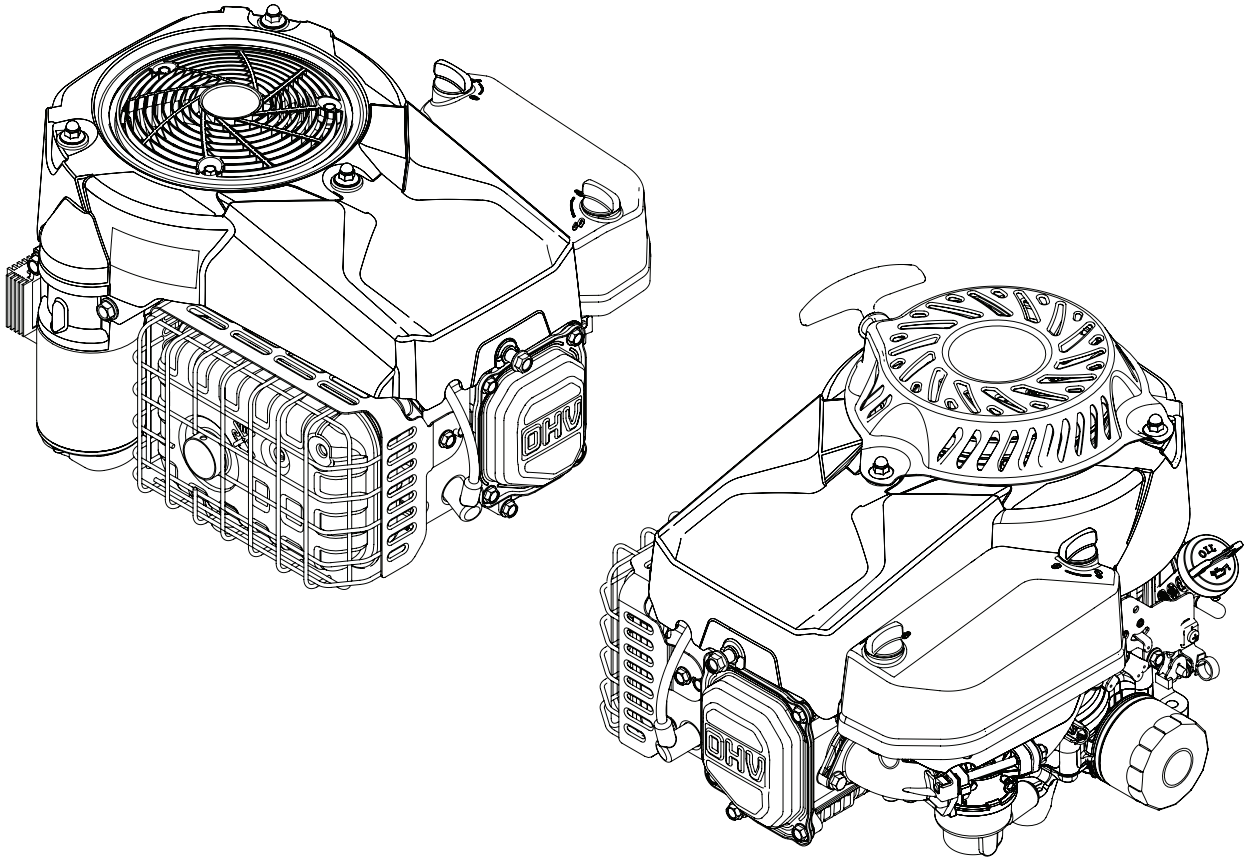


# OPERATOR'S MANUAL



## 382cc & 439cc OHV Vertical Shaft Engine

### **⚠ WARNING**

**READ AND FOLLOW ALL SAFETY RULES AND INSTRUCTIONS IN THIS MANUAL  
BEFORE ATTEMPTING TO OPERATE THIS ENGINE.  
FAILURE TO COMPLY WITH THESE INSTRUCTIONS MAY RESULT IN PERSONAL INJURY.**

MTD LLC, P.O. BOX 361131 CLEVELAND, OHIO 44136-0019



**Thank You**

This Operator’s Manual is an important part of your new engine. It will help you prepare and maintain the engine for the best performance. Please read and understand the contents before operating the engine.

**Table of Contents**

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**Record Product Information**

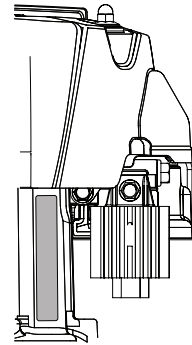
Before operating your new engine, please locate the model plate on the engine (shaded area in Figure below) and record the information in the provided area below. This information will be necessary, should you seek technical support via our web site or with your local dealer.

**MODEL NUMBER**

--	--	--	--	--	--	--	--

**SERIAL NUMBER**

--	--	--	--	--	--	--	--	--	--	--	--	--



**Customer Support**

*Please do NOT return the machine to the retailer or dealer without first contacting the Customer Support Department.*

If you have difficulty assembling this product, have questions regarding the controls, operation, or maintenance of this machine, want to order replacement parts/attachments/accessories, or want to view an online How-To video; you can seek help from the experts. Have your full model number and serial number ready. Choose from the options below:

- Web: [www.mtdproducts.com/equipment/mtdproducts](http://www.mtdproducts.com/equipment/mtdproducts)
- Phone: (800) 800-7310
- Mail: MTD LLC • P.O. Box 361131 • Cleveland, OH • 44136-0019

**⚠ WARNING!**

This symbol points out important safety instructions which, if not followed, could endanger the personal safety and/or property of yourself and others. Read and follow all instructions in this manual before attempting to operate the equipment. Failure to comply with these instructions may result in personal injury. When you see this symbol. **HEED ITS WARNING!**

**⚠ WARNING!**

**CALIFORNIA PROPOSITION 65**

Engine Exhaust, some of its constituents, and certain vehicle components contain or emit chemicals known to State of California to cause cancer and birth defects or other reproductive harm.

**⚠ DANGER!**

This engine was built to be operated according to the safe operation practices in this manual. As with any type of power equipment, carelessness or error on the part of the operator can result in serious injury. Failure to observe the following safety instructions could result in serious injury or death.

## Preparation

1. Wear sturdy, rough-soled work shoes and close fitting slacks and shirts. Loose fitting clothes or jewelry can be caught in the moving parts. Never operate the machine in bare feet or sandals.
2. Disengage clutch levers and shift (if equipped) into neutral ("N") before starting the engine.
3. Never leave the engine running while unattended.
4. Never attempt to make any adjustments while the engine is running, except where specifically recommended in the operator's manual.

## Safe Handling of Gasoline:

To avoid personal injury or property damage, use extreme care in handling gasoline. Gasoline is extremely flammable and the vapors are explosive. Serious personal injury can occur when gasoline is spilled on yourself and/or your clothes which can ignite. Wash your skin and change clothes immediately.

1. When adding fuel, turn engine OFF and let engine cool at least 2 minutes before removing the gas cap.
2. Fill fuel tank outdoors or in well ventilated area.
3. Use only an approved gasoline container.
4. Never fill containers inside a vehicle or on a truck or trailer bed with a plastic liner. Always place containers on the ground away from your vehicle before filling.
5. If possible, remove gas-powered equipment from the truck or trailer and refuel it on the ground. If this is not possible, then refuel such equipment on a trailer with a portable container, rather than from a gasoline dispenser nozzle.
6. Keep the nozzle in contact with the rim of the fuel tank or container opening at all times until fueling is complete. Do not use a nozzle lock-open device.
7. Do not overfill fuel tank. Fill tank to full as indicated by the fuel level indicator installed inside of the fuel tank or marked on the tank. Do not over-fill to allow space for fuel expansion. On some models, a fuel level indicator may NOT be present, in this instance, fill the tank no more than 1/2 inch below the bottom of the filler neck to allow space for fuel expansion.
8. Replace fuel cap and tighten until the cap ratchets.
9. If gasoline is spilled, wipe it off the engine and the equipment. Move the machine to another area. Wait five minutes before starting the engine.

10. To reduce fire hazards, keep the machine free of grass, leaves or other debris build up. Clean up oil or fuel spillage and remove any fuel-soaked debris.
11. Keep gasoline away from sparks, open flames, pilot lights, heat, and other ignition sources.
12. Never fuel equipment indoors because flammable vapors will accumulate in the area.
13. Extinguish all cigarettes, cigars, pipes, and other sources of ignition.
14. Check fuel line, tank, cap, and fittings frequently for cracks or leaks. Replace if necessary.

## Operation

1. When starting the engine, make sure spark plug, muffler, and fuel cap are in place.
2. Do not crank engine with spark plug removed.
3. If fuel spills, wait until it evaporates before starting engine.
4. Allow muffler, engine cylinder, and fins to cool before touching.
5. Keep children away from hot or running engines. They can suffer burns from a hot muffler.
6. Remove accumulated combustibles from muffler and cylinder area.
7. Operate equipment with all guards in place.
8. Keep hands and feet away from rotating parts.
9. Tie up long hair and remove jewelry.
10. Do not wear loose-fitting clothing, dangling drawstrings or items that could become caught.
11. When starting the engine, pull cord slowly until resistance is felt, then pull rapidly (if not electric start).
12. Remove all external equipment/engine loads before starting engine.
13. Direct coupled equipment components such as, but not limited to blades, impellers, pulleys, sprockets, etc., must be securely attached.

## Training

1. Read, understand and follow all instructions on the engine and in the manual(s) before attempting to assemble and operate. Keep this manual in a safe place for future and regular reference and for ordering replacement parts.
2. Be familiar with all controls and their proper operation. Know how to stop the engine and disengage them quickly.
3. Never allow children under 14 years of age to operate the engine. Children 14 and over should read and understand the instructions and safe operation practices in this manual and be trained and supervised by an adult.
4. Never allow adults to operate the machine without proper instruction.
5. Keep the area of operation clear of all persons, particularly small children and pets. Stop machine if anyone enters the area.

## Maintenance & Storage

1. Keep the engine in safe working order
2. Allow the engine to cool at least five minutes before storing. Never tamper with safety devices. Check their proper operation regularly.
3. Check bolts and screws for proper tightness at frequent intervals to keep the engine in safe working condition. Visually inspect the engine for any damage.
4. Before cleaning, repairing or inspecting; stop the engine and make certain all moving parts have stopped. Disconnect the spark plug wire and ground it against the engine to prevent unintended starting.
5. Do not change the engine governor settings or over-speed the engine. The governor controls the maximum safe operating speed of the engine.
6. Maintain and replace safety and instruction labels as necessary.

7. Always refer to the operator's manual for important details if the machine is to be stored for an extended period of time.
8. If the fuel tank has to be drained, do this outdoors.
9. Observe proper disposal laws and regulations for gas, oil, etc. to protect the environment.

## Do not modify engine

To avoid serious injury or death, do not modify engine in any way. Tampering with the governor setting can lead to a runaway engine and cause it to operate at unsafe speeds. Never tamper with factory setting of engine governor.

## Notice Regarding Emissions

Engines which are certified to comply with California and federal EPA emission regulations for SORE (Small Off Road Equipment) are certified to operate on regular unleaded gasoline, and may include the following emission control systems: Engine Modification (EM), Oxidizing Catalyst (OC), Secondary Air Injection (SAI) and Three Way Catalyst (TWC) if so equipped.

## Spark Arrestor

### ▲ WARNING!

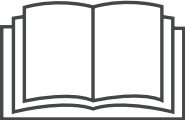




This machine is equipped with an internal combustion engine and should not be used on or near any unimproved forest-covered, brush covered or grass-covered land unless the engine's exhaust system is equipped with a spark arrestor meeting applicable local or state laws (if any).

If a spark arrestor is used, it should be maintained in effective working order by the operator. In the State of California the above is required by law (Section 4442 of the California Public Resources Code). Other states may have similar laws. Federal laws apply on federal lands.

A spark arrestor for the muffler is available through your nearest engine authorized service dealer or contact the service department, P.O. Box 361131 Cleveland, Ohio 44136-0019.

## Safety Symbols

This page depicts and describes safety symbols that may appear on this product. Read, understand, and follow all instructions on the machine before attempting to assemble and operate.

Symbol	Description
	<b>READ THE OPERATOR'S MANUAL(S)</b> Read, understand, and follow all instructions in the manual(s) before attempting to assemble and operate.
	<b>WARNING—GASOLINE IS FLAMMABLE</b> Allow the engine to cool at least two minutes before refueling.
	<b>WARNING— CARBON MONOXIDE</b> Never run an engine indoors or in a poorly ventilated area. Engine exhaust contains carbon monoxide, an odorless and deadly gas.
	<b>WARNING— ELECTRICAL SHOCK</b> Do not use the engine's electric starter in the rain.
	<b>WARNING— HOT SURFACE</b> Engine parts, especially the muffler, become extremely hot during operation. Allow engine and muffler to cool before touching.

### ▲ WARNING! - SAVE THESE INSTRUCTIONS!

Your Responsibility — Restrict the use of this power machine to persons who read, understand and follow the warnings and instructions in this manual and on the machine.

## Gas & Oil

**NOTE:** The engine is shipped without gasoline and with motor oil in the engine. However, you **MUST** check the oil level before operating. Be careful not to overfill. Running the engine with insufficient oil can cause serious engine damage and void the engine warranty.

### ▲ WARNING!

Always keep hands and feet clear of equipment moving parts. Do not use a pressurized starting fluid. Vapors are flammable.

## Oil Recommendations

Before starting engine, check oil level. Refer to viscosity chart in Figure 3-1 for oil recommendations. Do not over-fill. Use a 4-stroke, or an equivalent high detergent, premium quality motor oil certified to meet or exceed U.S. automobile manufacturer's requirements for service classification of a minimum level SJ (higher letter ratings are acceptable such as SL and SM grades). Motor oil will display this designation on the container. SAE 10W-30 is recommended for general, all temperature use. If single viscosity oil is used, select the appropriate viscosity for the average temperature in your area from the chart below.

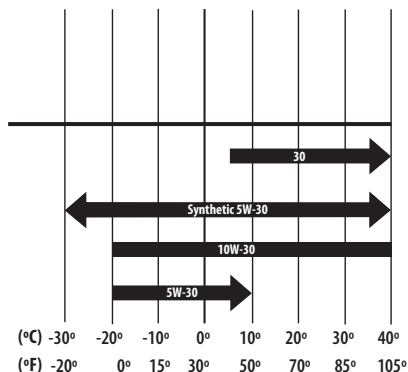


Figure 3-1

**CAUTION:** Do not use non-detergent oil or 2-stroke engine oil. It could shorten the engine's service life.

**NOTE:** A 5w30 synthetic oil may be used to improve start ability for cold weather (temperatures below 40° F).

## Checking Oil Level

**NOTE:** Be sure to check the oil while on a level surface with the engine stopped.

1. Remove the oil filler cap/dipstick and wipe the dipstick clean.
2. Insert the dipstick into the oil filler neck. Turn the dipstick a 1/4 turn into the locked position to fully seat. See Figure 3-2.

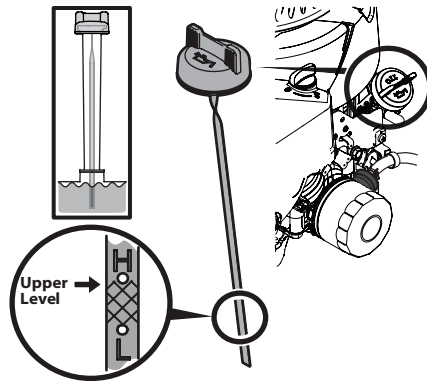


Figure 3-2

3. Remove dipstick to check the oil level.
4. If the level is low, slowly add oil to the upper limit on the dipstick. See Figure 3-2 inset.
5. Reinsert the dipstick and turn to the locked position before starting the engine.

**NOTE:** Do not overfill. Overfilling with oil may cause smoking, hard starting, spark plug fouling, hydraulic lock, or oil saturation of air cleaner.

## Fuel Requirements

### ▲ CAUTION

Operating the engine with E15 or E85 fuel, an oil/gasoline mixture, dirty gasoline, or **gasoline over 30 days old** without fuel stabilizing additive may result in **damage to your engine's carburetor. Subsequent damage would not be covered under the manufacturer's warranty.**

Use automotive gasoline (unleaded or low leaded to minimize combustion chamber deposits) with a minimum of 87 octane. Gasoline with up to 10% ethanol (E10) or 15% MTBE (Methyl Tertiary Butyl Ether) can be used. Never use an oil/gasoline mixture or dirty gasoline. Avoid getting dirt, dust, or water in the fuel tank. **DO NOT use E15 or E85 gasoline.**

### ▲ WARNING!

**Gasoline is extremely flammable and is explosive under certain conditions.**

- Refuel in a well-ventilated area with the engine stopped. Do not smoke or allow flames or sparks in the area where the engine is refueled or where gasoline is stored.
- Do not overfill the fuel tank. After refueling, make sure the tank cap is closed properly and securely.

- Be careful not to spill fuel when refueling. Spilled fuel or fuel vapor may ignite. If any fuel is spilled, make sure the area is dry before starting the engine.
- Avoid repeated or prolonged contact with skin or breathing of vapor.

## Adding Fuel

### ▲ WARNING!

An adult should fuel this engine. **NEVER** allow children to refuel the engine. Gasoline (fuel) vapors are highly flammable and can explode. Fuel vapors can spread and be ignited by a spark or flame many feet away from engine. To prevent injury or death from fuel fires, follow these instructions:

- **DO NOT use leaded fuel.**
- **Fuel must be fresh and clean. NEVER use fuel left over from last season or stored for long periods.**
- **NEVER mix oil with fuel in this engine.**
- **DO NOT use fuel containing Methanol (Wood Alcohol)**

**NOTE:** Before refueling, allow engine to cool two minutes.

1. Clean around fuel fill before removing cap to fuel.
2. Fill tank until fuel reaches 1/2 inch below the bottom of the filler neck to allow space for fuel expansion. Be careful not to overfill.
3. Replace the fuel cap and tighten securely. Wipe up spilled fuel before starting engine. If fuel is spilled **DO NOT** start engine. Move machine away from area of spillage. Avoid creating any source of ignition until fuel vapors are gone.

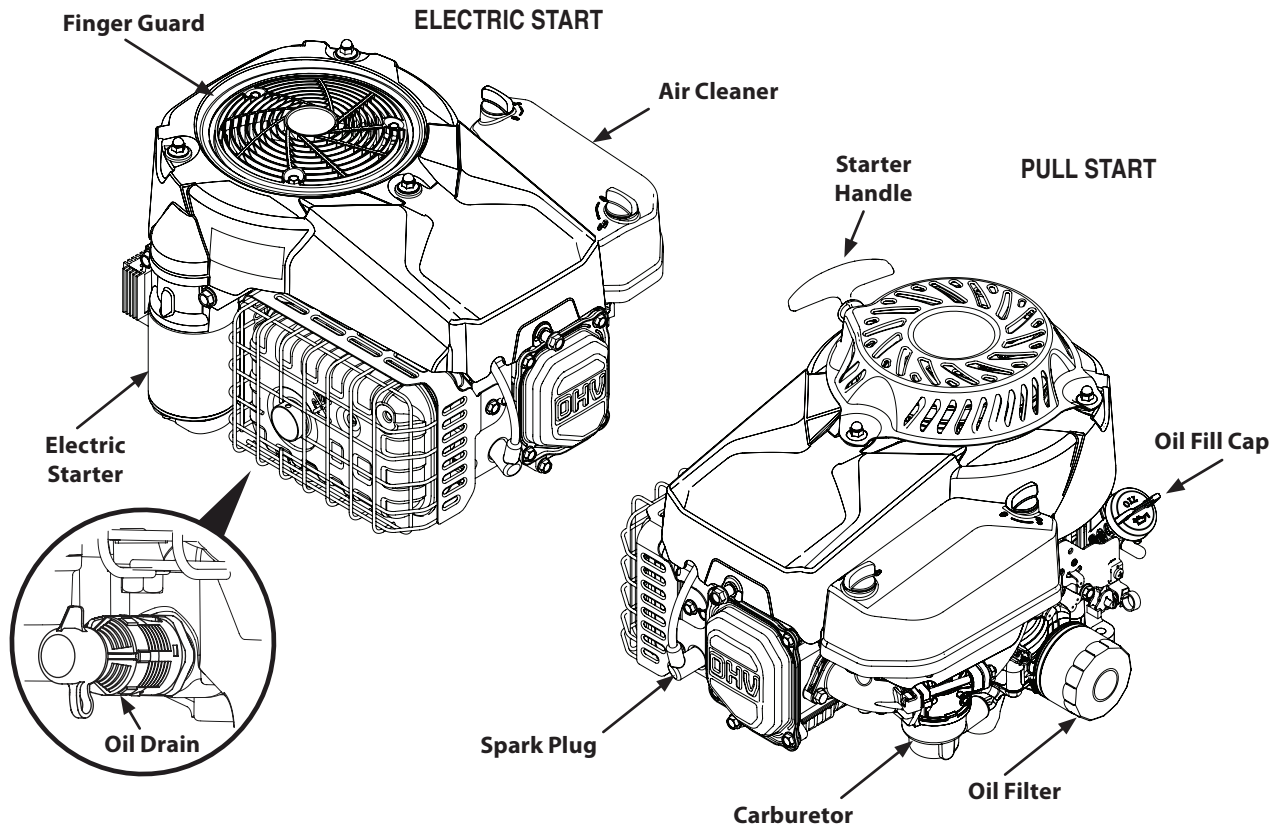


Figure 4-1

### Throttle Control

The throttle control is located on the mower and is used to aid in starting/stopping the engine and adjusting engine speeds. Refer to the Controls and Features section of the mower manual for more information regarding this control.

### Oil Drain

Opening the oil drain valve will drain the oil from the engine. The engine is equipped with a side drain.

**NOTE:** Select engines are equipped with a drain plug instead of the drain valve.

### Oil Fill Cap

Remove the oil fill cap to check the oil level and add oil.

### Fuel Cap

Remove the fuel cap to add fuel. Refer to the Operator's Manual shipped with machine for the location of the fuel cap.

## Pre-Operation Check

The engine is shipped without gasoline and with oil in the engine. See the Set-Up Section of this manual for instructions on adding gasoline and checking oil.

## Starting the Engine

### For Mowers Equipped with Electric Start

1. Release all controls on the mower.
2. Move the gear shift lever into the neutral (N) position.
3. Insert the key into the ignition switch.
4. Turn the ignition key clockwise to the START position. After the engine starts, release the key. It will return to the RUN position. See Figure 5-1.

#### ⚠ CAUTION:

DO NOT hold the key in the START position for longer than five seconds at a time. Doing so may cause damage to your engine's electric starter.

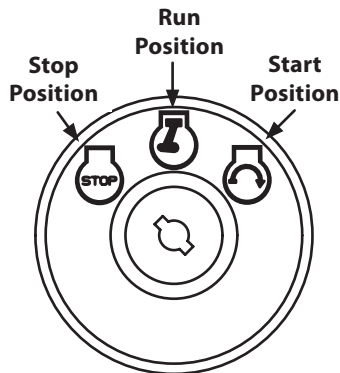


Figure 5-1

5. Move the throttle control into the FAST (rabbit) position.

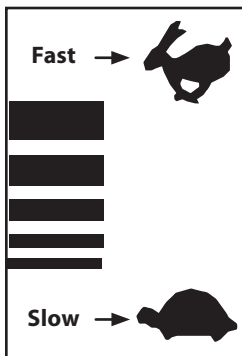


Figure 5-2

### For Mowers Equipped with Recoil Start

1. Release all controls on the mower.
2. Move the gear shift lever into the neutral (N) position.
3. Insert the key into the ignition switch.
4. Turn the ignition key clockwise to the RUN position. See Figure 5-1.
5. Grasp starter rope handle and pull slowly until rope pulls slightly harder. Let rope rewind slowly. Then pull rope with a rapid, full arm stroke. Let rope return slowly. If engine fails to start after three pulls, repeat instructions (try setting throttle at fast setting).
6. Move the throttle control into the FAST (rabbit) position. See Figure 5-2.

#### Starter Rope Handle

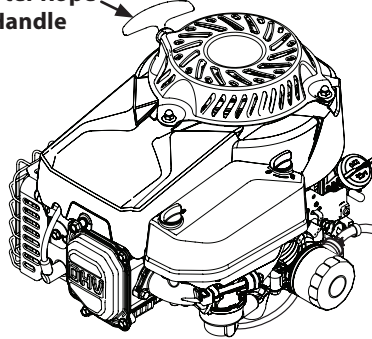


Figure 5-3

## Stopping the Engine

#### ⚠ WARNING!

If you strike a foreign object, stop the engine and remove the ignition key (if so equipped). Thoroughly inspect the machine for any damage. Repair the damage before restarting and operating.

1. If the blades are engaged, disengage the PTO.
2. Turn the ignition key counterclockwise to the STOP position.
3. Remove the key from the ignition switch to prevent unintended starting.

**▲ WARNING!**

Shut off the engine before performing any maintenance. To prevent accidental start-up, disconnect the spark plug boot.

Periodic inspection and adjustment of the engine is essential if high level performance is to be maintained. Regular maintenance will also ensure a long service life. The required service intervals and the kind of maintenance to be performed are described in the table below. Follow the hourly or calendar intervals, whichever occur first. More frequent service is required when operating in adverse conditions.

**▲ WARNING!**

If the engine has been running, the muffler will be very hot. Be careful not to touch the muffler.

## Maintenance Schedule

	After First 5 Hours	Each use or Every 5-10 Hrs.	Every Season or 25 Hours	Every season or 50 Hours	Every season or 100 Hours	Service Dates
Check Engine Oil Level		✓				
Change Engine Oil ††	✓			✓		
Change Engine Oil Filter ††				✓		
Check Air Cleaner		✓				
Service Air Cleaner †					✓	
Check Spark Plug			✓			
Replace Spark Plug					✓	
Clean Cooling Fins			✓			
Replace Fuel Filter					✓	
Clean Finger Guard and around Muffler		✓				

† Service more frequently when used in dusty areas.

†† Every season or 25 hours if operating under heavy load or high ambient temperature.

## Oil Service

- Check oil level regularly.
- Be sure correct oil level is maintained. Check every five to ten hours before starting engine. See oil checking procedure in the Set-Up section.

**NOTE:** Select engines are equipped with a drain plug instead of the drain valve. For these engines see the equipment manual for oil change procedures.

## Oil Drain

**IMPORTANT:** Be sure to check engine on a level surface with the engine stopped. Drain the oil while the engine is still warm to assure rapid and complete draining.

1. Locate the oil drain valve (a) and place a suitable container below the plug.
2. Remove the drain cap (b).

**NOTE:** If necessary, push the oil drain hose (if provided) onto the oil drain valve. Route the opposite end of the hose into an appropriate oil collection container with at least a 2.5 quart capacity, to collect the used oil.

3. Turn the drain plug valve 1/4 turn counterclockwise while gently pulling the valve away from the engine to open the oil drain valve.
4. Allow oil to drain into a suitable container.
5. Reverse STEPS 4-3 to close the oil drain valve and reinstall the drain cap.

**IMPORTANT:** Used motor oil may cause skin cancer if repeatedly left in contact with the skin for prolonged periods. Although this is unlikely unless you handle used oil on a daily basis, it is still advisable to thoroughly wash your hands with soap and water as soon as possible after handling used oil.

**NOTE:** Please dispose of used motor oil in a manner that is compatible with the environment. Check with your local municipality for proper disposal procedure. Do not throw it in the trash or pour it on the ground.

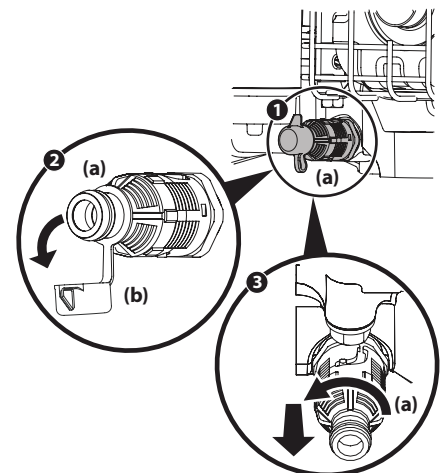


Figure 6-1



## Replace Oil Filter

This engine is equipped with a spin-on oil filter that should be replaced each time an oil change is performed, every season or 50 hours. Refer to Figure 6-2.

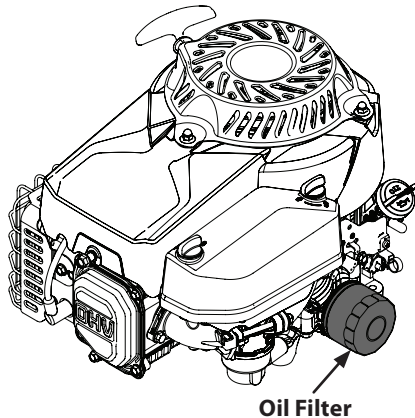


Figure 6-2

1. Drain oil. See oil drain section.
2. Remove oil filter. Dispose of old oil filter properly.
3. Lube gasket of new oil filter with clean oil.
4. Install and turn oil filter by hand until the gasket comes in contact with the sealing surface of the crankcase cover, then tighten the oil filter, 10-12 Nm (88.5-106.2 in-lb), 1/2-3/4 turn.
5. Add oil. See add oil section.
6. Make sure dipstick is installed.
7. Start and run engine. Check for leaks.
8. Stop engine. Wait a few minutes and check the oil level. See checking oil level section.
9. Install and tighten dipstick.

## Add Oil

**IMPORTANT:** Be sure to check engine on a level surface with the engine stopped.

1. Wipe around dipstick cap and tube with a clean cloth to remove any debris. See Figure 6-3.

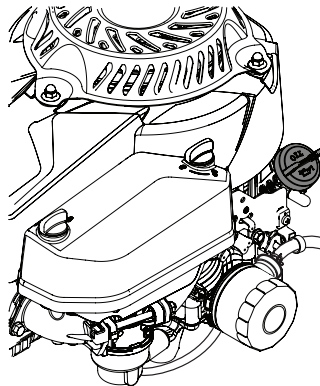


Figure 6-3

2. Remove dipstick and wipe clean with a cloth.
3. Pour oil into the dipstick tube. Do not over fill. With an oil filter change the high level amount of oil for this engine is 1400 ml (47.34 fl-oz.).
4. Install dipstick and turn to locked position before starting engine.
5. Start engine. Allow to run for a few seconds and then shut down the engine.
6. Check the oil level. See Checking Oil Level section.

## Air Filter Service

Paper filters cannot be cleaned and should be replaced every 100 operating hours; more often if used in extremely dusty conditions.

### ▲ WARNING!

Never use gasoline or low flash point solvents for cleaning the air filter element. A fire or explosion could result.

**IMPORTANT:** Never run the engine without the air filter. Rapid engine wear will result.

1. Unscrew a 1/4 turn and remove the thumb screws.
2. Remove the air filter cover. See Figure 6-4.

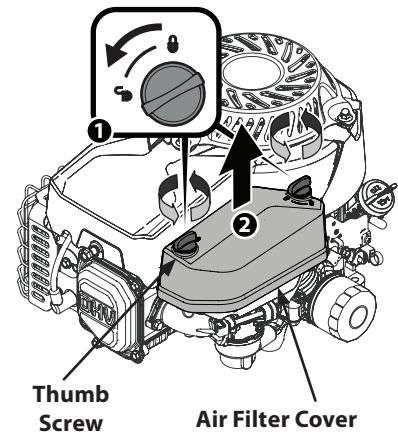


Figure 6-4

3. Pull up on an angle and then forward to remove the air filter. See Figure 6-5.

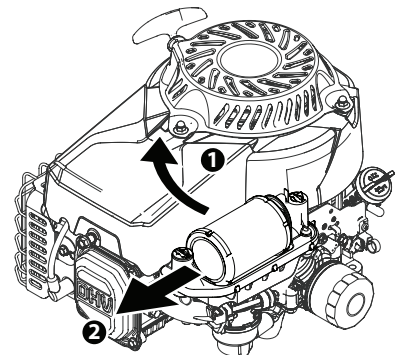


Figure 6-5

4. Remove the foam pre-filter from around the paper air filter. See Figure 6-6. Replace paper element when dirty or damaged. Clean foam element or replace when damaged.

**NOTE:** The foam element cannot be purchased separately. Air filter is only sold as an assembly.

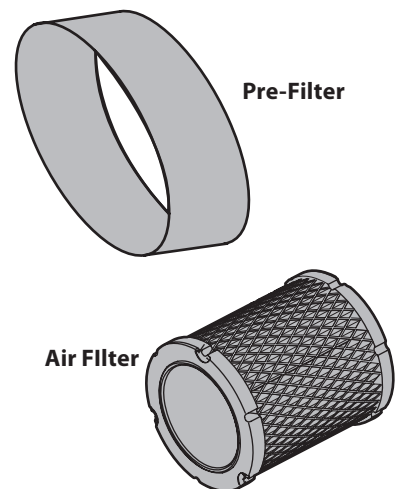
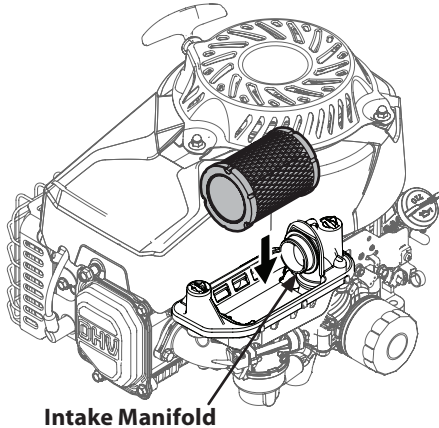


Figure 6-6

- To clean foam element, wash in a mild liquid detergent and water. Squeeze or press the foam element to rinse out dirt and water. Do not twist; this could damage or tear the foam element. Allow to dry thoroughly before using. DO NOT oil the foam element.
- Attach the new air filter with foam element, aligning the hole in the air filter with the intake manifold. See Figure 6-7.



Intake Manifold

Figure 6-7

- Attach the air filter cover. See Figure 6-8. Turn thumb screws clockwise a 1/4 turn until snug. Check for any misalignment.

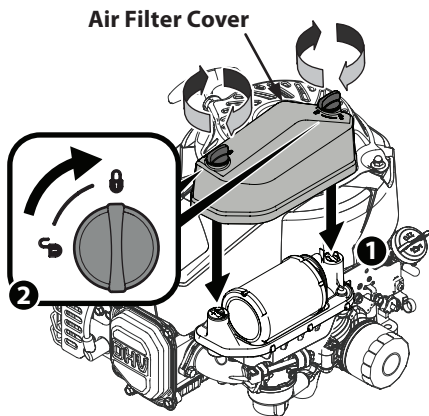


Figure 6-8

## Spark Plug Service

### ⚠ WARNING!

DO NOT check for spark with spark plug removed.  
DO NOT crank engine with spark plug removed.

### ⚠ WARNING!

If the engine has been running, the muffler will be very hot. Be careful not to touch the muffler.

To ensure proper engine operation, the spark plug must be properly gapped and free of deposits.

- Remove the spark plug boot and use a spark plug wrench to remove the plug. See Figure 6-9.

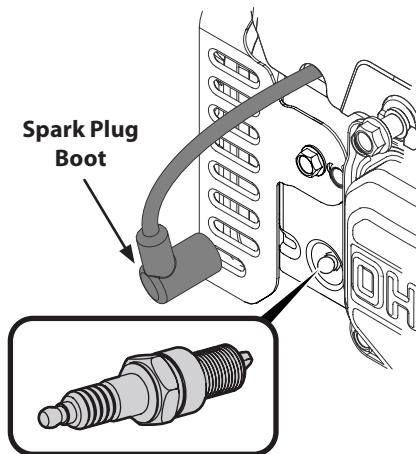


Figure 6-9

- Visually inspect the spark plug. Discard the spark plug if there is apparent wear, or if the insulator is cracked or chipped. Clean the spark plug with a wire brush if it is to be reused.
- Measure the plug gap with a feeler gauge. Correct as necessary by bending electrode. See Figure 6-10. The gap should be set to 0.024-0.031 in.

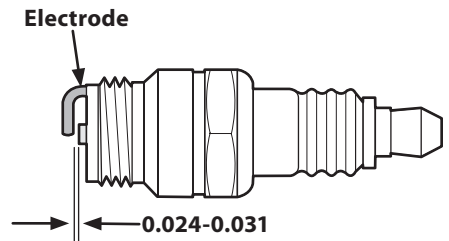


Figure 6-10

- Check that the spark plug washer is in good condition and thread the spark plug in by hand to prevent cross-threading.
- After the spark plug is seated, tighten with a spark plug wrench to compress the washer.

**NOTE:** When installing a new spark plug, tighten 1/2 turn after the spark plug seats to compress the washer. When reinstalling a used spark plug, tighten 1/8-1/4 turn after the spark plug seats to compress the washer.

**IMPORTANT:** The spark plug must be securely tightened. An improperly tightened spark plug can become very hot and may damage the engine.

## Fuel Filter Service

The fuel filter cannot be cleaned and should be replaced every 100 operating hours; more often if run with old gasoline.

1. Remove all fuel from tank by running engine until it stops from lack of fuel.
2. Use pliers to squeeze tabs on the clamps, then slide the clamps away from the fuel filter. See Figure 6-11.

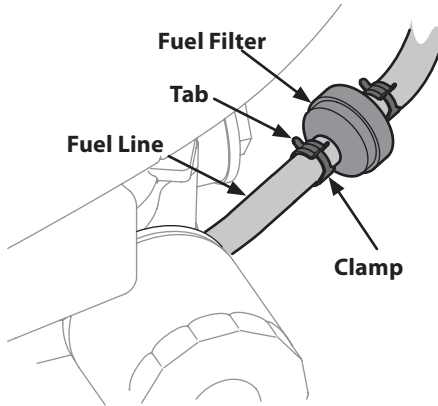


Figure 6-11

3. Twist and pull the fuel lines off of the fuel filter.
4. Replace with a new fuel filter.
5. Secure the fuel lines with the clamps.

## Clean Engine

If the engine has been running, allow it to cool for at least half an hour before cleaning. Periodically remove dirt build-up from engine. Clean cooling fins every 25 hours. Clean with a brush or compressed air.

**IMPORTANT:** Do not spray engine with water to clean because water could contaminate fuel. Using a garden hose or pressure washing equipment can also force water into the air cleaner or muffler opening. Water in the air cleaner will soak the paper element, and water that passes through the element or muffler can enter the cylinder, causing damage.

### ▲ WARNING!

Accumulation of debris around muffler could cause a fire. Inspect and clean before every use.

## Storage

### ▲ CAUTION

Failure to use a fuel stabilizing additive or completely run the engine until it's out of fuel before off-season storage may result in damage to your engine's carburetor. Subsequent damage would **not** be covered under the manufacturer's warranty.

Gasoline that will be stored longer than 30 days needs to be pre-treated upon purchase with fuel stabilizer to prevent gum and varnish from forming in the engine's fuel and intake system. Improper fuel storage can result in hard starting, no starting, stalling and poor performance. If the gasoline in your engine deteriorates during storage, you may need to have the carburetor, and other fuel system components, serviced or replaced.

1. Remove all fuel from tank by running engine until it stops from lack of fuel.

### ▲ WARNING!

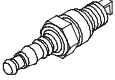


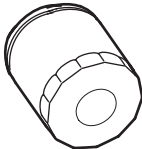
Never leave engine unattended while running.

2. Change oil. See Oil Change section.
3. Remove spark plug and pour about 1/2 an ounce of engine oil into cylinder. Replace spark plug and crank slowly to distribute oil.
4. Clean debris from around engine, under finger guard, and under, around and behind muffler. Touch up any damaged paint, and coat other areas that may rust with a light film of oil.
5. Store in a clean, dry and well ventilated area away from any appliance that operates with a flame or pilot light, such as a furnace, water heater, or clothes dryer. Also avoid any area with a spark producing electric motor, or where power tools are operated.
6. If possible, also avoid storage areas with high humidity, because that promotes rust and corrosion.
7. Keep the engine level in storage. Tilting can cause fuel or oil leakage.

## Removing From Storage

1. Check your engine as described in the Pre-Operation Check section of this manual. Check for debris under blower housing.
2. If the fuel was drained during storage preparation, fill the tank with fresh gasoline. If you keep a container of gasoline for refueling, make certain it contains only fresh fuel. Gasoline oxidizes and deteriorates over time, causing hard starting.
3. If the cylinder was coated with oil during storage preparation, the engine will smoke briefly at startup. This is normal.

Problem	Cause	Remedy
<b>Engine Fails to start</b>	<ol style="list-style-type: none"> <li>1. Auto choke system not functioning.</li> <li>2. Spark plug boot disconnected.</li> <li>3. Fuel tank empty or stale fuel.</li> <li>4. Faulty spark plug.</li> <li>5. Reduced fuel flow/Blocked fuel filter.</li> <li>6. Engine flooded.</li> <li>7. Dead battery.</li> <li>8. Blown fuse.</li> </ol>	<ol style="list-style-type: none"> <li>1. Clean Grass clippings and debris from around the carburetor and blower housing.</li> <li>2. Connect wire to spark boot.</li> <li>3. Fill tank with clean, fresh gasoline.</li> <li>4. Clean, adjust gap, or replace.</li> <li>5. Replace fuel filter as instructed in the Maintenance section.</li> <li>6. Crank engine with throttle in FAST position.</li> <li>7. Recharge battery. See equipment operator's manual.</li> <li>8. Replace blown fuse. See equipment operator's manual.</li> </ol>
<b>Engine runs erratic</b>	<ol style="list-style-type: none"> <li>1. Spark plug boot loose.</li> <li>2. Reduced fuel flow/Blocked fuel filter.</li> <li>3. Vent in gas cap plugged.</li> <li>4. Water or dirt in fuel system.</li> <li>5. Dirty air cleaner.</li> </ol>	<ol style="list-style-type: none"> <li>1. Connect and tighten spark plug boot.</li> <li>2. Replace fuel filter as instructed in the Maintenance section.</li> <li>3. Clear vent.</li> <li>4. Drain fuel tank. Refill with fresh fuel.</li> <li>5. Replace air cleaner element and/or clean pre-cleaner.</li> </ol>
<b>Engine overheats</b>	<ol style="list-style-type: none"> <li>1. Engine oil level low.</li> <li>2. Air flow restricted.</li> </ol>	<ol style="list-style-type: none"> <li>1. Fill crankcase with proper oil.</li> <li>2. Clean grass clippings and debris from around the engine's cooling fins and blower housing.</li> </ol>
<b>Occasional skips (hesitates) at high speed</b>	<ol style="list-style-type: none"> <li>1. Spark plug gap too close.</li> </ol>	<ol style="list-style-type: none"> <li>1. Remove spark plug and adjust gap.</li> </ol>
<b>Idles poorly</b>	<ol style="list-style-type: none"> <li>1. Spark plug fouled, faulty, or gap too wide.</li> <li>2. Dirty air cleaner.</li> </ol>	<ol style="list-style-type: none"> <li>1. Reset gap or replace spark plug.</li> <li>2. Replace air cleaner element and/or clean pre-cleaner.</li> </ol>

Component	Part Number and Description
	951-10292 Spark Plug
	937-05129 Air Filter Assembly (Includes Pre-Filter)
	951-3013 Fuel Filter
	951-12690 Oil Filter

Phone (800) 800-7310 or (330) 220-4683 to order replacement parts or a complete Parts Manual (have your full model number and serial number ready). Parts Manual downloads are also available free of charge at [www.mtdproducts.com](http://www.mtdproducts.com).

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