How to use this Service Manual

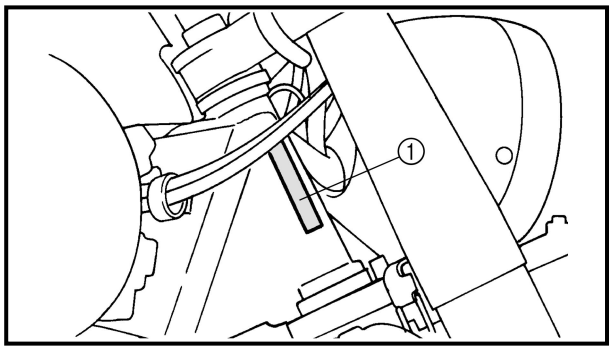
In the bookmarks to the left you will find different segments of this manual:

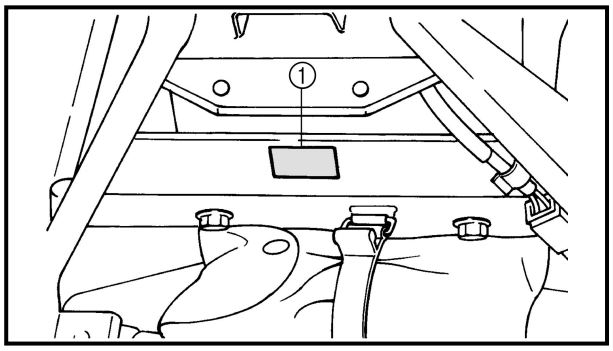
Service Manual

This is the standard manual for this vehicle. Use this segment as your major point of reference and information.

Supplementary Service Manual (if available)

These segments are updates and additions to the standard service manual. They are added as needed when certain changes are made to the model. Be sure to check these for additional information that may be lacking from the regular service manual.





EAS00014

GENERAL INFORMATION

MOTORCYCLE IDENTIFICATION

EAS00017

VEHICLE IDENTIFICATION NUMBER

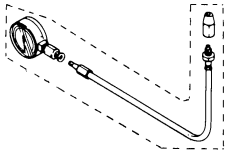
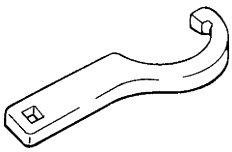
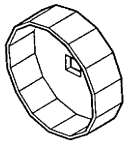
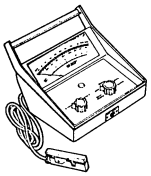
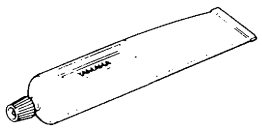
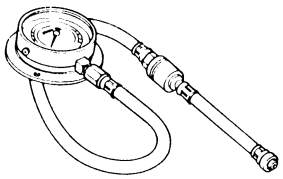
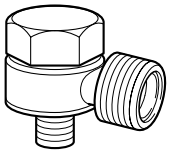
The vehicle identification number ① is stamped into the right side of the steering head pipe.

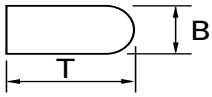
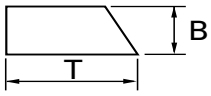
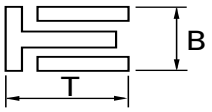
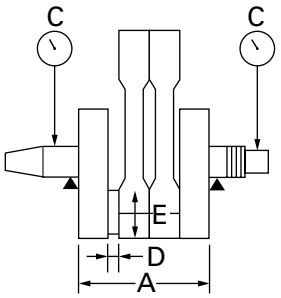
EAS00018

MODEL CODE

The model code label ① is affixed to the frame. This information will be needed to order spare parts.

1

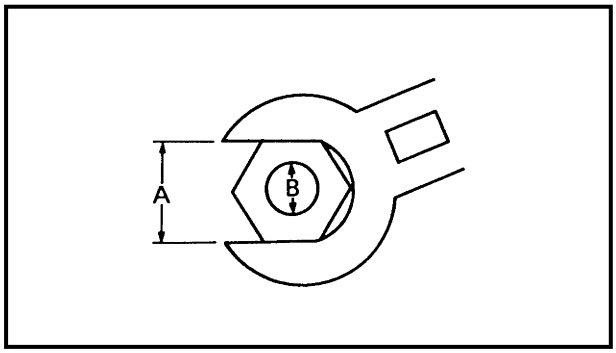
Tool No.	Tool name/Function	Illustration
Compression gauge YU-33223 Compression gauge adapter YU-33223-3	Compression gauge These tools are used to measure engine compression.	
YU-33975	Steering nut wrench This tool is used to loosen or tighten the steering stem ring nuts.	
YU-38411	Oil filter wrench This tool is needed to loosen or tighten the oil filter cartridge.	
YU-8036-A	Inductive tachometer This tool is used to check engine speed.	
ACC-11001-05-01	Quick Gasket® This sealant is used to seal two mating surfaces (e. g., crankcase mating surfaces).	
90890-03153	Oil pressure gauge This tool is used to measure the engine oil pressure.	
90890-03129	Oil pressure gauge adapter E This tool is used to measure the engine oil pressure.	

Item	Standard	Limit
Piston rings		
Top ring		
		
Ring type	Barrel	----
Dimensions (B × T)	1.2 × 3.8 mm (0.047 × 0.150 in)	----
End gap (installed)	0.30 ~ 0.45 mm (0.012 ~ 0.018 in)	0.65 mm (0.026 in)
Ring side clearance	0.03 ~ 0.08 mm (0.0012 ~ 0.0031 in)	0.12 mm (0.0047 in)
2nd ring		
		
Ring type	Taper	----
Dimensions (B × T)	1.2 × 3.8 mm (0.047 × 0.150 in)	----
End gap (installed)	0.30 ~ 0.45 mm (0.012 ~ 0.018 in)	0.8 mm (0.031 in)
Ring side clearance	0.03 ~ 0.07 mm (0.0012 ~ 0.0028 in)	0.12 mm (0.0047 in)
Oil ring		
		
Dimensions (B × T)	2.5 × 3.4 mm (0.098 × 0.134 in)	----
End gap (installed)	0.2 ~ 0.7 mm (0.008 ~ 0.028 in)	----
Connecting rods		
Crankshaft pin-to-big end bearing clearance	0.037 ~ 0.074 mm (0.0015 ~ 0.0029 in)	----
Bearing color code	1 = Blue, 2 = Black, 3 = Brown, 4 = Green, 5 = Yellow.	----
Connecting rod length	191.95 ~ 192.05 mm (7.557 ~ 7.561 in)	
Crankshaft		
		
Width A	132.8 ~ 133.2 mm (5.228 ~ 5.244 in)	----
Max. runout C		0.04 mm (0.0016 in)
Big end side clearance D	0.320 ~ 0.474 mm (0.013 ~ 0.019 in)	----

TIGHTENING TORQUES

GENERAL TIGHTENING TORQUES

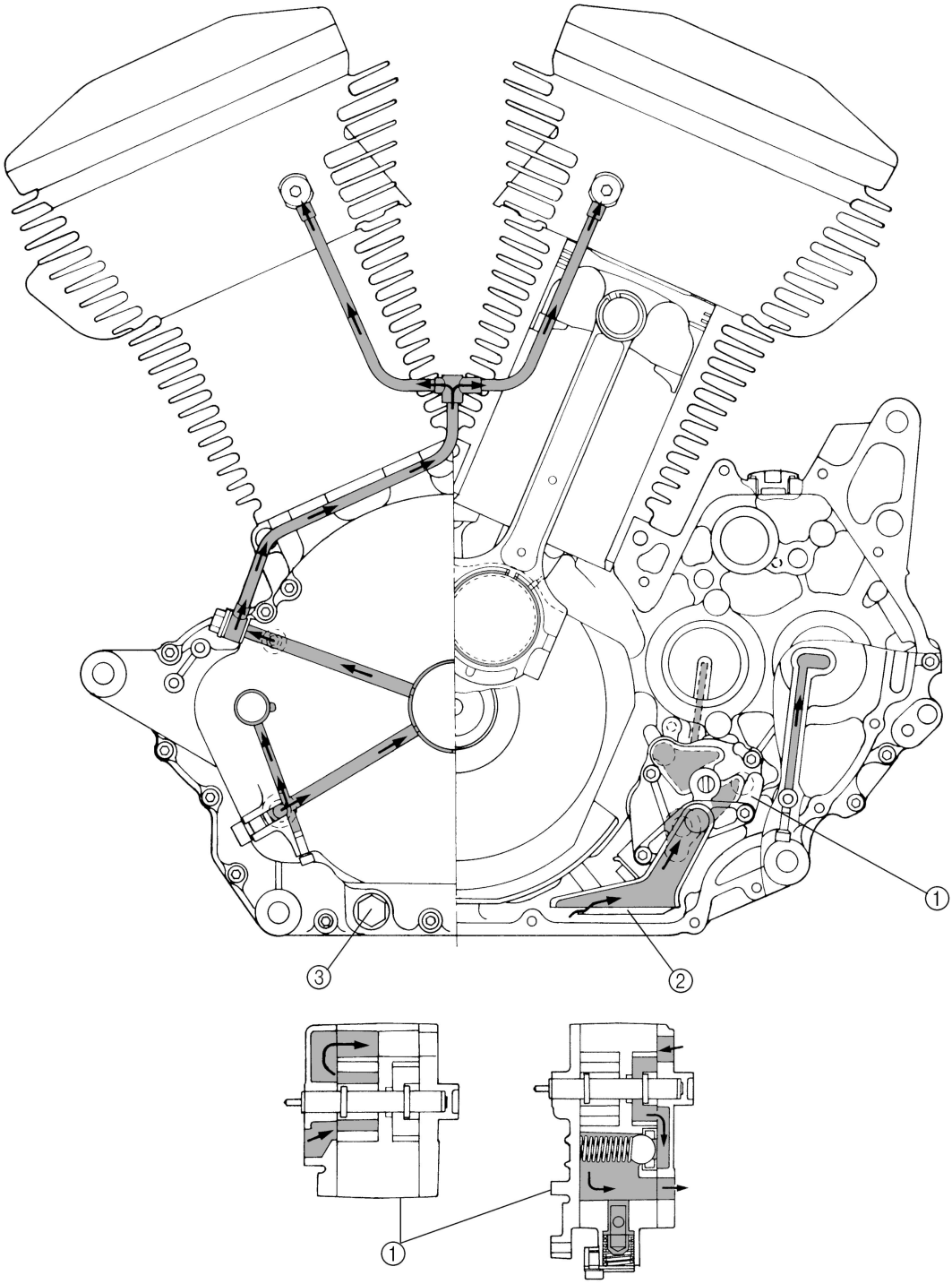
This chart specifies tightening torques for standard fasteners with a standard ISO thread pitch. Tightening torque specifications for special components or assemblies are provided for each chapter of this manual. To avoid warpage, tighten multi-fastener assemblies in a crisscross pattern and progressive stages until the specified tightening torque is reached. Unless otherwise specified, tightening torque specifications require clean, dry threads. Components should be at room temperature.

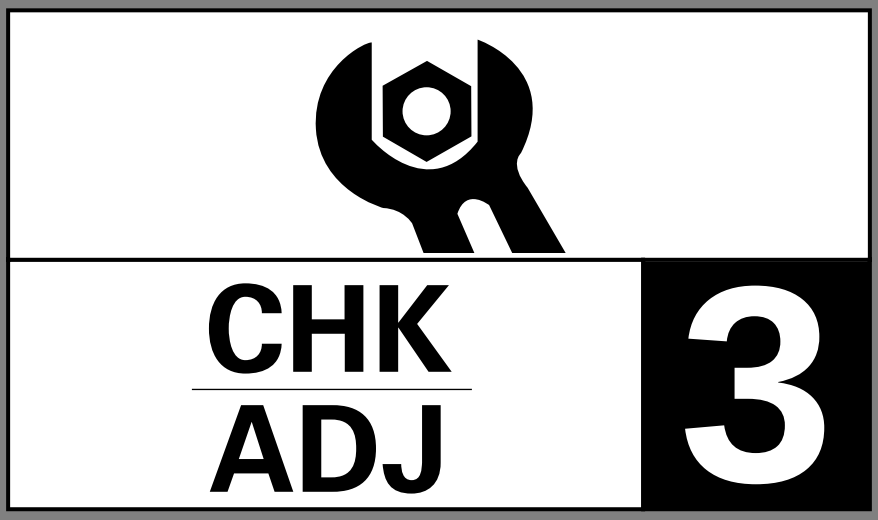


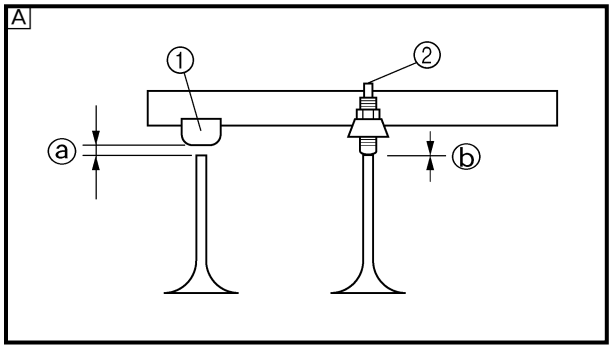
A: Width across flats
B: Thread diameter

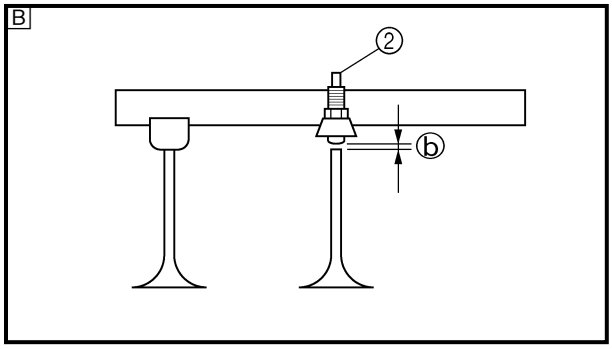
A (nut)	B (bolt)	General tightening torques		
		Nm	m•kg	ft•lb
10 mm	6 mm	6	0.6	4.3
12 mm	8 mm	15	1.5	11
14 mm	10 mm	30	3.0	22
17 mm	12 mm	55	5.5	40
19 mm	14 mm	85	8.5	61
22 mm	16 mm	130	13.0	94

① Engine oil pump
② Oil strainer
③ Engine oil drain bolt (engine)




CHK
ADJ
3





EAS00047
ENGINE

ADJUSTING THE VALVE CLEARANCE

The following procedure applies to all of the valves.

NOTE:

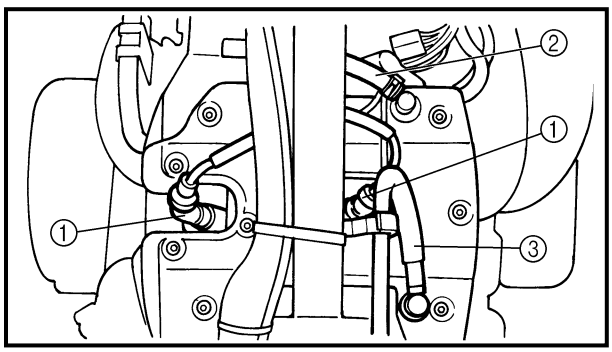
- The valve clearance is automatically adjusted by the hydraulic valve lifter. However, there are times that the valve clearance is needed to be adjusted manually. If this is the case, adjust the clearance of the two maladjusted or worn valves, of a rocker arm, with the adjusting screw.

Ⓐ If clearance is on the slip side ①, loosen the adjusting screw and bring the valve clearance ⓐ within specification. Check if the valve clearance ⓑ on the adjusting screw ② side is within specification.

Ⓑ If clearance is on the adjusting screw ② side, tighten the adjusting screw and bring the valve clearance ⓑ within specification.

- Valve clearance adjustment should be made on a cold engine, at room temperature.
- When the valve clearance is to be measured or adjusted, the piston must be at top dead center (TDC) on the compression stroke.

1. Remove:
   - rider seat
     Refer to “SEATS AND SIDE COVERS”.
   - fuel tank
     Refer to “FUEL TANK”.



2. Disconnect:
   - spark plug caps ①
   - cylinder head breather hose ②
   - oil tank breather hose ③
3. Remove:
   - spark plugs
   - cylinder head covers (upper)
   - gaskets
   - dowel pins

11. Adjust:
 • installed shift rod length
 Refer to "ADJUSTING THE SHIFT PEDAL".

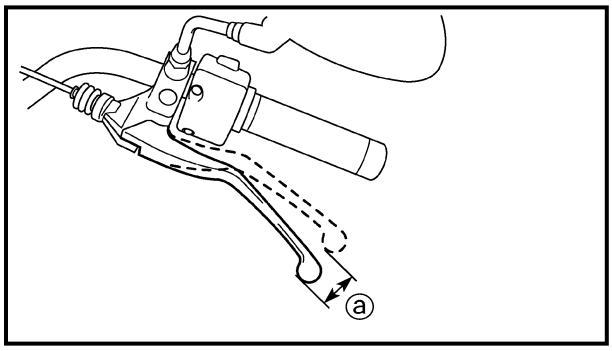
EAS00065
MEASURING THE COMPRESSION PRESSURE

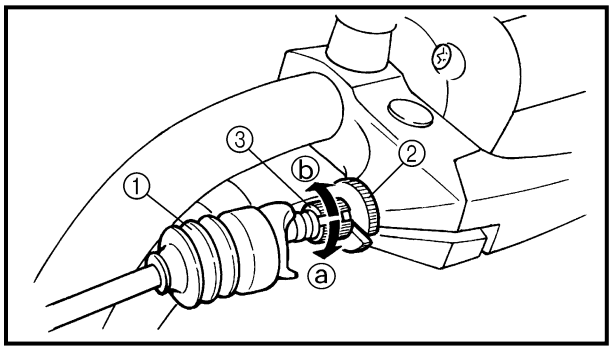
The following procedure applies to all of the cylinders.

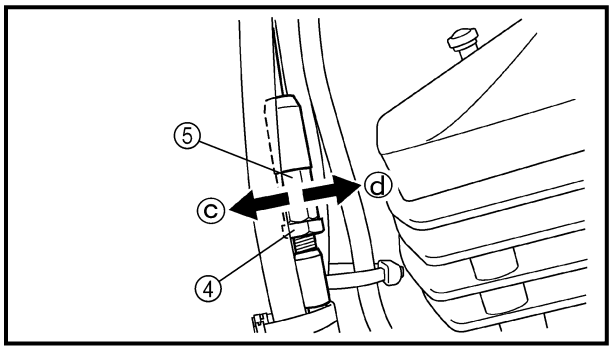
NOTE:
Insufficient compression pressure will result in a loss of performance.

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
 • fuel tank
 Refer to "SEATS AND SIDE COVERS" and "FUEL TANK".
4. Remove:
 • camshaft sprocket cover
 Refer to "ROCKER ARMS, PUSH RODS AND VALVE LIFTERS".
 • decompression solenoid
 Refer to "CAMSHAFTS".
5. Install:
 • camshaft sprocket cover
 Refer to "ROCKER ARMS, PUSH RODS AND VALVE LIFTERS".
6. Disconnect:
 • spark plug cap
7. Remove:
 • spark plug

CAUTION:
Before removing the spark plugs, use compressed air to blow away any dirt accumulated in the spark plug wells to prevent it from falling into the cylinders.







EAS00078

ADJUSTING THE CLUTCH CABLE FREE PLAY

1. Measure:
   • clutch cable free play ⓐ
   Out of specification → Adjust.

Clutch cable free play (at the end of the clutch lever)
10 ~ 15 mm (0.39 ~ 0.59 in)

2. Adjust:
   • clutch cable free play

▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼

Handlebar side

a. Pull the boot ① off.

b. Loosen the locknut ②.

c. Turn the adjusting bolt ③ in direction ⓐ or ⓑ until the specified clutch cable free play is obtained.

Direction ⓐ	**Clutch cable free play is increased.**
Direction ⓑ	**Clutch cable free play is decreased.**

d. Tighten the locknut.

NOTE:
If the specified clutch cable free play cannot be obtained on the handlebar side of the cable, use the adjusting nut on the engine side.

e. Pull the boot ① in.

Engine side

a. Loosen the locknut ④.

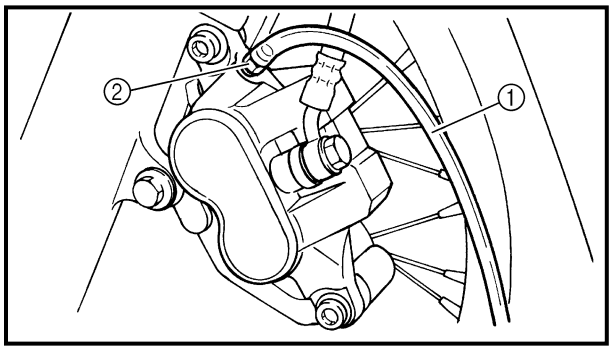
b. Turn the adjusting bolt ⑤ in direction ⓒ or ⓓ until the specified clutch cable free play is obtained.

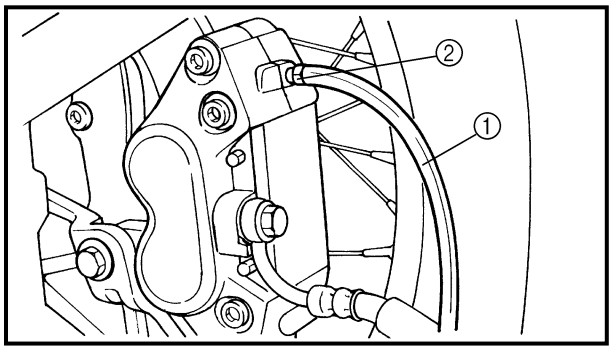
Direction ⓒ	**Clutch cable free play is increased.**
Direction ⓓ	**Clutch cable free play is decreased.**

c. Tighten the locknut.

▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲

3





c. Connect a clear plastic hose ① tightly to the bleed screw ②.

Ⓐ Front Ⓑ Rear

d. Place the other end of the hose into a container.

e. Slowly apply the brake several times.

f. Fully squeeze the brake lever or fully depress the brake pedal and hold it in position.

g. Loosen the bleed screw.

NOTE:

Loosening the bleed screw will release the pressure and cause the brake lever to contact the throttle grip or the brake pedal to fully extend.

h. Tighten the bleed screw and then release the brake lever or brake pedal.

i. Repeat steps (e) to (h) until all of the air bubbles have disappeared from the brake fluid in the plastic hose.

j. Tighten the bleed screw to specification.

	Bleed screw **6 Nm (0.6 m • kg, 4.3 ft • lb)**

k. Fill the brake fluid reservoir to the proper level with the recommended brake fluid.

Refer to "CHECKING THE BRAKE FLUID LEVEL".

⚠ WARNING

After bleeding the hydraulic brake system, check the brake operation.

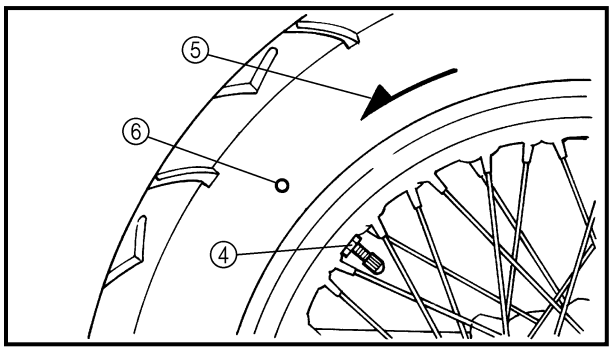
▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲

4. Install:
   - plastic clamps
   - muffler bracket

     26 Nm (2.6 m · kg, 19 ft · lb)
   - muffler
5. Tighten:
   - muffler bolts

     30 Nm (3.0 m · kg, 22 ft · lb)
   - muffler clamp bolts

     25 Nm (2.5 m · kg, 18 ft · lb)



⚠ WARNING

- **After mounting a new tire, ride conservatively for a while to become accustomed to the "feel" of the new tire and to allow the tire to seat itself properly in the rim. Failure to do so could lead to an accident with possible injury to the rider or damage to the motorcycle.**
- **After a tire has been repaired or replaced, be sure to tighten the tire air valve stem locknut ④ to specification.**

NOTE:

For tires with a direction of rotation mark ⑤:

- Install the tire with the mark pointing in the direction of wheel rotation.
- Align the mark ⑥ with the valve installation point.

	**Tire air valve stem locknut 1.5 Nm (0.5 m • kg, 1.1 ft • lb)**

EAS00169

CHECKING AND TIGHTENING THE SPOKES

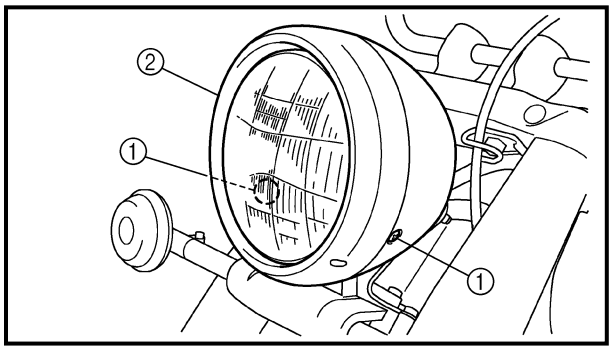
The following procedure applies to all of the spokes.

1. Check:
   - spoke
     Bends/damage → Replace.
     Loose → Tighten.
     Tap the spokes with a screwdriver.

NOTE:

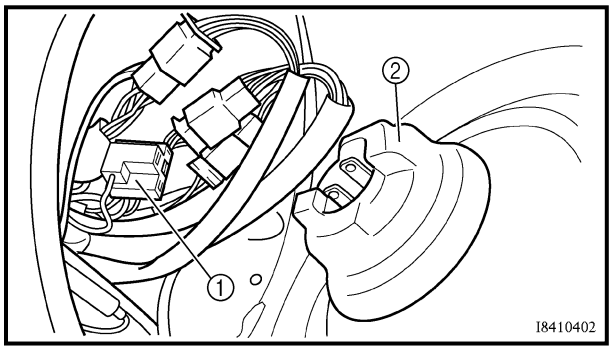
A tight spoke will emit a clear, ringing tone; a loose spoke will sound flat.

4. Install:
   • left side cover
   Refer to “SEATS AND SIDE COVERS”.

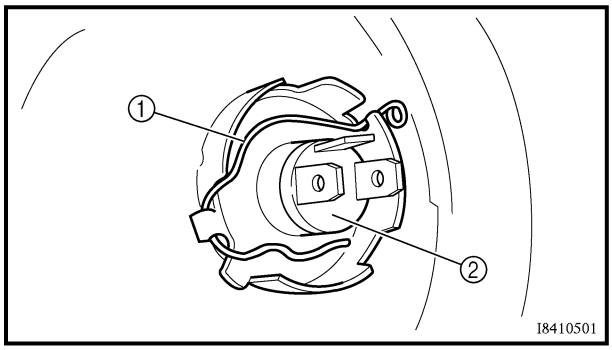


EAS00182
REPLACING THE HEADLIGHT BULB

1. Remove:
   • screws ①
   • headlight lens unit ②



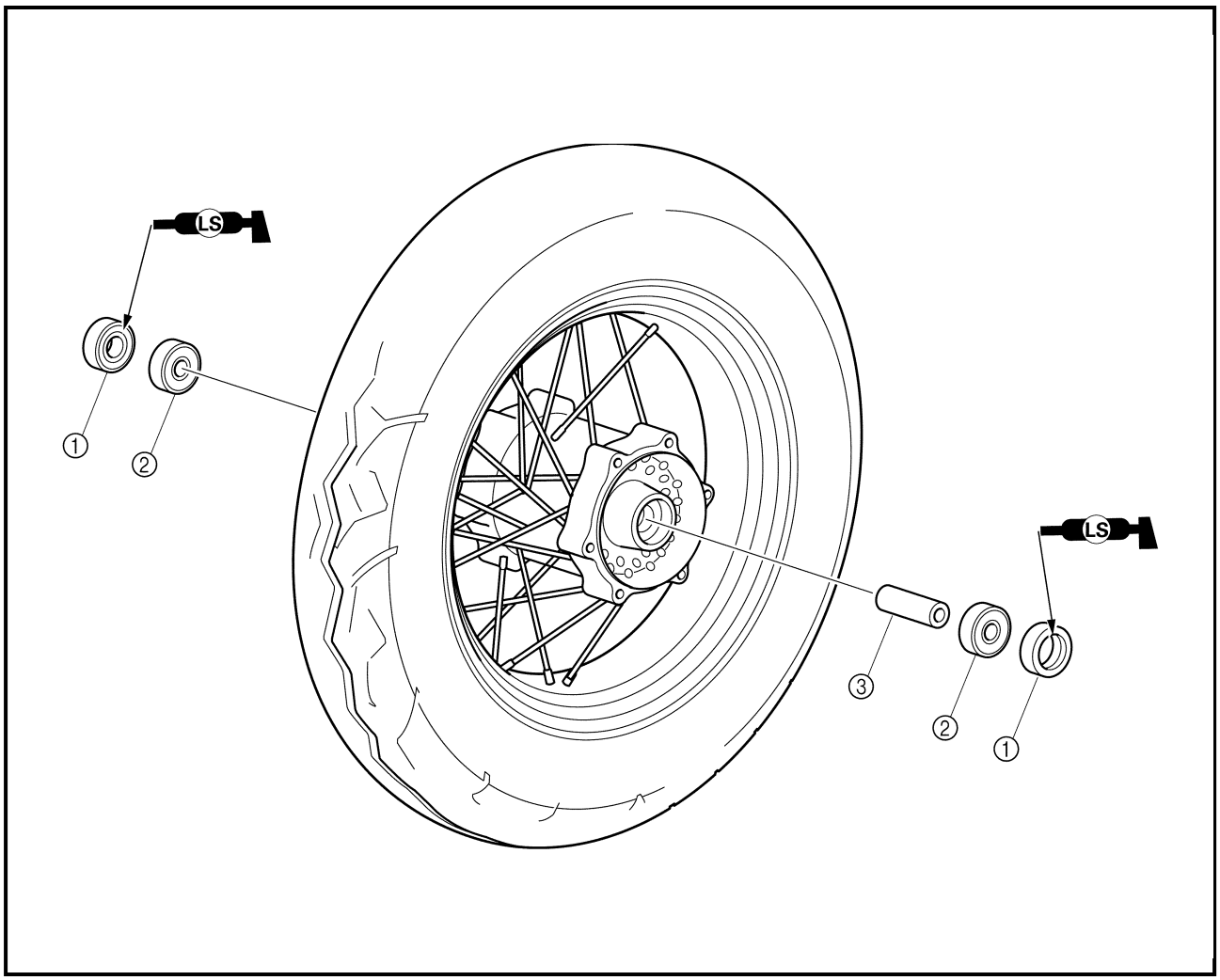
2. Disconnect:
   • headlight coupler ①
3. Remove:
   • headlight bulb holder cover ②



4. Detach:
   • headlight bulb holder ①
5. Remove:
   • headlight bulb ②

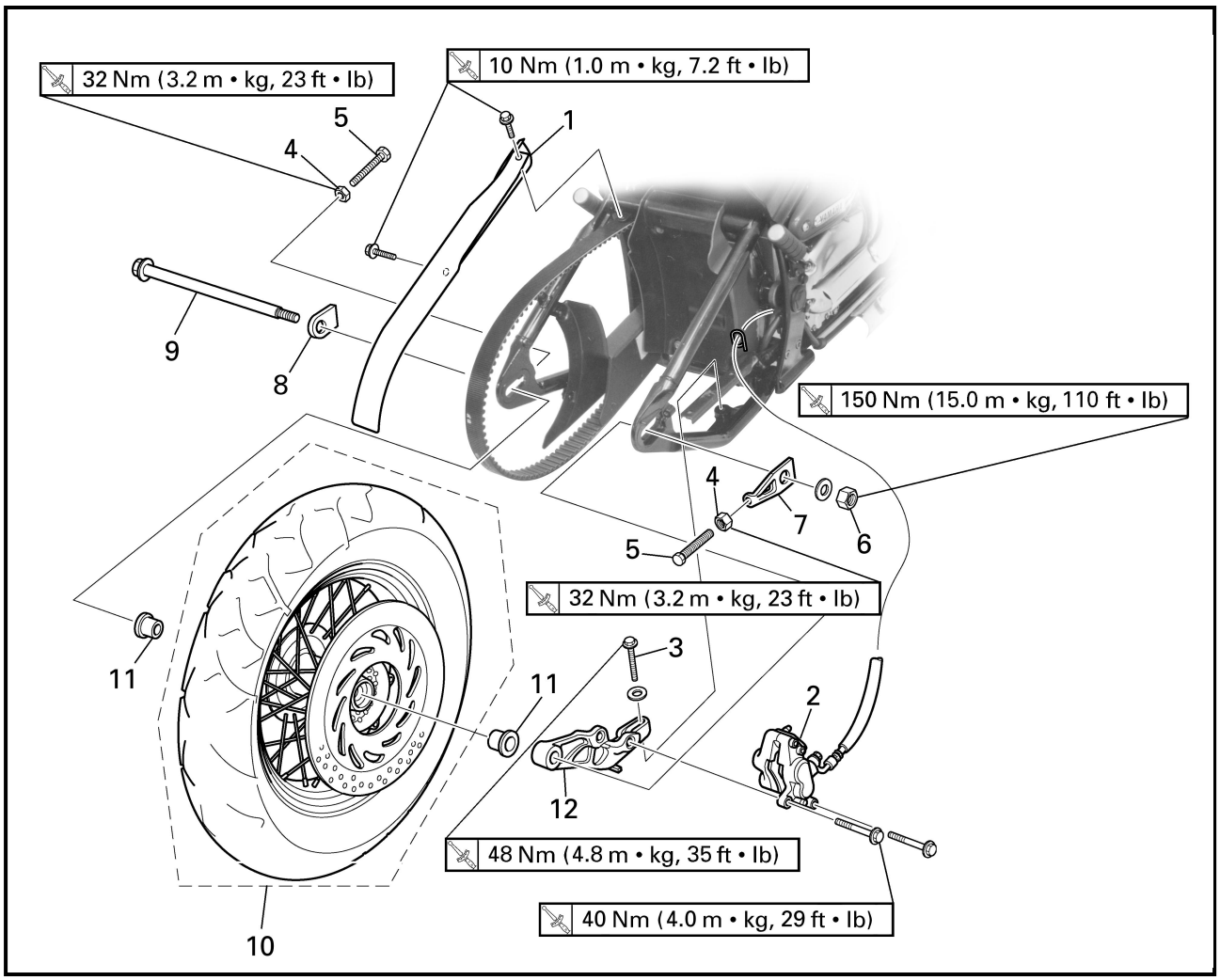
⚠ WARNING

Since the headlight bulb gets extremely hot, keep flammable products and your hands away from the bulb until it has cooled down.



Order	Job/Part	Q'ty	Remarks
	Disassembling the front wheel		Remove the parts in the order listed.
①	Oil seal (left and right)	2	
②	Wheel bearing (left and right)	2	
③	Spacer	1	
			For assembly, reverse the disassembly procedure.

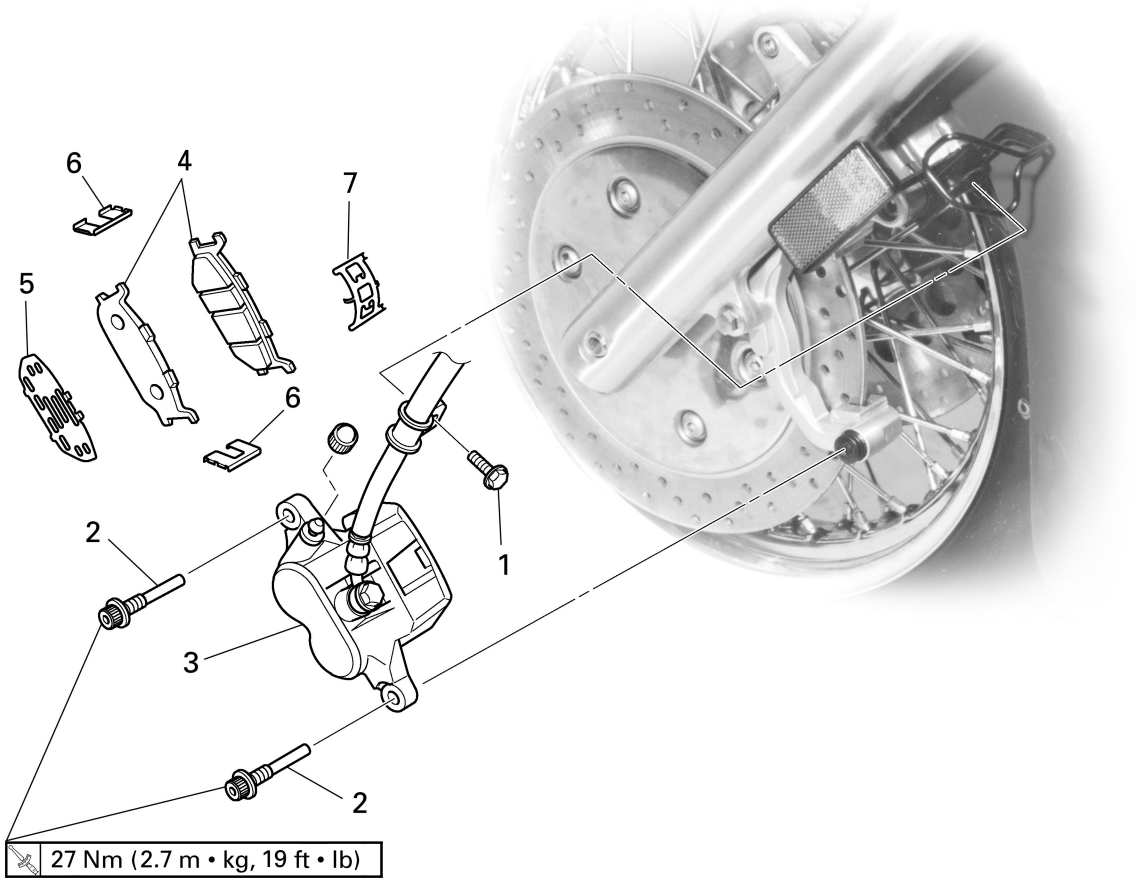
EAS00550



Order	Job/Part	Q'ty	Remarks
	Removing the rear wheel		Remove the parts in the order listed. **NOTE:** Place the motorcycle on a suitable stand so that the rear wheel is elevated.
1	Upper drive belt cover	1	
2	Brake caliper	1	
3	Brake caliper bracket bolt	1	
4	Locknut (left and right)	2	Loosen.
5	Adjusting bolt (left and right)	2	Loosen.
6	Wheel axle nut	1	
7	Right adjusting plate	1	
8	Left adjusting plate	1	
9	Rear wheel axle	1	

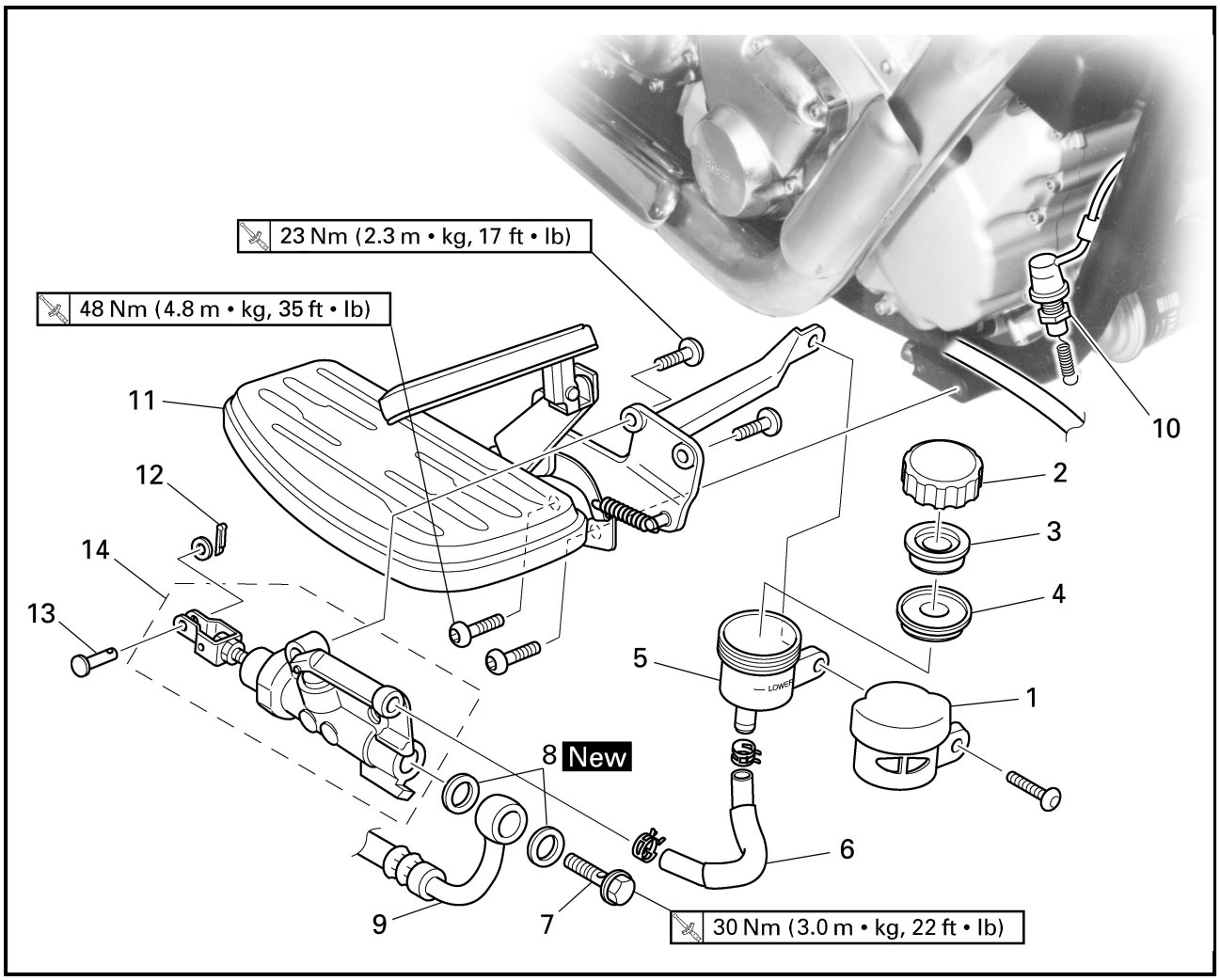
EAS00577
FRONT AND REAR BRAKES

FRONT BRAKE PADS



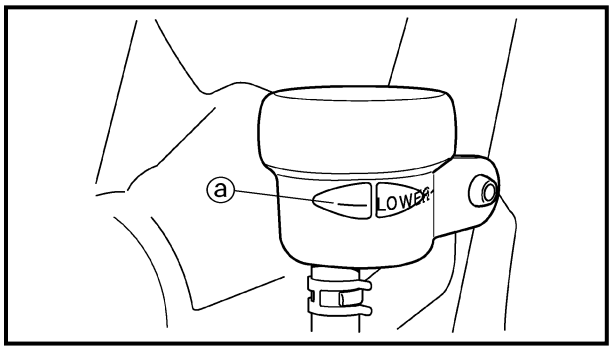
Order	Job/Part	Q'ty	Remarks
	Removing the front brake pads		Remove the parts in the order listed. The following procedure applies to both of the front brake calipers.
1	Brake hose holder bolt	1	
2	Retaining bolt	2	
3	Brake caliper	1	
4	Brake pad	2	
5	Brake pad shim	1	
6	Brake pad spring	2	
7	Brake pad spring	1	
			For installation, reverse the removal procedure.

EAS00586
REAR BRAKE MASTER CYLINDER

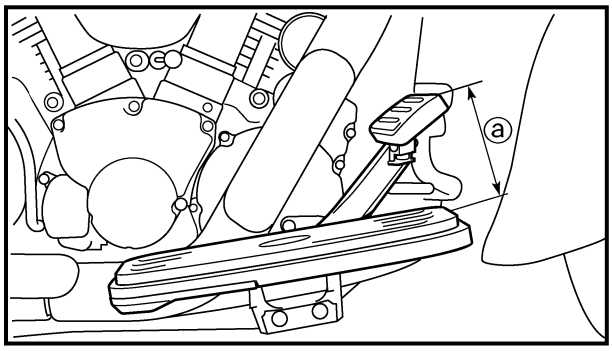


Order	Job/Part	Q'ty	Remarks
	Removing the rear brake master cylinder		Remove the parts in the order listed.
	Brake fluid		Drain.
1	Brake fluid reservoir cover	1	
2	Brake fluid reservoir cap	1	
3	Brake fluid reservoir diaphragm holder	1	
4	Brake fluid reservoir diaphragm	1	
5	Brake fluid reservoir	1	
6	Brake fluid reservoir hose	1	
7	Union bolt	1	
8	Copper washer	2	
9	Brake hose	1	Disconnect.
10	Rear brake light switch	1	Disconnect.

8. Bleed:
   • brake system
   Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM" in chapter 3.
9. Install:
   • brake fluid reservoir diaphragm
   • brake fluid reservoir diaphragm holder
   • brake fluid reservoir cap
   • brake fluid reservoir cover



10. Check:
   • brake fluid level
   Below the minimum level mark ⓐ → Add the recommended brake fluid to the proper level.
   Refer to "CHECKING THE BRAKE FLUID LEVEL" in chapter 3.

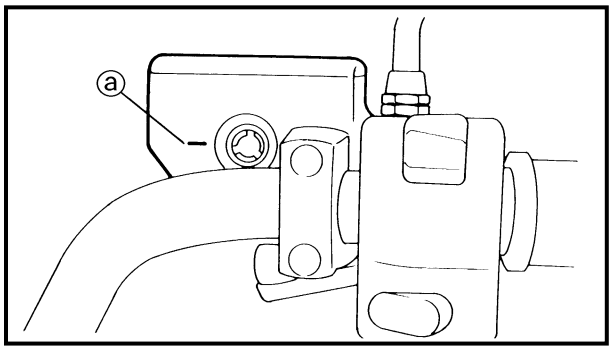


11. Adjust:
   • brake pedal position ⓐ
   Refer to "ADJUSTING THE REAR BRAKE" in chapter 3.

Brake pedal position (below the top of the rider footrest)
100 mm (3.9 in)

12. Adjust:
   • rear brake light operation timing
   Refer to "ADJUSTING THE REAR BRAKE LIGHT SWITCH" in chapter 3.

8. Bleed:
   • brake system
   Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM" in chapter 3.



9. Check:
   • brake fluid level
   Below the minimum level mark ⓐ → Add the recommended brake fluid to the proper level.
   Refer to "CHECKING THE BRAKE FLUID LEVEL" in chapter 3.

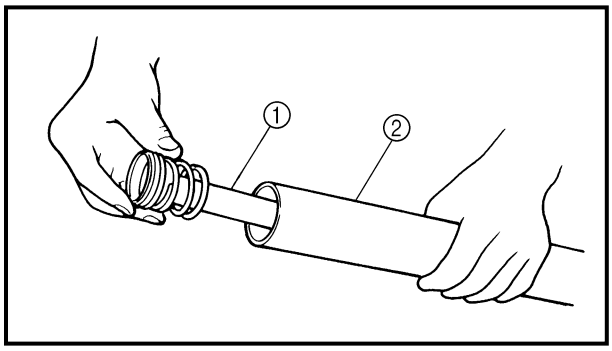
10. Check:
   • brake lever operation
   Soft or spongy feeling → Bleed the brake system.
   Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM" in chapter 3.

EAS00642
ASSEMBLING AND INSTALLING THE REAR BRAKE CALIPER

⚠ WARNING

- **Before installation, all internal brake components should be cleaned and lubricated with clean or new brake fluid.**
- **Never use solvents on internal brake components as they will cause the piston seals to swell and distort.**
- **Whenever a brake caliper is disassembled, replace the brake caliper piston seals.**

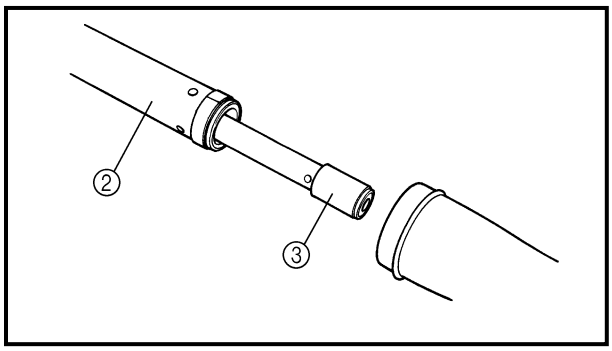
	Recommended brake fluid **DOT 4**



1. Install:
   • cartridge cylinder ①

CAUTION:

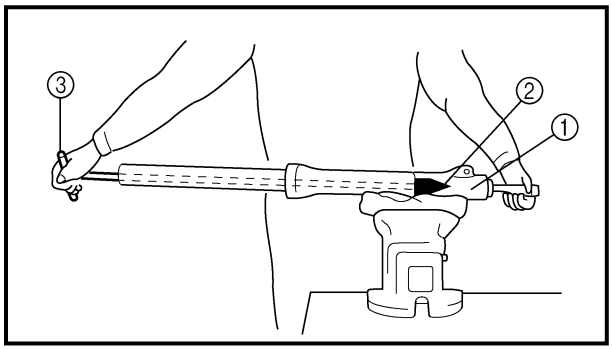
Allow the cartridge cylinder to slide slowly down the inner tube ② until it protrudes from the bottom of the inner tube. Be careful not to damage the inner tube.



2. Install:
   • oil flow stopper ③
3. Lubricate:
   • inner tube's outer surface

Recommended lubricant
Yamaha fork and shock oil 5WT or equivalent

4. Install:
   • outer tube
     (onto the inner tube)
   • copper washer New
   • cartridge cylinder bolt



5. Tighten:
   • cartridge cylinder bolt ①

20 Nm (2.0 m · kg, 14 ft · lb)

NOTE:

- Apply the locking agent (LOCTITE® 204) to the threads of the cartridge cylinder bolt.
- While holding the cartridge cylinder with the damper rod holder ② and T-handle ③, tighten the cartridge cylinder bolt.

Damper rod holder
YM-1300-1
T-handle
YM-01326

• First, tighten the upper bolt, then the lower bolt.

13.Connect:
• front brake light switch connector

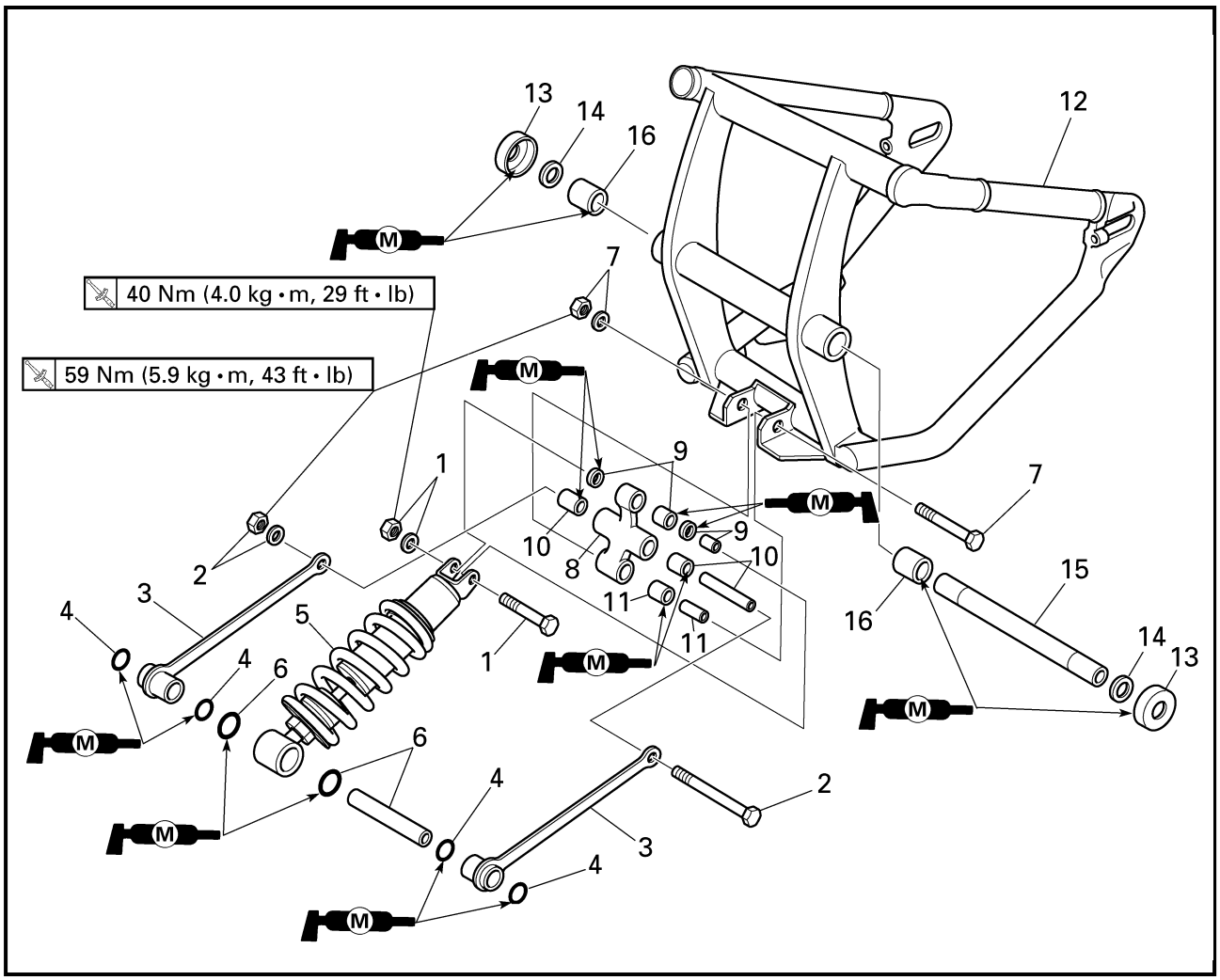
14.Install:
• plastic clamp
• rear view mirrors

15.Adjust:
• clutch cable free play
Refer to "ADJUSTING THE CLUTCH CABLE FREE PLAY" in chapter 3.

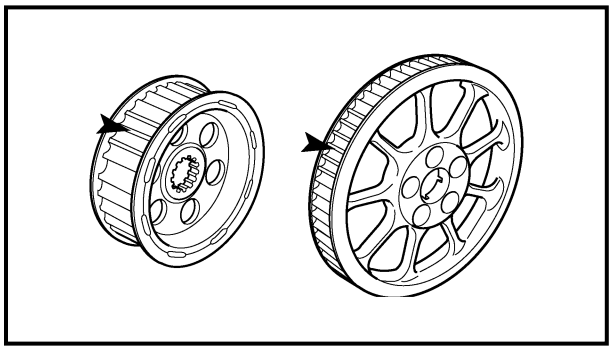
Clutch cable free play (at the end of the clutch lever)
10 ~ 15 mm (0.39 ~ 0.59 in)

16.Adjust:
• throttle cable free play
Refer to "ADJUSTING THE THROTTLE CABLE FREE PLAY" in chapter 3.

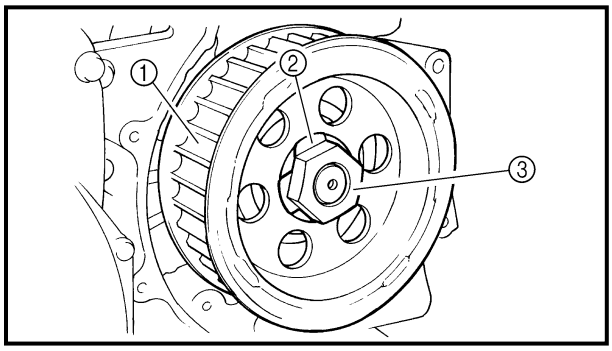
Throttle cable free play (at the flange of the throttle grip)
4 ~ 8 mm (0.16 ~ 0.31 in)



Order	Job/Part	Q'ty	Remarks
11	Spacer/bearing	1/1	
12	Swingarm	1	
13	Dust cover	2	
14	Washer	2	
15	Spacer	1	
16	Bearing	2	
			For installation, reverse the removal procedure.

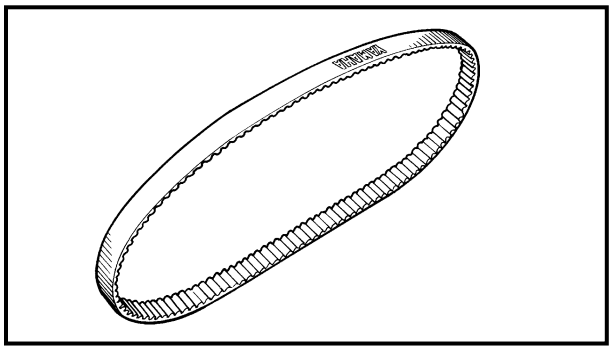


3. Check:
   • drive pulley
   • rear wheel pulley
   Bent teeth → Replace the drive belt and pulleys as a set.



INSTALLING THE DRIVE BELT AND DRIVE PULLEY

1. Install:
   • drive pulley ①
   • lock washer ② New
   • drive pulley nut ③



2. Install:
   • drive belt

CAUTION:

Install the drive belt facing the same way it was removed.

3. Install:
   • rear shock absorber and swingarm assembly
   Refer to "REAR SHOCK ABSORBER AND SWINGARM".
   • rear wheel
   Refer to "REAR WHEEL, BRAKE DISC AND SWINGARM".

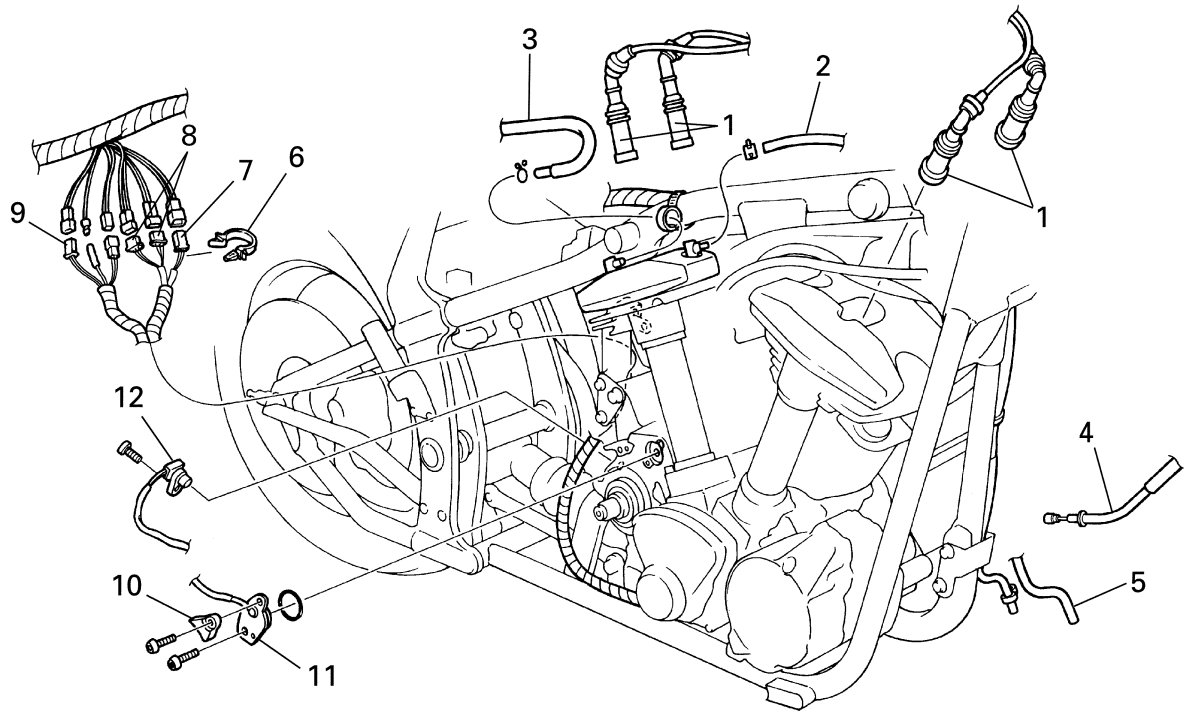
4. Tighten:
   • drive pulley nut

85 Nm (8.5 m · kg, 61 ft · lb)

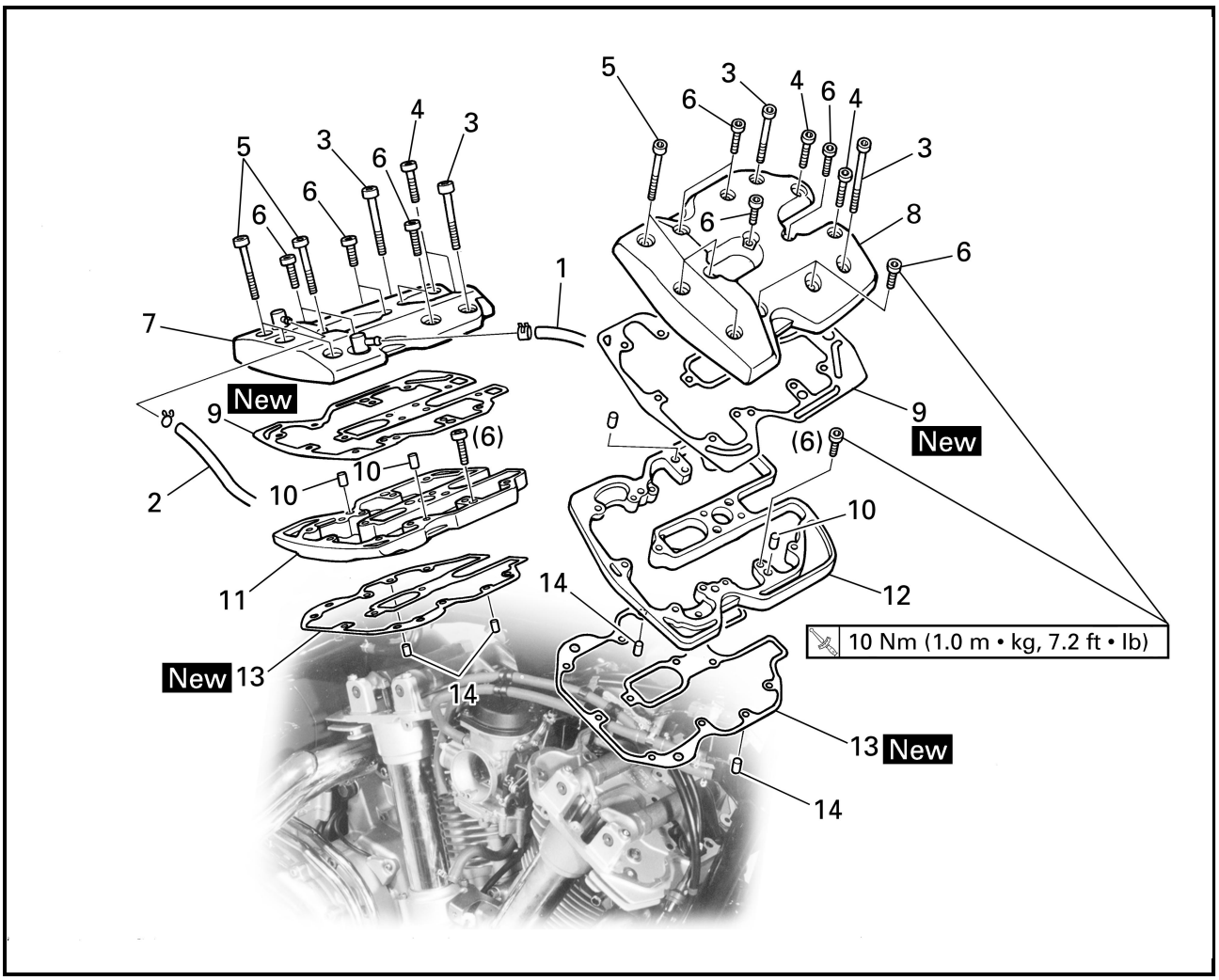
NOTE:

When tightening the drive pulley nut, press down on the brake pedal so the drive pulley does not move.

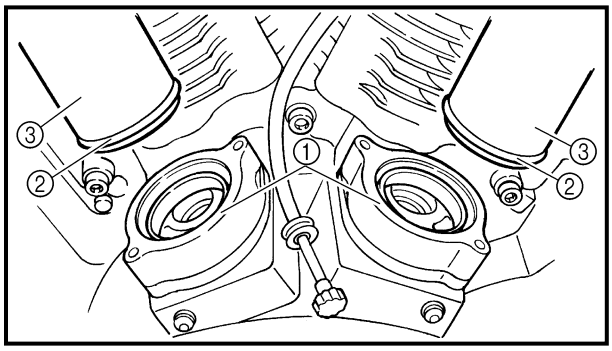
5. Bend the lock washer tab along a flat side of the nut.



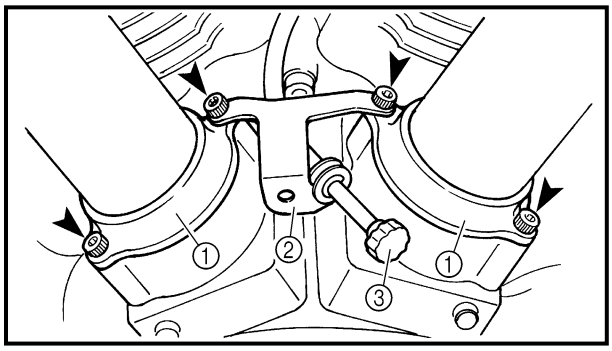
Order	Job/Part	Q'ty	Remarks
	Disconnecting the leads and hoses		Disconnect the parts in the order listed.
1	Spark plug caps	4	
2	Cylinder head breather hose	1	
3	Oil tank breather hose	1	
4	Clutch cable	1	
5	Charcoal canister hose (carburetor to charcoal canister)	1	
6	Plastic clamp	1	
7	Stator coil coupler	1	
8	Decompression solenoid coupler	2	
9	Pickup coil coupler	1	



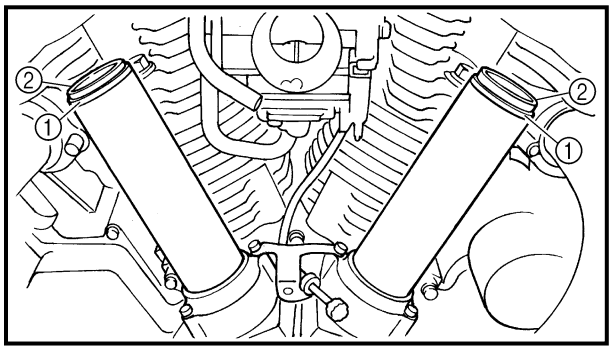
Order	Job/Part	Q'ty	Remarks
	Removing cylinder head covers		Remove the parts in the order listed.
1	Cylinder head breather hose	1	
2	Oil tank breather hose	1	
3	Bolt	4	ℓ = 65 mm (2.56 in)
4	Bolt	4	ℓ = 35 mm (1.38 in)
5	Bolt	4	ℓ = 50 mm (1.97 in)
6	Bolt	12	ℓ = 25 mm (0.98 in)
7	Rear cylinder head cover	1	
8	Front cylinder head cover	1	
9	Cylinder head cover gasket	2	
10	Dowel pin	4	



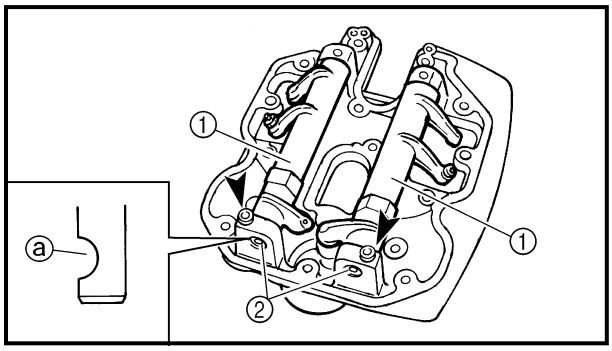
2. Install:
   - oil seals ①
   - O-rings ②
   - push rod covers ③



3. Install:
   - valve lifter case covers ①
   - throttle stop screw holder ②
4. Hook:
   - throttle stop screw ③



5. Install:
   - O-rings ①
   - oil seals ②



INSTALLING THE ROCKER ARMS AND PUSH RODS

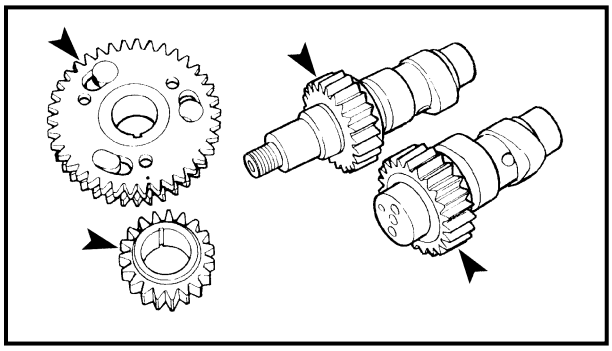
The following procedure applies to both cylinders.

1. Install:
   - rocker arms ①
   - rocker arm shafts ②
     (onto rocker arm base)

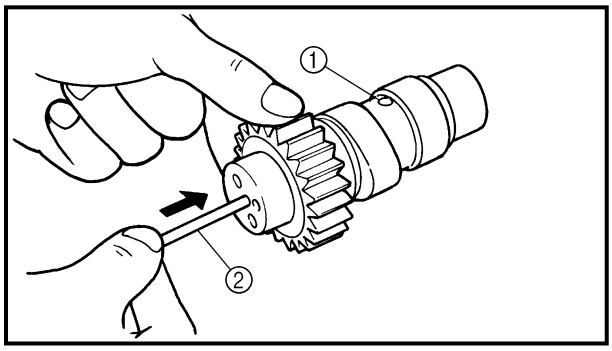
NOTE:

The thread hole ⓐ of the rocker arm shaft must face to the outside.

5



9. Check:
   - camshaft drive gears
   - camshaft driven gears
     Chips/pitting/roughness/wear → Replace the defective part(s).

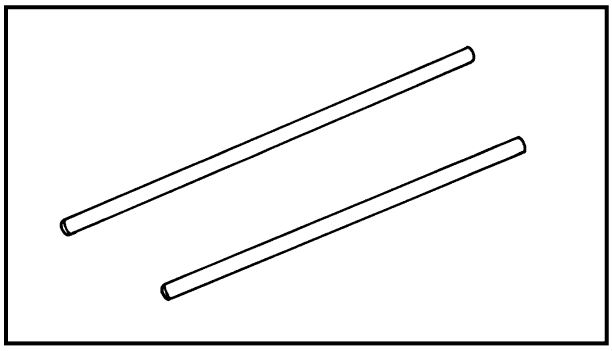


CHECKING THE DECOMPRESSION SYSTEM

1. Check:
   - decompression system

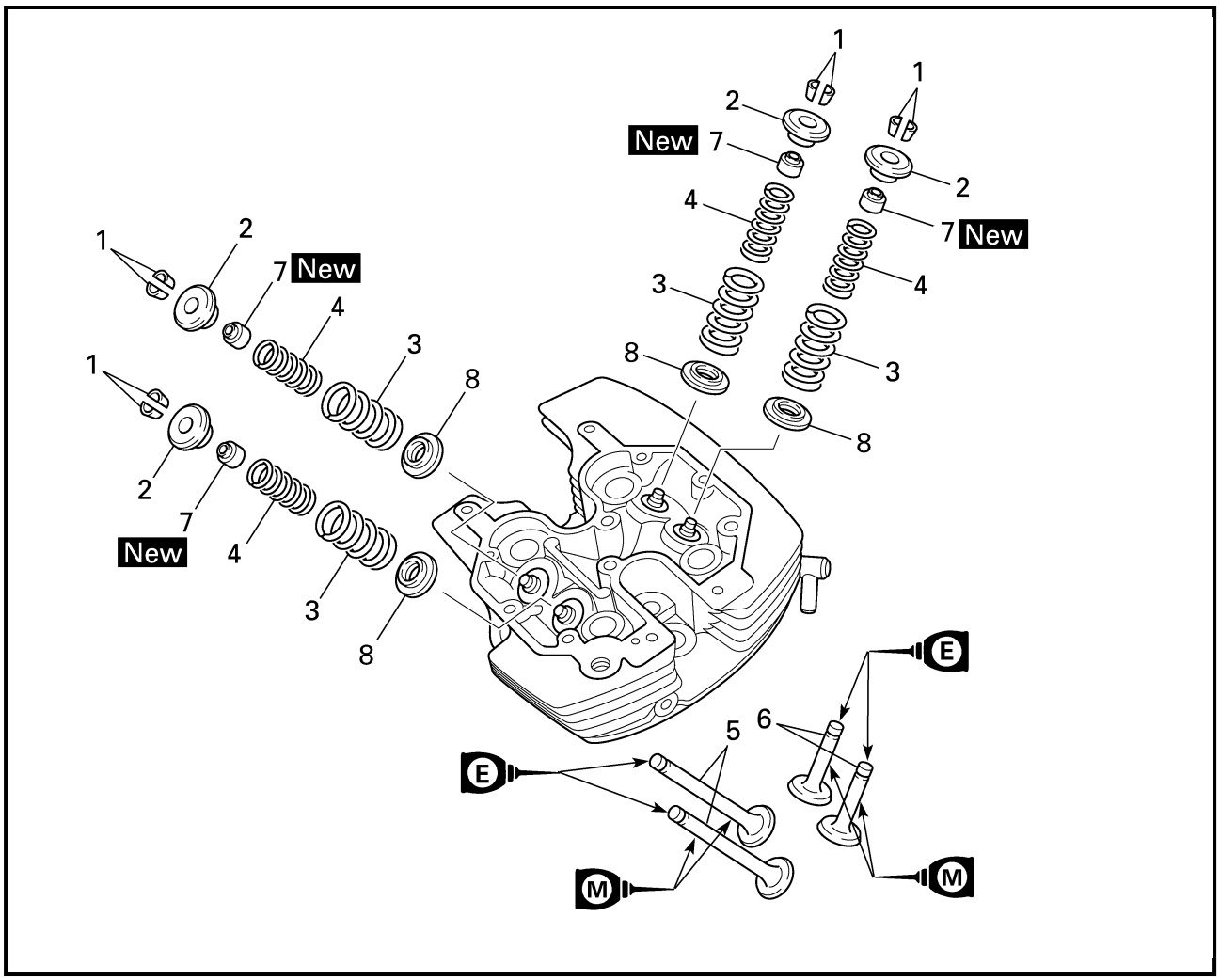
NOTE:

- Check the decompression system while the decompression push rod is installed in the camshaft.
- Check that the decompression pin ① projects from the camshaft.
- Check that the decompression push rod ② moves smoothly.

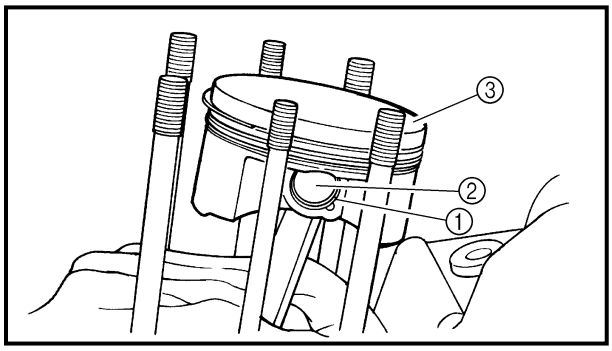


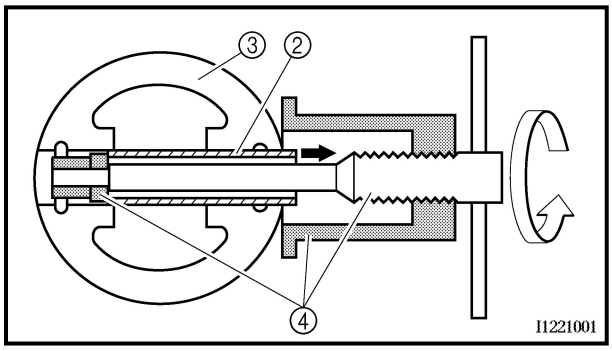
2. Check:
   - decompression push rods
     Bends/damage → Replace.

VALVES AND VALVE SPRINGS



Order	Job/Part	Q'ty	Remarks
	Removing the valves and valve springs		Remove the parts in the order listed. The following procedure applies to both cylinders.
	Cylinder head		Refer to "CYLINDER HEADS".
1	Valve cotter	4	
2	Upper spring seat	4	
3	Outer valve spring	4	
4	Inner valve spring	4	
5	Intake valve	2	
6	Exhaust valve	2	
7	Valve oil seal	4	
8	Lower spring seat	4	
			For installation, reverse the removal procedure.





EAS00254
REMOVING THE CYLINDERS AND PISTONS

The following procedure applies to all of the cylinders and pistons.

1. Remove:
   - piston pin clip ①
   - piston pin ②
   - piston ③

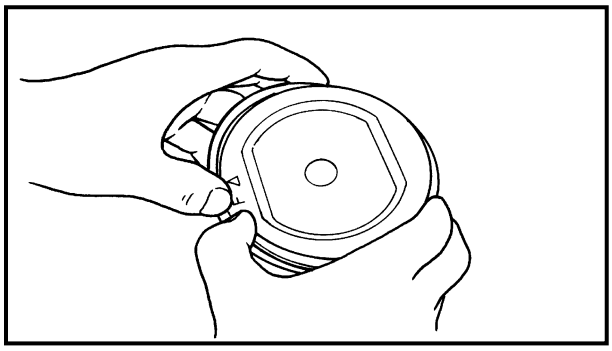
CAUTION:

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

NOTE:

- Before removing the piston pin clip, cover the crankcase opening with a clean rag to prevent the piston pin clip from falling into the crankcase.
- For reference during installation, put an identification mark on each piston crown.
- Before removing the piston pin, deburr the piston pin clip groove and the piston pin bore area. If both areas are deburred and the piston pin is still difficult to remove, remove it with the piston pin puller ④.

	**Piston pin puller YU-01304**



2. Remove:
   - top ring
   - 2nd ring
   - oil ring

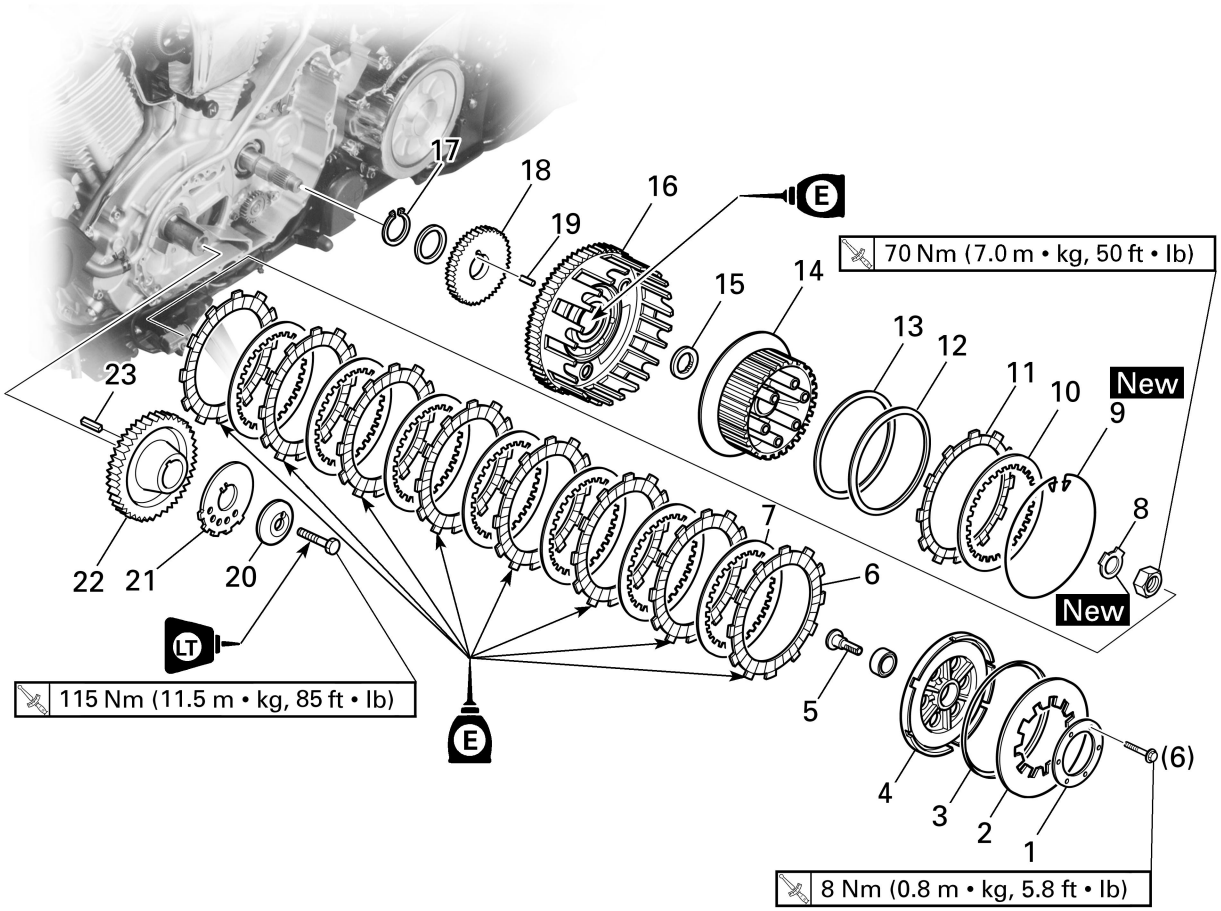
NOTE:

When removing a piston ring, open the end gap with your fingers and lift the other side of the ring over the piston crown.

EAS00258
CHECKING THE CYLINDERS AND PISTONS

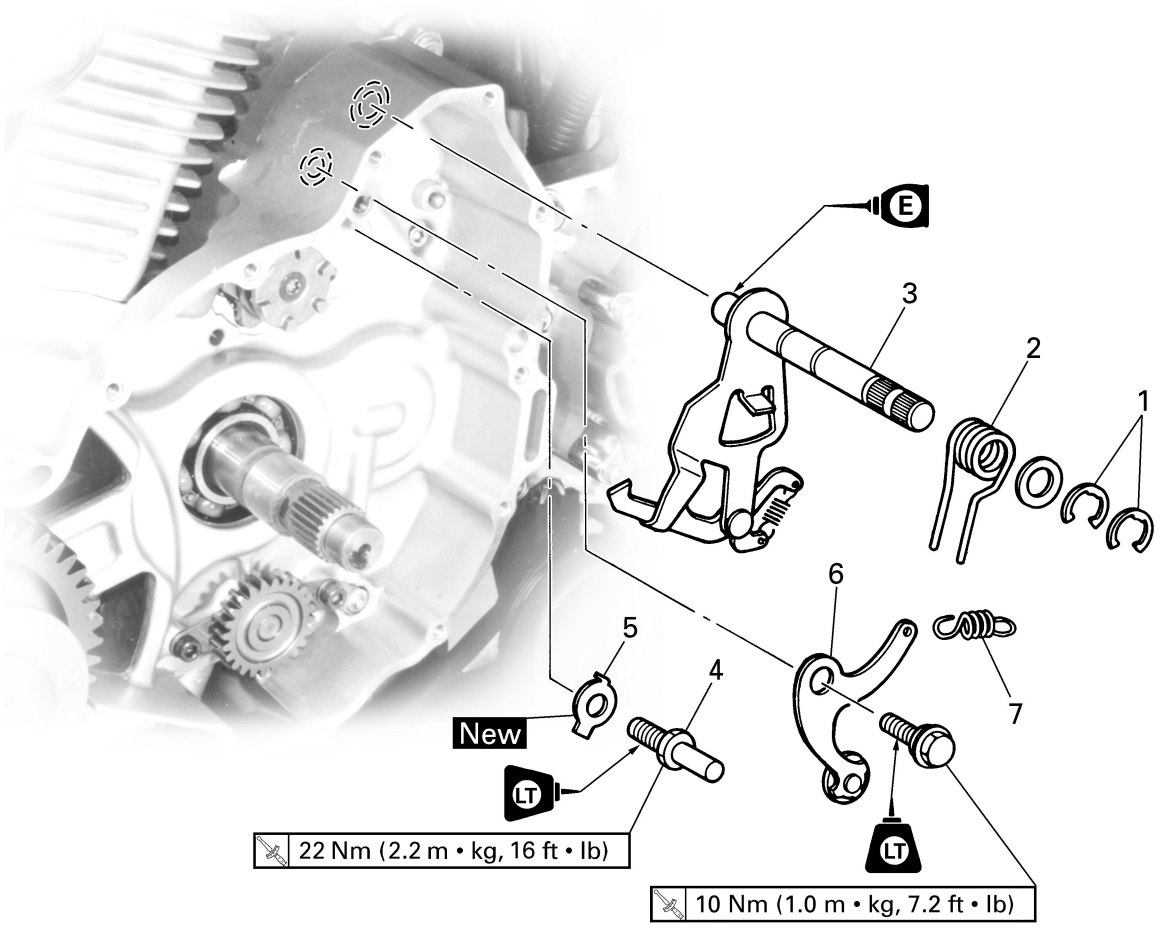
The following procedure applies to all of the cylinders and pistons.

1. Check:
   - piston wall
   - cylinder wall
     Vertical scratches → Replace the cylinder, and the piston and piston rings as a set.



Order	Job/Part	Q'ty	Remarks
13	Clutch damper spring seat	1	
14	Clutch boss	1	
15	Thrust washer	1	
16	Clutch housing	1	
17	Circlip	1	
18	Oil pump drive gear	1	
19	Dowel pin	1	
20	Spacer	1	
21	Pickup coil rotor	1	
22	Primary drive gear	1	
23	Straight key	1	
			For installation, reverse the removal procedure.

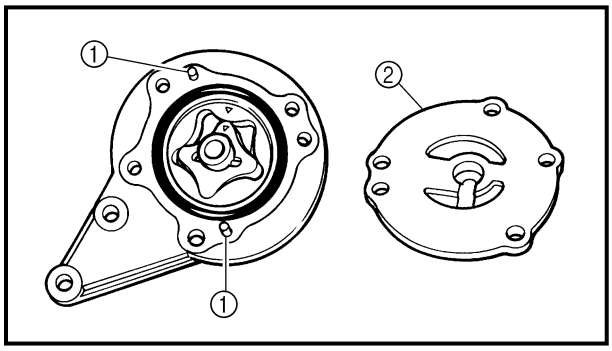
EAS00327
SHIFT SHAFT



Order	Job/Part	Q'ty	Remarks
	Removing the shift shaft and stopper lever		Remove the parts in the order listed.
	Engine oil		Drain.
	Clutch housing		Refer to "CLUTCH".
1	Circlip	2	
2	Shift shaft spring	1	
3	Shift shaft	1	
4	Shift shaft spring stopper	1	
5	Lock washer	1	
6	Stopper lever	1	
7	Stopper lever spring	1	
			For installation, reverse the removal procedure.

14.Install:
- exhaust pipes
- muffler
  Refer to “ENGINE”.

15.Install:
- fuel tank
- left side cover
- rider seat
  Refer to “FUEL TANK” and “SEATS AND SIDE COVERS” in chapter 3.

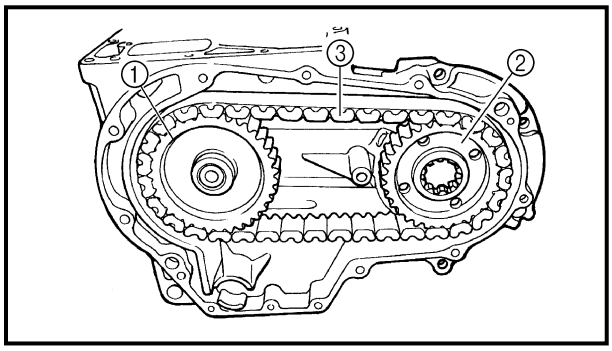


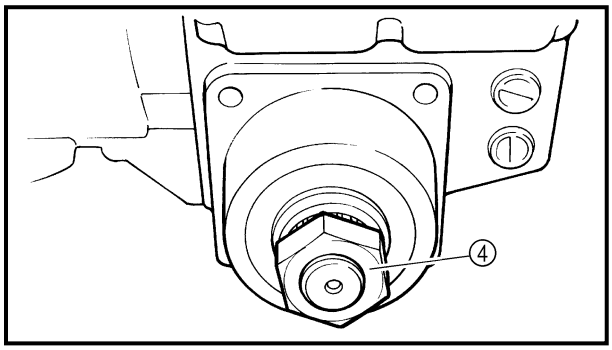
3. Install:
   • pins ①
   • oil pump cover ②

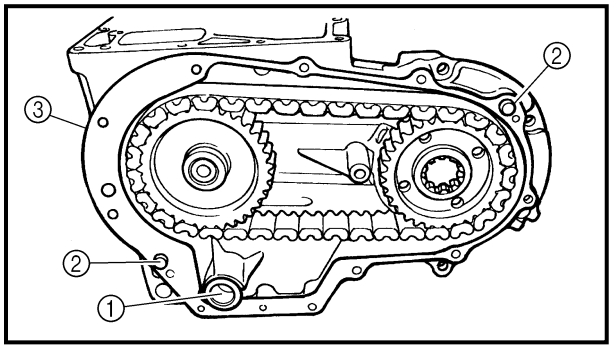
7 Nm (0.7 m · kg, 5.1 ft · lb)

NOTE:
Apply locking agent (LOCTITE®) to the threads of the oil pump cover screws.

4. Check:
   • oil pump operation
   Refer to "CHECKING THE OIL PUMP".







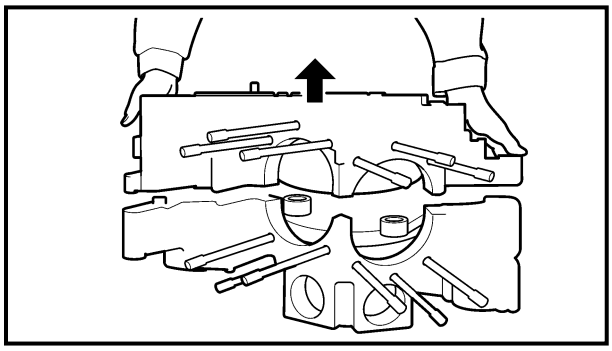
INSTALLING THE TRANSFER GEAR CASE

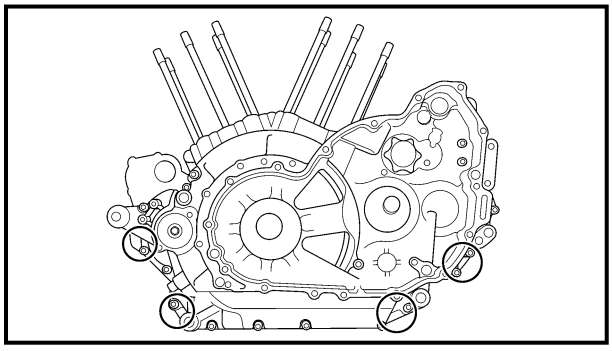
1. Install:
   • bearings
   • oil seal
2. Install:
   • middle driven shaft ①
   • middle drive gear ②
   • primary chain ③
   (into the transfer gear case)
   • O-ring
   • spacer
   • drive pulley nut ④

NOTE:
• Install the middle driven shaft, middle drive gear and primary chain at the same time.
• Temporarily install the drive pulley nut onto the middle driven shaft.

3. Install:
   • oil strainer ①
   • dowel pins ②
   • transfer gear case cover gasket ③ New

5





4. Remove:
   • right crankcase

CAUTION:

- **First check that the shift drum segment's teeth then remove the right crankcase.**
- **Tap on one side of the crankcase with a soft-face hammer. Tap only on reinforced portions of the crankcase, not on the crankcase mating surfaces. Work slowly and carefully and make sure the crankcase halves separate evenly.**

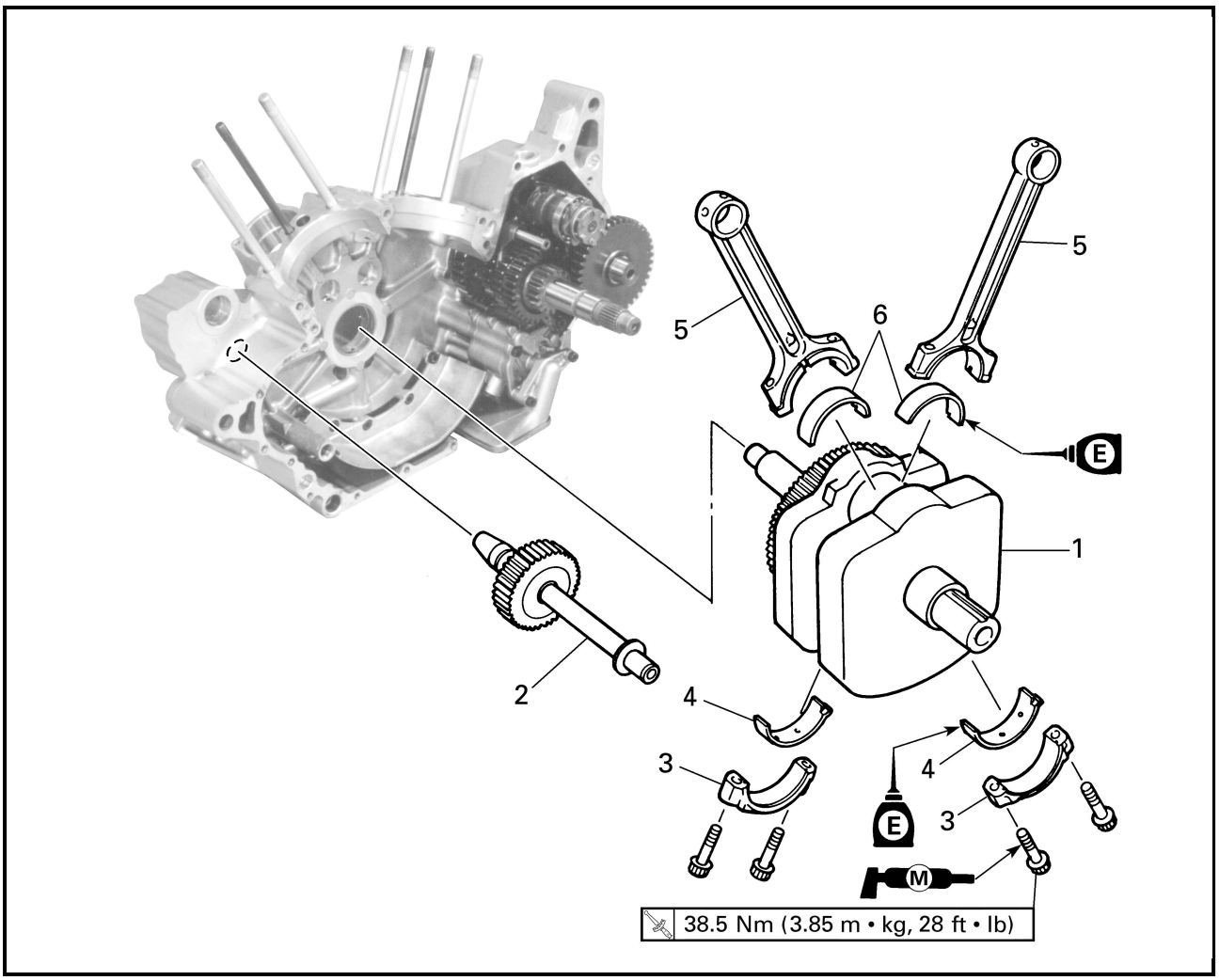
EAS00399
CHECKING THE CRANKCASE

1. Thoroughly wash the crankcase halves in a mild solvent.
2. Thoroughly clean all the gasket surfaces and crankcase mating surfaces.
3. Check:
   • crankcase
   Cracks/damage → Replace.
   • oil delivery passages
   Obstruction → Blow out with compressed air.

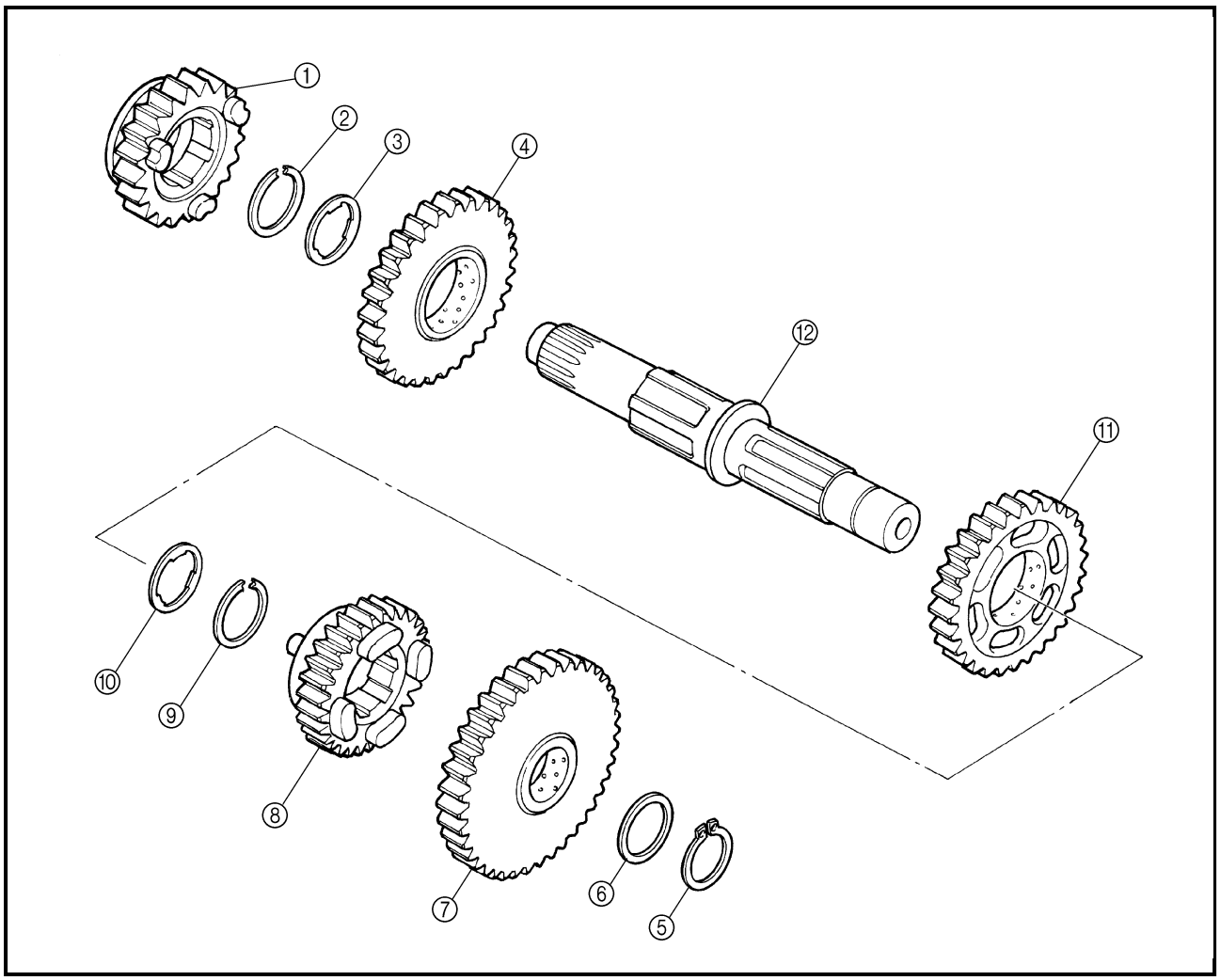
EAS00401
CHECKING THE BEARINGS AND OIL SEAL

1. Check:
   • bearings
   Clean and lubricate the bearings, then rotate the inner race with your finger.
   Rough movement → Replace.
2. Check:
   • oil seal
   Damage/wear → Replace.

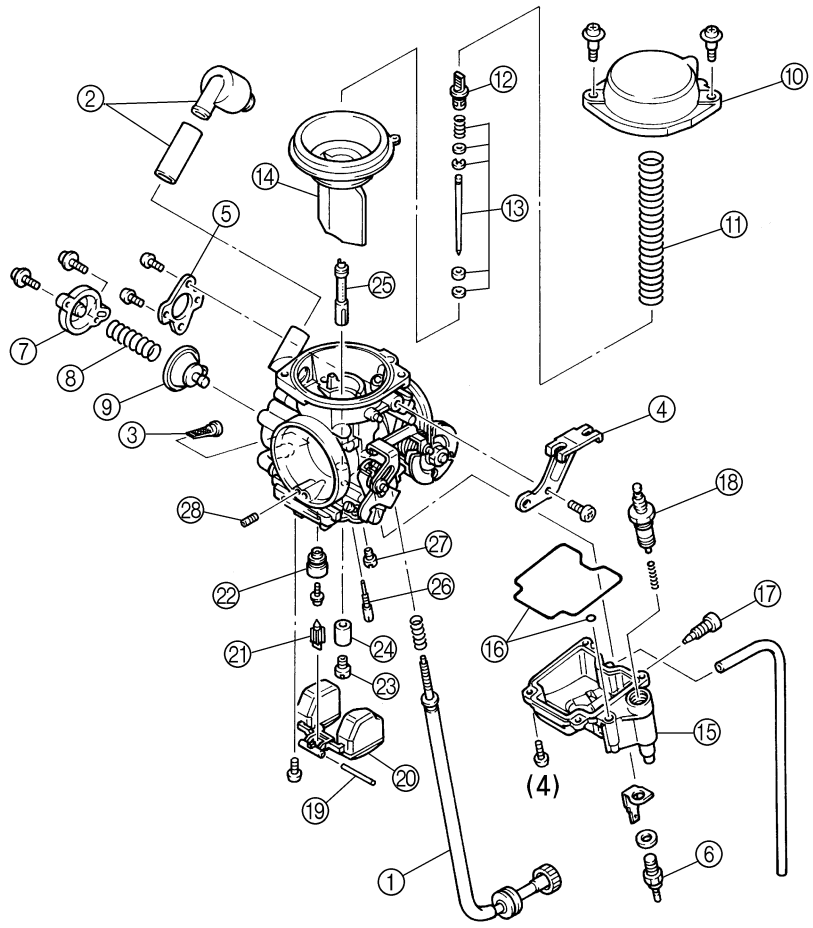
CRANKSHAFT AND CONNECTING RODS



Order	Job/Part	Q'ty	Remarks
	Removing the crankshaft and connecting rods		Remove the parts in the order listed.
	Crankcase		Separate. Refer to "CRANKCASE".
1	Crankshaft	1	
2	Generator shaft	1	
3	Connecting rod cap	2	
4	Big end lower bearing	2	
5	Connecting rod	2	
6	Big end upper bearing	2	
			For installation, reverse the removal procedure.



Order	Job/Part	Q'ty	Remarks
	Disassembling the drive axle assembly		Remove the parts in the order listed.
①	5th wheel gear	1	
②	Circlip	1	
③	Washer	1	
④	2nd wheel gear	1	
⑤	Circlip	1	
⑥	Washer	1	
⑦	1st wheel gear	1	
⑧	4th wheel gear	1	
⑨	Circlip	1	
⑩	Washer	1	
⑪	3rd wheel gear	1	
⑫	Drive axle	1	
			For assembly, reverse the disassembly procedure.



Order	Job/Part	Q'ty	Remarks
⑩	Vacuum chamber cover	1	
⑪	Piston valve spring	1	
⑫	Jet needle holder	1	
⑬	Jet needle kit	1	
⑭	Piston valve	1	
⑮	Float chamber	1	
⑯	Float chamber rubber gasket	1	
⑰	Drain bolt	1	
⑱	Accelerator plunger	1	
⑲	Float pivot pin	1	

6

11.Adjust:
• engine idling speed

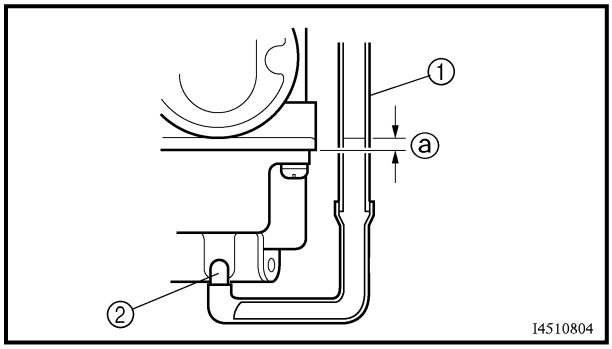
Engine idling speed
850 ~ 950 r/min

Refer to "ADJUSTING THE ENGINE IDLING SPEED" in chapter 3.

12.Adjust:
• throttle cable free play

Throttle cable free play (at the flange of the throttle grip)
4 ~ 8 mm (0.16 ~ 0.31 in)

Refer to "ADJUSTING THE THROTTLE CABLE FREE PLAY" in chapter 3.



EAS00498
MEASURING AND ADJUSTING THE FUEL LEVEL

1. Measure:
• fuel level ⓐ
Out of specification → Adjust.

Fuel level (above the float chamber mating surface)
4.0 ~ 5.0 mm (0.16 ~ 0.20 in)

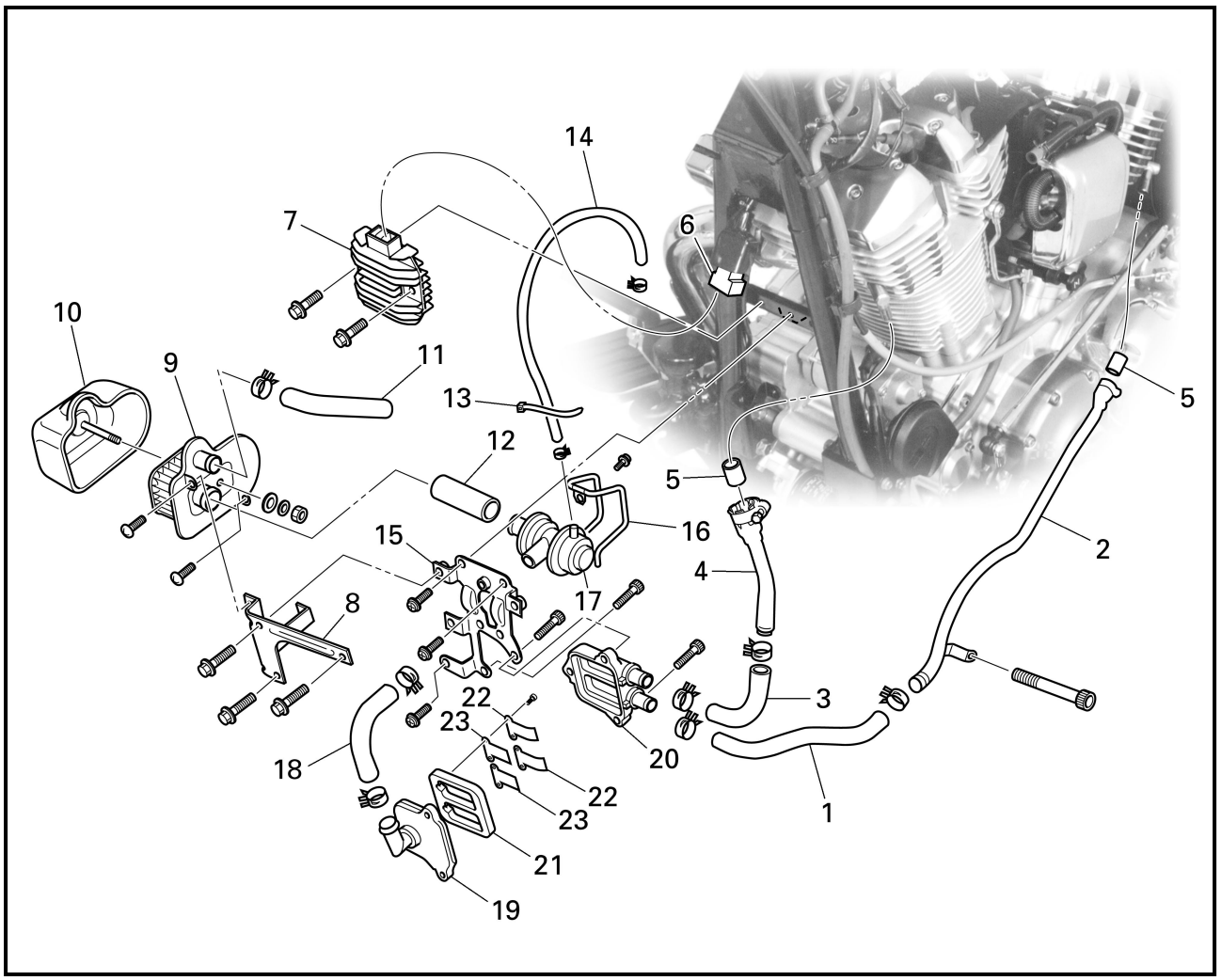
▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼

a. Stand the motorcycle on a level surface.
b. Place the motorcycle on a suitable stand to ensure that the motorcycle is standing straight up.
c. Install the fuel level gauge ① onto the fuel drain pipe ②.

Fuel level gauge
YM-01312-A

d. Loosen the fuel drain bolt.
e. Measure the fuel level ⓐ.

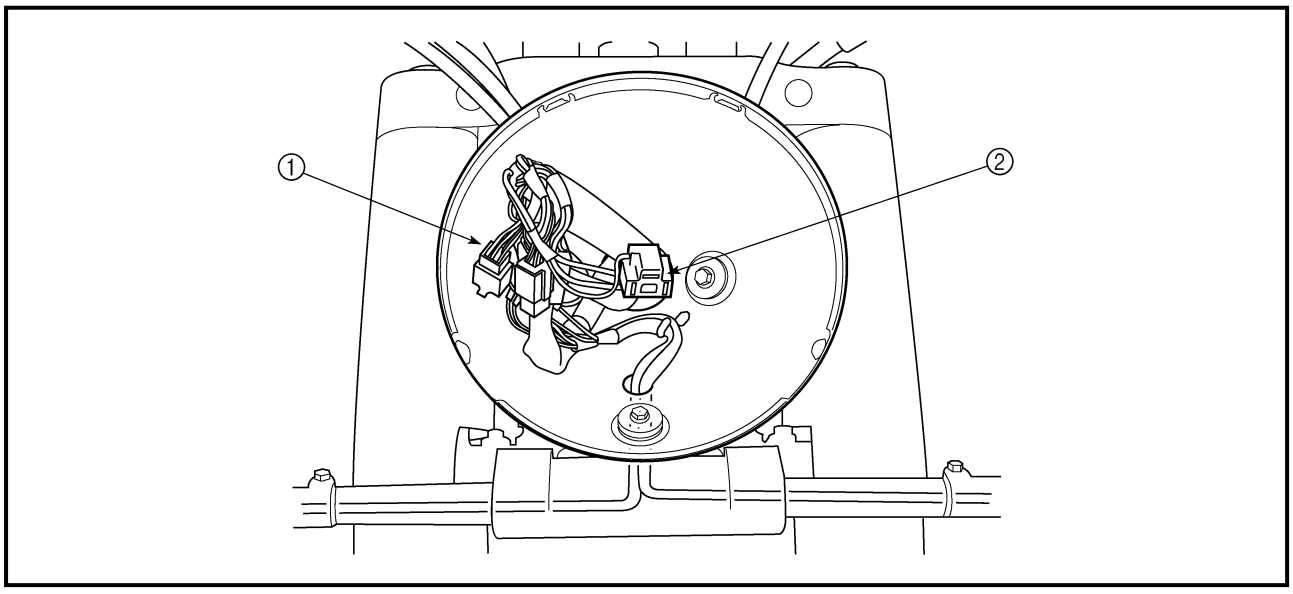
▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲



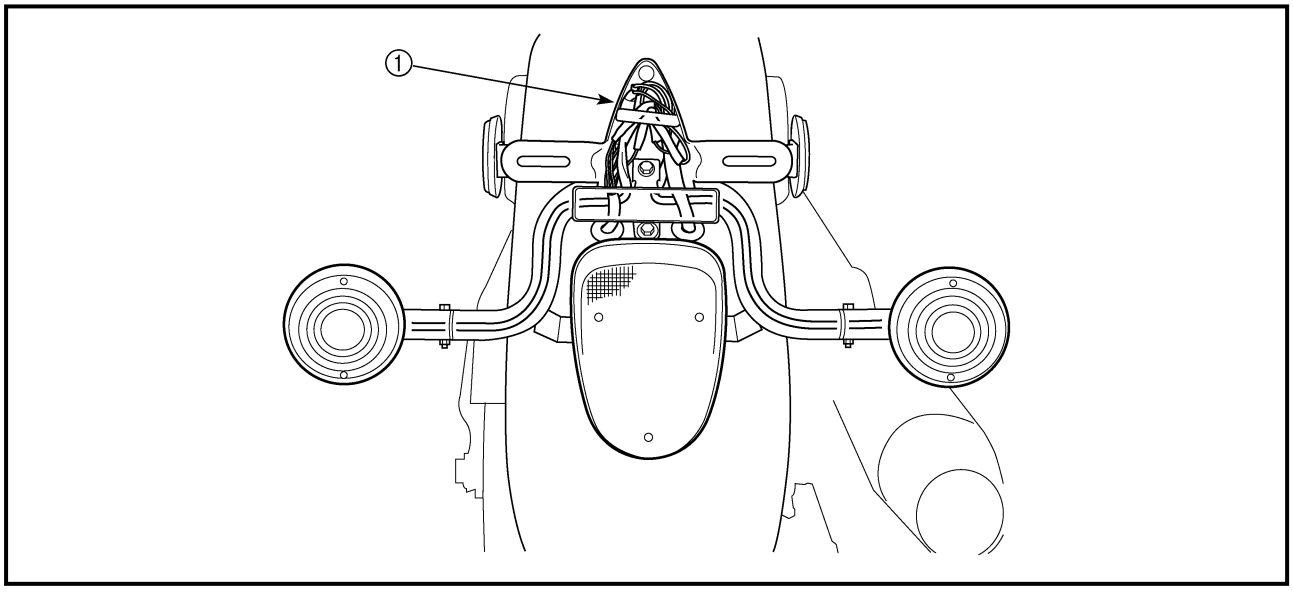
Order	Job/Part	Q'ty	Remarks
9	Air filter	1	
10	Air filter cover	1	
11	Air filter hose	1	
12	Air cut valve to air filter hose	1	
13	Plastic locking tie	1	
14	Vacuum hose	1	
15	Bracket	1	
16	Air cut valve holder	1	
17	Air cut valve	1	
18	Air cut valve to reed valve cover hose	1	
19	Reed valve cover	1	
20	Reed valve case	1	

ARRANGEMENT OF THE ELECTRICAL COMPONENTS AND COUPLERS

① Right handlebar switch coupler, left handlebar switch couplers and front turn signal connectors
② Headlight coupler



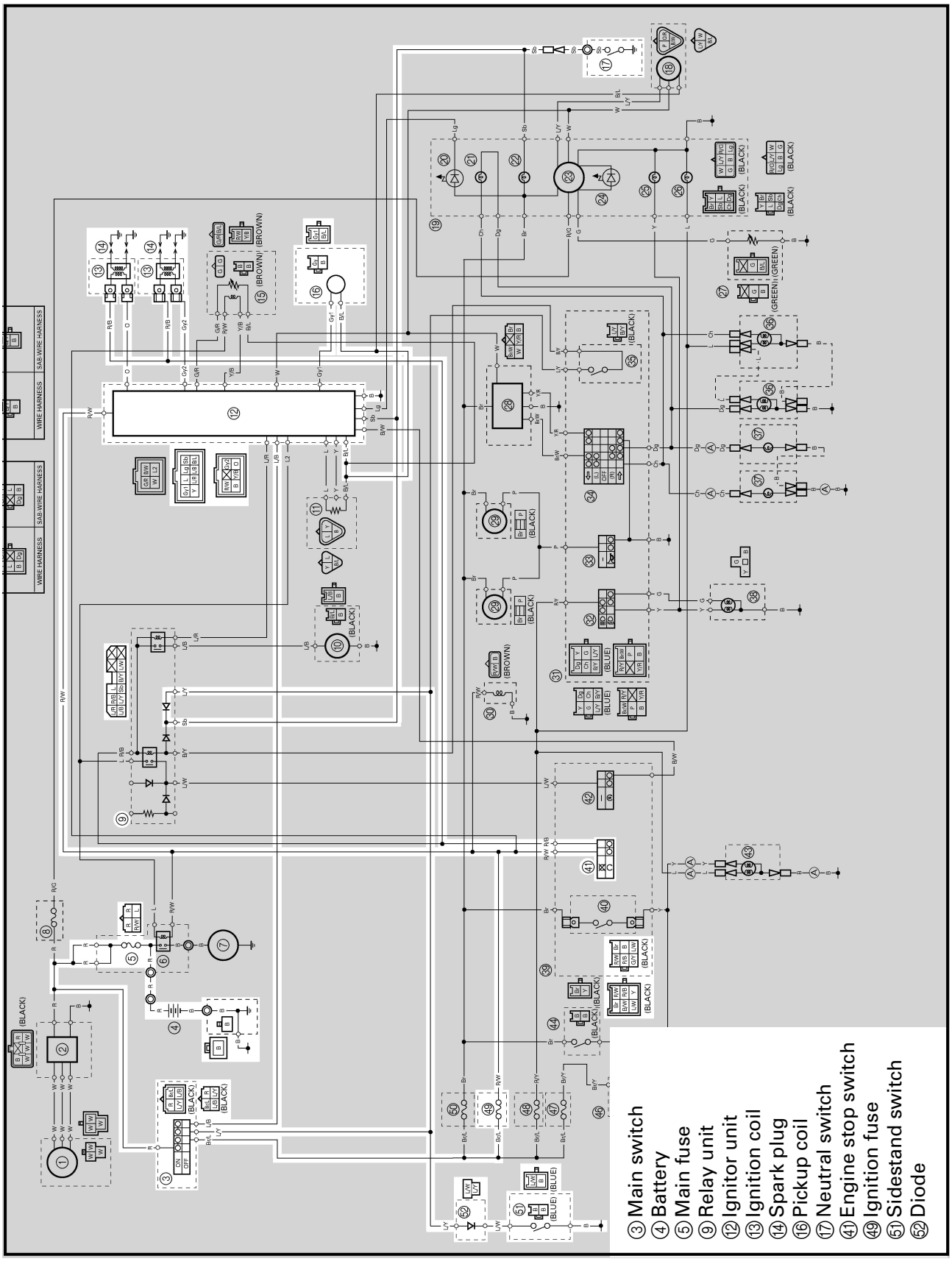
① Tail/brake light connectors and rear turn signal connectors



EB802001

IGNITION SYSTEM

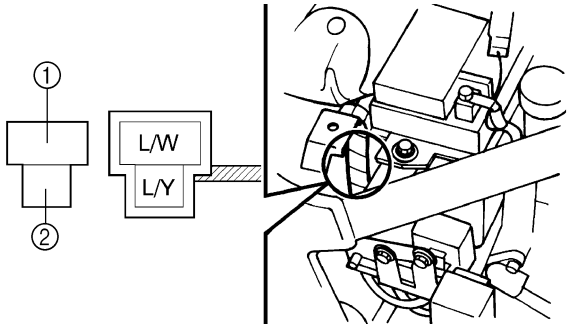
CIRCUIT DIAGRAM



11.Diode

- Remove the diode from the coupler.
- Connect the pocket tester (Ω × 1) to the diode terminals as shown.
- Check the diode for continuity as follows.

Tester positive probe → blue/white ① **Tester negative probe → blue/yellow ②**	**Continuity**
Tester positive probe → blue/yellow ② **Tester negative probe → blue/white ①**	**No continuity**



NOTE:
When you switch the tester's positive and negative probes, the readings in the above chart will be reversed.

- Are the tester readings correct?

YES → NO → Replace the diode.

EB803405

12.Clutch switch

- Check the clutch switch for continuity. Refer to "CHECKING THE SWITCHES".
- Is the clutch switch OK?

YES → NO → Replace the clutch switch.

EB803406

13.Start switch

- Check the start switch for continuity. Refer to "CHECKING THE SWITCHES".
- Is the start switch OK?

YES → NO → Replace the right handlebar switch.

FAS00754

14.Wiring

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

YES → NO → Properly connect or repair the starting system's wiring.

15.Decompression solenoid (thermistor)

- Check the decompression solenoid for continuity. Refer to "SELF-DIAGNOSIS".
- Is the decompression solenoid OK?

YES → Replace the ignitor unit.

NO → Replace the decompression solenoid.

7

EB805010
TROUBLESHOOTING

Any of the following fail to light: headlight, high beam indicator light, taillight, position light or meter light.

Check:
1. main, and headlight fuses
2. battery
3. main switch
4. dimmer switch
5. wiring
   (of the entire charging system)

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

1) rider seat
2) fuel tank
3) left side cover
4) headlight lens unit

- Troubleshoot with the following special tool(s).

Pocket tester
YU-03112

EB802400

1.Main and headlight fuses

- Check the main and headlight fuses for continuity.
  Refer to "CHECKING THE FUSES" in chapter 3.
- Are the main and headlight fuses OK?

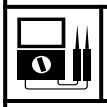
YES

NO → Replace the fuse(s).

EB802401

2.Battery

- Check the condition of the battery.
  Refer to "CHECKING AND CHARGING THE BATTERY" in chapter 3.



Open-circuit voltage
12.8 V or more at 20 ˚C (68 ˚F)

- Is the battery OK?

YES

NO →
- Clean the battery terminals.
- Recharge or replace the battery.

EB802411

3.Main switch

- Check the main switch for continuity.
  Refer to "CHECKING THE SWITCHES".
- Is the main switch OK?

YES

NO → Replace the main switch.

EB805401

4.Dimmer switch

- Check the dimmer switch for continuity.
  Refer to "CHECKING THE SWITCHES".
- Is the dimmer switch OK?

YES

NO → Replace the left handlebar switch.

7

3.Turn signal switch

- Check the turn signal switch for continuity.
  Refer to "CHECKING THE SWITCHES".
- Is the turn signal switch OK?

YES

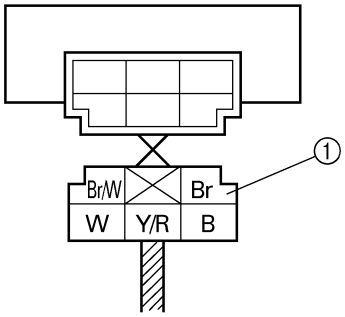
NO

Replace the left handlebar switch.

4.Voltage

- Connect the pocket tester (DC 20 V) to the turn signal relay coupler as shown.

Tester positive probe → brown ①
Tester negative probe → ground



- Set the main switch to "ON".
- Measure the voltage (12 V) of brown ① at the turn signal relay coupler.
- Is the voltage within specification?

YES

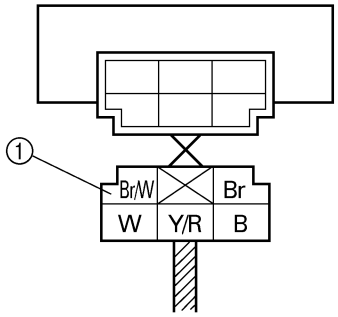
NO

The wiring circuit from the main switch to the turn signal relay coupler is faulty and must be repaired.

5.Voltage

- Connect the pocket tester (DC 20 V) to the turn signal relay coupler as shown.

Tester positive probe → brown/white ①
Tester negative probe → ground



- Set the main switch to "ON".
- Set the turn signal switch to "⇦" or "⇨".
- Measure the voltage (12 V) of brown/white at the turn signal relay coupler.
- Is the voltage within specification?

YES

NO

The turn signal relay is faulty and must be replaced.

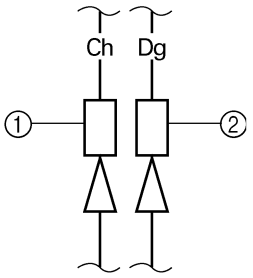
6.Voltage

- Connect the pocket tester (DC 20 V) to the turn signal light connectors (wire harness side) or the meter assembly coupler as shown.

A Turn signal light
B Turn signal indicator light

Left turn signal light
Tester positive probe → chocolate ①
Tester negative probe → ground
Right turn signal light
Tester positive probe → dark green ②
Tester negative probe → ground

A



7

EAS00821
TROUBLESHOOTING

The carburetor heating system fails to operate.

Check:
1. Main and carburetor heater fuses
2. Battery
3. Main switch
4. Thermo switch
5. Carburetor heater
6. Wiring
   (of the entire carburetor heating system)

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

1) rider seat
2) fuel tank
3) carburetor
4) left side cover

- Troubleshoot with the following special tool(s).

Pocket tester
YU-03112

EAS00738

1.Main and carburetor heater fuses

- Check the main and carburetor heater fuses for continuity.
  Refer to "CHECKING THE FUSES" in chapter 3.
- Are the main and carburetor heater fuses OK?

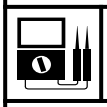
YES → NO

Replace the fuse(s).

EAS00739

2.Battery

- Check the condition of the battery.
  Refer to "CHECKING AND CHARGING THE BATTERY" in chapter 3.



Minimum open circuit voltage
12.8 V or more at 20 ˚C (68 ˚F)

- Is the battery OK?

YES → NO

- Clean the battery terminals.
- Recharge or replace the battery.

EAS00749

3.Main switch

- Check the main switch for continuity.
  Refer to "CHECKING THE SWITCHES".
- Is the main switch OK?

YES → NO

Replace the main switch.

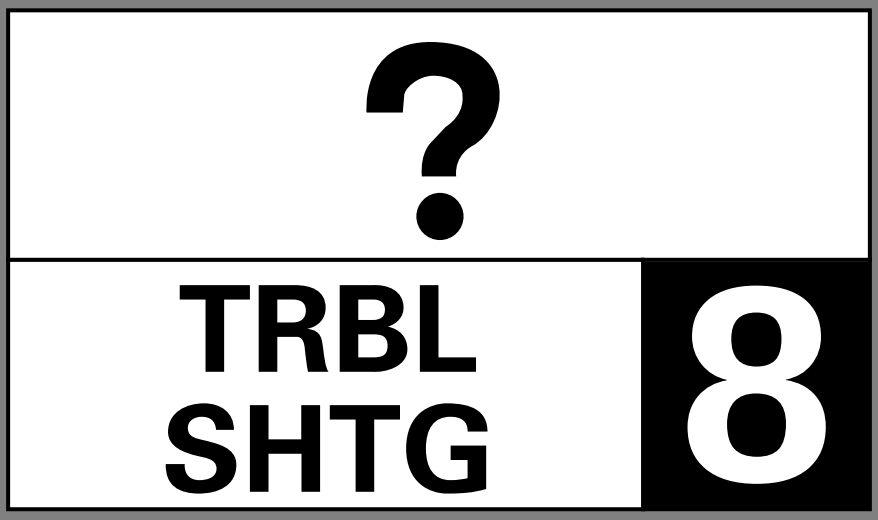
EAS00823

4.Thermo switch

- Remove the thermo switch from the plastic bracket.
- Connect the pocket tester to the thermo switch coupler as shown.

Tester positive lead → black ①
Tester negative lead → black ②

- Immerse the thermo switch in a container filled with water ③.
- Place a thermometer ④ in the water.
- Slowly heat the water, than let it cool to the specified temperature as indicated in the table.
- Check the thermo switch for continuity at the temperatures indicated in the table.

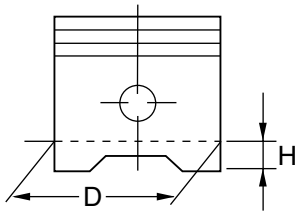
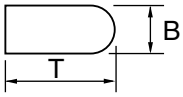
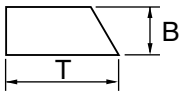
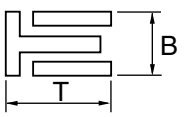

?
TRBL
SHTG
8

YAMAHA

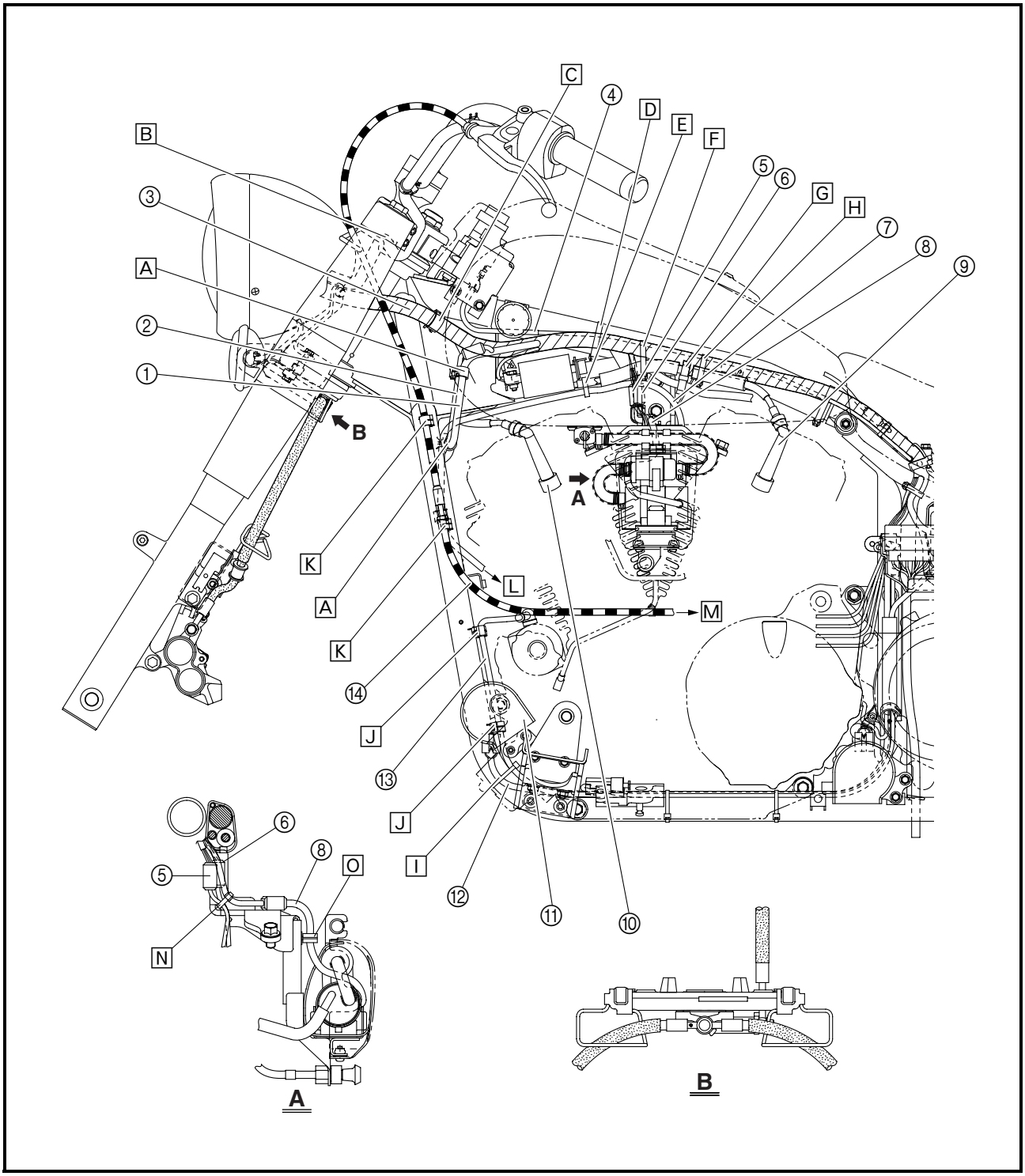
XV17AS(C)
XV17ASS(C)
XV17ATS(C)

SUPPLEMENTARY SERVICE MANUAL

LIT-11616-17-09 4WM-28197-E1

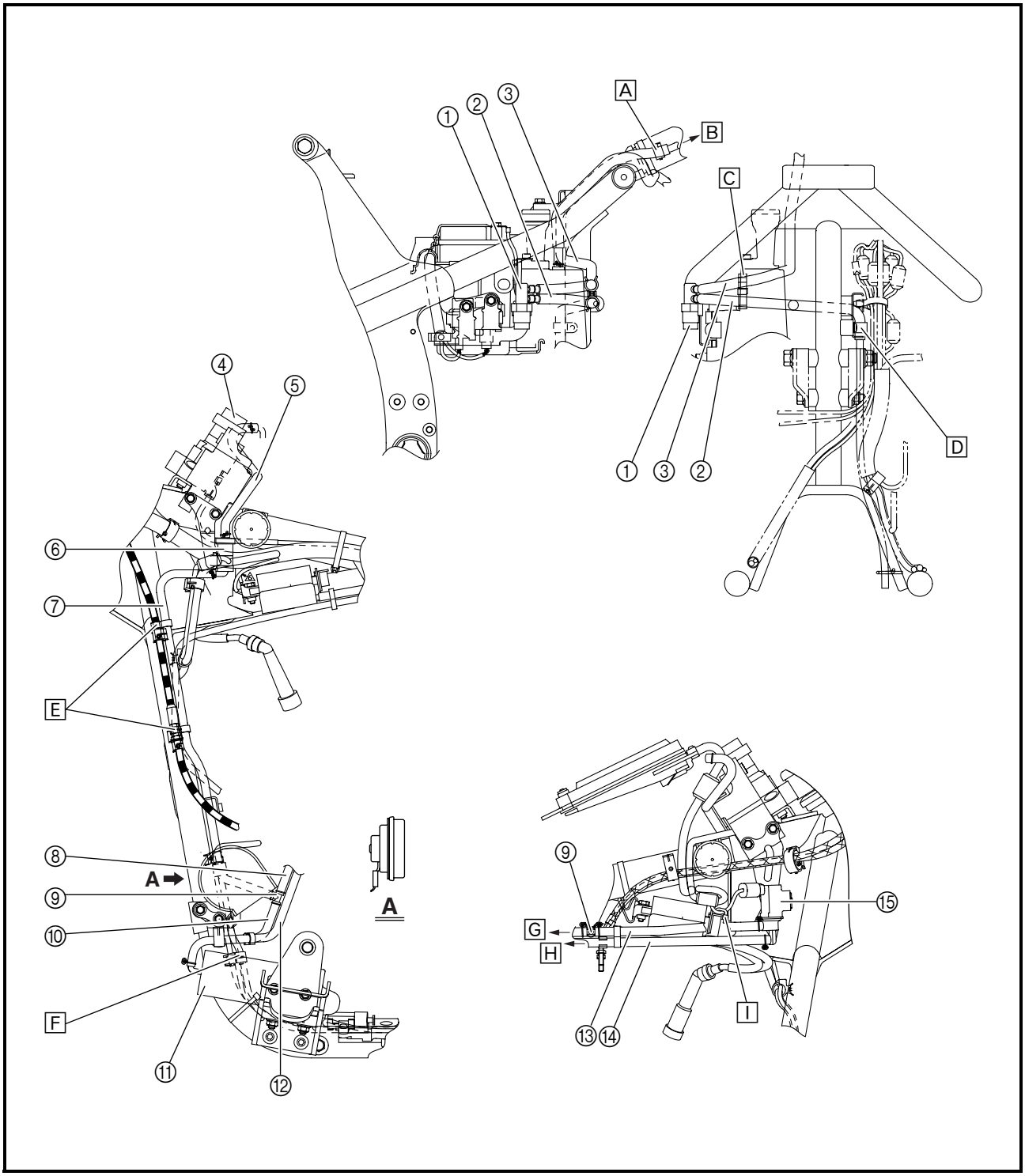
Item	Standard	Limit
Pistons		
Piston-to-cylinder clearance	0.025 ~ 0.050 mm (0.001 ~ 0.002 in)	0.15 mm (0.006 in)
Diameter D	96.960 ~ 96.975 mm (3.8173 ~ 3.8179 in)	----
		
Height H	5 mm (0.20 in)	----
Piston pin bore (in the piston)		
Diameter	22.004 ~ 22.015 mm (0.8663 ~ 0.8667 in)	22.045 mm (0.8679 in)
Offset	1.0 mm (0.04 in)	----
Piston pins		
Outside diameter	21.991 ~ 22.000 mm (0.8658 ~ 0.8661 in)	21.971 mm (0.8650 in)
Piston pin-to-piston pin bore clearance	0.004 ~ 0.024 mm (0.00016 ~ 0.00094 in)	0.074 mm (0.0029 in)
Piston rings		
Top ring		
		
Ring type	Barrel	----
Dimensions (B × T)	1.2 × 3.8 mm (0.047 × 0.150 in)	----
End gap (installed)	0.30 ~ 0.45 mm (0.012 ~ 0.018 in)	0.65 mm (0.026 in)
Ring side clearance	0.03 ~ 0.08 mm (0.0012 ~ 0.0031 in)	0.12 mm (0.0047 in)
2nd ring		
		
Ring type	Taper	----
Dimensions (B × T)	1.2 × 3.8 mm (0.047 × 0.150 in)	----
End gap (installed)	0.30 ~ 0.45 mm (0.012 ~ 0.018 in)	0.8 mm (0.031 in)
Ring side clearance	0.03 ~ 0.07 mm (0.0012 ~ 0.0028 in)	0.12 mm (0.0047 in)
Oil ring		
		
Dimensions (B × T)	2.5 × 3.4 mm (0.098 × 0.134 in)	----
End gap (installed)	0.2 ~ 0.7 mm (0.008 ~ 0.028 in)	----

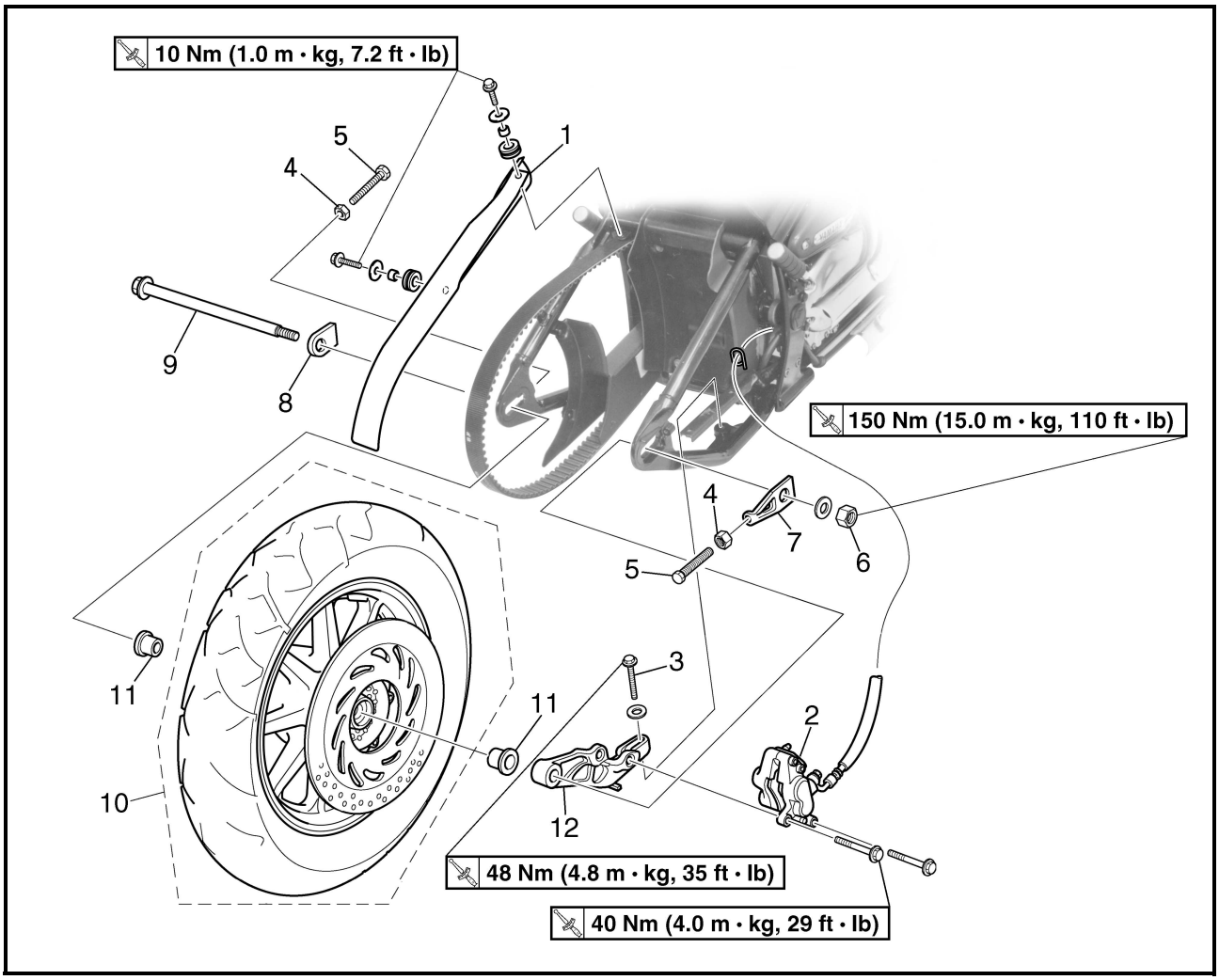
① Rectifier/regulator lead
② Rear brake light switch lead
③ Wire harness
④ Seat lock cable
⑤ Throttle position sensor coupler
⑥ Carburetor heater coupler
⑦ Air induction system vacuum hose
⑧ Fuel pump lead
⑨ Spark plug cap #1
⑩ Spark plug cap #3
⑪ Horn
⑫ Horn lead
⑬ Starter motor lead
⑭ Clutch cable



Evaporative emission control system (for California)

① Compensator
② Compensator breather hose
③ 3-way-joint-to-compensator hose
④ Main switch
⑤ Fuel tank breather hose
⑥ Rollover valve
⑦ Rollover-valve-to-3-way-joint hose
⑧ Surge-tank-to-3-way-joint hose
⑨ 3-way joint
⑩ 3-way-joint-to-charcoal-canister hose
⑪ Charcoal canister
⑫ Carburetor-to-charcoal-canister hose
⑬ Solenoid-valve-to-3-way-joint hose
⑭ Solenoid-valve-to-air-filter-case hose
⑮ Solenoid valve





Order	Job/Part	Q'ty	Remarks
7	Right adjusting plate	1	
8	Left adjusting plate	1	
9	Rear wheel axle	1	
10	Rear wheel	1	
11	Collar (left and right)	2	
12	Brake caliper bracket	1	
			For installation, reverse the removal procedure.

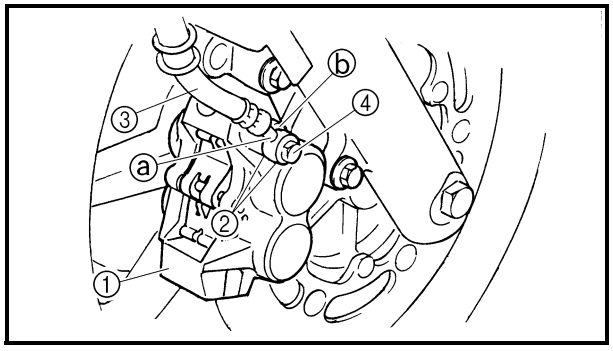
EAS00638
ASSEMBLING AND INSTALLING THE FRONT BRAKE CALIPERS

The following procedure applies to both of the brake calipers.

⚠ WARNING

- **Before installation, all internal brake components should be cleaned and lubricated with clean or new brake fluid.**
- **Never use solvents on internal brake components as they will cause the piston seals to swell and distort.**
- **Whenever a brake caliper is disassembled, replace the brake caliper piston seals.**

Recommended brake fluid
DOT 4



1. Install:
   - brake caliper ①
     (temporarily)
   - copper washers ② New
   - brake hose ③
   - union bolt ④ **30 Nm (3.0 m · kg, 22 ft · lb)**

⚠ WARNING

Proper brake hose routing is essential to insure safe motorcycle operation. Refer to "CABLE ROUTING" in chapter 2.

CAUTION:

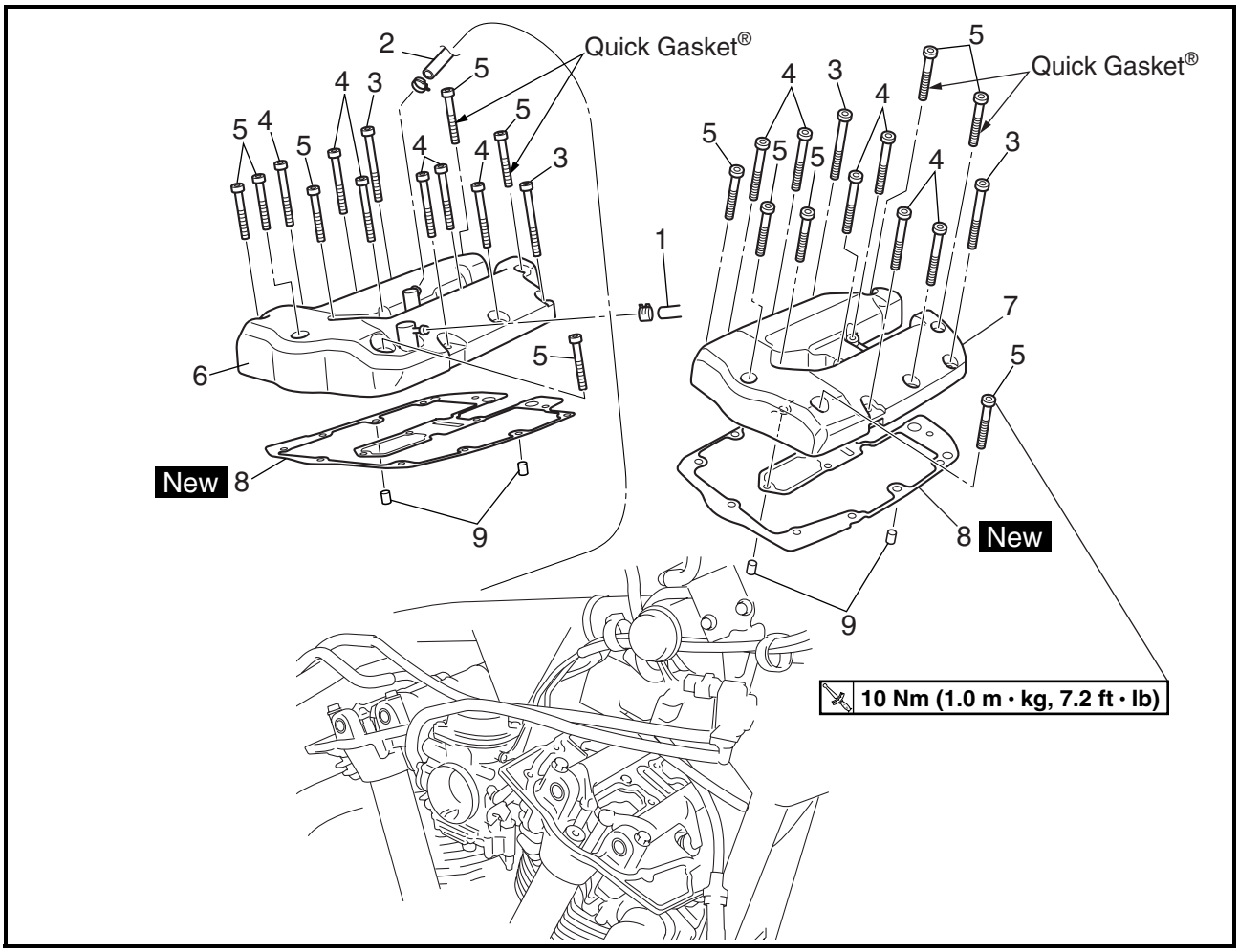
When installing the brake hose onto the brake caliper ①, make sure the brake pipe ⓐ touches the projection ⓑ on the brake caliper.

2. Remove:
   - brake caliper
3. Install:
   - brake pads
   - brake pad spring
   - brake caliper bolt

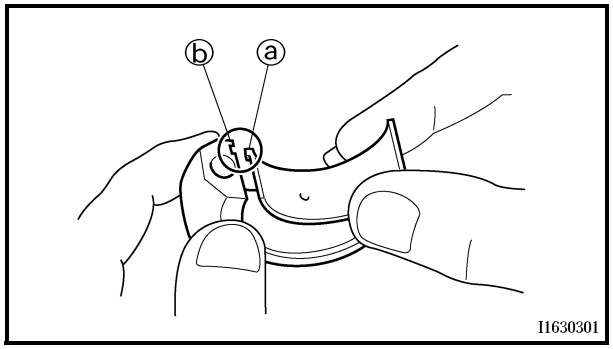
40 Nm (4.0 m · kg, 29 ft · lb)

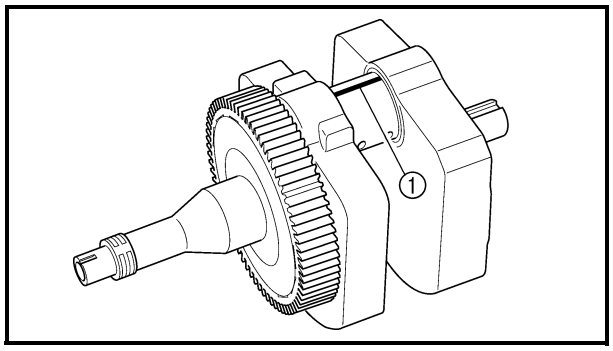
ENGINE

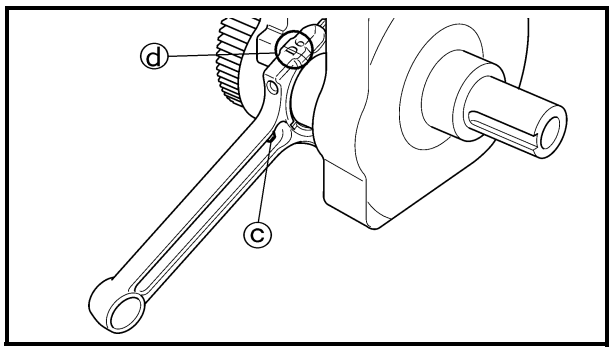
ROCKER ARMS, PUSH RODS AND VALVE LIFTERS

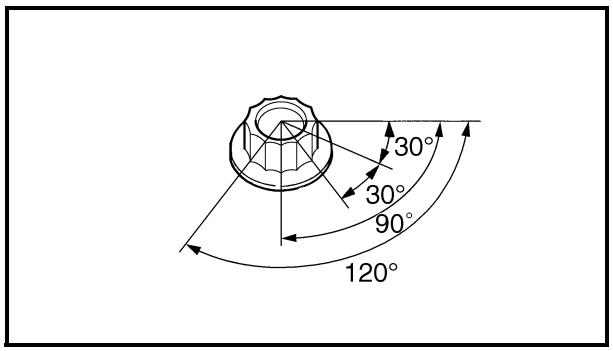


Order	Job/Part	Q'ty	Remarks
	Removing cylinder head covers		Remove the parts in the order listed.
	Engine left side cover Decompression solenoid cover Camshaft sprocket cover		Refer to "ROCKER ARMS, PUSH RODS AND VALVE LIFTERS" in chapter 5. (Manual No.: 4WM-28197-E0)
1	Cylinder head breather hose	1	
2	Oil tank breather hose	1	
3	Bolt	4	ℓ = 60 mm (2.36 in)
4	Bolt	12	ℓ = 50 mm (1.97 in)
5	Bolt	12	ℓ = 40 mm (1.57 in)
6	Rear cylinder head cover	1	
7	Front cylinder head cover	1	Refer to "INSTALLING THE CYLINDER HEAD COVERS".
8	Cylinder head cover gasket	2	
9	Dowel pin	4	
			For installation, reverse the removal procedure.









b. Install the big end upper bearing into the connecting rod and the big end lower bearing into the connecting rod cap.

NOTE:

Align the projections ⓐ on the big end bearings with the notches ⓑ in the connecting rod and connecting rod cap.

c. Put a piece of Plastigauge® ① on the crankshaft pin.

d. Assemble the connecting rod halves.

NOTE:

- Do not move the connecting rod or crankshaft until the clearance measurement has been completed.
- Lubricate the bolt threads and seats with molybdenum disulfide grease.
- Make sure the projection ⓒ on the connecting rod faces towards the left side of the crankshaft.
- Make sure the characters ⓓ on both the connecting rod and connecting rod cap are aligned.

e. Tighten the connecting rod bolts.

⚠ WARNING

- **Replace the connecting rod bolts with new ones.**
- **Clean the connecting rod bolts.**

NOTE:

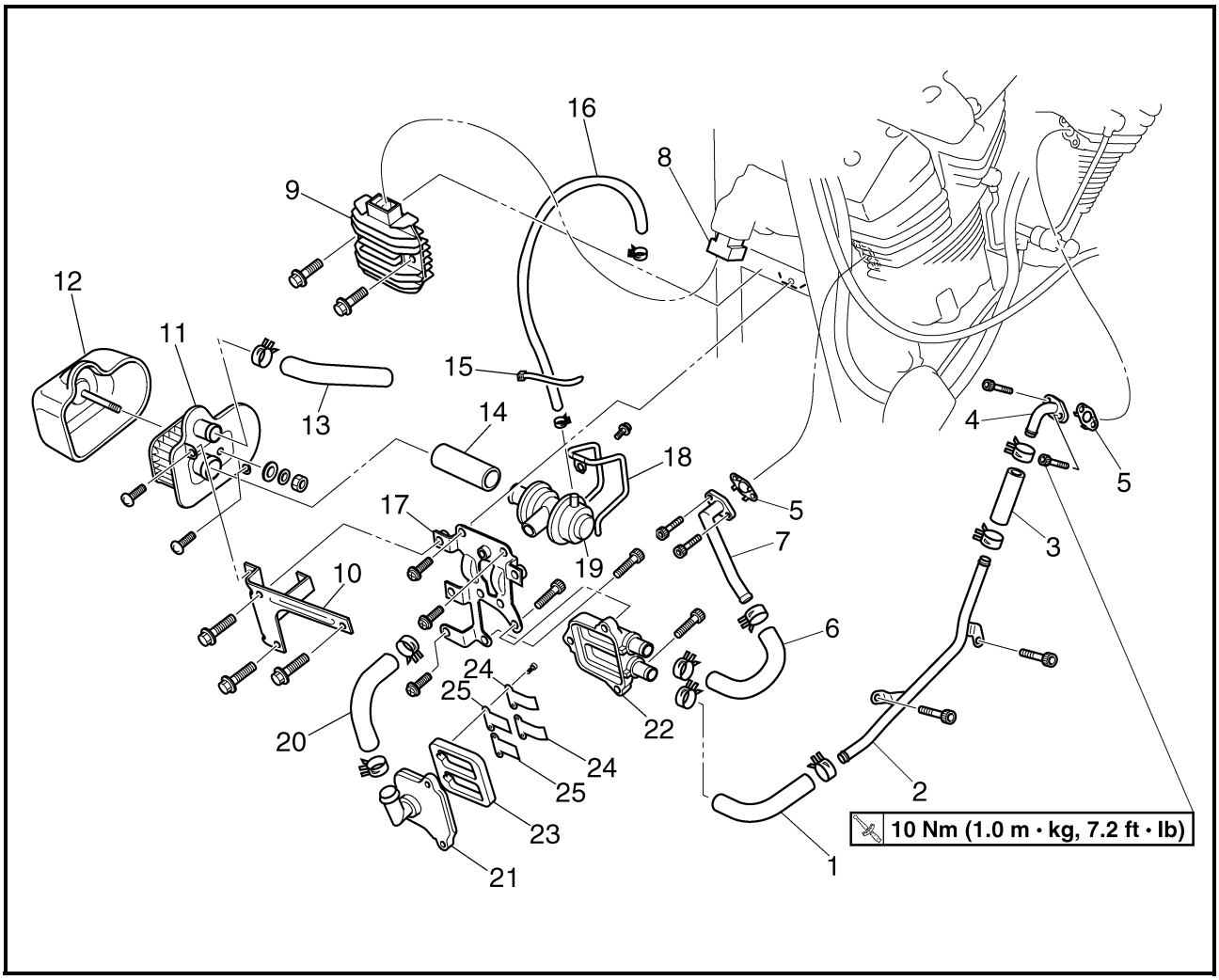
The tightening procedure of the connecting rod bolts is angle controlled, therefore tighten the bolts using the following procedure.

f. Tighten the connecting rod bolts to the specified torque.

Connecting rod bolt
1st
15 Nm (1.5 m · kg, 11 ft · lb)

g. Tighten the connecting rod bolts further to reach the specified angle 90° ~ 120°.

Connecting rod bolts
Final
Specified angle 90° ~ 120°



Order	Job/Part	Q'ty	Remarks
20	Air cut-off valve to reed valve cover hose	1	
21	Reed valve cover	1	
22	Reed valve case	1	
23	Reed valve base	1	
24	Reed valve stopper	2	
25	Reed valve	2	
			For installation, reverse the removal procedure.

SPECIFICATIONS

GENERAL SPECIFICATIONS

Item	Standard	Limit
Model code	5VNC (XV17AV for USA)	----
	5VND (XV17AVC for California)	----
	5VNE (XV17AWV for USA)	----
	5VNF (XV17AWVC for California)	----
	5VR7 (XV17AMV for USA)	----
	5VR8 (XV17AMVC for California)	----
	5VPA (XV17ATV for USA)	----
	5VPB (XV17ATVC for California)	----
	2D95 (XV17ATMV for USA)	----
	2D96 (XV17ATMVC for California)	----
Dimensions		
Overall length	2,500 mm (98.4 in)	----
Overall width	980 mm (38.6 in)	----
Overall height	1,140 mm (44.9 in) (XV17AV/XV17AVC/ XV17AWV/XV17AWVC/XV17AMV/ XV17AMVC)	----
	1,500 mm (59.1 in) (XV17ATV/ XV17ATVC/XV17ATMV/XV17ATMVC)	----
Seat height	710 mm (28.0 in)	----
Wheelbase	1,688 mm (66.5 in)	----
Minimum ground clearance	145 mm (5.71 in)	----
Minimum turning radius	3,200 mm (126 in)	----
Weight		
Wet (with oil and a full fuel tank)	334 kg (736 lb) (XV17AV/XV17AVC/ XV17AWV/XV17AWVC/XV17AMV/ XV17AMVC)	----
	349 kg (769 lb) (XV17ATV/XV17ATVC/ XV17ATMV/XV17ATMVC)	----
Dry (without oil and fuel)	312 kg (688 lb) (XV17AV/XV17AVC/ XV17AWV/XV17AWVC/XV17AMV/ XV17AMVC)	----
	327 kg (721 lb) (XV17ATV/XV17ATVC/ XV17ATMV/XV17ATMVC)	----
Maximum load (total of cargo, rider, passenger, and accessories)	194 kg (428 lb) (XV17AV/XV17AVC/ XV17AWV/XV17AWVC/XV17AMV/ XV17AMVC)	----
	179 kg (395 lb) (XV17ATV/XV17ATVC/ XV17ATMV/XV17ATMVC)	----

ELECTRICAL SPECIFICATIONS

Item	Standard	Limit
Throttle position sensor		
Resistance	4.0 ~ 6.0 kΩ	----
Output voltage (at idle)	0.65 ~ 0.75 V	----
Charging system		
System type	AC magneto	----
Model (manufacturer)	F004T36374 (MITSUBISHI)	----
Nominal output	14 V/28 A at 5,000 r/min	----
Stator coil resistance	0.225 ~ 0.275 Ω at 20 °C (68 °F)	----
Rectifier/regulator		
Regulator type	Semiconductor, short circuit	----
Model (manufacturer)	SH736AA (SHINDENGEN)	----
No-load regulated voltage	14.1 ~ 14.9 V	----
Rectifier capacity	22 A	----
Withstand voltage	200 V	----
Battery		
Battery type	YTX20L-BS	----
Battery voltage/capacity	12V/18Ah	----
Specific gravity	1.32	----
Manufacturer	GS YUASA	----
Ten hour rate amperage	1.8 A	----
Ignition system		
Ignition system type	Transistorized coil ignition (digital)	----
Ignition timing	5° BTDC at 900 r/min	----
Advancer type	Throttle position sensor and electrical	----
Pickup coil resistance/color	248 ~ 372 Ω/Gy—B	----
Transistorized coil ignition unit model (manufacturer)	J4T139 (MITSUBISHI)	----
Sidestand relay		
Model (manufacturer)	G8R-30Y-U2 (OMRON)	----
Coil resistance	162 ~ 198 Ω	----
Passing light relay		
Model (manufacturer)	ACA12115-1 (MATSUSHITA) (XV17AMV/XV17AMVC/XV17ATV/ XV17ATVC/XV17ATMV/XV17ATMVC)	----
Coil resistance	72 ~ 88 Ω (XV17AMV/XV17AMVC/XV17ATV/ XV17ATVC/XV17ATMV/XV17ATMVC)	----
Fuel pump relay		
Model (manufacturer)	G8R-30Y-U2 (OMRON)	----
Coil resistance	162 ~ 198 Ω	----

No.		ITEM	ROUTINE	INITIAL	ODOMETER READINGS				
				600 mi (1000 km) or 1 month	4000 mi (7000 km) or 6 months	8000 mi (13000 km) or 12 months	12000 mi (19000 km) or 18 months	16000 mi (25000 km) or 24 months	20000 mi (31000 km) or 30 months
23	*	**Transfer case oil**	• Check for leakage. • Change at initial 600 mi (1000 km) or 1 month, and thereafter every 16000 mi (25000 km) or 24 months.	**Change.**		√		**Change.**	
24	*	**Front and rear brake switches**	• Check operation.	√	√	√	√	√	√
25	*	**Control cables**	• Apply Yamaha chain and cable lube or engine oil SAE 10W-30 thoroughly.	√	√	√	√	√	√
26	*	**Throttle grip housing and cable**	• Check operation and free play. • Adjust the throttle cable free play if necessary. • Lubricate the throttle grip housing and cable.		√	√	√	√	√
27	*	**Lights, signals and switches**	• Check operation. • Adjust headlight beam.	√	√	√	√	√	√

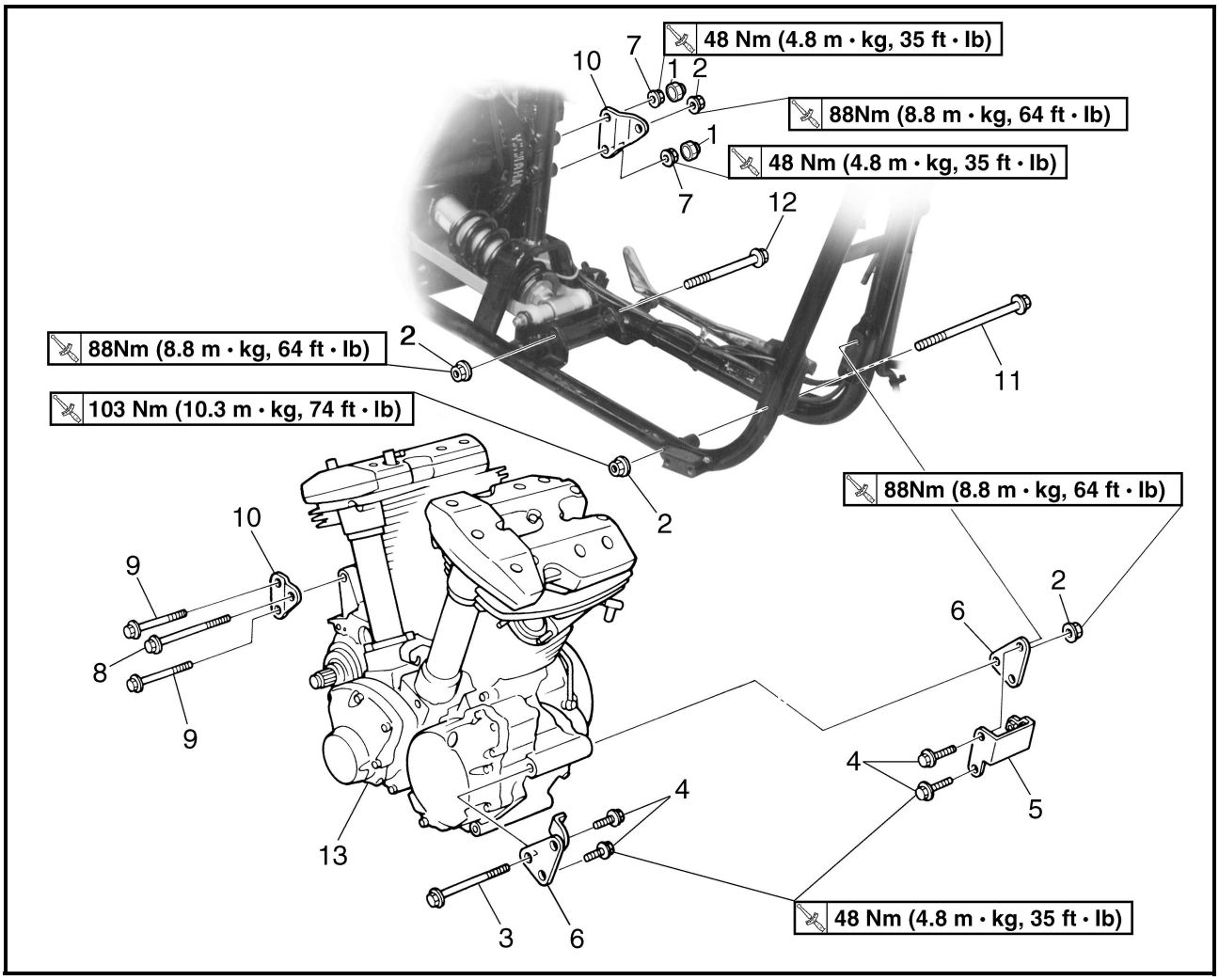
* Since these items require special tools, data and technical skills, have a Yamaha dealer perform the service.

NOTE:

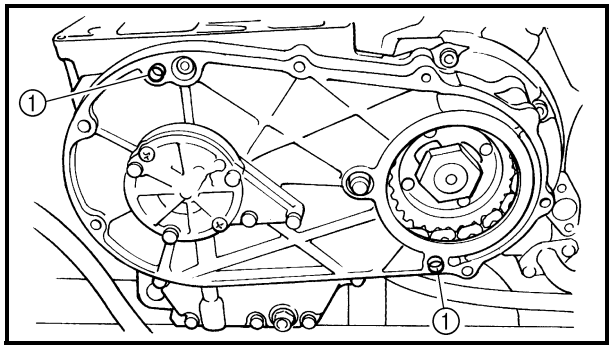
From 24000 mi (37000 km) or 36 months, repeat the maintenance intervals starting from 8000 mi (13000 km) or 12 months.

NOTE:

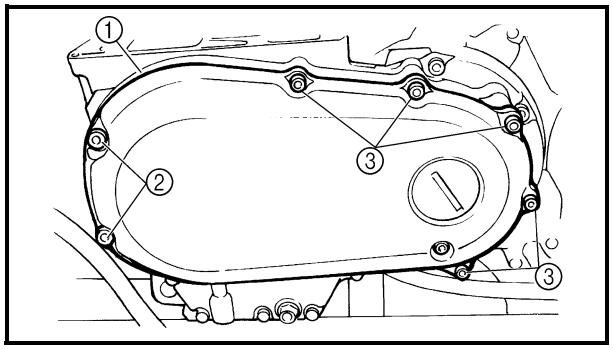
- The air filter needs more frequent service if you are riding in unusually wet or dusty areas.
- Hydraulic brake service
  - After disassembling the brake master cylinders and calipers, always change the fluid. Regularly check the brake fluid levels and fill the reservoirs as required.
  - Every two years replace the internal components of the brake master cylinders and calipers, and change the brake fluid.
  - Replace the brake hoses every four years and if cracked or damaged.



Order	Job/Part	Q'ty	Remarks
10	Rear engine bracket	2	
11	Lower front mounting bolt	1	
12	Lower rear mounting bolt	1	
13	Engine	1	Refer to "INSTALLING THE ENGINE" in chapter 5. (Manual No.: 4WM-28197-E0) For installation, reverse the removal procedure.



11.Install:
- dowel pins ①

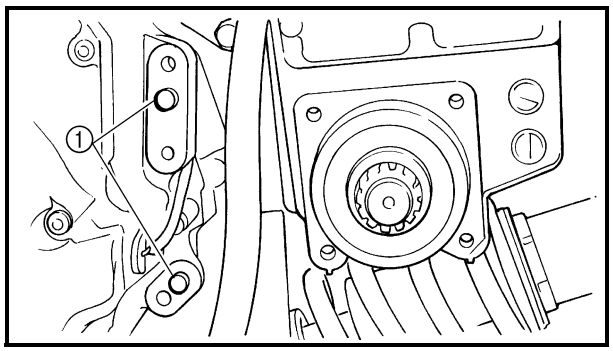


12.Install:
- cover ①
- cover bolts (M8) ②

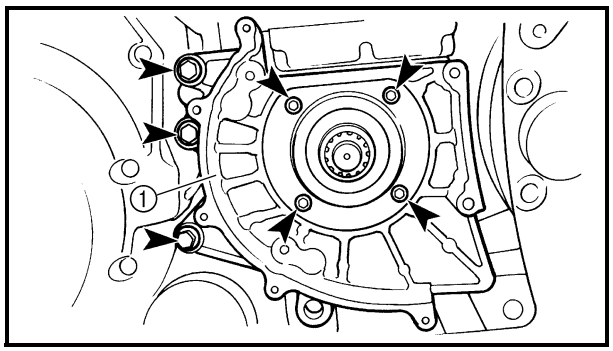
24 Nm (2.4 m · kg, 17 ft · lb)

- cover bolts (M6) ③

10 Nm (1.0 m · kg, 7.2 ft · lb)



13.Install:
- dowel pins ①



14.Install:
- drive pulley case ①
- bolts (M8)

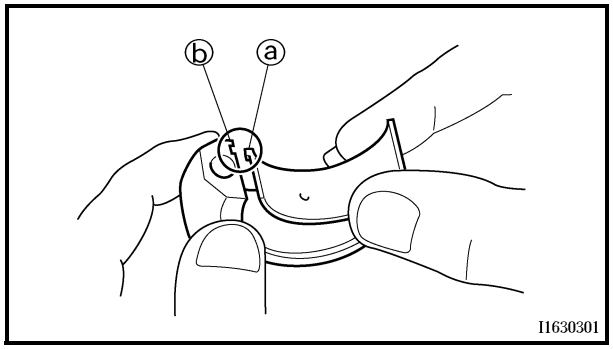
30 Nm (3.0 m · kg, 22 ft · lb)

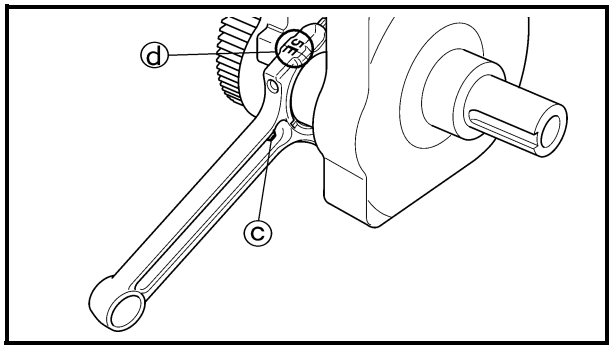
- cover bolts (M10)

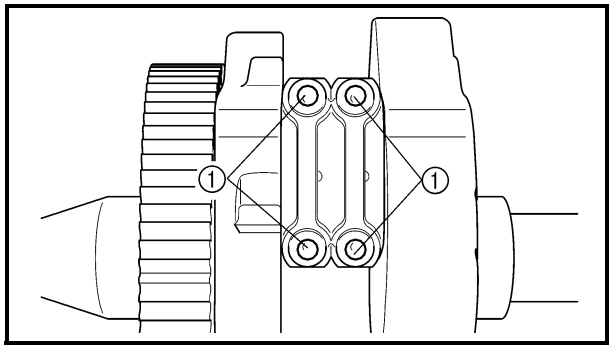
50 Nm (5.0 m · kg, 36 ft · lb)

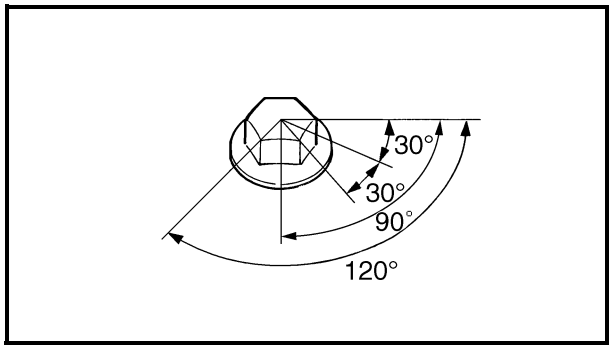
15.Install:
- drive pulley
  Refer to “DRIVE BELT AND DRIVE PULLEY”.

16.Fill:
- transfer gear case
  (with the specified amount of the recommended transfer gear oil)
  Refer to “CHANGING THE TRANSFER GEAR OIL” in chapter 3.
  (Manual No.: 4WM-28197-E0)









3. Install:
   - big end bearings
   - connecting rods
   - connecting rod caps
     (onto the crankshaft pins)

NOTE:
- Align the projections ⓐ on the big end bearings with the notches ⓑ in the connecting rods and connecting rod caps.
- Be sure to reinstall each big end bearing in its original place.
- Make sure the projection ⓒ on the connecting rods face towards the left side of the crankshaft.
- Make sure the characters ⓓ on both the connecting rod and connecting rod cap are aligned.

4. Tighten:
   - connecting rod bolts ①

⚠ WARNING
- **Replace the connecting rod bolts with new ones.**
- **Clean the connecting rod bolts.**

NOTE:
The tightening procedure of the connecting rod bolts is angle controlled, therefore tighten the bolts using the following procedure.

▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼

a. Tighten the connecting rod bolts to the specified torque.

Connecting rod bolt
1st
15 Nm (1.5 m · kg, 11 ft · lb)

b. Tighten the connecting rod bolts further to reach the specified angle 90° ~ 120°.

Connecting rod bolt
Final
Specified angle 90° ~ 120°