GASOLINE ENGINE MA390, MA421, MA460

USE MANUAL









INTRODUCTION

Thank you for purchasing our gasoline engine. We hope you enjoy operating one of the finest models on the market.

This manual handles the information and specifications on operation and maintenance of the models, MA390, MA421, MA460 gasoline engines, these manuals should be considered a permanent part of the engine and should remain with the engine if it is sold.

Safety Messages: They consist of an alert symbol and one of these three words Danger, Warning, and Caution.



DANGER: indicates danger, if not avoided can cause injury or even death



MARNING: indicates danger, if not avoided it may cause injury AND / or property damage.



lack Match out: indicates danger, if not avoided may cause minor injury AND / or property damage.

Useful information:

If you are aware of any problems, have your gasoline engine inspected and repaired by an authorized workshop.

SECURITY



The engine will work properly, follow this manual. Please read and understand this manual before operating the engine. Familiarize yourself with the controls and procedures for the safe operation of your engine to avoid accidents.

Safe Operation Information

- 1. Please do pre-use inspection before operating to avoid injury or equipment damage.
- 2. Keep the engine in a ventilated place and at least one meter from buildings and other machinery during use, and keep the engine away from flammable substances to avoid fire.
- 3. Hold to nchildren and pets outside the area of operation.

Four. Make sure who uses the mtoquina has received correct instruction on how to operate the engine.

- 5. Keep flammable substances (gasoline, matches) away from the engine.
- 6. Since gasoline is extremely flammable and explosive under certain conditions, please refuel in a well-ventilated area with the engine off.
- 7. Do not refuel above the gasoline strainer mark.
- 8. Make sure the gas cap is tight.
- 9. Make sure any gasoline spills are wiped up before starting the engine.

10.Do not smoke or allow flames or sparks where the engine is stored or refueled.

△ WARNING

Safe Operating Instructions

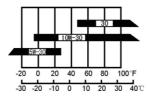
1. The exhaust releases poisonous carbon monoxide, a colorless, odorless gas. Breathing these gases can cause loss of consciousness and even death. Do not operate this machine without good ventilation or in a closed room.

- 2. If you use this engine in an enclosed or partially enclosed area, the air you breathe may contain a dangerous amount of gas. Make sure you have adequate ventilation to prevent the accumulation of these gases.
- 3. Put the engine on a level surface, the lean angle of the engine should not exceed 20°, otherwise it could cause fuel spillage.
- Four. The engine contains a spark arrestor. It may be against the law if you use the engine without the suppressor. Please inquire about local laws and regulations regarding this before using the engine.
- 5. The exhaust becomes very hot during and after using the engine. Be careful not to touch the exhaust while it is hot. Allow the engine to cool before storing it indoors.

CHECK BEFORE USE

- 1. Check oil level.
- 2. Check lubricant.
 - The lubricant plays an important part that can affect the performance and life of the engine. 2-stroke engines and oils without detergent will damage the engine and should not be used.
 - Before checking the lubricant, put the engine on a level surface.

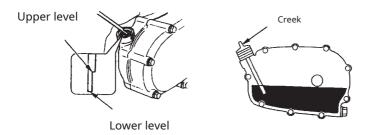
Use 4-stroke lubricant that meets the requirements for API service classification SF or SG. Always check the oil label to make sure it contains the letters SF or SG.



Temperature

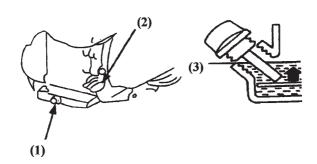
SAE10W-30 is generally recommended for use in all temperatures. Other viscosities indicated in the table can be used when the average temperature in your place is within the indicated range.

- Make sure the motor is on a level surface.
- Twist and remove the oil cap and wipe the cleat with a clean cloth
- Put the cleat back into the hole without turning the cap.
- If the oil level is below the mark designated as low level, fill with oil up to the high level indicated by the gauge.
- Turn and close the oil plug.
- Low speed gear oil (only for optional function) (Self-centrifugal clutch, 1/2 speed)
- Remove the oil filter cap and clean the dipstick.
- Reinsert the dipstick into the oil fill hole without turning it.
- If the oil level is low and needs to be refilled, be sure to use the recommended oil.



Engine oil alert system (optional function)

The oil alert system is designed to prevent damage caused by insufficient oil in the crankshaft. When the oil level in the crankshaft drops below a safe level, the alert system will automatically stop the engine even if the switch is in the on position. If the engine dies and you cannot restart it, check the oil level before checking for other possible causes.



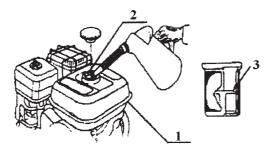
(1) Vacuum plug (2) InterrorpEngine Tor (3) Lower Level

Fuel level

- Check the fuel gauge, and fill the tank if the level is low. Do not refuel above the cap.
- Unleaded gasoline produces fewer engine failures and sparks, extending the life of the exhaust system.
- Never use contaminated or stale gasoline or mixed with oil. Prevent dirt, garbage, or water from entering the fuel tank.
- If the spark plug fails or the engine skips while operating at normal speed, change the brand of gasoline. If the fault persists, contact a workshop authorized.

⚠ WARNING:

- Use the engine with faulty spark plugsías it may cause engine damage.
- If these spark plug faultsíThis is due to improper use, the warrantyínot to coverto those damages.

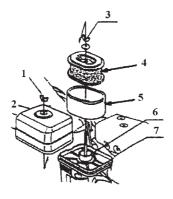


(1) Deposit of gasoline (2) Filler gap (3) Top level

AIR FILTER

The air filter is a dry type that includes a paper element and a sponge element.

- Remove the clip and dismantle the filter housing.
- Wash the item with a mixture of household detergent and warm water, then wash it with a non-flammable solvent, then allow it to dry completely.



- (1) Nut (2) Filter cover
- (3) Nut
- (4) Paper element
- (5) Sponge Element (6) Retandn
- (7) Muffler

⚠ NOTICE:

• Do not use the engine without Fair filter.

△ DANGER:

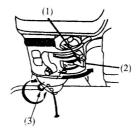
• Using gasoline or flammable solvents to clean the filter elements can cause fire or explosion.

⚠ WATCH OUT:

• Do not use the engine without the air filter, this will cause dirt or dust to enter through the carburetor causing the engine to break down.

Starting the engine

- Put the fuel valve in the ignition position, unscrew the drain plug from the bottom of the carburetor, adjust the drain plug until it starts to leak oil.
- Pull the bar throttle to closed position. Adjust the throttle to its proper position, pull the starter slightly until you feel resistance. Then pull hard.



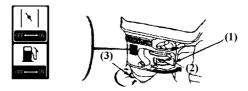
(1) Fuel valve (2) Start level (3) Drain plug

⚠ NOTICE:

- Do not allow the starter grip to click against the engine. Make it return slowly to avoid damage to the starter.
- Once on, let the engine idle for 1-3 min, make sure it is balanced, then put the throttle in the OPEN position, adjust the throttle bar. throttle to OPEN.



(1) auto-throttle (2) positionorn off

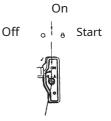


(1) auto-throttle (2) positionorshutdown n (3) start command

Start theandcitrus

Put the engine switch in the START position

Motor switch

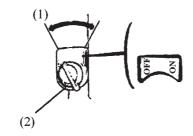


⚠ NOTICE:

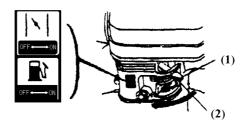
• Restrict startup time to 5 seconds to avoid damage. If the engine does not start, release the starter knob and try again 10 seconds later.

STOP THE ENGINE

Adjust throttle to proper position. Reduce engine speed, close throttle, change switch to OFF position.



(1) Accelerator control (2) Throttle OFF



△ DANGER:

- Gasoline is extremely flammable and explosive under certain conditions.
- Refuel in well-ventilated places with the engine off. Do not smoke or allow flames or sparks near where gasoline is refilled or stored.
- Do not add gasoline over the top. After refueling, close the gas cap tightly.
- Gasoline vapors are extremely flammable, and can catch fire after the engine starts.

- Make sure any spills have been wiped clean before starting the engine.
- Avoid getting gasoline on your skin for a long period of time, avoid breathing vapors, keep out of the reach of children.

⚠ NOTICE

• The gAsolin can cause damage to paints or plastics. Be careful when refueling. The DYears caused by gasoline are not covered under warranty.

MOTOR MAINTENANCE:

Perform regular maintenance to ensure the engine maintains good performance. Always follow maintenance guidelinesand inspection that mark this manual.

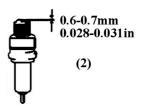
△ WARNING:

- Turn off the engine before performing maintenance. If the motor must be working, make sure there is bgood ventilation. Breathing these gases can cause loss of consciousness and even death.
- 1. Daily maintenance:
 - Air filter: A dirty air filter restricts air flow to the carburetor.PTo prevent carburetor malfunction, clean the air filter periodically. Clean more often when using the generator in dusty places.
 - Look at the air filter, keep it clean.
 - Look at nuts, tighten any that are loose.
 - Make sure that the lubricant level this within the indicated levels.
- 2. Clean air filter after 25 hours of work.
- 3. Clean carbon from the spark plugs after working more than 50 hours. TOAdjust the spark plug gap to 0.6-0.7mm. Check and clean radiator.
 - Drains the oil when the engine is warm, to ensure fast and complete drainage.or.
 - Remove the drain plug and the retainer.andn, remove the oil plug, and drain the oil.
 - Reinstall the drain plug and the retainer. Tighten the cap securely.
 - RFill with the recommended oil, and check the level.

⚠ NOTICE

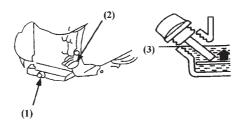
- Recommended oil: 15W / 40SAE
- MA390, MA421, MA460 1.1L capacity





(1) Remove spark plug (2) Adjust spark plug gap

4. Clean the fuel tank and filter once the mtoWho has done 100 hours of work: Remove the fuel cap and filter and wash with a light brush. Remove fuel tank, clean inside tank. Reinstall the tank, put the filter in place, fill with fuel to the top.



(1) tapordrain no. (2) motor switch (3) lower level

Check the aging of the gasoline line every 2 years. If you notice cracks, replace it. Aprietto together, and inspect for leaks.

Before storing the unit for a long time:

- Make sure the place is free of moisture and dust.
- Maintenance in accordance with the table.

Storage	Recommended maintenance to prevent hard starts
Less than 1 month	No preparation required
1 to 2 months	Fill with new gasoline
2 months to 1 year	Fill with new gasoline and add gasoline conditioner
	Prime the carburetor
	Clean fuel filter

MOTOR STORAGE

- If the motor is not used for a long period, rPerform proper maintenance before storing.
- First drain the gas tank, and clean the dirt and water inside the tank. Drain the carburetor completely, then tighten the filler cap securely. sewer system.
- Second, unscrew the drain plug at the bottom of the crankshaft, drain the lubricant from the crankshaft well, then retighten the drain plug.
- Finally, clean the surface of the motor with a clean cloth, removing dirt and dust. Then store the engine in a well-ventilated, dust-free place.

TRANSPORT

- Contact with a hot engine or exhaust can cause severe burns or fires. Allow the engine to coollaugh before transporting it.
- When the engine is transported, ponga the interrorpengine torch and the fuel valve in the OFF position. Keep the engine cool.

Problem solving

1. Engine does not start

- Check engine if you are not able to start it.
 - 1. First, check the fuel level in the tank. Turn the fuel valve to (2),cFuel should be drained when the valve is in the ON position. Tighten the drain plug.

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2. Spark plug

• Check the spark plug. Remove the cap and remove any dirt. If the engine still does not start, approach an authorized workshop. Users should not dismantle and reassemble units on their own.

3. Without Fsufficient force.

- · Check the air filters.
- Check the gasoline. Please leave empty/or the tank and carburetor and fill with new gasoline.
- For other situations, contact your dealer.

SPECS

KIND	MA390
Engine Model	One Cylinder, OHV25 °, Four Stroke, Cooled by toI will go
Caliber × Stroke (mm)	88 × 64
Displacement (cm3)	389
Power Max. (HP / Kw / rpm)	9.6 / 3600
Nominal Power (Kw / rpm)	7.3 / 3600
Max. torque (Nm / rpm)	26.5 / 2500
Fuel Tank Capacity (L)	6.5L
Engine Oil Capacity (L)	1.1
Ignition System	Non-contact transistor
Ignition system	start Handbook
Net weight / kg)	31
Fuel consumption (g / kw.h)	374

KIND	MA421
Engine Model	One Cylinder, OHV25 °, Four Stroke, Cooled by toI will go
Caliber × Stroke (mm)	90 × 66
Displacement (cm3)	420
Power Max. (HP / Kw / rpm)	11.2 / 3600
Nominal Power (Kw / rpm)	8.5 / 3600
Max. torque (Nm / rpm)	25.5 / 2500
Fuel Tank Capacity (L)	6.5L
Engine Oil Capacity (L)	1.1
Ignition System	Non-contact transistor
Ignition system	Manual start
Net weight / kg)	31
Fuel consumption (g / kw.h)	374

KIND	MA460
Engine Model	One Cylinder, OHV25 °, Four Stroke, Cooled by toI will go
Caliber × Stroke (mm)	92 × 69
Displacement (cm3)	459
Power Max. (HP / Kw / rpm)	11.5 / 3600
Nominal Power (Kw / rpm)	8.8 / 3600
Max. torque (Nm / rpm)	28/2500
Fuel Tank Capacity (L)	6.5L
Engine Oil Capacity (L)	1.1
Ignition System	Non-contact transistor
Ignition system	Manual start
Net weight / kg)	31
Fuel consumption (g / kw.h)	374

