

Product: 1990 Yamaha XT600E Motorcycle Service Repair Workshop Manual

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YAMAHA

OWNER'S SERVICE MANUAL

YZ450FR

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LIT-11026-10-88

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⚠ WARNING

The engine exhaust from this product contains chemicals known to the State of California to cause cancer, birth defects or other reproductive harm.

YAMAHA

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EC010000

YZ450FR
OWNER'S SERVICE MANUAL
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INTRODUCTION

Congratulations on your purchase of a Yamaha YZ series. This model is the culmination of Yamaha's vast experience in the production of pacesetting racing machines. It represents the highest grade of craftsmanship and reliability that have made Yamaha a leader.

This manual explains operation, inspection, basic maintenance and tuning of your machine. If you have any questions about this manual or your machine, please contact your Yamaha dealer.

NOTE:

As improvements are made on this model, some data in this manual may become outdated. If you have any questions, please consult your Yamaha dealer.

⚠ WARNING

PLEASE READ THIS MANUAL CAREFULLY AND COMPLETELY BEFORE OPERATING THIS MACHINE. DO NOT ATTEMPT TO OPERATE THIS MACHINE UNTIL YOU HAVE ATTAINED A SATISFACTORY KNOWLEDGE OF ITS CONTROLS AND OPERATING FEATURES AND UNTIL YOU HAVE BEEN TRAINED IN SAFE AND PROPER RIDING TECHNIQUES. REGULAR INSPECTIONS AND CAREFUL MAINTENANCE, ALONG WITH GOOD RIDING SKILLS, WILL ENSURE THAT YOU SAFELY ENJOY THE CAPABILITIES AND THE RELIABILITY OF THIS MACHINE.

EC030002
YAMAHA MOTOR CORPORATION, U.S.A.
YZ/WR MOTORCYCLE LIMITED WARRANTY

Yamaha Motor Corporation, U.S.A. hereby warrants to the original retail purchaser that the following components equipped on new Yamaha YZ or WR motorcycles purchased from an authorized Yamaha motorcycle dealer in the continental United States will be free from defects in material and workmanship for the period of time stated herein, subject to certain stated limitations. YZ or WR components included under this warranty are the engine, frame, swingarm, and monoshock. It is understood that the balance of the YZ or WR components are not covered by any warranty, expressed or implied. The balance of the components equipped on the unit are sold on an "as is" basis. This warranty applies to the original purchaser only and is not transferable.

THE PERIOD OF WARRANTY for the above-listed Yamaha YZ or WR components as originally installed on the unit shall be thirty (30) days from the date of purchase.

MODELS EXCLUDED FROM WARRANTY include those used for non-Yamaha-authorized renting, leasing, or other commercial purposes.

DURING THE PERIOD OF WARRANTY any authorized Yamaha motorcycle dealer will, free of charge, repair or replace, at Yamaha's option, any part adjudged defective by Yamaha due to faulty workmanship or material from the factory. Parts used in warranty repairs will be warranted for the balance of the product's warranty period. All parts replaced under warranty become property of Yamaha Motor Corporation U.S.A.

GENERAL EXCLUSIONS from this warranty shall include any failures caused by:

- a. Installation of parts or accessories that are not qualitatively equivalent to genuine Yamaha parts.
- b. Abnormal strain, neglect, or abuse.
- c. Accident or collision damage.
- d. Modification to original parts.
- e. Lack of proper maintenance.
- f. Damage due to improper transportation.

SPECIFIC EXCLUSIONS from this warranty shall include parts replaced due to normal wear or routine maintenance.

THE CUSTOMER'S RESPONSIBILITY under this warranty shall be to:

1. Operate and maintain the YZ or WR as specified in the appropriate Owner's Service Manual, and
2. Give notice to an authorized Yamaha motorcycle dealer of any and all apparent defects within ten (10) days after discovery, and make the machine available at that time for inspection and repairs at such dealer's place of business.

YAMAHA MOTOR CORPORATION, U.S.A. MAKES NO OTHER WARRANTY OF ANY KIND, EXPRESSED OR IMPLIED. ALL IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE WHICH EXCEED THE OBLIGATIONS AND TIME LIMITS STATED IN THIS WARRANTY ARE HEREBY DISCLAIMED BY YAMAHA MOTOR CORPORATION, U.S.A. AND EXCLUDED FROM THIS WARRANTY.

SOME STATES DO NOT ALLOW LIMITATIONS ON HOW LONG AN IMPLIED WARRANTY LASTS, SO THE ABOVE

LIMITATION MAY NOT APPLY TO YOU. ALSO EXCLUDED FROM THIS WARRANTY ARE ANY INCIDENTAL OR CONSEQUENTIAL DAMAGES INCLUDING LOSS OF USE. SOME STATES DO NOT ALLOW THE EXCLUSION OR LIMITATION OF INCIDENTAL OR CONSEQUENTIAL DAMAGES, SO THE ABOVE EXCLUSION MAY NOT APPLY TO YOU.

THIS WARRANTY GIVES YOU SPECIFIC LEGAL RIGHTS, AND YOU MAY ALSO HAVE OTHER RIGHTS WHICH VARY FROM STATE TO STATE.

YAMAHA MOTOR CORPORATION, U.S.A.
Post Office Box 6555
Cypress, California 90630

WARRANTY QUESTIONS AND ANSWERS

- Q. What costs are my responsibility during the warranty period?
- A. The customer's responsibility includes all costs of normal maintenance services, non-warranty repairs, accident and collision damage, and oil, oil filters, air filters, spark plugs, and brake shoes or pads.
- Q. What are some examples of "abnormal" strain, neglect, or abuse?
- A. These terms are general and overlap each other in areas. Specific examples include: Running the machine without oil; operating the machine with a broken or damaged part which causes another part to fail, damage or failure due to improper or careless transportation and or tie down; and so on. If you have any specific questions on operation or maintenance, please contact your dealer for advice.
- Q. Does the warranty cover incidental costs such as towing or transportation due to a failure?
- A. No. The warranty is limited to repair of the machine itself.
- Q. May I perform any or all of the recommended maintenance shown in the Owner's Service Manual instead of having the dealer do them?
- A. Yes, if you are a qualified mechanic and follow the procedures specified in the Owner's Service Manual. We do recommend, however, that items requiring special tools or equipment be done by a Yamaha motorcycle dealer.
- Q. Will the warranty be void or canceled if I do not operate or maintain my new YZ or WR exactly as specified in the Owner's Service Manual?
- A. No. The warranty on a new motorcycle cannot be "voided" or "cancelled." **However, if a particular failure is caused by operation or maintenance other than as shown in the Owner's Service Manual, that failure may not be covered under warranty.**
- Q. What responsibility does my dealer have under this warranty?
- A. Each Yamaha motorcycle dealer is expected to:
1. Completely set up every new machine before sale.
 2. Explain the operation, maintenance, and warranty requirements to your satisfaction at the time of sale, and upon your request at any later date.
In addition, each Yamaha motorcycle dealer is held responsible for his setup, service and warranty repair work.
- Q. Does the warranty on the engine include the carburetor, air filter, air box, and exhaust pipe?
- A. No. The warranty covers only the engine components.

CUSTOMER SERVICE

If your machine requires warranty service, you must take it to any authorized Yamaha motorcycle dealer within the continental United States. Be sure to bring your warranty registration identification or other valid proof of the original date of purchase. If a question or problem arises regarding warranty, first contact the owner of the dealer-ship. Since all warranty matters are handled at the dealer level, this person is in the best position to help you. If you are still not satisfied and require additional assistance, please write:

YAMAHA MOTOR CORPORATION U.S.A.
CUSTOMER RELATIONS DEPARTMENT
P.O. Box 6555
Cypress, California 90630

When contacting Yamaha Motor Corporation, U.S.A. don't forget to include any important information such as names, addresses, model, V.I.N. (frame number), dates, and receipts.

CHANGE OF ADDRESS

The federal government requires each manufacturer of a motor vehicle to maintain a complete, up-to-date list of all first purchasers against the possibility of a safety-related defect and recall. This list is compiled from the purchase registrations sent to Yamaha Motor Corporation, U.S.A. by the selling dealer at the time of your purchase.

If you should move after you have purchased your new motorcycle, please advise us of your new address by sending a postcard listing your motorcycle model name, V.I.N. (frame number), dealer number (or dealer's name) as it is shown on your warranty identification, your name and new mailing address. Mail to:

YAMAHA MOTOR CORPORATION, U.S.A.
WARRANTY DEPARTMENT
P.O.Box 6555
Cypress, California 90630

This will ensure that Yamaha Motor Corporation, U.S.A. has an up-to-date registration record in accordance with federal law.

IMPORTANT NOTICE

THIS MACHINE IS DESIGNED STRICTLY FOR COMPETITION USE, ONLY ON A CLOSED COURSE. It is illegal for this machine to be operated on any public street, road, or highway. Off-road use on public lands may also be illegal. Please check local regulations before riding.

⚠ SAFETY INFORMATION

- 1. THIS MACHINE IS TO BE OPERATED BY AN EXPERIENCED RIDER ONLY.**
Do not attempt to operate this machine at maximum power until you are totally familiar with its characteristics.
- 2. THIS MACHINE IS DESIGNED TO BE RIDDEN BY THE OPERATOR ONLY.**
Do not carry passengers on this machine.
- 3. ALWAYS WEAR PROTECTIVE APPAREL.**
When operating this machine, always wear an approved helmet with goggles or a face shield. Also wear heavy boots, gloves, and protective clothing. Always wear proper fitting clothing that will not be caught in any of the moving parts or controls of the machine.
- 4. ALWAYS MAINTAIN YOUR MACHINE IN PROPER WORKING ORDER.**
For safety and reliability, the machine must be properly maintained. Always perform the pre-operation checks indicated in this manual. Correcting a mechanical problem before you ride may prevent an accident.
- 5. GASOLINE IS HIGHLY FLAMMABLE.**
Always turn off the engine while refueling. Take care to not spill any gasoline on the engine or exhaust system. Never refuel in the vicinity of an open flame, or while smoking.

6. GASOLINE CAN CAUSE INJURY.

If you should swallow some gasoline, inhale excess gasoline vapors, or allow any gasoline to get into your eyes, contact a doctor immediately. If any gasoline spills onto your skin or clothing, immediately wash skin areas with soap and water, and change your clothes.

7. ONLY OPERATE THE MACHINE IN AN AREA WITH ADEQUATE VENTILATION.

Never start the engine or let it run for any length of time in an enclosed area. Exhaust fumes are poisonous. These fumes contain carbon monoxide, which by itself is odorless and colorless. Carbon monoxide is a dangerous gas which can cause unconsciousness or can be lethal.

8. PARK THE MACHINE CAREFULLY; TURN OFF THE ENGINE.

Always turn off the engine if you are going to leave the machine. Do not park the machine on a slope or soft ground as it may fall over.

9. THE ENGINE, EXHAUST PIPE, MUFFLER, AND OIL TANK WILL BE VERY HOT AFTER THE ENGINE HAS BEEN RUN.

Be careful not to touch them or to allow any clothing item to contact them during inspection or repair.

10. PROPERLY SECURE THE MACHINE BEFORE TRANSPORTING IT.

When transporting the machine in another vehicle, always be sure it is properly secured and in an upright position and that the fuel cock is in the "OFF" position. Otherwise, fuel may leak out of the carburetor or fuel tank.

EC050000

TO THE NEW OWNER

This manual will provide you with a good basic understanding of features, operation, and basic maintenance and inspection items of this machine. Please read this manual carefully and completely before operating your new machine. If you have any questions regarding the operation or maintenance of your machine, please consult your Yamaha dealer.

NOTE: _____

This manual should be considered a permanent part of this machine and should remain with it even if the machine is subsequently sold.

EC060000

NOTICE

Some data in this manual may become outdated due to improvements made to this model in the future. If there is any question you have regarding this manual or your machine, please consult your Yamaha dealer.

EC070001

F.I.M. MACHINE WEIGHTS: _____

Weights of machines without fuel

The minimum weights for motocross machines are:

for the class 125 cc..... minimum	88 kg (194 lb)
for the class 250 cc..... minimum	98 kg (216 lb)
for the class 500 cc..... minimum	102 kg (225 lb)

In modifying your machine (e.g., for weight reduction), take note of the above limits of weight.

HOW TO USE THIS MANUAL

PARTICULARLY IMPORTANT INFORMATION



The Safety Alert Symbol means ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED!

WARNING

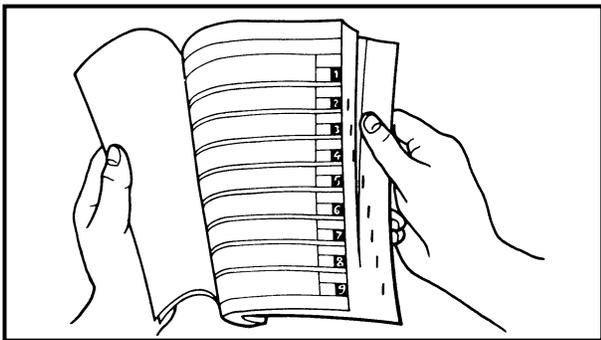
Failure to follow WARNING instructions could result in severe injury or death to the machine operator, a bystander, or a person inspecting or repairing the machine.

CAUTION:

A CAUTION indicates special precautions that must be taken to avoid damage to the machine.

NOTE:

A NOTE provides key information to make procedures easier or clearer.



FINDING THE REQUIRED PAGE

1. This manual consists of seven chapters; "General Information", "Specifications", "Regular inspection and adjustments", "Engine", "Chassis", "Electrical" and "Tuning".
2. The table of contents is at the beginning of the manual. Look over the general layout of the book before finding then required chapter and item.

Bend the book at its edge, as shown, to find the required fore edge symbol mark and go to a page for required item and description.

MANUAL FORMAT

All of the procedures in this manual are organized in a sequential, step-by-step format. The information has been compiled to provide the mechanic with an easy to read, handy reference that contains comprehensive explanations of all disassembly, repair, assembly, and inspection operations.

In this revised format, the condition of a faulty component will precede an arrow symbol and the course of action required will follow the symbol, e.g.,

- Bearings
Pitting/damage → Replace.

HOW TO READ DESCRIPTIONS

To help identify parts and clarify procedure steps, there are exploded diagrams at the start of each removal and disassembly section.

1. An easy-to-see exploded diagram ① is provided for removal and disassembly jobs.
2. Numbers ② are given in the order of the jobs in the exploded diagram. A number that is enclosed by a circle indicates a disassembly step.
3. An explanation of jobs and notes is presented in an easy-to-read way by the use of symbol marks ③. The meanings of the symbol marks are given on the next page.
4. A job instruction chart ④ accompanies the exploded diagram, providing the order of jobs, names of parts, notes in jobs, etc.
5. Extent of removal ⑤ is provided in the job instruction chart to save the trouble of an unnecessary removal job.
6. For jobs requiring more information, the step-by-step format supplements ⑥ are given in addition to the exploded diagram and job instruction chart.

CLUTCH REMOVAL

Extent of removal:

- ① Push rod and push lever removal
- ② Push pod 1 disassembly
- ③ Friction plate and clutch plate removal
- ④ Clutch housing removal

Extent of removal	Order	Part name	Qty	Remarks
Preparation for removal		CLUTCH REMOVAL		Refer to "ENGINE OIL REPLACEMENT" section in the CHAPTER 3.
		Drain the engine oil.		Refer to "ENGINE REMOVAL" section.
		Brake pedal Clutch cable		Disconnect at engine side.
⑤	1	Clutch cover	1	
	2	Gasket	1	
	3	Dowel pin	2	
	4	Clutch spring	6	
	5	Pressure plate	1	
	6	Push rod 1	1	
	7	Circlip	1	
	8	Plain washer	1	
	9	Bearing	1	
	10	Ball	1	
	11	Push rod 2	1	

REMOVAL POINTS

Clutch boss

- Remove:
 - Nut ①
 - Lock washer ②
 - Clutch boss ③

NOTE:
Straighten the lock washer tab and use the clutch holding tool ④ to hold the clutch boss.

Clutch holding tool:
YM-91042/90890-04086

Ⓐ For USA and CDN
Ⓑ Except for USA and CDN

INSPECTION

Clutch housing and boss

- Inspect:
 - Clutch housing ①
Cracks/wear/damage → Replace.
 - Clutch boss ②
Scoring/wear/damage → Replace.

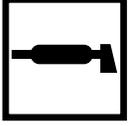
Primary driven gear

- Check:
 - Circumferential play
Free play exists → Replace.
 - Gear teeth ③
Wear/damage → Replace.

Clutch spring

- Measure:
 - Clutch spring free length ④
Out of specification → Replace springs as a set.

Clutch spring free length:	
Standard	<Limit>
50 mm (1.97 in)	49 mm (1.93 in)

① GEN INFO 	② SPEC 
③ INSP ADJ 	④ ENG 
⑤ CHAS 	⑥ ELEC 
⑦ TUN 	⑧ 
⑨ 	⑩ 
⑪ 	⑫ 
⑬ 	⑭ 
⑮ 	⑯ 
⑰ 	⑱ 
⑲ 	⑳ New

ILLUSTRATED SYMBOLS (Refer to the illustration)

Illustrated symbols ① to ⑦ are designed as thumb tabs to indicate the chapter's number and content.

- ① General information
- ② Specifications
- ③ Regular inspection and adjustments
- ④ Engine
- ⑤ Chassis
- ⑥ Electrical
- ⑦ Tuning

Illustrated symbols ⑧ to ⑭ are used to identify the specifications appearing in the text.

- ⑧ With engine mounted
- ⑨ Special tool
- ⑩ Filling fluid
- ⑪ Lubricant
- ⑫ Tightening
- ⑬ Specified value, Service limit
- ⑭ Resistance (Ω), Voltage (V), Electric current (A)

Illustrated symbols ⑮ to ⑱ in the exploded diagrams indicate grade of lubricant and location of lubrication point.

- ⑮ Apply engine oil
- ⑯ Apply molybdenum disulfide oil
- ⑰ Apply lightweight lithium-soap base grease
- ⑱ Apply molybdenum disulfide grease

Illustrated symbols ⑲ to ⑳ in the exploded diagrams indicate where to apply a locking agent and where to install new parts.

- ⑲ Apply locking agent (LOCTITE®)
- ⑳ Use new one

MEMO

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GENERAL INFORMATION

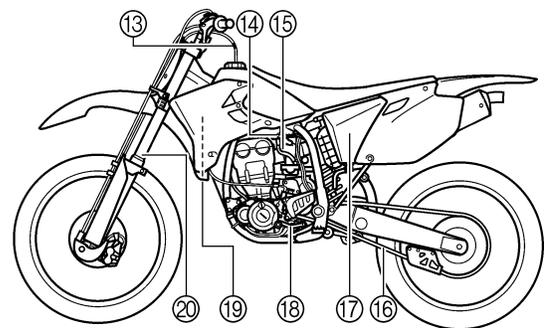
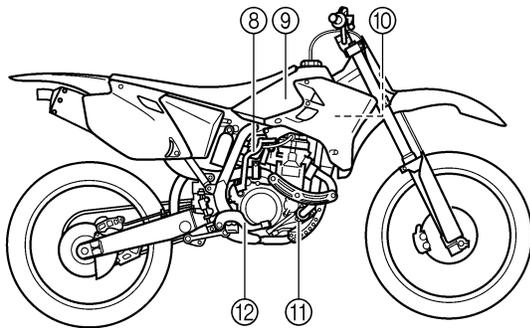
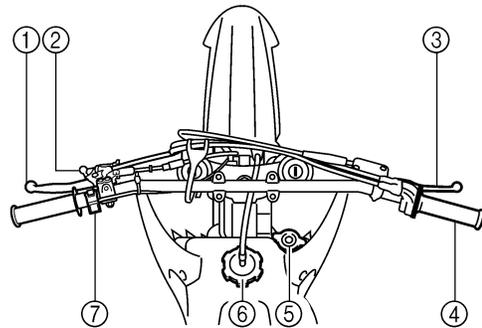
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DESCRIPTION

- ① Clutch lever
- ② Hot starter lever
- ③ Front brake lever
- ④ Throttle grip
- ⑤ Radiator cap
- ⑥ Fuel tank cap
- ⑦ "ENGINE STOP" button
- ⑧ Kick starter
- ⑨ Fuel tank
- ⑩ Radiator
- ⑪ Coolant drain bolt
- ⑫ Rear brake pedal
- ⑬ Valve joint
- ⑭ Fuel cock
- ⑮ Cold starter knob
- ⑯ Drive chain
- ⑰ Air cleaner
- ⑱ Shift pedal
- ⑲ Oil dipstick
- ⑳ Front fork

NOTE:

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



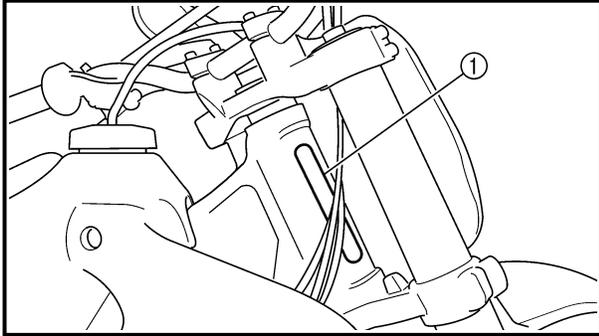
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MACHINE IDENTIFICATION

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

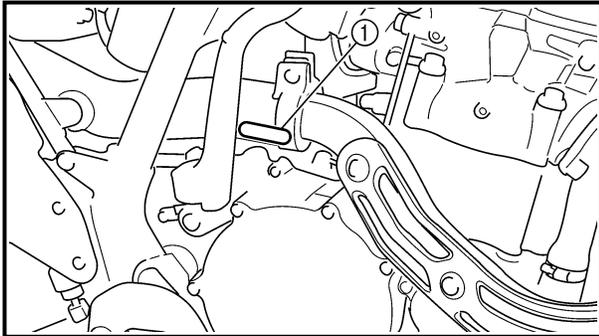
1. When ordering parts, you can give the number to your Yamaha dealer for positive identification of the model you own.
2. If your machine is stolen, the authorities will need the number to search for and identify your machine.



EC121001

VEHICLE IDENTIFICATION NUMBER

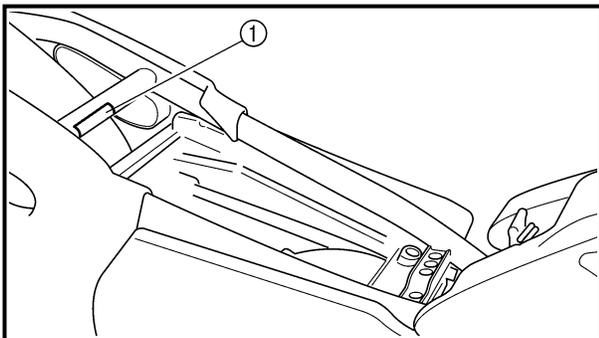
The vehicle identification number ① is stamped on the right of the steering head pipe.



EC123001

ENGINE SERIAL NUMBER

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



EC124000

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.



EC130000

IMPORTANT INFORMATION

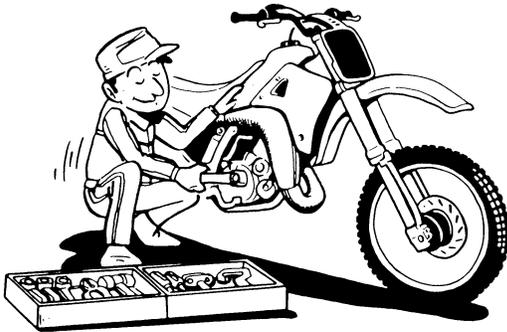
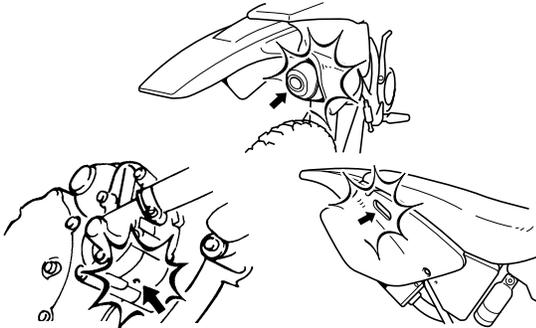
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PREPARATION FOR REMOVAL AND DISASSEMBLY

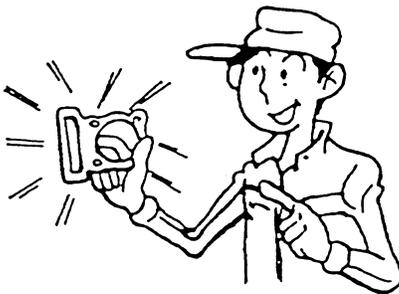
1. Remove all dirt, mud, dust, and foreign material before removal and disassembly.

When washing the machine with high pressured water, cover the parts as follows.

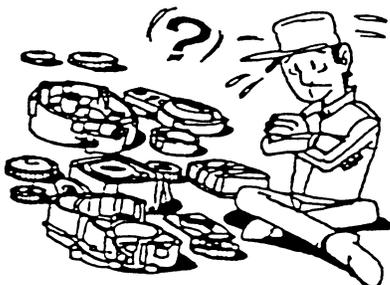
- Silencer exhaust port
- Side cover air intake port
- Water pump housing hole at the bottom
- Drain hole on the cylinder head (right side)



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.

EC132000

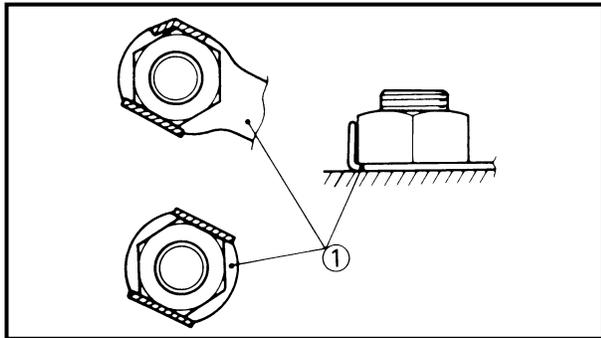
ALL REPLACEMENT PARTS

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

EC133000

GASKETS, OIL SEALS AND O-RINGS

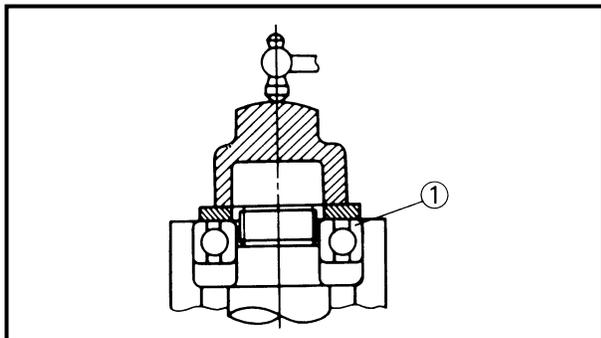
1. All gaskets, oil seals, and O-rings should be replaced when an engine is overhauled. All gasket surfaces, oil seal lips, and O-rings must be cleaned.
2. Properly oil all mating parts and bearings during reassembly. Apply grease to the oil seal lips.



EC134000

LOCK WASHERS/PLATES AND COTTER PINS

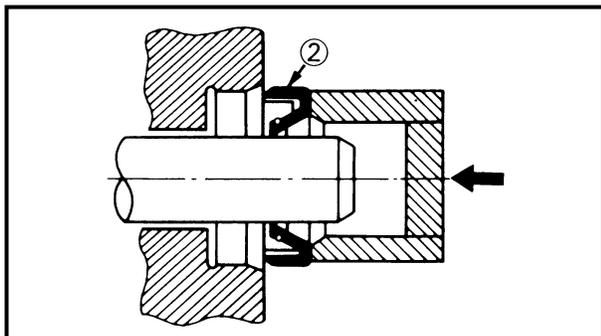
1. All lock washers/plates ① and cotter pins must be replaced when they are removed. Lock tab(s) should be bent along the bolt or nut flat(s) after the bolt or nut has been properly tightened.



EC135001

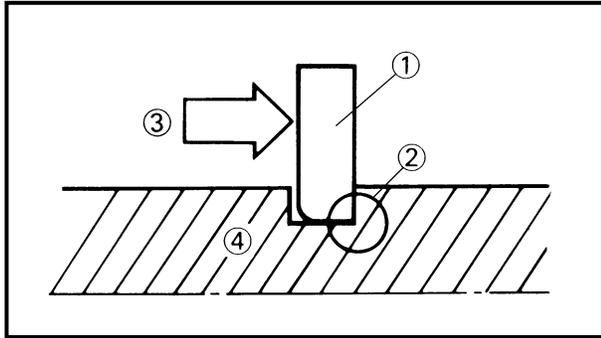
BEARINGS AND OIL SEALS

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 light-weight lithium base grease to the seal lip(s). Oil the bearings liberally when installing.



CAUTION:

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

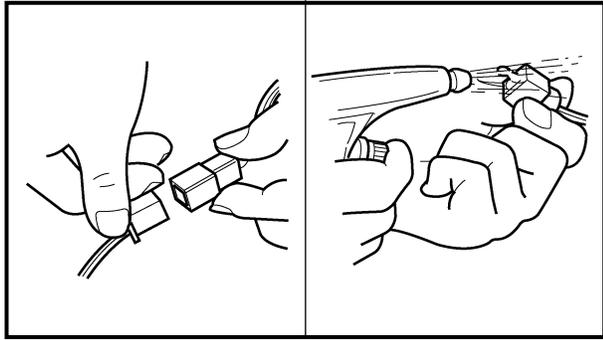


EC136000

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.

④ Shaft

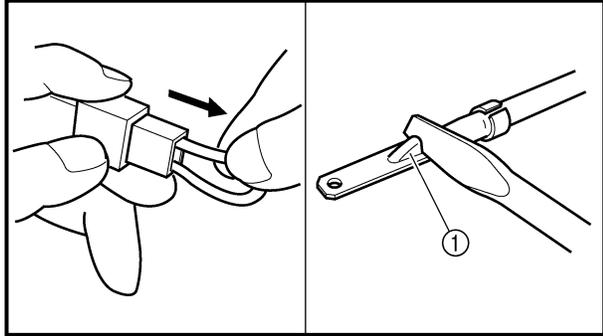


EC1C0001

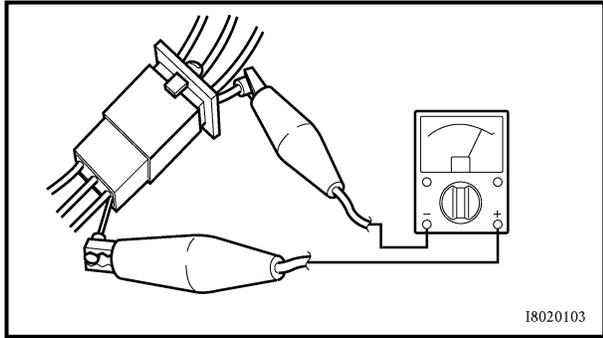
CHECKING OF CONNECTION

Dealing with stains, rust, moisture, etc. on the connector.

1. Disconnect:
 - Connector
2. Dry each terminal with an air blower.



3. Connect and disconnect the connector two or three times.
4. Pull the lead to check that it will not come off.
5. If the terminal comes off, bend up the pin ① and reinsert the terminal into the connector.



6. Connect:
 - Connector

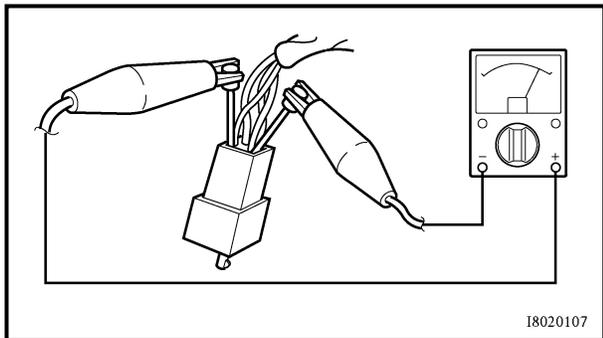
NOTE: _____

The two connectors “click” together.

7. Check for continuity with a tester.

NOTE: _____

- If there is no continuity, clean the terminals.
- Be sure to perform the steps 1 to 7 listed above when checking the wireharness.
- For a field remedy, use a contact revitalizer available on the market.
- Use the tester on the connector as shown.



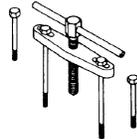
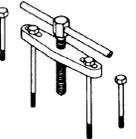
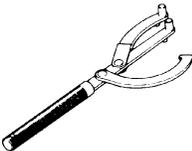
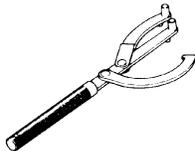
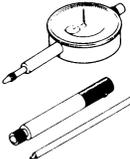
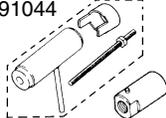
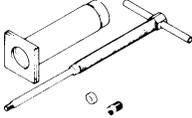
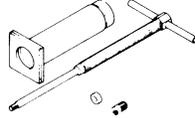
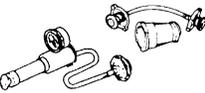
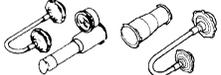
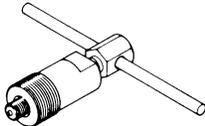
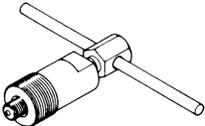
EC140001

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.

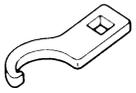
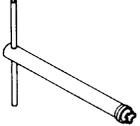
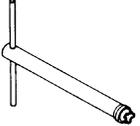
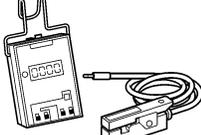
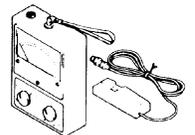
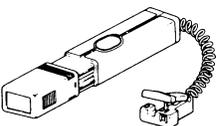
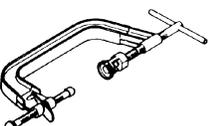
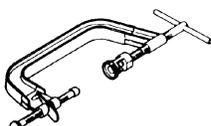
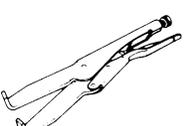
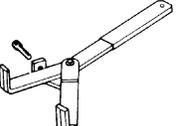
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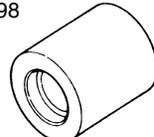
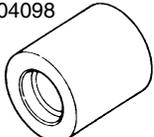
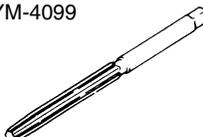
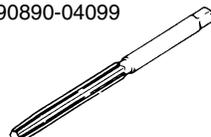
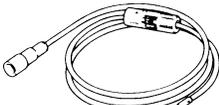
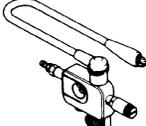
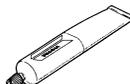
- For U.S.A. and Canada, use part number starting with “YM-”, “YU-” or “ACC-”.
- For others, use part number starting with “90890-”.

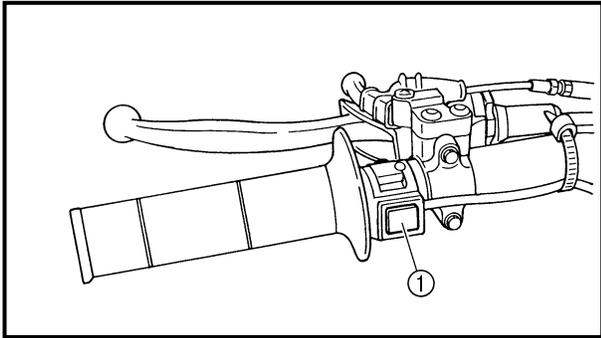
Part number	Tool name/How to use	Illustration	
YU-1135-A, 90890-01135	Crankcase separating tool These tool is used to remove the crankshaft from either case.	YU-1135-A 	90890-01135 
YU-1235, 90890-01235	Rotor holding tool This tool is used when loosening or tightening the fly-wheel magneto securing nut.	YU-1235 	90890-01235 
YU-3097, 90890-01252 YU-1256	Dial gauge and stand Stand These tools are used to check each part for runout or bend.	YU-3097 YU-1256 	90890-01252 
YU-90050, 90890-01274 YU-90050, 90890-01275 YU-91044, 90890-04081 YU-90063, 90890-01278	Crankshaft installing tool Crankshaft installing pot Crankshaft installing bolt Spacer (crankshaft installer) Adapter (M12) These tools are used to install the crankshaft.	YU-90050 YU-90063 YU-91044 	90890-01274 90890-01275 90890-01278 90890-04081 
YU-1304, 90890-01304	Piston pin puller This tool is used to remove the piston pin.	YU-1304 	90890-01304 
YU-24460-01, 90890-01325 YU-33984, 90890-01352	Radiator cap tester Adapter These tools are used for checking the cooling system.	YU-24460-01 YU-33984 	90890-01325 90890-01352 
YM-1189, 90890-01189	Flywheel puller This tool is used to remove the flywheel magneto.	YM-1189 	90890-01189 

SPECIAL TOOLS



Part number	Tool name/How to use	Illustration	
YU-33975, 90890-01403	Ring nut wrench This tool is used when tighten the steering ring nut to specification.	YU-33975 	90890-01403 
YM-1423, 90890-01423	Damper rod holder Use this tool to remove and install the damper rod.	YM-1423 	90890-01423 
YM-01442, 90890-01442	Fork seal driver This tool is used when install the fork oil seal.	YM-01442 	90890-01442 
YU-3112-C, 90890-03112	Yamaha pocket tester Use this tool to inspect the coil resistance, output voltage and amperage.	YU-3112-C 	90890-03112 
YU-8036-B 90890-03113	Inductive tachometer Engine tachometer This tool is needed for observing engine rpm.	YU-8036-B 	90890-03113 
YM-33277-A, 90890-03141	Timing light This tool is necessary for checking ignition timing.	YM-33277-A 	90890-03141 
YM-4019, 90890-04019	Valve spring compressor This tool is needed to remove and install the valve assemblies.	YM-4019 	90890-04019 
YM-91042, 90890-04086	Clutch holding tool This tool is used to hold the clutch when removing or installing the clutch boss securing nut.	YM-91042 	90890-04086 
YM-4116, 90890-04116 YM-4097, 90890-04097	Valve guide remover Intake 4.5 mm (0.18 in) Exhaust 5.0 mm (0.20 in) This tool is needed to remove and install the valve guide.	YM-4116 YM-4097 	90890-04116 90890-04097 

Part number	Tool name/How to use	Illustration	
YM-4117, 90890-04117 YM-4098, 90890-04098	Valve guide installer Intake Exhaust This tool is needed to install the valve guide.	YM-4117 YM-4098 	90890-04117 90890-04098 
YM-4118, 90890-04118 YM-4099, 90890-04099	Valve guide reamer Intake 4.5 mm (0.18 in) Exhaust 5.0 mm (0.20 in) This tool is needed to rebores the new valve guide.	YM-4118 YM-4099 	90890-04118 90890-04099 
YM-34487 90890-06754	Dynamic spark tester Ignition checker This instrument is necessary for checking the ignition system components.	YM-34487 	90890-06754 
ACC-QUICK-GS-KT 90890-85505	Quick gasket® YAMAHA Bond No. 1215 This sealant (Bond) is used for crankcase mating surface, etc.	ACC-QUICK-GS-KT 	90890-85505 



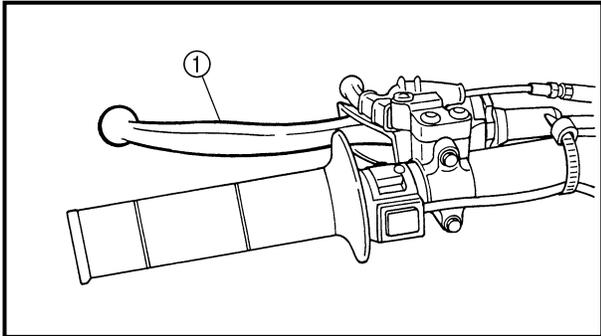
EC150000

CONTROL FUNCTIONS

EC151000

“ENGINE STOP” BUTTON

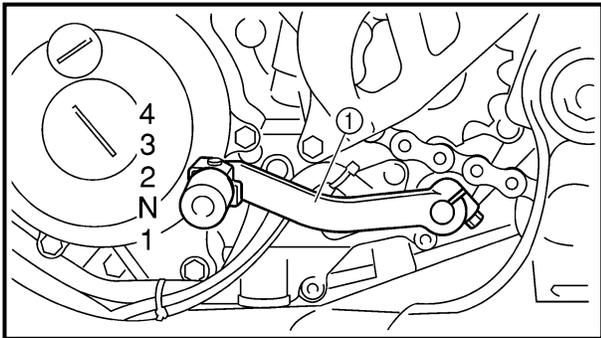
The “ENGINE STOP” button ① is located on the left handlebar. Continue pushing the “ENGINE STOP” button till the engine comes to a stop.



EC152000

CLUTCH LEVER

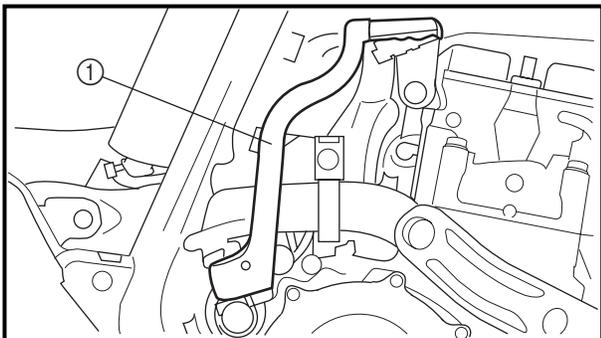
The clutch lever ① is located on the left handlebar; it disengages or engages the clutch. Pull the clutch lever to the handlebar to disengage the clutch, and release the lever to engage the clutch. The lever should be pulled rapidly and released slowly for smooth starts.



EC153000

SHIFT PEDAL

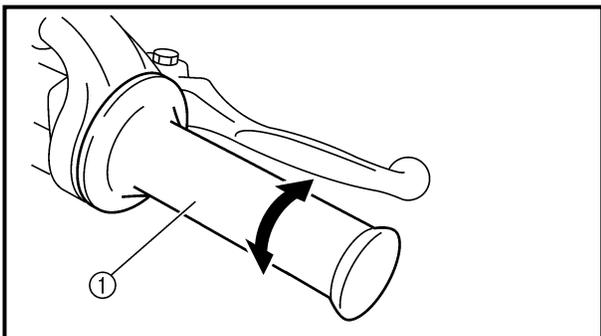
The gear ratios of the constant-mesh 4 speed transmission are ideally spaced. The gears can be shifted by using the shift pedal ① on the left side of the engine.



EC154000

KICK STARTER

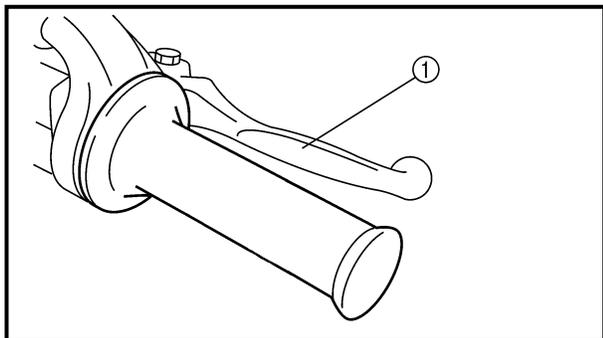
Rotate the kick starter ① away from the engine. Push the starter down lightly with your foot until the gears engage, then kick smoothly and forcefully to start the engine. This model has a primary kick starter so the engine can be started in any gear if the clutch is disengaged. In normal practices,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



EC155001

THROTTLE GRIP

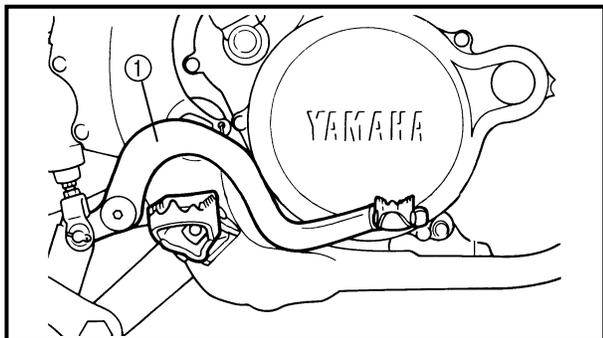
The throttle grip ① is located on the right handlebar; it accelerates or decelerates the engine. For acceleration, turn the grip toward you; for deceleration, turn it away from you.



EC156000

FRONT BRAKE LEVER

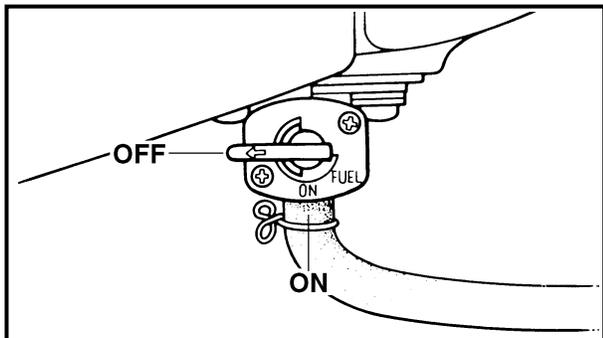
The front brake lever ① is located on the right handlebar. Pull it toward the handlebar to activate the front brake.



EC157000

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.



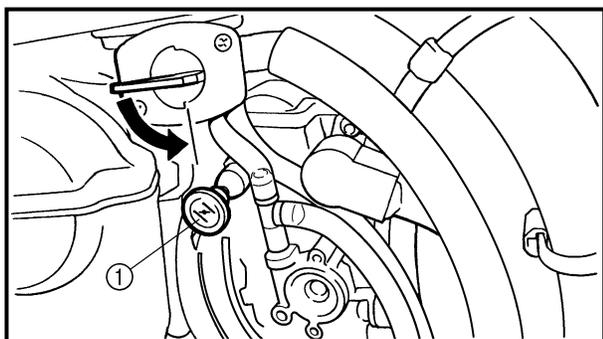
EC158001

FUEL COCK

The fuel cock supplies fuel from the tank to carburetor while filtering the fuel. The fuel cock has the two positions:

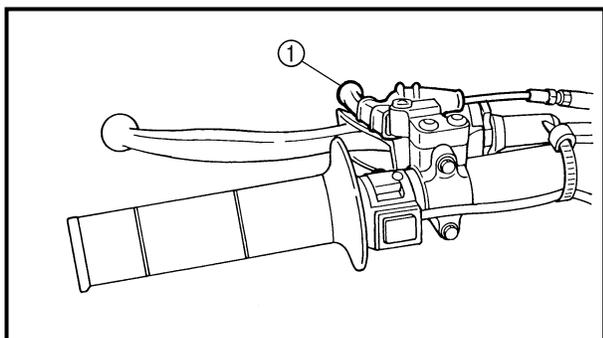
OFF: With the lever in this position, fuel will not flow. Always return the lever to this position when the engine is not running.

ON: With the lever in this position, fuel flows to the carburetor. Normal riding is done with the lever in this position.



COLD STARTER KNOB

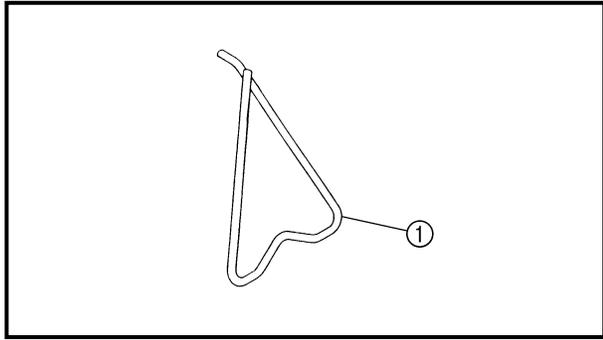
When cold, the engine requires a richer air-fuel mixture for starting. A separate starter circuit, which is controlled by the cold starter knob ①, supplies this mixture. Pull the cold starter knob out to open the circuit for starting. When the engine has warmed up, push it in to close the circuit.



HOT STARTER LEVER

The hot starter lever ① is used when starting a warm engine.

Use the hot starter lever when starting the engine again immediately after it was stopped (the engine is still warm). Pulling the hot starter lever injects secondary air to thin the air-fuel mixture temporarily, allowing the engine to be started more easily.



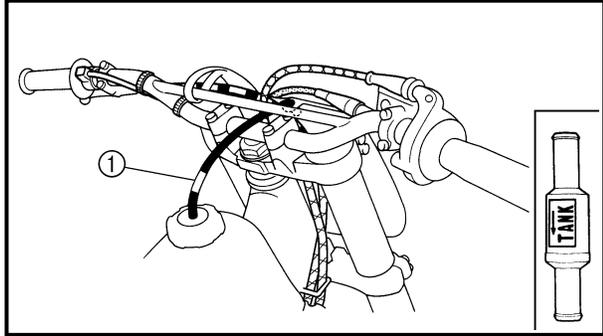
EC15R001

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.



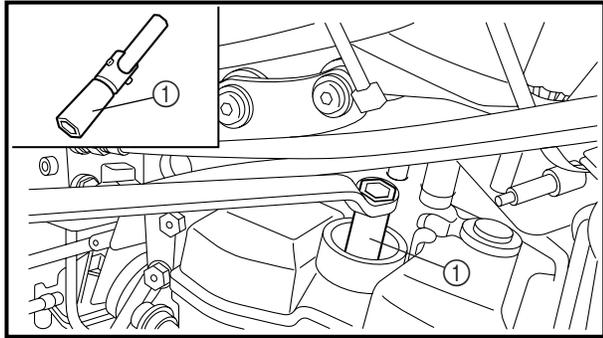
EC15F000

VALVE JOINT

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

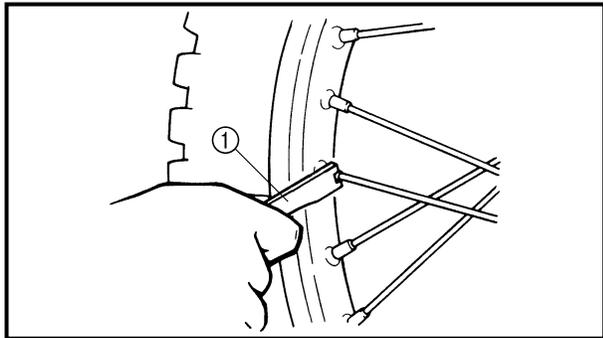
CAUTION:

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.



FUEL

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

**Recommended fuel:****Except for ZA:**

Premium unleaded gasoline only with a research octane number of 95 or higher.

For ZA:

Premium gasoline

CAUTION:

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.

NOTE:

If knocking or pinging occurs, use a different brand of gasoline or higher octane grade.

⚠ 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.

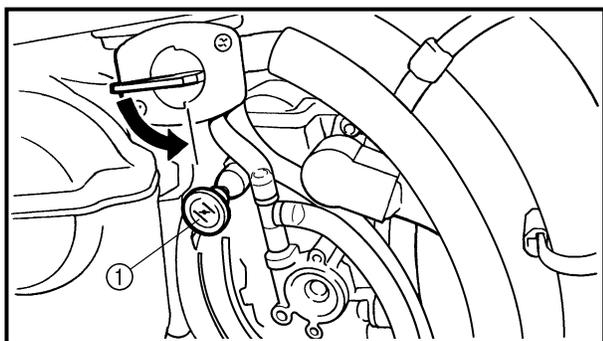
STARTING AND BREAK-IN

⚠ 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.

CAUTION:

- The carburetor on this motorcycle has a built-in accelerator pump. Therefore, when starting the engine, do not operate the throttle or the spark plug will foul.
- Unlike a two-stroke engine, this engine cannot be kick started when the throttle is open because the kick starter 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.



STARTING A COLD ENGINE

1. Inspect the coolant level.
2. Turn the fuel cock to "ON".
3. Shift the transmission into neutral.
4. Fully open the cold starter knob ①.
5. Kick the kick starter.

⚠ WARNING

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