



POWERHORSE™

Operation Manual / Manual De Empleo / Manuel D'opération

POWERHORSE ENGINES DE MOTORES POWERHORSE POWERHORSE MOTEURS

**SAVE THIS MANUAL FOR FUTURE USE.
CONSERVE ESTE MANUAL PARA SU REFERENCIA FUTURA.
CONSERVEZ LE GUIDE POUR CONSULTATION ULTÉRIEURE.**

! DANGER

CARBON MONOXIDE HAZARD

NEVER use engine inside homes, garages, crawl spaces, or other partially enclosed areas. Poisonous gases that can be harmful or fatal can build up in these areas. Using a fan and opening doors or windows does NOT provide enough fresh air.



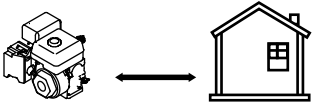
Engine exhaust contains carbon monoxide - a poisonous gas that can be harmful or fatal. You CANNOT see or smell this gas.

Use a battery-powered carbon monoxide detector when running an engine.

If you start to feel sick, dizzy, or weak while using an engine, shut it off and get to fresh air RIGHT AWAY. See a doctor. You may have carbon monoxide poisoning.

! DANGER

Using an engine or engine application indoors CAN KILL YOU IN MINUTES.
Exhaust contains carbon monoxide, a poison gas you cannot see or smell.

| | | |
|--|--|---|
|  NEVER use in the home or in partly enclosed areas such as garages. |  |  ONLY use outdoors and far from open windows doors, and vents. |
|--|--|---|

Avoid other engine dangers.
READ MANUAL BEFORE USE.

Introduction

When using this engine, your safety and the safety of others should be your top priority.

To assist you in making informed decisions regarding safety, we have provided operating procedures and other information on labels and in this manual. This information warns you of potential hazards that could hurt you or others.

Please stay safety conscious when using this engine.

We have provided important safety information in a variety of forms, including:

- Safety Labels: placed on the engine.
- Safety messages: preceded by a safety alert symbol and one of three signal words, DANGER, WARNING, or CAUTION. These safety alert symbols mean:

 **DANGER**

If you do not follow instructions, it **WILL** cause you **SERIOUS INJURY** or **DEATH**.

 **WARNING**

If you do not follow instructions, it **MAY** cause you **SERIOUS INJURY** or **DEATH**.

 **CAUTION**

If you do not follow instructions, it may cause you **SERIOUS INJURY** or **EQUIPMENT DAMAGE**.

- Safety Headings: such as **IMPORTANT SAFETY INSTRUCTIONS**.
- Safety Section: such as **ENGINE SAFETY**.
- Instructions: How to use this engine correctly and safely.

Thoroughly read and review this manual to know how to stay safe and get maximum benefit and enjoyment from using this engine.

Engine Safety

IMPORTANT SAFETY INSTRUCTIONS

Accidents occur less frequently when instructions are followed, the operator is safety conscious and the engine is properly maintained. Some of the most common hazards are discussed below, along with the best way to protect yourself and others.

Owner and Operator Responsibilities

Owners and operators should perform the following suggestions:

- Carefully read the owners manual.
- Follow the instructions in this manual carefully.
- Familiarize yourself with all controls and know how to stop the engine quickly in case of an emergency.
- Keep children away from the engine and do not let them operate it. Keep children and pets away from the area of operation.
- Operate this engine in well-ventilated areas. NEVER run engine indoors.

Refueling the Engine

Gasoline is extremely flammable, and gasoline vapor can explode. When refueling the engine, take the following precautions.

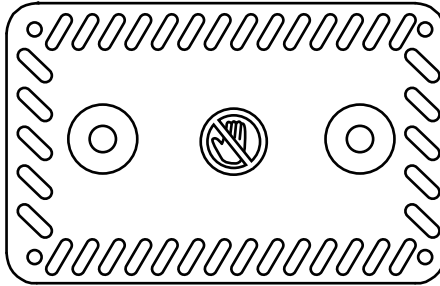
- Perform when the engine is cool.
- Refuel outdoors in well-ventilated areas.
- The engine should not be running.
- Make sure the engine is grounded to prevent static electrical spark.
- Do not smoke or use cell phones when refueling.
- Keep away from flames or sparks.
- If spillage occurs, be sure all areas are dry and vapor has dissipated prior to starting the engine.

Engine Safety CONTINUED

Exhaust / Muffler

Engine exhaust is dangerous because of intense heat and emission of carbon monoxide (poisonous gas).

- The muffler becomes very hot during operation and remains hot for a while after stopping the engine. Do not touch the muffler while it is hot. Do not store the engine until it is cool.



- To prevent fire hazards and for adequate ventilation, keep the engine at least 3 feet (1 meter) away from building walls and other equipment during operation. Do not place flammable objects close to the engine.

- **Carbon Monoxide Hazard:**
Exhaust gas contains carbon monoxide, a poisonous gas. Avoid inhalation of exhaust gas. Always run the engine in a well-ventilated area. Never run the engine indoors.

! DANGER

Other Equipment

Review the instructions provided with the equipment powered by this engine for any additional safety precautions that should be observed in conjunction with engine startup, shutdown, operation, or protective safety gear that may be needed to operate the equipment.

! WARNING



Do not touch hot sections of engine (see muffler figure above). The hot sections of the engine can cause severe burns.

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Controls & Features

CONTROLS

1. Fuel Valve

The fuel valve opens and closes the passage between the fuel tank and the carburetor. The fuel valve must be in the ON position for the engine to run. When the engine is not in use, be sure the fuel valve is in the OFF position to prevent carburetor flooding and to reduce the possibility of fuel leakage.

2. Engine ON/OFF Switch

The engine switch enables and disables the ignition system. Turn the engine switch to the ON position to start the engine. Turn the engine switch to the OFF position to stop the engine.

3. Choke Lever

The choke lever opens and closes the choke valve in the carburetor. The "ON" position enriches the fuel mixture which makes it easier when starting a cold engine. The opposite position provides the correct fuel mixture for operation after engine warms up.

4. Throttle Lever

The throttle lever controls engine speed (RPMs). Moving the throttle lever in the directions shown makes the engine run faster or slower. (Non-generator applications.)

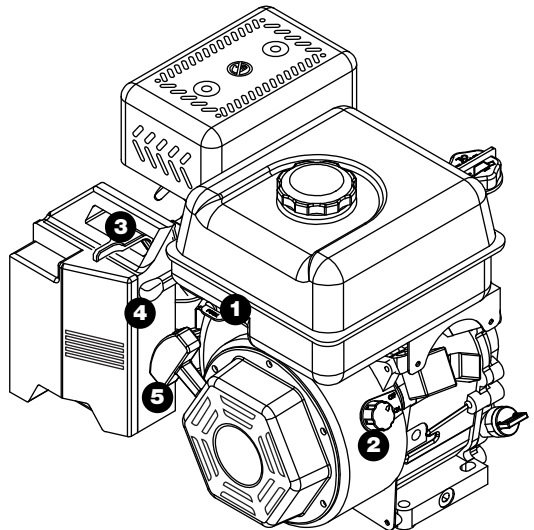
5. Recoil Starter Grip

Pulling the starter grip operates the recoil starter to crank the engine. Always grip snugly and have your body positioned properly when pulling. Keep thumb on the end of the handle in case of kick-back.

WARNING



Do not touch hot sections of engine. The hot sections of the engine can cause severe burns.



Before Operation

PRE-OPERATION CHECKS

For your safety, and to maximize the service life of your equipment, it is very important to take a few moments before you operate the engine to check its condition. Be sure to take care of any problem you find, or have your servicing dealer correct it, before you operate the engine.

WARNING

Improperly maintaining this engine or failing to correct a problem before operation, could cause a malfunction in which you could be seriously injured.

Always perform a pre-operation inspection before each operation and correct any problem.

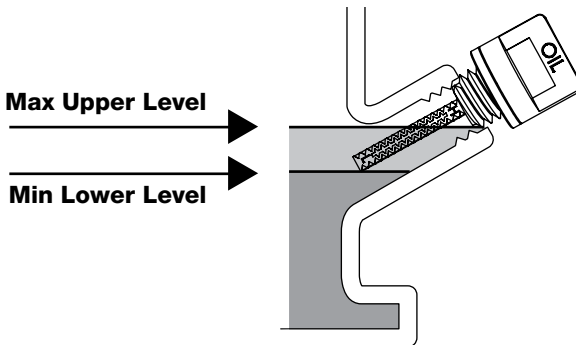
Before beginning your pre-operation checks, be sure the engine is level and the engine switch is in the OFF position.

Check the General Condition of the Engine

- Remove any excess dirt or debris, especially around the muffler, recoil starter, and cylinder head fins.
- Inspect for signs of damage and oil leakage.
- Be sure all shields and covers are in place. All nuts, bolts, and screws must be tight.

Check the Engine

- Check the engine oil level. Running the engine with a low oil level or improper oil can cause engine damage. To avoid the inconvenience of an unexpected shutdown, always check the engine oil on a level surface before startup.



Before Operation CONTINUED

- Check the air filter. A dirty air filter will restrict air flow to the carburetor, reducing engine performance and can cause excessive wear on the engine.
- Check the fuel level before start-up. Since the engine must be cool before refueling, starting with a full tank will help to eliminate or reduce operating interruptions for refueling.

Check all Equipment Powered by this Engine

Review the instructions provided with the equipment powered by this engine for all precautions and procedures that should be followed before starting the engine.

Operation

SAFE OPERATING PRECAUTIONS

Please review this section BEFORE OPERATION.

WARNING

Carbon monoxide gas is toxic.
Breathing it can cause unconsciousness and/or death.
Avoid any areas or actions that expose you to carbon monoxide.

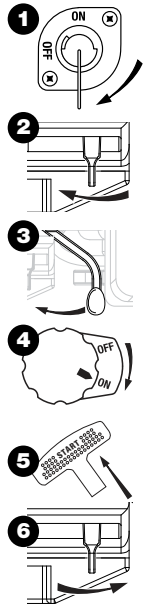
WARNING

DO NOT place the hands on or near the exhaust system while starting.

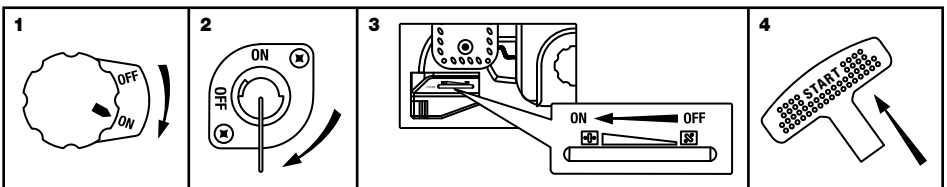
Review the instructions provided with the equipment powered by this engine for any safety precautions that should be observed in conjunction with starting, shutting down, or operating the engine.

STARTING THE ENGINE

1. Place the fuel valve to the ON position (if applicable).
2. To start a cold engine, move the choke lever to the ON position.
3. Move the throttle lever away from the SLOW position, about 1/3 of the way toward the FAST position. (Non-generator applications.)
4. Turn the engine switch to the ON position.
5. Pull the recoil handle.
6. If the choke lever has been moved to the ON position to start the engine, gradually move it to the opposite position as the engine warms up.



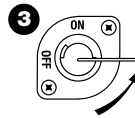
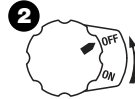
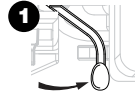
4 STEP STARTING PROCEDURE



STOPPING THE ENGINE

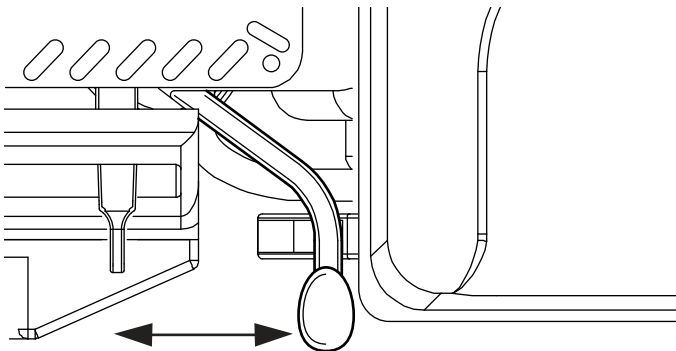
To stop the engine in an emergency, turn the engine switch to the OFF position. Under normal conditions, use the following procedure.

1. Move the throttle lever to the SLOW position and allow the engine to run slowly for cool down. This reduces the chance of backfire. (Non-generator applications.)
2. Turn the engine switch to the OFF position.
3. Turn the fuel valve lever to the OFF position.



SETTING ENGINE SPEED

Position the throttle lever for the desired engine speed. For engine speed recommendations, refer to the instruction manual provided with the equipment powered by this engine. (Non-generator applications.)



Increases RPM

Decreases RPM

Servicing Your Engine

THE IMPORTANCE OF MAINTENANCE

Protect yourself and your equipment by properly maintaining your engine. Proper engine maintenance is necessary for safe, economical, and trouble-free operation.

WARNING

Improperly maintaining this engine, or failure to correct a problem before operation, can cause a malfunction in which you can be seriously hurt or killed.

Always follow the inspection and maintenance recommendations and schedules in this owner's manual.

To assist you in properly caring for your engine, the following pages include routine inspection procedures and simple maintenance procedures using basic hand tools. Service tasks that are more difficult or which require special tools should be handled by professionals and are normally performed by a service technician or qualified mechanic.

If you operate your engine under stressful conditions such as sustained high-load or high-temperature operation, or use your engine in unusually wet or dusty conditions, servicing should be more frequent. Consult your service technician for recommendations applicable to your individual needs and use.

NOTE

See Maintenance Schedule for normal and extreme operation condition differences.

MAINTENANCE SAFETY INSTRUCTIONS

This manual contains very important safety precautions. However, we cannot warn you of every conceivable hazard that can arise while performing maintenance. You must decide whether or not you should perform a given task and always be safety conscious.

WARNING

Failure to properly follow maintenance instructions and precautions can cause you to be seriously hurt or killed.

Always follow the procedures and precautions in the owner's manual.

Safety Precautions

- Make sure the engine is not running, is turned OFF, spark plug cap is removed from spark plug, and engine is cooled off before you begin any maintenance or repairs. This can prevent several potential hazards, such as the following:

Carbon monoxide poisoning from engine exhaust.

Run engine in a well-ventilated area.

Burns from hot parts.

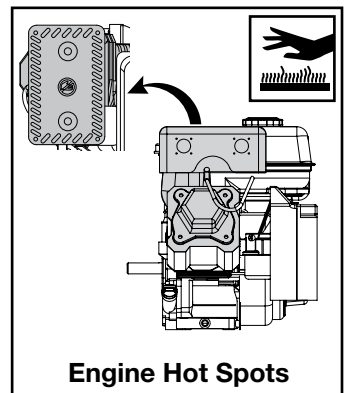
Let the engine and exhaust system cool-off before touching. (see drawing right)

Injury from moving parts.

Do not run the engine unless instructed to do so.

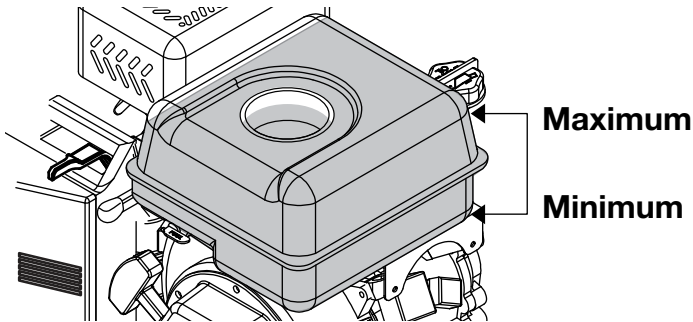
- Before you begin maintenance, read all instructions and make sure you have the tools and skills required.
- To reduce the possibility of fire or explosion, be alert when working around gasoline. Use only a nonflammable solvent, not gasoline, to clean parts. Keep cigarettes, sparks and flames away from all fuel-related parts.
- It is suggested to keep a fire extinguisher close by when performing maintenance.

Your servicing dealer knows your engine best and is equipped to maintain and repair it.



REFUELING

With the engine stopped and cool, remove the fuel tank cap and check the fuel level. Refill the tank if the fuel level is low. Leave enough area in the tank to allow for fuel expansion caused by heat. This will help prevent fuel from being forced from the tank onto a hot surface. **NEVER FILL TANK ABOVE MARKED RECOMMENDATIONS ON FILLER NECK.**



⚠ WARNING

Gasoline is highly flammable and explosive.

You can be burned or seriously injured when handling fuel.

- **Stop the engine and keep heat sparks and flame away.**
- **Only handle fuel outdoors.**
- **Wipe up spills immediately.**

Refuel in a well-ventilated area with the engine OFF and cool. Avoid spilling fuel. Do NOT fill above the fuel strainer marking. After refueling, tighten the fuel tank cap securely. Refuel the engine in a properly ventilated location and away from where fuel fumes may reach flames or sparks. Keep fuel away from appliance pilot lights, barbecues, electric appliances, power tools, and other electric appliances.

Spilled fuel is a fire hazard and it causes environmental damage. Wipe up spills immediately. Do not use cell phones or other electronic devices while refueling. Prevent static electricity when refueling. Fuel can damage paint and plastic. Do not spill fuel when filling your fuel tank. Damage caused by spilled fuel is not covered under warranty.

FUEL RECOMMENDATIONS

Use unleaded gasoline with a pump octane rating of 86 or higher. These engines operate best on unleaded gasoline.

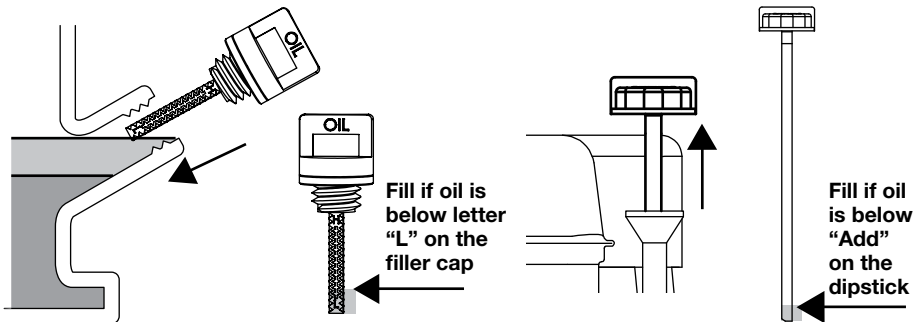
Do NOT use stale or contaminated gasoline or an oil/gasoline mixture. Avoid getting dirt or water in the fuel tank. Use only proper fuel containers that are properly marked.

Maximum recommended ethanol content: 10%

ENGINE OIL LEVEL CHECK

Check the engine oil level with the engine stopped and with the engine in a level position.

1. Remove either side mounted filler cap dipstick or high oil fill dipstick and wipe it clean.
2. Insert and remove the dipstick without screwing it into the filler neck. Check the oil level shown on the dipstick.
3. If the oil level is low, fill to the edge of the oil filler hole with the recommended oil.
4. Securely screw in the filler cap/dipstick. Running the engine with a low oil level can cause engine damage. Always check the engine oil before start up.



ENGINE OIL CHANGE

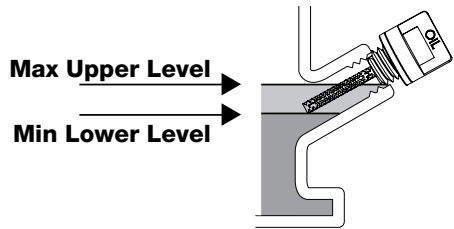
Drain the used oil while the engine is warm. Warm oil drains quickly and completely. Avoid contact with hot oil.

1. Place a suitable container below the engine to catch the used oil then remove the filler cap/dipstick and the drain plug.

continued on next page

Servicing Your Engine CONTINUED

2. Allow the used oil to drain completely, then reinstall the drain plug, and tighten it securely. Do not over tighten. Dispose of used motor oil in a manner that is compatible with the environment. We suggest you take used oil in a sealed container to your local recycling center or service station for reclamation. Do not throw used oil in the trash, pour it on the ground, or pour down a drain.
3. With the engine in a level position, fill to the outer edge of the oil filler hole with the recommended oil.



⚠ NOTICE

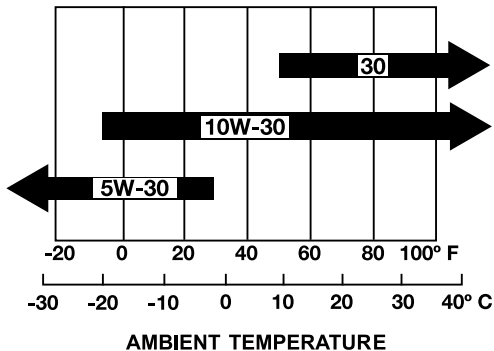
Running the engine with a low oil level can cause engine damage.

4. Securely screw in the filler cap/dipstick.

ENGINE OIL RECOMMENDATIONS

Engine oil affects performance and service life. Use 4-stroke automotive detergent oil.

SAE 10W-30 is recommended for general use. Other viscosities shown in the chart may be used when the average temperature in your area warrants.



The SAE oil viscosity and service classification are in the API label on the oil container. Use API SERVICE category SJ engine oil, or better.

AIR FILTER INSPECTION

Remove the air cleaner cover and inspect the filter. Use caution to avoid dropping debris into the air passage. Always replace damaged filter elements.

AIR FILTER SERVICE

A dirty air filter will restrict air flow to the carburetor, which will reduce engine performance. When an air filter becomes dirty, replace it immediately.

Operating the engine without an air filter or with a damaged air filter will allow dirt to enter the engine, causing the engine to wear rapidly. This type of damage is not covered by the Limited Warranty.

SPARK PLUG SERVICE

Recommended spark plugs: **F6RTC**

⚠ NOTICE

Using an incorrect spark plug may cause engine damage.

1. When engine is cool, disconnect the spark plug cap and remove any debris from the spark plug area with high pressure air.
2. Remove the spark plug with a 13/16-inch spark plug wrench.
3. Inspect the spark plug. Replace it if the electrodes are worn or if the insulator is cracked or chipped. Spark plug gap should be set to 0.027 - 0.030 inches.
4. Install the spark plug carefully to avoid cross threading. Screw in spark plug by hand until it stops turning.
5. Tighten the spark plug with a 13/16-inch spark plug wrench. Tighten 1/4 turn after the spark plug seats.

⚠ NOTICE

A loose spark plug can overheat and damage the engine. Over-tightening the spark plug can damage the threads in the cylinder head.

6. Attach the spark plug cap. Ensure spark plug cap snaps into place securely.

Helpful Tips & Suggestions

STORING YOUR ENGINE

Storage Preparation

Proper storage preparation keeps your engine trouble-free and clean. The following steps will assist in keeping rust and corrosion from impairing your engine's function and appearance, and will make the engine easier to start when using again.

Cleaning

If the engine has been running, allow it to cool for at least half an hour before cleaning. Clean all exterior surfaces and apply a light film of oil or WD-40 to prevent rust.

- Do not spray water into muffler or air cleaner. Water in the air cleaner will soak the air filter, and water that passes through the air filter or muffler can enter the cylinder and cause severe damage.
- Water contacting a hot engine can cause damage. If the engine has been running, allow it to cool for at least half an hour before washing.

Adding a Fuel Stabilizer to Extend Fuel Storage Life

1. Turn the fuel valve off while engine is running and allow the engine to run until it stops. Turn engine OFF when it begins surging to avoid engine damage.
2. Add fuel stabilizer, following the manufacturer's instructions.
3. Turn fuel valve on after adding fuel stabilizer
4. Re-start engine.
5. Run the engine outdoors for 1 minute to be sure that treated gasoline has replaced the untreated gasoline in the carburetor.
6. Slow the engine to an idle speed. (Non-generator application.)
7. Repeat step 1 above.

Helpful Tips & Suggestions CONTINUED

MAINTENANCE SCHEDULE

Normal Operating Conditions (less than 40 hrs. per year)

| | EACH USE | FIRST MONTH | EVERY 6 MONTHS | ONCE A YEAR |
|--------------------|-------------|----------------|-------------------|-----------------|
| Engine Oil Level | Check | | | |
| Engine Oil | | Replace | Replace | |
| Air Filter | Check | | | Clean / Replace |
| Spark Plug* | | | Clean | Replace |
| Cylinder/Head Fins | | | | Clean |
| Oil Leaks | Check | | | |
| Bolts | Check | | | |
| Fuel Hose Clamps | Check | | | |

* Spark plug gap to be set to 0.027 - 0.030 inches.

Extreme Operating Conditions (greater than 40 hrs. per year)

| | EACH USE | EVERY 40 HOURS |
|--------------------|-------------|-------------------|
| Engine Oil Level | Check | |
| Engine Oil | | Drain and Replace |
| Air Filter | Check | Replace |
| Spark Plug* | | Replace |
| Cylinder/Head Fins | Check | Clean |
| Oil Leaks | Check | |
| Bolts | Check | |
| Fuel Hose Clamps | Check | |

* Spark plug gap to be set to 0.027 - 0.030 inches.

NOTE

Following proper maintenance is critical under extreme operating conditions.

STORAGE PRECAUTIONS

If your engine will be stored with gasoline in the fuel tank and in the carburetor, there is the possible hazard of gasoline vapor ignition. Choose a well-ventilated storage area away from heat, sparks, flames, and any appliance that operates with a flame such as a furnace, water heater, or clothes dryer. Avoid any area with a spark-producing electric motor, garage door openers, or where power tools are operated.

Avoid storage areas with high humidity which causes rust and corrosion. Leave the fuel valve lever in the OFF position to reduce the possibility of fuel leakage.

Position the equipment so the engine is level to avoid fuel or oil leakage. When the engine and exhaust system are cool, cover the engine to keep out dust. A hot engine and exhaust system can ignite or melt certain materials. Do not use sheet plastic as a dust cover. A nonporous cover can trap moisture around the engine causing rust and corrosion.

Removal From Storage

Check your engine as described in the BEFORE OPERATION chapter of this manual. If refueling is required, only use fresh gasoline.

TRANSPORTING

Transport only when engine is cool. A hot engine and exhaust system can burn you and can ignite some materials. Keep the engine level when transporting to reduce the possibility of fuel leakage. Position the fuel valve lever to the OFF position. Secure the engine to prevent movement during transporting to prevent potential injury and damage to the engine.

EMISSION CONTROL SYSTEM INFORMATION

The U.S. and California Clean Air Acts

EPA and California regulations require all manufacturers to furnish written instructions describing the operation and maintenance of emission control systems.

The following instruction and procedures must be followed in order to keep the emissions from your engine within the emission standards.

Tampering and Altering

Tampering with or altering the emission control system may increase emissions beyond the legal limit. Among those acts that constitute tampering are:

- Removal or alteration of any part of the intake, fuel or exhaust systems.
- Altering or defeating the governor linkage or speed-adjusting mechanism to cause the engine to operate outside its design parameters.

CONSUMER INFORMATION

Manufacturer Publications

These publications will give you additional information for maintaining and repairing your engine. You may order them online at most book retailing web sites.

Small Engine Repair – Chilton Manual

This manual covers complete maintenance and overhaul procedures. It is intended to be used by a skilled technician.

Emissions Control Systems Warranty

United States Environmental Protection Agency (US EPA), and Powerhorse are pleased to explain the emission control system warranty on your small off-road engine. Powerhorse must warrant the emission control system on your small off-road engine for the periods of time listed below provided there has been no abuse, neglect or improper maintenance of your small off-road engine.

MANUFACTURER'S WARRANTY COVERAGE

1995 and later small off-road engines are warranted for two years. If any emission-related part on your engine is defective, the part will be repaired or replaced by Powerhorse.

OWNER'S WARRANTY RESPONSIBILITIES

As the small off-road engine owner, you are responsible for the performance of the required maintenance listed in your owner's manual. Powerhorse recommends that you retain all receipts covering maintenance on your small off-road engine. Powerhorse cannot deny warranty solely for the lack of receipts or for your failure to ensure the performance of all scheduled maintenance.

As the small off-road engine owner, you should however be aware that Powerhorse may deny you warranty coverage if your small off-road engine or a part has failed due to abuse, neglect, improper maintenance or unapproved modifications.

You are responsible for presenting your small off-road engine to an authorized Powerhorse service center as soon as a problem exists. The warranty repairs should be completed in a reasonable amount of time, not to exceed 30 days.

If you have any questions regarding your warranty rights and responsibilities, you should contact Powerhorse at 1-877-274-2214.

GENERAL EMISSIONS WARRANTY COVERAGE

The warranty period begins on the date the engine or equipment is delivered to an ultimate Purchaser. Powerhorse warrants to the ultimate purchaser and each subsequent purchaser that the engine is: (1) Designed,

built, and equipped so as to conform with all applicable regulations adopted by the Air Resources Board pursuant to its authority in Chapters 1 and 2, Part 5, Division 26 of the Health and Safety Code; and, (2) Free from defects in materials and workmanship that cause the failure of a warranted part to be identical in all material respects to the part as described in the Powerhorse's emission control system warranty manual for a period of two years. (3) Repair or replacement of any warranted part under the warranty provisions will be performed at no charge to the owner at a Powerhorse service center.

The warranty on emissions-related parts will be interpreted as follows: Any warranted part that is not scheduled for replacement as required maintenance in the written instructions supplied must be warranted for the warranty period specified in (2) above. If any such part fails during the period of warranty coverage, it must be repaired or replaced by Powerhorse according to (3) above. Any such part repaired or replaced under the warranty must be warranted for the remaining warranty period. Any warranted part that is scheduled only for regular inspection in the written instructions supplied must be warranted for the warranty period specified in (2) above. A statement in such written instructions to the effect of "repair or replace as necessary" will not reduce the period of warranty coverage. Any such part repaired or replaced under warranty must be warranted for the remaining warranty period.

Any warranted part that is scheduled for replacement as required maintenance in the written instructions supplied must be warranted for the period of time prior to the first scheduled replacement point for that part. If the part fails prior to the first scheduled replacement, the part will be repaired or replaced by Powerhorse according to (3) above. Any such part repaired or replaced under warranty will be warranted for the remainder of the period prior to the first scheduled replacement point for the part. Notwithstanding the provisions of (3) above, warranty services or repairs will be provided at all

Continued on next page

Emissions Control System Warranty CONTINUED

Powerhorse's service centers that are franchised to service the subject engines. The owner will not be charged for diagnostic labor that leads to the determination that a warranted part is in fact defective, provided that such diagnostic work is performed at an authorized Powerhorse service center.

Powerhorse is liable for damages to other engine components proximately caused by a failure under warranty of any warranted part. Throughout the engine's warranty period defined in (2) above, Powerhorse will maintain a supply of warranted parts sufficient to meet the expected demand for such parts. Any replacement part may be used in the performance of any warranty maintenance or repairs and will be provided without charge to the owner. Such use will not reduce the warranty obligations of Powerhorse. Add-on or modified parts may not be used. Such use will be grounds for disallowing a warranty claim. Powerhorse will not be liable to warrant failures of warranted parts caused by the use of such an add-on or modified part.

Manufacturers Warranty Information

ENGINE OWNER WARRANTY POLICY

Effective date: June 1, 2003

MANUFACTURER'S LIMITED WARRANTY STATEMENT

Powerhorse manufactures its engines and equipment to the highest level of quality to bring our customers unparalleled owner satisfaction. Powerhorse products are warranted to the original owner as follows:

WARRANTY COVERAGE

Powerhorse will repair or replace any part or parts of the engine that are found to be defective in material and workmanship or both, under normal use and maintenance, free of charge for the periods specified below. Transportation charges on parts submitted for repair or replacement under this warranty are charged to the purchaser. OEMs may include additional warranties at their discretion.

WARRANTY PERIOD

| PRODUCTS | |
|----------|---------|
| Engines | 2 years |

THERE IS NO OTHER EXPRESS WARRANTY MADE OR IMPLIED AND POWERHORSE DISCLAIMS ALL OTHER WARRANTIES, INCLUDING, WITHOUT LIMITATION, WARRANTIES OF PERFORMANCE, MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. IN NO EVENT AND UNDER NO THEORY WHATSOEVER, SHALL POWERHORSE BE LIABLE FOR ANY HARM OR DAMAGE, WHETHER DIRECT, INDIRECT, CONSEQUENTIAL OR SPECIAL, SUFFERED BY OWNER. OWNER'S SOLE REMEDY SHALL BE THE REPAIR OR REPLACEMENT OF THE DEFECTIVE POWERHORSE COMPONENT, PART OR EQUIPMENT THEREOF, AT POWERHORSE'S DISCRETION, ALL IN ACCORDANCE WITH THIS WRITTEN LIMITED WARRANTY. POWERHORSE HAS NOT AUTHORIZED ANY PERSON TO MODIFY, ALTER OR EXPAND THE WARRANTIES CONTAINED IN THIS DOCUMENT.

LIMITATION OF LIABILITY

It is understood and agreed that Powerhorse's liability and owner's sole remedy, whether in contract, under any warranty, in tort (including negligence) and strict liability or otherwise, shall not exceed the return of the amount of the purchase price paid by the owner and under no circumstances shall Powerhorse be liable for any special, incidental or consequential damages, including, but not limited to, personal injury, property damage, damage to or loss of equipment, lost profits or revenue, costs of renting replacements and other additional expenses, even if Powerhorse has been advised of the possibility of such damages. The price stated for the Powerhorse product is a consideration in limiting Powerhorse's Liability and owner's remedy. Some states do not allow the exclusion or limitation of incidental and consequential damages, and as such, the above language may not be applicable in such states that do not allow the exclusion or limitation of incidental and consequential damages. This Warranty gives you specific legal rights and you may also have other rights, which vary, from state to state.

If you have any questions regarding your warranty rights and responsibilities, you should contact:

Northern Tool + Equipment Co.,
2800 South Cross Drive West
P.O. Box 1499 Burnsville, MN 55337-0499

Phone Number: 1-866-443-2576

California Emission Control Warranty Statement

YOUR WARRANTY RIGHTS AND OBLIGATIONS

The California Air Resources Board and Powerhorse are pleased to explain the emission control system warranty on your 2006 and later small off-road engine (SORE). In California, new small off-road engines must be designed, built and equipped to meet the State's stringent anti-smog standards. Powerhorse must warrant the emission control system (EEC) on your small off-road engine for the periods of time listed below provided there has been no abuse, neglect or improper maintenance of your small off-road engine.

Your emission control system may include parts such as the carburetor, fuel tanks, fuel lines, fuel caps, valves, canisters, vapor hoses, clamps, connectors, and other associated components.

MANUFACTURER'S WARRANTY COVERAGE

This emissions control system is warranted for two years. If any emissions-related part on your equipment is defective, the part will be repaired or replaced by Powerhorse.

OWNER'S WARRANTY RESPONSIBILITIES

As the small off-road engine owner, you are responsible for the performance of the required maintenance listed in your owner's manual. Powerhorse recommends that you retain all receipts covering maintenance on your small off-road engine, but Powerhorse cannot deny warranty solely for the lack of receipts or for your failure to ensure the performance of all scheduled maintenance.

As the small off-road engine owner, you should however be aware that Powerhorse may deny you warranty coverage if your small off-road engine or a part has failed due to abuse, neglect, improper maintenance or unapproved modifications. You are responsible for presenting your small off-road engine to an authorized Powerhorse service center as soon as a problem exists. The warranty repairs should be completed in a reasonable amount of time, not to exceed 30 days.

If you have any questions regarding your warranty rights and responsibilities, you should contact:

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2800 South Cross Drive West
P.O. Box 1499 Burnsville, MN 55337-0499

Phone Number: 1-866-443-2576

General Emissions Warranty Coverage

YOUR WARRANTY RIGHTS AND OBLIGATIONS

Powerhorse's application for certification warrants to the ultimate purchaser and each subsequent purchaser that the engine is:

- (1) Designed, built, and equipped so as to conform with all applicable regulations and,
- (2) Free from defects in materials and workmanship that cause the failure of a warranted part to be identical in all material respects to the part as described in Powerhorse's application for certification.

WARRANTY PERIOD

The warranty period begins on the date the engine or equipment is delivered to an ultimate purchaser or first placed in service. The warranty period is two years.

WARRANTY COVERAGE FOR EMISSIONS-RELATED PARTS

Subject to certain conditions and exclusions as stated below, the warranty on emission-related parts is as follows:

- (1) Any warranted part that is not scheduled for replacement as required maintenance in the written instructions supplied is warranted for the warranty period stated above. If the part fails during the period of warranty coverage, the part will be repaired or replaced by Powerhorse according to subsection below. Any such part repaired or replaced under the warranty will be warranted for the remaining warranty period.
- (2) Any warranted part that is scheduled only for regular inspection in the written instructions supplied is warranted for the warranty period stated above. Any such part repaired or replaced under warranty will be warranted for the remaining warranty period.
- (3) Any warranted part that is scheduled for replacement as required maintenance in the written instructions supplied is warranted for the period of time before the first scheduled replacement date for that part. If the part fails prior to the first scheduled replacement, the part will be repaired or replaced by Powerhorse according to (4) below. Any such part repaired or replaced under warranty will be warranted for the

remainder of the period prior to the first scheduled replacement point for the part.

- (4) Repair or replacement of any warranted part under the warranty provisions herein will be performed at a warranty station at no charge to the owner.
- (5) Notwithstanding the provisions of herein, warranty services or repairs will be provided at all Powerhorse service centers that are franchised to service the subject engines.
- (6) The owner will not be charged for diagnostic labor that is directly associated with diagnosis of a defective, emission-related warranty part, provided that such diagnostic work is performed at a service center.
- (7) Powerhorse is liable for damages to other engine components proximately caused by a failure under warranty of any warranted part.
- (8) Throughout the engine's warranty period defined above, Powerhorse will maintain a supply of warranted parts sufficient to meet the expected demand for such parts.
- (9) Any replacement part may be used in the performance of any warranty maintenance or repairs and will be provided without charge to the owner. Such use will not reduce the warranty obligations of Powerhorse.
- (10) Add-on or modified parts that are not exempted by the Air Resources Board may not be used. The use of any non-exempted add-on or modified parts by the ultimate purchaser will be grounds for disallowing a warranty claim. Powerhorse will not be liable to warrant failures of warranted parts caused by the use of such an add-on or modified part.

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Warranted Parts

The repair or replacement of any warranted part otherwise eligible for warranty coverage may be excluded from such warranty coverage if Powerhorse demonstrates that the engine or equipment has been abused, neglected, or improperly maintained, and that such abuse, neglect, or improper maintenance was the direct cause of the need for repair or replacement of the part. That notwithstanding, any adjustment of a component that has a factory installed, and properly operating, adjustment limiting device is still eligible for warranty coverage. The following emission warranty parts list are covered:

- (1) Fuel Metering System
 - (i) Carburetor and internal parts (and/or pressure regulator or fuel injection system)
 - (ii) Cold start enrichment system
- (2) Air Induction System
 - (i) Intake manifold
- (3) Ignition System
 - (i) Magneto or electronic ignition system
 - (ii) Spark advance/retard system
- (4) Exhaust Gas Recirculation (EGR) System
 - (i) EGR valve body, and carburetor spacer if applicable
 - (ii) EGR rate feedback and control system
- (5) Air Injection System
 - (i) Air pump or pulse valve
 - (ii) Valves affecting distribution of flow
 - (iii) Distribution manifold
- (6) Catalyst or Thermal Reactor System
 - (i) Catalytic converter
 - (ii) Thermal reactor
 - (iii) Exhaust manifold
- (7) Particulate Control Traps
 - (i) Filters, precipitators, and any other device used to capture particulate emissions
- (8) Miscellaneous Items Used in Above Systems
 - (i) Vacuum, temperature, and time sensitive valves and switches
 - (ii) Electronic controls
 - (iii) Hoses, belts, connectors, and assemblies
- (9) Ignition System
 - (i) Fuel Line
 - (ii) Fuel Line Clamps

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Specifications

| Item | 208 | 291 | 414 |
|---------------------|--------------|--------------|--------------|
| Maximum speed | 3850±150rpm | 3850±150rpm | 3850±150rpm |
| Idle speed | 2150±50rpm | 2150±50rpm | 2150±50rpm |
| Compression | 8.5:1 | 8.2:1 | 8:1 |
| Displacement | 208cc | 291cc | 414cc |
| Cast iron sleeve | yes | yes | yes |
| Bore and stroke | 70mm x 54mm | 80mm x 58mm | 90mm x 65mm |
| Fuel | gasoline | gasoline | gasoline |
| Compression release | yes | yes | yes |
| Dry Weight | 36lbs / 15kg | 46lbs / 21kg | 58lbs / 26kg |
| Low oil shut off | if equipped | if equipped | if equipped |
| Fuel shut off valve | yes | yes | yes |



POWERHORSE™