



**XV19SW(C)**  
**XV19W(C)**  
**XV19MW(C)**  
**XV19CTSW(C)**  
**XV19CTW(C)**  
**XV19CTMW(C)**

**SERVICE MANUAL**

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# GENERAL INFORMATION

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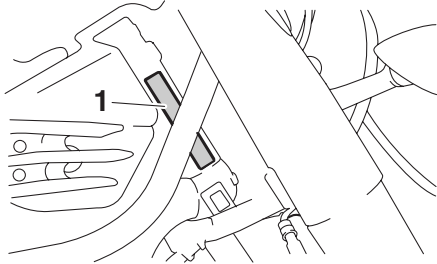
EAS20130

## IDENTIFICATION

EAS20140

### VEHICLE IDENTIFICATION NUMBER

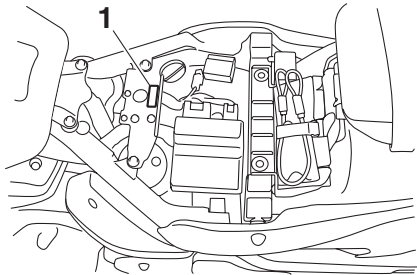
The vehicle identification number “1” is stamped into the right side of the steering head pipe.



EAS20150

### MODEL LABEL

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



EAS20170

## FEATURES

ET1D71017

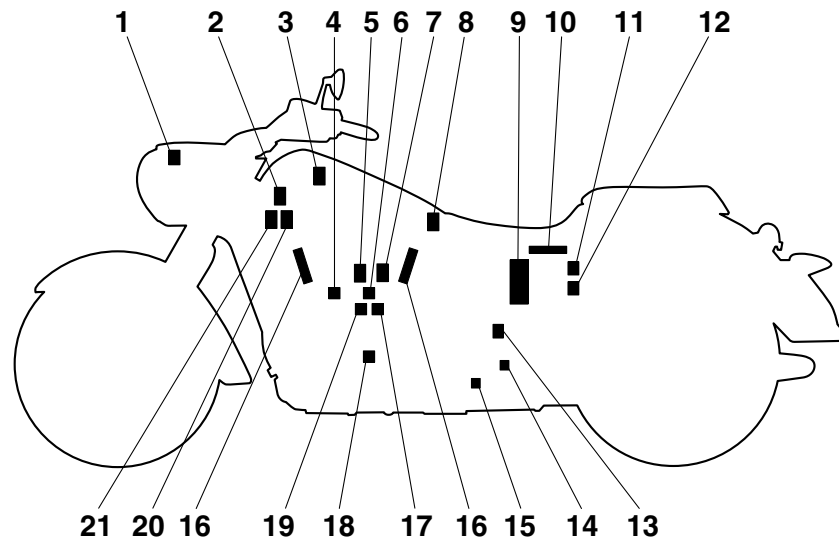
### OUTLINE OF THE FI SYSTEM

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. Air temperature sensor                 | 15. Lean angle sensor               |
| 2. ISC (idle speed control) unit          | 16. Spark plug                      |
| 3. Cylinder-#2 intake air pressure sensor | 17. Injector #1                     |
| 4. Engine temperature sensor              | 18. Crankshaft position sensor      |
| 5. Cylinder-#1 right ignition coil        | 19. Injector #2                     |
| 6. Throttle position sensor               | 20. Cylinder-#2 right ignition coil |
| 7. Cylinder-#1 left ignition coil         | 21. Cylinder-#2 left ignition coil  |
| 8. Cylinder-#1 intake air pressure sensor |                                     |
| 9. Fuel pump                              |                                     |
| 10. ECU (electronic control unit)         |                                     |
| 11. Relay unit (fuel pump relay)          |                                     |
| 12. EXUP servo motor                      |                                     |
| 13. Speed sensor                          |                                     |
| 14. O <sub>2</sub> sensor                 |                                     |

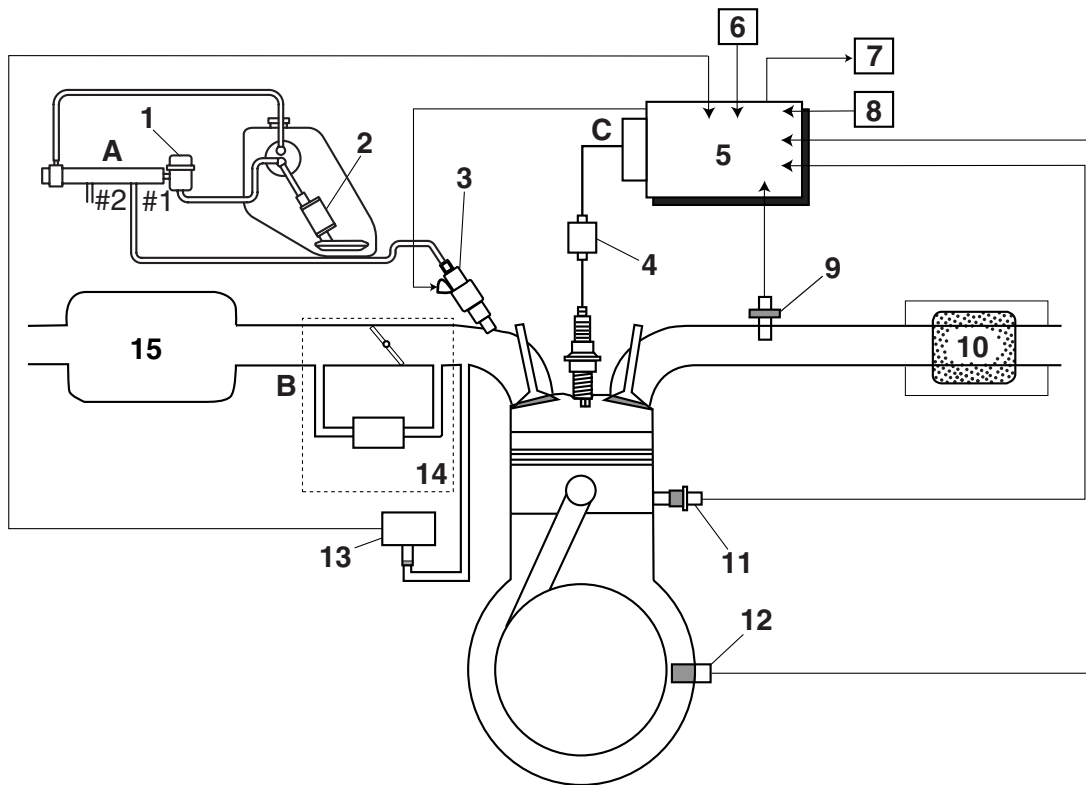
ET1D71018

## 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 392 kPa (3.92 kg/cm<sup>2</sup>, 55.7 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 remains 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, crankshaft position sensor, intake air pressure sensor, air temperature sensor, engine temperature 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.

**Illustration is for reference only.**



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

ET1D71036

## INSTRUMENT FUNCTIONS

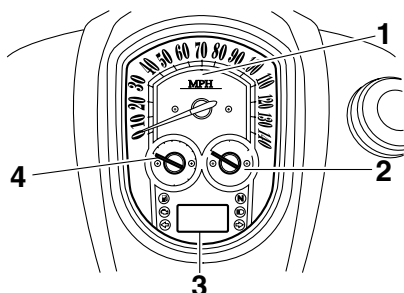
### Multi-function meter unit

EW1D71008



**WARNING**

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



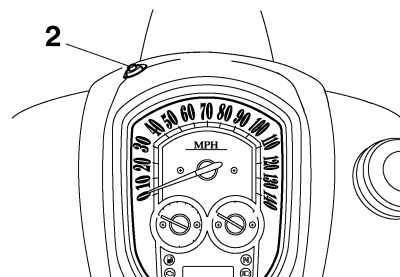
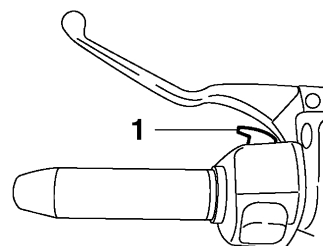
1. Speedometer
2. Fuel gauge
3. Odometer/tripmeter/fuel reserve tripmeter/clock
4. Tachometer

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

- a speedometer (which shows the riding speed)
- a tachometer (which shows the engine speed)
- a fuel gauge
- 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 on the fuel reserve)
- a clock
- a self-diagnosis device
- a brightness control mode

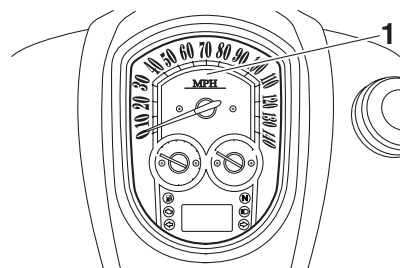
**NOTE:**

- Be sure to turn the key to “ON” before using the “SELECT” and “RESET” switches, except for setting the brightness control mode.
- To switch the odometer, the tripmeters and the fuel reserve tripmeter displays between kilometers and miles, press the “SELECT” switch for at least two seconds. (For USA and California only)



1. “SELECT” switch
2. “RESET” switch

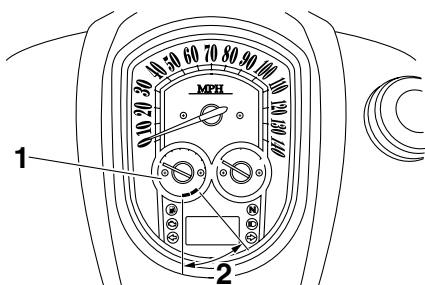
### Speedometer



1. Speedometer

The speedometer shows the riding speed. When the key is turned to “ON”, the speedometer needle will sweep once across the speed range and then return to zero in order to test the electrical circuit.

## 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.

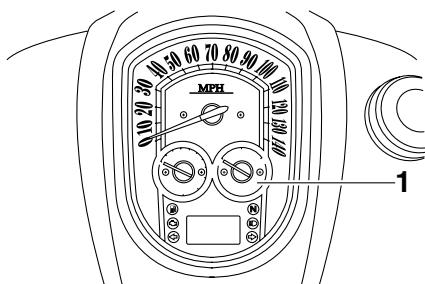
EC1D71017

### CAUTION:

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

**Red zone: 5000 r/min and above**

## Fuel gauge



1. Fuel gauge

The fuel gauge indicates the amount of fuel in the fuel tank. The needle moves towards “E” (Empty) as the fuel level decreases. When the needle reaches “E”, approximately 3.0 L (0.79 US gal) (0.66 Imp.gal) remain in the fuel tank. If this occurs, refuel as soon as possible.

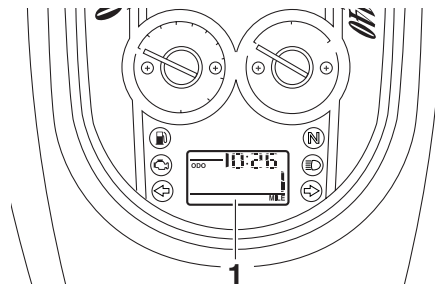
When the key is turned to “ON”, the fuel gauge needle will sweep once across the fuel level range and then return to the current amount in order to test the electrical circuit.

### NOTE:

- Do not allow the fuel tank to empty itself completely.

- The fuel gauge does not indicate the correct fuel level for the first 5 km/h (3 mi/h) after refueling.

## Odometer, tripmeter, and clock modes



1. Odometer/tripmeter/fuel reserve tripmeter/clock

Push the “SELECT” switch to switch the display between the odometer mode “ODO”, the tripmeter modes “TRIP 1” and “TRIP 2” and the clock mode in the following order:

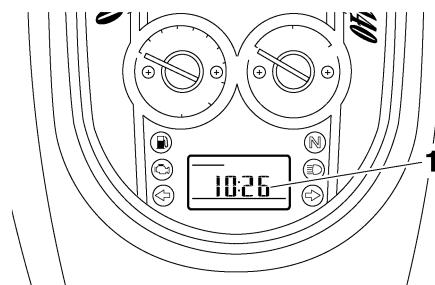
ODO → TRIP 1 → TRIP 2 → Clock → ODO

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” switch to switch the display between the various tripmeter, odometer, and clock modes in the following order:

F-TRIP → TRIP 1 → TRIP 2 → Clock → ODO → F-TRIP

To reset a tripmeter, select it by pushing the “SELECT” switch, and then push the “RESET” switch 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).

## Clock mode



1. Clock



To set the clock:

1. Push the "SELECT" switch to change the display to the clock mode.
2. Push the "SELECT" and "RESET" switches together for at least two seconds.
3. When the hour digits start flashing, push the "RESET" switch to set the hours.
4. Push the "SELECT" switch, and the minute digits will start flashing.
5. Push the "RESET" switch to set the minutes.
6. Push the "SELECT" switch and then release it to start the clock.

## Self-diagnosis device

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 odometer/tripmeter/clock display will indicate a two-digit error code (e.g., 12, 13, 14).

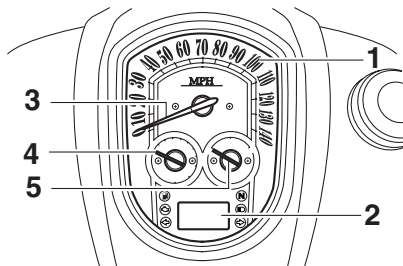
If the odometer/tripmeter/clock display indicates any error codes, note the code number, and then check the vehicle. Refer to "FUEL INJECTION SYSTEM" on page 7-27.

EC1D71018

### CAUTION:

**If the display indicates an error code, the vehicle should be checked as soon as possible in order to avoid engine damage.**

## Brightness control mode



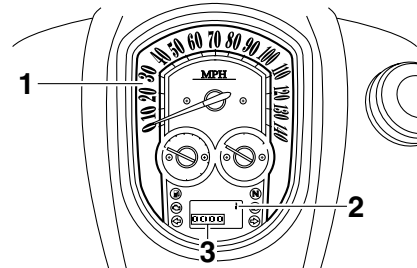
1. Multi-function meter unit panel
2. LCD
3. Speedometer needle
4. Tachometer needle
5. Fuel gauge needle

The brightness can be adjusted for the following:

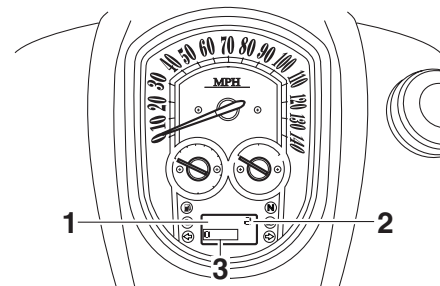
- the multi-function meter unit panel (item number "1")
- the LCD (item number "2")
- the speedometer, tachometer, and the fuel gauge needles (item number "3")

Select the brightness control mode as follows.

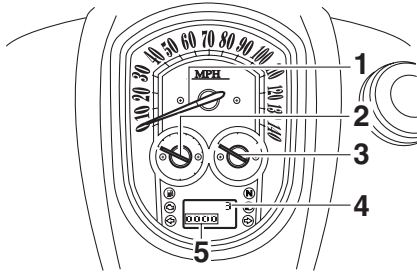
1. Turn the key to "OFF".
2. Push and hold the "SELECT" switch.
3. Turn the key to "ON", and then release the "SELECT" switch after five seconds. Item number "1" is displayed.



1. Multi-function meter unit panel
2. Item number
3. Brightness level
4. Adjust the multi-function meter unit panel brightness level by pushing the "RESET" switch.
5. Push the "SELECT" switch to select the LCD. Item number "2" is displayed. Adjust the LCD brightness level by pushing the "RESET" switch.



1. LCD
2. Item number
3. Brightness level
6. Push the "SELECT" switch to select the speedometer, tachometer, and the fuel gauge needles. Item number "3" is displayed. Adjust the brightness level of the speedometer, tachometer, and the fuel gauge needles by pushing the "RESET" switch.



1. Speedometer needle
  2. Tachometer needle
  3. Fuel gauge needle
  4. Item number
  5. Brightness level
7. Push the "SELECT" switch.  
The odometer/tripmeter/clock display will return to the prior mode.

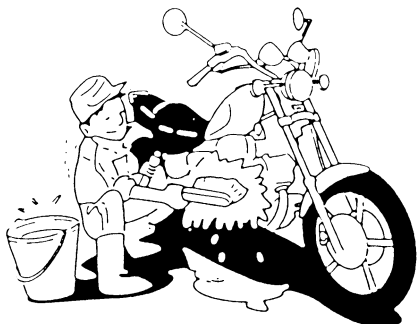
EAS20180

## IMPORTANT INFORMATION

EAS20190

### PREPARATION FOR REMOVAL AND DISASSEMBLY

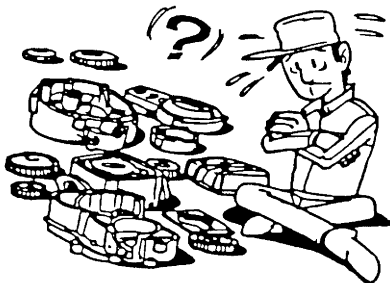
1. Before removal and disassembly, remove all dirt, mud, dust and foreign material.



2. Use only the proper tools and cleaning equipment.

Refer to "SPECIAL TOOLS" on page 1-11.

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.

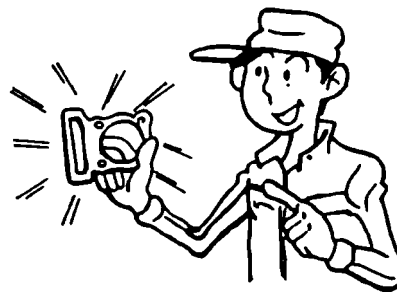


4. During disassembly, clean all of the parts and place them in trays in the order of disassembly. This will speed up assembly and allow for the correct installation of all parts.
5. Keep all parts away from any source of fire.

EAS20200

### REPLACEMENT PARTS

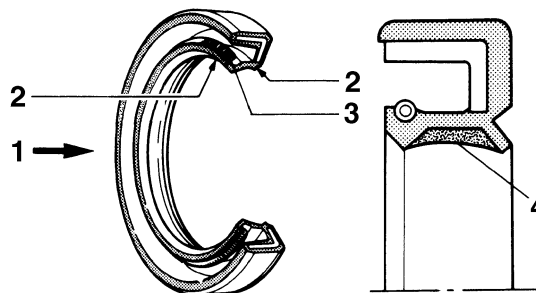
Use only genuine Yamaha parts for all replacements. Use oil and grease recommended by Yamaha for all lubrication jobs. Other brands may be similar in function and appearance, but inferior in quality.



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.

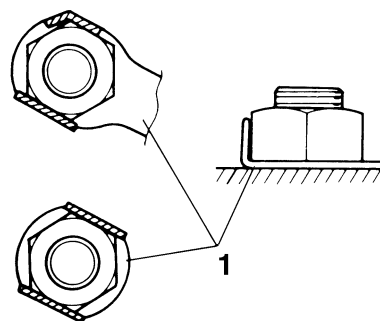


1. Oil
2. Lip
3. Spring
4. Grease

EAS20220

### LOCK WASHERS/PLATES AND COTTER PINS

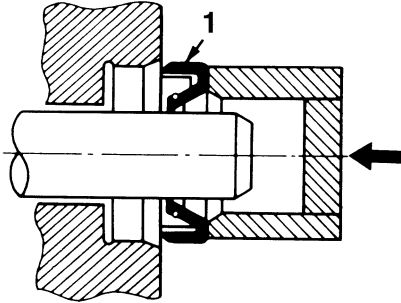
After removal, replace all lock washers/plates "1" and cotter pins. After the bolt or nut has been tightened to specification, bend the lock tabs along a flat of the bolt or nut.



EAS20230

## BEARINGS AND OIL SEALS

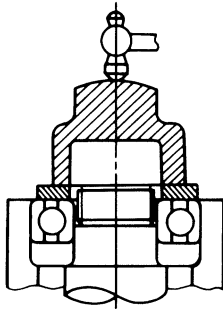
Install bearings and oil seals so that the manufacturer's marks or numbers are visible. When installing oil seals "1", lubricate the oil seal lips with a light coat of lithium-soap-based grease. Oil bearings liberally when installing, if appropriate.



ECA13300

### CAUTION:

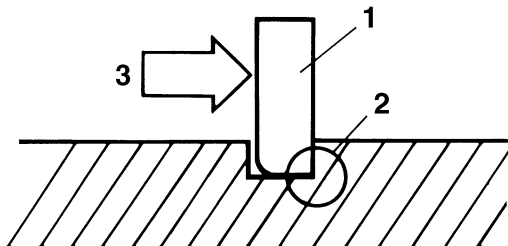
Do not spin the bearing with compressed air because this will damage the bearing surfaces.



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:

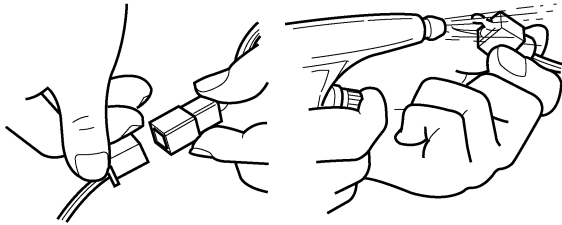
- Lead
- Coupler
- Connector

### 2. Check:

- Lead
- Coupler
- Connector

Moisture → Dry with an air blower.

Rust/stains → Connect and disconnect several times.



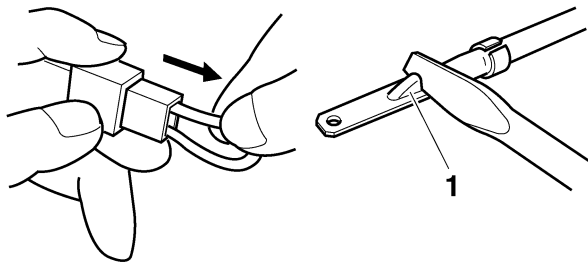
### 3. Check:

- 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:

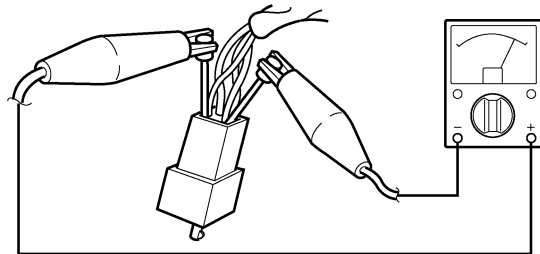
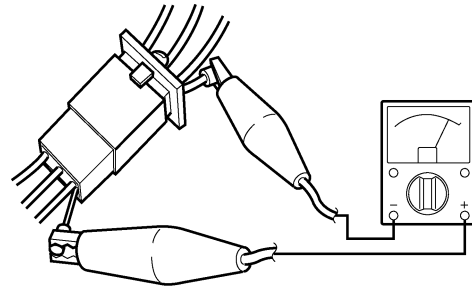
- Continuity  
(with the pocket tester)



**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.



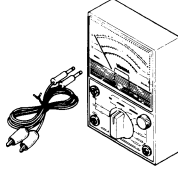
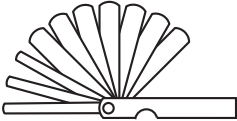
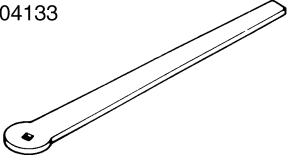
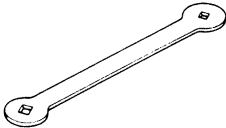
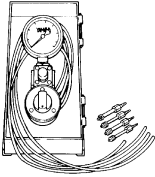

EAS20260

## SPECIAL TOOLS

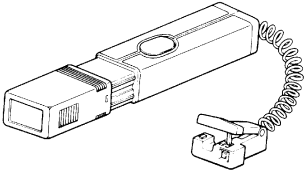
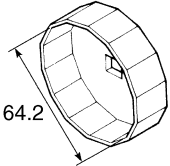

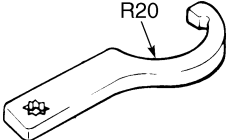
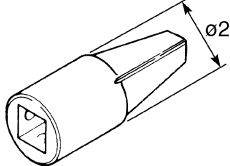
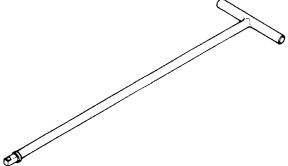
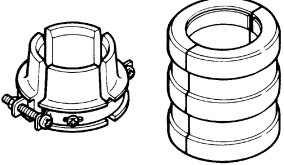
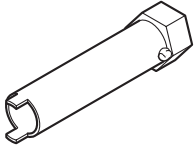
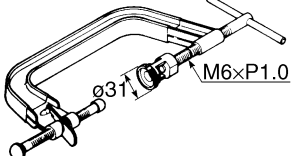
The following special tools are necessary for complete and accurate tune-up and assembly. Use only the appropriate special tools as this will help prevent damage caused by the use of inappropriate tools or improvised techniques. Special tools, part numbers or both may differ depending on the country.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

**NOTE:**

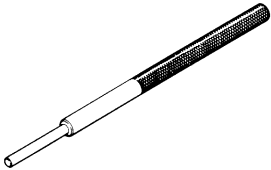
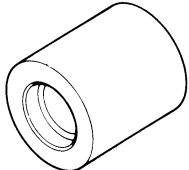
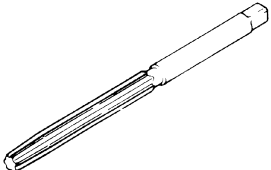
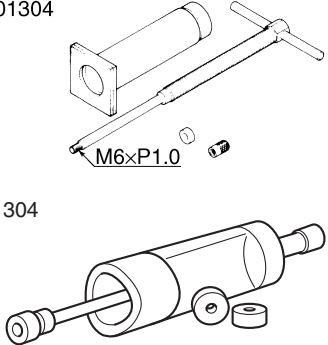
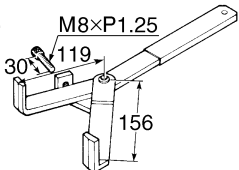
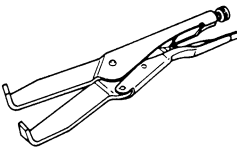
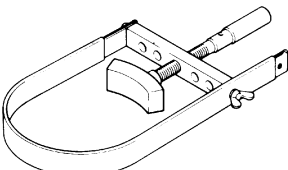
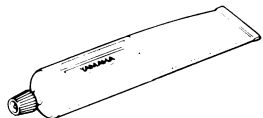
- For U.S.A. and Canada, use part number starting with “YM-”, “YU-”, or “ACC-”.
- For others, use part number starting with “90890-”.

Tool name/Tool No.	Illustration	Reference pages
Pocket tester 90890-03112 Analog pocket tester YU-03112-C		1-10, 5-79, 7-73, 7-74, 7-75, 7-79, 7-80, 7-81, 7-82, 7-83, 7-84, 7-85, 7-86, 7-87, 7-88, 7-89, 7-90, 7-91
Thickness gauge 90890-03180 Feeler gauge set YU-26900-9		3-6, 5-61
Tappet adjusting tool (4 mm) 90890-04133 Valve adjustment wrench 3 mm & 4 mm YM-08035-A	90890-04133  YM-08035-A 	3-6, 3-7
Vacuum gauge 90890-03094 Carburetor synchronizer YU-44456	90890-03094  YU-44456 	3-7

# SPECIAL TOOLS

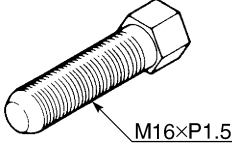
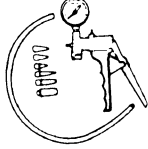
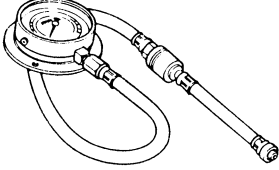
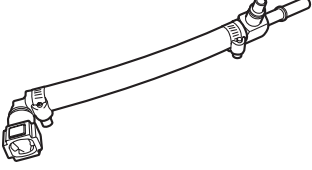
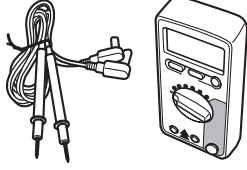
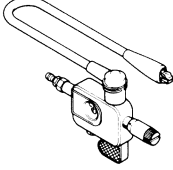
Tool name/Tool No.	Illustration	Reference pages
Timing light 90890-03141 Inductive clamp timing light YU-03141		3-10
Oil filter wrench 90890-01426 YU-38411		3-12
Belt tension gauge 90890-03170 Rear drive belt tension gauge YM-03170		3-24
Steering nut wrench 90890-01403 Spanner wrench YU-33975		3-26, 4-71
Damper rod holder 90890-01460		4-64, 4-66
T-handle 90890-01326 T-handle 3/8" drive 60 cm long YM-01326		4-64, 4-66
Fork seal driver 90890-01442 Adjustable fork seal driver (36–46 mm) YM-01442		4-66, 4-67
Pivot shaft wrench 90890-01485 Frame mount insert wrench YM-01485		5-12
Valve spring compressor 90890-04019 YM-04019		5-39, 5-44

# SPECIAL TOOLS

Tool name/Tool No.	Illustration	Reference pages
Valve guide remover (ø6) 90890-04064 Valve guide remover (6.0 mm) YM-04064-A		5-40
Valve guide installer (ø6) 90890-04065 Valve guide installer (6.0 mm) YM-04065-A		5-40
Valve guide reamer (ø6) 90890-04066 Valve guide reamer (6.0 mm) YM-04066		5-40
Piston pin puller set 90890-01304 Piston pin puller YU-01304	90890-01304  M6×P1.0 YU-01304	5-46
Universal clutch holder 90890-04086 YM-91042	90890-04086  M8×P1.25 30 119 156 YM-91042 	5-60, 5-65
Sheave holder 90890-01701 Primary clutch holder YS-01880-A		5-60, 5-64, 5-74, 5-75
Yamaha bond No. 1215 90890-85505 (Three Bond No.1215®)		5-66, 5-76, 5-93



# SPECIAL TOOLS

Tool name/Tool No.	Illustration	Reference pages
Rotor puller 90890-01080 Stator rotor puller YM-01080-A		5-74
Vacuum/pressure pump gauge set 90890-06756		6-12
Pressure gauge 90890-03153		6-12
Fuel pressure adapter 90890-03176 YM-03176		6-12
Digital circuit tester 90890-03174 Model 88 Multimeter with tachometer YU-A1927		6-12
Ignition checker 90890-06754 Opama pet-4000 spark checker YM-34487		7-83



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# SPECIFICATIONS

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# GENERAL SPECIFICATIONS

EAS20280

## GENERAL SPECIFICATIONS

### Model

Model	XV19SW 1D74 (USA) XV19SW 1D76 (CDN) XV19SWC 1D75 (California) XV19W 4D45 (USA) XV19W 4D47 (CDN) XV19WC 4D46 (California) XV19MW 4D54 (USA) XV19MW 4D56 (CDN) XV19MWC 4D55 (California) XV19CTSW 2C54 (USA) XV19CTSW 2C56 (CDN) XV19CTSWC 2C55 (California) XV19CTW 4P04 (USA) XV19CTW 4P06 (CDN) XV19CTWC 4P05 (California) XV19CTMW 4P14 (USA) XV19CTMW 4P16 (CDN) XV19CTMWC 4P15 (California)
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### Dimensions

Overall length	2580 mm (101.6 in)
Overall width	1100 mm (43.3 in)
Overall height	XV19S(C)/XV19(C)/XV19M(C): 1100 mm (43.3 in) XV19CTS(C)/XV19CT(C)/XV19CTM(C): 1515 mm (59.6 in)
Seat height	735 mm (28.9 in)
Wheelbase	1715 mm (67.5 in)
Ground clearance	155 mm (6.10 in)
Minimum turning radius	3480 mm (137.0 in)

### Weight

With oil and fuel	XV19S(C)/XV19(C)/XV19M(C): 340.0 kg (750 lb) XV19CTS(C)/XV19CT(C)/XV19CTM(C): 364.0 kg (802 lb)
Maximum load	XV19S(C)/XV19(C)/XV19M(C): 210 kg (463 lb) XV19CTS(C)/XV19CT(C)/XV19CTM(C): 186 kg (410 lb)

# ENGINE SPECIFICATIONS

EAS20290

## ENGINE SPECIFICATIONS

### Engine

Engine type	Air cooled 4-stroke, OHV
Displacement	1854.0 cm <sup>3</sup>
Cylinder arrangement	V-type 2-cylinder
Bore × stroke	100.0 × 118.0 mm (3.94 × 4.65 in)
Compression ratio	9.48 :1
Starting system	Electric starter

### Fuel

Recommended fuel	Premium unleaded gasoline only
Fuel tank capacity	17.0 L (4.49 US gal) (3.74 Imp.gal)
Fuel reserve amount	3.0 L (0.79 US gal) (0.66 Imp.gal)

### Engine oil

Lubrication system	Dry sump
Type	YAMALUBE 4 (20W40) or SAE20W40
Recommended engine oil grade	API service SG type or higher, JASO standard MA
Engine oil quantity	
Total amount	5.20 L (5.50 US qt) (4.58 Imp.qt)
Engine	3.2 L (3.38 US qt) (2.82 Imp.qt)
Oil tank	2.0 L (2.11 US qt) (1.76 Imp.qt)
Without oil filter cartridge replacement	4.10 L (4.33 US qt) (3.61 Imp.qt)
With oil filter cartridge replacement	4.90 L (5.18 US qt) (4.31 Imp.qt)
Oil pressure (hot)	60.0 kPa/900 r/min (8.7 psi/900 r/min) (0.60 kgf/cm <sup>2</sup> /900 r/min)

### Transfer gear oil

Type	SAE80 API GL-4 Hypoid gear oil
Quantity (disassembled)	0.60 L (0.63 US qt) (0.53 Imp.qt)
Quantity	0.55 L (0.58 US qt) (0.48 Imp.qt)

### Oil filter

Oil filter type	Cartridge (paper)
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### Oil pump

Oil pump type	Trochoid
Inner-rotor-to-outer-rotor-tip clearance	Less than 0.12 mm (0.0047 in)
Limit	0.20 mm (0.0079 in)
Outer-rotor-to-oil-pump-housing clearance	0.09–0.19 mm (0.0035–0.0075 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 kPa (87.0 psi) (6.00 kgf/cm <sup>2</sup> )

### Transfer gear oil pump

Oil pump type	Trochoid
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# ENGINE SPECIFICATIONS

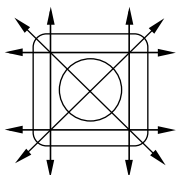
Inner-rotor-to-outer-rotor-tip clearance	Less than 0.12 mm (0.0047 in)
Limit	0.20 mm (0.0079 in)
Outer-rotor-to-oil-pump-housing clearance	0.10–0.15 mm (0.0039–0.0059 in)
Limit	0.22 mm (0.0087 in)
Oil-pump-housing-to-inner-and-outer-rotor clearance	0.04–0.09 mm (0.0016–0.0035 in)
Limit	0.160 mm (0.0063 in)

## Spark plug (s)

Manufacturer/model	NGK/DPR8EA-9
Manufacturer/model	DENSO/X24EPR-U9
Spark plug gap	0.8–0.9 mm (0.031–0.035 in)

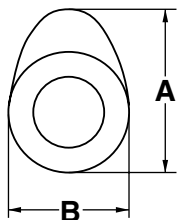
## Cylinder head

Volume	80.90–84.90 cm <sup>3</sup> (4.94–5.18 cu.in)
Warpage limit	0.03 mm (0.0012 in)



## Camshaft

Drive system	Gear drive
Crankcase hole inside diameter	25.000–25.021 mm (0.9843–0.9851 in)
Camshaft journal diameter (crankcase side)	24.957–24.980 mm (0.9826–0.9835 in)
Camshaft to crankcase clearance	0.020–0.064 mm (0.0008–0.0025 in)
Camshaft cover hole inside diameter	28.000–28.021 mm (1.1024–1.1032 in)
Camshaft journal diameter (camshaft cover side)	27.957–27.980 mm (1.1007–1.1016 in)
Camshaft to camshaft cover clearance	0.020–0.064 mm (0.0008–0.0025 in)
Camshaft lobe dimensions	
Intake A	42.532–42.632 mm (1.6745–1.6784 in)
Limit	42.432 mm (1.6705 in)
Intake B	35.950–36.050 mm (1.4154–1.4193 in)
Limit	35.850 mm (1.4114 in)
Exhaust A	42.530–42.630 mm (1.6744–1.6783 in) (cylinder #1)
	42.531–42.631 mm (1.6744–1.6784 in) (cylinder #2)
Limit	42.430 mm (1.6705 in) (cylinder #1)
	42.431 mm (1.6705 in) (cylinder #2)
Exhaust B	35.950–36.050 mm (1.4154–1.4193 in)
Limit	35.850 mm (1.4114 in)

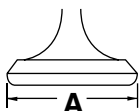


## Rocker arm/rocker arm shaft

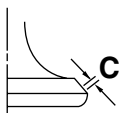
Rocker arm inside diameter	18.000–18.018 mm (0.7087–0.7094 in)
Limit	18.036 mm (0.7101 in)
Rocker arm shaft outside diameter	17.976–17.991 mm (0.7077–0.7083 in)
Rocker-arm-to-rocker-arm-shaft clearance	0.009–0.042 mm (0.0004–0.0017 in)
Limit	0.080 mm (0.0032 in)

## Valve, valve seat, valve guide

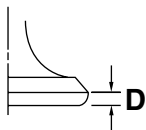
Valve clearance (cold)	
Intake	0.00–0.04 mm (0.0000–0.0016 in)
Exhaust	0.00–0.04 mm (0.0000–0.0016 in)
Valve dimensions	
Valve head diameter A (intake)	35.90–36.10 mm (1.4134–1.4213 in)
Valve head diameter A (exhaust)	30.90–31.10 mm (1.2165–1.2244 in)



Valve seat width C (intake)	1.10–1.30 mm (0.0433–0.0512 in)
Limit	2.0 mm (0.08 in)
Valve seat width C (exhaust)	1.10–1.30 mm (0.0433–0.0512 in)
Limit	2.0 mm (0.08 in)



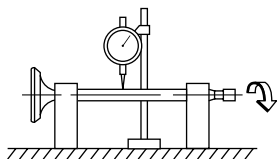
Valve margin thickness D (intake)	1.15–1.45 mm (0.0453–0.0571 in)
Limit	0.4 mm (0.02 in)
Valve margin thickness D (exhaust)	1.15–1.45 mm (0.0453–0.0571 in)
Limit	0.4 mm (0.02 in)



Valve stem diameter (intake)	5.975–5.990 mm (0.2352–0.2358 in)
Limit	5.945 mm (0.2341 in)
Valve stem diameter (exhaust)	5.960–5.975 mm (0.2346–0.2352 in)
Limit	5.920 mm (0.2331 in)
Valve guide inside diameter (intake)	6.000–6.012 mm (0.2362–0.2367 in)
Limit	6.050 mm (0.2382 in)

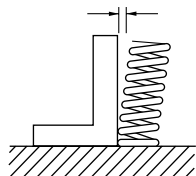
# ENGINE SPECIFICATIONS

Valve guide inside diameter (exhaust)	6.000–6.012 mm (0.2362–0.2367 in)
Limit	6.050 mm (0.2382 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)



## Valve spring

Free length (intake)	46.71 mm (1.84 in)
Limit	44.71 mm (1.76 in)
Free length (exhaust)	46.71 mm (1.84 in)
Limit	44.71 mm (1.76 in)
Installed length (intake)	32.66 mm (1.29 in)
Installed length (exhaust)	32.66 mm (1.29 in)
Spring rate K1 (intake)	16.58 N/mm (94.67 lb/in) (1.69 kgf/mm)
Spring rate K2 (intake)	21.98 N/mm (125.51 lb/in) (2.24 kgf/mm)
Spring rate K1 (exhaust)	16.58 N/mm (94.67 lb/in) (1.69 kgf/mm)
Spring rate K2 (exhaust)	21.98 N/mm (125.51 lb/in) (2.24 kgf/mm)
Installed compression spring force (intake)	217.00–249.00 N (48.78–55.98 lb) (22.13–25.39 kgf)
Installed compression spring force (exhaust)	217.00–249.00 N (48.78–55.98 lb) (22.13–25.39 kgf)
Spring tilt (intake)	2.5 °/2.0 mm
Spring tilt (exhaust)	2.5 °/2.0 mm



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

## Valve lifter

Valve lifter outside diameter (intake)	22.962–22.974 mm (0.9040–0.9045 in)
Valve lifter outside diameter (exhaust)	22.962–22.974 mm (0.9040–0.9045 in)
Valve lifter hole inside diameter (intake)	23.000–23.021 mm (0.9055–0.9063 in)
Valve lifter hole inside diameter (exhaust)	23.000–23.021 mm (0.9055–0.9063 in)
Valve-lifter-to-valve-lifter-hole clearance	0.026–0.059 mm (0.0010–0.0023 in)

## Valve push rod

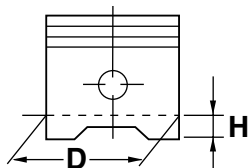
Valve push rod 1 length	286.5 mm (11.280 in)
Valve push rod 2 length	288.5 mm (11.358 in)



# ENGINE SPECIFICATIONS

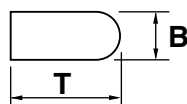
Valve push rod runout	0.3 mm (0.012 in)
<b>Cylinder</b>	
Bore	100.000–100.010 mm (3.9370–3.9374 in)
Taper limit	0.050 mm (0.0020 in)
Out of round limit	0.050 mm (0.0020 in)

<b>Piston</b>	
Piston-to-cylinder clearance Limit	0.025–0.050 mm (0.0010–0.0020 in) 0.15 mm (0.0059 in)
Diameter D	99.960–99.975 mm (3.9354–3.9360 in)
Height H	10.0 mm (0.39 in)



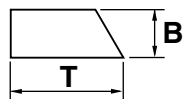
Offset	0.50 mm (0.0197 in)
Piston pin bore inside diameter Limit	23.004–23.015 mm (0.9057–0.9061 in) 23.045 mm (0.9073 in)
Piston pin outside diameter Limit	22.991–23.000 mm (0.9052–0.9055 in) 22.971 mm (0.9044 in)
Piston-pin-to-piston-pin-bore clearance Limit	0.004–0.024 mm (0.00016–0.00094 in) 0.074 mm (0.00291 in)

<b>Piston ring</b>	
Top ring	
Ring type	Barrel
Dimensions (B × T)	1.20 × 3.80 mm (0.05 × 0.15 in)



End gap (installed) Limit	0.20–0.35 mm (0.0079–0.0138 in) 0.55 mm (0.0217 in)
Ring side clearance Limit	0.030–0.080 mm (0.0012–0.0032 in) 0.120 mm (0.0047 in)

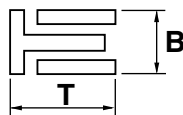
2nd ring	
Ring type	Taper
Dimensions (B × T)	1.20 × 4.00 mm (0.05 × 0.16 in)



End gap (installed) Limit	0.45–0.60 mm (0.0177–0.0236 in) 0.95 mm (0.0374 in)
Ring side clearance Limit	0.030–0.070 mm (0.0012–0.0028 in) 0.120 mm (0.0047 in)

# ENGINE SPECIFICATIONS

Oil ring	
Dimensions (B × T)	2.50 × 3.40 mm (0.10 × 0.13 in)



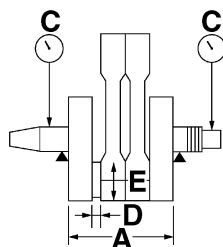
End gap (installed)	0.20–0.70 mm (0.0079–0.0276 in)
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## Connecting rod

Oil clearance (using plastigauge®)	0.050–0.074 mm (0.0020–0.0029 in)
Bearing color code	1.Blue 2.Black 3.Brown 4.Green 5.Yellow

## Crankshaft

Width A	105.80–106.20 mm (4.165–4.181 in)
Runout limit C	0.040 mm (0.0016 in)
Big end side clearance D	0.320–0.474 mm (0.0126–0.0187 in)
Big end radial clearance E	0.037–0.074 mm (0.0015–0.0029 in)
Limit	0.09 mm (0.0035 in)



Journal oil clearance (using plastigauge®)	0.030–0.060 mm (0.0012–0.0024 in)
Limit	0.10 mm (0.0039 in)

## Clutch

Clutch type	Wet, multiple-disc
Clutch release method	Hydraulic inner push
Operation	Left hand operation
Friction plate 1, 3 thickness	2.90–3.10 mm (0.114–0.122 in)
Wear limit	2.80 mm (0.110 in)
Plate quantity	10 pcs
Friction plate 2 thickness	2.92–3.08 mm (0.115–0.121 in)
Wear limit	2.82 mm (0.111 in)
Plate quantity	1 pcs
Clutch plate thickness	1.90–2.10 mm (0.075–0.083 in)
Plate quantity	10 pcs
Warpage limit	0.20 mm (0.0079 in)
Clutch spring free length	6.78 mm (0.27 in)
Minimum length	6.28 mm (0.25 in)
Spring quantity	1 pcs
Clutch housing thrust clearance	0.100–0.110 mm (0.0039–0.0043 in)
Clutch housing radial clearance	0.020–0.066 mm (0.0008–0.0026 in)

## Transmission

Transmission type	Constant mesh 5-speed
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# ENGINE SPECIFICATIONS

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Primary reduction system	Spur gear
Primary reduction ratio	72/51 (1.412)
Secondary reduction system	Belt drive
Secondary reduction ratio	70/31 (2.258)
Operation	Left foot operation
Gear ratio	
1st	38/16 (2.375)
2nd	33/21 (1.571)
3rd	29/25 (1.160)
4th	26/28 (0.929)
5th	24/30 (0.800)
Main axle runout limit	0.08 mm (0.0032 in)
Drive axle runout limit	0.08 mm (0.0032 in)

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<b>Shifting mechanism</b>	
Shift mechanism type	Guide bar
Shift fork guide bar bending limit	0.025 mm (0.0010 in)
Shift fork thickness	6.26–6.39 mm (0.2465–0.2516 in)

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

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<b>Fuel pump</b>	
Pump type	Electrical
Model/manufacturer	1D7/MITSUBISHI
Maximum consumption amperage	5.5 A
Output pressure	441.0–637.0 kPa (63.9–92.4 psi) (4.41–6.37 kgf/cm <sup>2</sup> )

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<b>Fuel injection</b>	
Model/quantity	INP-101/2
Manufacturer	NIPPON INJECTOR

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<b>Throttle body</b>	
Type/quantity	AC43/2
Manufacturer	MIKUNI
ID mark	XV19M/XV19S/XV19/XV19CTM/ XV19CTS/XV19CT: 1D71 00 XV19MC/XV19SC/XV19C/XV19CTMC/ XV19CTSC/XV19CTC: 1D72 10
Throttle valve size	#100

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<b>Throttle position sensor</b>	
Resistance	4.0–6.0 kΩ/blue-black
Output voltage (at idle)	0.63–0.73 V

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<b>Fuel injection sensor</b>	
Crankshaft position sensor resistance	248–372 Ω
Intake air pressure sensor output voltage	3.75–4.25 V
Engine temperature sensor resistance	0.90–1.10 kΩ at 100 °C (212 °F)

# ENGINE SPECIFICATIONS

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## Idling condition

Engine idling speed

850–950 r/min

Intake vacuum

31.3–35.3 kPa (9.3–10.4 inHg) (235–265 mmHg)

Oil temperature

80.0–90.0 °C (176.00–194.00 °F)

Throttle cable free play

4.0–6.0 mm (0.16–0.24 in)

# CHASSIS SPECIFICATIONS

EAS20300

## CHASSIS SPECIFICATIONS

### Chassis

Frame type	Double cradle
Caster angle	31.20 °
Trail	152.0 mm (5.98 in)

### Front wheel

Wheel type	Cast wheel
Rim size	18M/C × MT4.00
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)

### Rear wheel

Wheel type	Cast wheel
Rim size	17M/C × MT5.50
Rim material	Aluminum
Wheel travel	110.0 mm (4.33 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	130/70R18M/C 63H
Manufacturer/model	DUNLOP/D251F
Manufacturer/model	BRIDGESTONE/G851 RADIAL G
Wear limit (front)	1.0 mm (0.04 in)

### Rear tire

Type	Tubeless
Size	190/60R17M/C 78H
Manufacturer/model	DUNLOP/D251
Manufacturer/model	BRIDGESTONE/G850 RADIAL G
Wear limit (rear)	1.0 mm (0.04 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> )
Rear	280 kPa (41 psi) (2.80 kgf/cm <sup>2</sup> )
Loading condition	XV19S(C)/XV19(C)/XV19M(C):
	90–210 kg (198–463 lb)
	XV19CTS(C)/XV19CT(C)/XV19CTM(C):
	90–186 kg (198–410 lb)
Front	250 kPa (36 psi) (2.50 kgf/cm <sup>2</sup> )
Rear	280 kPa (41 psi) (2.80 kgf/cm <sup>2</sup> )
High-speed riding	
Front	250 kPa (36 psi) (2.50 kgf/cm <sup>2</sup> )
Rear	280 kPa (41 psi) (2.80 kgf/cm <sup>2</sup> )

# CHASSIS SPECIFICATIONS

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## Front brake

Type	Dual disc brake
Operation	Right hand operation
Front disc brake	
Disc outside diameter × thickness	298.0 × 5.0 mm (11.73 × 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)	5.5 mm (0.22 in)
Limit	0.5 mm (0.02 in)
Brake pad lining thickness (outer)	5.5 mm (0.22 in)
Limit	0.5 mm (0.02 in)
Master cylinder inside diameter	14.00 mm (0.55 in)
Caliper cylinder inside diameter	27.00 mm (1.06 in)
Caliper cylinder inside diameter	30.23 mm (1.19 in)
Recommended fluid	DOT 4

## Rear brake

Type	Single disc brake
Operation	Right foot operation
Brake pedal position	110.0 mm (4.33 in)
Rear disc brake	
Disc outside diameter × thickness	320.0 × 6.0 mm (12.60 × 0.24 in)
Brake disc thickness limit	5.5 mm (0.22 in)
Brake disc deflection limit	0.15 mm (0.0059 in)
Brake pad lining thickness (inner)	5.8 mm (0.23 in)
Limit	0.8 mm (0.03 in)
Brake pad lining thickness (outer)	5.8 mm (0.23 in)
Limit	0.8 mm (0.03 in)
Master cylinder inside diameter	12.7 mm (0.50 in)
Caliper cylinder inside diameter	41.30 mm (1.63 in)
Recommended fluid	DOT 4

## Steering

Steering bearing type	Taper roller bearing
Lock to lock angle (left)	35.0 °
Lock to lock angle (right)	35.0 °

## Front suspension

Type	Telescopic fork
Spring/shock absorber type	Coil spring/oil damper
Front fork travel	130.0 mm (5.12 in)
Fork spring free length	273.9 mm (10.78 in)
Limit	268.4 mm (10.57 in)
Collar length	230.0 mm (9.06 in)
Installed length	268.9 mm (10.59 in)
Spring rate K1	10.0 N/mm (57.1 lb/in) (1.02 kgf/mm)
Spring stroke K1	0.0–30.0 mm (0.00–1.18 in)
Spring rate K2	12.0 N/mm (68.5 lb/in) (1.22 kgf/mm)
Spring stroke K2	30.0–130.0 mm (1.18–5.12 in)
Inner tube outer diameter	46.0 mm (1.81 in)
Inner tube bending limit	0.2 mm (0.01 in)
Optional spring available	No

# CHASSIS SPECIFICATIONS

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Recommended oil	Fork oil 10WT
Quantity	571.0 cm <sup>3</sup> (19.31 US oz) (20.10 Imp.oz)
Level	124.0 mm (4.88 in)

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<b>Rear suspension</b>	
Type	Swingarm (link suspension)
Spring/shock absorber type	Coil spring/gas-oil damper
Rear shock absorber assembly travel	50.0 mm (1.97 in)
Spring free length	180.0 mm (7.09 in)
Limit	176.4 mm (6.94 in)
Installed length	XV19S(C)/XV19(C)/XV19M(C): 171.0 mm (6.73 in) XV19CTS(C)/XV19CT(C)/XV19CTM(C): 165.0 mm (6.50 in)
Spring rate K1	176.50 N/mm (1007.82 lb/in) (18.00 kgf/mm)
Spring stroke K1	0.0–50.0 mm (0.00–1.97 in)
Optional spring available	No
Enclosed gas/air pressure (STD)	0.98 MPa (139.4 psi) (9.8 kgf/cm <sup>2</sup> )
Spring preload adjusting positions	Installed spring length
Minimum	162.0 mm (6.38 in)
Standard	XV19S(C)/XV19(C)/XV19M(C): 171.0 mm (6.73 in) XV19CTS(C)/XV19CT(C)/XV19CTM(C): 165.0 mm (6.50 in)
Maximum	171.0 mm (6.73 in)

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<b>Swingarm</b>	
Swingarm end free play limit (radial)	1.0 mm (0.04 in)
Swingarm end free play limit (axial)	1.0 mm (0.04 in)

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<b>Drive belt</b>	
Model/manufacturer	UBD-0732/GATES CORPORATION
Drive belt slack (on the sidestand)	7.5–13 mm (0.30–0.51 in)
Drive belt slack (on a suitable stand)	14–21 mm (0.55–0.83 in)



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