

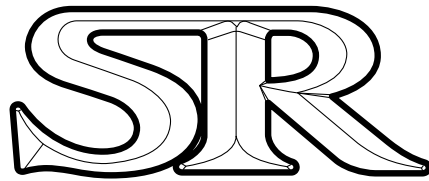


YAMAHA

2014

SERVICE MANUAL

**SR400
SR400E**



2RD-28197-E0

EAS20040

**SR400
SR400E
SERVICE MANUAL**
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IMPORTANT

This manual was produced by the Yamaha Motor Company, Ltd. primarily for use by Yamaha dealers and their qualified mechanics. It is not possible to include all the knowledge of a mechanic in one manual. Therefore, anyone who uses this book to perform maintenance and repairs on Yamaha vehicles should have a basic understanding of mechanics and the techniques to repair these types of vehicles. Repair and maintenance work attempted by anyone without this knowledge is likely to render the vehicle unsafe and unfit for use.




Yamaha Motor Company, Ltd. is continually striving to improve all of its models. Modifications and significant changes in specifications or procedures will be forwarded to all authorized Yamaha dealers and will appear in future editions of this manual where applicable.

TIP

Designs and specifications are subject to change without notice.

IMPORTANT MANUAL INFORMATION

Particularly important information is distinguished in this manual by the following notations.

	<p>This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.</p>
	<p>A WARNING indicates a hazardous situation which, if not avoided, could result in death or serious injury.</p>
	<p>A NOTICE indicates special precautions that must be taken to avoid damage to the vehicle or other property.</p>
<p>TIP</p>	<p>A TIP provides key information to make procedures easier or clearer.</p>

SYMBOLS

The following symbols are used in this manual for easier understanding.

TIP

The following symbols are not relevant to every vehicle.





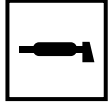



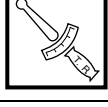





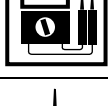





SYMBOL	DEFINITION	SYMBOL	DEFINITION
	Serviceable with engine mounted		Gear oil
	Filling fluid		Molybdenum disulfide oil
	Lubricant		Brake fluid
	Special tool		Wheel bearing grease
	Tightening torque		Lithium-soap-based grease
	Wear limit, clearance		Molybdenum disulfide grease
	Engine speed		Silicone grease
	Electrical data		YAMAHA GREASE "F"
	Engine oil		Apply locking agent (LOCTITE®).
	Silicone fluid		Replace the part with a new one.

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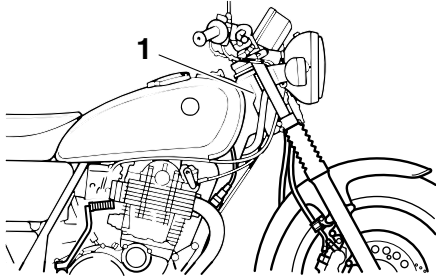
EAS20130

IDENTIFICATION

EAS20140

VEHICLE IDENTIFICATION NUMBER

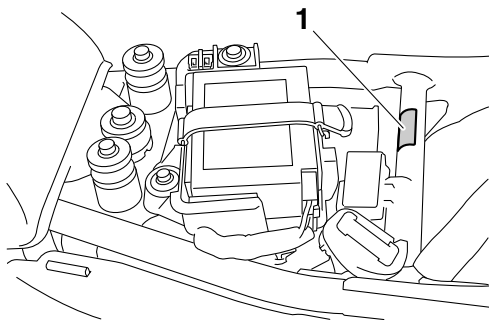
The vehicle identification number "1" is stamped into the right side of the steering head pipe.



EAS20150

MODEL LABEL

The model label "1" is affixed to the frame under the rider seat. This information will be needed to order spare parts.



EAS20170

FEATURES

EAS2RD1001

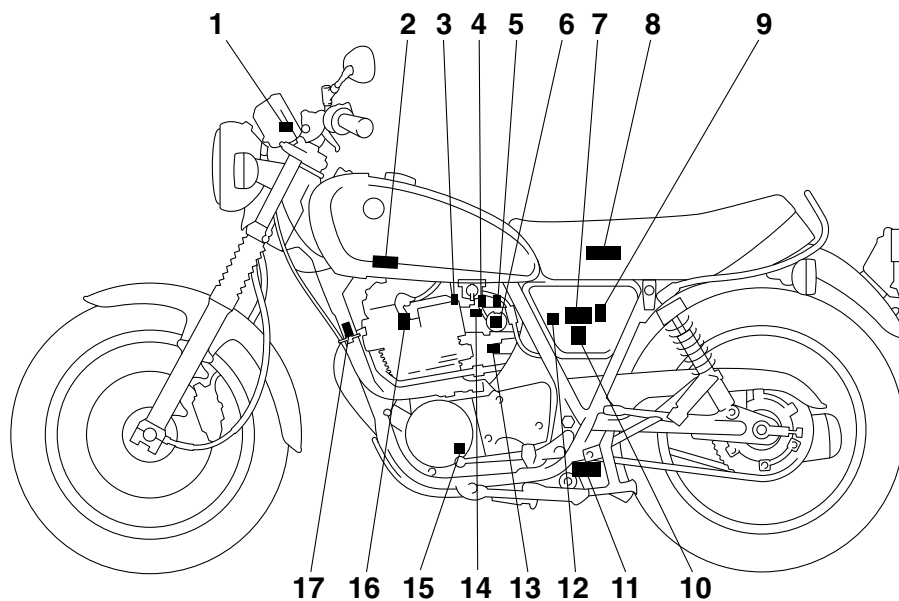
OUTLINE OF THE FI SYSTEM

The main function of a fuel supply system is to provide fuel to the combustion chamber at the optimum air-fuel ratio in accordance with the engine operating conditions and the atmospheric temperature. In the conventional carburetor system, the air-fuel ratio of the mixture that is supplied to the combustion chamber is created by the volume of the intake air and the fuel that is metered by the jet used in the respective carburetor.

Despite the same volume of intake air, the fuel volume requirement varies by the engine operating conditions, such as acceleration, deceleration, or operating under a heavy load. Carburetors that meter the fuel through the use of jets have been provided with various auxiliary devices, so that an optimum air-fuel ratio can be achieved to accommodate the constant changes in the operating conditions of the engine.

As the requirements for the engine to deliver more performance and cleaner exhaust gases increase, it becomes necessary to control the air-fuel ratio in a more precise and finely tuned manner. To accommodate this need, this model has adopted an electronically controlled fuel injection (FI) system, in place of the conventional carburetor system. This system can achieve an optimum air-fuel ratio required by the engine at all times by using a microprocessor that regulates the fuel injection volume according to the engine operating conditions detected by various sensors.

The adoption of the FI system has resulted in a highly precise fuel supply, improved engine response, better fuel economy, and reduced exhaust emissions.



- | | |
|-----------------------------------|--------------------------------|
| 1. Engine trouble warning light | 14. Intake air pressure sensor |
| 2. Ignition coil | 15. Crankshaft position sensor |
| 3. Engine temperature sensor | 16. Spark plug |
| 4. ISC (idle speed control) valve | 17. O ₂ sensor |
| 5. Fuel injector | |
| 6. Throttle position sensor | |
| 7. ECU (engine control unit) | |
| 8. Battery | |
| 9. Lean angle sensor | |
| 10. Fuel pump | |
| 11. Catalytic converter | |
| 12. Intake air temperature sensor | |
| 13. Air induction system solenoid | |

EAS2RD1003

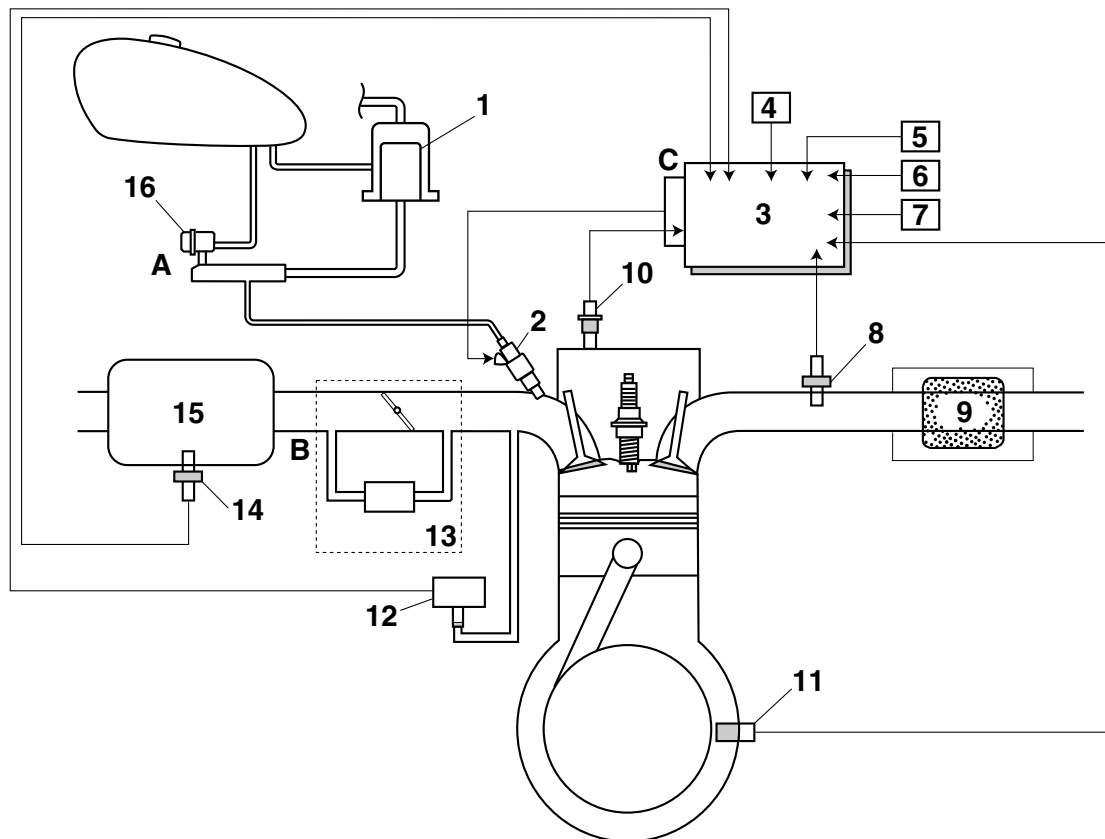
FI SYSTEM

The fuel pump delivers fuel to the fuel injector via the fuel filter. The pressure regulator maintains the fuel pressure that is applied to the fuel injector at a certain level. Accordingly, when the energizing signal from the ECU energizes the fuel injector, the fuel passage opens, causing the fuel to be injected into the intake manifold only during the time the passage remain open.

Therefore, the longer the length of time the fuel injector is energized (injection duration), the greater the volume of fuel that is supplied. Conversely, the shorter the length of time the fuel injector is energized (injection duration), the lesser the volume of fuel that is supplied.

The injection duration and the injection timing are controlled by the ECU. Signals that are input from the throttle position sensor, ISC (idle speed control) valve, engine temperature sensor, lean angle sensor, crankshaft position sensor, intake air pressure sensor, intake air temperature sensor, speed sensor and O₂ sensor enable the ECU to determine the injection duration. The injection timing is determined through the signals from the crankshaft position sensor. As a result, the volume of fuel that is required by the engine can be supplied at all times in accordance with the driving conditions.

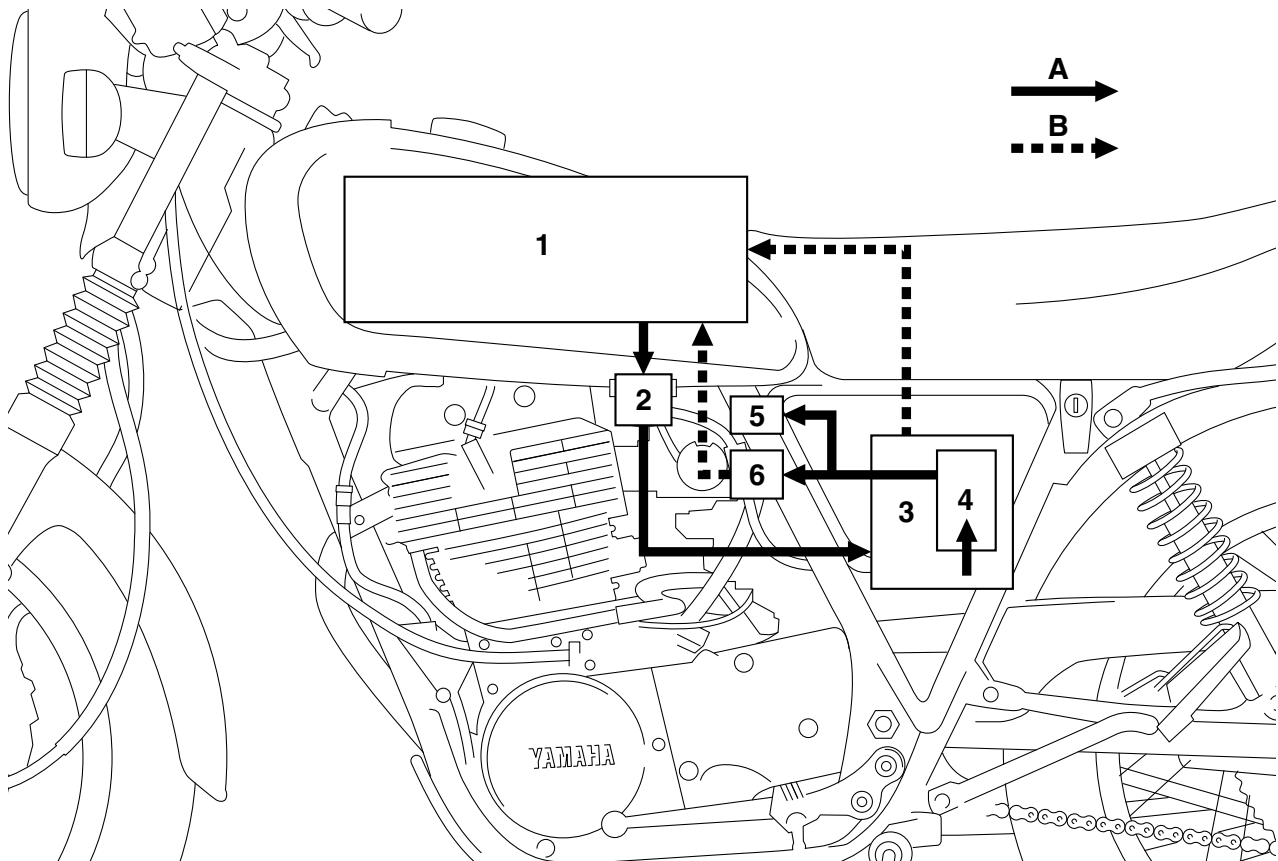
Illustration is for reference only.



- | | |
|-----------------------------------|-----------------------------------|
| 1. Fuel pump | 14. Intake air temperature sensor |
| 2. Fuel injector | 15. Air filter case |
| 3. ECU (engine control unit) | 16. Pressure regulator |
| 4. Throttle position sensor | A. Fuel system |
| 5. Lean angle sensor | B. Air system |
| 6. ISC (idle speed control) valve | C. Control system |
| 7. Speed sensor | |
| 8. O ₂ sensor | |
| 9. Catalytic converter | |
| 10. Engine temperature sensor | |
| 11. Crankshaft position sensor | |
| 12. Intake air pressure sensor | |
| 13. Throttle body | |

EAS2RD1002

FUEL LINE CHART



1. Fuel tank
2. Fuel cock
3. Fuel pump case
4. Fuel pump
5. Fuel injector
6. Pressure regulator

- A. Feeding side
B. Return side

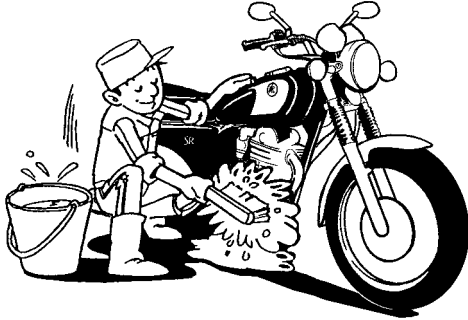
EAS20180

IMPORTANT INFORMATION

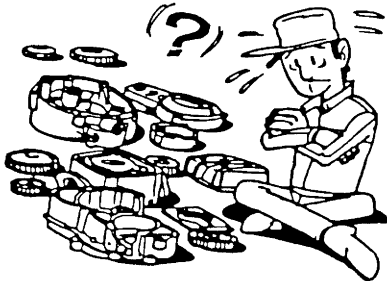
EAS20190

PREPARATION FOR REMOVAL AND DISASSEMBLY

1. Before removal and disassembly, remove all dirt, mud, dust and foreign material.



2. Use only the proper tools and cleaning equipment. Refer to "SPECIAL TOOLS" on page 1-12.
3. When disassembling, always keep mated parts together. This includes gears, cylinders, pistons and other parts that have been "mated" through normal wear. Mated parts must always be reused or replaced as an assembly.

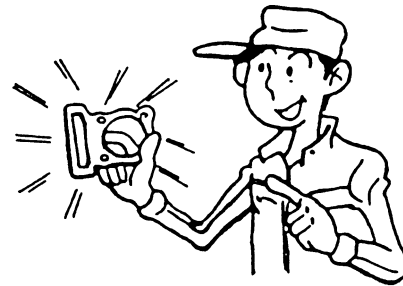


4. During disassembly, clean all of the parts and place them in trays in the order of disassembly. This will speed up assembly and allow for the correct installation of all parts.
5. Keep all parts away from any source of fire.

EAS20200

REPLACEMENT PARTS

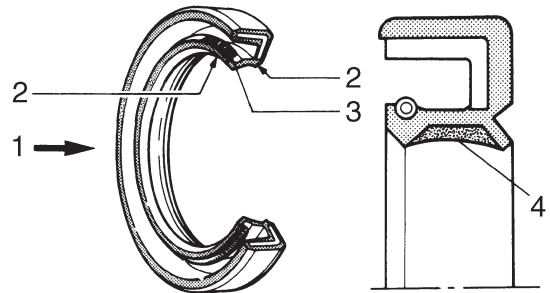
Use only genuine Yamaha parts for all replacements. Use oil and grease recommended by Yamaha for all lubrication jobs. Other brands may be similar in function and appearance, but inferior in quality.



EAS20210

GASKETS, OIL SEALS AND O-RINGS

1. When overhauling the engine, replace all gaskets, seals and O-rings. All gasket surfaces, oil seal lips and O-rings must be cleaned.
2. During reassembly, properly oil all mating parts and bearings and lubricate the oil seal lips with grease.

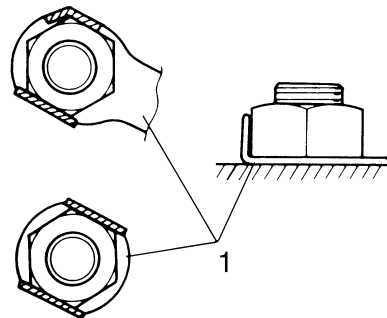


1. Oil
2. Lip
3. Spring
4. Grease

EAS20220

LOCK WASHERS/PLATES AND COTTER PINS

After removal, replace all lock washers/plates "1" and cotter pins. After the bolt or nut has been tightened to specification, bend the lock tabs along a flat of the bolt or nut.



EAS20231

BEARINGS AND OIL SEALS

Install bearings "1" and oil seals "2" so that the

IMPORTANT INFORMATION

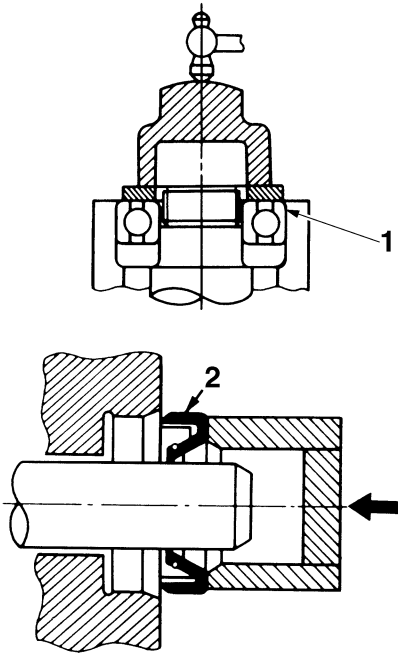
manufacturer marks or numbers are visible. When installing oil seals, lubricate the oil seal lips with a light coat of lithium-soap-based grease. Oil bearings liberally when installing, if appropriate.

ECA13300

NOTICE

Do not spin the bearing with compressed air because this will damage the bearing surfaces.

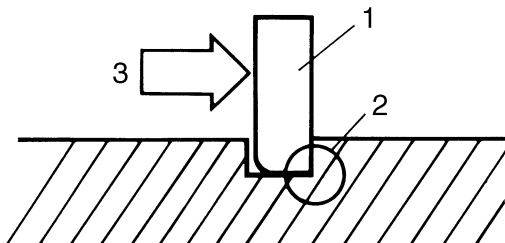
low any items other than the specified one to contact the parts.



EAS20240

CIRCLIPS

Before reassembly, check all circlips carefully and replace damaged or distorted circlips. Always replace piston pin clips after one use. When installing a circlip "1", make sure the sharp-edged corner "2" is positioned opposite the thrust "3" that the circlip receives.



EAS32080

RUBBER PARTS

Check rubber parts for deterioration during inspection. Some of the rubber parts are sensitive to gasoline, flammable oil, grease, etc. Do not al-

EAS30380

BASIC SERVICE INFORMATION

EAS30390

QUICK FASTENERS

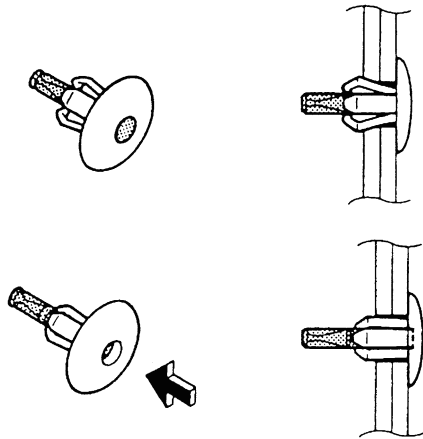
Rivet type

1. Remove:

- Quick fastener

TIP

To remove the quick fastener, push its pin with a screwdriver, then pull the fastener out.

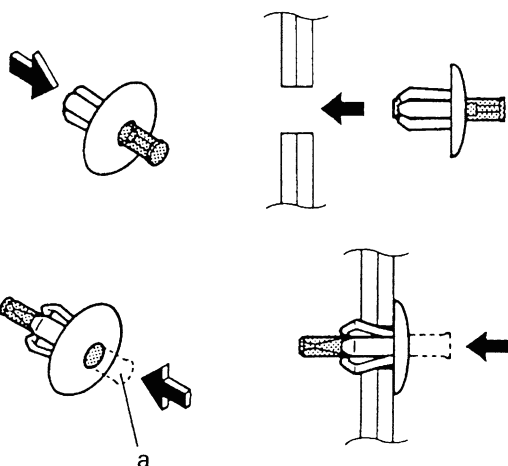


2. Install:

- Quick fastener

TIP

To install the quick fastener, push its pin so that it protrudes from the fastener head, then insert the fastener into the part to be secured and push the pin "a" in with a screwdriver. Make sure that the pin is flush with the fastener's head.



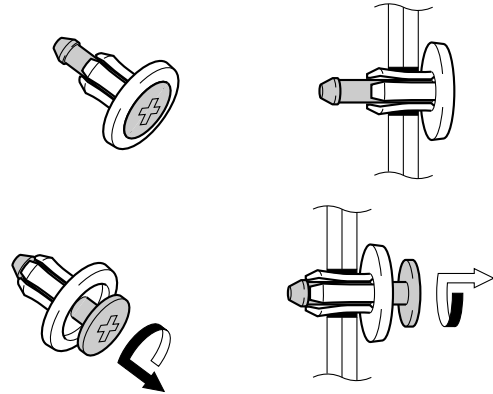
Screw type

1. Remove:

- Quick fastener

TIP

To remove the quick fastener, loosen the screw with a screwdriver, then pull the fastener out.

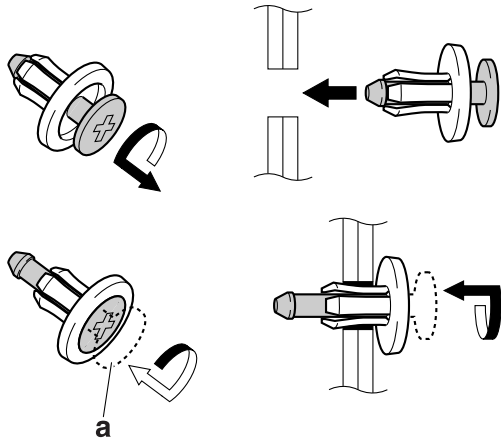


2. Install:

- Quick fastener

TIP

To install the quick fastener, insert the fastener into the part to be secured and tighten the screw "a".



EAS30401

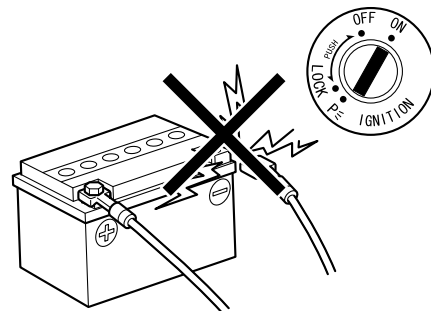
ELECTRICAL SYSTEM

Electrical parts handling

ECA16600

NOTICE

Never disconnect a battery lead while the engine is running; otherwise, the electrical components could be damaged.



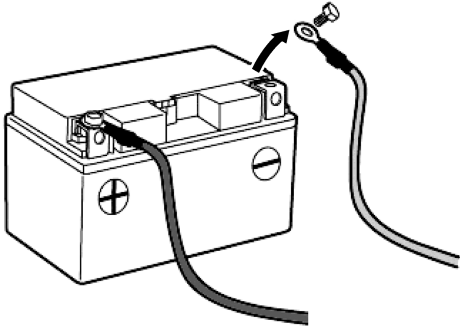
ECA16750

NOTICE

When disconnecting the battery leads from

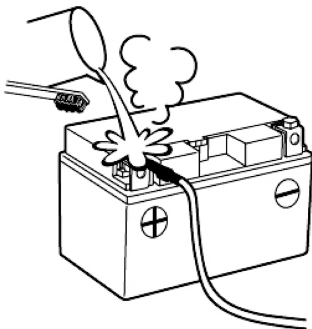
BASIC SERVICE INFORMATION

the battery, be sure to disconnect the negative battery lead first, then the positive battery lead. If a tool or similar item contacts the vehicle while only the negative battery lead is connected, a spark could be generated, which is extremely dangerous.



TIP

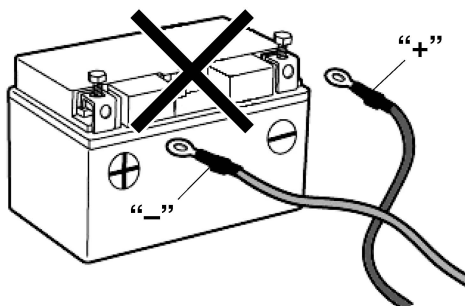
If a battery lead is difficult to disconnect due to rust on the battery terminal, remove the rust using hot water.



ECA16760

NOTICE

Be sure to connect the battery leads to the correct battery terminals. Reversing the battery lead connections could damage the electrical components.

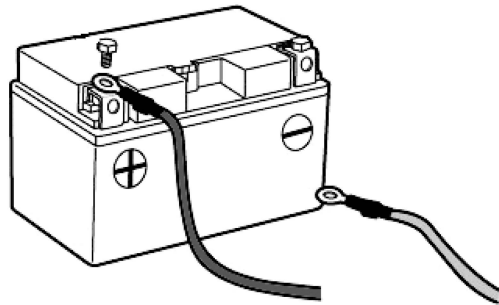


ECA16770

NOTICE

When connecting the battery leads to the battery, be sure to connect the positive battery lead first, then the negative battery lead. If a tool or similar item contacts the vehicle

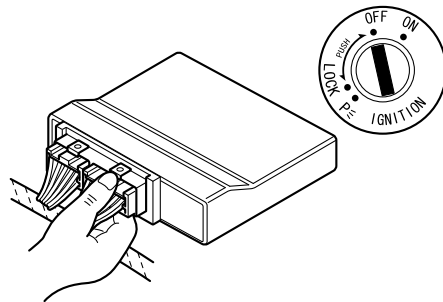
while only the negative battery lead is connected, a spark could be generated, which is extremely dangerous.



ECA16610

NOTICE

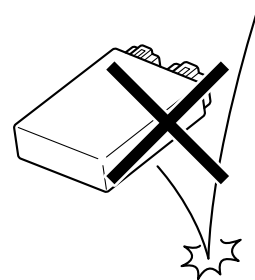
Turn the main switch to "OFF" before disconnecting or connecting an electrical component.



ECA16620

NOTICE

Handle electrical components with special care, and do not subject them to strong shocks.

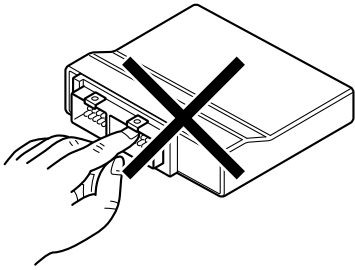


ECA16630

NOTICE

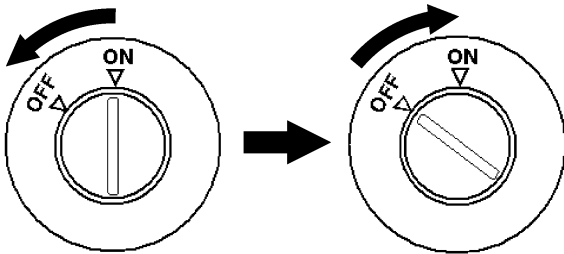
Electrical components are very sensitive to and can be damaged by static electricity. Therefore, never touch the terminals and be sure to keep the contacts clean.

BASIC SERVICE INFORMATION



TIP

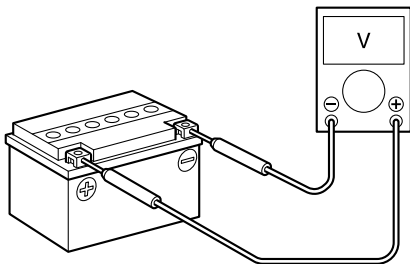
When resetting the ECU by turning the main switch to “OFF”, be sure to wait approximately 5 seconds before turning the main switch back to “ON”.



Checking the electrical system

TIP

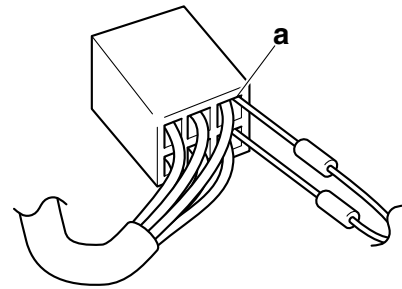
Before checking the electrical system, make sure that the battery voltage is at least 12 V.



ECA14371

NOTICE

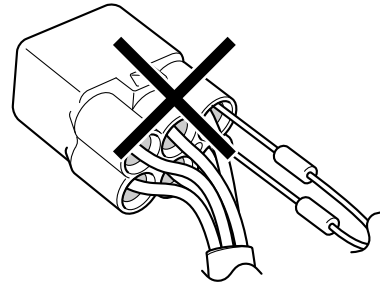
Never insert the tester probes into the coupler terminal slots. Always insert the probes from the opposite end “a” of the coupler, taking care not to loosen or damage the leads.



ECA16640

NOTICE

For waterproof couplers, never insert the tester probes directly into the coupler. When performing any checks using a waterproof coupler, use the specified test harness or a suitable commercially available test harness.



Checking the connections

Check the leads, couplers, and connectors for stains, rust, moisture, etc.

1. Disconnect:

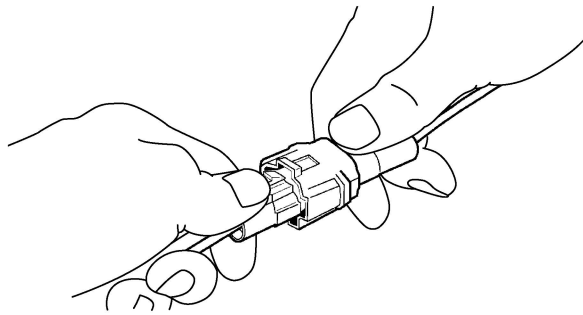
- Lead
- Coupler
- Connector

ECA16780

NOTICE

- When disconnecting a coupler, release the coupler lock, hold both sections of the coupler securely, and then disconnect the coupler.
- There are many types of coupler locks; therefore, be sure to check the type of coupler lock before disconnecting the coupler.

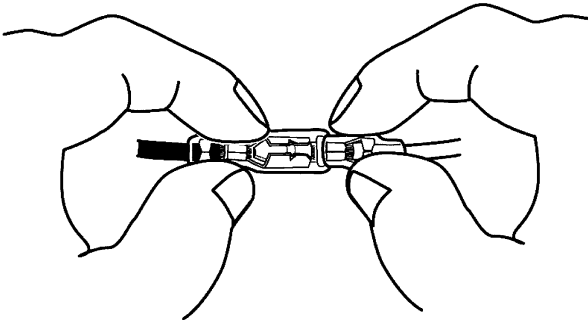
BASIC SERVICE INFORMATION



ECA16790

NOTICE

When disconnecting a connector, do not pull the leads. Hold both sections of the connector securely, and then disconnect the connector.

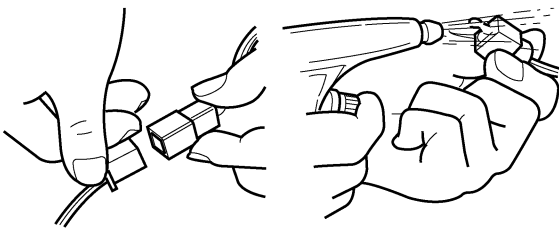


2. Check:

- Lead
- Coupler
- Connector

Moisture → Dry with an air blower.

Rust/stains → Connect and disconnect several times.



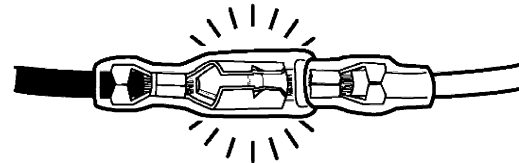
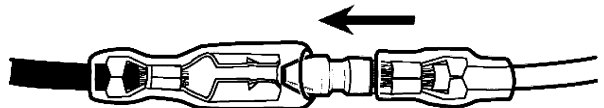
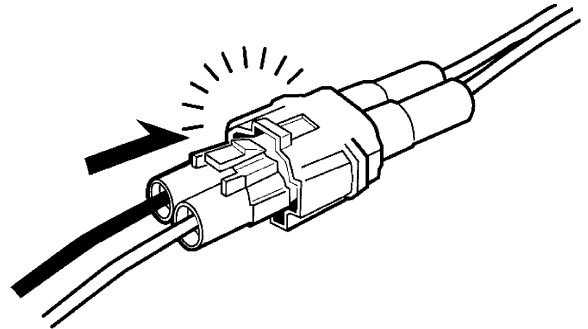
3. Connect:

- Lead
- Coupler
- Connector

TIP

- When connecting a coupler or connector, push both sections of the coupler or connector together until they are connected securely.

- Make sure all connections are tight.



4. Check:

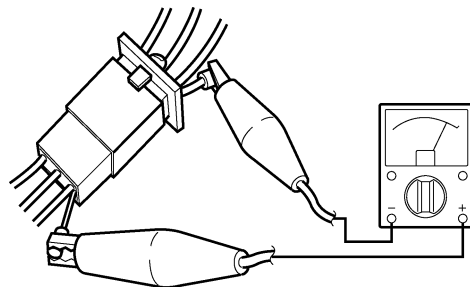
- Continuity (with the pocket tester)

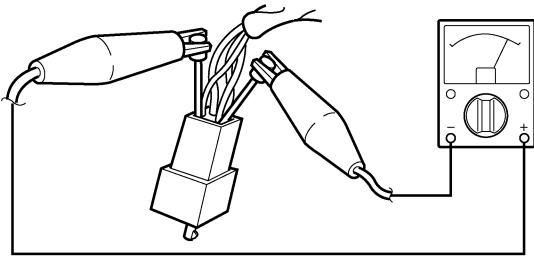


Pocket tester
90890-03112
Analog pocket tester
YU-03112-C

TIP

- If there is no continuity, clean the terminals.
- When checking the wire harness, perform steps (1) to (3).
- As a quick remedy, use a contact revitalizer available at most part stores.





5. Check:

- Resistance



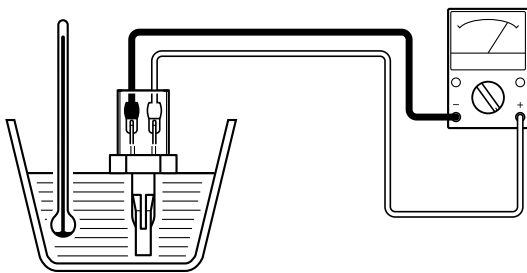
Pocket tester
90890-03112
Analog pocket tester
YU-03112-C

TIP

The resistance values shown were obtained at the standard measuring temperature of 20 °C (68 °F). If the measuring temperature is not 20 °C (68 °F), the specified measuring conditions will be shown.



Intake air temperature sensor re-
sistance
5.40–6.60 k Ω at 0 °C (32 °F)
290–390 Ω at 80 °C (176 °F)



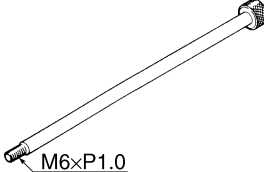
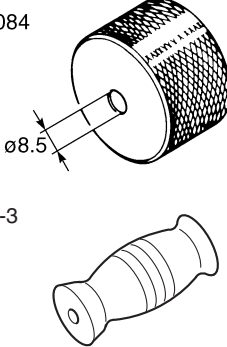
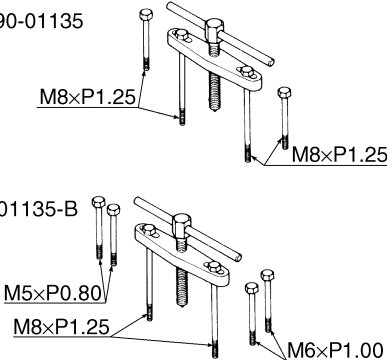
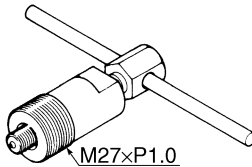
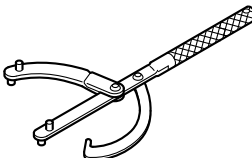
EAS20260

SPECIAL TOOLS

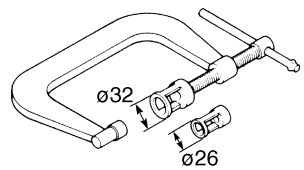
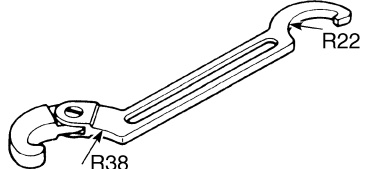
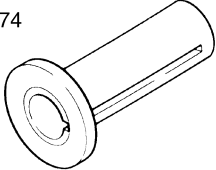
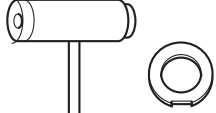
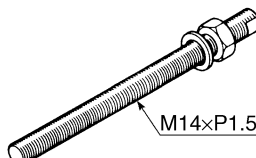
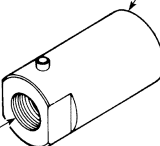
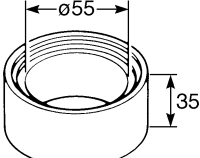
The following special tools are necessary for complete and accurate tune-up and assembly. Use only the appropriate special tools as this will help prevent damage caused by the use of inappropriate tools or improvised techniques. Special tools, part numbers or both may differ depending on the country. When placing an order, refer to the list provided below to avoid any mistakes.

TIP

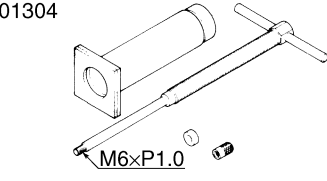
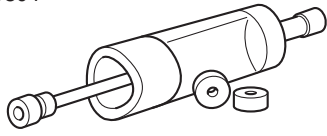
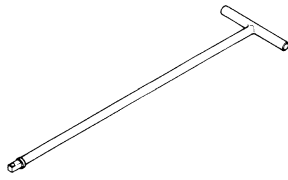
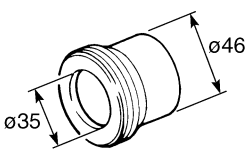
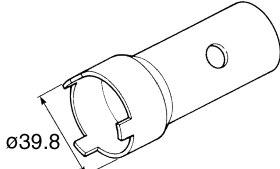
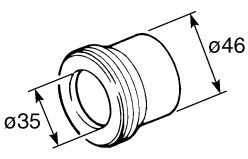
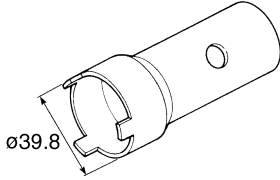
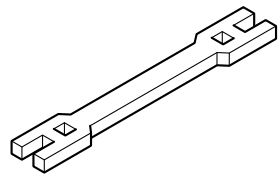
- For U.S.A. and Canada, use part number starting with "YM-", "YU-", or "ACC-".
- For others, use part number starting with "90890-".

Tool name/Tool No.	Illustration	Reference pages
Slide hammer bolt 90890-01083 Slide hammer bolt 6 mm YU-01083-1		5-14, 5-15
Weight 90890-01084 Weight YU-01083-3		5-14
Crankcase separating tool 90890-01135 Crankcase separator YU-01135-B		5-50, 5-53
Flywheel puller 90890-01189 Flywheel puller YM-01189		5-47
Rotor holding tool 90890-01235 Universal magneto and rotor holder YU-01235		5-7, 5-11, 5-47

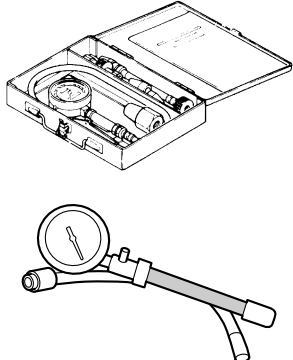
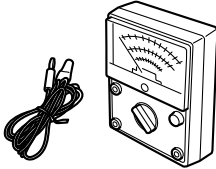
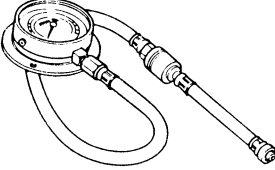
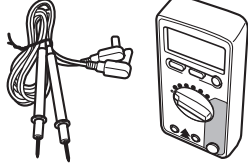
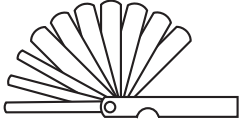
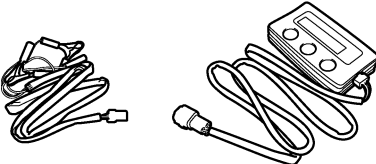
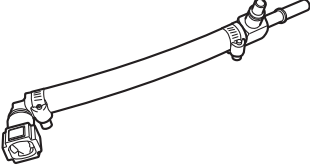
SPECIAL TOOLS

Tool name/Tool No.	Illustration	Reference pages
Valve spring compressor 90890-01253		5-17, 5-22
Ring nut wrench 90890-01268 Spanner wrench YU-01268		4-46
Crankshaft installer pot 90890-01274 Installing pot YU-90058	<p data-bbox="750 739 877 772">90890-01274</p>  <p data-bbox="750 940 957 974">YU-90058/YU-90059</p> 	5-54
Crankshaft installer bolt 90890-01275 Bolt YU-90060	 <p data-bbox="989 1232 1093 1265">M14xP1.5</p>	5-54
Adapter (M12) 90890-01278 Adapter #3 YU-90063	 <p data-bbox="1029 1332 1149 1355">M12xP1.25</p> <p data-bbox="782 1467 885 1489">M14xP1.5</p>	5-54
Spacer 90890-01288	 <p data-bbox="885 1534 981 1556"><math>\phi 55</math></p> <p data-bbox="1029 1612 1061 1646">35</p>	5-54

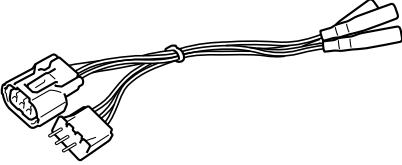
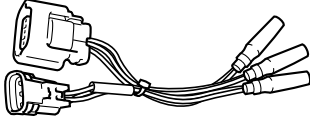
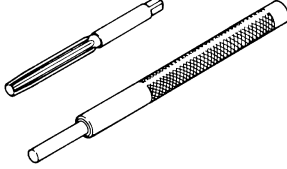
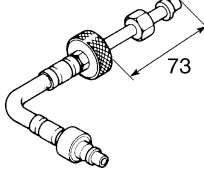
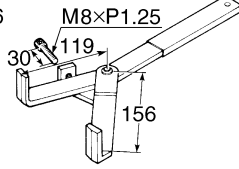
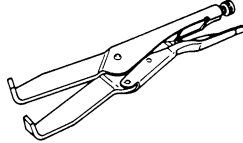
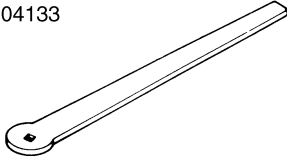
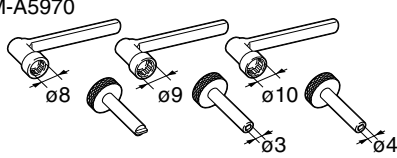
SPECIAL TOOLS

Tool name/Tool No.	Illustration	Reference pages
Piston pin puller set 90890-01304 Piston pin puller YU-01304	90890-01304  YU-01304 	5-24
T-handle 90890-01326 T-handle 3/8" drive 60 cm long YM-01326		4-39, 4-41
Fork seal driver weight 90890-01367 Replacement hammer YM-A9409-7	90890-01367  YM-A9409-7/YM-A5142-4 	4-41, 4-42
Fork seal driver attachment (ø35) 90890-01369 Replacement 35 mm YM-A9409-5		4-41
Steering nut wrench 90890-01385		3-19
Spoke nipple wrench (8-9) 90890-01522 Spoke nipple wrench (8-9) YM-01522		3-15

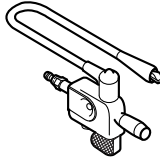
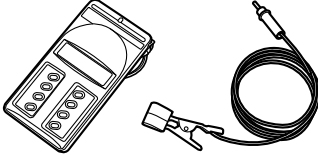
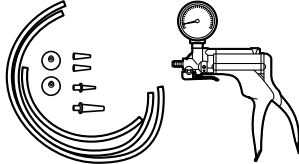
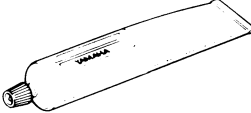
SPECIAL TOOLS

Tool name/Tool No.	Illustration	Reference pages
Compression gauge 90890-03081 Engine compression tester YU-33223		5-1
Pocket tester 90890-03112 Analog pocket tester YU-03112-C		1-10, 1-11, 7-57, 7-58, 7-59, 7-63, 7-64, 7-65, 7-66, 7-67, 7-68, 7-69, 7-70, 7-71, 7-72
Pressure gauge 90890-03153 Pressure gauge YU-03153		6-12
Digital circuit tester 90890-03174 Model 88 Multimeter with tachometer YU-A1927		7-71
Thickness gauge 90890-03180 Feeler gauge set YU-26900-9		3-6
FI diagnostic tool 90890-03182 FI diagnostic tool YU-03182		3-7, 6-13, 7-25
Fuel pressure adapter 90890-03186 Fuel pressure adapter YM-03186		6-12

SPECIAL TOOLS

Tool name/Tool No.	Illustration	Reference pages
Test harness S– pressure sensor 5S7 (3P) 90890-03211 Test harness S– pressure sensor 5S7 (3P) YU-03211		7-71
Test harness– lean angle sensor (3P) 90890-03213 Test harness– lean angle sensor (3P) YU-03213		7-67
Valve guide remover & installer set (ø8.0) 90890-04014 Valve guide remover (8.0 mm) YM-01200 Valve guide reamer (8.0 mm) YM-01211		5-18
Extension 90890-04082		5-1
Universal clutch holder 90890-04086 Universal clutch holder YM-91042	 	5-31, 5-33
Tappet adjusting tool (4 mm) 90890-04133 Six piece tappet set YM-A5970	 	3-6

SPECIAL TOOLS

Tool name/Tool No.	Illustration	Reference pages
Ignition checker 90890-06754 Oppama pet-4000 spark checker YM-34487		7-66
Digital tachometer 90890-06760 Digital tachometer YU-39951-B		3-7
Vacuum/pressure pump gauge set 90890-06945 Pressure/vacuum tester YB-35956-B		6-12
Yamaha bond No. 1215 90890-85505 (Three bond No.1215®)		5-11, 5-50

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GENERAL SPECIFICATIONS

EAS20280

GENERAL SPECIFICATIONS

Model

Model	2RD1 (EUR) 2RD4 (AUS)
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Dimensions

Overall length	2085 mm (82.1 in)
Overall width	750 mm (29.5 in)
Overall height	1095 mm (43.1 in)
Seat height	785 mm (30.9 in)
Wheelbase	1410 mm (55.5 in)
Ground clearance	130 mm (5.12 in)
Minimum turning radius	2400 mm (94.5 in)

Weight

Curb weight	174 kg (384 lb)
Maximum load	150 kg (331 lb)

ENGINE SPECIFICATIONS

EAS20290

ENGINE SPECIFICATIONS

Engine

Engine type	Air cooled 4-stroke, SOHC
Displacement	399 cm ³
Cylinder arrangement	Single cylinder
Bore × stroke	87.0 × 67.2 mm (3.43 × 2.65 in)
Compression ratio	8.50 : 1
Standard compression pressure (at sea level)	1050 kPa/700 r/min (10.5 kgf/cm ² /700 r/min, 149.3 psi/700 r/min)
Minimum–maximum	910–1180 kPa/700 r/min (9.1–11.8 kgf/cm ² /700 r/min, 129.4–167.8 psi/700 r/min)
Starting system	Kickstarter

Fuel

Recommended fuel	Regular unleaded gasoline (Gasohol (E10) acceptable)
Fuel tank capacity	12.0 L (3.17 US gal, 2.64 Imp.gal)
Fuel reserve amount	2.2 L (0.58 US gal, 0.48 Imp.gal)

Engine oil

Recommended brand	YAMALUBE
Type	SAE 10W-30, 10W-40, 10W-50, 15W-40, 20W-40 or 20W-50
Recommended engine oil grade	API service SG type or higher, JASO standard MA
Lubrication system	Dry sump
Engine oil quantity	
Quantity (disassembled)	2.40 L (2.54 US qt, 2.11 Imp.qt)
Without oil filter element replacement	2.00 L (2.11 US qt, 1.76 Imp.qt)
With oil filter element replacement	2.10 L (2.22 US qt, 1.85 Imp.qt)

Oil filter

Oil filter type	Paper
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Oil pump

Oil pump type	Trochoid
Inner-rotor-to-outer-rotor-tip clearance	0.070–0.120 mm (0.0028–0.0047 in)
Limit	0.20 mm (0.0079 in)
Outer-rotor-to-oil-pump-housing clearance	0.09–0.15 mm (0.0035–0.0059 in)
Limit	0.22 mm (0.0087 in)
Oil-pump-housing-to-inner-and-outer-rotor clearance	0.03–0.08 mm (0.0012–0.0032 in)
Limit	0.15 mm (0.0059 in)
Bypass valve opening pressure	40.0–80.0 kPa (0.40–0.80 kgf/cm ² , 5.8–11.6 psi)

Spark plug(s)

Manufacturer/model	NGK/BPR6ES
Spark plug gap	0.7–0.8 mm (0.028–0.031 in)

Cylinder head

Combustion chamber volume	63.60–65.60 cm ³ (3.88–4.00 cu.in)
Warpage limit	0.03 mm (0.0012 in)

ENGINE SPECIFICATIONS

Camshaft

Drive system	Chain drive (right)
Camshaft lobe dimensions	
Lobe height (Intake)	38.860–38.960 mm (1.5299–1.5339 in)
Limit	38.850 mm (1.5295 in)
Base circle diameter (Intake)	32.170–32.270 mm (1.2665–1.2705 in)
Limit	32.160 mm (1.2661 in)
Lobe height (Exhaust)	38.890–38.990 mm (1.5311–1.5350 in)
Limit	38.880 mm (1.5307 in)
Base circle diameter (Exhaust)	32.210–32.310 mm (1.2681–1.2720 in)
Limit	32.200 mm (1.2677 in)
Camshaft runout limit	0.010 mm (0.0004 in)

Timing chain

Tensioning system	Manual
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Rocker arm/rocker arm shaft

Rocker arm inside diameter	12.000–12.018 mm (0.4724–0.4731 in)
Limit	12.033 mm (0.4737 in)
Rocker arm shaft outside diameter	11.985–11.991 mm (0.4718–0.4721 in)
Limit	11.954 mm (0.4706 in)
Rocker-arm-to-rocker-arm-shaft clearance	0.009–0.033 mm (0.0004–0.0013 in)

Valve, valve seat, valve guide

Valve clearance (cold)	
Intake	0.07–0.12 mm (0.0028–0.0047 in)
Exhaust	0.12–0.17 mm (0.0047–0.0067 in)
Valve dimensions	
Valve head diameter (intake)	47.00–47.20 mm (1.8504–1.8583 in)
Valve head diameter (exhaust)	39.00–39.20 mm (1.5354–1.5433 in)
Valve seat contact width (intake)	1.30 mm (0.0512 in)
Limit	1.6 mm (0.06 in)
Valve seat contact width (exhaust)	1.30 mm (0.0512 in)
Limit	1.6 mm (0.06 in)
Valve stem diameter (intake)	7.975–7.990 mm (0.3140–0.3146 in)
Limit	7.945 mm (0.3128 in)
Valve stem diameter (exhaust)	7.960–7.975 mm (0.3134–0.3140 in)
Limit	7.930 mm (0.3122 in)
Valve guide inside diameter (intake)	8.010–8.019 mm (0.3154–0.3157 in)
Limit	8.057 mm (0.3172 in)
Valve guide inside diameter (exhaust)	8.010–8.019 mm (0.3154–0.3157 in)
Limit	8.057 mm (0.3172 in)
Valve-stem-to-valve-guide clearance (intake)	0.020–0.044 mm (0.0008–0.0017 in)
Limit	0.080 mm (0.0032 in)
Valve-stem-to-valve-guide clearance (exhaust)	0.035–0.059 mm (0.0014–0.0023 in)
Limit	0.100 mm (0.0039 in)
Valve stem runout	0.030 mm (0.0012 in)

Valve spring

Inner spring	
Free length (intake)	45.30 mm (1.78 in)
Limit	43.00 mm (1.69 in)
Free length (exhaust)	45.30 mm (1.78 in)

ENGINE SPECIFICATIONS

Limit	43.00 mm (1.69 in)
Installed length (intake)	38.00 mm (1.50 in)
Installed length (exhaust)	38.00 mm (1.50 in)
Spring rate K1 (intake)	16.40 N/mm (1.67 kgf/mm, 93.64 lbf/in)
Spring rate K2 (intake)	20.80 N/mm (2.12 kgf/mm, 118.77 lbf/in)
Spring rate K1 (exhaust)	16.40 N/mm (1.67 kgf/mm, 93.64 lbf/in)
Spring rate K2 (exhaust)	20.80 N/mm (2.12 kgf/mm, 118.77 lbf/in)
Installed compression spring force (intake)	119.64 N (12.20 kgf, 26.90 lbf)
Installed compression spring force (exhaust)	119.64 N (12.20 kgf, 26.90 lbf)
Spring tilt (intake)	1.9 mm (0.07 in)
Spring tilt (exhaust)	1.9 mm (0.07 in)
Winding direction (intake)	Counterclockwise
Winding direction (exhaust)	Counterclockwise
Outer spring	
Free length (intake)	44.60 mm (1.76 in)
Limit	42.00 mm (1.65 in)
Free length (exhaust)	44.60 mm (1.76 in)
Limit	42.00 mm (1.65 in)
Installed length (intake)	40.00 mm (1.57 in)
Installed length (exhaust)	40.00 mm (1.57 in)
Spring rate K1 (intake)	35.30 N/mm (3.60 kgf/mm, 201.56 lbf/in)
Spring rate K2 (intake)	45.40 N/mm (4.63 kgf/mm, 259.23 lbf/in)
Spring rate K1 (exhaust)	35.30 N/mm (3.60 kgf/mm, 201.56 lbf/in)
Spring rate K2 (exhaust)	45.40 N/mm (4.63 kgf/mm, 259.23 lbf/in)
Installed compression spring force (intake)	160.83 N (16.40 kgf, 36.15 lbf)
Installed compression spring force (exhaust)	160.83 N (16.40 kgf, 36.15 lbf)
Spring tilt (intake)	1.9 mm (0.07 in)
Spring tilt (exhaust)	1.9 mm (0.07 in)
Winding direction (intake)	Clockwise
Winding direction (exhaust)	Clockwise

Cylinder

Bore	87.000–87.015 mm (3.4252–3.4258 in)
Taper limit	0.050 mm (0.0020 in)
Out of round limit	0.010 mm (0.0004 in)

Piston

Piston-to-cylinder clearance	0.049–0.055 mm (0.0019–0.0022 in)
Diameter	86.948–86.963 mm (3.4231–3.4237 in)
Measuring point (from piston skirt bottom)	7.2 mm (0.28 in)
Piston pin bore inside diameter	20.004–20.015 mm (0.7876–0.7880 in)
Limit	20.045 mm (0.7892 in)
Piston pin outside diameter	19.995–20.000 mm (0.7872–0.7874 in)
Limit	19.975 mm (0.7864 in)
Piston-pin-to-piston-pin-bore clearance	0.004–0.020 mm (0.0002–0.0008 in)
Limit	0.070 mm (0.0028 in)

Piston ring

Top ring	
Ring type	Barrel
End gap (installed)	0.30–0.50 mm (0.0118–0.0197 in)
Limit	0.80 mm (0.0315 in)
Ring side clearance	0.030–0.080 mm (0.0012–0.0032 in)
Limit	0.150 mm (0.0059 in)

ENGINE SPECIFICATIONS

2nd ring	
Ring type	Taper
End gap (installed)	0.30–0.50 mm (0.0118–0.0197 in)
Limit	0.80 mm (0.0315 in)
Ring side clearance	0.030–0.070 mm (0.0012–0.0028 in)
Limit	0.150 mm (0.0059 in)
Oil ring	
End gap (installed)	0.20–0.90 mm (0.0079–0.0354 in)

Crankshaft

Crank assembly width	74.95–75.00 mm (2.951–2.953 in)
Runout limit	0.030 mm (0.0012 in)
Big end side clearance	0.350–0.650 mm (0.0138–0.0256 in)

Clutch

Clutch type	Wet, multiple-disc
Clutch release method	Inner push, cam push
Clutch lever free play	5.0–10.0 mm (0.20–0.39 in)
Friction plate thickness	2.74–2.86 mm (0.108–0.113 in)
Wear limit	2.50 mm (0.098 in)
Plate quantity	8 pcs
Clutch plate thickness	1.10–1.30 mm (0.043–0.051 in)
Plate quantity	7 pcs
Warping limit	0.05 mm (0.002 in)
Clutch spring free length	34.90 mm (1.37 in)
Limit	33.16 mm (1.31 in)
Spring quantity	6 pcs
Push rod bending limit	0.20 mm (0.008 in)

Transmission

Transmission type	Constant mesh 5-speed
Primary reduction ratio	2.567 (77/30)
Secondary reduction ratio	2.947 (56/19)
Final drive	Chain
Operation	Left foot operation
Gear ratio	
1st	2.357 (33/14)
2nd	1.556 (28/18)
3rd	1.190 (25/21)
4th	0.917 (22/24)
5th	0.778 (21/27)
Main axle runout limit	0.08 mm (0.0032 in)
Drive axle runout limit	0.08 mm (0.0032 in)

Shifting mechanism

Shift mechanism type	Shift drum and guide bar
Shift fork thickness	4.76–4.89 mm (0.1874–0.1925 in)

Kickstarter

Kickstarter type	Ratchet
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Decompression device

Device type	Manual
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Air filter

Air filter element	Oil-coated paper element
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ENGINE SPECIFICATIONS

Fuel pump	
Pump type	Electrical
Fuel injector	
Model/quantity	4C8/1
Throttle body	
Type/quantity	34EHS/1
ID mark	2RD1 00
Throttle position sensor	
Resistance	1.75–3.25 k Ω (L-B/L)
Idling condition	
Engine idling speed	1200–1400 r/min
Plug seat temperature	170.0–190.0 °C (338.00–374.00 °F)
CO% (AI system ON)	3.00 %
Intake vacuum	26.0–32.0 kPa (195–240 mmHg, 7.7–9.4 inHg)
Oil temperature	55.0–65.0 °C (131.00–149.00 °F)
Fuel line pressure at idling	310–360 kPa (3.1–3.6 kgf/cm ² 45.0–52.2 psi)/Regulated pressure 329 kPa (3.3 kgf/cm ² 47.7 psi)
Throttle grip free play	3.0–5.0 mm (0.12–0.20 in)
Air induction system	
Solenoid resistance	20–24 Ω

CHASSIS SPECIFICATIONS

EAS20300

CHASSIS SPECIFICATIONS

Chassis

Frame type	Semi double cradle
Caster angle	27.70 °
Trail	111 mm (4.4 in)

Front wheel

Wheel type	Spoke wheel
Rim size	18 × 1.85
Rim material	Aluminum
Wheel travel	150 mm (5.9 in)
Radial wheel runout limit	1.0 mm (0.04 in)
Lateral wheel runout limit	0.5 mm (0.02 in)
Wheel axle bending limit	0.25 mm (0.01 in)

Rear wheel

Wheel type	Spoke wheel
Rim size	18 × 2.15
Rim material	Aluminum
Wheel travel	105 mm (4.1 in)
Radial wheel runout limit	1.0 mm (0.04 in)
Lateral wheel runout limit	0.5 mm (0.02 in)
Wheel axle bending limit	0.25 mm (0.01 in)

Front tire

Type	With tube
Size	90/100-18M/C 54S
Manufacturer/model	METZELER/ME77 Front
Wear limit (front)	1.5 mm (0.06 in) (AUS) 1.6 mm (0.06 in) (EUR)

Rear tire

Type	With tube
Size	110/90-18M/C 61S
Manufacturer/model	METZELER/ME77
Wear limit (rear)	1.5 mm (0.06 in) (AUS) 1.6 mm (0.06 in) (EUR)

Tire air pressure (measured on cold tires)

Loading condition	0–90 kg (0–198 lb)
Front	175 kPa (1.75 kgf/cm ² , 25 psi)
Rear	200 kPa (2.00 kgf/cm ² , 29 psi)
Loading condition	90–150 kg (198–331 lb)
Front	200 kPa (2.00 kgf/cm ² , 29 psi)
Rear	225 kPa (2.25 kgf/cm ² , 33 psi)
High-speed riding	
Front	200 kPa (2.00 kgf/cm ² , 29 psi)
Rear	225 kPa (2.25 kgf/cm ² , 33 psi)

Front brake

Type	Single disc brake
Operation	Right hand operation
Front brake lever free play	5.0–8.0 mm (0.20–0.31 in)
Front disc brake	
Disc outside diameter × thickness	298.0 × 5.0 mm (11.73 × 0.20 in)

CHASSIS SPECIFICATIONS

Brake disc thickness limit	4.5 mm (0.18 in)
Brake disc runout limit (as measured on wheel)	0.15 mm (0.0059 in)
Brake pad lining thickness (inner) Limit	6.2 mm (0.24 in) 0.8 mm (0.03 in)
Brake pad lining thickness (outer) Limit	6.2 mm (0.24 in) 0.8 mm (0.03 in)
Master cylinder inside diameter	14.00 mm (0.55 in)
Caliper cylinder inside diameter	30.10 mm (1.19 in)
Caliper cylinder inside diameter	33.30 mm (1.31 in)
Specified brake fluid	DOT 4

Rear brake

Type	Drum brake
Operation	Right foot operation
Brake pedal position	20.0 mm (0.79 in)
Brake pedal free play	20.0–30.0 mm (0.79–1.18 in)
Rear drum brake	
Drum brake type	Leading, trailing
Brake drum inside diameter	150.0 mm (5.91 in)
Limit	151.0 mm (5.94 in)
Lining thickness	4.0 mm (0.16 in)
Limit	2.0 mm (0.08 in)
Shoe spring free length	68.0 mm (2.68 in)

Steering

Steering bearing type	Angular bearing
Center to lock angle (left)	42.0 °
Center to lock angle (right)	42.0 °

Front suspension

Type	Telescopic fork
Spring/shock absorber type	Coil spring/oil damper
Front fork travel	150.0 mm (5.91 in)
Fork spring free length	492.9 mm (19.41 in)
Limit	483.0 mm (19.02 in)
Fork spring installed length	487.9 mm (19.21 in)
Spring rate K1	4.50 N/mm (0.46 kgf/mm, 25.70 lbf/in)
Spring rate K2	6.50 N/mm (0.66 kgf/mm, 37.12 lbf/in)
Spring stroke K1	0.0–85.0 mm (0.00–3.35 in)
Spring stroke K2	85.0–150.0 mm (3.35–5.91 in)
Inner tube outer diameter	35.0 mm (1.38 in)
Inner tube bending limit	0.2 mm (0.01 in)
Recommended oil	Fork oil 10W or equivalent
Quantity	204.0 cm ³ (6.90 US oz, 7.20 Imp.oz)
Level	182.0 mm (7.17 in)

Rear suspension

Type	Swingarm
Spring/shock absorber type	Coil spring/oil damper
Rear shock absorber assembly travel	80.0 mm (3.15 in)
Spring free length	206.5 mm (8.13 in)
Spring installed length	196.3 mm (7.73 in)
Spring rate K1	19.00 N/mm (1.94 kgf/mm, 108.49 lbf/in)
Spring stroke K1	0.0–80.0 mm (0.00–3.15 in)

CHASSIS SPECIFICATIONS

Spring preload adjusting positions

Minimum	1
Standard	1
Maximum	5

Swingarm

Swingarm end free play limit (radial)	1.0 mm (0.04 in)
Swingarm end free play limit (axial)	0.5 mm (0.02 in)

Drive chain

Type/manufacturer	428HVS/DAIDO
Number of links	130
Drive chain slack	30.0–40.0 mm (1.18–1.57 in)
15-link length limit	191.5 mm (7.54 in)

ELECTRICAL SPECIFICATIONS

EAS20310

ELECTRICAL SPECIFICATIONS

Voltage

System voltage 12 V

Ignition system

Ignition system TCI
Advancer type Digital
Ignition timing (B.T.D.C.) 10.0 °/1300 r/min

Engine control unit

Model/manufacture TBDFL5/DENSO

Ignition coil

Minimum ignition spark gap 6.0 mm (0.24 in)
Primary coil resistance 2.16–2.64 Ω
Secondary coil resistance 8.64–12.96 kΩ

Spark plug cap

Material Resin
Resistance 10.0 kΩ

Lean angle sensor output voltage

Less than 45° 3.6–4.5 V
More than 45° 0.7–1.4 V

AC magneto

Standard output 14.0 V, 22.3 A@5000 r/min
Stator coil resistance 0.184–0.276 Ω (W-W)

Rectifier/regulator

Regulator type Semi conductor-short circuit
Regulated voltage (DC) 14.1–14.9 V
Rectifier capacity 35.0 A

Battery

Model GT4B-5
Voltage, capacity 12 V, 2.5 Ah
Specific gravity 1.350
Manufacturer GS YUASA
Ten hour rate charging current 0.25 A

Headlight

Bulb type Halogen bulb

Bulb voltage, wattage × quantity

Headlight 12 V, 60.0 W/55.0 W × 1
Auxiliary light 12 V, 4.0 W × 1
Tail/brake light 12 V, 5.0 W/21.0 W × 1
Front turn signal light 12 V, 21.0 W × 2
Rear turn signal light 12 V, 21.0 W × 2
Meter lighting 12 V, 1.7 W × 4

Indicator light

Neutral indicator light 12 V, 1.7 W × 1
Turn signal indicator light 12 V, 1.7 W × 1
High beam indicator light 12 V, 1.7 W × 1
Fuel level warning light 12 V, 3.0 W × 1

ELECTRICAL SPECIFICATIONS

Engine trouble warning light	12 V, 1.7 W × 1
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Horn	
Horn type	Plane
Quantity	1
Maximum amperage	3.0 A
Coil resistance	1.19–1.25 Ω

Turn signal/hazard relay	
Relay type	Full transistor
Built-in, self-canceling device	No
Turn signal blinking frequency	75–95 cycles/min

Fuel sender unit	
Sender unit resistance (thermistor)	1350–1900 Ω@25 °C (1350–1900 Ω@77 °F)

Fuel injection sensor	
Crankshaft position sensor resistance	192–288 Ω
Intake air pressure sensor output voltage	1.20–4.20 V
Intake air temperature sensor resistance	290–390 Ω@80 °C (290–390 Ω@176 °F)
Engine temperature sensor resistance	210–220 Ω@100 °C (210–220 Ω@212 °F)

Fuses	
Main fuse	30.0 A
Headlight fuse	15.0 A
Signaling system fuse	15.0 A
Ignition fuse	10.0 A
Parking lighting fuse	7.5 A
Fuel injection system fuse	7.5 A
Backup fuse	7.5 A
Spare fuse	30.0 A
Spare fuse	15.0 A
Spare fuse	10.0 A
Spare fuse	7.5 A

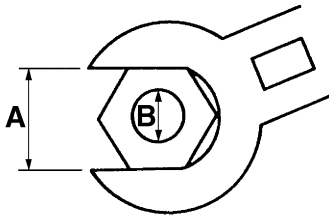
EAS20320

TIGHTENING TORQUES

EAS20331

GENERAL TIGHTENING TORQUE SPECIFICATIONS

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. Distance between flats
- B. Outside thread diameter

A (nut)	B (bolt)	General tightening torques		
		Nm	m·kgf	ft·lbf
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	94


TIGHTENING TORQUES

EAS20340









ENGINE TIGHTENING TORQUES

Item	Thread size	Q'ty	Tightening torque	Remarks
Cylinder head cover bolt	M6	3	10 Nm (1.0 m·kgf, 7.2 ft·lbf)	
Tappet cover bolt	M6	3	10 Nm (1.0 m·kgf, 7.2 ft·lbf)	
Exhaust tappet cover bolt (right side of the vehicle)	M6	1	10 Nm (1.0 m·kgf, 7.2 ft·lbf)	
Cylinder head cover nut	M10	4	38 Nm (3.8 m·kgf, 27 ft·lbf)	
Cylinder head nut (cap nut)	M10	1	38 Nm (3.8 m·kgf, 27 ft·lbf)	
Cylinder head stud bolt (around pistons): Long	M10	4	18 Nm (1.8 m·kgf, 13 ft·lbf)	Height 136.8– 139.3mm (5.39– 5.48 in)
Cylinder head stud bolt (right side of the vehicle): Long	M8	2	15 Nm (1.5 m·kgf, 11 ft·lbf)	Height 119.8– 122.3mm (4.72– 4.81 in)
Cylinder head stud bolt: Short	M10	1	18 Nm (1.8 m·kgf, 13 ft·lbf)	Height 39.8– 42.3 mm (1.57– 1.67 in)
Cylinder head cover nut	M8	2	20 Nm (2.0 m·kgf, 14 ft·lbf)	
Cylinder head bolt	M6	2	10 Nm (1.0 m·kgf, 7.2 ft·lbf)	
Spark plug	M14	1	25 Nm (2.5 m·kgf, 18 ft·lbf)	
Cylinder nut	M10	4	38 Nm (3.8 m·kgf, 27 ft·lbf)	
Cylinder stud bolt	M10	4	18 Nm (1.8 m·kgf, 13 ft·lbf)	
Cylinder bolt	M6	3	12 Nm (1.2 m·kgf, 8.7 ft·lbf)	
Oil check bolt (engine oil pressure check)	M8	1	18 Nm (1.8 m·kgf, 13 ft·lbf)	
Air induction system pipe holder bolt	M6	2	10 Nm (1.0 m·kgf, 7.2 ft·lbf)	
Tachometer gear bolt	M6	1	7 Nm (0.7 m·kgf, 5.1 ft·lbf)	
Cylinder head cover plug	M14	1	15 Nm (1.5 m·kgf, 11 ft·lbf)	
AC magneto nut	M12	1	65 Nm (6.5 m·kgf, 47 ft·lbf)	Tighten two times.
Valve clearance adjuster locknut	M8	2	27 Nm (2.7 m·kgf, 20 ft·lbf)	
Camshaft sprocket bolt	M10	1	35 Nm (3.5 m·kgf, 25 ft·lbf)	
Timing chain tensioner locknut	M18	1	38 Nm (3.8 m·kgf, 27 ft·lbf)	

TIGHTENING TORQUES

Item	Thread size	Q'ty	Tightening torque	Remarks
Timing chain tensioner cap	M30	1	18 Nm (1.8 m·kgf, 13 ft·lbf)	
Rocker arm shaft lock washer bolt	M6	2	10 Nm (1.0 m·kgf, 7.2 ft·lbf)	
Decomp cam bolt	M6	1	7 Nm (0.7 m·kgf, 5.1 ft·lbf)	
Timing chain guide bolt (exhaust side)	M6	2	8 Nm (0.8 m·kgf, 5.8 ft·lbf)	
Oil pump cover bolt	M6	2	7 Nm (0.7 m·kgf, 5.1 ft·lbf)	
Oil pump bolt	M6	3	7 Nm (0.7 m·kgf, 5.1 ft·lbf)	
Oil strainer cover bolt	M6	6	10 Nm (1.0 m·kgf, 7.2 ft·lbf)	
Oil drain bolt (crankcase side)	M14	1	30 Nm (3.0 m·kgf, 22 ft·lbf)	
Oil filter cover bolt	M6	2	10 Nm (1.0 m·kgf, 7.2 ft·lbf)	
Oil filter cover bolt (drain)	M6	1	10 Nm (1.0 m·kgf, 7.2 ft·lbf)	
Oil delivery pipe union bolt	M8	1	18 Nm (1.8 m·kgf, 13 ft·lbf)	
Oil delivery pipe union bolt	M14	1	18 Nm (1.8 m·kgf, 13 ft·lbf)	
Oil hose 2 bolt	M6	2	10 Nm (1.0 m·kgf, 7.2 ft·lbf)	
Oil pipe bolt	M6	2	10 Nm (1.0 m·kgf, 7.2 ft·lbf)	
Oil filter cover bleeder bolt	M5	1	5 Nm (0.5 m·kgf, 3.6 ft·lbf)	
Oil pipe stay bolt	M6	1	10 Nm (1.0 m·kgf, 7.2 ft·lbf)	
Oil hose 1 union nut (oil tank side)	M14	1	35 Nm (3.5 m·kgf, 25 ft·lbf)	
Oil hose 2 union nut (oil tank side)	M16	1	35 Nm (3.5 m·kgf, 25 ft·lbf)	
Throttle body joint bolt	M2	2	10 Nm (1.0 m·kgf, 7.2 ft·lbf)	
Throttle body joint clamp screw (engine side)	M5	1	3.0 Nm (0.30 m·kgf, 2.2 ft·lbf)	Tighten until the clamp comes into contact with the collar.
Throttle body joint clamp screw (air filter case side)	M4	1	2.0 Nm (0.20 m·kgf, 1.4 ft·lbf)	
Air filter case cover screw	M5	5	2.5 Nm (0.25 m·kgf, 1.8 ft·lbf)	
Air filter case bolt (upper side)	M6	1	7 Nm (0.7 m·kgf, 5.1 ft·lbf)	
Exhaust pipe stud bolt	M8	2	13 Nm (1.3 m·kgf, 9.4 ft·lbf)	
Exhaust pipe nut	M8	2	18 Nm (1.8 m·kgf, 13 ft·lbf)	
Exhaust pipe and frame bolt	M8	1	23 Nm (2.3 m·kgf, 17 ft·lbf)	
Muffler joint bolt	M8	1	20 Nm (2.0 m·kgf, 14 ft·lbf)	

TIGHTENING TORQUES


Item	Thread size	Q'ty	Tightening torque	Remarks
Muffler and frame bracket bolt	M8	1	20 Nm (2.0 m·kgf, 14 ft·lbf)	
Frame muffler bracket nut	M8	1	30 Nm (3.0 m·kgf, 22 ft·lbf)	
Muffler bracket and frame bolt	M12	1	60 Nm (6.0 m·kgf, 43 ft·lbf)	
Air induction system pipe bolt (cylinder head side)	M6	2	10 Nm (1.0 m·kgf, 7.2 ft·lbf)	
Air induction system pipe bolt	M6	2	10 Nm (1.0 m·kgf, 7.2 ft·lbf)	
Crankcase bolt	M6	14	12 Nm (1.2 m·kgf, 8.7 ft·lbf)	
Crankcase cover (left) bolt	M6	5	10 Nm (1.0 m·kgf, 7.2 ft·lbf)	
Drive sprocket cover bolt	M6	3	10 Nm (1.0 m·kgf, 7.2 ft·lbf)	
Drive sprocket cover stay bolt	M6	1	10 Nm (1.0 m·kgf, 7.2 ft·lbf)	
Crankcase cover (right) bolt	M6	10	10 Nm (1.0 m·kgf, 7.2 ft·lbf)	
Bearing cover plate screw (left side of the crankcase)	M5	3	3.8 Nm (0.38 m·kgf, 2.8 ft·lbf)	
Bearing cover plate screw (right side of the crankcase)	M6	2	7 Nm (0.7 m·kgf, 5.1 ft·lbf)	
Cover plate bolt	M6	2	7 Nm (0.7 m·kgf, 5.1 ft·lbf)	
Cover bolt (right inner side of the crankcase)	M6	4	7 Nm (0.7 m·kgf, 5.1 ft·lbf)	
Stator coil assembly lead holder bolt	M6	1	7 Nm (0.7 m·kgf, 5.1 ft·lbf)	
Kick crank bolt	M8	1	20 Nm (2.0 m·kgf, 14 ft·lbf)	
Ratchet wheel guide bolt	M6	3	10 Nm (1.0 m·kgf, 7.2 ft·lbf)	
Primary drive gear nut	M16	1	60 Nm (6.0 m·kgf, 43 ft·lbf)	
Clutch spring bolt	M6	6	9 Nm (0.9 m·kgf, 6.5 ft·lbf)	
Clutch boss nut	M18	1	60 Nm (6.0 m·kgf, 43 ft·lbf)	
Clutch push lever shaft adjuster locknut	M12	1	18 Nm (1.8 m·kgf, 13 ft·lbf)	
Drive sprocket nut	M18	1	90 Nm (9.0 m·kgf, 65 ft·lbf)	
Shift pedal bolt	M6	1	10 Nm (1.0 m·kgf, 7.2 ft·lbf)	
Side plate screw	M5	1	3.8 Nm (0.38 m·kgf, 2.8 ft·lbf)	
Stopper cam bolt	M14	1	28 Nm (2.8 m·kgf, 20 ft·lbf)	
Shift shaft locknut	M6	1	8 Nm (0.8 m·kgf, 5.8 ft·lbf)	
Shift shaft torsion spring stopper screw	M8	1	20 Nm (2.0 m·kgf, 14 ft·lbf)	
Neutral switch	M10	1	20 Nm (2.0 m·kgf, 14 ft·lbf)	
Stator coil assembly bolt	M6	3	7 Nm (0.7 m·kgf, 5.1 ft·lbf)	
Engine temperature sensor	M10	1	18 Nm (1.8 m·kgf, 13 ft·lbf)	

TIGHTENING TORQUES




Item	Thread size	Q'ty	Tightening torque	Remarks
Throttle position sensor screw	M5	2	3.5 Nm (0.35 m·kgf, 2.5 ft·lbf)	
Intake air pressure sensor screw	M5	1	3.5 Nm (0.35 m·kgf, 2.5 ft·lbf)	
O ₂ sensor	M18	1	45 Nm (4.5 m·kgf, 33 ft·lbf)	
Intake air temperature sensor screw	M5	1	2.5 Nm (0.25 m·kgf, 1.8 ft·lbf)	
Oil separator bolt	M6	1	3.0 Nm (0.30 m·kgf, 2.2 ft·lbf)	

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CHASSIS TIGHTENING TORQUES

Item	Thread size	Q'ty	Tightening torque	Remarks
Axle holder nut	M8	2	9 Nm (0.9 m·kgf, 6.5 ft·lbf)	
Lower bracket pinch bolt	M8	4	17 Nm (1.7 m·kgf, 12 ft·lbf)	
Upper bracket pinch bolt	M8	2	16 Nm (1.6 m·kgf, 12 ft·lbf)	
Main switch bolt	M8	2	29 Nm (2.9 m·kgf, 21 ft·lbf)	
Speedometer cable (meter side)	M12	1	4.5 Nm (0.45 m·kgf, 3.3 ft·lbf)	
Speedometer cable (meter gear unit side)	M12	1	4.5 Nm (0.45 m·kgf, 3.3 ft·lbf)	
Headlight unit screw	M5	2	3.8 Nm (0.38 m·kgf, 2.8 ft·lbf)	
Tachometer cable	M12	1	4.5 Nm (0.45 m·kgf, 3.3 ft·lbf)	
Rear shock absorber assembly lower nut	M10	2	30 Nm (3.0 m·kgf, 22 ft·lbf)	
Tension bar nut (swingarm side)	M8	1	19 Nm (1.9 m·kgf, 14 ft·lbf)	
Tension bar nut (brake shoe plate side)	M8	1	19 Nm (1.9 m·kgf, 14 ft·lbf)	
Chain case bolt	M6	2	7 Nm (0.7 m·kgf, 5.1 ft·lbf)	
Seat bolt	M8	2	16 Nm (1.6 m·kgf, 12 ft·lbf)	
Mudguard bolt	M6	2	7 Nm (0.7 m·kgf, 5.1 ft·lbf)	
Front wheel axle nut	M14	1	104 Nm (10.4 m·kgf, 75 ft·lbf)	
Spoke	BC3.5	—	3.0 Nm (0.30 m·kgf, 2.2 ft·lbf)	
Brake disc bolt	M8	6	23 Nm (2.3 m·kgf, 17 ft·lbf)	
Caliper bracket bolt	M10	2	40 Nm (4.0 m·kgf, 29 ft·lbf)	
Brake caliper bleed screw	M8	1	6 Nm (0.6 m·kgf, 4.3 ft·lbf)	
Rear wheel axle nut	M16	1	129 Nm (12.9 m·kgf, 93 ft·lbf)	
Rear wheel sprocket nut	M8	6	26 Nm (2.6 m·kgf, 19 ft·lbf)	
Brake camshaft lever bolt	M6	1	9 Nm (0.9 m·kgf, 6.5 ft·lbf)	
Drive chain adjusting bolt locknut	M8	2	16 Nm (1.6 m·kgf, 12 ft·lbf)	






TIGHTENING TORQUES

Item	Thread size	Q'ty	Tightening torque	Remarks
Oil drain bolt (oil tank side)	M8	1	16 Nm (1.6 m·kgf, 12 ft·lbf)	
Engine mount front bolt	M8	4	35 Nm (3.5 m·kgf, 25 ft·lbf)	
Engine mounting nut (front side)	M10	1	64 Nm (6.4 m·kgf, 46 ft·lbf)	
Engine mounting nut (front lower side)	M10	1	60 Nm (6.0 m·kgf, 43 ft·lbf)	
Engine mounting nut (rear lower side)	M10	1	60 Nm (6.0 m·kgf, 43 ft·lbf)	
Engine mount rear bolt	M8	2	42 Nm (4.2 m·kgf, 30 ft·lbf)	
Engine mounting nut (rear side)	M10	1	60 Nm (6.0 m·kgf, 43 ft·lbf)	
Engine mount upper nut	M8	1	35 Nm (3.5 m·kgf, 25 ft·lbf)	
Engine mounting nut (upper side)	M8	1	35 Nm (3.5 m·kgf, 25 ft·lbf)	
Air cut-off valve bracket nut	M6	2	7 Nm (0.7 m·kgf, 5.1 ft·lbf)	
Front fender bolt	M8	4	16 Nm (1.6 m·kgf, 12 ft·lbf)	
Rear shock absorber assembly upper nut	M10	2	30 Nm (3.0 m·kgf, 22 ft·lbf)	
Rear fender nut	M8	4	16 Nm (1.6 m·kgf, 12 ft·lbf)	
Grab bar bolt	M8	2	16 Nm (1.6 m·kgf, 12 ft·lbf)	
Rear turn signal light bolt	M6	2	7 Nm (0.7 m·kgf, 5.1 ft·lbf)	
Rear turn signal light nut	M12	2	7 Nm (0.7 m·kgf, 5.1 ft·lbf)	
Tail/brake light assembly nut	M6	4	7 Nm (0.7 m·kgf, 5.1 ft·lbf)	
Rear reflector nut	M5	1	1.5 Nm (0.15 m·kgf, 1.1 ft·lbf)	
Fuel pump case mounting bolt (front side)	M6	1	7 Nm (0.7 m·kgf, 5.1 ft·lbf)	
Fuel pump case mounting bolt (rear side)	M6	1	10 Nm (1.0 m·kgf, 7.2 ft·lbf)	
Fuel pump case bracket bolt	M6	3	7 Nm (0.7 m·kgf, 5.1 ft·lbf)	
Fuel pump case stay bolt	M6	2	2.0 Nm (0.20 m·kgf, 1.4 ft·lbf)	
Fuel pump case box bolt (upper side)	M6	2	7 Nm (0.7 m·kgf, 5.1 ft·lbf)	
Fuel pump case box bolt (lower side)	M6	1	7 Nm (0.7 m·kgf, 5.1 ft·lbf)	
Lean angle sensor bolt	M5	2	0.5 Nm (0.05 m·kgf, 0.36 ft·lbf)	
Tool box bolt	M6	1	7 Nm (0.7 m·kgf, 5.1 ft·lbf)	
Tool box key cylinder	M22	1	2.5 Nm (0.25 m·kgf, 1.8 ft·lbf)	
Side cover (left) lock bolt	M6	2	7 Nm (0.7 m·kgf, 5.1 ft·lbf)	
Side cover (right) bolt	M6	1	7 Nm (0.7 m·kgf, 5.1 ft·lbf)	
Engine protector bolt	M6	3	7 Nm (0.7 m·kgf, 5.1 ft·lbf)	

TIGHTENING TORQUES

Item	Thread size	Q'ty	Tightening torque	Remarks
Lower ring nut	M25	1	—	See TIP.
Steering stem nut	M22	1	110 Nm (11 m·kgf, 80 ft·lbf)	
Rollover valve clamp bolt	M5	1	3.8 Nm (0.38 m·kgf, 2.8 ft·lbf)	
Fuel cock screw	M6	2	7 Nm (0.7 m·kgf, 5.1 ft·lbf)	
Fuel tank bolt	M8	1	16 Nm (1.6 m·kgf, 12 ft·lbf)	
Fuel sender screw	M6	2	7 Nm (0.7 m·kgf, 5.1 ft·lbf)	
Fuel pump bolt	M5	4	4.0 Nm (0.40 m·kgf, 2.9 ft·lbf)	
Brake hose union bolt	M10	2	30 Nm (3.0 m·kgf, 22 ft·lbf)	
Brake hose holder bolt	M6	2	10 Nm (1.0 m·kgf, 7.2 ft·lbf)	
Upper handlebar holder bolt	M8	4	23 Nm (2.3 m·kgf, 17 ft·lbf)	
Lower handlebar holder nut	M10	2	32 Nm (3.2 m·kgf, 23 ft·lbf)	
Master cylinder reservoir cap screw	M4	2	1.5 Nm (0.15 m·kgf, 1.1 ft·lbf)	
Throttle cable adjusting nut	M6	2	4.5 Nm (0.45 m·kgf, 3.3 ft·lbf)	
Throttle cable nut	M12	2	7 Nm (0.7 m·kgf, 5.1 ft·lbf)	
Master cylinder holder bolt	M6	2	7 Nm (0.7 m·kgf, 5.1 ft·lbf)	
Brake lever bolt	M6	1	7 Nm (0.7 m·kgf, 5.1 ft·lbf)	
Brake lever nut	M6	1	7 Nm (0.7 m·kgf, 5.1 ft·lbf)	
Brake lever adjusting screw lock-nut	M6	1	3.8 Nm (0.38 m·kgf, 2.8 ft·lbf)	
Lever holder bolt	M6	1	7 Nm (0.7 m·kgf, 5.1 ft·lbf)	
Decompression lever nut	M5	1	2.3 Nm (0.23 m·kgf, 1.7 ft·lbf)	
Headlight assembly nut	M8	2	8 Nm (0.8 m·kgf, 5.8 ft·lbf)	
Meter stay nut	M6	2	7 Nm (0.7 m·kgf, 5.1 ft·lbf)	
Light stay bolt	M6	3	7 Nm (0.7 m·kgf, 5.1 ft·lbf)	
Headlight beam adjusting stay bolt	M6	1	7 Nm (0.7 m·kgf, 5.1 ft·lbf)	
Headlight beam adjusting screw	M6	1	7 Nm (0.7 m·kgf, 5.1 ft·lbf)	
Horn bolt	M8	1	16 Nm (1.6 m·kgf, 12 ft·lbf)	
Headlight/meter bracket bolt	M6	2	7 Nm (0.7 m·kgf, 5.1 ft·lbf)	
Front turn signal light nut	M6	2	7 Nm (0.7 m·kgf, 5.1 ft·lbf)	
Front turn signal light nut	M12	2	7 Nm (0.7 m·kgf, 5.1 ft·lbf)	
Battery box bolt	M6	3	7 Nm (0.7 m·kgf, 5.1 ft·lbf)	
Seat mounting damper bolt	M6	2	10 Nm (1.0 m·kgf, 7.2 ft·lbf)	
Brake pedal bolt	M6	1	10 Nm (1.0 m·kgf, 7.2 ft·lbf)	

TIGHTENING TORQUES

Item	Thread size	Q'ty	Tightening torque	Remarks
Brake pedal adjusting bolt lock-nut	M6	1	7 Nm (0.7 m·kgf, 5.1 ft·lbf)	
Centerstand nut	M10	2	32 Nm (3.2 m·kgf, 23 ft·lbf)	
Pivot shaft nut	M16	2	104 Nm (10.4 m·kgf, 75 ft·lbf)	
Pivot shaft bolt	M6	2	10 Nm (1.0 m·kgf, 7.2 ft·lbf)	
Sidestand bolt	M10	1	40 Nm (4.0 m·kgf, 29 ft·lbf)	
Sidestand nut	M10	1	32 Nm (3.2 m·kgf, 23 ft·lbf)	
Sidestand switch screw	M5	2	3.7 Nm (0.37 m·kgf, 2.7 ft·lbf)	
Rear right footrest assembly nut	M12	1	30 Nm (3.0 m·kgf, 22 ft·lbf)	
Rear left footrest assembly bolt	M10	2	32 Nm (3.2 m·kgf, 23 ft·lbf)	
Front footrest assembly nut	M8	4	32 Nm (3.2 m·kgf, 23 ft·lbf)	
Rear footrest nut	M6	2	4.0 Nm (0.40 m·kgf, 2.9 ft·lbf)	
Rear footrest cover screw	M5	4	3.8 Nm (0.38 m·kgf, 2.8 ft·lbf)	
Ignition coil bolt	M6	2	7 Nm (0.7 m·kgf, 5.1 ft·lbf)	
Rectifier/regulator stay bolt	M6	3	7 Nm (0.7 m·kgf, 5.1 ft·lbf)	
Rectifier/regulator nut	M6	2	7 Nm (0.7 m·kgf, 5.1 ft·lbf)	
Throttle cable guide screw	M5	1	3.8 Nm (0.38 m·kgf, 2.8 ft·lbf)	
Oil hose 2 holder bolt	M5	1	4.5 Nm (0.45 m·kgf, 3.3 ft·lbf)	
Front fork cap bolt	M28	2	23 Nm (2.3 m·kgf, 17 ft·lbf)	
Fork boot lock screw	M5	2	2.5 Nm (0.25 m·kgf, 1.8 ft·lbf)	
Damper rod assembly bolt	M10	2	28 Nm (2.8 m·kgf, 20 ft·lbf)	
Caliper support bolt	M10	2	27 Nm (2.7 m·kgf, 20 ft·lbf)	
Front footrest cover screw	M5	4	3.8 Nm (0.38 m·kgf, 2.8 ft·lbf)	
Front footrest guard bolt	M8	2	10 Nm (1.0 m·kgf, 7.2 ft·lbf)	
Handlebar switch screw	M5	4	3.5 Nm (0.35 m·kgf, 2.5 ft·lbf)	

TIP

Lower ring nut

1. First, tighten the lower ring nut to 38 Nm (3.8 m·kgf, 27 ft·lbf) with a torque wrench, then loosen the ring nut completely.
2. Retighten the lower ring nut to 18 Nm (1.8 m·kgf, 13 ft·lbf).































LUBRICATION POINTS AND LUBRICANT TYPES

EAS20360











LUBRICATION POINTS AND LUBRICANT TYPES

EAS20370

ENGINE










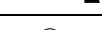
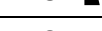
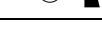
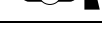


Lubrication point	Lubricant
Oil seal lips	
O-rings	
Bearings	
Cylinder head cover nut (M10) thread, bearing surface	
Cylinder head stud bolt	
Cylinder nut thread, bearing surface	
Cylinder stud bolt	
Crank pin outer circumference	
Connecting rod big end, thrust end surface	
Piston pin outer circumference	
Piston outer circumference	
Piston ring	
Cylinder sleeve inner circumference	
Valve stem	
Valve stem end	
Valve stem seal	
Valve guide	
Rocker arm shaft outer circumference	
Camshaft lobe and journal	
Rocker arm inner circumference	
Decomp cam outer circumference	
Kick gear inner circumference	
Drive axle outer circumference	
Main axle outer circumference	
Ratchet wheel inner circumference	
Kick idle gear inner circumference	
Kick axle	
Kick gear inner circumference	
Push rod outer circumference, end surface	
Primary driven gear	

LUBRICATION POINTS AND LUBRICANT TYPES











Lubrication point	Lubricant
Clutch housing spacer inner circumference	
Push lever shaft outer circumference	
Transmission sliding portion, wheel gear and pinion gear inner surface, end surface	
Shift fork guide bar outer circumference, end surface	
Shift drum bearing	
Shift shaft bearing	
Crankcase mating surfaces	Yamaha bond No. 1215 (Three bond No. 1215®)
Cylinder head cover and cylinder head mating surfaces	Yamaha bond No. 1215 (Three bond No. 1215®)
Oil pump shaft	
Oil pump inner rotor and outer rotor	
Crankcase (AC magneto chamber) breather	
Kick crank rotating part, sliding part	

EAS20380

CHASSIS

Lubrication point	Lubricant
Steering bearing and bearing races	
Throttle grip inner side and throttle cable end	
Clutch cable end	
Brake lever pivoting points and metal-to-metal moving parts	
Master cylinder piston end and brake lever adjusting screw end	
Clutch lever pivoting points and metal-to-metal moving parts	
Brake pedal shaft	
Centerstand pivoting points and metal-to-metal moving parts	
Pivot shaft outer periphery	
Pivot shaft screw and bearing surface	
Swingarm oil seal lip, bearing, collar	
Sidestand pivoting points and metal-to-metal moving parts	
Rear footrest sliding part	
Front wheel oil seal lip	
Front wheel axle	

LUBRICATION POINTS AND LUBRICANT TYPES

Lubrication point	Lubricant
Speedometer gear O-ring and sliding part	
Rear brake camshaft mating surfaces, shaft	
Rear brake shoe plate pin pivot	
Rear wheel oil seal lip	
Rear wheel axle	
Rear wheel drive hub	
Brake caliper piston seal	
Master cylinder inside	
Brake caliper piston dust seal	
Caliper support bolt	

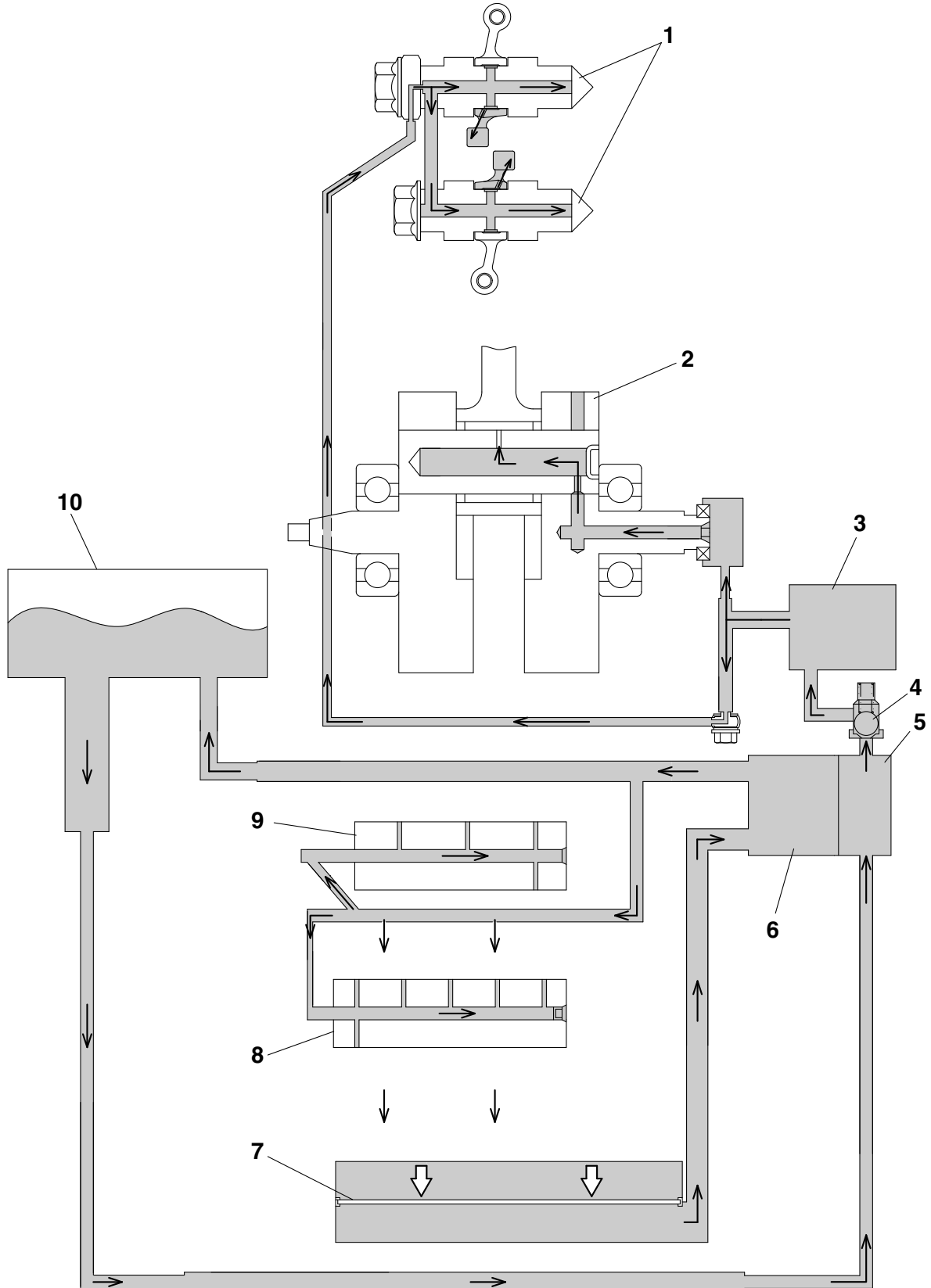
LUBRICATION SYSTEM CHART AND DIAGRAMS

EAS20390

LUBRICATION SYSTEM CHART AND DIAGRAMS

EAS20400

ENGINE OIL LUBRICATION CHART



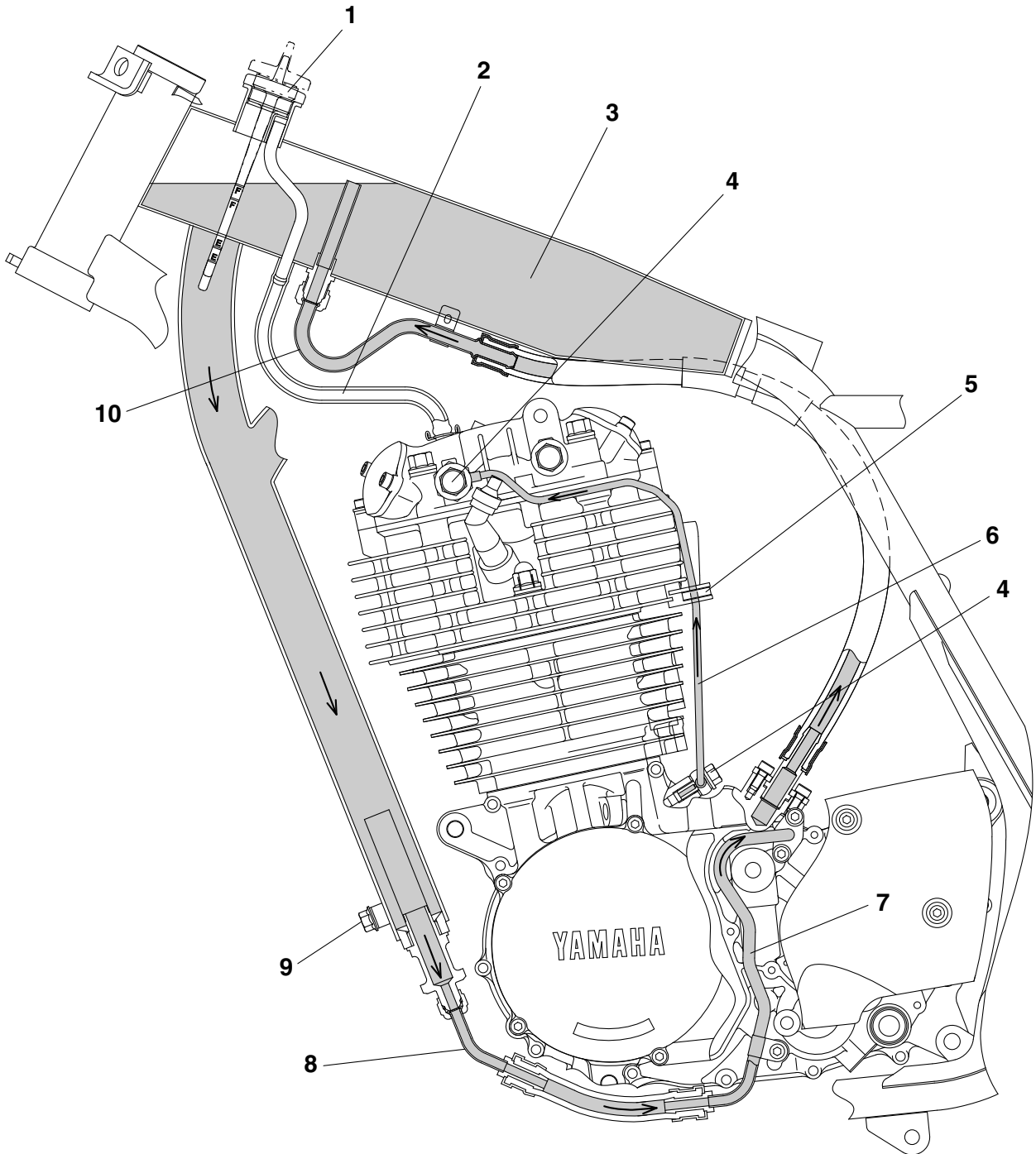
LUBRICATION SYSTEM CHART AND DIAGRAMS

1. Rocker arm shaft
2. Crankshaft
3. Oil filter element
4. Check ball
5. Oil feed pump
6. Scavenging pump
7. Oil strainer
8. Drive axle
9. Main axle
10. Oil tank (frame)

LUBRICATION SYSTEM CHART AND DIAGRAMS

EAS20410

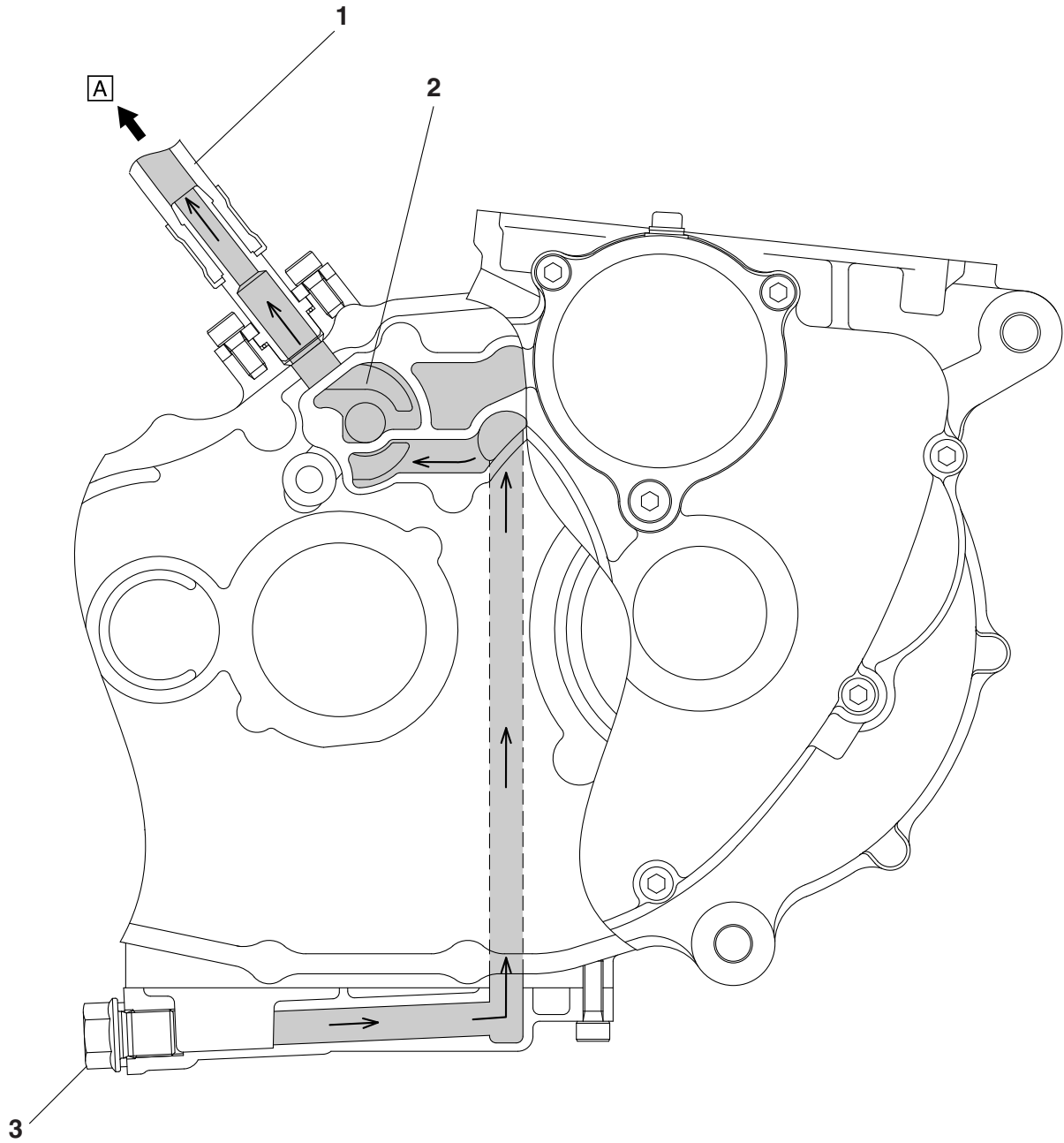
LUBRICATION DIAGRAMS



LUBRICATION SYSTEM CHART AND DIAGRAMS

1. Engine oil level gauge
2. Breather hose
3. Oil tank
4. Union bolt
5. Oil delivery pipe clamp
6. Oil delivery pipe
7. Oil pipe
8. Oil hose 1
9. Oil drain bolt (oil tank side)
10. Oil hose 2

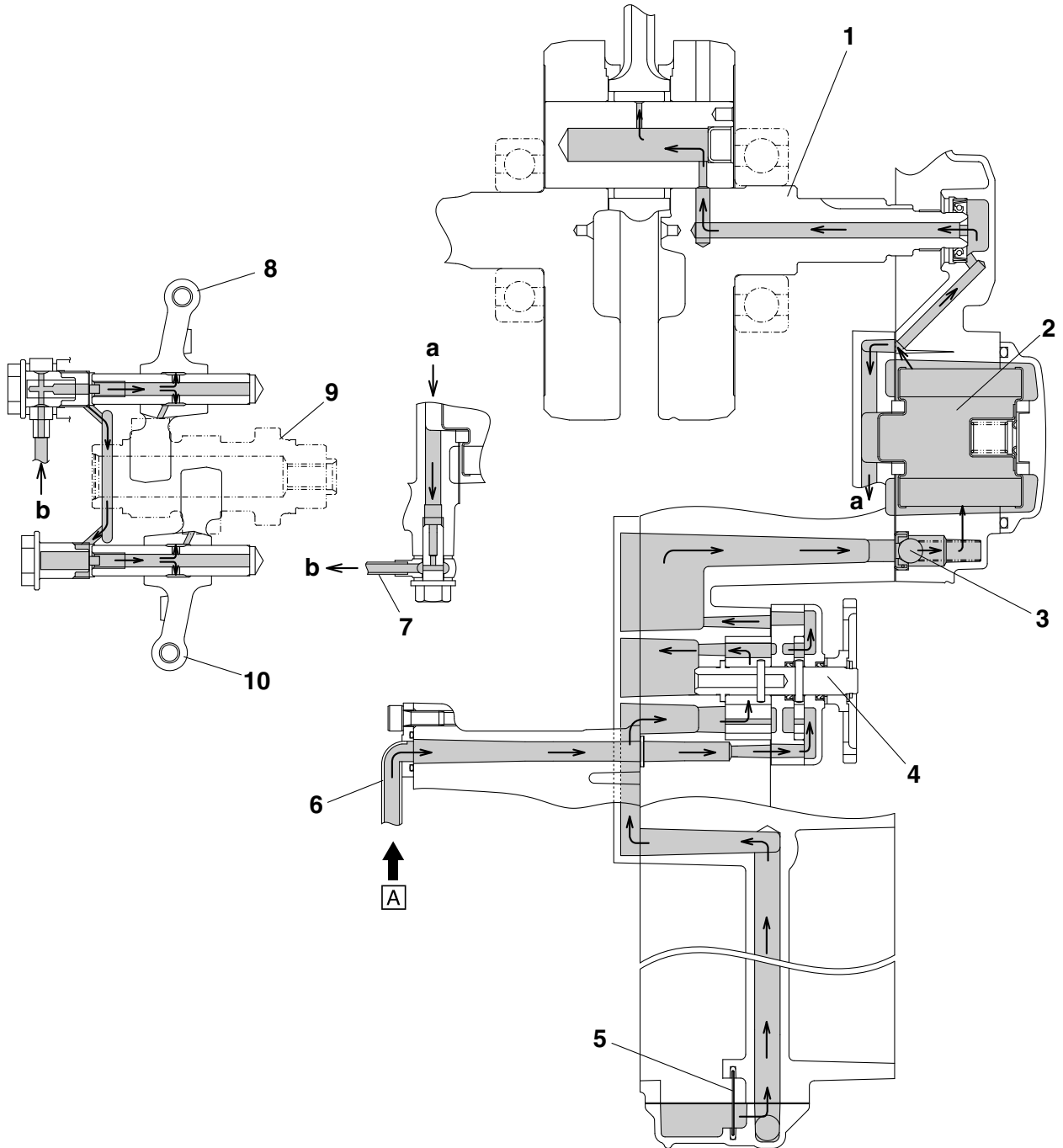
LUBRICATION SYSTEM CHART AND DIAGRAMS



LUBRICATION SYSTEM CHART AND DIAGRAMS

1. Oil hose 2
 2. Scavenging pump
 3. Oil drain bolt (crankcase side)
- A. To oil tank

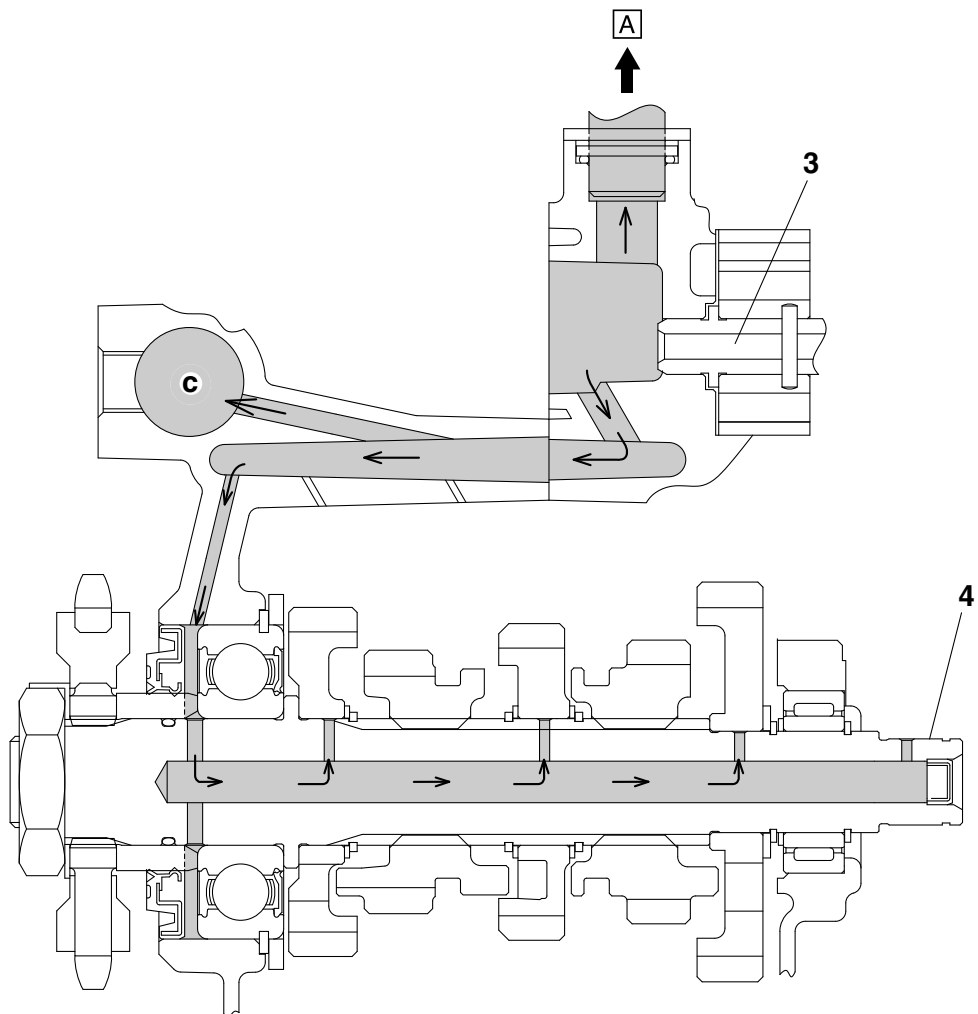
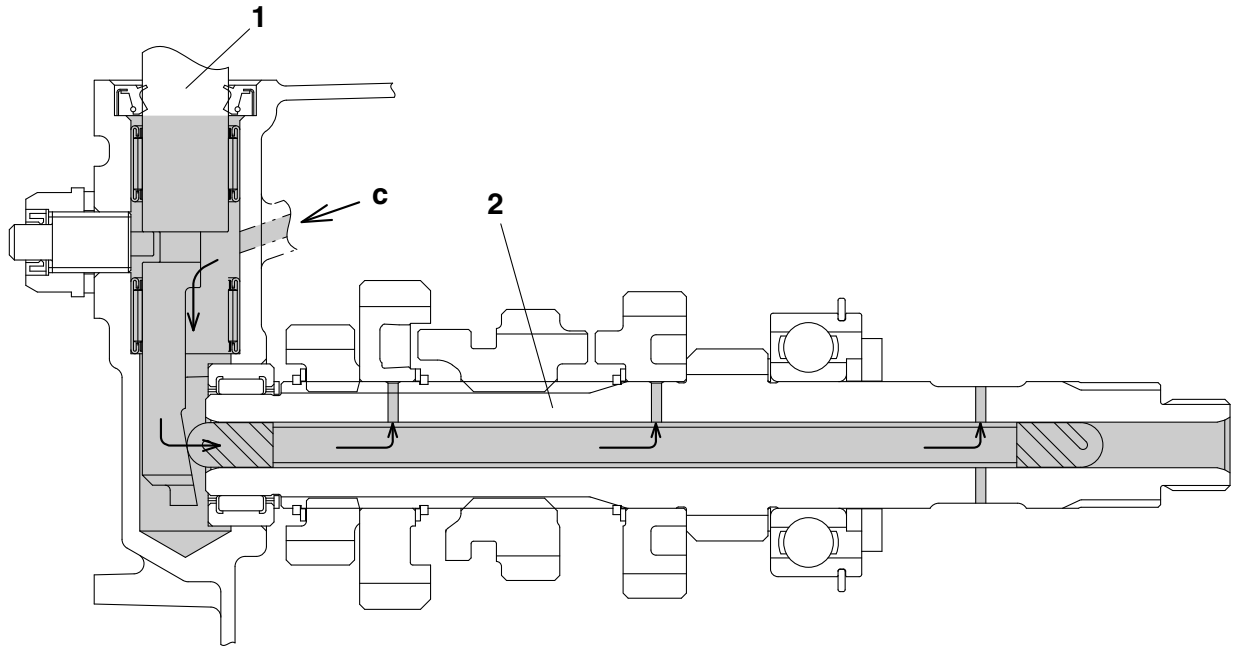
LUBRICATION SYSTEM CHART AND DIAGRAMS



LUBRICATION SYSTEM CHART AND DIAGRAMS

1. Crankshaft
 2. Oil filter element
 3. Check ball
 4. Oil feed pump
 5. Oil strainer
 6. Oil pipe
 7. Oil delivery pipe
 8. Rocker arm (exhaust side)
 9. Camshaft
 10. Rocker arm (intake side)
- A. From oil tank

LUBRICATION SYSTEM CHART AND DIAGRAMS



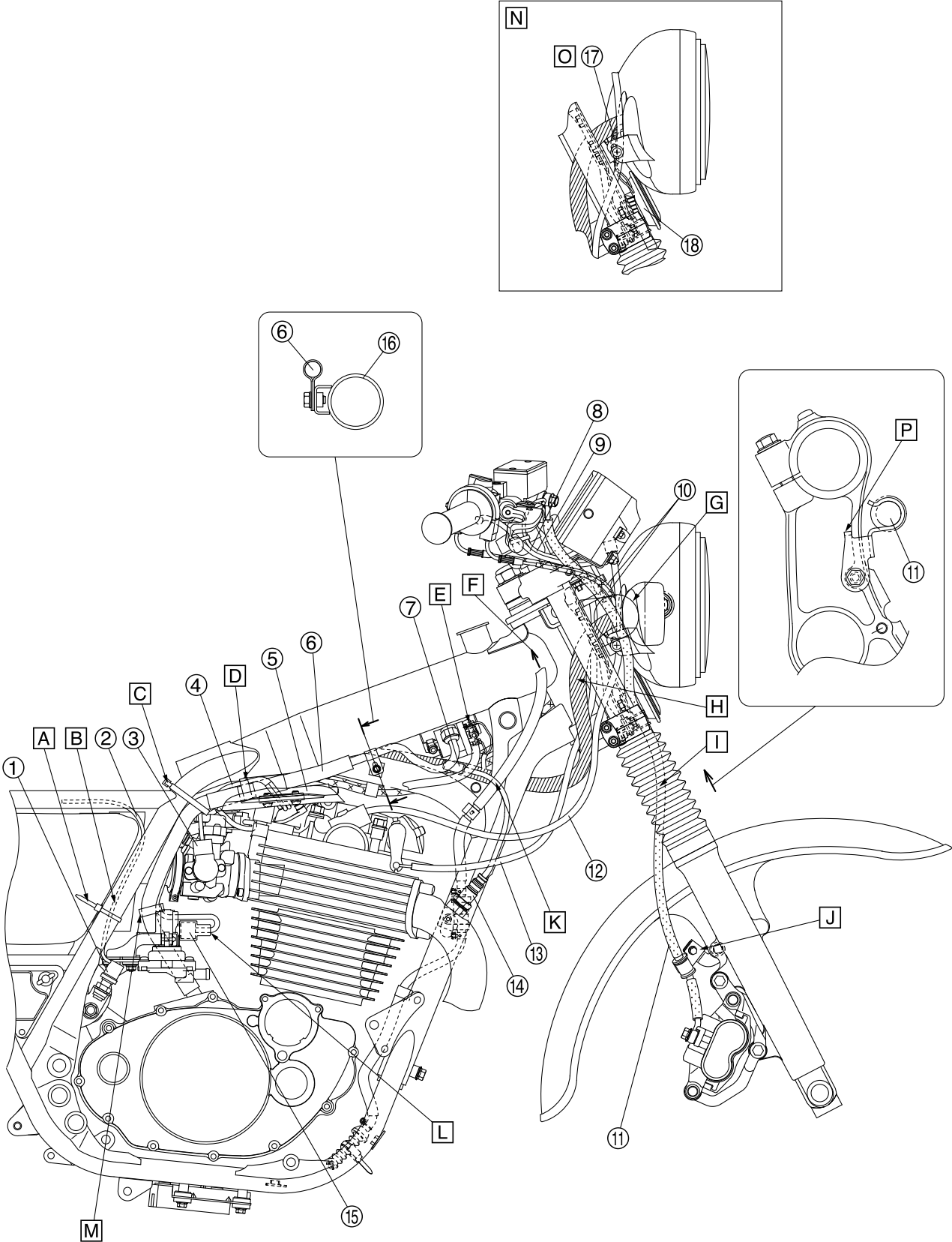
LUBRICATION SYSTEM CHART AND DIAGRAMS

1. Clutch push lever shaft
 2. Main axle
 3. Oil pump
 4. Drive axle
- A. To oil tank

EAS20430

CABLE ROUTING

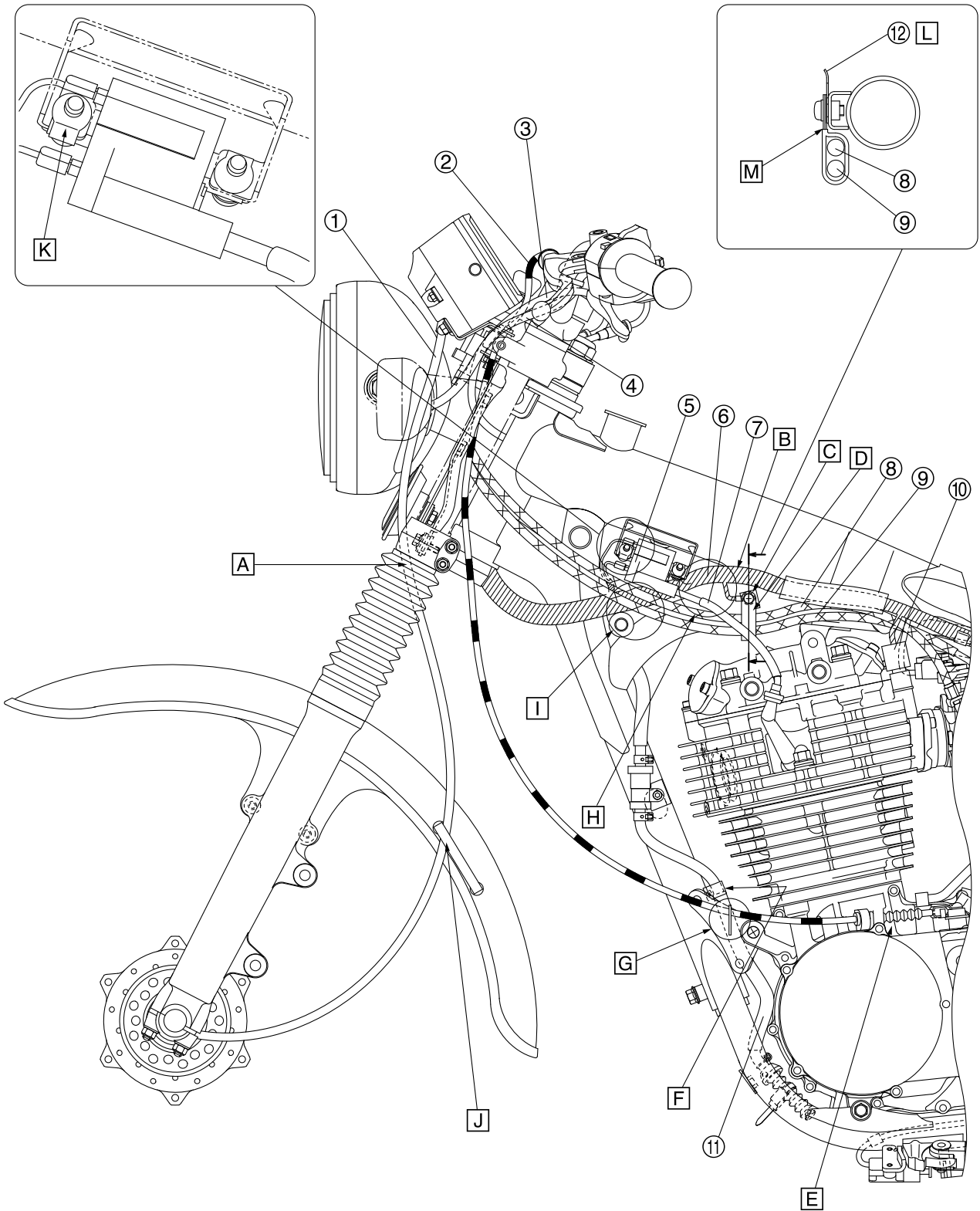
Right side view



1. Rear brake light switch
 2. Rear brake light switch lead
 3. Throttle position sensor coupler
 4. Fuel sender lead
 5. Fuel tank
 6. Oil hose 2
 7. O₂ sensor coupler
 8. Right handlebar switch lead
 9. Front brake light switch lead
 10. Throttle cable
 11. Brake hose
 12. Tachometer cable
 13. Decompression cable
 14. O₂ sensor
 15. Air induction system solenoid coupler
 16. Frame
 17. Horn lead
 18. Horn
-
- A. Fasten the rear brake light switch lead with the plastic locking tie. Direct the end toward the rear inner side of the vehicle.
 - B. Pass the rear brake light switch lead through the inside of the frame.
 - C. Pass the tube through a plastic locking tie and fasten the oil hose 2. Direct the end toward the inside of the vehicle.
 - D. Fasten the oil hose 2 and fuel sender lead with the clamp.
 - E. Point the end of the clamp toward the outside of the vehicle.
 - F. To the fuel tank
 - G. Route the throttle cable above the wire harness.
 - H. Route the wire harness to the right side of the head pipe.
 - I. Route the brake hose to the inside of the front fork.
 - J. Fasten the brake hose with the clamp.
 - K. Route the O₂ sensor lead outside of the fuel tank breather hose and above the tank stopper. Route the O₂ sensor lead inside of the tachometer cable and decompression cable.
 - L. Turn back the air induction system solenoid lead at the boot end of the coupler.
 - M. Fasten the oil hose 2 and air induction system solenoid lead with the clamp. Point the open end toward the inside of the vehicle.
 - N. Horn lead routing
 - O. Install the horn connector to the horn to point downward.
 - P. Install the holder so that its projection is hooked on the inside of the lower bracket.

CABLE ROUTING

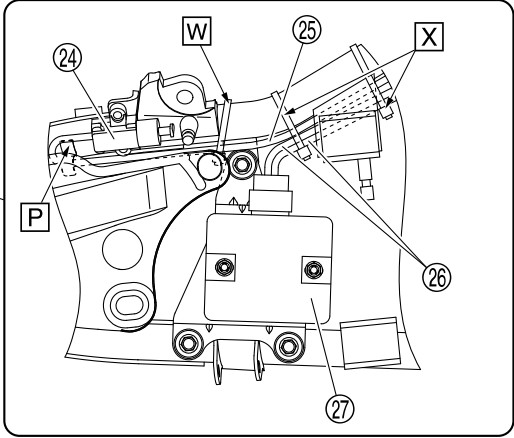
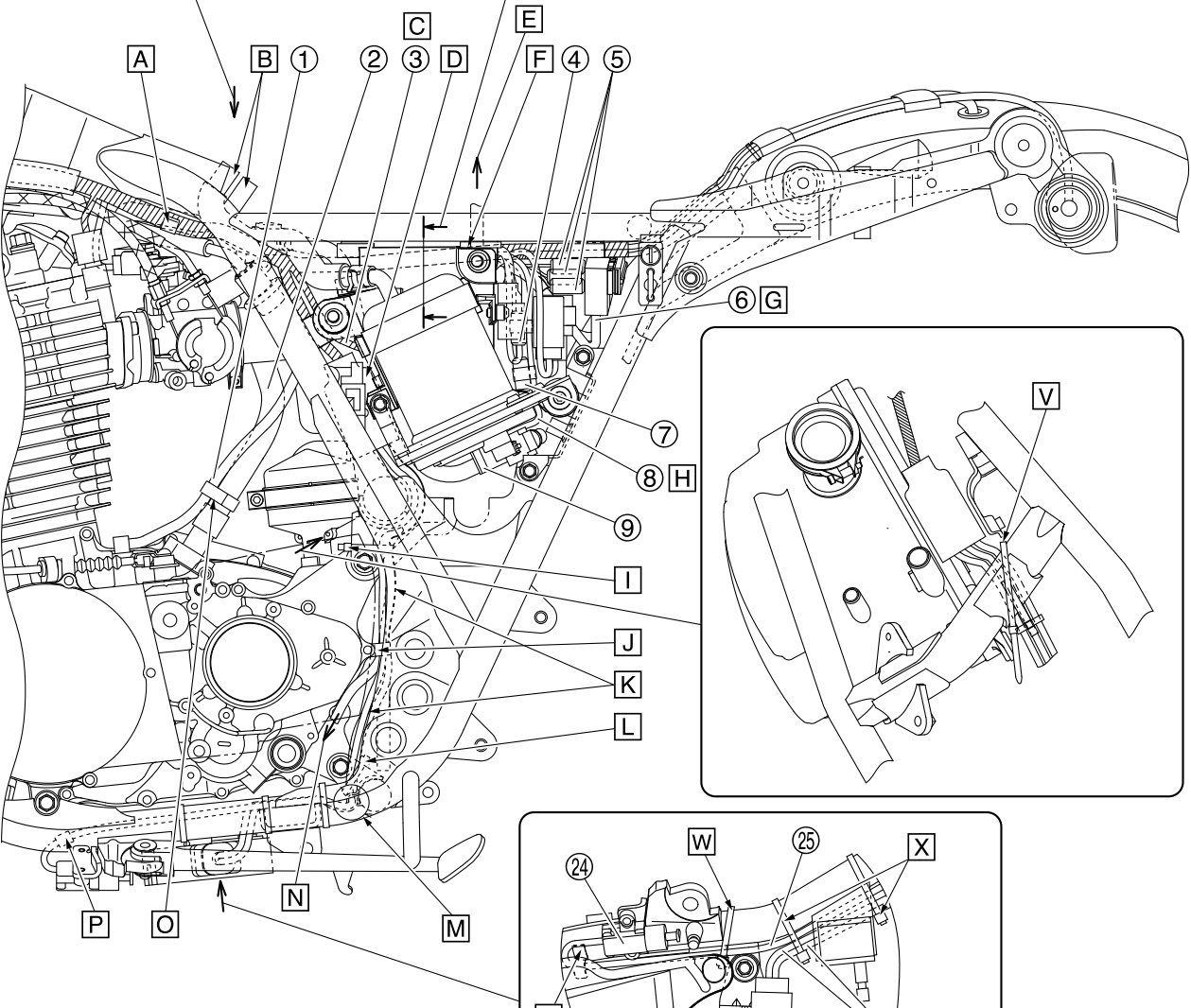
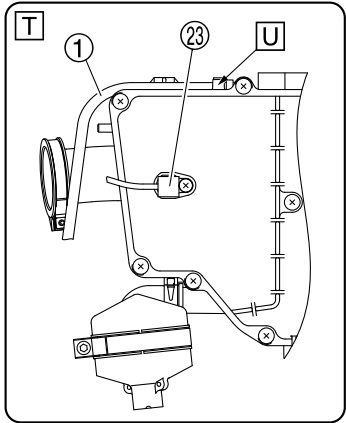
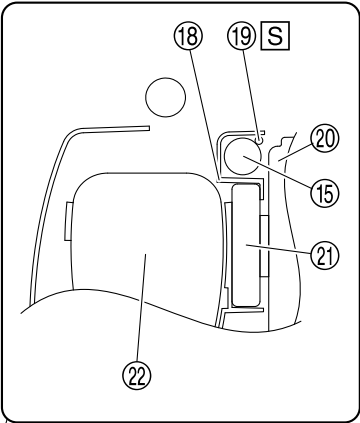
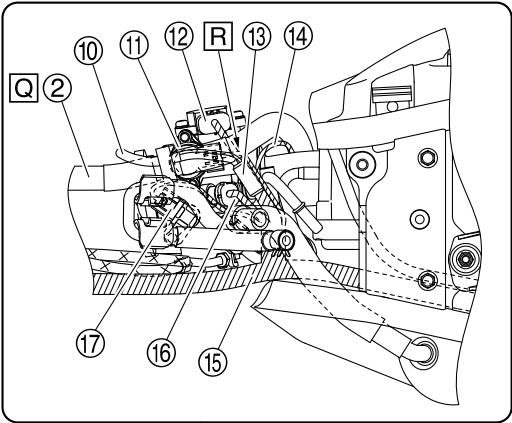
Left side front view



1. Speedometer cable
 2. Clutch cable
 3. Decompression cable
 4. Left handlebar switch lead
 5. Ignition coil
 6. Wire harness
 7. Spark plug lead
 8. Throttle cable (decelerator)
 9. Throttle cable (accelerator)
 10. Engine temperature sensor
 11. Fuel tank breather hose
 12. Ground lead
-
- A. Route the speedometer cable to the inside of the front fork.
 - B. Fasten the wire harness to the frame with the T-stud.
 - C. Fasten the ground lead and throttle cable guide.
 - D. Pass only the throttle cables through the guide.
 - E. Silicon solution or soap water may be applied when a boot is installed to the clutch cable.
 - F. Fasten with the clamp at an area where no fuel tank breather hose protector is mounted.
 - G. Pass the clutch cable through the engine mount guide.
 - H. Route the wire harness to the inside of the spark plug lead.
 - I. Route the wire harness and throttle cable above the tank stopper.
 - J. Pass the speedometer cable through the front fender guide.
 - K. Install the ignition coil damper at the vehicle front so that the bent portion points downward.
 - L. Point the ground lead forward and crimped side toward the inside.
 - M. Install the guide to point downward.

CABLE ROUTING

Left side rear view



CABLE ROUTING

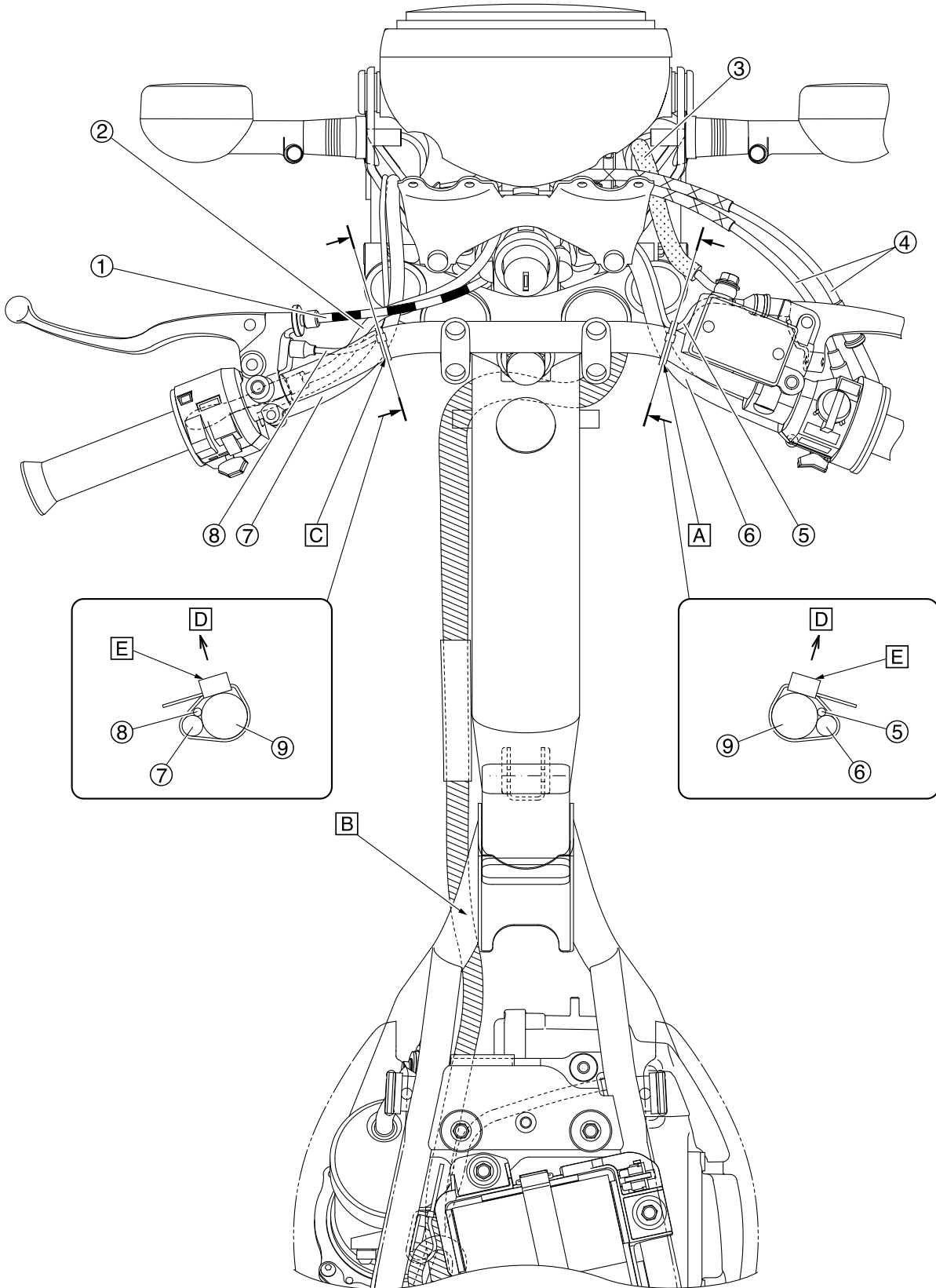
1. Breather hose
2. Oil hose 2
3. Intake air temperature sensor lead
4. Rear brake light switch coupler
5. Optional coupler
6. Fuel pump relay lead, headlight relay (on/off) lead (white tape)
7. Diode 1
8. Fuel pump lead
9. Fuel pump coupler
10. Fuel sender lead
11. ISC (idle speed control) valve
12. Throttle position sensor
13. Fuel sender coupler
14. Air induction system solenoid lead
15. Wire harness
16. Fuel injector
17. Intake air pressure sensor
18. Fuel pump case box
19. Rear brake light switch lead
20. Air filter case
21. ECU (engine control unit)
22. Fuel pump case
23. Intake air temperature sensor
24. Sidestand switch
25. Sidestand switch lead
26. Rectifier/regulator lead
27. Rectifier/regulator

- A. Fasten the wire harness with the clamp on the frame. Fasten the wire harness to avoid slack.
- B. To the fuel tank
- C. When routing the intake air temperature sensor lead, make sure that it is not seized in the fuel pump case box.
- D. Place the sidestand switch coupler and two stator coil assembly couplers in the coupler cover.
- E. To battery terminal
- F. Fasten the battery leads with the plastic locking tie. Point the end forward.
- G. Route the headlight relay (on/off) lead (white tape) to the inside of the vehicle.
- H. Route the fuel pump lead between the fuel pump case and the fuel pump case box. Also, route the fuel pump lead between the fuel pump case and the fuel hose (fuel pump–fuel rail).
- I. Fasten the sidestand switch lead and two stator coil assembly leads to the external side of the engine mount with the plastic locking tie. Point the end forward and cut off an excess end.
- J. Fasten the sidestand switch lead, two stator coil assembly leads, and air filter case drain hose with the clamp.
- K. Avoid slack of the lead in this space.
- L. Fasten the sidestand switch lead and rectifier/regulator lead to the external side of the engine mount stay with the plastic locking tie. Point the end upward and cut off an excess end.
- M. Fasten the taped portion of the sidestand switch lead and rectifier/regulator lead with the frame clamp. Fasten the leads so that there is no slack.
- N. To the engine

- O. Fasten the breather hose and oil hose 2 with the clamp.
- P. Fasten the sidestand switch lead with the frame clamp.
- Q. Route the oil hose 2 below the tank rail.
- R. Route the throttle position sensor lead above the ISC (idle speed control) valve lead.
- S. Pass the rear brake light switch lead through the inside of the fuel pump case box flange.
- T. Breather hose routing
- U. Fasten the breather hose with the air filter case holder.
- V. Fasten the sidestand switch lead and two stator coil assembly leads with the plastic locking tie. Point the end downward.
- W. Fasten the sidestand switch lead with the plastic locking tie. Point the end to the inside of the vehicle and cut off an excess end.
- X. Fasten the sidestand switch lead and rectifier/regulator lead with the plastic locking tie. Point the end to the inside of the vehicle and cut off an excess end.

CABLE ROUTING

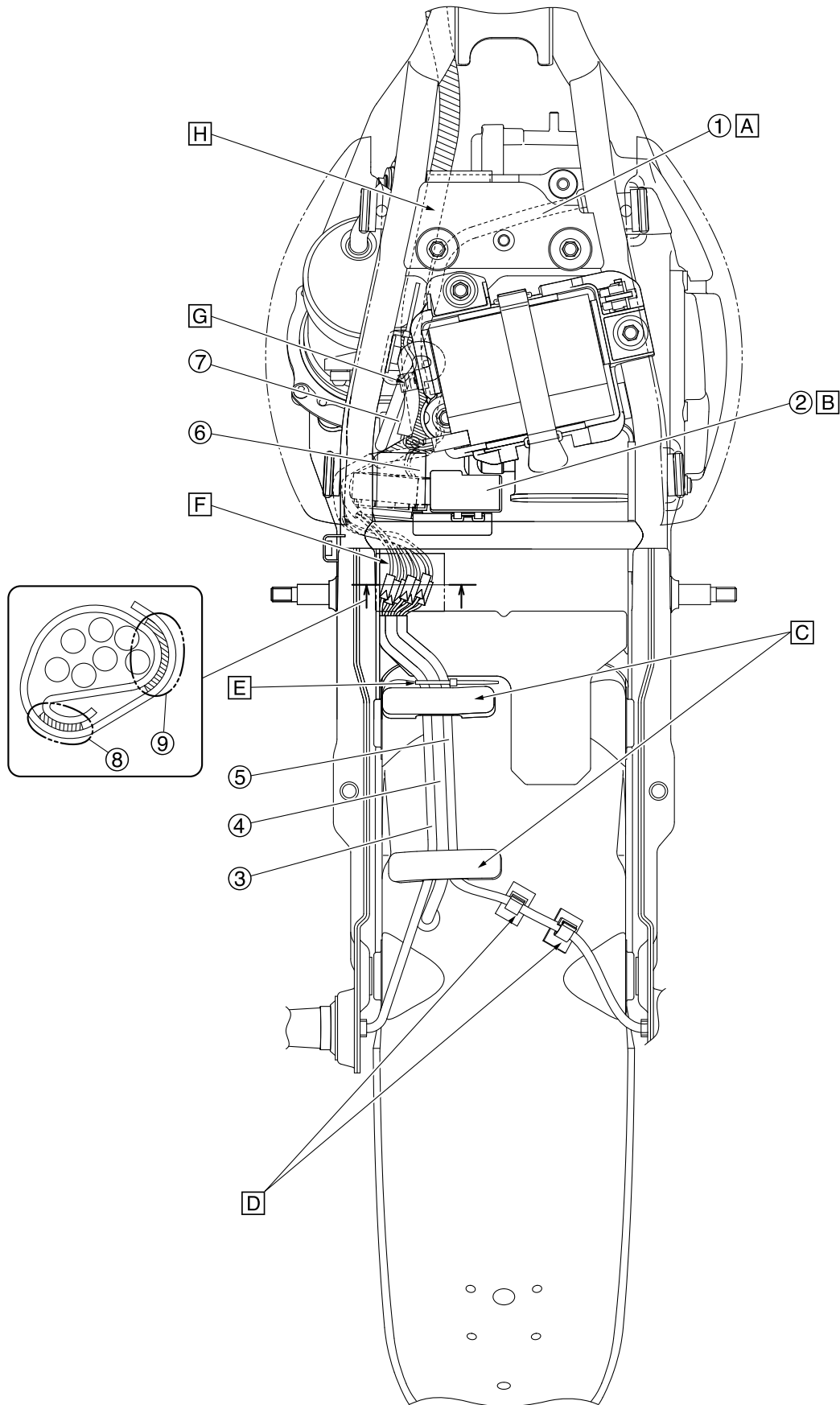
Upper front view



CABLE ROUTING

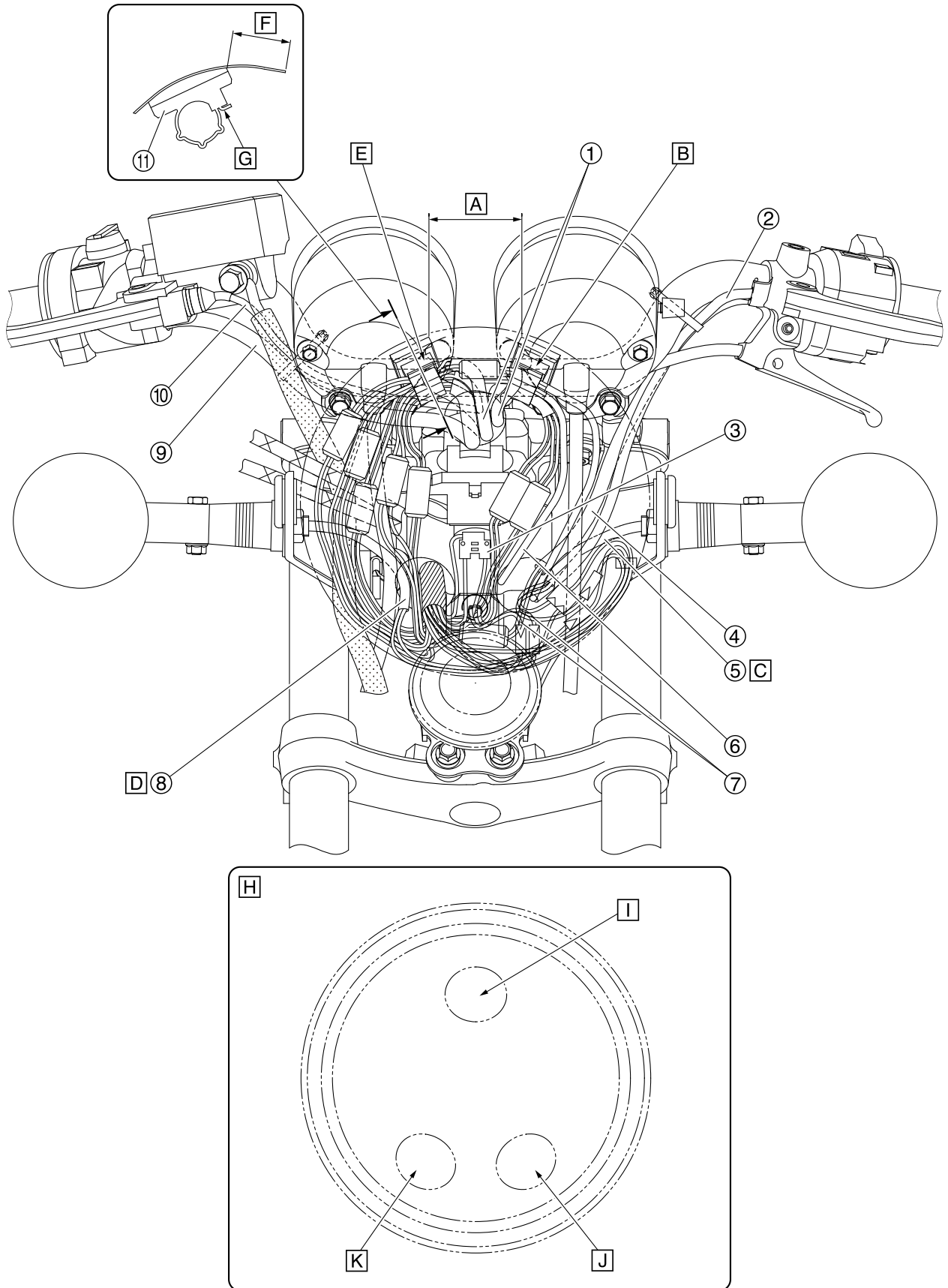
1. Clutch cable
 2. Decompression cable
 3. Brake hose
 4. Throttle cable
 5. Front brake light switch lead
 6. Right handlebar switch lead
 7. Left handlebar switch lead
 8. Clutch switch lead
 9. Handlebar
-
- A. Fasten the right handlebar switch lead and front brake light switch lead with the plastic locking tie.
 - B. Route the wire harness to the inside of the frame.
 - C. Fasten the left handlebar switch lead and clutch switch lead with the plastic locking tie.
 - D. Front of the vehicle
 - E. Fasten the leads to the lower side of the vehicle with the plastic locking tie. Point the tie of the plastic locking tie forward with its end facing downward. Do not cut off the excess end of the plastic locking tie.

Upper rear view



1. Rear brake light switch lead
 2. Fuse box
 3. Rear left turn signal light lead
 4. Tail/brake light lead
 5. Rear right turn signal light lead
 6. Joint coupler
 7. Battery lead
 8. Hook-and-loop fastener 1
 9. Hook-and-loop fastener 2
-
- A. Route the rear brake light switch lead to the rear of the air filter case.
 - B. Firmly insert the fuse box into the stay of the frame.
 - C. Fasten the tail/brake light lead, rear left turn signal light lead, and rear right turn signal light lead with the clamp. Fasten the leads to avoid overlap with one another.
 - D. Fasten the rear right turn signal light lead with the clamp. (Two locations)
 - E. Fasten the tail/brake light lead, rear left turn signal light lead, and rear right turn signal light lead with the plastic locking tie. The plastic locking tie should be located just in front of the clamp and the end of the plastic locking tie should point toward the inside of the vehicle. At this time, avoid slack of the rear left turn signal light lead and rear right turn signal light lead.
 - F. Place the three tail/brake light connectors, two rear left turn signal light connectors, and two rear right turn signal light connectors in the protector.
 - G. After connecting the battery lead to the battery terminal, fasten the battery lead with the clamp.
 - H. Put the wire harness into the groove of the pump case box.

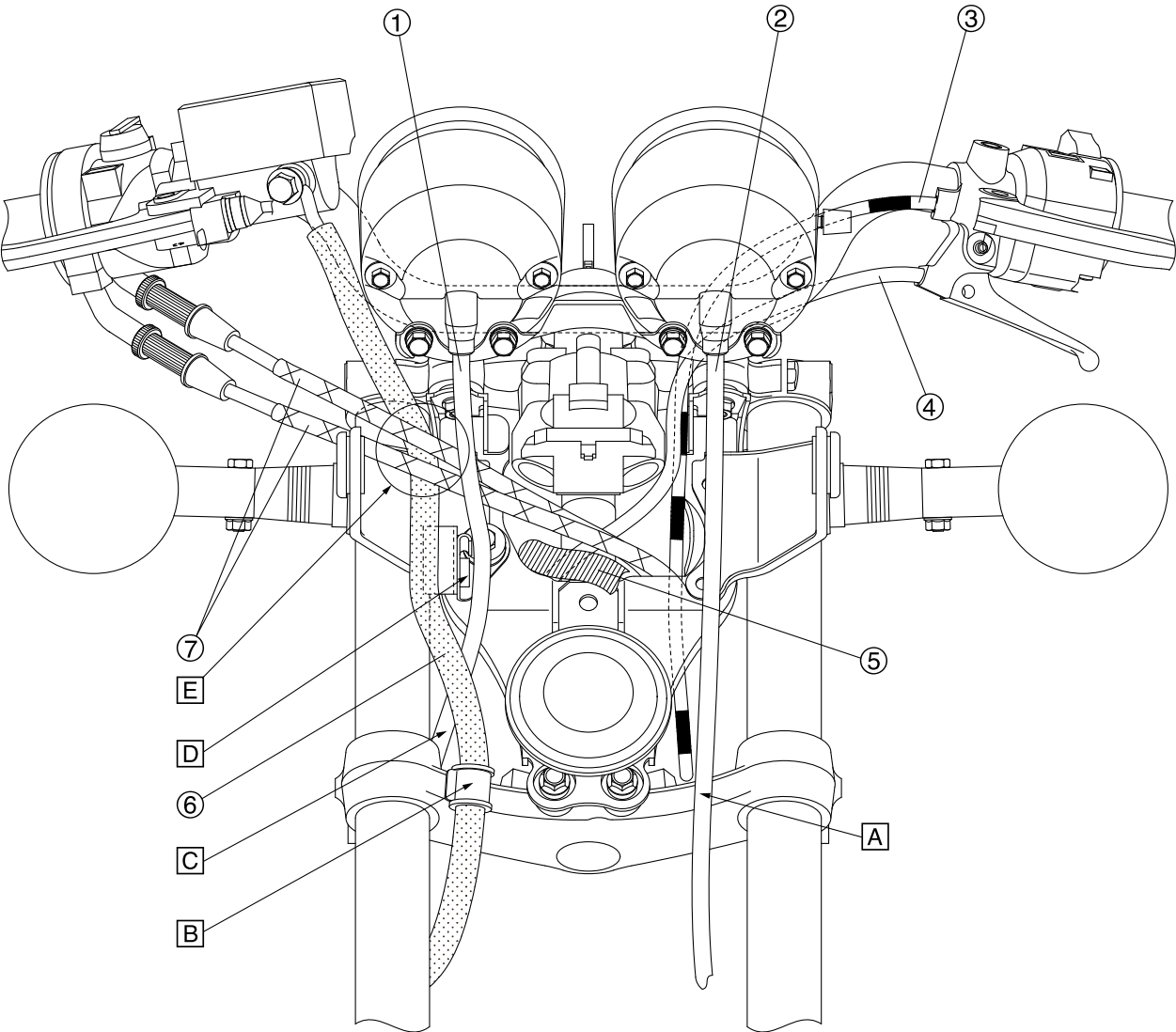
Headlight



1. Meter lead
2. Clutch switch lead
3. Headlight coupler
4. Left handlebar switch lead
5. Front left turn signal light lead
6. Main switch lead
7. Auxiliary light lead
8. Front right turn signal light lead
9. Right handlebar switch lead
10. Front brake light switch lead
11. Clamp
 - A. 50–60 mm (1.97–2.36 in)
 - B. Fasten the meter lead (speedometer), main switch lead, and clutch switch lead with the clamp.
 - C. Route the front left turn signal light lead inside of the headlight through the rear of the speedometer cable.
 - D. Route the front right turn signal light lead inside of the headlight through the rear of the tachometer cable.
 - E. Fasten the meter lead (tachometer), main switch lead, front brake light switch lead, right handlebar switch lead, and clutch switch lead with the clamp.
 - F. Over 20 mm (0.79 in) away from the end
 - G. Point the open end of the clamp forward.
 - H. Harness coming into the inside of the headlight
 - I. Route the right handlebar switch lead, front brake light switch lead, and meter lead (speedometer and tachometer).
 - J. Route the left handlebar switch lead, front left turn signal light lead, main switch lead, and clutch switch lead.
 - K. Route the wire harness and front right turn signal light lead.

CABLE ROUTING

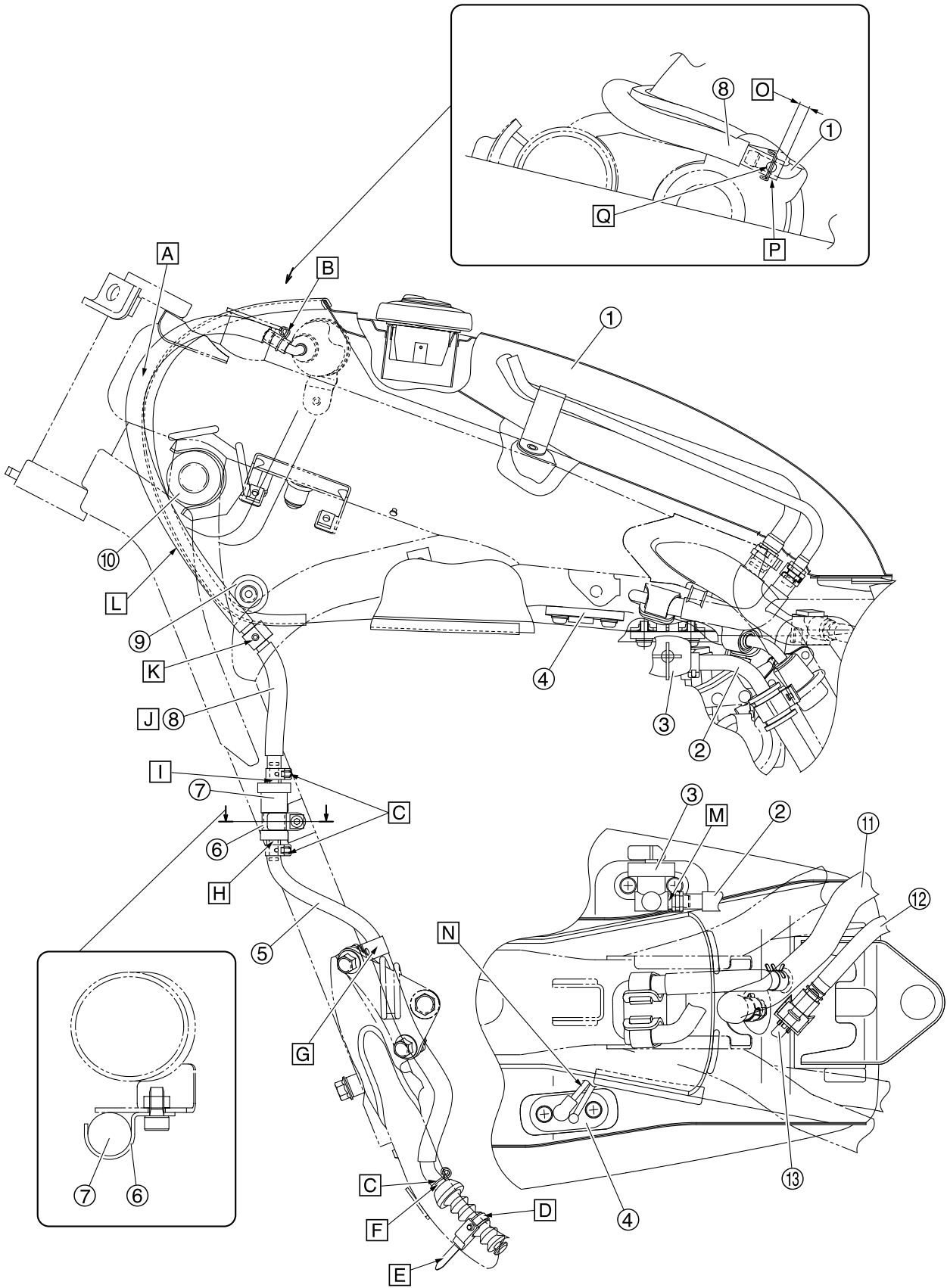
Handle



CABLE ROUTING

1. Tachometer cable
 2. Speedometer cable
 3. Clutch cable
 4. Decompression cable
 5. Wire harness
 6. Brake hose
 7. Throttle cable
-
- A. Route the speedometer cable to the front of the lower bracket.
 - B. Fasten the brake hose with the clamp.
 - C. Route the tachometer cable to the upper right side of the lower bracket.
 - D. Route the tachometer cable to the inside of the headlight beam adjusting stay.
 - E. Route the throttle cable to the front of the brake hose and the rear of the tachometer cable.

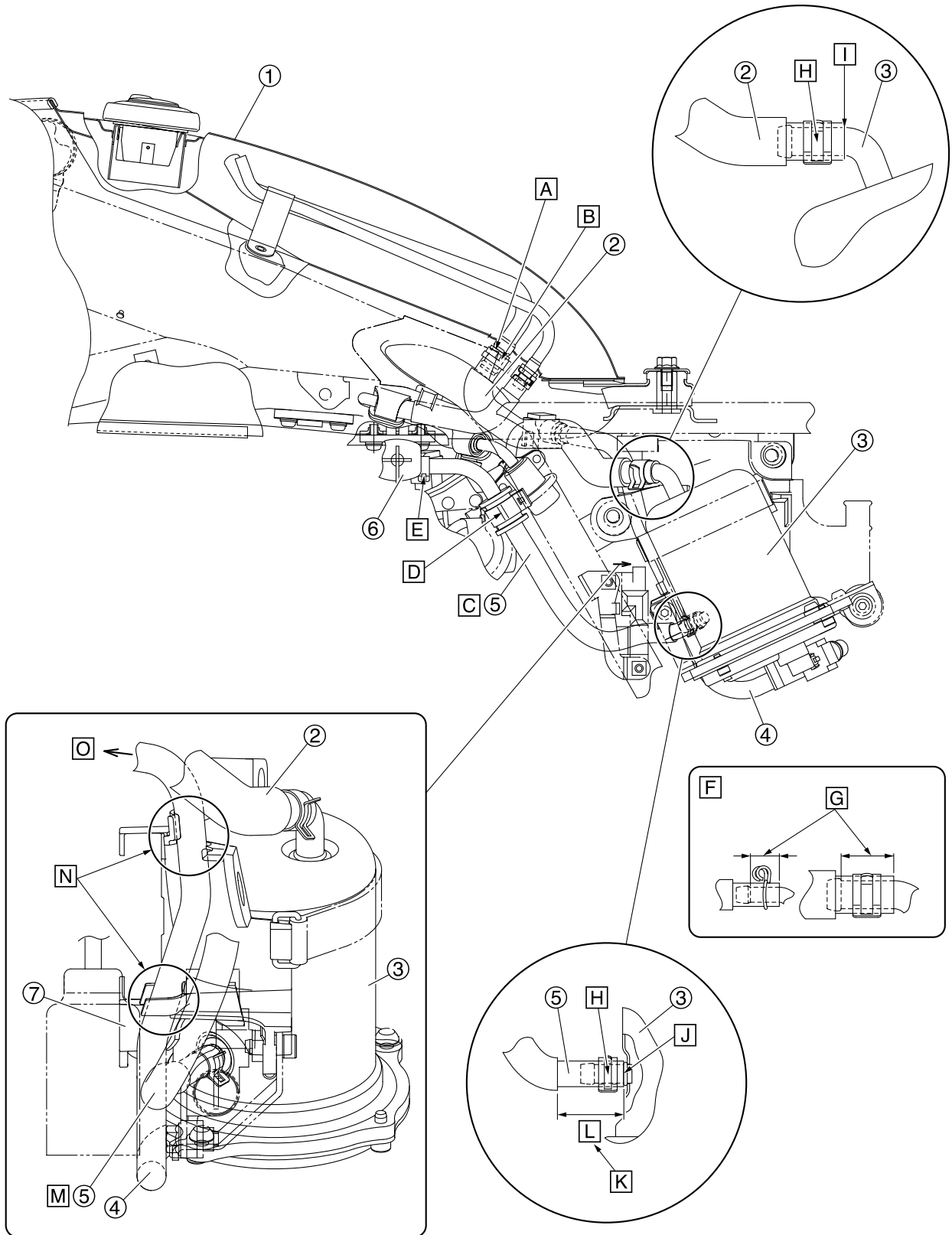
Fuel tank breather hose



1. Fuel tank
 2. Fuel hose (fuel tank–fuel pump case)
 3. Fuel cock
 4. Fuel sender
 5. Fuel tank breather hose 2
 6. Clamp
 7. Rollover valve
 8. Fuel tank breather hose 1
 9. Tank stopper
 10. Damper
 11. Pump case breather hose (fuel pump case–fuel tank)
 12. Fuel hose (fuel pump–fuel rail)
 13. Fuel rail
-
- A. The fuel tank breather hose 1 may be passed through the inside of the fuel tank flange.
 - B. Point the end of the clamp upward.
 - C. Point the end of the clamp rearward.
 - D. Fasten the plug with the plastic locking tie at the recessed portion that is the fourth from the hose mounting side
 - E. Point the end of the plastic locking tie downward and do not cut off an excess end.
 - F. Insert the fuel tank breather hose 2 into the base of the plug.
 - G. Point the open end of the clamp to the right.
 - H. Insert the fuel tank breather hose 2 into the base of the rollover valve.
 - I. Insert the fuel tank breather hose 1 into the base of the rollover valve.
 - J. Install the fuel tank breather hose 1 so that its white paint mark is located at the fuel tank side.
 - K. Point the open end of the clamp rearward.
 - L. Route the fuel tank breather hose 1 to the front of the damper and tank stopper.
 - M. Insert the fuel hose (fuel tank–fuel pump case) into the base of the fuel cock.
 - N. Install the fuel sender lead to face the inside of the vehicle.
 - O. 5 mm (0.20 in)
 - P. Insert the fuel tank breather hose 1 into an end of the round portion.
 - Q. Install the clamp to the position indicated by a white paint mark on the fuel tank breather hose 1.

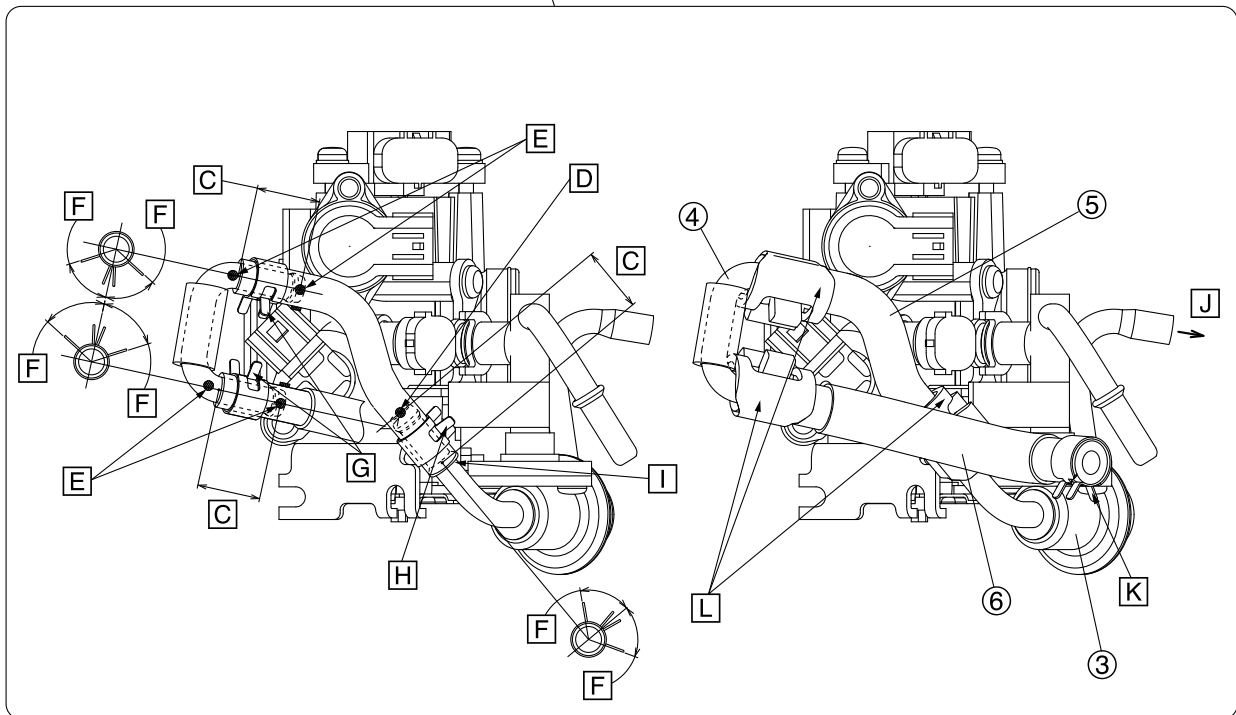
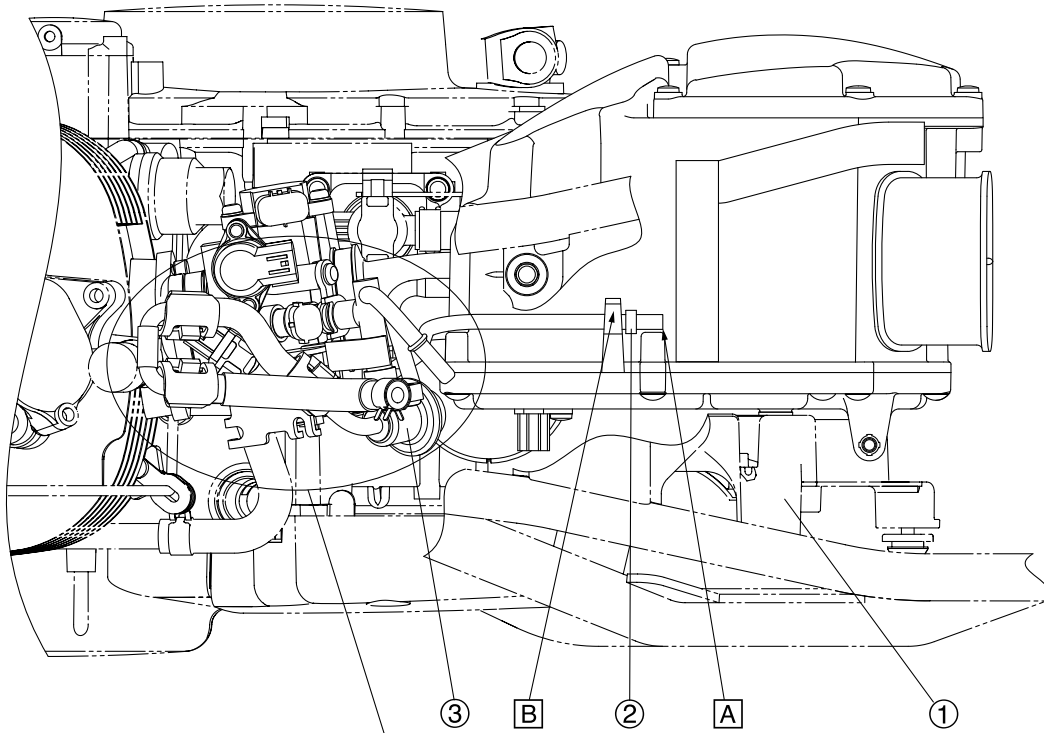
CABLE ROUTING

Fuel pump case



1. Fuel tank
 2. Pump case breather hose (fuel pump case–fuel tank)
 3. Fuel pump case
 4. Fuel hose (fuel pump–fuel rail)
 5. Fuel hose (fuel tank–fuel pump case)
 6. Fuel cock
 7. Fuel pump case box
-
- A. Insert the pump case breather hose (fuel pump case–fuel tank) to the base of the fuel tank pipe.
 - B. Install the pump case breather hose (fuel pump case–fuel tank) so that its paint mark is located at the left side of the vehicle. Install so that an end of the clamp overlaps the paint mark and point the open end rearward.
 - C. The protector end of the fuel hose should be located below the grommet.
 - D. Point the open end of the clamp to the inside.
 - E. Point the end of the clamp downward.
 - F. Detailed clamp installation
 - G. Install a clamp halfway between the hose end and the bulge of a pipe end.
 - H. Point the end of the clamp to the left.
 - I. Insert the pump case breather hose (fuel pump case–fuel tank) into the end of the round portion at the fuel pump case.
 - J. Insert the fuel hose (fuel tank–fuel pump case) into the base of the fuel pump case pipe.
 - K. Make sure that the fuel hose is not inverted when installed.
 - L. 29 mm (1.14 in)
 - M. Route the fuel hose (fuel tank–fuel pump case) between the coupler cover and the key cylinder.
 - N. Install the fuel hose (fuel pump–fuel rail) to the guide of the fuel pump case box.
 - O. To the throttle body assembly (fuel pipe)

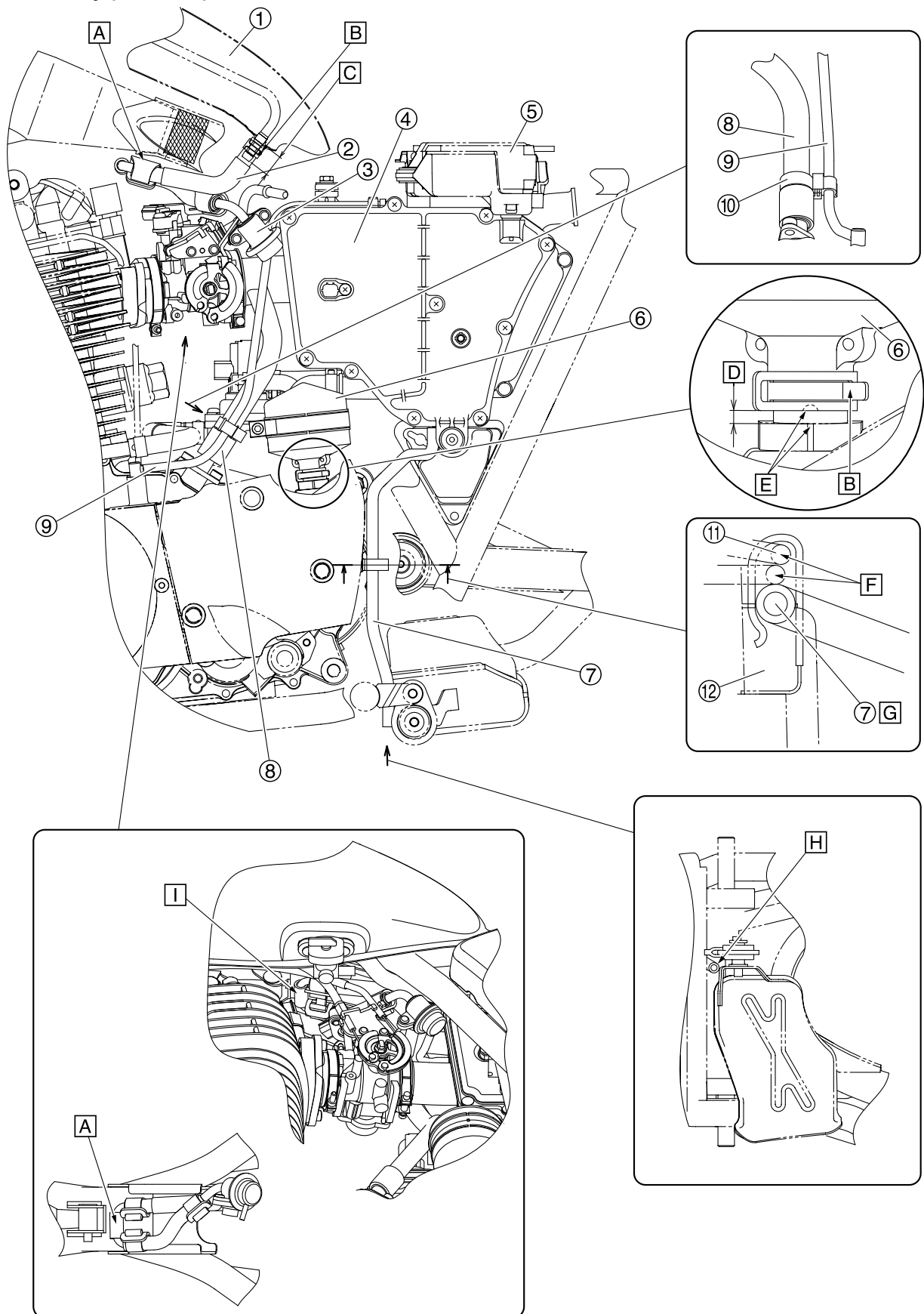
Throttle body (upper view)



1. Fuel pump case box
 2. Breather hose
 3. Pressure regulator
 4. Fuel pipe
 5. Fuel hose (pressure regulator–fuel pipe)
 6. Fuel hose (fuel pipe–fuel tank)
-
- A. Avoid contact of the end of the breather hose with the damper.
 - B. Install the breather hose to the air filter case holder.
 - C. 20.0 mm (0.79 in)
 - D. Point the green paint mark upward.
 - E. Align the fuel hose and fuel pipe yellow paint marks with each other. Point the paint mark upward.
 - F. 60°
 - G. Point the end of the clamp to the inside.
 - H. Point the end of the clamp to the fuel rail side.
 - I. Insert the fuel hose (pressure regulator–fuel pipe) into the bulge of the pressure regulator.
 - J. To the air filter case
 - K. Point the end of the clamp toward the outside of the vehicle.
 - L. Install the cover to the clamp to avoid slack.

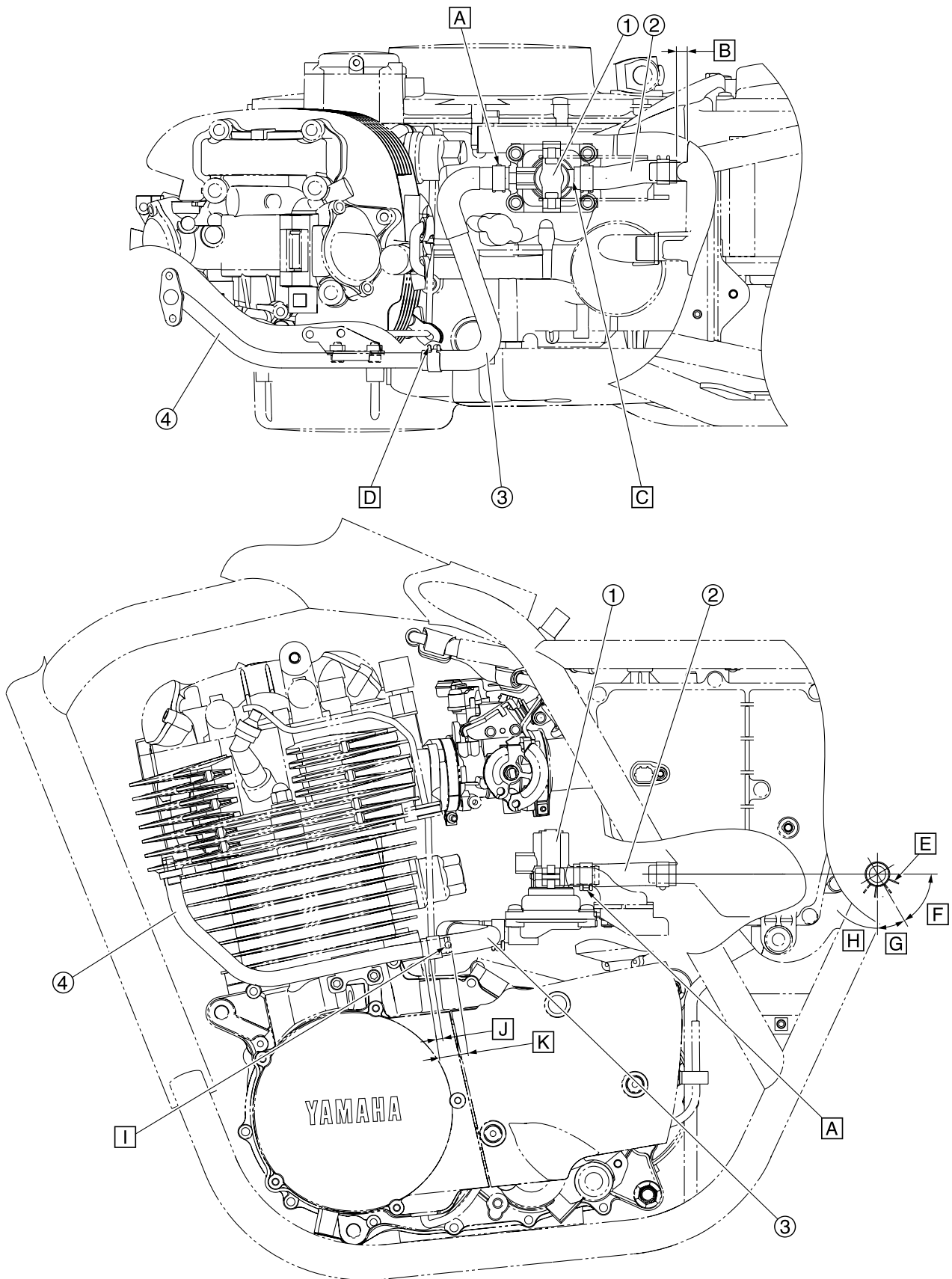
CABLE ROUTING

Throttle body (side view)



1. Fuel tank
 2. Fuel hose (pressure regulator–fuel tank)
 3. Pressure regulator
 4. Air filter case
 5. Battery box
 6. Oil separator
 7. Air filter case drain hose
 8. Oil hose 2
 9. Breather hose
 10. Clamp
 11. Stator coil assembly lead
 12. Crankcase
-
- A. Dispose the fuel hose (pressure regulator–fuel tank) below the frame.
 - B. Point the end of the clamp toward the outside of the vehicle.
 - C. 10.0 mm (0.39 in)
 - D. 0–3.0 mm (0–0.12 in)
 - E. Align the oil separator and crankcase marks with each other.
 - F. Fasten the sidestand switch lead and stator coil assembly lead with the clamp.
 - G. Fasten the air filter case drain hose with the clamp.
 - H. Route the air filter case drain hose between the muffler chamber and the frame.
 - I. Make sure that the fuel hose (pressure regulator–fuel tank) is located as shown in the illustration.

Air induction system solenoid



1. Air cut-off valve
 2. Air induction system hose (air filter case–air cut-off valve)
 3. Air induction system hose (air cut-off valve–air induction system pipe)
 4. Air induction system pipe
- A. Point the end of the clamp downward.
 - B. A 0 to 5 mm (0 to 0.2 in) gap is allowed to be present between the air induction system hose and the air filter case.
 - C. Insert the air induction system hose (air filter case–air cut-off valve) into the base of the air cut-off valve.
 - D. Point the end of the clamp to the inside.
 - E. Point the end of the clamp obliquely downward.
 - F. 60°
 - G. 30°
 - H. Clamp installation range
 - I. Install the air induction system hose (air cut-off valve–air induction system pipe) so that the white paint mark faces outward.
 - J. 2.0–6.0 mm (0.08–0.24 in)
 - K. 23.0 mm (0.91 in)

PERIODIC CHECKS AND ADJUSTMENTS

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PERIODIC MAINTENANCE

EAS20450

PERIODIC MAINTENANCE

EAS20460

INTRODUCTION

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

TIP

- **The annual checks must be performed every year, except if a kilometer-based maintenance, or for the UK, a mileage-based maintenance, is performed instead.**
- From 50000 km (30000 mi), repeat the maintenance intervals starting from 10000 km (6000 mi).
- Items marked with an asterisk should be performed by a Yamaha dealer as they require special tools, data and technical skills.

EAS2RD1004

PERIODIC MAINTENANCE CHART FOR THE EMISSION CONTROL SYSTEM

NO.	ITEM	CHECK OR MAINTENANCE JOB	ODOMETER READING					ANNUAL CHECK
			1000 km (600 mi)	10000 km (6000 mi)	20000 km (12000 mi)	30000 km (18000 mi)	40000 km (24000 mi)	
1	* Fuel line	<ul style="list-style-type: none"> • Check fuel hoses for cracks or damage. 		√	√	√	√	√
2	Spark plug	<ul style="list-style-type: none"> • Check condition. • Clean and regap. 		√		√		
		<ul style="list-style-type: none"> • Replace. 			√		√	
3	* Valves	<ul style="list-style-type: none"> • Check valve clearance. • Adjust. 	√	√	√	√	√	
4	* Fuel injection	<ul style="list-style-type: none"> • Check engine idle speed. 		√	√	√	√	√
5	* Muffler and exhaust pipe	<ul style="list-style-type: none"> • Check the screw clamp(s) for looseness. 	√	√	√	√	√	
6	* Air induction system	<ul style="list-style-type: none"> • Check the air cut-off valve, reed valve, and hose for damage. • Replace any damaged parts if necessary. 		√	√	√	√	√

EAS2RD1005

GENERAL MAINTENANCE AND LUBRICATION CHART

NO.	ITEM	CHECK OR MAINTENANCE JOB	ODOMETER READING					ANNUAL CHECK
			1000 km (600 mi)	10000 km (6000 mi)	20000 km (12000 mi)	30000 km (18000 mi)	40000 km (24000 mi)	
1	Air filter element	<ul style="list-style-type: none"> • Replace. 	Every 20000 km (12500 mi)					
2	Clutch	<ul style="list-style-type: none"> • Check operation. • Adjust. 	√	√	√	√	√	
3	* Timing chain	<ul style="list-style-type: none"> • Check timing chain tensioner. • Adjust if necessary. 	√	√	√	√	√	
4	* Decompression system	<ul style="list-style-type: none"> • Check operation. • Adjust or replace cable. 	√	√	√	√	√	

PERIODIC MAINTENANCE

NO.	ITEM	CHECK OR MAINTENANCE JOB	ODOMETER READING					ANNUAL CHECK
			1000 km (600 mi)	10000 km (6000 mi)	20000 km (12000 mi)	30000 km (18000 mi)	40000 km (24000 mi)	
5 *	Front brake	<ul style="list-style-type: none"> • Check operation, fluid level and vehicle for fluid leakage. • Adjust brake lever free play. 	√	√	√	√	√	√
		<ul style="list-style-type: none"> • Replace brake pads. 	Whenever worn to the limit					
6 *	Rear brake	<ul style="list-style-type: none"> • Check operation and adjust brake pedal free play. 	√	√	√	√	√	√
		<ul style="list-style-type: none"> • Replace brake shoes. 	Whenever worn to the limit					
7 *	Brake hose	<ul style="list-style-type: none"> • Check for cracks or damage. • Check for correct routing and clamping. 		√	√	√	√	√
		<ul style="list-style-type: none"> • Replace. 	Every 4 years					
8 *	Brake fluid	<ul style="list-style-type: none"> • Replace. 	Every 2 years					
9 *	Wheels	<ul style="list-style-type: none"> • Check runout, spoke tightness and for damage. • Tighten spokes if necessary. 	√	√	√	√	√	
10 *	Tires	<ul style="list-style-type: none"> • Check tread depth and for damage. • Replace if necessary. • Check air pressure. • Correct if necessary. 		√	√	√	√	√
11 *	Wheel bearings	<ul style="list-style-type: none"> • Check bearings for looseness or damage. 		√	√	√	√	
12 *	Swingarm	<ul style="list-style-type: none"> • Check operation and for excessive play. 		√	√	√	√	
		<ul style="list-style-type: none"> • Lubricate with lithium-soap-based grease. 	Every 50000 km (30000 mi)					
13	Drive chain	<ul style="list-style-type: none"> • Check chain slack, alignment and condition. • Adjust and lubricate chain with a special O-ring chain lubricant thoroughly. 	Every 500 km (300 mi) and after washing the motorcycle, riding in the rain or riding in wet areas					
14 *	Steering bearings	<ul style="list-style-type: none"> • Check bearing play and steering for roughness. 	√	√	√	√	√	
		<ul style="list-style-type: none"> • Lubricate with lithium-soap-based grease. 	Every 20000 km (12000 mi)					
15 *	Chassis fasteners	<ul style="list-style-type: none"> • Make sure that all nuts, bolts and screws are properly tightened. 		√	√	√	√	√
16	Brake lever pivot shaft	<ul style="list-style-type: none"> • Lubricate with silicone grease. 		√	√	√	√	√
17	Brake pedal pivot shaft	<ul style="list-style-type: none"> • Lubricate with lithium-soap-based grease. 		√	√	√	√	√
18	Clutch lever pivot shaft	<ul style="list-style-type: none"> • Lubricate with lithium-soap-based grease. 		√	√	√	√	√
19	Sidestand, centerstand	<ul style="list-style-type: none"> • Check operation. • Lubricate with lithium-soap-based grease. 		√	√	√	√	√
20 *	Sidestand switch	<ul style="list-style-type: none"> • Check operation. 	√	√	√	√	√	√
21 *	Front fork	<ul style="list-style-type: none"> • Check operation and for oil leakage. 		√	√	√	√	

PERIODIC MAINTENANCE

NO.	ITEM	CHECK OR MAINTENANCE JOB	ODOMETER READING					ANNUAL CHECK
			1000 km (600 mi)	10000 km (6000 mi)	20000 km (12000 mi)	30000 km (18000 mi)	40000 km (24000 mi)	
22	* Shock absorber assemblies	• Check operation and shock absorbers for oil leakage.		√	√	√	√	
23	Engine oil	• Change. • Check oil level and vehicle for oil leakage.	√	√	√	√	√	√
24	Engine oil filter element	• Replace.	√		√		√	
25	* Front and rear brake switches	• Check operation.	√	√	√	√	√	√
26	Moving parts and cables	• Lubricate.		√	√	√	√	√
27	* Throttle grip	• Check operation. • Check throttle grip free play, and adjust if necessary. • Lubricate cable and grip housing.		√	√	√	√	√
28	* Lights, signals and switches	• Check operation. • Adjust headlight beam.	√	√	√	√	√	√

TIP

- Air filter
 - This model's air intake system is equipped with a disposable oil-coated paper element. The air filter element cannot be cleaned with compressed air, it must be replaced.
 - The air filter element needs to be replaced more frequently when riding in unusually wet or dusty areas.
- Hydraulic brake service
 - After disassembling the brake master cylinder and caliper, always change the fluid. Regularly check the brake fluid level and fill the reservoir as required.
 - Every two years replace the internal components of the brake master cylinder and caliper, and change the brake fluid.
 - Replace the brake hose every four years and if cracked or damaged.

PERIODIC MAINTENANCE

EAS21030

CHECKING THE FUEL LINE

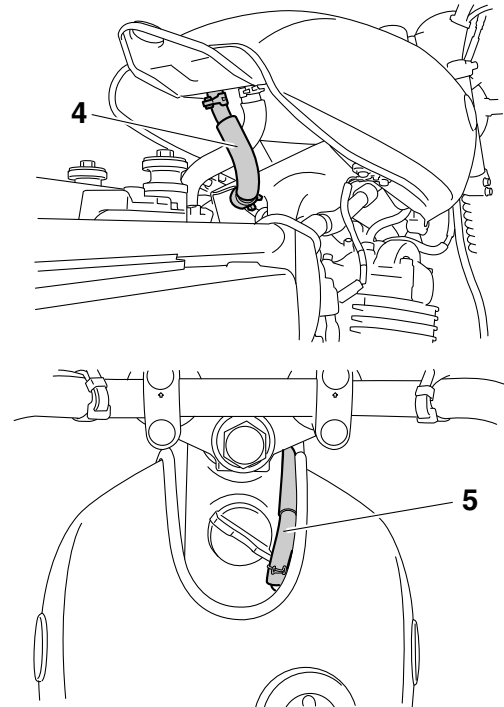
The following procedure applies to all of the fuel, vacuum and breather hoses.

1. Remove:
 - Seat
 - Side cover (left)
Refer to "GENERAL CHASSIS" on page 4-1.
 - Fuel tank
Refer to "FUEL TANK" on page 6-1.
2. Check:
 - Fuel hose (fuel tank–fuel pump case) "1"
 - Pump case breather hose (fuel pump case–fuel tank) "2"
 - Fuel hose (fuel pump–fuel rail) "3"
 - Fuel hose (pressure regulator–fuel tank) "4"
 - Fuel tank breather hose "5"
Cracks/damage → Replace.
Loose connections → Connect properly.

ECA14940

NOTICE

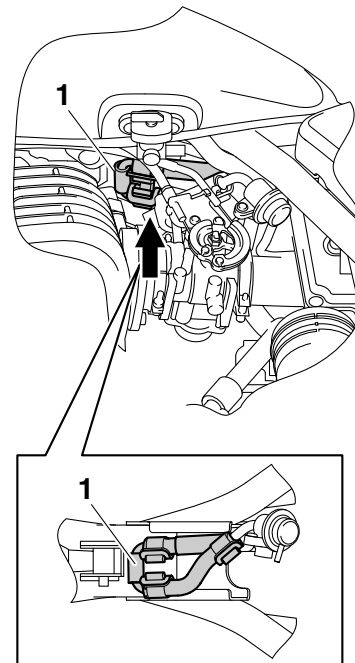
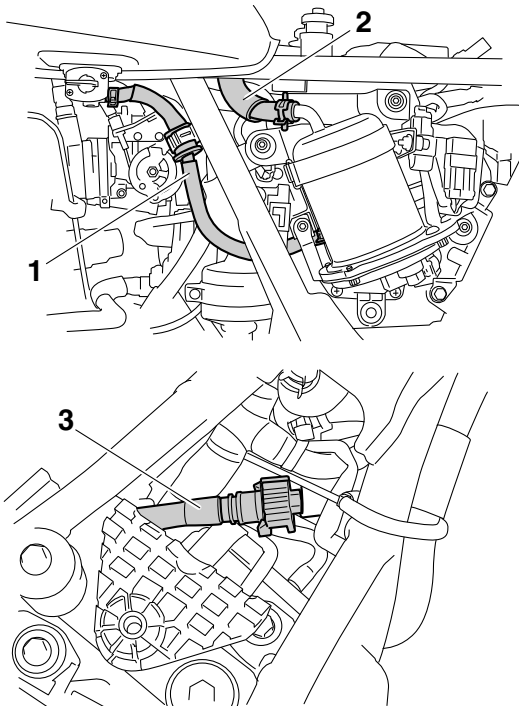
Make sure the fuel tank breather hose is routed correctly.



3. Check:
 - Fuel hose (pressure regulator–fuel tank) location

TIP

Make sure that the fuel hose "1" is located (below the frame), as shown.



4. Install:
 - Fuel tank
Refer to "FUEL TANK" on page 6-1.
 - Side cover (left)
 - Seat

PERIODIC MAINTENANCE

Refer to "GENERAL CHASSIS" on page 4-1.

EAS20690

CHECKING THE SPARK PLUG

1. Remove:
 - Spark plug cap
2. Remove:
 - Spark plug

ECA13330

NOTICE

Before removing the spark plug, blow away any dirt accumulated in the spark plug well with compressed air to prevent it from falling into the cylinder.

3. Check:
 - Spark plug type
Incorrect → Change.

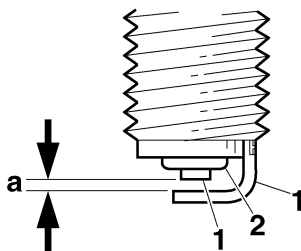


Manufacturer/model
NGK/BPR6ES

4. Check:
 - Electrode "1"
Damage/wear → Replace the spark plug.
 - Insulator "2"
Abnormal color → Replace the spark plug.
Normal color is medium-to-light tan.
5. Clean:
 - Spark plug
(with a spark plug cleaner or wire brush)
6. Measure:
 - Spark plug gap "a"
Out of specification → Regap.



Spark plug gap
0.7–0.8 mm (0.028–0.031 in)



7. Install:
 - Spark plug



Spark plug
25 Nm (2.5 m·kgf, 18 ft·lbf)

TIP

Before installing the spark plug, clean the spark

plug and gasket surface.

8. Connect:
 - Spark plug cap

EAS20520

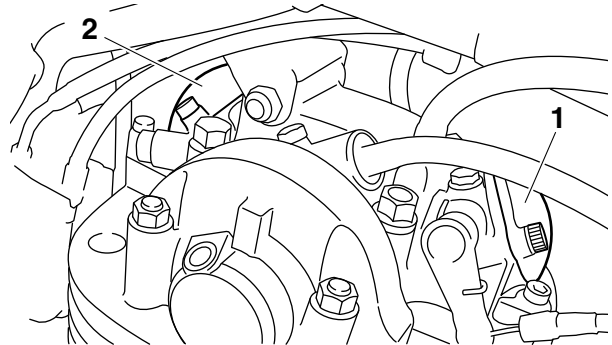
ADJUSTING THE VALVE CLEARANCE

The following procedure applies to all of the valves.

TIP

- 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:
 - Seat
Refer to "GENERAL CHASSIS" on page 4-1.
 - Fuel tank
Refer to "FUEL TANK" on page 6-1.
 - Spark plug cap
 - Spark plug
 - Exhaust tappet cover "1"
 - Intake tappet cover "2"
Refer to "CYLINDER HEAD" on page 5-6.



2. Remove:
 - Crankcase cover (left)
Refer to "GENERATOR" on page 5-46.
3. Measure:
 - Valve clearance
Out of specification → Adjust.



Valve clearance (cold)

Intake

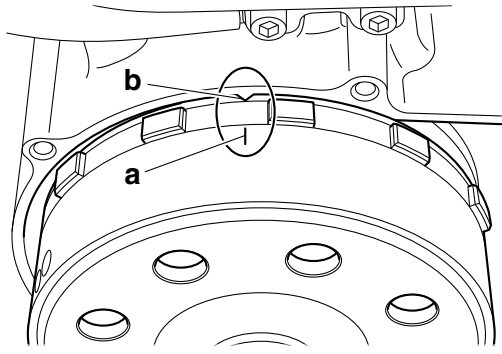
0.07–0.12 mm (0.0028–0.0047 in)

Exhaust

0.12–0.17 mm (0.0047–0.0067 in)

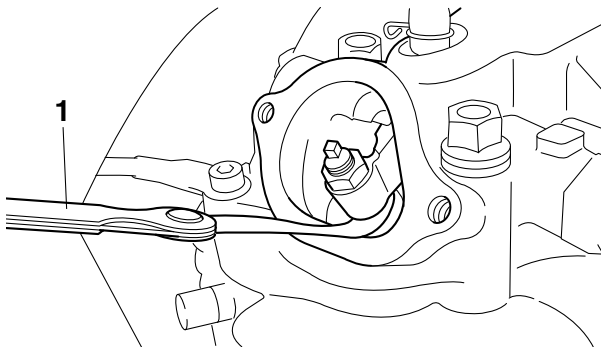
- a. Turn the crankshaft counterclockwise.
- b. When the piston is on the compression stroke, align AC magneto "T" mark "a" with crankcase alignment mark "b". (TDC)

PERIODIC MAINTENANCE



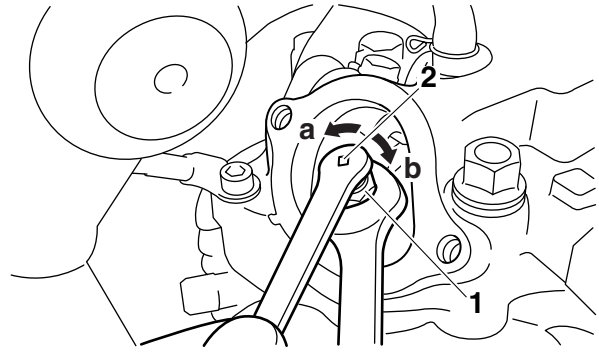
- c. A position where the AC magneto "T" mark matches the crankcase alignment mark is the compression top dead center (TDC).
- d. Measure the valve clearance with a thickness gauge "1".
Out of specification → Adjust.

	Thickness gauge 90890-03180 Feeler gauge set YU-26900-9
--	--



4. Adjust:
- Valve clearance

- a. Loosen the locknut "1".
- b. Insert a thickness gauge between the end of the adjusting screw and the valve stem end.
- c. Turn the adjusting screw "2" in direction "a" or "b" until the specified valve clearance is obtained.



Direction "a" Valve clearance is increased. Direction "b" Valve clearance is decreased.	
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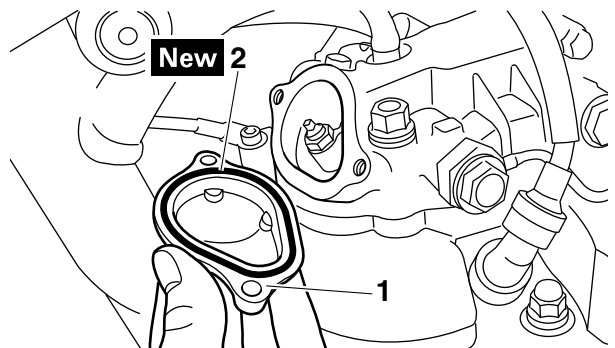
	Tappet adjusting tool (4 mm) 90890-04133 Six piece tappet set YM-A5970
--	---

- Hold the adjusting screw to prevent it from moving and tighten the locknut to specification.

	Locknut 27 Nm (2.7 m-kgf, 20 ft-lbf)
--	---

- d. Measure the valve clearance again.
- e. If the valve clearance is still out of specification, repeat all of the valve clearance adjustment steps until the specified clearance is obtained.

5. Install:
- Exhaust tappet cover "1"
 - O-ring "2" **New**



6. Install:
- Intake tappet cover
 - O-ring **New**
 - Spark plug
 - Spark plug cap

PERIODIC MAINTENANCE

- Crankcase cover (left)
Refer to "GENERATOR" on page 5-46.
 - Fuel tank
Refer to "FUEL TANK" on page 6-1.
 - Seat
Refer to "GENERAL CHASSIS" on page 4-1.
7. Adjust:
- Decompression lever free play
Refer to "ADJUSTING THE DECOMPRESSION LEVER FREE PLAY" on page 3-11.

EAS2RD1006

CHECKING THE ENGINE IDLING SPEED

TIP

Prior to checking the engine idling speed, the air filter element should be clean, and the engine should have adequate compression.

1. Start the engine and let it warm up for several minutes.
2. Install:
 - Digital tachometer
(To the spark plug lead)



Digital tachometer
90890-06760
Digital tachometer
YU-39951-B

3. Measure:
 - Engine idling speed
Out of specification → Replace the throttle body.

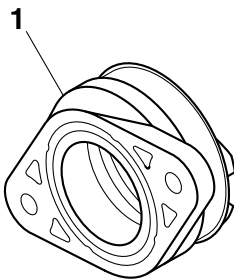


Engine idling speed
1200–1400 r/min

EAS21020

CHECKING THE THROTTLE BODY JOINT

1. Remove:
 - Throttle body
Refer to "THROTTLE BODY" on page 6-9.
2. Check:
 - Throttle body joint "1"
Cracks/damage → Replace.



3. Install:
 - Throttle body
Refer to "THROTTLE BODY" on page 6-9.

EAS20600

ADJUSTING THE EXHAUST GAS VOLUME

TIP

Be sure to set the CO density level to standard, and then adjust the exhaust gas volume.

1. Adjust:
 - Exhaust gas volume



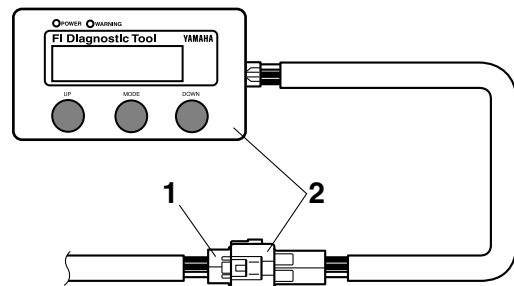
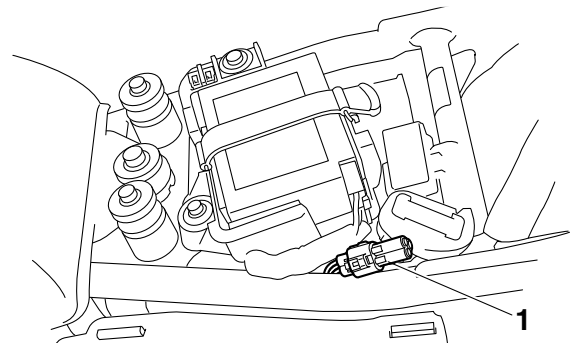
- a. Turn the main switch to "OFF".
- b. Connect the self-diagnosis signal coupler "1" to the FI diagnostic tool "2" as shown.

TIP

Remove the cap from the self-diagnosis signal coupler before connecting the FI diagnostic tool.



FI diagnostic tool
90890-03182
FI diagnostic tool
YU-03182

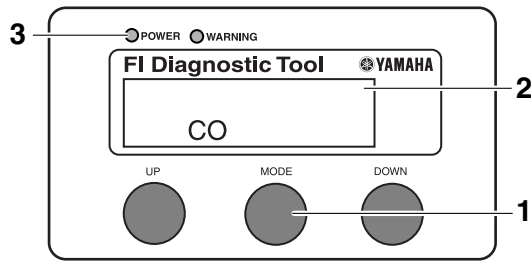


- c. While pressing the "MODE" button "1", turn the main switch to "ON".

TIP

- "DIAG" appears on the LCD display "2" of the FI diagnostic tool.
- "POWER" LED (green) "3" comes on.

PERIODIC MAINTENANCE



- d. Press the "UP" button and select the CO adjustment mode "CO".
- e. Select "CO", and then press the "MODE" button.
- f. Check that "C1" appears on the LCD display of the FI diagnostic tool.
- g. Start the engine.

TIP

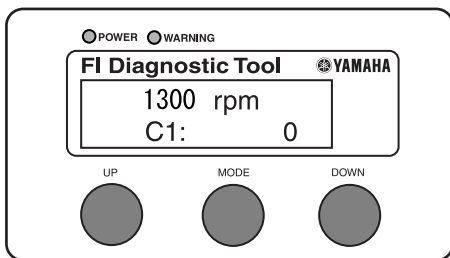
Make an adjustment after the battery is fully charged.

- h. Change the volume of CO adjustment by pressing the "UP" and "DOWN" buttons.

TIP

The CO adjustment volume and idling speed appear on the LCD of the FI diagnostic tool.

- To decrease the CO adjustment volume, press the "DOWN" button.
- To increase the CO adjustment volume, press the "UP" button.



- i. Release "DOWN" and "UP" buttons.
- j. Turn the main switch to "OFF".
- k. Disconnect the FI diagnostic tool and install the self-diagnosis signal coupler cap.



EAS21081

CHECKING THE EXHAUST SYSTEM

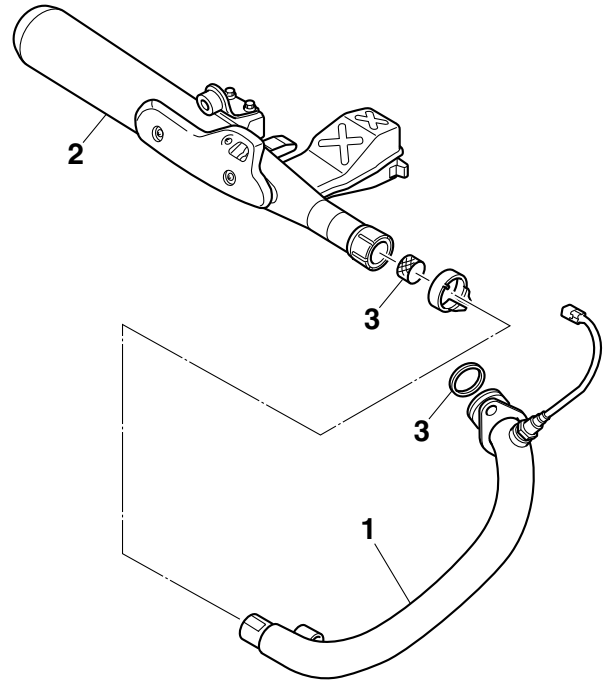
The following procedure applies to the exhaust pipe and gasket.

1. Remove:
 - Seat

Refer to "GENERAL CHASSIS" on page 4-1.

- Fuel tank
Refer to "FUEL TANK" on page 6-1.

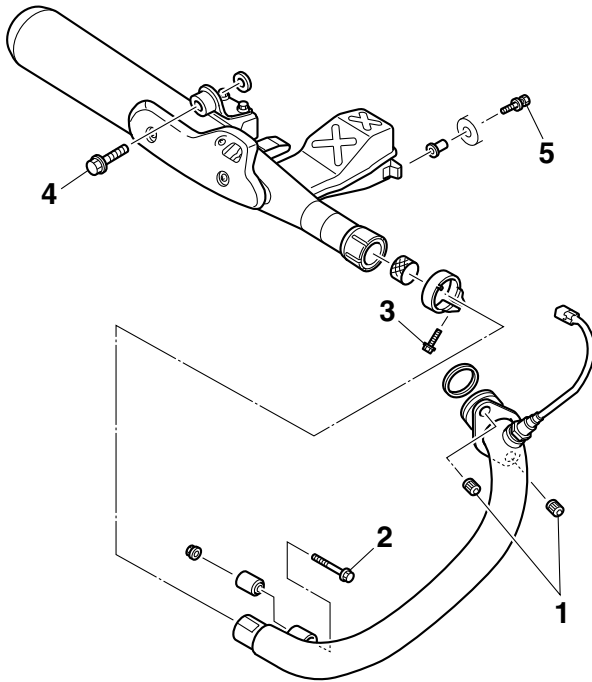
2. Check:
 - Exhaust pipe "1"
 - Muffler "2"
 - Cracks/damage → Replace.
 - Gasket "3"
 - Exhaust gas leaks → Replace the gasket.



3. Check:
 - Tightening torque

	Exhaust pipe nut "1"
	18 Nm (1.8 m·kgf, 13 ft·lbf)
	Exhaust pipe and frame bolt "2"
	23 Nm (2.3 m·kgf, 17 ft·lbf)
	Muffler joint bolt "3"
	20 Nm (2.0 m·kgf, 14 ft·lbf)
	Muffler bracket and frame bolt "4"
	60 Nm (6.0 m·kgf, 43 ft·lbf)
	Muffler and frame bracket bolt "5"
	20 Nm (2.0 m·kgf, 14 ft·lbf)

PERIODIC MAINTENANCE



4. Install:
- Fuel tank
Refer to "FUEL TANK" on page 6-1.
 - Seat
Refer to "GENERAL CHASSIS" on page 4-1.

EAS2RD1009

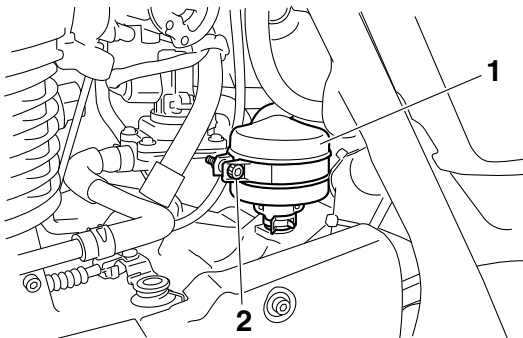
CHECKING THE AIR INDUCTION SYSTEM

1. Check:
- Air induction system
Refer to "CHECKING THE AIR INDUCTION SYSTEM" on page 6-18.

EAS2RD1008

CHECKING THE OIL SEPARATOR

1. Check:
- Oil separator "1"
Cracks/damage → Replace.
Loose connections → Tighten the clamp screw "2".

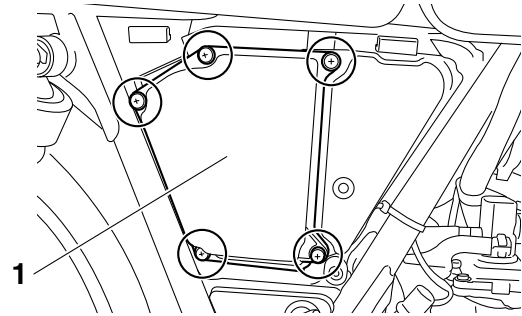


EAS20961

REPLACING THE AIR FILTER ELEMENT

1. Remove:
- Side cover (right)
Refer to "GENERAL CHASSIS" on page 4-1.

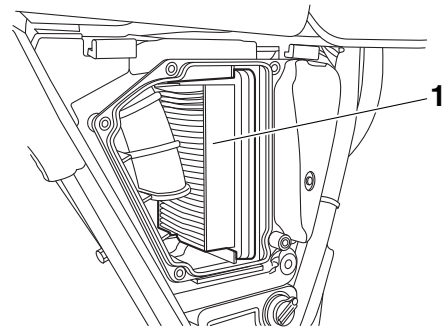
- Refer to "GENERAL CHASSIS" on page 4-1.
2. Remove:
- Air filter case cover "1"



3. Check:
- Air filter element "1"
Dirt/damage → Replace.

TIP

- Replace the air filter element every 20000 km (12500 mi) of operation.
- The air filter needs more frequent service if you are riding in unusually wet or dusty areas.



4. Install:
- Air filter case cover

ECA2RD1018

NOTICE

Never operate the engine without the air filter element installed. Failure to install the air filter element may cause rapid wear of engine parts and may damage the engine.

TIP

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

5. Install:
- Side cover (right)
Refer to "GENERAL CHASSIS" on page 4-1.



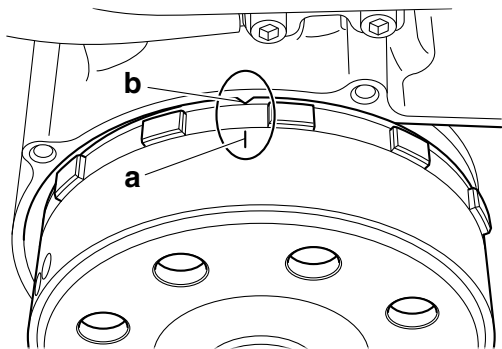
**Timing chain tensioner cap
18 Nm (1.8 m·kgf, 13 ft·lbf)**

EAS2RD1007

**ADJUSTING THE DECOMPRESSION LEVER
FREE PLAY**

- 1. Fully turn the handle to the left.
- 2. Remove:
 - Spark plug cap
 - Spark plug
- 3. Remove:
 - Crankcase cover (left)
 Refer to "GENERATOR" on page 5-46.
- 4. Turn the AC magneto counterclockwise and align the "T" mark "a" of the AC magneto with the matching mark "b" of the crankcase at compression top dead center.

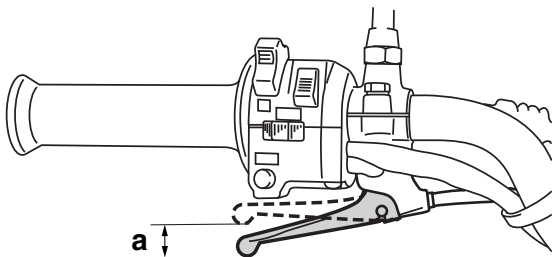
TIP
 A position where the AC magneto "T" mark matches the crankcase matching mark is the compression top dead center (TDC).



- 5. Check:
 - Decompression lever free play "a"
 Out of specification → Adjust.



**Decompression lever free play
(decompression lever end)
5.0–10.0 mm (0.20–0.39 in)**

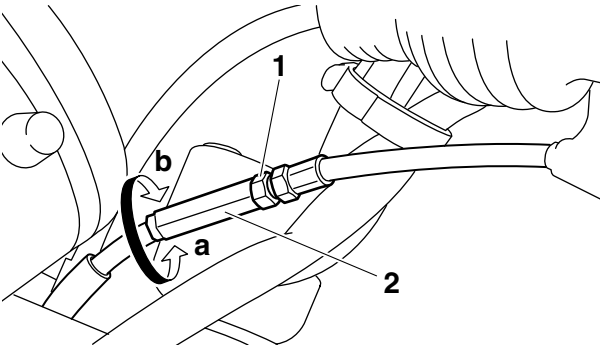


- 6. Adjust:
 - Decompression lever free play

- a. Loosen the locknut "1".
- b. Turn the adjusting nut "2" in direction "a" or "b" until decompression lever free play is obtained.

Direction "a"
 Decompression lever free play is increased.

Direction "b"
 Decompression lever free play is decreased.



- c. Tighten the locknut.

- 7. Install:
 - Crankcase cover (left)
 Refer to "GENERATOR" on page 5-46.
- 8. Install:
 - Spark plug
 - Spark plug cap

EAS2RD1020

CHECKING THE BRAKE OPERATION

- 1. Check:
 - Brake operation
 Brake not working properly → Check the brake system.
 Refer to "FRONT BRAKE" on page 4-17 and "REAR BRAKE" on page 4-30.

TIP
 Drive on the dry road, operate the front and rear brakes separately and check to see if the brakes are operating properly.

EAS21240

CHECKING THE BRAKE FLUID LEVEL

- 1. Stand the vehicle on a level surface.

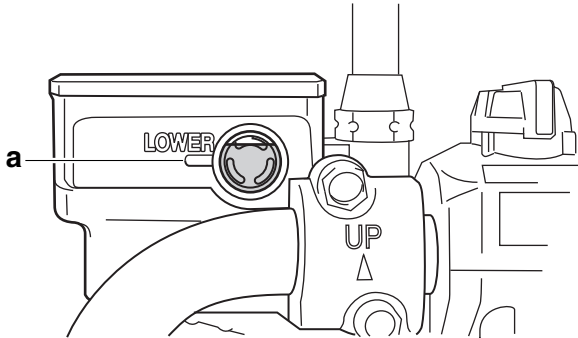
TIP

 - Place the vehicle on a suitable stand.
 - Make sure the vehicle is upright.
- 2. Check:
 - Brake fluid level

PERIODIC MAINTENANCE

Below the minimum level mark "a" → Add the specified brake fluid to the proper level.

	Specified brake fluid DOT 4
---	--



EWA13090

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.

ECA13540

NOTICE

Brake fluid may damage painted surfaces and plastic parts. Therefore, always clean up any spilled brake fluid immediately.


TIP

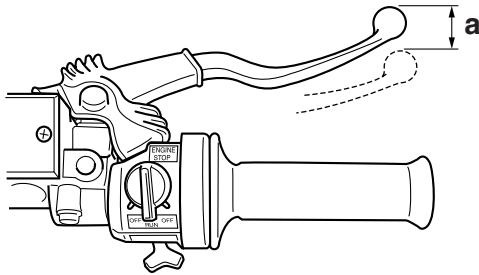
In order to ensure a correct reading of the brake fluid level, make sure the top of the brake fluid reservoir is horizontal.

EAS21170

ADJUSTING THE FRONT DISC BRAKE

1. Check:
 - Brake lever free play "a"
Out of specification → Adjust.

	Front brake lever free play 5.0–8.0 mm (0.20–0.31 in)
---	--



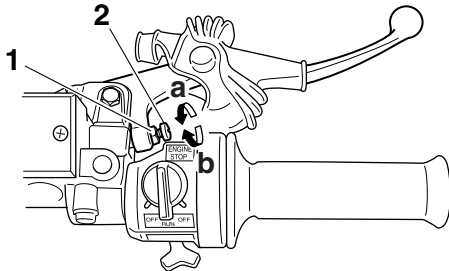
2. Adjust:
 - Brake lever free play



- a. Loosen the locknut "1".
- b. Turn the adjusting screw "2" in direction "a" or "b" until the specified brake lever free play is obtained.

Direction "a" Brake lever free play is increased.
Direction "b" Brake lever free play is decreased.

- c. Tighten the locknut "1".



EWA13050

WARNING

A soft or spongy feeling in the brake lever can indicate the presence of air in the brake system. Before the vehicle is operated, the air must be removed by bleeding the brake system. Air in the brake system will considerably reduce braking performance.

ECA13490

NOTICE

After adjusting the brake lever position, make sure there is no brake drag.



EAS21250

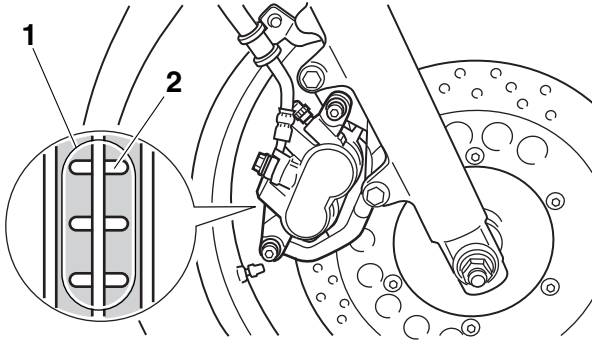
CHECKING THE FRONT BRAKE PADS

The following procedure applies to all of the brake pads.

PERIODIC MAINTENANCE

1. Operate the brake.
2. Check:
 - Front brake pad "1"

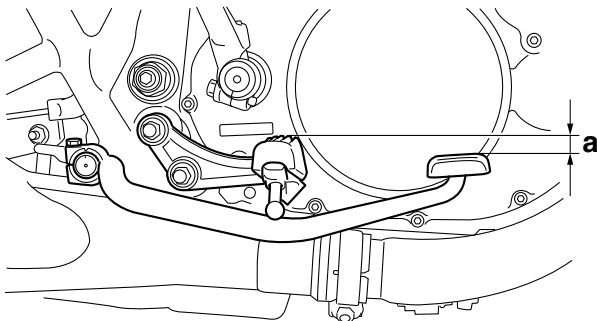
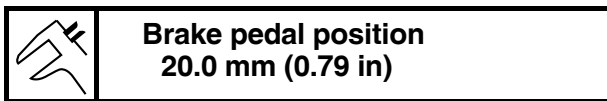
Wear indicator grooves "2" almost disappeared → Replace the brake pads as a set.
Refer to "FRONT BRAKE" on page 4-17.



EAS21220

ADJUSTING THE REAR DRUM BRAKE

1. Check:
 - Brake pedal position
(distance "a" from the top of the rider footrest to the top of the brake pedal)
Out of specification → Adjust.

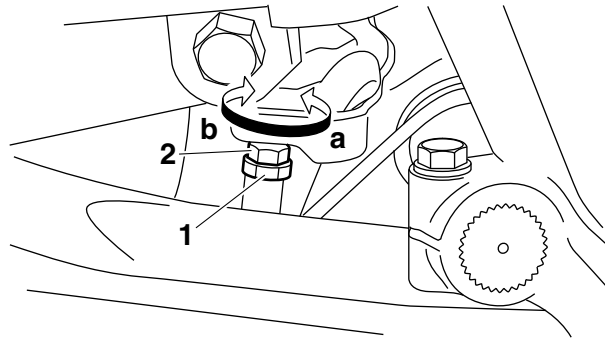
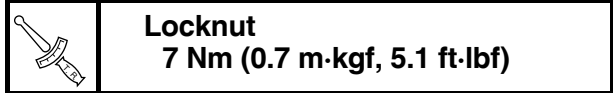


2. Adjust:
 - Brake pedal position

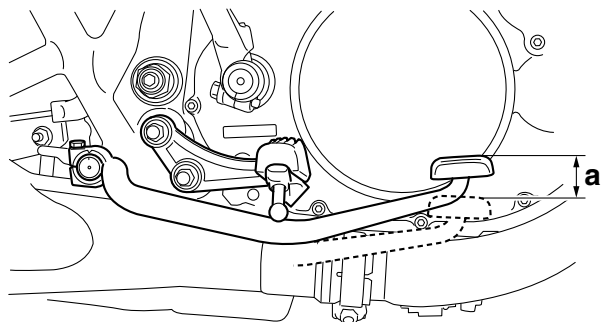
- a. Loosen the locknut "1".
- b. Turn the adjusting bolt "2" in direction "a" or "b" until the specified brake pedal position is obtained.



- c. Tighten the locknut "1" to specification.

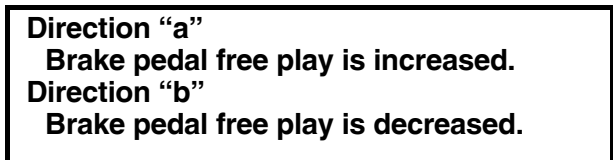


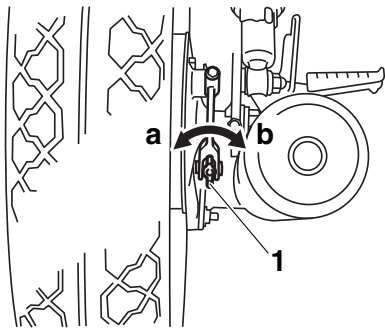
3. Check:
 - Brake pedal free play "a"
Out of specification → Adjust.



4. Adjust:
 - Brake pedal free play

- a. Turn the adjusting nut "1" in direction "a" or "b" until the specified brake pedal free play is obtained.





ECA13520

NOTICE

After adjusting the brake pedal position and free play, make sure there is no brake drag.



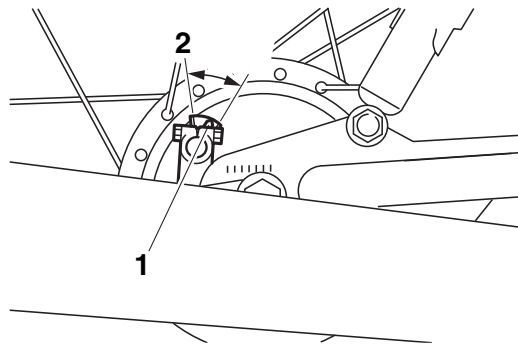
5. Adjust:

- Rear brake light switch
Refer to "ADJUSTING THE REAR BRAKE LIGHT SWITCH" on page 3-24.

EAS21310

CHECKING THE REAR BRAKE SHOES

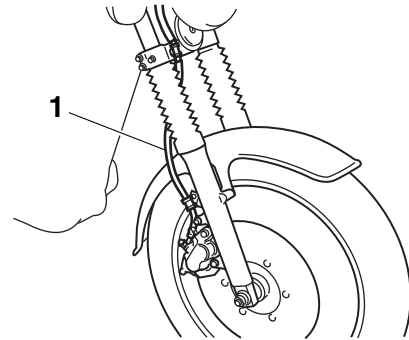
1. Operate the brake.
2. Check:
 - Brake shoe wear indicator "1"
 Reaches the wear limit line "2" → Replace the brake shoes as a set.
Refer to "REAR BRAKE" on page 4-30.



EAS21270

CHECKING THE FRONT BRAKE HOSE

1. Check:
 - Brake hose "1"
 Cracks/damage/wear → Replace.



2. Check:

- Brake hose clamp
Loose → Tighten the clamp bolt.
3. Hold the vehicle upright and apply the front brake several times.
 4. Check:
 - Brake hose
Brake fluid leakage → Replace the damaged hose.
Refer to "FRONT BRAKE" on page 4-17.

EAS21340

BLEEDING THE HYDRAULIC BRAKE SYSTEM

EWA13100

WARNING

Bleed the hydraulic brake system whenever:

- the system is disassembled.
- a brake hose is loosened, disconnected or replaced.
- the brake fluid level is very low.
- brake operation is faulty.

1. Remove:

- Reservoir cap

TIP

- Be careful not to spill any brake fluid or allow the brake master cylinder reservoir or brake fluid reservoir to overflow.
- When bleeding the hydraulic brake system, make sure there is always enough brake fluid before applying the brake. Ignoring this precaution could allow air to enter the hydraulic brake system, considerably lengthening the bleeding procedure.
- If bleeding is difficult, it may be necessary to let the brake fluid settle for a few hours. Repeat the bleeding procedure when the tiny bubbles in the hose have disappeared.

2. Bleed:

- Hydraulic brake system

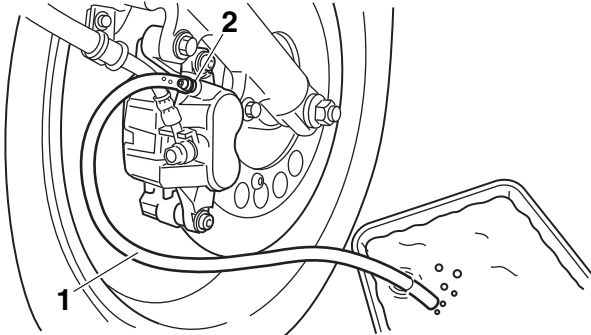


- a. Fill the brake fluid reservoir to the proper level

PERIODIC MAINTENANCE

with the specified brake fluid.

- b. Install the brake master cylinder reservoir diaphragm.
- c. Connect a clear plastic hose "1" tightly to the bleed screw "2".




- d. Place the other end of the hose into a container.
- e. Slowly apply the brake lever several times.
- f. Fully pull the brake lever and hold it in position.
- g. Loosen the bleed screw.

TIP

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

- h. Tighten the bleed screw and then release the brake lever.
- 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·kgf, 4.3 ft·lbf)
---	---

- k. Fill the brake fluid reservoir to the proper level with the specified brake fluid.
Refer to "CHECKING THE BRAKE FLUID LEVEL" on page 3-11.

EWA13110

WARNING

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



EAS21670

CHECKING THE WHEELS

The following procedure applies to both of the wheels.

1. Check:
 - Wheel
Damage/out-of-round → Replace.

EWA13260

WARNING

Never attempt to make any repairs to the wheel.

TIP

After a tire or wheel has been changed or replaced, always balance the wheel.

EAS21681

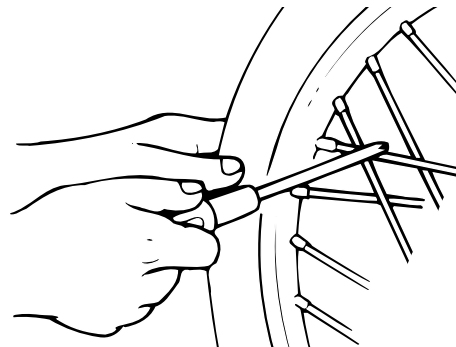
CHECKING AND TIGHTENING THE SPOKES

The following procedure applies to all of the spokes.

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

TIP


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




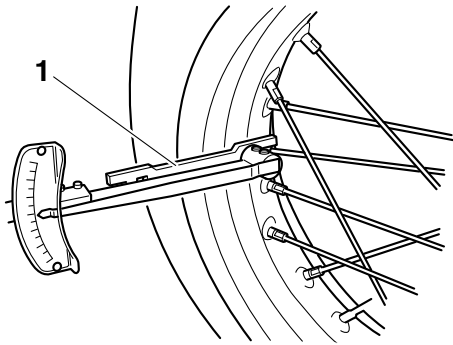
2. Tighten:
 - Spoke
(with a spoke nipple wrench "1")

TIP

Be sure to tighten the spokes before and after break-in.

	Spoke nipple wrench (8-9) 90890-01522 Spoke nipple wrench (8-9) YM-01522
---	---

	Spoke 3.0 Nm (0.30 m·kgf, 2.2 ft·lbf)
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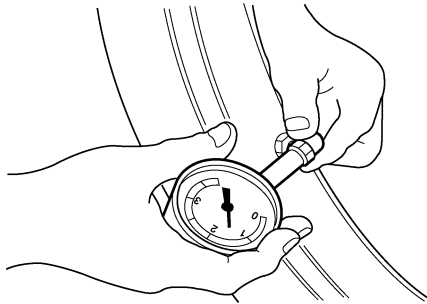
EAS21650

CHECKING THE TIRES

The following procedure applies to both of the tires.

1. Check:

- Tire pressure
Out of specification → Regulate.



EWA13180

WARNING

- The tire pressure should only be checked and regulated when the tire temperature equals the ambient air temperature.
- The tire pressure and the suspension must be adjusted according to the total weight (including cargo, rider, passenger and accessories) and the anticipated riding speed.
- Operation of an overloaded vehicle could cause tire damage, an accident or an injury. **NEVER OVERLOAD THE VEHICLE.**



Tire air pressure (measured on cold tires)

Loading condition
0–90 kg (0–198 lb)

Front
175 kPa (1.75 kgf/cm², 25 psi)

Rear
200 kPa (2.00 kgf/cm², 29 psi)

Loading condition
90–150 kg (198–331 lb)

Front
200 kPa (2.00 kgf/cm², 29 psi)

Rear
225 kPa (2.25 kgf/cm², 33 psi)

High-speed riding

Front
200 kPa (2.00 kgf/cm², 29 psi)

Rear
225 kPa (2.25 kgf/cm², 33 psi)

Maximum load
150 kg (331 lb)

* Total weight of rider, passenger, cargo and accessories

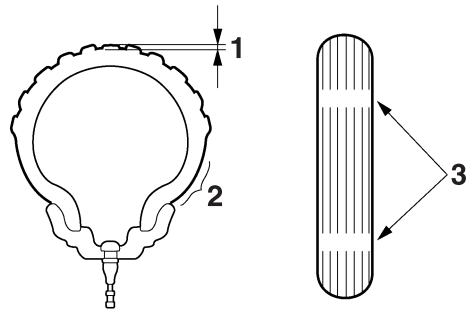
EWA13190

WARNING

It is dangerous to ride with a worn-out tire. When the tire tread reaches the wear limit, replace the tire immediately.

2. Check:

- Tire surfaces
Damage/wear → Replace the tire.



1. Tire tread depth
2. Side wall
3. Wear indicator



Wear limit (front)

1.5 mm (0.06 in) (AUS)

1.6 mm (0.06 in) (EUR)

Wear limit (rear)

1.5 mm (0.06 in) (AUS)

1.6 mm (0.06 in) (EUR)

PERIODIC MAINTENANCE

EWA14080

WARNING


- Do not use a tubeless tire on a wheel designed only for tube tires to avoid tire failure and personal injury from sudden deflation.
- When using a tube tire, be sure to install the correct tube.
- Always replace a new tube tire and a new tube as a set.
- To avoid pinching the tube, make sure the wheel rim band and tube are centered in the wheel groove.
- Patching a punctured tube is not recommended. If it is absolutely necessary to do so, use great care and replace the tube as soon as possible with a good quality replacement.


Tube wheel	Tube tire only
Tubeless wheel	Tube or tubeless tire

EWA14090

WARNING

After extensive tests, the tires listed below have been approved by Yamaha Motor Co., Ltd. for this model. The front and rear tires should always be by the same manufacturer and of the same design. No guarantee concerning handling characteristics can be given if a tire combination other than one approved by Yamaha is used on this vehicle.

	Front tire Size 90/100-18M/C 54S Manufacturer/model METZELER/ME77 Front
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	Rear tire Size 110/90-18M/C 61S Manufacturer/model METZELER/ME77
---	---

EWA13210

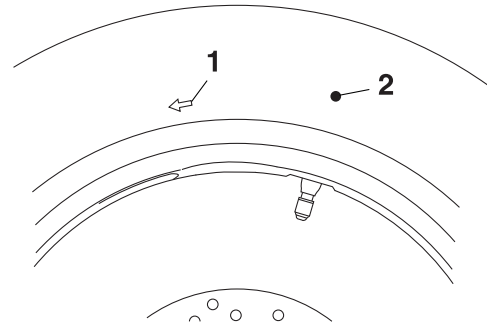
WARNING

New tires have a relatively low grip on the road surface until they have been slightly worn. Therefore, approximately 100 km should be traveled at normal speed before any high-speed riding is done.

TIP

For tires with a direction of rotation mark "1":

- Install the tire with the mark pointing in the direction of wheel rotation.
- Align the mark "2" with the valve installation point.



EAS2RD1021

CHECKING THE WHEEL BEARINGS

The following procedure applies to all of the wheel bearings.

1. Check:
 - Wheel bearing
Refer to "CHECKING THE FRONT WHEEL" on page 4-7 and "CHECKING THE REAR WHEEL" on page 4-14.

EAS2RD1022

CHECKING THE SWINGARM OPERATION

1. Check:
 - Swingarm operation
Swingarm not working properly → Check the swingarm.
Refer to "REAR SHOCK ABSORBER ASSEMBLY AND SWINGARM" on page 4-48.
2. Check:
 - Swingarm excessive play
Refer to "REAR SHOCK ABSORBER ASSEMBLY AND SWINGARM" on page 4-48.

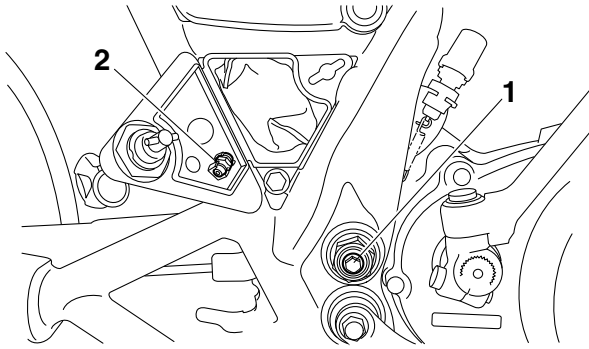
EAS2RD1029

LUBRICATING THE SWINGARM

Remove the bolts "1" at both ends of the pivot shaft and install the grease nipple "2" to the pivot shaft before lubrication.

	Recommended lubricant Lithium-soap-based grease
---	--

PERIODIC MAINTENANCE



EAS21390

ADJUSTING THE DRIVE CHAIN SLACK

ECA13550

NOTICE

A drive chain that is too tight will overload the engine and other vital parts, and one that is too loose can skip and damage the swing-arm or cause an accident. Therefore, keep the drive chain slack within the specified limits.

TIP

The drive chain slack must be checked at the tightest point on the chain.

- Stand the vehicle on a level surface.

EWA13120

WARNING

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

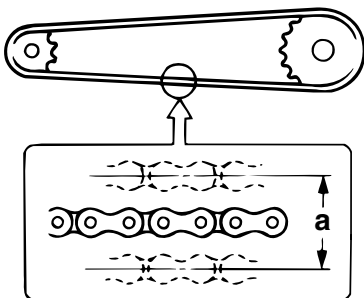
TIP

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

- Move the rear wheel several times and find the tightest position of drive chain.
- Check:
 - Drive chain slack "a"
 Out of specification → Adjust.



Drive chain slack
30.0–40.0 mm (1.18–1.57 in)

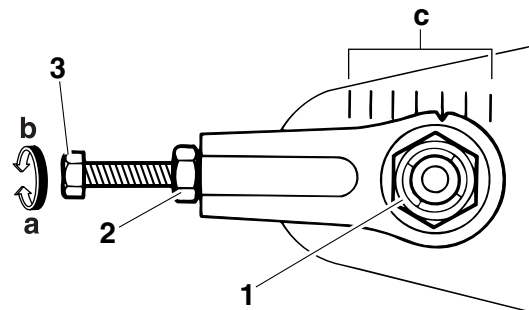


- Adjust:

- Drive chain slack

- Loosen wheel axle nut "1".
- Loosen the brake pedal free play adjusting nut and tension bar nut.
- Loosen both locknuts "2".
- Turn the adjusting bolts "3" in direction "a" or "b" until the specified drive chain slack is obtained.

Direction "a"
Drive chain is tightened.
Direction "b"
Drive chain is loosened.



TIP

- To maintain the proper wheel alignment, adjust both sides evenly.
- Align matching marks "c" with the same position.

- Tighten the wheel axle nut to specification.



Wheel axle nut
129 Nm (12.9 m·kgf, 93 ft·lbf)

- Tighten the locknuts to specification.



Locknut
16 Nm (1.6 m·kgf, 12 ft·lbf)

- Tighten the tension bar nut to specification.



Tension bar nut
19 Nm (1.9 m·kgf, 14 ft·lbf)

EAS21440

LUBRICATING THE DRIVE CHAIN

The drive chain consists of many interacting parts. If the drive chain is not maintained properly, it will wear out quickly. Therefore, the drive chain should be serviced, especially when the

PERIODIC MAINTENANCE

vehicle is used in dusty areas.

This vehicle has a drive chain with small rubber O-rings between each side plate. Steam cleaning, high-pressure washing, certain solvents, and the use of a coarse brush can damage these O-rings. Therefore, use only kerosene to clean the drive chain. Wipe the drive chain dry and thoroughly lubricate it with engine oil or chain lubricant that is suitable for O-ring chains. Do not use any other lubricants on the drive chain since they may contain solvents that could damage the O-rings.



EAS21510

CHECKING AND ADJUSTING THE STEERING HEAD

1. Stand the vehicle on a level surface.

EWA13120



WARNING

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

TIP

Place the vehicle on a suitable stand so that the front wheel is elevated.

2. Check:

- Steering head
Grasp the bottom of the front fork legs and gently rock the front fork.
Binding/looseness → Adjust the steering head.

3. Remove:

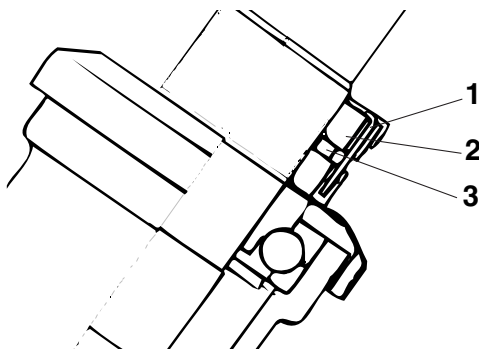
- Upper bracket
Refer to “STEERING HEAD” on page 4-44.

4. Adjust:

- Steering head



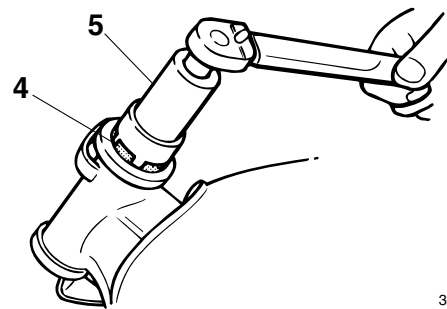
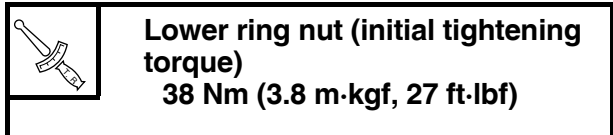
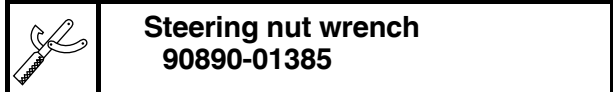
a. Remove the lock washer “1”, upper ring nut “2”, and rubber washer “3”.



b. Tighten the lower ring nut “4” to specification with a steering nut wrench “5”.

TIP

Set the torque wrench at a right angle to the steering nut wrench.



354-017

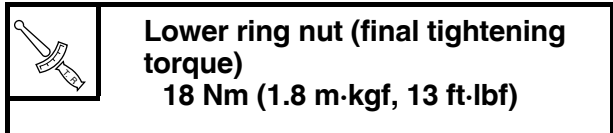
c. After fully loosening the lower ring nut, tighten it to specification with a steering nut wrench.

EWA13140



WARNING

Do not overtighten the lower ring nut.



d. Check the steering head for looseness or binding by turning the front fork all the way in both directions. If any binding is felt, remove the lower bracket and check the upper and lower bearings.

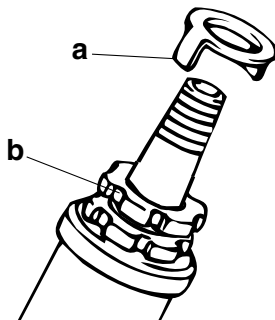
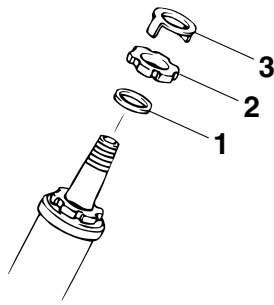
Refer to “CHECKING THE STEERING HEAD” on page 4-46.

- e. Install the rubber washer “1”.
- f. Install the upper ring nut “2”.
- g. Finger tighten the upper ring nut, then align the slots of both ring nuts. If necessary, hold the lower ring nut and tighten the upper ring nut until their slots are aligned.

TIP

Make sure the lock washer “3” tab “a” sit correctly in the ring nut slots “b”.

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5. Install:

- Upper bracket
Refer to “STEERING HEAD” on page 4-44.

EAS2RD1024

LUBRICATING THE STEERING HEAD

- Lubricate:
 - Upper bearing
 - Lower bearing
 - Bearing race



EAS2RD1025

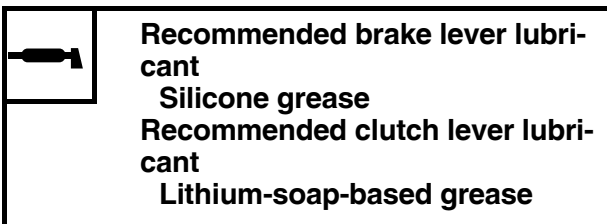
CHECKING THE CHASSIS FASTENERS

Make sure that all nuts, bolts, and screws are properly tightened.
Refer to “CHASSIS TIGHTENING TORQUES” on page 2-16.

EAS21700

LUBRICATING THE LEVERS

Lubricate the pivoting point and metal-to-metal moving parts of the levers.



EAS21710

LUBRICATING THE PEDAL

Lubricate the pivoting point and metal-to-metal moving parts of the pedal.



EAS2RD1026

CHECKING THE SIDESTAND

- Check:
 - Sidestand operation
Check that the sidestand moves smoothly.
Rough movement → Repair or replace.

EAS21720

LUBRICATING THE SIDESTAND

Lubricate the pivoting point, metal-to-metal moving parts and spring contact point of the sidestand.



EAS2RD1038

CHECKING THE CENTERSTAND

- Check:
 - Centerstand operation
Check that the centerstand moves smoothly.
Rough movement → Repair or replace.

EAS21730

LUBRICATING THE CENTERSTAND

Lubricate the pivoting point and metal-to-metal moving parts of the centerstand.



EAS2RD1033

CHECKING THE SIDESTAND SWITCH

Refer to “ELECTRICAL COMPONENTS” on page 7-51.

EAS21531

CHECKING THE FRONT FORK

- Stand the vehicle on a level surface.

EWA13120

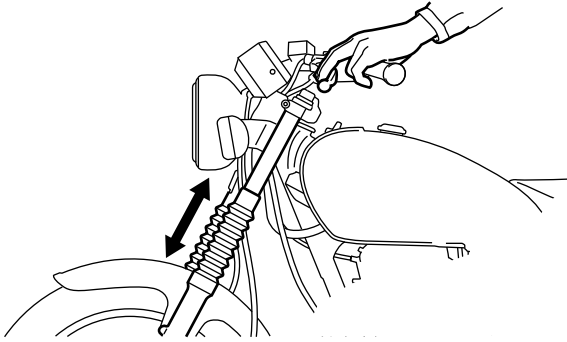



Securely support the vehicle so that there is no danger of it falling over.

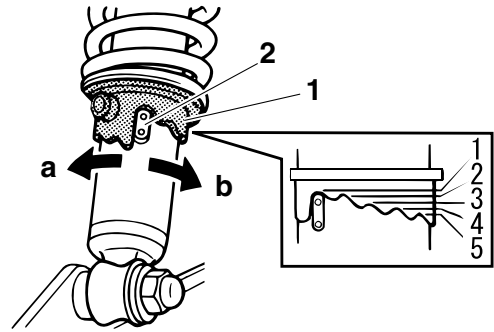
- Check:
 - Inner tube
Damage/scratches → Replace.
 - Front fork leg
Oil leaks between inner tube and outer tube → Replace the oil seal.

PERIODIC MAINTENANCE

3. Hold the vehicle upright and apply the front brake.
4. Check:
 - Front fork operation
Push down hard on the handlebar several times and check if the front fork rebounds smoothly.
Rough movement → Repair.
Refer to “FRONT FORK” on page 4-37.



Spring preload adjusting positions	
	Minimum
	1
	Standard
	1
	Maximum
	5



EAS2RD1036

CHECKING THE REAR SHOCK ABSORBER ASSEMBLY

Refer to “CHECKING THE REAR SHOCK ABSORBER ASSEMBLY” on page 4-49.

EAS21590

ADJUSTING THE REAR SHOCK ABSORBER ASSEMBLY

EWA13120



WARNING

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

Spring preload

ECA13590

NOTICE

Never go beyond the maximum or minimum adjustment positions.

1. Adjust:
 - Spring preload

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

Direction “a”

Spring preload is increased (suspension is harder).

Direction “b”

Spring preload is decreased (suspension is softer).

EAS20731

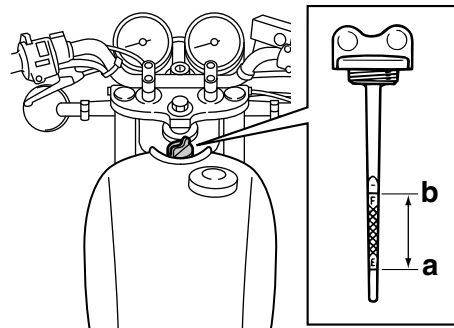
CHECKING THE ENGINE OIL LEVEL

1. Stand the vehicle on a level surface.

TIP

Place the vehicle upright on the centerstand.

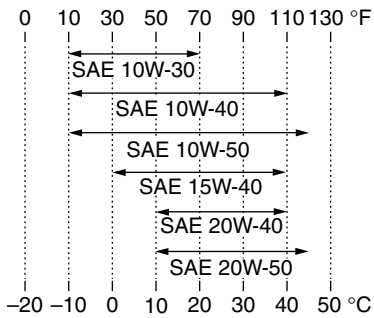
2. Start the engine, warm it up for several minutes, and then turn it off. Before checking the engine oil level, wait a few minutes until the oil has settled.
3. Check:
 - Engine oil level
The engine oil level should be between the minimum level mark “a” and maximum level mark “b”.
Below the minimum level mark → Add the recommended engine oil to the proper level.



PERIODIC MAINTENANCE



**Recommended brand
YAMALUBE**
Type
**SAE 10W-30, 10W-40, 10W-50,
15W-40, 20W-40 or 20W-50**
Recommended engine oil grade
**API service SG type or higher,
JASO standard MA**



ECA13361

NOTICE

- Engine oil also lubricates the clutch and the wrong oil types or additives could cause clutch slippage. Therefore, do not add any chemical additives or use engine oils with a grade of “CD” or higher and do not use oils labeled “ENERGY CONSERVING II”.
- Do not allow foreign materials to enter the crankcase.

TIP

Before checking the engine oil level, wait a few minutes until the oil has settled.

4. Start the engine, warm it up for several minutes, and then turn it off.
5. Check the engine oil level again.

TIP

Before checking the engine oil level, wait a few minutes until the oil has settled.

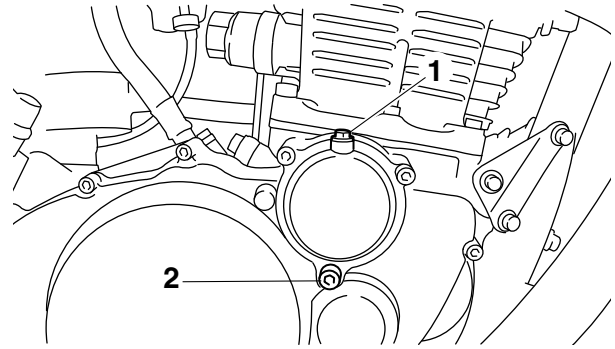
EAS20811

CHANGING THE ENGINE OIL

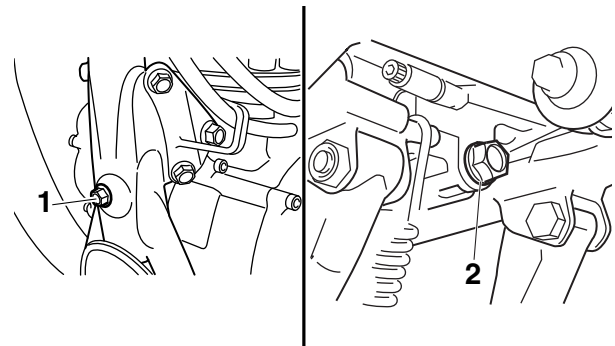
1. Start the engine, warm it up for several minutes, and then turn it off.
2. Place a container under the engine oil drain bolt.
3. Loosen:
 - Bleeder bolt “1”
 - Oil filter cover bolt “2”

TIP

Do not remove the bolt.

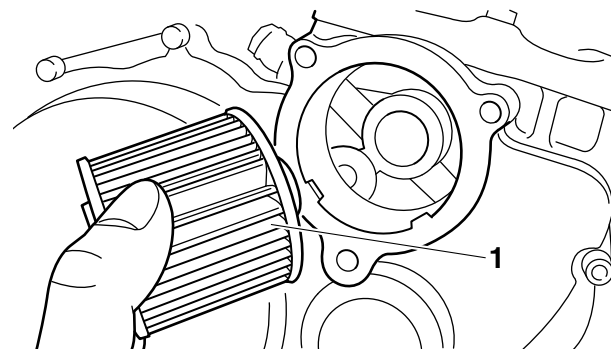


4. Remove:
 - Engine oil level gauge
 - Oil drain bolt (oil tank side) “1”
 - Oil drain bolt (crankcase side) “2”



5. Drain:
 - Engine oil (completely from the oil tank and the crankcase)
6. If the oil filter element is also to be replaced, perform the following procedure.

- a. Remove the oil filter cover and oil filter element.
- b. Install a new oil filter element “1”.

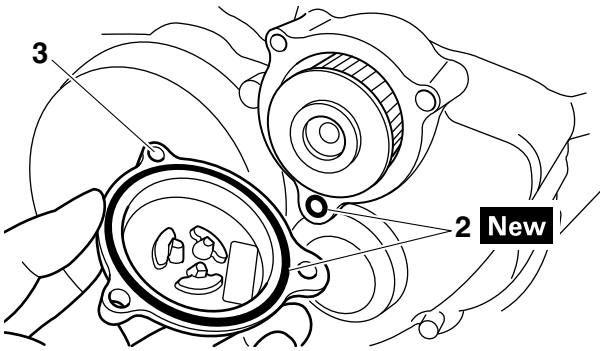


- c. Install a new O-ring “2” and oil filter cover “3”.




**Oil filter cover bolt
10 Nm (1.0 m·kgf, 7.2 ft·lbf)**
**Bleeder bolt
5 Nm (0.5 m·kgf, 3.6 ft·lbf)**

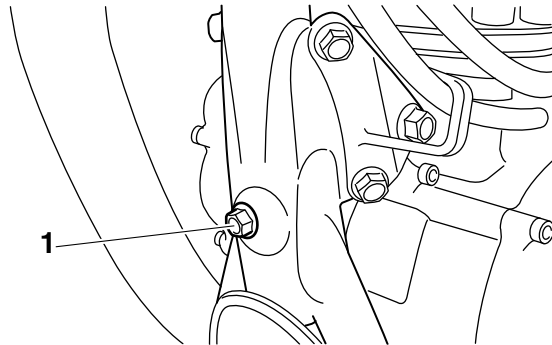
PERIODIC MAINTENANCE




7. Install:

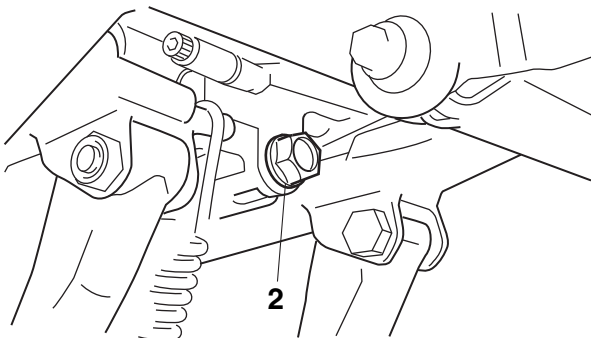
- Oil drain bolt gasket **New**
- Oil drain bolt (oil tank side) "1"

	Oil drain bolt 16 Nm (1.6 m·kgf, 12 ft·lbf)
---	--



- Oil drain bolt gasket **New**
- Oil drain bolt (crankcase side) "2"

	Oil drain bolt 30 Nm (3.0 m·kgf, 22 ft·lbf)
---	--



8. Fill:

- Oil tank
(with the specified amount of the recommended engine oil)



Engine oil quantity

Quantity (disassembled)

2.40 L (2.54 US qt, 2.11 Imp.qt)

Without oil filter element replacement

2.00 L (2.11 US qt, 1.76 Imp.qt)

With oil filter element replacement

2.10 L (2.22 US qt, 1.85 Imp.qt)

9. Install:

- Engine oil level gauge

10. Start the engine, warm it up for several minutes, and then turn it off. Before checking the engine oil level, wait a few minutes until the oil has settled.

11. Check:

- Engine
(for engine oil leaks)

12. Check:

- Engine oil level
Refer to "CHECKING THE ENGINE OIL LEVEL" on page 3-21.

13. Check:

- Engine oil pressure



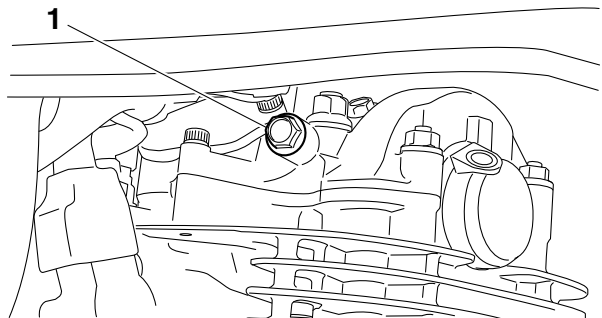
a. Slightly loosen the oil check bolt "1".

ECA2RD1002

NOTICE

Engine start-up with the oil check bolt removed will cause an oil spout. Check with the oil check bolt loosened without fail.

1



b. Start the engine and check to see if oil seeps out while idling the engine for about one minute.

ECA2RD1003

NOTICE

Any inspection must be conducted at engine idling speed. Do not rev up the engine.

c. If no oil seeps out, check the engine oil passages, the oil filter element and the oil pump for damage or leakage.

- d. Start the engine after solving the problem(s) and make sure that oil seeps out.
- e. Tighten the oil check bolt to specification.

	Oil check bolt 18 Nm (1.8 m·kgf, 13 ft·lbf)
---	--



EAS2RD1037

CHECKING THE FRONT BRAKE LIGHT SWITCH

Refer to “ELECTRICAL COMPONENTS” on page 7-51.

EAS21330

ADJUSTING THE REAR BRAKE LIGHT SWITCH

TIP

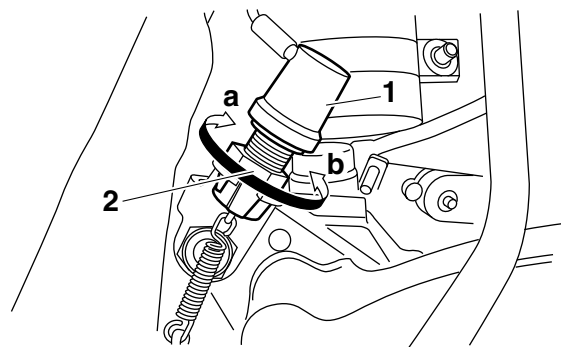
The rear brake light switch is operated by movement of the brake pedal. The rear brake light switch is properly adjusted when the brake light comes on just before the braking effect starts.

1. Check:
 - Rear brake light operation timing
Incorrect → Adjust.
2. Adjust:
 - Rear brake light operation timing



- a. Hold the main body “1” of the rear brake light switch so that it does not rotate and turn the adjusting nut “2” in direction “a” or “b” until the rear brake light comes on at proper timing.

Direction “a” Brake light comes on sooner. Direction “b” Brake light comes on later.



EAS21690

CHECKING AND LUBRICATING THE CABLES

The following procedure applies to all of the inner and outer cables.

EWA13270

WARNING

Damaged outer cable may cause the cable to corrode and interfere with its movement. Replace damaged outer cable and inner cables as soon as possible.

1. Check:
 - Outer cable
Damage → Replace.
2. Check:
 - Cable operation
Rough movement → Lubricate.

	Recommended lubricant Suitable cable lubricant
---	---

TIP

Hold the cable end upright and pour a few drops of lubricant into the cable sheath or use a suitable lubricating device.

EAS30890

CHECKING THE THROTTLE GRIP

1. Check:
 - Throttle cable
Damage/deterioration → Replace.
 - Throttle cable installation
Incorrect → Reinstall the throttle cables.
Refer to “HANDLEBAR” on page 4-33.
2. Check:
 - Throttle grip movement
Rough movement → Lubricate or replace the defective part(s).

	Recommended lubricant Suitable cable lubricant
---	---

TIP

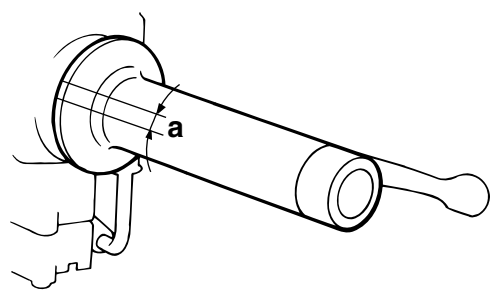
With the engine stopped, turn the throttle grip slowly and release it. Make sure that the throttle grip turns smoothly and returns properly when released.

Repeat this check with the handlebar turned all the way to the left and right.

3. Check:
 - Throttle grip free play “a”
Out of specification → Adjust.

PERIODIC MAINTENANCE

	Throttle grip free play 3.0–5.0 mm (0.12–0.20 in)
---	---



4. Adjust:
- Throttle grip free play

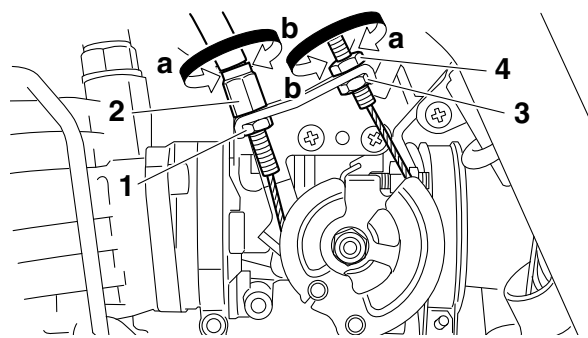


Throttle body side

- Loosen the locknut “1” on the decelerator cable.
- Turn the adjusting nut “2” in direction “a” or “b” to take up any slack on the decelerator cable.
- Loosen the locknut “3” on the accelerator cable.
- Turn the adjusting nut “4” in direction “a” or “b” until the specified throttle grip free play is obtained.

Direction “a”
Throttle grip free play is increased.
Direction “b”
Throttle grip free play is decreased.

- e. Tighten the locknuts “1” and “3”.



TIP
If the specified throttle grip free play cannot be obtained on the throttle body side of the cable, use the adjusting nut on the handlebar side.



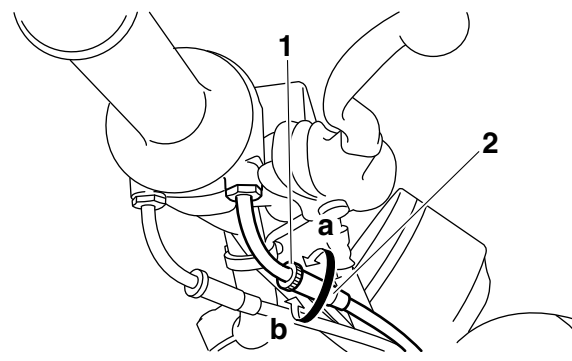
Handlebar side

- Loosen the locknut “1”.

- Turn the adjusting nut “2” in direction “a” or “b” until the specified throttle grip free play is obtained.

Direction “a”
Throttle grip free play is increased.
Direction “b”
Throttle grip free play is decreased.

- Tighten the locknut.



EWA2RD1001
 **WARNING**

After adjusting the throttle grip free play, start the engine and turn the handlebars to the right and to the left to ensure that this does not cause the engine idling speed to change.

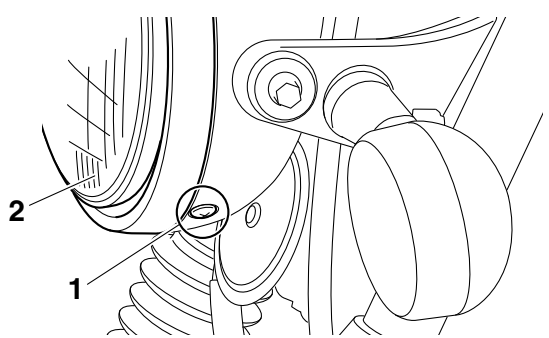


EAS21760
CHECKING AND CHARGING THE BATTERY
Refer to “CHECKING AND CHARGING THE BATTERY” on page 7-60.

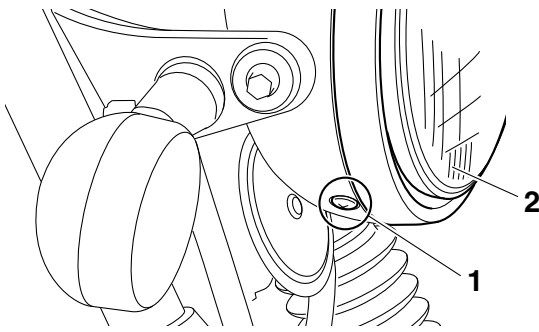
EAS21770
CHECKING THE FUSES
Refer to “CHECKING THE FUSES” on page 7-59.

EAS21790
REPLACING THE HEADLIGHT BULB
1. Remove:

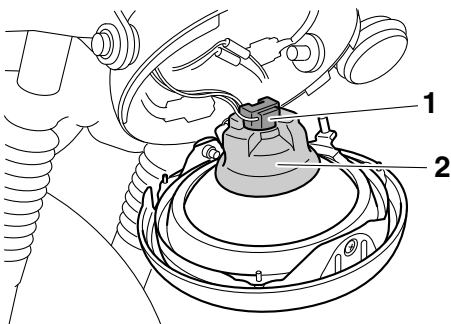
- Screw “1”
- Headlight unit assembly “2”



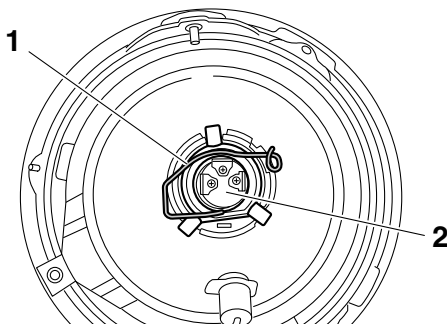
PERIODIC MAINTENANCE



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



4. Unhook:
 - Headlight bulb holder "1"
5. Remove:
 - Headlight bulb "2"



EWA13320

WARNING

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

6. Install:
 - Headlight bulb **New**
Secure the new headlight bulb with the headlight bulb holder.

ECA13690

NOTICE

Avoid touching the glass part of the headlight bulb to keep it free from oil, otherwise the transparency of the glass, the life of the bulb and the luminous flux will be adversely

affected. If the headlight bulb gets soiled, thoroughly clean it with a cloth moistened with alcohol or lacquer thinner.

7. Hook:
 - Headlight bulb holder
8. Install:
 - Headlight bulb cover
9. Connect:
 - Headlight coupler
10. Install:
 - Headlight unit assembly
 - Screw

EAS21800

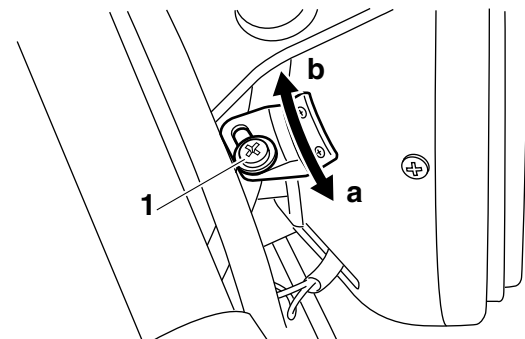
ADJUSTING THE HEADLIGHT BEAM

1. Adjust:
 - Headlight beam (vertically)



- a. Loosen the adjusting screw "1" and move the headlight unit in direction "a" or "b" for adjustment.

Direction "a"
Headlight beam is raised.
Direction "b"
Headlight beam is lowered.



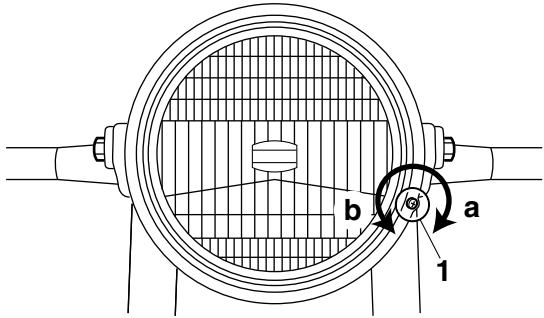
2. Adjust:
 - Headlight beam (horizontally)



- a. Turn the adjusting screw "1" in direction "a" or "b" for adjustment.

Direction "a"
Headlight beam moves to the right.
Direction "b"
Headlight beam moves to the left.

PERIODIC MAINTENANCE



PERIODIC MAINTENANCE

CHASSIS

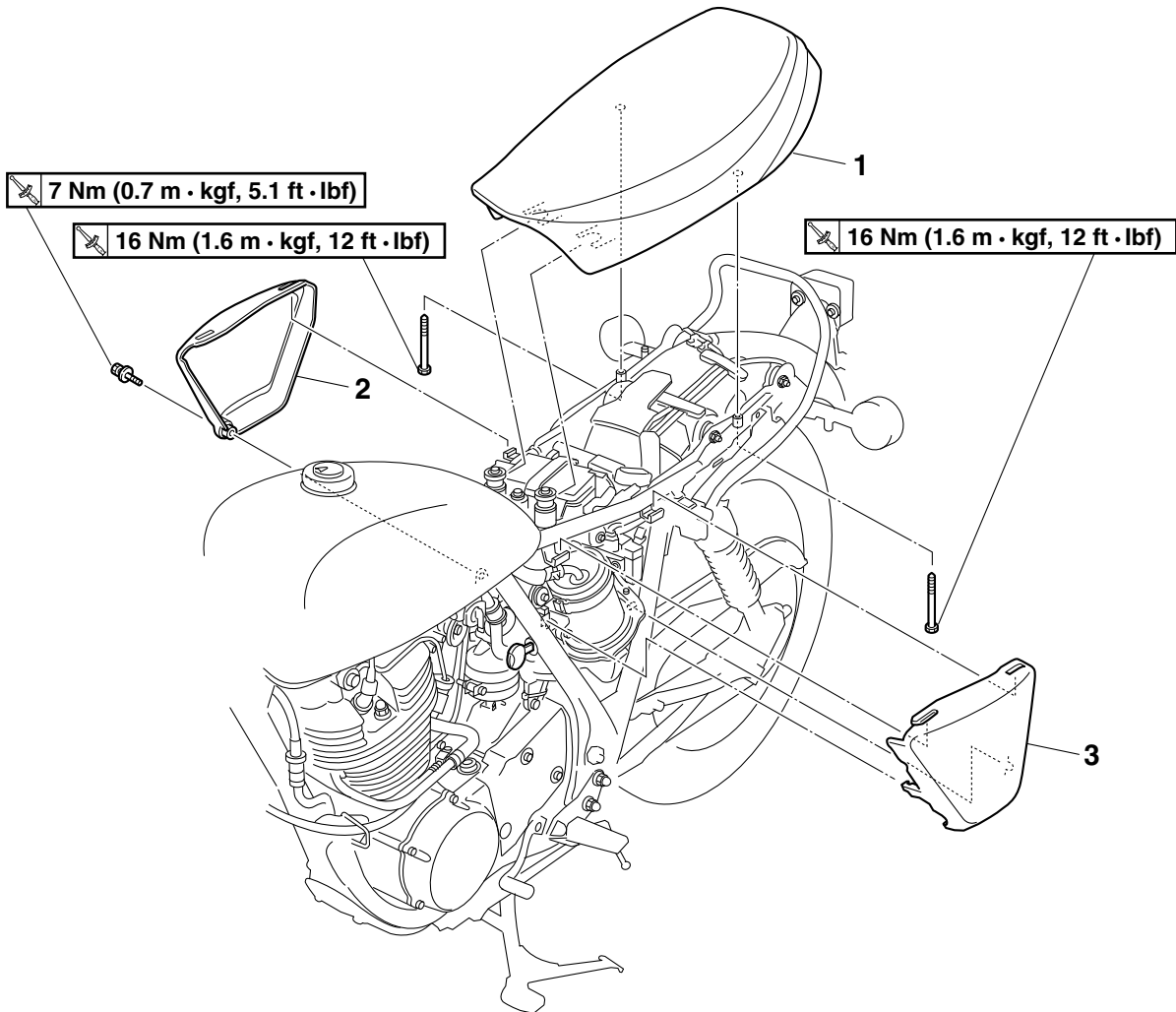
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EAS21830

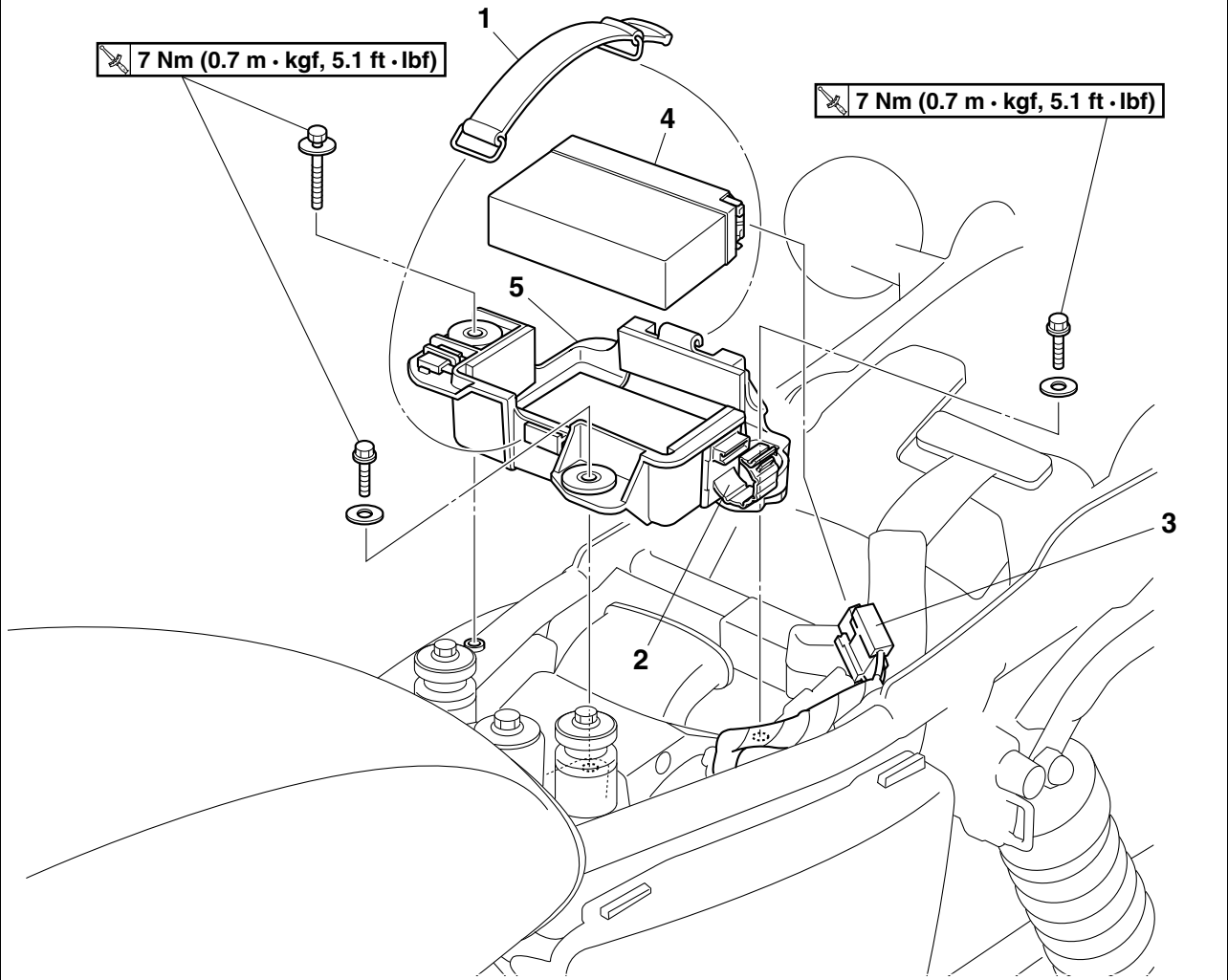
GENERAL CHASSIS

Removing the seat and side covers



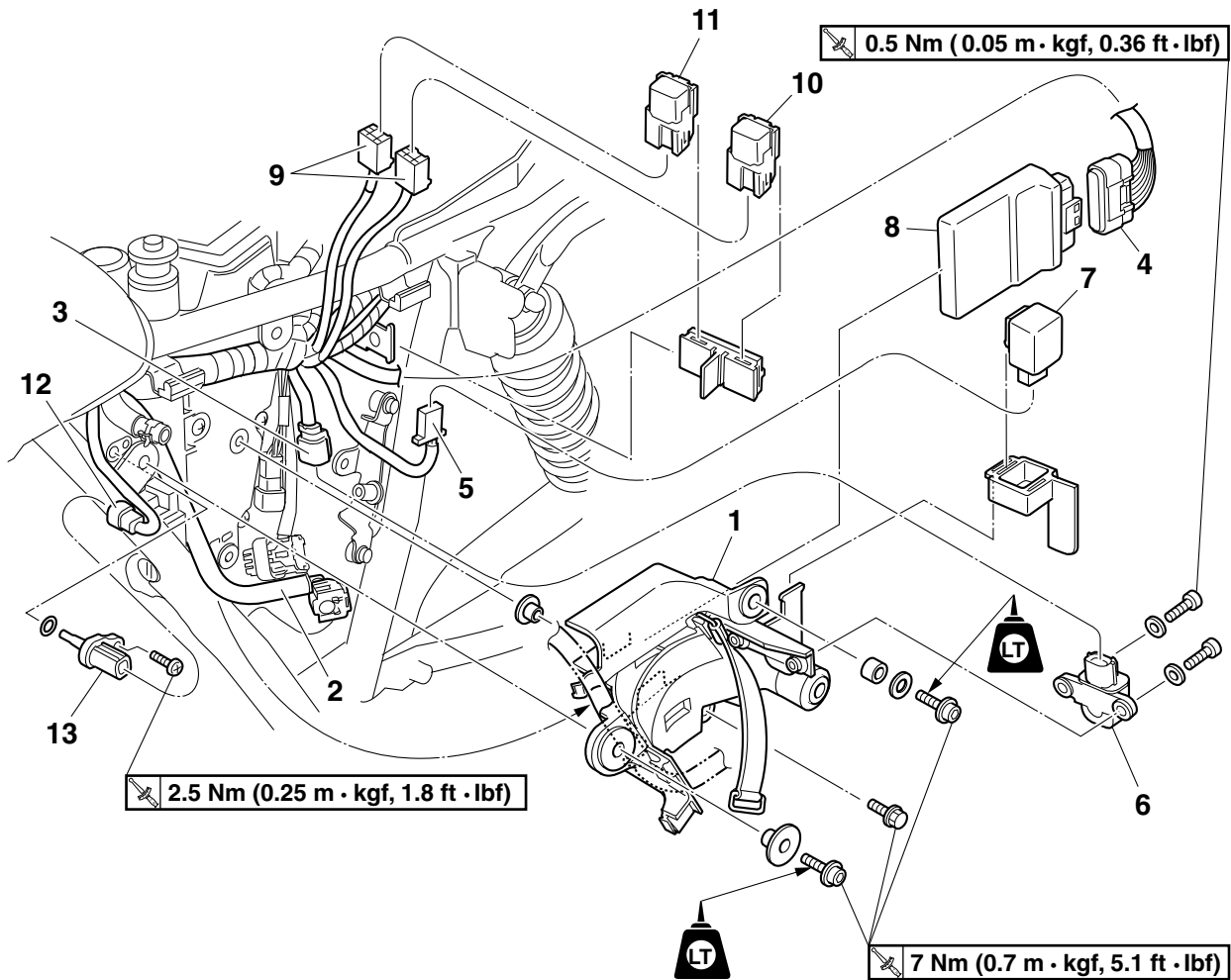
Order	Job/Parts to remove	Q'ty	Remarks
1	Seat	1	
2	Side cover (right)	1	
3	Side cover (left)	1	Unlock using the key.

Removing the battery and battery box



Order	Job/Parts to remove	Q'ty	Remarks
	Seat		
1	Battery band	1	
2	Clamp	1	Remove the battery lead.
3	Battery connector	1	
4	Battery	1	
5	Battery box	1	

Removing the electrical components

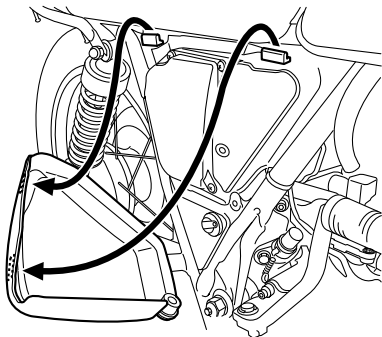
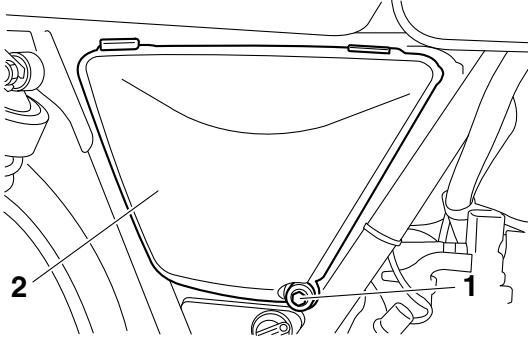


Order	Job/Parts to remove	Q'ty	Remarks
	Seat		
	Side cover (left)		
	Fuel pump case		Refer to "FUEL TANK" on page 6-1.
1	Pump case box	1	
2	Fuel hose (fuel pump–fuel rail)	1	Remove from the pump case box.
3	Lean angle sensor coupler	1	Disconnect.
4	ECU coupler	1	Disconnect.
5	Turn signal/hazard relay coupler	1	Disconnect.
6	Lean angle sensor	1	
7	Turn signal/hazard relay	1	
8	ECU (engine control unit)	1	
9	Fuel pump relay coupler/headlight relay (on/off) coupler	1/1	Disconnect.
10	Fuel pump relay	1	
11	Headlight relay (on/off)	1	
12	Intake air temperature sensor coupler	1	Disconnect.
13	Intake air temperature sensor	1	

EAS2RD1010

REMOVING THE SIDE COVERS

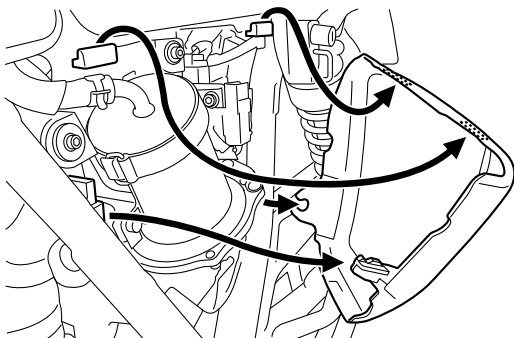
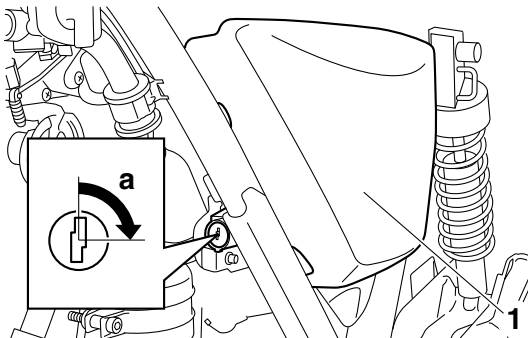
1. Remove:
 - Bolt "1"
 - Side cover (right) "2"



2. Remove:
 - Side cover (left) "1"

TIP

Insert the key into the lock release cylinder and unlock by turning it clockwise "a".



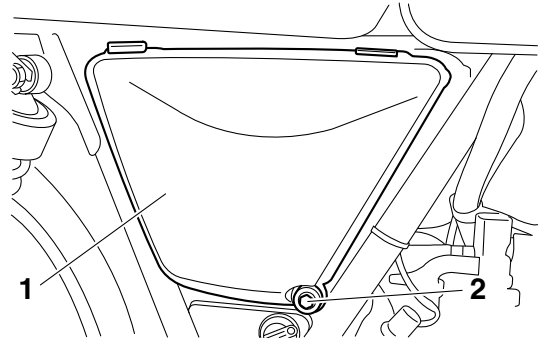
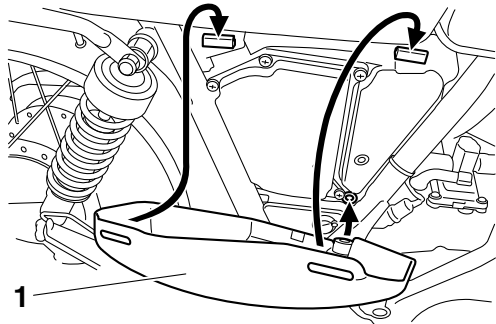
EAS2RD1030

INSTALLING THE SIDE COVERS

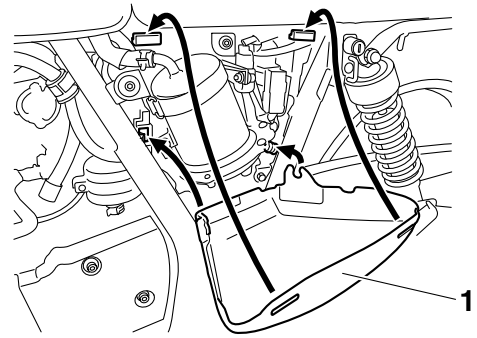
1. Install:
 - Side cover (right) "1"
 - Bolt "2"



Side cover (right) bolt
7 Nm (0.7 m·kgf, 5.1 ft·lbf)



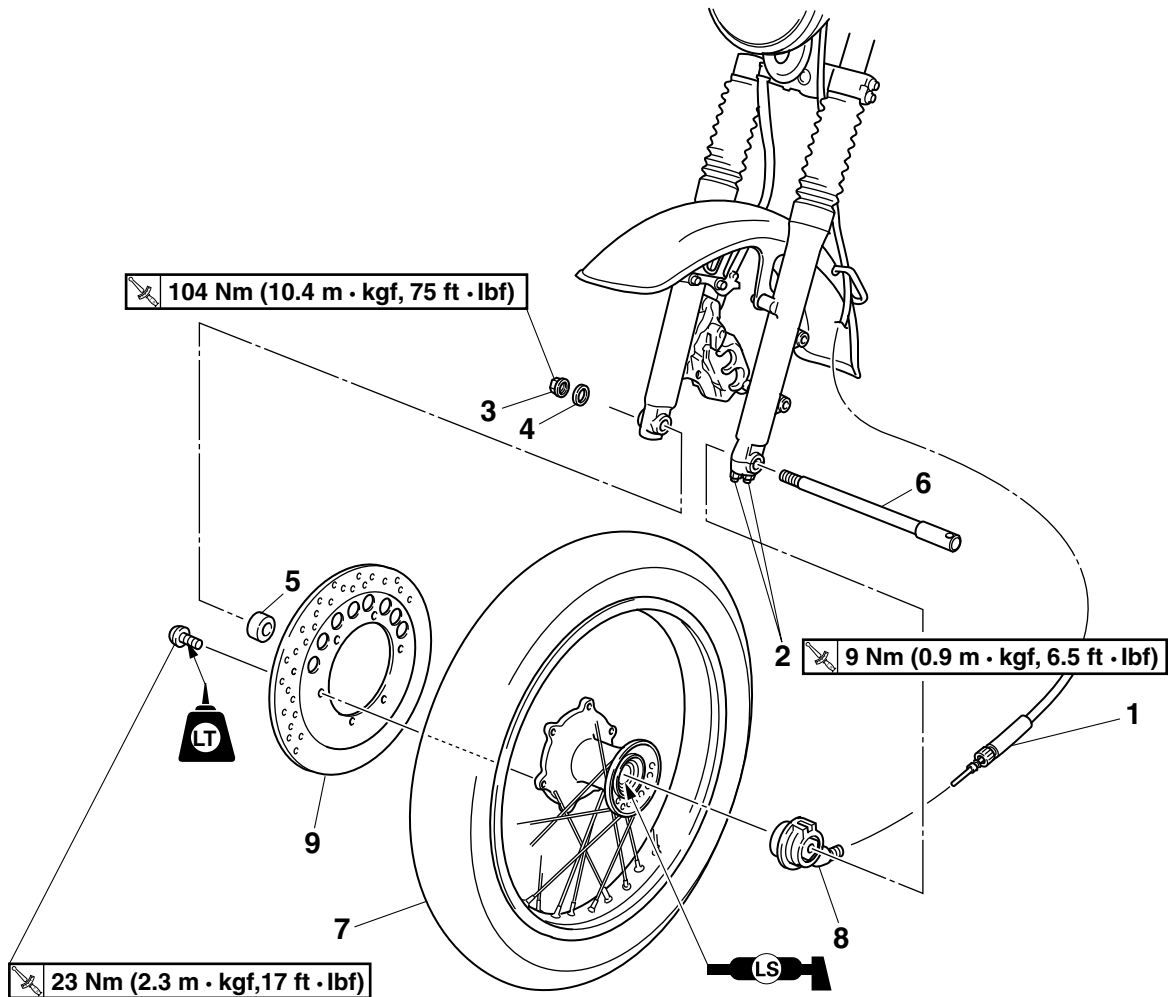
2. Install:
 - Side cover (left) "1"



EAS21870

FRONT WHEEL

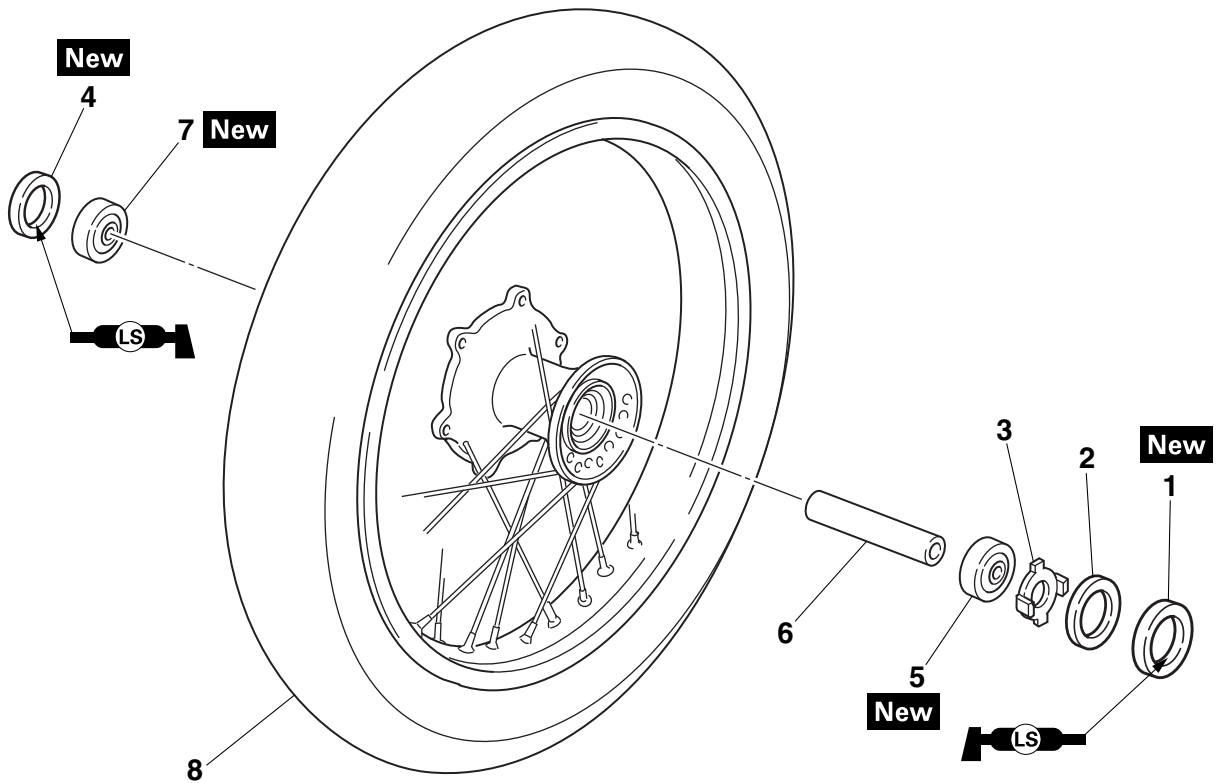
Removing the front wheel and brake disc



Order	Job/Parts to remove	Q'ty	Remarks
1	Speedometer cable	1	
2	Axle holder nut	2	Loosen.
3	Wheel axle nut	1	
4	Washer	1	
5	Collar	1	
6	Wheel axle	1	
7	Front wheel assembly	1	
8	Speedometer gear unit assembly	1	
9	Brake disc	1	

FRONT WHEEL

Disassembling the front wheel



Order	Job/Parts to remove	Q'ty	Remarks
1	Oil seal	1	
2	Clutch retainer	1	
3	Meter clutch	1	
4	Oil seal	1	
5	Bearing	1	
6	Spacer	1	
7	Bearing	1	
8	Front wheel	1	

FRONT WHEEL

EAS21890

REMOVING THE FRONT WHEEL

1. Stand the vehicle on a level surface.

EWA13120

WARNING

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

TIP

Place the vehicle on a suitable stand so that the front wheel is elevated.

2. Loosen:
 - Axle holder nut
3. Remove:
 - Speedometer cable
 - Wheel axle nut
 - Wheel axle
 - Front wheel

EAS21932

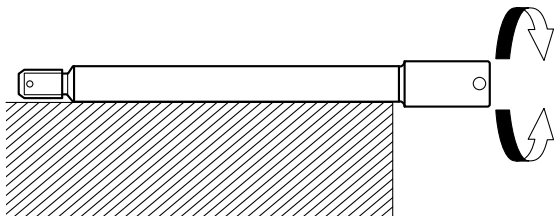
CHECKING THE FRONT WHEEL

1. Check:
 - Wheel axleRoll the wheel axle on a flat surface.
Bends → Replace.

EWA13460

WARNING

Do not attempt to straighten a bent wheel axle.



2. Check:
 - Tire
 - Front wheelDamage/wear → Replace.
Refer to “CHECKING THE TIRES” on page 3-16 and “CHECKING THE WHEELS” on page 3-15.
3. Check:
 - SpokeBends/damage → Replace.
Loose → Tighten.
Refer to “CHECKING AND TIGHTENING THE SPOKES” on page 3-15.

TIP

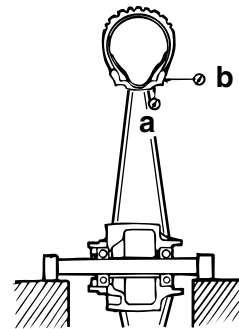
After tightening the spokes, measure the front

wheel runout.

4. Measure:
 - Front wheel radial runout “a”
 - Front wheel lateral runout “b”Over the specified limits → Replace.



Radial wheel runout limit
1.0 mm (0.04 in)
Lateral wheel runout limit
0.5 mm (0.02 in)



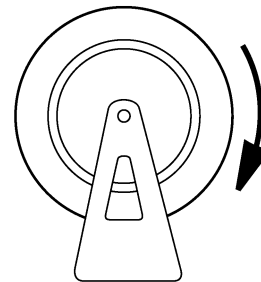
5. Check:
 - CollarDamage/wear → Replace.

EWA2RD1007

WARNING

- Immediately after tires are replaced with new ones, drive carefully until getting used to the travelling feeling given by the new tires and the tires uniformly settle into the tire rims. Failure to follow this practice may result in injury to the driver and passenger or damage to the vehicle.
- If tires are repaired or replaced, be sure to tighten the valve stem locknuts.

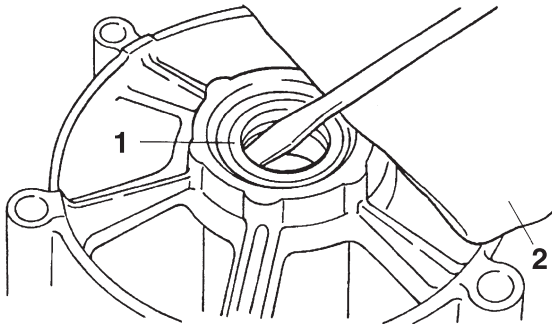
6. Check:
 - Wheel bearingFront wheel turns roughly or is loose → Replace the wheel bearings.



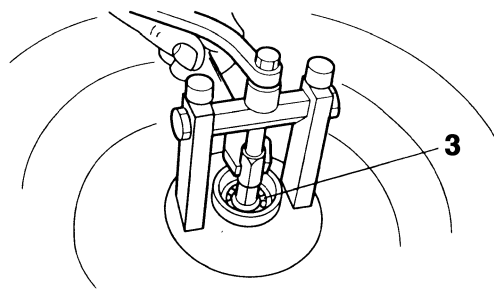
7. Replace:
 - Wheel bearing **New**
 - Oil seal **New**

- a. Clean the outside of the front wheel hub.
- b. Remove the oil seals "1" with a flathead screwdriver.

TIP _____
 To prevent damaging the wheel, place a rag "2" between the screwdriver and the wheel surface.



- c. Remove the wheel bearings "3" with a general bearing puller.



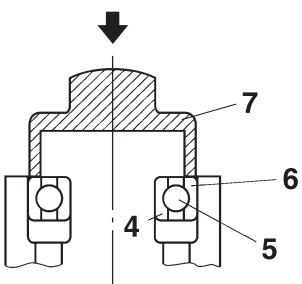
I2010201

- d. Install the new wheel bearings and oil seals in the reverse order of disassembly.

ECA14131

NOTICE _____
Do not contact the wheel bearing inner race "4" or balls "5". Contact should be made only with the outer race "6".

TIP _____
 Use a socket "7" that matches the diameter of the wheel bearing outer race and oil seal.



EAS21940

CHECKING THE SPEEDOMETER GEAR UNIT

1. Check:
 - Speedometer clutch
Bends/damage/wear → Replace.
2. Check:
 - Speedometer drive gear
 - Speedometer driven gear
Damage/wear → Replace.

EAS21970

ADJUSTING THE FRONT WHEEL STATIC BALANCE

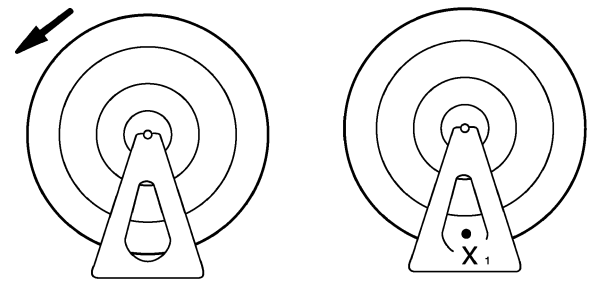
TIP _____
 • After replacing the tire, wheel or both, the front wheel static balance should be adjusted.
 • Adjust the front wheel static balance with the brake disc installed.

1. Remove:
 - Balancing weight(s)
2. Find:
 - Front wheel's heavy spot

TIP _____
 Place the front wheel on a suitable balancing stand.

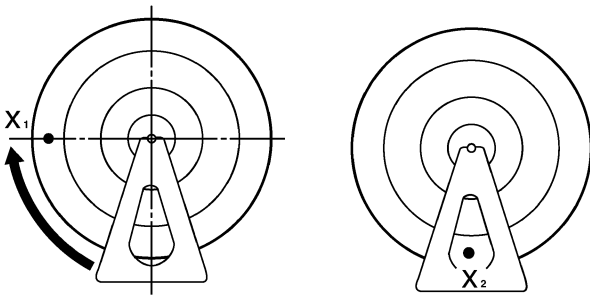


- a. Spin the front wheel.
- b. When the front wheel stops, put an "X₁" mark at the bottom of the wheel.



- c. Turn the front wheel 90° so that the "X₁" mark is positioned as shown.
- d. Release the front wheel.
- e. When the front wheel stops, put an "X₂" mark at the bottom of the wheel.

FRONT WHEEL



- f. Repeat steps (c) through (e) several times until all the marks come to rest at the same spot.
- g. The spot where all the marks come to rest is the front wheel's heavy spot "X".

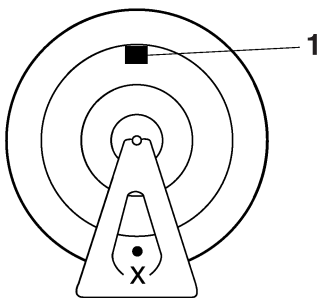


3. Adjust:
- Front wheel static balance

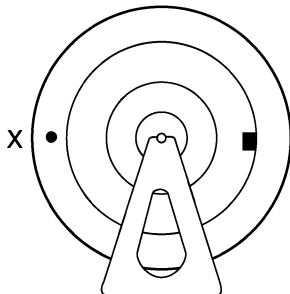


- a. Install a balancing weight "1" onto the rim exactly opposite the heavy spot "X".

TIP _____
Start with the lightest weight.



- b. Turn the front wheel 90° so that the heavy spot is positioned as shown.



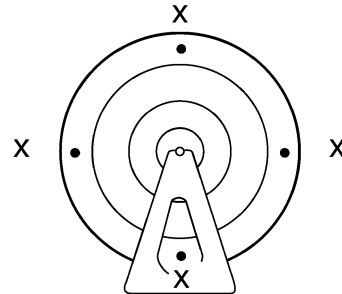
- c. If the heavy spot does not stay in that position, install a heavier weight.
- d. Repeat steps (b) and (c) until the front wheel is balanced.



4. Check:
- Front wheel static balance



- a. Turn the front wheel and make sure it stays at each position shown.



- b. If the front wheel does not remain stationary at all of the positions, rebalance it.



EAS22000

INSTALLING THE FRONT WHEEL

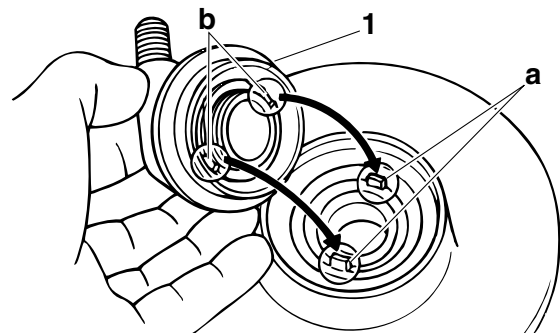
The following procedure applies to both of the brake discs.

1. Lubricate:
- Oil seal lip

	Recommended lubricant Lithium-soap-based grease
--	--

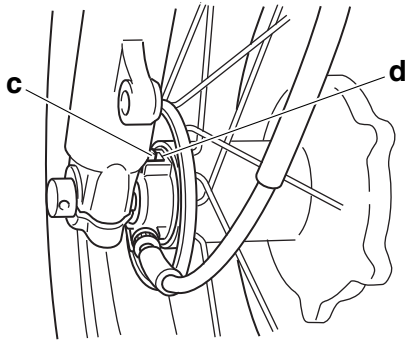
2. Install:
- Speedometer gear unit "1"

TIP _____
Align the projections "a" of the meter clutch with the slots "b" of the speedometer gear unit.



3. Install:
- Front wheel
 - Wheel axle
 - Wheel axle nut

TIP _____
Align the stopper "c" of the outer tube with the groove "d" of the speedometer gear unit.



4. Tighten:

- Wheel axle nut
- Axle holder nut "1"

ECA14140

NOTICE

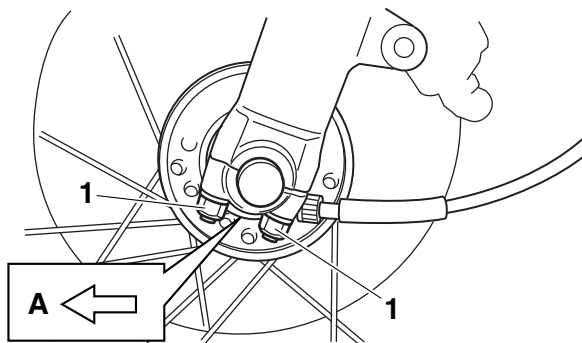
Before tightening the wheel axle nut, push down hard on the handlebar(s) several times and check if the front fork rebounds smoothly.

TIP

- Make sure that an arrow of the axle holder points toward the front "A".
- Tighten the axle holder nut at the front side first and then the rear side.



Wheel axle nut
104 Nm (10.4 m·kgf, 75 ft·lbf)
Axle holder nut
9 Nm (0.9 m·kgf, 6.5 ft·lbf)



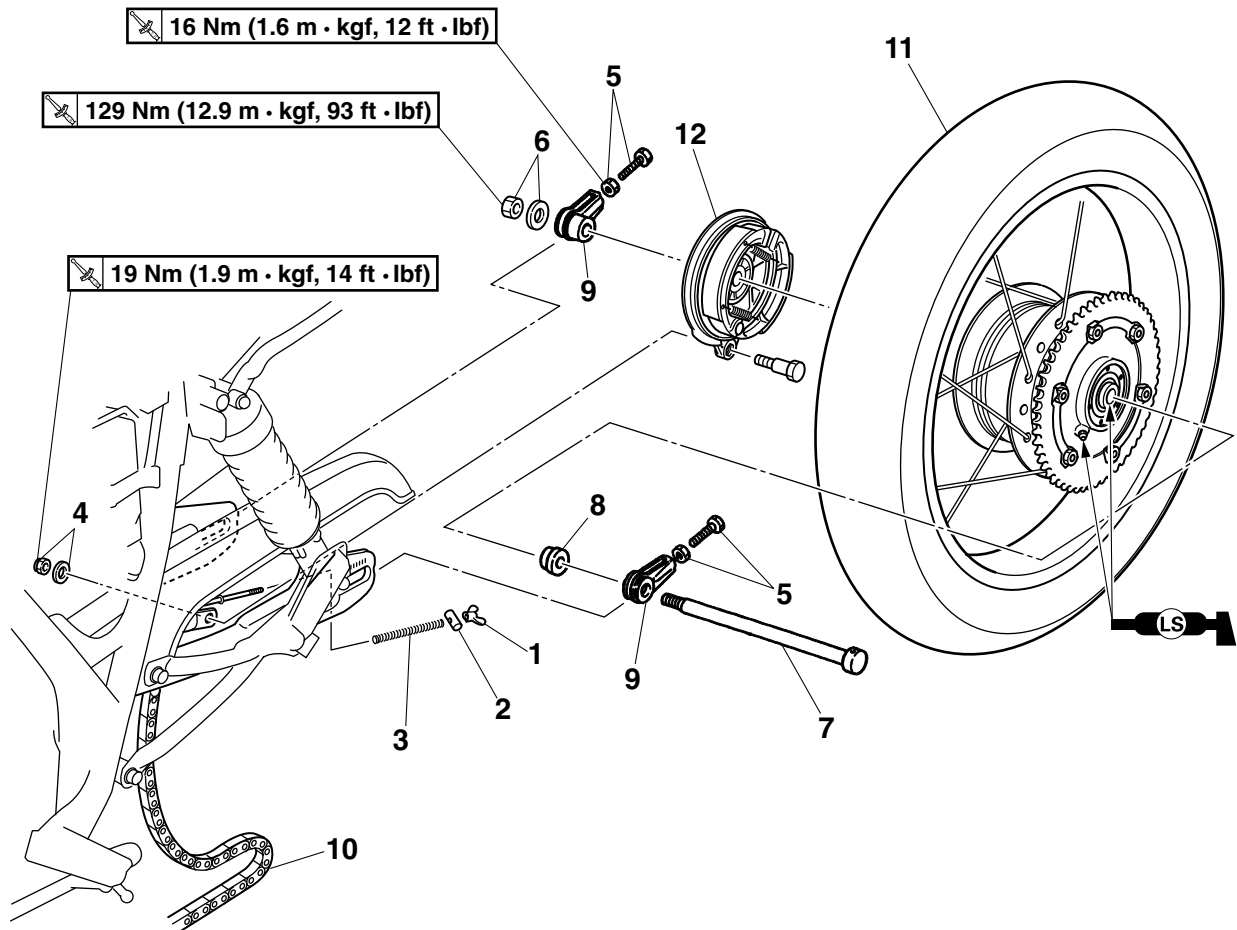
5. Install:

- Speedometer cable

EAS22020

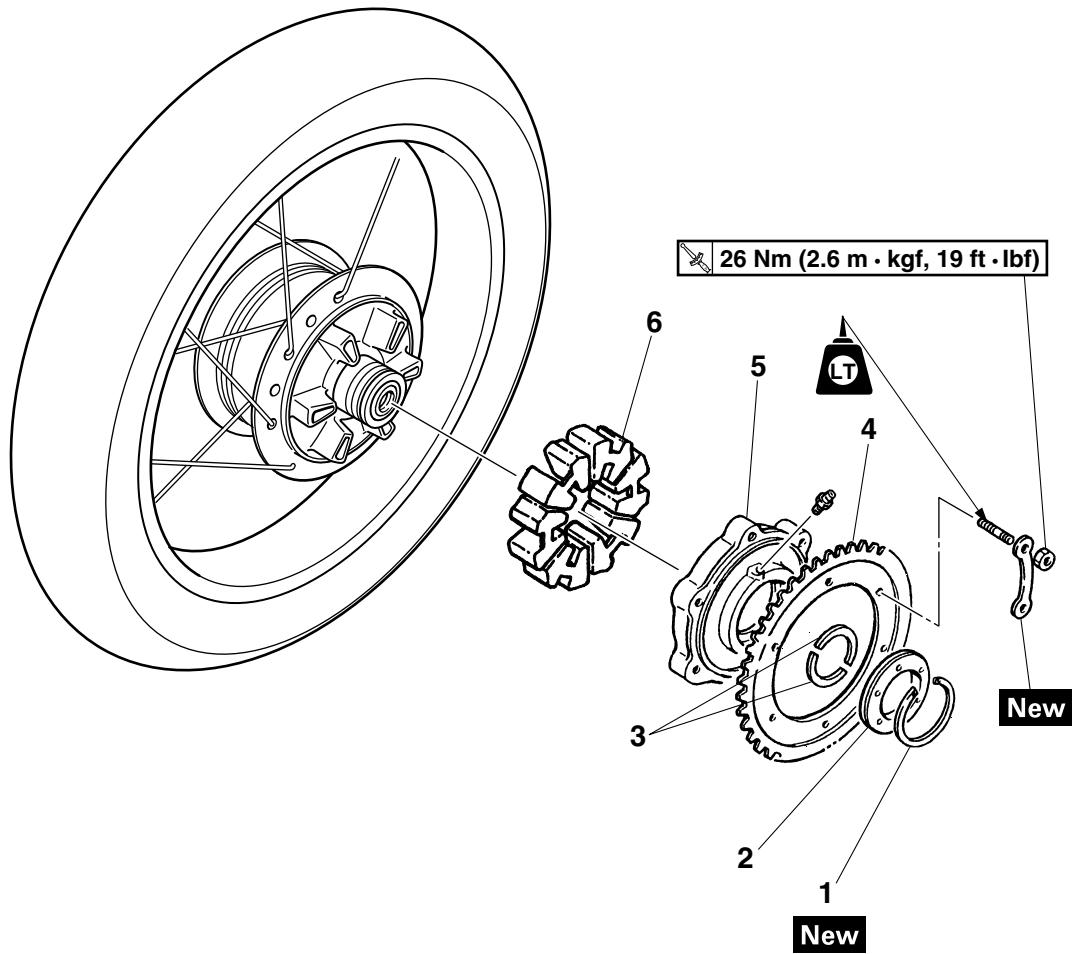
REAR WHEEL

Removing the rear wheel and rear brake



Order	Job/Parts to remove	Q'ty	Remarks
1	Adjusting nut	1	
2	Pin	1	
3	Compression spring	1	
4	Nut/washer	1/1	
5	Locknut/adjusting bolt	2/2	Loosen.
6	Wheel axle nut/washer	1/1	
7	Wheel axle	1	
8	Spacer	1	
9	Chain puller (left)/chain puller (right)	1/1	
10	Drive chain	1	
11	Rear wheel assembly	1	
12	Brake shoe plate	1	

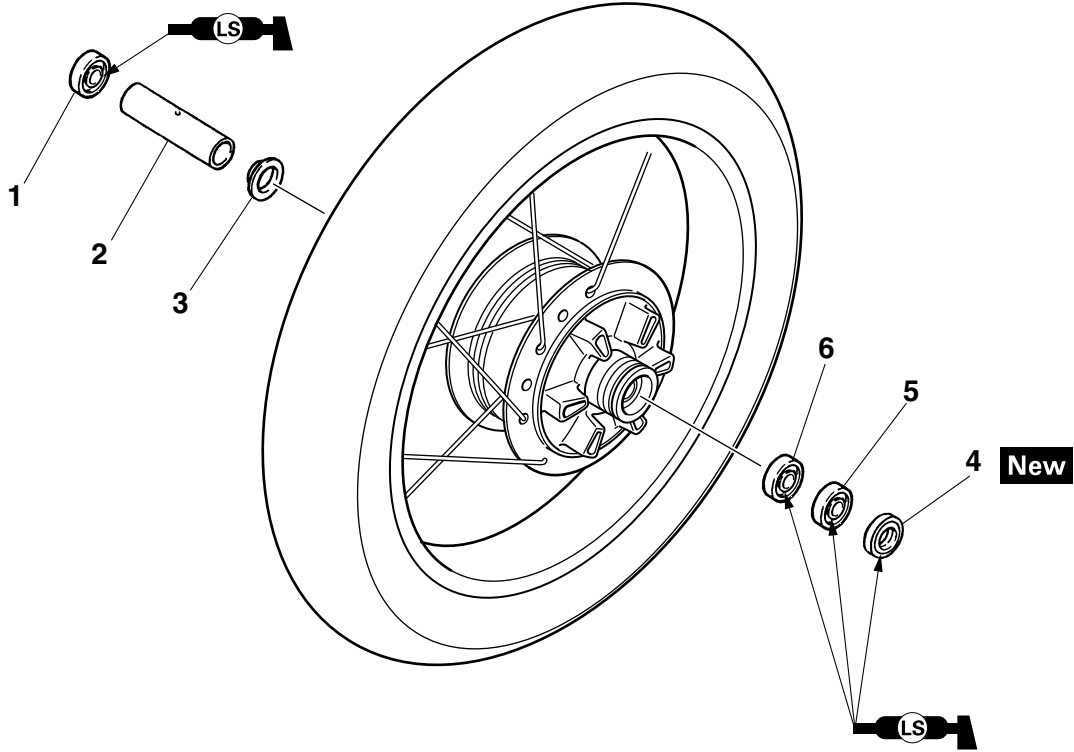
Removing the rear wheel sprocket



Order	Job/Parts to remove	Q'ty	Remarks
1	Circlip	1	
2	Hub dust seal	1	
3	Hub stopper	2	
4	Rear wheel sprocket	1	
5	Drive hub	1	
6	Drive hub damper	6	

REAR WHEEL

Disassembling the rear wheel



Order	Job/Parts to remove	Q'ty	Remarks
1	Bearing	1	
2	Spacer	1	
3	Flange spacer	1	
4	Oil seal	1	
5	Bearing	1	
6	Bearing	1	

EAS22060

REMOVING THE REAR WHEEL (DRUM)

1. Stand the vehicle on a level surface.

EWA13120

WARNING

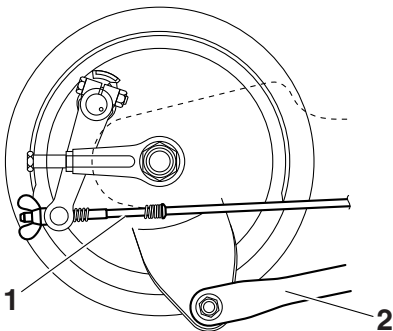
Securely support the vehicle so that there is no danger of it falling over.

TIP

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

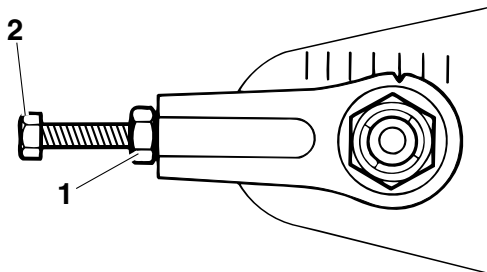
2. Remove:

- Brake rod "1"
- Tension bar "2"



3. Loosen:

- Locknut "1"
- Adjusting bolt "2"



4. Remove:

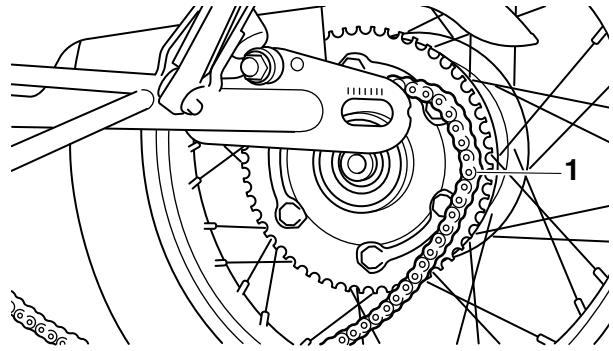
- Wheel axle nut

5. Remove:

- Wheel axle
- Spacer
- Chain puller (left/right)
- Drive chain "1"
- Rear wheel

TIP

Push the rear wheel forward and remove the drive chain from the rear wheel sprocket.



6. Remove:

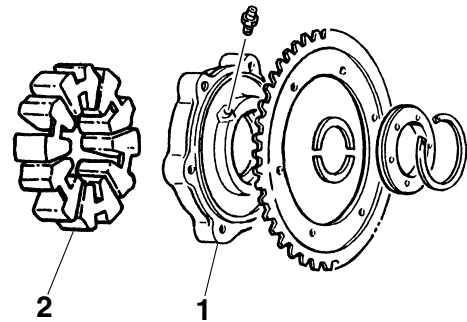
- Brake shoe plate

EAS22110

CHECKING THE REAR WHEEL DRIVE HUB

1. Check:

- Rear wheel drive hub "1"
Cracks/damage → Replace.
- Rear wheel drive hub damper "2"
Damage/wear → Replace.



EAS22101

CHECKING THE REAR WHEEL

1. Check:

- Wheel axle
 - Rear wheel
 - Wheel bearing
 - Oil seal
- Refer to "CHECKING THE FRONT WHEEL" on page 4-7.

2. Check:

- Tire
 - Rear wheel
- Damage/wear → Replace.
- Refer to "CHECKING THE TIRES" on page 3-16 and "CHECKING THE WHEELS" on page 3-15.

3. Check:


- Spoke
- Refer to "CHECKING AND TIGHTENING THE SPOKES" on page 3-15.

4. Measure:


- Radial wheel runout
- Lateral wheel runout

	Recommended lubricant Lithium-soap-based grease
---	--

3. Install:
- Rear wheel
 - Drive chain
 - Chain puller (left/right)
 - Toothed spacer
 - Wheel axle
 - Wheel axle nut
4. Adjust:
- Drive chain slack
- Refer to “ADJUSTING THE DRIVE CHAIN SLACK” on page 3-18.

	Drive chain slack 30.0–40.0 mm (1.18–1.57 in)
---	--

5. Tighten:
- Wheel axle nut

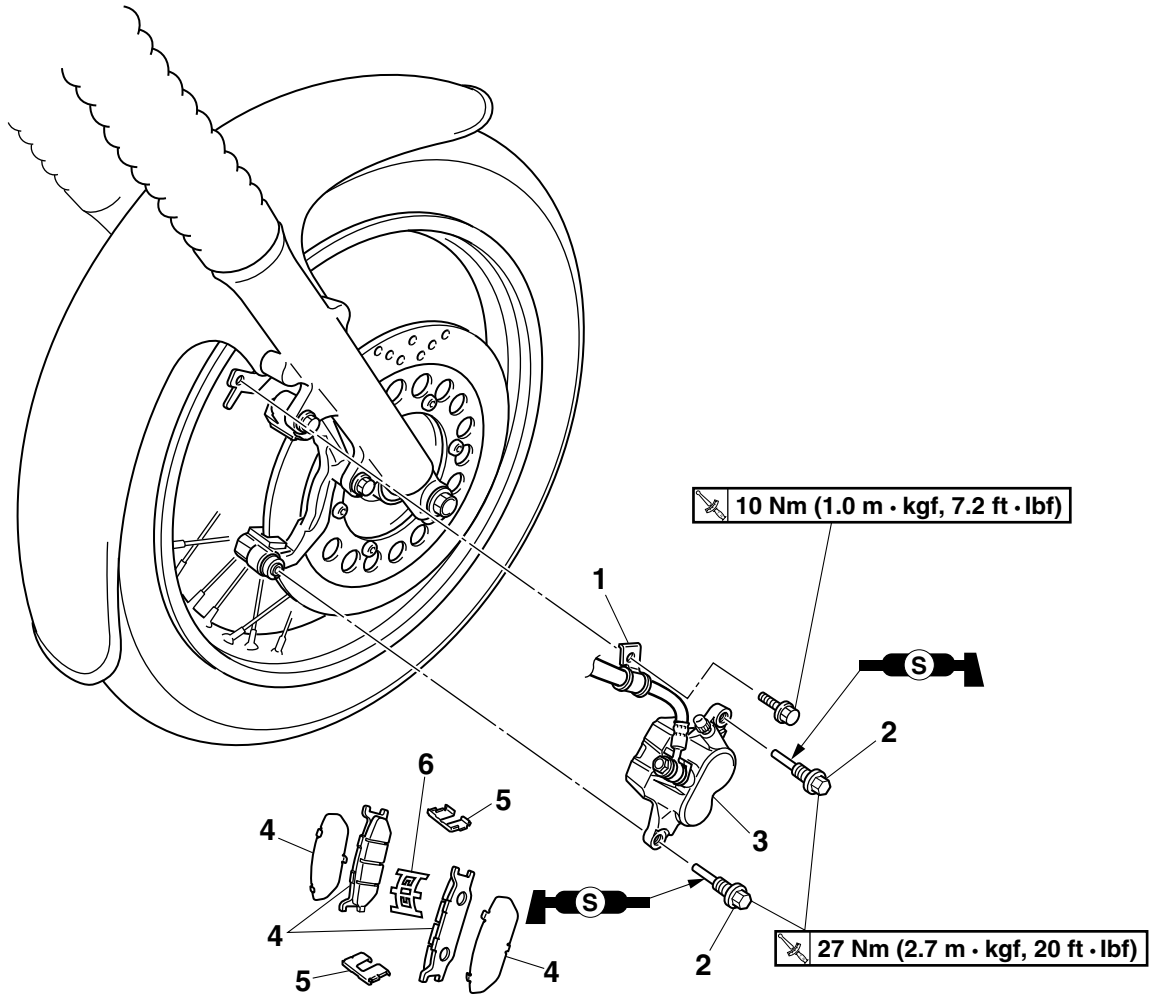
	Wheel axle nut 129 Nm (12.9 m·kgf, 93 ft·lbf)
---	--

6. Install:
- Tension bar
 - Brake rod
7. Adjust:
- Brake pedal free play
- Refer to “ADJUSTING THE REAR DRUM BRAKE” on page 3-13.

EAS22210

FRONT BRAKE

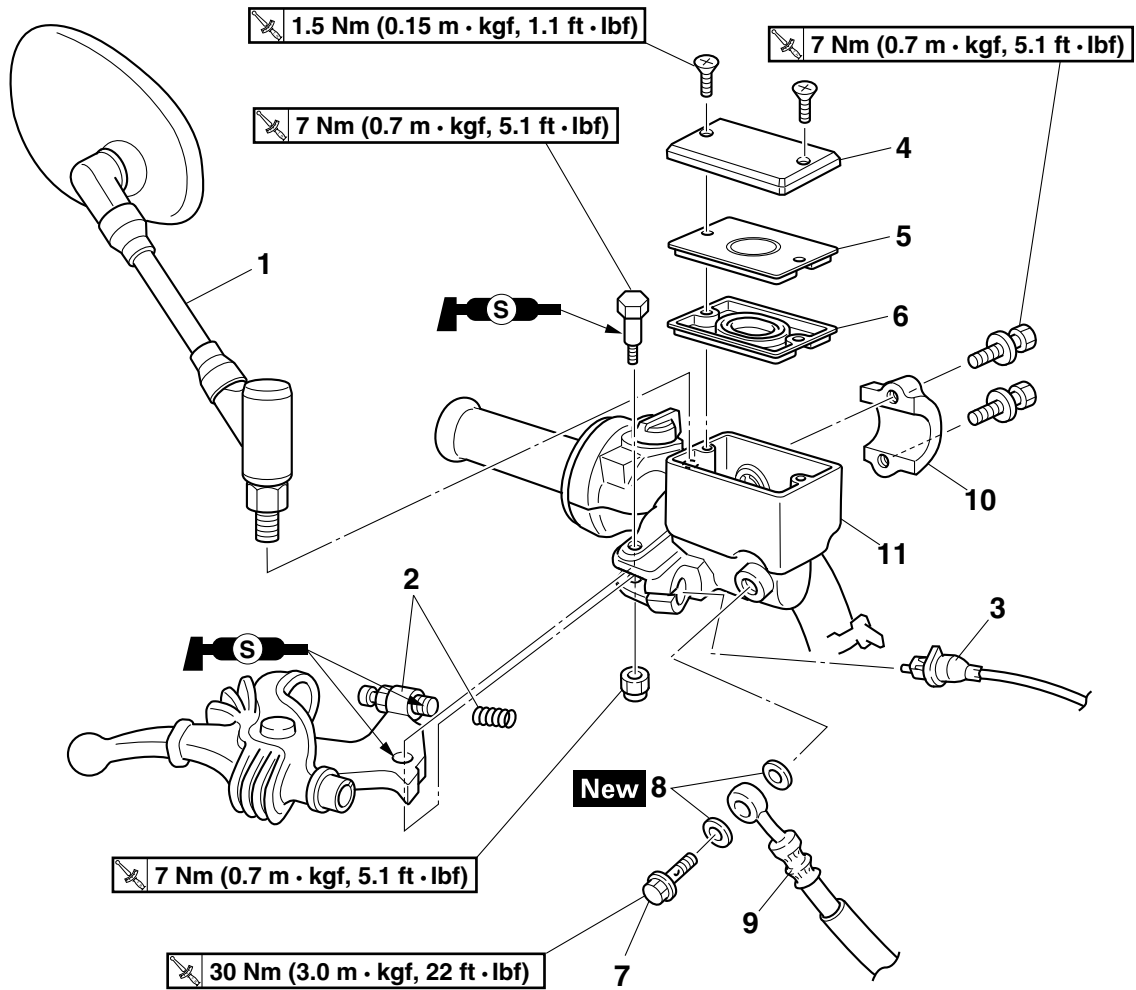
Removing the front brake pads



Order	Job/Parts to remove	Q'ty	Remarks
1	Brake hose holder	1	
2	Caliper support bolt	2	
3	Caliper assembly	1	
4	Brake pad/shim	2/2	
5	Pad support	2	
6	Pad spring	1	

FRONT BRAKE

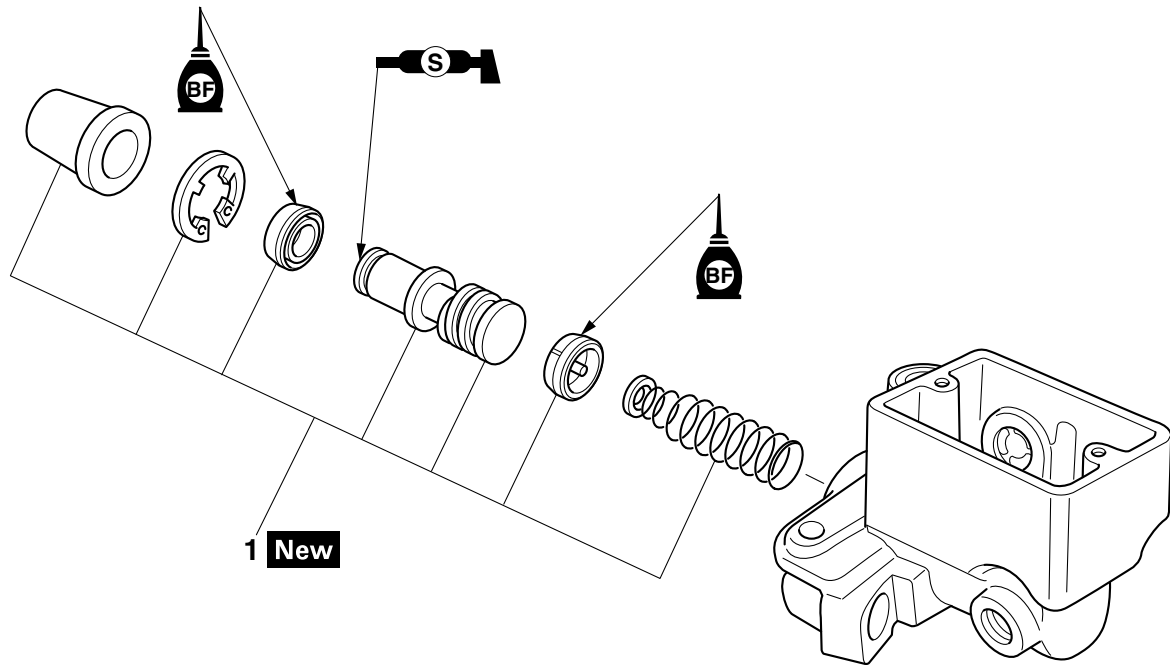
Removing the front brake master cylinder



Order	Job/Parts to remove	Q'ty	Remarks
	Brake fluid		Drain. Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM" on page 3-14.
1	Rearview mirror (right)	1	
2	Brake lever/Compression spring	1/1	
3	Front brake light switch	1	
4	Brake master cylinder reservoir cap	1	
5	Brake master cylinder reservoir diaphragm holder	1	
6	Brake master cylinder reservoir diaphragm	1	
7	Union bolt	1	
8	Gasket	2	
9	Brake hose	1	
10	Master cylinder holder	1	
11	Master cylinder	1	

FRONT BRAKE

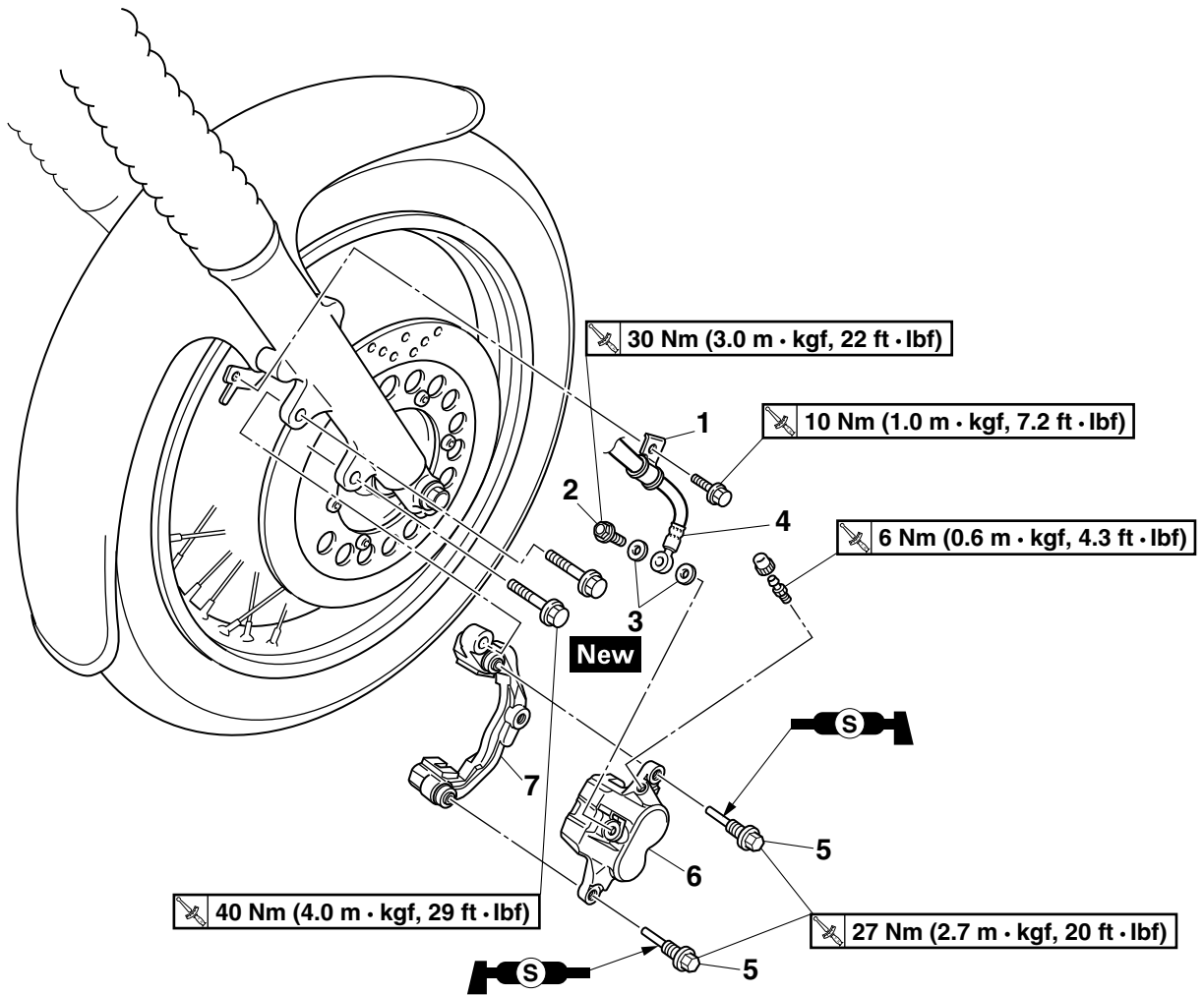
Disassembling the front brake master cylinder



Order	Job/Parts to remove	Q'ty	Remarks
1	Master cylinder kit	1	

FRONT BRAKE

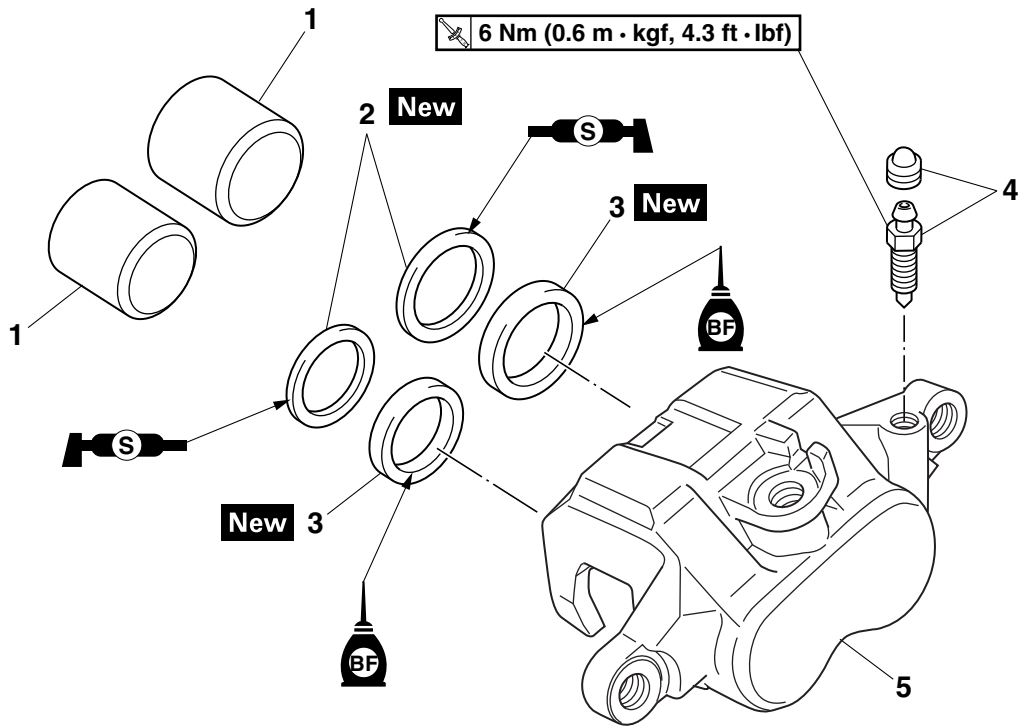
Removing the front brake caliper



Order	Job/Parts to remove	Q'ty	Remarks
	Brake fluid		Drain. Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM" on page 3-14.
1	Brake hose holder	1	
2	Union bolt	1	
3	Gasket	2	
4	Brake hose	1	
5	Caliper support bolt	2	
6	Caliper assembly	1	
7	Caliper bracket	1	

FRONT BRAKE

Disassembling the front brake caliper



Order	Job/Parts to remove	Q'ty	Remarks
1	Brake caliper piston	2	
2	Brake caliper piston dust seal	2	
3	Brake caliper piston seal	2	
4	Bleed screw	1	
5	Brake caliper cylinder	1	

EAS22221

INTRODUCTION

EWA14101

WARNING

Disc brake components rarely require disassembly. Therefore, always follow these preventive measures:

- Never disassemble brake components unless absolutely necessary.
- If any connection on the hydraulic brake system is disconnected, the entire brake system must be disassembled, drained, cleaned, properly filled, and bled after reassembly.
- Never use solvents on internal brake components.
- Use only clean or new brake fluid for cleaning brake components.
- Brake fluid may damage painted surfaces and plastic parts. Therefore, always clean up any spilt brake fluid immediately.
- Avoid brake fluid coming into contact with the eyes as it can cause serious injury.

FIRST AID FOR BRAKE FLUID ENTERING THE EYES:

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

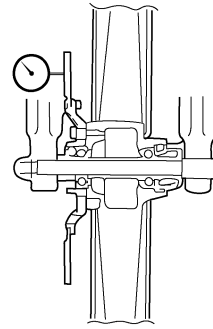
EAS22230

CHECKING THE FRONT BRAKE DISC

1. Remove:
 - Front wheel
Refer to "FRONT WHEEL" on page 4-5.
2. Check:
 - Brake disc
Damage/galling → Replace.
3. Measure:
 - Brake disc runout
Out of specification → Correct the brake disc runout or replace the brake disc.



Brake disc runout limit (as measured on wheel)
0.15 mm (0.0059 in)

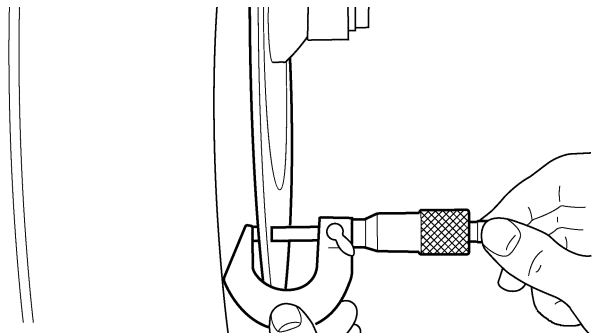


- a. Place the vehicle on a suitable stand so that the front wheel is elevated.
- b. Before measuring the front brake disc runout, turn the handlebar to the left or right to ensure that the front wheel is stationary.
- c. Remove the brake caliper.
- d. Hold the dial gauge at a right angle against the brake disc surface.
- e. Measure the runout 3.0 mm (0.12 in) below the edge of the brake disc.

4. Measure:
 - Brake disc thickness
Measure the brake disc thickness at a few different locations.
Out of specification → Replace.



Brake disc thickness limit
4.5 mm (0.18 in)




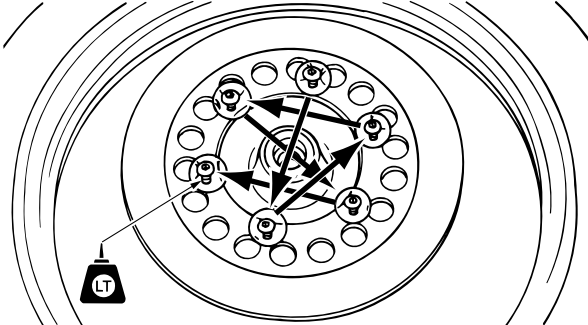
5. Adjust:
 - Brake disc runout

- a. Remove the brake disc.
- b. Rotate the brake disc by one bolt hole.
- c. Install the brake disc.

TIP

Tighten the brake disc bolts in stages and in a crisscross pattern.

 **Brake disc bolt**
23 Nm (2.3 m·kgf, 17 ft·lbf)
LOCTITE®



- d. Measure the brake disc runout.
- e. If out of specification, repeat the adjustment steps until the brake disc runout is within specification.
- f. If the brake disc runout cannot be brought within specification, replace the brake disc.



6. Install:
 - Front wheel
 Refer to "FRONT WHEEL" on page 4-5.

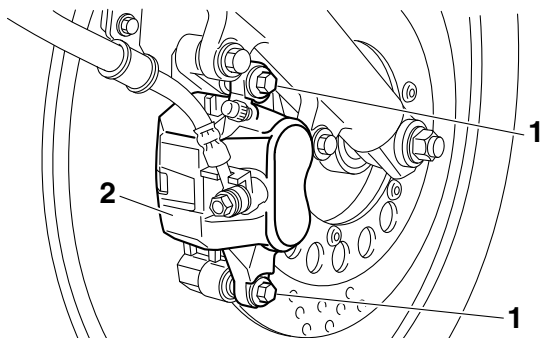
EAS22281

REPLACING THE FRONT BRAKE PADS

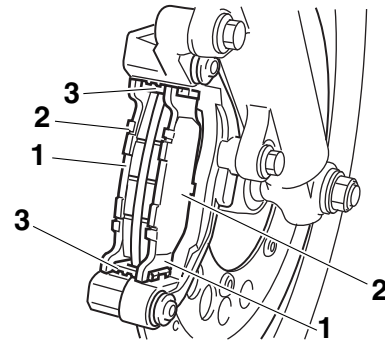
TIP

When replacing the brake pads, it is not necessary to disconnect the brake hose or disassemble the brake caliper.

1. Remove:
 - Caliper support bolt "1"
 - Brake caliper "2"



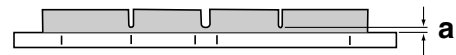
2. Remove:
 - Brake pad "1"
 - Shim "2"
 - Pad support "3"
 - Pad spring



3. Measure:
 - Brake pad wear limit "a"
 Out of specification → Replace the brake pads as a set.



Brake pad lining thickness (inner)
6.2 mm (0.24 in)
Limit
0.8 mm (0.03 in)
Brake pad lining thickness (outer)
6.2 mm (0.24 in)
Limit
0.8 mm (0.03 in)



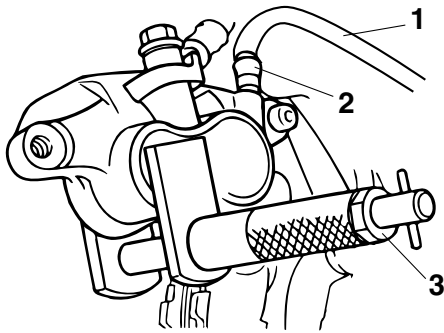
4. Install:
 - Pad spring
 - Pad support
 - Shim (onto the brake pads)
 - Brake pad

TIP

Always install new brake pads, brake pad shims, and brake pad spring as a set.



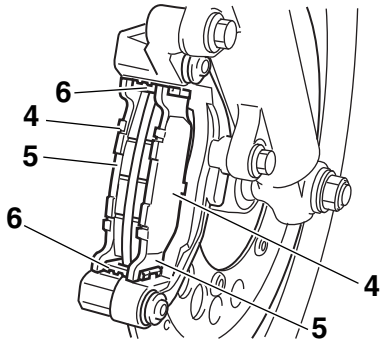
- a. Connect a clear plastic hose "1" tightly to the bleed screw "2". Put the other end of the hose into an open container.
- b. Loosen the bleed screw and push the brake caliper pistons into the brake caliper using a caliper piston presser "3" (recommended by YAMAHA).



c. Tighten the bleed screw.

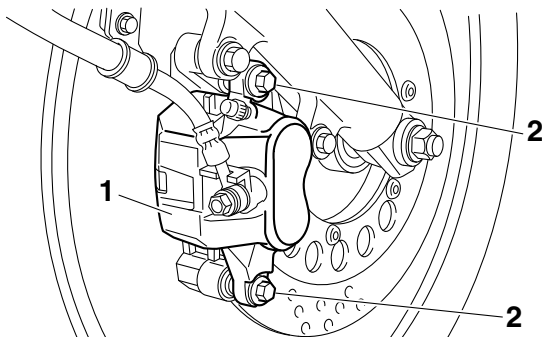
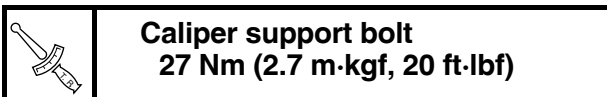


d. Install the shims “4” onto each brake pad “5”.
 e. Install pad spring, pad supports “6”, and brake pads.



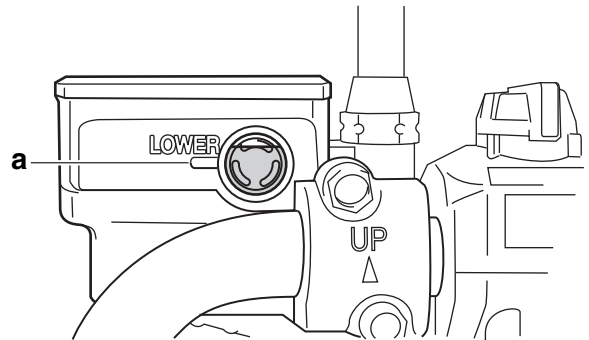
5. Install:

- Brake caliper “1”
- Caliper support bolt “2”



6. Check:

- Brake fluid level
 Below the minimum level mark “a” → Add the specified brake fluid to the proper level.
 Refer to “CHECKING THE BRAKE FLUID LEVEL” on page 3-11.



7. Check:

- Brake lever operation
 Soft or spongy feeling → Bleed the brake system.
 Refer to “BLEEDING THE HYDRAULIC BRAKE SYSTEM” on page 3-14.

EAS22290

REMOVING THE FRONT BRAKE CALIPER

TIP

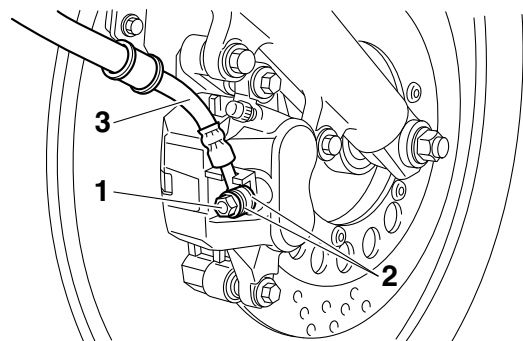
Before removing the brake caliper, drain the brake fluid from the entire brake system.

1. Remove:

- Union bolt “1”
- Gasket “2”
- Brake hose “3”

TIP

Put the end of the brake hose into a container and pump out the brake fluid carefully.

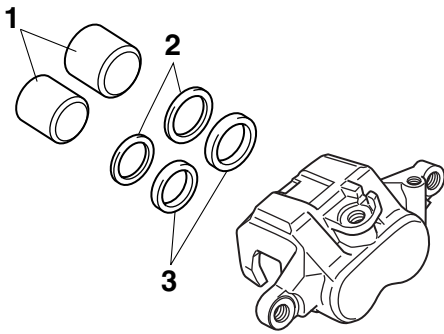


EAS22321

DISASSEMBLING THE FRONT BRAKE CALIPER

1. Remove:

- Brake caliper piston “1”
- Brake caliper piston dust seal “2”
- Brake caliper piston seal “3”



Rust/scratches/wear → Replace the brake caliper pistons.

- Brake caliper cylinder “2”
Scratches/wear → Replace the brake caliper assembly.
- Brake caliper body “3”
Cracks/damage → Replace the brake caliper assembly.
- Brake fluid delivery passage (brake caliper body)
Obstruction → Blow out with compressed air.

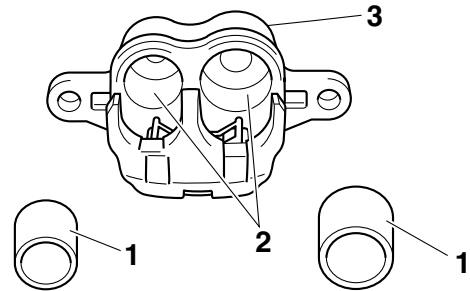


- Blow compressed air into the brake hose joint opening “a” to force out the pistons from the brake caliper.

EWA13560

WARNING

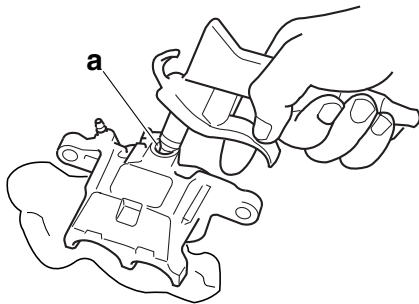
- Cover the brake caliper pistons with a rag. Be careful not to get injured when the pistons are expelled from the brake caliper.
- Never try to pry out the brake caliper pistons.



EWA13611

WARNING

Whenever a brake caliper is disassembled, replace the brake caliper piston dust seals and brake caliper piston seals.



- Remove the brake caliper piston dust seals and brake caliper piston seals.



EAS22381

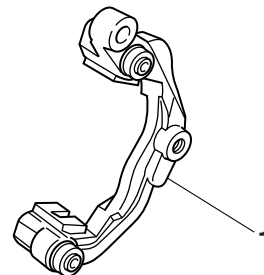
CHECKING THE FRONT BRAKE CALIPER

Recommended brake component replacement schedule	
Brake pads	If necessary
Piston seals	Every two years
Piston dust seals	Every two years
Brake hoses	Every four years
Brake fluid	Every two years and whenever the brake is disassembled

- Check:
 - Brake caliper piston “1”

- Check:

- Brake caliper bracket “1”
Cracks/damage → Replace.



EAS22401

ASSEMBLING THE FRONT BRAKE CALIPER

EWA13621

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 brake caliper piston dust seals and brake caliper piston seals to swell and distort.
- Whenever a brake caliper is disassembled, replace the brake caliper piston dust seals


and brake caliper piston seals.

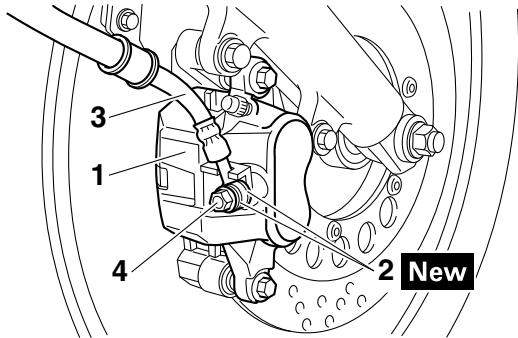
	Specified brake fluid DOT 4
---	--

EAS22420

INSTALLING THE FRONT BRAKE CALIPER

- Install:
 - Brake caliper “1” (temporarily)
 - Gasket “2” **New**
 - Brake hose “3”
 - Union bolt “4”

	Brake hose union bolt 30 Nm (3.0 m·kgf, 22 ft·lbf)
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EWA2RD1011

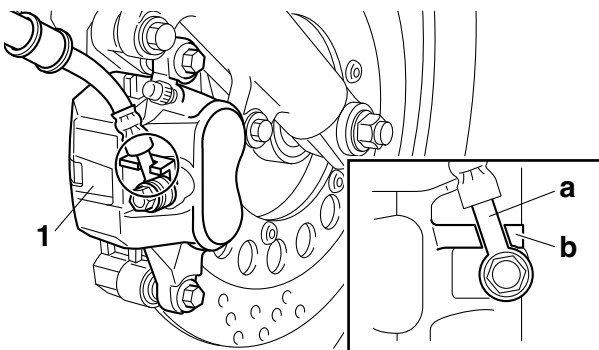
WARNING

Proper brake hose routing is essential to insure safe vehicle operation. Refer to “CABLE ROUTING” on page 2-33.

ECA14170

NOTICE


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



- Remove:
 - Brake caliper
- Install:
 - Shim

- Brake pad
- Pad spring
- Pad support
- Caliper support bolt
- Brake caliper
- Brake hose holder

Refer to “REPLACING THE FRONT BRAKE PADS” on page 4-23.

	Caliper support bolt 27 Nm (2.7 m·kgf, 20 ft·lbf) Brake hose holder bolt 10 Nm (1.0 m·kgf, 7.2 ft·lbf)
---	---

- Fill:
 - Brake master cylinder reservoir

	Specified brake fluid DOT 4
---	--

EWA13090

WARNING

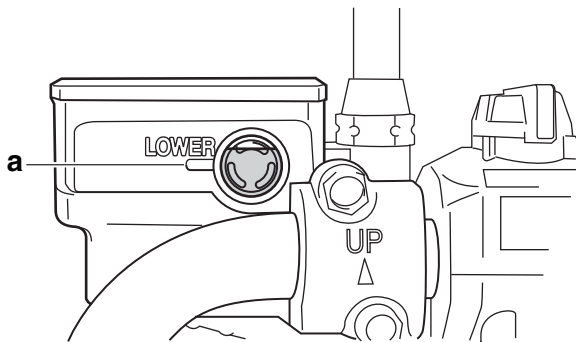
- Use only the designated brake fluid. Other brake fluids may cause the rubber seals to deteriorate, causing leakage and poor brake performance.
- Refill with the same type of brake fluid that is already in the system. Mixing brake fluids may result in a harmful chemical reaction, leading to poor brake 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.

ECA13540

NOTICE

Brake fluid may damage painted surfaces and plastic parts. Therefore, always clean up any spilt brake fluid immediately.

- Bleed:
 - Brake system
Refer to “BLEEDING THE HYDRAULIC BRAKE SYSTEM” on page 3-14.
- Check:
 - Brake fluid level
Below the minimum level mark “a” → Add the specified brake fluid to the proper level.
Refer to “CHECKING THE BRAKE FLUID LEVEL” on page 3-11.



7. Check:

- Brake lever operation
Soft or spongy feeling → Bleed the brake system.
Refer to “BLEEDING THE HYDRAULIC BRAKE SYSTEM” on page 3-14.

EAS22490

REMOVING THE FRONT BRAKE MASTER CYLINDER

TIP

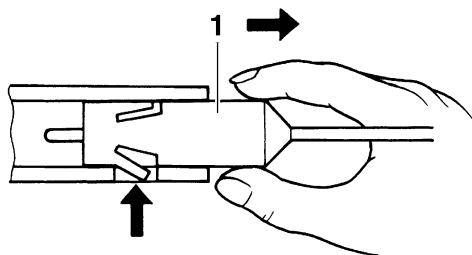
Before removing the front brake master cylinder, drain the brake fluid from the entire brake system.

1. Remove:

- Brake light switch “1”

TIP

Remove the brake light switch from the master cylinder by pressing the projection on the brake light switch.

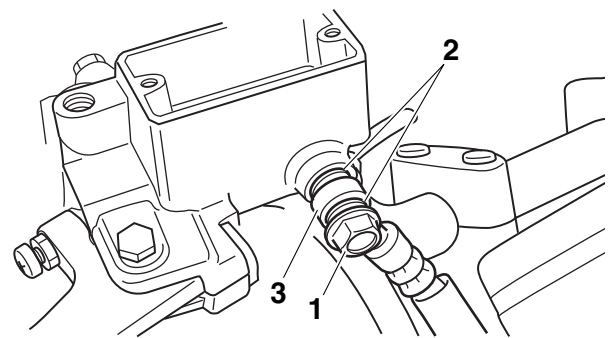


2. Remove:

- Union bolt “1”
- Gasket “2”
- Brake hose “3”

TIP

To collect any remaining brake fluid, place a container under the master cylinder and the end of the brake hose.

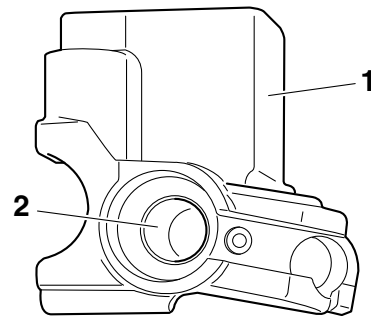


EAS22500

CHECKING THE FRONT BRAKE MASTER CYLINDER

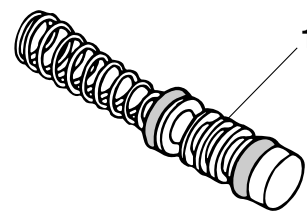
1. Check:

- Brake master cylinder “1”
Damage/scratches/wear → Replace.
- Brake fluid delivery passage “2”
(Brake master cylinder body)
Obstruction → Blow out with compressed air.



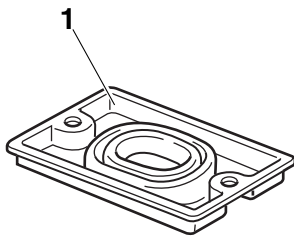
2. Check:

- Brake master cylinder kit “1”
Damage/scratches/wear → Replace.



3. Check:

- Brake master cylinder reservoir diaphragm “1”
Damage/wear → Replace.



4. Check:

- Brake hose
Cracks/damage/wear → Replace.

EAS22520

ASSEMBLING THE FRONT BRAKE MASTER CYLINDER

EWA13520

⚠ 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.



**Specified brake fluid
DOT 4**

EAS22530

INSTALLING THE FRONT BRAKE MASTER CYLINDER

1. Install:

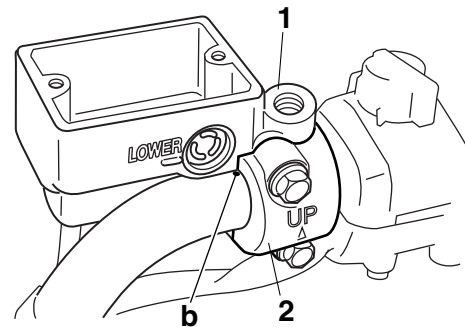
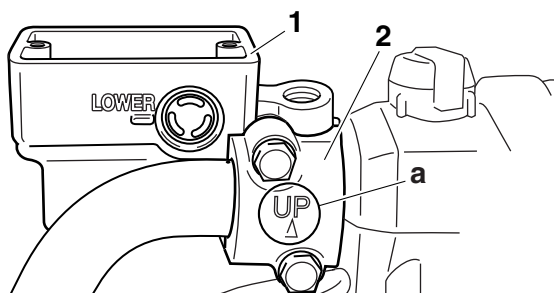
- Brake master cylinder "1"
- Brake master cylinder holder "2"



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

TIP

- Install the brake master cylinder holder with the "UP" mark "a" facing up.
- Align the end of the brake master cylinder holder with the punch mark "b" on the handlebar.
- First, tighten the upper bolt, then the lower bolt.



2. Install:

- Gasket **New**
- Brake hose
- Union bolt



**Brake hose union bolt
30 Nm (3.0 m·kgf, 22 ft·lbf)**

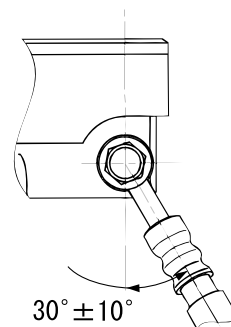
EWA2RD1011

⚠ WARNING

Proper brake hose routing is essential to insure safe vehicle operation. Refer to "CABLE ROUTING" on page 2-33.

TIP

- While holding the brake hose, tighten the union bolt as shown.
- Turn the handlebar to the left and right to make sure the brake hose does not touch other parts (e.g., wire harness, cables, leads). Correct if necessary.



3. Fill:

- Brake master cylinder reservoir



**Specified brake fluid
DOT 4**

EWA13540

⚠ 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 master cylinder reservoir. Water will significantly lower the boiling point of the brake fluid and could cause vapor lock.

ECA13540

NOTICE

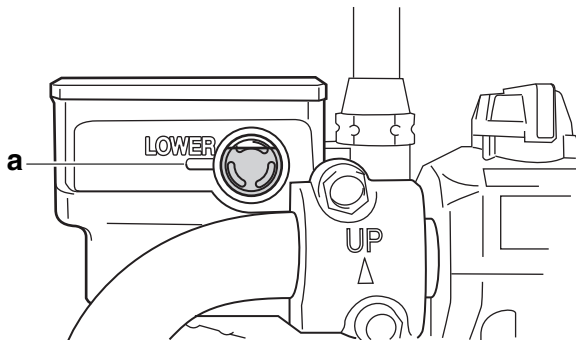
Brake fluid may damage painted surfaces and plastic parts. Therefore, always clean up any spilt brake fluid immediately.

4. Bleed:

- Brake system
Refer to “BLEEDING THE HYDRAULIC BRAKE SYSTEM” on page 3-14.

5. Check:

- Brake fluid level
Below the minimum level mark “a” → Add the specified brake fluid to the proper level.
Refer to “CHECKING THE BRAKE FLUID LEVEL” on page 3-11.



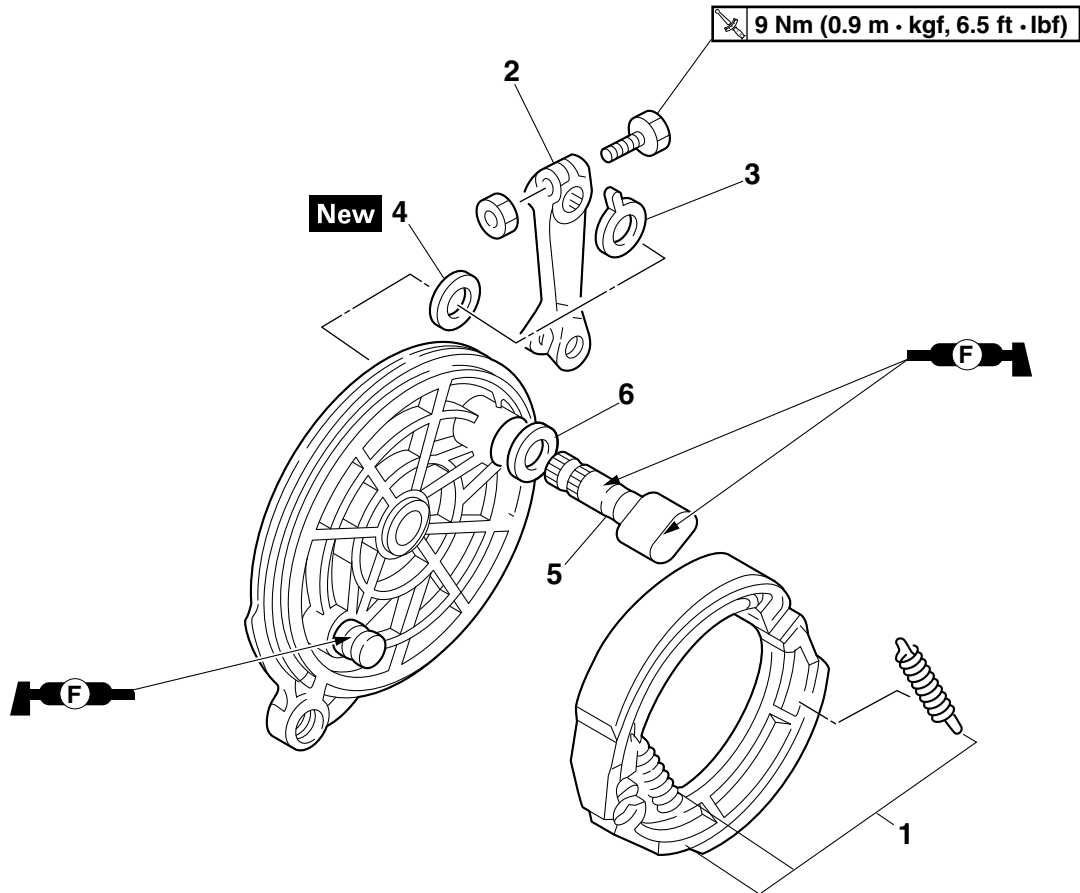
6. Check:

- Brake lever operation
Soft or spongy feeling → Bleed the brake system.
Refer to “BLEEDING THE HYDRAULIC BRAKE SYSTEM” on page 3-14.

EAS22550

REAR BRAKE

Disassembling the rear brake

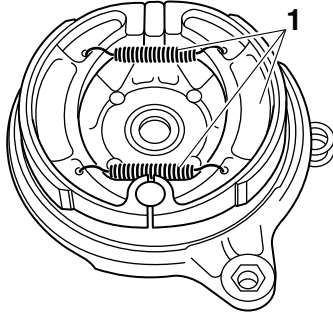


Order	Job/Parts to remove	Q'ty	Remarks
1	Brake shoe kit	1	
2	Brake camshaft lever	1	
3	Indicator plate	1	
4	Oil seal	1	
5	Brake camshaft	1	
6	Camshaft shim	1	

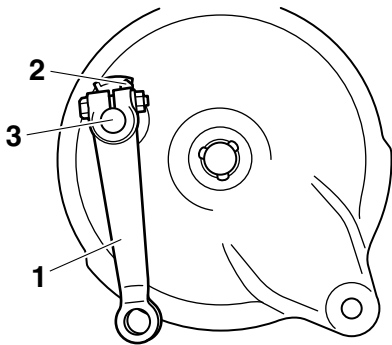
EAS2RD1031

DISASSEMBLING THE REAR BRAKE SHOE PLATE

1. Remove:
 - Brake shoe kit "1"



2. Remove:
 - Brake camshaft lever "1"
 - Indicator plate "2"
 - Brake camshaft "3"



EAS22681

CHECKING THE REAR BRAKE SHOES

1. Check:
 - Brake shoe lining
Glazed areas → Repair.
Sand the glazed areas with coarse sandpaper.

TIP
After sanding the glazed areas, clean the brake shoe with a cloth.

2. Measure:
 - Brake shoe lining thickness "a"
Out of specification → Replace.

EWA17580

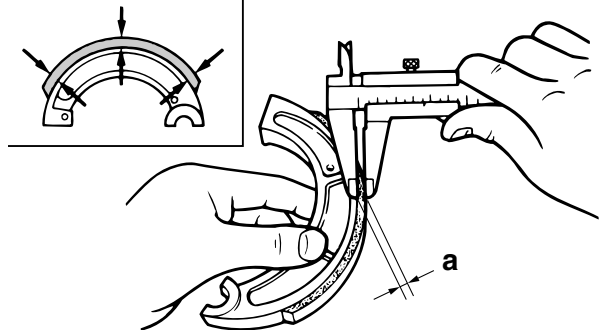
WARNING

Do not allow oil or grease on the brake shoes.

TIP
Replace the brake shoes as a set, if either is worn to the wear limit.



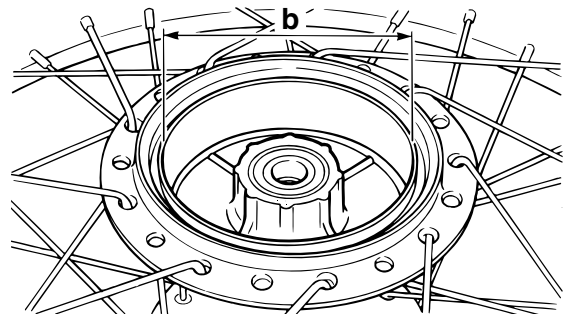
Lining thickness
4.0 mm (0.16 in)
Limit
2.0 mm (0.08 in)



3. Measure:
 - Brake drum inside diameter "b"
Out of specification → Replace the hub.



Brake drum inside diameter
150.0 mm (5.91 in)
Limit
151.0 mm (5.94 in)



4. Check:
 - Brake drum inner surface
Oil deposits → Clean.
Remove the oil with a rag soaked in lacquer thinner or solvent.
Scratches → Replace.
Lightly and evenly polish the scratches with an emery cloth.
5. Check:
 - Brake camshaft
Damage/wear → Replace.

EAS22690

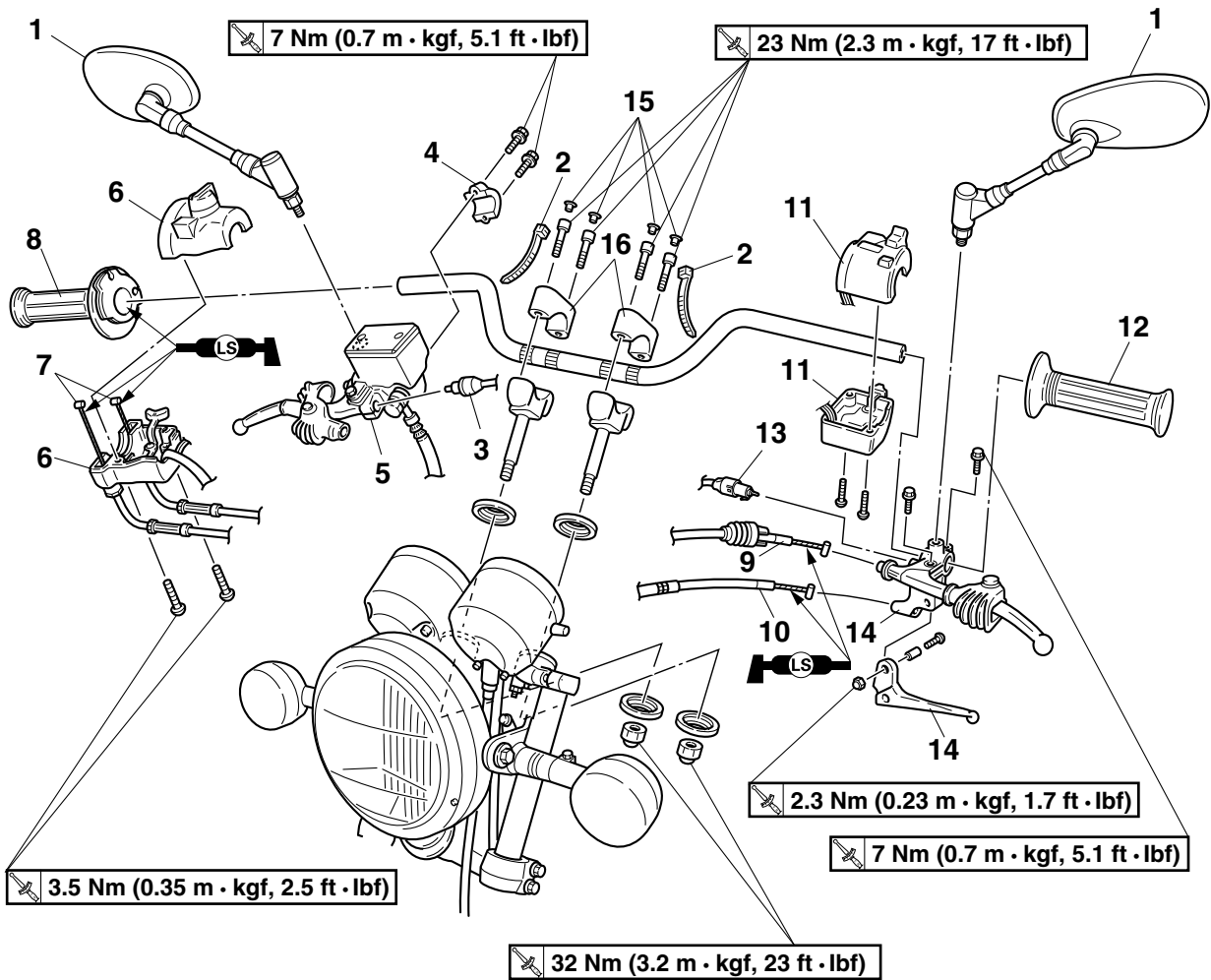
ASSEMBLING THE REAR BRAKE SHOE PLATE

1. Install:
 - Brake camshaft "1"
 - Indicator plate "2"

EAS22840

HANDLEBAR

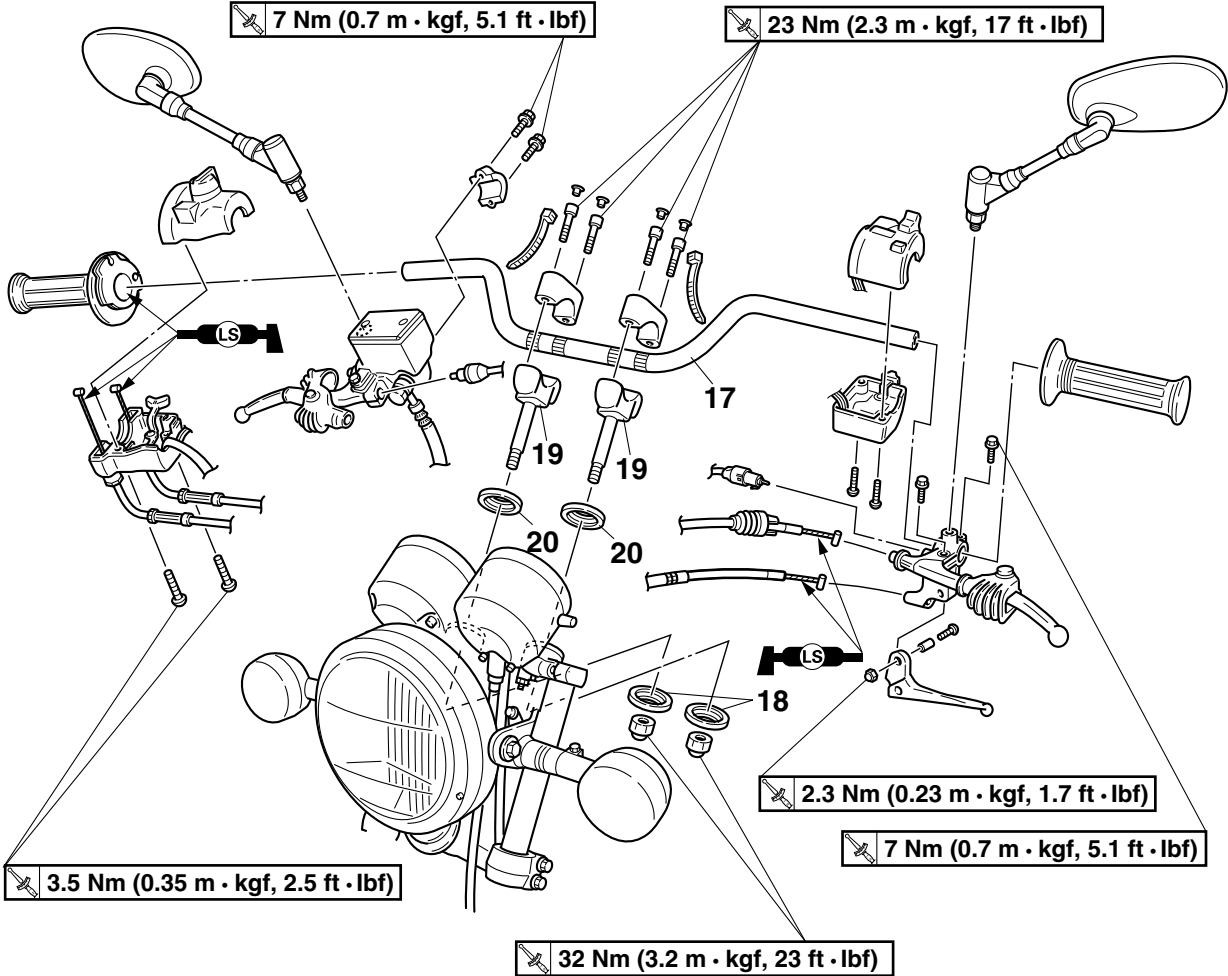
Removing the handlebar



Order	Job/Parts to remove	Q'ty	Remarks
1	Rearview mirror	2	
2	Band	2	
3	Front brake light switch	1	
4	Master cylinder holder	1	
5	Master cylinder assembly	1	
6	Right handlebar switch	1	
7	Throttle cable 1, 2	1/1	
8	Throttle grip	1	
9	Clutch cable	1	
10	Decompression cable	1	
11	Left handlebar switch	1	
12	Handlebar grip	1	
13	Clutch switch	1	
14	Lever holder/decompression lever	1/1	
15	Cap	4	
16	Upper handlebar holder	2	

HANDLEBAR

Removing the handlebar



Order	Job/Parts to remove	Q'ty	Remarks
17	Handlebar	1	
18	Washer plain	2	
19	Lower handlebar holder	2	
20	Cover	2	

EAS22860

REMOVING THE HANDLEBAR

1. Stand the vehicle on a level surface.

EWA13120

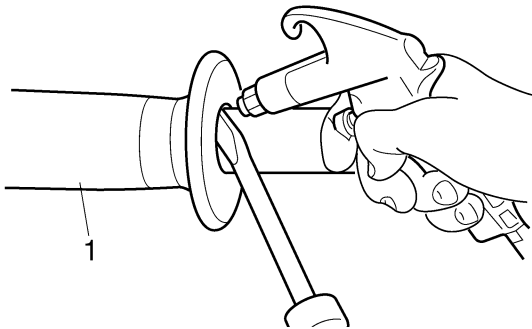
WARNING

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

2. Remove:
 - Handlebar grip "1"

TIP

Blow compressed air between the left handlebar and the handlebar grip, and gradually push the grip off the handlebar.



EAS22880

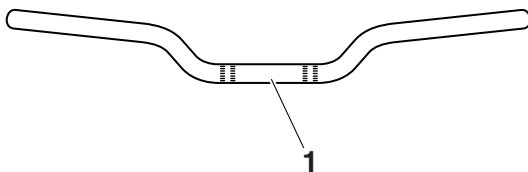
CHECKING THE HANDLEBAR

1. Check:
 - Handlebar "1"
 Bends/cracks/damage → Replace.

EWA13690

WARNING

Do not attempt to straighten a bent handlebar as this may dangerously weaken it.



EAS22921

INSTALLING THE HANDLEBAR

1. Stand the vehicle on a level surface.

EWA13120

WARNING

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

2. Install:
 - Handlebar "1"
 - Upper handlebar holder "2"



Upper handlebar holder bolt
23 Nm (2.3 m·kgf, 17 ft·lbf)

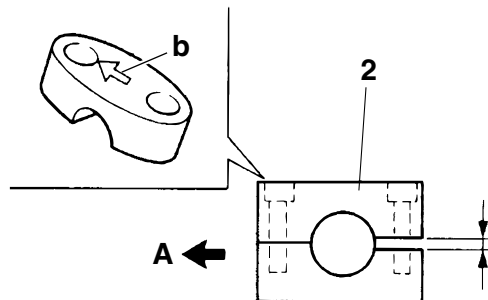
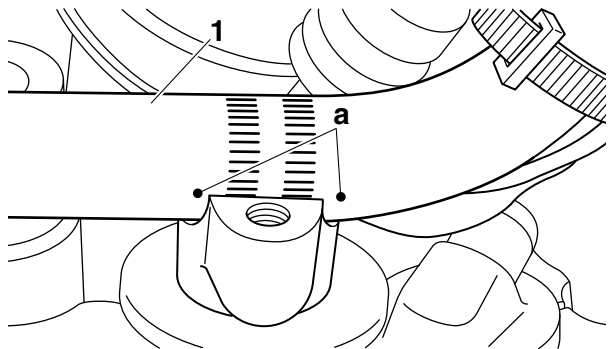
ECA14250

NOTICE

- First, tighten the bolts on the front side of the handlebar holder, and then on the rear side.
- Turn the handlebar all the way to the left and right. If there is any contact with the fuel tank, adjust the handlebar position.

TIP

- Align the match marks "a" on the handlebar with the upper surface of the lower handlebar holder.
- The upper handlebar holders should be installed with the arrow marks "b" facing forward "A".



3. Install:
 - Throttle grip
 - Throttle cable

TIP

Lubricate the inside of the throttle grip with a thin coat of lithium-soap-based grease and install it onto the handlebar.

4. Install:
 - Right handlebar switch "1"
 - Brake master cylinder "2"
 - Brake master cylinder holder "3"
 Refer to "INSTALLING THE FRONT BRAKE"

MASTER CYLINDER” on page 4-28.

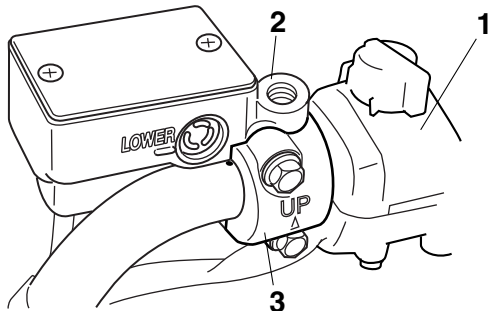
EWA13720

WARNING

Make sure the throttle grip operates smoothly.

TIP

The mating surfaces of the right handlebar switch should be perpendicular to the mating surfaces of the master cylinder holder.

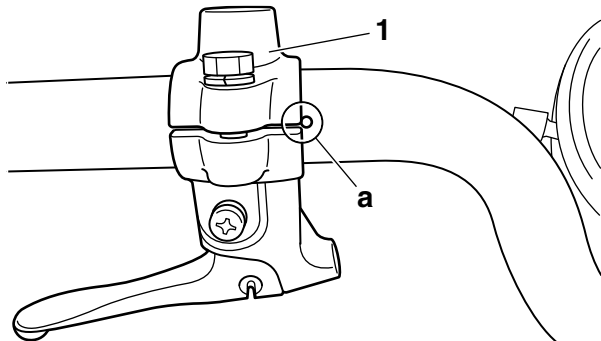


5. Install:

- Lever holder “1”

TIP

Align the mating surfaces of the lever holder with the punch mark “a” on the handlebar.



6. Install:

- Left handlebar switch

TIP

During installation, bring the projection of the left handlebar switch into contact with the lever holder.

7. Install:

- Handlebar grip

- Slightly coat the handlebar left end with a rubber adhesive.
- Slide the handlebar grip over the left end of the handlebar.
- Wipe off any excess rubber adhesive with a clean rag.

EWA13700

WARNING

Do not touch the handlebar grip until the rubber adhesive has fully dried.

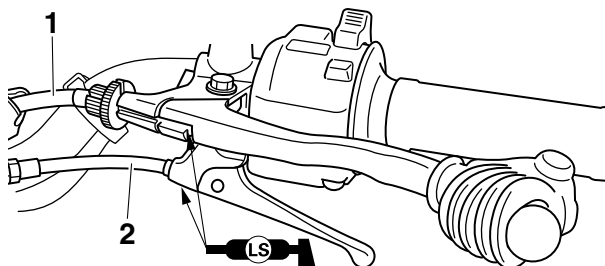


8. Install:

- Clutch cable “1”
- Decompression cable “2”

TIP

Apply lithium-soap-based grease to the end of the cable before installation.



9. Adjust:

- Clutch lever free play
Refer to “ADJUSTING THE CLUTCH LEVER FREE PLAY” on page 3-10.

	Clutch lever free play 5.0–10.0 mm (0.20–0.39 in)
--	---

10. Adjust:

- Throttle grip free play
Refer to “CHECKING THE THROTTLE GRIP” on page 3-24.

	Throttle grip free play 3.0–5.0 mm (0.12–0.20 in)
--	---

11. Adjust:

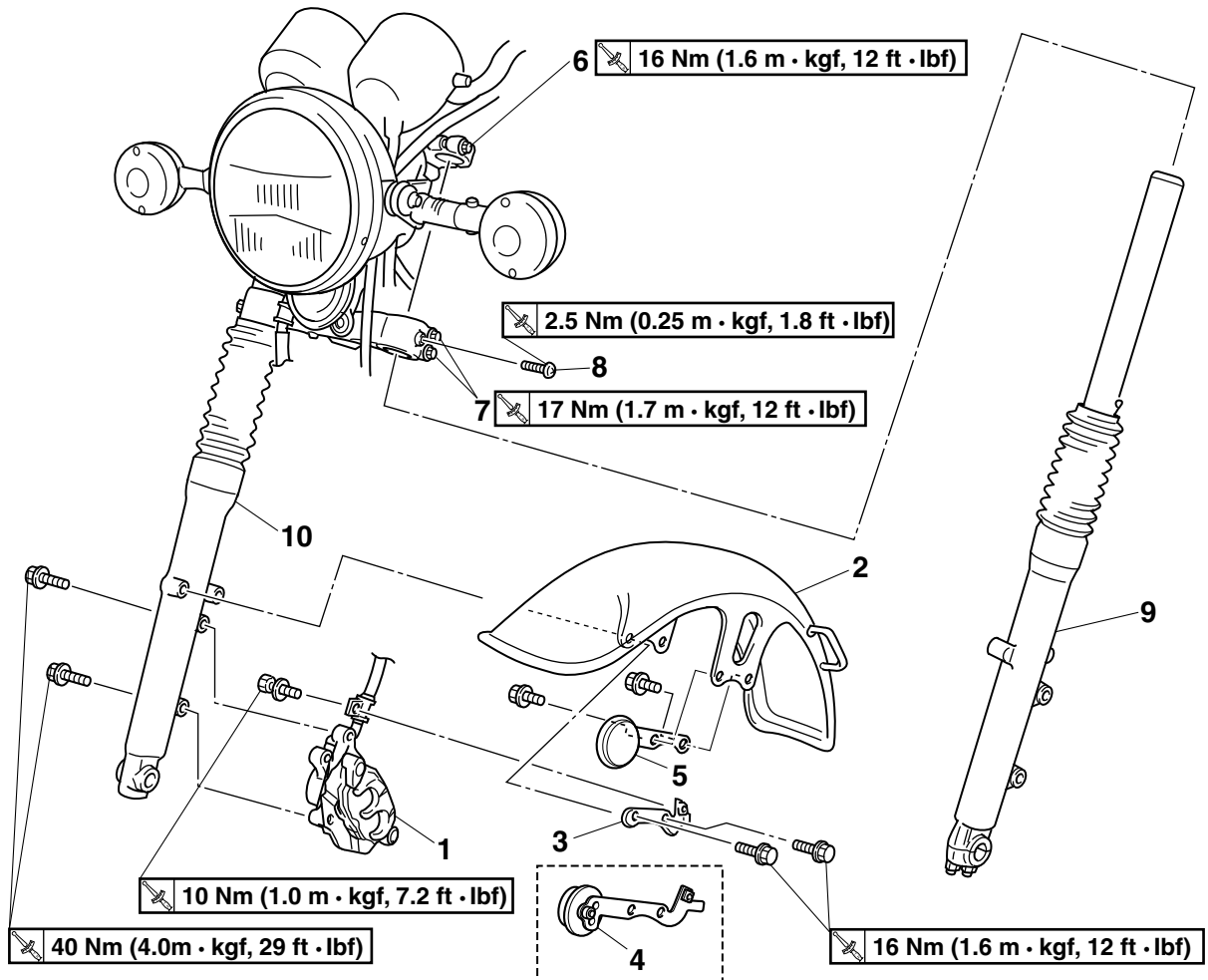
- Decompression lever free play
Refer to “ADJUSTING THE DECOMPRESSION LEVER FREE PLAY” on page 3-11.

	Decompression lever free play (decompression lever end) 5.0–10.0 mm (0.20–0.39 in)
--	--

EAS22950

FRONT FORK

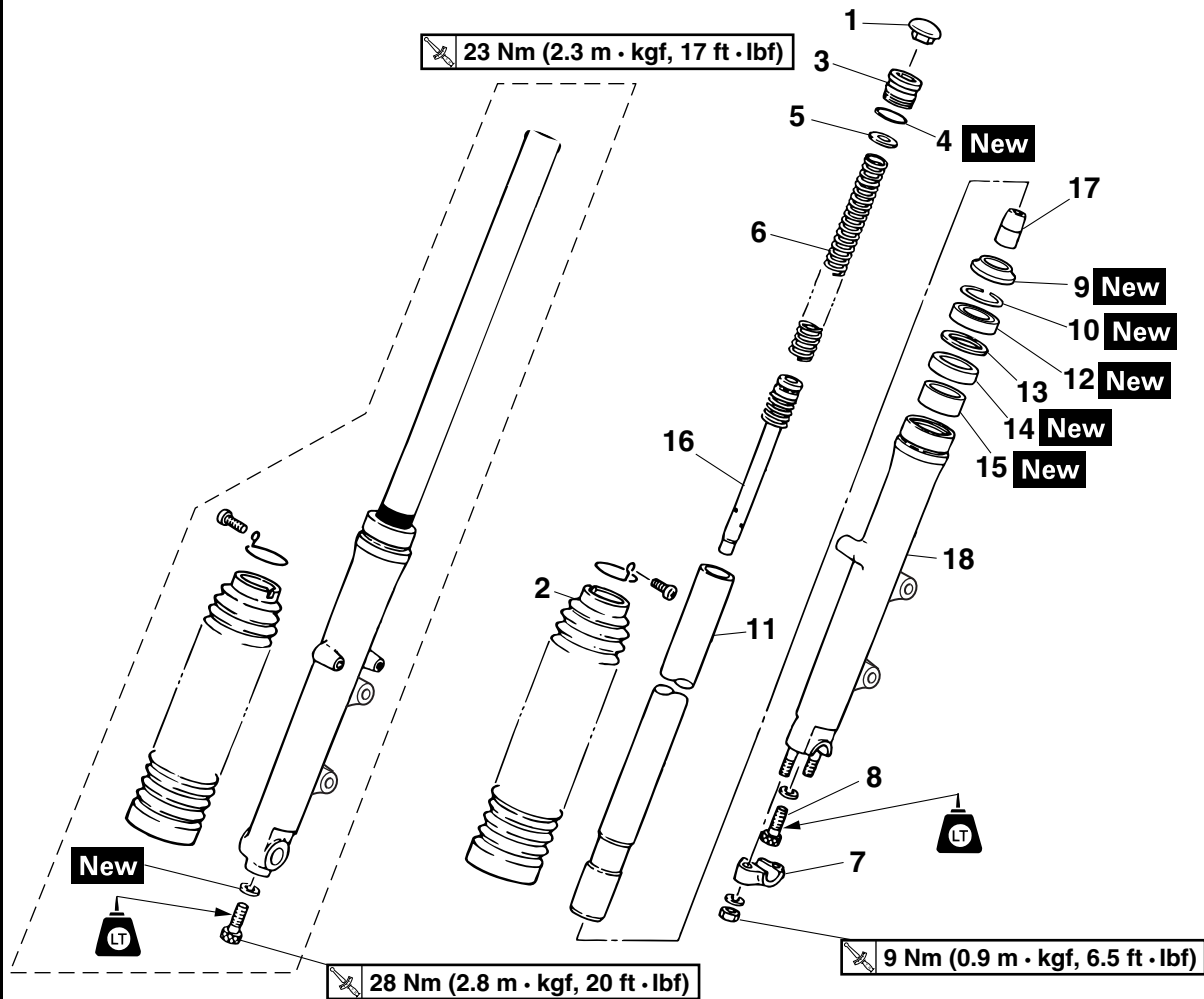
Removing the front fork legs



Order	Job/Parts to remove	Q'ty	Remarks
	Front wheel		Refer to "FRONT WHEEL" on page 4-5.
1	Brake caliper	1	
2	Front fender	1	
3	Holder stay	1	Except for AUS.
4	Right reflector	1	For AUS.
5	Left reflector	1	For AUS.
6	Upper bracket pinch bolt	2	Loosen.
7	Lower bracket pinch bolt	4	Loosen.
8	Fork boot lock screw	1	Loosen.
9	Front fork leg (left)	1	
10	Front fork leg (right)	1	

FRONT FORK

Disassembling the front fork legs



Order	Job/Parts to remove	Q'ty	Remarks
1	Cap	1	
2	Dust boot	1	
3	Cap bolt	1	
4	O-ring	1	
5	Spring seat	1	
6	Fork spring	1	
7	Axle holder	1	
8	Damper rod assembly bolt	1	
9	Dust seal	1	
10	Oil seal clip	1	
11	Inner tube	1	
12	Oil seal	1	
13	Washer	1	
14	Slide metal	1	
15	Piston metal	1	
16	Damper rod/rebound spring	1/1	
17	Oil lock piece	1	
18	Outer tube	1	

EAS22970

REMOVING THE FRONT FORK LEGS

The following procedure applies to both of the front fork legs.

1. Stand the vehicle on a level surface.

EWA13120

WARNING

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

TIP

Place the vehicle on a suitable stand so that the front wheel is elevated.

2. Remove:

- Front wheel
Refer to "FRONT WHEEL" on page 4-5.

- Brake caliper
- Front fender

3. Loosen:

- Cap bolt "1"
- Upper bracket pinch bolt "2"
- Lower bracket pinch bolt "3"
- Fork boot lock screw "4"

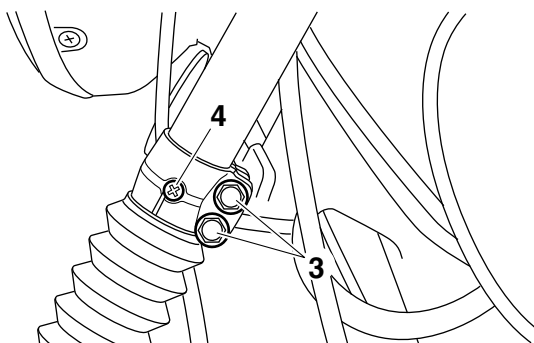
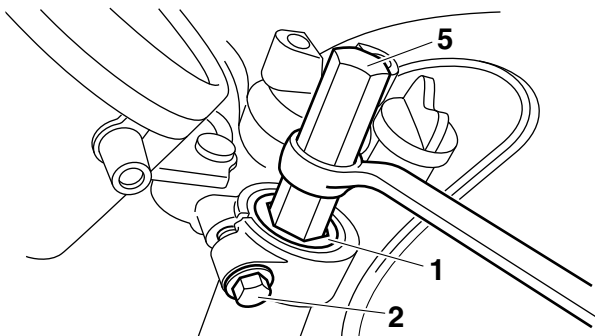
EWA13640

WARNING

Before loosening the upper and lower bracket pinch bolts, support the front fork leg.

TIP

Loosen the cap bolt with a 17 mm (0.67 in) hexagon wrench "5".



4. Remove:

- Front fork leg

- Dust boot

EAS22980

DISASSEMBLING THE FRONT FORK LEGS

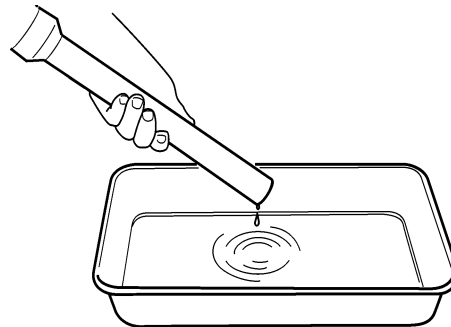
The following procedure applies to both of the front fork legs.

1. Drain:

- Fork oil

TIP

Stroke the outer tube several times while draining the fork oil.



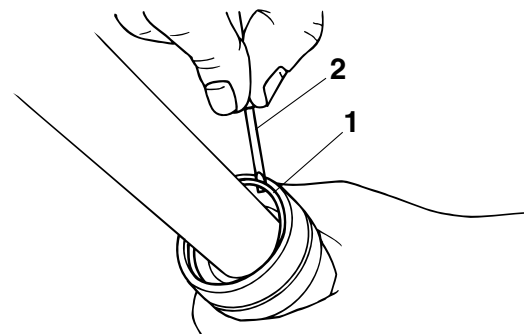
2. Remove:

- Dust seal
- Oil seal clip "1"
(with a flathead screwdriver "2".)

ECA14180

NOTICE

Do not scratch the inner tube.



3. Remove:

- Damper rod assembly bolt "1"
- Copper washer

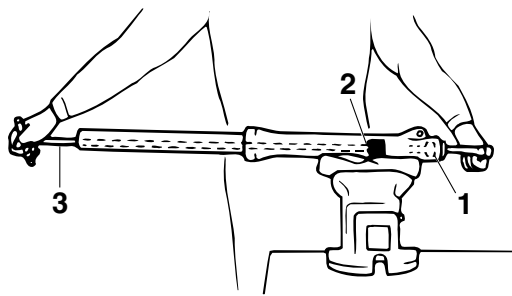
TIP

While holding the damper rod with a 17 mm (0.67 in) hexagon wrench "2", 17 mm (0.67 in) socket, and T-handle "3", loosen the damper rod assembly bolt.



T-handle
90890-01326
T-handle 3/8" drive 60 cm long
YM-01326

FRONT FORK



4. Remove:
- Inner tube

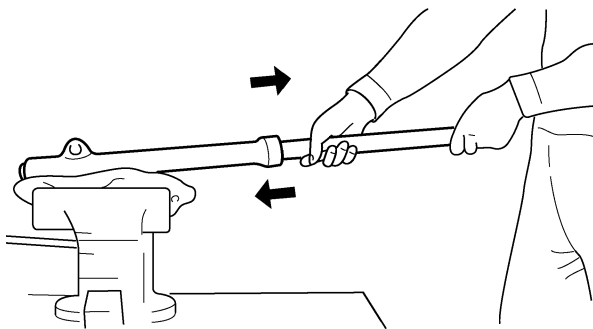


- Hold the front fork leg horizontally.
- Securely clamp the brake caliper bracket in a vise with soft jaws.
- Separate the inner tube from the outer tube by pulling the inner tube forcefully but carefully.

ECA2RD1019

NOTICE

- Excessive force will damage the oil seal and bushing. A damaged oil seal or bushing must be replaced.
- Avoid bottoming the inner tube into the outer tube during the above procedure, as the oil lock piece will be damaged.



EAS23011

CHECKING THE FRONT FORK LEGS

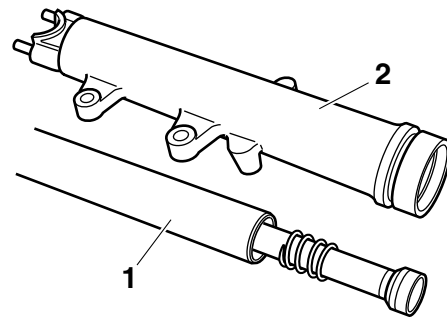
The following procedure applies to both of the front fork legs.

- Check:
 - Inner tube “1”
 - Outer tube “2”
 Bends/damage/scratches → Replace.

EWA13650

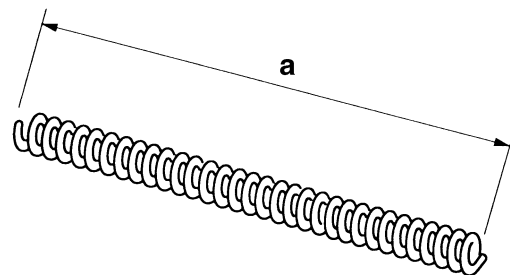
WARNING

Do not attempt to straighten a bent inner tube as this may dangerously weaken it.



- Measure:
 - Spring free length “a”
 Out of specification → Replace.

	Fork spring free length
	492.9 mm (19.41 in)
	Limit
	483.0 mm (19.02 in)



- Check:
 - Damper rod
 Damage/wear → Replace.
 Obstruction → Blow out all of the oil passages with compressed air.
- Check:
 - Oil lock piece
 Damage → Replace.
- Check:
 - Cap bolt
 Damage/wear → Replace.

EAS23021

ASSEMBLING THE FRONT FORK LEGS

The following procedure applies to both of the front fork legs.

EWA13660

WARNING

- Make sure the oil levels in both front fork legs are equal.
- Uneven oil levels can result in poor handling and a loss of stability.

TIP

- When assembling the front fork leg, be sure to replace the following parts:
 - Slide metal

FRONT FORK

- Piston metal
- Oil seal
- Dust seal
- Before assembling the front fork leg, make sure all of the components are clean.

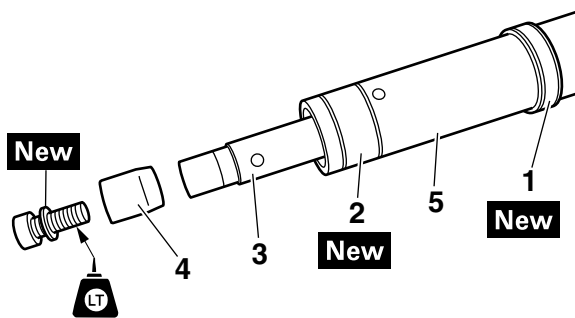
1. Install:

- Slide metal "1" **New**
- Piston metal "2" **New**
- Damper rod assembly "3"
- Oil lock piece "4"

ECA2RD1016

NOTICE

Allow the damper rod to slide slowly down the inner tube "5" until it protrudes from the bottom of the inner tube. Be careful not to damage the inner tube.



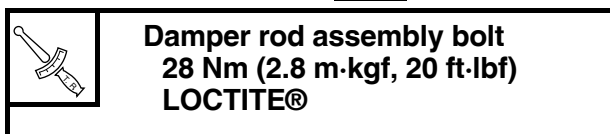
2. Lubricate:

- Inner tube's outer surface



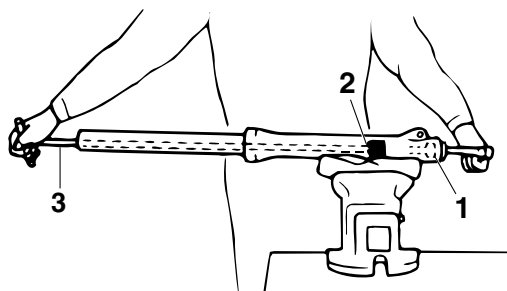
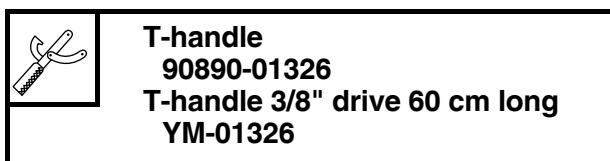
3. Tighten:

- Damper rod assembly bolt "1"
(along with the gasket **New**)



TIP

Tighten the damper rod assembly bolt with a 17 mm (0.67 in) hexagon wrench "2", 17 mm (0.67 in) socket, and T-handle "3".



4. Install:

- Washer
- Oil seal "1" **New**
(with the fork seal driver weight and fork seal driver attachment (ø35).)

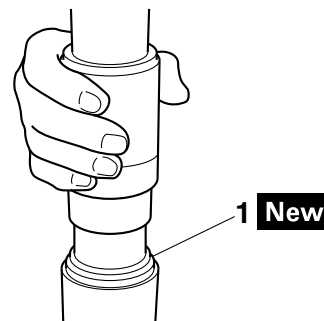
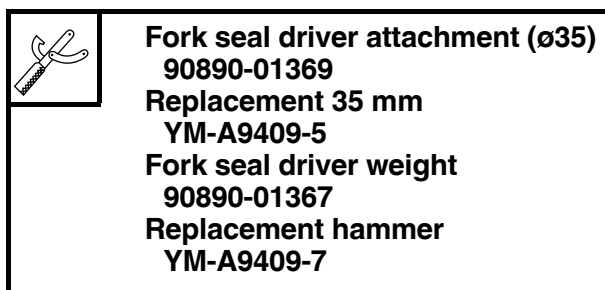
ECA14220

NOTICE

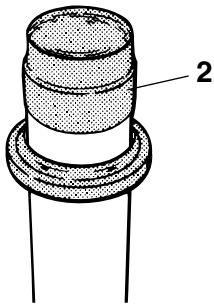
Make sure the numbered side of the oil seal faces up.

TIP

- Before installing the oil seal, lubricate its lips with lithium soap base grease.
- Lubricate the outer surface of the inner tube with fork oil.
- Before installing the oil seal, cover the top of the front fork leg with a plastic bag "2" to protect the oil seal during installation.



FRONT FORK



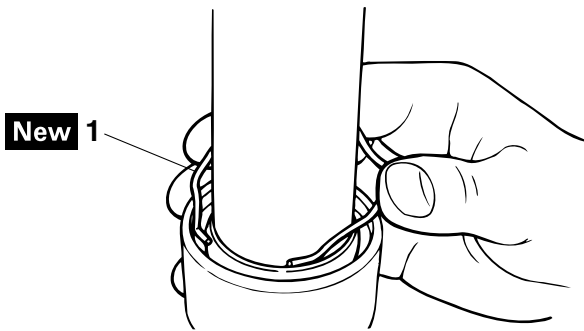
342-034

5. Install:

- Oil seal clip "1" **New**

TIP

Adjust the oil seal clip so that it fits into the outer tube's groove.

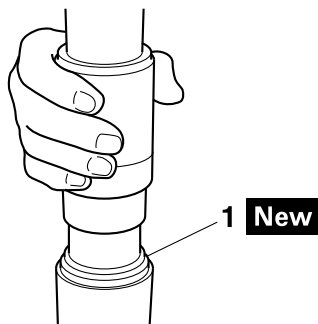


6. Install:

- Dust seal "1" **New**
(with the fork seal driver weight)



Fork seal driver weight
90890-01367
Replacement hammer
YM-A9409-7



7. Fill:

- Front fork leg
(with the specified amount of the recommended fork oil)



Quantity
204.0 cm³ (6.90 US oz, 7.20 Imp.oz)

Recommended oil
Fork oil 10W or equivalent

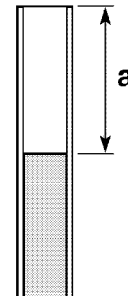


Level
182.0 mm (7.17 in)

*At position "a" from the inner tube top end when the inner tube is fully compressed in the outer tube.

TIP

- While filling the front fork leg, keep it upright.
- After filling, slowly pump the front fork leg up and down to distribute the fork oil.

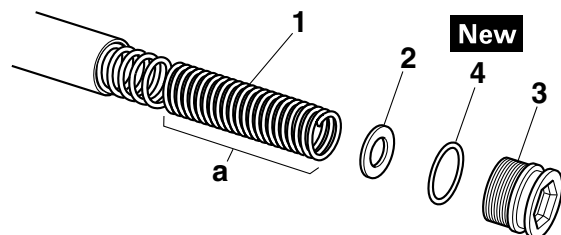


8. Install:

- Spring "1"
- Spring seat "2"
- Cap bolt "3"
(along with the O-ring "4" **New**)

TIP

- Install the spring with the smaller pitch "a" facing up.
- Before installing the cap bolt, lubricate its O-ring with grease.
- Temporarily tighten the cap bolt.



EAS23050

INSTALLING THE FRONT FORK LEGS

The following procedure applies to both of the

FRONT FORK

front fork legs.

1. Install:


- Front fork leg
Temporarily tighten the upper and lower bracket pinch bolts.

TIP

Make sure the inner tube is flush with the top of the upper bracket.

2. Tighten:


- Lower bracket pinch bolt "1"

	Lower bracket pinch bolt 17 Nm (1.7 m·kgf, 12 ft·lbf)
---	---


- Cap bolt "2"

TIP

Tighten the cap bolt with a 17 mm (0.67 in) hexagon wrench "3".

	Cap bolt 23 Nm (2.3 m·kgf, 17 ft·lbf)
---	---

- Upper bracket pinch bolt "4"


	Upper bracket pinch bolt 16 Nm (1.6 m·kgf, 12 ft·lbf)
---	---

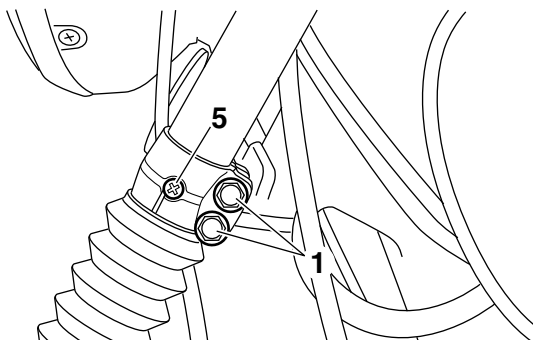
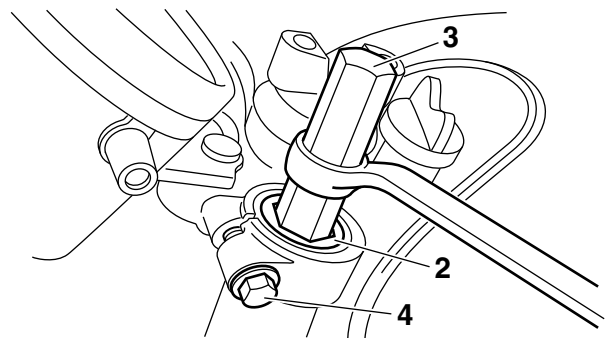
- Fork boot lock screw "5"

EWA13680

⚠ WARNING

Make sure the brake hoses are routed properly.

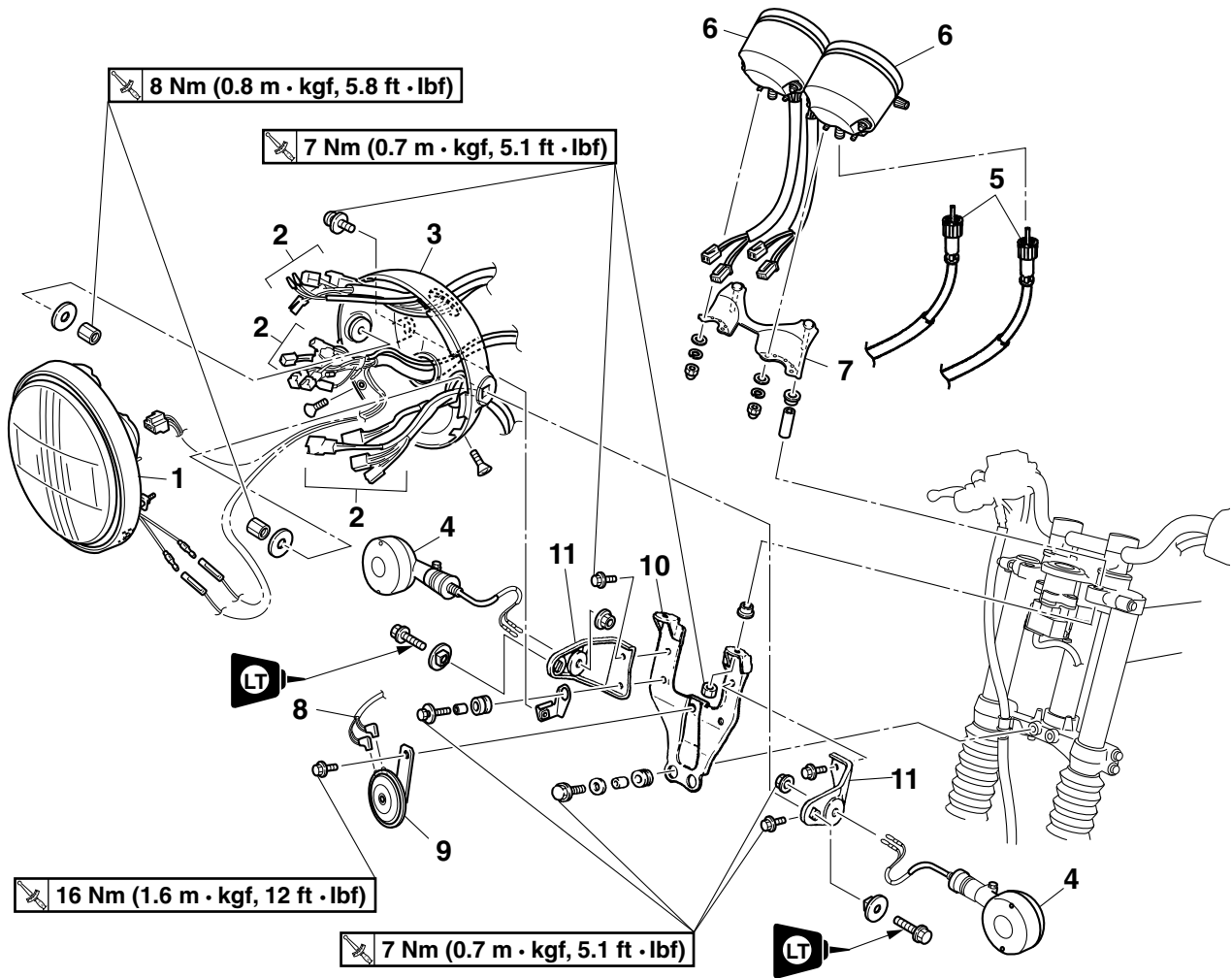
	Fork boot lock screw 2.5 Nm (0.25 m·kgf, 1.8 ft·lbf)
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EAS23090

STEERING HEAD

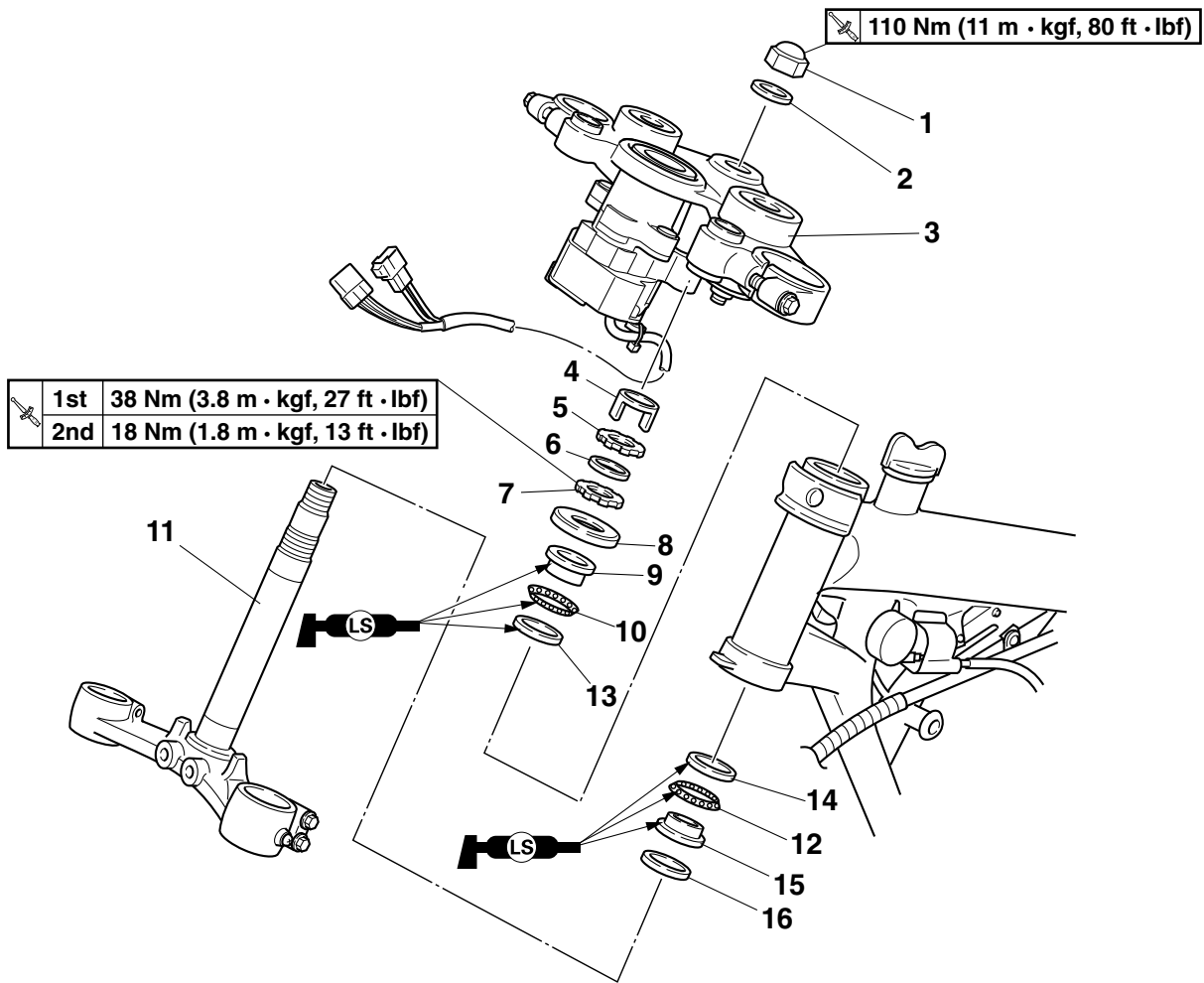
Removing the headlight unit, meter assembly, and turn signal lights



Order	Job/Parts to remove	Q'ty	Remarks
	Handlebar		Refer to "HANDLEBAR" on page 4-33.
1	Headlight unit assembly	1	
2	Wirings in headlight body		Disconnect.
3	Headlight body	1	
4	Front right turn signal light/front left turn signal light	1/1	
5	Speedometer cable/Tachometer cable	1/1	
6	Speedometer/tachometer	1/1	
7	Meter stay	1	
8	Horn lead	1	Disconnect.
9	Horn	1	
10	Bracket	1	
11	Light stay (left)/light stay (right)	1/1	

STEERING HEAD

Removing the lower bracket



Order	Job/Parts to remove	Q'ty	Remarks
	Front fork leg		Refer to "FRONT FORK" on page 4-37.
	Handlebar		Refer to "HANDLEBAR" on page 4-33.
	Headlight, meter assembly		
1	Steering stem nut	1	
2	Washer	1	
3	Upper bracket	1	
4	Lock washer	1	
5	Upper ring nut	1	
6	Rubber washer	1	
7	Lower ring nut	1	
8	Ball race cover	1	
9	Ball race 1	1	
10	Bearing 1	1	
11	Lower bracket	1	
12	Bearing 2	1	
13	Ball race 2	1	
14	Ball race 3	1	
15	Ball race 4	1	
16	Dust seal	1	

- Lower bracket
(along with the steering stem)
Bends/cracks/damage → Replace.

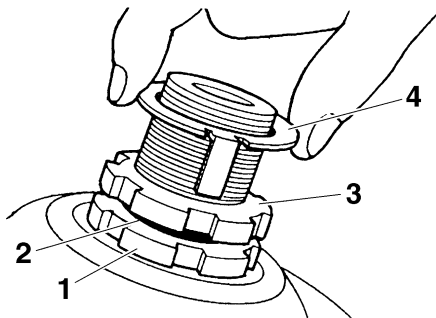
EAS23140

INSTALLING THE STEERING HEAD

1. Lubricate:
 - Upper bearing
 - Lower bearing
 - Bearing race



2. Install:
 - Lower ring nut “1”
 - Rubber washer “2”
 - Upper ring nut “3”
 - Lock washer “4”Refer to “CHECKING AND ADJUSTING THE STEERING HEAD” on page 3-19.



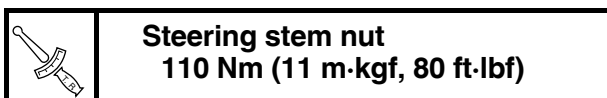
3. Install:
 - Upper bracket
 - Steering stem nut

TIP _____
Temporarily tighten the steering stem nut.

4. Install:
 - Front fork legRefer to “FRONT FORK” on page 4-37.

TIP _____
Temporarily tighten the upper and lower bracket pinch bolts.

5. Tighten:
 - Steering stem nut

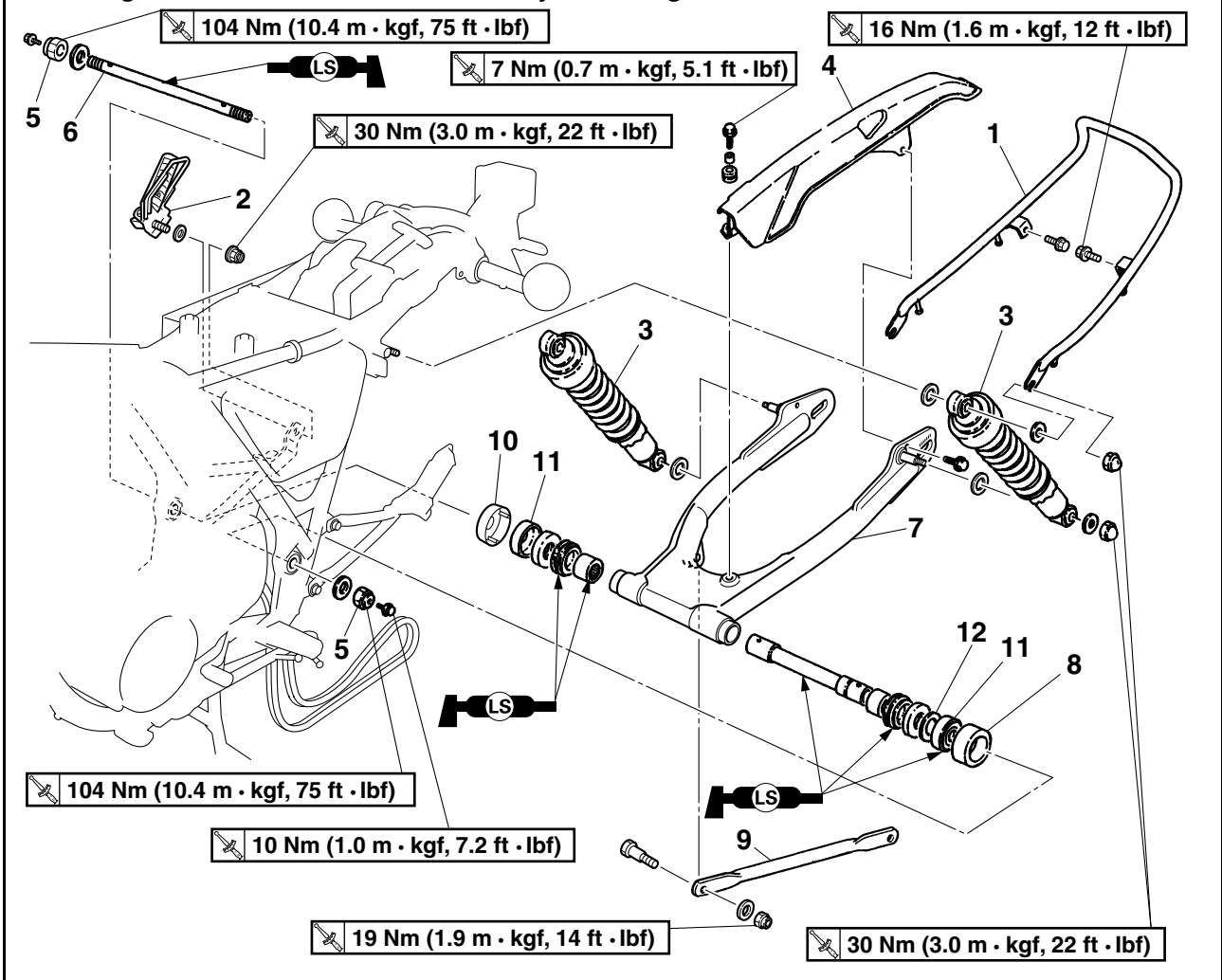


REAR SHOCK ABSORBER ASSEMBLY AND SWINGARM

EAS2RD1027

REAR SHOCK ABSORBER ASSEMBLY AND SWINGARM

Removing the rear shock absorber assembly and swingarm



Order	Job/Parts to remove	Q'ty	Remarks
	Rear wheel		Refer to "REAR WHEEL" on page 4-11.
1	Grab bar	1	
2	Rear right footrest	1	
3	Rear shock absorber assembly	2	
4	Chain case	1	
5	Pivot shaft nut	2	Remove either one of the right and left.
6	Pivot shaft	1	
7	Swingarm	1	
8	Collar	1	
9	Tension bar	1	
10	Washer	1	Only models with the mark stamped on the frame.
11	Dust cover	2	
12	Shim	1	Install the required number of them, depending on the thrust clearance.

REAR SHOCK ABSORBER ASSEMBLY AND SWINGARM

EAS23220

REMOVING THE REAR SHOCK ABSORBER ASSEMBLIES

1. Stand the vehicle on a level surface.

EWA13120

WARNING

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

TIP

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

2. Remove:

- Rear right footrest

3. Remove:

- Rear shock absorber assembly lower nut
- Washer

4. Remove:

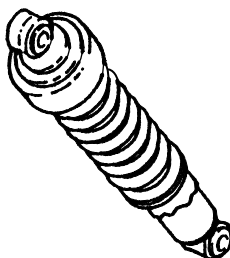
- Rear shock absorber assembly upper nut
- Washer
- Rear shock absorber assembly

EAS23240

CHECKING THE REAR SHOCK ABSORBER ASSEMBLY

1. Check:

- Rear shock absorber rod
Bends/damage → Replace the rear shock absorber assembly.
- Rear shock absorber
Oil leaks → Replace the rear shock absorber assembly.
- Spring
Damage/wear → Replace the rear shock absorber assembly.
- Bushing
Damage/wear → Replace.
- Bolt
Bends/damage/wear → Replace.



EAS23311

INSTALLING THE REAR SHOCK ABSORBER ASSEMBLY

1. Install:

- Rear shock absorber assembly

- Washer
 - Rear shock absorber assembly lower nut
2. Install:
- Washer
 - Grab bar
 - Washer
 - Rear shock absorber assembly upper nut

TIP

When installing the rear shock absorber assembly, lift up the swingarm.

3. Tighten:

- Rear shock absorber assembly upper nut
- Rear shock absorber assembly lower nut



Rear shock absorber assembly upper nut

30 Nm (3.0 m·kgf, 22 ft·lbf)

Rear shock absorber assembly lower nut

30 Nm (3.0 m·kgf, 22 ft·lbf)

4. Install:

- Rear right footrest



Rear right footrest assembly nut

30 Nm (3.0 m·kgf, 22 ft·lbf)

EAS23340

REMOVING THE SWINGARM

1. Stand the vehicle on a level surface.

EWA13120

WARNING

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

TIP

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

2. Remove:

- Rear wheel
Refer to “REAR WHEEL” on page 4-11.
- Rear shock absorber assembly
Refer to “REMOVING THE REAR SHOCK ABSORBER ASSEMBLIES” on page 4-49.

3. Measure:

- Swingarm side play
- Swingarm vertical movement

a. Measure the tightening torque of the pivot shaft nut.



Pivot shaft nut


104 Nm (10.4 m·kgf, 75 ft·lbf)

b. Measure the swingarm side play “A” by mov-

REAR SHOCK ABSORBER ASSEMBLY AND SWINGARM

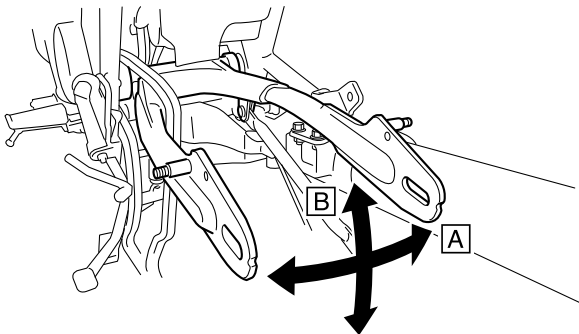
ing the swingarm from side to side.

- c. If the swingarm side play is out of specification, check the spacers and bearings.



Swingarm end free play limit (radial)
1.0 mm (0.04 in)

- d. Check the swingarm vertical movement "B" by moving the swingarm up and down. If swingarm vertical movement is not smooth or if there is binding, check the collars and bearings.



4. Remove:
- Pivot shaft
 - Swingarm

EAS23371

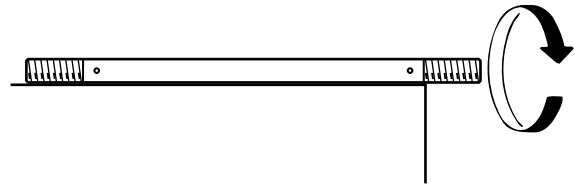
CHECKING THE SWINGARM

1. Check:
 - Swingarm
 Bends/cracks/damage → Replace.
2. Check:
 - Pivot shaft nut
 Damage/wear → Replace.
3. Check:
 - Pivot shaft
 Roll the pivot shaft on a flat surface.
Bends → Replace.

EWA13770

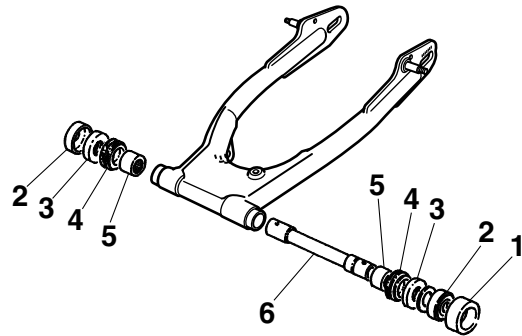


Do not attempt to straighten a bent pivot shaft.



340-008


4. Check:
- Collar "1"
 - Dust cover "2"
 - Bearing "3"
 - Oil seal "4"
 - Bearing "5"
 - Collar "6"
- Damage/wear → Replace.



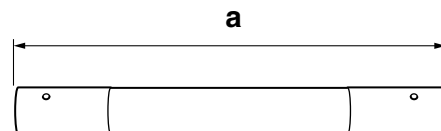
EAS2RD1028

ADJUSTING THE THRUST CLEARANCE

1. Measure:
 - Collar (head pipe) length "a"
 Out of specification → Replace.



Collar (head pipe) length, standard value
197.3–197.5 mm (7.77–7.78 in)

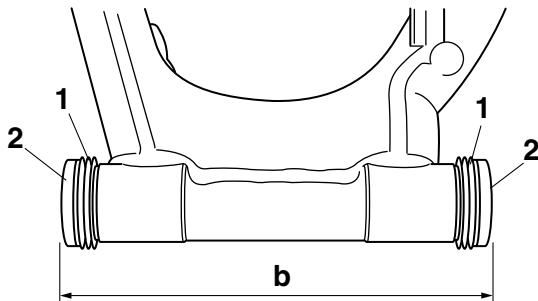


2. Measure:
 - Size "b" (swingarm pivot shaft length + thickness of both bearings "1" + thickness of cover "2")

REAR SHOCK ABSORBER ASSEMBLY AND SWINGARM



Size “b” (swingarm pivot shaft length + thickness of both bearings “1” + thickness of cover “2”)
196.7–196.9 mm (7.74–7.75 in)



3. Calculate the thrust clearance.

• Thrust clearance = swingarm head pipe collar length “a” – “b” (swingarm pivot shaft length + thickness of both bearings)

Out of specification → Adjust the shim.



Standard thrust clearance (size “a” – “b”)
0.1–0.3 mm (0.0039–0.0118 in)

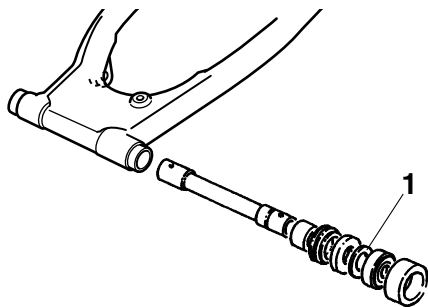
4. If the standard clearance is not met, put the adjusting shim “1” to cause the thrust clearance (size “a” – “b”) to fall within the specified range.



Type of shim
0.2 mm (0.0079 in)
0.3 mm (0.0118 in)

TIP

Put each shim in the left side.



EAS23380

INSTALLING THE SWINGARM

1. Lubricate:

- Bearing

- Collar
- Dust cover
- Oil seal
- Pivot shaft



Recommended lubricant
Lithium-soap-based grease

2. Install:

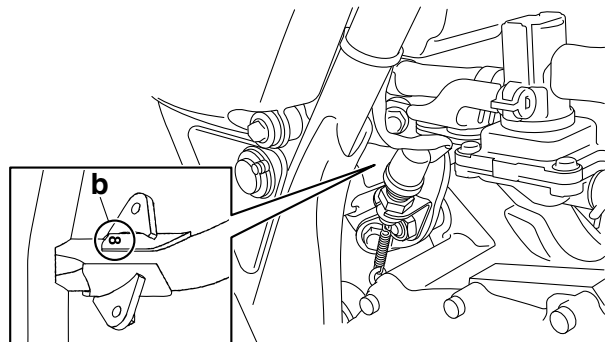
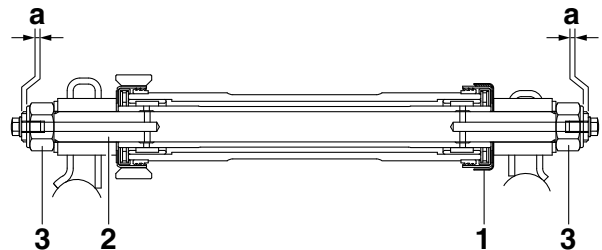
- Collar
- Bearing
- Oil seal **New**
- Dust cover
- Washer “1”
- Swingarm
- Pivot shaft “2”
- Pivot shaft nut “3”



Pivot shaft nut
104 Nm (10.4 m·kgf, 75 ft·lbf)

TIP

- After tightening the pivot shaft nut, make sure that the dimension “a” is 1.7 mm (0.07 in) or more. If the dimension is less than 1.7 mm (0.07 in), reinstall the pivot shaft.
- Install a washer “1” to only points “b” that are stamped on the frame.



3. Install:

- Rear shock absorber assembly
- Rear wheel

Refer to “REAR WHEEL” on page 4-11.

REAR SHOCK ABSORBER ASSEMBLY AND SWINGARM

4. Adjust:

- Drive chain slack

Refer to "ADJUSTING THE DRIVE CHAIN SLACK" on page 3-18



Drive chain slack
30.0–40.0 mm (1.18–1.57 in)

EAS23400

CHAIN DRIVE

EAS23420

REMOVING THE DRIVE CHAIN

1. Stand the vehicle on a level surface.

EWA13120

WARNING

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

TIP

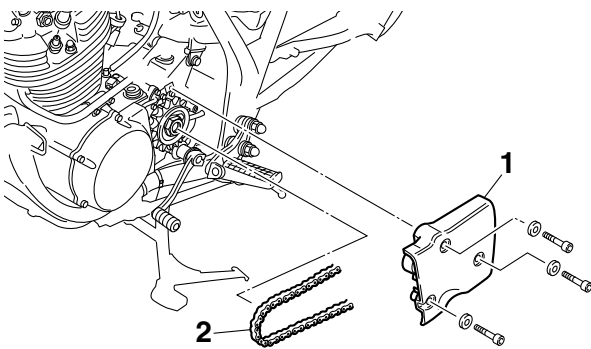
Place the vehicle on a suitable stand so that the rear wheel is elevated.

2. Remove:

- Rear wheel
Refer to "REAR WHEEL" on page 4-11.
- Swingarm
Refer to "REAR SHOCK ABSORBER ASSEMBLY AND SWINGARM" on page 4-48.

3. Remove:

- Drive sprocket cover "1"
- Drive chain "2"



EAS23441

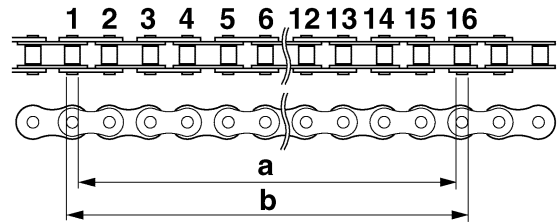
CHECKING THE DRIVE CHAIN

1. Measure:

- 15-link section of the drive chain
Out of specification → Replace the drive chain.

	15-link length limit 191.5 mm (7.54 in)
--	--

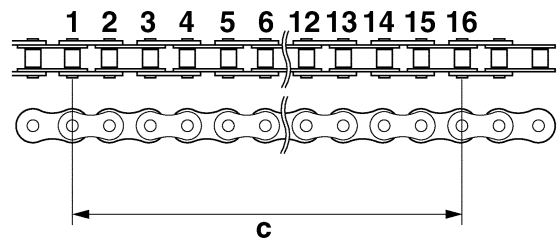
- a. Measure the length "a" between the inner sides of the pins and the length "b" between the outer sides of the pins on a 15-link section of the drive chain as shown in the illustration.



- b. Calculate the length "c" of the 15-link section of the drive chain using the following formula.
Drive chain 15-link section length "c" = (length "a" between pin inner sides + length "b" between pin outer sides)/2

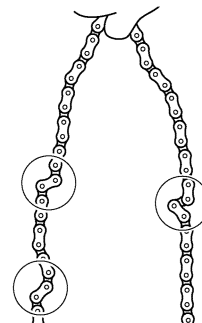
TIP

- When measuring a 15-link section of the drive chain, make sure that the drive chain is taut.
- Perform this procedure 2–3 times, at a different location each time.



2. Clean:

- Drive chain

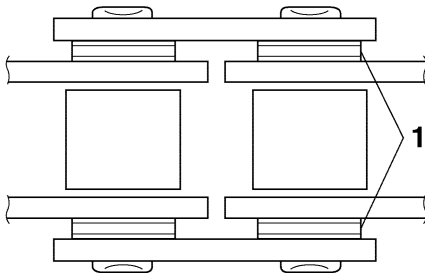
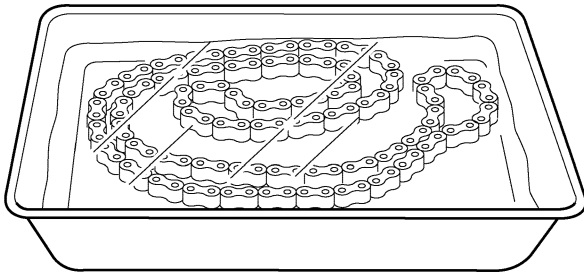


- a. Wipe the drive chain with a clean cloth.
- b. Put the drive chain in kerosene and remove any remaining dirt.
- c. Remove the drive chain from the kerosene and completely dry it.

ECA2RD1006

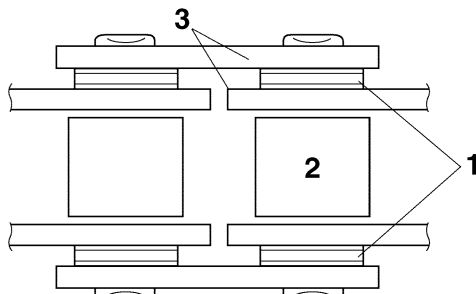
NOTICE

This vehicle has a drive chain with small rubber O-rings "1" between the drive chain side plates. Steam cleaning, high-pressure washing, certain solvents, and the use of a coarse brush can damage these O-rings.



3. Check:

- O-ring "1"
Damage → Replace the drive chain.
- Drive chain roller "2"
Damage/wear → Replace the drive chain.
- Drive chain side plate "3"
Damage/wear → Replace the drive chain.
Cracks → Replace the drive chain.



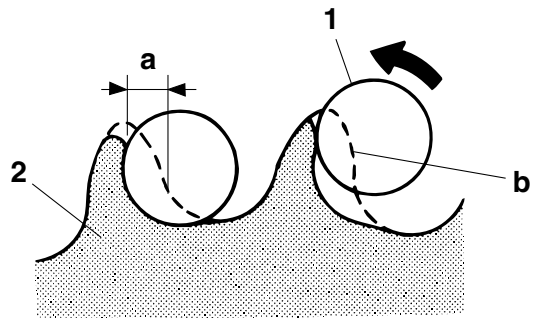
4. Lubricate:
- Drive chain



EAS23460

CHECKING THE DRIVE SPROCKET

1. Check:
 - Drive sprocket
More than 1/4 tooth "a" wear → Replace the drive chain, drive sprocket, and rear wheel sprocket as a set.
Bent teeth → Replace the drive chain, drive sprocket, and rear wheel sprocket as a set.



- b. Correct
1. Drive chain roller
 2. Drive sprocket

EAS23470

CHECKING THE REAR WHEEL SPROCKET

Refer to "CHECKING AND REPLACING THE REAR WHEEL SPROCKET" on page 4-15

EAS23480

CHECKING THE REAR WHEEL DRIVE HUB

Refer to "CHECKING THE REAR WHEEL DRIVE HUB" on page 4-14

EAS23490

INSTALLING THE DRIVE CHAIN

1. Lubricate:
 - Drive chain



2. Install:
 - Drive chain
 - Drive sprocket cover

TIP

Install the drive chain to the drive sprocket.

3. Install:
 - Swingarm
Refer to "REAR SHOCK ABSORBER ASSEMBLY AND SWINGARM" on page 4-48.
 - REAR WHEEL
Refer to "REAR WHEEL" on page 4-11.

4. Adjust:

- Drive chain slack

Refer to “ADJUSTING THE DRIVE CHAIN SLACK” on page 3-18.

	Drive chain slack 30.0–40.0 mm (1.18–1.57 in)
---	---

ECA13550

NOTICE

A drive chain that is too tight will overload the engine and other vital parts, and one that is too loose can skip and damage the swing-arm or cause an accident. Therefore, keep the drive chain slack within the specified limits.

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EAS2RD1039

ENGINE INSPECTION

EAS20720

MEASURING THE COMPRESSION PRESSURE

The following procedure applies to checking and adjusting the compression pressure.

TIP

Insufficient compression pressure will result in a loss of performance.

- 1. Measure:
• Valve clearance
Out of specification -> Adjust.
Refer to "ADJUSTING THE VALVE CLEARANCE" on page 3-5.
2. Start the engine, warm it up for several minutes, and then turn it off.
3. Remove:
• Spark plug cap
4. Remove:
• Spark plug

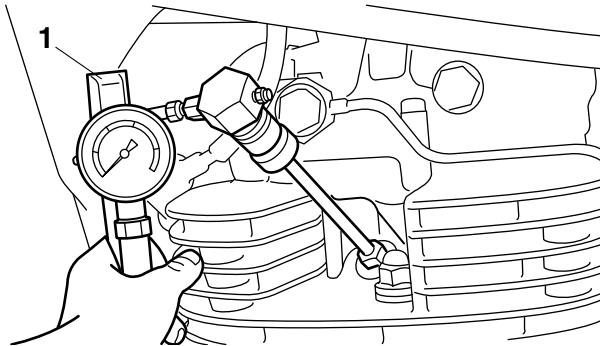
ECA20470

NOTICE

Before removing the spark plug, use compressed air to blow away any dirt accumulated in the spark plug well to prevent it from falling into the cylinder.

- 5. Install:
• Compression gauge "1"

Compression gauge 90890-03081
Engine compression tester YU-33223
Extension 90890-04082



- 6. Measure:
• Compression pressure
Out of specification -> Refer to steps (b) and (c).



Standard compression pressure (at sea level)
1050 kPa/700 r/min (10.5 kgf/cm2/700 r/min, 149.3 psi/700 r/min)
Minimum-maximum
910-1180 kPa/700 r/min (9.1-11.8 kgf/cm2/700 r/min, 129.4-167.8 psi/700 r/min)

- a. With the throttle wide open, kick the kickstarter lever until the reading on the compression gauge stabilizes.

EWA2RD1003

WARNING

To prevent spark generation, spark plug lead should be grounded before cranking by the kickstarter.

- b. If the compression pressure is above the maximum specification, check the cylinder head, valve surfaces, and piston crown for carbon deposits. Carbon deposits -> Eliminate.
c. If the compression pressure is below the minimum specification, pour a teaspoonful engine oil into the spark plug bore and measure again. Refer to the following table.

Table with 2 columns: Reading, Diagnosis. Rows describe higher and same compression pressure readings and their corresponding diagnoses like piston ring wear or carbon deposits.

- 7. Install:
• Spark plug

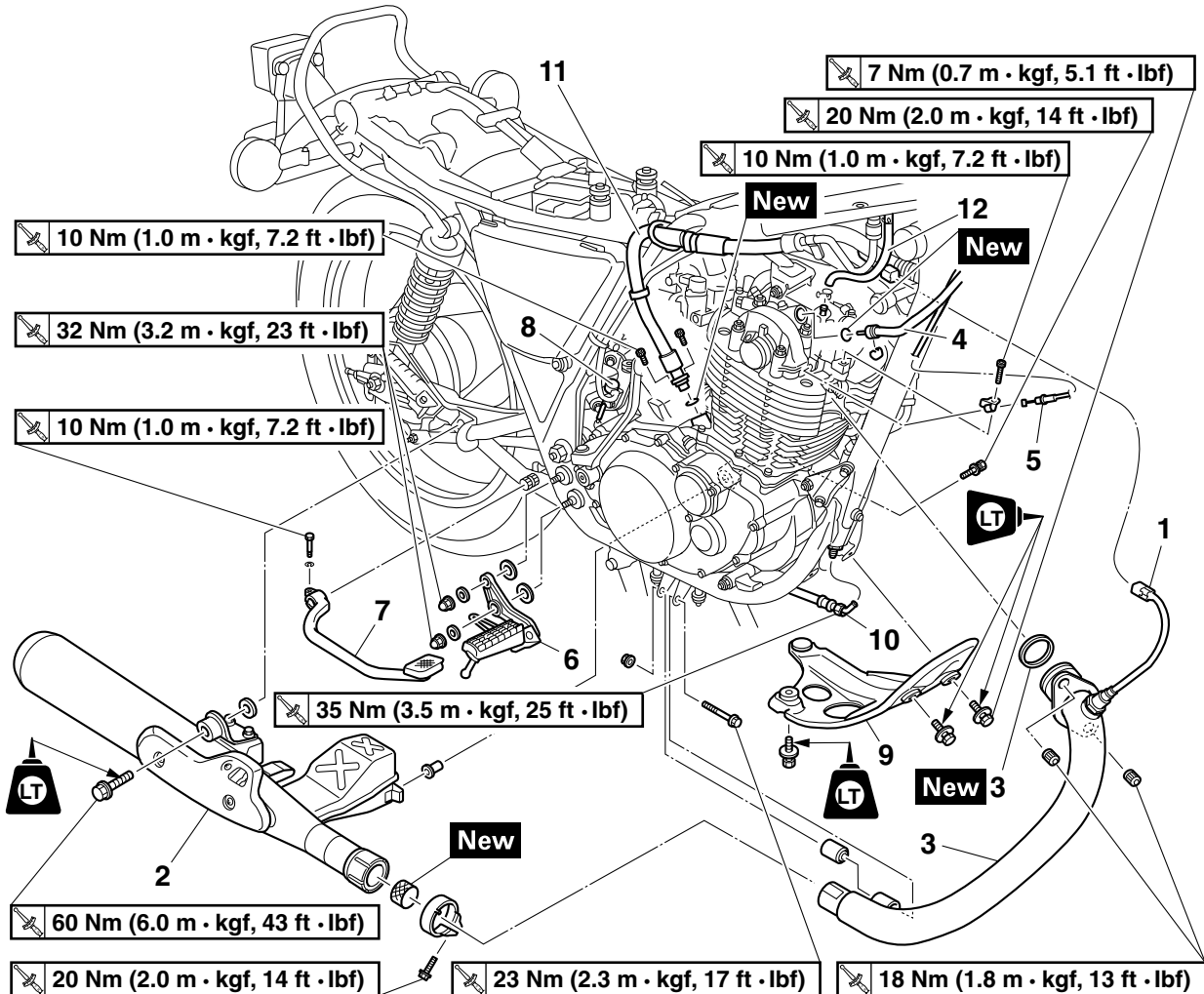
Spark plug
25 Nm (2.5 m-kgf, 18 ft-lbf)

- 8. Connect:
• Spark plug cap

EAS23711

ENGINE REMOVAL

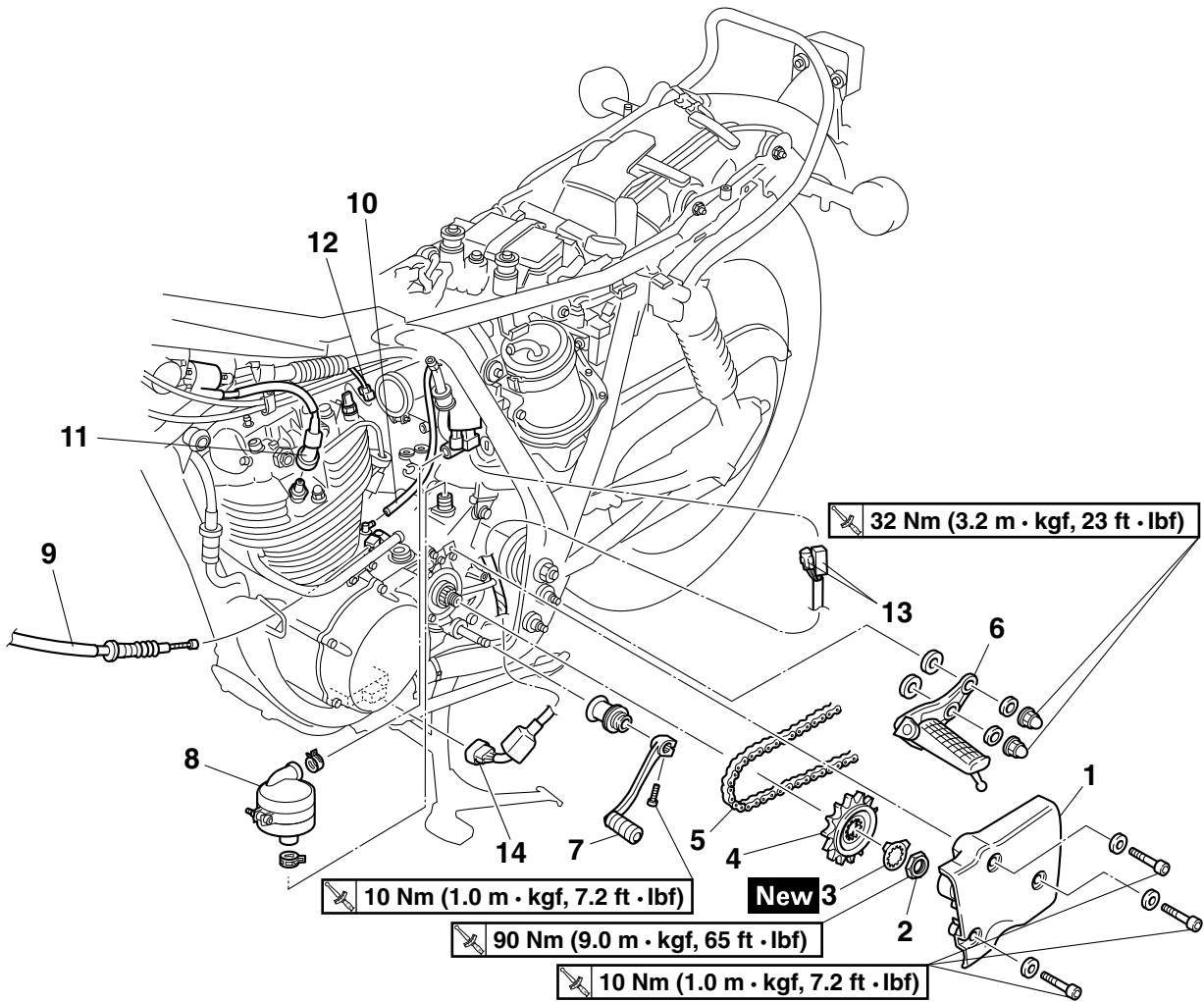
Removing the exhaust pipe and muffler



Order	Job/Parts to remove	Q'ty	Remarks
	Seat		Refer to "GENERAL CHASSIS" on page 4-1.
	Fuel tank		Refer to "FUEL TANK" on page 6-1.
	Engine oil		Drain. Refer to "CHANGING THE ENGINE OIL" on page 3-22.
1	O ₂ sensor coupler	1	Disconnect. The O ₂ sensor should not be removed except when it is replaced.
2	Muffler assembly	1	
3	Exhaust pipe/gasket	1/1	
4	Circlip/tachometer cable	1/1	
5	Decompression cable	1	
6	Front right footrest	1	
7	Brake pedal	1	
8	Rear brake light switch	1	Remove from the holder.
9	Engine protector	1	
10	Oil hose 1	1	Remove the oil tank side.
11	Oil hose 2	1	Remove the crankcase side.
12	Cylinder head breather hose	1	

ENGINE REMOVAL

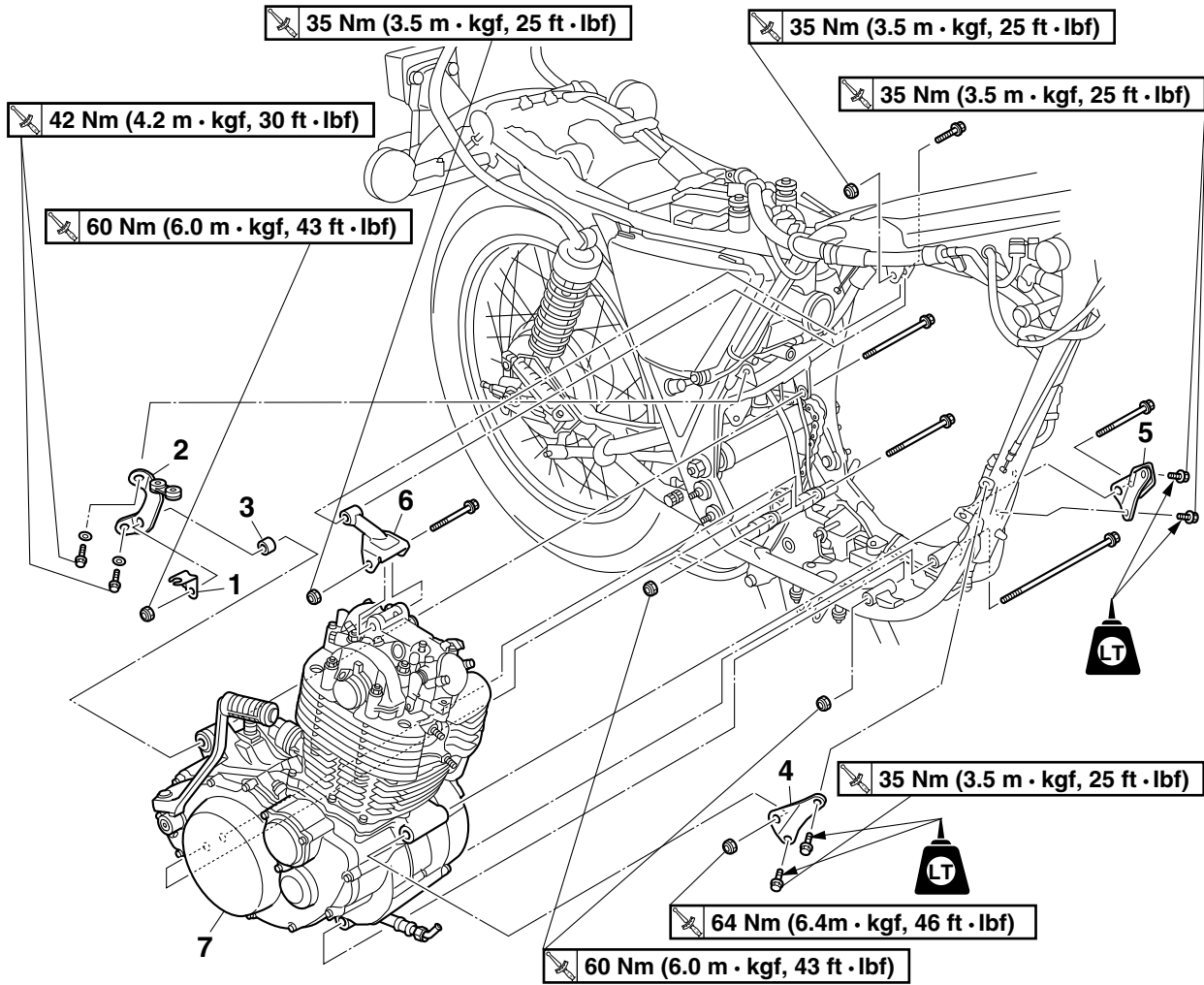
Disconnecting the cables, leads, and hoses



Order	Job/Parts to remove	Q'ty	Remarks
	Air induction system		Refer to "AIR INDUCTION SYSTEM" on page 6-15.
	Throttle body		Refer to "THROTTLE BODY" on page 6-9.
1	Drive sprocket cover	1	
2	Nut	1	
3	Lock washer	1	Straighten the tab of the lock washer before loosening the nut.
4	Drive sprocket	1	
5	Drive chain	1	Loosen the rear wheel axle nut to make the drive chain slack before removal.
6	Front left footrest	1	
7	Shift pedal	1	
8	Oil separator	1	
9	Clutch cable	1	Disconnect.
10	Breather hose	1	Disconnect.
11	Spark plug cap	1	
12	Engine temperature sensor coupler	1	Disconnect.
13	Stator coil assembly coupler	2	Disconnect.
14	Rectifier/regulator coupler	1	Disconnect.

ENGINE REMOVAL

Removing the engine



Order	Job/Parts to remove	Q'ty	Remarks
1	Rear brake light switch holder	1	
2	Engine mount rear	1	
3	Collar	1	
4	Engine mount front (right)	1	
5	Engine mount front (left)	1	
6	Engine mount upper	1	
7	Engine	1	

ENGINE REMOVAL

EAS23720

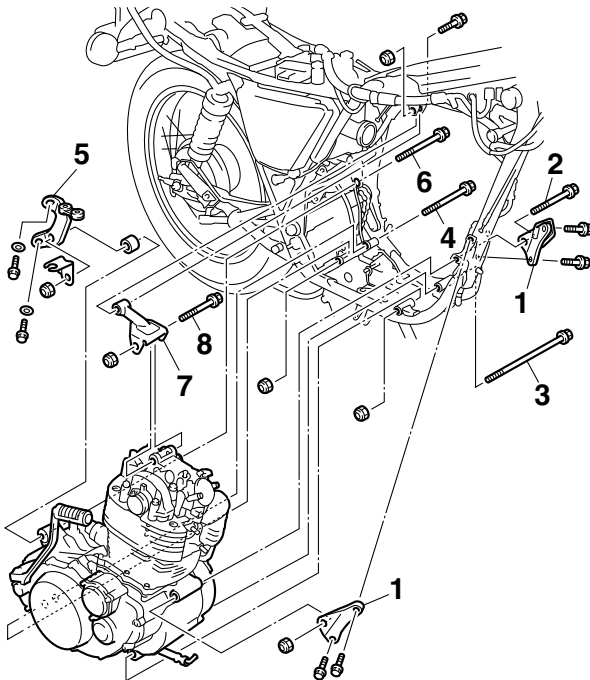
INSTALLING THE ENGINE

1. Install:

- Engine mount front "1"
- Engine mounting bolt/nut (front side) "2"
- Engine mounting bolt/nut (front lower side) "3"
- Engine mounting bolt/nut (rear lower side) "4"
- Engine mount rear "5"
- Engine mounting bolt/nut (rear side) "6"
- Engine mount upper "7"
- Engine mounting bolt/nut (upper side) "8"

TIP

Do not fully tighten the bolts. (temporarily tighten.)



- Engine mount rear bolt
- Engine mounting nut (rear side)



Engine mount rear bolt
42 Nm (4.2 m·kgf, 30 ft·lbf)
Engine mounting nut (rear side)
60 Nm (6.0 m·kgf, 43 ft·lbf)

- Engine mount upper nut
- Engine mounting nut (upper side)



Engine mount upper nut
35 Nm (3.5 m·kgf, 25 ft·lbf)
Engine mounting nut (upper side)
35 Nm (3.5 m·kgf, 25 ft·lbf)

3. Install:

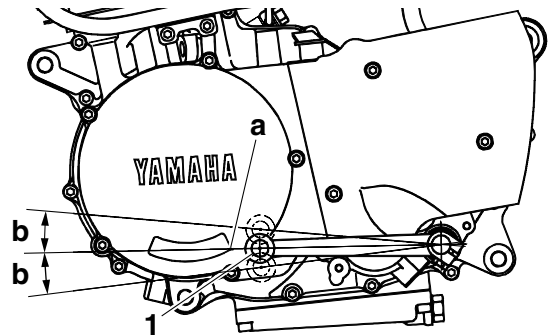
- Shift pedal "1"



Shift pedal bolt
10 Nm (1.0 m·kgf, 7.2 ft·lbf)

TIP

The angle "b" of the shift pedal end must fall within 6° with reference to the line passing through "a" shown in the illustration.



2. Tighten:

- Engine mount front bolt
- Engine mounting nut (front side)



Engine mount front bolt
35 Nm (3.5 m·kgf, 25 ft·lbf)
LOCTITE®
Engine mounting nut (front side)
64 Nm (6.4 m·kgf, 46 ft·lbf)

- Engine mounting nut (front lower side)
- Engine mounting nut (rear lower side)

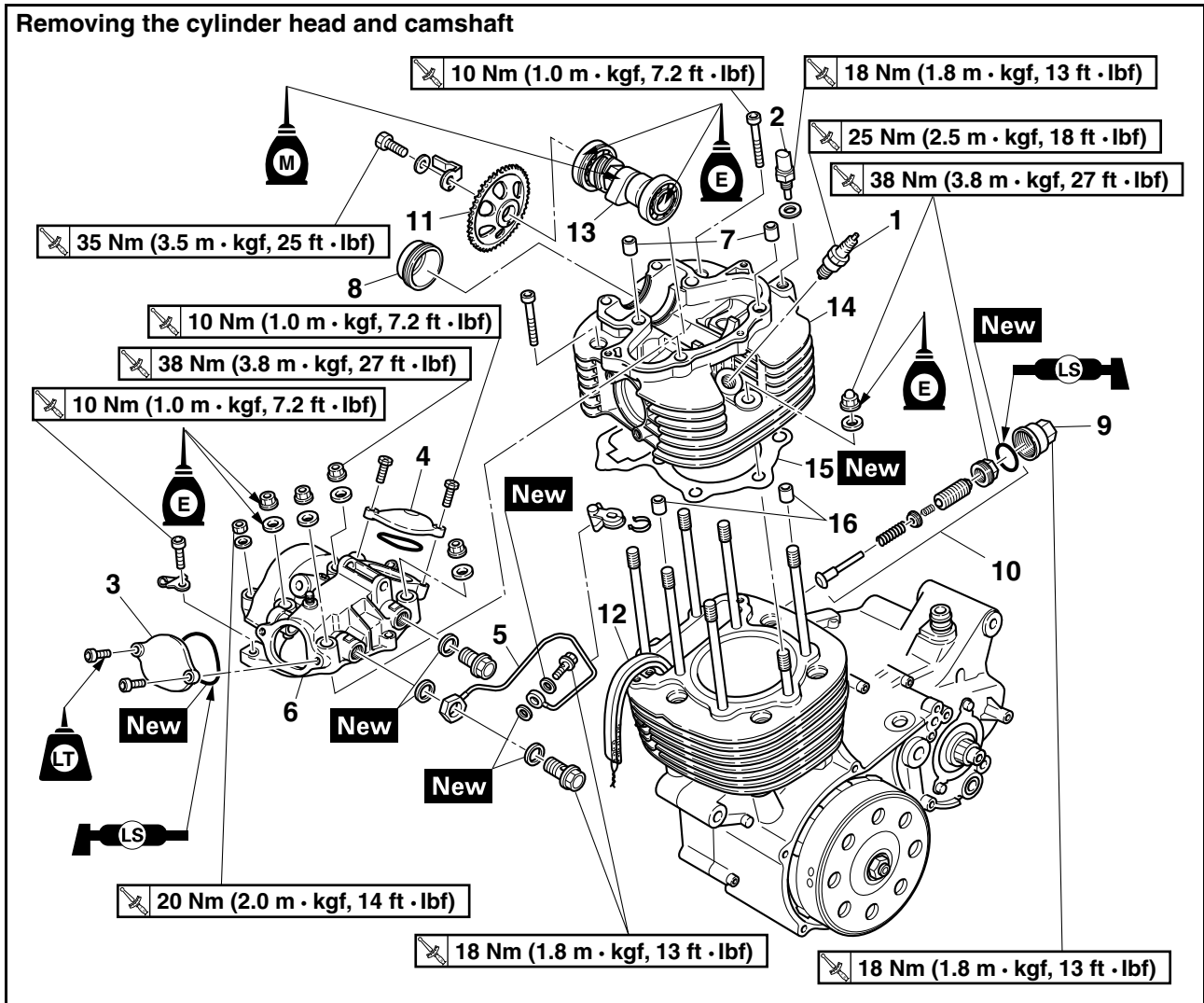


Engine mounting nut (front lower side)
60 Nm (6.0 m·kgf, 43 ft·lbf)
Engine mounting nut (rear lower side)
60 Nm (6.0 m·kgf, 43 ft·lbf)

EAS24100

CYLINDER HEAD

Removing the cylinder head and camshaft



Order	Job/Parts to remove	Q'ty	Remarks
	Engine		Refer to "ENGINE REMOVAL" on page 5-2.
1	Spark plug	1	
2	Engine temperature sensor	1	
3	Exhaust tappet cover	1	
4	Intake tappet cover	1	
5	Oil delivery pipe	1	
6	Cylinder head cover assembly	1	
7	Dowel pin	2	
8	Viewer plug	1	
9	Timing chain tensioner cap	1	
10	Timing chain tensioner assembly	1	
11	Camshaft sprocket	1	
12	Timing chain	1	
13	Camshaft	1	
14	Cylinder head assembly	1	
15	Gasket	1	
16	Dowel pin	2	

EAS24130

REMOVING THE CYLINDER HEAD

1. Remove:

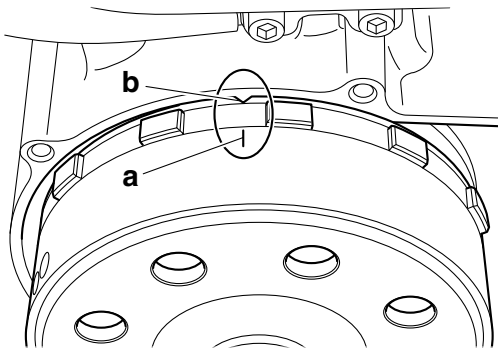
- Crankcase cover (left)
Refer to "GENERATOR" on page 5-46.

2. Align:

- "T" mark "a" on the AC magneto
(with the match mark "b" on the crankcase)

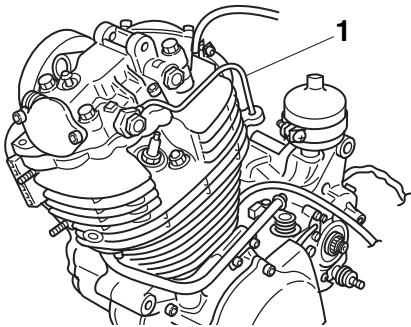


- Turn the AC magneto counterclockwise.
- When the piston is on the compression stroke, align the AC magneto "T" mark "a" with the mark "b" on the crankcase. (TDC)



3. Remove:

- Oil delivery pipe "1"

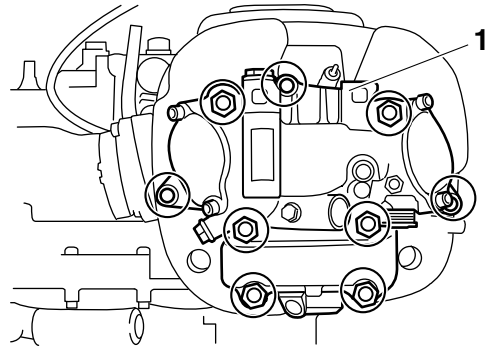


4. Remove:

- Cylinder head cover assembly "1"

TIP

- Loosen bolts and nuts in a crisscross pattern.
- Loosen each bolt and nut 1/2 of a turn at a time. After all of the bolts and nuts are fully loosened, remove them.



5. Loosen:

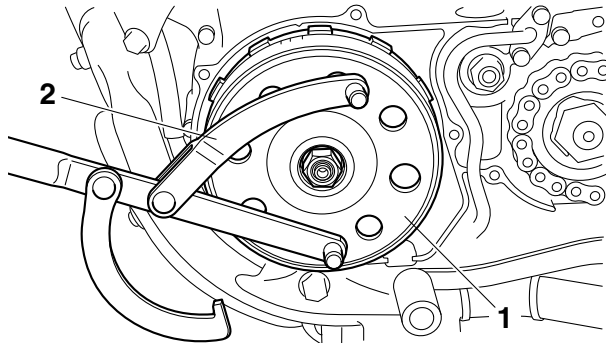
- Camshaft sprocket bolt

TIP

While holding the AC magneto "1" with the rotor holding tool "2", loosen the camshaft sprocket bolt.



Rotor holding tool
90890-01235
Universal magneto and rotor holder
YU-01235



6. Remove:

- Timing chain tensioner cap
- Timing chain tensioner assembly
- Camshaft sprocket bolt "1"
- Timing chain "2"
- Camshaft sprocket "3"
- Camshaft "4"

TIP

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



Camshaft lobe dimensions

Lobe height (Intake)

38.860–38.960 mm
(1.5299–1.5339 in)

Limit

38.850 mm (1.5295 in)

Base circle diameter (Intake)

32.170–32.270 mm
(1.2665–1.2705 in)

Limit

32.160 mm (1.2661 in)

Lobe height (Exhaust)

38.890–38.990 mm
(1.5311–1.5350 in)

Limit

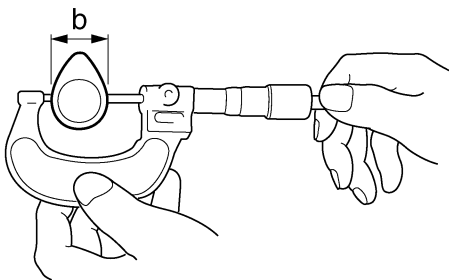
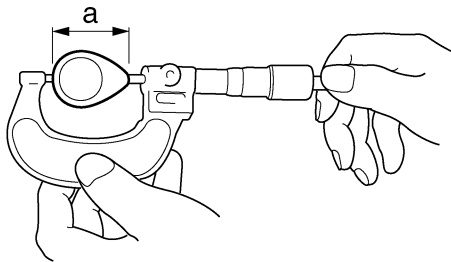
38.880 mm (1.5307 in)

Base circle diameter (Exhaust)

32.210–32.310 mm
(1.2681–1.2720 in)

Limit

32.200 mm (1.2677 in)



3. Check:

- Rocker arm and rocker arm shaft oil passage
Obstruction → Blow out with compressed air.

EAS23870

CHECKING THE TIMING CHAIN AND CAMSHAFT SPROCKET

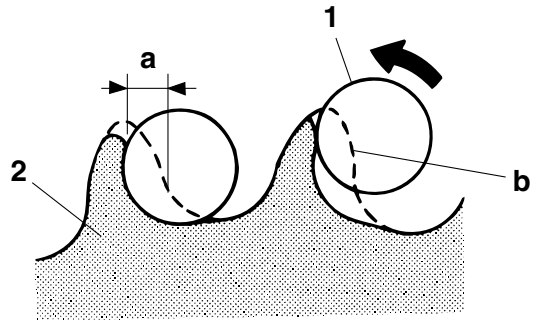
1. Check:

- Timing chain
Damage/stiffness → Replace the timing chain, camshaft sprocket, and crankshaft sprocket as a set.

2. Check:

- Camshaft sprocket
- Crankshaft sprocket

More than 1/4 tooth wear “a” → Replace the camshaft sprocket, crankshaft sprocket, and timing chain as a set.



- a. 1/4 tooth
b. Correct

1. Timing chain roller

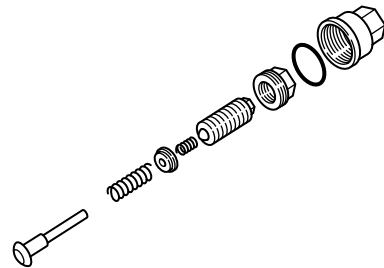
2. Camshaft sprocket or crankshaft sprocket

EAS24200

CHECKING THE TIMING CHAIN TENSIONER

1. Check:

- Timing chain tensioner
Cracks/damage/rough movement → Replace.



EAS24230

INSTALLING THE CYLINDER HEAD

1. Install:

- Cylinder head gasket **New**
- Dowel pin

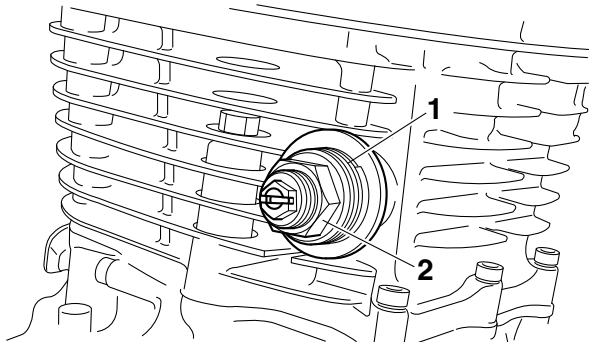
2. Install:

- Cylinder head “1”

CYLINDER HEAD

- Timing chain tensioner locknut "2"

	Timing chain tensioner locknut 38 Nm (3.8 m·kgf, 27 ft·lbf)
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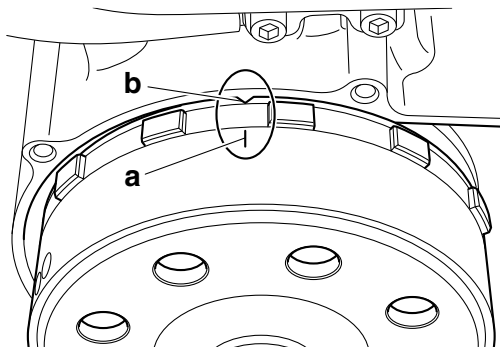


9. Turn:

- Crankshaft
(several turns counterclockwise)


10. Check:

- "T" mark "a"
- Align the AC magneto "T" mark with the mark "b" on the crankcase.
Not aligned → Reinstall the camshaft sprocket.
Refer to the installation steps above.



11. Tighten:

- Camshaft sprocket bolt

	Camshaft sprocket bolt 35 Nm (3.5 m·kgf, 25 ft·lbf)
---	--

ECA13750

NOTICE

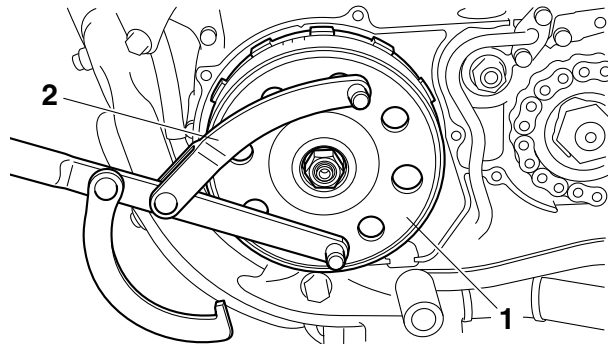
Be sure to tighten the camshaft sprocket bolts to the specified torque to avoid the possibility of the bolts coming loose and damaging the engine.

TIP

While holding the AC magneto "1" with the rotor holding tool "2", tighten the camshaft sprocket bolt.



Rotor holding tool
90890-01235
Universal magneto and rotor holder
YU-01235



12. Install:

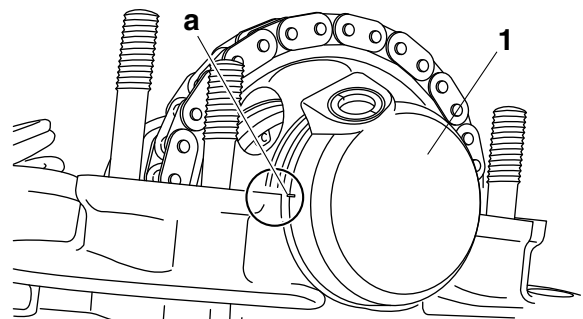
- Crankcase cover (left)
Refer to "GENERATOR" on page 5-46.

13. Install:

- Viewer plug "1"

TIP

Align the marked line "a" on the viewer plug with the end surface of the cylinder head rear section.



14. Loosen:

- Locknut (rocker arm)
- Adjuster (rocker arm)
Refer to "ROCKER ARMS" on page 5-13.

15. Clean the mating surfaces between the cylinder head cover assembly and the cylinder head.

16. Apply:

- Sealant
(mating surfaces between the cylinder head cover assembly and the cylinder head)

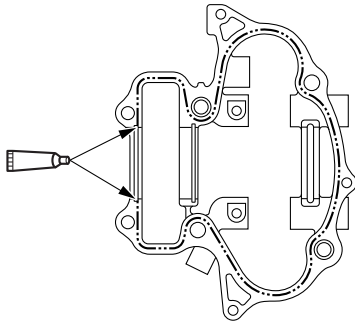


Yamaha bond No. 1215
90890-85505
(Three bond No.1215®)

CYLINDER HEAD

TIP

Do not allow any sealant to come into contact with the oil gallery.



17. Install:

- Cylinder head cover assembly



**Cylinder head cover nut (10 mm:
“1”-“4”)**

38 Nm (3.8 m·kgf, 27 ft·lbf)

**Cylinder head cover nut (8 mm:
“5”, “6”)**

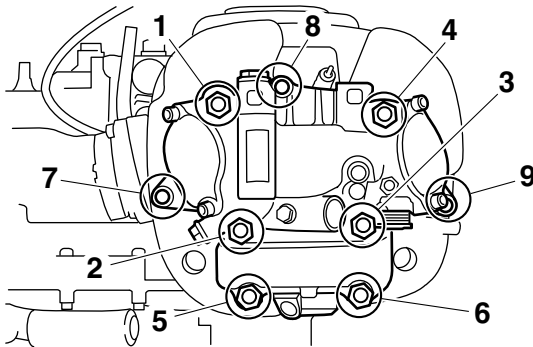
20 Nm (2.0 m·kgf, 14 ft·lbf)

**Cylinder head cover bolt (6 mm:
“7”-“9”)**

10 Nm (1.0 m·kgf, 7.2 ft·lbf)

TIP

Tighten the bolts and nuts in a crisscross pattern in two to three stages.



18. Measure:

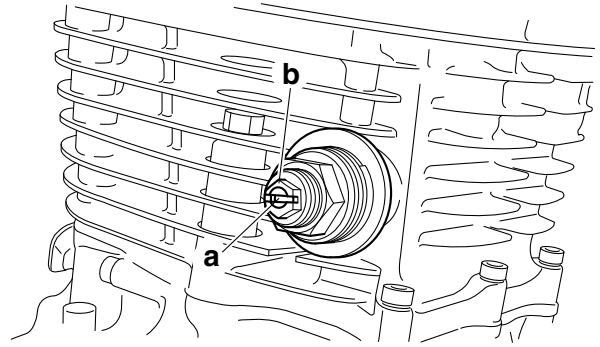
- Valve clearance
Out of specification → Adjust.
Refer to “ADJUSTING THE VALVE CLEAR-
ANCE” on page 3-5.

19. Adjust:

- Cam chain tensioner

TIP

Screw until the end surface of the screw “a” becomes flush with the end surface of the rod “b” and tighten the locknut before installing the timing chain tensioner cap.



20. Install:

- Timing chain tensioner cap

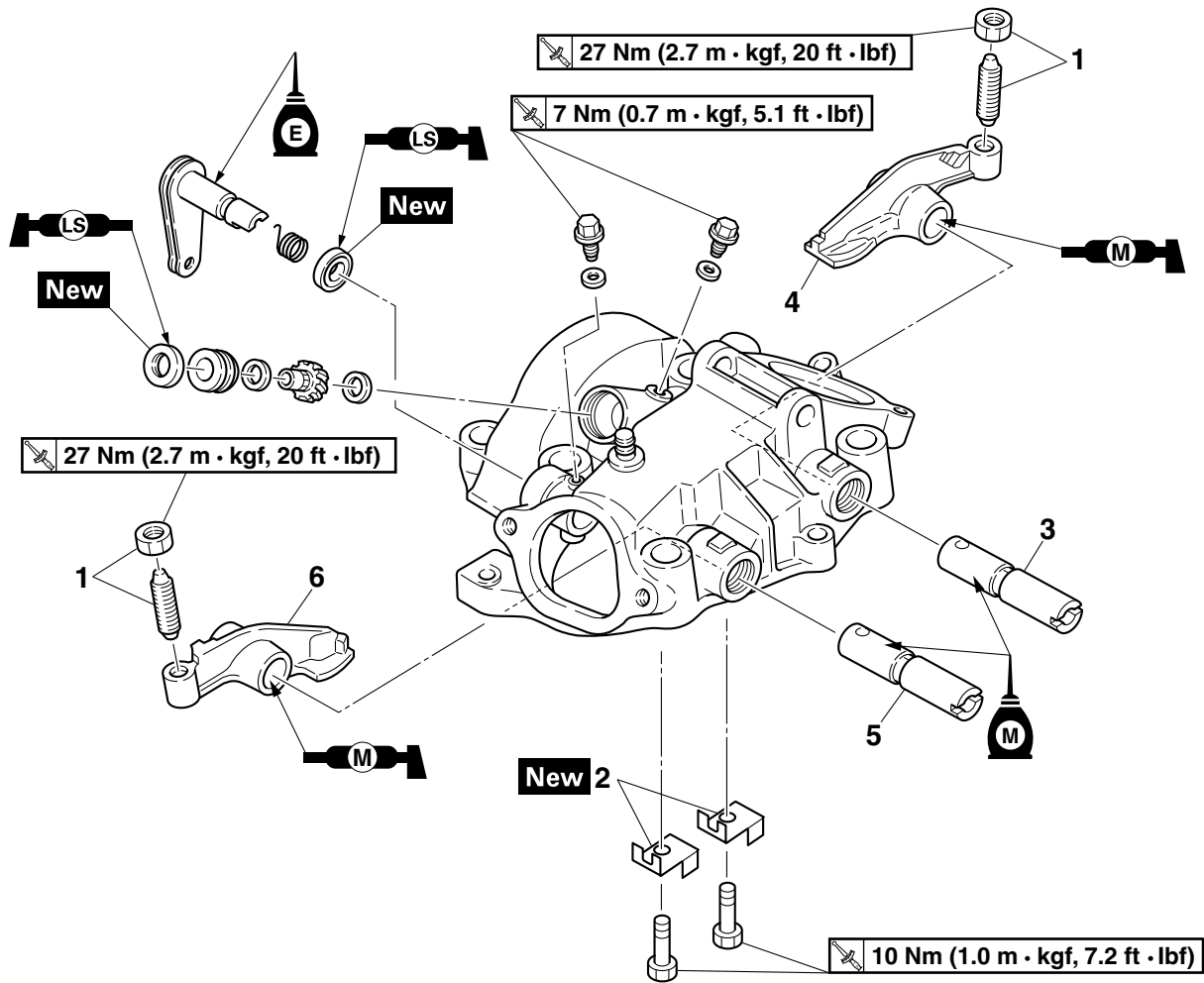


**Timing chain tensioner cap
18 Nm (1.8 m·kgf, 13 ft·lbf)**

EAS2RD1012

ROCKER ARMS

Removing the rocker arms and rocker arm shaft



Order	Job/Parts to remove	Q'ty	Remarks
	Engine		Refer to "ENGINE REMOVAL" on page 5-2.
	Cylinder head		Refer to "CYLINDER HEAD" on page 5-6.
1	Locknut/adjuster	2/2	
2	Lock washer	2	
3	Rocker arm shaft (intake)	1	
4	Rocker arm (intake)	1	
5	Rocker arm shaft (exhaust)	1	
6	Rocker arm (exhaust)	1	

ROCKER ARMS

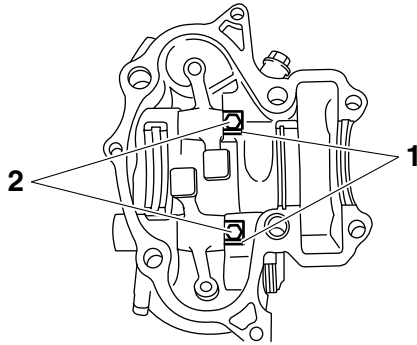
EAS2RD1040

REMOVING THE ROCKER ARMS AND ROCKER ARM SHAFTS

1. Remove:
 - Lock washer "1"

TIP

Straighten the lock washer tab and remove the bolt "2".



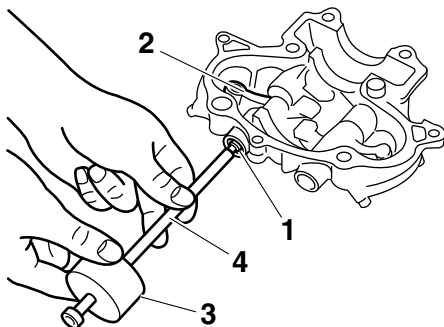
2. Remove:
 - Intake rocker arm shaft "1"
 - Intake rocker arm "2"
 - Exhaust rocker arm shaft
 - Exhaust rocker arm

TIP

Remove the rocker arm shafts with the weight "3" and slide hammer bolt "4".



Slide hammer bolt
90890-01083
Slide hammer bolt 6 mm
YU-01083-1
Weight
90890-01084
Weight
YU-01083-3



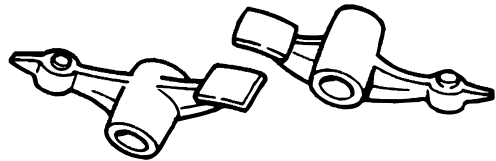
EAS23880

CHECKING THE ROCKER ARMS AND ROCKER ARM SHAFTS

The following procedure applies to all of the rocker arms and rocker arm shafts.

1. Check:
 - Rocker arm

Damage/wear → Replace.



2. Check:

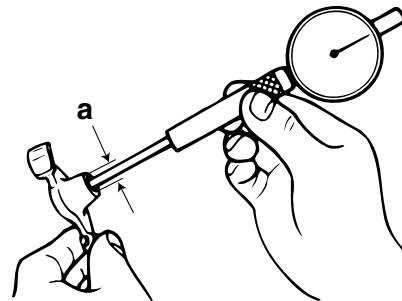
- Rocker arm shaft
Blue discoloration/excessive wear/pitting/scratches → Replace or check the lubrication system.

3. Measure:

- Rocker arm inside diameter "a"
Out of specification → Replace.



Rocker arm inside diameter
12.000–12.018 mm
(0.4724–0.4731 in)
Limit
12.033 mm (0.4737 in)



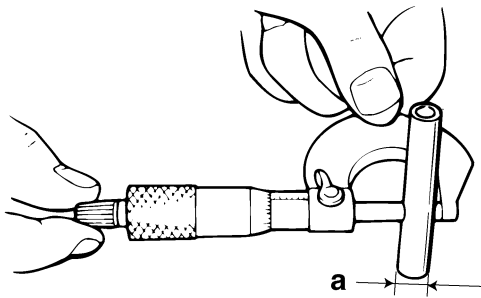
4. Measure:

- Rocker arm shaft outside diameter "a"
Out of specification → Replace.



Rocker arm shaft outside diameter
11.985–11.991 mm
(0.4718–0.4721 in)
Limit
11.954 mm (0.4706 in)

ROCKER ARMS



Slide hammer bolt
90890-01083
Slide hammer bolt 6 mm
YU-01083-1

5. Calculate:

- Rocker-arm-to-rocker-arm-shaft clearance

TIP

Calculate the clearance by subtracting the rocker arm shaft outside diameter from the rocker arm inside diameter.

Out of specification → Replace.



Rocker-arm-to-rocker-arm-shaft clearance
0.009–0.033 mm (0.0004–0.0013 in)

EAS2RD1013

CHECKING THE CYLINDER HEAD COVER, TAPPET COVER, AND VIEWER PLUG

1. Check:

- Cylinder head cover
 - Tappet cover
 - Viewer plug
- Damage → Replace.

EAS2RD1041

INSTALLING THE ROCKER ARM SHAFTS AND ROCKER ARMS

1. Lubricate:

- Rocker arm (cavity)



Recommended lubricant
Molybdenum disulfide grease

2. Lubricate:

- Rocker arm shaft



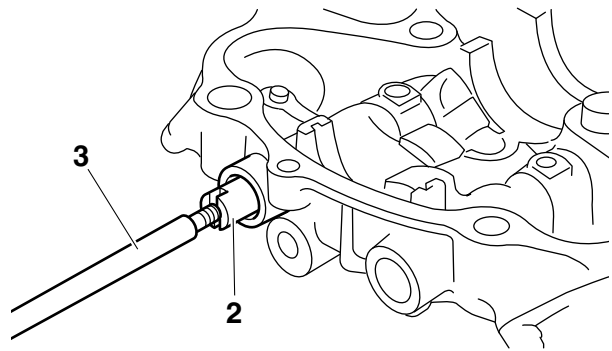
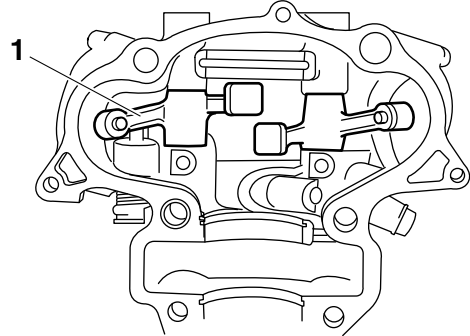
Recommended lubricant
Molybdenum disulfide oil

3. Install:

- Rocker arm “1”
- Rocker arm shaft “2”

TIP

Install the rocker arm shafts with the slide hammer bolt “3”.



TIP

Make sure that a recess in the rocker arm shaft is aligned with the tightening bolt hole in the cylinder head.

4. Install:

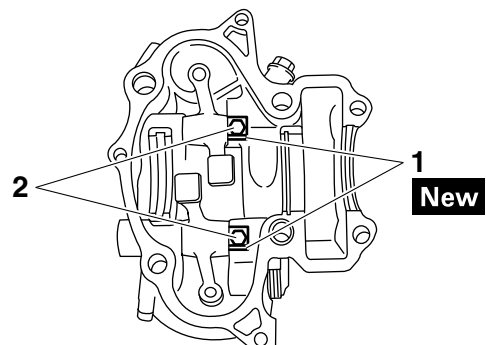
- Lock washer “1” **New**
- Lock washer bolt “2”



Lock washer bolt
10 Nm (1.0 m·kgf, 7.2 ft·lbf)

TIP

Bend the lock washer tab along a flat side of the bolt.

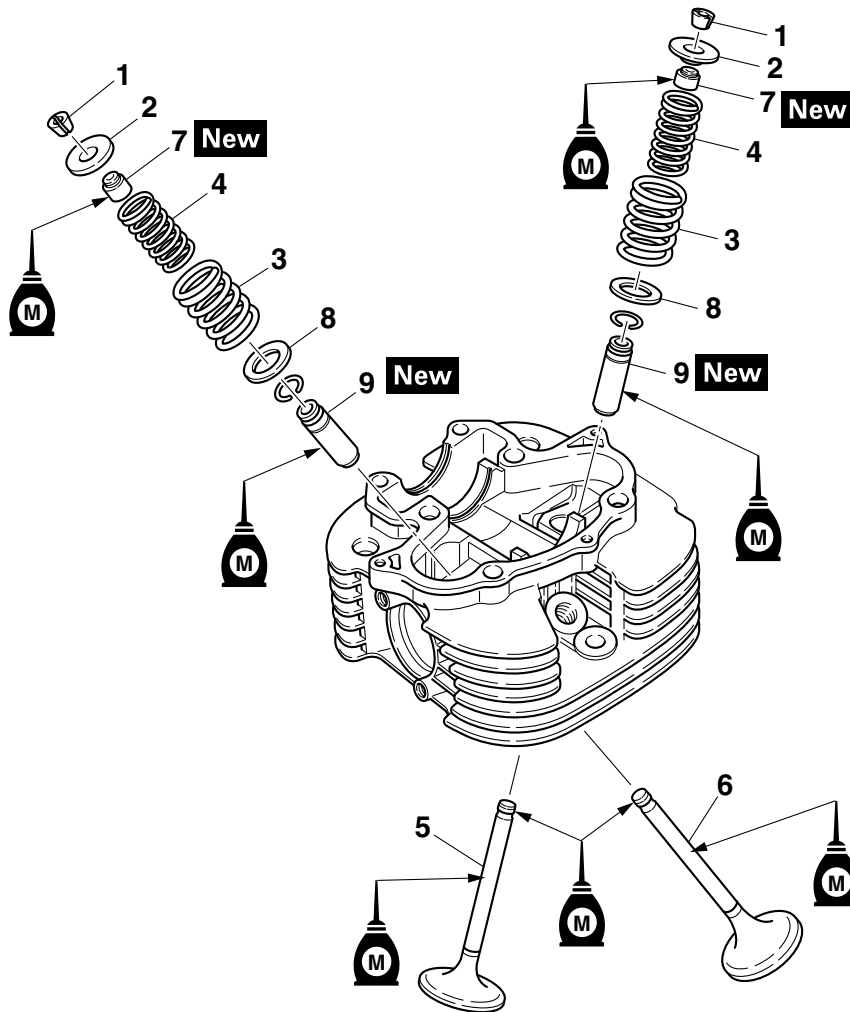


VALVES AND VALVE SPRINGS

EAS24270

VALVES AND VALVE SPRINGS

Removing the valves and valve springs



Order	Job/Parts to remove	Q'ty	Remarks
	Engine		Refer to "ENGINE REMOVAL" on page 5-2.
	Cylinder head, camshaft		Refer to "CYLINDER HEAD" on page 5-6.
1	Valve cotter	4	
2	Valve spring retainer	2	
3	Valve spring (outer)	2	
4	Valve spring (inner)	2	
5	Intake valve	1	
6	Exhaust valve	1	
7	Valve stem seal	2	
8	Valve spring seat	2	
9	Valve guide	2	

VALVES AND VALVE SPRINGS

EAS24280

REMOVING THE VALVES

The following procedure applies to all of the valves and related components.

TIP

Before removing the internal parts of the cylinder head (e.g., valves, valve springs, valve seats), make sure the valves properly seal.

1. Check:

- Valve sealing

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

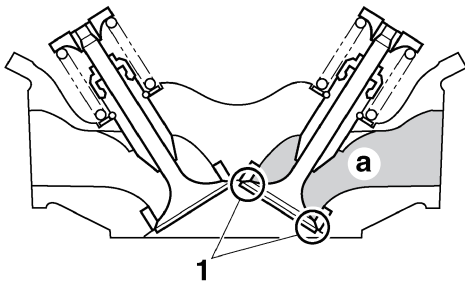
Refer to “CHECKING THE VALVE SEATS” on page 5-19.

a. Pour a clean solvent “a” into the intake and exhaust ports.

b. Check that the valves properly seal.

TIP

There should be no leakage at the valve seat “1”.

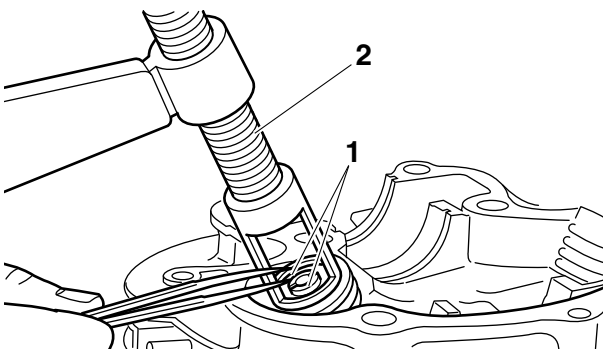


2. Remove:

- Valve cotter “1”

TIP

Remove the valve cottes by compressing the valve spring with the valve spring compressor “2”.

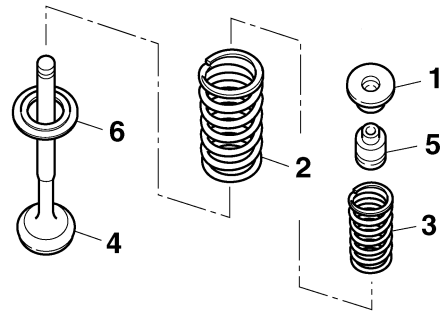


3. Remove:

- Valve spring retainer “1”
- Outer valve spring “2”
- Inner valve spring “3”
- Valve “4”
- Valve stem seal “5”
- Valve spring seat “6”

TIP

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



EAS24290

CHECKING THE VALVES AND VALVE GUIDES

The following procedure applies to all of the valves and valve guides.

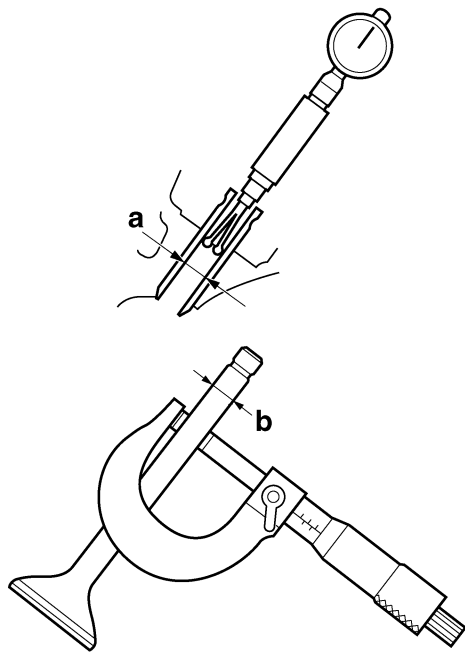
1. Measure:

- Valve-stem-to-valve-guide clearance
Out of specification → Replace the valve guide.

$$\text{Valve-stem-to-valve-guide clearance} = \text{Valve guide inside diameter "a"} - \text{Valve stem diameter "b"}$$

	Valve-stem-to-valve-guide clearance (intake)
	0.020–0.044 mm (0.0008–0.0017 in)
	Limit
	0.080 mm (0.0032 in)
	Valve-stem-to-valve-guide clearance (exhaust)
	0.035–0.059 mm (0.0014–0.0023 in)
	Limit
	0.100 mm (0.0039 in)

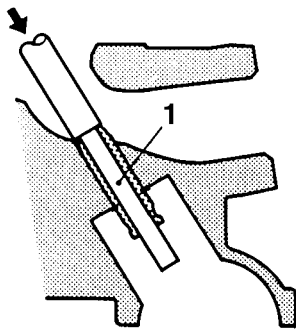
VALVES AND VALVE SPRINGS



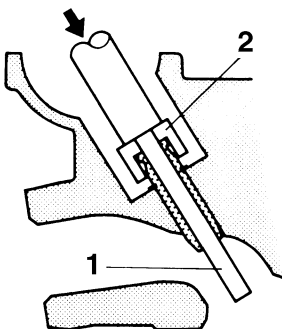
2. Replace:
- Valve guide

TIP
To ease valve guide removal and installation, and to maintain the correct fit, heat the cylinder head to 100 °C (212 °F) in an oven.

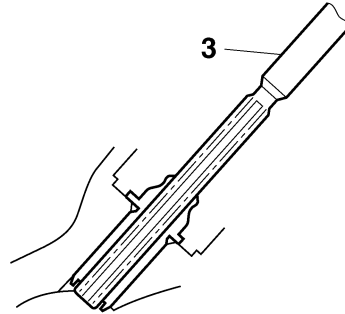
- a. Remove the valve guide with the valve guide remover "1".



- b. Install the new valve guides with the valve guide installer "2" and valve guide remover "1".



- c. After installing the valve guide, bore the valve guide with the valve guide reamer "3" to obtain the proper valve-stem-to-valve-guide clearance.



TIP
After replacing the valve guide, reface the valve seat.

	<p>Valve guide remover & installer set (ø8.0) 90890-04014 Valve guide remover (8.0 mm) YM-01200 Valve guide reamer (8.0 mm) YM-01211</p>
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3. Eliminate:
- Carbon deposits (from the valve face and valve seat)
4. Check:
- Valve stem end
Mushroom shape or diameter larger than the body of the valve stem → Replace the valve.
5. Measure:
- Valve stem runout
Out of specification → Replace the valve.

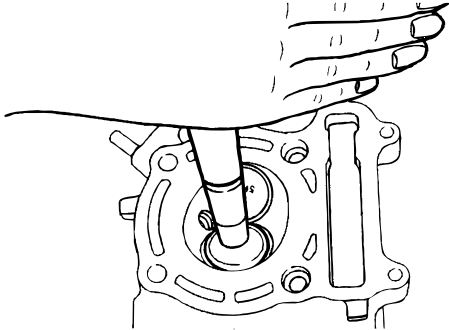
TIP
• When installing a new valve, always replace the valve guide.
• If the valve is removed or replaced, always replace the oil seal.

	<p>Valve stem runout 0.030 mm (0.0012 in)</p>
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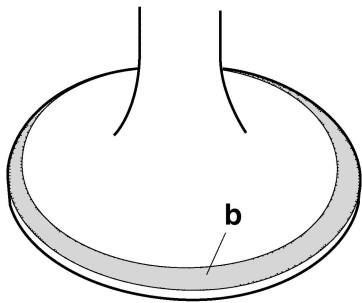
VALVES AND VALVE SPRINGS

TIP

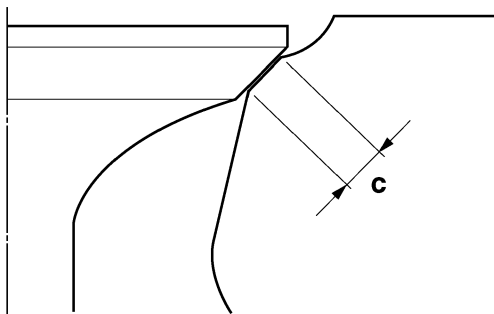
For the best lapping results, lightly tap the valve seat while rotating the valve back and forth between your hands.



- e. Apply a fine lapping compound to the valve face and repeat the above steps.
- f. After every lapping procedure, be sure to clean off all of the lapping compound from the valve face and valve seat.
- g. Apply blue layout fluid “b” to the valve faces.



- h. Install the valve into the cylinder head.
- i. Press the valve through the valve guide and onto the valve seat to make a clear impression.
- j. Measure the valve seat width “c” again. If the valve seat width is out of specification, reface and lap the valve seat.



EAS24310

CHECKING THE VALVE SPRINGS

The following procedure applies to all of the

valve springs.

1. Measure:

- Valve spring free length “a”
Out of specification → Replace the valve spring.



Inner spring

Free length (intake)
45.30 mm (1.78 in)

Limit
43.00 mm (1.69 in)

Free length (exhaust)
45.30 mm (1.78 in)

Limit
43.00 mm (1.69 in)

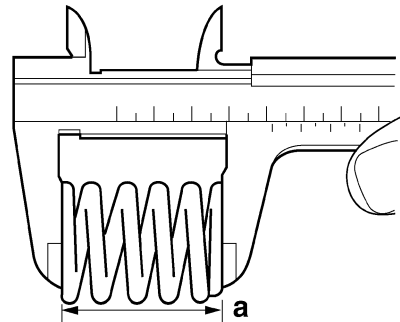
Outer spring

Free length (intake)
44.60 mm (1.76 in)

Limit
42.00 mm (1.65 in)

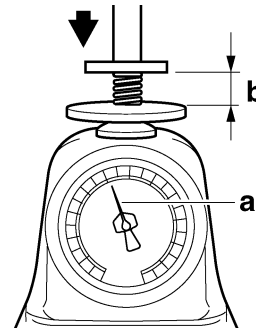
Free length (exhaust)
44.60 mm (1.76 in)

Limit
42.00 mm (1.65 in)



2. Measure:

- Compressed valve spring force “a”
Out of specification → Replace the valve spring.



a. Compressed valve spring force

b. Installed length

VALVES AND VALVE SPRINGS



Inner spring

Installed compression spring force (intake)
119.64 N (12.20 kgf, 26.90 lbf)
Installed compression spring force (exhaust)
119.64 N (12.20 kgf, 26.90 lbf)
Installed length (intake)
38.00 mm (1.50 in)
Installed length (exhaust)
38.00 mm (1.50 in)

Outer spring

Installed compression spring force (intake)
160.83 N (16.40 kgf, 36.15 lbf)
Installed compression spring force (exhaust)
160.83 N (16.40 kgf, 36.15 lbf)
Installed length (intake)
40.00 mm (1.57 in)
Installed length (exhaust)
40.00 mm (1.57 in)

3. Measure:

- Valve spring tilt "a"
Out of specification → Replace the valve spring.

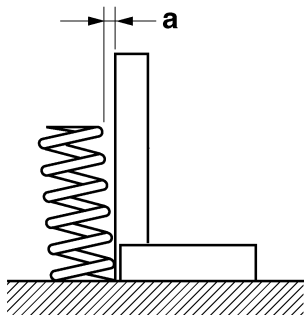


Inner spring

Spring tilt (intake)
1.9 mm (0.07 in)
Spring tilt (exhaust)
1.9 mm (0.07 in)

Outer spring

Spring tilt (intake)
1.9 mm (0.07 in)
Spring tilt (exhaust)
1.9 mm (0.07 in)



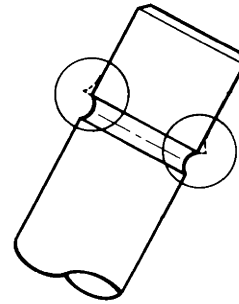
EAS24340

INSTALLING THE VALVES

The following procedure applies to all of the valves and related components.

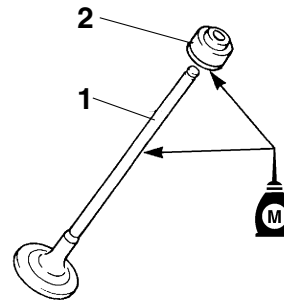
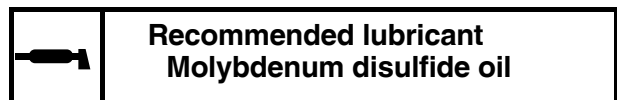
1. Deburr:

- Valve stem end
(with an oil stone)



2. Lubricate:

- Valve stem "1"
- Valve stem seal "2"
(with the recommended lubricant)



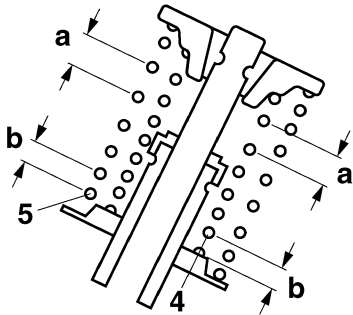
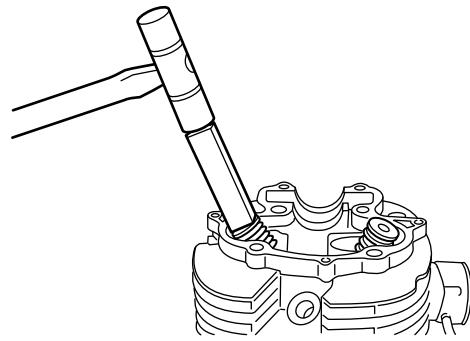
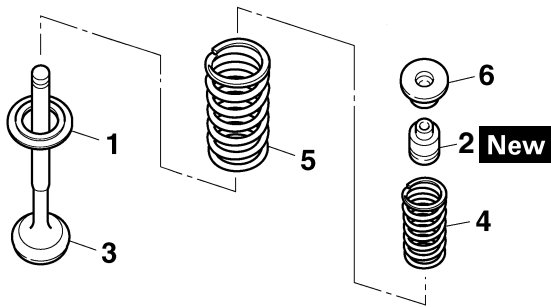
3. Install:

- Valve spring seat "1"
- Valve stem seal "2" **New**
- Valve "3"
- Inner valve spring "4"
- Outer valve spring "5"
- Valve spring retainer "6"
(into the cylinder head)

TIP

- Make sure each valve is installed in its original place. Refer to the following embossed marks.
Intake valve: "2J2"
Exhaust valve: "5A8"
- Install the valve springs with the larger pitch "a" facing up.

VALVES AND VALVE SPRINGS



- a. Larger pitch
- b. Smaller pitch

4. Install:

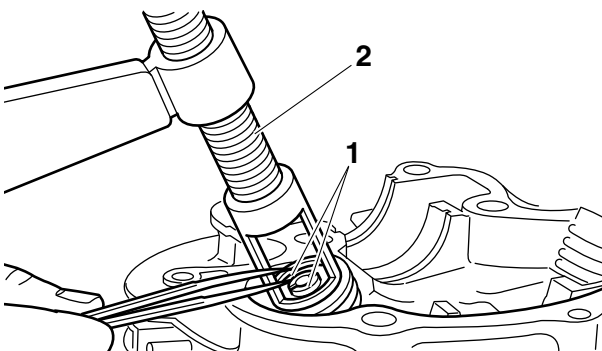
- Valve cotter "1"

TIP

Install the valve coppers by compressing the valve spring with the valve spring compressor "2".



Valve spring compressor
90890-01253



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

ECA13800

NOTICE

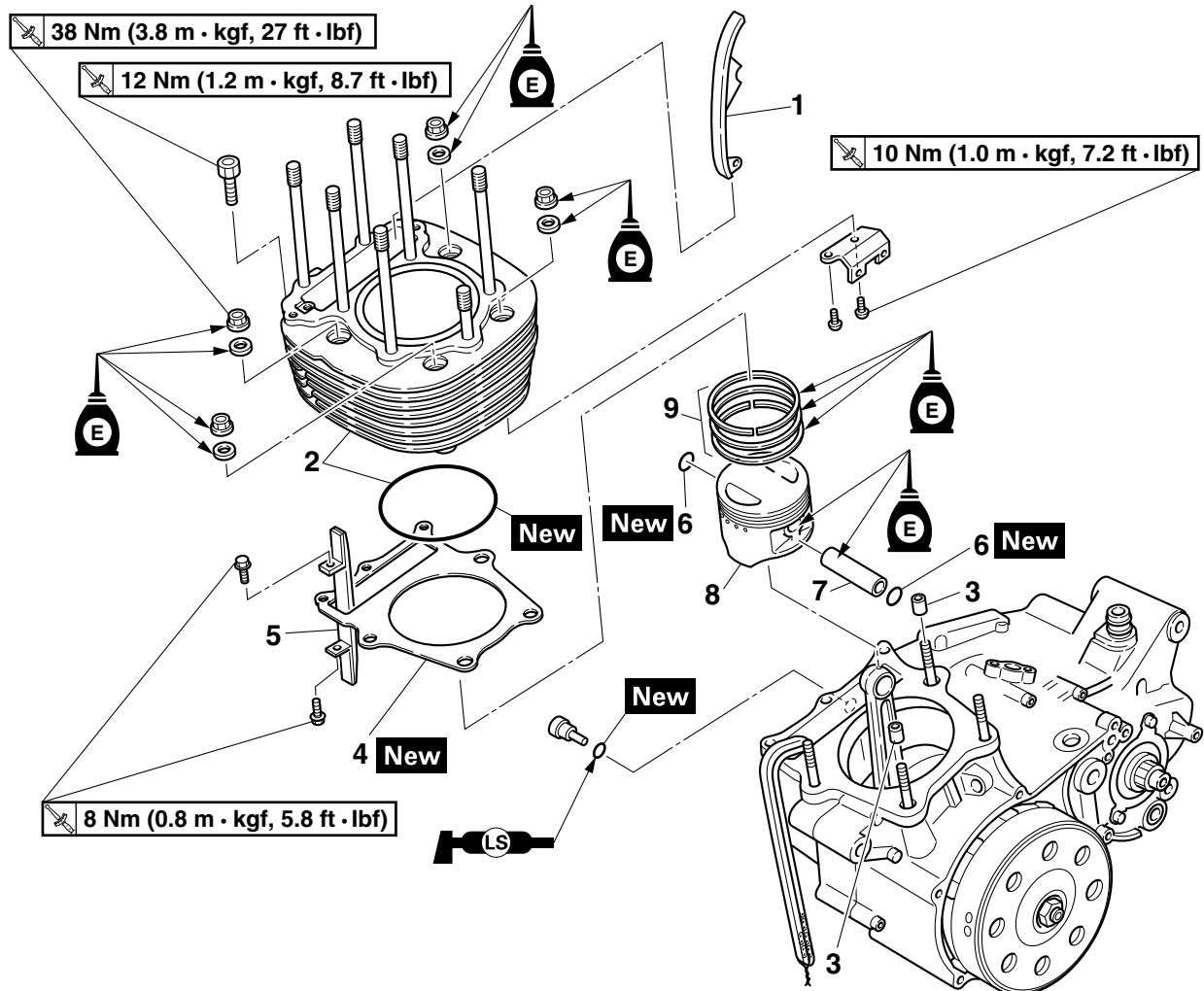
Hitting the valve tip with excessive force could damage the valve.

CYLINDER AND PISTON

EAS24350

CYLINDER AND PISTON

Removing the cylinder and piston



Order	Job/Parts to remove	Q'ty	Remarks
	Engine		Refer to "ENGINE REMOVAL" on page 5-2.
	Cylinder head		Refer to "CYLINDER HEAD" on page 5-6.
1	Timing chain guide (intake side)	1	
2	Cylinder/O-ring	1/1	
3	Dowel pin	2	
4	Cylinder gasket	1	
5	Timing chain guide (exhaust side)	1	
6	Piston pin clip	2	
7	Piston pin	1	
8	Piston	1	
9	Piston ring set	1	

CYLINDER AND PISTON

EAS24380

REMOVING THE PISTON

1. Remove:

- Piston pin clip "1"
- Piston pin "2"
- Piston "3"

ECA13810

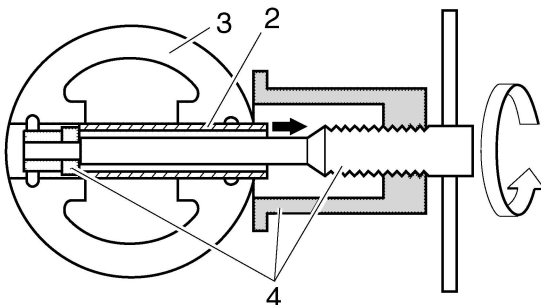
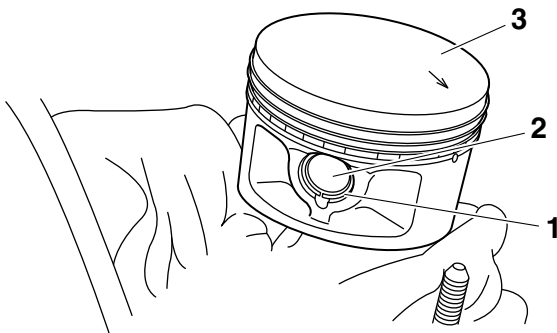
NOTICE

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

TIP

- 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.
- 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 set "4".

	<p>Piston pin puller set 90890-01304 Piston pin puller YU-01304</p>
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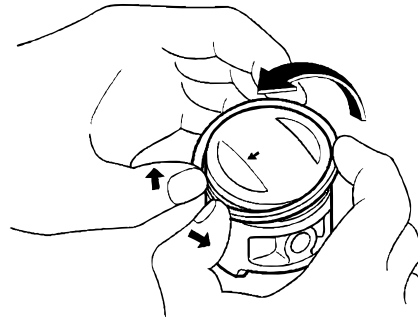
2. Remove:

- Top ring
- 2nd ring
- Oil ring

TIP

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

over the piston crown.



I1221502

EAS24390

CHECKING THE CYLINDER AND PISTON

1. Check:

- Piston wall
- Cylinder wall

Vertical scratches → Rebore or replace the cylinder, and replace the piston and piston rings as a set.

2. Measure:


- Piston-to-cylinder clearance



a. Measure the cylinder bore "C" with the cylinder bore gauge.

TIP

Measure the cylinder bore "C" by taking side-to-side and front-to-back measurements of the cylinder. Then, find the average of the measurements.

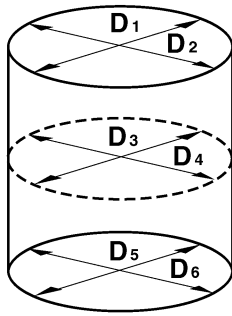
	<p>Bore 87.000–87.015 mm (3.4252–3.4258 in) Taper limit 0.050 mm (0.0020 in) Out of round limit 0.010 mm (0.0004 in)</p>
---	---

"C" = maximum of D_1 – D_6

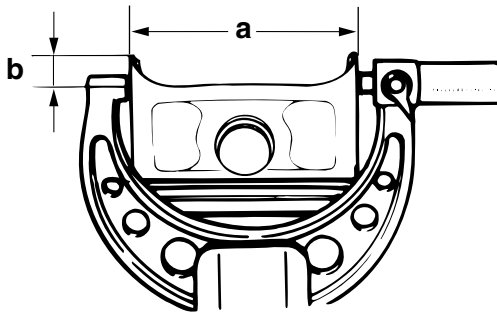
Taper limit = maximum of D_1 or D_2 - maximum of D_5 or D_6

Out of round limit = maximum of D_1 , D_3 or D_5 - minimum of D_2 , D_4 or D_6


CYLINDER AND PISTON



- b. If out of specification, rebores or replace the cylinder, and replace the piston and piston rings as a set.
- c. Measure piston skirt diameter "D" "a" with a micrometer.




- a. Piston skirt diameter "D"
- b. 7.2 mm (0.28 in) from the bottom edge of the piston

	<p>Diameter 86.948–86.963 mm (3.4231–3.4237 in)</p>
---	--

- d. If out of specification, replace the piston and piston rings as a set.
- e. Calculate the piston-to-cylinder clearance with the following formula.

<ul style="list-style-type: none"> • Piston-to-cylinder clearance = Cylinder bore "C" - Piston skirt diameter "D"
--

	<p>Piston-to-cylinder clearance 0.049–0.055 mm (0.0019–0.0022 in)</p>
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- f. If out of specification, replace the cylinder, and replace the piston and piston rings as a set.




EAS24430

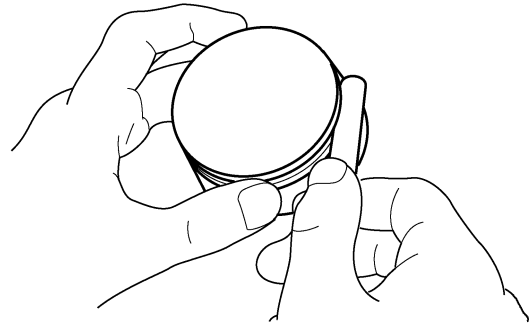
CHECKING THE PISTON RINGS

1. Measure:
 - Piston ring side clearance
 Out of specification → Replace the piston and piston rings as a set.

TIP

Before measuring the piston ring side clearance, eliminate any carbon deposits from the piston ring grooves and piston rings.

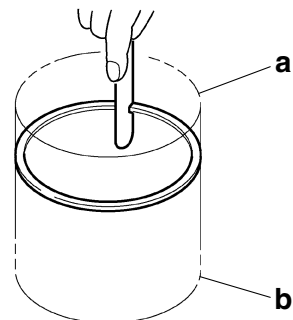
	<p>Top ring Ring side clearance 0.030–0.080 mm (0.0012–0.0032 in) Limit 0.150 mm (0.0059 in)</p> <p>2nd ring Ring side clearance 0.030–0.070 mm (0.0012–0.0028 in) Limit 0.150 mm (0.0059 in)</p>
---	---



2. Install:
 - Piston ring
 (into the cylinder)

TIP

Use the piston crown to level the piston ring near bottom of cylinder "a", where cylinder wear is lowest.



- b. Upper of cylinder


CYLINDER AND PISTON

3. Measure:

- Piston ring end gap
Out of specification → Replace the piston ring.

TIP

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 gaps
	Top ring
	End gap (installed)
	0.30–0.50 mm (0.0118–0.0197 in)
	Limit
	0.80 mm (0.0315 in)
	2nd ring
	End gap (installed)
	0.30–0.50 mm (0.0118–0.0197 in)
Limit	
0.80 mm (0.0315 in)	
Oil ring	
End gap (installed)	
0.20–0.90 mm (0.0079–0.0354 in)	

EAS24440


CHECKING THE PISTON PIN

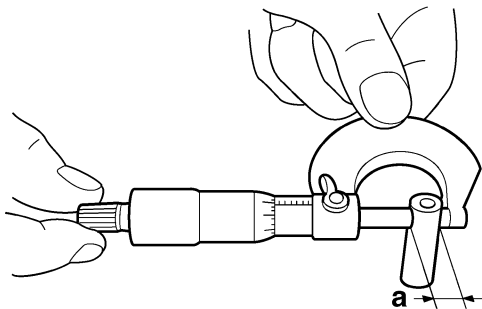
1. Check:

- Piston pin
Blue discoloration/grooves → Replace the piston pin and then check the lubrication system.

2. Measure:

- Piston pin outside diameter “a”
Out of specification → Replace the piston pin.

	Piston pin outside diameter
	19.995–20.000 mm
	(0.7872–0.7874 in)
	Limit
19.975 mm (0.7864 in)	

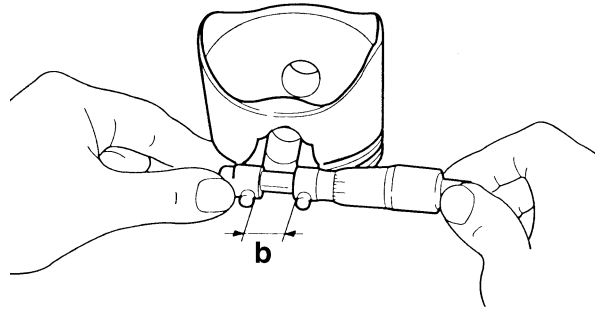


3. Measure:

- Piston pin bore inside diameter “b”
Out of specification → Replace the piston.



Piston pin bore inside diameter
20.004–20.015 mm
(0.7876–0.7880 in)
Limit
20.045 mm (0.7892 in)



4. Calculate:

- Piston-pin-to-piston-pin-bore clearance
Out of specification → Replace the piston pin and piston as a set.

• Piston-pin-to-piston-pin-bore clearance =
Piston pin bore inside diameter “b” -
Piston pin outside diameter “a”



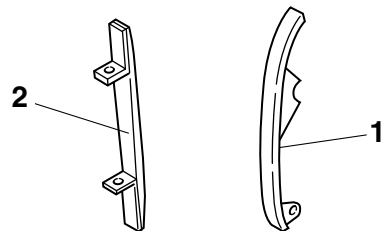
Piston-pin-to-piston-pin-bore clearance
0.004–0.020 mm (0.0002–0.0008 in)
Limit
0.070 mm (0.0028 in)

EAS23950

CHECKING THE TIMING CHAIN GUIDES

1. Check:

- Timing chain guide (intake side) “1”
- Timing chain guide (exhaust side) “2”
Damage/wear → Replace.



EAS24450

INSTALLING THE PISTON AND CYLINDER

1. Install:

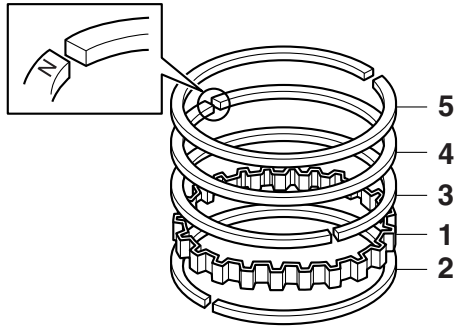
- Oil ring expander “1”
- Lower oil ring rail “2”
- Upper oil ring rail “3”

CYLINDER AND PISTON

- 2nd ring “4”
- Top ring “5”

TIP

Be sure to install the 2nd ring so that the manufacturer’s mark “N” faces up.

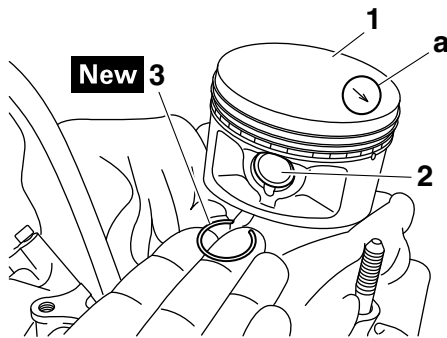


2. Install:

- Piston “1”
- Piston pin “2”
- Piston pin clip “3” **New**

TIP

- Apply engine oil the piston pin.
- Make sure that the arrow mark “a” on the piston points towards the exhaust side of the cylinder.
- Before installing the piston pin clip, cover the crankcase opening with a clean rag to prevent the clip from falling into the crankcase.



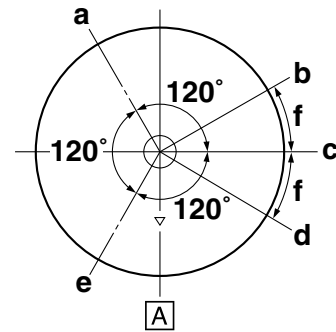
3. Lubricate:

- Piston
 - Piston ring
 - Cylinder
- (with the recommended lubricant)



4. Offset:

- Piston ring end gap



- a. Top ring
- b. Upper oil ring rail
- c. Oil ring expander
- d. Lower oil ring rail
- e. 2nd ring
- f. 20 mm (0.79 in)

A. Exhaust side

5. Install:

- Timing chain guide (exhaust side)



Timing chain guide bolt (exhaust side)
8 Nm (0.8 m·kgf, 5.8 ft·lbf)

6. Install:

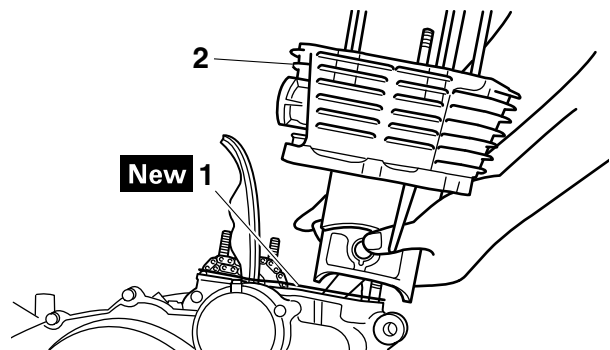
- O-ring **New**
- Cylinder gasket “1” **New**
- Dowel pin
- Cylinder “2”



Cylinder nut
38 Nm (3.8 m·kgf, 27 ft·lbf)
Cylinder bolt
12 Nm (1.2 m·kgf, 8.7 ft·lbf)

TIP

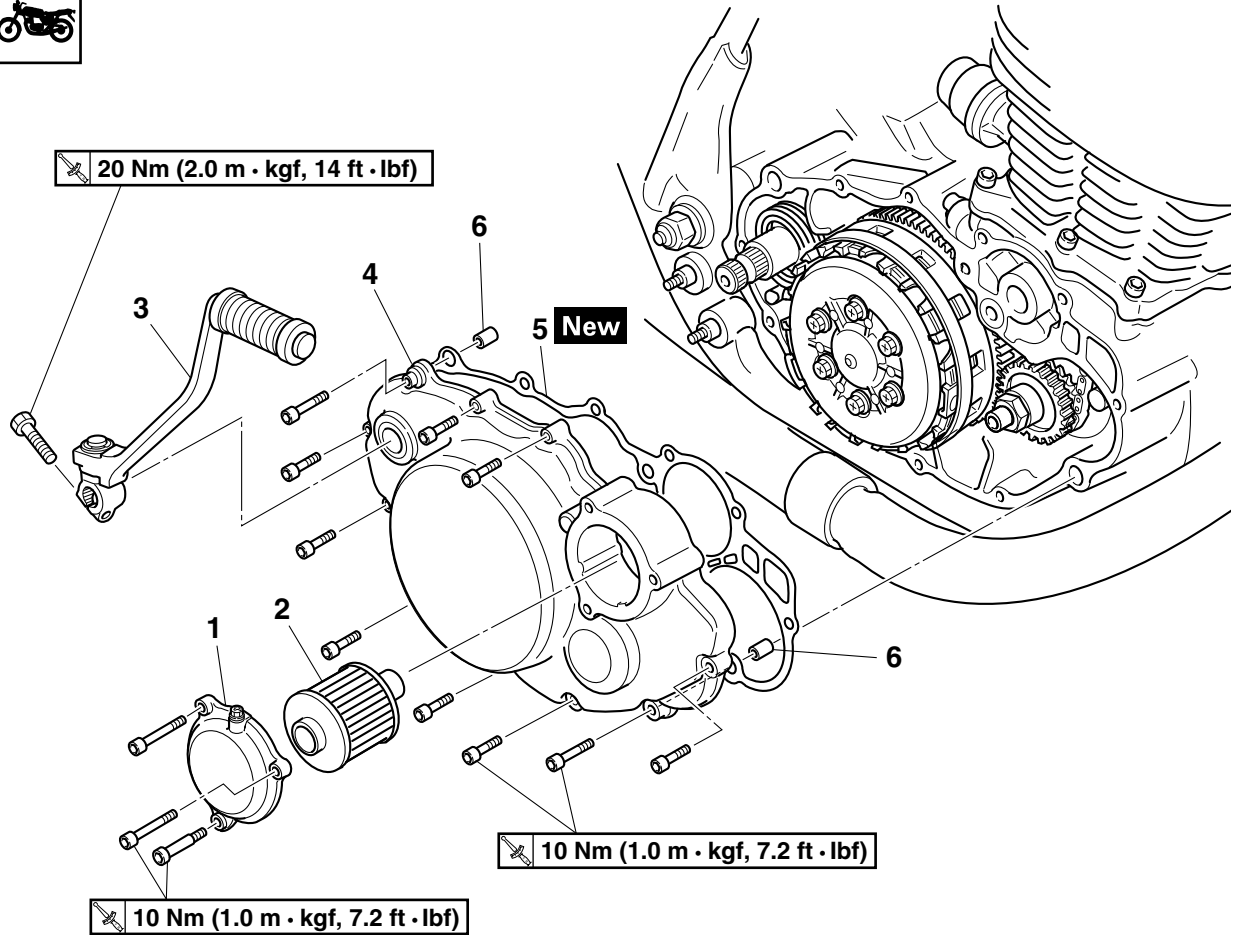
- While compressing the piston rings with one hand, install the cylinder with the other hand.
- Pass the timing chain and timing chain guide (intake side) through the timing chain cavity.



EAS25061

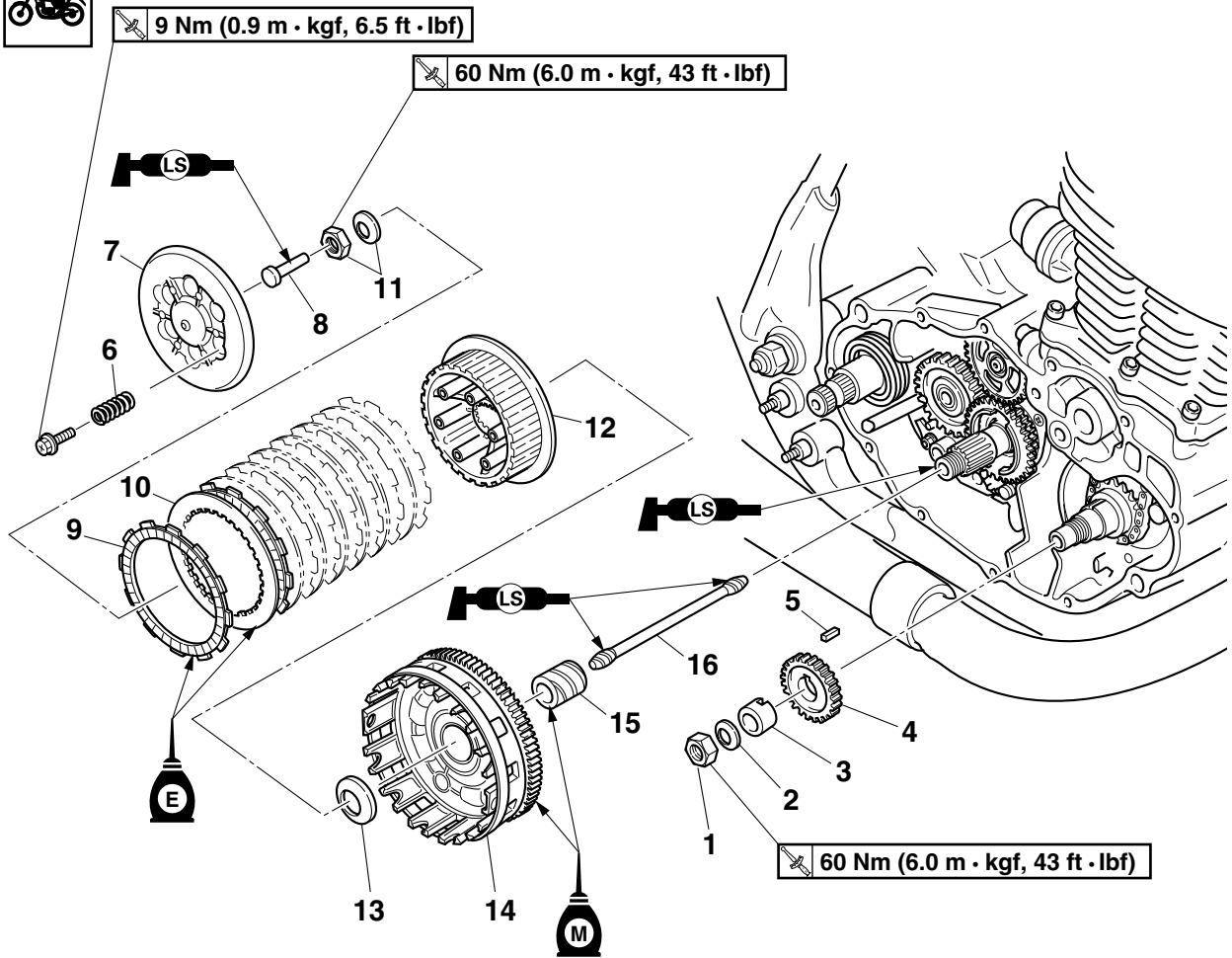
CLUTCH

Removing the kick crank and right crankcase cover



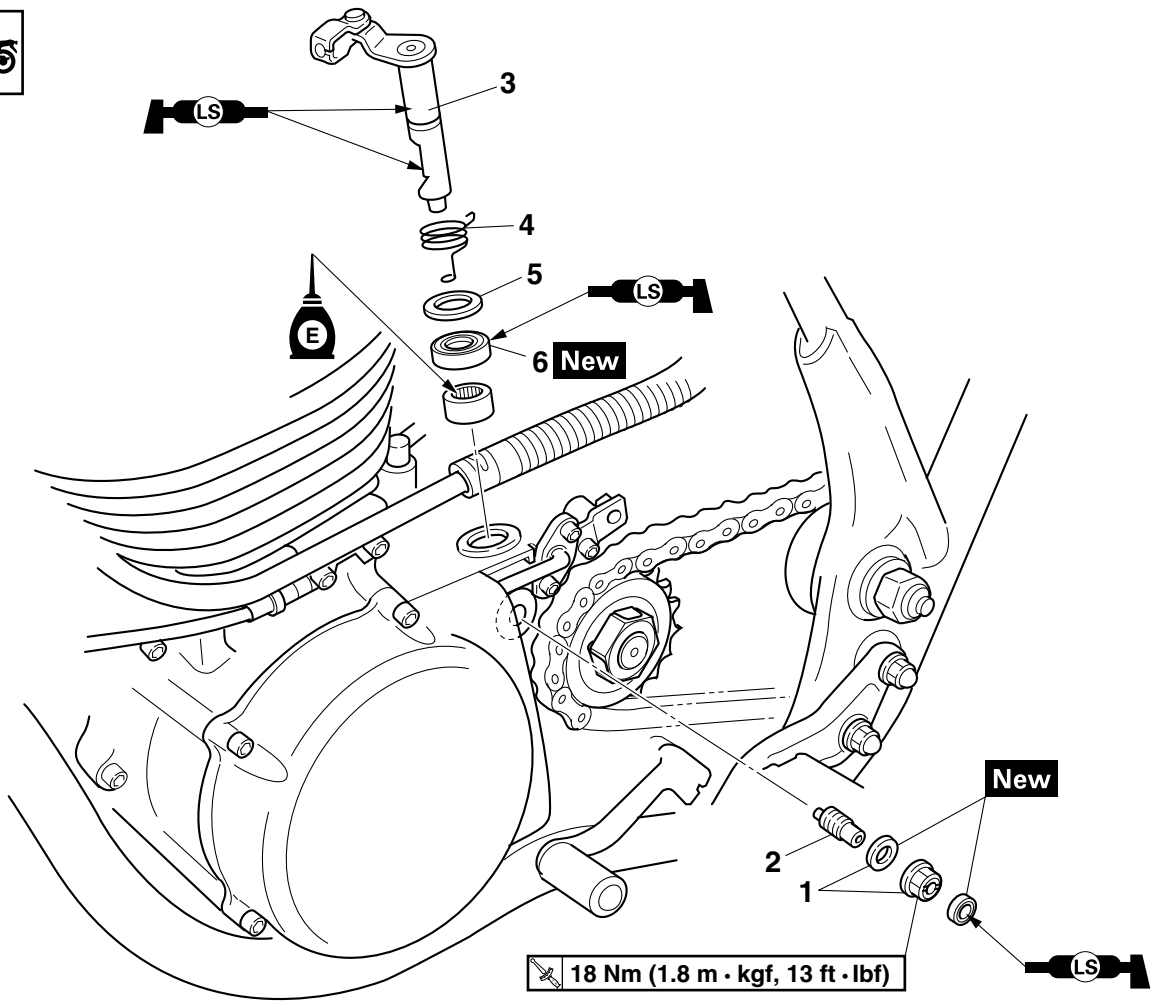
Order	Job/Parts to remove	Q'ty	Remarks
	Engine oil		Drain. Refer to "CHANGING THE ENGINE OIL" on page 3-22.
	Front right footrest		Refer to "ENGINE REMOVAL" on page 5-2.
1	Oil filter cover	1	
2	Oil filter element	1	
3	Kick crank	1	
4	Crankcase cover (right)	1	
5	Gasket	1	
6	Dowel pin	2	

Removing the clutch assembly



Order	Job/Parts to remove	Q'ty	Remarks
	Crankcase cover (right)		
1	Nut	1	
2	Conical washer	1	
3	Holder	1	
4	Primary drive gear	1	
5	Straight key	1	
6	Clutch spring	6	
7	Pressure plate	1	
8	Push rod 2	1	
9	Friction plate	8	
10	Clutch plate	7	
11	Nut/Belleville washer	1/1	
12	Clutch boss	1	
13	Washer	1	
14	Clutch housing	1	
15	Spacer	1	
16	Push rod 1	1	

Removing the push lever shaft



Order	Job/Parts to remove	Q'ty	Remarks
	Drive sprocket cover		
	Clutch cable		
	Clutch assembly		
1	Locknut/gasket	1/1	
2	Adjuster	1	
3	Push lever shaft	1	
4	Torsion spring	1	
5	Washer	1	
6	Oil seal	1	

EAS25070

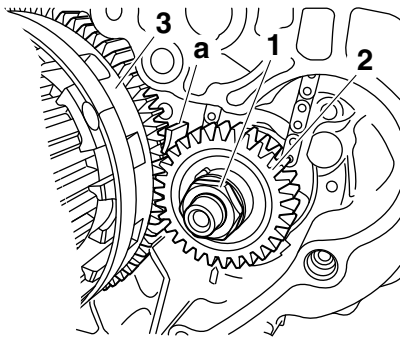
REMOVING THE CLUTCH

1. Loosen:

- Primary drive gear nut "1"

TIP

Insert aluminum plate "a" between the primary drive gear "2" and clutch housing "3", and loosen the primary drive gear nut.

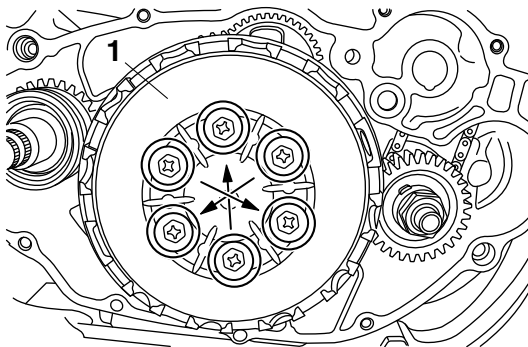


2. Remove:

- Pressure plate "1"

TIP

Remove the clutch spring by loosening the clutch spring bolt in a crisscross pattern.



3. Loosen:

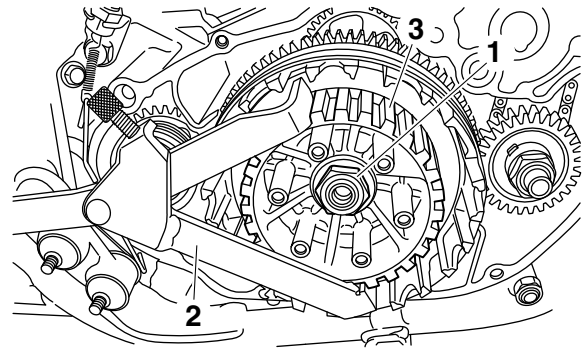
- Clutch boss nut "1"

TIP

While holding the clutch boss "3" with the universal clutch holder "2", loosen the clutch boss nut.



Universal clutch holder
90890-04086
Universal clutch holder
YM-91042



EAS25100

CHECKING THE FRICTION PLATES

The following procedure applies to all of the friction plates.

1. Check:

- Friction plate
 Damage/wear → Replace the friction plates as a set.

2. Measure:

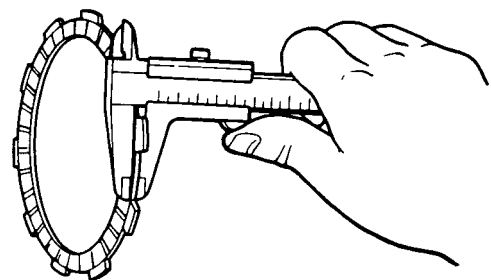
- Friction plate thickness
 Out of specification → Replace the friction plates as a set.

TIP

Measure the friction plate at four places.



Friction plate thickness
2.74–2.86 mm (0.108–0.113 in)
Wear limit
2.50 mm (0.098 in)



EAS25111

CHECKING THE CLUTCH PLATES


The following procedure applies to all of the clutch plates.

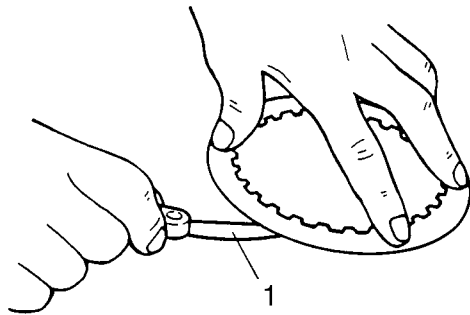
1. Check:

- Clutch plate
 Damage → Replace the clutch plates as a set.

2. Measure:

- Clutch plate warpage
 (with a surface plate and thickness gauge "1")
 Out of specification → Replace the clutch plates as a set.

 **Warpage limit**
0.05 mm (0.002 in)




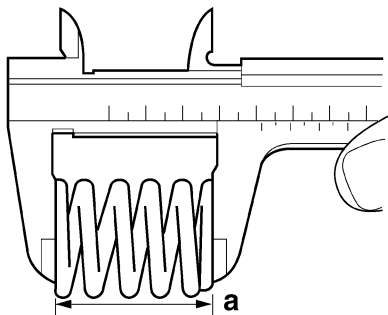
EAS25140

CHECKING THE CLUTCH SPRINGS

The following procedure applies to all of the clutch springs.

1. Check:
 - Clutch spring
Damage → Replace the clutch springs as a set.
2. Measure:
 - Clutch spring free length “a”
Out of specification → Replace the clutch springs as a set.

 **Clutch spring free length**
34.90 mm (1.37 in)
Limit
33.16 mm (1.31 in)

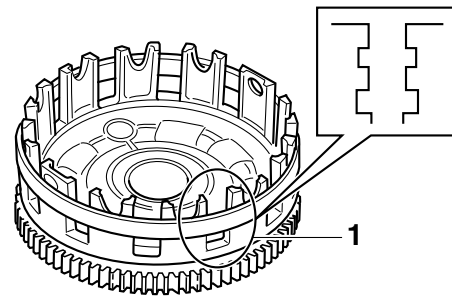


EAS25150

CHECKING THE CLUTCH HOUSING

1. Check:
 - Clutch housing dog “1”
Damage/pitting/wear → Deburr the clutch housing dogs or replace the clutch housing.

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

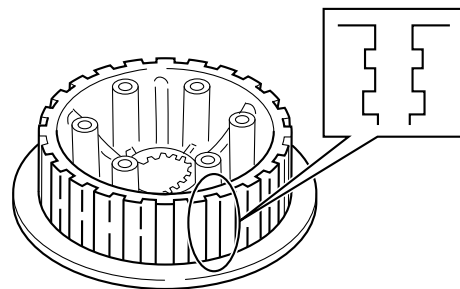


EAS25160

CHECKING THE CLUTCH BOSS

1. Check:
 - Clutch boss spline
Damage/pitting/wear → Replace the clutch boss.

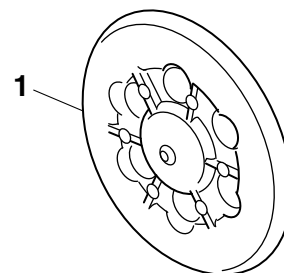
TIP _____
Pitting on the clutch boss splines will cause erratic clutch operation.



EAS25170

CHECKING THE PRESSURE PLATE

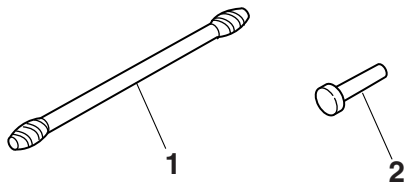
1. Check:
 - Pressure plate “1”
Cracks/damage → Replace.



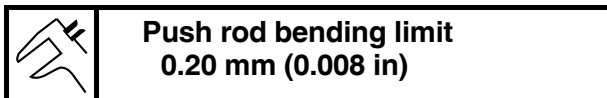
EAS25191

CHECKING THE CLUTCH PUSH RODS

1. Check:
 - Clutch push rod 1 “1”
 - Clutch push rod 2 “2”
Cracks/damage/wear → Replace the defective part(s).



2. Measure:
- Push rod 1 bending limit
Out of specification → Replace.



EAS25200

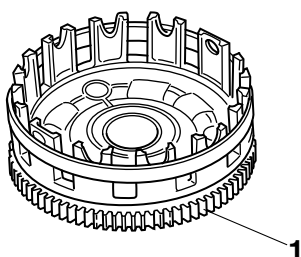
CHECKING THE PRIMARY DRIVE GEAR

1. Check:
 - Primary drive gear
Damage/wear → Replace the primary drive gear and primary driven gear (clutch housing) as a set.
Excessive noise during operation → Replace the primary drive gear and primary driven gear (clutch housing) as a set.
2. Check:
 - Primary-drive-gear-to-primary-driven-gear free play
Free play exists → Replace the primary drive gear and primary driven gear (clutch housing) as a set.

EAS25210

CHECKING THE PRIMARY DRIVEN GEAR

1. Check:
 - Primary driven gear “1”
Damage/wear → Replace the primary drive gear and primary driven gear (clutch housing) as a set.
Excessive noise during operation → Replace the primary drive gear and primary driven gear (clutch housing) as a set.



2. Check:
 - Primary-drive-gear-to-primary-driven-gear free play
Free play exists → Replace the primary drive gear and primary driven gear (clutch housing) as a set.

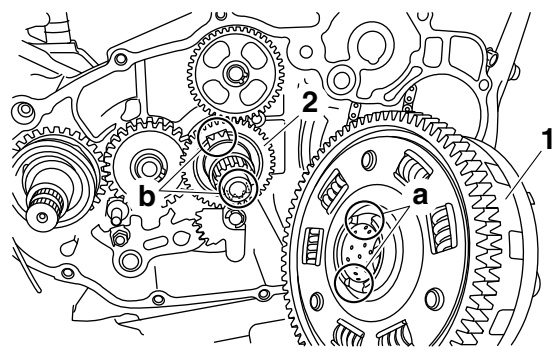
EAS25260

INSTALLING THE CLUTCH

1. Install:
 - Clutch housing “1”

TIP

Align the recess “a” in the clutch housing with the projection “b” on the kick pinion gear “2”.



2. Install:
 - Clutch boss
 - Washer
3. Tighten:
 - Clutch boss nut “1”



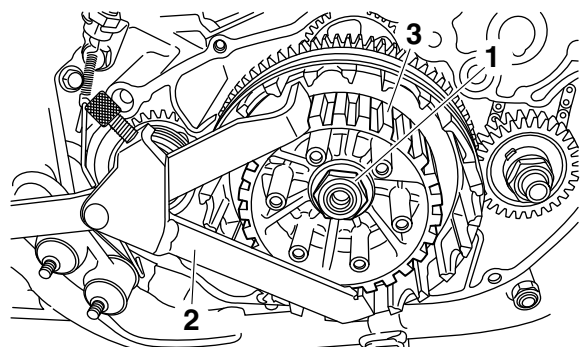
**Clutch boss nut
60 Nm (6.0 m-kgf, 43 ft-lbf)**

TIP

While holding the clutch boss “3” with the universal clutch holder “2”, tighten the clutch boss nut.



**Universal clutch holder
90890-04086
Universal clutch holder
YM-91042**



4. Lubricate:

- Friction plate
- Clutch plate
(with the recommended lubricant)

	Recommended lubricant Engine oil
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5. Install:


- Friction plate
- Clutch plate

TIP

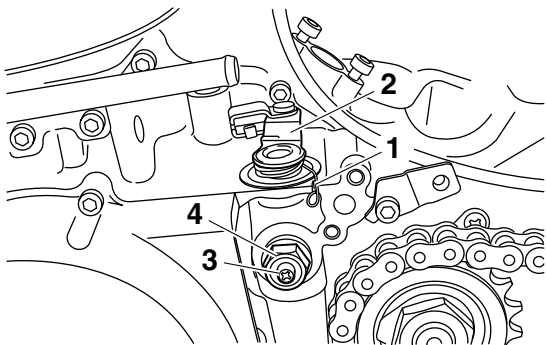
First, install a friction plate and then alternate between a clutch plate and a friction plate.

6. Install:

- Bearing
- Oil seal **New**
- Washer
- Torsion spring "1"
- Push lever shaft "2"
- Adjuster "3"
- Gasket **New**
- Locknut "4"

	Adjuster locknut 18 Nm (1.8 m-kgf, 13 ft-lbf)
---	--

- Clutch cable



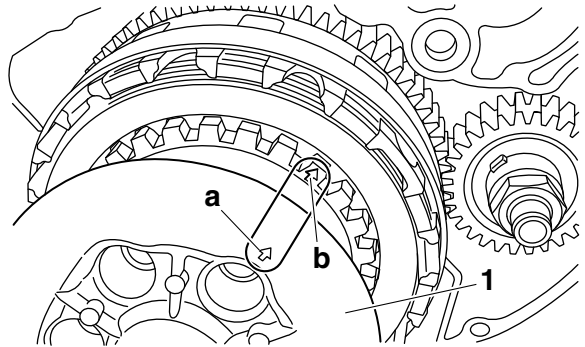
7. Install:

- Clutch push rod 2
- Pressure plate "1"
- Clutch spring
- Clutch spring bolt

	Clutch spring bolt 9 Nm (0.9 m-kgf, 6.5 ft-lbf)
---	--

TIP

- Align the match mark "a" in the pressure plate with the match mark "b" in the clutch boss before installation.
- Tighten the clutch spring bolts in stages and in a crisscross pattern.

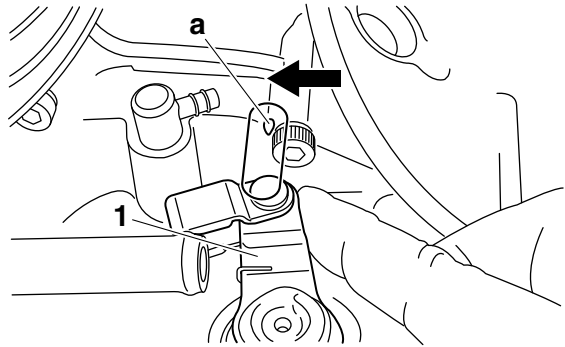


8. Check:

- Push lever position
The push lever "1" and the match mark "a" in the crankcase are not aligned with each other as shown in the illustration → Correct.

TIP

Push the push lever in the arrow direction and make sure the marks are aligned.



9. Adjust:

- Push lever position




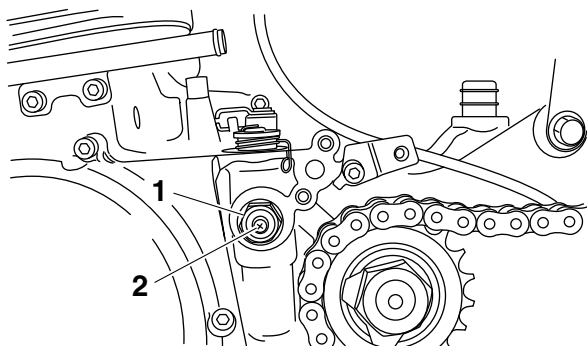
- Loosen the locknut "1".
- Turn the adjuster "2" in or out until the marks are aligned.
- Hold the adjuster to prevent it from moving and then tighten the locknut to specification.

ECA13820

NOTICE

Do not overtighten the locknut since this will remove the free play between both push rods.

	Adjuster locknut 18 Nm (1.8 m-kgf, 13 ft-lbf)
---	--




10.Adjust:

- Clutch lever free play
Refer to “ADJUSTING THE CLUTCH LEVER
FREE PLAY” on page 3-10.


11.Install:

- Drive sprocket cover

	Drive sprocket cover bolt 10 Nm (1.0 m·kgf, 7.2 ft·lbf)
---	--

12.Install:

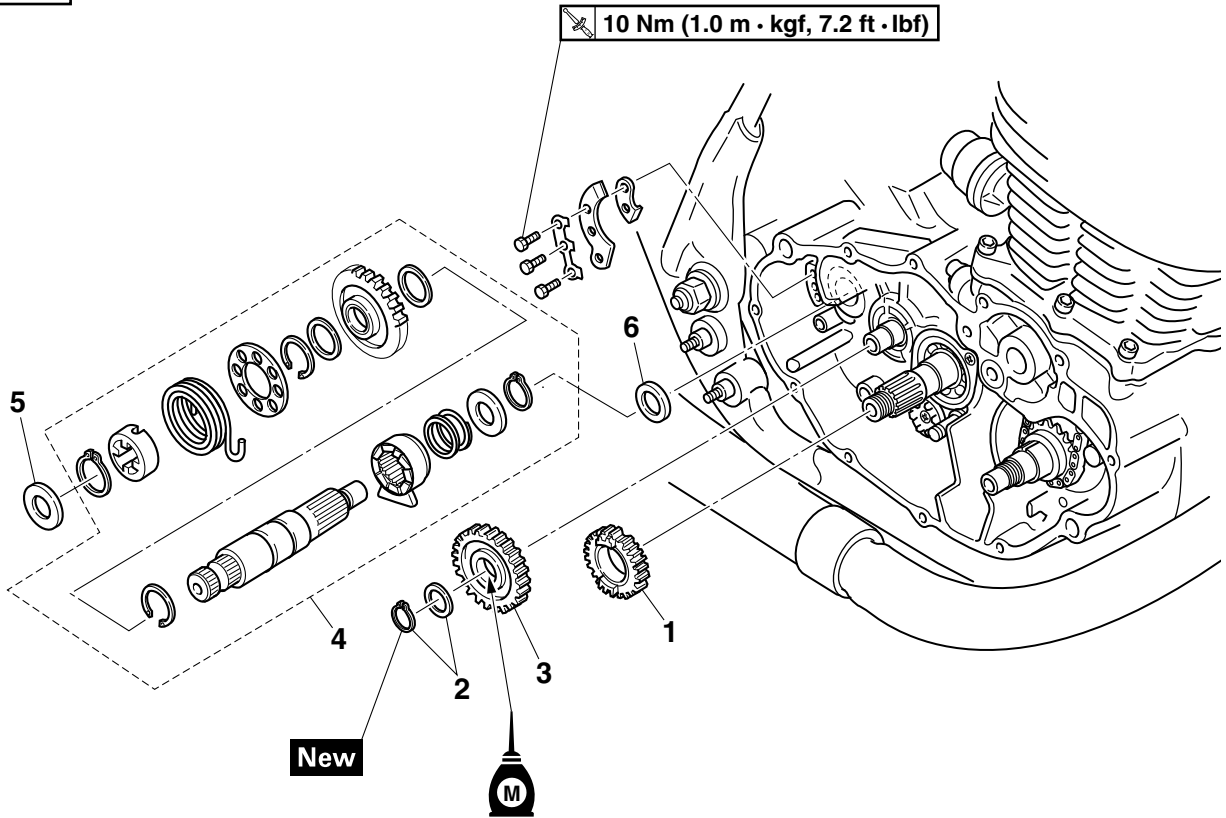
- Dowel pin
- Crankcase cover gasket **New**
- Crankcase cover (right)

	Crankcase cover (right) bolt 10 Nm (1.0 m·kgf, 7.2 ft·lbf)
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EAS24820

KICKSTARTER

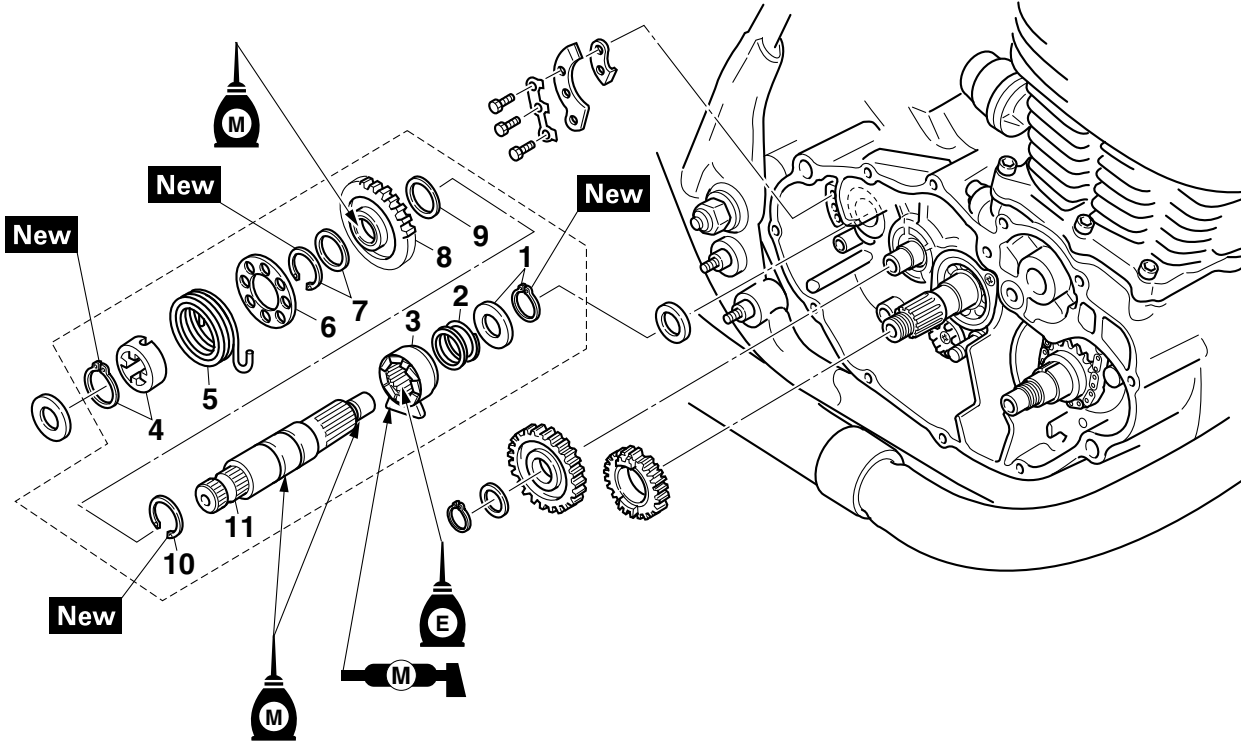
Removing the kickstarter



Order	Job/Parts to remove	Q'ty	Remarks
	Crankcase cover (right)		Refer to "CLUTCH" on page 5-28.
	Clutch		Refer to "CLUTCH" on page 5-28.
1	Kick pinion gear	1	
2	Circlip/washer	1/1	
3	Kick idle gear	1	
4	Kickstarter assembly	1	
5	Washer	1	
6	Washer	1	

KICKSTARTER

Disassembling the kickstarter



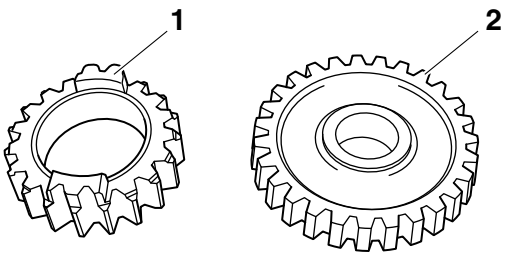
Order	Job/Parts to remove	Q'ty	Remarks
1	Circlip/spring cover	1/1	
2	Compression spring	1	
3	Ratchet wheel	1	
4	Circlip/spacer	1/1	
5	Torsion spring	1	
6	Spring cover	1	
7	Circlip/washer	1/1	
8	Kick gear	1	
9	Washer	1	
10	Circlip	1	
11	Kick axle assembly	1	

KICKSTARTER

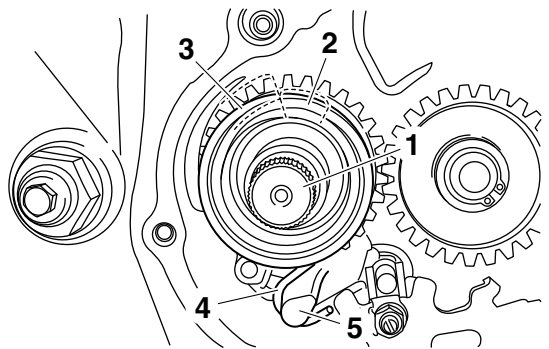
EAS24850

CHECKING THE KICKSTARTER

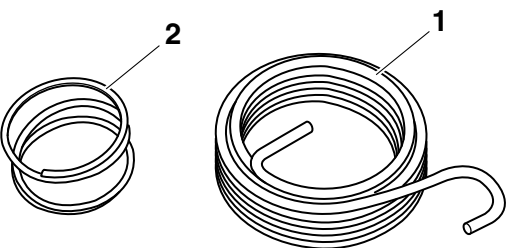
1. Check:
- Kick pinion gear "1"
 - Kick idle gear "2"
- Damage/wear → Replace.



TIP _____
Align the ratchet wheel "2" with the stopper "3" and put the torsion spring "4" on the kick spring stopper "5".



2. Check:
- Torsion spring "1"
 - Compression spring "2"
- Damage/wear → Replace.

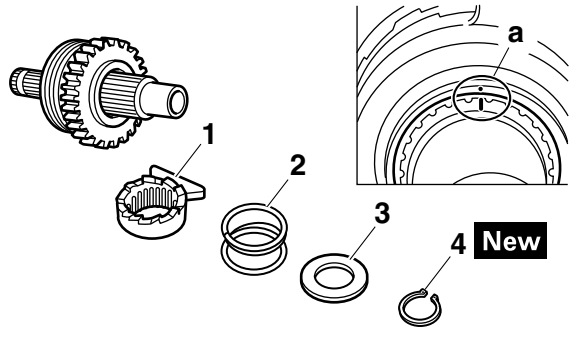


EAS24880

INSTALLING THE KICKSTARTER

1. Install:
- Ratchet wheel "1"
 - Compression spring "2"
 - Spring cover "3"
 - Circlip "4" **New**

TIP _____
Align the ratchet wheel and kick axle punch marks with each other ("a").

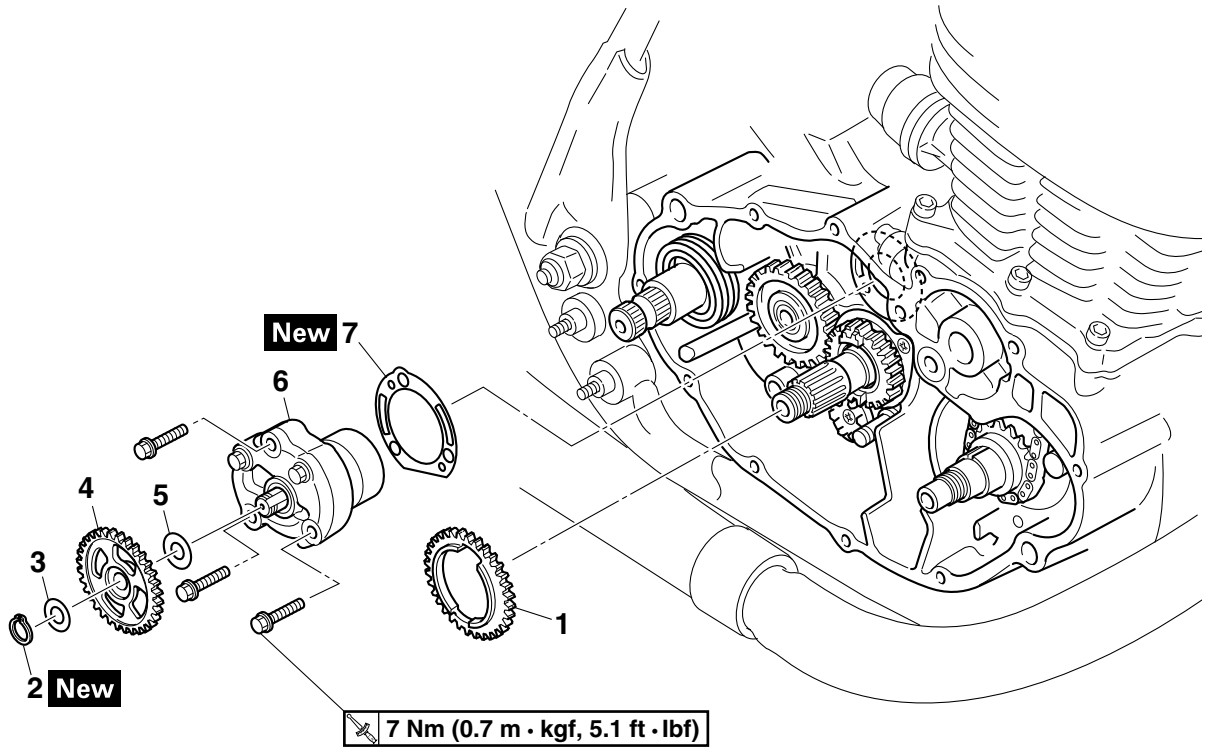


2. Install:
- Kickstarter assembly "1"

EAS24911

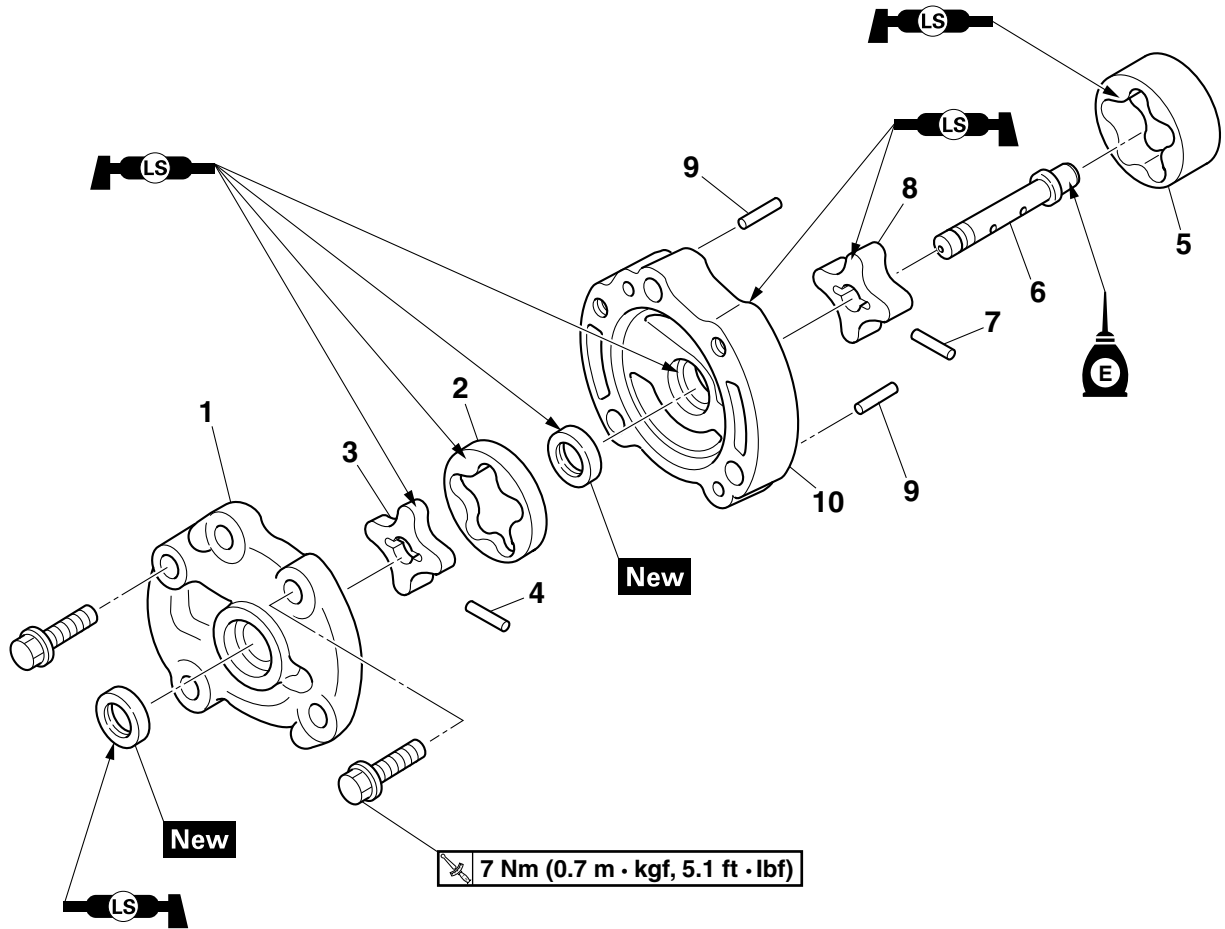
OIL PUMP

Removing the oil pump



Order	Job/Parts to remove	Q'ty	Remarks
	Crankcase cover (right)		Refer to "CLUTCH" on page 5-28.
	Clutch		Refer to "CLUTCH" on page 5-28.
1	Oil pump drive gear	1	
2	Circlip	1	
3	Plate washer	1	
4	Oil pump driven gear	1	
5	Washer	1	
6	Oil pump assembly	1	
7	Gasket	1	

Disassembling the oil pump

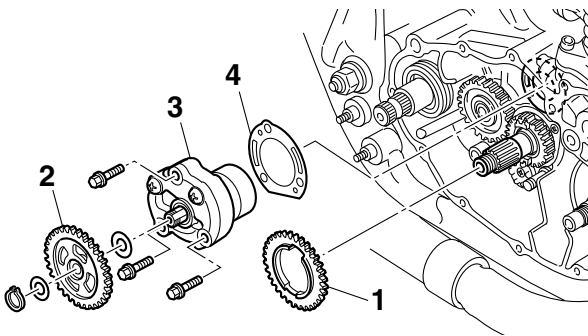


Order	Job/Parts to remove	Q'ty	Remarks
1	Oil pump cover	1	
2	Feed side outer rotor	1	
3	Feed side inner rotor	1	
4	Dowel pin	1	
5	Scavenger side outer rotor	1	
6	Pump shaft	1	
7	Dowel pin	1	
8	Scavenger side inner rotor	1	
9	Dowel pin	2	
10	Oil pump housing	1	

EAS24940

REMOVING THE OIL PUMP

1. Drain:
 - Engine oil
(completely from the crankcase and oil tank)
Refer to "CHANGING THE ENGINE OIL" on page 3-22.
2. Remove:
 - Clutch assembly
Refer to "CLUTCH" on page 5-28.
3. Remove:
 - Oil pump drive gear "1"
 - Oil pump driven gear "2"
 - Oil pump assembly "3"
 - Gasket "4"



EAS24960

CHECKING THE OIL PUMP

1. Check:
 - Oil pump drive gear
 - Oil pump driven gear
 - Oil pump housing
 - Oil pump cover
 Cracks/damage/wear → Replace.
2. Measure:
 - Inner-rotor-to-outer-rotor-tip clearance "a"
 - Outer-rotor-to-oil-pump-housing clearance "b"
 - Oil-pump-housing-to-inner-rotor-and-outer-rotor clearance "c"
 Out of specification → Replace the oil pump.



Inner-rotor-to-outer-rotor-tip clearance

0.070–0.120 mm (0.0028–0.0047 in)

Limit

0.20 mm (0.0079 in)

Outer-rotor-to-oil-pump-housing clearance

0.09–0.15 mm (0.0035–0.0059 in)

Limit

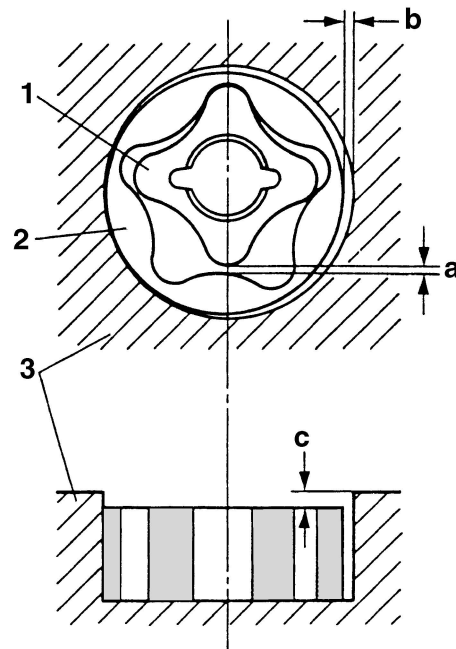
0.22 mm (0.0087 in)

Oil-pump-housing-to-inner-and-outer-rotor clearance

0.03–0.08 mm (0.0012–0.0032 in)

Limit

0.15 mm (0.0059 in)



1. Inner rotor
2. Outer rotor
3. Oil pump housing

3. Check:

- Oil pump operation

Rough movement → Repeat steps (1) and (2) or replace the defective part(s).

EAS25000

ASSEMBLING THE OIL PUMP

1. Lubricate:

- Inner rotor
- Outer rotor
(with the recommended lubricant)

	Recommended lubricant Lithium-soap-based grease
---	--

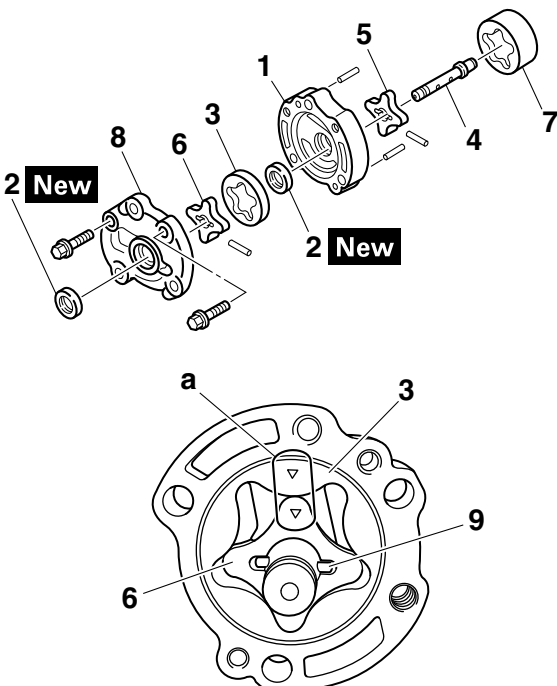
- Oil pump shaft
(with the recommended lubricant)

	Recommended lubricant Engine oil
---	---

- Install:
 - Oil pump housing "1"
 - Oil seal "2" **New**
 - Feed side outer rotor "3"
 - Oil pump shaft "4"
 - Scavenger side inner rotor "5"
 - Feed side inner rotor "6"
 - Scavenger side outer rotor "7"
 - Oil pump cover "8"

	Oil pump cover bolt 7 Nm (0.7 m·kgf, 5.1 ft·lbf)
---	---

TIP
Align the groove in the feed side inner rotor with the dowel pin "9" and align inner and outer match marks with each other ("a").




- Check:
 - Oil pump operation
Refer to "CHECKING THE OIL PUMP" on page 5-41.

EAS25020

INSTALLING THE OIL PUMP

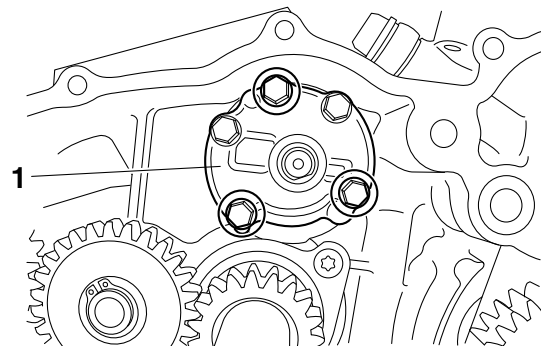
- Install:
 - Gasket **New**
 - Oil pump "1"

	Oil pump bolt 7 Nm (0.7 m·kgf, 5.1 ft·lbf)
---	---

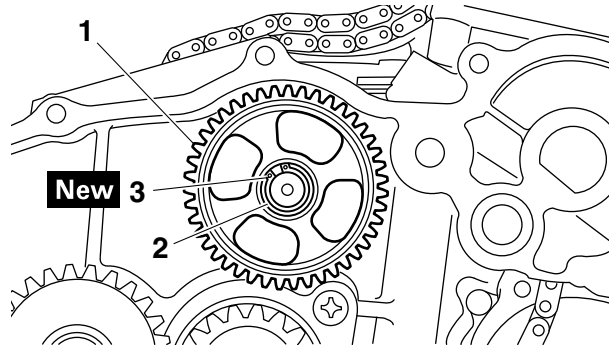
ECA13890

NOTICE

After tightening the bolts, make sure the oil pump turns smoothly.



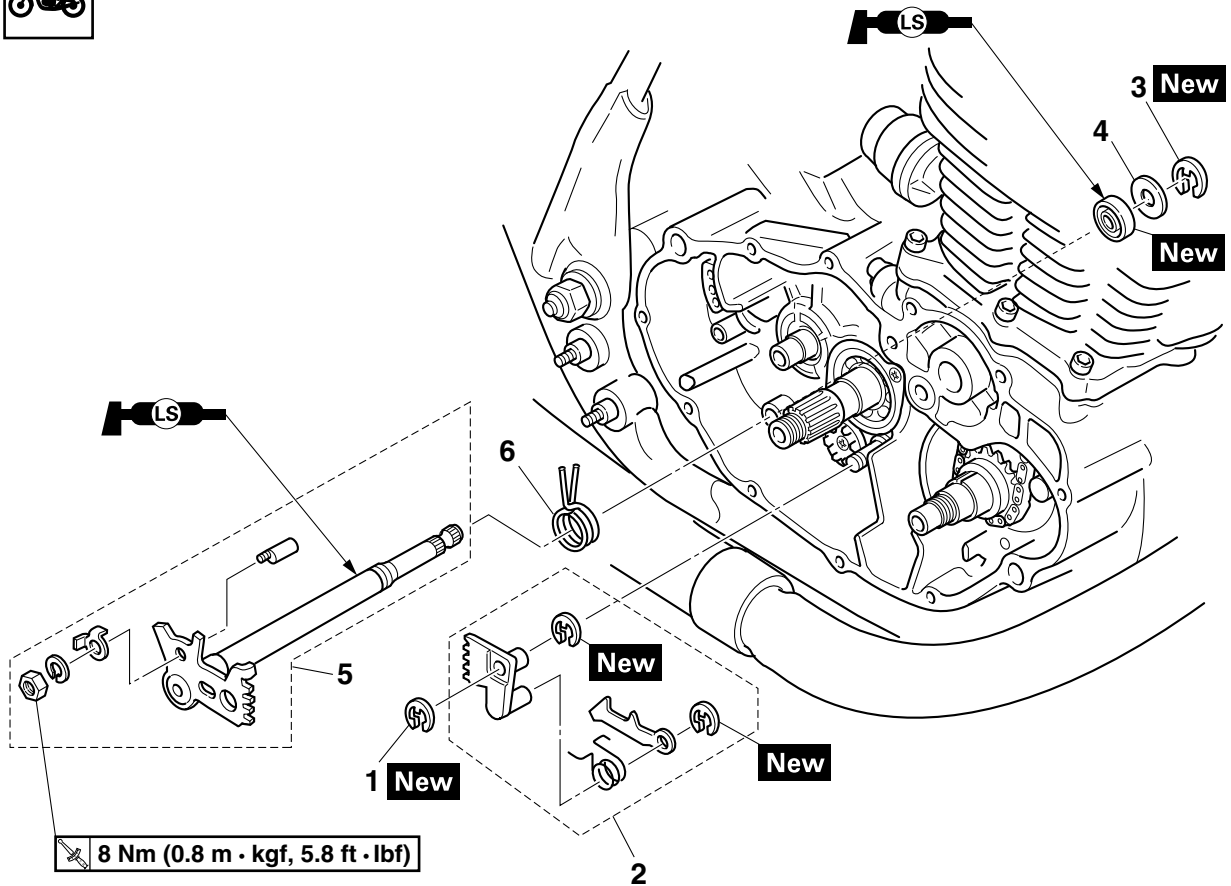
- Install:
 - Oil pump driven gear "1"
 - Plate washer "2"
 - Circlip "3" **New**



EAS25410

SHIFT SHAFT

Removing the shift shaft and stopper lever



Order	Job/Parts to remove	Q'ty	Remarks
	Clutch		Refer to "CLUTCH" on page 5-28.
1	Circlip	1	
2	Stopper lever assembly	1	
3	Circlip	1	
4	Washer	1	
5	Shift shaft assembly	1	
6	Torsion spring	1	

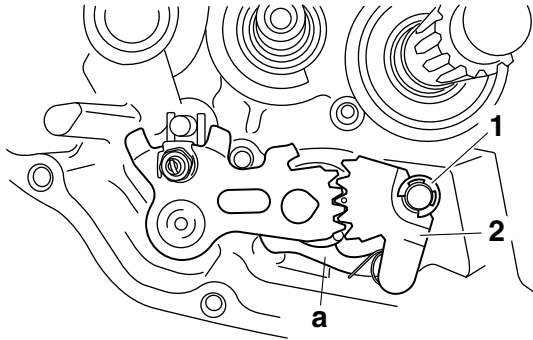
EAS2RD1014

REMOVING THE SHIFT SHAFT

- Remove:
 - Circlip "1"
 - Stopper lever assembly "2"
 - Circlip (left side of the crankcase)
 - Shift shaft assembly

TIP

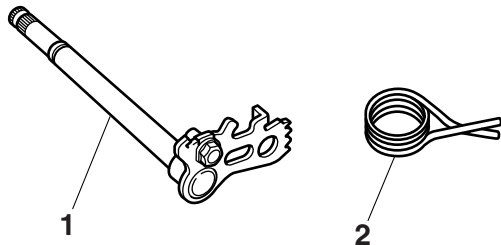
Remove the shift lever "a" by pressing down.



EAS25420

CHECKING THE SHIFT SHAFT

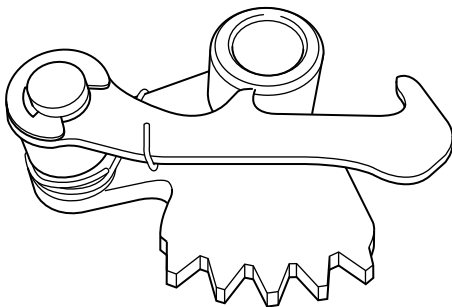
- Check:
 - Shift shaft "1"
Bends/damage/wear → Replace.
 - Torsion spring "2"
Damage/wear → Replace.



EAS25430

CHECKING THE STOPPER LEVER

- Check:
 - Stopper lever assembly
Bends/damage → Replace.



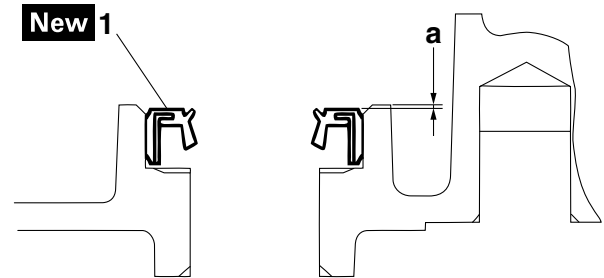
EAS25451

INSTALLING THE SHIFT SHAFT

- Install:
 - Oil seal (left side of the crankcase) "1" **New**
(to the crankcase)



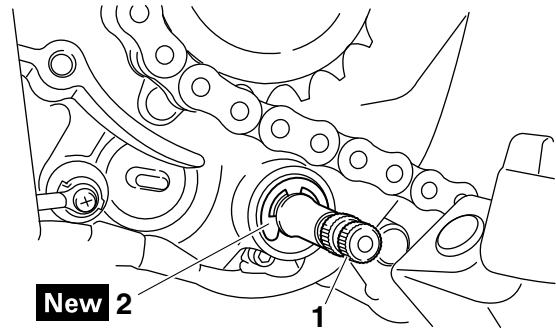
Installed depth "a"
0.0–0.5 mm (0.00–0.02 in)



- Install:
 - Torsion spring
 - Shift shaft "1"
 - Washer (left side of the crankcase)
 - Circlip (left side of the crankcase) "2" **New**

TIP

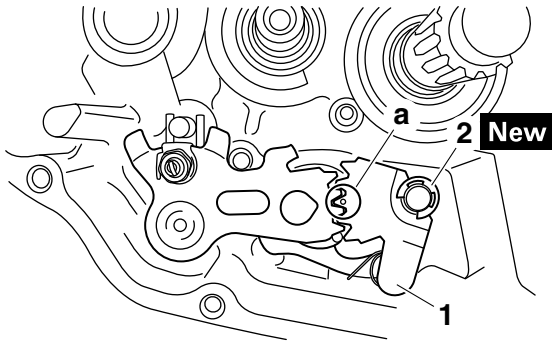
- Lubricate the oil seal lips with lithium-soap-based grease.
- Install the torsion spring to the shift shaft.



- Install:
 - Stopper lever assembly "1"
 - Circlip "2" **New**

TIP

Align the match mark in the shift shaft with the match mark in the shift lever 2 ("a").

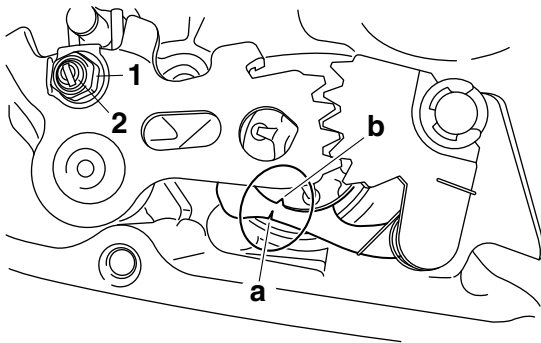


4. Check:

- Shift lever 3 match mark "a"
Shift the gear into 2nd and check for alignment with the match mark "b" in the shift drum.
Not aligned → Adjust.

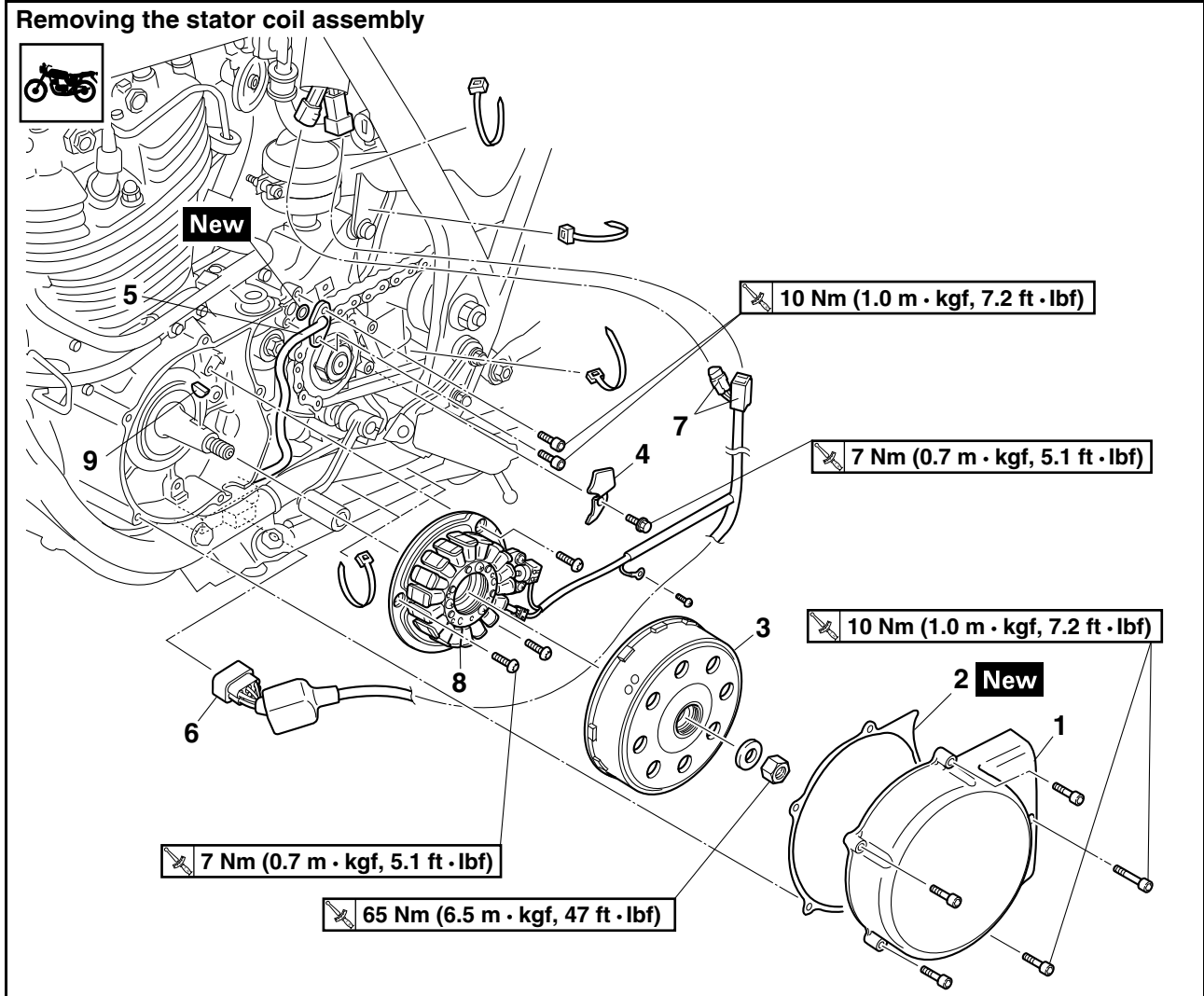
TIP

Loosen the locknut "1" and adjust with the adjuster "2".



EAS24480

GENERATOR



Order	Job/Parts to remove	Q'ty	Remarks
	Drive sprocket cover		Refer to "ENGINE REMOVAL" on page 5-2.
1	Crankcase cover (left)	1	
2	Gasket	1	
3	AC magneto	1	
4	Holder	1	
5	Oil pipe	1	Remove only the upper bolt.
6	Rectifier/regulator coupler	1	Disconnect.
7	Stator coil assembly coupler	2	Disconnect.
8	Stator coil assembly	1	
9	Woodruff key	1	

EAS24490

REMOVING THE GENERATOR

1. Remove:

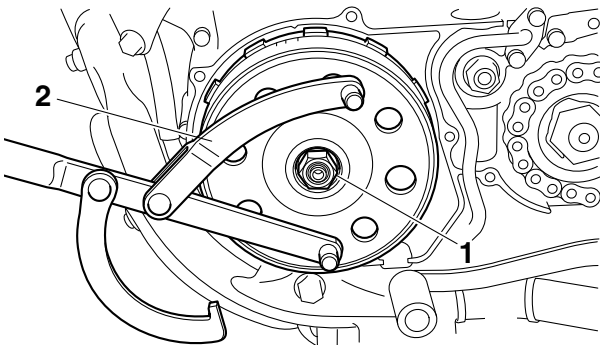
- AC magneto nut "1"
- Washer

TIP

While holding the AC magneto with the rotor holding tool "2", loosen the nut.



Rotor holding tool
90890-01235
Universal magneto and rotor
holder
YU-01235



2. Remove:

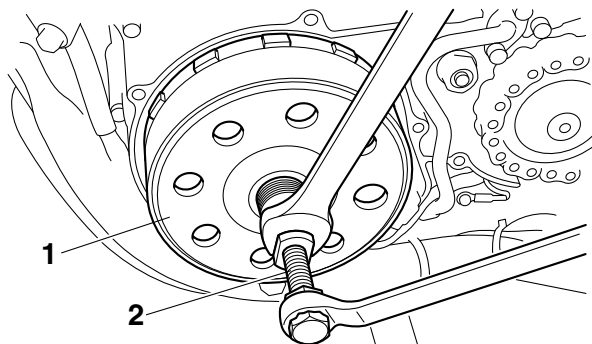
- AC magneto "1"
 (with the flywheel puller "2".)
- Woodruff key

TIP

Make sure the flywheel puller is centered over the generator rotor.



Flywheel puller
90890-01189
Flywheel puller
YM-01189



EAS24500

INSTALLING THE GENERATOR

1. Install:

- Stator coil assembly



Stator coil assembly bolt
7 Nm (0.7 m·kgf, 5.1 ft·lbf)

2. Install:

- Woodruff key
- AC magneto
- Washer
- AC magneto nut

TIP

- Clean the tapered portion of the crankshaft and the AC magneto hub.
- When installing the AC magneto, make sure the woodruff key is properly sealed in the key-way of the crankshaft.

3. Tighten:

- AC magneto nut "1"



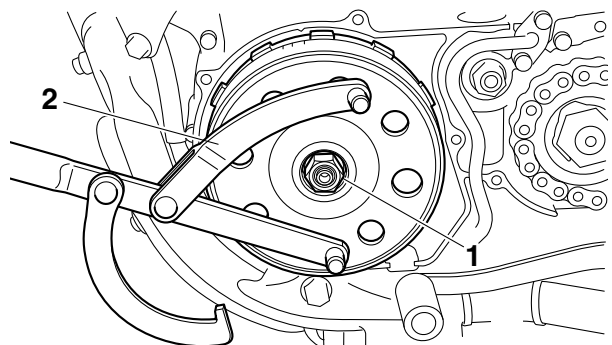
AC magneto nut
65 Nm (6.5 m·kgf, 47 ft·lbf)

TIP

- While holding the AC magneto with the rotor holding tool "2", tighten the nut.
- Tighten the AC magneto nut in two stages.



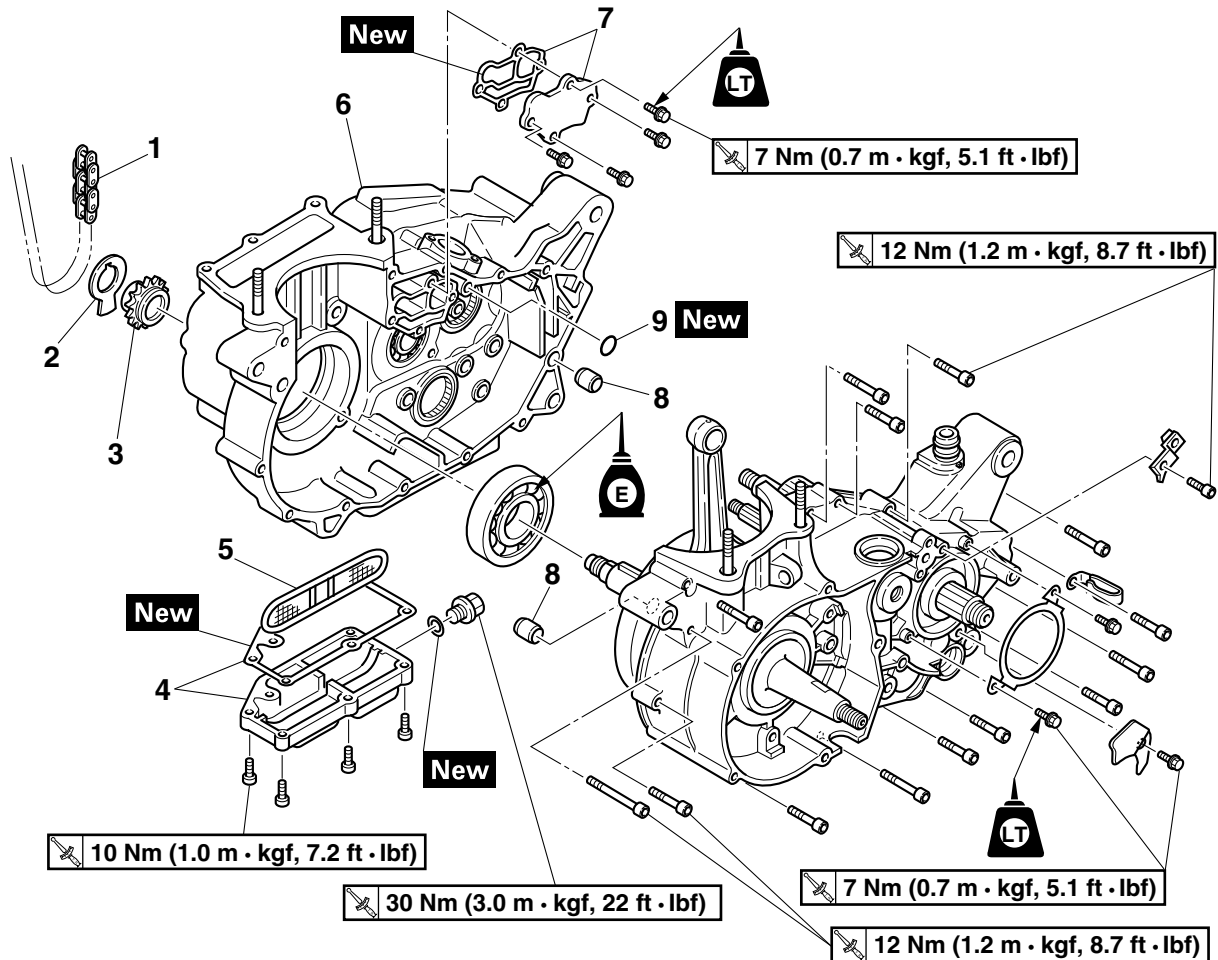
Rotor holding tool
90890-01235
Universal magneto and rotor
holder
YU-01235



EAS25540

CRANKCASE

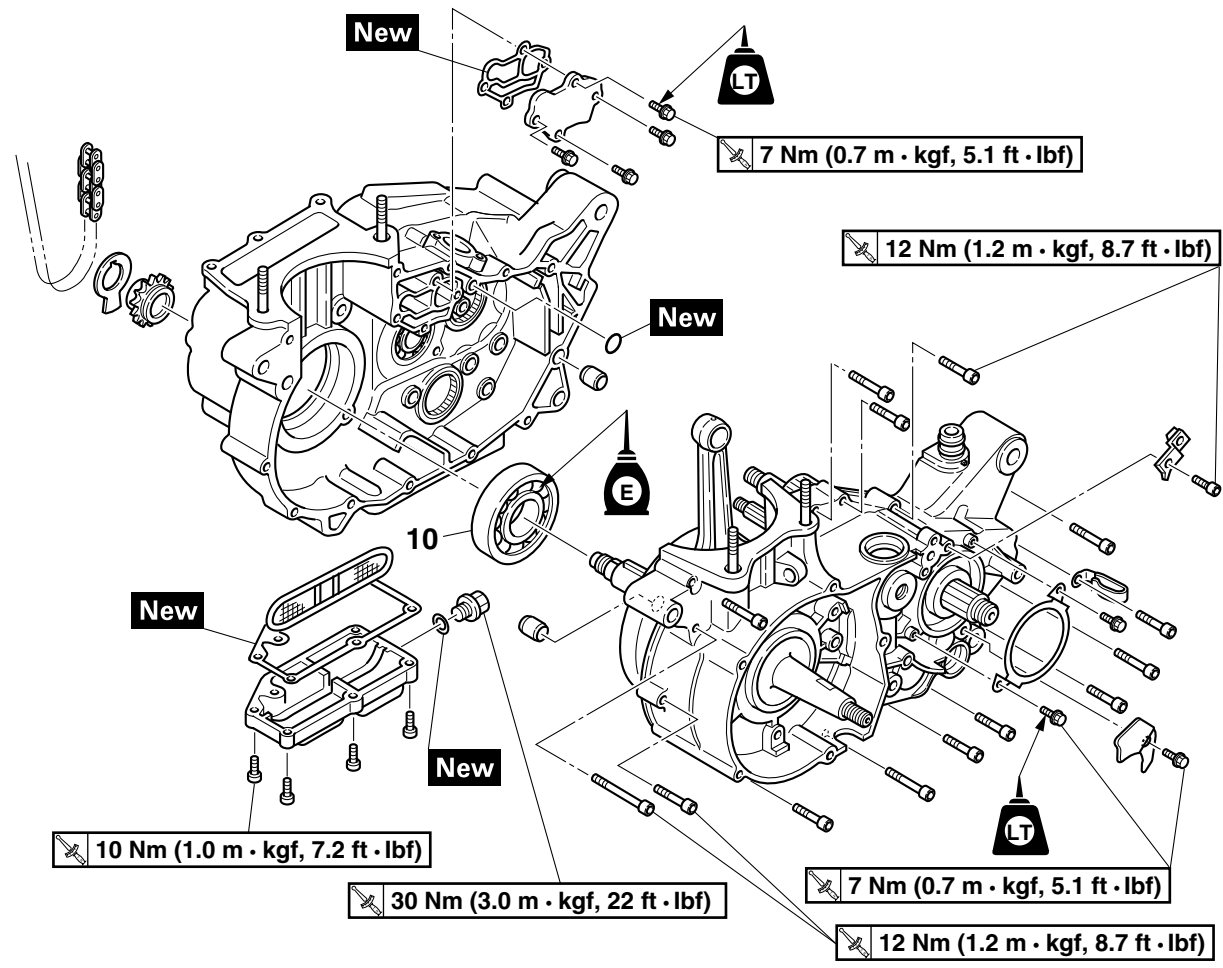
Separating the crankcase



Order	Job/Parts to remove	Q'ty	Remarks
	Engine		Refer to "ENGINE REMOVAL" on page 5-2.
	Cylinder head		Refer to "CYLINDER HEAD" on page 5-6.
	Cylinder, piston		Refer to "CYLINDER AND PISTON" on page 5-23.
	Clutch		Refer to "CLUTCH" on page 5-28.
	Kickstarter		Refer to "KICKSTARTER" on page 5-36.
	Oil pump		Refer to "OIL PUMP" on page 5-39.
	Shift shaft		Refer to "SHIFT SHAFT" on page 5-43.
	AC magneto		Refer to "GENERATOR" on page 5-46.
1	Timing chain	1	
2	Indicator plate	1	
3	Crankshaft sprocket	1	
4	Oil strainer cover/Gasket	1/1	
5	Oil strainer	1	
6	Crankcase (right)	1	
7	Cover/gasket	1/1	
8	Dowel pin	2	
9	O-ring	1	

CRANKCASE

Disassembling the crankcase



Order	Job/Parts to remove	Q'ty	Remarks
10	Bearing	1	

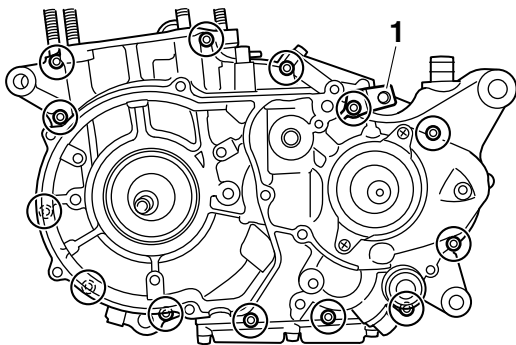
EAS25570

DISASSEMBLING THE CRANKCASE

1. Remove:
 - Timing chain
 - Oil strainer cover
 - Oil strainer
2. Remove:
 - Crankcase bolt
 - Stay "1"

TIP

Loosen each bolt 1/4 of a turn at a time, in stages and in a crisscross pattern. After all of the bolts are fully loosened, remove them.



3. Remove:
 - Crankcase (right) "1"

ECA2RD1004

NOTICE

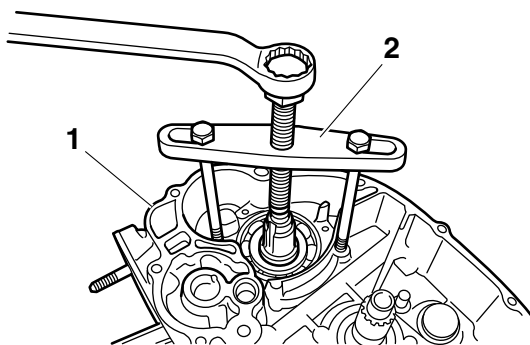
Do not damage the crankcase mating surfaces.

TIP

Install the crankcase separating tool "2" to the crankcase "1" in parallel and disassemble.



**Crankcase separating tool
90890-01135
Crankcase separator
YU-01135-B**



EAS25580

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 passage
Obstruction → Blow out with compressed air.

EAS2RD1015

CHECKING THE TIMING CHAIN AND CRANKSHAFT SPROCKET

1. Check:
 - Timing chain
 - Crankshaft sprocket

Refer to "CHECKING THE TIMING CHAIN AND CAMSHAFT SPROCKET" on page 5-9.

EAS2RD1016

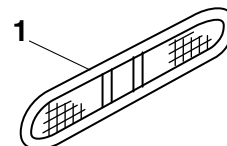
CHECKING THE BEARING

1. Check:
 - Bearing
Abnormal sound/rough movement/looseness
→ Replace.

EAS24990

CHECKING THE OIL STRAINER

1. Check:
 - Oil strainer "1"
Damage → Replace.
Contaminants → Clean with solvent.



EAS25700

ASSEMBLING THE CRANKCASE

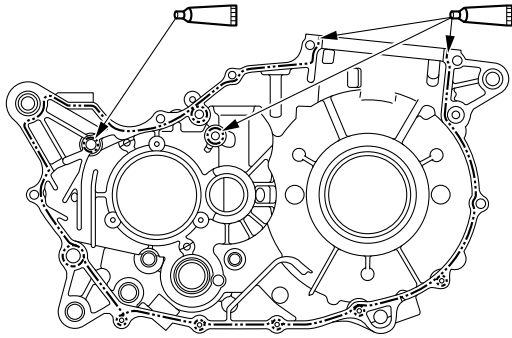
1. Thoroughly clean all the gasket mating surfaces and crankcase mating surfaces.
2. Apply:
 - Sealant
(onto the crankcase mating surfaces)



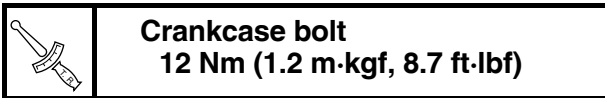
**Yamaha bond No. 1215
90890-85505
(Three bond No.1215®)**

TIP

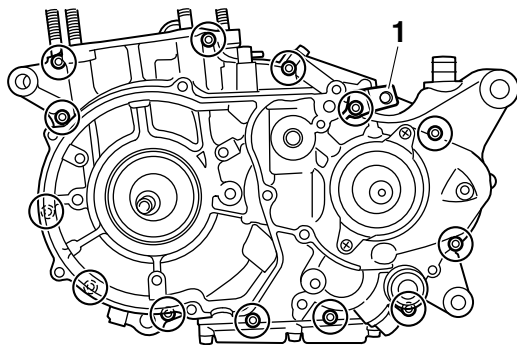
Do not allow any sealant to come into contact with the oil gallery.



3. Install:
 - Dowel pin
4. Install:
 - Crankcase bolt
 - Stay "1"



TIP _____
Tighten the bolts in stages and in a crisscross pattern.



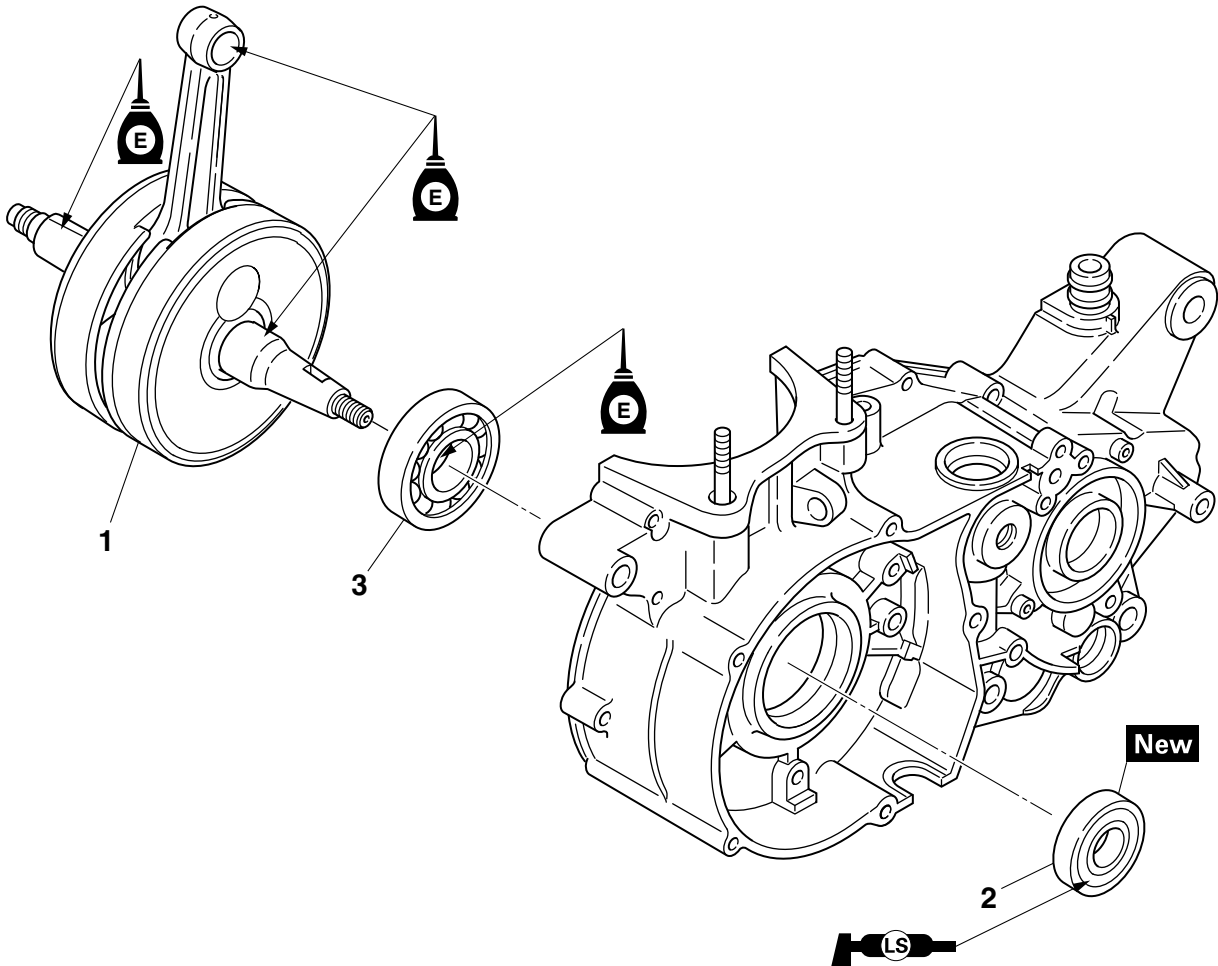
5. Install:
 - Oil strainer
 - Oil strainer cover
 - Timing chain

CRANKSHAFT ASSEMBLY

EAS25970

CRANKSHAFT ASSEMBLY

Removing the crankshaft assembly



Order	Job/Parts to remove	Q'ty	Remarks
	Separate the crankcase.		Refer to "CRANKCASE" on page 5-48.
1	Crankshaft assembly	1	
2	Oil seal	1	
3	Bearing	1	

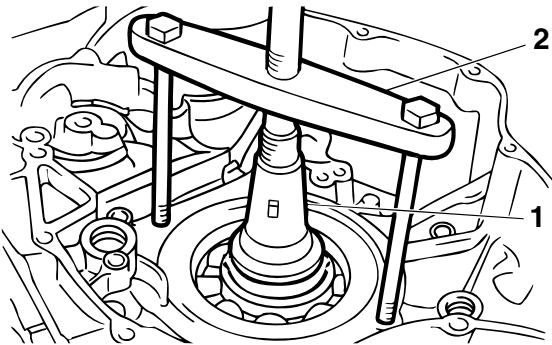
CRANKSHAFT ASSEMBLY

EAS26000

REMOVING THE CRANKSHAFT ASSEMBLY

1. Remove:

- Crankshaft assembly "1"



ECA2RD1005

NOTICE

Do not tap the crankshaft directly with a hammer, etc.

TIP

- Remove the crankshaft assembly with the crankcase separating tool "2".
- Install the crankcase separating tool to the left side of the crankcase in parallel and disassemble it.



Crankcase separating tool
90890-01135
Crankcase separator
YU-01135-B

EAS2RD1017

CHECKING THE CRANKSHAFT ASSEMBLY

1. Measure:

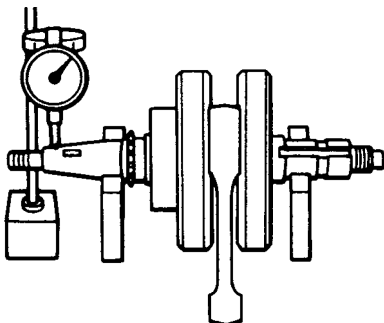
- Crankshaft runout
 Out of specification → Replace the crankshaft assembly.

TIP

Turn the crankshaft slowly.



Crankshaft
Runout limit
0.030 mm (0.0012 in)

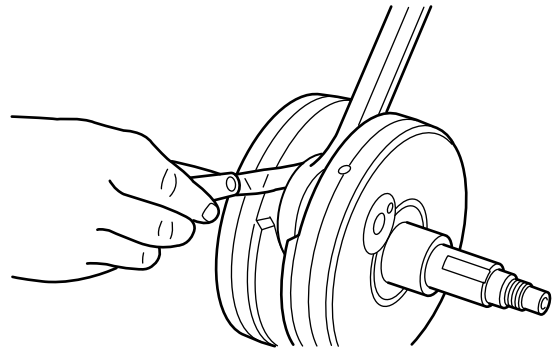


2. Measure:

- Big end side clearance
 Out of specification → Replace the crankshaft assembly.



Big end side clearance
0.350–0.650 mm (0.0138–0.0256 in)

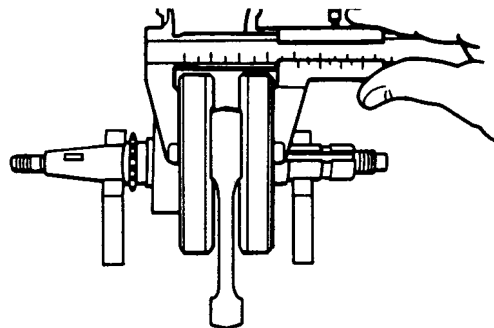


3. Measure:

- Crankshaft width
 Out of specification → Replace the crankshaft assembly.



Crank assembly width
74.95–75.00 mm (2.951–2.953 in)



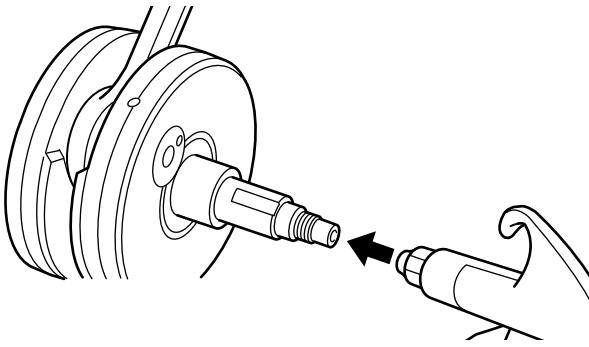
4. Check:

- Bearing
 Cracks/damage/wear → Replace the bearing.

5. Check:

- Crankshaft passage
 Obstruction → Blow out with compressed air.

CRANKSHAFT ASSEMBLY



TIP

Hold the connecting rod at top dead center (TDC) with one hand while turning the nut of the crankshaft installer bolt with the other. Turn the crankshaft installer nut until the crankshaft assembly bottoms against the bearing in the crankcase.

EAS26210

INSTALLING THE CRANKSHAFT ASSEMBLY

1. Install:

- Crankshaft assembly "1"

TIP

Install the crankshaft assembly with the crankshaft installer pot "2", crankshaft installer bolt "3", adapter (M12) "4", and spacer "5".



Crankshaft installer pot

90890-01274

Installing pot

YU-90058

Crankshaft installer bolt

90890-01275

Bolt

YU-90060

Adapter (M12)

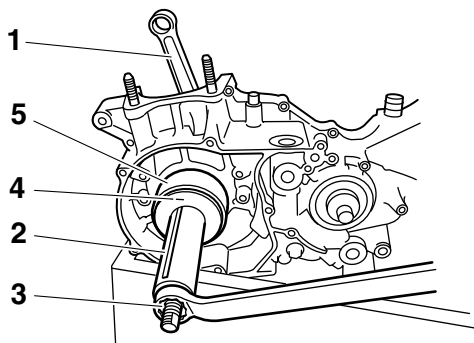
90890-01278

Adapter #3

YU-90063

Spacer

90890-01288



2. Install:

- Crankshaft assembly

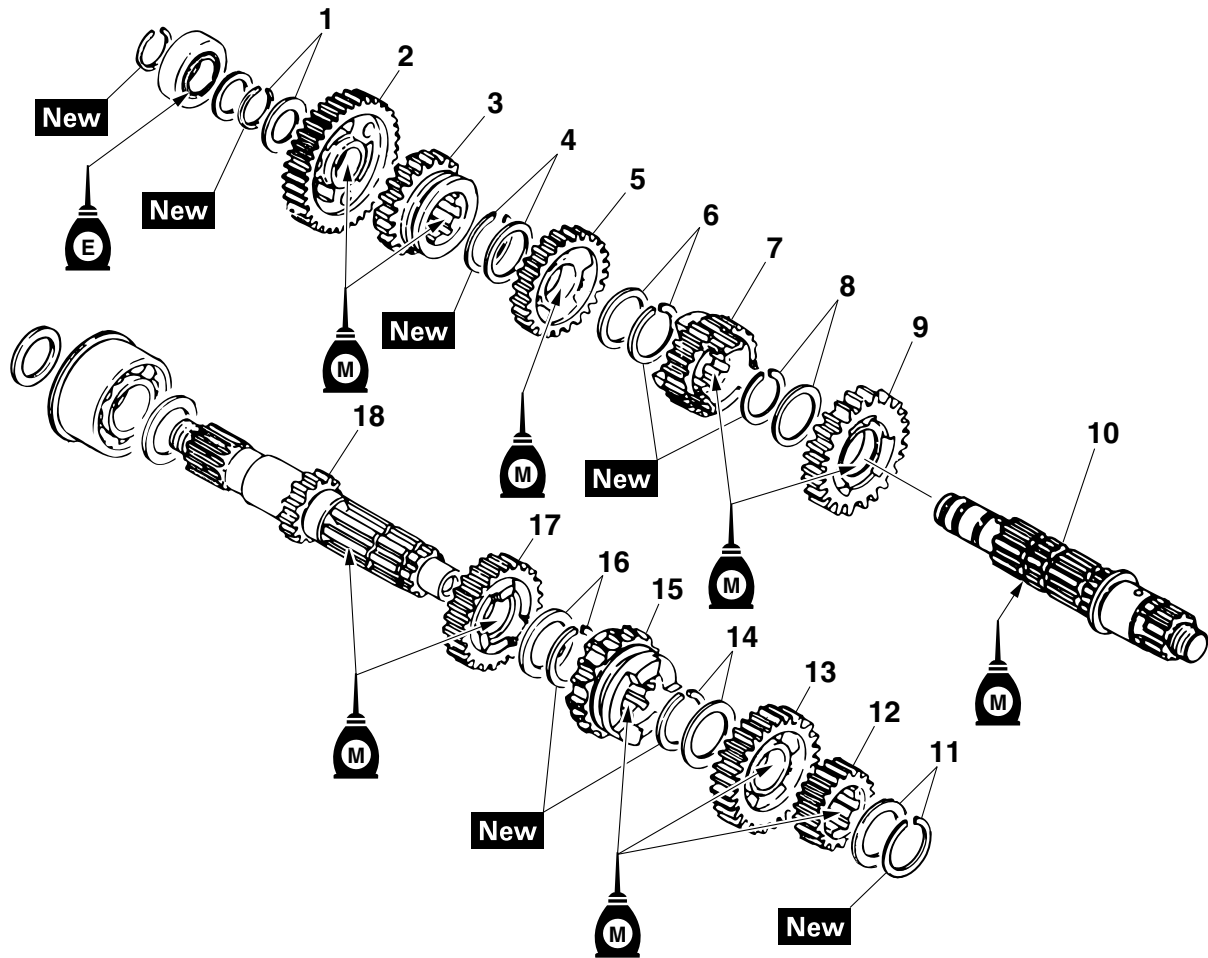
ECA13970

NOTICE

To avoid scratching the crankshaft and to ease the installation procedure, lubricate the oil seal lips with lithium-soap-based grease and each bearing with engine oil.

TRANSMISSION

Disassembling the transmission



Order	Job/Parts to remove	Q'ty	Remarks
1	Circlip/washer	1/1	
2	1st wheel gear	1	
3	4th wheel gear	1	
4	Circlip/washer	1/1	
5	3rd wheel gear	1	
6	Circlip/washer	1/1	
7	5th wheel gear	1	
8	Circlip/washer	1/1	
9	2nd wheel gear	1	
10	Drive axle	1	
11	Circlip/washer	1/1	
12	2nd pinion gear	1	
13	5th pinion gear	1	
14	Circlip/washer	1/1	
15	3rd pinion gear	1	
16	Circlip/washer	1/1	
17	4th pinion gear	1	
18	Main axle	1	

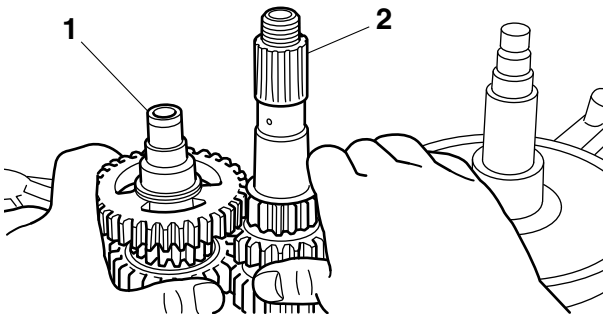
EAS26250

REMOVING THE TRANSMISSION

1. Remove:
 - Stopper cam assembly
2. Remove:
 - Drive axle assembly "1"
 - Main axle assembly "2"

TIP

Remove the drive axle assembly and the main axle assembly simultaneously.

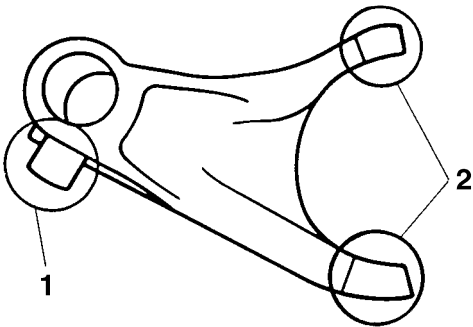


EAS26260

CHECKING THE SHIFT FORKS

The following procedure applies to all of the shift forks.

1. Check:
 - Shift fork cam follower "1"
 - Shift fork pawl "2"
 Bends/damage/scoring/wear → Replace the shift fork.

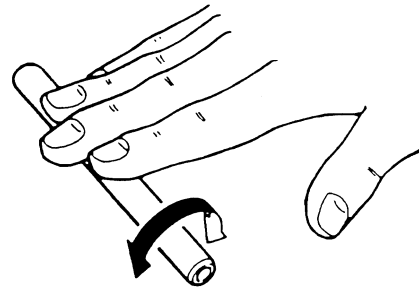


2. Check:
 - Shift fork guide bar
 Roll the shift fork guide bar on a flat surface.
 Bends → Replace.

EWA12840

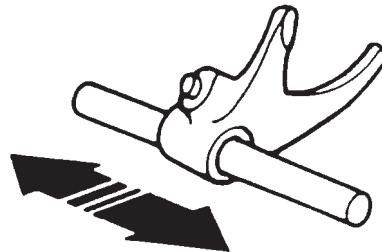
⚠ WARNING

Do not attempt to straighten a bent shift fork guide bar.



319-010

3. Check:
 - Shift fork movement (along the shift fork guide bar)
 Rough movement → Replace the shift forks and shift fork guide bar as a set.

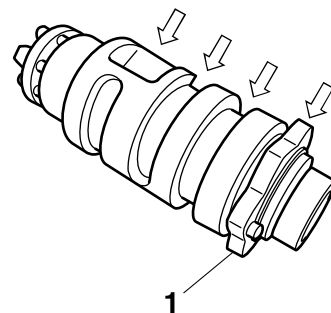


319-011

EAS26270

SHIFT DRUM ASSEMBLY

1. Check:
 - Shift drum groove
 - Shift drum segment "1"
 - Shift drum bearing
 Damage/scratches/wear → Replace the shift drum assembly.
 Damage/wear → Replace the shift drum segment.
 Damage/pitting → Replace the shift drum bearing.

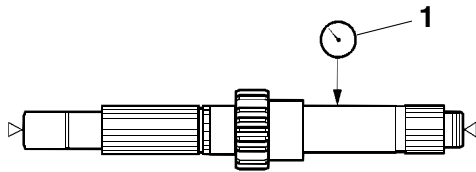
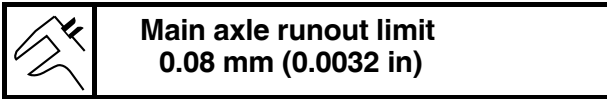


EAS26300

CHECKING THE TRANSMISSION

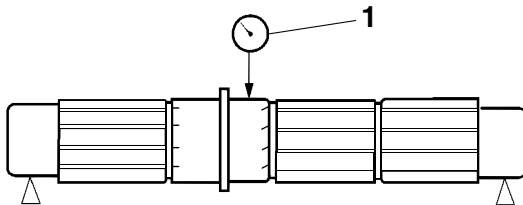
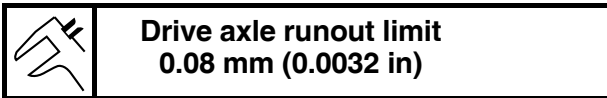
1. Measure:

- Main axle runout
(with a centering device and dial gauge "1")
Out of specification → Replace the main axle.



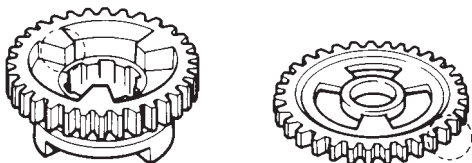
2. Measure:

- Drive axle runout
(with a centering device and dial gauge "1")
Out of specification → Replace the drive axle.



3. Check:

- Transmission gear
Blue discoloration/pitting/wear → Replace the defective gear(s).
- Transmission gear dog
Cracks/damage/rounded edges → Replace the defective gear(s).



4. Check:

- Transmission gear engagement
(each pinion gear to its respective wheel gear)
Incorrect → Reassemble the transmission axle assemblies.

5. Check:

- Transmission gear movement
Rough movement → Replace the defective part(s).

6. Check:

- Circlip
Damage/bends/looseness → Replace.

EAS29020

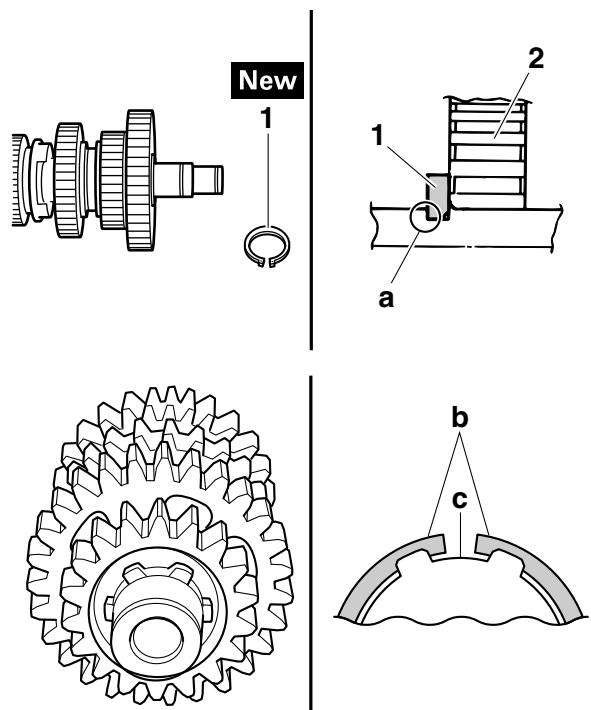
ASSEMBLING THE MAIN AXLE AND DRIVE AXLE

1. Install:

- Circlip "1" **New**

TIP

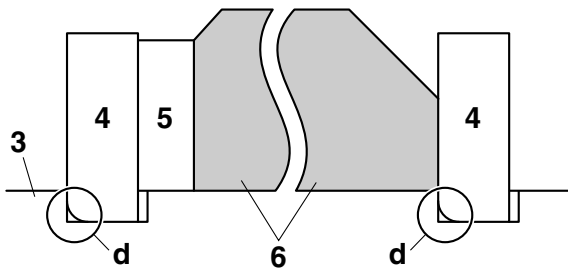
- Be sure the circlip sharp-edged corner "a" is positioned opposite side to the gear "2".
- Align the opening between the ends "b" of the circlip with a groove "c" in the axle.



TIP

- Install the circlip "4", washer "5", and bearing "6" to the drive axle "3", as shown in the illustration.

319 008



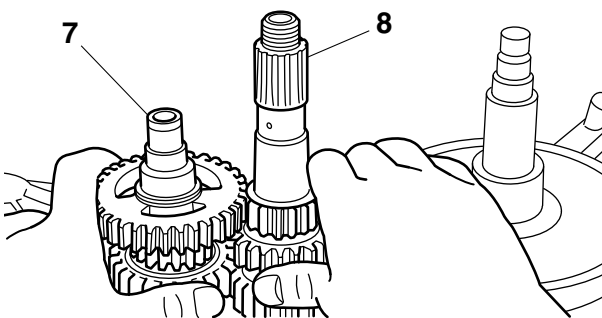
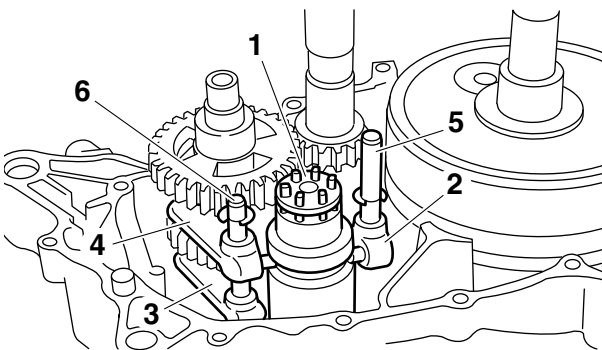
d. Chamfer side

EAS26320

INSTALLING THE SHIFT FORKS AND SHIFT DRUM ASSEMBLY

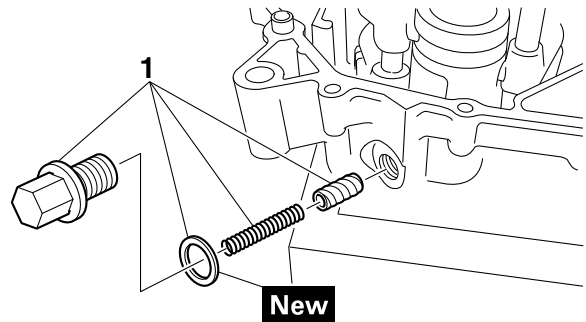
1. Install:

- Shift drum "1"
- Shift fork 1 (C) "2"
- Shift fork 3 (L) "3"
- Shift fork 2 (R) "4"
- Shift fork guide bar 1 "5"
- Shift fork guide bar 2 "6"
- Drive axle assembly "7"
- Main axle assembly "8"



2. Install:

- Stopper cam assembly "1"

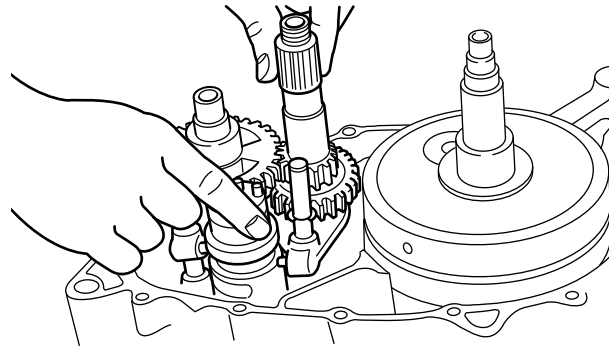


3. Check:

- Shift cam operation
Rough movement → Reassemble the transmission.

TIP

By turning the shift cam, make sure that the shift fork, main axle, and drive axle move smoothly.



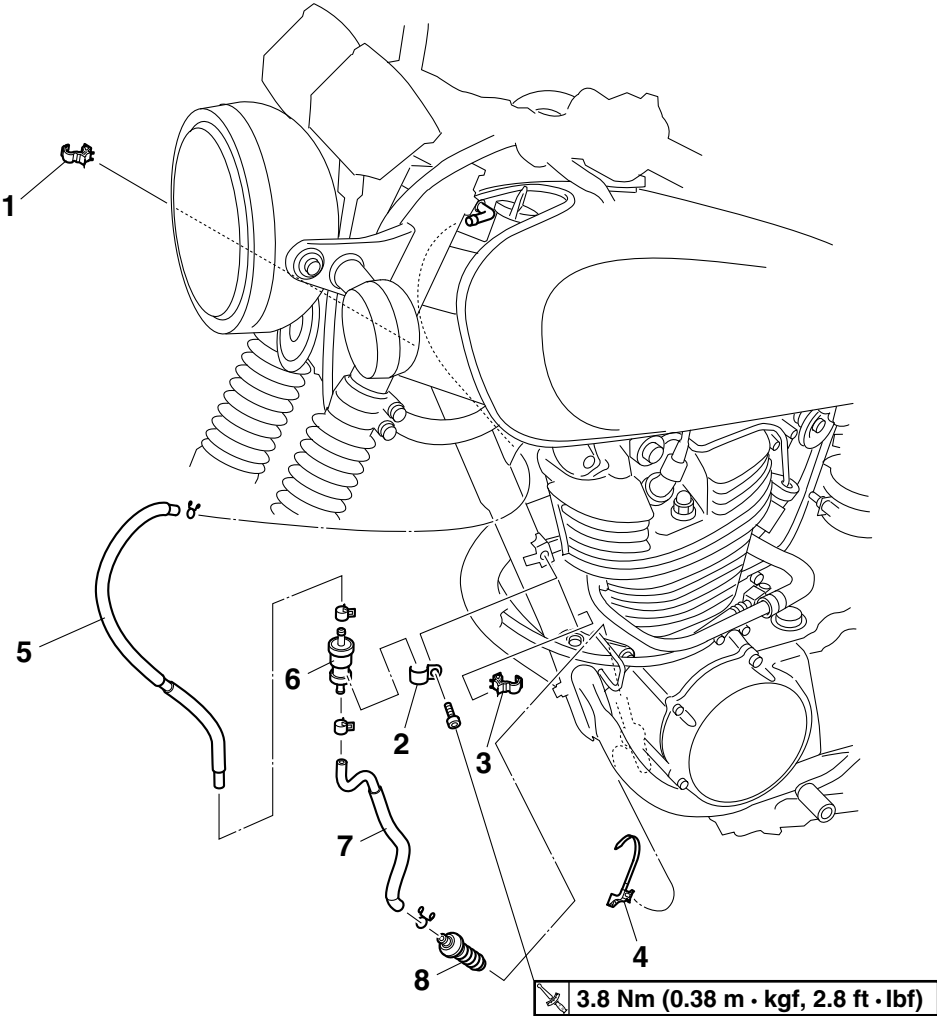
FUEL SYSTEM

FUEL TANK	6-1
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EAS26620

FUEL TANK

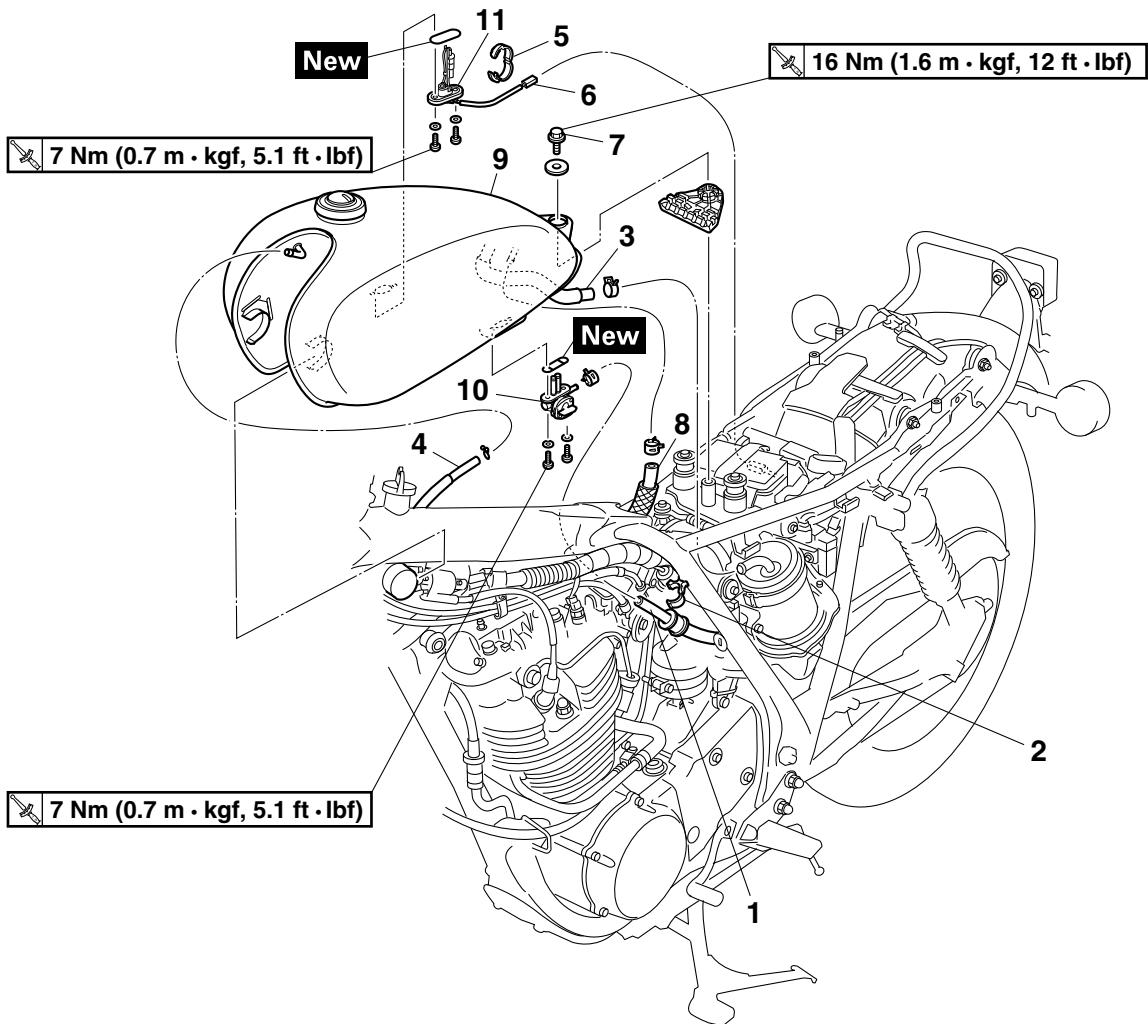
Removing the fuel tank breather hose and rollover valve



Order	Job/Parts to remove	Q'ty	Remarks
	Engine protector		Refer to "ENGINE REMOVAL" on page 5-2.
1	Clamp 1	1	
2	Rollover valve clamp	1	
3	Clamp 2	1	
4	Plastic locking tie	1	
5	Fuel tank breather hose 1	1	
6	Rollover valve	1	
7	Fuel tank breather hose 2	1	
8	Plug	1	

FUEL TANK

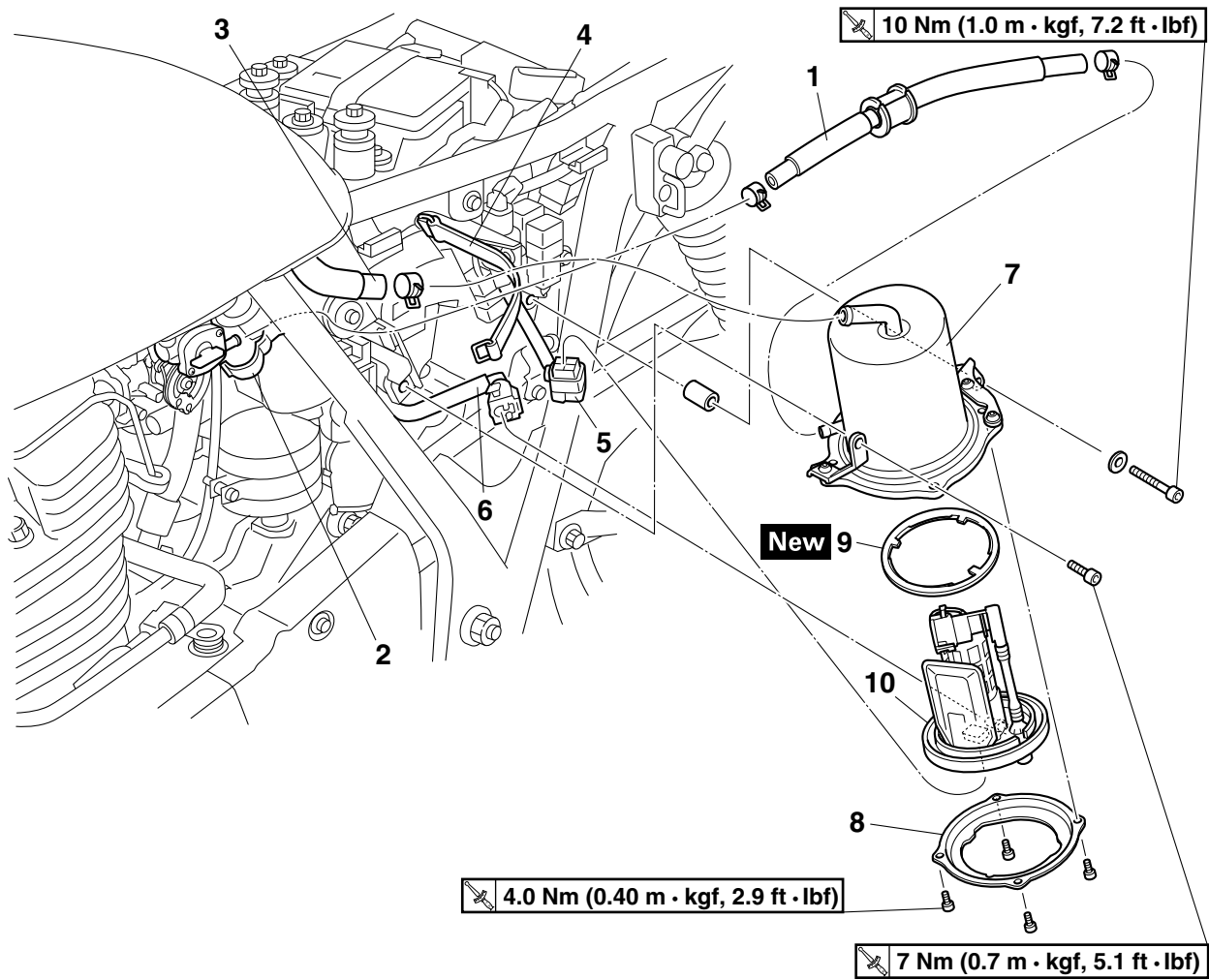
Removing the fuel tank



Order	Job/Parts to remove	Q'ty	Remarks
	Seat		Refer to "GENERAL CHASSIS" on page 4-1.
	Side cover (left)		Refer to "GENERAL CHASSIS" on page 4-1.
	Turn the fuel cock to "OFF".		
1	Fuel hose (fuel tank–fuel pump case)	1	Disconnect the connection at the fuel cock side.
2	Holder	1	
3	Pump case breather hose (fuel pump case–fuel tank)	1	Disconnect the connection at the fuel pump case side.
4	Fuel tank breather hose	1	
5	Clamp	1	
6	Fuel sender coupler	1	Disconnect.
7	Fuel tank bolt	1	
8	Fuel hose (pressure regulator–fuel tank)	1	Disconnect the connection at the fuel tank side.
9	Fuel tank	1	
10	Fuel cock	1	
11	Fuel sender	1	

FUEL TANK

Removing the fuel pump case



Order	Job/Parts to remove	Q'ty	Remarks
	Side cover (left)		Refer to "GENERAL CHASSIS" on page 4-1.
	Turn the fuel cock to "OFF".		
1	Fuel hose (fuel tank–fuel pump case)	1	Disconnect the connection at the fuel cock side.
2	Holder	1	
3	Pump case breather hose (fuel pump case–fuel tank)	1	
4	Band	1	
5	Fuel pump coupler	1	Disconnect.
6	Fuel hose (fuel pump–fuel rail)	1	
7	Fuel pump case	1	
8	Fuel pump bracket	1	
9	Fuel pump gasket	1	
10	Fuel pump	1	

EAS26630

REMOVING THE FUEL TANK

EWA2RD1010

WARNING

Gasoline is very flammable and dangerous. While handling gasoline, keep it away from an open flame as well as a spark or any other source of high heat.

TIP

Before removing the fuel hose, blow away any dirt accumulated around the hose with compressed air to prevent it from entering the hose or tank.

1. Remove:

- Seat
- Side cover (left)

Refer to "GENERAL CHASSIS" on page 4-1.

2. Remove:

- Fuel tank

EWA2RD1009

WARNING

Cover fuel hose connection with a cloth when disconnecting them. Residual pressure in the fuel lines could cause fuel to spurt out when removing the hose.

ECA2RD1010

NOTICE

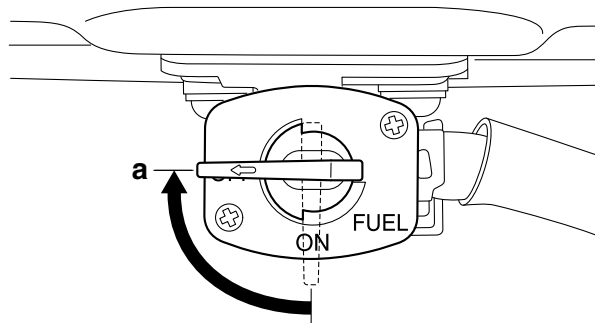
Be sure to disconnect the fuel hose by hand. Do not forcefully disconnect the hose with tools.

TIP

- Before removing the hose, place a few rags in the area under where it will be removed.
- Wipe off any spilled fuel immediately.

a. Extract the fuel in the fuel tank through the fuel tank filler opening with a hand pump.

b. Turn the fuel cock to the "OFF" position "a".



c. Turn the main switch to "ON" and 3 seconds later turn it to "OFF". Repeat these steps several times.

TIP

- Repeating main switch turning "ON" and turning "OFF" allows the fuel in the fuel pump case to be sent to the fuel tank.
- Even after this operation, a small amount of fuel remains in the fuel pump case.

d. Start the engine with the fuel cock in the "OFF" position and keep idling speed until the engine comes to a stop.

TIP

Performing this step allows the fuel hose to be drained.

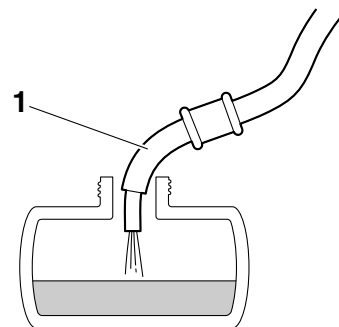
e. Disconnect the fuel hose (fuel tank–fuel pump case) "1" at the fuel cock side.

f. Remove the fuel hose from the holder "2" and drain the fuel pump case.

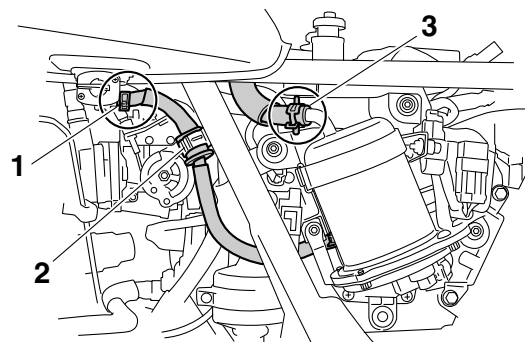
ECA2RD1011

NOTICE

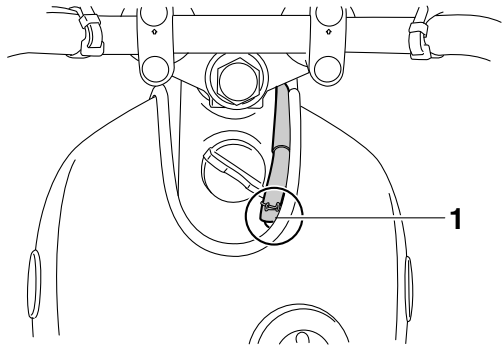
The holder is intended to avoid a fuel flow out of the fuel pump casing associated with the fuel hose falling down following the removal of the hose from the fuel cock. Make sure that the fuel hose is fastened with the holder when installed.



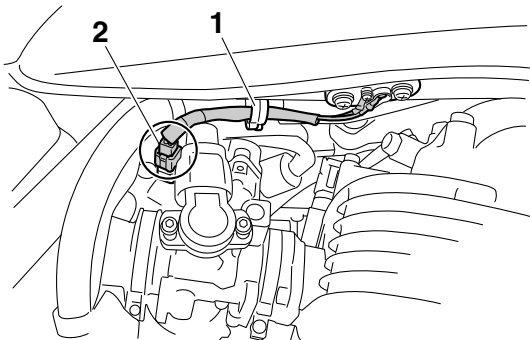
g. Disconnect the pump case breather hose (fuel pump case–fuel tank) "3" at the fuel pump case side.



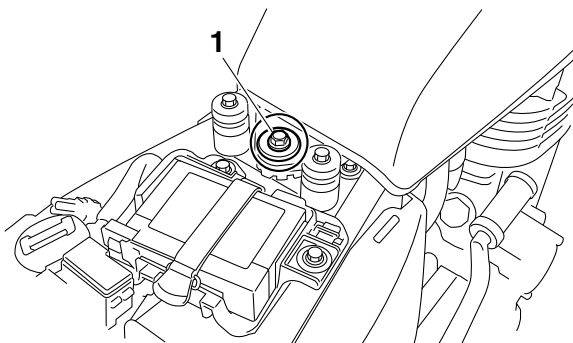
h. Disconnect the fuel tank breather hose "1".



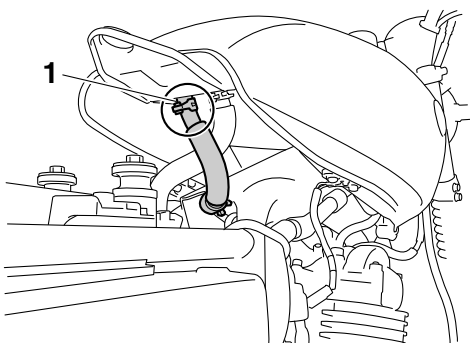
- i. Remove the clamp “1” and disconnect the fuel sender coupler “2”.



- j. Remove the fuel tank bolt “1”.



- k. Disconnect the fuel hose (pressure regulator-fuel tank) “1” at the fuel tank side.



- l. Remove the fuel tank.

TIP

Be sure to place the fuel tank horizontally. Place the fuel tank so that it does not come into direct contact with the fuel cock.



EAS2RD1034

REMOVING THE FUEL PUMP CASE

EWA2RD1010

WARNING

Gasoline is very flammable and dangerous. While handling gasoline, keep it away from an open flame as well as a spark or any other source of high heat.

TIP

Before removing the fuel hose, blow away any dirt accumulated around the hose with compressed air to prevent it from entering the hose or tank.

1. Remove:

- Side cover (left)
Refer to “GENERAL CHASSIS” on page 4-1.

2. Remove:

- Fuel pump case

EWA2RD1009

WARNING

Cover fuel hose connection with a cloth when disconnecting them. Residual pressure in the fuel lines could cause fuel to spurt out when removing the hose.

ECA2RD1010

NOTICE

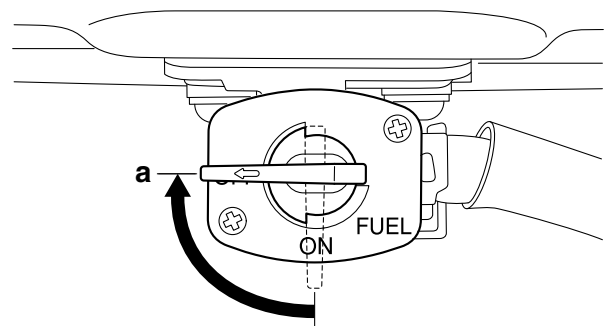
Be sure to disconnect the fuel hose by hand. Do not forcefully disconnect the hose with tools.

TIP

- Before removing the hose, place a few rags in the area under where it will be removed.
- Wipe off any spilled fuel immediately.



- a. Turn the fuel cock to the “OFF” position “a”.



- b. Turn the main switch to “ON” and 3 seconds later turn it to “OFF”. Repeat these steps four times.

TIP

- Repeating main switch turning “ON” and turning “OFF” allows the fuel in the fuel pump case to be sent to the fuel tank.
- Even after this operation, a small amount of fuel remains in the fuel pump case.

c. Start the engine with the fuel cock in the “OFF” position and keep idling speed until the engine comes to a stop.

TIP

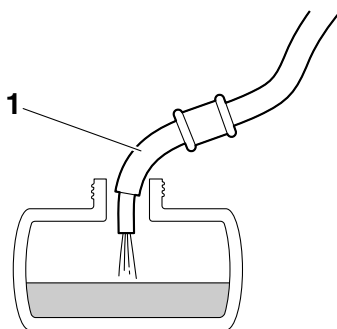
Performing this step allows the fuel hose to be drained.

- d. Disconnect the fuel hose (fuel tank–fuel pump case) “1” at the fuel cock side.
- e. Remove the fuel hose from the holder “2” and drain the fuel pump case.

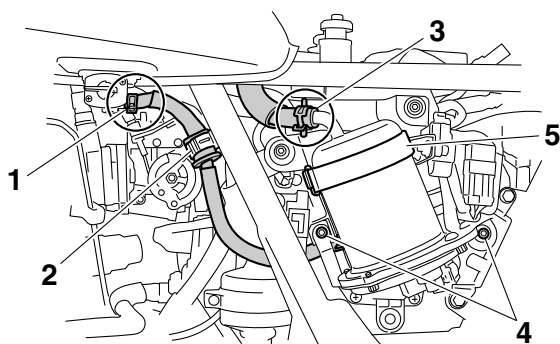
ECA2RD1011

NOTICE

The holder is intended to avoid a fuel flow out of the fuel pump casing associated with the fuel hose falling down following the removal of the hose from the fuel cock. Make sure that the fuel hose is fastened with the holder when installed.



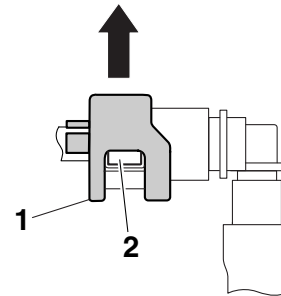
- f. Disconnect the pump case breather hose (fuel pump case–fuel tank) “3” at the fuel pump case side.
- g. Remove the fuel pump case bolt “4” and band “5”.



h. Remove the fuel pump coupler and fuel hose connector.

TIP

To remove the fuel hose from the fuel pump, slide the fuel hose connector cover “1” on the end of the hose in the direction of the arrow shown, press the two buttons “2” on the sides of the connector, and then remove the hose.



i. Remove the fuel pump case.

TIP

Place the fuel pump case so that it does not contact the installation surface of the fuel pump.



EAS26640

REMOVING THE FUEL PUMP

1. Remove:
 - Fuel pump

ECA2RD1022

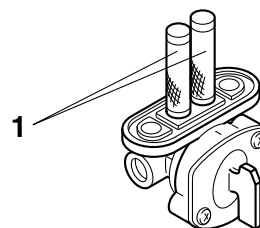
NOTICE

Do not drop the fuel pump or give it a strong shock.

EAS26650

CHECKING THE FUEL COCK

1. Check:
 - Fuel cock
Cracks/damage/wear → Replace.
2. Check:
 - Fuel cock strainer “1”
Clogging → Clean.
Blow out the jets with compressed air.
Damage → Replace the fuel cock.



EAS2RD1018

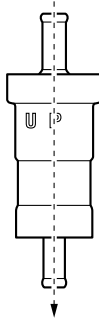
CHECKING THE ROLLOVER VALVE

1. Check:

- Rollover valve
Cracks/damage → Replace.

TIP

- Check that air flows smoothly only in the direction of the arrow shown in the illustration.
- The rollover valve must be in an upright position when checking the airflow.



EAS26670

CHECKING THE FUEL PUMP BODY

1. Check:

- Fuel pump body
Obstruction → Clean.
Cracks/damage → Replace the fuel pump assembly.

EAS26690

CHECKING THE FUEL PUMP OPERATION

1. Check:

- Fuel pump operation
Refer to “CHECKING THE PRESSURE REGULATOR OPERATION” on page 6-12.

EAS26710

INSTALLING THE FUEL PUMP

1. Install:

- Fuel pump gasket **New**
- Fuel pump
- Fuel pump bracket

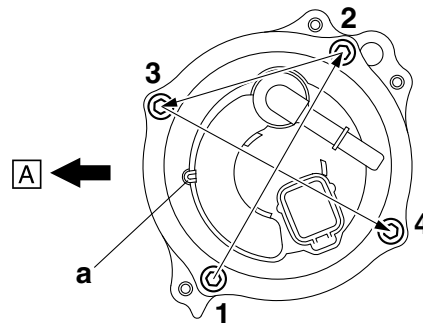


Fuel pump bolt
4.0 Nm (0.40 m·kgf, 2.9 ft·lbf)

TIP

- Do not damage the installation surfaces with the fuel pump case when installing the fuel pump.
- Use a new fuel pump gasket.
- Install the fuel pump so that it faces the direction shown in the illustration.
- Align the projection “a” on the fuel pump with the cutout on the fuel pump bracket.
- Tighten the fuel pump bolts diagonally in two

stages in order shown in the illustration.



A. Front side

EAS2RD1019

INSTALLING THE FUEL TANK

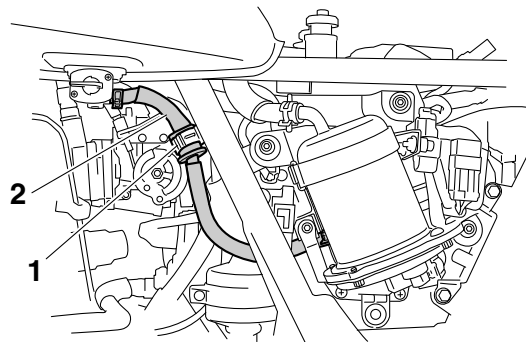
1. Install:

- Fuel hose
- Fuel tank

ECA2RD1012

NOTICE

- The fuel hose cannot be properly mounted unless it is securely connected and the fuel hose holder is installed to correct positions.
- The holder “1” is intended to avoid a fuel flow out of the fuel pump casing associated with the fuel hose “2” falling down following the removal of the hose from the fuel cock. Make sure that the fuel hose is fastened with the holder.

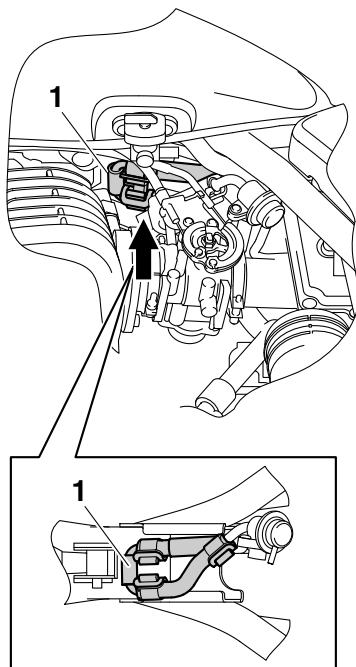


2. Check:

- Fuel hose (pressure regulator–fuel tank) location

TIP

Make sure that the fuel hose “1” is located (below the frame), as shown in the illustration.



3. Install:

- Side cover (left)
- Seat

Refer to “GENERAL CHASSIS” on page 4-1.

EAS2RD1035

INSTALLING THE FUEL PUMP CASE

1. Install:

- Fuel hose
- Fuel pump coupler
- Fuel pump case

ECA2RD1013

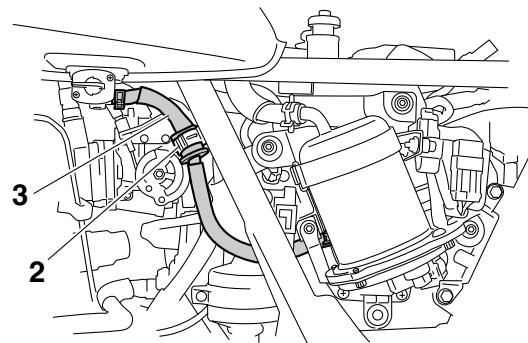
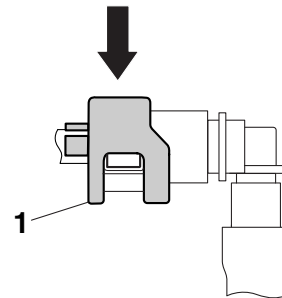
NOTICE

- When installing the fuel hose, make sure that it is securely connected, and that the fuel hose connector cover “1” on the fuel hose is in the correct position, otherwise the fuel hose will not be properly installed.
- The fuel hose cannot be properly installed unless it is securely connected and the fuel hose holder is installed to correct positions.
- The holder “2” is intended to avoid a fuel flow out of the fuel pump casing associated with the fuel hose “3” falling down following the removal of the hose from the fuel cock. Make sure that the fuel hose is fastened with the holder.

TIP

- Install the fuel hose securely onto the fuel pump until a distinct “click” is heard.
- To install the fuel hose onto the fuel pump, slide the fuel hose connector cover “1” on the

end of the hose in the direction of the arrow shown.



2. Install:

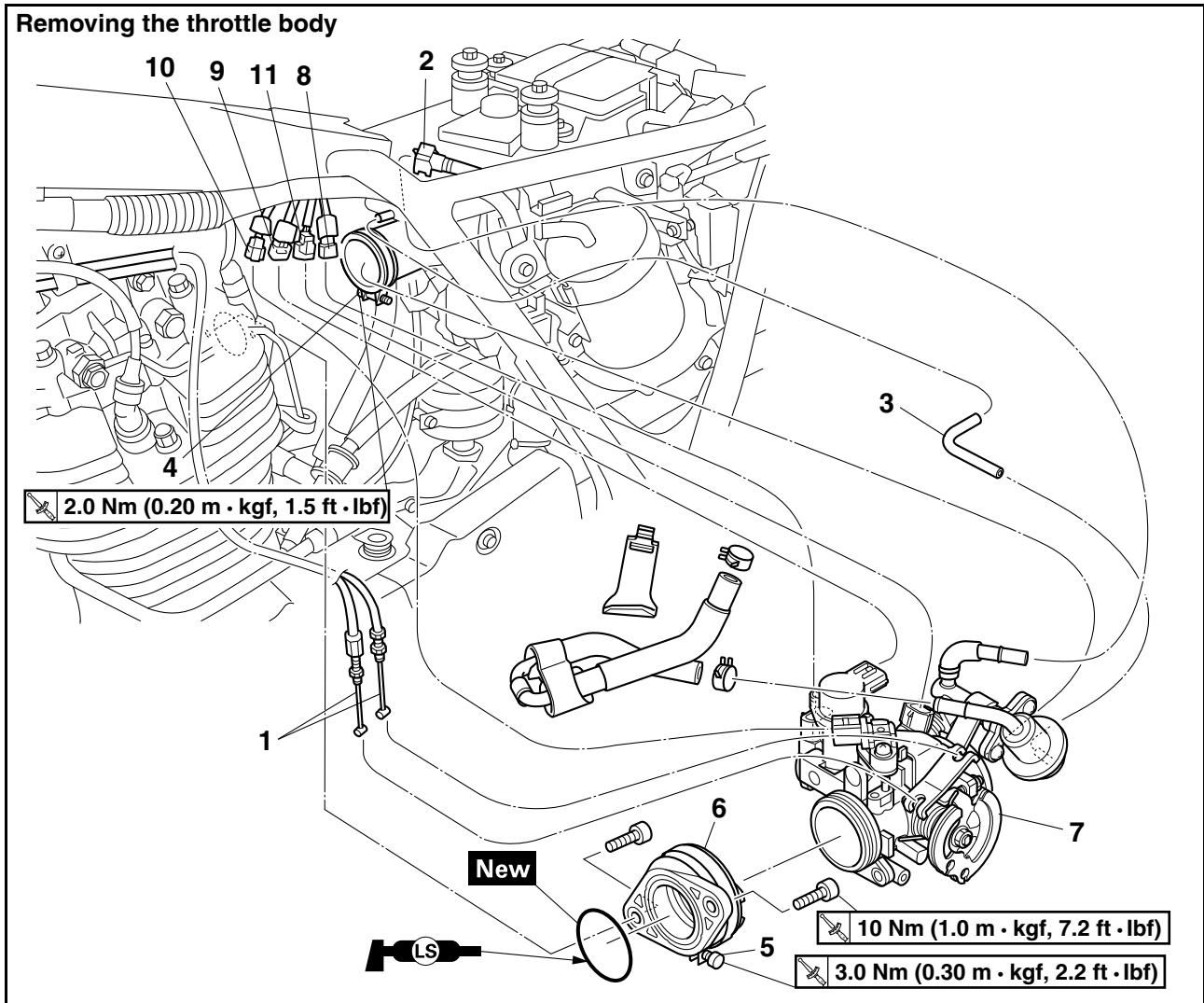
- Side cover (left)

Refer to “GENERAL CHASSIS” on page 4-1.

EAS26970

THROTTLE BODY

Removing the throttle body



Order	Job/Parts to remove	Q'ty	Remarks
	Seat		Refer to "GENERAL CHASSIS" on page 4-1.
	Side cover (left)		Refer to "GENERAL CHASSIS" on page 4-1.
	Fuel tank		Refer to "FUEL TANK" on page 6-1.
1	Throttle cable	2	
2	Fuel hose (fuel pump–fuel rail)	1	
3	Negative pressure hose (pressure regulator–air filter case)	1	
4	Clamp screw	1	Loosen.
5	Clamp screw	1	Loosen.
6	Throttle body joint	1	
7	Throttle body assembly	1	
8	Throttle position sensor coupler	1	Disconnect.
9	ISC (idle speed control valve) valve coupler	1	Disconnect.
10	Intake air pressure sensor coupler	1	Disconnect.
11	Injector coupler	1	Disconnect.

THROTTLE BODY

Removing the throttle body

2.0 Nm (0.20 m · kgf, 1.5 ft · lbf)

12

13

New

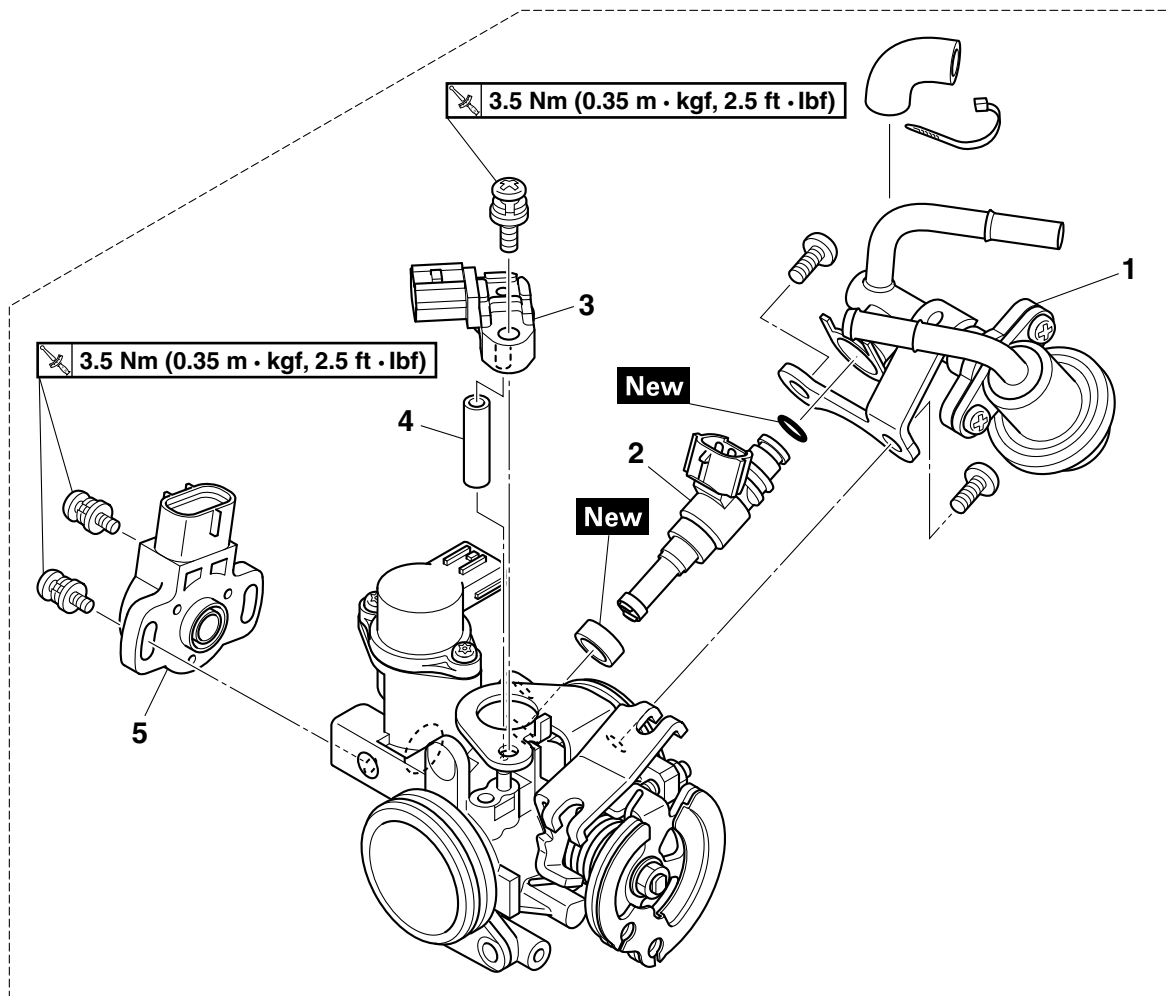
10 Nm (1.0 m · kgf, 7.2 ft · lbf)

3.0 Nm (0.30 m · kgf, 2.2 ft · lbf)

Order	Job/Parts to remove	Q'ty	Remarks
12	Cover	1	
13	Fuel hose (pressure regulator–fuel tank)	1	

THROTTLE BODY

Disassembling the throttle body



Order	Job/Parts to remove	Q'ty	Remarks
1	Fuel rail/pressure regulator assembly	1	
2	Fuel injector	1	
3	Intake air pressure sensor	1	
4	Hose	1	
5	Throttle position sensor	1	

THROTTLE BODY

special care.

- Never subject the throttle position sensor to strong shocks. If the throttle position sensor is dropped, replace it.

1. Check:

- Throttle position sensor

Refer to “CHECKING THE THROTTLE POSITION SENSOR” on page 7-70.

2. Adjust:

- Throttle position sensor angle

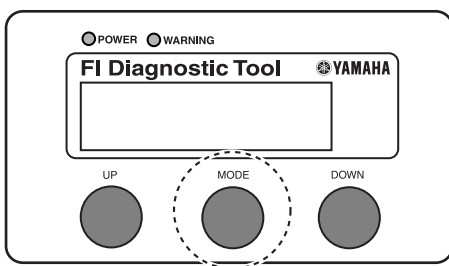
- Temporarily tighten the throttle position sensor screws.
- Make sure that the throttle grip is fully closed.
- Connect the wire harness to the throttle position sensor coupler.
- Turn the main switch to “OFF”.
- Connect the FI diagnostic tool to the self-diagnosis signal coupler.
Refer to “DIAGNOSTIC MODE” on page 7-25.

	FI diagnostic tool 90890-03182
	FI diagnostic tool YU-03182

- While pressing the “MODE” button, turn the main switch to “ON”.

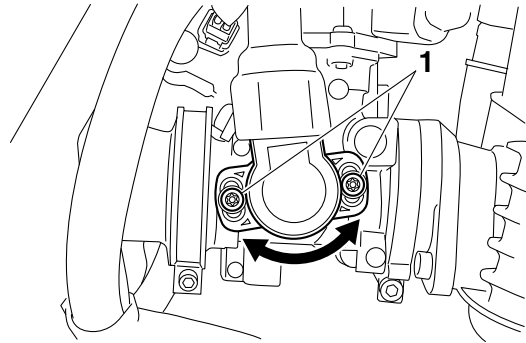
TIP

“DIAG” appears on the LCD of the FI diagnostic tool.



- Select diagnostic code No. “D:01”.
- Adjust the position of the throttle position sensor angle so that 14–20 can appear in the LCD.
- After adjusting the throttle position sensor angle, tighten the throttle position sensor screws “1”.

	Throttle position sensor screw 3.5 Nm (0.35 m·kgf, 2.5 ft·lbf)

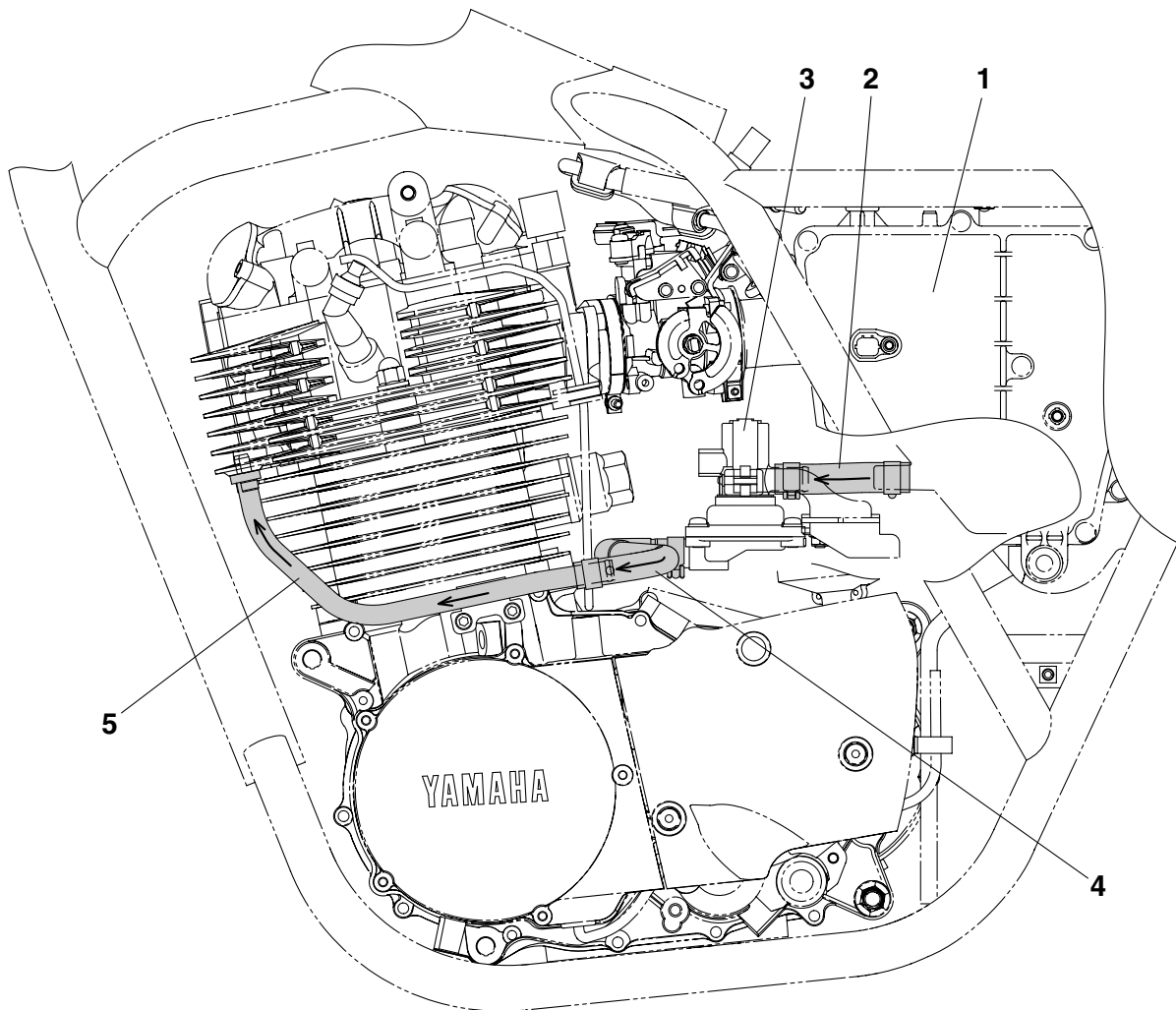
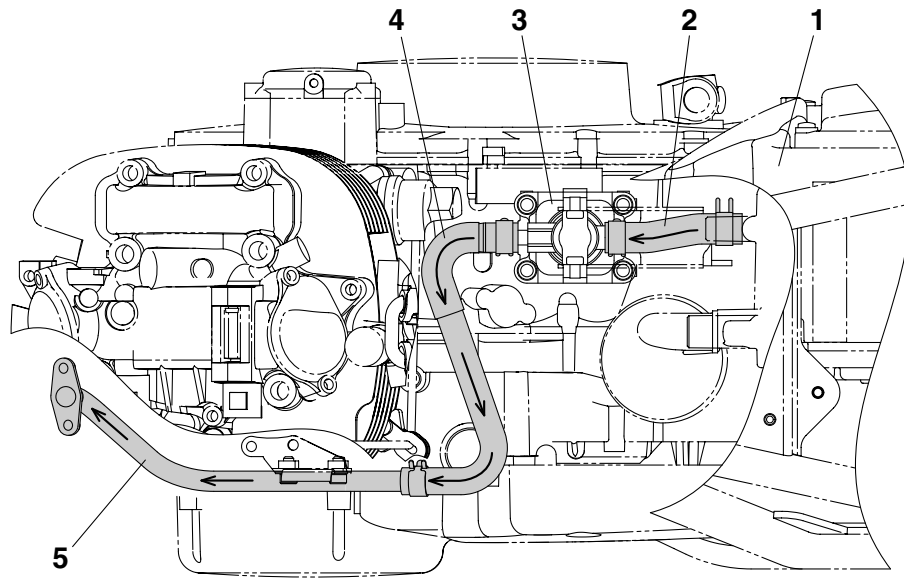


- Disconnect the FI diagnostic tool and install the self-diagnosis signal coupler cap.

AIR INDUCTION SYSTEM

EAS27040

AIR INDUCTION SYSTEM

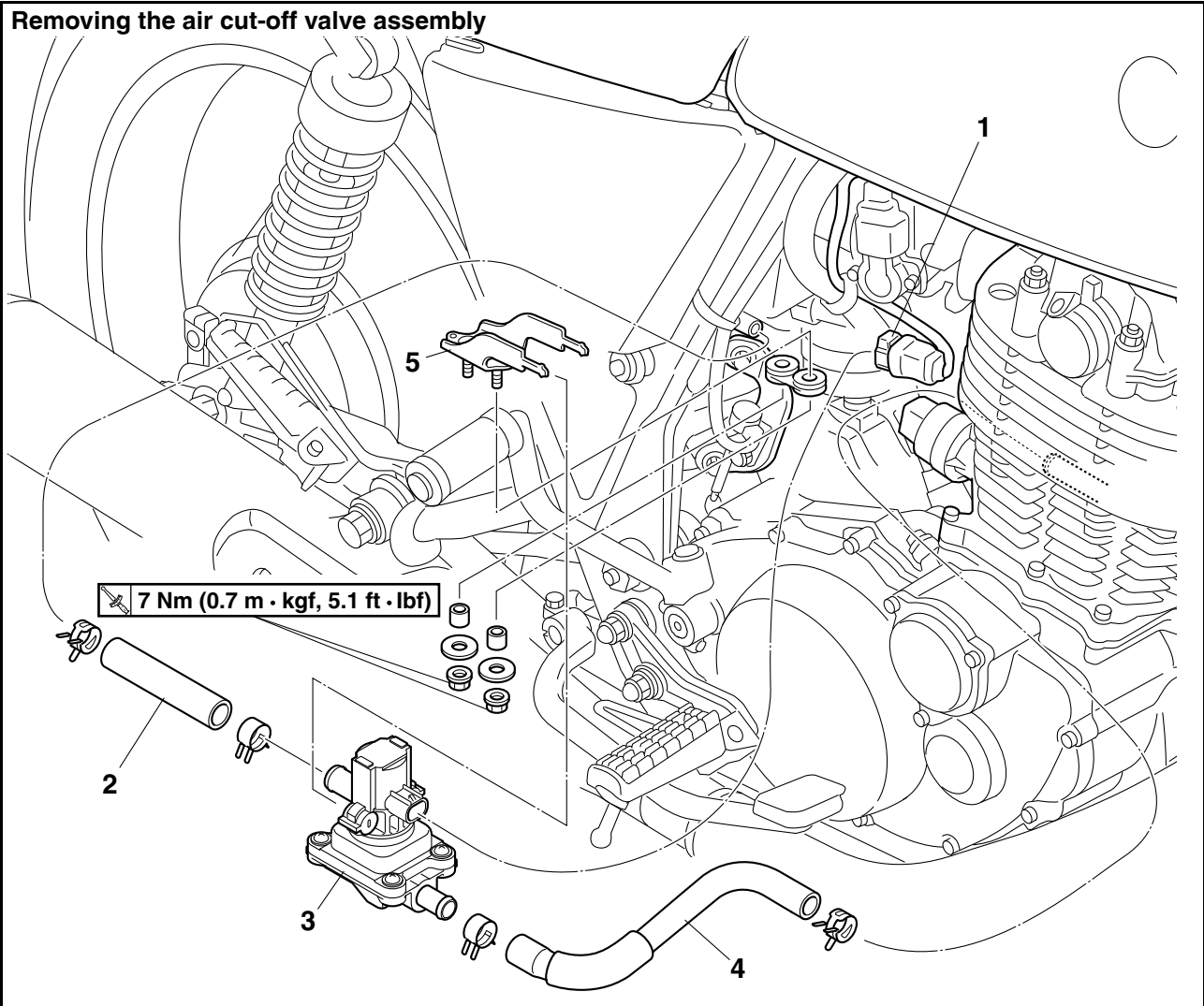


AIR INDUCTION SYSTEM

1. Air filter case
2. Air induction system hose (air filter case–air cut-off valve)
3. Air cut-off valve
4. Air induction system hose (air cut-off valve–air induction system pipe)
5. Air induction system pipe

AIR INDUCTION SYSTEM

Removing the air cut-off valve assembly



Order	Job/Parts to remove	Q'ty	Remarks
1	Air induction system solenoid coupler	1	Disconnect.
2	Air induction system hose (air filter case–air cut-off valve)	1	Remove from the air filter case side
3	Air cut-off valve	1	
4	Air induction system hose (air cut-off valve–air induction system pipe)	1	
5	Air cut-off valve bracket	1	

EAS27060

CHECKING THE AIR INDUCTION SYSTEM

Air injection

The air induction system burns unburned exhaust gases by injecting fresh air (secondary air) into the exhaust port, reducing the emission of hydrocarbons. When there is negative pressure at the exhaust port, the reed valve opens, allowing secondary air to flow into the exhaust port. The required temperature for burning the unburned exhaust gases is approximately 600 to 700 °C (1112 to 1292 °F).

Air cut-off valve

The air cut-off valve is controlled by the signals from the ECU in accordance with the combustion conditions. Ordinarily, the air cut-off valve opens to allow the air to flow during idle and closes to cut-off the flow when the vehicle is being driven. However, if the coolant temperature is below the specified value, the air cut-off valve remains open and allows the air to flow into the exhaust pipe until the temperature becomes higher than the specified value.

2. Check:

- Air cut-off valve
Cracks/damage → Replace.

3. Check:

- Air induction system solenoid
Refer to "CHECKING THE AIR INDUCTION SYSTEM SOLENOID" on page 7-71.

EAS27070

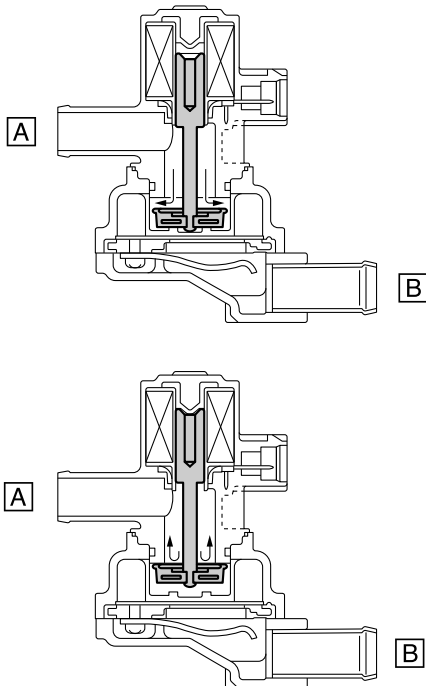
INSTALLING THE AIR INDUCTION SYSTEM

1. Install:

- Air cut-off valve bracket
- Air cut-off valve
- Air induction system solenoid coupler



**Air cut-off valve bracket nut
7 Nm (0.7 m·kgf, 5.1 ft·lbf)**



A. From the air filter case

B. To the cylinder head

1. Check:

- Hose
Loose connections → Connect properly.
Cracks/damage → Replace.
- Pipe
Cracks/damage → Replace.

ELECTRICAL SYSTEM

IGNITION SYSTEM	7-1
CIRCUIT DIAGRAM	7-1
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CIRCUIT DIAGRAM	7-7
TROUBLESHOOTING	7-9
LIGHTING SYSTEM	7-11
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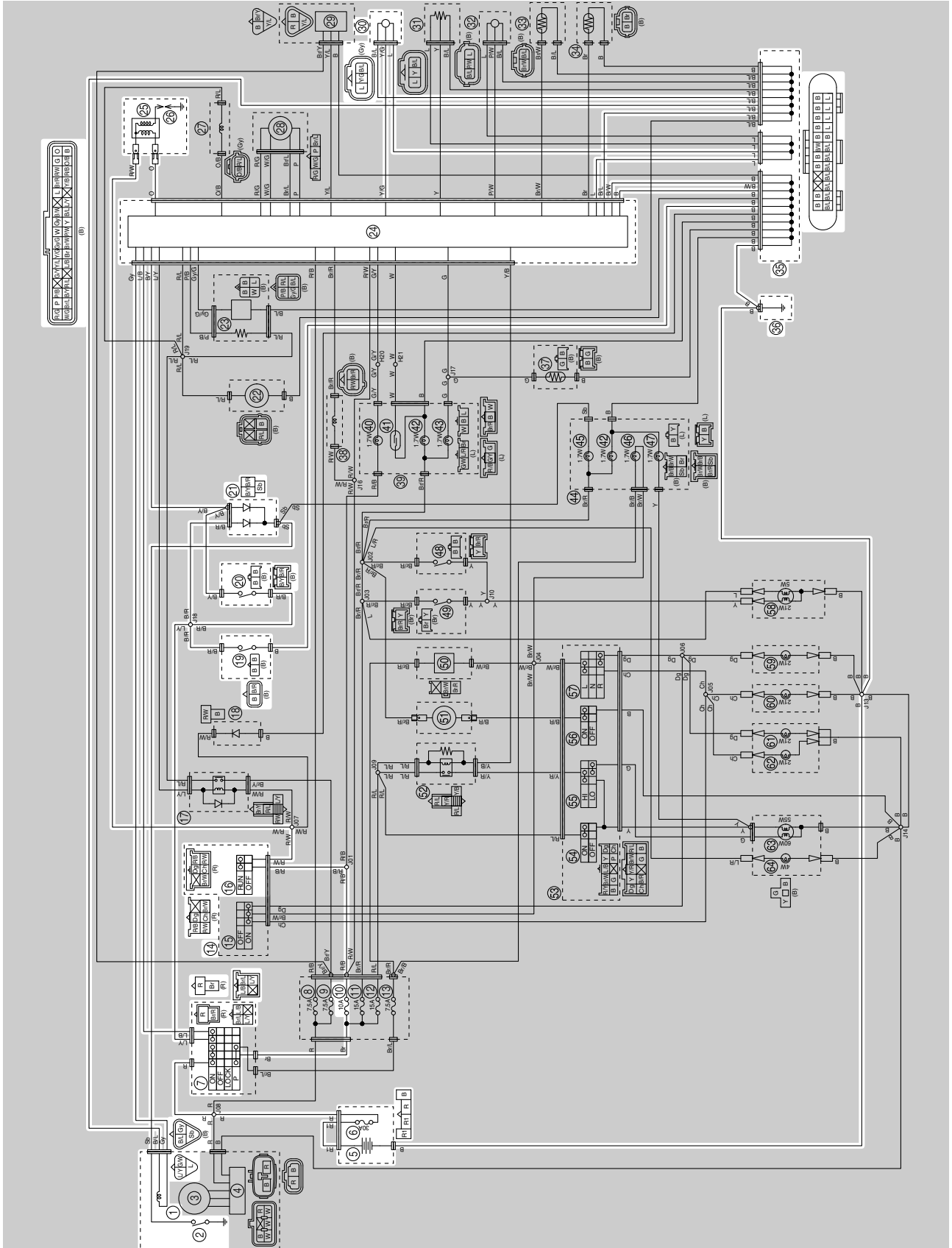
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EAS27090

IGNITION SYSTEM

EAS27100

CIRCUIT DIAGRAM



IGNITION SYSTEM

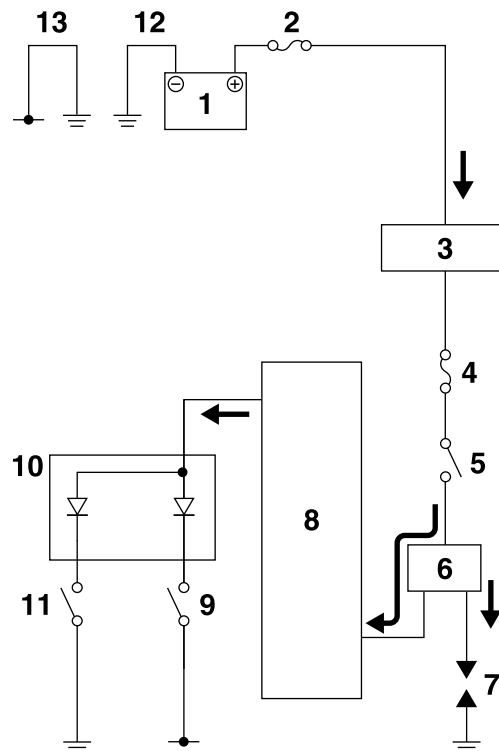
1. Crankshaft position sensor
2. Neutral switch
5. Battery
6. Main fuse
7. Main switch
10. Ignition fuse
14. Right handlebar switch
16. Engine stop switch
19. Sidestand switch
20. Clutch switch
21. Diode 1
24. ECU (engine control unit)
25. Ignition coil
26. Spark plug
30. Lean angle sensor
35. Joint coupler
36. Frame ground

EAS32020

ENGINE STOPPING DUE TO SIDESTAND OPERATION

When the engine is running and the transmission is in gear, the engine will stop if the sidestand is moved down. This is because the electric current from the ECU does not flow to the ignition coil or injector when the neutral switch circuit or sidestand switch circuit is open. However, the engine continues to run under the following conditions:

- The transmission is in gear (the neutral switch circuit is open) and the sidestand is up (the sidestand switch circuit is closed).
- The transmission is in neutral (the neutral switch circuit is closed) and the sidestand is down (the sidestand switch circuit is open).



IGNITION SYSTEM

1. Battery
2. Main fuse
3. Main switch
4. Ignition fuse
5. Engine stop switch
6. Ignition coil
7. Spark plug
8. ECU (engine control unit)
9. Sidestand switch
10. Diode 1
11. Neutral switch
12. Negative battery lead
13. Frame ground

EAS27131

TROUBLESHOOTING

The ignition system fails to operate (no spark or intermittent spark).

TIP

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

1. Seat
2. Side cover (left)
3. Fuel tank
4. Crankcase cover (left)
5. Drive sprocket cover

<p>1. Check the fuses. (Main and ignition) Refer to "CHECKING THE FUSES" on page 7-59.</p>	NG→	<p>Replace the fuse(s).</p>
OK↓		
<p>2. Check the battery. Refer to "CHECKING AND CHARGING THE BATTERY" on page 7-60.</p>	NG→	<ul style="list-style-type: none"> • Clean the battery terminals. • Recharge or replace the battery.
OK↓		
<p>3. Check the spark plug. Refer to "CHECKING THE SPARK PLUG" on page 3-5.</p>	NG→	<p>Re-gap or replace the spark plug.</p>
OK↓		
<p>4. Check the ignition spark gap. Refer to "CHECKING THE IGNI- TION SPARK GAP" on page 7-66.</p>	OK→	<p>Ignition system is OK.</p>
NG↓		
<p>5. Check the spark plug cap. Refer to "CHECKING THE SPARK PLUG CAP" on page 7-65.</p>	NG→	<p>Replace the spark plug cap.</p>
OK↓		
<p>6. Check the ignition coil. Refer to "CHECKING THE IGNI- TION COIL" on page 7-65.</p>	NG→	<p>Replace the ignition coil</p>
OK↓		
<p>7. Check the crankshaft position sen- sor. Refer to "CHECKING THE CRANK- SHAFT POSITION SENSOR" on page 7-67.</p>	NG→	<p>Replace the stator coil assembly.</p>
OK↓		
<p>8. Check the main switch. Refer to "CHECKING THE SWITCHES" on page 7-55.</p>	NG→	<p>Replace the main switch.</p>
OK↓		

IGNITION SYSTEM

9. Check the engine stop switch. Refer to "CHECKING THE SWITCHES" on page 7-55.	NG→	Replace the right handlebar switch.
OK↓		
10. Check the neutral switch. Refer to "CHECKING THE SWITCHES" on page 7-55.	NG→	Replace the neutral switch.
OK↓		
11. Check the sidestand switch. Refer to "CHECKING THE SWITCHES" on page 7-55.	NG→	Replace the sidestand switch.
OK↓		
12. Check the clutch switch. Refer to "CHECKING THE SWITCHES" on page 7-55.	NG→	Replace the clutch switch.
OK↓		
13. Check the diode 1. Refer to "CHECKING THE DIODE" on page 7-64.	NG→	Replace the diode 1.
OK↓		
14. Check the lean angle sensor. Refer to "CHECKING THE LEAN ANGLE SENSOR" on page 7-67.	NG→	Replace the lean angle sensor.
OK↓		
15. Check the entire ignition system wiring. Refer to "CIRCUIT DIAGRAM" on page 7-1.	NG→	Properly connect or repair the ignition system wiring.
OK↓		
Replace the ECU (engine control unit).		

CHARGING SYSTEM

3. AC magneto
4. Rectifier/regulator
5. Battery
6. Main fuse
36. Frame ground

CHARGING SYSTEM

EAS27220

TROUBLESHOOTING

The battery is not being charged.

TIP

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

1. Seat
2. Side cover (left)
3. Fuel tank
4. Crankcase cover (left)

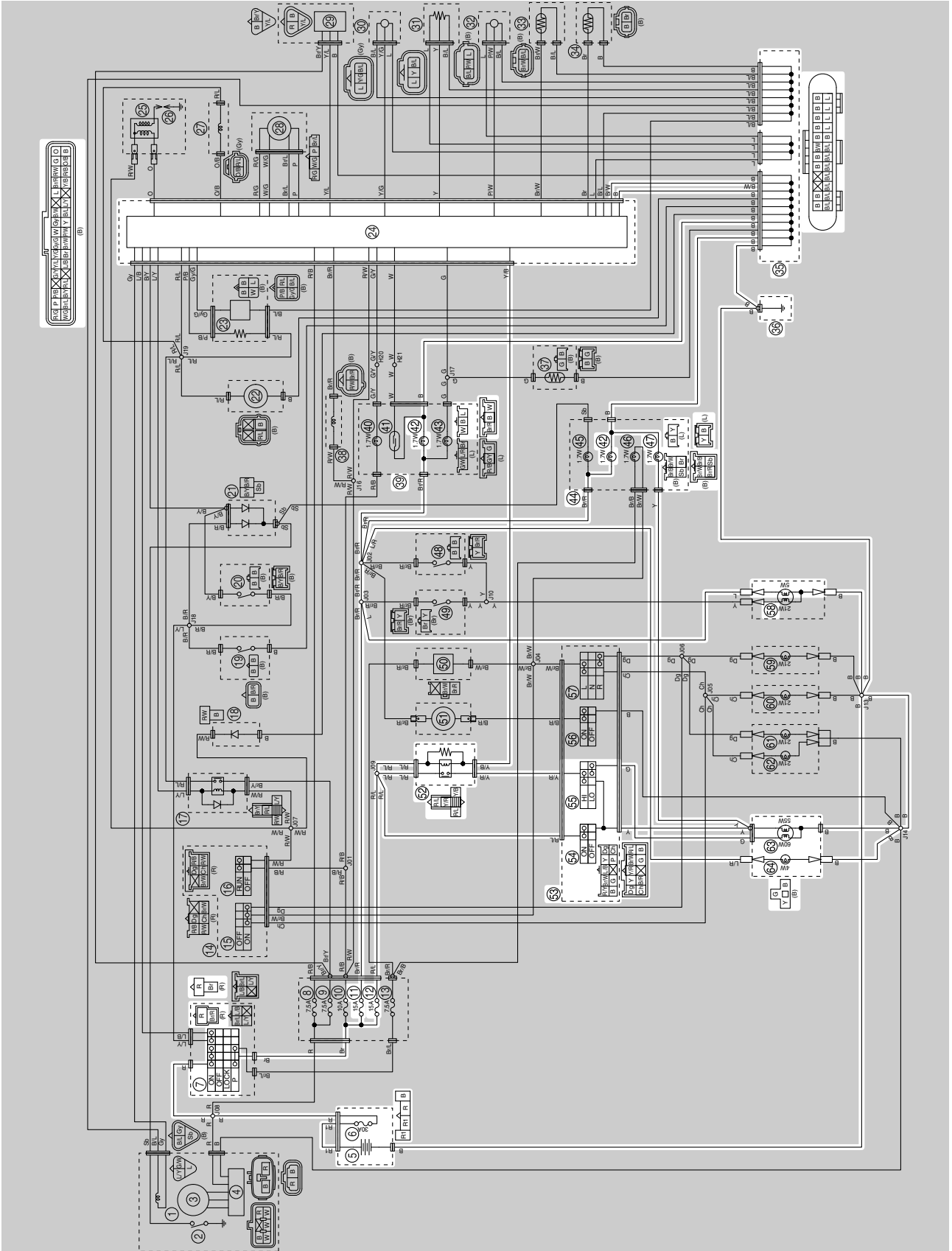
1. Check the fuse. (Main) Refer to "CHECKING THE FUSES" on page 7-59.	NG→	Replace the fuse(s).
OK↓		
2. Check the battery. Refer to "CHECKING AND CHARGING THE BATTERY" on page 7-60.	NG→	<ul style="list-style-type: none">• Clean the battery terminals.• Recharge or replace the battery.
OK↓		
3. Check the stator coil. Refer to "CHECKING THE STA- TOR COIL" on page 7-68.	NG→	Replace the stator coil assembly.
OK↓		
4. Check the rectifier/regulator. Refer to "CHECKING THE RECTI- FIER/REGULATOR" on page 7-68.	NG→	Replace the rectifier/regulator.
OK↓		
5. Check the entire charging system wiring. Refer to "CIRCUIT DIAGRAM" on page 7-7.	NG→	Properly connect or repair the charging system wiring.
OK↓		
The charging system circuit is OK.		

EAS27240

LIGHTING SYSTEM

EAS27250

CIRCUIT DIAGRAM



- 5. Battery
- 6. Main fuse
- 7. Main switch
- 11. Signaling system fuse
- 12. Headlight fuse
- 24. ECU (engine control unit)
- 35. Joint coupler
- 36. Frame ground
- 39. Speedometer
- 42. Meter light
- 44. Tachometer
- 47. High beam indicator light
- 52. Headlight relay (on/off)
- 53. Left handlebar switch
- 54. Pass switch
- 55. Dimmer switch
- 58. Tail/brake light
- 63. Headlight
- 64. Auxiliary light

EAS27260

TROUBLESHOOTING

Any of the following fail to light: headlight, high beam indicator light, tail light, auxiliary light or meter light

TIP

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

1. Seat
2. Fuel side cover (left)
3. Fuel tank
4. Fuel pump case

<p>1. Check the each bulbs and bulb sockets condition. Refer to "CHECKING THE BULBS AND BULB SOCKETS" on page 7-58.</p>	NG→	<p>Replace the bulb(s) and bulb socket(s).</p>
OK↓		
<p>2. Check the fuses. (Main, headlight and signaling system) Refer to "CHECKING THE FUSES" on page 7-59.</p>	NG→	<p>Replace the fuse(s).</p>
OK↓		
<p>3. Check the battery. Refer to "CHECKING AND CHARGING THE BATTERY" on page 7-60.</p>	NG→	<ul style="list-style-type: none"> • Clean the battery terminals. • Recharge or replace the battery.
OK↓		
<p>4. Check the main switch. Refer to "CHECKING THE SWITCHES" on page 7-55.</p>	NG→	<p>Replace the main switch.</p>
OK↓		
<p>5. Check the dimmer switch. Refer to "CHECKING THE SWITCHES" on page 7-55.</p>	NG→	<p>The dimmer switch is faulty. Replace the left handlebar switch.</p>
OK↓		
<p>6. Check the pass switch. Refer to "CHECKING THE SWITCHES" on page 7-55.</p>	NG→	<p>The pass switch is faulty. Replace the left handlebar switch.</p>
OK↓		
<p>7. Check the headlight relay (on/off). Refer to "CHECKING THE RELAYS" on page 7-63.</p>	NG→	<p>Replace the headlight relay (on/off).</p>
OK↓		

LIGHTING SYSTEM

8. Check the entire lighting system wiring.
Refer to "CIRCUIT DIAGRAM" on page 7-11.

OK↓

Replace the ECU (engine control unit) or meter assembly.

NG→

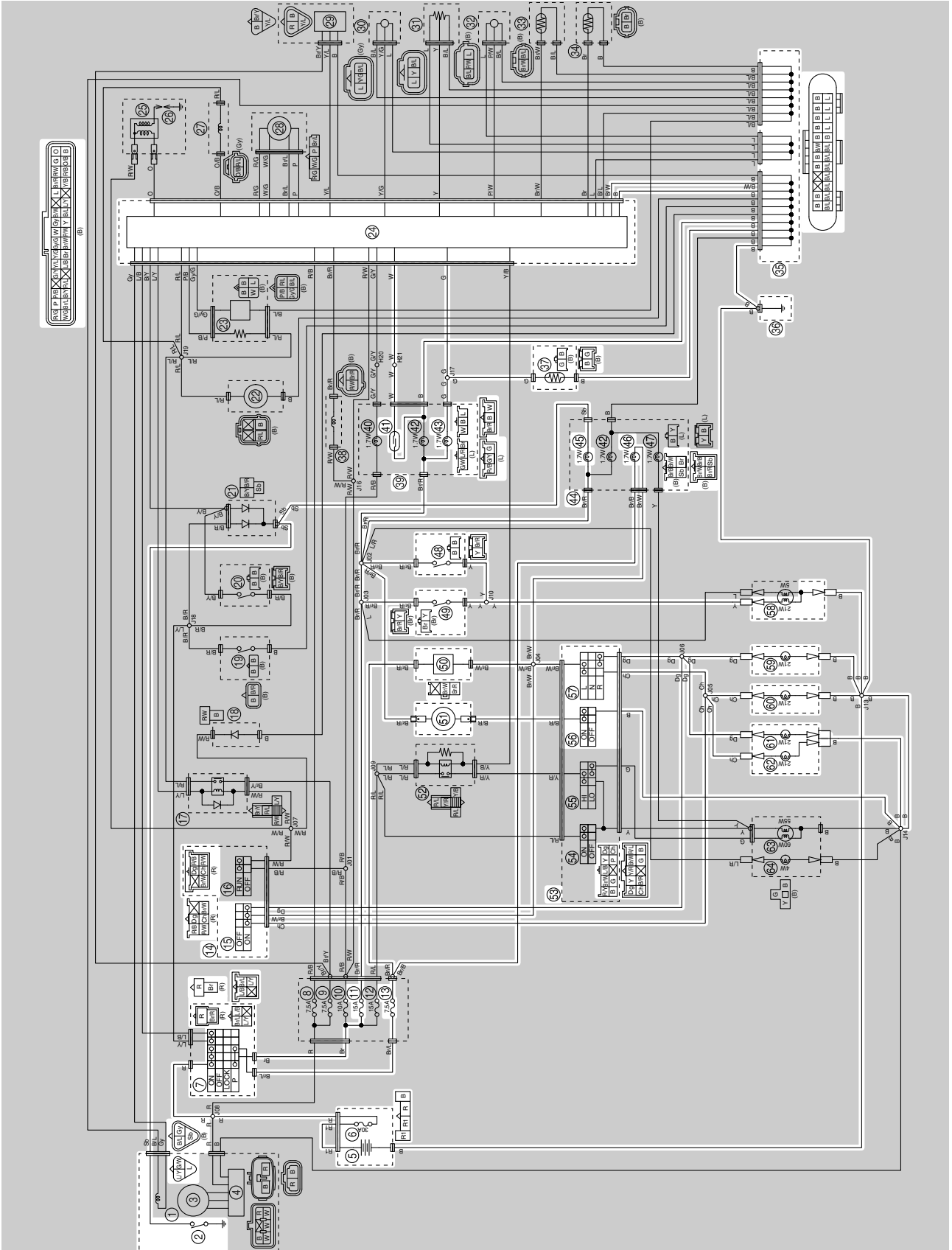
Properly connect or repair the lighting system wiring.

EAS27270

SIGNALING SYSTEM

EAS27280

CIRCUIT DIAGRAM



- 2. Neutral switch
- 5. Battery
- 6. Main fuse
- 7. Main switch
- 11. Signaling system fuse
- 13. Parking lighting fuse
- 14. Right handlebar switch
- 15. Hazard switch
- 24. ECU (engine control unit)
- 35. Joint coupler
- 36. Frame ground
- 37. Fuel sender
- 39. Speedometer
- 41. Speed sensor
- 43. Fuel level warning light
- 44. Tachometer
- 45. Neutral indicator light
- 46. Turn signal indicator light
- 48. Front brake light switch
- 49. Rear brake light switch
- 50. Turn signal/hazard relay
- 51. Horn
- 53. Left handlebar switch
- 56. Horn switch
- 57. Turn signal switch
- 58. Tail/brake light
- 59. Rear right turn signal light
- 60. Rear left turn signal light
- 61. Front right turn signal light
- 62. Front left turn signal light

EAS27290

TROUBLESHOOTING

- Any of the following fail to light: turn signal light, brake light or an indicator light.
- The horn fails to sound.

TIP

- Before troubleshooting, remove the following part(s):
 1. Seat
 2. Side cover (left)
 3. Fuel tank
 4. Fuel pump case

<p>1. Check the fuses. (Main, signaling system and parking lighting) Refer to "CHECKING THE FUSES" on page 7-59.</p>	NG→	<p>Replace the fuse(s).</p>
OK↓		
<p>2. Check the battery. Refer to "CHECKING AND CHARGING THE BATTERY" on page 7-60.</p>	NG→	<ul style="list-style-type: none"> • Clean the battery terminals. • Recharge or replace the battery.
OK↓		
<p>3. Check the main switch. Refer to "CHECKING THE SWITCHES" on page 7-55.</p>	NG→	<p>Replace the main switch.</p>
OK↓		
<p>4. Check the entire signaling system wiring. Refer to "CIRCUIT DIAGRAM" on page 7-15.</p>	NG→	<p>Properly connect or repair or replace the signaling system wiring.</p>
OK↓		
<p>Check the condition of each of the signaling system circuits. Refer to "Checking the signaling system".</p>		
<p>Checking the signaling system</p>		
<p><u>The horn fails to sound.</u></p>		
<p>1. Check the horn switch. Refer to "CHECKING THE SWITCHES" on page 7-55.</p>	NG→	<p>Replace the left handlebar switch.</p>
OK↓		
<p>2. Check the horn. Refer to "CHECKING THE HORN" on page 7-68.</p>	NG→	<p>Replace the horn.</p>
OK↓		

SIGNALING SYSTEM

3. Check the entire signaling system wiring. Refer to "CIRCUIT DIAGRAM" on page 7-15.	NG→	Properly connect or repair the signaling system wiring.
OK↓		
This circuit is OK.		
<u>The tail/brake light fails to come on.</u>		
1. Check the tail/brake light bulb and socket. Refer to "CHECKING THE BULBS AND BULB SOCKETS" on page 7-58.	NG→	Replace the tail/brake light bulb, socket or both.
OK↓		
2. Check the front brake light switch. Refer to "CHECKING THE SWITCHES" on page 7-55.	NG→	Replace the front brake light switch.
OK↓		
3. Check the rear brake light switch. Refer to "CHECKING THE SWITCHES" on page 7-55.	NG→	Replace the rear brake light switch.
OK↓		
4. Check the entire signaling system wiring. Refer to "CIRCUIT DIAGRAM" on page 7-15.	NG→	Properly connect or repair or replace the signaling system wiring.
OK↓		
This circuit is OK.		
<u>The turn signal light, turn signal indicator light or both fail to blink.</u>		
1. Check the turn signal indicator light bulb and socket. Refer to "CHECKING THE BULBS AND BULB SOCKETS" on page 7-58.	NG→	Replace the turn signal light bulb(s), socket(s) or both.
OK↓		
2. Check the turn signal switch. Refer to "CHECKING THE SWITCHES" on page 7-55.	NG→	Replace the left handlebar switch.
OK↓		
3. Check the hazard switch. Refer to "CHECKING THE SWITCHES" on page 7-55.	NG→	Replace the right handlebar switch.
OK↓		

SIGNALING SYSTEM

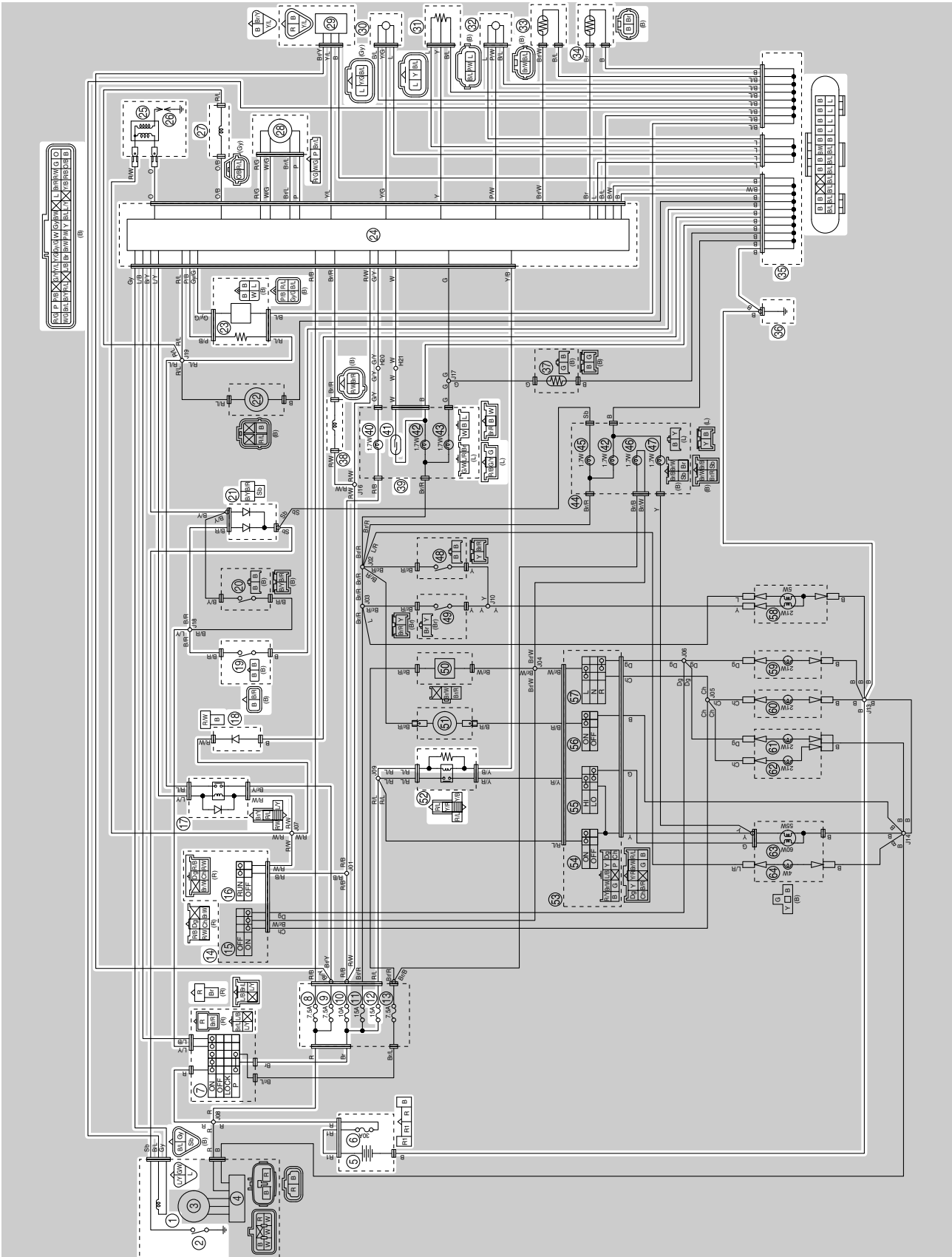
4. Check the turn signal/hazard relay. Refer to "CHECKING THE TURN SIGNAL/HAZARD RELAY" on page 7-63.	NG→	Replace the turn signal/hazard relay.
OK↓		
5. Check the entire signaling system wiring. Refer to "CIRCUIT DIAGRAM" on page 7-15.	NG→	Properly connect or repair the signaling system wiring.
OK↓		
Replace the meter assembly.		
<u>The neutral indicator light fails to come on.</u>		
1. Check the neutral indicator light bulb and socket. Refer to "CHECKING THE BULBS AND BULB SOCKETS" on page 7-58.	NG→	Replace the neutral indicator light bulb, socket or both.
OK↓		
2. Check the neutral switch. Refer to "CHECKING THE SWITCHES" on page 7-55.	NG→	Replace the neutral switch.
OK↓		
3. Check the entire signaling system wiring. Refer to "CIRCUIT DIAGRAM" on page 7-15.	NG→	Properly connect or repair the signaling system wiring.
OK↓		
Replace the meter assembly.		
<u>The fuel level warning light fails to come on.</u>		
1. Check the fuel level warning light bulb and socket. Refer to "CHECKING THE BULBS AND BULB SOCKETS" on page 7-58.	NG→	Replace the fuel level warning light bulb, socket or both.
OK↓		
2. Check the fuel sender. Refer to "CHECKING THE FUEL SENDER" on page 7-69.	NG→	Replace the fuel sender.
OK↓		
3. Check the entire signaling system wiring. Refer to "CIRCUIT DIAGRAM" on page 7-15.	NG→	Properly connect or repair the signaling system wiring.
OK↓		
This circuit is OK.		

EAS27331

FUEL INJECTION SYSTEM

EAS27340

CIRCUIT DIAGRAM



FUEL INJECTION SYSTEM

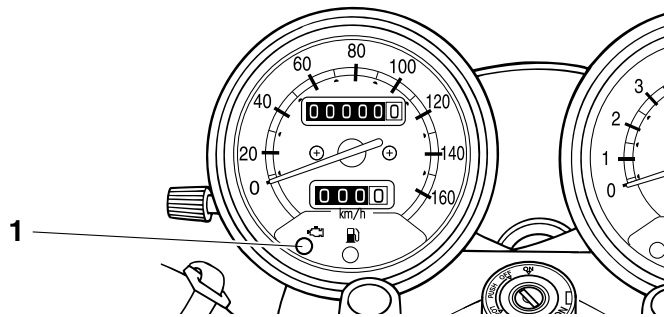
1. Crankshaft position sensor
2. Neutral switch
5. Battery
6. Main fuse
7. Main switch
8. Backup fuse
9. Fuel injection system fuse
10. Ignition fuse
12. Headlight fuse
14. Right handlebar switch
16. Engine stop switch
17. Fuel pump relay
18. Diode 2
19. Sidestand switch
21. Diode 1
23. O₂ sensor
24. ECU (engine control unit)
25. Ignition coil
26. Spark plug
27. Fuel injector
28. ISC (idle speed control) valve
29. FI diagnostic tool (OPTION)
30. Lean angle sensor
31. Throttle position sensor
32. Intake air pressure sensor
33. Intake air temperature sensor
34. Engine temperature sensor
35. Joint coupler
36. Frame ground
38. Air induction system solenoid
39. Speedometer
40. Engine trouble warning light
41. Speed sensor
52. Headlight relay (on/off)

EAS30570

ECU SELF-DIAGNOSTIC FUNCTION

The ECU is equipped with a self-diagnostic function in order to ensure that the fuel injection system is operating normally. If this function detects a malfunction in the system, it immediately operates the engine under substitute characteristics and illuminates the engine trouble warning light to alert the rider that a malfunction has occurred in the system. Once a malfunction has been detected, a fault code number is stored in the memory of the ECU.

- To inform the rider that the fuel injection system is not functioning, the engine trouble warning light flashes while the engine is being cranked at an engine start-up.
- If a malfunction is detected in the system by the self-diagnostic function, the ECU provides an appropriate substitute characteristic operation, and alerts the rider of the detected malfunction by illuminating the engine trouble warning light.
- After the engine has been stopped, the lowest fault code number is indicated by the engine trouble warning light (or displayed on the FI diagnostic tool). This number remains stored in the memory of the ECU until it is deleted.



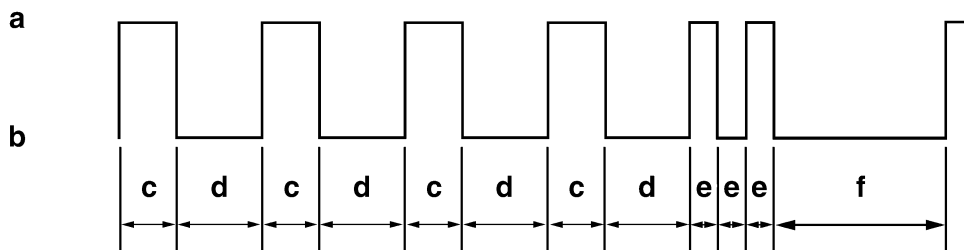
1. Engine trouble warning light

Engine trouble warning light fault code number indication

Digit of 10: Cycles of 1 sec. on and 1.5 sec. off.

Digit of 1: Cycles of 0.5 sec. on and 0.5 sec. off.

Example: 42



- Light on
- Light off
- 1
- 1.5
- 0.5
- 3

FUEL INJECTION SYSTEM

Engine trouble warning light indication and fuel injection system operation

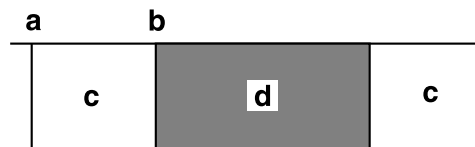
Warning light indication	ECU operation	Fuel injection operation	Vehicle operation
Flashing*	Warning provided when unable to start engine	Operation stopped	Cannot be operated
Remains on	Malfunction detected	Operated with substitute characteristics in accordance with the description of the malfunction	Can or cannot be operated depending on the fault code number

* The warning light flashes if the engine is cranked under any of the following conditions.

- | | | | |
|-----|---|-----|--|
| 19: | Blue/black ECU lead
(broken or disconnected) | | |
| 30: | Lean angle sensor
(latch up detected) | 41: | Lean angle sensor
(open or short circuit) |
| 33: | Faulty ignition | 50: | ECU internal malfunction
(memory check error) |

Checking the engine trouble warning light

The engine trouble warning light comes on for 3 seconds after the main switch has been set to "ON". If the warning light does not come on under these conditions, the warning light bulb may be defective.



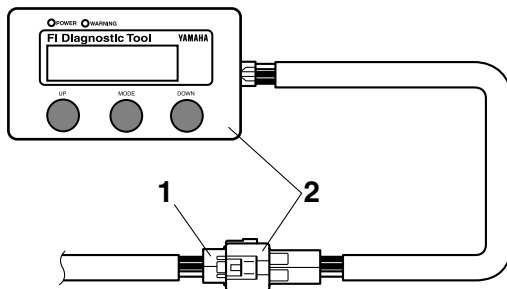
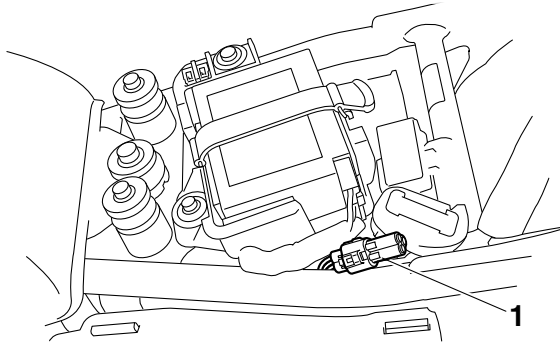
- | | |
|--|---|
| a. Main switch "OFF" | d. Engine trouble warning light: On for 3 seconds |
| b. Main switch "ON" | |
| c. Engine trouble warning light: Light off | |

ECU detects an abnormal signal from a sensor

If the ECU detects an abnormal signal from a sensor while the vehicle is being driven, the ECU illuminates the engine trouble warning light and provides the engine with alternate operating instructions that are appropriate for the type of malfunction.

When an abnormal signal is received from a sensor, the ECU processes the specified values that are programmed for each sensor in order to provide the engine with alternate operating instructions that enable the engine to continue operating or stop operating, depending on the conditions.

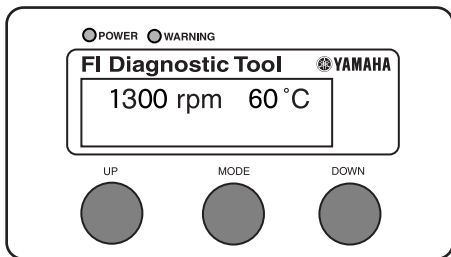
FUEL INJECTION SYSTEM



3. Turn the main switch to “ON” and start the engine.

TIP

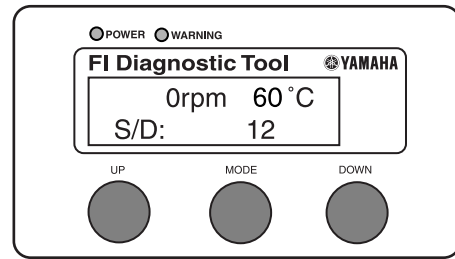
- The engine temperature and engine speed appear on the LCD of the FI diagnostic tool.
- “POWER” LED (green) comes on.
- If a malfunction is detected in the system, the “WARNING” LED (orange) comes on.



4. Stop the engine.

TIP

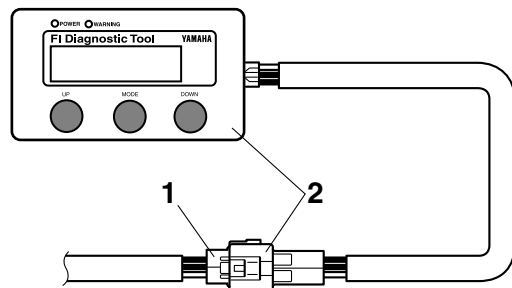
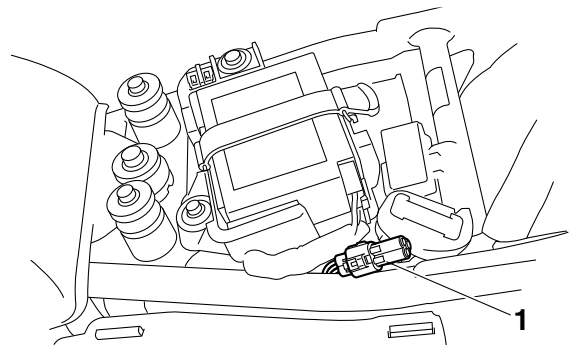
If a malfunction is detected in the system, the fault code number appears on the LCD of the FI diagnostic tool. In addition, the “WARNING” LED (orange) comes on.



5. Turn the main switch to “OFF” to cancel the normal mode.
6. Disconnect the FI diagnostic tool and install the self-diagnosis signal coupler cap.

Setting the diagnostic mode

1. Turn the main switch to “OFF” and engine stop switch to “○”.
2. Connect the self-diagnosis signal coupler “1” to the FI diagnostic tool “2” as shown.



3. Disconnect the wire harness coupler from the fuel pump.
4. While pressing the “MODE” button, turn the main switch to “ON”.

TIP

- “DIAG” appears on the LCD of the FI diagnostic tool. If “CO” appears on the LCD of the FI diagnostic tool, press the “UP” button and select “DIAG”.
- “POWER” LED (green) comes on.

5. Press the "MODE" button.

TIP

The diagnostic code number "D01" appears on the LCD of the FI diagnostic tool.

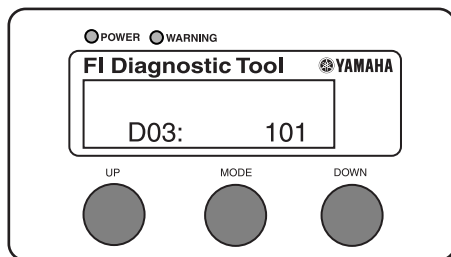
6. Set the engine stop switch to "OFF".

7. Select the diagnostic code number corresponding to the fault code number by pressing the "UP" and "DOWN" buttons.

TIP

- The diagnostic code number appears on the LCD (D01-D70).
- To decrease the selected diagnostic code number, press the "DOWN" button. Press the "DOWN" button for 1 second or more to automatically decrease the diagnostic code numbers.
- To increase the selected diagnostic code number, press the "UP" button. Press the "UP" button for 1 second or more to automatically increase the diagnostic code numbers.

corresponding fault code number, the information is shown in "DIAGNOSTIC CODE TABLE". (Refer to "DIAGNOSTIC CODE TABLE" on page 7-42.)



8. Check the operation of the sensor or actuator.

• Sensor operation

The data representing the operating conditions of the sensor appears on the LCD.

• Actuator operation

Set the engine stop switch to "⊗", then to "○".

9. Turn the main switch to "OFF" to cancel the diagnostic mode.

10. Connect the fuel pump coupler.

11. Disconnect the FI diagnostic tool and install the self-diagnosis signal coupler cap.

TIP

Information about each diagnostic code number is organized in this manual as follows:

- If a diagnostic code number has a corresponding fault code number, the information is shown in "TROUBLESHOOTING DETAILS". (Refer to "TROUBLESHOOTING DETAILS" on page 7-28.)
- If a diagnostic code number does not have a

FUEL INJECTION SYSTEM

EAS30651

TROUBLESHOOTING DETAILS

This section describes the measures per fault code number displayed on the FI diagnostic tool. Check and service the items or components that are the probable cause of the malfunction following the order given.

After the check and service of the malfunctioning part have been completed, reset the FI diagnostic tool display according to the reinstatement method.

Fault code No.:

Fault code numbers displayed on the FI diagnostic tool when the engine failed to work normally

Diagnostic code No.:

Diagnostic code number to be used when the diagnostic mode is operated (refer to "DIAGNOSTIC MODE" on page 7-25)

Fault code No.	12	
Item	Crankshaft position sensor: no normal signals are received from the crankshaft position sensor.	
Fail-safe system	Unable to start engine	
	Unable to drive vehicle	
Diagnostic code No.	—	
FI diagnostic tool display	—	
Procedure	—	
Probable cause of malfunction		Check or maintenance job
1	Installed condition of crankshaft position sensor.	<ul style="list-style-type: none"> • Check for looseness or pinching.
2	Connections <ul style="list-style-type: none"> • Crankshaft position sensor coupler • Wire harness ECU coupler 	<ul style="list-style-type: none"> • Check the coupler for any pins that may be pulled out. • Check the locking condition of the coupler. • If there is a malfunction, repair it and connect the coupler securely.
3	Open or short circuit in wire harness.	<ul style="list-style-type: none"> • Repair or replace if there is an open or short circuit. • Between crankshaft position sensor coupler and ECU coupler. B/L–B/L (black/blue–black/blue) Gy–Gy (gray–gray)
4	Defective crankshaft position sensor.	<ul style="list-style-type: none"> • Replace if defective. Refer to "CHECKING THE CRANKSHAFT POSITION SENSOR" on page 7-67.
Reinstatement method	Crank the engine.	

Fault code No.	13	
Item	Intake air pressure sensor: open or short circuit detected.	
Fail-safe system	Able to start engine	
	Able to drive vehicle	
Diagnostic code No.	D03	

FUEL INJECTION SYSTEM

Fault code No.	13	
Item	Intake air pressure sensor: open or short circuit detected.	
FI diagnostic tool display	Displays the intake air pressure.	
Procedure	Set the engine stop switch to “○”, and then operate the throttle while cranking the engine. (If the display values change, the performance is OK.)	
Probable cause of malfunction		Check or maintenance job
1	Connections <ul style="list-style-type: none"> • Intake air pressure sensor coupler • Wire harness ECU coupler • Sub-wire harness coupler 	<ul style="list-style-type: none"> • Check the coupler for any pins that may be pulled out. • Check the locking condition of the coupler. • If there is a malfunction, repair it and connect the coupler securely.
2	Open or short circuit in wire harness and/or sub-wire harness.	<ul style="list-style-type: none"> • Repair or replace if there is an open or short circuit. • Between intake air pressure sensor coupler and ECU coupler. L-L (blue-blue) P/W-P/W (pink/white-pink/white) B/L-B/L (black/blue-black/blue)
3	Defective intake air pressure sensor.	<ul style="list-style-type: none"> • Execute diagnostic code No. D03. • Replace if defective. Refer to “CHECKING THE INTAKE AIR PRESSURE SENSOR” on page 7-71.
Reinstatement method	Turn the main switch to “ON”.	

Fault code No.	14	
Item	Intake air pressure sensor: hose system malfunction (clogged or detached hose).	
Fail-safe system	Able to start engine	
	Able to drive vehicle	
Diagnostic code No.	D03	
FI diagnostic tool display	Displays the intake air pressure.	
Procedure	Set the engine stop switch to “○”, and then operate the throttle while cranking the engine. (If the display value changes, the performance is OK.)	
Probable cause of malfunction		Check or maintenance job
1	Intake air pressure sensor hose.	<ul style="list-style-type: none"> • Check the intake air pressure sensor hose condition. • Repair or replace the intake air pressure sensor hose.
2	Defective intake air pressure sensor.	<ul style="list-style-type: none"> • Execute diagnostic code No. D03. • Replace if defective. Refer to “CHECKING THE INTAKE AIR PRESSURE SENSOR” on page 7-71.

FUEL INJECTION SYSTEM

Fault code No.	14
Item	Intake air pressure sensor: hose system malfunction (clogged or detached hose).
Reinstatement method	Start the engine and let it run at idle.

Fault code No.	15
Item	Throttle position sensor: open or short circuit detected.
Fail-safe system	Able to start engine
	Able to drive vehicle
Diagnostic code No.	D01
FI diagnostic tool display	Throttle angle <ul style="list-style-type: none"> • 14–20 (fully closed position) • 79–85 (fully open position)
Procedure	<ul style="list-style-type: none"> • Check with throttle fully closed. • Check with throttle fully open.

Probable cause of malfunction		Check or maintenance job
1	Installed condition of throttle position sensor.	<ul style="list-style-type: none"> • Check for looseness or pinching. • Check that the sensor is installed in the specified position.
2	Connections <ul style="list-style-type: none"> • Throttle position sensor coupler • Wire harness ECU coupler • Sub-wire harness coupler 	<ul style="list-style-type: none"> • Check the coupler for any pins that may be pulled out. • Check the locking condition of the coupler. • If there is a malfunction, repair it and connect the coupler securely.
3	Open or short circuit in wire harness and/or sub-wire harness.	<ul style="list-style-type: none"> • Repair or replace if there is an open or short circuit. • Between throttle position sensor coupler and ECU coupler. L–L (blue–blue) B/L–B/L (black/blue–black/blue) Y–Y (yellow–yellow)
4	Defective throttle position sensor.	<ul style="list-style-type: none"> • Execute diagnostic code No. D01. • Replace if defective. Refer to “CHECKING THE THROTTLE POSITION SENSOR” on page 7-70.
Reinstatement method		Turn the main switch to “ON”.

Fault code No.	16
Item	Throttle position sensor: stuck throttle position sensor detected.
Fail-safe system	Able to start engine
	Able to drive vehicle
Diagnostic code No.	D01

FUEL INJECTION SYSTEM

Fault code No.	16	
Item	Throttle position sensor: stuck throttle position sensor detected.	
FI diagnostic tool display	Throttle angle <ul style="list-style-type: none"> • 14–20 (fully closed position) • 79–85 (fully open position) 	
Procedure	<ul style="list-style-type: none"> • Check with throttle fully closed. • Check with throttle fully open. 	
Probable cause of malfunction		Check or maintenance job
1	Installed condition of throttle position sensor.	<ul style="list-style-type: none"> • Check for looseness or pinching. • Check that the sensor is installed in the specified position.
2	Defective throttle position sensor.	<ul style="list-style-type: none"> • Execute diagnostic code No. D01. • Replace if defective. Refer to “CHECKING THE THROTTLE POSITION SENSOR” on page 7-70.
Reinstatement method	Start the engine, let it run at idle, and then race it.	

Fault code No.	19	
Item	Sidestand switch: a break or disconnection of blue/black lead of the ECU is detected.	
Fail-safe system	Unable to start engine	
	Unable to drive vehicle	
Diagnostic code No.	D20	
FI diagnostic tool display	Sidestand switch <ul style="list-style-type: none"> • on (sidestand retracted) • off (sidestand extended) 	
Procedure	Extend and retract the sidestand (with the transmission in gear).	
Probable cause of malfunction		Check or maintenance job
1	Connections <ul style="list-style-type: none"> • Wire harness ECU coupler 	<ul style="list-style-type: none"> • Check the coupler for any pins that may be pulled out. • Check the locking condition of the coupler. • If there is a malfunction, repair it and connect the coupler securely.
2	Open or short circuit in wire harness.	<ul style="list-style-type: none"> • Repair or replace if there is an open or short circuit. • Between the ECU and blue/black lead
3	Defective sidestand switch.	<ul style="list-style-type: none"> • Execute diagnostic code No. D20. • Replace if defective. Refer to “CHECKING THE SWITCHES” on page 7-55.
Reinstatement method	If the transmission in gear, retract the sidestand. If the transmission is in neutral, connect the wiring.	

FUEL INJECTION SYSTEM

Fault code No.	22	
Item	Intake air temperature sensor: open or short circuit detected.	
Fail-safe system	Able to start engine	
	Able to drive vehicle	
Diagnostic code No.	D05	
FI diagnostic tool display	Displays the intake air temperature.	
Procedure	Compare the actually measured intake air temperature with the FI diagnostic tool display value.	
Probable cause of malfunction		Check or maintenance job
1	Installed condition of intake air temperature sensor.	<ul style="list-style-type: none"> • Check for looseness or pinching.
2	Connections <ul style="list-style-type: none"> • Intake air temperature sensor coupler • Wire harness ECU coupler • Sub-wire harness coupler 	<ul style="list-style-type: none"> • Check the coupler for any pins that may be pulled out. • Check the locking condition of the coupler. • If there is a malfunction, repair it and connect the coupler securely.
3	Open or short circuit in wire harness and/or sub-wire harness.	<ul style="list-style-type: none"> • Repair or replace if there is an open or short circuit. • Between intake air temperature sensor coupler and ECU coupler. Br/W–Br/W (brown/white–brown/white) B/L–B/L (black/blue–black/blue)
4	Defective intake air temperature sensor.	<ul style="list-style-type: none"> • Execute diagnostic code No. D05. • Replace if defective. Refer to “CHECKING THE INTAKE AIR TEMPERATURE SENSOR” on page 7-72.
Reinstatement method	Turn the main switch to “ON”.	

Fault code No.	24	
Item	O₂ sensor: no normal signals are received from the O₂ sensor.	
Fail-safe system	Able to start engine	
	Able to drive vehicle	
Diagnostic code No.	—	
FI diagnostic tool display	—	
Procedure	—	
Probable cause of malfunction		Check or maintenance job
1	Installed condition of O ₂ sensor.	<ul style="list-style-type: none"> • Check for looseness or pinching.

FUEL INJECTION SYSTEM

Fault code No.		24
Item		O₂ sensor: no normal signals are received from the O₂ sensor.
2	Connections <ul style="list-style-type: none"> • O₂ sensor coupler • Wire harness ECU coupler • Sub-wire harness coupler 	<ul style="list-style-type: none"> • Check the coupler for any pins that may be pulled out. • Check the locking condition of the coupler. • If there is a malfunction, repair it and connect the coupler securely.
3	Open or short circuit in wire harness and/or sub-wire harness.	<ul style="list-style-type: none"> • Repair or replace if there is an open or short circuit. • Between O₂ sensor coupler and ECU coupler <ul style="list-style-type: none"> B/L–B/L (black/blue–black/blue) Gy/G–Gy/G (gray/green–gray/green) P/B–P/B (pink/black–pink/black) R/L–R/L (red/blue–red/blue)
4	Incorrect fuel pressure	<ul style="list-style-type: none"> • Check the fuel pressure. Refer to “CHECKING THE PRESSURE REGULATOR OPERATION” on page 6-12.
5	Defective O ₂ sensor.	<ul style="list-style-type: none"> • Replace if defective.
Reinstatement method		Start the engine and let it run at idle, or reset it with diagnostic code No. D63.

Fault code No.		28
Item		Engine temperature sensor: open or short circuit detected.
Fail-safe system		Able to start engine
		Able to drive vehicle
Diagnostic code No.		D11
FI diagnostic tool display		Displays the engine temperature.
Procedure		Compare the actually measured engine temperature with the FI diagnostic tool display value.
Probable cause of malfunction		Check or maintenance job
1	Installed condition of engine temperature sensor.	<ul style="list-style-type: none"> • Check for looseness or pinching.
2	Connections <ul style="list-style-type: none"> • Engine temperature sensor coupler • Wire harness ECU coupler • Sub-wire harness coupler 	<ul style="list-style-type: none"> • Check the coupler for any pins that may be pulled out. • Check the locking condition of the coupler. • If there is a malfunction, repair it and connect the coupler securely.

FUEL INJECTION SYSTEM

Fault code No.		28
Item		Engine temperature sensor: open or short circuit detected.
3	Open or short circuit in wire harness and/or sub-wire harness.	<ul style="list-style-type: none"> • Repair or replace if there is an open or short circuit. • Between engine temperature sensor coupler and ECU coupler. Br-Br (brown-brown) B-B/L (black-black/blue)
4	Defective engine temperature sensor.	<ul style="list-style-type: none"> • Execute diagnostic code No. D11. • Replace if defective. Refer to "CHECKING THE ENGINE TEMPERATURE SENSOR" on page 7-69.
Reinstatement method		Turn the main switch to "ON".

Fault code No.		30
Item		Latch up detected. No normal signals are received from the lean angle sensor.
Fail-safe system		Unable to start engine Unable to drive vehicle
Diagnostic code No.		D08
FI diagnostic tool display		Lean angle sensor output voltage <ul style="list-style-type: none"> • 3.6-4.5 (upright) • 0.7-1.4 (overturned)
Procedure		Remove the lean angle sensor and incline it more than 45 degrees.
Probable cause of malfunction		Check or maintenance job
1	The vehicle has overturned.	<ul style="list-style-type: none"> • Raise the vehicle upright.
2	Installed condition of lean angle sensor.	<ul style="list-style-type: none"> • Check the installed direction and condition of the sensor.
3	Connections <ul style="list-style-type: none"> • Lean angle sensor coupler • Wire harness ECU coupler 	<ul style="list-style-type: none"> • Check the coupler for any pins that may be pulled out. • Check the locking condition of the coupler. • If there is a malfunction, repair it and connect the coupler securely.
4	Defective lean angle sensor.	<ul style="list-style-type: none"> • Execute diagnostic code No. D08. • Replace if defective. Refer to "CHECKING THE LEAN ANGLE SENSOR" on page 7-67.
Reinstatement method		Turn the main switch to "ON" (however, the engine cannot be restarted unless the main switch is first set to "OFF").

FUEL INJECTION SYSTEM

Fault code No.	33	
Item	Ignition coil: open or short circuit detected in the primary lead of the ignition coil.	
Fail-safe system	Unable to start engine	
	Unable to drive vehicle	
Diagnostic code No.	D30	
Actuation	The ignition coil is actuated five times at one-second intervals, and the "WARNING" LED on the FI diagnostic tool comes on each time the coil is actuated.	
Procedure	Check that a spark is generated five times. • Connect an ignition checker.	
Probable cause of malfunction		Check or maintenance job
1	Installed condition of ignition coil.	• Check for looseness or pinching.
2	Connections <ul style="list-style-type: none"> • Ignition coil coupler • Wire harness ECU coupler • Sub-wire harness coupler 	<ul style="list-style-type: none"> • Check the coupler for any pins that may be pulled out. • Check the locking condition of the coupler. • If there is a malfunction, repair it and connect the coupler securely.
3	Open or short circuit in wire harness and/or sub-wire harness.	<ul style="list-style-type: none"> • Repair or replace if there is an open circuit. • Between ignition coil coupler and ECU coupler. O-O (orange-orange)
4	Defective ignition coil.	<ul style="list-style-type: none"> • Execute diagnostic code No. D30. • Check the primary and secondary coils for continuity. • Replace if defective. Refer to "CHECKING THE IGNITION COIL" on page 7-65.
Reinstatement method	Start the engine and let it run at idle.	

Fault code No.	37	
Item	ISC valve: engine speed is high when the engine is idling.	
Fail-safe system	Able to start engine	
	Able to drive vehicle	
Diagnostic code No.	D54	
Actuation	After the ISC valve is fully closed, it opens to the standby opening position (position when the engine is started). This operation takes approximately 3 seconds until it is completed. Illuminates the "WARNING" LED on the FI diagnostic tool.	
Procedure	Check that the ISC unit vibrates when the ISC valve operates.	
Probable cause of malfunction		Check or maintenance job

FUEL INJECTION SYSTEM

Fault code No.		37
Item		ISC valve: engine speed is high when the engine is idling.
1	Throttle valve does not fully close.	<ul style="list-style-type: none"> • Check the throttle body. Refer to “THROTTLE BODY” on page 6-9. • Check the throttle cables. Refer to “CHECKING THE THROTTLE GRIP” on page 3-24.
2	The ISC valve is stuck fully open due to a disconnected ISC unit or coupler. (High engine idle speeds are detected with the ISC valve stuck fully open even though signals for the valve to close are continuously being transmitted by the ECU.)	<ul style="list-style-type: none"> • Check the ISC unit screw for looseness or disconnection. • Check the ISC unit coupler for disconnection. • The ISC valve is stuck fully open if it does not operate when the main switch is set to “OFF”. (Make sure that the ISC unit vibrates by touching it. If the ISC valve is vibrating, it is working normally.)
3	ISC valve is not moving correctly.	<ul style="list-style-type: none"> • Execute diagnostic code No. D54. • After the ISC valve is fully closed, the valve opens to the standby opening position (position when the engine is started). This operation takes approximately 3 seconds until it is completed. Start the engine. If the error recurs, replace the throttle body assembly.
Reinstatement method		Turn the main switch to “ON” and back to “OFF” to return the ISC valve to its original position, and then start the engine. After starting, let the engine run at idle speed for about 10 seconds.

Fault code No.		41
Item		Lean angle sensor: open or short circuit detected.
Fail-safe system		Unable to start engine
		Unable to drive vehicle
Diagnostic code No.		D08
FI diagnostic tool display		Lean angle sensor output voltage <ul style="list-style-type: none"> • 3.6–4.5 (upright) • 0.7–1.4 (overtuned)
Procedure		Remove the lean angle sensor and incline it more than 45 degrees.
Probable cause of malfunction		Check or maintenance job
1	Connections <ul style="list-style-type: none"> • Lean angle sensor coupler • Wire harness ECU coupler 	<ul style="list-style-type: none"> • Check the coupler for any pins that may be pulled out. • Check the locking condition of the coupler. • If there is a malfunction, repair it and connect the coupler securely.

FUEL INJECTION SYSTEM

Fault code No.		41
Item		Lean angle sensor: open or short circuit detected.
2	Open or short circuit in wire harness.	<ul style="list-style-type: none"> • Repair or replace if there is an open or short circuit. • Between lean angle sensor coupler and ECU coupler. L-L (blue-blue) Y/G-Y/G (yellow/green-yellow/green) B/L-B/L (black/blue-black/blue)
3	Defective lean angle sensor.	<ul style="list-style-type: none"> • Execute diagnostic code No. D08. • Replace if defective. Refer to "CHECKING THE LEAN ANGLE SENSOR" on page 7-67.
Reinstatement method		Turn the main switch to "ON".

Fault code No.		42
Item		Speed sensor: no normal signals are received from the speed sensor.
Fail-safe system		Able to start engine Able to drive vehicle
Diagnostic code No.		D07
FI diagnostic tool display		Vehicle speed pulse 0-999
Procedure		Check that the number increases when the front wheel is rotated. The number is cumulative and does not reset each time the wheel is stopped.
Probable cause of malfunction		Check or maintenance job
1	Connections <ul style="list-style-type: none"> • Speed sensor coupler • Wire harness ECU coupler 	<ul style="list-style-type: none"> • Check the coupler for any pins that may be pulled out. • Check the locking condition of the coupler. • If there is a malfunction, repair it and connect the coupler securely.
2	Open or short circuit in wire harness.	<ul style="list-style-type: none"> • Repair or replace if there is an open or short circuit. • Between speed sensor coupler and ECU coupler. W-W (white-white)
3	Defective speed sensor.	<ul style="list-style-type: none"> • Execute diagnostic code No. D07. • Replace if defective. Refer to "CHECKING THE SPEED SENSOR" on page 7-70.
Reinstatement method		Start the engine and run the vehicle at 20 to 30 km/h.

FUEL INJECTION SYSTEM

Fault code No.		43
Item		Fuel system voltage: the ECU is unable to monitor the battery voltage (an open or short circuit in the wire harness to the ECU).
Fail-safe system		Able to start engine
		Able to drive vehicle
Diagnostic code No.		D09, D50
D09	FI diagnostic tool display	Fuel system voltage (battery voltage) Approximately 12.0 V
	Procedure	Compare the actually measured battery voltage with the FI diagnostic tool display value. (If the actually measured battery voltage is low, charge the battery.)
D50	Actuation	The fuel pump relay is actuated five times at five-second intervals (2 seconds on, 3 seconds off), and the "WARNING" LED on the FI diagnostic tool comes on each time the relay is actuated.
	Procedure	Check that the fuel pump relay is actuated five times by listening for the operating sound.
Probable cause of malfunction		Check or maintenance job
1	Connections <ul style="list-style-type: none"> • Fuel pump relay coupler • Fuel pump coupler • Injector coupler • Wire harness ECU coupler 	<ul style="list-style-type: none"> • Check the coupler for any pins that may be pulled out. • Check the locking condition of the coupler. • If there is a malfunction, repair it and connect the coupler securely.
2	Open or short circuit in wire harness.	<ul style="list-style-type: none"> • Repair or replace if there is an open or short circuit. • Between the fuel pump relay coupler and the ECU L/Y–L/Y (blue/yellow–blue/yellow) R/L–R/L (red/blue–red/blue)
3	Faulty battery.	<ul style="list-style-type: none"> • Execute diagnostic code No. D09. • Replace or recharge the battery. Refer to "CHECKING AND CHARGING THE BATTERY" on page 7-60.
4	Malfunction in fuel pump relay or disconnection	<ul style="list-style-type: none"> • Execute diagnostic code No. D50. • Replace if defective. • If there is no malfunction with the fuel pump relay, replace the ECU.
Reinstatement method		After starting, let the engine run at idle speed for about 60 seconds.

FUEL INJECTION SYSTEM

Fault code No.	44	
Item	EEPROM fault code number: an error is detected while reading or writing on EEPROM (CO adjustment value).	
Fail-safe system	Able to start engine	
	Able to drive vehicle	
Diagnostic code No.	D60	
FI diagnostic tool display	EEPROM fault code display <ul style="list-style-type: none"> • 00 (no history) • 01: CO adjustment value is detected. (history exists) 	
Procedure	Change and write #1 (No.1 cylinder) CO density level. Turn the main switch OFF/ON after adjustment.	
Probable cause of malfunction		Check or maintenance job
1	Malfunction in ECU	<ul style="list-style-type: none"> • Execute diagnostic code No. D60. • If "01" is displayed, readjust the CO. Refer to "ADJUSTING THE EXHAUST GAS VOLUME" on page 3-7. • Replace the ECU if defective.
Reinstatement method		Turn the main switch to "ON".

Fault code No.	46	
Item	Power supply to the fuel injection system is not normal.	
Fail-safe system	Able to start engine	
	Able to drive vehicle	
Diagnostic code No.	—	
FI diagnostic tool display	—	
Procedure	—	
Probable cause of malfunction		Check or maintenance job
1	Connections <ul style="list-style-type: none"> • Wire harness ECU coupler 	<ul style="list-style-type: none"> • Check the coupler for any pins that may be pulled out. • Check the locking condition of the coupler. • If there is a malfunction, repair it and connect the coupler securely.
2	Faulty battery.	<ul style="list-style-type: none"> • Replace or charge the battery. Refer to "CHECKING AND CHARGING THE BATTERY" on page 7-60.
3	Malfunction in rectifier/regulator	<ul style="list-style-type: none"> • Replace if defective. Refer to "CHECKING THE RECTIFIER/REGULATOR" on page 7-68.

FUEL INJECTION SYSTEM

Fault code No.		46	
Item		Power supply to the fuel injection system is not normal.	
4	Open or short circuit in wire harness.	<ul style="list-style-type: none"> • Repair or replace if there is an open or short circuit. • Between battery and main fuse terminal. R–R (red–red) • Between the main fuse terminal and fuse box terminal (fuel injection system fuse) R–R (red–red) • Between the fuse box terminal (fuel injection system fuse) and the fuel pump relay coupler Br/Y–Br/Y (brown/yellow–brown/yellow) • Between the fuel pump relay coupler and the injector coupler R/L–R/L (red/blue–red/blue) 	
Reinstatement method		After starting, let the engine run at idle speed for about 5 seconds.	

Fault code No.		50	
Item		Malfunction in ECU memory.	
Fail-safe system		Unable to start engine	
		Unable to drive vehicle	
Diagnostic code No.		—	
FI diagnostic tool display		—	
Procedure		—	
Probable cause of malfunction		Check or maintenance job	
1	Malfunction in ECU	<ul style="list-style-type: none"> • Replace the ECU. <p>TIP _____ Do not replace the ECU with the main switch set to “ON”.</p>	
Reinstatement method		Turn the main switch to “ON”.	

Fault code No.		70	
Item		Engine idling stop: engine has been left idling. (The ECU automatically stops the engine after 20 minutes if it is left idling.)	
Fail-safe system		Able to start engine	
		Able to drive vehicle	
Diagnostic code No.		—	
FI diagnostic tool display		—	
Procedure		—	
Probable cause of malfunction		Check or maintenance job	

FUEL INJECTION SYSTEM

Fault code No.	70		
Item	Engine idling stop: engine has been left idling. (The ECU automatically stops the engine after 20 minutes if it is left idling.)		
1	—		—
Reinstatement method	—		

FUEL INJECTION SYSTEM

EAS30700

DIAGNOSTIC CODE TABLE

Diagnostic code No.	Item	FI diagnostic tool display/Actuation	Procedure
D01	Throttle angle <ul style="list-style-type: none"> • Fully closed position • Fully open position 	14–20 79–85	Check with throttle fully closed. Check with throttle fully open.
D03	Intake air pressure	Displays the intake air pressure.	Set the engine stop switch to “○”, and then operate the throttle while cranking the engine. (If the display values change, the performance is OK.)
D05	Intake air temperature	Displays the intake air temperature.	Compare the actually measured intake air temperature with the FI diagnostic tool display value.
D07	Vehicle speed pulse	0–999	Check that the number increases when the front wheel is rotated. The number is cumulative and does not reset each time the wheel is stopped.
D08	Lean angle sensor <ul style="list-style-type: none"> • Upright • Overturned 	3.4–4.5 0.7–1.4	Remove the lean angle sensor and incline it more than 45 degrees.
D09	Fuel system voltage (battery voltage)	Approximately 12.0	Compare the actually measured battery voltage with the FI diagnostic tool display value. (If the actually measured battery voltage is low, charge the battery.)
D11	Engine temperature	Displays the engine temperature.	Compare the actually measured engine temperature with the FI diagnostic tool display value.
D20	Sidestand switch <ul style="list-style-type: none"> • Sidestand retracted • Sidestand extended 	on off	Extend and retract the sidestand (with the transmission in gear).
D21	Neutral switch <ul style="list-style-type: none"> • Neutral • In gear 	on off	Shift the transmission.

FUEL INJECTION SYSTEM

Diagnostic code No.	Item	FI diagnostic tool display/Actuation	Procedure
D30	Ignition coil	When the engine stop switch is set from "⊗" to "○", the ignition coil is actuated five times at one-second intervals and the "WARNING" LED on the FI diagnostic tool comes on each time the coil is actuated.	Check that a spark is generated five times. <ul style="list-style-type: none"> • Connect an ignition checker.
D36	Injector	When the engine stop switch is set from "⊗" to "○", the injector is actuated five times at one-second intervals and the "WARNING" LED on the FI diagnostic tool comes on each time the injector is actuated.	Check that the injector is actuated five times by listening for the operating sound.
D48	Air induction system solenoid	When the engine stop switch is set from "⊗" to "○", the air induction system solenoid is actuated five times at one-second intervals and the "WARNING" LED on the FI diagnostic tool comes on each time the solenoid is actuated.	Check that the air induction system solenoid is actuated five times by listening for the operating sound.
D50	Fuel pump relay	When the engine stop switch is set from "⊗" to "○", the fuel pump relay is actuated five times at five-second intervals (2 seconds ON, 3 seconds OFF), and the "WARNING" LED on the FI diagnostic tool comes on each time the relay is actuated.	Check that the fuel pump relay is actuated five times by listening for the operating sound.
D52	Headlight relay	When the engine stop switch is set from "⊗" to "○", the headlight relay is actuated five times at five-second intervals (2 seconds on, 3 seconds off), and the FI diagnostic tool "WARNING" LED, high beam indicator light, and the headlight come on each time the relay is actuated.	Check that the headlight relay is actuated five times by listening for the operating sound.

FUEL INJECTION SYSTEM

Diagnostic code No.	Item	FI diagnostic tool display/Actuation	Procedure
D54	ISC valve	When the engine stop switch is set from “⊗” to “○”, the ISC valve is fully closed and opens to the standby opening position (position when the engine is started). This operation takes approximately 3 seconds until it is completed. Illuminates the “WARNING” LED on the FI diagnostic tool.	Check that the ISC unit vibrates when the ISC valve operates.
D60	EEPROM fault code display <ul style="list-style-type: none"> • No history • History exists 	00 01: CO adjusting value is detected.	—
D61	Malfunction history code display <ul style="list-style-type: none"> • No history • History exists 	00 12–70: Fault code number <ul style="list-style-type: none"> • If more than one malfunction is detected, the display switches every two seconds to show the fault code numbers of all malfunctions in a repeating cycle. 	—
D62	Malfunction history code erasure <ul style="list-style-type: none"> • No history • History exists 	00 <ul style="list-style-type: none"> • Displays the total number of malfunctions, including the current malfunction, that have occurred since the history was last erased. (For example, if there have been three malfunctions, “03” is displayed.) 	— To erase the history, set the engine stop switch to “⊗” → “○”.

FUEL INJECTION SYSTEM

Diagnostic code No.	Item	FI diagnostic tool display/Actuation	Procedure
D63	Malfunction code reinstatement (for fault code No. 24 only) <ul style="list-style-type: none"> • No malfunction code • Malfunction code exists 	00 24: Fault code number	— To reinstate, set the engine stop switch to “⊗” → “○”.
D70	Control number	00–254	—

Communication error with the FI diagnostic tool

LCD display	Symptom	Probable cause of malfunction
Waiting for connection....	No signals are received from the ECU.	<ul style="list-style-type: none"> • Connecting lead is not connected properly. • Main switch is in the “⊗” position. • Malfunction in wire harness ECU coupler. • Malfunction in FI diagnostic tool coupler. • Open or short circuit in wire harness. • Malfunction in FI diagnostic tool. • Malfunction in ECU
ERROR_4	Commands from the FI diagnostic tool are not accepted by the ECU.	<ul style="list-style-type: none"> • Vehicle battery is insufficiently charged. • Malfunction in wire harness ECU coupler. • Malfunction in FI diagnostic tool coupler. • Open or short circuit in wire harness. • Malfunction in FI diagnostic tool. • Malfunction in ECU

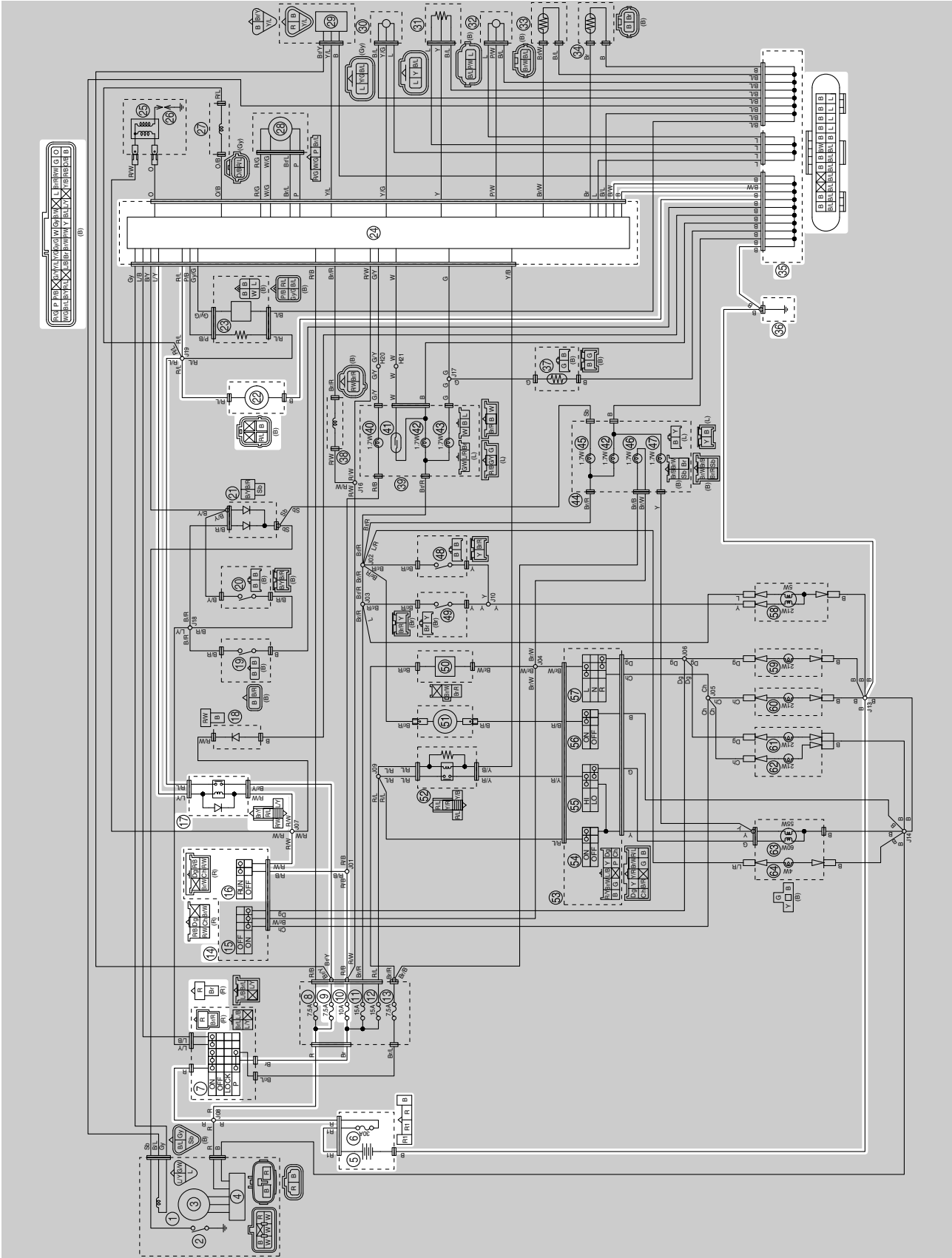
FUEL INJECTION SYSTEM

EAS27550

FUEL PUMP SYSTEM

EAS27560

CIRCUIT DIAGRAM



- 5. Battery
- 6. Main fuse
- 7. Main switch
- 9. Fuel injection system fuse
- 10. Ignition fuse
- 14. Right handlebar switch
- 16. Engine stop switch
- 17. Fuel pump relay
- 22. Fuel pump
- 24. ECU (engine control unit)
- 35. Joint coupler
- 36. Frame ground

EAS27600

TROUBLESHOOTING

When the engine speed changes, the EXUP servo motor does not operate.

TIP

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

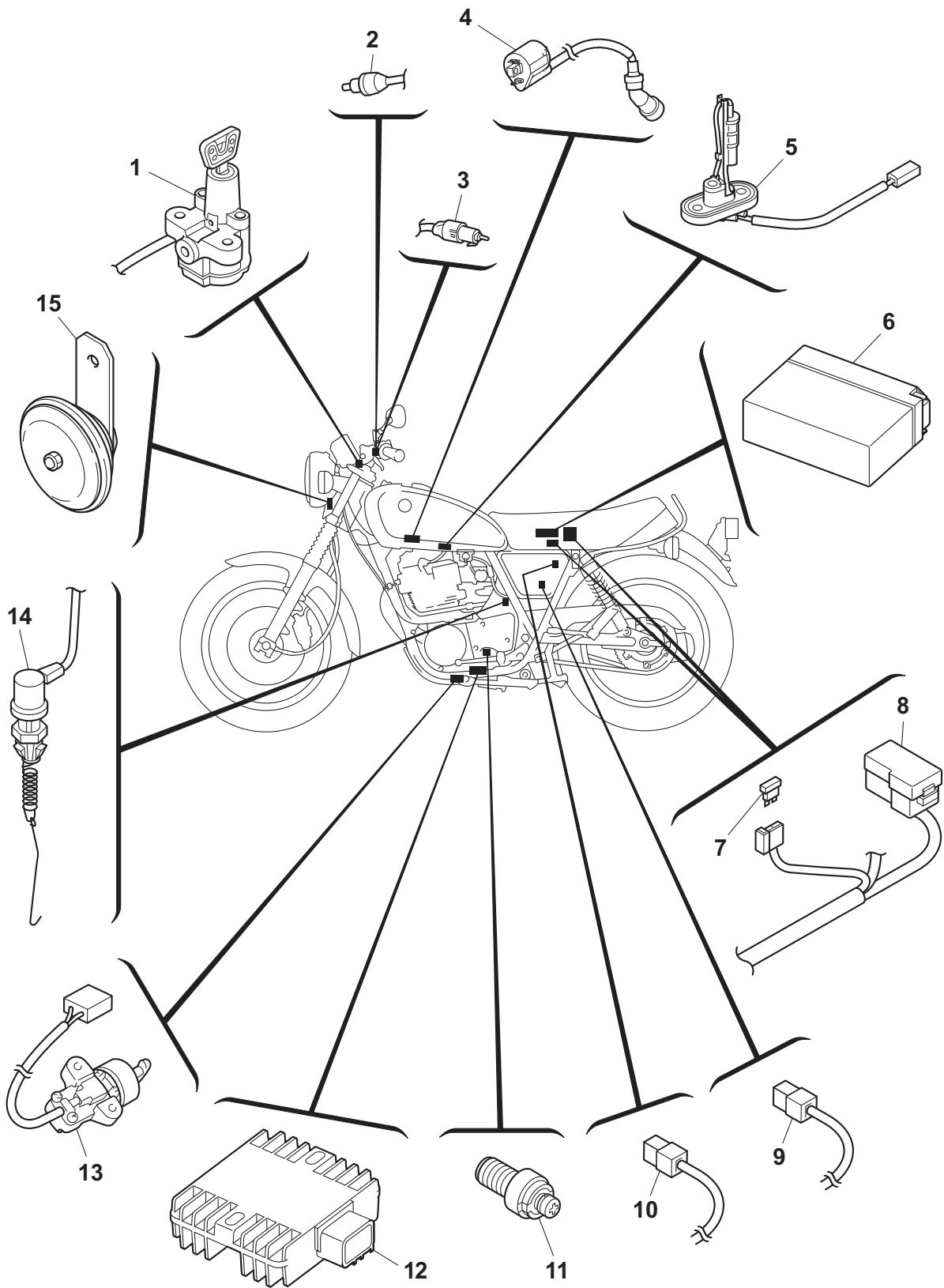
1. Seat
2. Side cover (left)
3. Fuel tank
4. Fuel pump case

<p>1. Check the fuses. (Main, ignition, fuel injection system) Refer to "CHECKING THE FUSES" on page 7-59.</p>	NG→	<p>Replace the fuse(s).</p>
OK↓		
<p>2. Check the battery. Refer to "CHECKING AND CHARGING THE BATTERY" on page 7-60.</p>	NG→	<ul style="list-style-type: none"> • Clean the battery terminals. • Recharge or replace the battery.
OK↓		
<p>3. Check the main switch. Refer to "CHECKING THE SWITCHES" on page 7-55.</p>	NG→	<p>Replace the main switch.</p>
OK↓		
<p>4. Check the engine stop switch. Refer to "CHECKING THE SWITCHES" on page 7-55.</p>	NG→	<p>Replace the right handlebar switch.</p>
OK↓		
<p>5. Check the fuel pump relay. Refer to "CHECKING THE RELAYS" on page 7-63.</p>	NG→	<p>Replace the fuel pump relay.</p>
OK↓		
<p>6. Check the fuel pump. Refer to "CHECKING THE PRESSURE REGULATOR OPERATION" on page 6-12.</p>	NG→	<p>Replace the fuel pump.</p>
OK↓		
<p>7. Check the entire fuel pump system wiring. Refer to "CIRCUIT DIAGRAM" on page 7-47.</p>	NG→	<p>Properly connect or repair the fuel pump system wiring.</p>
OK↓		
<p>Replace the ECU (engine control unit).</p>		

ELECTRICAL COMPONENTS

EAS27973

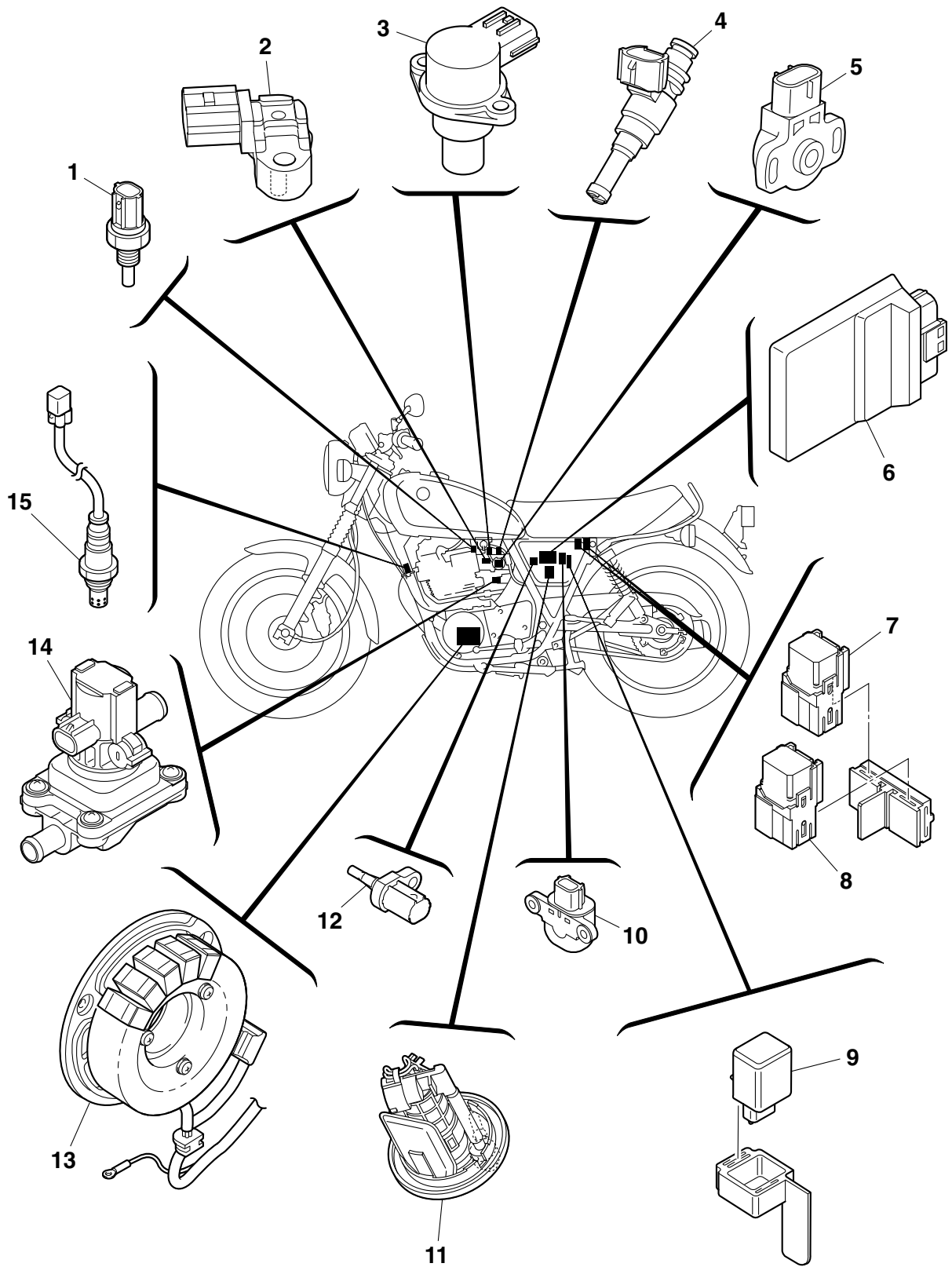
ELECTRICAL COMPONENTS



ELECTRICAL COMPONENTS

1. Main switch
2. Front brake light switch
3. Clutch switch
4. Ignition coil
5. Fuel sender
6. Battery
7. Main fuse
8. Fuse box
9. Diode 1
10. Diode 2
11. Neutral switch
12. Rectifier/regulator
13. Sidestand switch
14. Rear brake light switch
15. Horn

ELECTRICAL COMPONENTS



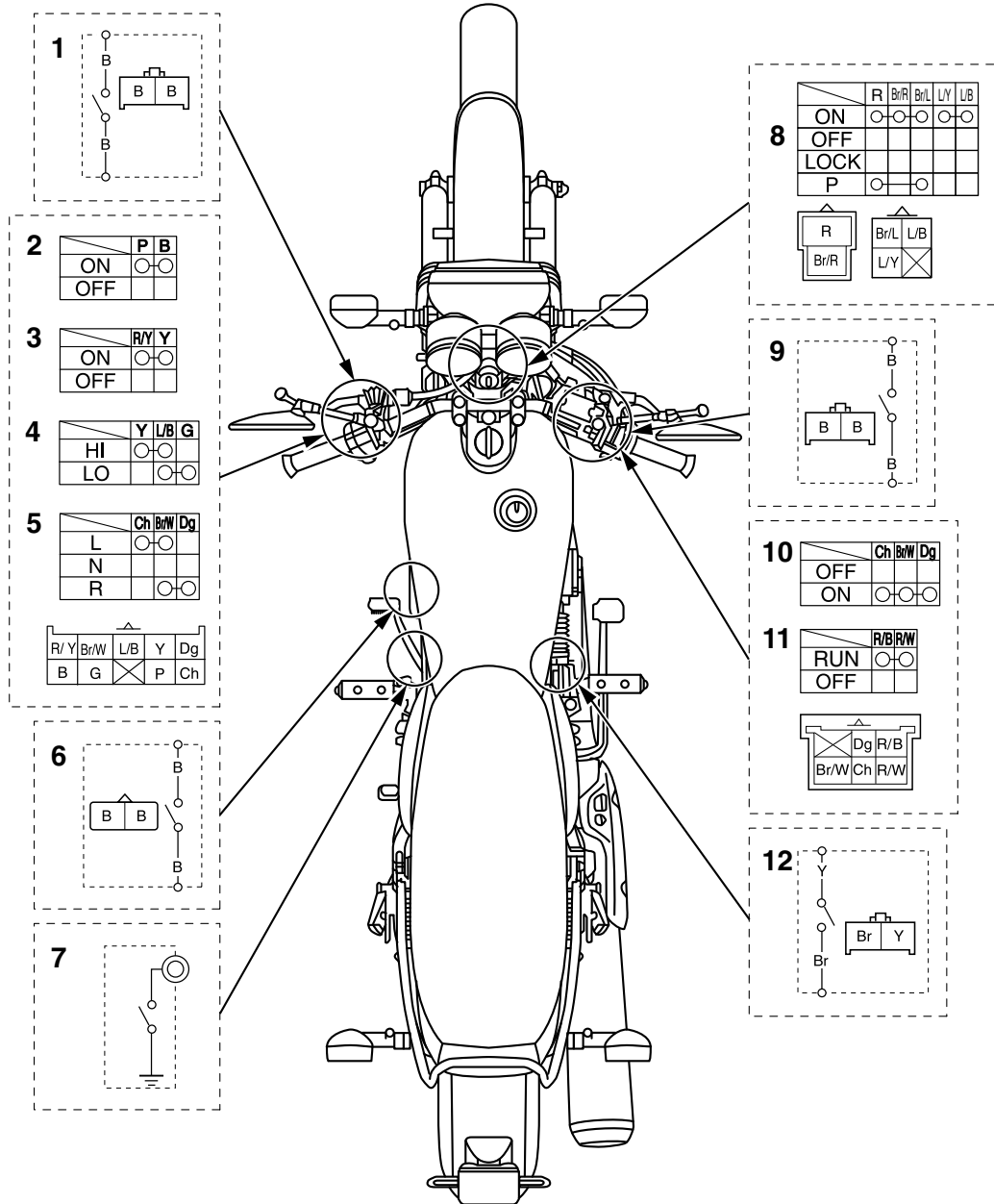
ELECTRICAL COMPONENTS

1. Engine temperature sensor
2. Intake air pressure sensor
3. ISC (idle speed control) valve
4. Fuel injector
5. Throttle position sensor
6. ECU (engine control unit)
7. Headlight relay (on/off)
8. Fuel pump relay
9. Turn signal/hazard relay
10. Lean angle sensor
11. Fuel pump
12. Intake air temperature sensor
13. Stator coil assembly
14. Air induction system solenoid
15. O₂ sensor

ELECTRICAL COMPONENTS

EAS27981

CHECKING THE SWITCHES



ELECTRICAL COMPONENTS

1. Clutch switch
2. Horn switch
3. Pass switch
4. Dimmer switch
5. Turn signal switch
6. Sidestand switch
7. Neutral switch
8. Main switch
9. Front brake light switch
10. Hazard switch
11. Engine stop switch
12. Rear brake light switch

ELECTRICAL COMPONENTS

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.

ECA14370

NOTICE

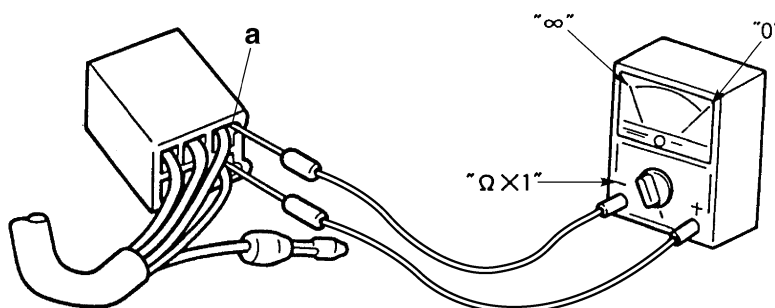
Never insert the tester probes into the coupler terminal slots "a". Always insert the probes from the opposite end of the coupler, taking care not to loosen or damage the leads.



Pocket tester
90890-03112
Analog pocket tester
YU-03112-C

TIP

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



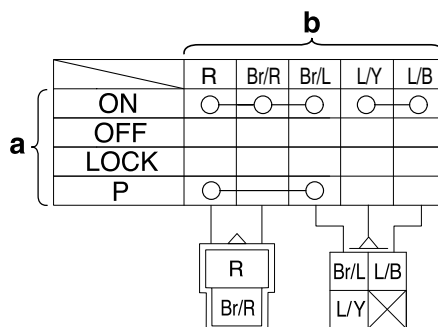
The switches and their terminal connections are illustrated as in the following example of the main switch.

The switch positions "a" are shown in the far left column and the switch lead colors "b" are shown in the top row.

The continuity (i.e., a closed circuit) between switch terminals at a given switch position is indicated by "○—○".

There is continuity between red, brown/red, and brown/blue and between blue/yellow and blue/black when the switch is set to "ON".

There is continuity between red and brown/blue when the switch is set to "P".



EAS27990

CHECKING THE BULBS AND BULB SOCKETS

Check each bulb and bulb socket for damage or wear, proper connections, and also for continuity between the terminals.

Damage/wear → Repair or replace the bulb, bulb socket or both.

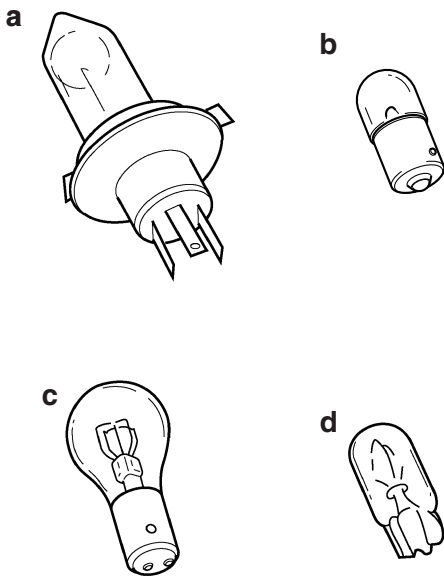
Improperly connected → Properly connect.

No continuity → Repair or replace the bulb, bulb socket or both.

Types of bulbs

The bulbs used on this vehicle are shown in the illustration.

- Bulbs “a” is used for the headlights and usually use a bulb holder that must be detached before removing the bulb. The majority of these types of bulbs can be removed from their respective socket by turning them counterclockwise.
- Bulbs “b” and “c” are used for turn signal and tail/brake lights and can be removed from the socket by pushing and turning the bulb counterclockwise.
- Bulbs “d” is used for meter and indicator lights and can be removed from their respective socket by carefully pulling them out.



Checking the condition of the bulbs

The following procedure applies to all of the bulbs.

1. Remove:
 - Bulb

EWA13320



WARNING

Since the headlight bulb gets extremely hot,

keep flammable products and your hands away from the bulb until it has cooled down.

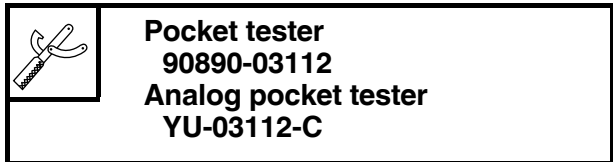
ECA14380

NOTICE

- Be sure to hold the socket firmly when removing the bulb. Never pull the lead, otherwise it may be pulled out of the terminal in the coupler.
- Avoid touching the glass part of the headlight bulb to keep it free from oil, otherwise the transparency of the glass, the life of the bulb, and the luminous flux will be adversely affected. If the headlight bulb gets soiled, thoroughly it with a cloth moistened with alcohol or lacquer thinner.

2. Check:

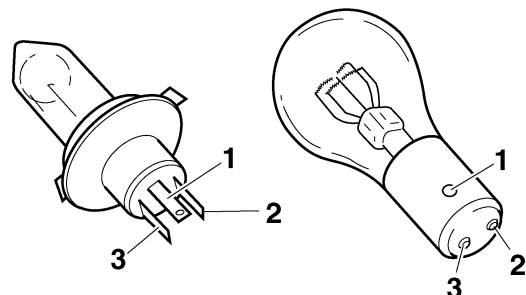
- Bulb (for continuity)
(with the pocket tester)
No continuity → Replace.



TIP

Before checking for continuity, set the pocket tester to “0” and to the “Ω × 1” range.

- a. Connect the positive tester probe to terminal “1” and the negative tester probe to terminal “2”, and check the continuity.
- b. Connect the positive tester probe to terminal “1” and the negative tester probe to terminal “3”, and check the continuity.
- c. If either of the readings indicate no continuity, replace the bulb.



Checking the condition of the bulb sockets

The following procedure applies to all of the bulb sockets.

ELECTRICAL COMPONENTS

1. Check:
 - Bulb socket (for continuity)
(with the pocket tester)
No continuity → Replace.



Pocket tester
90890-03112
Analog pocket tester
YU-03112-C

TIP

Check each bulb socket for continuity in the same manner as described in the bulb section; however, note the following.

- a. Install a good bulb into the bulb socket.
- b. Connect the pocket tester probes to the respective leads of the bulb socket.
- c. Check the bulb socket for continuity. If any of the readings indicate no continuity, replace the bulb socket.

EAS28000

CHECKING THE FUSES

The following procedure applies to all of the fuses.

ECA2RD1017

NOTICE

To avoid a short circuit, always disconnect battery connector from the battery when checking or replacing a fuse.

1. Remove:
 - Seat
Refer to “GENERAL CHASSIS” on page 4-1.
2. Check:
 - Fuse

TIP

Set the pocket tester selector to “ $\Omega \times 1$ ”.



Pocket tester
90890-03112
Analog pocket tester
YU-03112-C

- b. If the pocket tester indicates “ ∞ ”, replace the fuse.

3. Replace:
 - Blown fuse

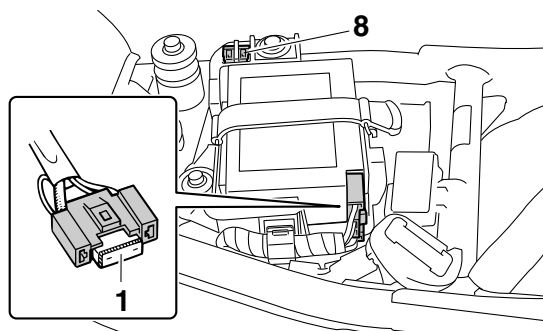
- a. Turn the main switch to “OFF”.
- b. Install a new fuse of the correct amperage rating.
- c. Set on the switches to verify if the electrical circuit is operational.
- d. If the fuse immediately blows again, check the electrical circuit.

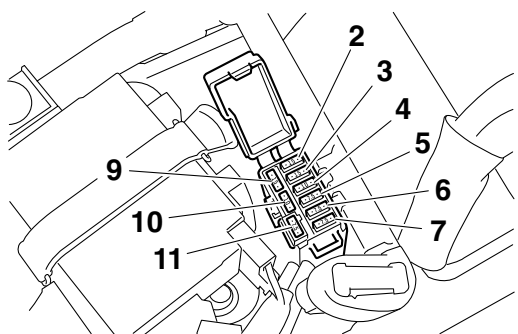
Fuses	Amperage rating	Q'ty
Main “1”	30 A	1
Headlight “2”	15 A	1
Signaling system “3”	15 A	1
Ignition “4”	10 A	1
Backup “5”	7.5 A	1
Fuel injection system “6”	7.5 A	1
Parking lighting “7”	7.5 A	1
Reserve “8”	30 A	1
Reserve “9”	15 A	1
Reserve “10”	10 A	1
Reserve “11”	7.5 A	1

EWA13310

WARNING

Never use a fuse with an amperage rating other than that specified. Improvising or using a fuse with the wrong amperage rating may cause extensive damage to the electrical system, cause the lighting and ignition systems to malfunction and could possibly cause a fire.





4. Install:

- Seat
Refer to “GENERAL CHASSIS” on page 4-1.

EAS28031

CHECKING AND CHARGING THE BATTERY

EWA13290

WARNING

Batteries generate explosive hydrogen gas and contain electrolyte which is made of poisonous and highly caustic sulfuric acid. Therefore, always follow these preventive measures:

- Wear protective eye gear when handling or working near batteries.
- Charge batteries in a well-ventilated area.
- Keep batteries away from fire, sparks or open flames (e.g., welding equipment, lighted cigarettes).
- **DO NOT SMOKE** when charging or handling batteries.
- **KEEP BATTERIES AND ELECTROLYTE OUT OF REACH OF CHILDREN.**
- Avoid bodily contact with electrolyte as it can cause severe burns or permanent eye injury.

FIRST AID IN CASE OF BODILY CONTACT: EXTERNAL

- Skin — Wash with water.
- Eyes — Flush with water for 15 minutes and get immediate medical attention.

INTERNAL

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

ECA13661

NOTICE

- This is a VRLA (Valve Regulated Lead Acid) battery. Never remove the sealing caps because the balance between cells will not be

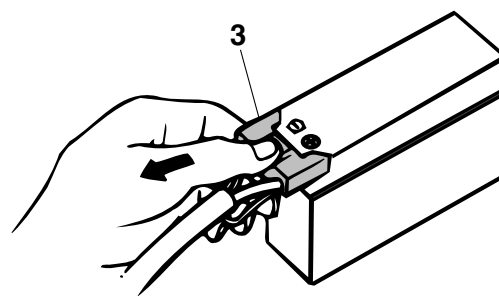
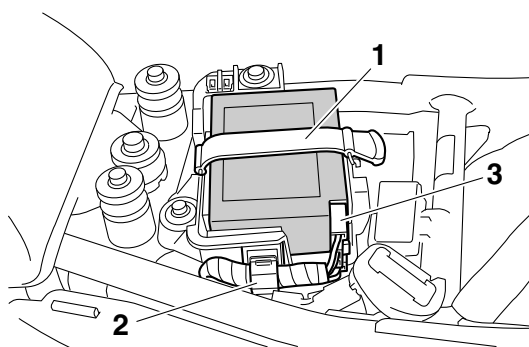
maintained and battery performance will deteriorate.

- Charging time, charging amperage and charging voltage for a VRLA (Valve Regulated Lead Acid) battery are different from those of conventional batteries. The VRLA (Valve Regulated Lead Acid) battery should be charged according to the appropriate charging method. If the battery is overcharged, the electrolyte level will drop considerably. Therefore, take special care when charging the battery.

TIP

Since VRLA (Valve Regulated Lead Acid) batteries are sealed, it is not possible to check the charge state of the battery by measuring the specific gravity of the electrolyte. Therefore, the charge of the battery has to be checked by measuring the voltage at the battery terminals.

1. Remove:
 - Seat
Refer to “GENERAL CHASSIS” on page 4-1.
2. Disconnect:
 - Battery band “1”
 - Clamp “2”
 - Battery connector “3”
(from the battery terminal)



3. Remove:
 - Battery
Refer to “GENERAL CHASSIS” on page 4-1.

4. Check:

- Battery charge



- Connect a pocket tester to the battery terminals.

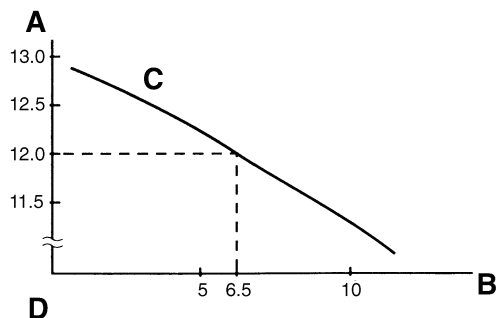
- Positive tester probe → Positive battery terminal
- Negative tester probe → Negative battery terminal

TIP

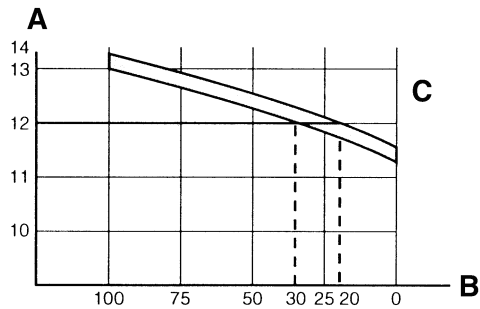
- The charge state of a VRLA (Valve Regulated Lead Acid) battery can be checked by measuring its open-circuit voltage (i.e., the voltage when the positive battery terminal is disconnected).
- No charging is necessary when the open-circuit voltage equals or exceeds 12.8 V.

- Check the charge of the battery, as shown in the charts and the following example.

Example
 Open-circuit voltage = 12.0 V
 Charging time = 6.5 hours
 Charge of the battery = 20–30 %



- Open-circuit voltage (V)
- Charging time (hours)
- Relationship between the open-circuit voltage and the charging time at 20 °C (68 °F)
- These values vary with the temperature, the condition of the battery plates, and the electrolyte level.



- Open-circuit voltage (V)
- Charging condition of the battery (%)
- Ambient temperature 20 °C (68 °F)



5. Charge:

- Battery
 (refer to the appropriate charging method)

EWA13300



WARNING

Do not quick charge a battery.

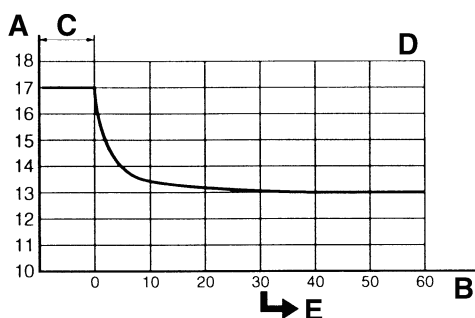
ECA13671

NOTICE

- **Do not use a high-rate battery charger since it forces a high-amperage current into the battery quickly and can cause battery overheating and battery plate damage.**
- **If it is impossible to regulate the charging current on the battery charger, be careful not to overcharge the battery.**
- **When charging a battery, be sure to remove it from the vehicle. (If charging has to be done with the battery mounted on the vehicle, disconnect the negative battery lead from the battery terminal.)**
- **To reduce the chance of sparks, do not plug in the battery charger until the battery charger leads are connected to the battery.**
- **Before removing the battery charger lead clips from the battery terminals, be sure to turn off the battery charger.**
- **Make sure the battery charger lead clips are in full contact with the battery terminal and that they are not shorted. A corroded battery charger lead clip may generate heat in the contact area and a weak clip spring may cause sparks.**
- **If the battery becomes hot to the touch at any time during the charging process, disconnect the battery charger and let the battery cool before reconnecting it. Hot**

batteries can explode!

- As shown in the following illustration, the open-circuit voltage of a VRLA (Valve Regulated Lead Acid) battery stabilizes about 30 minutes after charging has been completed. Therefore, wait 30 minutes after charging is completed before measuring the open-circuit voltage.



- A. Open-circuit voltage (V)
- B. Time (minutes)
- C. Charging
- D. Ambient temperature 20 °C (68 °F)
- E. Check the open-circuit voltage.

Charging method using a variable-current (voltage) charger

- a. Measure the open-circuit voltage prior to charging.

TIP _____
Voltage should be measured 30 minutes after the engine is stopped.

- b. Connect a charger and ammeter to the battery and start charging.

TIP _____
Set the charging voltage to 16–17 V. If the setting is lower, charging will be insufficient. If too high, the battery will be over-charged.

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

TIP _____
If the current is lower than the standard charging current written on the battery, set the charging voltage adjust dial at 20–24 V and monitor the amperage for 3–5 minutes to check the battery.

- Standard charging current is reached
Battery is good.
- Standard charging current is not reached
Replace the battery.

- d. Adjust the voltage so that the current is at the

standard charging level.

- e. Set the time according to the charging time suitable for the open-circuit voltage.
- f. If charging requires more than 5 hours, it is advisable to check the charging current after a lapse of 5 hours. If there is any change in the amperage, readjust the voltage to obtain the standard charging current.
- g. 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.



Charging method using a constant voltage charger

- a. Measure the open-circuit voltage prior to charging.

TIP _____
Voltage should be measured 30 minutes after the engine is stopped.

- b. Connect a charger and ammeter to the battery and start charging.
- c. Make sure that the current is higher than the standard charging current written on the battery.

TIP _____
If the current is lower than the standard charging current written on the battery, this type of battery charger cannot charge the VRLA (Valve Regulated Lead Acid) battery. A variable voltage charger is recommended.

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

TIP _____
Set the charging time at 20 hours (maximum).

- e. 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.



- 6. Install:
 - Battery
 Refer to "GENERAL CHASSIS" on page 4-1.

ELECTRICAL COMPONENTS

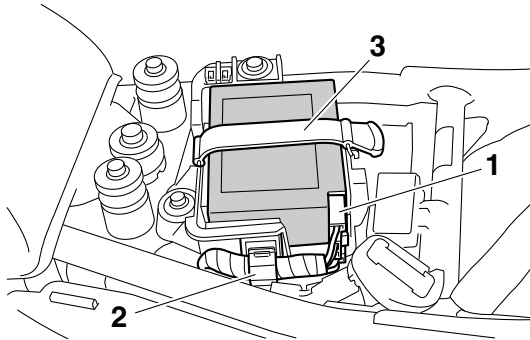
7. Connect:

- Battery connector "1"
(to the battery terminal)
- Clamp "2"
- Battery band "3"

ECA2RD1020

NOTICE

Fasten the battery lead with the clamp.



8. Check:

- Battery terminal
Dirt → Clean with a wire brush.
Loose connection → Connect properly.

9. Lubricate:

- Battery terminal



Recommended lubricant
Dielectric grease

10. Install:

- Seat
Refer to "GENERAL CHASSIS" on page 4-1.

EAS28040

CHECKING THE RELAYS

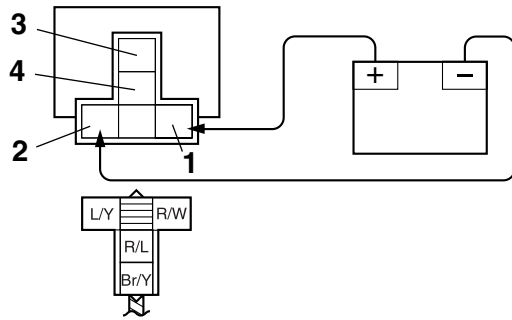
Check each switch for continuity with the pocket tester. If the continuity reading is incorrect, replace the relay.



Pocket tester
90890-03112
Analog pocket tester
YU-03112-C

1. Disconnect the relay from the wire harness.
2. Connect the pocket tester ($\Omega \times 1$) and battery (12 V) to the relay terminal as shown.
Check the relay operation.
Out of specification → Replace.

Fuel pump relay



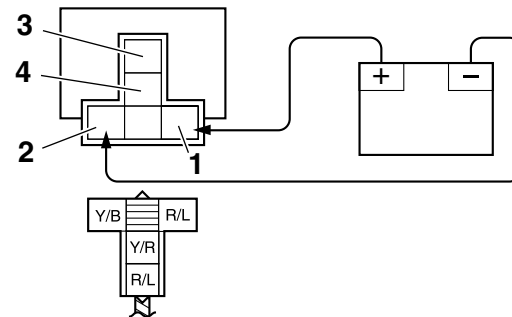
1. Positive battery terminal
2. Negative battery terminal
3. Positive tester probe
4. Negative tester probe



Result

Continuity/No continuity
(between "3" and "4")

Headlight relay (on/off)



1. Positive battery terminal
2. Negative battery terminal
3. Positive tester probe
4. Negative tester probe



Result

Continuity/No continuity
(between "3" and "4")

EAS2RD1023

CHECKING THE TURN SIGNAL/HAZARD RELAY

1. Check:

- Turn signal/hazard relay input voltage
Out of specification → The wiring circuit from the main switch to the turn signal/hazard relay coupler is faulty and must be repaired.



Turn signal/hazard relay input
voltage
DC 12 V

ELECTRICAL COMPONENTS



Continuity

Positive tester probe → sky blue “1”

Negative tester probe → black/red “2”

Continuity

Positive tester probe → sky blue “1”

Negative tester probe → black/yellow “3”

No continuity

Positive tester probe → black/red “2”

Negative tester probe → sky blue “1”

No continuity

Positive tester probe → black/yellow “3”

Negative tester probe → sky blue “1”

Continuity

Positive tester probe → red/white “4”

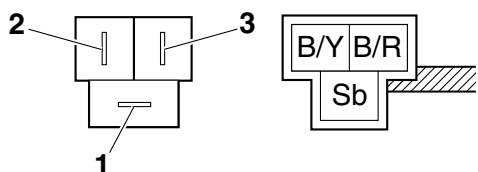
Negative tester probe → black “5”

No continuity

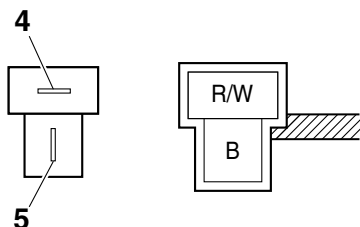
Positive tester probe → black “5”

Negative tester probe → red/white “4”

A



B



- A. Diode 1
- B. Diode 2



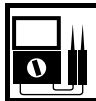
- a. Disconnect the diode from the wire harness.
- b. Connect the pocket tester ($\Omega \times 1$) to the diode terminals as shown.
- c. Check the diode for continuity.
- d. Check the diode for no continuity.



EAS28060

CHECKING THE SPARK PLUG CAP

1. Check:
 - Spark plug cap resistance
 Out of specification → Replace.



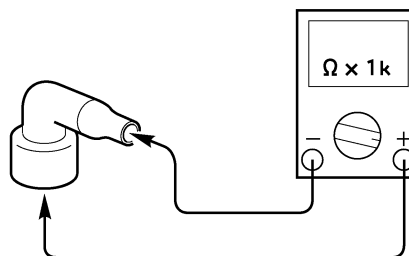
Spark plug cap Resistance
10.0 k Ω



- a. Remove the spark plug cap from the spark plug lead.
- b. Connect the pocket tester ($\Omega \times 1k$) to the spark plug cap as shown.



Pocket tester
90890-03112
Analog pocket tester
YU-03112-C



- c. Measure the spark plug cap resistance.



EAS28090

CHECKING THE IGNITION COIL

1. Check:
 - Primary coil resistance
 Out of specification → Replace.




Primary coil resistance
2.16–2.64 Ω



- a. Disconnect the ignition coil lead terminals from the wire harness.

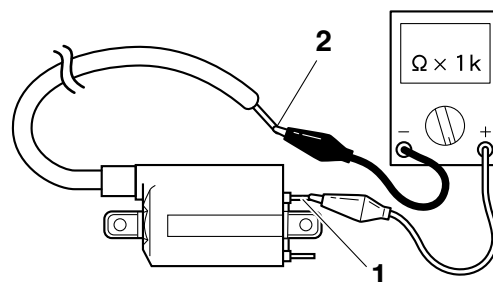
ELECTRICAL COMPONENTS

b. Connect the pocket tester ($\Omega \times 1$) to the ignition coil as shown.



Pocket tester
90890-03112
Analog pocket tester
YU-03112-C

- Positive tester probe orange "1"
- Negative tester probe red/white "2"



c. Measure the secondary coil resistance.

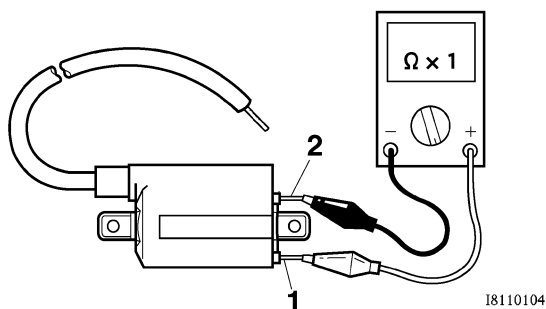


EAS28930

CHECKING THE IGNITION SPARK GAP

1. Check:

- Ignition spark gap
 Out of specification → Perform the ignition system troubleshooting, starting with step 5. Refer to "TROUBLESHOOTING" on page 7-5.




18110104

c. Measure the primary coil resistance.



2. Check:

- Secondary coil resistance
 Out of specification → Replace.




Secondary coil resistance
8.64–12.96 k Ω




a. Disconnect the spark plug cap from the ignition coil.

b. Connect the pocket tester ($\Omega \times 1k$) to the ignition coil as shown.



Pocket tester
90890-03112
Analog pocket tester
YU-03112-C

- Negative tester probe red/white "1"
- Positive tester probe Ignition coil spark plug lead "2"



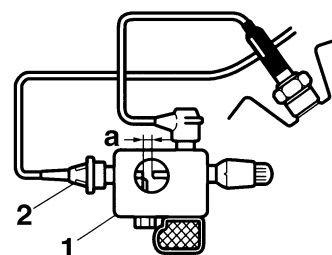
Minimum ignition spark gap
6.0 mm (0.24 in)



- a. Disconnect the spark plug cap from the spark plug.
- b. Connect the ignition checker "1" as shown.



Ignition checker
90890-06754
Oppama pet-4000 spark checker
YM-34487



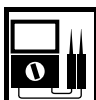
1. Ignition checker
2. Spark plug cap

- c. Turn the main switch to "ON".
- d. Measure the ignition spark gap "a".
- e. Crank the engine and gradually increase the spark plug gap until a misfire occurs.

EAS28120

CHECKING THE CRANKSHAFT POSITION SENSOR

1. Disconnect:
 - Crankshaft position sensor coupler (from the wire harness)
2. Check:
 - Crankshaft position sensor resistance
Out of specification → Replace.



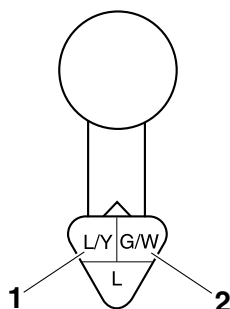
Crankshaft position sensor resistance
192–288 Ω

- a. Connect the pocket tester ($\Omega \times 100$) to the crankshaft position sensor coupler as shown.



Pocket tester
90890-03112
Analog pocket tester
YU-03112-C

- Positive tester probe blue/yellow “1”
- Negative tester probe green/white “2”



- b. Measure the crankshaft position sensor resistance.



EAS28131

CHECKING THE LEAN ANGLE SENSOR

1. Remove:
 - Lean angle sensor (from the fuel pump case box)
2. Check:
 - Lean angle sensor output voltage
Out of specification → Replace.



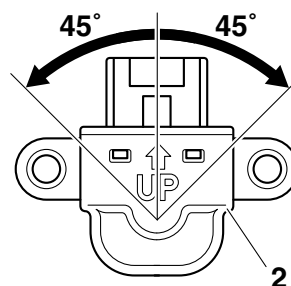
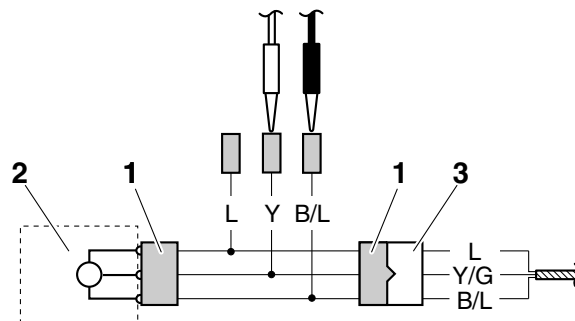
Lean angle sensor output voltage
Less than 45°
3.6–4.5 V
More than 45°
0.7–1.4 V

- a. Connect the test harness “1” to the lean angle sensor “2” and wire harness “3” as shown.
- b. Connect the pocket tester (DC 20 V) to the test harness as shown.



Pocket tester
90890-03112
Analog pocket tester
YU-03112-C
Test harness– lean angle sensor (3P)
90890-03213
Test harness– lean angle sensor (3P)
YU-03213

- Positive tester probe yellow/green (wire harness color)
- Negative tester probe black/blue (wire harness color)



- c. Turn the main switch to “ON”.
- d. Turn the lean angle sensor to 45°.
- e. Measure the lean angle sensor output voltage.


EAS28150

CHECKING THE STATOR COIL

1. Remove:
 - Stator coil coupler (from the wire harness)
2. Check:
 - Stator coil resistance
Out of specification → Replace the stator coil.

	Stator coil resistance 0.184–0.276 Ω (W-W)
---	---

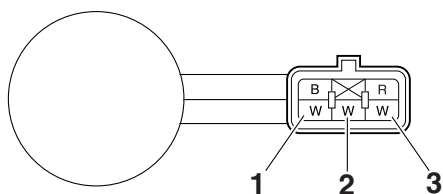
- a. Connect the pocket tester ($\Omega \times 1$) to the rectifier/regulator coupler as shown.

	Pocket tester 90890-03112 Analog pocket tester YU-03112-C
---	--

- Positive tester probe white “1”
- Negative tester probe white “2”

- Positive tester probe white “1”
- Negative tester probe white “3”

- Positive tester probe white “2”
- Negative tester probe white “3”



- b. Measure the stator coil resistance.


EAS28170

CHECKING THE RECTIFIER/REGULATOR


TIP

Before checking the rectifier/regulator, check the stator coil.

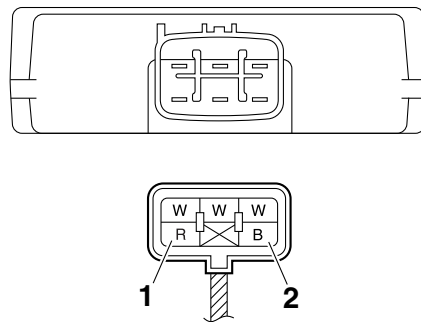
1. Check:
 - Rectifier/regulator output voltage
Out of specification → Replace the rectifier/regulator.

	Regulated voltage (DC) 14.1–14.9 V
---	---

- a. Set the engine tachometer to the spark plug lead.
- b. Connect the pocket tester (DC 20 V) to the rectifier/regulator coupler as shown.

	Pocket tester 90890-03112 Analog pocket tester YU-03112-C
---	--

- Positive tester probe red “1”
- Negative tester probe black “2”



- c. Start the engine and let it warm up.
- d. Measure the rectifier/regulator output voltage.


EAS28180

CHECKING THE HORN

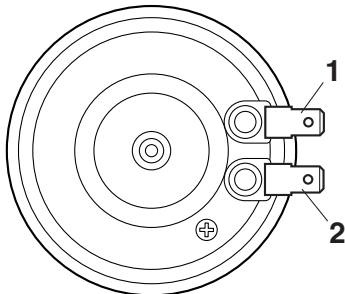
1. Check:
 - Horn resistance
Out of specification → Replace.

	Horn Coil resistance 1.19–1.25 Ω
---	---

- a. Disconnect the horn leads from the horn terminals.
- b. Connect the pocket tester ($\Omega \times 1$) to the horn terminals.

	Pocket tester 90890-03112 Analog pocket tester YU-03112-C
---	--

- Positive tester probe
Horn terminal "1"
- Negative tester probe
Horn terminal "2"



- c. Measure the horn resistance.

2. Check:
 - Horn sound
 - Faulty sound → Replace.

EAS28211

CHECKING THE ENGINE TEMPERATURE SENSOR


1. Remove:
 - Engine temperature sensor
 Refer to "CYLINDER HEAD" on page 5-6.

EWA14140


WARNING

- Handle the engine temperature sensor with special care.
- Never subject the engine temperature sensor to strong shocks. If the engine temperature sensor is dropped, replace it.

2. Check:
 - Engine temperature sensor resistance
 - Out of specification → Replace.

	Engine temperature sensor resistance 210–220 Ω@100 °C (210–220 Ω@212 °F)
---	---

- a. Connect the pocket tester ($\Omega \times 100$) to the engine temperature sensor terminal as shown.

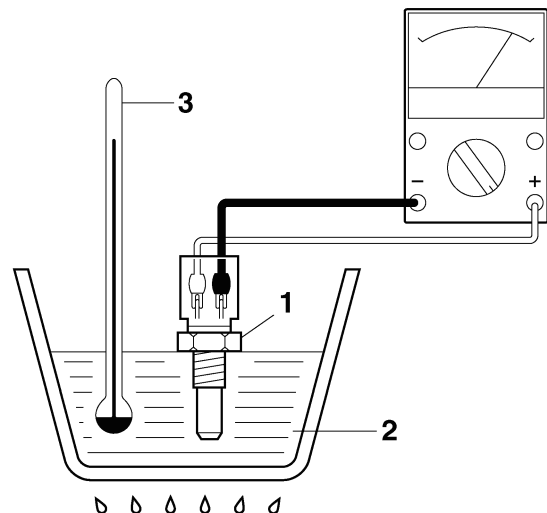
	Pocket tester 90890-03112 Analog pocket tester YU-03112-C
---	--

- b. Immerse the engine temperature sensor "1" in a container "2" filled with water.


TIP

Make sure that the engine temperature sensor terminals do not get wet.

- c. Place a thermometer "3" in the water.
- d. Heat the water or let it cool down to the specified temperatures.
- e. Measure the engine temperature sensor resistance.



3. Install:
 - Engine temperature sensor

	Engine temperature sensor 18 Nm (1.8 m·kgf, 13 ft·lbf)
---	---

EAS28230

CHECKING THE FUEL SENDER

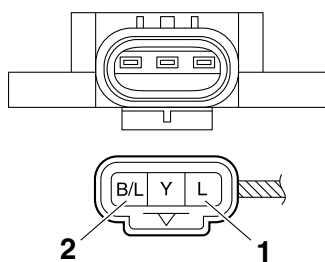
1. Remove:
 - Fuel sender
 - (from the fuel tank)

ELECTRICAL COMPONENTS



Pocket tester
90890-03112
Analog pocket tester
YU-03112-C

- Positive tester probe → blue “1”
- Negative tester probe → black/blue “2”



b. Check the throttle position sensor maximum resistance.

3. Install:

- Throttle position sensor

TIP

When installing the throttle position sensor, adjust its angle properly. Refer to “ADJUSTING THE THROTTLE POSITION SENSOR” on page 6-12.

EAS28371

CHECKING THE AIR INDUCTION SYSTEM SOLENOID

1. Check:

- Air induction system solenoid resistance
 Out of specification → Replace.



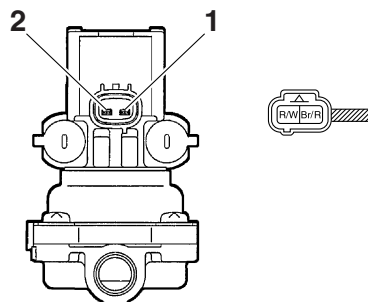
Air induction system
Solenoid resistance
20–24 Ω

- Remove the air induction system solenoid coupler from the air induction system solenoid.
- Connect the pocket tester ($\Omega \times 10$) to the air induction system solenoid terminals as shown.



Pocket tester
90890-03112
Analog pocket tester
YU-03112-C

- Positive tester probe → red/white “1”
- Negative tester probe → brown/red “2”



c. Measure the air induction system solenoid resistance.

EAS28411

CHECKING THE INTAKE AIR PRESSURE SENSOR

1. Check:

- Intake air pressure sensor output voltage
 Out of specification → Replace.



Intake air pressure sensor output voltage
1.20–4.20 V

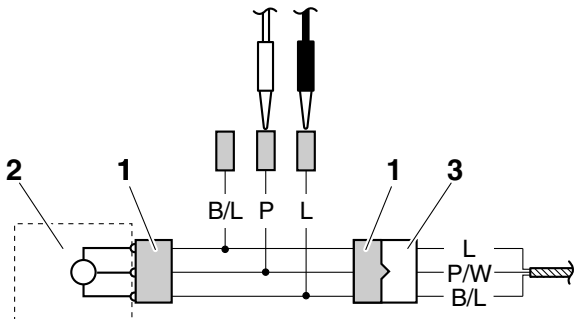
- Connect the test harness S– pressure sensor (3P) “1” to the intake air pressure sensor “2” and wire harness “3”.
- Connect the digital circuit tester (DCV) to the test harness S– pressure sensor (3P).



Digital circuit tester
90890-03174
Model 88 Multimeter with tachometer
YU-A1927
Test harness S– pressure sensor
5S7 (3P)
90890-03211
Test harness S– pressure sensor
5S7 (3P)
YU-03211

ELECTRICAL COMPONENTS

- Positive tester probe pink/white (wire harness color)
- Negative tester probe black/blue (wire harness color)



- Turn the main switch to "ON".
- Measure the intake air pressure sensor output voltage.



EAS28421

CHECKING THE INTAKE AIR TEMPERATURE SENSOR

- Remove:
 - Intake air temperature sensor (from the air filter case.)
 Refer to "GENERAL CHASSIS" on page 4-1.

EWA14110



WARNING

- Handle the intake air temperature sensor with special care.
- Never subject the intake air temperature sensor to strong shocks. If the intake air temperature sensor is dropped, replace it.

- Check:
 - Intake air temperature sensor resistance
 Out of specification → Replace.



Intake air temperature sensor resistance
 290–390 Ω @ 80 °C (290–390 Ω @ 176 °F)



- Connect the pocket tester ($\Omega \times 100$) to the intake air temperature sensor terminal as shown.



Pocket tester
 90890-03112
Analog pocket tester
 YU-03112-C

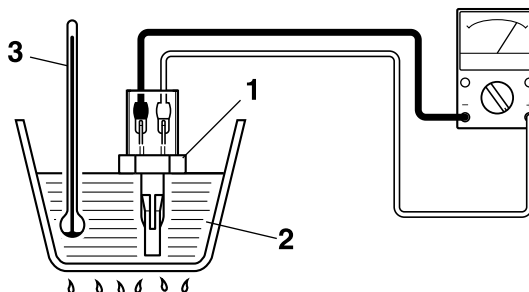
- Immerse the intake air temperature sensor

"1" in a container filled with water "2".

TIP

Make sure that the intake air temperature sensor terminals do not get wet.

- Place a thermometer "3" in the water.



- Slowly heat the water, then let it cool down to the specified temperature.
- Measure the intake air temperature sensor resistance.



- Install:
 - Intake air temperature sensor
 Refer to "GENERAL CHASSIS" on page 4-1.



Intake air temperature sensor screw
 2.5 Nm (0.25 m·kgf, 1.8 ft·lbf)

EAS2RD1042

CHECKING THE FUEL INJECTOR

- Remove:
 - Fuel injector
 Refer to "THROTTLE BODY" on page 6-9.
- Check:
 - Fuel injector resistance
 Out of specification → Replace the fuel injector.



Resistance
 12.0 Ω

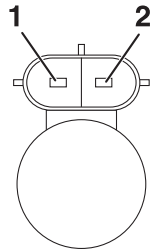


- Disconnect the fuel injector coupler from the fuel injector.
- Connect the pocket tester ($\Omega \times 10$) to the fuel injector coupler as shown.



Pocket tester
 90890-03112
Analog pocket tester
 YU-03112-C

- Positive tester probe →
Injector terminal “1”
- Negative tester probe →
Injector terminal “2”



c. Measure the fuel injector resistance.



TROUBLESHOOTING

TROUBLESHOOTING	8-1
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EAS28451

TROUBLESHOOTING

EAS28460

GENERAL INFORMATION

TIP

The following guide for troubleshooting does not cover all the possible causes of trouble. It should be helpful, however, as a guide to basic troubleshooting. Refer to the relative procedure in this manual for checks, adjustments, and replacement of parts.

EAS30410

STARTING FAILURES

Engine

1. Cylinder(s) and cylinder head(s)
 - Loose spark plug
 - Loose cylinder head or cylinder
 - Damaged cylinder head gasket
 - Damaged cylinder gasket
 - Worn or damaged cylinder
 - Incorrect valve clearance
 - Improperly sealed valve
 - Incorrect valve-to-valve-seat contact
 - Incorrect valve timing
 - Faulty valve spring
 - Seized valve
2. Piston(s) and piston ring(s)
 - Improperly installed piston ring
 - Damaged, worn or fatigued piston ring
 - Seized piston ring
 - Seized or damaged piston
3. Air filter
 - Improperly installed air filter
 - Clogged air filter element
4. Crankcase and crankshaft
 - Improperly assembled crankcase
 - Seized crankshaft

Fuel system

1. Fuel tank
 - Empty fuel tank
 - Clogged fuel filter
 - Clogged fuel tank cap breather hole
 - Clogged rollover valve
 - Clogged rollover valve hose
 - Deteriorated or contaminated fuel
 - Clogged or damaged fuel hose
2. Fuel pump
 - Faulty fuel pump
 - Faulty fuel pump relay
3. Throttle body(-ies)
 - Deteriorated or contaminated fuel
 - Sucked-in air

Electrical system

1. Battery
 - Discharged battery
 - Faulty battery
2. Fuse(s)
 - Blown, damaged or incorrect fuse
 - Improperly installed fuse
3. Spark plug
 - Incorrect spark plug gap
 - Incorrect spark plug heat range
 - Fouled spark plug
 - Worn or damaged electrode
 - Worn or damaged insulator
 - Faulty spark plug cap
4. Ignition coil(s)
 - Cracked or broken ignition coil body
 - Broken or shorted primary or secondary coils
 - Faulty spark plug lead
5. Ignition system
 - Faulty ECU
 - Faulty crankshaft position sensor
 - Broken generator rotor woodruff key
6. Switches and wiring
 - Faulty main switch
 - Faulty engine stop switch
 - Broken or shorted wiring
 - Faulty neutral switch
 - Faulty sidestand switch
 - Faulty clutch switch
 - Improperly grounded circuit
 - Loose connections

EAS30430

INCORRECT ENGINE IDLING SPEED

Engine

1. Cylinder(s) and cylinder head(s)
 - Incorrect valve clearance
 - Damaged valve train components
2. Air filter
 - Clogged air filter element

Fuel system

1. Throttle body(-ies)
 - Damaged or loose throttle body joint
 - Improper throttle grip free play
 - Flooded throttle body
 - Faulty air induction system

Electrical system

1. Battery
 - Discharged battery
 - Faulty battery
2. Spark plug
 - Incorrect spark plug gap
 - Incorrect spark plug heat range
 - Fouled spark plug

- Worn or damaged electrode
 - Worn or damaged insulator
 - Faulty spark plug cap
3. Ignition coil(s)
 - Broken or shorted primary or secondary coils
 - Faulty spark plug lead
 - Cracked or broken ignition coil
 4. Ignition system
 - Faulty ECU
 - Faulty crankshaft position sensor
 - Broken generator rotor woodruff key

EAS30460

POOR MEDIUM-AND-HIGH-SPEED PERFORMANCE

Refer to “STARTING FAILURES” on page 8-1.

Engine

1. Air filter
 - Clogged air filter element
2. Air intake system
 - Clogged or leaking air duct

Fuel system

1. Throttle body(-ies)
 - Faulty throttle body
2. Fuel pump
 - Faulty fuel pump

EAS28530

FAULTY GEAR SHIFTING

Shifting is difficult

Refer to “Clutch drags”.

EAS28540

SHIFT PEDAL DOES NOT MOVE

Shift shaft

- Improperly adjusted shift rod
- Bent shift shaft

Shift drum and shift forks

- Foreign object in a shift drum groove
- Seized shift fork
- Bent shift fork guide bar

Transmission

- Seized transmission gear
- Foreign object between transmission gears
- Improperly assembled transmission

EAS28550

JUMPS OUT OF GEAR

Shift shaft

- Incorrect shift pedal position
- Improperly returned stopper lever

Shift forks

- Worn shift fork

Shift drum

- Incorrect axial play
- Worn shift drum groove

Transmission

- Worn gear dog

EAS28560

FAULTY CLUTCH

Clutch slips

1. Clutch
 - Improperly assembled clutch
 - Improperly adjusted clutch cable
 - Loose or fatigued clutch spring
 - Worn friction plate
 - Worn clutch plate
2. Engine oil
 - Incorrect oil level
 - Incorrect oil viscosity (low)
 - Deteriorated oil

Clutch drags

1. Clutch
 - Unevenly tensioned clutch springs
 - Warped pressure plate
 - Bent clutch plate
 - Swollen friction plate
 - Bent clutch push rod
 - Broken clutch boss
 - Burnt primary driven gear bushing
 - Match marks not aligned
2. Engine oil
 - Incorrect oil level
 - Incorrect oil viscosity (high)
 - Deteriorated oil

EAS30470

OVERHEATING

Engine

1. Cylinder head(s) and piston(s)
 - Heavy carbon buildup
2. Engine oil
 - Incorrect oil level
 - Incorrect oil viscosity
 - Inferior oil quality

Fuel system

1. Throttle body(-ies)
 - Damaged or loose throttle body joint
2. Air filter
 - Clogged air filter element

Chassis

1. Brake(s)
 - Dragging brake

Electrical system

1. Spark plug
 - Incorrect spark plug gap
 - Incorrect spark plug heat range
2. Ignition system
 - Faulty ECU

EAS28640

POOR BRAKING PERFORMANCE

1. Disc brake
 - Worn brake pad
 - Worn brake disc
 - Air in hydraulic brake system
 - Leaking brake fluid
 - Faulty brake caliper kit
 - Faulty brake caliper seal
 - Loose union bolt
 - Damaged brake hose
 - Oil or grease on the brake disc
 - Oil or grease on the brake pad
 - Incorrect brake fluid level
2. Drum brake
 - Worn brake shoe
 - Worn or rusty brake drum
 - Incorrect brake pedal position (above the top of the rider footrest)
 - Incorrect brake pedal free play
 - Incorrect brake camshaft lever position
 - Incorrect brake shoe position
 - Damaged or fatigued brake shoe spring
 - Oil or grease on the brake shoe
 - Oil or grease on the brake drum
 - Broken brake torque rod

EAS28660

FAULTY FRONT FORK LEGS

Leaking oil

- Bent, damaged or rusty inner tube
- Cracked or damaged outer tube
- Improperly installed oil seal
- Damaged oil seal lip
- Incorrect oil level (high)
- Loose damper rod assembly bolt
- Damaged damper rod assembly bolt copper washer
- Cracked or damaged cap bolt O-ring

Malfunction

- Bent or damaged inner tube
- Bent or damaged outer tube
- Damaged fork spring
- Worn or damaged outer tube bushing
- Bent or damaged damper rod
- Incorrect oil viscosity
- Incorrect oil level

EAS28690

UNSTABLE HANDLING

1. Handlebar
 - Bent or improperly installed handlebar
2. Steering head components
 - Improperly installed upper bracket
 - Improperly installed lower bracket

- (improperly tightened ring nut)
 - Bent steering stem
 - Damaged ball bearing or bearing race
3. Front fork leg(s)
 - Uneven oil levels (both front fork legs)
 - Unevenly tensioned fork spring (both front fork legs)
 - Broken fork spring
 - Bent or damaged inner tube
 - Bent or damaged outer tube
 4. Swingarm
 - Worn bearing or bushing
 - Bent or damaged swingarm
 5. Rear shock absorber assembly(-ies)
 - Faulty rear shock absorber spring
 - Leaking oil
 6. Tire(s)
 - Uneven tire pressures (front and rear)
 - Incorrect tire pressure
 - Uneven tire wear
 7. Wheel(s)
 - Incorrect wheel balance
 - Broken or loose spoke
 - Damaged wheel bearing
 - Bent or loose wheel axle
 - Excessive wheel runout
 8. Frame
 - Bent frame
 - Damaged steering head pipe
 - Improperly installed bearing race

EAS28710

FAULTY LIGHTING OR SIGNALING SYSTEM

Headlight does not come on

- Wrong headlight bulb
- Too many electrical accessories
- Hard charging
- Incorrect connection
- Improperly grounded circuit
- Poor contacts (main or dimmer switch)
- Burnt-out headlight bulb

Headlight bulb burnt out

- Wrong headlight bulb
- Faulty battery
- Faulty rectifier/regulator
- Improperly grounded circuit
- Faulty main switch
- Faulty dimmer switch
- Headlight bulb life expired

The tail/brake light does not come on

- Wrong tail/brake light bulb
- Too many electrical accessories
- Incorrect connection
- Improperly grounded circuit

- Poor contacts (main or rear brake light switch)
- Burnt-out tail/brake light bulb

Burnt-out tail/brake light bulb

- Wrong tail/brake light bulb
- Faulty battery
- Faulty rectifier/regulator
- Improperly grounded circuit
- Faulty main switch
- Incorrectly adjusted rear brake light switch
- Tail/brake light bulb life expired

Turn signal does not come on

- Faulty turn signal switch
- Faulty turn signal/hazard relay
- Burnt-out turn signal bulb
- Incorrect connection
- Disconnected or damaged wire harness
- Improperly grounded circuit
- Faulty battery
- Blown, damaged or incorrect fuse

Turn signal blinks slowly

- Faulty turn signal/hazard relay
- Faulty main switch
- Faulty turn signal switch
- Incorrect turn signal bulb

Turn signal blinks quickly

- Incorrect turn signal bulb
- Faulty turn signal/hazard relay
- Burnt-out turn signal bulb

Horn does not sound

- Damaged or faulty horn
- Faulty main switch
- Faulty horn switch
- Faulty battery
- Blown, damaged or incorrect fuse
- Faulty wire harness

EAS28740

WIRING DIAGRAM**SR400/SR400E 2014**

- 1 Crankshaft position sensor
- 2 Neutral switch
- 3 AC magneto
- 4 Rectifier/regulator
- 5 Battery
- 6 Main fuse
- 7 Main switch
- 8 Backup fuse
- 9 Fuel injection system fuse
- 10 Ignition fuse
- 11 Signaling system fuse
- 12 Headlight fuse
- 13 Parking lighting fuse
- 14 Right handlebar switch
- 15 Hazard switch
- 16 Engine stop switch
- 17 Fuel pump relay
- 18 Diode 2
- 19 Sidestand switch
- 20 Clutch switch
- 21 Diode 1
- 22 Fuel pump
- 23 O₂ sensor
- 24 ECU (engine control unit)
- 25 Ignition coil
- 26 Spark plug
- 27 Fuel injector
- 28 ISC (idle speed control) valve
- 29 FI diagnostic tool (OPTION)
- 30 Lean angle sensor
- 31 Throttle position sensor
- 32 Intake air pressure sensor
- 33 Intake air temperature sensor
- 34 Engine temperature sensor
- 35 Joint coupler
- 36 Frame ground
- 37 Fuel sender
- 38 Air induction system solenoid
- 39 Speedometer
- 40 Engine trouble warning light
- 41 Speed sensor
- 42 Meter light
- 43 Fuel level warning light
- 44 Tachometer
- 45 Neutral indicator light
- 46 Turn signal indicator light
- 47 High beam indicator light
- 48 Front brake light switch
- 49 Rear brake light switch
- 50 Turn signal/hazard relay
- 51 Horn
- 52 Headlight relay (on/off)
- 53 Left handlebar switch
- 54 Pass switch
- 55 Dimmer switch
- 56 Horn switch
- 57 Turn signal switch

- 58 Tail/brake light
- 59 Rear right turn signal light
- 60 Rear left turn signal light
- 61 Front right turn signal light
- 62 Front left turn signal light
- 63 Headlight
- 64 Auxiliary light

EAS28750

COLOR CODE

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



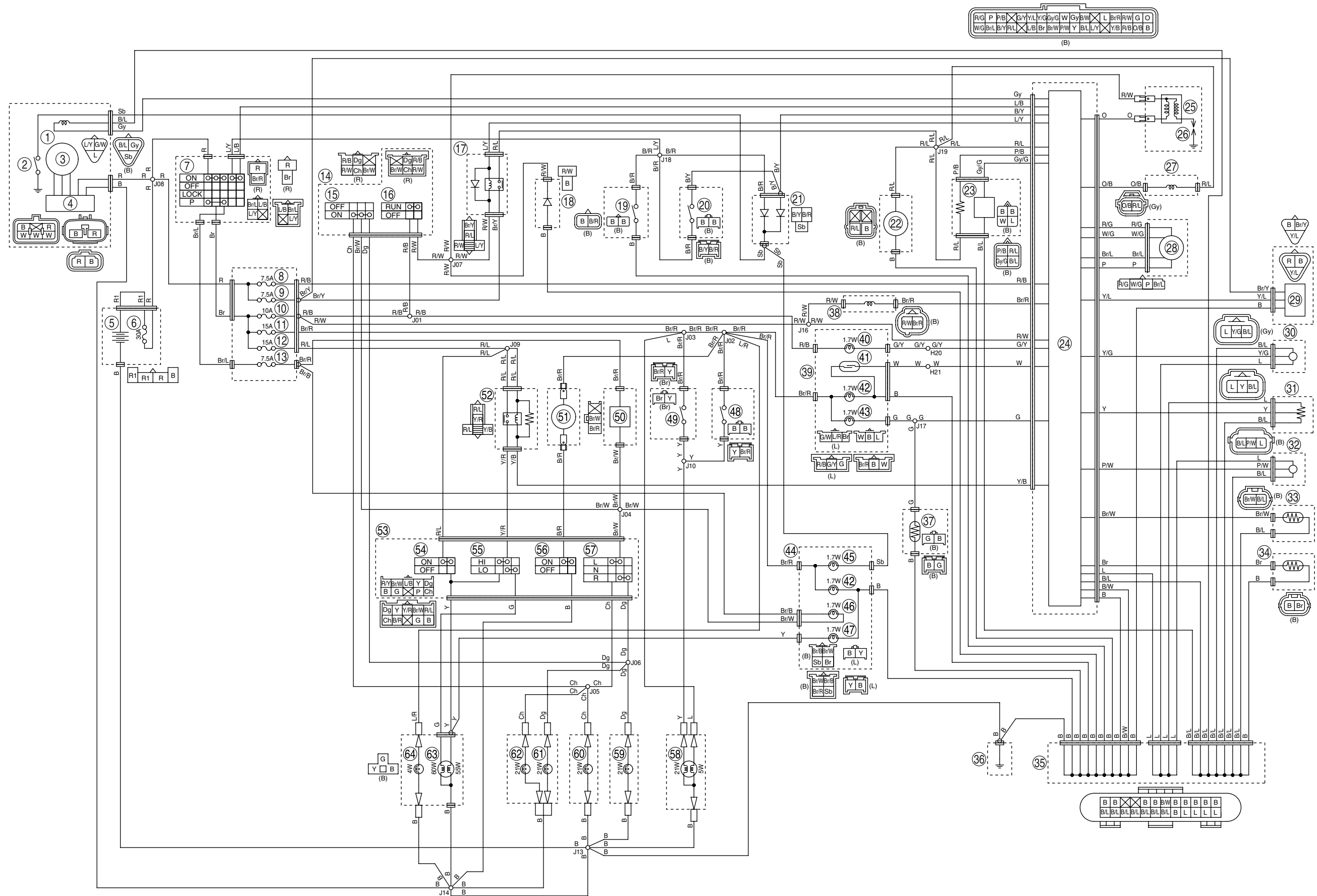
SR400/SR400E 2014
WIRING DIAGRAM

SR400/SR400E 2014
SCHEMA DE CÂBLAGE

SR400/SR400E 2014
SCHALTPLAN

SR400/SR400E 2014
SCHEMA ELETTRICO

SR400/SR400E 2014
DIAGRAMA ELÉCTRICO



SR400/SR400E 2014
WIRING DIAGRAM

SR400/SR400E 2014
SCHEMA DE CÂBLAGE

SR400/SR400E 2014
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SR400/SR400E 2014
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SR400/SR400E 2014
DIAGRAMA ELÉCTRICO

