












YZF-R1S YZF-R1SC

SERVICE MANUAL

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CHAPTER 8

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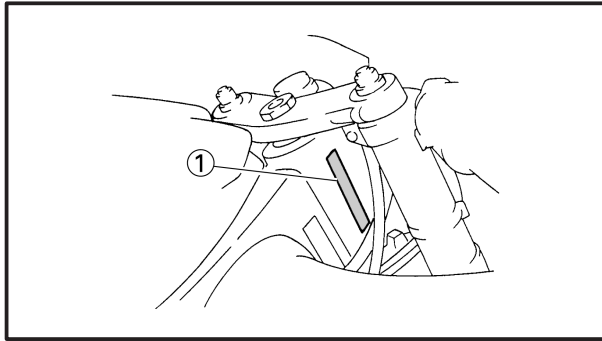
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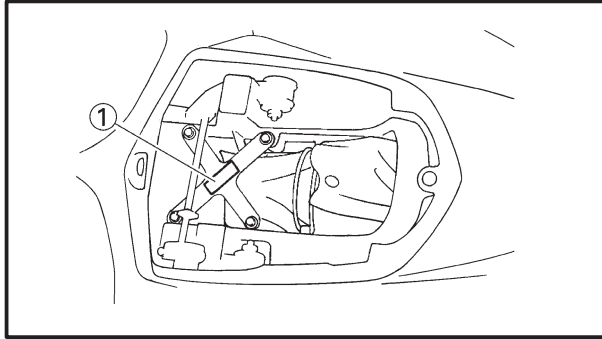
EAS00014

GENERAL INFORMATION MOTORCYCLE IDENTIFICATION

EAS00017

VEHICLE IDENTIFICATION NUMBER

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

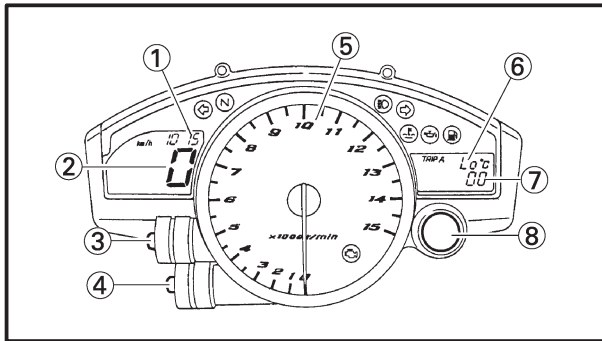


EAS00018

MODEL LABEL

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

EAS00019



- ① Clock
- ② Speedometer
- ③ “SELECT” button
- ④ “RESET” button
- ⑤ Tachometer
- ⑥ Coolant temperature display/air intake temperature display
- ⑦ Odometer/tripmeters/fuel reserve tripmeter/stopwatch
- ⑧ Shift timing indicator light

FEATURES
INSTRUMENT FUNCTIONS

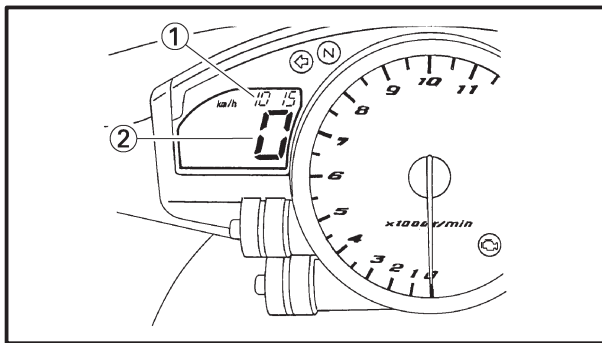
Multi-function display

The multi-function meter unit is equipped with the following:

- a speedometer (which shows the riding speed)
- a tachometer (which shows engine speed)
- an odometer (which shows the total distance traveled)
- two tripmeters (which show the distance traveled since they were last set to zero)
- a fuel reserve tripmeter (which shows the distance traveled since the fuel level warning light came on)
- a stopwatch
- a clock
- a coolant temperature display
- an air intake temperature display
- a self-diagnosis device
- a display brightness and shift timing indicator light control mode

NOTE:

- Be sure to turn the key to “ON” before using the “SELECT” and “RESET” buttons.



- ① Clock
- ② Speedometer

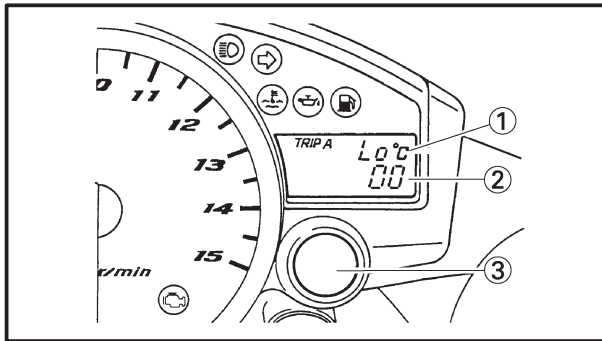
Clock mode

Turn the key to “ON”.

To set the clock

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

1



- ① Coolant temperature display/air intake temperature display
- ② Odometer/tripmeters/fuel reserve tripmeter/stopwatch
- ③ Shift timing indicator light

Odometer, tripmeter, and stopwatch modes

Push the “SELECT” button to switch the display between the odometer mode “ODO”, the tripmeter modes “TRIP A” and “TRIP B” and the stopwatch mode in the following order:

TRIP A → TRIP B → ODO → Stopwatch → TRIP A

If the fuel level warning light comes on, the odometer display will automatically change to the fuel reserve tripmeter mode “F-TRIP” and start counting the distance traveled from that point. In that case, push the “SELECT” button to switch the display between the various tripmeter, odometer, and stopwatch modes in the following order:

F-TRIP → Stopwatch → TRIP A → TRIP B → ODO → F-TRIP

To reset a tripmeter, select it by pushing the “SELECT” button, and then push the “RESET” button for at least one second. If you do not reset the fuel reserve tripmeter manually, it will reset itself automatically and the display will return to the prior mode after refueling and traveling 5 km (3 mi).

Stopwatch mode

Standard measurement

1. Push the “RESET” button to start the stopwatch.
2. Push the “SELECT” button to stop the stopwatch.
3. Push the “SELECT” button again to reset the stopwatch.

Split-time measurement

1. Push the “RESET” button to start the stopwatch.
2. Push the “RESET” button to measure split-times. (The colon “:” will start flashing.)
3. Push the “RESET” button to display the final split-time or push the “SELECT” button to stop the stopwatch and display total elapsed time.
4. Push the “SELECT” button to reset the stopwatch.

Coolant temperature display

The coolant temperature display indicates the temperature of the coolant. Push the “RESET” button to switch the coolant temperature display to the air intake temperature display.

NOTE: _____

When the coolant temperature display is selected, “C” is displayed before the coolant temperature.

Air intake temperature display

The air intake temperature display indicates the temperature of the air drawn into the air filter case. Push the “RESET” button to switch the coolant temperature display to the air intake temperature display.

NOTE: _____

- Even if the air intake temperature is set to be displayed, the coolant temperature warning light comes on when the engine overheats.
- When the key is turned to “ON”, the coolant temperature is automatically displayed, even if the air intake temperature was displayed prior to turning the key to “OFF”.
- When the air intake temperature display is selected, “A” is displayed before the temperature.

Self-diagnosis devices

The model is equipped with a self-diagnosis device for various electrical circuits. If any of those circuits are defective, the engine trouble warning light will come on, and then the right display will indicate a two-digit error code (e.g.,11,12,13).

Display brightness and shift timing indicator light control mode

This mode cycles through five control functions, allowing you to make the following settings in the order listed below.

- Display brightness:
This function allows you to adjust the brightness of the displays and tachometer to suit the outside lighting conditions.
- Shift timing indicator light activity:
This function allows you to choose whether or not the indicator light should be activated and whether it should flash or stay on when activated.
- Shift timing indicator light activation:
This function allows you to select the engine speed at which the indicator light will be activated.
- Shift timing indicator light deactivation:
This function allows you to select the engine speed at which the indicator light will be deactivated.
- Shift timing indicator light brightness:
This function allows you to adjust the brightness of the indicator light to suit your preference.

NOTE:

- To make any settings in this mode, you have to cycle through all of its functions. However, if the key is turned to “OFF” or the engine is started before completing the procedure, only the settings made before the “SELECT” button was last pushed will be applied.
- In this mode, the right display shows the current setting for each function (except the shift timing indicator light activity function).

To adjust the brightness of the multifunction meter displays and tachometer

1. Turn the key to “OFF”.
2. Push and hold the “SELECT” button.
3. Turn the key to “ON”, and then release the “SELECT” button after five seconds.
4. Push the “RESET” button to select the desired brightness level.
5. Push the “SELECT” button to confirm the selected brightness level. The control mode changes to the shift timing indicator light activity function.

To set the shift timing indicator light activity function

1. Push the “RESET” button to select one of the following indicator light activity settings:
 - The indicator light will stay on when activated. (This setting is selected when the indicator light stays on.)
 - The indicator light will flash when activated. (This setting is selected when the indicator light flashes four times per second.)
 - The indicator light is deactivated; in other words, it will not come on or flash. (This setting is selected when the indicator light flashes once every two seconds.)
2. Push the “SELECT” button to confirm the selected indicator light activity. The control mode changes to the shift timing indicator light activation function.

To set the shift timing indicator light activation function

NOTE: _____

The shift timing indicator light activation function can be set between 7000 r/min and 15000 r/m. From 7000 r/min to 12000 r/min, the indicator light can be set in increments of 500 r/min. From 12000 r/min to 15000 r/min, the indicator light can be set in increments of 200 r/min.

1. Push the “RESET” button to select the desired engine speed for activating the indicator light.
2. Push the “SELECT” button to confirm the selected engine speed. The control mode changes to the shift timing indicator light deactivation function.

To set the shift timing indicator light deactivation function

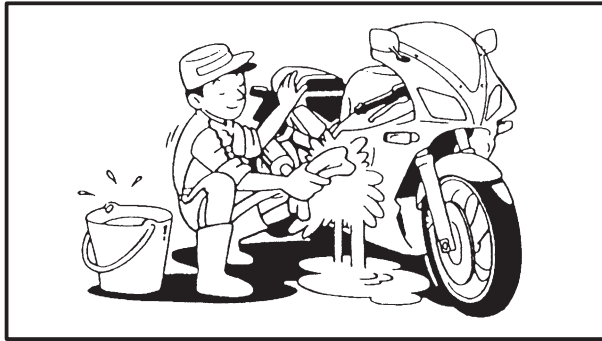
NOTE: _____

- The shift timing indicator light activation function can be set between 7000 r/min and 15000 r/min. From 7000 r/min to 12000 r/min, the indicator light can be set in increments of 500 r/min. From 12000 r/min to 15000 r/min, the indicator light can be set in increments of 200 r/min.
 - Be sure to set the deactivation function to a higher engine speed than for the activation function, otherwise the shift timing indicator light will remain deactivated.
-

1. Push the “RESET” button to select the desired engine speed for deactivating the indicator light.
2. Push the “SELECT” button to confirm the selected engine speed. The control mode changes to the shift timing indicator light brightness function.

To adjust the shift timing indicator light brightness

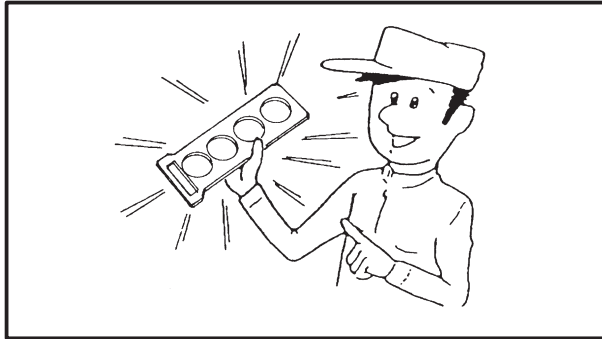
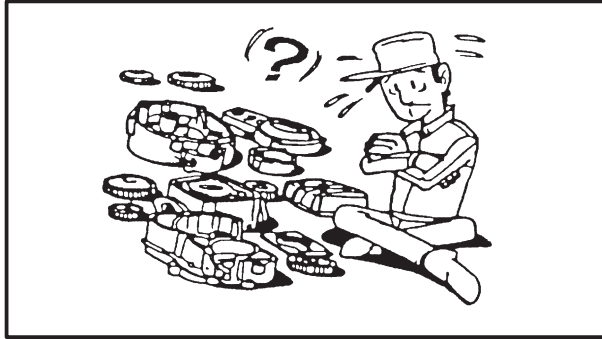
1. Push the “RESET” button to select the desired indicator light brightness level.
2. Push the “SELECT” button to confirm the selected indicator light brightness level. The right display will return to the odometer or tripmeter mode



EAS00020

**IMPORTANT INFORMATION
PREPARATION FOR REMOVAL AND
DISASSEMBLY**

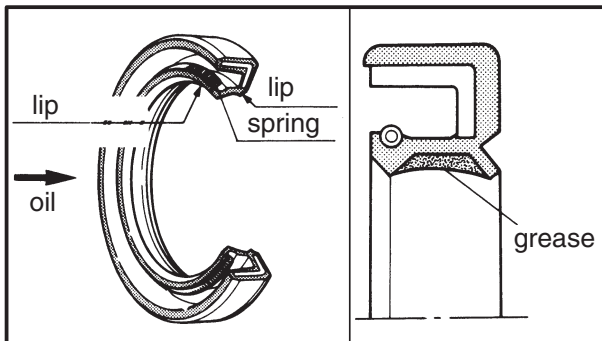
1. Before removal and disassembly, eliminate all dirt, mud, dust and foreign material.
2. Use only the proper tools and cleaning equipment.
Refer to the "SPECIAL TOOLS".
3. When disassembling, always keep mated parts together. This includes gears, cylinders, pistons and other parts that have been "mated" 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.



EAS00021

REPLACEMENT PARTS

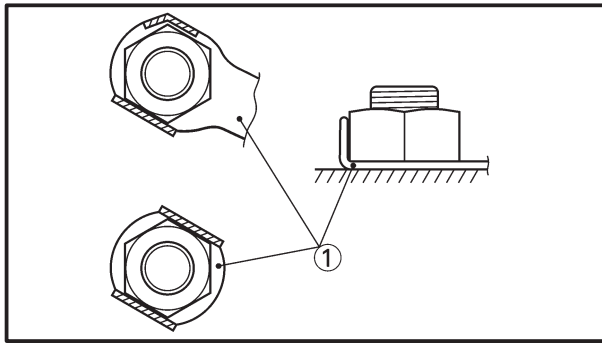
Use only genuine Yamaha parts for all replacements. Use oil and grease recommended by Yamaha for all lubrication jobs. Other brands may be similar in function and appearance, but inferior in quality.



EAS00022

GASKETS, OIL SEALS AND O-RINGS

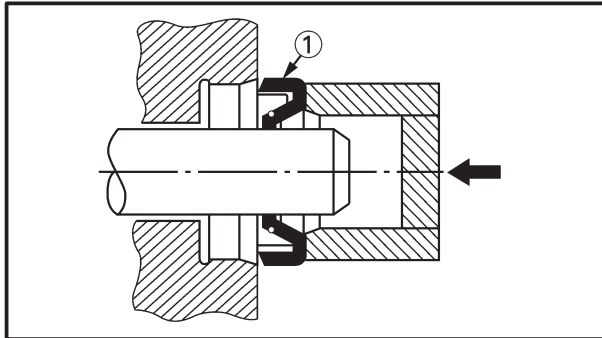
1. When overhauling the engine, replace all gaskets, seals and O-rings. All gasket surfaces, oil seal lips and O-rings must be cleaned.
2. During reassembly, properly oil all mating parts and bearings and lubricate the oil seal lips with grease.



EAS00023

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.



EAS00024

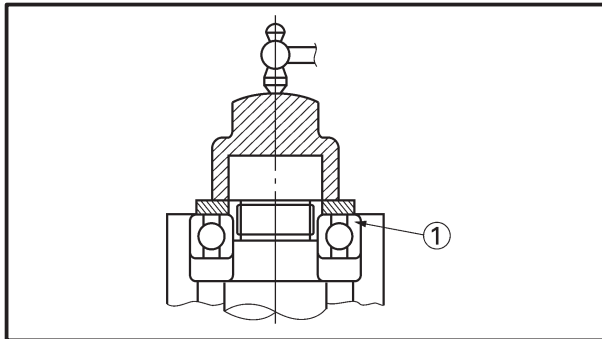
BEARINGS AND OIL SEALS

Install bearings and oil seals so that the manufacturer's 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.

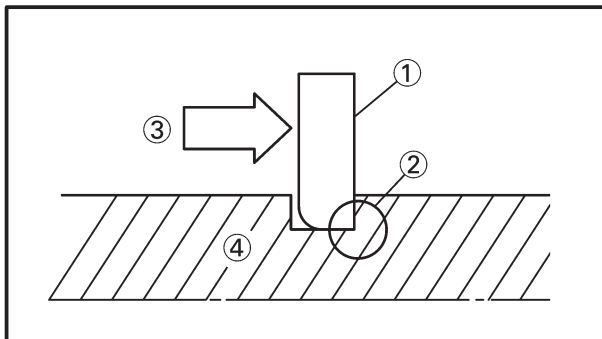
① Oil seal

CAUTION:

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



① Bearing



EAS00025

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.

④ Shaft

EAS00026

CHECKING THE CONNECTIONS

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

1. Disconnect:

- lead
- coupler
- connector

2. Check:

- lead
- coupler
- connector

Moisture → Dry with an air blower.

Rust/stains → Connect and disconnect several times.

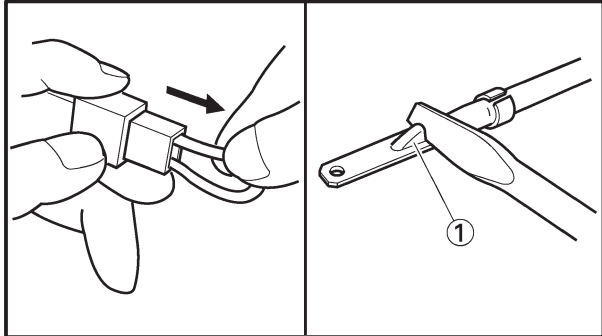
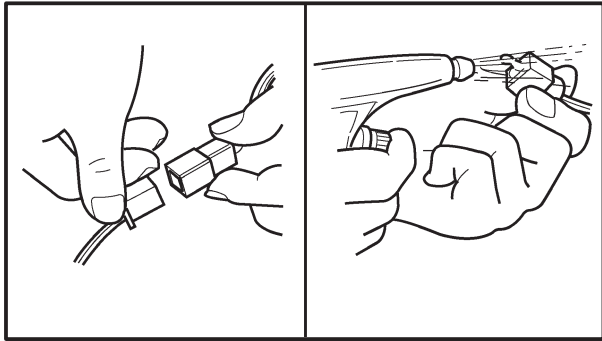
3. Check:

- all connections

Loose connection → Connect properly.

NOTE: _____

If the pin ① on the terminal is flattened, bend it up.

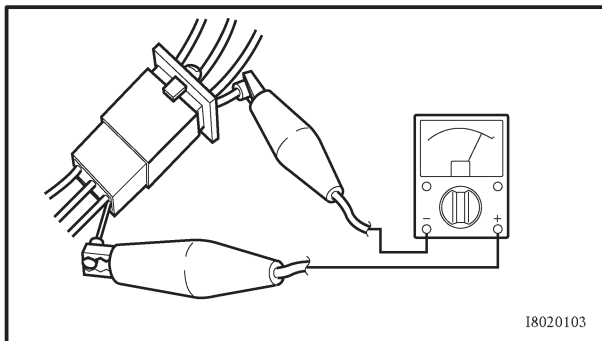


4. Connect:

- lead
- coupler
- connector

NOTE: _____


Make sure all connections are tight.



18020103

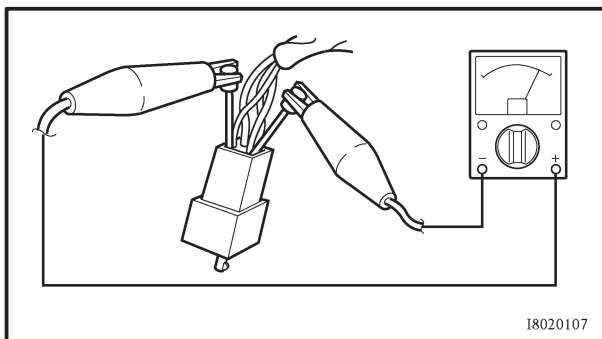
5. Check:

- continuity
(with the pocket tester)

	Pocket tester 90890-03112, YU-3112
---	--

NOTE: _____

- 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.



18020107



EAS00027

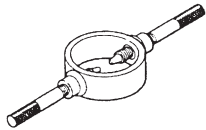
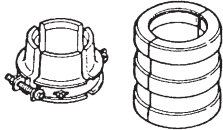
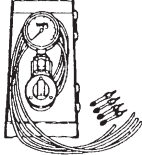
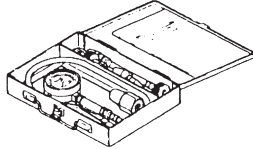
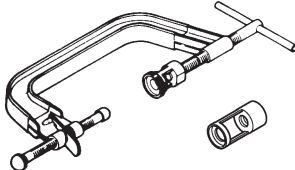
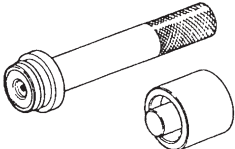
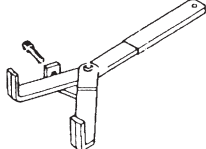
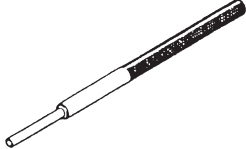
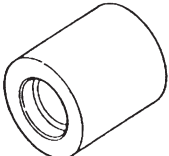
SPECIAL TOOLS

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.

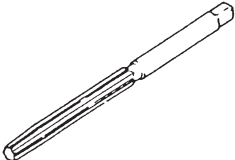
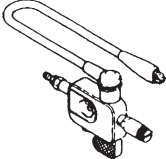
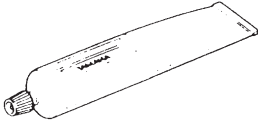
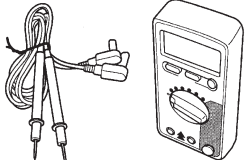
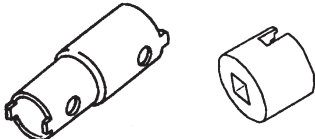
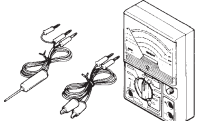
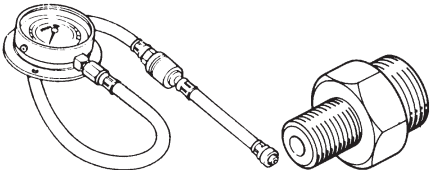
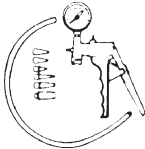

NOTE:

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

Tool No.	Tool name/Function	Illustration
90890-01304 YU-01304	Piston pin puller This tool is used to remove the piston pins.	
Radiator cap tester 90890-01325 YU-24460-01 Adapter 90890-01352 YU-33984	Radiator cap tester Radiator cap tester adapter These tools are used to check the cooling system.	
90890-01403 YU-33975	Steering nut wrench This tool is used to loosen or tighten the steering stem ring nuts.	
90890-01423 YM-01423	Damper rod holder This tool is used to hold the damper rod assembly when loosening or tightening the damper rod assembly bolt.	
90890-01426 YU-38411	Oil filter wrench This tool is needed to loosen or tighten the oil filter cartridge.	
90890-01434 YM-01434	Rod holder This tool is used to support the damper adjusting rod.	
Rod puller 90890-01437 YM-01437 Rod puller attachment 90890-01436 YM-01436	Rod puller Rod puller attachment These tools are used to pull up the front fork damper rod.	

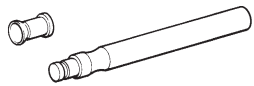
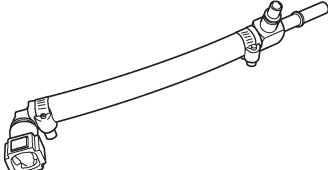
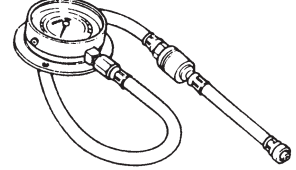
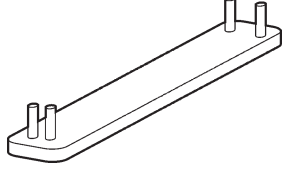
Tool No.	Tool name/Function	Illustration
90890-01441 YM-01441	<p>Fork spring compressor</p> <p>This tool is used to disassemble or assemble the front fork legs.</p>	
90890-01442 YM-01442	<p>Fork seal driver</p> <p>This tool is used to install the front fork's oil seal and dust seal.</p>	
90890-03094 YU-08030	<p>Vacuum gauge</p> <p>This guide is used to synchronize the carburetors.</p>	
Compression gauge 90890-03081 YU-33223 Adapter 90890-04136	<p>Compression gauge Compression gauge adapter</p> <p>These tools are used to measure engine compression.</p>	
Valve spring compressor 90890-04019 YM-04019 Attachment 90890-04108 YM-01253 90890-04114 YM-4114	<p>Valve spring compressor Valve spring compressor attachment</p> <p>These tools are used to remove or install the valve assemblies.</p>	
Middle driven shaft bearing driver 90890-04058 YM-4058 Mechanical seal installer 90890-04078 YM-33221	<p>Middle driven shaft bearing driver Mechanical seal installer</p> <p>These tools are used to install the water pump seal.</p>	
90890-04086 YM-91042	<p>Clutch holding tool</p> <p>This tool is used to hold the clutch boss when removing or installing the clutch boss nut.</p>	
90890-04111 90890-04116 YM-4116	<p>Valve guide remover</p> <p>This tool is used to remove or install the valve guides.</p>	
90890-04112 90890-04117 YM-4117	<p>Valve guide installer</p> <p>This tool is used to install the valve guides.</p>	



Tool No.	Tool name/Function	Illustration
90890-04113 YM-04113 90890-04118 YM-4118	Valve guide reamer This tool is used to rebores the new valve guides.	
90890-06754 YM-34487	Ignition checker This tool is used to check the ignition system components.	
90890-85505 ACC-1109-0501	Yamaha bond No. 1215 This bond is used to seal two mating surfaces (e.g., crankcase mating surfaces).	
90890-03174	Digital circuit tester This tool is used to check the electrical system.	
Pivot shaft wrench 90890-01471 YM-01471 Pivot shaft wrench adapter 90890-01476	Pivot shaft wrench Pivot shaft wrench adapter This tool is needed to loosen or tighten the spacer bolt.	
90890-03132 YU-3112	Pocket tester This instrument is needed for checking the engine oil temperature.	
Oil pressure gauge 90890-03153 YU-03153 Adapter 90890-03139	Oil pressure gauge Adapter These tools are used to measure engine oil pressure.	
90890-06756	Vacuum/pressure pump gauge set This tool used to measure the vacuum pressure.	
90793-80009	Engine tachometer This tool is needed for observing engine rpm.	

SPECIAL TOOLS

GEN INFO	
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Tool No.	Tool name/Function	Illustration
90890-04101	<p>Valve lapper</p> <p>This tool is needed to remove and install the valve lifter.</p>	
90890-03176 YM-03176	<p>Fuel pressure adapter</p> <p>This tool is needed to measure fuel pressure.</p>	
90890-03153 YU-03153	<p>Pressure gauge</p> <p>This tool is used to measure fuel pressure.</p>	
90890-04143 YM-04143	<p>Camshaft wrench</p> <p>This tool is used to hold and rotate the camshaft sprocket.</p>	



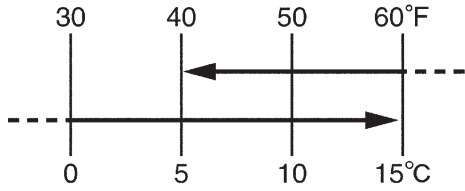
SPECIFICATIONS

GENERAL SPECIFICATIONS

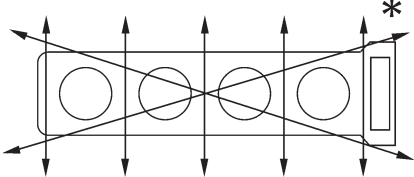
Item	Standard	Limit
Model code	5VY4 (USA), 5VY5 (CAL)	...
Dimensions		
Overall length	2,065 mm (8.13 in)	...
Overall width	720 mm (28.3 in)	...
Overall height	1,105 mm (43.5 in)	...
Seat height	835 mm (32.9 in)	...
Wheelbase	1,395 mm (54.9 in)	...
Minimum ground clearance	135 mm (5.31 in)	...
Minimum turning radius	3,400 mm (133.9 in)	...
Weight		
Wet (with oil and a full fuel tank)	193 kg (425 lb) (USA) 194 kg (428 lb) (CAL)	...
Maximum load (except motorcycle)	202 kg (445 lb) (USA) 201 kg (443 lb) (CAL)	...



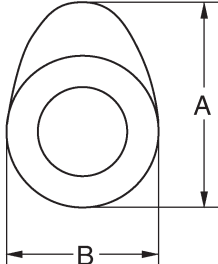
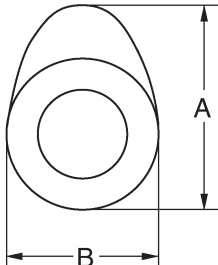
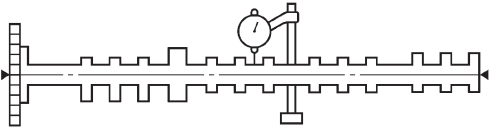
ENGINE SPECIFICATIONS

Item	Standard	Limit
<p>Engine Engine type Displacement Cylinder arrangement Bore × stroke Compression ratio Engine idling speed Vacuum pressure at engine idling speed Standard compression pressure (at sea level)</p>	<p>Liquid-cooled, 4-stroke, DOHC 998 cm³ (60.90 cu.in) Forward-inclined parallel 4-cylinder 77.0 × 53.6 mm (3.03 × 2.11 in) 12.4 : 1 1,150 ~ 1,250 r/min 22 kPa (165 mmHg, 6.5 inHg) 1,480 kPa (14.80 kg/cm², 14.80 bar, 210.5 psi) at 350 r/min</p>	<p>... </p>
<p>Fuel Recommended fuel Fuel tank capacity Total (including reserve) Reserve only</p>	<p>Premium unleaded gasoline only 18 L (3.96 Imp gal, 4.76 US gal) 3.4 L (0.75 Imp gal, 0.90 US gal)</p>	<p>... </p>
<p>Engine oil Lubrication system Recommended oil</p>  <p>Quantity Total amount Without oil filter cartridge replacement With oil filter cartridge replacement Oil pressure</p> <p>Engine oil temperature Relief valve opening pressure</p>	<p>Wet sump</p> <p>At 5°C (40°F) or higher Yamalube 4 (20W40) or SAE 20W40 type SE motor oil At 15°C (60°F) or lower Yamalube 4 (10W30) or SAE 10W30 type SE motor oil</p> <p>3.8 L (3.35 Imp qt, 4.02 US qt) 2.9 L (2.55 Imp qt, 3.07 US qt) 3.1 L (2.73 Imp qt, 3.28 US qt) 230 kPa at 5,000 r/min (2.3 kg/cm² at 5,000 r/min) (2.3 bar at 5,000 r/min) (32.7 psi at 5,000 r/min) 100°C (212°F) 600 ~ 680 kPa (6.0 ~ 6.8 kg/cm², 6.0 ~ 6.8 bar, 87.0 ~ 98.6 psi)</p>	<p>... </p>

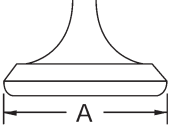
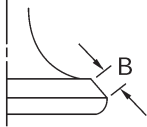
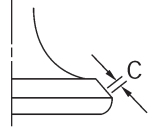
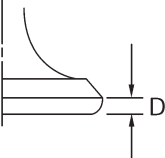
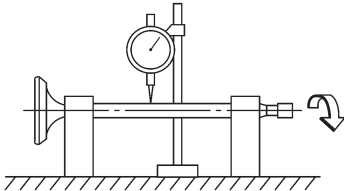


Item	Standard	Limit
Oil filter Oil filter type Bypass valve opening pressure	Paper 80 ~ 120 kPa (0.8 ~ 1.2 kg/cm ² , 0.8 ~ 1.2 bar, 11.6 ~ 17.4 psi)
Oil pump Oil pump type Inner-rotor-to-outer-rotor-tip clearance Outer-rotor-to-oil-pump-housing clearance	Trochoid 0.01 ~ 0.10 mm (0.0004 ~ 0.0039 in) 0.09 ~ 0.15 mm (0.00035 ~ 0.0059 in)	... 0.18 mm (0.0071 in) 0.22 mm (0.0087 in)
Cooling system Radiator capacity Radiator cap opening pressure Radiator core Width Height Depth Coolant reservoir Capacity Water pump Water pump type Reduction ratio Max. impeller shaft tilt	2.51 L (2.21 Imp qt, 2.65 US qt) 108 ~ 137 kPa (1.08 ~ 1.37 kg/cm ² , 1.0 ~ 1.3 bar, 15.6 ~ 19.9 psi) 380 mm (14.96 in) 258 mm (10.2 in) 24 mm (0.94 in) 0.25 L (0.22 Imp qt, 0.26 US qt) Single suction centrifugal pump 65/43 × 25/32 (1.181) 0.15 mm (0.006 in)
Starting system type	Electric starter	
Spark plugs Model (manufacturer) × quantity Spark plug gap	CR9EK (NGK) × 4 0.6 ~ 0.7 mm (0.0236 ~ 0.0276 in)
Cylinder head Volume Max. warpage 	12.5 ~ 13.1 cm ³ (0.76 ~ 0.80 cu.in) 0.10 mm (0.0039 in)

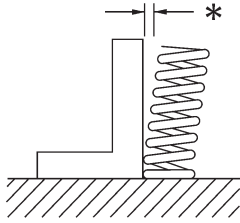



Item	Standard	Limit
<p>Camshafts Drive system Camshaft cap inside diameter Camshaft journal diameter Camshaft-journal-to-camshaft-cap clearance Intake camshaft lobe dimensions</p>	<p>Chain drive (right) 22.500 ~ 22.521 mm (0.8858 ~ 0.8867 in) 22.459 ~ 22.472 mm (0.8842 ~ 0.8847 in) 0.028 ~ 0.062 mm (0.0011 ~ 0.0024 in)</p>	<p>••• ••• •••</p>
		
<p>Measurement A</p>	<p>32.85 ~ 32.95 mm (1.293 ~ 1.297 in)</p>	<p>32.75 mm (1.289 in)</p>
<p>Measurement B</p>	<p>25.14 ~ 25.24 mm (0.990 ~ 0.994 in)</p>	<p>25.04 mm (0.986 in)</p>
<p>Exhaust camshaft lobe dimensions</p>		
		
<p>Measurement A</p>	<p>30.75 ~ 30.85 mm (1.211 ~ 1.215 in)</p>	<p>30.65 mm (1.207 in)</p>
<p>Measurement B</p>	<p>23.09 ~ 23.19 mm (0.909 ~ 0.913 in)</p>	<p>22.99 mm (0.905 in)</p>
<p>Max. camshaft runout</p>	<p>•••</p>	<p>0.03 mm (0.0012 in)</p>
		

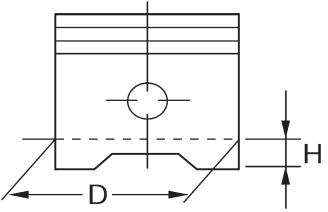
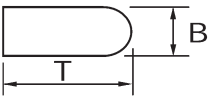
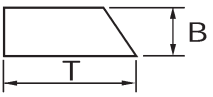
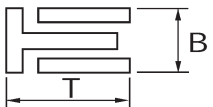


Item	Standard	Limit
Timing chain		
Model/number of links	RH2020/122	•••
Tensioning system	Automatic	•••
Valves, valve seats, valve guides		
Valve clearance (cold)		
Intake	0.11 ~ 0.20 mm (0.0043 ~ 0.0079 in)	•••
Exhaust	0.21 ~ 0.25 mm (0.0083 ~ 0.0098 in)	•••
Valve dimensions		
		
		
Head Diameter	Face Width	Seat Width
		Margin Thickness
Valve head diameter A		
Intake	23.4 ~ 23.6 mm (0.9213 ~ 0.9291 in)	•••
Exhaust	24.9 ~ 25.1 mm (0.9803 ~ 0.9882 in)	•••
Valve face width B		
Intake	1.76 ~ 2.90 mm (0.0693 ~ 0.1142 in)	•••
Exhaust	1.76 ~ 2.90 mm (0.0693 ~ 0.1142 in)	•••
Valve seat width C		
Intake	0.9 ~ 1.1 mm (0.0354 ~ 0.0433 in)	1.6 mm (0.06 in)
Exhaust	0.9 ~ 1.1 mm (0.0354 ~ 0.0433 in)	1.6 mm (0.06 in)
Valve margin thickness D		
Intake	0.5 ~ 0.9 mm (0.0197 ~ 0.0354 in)	0.5 mm (0.02 in)
Exhaust	0.5 ~ 0.9 mm (0.0197 ~ 0.0354 in)	0.5 mm (0.02 in)
Valve stem diameter		
Intake	3.975 ~ 3.990 mm (0.1565 ~ 0.1571 in)	3.945 mm
Exhaust	4.460 ~ 4.475 mm (0.1756 ~ 0.1762 in)	(0.1553 in)
Exhaust		4.425 mm
Exhaust		(0.1742 in)
Valve guide inside diameter		
Intake	4.000 ~ 4.012 mm (0.1575 ~ 0.1580 in)	4.050 mm
Exhaust	4.500 ~ 4.512 mm (0.1772 ~ 0.1776 in)	(0.1594 in)
Exhaust		4.550 mm
Exhaust		(0.1791 in)
Valve-stem-to-valve-guide clearance		
Intake	0.010 ~ 0.037 mm (0.0004 ~ 0.0015 in)	0.08 mm
Exhaust	0.025 ~ 0.052 mm (0.0010 ~ 0.0020 in)	(0.0032 in)
Exhaust		0.10 mm
Exhaust		(0.0039 in)
Valve stem runout	•••	0.01 mm
Exhaust		(0.0004 in)
		
Valve seat width		
Intake	0.9 ~ 1.1 mm (0.0354 ~ 0.0433 in)	1.6 mm (0.06 in)
Exhaust	0.9 ~ 1.1 mm (0.0354 ~ 0.0433 in)	1.6 mm (0.06 in)

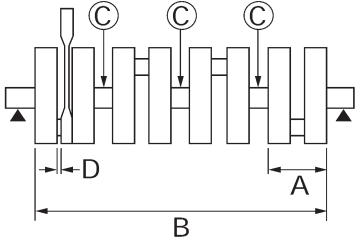


Item	Standard	Limit
Valve springs		
Free length		
Intake	39.3 mm (1.55 in)	37.3 mm (1.47 in)
Exhaust	39.3 mm (1.55 in)	37.3 mm (1.47 in)
Installed length (valve closed)		
Intake	32.7 mm (1.29 in)	•••
Exhaust	32.8 mm (1.29 in)	•••
Compressed spring force (installed)		
Intake	145.9 ~ 167.9 N (14.88 ~ 17.12 kg, 32.80 ~ 37.74 lb)	•••
Exhaust	164.1 ~ 188.9 N (16.73 ~ 19.26 kg, 36.89 ~ 42.46 lb)	•••
Spring tilt		
		
Intake	•••	2.5°/1.7 mm (0.07 in)
Exhaust	•••	2.5°/1.7 mm (0.07 in)
Winding direction (top view)		
Intake	Clockwise	•••
Exhaust	Clockwise	•••
		
Cylinders		
Cylinder arrangement	Forward-inclined, parallel 4-cylinder	•••
Bore × stroke	77.0 mm × 53.6 mm (3.03 × 2.11 in)	•••
Compression ratio	12.4 : 1	•••
Bore	77.00 ~ 77.01 mm (3.0315 ~ 3.0319 in)	•••
Max. out-of-round	•••	0.005 mm (0.0002 in)



Item	Standard	Limit
Piston		
Piston-to-cylinder clearance	0.010 ~ 0.035 mm (0.0004 ~ 0.0014 in)	0.120 mm (0.0047 in)
Diameter D 	76.975 ~ 76.990 mm (3.0305 ~ 3.0311 in)	•••
Height H	5 mm (0.20 in)	•••
Piston pin bore (in the piston)		
Diameter	17.002 ~ 17.013 mm (0.6694 ~ 0.6698 in)	17.043 mm (0.6710 in)
Offset	0.5 mm (0.0197 in)	•••
Offset direction	Intake side	•••
Piston pins		
Outside diameter	16.991 ~ 17.000 mm (0.6689 ~ 0.6693 in)	16.971 mm (0.6682 in)
Piston-pin-to-piston-pin-bore clearance	0.002 ~ 0.022 mm (0.0001 ~ 0.0009 in)	0.072 mm (0.0028 in)
Piston rings		
Top ring 		
Ring type	Barrel	•••
Dimensions (B × T)	0.90 × 2.75 mm (0.04 × 0.11 in)	•••
End gap (installed)	0.15 ~ 0.25 mm (0.0059 ~ 0.0098 in)	0.50 mm (0.0197 in)
Ring side clearance	0.030 ~ 0.065 mm (0.0012 ~ 0.0026 in)	0.115 mm (0.0045 in)
2nd ring		
		
Ring type	Taper	•••
Dimensions (B × T)	0.80 × 2.75 mm (0.03 × 0.11 in)	•••
End gap (installed)	0.30 ~ 0.45 mm (0.0118 ~ 0.0177 in)	0.80 mm (0.0315 in)
Ring side clearance	0.020 ~ 0.055 mm (0.0008 ~ 0.0022 in)	0.115 mm (0.0045 in)
Oil ring		
		
Dimensions (B × T)	1.50 × 2.25 mm (0.06 × 0.09 in)	•••
End gap (installed)	0.10 ~ 0.40 mm (0.0039 ~ 0.0158 in)	•••



Item	Standard	Limit
<p>Connecting rods Crankshaft-pin-to-big-end-bearing clearance Bearing color code</p>	<p>0.034 ~ 0.058 mm (0.0013 ~ 0.0023 in) 1 = Blue 2 = Black 3 = Brown 4 = Green</p>	<p>0.09 mm (0.0035 in) ...</p>
<p>Crankshaft</p>  <p>Width A Width B Max. runout C Big end side clearance D Crankshaft-journal-to-crankshaft-journal-bearing clearance Bearing color code</p>	<p>55.20 ~ 56.60 mm (2.17 ~ 2.23 in) 298.8 ~ 300.7 mm (11.76 ~ 11.84 in) ... 0.160 ~ 0.262 mm (0.0063 ~ 0.0103 in) 0.014 ~ 0.037 mm (0.0006 ~ 0.0015 in) 0 = White 1 = Blue 2 = Black 3 = Brown 4 = Green</p>	<p>... ... 0.03 mm (0.0012 in) ... 0.10 mm (0.0039 in) ...</p>

ENGINE SPECIFICATIONS

SPEC



Item	Standard	Limit
Clutch		
Clutch type	Wet, multiple disc	•••
Clutch release method	Outer pull, rack and pinion pull	•••
Clutch release method operation	Cable operation	•••
Operation	Left-hand operation	•••
Clutch cable free play (at the end of the clutch lever)	10 ~ 15 mm (0.39 ~ 0.59 in)	•••
Friction plates		
Color code	Purple	•••
Thickness	2.9 ~ 3.1 mm (0.114 ~ 0.122 in)	2.8 mm (0.110 in)
Plate quantity	7	•••
Color code	Green	•••
Thickness	2.9 ~ 3.1 mm (0.114 ~ 0.112 in)	2.8 mm (0.110 in)
Plate quantity	1	•••
Color code	—	•••
Thickness	2.9 ~ 3.1 mm (0.114 ~ 0.112 in)	2.8 mm (0.110 in)
Plate quantity	1	•••
Clutch plates		
Thickness	1.9 ~ 2.1 mm (0.07 ~ 0.08 in)	•••
Plate quantity	8	•••
Max. warpage	•••	0.1 mm (0.0039 in)
Clutch springs		
Free length	52.5 mm (2.07 in)	49.9 mm (1.96 in)
Spring quantity	6	•••

ENGINE SPECIFICATIONS

SPEC



Item	Standard	Limit
Transmission		
Transmission type	Constant mesh, 6-speed	•••
Primary reduction system	Spur gear	•••
Primary reduction ratio	65/43 (1.512)	•••
Secondary reduction system	Chain drive	•••
Secondary reduction ratio	45/17 (2.647)	•••
Operation	Left-foot operation	•••
Gear ratios		
1st gear	38/15 (2.533)	•••
2nd gear	33/16 (2.063)	•••
3rd gear	37/21 (1.762)	•••
4nd gear	35/23 (1.522)	•••
5th gear	30/22 (1.364)	•••
6th gear	33/26 (1.269)	•••
Max. main axle runout	•••	0.08 mm (0.0032 in)
Max. drive axle runout	•••	0.08 mm (0.0032 in)
Shifting mechanism		
Shift mechanism type	Shift drum/Guide bar	•••
Max. shift fork guide bar bending	•••	0.10 mm (0.0039 in)
Air filter type		
	Oil coated paper element	•••
Fuel pump		
Pump type	Electrical	•••
Model (manufacturer)	5PW (DENSO)	•••
Output pressure	294 kPa (2.94 kg/cm ² , 2.94 bar, 42.6 psi)	•••
Throttle position sensor		
Resistance	4.9 ~ 5.1 kΩ at 20°C (68°F)	•••
Output voltage (at idle)	0.63 ~ 0.73 V	•••
Throttle bodies		
Model (manufacturer) × quantity	45EIDW (MIKUNI) × 2	•••
Intake vacuum pressure	22 kPa (165 mmHg, 6.4966 inHg)	•••
Throttle cable free play (at the flange of the throttle grip)	3 ~ 5 mm (0.12 ~ 0.20 in)	•••
ID mark	5VY1 00 (USA) 5VY5 10 (CAL)	•••
Throttle valve size	#100	•••



CHASSIS SPECIFICATIONS

Item	Standard	Limit
Frame		
Frame type	Diamond	•••
Caster angle	24°	•••
Trail	97 mm (3.82 in)	•••
Front wheel		
Wheel type	Cast wheel	•••
Rim		
Size	17 M/C × MT3.50	•••
Material	Aluminum	•••
Wheel travel	120 mm (4.72 in)	•••
Wheel runout		
Max. radial wheel runout	•••	1 mm (0.04 in)
Max. lateral wheel runout	•••	0.5 mm (0.02 in)
Rear wheel		
Wheel type	Cast wheel	•••
Rim		
Size	17 M/C × MT6.00	•••
Material	Aluminum	•••
Wheel travel	130 mm (5.12 in)	•••
Wheel runout		
Max. radial wheel runout	•••	1 mm (0.04 in)
Max. lateral wheel runout	•••	0.5 mm (0.02 in)
Front tire		
Tire type	Tubeless	•••
Size	120/70 ZR17 M/C (58W)	•••
Model (manufacturer)	Pilot POWER C (MICHELIN) D218FL (DUNLOP)	•••
Tire pressure (cold)		
0 ~ 90 kg (0 ~ 198 lb)	250 kPa (2.5 kgf/cm ² , 2.5 bar, 35.6 psi)	•••
90 ~ 202 kg (198 ~ 445 lb)	250 kPa (2.5 kgf/cm ² , 2.5 bar, 35.6 psi)	•••
High-speed riding	250 kPa (2.5 kgf/cm ² , 2.5 bar, 35.6 psi)	•••
Min. tire tread depth	•••	1.6 mm (0.06 in)
Rear tire		
Tire type	Tubeless	•••
Size	190/50 ZR17 M/C (73W)	•••
Model (manufacturer)	Pilot POWER G (MICHELIN) D218L (DUNLOP)	•••
Tire pressure (cold)		
0 ~ 90 kg (0 ~ 198 lb)	290 kPa (2.9 kgf/cm ² , 2.9 bar, 41.3 psi)	•••
90 ~ 202 kg (198 ~ 445 lb)	290 kPa (2.9 kgf/cm ² , 2.9 bar, 41.3 psi)	•••
High-speed riding	290 kPa (2.9 kgf/cm ² , 2.9 bar, 41.3 psi)	•••
Min. tire tread depth	•••	1.6 mm (0.06 in)

CHASSIS SPECIFICATIONS

SPEC



Item	Standard	Limit
Front brakes		
Brake type	Dual disc brake	•••
Operation	Right hand operation	•••
Recommended fluid	DOT 4	•••
Brake lever free play	2.3 ~ 11.5 mm (0.09 ~ 0.45 in)	•••
Brake discs		
Diameter × thickness	320 × 4.5 mm (12.60 × 0.18 in)	•••
Min. thickness	•••	4.0 mm (0.16 in)
Max. deflection	•••	0.1 mm (0.004 in)
Brake pad lining thickness (inner)	4.5 mm (0.18 in)	0.5 mm (0.02 in)
Brake pad lining thickness (outer)	4.5 mm (0.18 in)	0.5 mm (0.02 in)
Master cylinder inside diameter	14 mm (0.55 in)	•••
Caliper cylinder inside diameter	30.1 mm and 27 mm (1.19 in and 1.06 in)	•••
Rear brake		
Brake type	Single disc brake	•••
Operation	Right foot operation	•••
Recommended fluid	DOT 4	•••
Brake pedal freeplay	4.3 ~ 9.3 mm (0.17 ~ 0.37 in)	•••
Brake discs		
Diameter × thickness	220 × 5 mm (8.66 × 0.20 in)	•••
Min. thickness	•••	4.5 mm (0.18 in)
Max. deflection	•••	0.15 mm (0.006 in)
Brake pad lining thickness (inner)	6.0 mm (0.24 in)	1.0 mm (0.04 in)
Brake pad lining thickness (outer)	6.0 mm (0.24 in)	1.0 mm (0.04 in)
Master cylinder inside diameter	12.7 mm (0.5 in)	•••
Caliper cylinder inside diameter	31.8 mm (1.25 in)	•••

CHASSIS SPECIFICATIONS

SPEC



Item	Standard	Limit
Front suspension		
Suspension type	Telescopic fork	•••
Front fork type	Coil spring/oil damper	•••
Front fork travel	120 mm (4.72 in)	•••
Spring		
Free length	236.5 mm (9.31 in)	231.8 mm (9.13 in)
Spacer length	100 mm (3.937 in)	•••
Installed length	222.5 mm (8.76 in)	•••
Spring rate (K1)	8.83 N/mm (0.90 kg/mm, 50.42 lb/in)	•••
Spring stroke (K1)	0 ~ 120 mm (0 ~ 4.7244 in)	•••
Inner tube outer diameter	43 mm (1.69 in)	•••
Inner tube bending limit	•••	0.2 mm (0.01 in)
Optional spring available	No	•••
Fork oil		
Recommended oil	Suspension oil "01"	•••
Quantity (each front fork leg)	0.53 L (0.47 Imp qt, 0.56 US qt)	•••
Level (from the top of the outer tube, with the outer tube fully compressed, and without the fork spring)	76 mm (2.99 in)	•••
Spring preload adjusting positions		
Minimum	8	•••
Standard	4.5	•••
Maximum	1	•••
Rebound damping adjusting positions		
Minimum*	26	•••
Standard*	10	•••
Maximum*	1	•••
Compression damping adjusting positions		
Minimum*	25	•••
Standard*	10	•••
Maximum*	1	•••
*from the fully turned-in position		

CHASSIS SPECIFICATIONS

SPEC



Item	Standard	Limit
Steering		
Steering bearing type	Angular bearing	•••
Lock to lock angle (left)	27°	•••
Lock to lock angle (right)	27°	•••
Rear suspension		
Suspension type	Swingarm (link suspension)	•••
Rear shock absorber assembly type	Coil spring/gas-oil damper	•••
Rear shock absorber assembly travel	65 mm (2.56 in)	•••
Spring		
Free length	173.5 mm (6.83 in)	•••
Installed length	163.5 mm (6.44 in)	•••
Spring rate (K1)	83.4 N/mm (8.50 kg/mm, 476.21 lb/in)	•••
Spring stroke (K1)	0 ~ 65 mm (0.00 ~ 2.56 in)	•••
Optional spring available	No	•••
Standard spring preload gas/air pressure	1,200 kPa (12 kg/cm ² , 12 bar, 171 psi)	•••
Spring preload adjusting positions		
Minimum	1	•••
Standard	4	•••
Maximum	9	•••
Rebound damping adjusting positions		
Minimum*	20	•••
Standard*	17	•••
Maximum*	1	•••
Compression damping adjusting positions		
Minimum*	20	•••
Standard*	12	•••
Maximum*	1	•••
*from the fully turned-in position		
Swingarm		
Free play (at the end of the swingarm)		
Radial	•••	1.0 mm (0.04 in)
Axial	•••	1.0 mm (0.04 in)
Drive chain		
Model (manufacturer)	50VA8 (DAIDO)	•••
Link quantity	116	•••
Drive chain slack	25 ~ 35 mm (0.98 ~ 1.38 in)	•••
Maximum ten-link section	•••	150.1 mm (5.91 in)



ELECTRICAL SPECIFICATIONS

Item	Standard	Limit
System voltage	12 V	...
Ignition system		
Ignition system type	DC. T.C.I.	...
Ignition timing	5° BTDC at 1,050 r/min	...
Crankshaft position sensor resistance/color	336 ~ 504 Ω at 20°C (68°F)/Gy-B	...
T.C.I. unit model (manufacturer)	F8T822 (MITSUBISHI) (USA) F8T823 (MITSUBISHI) (CAL)
Ignition coils		
Model (manufacturer)	F6T558 (MITSUBISHI)	...
Minimum ignition spark gap	6 mm (0.24 in)	...
Primary coil resistance	1.19 ~ 1.61 Ω at 20°C (68°F)	...
Secondary coil resistance	8.5 ~ 11.5 kΩ at 20°C (68°F)	...
Charging system		
System type	A.C. magneto	...
Model (manufacturer)	F4T850 (MITSUBISHI)	...
Normal output	14 V/560 W at 5,000 r/min	...
Stator coil resistance/color	0.14 ~ 0.18 Ω at 20°C (68°F)/W-W	...
Rectifier/regulator		
Regulator type	Semi conductor short circuit	...
Model (manufacture)	FH011AA (SHINDENGEN)	...
No-load regulated voltage	14.3 ~ 15.1 V	...
Rectifier capacity	50 A	...
Withstand voltage	100 V	...
Battery		
Battery type	YTZ10S	...
Battery voltage/capacity	12 V/8.6 Ah	...
Specific gravity	1.310	...
Manufacturer	YUASA	...
Ten hour rate amperage	0.8 A	...
Headlight type	Halogen bulb	
Bulbs (voltage/wattage × quantity)		
Headlight	12 V 55 W × 4	...
Auxiliary light	12 V 5 W × 2	...
Tail/brake light	LED × 1	...
Front turn signal light/position light	12 V 21 W/5 W × 2	...
Rear turn signal light	12 V 21 W × 2	...
Licence plate light	12 V 5 W × 1	...
Meter light	LED × 1	...

ELECTRICAL SPECIFICATIONS

SPEC



Item	Standard	Limit
Indicator light (voltage/wattage × quantity)		
Neutral indicator light	LED × 1	...
High beam indicator light	LED × 1	...
Oil level warning light	LED × 1	...
Turn signal indicator light	LED × 2	...
Fuel level warning light	LED × 1	...
Coolant tempature indicator light	LED × 1	...
Engine trouble warning light	LED × 1	...
Shift timing indicator light	LED × 1	...
Electric starting system		
System type	Constant mesh	...
Starter motor		
Model (manufacturer)	5VY (YAMAHA)	...
Power output	0.9 kW	...
Brushes		
Overall length	10.8 mm (0.43 in)	3.6 mm (0.14 in)
Spring force	5.28 ~ 7.92 N (538 ~ 808 g, 18.99 ~ 28.48 oz)	...
Armature coil resistance	0.0090 ~ 0.0110 Ω at 20°C (68°F)	...
Commutator diameter	24.5 mm (0.96 in)	23.5 mm (0.93 in)
Mica undercut	1.5 mm (0.06 in)	...
Starter relay		
Model (manufacturer)	2768079-A (JIDECO)	...
Amperage	180 A	...
Coil resistance	4.18 ~ 4.62 Ω at 20°C (68°F)	...
Horn		
Horn type	Plane	...
Model (manufacturer) × quantity	YF-12 (NIKKO) × 1	...
Max. amperage	3 A	...
Performance	105 ~ 113 db/2 m	...
Coil resistance	1.15 ~ 1.25 Ω at 20°C (68°F)	...
Turn signal relay		
Relay type	Full transistor	...
Model (manufacturer)	FE218BH (DENSO)	...
Self-cancelling device built-in	No	...
Turn signal blinking frequency	75 ~ 95 cycles/min.	...
Wattage	21 W × 2 + 3.4 W	...
Oil level switch		
Model (manufacturer)	5VY (SOMIC ISHIKAWA)	...
EXUP servo motor		
Model (manufacturer)	5VY (YAMAHA)	...

ELECTRICAL SPECIFICATIONS

SPEC



Item	Standard	Limit
Fuses (amperage × quantity)		
Main fuse	50 A × 1	...
Fuel injection system fuse	15 A × 1	...
Headlight fuse	25 A × 1	...
Signaling system fuse	10 A × 1	...
Ignition fuse	15 A × 1	...
Radiator fan motor fuse	15 A × 2	...
Backup fuse (odometer and clock)	10 A × 1	...
Reserve fuse	25 A, 15 A, 10 A × 1	...

CONVERSION TABLE/ GENERAL TIGHTENING TORQUE SPECIFICATIONS



EAS00028

EAS00030

CONVERSION TABLE

All specification data in this manual are listed in SI and METRIC UNITS.

Use this table to convert METRIC unit data to IMPERIAL unit data.

Ex.

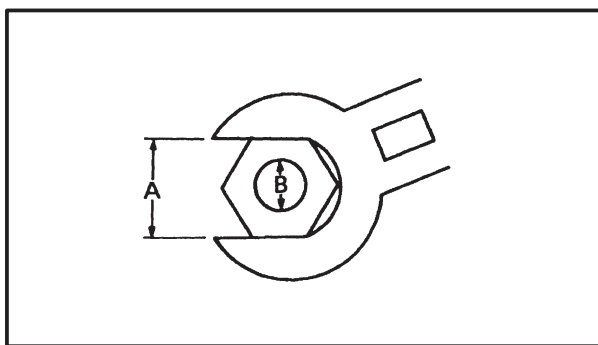
METRIC		MULTIPLIER	=	IMPERIAL
** mm	×	0.03937	=	** in
2 mm	×	0.03937	=	0.08 in

CONVERSION TABLE

METRIC TO IMPERIAL			
	Metric unit	Multiplier	Imperial unit
Tightening torque	m•kg	7.233	ft•lb
	m•kg	86.794	in•lb
	cm•kg	0.0723	ft•lb
	cm•kg	0.8679	in•lb
Weight	kg	2.205	lb
	g	0.03527	oz
Speed	km/hr	0.6214	mph
Distance	km	0.6214	mi
	m	3.281	ft
	m	1.094	yd
	cm	0.3937	in
	mm	0.03937	in
Volume/ Capacity	cc (cm ³)	0.03527	oz (IMP liq.)
	cc (cm ³)	0.06102	cu•in
	lt (liter)	0.8799	qt (IMP liq.)
	lt (liter)	0.2199	gal (IMP liq.)
Misc.	kg/mm	55.997	lb/in
	kg/cm ²	14.2234	psi (lb/in ²)
	Centigrade (°C)	9/5+32	Fahrenheit (°F)

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•kg	ft•lb
10 mm	6 mm	6	0.6	4.3
12 mm	8 mm	15	1.5	11
14 mm	10 mm	30	3.0	22
17 mm	12 mm	55	5.5	40
19 mm	14 mm	85	8.5	61
22 mm	16 mm	130	13.0	94



TIGHTENING TORQUES
ENGINE TIGHTENING TORQUES

Item	Fastener	Thread size	Q'ty	Tightening torque			Remarks
				Nm	m•kg	ft•lb	
Spark plugs	—	M10	4	13	1.3	9.4	
Cylinder head	Nut	M10	10	See NOTE 1			
	Bolt	M6	2	12	1.2	8.7	
Camshaft caps	Bolt	M6	28	10	1.0	7.2	
Cylinder head cover	Bolt	M6	6	12	1.2	8.7	
Cylinder head (exhaust pipe)	Stud bolt	M8	8	15	1.5	11	
Air indication system cap	Bolt	M6	4	10	1.0	7.2	
Camshaft sprockets	Bolt	M7	4	24	2.4	17	
Cylinder head and throttle body	Clamp	M5	4	3	0.3	2.2	
Connecting rod caps	Bolt	M8	8	20+150°	2.0+150°	14+150°	
Generator rotor	Bolt	M10	1	60	6.0	43	
Timing chain tensioner	Bolt	M6	2	10	1.0	7.2	
Water pump outlet pipe	Bolt	M6	1	10	1.0	7.2	
Water pump inlet pipe (water pump side)	Bolt	M6	1	10	1.0	7.2	
Water pump inlet pipe (front side)	Bolt	M6	1	10	1.0	7.2	
Oil/water pump assembly sprocket	Bolt	M6	1	15	1.5	11	
Water pump	Bolt	M6	2	12	1.2	8.7	
Thermostat cover	Nut	M6	2	10	1.0	7.2	
Thermostat inlet pipe	Bolt	M6	1	10	1.0	7.2	
Oil cooler	Bolt	M20	1	63	6.3	46	
Engine oil drain bolt	Bolt	M14	1	43	4.3	31	
Oil pipe	Bolt	M6	2	10	1.0	7.2	
Oil strainer	Bolt	M6	3	10	1.0	7.2	
Oil delivery pipe	Bolt	M6	3	10	1.0	7.2	
Oil filter union bolt	Bolt	M20	1	70	7.0	51	
Oil filter	—	M20	1	17	1.7	12	
Oil pan	Bolt	M6	14	12	1.2	8.7	
Oil pan	Bolt	M6	1	12	1.2	8.7	
Air filter case cover	Screw	M5	10	1.7	0.17	1.2	
Throttle body and throttle body joint	Clamp	M5	4	3	0.3	2.2	
Throttle body and funnel	Bolt	M5	6	4.2	0.42	3.0	
Throttle cable	Nut	M6	1	4.5	0.45	3.3	
Throttle cable adjuster	Bolt	M6	1	4.5	0.45	3.3	
Stator coil	Screw	M6	3	14	1.4	10	
Generator rotor cover and bearing housing	Screw	M6	3	10	1.0	7.2	
Pull lever cover	Bolt	M6	2	10	1.0	7.2	
Thermostat assembly stay	Bolt	M6	2	10	1.0	7.2	
Starter clutch idler gear	Bolt	M6	1	10	1.0	7.2	
Clutch boss	Nut	M20	1	95	9.5	69	Stake
Clutch spring	Bolt	M6	6	10	1.0	7.2	
Drive sprocket	Nut	M22	1	85	8.5	61	Use a lock washer

TIGHTENING TORQUES

SPEC









Item	Fastener	Thread size	Q'ty	Tightening torque			Remarks
				Nm	m•kg	ft•lb	
Exhaust pipe and cylinder head	Nut	M8	8	20	2.0	14	
Catalyst pipe assembly and muffler	Bolt	M8	2	20	2.0	14	
Exhaust pipe and exhaust valve pipe assembly	Bolt	M6	5	10	1.0	7.2	
Exhaust valve pipe and housing	Bolt	M6	1	10	1.0	7.2	
Pulley and shaft arm	Nut	M6	1	7	0.7	5.0	
EXUP pulley bracket	Bolt	M6	1	10	1.0	7.2	
EXUP pulley cover	Bolt	M6	2	10	1.0	7.2	
Exhaust valve pipe and bracket	Bolt	M8	1	20	2.0	14	
EXUP cable nut	Nut	M6	2	7	0.7	5.0	
Catalyst pipe bracket and frame	Bolt	M8	1	20	2.0	14	
Catalyst pipe and catalyst pipe bracket	Bolt	M8	1	20	2.0	14	
Exhaust valve pipe and catalyst pipe	Bolt	M8	1	20	2.0	14	
EXUP servo motor	Bolt	M6	2	7	0.7	5.0	
Muffler and rear frame	Bolt	M8	2	23	2.3	17	
Muffler cover	Bolt	M6	2	10	1.0	7.2	
Crankcase	Stud bolt	M10	10	8	0.8	5.8	
Crankcase (main journal)	Bolt	M9	10	See NOTE 2			
Crankcase	Bolt	M6	10	12	1.2	8.7	
Crankcase	Bolt	M8	1	24	2.4	17	
Crankcase	Bolt	M8	5	24	2.4	17	
Generator rotor cover	Bolt	M6	4	12	1.2	8.7	
Generator rotor cover	Bolt	M8	3	22	2.2	16	
Drive sprocket cover	Bolt	M6	2	10	1.0	7.2	
Drive sprocket cover	Bolt	M6	1	10	1.0	7.2	
Crankcase cover (left)	Screw	M6	3	10	1.0	7.2	
Clutch cover	Bolt	M6	7	12	1.2	8.7	
Clutch cover	Bolt	M6	1	12	1.2	8.7	
Pickup rotor cover	Bolt	M6	6	12	1.2	8.7	
Breather cover	Bolt	M6	4	12	1.2	8.7	
Breather plate	Bolt	M6	3	10	1.0	7.2	
Plate	Bolt	M6	2	10	1.0	7.2	
Pickup rotor cover blind bolt	Bolt	M8	1	15	1.5	11	
Generator rotor cover plug	Plug	M20	1	8	0.8	5.8	
Main gallery plug (oil return)	Plug	M16	3	8	0.8	5.8	
Main gallery plug	Plug	M20	1	8	0.8	5.8	
Oil return pipe	Bolt	M6	2	10	1.0	7.2	
Oil return plug	Screw	M12	2	24	2.4	17	
Stator coil lead	Bolt	M6	1	10	1.0	7.2	

TIGHTENING TORQUES

SPEC



Item	Fastener	Thread size	Q'ty	Tightening torque			Remarks
				Nm	m•kg	ft•lb	
Main axle bearing housing	Bolt	M6	3	12	1.2	8.7	
Shift fork shaft stopper	Bolt	M6	2	10	1.0	7.2	
Stopper screw	Screw	M8	1	22	2.2	16	
Shift rod lock nut (rear)	Nut	M6	1	7	0.7	5.0	Left thread
Shift rod lock nut (front)	Nut	M6	1	7	0.7	5.0	
Shift rod joint	Bolt	M6	1	10	1.0	7.2	
Shift arm	Bolt	M6	1	10	1.0	7.2	
E.C.U.	Screw	M6	2	7	0.7	5.0	
Neutral switch	—	M10	1	20	2.0	15	
EXUP servo motor cover	Screw	M5	2	2	0.2	1.5	
Coolant temperature sensor	—	M12	1	18	1.8	13	
Cylinder identification sensor	Bolt	M6	1	8	0.8	5.7	
Atmospheric pressure sensor	Screw	M5	2	7	0.7	5.0	
Crankshaft position sensor	Bolt	M6	1	10	1.0	7.2	
Oil level switch	Bolt	M6	2	10	1.0	7.2	

NOTE 1:

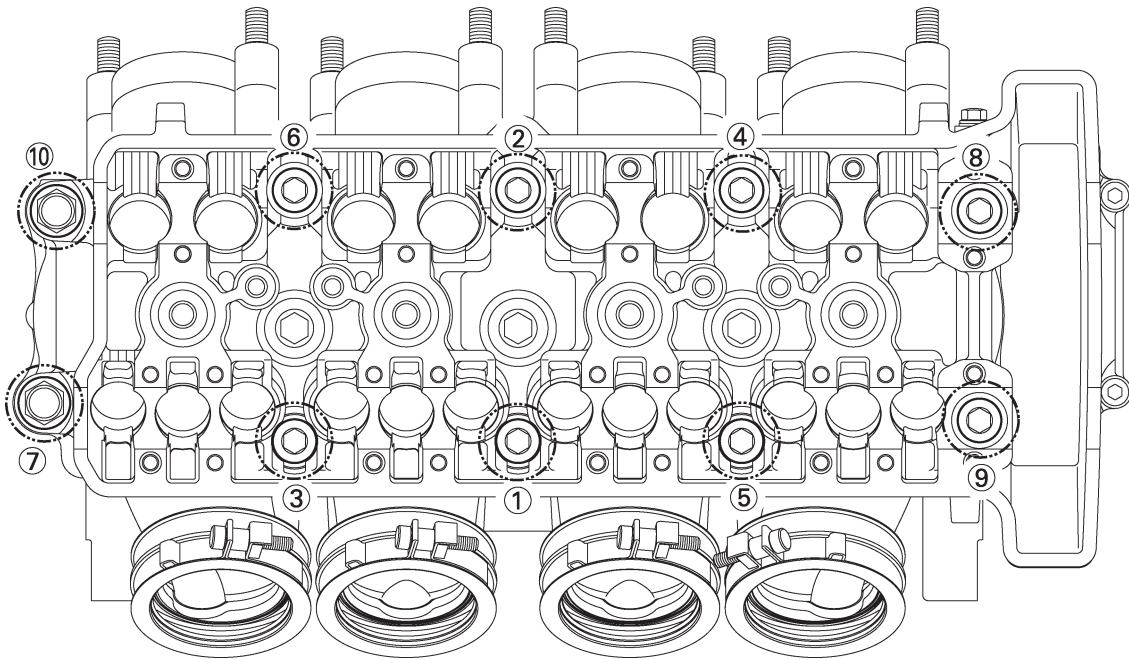
1. First, tighten the bolts to approximately 19 Nm (1.9 m•kg, 14 ft•lb) with a torque wrench following the tightening order.
2. Retighten the bolts 67 Nm (6.7 m•kg, 48 ft•lb) with a torque wrench.

NOTE 2:

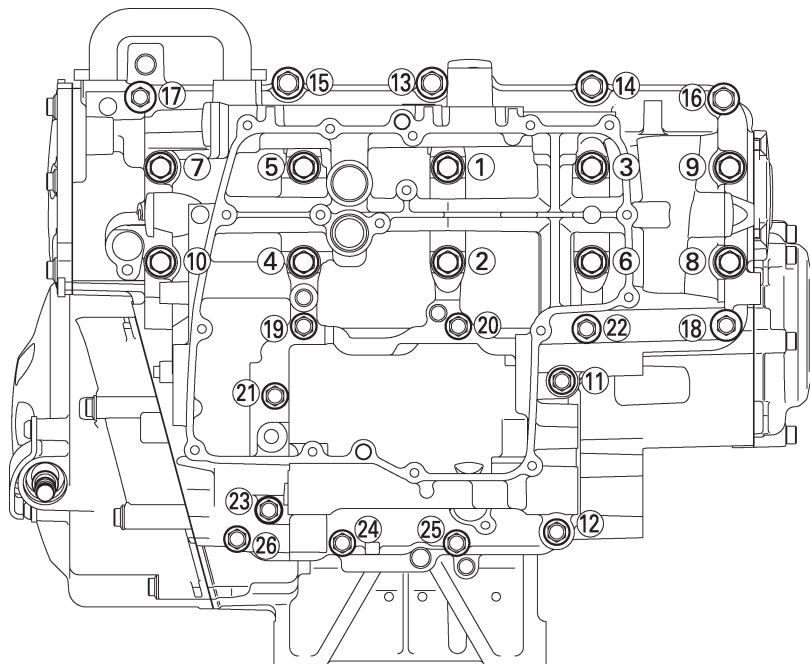
1. First, tighten the bolts to approximately 20 Nm (2.0 m•kg, 15 ft•lb) with a torque wrench following the tightening order.
2. Loosen the all bolts one by one following the tightening order and then tighten them to 20 Nm (2.7 m•kg, 15 ft•lb) again.
3. Retighten the bolts further to reach the specified angle (60°).



Cylinder head tightening sequence:



Crankcase tightening sequence.






CHASSIS TIGHTENING TORQUES

Item	Thread size	Tightening			Remarks	
		Nm	m•kg	ft•lb		
Upper bracket and outer tube	M8	26	2.6	19	See NOTE 1	
Upper bracket and steering stem nut	M28	113	11.3	82		
Handlebar and outer tube	M8	17	1.7	12		
Handlebar and upper bracket	M6	13	1.3	9		
Steering shaft and ring nut	M30	18	1.8	13		
Outer tube and under bracket	M8	23	2.3	17		
Main switch and upper bracket	M8	26	2.6	19		
Front brake master cylinder cap stopper	M4	1.2	0.12	0.9		
Front brake hose union bolts	M10	30	3.0	22		
Front brake master cylinder and bracket	M6	13	1.3	9		
Meter assembly and front cowling stay	—	1.3	0.13	0.9		
Headlight and front cowling stay	—	0.8	0.08	0.6		
Front cowling and headlight assembly	—	1.5	0.15	1.1		
Cover 7, 8 and frame	M6	5	0.5	3.6		
Under cowling and engine	M6	5	0.5	3.6		
Windshield and front cowling	M5	0.4	0.04	0.3		
Duct and console panel	M5	1.3	0.13	0.9		
End grip and handlebar	M6	4	0.4	2.9		
Horn bracket and under bracket	M6	4	0.4	2.9		
Coolant reservoir tank and frame	M6	5	0.5	3.6		
Engine mount front (left and right)	M10	45	4.5	33		See NOTE 2
Engine mount rear upper	M10	51	5.1	37		
Engine mount rear under	M10	51	5.1	37		
Engine mount rear adjust bolt	M16	7	0.7	5.1		
Catalyst pipe stay and frame	M10	44	4.4	32		
Clutch cable lock nut (engine side)	M8	7	0.7	5.1		
Main frame and rear frame	M10	41	4.1	30		
Throttle cable adjust nut (throttle body side)	M6	5	0.5	3.6		
Cover 2 and plate	—	0.8	0.08	0.6		
Pivot shaft and nut	M18	105	10.5	76		
Connecting rod and frame	M10	44	4.4	32		
Relay arm and connecting rod	M10	44	4.4	32		
Relay arm and swingarm	M10	44	4.4	32		
Rear shock absorber and relay arm	M10	44	4.4	32		
Rear shock absorber and upper bracket	M10	44	4.4	32		
Upper bracket and frame	M14	92	9.2	67		
Seal guard	M6	7	0.7	5.1		
Drive chain case	M6	7	0.7	5.1		
Chain puller adjust nut	M8	16	1.6	12		
Fuel tank and fuel pump assembly	M5	4	0.4	2.9		
Fuel tank stay (front side) and frame	M6	7	0.7	5.1		
Fuel tank and fuel tank stay (front side)	M6	7	0.7	5.1		
Fuel tank stay (rear side) and rear frame	M6	7	0.7	5.1		
Side cover and fuel tank	M5	0.4	0.04	0.3		
Rider seat and frame	M6	7	0.7	5.1		
Seat lock plate and rear frame	M6	10	1.0	7		
Side cover (rear side) and frame	M5	4	0.4	2.9		



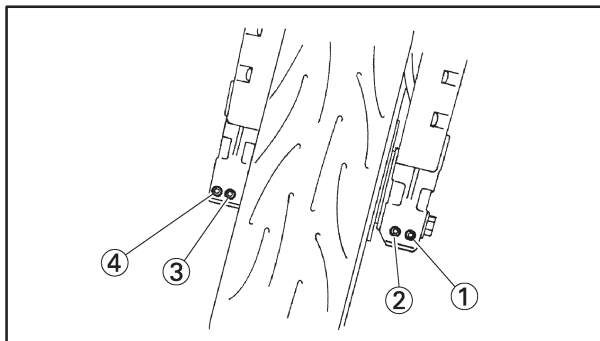
Item	Thread size	Tightening			Remarks
		Nm	m•kg	ft•lb	
Battery box and frame	M6	7	0.7	5.1	 See NOTE 3
Atmospheric pressure sensor and battery box	—	0.7	0.07	0.5	
Lean angle cut-off switch and battery box	—	2	0.2	1.4	
Foot rest bracket (front) and frame	M8	28	2.8	20	
Foot rest bracket (rear) and frame	M8	28	2.8	20	
Rear brake master cylinder and foot rest bracket	M6	18	1.8	13	
Rear brake hose union bolt	M10	30	3.0	22	
Sidestand bracket and frame	M10	63	6.3	46	
Front wheel axle shaft and bolt	M14	91	9.1	66	
Rear wheel axle nut	M24	150	15.0	109	
Front brake caliper and front fork	M10	35	3.5	25	
Front brake disc and front wheel	M6	18	1.8	13	
Rear brake disc and rear wheel	M6	30	3.0	22	
Rear wheel sprocket and drive hub	M10	100	10.0	72	
Brake caliper bleed screw	M8	6	0.6	4.3	
Front wheel axle pinch bolt	M8	20	2.0	14	

NOTE 1:

1. First, tighten the ring nut to approximately 52 Nm (5.2 m•kg, 38 ft•lb) with a torque wrench, then loosen the ring nut completely.
2. Retighten the lower ring nut to specification.

NOTE 2:

Refer to “INSTALLING THE ENGINE” in chapter 5.






























NOTE 3:

1. Insert the front wheel axle from the right side and tighten it with the flange bolt from the left side to 91 Nm (9.1 m•kg, 65.8 ft•lb).
2. In the order from the pinch bolt ② → pinch bolt ① → pinch bolt ②, tighten each bolt to 20 Nm (2.0 m•kg, 14 ft•lb) without performing temporary tightening.
3. Check that the end face of the axle head and the end face of the fork side are flush-mounted. If they are out of alignment, make sure to fit them by adding the external force by hand or with a plastic hammer, etc.
If the end face of the axle is not parallel to the end face of the fork, align them so that one point of the axle circumference is positioned on the end face of the fork.
At this stage, it can be accepted if the end face of the axle becomes partially concave to the end face of the fork.
4. In the order from the pinch bolt ④ → pinch bolt ③ → pinch bolt ④, tighten each bolt to 20 Nm (2.0 m•kg, 14 ft•lb) without performing temporary tightening.























EAS00031

**LUBRICATION POINTS AND LUBRICANT TYPES
ENGINE**

Lubrication point	Lubricant
Oil seal lips	
O-rings	
Bearings	
Crankshaft pins	
Piston surfaces	
Piston pins	
Crankshaft journals	
Camshaft lobes	
Camshaft journals	
Valve stems (intake and exhaust)	
Valve stem ends (intake and exhaust)	
Water pump impeller shaft	
Oil pump rotors (inner and outer)	
Oil pump housing	
Oil strainer	
Clutch (pull rod)	
Oil/water pump drive sprocket and washer	
Clutch (thrust plate)	
Starter clutch idle gear inner surface	
Starter clutch assembly	
Primary driven gear	
Transmission gears (wheel and pinion)	
Main axle and drive axle	
Shift drum	
Shift forks and shift fork guide bars	
Shift shaft	
Shift shaft boss	
Cylinder head cover mating surface	Yamaha bond No.1215
Crankcase mating surface	Yamaha bond No.1215
Clutch cover (crankcase mating surface)	Yamaha bond No.1215
Generator rotor cover (crankcase mating surface)	Yamaha bond No.1215
Pickup rotor cover	Yamaha bond No.1215

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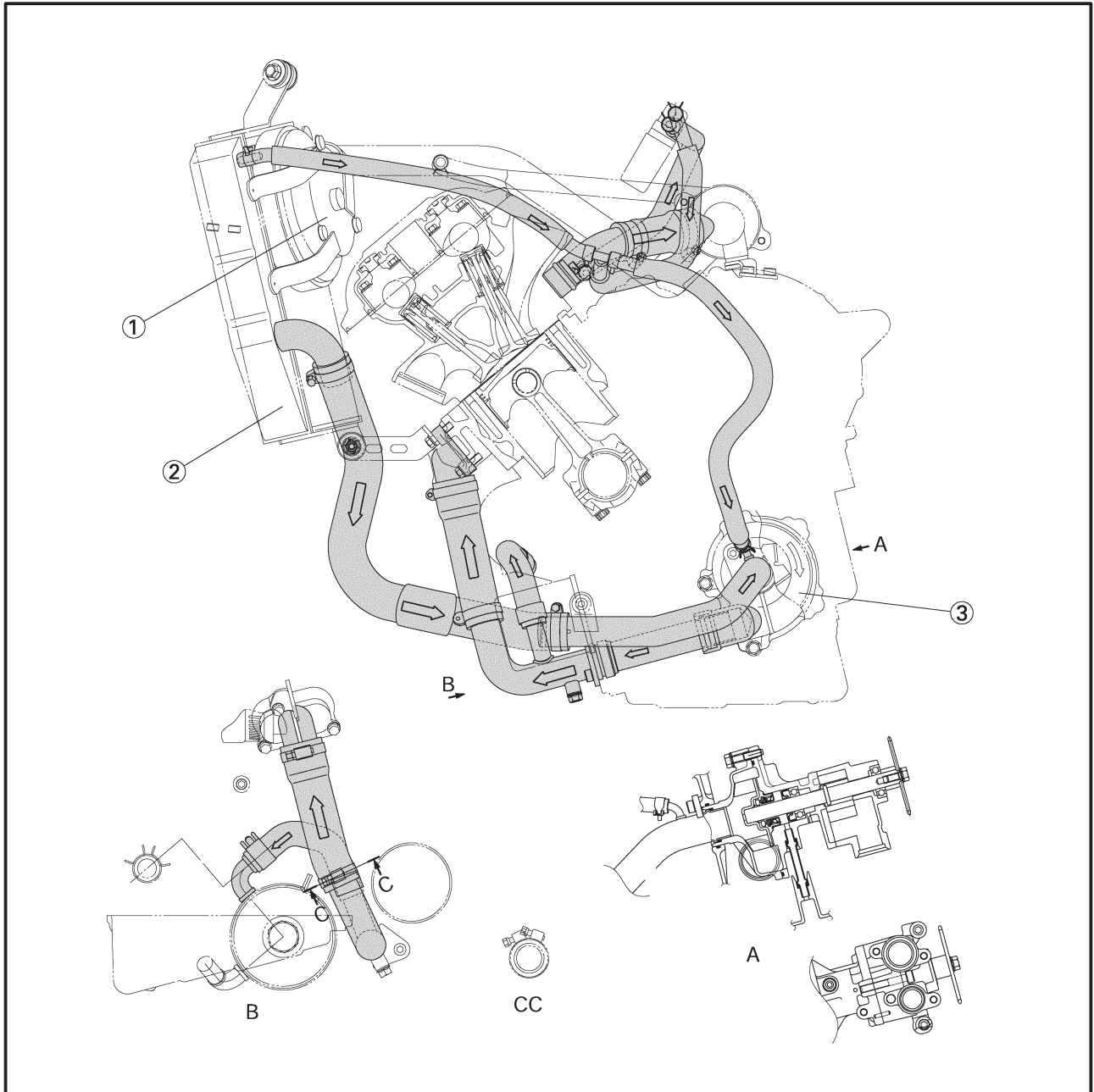
CHASSIS

Lubrication point	Lubricant
Steering bearings and bearing races (upper and lower)	
Throttle grip inner surface	
Brake lever pivoting point and metal-to-metal moving parts	
Clutch lever pivoting point and metal-to-metal moving parts	
Engine mount bolts (rear upper and lower)	
Relay arm, connecting rod and rear shock absorber collar	
Pivot shaft	
Swingarm pivot bearing	
Swingarm head pipe end, oil seal and bush	
Oil seal (relay arm, connecting arm and rear shock absorber)	
Seat lock assembly moving parts	
Sidestand pivoting pint and metal-to-metal moving parts	
Link and sidestand switch contact point	
Sidestand hook and spring	
Shift shaft joint	
Front wheel oil seal (right and left)	
Front axle shaft	
Rear wheel oil seal	
Rear wheel drive hub oil seal	
Rear wheel drive hub mating surface	

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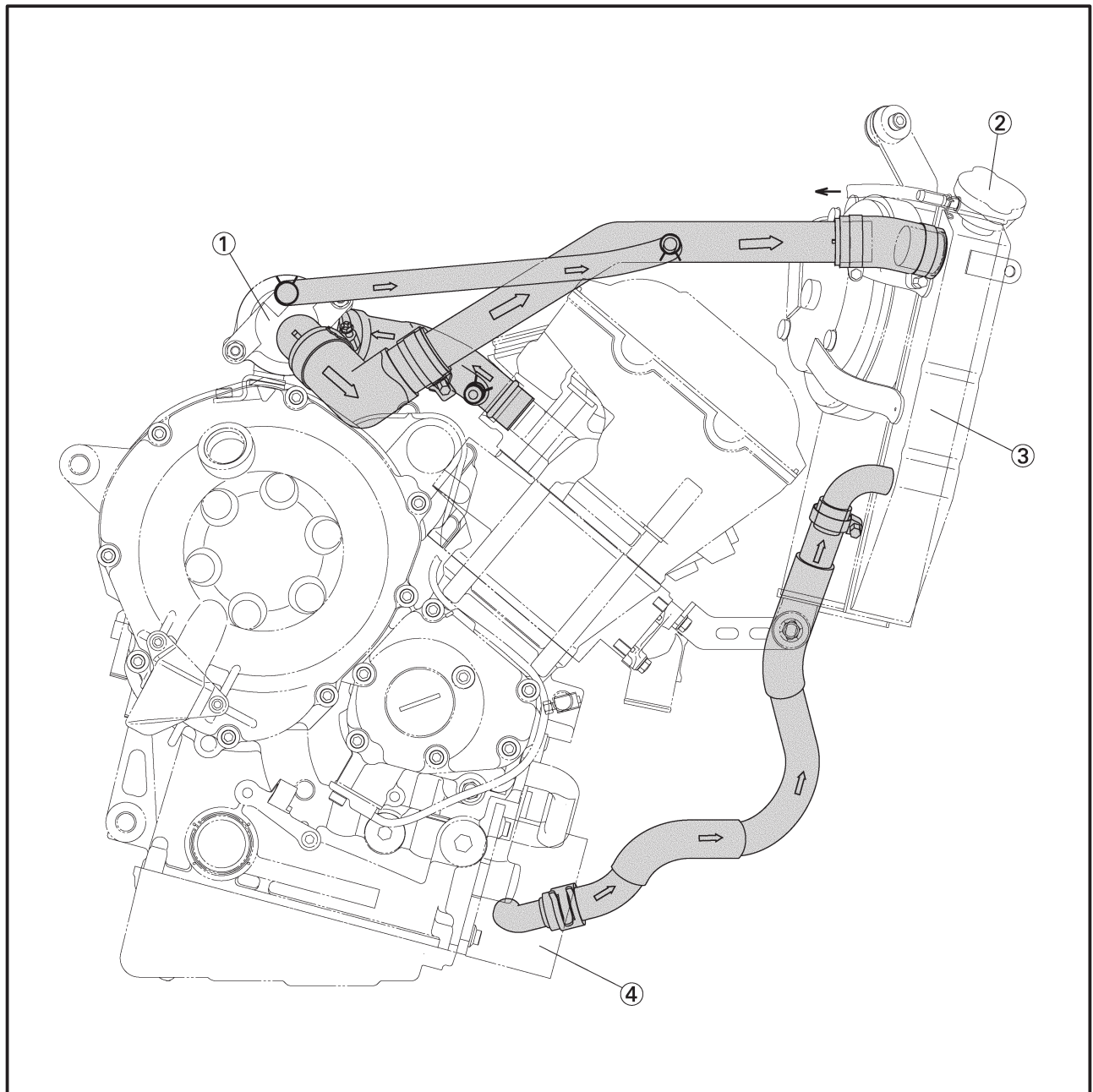
COOLING SYSTEM DIAGRAMS

- ① Radiator fan
- ② Radiator
- ③ Water pump



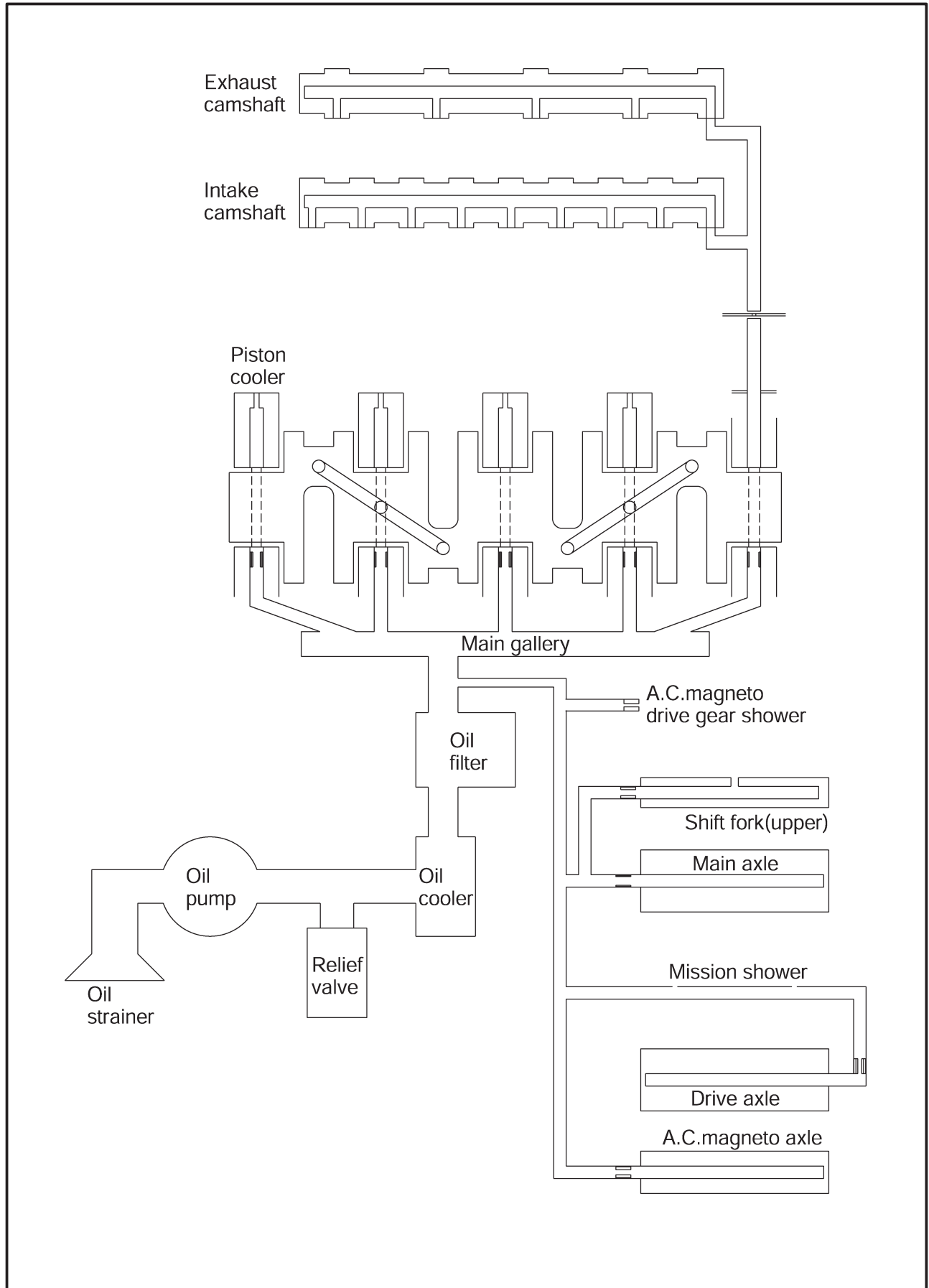


- ① Thermostat
- ② Radiator cap
- ③ Radiator
- ④ Oil cooler





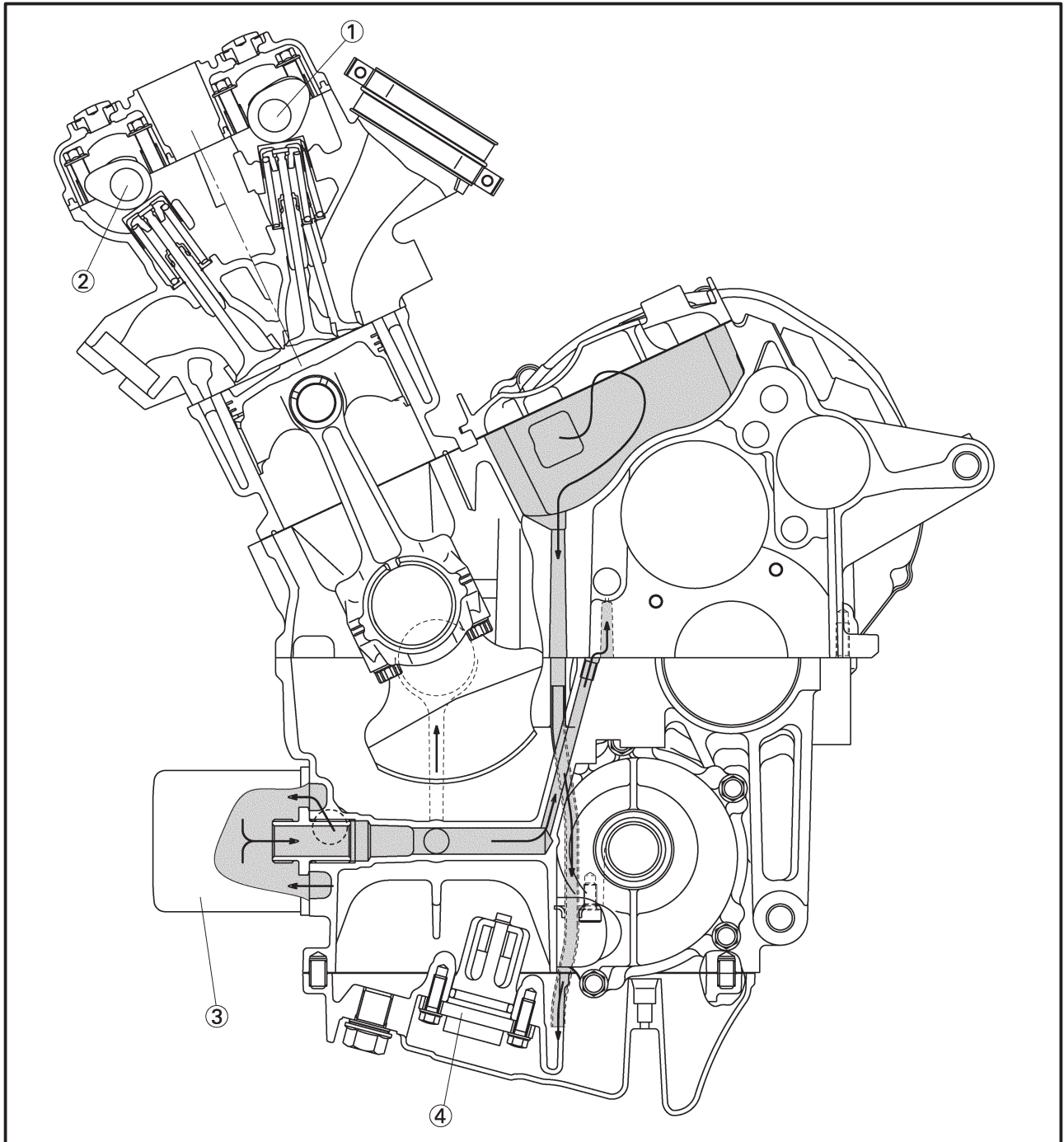
ENGINE OIL LUBRICATION CHART



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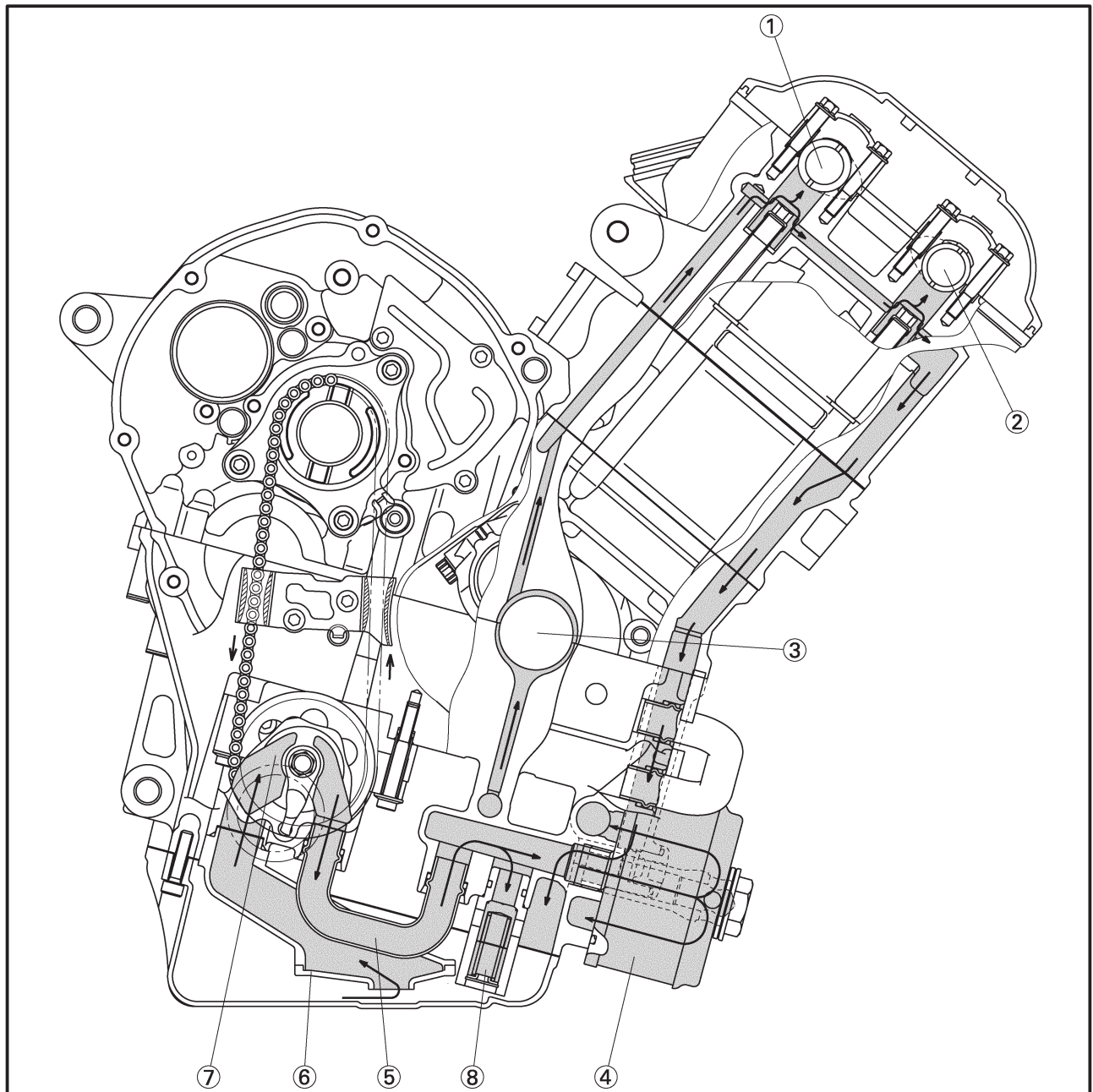
LUBRICATION DIAGRAMS

- ① Intake camshaft
- ② Exhaust camshaft
- ③ Oil filter cartridge
- ④ Oil level switch



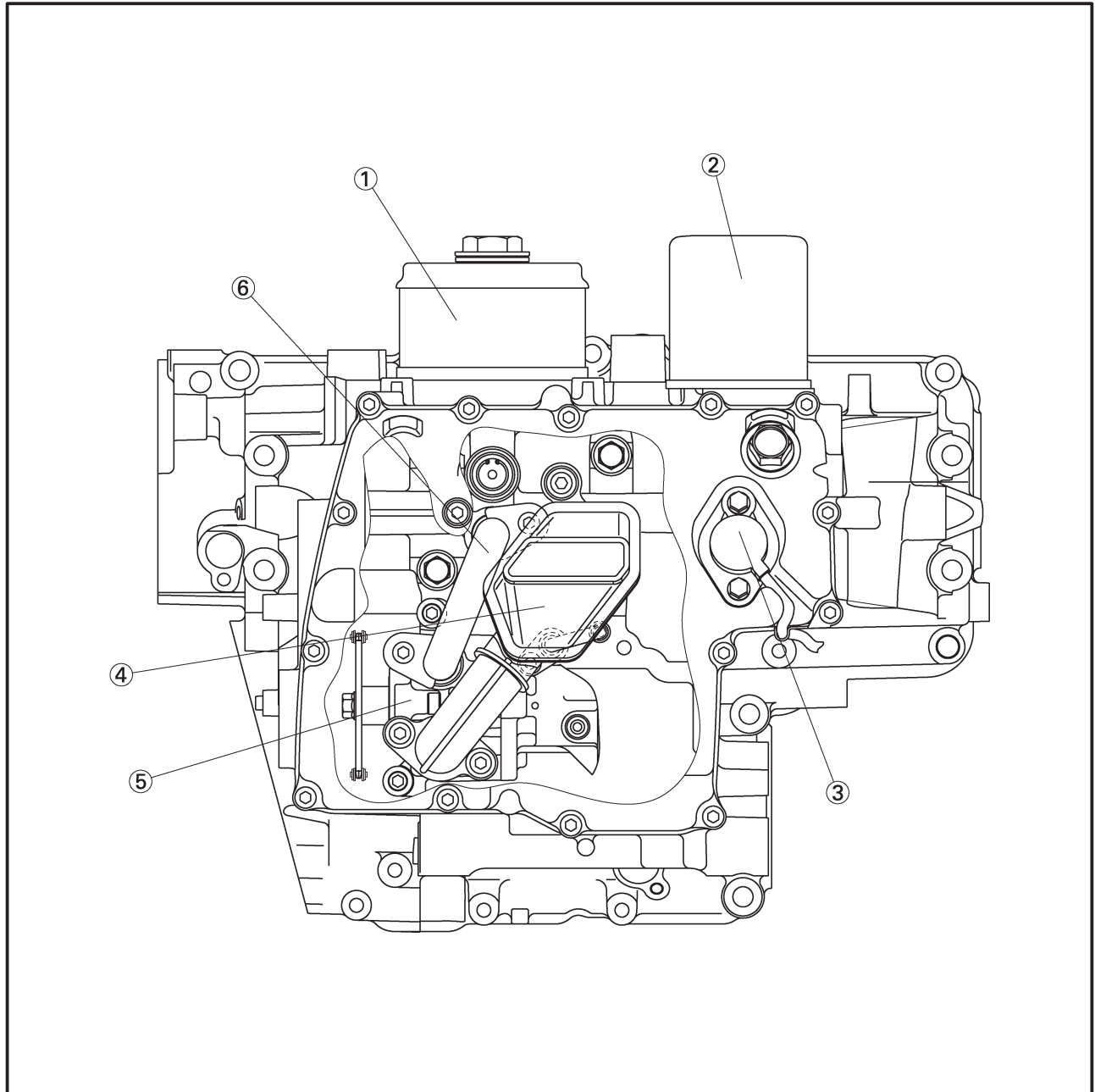


- ① Intake camshaft
- ② Exhaust camshaft
- ③ Crankshaft
- ④ Oil cooler
- ⑤ Oil pipe
- ⑥ Oil strainer
- ⑦ Oil pump
- ⑧ Relief valve





- ① Oil cooler
- ② Oil filter cartridge
- ③ Oil level switch
- ④ Oil strainer
- ⑤ Oil pump
- ⑥ Oil pipe





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