

KOHLER Command PRO

HORIZONTAL CRANKSHAFT

CH270

CH395

CH440



Congratulations – You have selected a fine four-cycle, single cylinder, air-cooled engine. Kohler designs long life strength and on-the-job durability into each engine...making a Kohler engine dependable...dependability you can count on. Here are some reasons why:

- Efficient overhead valve design provide maximum power, torque, and reliability under all operating conditions.
- Dependable, maintenance-free electronic ignition ensures fast, easy starts time after time.
- Kohler engines are easy to service. All routine service areas (like the dipstick and oil fill, air cleaner, and spark plugs) are easily and quickly accessible.
- Parts subject to the most wear and tear (like the cylinder liner and camshaft) are made from precision formulated cast iron.
- Every Kohler engine is backed by a worldwide network of over 10,000 distributors and dealers. Service support is just a phone call away. Call 1-800-544-2444 (U.S. & Canada) for Sales & Service assistance. Or visit www.KohlerEngines.com.

To keep your engine in top operating condition, follow the maintenance procedures in this manual.

**California
Proposition 65 Warning**

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

Table of Contents

| | | | |
|---|-----|---|-------|
| Congratulations | 2 | Ignition System | 15 |
| Safety Precautions | 3-5 | Check Spark Plug | 15 |
| Symbols Associated with This Product | 5 | Fuel Tank Filter | 15 |
| Control and Service Point Locations | 6 | Fuel Valve | 16 |
| Oil Recommendations | 7 | Muffler Screen | 17 |
| Oil Type | 7 | Clean Air Intake/Cooling Areas | 17 |
| Fuel Recommendations | 7 | Carburetor Troubleshooting and | |
| General Fuel Recommendations | 7 | Adjustments | 18 |
| Fuel Type | 7 | Troubleshooting | 18 |
| Operating Instructions | 8 | Troubleshooting | 19 |
| Pre-Start Checklist | 8 | Storage | 19 |
| Cold Weather Starting Hints | 8 | Transport | 19 |
| Starting | 8 | Major Repair | 20 |
| Stopping | 9 | Parts Ordering | 20 |
| Operating | 10 | Specifications | 20 |
| Angle of Operation | 10 | Engine Warranty | 21 |
| Cooling | 10 | Emission Control System Warranty | 22-23 |
| Maintenance Instructions | 11 | | |
| Maintenance Schedule | 11 | | |
| Check Oil Level | 11 | | |
| Change Oil | 12 | | |
| Service Precleaner and Air Cleaner Element | 13 | | |
| Service Precleaner (If Equipped) | 13 | | |
| Service Paper Element | 14 | | |

Safety Precautions

To ensure safe operation please read the following statements and understand their meaning. Also refer to your equipment owner's manual for other important safety information. This manual contains safety precautions which are explained below. Please read carefully.

WARNING

Warning is used to indicate the presence of a hazard that *can* cause *severe* personal injury, death, or substantial property damage if the warning is ignored.

CAUTION

Caution is used to indicate the presence of a hazard that *will* or *can* cause *minor* personal injury or property damage if the caution is ignored.



NOTE

Note is used to notify people of installation, operation, or maintenance information that is important but not hazard-related.

For Your Safety!



These precautions should be followed at all times. Failure to follow these precautions could result in injury to yourself and others.

Safety Precautions (Continued)

| |
|--|
|  WARNING |
|  |
| Explosive Fuel can cause fires and severe burns. Do not fill the fuel tank while the engine is hot or running. |

Explosive Fuel!

Gasoline is extremely flammable and its vapors can explode if ignited. Store gasoline only in approved containers, in well ventilated, unoccupied buildings, away from sparks or flames. Do not fill the fuel tank while the engine is hot or running, since spilled fuel could ignite if it comes in contact with hot parts or sparks from ignition. Do not start the engine near spilled fuel. Never use gasoline as a cleaning agent.

| |
|---|
|  WARNING |
|  |
| Carbon Monoxide can cause severe nausea, fainting or death. Avoid inhaling exhaust fumes, and never run the engine in a closed building or confined area. |

Lethal Exhaust Gases!

Engine exhaust gases contain poisonous carbon monoxide. Carbon monoxide is odorless, colorless, and can cause death if inhaled. Avoid inhaling exhaust fumes, and never run the engine in a closed building or confined area.

| |
|---|
|  WARNING |
|  |
| Hot Parts can cause severe burns. Do not touch engine while operating or just after stopping. |

Hot Parts!



Engine components can get extremely hot from operation. To prevent severe burns, do not touch these areas while the engine is running, or immediately after it is turned off. Never operate the engine with heat shields or guards removed.

Safety Precautions (Continued)

| |
|---|
|  WARNING |
|  |
| <p>Accidental Starts can cause severe injury or death.</p> <p>Disconnect and ground spark plug leads before servicing.</p> |



Accidental Starts!

Disabling engine. Accidental starting can cause severe injury or death. Before working on the engine or equipment, disable the engine as follows: 1) Disconnect the spark plug lead(s). 2) Disconnect negative (-) battery cable from battery.

| |
|--|
|  WARNING |
|  |
| <p>Rotating Parts can cause severe injury.</p> <p>Stay away while engine is in operation.</p> |

Rotating Parts!














Keep hands, feet, hair, and clothing away from all moving parts to prevent injury. Never operate the engine with covers, shrouds, or guards removed.

| |
|---|
|  CAUTION |
|  |
| <p>Electrical Shock can cause injury.</p> <p>Do not touch wires while engine is running.</p> |

Electrical Shock!

Never touch electrical wires or components while the engine is running. They can be sources of electrical shock.

Symbols Associated With This Product

| | | | |
|---|------------------------|---|-------------|
|  | Alert |  | Read Manual |
|  | On |  | Choke |
|  | Off |  | Slow |
|  | Start |  | Fast |
|  | Stop |  | Fuel |
|  | Normal Operation |  | Oil |
|  | Cold Weather Operation | | |

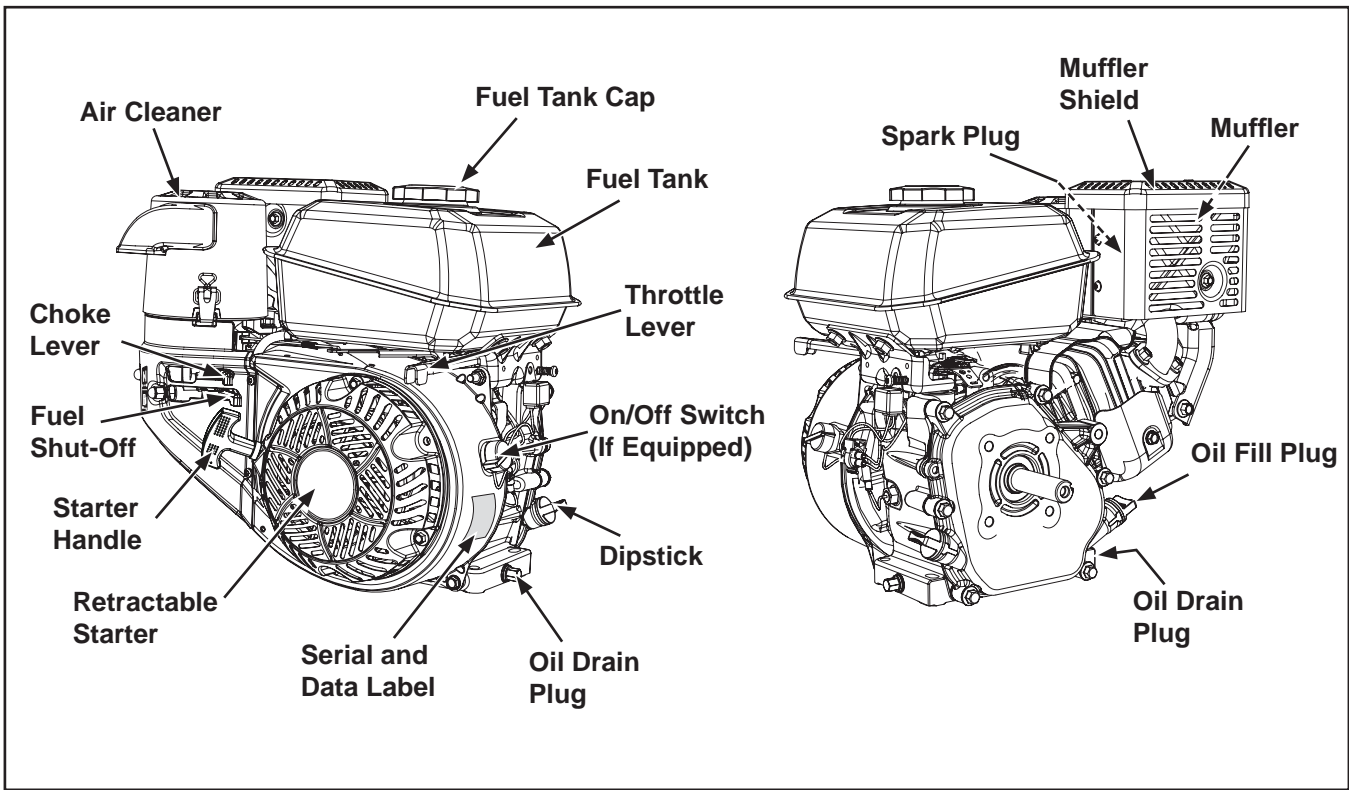


Figure 1. Control and Service Point Locations.

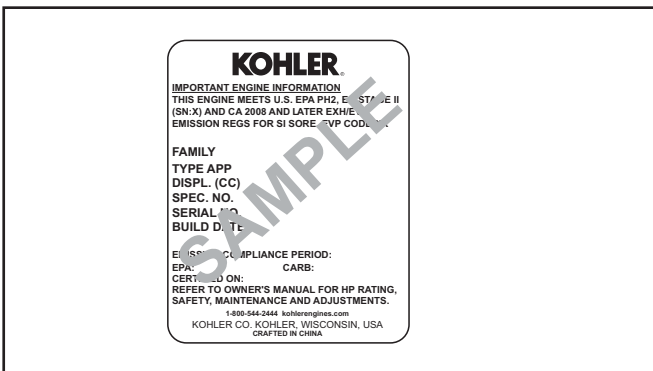


Figure 2. Serial and Data Label (Example).

The Emission Compliance Period referred to on the Emission Control or Air Index label indicates the number of operating hours for which the engine has been shown to meet Federal and CARB emission requirements. The following table provides the Engine Compliance Period (in hours) associated with the category descriptor found on the certification label.

Emission Compliance Period (Hours)

| EPA | Category C | Category B | Category A |
|-------------|-----------------------|---------------------------|-----------------------|
| < 225 CC | 125 hours | 250 hours | 500 hours |
| > 225 CC | 250 hours | 500 hours | 1000 hours |
| CARB | Moderate 125 hours | Intermediate 250 hours | Extended 500 hours |

Refer to certification label for engine displacement. Exhaust Emission Control System for models CH270, CH395, CH440 is EM for U.S. EPA and Europe.

Oil Recommendations

Using the proper type and weight of oil in the crankcase is extremely important. So is checking oil daily and changing oil regularly. Failure to use the correct oil, or using dirty oil, causes premature engine wear and failure.

Oil Type

Use high quality detergent oil of API (American Petroleum Institute) service class SJ or higher. Select the viscosity based on the air temperature at the time of operation as shown in the following table.

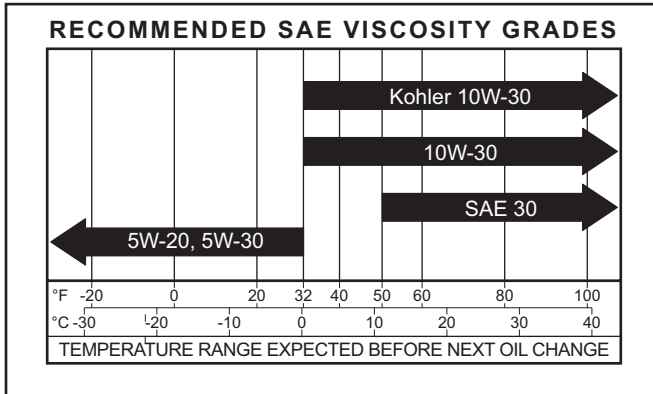


Figure 3. Oil Viscosity Grades Table.

Refer to Maintenance Instructions for detailed oil check and oil change procedures.

Fuel Recommendations

| | |
|--|--|
| | WARNING |
| | Explosive Fuel can cause fires and severe burns. Do not fill the fuel tank while the engine is hot or running. |

Gasoline is extremely flammable and its vapors can explode if ignited. Store gasoline only in approved containers, in well ventilated, unoccupied buildings, away from sparks or flames. Do not fill the fuel tank while the engine is hot or running, since spilled fuel could ignite if it comes in contact with hot parts or sparks from ignition. Do not start the engine near spilled fuel. Never use gasoline as a cleaning agent.

General Recommendations

Purchase gasoline in small quantities and store in clean, approved containers. A container with a capacity of 2 gallons or less with a pouring spout is recommended. Such a container is easier to handle and helps eliminate spillage during refueling.

Do not use gasoline left over from the previous season, to minimize gum deposits in your fuel system and to ensure easy starting.

Do not add oil to the gasoline.

Do not overfill the fuel tank. Leave room for the fuel to expand. See Figure 4.

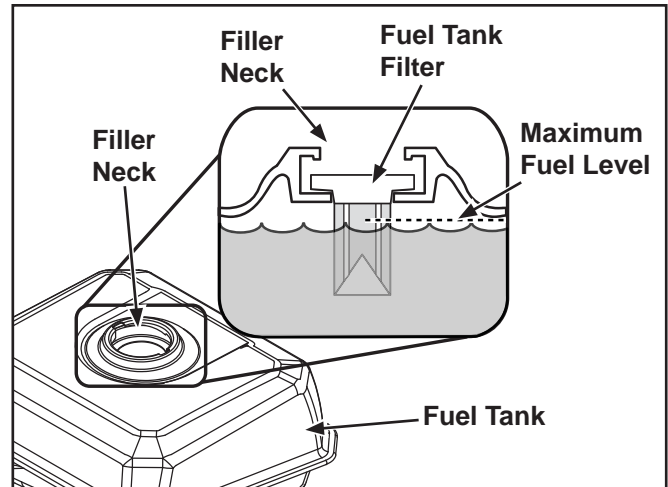


Figure 4. Maximum Fuel Level.

Fuel Type

For best results use only clean, fresh, unleaded gasoline with a pump sticker octane rating of 87 or higher. In countries using the Research method, it should be 90 octane minimum.

Unleaded gasoline is recommended as it leaves less combustion chamber deposits and reduces harmful exhaust emissions. Leaded gasoline is not recommended.

Gasoline/Alcohol blends

Gasohol (up to 10% ethyl alcohol, 90% unleaded gasoline by volume) is approved as a fuel for Kohler engines. Other gasoline/alcohol blends including E20 and E85 are not to be used and are not approved. Any failures resulting from use of these fuels will not be warranted.

Gasoline/Ether blends


Methyl Tertiary Butyl Ether (MTBE) and unleaded gasoline blends (up to a maximum of 15% MTBE by volume) are approved as a fuel for Kohler engine. Other gasoline/ether blends are not approved.

Operating Instructions

Also read the operating instructions of the equipment this engine powers.

Pre-Start Checklist

- Check oil level. Add oil if low. Do not overfill.
- Check fuel level. Add fuel if low.
- Check cooling air intake areas and external surfaces of engine. Make sure they are clean and unobstructed.
- Check that the air cleaner components and all shrouds, equipment covers, and guards are in place and securely fastened.
- Check that any clutches or transmissions are disengaged or placed in neutral. This is especially important on equipment with hydrostatic drive. The shift lever must be exactly in neutral to prevent resistance which could keep the engine from starting.

| | |
|--|---|
|  | WARNING Carbon Monoxide can cause severe nausea, fainting or death. Avoid inhaling exhaust fumes, and never run the engine in a closed building or confined area. |
|--|---|

Engine exhaust gases contain poisonous carbon monoxide. Carbon monoxide is odorless, colorless, and can cause death if inhaled. Avoid inhaling exhaust fumes, and never run the engine in a closed building or confined area.

Cold Weather Starting Hints

1. Be sure to use the proper oil for the temperature expected. See Oil Recommendations.
2. Declutch all possible external loads.
3. Use fresh winter grade fuel. NOTE: Winter grade gasoline has higher volatility to improve starting. Do not use gasoline left over from summer.
4. **Electric Start Models:** Be sure the battery is in good condition. A warm battery has much more starting capacity than a cold battery.

Starting

1. Turn the fuel shut-off valve to the "ON" position. See Figure 5.

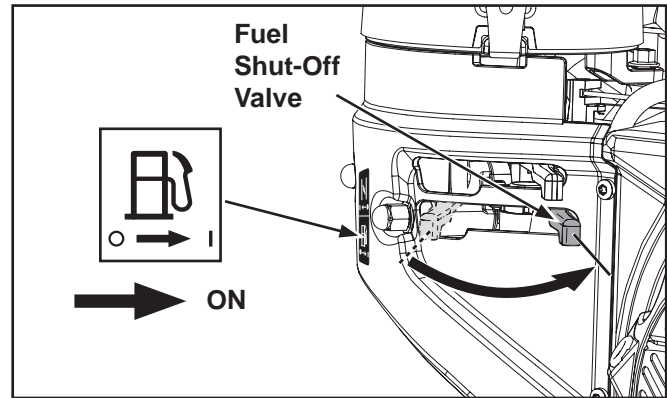


Figure 5. "On" Position of Fuel Shut-Off Valve.

2. For a Cold Engine – Place the throttle control midway between the "SLOW" and "FAST" positions. See Figure 6. Place the choke control into the "on" position. See Figure 7.

For a Warm Engine (normal operating temperatures) – Place the throttle control midway between the "SLOW" and "FAST" positions. See Figure 6. A warm engine usually does not require the choke on.

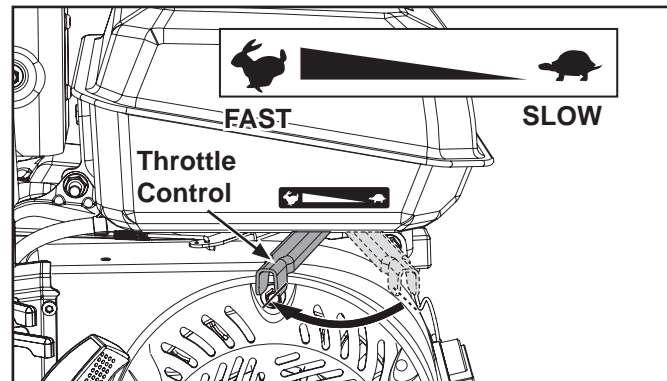


Figure 6. "Fast" Position of Throttle Control.

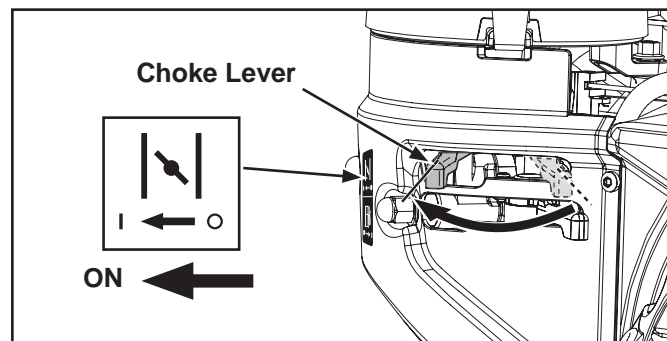


Figure 7. "On" Position of Choke Lever.

NOTE: The choke position for starting may vary depending upon temperature and other factors. Once engine is running and warm turn choke to "OFF" position. See Figure 10.

3. Start the engine as follows:

For Retractable Start Engine – Turn engine On/Off switch to the "ON" (See Figure 8) .

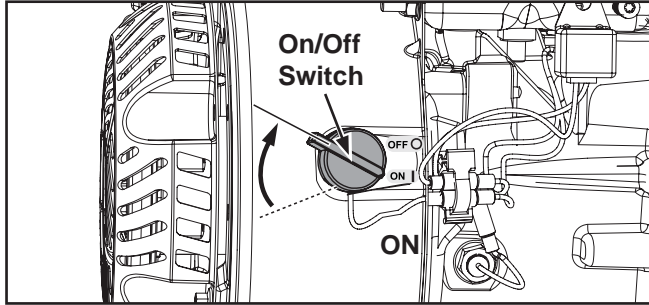


Figure 8. Engine On/Off Switch.

SLOWLY pull the starter handle until just past compression – STOP! Return starter handle, pull firmly with a smooth, steady motion to start. Pull the handle straight out to avoid excessive rope wear from the starter rope guide (see Figure 9).

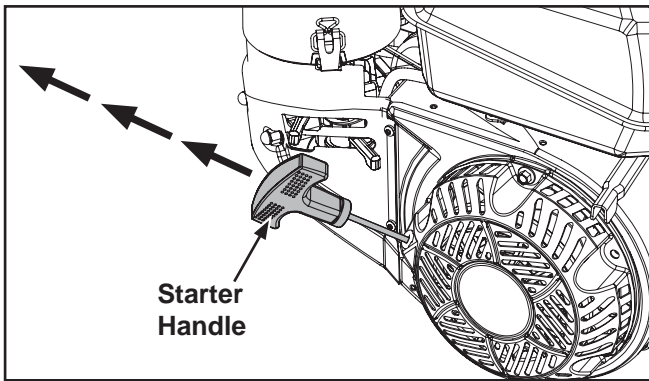


Figure 9. Operating the Retractable Starter.

NOTE: Extend the starting rope periodically and check its condition. If the rope is frayed, have it replaced immediately by your Kohler Engine Service Center.

4. Gradually return the choke control to the "OFF" position after the engine starts and warms up. See Figure 10.

The engine/equipment may be operated during the warm up period, but it may be necessary to leave the choke partially on until the engine warms up.

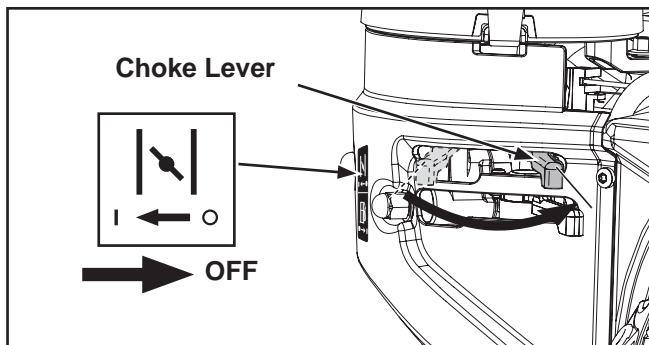


Figure 10. "Off" Position of Choke Lever.

Stopping

1. If possible, remove the load.
2. Move the throttle control to the "SLOW" or "LOW" idle position. Allow the engine to run at idle for 30-60 seconds. See Figure 11.

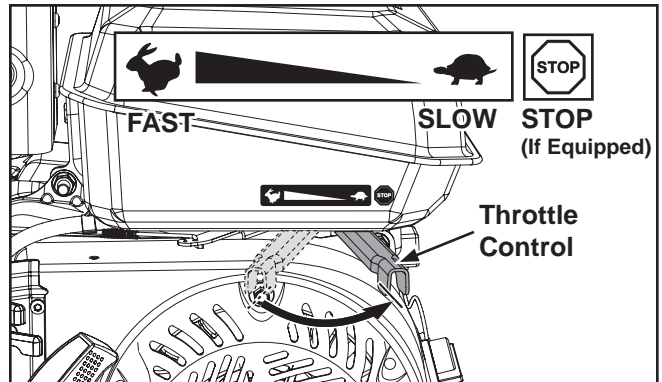


Figure 11. "Slow" Position of Throttle Control.

3. Turn key switch or on/off switch to the "OFF" position. Move throttle to the "stop" position if equipped. See Figure 12.

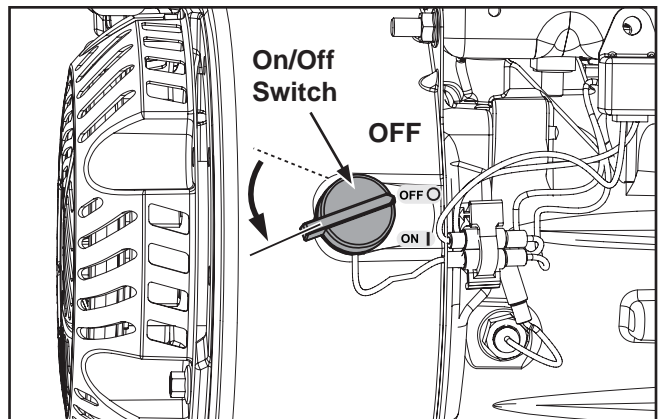


Figure 12. Engine On/Off Switch.

4. Close the fuel shut-off valve. See Figure 13.

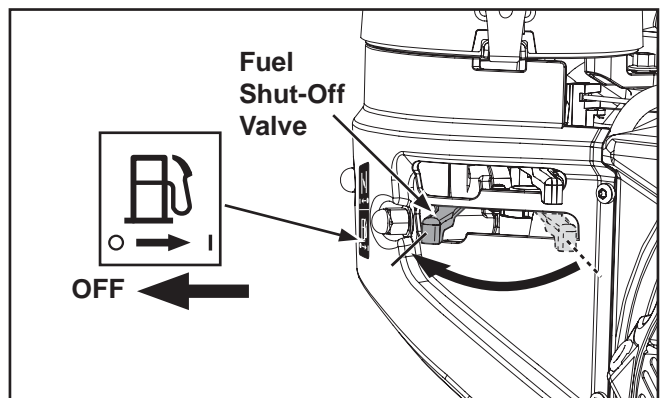


Figure 13. "Off" Position of Fuel Shut-Off Valve.

Operating

Angle of Operation

Continuous operation at angles up to 25° with 1/2 full fuel tank. Before operation check oil level to assure crankcase oil level is correct. See Check Oil Level.

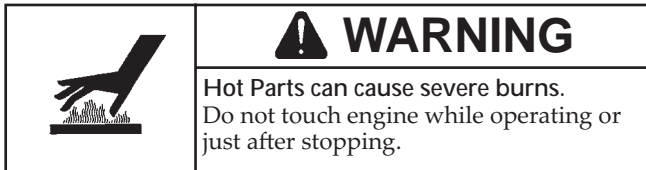
Intermittent operation, up to one minute at angles up to 30° with 1/2 full fuel tank. Check oil level to assure crankcase oil level is correct. See Check Oil Level.

Refer to the operating instructions of the equipment this engine powers. Because of equipment design or application, there may be more stringent restrictions regarding the angle of operation.

NOTE: Do not operate this engine continuously at angles exceeding 25° in any direction. Engine damage could result from insufficient lubrication.

Cooling

NOTE: If debris builds up on the grass screen or other cooling areas, stop the engine immediately and clean. Operating the engine with blocked or dirty air intake and cooling areas can cause extensive damage due to overheating. See Clean Air Intake/Cooling Areas.



Engine components can get extremely hot from operation. To prevent severe burns, do not touch these areas while the engine is running, or immediately after it is turned off. Never operate the engine with heat shields or guards removed.

Engine Speed

NOTE: Do not tamper with the governor setting to increase the maximum engine speed. Overspeed is hazardous and will void the engine warranty. The maximum allowable high idle speed for these engines is 3750 RPM, no load.

Carburetor Icing

Carburetor icing can take place when certain combinations of temperature and humidity exist. The result of carburetor icing is rough running at idle or low speed as well as black smoke.

To reduce the likelihood of carburetor icing the air cleaner cover can be rotated to draw warmer air from the muffler side. To set the air cleaner cover to "cold weather operation" see Figure 14.

To set the air cleaner cover to "normal operation" see Figure 15.

NOTE: Running the engine in the "cold weather operation" position in normal conditions can damage the engine.

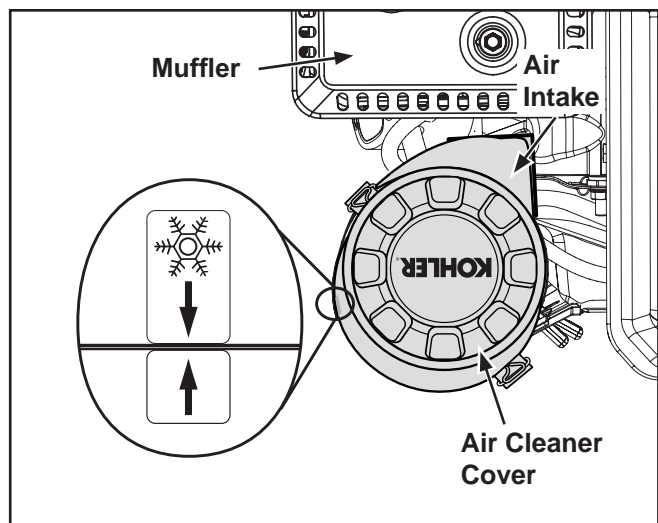


Figure 14. "Cold Weather Operation" Position of Air Cleaner Cover.

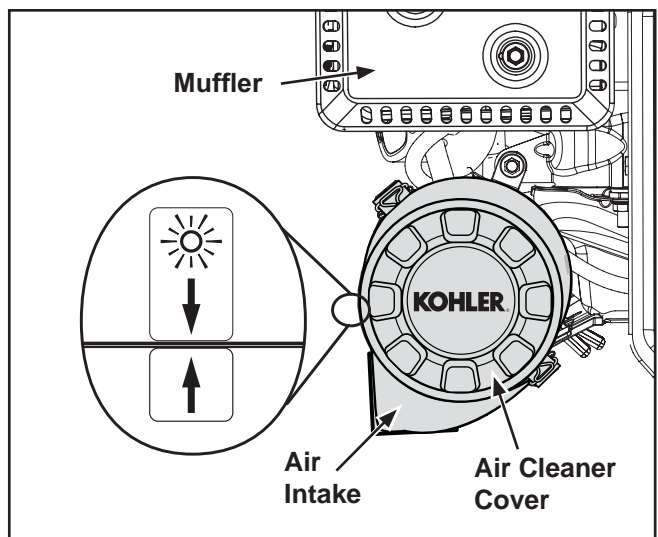




Figure 15. "Normal Operation" Position of Air Cleaner Cover.

Maintenance Instructions

Maintenance, repair or replacement of the emission control devices and systems, which are being done at the customers expense, may be performed by any non-road engine repair establishment or individual. Warranty repairs must be performed by an authorized Kohler Engine Service Center.

| | |
|---|---|
|  |  WARNING |
| | <p>Accidental Starts can cause severe injury or death. Disconnect and ground spark plug leads before servicing.</p> |

Disabling engine. Accidental starting can cause severe injury or death. Before working on the engine or equipment, disable the engine as follows: 1) Disconnect the spark plug lead(s). 2) Disconnect negative (-) battery cable from battery.

Maintenance Schedule

These required maintenance procedures should be performed at the frequency stated in the table below. They should also be included as part of any seasonal tune-up.

| Frequency | Maintenance Required |
|--|--|
| Daily or Before Starting Engine | Check oil level. |
| | Fill fuel tank. |
| | Check air intake and cooling areas; clean as necessary. ¹ |
| | Check air cleaner and precleaner. |
| | Check muffler screen (if equipped) clean as necessary. ¹ |
| Yearly or Every 50 Hours | Clean or replace precleaner. |
| Yearly or Every 100 Hours | Change oil. |
| | Clean cooling areas. |
| | Clean muffler screen (if equipped). |
| | Clean, set gap or replace spark plug, and set gap. |
| Yearly or Every 200 Hours | Replace air cleaner element. |
| | Replace fuel filter (if equipped). |
| Yearly or Every 200 Hours | Check and adjust valve clearance when engine is cold. ² |
| | Service starter motor drive, if so equipped. ² |
| | Have combustion chamber decarbonized. ² |

¹Perform these maintenance procedures more frequently under extremely dusty, dirty conditions.
²Have a Kohler Engine Service Center perform this service.

Check Oil Level

The importance of checking and maintaining the proper oil level in the crankcase cannot be overemphasized. Check oil **BEFORE EACH USE** as follows:

1. Make sure the engine is stopped, level, and is cool so the oil has had time to drain into the sump.
2. Clean the area around and beneath the dipstick or the oil fill plug before removing it. This will help keep dirt, debris, and other foreign matter out of the engine. See Figure 16.

NOTE: The engine may be equipped with two dipsticks or an oil fill plug and a dipstick. These can be placed in either hole. See Figure 16.

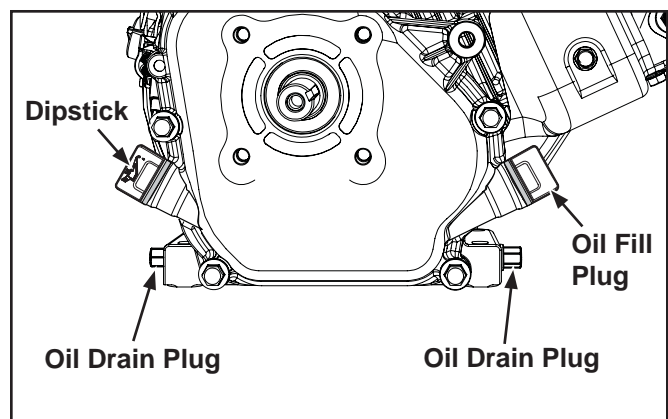


Figure 16. Location of Dipstick and Oil Fill Plug.

3. **Checking oil level with a dipstick.** Unscrew and remove the dipstick; wipe off oil. Reinsert the dipstick into the oil fill tube and rest the dipstick on the oil fill neck. Turn it counterclockwise until the oil fill cap drops down to the lowest point of the thread leads. **Do not** thread the dipstick cap onto the tube. See Figure 18.

Checking oil level with an oil fill plug. Unscrew and remove the oil fill plug. The level should be up to but not over, the point of overflowing the filler neck. See Figure 19.

4. If the level is low, add oil of the proper type (Refer to "Oil Type") and to the correct level. Always check the level before adding more oil. See Figures 18 and 19.

NOTE: To prevent extensive engine wear or damage, always maintain the proper oil level in the crankcase. Never operate the engine with the oil level above the correct level.

Change Oil

For a new engine, change oil after the first 5 hours of operation. Thereafter, change oil after every 100 hours of operation.

For an overhauled engine, use Kohler 10W-30 service class, SJ or higher oil for the first 5 hours of operation. Change the oil after this initial run-in period. Refill with service class SJ or higher oil as specified in the "Viscosity Grades" table (Figure 3).

Change the oil while the engine is still warm. The oil will flow freely and carry away more impurities. Make sure the engine is level when filling, checking, or changing the oil.

Change the oil as follows:

1. To keep dirt, debris, etc., out of the engine, clean the area around the oil fill plug/dipstick before removing it.
2. Remove the oil drain plug and the dipstick/oil fill plug. Allow ample time for complete drainage.
3. Reinstall the drain plug and tighten to 17.6 N·m (13 ft. lb.).
4. Fill the crankcase, with new oil of the proper type, up to the point of overflowing the filler neck. Refer to "Oil Type". Always check the level before adding more oil.
5. Reinstall the dipstick/oil fill plug and tighten securely. See Figure 21.

NOTE: Over tightening the dipstick will distort the gasket and may cause oil weeping.

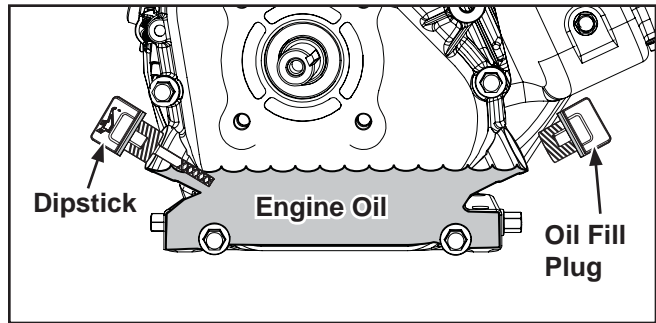


Figure 17. Location of Dipstick and Oil Fill Plug.

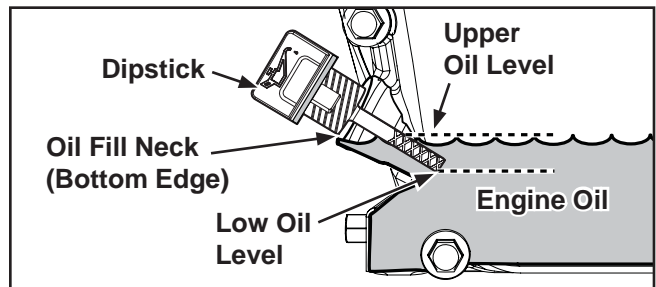


Figure 18. Dipstick Oil Level Check.

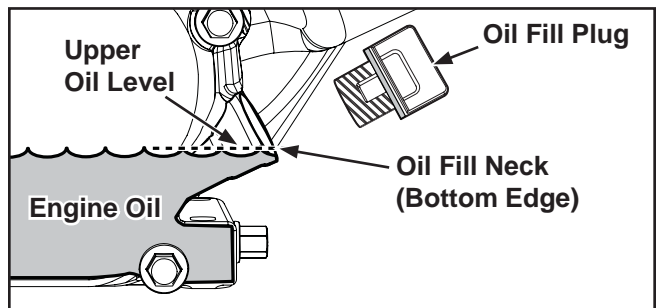


Figure 19. Oil Fill Plug Oil Level Check.

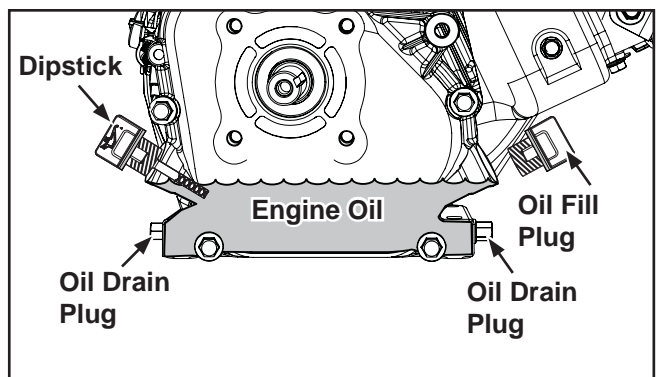


Figure 20. Location of Dipstick and Oil Drain Plug.

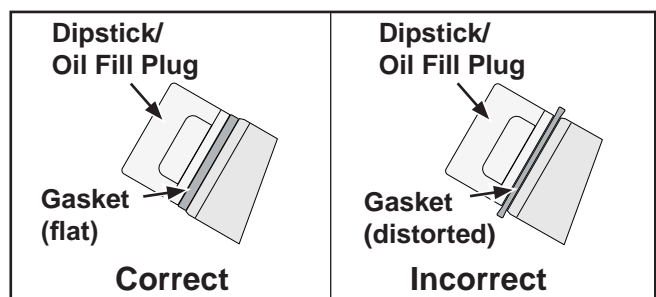


Figure 21. Dipstick Reinstallation.

Oil Sentry™

Some engines are equipped with an optional Oil Sentry™ oil level switch. If the oil level drops below an acceptable level, the Oil Sentry™ will either shut off the engine or activate a warning signal, depending on the application.

NOTE: Check the oil level **BEFORE EACH USE** and maintain to the correct level. This includes engines equipped with Oil Sentry™.

Service Precleaner and Air Cleaner Element

These engines are equipped with a replaceable, high density paper air cleaner element. Some engines are also equipped with a preoiled, foam precleaner which surrounds the paper element. See Figure 22.

Check the air cleaner **daily or before starting the engine**. Check for a buildup of dirt and debris around the air cleaner system. Keep this area clean. Also check for loose or damaged components. Replace all bent or damaged air cleaner components.

NOTE: Operating the engine with loose or damaged air cleaner components could allow unfiltered air into the engine causing premature wear and failure.

Service Precleaner (If Equipped)

Wash the precleaner every **50 hours** of operation (more often under extremely dusty or dirty conditions).

1. Remove the air cleaner cover. Move the bails on the air cleaner cover down. Remove the latches from under the tabs of the air cleaner base. Lift and remove the air cleaner cover from the air cleaner base. See Figure 23.
2. Remove the precleaner from the paper element.
3. Wash the precleaner in warm water with detergent. Rinse the precleaner thoroughly until all traces of detergent are eliminated. Squeeze out excess water (do not wring). Allow the precleaner to air dry.
4. Reinstall the precleaner over the paper element.
5. Slide the precleaner and paper element onto the air cleaner base. See Figure 22.

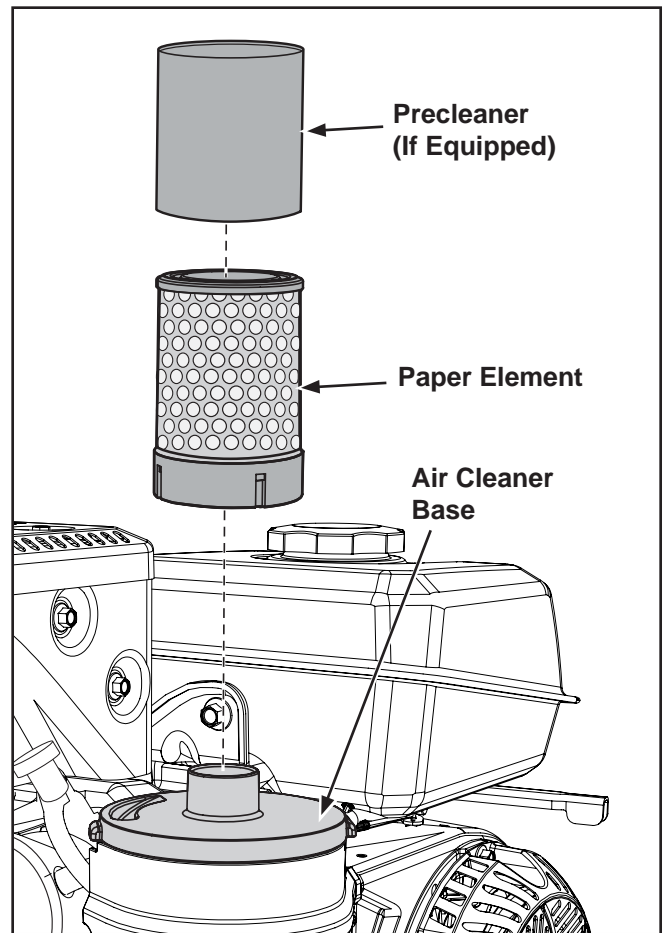


Figure 22. Air Cleaner Element and Precleaner.

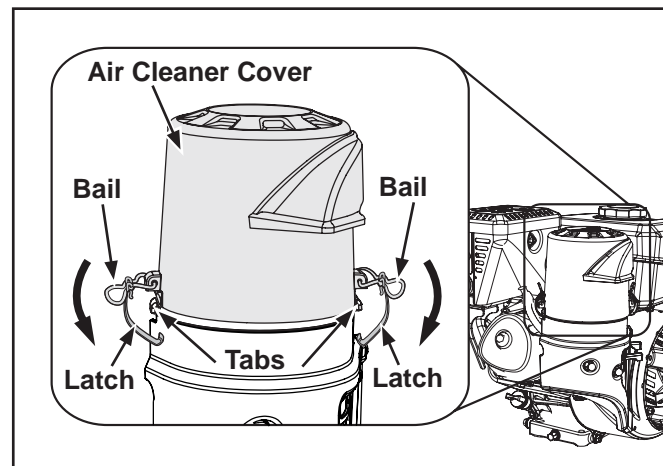


Figure 23. Air Cleaner Cover Removal.

- Position the air cleaner cover.
For "normal operation" conditions see Figure 25.
For "cold weather operation" conditions see Figure 26.

NOTE: Running the engine in the "cold weather operation" position in normal conditions can damage the engine.

- Reinstall and secure the air cleaner cover. Align the air cleaner cover latches with the tabs on the base. Place the latches under the tabs and lift up on the bails. See Figure 24.

Service Paper Element

Every 200 hours of operation (more often under extremely dusty or dirty conditions), replace the paper element.

- Remove the air cleaner cover. Move the bails on the air cleaner cover down. Remove the latches from under the tabs of the air cleaner base. Lift and remove the air cleaner cover from the air cleaner base. Separate the precleaner from the element and service as outlined above. See Figures 22 and 23.
- Do not** wash the paper element or use pressurized air, as this will damage the element. Replace a dirty, bent, or damaged element with a genuine Kohler element. Handle new elements carefully; do not use if the sealing surfaces are bent or damaged.
- When servicing the air cleaner, check the air cleaner base. Make sure it is secured and not bent or damaged. Check the air cleaner cover/housing for damage or improper fit. Replace all bent or damaged air cleaner components.

- Slide the precleaner and paper element onto the air cleaner base. See Figure 22.
- Position the air cleaner cover.
For "normal operation" conditions see Figure 25.
For "cold weather operation" conditions see Figure 26.

NOTE: Running the engine in "cold weather operation" position of the air cleaner cover in normal conditions can damage the engine.

- Reinstall and secure the air cleaner cover. Align the air cleaner cover latches with the tabs on the base. Place the latches under the tabs and lift up on the bails. See Figure 24.

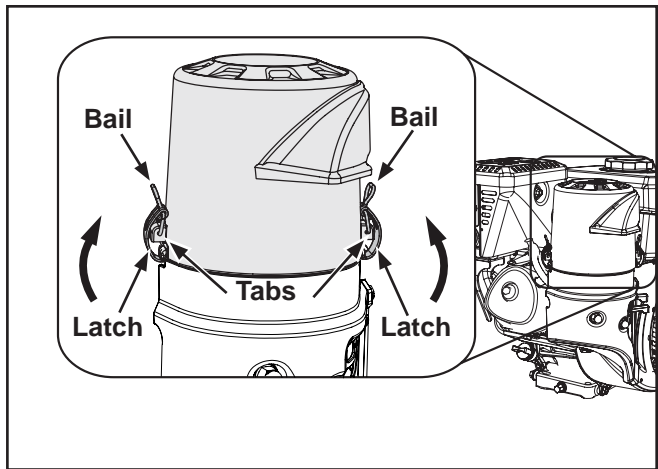


Figure 24. Air Cleaner Cover Installation.

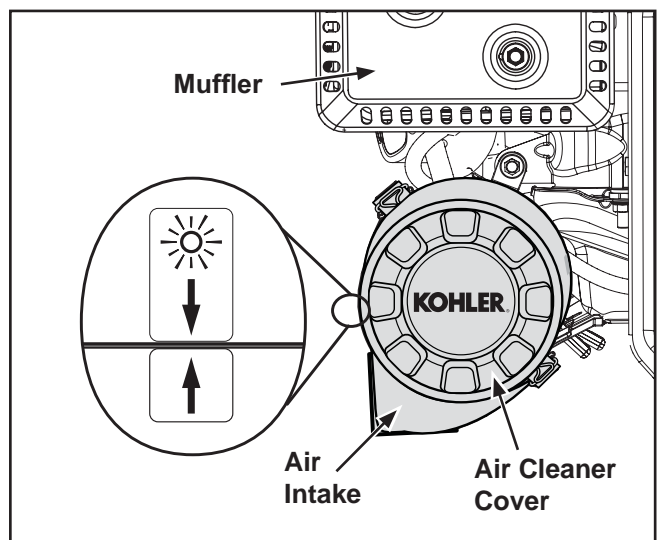


Figure 25. "Normal Operation" Position of Air Cleaner Cover.

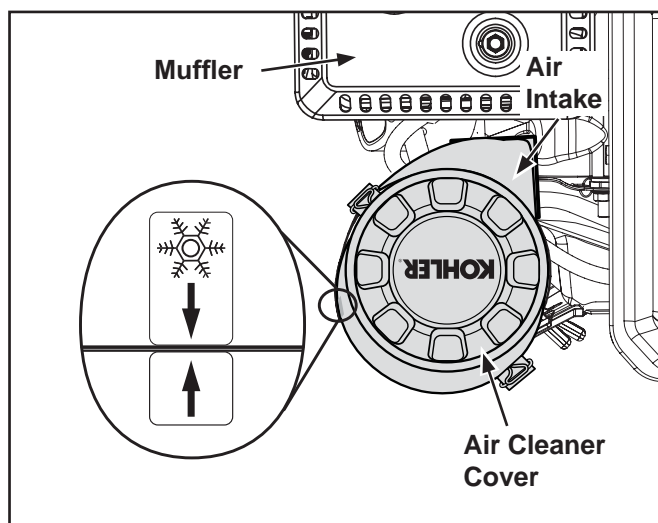


Figure 26. "Cold Weather Operation" Position of Air Cleaner Cover.

Ignition System

This engine is equipped with a dependable electronic magneto ignition system. Other than periodically checking/replacing the spark plug, no maintenance or adjustments are necessary or possible with this system.

In the event starting problems should occur which are not corrected by replacing the spark plug, see your Kohler Engine Service Center for trouble analysis.

Check Spark Plug

Annually or every **100 hours** of operation, remove the spark plug, check condition, and reset the gap or replace with a new plug as necessary. The original spark plug is a Champion® RC12YC, the Kohler equivalent is **Kohler Part No. 12 132 02-S** or for RFI **Kohler Part No. 25 132 14-S**. Equivalent alternate brand plugs can also be used.


1. Before removing the spark plug, clean the area around the base of the plug to keep dirt and debris out of the engine.
2. Remove the plug and check its condition. Replace the plug if worn or reuse is questionable.

NOTE: Do not clean the spark plug in a machine using abrasive grit. Some grit could remain in the spark plug and enter the engine causing extensive wear and damage.

3. Check the gap using a wire feeler gauge. Adjust the gap to **0.76 mm (0.030 in.)** by carefully bending the ground electrode. See Figure 27.
4. Reinstall the spark plug into the cylinder head. Torque the spark plug to **20 N·m (14 ft. lb.)**.

Fuel Tank Filter

A serviceable fuel tank filter is located under the fuel tank cap, in the filler neck.

| | |
|---|---|
|  | <p>WARNING</p> <p>Explosive Fuel can cause fires and severe burns. Do not fill the fuel tank while the engine is hot or running.</p> |
|---|---|

Daily or as required clean filter of any accumulation as follows:

1. Remove the fuel tank cap and filter. See Figure 28.
2. Clean the filter with solvent, replace if damaged.
3. Wipe the filter and insert it.
4. Tighten the tank cap securely.

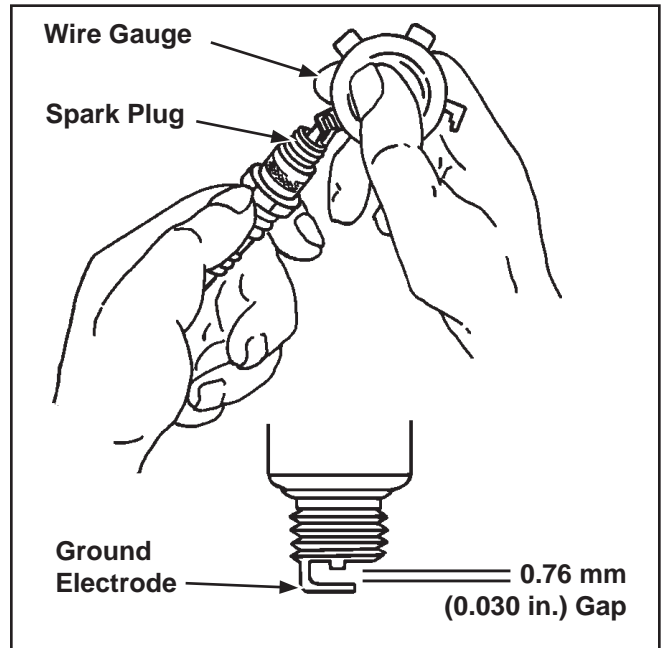


Figure 27. Servicing Spark Plug.

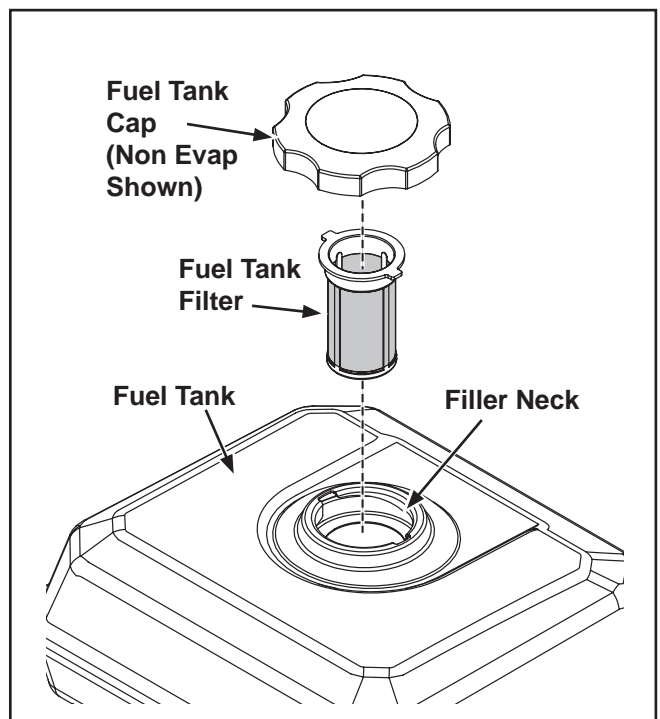
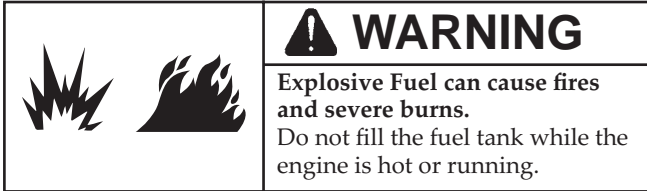


Figure 28. Fuel Tank Filter.

Fuel Valve

Engines are equipped with a fuel valve and integral screen filter located at the inlet of the carburetor. It controls and filters fuel flow from the tank to the carburetor.

Every 100 hours of operation clean fuel valve cup of any accumulated debris. If the screen becomes clogged or damaged replace it.



1. Stop the engine.
2. Remove the securing hardware and the carburetor cover panel. See Figure 29.
3. Turn the fuel valve lever to the "OFF" position.
4. Remove the fuel valve cup. See Figure 30.
5. Clean the fuel valve cup with solvent and wipe it off.
6. Check the O-ring, replace if damaged. Check the screen for blockage or damage, replace if necessary. The new screen must be located on the pick-up tube as shown in Figure 31.
7. Place the O-ring on the screen followed by the fuel valve cup. Rotate the fuel valve cup until it is finger tight. Turn with a wrench 1/2 to 3/4 full turn. See Figure 31.
8. Turn the fuel valve to the "ON" position and check for leaks. If fuel valve cup leaks repeat step 6 and 7.
9. Tighten the tank cap securely.
10. Reinstall the carburetor cover panel securing with hardware removed in step 2.

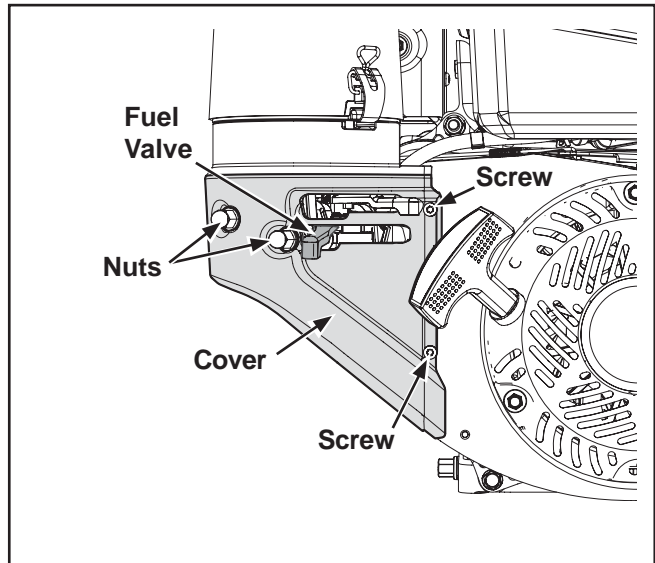


Figure 29. Carburetor Cover Panel.

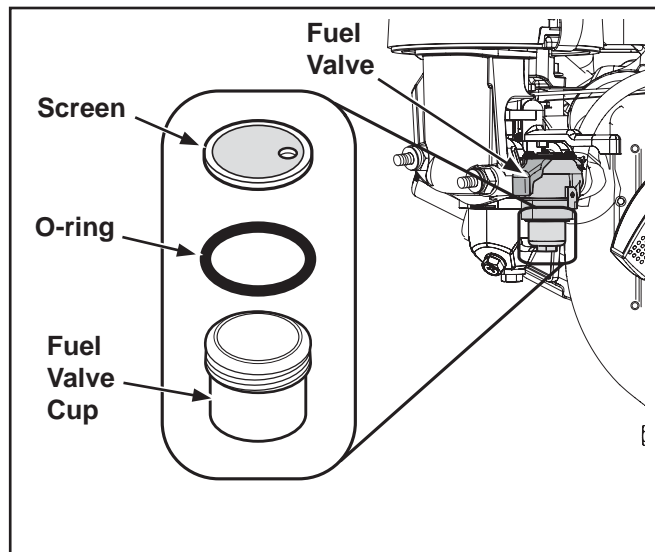


Figure 30. Fuel Valve Cup, O-ring, and Screen.

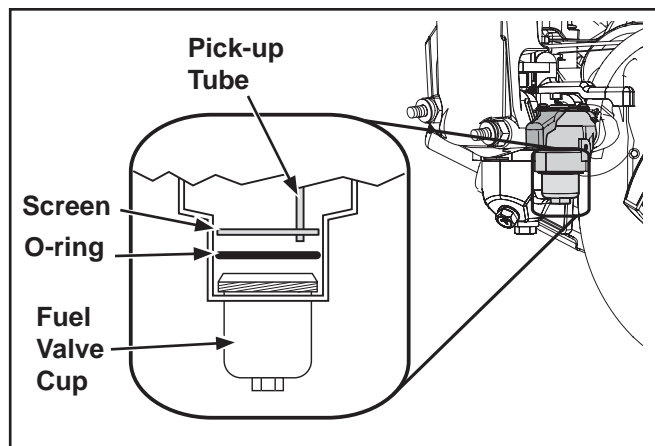
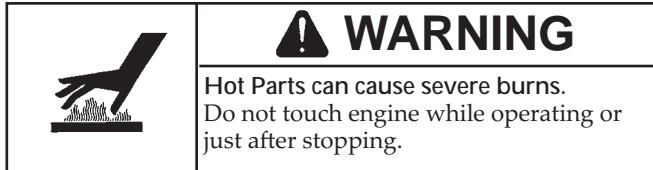


Figure 31. Pick-up Tube and Screen Orientation.

Muffler Screen

Engines are equipped with a muffler screen for operational and environmental safety.

Every **100 hours** of operation, remove and clean or replace the muffler screen following the instructions below.



1. Remove the securing hardware and the muffler screen. See Figure 32.
2. Clean the carbon deposits out of the screen using a wire brush.
3. Check the muffler screen, replace if damaged.
4. Reinstall the muffler screen, securing with the hardware previously removed.

Clean Air Intake/Cooling Areas

To ensure proper cooling, make sure the grass screen, cooling fins, and other external surfaces of the engine are kept clean at all times.

Every **100 hours** of operation (more often under extremely dusty, dirty conditions), remove the blower housing and other cooling shrouds. Clean the cooling fins and external surfaces as necessary. Make sure the cooling shrouds are reinstalled.

NOTE: Operating the engine with a blocked grass screen, dirty or plugged cooling fins, and/or cooling shrouds removed, will cause engine damage due to overheating.

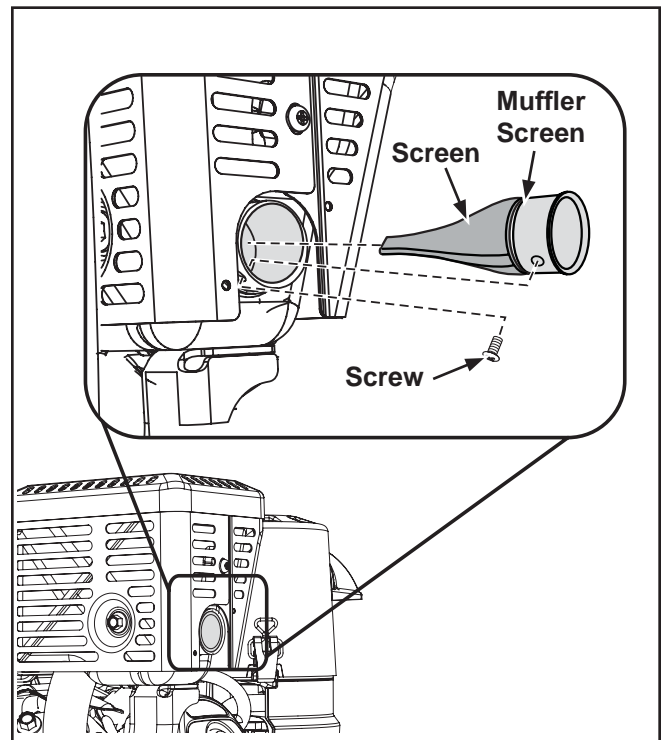


Figure 32. Muffler screen.

Carburetor Troubleshooting and Adjustments

NOTE: Carburetor adjustments should be made only after the engine is at operating temperature.

The carburetor is designed to deliver the correct fuel-to-air mixture to the engine under all operating conditions. The idle mixture is set at the factory and normally does not require adjustment.

If the engine is hard to start, runs roughly, or stalls at low idle speed, it may be necessary to adjust or service the carburetor. Engine must not exceed 3750 RPM if the high speed screw is adjusted. See Figure 33.

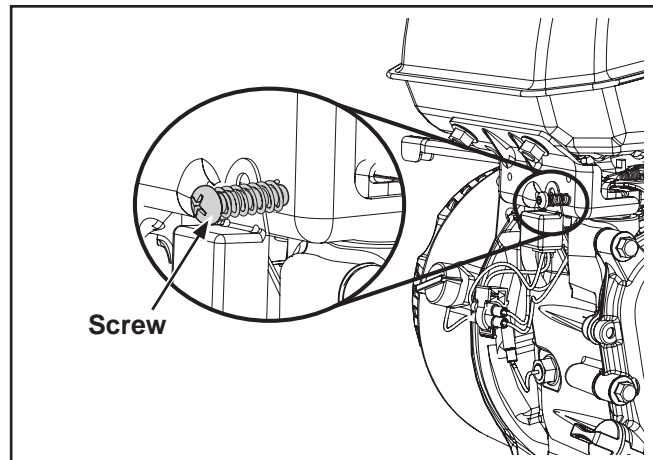


Figure 33. High Speed Screw.

Troubleshooting

If engine troubles are experienced that appear to be fuel system related, check the following areas before adjusting the carburetor.

- Make sure the fuel tank is filled with clean, fresh gasoline.
- Make sure the fuel tank cap vent is not blocked and that it is operating properly.
- Make sure the fuel shut-off valve is fully open.
- Make sure fuel shut-off valve strainer, and in-line fuel filter (if used) are clean and unobstructed. Clean or replace as necessary.
- Make sure fuel is reaching the carburetor. This includes checking the fuel lines and components for restrictions or problems. Replace as necessary.
- Make sure On-Off switch is functioning properly.
- Make sure the air cleaner element is clean and all air cleaner components are fastened securely.

If, after checking the items listed above, the engine is hard to start, runs roughly, or stalls at low idle speed, it may be necessary to adjust or service the carburetor.

Troubleshooting

When troubles occur, be sure to check the simple causes which, at first, may seem too obvious to be considered. For example, a starting problem could be caused by an empty fuel tank. Some common causes of engine troubles are listed in the table below.

Do not attempt to service or replace major engine components, or any items that require special timing or adjustment procedures. Have this work done by a Kohler Engine Service Center.

| Problem | Possible Cause | | | | | | | |
|-----------------------|----------------|---------------|-------------------|--------------------|---------------------|-------------------|-------------------|-------------------|
| | No Fuel | Improper Fuel | Dirt In Fuel Line | Dirty Grass Screen | Incorrect Oil Level | Engine Overloaded | Dirty Air Cleaner | Faulty Spark Plug |
| Will Not Start | ● | ● | ● | | ● | ● | ● | ● |
| Hard Starting | ● | ● | ● | | ● | ● | ● | ● |
| Stops Suddenly | ● | | ● | ● | ● | ● | ● | |
| Lacks Power | | ● | ● | ● | ● | ● | ● | ● |
| Operates Erratically | | ● | ● | ● | | ● | ● | ● |
| Knocks or Pings | | ● | | ● | | ● | | ● |
| Skips or Misfires | | ● | ● | ● | | | ● | ● |
| Backfires | | | ● | | | ● | ● | ● |
| Overheats | | | ● | ● | ● | ● | ● | |
| High Fuel Consumption | | | | | | ● | ● | ● |

Storage

If the engine will be out of service for two months or more, use the following storage procedure:

1. Clean the exterior surfaces of the engine.
2. Change the oil while the engine is still warm from operation. See "Change Oil".
3. The fuel system must be completely emptied, or the gasoline must be treated with a stabilizer to prevent deterioration. If you choose to use a stabilizer, follow the manufacturers recommendations, and add the correct amount for the capacity of the fuel system. Fill the fuel tank with clean, fresh gasoline. Run the engine for 2-3 minutes to get stabilized fuel into the carburetor.
4. Remove the spark plug. Add one tablespoon of engine oil into the spark plug hole. Install the plug, but do not connect the plug lead. Crank the engine two or three revolutions.
5. Remove the spark plug. Cover the spark plug hole with your thumb, and turn the engine over until the piston is at the top of its stroke. (Pressure against the thumb is greatest.) Reinstall the plug, but do not connect the plug lead.
6. Store the engine in a clean, dry place.

Transport

1. Turn the fuel valve to the "OFF" position.
2. Tighten the fuel cap.
3. Read and follow the transport guidelines provided by equipment manufacturer.

To empty the system, run the engine until the tank and system are empty.

4. Remove the spark plug. Add one tablespoon of engine oil into the spark plug hole. Install the plug, but do not connect the plug lead. Crank the engine two or three revolutions.

Major Repair

Major repair information is available in Kohler Engine Service Manuals. This type of repair generally requires the services of a trained mechanic and the use of special tools and equipment. Kohler Engine Service Centers have the facilities, training, and genuine Kohler replacement parts necessary to perform this service.

For the nearest sales and service location:

- Visit our Web site: www.KohlerEngines.com
- Call 1-800-544-2444 (U.S. and Canada)
- Look in your local telephone directory under Engines-Gasoline

Parts Ordering

The engine model, specification, and serial numbers are required when ordering replacement parts from your Kohler Engine Service Center. These numbers are found on the identification plate which is affixed to the engine shrouding. Include letter suffixes if there are any. See Serial Data Label on Page 6.

Always insist on genuine Kohler parts. All genuine Kohler parts meet strict standards for fit, reliability, and performance.

| Specifications | | | | |
|--|--|-------------------|--------------------|---------------------------|
| Model: | | CH270 | CH395 | CH440 |
| Bore: | mm (in.) | 70 (2.8) | 78 (3.1) | 89 (3.5) |
| Stroke: | mm (in.) | 54 (2.1) | 58 (2.3) | 69 (2.7) |
| Displacement: | cm ³ (in. ³) | 208 (12.7) | 277 (16.9) | 429 (24.7) |
| *Gross Power (@ 3600 RPM): | kW (HP) | 5.2 (7) | 7.1 (9.5) | 10.5* (14)* |
| *Net Power (@ 3600 RPM): | kW (HP) | 4.4 (6) | 6.4 (8.5) | 8.9* (11.9)* |
| Peak Torque @ RPM: | N·m (ft. lb.) | 12.3 (9.1) @ 2800 | 17.8 (13.1) @ 2600 | 25.1** (18.5)** @ 2600 |
| Compression Ratio: | | 8.5:1 | 8.2:1 | 8:1 |
| Weight (Recoil Start): | kg (lbs.) | 17.5 (38.7) | 27.8 (61.5) | 34.7** (76.5)** |
| Oil Capacity: | L (U.S. qt.) | 0.6 (0.63) | 1.1** (1.16)** | |
| Fuel Tank Capacity: | L (U.S. qt.) | 4.1 (4.3) | 7.3 (7.7) | |
| Exhaust Emission Control System: | EM for U.S. EPA and Europe | | | |
| *Horsepower ratings exceed Society of Automotive Engineers Small Engine Test Code J1940. Actual engine horsepower is lower and affected by, but not limited to, accessories (air cleaner, exhaust, charging, cooling, fuel pump, etc.), application, engine speed and ambient operating conditions (temperature, humidity, and altitude). Kohler reserves the right to change product specifications, designs, and equipment without notice and without incurring obligation | | | | |
| **Based on preliminary information. | | | | |

LIMITED 3 YEAR CH270, CH395, CH440 COMMAND PRO ENGINE WARRANTY

Kohler Co. warrants to the original consumer that each new COMMAND engine sold by Kohler Co. will be free from manufacturing defects in materials or workmanship in normal service for a period of three (3) years from date of purchase, provided it is operated and maintained in accordance with Kohler Co.'s instructions and manuals.

Our obligation under this warranty is expressly limited, at our option, to the replacement or repair at Kohler Co., Kohler, Wisconsin 53044, or at a service facility designated by us of such parts as inspection shall disclose to have been defective.

EXCLUSIONS:

Mufflers on engines used commercially (non-residential) are warranted for one (1) year from date of purchase, except catalytic mufflers, which are warranted for three (3) years.

This warranty does not apply to defects caused by casualty or unreasonable use, including faulty repairs by others and failure to provide reasonable and necessary maintenance.

The following items are not covered by this warranty:

Engine accessories such as fuel tanks, clutches, transmissions, power-drive assemblies, and batteries, unless supplied or installed by Kohler Co. These are subject to the warranties, if any, of their manufacturers.

KOHLER CO. AND/OR THE SELLER SHALL NOT BE LIABLE FOR SPECIAL, INDIRECT, INCIDENTAL, OR CONSEQUENTIAL DAMAGES OF ANY KIND, including but not limited to labor costs or transportation charges in connection with the repair or replacement of defective parts.

IMPLIED OR STATUTORY WARRANTIES, INCLUDING WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, ARE EXPRESSLY LIMITED TO THE DURATION OF THIS WRITTEN WARRANTY. We make no other express warranty, nor is any one authorized to make any on our behalf.

Some states do not allow limitations on how long an implied warranty lasts, or the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you.

This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

TO OBTAIN WARRANTY SERVICE:

Purchaser must bring the engine to an authorized Kohler service facility. To locate the nearest facility, visit our website www.KohlerEngines.com, or telephone 1-800-544-2444, consult your local telephone directory.

ENGINE DIVISION, KOHLER CO., KOHLER, WISCONSIN 53044

**KOHLER CO.
FEDERAL AND CALIFORNIA EMISSION CONTROL SYSTEMS
LIMITED WARRANTY SMALL OFF-ROAD ENGINES**

The U.S. Environmental Protection Agency (EPA), the California Air Resources Board (CARB), and Kohler Co. are pleased to explain the Federal and California Emission Control Systems Warranty on your small off-road equipment engine. In California beginning in 2006, "emissions" means both exhaust and evaporative emissions. For California, engines produced in 2006 and later must be designed, built and equipped to meet the state's stringent anti-smog standards. In other states, 1997 and later model year engines must be designed, built and equipped, to meet the U.S. EPA regulations for small non-road engines. The engine must be free from defects in materials and workmanship which cause it to fail to conform with U.S. EPA standards for the first two years of engine use from the date of sale to the ultimate purchaser. Kohler Co. must warrant the emission control system on the engine for the period of time listed above, provided there has been no abuse, neglect or improper maintenance.

The emission control system may include parts such as the carburetor or fuel injection system, the ignition system, and catalytic converter. Also included are the hoses, belts and connectors and other emission related assemblies.

Where a warrantable condition exists, Kohler Co. will repair the engine at no cost, including diagnosis (if the diagnostic work is performed at an authorized dealer), parts and labor.

MANUFACTURER'S WARRANTY COVERAGE

Engines produced in 2006 or later are warranted for two years in California. In other states, 1997 and later model year engines are warranted for two years. If any emission related part on the engine is defective, the part will be repaired or replaced by Kohler Co. free of charge.

OWNER'S WARRANTY RESPONSIBILITIES

- (a) The engine owner is responsible for the performance of the required maintenance listed in the owner's manual. Kohler Co. recommends that you retain all receipts covering maintenance on the engine, But Kohler Co. cannot deny warranty solely for the lack of receipts or for your failure to assure that all scheduled maintenance was performed.
- (b) Be aware, however, that Kohler Co. may deny warranty coverage if the engine or a part has failed due to abuse, neglect, improper maintenance or unapproved modifications.
- (c) For warranty repairs, the engine must be presented to a Kohler Co. service center as soon as a problem exists. Call 1-800-544-2444 or access our web site at: www.KohlerEngines.com, for the names of the nearest service centers. The warranty repairs should be completed in a reasonable amount of time, not to exceed 30 days.

If you have any questions regarding warranty rights and responsibilities, you should contact Kohler Co. at 1-920-457-4441 and ask for an Engine Service representative.

COVERAGE

Kohler Co. warrants to the ultimate purchaser and each subsequent purchaser that the engine will be designed, built and equipped, at the time of sale, to meet all applicable regulations. Kohler Co. also warrants to the initial purchaser and each subsequent purchaser, that the engine is free from defects in materials and workmanship which cause the engine to fail to conform with applicable regulations for a period of two years.

Engines produced in 2006 or later are warranted for two years in California. For 1997 and later model years, EPA requires manufacturers to warrant engines for two years in all other states. These warranty periods will begin on the date the engine is purchased by the initial purchaser. If any emission related part on the engine is defective, the part will be replaced by Kohler Co. at no cost to the owner. Kohler Co. is liable for damages to other engine components caused by the failure of a warranted part still under warranty.

Kohler Co. shall remedy warranty defects at any authorized Kohler Co. engine dealer or warranty station. Warranty repair work done at an authorized dealer or warranty station shall be free of charge to the owner if such work determines that a warranted part is defective.

Listed below are the parts covered by the Federal and California Emission Control Systems Warranty. Some parts listed below may require scheduled maintenance and are warranted up to the first scheduled replacement point for that part. The warranted parts include the following if they were present in the engine purchased:

- Oxygen sensor (if equipped)
- Intake manifold (if equipped)
- Exhaust manifold (if equipped)
- Catalytic muffler (if equipped)
- Thermal reactor muffler (if equipped)
- Spark advance module (if equipped)
- Air filter, fuel filter, and spark plugs (only to first scheduled replacement)
- Crankcase breather
- Air injection system (if equipped)
 - Air pump or pulse valve assembly (if equipped)
 - Control/distribution valve (if equipped)
 - Distribution manifold (if equipped)
 - Air hoses (if equipped)
 - Vacuum lines (if equipped)
- Ignition module(s) with high tension lead
- Gaseous fuel regulator (if equipped)
- Electronic control unit (if equipped)
- Carburetor or fuel injection system (if equipped)
- Fuel lines, fuel line fittings and clamps (if equipped)
- Fuel metering valve (if equipped)
- Evaporative system (if equipped)
 - Canister (if equipped)
 - Canister filter (if equipped)
 - Vapor hose (if equipped)
 - Orifice connector (if equipped)
 - Fuel tank (if equipped)
 - Fuel cap (if equipped)
 - Primer bulb canister (if equipped)

LIMITATIONS

This Emission Control Systems Warranty shall not cover any of the following:

- (a) repair or replacement required because of misuse or neglect, improper maintenance, repairs improperly performed or replacements not conforming to Kohler Co. specifications that adversely affect performance and/or durability and alterations or modifications not recommended or approved in writing by Kohler Co.,
- (b) replacement of parts and other services and adjustments necessary for required maintenance at and after the first scheduled replacement point,
- (c) consequential damages such as loss of time, inconvenience, loss of use of the engine or equipment, etc.,
- (d) diagnosis and inspection fees that do not result in eligible warranty service being performed, and
- (e) any add-on or modified part, or malfunction of authorized parts due to the use of add-on or modified parts.

MAINTENANCE AND REPAIR REQUIREMENTS

The owner is responsible for the proper use and maintenance of the engine. Kohler Co. recommends that all receipts and records covering the performance of regular maintenance be retained in case questions arise. If the engine is resold during the warranty period, the maintenance records should be transferred to each subsequent owner. Kohler Co. reserves the right to deny warranty coverage if the engine has not been properly maintained; however, Kohler Co. may not deny warranty repairs solely because of the lack of repair maintenance or failure to keep maintenance records.

Normal maintenance, replacement or repair of emission control devices and systems may be performed by any repair establishment or individual; however, **warranty repairs must be performed by a Kohler authorized service center.** Any replacement part or service that is equivalent in performance and durability may be used in non-warranty maintenance or repairs, and shall not reduce the warranty obligations of the engine manufacturer.

KOHLER[®] ENGINES

FOR SALES AND SERVICE INFORMATION
IN U.S. AND CANADA, CALL **1-800-544-2444**

KohlerEngines.com

ENGINE DIVISION, KOHLER CO., KOHLER, WISCONSIN 53044

| | |
|-----------|-------------|
| FORM NO.: | 17 590 01-A |
| ISSUED: | 10/08 |
| REVISED: | 3/09 |



1P17 590 01-A



6 50531 87065 0