



# **YZFR1W YZFR1WC**

## **SERVICE MANUAL**

---

# TABLE OF CONTENTS

<b>GENERAL INFORMATION</b>	<b>1</b>
<b>SPECIFICATIONS</b>	<b>2</b>
<b>PERIODIC CHECKS AND ADJUSTMENTS</b>	<b>3</b>
<b>CHASSIS</b>	<b>4</b>
<b>ENGINE</b>	<b>5</b>
<b>COOLING SYSTEM</b>	<b>6</b>
<b>FUEL SYSTEM</b>	<b>7</b>
<b>ELECTRICAL SYSTEM</b>	<b>8</b>
<b>TROUBLESHOOTING</b>	<b>9</b>

---

## GENERAL INFORMATION

<b>IDENTIFICATION</b> .....	1-1
VEHICLE IDENTIFICATION NUMBER.....	1-1
MODEL LABEL .....	1-1
<b>FEATURES</b> .....	1-2
FI SYSTEM.....	1-3
<b>IMPORTANT INFORMATION</b> .....	1-12
PREPARATION FOR REMOVAL AND DISASSEMBLY .....	1-12
REPLACEMENT PARTS.....	1-12
GASKETS, OIL SEALS AND O-RINGS.....	1-12
LOCK WASHERS/PLATES AND COTTER PINS .....	1-12
BEARINGS AND OIL SEALS .....	1-13
CIRCLIPS .....	1-13
<b>CHECKING THE CONNECTIONS</b> .....	1-14
<b>SPECIAL TOOLS</b> .....	1-15

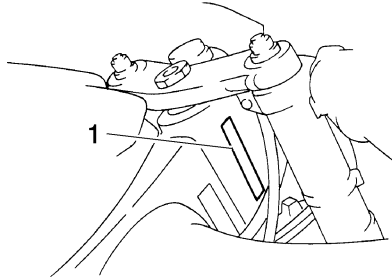
EAS20130

## IDENTIFICATION

EAS20140

### VEHICLE IDENTIFICATION NUMBER

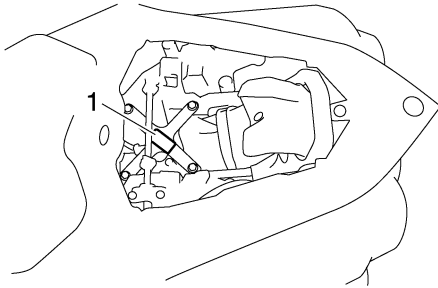
The vehicle identification number "1" is stamped into the right side of the steering head pipe.



EAS20150

### MODEL LABEL

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



EAS20170

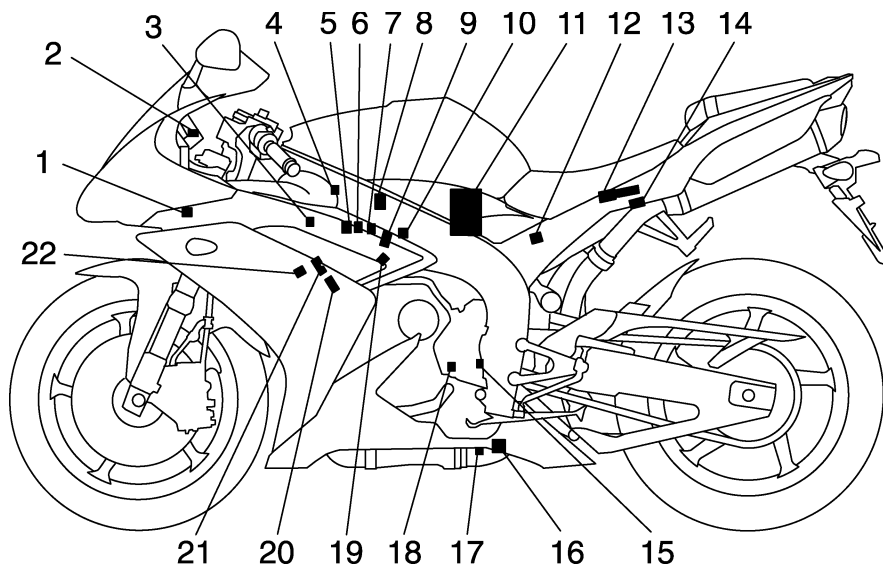
## FEATURES

### 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. Intake air temperature sensor                        | 14. Starting circuit cut-off relay |
| 2. Engine trouble warning light                         | 15. Speed sensor                   |
| 3. Air induction system solenoid                        | 16. EXUP servo motor               |
| 4. Atmospheric pressure sensor                          | 17. O <sub>2</sub> sensor          |
| 5. Throttle position sensor (for throttle cable pulley) | 18. Crankshaft position sensor     |
| 6. Throttle servo motor                                 | 19. Coolant temperature sensor     |
| 7. Throttle position sensor (for throttle valves)       | 20. Spark plug                     |
| 8. Intake funnel servo motor                            | 21. Ignition coil                  |
| 9. Injector                                             | 22. Cylinder identification sensor |
| 10. Intake air pressure sensor                          |                                    |
| 11. Fuel pump                                           |                                    |
| 12. Lean angle sensor                                   |                                    |
| 13. ECU (engine control unit)                           |                                    |

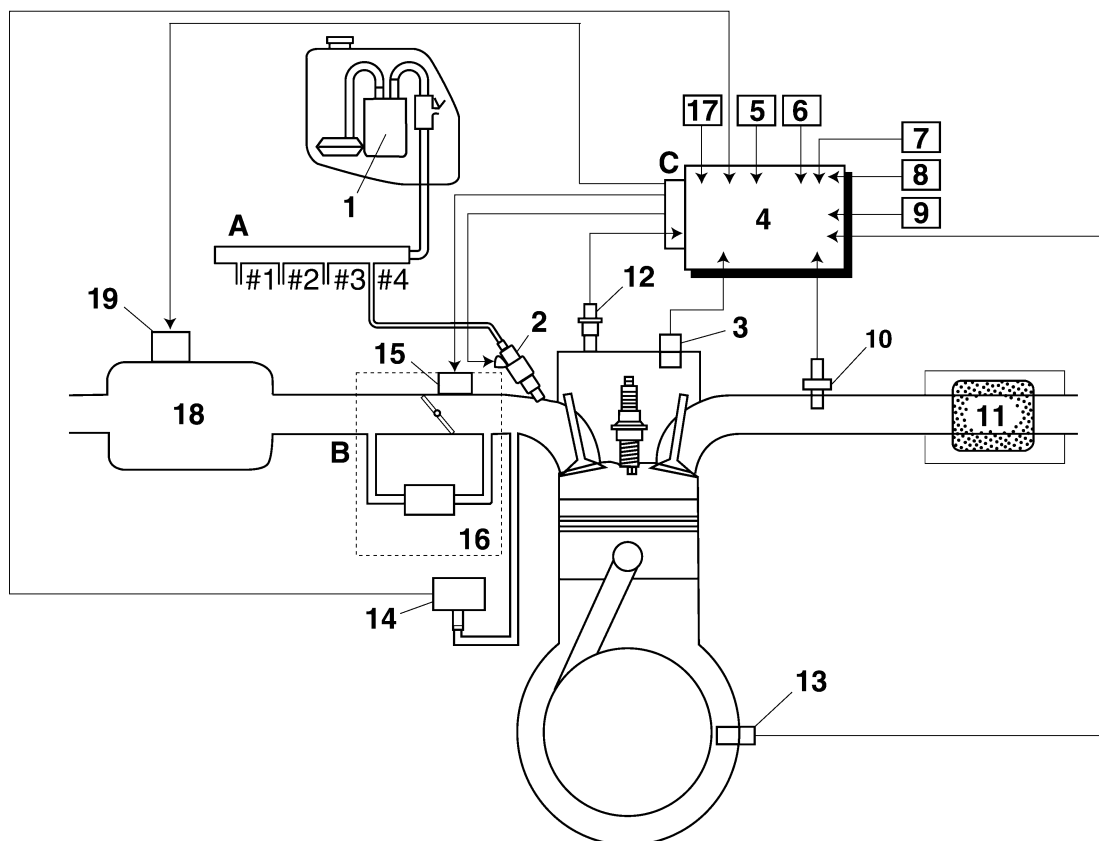
EAS4C81010

## 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 only 324 kPa (3.24 kg/cm<sup>2</sup>, 46.1 psi). 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 (for throttle valves), throttle position sensor (for throttle cable pulley), crankshaft position sensor, intake air pressure sensor, intake air temperature sensor, coolant temperature sensor, atmospheric pressure sensor, cylinder identification sensor, lean angle sensor, speed sensor and O<sub>2</sub> 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.



- |                                                         |                                 |
|---------------------------------------------------------|---------------------------------|
| 1. Fuel pump                                            | 12. Coolant temperature sensor  |
| 2. Injector                                             | 13. Crankshaft position sensor  |
| 3. Cylinder identification sensor                       | 14. Intake air pressure sensor  |
| 4. ECU (engine control unit)                            | 15. Throttle servo motor        |
| 5. Throttle position sensor (for throttle valves)       | 16. Throttle body               |
| 6. Throttle position sensor (for throttle cable pulley) | 17. Atmospheric pressure sensor |
| 7. Speed sensor                                         | 18. Air filter case             |
| 8. Intake air temperature sensor                        | 19. Intake funnel servo motor   |
| 9. Lean angle sensor                                    | A. Fuel system                  |
| 10. O <sub>2</sub> sensor                               | B. Air system                   |
| 11. Catalytic converter                                 | C. Control system               |

EAS4C81011

## YCC-T (Yamaha Chip Controlled Throttle) YCC-I (Yamaha Chip Controlled Intake)

### Mechanism characteristics

Yamaha developed the YCC-T and YCC-I system employing the most advanced electronic control technologies. Electronic control throttle systems have been used on automobiles, but Yamaha has developed a faster, more compact system specifically for the needs of a sports motorcycle. The Yamaha-developed system has a high-speed calculating capacity that produces computations of running conditions every 1/1000th of a second.

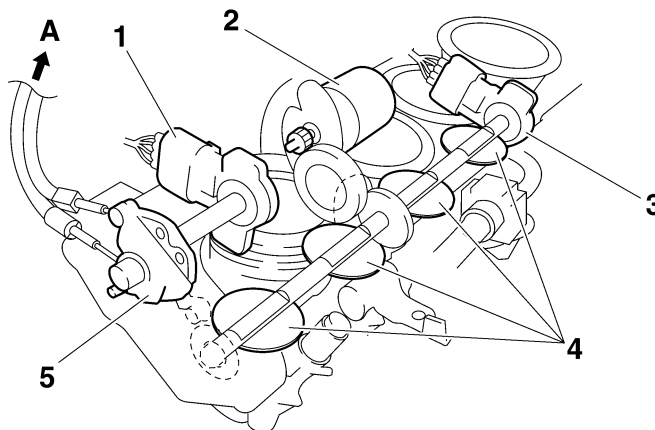
The YCC-T system is designed to respond to the throttle action of the rider by having the ECU instantaneously calculate the ideal throttle valve opening and generate signals to operate the motor-driven throttle valves and thus actively control the intake air volume.

The ECU contains three CPUs with a capacity about five times that of conventional units, making it possible for the system to respond extremely quickly to the slightest adjustments made by the rider. In particular, optimized control of the throttle valve opening provides the optimum volume of intake air for easy-to-use torque, even in a high-revving engine.

The YCC-I system calculates the value from the engine revolution number and throttle opening rate, activates the intake air funnel with the electronic control motor drive to control the intake pipe length in order to gain the high power output in all revolution ranges from low speeds to high speeds.

### Aims and advantages of using YCC-T system

- Increased engine power  
By shortening the air intake path, higher engine speed is possible → Increased engine power.
- Improved driveability  
Air intake volume is controlled according to the operating conditions → Improved throttle response to meet engine requirement.  
Driving force is controlled at the optimal level according to the transmission gear position and engine speed → Improved throttle control.
- Engine braking control  
Due to the throttle control, optimal engine braking is made possible.
- Simplified idle speed control (ISC) mechanism  
The bypass mechanism and ISC actuator are eliminated → A simple mechanism is used to maintain a steady idle speed.
- Reduced weight  
Compared to using a sub-throttle mechanism, weight is reduced.



1. Throttle position sensor (for throttle cable pulley)
2. Throttle servo motor
3. Throttle position sensor (for throttle valves)
4. Throttle valves
5. Throttle cable pulley with linkage guard

A. To throttle grip

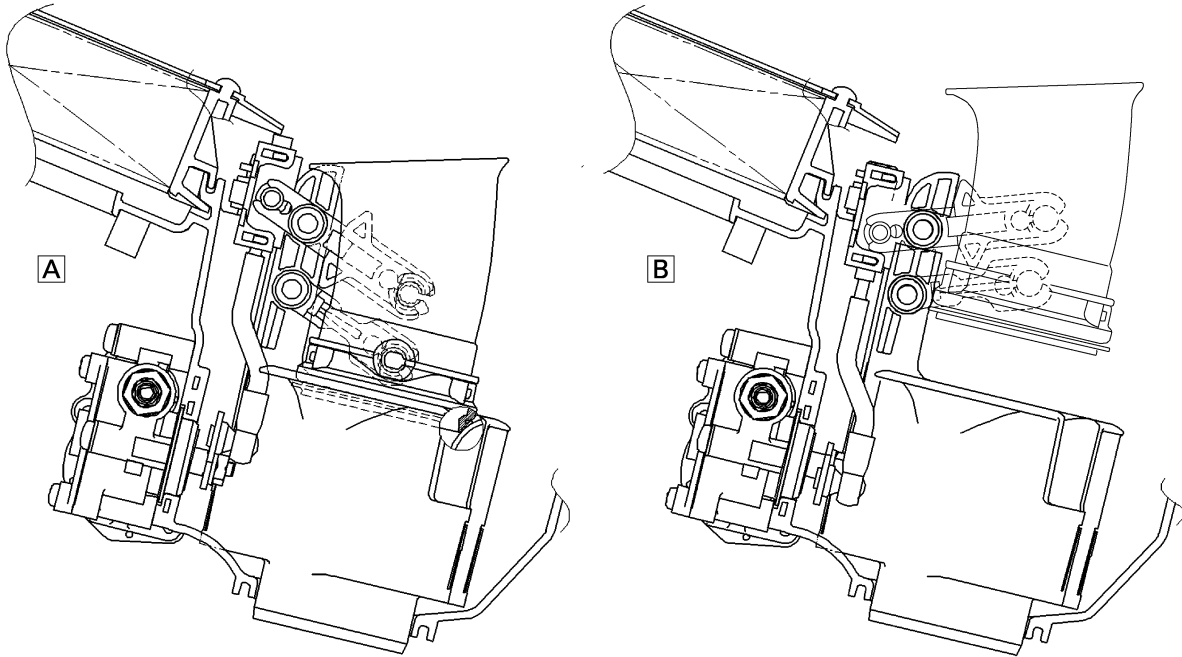
## Aims and advantages of using YCC-I system

- Improvement of the engine power characteristics

The high power design in all ranges is now provided by having both two features of the short intake function to ensure the power at the high speed revolution of engine, and the long intake function to ensure the power in the practical use range.

- Intake pipe length switching control using the motor

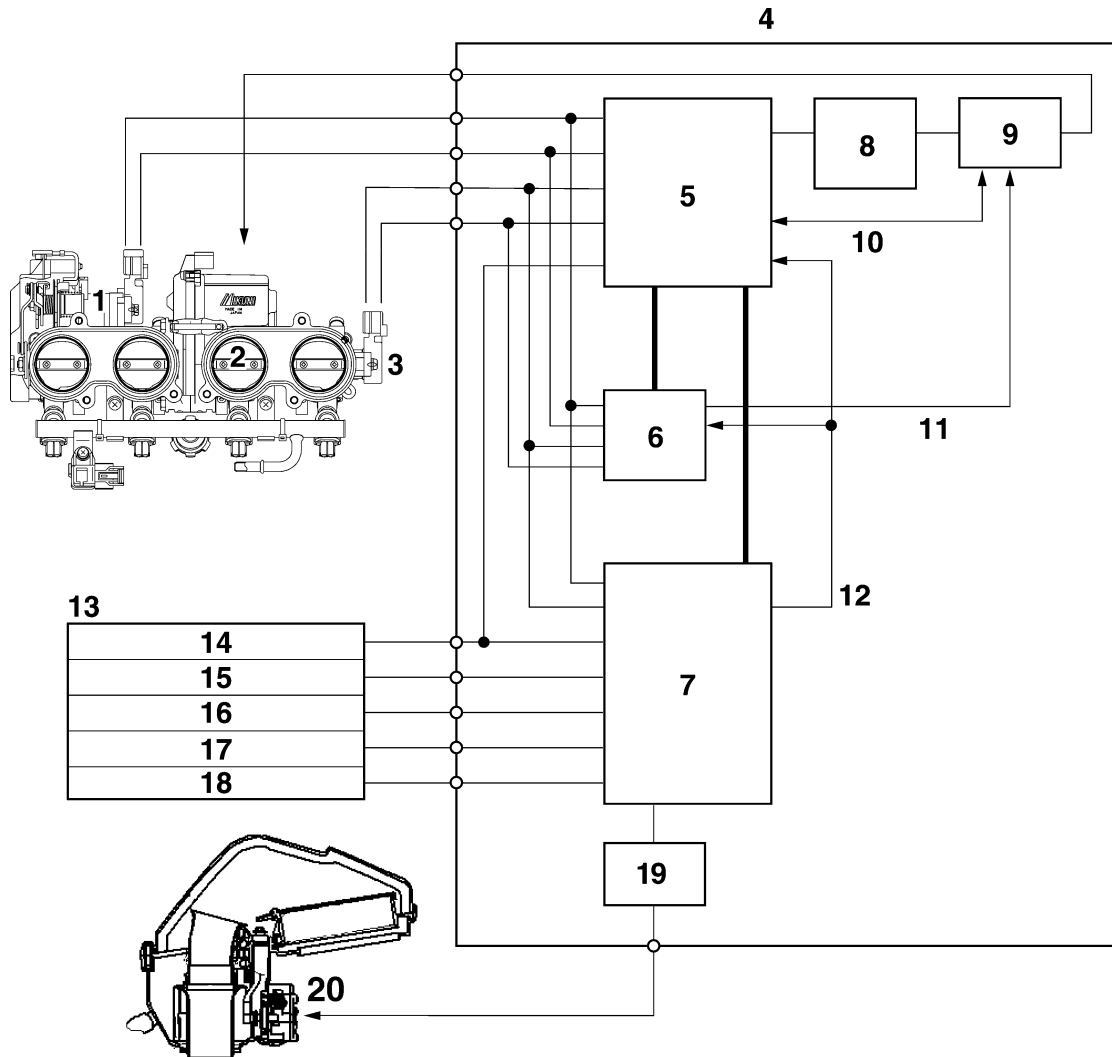
The intake pipe length switching operation in a minute time is now available by means of the motor drive using the electronic control. The smooth power characteristic is provided, which does not let an operator feel the switching action by the optimization of its switching revolution number and the most suitable application of engine at the time of changing the revolution.



- A. Down position (long intake)  
(Low rpm to Mid rpm)
- B. Up position (short intake)  
(High rpm)



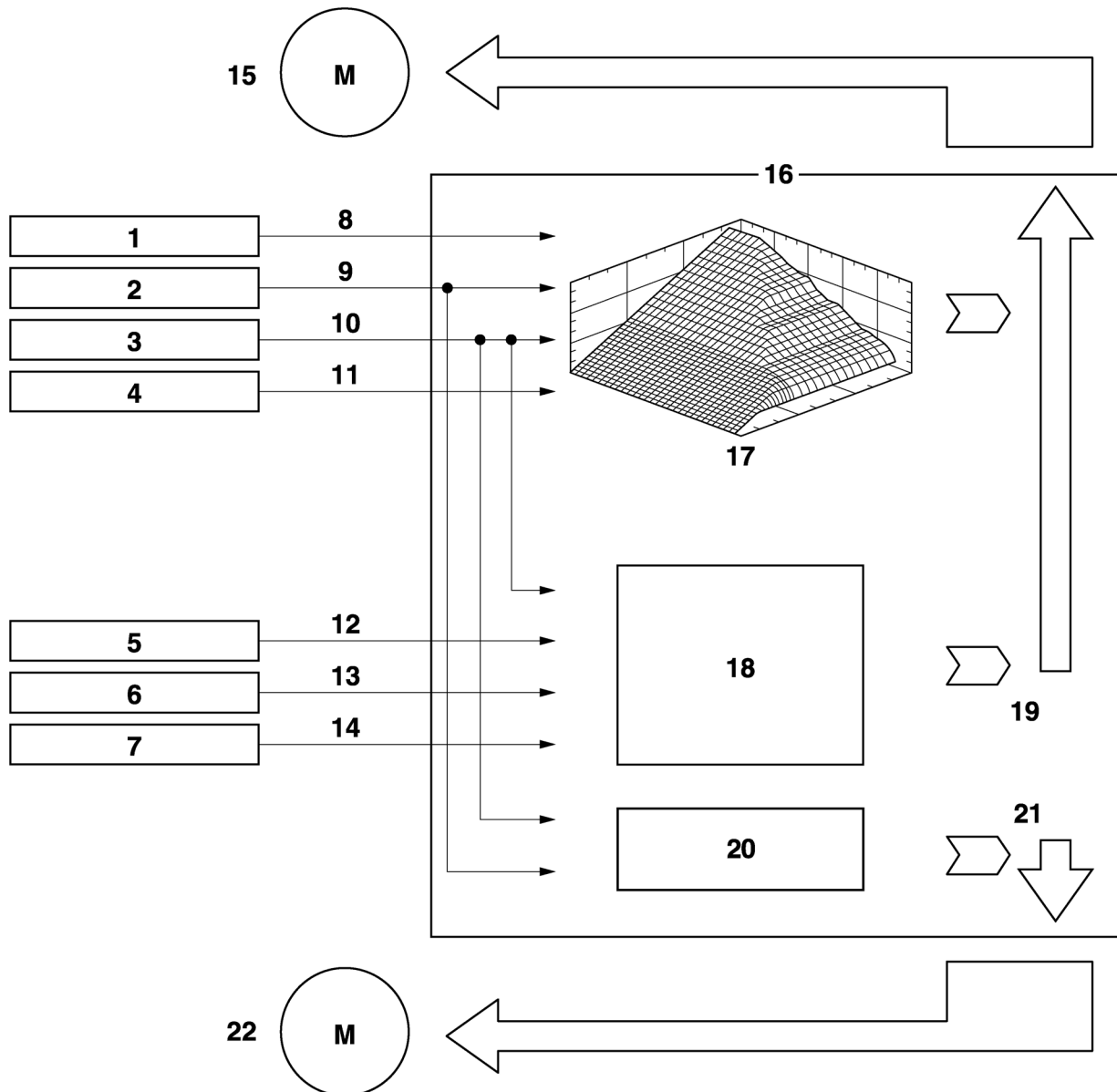
## YCC-T/YCC-I system outline



1. Throttle position sensor (for throttle cable pulley)
2. Throttle servo motor
3. Throttle position sensor (for throttle valves)
4. ECU (engine control unit)
5. ETV main CPU (32 bit)
6. ETV sub CPU (16 bit)
7. FI CPU (32 bit)
8. Throttle servo motor driver
9. Throttle servo motor driver operation sensing/shut off circuit
10. Throttle servo motor driver operation sensing feedback/emergency stop
11. Emergency stop
12. Engine revolution (pulse signal)
13. Sensor input
14. Neutral switch
15. Crankshaft position sensor
16. Speed sensor
17. Coolant temperature sensor
18. Atmospheric pressure sensor

19. Intake funnel servo motor driver
20. Intake funnel servo motor

## YCC-T/YCC-I control outline



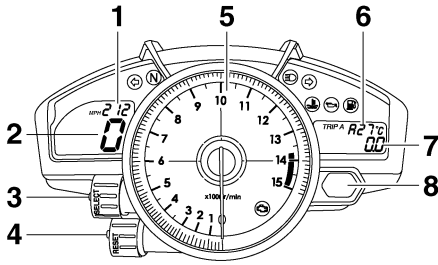
1. Throttle position sensor (for throttle cable pulley)
2. Throttle position sensor (for throttle valves)
3. Crankshaft position sensor
4. Speed sensor
5. Coolant temperature sensor
6. Neutral switch
7. Atmospheric pressure sensor
8. Accelerator position (two signals)
9. Throttle position (two signals)
10. Engine revolution
11. Vehicle speed
12. Coolant temperature
13. Neutral/In gear
14. Atmospheric pressure

15. Throttle servo motor
16. ECU (engine control unit)
17. Base map
18. Idle speed control
19. Calculated throttle valve opening angle
20. Base map
21. Air funnel position (Calculation value)
22. Intake funnel servo motor

EAS4C81024

## INSTRUMENT FUNCTIONS

### Multi-function meter unit



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

EWA4C81008

### **WARNING**

**Be sure to stop the vehicle before making any setting changes to the multi-function meter unit.**

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

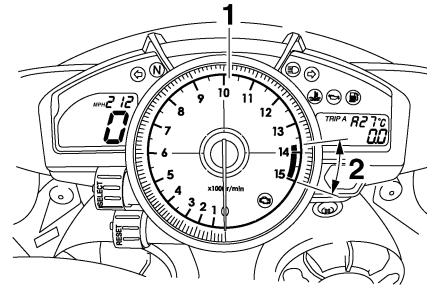
- a speedometer (which shows the riding speed)
- a tachometer (which shows engine speed)
- an odometer (which shows the total distance traveled)
- two tripmeters (which show the distance traveled since they were last set to zero)
- a fuel reserve tripmeter (which shows the distance traveled since the fuel level warning light came on)
- a 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.

- To switch the speedometer and odometer/ tripmeter displays between kilometers and miles, press the "SELECT" button for at least one second.

### Tachometer



1. Tachometer
2. Tachometer red zone

The electric tachometer allows the rider to monitor the engine speed and keep it within the ideal power range.

When the key is turned to "ON", the tachometer needle will sweep once across the r/min range and then return to zero r/min in order to test the electrical circuit.

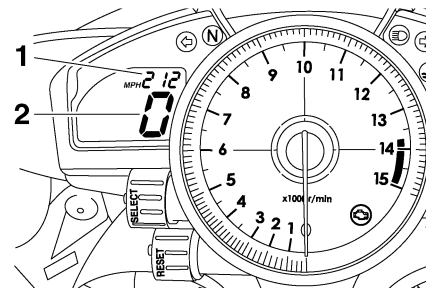
ECA4C81017

### **CAUTION:**

**Do not operate the engine in the tachometer red zone.**

**Red zone: 13750 r/min and above**

### Clock mode



1. Clock

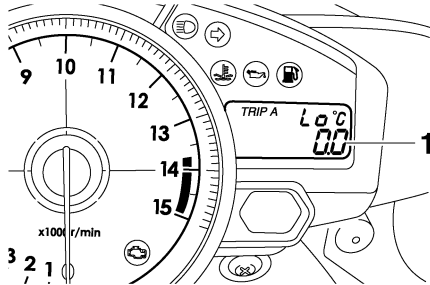
Turn the key to "ON".

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.

## Odometer, tripmeter, and stopwatch modes



1. Odometer/tripmeter/fuel reserve tripmeter

Push the “SELECT” button to switch the display between the odometer mode “ODO” and 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



To change the display to the stopwatch mode, select it by pushing the “SELECT” button. (The stopwatch digits will start flashing.) Release the “SELECT” button, and then push it again for a few seconds until the stopwatch digits stop flashing.

### 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.

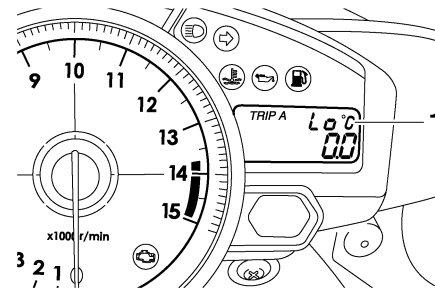
### Split-time measurement

1. Push the “RESET” button to start the stopwatch.
2. Push the “RESET” button or start switch “” to measure split-times. (The colon “:” will start flashing.)
3. Push the “RESET” button or start switch “” to measure split-times. (The colon “:” will start flashing.)
4. Push the “SELECT” button to reset the stopwatch.

### NOTE:

To change the display back to the prior mode, push the “SELECT” button for a few seconds.

## Coolant temperature display



1. 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:

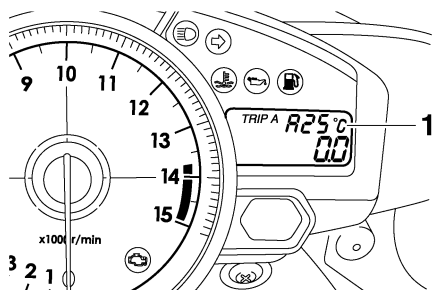
When the coolant temperature display is selected, “C” is displayed for one second, and then the coolant temperature is displayed.

ECA4C81018

### CAUTION:

**Do not operate the engine if it is overheated.**

## Air intake temperature display



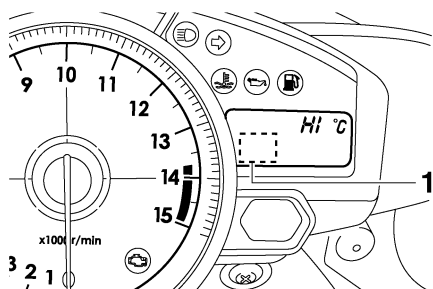
1. Air intake temperature display

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.

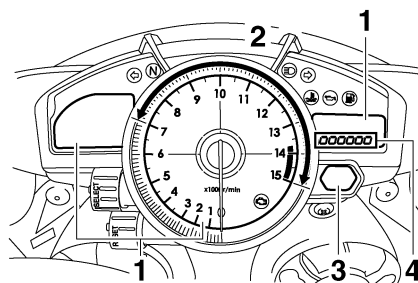
## Self-diagnosis device



1. Error code display

This 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 display will indicate a two-digit error code.

## Display brightness and shift timing indicator light control mode



1. Display brightness
2. Shift timing indicator light activation/deactivation
3. Shift timing indicator light
4. Brightness level

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:

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.ry two seconds.)

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/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.

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 deactivation 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.

EAS20180

## IMPORTANT INFORMATION

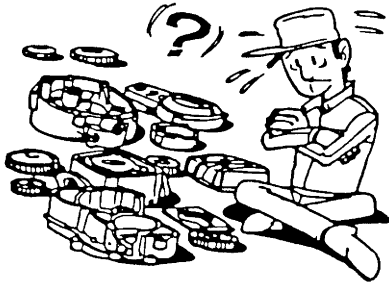
EAS20190

### 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 1-15.
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.

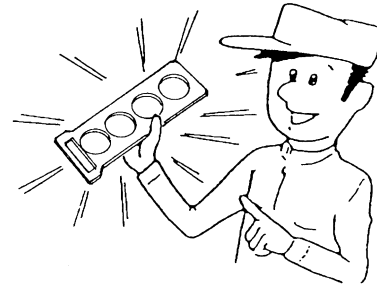


4. During disassembly, clean all of the parts and place them in trays in the order of disassembly. This will speed up assembly and allow for the correct installation of all parts.
5. Keep all parts away from any source of fire.

EAS20200

### REPLACEMENT PARTS

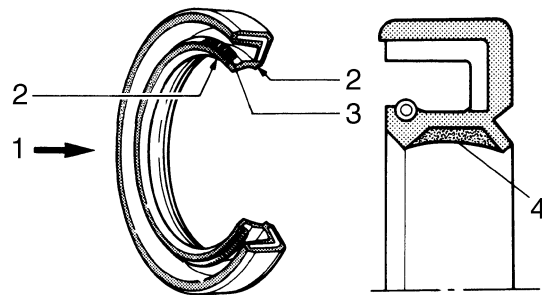
Use only genuine Yamaha parts for all replacements. Use oil and grease recommended by Yamaha for all lubrication jobs. Other brands may be similar in function and appearance, but inferior in quality.



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.

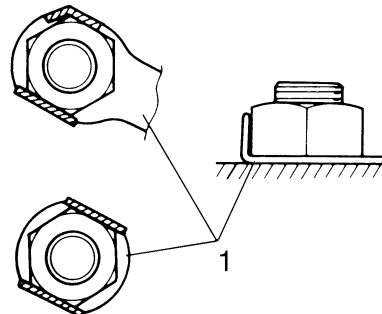


1. Oil
2. Lip
3. Spring
4. Grease

EAS20220

### LOCK WASHERS/PLATES AND COTTER PINS

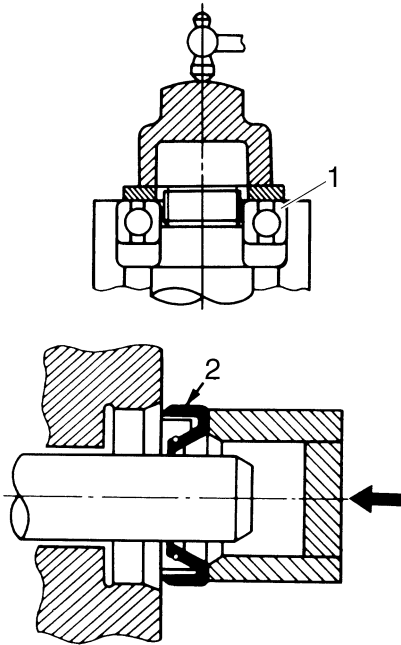
After removal, replace all lock washers/plates "1" and cotter pins. After the bolt or nut has been tightened to specification, bend the lock tabs along a flat of the bolt or nut.



EAS20230

## BEARINGS AND OIL SEALS

Install bearings "1" and oil seals "2" 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.



ECA13300

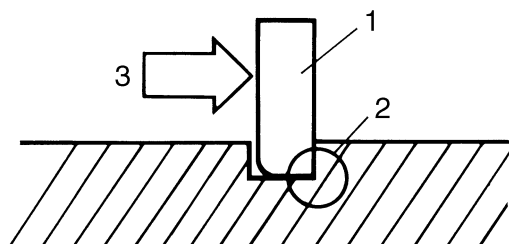
### CAUTION:

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

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.





# CHECKING THE CONNECTIONS

EAS20250

## CHECKING THE CONNECTIONS

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

1. Disconnect:

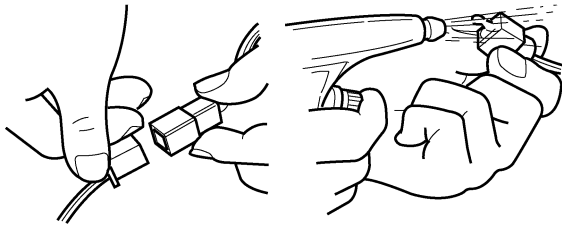
- Lead
- Coupler
- Connector

2. Check:

- Lead
- Coupler
- Connector

Moisture → Dry with an air blower.

Rust/stains → Connect and disconnect several times.



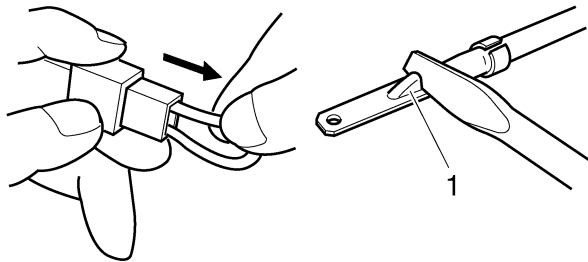
3. Check:

- 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.

5. Check:

- Continuity  
(with the pocket tester)



Pocket tester

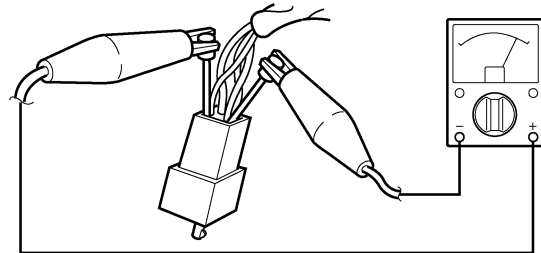
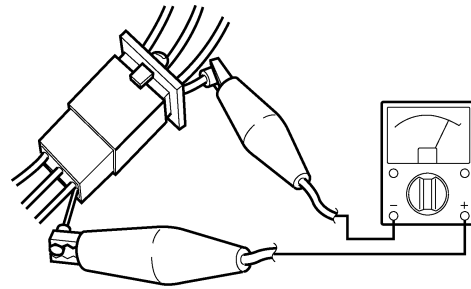
90890-03112

Analog pocket tester

YU-03112-C

**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.



EAS20260

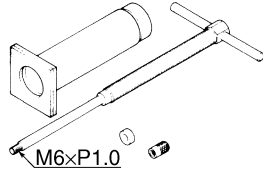
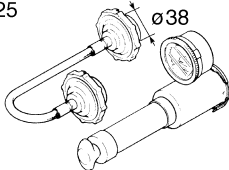
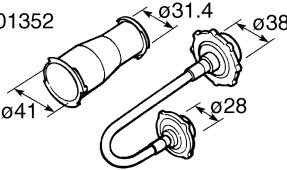
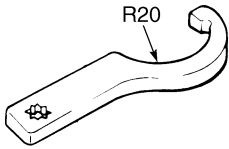
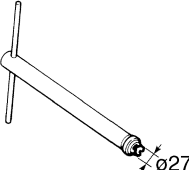
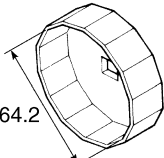
## SPECIAL TOOLS

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.

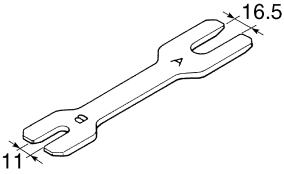
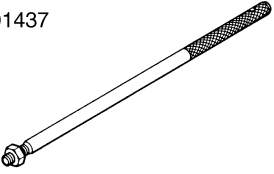
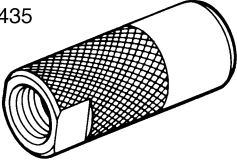
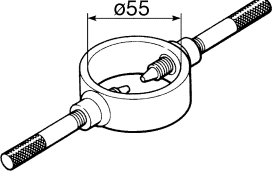
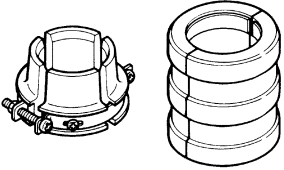
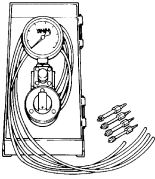
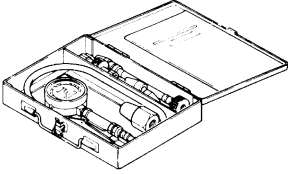
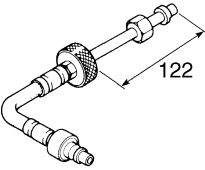
When placing an order, refer to the list provided below to avoid any mistakes.

### NOTE:

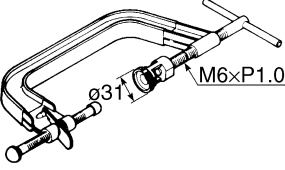
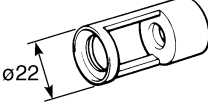
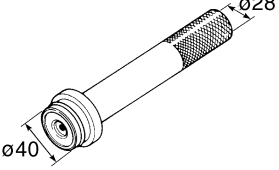
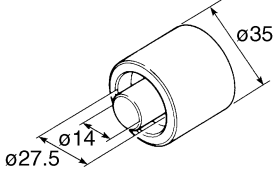
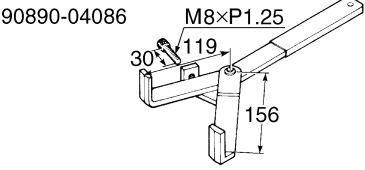
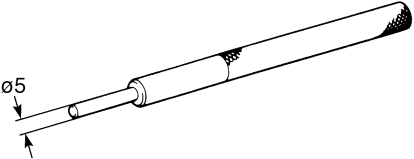
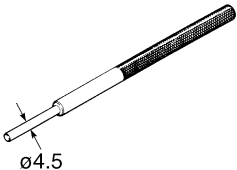

- For U.S.A. and Canada, use part number starting with “YM-”, “YU-”, or “ACC-”.
- For others, use part number starting with “90890-”.

Tool name/Tool No.	Illustration	Reference pages
Piston pin puller set 90890-01304 Piston pin puller YU-01304	90890-01304 	5-71
Radiator cap tester 90890-01325 Radiator pressure tester YU-24460-01	90890-01325 	6-3
Radiator cap tester adapter 90890-01352 Radiator pressure tester adapter YU-33984	90890-01352 	6-3
Steering nut wrench 90890-01403 Spanner wrench YU-33975		3-28, 4-60
Damper rod holder 90890-01423 Damping rod holder YM-01423		4-52, 4-53
Oil filter wrench 90890-01426 YU-38411		3-12

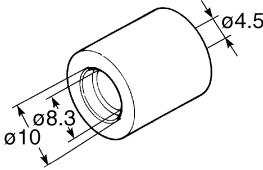
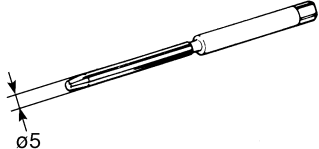
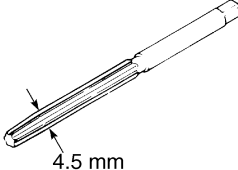
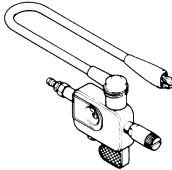
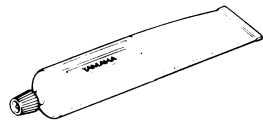
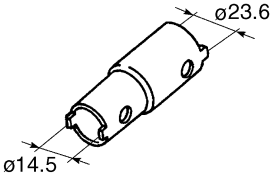
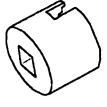

# SPECIAL TOOLS

Tool name/Tool No.	Illustration	Reference pages
Rod holder 90890-01434 Damper rod holder double ended YM-01434		4-51, 4-56
Rod puller 90890-01437 Universal damping rod bleeding tool set YM-A8703	90890-01437 	4-55, 4-56
Rod puller attachment (M12) 90890-01435 Universal damping rod bleeding tool set YM-A8703	90890-01435 	4-55, 4-56
Fork spring compressor 90890-01441 YM-01441		4-51, 4-56
Fork seal driver 90890-01442 Adjustable fork seal driver (36–46 mm) YM-01442		4-54
Vacuum gauge 90890-03094 Carburetor synchronizer YU-44456	90890-03094 	3-7
Compression gauge 90890-03081 Engine compression tester YU-33223		3-10
Extension 90890-04136		3-10

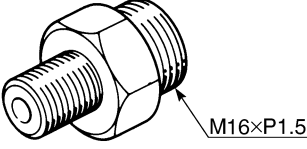
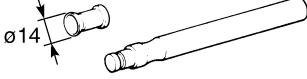
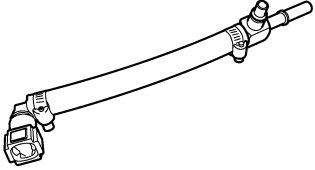
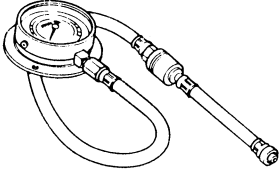
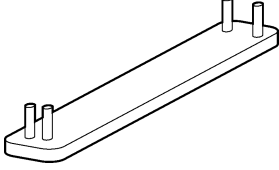
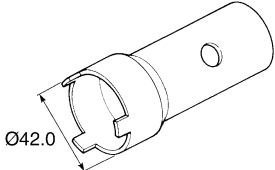
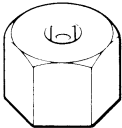
# SPECIAL TOOLS

Tool name/Tool No.	Illustration	Reference pages
Valve spring compressor 90890-04019 YM-04019		5-23, 5-29
Valve spring compressor attachment 90890-04108 Valve spring compressor adapter (22 mm) YM-04108		5-23, 5-29
Middle driven shaft bearing driver 90890-04058 Bearing driver (40 mm) YM-04058		6-11
Mechanical seal installer 90890-04078 Water pump seal installer YM-33221-A		6-11
Universal clutch holder 90890-04086 YM-91042		5-47, 5-51
Valve guide remover (ø5) 90890-04097 Valve guide remover (5.0 mm) YM-04097		5-25
Valve guide remover (ø4.5) 90890-04116 Valve guide remover (4.5 mm) YM-04116		5-25
Valve guide installer (ø5) 90890-04098 Valve guide installer (5.0 mm) YM-04098		5-25

# SPECIAL TOOLS

Tool name/Tool No.	Illustration	Reference pages
Valve guide installer (ø4.5) 90890-04117 Valve guide installer (4.5 mm) YM-04117		5-25
Valve guide reamer (ø5) 90890-04099 Valve guide reamer (5.0 mm) YM-04099		5-25
Valve guide reamer (ø4.5) 90890-04118 Valve guide reamer (4.5mm) YM-04118		5-25
Ignition checker 90890-06754 Opama pet-4000 spark checker YU-34487		8-84
Yamaha bond No.1215 (Three Bond No.1215) 90890-85505		5-67, 6-11
Pivot shaft wrench 90890-01471 Frame spanner socket YM-01471		5-7
Pivot shaft wrench adapter 90890-01476		5-7
Pocket tester 90890-03112 Analog pocket tester YU-03112-C		1-14, 5-41, 8-75, 8-76, 8-77, 8-80, 8-81, 8-82, 8-83, 8-84, 8-85, 8-86, 8-87, 8-88, 8-89, 8-90, 8-91, 8-92

# SPECIAL TOOLS

Tool name/Tool No.	Illustration	Reference pages
Oil pressure gauge adapter 90890-03139		3-13
Valve lapper 90890-04101 Valve lapping tool YM-A8998		3-5
Fuel pressure adapter 90890-03176 YM-03176		7-6
Pressure gauge 90890-03153 YU-03153		3-13, 7-6
Camshaft wrench 90890-04143 YM-04143		5-11, 5-16
Ring nut wrench 90890-01507 YM-01507		4-67, 4-69
Damper rod holder (22 mm) 90890-01365		4-68, 4-69

---

# SPECIFICATIONS

<b>GENERAL SPECIFICATIONS</b> .....	2-1
<b>ENGINE SPECIFICATIONS</b> .....	2-2
<b>CHASSIS SPECIFICATIONS</b> .....	2-8
<b>ELECTRICAL SPECIFICATIONS</b> .....	2-10
<b>TIGHTENING TORQUES</b> .....	2-12
GENERAL TIGHTENING TORQUE SPECIFICATIONS .....	2-12
ENGINE TIGHTENING TORQUES .....	2-13
CHASSIS TIGHTENING TORQUES .....	2-17
<b>LUBRICATION POINTS AND LUBRICANT TYPES</b> .....	2-20
ENGINE .....	2-20
CHASSIS .....	2-21
<b>LUBRICATION SYSTEM CHART AND DIAGRAMS</b> .....	2-23
ENGINE OIL LUBRICATION CHART .....	2-23
LUBRICATION DIAGRAMS .....	2-25
<b>COOLING SYSTEM DIAGRAMS</b> .....	2-35
<b>CABLE ROUTING</b> .....	2-39

# GENERAL SPECIFICATIONS

---

EAS20280

## GENERAL SPECIFICATIONS

---

### Model

Model	4C84 (U.S.A.) 4C85 (California)
-------	------------------------------------

---

### Dimensions

Overall length	2060 mm (81.1 in)
Overall width	720 mm (28.3 in)
Overall height	1110 mm (43.7 in)
Seat height	835 mm (32.9 in)
Wheelbase	1415 mm (55.7 in)
Ground clearance	135 mm (5.31 in)
Minimum turning radius	3400 mm (133.9 in)

---

### Weight

With oil and fuel	200 kg (441 lb)
Maximum load	195 kg (430 lb)



# ENGINE SPECIFICATIONS

EAS20290

## ENGINE SPECIFICATIONS

### Engine

Engine type	Liquid cooled 4-stroke, DOHC
Displacement	998.0 cm <sup>3</sup>
Cylinder arrangement	Forward-inclined parallel 4-cylinder
Bore × stroke	77.0 × 53.6 mm (3.03 × 2.11 in)
Compression ratio	12.70 :1
Standard compression pressure (at sea level)	1480 kPa/350 r/min (210.5 psi/350 r/min) (14.8 kgf/cm <sup>2</sup> /350 r/min)
Starting system	Electric starter

### Fuel

Recommended fuel	Premium unleaded gasoline only
Fuel tank capacity	18.0 L (4.76 US gal) (3.96 Imp.gal)
Fuel reserve amount	3.2 L (0.85 US gal) (0.70 Imp.gal)

### Engine oil

Lubrication system	Wet sump
Type	YAMALUBE 4, SAE 10W30 or SAE 20W40
Recommended engine oil grade	API service, SG type or higher, JASO standard MA

### Engine oil quantity

Total amount	3.83 L (4.05 US qt) (3.37 Imp.qt)
Without oil filter cartridge replacement	2.90 L (3.07 US qt) (2.55 Imp.qt)
With oil filter cartridge replacement	3.10 L (3.28 US qt) (2.73 Imp.qt)

### Oil filter

Oil filter type	Formed
-----------------	--------

### Oil pump

Oil pump type	Trochoid
Inner-rotor-to-outer-rotor-tip clearance	0.010–0.100 mm (0.0004–0.0039 in)
Limit	0.18 mm (0.0071 in)
Outer-rotor-to-oil-pump-housing clearance	0.090–0.190 mm (0.0035–0.0074 in)
Limit	0.26 mm (0.0102 in)
Oil-pump-housing-to-inner-and-outer-rotor clearance	0.06–0.13 mm (0.0024–0.0051 in)
Limit	0.20 mm (0.0079 in)
Bypass valve opening pressure	80.0–120.0 kPa (11.6–17.4 psi) (0.80–1.20 kgf/cm <sup>2</sup> )
Relief valve operating pressure	600.0–680.0 kPa (87.0–98.6 psi) (6.00–6.80 kgf/cm <sup>2</sup> )

### Cooling system

Radiator capacity (including all routes)	2.76 L (2.92 US qt) (2.43 Imp.qt)
Coolant reservoir capacity (up to the maximum level mark)	0.25 L (0.26 US qt) (0.22 Imp.qt)
Radiator cap opening pressure	108–137 kPa (15.4–19.5 psi) (1.08–1.37 kgf/cm <sup>2</sup> )

### Radiator core

Width	374.0 mm (14.72 in)
Height	257.8 mm (10.15 in)
Depth	24.0 mm (0.94 in)

### Water pump

Water pump type	Single suction centrifugal pump
Reduction ratio	65/43 × 25/32 (1.181)

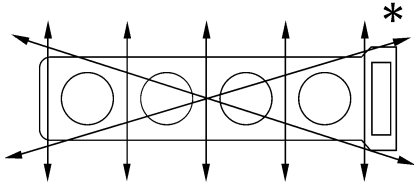
### Spark plug (s)

# ENGINE SPECIFICATIONS

Manufacturer/model	NGK/CR9EK
Spark plug gap	0.6–0.7 mm (0.024–0.028 in)

## Cylinder head

Volume	14.00–14.80 cm <sup>3</sup> (0.85–0.90 cu.in)
Warpage limit*	0.10 mm (0.0039 in)

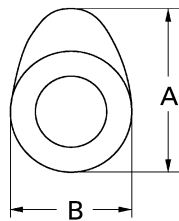


## Camshaft

Drive system	Chain drive (right)
Camshaft cap inside diameter	24.500–24.521 mm (0.9646–0.9654 in)
Camshaft journal diameter	24.459–24.472 mm (0.9630–0.9635 in)
Camshaft-journal-to-camshaft-cap clearance	0.028–0.062 mm (0.0011–0.0024 in)

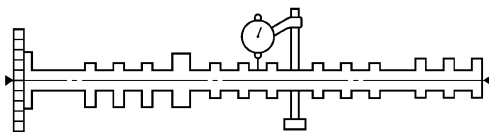
## Camshaft lobe dimensions

Intake A	34.450–34.550 mm (1.3563–1.3602 in)
Limit	34.350 mm (1.3524 in)
Intake B	25.170–25.270 mm (0.9909–0.9949 in)
Limit	25.070 mm (0.9870 in)
Exhaust A	33.550–33.650 mm (1.3209–1.3248 in)
Limit	33.450 mm (1.3169 in)
Exhaust B	25.192–25.292 mm (0.9918–0.9957 in)
Limit	25.092 mm (0.9879 in)



Camshaft runout limit

0.030 mm (0.0012 in)



## Timing chain

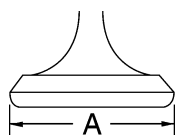
Model/number of links	RH2020/124
Tensioning system	Automatic

## Valve clearance (cold)

Intake	0.11–0.20 mm (0.0043–0.0079 in)
Exhaust	0.26–0.30 mm (0.0102–0.0118 in)

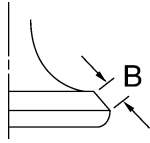
## Valve dimensions

Valve head diameter A (intake)	30.90–31.10 mm (1.2165–1.2244 in)
Valve head diameter A (exhaust)	24.90–25.10 mm (0.9803–0.9882 in)

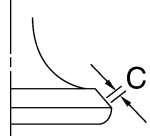


# ENGINE SPECIFICATIONS

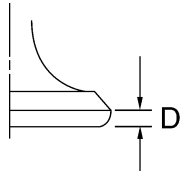
Valve face width B (intake)	1.200–2.480 mm (0.0472–0.0976 in)
Valve face width B (exhaust)	1.625–2.900 mm (0.0640–0.1142 in)



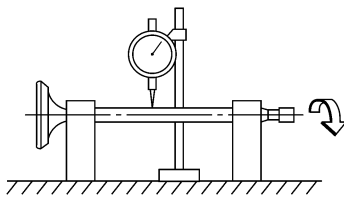
Valve seat width C (intake)	0.90–1.10 mm (0.0354–0.0433 in)
Valve seat width C (exhaust)	0.90–1.10 mm (0.0354–0.0433 in)



Valve margin thickness D (intake)	1.10–1.50 mm (0.0433–0.0591 in)
Valve margin thickness D (exhaust)	0.50–0.90 mm (0.0197–0.0354 in)



Valve stem diameter (intake)	4.975–4.990 mm (0.1959–0.1965 in)
Limit	4.960 mm (0.1953 in)
Valve stem diameter (exhaust)	4.460–4.475 mm (0.1756–0.1762 in)
Limit	4.425 mm (0.1742 in)
Valve guide inside diameter (intake)	5.000–5.012 mm (0.1969–0.1973 in)
Limit	5.050 mm (0.1988 in)
Valve guide inside diameter (exhaust)	4.500–4.512 mm (0.1772–0.1776 in)
Limit	4.550 mm (0.1791 in)
Valve-stem-to-valve-guide clearance (intake)	0.010–0.037 mm (0.0004–0.0015 in)
Limit	0.080 mm (0.0032 in)
Valve-stem-to-valve-guide clearance (exhaust)	0.025–0.052 mm (0.0010–0.0020 in)
Limit	0.100 mm (0.0039 in)
Valve stem runout	0.010 mm (0.0004 in)

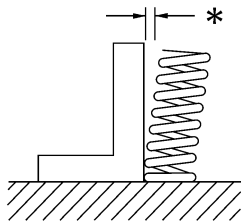


Cylinder head valve seat width (intake)	0.90–1.10 mm (0.0354–0.0433 in)
Cylinder head valve seat width (exhaust)	0.90–1.10 mm (0.0354–0.0433 in)

# ENGINE SPECIFICATIONS

## Valve spring

Inner spring	
Free length (intake)	39.79 mm (1.57 in)
Free length (exhaust)	38.42 mm (1.51 in)
Installed length (intake)	35.50 mm (1.40 in)
Installed length (exhaust)	33.00 mm (1.30 in)
Spring rate K1 (intake)	42.91 N/mm (245.02 lb/in) (4.38 kgf/mm)
Spring rate K2 (intake)	56.23 N/mm (321.07 lb/in) (5.73 kgf/mm)
Spring rate K1 (exhaust)	40.10 N/mm (228.97 lb/in) (4.09 kgf/mm)
Spring rate K2 (exhaust)	51.85 N/mm (296.06 lb/in) (5.29 kgf/mm)
Installed compression spring force (intake)	171–197 N (38.44–44.29 lbf) (17.44–20.09 kgf) at 35.50 mm (1.398 in)
Installed compression spring force (exhaust)	202–232 N (45.41–52.15 lbf) (20.60–23.66 kgf) at 33.00 mm (1.299 in)
Spring tilt (intake)*	2.5 °/1.7 mm
Spring tilt (exhaust)*	2.5 °/1.7 mm



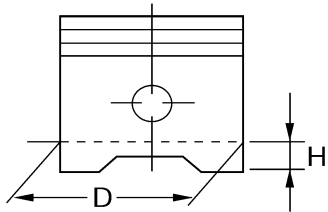
Winding direction (intake)	Clockwise
Winding direction (exhaust)	Clockwise

## Cylinder

Bore	77.000–77.010 mm (3.0315–3.0319 in)
Taper limit	0.050 mm (0.0020 in)
Out of round limit	0.050 mm (0.0020 in)

## Piston

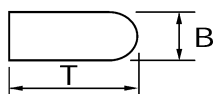
Piston-to-cylinder clearance	0.010–0.035 mm (0.0004–0.0014 in)
Limit	0.12 mm (0.0047 in)
Diameter D	76.975–76.990 mm (3.0305–3.0311 in)
Height H	12.0 mm (0.47 in)



Offset	0.50 mm (0.0197 in)
Offset direction	Intake side
Piston pin bore inside diameter	17.002–17.013 mm (0.6694–0.6698 in)
Piston pin outside diameter	16.991–17.000 mm (0.6689–0.6693 in)

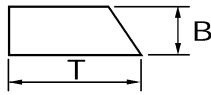
## Piston ring

Top ring	
Ring type	Barrel
Dimensions (B × T)	0.90 × 2.75 mm (0.04 × 0.11 in)

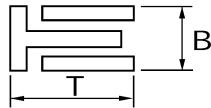


# ENGINE SPECIFICATIONS

End gap (installed)	0.15–0.25 mm (0.0059–0.0098 in)
Ring side clearance	0.030–0.065 mm (0.0012–0.0026 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)
Ring side clearance	0.020–0.055 mm (0.0008–0.0022 in)
Oil ring	
Dimensions (B × T)	1.50 × 2.25 mm (0.06 × 0.09 in)



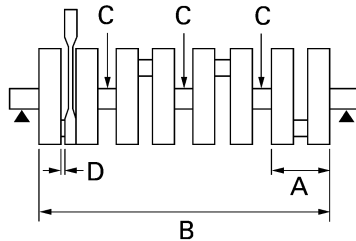
End gap (installed)	0.10–0.40 mm (0.0039–0.0157 in)
---------------------	---------------------------------

## Connecting rod

Oil clearance (using plastigauge®)	0.034–0.058 mm (0.0013–0.0023 in)
Bearing color code	1.Blue 2.Black 3.Brown 4.Green

## Crankshaft

Width A	55.20–56.60 mm (2.173–2.228 in)
Width B	298.75–300.65 mm (11.76–11.84 in)
Runout limit C	0.030 mm (0.0012 in)
Big end side clearance D	0.160–0.262 mm (0.0063–0.0103 in)



Journal oil clearance (using plastigauge®)	0.014–0.037 mm (0.0006–0.0015 in)
Bearing color code	0.White 1.Blue 2.Black 3.Brown 4.Green

## Clutch

Clutch type	Wet, multiple-disc
Clutch release method	Outer pull, rack and pinion pull
Clutch lever free play	10.0–15.0 mm (0.39–0.59 in)
Friction plate thickness	2.90–3.10 mm (0.114–0.122 in)
Wear limit	2.80 mm (0.1102 in)
Plate quantity	9 pcs
Clutch plate thickness	1.90–2.10 mm (0.075–0.083 in)
Plate quantity	8 pcs
Warpage limit	0.10 mm (0.0039 in)
Clutch spring free length	43.80 mm (1.72 in)
Spring quantity	6 pcs

## Transmission

Transmission type	Constant mesh 6-speed
Primary reduction system	Spur gear
Primary reduction ratio	65/43 (1.512)
Secondary reduction system	Chain drive

# ENGINE SPECIFICATIONS

---

Secondary reduction ratio	45/17 (2.647)
Operation	Left foot operation

---

<b>Gear ratio</b>	
1st	38/15 (2.533)
2nd	33/16 (2.063)
3rd	37/21 (1.762)
4th	35/23 (1.522)
5th	30/22 (1.364)
6th	33/26 (1.269)
Main axle runout limit	0.08 mm (0.0032 in)
Drive axle runout limit	0.08 mm (0.0032 in)

---

<b>Shifting mechanism</b>	
Shift mechanism type	Shift drum and guide bar
Shift fork guide bar bending limit	0.100 mm (0.0039 in)
Shift fork thickness	5.80–5.88 mm (0.2283–0.2315 in)

---

<b>Air filter</b>	
Air filter element	Oil-coated paper element

---

<b>Fuel pump</b>	
Pump type	Electrical
Model/manufacture	4C8/DENSO
Maximum consumption amperage	6.0 A
Output pressure	324.0 kPa (46.1 psi) (3.24 kgf/cm <sup>2</sup> )

---

<b>Fuel injector</b>	
Model/quantity	297500-1110/4
Manufacturer	DENSO

---

<b>Throttle body</b>	
Type/quantity	45EIDW/1
Manufacturer	MIKUNI
ID mark	4C81 00 (U.S.A.) 4C85 10 (California)
Throttle valve size	#50

---

<b>Throttle position sensor</b>	
Resistance	2.0–3.0 k $\Omega$
Output voltage (at idle)	0.63–0.73 V

---

<b>Idling condition</b>	
Engine idling speed	1150–1250 r/min
Intake vacuum	22.0 kPa (6.5 inHg) (165 mmHg)
Water temperature	95.0–105.0 °C (203.00–221.00 °F)
Oil temperature	80.0–90.0 °C (176.00–194.00 °F)
Throttle cable free play	3.0–5.0 mm (0.12–0.20 in)

# CHASSIS SPECIFICATIONS

EAS20300

## CHASSIS SPECIFICATIONS

---

### Chassis

Frame type	Diamond
Caster angle	24.00 °
Trail	102.0 mm (4.02 in)

---

### Front wheel

Wheel type	Cast wheel
Rim size	17M/C × MT3.50
Rim material	Aluminum
Wheel travel	120.0 mm (4.72 in)
Radial wheel runout limit	1.0 mm (0.04 in)
Lateral wheel runout limit	0.5 mm (0.02 in)

---

### Rear wheel

Wheel type	Cast wheel
Rim size	17M/C × MT6.00
Rim material	Aluminum
Wheel travel	130.0 mm (5.12 in)
Radial wheel runout limit	1.0 mm (0.04 in)
Lateral wheel runout limit	0.5 mm (0.02 in)

---

### Front tire

Type	Tubeless
Size	120/70 ZR17M/C (58W)
Manufacturer/model	PIRELLI/DIABLO CORSA E
Manufacturer/model	MICHELIN/Pilot POWER
Wear limit (front)	0.8 mm (0.03 in)

---

### Rear tire

Type	Tubeless
Size	190/50 ZR17M/C (73W)
Manufacturer/model	PIRELLI/DIABLO CORSA L
Manufacturer/model	MICHELIN/ Pilot POWER
Wear limit (rear)	0.8 mm (0.03 in)

---

### Tire air pressure (measured on cold tires)

Loading condition	0–90 kg (0–198 lb)
Front	250 kPa (36 psi) (2.50 kgf/cm <sup>2</sup> ) (2.50 bar)
Rear	290 kPa (42 psi) (2.90 kgf/cm <sup>2</sup> ) (2.90 bar)
Loading condition	90–195 kg (198–430 lb)
Front	250 kPa (36 psi) (2.50 kgf/cm <sup>2</sup> ) (2.50 bar)
Rear	290 kPa (42 psi) (2.90 kgf/cm <sup>2</sup> ) (2.90 bar)
High-speed riding	
Front	250 kPa (36 psi) (2.50 kgf/cm <sup>2</sup> ) (2.50 bar)
Rear	290 kPa (42 psi) (2.90 kgf/cm <sup>2</sup> ) (2.90 bar)

---

### Front brake

Type	Dual disc brake
Operation	Right hand operation
Front brake lever free play	2.3–11.5 mm (0.09–0.45 in)

---

### Front disc brake

Disc outside diameter × thickness	310.0 × 5.0 mm (12.20 × 0.20 in)
Brake disc thickness limit	4.5 mm (0.18 in)
Brake disc deflection limit	0.10 mm (0.0039 in)
Brake pad lining thickness (inner)	4.5 mm (0.18 in)
Limit	0.8 mm (0.03 in)
Brake pad lining thickness (outer)	4.5 mm (0.18 in)
Limit	0.8 mm (0.03 in)

# CHASSIS SPECIFICATIONS

---

Master cylinder inside diameter	16.00 mm (0.63 in)
Caliper cylinder inside diameter	24.05 mm × 3 (0.95 in × 3)
Recommended fluid	DOT 4

---

<b>Rear brake</b>	
Type	Single disc brake
Operation	Right foot operation
Brake pedal free play	4.3–9.3 mm (0.17–0.37 in)

---

<b>Rear disc brake</b>	
Disc outside diameter × thickness	220.0 × 5.0 mm (8.66 × 0.20 in)
Brake disc thickness limit	4.5 mm (0.18 in)
Brake disc deflection limit	0.15 mm (0.0059 in)
Brake pad lining thickness (inner)	6.0 mm (0.24 in)
Limit	1.0 mm (0.04 in)
Brake pad lining thickness (outer)	6.0 mm (0.24 in)
Limit	1.0 mm (0.04 in)
Master cylinder inside diameter	12.7 mm (0.50 in)
Caliper cylinder inside diameter	38.18 mm (1.50 in)
Recommended fluid	DOT 4

---

<b>Steering</b>	
Steering bearing type	Angular bearing
Lock to lock angle (left)	27.0 °
Lock to lock angle (right)	27.0 °

---

<b>Front suspension</b>	
Type	Telescopic fork
Spring/shock absorber type	Coil spring/oil damper
Front fork travel	120.0 mm (4.72 in)
Fork spring free length	237.5 mm (9.35 in)
Limit	232.8 mm (9.17 in)
Collar length	100.0 mm (3.94 in)
Installed length	223.0 mm (8.78 in)
Spring rate K1	9.07 N/mm (51.79 lb/in) (0.92 kgf/mm)
Spring stroke K1	0.0–120.0 mm (0.00–4.72 in)
Inner tube outer diameter	43.0 mm (1.69 in)
Inner tube bending limit	0.2 mm (0.01 in)
Optional spring available	No
Recommended oil	Suspension oil 01
Quantity	513.0 cm <sup>3</sup> (17.34 US oz) (18.09 Imp.oz)
Level	101.0 mm (3.98 in)

---

<b>Rear suspension</b>	
Type	Swingarm (link suspension)
Spring/shock absorber type	Coil spring/gas-oil damper
Rear shock absorber assembly travel	65.0 mm (2.56 in)
Spring free length	179.5 mm (7.07 in)
Installed length	166.5 mm (6.56 in)
Spring rate K1	93.00 N/mm (531.03 lb/in) (9.48 kgf/mm)
Spring stroke K1	0.0–65.0 mm (0.00–2.56 in)
Optional spring available	No
Enclosed gas/air pressure (STD)	1200 kPa (170.7 psi) (12.0 kgf/cm <sup>2</sup> )

---

<b>Drive chain</b>	
Type/manufacturer	50VA8/DAIDO
Link quantity	118
Drive chain slack	30.0–40.0 mm (1.18–1.57 in)
15-link length limit	239.3 mm (9.42 in)



# ELECTRICAL SPECIFICATIONS

EAS20310

## ELECTRICAL SPECIFICATIONS

---

### Voltage

System voltage 12 V

---

### Ignition system

Ignition system Transistorized coil ignition (digital)

Ignition timing (B.T.D.C.) 5.0 °/1050 r/min

---

### Engine control unit

Model/manufacture TBDF42/DENSO

---

### Ignition coil

Model/manufacture F6T568/MITSUBISHI

Minimum ignition spark gap 6.0 mm (0.24 in)

Primary coil resistance 0.85–1.15  $\Omega$  at 20 °C (68 °F)

Secondary coil resistance 5.02–6.79 k $\Omega$  at 20 °C (68 °F)

---

### AC magneto

Model/manufacture F4T850/MITSUBISHI

Standard output 14.0 V40.0 A5000 r/min

Stator coil resistance 0.14–0.18  $\Omega$  at 20 °C (68 °F)

---

### Rectifier/regulator

Regulator type Semi conductor-short circuit

Model/manufacture FH012AA/SHINDENGEN

Regulated voltage (DC) 14.2–14.8 V

Rectifier capacity 50.0 A

Withstand voltage 40.0 V

---

### Battery

Model YTZ10S

Voltage, capacity 12 V, 8.6 Ah

Specific gravity 1.310

Manufacturer GYM

Ten hour rate amperage 0.90 A

---

### Headlight

Bulb type Halogen bulb

---

### Bulb voltage, wattage × quantity

Headlight 12 V, 55.0 W × 4

Auxiliary light 12 V, 5.0 W × 2

Tail/brake light LED

Front turn signal/position light 12 V, 21.0 W/5.0 W × 2

Rear turn signal light 12 V, 21.0 W × 2

License plate light 12 V, 5.0 W × 1

Meter lighting LED

---

### Indicator light

Neutral indicator light LED

Turn signal indicator light LED

Oil level warning light LED

High beam indicator light LED

Fuel level warning light LED

Coolant temperature warning light LED

Engine trouble warning light LED

Shift timing indicator light LED

---

### Electric starting system

System type Constant mesh

# ELECTRICAL SPECIFICATIONS

---

## Starter motor

Model/manufacture	5VY/YAMAHA
Power output	0.90 kW
Armature coil resistance	0.0090–0.0110 $\Omega$
Brush overall length	10.8 mm (0.43 in)
Limit	7.19 mm (0.28 in)
Brush spring force	5.28–7.92 N (19.01–28.51 oz) (538–808 gf)
Commutator diameter	24.5 mm (0.96 in)
Limit	23.5 mm (0.93 in)
Mica undercut (depth)	1.50 mm (0.06 in)

---

## Starter relay

Model/manufacture	2768093-A/JIDECO
Amperage	180.0 A
Coil resistance	4.18–4.62 $\Omega$

---

## Horn

Horn type	Plane
Quantity	1 pcs
Model/manufacture	YF-12/NIKKO
Maximum amperage	3.0 A
Coil resistance	1.15–1.25 $\Omega$
Performance	105–113 dB/2m

---

## Turn signal relay

Relay type	Full transistor
Model/manufacture	FE246BS/DENSO
Built-in, self-canceling device	No
Turn signal blinking frequency	75.0–95.0 cycles/min
Wattage	21 W $\times$ 2.0 +3.4 W

---

## Oil level gauge

Model/manufacture	5VY/SOMIC ISHIKAWA
-------------------	--------------------

---

## Servo motor

Model/manufacture	5VY/YAMAHA
-------------------	------------

---

## Fuses

Main fuse	50.0 A
Headlight fuse	25.0 A
Signaling system fuse	7.5 A
Ignition fuse	15.0 A
Radiator fan fuse	15.0 A $\times$ 2
Backup fuse	7.5 A
Electric throttle valve fuse	7.5 A
Reserve fuse	25.0 A
Reserve fuse	15.0 A
Reserve fuse	7.5 A

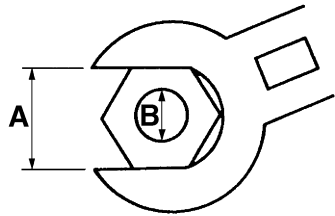
EAS20320

## TIGHTENING TORQUES

EAS20330

### 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

EAS20340















## ENGINE TIGHTENING TORQUES

Item	Thread size	Q'ty	Tightening torque	Remarks
Spark plugs	M10	4	13 Nm (1.3 m·kg, 9.4 ft·lb)	
Cylinder head nut (2pieces)	M10	2	See NOTE	
Cylinder head nut (8pieces)	M10	8	See NOTE	
Cylinder head bolt	M6	2	12 Nm (1.2 m·kg, 8.7 ft·lb)	
Camshaft cap bolt	M6	20	10 Nm (1.0 m·kg, 7.2 ft·lb)	
Cylinder head cover bolt	M6	6	12 Nm (1.2 m·kg, 8.7 ft·lb)	
Cylinder head stud bolt (exhaust pipe)	M8	8	15 Nm (1.5 m·kg, 11 ft·lb)	
Air induction system cap bolt	M6	4	10 Nm (1.0 m·kg, 7.2 ft·lb)	
Camshaft sprocket bolt	M7	4	24 Nm (2.4 m·kg, 17 ft·lb)	
Cylinder head and throttle body clamp	M6	7	10 Nm (1.0 m·kg, 7.2 ft·lb)	
Connecting rod cap bolt (1st)	M8	8	20 Nm (2.0 m·kg, 14 ft·lb)	
Connecting rod cap bolt (final)	M8	8	specified angle 150°	
Generator rotor bolt	M10	1	60 Nm (6.0 m·kg, 43 ft·lb)	
Timing chain tensioner bolt	M6	2	10 Nm (1.0 m·kg, 7.2 ft·lb)	
Water pump outlet pipe bolt	M6	1	10 Nm (1.0 m·kg, 7.2 ft·lb)	
Water pump inlet pipe bolt (water pump side)	M6	1	10 Nm (1.0 m·kg, 7.2 ft·lb)	
Water pump inlet pipe bolt (front side)	M6	1	10 Nm (1.0 m·kg, 7.2 ft·lb)	
Oil/water pump drive sprocket bolt	M6	1	15 Nm (1.5 m·kg, 11 ft·lb)	
Water pump bolt	M6	2	12 Nm (1.2 m·kg, 8.7 ft·lb)	
Thermostat cover nut	M6	2	10 Nm (1.0 m·kg, 7.2 ft·lb)	
Thermostat inlet pipe bolt	M6	1	10 Nm (1.0 m·kg, 7.2 ft·lb)	
Oil cooler bolt	M20	1	63 Nm (6.3 m·kg, 46 ft·lb)	
Engine oil drain bolt	M14	1	43 Nm (4.3 m·kg, 31 ft·lb)	
Oil pipe bolt	M6	2	10 Nm (1.0 m·kg, 7.2 ft·lb)	
Oil strainer bolt	M6	3	10 Nm (1.0 m·kg, 7.2 ft·lb)	
Oil delivery pipe bolt	M6	3	10 Nm (1.0 m·kg, 7.2 ft·lb)	
Oil filter union bolt	M20	1	70 Nm (7.0 m·kg, 51 ft·lb)	
Oil filter	M20	1	17 Nm (1.7 m·kg, 12 ft·lb)	
Oil pan bolt	M6	14	12 Nm (1.2 m·kg, 8.7 ft·lb)	
Air filter case screw	M5	9	2.0 Nm (0.2 m·kg, 1.4 ft·lb)	
Air filter case and funnel screw	M5	2	2.5 Nm (0.25 m·kg, 1.8 ft·lb)	
Throttle body and throttle body joint clamp	M5	4	3.0 Nm (0.3 m·kg, 2.2 ft·lb)	
Throttle body and funnel bolt	M6	6	6.0 Nm (0.6 m·kg, 4.3 ft·lb)	
Throttle cable adjusting bolt	M5	2	4.0 Nm (0.4 m·kg, 2.9 ft·lb)	
Cylinder head and exhaust pipe nut	M8	8	20 Nm (2.0 m·kg, 14 ft·lb)	

# TIGHTENING TORQUES

Item	Thread size	Q'ty	Tightening torque	Remarks
Exhaust pipe and muffler bolt	M8	2	20 Nm (2.0 m·kg, 14 ft·lb)	
Exhaust pipe and EXUP valve bolt	M6	5	12 Nm (1.2 m·kg, 8.7 ft·lb)	
Exhaust valve pipe bracket bolt	M8	1	20 Nm (2.0 m·kg, 14 ft·lb)	
EXUP pulley and shaft arm nut	M6	1	6.5 Nm (0.65 m·kg, 4.7 ft·lb)	
EXUP valve pulley cover bolt	M6	2	10 Nm (1.0 m·kg, 7.2 ft·lb)	
EXUP valve and EXUP valve pipe bolt	M6	1	10 Nm (1.0 m·kg, 7.2 ft·lb)	
EXUP cable bracket bolt	M6	1	10 Nm (1.0 m·kg, 7.2 ft·lb)	
EXUP cable nut	M6	2	6.5 Nm (0.65 m·kg, 4.7 ft·lb)	
EXUP servo motor cover bolt	M5	2	2 Nm (0.2 m·kg, 1.4 ft·lb)	
EXUP servo motor bolt	M6	2	6.0 Nm (0.6 m·kg, 4.3 ft·lb)	
Catalyst pipe bracket and rear frame	M8	1	20 Nm (2.0 m·kg, 14 ft·lb)	
Catalyst pipe and EXUP valve pipe bolt	M8	1	20 Nm (2.0 m·kg, 14 ft·lb)	
Catalyst pipe and catalyst pipe bracket bolt	M8	1	20 Nm (2.0 m·kg, 14 ft·lb)	
Catalyst pipe protector	M6	4	6.5 Nm (0.65 m·kg, 4.7 ft·lb)	
Muffler and rear frame bolt	M8	2	23 Nm (2.3 m·kg, 17 ft·lb)	
Muffler protector bolt	M6	4	10 Nm (1.0 m·kg, 7.2 ft·lb)	
Crankcase stud bolt	M10	10	8.0 Nm (0.8 m·kg, 5.8 ft·lb)	
Crankcase bolt (main journal)	M9	10	See NOTE	
Crankcase bolt	M6	2	10 Nm (1.0 m·kg, 7.2 ft·lb)	
Crankcase bolt	M6	8	10 Nm (1.0 m·kg, 7.2 ft·lb)	
Crankcase bolt	M8	1	24 Nm (2.4 m·kg, 17 ft·lb)	 
Crankcase bolt	M8	5	24 Nm (2.4 m·kg, 17 ft·lb)	
Generator rotor cover bolt	M6	4	12 Nm (1.2 m·kg, 8.7 ft·lb)	
Generator rotor cover bolt	M8	3	22 Nm (2.2 m·kg, 16 ft·lb)	
Drive sprocket cover bolt	M6	3	12 Nm (1.2 m·kg, 8.7 ft·lb)	
Crankcase cover bolt	M6	3	10 Nm (1.0 m·kg, 7.2 ft·lb)	
Clutch cover bolt	M6	7	12 Nm (1.2 m·kg, 8.7 ft·lb)	
Clutch cover bolt	M6	1	12 Nm (1.2 m·kg, 8.7 ft·lb)	
Pickup rotor cover bolt	M6	6	12 Nm (1.2 m·kg, 8.7 ft·lb)	
Breather cover bolt	M6	4	12 Nm (1.2 m·kg, 8.7 ft·lb)	
Breather plate bolt	M6	3	10 Nm (1.0 m·kg, 7.2 ft·lb)	
Plate bolt	M6	1	12 Nm (1.2 m·kg, 8.7 ft·lb)	
Plate bolt	M6	1	12 Nm (1.2 m·kg, 8.7 ft·lb)	
Pickup rotor cover blind bolt	M8	1	15 Nm (1.5 m·kg, 11 ft·lb)	
Oil level plug	M20	1	1.5 Nm (0.15 m·kg, 1.1 ft·lb)	
Generator rotor cover plug	M20	1	8.0 Nm (0.8 m·kg, 5.8 ft·lb)	
Main gallery plug (oil return)	M16	3	8.0 Nm (0.8 m·kg, 5.8 ft·lb)	
Main gallery plug	M20	1	8.0 Nm (0.8 m·kg, 5.8 ft·lb)	

# TIGHTENING TORQUES

Item	Thread size	Q'ty	Tightening torque	Remarks
Oil return pipe bolt	M6	2	10 Nm (1.0 m·kg, 7.2 ft·lb)	
Oil return plug	M12	2	24 Nm (2.4 m·kg, 17 ft·lb)	
AC magneto lead bolt	M6	1	10 Nm (1.0 m·kg, 7.2 ft·lb)	
Stator coil screw	M6	3	14 Nm (1.4 m·kg, 10 ft·lb)	
Generator rotor cover screw	M6	3	10 Nm (1.0 m·kg, 7.2 ft·lb)	
Thermostat assembly stay bolt	M6	2	10 Nm (1.0 m·kg, 7.2 ft·lb)	
Starter clutch idler gear bolt	M6	1	10 Nm (1.0 m·kg, 7.2 ft·lb)	
Clutch boss nut	M20	1	115 Nm (11.5 m·kg, 83 ft·lb)	 Use a lock washer
Clutch spring bolt	M6	6	10 Nm (1.0 m·kg, 7.2 ft·lb)	
Drive sprocket nut	M22	1	85 Nm (8.5 m·kg, 61 ft·lb)	 Use a lock washer
Bearing plate bolt	M6	3	12 Nm (1.2 m·kg, 8.7 ft·lb)	
Shift bar stopper plate bolt	M6	2	10 Nm (1.0 m·kg, 7.2 ft·lb)	
Stopper screw	M8	1	22 Nm (2.2 m·kg, 16 ft·lb)	
Shift rod nut	M6	1	6.5 Nm (0.65 m·kg, 4.7 ft·lb)	Left thread
Shift rod nut	M6	1	6.5 Nm (0.65 m·kg, 4.7 ft·lb)	
Joint rod bolt	M6	1	10 Nm (1.0 m·kg, 7.2 ft·lb)	
Shift arm bolt	M6	1	10 Nm (1.0 m·kg, 7.2 ft·lb)	
Neutral switch	M10	1	20 Nm (2.0 m·kg, 14 ft·lb)	
Coolant temperature sensor	M12	1	18 Nm (1.8 m·kg, 13 ft·lb)	
Cylinder identification sensor bolt	M6	1	8.0 Nm (0.8 m·kg, 5.8 ft·lb)	
Atmospheric pressure sensor screw	M5	2	7.0 Nm (0.7 m·kg, 5.0 ft·lb)	
Crankshaft position sensor bolt	M6	1	10 Nm (1.0 m·kg, 7.2 ft·lb)	
Oil level switch bolt	M6	2	10 Nm (1.0 m·kg, 7.2 ft·lb)	

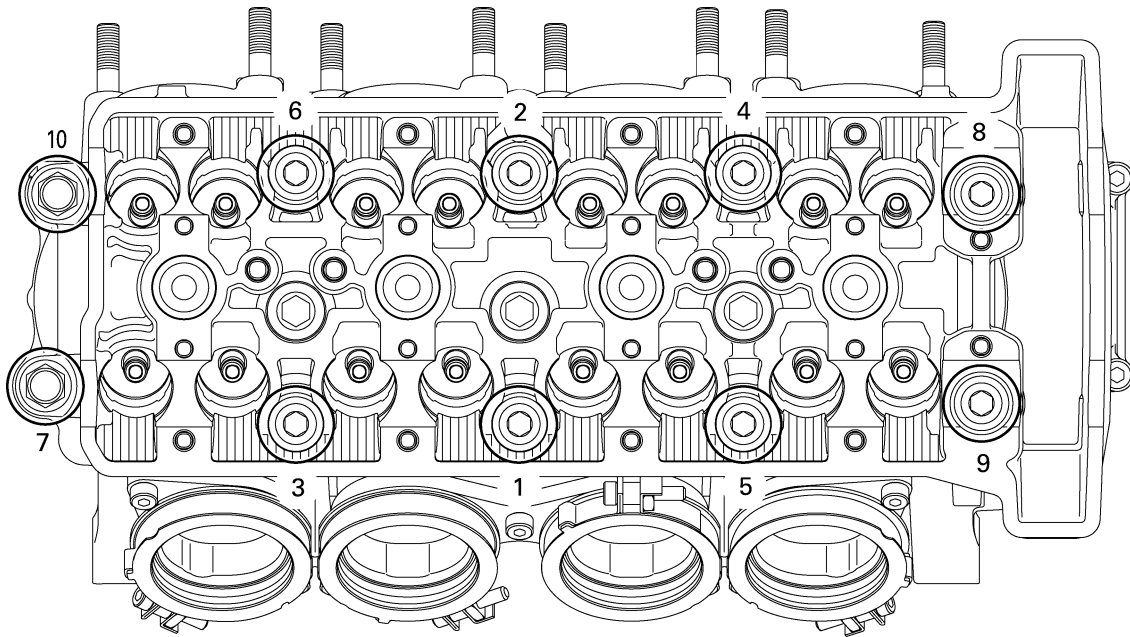
**NOTE:**

- Cylinder head nut (2 pieces)
  1. First, tighten the bolts to 10 Nm (1.0 m·kg, 7.2 ft·lb) with a torque wrench following the tightening order.
  2. Second, tighten the bolts to 25 Nm (2.5 m·kg, 18 ft·lb) with a torque wrench following the tightening order.
  3. Third, tighten the bolts to 40 Nm (4.0 m·kg, 29 ft·lb) with a torque wrench following the tightening order.
  4. Final, tighten the bolts to 55 Nm (5.5 m·kg, 40 ft·lb) with a torque wrench following the tightening order.
- Cylinder head nut (8 pieces)
  1. First, tighten the bolts to 10 Nm (1.0 m·kg, 7.2 ft·lb) with a torque wrench following the tightening order.
  2. Second, tighten the bolts to 25 Nm (2.5 m·kg, 18 ft·lb) with a torque wrench following the tightening order.

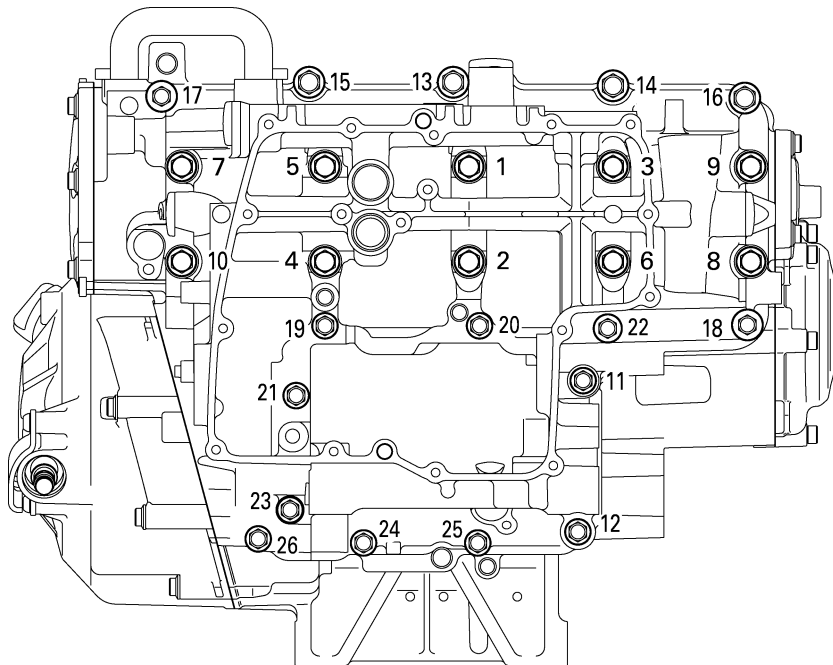
# TIGHTENING TORQUES

3. Final, tighten the bolts to 40 Nm (4.0 m·kg, 29 ft·lb) with a torque wrench following the tightening order.
- Crankcase bolt (main journal)
    1. First, tighten the bolts to approximately 20 Nm (2.0 m·kg, 14 ft·lb) with a torque wrench following the tightening order.
    2. Loosen all the bolts one by one following the tightening order and then tighten them to 20 Nm (2.7 m·kg, 14 ft·lb) again.
    3. Retighten the bolts further to reach the specified angle (56-61°).

## Cylinder head tightening sequence:







## Crankcase tightening sequence:



# TIGHTENING TORQUES





EAS20350

## CHASSIS TIGHTENING TORQUES

Item	Thread size	Q'ty	Tightening torque	Remarks
Upper bracket pinch bolt	M8	2	26 Nm (2.6 m·kg, 19 ft·lb)	
Steering stem nut	M28	1	113 Nm (11.3 m·kg, 82 ft·lb)	
Handlebar pinch bolt	M8	2	17 Nm (1.7m·kg, 12 ft·lb)	
Handlebar bolt	M6	2	13 Nm (1.3 m·kg, 9.4 ft·lb)	
Cap bolt	M46	2	23 Nm (2.3 m·kg, 17 ft·lb)	
Lower ring nut	M30	2	See NOTE	
Lower bracket pinch bolt	M8	4	23 Nm (2.3 m·kg, 17 ft·lb)	
Brake master cylinder reservoir cap screw	M4	1	1.2 Nm (0.12 m·kg, 0.9 ft·lb)	
Front brake hose union bolt	M10	3	30 Nm (3.0 m·kg, 22 ft·lb)	
Front brake master cylinder holder bolt	M6	2	13 Nm (1.3 m·kg, 9.4 ft·lb)	
Meter assembly and cowling stay screw	–	3	1.3 Nm (0.13 m·kg, 0.9 ft·lb)	
Headlight and cowling stay screw	–	6	0.8 Nm (0.08 m·kg, 0.6 ft·lb)	
Front cowling and headlight screw	–	5	1.5 Nm (0.15 m·kg, 1.1 ft·lb)	
Side cowling bracket and frame bolt	M6	2	5.0 Nm (0.5 m·kg, 3.6 ft·lb)	
Under cowling and engine bolt	M6	3	5.0 Nm (0.5 m·kg, 3.6 ft·lb)	
Rear view mirror nut	M6	4	7.0 Nm (0.7 m·kg, 5.1 ft·lb)	
Front cowling and intake air duct panel screw	M5	2	1.3 Nm (0.13 m·kg, 0.9 ft·lb)	
Grip end bolt	M6	2	4.0 Nm (0.4 m·kg, 2.9 ft·lb)	
Horn bracket bolt	M6	2	11 Nm (1.1 m·kg, 8.0 ft·lb)	
Coolant reservoir bolt	M6	2	5.0 Nm (0.5 m·kg, 3.6 ft·lb)	
Left front engine mounting bolt	M10	1	45 Nm (4.5 m·kg, 33 ft·lb)	
Right front engine mounting bolt	M10	1	45 Nm (4.5 m·kg, 33 ft·lb)	
Engine mount self locking nut (upper)	M10	1	51 Nm (5.1 m·kg, 37 ft·lb)	See NOTE 
Engine mount self locking nut (lower)	M10	1	51 Nm (5.1 m·kg, 37 ft·lb)	See NOTE 
Engine mounting adjust bolt (upper)	M16	1	7.0 Nm (0.7 m·kg, 5.1 ft·lb)	See NOTE
Engine mounting adjust bolt (lower)	M16	1	7.0 Nm (0.7 m·kg, 5.1 ft·lb)	See NOTE
Clutch cable locknut (engine side)	M8	1	7.0 Nm (0.7 m·kg, 5.1 ft·lb)	
Main frame and rear frame bolt	M10	4	41 Nm (4.1 m·kg, 30 ft·lb)	See NOTE 
Pivot shaft	M30	1	7.0 Nm (0.7 m·kg, 5.1 ft·lb)	
Pivot shaft ring nut	M30	1	65 Nm (6.5 m·kg, 47 ft·lb)	
Pivot shaft nut	M20	1	105 Nm (10.5 m·kg, 76 ft·lb)	



# TIGHTENING TORQUES

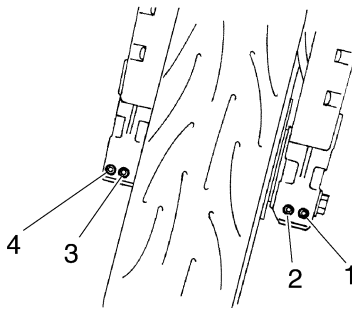
Item	Thread size	Q'ty	Tightening torque	Remarks
Connecting arm nut (connecting arm and frame)	M10	1	44 Nm (4.4 m·kg, 32 ft·lb)	
Relay arm nut (relay arm and connecting arm)	M10	1	44 Nm (4.4 m·kg, 32 ft·lb)	
Relay arm nut (relay arm and swingarm)	M10	1	44 Nm (4.4 m·kg, 32 ft·lb)	
Rear shock absorber assembly lower nut	M10	1	44 Nm (4.4 m·kg, 32 ft·lb)	
Rear shock absorber upper bracket nut	M10	1	44 Nm (4.4 m·kg, 32 ft·lb)	
Rear shock absorber assembly upper nut	M10	1	92 Nm (9.2 m·kg, 67 ft·lb)	
Drive chain guard bolt	M6	2	7.0 Nm (0.7 m·kg, 5.1 ft·lb)	
Drive chain guide bolt	M6	1	13 Nm (1.3 m·kg, 9.4 ft·lb)	
Drive chain adjusting locknut	M8	2	16 Nm (1.6 m·kg, 12 ft·lb)	
Fuel pump bolt	M5	6	4.0 Nm (0.4 m·kg, 2.9 ft·lb)	
Fuel tank bolt (front)	M6	1	7.0 Nm (0.7 m·kg, 5.1 ft·lb)	
Fuel tank bracket bolt	M6	2	7.0 Nm (0.7 m·kg, 5.1 ft·lb)	
Fuel tank bolt (rear)	M6	4	7.0 Nm (0.7 m·kg, 5.1 ft·lb)	
Fuel tank side cover screw	M5	2	4.0 Nm (0.4 m·kg, 2.9 ft·lb)	
Rider seat bolt	M6	2	7.0 Nm (0.7 m·kg, 5.1 ft·lb)	
Seat lock assembly bolt	M6	2	10 Nm (1.0 m·kg, 7.2 ft·lb)	
Upper tail cover bolt	M5	1	4.0 Nm (0.4 m·kg, 2.9 ft·lb)	
Battery box bolt	M6	2	7.0 Nm (0.7 m·kg, 5.1 ft·lb)	
Lean angle sensor bolt	M4	2	2.0 Nm (0.2 m·kg, 1.4 ft·lb)	
Footrest bracket bolt	M8	4	28 Nm (2.8 m·kg, 20 ft·lb)	
Rear brake master cylinder bolt	M8	2	23 Nm (2.3 m·kg, 17 ft·lb)	
Rear brake hose union bolt	M10	2	30 Nm (3.0 m·kg, 22 ft·lb)	
Sidestand and bracket nut	M10	1	61 Nm (6.1 m·kg, 44 ft·lb)	
Sidestand bracket and frame bolt	M10	2	63 Nm (6.3 m·kg, 46 ft·lb)	
Front wheel axle bolt	M14	1	91 Nm (9.1 m·kg, 66 ft·lb)	
Rear wheel axle nut	M24	1	150 Nm (15.0 m·kg, 108 ft·lb)	
Front brake caliper bolt	M10	4	35 Nm (3.5 m·kg, 25 ft·lb)	
Front brake disc bolt	M6	10	18 Nm (1.8 m·kg, 13 ft·lb)	
Rear brake disc bolt	M8	5	30 Nm (3.0 m·kg, 22 ft·lb)	
Rear wheel sprocket nut	M10	6	100 Nm (10.0 m·kg, 72 ft·lb)	
Brake caliper bleed screw	M8	3	6.0 Nm (0.6 m·kg, 4.3 ft·lb)	
Front wheel axle pinch bolt	M8	4	21 Nm (2.1 m·kg, 15 ft·lb)	See NOTE

**NOTE:**

- Lower ring nut
  1. First, tighten the lower ring nut approximately 52 Nm (5.2 m·kg, 38 ft·lb) by using the torque wrench, then loosen the ring nut completely.
  2. Retighten the lower ring nut 18 Nm (1.8 m·kg, 13 ft·lb).

# TIGHTENING TORQUES

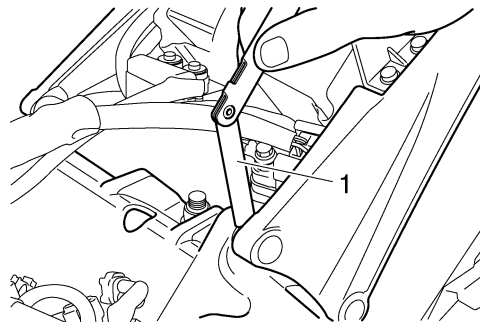
- Engine mounting adjust bolt and engine mount self locking nut  
Refer to "INSTALLING THE ENGINE" on page 5-7.
- Front wheel axle pinch bolt
  1. Insert the front wheel axle from the right side and tighten it with the flange bolt from the left side to 91 Nm (9.1 m·kg, 65.8 ft·lb).
  2. In the order from the pinch bolt "2" → pinch bolt "1" → pinch bolt "2", tighten each bolt to 21 Nm (2.1 m·kg, 15 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 21 Nm (2.1 m·kg, 15 ft·lb) without performing temporary tightening.



- Main frame and rear frame bolt
  1. Check the clearance between rear frame and main frame by thickness gauge "1".  
Insert adjusting shim(s) to eliminate the gap according to the chart as shown below.

Thickness	Shim(s)
Under 0.5 mm (Under 0.01969 in)	NONE
0.51–1.0 mm (0.02008–0.03937 in)	One shim on the left side
1.01–1.5 mm (0.03976–0.05906 in)	Two shims on the left side
1.51–2.0 mm (0.05945–0.07874 in)	Three shims on the left side
2.01–2.5 mm (0.07913–0.09843 in)	Three shims on the left side and one shim on the right side
2.51–3.0 mm (0.09882–0.11811 in)	Three shims on the left side and two shims on the right side

Shim: 0.5 mm (0.02 in)



























# LUBRICATION POINTS AND LUBRICANT TYPES

EAS20360

## LUBRICATION POINTS AND LUBRICANT TYPES

EAS20370





















### ENGINE

Lubrication point	Lubricant
Oil seal lips	
O-rings	
Bearings	
Crankshaft pins	
Piston surfaces	
Piston pins	
Connecting rod bolts	
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)	
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	
Cylinder head cover mating surface	Yamaha bond No. 1215
Cylinder head cover semicircular	Yamaha bond No. 1215
Crankcase mating surface	Yamaha bond No. 1215
Crankcase cover mating surface	Yamaha bond No. 1215
Generator rotor cover (stator coil assembly lead grommet)	Yamaha bond No. 1215

# LUBRICATION POINTS AND LUBRICANT TYPES

EAS20380

## 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	

# LUBRICATION POINTS AND LUBRICANT TYPES

---

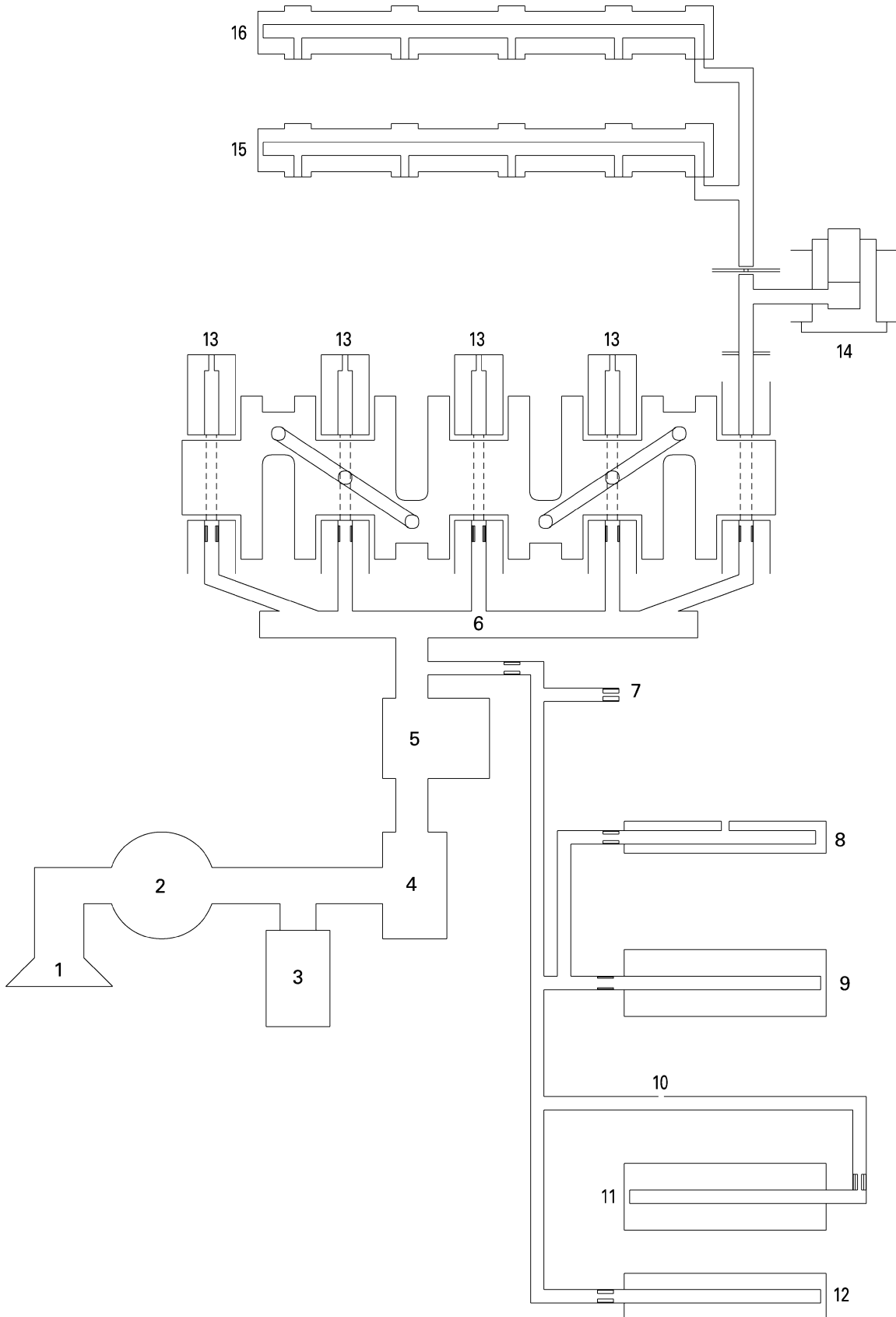
# LUBRICATION SYSTEM CHART AND DIAGRAMS

EAS20390

## LUBRICATION SYSTEM CHART AND DIAGRAMS

EAS20400

### ENGINE OIL LUBRICATION CHART



# LUBRICATION SYSTEM CHART AND DIAGRAMS

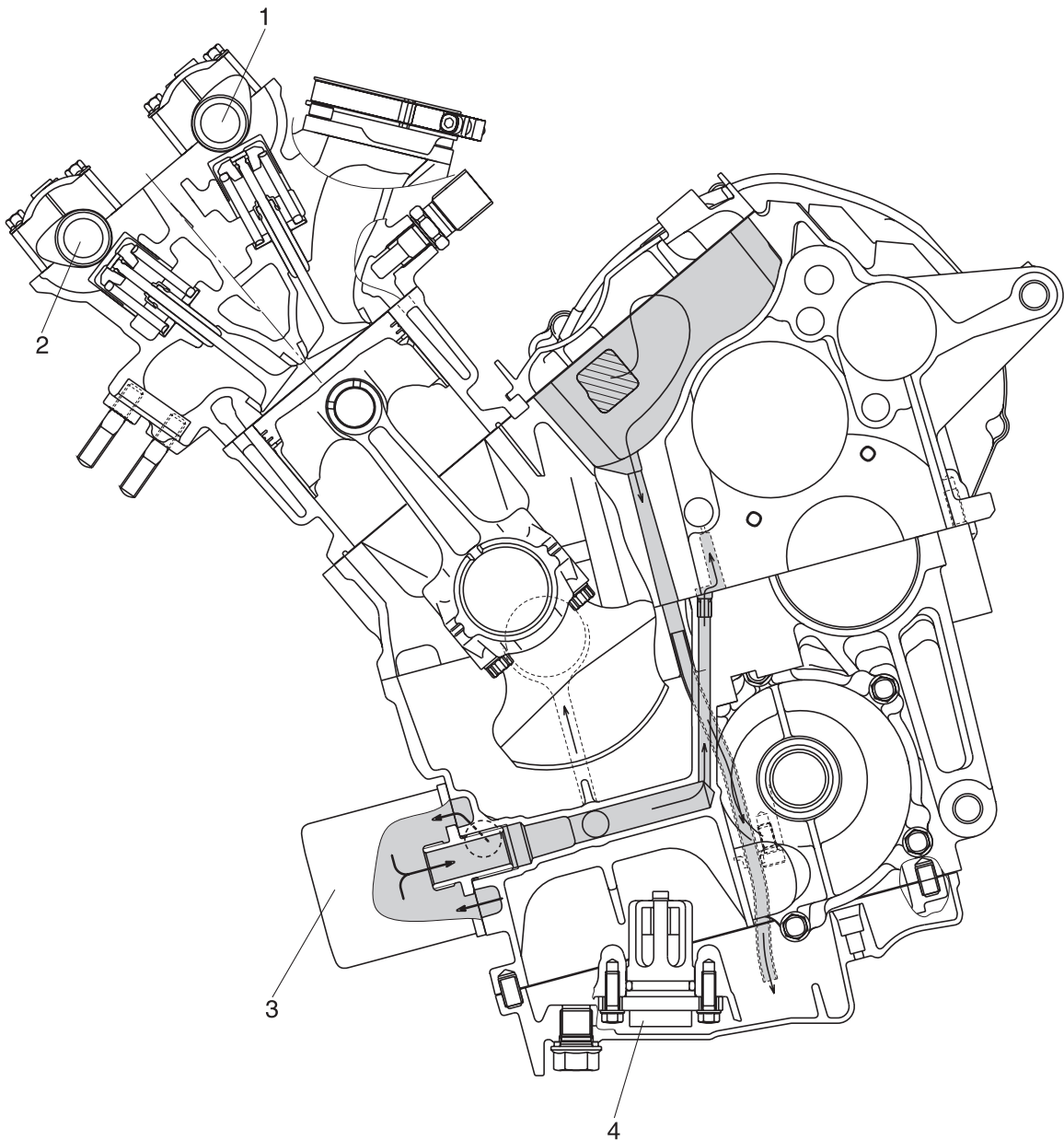
---

1. Oil strainer
2. Oil pump
3. Relief valve
4. Oil cooler
5. Oil filter
6. Main gallery
7. AC magneto drive gear shower
8. Shift fork (upper)
9. Main axle
10. Mission shower
11. Drive axle
12. AC magneto axle
13. Piston cooler
14. Chain tensioner
15. Intake camshaft
16. Exhaust camshaft

# LUBRICATION SYSTEM CHART AND DIAGRAMS

EAS20410

## LUBRICATION DIAGRAMS





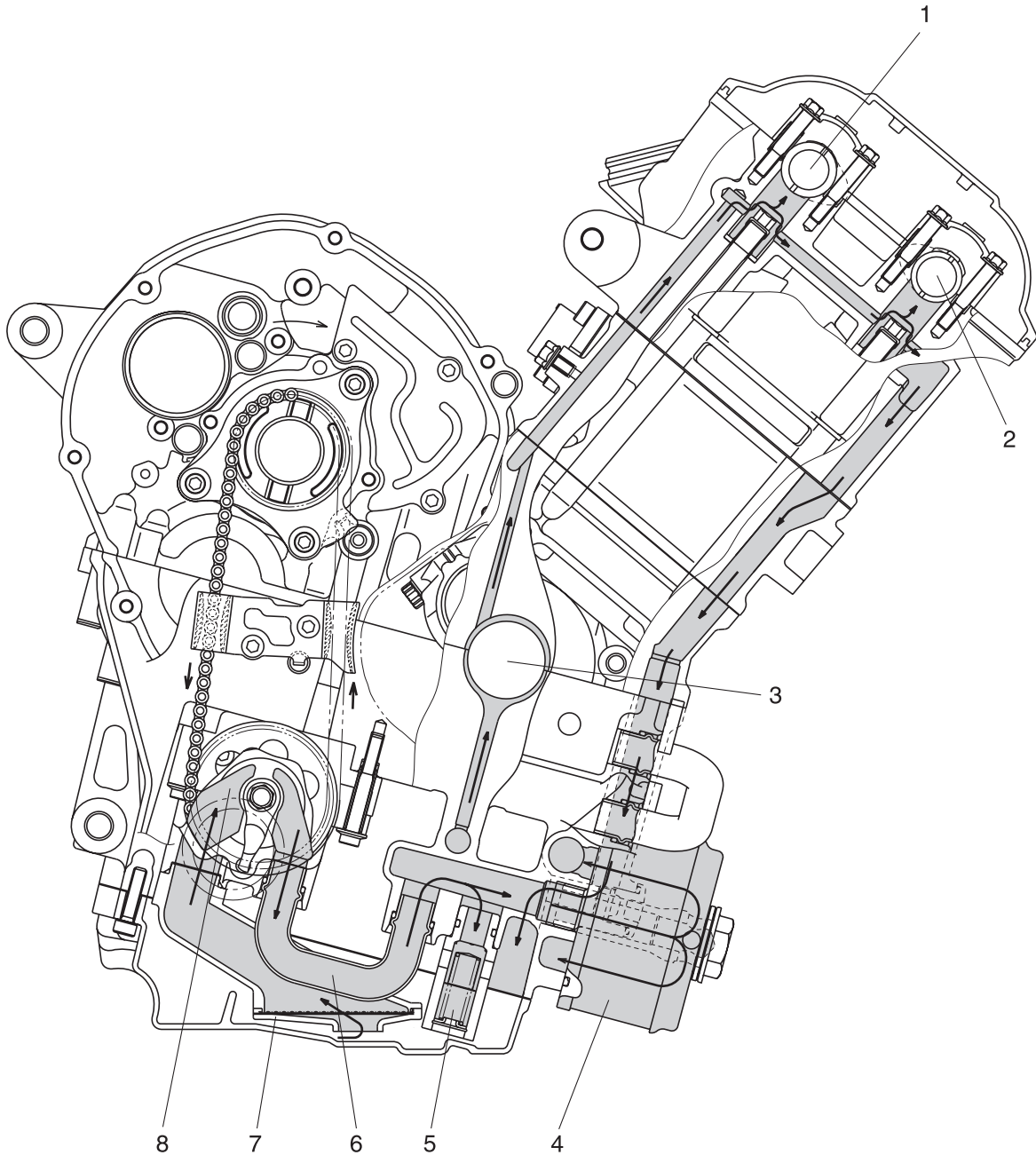
# LUBRICATION SYSTEM CHART AND DIAGRAMS

---

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

# LUBRICATION SYSTEM CHART AND DIAGRAMS

---



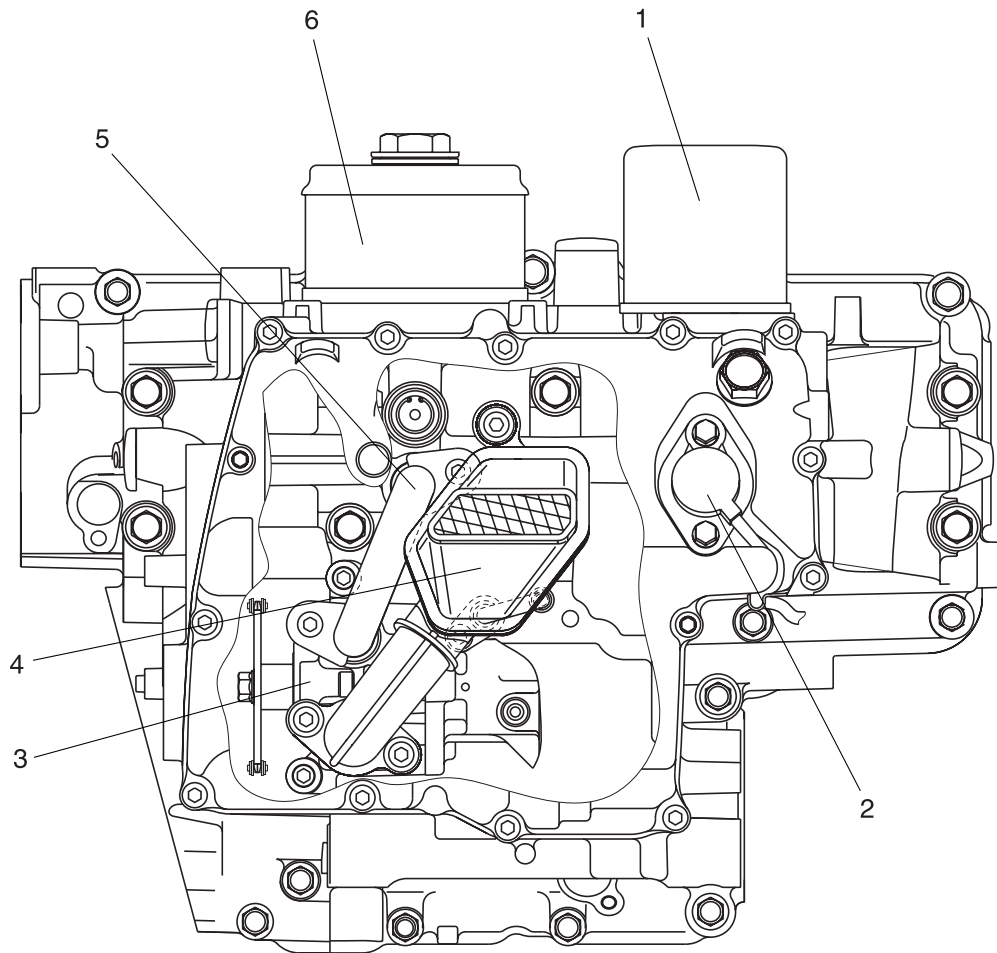
# LUBRICATION SYSTEM CHART AND DIAGRAMS

---

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

# LUBRICATION SYSTEM CHART AND DIAGRAMS

---



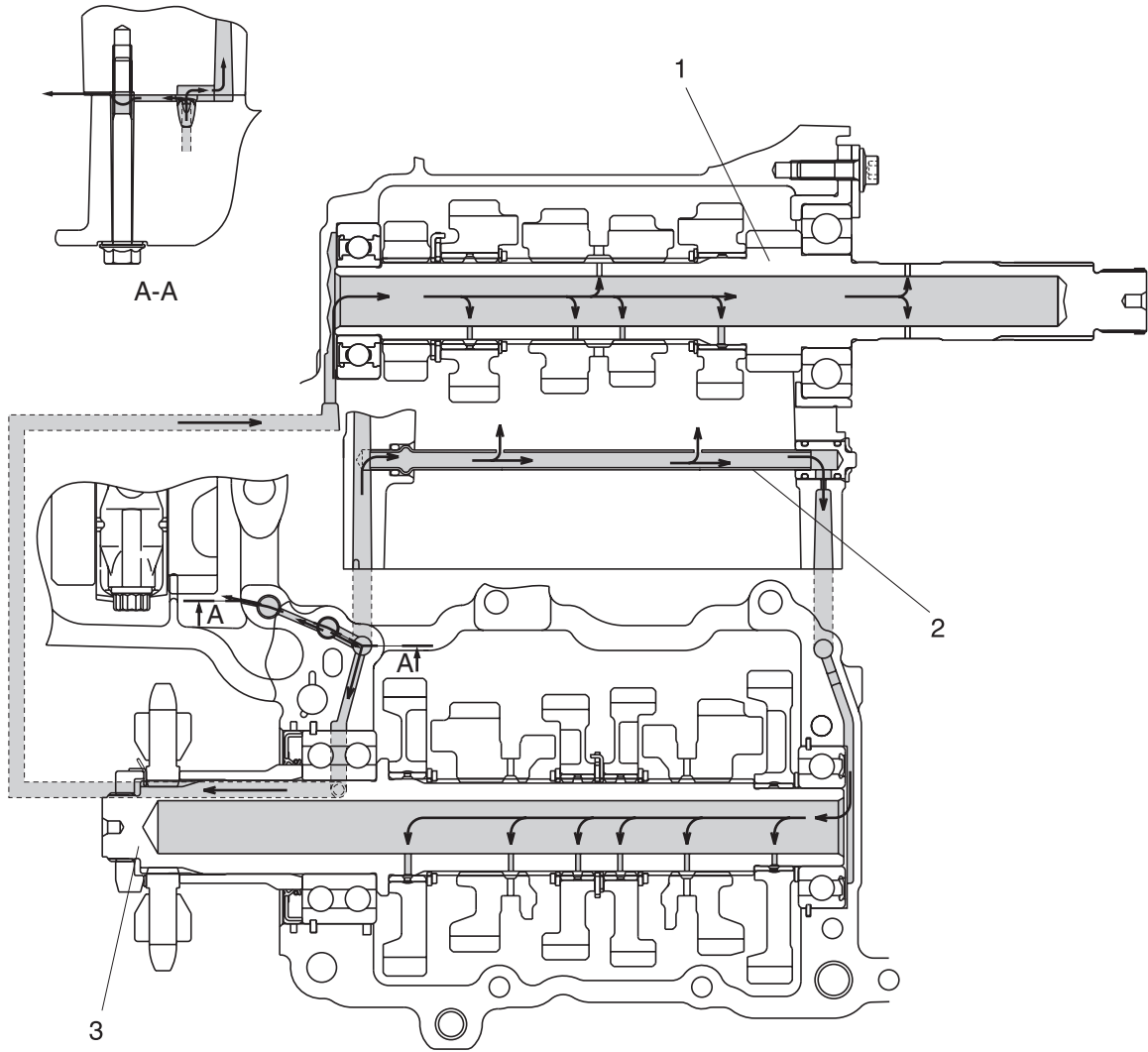
# LUBRICATION SYSTEM CHART AND DIAGRAMS

---

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

# LUBRICATION SYSTEM CHART AND DIAGRAMS

---



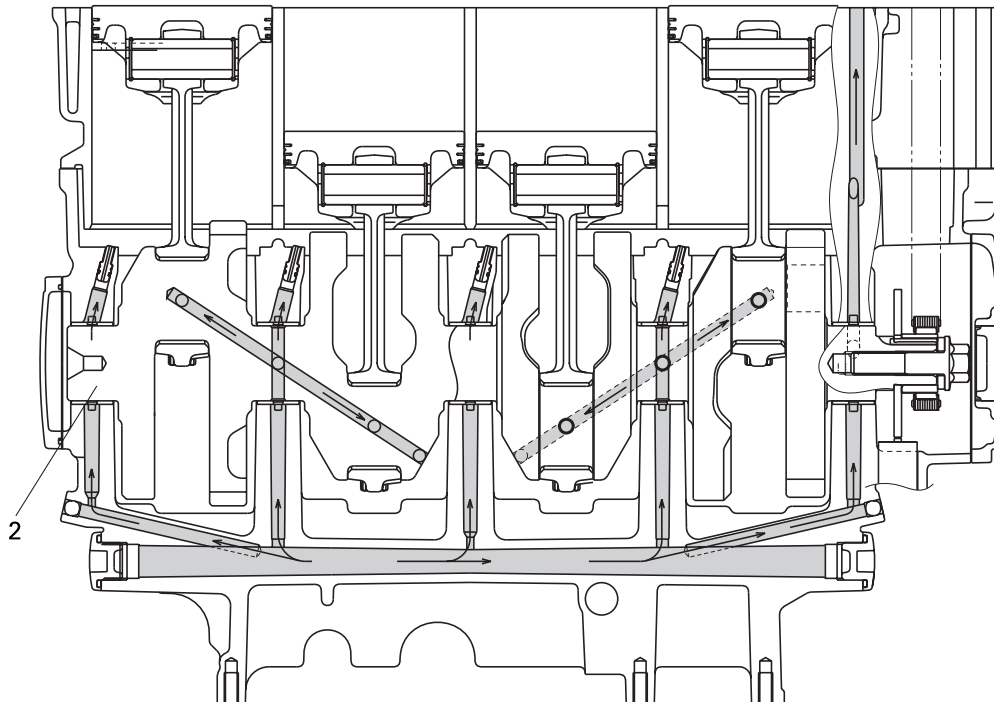
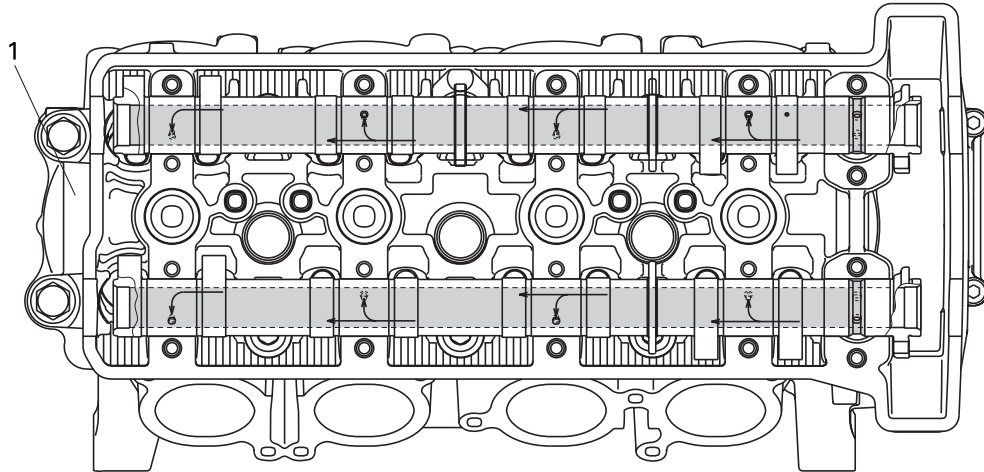
# LUBRICATION SYSTEM CHART AND DIAGRAMS

---

1. Main axle
2. Oil delivery pipe
3. Drive axle

# LUBRICATION SYSTEM CHART AND DIAGRAMS

---





# LUBRICATION SYSTEM CHART AND DIAGRAMS

---

1. Cylinder head
2. Crankshaft



**Download the full PDF manual instantly.**

**Our customer service e-mail:**

**[aservicemanualpdf@yahoo.com](mailto:aservicemanualpdf@yahoo.com)**