YAMAHA

2010

Read this manual carefully before operating this vehicle.

OWNER'S SERVICE MANUAL

YZ450F(Z)

33D-28199-80-E0

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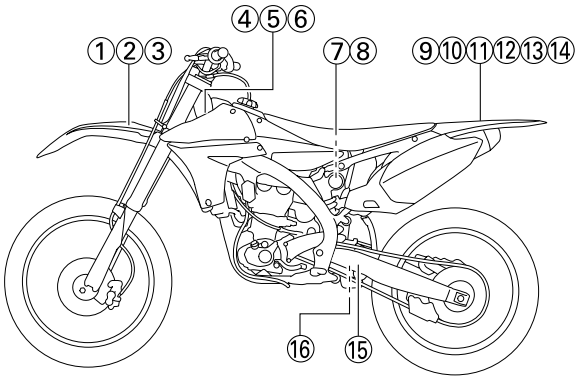
GENERAL INFORMATION

LOCATION OF IMPORTANT LABELS

Please read the following important labels carefully before operating this vehicle.



CANADA

1

Premium unleaded gasoline only.

3FB-2415E-02

2

Essence super sans plomb seulernent.

3FB-2415E-12

3

THIS VEHICLE IS A COMPETITION MOTORCYCLE AND IS FOR USE EXCLUSIVELY IN CLOSED COURSE COMPETITION AND IS NOT INTENDED FOR USE ON PUBLIC HIGHWAYS.

CE VÉHICULE EST UNE MOTORCYCLETTE DE COMPÉTITION DONT L'USAGE EST RÉSERVÉ AUX COMPÉTITIONS EN CIRCUITS FERMÉS ET NON DESTINÉ AUX VOIES PUBLIQUES.

4SR-2416E-00

4

MFD. BY YAMAHA MOTOR CO., LTD. MM / YY MADE IN JAPAN
COMPETITION MOTORCYCLE
FABRIQUÉ PAR YAMAHA MOTOR CO., LTD. MM / YY FABRIQUÉ AU JAPON
MOTOCYCLETTE DE COMPETITION
****

4SR-21186-01

5

CANADA · CMVSS · 506 · TROPSNART · C-VASN

This spark ignition system meets all requirements of the Canadian Interference Causing Equipment Regulations.

Ce système d'allumage par étincelle de véhicule respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

3JK-82377-10

7

⚠WARNING

This unit contains high pressure nitrogen gas.
Mishandling can cause explosion.
- Read owner's manual for instructions.
- Do not incinerate, puncture or open.

⚠AVERTISSEMENT

Cette unité contient de l'azote à haute pression.
Une mauvaise manipulation peut entrainer d'expiosion.
- Voir le manuel d'utilisateur pour les instructions.
- Ne pas brûler ni perforer ni ouvrir.

4AA-22259-70

9

⚠ WARNING

- BEFORE YOU OPERATE THIS VEHICLE, READ THE OWNER'S MANUAL AND ALL LABELS.
- NEVER CARRY A PASSENGER. You increase your risk of losing control if you carry a passenger.
- NEVER OPERATE THIS VEHICLE ON PUBLIC ROADS. You can collide with another vehicle if you operate this vehicle on a public road.
- ALWAYS WEAR AN APPROVED MOTORCYCLE HELMET, eye protection, and protective clothing.
- EXPERIENCED RIDER ONLY.

5PA-2118K-00

10

⚠ AVERTISSEMENT

- LIRE LE MANUEL DU PROPRIETAIRE AINSI QUE TOUTES LES ETIQUETTES AVANT D'UTILISER CE VEHICULE.
- NE JAMAIS TRANSPORTER DE PASSAGER. La conduite avec passager augmente les risques de perte de contrôle.
- NE JAMAIS ROULER SUR DES CHEMINS PUBLICS. Vous pourriez entrer en collision avec un autre véhicule.
- TOUJOURS PORTER UN CASQUE DE MOTOCYCLISTE APPROUVE, des lunettes et des vêtements de protection.
- EXCLUSIVEMENT POUR L'USAGE D'UN CONDUCTEUR EXPERIMENTE.

5PA-2118K-10

11

⚠ WARNING

Riding as a passenger can cause the vehicle to go out of control.

Loss of control can cause a collision or rollover, which can result in severe injury or death.

NEVER ride as a passenger.

3XJ-2151H-A1

12

⚠ AVERTISSEMENT

Un passager pourrait causer une perte de contrôle du véhicule.

Une perte de contrôle peut provoquer une collision ou un renversement, résultant en des blessures sérieuses, voire mortelles.

AUCUN passager permis.

3XJ-2151H-B1

15

TIRE INFORMATION

Cold tire normal pressure should be set as follows.
FRONT : 100kPa, {1.00kgf/cm^2}, 15psi
REAR : 100kPa, {1.00kgf/cm^2}, 15psi

3RV-21668-A0

16

INFORMATION SUR LES PNEUS

La pression des pneus à froid doit normalement être réglée comme suit.
AVANT : 100kPa, {1.00kgf/cm^2}, 15psi
ARRIERE : 100kPa, {1.00kgf/cm^2}, 15psi

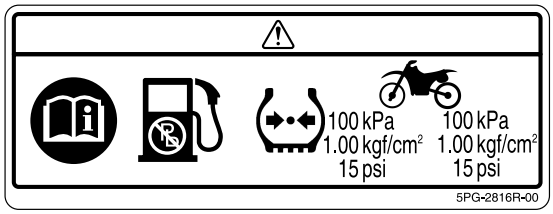
3RV-21668-B0

EUROPE

6

CE
YAMAHA MOTOR CO., LTD.
SHIZUOKA JAPAN
YAMAHA 4GB-2155A-00

13



5PG-2816R-00

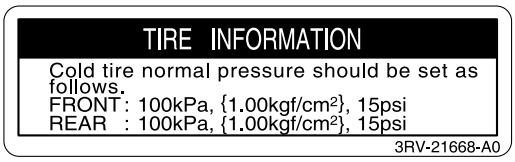
8

4AA-22259-40

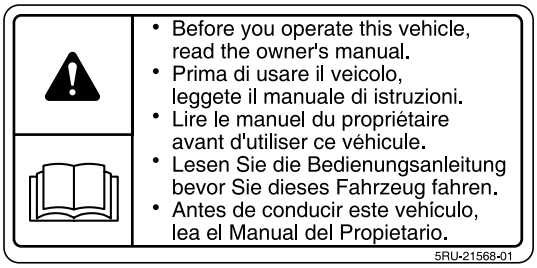
AUS, NZ, ZA

8

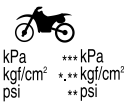
15



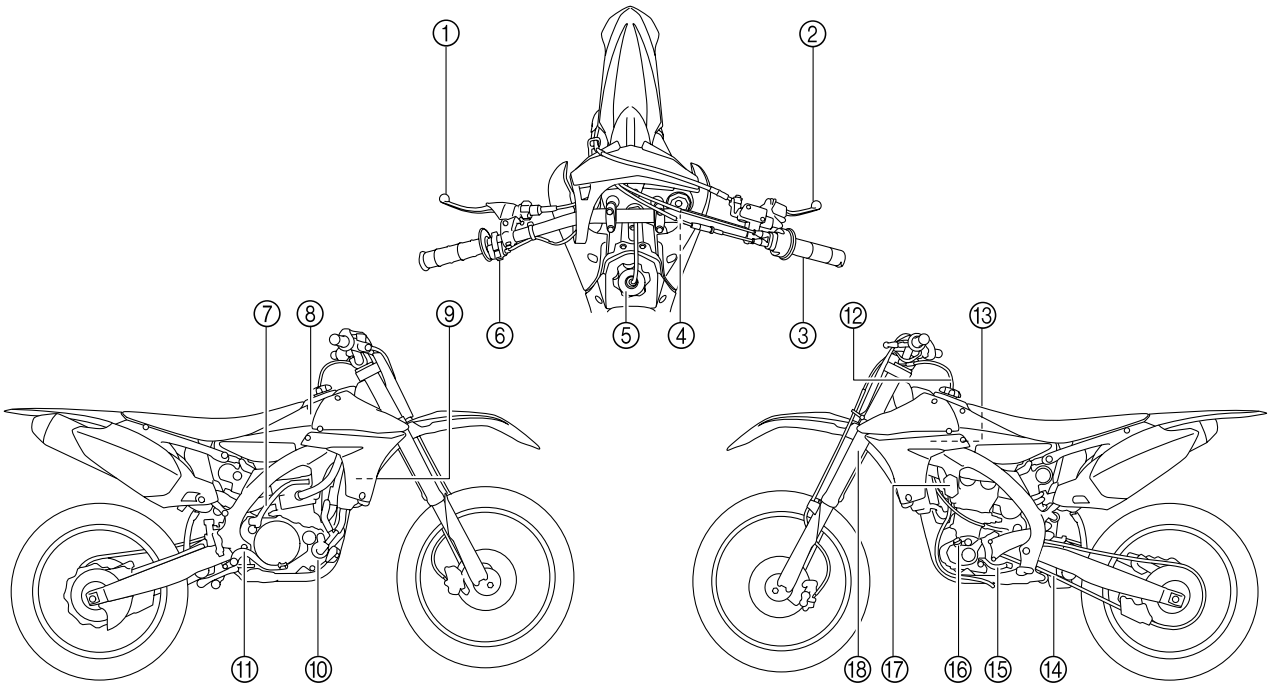
14



Familiarize yourself with the following pictograms and read the explanatory text.

	Read Owner's service manual.
	This unit contains high-pressure nitrogen gas. Mishandling can cause explosion. Do not incinerate, puncture or open.
	Turn off the main switch after riding to avoid draining the battery.
	Use unleaded gasoline only.
	Measure tire pressure when tires are cold.
	Adjust tire pressure. Improper tire pressure can cause loss of control. Loss of control can result in severe injury or death.

DESCRIPTION



1. Clutch lever
2. Front brake lever
3. Throttle grip
4. Radiator cap
5. Fuel tank cap
6. Engine stop switch
7. Kickstarter crank
8. Fuel tank
9. Radiator
10. Coolant drain bolt
11. Rear brake pedal
12. Valve joint
13. Air cleaner
14. Drive chain
15. Shift pedal
16. Oil level check window
17. Starter knob/idle screw
18. Front fork

TIP

- The machine you have purchased may differ slightly from those shown in the following.
- Designs and specifications are subject to change without notice.

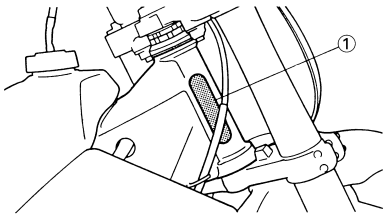
CONSUMER INFORMATION

There are two significant reasons for knowing the serial number of your machine:

1. When ordering parts, you can give the number to your Yamaha dealer for positive identification of the model you own.
2. If your machine is stolen, the authorities will need the number to search for and identify your machine.

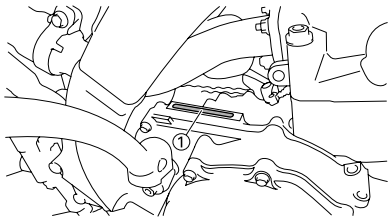
VEHICLE IDENTIFICATION NUMBER

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



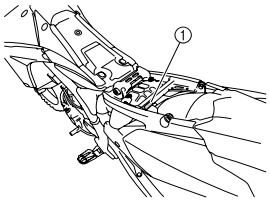
ENGINE SERIAL NUMBER

The engine serial number "1" is stamped into the elevated part of the right-side of the engine.



MODEL LABEL

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



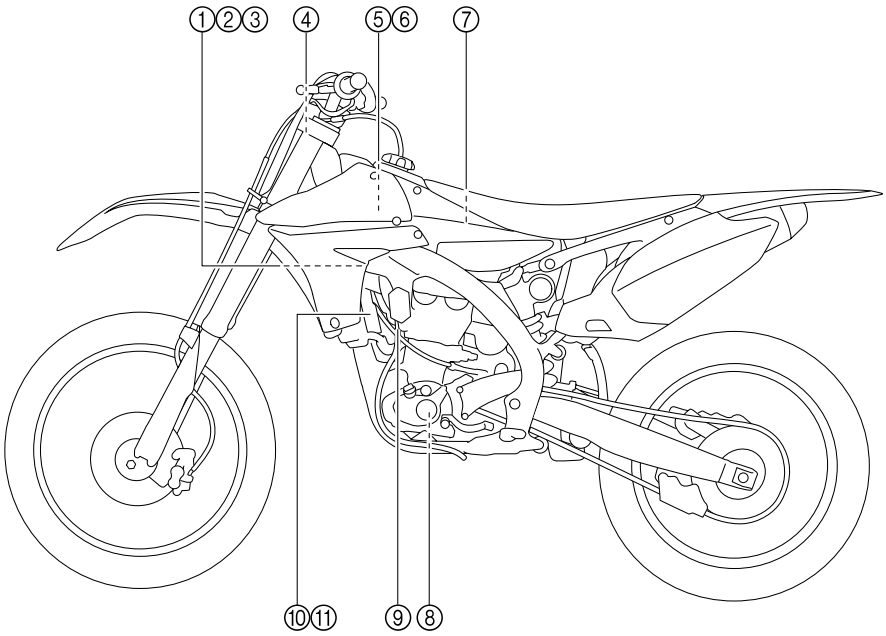
FEATURES

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 combustionchamber 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 thefuel 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.

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 bythe engine at all times by using a microprocessor that regulates the fuel injection volume according tothe engine operating conditions detected by various sensors.

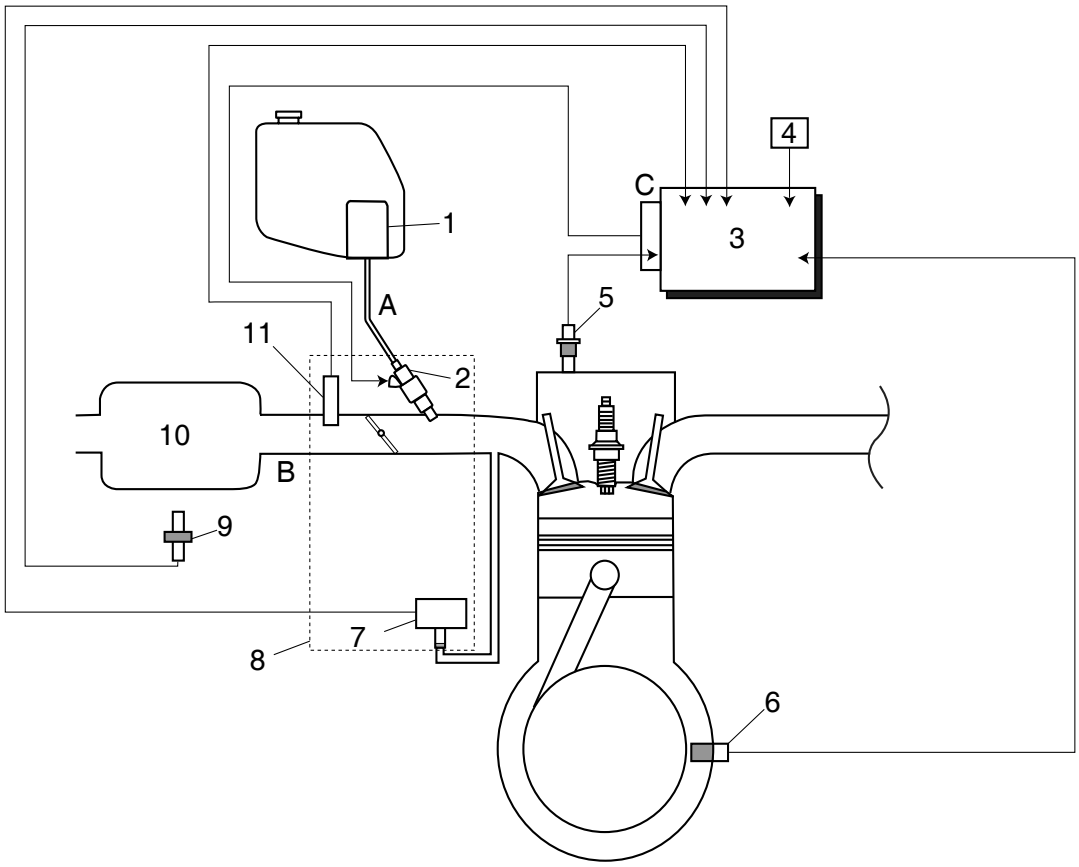


1. Fuel injector
2. Throttle position sensor
3. Intake air pressure sensor
4. ECU
5. Fuel pump
6. Intake air temperature sensor
7. Atmospheric pressure sensor
8. Crankshaft position sensor
9. Coolant temperature sensor
10. Ignition coil
11. Condenser

FI SYSTEM

The fuel pump delivers fuel to the fuel injector via the fuel filter. The pressure regulator maintains thefuel pressure that is applied to the fuel injector at only 324 kPa (3.24 kgf/cm ², 47.0 psi). Accordingly,when the energizing signal from the ECU energizes the fuel injector, the fuel passage opens, causingthe 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, coolant temperature sensor, atmospheric pressure sensor, lean angle sensor, crankshaft position sensor, intake air pressure sensor and intake air temperature 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
2. Fuel injector
3. ECU
4. Throttle position sensor
5. Coolant temperature sensor
6. Crankshaft position sensor
7. Intake air pressure sensor
8. Throttle body
9. Intake air temperature sensor
10. Air filter case
11. Atmospheric pressure sensor

A. Fuel system
B. Intake system
C. Control system

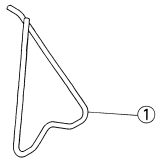
INCLUDED PARTS

DETACHABLE SIDESTAND

This sidestand "1" is used to support only the machine when standing or transporting it.

⚠ WARNING

- **Never apply additional force to the sidestand.**
- **Remove this sidestand before starting out.**

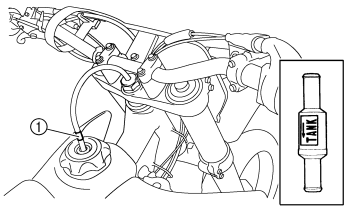


VALVE JOINT

This valve joint "1" prevents fuel from flowing out and is installed to the fuel tank breather hose.

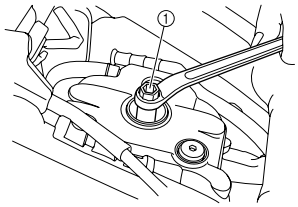
NOTICE

In this installation, make sure the arrow faces the fuel tank and also downward.



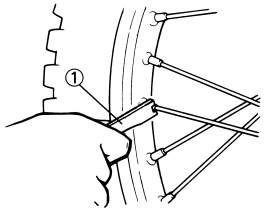
SPARK PLUG WRENCH

This spark plug wrench "1" is used to remove and install the spark plug.



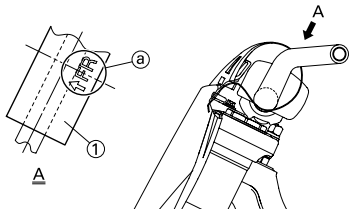
NIPPLE WRENCH

This nipple wrench "1" is used to tighten the spoke.



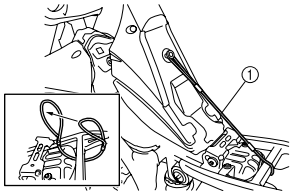
HANDLEBAR PROTECTOR

Install the handlebar protector "1" so that the mark "a" face forward.



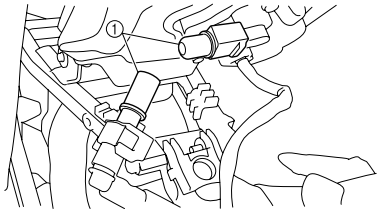
FUEL TANK HOLDING CABLE

The fuel tank holding cable "1" is used to support the fuel tank during maintenance.



FUEL HOSE JOINT COVER

The fuel hose joint covers "1" are used to prevent mud, dust, and other foreign material from entering the fuel pump when the fuel hose is disconnected.

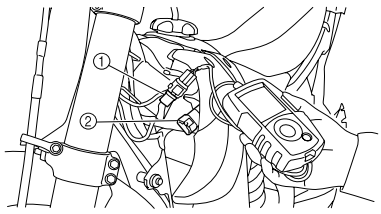


COUPLER FOR CONNECTING OPTIONAL PART

This coupler "1" is used for connection to an optional Power Tuner and so on.

NOTICE

When no optional parts, etc. are connected, connect the connection terminal to the original coupler "2".
Before removing the coupler, thoroughly wipe off any mud or water stuck to it.



Part name	Part number
YZ Power Tuner	33D-859C0-10

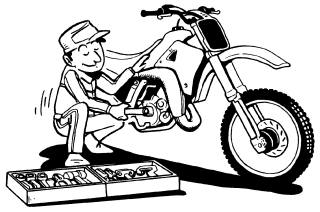
The YZ Power Tuner is optional.

IMPORTANT INFORMATION

PREPARATION FOR REMOVAL AND DISASSEMBLY

1. Remove all dirt, mud, dust, and foreign material before removal and disassembly.
   - When washing the machine with high pressured water, cover the parts follows.
     Air duct
     Silencer exhaust port
     Drain hole on the cylinder head (right side)
     Water pump housing hole at the bottom

2. Use proper tools and cleaning equipment. Refer to "SPECIAL TOOLS" section.



3. When disassembling the machine, keep mated parts together. They include gears, cylinders, pistons, and other mated parts that have been "mated" through normal wear. Mated parts must be reused as an assembly or replaced.

4. During the machine disassembly, clean all parts and place them in trays in the order of disassembly. This will speed up assembly time and help assure that all parts are correctly reinstalled.

5. Keep away from fire.

ALL REPLACEMENT PARTS

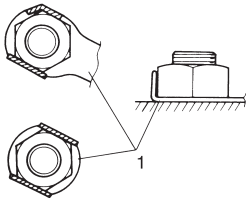
1. We recommend to use Yamaha genuine parts for all replacements. Use oil and/or grease recommended by Yamaha for assembly and adjustment.

GASKETS, OIL SEALS AND O-RINGS

1. All gaskets, oil seals, and O-rings should be replaced when an engine is overhauled. All gasket surfaces, oil seal lips, and O-rings must be cleaned.
2. Properly oil all mating parts and bearings during reassembly. Apply grease to the oil seal lips.

LOCK WASHERS/PLATES AND COTTER PINS

1. All lock washers/plates "1" and cotter pins must be replaced when they are removed. Lock tab(s) should be bent along the bolt or nut flat(s) after the bolt or nut has been properly tightened.

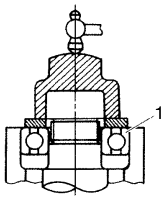


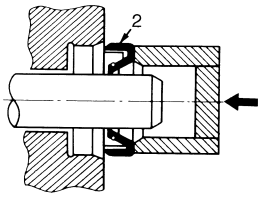
BEARINGS AND OIL SEALS

1. Install the bearing(s) "1" and oil seal(s) "2" with their manufacturer's marks or numbers facing outward. (In other words, the stamped letters must be on the side exposed to view.) When installing oil seal(s), apply a light coating of lightweight lithium base grease to the seal lip(s). Oil the bearings liberally when installing.

NOTICE

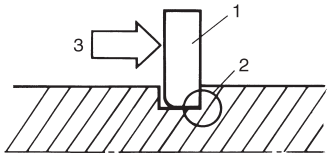
Do not use compressed air to spin the bearings dry. This causes damage to the bearing surfaces.





CIRCLIPS

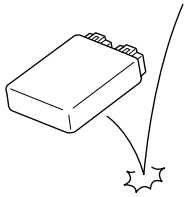
1. All circlips should be inspected carefully before reassembly. Always replace piston pin clips after one use. Replace distorted circlips. When installing a circlip "1", make sure that the sharp-edged corner "2" is positioned opposite to the thrust "3" it receives. See the sectional view.



HANDLING THE ELECTRONIC PARTS

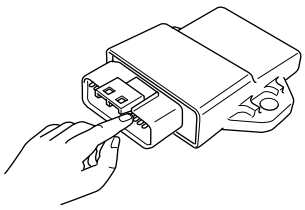
NOTICE

Electronic parts are very sensitive. Handle with care and do not give impact.



NOTICE

- **Mankind has static electricity. It`s voltage is very high and electronic parts are very sensitive.**
- **It is possible that inner small components of electronic parts are destroyed by static electricity.**
- **Do not touch and do not make them dirty.**

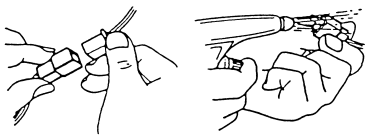


CHECKING OF CONNECTION

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.

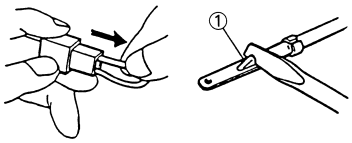


3. Check:
   - All connections

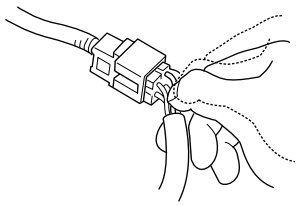
   Loose connection → Connect properly.

TIP

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



TIP
If the contact seems not good, pull the terminal by hand and check its condition.



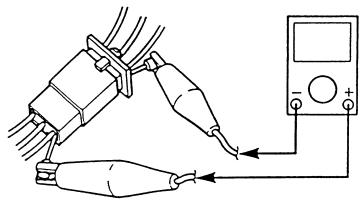
4. Connect:
   - Lead
   - Coupler
   - Connector

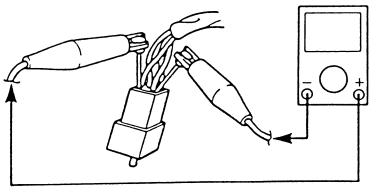
TIP
Make sure all connections are tight.

5. Check:
   - Continuity
     (with the pocket tester)

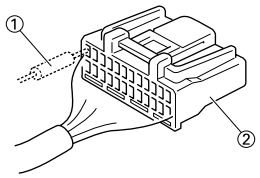
	**Pocket tester:** **90890-03112** **Analog pocket tester:** **YU-03112-C**

TIP
- If there is no continuity, clean the terminals.
- When checking the wire harness, perform steps (1) to (5).
- As a quick remedy, use a contact revitalizer available at most part stores.





TIP
When you check the voltage or electrical continuity, insert the measuring probe from back side as you can insert from back side.

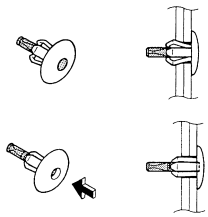


1. Probe
2. Coupler

REMOVING THE QUICK FASTENER

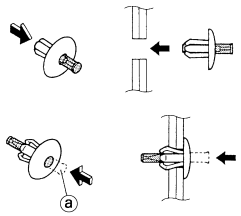
NOTICE
Do not push the center pin with too much force. Otherwise, the center pin could be damaged.

TIP
To remove a quick fastener, push the center pin in with a screwdriver, then pull the fastener out.



INSTALLING THE QUICK FASTENER

TIP
To install a quick fastener, push its center pin "a" back so that it protrudes from the fastener head, then insert the fastener and push the protruding pin in until it is flush with the fastener head.

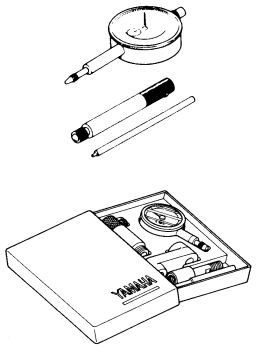
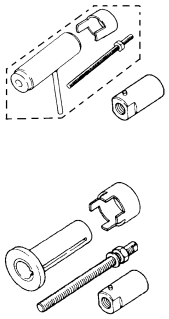
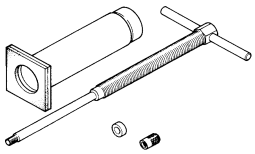
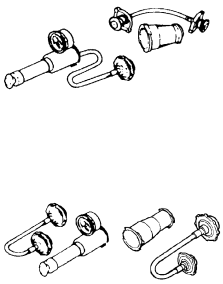
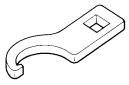


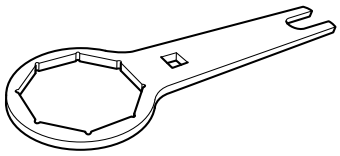
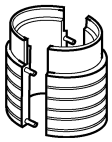
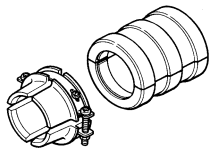
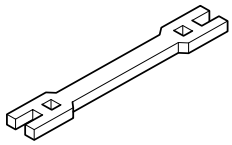
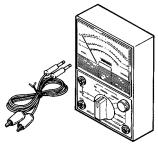
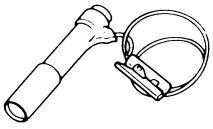
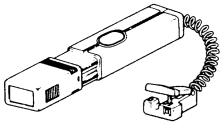
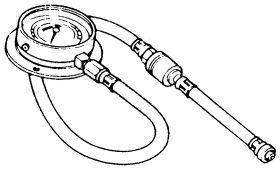
SPECIAL TOOLS

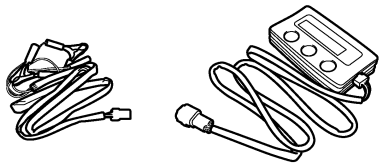
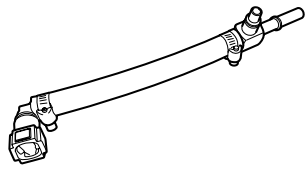
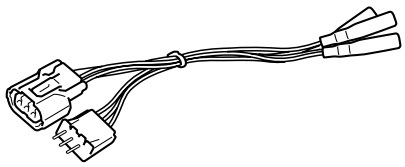
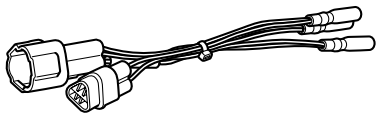
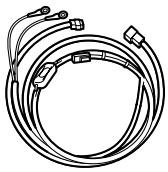
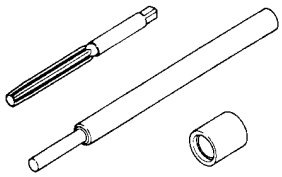
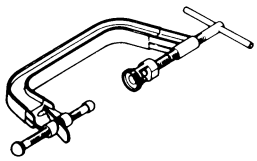
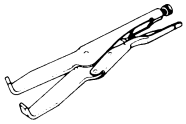
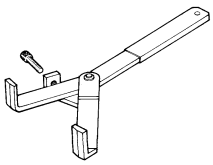
The proper special tools are necessary for complete and accurate tune-up and assembly. Using the correct special tool will help prevent damage caused by the use of improper tools or improvised techniques. The shape and part number used for the special tool differ by country, so two types are provided. Refer to the list provided to avoid errors when placing an order.

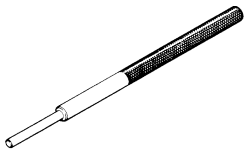
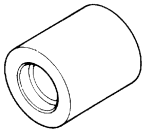
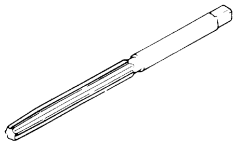
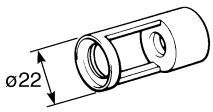
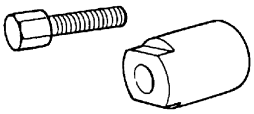
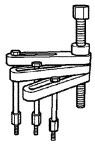
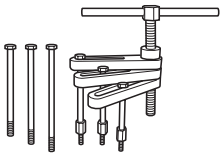
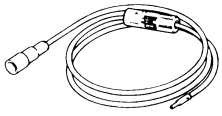
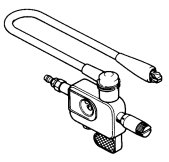
TIP

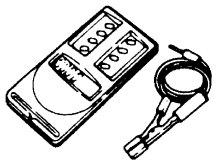
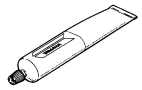
- For U.S.A. and Canada, use part number starting with "YM-", "YU-" or "ACC-".
- For others, use part number starting with "90890-".

Tool name/Part number	How to use	Illustration
Dial gauge and stand YU-3097, 90890-01252 Stand YU-1256	These tools are used to check each part for runout or bend.	
Crankshaft installing tool Crankshaft installing pot YU-90050, 90890-01274 Crankshaft installing bolt YU-90050, 90890-01275 Spacer (crankshaft installer) YM-91044, 90890-04081 Adapter (M12) YU-90063, 90890-01278	These tools are used to install the crankshaft.	
Piston pin puller set YU-1304, 90890-01304	This tool is used to remove the piston pin.	
Radiator cap tester YU-24460-01, 90890-01325 Radiator cap tester adapter YU-33984, 90890-01352	These tools are used for checking the cooling system.	
Steering nut wrench YU-33975, 90890-01403	This tool is used when tighten the steering ring nut to specification.	

Tool name/Part number	How to use	Illustration
Cap bolt wrench YM-01500, 90890-01500	This tool is used to loosen or tighten the base valve.	
Cap bolt ring wrench YM-01501, 90890-01501	This tool is used to loosen or tighten the damper assembly.	
Fork seal driver YM-A0948, 90890-01502	This tool is used when install the fork oil seal.	 
Spoke nipple wrench YM-01521, 90890-01521	This tool is used to tighten the spoke.	
Pocket tester YU-03112-C, 90890-03112	Use this tool to inspect the coil resistance, output voltage and amperage.	
Timing light YM-33277-A, 90890-03141	This tool is necessary for checking ignition timing.	 
Pressure gauge. YU-03153, 90890-03153	This tool is used to measure the fuel pressure.	

Tool name/Part number	How to use	Illustration
FI diagnostic tool YU-03182, 90890-03182	This tool is used to check the fault codes and diagnose any problems.	
Fuel pressure adapter YM-03186, 90890-03186	This tool is used to attach the pressure gauge.	
Test harness S-pressure sensor (3P) YU-03207, 90890-03207	This tool is connected between the intake air pressure sensor and the wire harness and is used to measure the voltage.	
Test harness-speed sensor (3P) YU-03208, 90890-03208	This tool is connected between the throttle position sensor and the wire harness and is used to measure the voltage.	
FI diagnostic tool sub-lead YU-03212, 90890-03212	This tool is used to connect the FI diagnostic tool to a battery.	
Valve guide remover & installer set 90890-04016	This tool is needed to remove and install the valve guide.	
Valve spring compressor YM-4019, 90890-04019	This tool is needed to remove and install the valve assemblies.	
Clutch holding tool YM-91042, 90890-04086	This tool is used to hold the clutch when removing or installing the clutch boss securing nut.	 

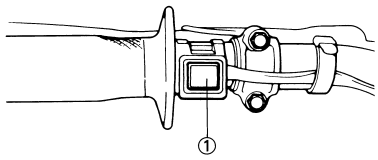
Tool name/Part number	How to use	Illustration
Valve guide remover 5.5 mm (0.22 in) YM-01122	This tool is needed to remove and install the valve guide.	
Valve guide installer 5.5 mm (0.22 in) YM-04015	This tool is needed to install the valve guide.	
Valve guide reamer 5.5 mm (0.22 in) YM-01196	This tool is needed to rebore the new valve guide.	
Valve spring compressor attachment YM-04108, 90890-04108	This tool is needed to remove and install the valve assemblies.	
Rotor puller YM-04151, 90890-04151	This tool is used to remove the flywheel magneto.	
Crankcase separating tool YU-A9642 90890-04152	These tool is used to remove the crankshaft from either case.	 
Dynamic spark tester YM-34487 Ignition checker 90890-06754	This instrument is necessary for checking the ignition system components.	 

Tool name/Part number	How to use	Illustration
Digital tachometer YU-39951-B, 90890-06760	This tool is needed for observing engine rpm.	
YAMAHA Bond No. 1215 (Three-Bond® No. 1215) 90890-85505	This sealant (Bond) is used for crankcase mating surface, etc.	

CONTROL FUNCTIONS

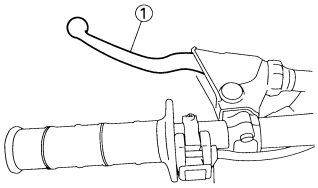
ENGINE STOP SWITCH

The engine stop switch "1" is located on the left handlebar. Continue pushing the engine stop switch till the engine comes to a stop.



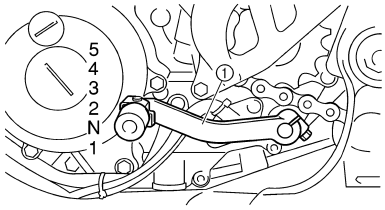
CLUTCH LEVER

The clutch lever "1" is located on the left handlebar; it disengages or engages the clutch. Pull the clutch lever to the handlebar to disengage the clutch, and release the lever to engage the clutch. The lever should be pulled rapidly and released slowly for smooth starts.



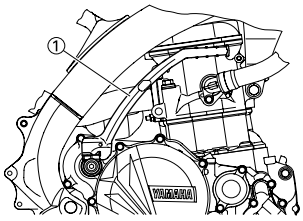
SHIFT PEDAL

The gear ratios of the constant-mesh 5 speed transmission are ideally spaced. The gears can be shifted by using the shift pedal "1" on the left side of the engine.



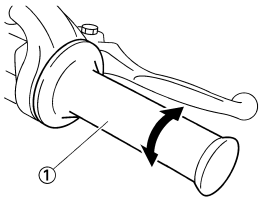
KICKSTARTER CRANK

Rotate the kickstarter crank "1" away from the engine. Push the starter down lightly with your foot until the gears engage, then kick smoothly and forcefully to start the engine. This model has a primary kickstarter crank so the engine can be started in any gear if the clutch is disengaged. In normal practices, however, shift to neutral before starting.



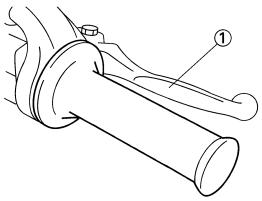
THROTTLE GRIP

The throttle grip "1" is located on the right handlebar; it accelerates or decelerates the engine. For acceleration, turn the grip toward you; for deceleration, turn it away from you.



FRONT BRAKE LEVER

The front brake lever "1" is located on the right handlebar. Pull it toward the handlebar to activate the front brake.

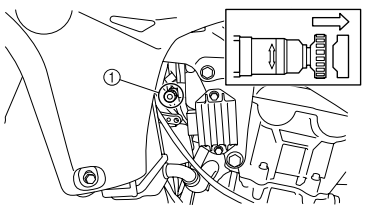


REAR BRAKE PEDAL

The rear brake pedal "1" is located on the right side of the machine. Press down on the brake pedal to activate the rear brake.

STARTER KNOB/IDLE SCREW

The starter knob/idle screw "1" is used when starting a cold engine. Pull the starter knob/idle screw out to open the circuit for starting. When the engine has warmed up, push it in to close the circuit.



STARTING AND BREAK-IN

FUEL

Always use the recommended fuel as stated below. Also, be sure to use new gasoline the day of a race.

Recommended fuel:
Premium unleaded gasoline only

NOTICE

Use only unleaded gasoline. The use of leaded gasoline will cause severe damage to the engine internal parts such as valves, piston rings, and exhaust system, etc.

TIP

Your Yamaha engine has been designed to use premium unleaded gasoline with a pump octane number [(R+M)/2] of 91 or higher, or a research octane number of 95 or higher. If knocking (or pinging) occurs, use a gasoline of a different brand.

⚠ WARNING

- **For refueling, be sure to stop the engine and use enough care not to spill any fuel. Also be sure to avoid refueling close to a fire.**
- **Refuel after the engine, exhaust pipe, etc. have cooled off.**

Gasohol (For USA and Canada)

There are two types of gasohol: gasohol containing ethanol and that containing methanol. Gasohol containing ethanol can be used if the ethanol content does not exceed 10%. Gasohol containing methanol is not recommended by Yamaha because it can cause damage to the fuel system or vehicle performance problems.

HANDLING NOTE

⚠ WARNING

Never start or run the engine in a closed area. The exhaust fumes are poisonous; they can cause loss of consciousness and death in a very short time. Always operate the machine in a well-ventilated area.

NOTICE

- **Unlike a two-stroke engine, this engine cannot be kick started when the throttle is open because the kickstarter may kick back. Also, if the throttle is open the air/fuel mixture may be too lean for the engine to start.**
- **Before starting the machine, perform the checks in the pre-operation check list.**

AIR FILTER MAINTENANCE

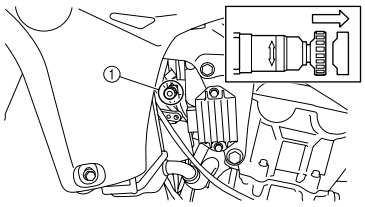
According to "CLEANING THE AIR FILTER ELEMENT" section in the CHAPTER 3, apply the foam-air-filter oil or its equivalent to the element. (Excess oil in the element may adversely affect engine starting.)

STARTING A COLD ENGINE

1. Inspect the coolant level.
2. Shift the transmission into neutral.
3. Pull the starter knob/ idle screw "1" to its full length.

TIP

Use the starter knob/ idle screw below an air temperature of 15°C (59°F).



4. Push the kickstarter down lightly with your foot until resistance is felt.
5. With the throttle fully closed, fold out the kickstarter lever, move it down lightly with your foot until the gears engage, and then push it down smoothly but forcefully.

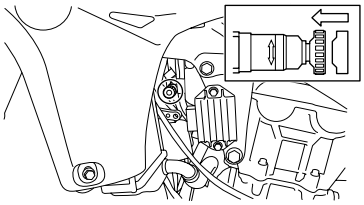
⚠ WARNING

Do not open the throttle while kicking the kickstarter crank. Otherwise, the kickstarter crank may kick back.

TIP

If the engine fails to start, give the kickstarter 10 to 20 slow kicks at full throttle in order to clear the engine of the rich air-fuel mixture retained in it.

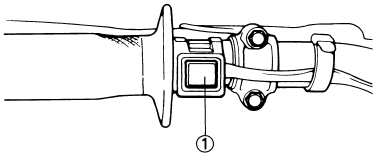
6. When the engine starts running, warm it up one or two minutes at a steady speed (of 3,000 to 5,000 r/min), and then return the starter knob/ idle screw to its original position.



7. Push the engine stop switch "1".

NOTICE

Do not warm up the engine for extended periods of time.



STARTING A WARM ENGINE

To start a warm engine, make sure that the starter (choke) knob/idling screw is pushed in and the throttle is closed, and then start the engine by pushing the kickstarter.

TIP

If the engine fails to start, give the kickstarter 10 to 20 slow kicks at full throttle in order to clear the engine of the rich air-fuel mixture retained in it.

BREAK-IN PROCEDURES

1. Before starting the engine, fill the fuel tank with the fuel.
2. Perform the pre-operation checks on the machine.
3. Start and warm up the engine. Check the idle speed, and check the operation of the controls and the engine stop switch. Then, restart the engine and check its operation within no more than 5 minutes after it is restarted.
4. Operate the machine in the lower gears at moderate throttle openings for five to eight minutes.
5. Check how the engine runs when the machine is ridden with the throttle 1/4 to 1/2 open (low to medium speed) for about one hour.
6. Restart the engine and check the operation of the machine throughout its entire operating range. Restart the machine and operate it for about 10 to 15 more minutes. The machine will now be ready to race.

NOTICE

- **After the break-in or before each race, you must check the entire machine for loose fittings and fasteners as per "TORQUE-CHECK POINTS". Tighten all such fasteners as required.**
- **When any of the following parts have been replaced, they must be broken in.**
  CYLINDER AND CRANKSHAFT:
  About one hour of break-in operation is necessary.
  PISTON, RING, VALVES, CAMSHAFTS AND GEARS:
  These parts require about 30 minutes of break-in operation at half-throttle or less. Observe the condition of the engine carefully during operation.

TORQUE-CHECK POINTS

Frame construction				Frame to rear frame
		Combined seat and fuel tank		Fuel tank to frame
Exhaust system				Silencer to rear frame
Engine mounting				Frame to engine
				Engine bracket to engine
				Engine bracket to frame
Steering		Steering stem to handlebar		Steering stem to frame
				Steering stem to upper bracket
				Upper bracket to handlebar
Suspension	Front	Steering stem to front fork		Front fork to upper bracket
				Front fork to lower bracket
	Rear	For link type		Assembly of links
				Link to frame
				Link to rear shock absorber
				Link to swingarm
		Installation of rear shock absorber		Rear shock absorber to frame
		Installation of swingarm		Tightening of pivot shaft
Wheel		Installation of wheel	Front	Tightening of wheel axle
				Tightening of axle holder
			Rear	Tightening of wheel axle
				Wheel to rear wheel sprocket
Brake			Front	Brake caliper to front fork
				Brake disc to wheel
				Tightening of union bolt
				Brake master cylinder to handlebar
				Tightening of bleed screw
				Tightening of brake hose holder
			Rear	Brake pedal to frame
				Brake disc to wheel
				Tightening of union bolt
				Brake master cylinder to frame
				Tightening of bleed screw
				Tightening of brake hose holder
Fuel system				Fuel pump to fuel tank

TIP

Concerning the tightening torque, refer to "TIGHTENING TORQUES" section in the CHAPTER 2.

CLEANING AND STORAGE

CLEANING

Frequent cleaning of your machine will enhance its appearance, maintain good overall performance, and extend the life of many components.

1. Before washing the machine, block off the end of the exhaust pipe to prevent water from entering. A plastic bag secured with a rubber band may be used for this purpose.
2. If the engine is excessively greasy, apply some degreaser to it with a paint brush. Do not apply degreaser to the chain, sprockets, or wheel axles.
3. Rinse the dirt and degreaser off with a garden hose; use only enough pressure to do the job.

NOTICE

Do not use high-pressure washers or steam-jet cleaners since they cause water seepage and deterioration seals.

4. After the majority of the dirt has been hosed off, wash all surfaces with warm water and a mild detergent. Use an old toothbrush to clean hard-to-reach places.
5. Rinse the machine off immediately with clean water, and dry all surfaces with a soft towel or cloth.
6. Immediately after washing, remove excess water from the chain with a paper towel and lubricate the chain to prevent rust.
7. Clean the seat with a vinyl upholstery cleaner to keep the cover pliable and glossy.
8. Automotive wax may be applied to all painted or chromed surfaces. Avoid combination cleaner-waxes, as they may contain abrasives.
9. After completing the above, start the engine and allow it to idle for several minutes.

STORAGE

If your machine is to be stored for 60 days or more, some preventive measures must be taken to avoid deterioration. After cleaning the machine thoroughly, prepare it for storage as follows:

1. Fill up the fuel tank and add fuel stabilizer (if available) to prevent the fuel tank from rusting and the fuel from deteriorating.
2. Remove the spark plug, pour a tablespoon of SAE 10W-40 motor oil in the spark plug hole, and reinstall the plug. With the engine stop switch pushed in, kick the engine over several times to coat the cylinder walls with oil.
3. Remove the drive chain, clean it thoroughly with solvent, and lubricate it. Reinstall the chain or store it in a plastic bag tied to the frame.
4. Lubricate all control cables.
5. Block the frame up to raise the wheels off the ground.
6. Tie a plastic bag over the exhaust pipe outlet to prevent moisture from entering.
7. If the machine is to be stored in a humid or salt-air environment, coat all exposed metal surfaces with a film of light oil. Do not apply oil to rubber parts or the seat cover.

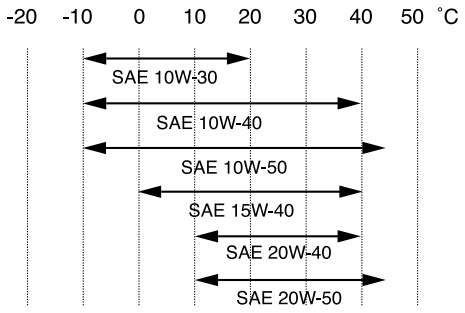
TIP

Make any necessary repairs before the machine is stored.

SPECIFICATIONS

GENERAL SPECIFICATIONS

Model name:	YZ450FZ (USA, CDN, AUS, NZ) YZ450F (EUROPE, ZA)		
Model code number:	33D1 (USA,CDN) 33D2 (EUROPE) 33D4 (AUS, NZ, ZA)		
Dimensions:	USA, CDN	EUROPE	AUS, NZ, ZA
Overall length	2,193 mm (86.34 in)	2,191 mm (86.26 in)	2,194 mm (86.38 in)
Overall width	825 mm (32.48 in)	←	←
Overall height	1,311 mm (51.61 in)	←	←
Seat height	999 mm (39.33 in)	←	998 mm (39.29 in)
Wheelbase	1,492 mm (58.74 in)	1,487 mm (58.54 in)	←
Minimum ground clearance	383 mm (15.08 in)	←	384 mm (15.12 in)
Weight:	USA, CDN	EUROPE	AUS, NZ, ZA
With oil and fuel	111.3 kg (245 lb)	111.9 kg (247 lb)	111.5 kg (246 lb)
Engine:			
Engine type	Liquid cooled 4-stroke, DOHC		
Cylinder arrangement	Single cylinder, Backward inclined		
Displacement	449.7 cm^3 (15.8 Imp oz, 15.2 US oz)		
Bore × stroke	97.0 × 60.8 mm (3.82 × 2.39 in)		
Compression ratio	12.5 : 1		
Starting system	Kickstarter		
Lubrication system:	Dry sump		
Oil type or grade:			
Engine oil	Recommended brand: YAMALUBE SAE10W-30, SAE10W-40, SAE10W-50, SAE15W-40, SAE20W-40 or SAE20W-50 API service SG type or higher, JASO standard MA		
Oil capacity:			
Engine oil			
Periodic oil change	0.95 L (0.84 Imp qt, 1.00 US qt)		
With oil filter replacement	1.0 L (0.88 Imp qt, 1.06 US qt)		
Total amount	1.2 L (1.06 Imp qt, 1.27 US qt)		
Coolant capacity (including all routes):	1.13 L (0.99 Imp qt, 1.19 US qt)		
Air filter:	Wet type element		

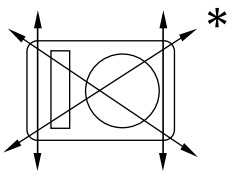
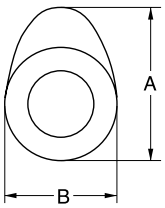
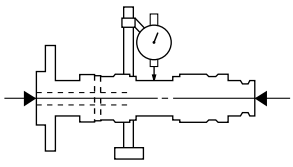


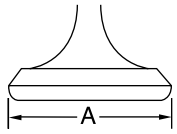
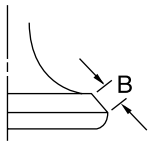
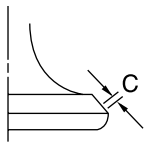
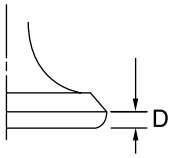
Fuel:			
Type	Premium unleaded gasoline only		
Tank capacity	6.0 L (1.30 Imp gal, 1.59 US gal)		
Throttle body:			
Type	30RA		
Manufacturer	KEIHIN		
Spark plug:			
Type/manufacturer	CR8E/NGK (resistance type)		
Gap	0.7–0.8 mm (0.028–0.031 in)		
Clutch type:	Wet, multiple-disc		
Transmission:			
Primary reduction system	Gear		
Primary reduction ratio	61/23 (2.652)		
Secondary reduction system	Chain drive		
Secondary reduction ratio	48/13 (3.692) (For USA, CDN)		
	49/13 (3.769) (For EUROPE, AUS, NZ, ZA)		
Transmission type	Constant mesh, 5-speed		
Operation	Left foot operation		
Gear ratio:			
1st	27/14 (1.929)		
2nd	23/15 (1.533)		
3rd	23/18 (1.278)		
4th	24/22 (1.091)		
5th	20/21 (0.952)		
Chassis:	USA, CDN	EUROPE	AUS, NZ, ZA
Frame type	Bilateral beam	←	←
Caster angle	26.9°	26.8°	26.9°
Trail	118.6 mm (4.67 in)	117.5 mm (4.63 in)	119.0 mm (4.69 in)
Tire:			
Type	With tube		
Size (front)	80/100-21 51M		
Size (rear)	120/80-19 63M (For USA, CDN, AUS, NZ, ZA)		
	110/90-19 62M (For EUROPE)		
Tire pressure (front and rear)	100 kPa (1.0 kgf/cm^2, 15 psi)		
Brake:			
Front brake type	Single disc brake		
Operation	Right hand operation		
Rear brake type	Single disc brake		
Operation	Right foot operation		
Suspension:			
Front suspension	Telescopic fork		
Rear suspension	Swingarm (link type monocross suspension)		
Shock absorber:			
Front shock absorber	Coil spring/oil damper		
Rear shock absorber	Coil spring/gas, oil damper		

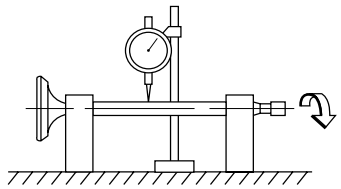
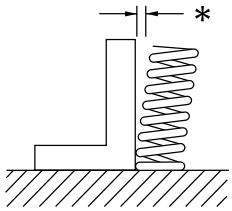
Wheel travel:	
Front wheel travel	310 mm (12.2 in)
Rear wheel travel	315 mm (12.4 in) (For USA, CDN) 312 mm (12.3 in) (For EUROPE, AUS, NZ, ZA)
Electrical:	
Ignition system	TCI

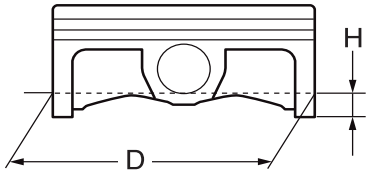
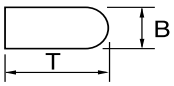
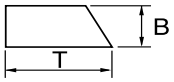
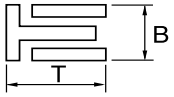
MAINTENANCE SPECIFICATIONS

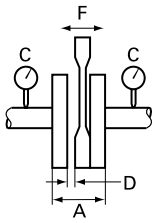
ENGINE

Item	Standard	Limit
Cylinder head:		
Warp limit	----	0.05 mm (0.002 in)
		
Cylinder:		
Bore size	97.00–97.01 mm (3.8189–3.8193 in)	----
Out of round limit	----	0.05 mm (0.002 in)
Camshaft:		
Drive method	Chain drive (Left)	----
Camshaft cap inside diameter	22.000–22.021 mm (0.8661–0.8670 in)	----
Camshaft outside diameter	21.959–21.972 mm (0.8645–0.8650 in)	----
Shaft-to-cap clearance	0.028–0.062 mm (0.0011–0.0024 in)	0.08 mm (0.003 in)
Cam dimensions		
		
Intake "A"	37.750–37.850 mm (1.4862–1.4902 in)	37.650 mm (1.4823 in)
Intake "B"	28.129–28.229 mm (1.1074–1.1114 in)	28.029 mm (1.1035 in)
Exhaust "A"	33.540–33.640 mm (1.3205–1.3244 in)	33.440 mm (1.3165 in)
Exhaust "B"	24.769–24.869 mm (0.9752–0.9791 in)	24.669 mm (0.9712 in)
Camshaft runout limit	----	0.03 mm (0.0012 in)
		

Item	Standard	Limit
Timing chain:		
Timing chain type/No. of links	98XRH2010-122M/122	----
Timing chain adjustment method	Automatic	----
Valve, valve seat, valve guide:		
Valve clearance (cold)		
IN	0.10–0.15 mm (0.0039–0.0059 in)	----
EX	0.20–0.25 mm (0.0079–0.0098 in)	----
Valve dimensions:		
"A" head diameter (IN)	35.9–36.1 mm (1.4134–1.4213 in)	----
"A" head diameter (EX)	29.9–30.1 mm (1.1772–1.1850 in)	----
		
"B" face width (IN)	2.26 mm (0.089 in)	----
"B" face width (EX)	2.26 mm (0.089 in)	----
		
"C" seat width (IN)	0.9–1.1 mm (0.0354–0.0433 in)	1.6 mm (0.0630 in)
"C" seat width (EX)	0.9–1.1 mm (0.0354–0.0433 in)	1.6 mm (0.0630 in)
		
"D" margin thickness (IN)	1.3 mm (0.0512 in)	----
"D" margin thickness (EX)	1.0 mm (0.0394 in)	----
		
Stem outside diameter (IN)	5.475–5.490 mm (0.2156–0.2161 in)	5.445 mm (0.2144 in)
Stem outside diameter (EX)	5.465–5.480 mm (0.2152–0.2157 in)	5.435 mm (0.2140 in)
Guide inside diameter (IN)	5.500–5.512 mm (0.2165–0.2170 in)	5.550 mm (0.2185 in)
Guide inside diameter (EX)	5.500–5.512 mm (0.2165–0.2170 in)	5.550 mm (0.2185 in)

Item	Standard	Limit
Stem-to-guide clearance (IN)	0.010–0.037 mm (0.0004–0.0015 in)	0.08 mm (0.003 in)
Stem-to-guide clearance (EX)	0.020–0.047 mm (0.0008–0.0019 in)	0.10 mm (0.004 in)
Stem runout limit 	----	0.01 mm (0.0004 in)
Valve seat width (IN)	0.9–1.1 mm (0.0354–0.0433 in)	1.6 mm (0.0630 in)
Valve seat width (EX)	0.9–1.1 mm (0.0354–0.0433 in)	1.6 mm (0.0630 in)
Valve spring:		
Free length (IN)	40.76 mm (1.60 in)	39.76 mm (1.57 in)
Free length (EX)	37.01mm (1.46 in)	36.01 mm (1.42 in)
Set length (valve closed) (IN)	34.78 mm (1.37 in)	----
Set length (valve closed) (EX)	30.83 mm (1.21 in)	----
Compressed force (installed) (IN)	178–204 N at 34.78 mm (18.2–20.8 kg at 34.78 mm, 40.01–45.86 lb at 1.37 in)	----
Compressed force (installed) (EX)	124–142 N at 30.83 mm (12.6–14.5 kg at 30.83 mm, 27.88–31.92 lb at 1.21 in)	----
Tilt limit* (IN)	----	2.5°/1.8 mm (2.5°/0.071 in)
Tilt limit* (EX) 	----	2.5°/1.6 mm (2.5°/0.063 in)
Direction of winding (top view) (IN)	Clockwise	----
Direction of winding (top view) (EX)	Clockwise	----

Item	Standard	Limit
Piston:		
Piston to cylinder clearance	0.020–0.045 mm (0.0008–0.0018 in)	0.1 mm (0.004 in)
Piston size "D"	96.965–96.980 mm (3.8175–3.8181 in)	----
		
Measuring point "H"	9.0 mm (0.354 in)	----
Piston off-set	Zero mm (Zero in)	----
Piston pin bore inside diameter	18.004–18.015 mm (0.7088–0.7093 in)	18.045 mm (0.7104 in)
Piston pin outside diameter	17.991–18.000 mm (0.7083–0.7087 in)	17.971 mm (0.7075 in)
Piston rings:		
Top ring:		
		
Type	Barrel	----
Dimensions (B × T)	1.00 × 3.30 mm (0.04 × 0.13 in)	----
End gap (installed)	0.20–0.30 mm (0.008–0.012 in)	0.55 mm (0.022 in)
Side clearance (installed)	0.015–0.065 mm (0.0015–0.0026 in)	0.120 mm (0.0047 in)
2nd ring:		
		
Type	Taper	----
Dimensions (B × T)	1.00 × 3.10 mm (0.04 × 0.12 in)	----
End gap (installed)	0.35–0.50 mm (0.014–0.020 in)	0.85 mm (0.033 in)
Side clearance	0.020–0.060 mm (0.0008–0.0024 in)	0.120 mm (0.0047 in)
Oil ring:		
		
Dimensions (B × T)	1.5 × 2.55 mm (0.06 × 0.10 in)	----
End gap (installed)	0.2–0.5 mm (0.01–0.02 in)	----

Item	Standard	Limit
Crankshaft:		
Crank width "A"	61.95–62.00 mm (2.439–2.441 in)	----
Runout limit "C"	0.03 mm (0.0012 in)	0.05 mm (0.002 in)
Big end side clearance "D"	0.15–0.45 mm (0.0059–0.0177 in)	0.50 mm (0.02 in)
Small end free play "F"	0.4–1.0 mm (0.02–0.04 in)	2.0 mm (0.08 in)
		
Balancer:		
Balancer drive method	Gear	----
Air filter oil grade:	Foam-air-filter oil or equivalent oil	----
Clutch:		
Friction plate thickness	2.92–3.08 mm (0.115–0.121 in)	2.8 mm (0.110 in)
Quantity	8	----
Clutch plate thickness	1.5–1.7 mm (0.059–0.067 in)	----
Quantity	7	----
Warp limit	----	0.1 mm (0.004 in)
Clutch spring free length	50.0 mm (1.97 in)	49.0 mm (1.93 in)
Quantity	6	----
Clutch housing thrust clearance	0.10–0.35 mm (0.0039–0.0138 in)	----
Clutch housing radial clearance	0.010–0.044 mm (0.0004–0.0017 in)	----
Clutch release method	Inner push, cam push	----
Shifter:		
Shifter type	Cam drum and guide bar	----
Guide bar bending limit	----	0.05 mm (0.002 in)
Kickstarter:		
Type	Kick and ratchet type	----
Fuel pump:		
Fuel pressure	324 kPa (3.24 kg/cm^2, 46.1 psi)	----
Fuel injector:		----
Model/manufacturer	1010/DENSO	----
Throttle body:		----
I. D. mark	33D1 00	----
Manufacturer	KEIHIN	----