YAMAHA

FZ6-SS
FZ6-SSC

SERVICE MANUAL

LIT-11616-17-50

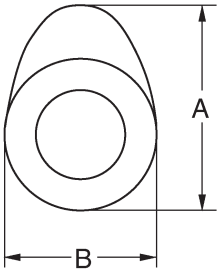
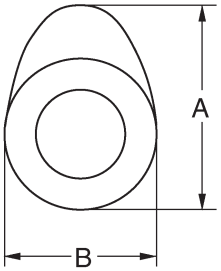
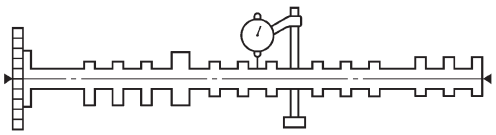
5VX-28197-10

CHAPTER 5
ENGINE

Clock mode

To set the clock:

1. Push the “SELECT” button and “RESET” button together for at least two seconds.
2. When the hour digits start flashing, push the “RESET” button to set the hours.
3. Push the “SELECT” button, and the minute digits will start flashing.
4. Push the “RESET” button to set the minutes.
5. Push the “SELECT” button and then release it to start the clock.

Item	Standard	Limit
Camshafts		
Drive system	Chain drive (right)	•••
Camshaft cap inside diameter	23.008 ~ 23.029 mm (0.9058 ~ 0.9067 in)	•••
Camshaft journal diameter	22.967 ~ 22.980 mm (0.9042 ~ 0.9047 in)	•••
Camshaft-journal-to-camshaft-cap clearance	0.028 ~ 0.062 mm (0.0011 ~ 0.0024 in)	0.08 mm (0.0032 in)
Intake camshaft lobe dimensions		
		
Measurement A	32.45 ~ 32.55 mm (1.278 ~ 1.282 in)	32.40 mm (1,276 in)
Measurement B	24.95 ~ 25.05 mm (0.982 ~ 0.986 in)	24.90 mm (0.980 in)
Exhaust camshaft lobe dimensions		
		
Measurement A	32.45 ~ 32.55 mm (1.278 ~ 1.282 in)	32.40 mm (1.276 in)
Measurement B	24.95 ~ 25.05 mm (0.982 ~ 0.986 in)	24.90 mm (0.980 in)
Max. camshaft runout	•••	0.06 mm (0.0024 in)
		

ELECTRICAL SPECIFICATIONS

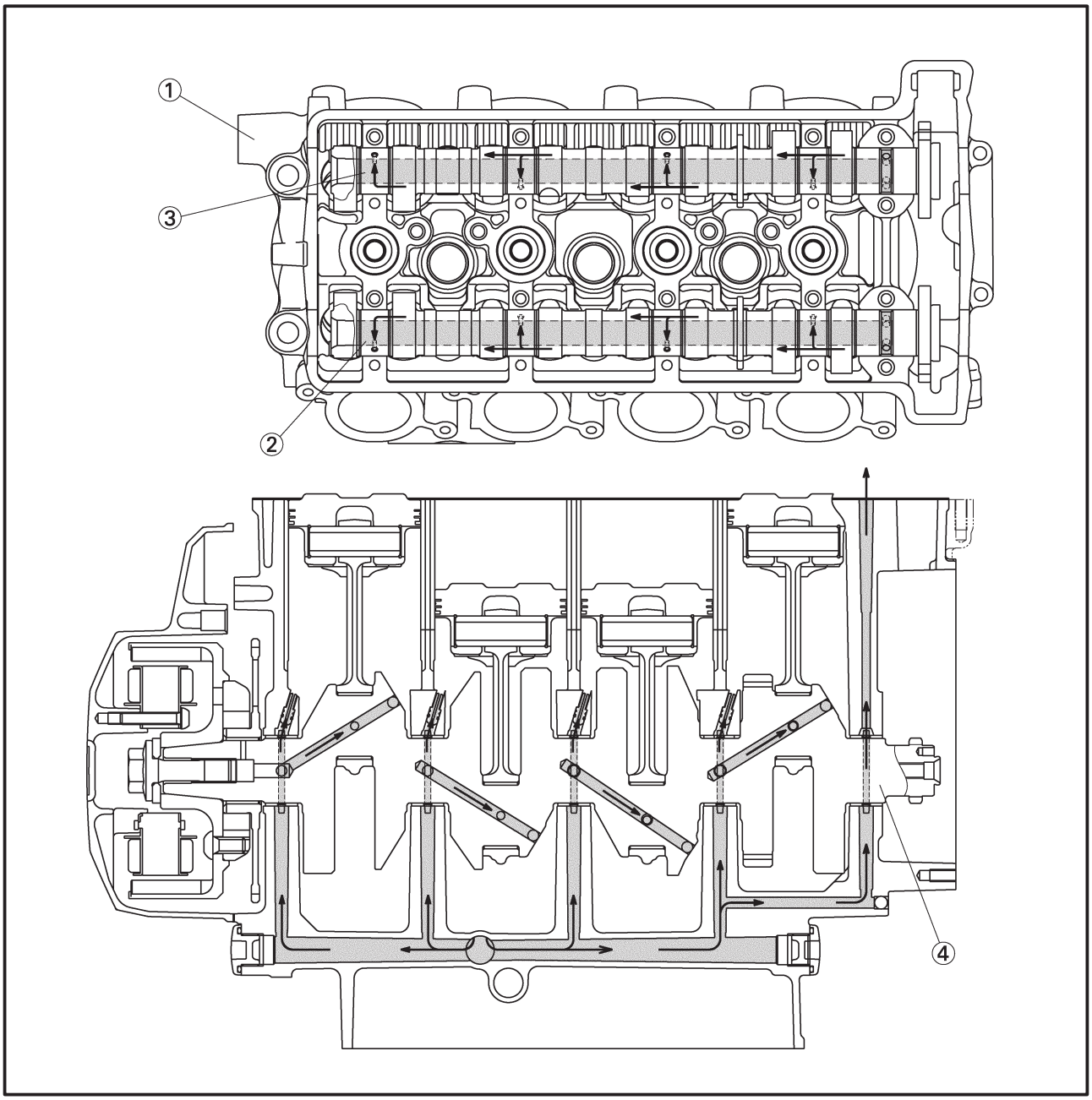
Item	Standard	Limit
System voltage	12 V	•••
Ignition system		
Ignition system type	DC. T.C.I.	•••
Ignition timing	5° BTDC at 1,300 r/min	•••
Advancer type	Digital	•••
Crankshaft position sensor resistance/color	248 ~ 372 Ω at 20°C (68°F)/Gy-B	•••
T.C.I. unit model (manufacturer)	F8T811 (MITSUBISHI)	•••
Ignition coils		
Model (manufacturer)	JO383 (DENSO)	•••
Minimum ignition spark gap	6 mm (0.24 in)	•••
Primary coil resistance	1.53 ~ 2.07 Ω at 20°C (68°F)	•••
Secondary coil resistance	12.0 ~ 18.0 kΩ at 20°C (68°F)	•••
Spark plug cap		
Material	Resin	•••
Resistance	10.0 kΩ at 20°C (68°F)	•••
Charging system		
System type	A.C. magneto	•••
Model (manufacturer)	F5VX (MORIC)	•••
Normal output	14 V/310 W at 5,000 r/min	•••
Stator coil resistance/color	0.22 ~ 0.34 Ω at 20°C (68°F)/W-W	•••
Rectifier/regulator		
Regulator type	Semi conductor short circuit	•••
Model (manufacture)	SH719AA (SHINDENGEN)	•••
No-load regulated voltage	14.1 ~ 14.9 V	•••
Rectifier capacity	18 A	•••
Withstand voltage	240 V	•••
Battery		
Battery type	GT12B-4	•••
Battery voltage/capacity	12 V/10 Ah	•••
Specific gravity	1.320	•••
Manufacturer	GS	•••
Ten hour rate amperage	1.0 A	•••
Headlight type	Halogen bulb	
Bulbs (voltage/wattage × quantity)		
Headlight	12V 60 W/55 W × 1	•••
	12 V 55 W × 1	•••
Tail/brake light	12 V 5 W/21 W × 1	•••
Front turn signal/position light	12 V 21 W/5 W × 2	•••
Rear turn signal light	12 V 21 W × 2	•••
Licence light	12 V 5 W × 1	•••
Meter light	EL	•••

EAS00032

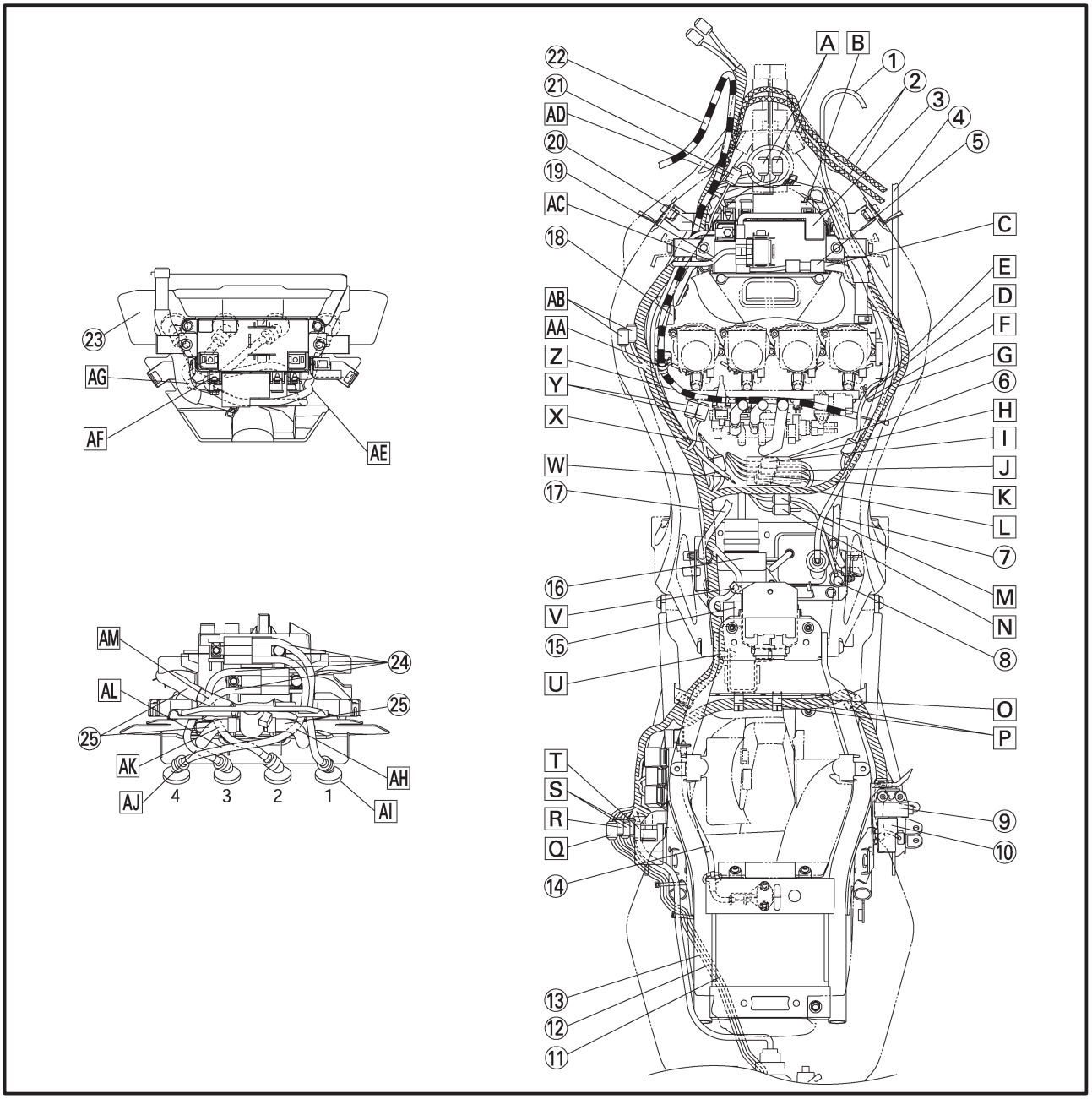
CHASSIS

Lubrication point	Lubricant
Steering bearings and bearing races (upper and lower)	LS
Front wheel oil seal (right and left)	LS
Rear wheel oil seal	LS
Rear wheel drive hub oil seal	LS
Rear wheel drive hub mating surface	LS
Rear brake pedal shaft	LS
Sidestand pivoting point and metal-to-metal moving parts	LS
Link and sidestand switch contact point	LS
Throttle grip inner surface	LS
Brake lever pivoting point and metal-to-metal moving parts	LS
Clutch lever pivoting point and metal-to-metal moving parts	LS
Rear shock absorber collar	LS
Pivot shaft	LS
Swingarm pivot bearing	LS
Swingarm head pipe end, oil seal and bush	LS
Engine mount bolts (rear upper and lower)	LS
Shift pedal shaft	LS
Shift shaft joint	LS
Rear footrest ball and metal-to-metal moving parts	LS
Main stand metal-to-metal moving parts	LS

① Cylinder head
② Intake camshaft
③ Exhaust camshaft
④ Crankshaft



[A] Either right or left side arrangement for the left handlebar switch lead coupler and radiator fan motor coupler can be accepted.
[B] Point the L-shape terminal to the front side of the vehicle.
[C] Hook the starter motor lead to the alternate pawls on the battery cover.
[D] Route the crank shaft position sensor lead above the starter motor leads.
[E] To the crankshaft position sensor.
[F] Clamp the starter motor lead and crank shaft position sensor lead. Point the projected part of the tip to the inner side of the vehicle.
[G] Pass the radiator hose, coolant reservoir hose, wire harness and starter motor lead in order through the lower side of the vehicle.
[H] Set the 4-pin coupler in the connector cover after wiring it.
[I] To the sidestand switch.
[J] To the speed sensor.
[K] To the A.C. magneto.
[L] To the oil level gauge.
[M] To the rear brake/light switch.
[N] To the neutral switch.
[O] Push the wire harness in the groove of the mud guard.
[P] Point the opening section of the clamp upward.
[Q] To the rear turn signal (right)
[R] To the rear turn signal (left)



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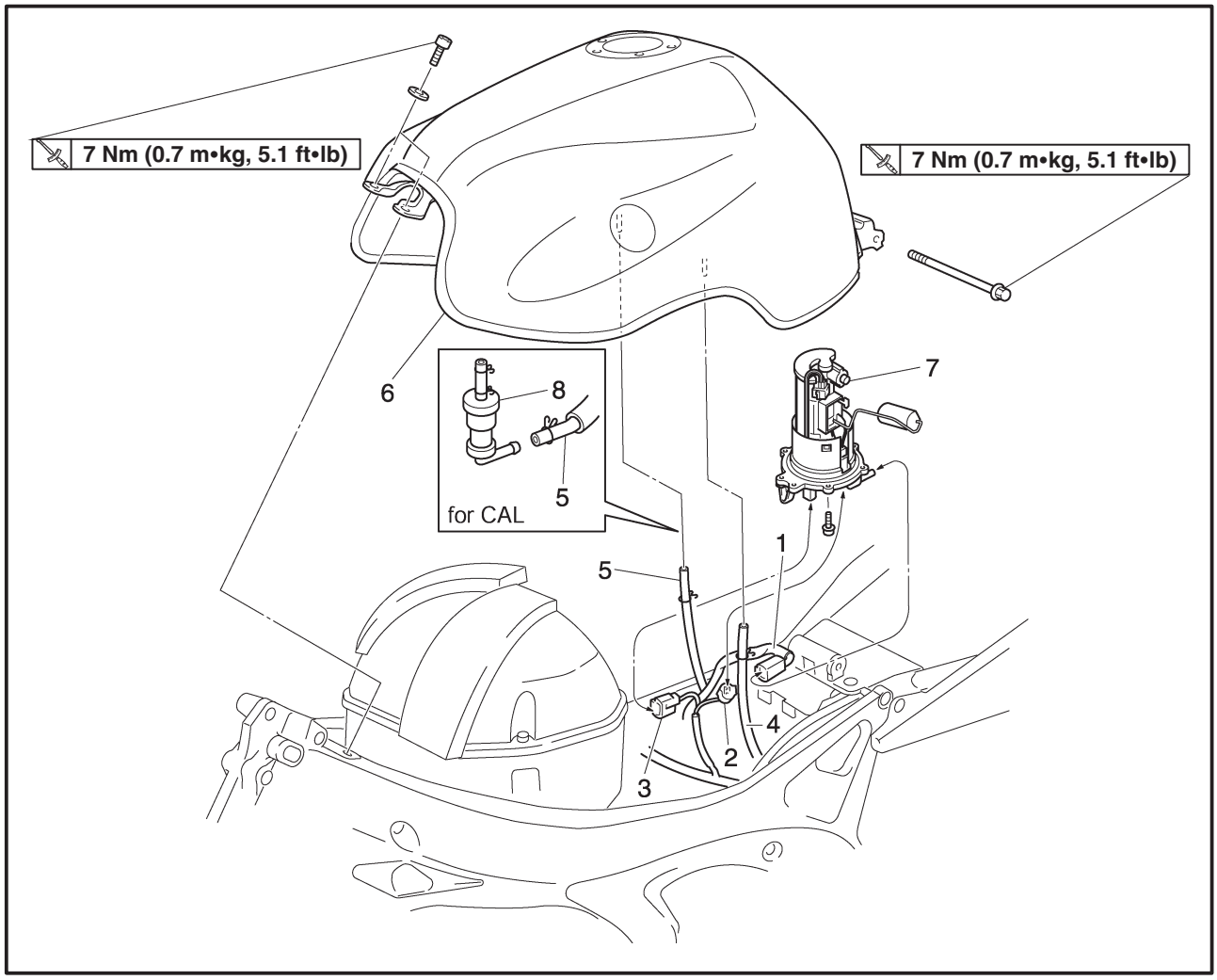
FUEL TANK



Order	Job/Part	Q'ty	Remarks
	Removing the fuel tank		Remove the parts in the order listed. Disconnect.
	Seat		Refer to "SEAT".
	Front cowling inner panel (left and right)		Refer to "COWLINGS".
1	Fuel hose	1	
2	Fuel sender coupler	1	
3	Fuel pump coupler	1	
4	Fuel tank drain hose	1	
5	Fuel tank breather hose (except for CAL) Canister hose (for CAL)	1	**NOTE:** There is a white paint mark on the fuel tank breather hose.
6	Fuel tank	1	
7	Fuel pump	1	

c. Round off the original valve pad number according to the following table.

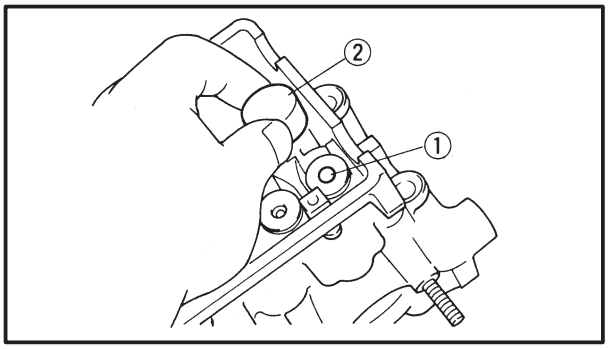
Last digit	Rounded value
0 or 2	0
5	5
8	10

EXAMPLE:
Original valve pad number
= 148 (thickness =1.48 mm (0.058 in))
Rounded value = 150

d. Locate the rounded number of the original valve pad and the measured valve clearance in the valve pad selection table. The point where the column and row intersect is the new valve pad number.

NOTE:

The new valve pad number is only an approximation. The valve clearance must be measured again and the above steps should be repeated if the measurement is still incorrect.



e. Install the new valve pad ① and the valve lifter ②.

NOTE:

- Lubricate the valve pad with molybdenum disulfide grease.
- Lubricate the valve lifter with molybdenum disulfide oil.
- Install the valve lifter and the valve pad in the correct place.
- The valve lifter must turn smoothly when rotated by hand.

f. Install the exhaust and intake camshafts, timing chain and camshaft caps.

Camshaft cap bolt
10 Nm (1.0 m•kg, 7.2 ft•lb)

7. Install:
   • spark plug — 18 Nm (1.8 m•kg, 13 ft•lb)
   • spark plug caps

NOTE:

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

8. Install:
   • radiator lower hose bracket bolt
   • radiator lower bolt

EAS00065

MEASURING THE COMPRESSION PRESSURE

The following procedure applies to all of the cylinders.

NOTE:

Insufficient compression pressure will result in a loss of performance.

1. Measure:
   • valve clearance
   Out of specification → Adjust.
   Refer to “ADJUSTING THE VALVE CLEARANCE”.
2. Start the engine, warm it up for several minutes, and then turn it off.
3. Remove:
   • rider seat
   Refer to “SEAT”.
   • front cowling inner panel (letf and right)
   Refer to “COWLINGS”.
   • fuel tank
   Refer to “FUEL TANK”.
   • air filter case
   Refer to “AIR FILTER CASE”.
   • battery
   Refer to “CHECKING AND CHARGING THE BATTERY” in chapter 3.
   • battery box
   • battery box bracket
   Refer to “BATTERY BOX AND BATTERY BOX BRACKET”.
   • heat protector plate
4. Remove:
   • cover
   • ignition coils
   • spark plug caps
   • spark plugs

NOTE:

When installing the air filter element into the air filter case cover, make sure their sealing surfaces are aligned to prevent any air leaks.

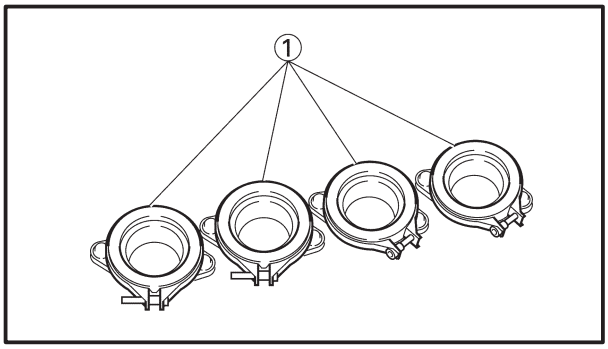
6. Install:
   - fuel tank
     Refer to “FUEL TANK”.
   - front cowling inner panel (left and right)
     Refer to “COWLINGS”.
   - rider seat
     Refer to “SEAT”.

EAS00095

CHECKING THE THROTTLE BODY JOINTS

The following procedure applies to all of the throttle body joints and intake manifolds.

1. Remove:
   - throttle bodies
     Refer to “THROTTLE BODIES” in chapter 7.
2. Check:
   - throttle body joints ①
     Cracks/damage → Replace.
3. Install:
   - throttle bodies
     Refer to “THROTTLE BODIES” in chapter 7.



3. Adjust:
   • rear brake light switch
   Refer to “ADJUSTING THE REAR BRAKE LIGHT SWITCH”.

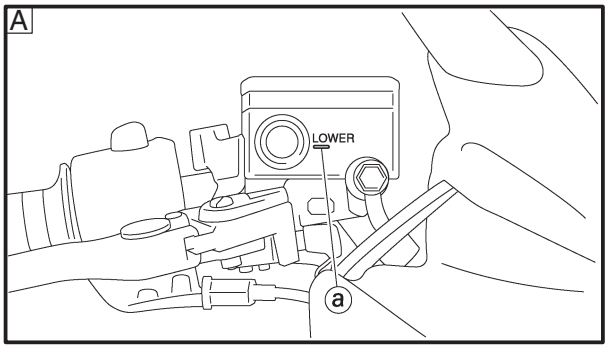
EAS00115

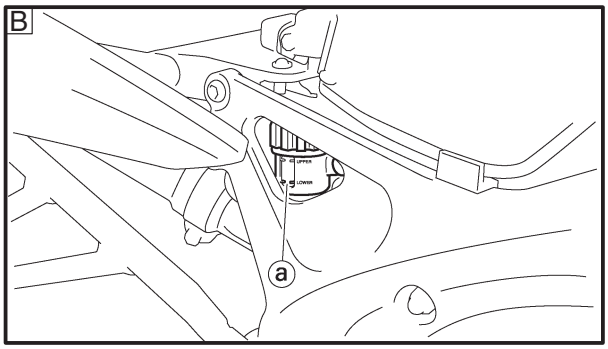
CHECKING THE BRAKE FLUID LEVEL

1. Stand the motorcycle on a level surface.

NOTE:

- Place the motorcycle on a suitable stand.
- Make sure the motorcycle is upright.





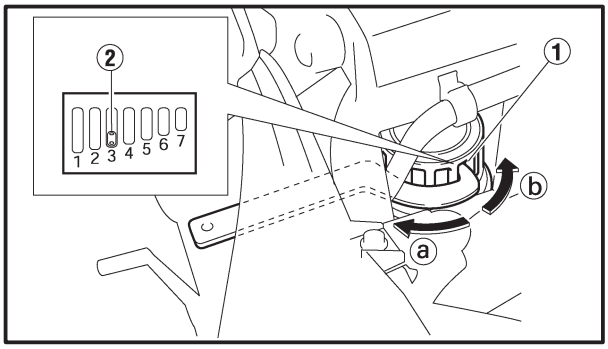
2. Check:
   • brake fluid level
   Below the minimum level mark ⓐ → Add the recommended brake fluid to the proper level.

Recommended brake fluid
DOT 4

A Front brake
B Rear brake

⚠ WARNING

- **Use only the designated brake fluid. Other brake fluids may cause the rubber seals to deteriorate, causing leakage and poor brake performance.**
- **Refill with the same type of brake fluid that is already in the system. Mixing brake fluids may result in a harmful chemical reaction, leading to poor brake performance.**
- **When refilling, be careful that water does not enter the brake fluid reservoir. Water will significantly lower the boiling point of the brake fluid and could cause vapor lock.**



EAS00156

ADJUSTING THE REAR SHOCK ABSORBER ASSEMBLY

⚠ WARNING

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

Spring preload

CAUTION:

Never go beyond the maximum or minimum adjustment positions.

1. Adjust:
   • spring preload

▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼

a. Adjust the spring preload with a ring nut wrench.

	Ring nut wrench **90890-01268, YU-01268**

b. Turn the adjusting ring ① in direction ⓐ or ⓑ.
c. Align the desired position on the adjusting ring with the stopper ②.

Direction ⓐ	**Spring preload is increased (suspension is harder).**
Direction ⓑ	**Spring preload is decreased (suspension is softer).**

Adjusting positions
Minimum: 1
Standard: 3
Maximum: 7

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EAS00162

CHECKING THE TIRES

The following procedure applies to both of the tires.

1. Check:
   • tire pressure
   Out of specification → Regulate.

Charging method using a constant voltage charger

Measure the open-circuit voltage prior to charging.

NOTE:
Voltage should be measured 30 minutes after the machine is stopped.

Connect a charger and AMP meter to the battery and start charging.

Make sure that the current is higher than the standard charging current written on the battery.

YES

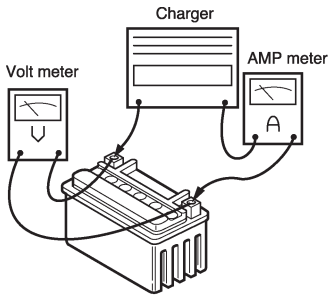
Charge the battery until the battery's charging voltage is 15 V.

NOTE:
Set the charging time at 20 hours (maximum).

Measure the battery open-circuit voltage after leaving the battery unused for more than 30 minutes.
12.8 V or more --- Charging is complete.
12.7 V or less --- Recharging is required.
Under 12.0 V --- Replace the battery.

NO

This type of battery charger cannot charge the MF battery. A variable voltage charger is recommended.



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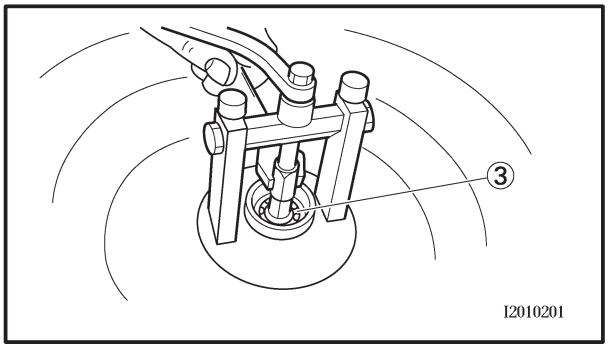
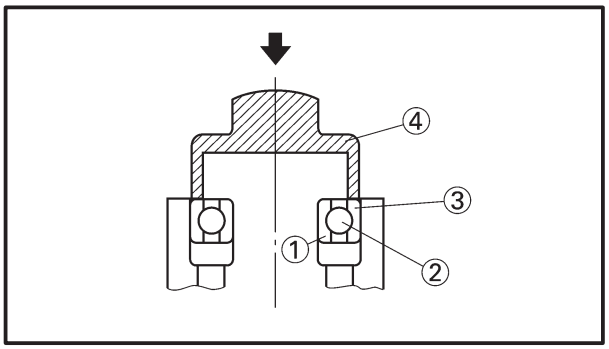




c. Remove the wheel bearings ③ with a general bearing puller.
d. Install the new wheel bearings and oil seals in the reverse order of disassembly.

CAUTION:

Do not contact the wheel bearing inner race ① or balls ②. Contact should be made only with the outer race ③.

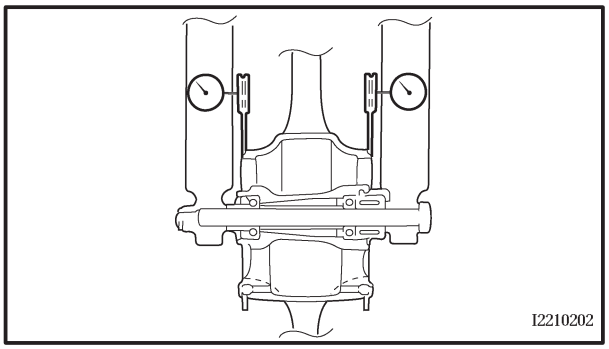
Use a socket ④ that matches the diameter of the wheel bearing outer race and oil seal.

EAS00531

CHECKING THE BRAKE DISCS

The following procedure applies to all of the brake discs.

1. Check:
   - brake disc
     Damage/galling → Replace.



2. Measure:
   - brake disc deflection
     Out of specification → Correct the brake disc deflection or replace the brake disc.

Brake disc deflection limit (maximum)
Front: 0.1 mm (0.004 in)
Rear: 0.15 mm (0.006 in)

a. Place the motorcycle on a suitable stand so that the wheel is elevated.
b. Before measuring the front brake disc deflection, turn the handlebar to the left or right to ensure that the front wheel is stationary.
c. Remove the brake caliper.
d. Hold the dial gauge at a right angle against the brake disc surface.
e. Measure the deflection 2 ~ 3 mm (0.08 ~ 0.12 in) below the edge of the brake disc.

EAS00575

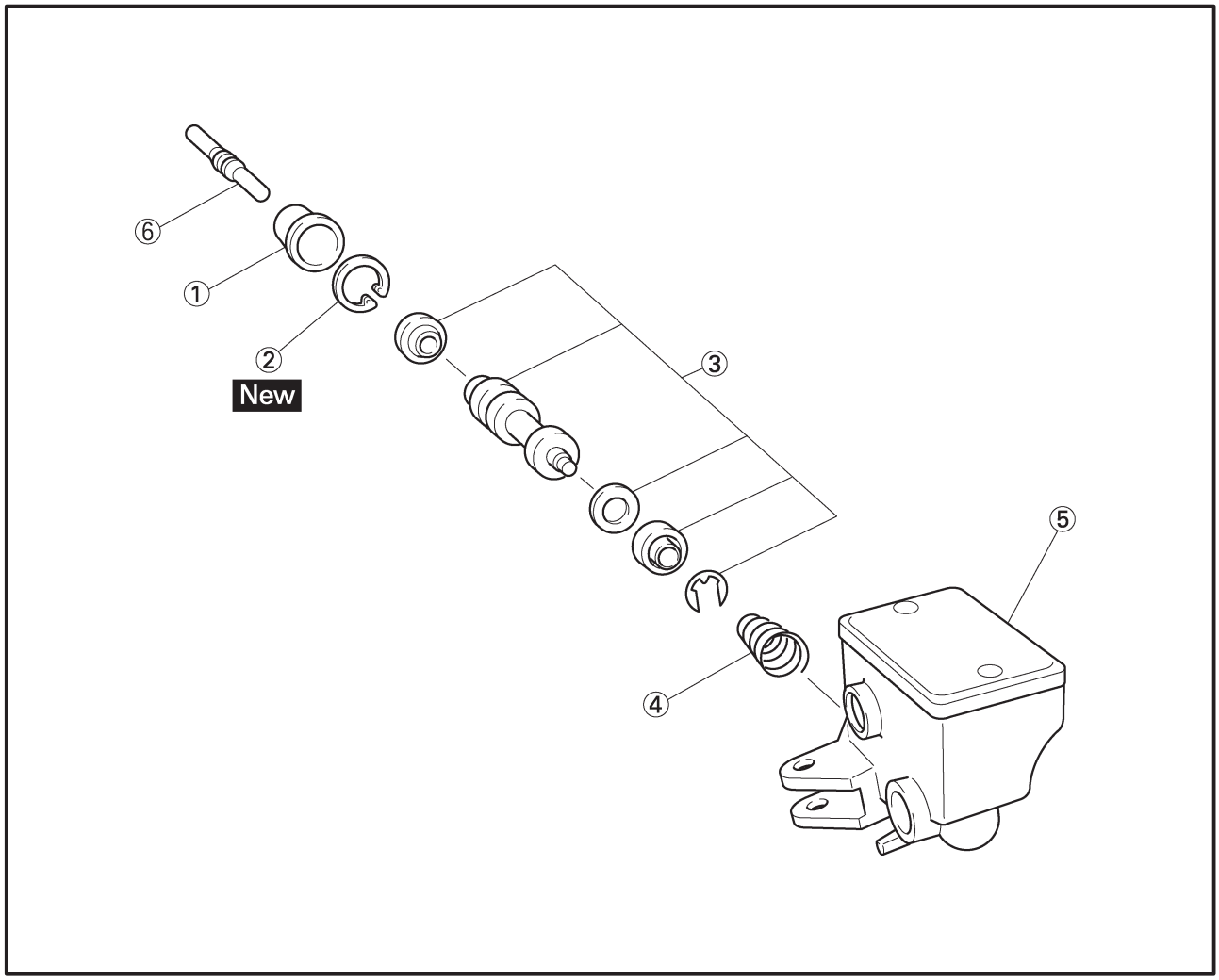
ADJUSTING THE REAR WHEEL STATIC BALANCE

NOTE:

- After replacing the tire, wheel or both, the rear wheel static balance should be adjusted.
- Adjust the rear wheel static balance with the brake disc and rear wheel drive hub installed.

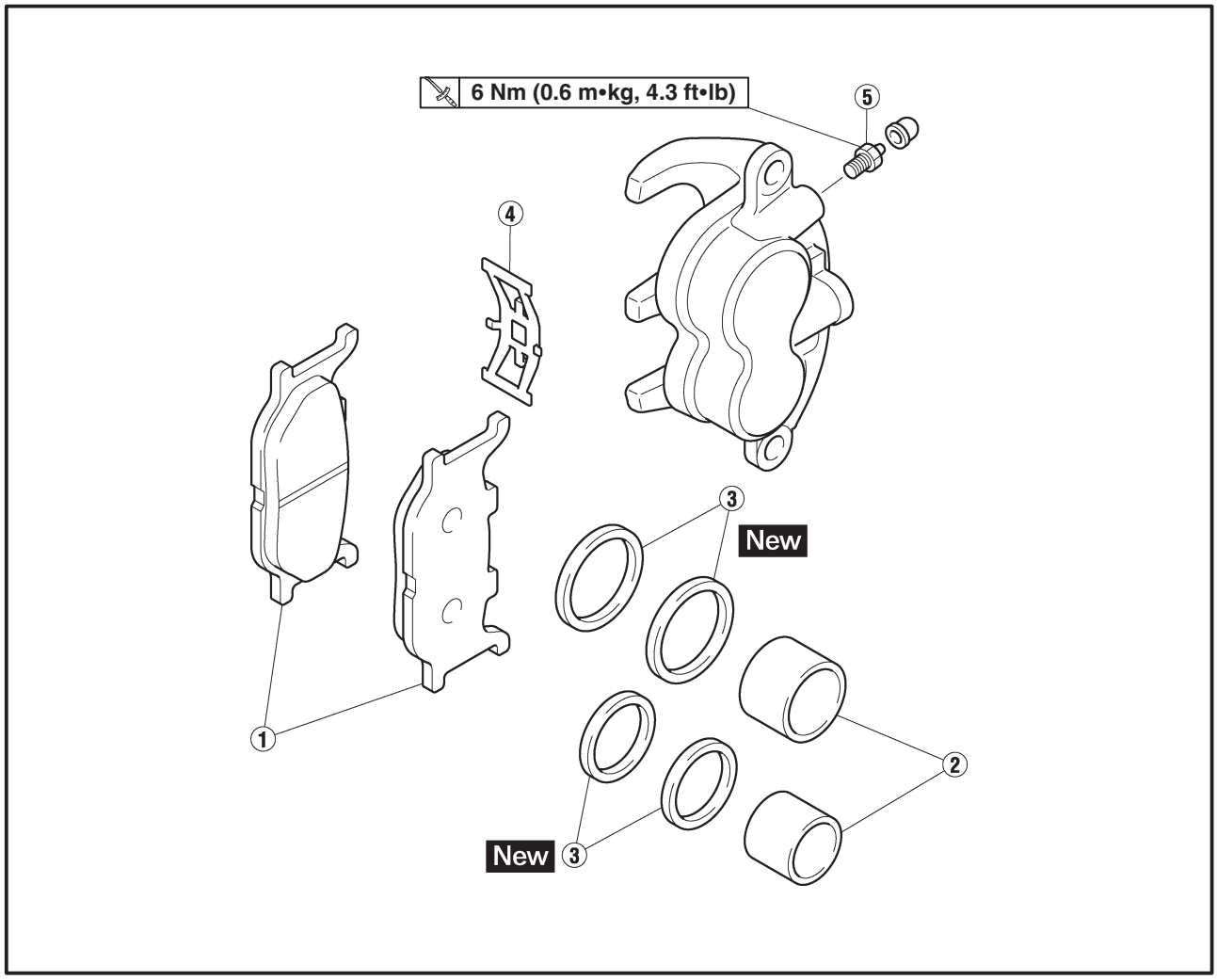
1. Adjust:
   - rear wheel static balance
     Refer to "ADJUSTING THE FRONT WHEEL STATIC BALANCE".

EAS00585



Order	Job/Part	Q'ty	Remarks
	Disassembling the front brake master cylinder		Disassemble the parts in the order listed.
①	Dust boot	1	
②	Circlip	1	
③	Master cylinder kit	1	
④	Spring	1	
⑤	Master cylinder	1	
⑥	Push rod	1	
			For assembly, reverse the disassembly procedure.

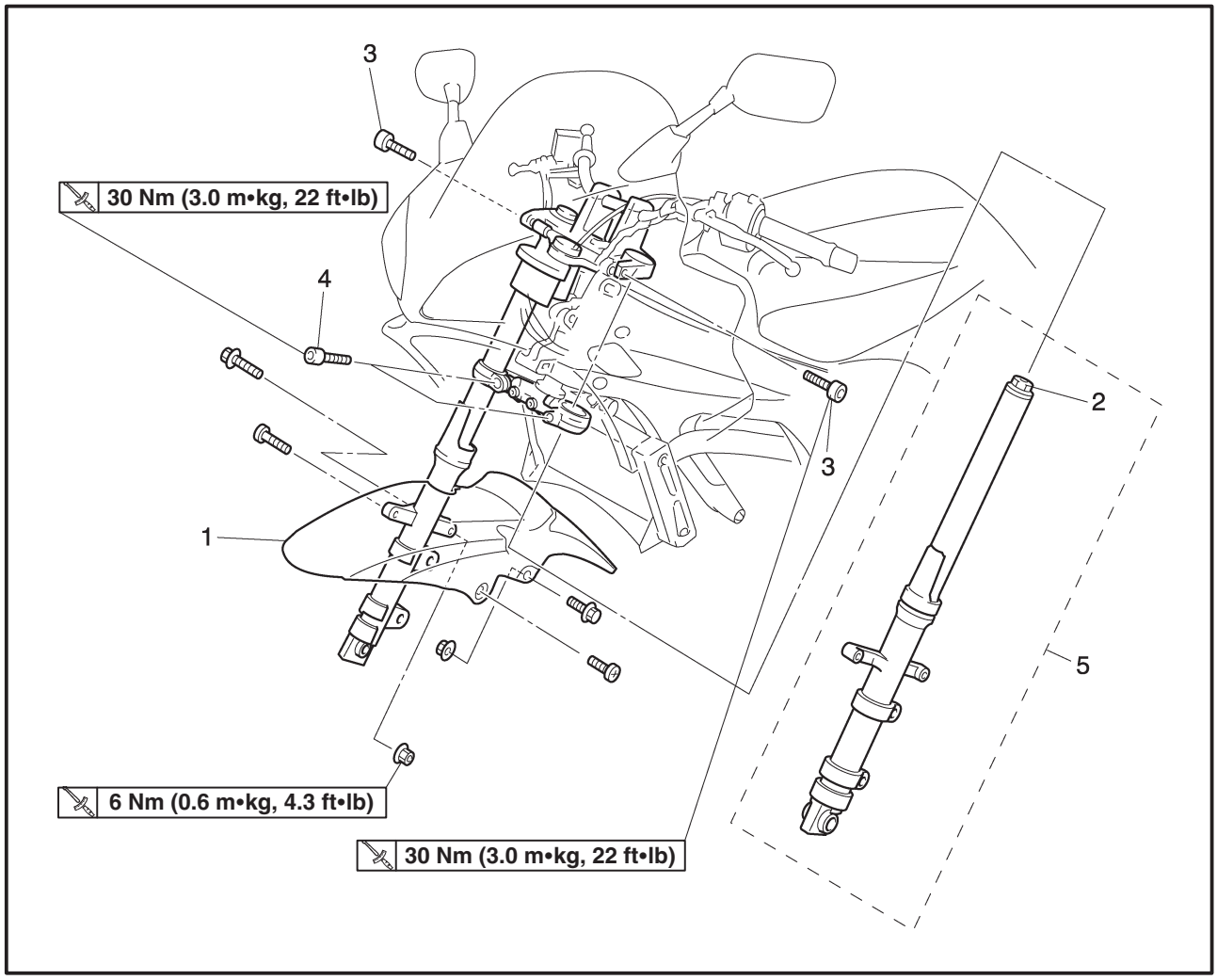
EAS00615



Order	Job/Part	Q'ty	Remarks
	Disassembling the front brake calipers		Disassemble the parts in the order listed. **NOTE:** The following procedure applies to both of the front brake calipers.
①	Brake pad	2	
②	Brake caliper piston	2	
③	Brake caliper piston seal	4	
④	Brake pad spring	1	
⑤	Bleed screw	1	
			For assembly, reverse the disassembly procedure.

EAS00647

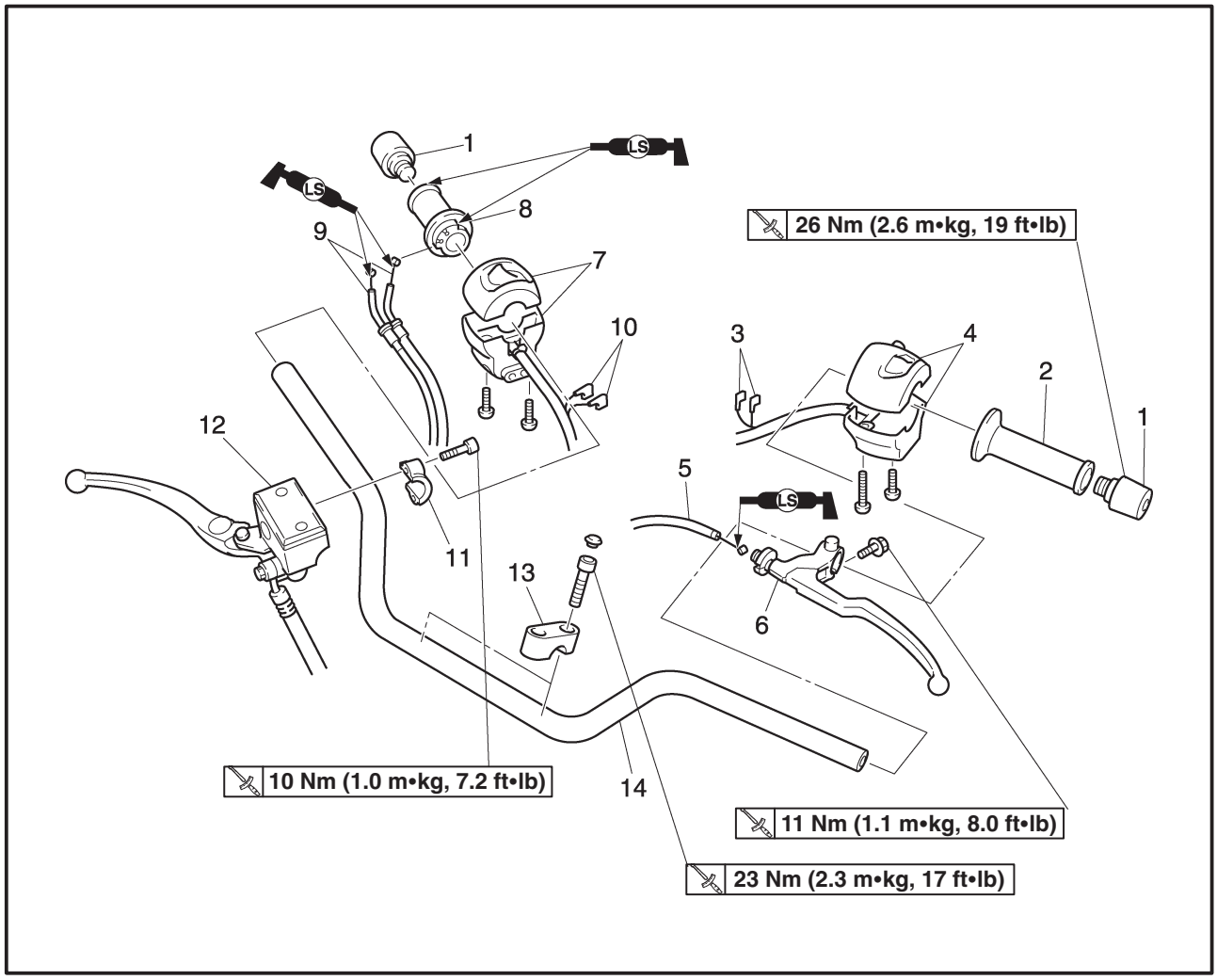
FRONT FORK
FRONT FORK LEGS



Order	Job/Part	Q'ty	Remarks
	Removing the front fork legs		Remove the parts in the order listed.
	Front wheel		Refer to "FRONT WHEEL AND BRAKE DISCS".
	Front brake calipers		Refer to "FRONT AND REAR BRAKES".
1	Front fender	1	
2	Cap bolt	1	Loosen.
3	Upper bracket pinch bolt	1	Loosen.
4	Under bracket pinch bolt	1	Loosen.
5	Front fork leg	1	
			For installation, reverse the removal procedure.

EAS00664

HANDLEBAR



Order	Job/Part	Q'ty	Remarks
	Removing the handlebar		Remove the parts in the order listed.
1	Grip end	2	
2	Handlebar grip (left)	1	
3	Clutch switch connector	1	Disconnect.
4	Left handlebar switch	1	
5	Clutch cable	1	
6	Clutch lever	1	
7	Right handlebar switch	1	
8	Throttle grip	1	
9	Throttle cable	2	
10	Front brake light switch connector	1	Disconnect.
11	Front brake master cylinder holder	1	
12	Front brake master cylinder	1	
13	Upper handlebar holder	2	
14	Handlebar	1	
			For installation, reverse the removal procedure.

EAS00694

REMOVING THE REAR SHOCK ABSORBER ASSEMBLY

1. Stand the motorcycle on a level surface.

⚠ WARNING

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

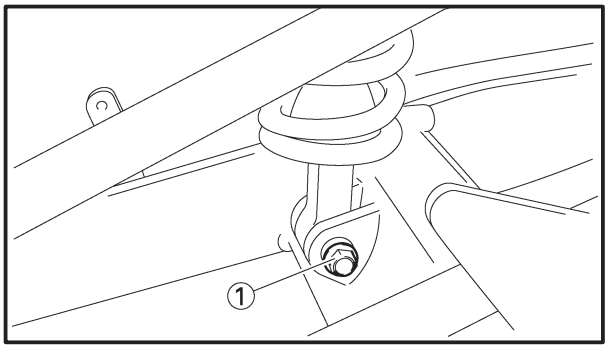
NOTE:

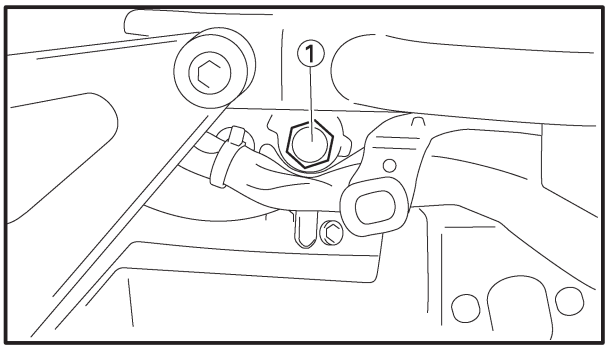
Place the motorcycle on a suitable stand so that the rear wheel is elevated.

2. Remove:
   - rear wheel
     Refer to "REAR WHEEL AND BRAKE DISC".
3. Remove:
   - rear shock absorber assembly lower bolt ①

NOTE:

While removing the rear shock absorber assembly lower bolt, hold the swingarm so that it does not drop down.



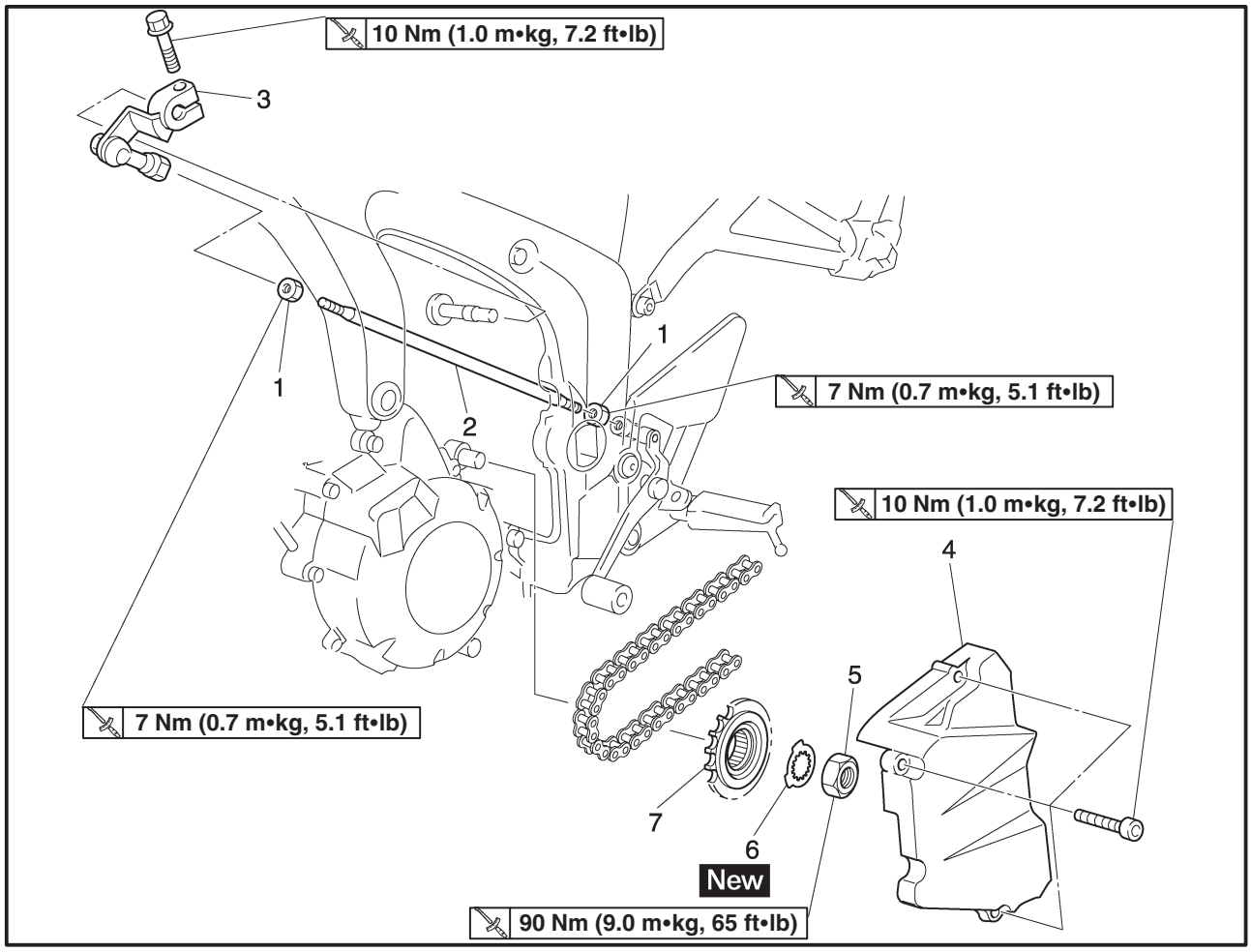


4. Remove:
   - rear shock absorber assembly upper bolt ①
   - rear shock absorber assembly

EAS00188

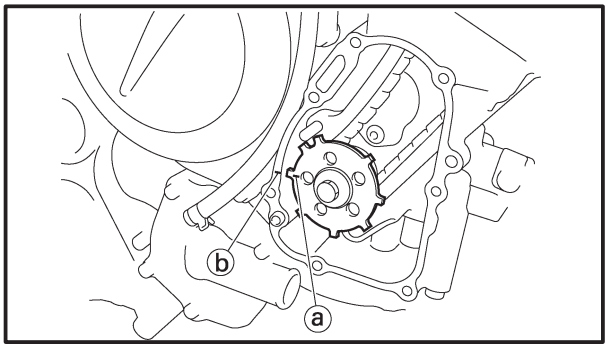
ENGINE

ENGINE
DRIVE SPROCKET



Order	Job/Part	Q'ty	Remarks
	Removing the drive sprocket		
	Drive chain		Loosen. Refer to "ADJUSTING THE DRIVE CHAIN SLACK" in chapter 3.
1	Lock nut	2	Loosen.
2	Shift rod	1	
3	Shift arm	1	
4	Drive sprocket cover	1	
5	Nut	1	
6	Lock washer	1	
7	Drive sprocket	1	
			For installation, reverse the removal procedure.

5



EAS00198
REMOVING THE CAMSHAFTS

1. Remove:
   - pickup rotor cover
     Refer to "CRANKSHAFT POSITION SENSOR AND PICKUP ROTOR".
2. Align:
   - "T" mark ⓐ on the pickup rotor
     (with the crankcase mating surface ⓑ)

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a. Turn the crankshaft clockwise.
b. When piston #1 is at TDC on the compression stroke, align the "T" mark ⓐ on the pickup rotor with the crankcase mating surface ⓑ.

NOTE:

TDC on the compression stroke can be found when the camshaft lobes are turned away from each other.

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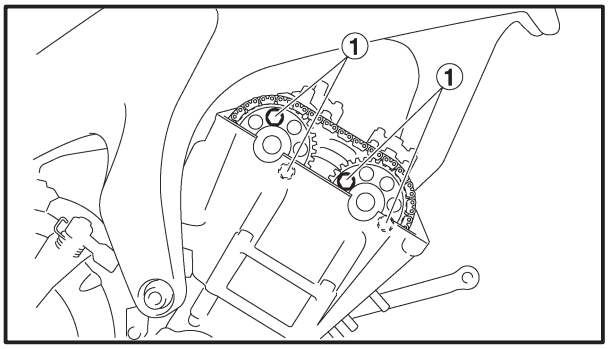
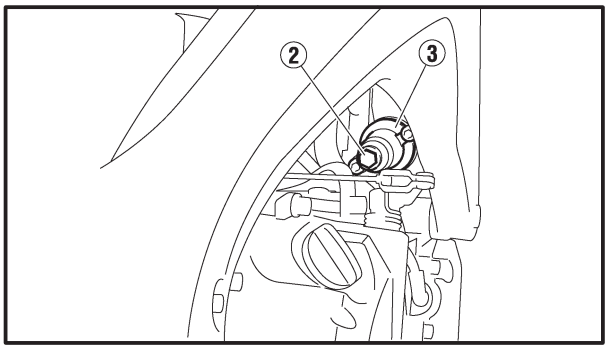
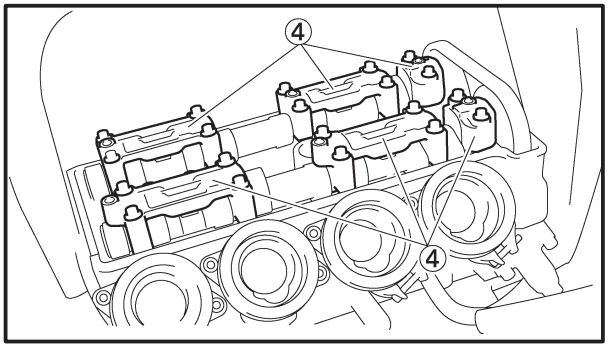


3. Loosen:
   - camshaft sprocket bolts ①



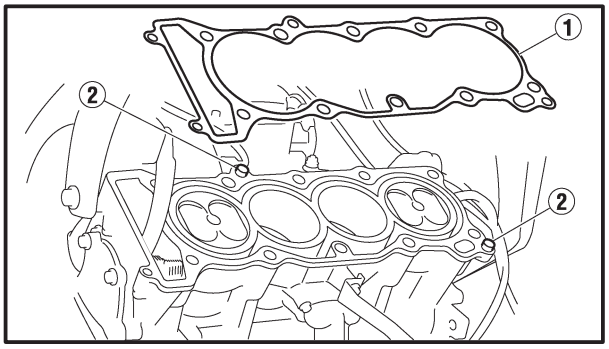
4. Loosen:
   - cap bolt ②
5. Remove:
   - timing chain tensioner ③
   - gasket

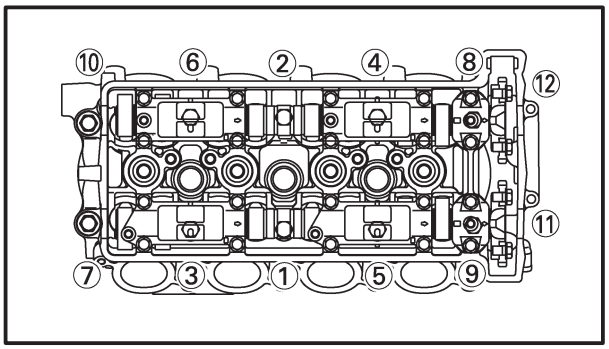


6. Remove:
   - timing chain guide (exhaust side)
   - camshaft caps ④
   - dowel pins

CAUTION:

To prevent damage to the cylinder head, camshafts or camshaft caps, loosen the camshaft cap bolts in stages and in a crisscross pattern, working from the outside in.





EAS00233
INSTALLING THE CYLINDER HEAD

1. Install:
   - gasket New ①
   - dowel pins ②
2. Install:
   - cylinder head

NOTE:

Pass the timing chain through the timing chain cavity.

3. Tighten:
   - cylinder head bolts ① ~ ⑩

1st	19 Nm (1.9 m•kg, 14 ft•lb)
2nd	50 Nm (5.0 m•kg, 36 ft•lb)

   - cylinder head bolts ⑪, ⑫

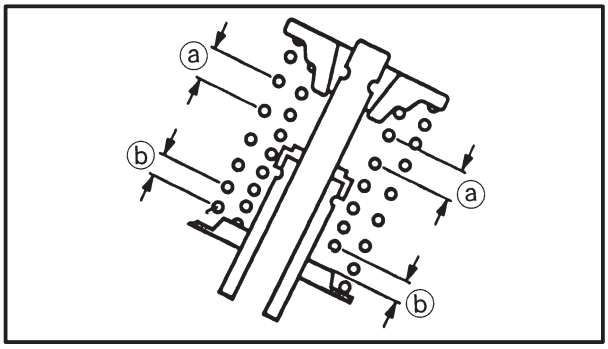
	12 Nm (1.2 m•kg, 8.7 ft•lb)

NOTE:

- Lubricate the cylinder head bolts with engine oil.
- Tighten the cylinder head bolts in the proper tightening sequence as shown and torque them in two stages.
- First, tighten the bolts ① ~ ⑩ to approximately 19 Nm (1.9 m•kg, 14 ft•lb) with a torque wrench and then tighten the 50 Nm (5.0 m•kg, 36 ft•lb).

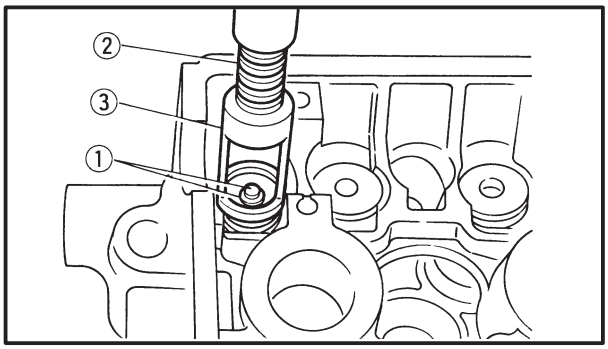
4. Install:
   - exhaust camshaft
   - intake camshaft

   Refer to “INSTALLING THE CAMSHAFTS”.



NOTE:
- Make sure that each valve is installed in its original place.
- Install the valve springs with the larger pitch ⓐ facing up.

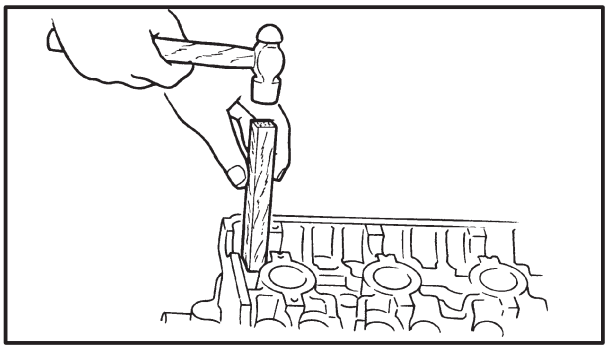
ⓑ Smaller pitch



4. Install:
   - valve cotters ①

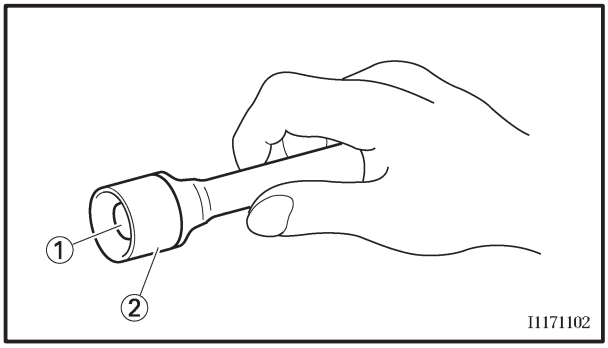
NOTE:
Install the valve cotters by compressing the valve springs with the valve spring compressor ② and the valve spring compressor attachment ③.

Valve spring compressor
90890-04019, YM-04019
Valve spring compressor attachment
90890-04108, YM-01253



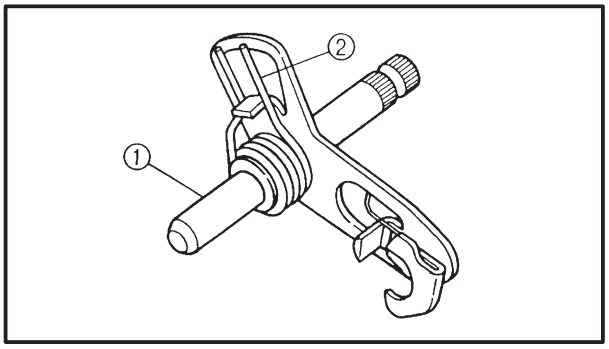
5. To secure the valve cotters onto the valve stem, lightly tap the valve tip with a soft-face hammer.

CAUTION:
Hitting the valve tip with excessive force could damage the valve.

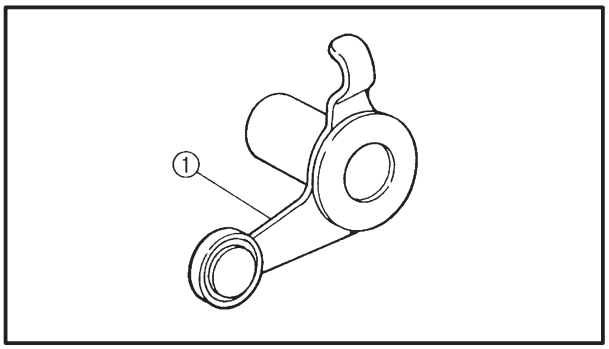


6. Install:
   - valve pad ①
   - valve lifter ②

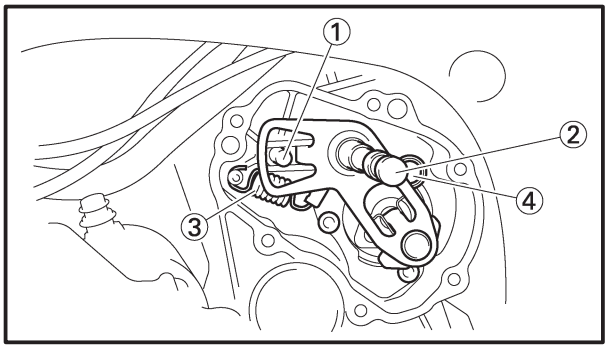
NOTE:
- Lubricate the valve lifter and valve pad with molybdenum disulfide oil.
- The valve lifter must move smoothly when rotated with a finger.
- Each valve lifter and valve pad must be reinstalled in its original position.



EAS00328
CHECKING THE SHIFT SHAFT
1. Check:
   - shift shaft ①
     Bends/damage/wear → Replace.
   - shift shaft spring ②
     Damage/wear → Replace.



EAS00330
CHECKING THE STOPPER LEVER
1. Check:
   - stopper lever ①
     Bends/damage → Replace.
     Roller turns roughly → Replace the stopper lever.



EAS00332
INSTALLING THE SHIFT SHAFT
1. Install:
   - shift shaft spring stopper ①
     22 Nm (2.2 m•kg, 16 ft•lb)
   - washers
   - shift shaft ②

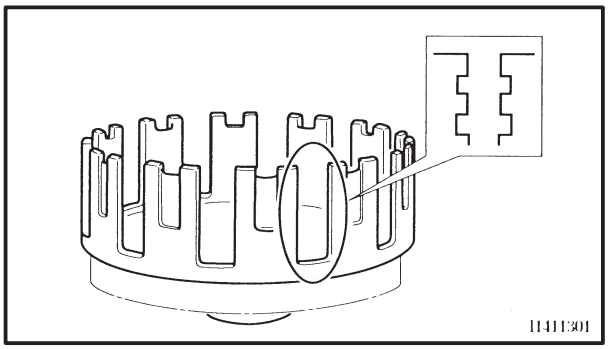
NOTE:
- Apply LOCTITE® to the threads of the shift shaft spring stopper.
- Hook the ends ③ of the stopper lever spring onto the stopper lever ④ and the crankcase boss.
- Mesh the stopper lever with the shift drum segment assembly.

2. Install:
   - shift shaft cover

NOTE:
Lubricate the oil seal lips with lithium-soap-based grease.

2. Measure:
   • clutch spring free length ⓐ
   Out of specification → Replace the clutch springs as a set.

Clutch spring free length
55 mm (2.17 in)
<Limit>: 52.3 mm (2.06 in)



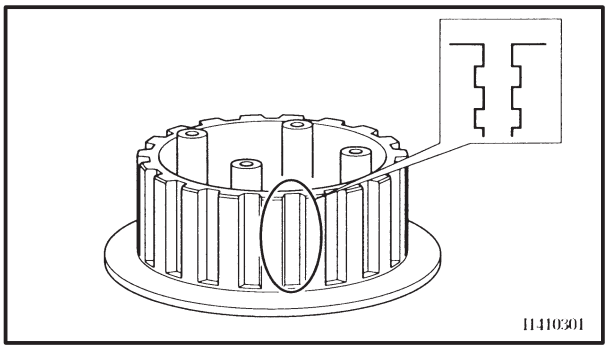
EAS00284
CHECKING THE CLUTCH HOUSING

1. Check:
   • clutch housing dogs
   Damage/pitting/wear → Deburr the clutch housing dogs or replace the clutch housing.

NOTE:

Pitting on the clutch housing dogs will cause erratic clutch operation.

2. Check:
   • bearing
   Damage/wear → Replace the bearing and clutch housing.

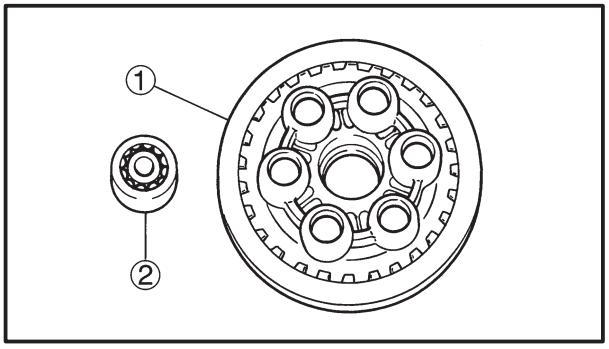


EAS00285
CHECKING THE CLUTCH BOSS

1. Check:
   • clutch boss splines
   Damage/pitting/wear → Replace the clutch boss.

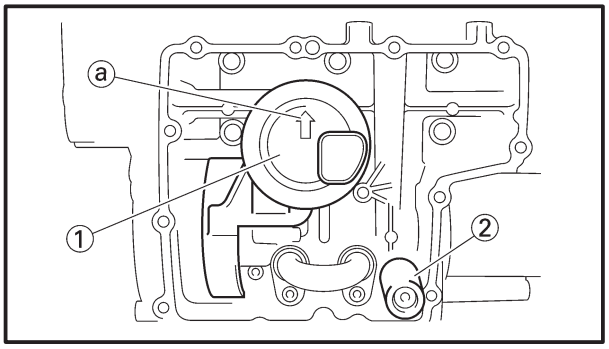
NOTE:

Pitting on the clutch boss splines will cause erratic clutch operation.



EAS00286
CHECKING THE PRESSURE PLATE

1. Check:
   • pressure plate ①
   Cracks/damage → Replace.
   • bearing ②
   Damage/wear → Replace.

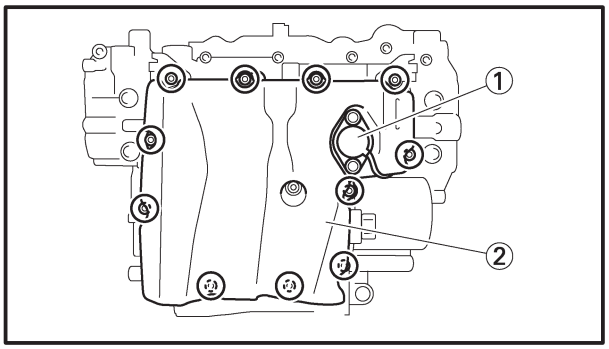


EAS00378
INSTALLING THE OIL STRAINER
1. Install:
   - oil strainer ①
   - relief valve ②

NOTE:

Make sure to check the arrow mark ⓐ located on the oil strainer housing for the front and rear direction of the engine and then install the oil strainer so that its arrow mark points to the front side of the engine.

EAS00380
INSTALLING THE OIL PAN
1. Install:
   - oil pipe
   - oil delivery pipe
2. Install:
   - dowel pins
   - gasket New
   - oil pan ① **12 Nm (1.2 m•kg, 8.7 ft•lb)**
   - oil level switch ② **10 Nm (1.0 m•kg, 7.2 ft•lb)**
   - engine oil drain bolt **43 Nm (4.3 m•kg, 31 ft•lb)**



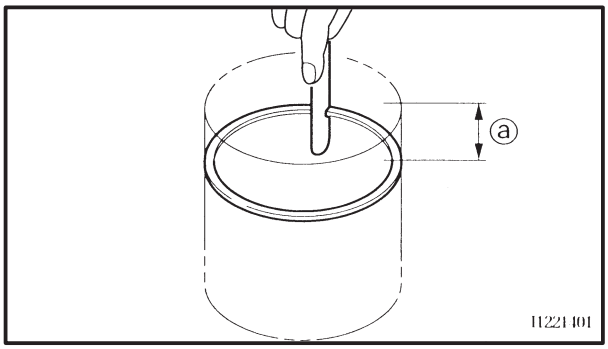
⚠ WARNING

Always use new copper washers.

NOTE:

- Tighten the oil pan bolts in stages and in a crisscross pattern.
- Lubricate the oil level switch O-ring with engine oil.

Piston ring side clearance
Top ring
0.030 ~ 0.065 mm
(0.0012 ~ 0.0026 in)
<Limit>: 0.115 mm (0.0045 in)
2nd ring
0.030 ~ 0.065 mm
(0.0012 ~ 0.0026 in)
<Limit>: 0.125 mm (0.0049 in)



2. Install:
   • piston ring
   (into the cylinder)

NOTE:

Level the piston ring into the cylinder with the piston crown.

ⓐ 5 mm (0.20 in)

3. Measure:
   • piston ring end gap
   Out of specification → Replace the piston ring.

NOTE:

The oil ring expander spacer's end gap cannot be measured. If the oil ring rail's gap is excessive, replace all three piston rings.

Piston ring end gap
Top ring
0.25 ~ 0.35 mm
(0.0098 ~ 0.0138 in)
<Limit>: 0.60 mm (0.0236 in)
2nd ring
0.7 ~ 0.8 mm
(0.0276 ~ 0.0315 in)
<Limit>: 1.15 mm (0.0453 in)
Oil ring
0.10 ~ 0.35 mm
(0.0039 ~ 0.0138 in)

CHECKING THE PISTON PINS

The following procedure applies to all of the piston pins.

1. Check:
   • piston pin
   Blue discoloration/grooves → Replace the piston pin and then check the lubrication system.

7. Tighten:

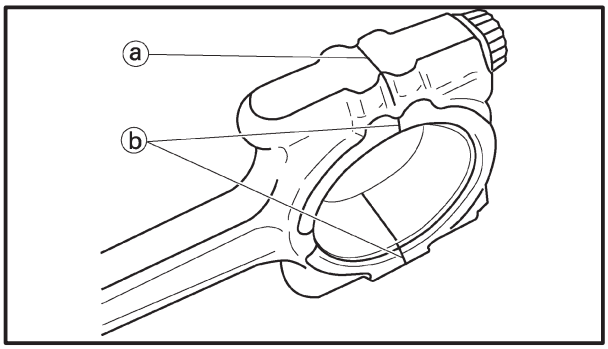
NOTE:

Install by carrying out the following procedures in order to assemble in the most suitable condition.

- connecting rod bolts.

24.5 Nm (2.5 m•kg, 17.7 ft•lb)

a. Replace the connecting rod bolts with new oncs.



CAUTION:

Tighten the connecting rod bolts using the plastic-region tightening angle method. Always install new bolts.

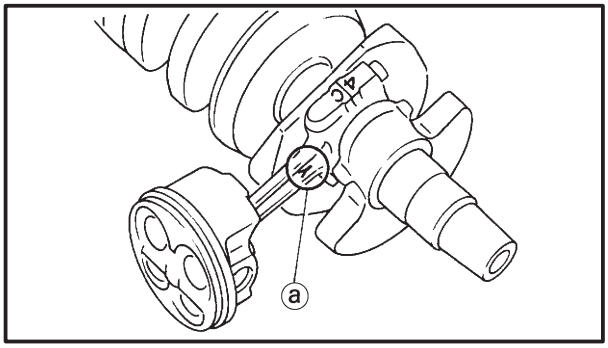
b. Clean the connecting rod bolts.
c. After installing the big end bearing, assemble the connecting rod and connecting rod cap once using a single unit of the connecting rod.
d. Tighten the connecting rod bolt while checking that the sections shown ⓐ and ⓑ are flush with each other by touching the surface.
   - Side machined face ⓐ
   - Thrusting faces (4 places at front and rear) ⓑ

NOTE:

To install the big end bearing, care should be taken not to install it at an angle and the position should not be out of alignment.

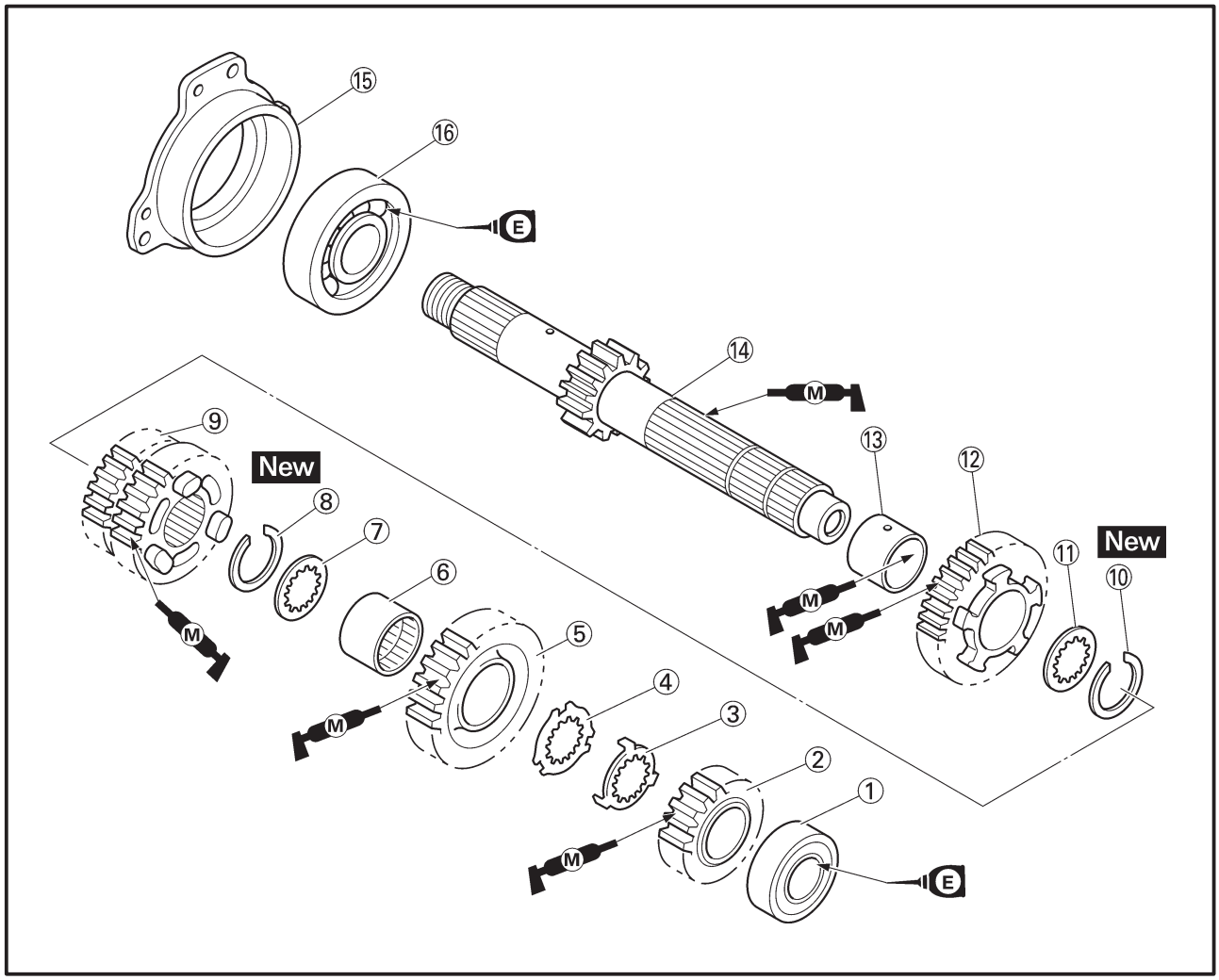
e. Loosen the connecting rod bolt, remove the connecting rod and connecting rod cap and install these parts to the crankshaft with the big end bearing kept in the current condition.

8. Install:
   - connecting rod assembly
     (into the cylinder and onto the crankshaft pin)



NOTE:

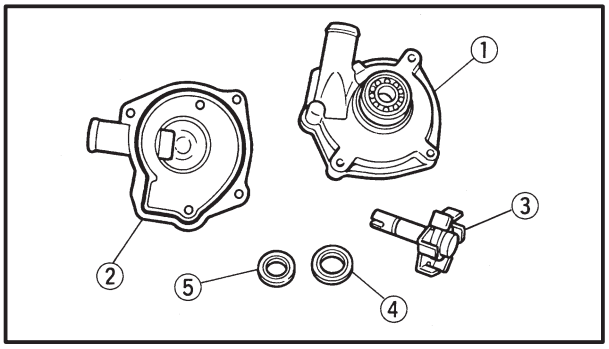
- Be sure to reinstall each big end bearing in its original place.
- While compressing the piston rings with one hand, install the connecting rod assembly into the cylinder with the other hand.
- Make sure that the "Y" marks ⓐ on the connecting rods face towards the left side of the crankshaft.



Order	Job/Part	Q'ty	Remarks
⑮	Bearing housing	1	
⑯	Bearing	1	
			For installation, reverse the removal procedure.

EAS00456
INSTALLING THE RADIATOR

1. Install:
   - radiator
   - coolant hoses
2. Fill:
   - cooling system
     (with the specified amount of the recommended coolant)
     Refer to “CHANGING THE COOLANT” in chapter 3.
3. Check:
   - cooling system
     Leaks → Repair or replace any faulty part.
4. Measure:
   - radiator cap opening pressure
     Below the specified pressure → Replace the radiator cap.
     Refer to “CHECKING THE RADIATOR”.

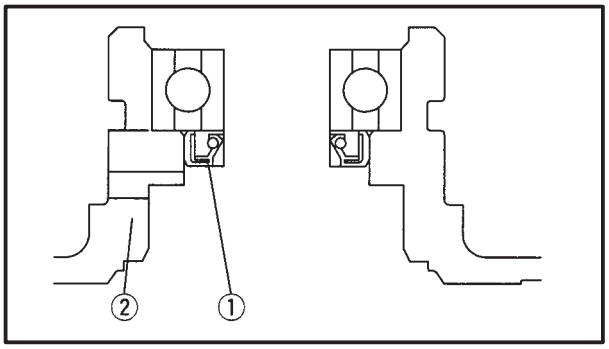


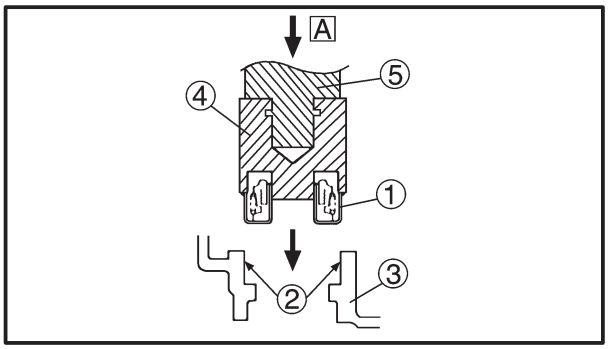
EAS00473
CHECKING THE WATER PUMP
1. Check:
   - water pump housing ①
   - water pump cover ②
   - impeller ③
   - rubber damper ④
   - rubber damper holder ⑤
   - water pump seals
   - oil seal

   Cracks/damage/wear → Replace.
2. Check:
   - bearing

   Rough movement → Replace.
3. Check:
   - water pump outlet hose
   - radiator outlet hose

   Cracks/damage/wear → Replace.





EAS00475
ASSEMBLING THE WATER PUMP
1. Install:
   - bearing
   - oil seal New ①

   (into the water pump housing ②)

NOTE:
- Before installing the oil seal, apply tap water or coolant onto its out surface.
- Install the oil seal with a socket that matches its outside diameter.

2. Install:
   - water pump seal New ①

CAUTION:

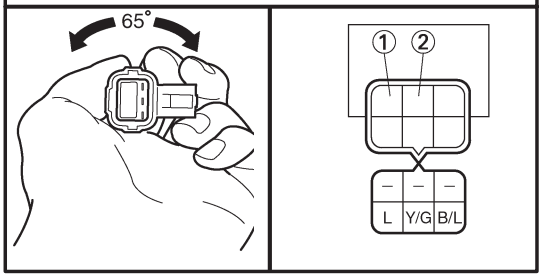
Never lubricate the water pump seal surface with oil or grease.

NOTE:
- Install the water pump seal with the special tools.
- Before installing the water pump seal, apply Yamaha bond No.1215 or Quick Gasket ② to the water pump housing ③.

7. Verify the operation of the sensor or actuator.
   - Sensor operation
     The data representing the operating conditions of the sensor appears on the trip LCD.
   - Actuator operation
     Set the engine stop switch to “ON” to operate the actuator.
   * If the engine stop switch is set to “ON”, set it to “OFF”, and then set it to “ON” again.
8. Turn the main switch to “OFF” to cancel the the diagnostic mode.

NOTE:

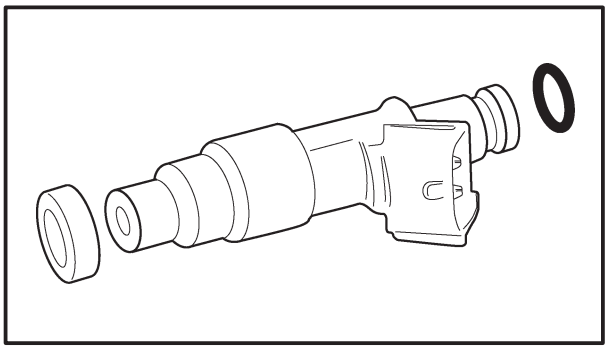
To perform a reliable diagnosis, make sure to turn “OFF” the power supply before every check and then start right from the beginning.

Fault code No.	30	Symptom	The motorcycle has overturned.	
Used diagnostic code No. 08 (lean angle cut-off switch)				
Order	Inspection operation item and probable cause	Operation item and countermeasure		Reinstatement method
1	The motorcycle has overturned.	Raise the motorcycle upright.		Reinstated by turning the main switch ON (however, the engine cannot be re-started unless the main switch is first turned OFF).
2	Installed condition of the lean angle cut-off switch	Check the installed area for looseness or pinching.		
3	Connected condition of connector Inspect the coupler for any pins that may have pulled out. Check the locking condition of the coupler.	If there is a malfunction, repair it and connect it securely. Lean angle cut-off switch coupler Main wiring harness ECU coupler		
4	Defective lean angle cut-off switch	Execute the diagnostic mode (code No. 08) Replace if defective. 1. Remove the lean angle cut-off switch from the motorcycle. 2. Connect the lean angle cut-off switch coupler to the wireharness. 3. Connect the pocket tester (DC 20 V) to the lean angle cut-off switch coupler as shown. **Tester positive prove → blue ①** **Tester negative prove → yellow/green ②**  4. When turning the lean angle cut-off switch approx. 65°, the voltage reading change from 1.0 V to 4.0 V. 5. Is the emergency stop switch OK?		

EAS00911

CAUTION:

The throttle bodies should not be disassembled.



EAS00912

CHECKING THE INJECTORS

1. Check:
   - injectors
     Damage → Replace.

EAS00913

CHECKING THE THROTTLE BODIES

1. Check:
   - throttle bodies
     Cracks/damage → Replace the throttle bodies as a set.

2. Check:
   - fuel passages
     Obstructions → Clean.

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a. Wash the throttle bodies in a petroleum-based solvent.
   Do not use any caustic carburetor cleaning solution.
b. Blow out all of the passages with compressed air.

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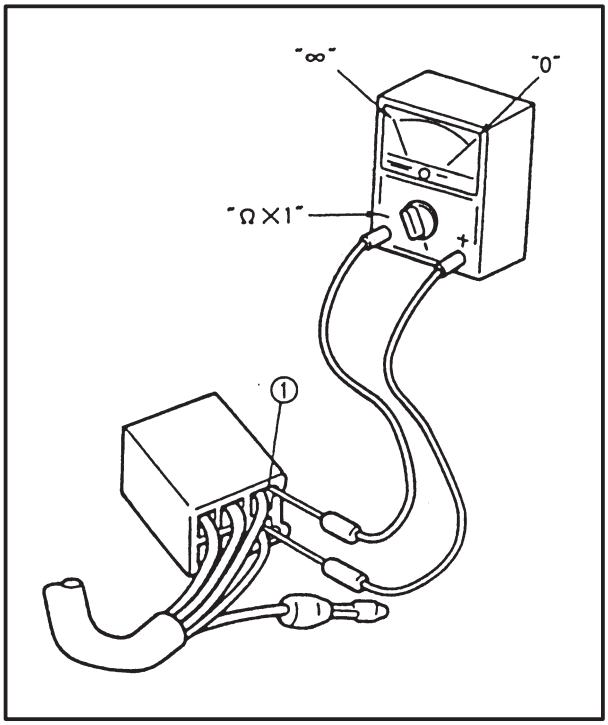
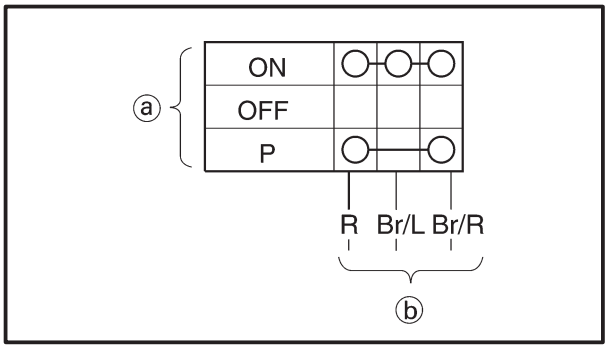
   - fuel pulsation damper

CAUTION:

Do not adjust the fuel pulsation damper.





EAS00730

CHECKING SWITCH CONTINUITY

Check each switch for continuity with the pocket tester. If the continuity reading is incorrect, check the wiring connections and if necessary, replace the switch.

CAUTION:

Never insert the tester probes into the coupler terminal slots. Always insert the probes from the opposite end of the coupler ① taking care not to loosen or damage the leads.

Pocket tester
90890-03112, YU-3112

NOTE:

- Before checking for continuity, set the pocket tester to "0" and to the "Ω × 1" range.
- When checking for continuity, switch back and forth between the switch positions a few times.

The terminal connections for switches (e.g., main switch, engine stop switch) are shown in an illustration similar to the one on the left.
The switch positions ⓐ are shown in the far left column and the switch lead colors ⓑ are shown in the top row in the switch illustration.

NOTE:

"○——○" indicates a continuity of electricity between switch terminals (i.e., a closed circuit at the respective switch position).

The example illustration on the left shows that:
There is continuity between red and brown/red when the switch is set to "P".
There is continuity between red, brown/blue and brown/red when the switch is set to "ON".

EAS00754

15. Wiring

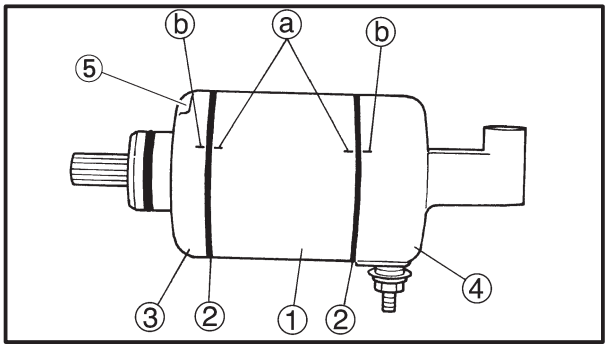
- Check the entire ignition system's wiring. Refer to "CIRCUIT DIAGRAM".
- Is the ignition system's wiring properly connected and without defects?

YES

Replace the ECU.

NO

Properly connect or repair the ignition system's wiring.



3. Install:
   - starter motor yoke ①
   - O-ring ② New
   - front cover ③
   - rear cover ④
   - bolts ⑤

3.4 Nm (0.34 m•kg, 2.5 ft•lb)

NOTE:

Align the match marks ⓐ on the starter motor yoke with the match marks ⓑ on the front and starter motor rear covers.

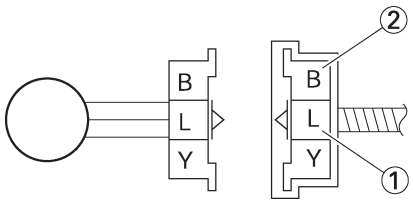
EAS00790
3. The tail/brake light fails to come on.

1. Tail/brake light bulb and socket
- Check the tail/brake light bulb and socket for continuity.
  Refer to "CHECKING THE BULBS AND BULB SOCKETS".
- Are the tail/brake light bulb and socket OK?

YES
NO → Replace the tail/brake light bulb, socket or both.

2. Voltage
- Connect the pocket tester (DC 20 V) to the tail/brake light coupler (wire harness side) as shown.

Positive tester probe → blue ①
Negative tester probe → black ②



- Turn the main switch to "ON".
- Measure the voltage (DC 12 V) of blue ② on the tail/brake light coupler (wire harness side).
- Is the voltage within specification?

YES → This circuit is OK.
NO → Wiring circuit from the main switch to the tail/brake light coupler is faulty and must be repaired.

EAS00791
4. The turn signal/position light fails to come on.

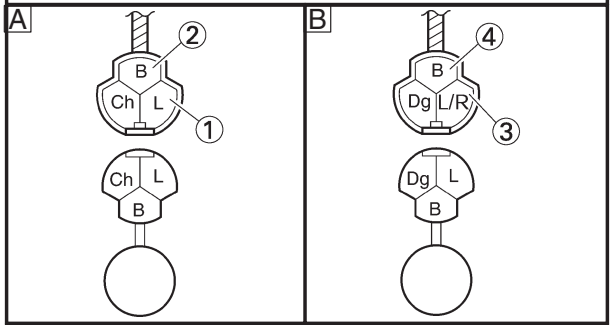
1. Turn signal/position light and socket
- Check the turn signal/position light bulb and socket for continuity.
  Refer to "CHECKING THE BULBS AND BULB SOCKETS".
- Are the turn signal/position light bulb and socket OK?

YES
NO → Replace the turn signal/position light bulb, socket or both.

2. Voltage
- Connect the pocket tester (DC 20 V) to the turn signal/position light coupler (wire harness side) as shown.

A Left turn signal/position light
B Right turn signal/position light

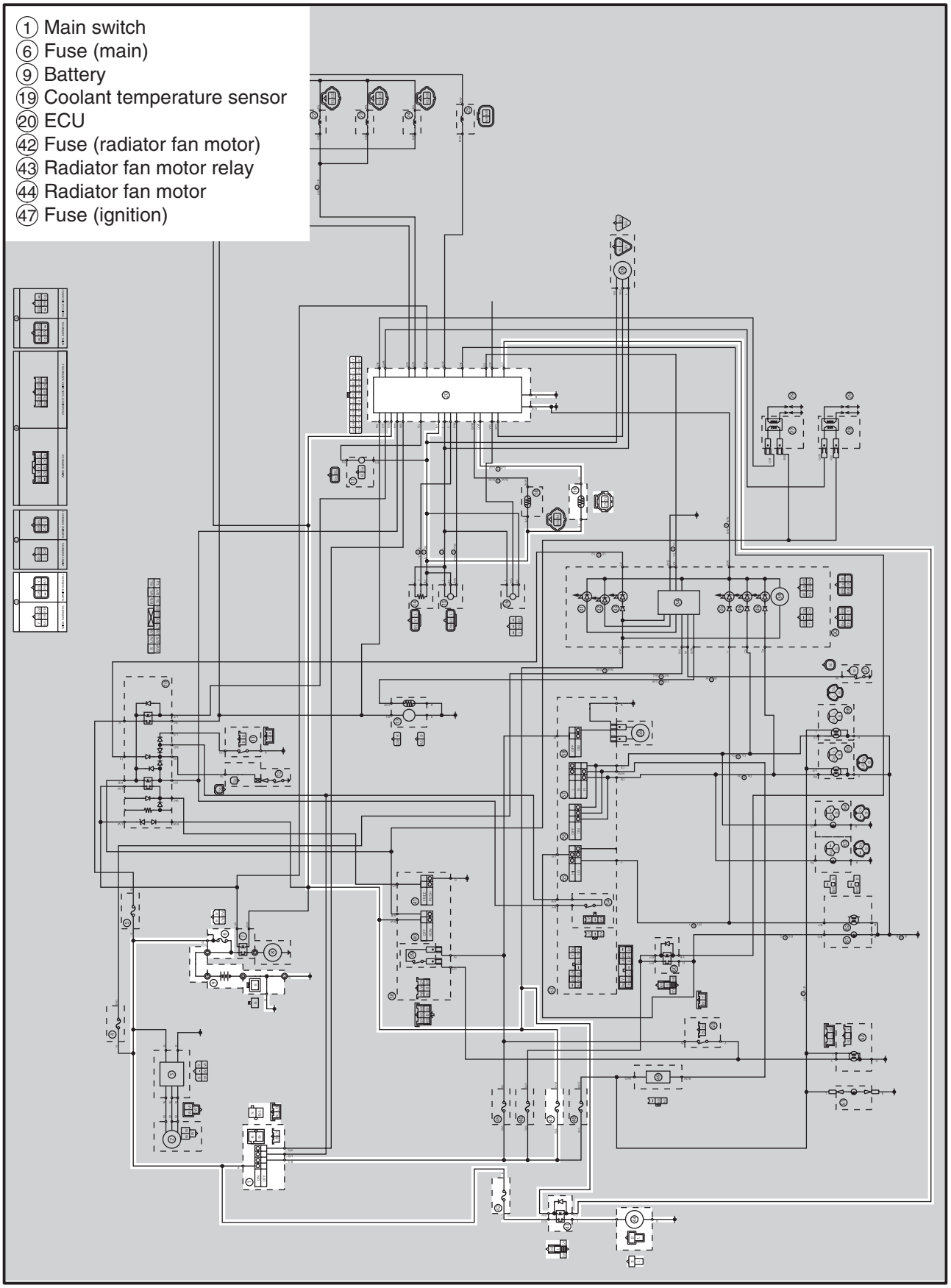
Left turn signal/position light
Positive tester probe → blue ①
Negative tester probe → black ②
Right turn signal/position light
Positive tester probe → blue/red ③
Negative tester probe → black ④



- Turn the main switch to "ON".
- Measure the voltage (DC 12 V) of blue ① or blue/red ③ on the turn signal/position light coupler (wire harness side).
- Is the voltage within specification?

YES → This circuit is OK.
NO → The wiring circuit from the main switch to the turn signal/position light coupler is faulty and must be repaired.

EAS00807
COOLING SYSTEM
CIRCUIT DIAGRAM



TROUBLESHOOTING

The warning light starts to indicate the self-diagnosis sequence.

Check:
1. fuel pump thermistor
2. oil level switch

NOTE:

- Before troubleshooting, remove the following part(-s):

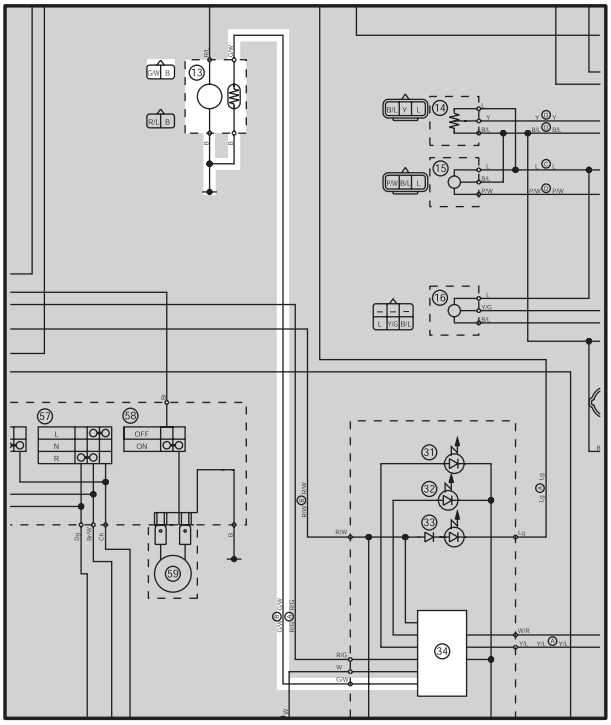
1. seat
2. front cowling inner panel (left and right)
3. fuel tank

- Troubleshoot with the following special tool(-s).

Pocket tester
90890-03112, YU-3112

1. Fuel pump thermistor

CIRCUIT DIAGRAM



⑬ Fuel pump
㉞ Multi-function meter

1. Wire harness

- Check the wire harness for continuity. Refer to “CIRCUIT DIAGRAM”.
- Is the wire harness OK?

YES

NO → Repair or replace the wire harness.

2. Fuel pump thermistor

- Check the fuel pump thermistor for continuity. Refer to “The fuel level indicator light fails to come on”.
- Is the fuel pump thermistor OK?

YES → Replace the multi-function meter.

NO → Replace the fuel pump.