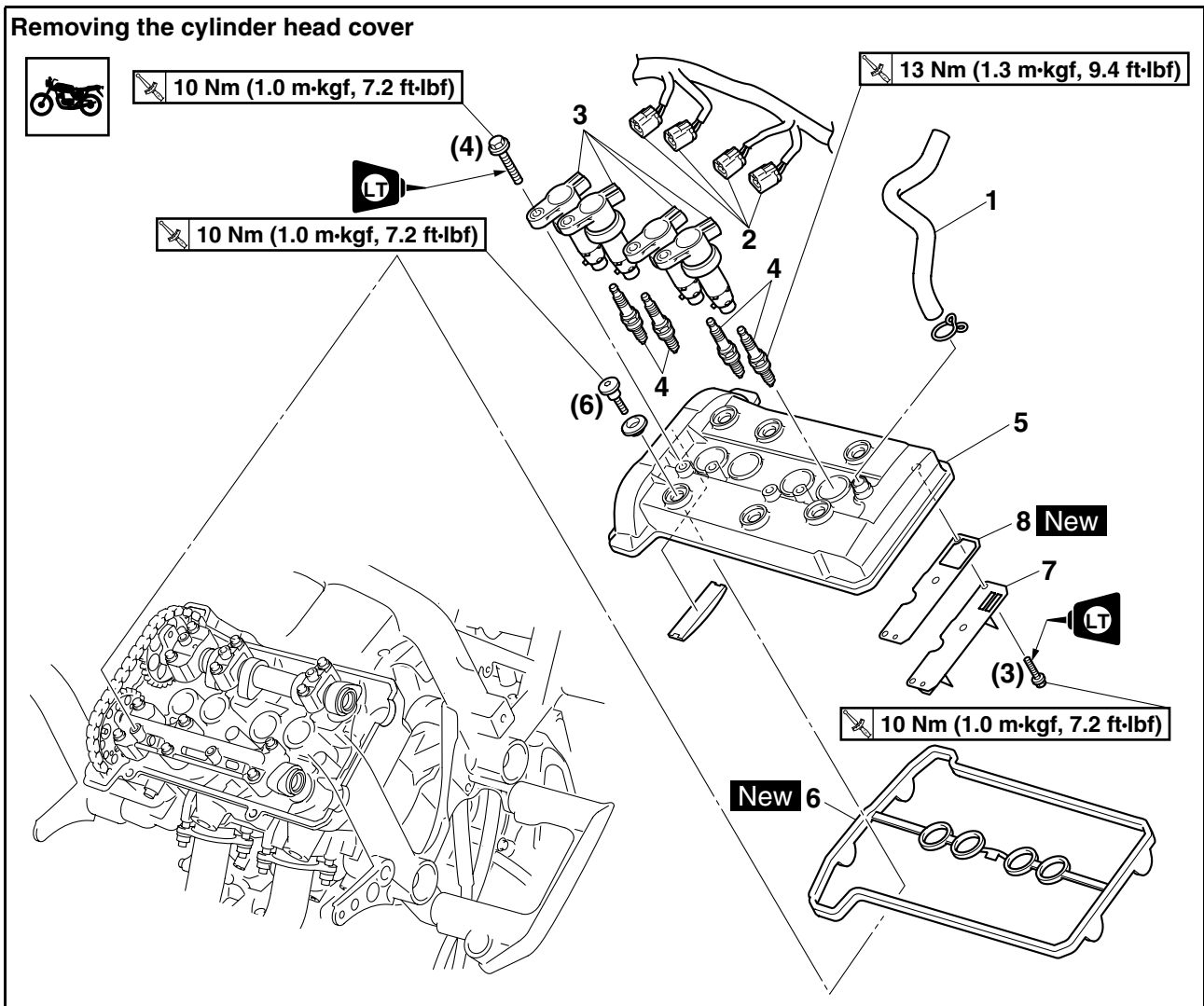


EAS23760

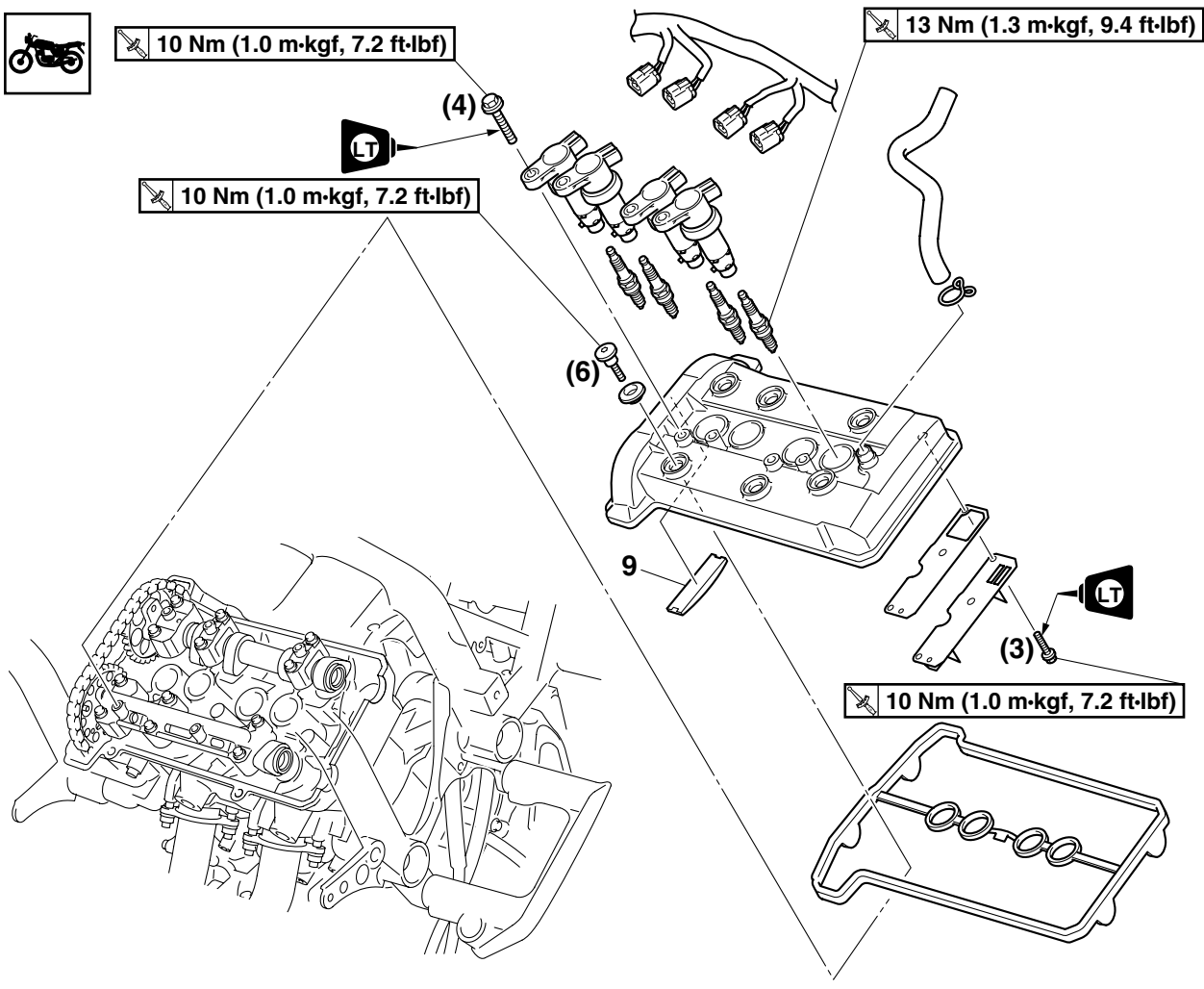
## CAMSHAFTS

### Removing the cylinder head cover



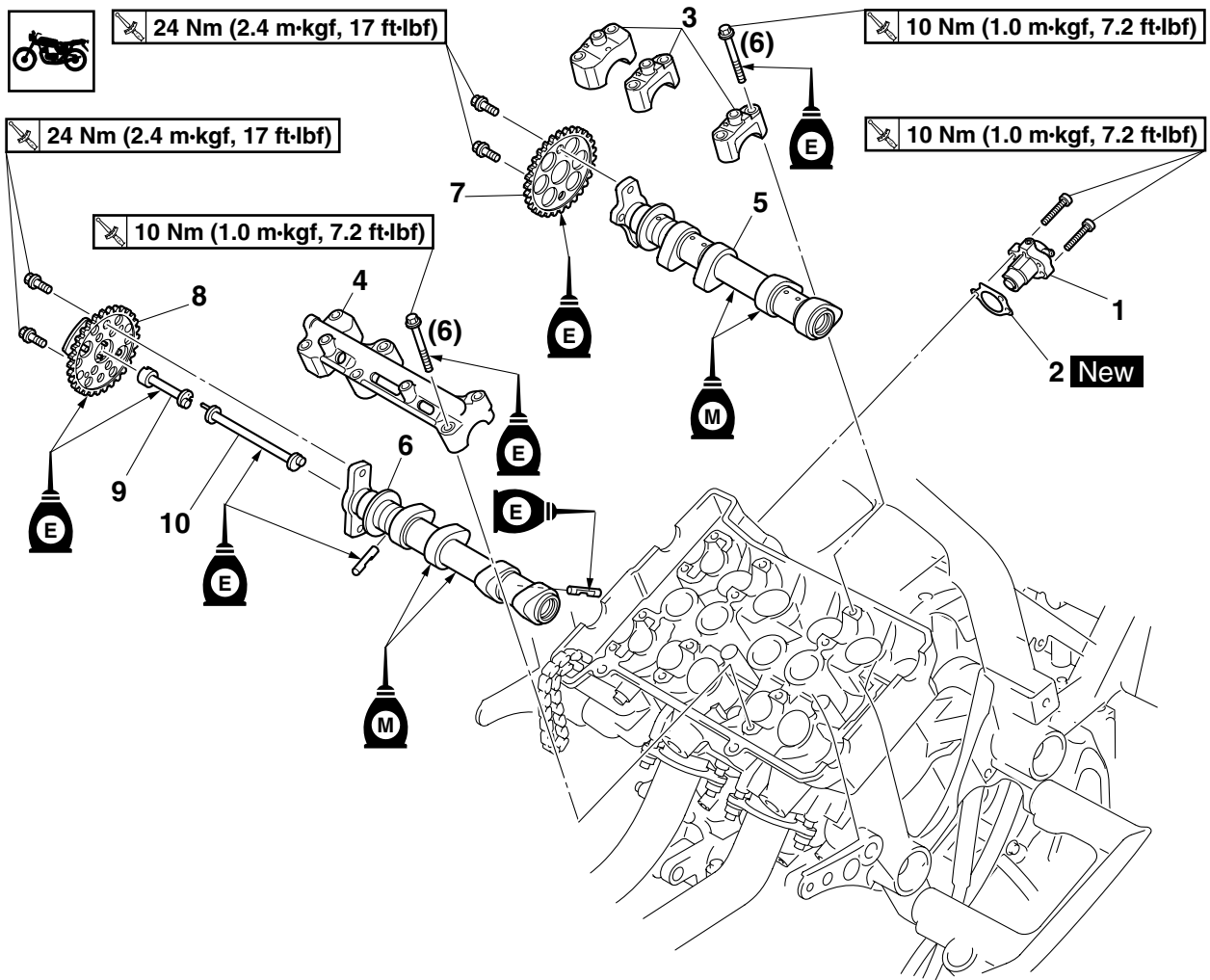
Order	Job/Parts to remove	Q'ty	Remarks
			<b>TIP</b> _____ Place a suitable stand under the engine.
	Engine bracket		Refer to "ENGINE REMOVAL" on page 5-3.
	Throttle bodies		Refer to "THROTTLE BODIES" on page 7-5.
1	Cylinder head breather hose	1	
2	Ignition coil coupler	4	Disconnect.
3	Ignition coil	4	
4	Spark plug	4	
5	Cylinder head cover	1	
6	Cylinder head cover gasket	1	
7	Breather plate	1	
8	Breather plate gasket	1	

## Removing the cylinder head cover



Order	Job/Parts to remove	Q'ty	Remarks
9	Timing chain guide (upper side)	1	
			For installation, reverse the removal procedure.

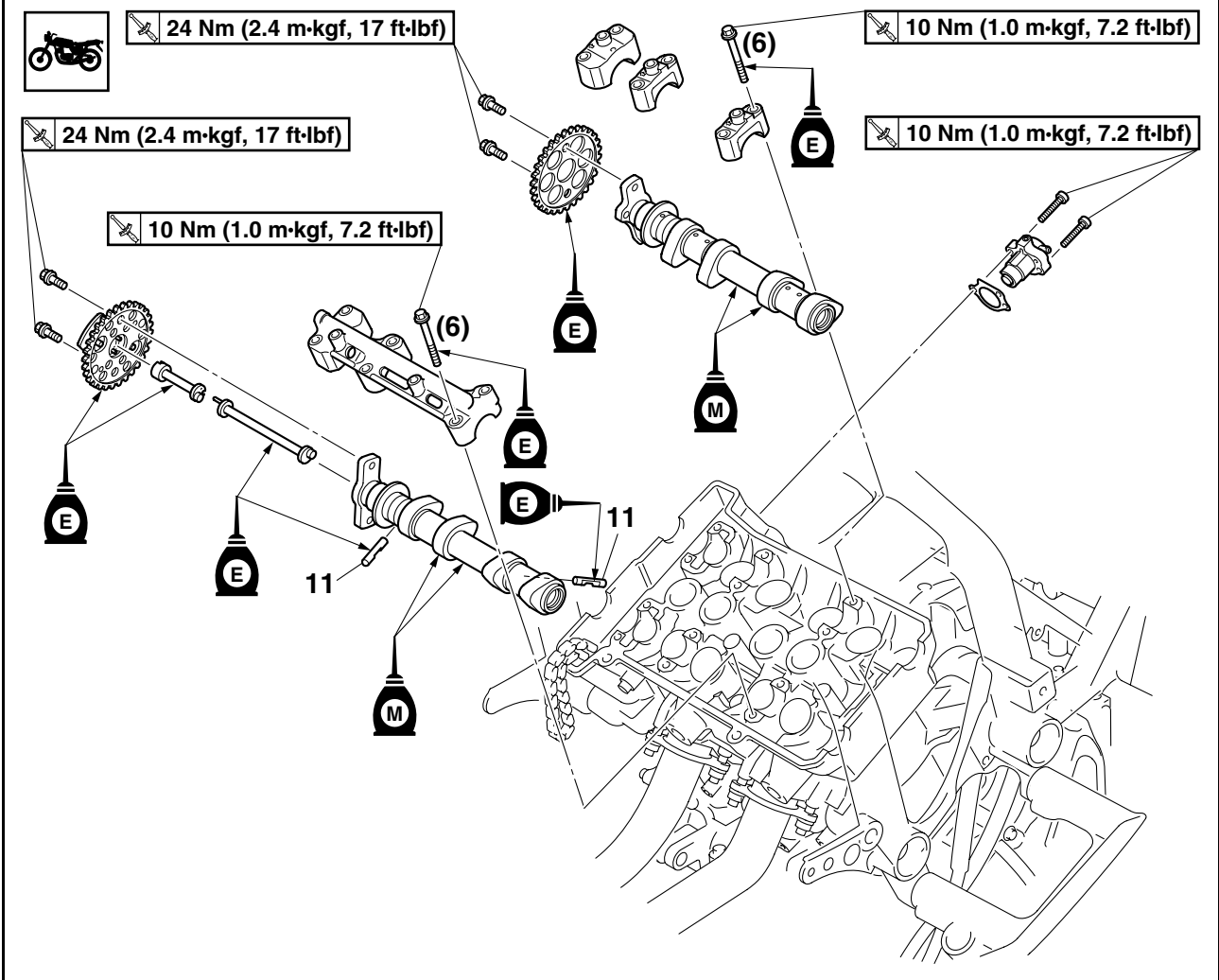
## Removing the camshafts



Order	Job/Parts to remove	Q'ty	Remarks
	Electrical components tray		Refer to "GENERAL CHASSIS" on page 4-1.
	Clutch cover		Refer to "CLUTCH" on page 5-52.
1	Timing chain tensioner	1	
2	Timing chain tensioner gasket	1	
3	Intake camshaft cap	3	
4	Exhaust camshaft cap	1	
5	Intake camshaft	1	
6	Exhaust camshaft	1	
7	Intake camshaft sprocket	1	
8	Exhaust camshaft sprocket	1	
9	Decompressor lever #2	1	
10	Decompressor lever #1	1	

# CAMSHAFTS

## Removing the camshafts



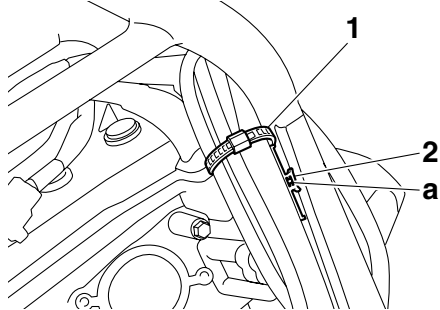
Order	Job/Parts to remove	Q'ty	Remarks
11	Decompressor lever pin	2	
			For installation, reverse the removal procedure.

EAS23P1089

## REMOVING THE CYLINDER HEAD COVER

1. Remove:

- Plastic band "1"
- Wire harness holder "2"

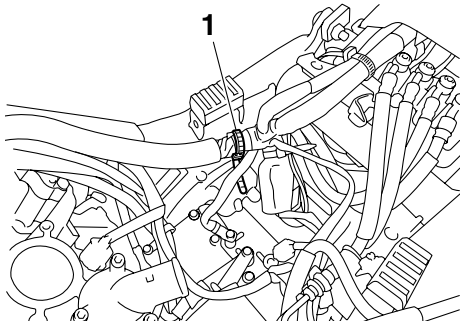


### TIP

To remove the wire harness holder, push in the tab "a" of the holder with a thin, flat-head screwdriver.

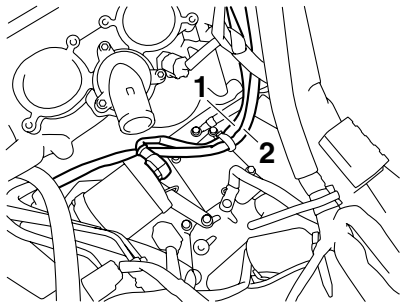
2. Remove:

- Plastic band "1"



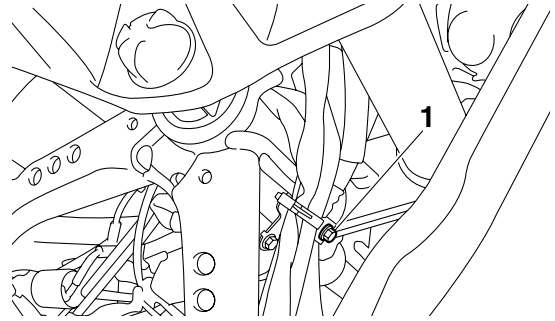
3. Remove:

- Starter motor lead "1"
- Stator coil lead "2"



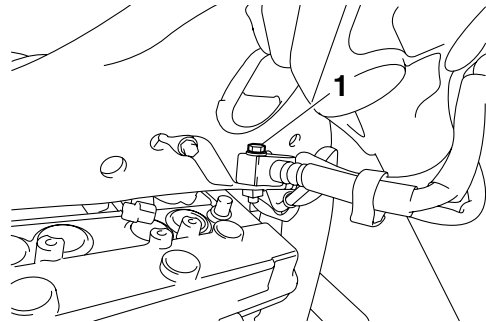
4. Remove:

- Brake hose joint bolt (front brake master cylinder to hydraulic unit) "1"



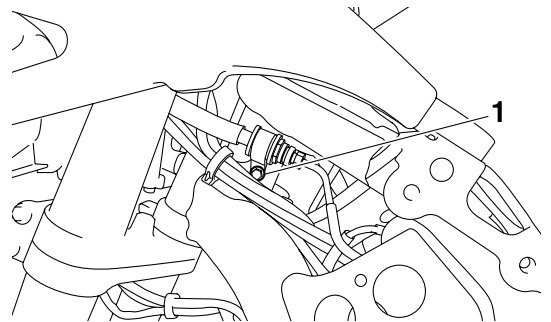
5. Remove:

- Brake hose joint bolt (hydraulic unit to left front brake caliper) "1"



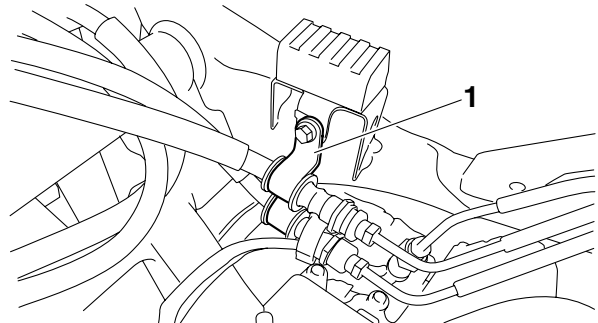
6. Remove:

- Clutch hose holder bolt "1"



7. Remove:

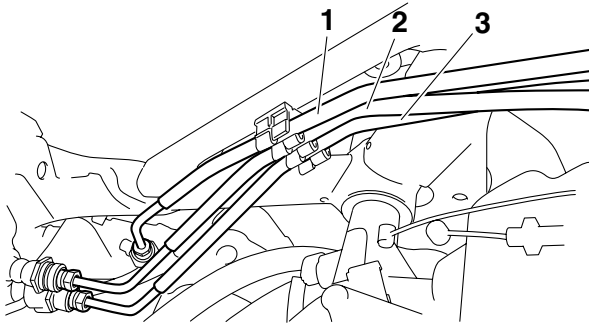
- Brake hose holders "1"



8. Remove:

- Clutch pipe "1"
- Brake pipe (front brake master cylinder to hydraulic unit) "2"

- Brake pipe (hydraulic unit to left front brake caliper) "3"

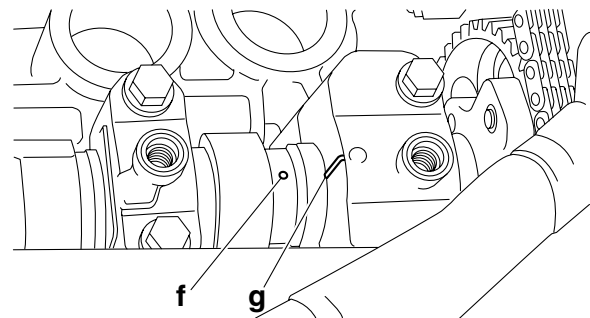
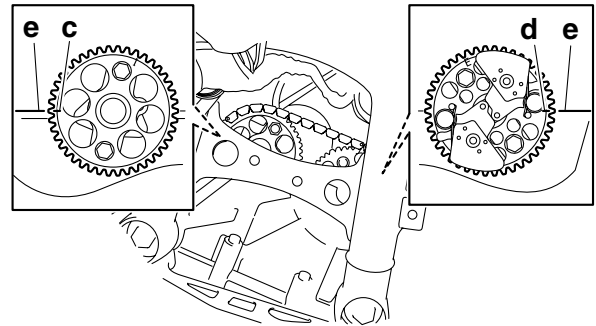
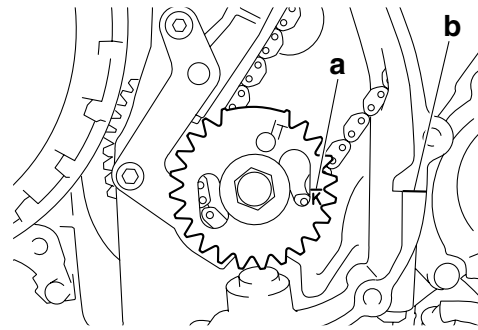
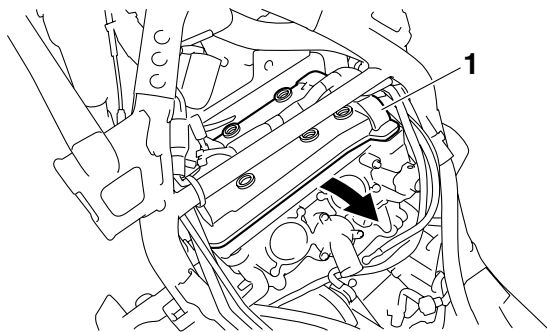


9. Remove:

- Cylinder head cover "1"
- Cylinder head cover gasket

**TIP**

Lift up the wire harness, brake pipes, clutch pipe, and clutch hose, and then pull the cylinder head cover rearward to remove it.



EAS23810

## REMOVING THE CAMSHAFTS

1. Align:

- "K" mark "a" on the pickup rotor (with the crankcase mating surface "b")

a. Turn the crankshaft clockwise.

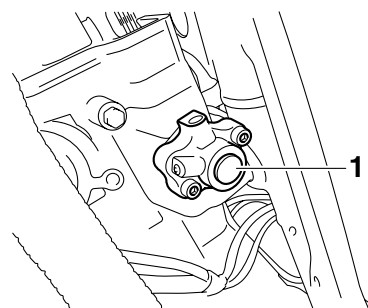
b. Align the "K" mark "a" with the crankcase mating surface "b".

**TIP**

When the "K" mark "a" is aligned with the crankcase mating surface "b", check that the match mark "c" on the intake camshaft sprocket and match mark "d" on the exhaust camshaft sprocket are aligned with the cylinder head surface "e". Also, check that the hole "f" in the intake camshaft is aligned with the match mark "g" on the intake camshaft cap. If the match marks or hole are not aligned, turn the crankshaft clockwise 360 degrees.

2. Remove:

- Timing chain tensioner "1"
- Timing chain tensioner gasket



3. Remove:

- Camshaft caps

ECA13720

## NOTICE

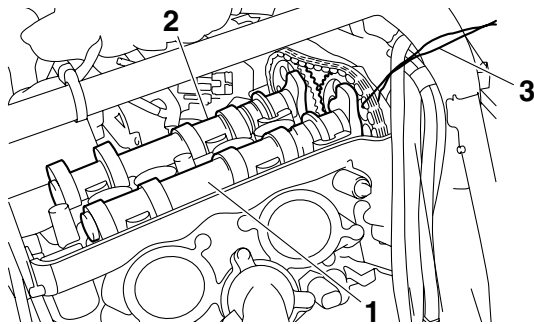
To prevent damage to the cylinder head, camshafts or camshaft caps, loosen the camshaft cap bolts in stages and in a criss-cross pattern, working from the outside in.

4. Remove:

- Intake camshaft "1"
- Exhaust camshaft "2"

## TIP

To prevent the timing chain from falling into the crankcase, fasten it with a wire "3".



5. Remove:

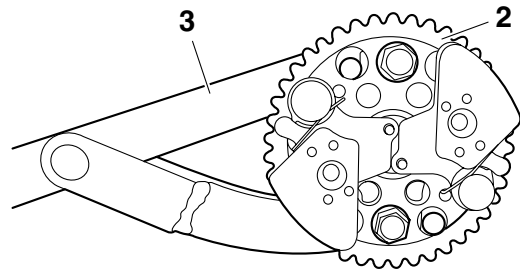
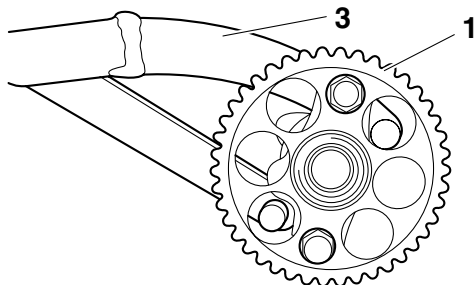
- Intake camshaft sprocket "1"
- Exhaust camshaft sprocket "2"

## TIP

While holding the intake camshaft sprocket and exhaust camshaft sprocket with the rotor holding tool "3", loosen the intake camshaft sprocket bolts and exhaust camshaft sprocket bolts.



**Rotor holding tool**  
**90890-01235**  
**Universal magneto & rotor holder**  
**YU-01235**



EAS23850

## CHECKING THE CAMSHAFTS

1. Check:

- Camshaft lobes  
Blue discoloration/pitting/scratches → Replace the camshaft.

2. Measure:

- Camshaft lobe dimensions "a" and "b"  
Out of specification → Replace the camshaft.



### Camshaft lobe dimensions

#### Intake A

40.250–40.350 mm (1.5846–1.5886 in)

#### Limit

40.150 mm (1.5807 in)

#### Intake B

29.976–30.076 mm (1.1802–1.1841 in)

#### Limit

29.876 mm (1.1762 in)

#### Exhaust A

39.250–39.350 mm (1.5453–1.5492 in)

#### Limit

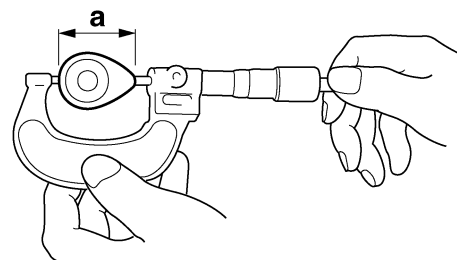
39.150 mm (1.5413 in)

#### Exhaust B

29.950–30.050 mm (1.1791–1.1831 in)

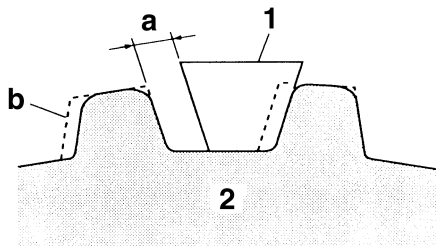
#### Limit

29.850 mm (1.1752 in)









- a. 1/4 tooth
- b. Correct
- 1. Timing chain roller
- 2. Camshaft sprocket

EAS23960

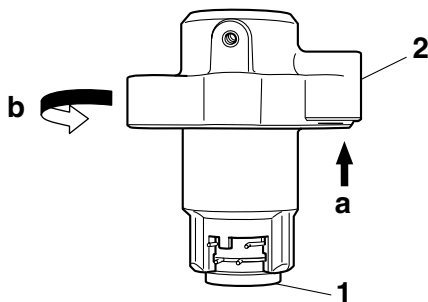
## CHECKING THE TIMING CHAIN TENSIONERS

1. Check:
  - Timing chain tensioner
  - Cracks/damage → Replace.

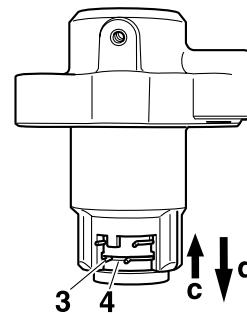
- 
- a. Push and insert timing chain tensioner rod "1" into the timing chain tensioner housing.

### TIP

Push the timing chain tensioner rod in direction "a", and turn the timing chain tensioner body "2" in direction "b" until it stops.



- b. Keep pressing the timing chain tensioner rod, mount clip "3" into groove "4", and lock the timing chain tensioner rod.
- c. Push the timing chain tensioner rod in direction "c".
- d. Make sure that the timing chain tensioner rod can smoothly move out from the timing chain tensioner housing in direction "d". If not smooth, replace the timing chain tensioner assembly.



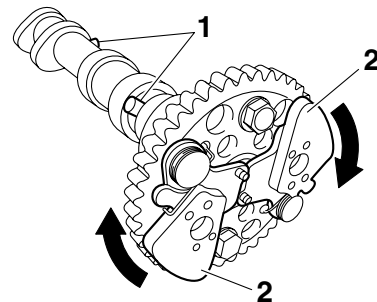
EAS23980

## CHECKING THE DECOMPRESSION SYSTEM

1. Check:
  - Decompression system

### TIP

- Check that the decompression pins "1" projects from the camshaft.
- Check that the decompression cams "2" and decompression pins "1" moves smoothly.



EAS24000

## INSTALLING THE CAMSHAFTS

1. Align:
  - "K" mark "a" on the pickup rotor (with the crankcase mating surface "b")

- 
- a. Turn the crankshaft clockwise.
  - b. Align the "K" mark "a" with the crankcase mating surface "b".

### TIP

When piston #1 is before 71° of TDC on the compression stroke, align the "K" mark with the crankcase mating surface.

# CAMSHAFTS

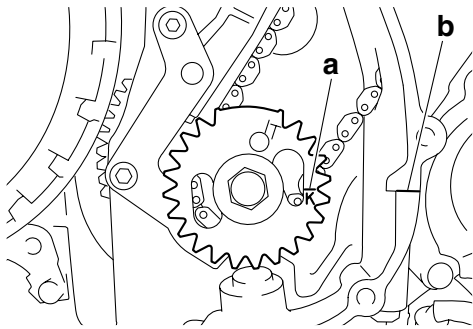
ECA23P1077

## NOTICE

Be sure to tighten the camshaft sprocket bolts to the specified torque to avoid the possibility of the bolts coming loose and damaging the engine.

## TIP

- Install the cam lobe #1 "a" at the position shown in the illustration.
- Tighten the camshaft sprocket bolt with the rotor holding tool "3".

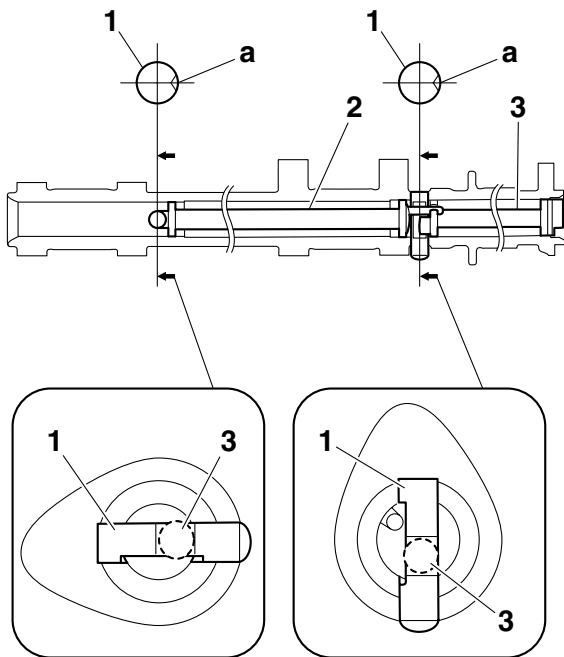


### 2. Install:

- Decompressor lever pins "1"
- Decompressor lever #1 "2"
- Decompressor lever #2 "3"

### TIP

- Face the cutout "a" in each decompressor lever pin toward the exhaust camshaft sprocket.
- Install the decompressor lever pins, decompressor lever #1, and decompressor lever #2 in the exhaust camshaft as shown in the illustration.



### 3. Install:

- Intake camshaft sprocket "1"
- Exhaust camshaft sprocket "2"



**Camshaft sprocket bolt**  
24 Nm (2.4 m-kgf, 17 ft-lbf)

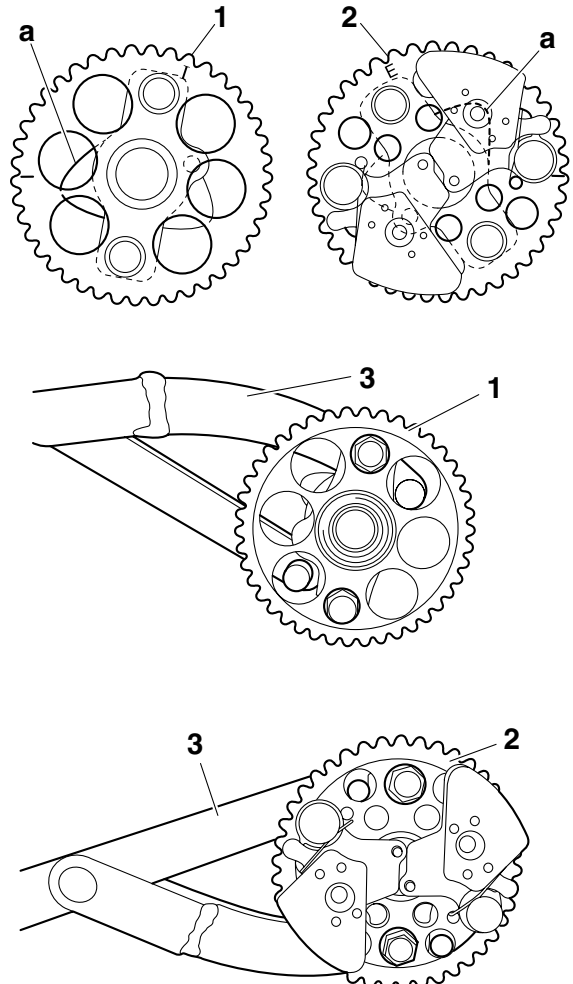


### Rotor holding tool

90890-01235

Universal magneto & rotor holder

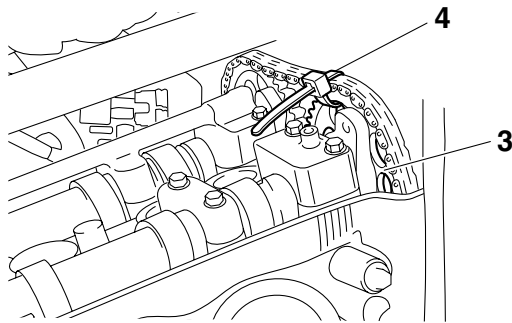
YU-01235



### 4. Install:

- Timing chain "1"
- Exhaust camshaft "2"
- Exhaust camshaft cap





d. Tighten the intake camshaft cap bolts.

**TIP**

To prevent the timing chain from skipping a tooth on the intake camshaft sprocket, do not remove the plastic locking tie before installing the timing chain tensioner.



**Intake camshaft cap bolt**  
10 Nm (1.0 m·kgf, 7.2 ft·lbf)

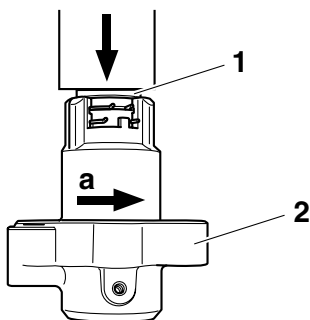
6. Install:

- Timing chain tensioner
- Timing chain tensioner gasket **New**

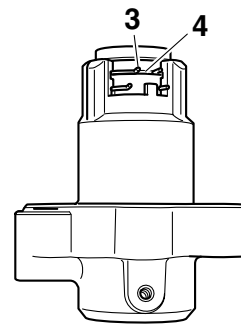
a. Push and insert timing chain tensioner rod "1" into the timing chain tensioner housing.

**TIP**

Push the timing chain tensioner rod in direction "a", and turn the timing chain tensioner body "2" in direction "a" until it stops.



b. Keep pressing the timing chain tensioner rod, mount clip "3" into groove "4", and lock the timing chain tensioner rod.

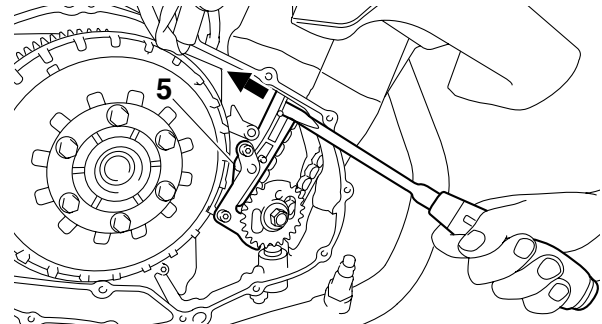


c. Install the timing chain tensioner in the cylinder block.



**Timing chain tensioner bolt**  
10 Nm (1.0 m·kgf, 7.2 ft·lbf)

d. Push the timing chain guide "5" as shown in the illustration to release the timing chain tensioner rod.



e. Check that the timing chain is taut. If the chain is slack, reinstall the timing chain tensioner.

7. Remove:

- Plastic locking tie

**TIP**

Remove the plastic locking tie that was used to fasten the timing chain to the intake camshaft sprocket.

8. Turn:

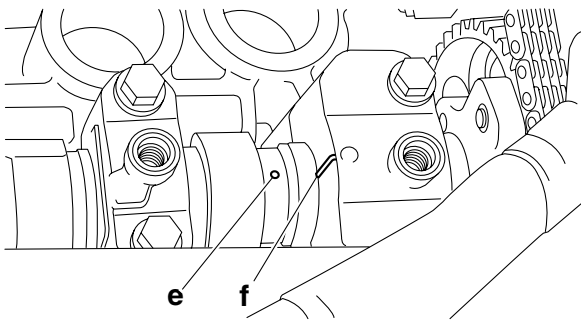
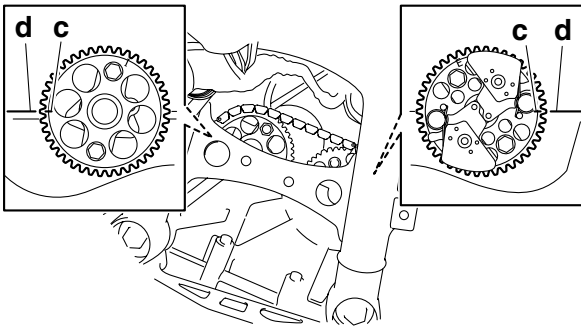
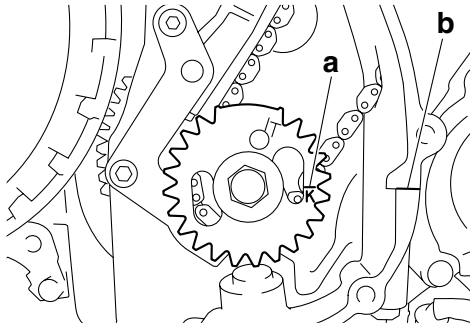
- Crankshaft  
(several turns clockwise)

9. Check:

- "K" mark  
Make sure the "K" mark "a" on the pickup rotor is aligned with the crankcase mating surface "b".
- Camshaft sprocket match mark  
Make sure the match marks "c" on the camshaft sprockets are aligned with the cylinder head mating surface "d".  
Out of alignment → Adjust.

Refer to the installation steps above.

- Intake camshaft hole  
Make sure the hole “e” in the intake camshaft is aligned with the match mark “f” on the intake camshaft cap.  
Out of alignment → Adjust.  
Refer to the installation steps above.



## 10. Measure:

- Valve clearance  
Out of specification → Adjust.  
Refer to “ADJUSTING THE VALVE CLEARANCE” on page 3-5.

EAS23P1091

## INSTALLING THE CYLINDER HEAD COVER

### 1. Install:

- Cylinder head cover gasket “1” **New**  
(to the cylinder head cover “2”)

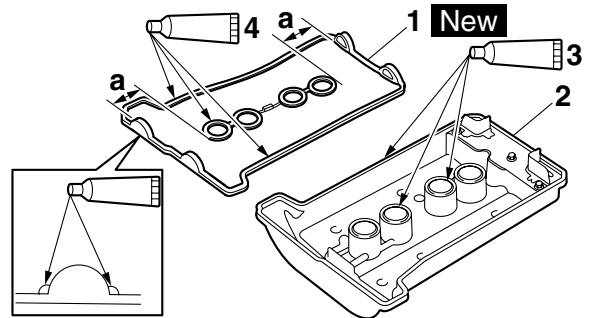
### TIP

- Apply Three Bond No.1541C® “3” onto the mating surfaces of the cylinder head cover and cylinder head cover gaskets.

- Apply Yamaha bond No.1215 “4” onto the mating surfaces of the cylinder head cover gasket and cylinder head.
- Install a cylinder head cover gasket “1”, and then cut the portions “a”.



**Yamaha bond No. 1215**  
**90890-85505**  
**(Three Bond No.1215®)**



2. Install:
  - Cylinder head cover

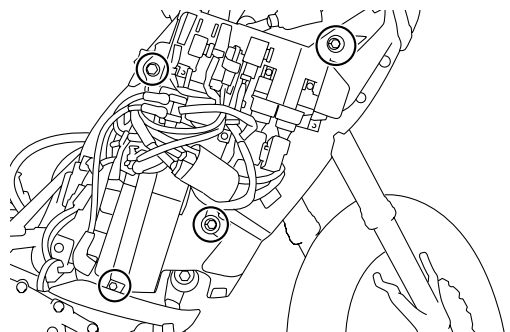
ECA23P1074

### NOTICE

**When installing the cylinder head cover to the cylinder head, make sure that the cylinder head cover gasket remains in place.**

3. Check:
  - Cylinder head cover gasket

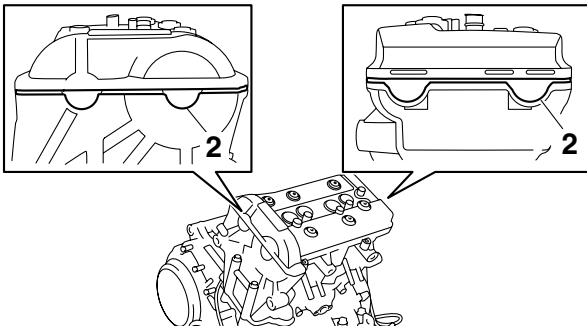
- a. Remove the electrical components tray bolts.



- b. Move the electrical components tray “1” away from the engine as shown in the illustration.



- c. Check that the cylinder head cover gasket "2" is installed properly between the cylinder head cover and the cylinder head.



- d. Install the electrical components tray bolts. Refer to "GENERAL CHASSIS" on page 4-1.



4. Tighten:
- Cylinder head cover bolts



**Cylinder head cover bolt**  
10 Nm (1.0 m·kgf, 7.2 ft·lbf)

**TIP**

Tighten the cylinder head cover bolts in stages and in a crisscross pattern.

5. Install:
- Brake pipe (hydraulic unit to left front brake caliper)
  - Brake pipe (front brake master cylinder to hydraulic unit)
  - Clutch pipe

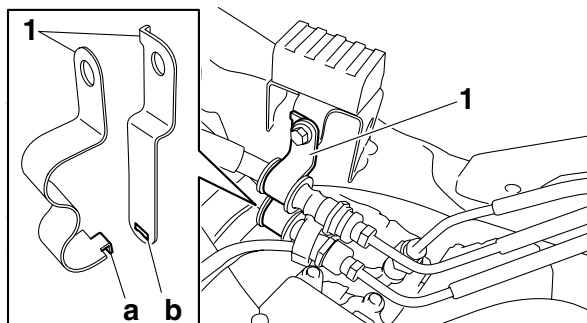
6. Install:
- Brake hose holders "1"



**Brake hose holder bolt**  
7 Nm (0.7 m·kgf, 5.1 ft·lbf)

**TIP**

Be sure to fit the projection "a" on the outer section of the brake hose holder into the hole "b" in the inner section.



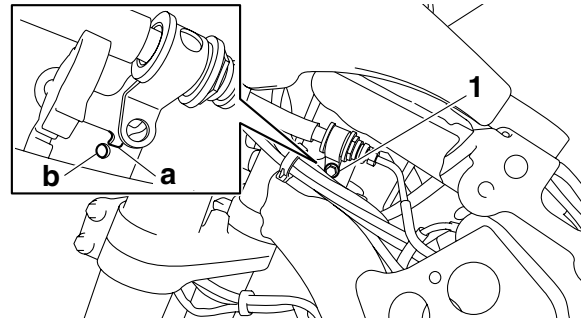
7. Install:
- Clutch hose holder bolt "1"



**Clutch hose holder bolt**  
9 Nm (0.9 m·kgf, 6.5 ft·lbf)

**TIP**

Insert the tab "a" on the clutch hose holder into the slot "b" in the frame.



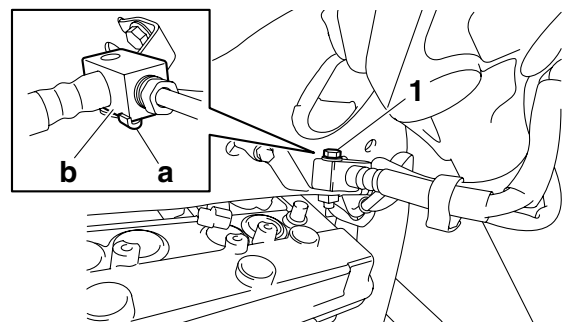
8. Install:
- Brake hose joint bolt (hydraulic unit to left front brake caliper) "1"
  - Brake hose joint bolt (front brake master cylinder to hydraulic unit) "2"

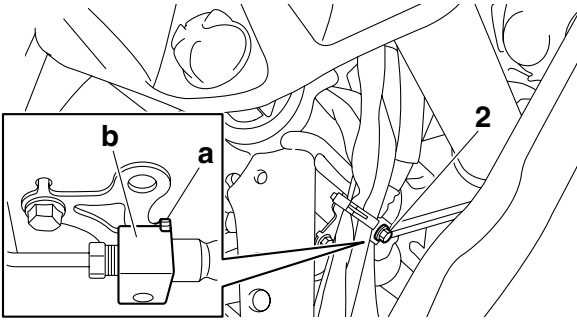


**Brake hose joint bolt (hydraulic unit to left front brake caliper)**  
7 Nm (0.7 m·kgf, 5.1 ft·lbf)  
**Brake hose joint bolt (front brake master cylinder to hydraulic unit)**  
9 Nm (0.9 m·kgf, 6.5 ft·lbf)

**TIP**

Make sure that the tab "a" on the brake hose joint bracket contacts the side of the brake hose joint "b".





9. Install:

- Stator coil lead
- Starter motor lead
- Plastic bands
- Wire harness holder