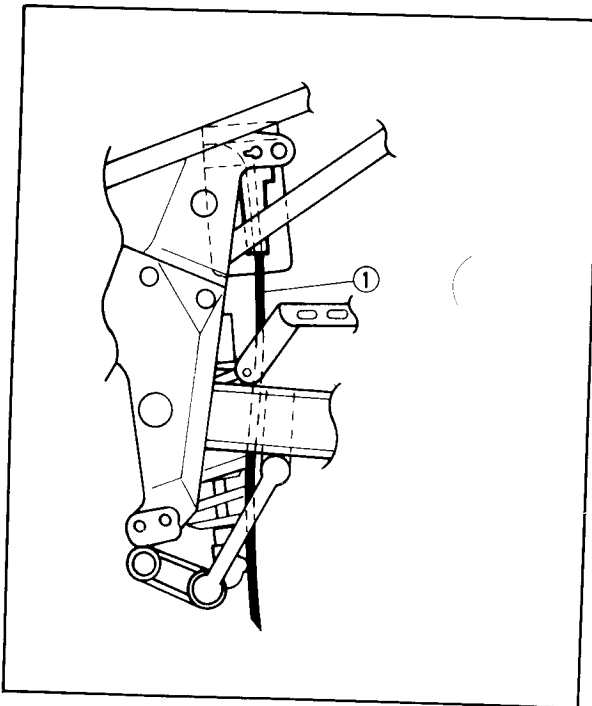
2. Inspect:

Fluid level ③ should be between upper ① and lower ② marks.

Incorrect → Refill.

⚠ CAUTION:

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



3. Connect:

- Breather pipe (Battery) ①

Be sure the hose is properly attached and routed.

4. Inspect:

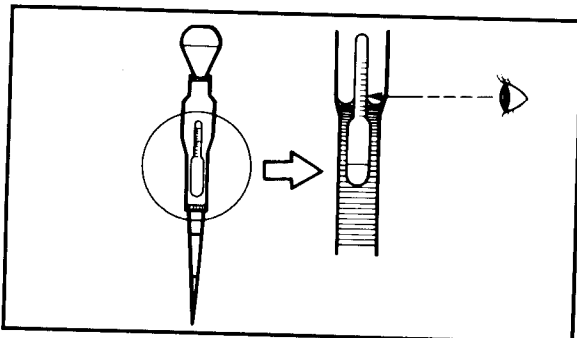
- Breather pipe (Battery) ①

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 severe burns or permanent eye injury.

- Wear protective eye gear when handling or working near batteries.

Antidote (EXTERNAL):

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

Antidote (INTERNAL):

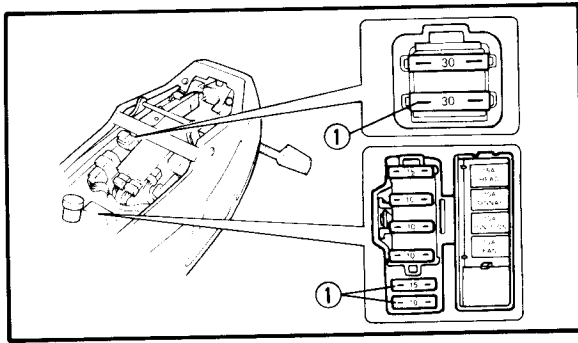
- Drink large quantities of water or milk follow with milk of magnesia, beaten egg, or vegetable oil. Get immediate medical attention.

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

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

KEEP BATTERIES AND ELECTROLYTE OUT OF REACH OF CHILDREN.





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

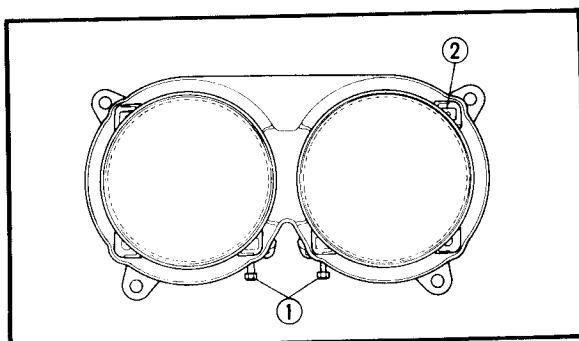
Description	Amperage	Quantity
Main	30A	1
Headlight	10A	1
Signal	10A	1
Ignition	10A	1
Reserve	10A	1
	30A	1

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:

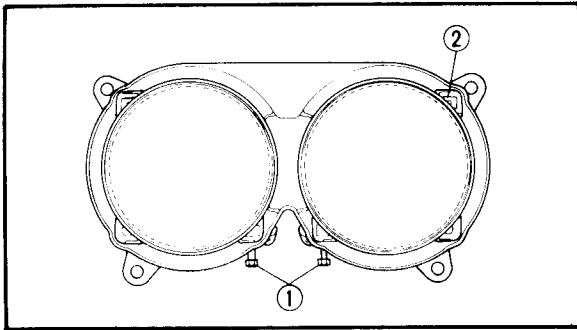
Do not use fuses of higher amperage rating than recommended. Extensive electrical system damage and fire could result from substitution of a fuse of improper amperage.



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.



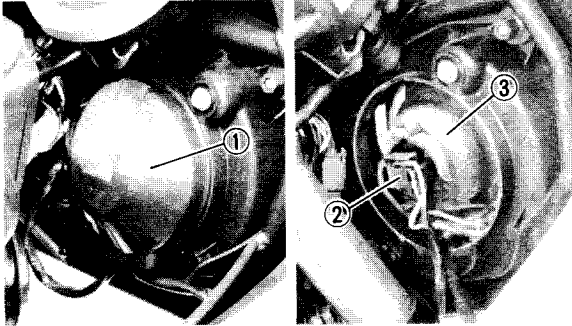
2. Adjust:

• 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:

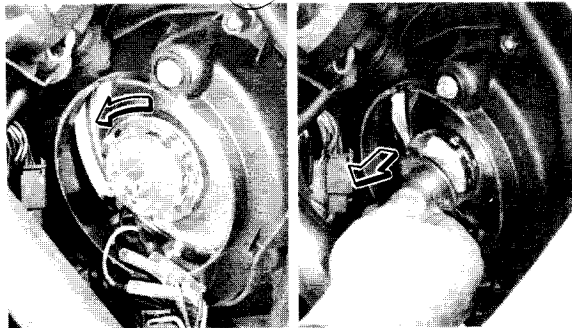
- Headlight cover ①

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.

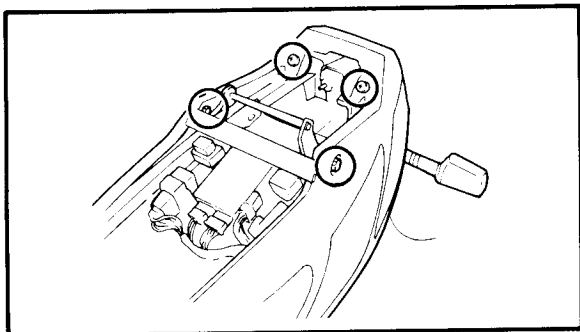
⚠ CAUTION:

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:

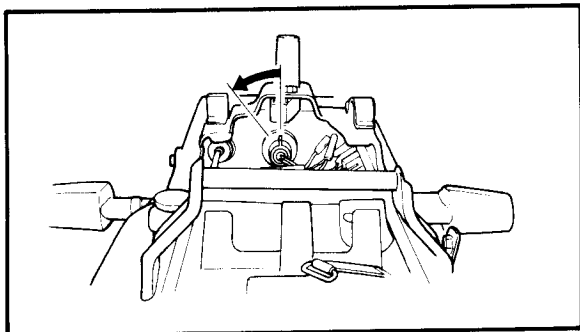
- Headlight bulb cover

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

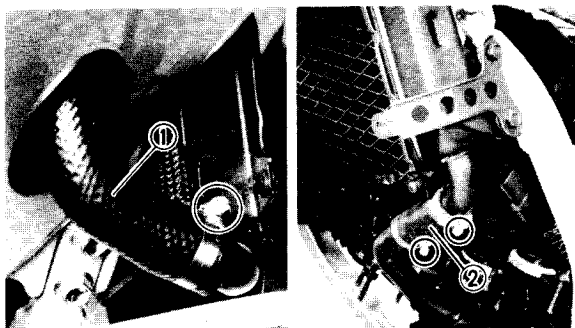
Refer to the "COOLANT REPLACEMENT" section in the CHAPTER 3.

AIR FILTER CASE AND CARBURETOR

1. Remove:

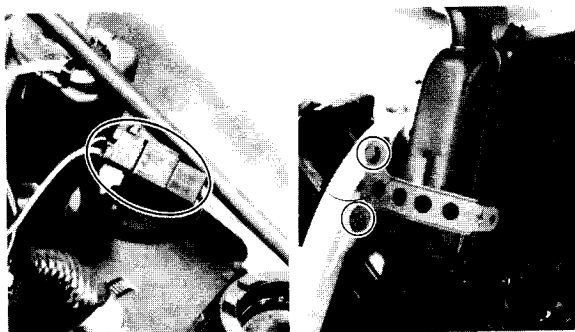
- Air filter case
- Carburetor

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



RADIATOR

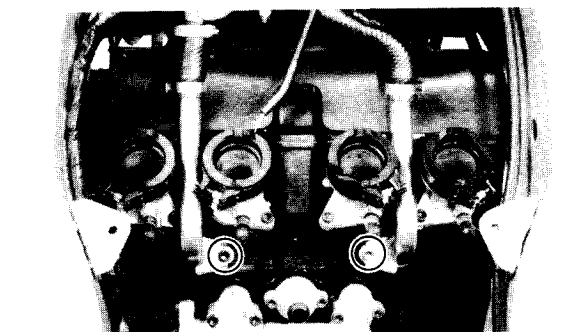
1. Disconnect:
 - Hose (Radiator – Inlet) ①
 - Hose (Radiator – Outlet) ②



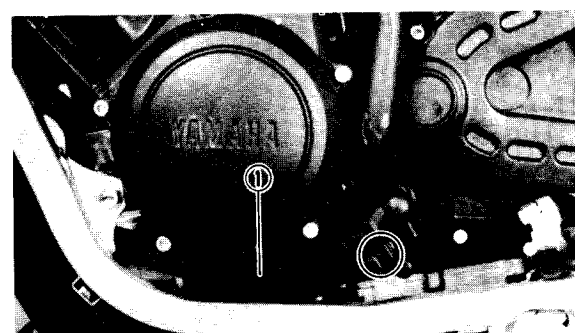
2. Disconnect:
 - Fan motor coupler
3. Remove:
 - Radiator assembly

⚠ CAUTION:

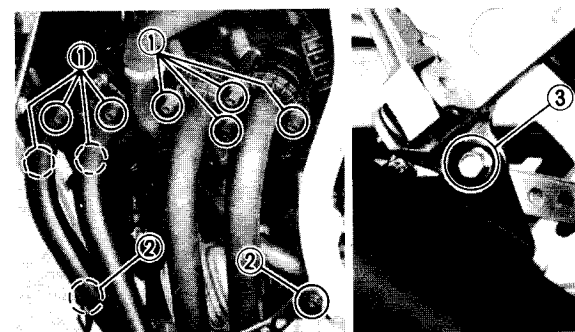
Cover the cylinder head cover and the fender with rags to prevent a scratching.



4. Disconnect:
 - Pipes (Left and right)

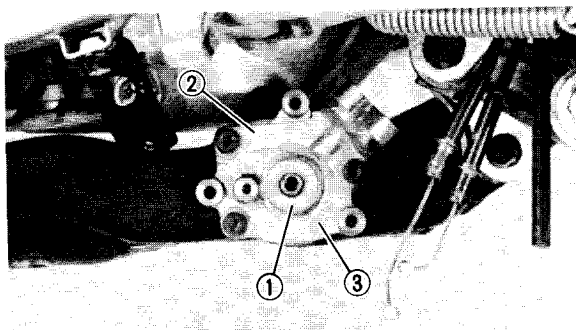
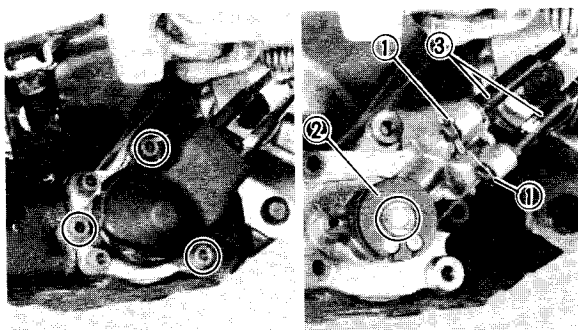
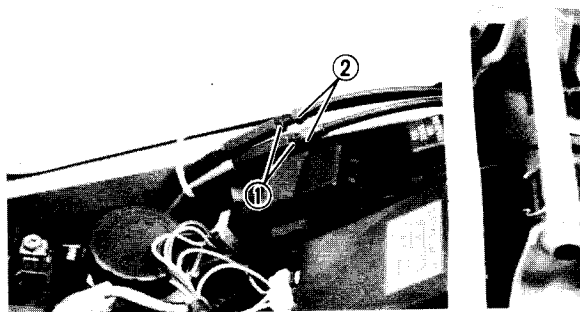
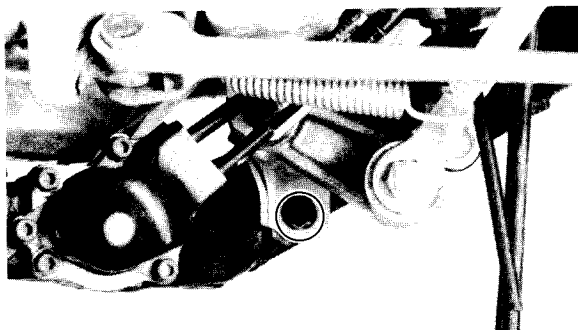
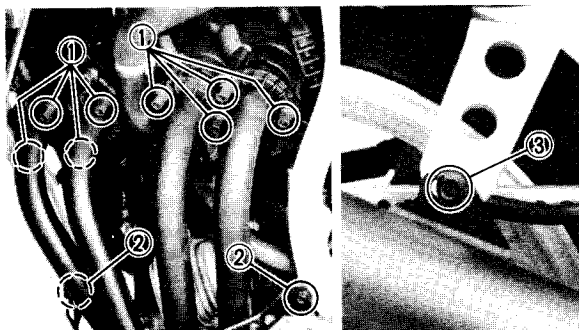


5. Remove:
 - Pipes (Radiator – Outlet) ①



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:

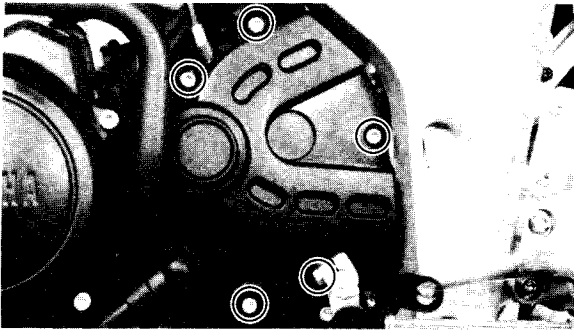
- Lock nut ①
- Adjuster ②

4. Remove:

- Cover
- Clips ①
- Pulley ②
- Cables ③

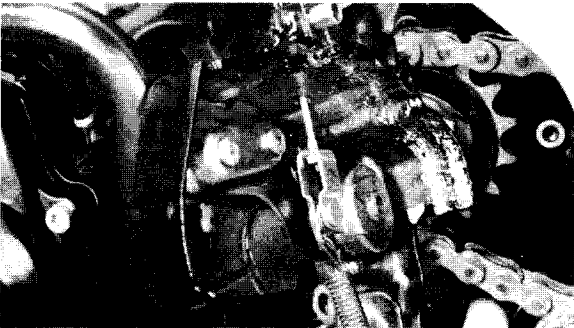
5. Remove:

- Washer ①
- Bracket ②
- Housing ③
- Gasket
(Left side)
- Shaft arm

**CLUTCH CABLE AND DRIVE CHAIN**

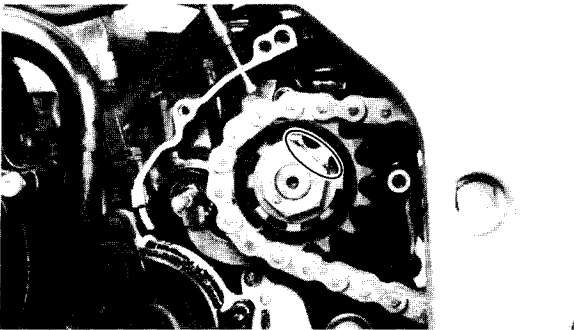
1. Remove:

- Shift arm
- Crankcase cover (Left)



2. Remove:

- Clutch cable

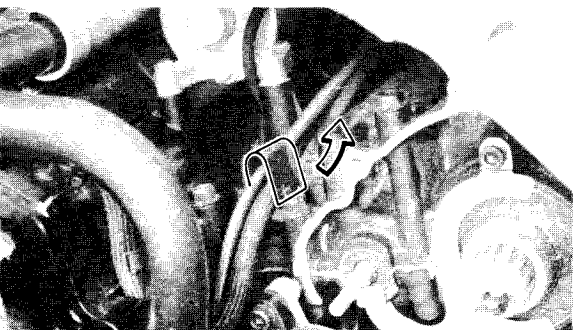


3. Straighten:

- Lock washer tab

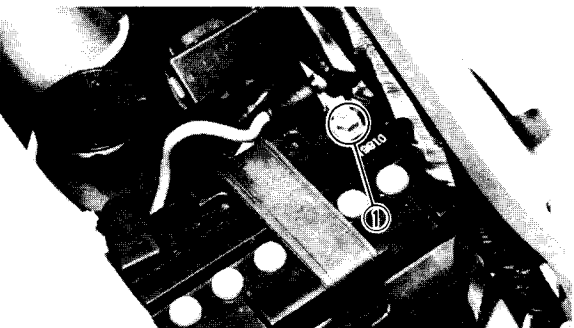
4. Remove:

- Drive sprocket

**LEADS**

1. Straighten:

- Clamp

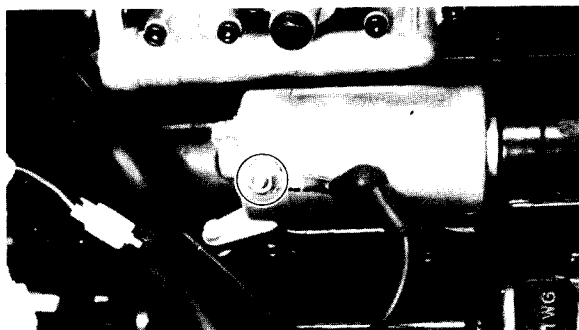


2. Disconnect:

- Battery leads

NOTE: _____

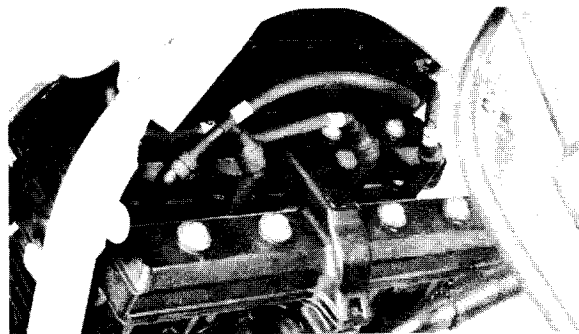
Disconnect the negative lead ① first.



3. Disconnect:
- Lead (Starter motor)

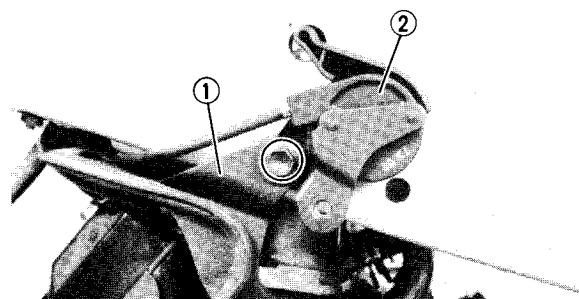


4. Remove:
- Cover
5. Disconnect:
- Coupler (Oil level Neutral switch)
 - Coupler (A.C. generator)
 - Coupler (Sidestand switch)

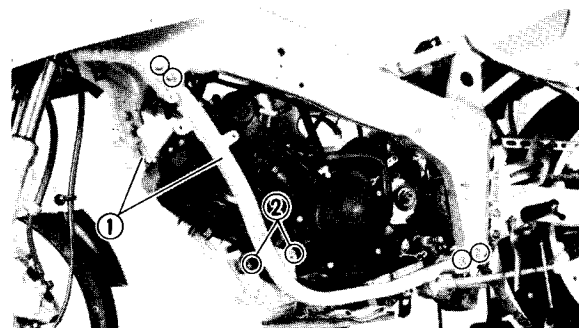


6. Remove:
- Spark plug leads

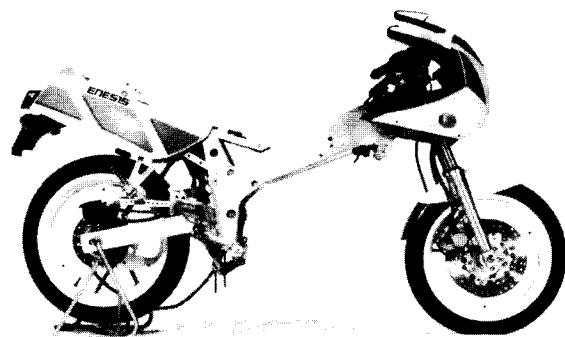
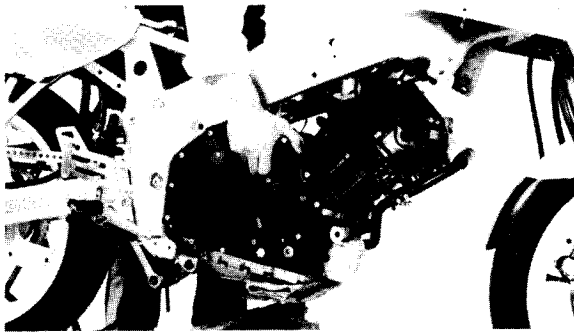
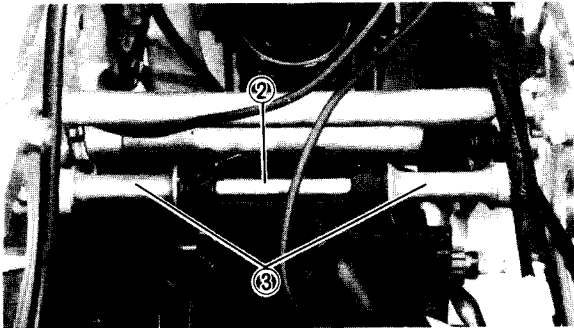
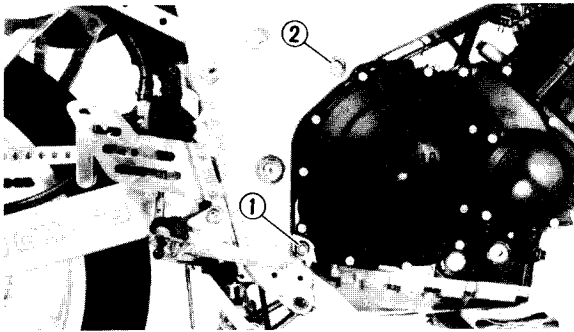
ENGINE REMOVAL



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.



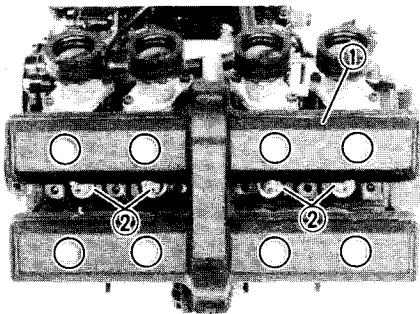
ENGINE DISASSEMBLY

CYLINDER HEAD COVER, CAMSHAFT AND CYLINDER HEAD

NOTE: _____

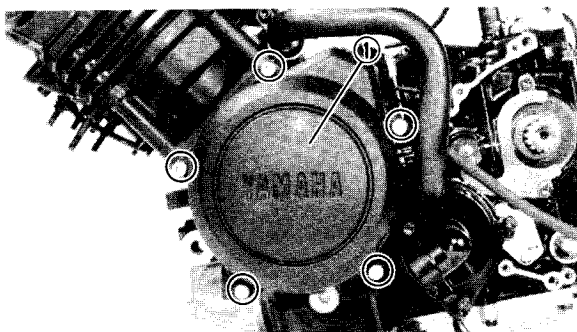
With the engine mounted, the cylinder head cover, camshaft and cylinder head can be maintained by removing the following parts.

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



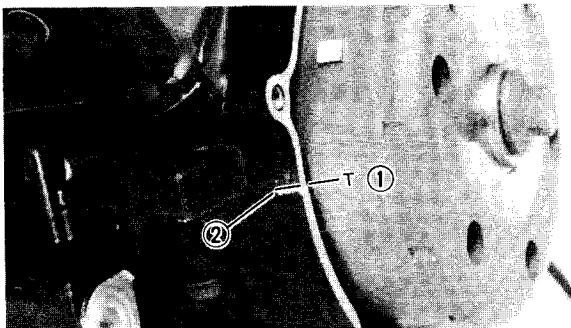
1. Remove:

- Cylinder head cover ①
- Gasket (Cylinder head cover)
- Spark plugs ②



2. Remove:

- Generator cover ①
- Dowel pins



3. Turn:

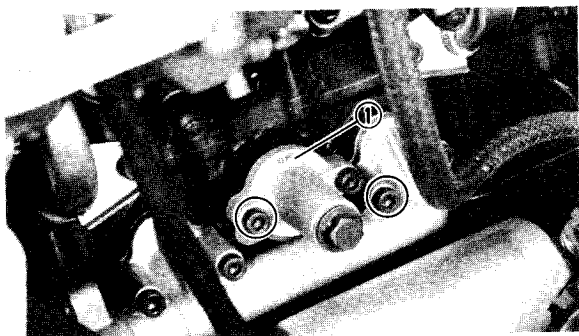
- Crankshaft
Counterclockwise

4. Align:

- "T" mark ①
- Crankcase end ②

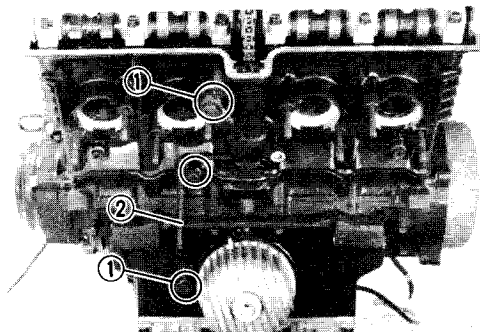
NOTE: _____

When #1 piston is at TDC on compression stroke.



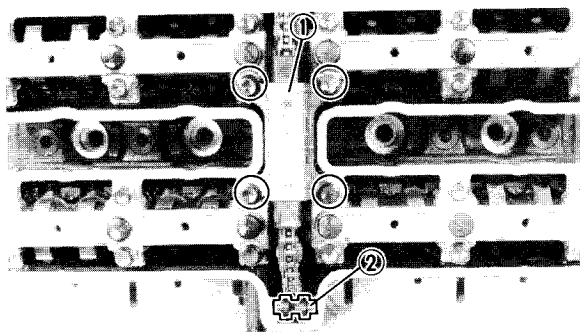
5. Remove:

- 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.

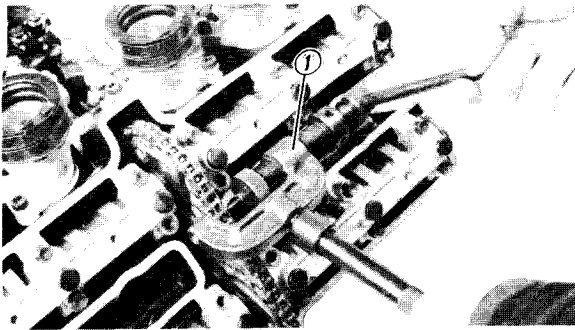
The pistons and cylinder can be removed without removing the camshafts.

● **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.**

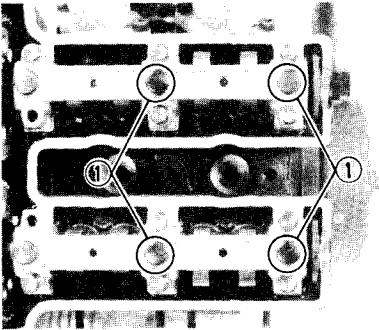
1. Disconnect:

- Cam chain

Use the Cam Chain Cutter ①.

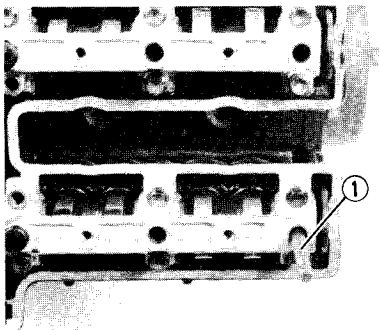


Cam Chain Cutter:
P/N YM-01112



2. Remove:

- Rubbers (Camshaft cap) ①



3. Remove:

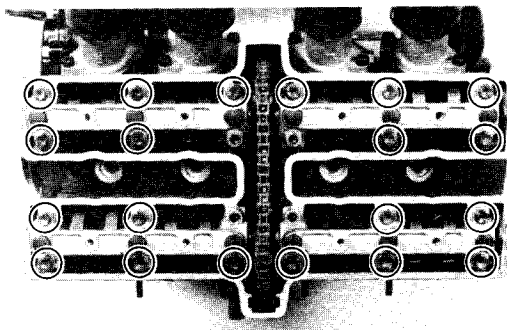
- Nuts (Cylinder head)

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:

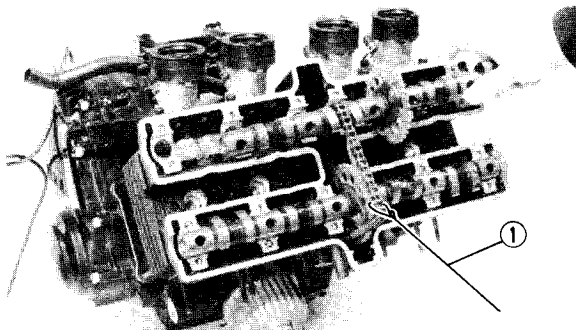
Do not rotate the camshaft or valve damage may occur.

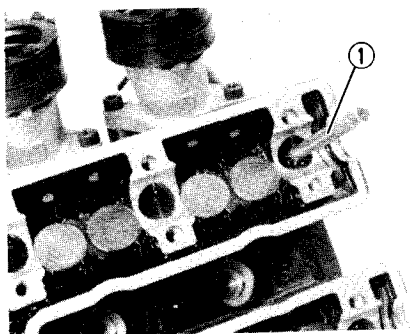
2. Remove:

- Camshafts

NOTE:

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



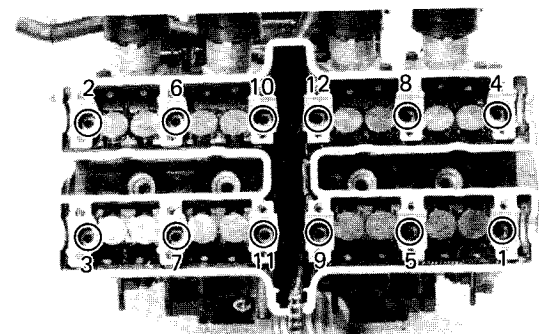


3. Remove:

- 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.

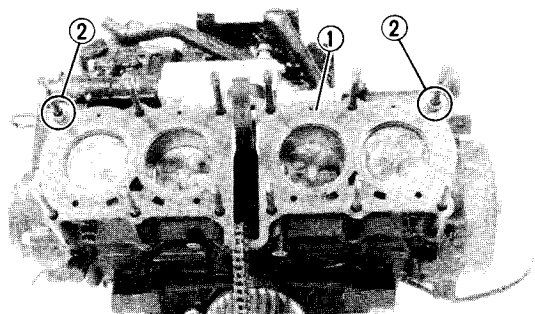


4. Remove:

- 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:

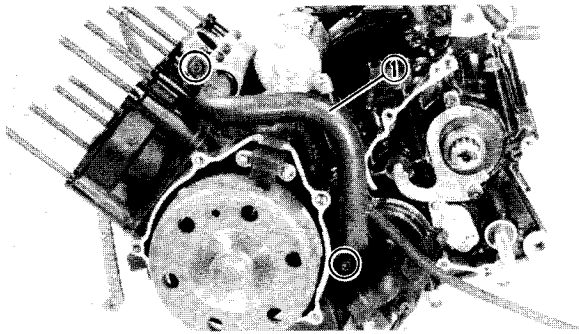
- Gasket (Cylinder head) ①
- Dowel pins ②

CYLINDER AND PISTON

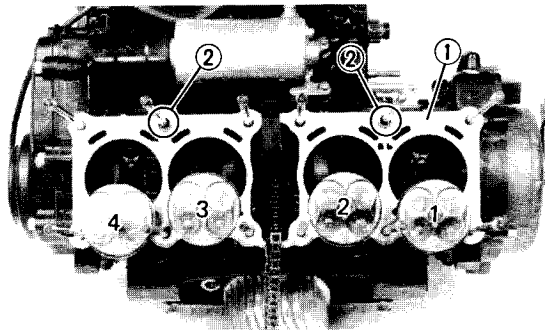
NOTE:

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



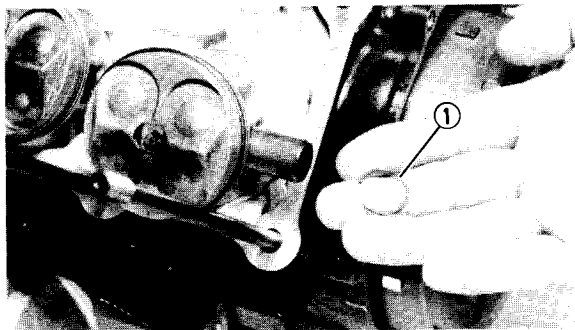
1. Remove:
 - Water pipe ①
 - O-rings
 - Cylinder



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

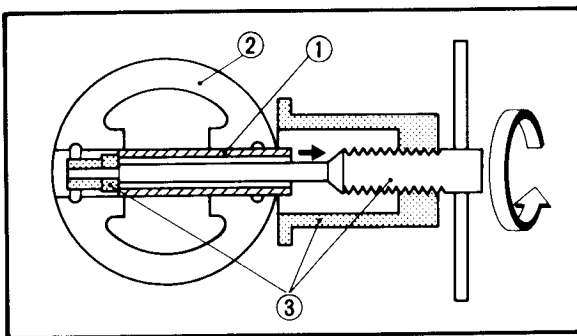
3. Mark:
 - Pistons

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.

	<p>Piston Pin Puller: P/N YU-01304</p>
--	--

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

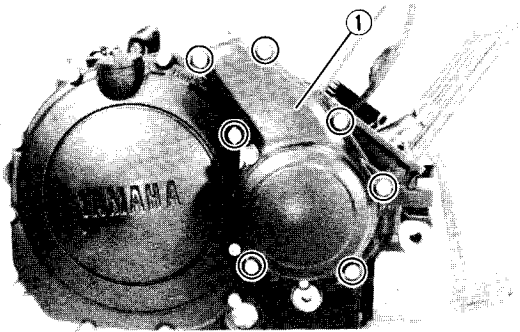


STARTER CLUTCH

NOTE:

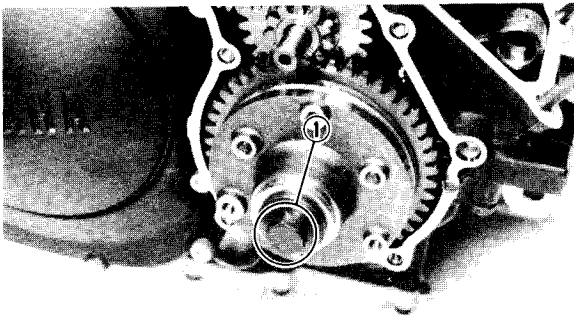
With the engine mounted, the starter clutch can be maintained by removing the following parts.

- Lower cowling (Right)
- Starter clutch cover



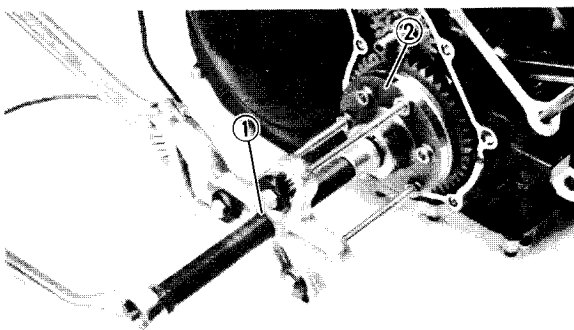
1. Remove:

- Starter clutch cover ①
- Gasket (Starter clutch cover)
- Dowel pins.



2. Remove:

- Bolt (Starter clutch) ①
- Washer



3. Attach:

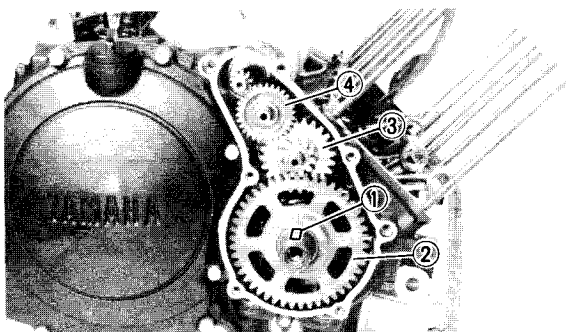
- Heavy Duty Puller ①



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

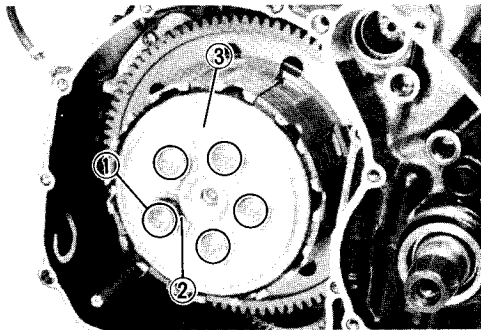
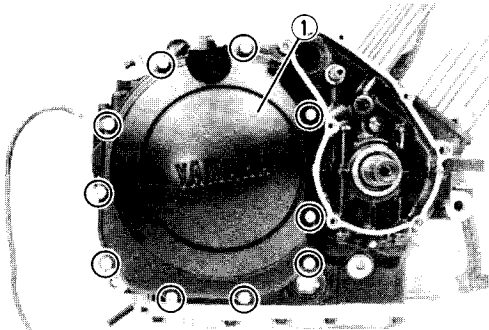


CLUTCH

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:

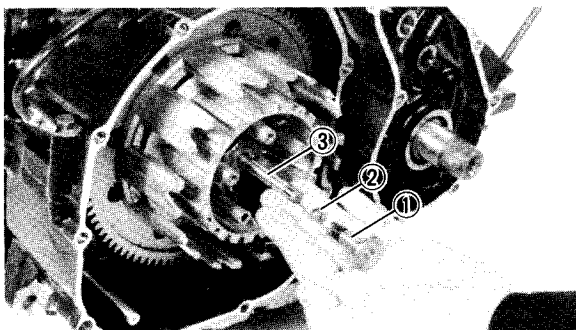
Working in a crisscross pattern, loosen bolts 1/4 turn each. Remove them after all are loosened.

2. Remove:

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

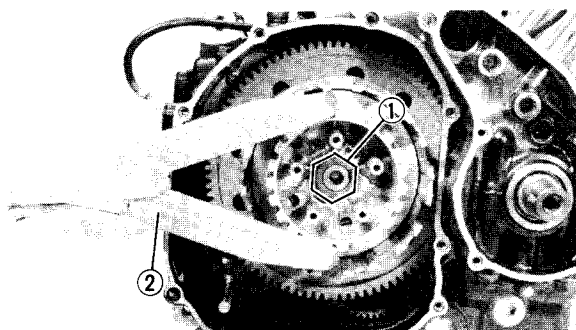
NOTE:

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:

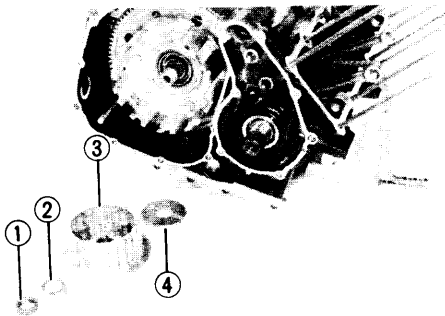
- Nut (Clutch boss) ①
- Use the Universal Clutch Holder ②.



Universal Clutch Holder:
P/N YM-91042

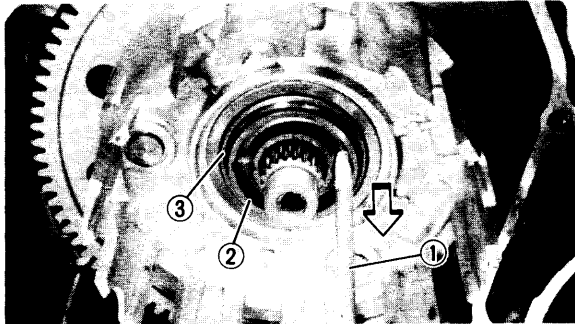
NOTE:

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

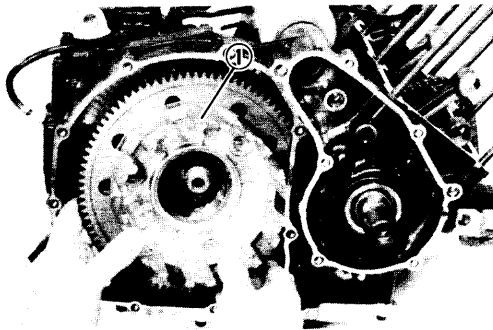


7. Remove:

- 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:

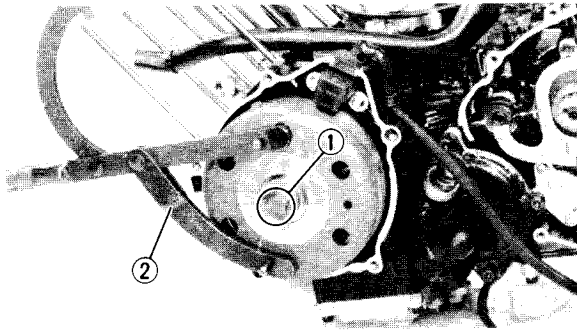
- Thrust washer ①
- Collar ②

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
-

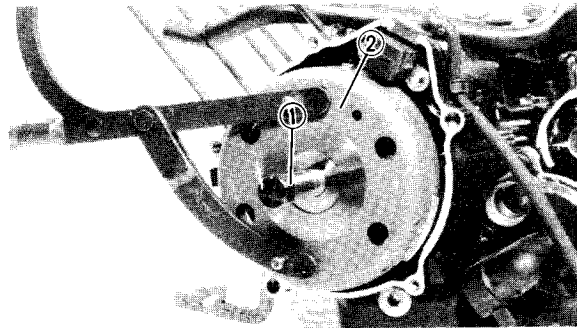


1. Remove:
 - Bolt (Magneto) ①
 - Washer

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



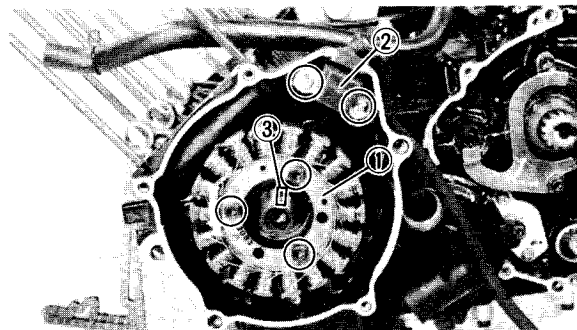
Universal Rotor Holder:
 P/N YU-01235



2. Attach:
 - Rotor puller ①



Rotor Puller:
 P/N YM-01080

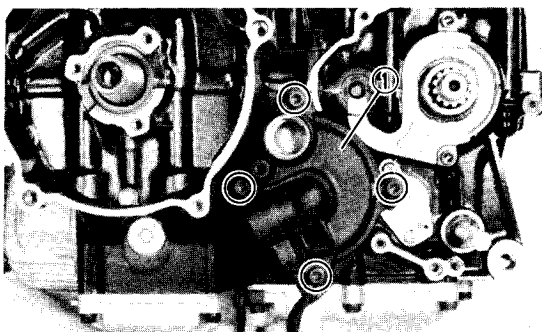


3. Remove:
 - Magneto ②
4. Remove:
 - Starter coil assembly ①
 - Pickup coil ②
 - Woodruff key ③

WATER PUMP

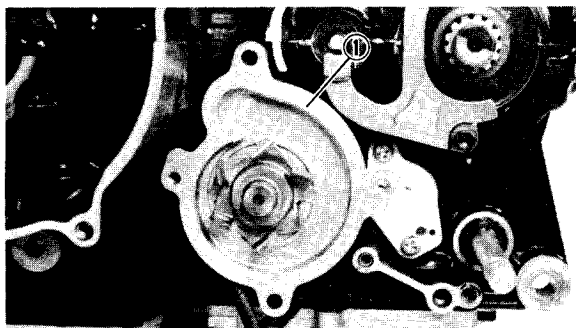
NOTE: _____
 With the engine mounted, the water pump can be maintained by removing the following parts.

- 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:

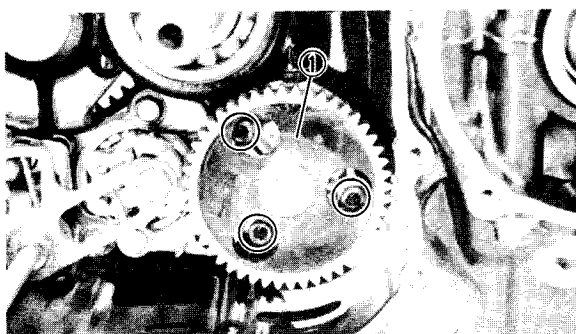
- Water pump housing ①

OIL PUMP AND SHIFT SHAFT

NOTE:

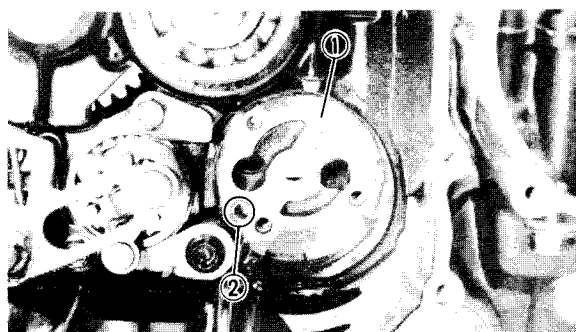
With the engine mounted, the oil pump and shift shaft can be maintained by removing the following parts.

- Lower cowling (Right)
- Crankcase cover (Right)
- Clutch housing



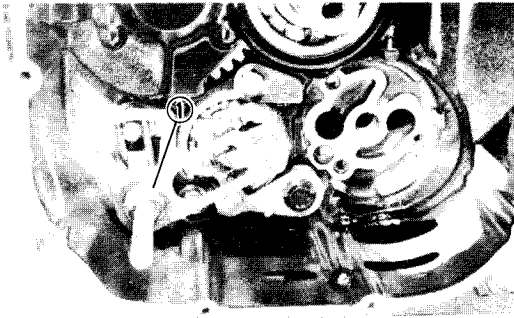
1. Remove:

- Oil pump assembly ①



2. Remove:

- Gasket (Oil pump assembly) ①
- Dowel pin ②



3. Remove:

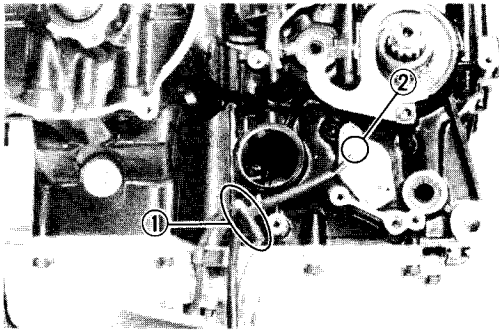
- Shift shaft assembly ①

OIL PAN AND OIL STRAINER

NOTE:

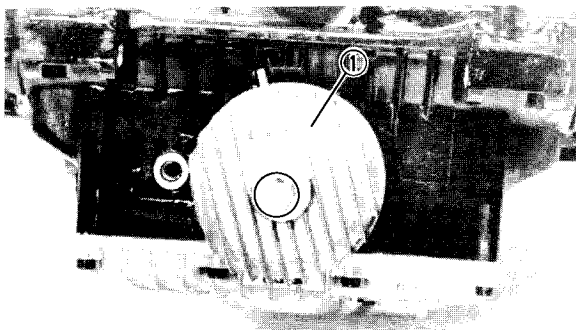
With the engine mounted, the oil pan and oil strainer can be maintained by removing the following parts.

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



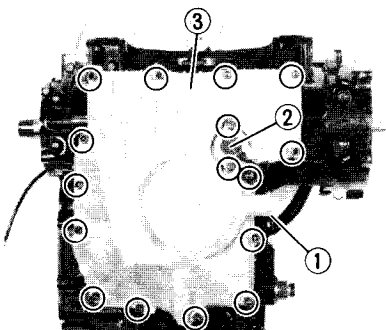
1. Disconnect:

- Oil level switch lead ①
- Neutral switch lead ②



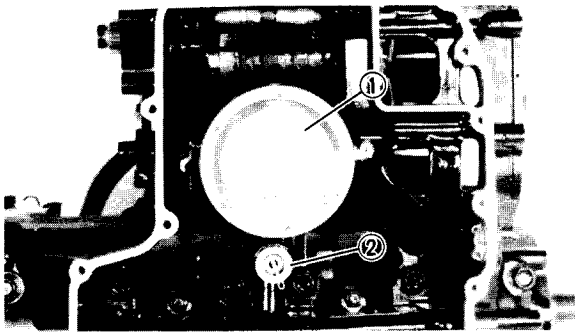
2. Remove:

- Oil filter cover ①
- Oil filter



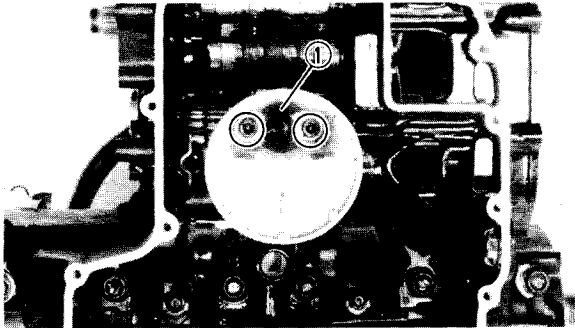
3. Remove:

- 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:

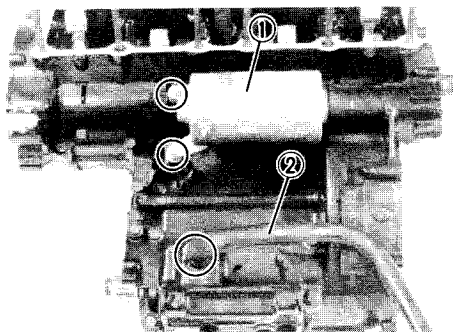
- Oil strainer assembly ①

STARTER MOTOR

NOTE: _____

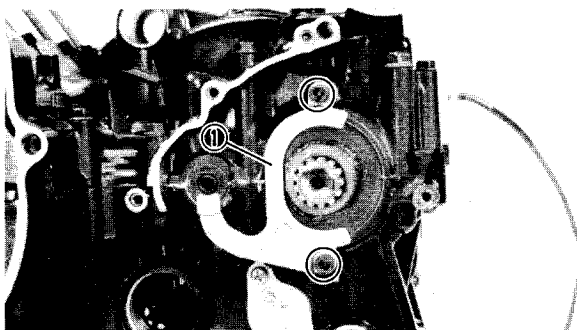
With the engine mounted, the starter motor, can be maintained by removing the following parts.

- Seat
- Top cover
- Fuel tank



1. Remove:

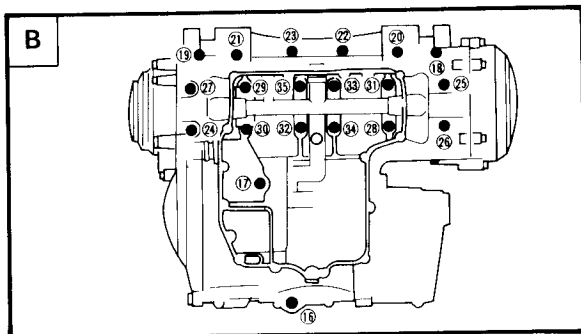
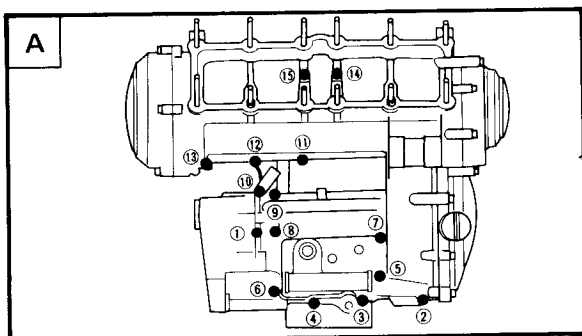
- Starter motor ①
- Crankcase ventilation hose ②



CRANKCASE DISASSEMBLY

1. Remove:

- Oil seal stopper ①



3. Remove:
- Bolts (Crankcase)

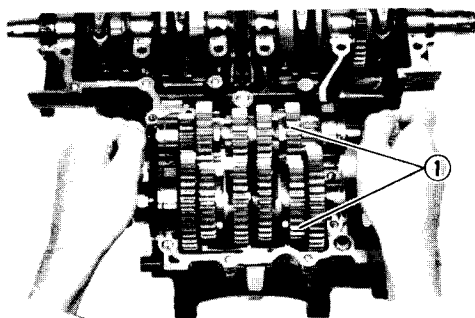
NOTE:

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

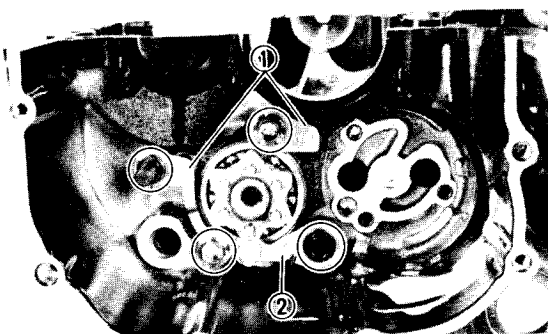
4. Place the engine upside down.
5. Remove:
- Crankcase (Lower)
- Use a soft hammer.

- A** Upper case
B Lower case

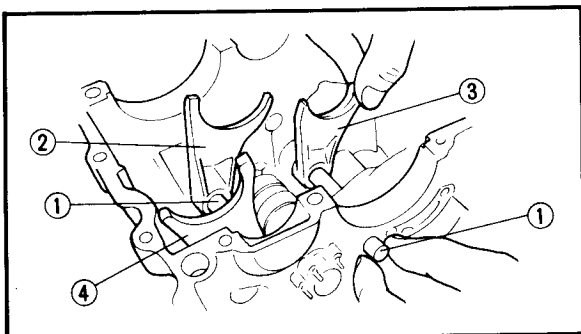
TRANSMISSION, SHIFTER AND SHIFT CAM



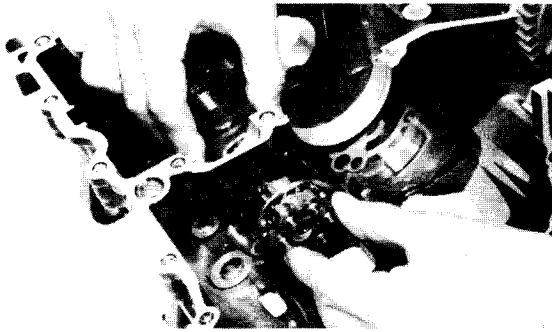
1. Remove:
- Transmission assembly ①
 - Dowel pins



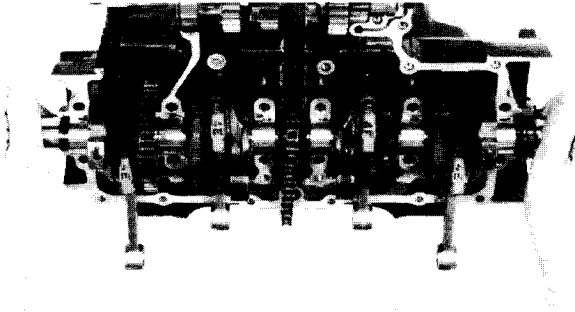
2. Remove:
- Stopper lever ①
 - Stopper plate (Shift cam) ②



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

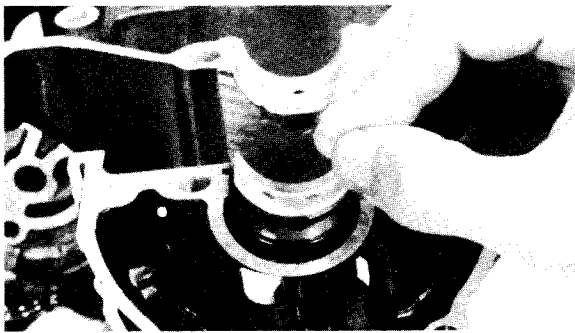


4. Remove:
- Shift cam



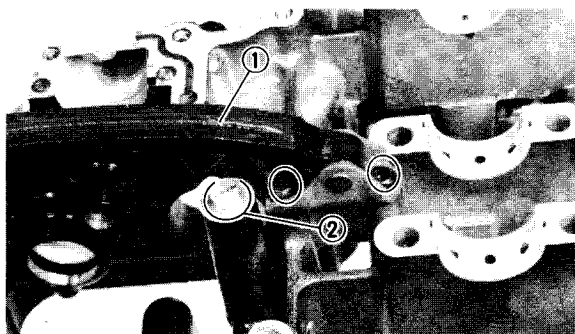
CRANKSHAFT

1. Remove:
- Crankshaft assembly

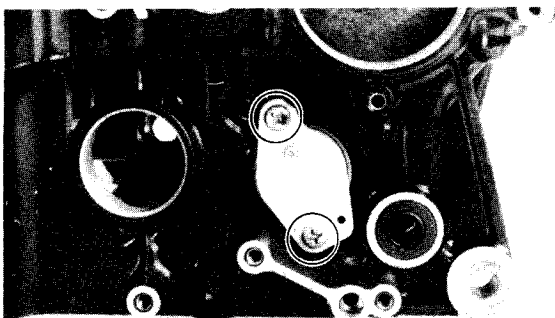


2. Remove:
- Main journal bearing

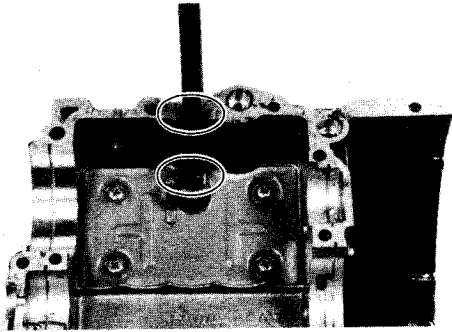
NOTE: _____
Identify each main journal bearing position very carefully so that it can be reinstalled in its original place.



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



4. Remove:
- Neutral switch



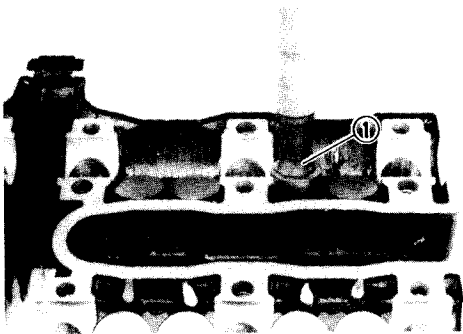
5. Remove:
 - Breather hose
 - Oil baffle plate

VALVE PAD AND VALVE

NOTE: _____

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

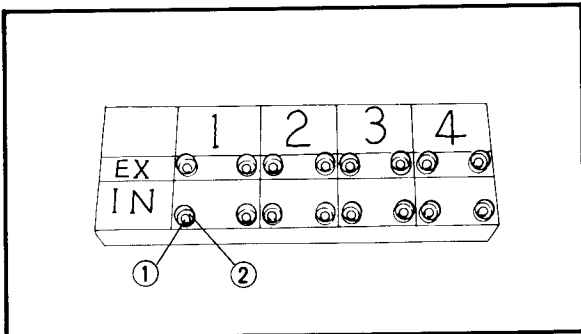
- Lower cowlings (Left and right)
- Center cowlings (Left and right)
- Fuel tank
- Carburetor
- Radiator
- Generator cover
- Cylinder head cover
- Cam chain tensioner
- Cylinder head



1. Remove:
 - Lifters ①
 - Valve pads

NOTE: _____

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



- ① Lifters
- ② Valve pads



2. Check:

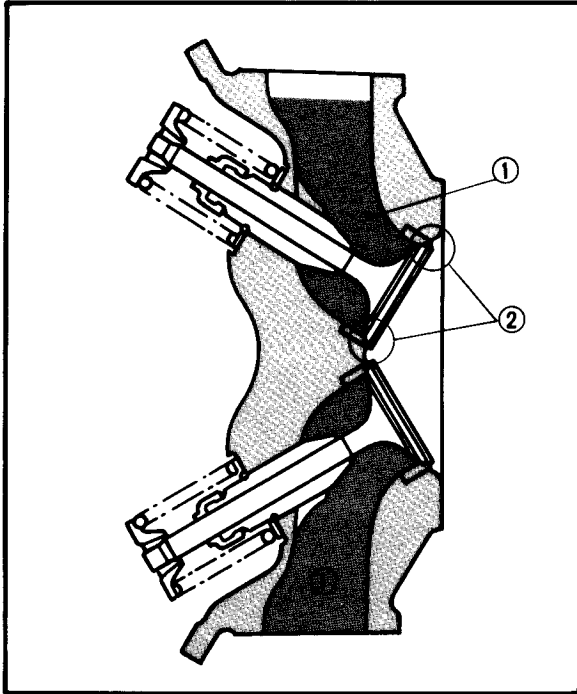
- Valve sealing

Leakage at valve seat → Inspect the valve face, valve seat and valve seat width.

Refer to the "INSPECTION AND REPAIR – VALVE SEAT" section.

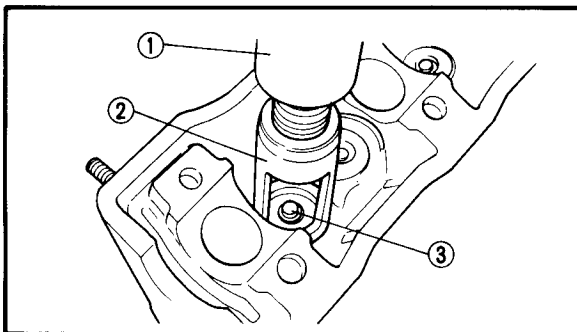
NOTE:

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.



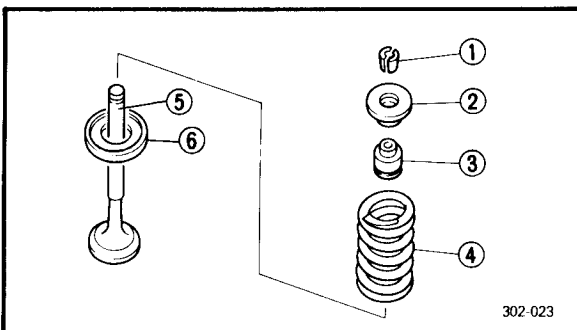
3. Attach:

- 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

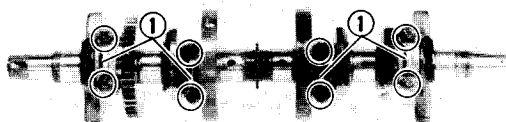
NOTE:

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

**CONNECTING ROD**

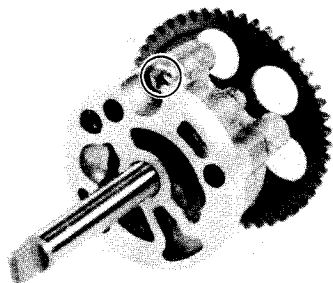
1. Remove:

- Connecting rod ①
- Connecting rod bearing

**INNER ROTOR (OIL PUMP)**

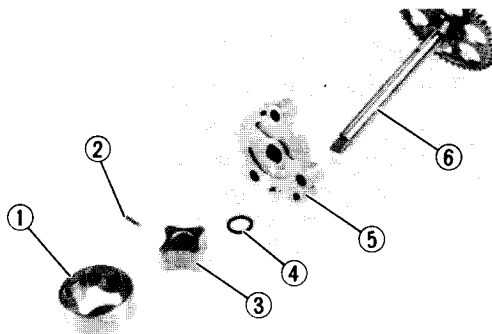
1. Remove:

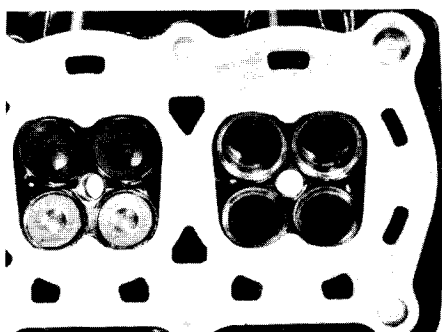
- Pump housing



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:

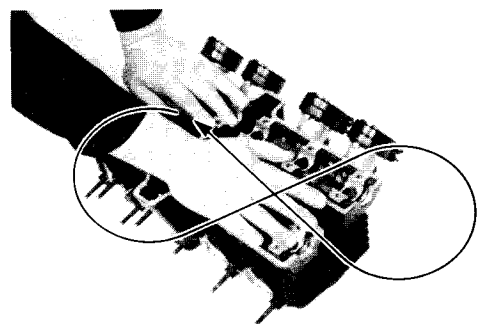
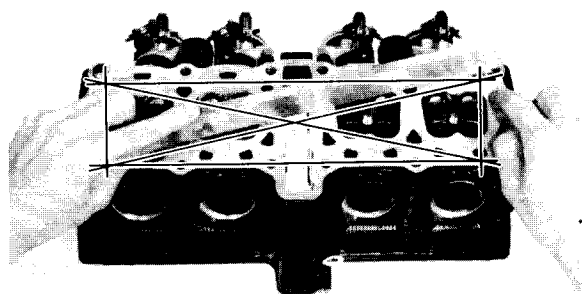
- Spark plug threads
- Valve seat

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:

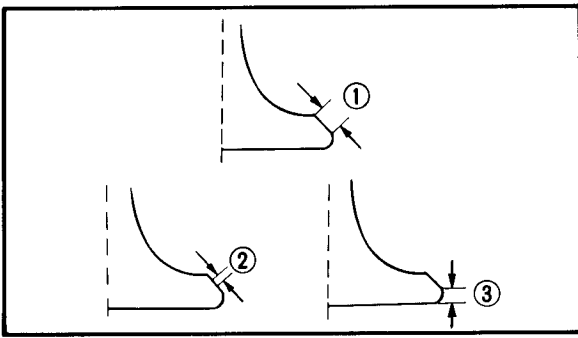
- Cylinder head

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.

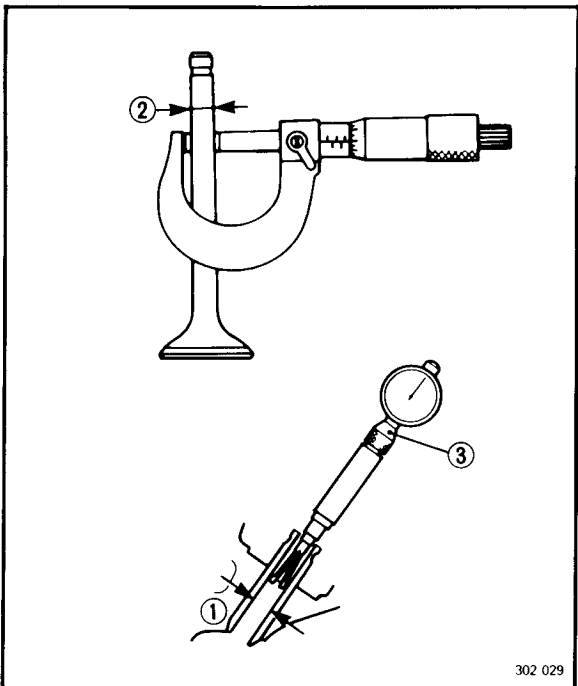


VALVE

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)




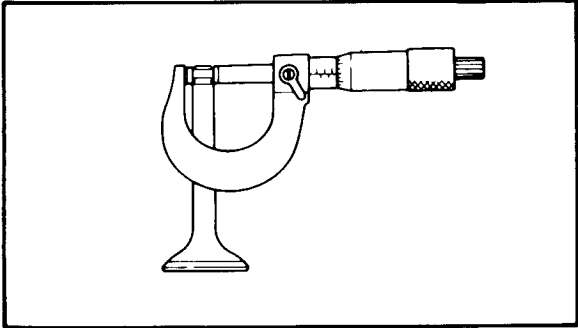
2. Measure:

- Valve stem clearance

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

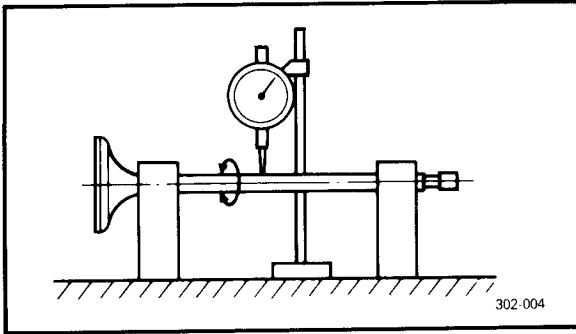
Out of specification → Replace either valve and/or guide.
Use a Micrometer and Bore Gauge ③ .

	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:

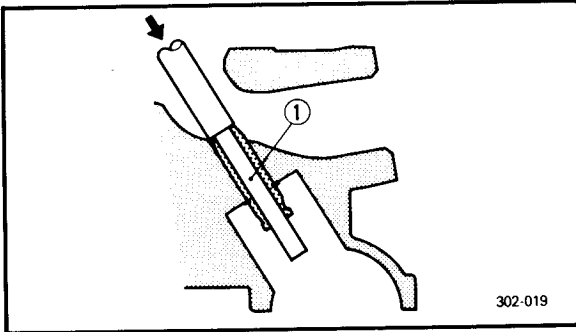
- Always replace the valve guide if the valve is replaced.
- Always replace the oil seal if the valve is removed.

1. Inspect:

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

2. Remove:

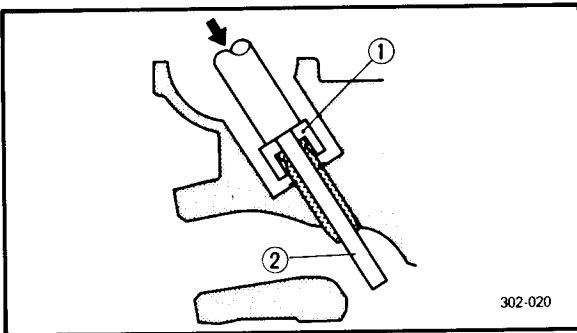
- Valve guide
- Use the Valve Guide Remover ① .



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 .

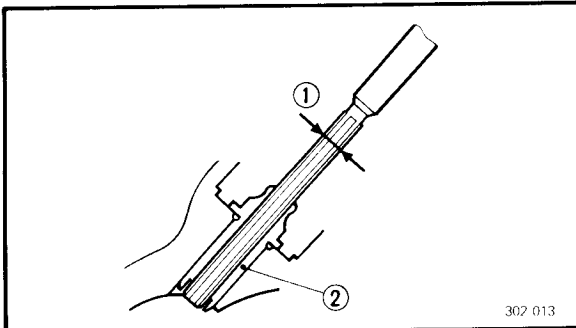


Valve Guide Installer:
P/N YM-04117

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:

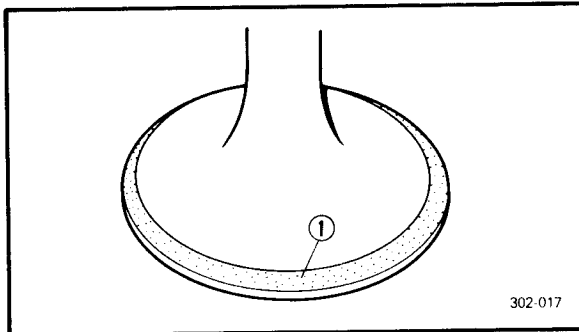
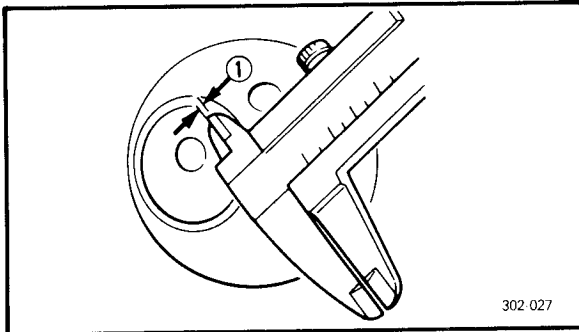
- Valve face
 - Valve seat
- Remove carbon deposit.

2. Inspect:

- Valve seat
- Pitting/Wear → Reface valve seat.

3. Measure:

- Valve seat width ①
- Out of specification → Reface valve seat.



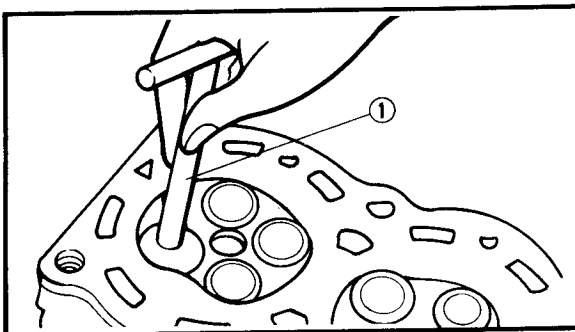
	Valve Seat Width
Intake	0.9 ~ 1.1 mm (0.035 ~ 0.043 in)
Exhaust	0.9 ~ 1.1 mm (0.035 ~ 0.043 in)

Valve seat width measurement steps:

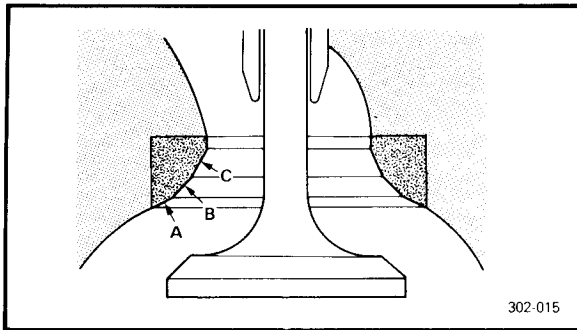
- Apply the Mechanic's bluing dye (Dykem) ① to the valve face.
- Install the valve into the cylinder head.
- Press the valve through the valve guide and onto the valve seat to make a clean pattern.
- Measure the valve seat width. Whether the valve seat and valve face made contact, bluing will have been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

4. Reface:

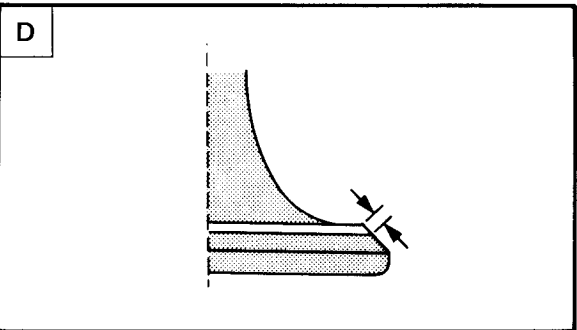
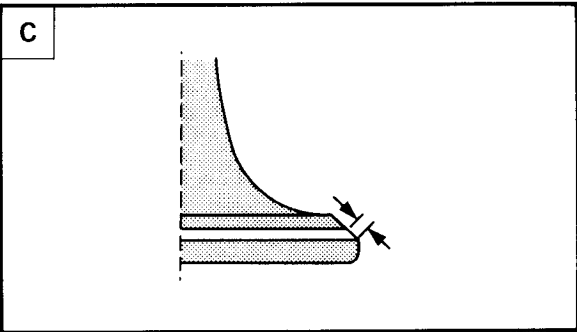
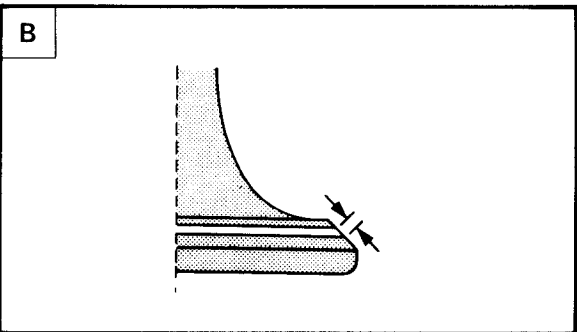
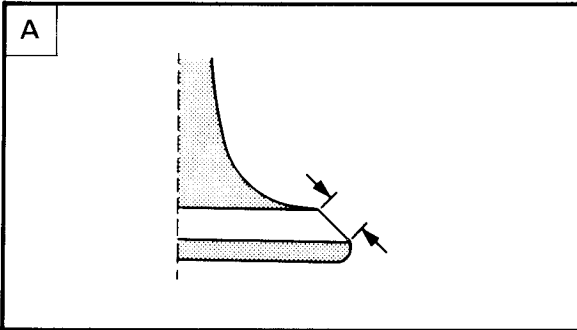
- Valve seat
- Use 20°, 45° and 60° Valve Seat Cutter.



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



302-015



⚠ CAUTION:

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

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

Valve seat refacing steps:

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

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

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

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

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

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

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

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

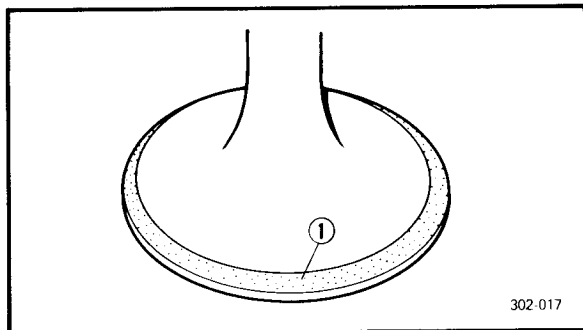


5. Lap:

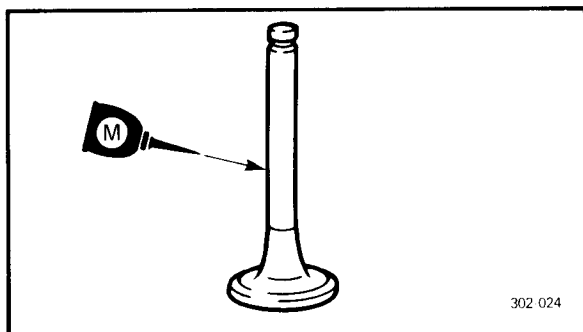
- Valve face
- Valve seat

NOTE: _____

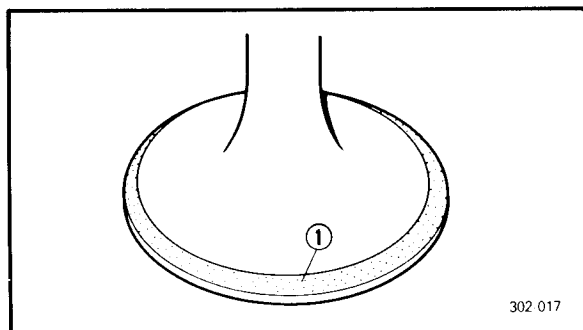
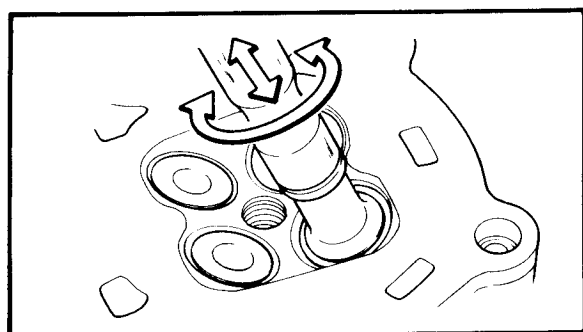
After refacing the valve seat or replacing the valve and valve guide, the valve seat and valve face should be lapped.



302-017



302 024



302 017

Valve lapping steps:

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

CAUTION: _____

Be sure no compound enters the gap between the valve stem and guide.

- Apply a molybdenum 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: _____

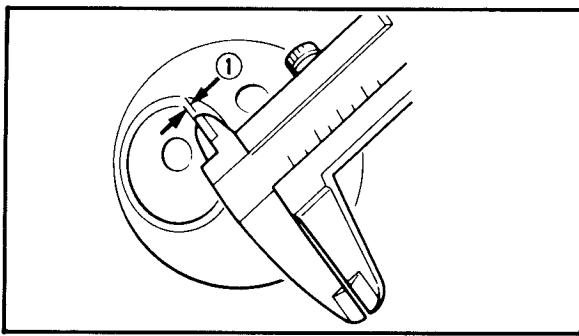
To obtain the best lapping result, lightly tap the valve seat while rotating the valve back and forth between your hand.

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

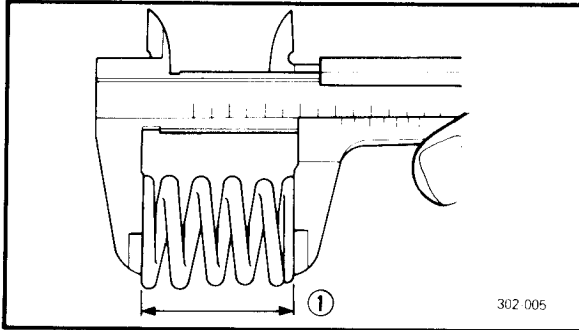
NOTE: _____

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.



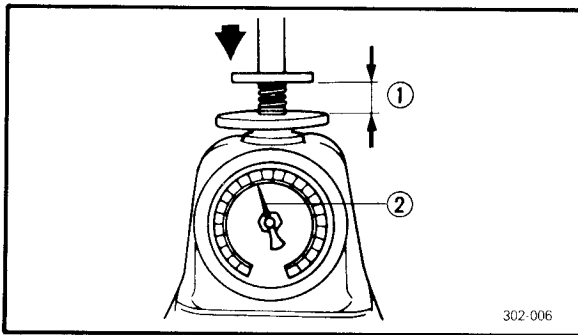
302-005

VALVE SPRING

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



Valve Spring Free Length:
41.94 mm (1.65 in)



302-006

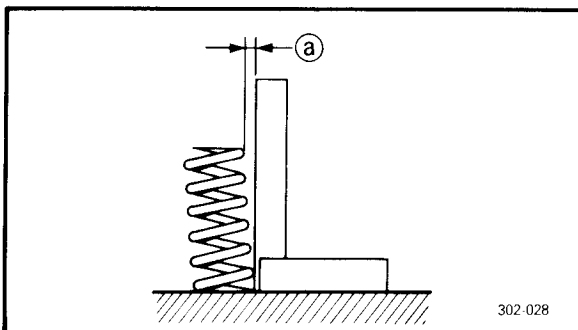
2. Measure:
 - Valve spring installed force ②
 - Out of specification → Replace.

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)

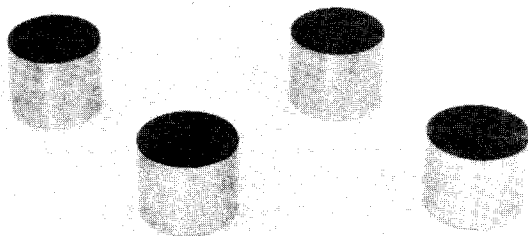


302-028

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



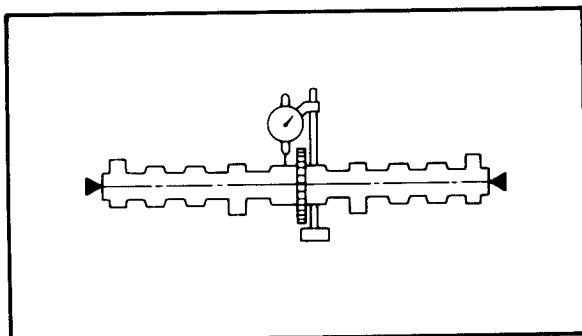
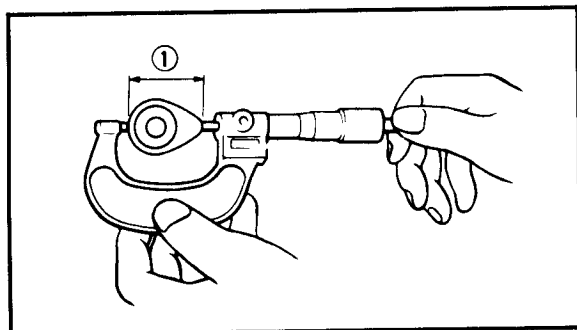
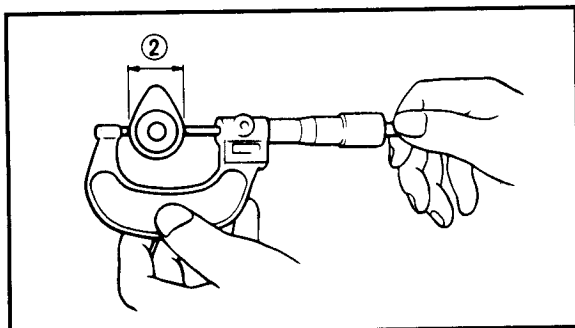
Spring Tilt:
Less than 1.8 mm (0.0709 in)



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:

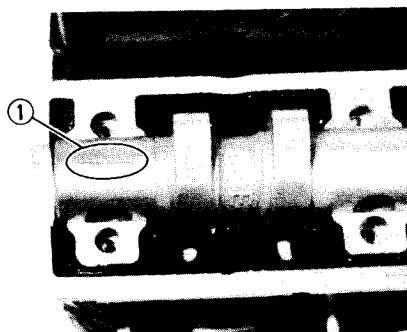
- Cam lobes
Use the Micrometer.
Out of specification → Replace.

	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

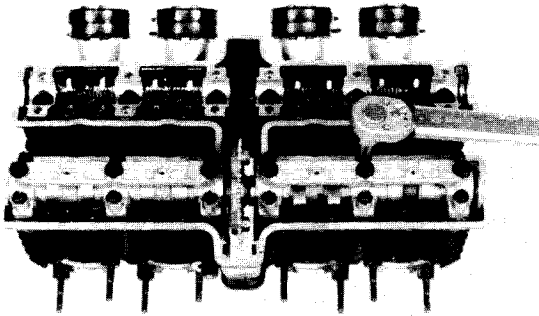
1. Install:

- 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



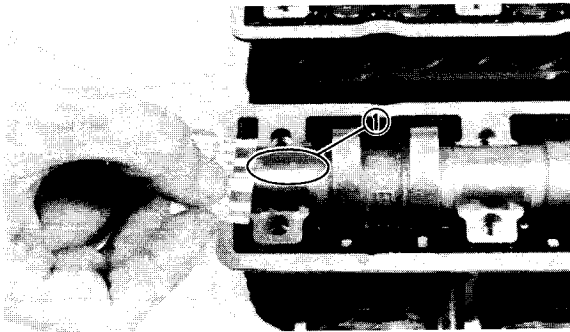
Bolts (Camshaft Cap):
10 Nm (1.0 m·kg, 7.2 ft·lb)

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

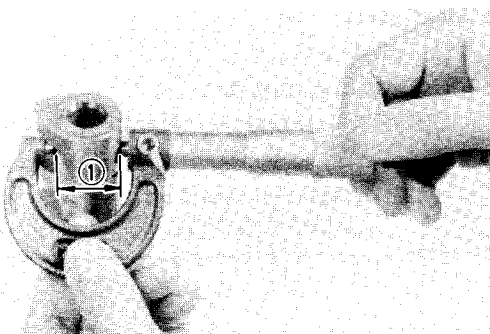


6. Measure:

- 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)

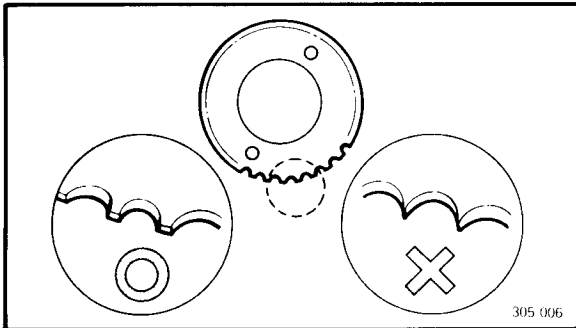


Cam Chain

1. Inspect:

- Cam chain

Chain stretch/Cracks → Replace.



Cam Sprockets

1. Inspect:

- Cam sprockets

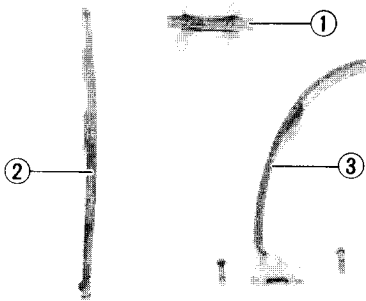
Wear/Damage → Replace.

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:

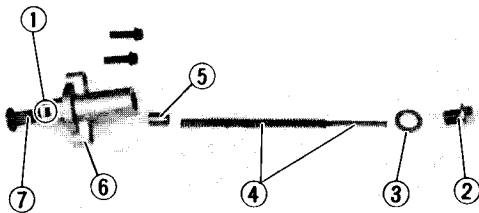
- One-way cam ① operation

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

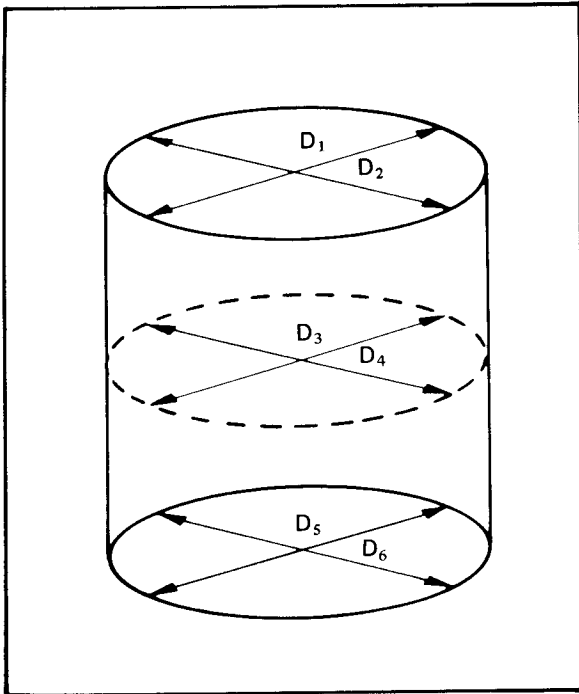
1. Inspect:

- 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 D₁ or D₂) –
(Maximum D₅ or D₆)


R = (Maximum D₁, D₃ or D₅) –
(Minimum D₂, D₄ or D₆)

- 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.

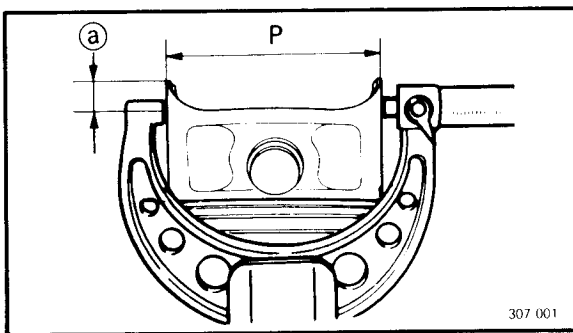
	Piston Size P
Standard	55.945 ~ 55.960 mm (2.2026 ~ 2.2031 in)
Over size 2	56.5 mm (2.22 in)
Over size 4	57.0 mm (2.24 in)

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

3rd step:

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

$$\text{Piston-to-cylinder Clearance} = \text{Cylinder bore "C"} - \text{Piston skirt diameter "P"}$$



307 001



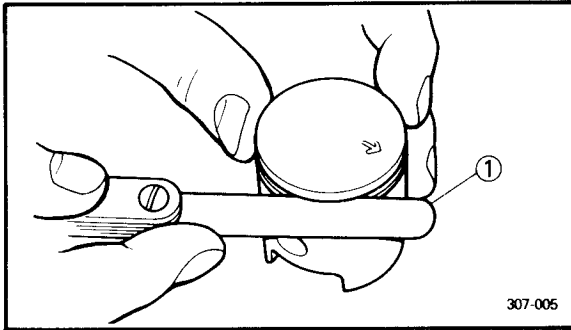
- If out of specification, rebore or replace cylinder, and replace piston and piston rings as a set.



Piston-to-cylinder Clearance:

0.04 ~ 0.06 mm
(0.0016 ~ 0.0024 in)

Limit: 0.15 mm (0.006 in)



307-005

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.

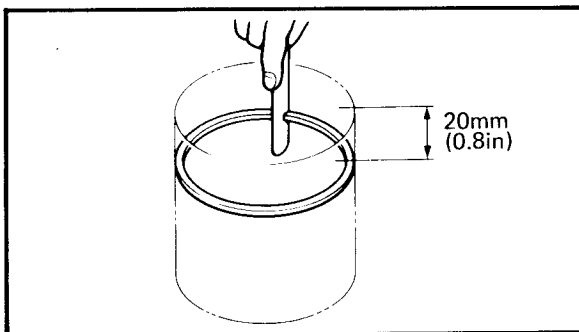
NOTE:

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



Side Clearance:

	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.

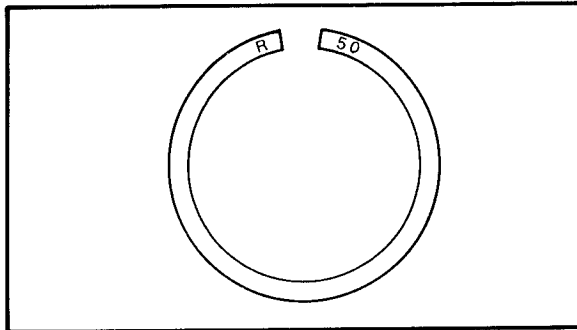
3. Measure:

- End gap

Out of specification → Replace.



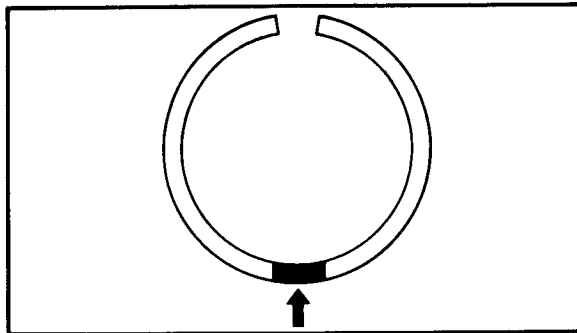
	End Gap (Installed):
	Standard
Top ring	0.15 ~ 0.30 mm (0.0059 ~ 0.0118 in)
2nd ring	0.15 ~ 0.30 mm (0.0059 ~ 0.0118 in)
Oil control (Rails)	0.2 ~ 0.8 mm (0.0079 ~ 0.0315 in)



Piston Ring Oversize

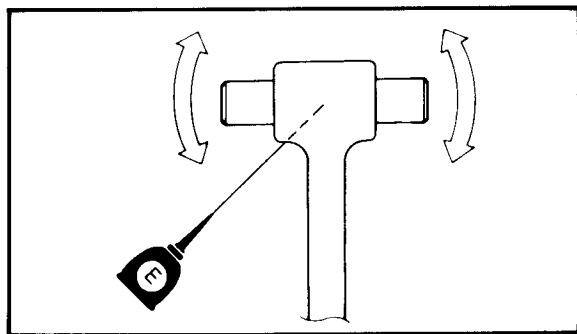
- Top and 2nd piston ring
Oversize top and middle ring size is stamped on the top of ring.

Oversize 2	0.50 mm (0.0197 in)
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- Oil control ring
Expander spacer of bottom ring (oil control ring) is color-coded to identify sizes.

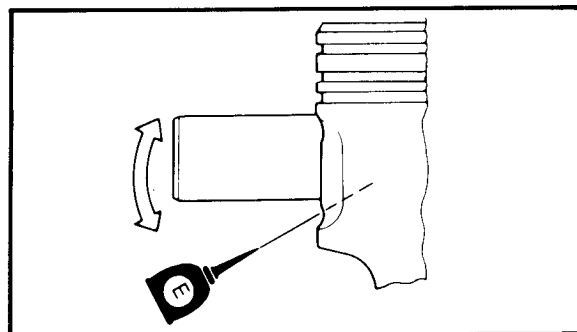
Size	Color
Oversize 2	Red



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.

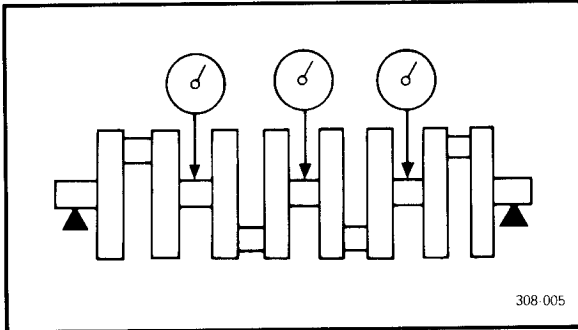


5. Check:

- 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

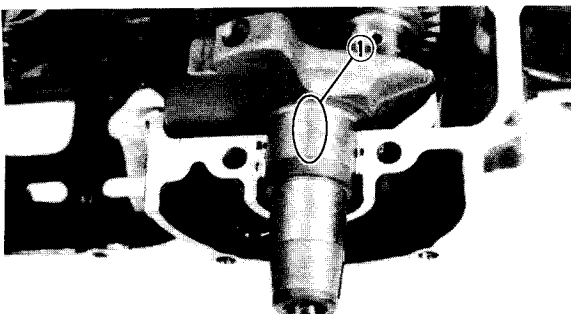
Into the upper crankcase.

- Crankshaft

4. Attach:

- Plastigage® ①

Onto the crankshaft journal surface.



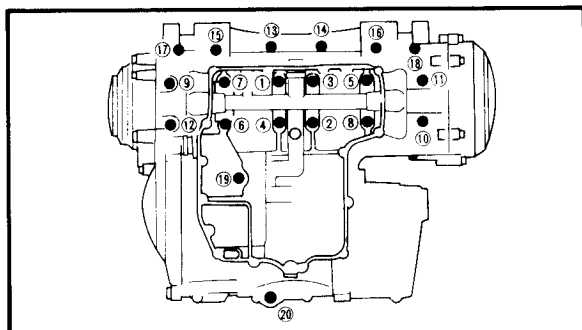
Plastigage® :
P/N YU-33210



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

⚠ CAUTION: _____

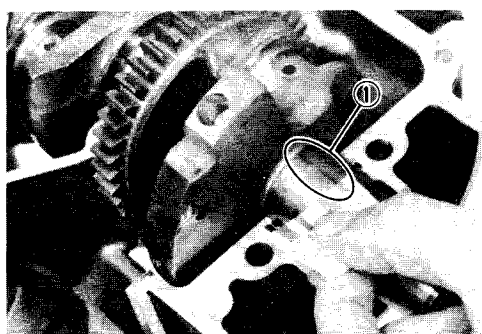
Tighten to full torque in torque sequence cast on the crankcase.



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.



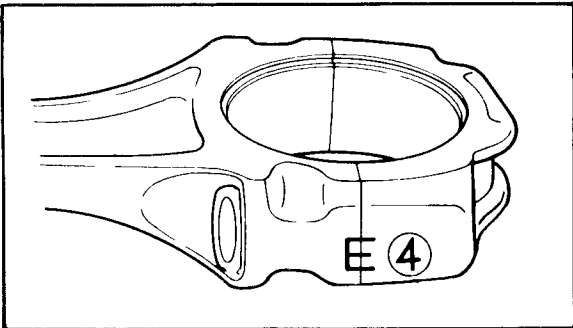
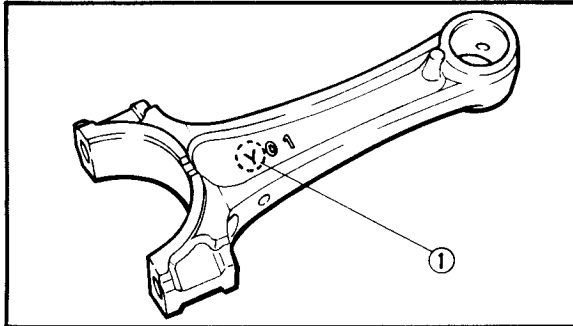
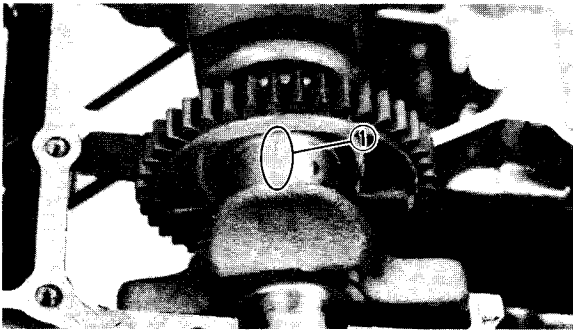
8. Measure:
 - Plastigage width ⑪
Out of specification → Replace the bearings;
replace the crankshaft if necessary.



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:

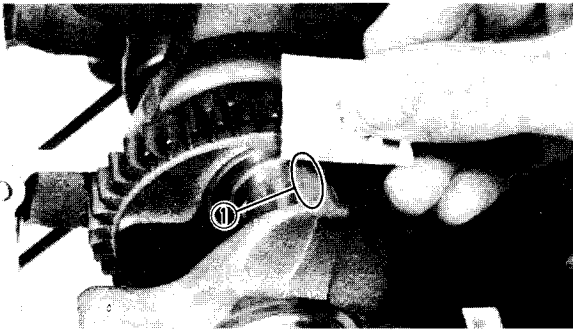
Do not turn the connecting rod until the clearance measurement has been completed.

⚠ 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:

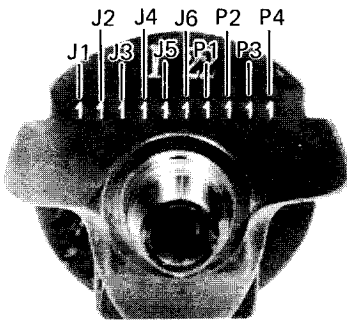
- Connecting rod cap
Use care in removing.

8. Measure:

- Width of Plastigage® ①
Out of specification → Replace the bearings and/or replace the crankshaft if necessary.



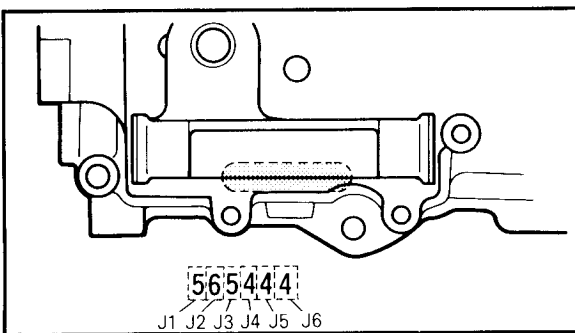
Connecting Rod Oil Clearance:
0.043 ~ 0.0066 mm
(0.0017 ~ 0.0026 in)



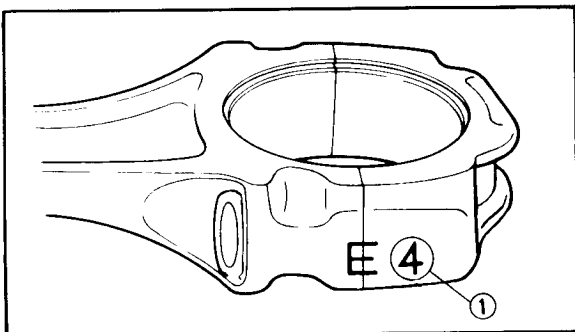
Crankshaft Main Journal and Connecting Rod Bearing Selection

- 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.

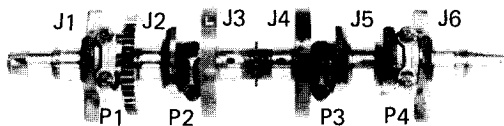


- The numbers are stamped in ink on the rod cap ① .



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)

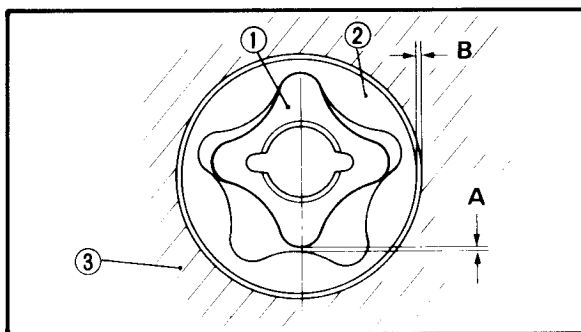
BEARING COLOR CODE	
No. 1	Blue
No. 2	Black
No. 3	Brown
No. 4	Green
No. 5	Yellow

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:

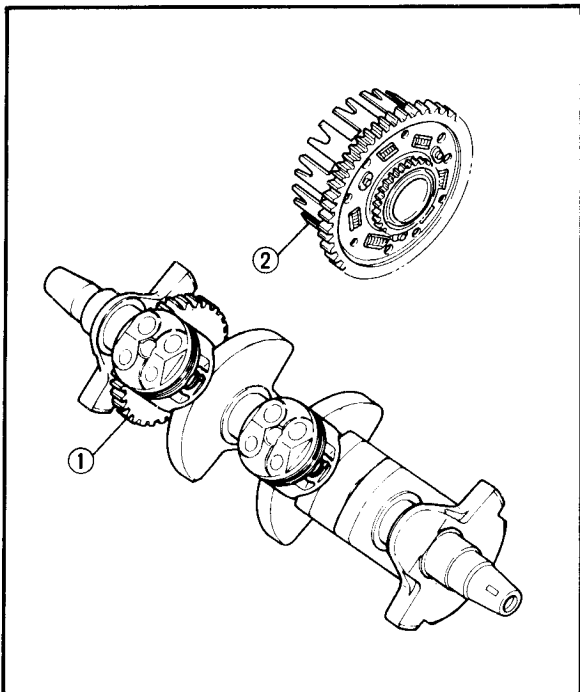
Reverse removal procedure.

NOTE:

Align 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.

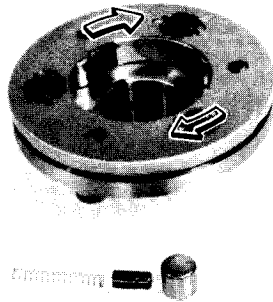
Primary reduction ratio:		
No. of teeth		Ratio
Drive	Driven	
41	89	2.170



STARTER CLUTCH

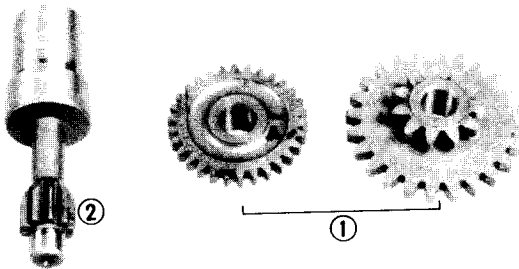
1. Check:

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



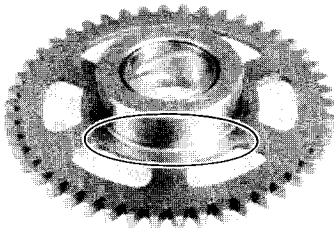
2. Inspect:

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



3. Inspect:

- Contacting surfaces
Pitting/Wear/Damage → Replace.

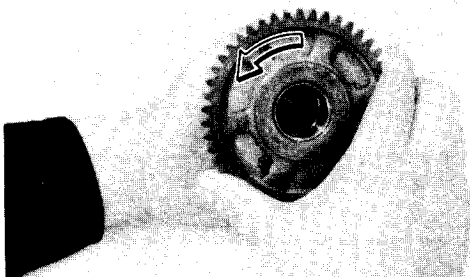
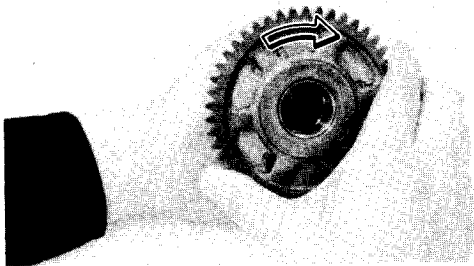


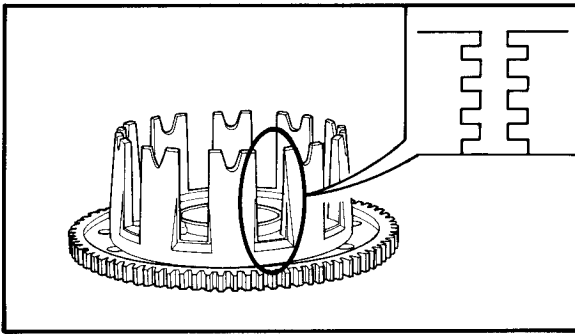
4. Check:

- 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 counter-clockwise, the starter clutch gear should turn freely.
If not, the starter clutch is faulty. Replace it.





CLUTCH

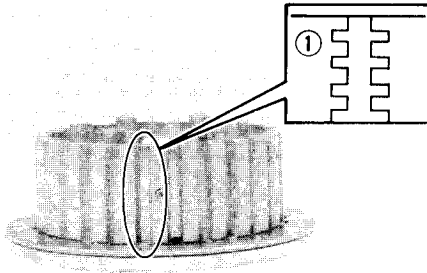
Clutch Housing

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.



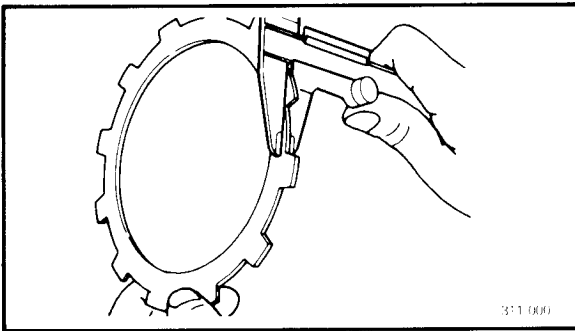
Clutch Boss

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

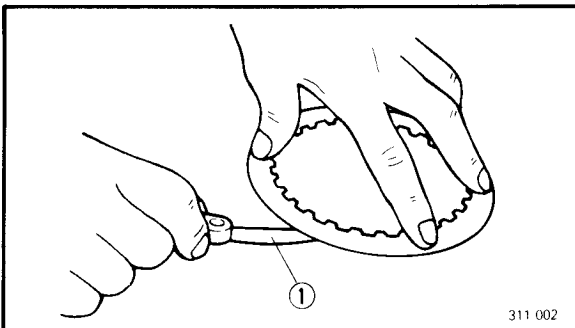
1. Inspect:

- 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.

	<p>Wear Limit: 2.8 mm (0.11 in)</p>
--	--

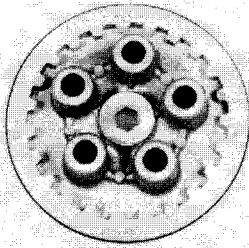


Clutch Plates

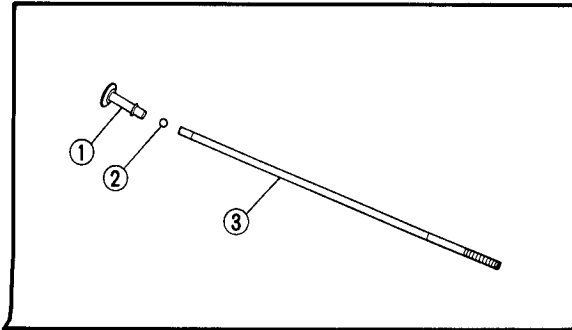
1. Measure:

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

	<p>Warp Limit: 0.1 mm (0.004 in)</p>
--	---

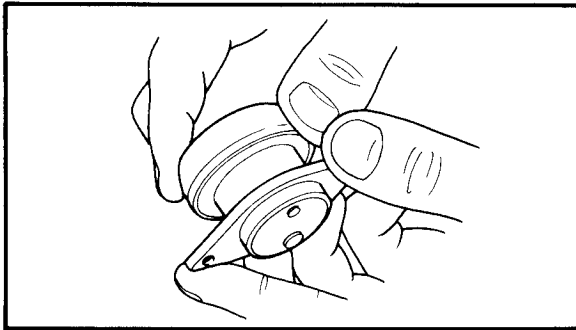


2. Inspect:
- Pressure plate
Damage → Replace.



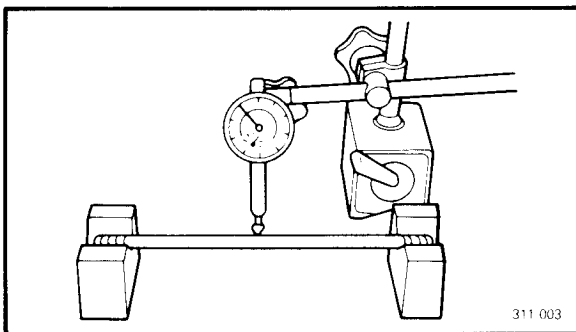
Push Rod

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




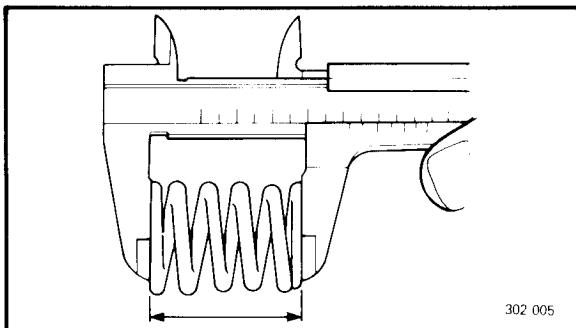
Push Lever Assembly and Bolt Screw Housing

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




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

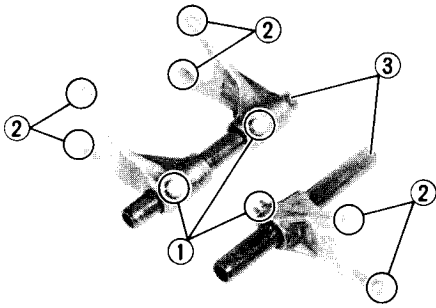
 **Bending Limit:**
0.3 mm (0.012 in)



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.

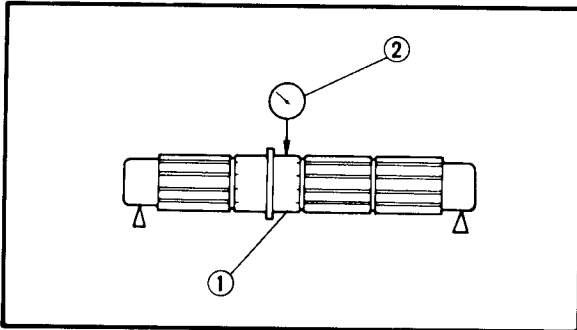
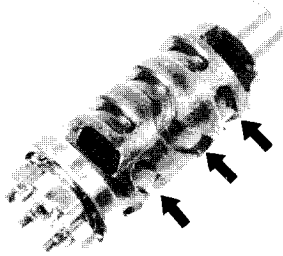
2. Check:

- 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:

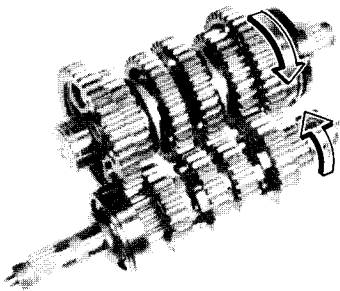
- Gears
- Damage/Wear → Replace.

2. Check:

- Gear movement
- Unsmooth operation → Replace.

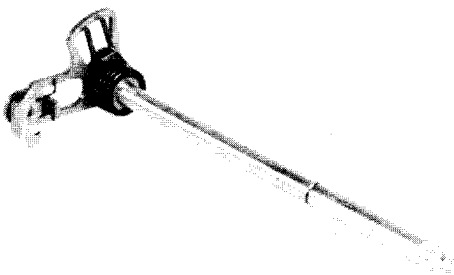
3. Inspect:

- Mating dogs
- Cracks/Wear/Damage → Replace.

**Shift Shaft Assembly**

1. Inspect:

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



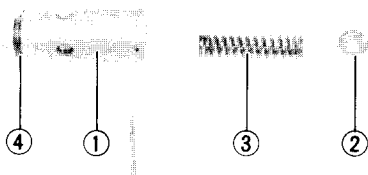


RELIEF VALVE AND PIPE

1. Check:

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

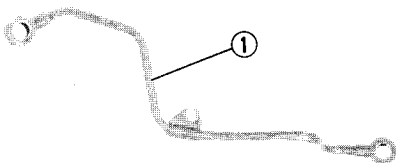
Damage/Wear → Replace.



2. Check:

- Oil pipe ①
- Damage → Replace.

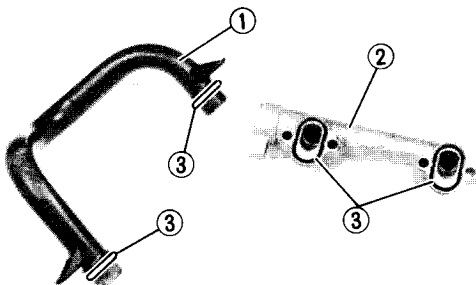
Contamination → Wash and blow out the passage.



3. Check:

- Water pipe ①
- Water jacket joint ②
- O-rings ③

Damage → Replace.

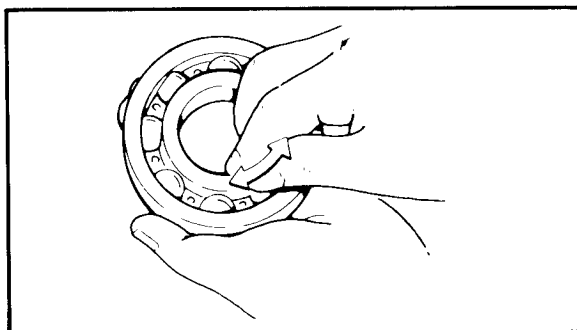


CRANKCASE

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).

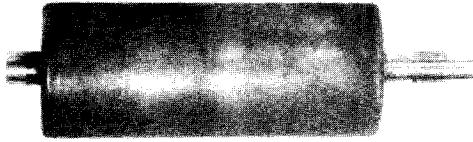
2. Inspect:

- Oil seals

Damage/Wear → Replace the (see Removal).

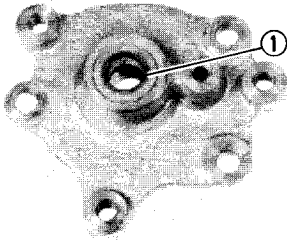


**YAMAHA EXHAUST VARIABLE VALVE
(For California Only)**



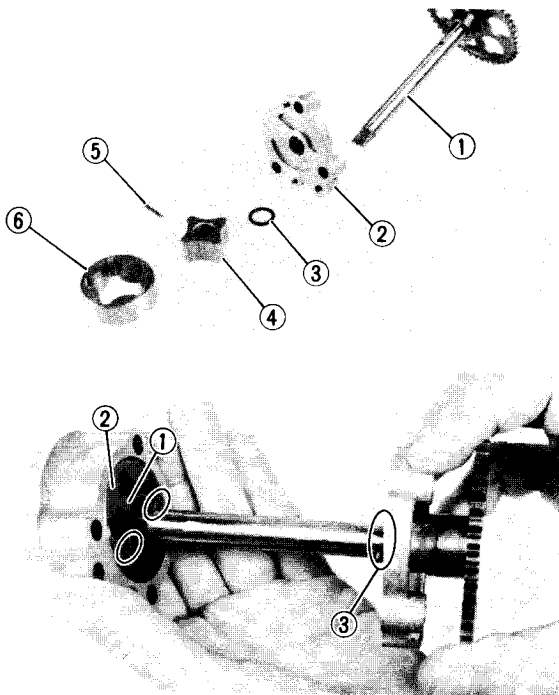
1. Inspect:

- Shaft arm
Wear/Cracks/Damage → Replace.



2. Inspect:

- Bush ①
Wear → Replace.



ENGINE ASSEMBLY AND ADJUSTMENT

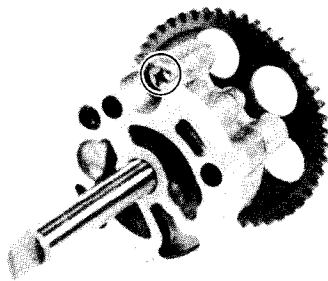
INNER ROTOR (OIL PUMP)

1. Install:

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

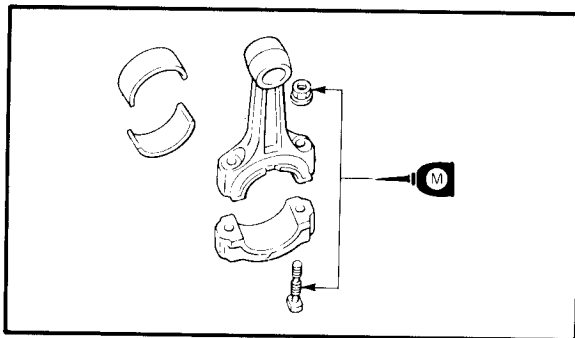
NOTE:

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:

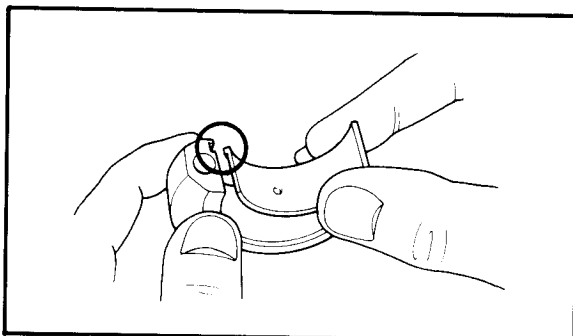
- Crankshaft
- Connecting rods

2. Install:

- Connecting rod bearings
Into the connecting rod and cap.

3. Lubricate:

- Connecting rod bolt threads
- Connecting rod nuts



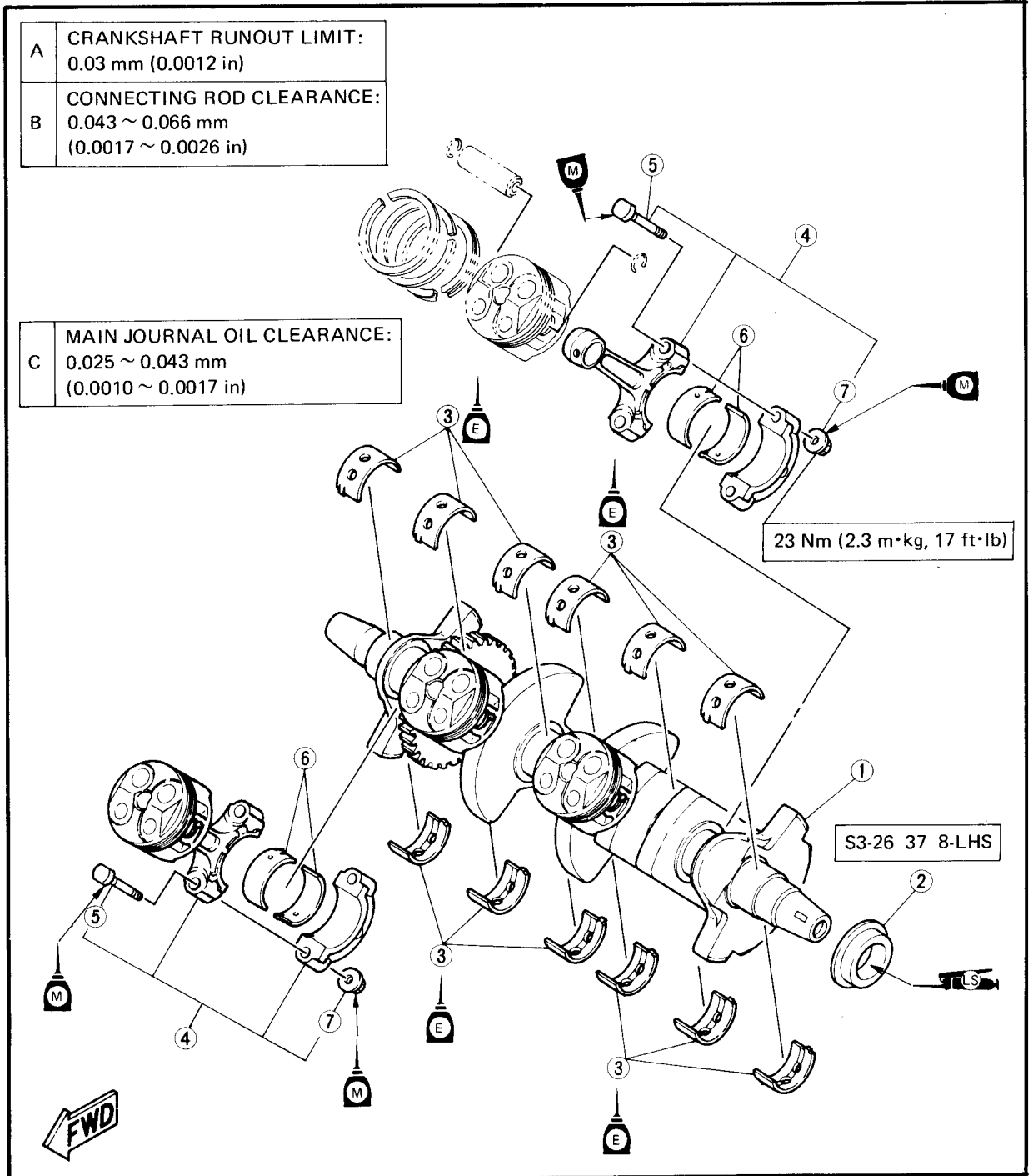
Molybdenum Disulfide Oil

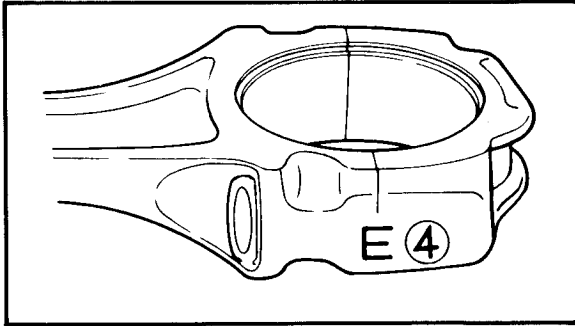
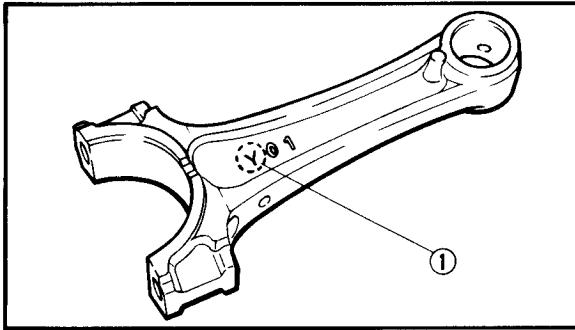
4. Apply engine oil to the crankshaft pins.



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:

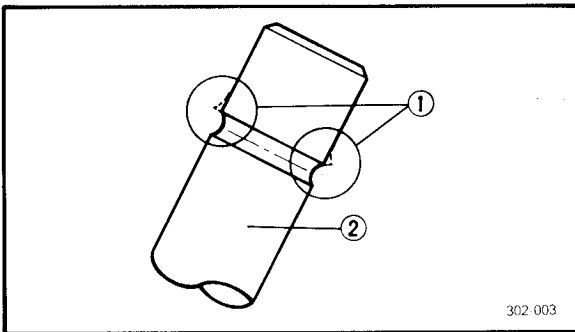
- Connecting rod nuts

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)



302-003

VALVE PAD AND VALVE

NOTE:

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

- ① Deburr
- ② Valve stem

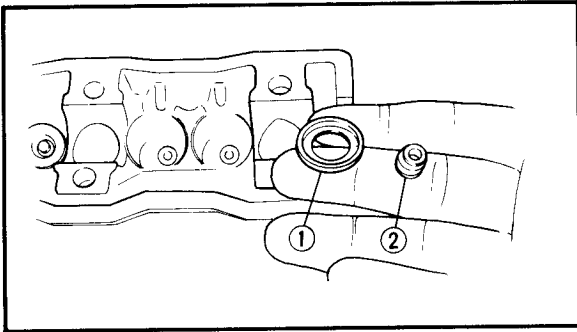
1. Eliminate:

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

NOTE:

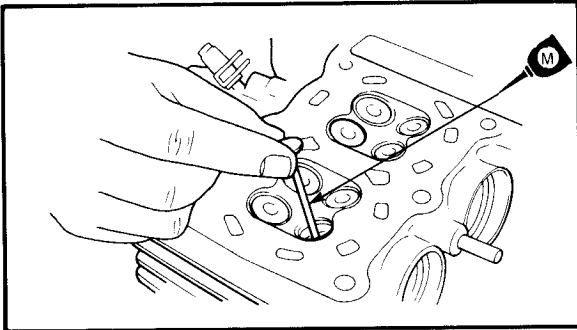
Do not use a sharp instrument and avoid damaging or scratching:

- Spark plug threads
- Valve seat
- Cylinder head



2. Install:

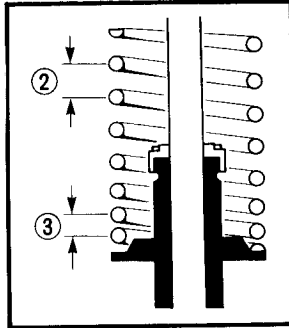
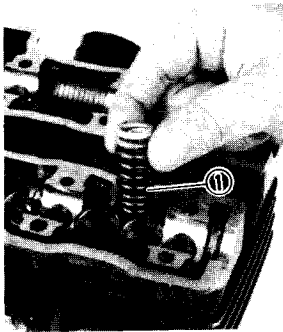
- Valve spring seat ①
- Oil seal ②



3. Install:

- Valve

NOTE: _____
Apply molybdenum disulfide oil.

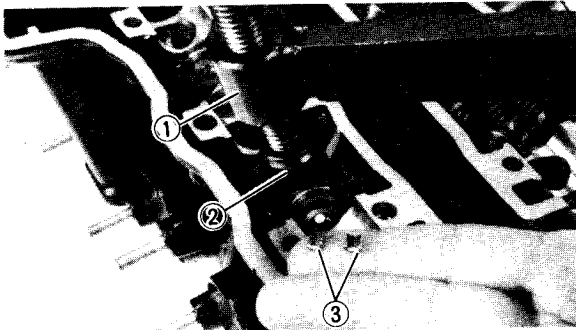


4. Install:

- 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



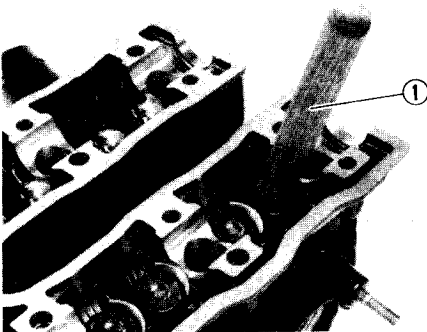
Valve Spring Compressor:
P/N YM-04019
Attachment:
P/N YM-04108

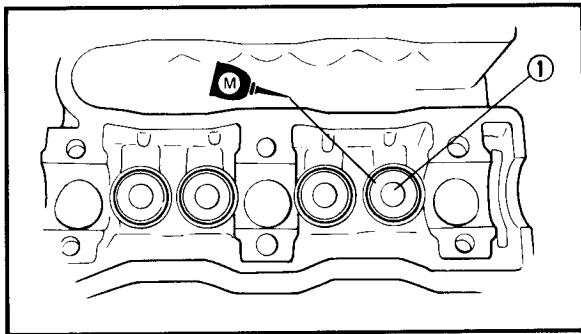
6. Install:

- Valve retainers ③

7. Settle the valve retainer by lightly patting the valve seat with a piece of wood ① in between.

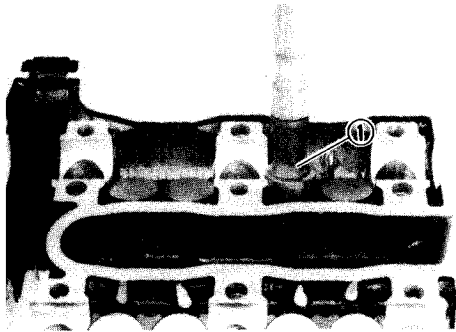
NOTE: _____
Do not hit so much as to damage the valve.





8. Install:
- Valve pads ①

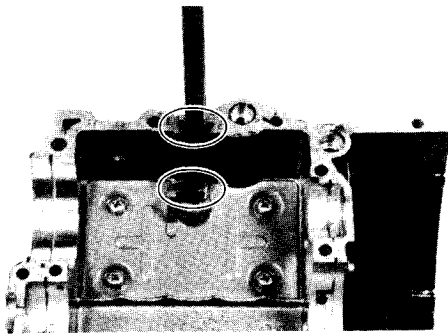
NOTE:
Apply molybdenum disulfide oil.



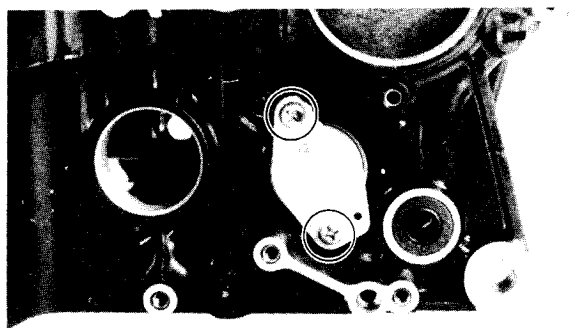
9. Install:
- Lifters ①

CRANKSHAFT

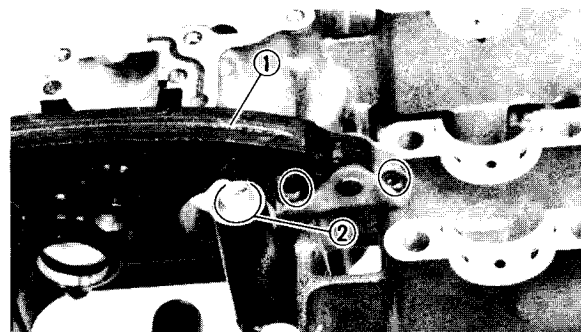
1. Install:
- Oil baffle plate
 - Breather hose



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)

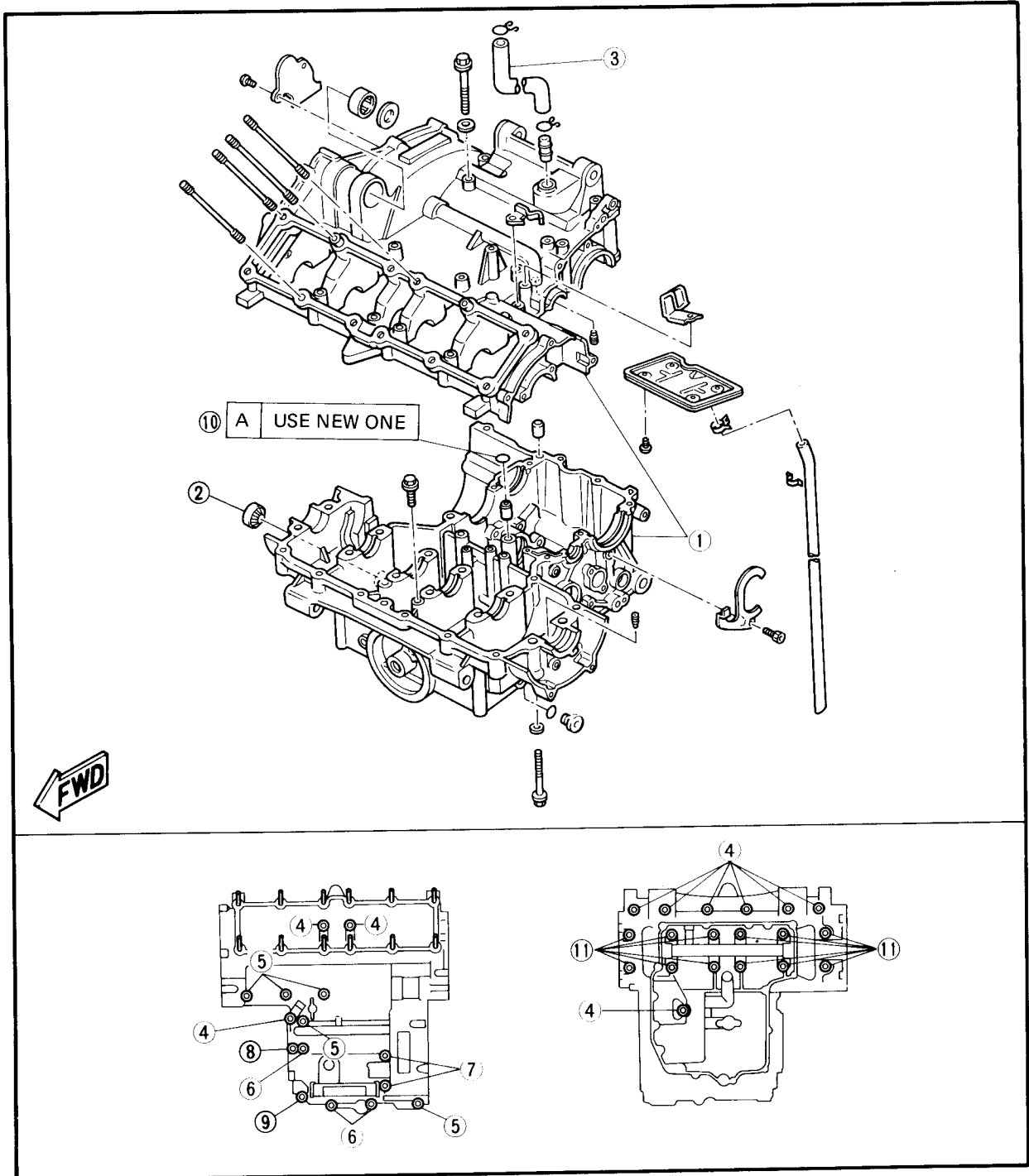


CRANKCASE

- 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

④ ⑤ ⑥ ⑦ ⑧ :
12 Nm (1.2 m·kg, 8.7 ft·lb)

⑨ ⑪ :
24 Nm (2.4 m·kg, 17 ft·lb)

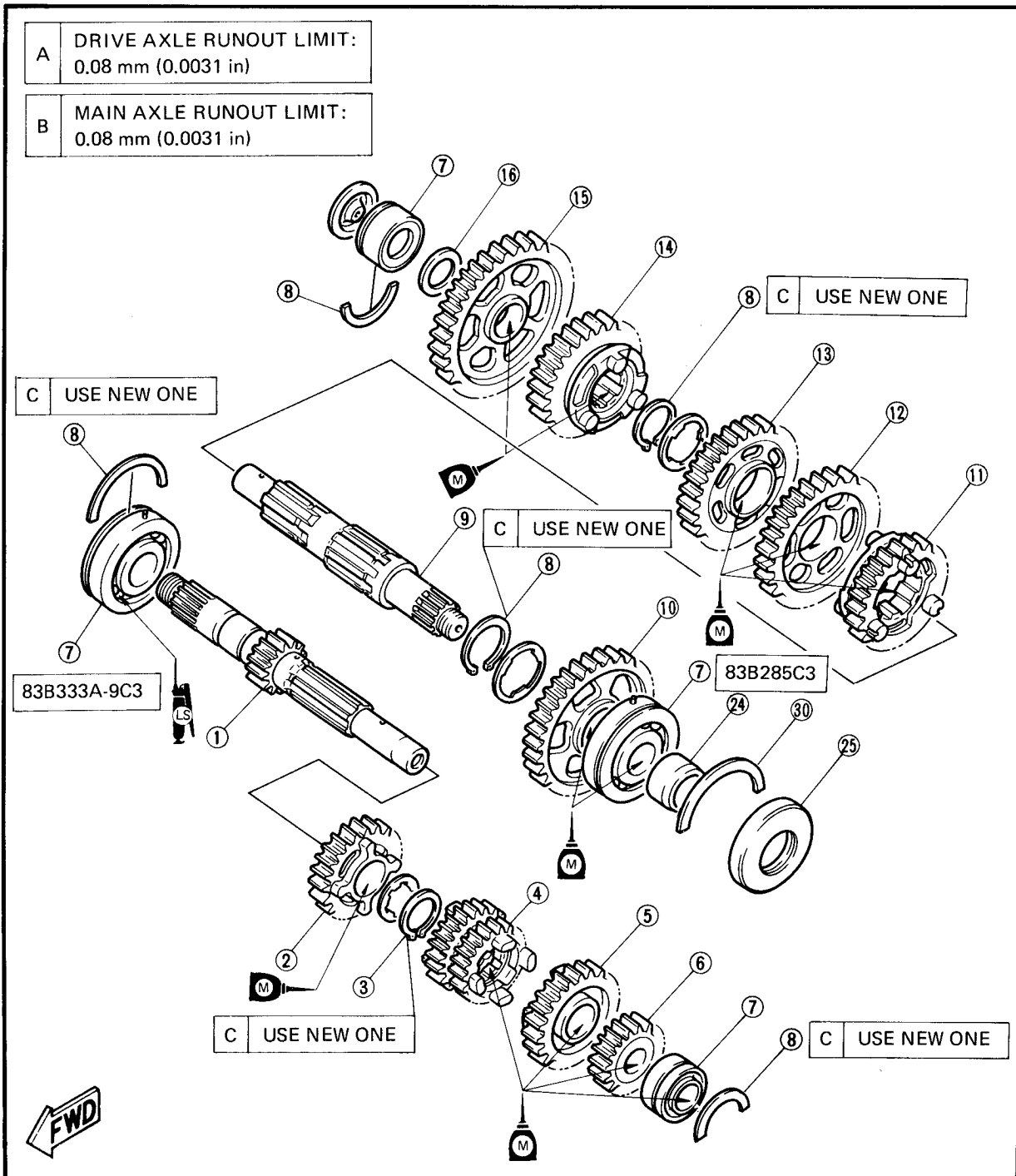


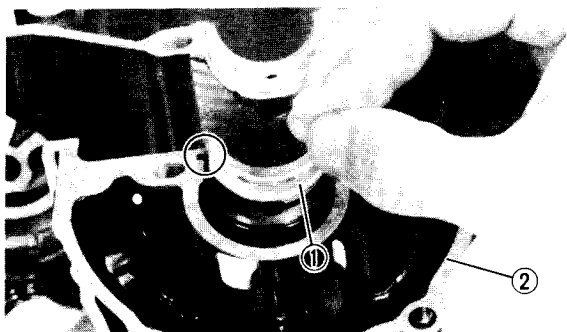
TRANSMISSION

- 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

A DRIVE AXLE RUNOUT LIMIT:
0.08 mm (0.0031 in)

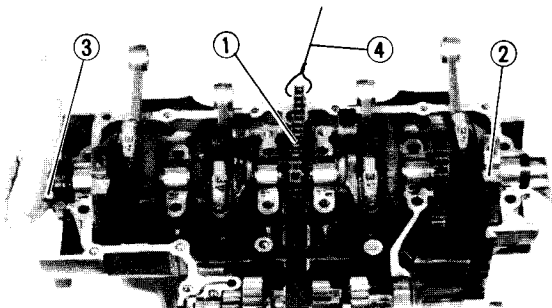
B MAIN AXLE RUNOUT LIMIT:
0.08 mm (0.0031 in)





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

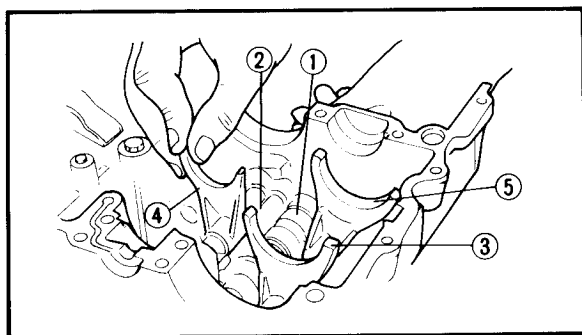
NOTE: _____
Apply molybdenum disulfide oil.



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

NOTE: _____

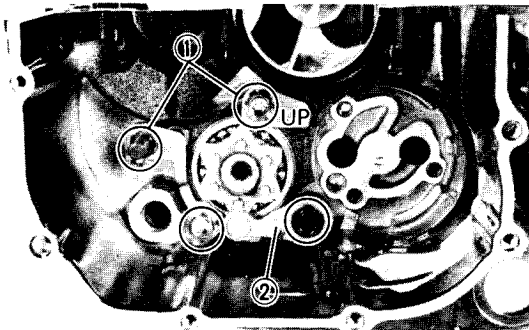
- The stepped crankshaft end ③ should face to the left.
- Pass the cam chain through the cam chain cavity. Be sure to attach a retaining wire ④ to the cam chain.



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.



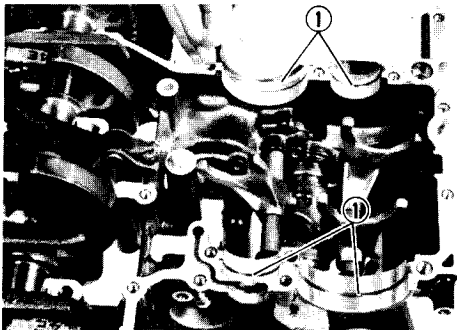
2. Install:

- 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®

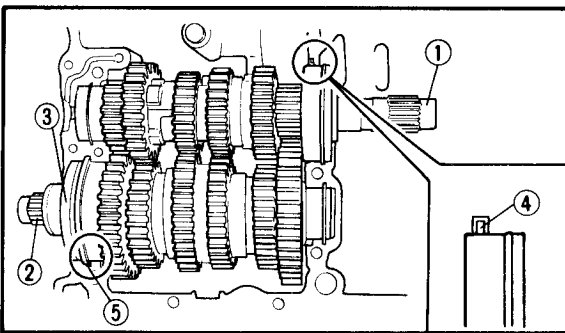


3. Install:

- 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

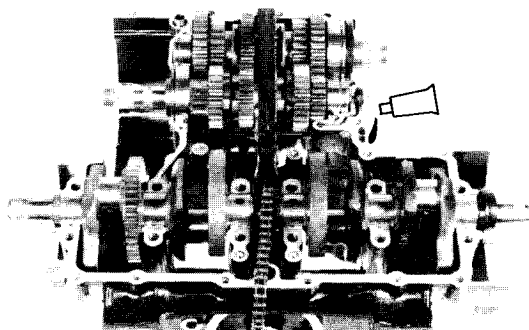
NOTE:

- 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.

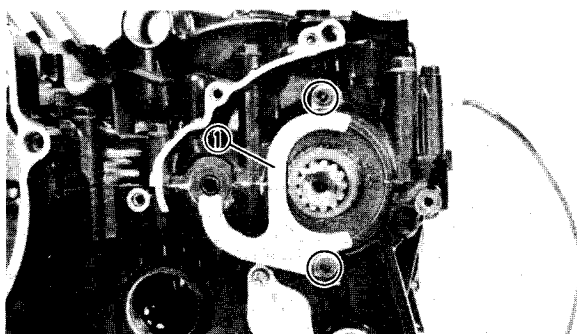
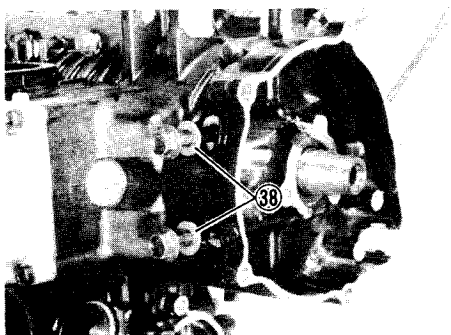
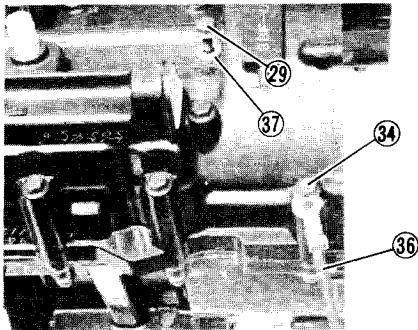
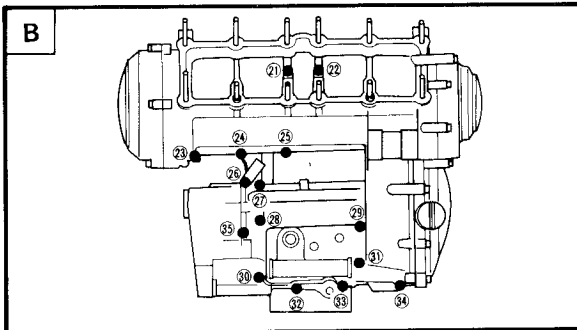
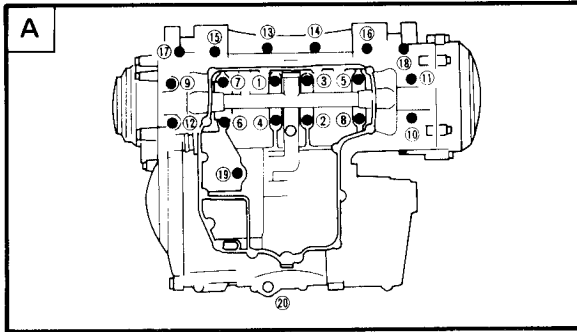
CRANKCASE ASSEMBLY

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 ③① :
24 Nm (2.4 m·kg, 17 ft·lb)
6 mm Bolt ⑬ ~ ⑲ ③② ~ 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:

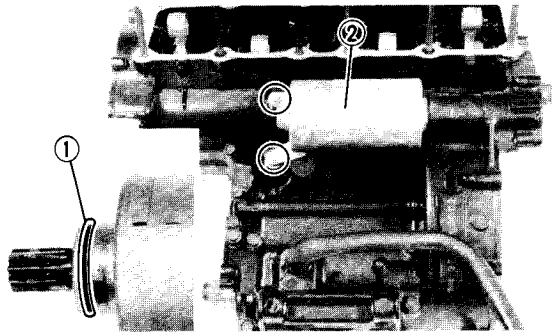
- Install the washer ③⑧ on bolt No. ⑨ , ⑩ , ⑪ , ⑫ .

3. Install:

- Oil seal stopper ①




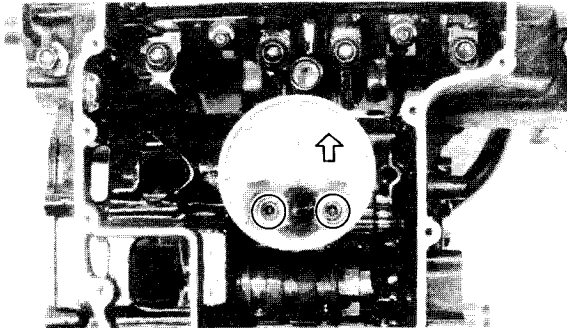
Bolts (Oil Seal Stopper):
10 Nm (1.0 m·kg, 7.2 ft·lb)



STARTER MOTOR


1. Check:
 - O-ring (Starter motor) ①
Damage → Replace.
2. Install:
 - Starter motor ②

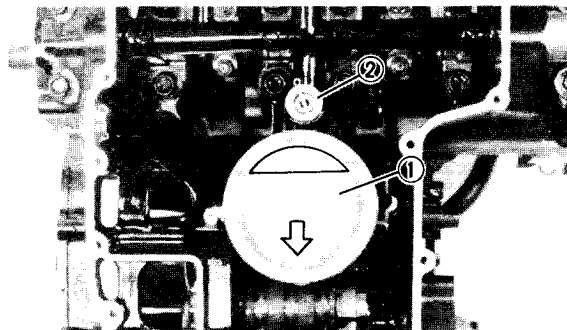
 **Bolt (Starter Motor):**
10 Nm (1.0 m·kg, 7.2 ft·lb)



OIL PAN AND OIL STRAINER

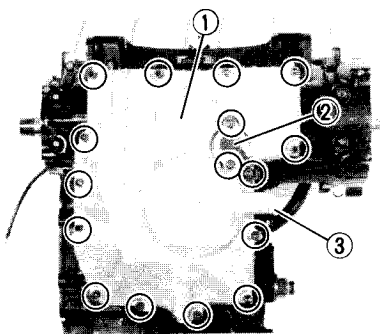
1. Install:
 - Oil strainer assembly

 **Bolts (Oil Strainer Assembly):**
10 Nm (1.0 m·kg, 7.2 ft·lb)




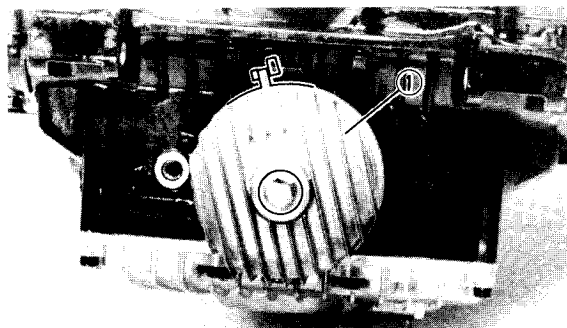
2. Install:
 - Oil strainer cover ①
 - Relief valve ②

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

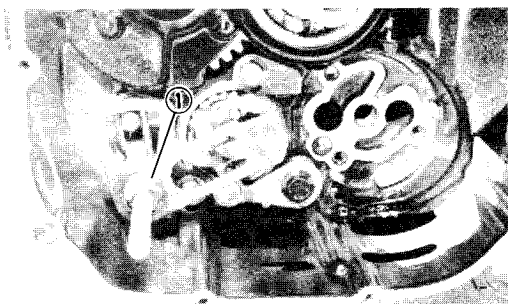
 **Bolts (Oil Pan):**
10 Nm (1.0 m·kg, 7.2 ft·lb)



4. Install:
 - Oil filter
 - Oil filter cover ①

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

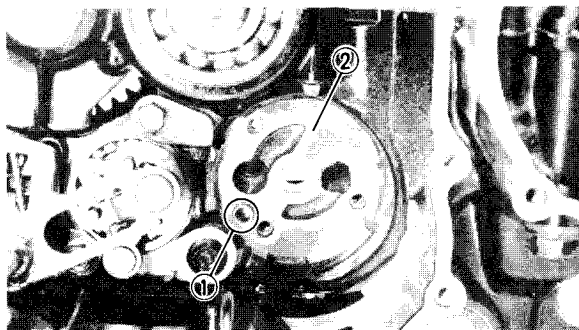
Refer to the "ENGINE OIL FILTER REPLACEMENT" section in the CHAPTER 3.



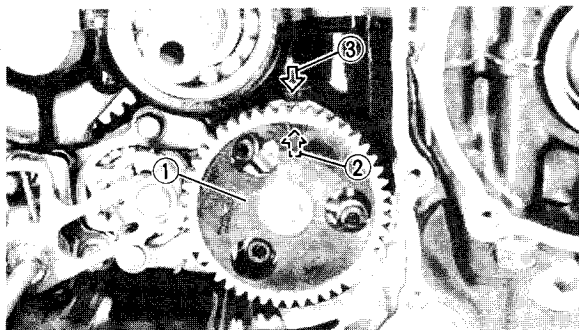
OIL PUMP AND SHIFT SHAFT

1. Install:
 - Shift shaft

NOTE: _____
 Insert the stopper between spring ends.



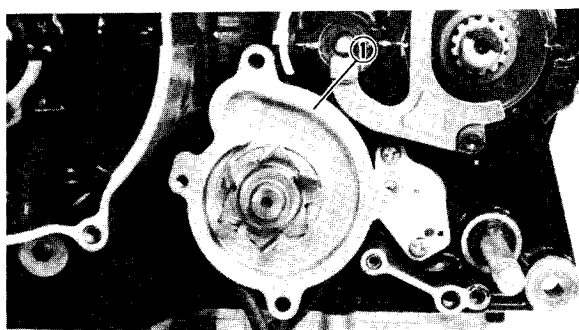
2. Install:
 - Dowel pin ①
 - Gasket (New) ②



3. Install:
 - Oil pump assembly ①

	<p>Oil Pump Mounting Bolts: 10 Nm (1.0 m·kg, 7.2 ft·lb) Use LOCTITE®</p>
--	---

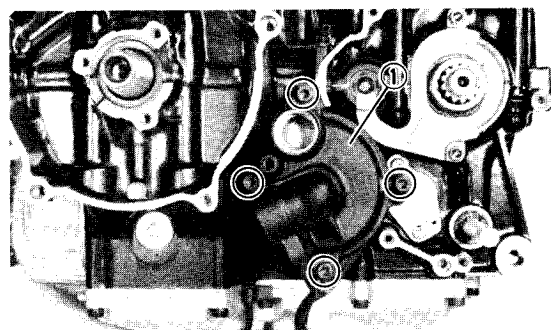
NOTE: _____
 Align the oil pump arrow mark ② with crankcase arrow mark ③.



WATER PUMP

1. Install:
 - Water pump housing ①

	<p>Bolts (Water Pump Housing): 10 Nm (1.0 m·kg, 7.2 ft·lb)</p>
--	--



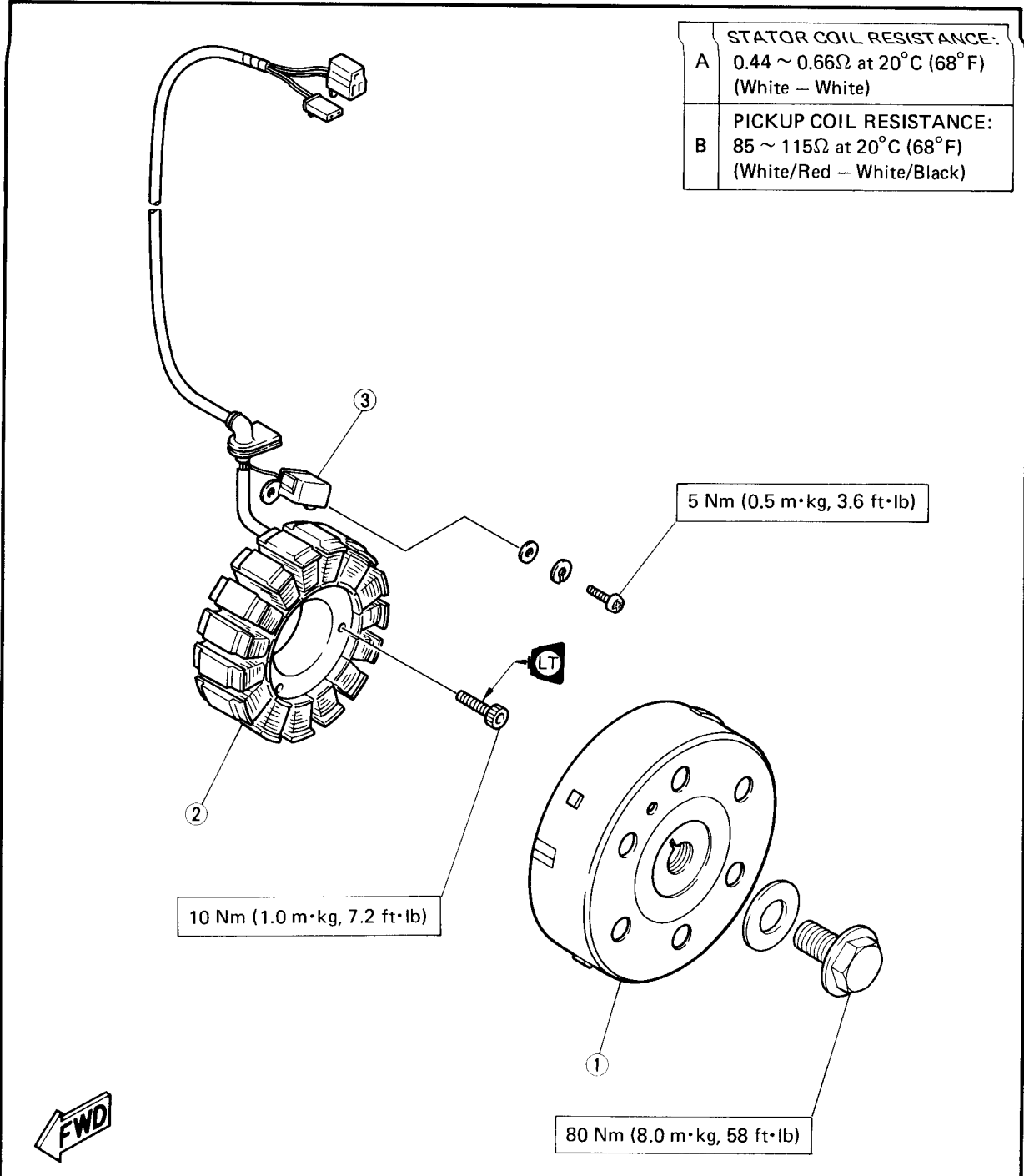
2. Install:
 - O-ring
 - Water pump cover ①

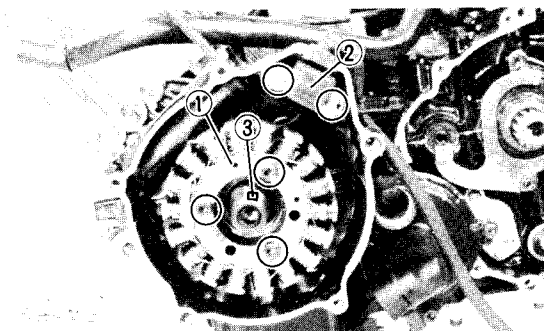
	<p>Bolts (Water Pump Cover): 10 Nm (1.0 m·kg, 7.2 ft·lb)</p>
--	--



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

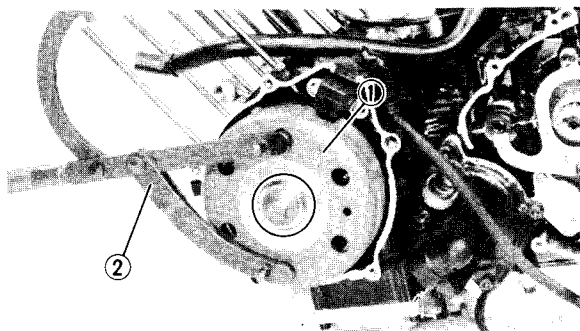


Bolts (Stator Coil Assembly):
 10 Nm (1.0 m·kg, 7.2 ft·lb)
 Use LOCTITE®

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:

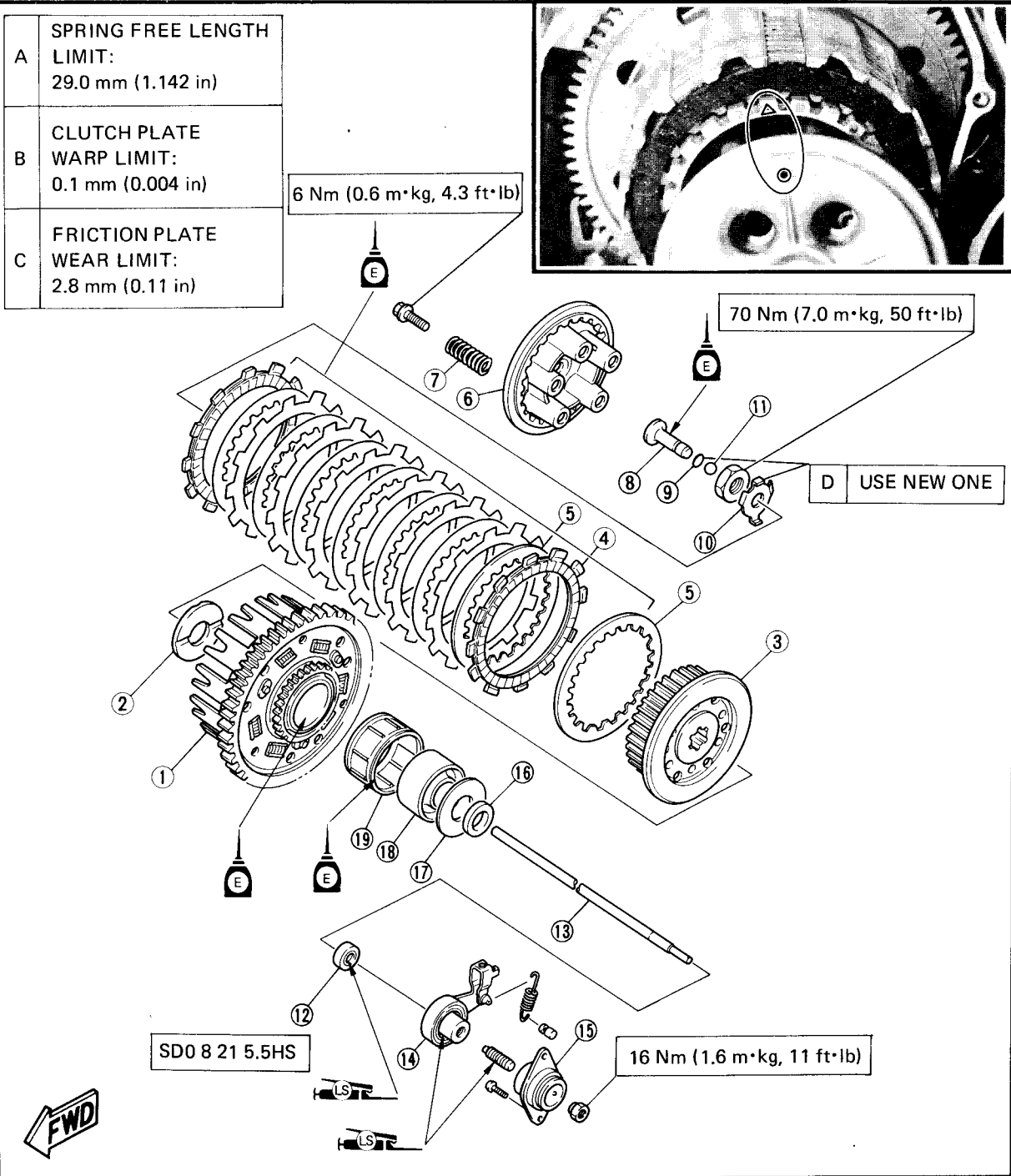
- Bolt (Magneto)



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

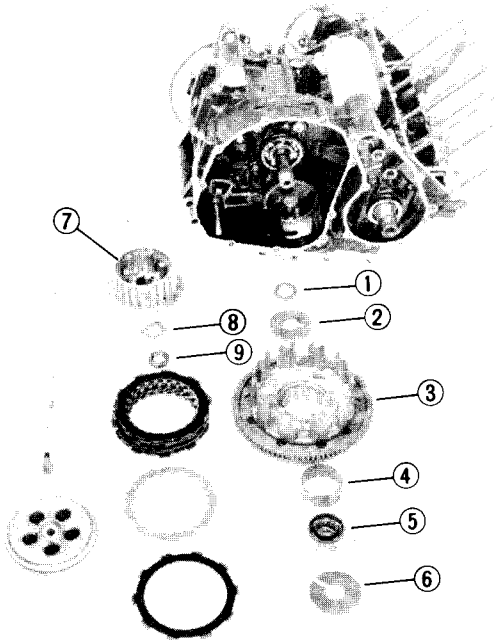




CLUTCH

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:

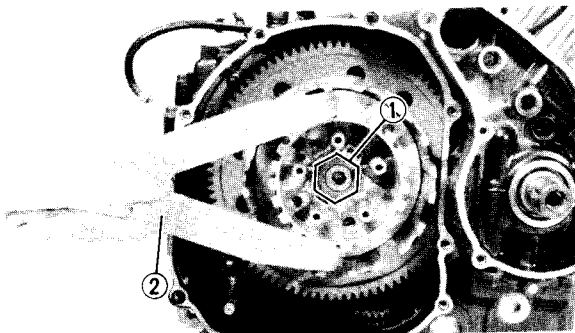
Install the bearing ④ and spacer ⑤ after installation of the clutch housing ③ .

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 .



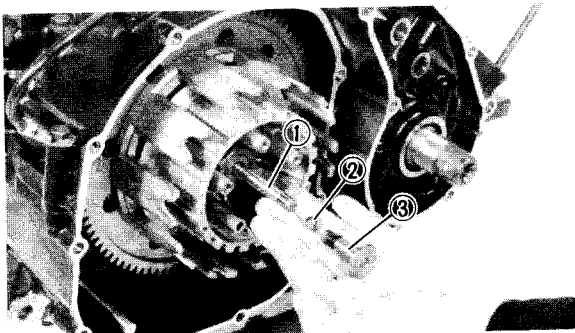
Universal Clutch Holder:
P/N YM-91042



Nut (Clutch Boss):
70 Nm (7.0 m·kg, 50 ft·lb)

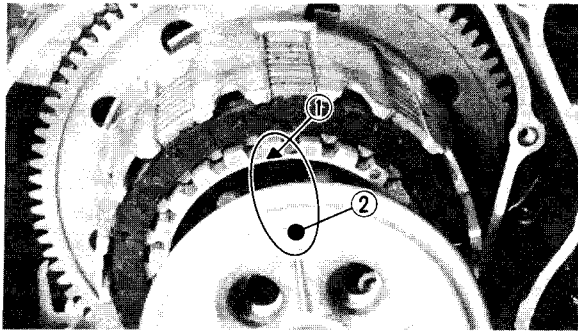
NOTE:

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

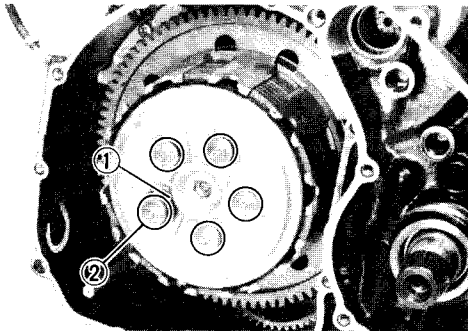


4. Install:

- Pressure plate

NOTE:

Be sure the match mark ① on the clutch boss is aligned with the match mark ② on the pressure plate.

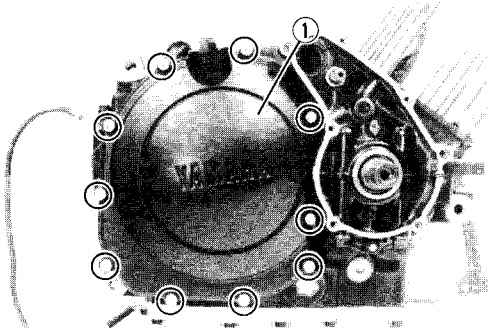


5. Install:

- Clutch springs ①
- Bolts (Clutch spring) ②



Bolts (Clutch Spring):
6 Nm (0.6 m·kg, 4.3 ft·lb)

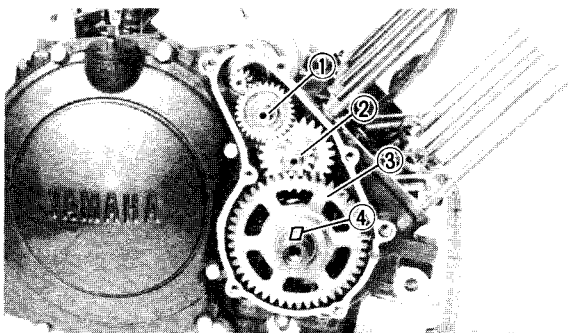


6. Install:

- Dowel pins
- Gasket (Crankcase cover)
- Crankcase cover (Right) ①



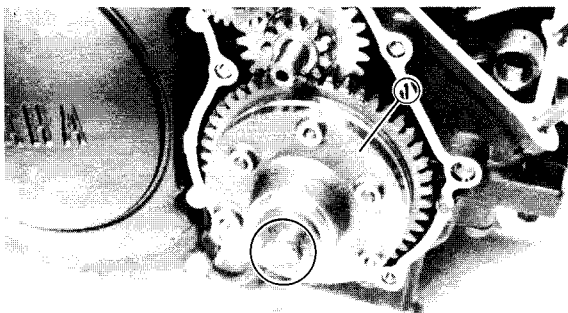
Bolts (Crankcase Cover):
10 Nm (1.0 m·kg, 7.2 ft·lb)



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)

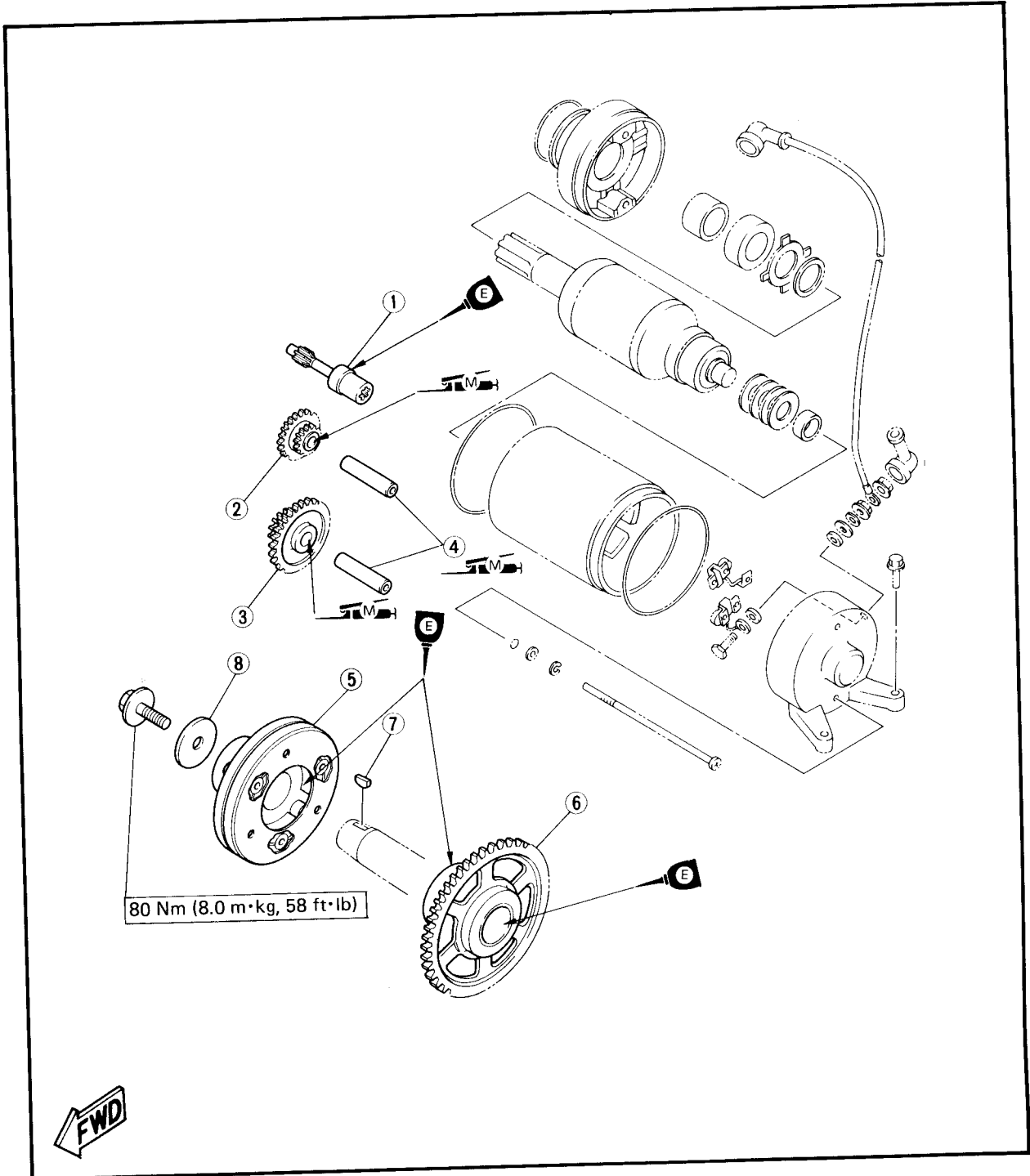


Bolt (Starter Clutch):
80 Nm (8.0 m·kg, 58 ft·lb)



STARTER CLUTCH

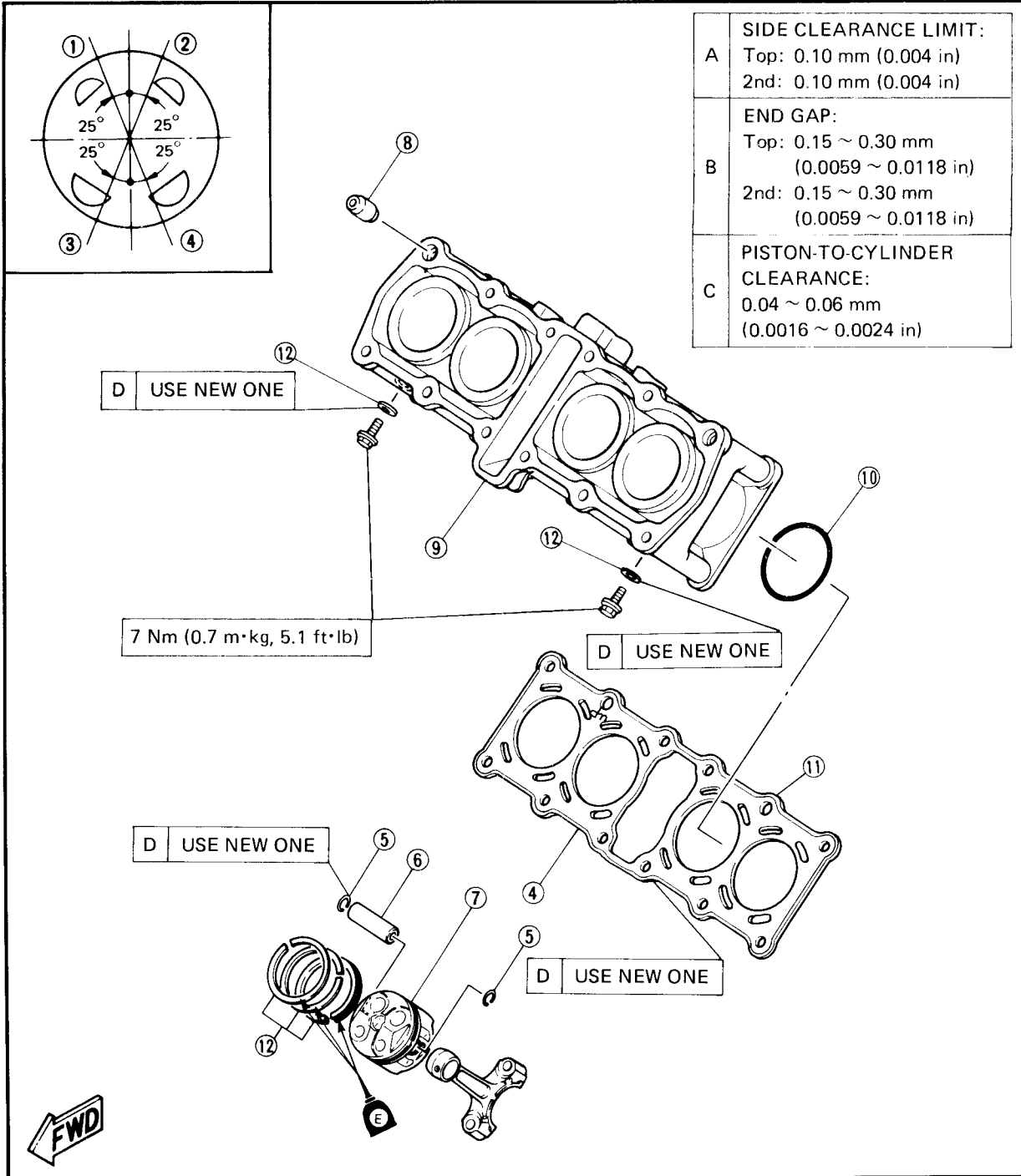
- ① Starter drive gear
- ② Idle gear
- ③ Idle gear
- ④ Shaft
- ⑤ Starter clutch assembly
- ⑥ Starter clutch gear
- ⑦ Woodruff key
- ⑧ Washer

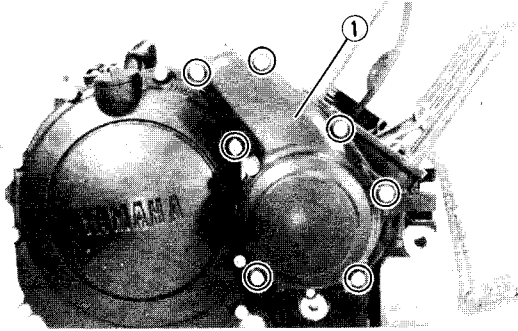




PISTON AND CYLINDER

- 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



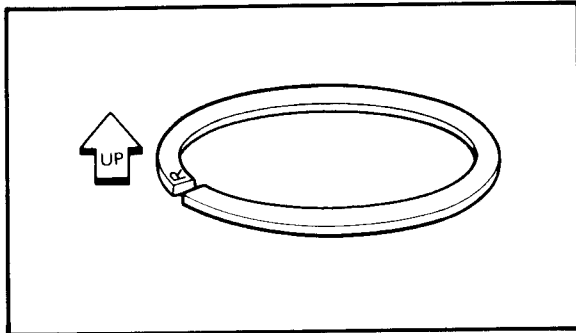


3. Install:

- 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)



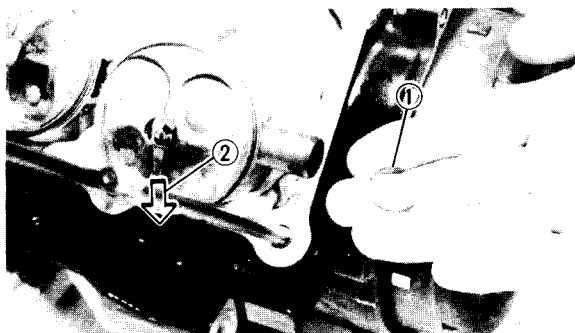
PISTON AND CYLINDER

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.

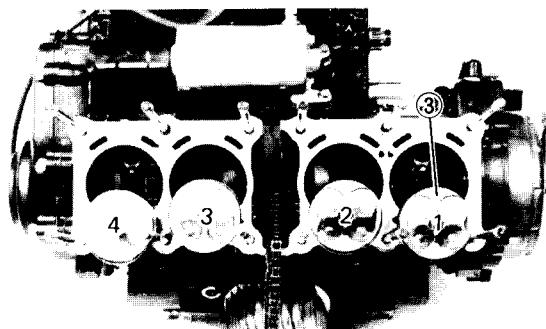


2. Install:

- Piston pins
- Pistons
- Circlips (Piston pin) ①

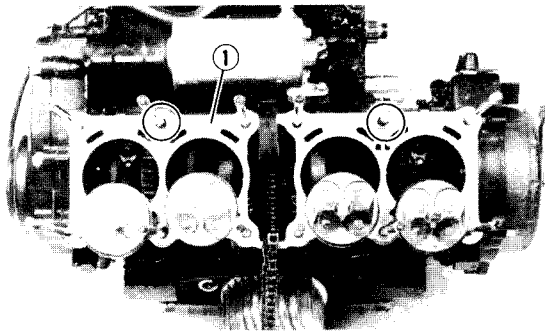
NOTE:

- 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) beginning from the left.



WARNING:

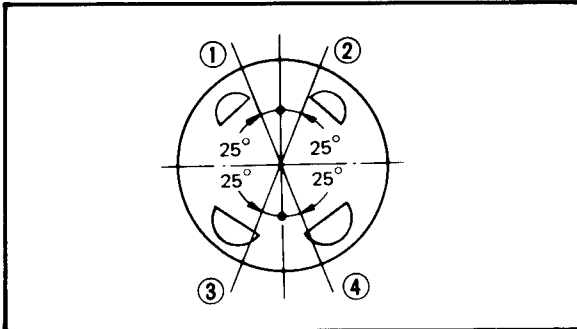
Always use new circlips (Piston pin).



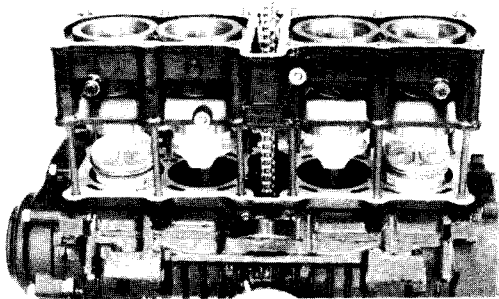
3. Install:
 - Gasket (Cylinder) ①
 - Dowel pins
4. Lubricate:
 - Pistons
 - Piston rings
 - Cylinder

NOTE: _____

Apply a liberal coating of 4-stroke engine oil.



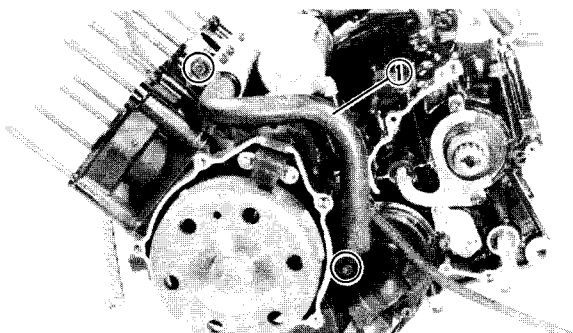
5. Position:
 - Offset the piston ring end gaps.
 - Top ring end ①
 - Oil ring end (Lower) ②
 - Oil ring end (Upper) ③
 - 2nd ring end ④



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: _____

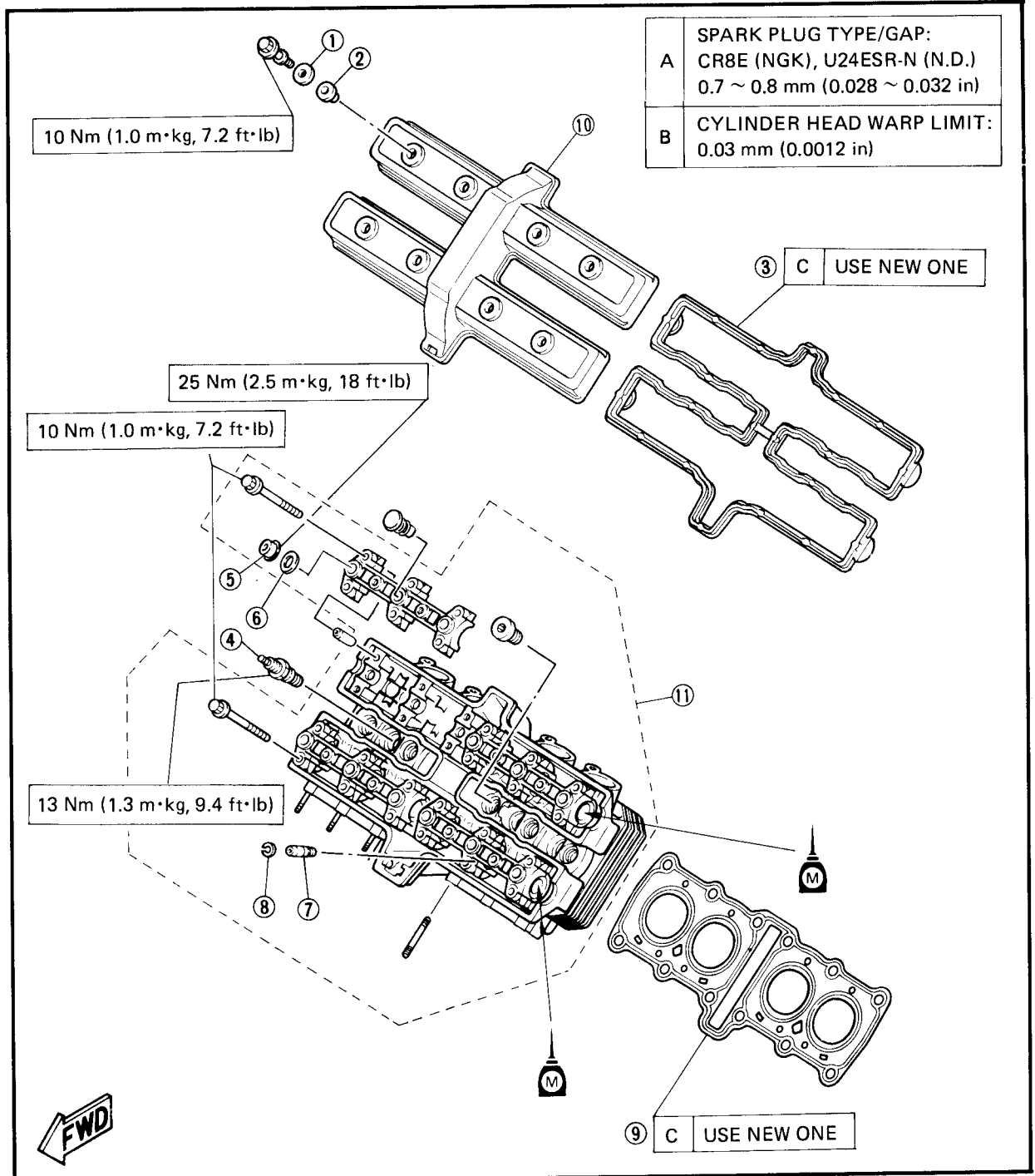
When # 1 piston is at TDC.



CYLINDER HEAD AND CAMSHAFT

Cylinder Head

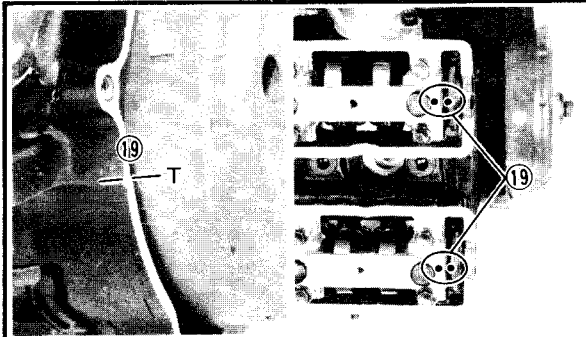
- ① Washer
- ② Rubber washer
- ③ Gasket (Cylinder head cover)
- ④ Spark plug
- ⑤ Nut
- ⑥ Washer
- ⑦ Valve guide
- ⑧ Circlip
- ⑨ Gasket (Cylinder head)
- ⑩ Cylinder head cover
- ⑪ Cylinder head assembly



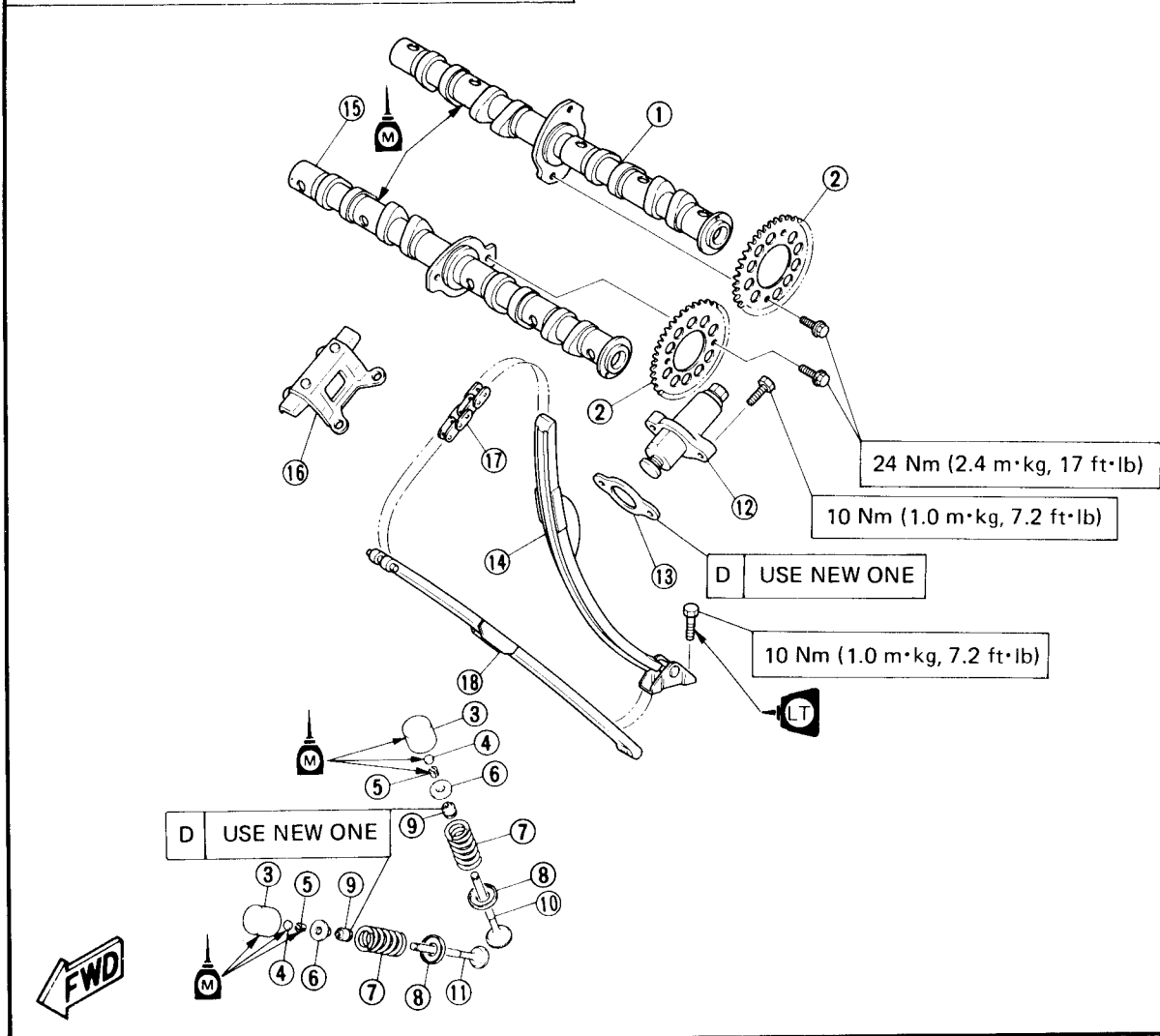


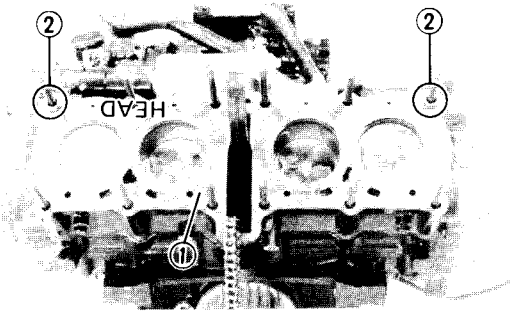
Camshaft

- 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: _____

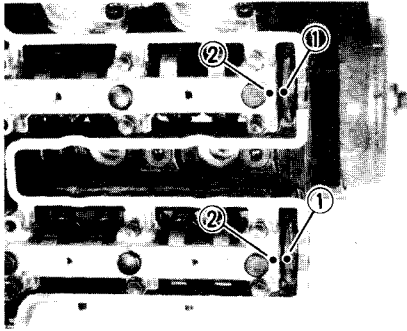
- Select either of the two procedures explained in this manual, as follows:

• Procedure 1.

The cam chain is disconnected → Connect.

• Procedure 2.

The camshafts are removed → Install.



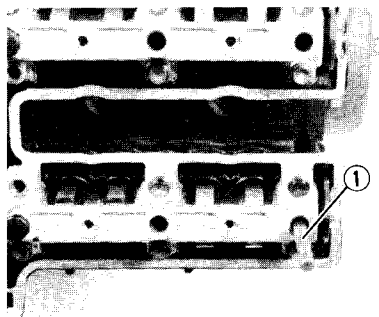
Procedure 1

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)

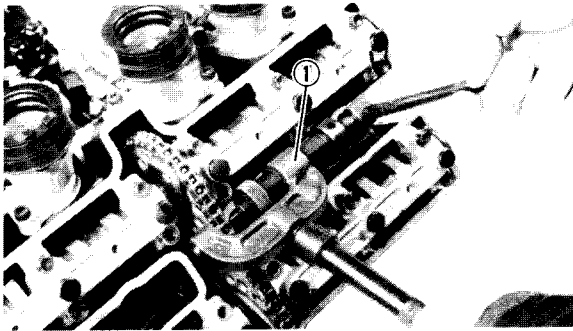
Use the Hexagon Wrench 6 mm (0.24 in) ① .

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:

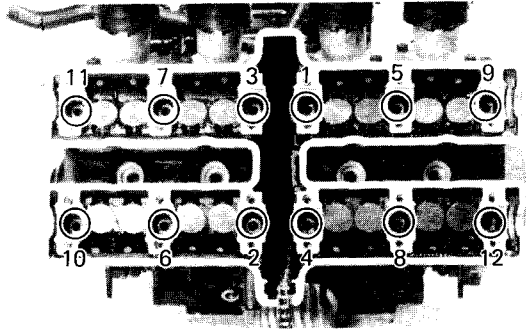
- Cam chain
- With the chain joint (New).
Use the Cam Chain Cutter ① .



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:

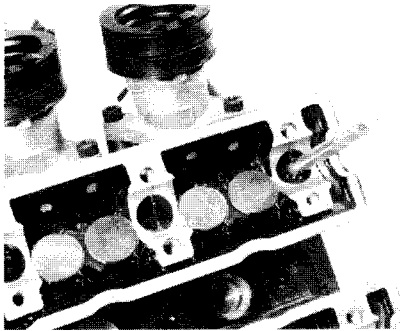
- Camshaft case and cylinder head assembly

2. Tighten:

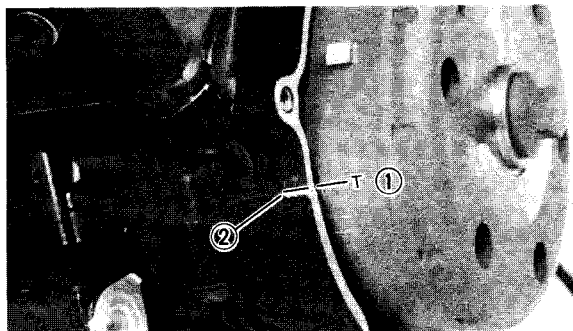
- Nuts (Cylinder head)
- Use the Hexagon Wrench 6 mm (0.24 in) .

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:

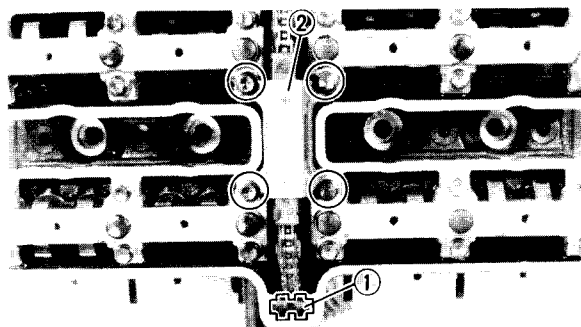
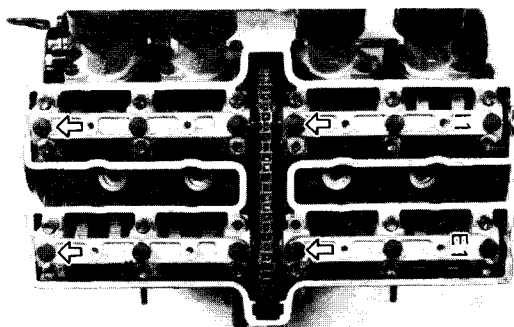
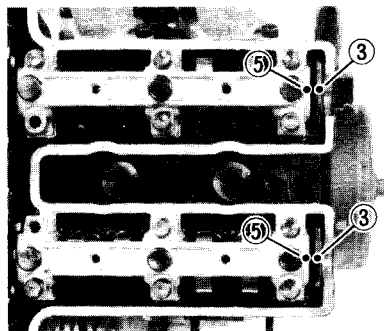
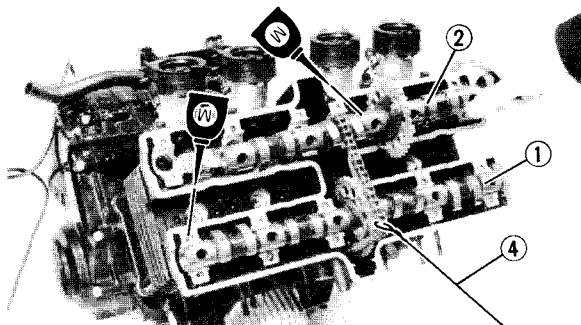
- Camshafts

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)

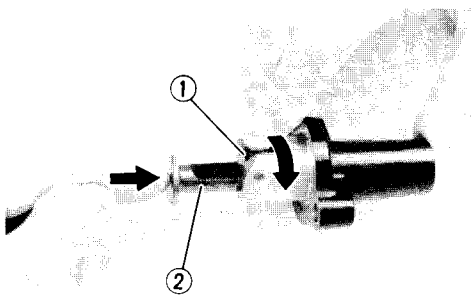
4. Install:
- Cam chain guide (Exhaust side) ①
 - Cam chain guide (Upper) ②

CAM CHAIN TENSIONER

1. Position:
 - Cam chain
 - Exhaust side → Tense.
 - Intake side → Slack.
2. Install:
 - Cam chain tensioner

Cam chain tensioner installation steps:

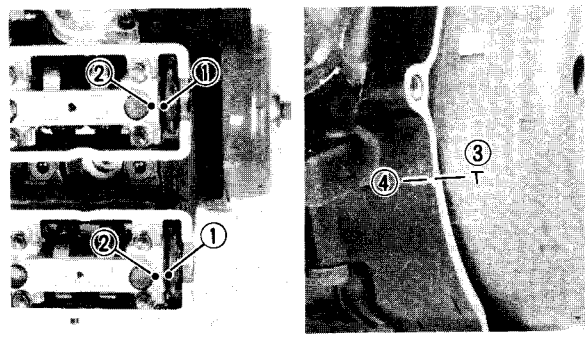
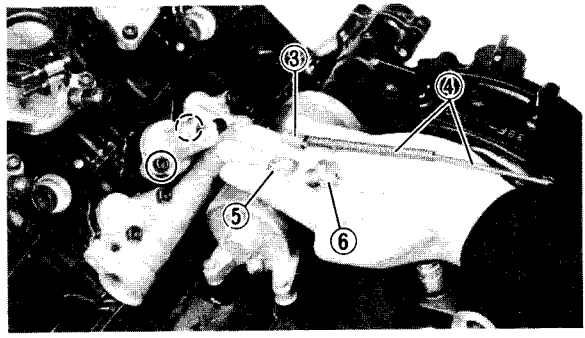
- Remove the tensioner end cap bolt and spring.
- Release the cam chain tensioner one-way cam ① and push the tension rod ②.
- Install the tensioner with a new gasket into the cylinder.



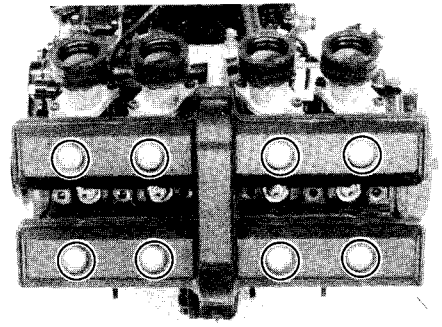
Bolts (Cam Chain Tensioner):
10 Nm (1.0 m·kg, 7.2 ft·lb)

- Install the collar ③, springs ④, washer ⑤ and end cap bolt ⑥.

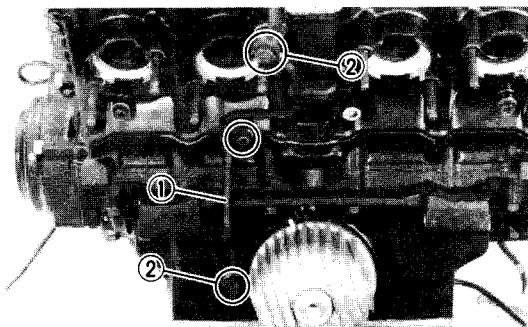
End Cap Bolt (Cam Chain Tensioner):
20 Nm (2.0 m·kg, 14 ft·lb)



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)

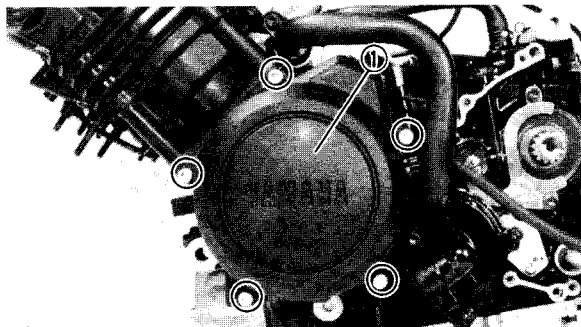


6. Install:

- Washers (New)
- Oil delivery pipe ①
- Union bolts ②



Union Bolts (Oil Delivery Pipe):
20 Nm (2.0 m·kg, 14 ft·lb)

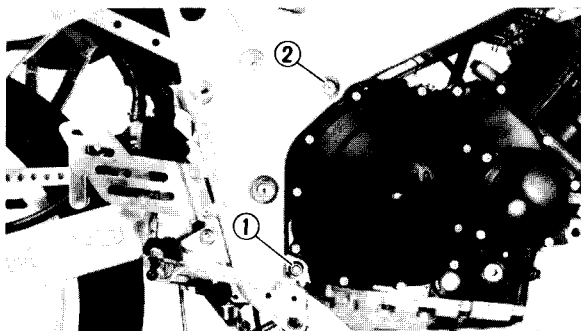


7. Install:

- 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.

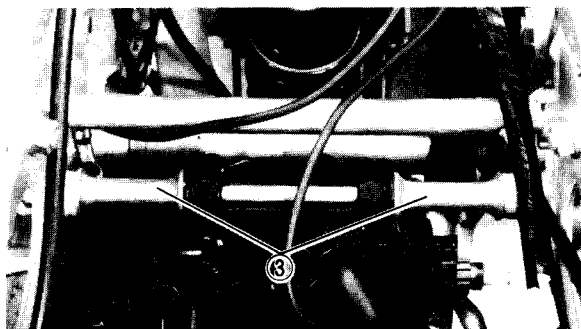
1. Install:

- 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)

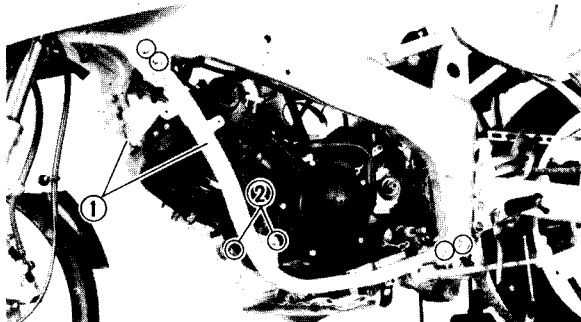
Bolt (Engine Mount – Rear Upper):
55 Nm (5.5 m·kg, 40 ft·lb)



③ Collars

2. Install:

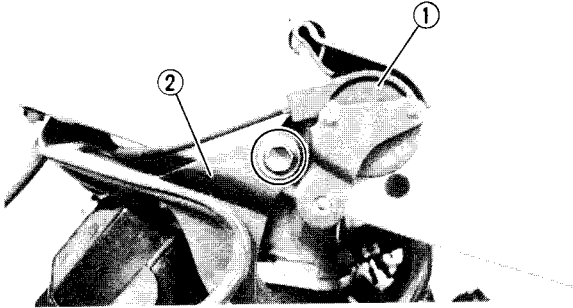
- Down tube frames (Left and right) ①
- Bolt (Engine – Mount) ②



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)

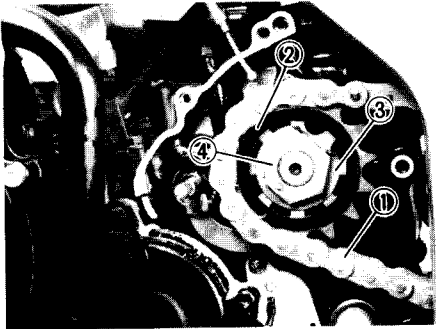


3. Install:

- Starter lever ①
- Cover ②



Bolt (Starter Lever):
8 Nm (0.8 m·kg, 5.8 ft·lb)



4. Install:

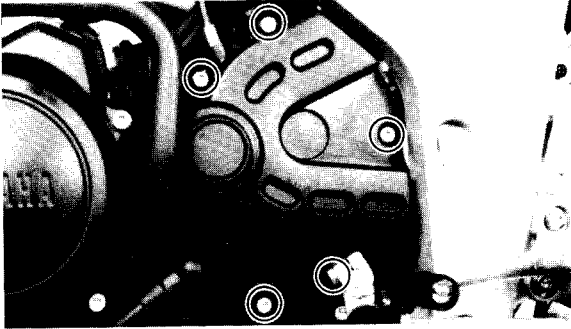
- Drive chain ①
- Drive sprocket ②
- Lock washer (New) ③
- Nut (Drive sprocket) ④



Nut (Drive Sprocket):
70 Nm (7.0 m·kg, 50 ft·lb)

NOTE:

Adjust the drive chain slack if necessary.



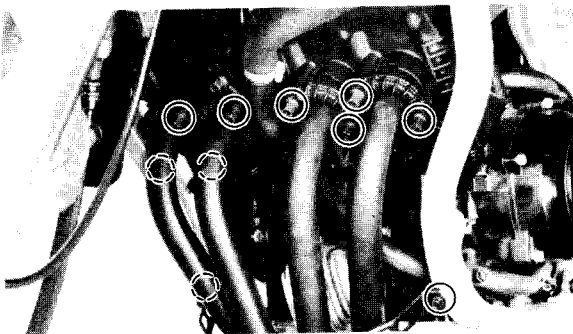
5. Install:

- 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

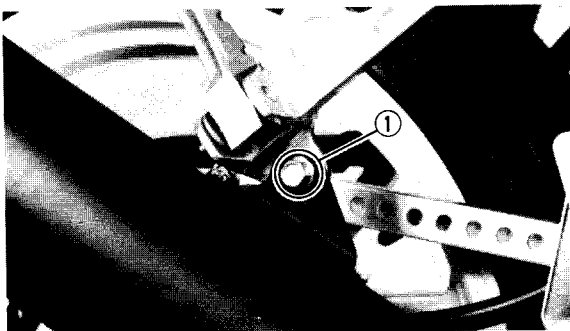
7. Tighten:

- 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

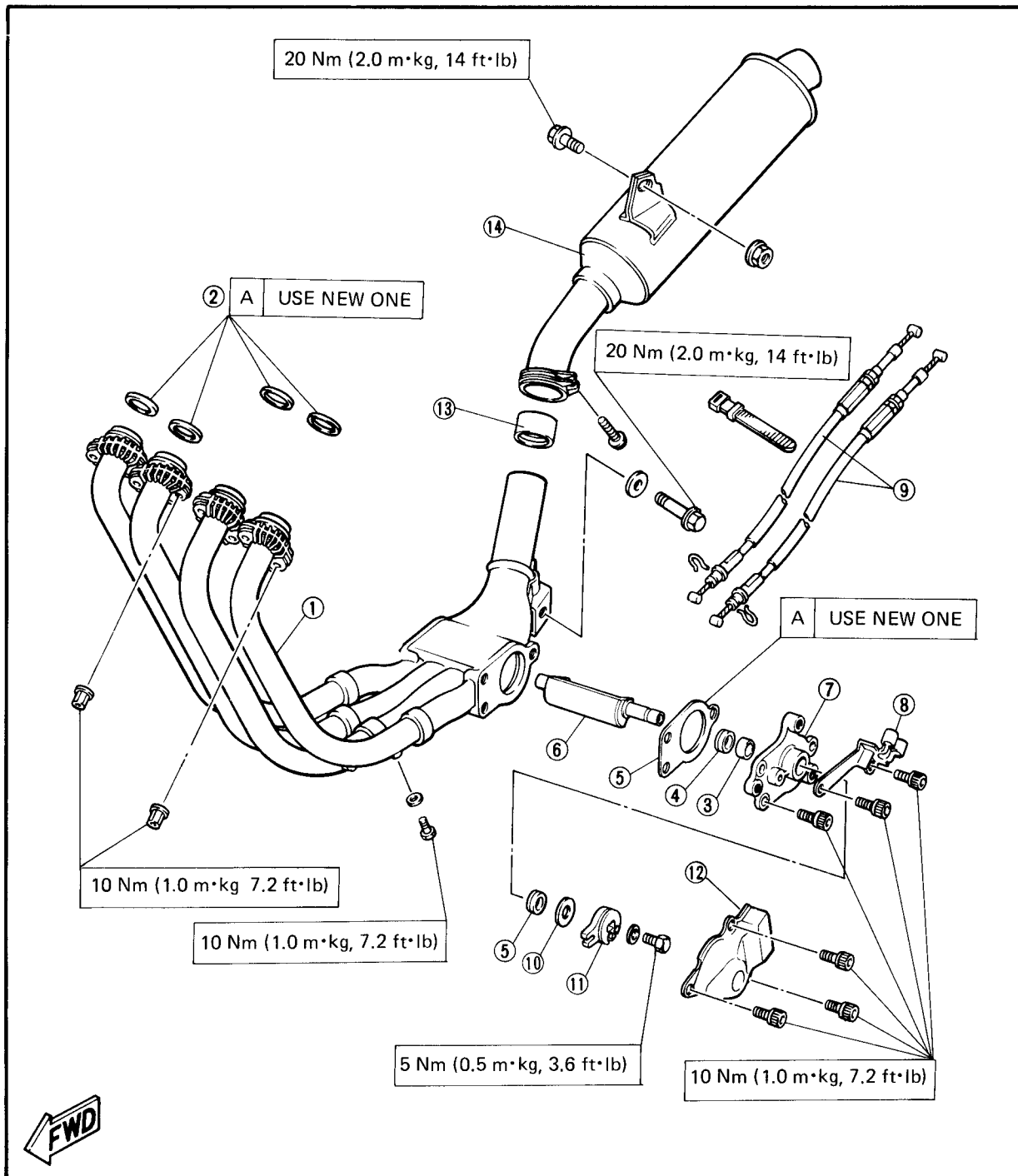


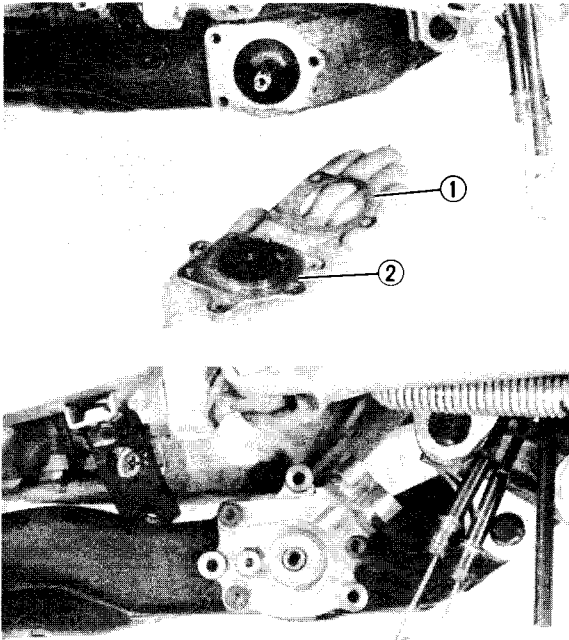
Bolt (Muffler Bracket):
20 Nm (2.0 m·kg, 14 ft·lb)

**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):

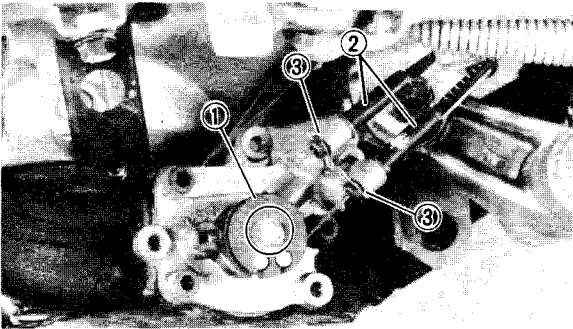
- Shaft arm
- Gasket ①
- Housing ②

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 ADJUSTMENT" 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 REPLACEMENT" section in the CHAPTER 3.

16. Fill:

- Engine oil



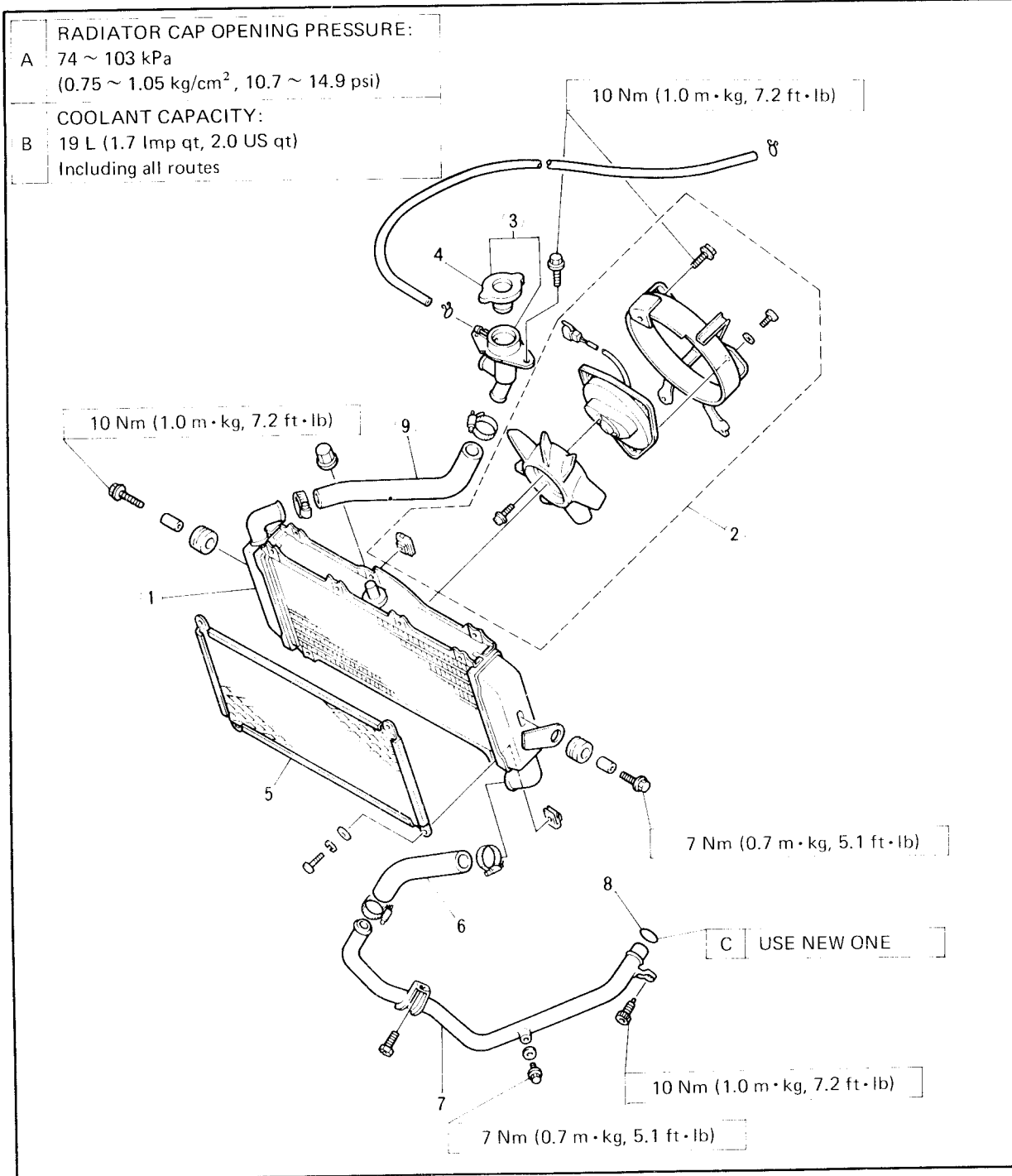
Total Amount:
0.8 L (0.7 Imp qt, 0.84 US qt)

Refer to the "ENGINE OIL REPLACEMENT" 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:

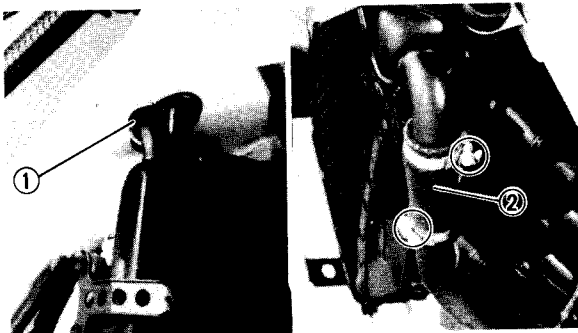
Thoroughly flush the cooling system with clean tap water.

⚠ CAUTION:

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

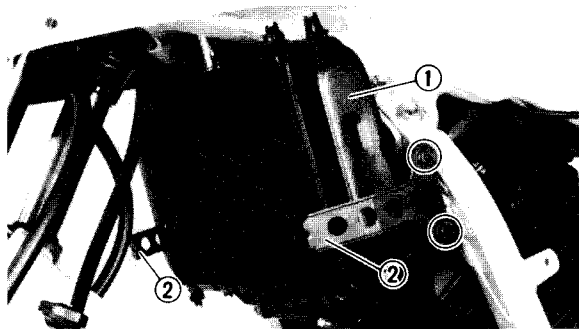
⚠ WARNING:

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



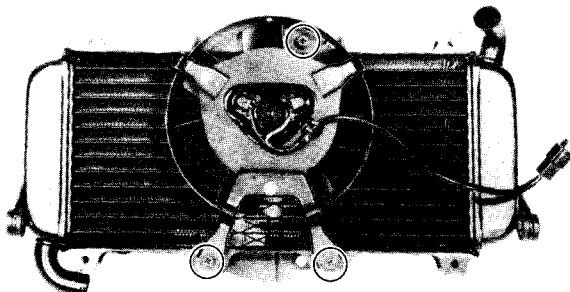
4. Disconnect:

- Hose (Radiator – Inlet) ①
- Hose (Radiator – Outlet) ②



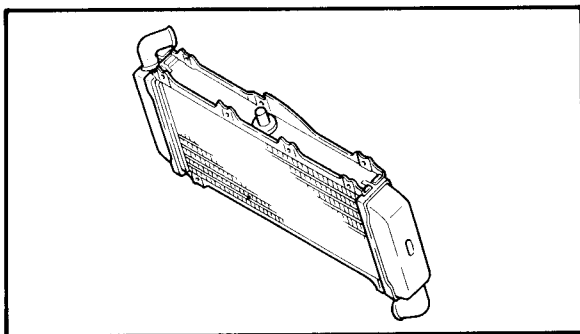
5. Remove:

- 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:

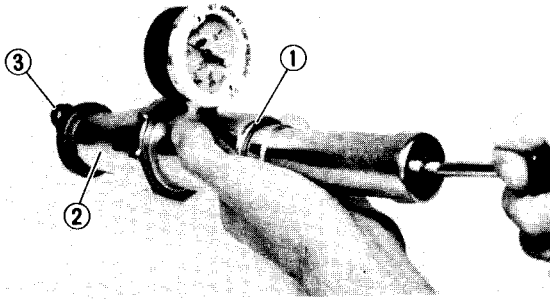
- Radiator cap opening pressure

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:

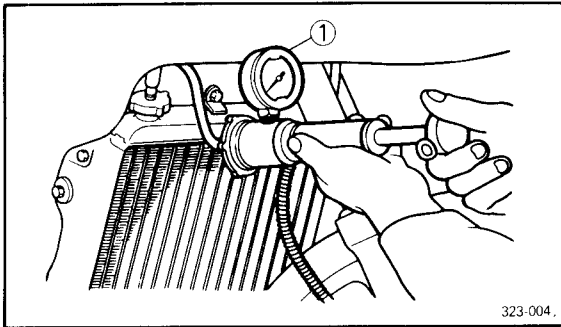
- Cooling system

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**

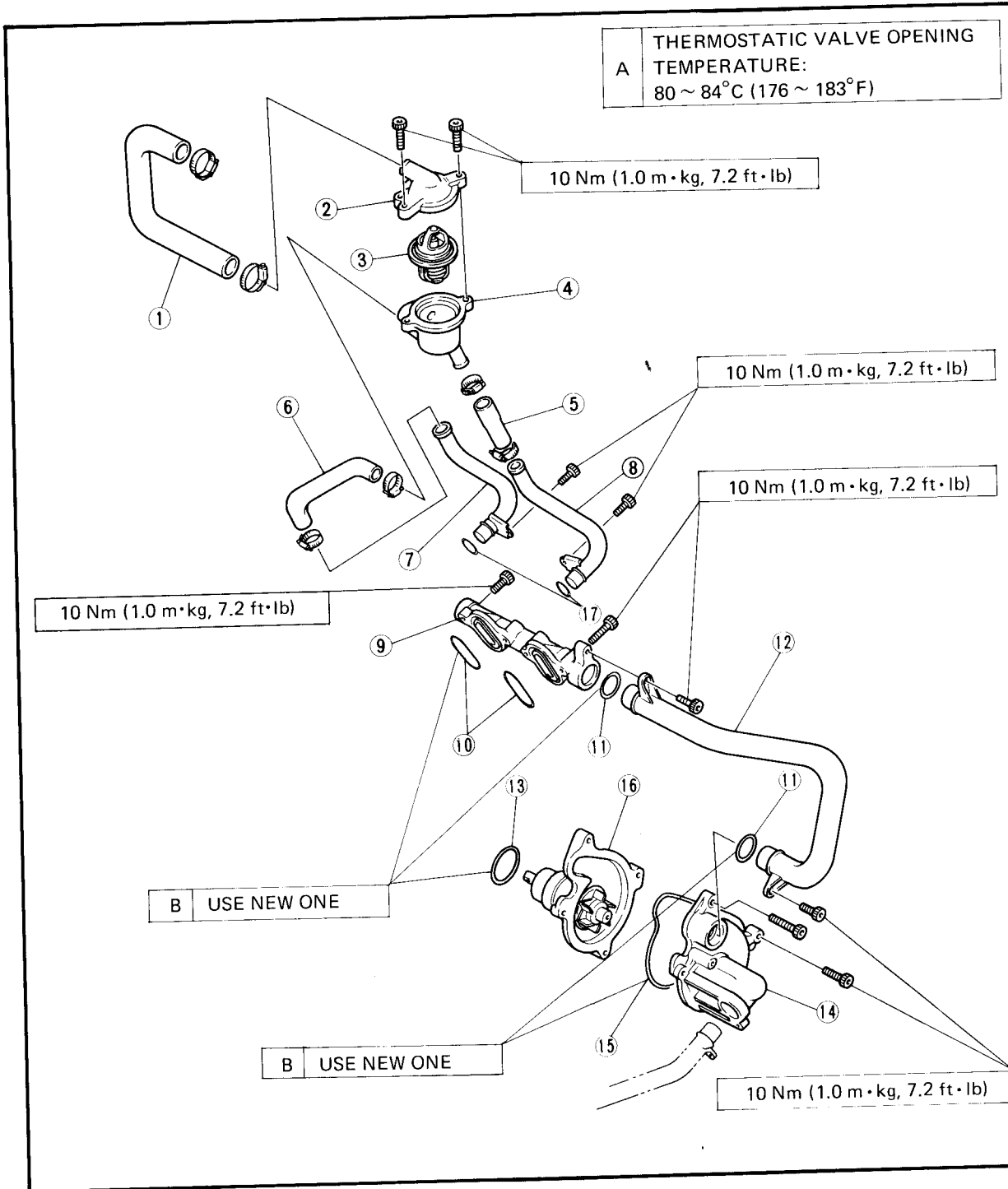
- Apply 100 kPa (1.0 kg/cm², 14 psi) pressure .
- Measure the indicated pressure with the gauge.

WATER PUMP AND THERMOSTATIC VALVE



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:

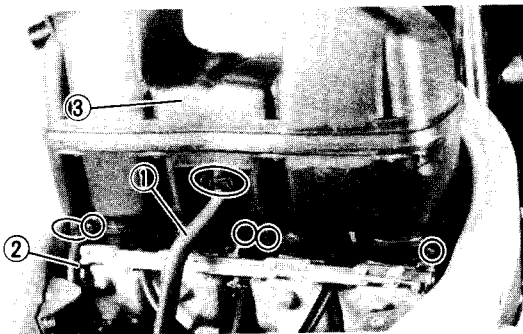
- Cooling system

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

3. Remove:

- Fuel tank

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

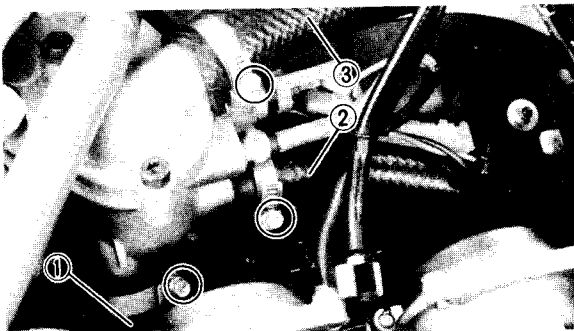


4. Disconnect:

- Crankcase ventilation hose ①
- Air vent hose ②

5. Remove:

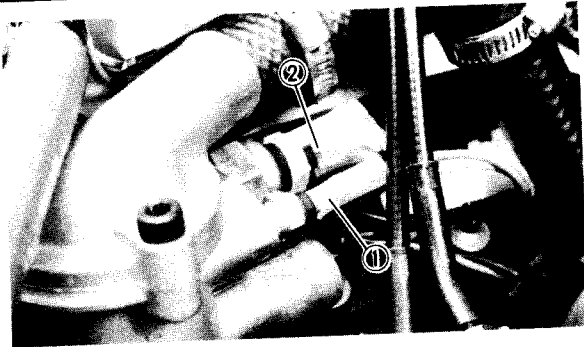
- Air filter case ③



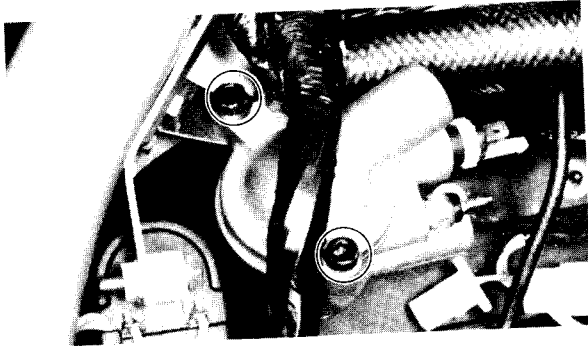
6. Disconnect:

- Hose 1 ①
- Hose 2 ②
- Hose 3 ③

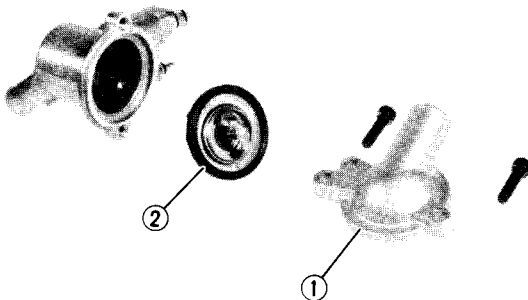
WATER PUMP AND THERMOSTATIC VALVE



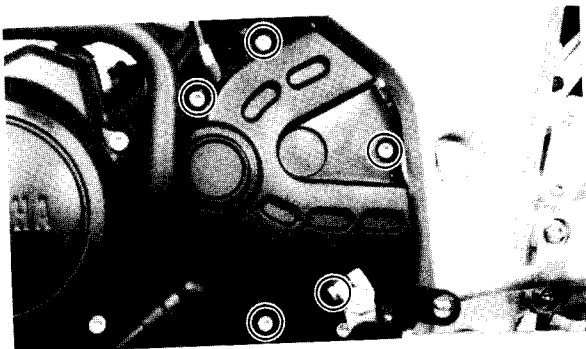
7. Disconnect:
- Thermo unit lead ①
 - Thermo switch lead ②



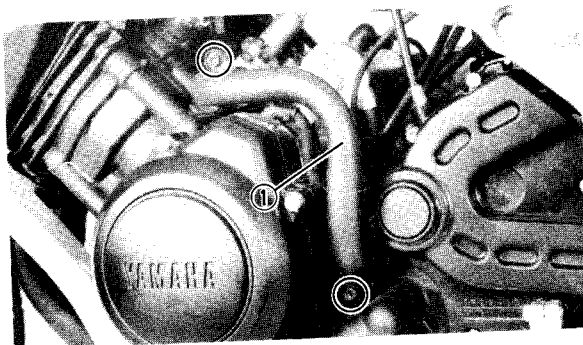
8. Remove:
- Thermostatic housing



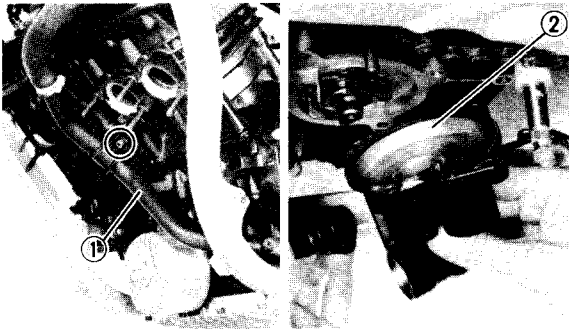
9. Remove:
- Thermostatic cover ①
 - Thermostatic ②



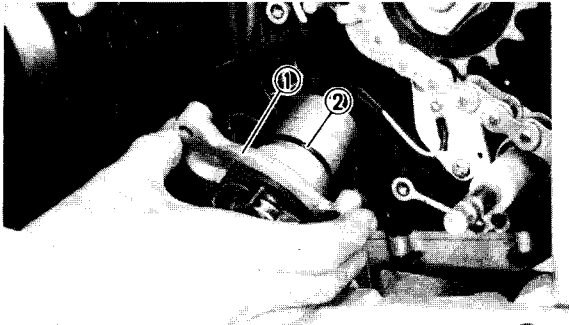
10. Remove:
- Shift arm
 - Crankcase cover (Left)



11. Remove:
- Water pipe ①



12. Remove:
- Water pipe ①
 - Water pump cover ②

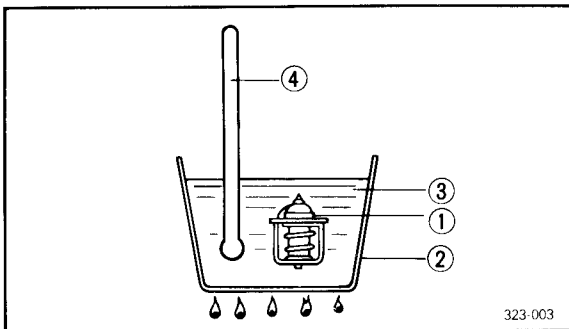


13. Remove:
- Water pump housing ①

② O-ring

INSPECTION

1. Inspect:
- Thermostatic valve
- Valve does not open at 80 ~ 84°C (176 ~ 183°F) → Replace.

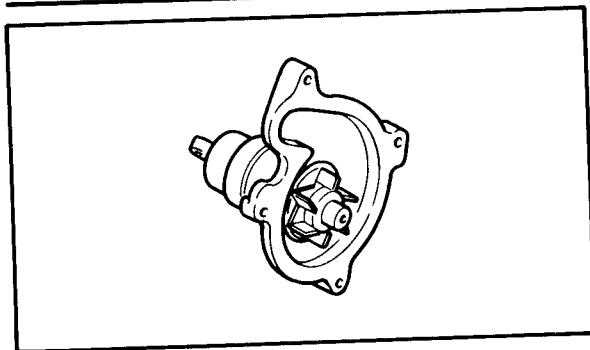


Inspection steps:

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

NOTE:

Thermostatic valve is sealed and its setting is specialized work. If its accuracy is in doubt, always 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.



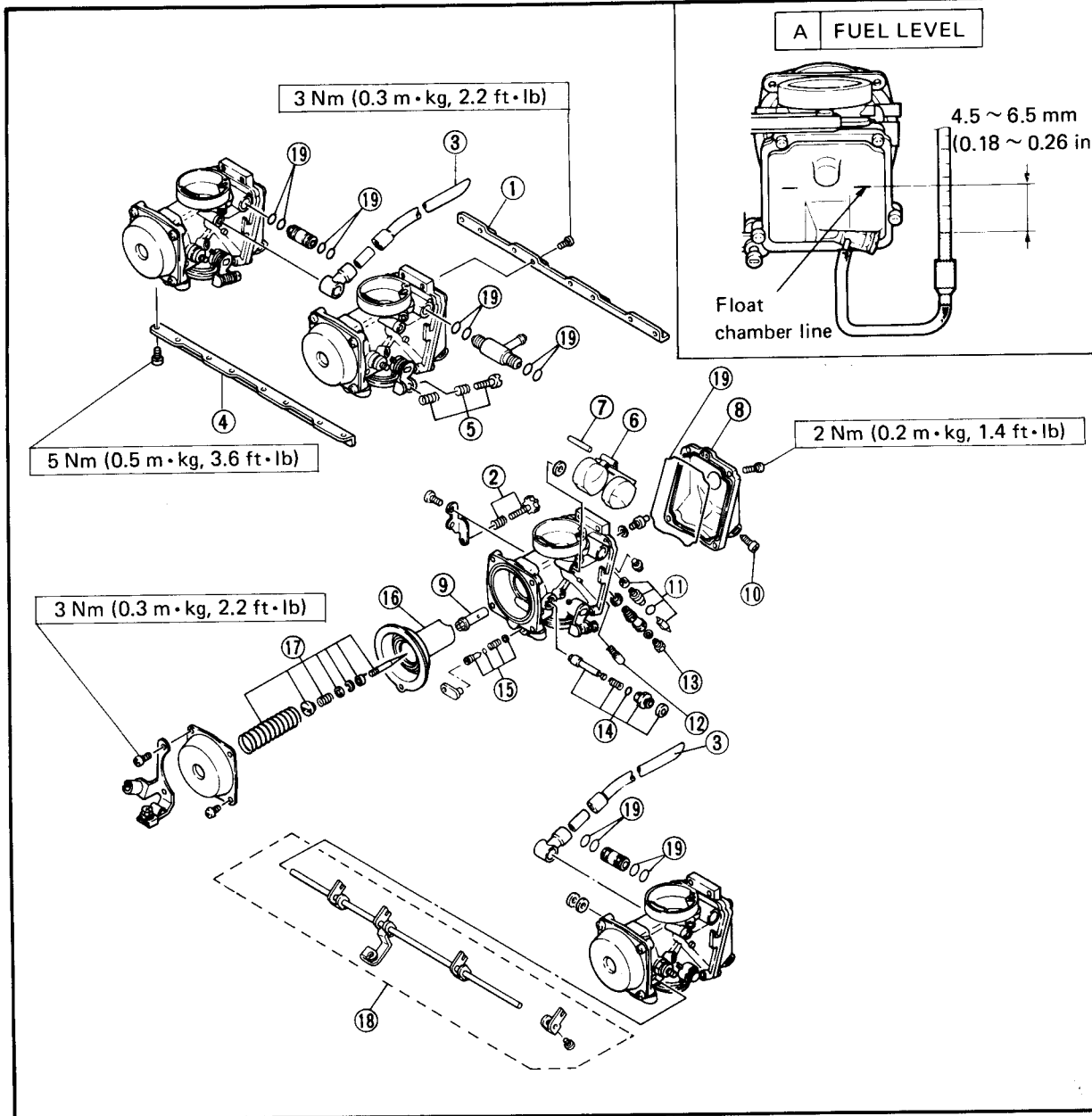
CARBURETOR

CARBURETOR

- ① Upper bracket
- ② Throttle stop screw
- ③ Fuel overflow hose
- ④ Lower bracket
- ⑤ Synchronizing 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	5CF22
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)



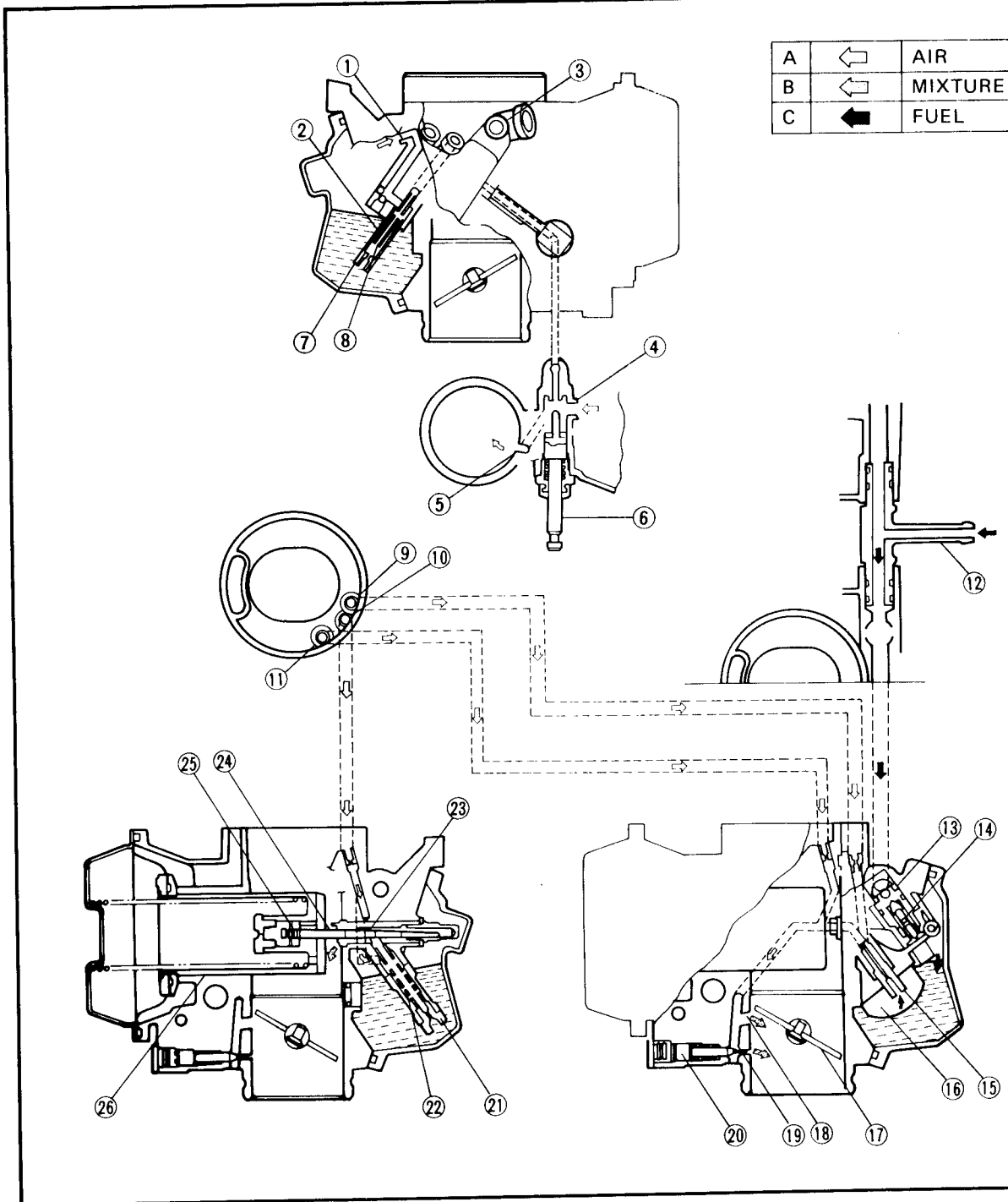


SECTION VIEW

- 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 for maximum performance at the factory. Any attempt to change these settings will decrease engine performance.



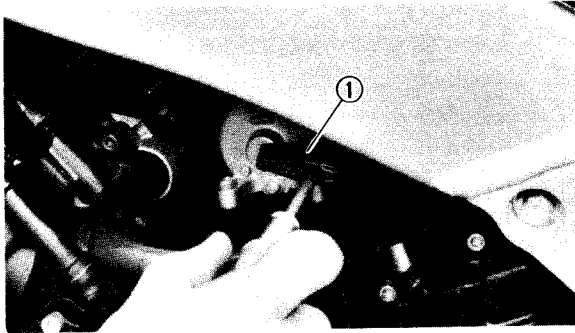


REMOVAL

1. Remove:

- Seat
- Top cover

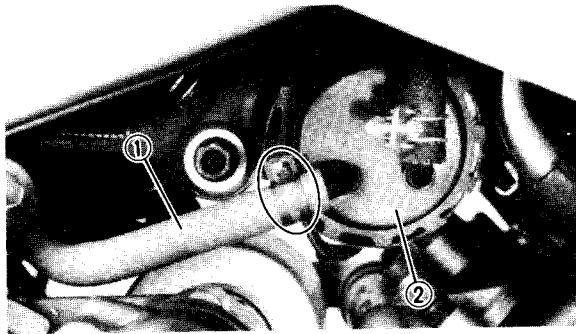
Refer to the "COWLING REMOVAL AND INSTALLATION – REMOVAL" section in the CHAPTER 3.



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

3. Remove:

- Fuel cock lever ①



4. Disconnect:

- Fuel hose ①

5. Remove:

- Fuel pump ②

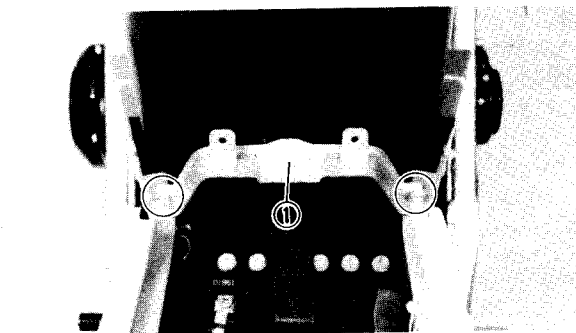
⚠ WARNING:

Gasoline is highly flammable.

Avoid spilling fuel on the hot engine.

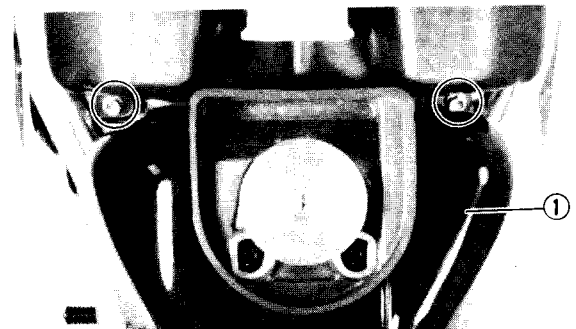
6. Remove:

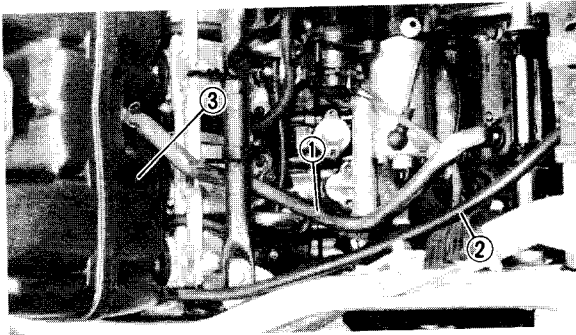
- Fuel tank bracket ①



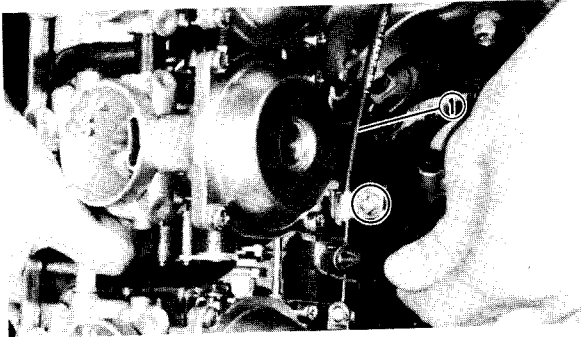
7. Remove:

- Fuel tank ①

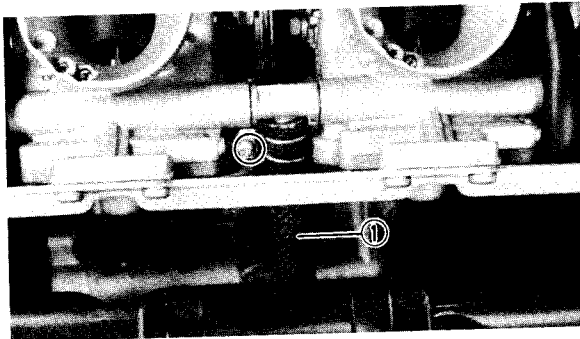




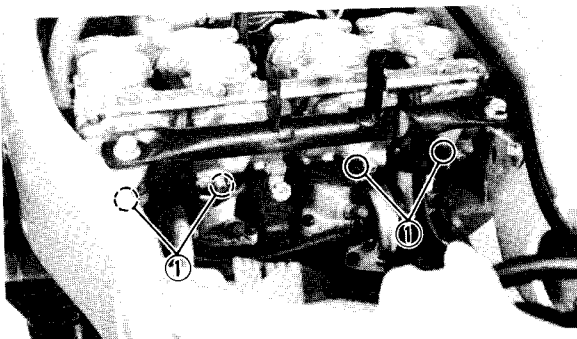
8. Disconnect:
 - Crankcase ventilation hose ①
 - Air vent hose ②
9. Remove:
 - Air filter case ③



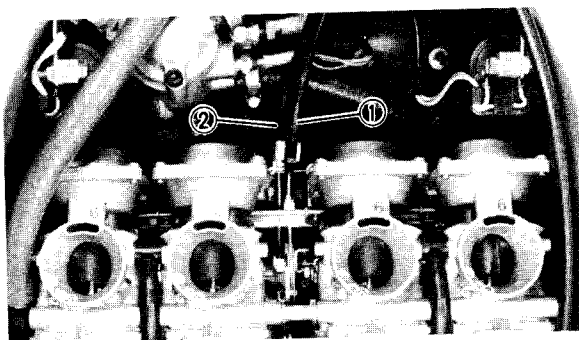
10. Loosen:
 - Screw (Starter cable clamp)
11. Disconnect:
 - Starter cable ①



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

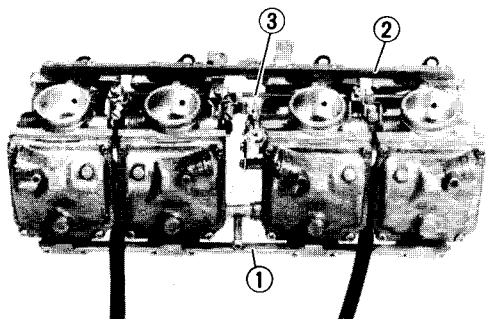


DISASSEMBLY

NOTE: _____

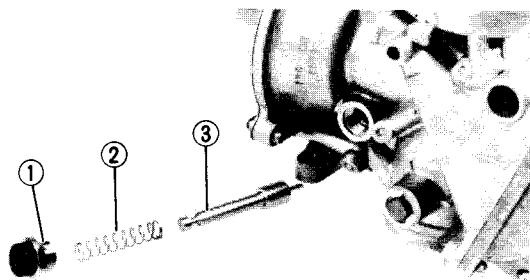
The following parts can be cleaned and inspected without carburetor separation.

- Throttle valve
- Piston valve
- Starter plunger
- Float chamber components



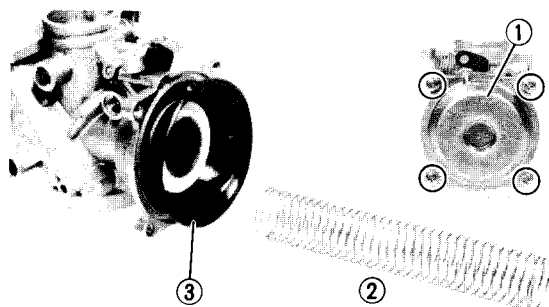
1. Remove:

- Bracket (Upper) ①
- Bracket (Lower) ②
- Starter lever shaft ③



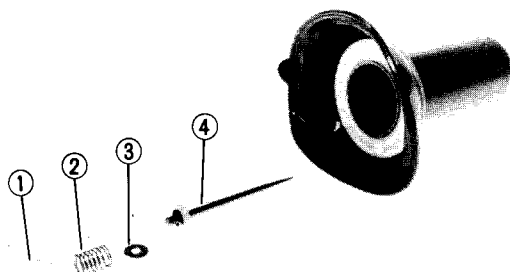
2. Remove:

- Nut ①
- Spring ②
- Starter plunger ③



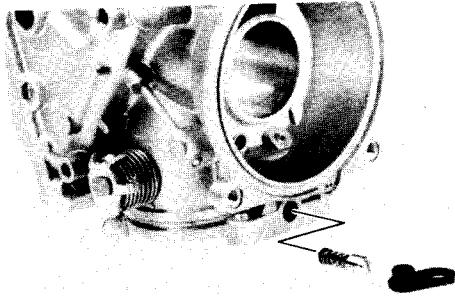
3. Remove:

- Vacuum chamber cover ①
- Spring ②
- Piston valve assembly ③

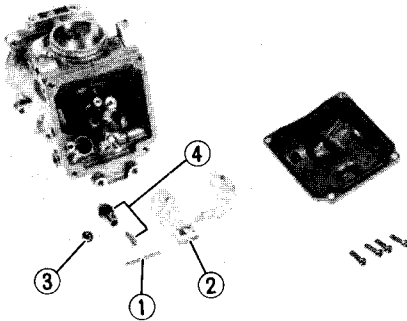


4. Remove:

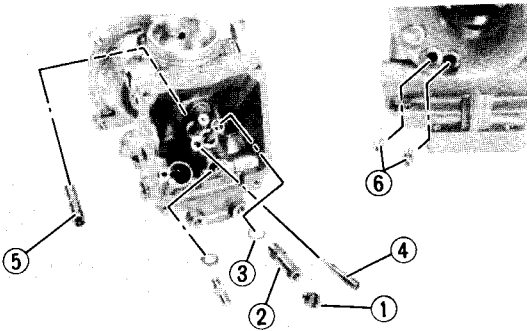
- Plug (Jet needle) ①
- Spring ②
- Washer ③
- Jet needle ④



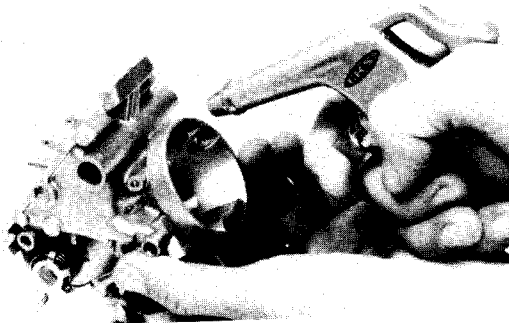
5. Remove:
- Pilot screw



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

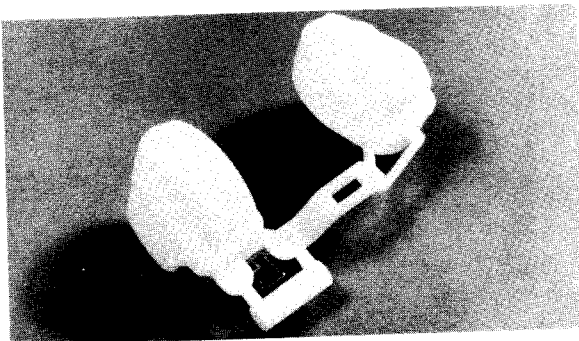


INSPECTION

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

Carburetor cleaning steps:

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



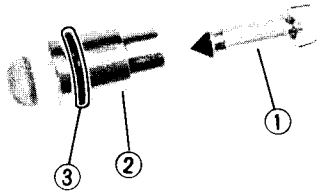
2. Inspect:
- Floats
- Damage → Replace.



3. Inspect:

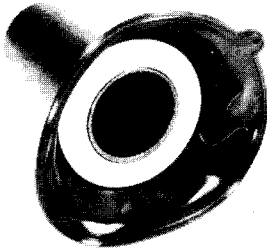
- Float needle valve ①
- Valve seat ②
- O-ring ③

Damage/Wear/Contamination → Replace as a set.



4. Inspect:

- Throttle valve
Scratches → Replace.
- Rubber diaphragm
Tears → Replace.

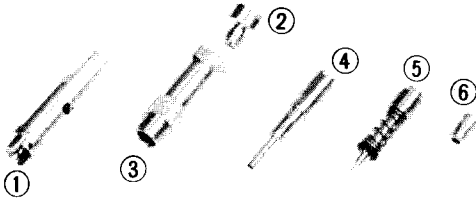


5. Inspect:

- 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.

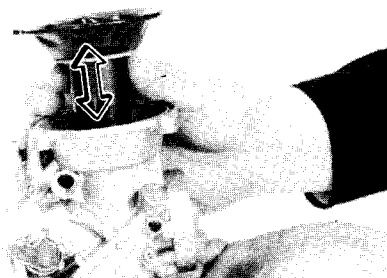


6. Check:

- Free movement

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

Stick → Replace.



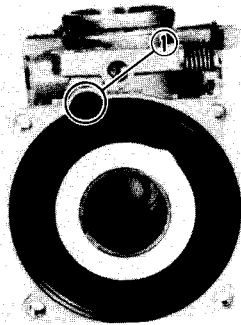


ASSEMBLY

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.

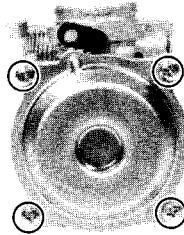
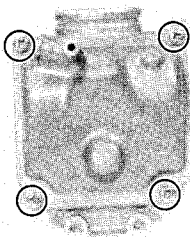


1. Install:

- 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

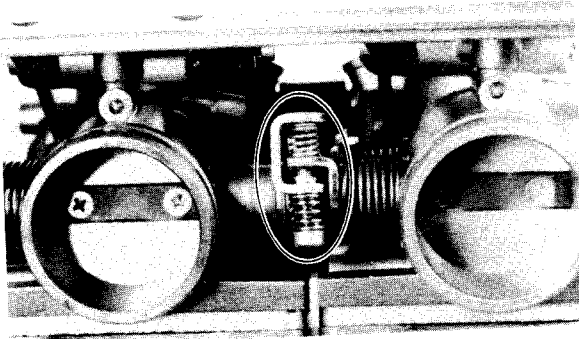


Screw (Float Chamber Cover):

2 Nm (0.2 m•kg, 1.4 ft•lb)

Screw (Vacuum Chamber Cover):

3 Nm (0.3 m•kg, 2.2 ft•lb)

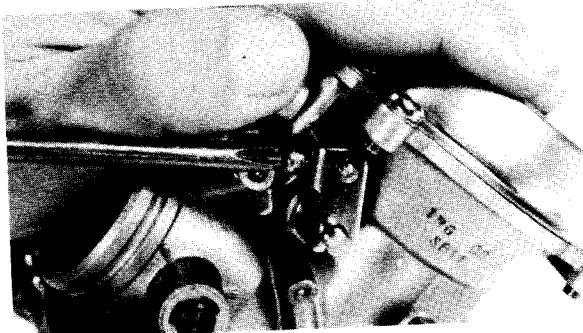


3. Connect:

- Throttle shaft

⚠ CAUTION:

Throttle valves must be fully closed.



4. Install:

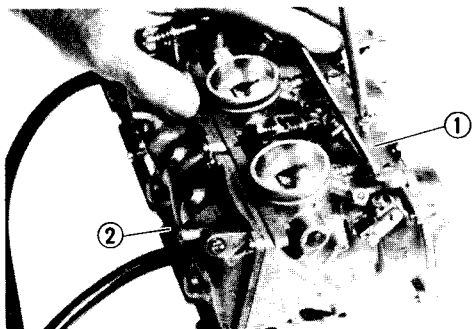
- Starter lever shaft



Screw (Starter Lever Shaft):

3 Nm (0.3 m•kg, 2.2 ft•lb)

Apply LOCTITE®.



5. Installer:

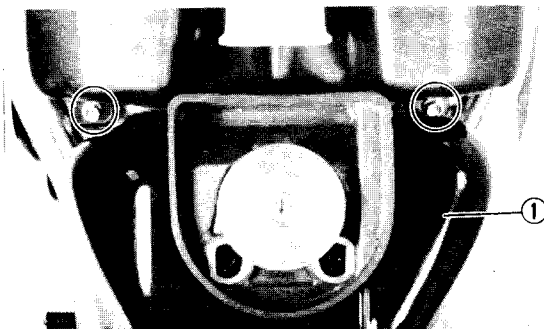
- Upper bracket ①
- Lower bracket ②



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.

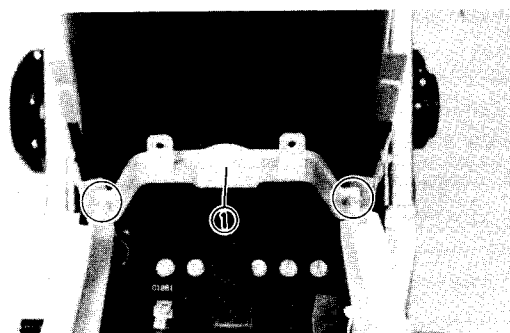


1. Install:

- Fuel tank ①



Bolts (Fuel Tank):
14 Nm (1.4 m·kg, 10.2 ft·lb)

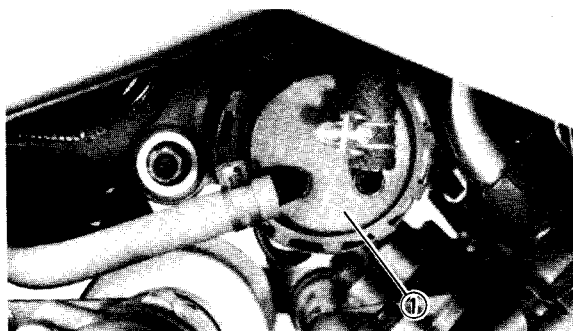


2. Install:

- 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 height should be adjusted.

⚠ CAUTION:

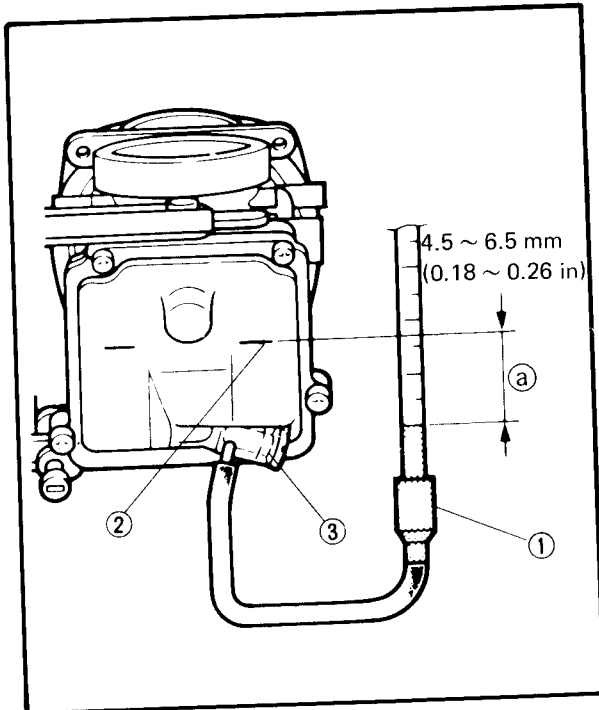
The pilot screw settings are adjusted for maximum performance at the factory. An attempt to change these settings will decrease engine performance.

Fuel Level Adjustment

1. Measure:

- Fuel level (a)

Out of specification → Adjust it by the following adjustment steps.



Fuel Level (a) :

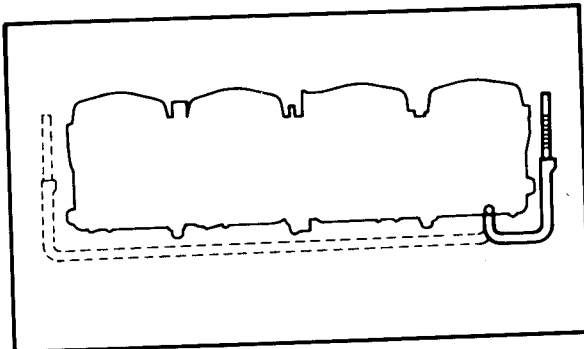
4.5 ~ 6.5 mm (0.18 ~ 0.26 in)
Below the float chamber line.

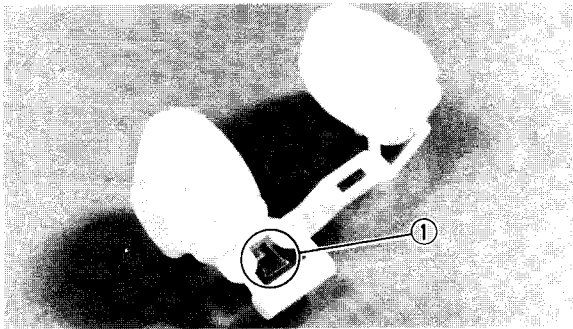
Fuel level measurement steps:

- 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 float chamber line (2).
- Loosen the drain screw (3).
- Warm up the engine, then shut it off after a few minutes.
- Measure the fuel level. It should be within the specified range.

NOTE:

Fuel level readings of both side of carburetor 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.

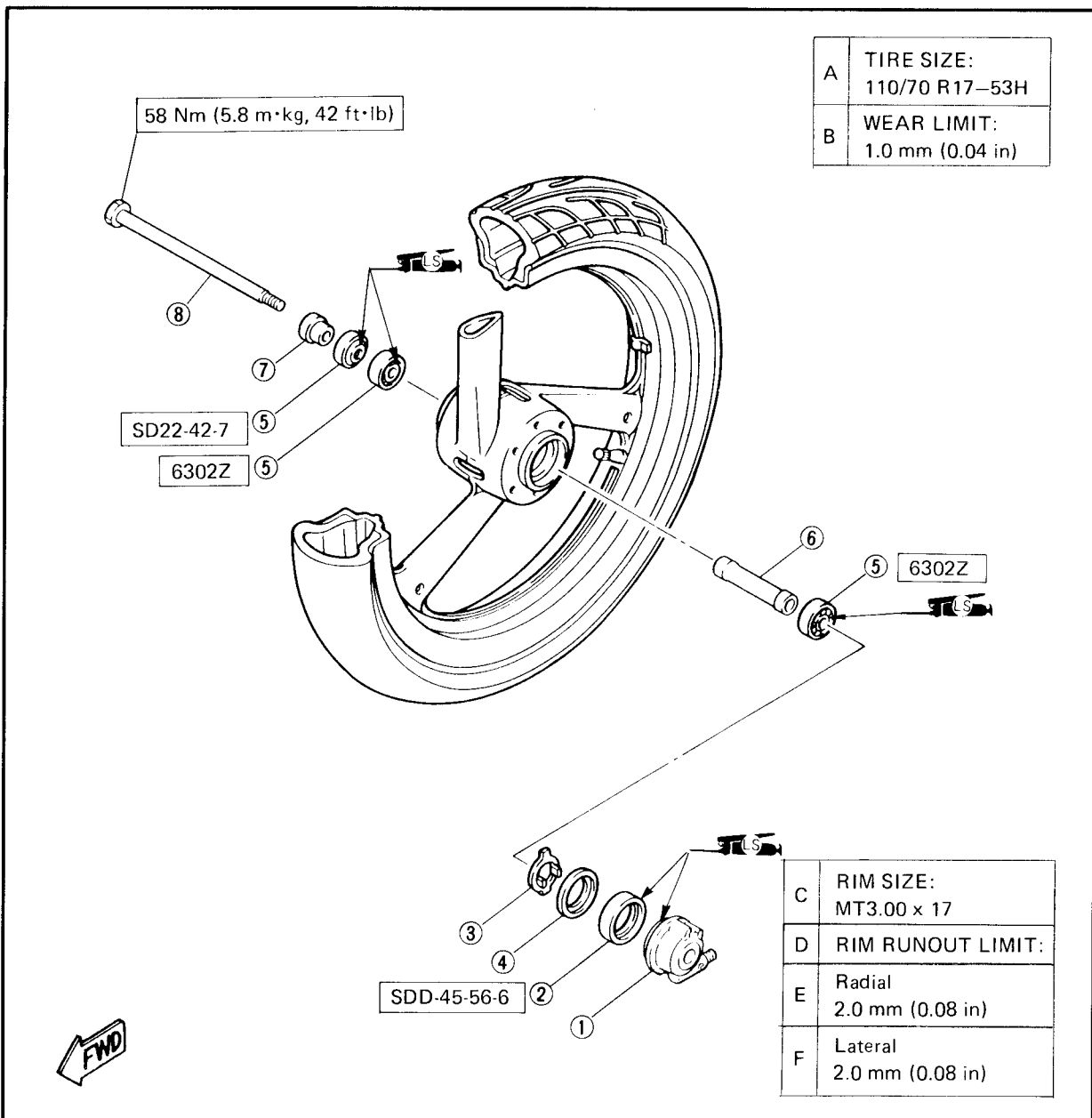
CHASSIS

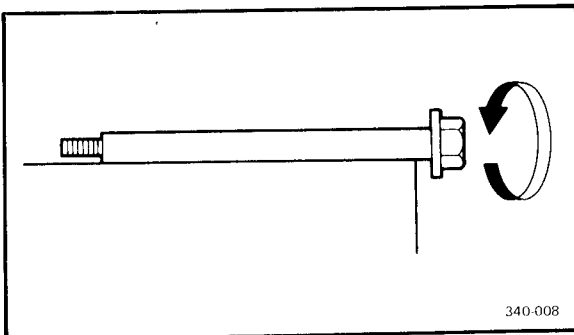
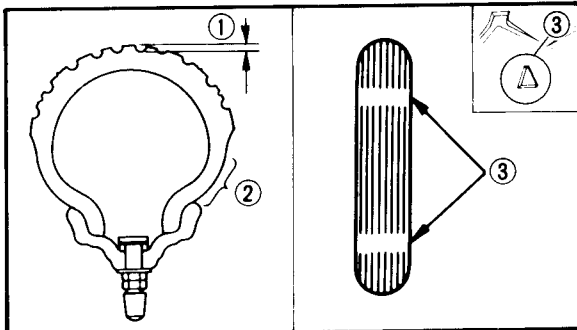
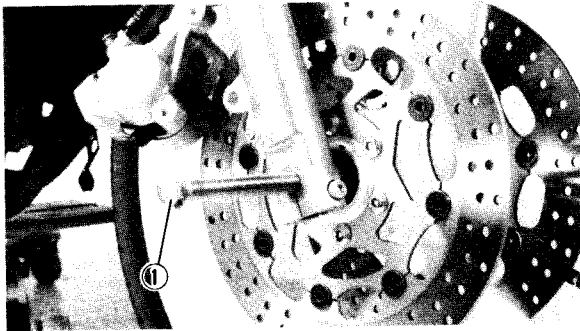
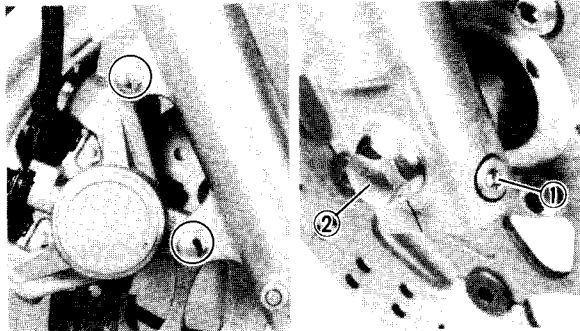
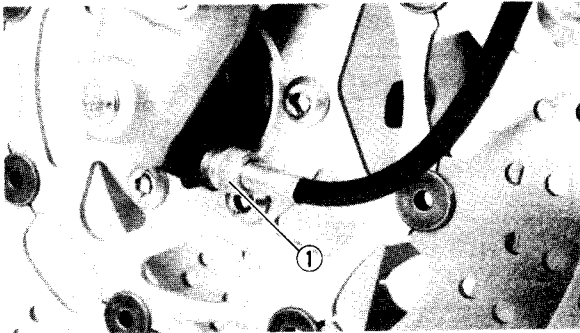
FRONT WHEEL

- ① Gear unit assembly ⑤ Bearing
- ② Oil seal ⑥ Spacer
- ③ Meter clutch ⑦ Collar
- ④ Clutch retainer ⑧ Wheel axle

TIRE AIR PRESSURE (COLD):		
Cold tire pressure	Front	Rear
Up to 90 kg (198 lb) load*	200 kPa (2.0 kg/cm ² , 28 psi)	230 kPa (2.3 kg/cm ² , 32 psi)
90 kg (198 lb) ~ Maximum load*	200 kPa (2.0 kg/cm ² , 28 psi)	250 kPa (2.5 kg/cm ² , 36 psi)
High speed riding	200 kPa (2.0 kg/cm ² , 28 psi)	250 kPa (2.5 kg/cm ² , 36 psi)

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





340-008

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 → Replace.

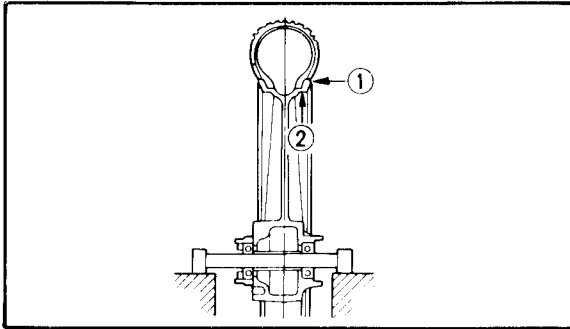
 **Minimum Tire Tread Depth:**
1.0 mm (0.04 in)

- 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 → Replace.

**Rim Runout Limits:**

Radial ① : 2.0 mm (0.08 in)

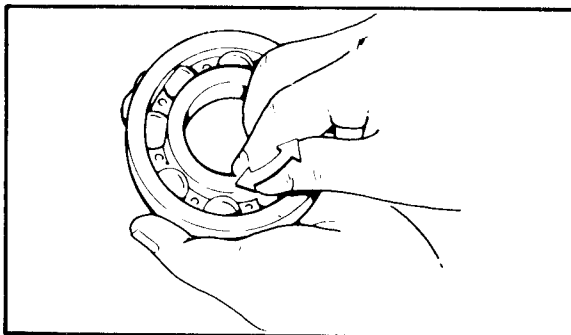
Lateral ② : 2.0 mm (0.08 in)

⚠ 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:**

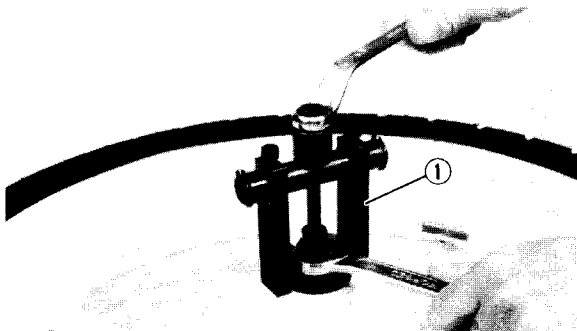
1.5 Nm (0.15 m · kg, 1.1 ft · lb)



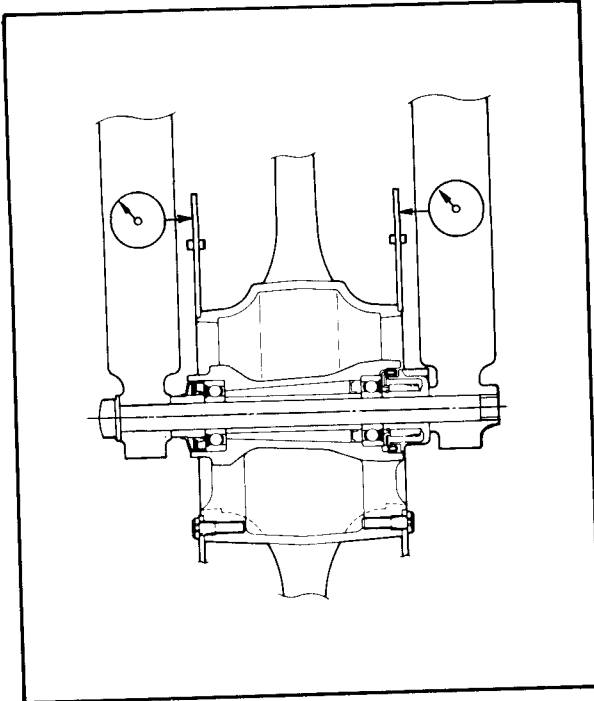
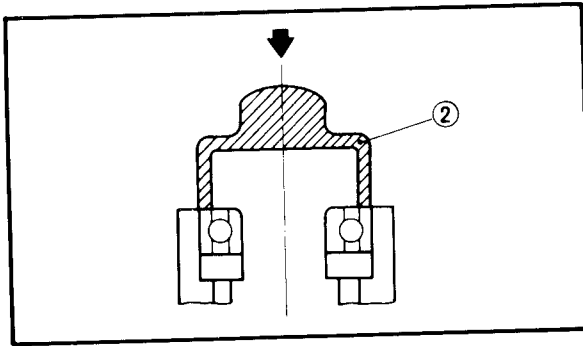
5. Inspect:

- Wheel bearings

Bearings allow play in the wheel hub or wheel turns roughly → Replace.

**Wheel bearing replacement steps:**

- Clean the outside of the wheel hub.
- Remove the bearing using a general bearing puller ①.
- Install the new bearing 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 the removal procedure. Note the following points.

1. Lubricate:

- Bearings
- Oil seals



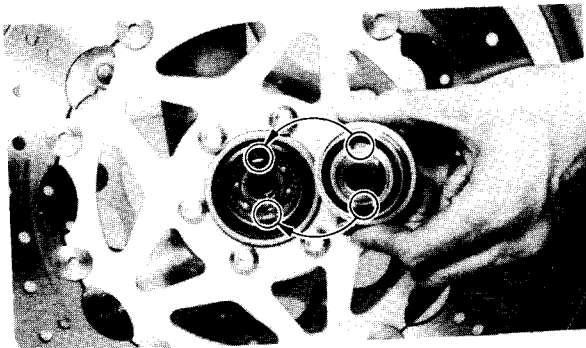
Lithium – Soap Base Grease

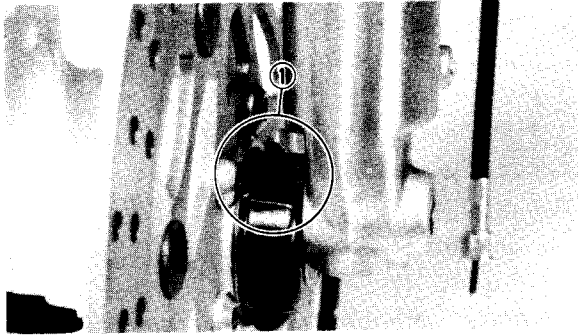
2. Install:

- Speedometer gear unit

NOTE:

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





3. Install:

- Front wheel

NOTE:

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

4. Tighten:

- Front axle
- Pinch bolt (Front axle)
- Brake calipers (Right/Left)
- Speedometer cable

**Front Axle:**

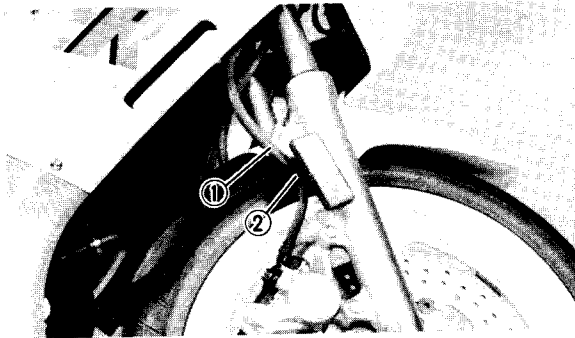
58 Nm (5.8 m·kg, 42 ft·lb)

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.

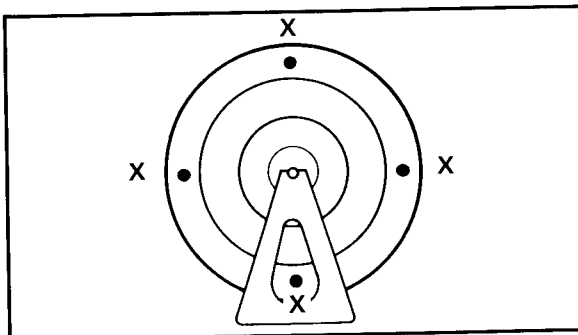
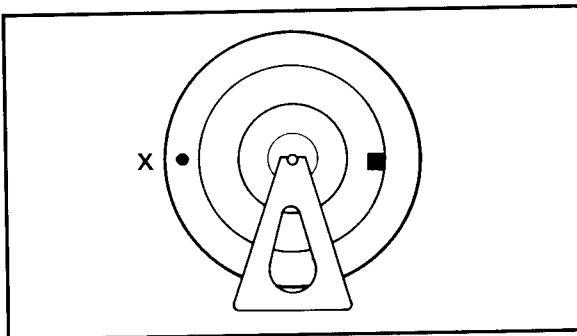
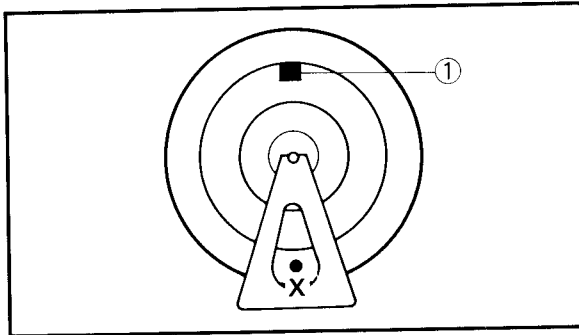
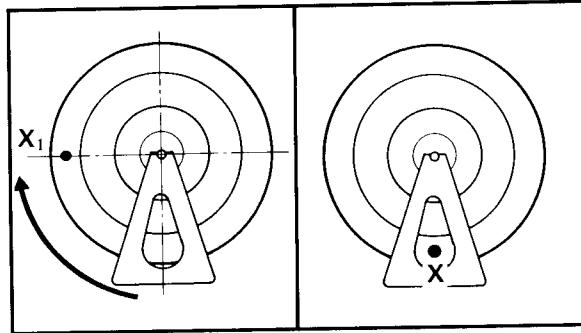
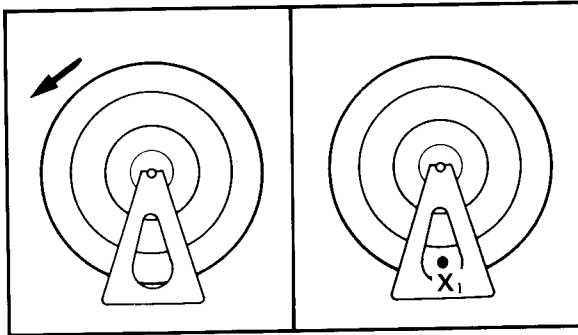
- ① Brake hose
- ② Brake hose holder

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:

- Spin the wheel and wait for it to rest.
- Put an "X₁" mark on the wheel bottom spot.
- Turn the wheel so that the "X₁" mark is 90° up.
- Let the wheel fall and wait for it to rest. Put an "X₂" mark on the wheel bottom spot.
- Repeat the above b., c., and d. several times until these marks come to the same spot.
- 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:

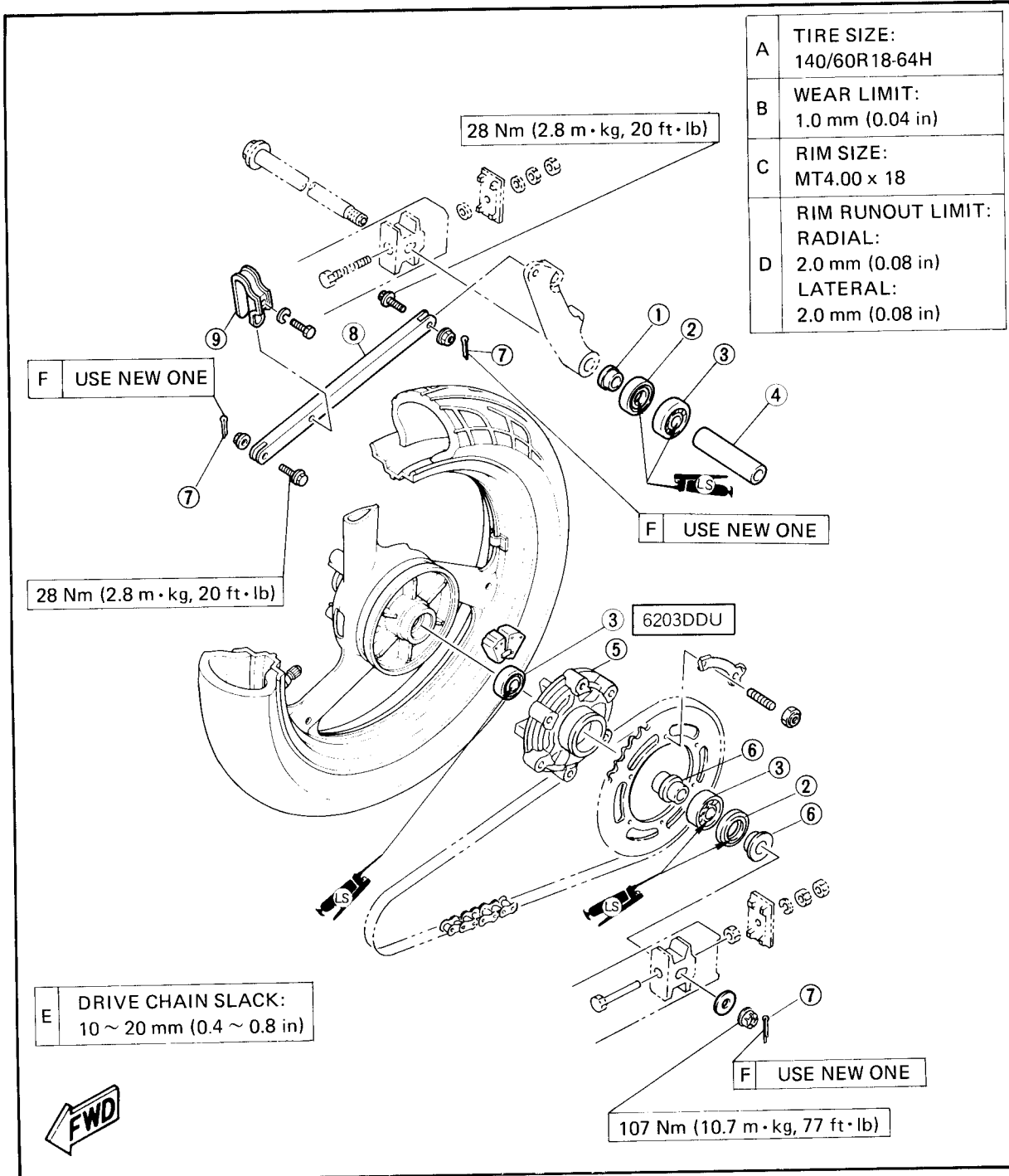
- Wheel balance

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:

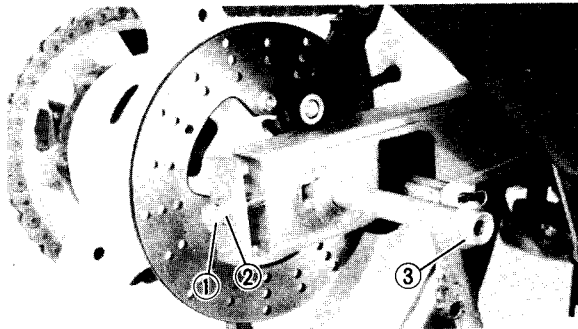
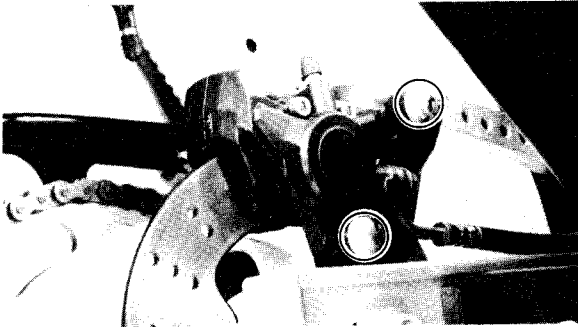
Securely support the motorcycle so there is no danger of it falling over.

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 – INSPECTION".

2. Measure:
 - Wheel runout

Refer to the "FRONT WHEEL – INSPECTION".

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:

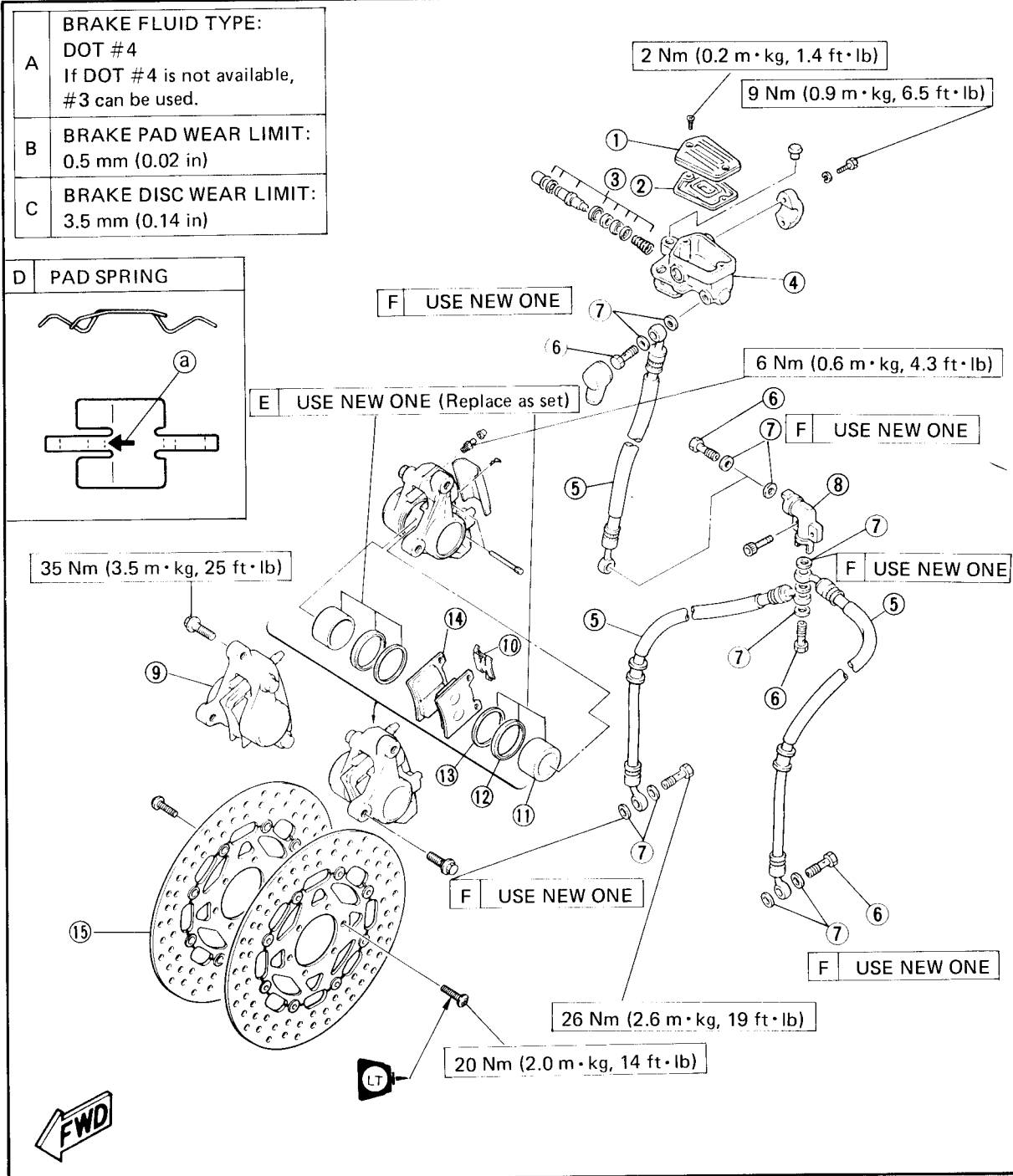
- Wheel balance

Refer to the "FRONT WHEEL – STATIC WHEEL BALANCE ADJUSTMENT" section in the CHAPTER 7.

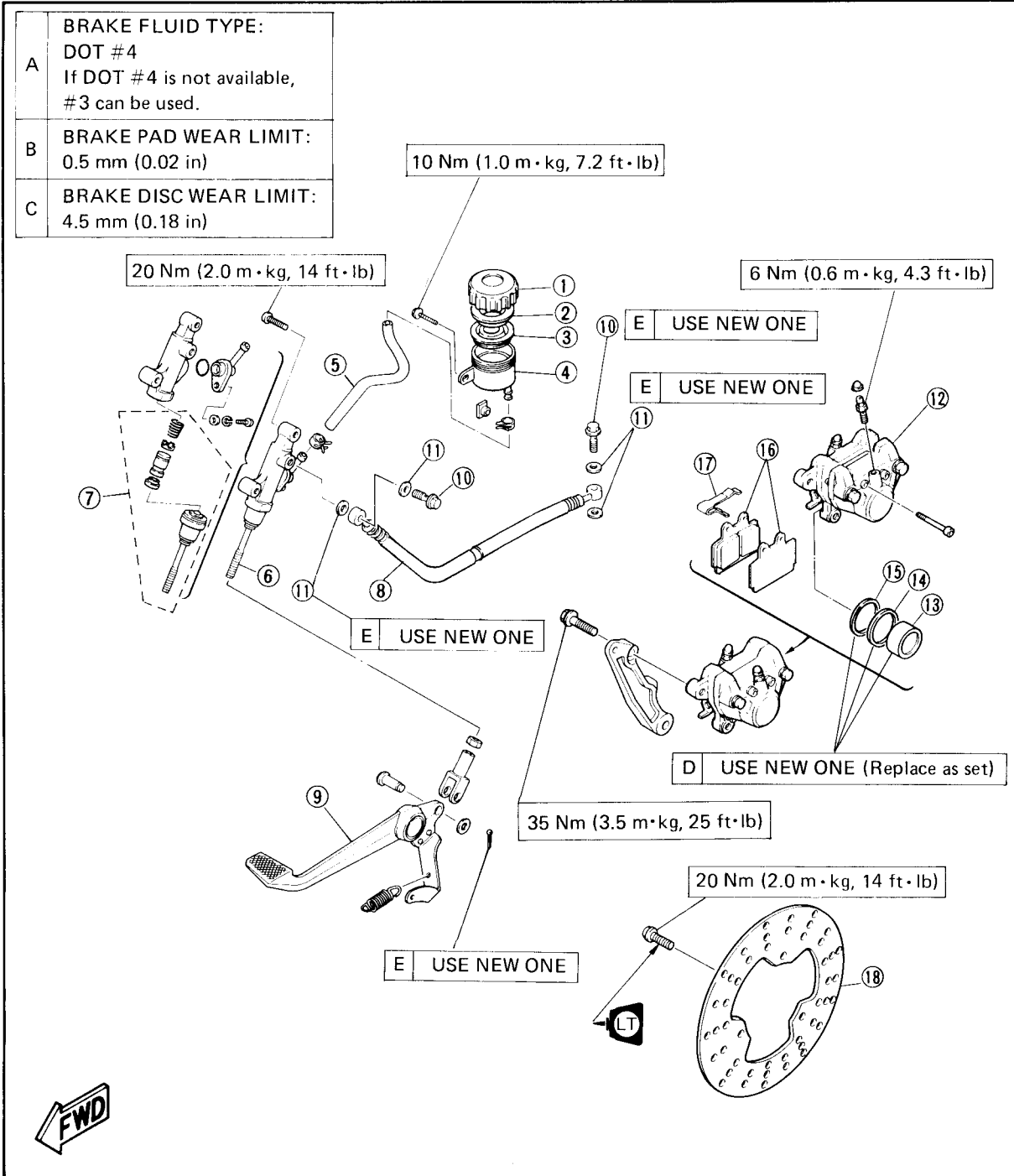
FRONT AND REAR BRAKE

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



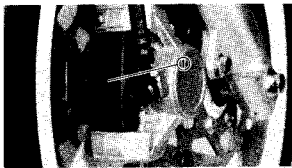
CAUTION:

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.

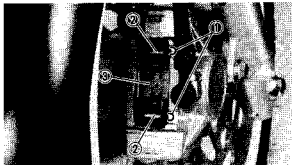
Solvents will cause seals to swell and distort. Use only clean brake fluid for cleaning. Use care with brake fluid. Brake fluid is injurious to eyes and will damage painted surfaces and plastic parts.

BRAKE PAD REPLACEMENT**NOTE:**

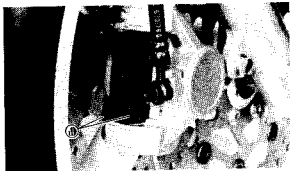
It is not necessary to disassemble the brake caliper and brake hose to replace the brake pads.

**Front Brake**

1. Remove:
 - Cover ①



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

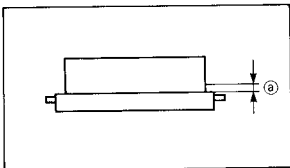


3. Remove:

- 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.



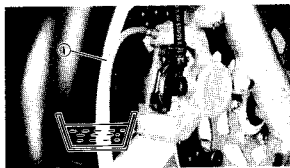
NOTE:

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)

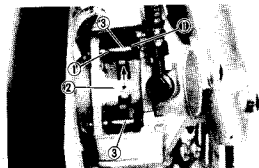


4. Connect a suitable hose ① tightly to the caliper bleed screw. Then, place other end of this hose into an open container.
5. Loosen the caliper bleed screw and push the piston into the caliper by your finger.
6. Tighten:
 - Caliper bleed screw



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



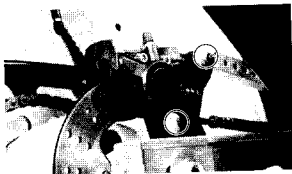
8. Inspect:

- Brake fluid level
Refer to the "BRAKE FLUID INSPECTION" section in the CHAPTER 3.

① "LOWER" level line

9. Check:

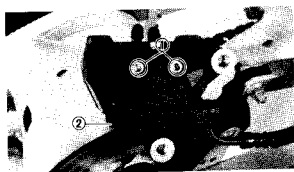
- Brake lever operation
A softy or spongy filling → Bleed brake system.
Refer to the "AIR BLEEDING" section in the CHAPTER 3.



Rear Brake

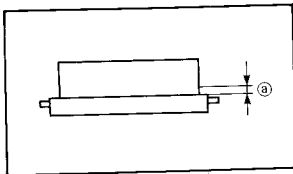
1. Remove:

- Bolts (Brake caliper)



2. Remove:

- Retaining bolts ①
- Brake pads ②
- Pad spring

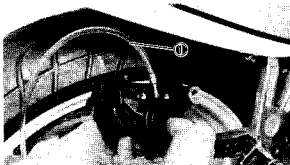


NOTE:

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



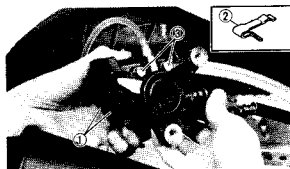
Wear Limit:
0.5 mm (0.02 in)



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 pistons into the caliper by your finger.
6. Tighten:
 - Caliper bleed screw



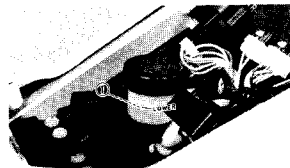
Caliper Bleed Screw:
6 Nm (0.6 m · kg, 4.3 ft · lb)



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 filling → Bleed brake system.
Refer to the "AIR BLEEDING" section in the CHAPTER 3.

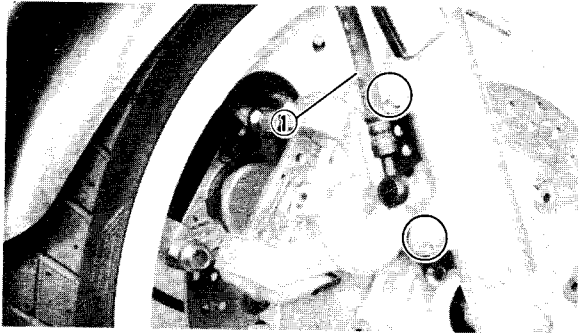
**CALIPER DISASSEMBLY****NOTE:** _____

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.

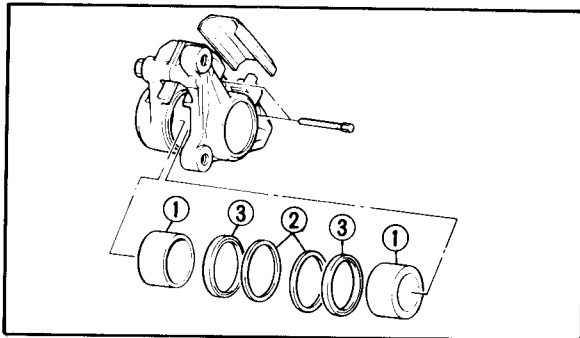
**2. Remove:**

- Brake hose ①

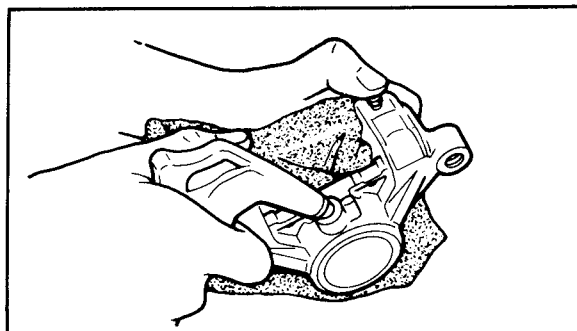
Place the open hose end into a container and pump the old fluid out carefully.

3. Remove:

- Caliper body

**4. Remove:**

- Pistons ①
- Dust seals ②
- Piston seals ③

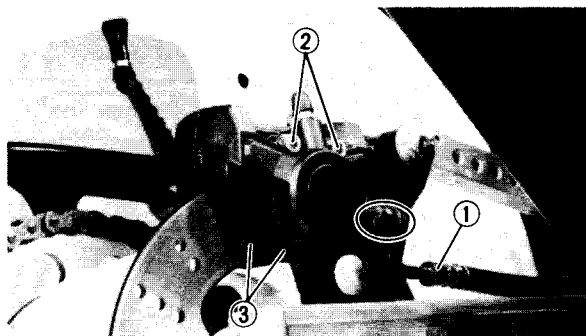


Remove steps:

- 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.



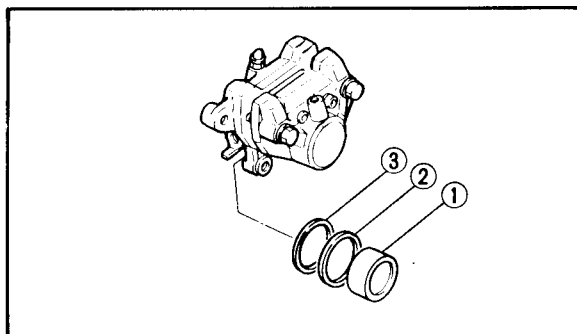
Rear Brake

1. Remove:

- Brake hose ①
Place the open hose end into a container and pump the old fluid out carefully.

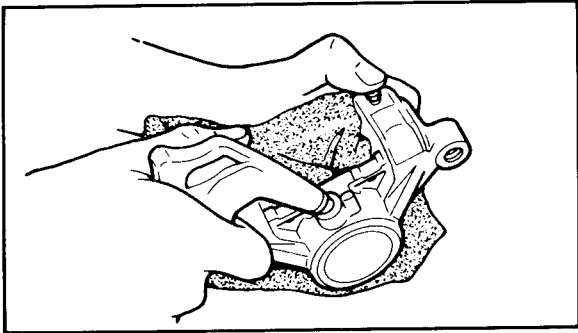
2. Remove:

- 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:**

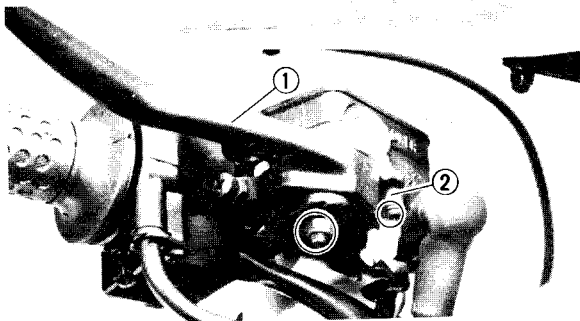
- Blow compressed air into the tube joint opening to force out the piston from the caliper body.

⚠ WARNING:

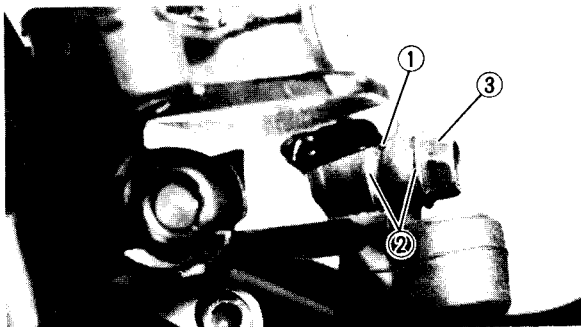
- Never try to pry out the piston.
- Cover the piston with a rag. Use care so that piston does not cause injury as it is expelled from the cylinder.

MASTER CYLINDER DISASSEMBLY**NOTE:**

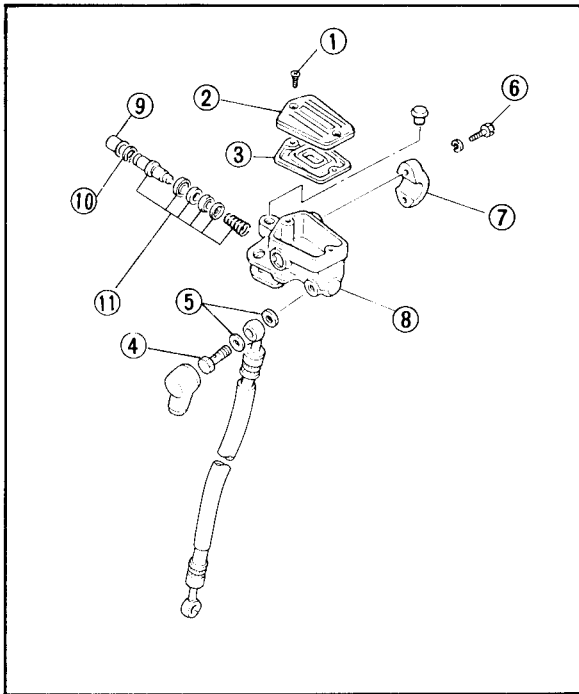
Before disassembling the front or rear brake master cylinders, drain the brake system of the brake fluid.

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

- Brake lever ①
- Brake switch ②

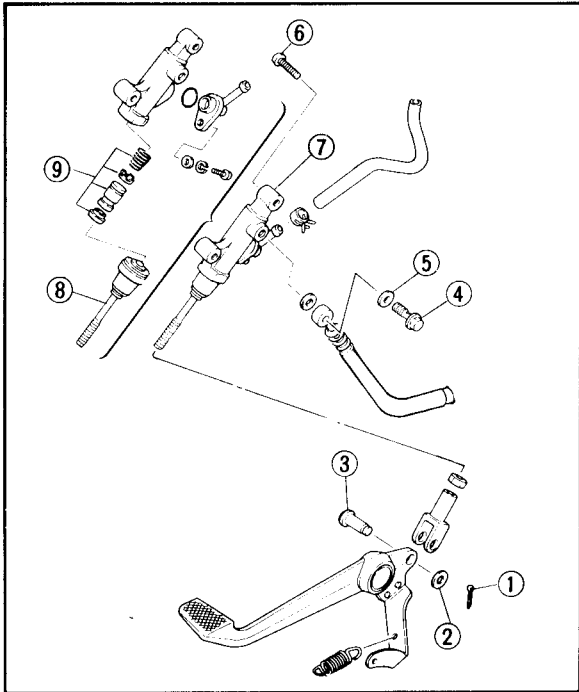
**2. Remove:**

- Union bolt ①
- Copper washer ②
- Brake hose ③



3. Remove:

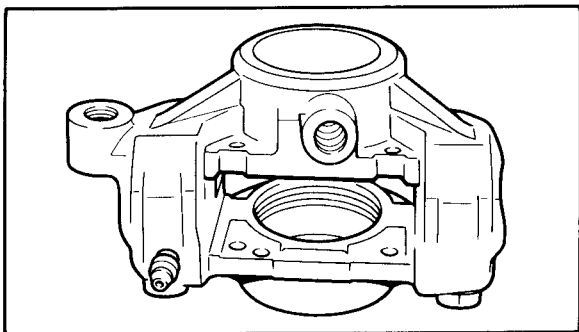
- Screw (Master cylinder cap) ①
- Master cylinder cap ②
- Rubber seal ③
- Union bolt ④
- Copper washer ⑤
- Bolt (Master cylinder bracket) ⑥
- Master cylinder bracket ⑦
- Master cylinder ⑧
- Dust boot ⑨
- Circlip ⑩
- Master cylinder kit ⑪



Rear Brake

1. Remove:

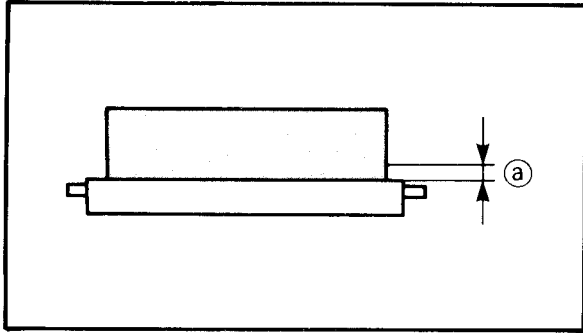
- Cotter pin ①
- Plain washer ②
- Shaft ③
- Union bolt ④
- Copper washer ⑤
- Bolt (Master cylinder) ⑥
- Master cylinder ⑦
- Adjusting rod ⑧
- Master cylinder kit ⑨



INSPECTION AND REPAIR


1. Inspect:

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



2. Measure:

- Brake pad thickness ①
- Out of specification → Replace.

	<p>Pad Wear Limit: 0.5 mm (0.02 in)</p>
---	--

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

3. Inspect:

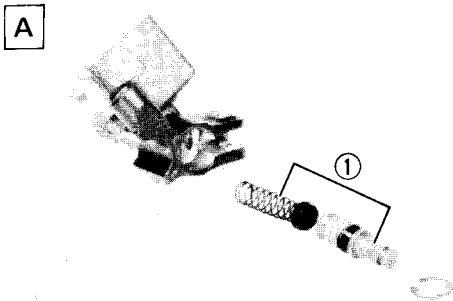
- Brake hose
- Cracks/Damage → Replace.



4. Inspect:

- Master cylinder body
- Scratches/Wear → Replace.

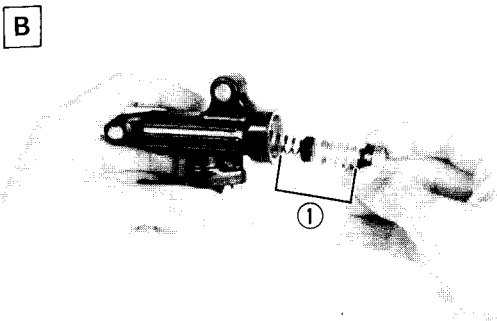
NOTE: _____
 Clean all passages with new brake fluid.



5. Inspect:

- Master cylinder kit ①
- Scratches/Wear → Replace.

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





ASSEMBLY

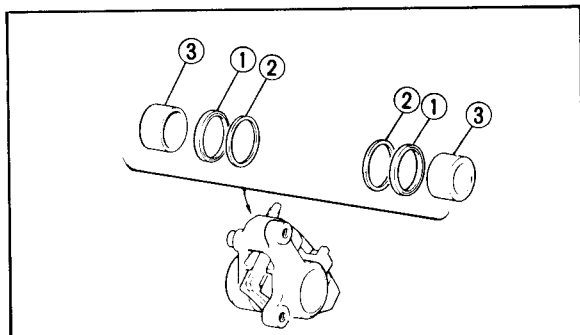
⚠ WARNING:

- 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

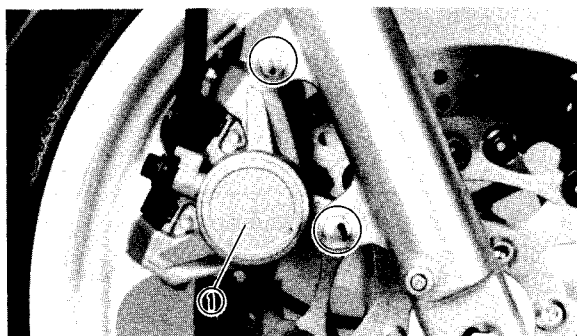
2. Install:

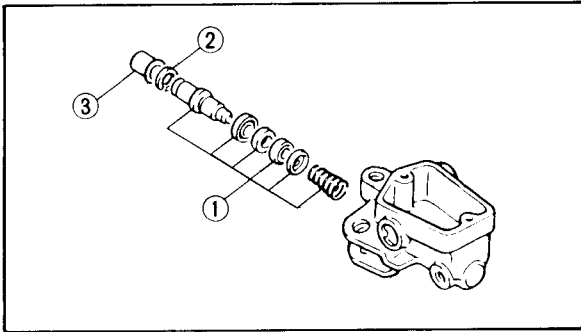
- Brake pad
- Pad spring
- Retaining bolt
- Retaining crip

Refer to the "BRAKE PAD REPLACEMENT" section.

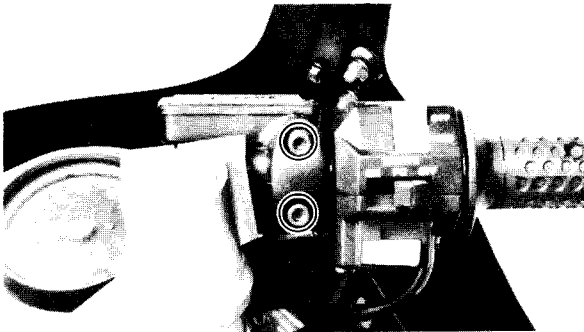
3. Install:

- Brake caliper ①


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




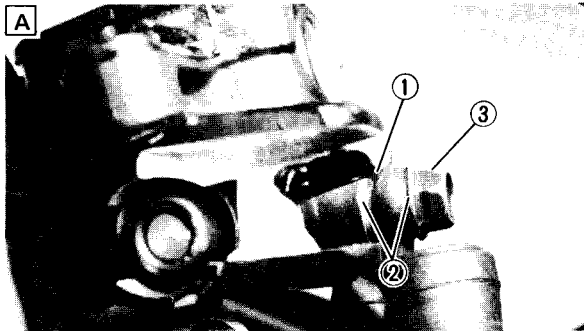
4. Install:
- Master cylinder kit ①
 - Circlip ②
 - Dust boot ③




5. Install:
- Master cylinder

NOTE: _____
Tighten first the upper bolt, then the lower bolt.

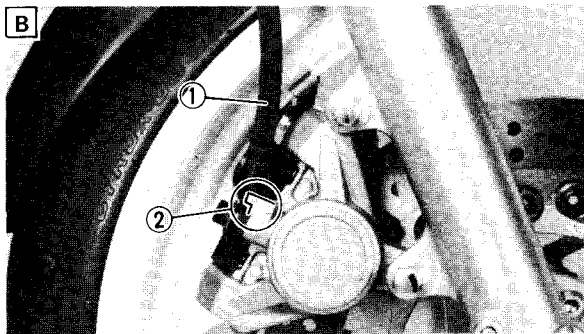
 **Bolts (Master Cylinder Bracket):**
9 Nm (0.9 m · kg, 6.5 ft · lb)



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

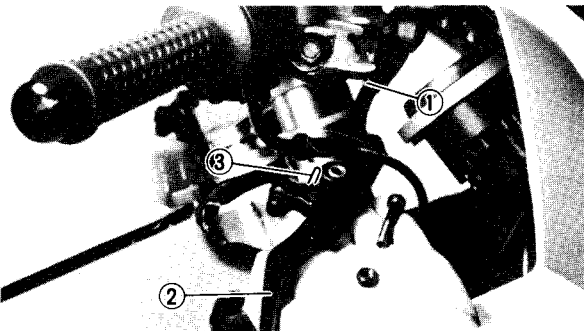
 **Union Bolts:**
26 Nm (2.6 m · kg, 19 ft · lb)

- 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:**

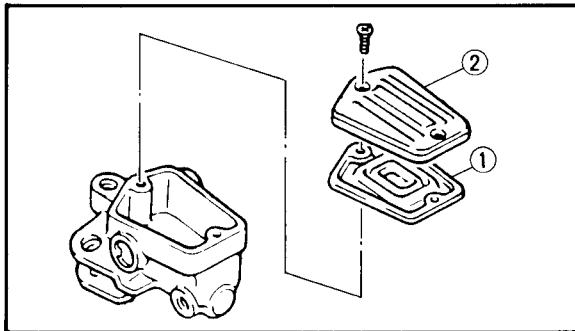
DOT # 4

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:

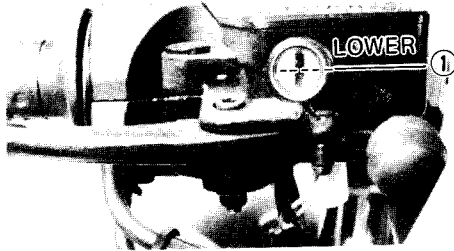
- Rubber seal ①
- Master cylinder cap ②

**Screws (Master Cylinder Cap):**
2 Nm (0.2 m · kg, 1.4 ft · lb)

10. Air bleed:

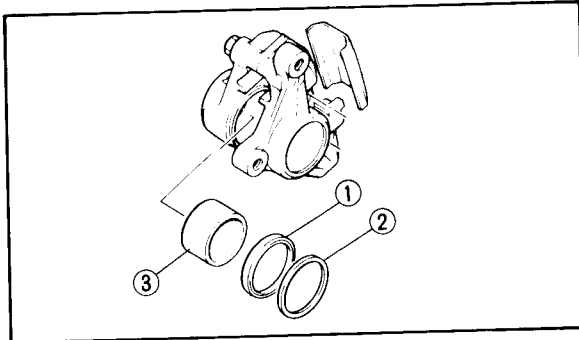
- Brake system

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



11. Inspect:

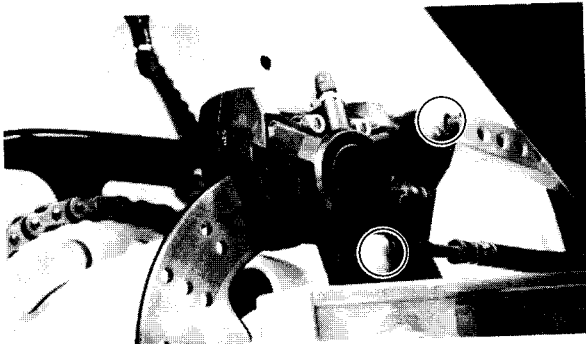
- Brake fluid level
Fluid level is under "LOWER" level line
① → Replenish.
Refer to the "BRAKE FLUID INSPECTION" section in the CHAPTER 3.



Rear Brake

1. Install:

- Piston seal ①
- Dust seal ②
- Piston ③



2. Install:

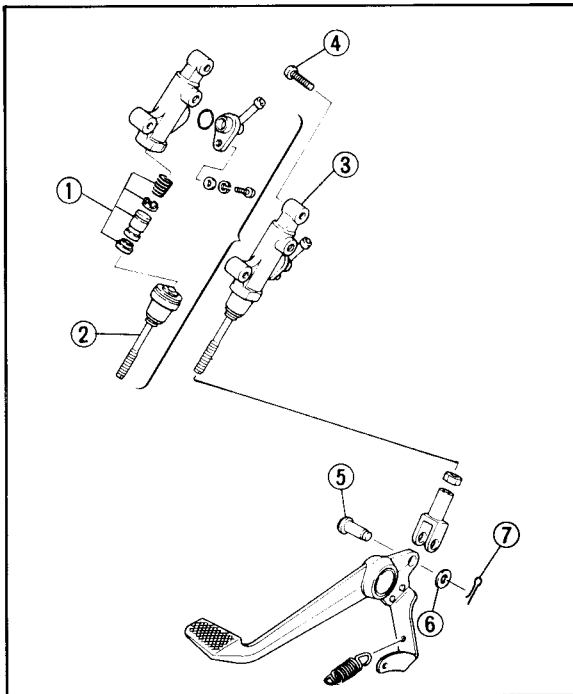
- Brake caliper

	<p>Bolts (Brake Caliper): 35 Nm (3.5 m · kg, 25 ft · lb)</p>
--	---

3. Install:


- Brake pad
- Pad spring
- Retaining bolt

Refer to the "BRAKE PAD REPLACEMENT" section.

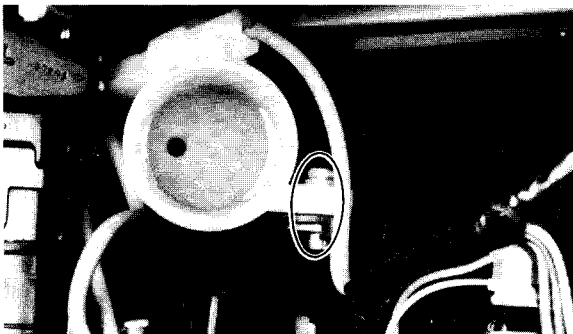


4. Install:

- Master cylinder kit ①
- Adjusting rod ②
- Master cylinder ③
- Bolt (Master Cylinder) ④
- Shaft ⑤
- Plain washer ⑥
- Cotter pin ⑦

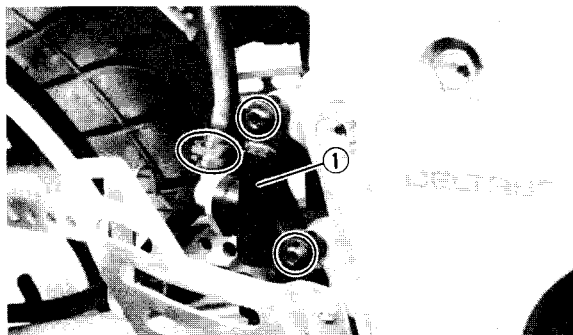
	Bolt (Master Cylinder): 20 Nm (2.0 m·kg, 14 ft·lb)
---	--

⚠ WARNING: _____
Always use new cotter pin.




5. Install:

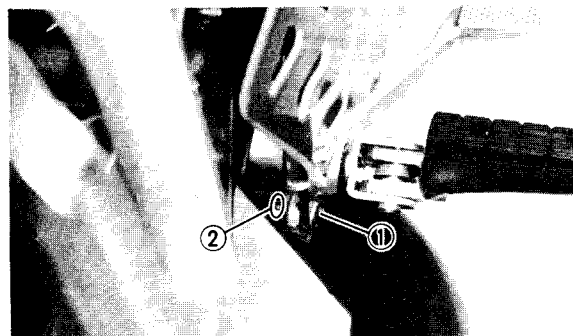
- Reservoir tank



6. Install:

- Master cylinder assembly ①

	Bolts (Master Cylinder Assembly): 35 Nm (3.5 m·kg, 25 ft·lb)
---	--




7. Install:

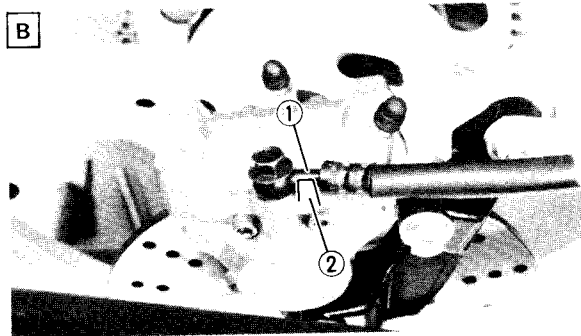
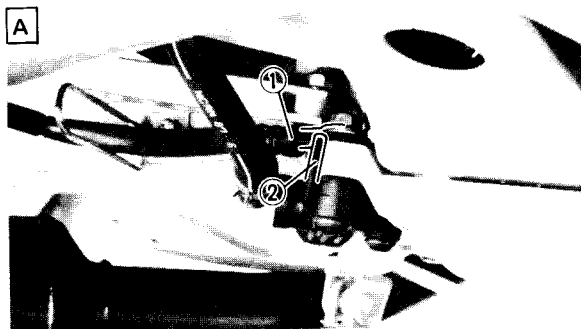
- Pin ①
- Plain washer
- Cotter pin ②

⚠ 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** 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

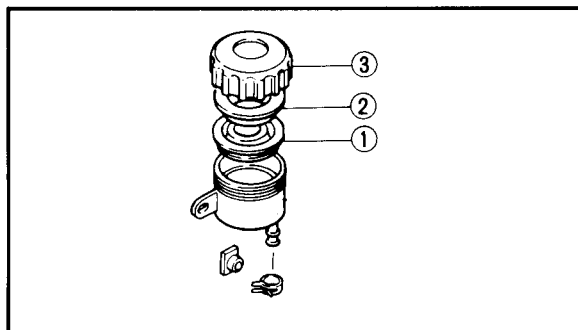
	Recommended Brake Fluid: DOT #4 If DOT #4 is not available, DOT #3 can be used.
---	---

⚠ 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.

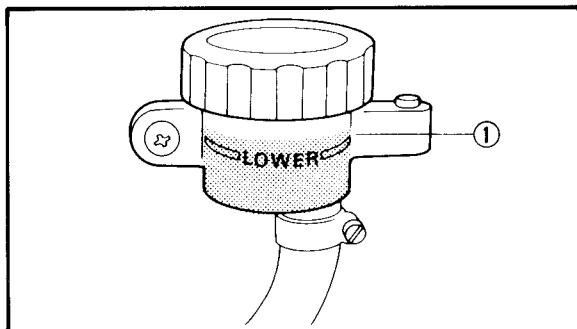


10. Install:

- Diaphragm ①
- Bush ②
- Reservoir tank cap ③

11. Air bleed:

- Brake system
Refer to the "AIR BLEEDING" section in the CHAPTER 3.

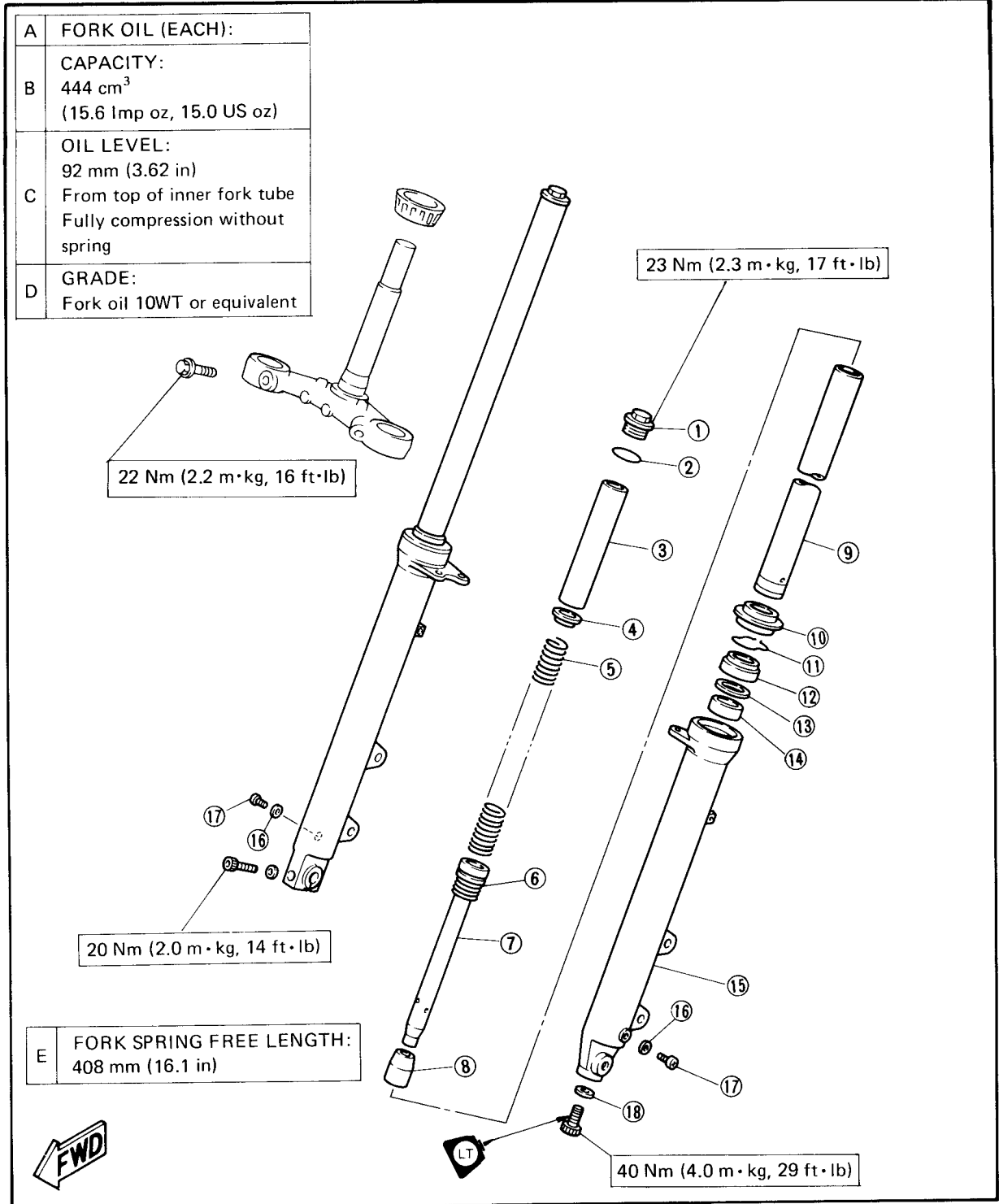


12. Inspect:

- 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

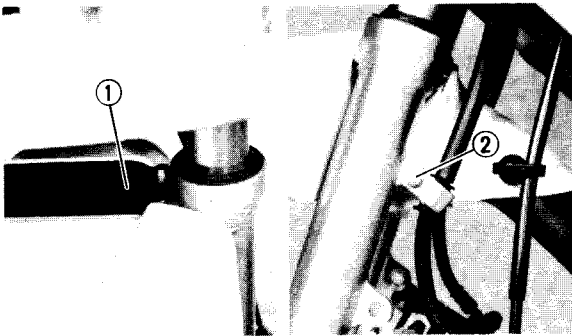
⚠ WARNING:

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.

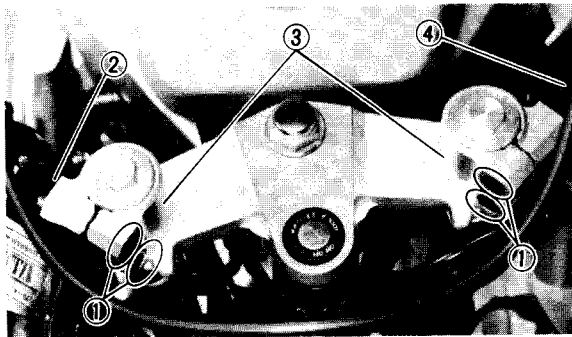
2. Remove:

- Front wheel
Refer to the "FRONT WHEEL – REMOVAL" section.



3. Remove:

- Front brake caliper
- Front fender ①
- Bolts (Brake hose clamp) ②

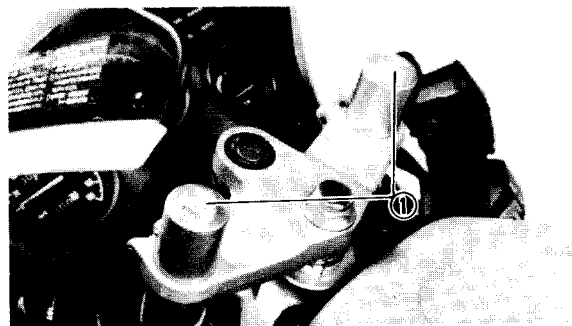


4. Loosen:

- Bolts (Handlebar bosses) ①

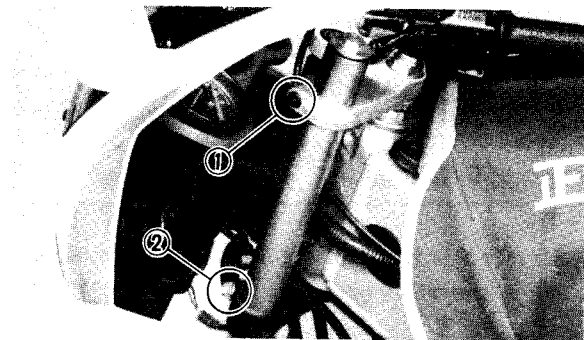
5. Remove:

- Handlebar (Right) ②
- Handlebar bosses (Left and right) ③ with handlebar (Left) ④



6. Loosen:

- Cap bolts ①

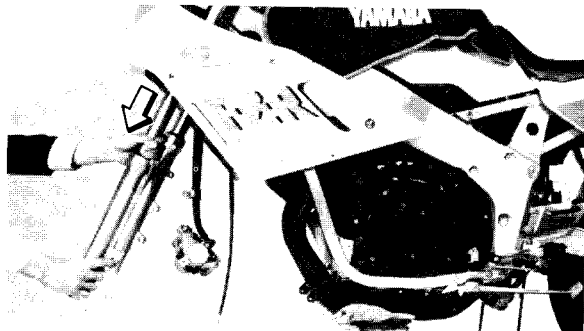


7. Loosen:

- Pinch bolt (Handlebar crown) ①
- Pinch bolt (Steering stem) ②

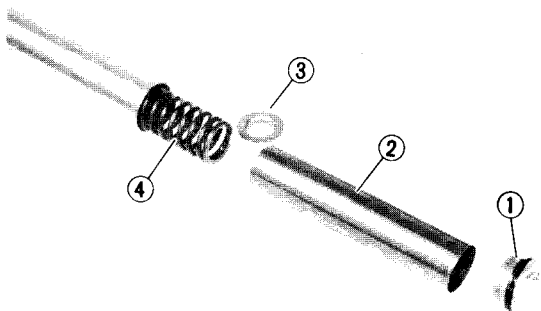
⚠ WARNING:

Support the fork before loosening the pinch bolts.



8. Remove:

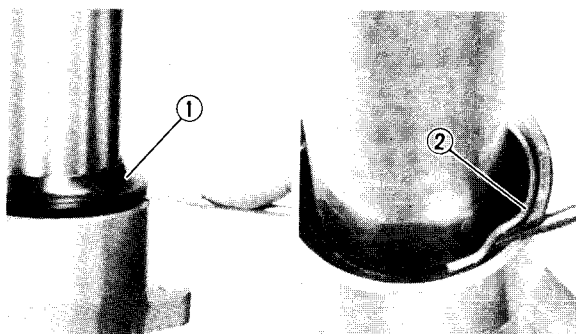
- Front fork



DISASSEMBLY

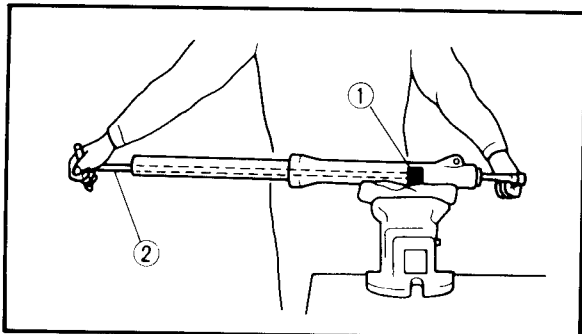
1. Remove:

- 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.



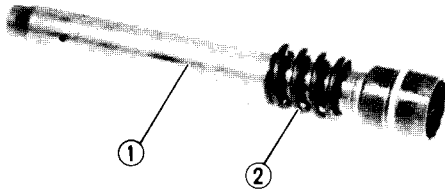
Damper Rod Holder:
P/N YM-01300-1

T-Handle:
P/N YM-01326



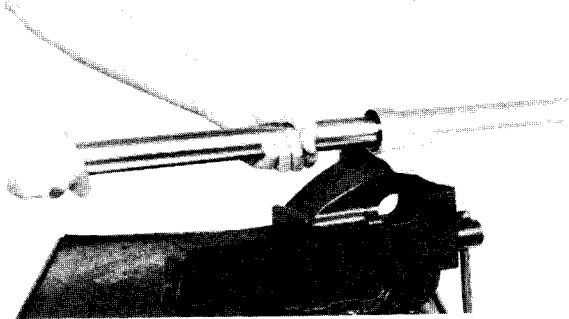
4. Remove:

- Damper rod ①
- Rebound spring ②



5. Remove:

- Inner tube

**Inner tube removal steps:**

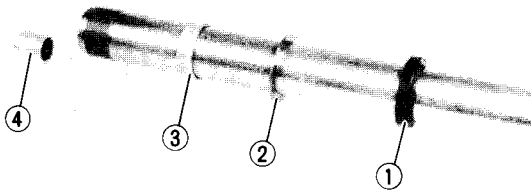
- Hold fork leg horizontally.
- Clamp the caliper mounting boss of the outer tube securely in a vise with soft jaws.
- Pull out the inner tube from the outer tube by forcefully, but carefully, with drawing the inner tube.

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

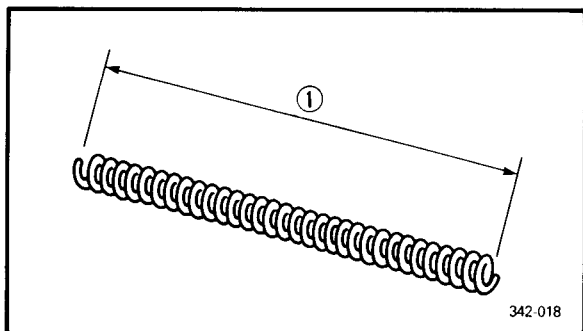
**INSPECTION**

1. Inspect:


- Inner tube
- Scratches/Bends → Replace.

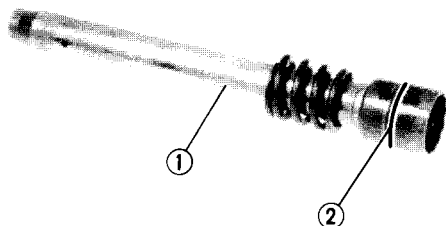
⚠ WARNING:

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.

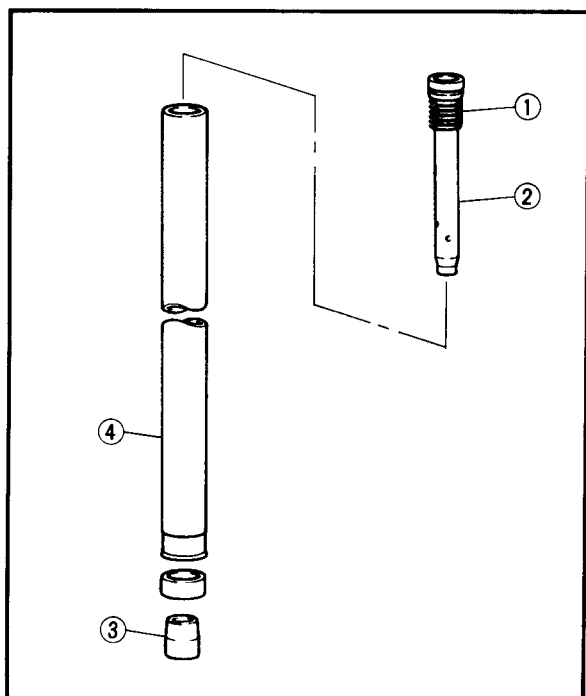
ASSEMBLY

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

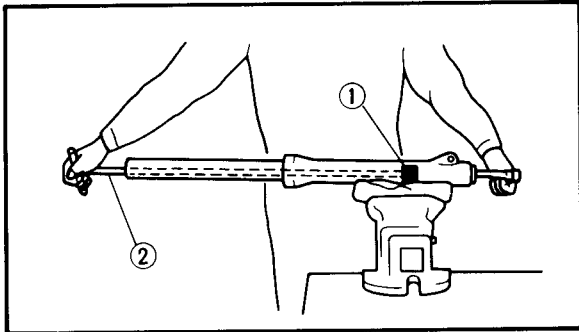
NOTE: _____

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 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.

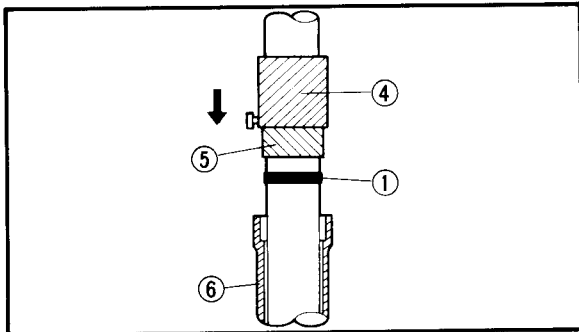


Damper Rod Holder:
P/N YM-01300-1

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)

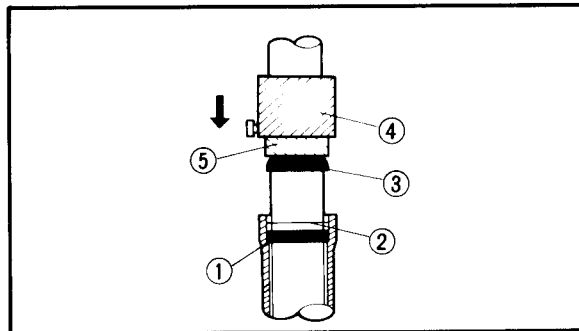
Into the outer tube ⑥ .

- Seal spacer ②

On the top of guide bushing ① .

- Oil seal ③

Use the Fork Seal Driver Weight ④ and Adapter ⑤ .



Fork Seal Driver Weight:
P/N YM-33963

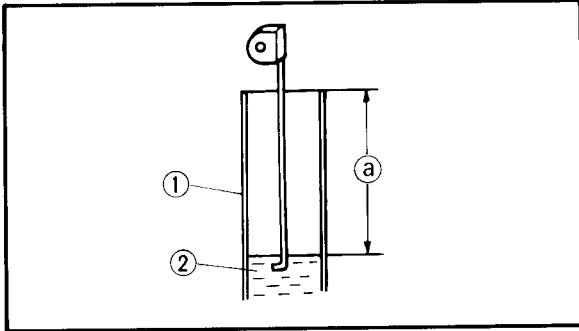
Fork Seal Driver Adapter:
P/N YM-01372

- 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 (a) :
 92 mm (3.62 in)
 From the top of inner fork tube
 fully compressed without spring.

- ① Inner tube
- ② Fork oil

5. Install:

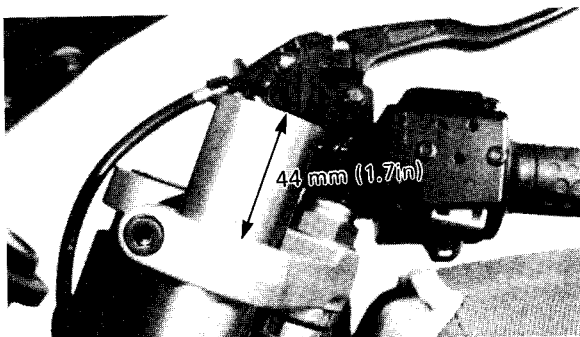
- Fork spring
 With the smaller pitch side up.
- Spring seat
- Collar
- Cap bolt
 Temporarily tighten the cap bolt.



Cap Bolt:
 23 Nm (2.3 m·kg, 17 ft·lb)

INSTALLATION

Reverse the removal procedure.
 Note the following point.

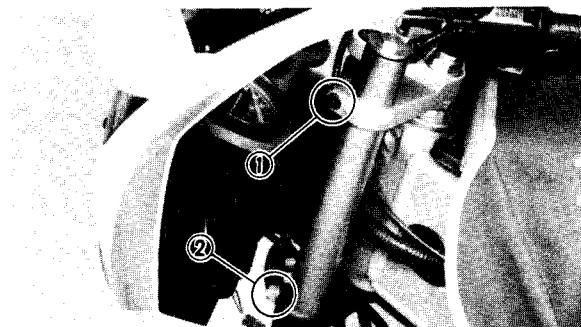


1. Install:

- 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)

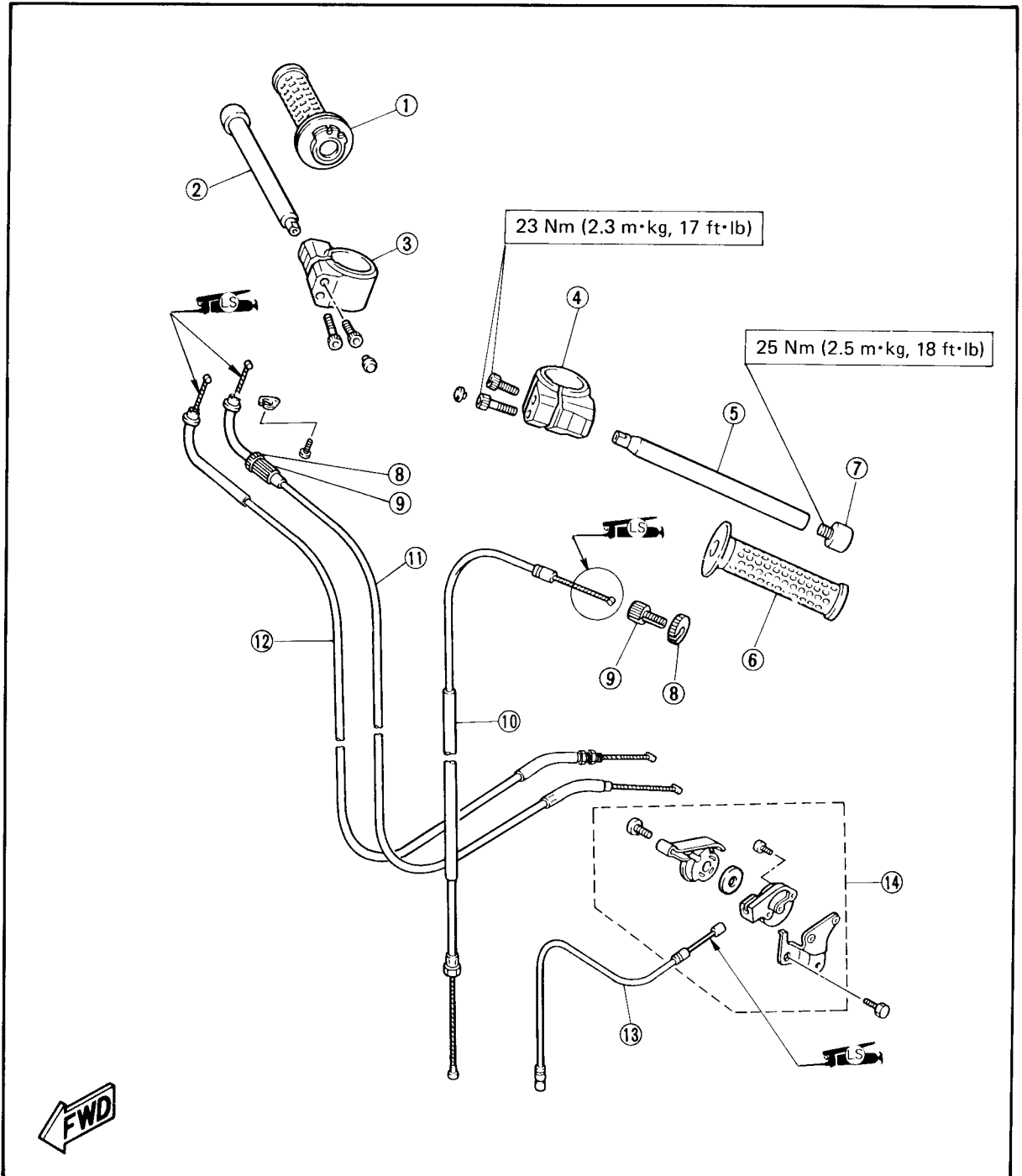
⚠ WARNING:

Make sure that the brake hoses are routed properly.

STEERING HEAD AND HANDLEBAR

Handlebar

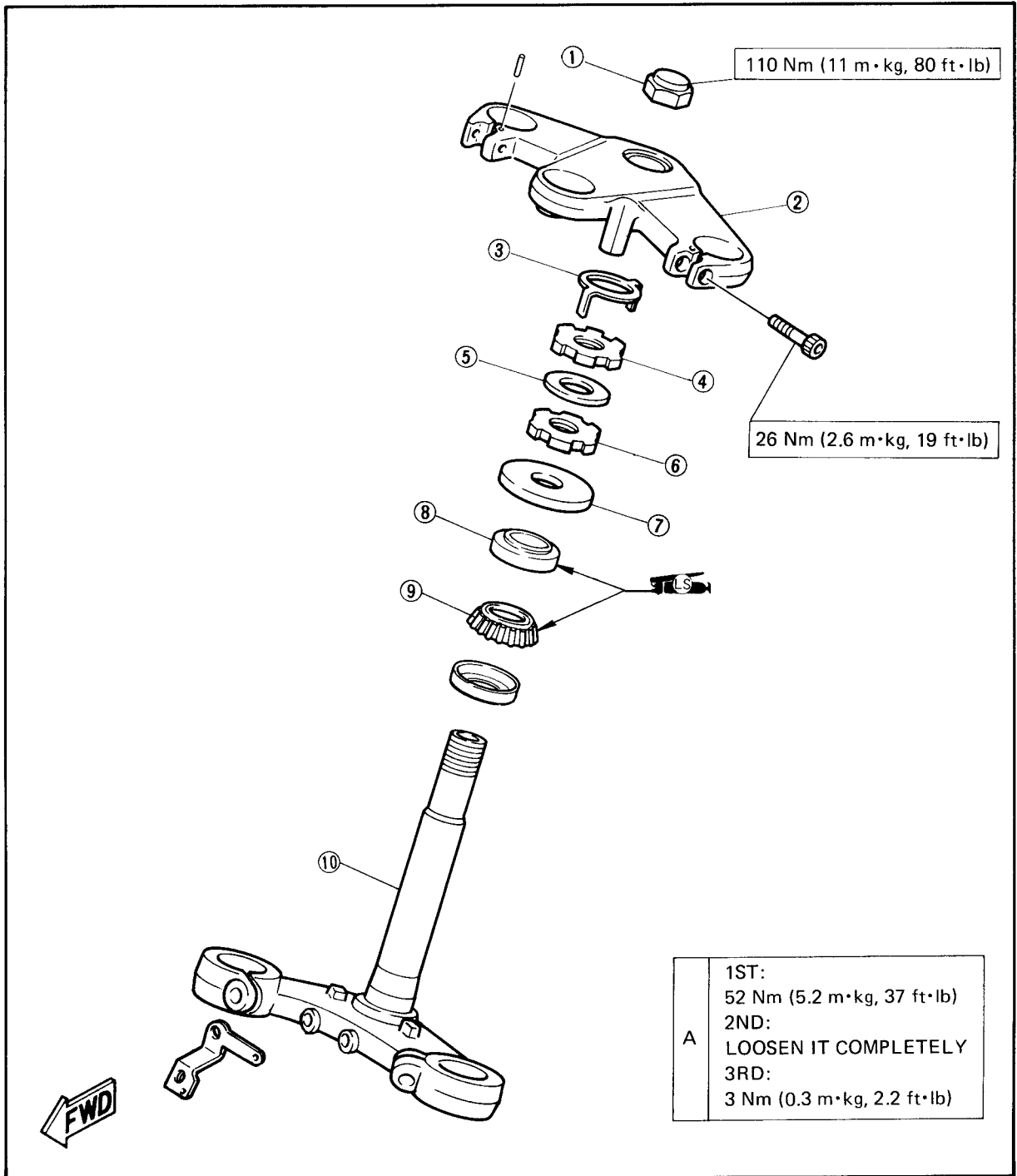
- ① Throttle guide tube
- ② Handlebar (Right)
- ③ Handlebar boss (Right)
- ④ Handlebar boss (Left)
- ⑤ Handlebar (Left)
- ⑥ Grip rubber
- ⑦ Handlebar grip end
- ⑧ Locknut
- ⑨ Adjuster
- ⑩ Clutch cable
- ⑪ Throttle cable 1
- ⑫ Throttle cable 2
- ⑬ Starter cable
- ⑭ Starter lever assembly





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



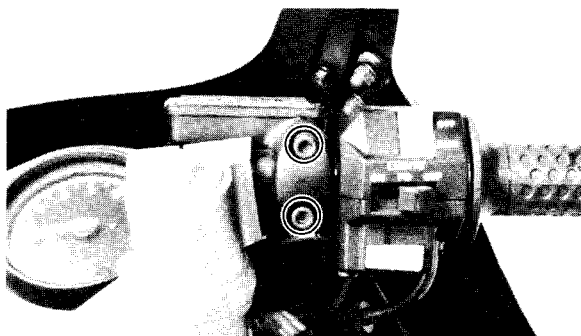


REMOVAL

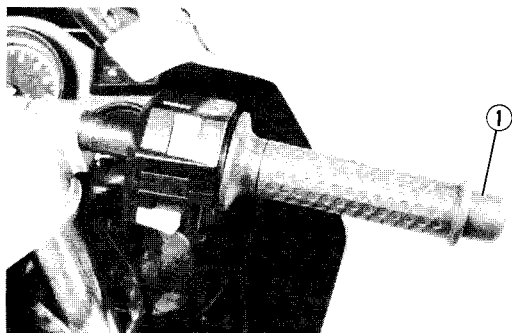
⚠ WARNING:

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

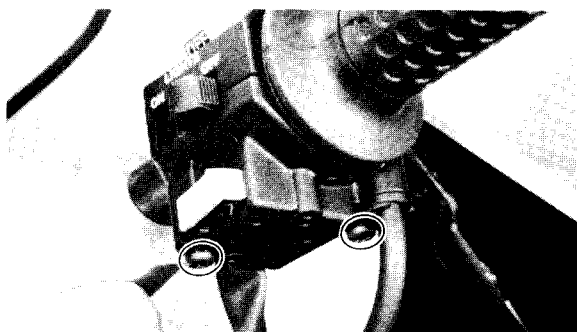
1. Elevate the front wheel by placing a suitable stand under the engine.
2. Remove:
 - Front wheel
Refer to the "FRONT WHEEL – REMOVAL" section.



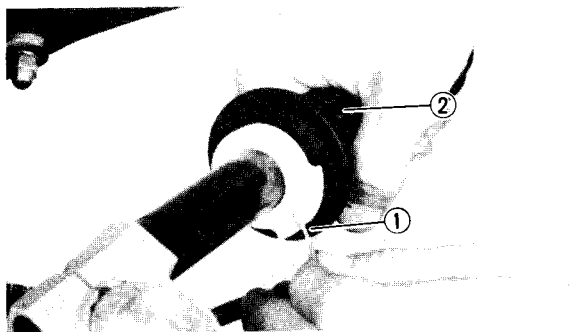
3. Remove:
 - Bracket (Master cylinder)



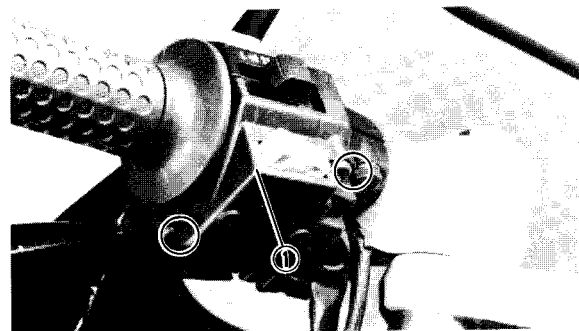
4. Remove:
 - Handlebar grip end (Right) ①



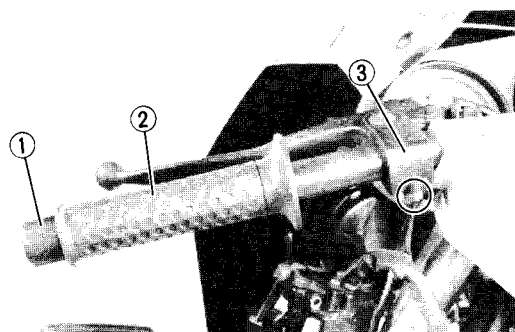
5. Remove:
 - Handlebar switch (Right)



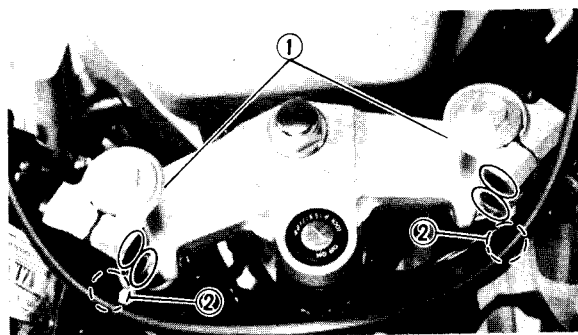
6. Remove:
- Throttle cable ①
 - Handlebar grip (Right) ②



7. Remove:
- Handlebar switch (Left) ①



8. Remove:
- Handlebar grip end (Left) ①
 - Handlebar grip (Left) ②
 - Clutch lever holder ③

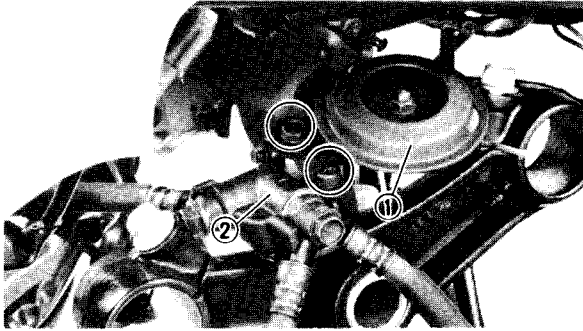


9. Remove:
- Handlebar (Right)
 - Handlebar bosses (Left and right) ① with handlebar (Left).

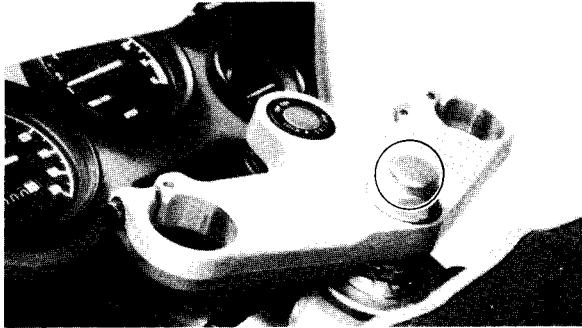
10. Loosen:
- Pinch bolt (Handlebar crown) ②

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.

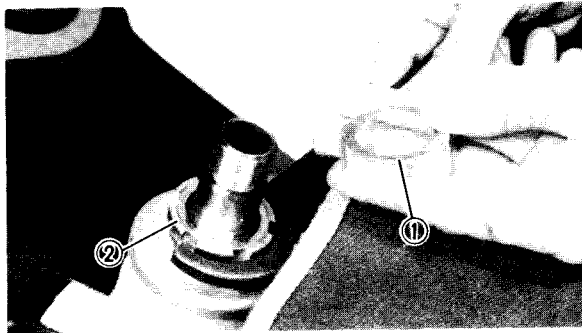
12. Remove:
- Front forks (Left and right)
- Refer to the "FRONT FORK – REMOVAL" section.



13. Remove:
- Horn ①
 - Joint (Brake hose) ②



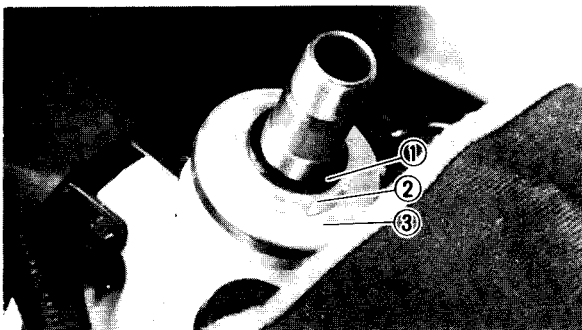
14. Remove:
- Handlebar crown



15. Remove:
- Lock washer ①
 - Ring nut (Upper) ②
- Use Ring Nut Wrench



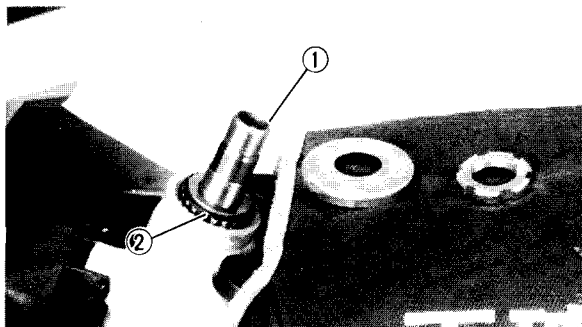
Ring Nut Wrench:
P/N YU-33975



16. Remove:
- Washer ①
 - Ring nut (Lower) ②
 - Bearing cover ③

⚠ WARNING:

Support the steering shaft so that it may not fall down.

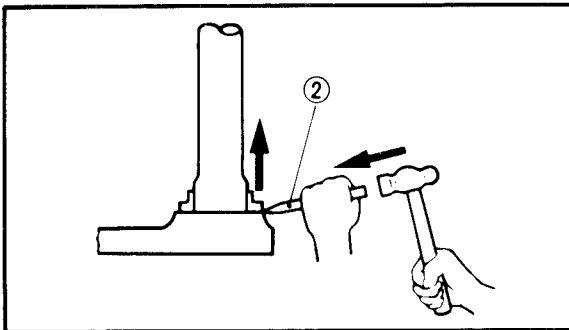
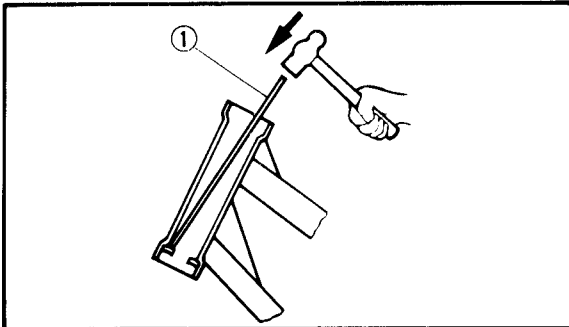


17. Remove:
- Steering stem ①
 - Bearing (Upper) ②
 - Bearing (Lower)



INSPECTION

1. Wash the bearing in a solvent.
2. Inspect:
 - Bearings
 - Bearing race
 Pitting/Damage → Replace.



Bearing race replacement 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



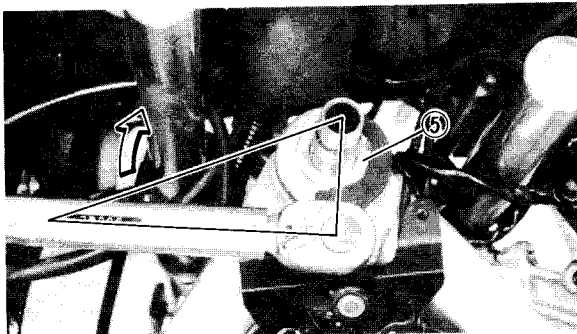
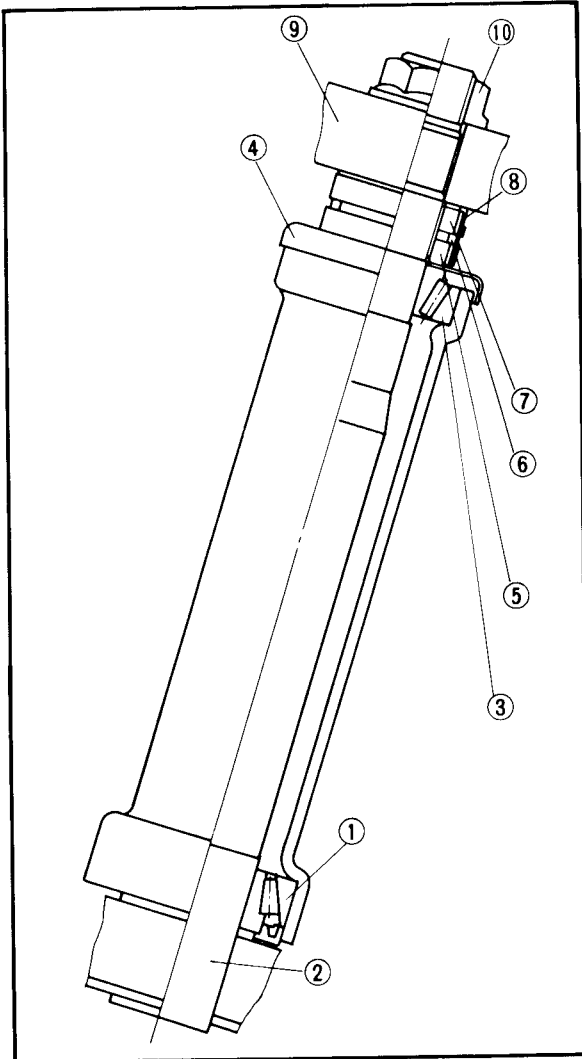
Lithium-Soap Base

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)

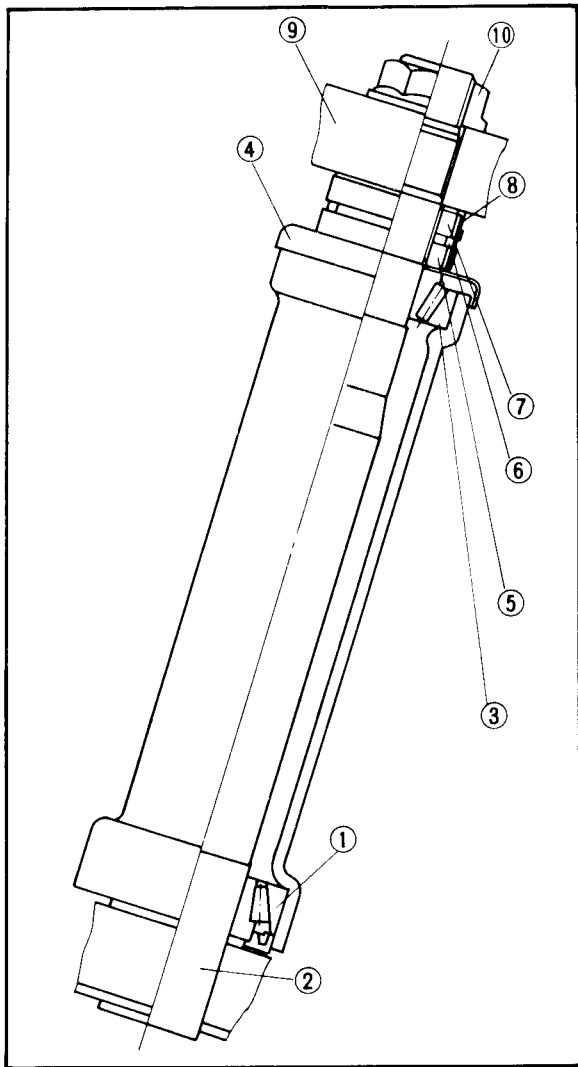
- LOOSEN THE RING NUT ⑤ COMPLETELY and retighten it to specification.

⚠ 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.

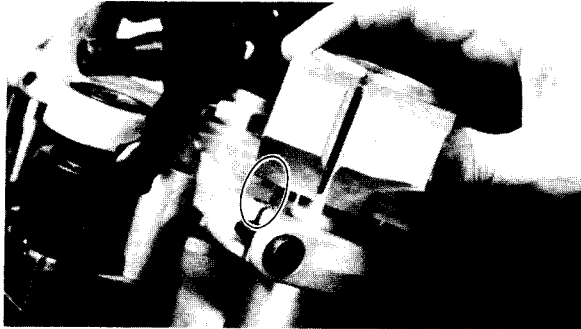
	Nut (Steering Stem): 110 Nm (11.0 m·kg, 80 ft·lb)
--	--

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 – INSTALLATION" 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)




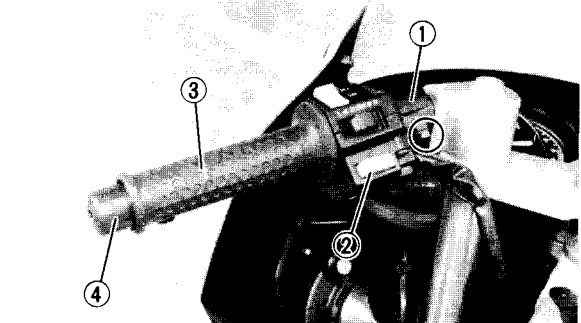
8. Install:
- Handlebar bosses

NOTE: _____
 Insert the pin on the handlebar bosses into the corresponding hole on the handlebar crown.

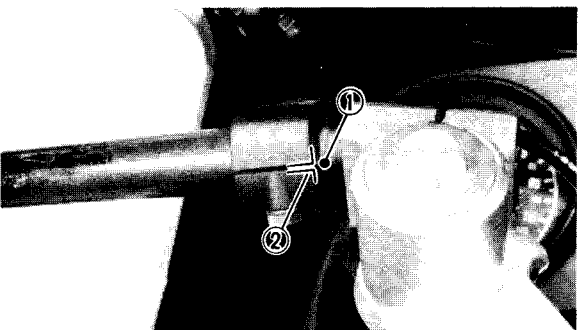


9. Install:
- Handlebars


	Pinch Bolts (Handlebar): 23 Nm (2.3 m·kg, 17 ft·lb)
---	---



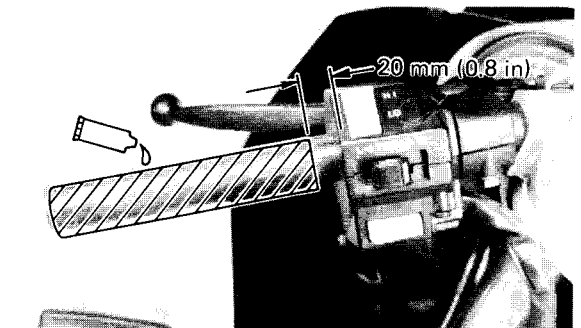
10. Install:
- Clutch lever holder ①
 - Handlebar switch (Left) ②
 - Handlebar grip (Left) ③
 - Handlebar grip end (Left) ④



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.
 (a) 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).

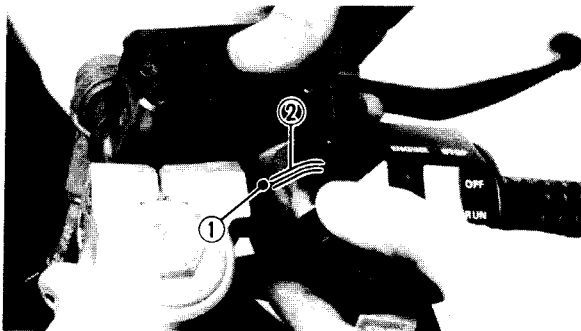


Handlebar Grip End:
25 Nm (2.5 m·kg, 18 ft·lb)

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.



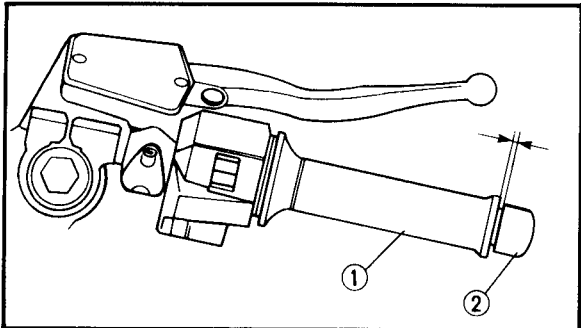
12. Install:
- Front brake master cylinder

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.

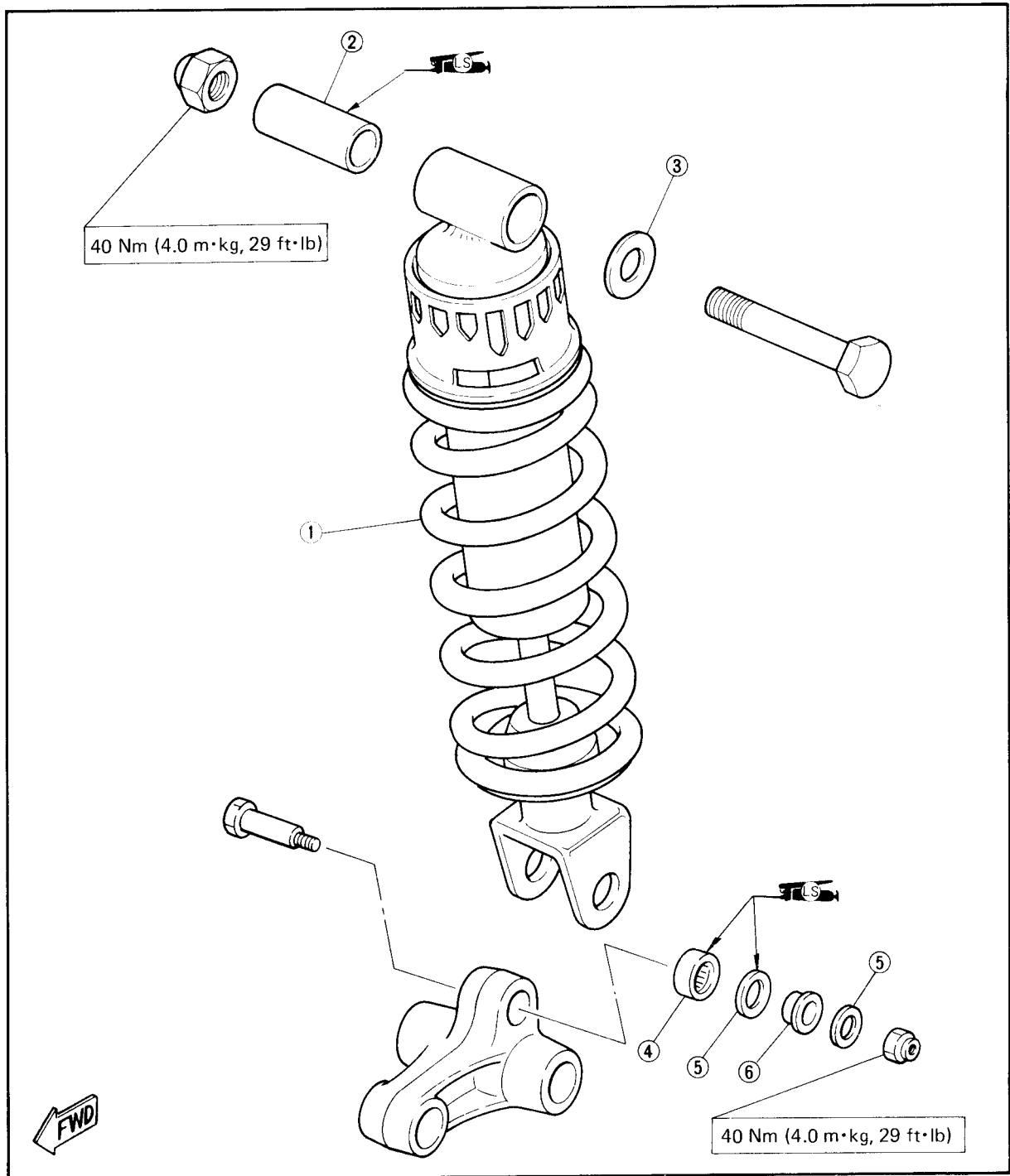


Free Play:
2 ~ 3 mm (0.08 ~ 0.12 in)
At The Lever Pivot.

REAR SHOCK ABSORBER AND SWINGARM

Rear Shock Absorber

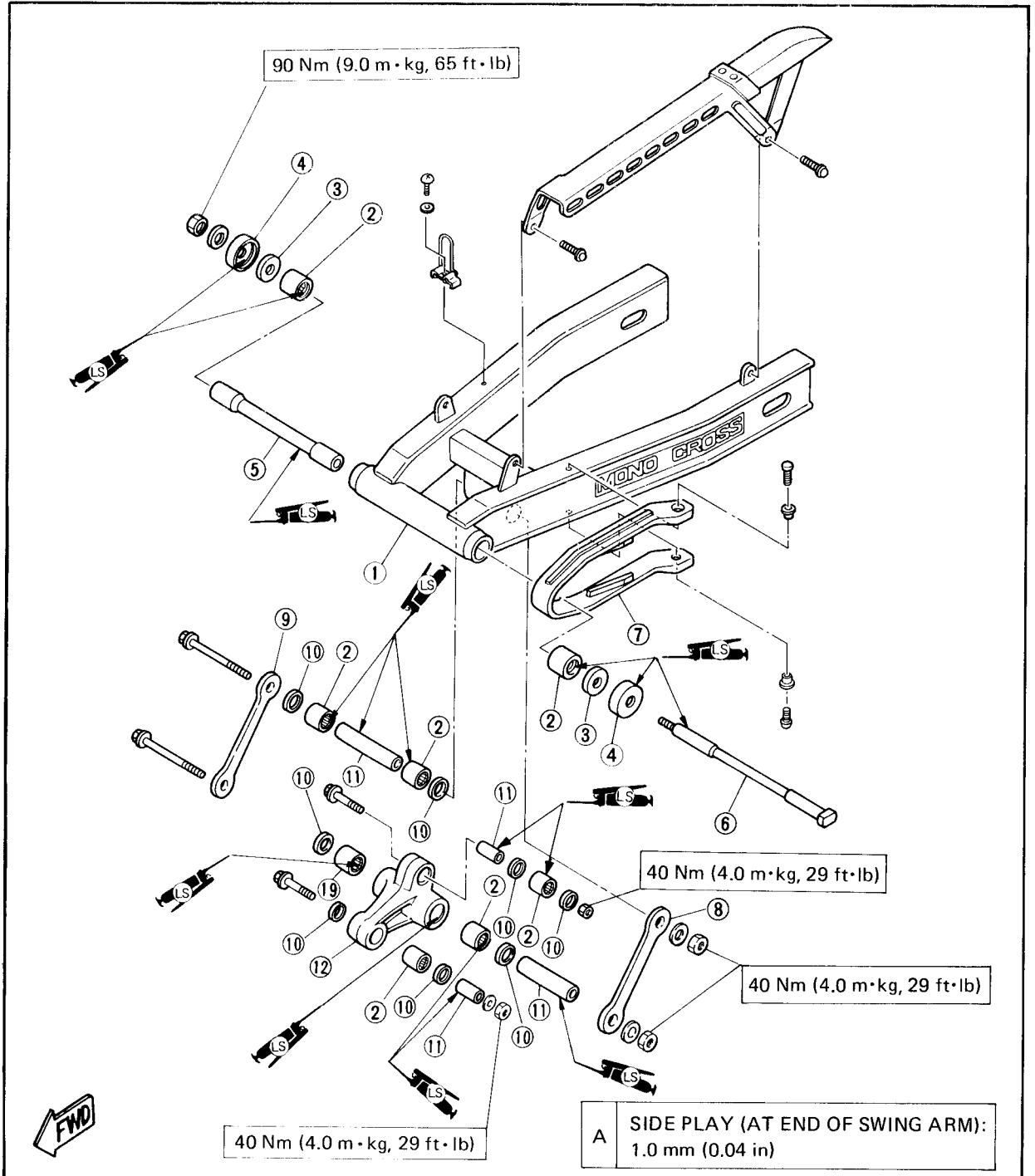
- ① Shock absorber
- ② Collar
- ③ Washer
- ④ Collar
- ⑤ Oil seal
- ⑥ Bearing



Swingarm

- | | |
|-----------------|---------------|
| ① Swingarm | ⑦ Guard seal |
| ② Bearing | ⑧ Arm (Left) |
| ③ Thrust washer | ⑨ Arm (Right) |
| ④ Thrust cover | ⑩ Oil seal |
| ⑤ Bush | ⑪ Collar |
| ⑥ Pivot shaft | 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.

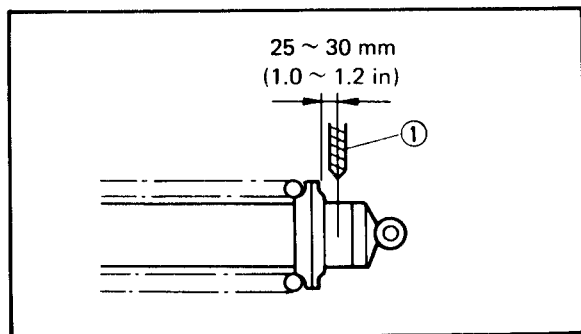


HANDLING NOTES

⚠ 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

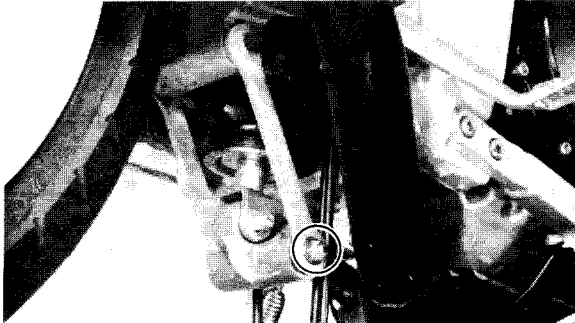
1. Place the motorcycle on a level place.

⚠ WARNING:

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

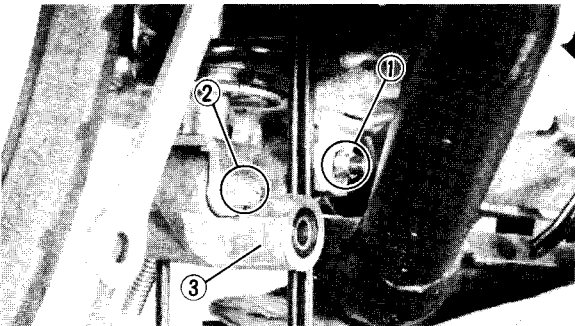
2. Remove:

- Lower cowlings (Left and right)
Refer to the "COWLING REMOVAL AND INSTALLATION – REMOVAL" section in the CHAPTER 3.



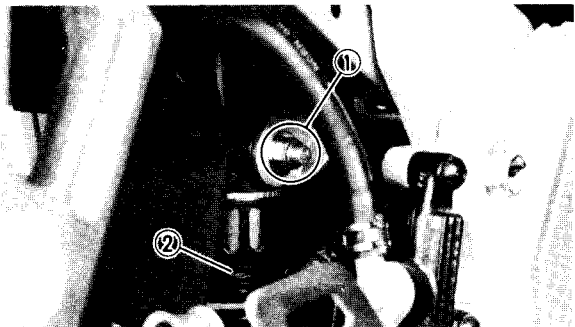
3. Remove:

- 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

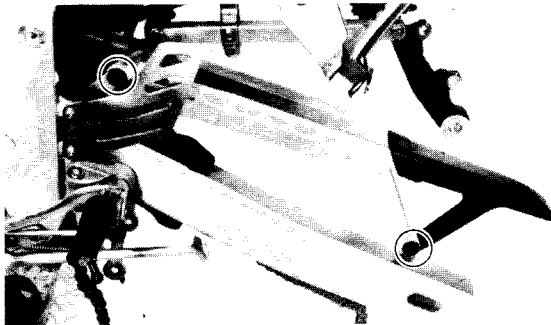
Swingarm

⚠ WARNING:

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

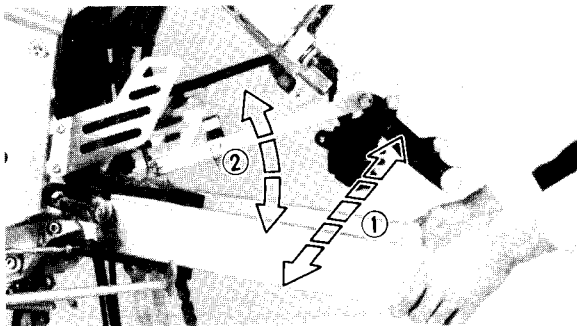
1. Remove:

- Rear wheel
Refer to the "REAR WHEEL – REMOVAL" section.
- Rear shock absorber




2. Remove:

- Chain case



3. Check:

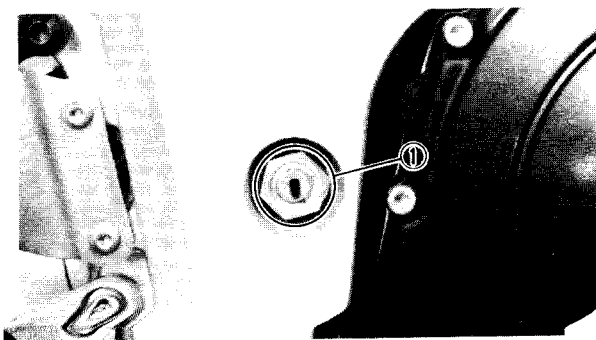
- Swingarm (Side play) ①
Side play → Replace the bearings and collar.
Move the swingarm from side to side.
There should be no noticeable side play.



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

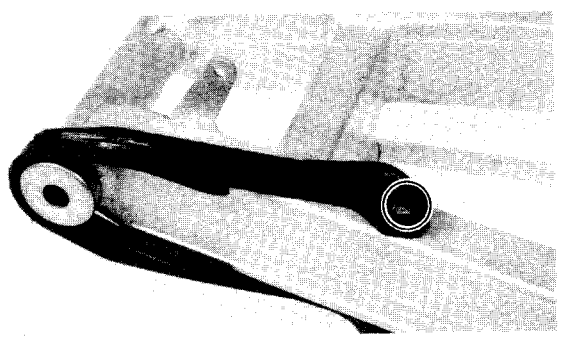
4. Check:

- Swingarm (Vertical movement) ②
Tightness/Binding/Rough spots → Replace the bearings.
Move the swingarm up and down.

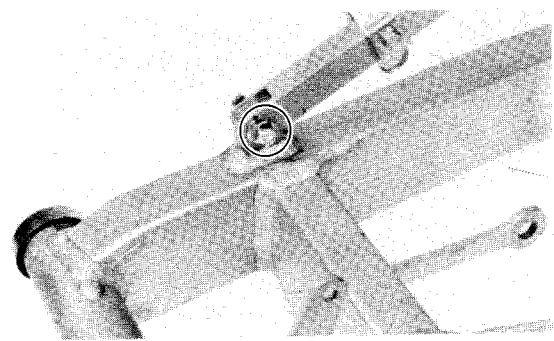


5. Remove:

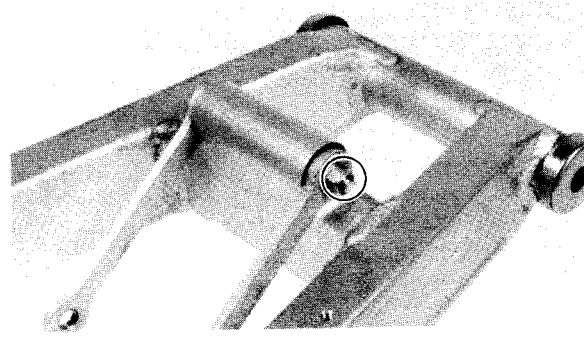
- Nut (Pivot shaft) ①
- Swingarm



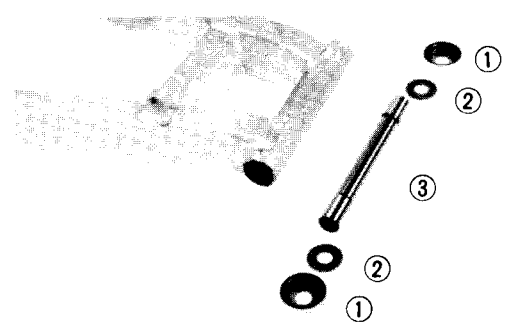
6. Remove:
- Guard seal



7. Remove:
- Tension bar



8. Remove:
- Arms (Left and right)

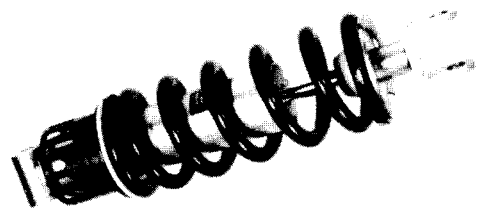


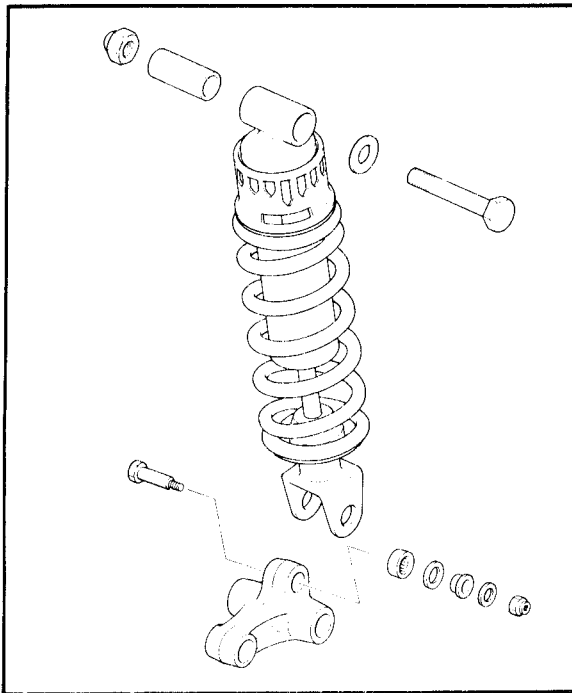
9. Remove:
- Thrust covers ①
 - Thrust washer ②
 - Bush ③

INSPECTION

Rear shock absorber

1. Inspect:
- Rear shock absorber
Oil leaks/Damage → Replace.

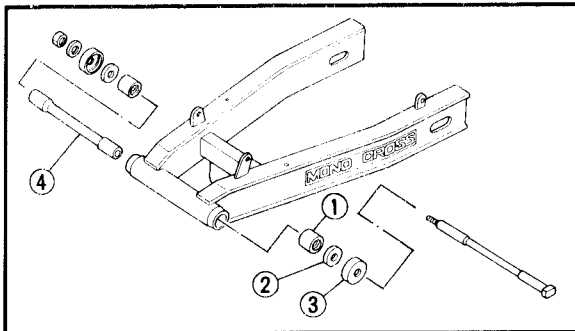




2. Inspect:

- Bushings
- Bearing
- Dust seals

Wear/Damage → Replace.

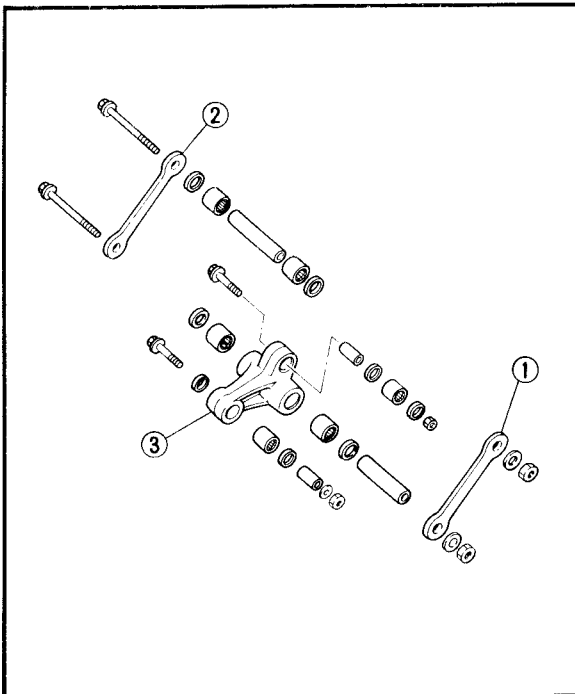


Swingarm

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/Damage → Replace.
- Oil seals
- Collars
Damage → Replace.



INSTALLATION

Reverse the removal procedure.

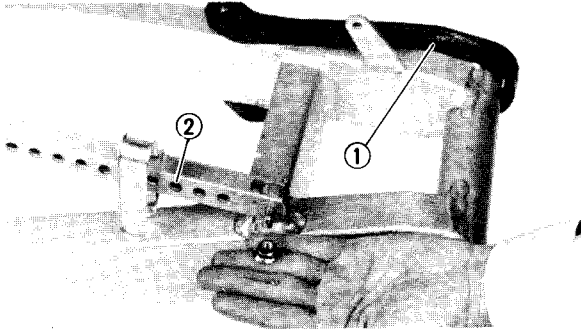
Note the following points.

1. Lubricate:

- Bearings
- Oil seals
- Collars



Lithium-Soap Base Grease



Swingarm

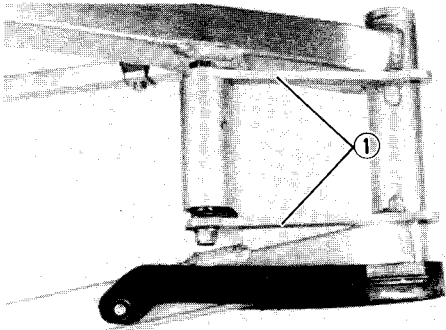
1. Install:

- 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)

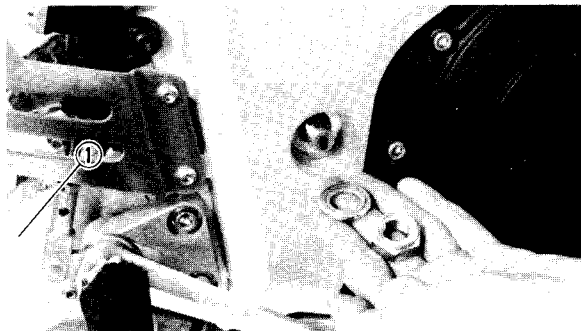


2. Install:

- Arms (Left and right) ①



Bolt (Arm):
40 Nm (4.0 m·kg, 29 ft·lb)

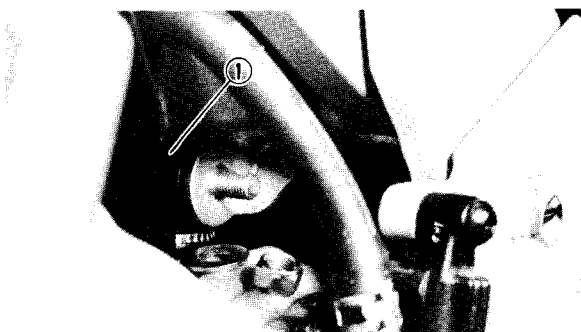


3. Install:

- Swing arm ①



Pivot Shaft (Swingarm):
90 Nm (9.0 m·kg, 65 ft·lb)



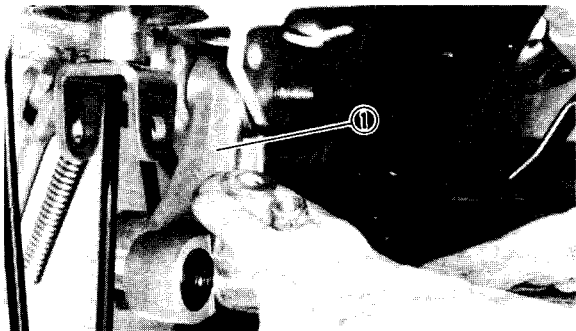
Rear Shock Absorber

1. Install:


- Rear shock absorber ①

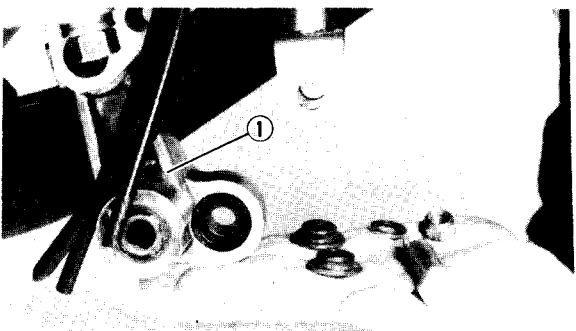


Rear Shock Absorber:
Upper:
40 Nm (4.0 m·kg, 29 ft·lb)




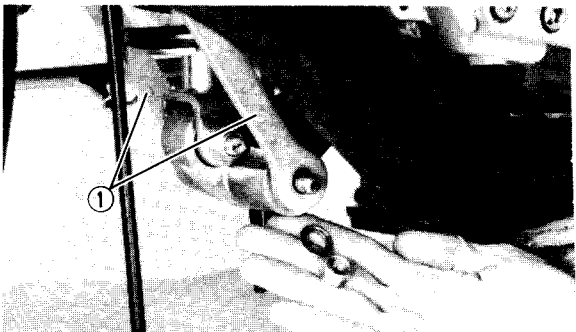
2. Install:
- Relay arm ①

	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)
---	--

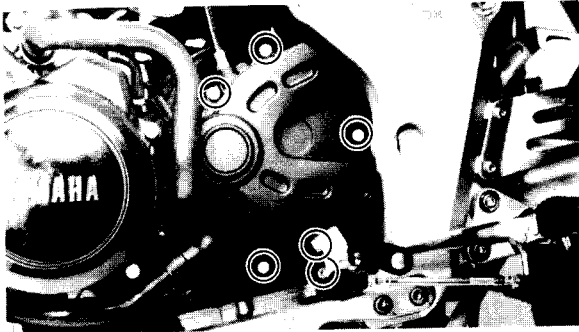
DRIVE CHAIN AND SPROCKET

REMOVAL

1. Place the motorcycle vertically 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.

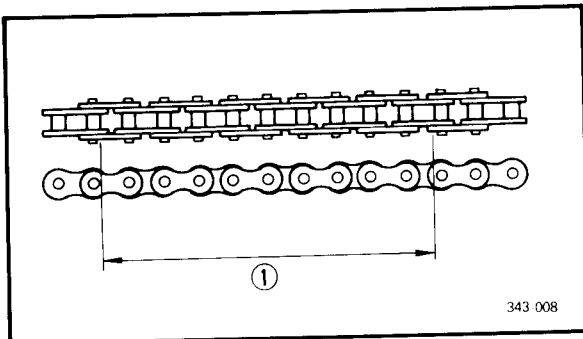
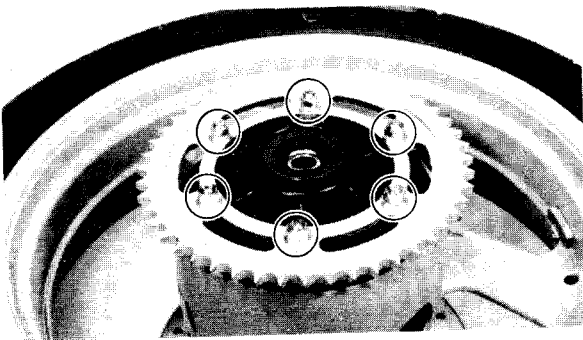
3. Remove:

- 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:

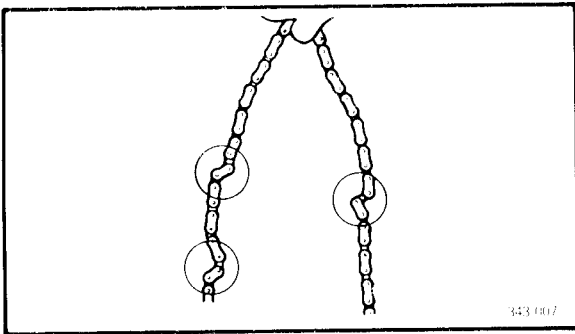
- Drive chain wear ①

Length of 10 links.

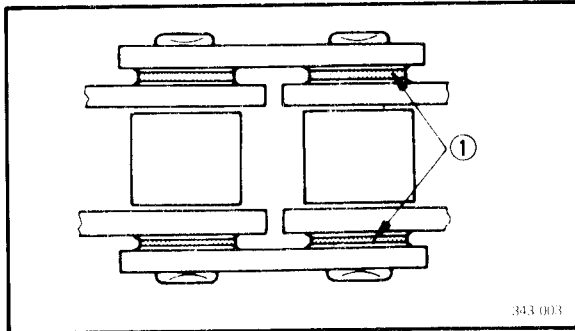
Over specified limit → Replace the drive chain, drive sprocket and driven sprocket as a set.



**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.

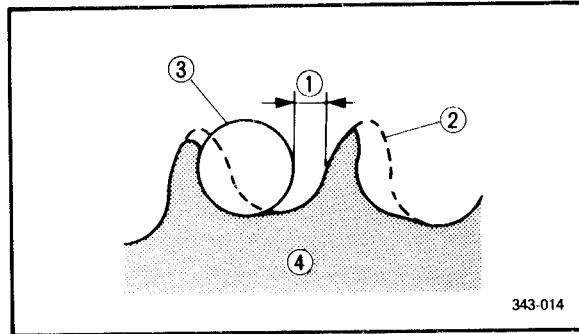


3. Clean:
- Drive chain

Drive Chain Cleaner:
Kerosene

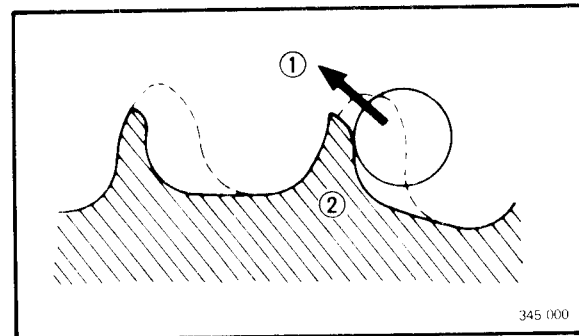
⚠ CAUTION:

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

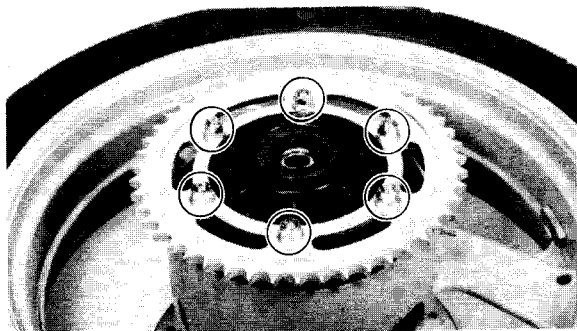
INSTALLATION

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.

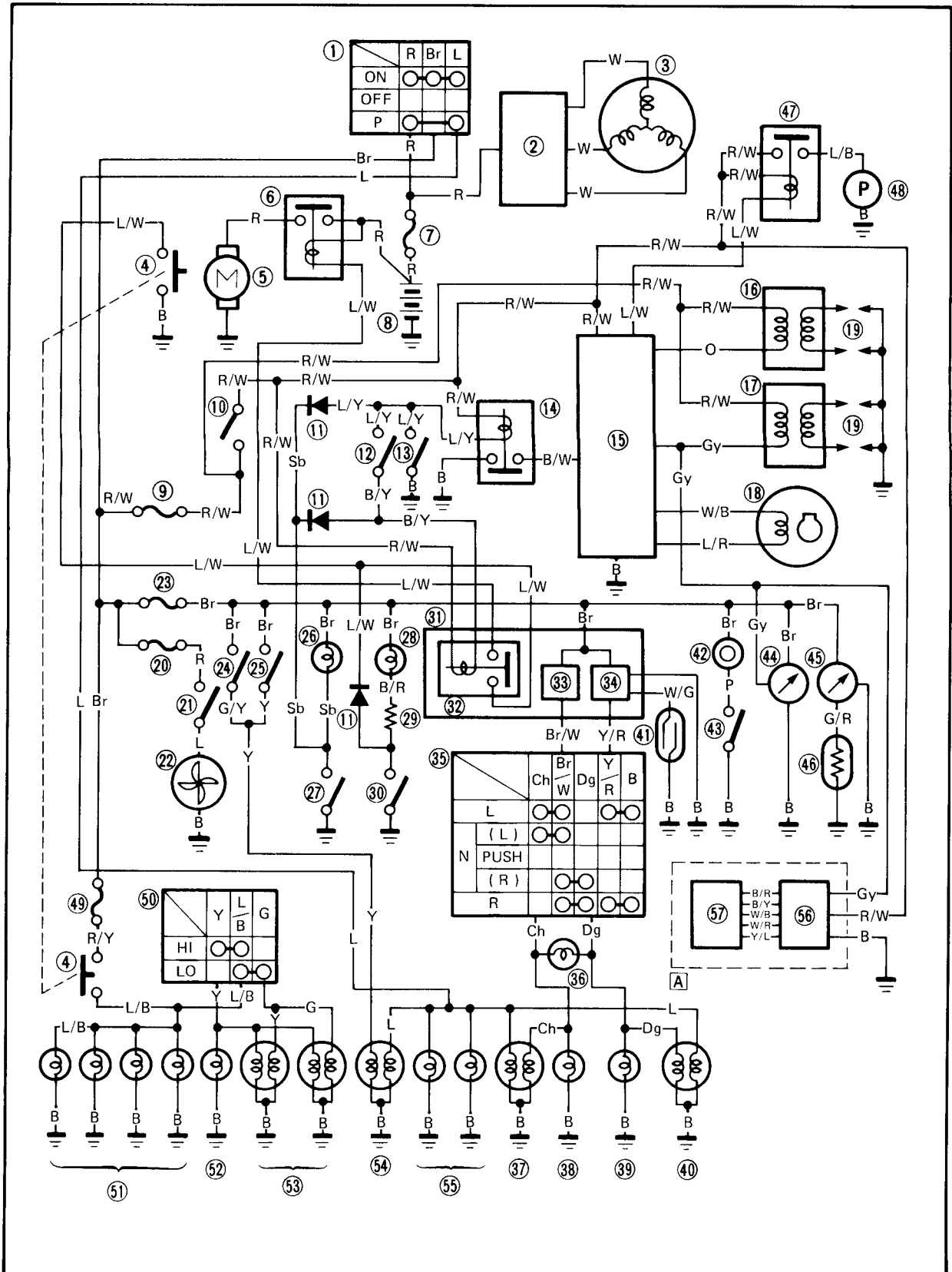
⚠ WARNING:

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
- ① Meter light
- ② "HIGH BEAM" indicator light
- ③ Headlight
- ④ Tail/Brake light
- ⑤ License light
- ⑥ EXUP control unit
- ⑦ EXUP servomotor

Ⓐ For California only

COLOR CODE

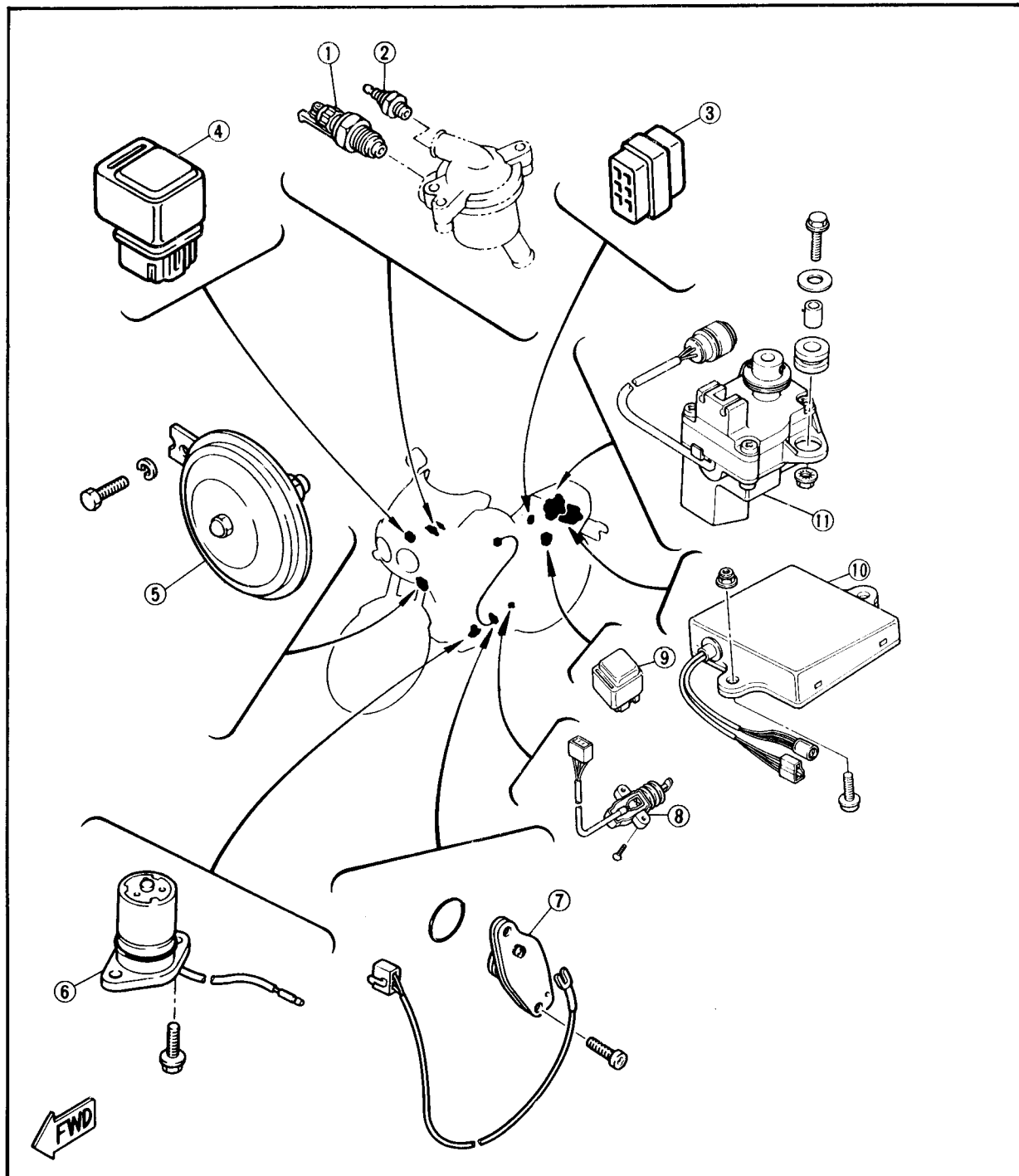
O	Orange	Y/R	Yellow/Red
R	Red	Br/W	Brown/White
L	Blue	R/W	Red/White
Br	Brown	R/Y	Red/Yellow
B	Black	B/R	Black/Red
Y	Yellow	B/W	Black/White
W	White	B/Y	Black/Yellow
G	Green	L/W	Blue/White
P	Pink	L/B	Blue/Black
Dg	Dark green	L/Y	Blue/Yellow
Ch	Chocolate	G/Y	Green/Yellow
Gy	Gray	W/R	White/Red
Sb	Sky blue	W/G	White/Green



ELECTRICAL COMPONENTS (1)

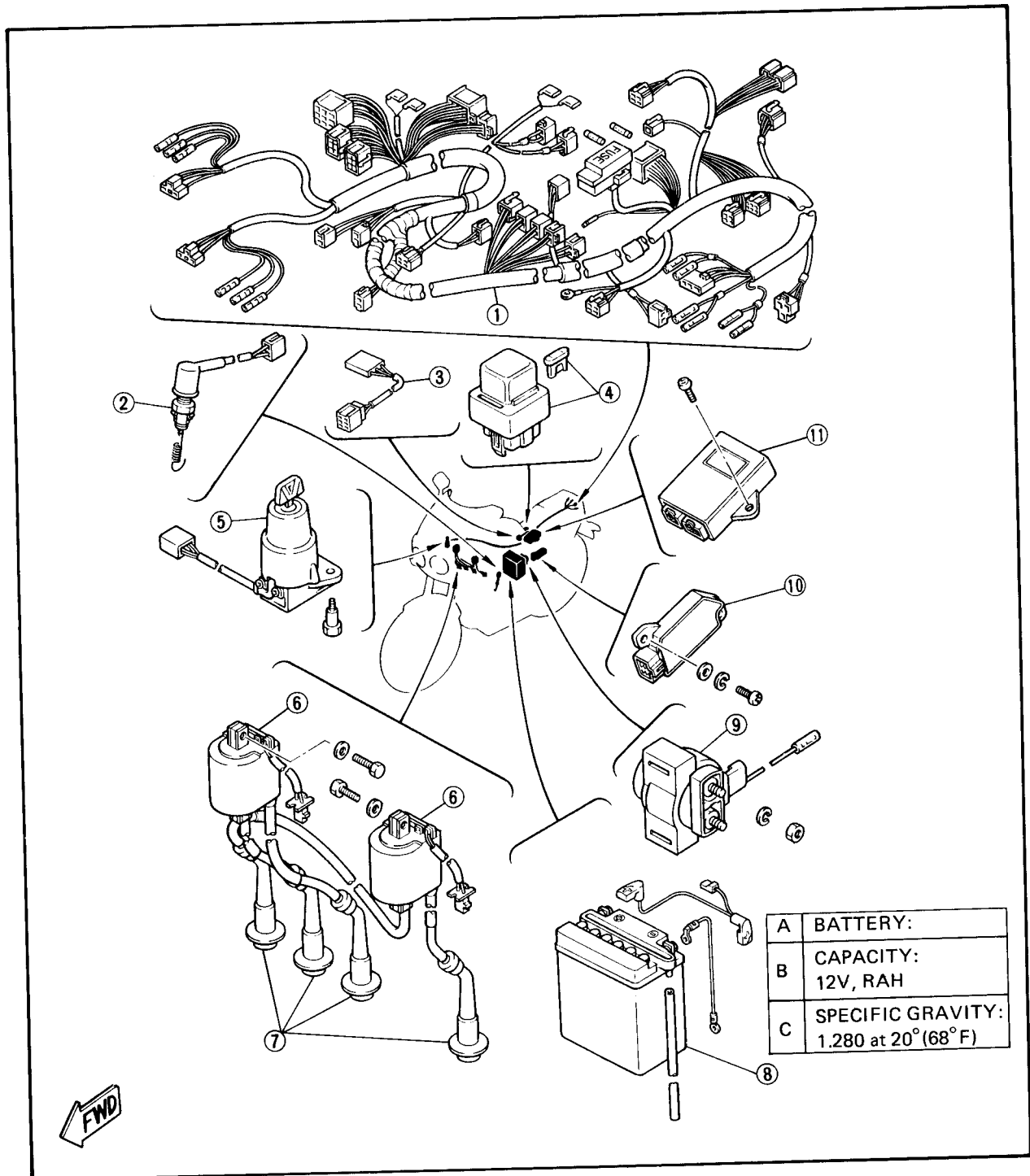
- ① Thermo switch
- ② Thermo unit
- ③ Relay assembly
- ④ Fuel pump relay
- ⑤ Horn
- ⑥ Oil level switch
- ⑦ Neutral switch
- ⑧ Sidestand switch
- ⑨ Sidestand relay
- ⑩ EXUP control unit
(For California only)
- ⑪ EXUP servomotor
(For California only)

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.

	B	B/W	R	Br	L/W	L/R
ON			○—○		○—○	
OFF	○—○					
LOCK	○—○					
P	○—○		○—○			○—○

“○—○” 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.

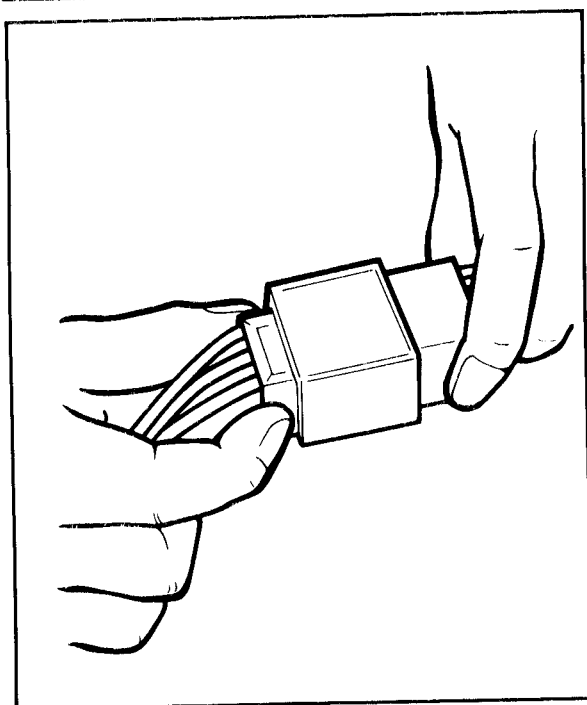
“B and B/W” is continuous with the “LOCK” switch position.

“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.

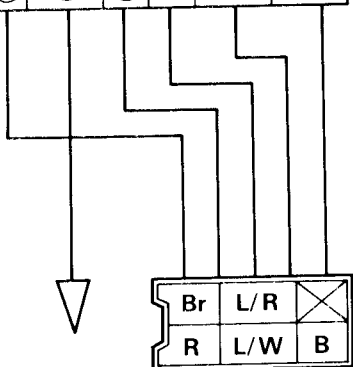
2. Inspect whether any lead is off the terminal inside the coupler. If it is, repair it.

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.

	B	B/W	R	Br	L/W	L/R
ON			○	○	○	○
OFF	○	○				
LOCK	○	○				
P	○	○	○			○



“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.

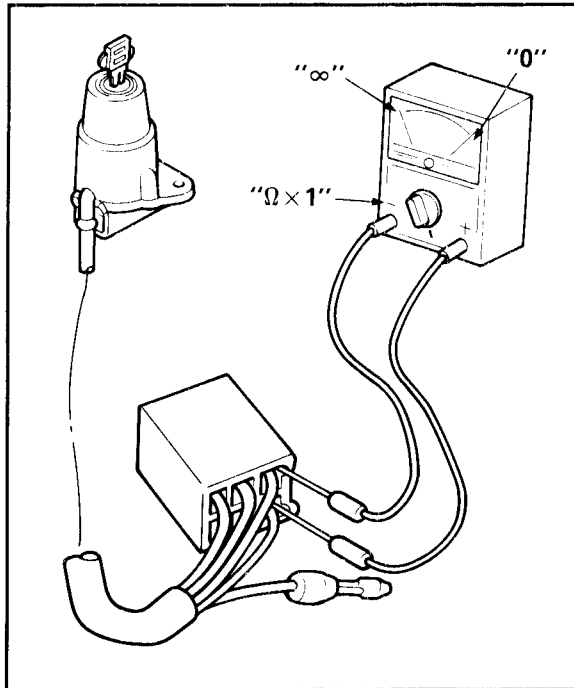
“B and B/W” and “R and L/R” are continuous with the “P” switch position.

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 “ $\Omega \times 1$ ”.
- Connect the tester (+) lead to the “R” lead terminal in the coupler and the (-) lead to the “Br” lead terminal.

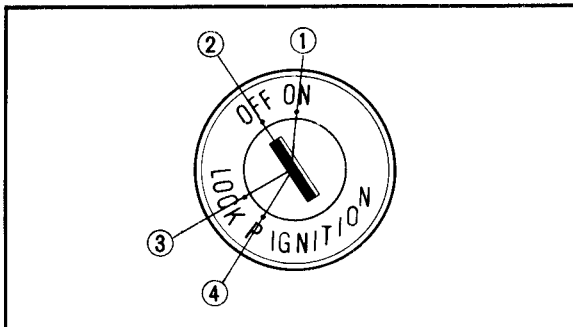
**NOTE:**

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.

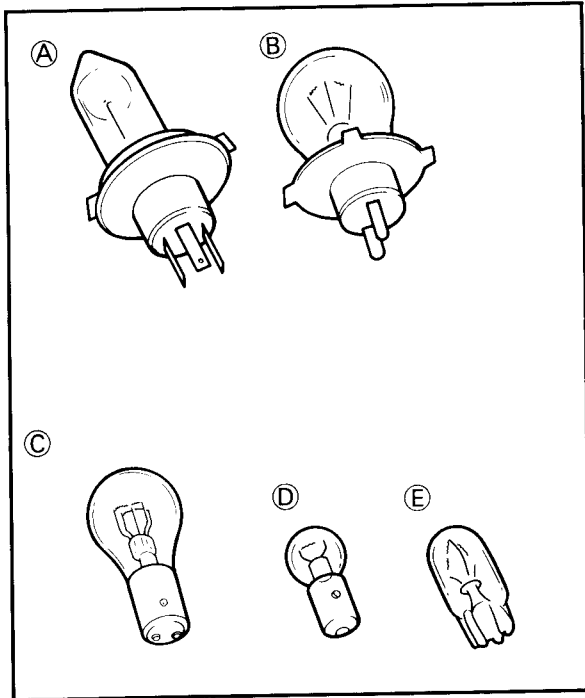


CHECKING OF BULBS (FOR HEADLIGHT, TAIL/BRAKE LIGHT, FLASHER LIGHT, METER LIGHT, ETC.)

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.



(A) and (B) are mainly used for the headlight.

(C) is mainly used for the flasher light and tail/brake light.

(D) and (E) are mainly used for the meter light and other indicator lights.

CHECKING BULB CONDITION

1. Remove the bulb.

NOTE:

- Bulbs of the (A) and (B) 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 (C) and (D) type can be removed from the bulb sockets by pushing and turning them counterclockwise.
- Bulbs of the (E) 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:

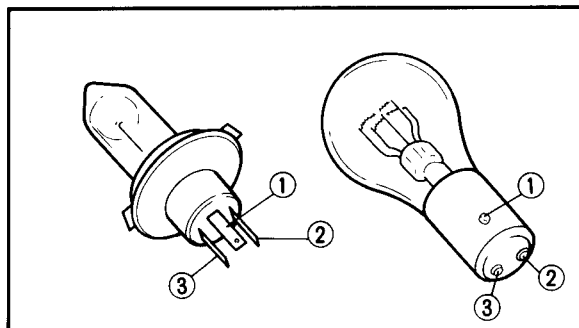
Keep flammable products or your hands away from the headlight bulb while it is on. It will be hot. Do not touch the bulb until it cools down.



2. Check the bulb terminals for continuity.

Checking steps:

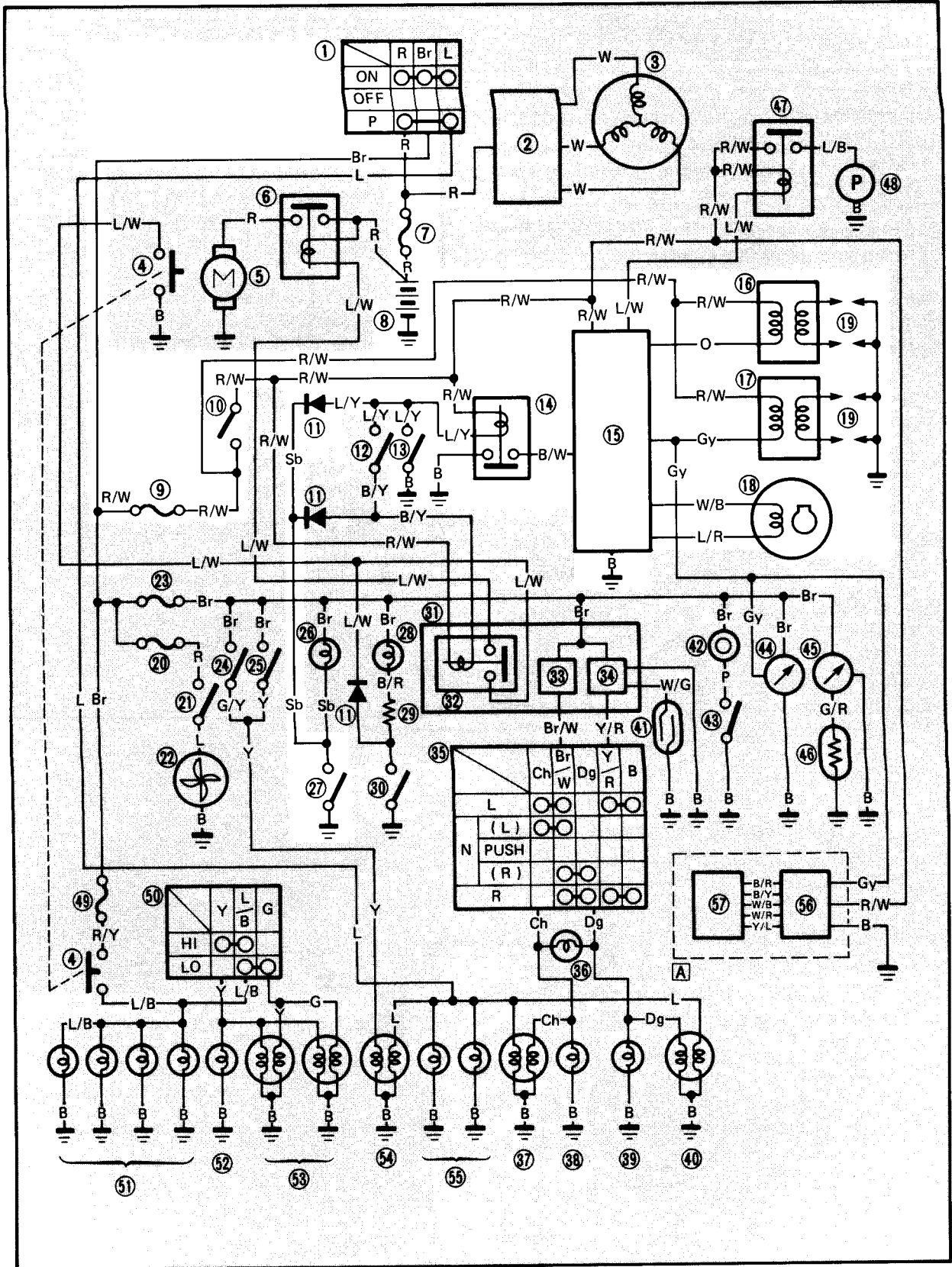
- Set the pocket tester selector to the " $\Omega \times 1$ ".
- Connect the tester leads to the respective bulb terminals. Take for example a 3-terminal bulb as shown left. First check the continuity between the ① and ② terminals by connecting the tester (+) lead to the ① terminal and the tester (-) 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



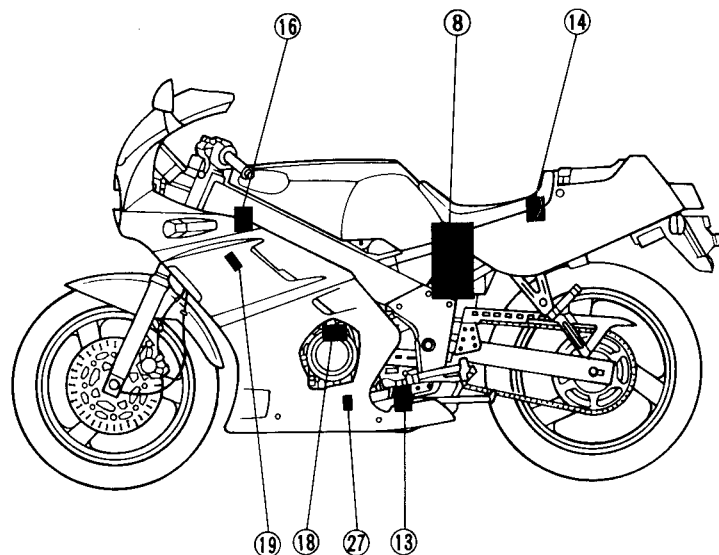
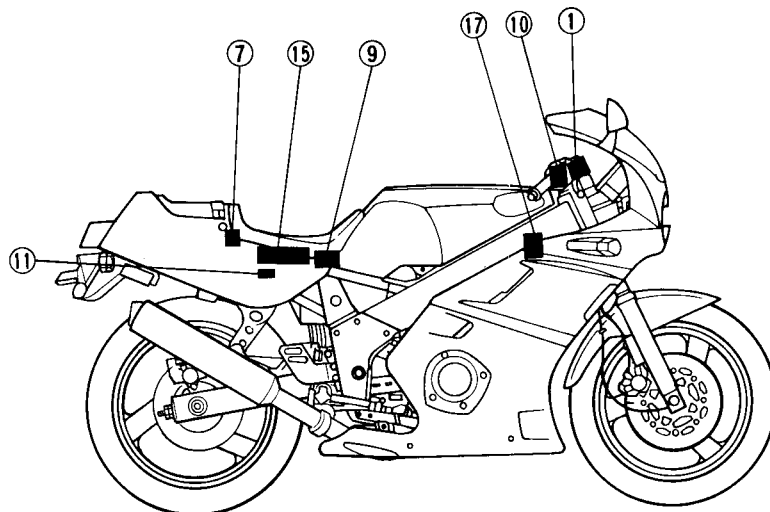


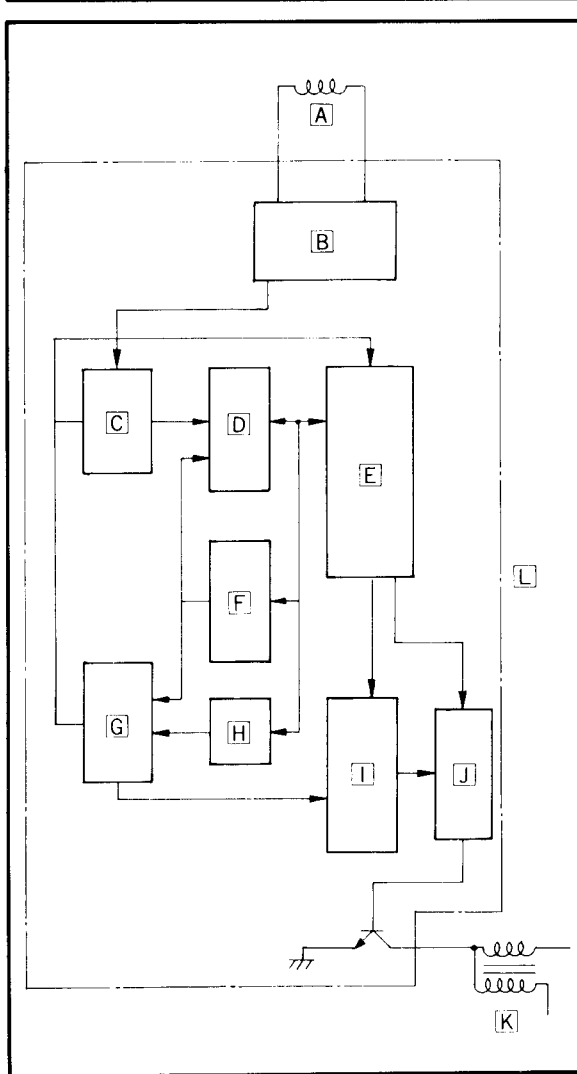
Aforementioned circuit diagram shows the ignition circuit in the wiring diagram.

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 Spark plug
- ⑳ 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.

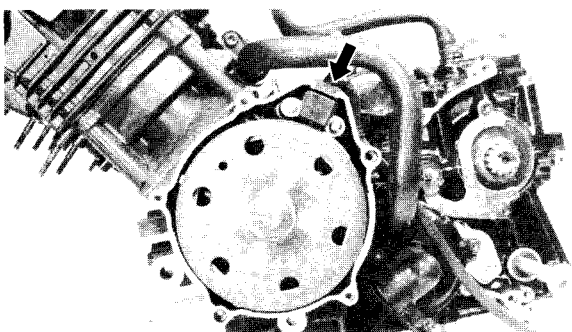
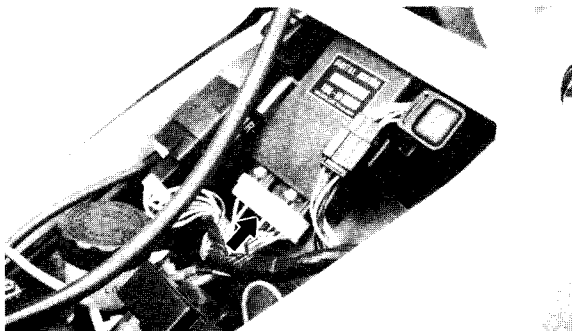
The digital ignitor also includes the control unit for the electric fuel pump.

- 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. Determining proper ignition timing.
2. Sensing the engine revolution speed.
3. Determining 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;

- | | |
|---|---|
| <ol style="list-style-type: none"> 1. Fuse "MAIN" 2. Battery 3. Spark plug 4. Ignition spark gap 5. Spark plug cap resistance 6. Ignition coil resistance 7. Main switch | <ol style="list-style-type: none"> 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.

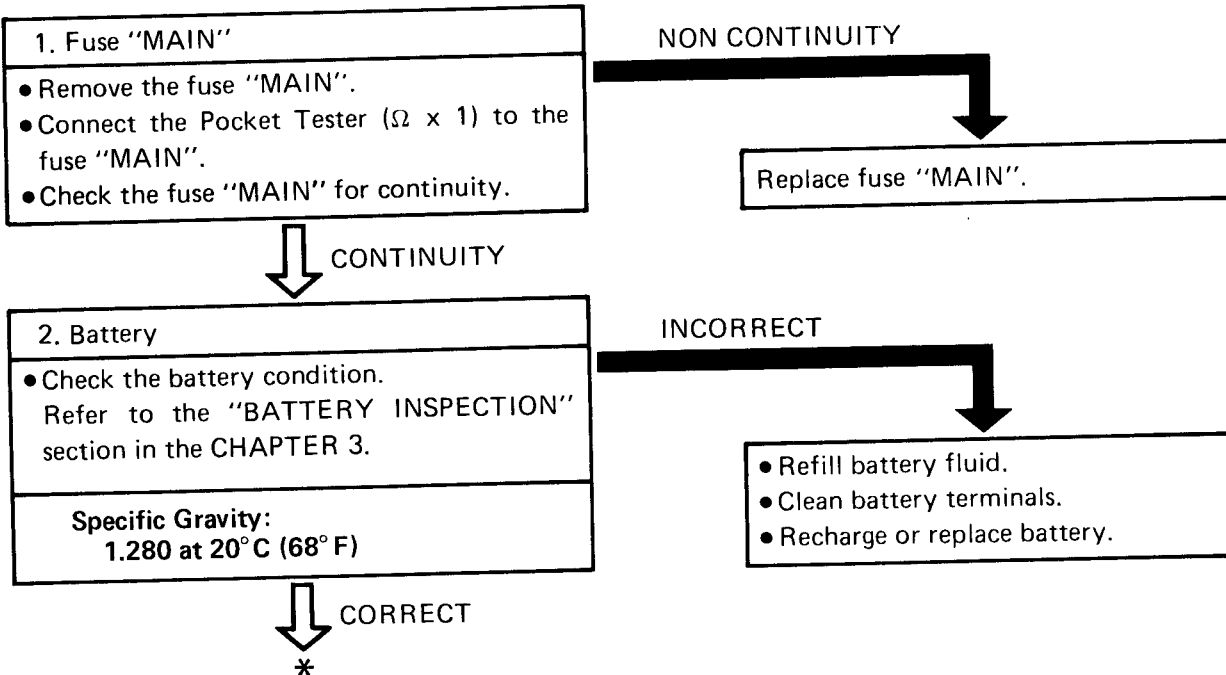
<ol style="list-style-type: none"> 1) Seat 2) Lower cowling 3) Center cowling 	<ol style="list-style-type: none"> 4) Top cover 5) Air filter case 6) Crankcase cover (Left)
--	---
- Use the following special tools in this troubleshooting.



Dynamic Spark Tester:
P/N. YM-34487



Pocket Tester:
P/N. YU-03112






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)

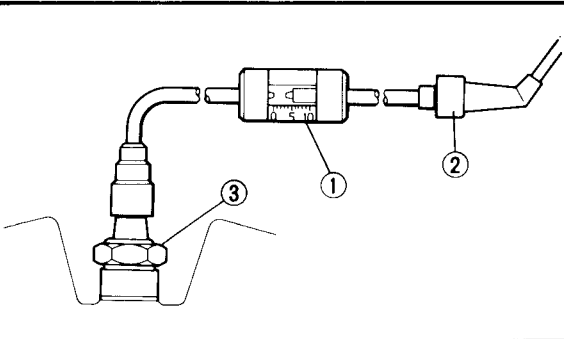
INCORRECT

Repair or replace spark plug.




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".



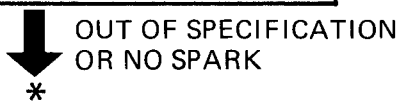
① Dynamic Spark Tester
② Spark plug cap
③ Spark plug

- 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

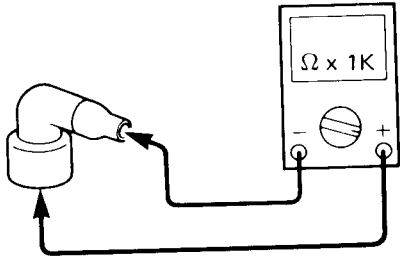
Ignition system is good.





5. Spark plug cap resistance

- Remove the spark plug cap.
- Connect the Pocket Tester ($\Omega \times 1k$) to the spark plug cap.



- Check the spark plug cap for specified resistance.



Spark Plug Cap Resistance:
9 ~ 11 k Ω at 20°C (68°F)

OUT OF SPECIFICATION

Replace spark plug cap.

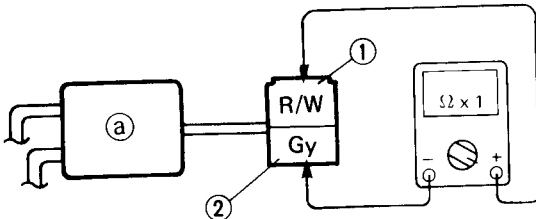
MEETS SPECIFICATION

6. Ignition coil resistance

- Disconnect the ignition coil coupler from the wireharness.
- Connect the Pocket Tester ($\Omega \times 1$) to the ignition coil.

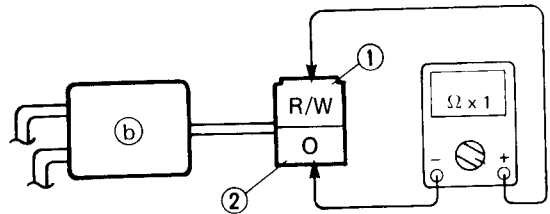
Ignition coil (Right) (a) :

Tester (+) lead → Red/White ① Terminal
Tester (-) lead → Gray ② Terminal



Ignition coil (Left) (b) :

Tester (+) lead → Red/White ① Terminal
Tester (-) lead → Orange ② Terminal



- Check the primary coil for specified resistance.

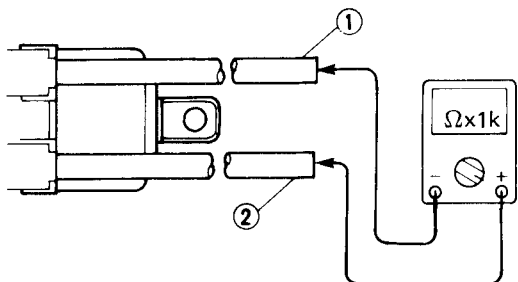


Primary Coil Resistance:
1.8 ~ 2.2 Ω at 20°C (68°F)



• Connect the Pocket Tester ($\Omega \times 1k$) to the ignition coil.

Tester (+) Lead \rightarrow Spark Plug Lead ①
 Tester (-) Lead \rightarrow Spark Plug Lead ②



• Check the Secondary coil for specified resistance.



Secondary Coil Resistance:
 9.6 ~ 14.4 k Ω at 20°C (68°F)
 (Spark Plug Lead – Spark plug)

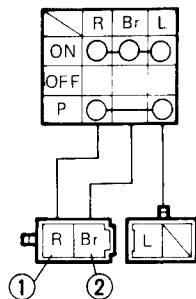
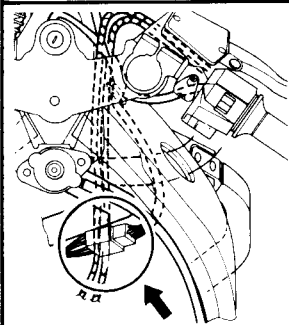
OUT OF SPECIFICATION

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 "CHECKING OF SWITCHES" section.



INCORRECT

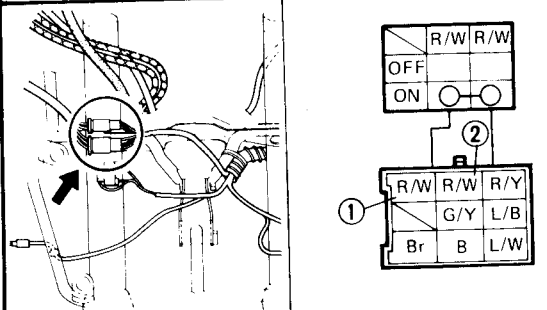
Replace main switch.

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

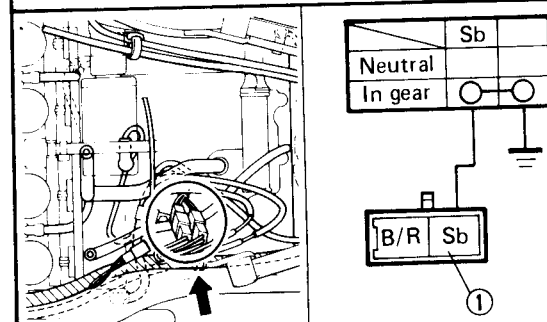
Replace handlebar switch (Right).



CORRECT

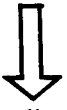
9. Neutral switch

- 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.



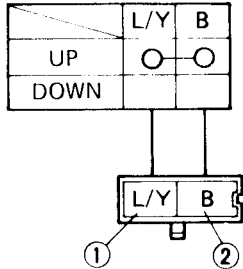
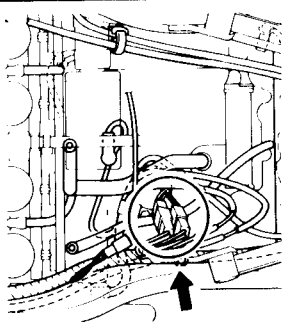
CORRECT

*



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.

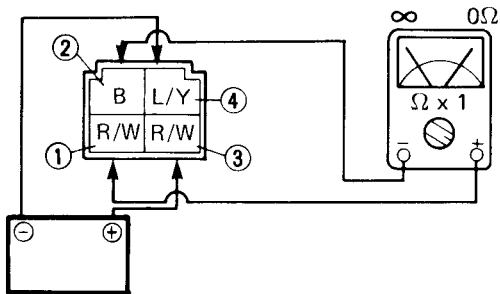


CORRECT

11. Sidestand relay

- Disconnect the sidestand relay coupler from the wire harness.
- Connect the Pocket Tester ($\Omega \times 1$) 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



NOCONTINUITY

Replace sidestand relay.

- Check the relay for continuity.



CONTINUITY




12. Pickup coil resistance

- Disconnect the A.C. magneto coupler from the wire harness.
- Connect the Pocket Tester ($\Omega \times 100$) to the pickup coil terminal.

Tester (+) Lead → White/Red ① Terminal
 Tester (-) Lead → White/Black ② Terminal

- Check the pickup coil for specified resistance.

 **Pickup Coil Resistance:**
 85 ~ 115 Ω 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.

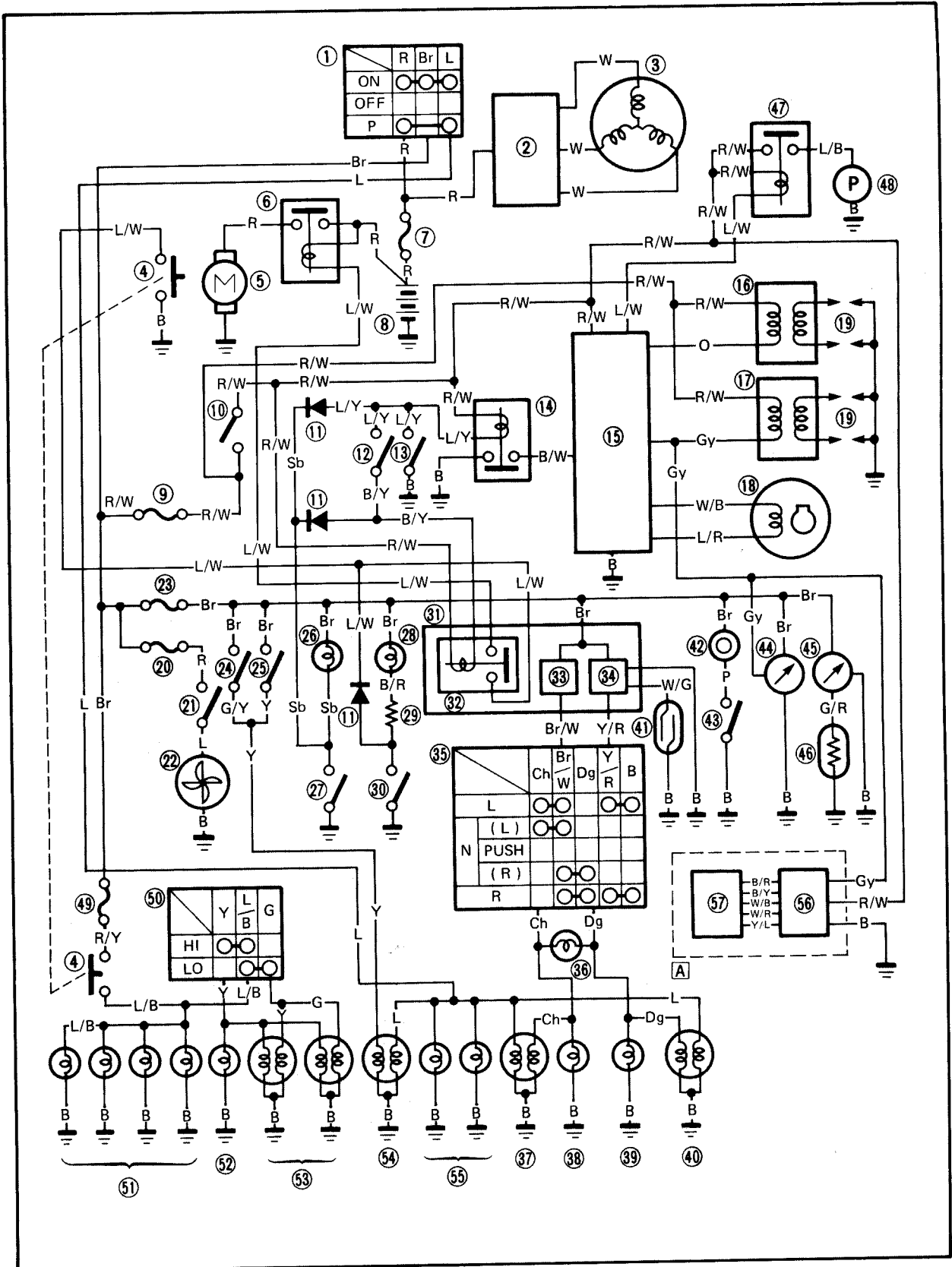
POOR CONNECTION

Correct.

CORRECT

Digital ignitor unit is faulty.
 Replace the digital ignitor unit.

ELECTRIC STARTING SYSTEM
CIRCUIT DIAGRAM

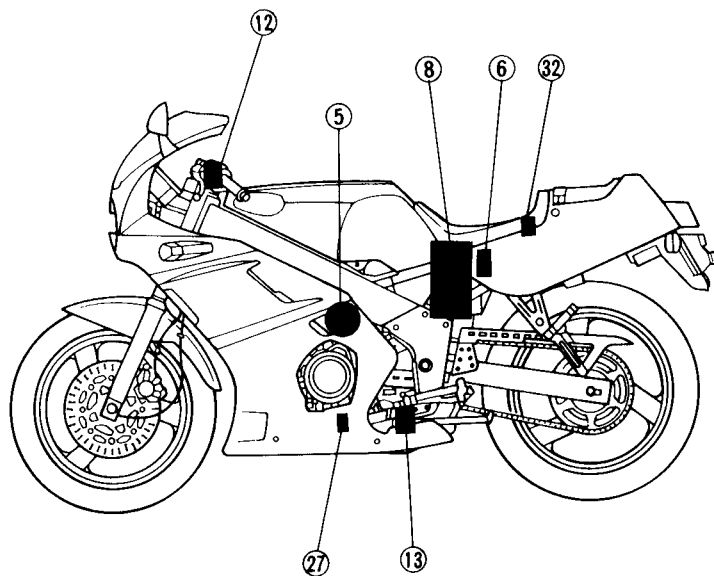
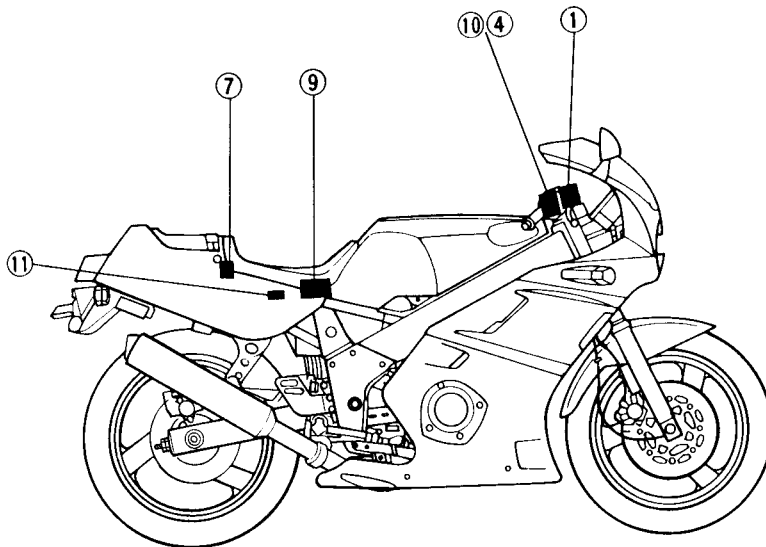


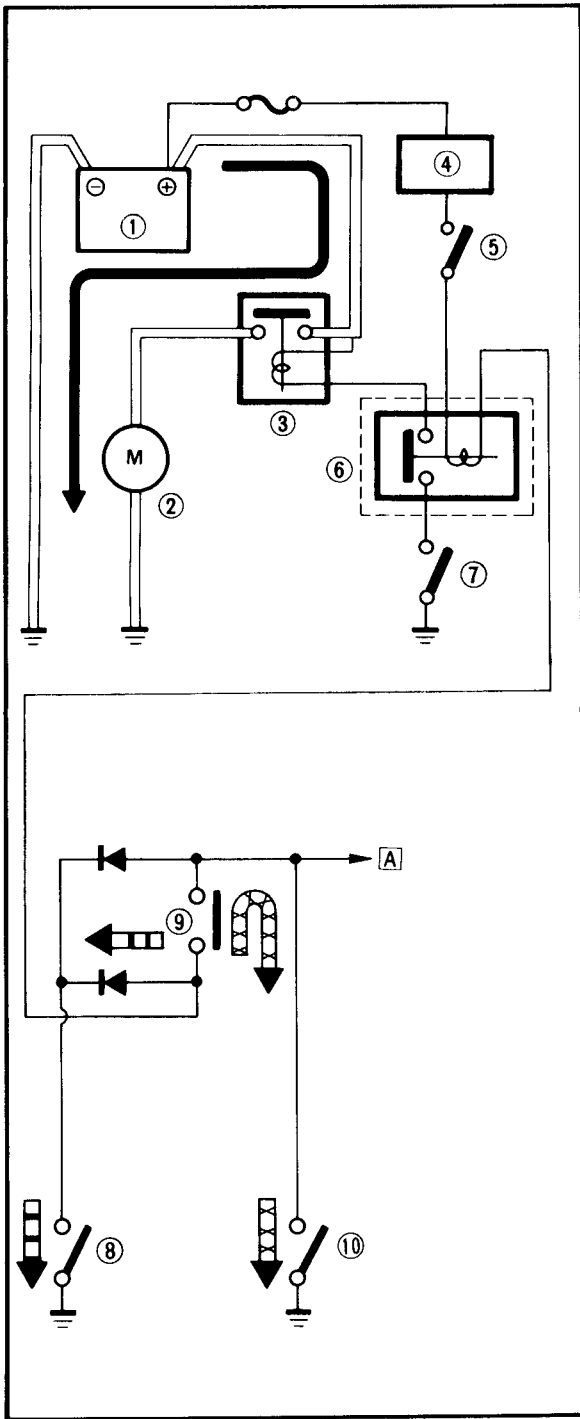
A forementioned circuit diagram shows the electric starting circuit in the wiring diagram.

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
- ⑰ Neutral switch
- ⑳ Starting circuit cut-off relay (Relay assembly ⑳)





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
- ← [X X X] 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;

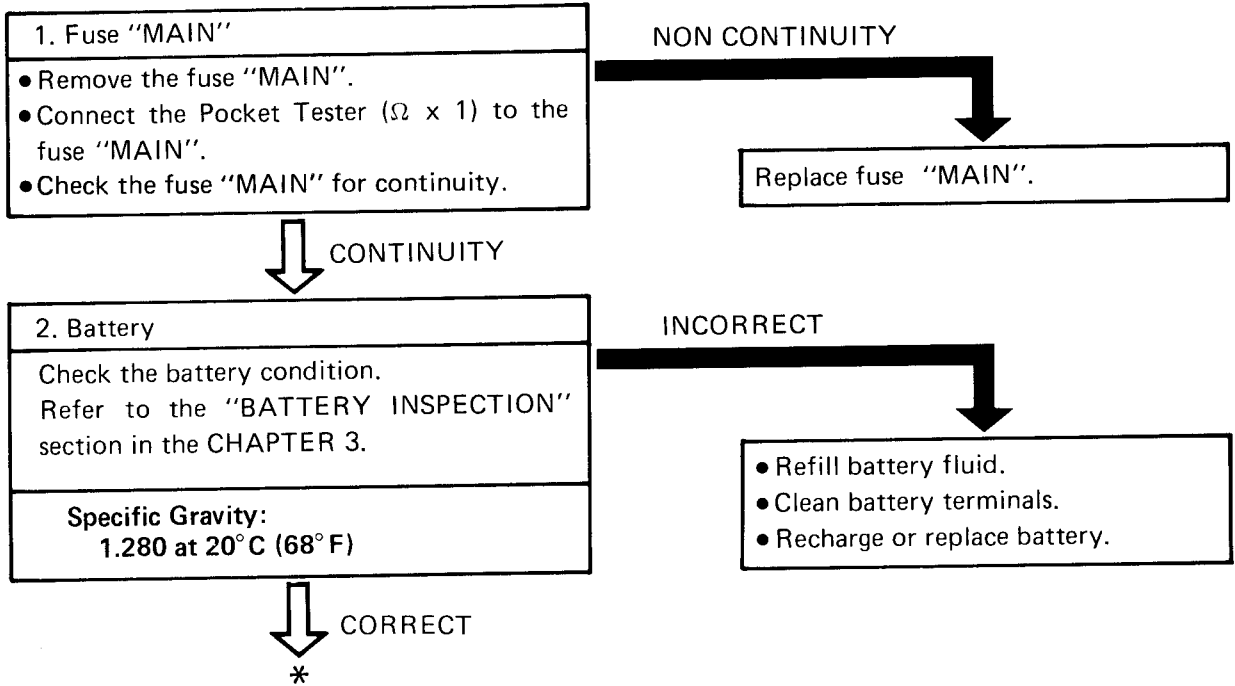
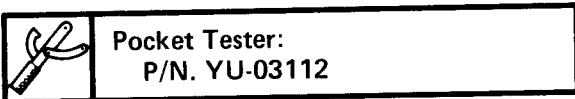
- | | |
|-----------------------------------|-----------------------------------|
| 1. Fuse "MAIN" | 8. Neutral switch |
| 2. Battery | 9. Sidestand switch |
| 3. Starter motor | 10. Clutch switch |
| 4. Starter relay | 11. "START" switch |
| 5. Starting circuit cut-off relay | 12. Wiring connection |
| 6. Main switch | (Entire electric starting system) |
| 7. "ENGINE STOP" switch | |

NOTE:

Remove the following before troubleshooting.

- | | |
|-----------------|------------------|
| 1) Seat | 3) Lower cowling |
| 2) Seat cowling | 4) Fuel tank |

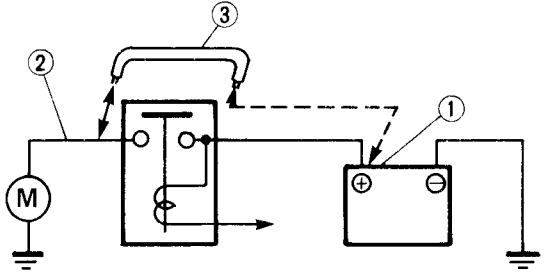
• Use the following special tool in this troubleshooting.





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.

*

⚠ 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.

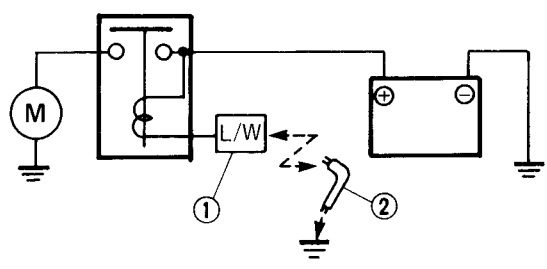
NO OPERATIVE

Repair or replace starter motor.



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.



5. Starting circuit cut-off relay

- Disconnect the relay assembly coupler from the wire harness.
- Connect the pocket tester ($\Omega \times 1$) and battery (12V) voltage to the relay assembly coupler terminals.



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.

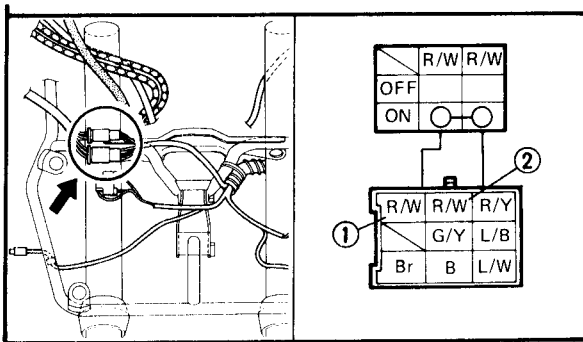
INCORRECT

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.



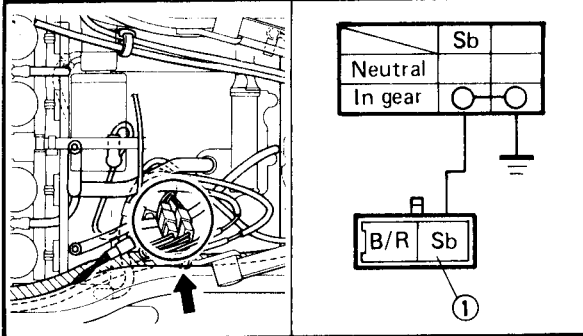
INCORRECT

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.



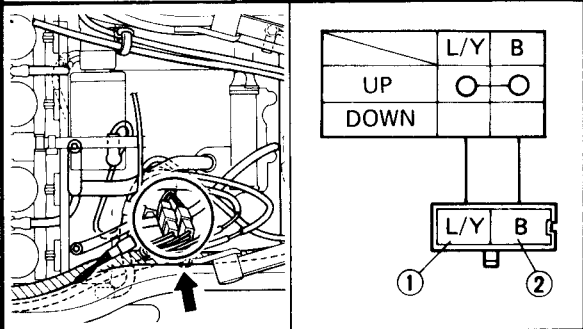
INCORRECT

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.

	L/Y	B/Y
Release		
Hold	○	○

INCORRECT

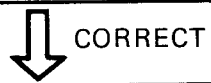


11. "START" switch

- 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.

	L/W	B	R/Y	L/B
OFF			○	○
ON	○	○		

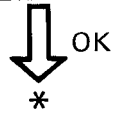
INCORRECT



12. Wiring connection

Check the entire ignition system for connections.
Refer to the "WIRING DIAGRAM" section.

POOR CONNECTION





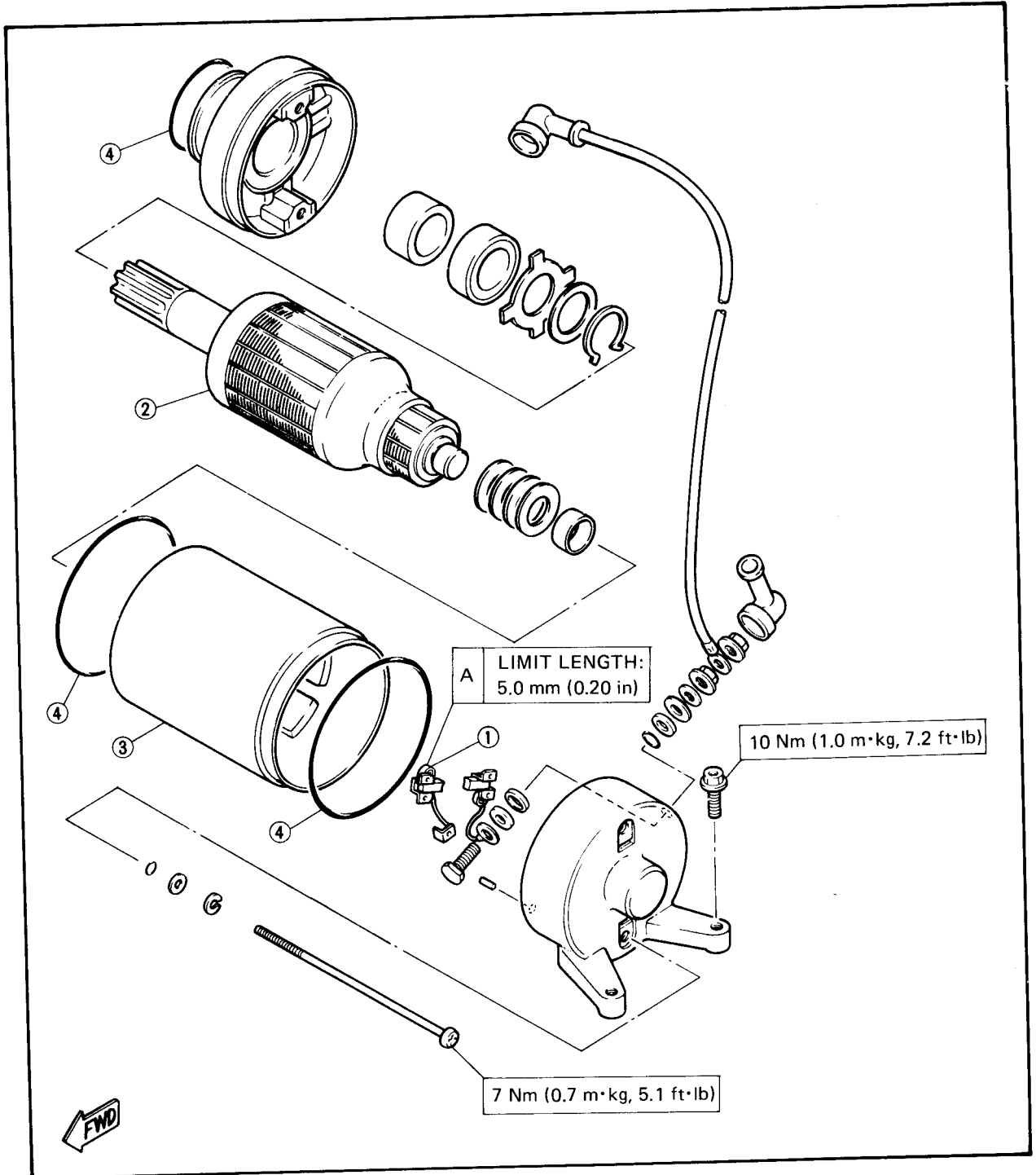
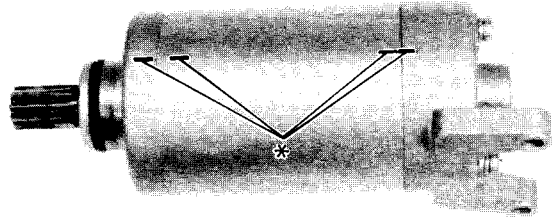
Diode block is faulty.
Replace the diode block.



STARTER MOTOR

- ① Brush
- ② Armature
- ③ Stator
- ④ O-ring

* MATCH MARKS



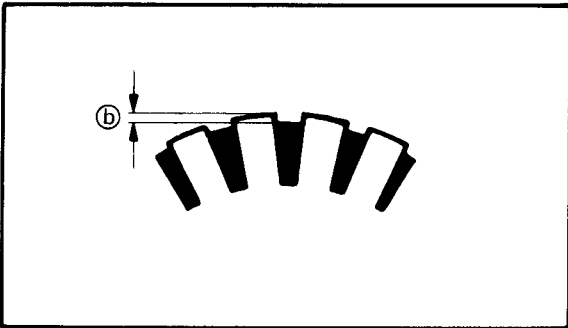
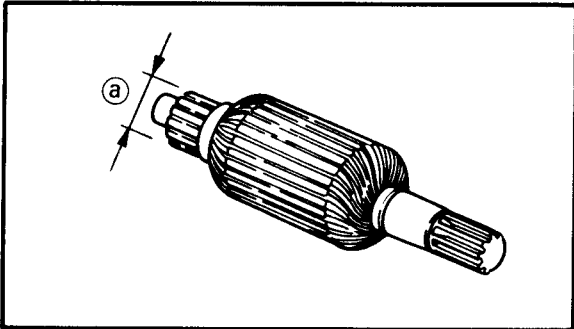


Removal

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 (a)

Out of specification → Replace starter motor.

	Commutator Wear Limit (a) : 22 mm (0.87 in)
--	---

3. Measure:

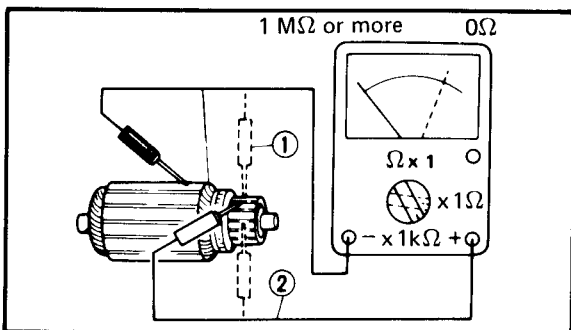
- Mica undercut (b)

Out of specification → Scrape the mica to proper value use a hacksaw blade can be ground to fit.

	Mica Undercut (b) : 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 armature resistances.

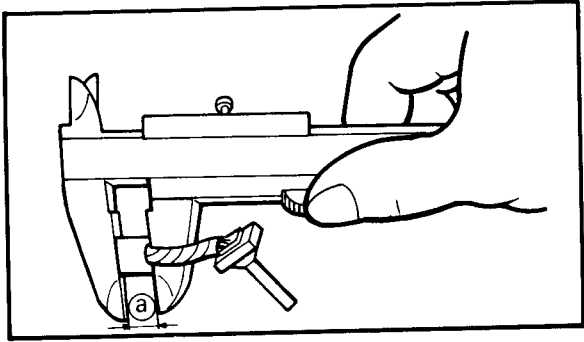


Armature Coil Resistance:
Continuity Check ① :
 0Ω at 20°C (68°F)
Insulation Check ② :
 More than 1MΩ at 20°C (68°F)

- If the resistance is incorrect, replace the starter motor.

5. Measure:

- Brush length ③
 Out of specification → Replace.



Brush Length Limit:
 5.0 mm (0.20 in)

6. Measure:

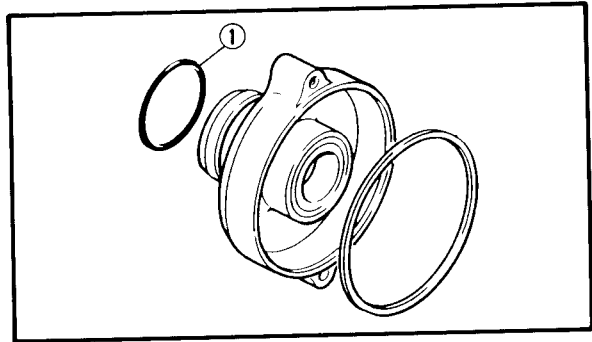
- Brush spring pressure
 Fatigue/Out of specification → Replace as a set.



Brush Spring Pressure:
 540 ~ 660 g (19.05 ~ 23.28 oz)

7. Inspect:

- Bearing
- Oil seal
- O-rings ①
 Wear/Damage → Replace.



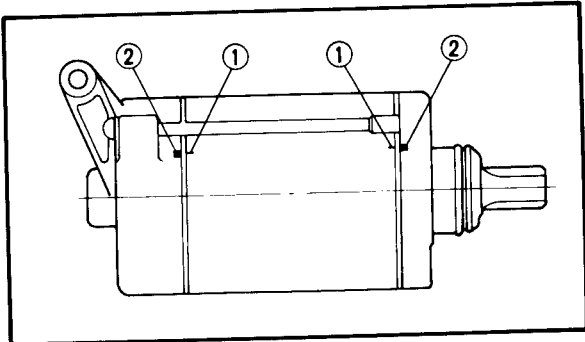
Installation

1. Install:

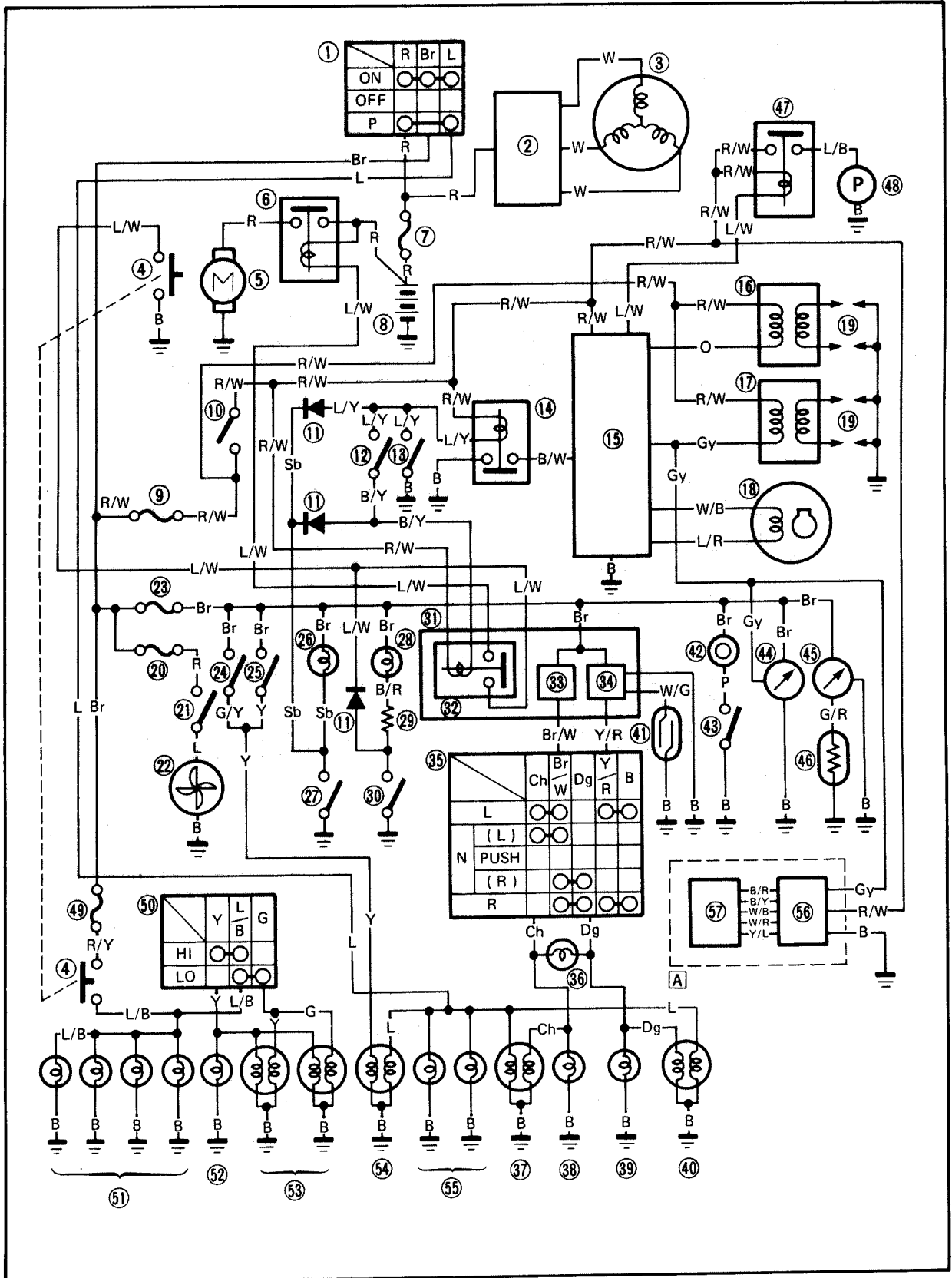
- Starter motor

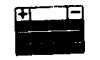
NOTE:

Align the match marks ① on the bracket with the match marks ② on the housing.



CHARGING SYSTEM
CIRCUIT DIAGRAM



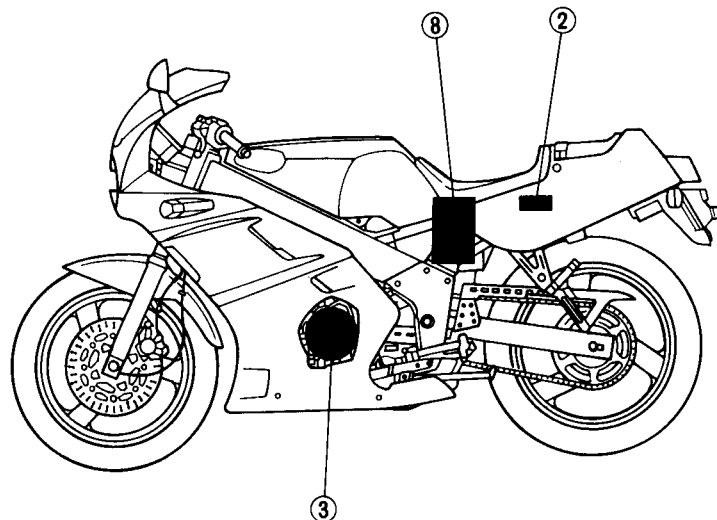
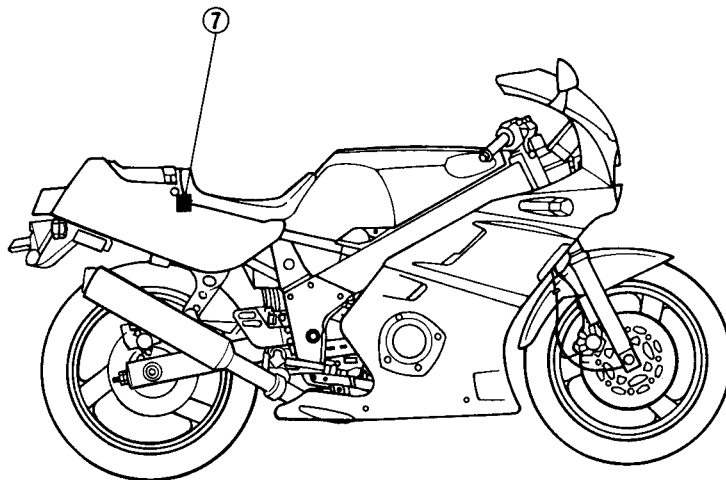


Aforementioned circuit diagram show the charging circuit in the wiring diagram.

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;

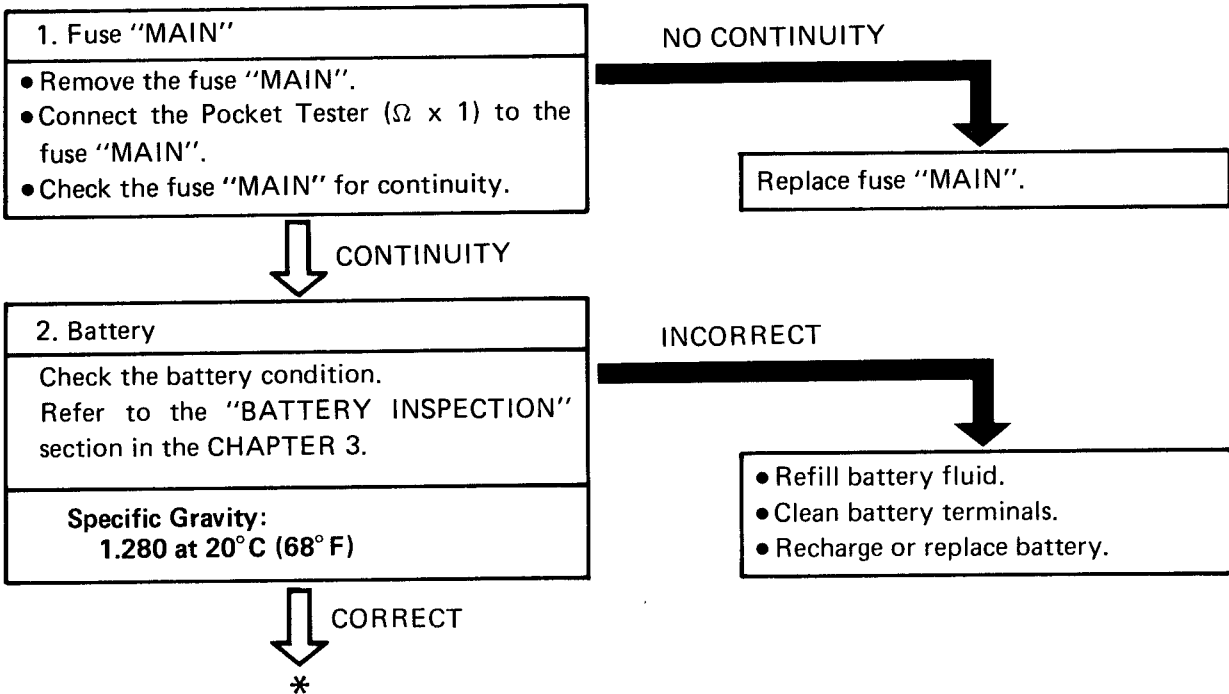
- 1. Fuse "MAIN"
- 2. Battery
- 3. Charge voltage
- 4. Stator coil resistance
- 5. Wiring connection
(Entire charging system)

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.

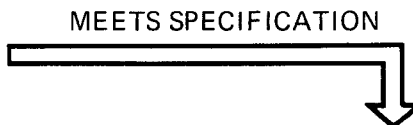
 **Inductive Tachometer:**
P/N. YU-08036

 **Pocket Tester:**
P/N. YU-03112





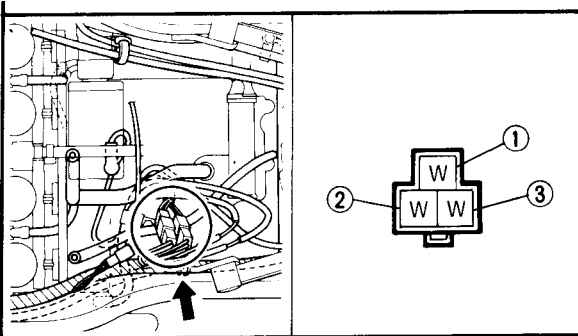
3. Charge voltage	
<ul style="list-style-type: none"> • Connect the Inductive Tachometer to spark plug lead. • Connect the Pocket Tester (DC20V) to the battery. 	
Tester (+) Lead → Battery (+) Terminal Tester (-) Lead → Battery (-) Terminal	
<ul style="list-style-type: none"> • Start the engine and accelerate to about, 3,000 r/min. • Check charging voltage. 	
	Charging Voltage: 14.3 ~ 15.3V at 3,000 r/min



Replace battery.



4. Stator coil resistance	
<ul style="list-style-type: none"> • Disconnect the A.C. magneto coupler from the wire harness. • Connect the Pocket Tester ($\Omega \times 1$) 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 specified resistance.



Stator Coil Resistance:

- White ① – White ②
0.44 ~ 0.66Ω at 20°C (68°F)
- White ① – White ③
0.44 ~ 0.66Ω at 20°C (68°F)

↓ BOTH RESISTANCES MEET SPECIFICATIONS

5. Wiring connection

Check the entire charging system for connections.
Refer to the "WIRING DIAGRAM" section.

↓ CORRECT

Replace rectifier/regulator.

OUT OF SPECIFICATION

Replace stator coil.

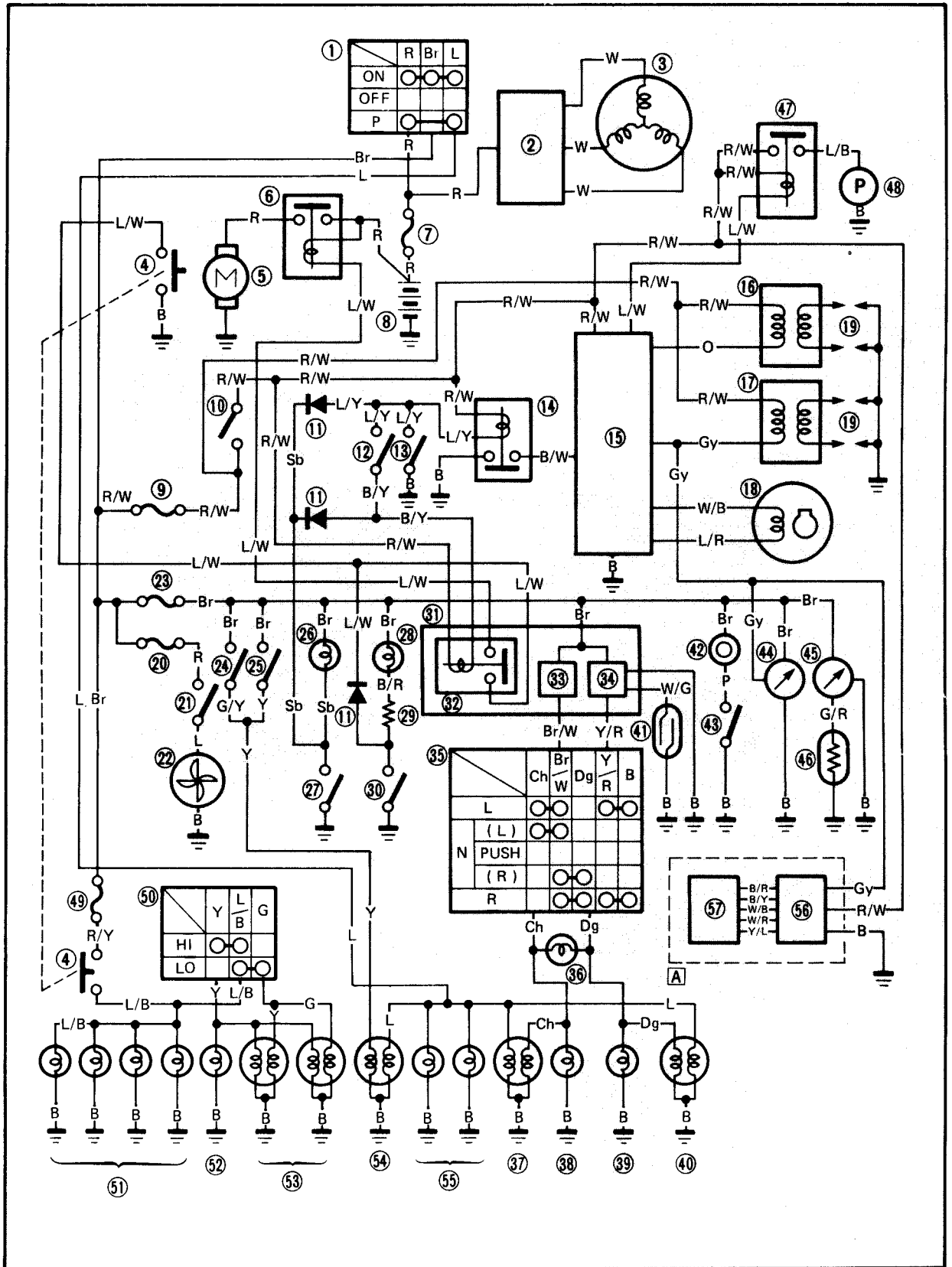
POOR CONNECTION

Correct.



LIGHTING SYSTEM

CIRCUIT DIAGRAM



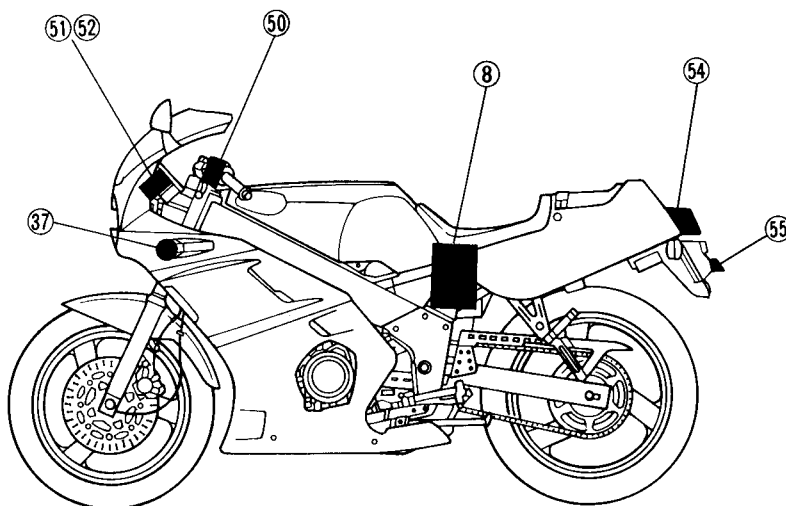
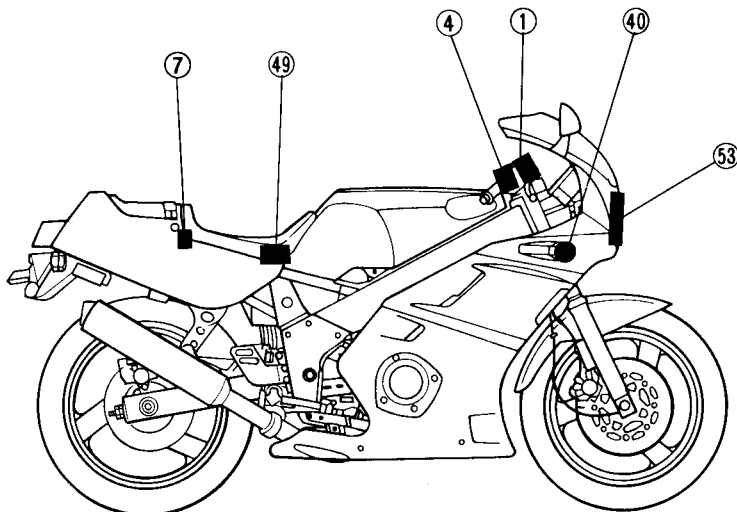


Aforementioned circuit diagram shows the lighting circuit in the wiring diagram.

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)
- ④⑩ Front position light (Right)
- ④⑨ Fuse "HEAD"
- ⑤⑩ "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;

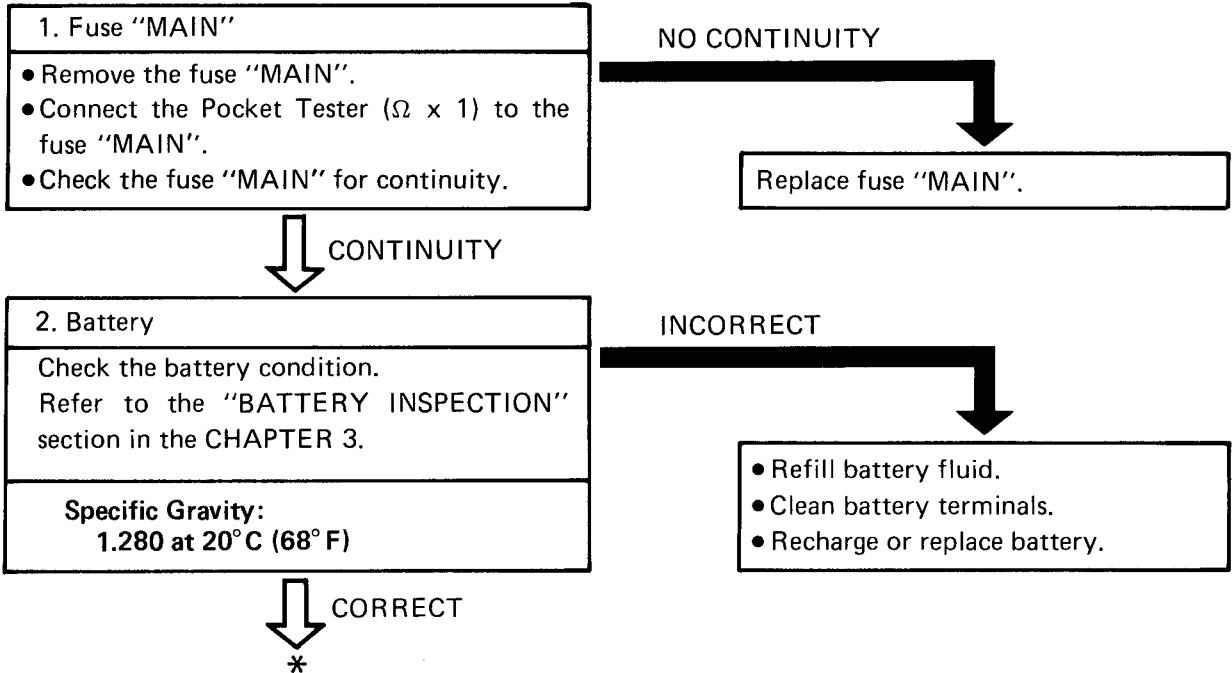
- | | |
|--|--|
| <ul style="list-style-type: none"> 1. Fuse "MAIN" 2. Battery 3. Main switch | <ul style="list-style-type: none"> 4. "LIGHTS" (Dimmer) switch 5. Wiring connection
(Entire lighting system) |
|--|--|

NOTE:

- Remove the following parts before troubleshooting.

1) Seat	3) Seat cowling
2) Upper cowling	
- Use the following special tool in this troubleshooting.

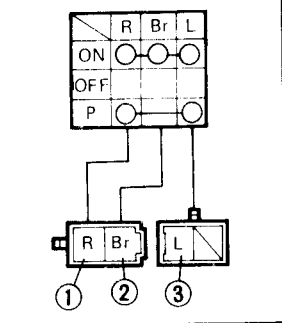
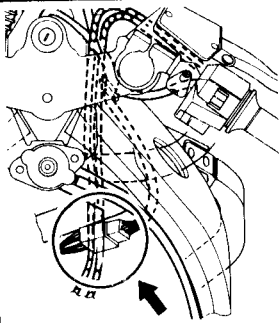
	Pocket Tester: P/N. YU-03112
---	--





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

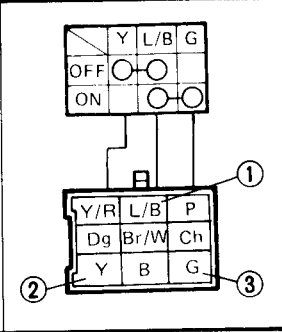
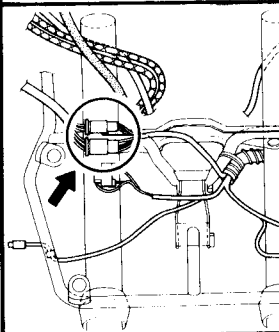
Replace main switch.



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).



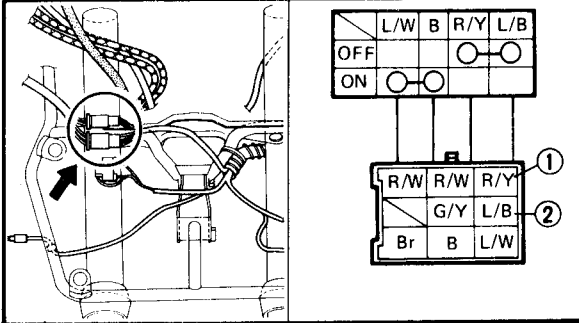
CORRECT

*



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).



6. Wiring connection

Check the entire lighting system for connections.
Refer to the "WIRING DIAGRAM" section.

POOR CONNECTION

Correct.

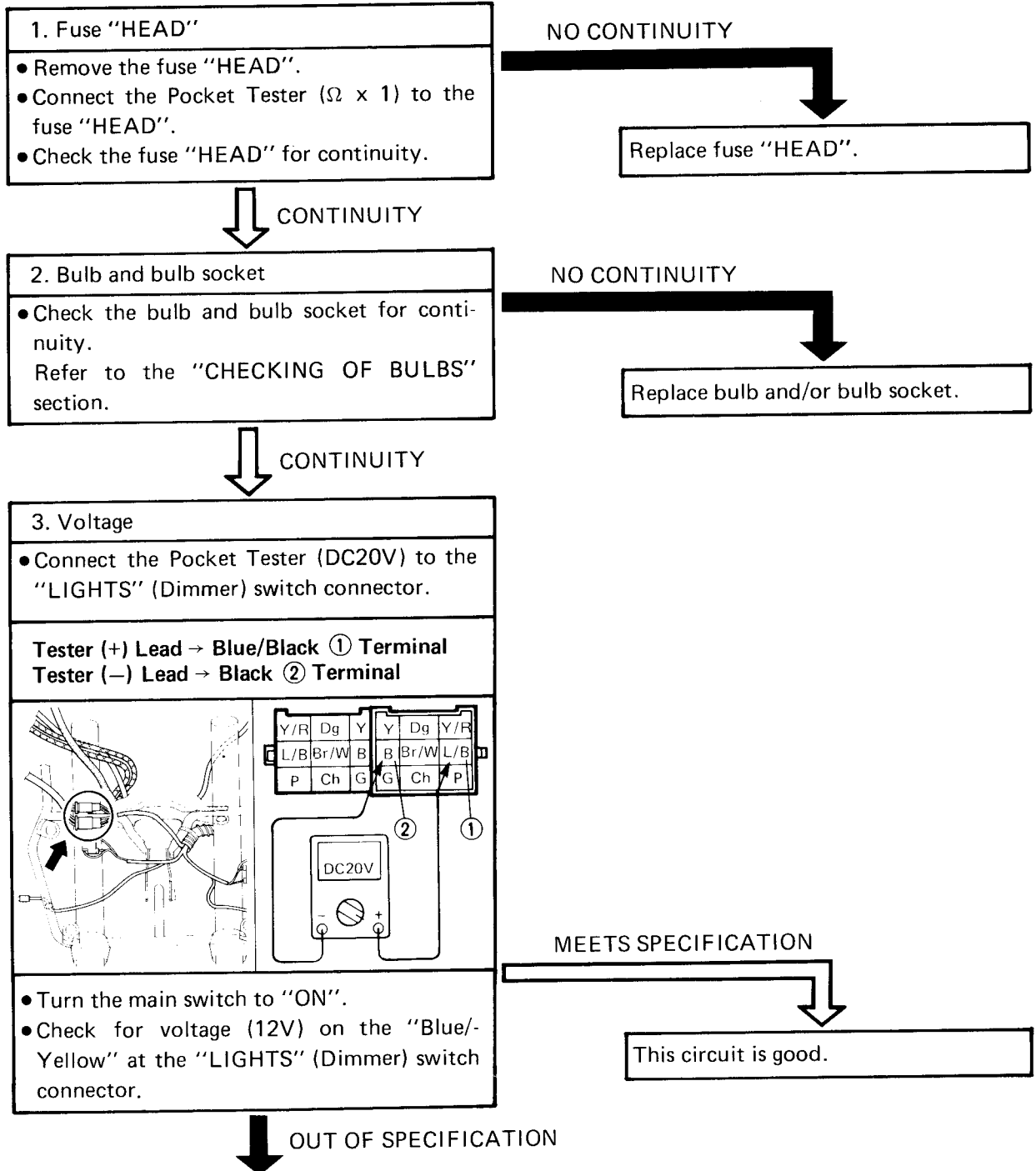


Check condition of each circuit for lighting system.
Refer to the "LIGHTING SYSTEM CHECK" section.



LIGHTING SYSTEM CHECK

1. Headlight and "HIGH BEAM" indicator light do not come on.



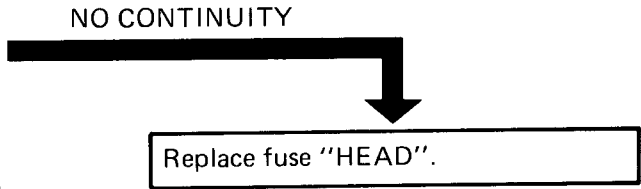


4. Wiring connection
 Check the entire lighting system for connections.
 Refer to the "WIRING DIAGRAM" section.

2. Meter light does not come on.

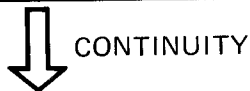
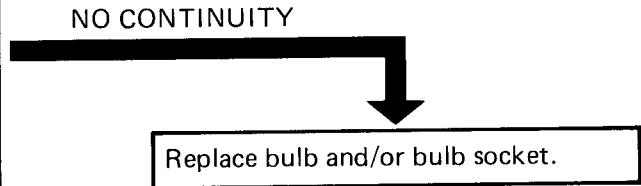
1. Fuse "HEAD"

- Remove the fuse "HEAD".
- Connect the Pocket Tester ($\Omega \times 1$) to the fuse "HEAD".
- Check the fuse "HEAD" for continuity.



2. Bulb and bulb socket

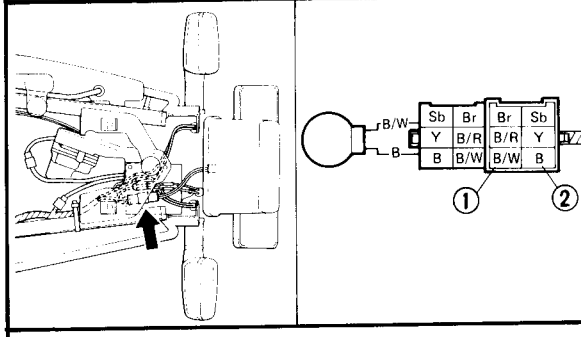
- Check the bulb and bulb socket for continuity.
 Refer to the "CHECKING OF BULBS" section.



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.

MEETS SPECIFICATION (12V)

This circuit is good.

3. License light does not come on.

OUT OF SPECIFICATION

4. Wiring connection

Check the entire lighting system for connections. Refer to the "WIRING DIAGRAM" section.

1. Bulb and bulb socket

- Check the bulb and bulb socket for continuity. Refer to the "CHECKING OF BULBS" section.

CONTINUITY

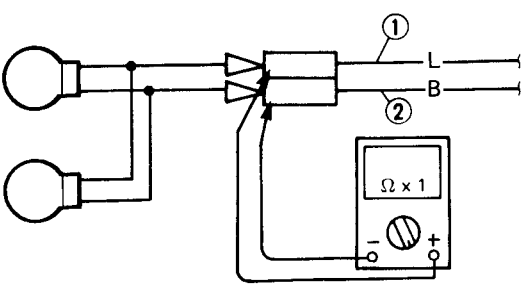
NO CONTINUITY

Replace bulb and/or bulb socket.

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.

MEETS SPECIFICATION (12V)

This circuit is good.

OUT OF SPECIFICATION

3. Wiring connection

Check the entire lighting system for connections. Refer to the "WIRING DIAGRAM" section.



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.

CONTINUITY

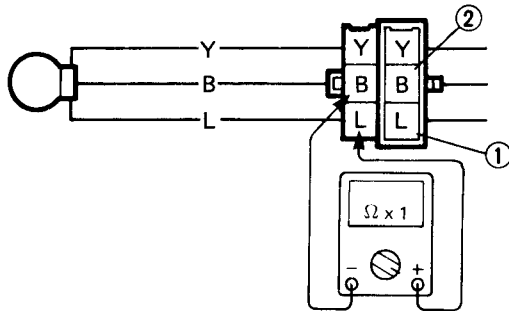
NO CONTINUITY

Replace bulb and/or bulb socket.

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.

MEETS SPECIFICATION (12V)

OUT OF SPECIFICATION

3. Wiring connection

Check the entire lighting system for connections. Refer to the "WIRING DIAGRAM" section.

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

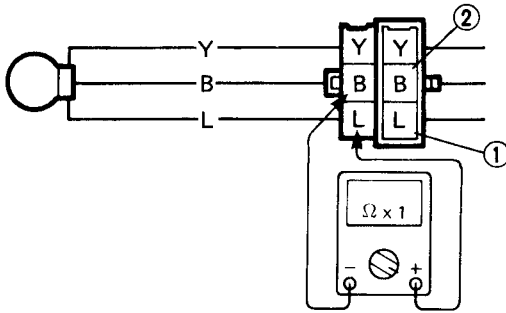
Replace bulb and/or bulb socket.

CONTINUITY

2. Voltage

- Connect the Pocket Tester (DC20V) to the bulb socket connector.

Tester (+) Lead → Blue ① Terminal
 Tester (-) Lead → Black ② Terminal



OUT OF SPECIFICATION

3. Wiring connection

Check the entire lighting system for connections. Refer to the "WIRING DIAGRAM" section.

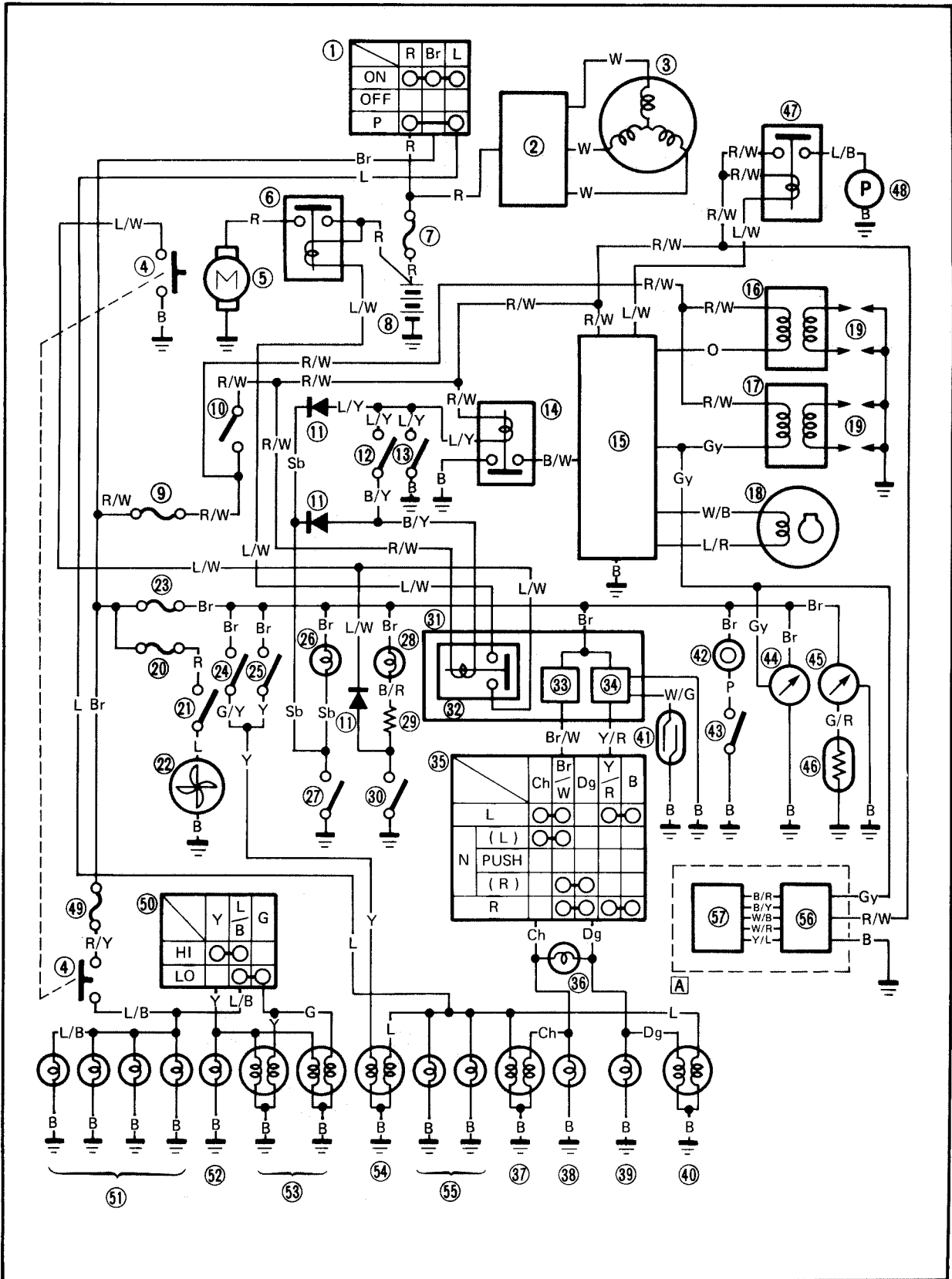
- Turn the main switch to "ON".
- Turn the "LIGHTS" switch to "ON".
- Check for voltage (12V) on the "Blue" lead at the bulb socket connector.

MEETS SPECIFICATION (12V)

This circuit is good.



SIGNAL SYSTEM
CIRCUIT DIAGRAM



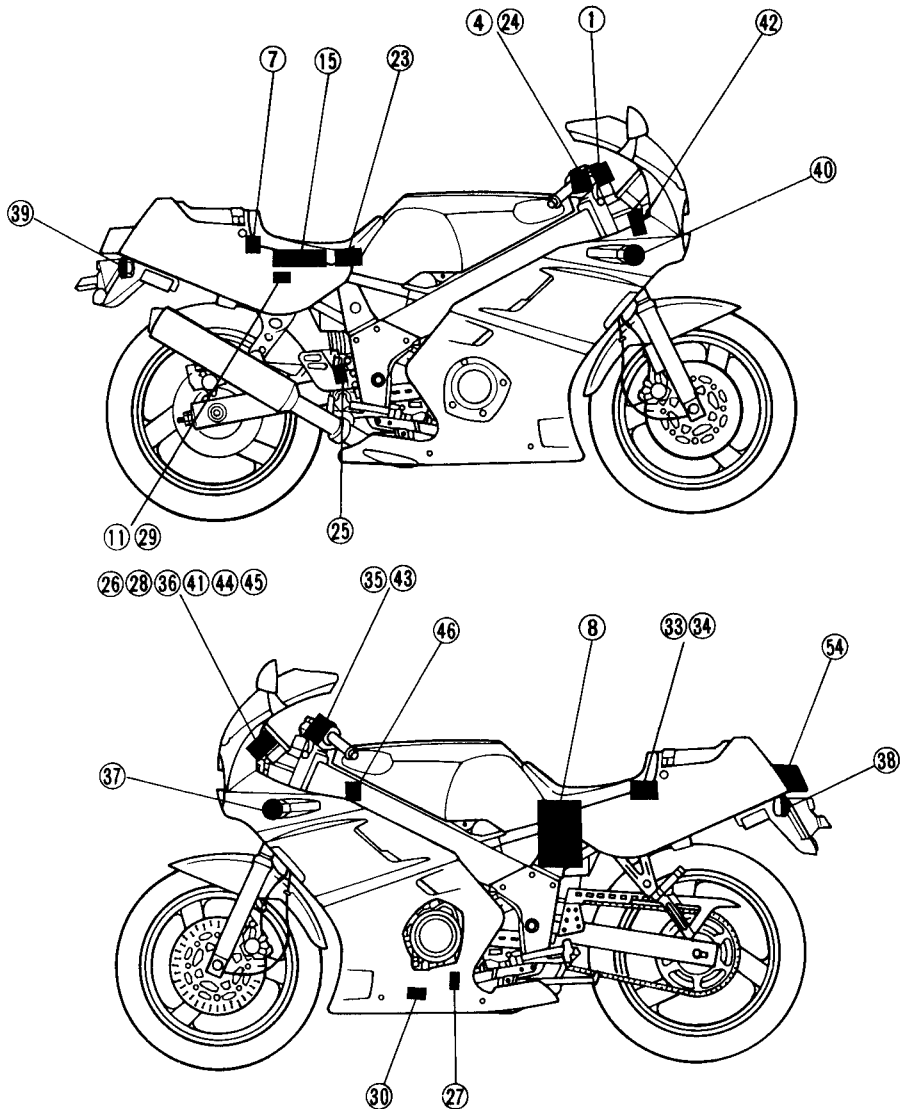


Aforementioned circuit diagram shows the signal circuit in the wiring diagram.

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
- ⑲ Fuse "SIGNAL"
- ⑳ Front brake switch
- ㉑ Rear brake switch
- ㉒ "NEUTRAL" indicator light
- ㉓ Neutral switch
- ㉔ "OIL" indicator light
- ㉕ Resistor
- ㉖ Oil level switch
- ㉗ Flasher relay (Relay assembly ㉘)
- ㉙ Cancelling unit (Relay assembly ㉚)
- ㉛ "TURN" switch
- ㉜ "TURN" indicator light
- ㉝ Front flasher light (Left)
- ㉞ Rear flasher light (Left)
- ㉟ Rear flasher light (Right)
- ㊱ Front flasher light (Right)
- ㊲ Reed switch
- ㊳ Horn
- ㊴ "HORN" switch
- ㊵ Tachometer
- ㊶ Temp meter
- ㊷ Thermo unit
- ㊸ 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;

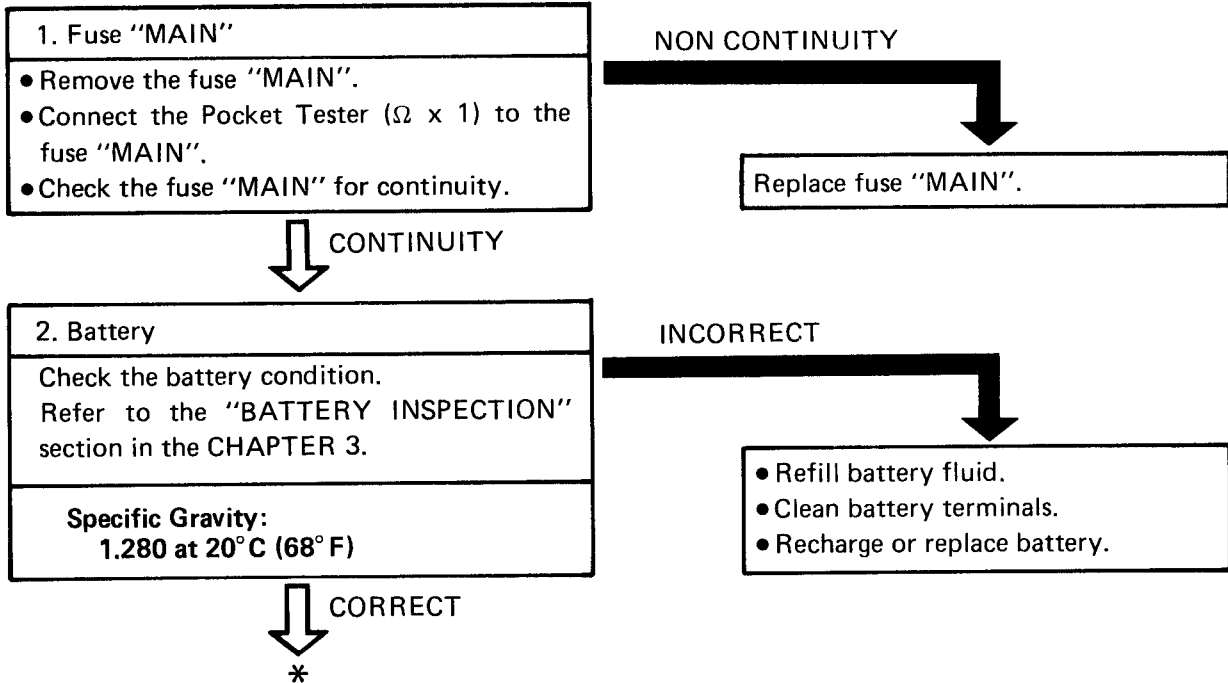
- | | |
|----------------|--|
| 1. Fuse "MAIN" | 4. Wiring connection
(Entire signal system) |
| 2. Battery | |
| 3. Main switch | |

NOTE:

- Remove the following parts before troubleshooting.

1) Seat	3) Seat cowling
2) Lower cowling	4) Air filter case
- Use the following special tool in this troubleshooting.

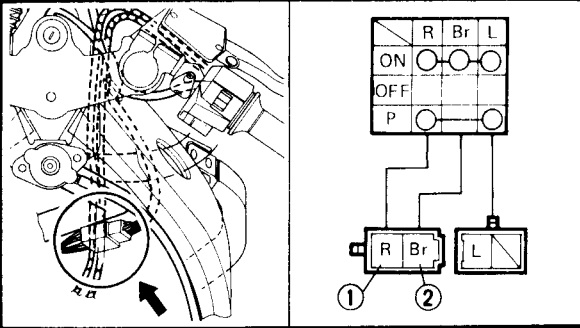

Pocket Tester:
P/N. YU-03112





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.



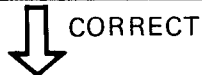
INCORRECT



Replace main switch.

4. Wiring connection

Check the entire signal system for connections. Refer to the "WIRING DIAGRAM" section.



POOR CONNECTION



Correct.

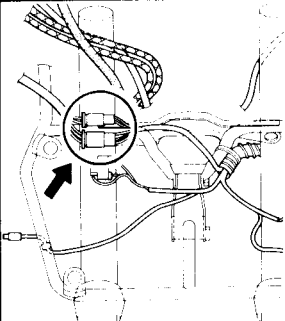
Check condition of each circuit for signal system. Refer to the "SIGNAL SYSTEM CHECK" section.

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.



	P	B
OFF (Free)		
ON (Push)	○	○

Y	B	G
Dg	Br/W	Ch
Y/R	L/W	P

INCORRECT

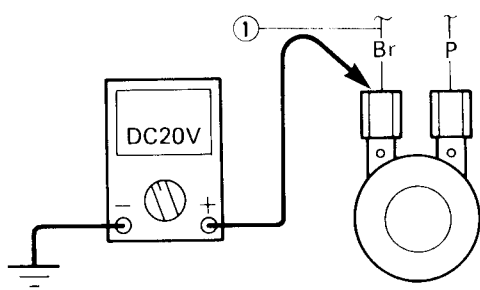
Replace handlebar switch (Left).

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

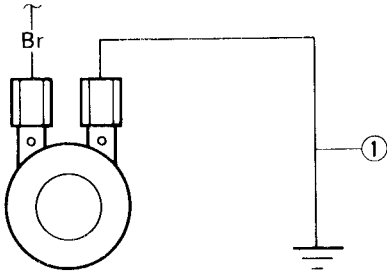
Check the entire lighting system for connections.

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

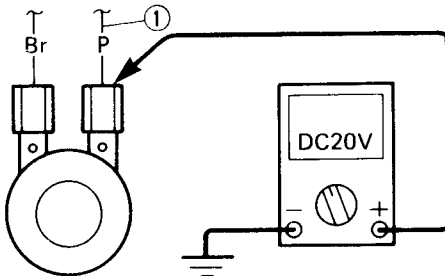
Horn is good.

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



OUT OF SPECIFICATION

Replace horn.

- Turn the main switch to "ON".
- Check for voltage (12V) on the "Pink" lead at the horn terminal.

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.

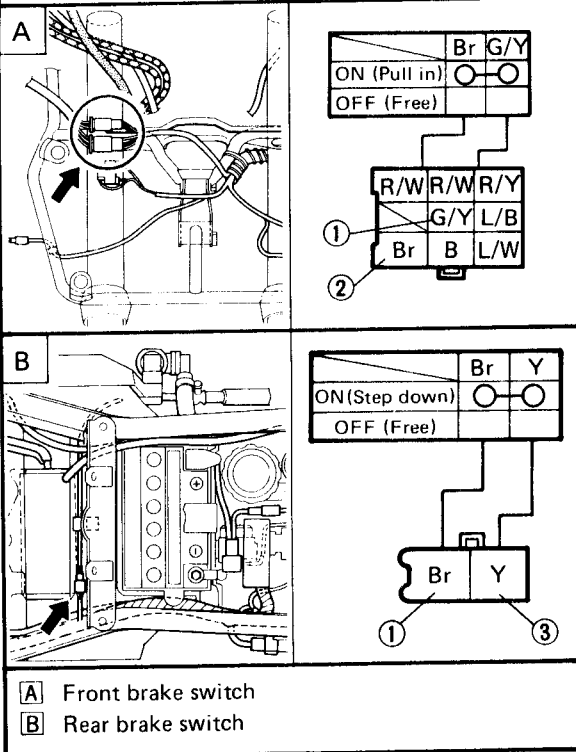
NON CONTINUITY

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.



INCORRECT

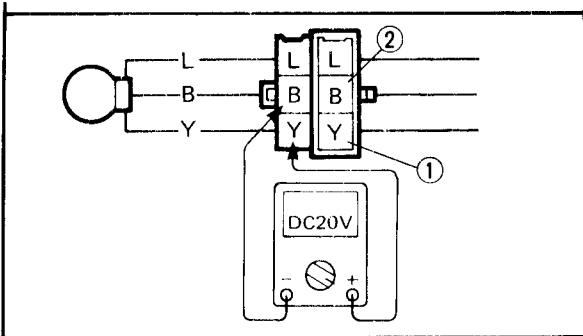
Replace brake switch.

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.

MEETS SPECIFICATION (12V)

This circuit is good.

OUT OF SPECIFICATION

4. Wiring connection

Check the entire signal system for connections. Refer to the "WIRING DIAGRAM" section.

3. Flasher light and/or "TURN" indicator light do not blink.

1. Bulb and bulb socket

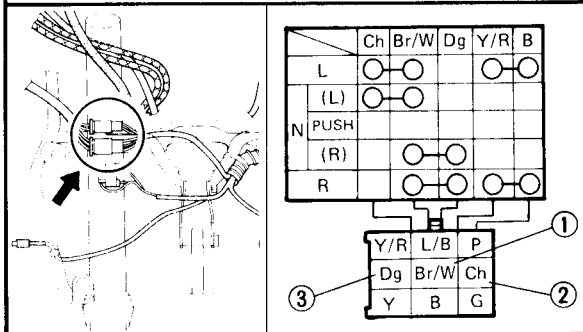
- Check the bulb and bulb socket for continuity. Refer to the "CHECKING OF BULBS" section.

NO CONTINUITY

CONTINUITY

2. "TURN" switch

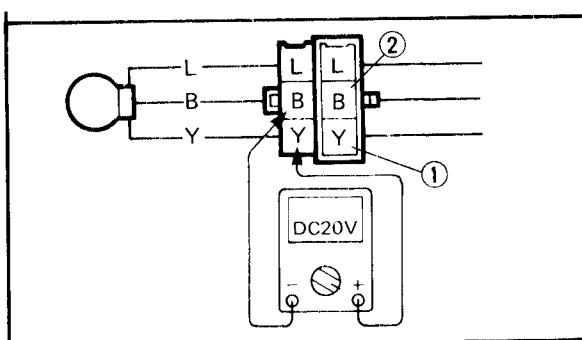
- Disconnect the handlebar switch coupler from the wire harness.
- Check the switch component for the continuity between "Brown/White ① and Chocolate ②" and "Brown/White ① and Dark green ③". Refer to the "CHECKING OF SWITCHES" section.



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.

MEETS SPECIFICATION (12V)

This circuit is good.

OUT OF SPECIFICATION

4. Wiring connection

Check the entire signal system for connections. Refer to the "WIRING DIAGRAM" section.

3. Flasher light and/or "TURN" indicator light do not blink.

1. Bulb and bulb socket

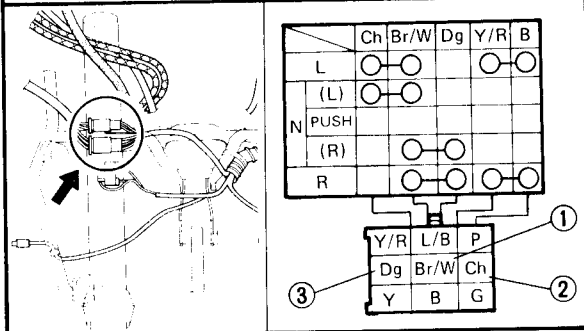
- Check the bulb and bulb socket for continuity. Refer to the "CHECKING OF BULBS" section.

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

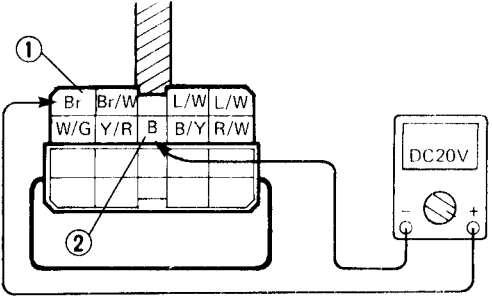
*



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

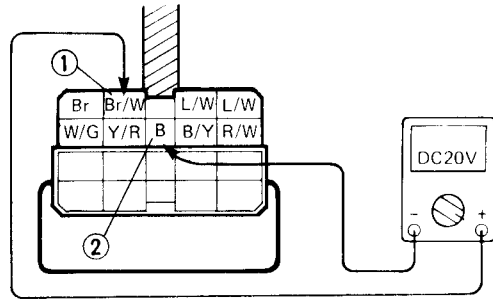
Check the entire signal system for connections.

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)





<p>5. Voltage</p> <ul style="list-style-type: none"> • Connect the Pocket Tester (DC20V) to the bulb socket connector.
<p>At Flasher Light (Left): Tester (+) Lead → Chocolate ① Lead Tester (-) Lead → Frame Ground</p>
<p>At Flasher Light (Right): Tester (+) Lead → Dark green ② Lead Tester (-) Lead → Frame Ground</p>
<ul style="list-style-type: none"> • 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

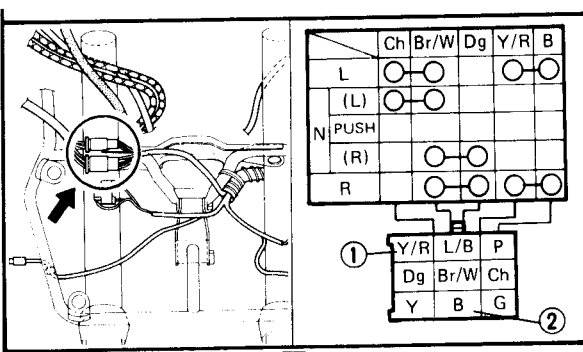
MEETS SPECIFICATION (12V)

This circuit is good.

<p>6. Wiring connection</p> <p>Check the entire signal system for connections. Refer to the "WIRING DIAGRAM" section.</p>

4. Blinking (Flasher light) is not cancelled automatically.

<p>1. "TURN" switch</p> <ul style="list-style-type: none"> • Disconnect the handlebar switch coupler from the wire harness. • Check the switch component for the continuity between "Yellow/Red ① and Black ②". <p>Refer to the "CHECKING OF SWITCHES" section.</p>
--



INCORRECT

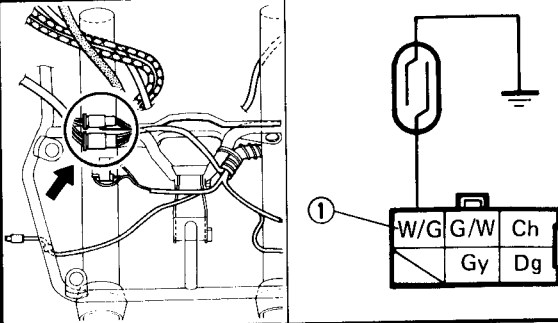
Replace handlebar switch (Left).

CORRECT

2. Reed switch

- Disconnect reed switch coupler from the wire harness.
- Connect the pocket tester ($\Omega \times 1$) to the reed switch terminal.

Tester (+) Lead → White/Green ① Terminal
 Tester (-) Lead → Ground



NOTE: _____
 When measuring reed switch resistance, lift front wheel and rotate the wheel by hand.

- Check the reed switch for specified resistance.



Reed Switch Resistance:
 About 7Ω
 (White/Green – Ground)
 Then return back 0Ω or $\infty\Omega$
 when wheel is stopped.

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

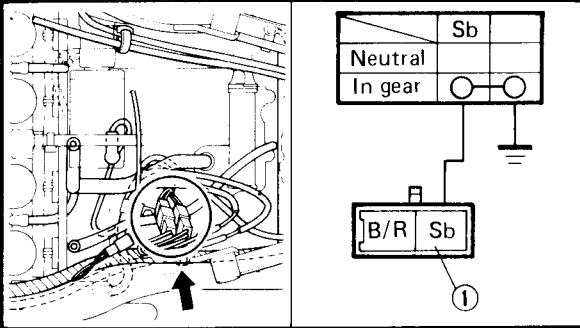
Replace bulb and/or bulb socket.



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.

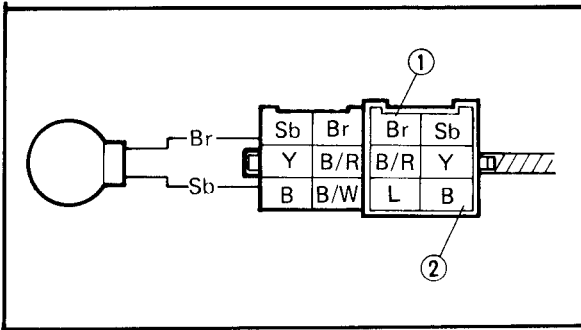


CORRECT

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.

MEETS SPECIFICATION (12V)

This circuit is good.

OUT OF SPECIFICATION

6. Wiring connection
 Check the entire signal system for connections. Refer to the "WIRING DIAGRAM" section.

5. "OIL" indicator light does not come on when push "START" switch.

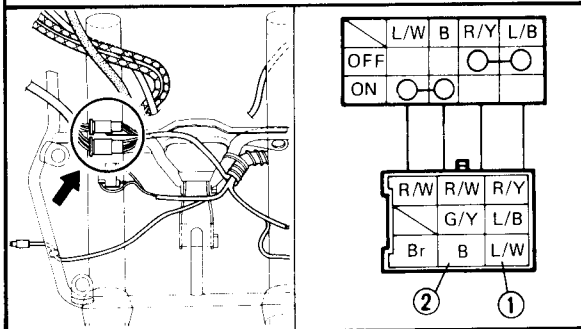
1. Bulb and bulb socket
- Check the bulb and bulb socket for continuity. Refer to the "CHECKING OF BULBS" section.

CONTINUITY

NO CONTINUITY

Replace bulb and/or bulb socket.

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.



CORRECT

INCORRECT

Replace handlebar switch (Right).



3. Diode

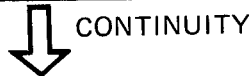
- Disconnect the diode unit coupler from the wire harness.
- Connect the pocket tester ($\Omega \times 1$) to the diode leads.

Tester (+) Lead → Blue/White ① Lead
 Tester (-) Lead → Green ② Lead

- Check the diode for continuity.

NO CONTINUITY

Replace diode unit.



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.

MEETS SPECIFICATION (12V)

This circuit is good.

OUT OF SPECIFICATION

5. Wiring connection

Check the entire signal system for connections. Refer to the "WIRING DIAGRAM" section.

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.

CONTINUITY

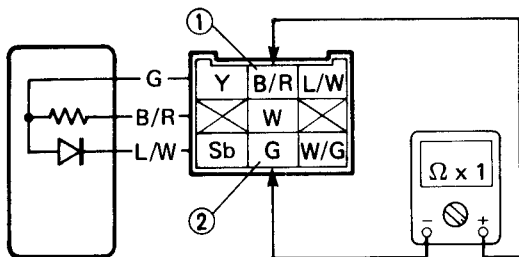
Replace bulb and/or bulb socket.

NO CONTINUITY

2. Resister

- Disconnect the diode unit coupler from the wire harness.
- Connect the pocket tester ($\Omega \times 1$) to the diode leads.

Tester (+) Lead \rightarrow Black/Red ① Lead
 Tester (-) Lead \rightarrow Green ② Lead



- Check the resister for continuity.

CONTINUITY
*

NO CONTINUITY

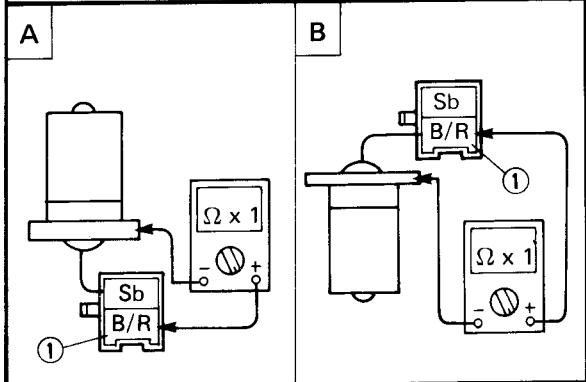
Replace diode unit.



3. Oil level switch

- Remove the oil level switch from the oil tank.
- Connect the pocket tester ($\Omega \times 1$) to the oil level gauge.

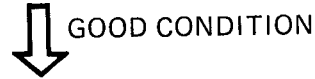
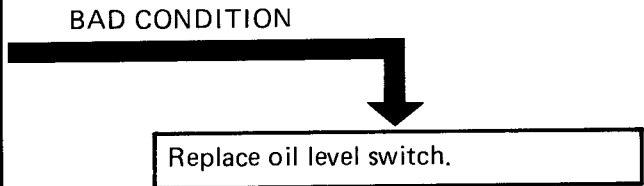
Tester (+) Lead → Black/Red ① Terminal
 Tester (-) Lead → Oil Level Switch Body



• Check the oil level switch for continuity.

Switch position	Good condition		Bad condition	
	○	X	○	X
A Upright position	X	○	X	○
B Upside down position	○	X	X	○

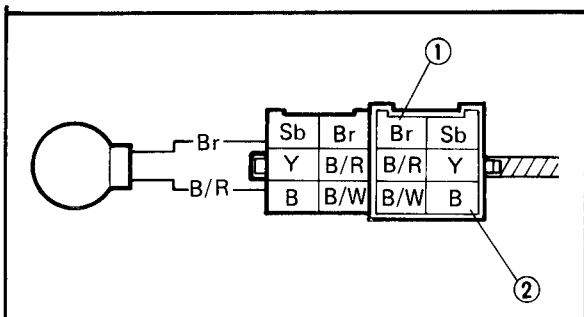
○ : Continuity X : No continuity



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.

MEETS SPECIFICATION (12V)

This circuit is good.

OUT OF SPECIFICATION

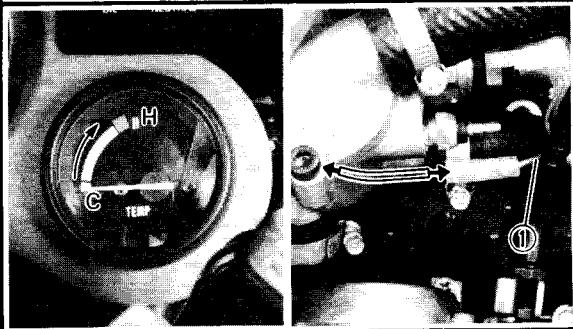
5. Wiring connection

Check the entire signal system for connections. Refer to the "WIRING DIAGRAM" section.

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".



INCORRECT

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.

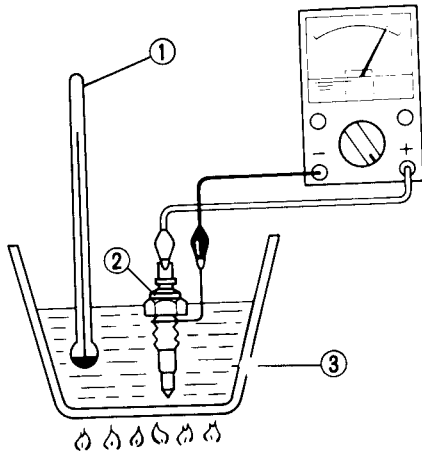
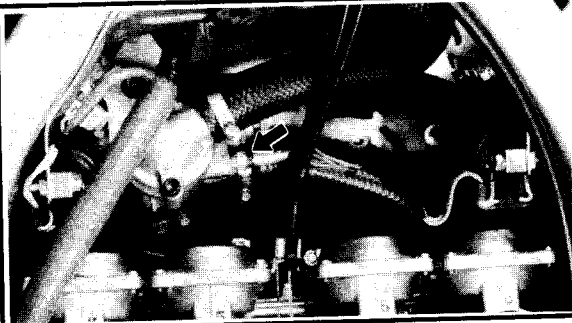


2. Thermo unit

- 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)	154 Ω
80° C (176° F)	47 ~ 57 Ω
100° C (212° F)	26 ~ 29 Ω
120° C (248° F)	16 Ω



- 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.

MEETS SPECIFICATIONS

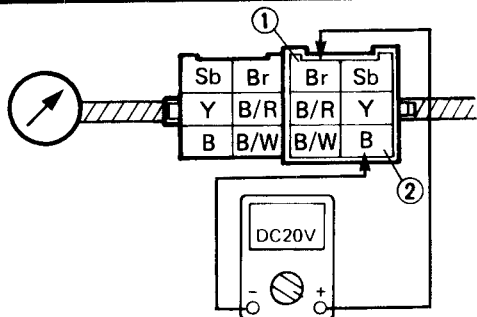
OUT OF SPECIFICATION

Replace thermo unit.

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.

MEETS SPECIFICATION (12V)

OUT OF SPECIFICATION

Check the entire signal system for connections.

6. Wiring connection

Check the entire signal system for connections. Refer to the "WIRING DIAGRAM" section.

POOR CONNECTION

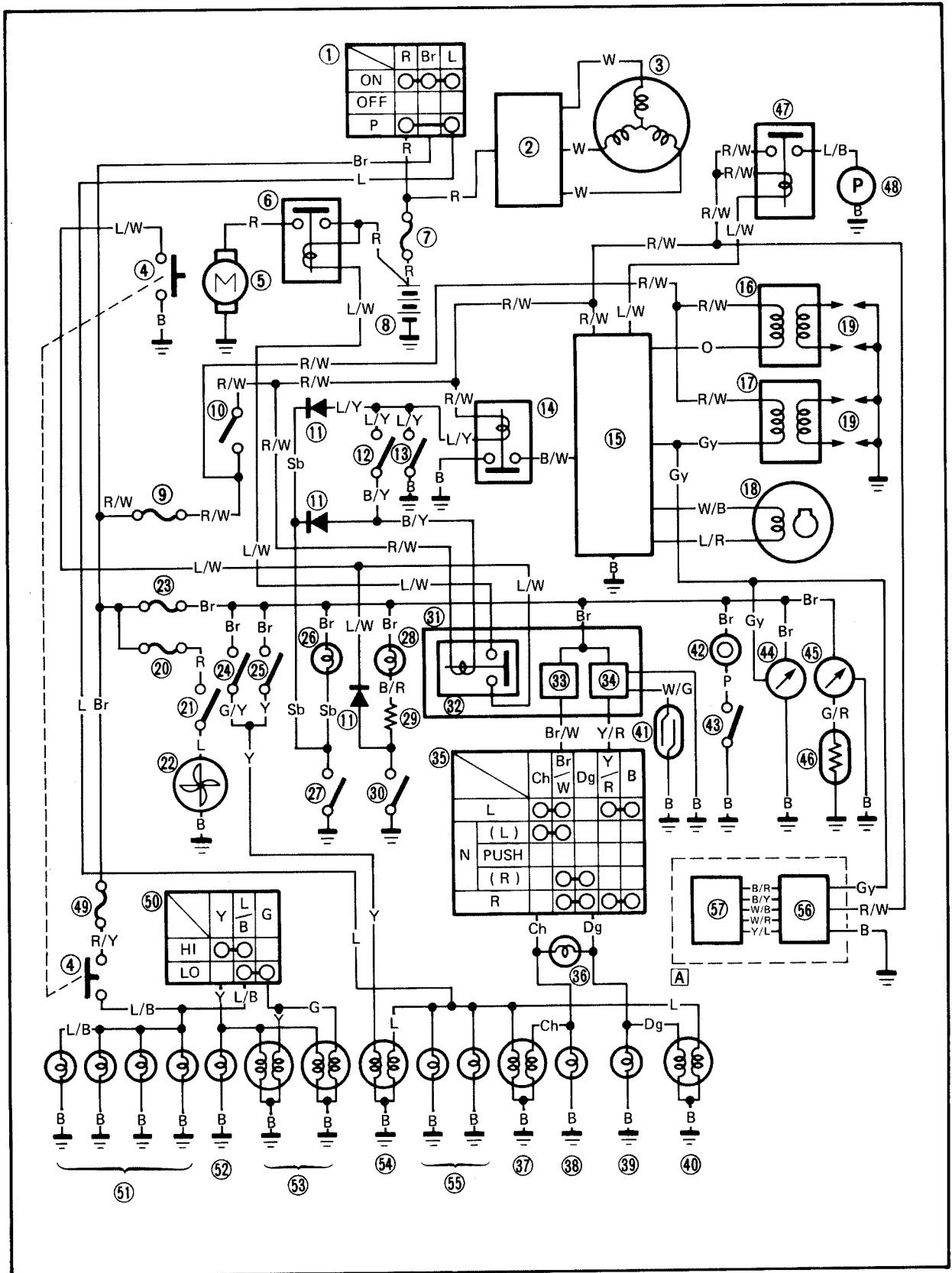
Correct.

CORRECT

Replace tempmeter.



COOLING SYSTEM
CIRCUIT DIAGRAM



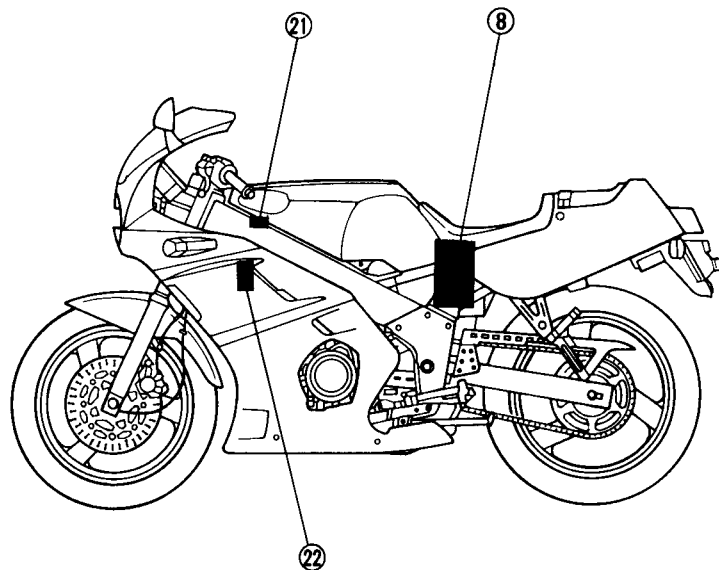
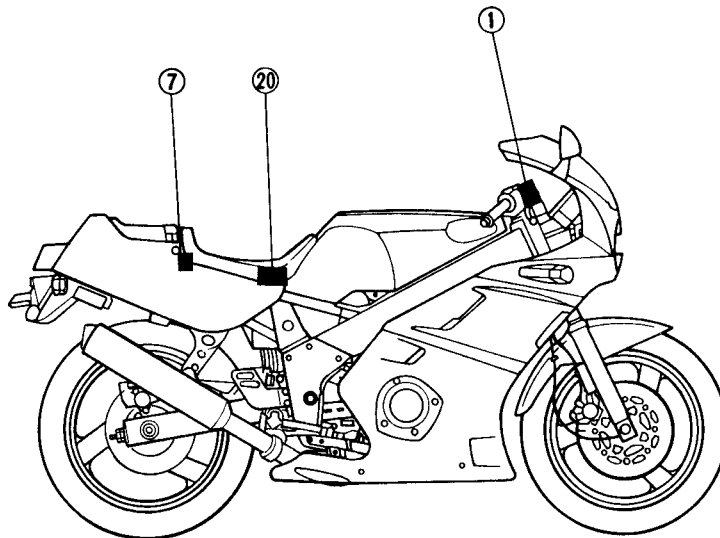


A forementioned circuit diagram shows the cooling circuit in the circuit diagram.

NOTE:

For the color codes, see page 8-2.

- ① Main switch
- ⑦ Fuse "MAIN"
- ⑧ Battery
- ⑳ Fuse "FAN"
- ㉑ Thermo switch
- ㉒ Fan motor



TROUBLESHOOTING

FAN MOTOR DOES NOT TURN.

Procedure

Check;

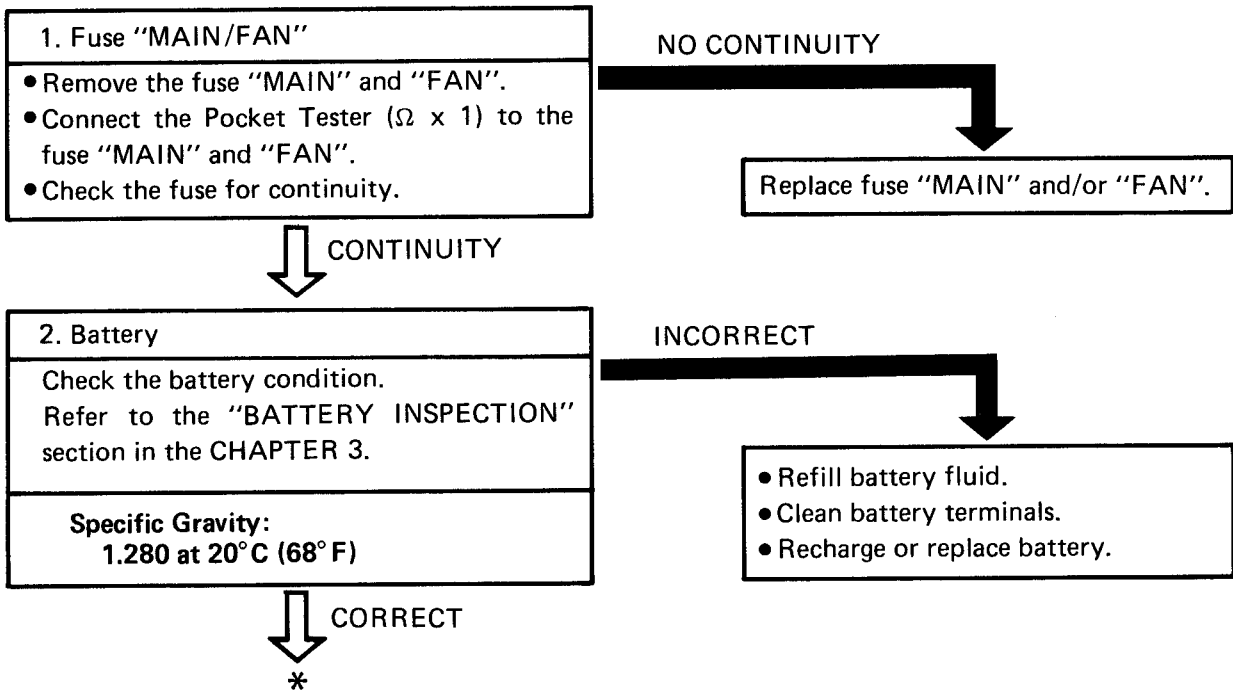
- | | |
|-----------------------|-------------------------|
| 1. Fuse "MAIN/FAN" | 5. Thermo switch |
| 2. Battery | 6. Wiring connection |
| 3. Fan motor (Test 1) | (Entire cooling system) |
| 4. Fan motor (Test 2) | |

NOTE:

- Remove the following before troubleshooting.

1) Seat	3) Air filter case
2) Top cover	
- Use the following special tool in this troubleshooting.

	Pocket Tester: P/N. YU-03112
---	--

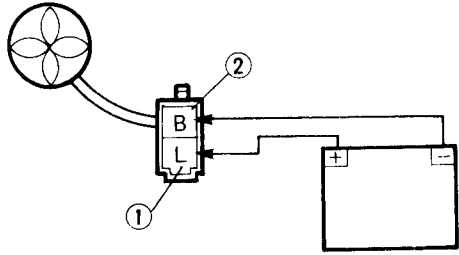




3. Fan motor (Test 1)


- Disconnect the fan motor coupler.
- Connect the battery voltage as shown.

Battery (+) Lead → Blue ① Terminal
Battery (-) Lead → Black ② Terminal

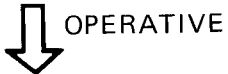


• Check the fan motor for operation.

NO OPERATIVE

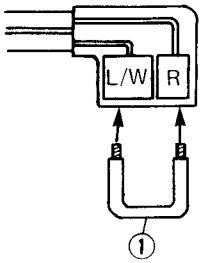
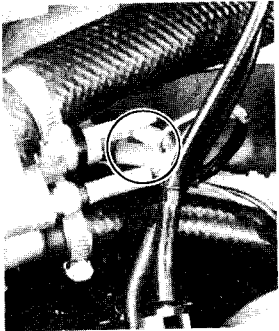


Replace fan motor.




4. Fan motor (Test 2)

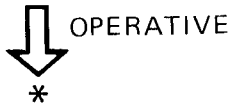
- Disconnect the thermo switch coupler.
- Connect the terminal with the jumper ① lead as shown.



NO OPERATIVE



Check wiring connection(s).





5. Thermo switch

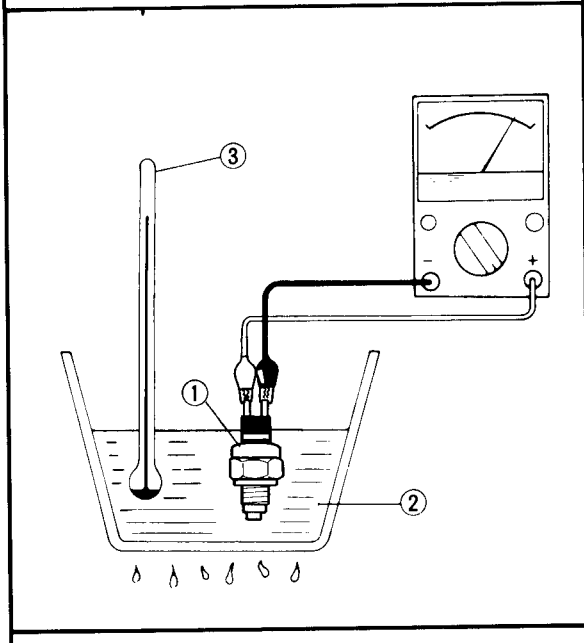
- Remove the thermo switch from the thermostat housing.
- Connect the pocket tester ($\Omega \times 1$) to the thermo switch ① .
- Immerse the thermo switch in the water ② .
- Check the thermo switch for continuity. Note temperatures while heating the water with the temperature gauge ③ .

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.



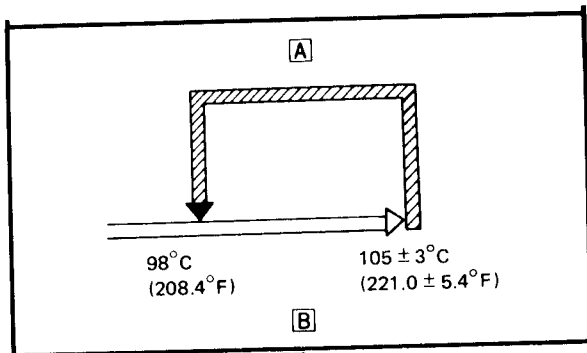
Thermo Switch:
8 Nm (0.8 m·kg, 5.8 ft·lb)
Three Bond Sealock® # 10

⚠ CAUTION:

After replacing the thermo switch, check the coolant 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.

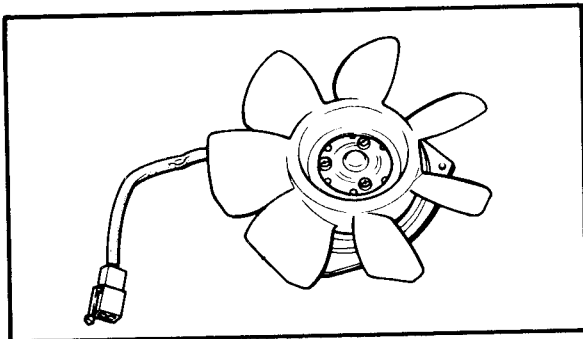
GOOD CONDITION

6. Wiring connection

- Check the entire cooling system for connections. Refer to the "WIRING DIAGRAM" section.

POOR CONNECTION

Correct.



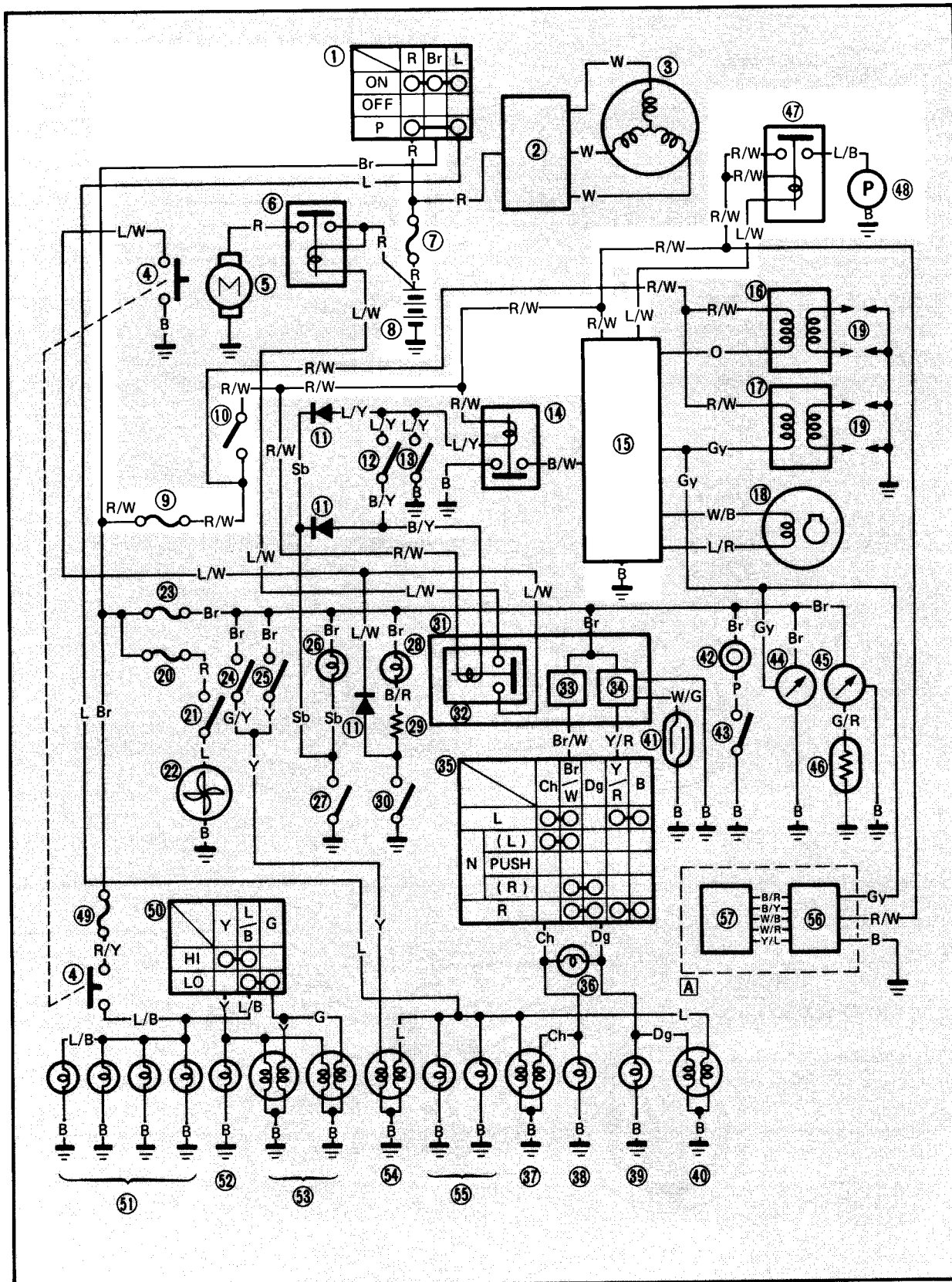
Fan Motor Inspection

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



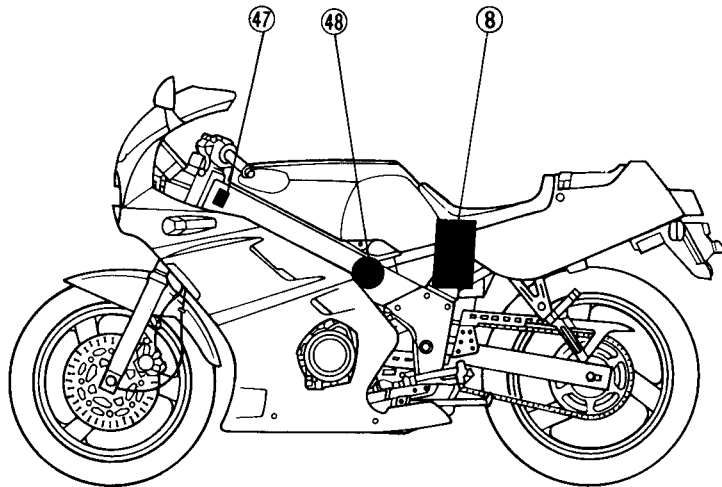
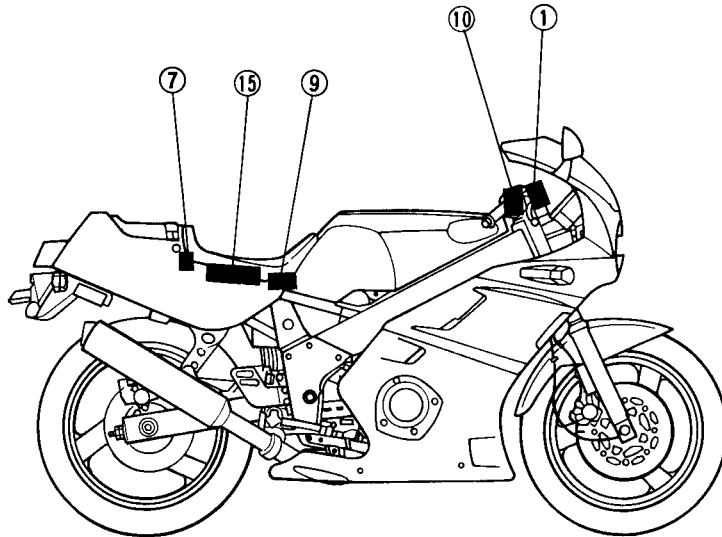


A forementioned circuit diagram shows the fuel circuit in the circuit diagram.

NOTE:

For the color codes, see page 8-2.

- ① Main switch
- ⑦ Fuse "MAIN"
- ⑧ Battery
- ⑨ Fuse "IGNITION"
- ⑩ "ENGINE STOP" switch
- ⑮ Digital ignitor unit
- ④⑦ Fuel pump relay
- ④⑧ Fuel pump





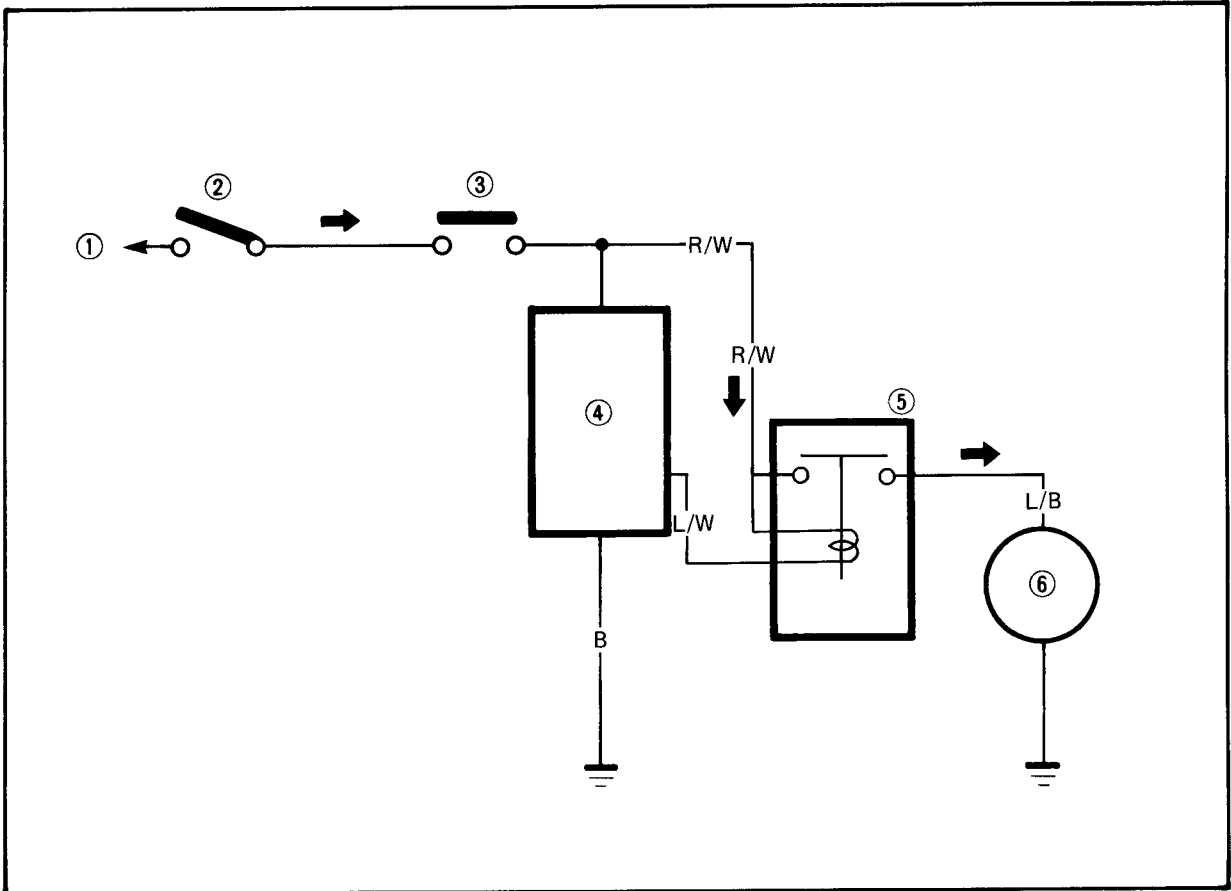
FUEL PUMP CIRCUIT OPERATION

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
<ul style="list-style-type: none"> ● Main/Engine stop switch turned to "ON" 	<ul style="list-style-type: none"> ● Engine turned on 	<ul style="list-style-type: none"> ● 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.

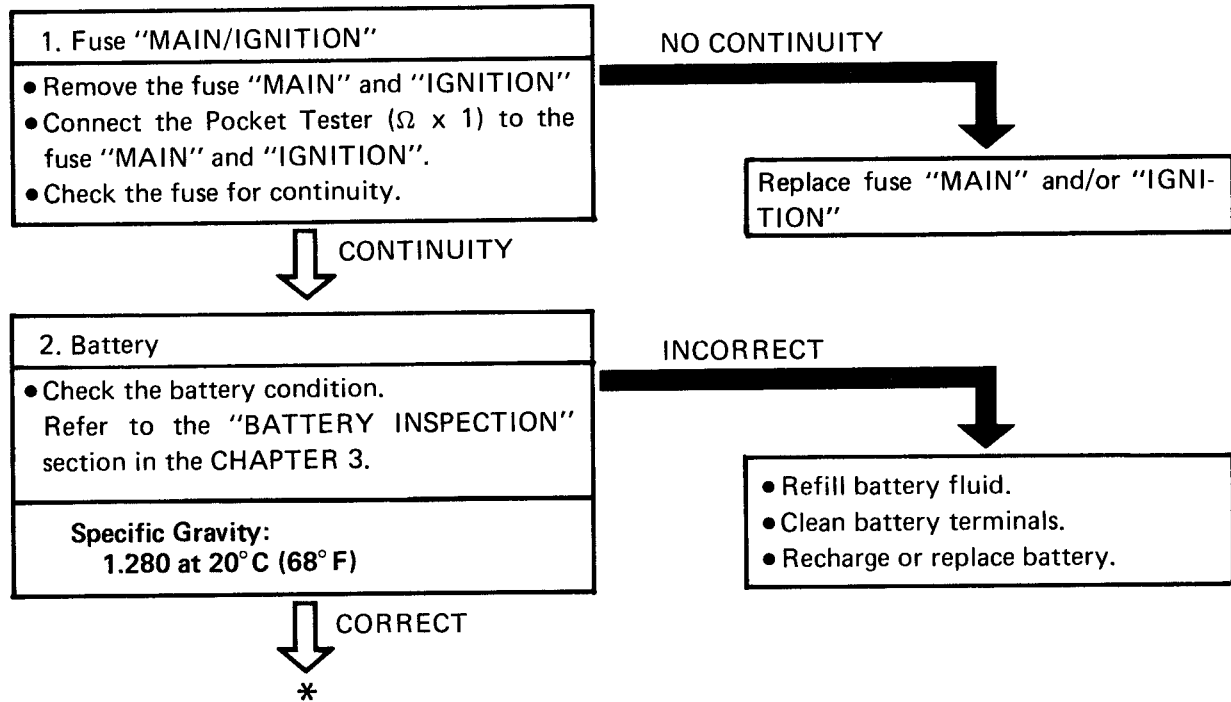
Procedure

- | | |
|-------------------------|----------------------|
| 1. Fuse "MAIN/IGNITION" | 5. Fuel pump relay |
| 2. Battery | 6. Fuel pump |
| 3. Main switch | 7. Wiring connection |
| 4. "ENGINE STOP" switch | (Entire fuel system) |

NOTE:

- Remove the following before troubleshooting.
 - 1) Seat
 - 2) Fuel tank
- Use the following special tool in this troubleshooting.

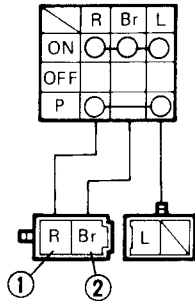
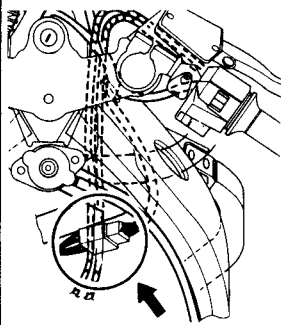
	Pocket Tester: YU-03112
---	-----------------------------------





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.



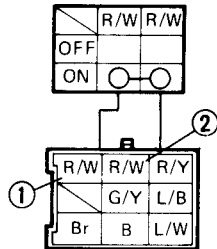
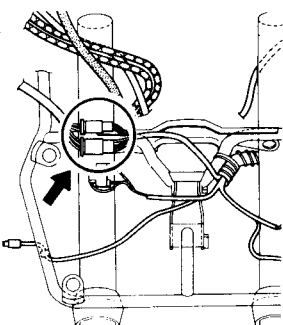
INCORRECT

Replace main switch.



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).



*

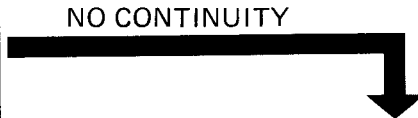


5. Fuel pump relay

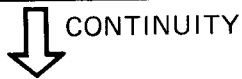
- Disconnect the fuel pump relay coupler from the wire harness.
- Connect the pocket tester ($\Omega \times 1$) and battery (12V) voltage to the fuel pump relay coupler terminals.

Tester (+) Lead \rightarrow Blue/Black ① Terminal
 Tester (-) Lead \rightarrow Red/White ② Terminal
 Battery (+) Lead \rightarrow Red/White ③ Terminal
 Battery (-) Lead \rightarrow Blue/White ④ Terminal

- Check the relay for continuity.



Replace fuel pump relay.

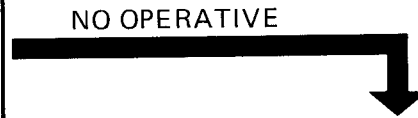


6. Fuel pump

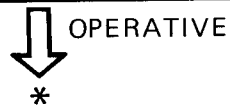
- Disconnect the fuel pump coupler from the wire harness.
- Connect the battery voltage as shown.

Battery (+) Lead \rightarrow Blue/Black ① Terminal
 Battery (-) Lead \rightarrow Black ② Terminal

- Check the fuel pump operation.



Replace fuel pump.





7. Wiring connection
Check the entire fuel system for connections.
Refer to the "WIRING DIAGRAM" section.

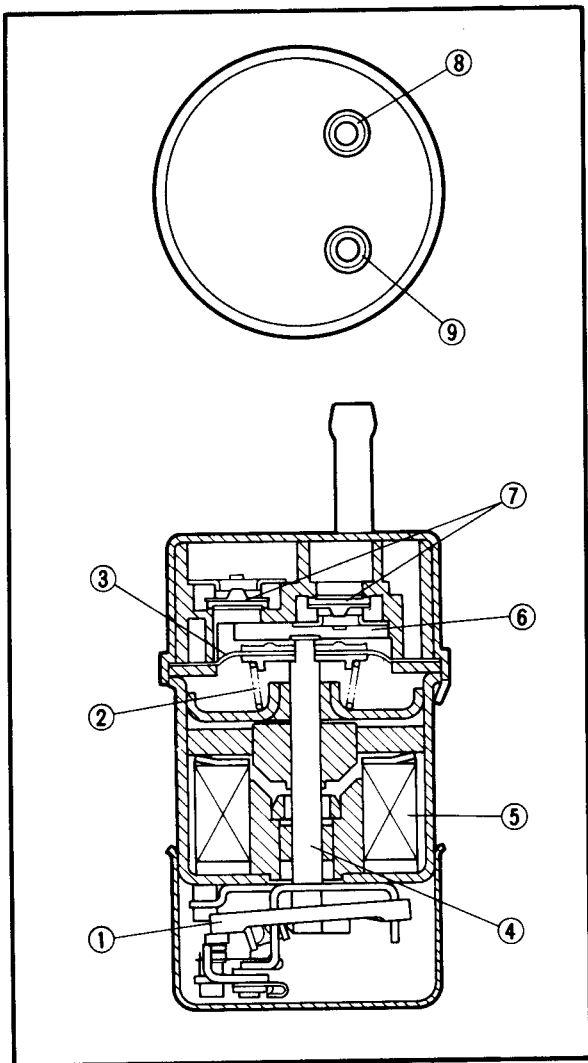
POOR CONNECTION



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.

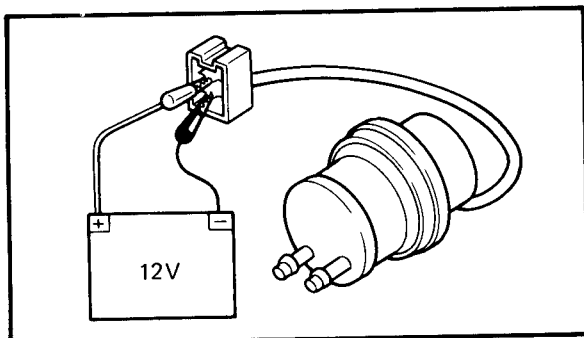
NOTE: _____

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.

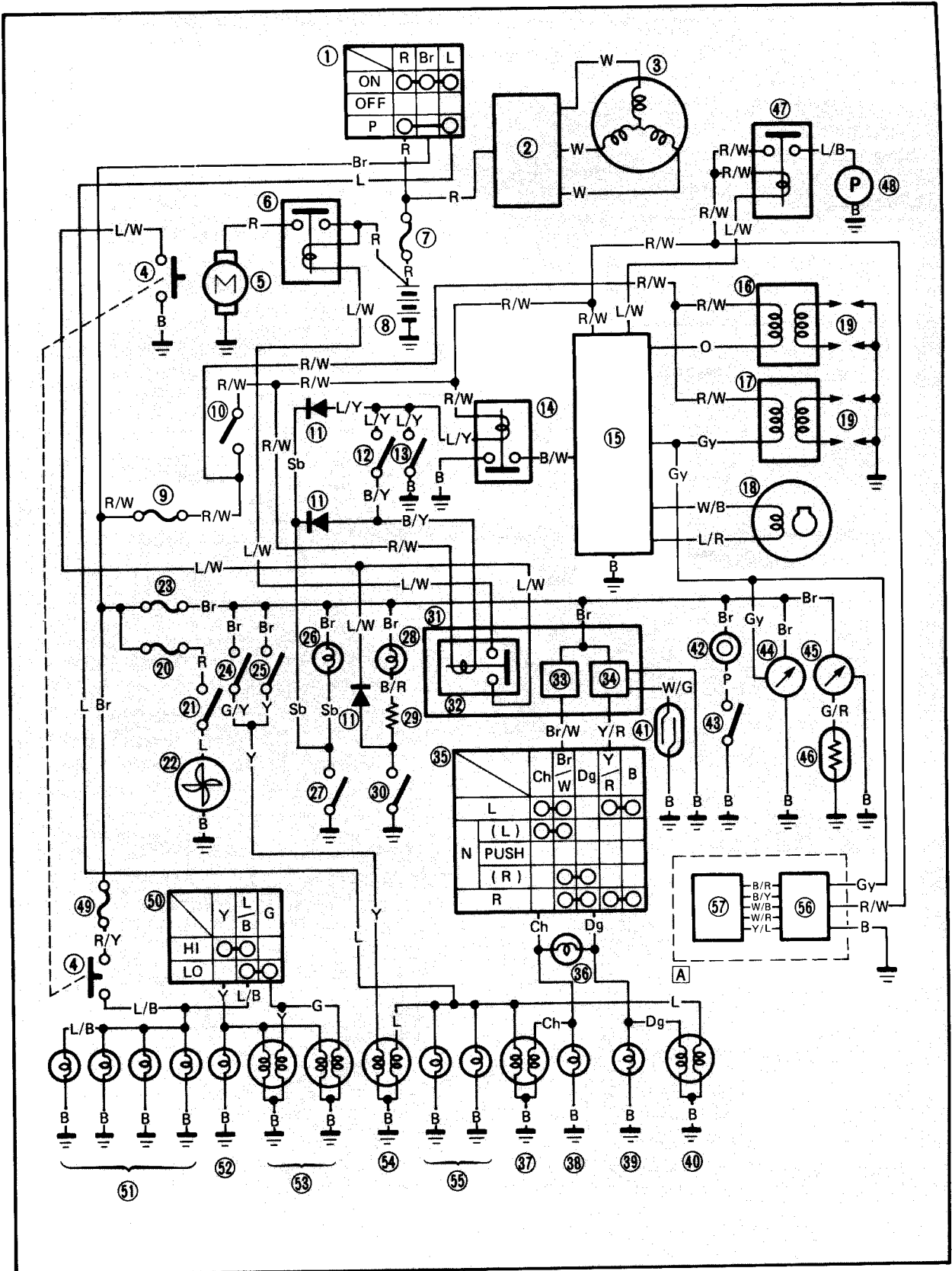
- ① Cut-off switch
- ② Spring
- ③ Diaphragm
- ④ Plunger
- ⑤ Solenoid coil
- ⑥ Fuel chamber
- ⑦ Valve
- ⑧ Outlet
- ⑨ Inlet

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



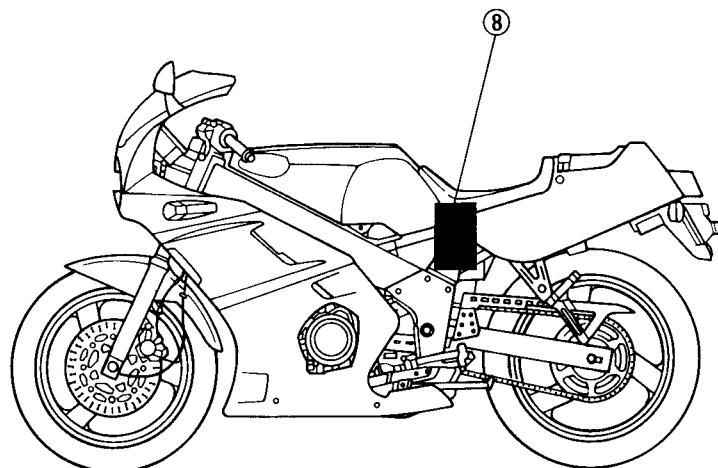
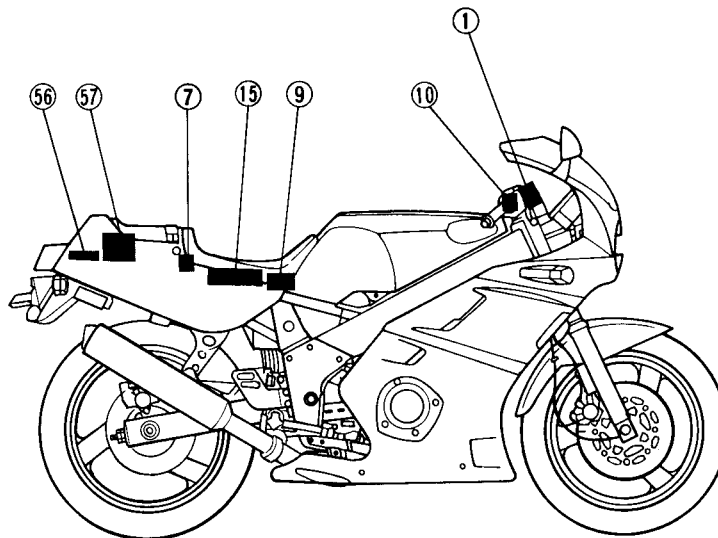


A forementioned circuit diagram shows the cooling circuit in the circuit diagram.

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
- ⑤⑥ EXUP control unit
- ⑤⑦ 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

MEETS SPECIFICATION

OUT OF SPECIFICATION

Go to the "Procedure (2)".

2. EXUP servomotor operation

- Disconnect the EXUP cables from the pulley.
- Turn the main switch to "ON" and check the EXUP servomotor operation.

OPERATIVE

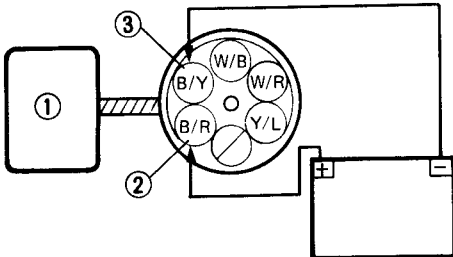
Seized or damaged power valve at muffler.

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 ($\Omega \times 1$) 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.

INCORRECT

- Refill battery fluid.
- Clean battery terminals.
- Recharge or replace battery.

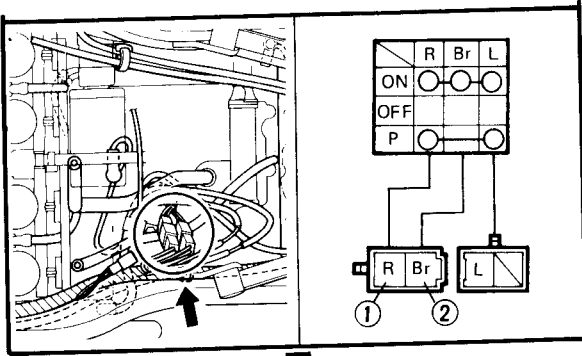
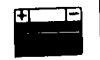
Specific Gravity:
 1.280 at 20°C (68°F)



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.



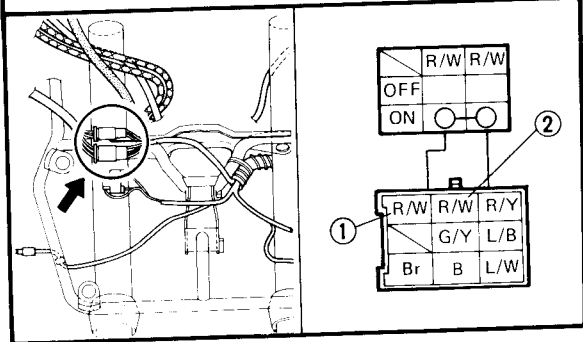
CORRECT

INCORRECT

Replace main switch.

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.



CORRECT

INCORRECT

Replace handlebar switch (Right).

5. Wiring connection

Check the entire EXUP system for connections. Refer to the "WIRING DIAGRAM" section.

CORRECT

POOR CONNECTION

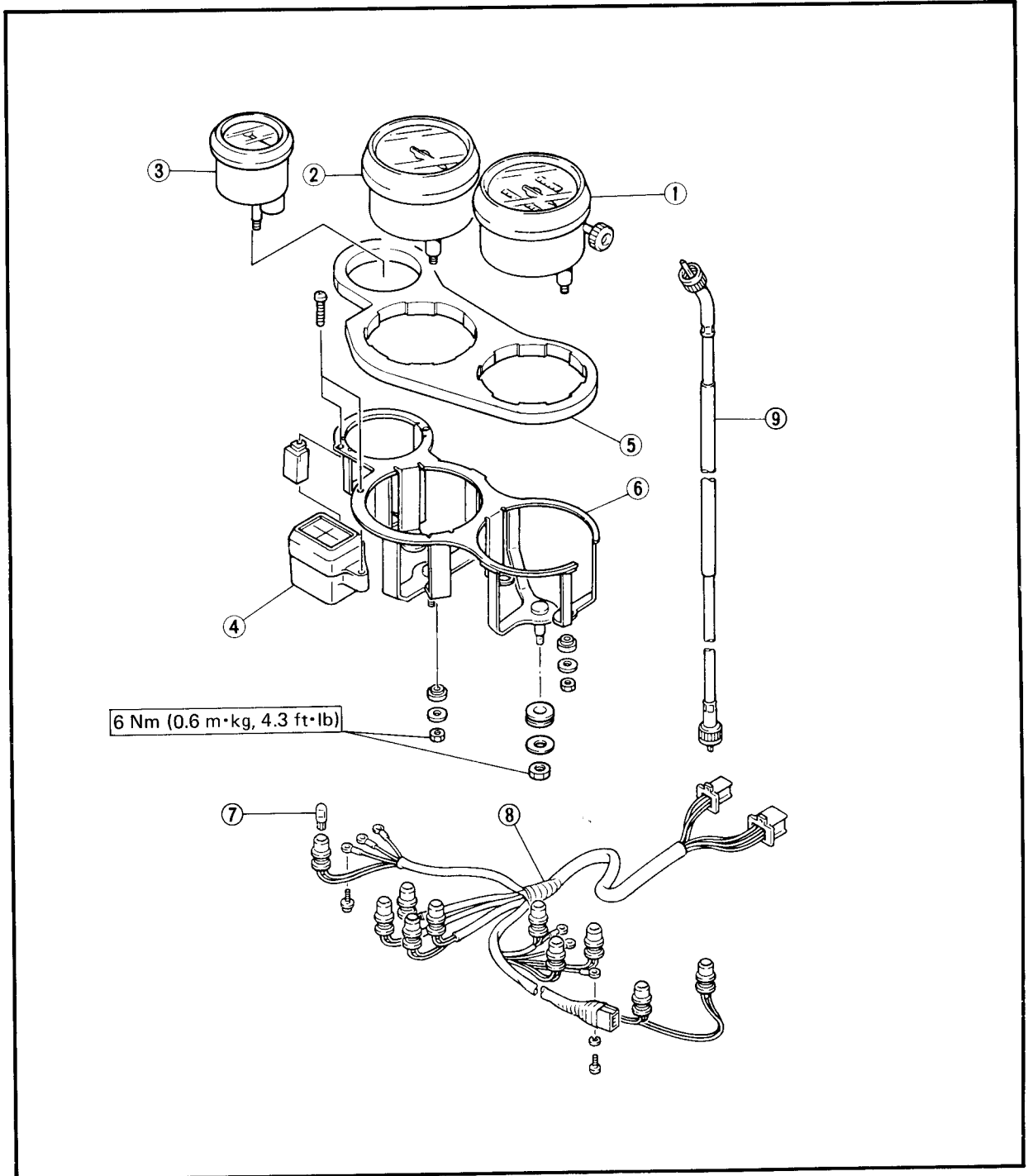
Correct.

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



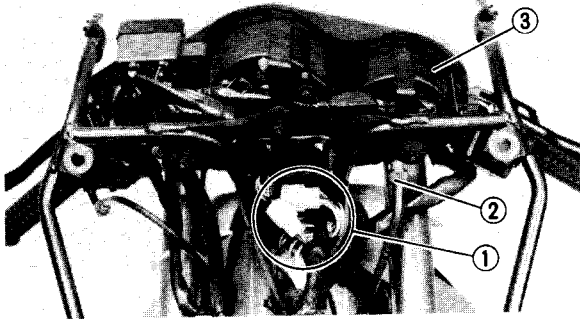


REMOVAL

1. Remove:

- Upper cowling

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



2. Disconnect:

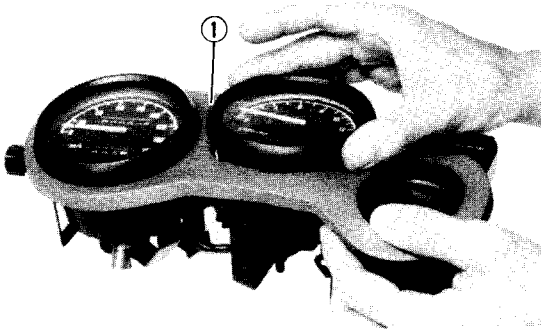
- Bulb socket coupler ①
- Speedometer cable ②

3. Remove:

- Speedometer assembly ③

4. Remove:

- Damper ①

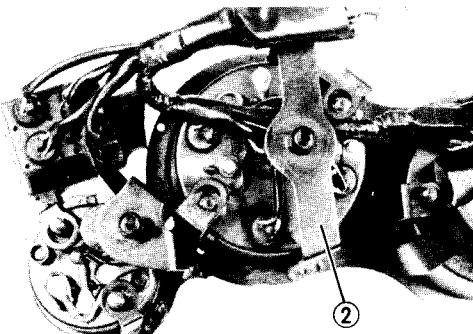
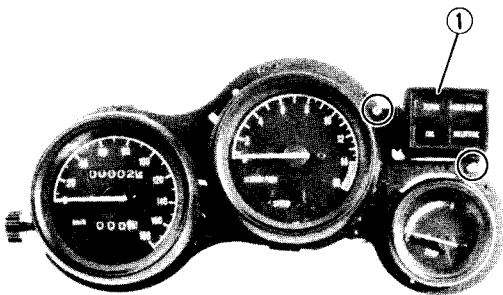


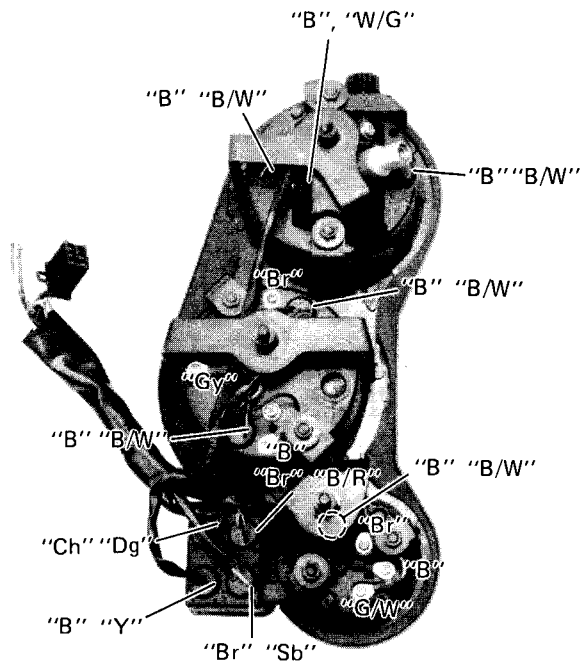
5. Remove:

- Indicator light unit ①
- Meter bracket ②

6. Remove:

- Bulb socket lead





INSTALLATION

Reverse the "REMOVAL" procedure.

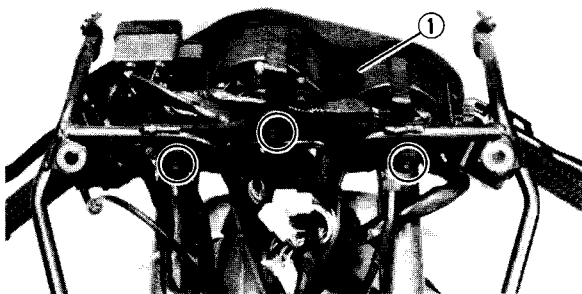
Note the following points.


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)
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TROUBLESHOOTING

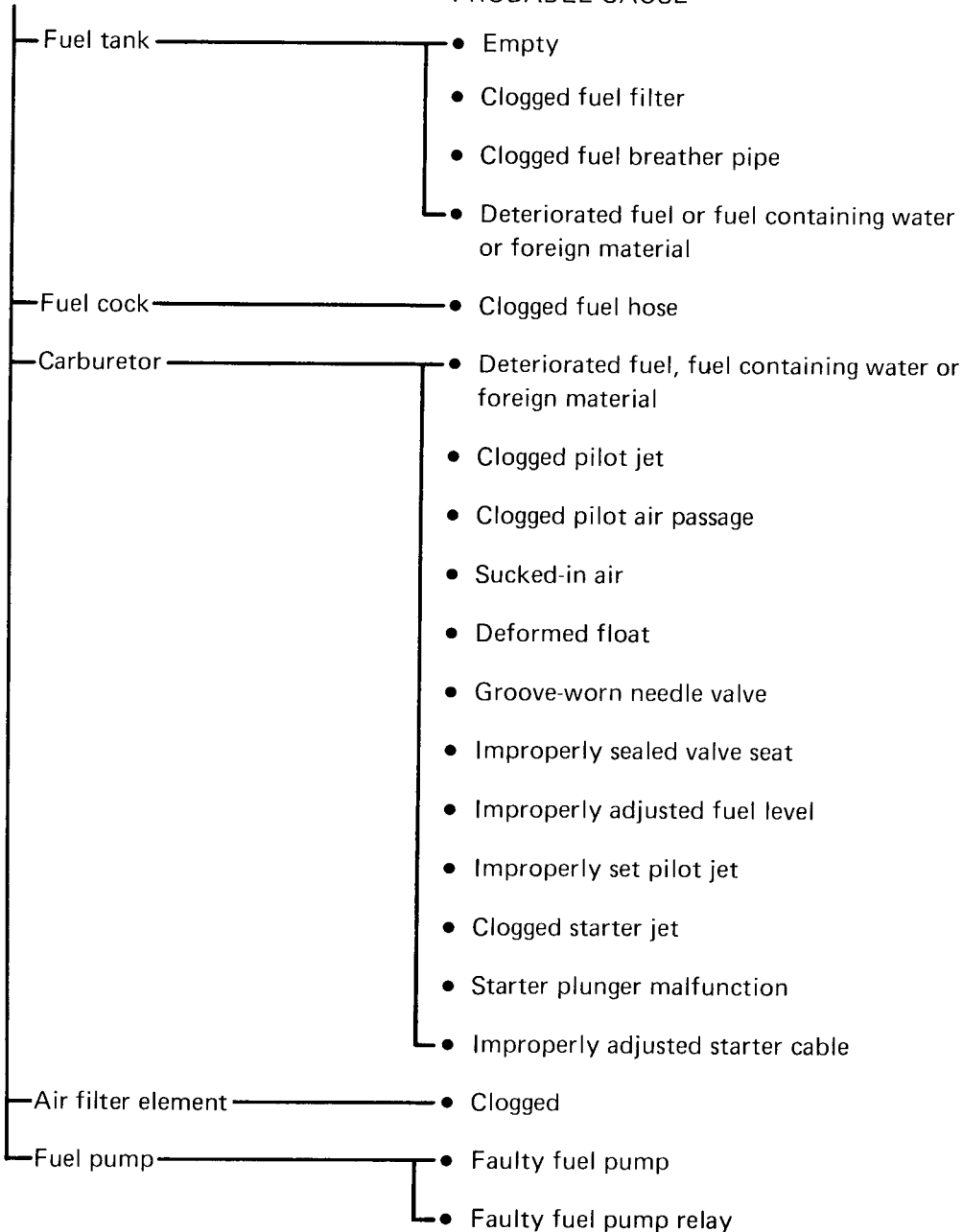
NOTE:

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.

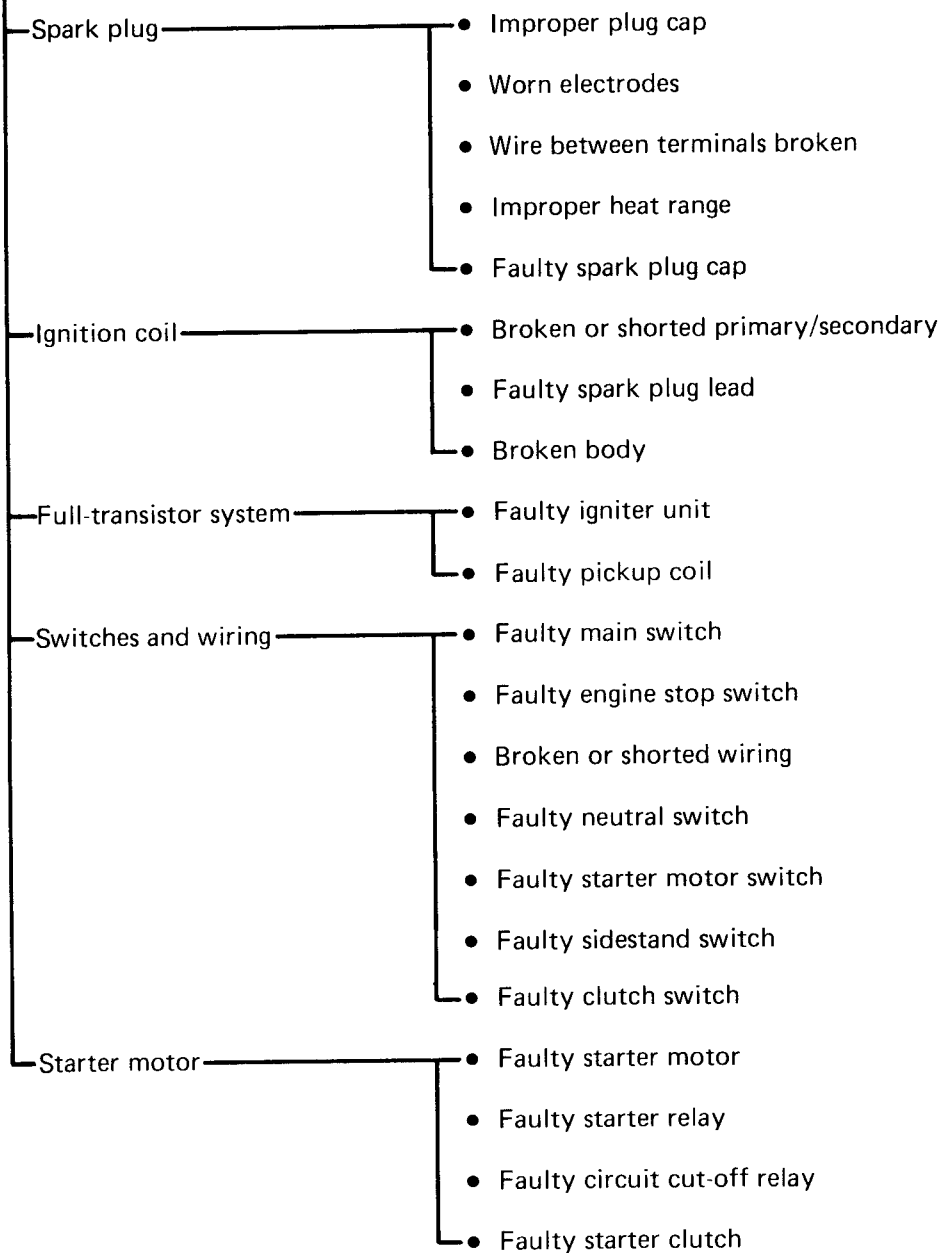
STARTING FAILURE/HARD STARTING

FUEL SYSTEM

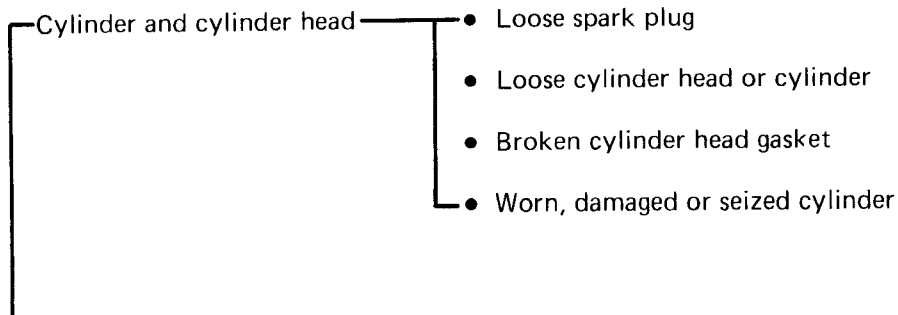
PROBABLE CAUSE

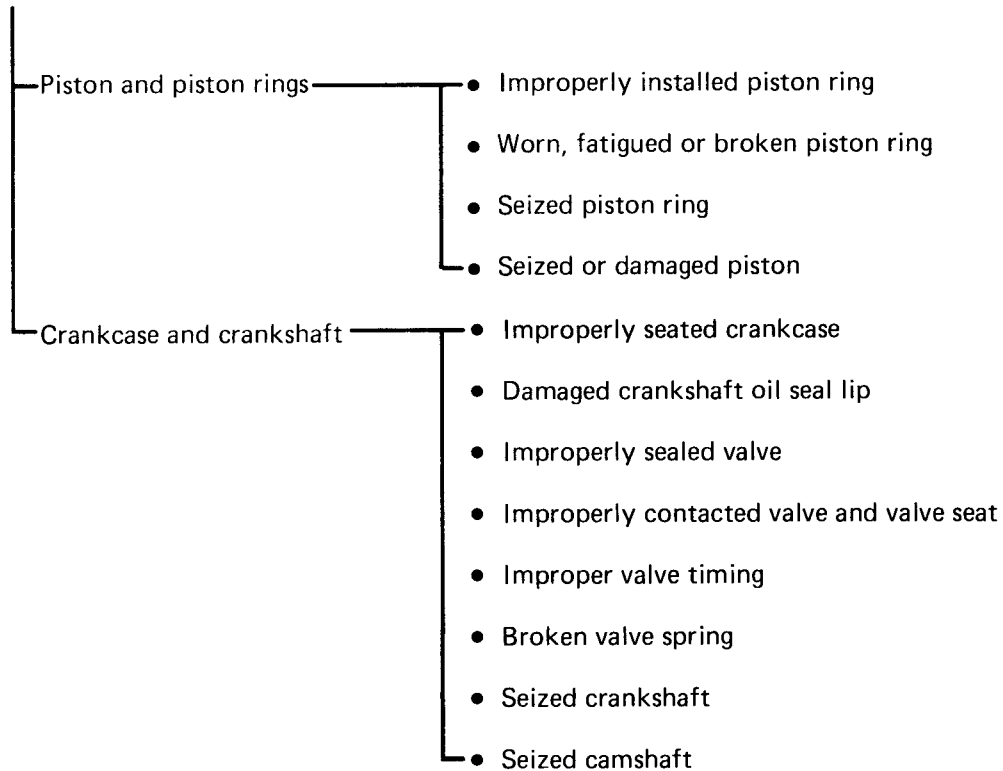


ELECTRICAL SYSTEM



COMPRESSION SYSTEM





POOR IDLE SPEED PERFORMANCE

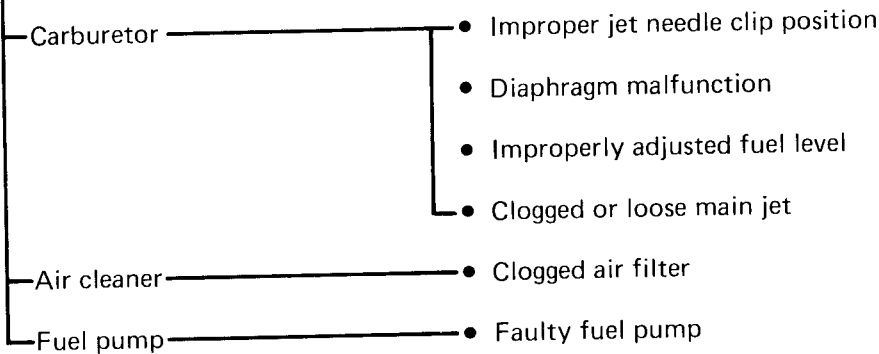
POOR IDLE SPEED PERFORMANCE	PROBABLE CAUSE
Carburetor	• Improperly returned starter plunger
	• Loose pilot jet
	• Clogged pilot air jet
	• Improperly synchronized carburetors
	• Improperly adjusted idle speed (Throttle stop screw)
	• Improper throttle cable play
	• Flooded carburetor
Electrical system	• 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



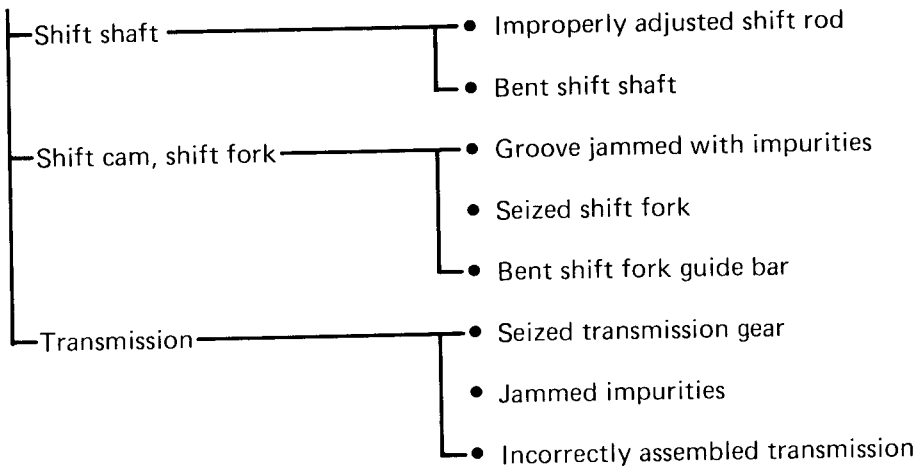
FAULTY GEAR SHIFTING

HARD SHIFTING

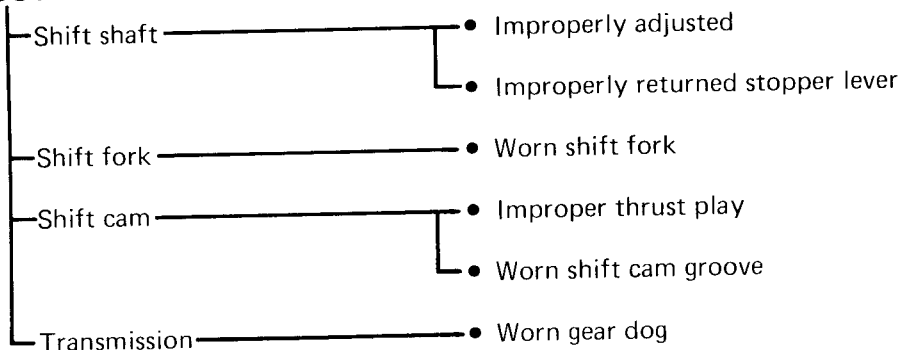
Refer to "Clutch dragging."

SHIFT PEDAL DOES NOT MOVE

PROBABLE CAUSE



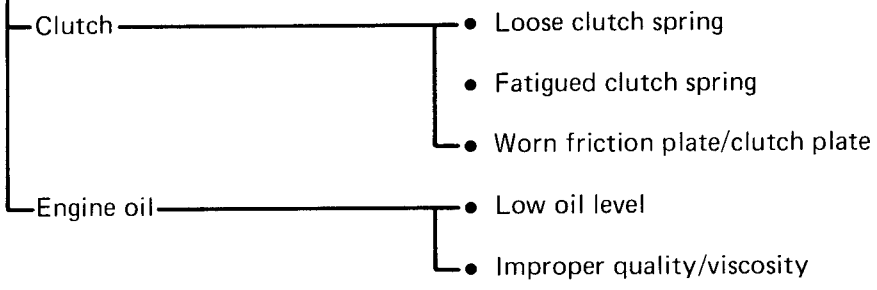
JUMP-OUT GEAR



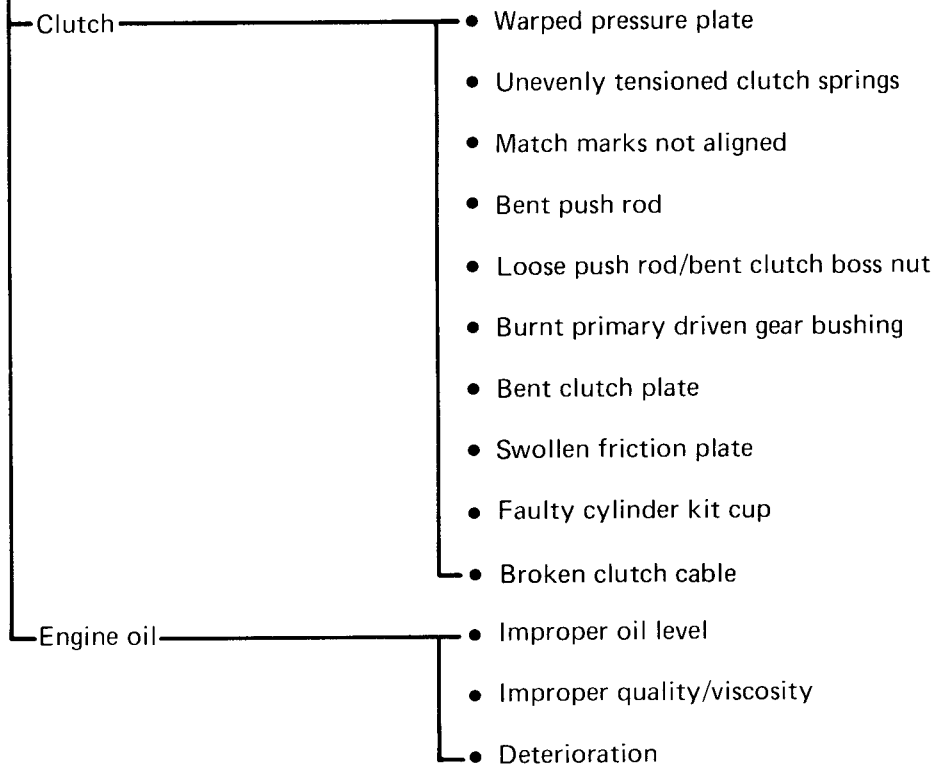
CLUTCH SLIPPING/DRAGGING

CLUTCH SLIPPING

PROBABLE CAUSE

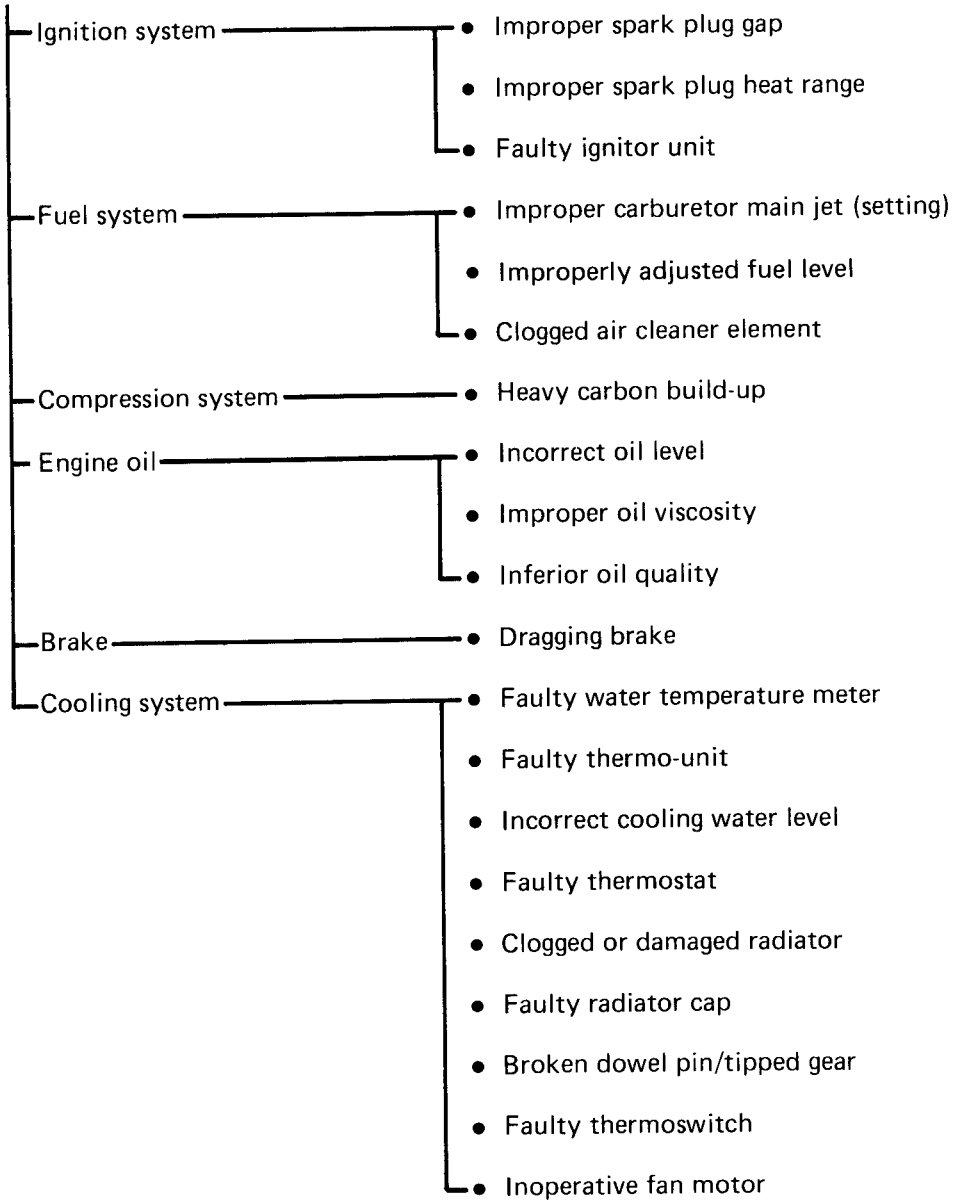


CLUTCH DRAGGING

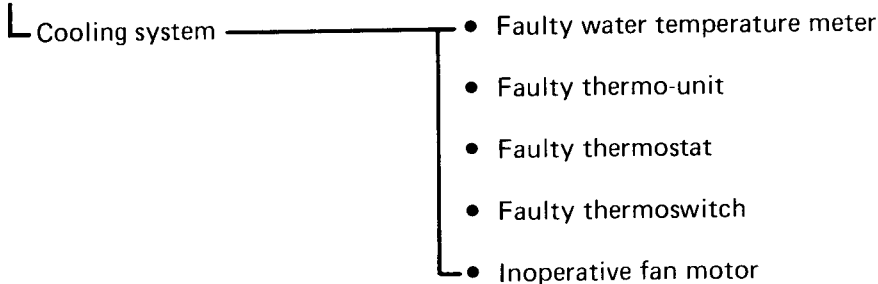


OVERHEATING OR OVER-COOLING

OVERHEATING



OVER-COOLING



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

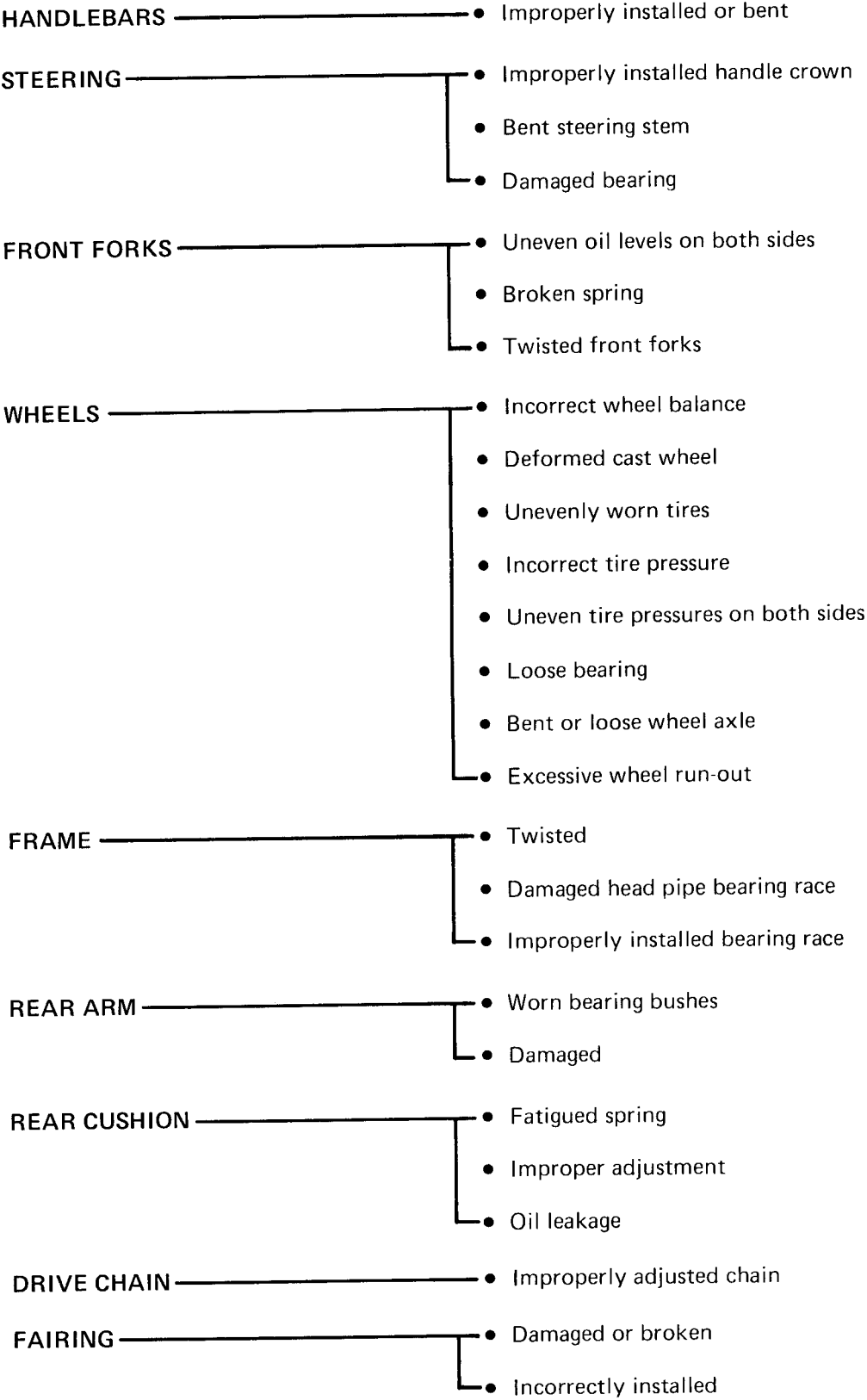
OIL LEAKAGE

- 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



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

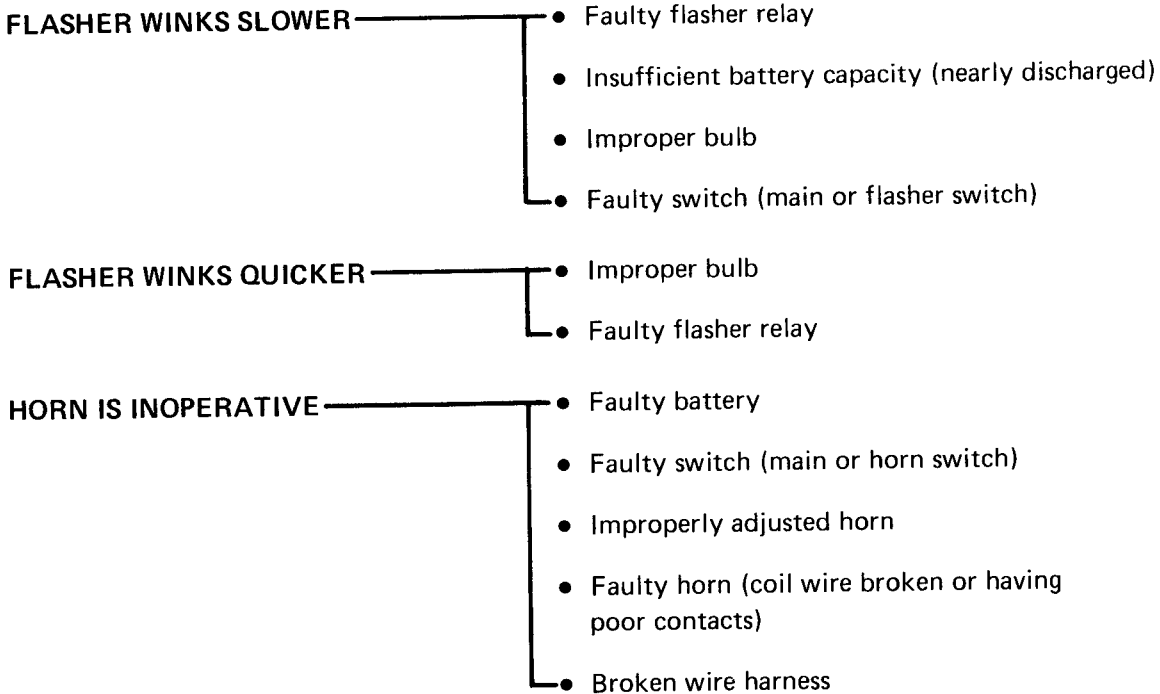
FLASHER DOES NOT LIGHT

- Improperly grounded
- Discharged battery
- Faulty flasher switch
- Faulty flasher relay
- Broken wire harness/loosely connected coupler
- Bulb burnt out

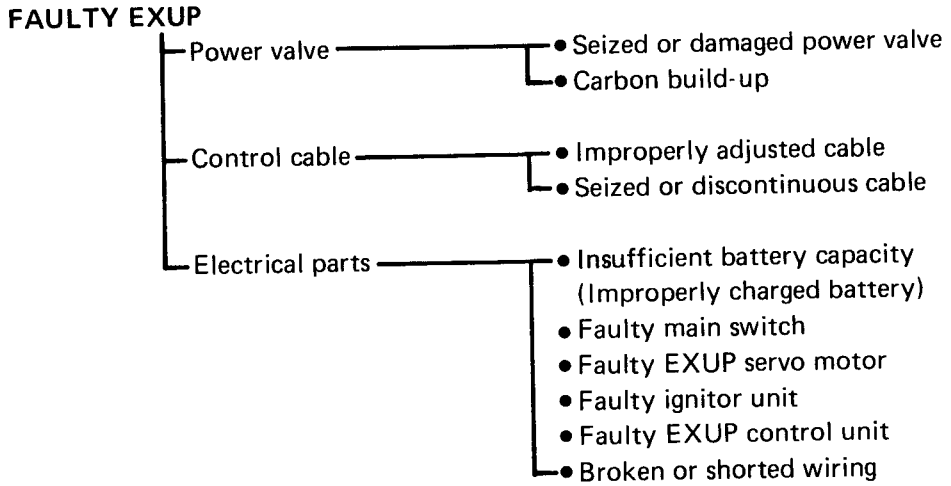
FLASHER KEEPS ON

- Faulty flasher relay
- Insufficient battery capacity (nearly discharged)
- Bulb burnt out (front or rear)

FAULTY SIGNALS AND LIGHTS



FAULTY EXUP (For California only)



FZR400U/FZR400SUC WIRING DIAGRAM

